N A V I G A T I O N

Almanak 2013

ATT 2013 i Uddrag

NP 303 vol 1 Stjerner i uddrag

NP 303 vol 3 i uddrag

Brugervejledning

Navigation består af en samling pdf-filer af skemaer og tabeller, der kan læses og printes ved hjælp af programmet Acrobat Reader 5.0 eller senere versioner.

Til at navigere rundt er der en Hovedmenu og en række faneblade.
Disse sider skal sammen med Acrobat Readers værktøjslinje anvendes, når der skal navigeres mellem dokumenterne eller til at printe.

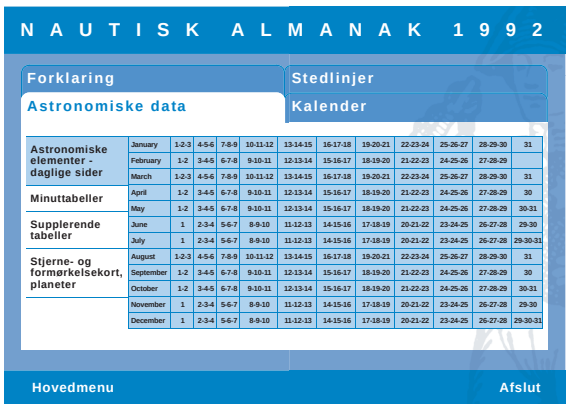
Indhold
For at komme fra indgangsbilledet til fanebladene i de enkelte afsnit, skal der klikkes på det ønskede emne.

Skærmbilleder
Ved opslag i de forskellige menuer vises et skærmbillede af den valgte side i en opløsning, som kan forekomme lidt grov. Når siden udskrives, er opløsningen optimal.

Under de enkelte emner vises en oversigt med et eller flere faneblade.

Ved at klikke på en af fanerne, vises der en ny indholdsfortegnelse.

Til højre for indholdsfortegnelsen vises valgmuligheder for de enkelte dokumenter.



Dokumenterne fra cd'en åbnes ved at klikke på linjerne/cellerne fx 1-2-3 ud for January.
Skal det pågældende dokument printes, er det nødvendigt først at åbne dokumentet, og der skal nu klikkes på  på værktøjslinjen.

Når dokumentet er åbent, kan der zoomes ind og ud, så det er muligt at se mere detaljerede dele af tegning eller tekst.

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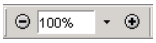
Skal hele skærmbilledet formindskes eller forstørres, kan der klikke på henholdsvis Minus eller Plus 

.
Alternativt kan procenten vælges.
For at returnere til indholdsfortegnelsen, klik på den grå knap 

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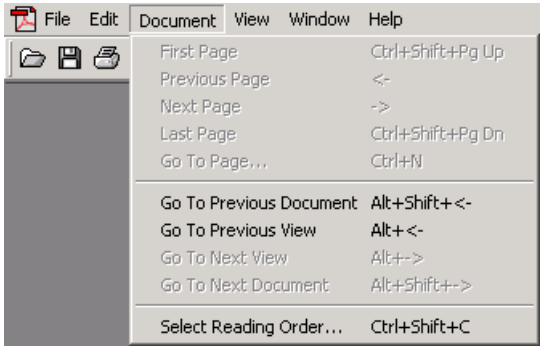
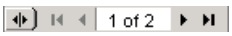
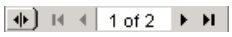
Det er også muligt at bruge menuen: Vælg menuen **Document** og **Go To Previous Document** på menulinjen.



Nogle af dokumenterne består af flere sider. Nederst til venstre vises der, hvor mange sider, der er i dokumentet: 

Brug enten  i værktøjslinjen eller 

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Print af dokumenter
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B R U G E R V E J L E D N I N G

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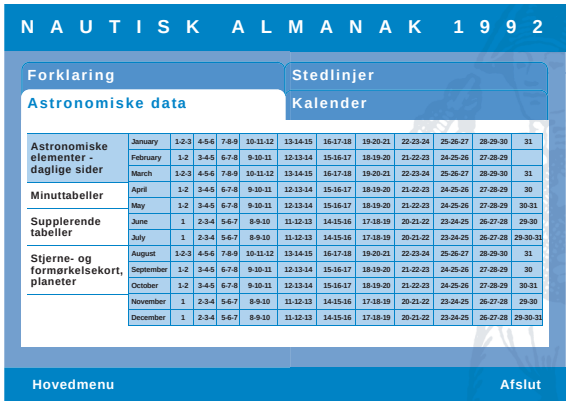

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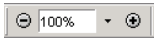
Skal hele skærmbilledet formindskes eller forstørres, kan der klikke på henholdsvis Minus eller Plus 

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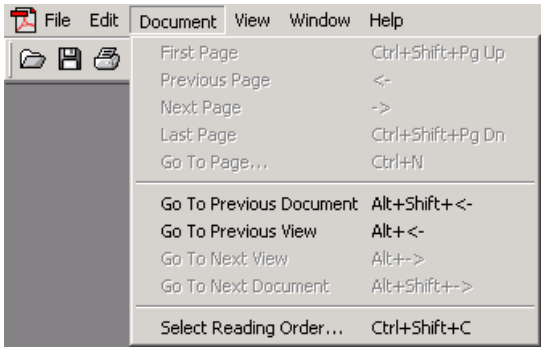
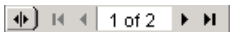


Nogle af dokumenterne består af flere sider. Nederst til venstre vises der, hvor mange sider, der er i dokumentet: 

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Forklaring

Astronomiske data

Astronomiske elementer - daglige sider

Minuttabeller

Supplerende tabeller

Stjerne- og formørkelsekort, planeter

January	1-2-3	4-5-6	7-8-9	10-11-12	13-14-15	16-17-18	19-20-21	22-23-24	25-26-27	28-29-30	31
February	1-2	3-4-5	6-7-8	9-10-11	12-13-14	15-16-17	18-19-20	21-22-23	24-25-26	27-28	
March	1	2-3-4	5-6-7	8-9-10	11-12-13	14-15-16	17-18-19	20-21-22	23-24-25	26-27-28	29-30-31
April	1-2-3	4-5-6	7-8-9	10-11-12	13-14-15	16-17-18	19-20-21	22-23-24	25-26-27	28-29-30	
May	1-2-3	4-5-6	7-8-9	10-11-12	13-14-15	16-17-18	19-20-21	22-23-24	25-26-27	28-29-30	31
June	1-2	3-4-5	6-7-8	9-10-11	12-13-14	15-16-17	18-19-20	21-22-23	24-25-26	27-28-29	30
July	1-2	3-4-5	6-7-8	9-10-11	12-13-14	15-16-17	18-19-20	21-22-23	24-25-26	27-28-29	30-31
August	1	2-3-4	5-6-7	8-9-10	11-12-13	14-15-16	17-18-19	20-21-22	23-24-25	26-27-28	29-30-31
September	1-2-3	4-5-6	7-8-9	10-11-12	13-14-15	16-17-18	19-20-21	22-23-24	25-26-27	28-29-30	
October	1-2-3	4-5-6	7-8-9	10-11-12	13-14-15	16-17-18	19-20-21	22-23-24	25-26-27	28-29-30	31
November	1-2	3-4-5	6-7-8	9-10-11	12-13-14	15-16-17	18-19-20	21-22-23	24-25-26	27-28-29	-30
December	1-2	3-4-5	6-7-8	9-10-11	12-13-14	15-16-17	18-19-20	21-22-23	24-25-26	27-28-29	-30-31

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.7		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
1 00	100 48.7	201 53.4	S22 20.7	153 29.8	S20 12.5	34 41.7	N20 54.3	242 54.4	S12 26.9	Acamar	315 18.3	S40 15.4
01	115 51.1	216 52.5	21.0	168 30.2	12.0	49 44.5	54.3	257 56.7	27.0	Achernar	335 26.9	S57 10.5
02	130 53.6	231 51.6	21.4	183 30.6	11.5	64 47.2	54.3	272 59.0	27.0	Acrux	173 09.5	S63 10.1
03	145 56.0	246 50.6	21.7	198 31.1	11.1	79 49.9	54.2	288 01.2	27.1	Adhara	255 12.4	S28 59.6
04	160 58.5	261 49.7	22.0	213 31.5	10.6	94 52.6	54.2	303 03.5	27.1	Aldebaran	290 49.4	N16 32.0
05	176 01.0	276 48.8	22.4	228 32.0	10.1	109 55.3	54.2	318 05.8	27.2			
06	191 03.4	291 47.9	S22 22.7	243 32.4	S20 09.6	124 58.0	N20 54.1	333 08.1	S12 27.2	Alioth	166 21.0	N55 53.0
07	206 05.9	306 47.0	23.1	258 32.8	09.1	140 00.7	54.1	348 10.3	27.3	Alkaid	152 59.3	N49 14.6
08	221 08.4	321 46.1	23.4	273 33.3	08.7	155 03.5	54.1	3 12.6	27.3	Al Na'ir	27 44.4	S46 53.9
09	236 10.8	336 45.2	23.7	288 33.7	08.2	170 06.2	54.1	18 14.9	27.4	Alnilam	275 46.3	S 1 11.8
10	251 13.3	351 44.3	24.0	303 34.1	07.7	185 08.9	54.0	33 17.2	27.5	Alphard	217 56.1	S 8 43.1
11	266 15.8	6 43.4	24.4	318 34.6	07.2	200 11.6	54.0	48 19.4	27.5			
12	281 18.2	21 42.5	S22 24.7	333 35.0	S20 06.7	215 14.3	N20 54.0	63 21.7	S12 27.6	Alphecca	126 11.5	N26 40.2
13	296 20.7	36 41.6	25.0	348 35.4	06.2	230 17.0	53.9	78 24.0	27.6	Alpheratz	357 43.8	N29 10.0
14	311 23.1	51 40.7	25.4	3 35.9	05.8	245 19.7	53.9	93 26.3	27.7	Altair	62 08.9	N 8 54.3
15	326 25.6	66 39.8	25.7	18 36.3	05.3	260 22.4	53.9	108 28.5	27.7	Ankaa	353 16.0	S42 14.3
16	341 28.1	81 38.9	26.0	33 36.8	04.8	275 25.1	53.9	123 30.8	27.8	Antares	112 26.9	S26 27.5
17	356 30.5	96 38.0	26.3	48 37.2	04.3	290 27.9	53.8	138 33.1	27.8			
18	11 33.0	111 37.1	S22 26.7	63 37.6	S20 03.8	305 30.6	N20 53.8	153 35.4	S12 27.9	Arcturus	145 56.1	N19 06.8
19	26 35.5	126 36.2	27.0	78 38.1	03.3	320 33.3	53.8	168 37.6	27.9	Atria	107 29.5	S69 02.8
20	41 37.9	141 35.3	27.3	93 38.5	02.9	335 36.0	53.7	183 39.9	28.0	Avior	234 17.5	S59 33.1
21	56 40.4	156 34.4	27.6	108 38.9	02.4	350 38.7	53.7	198 42.2	28.0	Bellatrix	278 32.0	N 6 21.5
22	71 42.9	171 33.5	27.9	123 39.4	01.9	5 41.4	53.7	213 44.5	28.1	Betelgeuse	271 01.3	N 7 24.4
23	86 45.3	186 32.6	28.2	138 39.8	01.4	20 44.1	53.7	228 46.7	28.1			
2 00	101 47.8	201 31.7	S22 28.6	153 40.3	S20 00.9	35 46.8	N20 53.6	243 49.0	S12 28.2	Canopus	263 55.7	S52 42.3
01	116 50.3	216 30.7	28.9	168 40.7	20 00.4	50 49.5	53.6	258 51.3	28.2	Capella	280 34.4	N46 00.6
02	131 52.7	231 29.8	29.2	183 41.1	19 59.9	65 52.2	53.6	273 53.6	28.3	Deneb	49 32.1	N45 19.9
03	146 55.2	246 28.9	29.5	198 41.6	59.4	80 54.9	53.5	288 55.8	28.3	Denebola	182 33.9	N14 29.7
04	161 57.6	261 28.0	29.8	213 42.0	59.0	95 57.6	53.5	303 58.1	28.4	Diphda	348 56.2	S17 55.0
05	177 00.1	276 27.1	30.1	228 42.5	58.5	111 00.4	53.5	319 00.4	28.4			
06	192 02.6	291 26.2	S22 30.4	243 42.9	S19 58.0	126 03.1	N20 53.5	334 02.7	S12 28.5	Dubhe	193 51.8	N61 40.4
07	207 05.0	306 25.3	30.7	258 43.3	57.5	141 05.8	53.4	349 05.0	28.6	Elnath	278 12.6	N28 37.0
08	222 07.5	321 24.4	31.0	273 43.8	57.0	156 08.5	53.4	4 07.2	28.6	Eltanin	90 46.8	N51 29.3
09	237 10.0	336 23.5	31.3	288 44.2	56.5	171 11.2	53.4	19 09.5	28.7	Enif	33 47.6	N 9 56.3
10	252 12.4	351 22.6	31.6	303 44.7	56.0	186 13.9	53.4	34 11.8	28.7	Fomalhaut	15 24.5	S29 33.2
11	267 14.9	6 21.6	31.9	318 45.1	55.5	201 16.6	53.3	49 14.1	28.8			
12	282 17.4	21 20.7	S22 32.2	333 45.5	S19 55.0	216 19.3	N20 53.3	64 16.3	S12 28.8	Gacrux	172 01.1	S57 11.0
13	297 19.8	36 19.8	32.5	348 46.0	54.5	231 22.0	53.3	79 18.6	28.9	Gienah	175 52.5	S17 36.9
14	312 22.3	51 18.9	32.8	3 46.4	54.0	246 24.7	53.2	94 20.9	28.9	Hadar	148 48.5	S60 25.9
15	327 24.8	66 18.0	33.1	18 46.9	53.6	261 27.4	53.2	109 23.2	29.0	Hamal	328 00.9	N23 31.5
16	342 27.2	81 17.1	33.4	33 47.3	53.1	276 30.1	53.2	124 25.5	29.0	Kaus Aust.	83 44.6	S34 22.5
17	357 29.7	96 16.2	33.7	48 47.7	52.6	291 32.8	53.2	139 27.7	29.1			
18	12 32.1	111 15.3	S22 34.0	63 48.2	S19 52.1	306 35.5	N20 53.1	154 30.0	S12 29.1	Kochab	137 20.7	N74 05.8
19	27 34.6	126 14.4	34.3	78 48.6	51.6	321 38.2	53.1	169 32.3	29.2	Markab	13 38.8	N15 16.7
20	42 37.1	141 13.4	34.6	93 49.1	51.1	336 40.9	53.1	184 34.6	29.2	Menkar	314 15.2	N 4 08.4
21	57 39.5	156 12.5	34.9	108 49.5	50.6	351 43.6	53.1	199 36.8	29.3	Menkent	148 08.0	S36 25.9
22	72 42.0	171 11.6	35.2	123 50.0	50.1	6 46.3	53.0	214 39.1	29.3	Miaplacidus	221 38.9	S69 46.2
23	87 44.5	186 10.7	35.5	138 50.4	49.6	21 49.0	53.0	229 41.4	29.4			
3 00	102 46.9	201 09.8	S22 35.8	153 50.8	S19 49.1	36 51.7	N20 53.0	244 43.7	S12 29.4	Mirfak	308 40.4	N49 54.6
01	117 49.4	216 08.9	36.0	168 51.3	48.6	51 54.4	52.9	259 46.0	29.5	Nunki	75 59.1	S26 16.7
02	132 51.9	231 08.0	36.3	183 51.7	48.1	66 57.1	52.9	274 48.2	29.5	Peacock	53 20.3	S56 41.5
03	147 54.3	246 07.0	36.6	198 52.2	47.6	81 59.8	52.9	289 50.5	29.6	Pollux	243 27.7	N27 59.4
04	162 56.8	261 06.1	36.9	213 52.6	47.1	97 02.5	52.9	304 52.8	29.6	Procyon	244 59.7	N 5 11.3
05	177 59.2	276 05.2	37.2	228 53.1	46.6	112 05.2	52.8	319 55.1	29.7			
06	193 01.7	291 04.3	S22 37.4	243 53.5	S19 46.1	127 07.9	N20 52.8	334 57.4	S12 29.7	Rasalhague	96 07.1	N12 33.1
07	208 04.2	306 03.4	37.7	258 53.9	45.6	142 10.6	52.8	349 59.6	29.8	Regulus	207 43.6	N11 54.0
08	223 06.6	321 02.5	38.0	273 54.4	45.1	157 13.3	52.8	5 01.9	29.8	Rigel	281 12.0	S 8 11.4
09	238 09.1	336 01.6	38.3	288 54.8	44.6	172 16.0	52.7	20 04.2	29.9	Rigil Kent.	139 52.4	S60 53.0
10	253 11.6	351 00.6	38.6	303 55.3	44.1	187 18.7	52.7	35 06.5	29.9	Sabik	102 13.2	S15 44.3
11	268 14.0	5 59.7	38.8	318 55.7	43.6	202 21.4	52.7	50 08.8	30.0			
12	283 16.5	20 58.8	S22 39.1	333 56.2	S19 43.1	217 24.1	N20 52.7	65 11.1	S12 30.0	Schedar	349 40.8	N56 36.9
13	298 19.0	35 57.9	39.4	348 56.6	42.6	232 26.8	52.6	80 13.3	30.1	Shaula	96 22.7	S37 06.6
14	313 21.4	50 57.0	39.6	3 57.1	42.1	247 29.5	52.6	95 15.6	30.1	Sirius	258 33.6	S16 44.2
15	328 23.9	65 56.0	39.9	18 57.5	41.6	262 32.2	52.6	110 17.9	30.2	Spica	158 31.6	S11 13.7
16	343 26.4	80 55.1	40.2	33 57.9	41.1	277 34.9	52.5	125 20.2	30.2	Suhail	222 52.3	S43 29.2
17	358 28.8	95 54.2	40.4	48 58.4	40.6	292 37.6	52.5	140 22.5	30.3			
18	13 31.3	110 53.3	S22 40.7	63 58.8	S19 40.1	307 40.3	N20 52.5	155 24.7	S12 30.3	Vega	80 39.6	N38 47.9
19	28 33.7	125 52.4	41.0	78 59.3	39.6	322 43.0	52.5	170 27.0	30.4	Zuben'ubi	137 05.9	S16 05.7
20	43 36.2	140 51.5	41.2	93 59.7	39.1	337 45.7	52.4	185 29.3	30.4			
21	58 38.7	155 50.5	41.5	109 00.2	38.6	352 48.4	52.4	200 31.6	30.5		SHA	Mer.Pass.
22	73 41.1	170 49.6	41.8	124 00.6	38.1	7 51.1	52.4	215 33.9	30.5		° ′	h m
23	88 43.6	185 48.7	42.0	139 01.1	37.6	22 53.8	52.4	230 36.2	30.6	Venus	99 43.9	10 35
	h m									Mars	51 52.5	13 45
Mer.Pass.	17 10.0	v −0.9	d 0.3	v 0.4	d 0.5	v 2.7	d 0.0	v 2.3	d 0.1	Jupiter	293 59.0	21 33
										Saturn	142 01.2	7 44

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		1	2	3	4
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
1 00	179 08.3	S23 00.1	319 18.2	13.4	N 9 42.5	10.0	55.5	N 72	08 23	10 39		20 02	21 51	23 41	25 37
01	194 08.1	22 59.9	333 50.6	13.5	9 32.5	10.0	55.5	N 70	08 04	09 48		20 12	21 53	23 36	25 23
02	209 07.8	59.7	348 23.1	13.5	9 22.5	10.1	55.6	68	07 49	09 16		20 19	21 54	23 31	25 12
03	224 07.5	59.5	2 55.6	13.5	9 12.4	10.1	55.6	66	07 37	08 52	10 26	20 25	21 55	23 28	25 03
04	239 07.2	59.3	17 28.1	13.5	9 02.3	10.2	55.6	64	07 26	08 33	09 48	20 30	21 57	23 25	24 56
05	254 06.9	59.1	32 00.6	13.5	8 52.1	10.2	55.6	62	07 17	08 18	09 22	20 35	21 58	23 22	24 49
06	269 06.6	S22 58.9	46 33.1	13.5	N 8 41.9	10.2	55.6	60	07 09	08 05	09 02	20 39	21 58	23 20	24 44
07	284 06.3	58.7	61 05.6	13.5	8 31.7	10.3	55.7	N 58	07 02	07 54	08 45	20 42	21 59	23 18	24 39
08	299 06.0	58.5	75 38.1	13.5	8 21.4	10.4	55.7	56	06 55	07 44	08 31	20 45	22 00	23 16	24 35
09	314 05.7	58.3	90 10.6	13.6	8 11.0	10.4	55.7	54	06 50	07 35	08 19	20 48	22 00	23 14	24 31
10	329 05.4	58.1	104 43.2	13.5	8 00.6	10.4	55.7	52	06 44	07 27	08 08	20 50	22 01	23 13	24 27
11	344 05.1	57.8	119 15.7	13.6	7 50.2	10.5	55.8	50	06 39	07 20	07 58	20 53	22 01	23 12	24 24
12	359 04.8	S22 57.6	133 48.3	13.5	N 7 39.7	10.5	55.8	45	06 28	07 05	07 38	20 57	22 02	23 09	24 17
13	14 04.5	57.4	148 20.8	13.6	7 29.2	10.5	55.8	N 40	06 18	06 52	07 22	21 01	22 03	23 06	24 11
14	29 04.2	57.2	162 53.4	13.5	7 18.7	10.6	55.8	35	06 09	06 40	07 08	21 05	22 04	23 04	24 07
15	44 03.9	57.0	177 25.9	13.6	7 08.1	10.7	55.8	30	06 00	06 30	06 56	21 08	22 05	23 03	24 02
16	59 03.7	56.8	191 58.5	13.5	6 57.4	10.7	55.9	20	05 44	06 12	06 36	21 13	22 06	22 59	23 55
17	74 03.4	56.6	206 31.0	13.6	6 46.7	10.7	55.9	N 10	05 28	05 55	06 17	21 18	22 07	22 57	23 48
18	89 03.1	S22 56.3	221 03.6	13.5	N 6 36.0	10.7	55.9	0	05 12	05 38	06 00	21 22	22 08	22 54	23 42
19	104 02.8	56.1	235 36.1	13.6	6 25.3	10.8	55.9	S 10	04 53	05 20	05 43	21 27	22 09	22 52	23 36
20	119 02.5	55.9	250 08.7	13.6	6 14.5	10.8	55.9	20	04 31	05 00	05 25	21 31	22 10	22 49	23 30
21	134 02.2	55.7	264 41.3	13.5	6 03.7	10.9	56.0	30	04 03	04 36	05 03	21 37	22 11	22 46	23 23
22	149 01.9	55.4	279 13.8	13.6	5 52.8	10.9	56.0	35	03 45	04 21	04 51	21 40	22 12	22 45	23 19
23	164 01.6	55.2	293 46.4	13.5	5 41.9	10.9	56.0	40	03 22	04 03	04 36	21 43	22 13	22 43	23 14
2 00	179 01.3	S22 55.0	308 18.9	13.6	N 5 31.0	10.9	56.0	45	02 52	03 41	04 18	21 47	22 14	22 41	23 09
01	194 01.0	54.8	322 51.5	13.5	5 20.1	11.0	56.1	S 50	02 09	03 13	03 56	21 52	22 15	22 38	23 03
02	209 00.7	54.6	337 24.0	13.6	5 09.1	11.0	56.1	52	01 43	02 58	03 46	21 54	22 15	22 37	23 00
03	224 00.5	54.3	351 56.6	13.5	4 58.1	11.1	56.1	54	01 04	02 41	03 34	21 56	22 16	22 35	22 57
04	239 00.2	54.1	6 29.1	13.5	4 47.0	11.1	56.1	56	////	02 20	03 20	21 59	22 16	22 34	22 53
05	253 59.9	53.9	21 01.6	13.6	4 35.9	11.1	56.2	58	////	01 52	03 04	22 02	22 17	22 33	22 49
06	268 59.6	S22 53.6	35 34.2	13.5	N 4 24.8	11.1	56.2	S 60	////	01 10	02 45	22 05	22 18	22 31	22 45
07	283 59.3	53.4	50 06.7	13.5	4 13.7	11.2	56.2								
08	298 59.0	53.2	64 39.2	13.5	4 02.5	11.2	56.2								
09	313 58.7	53.0	79 11.7	13.5	3 51.3	11.2	56.2								
10	328 58.4	52.7	93 44.2	13.4	3 40.1	11.2	56.3								
11	343 58.1	52.5	108 16.6	13.5	3 28.9	11.3	56.3								
12	358 57.8	S22 52.3	122 49.1	13.4	N 3 17.6	11.3	56.3								
13	13 57.6	52.0	137 21.5	13.5	3 06.3	11.3	56.3								
14	28 57.3	51.8	151 54.0	13.4	2 55.0	11.3	56.4								
15	43 57.0	51.6	166 26.4	13.4	2 43.7	11.4	56.4								
16	58 56.7	51.3	180 58.8	13.4	2 32.3	11.4	56.4								
17	73 56.4	51.1	195 31.2	13.4	2 20.9	11.4	56.4								
18	88 56.1	S22 50.8	210 03.6	13.3	N 2 09.5	11.4	56.5								
19	103 55.8	50.6	224 35.9	13.4	1 58.1	11.4	56.5								
20	118 55.5	50.4	239 08.3	13.3	1 46.7	11.5	56.5								
21	133 55.2	50.1	253 40.6	13.3	1 35.2	11.4	56.5								
22	148 55.0	49.9	268 12.9	13.3	1 23.8	11.5	56.6								
23	163 54.7	49.6	282 45.2	13.2	1 12.3	11.5	56.6								
3 00	178 54.4	S22 49.4	297 17.4	13.3	N 1 00.8	11.5	56.6								
01	193 54.1	49.2	311 49.7	13.2	0 49.3	11.6	56.7								
02	208 53.8	48.9	326 21.9	13.2	0 37.7	11.5	56.7								
03	223 53.5	48.7	340 54.1	13.1	0 26.2	11.6	56.7								
04	238 53.2	48.4	355 26.2	13.2	0 14.6	11.5	56.7								
05	253 52.9	48.2	9 58.4	13.1	N 0 03.1	11.6	56.8								
06	268 52.7	S22 47.9	24 30.5	13.1	S 0 08.5	11.6	56.8								
07	283 52.4	47.7	39 02.6	13.0	0 20.1	11.6	56.8								
08	298 52.1	47.4	53 34.6	13.1	0 31.7	11.6	56.8								
09	313 51.8	47.2	68 06.7	13.0	0 43.3	11.6	56.9								
10	328 51.5	46.9	82 38.7	12.9	0 54.9	11.6	56.9								
11	343 51.2	46.7	97 10.6	13.0	1 06.5	11.6	56.9								
12	358 50.9	S22 46.4	111 42.6	12.9	S 1 18.1	11.6	56.9								
13	13 50.7	46.2	126 14.5	12.8	1 29.7	11.7	57.0								
14	28 50.4	45.9	140 46.3	12.9	1 41.4	11.6	57.0								
15	43 50.1	45.7	155 18.2	12.8	1 53.0	11.6	57.0								
16	58 49.8	45.4	169 50.0	12.7	2 04.6	11.7	57.1								
17	73 49.5	45.2	184 21.7	12.8	2 16.3	11.6	57.1								
18	88 49.2	S22 44.9	198 53.5	12.7	S 2 27.9	11.6	57.1								
19	103 49.0	44.6	213 25.2	12.6	2 39.5	11.6	57.1								
20	118 48.7	44.4	227 56.8	12.6	2 51.1	11.7	57.2								
21	133 48.4	44.1	242 28.4	12.6	3 02.8	11.6	57.2								
22	148 48.1	43.9	257 00.0	12.5	3 14.4	11.6	57.2								
23	163 47.8	43.6	271 31.5	12.5	S 3 26.0	11.6	57.3								
	SD 16.3	d 0.2	SD	15.2		15.3		15.5							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	1	2	3	4
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 30	15 46	10 42	10 29	10 16	10 03
N 70	▬	14 21	16 05	10 31	10 24	10 18	10 11
68	▬	14 53	16 20	10 21	10 20	10 19	10 18
66	13 43	15 17	16 32	10 14	10 17	10 20	10 23
64	14 20	15 35	16 42	10 07	10 14	10 21	10 28
62	14 47	15 50	16 52	10 02	10 12	10 22	10 32
60	15 07	16 03	17 00	09 57	10 10	10 22	10 35
N 58	15 24	16 15	17 07	09 52	10 08	10 23	10 39
56	15 38	16 24	17 13	09 48	10 06	10 23	10 41
54	15 50	16 33	17 19	09 45	10 05	10 24	10 44
52	16 01	16 41	17 24	09 42	10 03	10 24	10 46
50	16 10	16 48	17 29	09 39	10 02	10 25	10 48
45	16 30	17 04	17 41	09 32	09 59	10 26	10 53
N 40	16 46	17 17	17 51	09 27	09 57	10 26	10 57
35	17 00	17 28	18 00	09 22	09 55	10 27	11 00
30	17 12	17 38	18 08	09 18	09 53	10 27	11 03
20	17 33	17 57	18 24	09 11	09 50	10 28	11 08
N 10	17 51	18 14	18 40	09 05	09 47	10 29	11 13
0	18 08	18 30	18 56	08 59	09 44	10 30	11 17
S 10	18 25	18 48	19 15	08 53	09 41	10 31	11 21
20	18 43	19 08	19 37	08 46	09 38	10 31	11 26
30	19 05	19 32	20 05	08 39	09 35	10 32	11 31
35	19 18	19 47	20 23	08 35	09 33	10 33	11 34
40	19 32	20 05	20 46	08 30	09 31	10 33	11 37
45	19 50	20 27	21 15	08 24	09 28	10 34	11 41
S 50	20 11	20 55	21 58	08 17	09 25	10 35	11 46
52	20 22	21 10	22 24	08 14	09 24	10 35	11 48
54	20 34	21 27	23 02	08 11	09 22	10 35	11 50
56	20 47	21 47	////	08 07	09 20	10 36	11 53
58	21 03	22 15	////	08 02	09 19	10 36	11 56
S 60	21 22	22 56	////	07 57	09 16	10 37	11 59

Day	SUN			MOON			
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00h	12h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
1	03 26	03 40	12 04	02 48	15 11	19	85
2	03 54	04 08	12 04	03 33	15 56	20	77
3	04 22	04 36	12 05	04 19	16 42	21	68

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.7		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
4 00	103 46.1	200 47.8	S22 42.3	154 01.5	S19 37.1	37 56.5	N20 52.3	245 38.4	S12 30.6	Acamar	315 18.3	S40 15.4
01	118 48.5	215 46.9	42.5	169 02.0	36.6	52 59.1	52.3	260 40.7	30.7	Achernar	335 26.9	S57 10.5
02	133 51.0	230 45.9	42.8	184 02.4	36.1	68 01.8	52.3	275 43.0	30.7	Acrux	173 09.4	S63 10.1
03	148 53.5	245 45.0 . .	43.0	199 02.9 . .	35.6	83 04.5 . .	52.3	290 45.3 . .	30.8	Adhara	255 12.4	S28 59.6
04	163 55.9	260 44.1	43.3	214 03.3	35.0	98 07.2	52.2	305 47.6	30.8	Aldebaran	290 49.4	N16 32.0
05	178 58.4	275 43.2	43.5	229 03.7	34.5	113 09.9	52.2	320 49.9	30.9			
06	194 00.9	290 42.3	S22 43.8	244 04.2	S19 34.0	128 12.6	N20 52.2	335 52.1	S12 30.9	Alioth	166 21.0	N55 53.0
07	209 03.3	305 41.3	44.0	259 04.6	33.5	143 15.3	52.2	350 54.4	31.0	Alkaid	152 59.3	N49 14.6
08	224 05.8	320 40.4	44.3	274 05.1	33.0	158 18.0	52.1	5 56.7	31.0	Al Na'ir	27 44.4	S46 53.9
F 09	239 08.2	335 39.5 . .	44.5	289 05.5 . .	32.5	173 20.7 . .	52.1	20 59.0 . .	31.1	Alnilam	275 46.3	S 1 11.8
R 10	254 10.7	350 38.6	44.8	304 06.0	32.0	188 23.4	52.1	36 01.3	31.1	Alphard	217 56.1	S 8 43.1
I 11	269 13.2	5 37.6	45.0	319 06.4	31.5	203 26.1	52.1	51 03.6	31.2			
D 12	284 15.6	20 36.7	S22 45.3	334 06.9	S19 31.0	218 28.8	N20 52.0	66 05.8	S12 31.2	Alphecca	126 11.5	N26 40.2
A 13	299 18.1	35 35.8	45.5	349 07.3	30.5	233 31.4	52.0	81 08.1	31.3	Alpheratz	357 43.9	N29 10.0
Y 14	314 20.6	50 34.9	45.8	4 07.8	30.0	248 34.1	52.0	96 10.4	31.3	Altair	62 08.9	N 8 54.3
15	329 23.0	65 34.0 . .	46.0	19 08.2 . .	29.4	263 36.8 . .	51.9	111 12.7 . .	31.4	Ankaa	353 16.1	S42 14.3
16	344 25.5	80 33.0	46.2	34 08.7	28.9	278 39.5	51.9	126 15.0	31.4	Antares	112 26.9	S26 27.5
17	359 28.0	95 32.1	46.5	49 09.1	28.4	293 42.2	51.9	141 17.3	31.5			
18	14 30.4	110 31.2	S22 46.7	64 09.6	S19 27.9	308 44.9	N20 51.9	156 19.5	S12 31.5	Arcturus	145 56.1	N19 06.7
19	29 32.9	125 30.3	46.9	79 10.0	27.4	323 47.6	51.8	171 21.8	31.6	Atria	107 29.5	S69 02.8
20	44 35.3	140 29.3	47.2	94 10.5	26.9	338 50.3	51.8	186 24.1	31.6	Avior	234 17.5	S59 33.1
21	59 37.8	155 28.4 . .	47.4	109 10.9 . .	26.4	353 52.9 . .	51.8	201 26.4 . .	31.7	Bellatrix	278 32.0	N 6 21.5
22	74 40.3	170 27.5	47.6	124 11.4	25.9	8 55.6	51.8	216 28.7	31.7	Betelgeuse	271 01.3	N 7 24.4
23	89 42.7	185 26.6	47.9	139 11.8	25.3	23 58.3	51.7	231 31.0	31.8			
5 00	104 45.2	200 25.6	S22 48.1	154 12.3	S19 24.8	39 01.0	N20 51.7	246 33.3	S12 31.8	Canopus	263 55.7	S52 42.4
01	119 47.7	215 24.7	48.3	169 12.7	24.3	54 03.7	51.7	261 35.5	31.9	Capella	280 34.4	N46 00.6
02	134 50.1	230 23.8	48.6	184 13.2	23.8	69 06.4	51.7	276 37.8	31.9	Deneb	49 32.1	N45 19.9
03	149 52.6	245 22.9 . .	48.8	199 13.6 . .	23.3	84 09.1 . .	51.6	291 40.1 . .	32.0	Denebola	182 33.9	N14 29.7
04	164 55.1	260 21.9	49.0	214 14.1	22.8	99 11.7	51.6	306 42.4	32.0	Diphda	348 56.2	S17 55.0
05	179 57.5	275 21.0	49.2	229 14.5	22.3	114 14.4	51.6	321 44.7	32.1			
06	195 00.0	290 20.1	S22 49.5	244 15.0	S19 21.7	129 17.1	N20 51.6	336 47.0	S12 32.1	Dubhe	193 51.8	N61 40.4
07	210 02.5	305 19.2	49.7	259 15.4	21.2	144 19.8	51.6	351 49.3	32.2	Elnath	278 12.6	N28 37.0
S 08	225 04.9	320 18.2	49.9	274 15.9	20.7	159 22.5	51.5	6 51.6	32.2	Eltanin	90 46.8	N51 29.3
A 09	240 07.4	335 17.3 . .	50.1	289 16.3 . .	20.2	174 25.2 . .	51.5	21 53.8 . .	32.2	Enif	33 47.7	N 9 56.2
T 10	255 09.8	350 16.4	50.3	304 16.8	19.7	189 27.8	51.5	36 56.1	32.3	Fomalhaut	15 24.5	S29 33.2
U 11	270 12.3	5 15.4	50.5	319 17.3	19.1	204 30.5	51.5	51 58.4	32.3			
R 12	285 14.8	20 14.5	S22 50.8	334 17.7	S19 18.6	219 33.2	N20 51.4	67 00.7	S12 32.4	Gacrux	172 01.1	S57 11.0
D 13	300 17.2	35 13.6	51.0	349 18.2	18.1	234 35.9	51.4	82 03.0	32.4	Gienah	175 52.5	S17 36.9
A 14	315 19.7	50 12.7	51.2	4 18.6	17.6	249 38.6	51.4	97 05.3	32.5	Hadar	148 48.5	S60 25.9
Y 15	330 22.2	65 11.7 . .	51.4	19 19.1 . .	17.1	264 41.3 . .	51.4	112 07.6 . .	32.5	Hamal	328 01.0	N23 31.5
16	345 24.6	80 10.8	51.6	34 19.5	16.6	279 43.9	51.3	127 09.9	32.6	Kaus Aust.	83 44.6	S34 22.5
17	0 27.1	95 09.9	51.8	49 20.0	16.0	294 46.6	51.3	142 12.1	32.6			
18	15 29.6	110 08.9	S22 52.0	64 20.4	S19 15.5	309 49.3	N20 51.3	157 14.4	S12 32.7	Kochab	137 20.7	N74 05.8
19	30 32.0	125 08.0	52.2	79 20.9	15.0	324 52.0	51.3	172 16.7	32.7	Markab	13 38.8	N15 16.7
20	45 34.5	140 07.1	52.4	94 21.3	14.5	339 54.7	51.2	187 19.0	32.8	Menkar	314 15.2	N 4 08.4
21	60 37.0	155 06.2 . .	52.6	109 21.8 . .	13.9	354 57.3 . .	51.2	202 21.3 . .	32.8	Menkent	148 08.0	S36 25.9
22	75 39.4	170 05.2	52.8	124 22.2	13.4	10 00.0	51.2	217 23.6	32.9	Miaplacidus	221 38.9	S69 46.2
23	90 41.9	185 04.3	53.0	139 22.7	12.9	25 02.7	51.2	232 25.9	32.9			
6 00	105 44.3	200 03.4	S22 53.2	154 23.2	S19 12.4	40 05.4	N20 51.1	247 28.2	S12 33.0	Mirfak	308 40.4	N49 54.6
01	120 46.8	215 02.4	53.4	169 23.6	11.9	55 08.1	51.1	262 30.5	33.0	Nunki	75 59.1	S26 16.7
02	135 49.3	230 01.5	53.6	184 24.1	11.3	70 10.7	51.1	277 32.7	33.1	Peacock	53 20.3	S56 41.5
03	150 51.7	245 00.6 . .	53.8	199 24.5 . .	10.8	85 13.4 . .	51.1	292 35.0 . .	33.1	Pollux	243 27.7	N27 59.4
04	165 54.2	259 59.6	54.0	214 25.0	10.3	100 16.1	51.0	307 37.3	33.2	Procyon	244 59.7	N 5 11.3
05	180 56.7	274 58.7	54.2	229 25.4	09.8	115 18.8	51.0	322 39.6	33.2			
06	195 59.1	289 57.8	S22 54.4	244 25.9	S19 09.2	130 21.4	N20 51.0	337 41.9	S12 33.2	Rasalhague	96 07.1	N12 33.1
07	211 01.6	304 56.9	54.6	259 26.3	08.7	145 24.1	51.0	352 44.2	33.3	Regulus	207 43.6	N11 54.0
08	226 04.1	319 55.9	54.8	274 26.8	08.2	160 26.8	50.9	7 46.5	33.3	Rigel	281 12.0	S 8 11.4
S 09	241 06.5	334 55.0 . .	55.0	289 27.3 . .	07.7	175 29.5 . .	50.9	22 48.8 . .	33.4	Rigil Kent.	139 52.4	S60 53.0
U 10	256 09.0	349 54.1	55.2	304 27.7	07.1	190 32.1	50.9	37 51.1	33.4	Sabik	102 13.2	S15 44.3
N 11	271 11.4	4 53.1	55.4	319 28.2	06.6	205 34.8	50.9	52 53.4	33.5			
D 12	286 13.9	19 52.2	S22 55.6	334 28.6	S19 06.1	220 37.5	N20 50.9	67 55.6	S12 33.5	Schedar	349 40.8	N56 36.9
A 13	301 16.4	34 51.3	55.7	349 29.1	05.5	235 40.2	50.8	82 57.9	33.6	Shaula	96 22.7	S37 06.6
Y 14	316 18.8	49 50.3	55.9	4 29.5	05.0	250 42.8	50.8	98 00.2	33.6	Sirius	258 33.6	S16 44.2
15	331 21.3	64 49.4 . .	56.1	19 30.0 . .	04.5	265 45.5 . .	50.8	113 02.5 . .	33.7	Spica	158 31.6	S11 13.8
16	346 23.8	79 48.5	56.3	34 30.5	04.0	280 48.2	50.8	128 04.8	33.7	Suhail	222 52.2	S43 29.2
17	1 26.2	94 47.5	56.5	49 30.9	03.4	295 50.9	50.7	143 07.1	33.8			
18	16 28.7	109 46.6	S22 56.6	64 31.4	S19 02.9	310 53.5	N20 50.7	158 09.4	S12 33.8	Vega	80 39.6	N38 47.9
19	31 31.2	124 45.7	56.8	79 31.8	02.4	325 56.2	50.7	173 11.7	33.9	Zuben'ubi	137 05.9	S16 05.7
20	46 33.6	139 44.7	57.0	94 32.3	01.8	340 58.9	50.7	188 14.0	33.9		SHA	Mer.Pass.
21	61 36.1	154 43.8 . .	57.2	109 32.7 . .	01.3	356 01.5 . .	50.6	203 16.3 . .	33.9		° ′	h m
22	76 38.6	169 42.9	57.4	124 33.2	00.8	11 04.2	50.6	218 18.6	34.0	Venus	95 40.4	10 39
23	91 41.0	184 41.9	57.5	139 33.7	00.2	26 06.9	50.6	233 20.8	34.0	Mars	49 27.1	13 43
	h m									Jupiter	294 15.8	21 20
Mer.Pass.	16 58.2	v −0.9	d 0.2	v 0.5	d 0.5	v 2.7	d 0.0	v 2.3	d 0.0	Saturn	141 48.1	7 33

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 4	Moonrise 5	Moonrise 6	Moonrise 7
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
4 00	178 47.5	S22 43.3	286 03.0	12.4	S 3 37.6	11.6	57.3	N 72	08 19	10 29	▬	25 37	01 37	03 45	06 27
01	193 47.2	43.1	300 34.4	12.4	3 49.2	11.6	57.3	N 70	08 01	09 42	▬	25 23	01 23	03 19	05 26
02	208 47.0	42.8	315 05.8	12.4	4 00.8	11.6	57.3	68	07 47	09 12	11 27	25 12	01 12	02 59	04 51
03	223 46.7 . .	42.6	329 37.2	12.3	4 12.4	11.6	57.4	66	07 35	08 49	10 19	25 03	01 03	02 43	04 26
04	238 46.4	42.3	344 08.5	12.3	4 24.0	11.6	57.4	64	07 25	08 31	09 44	24 56	00 56	02 30	04 07
05	253 46.1	42.0	358 39.8	12.2	4 35.6	11.5	57.4	62	07 16	08 16	09 19	24 49	00 49	02 20	03 51
06	268 45.8	S22 41.8	13 11.0	12.1	S 4 47.1	11.6	57.5	60	07 08	08 04	08 59	24 44	00 44	02 10	03 38
07	283 45.6	41.5	27 42.1	12.2	4 58.7	11.5	57.5	N 58	07 01	07 53	08 43	24 39	00 39	02 02	03 27
08	298 45.3	41.2	42 13.3	12.0	5 10.2	11.5	57.5	56	06 55	07 43	08 30	24 35	00 35	01 55	03 17
F 09	313 45.0 . .	41.0	56 44.3	12.0	5 21.7	11.5	57.6	54	06 49	07 35	08 18	24 31	00 31	01 49	03 09
R 10	328 44.7	40.7	71 15.3	12.0	5 33.2	11.5	57.6	52	06 44	07 27	08 07	24 27	00 27	01 44	03 01
I 11	343 44.4	40.4	85 46.3	11.9	5 44.7	11.5	57.6	50	06 39	07 20	07 58	24 24	00 24	01 39	02 54
D 12	358 44.1	S22 40.1	100 17.2	11.9	S 5 56.2	11.4	57.6	45	06 28	07 05	07 38	24 17	00 17	01 28	02 40
A 13	13 43.9	39.9	114 48.1	11.7	6 07.6	11.5	57.7	N 40	06 18	06 52	07 22	24 11	00 11	01 19	02 28
Y 14	28 43.6	39.6	129 18.8	11.8	6 19.1	11.4	57.7	35	06 09	06 41	07 09	24 07	00 07	01 11	02 17
15	43 43.3 . .	39.3	143 49.6	11.7	6 30.5	11.4	57.7	30	06 01	06 31	06 57	24 02	00 02	01 04	02 09
16	58 43.0	39.0	158 20.3	11.6	6 41.9	11.3	57.8	20	05 45	06 12	06 36	23 55	24 53	00 53	01 53
17	73 42.7	38.8	172 50.9	11.6	6 53.2	11.4	57.8	N 10	05 30	05 56	06 19	23 48	24 43	00 43	01 40
18	88 42.5	S22 38.5	187 21.5	11.5	S 7 04.6	11.3	57.8	0	05 13	05 39	06 02	23 42	24 33	00 33	01 28
19	103 42.2	38.2	201 52.0	11.4	7 15.9	11.3	57.9	S 10	04 55	05 22	05 45	23 36	24 24	00 24	01 15
20	118 41.9	37.9	216 22.4	11.4	7 27.2	11.2	57.9	20	04 33	05 02	05 27	23 30	24 14	00 14	01 02
21	133 41.6 . .	37.7	230 52.8	11.4	7 38.4	11.3	57.9	30	04 05	04 38	05 05	23 23	24 03	00 03	00 47
22	148 41.3	37.4	245 23.2	11.2	7 49.7	11.2	57.9	35	03 47	04 24	04 53	23 19	23 57	24 39	00 39
23	163 41.1	37.1	259 53.4	11.2	8 00.9	11.2	58.0	40	03 25	04 06	04 39	23 14	23 49	24 29	00 29
5 00	178 40.8	S22 36.8	274 23.6	11.2	S 8 12.1	11.1	58.0	45	02 56	03 45	04 21	23 09	23 41	24 18	00 18
01	193 40.5	36.5	288 53.8	11.0	8 23.2	11.1	58.0	S 50	02 14	03 16	04 00	23 03	23 31	24 04	00 04
02	208 40.2	36.3	303 23.8	11.0	8 34.3	11.1	58.1	52	01 49	03 02	03 50	23 00	23 26	23 58	24 37
03	223 39.9 . .	36.0	317 53.8	11.0	8 45.4	11.1	58.1	54	01 13	02 45	03 38	22 57	23 21	23 51	24 28
04	238 39.7	35.7	332 23.8	10.8	8 56.5	11.0	58.1	56	////	02 25	03 25	22 53	23 15	23 43	24 19
05	253 39.4	35.4	346 53.6	10.8	9 07.5	11.0	58.2	58	////	01 59	03 09	22 49	23 09	23 34	24 07
06	268 39.1	S22 35.1	1 23.4	10.8	S 9 18.5	10.9	58.2	S 60	////	01 20	02 50	22 45	23 02	23 24	23 55
07	283 38.8	34.8	15 53.2	10.6	9 29.4	10.9	58.2								
S 08	298 38.5	34.6	30 22.8	10.6	9 40.3	10.9	58.3								
A 09	313 38.3 . .	34.3	44 52.4	10.6	9 51.2	10.8	58.3								
T 10	328 38.0	34.0	59 22.0	10.4	10 02.0	10.8	58.3								
U 11	343 37.7	33.7	73 51.4	10.4	10 12.8	10.7	58.3								
R 12	358 37.4	S22 33.4	88 20.8	10.3	S10 23.5	10.7	58.4								
D 13	13 37.2	33.1	102 50.1	10.2	10 34.2	10.6	58.4								
A 14	28 36.9	32.8	117 19.3	10.2	10 44.8	10.6	58.4								
Y 15	43 36.6 . .	32.5	131 48.5	10.0	10 55.4	10.6	58.5								
16	58 36.3	32.2	146 17.5	10.0	11 06.0	10.5	58.5								
17	73 36.1	31.9	160 46.5	10.0	11 16.5	10.4	58.5								
18	88 35.8	S22 31.7	175 15.5	9.8	S11 26.9	10.4	58.6								
19	103 35.5	31.4	189 44.3	9.8	11 37.3	10.4	58.6								
20	118 35.2	31.1	204 13.1	9.7	11 47.7	10.2	58.6								
21	133 35.0 . .	30.8	218 41.8	9.6	11 57.9	10.3	58.7								
22	148 34.7	30.5	233 10.4	9.5	12 08.2	10.1	58.7								
23	163 34.4	30.2	247 38.9	9.5	12 18.3	10.1	58.7								
6 00	178 34.1	S22 29.9	262 07.4	9.3	S12 28.4	10.1	58.8								
01	193 33.9	29.6	276 35.7	9.3	12 38.5	10.0	58.8								
02	208 33.6	29.3	291 04.0	9.2	12 48.5	9.9	58.8								
03	223 33.3 . .	29.0	305 32.2	9.1	12 58.4	9.9	58.8								
04	238 33.0	28.7	320 00.3	9.1	13 08.3	9.8	58.9								
05	253 32.8	28.4	334 28.4	8.9	13 18.1	9.7	58.9								
06	268 32.5	S22 28.1	348 56.3	8.9	S13 27.8	9.7	58.9								
07	283 32.2	27.8	3 24.2	8.8	13 37.5	9.6	59.0								
S 08	298 31.9	27.5	17 52.0	8.7	13 47.1	9.5	59.0								
U 09	313 31.7 . .	27.1	32 19.7	8.6	13 56.6	9.4	59.0								
N 10	328 31.4	26.8	46 47.3	8.5	14 06.0	9.4	59.1								
D 11	343 31.1	26.5	61 14.8	8.5	14 15.4	9.3	59.1								
A 12	358 30.8	S22 26.2	75 42.3	8.3	S14 24.7	9.2	59.1								
Y 13	13 30.6	25.9	90 09.6	8.3	14 33.9	9.2	59.2								
14	28 30.3	25.6	104 36.9	8.2	14 43.1	9.1	59.2								
15	43 30.0 . .	25.3	119 04.1	8.1	14 52.2	8.9	59.2								
16	58 29.8	25.0	133 31.2	8.0	15 01.1	9.0	59.2								
17	73 29.5	24.7	147 58.2	7.9	15 10.1	8.8	59.3								
18	88 29.2	S22 24.4	162 25.1	7.8	S15 18.9	8.7	59.3								
19	103 28.9	24.0	176 51.9	7.8	15 27.6	8.7	59.3								
20	118 28.7	23.7	191 18.7	7.6	15 36.3	8.5	59.4								
21	133 28.4 . .	23.4	205 45.3	7.6	15 44.8	8.5	59.4								
22	148 28.1	23.1	220 11.9	7.5	15 53.3	8.4	59.4								
23	163 27.9	22.8	234 38.4	7.4	S16 01.7	8.3	59.5								
	SD 16.3	d 0.3	SD	15.7		15.9		16.1							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 4	Moonset 5	Moonset 6	Moonset 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 43	15 52	10 03	09 48	09 28	08 41
N 70	▬	14 29	16 10	10 11	10 04	09 56	09 43
68	12 44	15 00	16 25	10 18	10 17	10 17	10 19
66	13 52	15 22	16 37	10 23	10 27	10 34	10 45
64	14 27	15 40	16 47	10 28	10 36	10 48	11 05
62	14 52	15 55	16 56	10 32	10 44	10 59	11 21
60	15 12	16 08	17 03	10 35	10 51	11 09	11 35
N 58	15 28	16 18	17 10	10 39	10 56	11 18	11 46
56	15 42	16 28	17 17	10 41	11 02	11 26	11 57
54	15 54	16 37	17 22	10 44	11 06	11 33	12 06
52	16 04	16 44	17 28	10 46	11 10	11 39	12 14
50	16 13	16 51	17 32	10 48	11 14	11 44	12 21
45	16 33	17 07	17 43	10 53	11 23	11 57	12 37
N 40	16 49	17 19	17 53	10 57	11 30	12 07	12 50
35	17 03	17 31	18 02	11 00	11 36	12 15	13 00
30	17 14	17 41	18 10	11 03	11 41	12 23	13 10
20	17 35	17 59	18 26	11 08	11 50	12 36	13 27
N 10	17 52	18 15	18 41	11 13	11 59	12 48	13 41
0	18 09	18 32	18 58	11 17	12 06	12 59	13 55
S 10	18 26	18 49	19 16	11 21	12 14	13 10	14 08
20	18 44	19 09	19 38	11 26	12 22	13 21	14 23
30	19 05	19 33	20 05	11 31	12 32	13 35	14 40
35	19 18	19 47	20 23	11 34	12 37	13 42	14 49
40	19 32	20 04	20 45	11 37	12 43	13 51	15 01
45	19 49	20 26	21 14	11 41	12 50	14 02	15 14
S 50	20 11	20 54	21 56	11 46	12 59	14 14	15 30
52	20 21	21 08	22 20	11 48	13 03	14 20	15 37
54	20 32	21 25	22 55	11 50	13 08	14 27	15 46
56	20 46	21 45	////	11 53	13 12	14 34	15 55
58	21 01	22 11	////	11 56	13 18	14 42	16 06
S 60	21 20	22 49	////	11 59	13 24	14 51	16 18

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
4	04 49	05 03	12 05	05 06	17 30	22	57
5	05 16	05 30	12 05	05 54	18 20	23	46
6	05 43	05 56	12 06	06 46	19 13	24	35

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.7		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
MONDAY 7 00	106 43.5	199 41.0	S22 57.7	154 34.1	S18 59.7	41 09.6	N20 50.6	248 23.1	S12 34.1
01	121 45.9	214 40.1	57.9	169 34.6	59.2	56 12.2	50.6	263 25.4	34.1
02	136 48.4	229 39.1	58.0	184 35.0	58.6	71 14.9	50.5	278 27.7	34.2
03	151 50.9	244 38.2	. . 58.2	199 35.5	. . 58.1	86 17.6	. . 50.5	293 30.0	. . 34.2
04	166 53.3	259 37.3	58.4	214 36.0	57.6	101 20.2	50.5	308 32.3	34.3
05	181 55.8	274 36.3	58.5	229 36.4	57.0	116 22.9	50.5	323 34.6	34.3
06	196 58.3	289 35.4	S22 58.7	244 36.9	S18 56.5	131 25.6	N20 50.4	338 36.9	S12 34.4
07	212 00.7	304 34.5	58.9	259 37.3	56.0	146 28.2	50.4	353 39.2	34.4
08	227 03.2	319 33.5	59.0	274 37.8	55.4	161 30.9	50.4	8 41.5	34.5
09	242 05.7	334 32.6	. . 59.2	289 38.3	. . 54.9	176 33.6	. . 50.4	23 43.8	. . 34.5
10	257 08.1	349 31.6	59.3	304 38.7	54.4	191 36.2	50.4	38 46.1	34.5
11	272 10.6	4 30.7	59.5	319 39.2	53.8	206 38.9	50.3	53 48.4	34.6
12	287 13.1	19 29.8	S22 59.7	334 39.6	S18 53.3	221 41.6	N20 50.3	68 50.7	S12 34.6
13	302 15.5	34 28.8	22 59.8	349 40.1	52.8	236 44.2	50.3	83 53.0	34.7
14	317 18.0	49 27.9	23 00.0	4 40.6	52.2	251 46.9	50.3	98 55.2	34.7
15	332 20.4	64 27.0	. . 00.1	19 41.0	. . 51.7	266 49.6	. . 50.2	113 57.5	. . 34.8
16	347 22.9	79 26.0	00.3	34 41.5	51.2	281 52.2	50.2	128 59.8	34.8
17	2 25.4	94 25.1	00.4	49 42.0	50.6	296 54.9	50.2	144 02.1	34.9
18	17 27.8	109 24.2	S23 00.6	64 42.4	S18 50.1	311 57.6	N20 50.2	159 04.4	S12 34.9
19	32 30.3	124 23.2	00.7	79 42.9	49.5	327 00.2	50.2	174 06.7	35.0
20	47 32.8	139 22.3	00.9	94 43.3	49.0	342 02.9	50.1	189 09.0	35.0
21	62 35.2	154 21.3	. . 01.0	109 43.8	. . 48.5	357 05.6	. . 50.1	204 11.3	. . 35.0
22	77 37.7	169 20.4	01.2	124 44.3	47.9	12 08.2	50.1	219 13.6	35.1
23	92 40.2	184 19.5	01.3	139 44.7	47.4	27 10.9	50.1	234 15.9	35.1
TUESDAY 8 00	107 42.6	199 18.5	S23 01.4	154 45.2	S18 46.8	42 13.6	N20 50.1	249 18.2	S12 35.2
01	122 45.1	214 17.6	01.6	169 45.7	46.3	57 16.2	50.0	264 20.5	35.2
02	137 47.6	229 16.7	01.7	184 46.1	45.8	72 18.9	50.0	279 22.8	35.3
03	152 50.0	244 15.7	. . 01.9	199 46.6	. . 45.2	87 21.5	. . 50.0	294 25.1	. . 35.3
04	167 52.5	259 14.8	02.0	214 47.0	44.7	102 24.2	50.0	309 27.4	35.4
05	182 54.9	274 13.8	02.1	229 47.5	44.1	117 26.9	49.9	324 29.7	35.4
06	197 57.4	289 12.9	S23 02.3	244 48.0	S18 43.6	132 29.5	N20 49.9	339 32.0	S12 35.4
07	212 59.9	304 12.0	02.4	259 48.4	43.0	147 32.2	49.9	354 34.3	35.5
08	228 02.3	319 11.0	02.5	274 48.9	42.5	162 34.8	49.9	9 36.6	35.5
09	243 04.8	334 10.1	. . 02.7	289 49.4	. . 42.0	177 37.5	. . 49.9	24 38.9	. . 35.6
10	258 07.3	349 09.1	02.8	304 49.8	41.4	192 40.2	49.8	39 41.2	35.6
11	273 09.7	4 08.2	02.9	319 50.3	40.9	207 42.8	49.8	54 43.5	35.7
12	288 12.2	19 07.3	S23 03.1	334 50.8	S18 40.3	222 45.5	N20 49.8	69 45.8	S12 35.7
13	303 14.7	34 06.3	03.2	349 51.2	39.8	237 48.1	49.8	84 48.1	35.8
14	318 17.1	49 05.4	03.3	4 51.7	39.2	252 50.8	49.8	99 50.4	35.8
15	333 19.6	64 04.5	. . 03.4	19 52.2	. . 38.7	267 53.5	. . 49.7	114 52.7	. . 35.8
16	348 22.0	79 03.5	03.6	34 52.6	38.1	282 56.1	49.7	129 54.9	35.9
17	3 24.5	94 02.6	03.7	49 53.1	37.6	297 58.8	49.7	144 57.2	35.9
18	18 27.0	109 01.6	S23 03.8	64 53.6	S18 37.1	313 01.4	N20 49.7	159 59.5	S12 36.0
19	33 29.4	124 00.7	03.9	79 54.0	36.5	328 04.1	49.7	175 01.8	36.0
20	48 31.9	138 59.8	04.0	94 54.5	36.0	343 06.7	49.6	190 04.1	36.1
21	63 34.4	153 58.8	. . 04.1	109 55.0	. . 35.4	358 09.4	. . 49.6	205 06.4	. . 36.1
22	78 36.8	168 57.9	04.3	124 55.4	34.9	13 12.1	49.6	220 08.7	36.2
23	93 39.3	183 56.9	04.4	139 55.9	34.3	28 14.7	49.6	235 11.0	36.2
WEDNESDAY 9 00	108 41.8	198 56.0	S23 04.5	154 56.4	S18 33.8	43 17.4	N20 49.6	250 13.3	S12 36.2
01	123 44.2	213 55.1	04.6	169 56.8	33.2	58 20.0	49.5	265 15.6	36.3
02	138 46.7	228 54.1	04.7	184 57.3	32.7	73 22.7	49.5	280 17.9	36.3
03	153 49.2	243 53.2	. . 04.8	199 57.8	. . 32.1	88 25.3	. . 49.5	295 20.2	. . 36.4
04	168 51.6	258 52.2	04.9	214 58.2	31.6	103 28.0	49.5	310 22.5	36.4
05	183 54.1	273 51.3	05.0	229 58.7	31.0	118 30.6	49.5	325 24.8	36.5
06	198 56.5	288 50.3	S23 05.1	244 59.2	S18 30.5	133 33.3	N20 49.4	340 27.1	S12 36.5
07	213 59.0	303 49.4	05.2	259 59.6	29.9	148 35.9	49.4	355 29.4	36.6
08	229 01.5	318 48.5	05.4	275 00.1	29.4	163 38.6	49.4	10 31.7	36.6
09	244 03.9	333 47.5	. . 05.5	290 00.6	. . 28.8	178 41.2	. . 49.4	25 34.0	. . 36.6
10	259 06.4	348 46.6	05.6	305 01.1	28.3	193 43.9	49.4	40 36.3	36.7
11	274 08.9	3 45.6	05.7	320 01.5	27.7	208 46.5	49.3	55 38.6	36.7
12	289 11.3	18 44.7	S23 05.8	335 02.0	S18 27.1	223 49.2	N20 49.3	70 40.9	S12 36.8
13	304 13.8	33 43.8	05.8	350 02.5	26.6	238 51.8	49.3	85 43.2	36.8
14	319 16.3	48 42.8	05.9	5 02.9	26.0	253 54.5	49.3	100 45.5	36.9
15	334 18.7	63 41.9	. . 06.0	20 03.4	. . 25.5	268 57.1	. . 49.3	115 47.8	. . 36.9
16	349 21.2	78 40.9	06.1	35 03.9	24.9	283 59.8	49.2	130 50.1	36.9
17	4 23.7	93 40.0	06.2	50 04.3	24.4	299 02.4	49.2	145 52.4	37.0
18	19 26.1	108 39.0	S23 06.3	65 04.8	S18 23.8	314 05.1	N20 49.2	160 54.7	S12 37.0
19	34 28.6	123 38.1	06.4	80 05.3	23.3	329 07.7	49.2	175 57.0	37.1
20	49 31.0	138 37.2	06.5	95 05.8	22.7	344 10.4	49.2	190 59.3	37.1
21	64 33.5	153 36.2	. . 06.6	110 06.2	. . 22.2	359 13.0	. . 49.1	206 01.7	. . 37.2
22	79 36.0	168 35.3	06.7	125 06.7	21.6	14 15.7	49.1	221 04.0	37.2
23	94 38.4	183 34.3	06.8	140 07.2	21.0	29 18.3	49.1	236 06.3	37.2
	h m								
Mer. Pass.	16 46.4	v −0.9	d 0.1	v 0.5	d 0.5	v 2.7	d 0.0	v 2.3	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.4	S40 15.4
Achernar	335 26.9	S57 10.5
Acrux	173 09.4	S63 10.1
Adhara	255 12.4	S28 59.6
Aldebaran	290 49.4	N16 32.0
Alioth	166 20.9	N55 53.0
Alkaid	152 59.2	N49 14.6
Al Na'ir	27 44.5	S46 53.9
Alnilam	275 46.3	S 1 11.8
Alphard	217 56.1	S 8 43.1
Alphecca	126 11.5	N26 40.2
Alpheratz	357 43.9	N29 10.0
Altair	62 08.8	N 8 54.3
Ankaa	353 16.1	S42 14.3
Antares	112 26.9	S26 27.5
Arcturus	145 56.1	N19 06.7
Atria	107 29.4	S69 02.8
Avior	234 17.5	S59 33.2
Bellatrix	278 32.0	N 6 21.5
Betelgeuse	271 01.3	N 7 24.4
Canopus	263 55.7	S52 42.4
Capella	280 34.4	N46 00.6
Deneb	49 32.1	N45 19.8
Denebola	182 33.8	N14 29.7
Diphda	348 56.2	S17 55.0
Dubhe	193 51.7	N61 40.4
Elnath	278 12.6	N28 37.0
Eltanin	90 46.8	N51 29.3
Enif	33 47.7	N 9 56.2
Fomalhaut	15 24.5	S29 33.2
Gacrux	172 01.1	S57 11.0
Gienah	175 52.5	S17 36.9
Hadar	148 48.4	S60 25.9
Hamal	328 01.0	N23 31.5
Kaus Aust.	83 44.6	S34 22.5
Kochab	137 20.6	N74 05.8
Markab	13 38.8	N15 16.7
Menkar	314 15.2	N 4 08.4
Menkent	148 08.0	S36 25.9
Miaplacidus	221 38.8	S69 46.2
Mirfak	308 40.4	N49 54.6
Nunki	75 59.0	S26 16.7
Peacock	53 20.3	S56 41.5
Pollux	243 27.7	N27 59.4
Procyon	244 59.7	N 5 11.3
Rasalhague	96 07.0	N12 33.1
Regulus	207 43.6	N11 54.0
Rigel	281 12.0	S 8 11.4
Rigil Kent.	139 52.3	S60 53.0
Sabik	102 13.2	S15 44.3
Schedar	349 40.9	N56 36.9
Shaula	96 22.7	S37 06.6
Sirius	258 33.6	S16 44.3
Spica	158 31.6	S11 13.8
Suhail	222 52.2	S43 29.2
Vega	80 39.6	N38 47.8
Zuben'ubi	137 05.9	S16 05.7

	SHA	Mer. Pass.
	° ′	h m
Venus	91 35.9	10 43
Mars	47 02.6	13 41
Jupiter	294 30.9	21 07
Saturn	141 35.6	7 22

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		7	8	9	10
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
MONDAY 7 00	178 27.6	S22 22.5	249 04.8	7.3	S16 10.0	8.2	59.5	N 72	08 15	10 18		06 27			
01	193 27.3	22.1	263 31.1	7.2	16 18.2	8.1	59.5	N 70	07 57	09 36		05 26	08 07		
02	208 27.0	21.8	277 57.3	7.1	16 26.3	8.0	59.5	68	07 44	09 07	11 08	04 51	06 46	08 25	09 16
03	223 26.8	. . 21.5	292 23.4	7.1	16 34.3	8.0	59.6	66	07 32	08 46	10 12	04 26	06 08	07 34	08 31
04	238 26.5	21.2	306 49.5	6.9	16 42.3	7.8	59.6	64	07 22	08 28	09 39	04 07	05 41	07 02	08 01
05	253 26.2	20.9	321 15.4	6.9	16 50.1	7.7	59.6	62	07 14	08 14	09 16	03 51	05 20	06 38	07 38
06	268 26.0	S22 20.5	335 41.3	6.8	S16 57.8	7.6	59.7	60	07 06	08 02	08 57	03 38	05 04	06 19	07 20
07	283 25.7	20.2	350 07.1	6.7	17 05.4	7.5	59.7	N 58	07 00	07 51	08 41	03 27	04 49	06 04	07 04
08	298 25.4	19.9	4 32.8	6.6	17 12.9	7.4	59.7	56	06 54	07 42	08 28	03 17	04 37	05 50	06 51
09	313 25.2	. . 19.6	18 58.4	6.5	17 20.3	7.4	59.7	54	06 48	07 33	08 16	03 09	04 27	05 39	06 40
10	328 24.9	19.2	33 23.9	6.5	17 27.7	7.2	59.8	52	06 43	07 26	08 06	03 01	04 18	05 29	06 30
11	343 24.6	18.9	47 49.4	6.3	17 34.9	7.0	59.8	50	06 38	07 19	07 57	02 54	04 09	05 19	06 21
12	358 24.4	S22 18.6	62 14.7	6.3	S17 41.9	7.0	59.8	45	06 27	07 04	07 38	02 40	03 52	05 00	06 02
13	13 24.1	18.3	76 40.0	6.2	17 48.9	6.9	59.8	N 40	06 18	06 52	07 22	02 28	03 37	04 44	05 47
14	28 23.8	17.9	91 05.2	6.1	17 55.8	6.8	59.9	35	06 09	06 41	07 09	02 17	03 25	04 31	05 33
15	43 23.6	. . 17.6	105 30.3	6.0	18 02.6	6.6	59.9	30	06 01	06 31	06 57	02 09	03 14	04 20	05 22
16	58 23.3	17.3	119 55.3	6.0	18 09.2	6.5	59.9	20	05 46	06 13	06 37	01 53	02 56	04 00	05 02
17	73 23.0	17.0	134 20.3	5.8	18 15.7	6.5	60.0	N 10	05 31	05 57	06 20	01 40	02 40	03 43	04 45
18	88 22.8	S22 16.6	148 45.1	5.8	S18 22.2	6.3	60.0	0	05 15	05 41	06 03	01 28	02 26	03 27	04 29
19	103 22.5	16.3	163 09.9	5.7	18 28.5	6.1	60.0	S 10	04 57	05 24	05 46	01 15	02 11	03 11	04 14
20	118 22.2	16.0	177 34.6	5.6	18 34.6	6.1	60.0	20	04 35	05 04	05 29	01 02	01 55	02 54	03 57
21	133 22.0	. . 15.6	191 59.2	5.6	18 40.7	6.0	60.1	30	04 08	04 41	05 08	00 47	01 38	02 34	03 37
22	148 21.7	15.3	206 23.8	5.4	18 46.7	5.8	60.1	35	03 50	04 26	04 56	00 39	01 27	02 23	03 26
23	163 21.4	15.0	220 48.2	5.4	18 52.5	5.7	60.1	40	03 29	04 09	04 41	00 29	01 16	02 10	03 13
TUESDAY 8 00	178 21.2	S22 14.6	235 12.6	5.3	S18 58.2	5.5	60.1	45	03 00	03 48	04 25	00 18	01 02	01 55	02 57
01	193 20.9	14.3	249 36.9	5.2	19 03.7	5.5	60.2	S 50	02 20	03 21	04 04	00 04	00 45	01 36	02 38
02	208 20.6	13.9	264 01.1	5.2	19 09.2	5.3	60.2	52	01 56	03 07	03 54	24 37	00 37	01 27	02 29
03	223 20.4	. . 13.6	278 25.3	5.1	19 14.5	5.2	60.2	54	01 23	02 51	03 42	24 28	00 28	01 17	02 19
04	238 20.1	13.3	292 49.4	5.0	19 19.7	5.0	60.2	56	////	02 31	03 29	24 19	00 19	01 06	02 08
05	253 19.8	12.9	307 13.4	4.9	19 24.7	5.0	60.2	58	////	02 06	03 14	24 07	00 07	00 53	01 55
06	268 19.6	S22 12.6	321 37.3	4.9	S19 29.7	4.8	60.3	S 60	////	01 30	02 56	23 55	24 38	00 38	01 40
07	283 19.3	12.2	336 01.2	4.8	19 34.5	4.6	60.3								
08	298 19.0	11.9	350 25.0	4.7	19 39.1	4.6	60.3								
09	313 18.8	. . 11.6	4 48.7	4.7	19 43.7	4.4	60.3								
10	328 18.5	11.2	19 12.4	4.6	19 48.1	4.2	60.4								
11	343 18.3	10.9	33 36.0	4.5	19 52.3	4.1	60.4								
12	358 18.0	S22 10.5	47 59.5	4.5	S19 56.4	4.0	60.4								
13	13 17.7	10.2	62 23.0	4.4	20 00.4	3.9	60.4								
14	28 17.5	09.8	76 46.4	4.4	20 04.3	3.7	60.4								
15	43 17.2	. . 09.5	91 09.8	4.3	20 08.0	3.5	60.5								
16	58 16.9	09.1	105 33.1	4.2	20 11.5	3.5	60.5								
17	73 16.7	08.8	119 56.3	4.2	20 15.0	3.2	60.5								
WEDNESDAY 9 00	88 16.4	S22 08.4	134 19.5	4.1	S20 18.2	3.2	60.5								
01	103 16.2	08.1	148 42.6	4.1	20 21.4	3.0	60.5								
02	118 15.9	07.7	163 05.7	4.0	20 24.4	2.8	60.5								
03	133 15.6	. . 07.4	177 28.7	4.0	20 27.2	2.7	60.6								
04	148 15.4	07.0	191 51.7	3.9	20 29.9	2.6	60.6								
05	163 15.1	06.7	206 14.6	3.9	20 32.5	2.4	60.6								
06	178 14.9	S22 06.3	220 37.5	3.8	S20 34.9	2.2	60.6								
07	193 14.6	06.0	235 00.3	3.8	20 37.1	2.1	60.6								
08	208 14.3	05.6	249 23.1	3.8	20 39.2	2.0	60.6								
09	223 14.1	. . 05.3	263 45.9	3.7	20 41.2	1.8	60.7								
10	238 13.8	04.9	278 08.6	3.7	20 43.0	1.6	60.7								
11	253 13.6	04.6	292 31.3	3.6	20 44.6	1.5	60.7								
12	268 13.3	S22 04.2	306 53.9	3.6	S20 46.1	1.4	60.7								
13	283 13.0	03.8	321 16.5	3.6	20 47.5	1.2	60.7								
14	298 12.8	03.5	335 39.1	3.6	20 48.7	1.0	60.7								
15	313 12.5	. . 03.1	350 01.7	3.5	20 49.7	0.9	60.7								
16	328 12.3	02.8	4 24.2	3.5	20 50.6	0.8	60.8								
17	343 12.0	02.4	18 46.7	3.5	20 51.4	0.5	60.8								
THURSDAY 12	358 11.8	S22 02.0	33 09.2	3.4	S20 51.9	0.5	60.8								
13	13 11.5	01.7	47 31.6	3.5	20 52.4	0.3	60.8								
14	28 11.2	01.3	61 54.1	3.4	20 52.7	0.1	60.8								
15	43 11.0	. . 00.9	76 16.5	3.4	20 52.8	0.1	60.8								
16	58 10.7	00.6	90 38.9	3.4	20 52.7	0.1	60.8								
17	73 10.5	22 00.2	105 01.3	3.4	20 52.6	0.4	60.8								
18	88 10.2	S21 59.8	119 23.7	3.3	S20 52.2	0.5	60.8								
19	103 10.0	59.5	133 46.0	3.4	20 51.7	0.6	60.8								
20	118 09.7	59.1	148 08.4	3.3	20 51.1	0.9	60.8								
21	133 09.5	. . 58.7	162 30.7	3.4	20 50.2	0.9	60.9								
22	148 09.2	58.4	176 53.1	3.3	20 49.3	1.1	60.9								
23	163 08.9	58.0	191 15.4	3.4	S20 48.2	1.3	60.9								
	SD 16.3	d 0.3	SD	16.3		16.5		16.6							

Day	SUN				MOON			
	Eqn. of Time		Mer. Pass.		Mer. Pass.		Age	Phase
	00^h	12^h			Upper	Lower		
d	m s	m s	h m		h m	h m	d	%
7	06 09	06 22	12 06		07 41	20 10	25	25
8	06 35	06 47	12 07		08 40	21 11	26	15
9	07 00	07 12	12 07		09 42	22 13	27	8

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.7		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
10 00	109 40.9	198 33.4	S23 06.8	155 07.6	S18 20.5	44 21.0	N20 49.1	251 08.6	S12 37.3	Acamar	315 18.4	S40 15.4
01	124 43.4	213 32.4	06.9	170 08.1	19.9	59 23.6	49.1	266 10.9	37.3	Achernar	335 27.0	S57 10.5
02	139 45.8	228 31.5	07.0	185 08.6	19.4	74 26.3	49.0	281 13.2	37.4	Acrux	173 09.3	S63 10.1
03	154 48.3	243 30.6	07.1	200 09.1	18.8	89 28.9	49.0	296 15.5	37.4	Adhara	255 12.3	S28 59.6
04	169 50.8	258 29.6	07.2	215 09.5	18.3	104 31.6	49.0	311 17.8	37.5	Aldebaran	290 49.4	N16 32.0
05	184 53.2	273 28.7	07.2	230 10.0	17.7	119 34.2	49.0	326 20.1	37.5			
06	199 55.7	288 27.7	S23 07.3	245 10.5	S18 17.1	134 36.8	N20 49.0	341 22.4	S12 37.5	Alioth	166 20.9	N55 53.0
07	214 58.2	303 26.8	07.4	260 10.9	16.6	149 39.5	49.0	356 24.7	37.6	Alkaid	152 59.2	N49 14.6
08	230 00.6	318 25.8	07.5	275 11.4	16.0	164 42.1	48.9	11 27.0	37.6	Al Na'ir	27 44.5	S46 53.9
09	245 03.1	333 24.9	07.5	290 11.9	15.5	179 44.8	48.9	26 29.3	37.7	Alnilam	275 46.3	S 1 11.8
10	260 05.5	348 24.0	07.6	305 12.4	14.9	194 47.4	48.9	41 31.6	37.7	Alphard	217 56.1	S 8 43.1
11	275 08.0	3 23.0	07.7	320 12.8	14.3	209 50.1	48.9	56 33.9	37.7			
12	290 10.5	18 22.1	S23 07.7	335 13.3	S18 13.8	224 52.7	N20 48.9	71 36.2	S12 37.8	Alphecca	126 11.5	N26 40.1
13	305 12.9	33 21.1	07.8	350 13.8	13.2	239 55.3	48.8	86 38.5	37.8	Alpheratz	357 43.9	N29 10.0
14	320 15.4	48 20.2	07.9	5 14.3	12.6	254 58.0	48.8	101 40.8	37.9	Altair	62 08.8	N 8 54.3
15	335 17.9	63 19.2	07.9	20 14.7	12.1	270 00.6	48.8	116 43.1	37.9	Ankaa	353 16.1	S42 14.3
16	350 20.3	78 18.3	08.0	35 15.2	11.5	285 03.3	48.8	131 45.4	38.0	Antares	112 26.9	S26 27.5
17	5 22.8	93 17.4	08.1	50 15.7	11.0	300 05.9	48.8	146 47.7	38.0			
18	20 25.3	108 16.4	S23 08.1	65 16.2	S18 10.4	315 08.5	N20 48.7	161 50.0	S12 38.0	Arcturus	145 56.1	N19 06.7
19	35 27.7	123 15.5	08.2	80 16.6	09.8	330 11.2	48.7	176 52.3	38.1	Atria	107 29.4	S69 02.7
20	50 30.2	138 14.5	08.2	95 17.1	09.3	345 13.8	48.7	191 54.6	38.1	Avior	234 17.5	S59 33.2
21	65 32.7	153 13.6	08.3	110 17.6	08.7	0 16.5	48.7	206 56.9	38.2	Bellatrix	278 32.0	N 6 21.5
22	80 35.1	168 12.6	08.4	125 18.1	08.1	15 19.1	48.7	221 59.2	38.2	Betelgeuse	271 01.3	N 7 24.4
23	95 37.6	183 11.7	08.4	140 18.5	07.6	30 21.7	48.7	237 01.6	38.2			
11 00	110 40.0	198 10.7	S23 08.5	155 19.0	S18 07.0	45 24.4	N20 48.6	252 03.9	S12 38.3	Canopus	263 55.7	S52 42.4
01	125 42.5	213 09.8	08.5	170 19.5	06.4	60 27.0	48.6	267 06.2	38.3	Capella	280 34.4	N46 00.6
02	140 45.0	228 08.9	08.6	185 20.0	05.9	75 29.7	48.6	282 08.5	38.4	Deneb	49 32.1	N45 19.8
03	155 47.4	243 07.9	08.6	200 20.5	05.3	90 32.3	48.6	297 10.8	38.4	Denebola	182 33.8	N14 29.7
04	170 49.9	258 07.0	08.7	215 20.9	04.7	105 34.9	48.6	312 13.1	38.5	Diphda	348 56.2	S17 55.0
05	185 52.4	273 06.0	08.7	230 21.4	04.2	120 37.6	48.6	327 15.4	38.5			
06	200 54.8	288 05.1	S23 08.8	245 21.9	S18 03.6	135 40.2	N20 48.5	342 17.7	S12 38.5	Dubhe	193 51.7	N61 40.4
07	215 57.3	303 04.1	08.8	260 22.4	03.0	150 42.8	48.5	357 20.0	38.6	Elnath	278 12.6	N28 37.0
08	230 59.8	318 03.2	08.9	275 22.8	02.5	165 45.5	48.5	12 22.3	38.6	Eltanin	90 46.8	N51 29.2
09	246 02.2	333 02.2	08.9	290 23.3	01.9	180 48.1	48.5	27 24.6	38.7	Enif	33 47.7	N 9 56.2
10	261 04.7	348 01.3	08.9	305 23.8	01.3	195 50.7	48.5	42 26.9	38.7	Fomalhaut	15 24.5	S29 33.2
11	276 07.2	3 00.3	09.0	320 24.3	00.8	210 53.4	48.5	57 29.2	38.7			
12	291 09.6	17 59.4	S23 09.0	335 24.7	S18 00.2	225 56.0	N20 48.4	72 31.5	S12 38.8	Gacrux	172 01.0	S57 11.0
13	306 12.1	32 58.5	09.1	350 25.2	17 59.6	240 58.6	48.4	87 33.9	38.8	Gienah	175 52.5	S17 36.9
14	321 14.5	47 57.5	09.1	5 25.7	59.1	256 01.3	48.4	102 36.2	38.9	Hadar	148 48.4	S60 25.9
15	336 17.0	62 56.6	09.1	20 26.2	58.5	271 03.9	48.4	117 38.5	38.9	Hamal	328 01.0	N23 31.5
16	351 19.5	77 55.6	09.2	35 26.7	57.9	286 06.5	48.4	132 40.8	38.9	Kaus Aust.	83 44.6	S34 22.5
17	6 21.9	92 54.7	09.2	50 27.1	57.3	301 09.2	48.3	147 43.1	39.0			
18	21 24.4	107 53.7	S23 09.2	65 27.6	S17 56.8	316 11.8	N20 48.3	162 45.4	S12 39.0	Kochab	137 20.6	N74 05.8
19	36 26.9	122 52.8	09.3	80 28.1	56.2	331 14.4	48.3	177 47.7	39.1	Markab	13 38.8	N15 16.7
20	51 29.3	137 51.8	09.3	95 28.6	55.6	346 17.1	48.3	192 50.0	39.1	Menkar	314 15.2	N 4 08.4
21	66 31.8	152 50.9	09.3	110 29.1	55.1	1 19.7	48.3	207 52.3	39.1	Menkent	148 08.0	S36 25.9
22	81 34.3	167 50.0	09.3	125 29.5	54.5	16 22.3	48.3	222 54.6	39.2	Miaplacidus	221 38.8	S69 46.3
23	96 36.7	182 49.0	09.4	140 30.0	53.9	31 25.0	48.2	237 56.9	39.2			
12 00	111 39.2	197 48.1	S23 09.4	155 30.5	S17 53.3	46 27.6	N20 48.2	252 59.2	S12 39.3	Mirfak	308 40.4	N49 54.6
01	126 41.7	212 47.1	09.4	170 31.0	52.8	61 30.2	48.2	268 01.6	39.3	Nunki	75 59.0	S26 16.7
02	141 44.1	227 46.2	09.4	185 31.5	52.2	76 32.9	48.2	283 03.9	39.3	Peacock	53 20.3	S56 41.5
03	156 46.6	242 45.2	09.5	200 31.9	51.6	91 35.5	48.2	298 06.2	39.4	Pollux	243 27.7	N27 59.4
04	171 49.0	257 44.3	09.5	215 32.4	51.0	106 38.1	48.2	313 08.5	39.4	Procyon	244 59.7	N 5 11.3
05	186 51.5	272 43.3	09.5	230 32.9	50.5	121 40.7	48.2	328 10.8	39.5			
06	201 54.0	287 42.4	S23 09.5	245 33.4	S17 49.9	136 43.4	N20 48.1	343 13.1	S12 39.5	Rasalhague	96 07.0	N12 33.1
07	216 56.4	302 41.4	09.5	260 33.9	49.3	151 46.0	48.1	358 15.4	39.5	Regulus	207 43.6	N11 54.0
08	231 58.9	317 40.5	09.5	275 34.4	48.7	166 48.6	48.1	13 17.7	39.6	Rigel	281 12.0	S 8 11.4
09	247 01.4	332 39.6	09.6	290 34.8	48.2	181 51.2	48.1	28 20.0	39.6	Rigil Kent.	139 52.3	S60 53.0
10	262 03.8	347 38.6	09.6	305 35.3	47.6	196 53.9	48.1	43 22.3	39.7	Sabik	102 13.1	S15 44.3
11	277 06.3	2 37.7	09.6	320 35.8	47.0	211 56.5	48.1	58 24.7	39.7			
12	292 08.8	17 36.7	S23 09.6	335 36.3	S17 46.4	226 59.1	N20 48.0	73 27.0	S12 39.7	Schedar	349 40.9	N56 36.9
13	307 11.2	32 35.8	09.6	350 36.8	45.9	242 01.8	48.0	88 29.3	39.8	Shaula	96 22.7	S37 06.6
14	322 13.7	47 34.8	09.6	5 37.3	45.3	257 04.4	48.0	103 31.6	39.8	Sirius	258 33.6	S16 44.3
15	337 16.1	62 33.9	09.6	20 37.7	44.7	272 07.0	48.0	118 33.9	39.9	Spica	158 31.5	S11 13.8
16	352 18.6	77 32.9	09.6	35 38.2	44.1	287 09.6	48.0	133 36.2	39.9	Suhail	222 52.2	S43 29.2
17	7 21.1	92 32.0	09.6	50 38.7	43.5	302 12.2	48.0	148 38.5	39.9			
18	22 23.5	107 31.0	S23 09.6	65 39.2	S17 43.0	317 14.9	N20 47.9	163 40.8	S12 40.0	Vega	80 39.6	N38 47.8
19	37 26.0	122 30.1	09.6	80 39.7	42.4	332 17.5	47.9	178 43.2	40.0	Zuben'ubi	137 05.8	S16 05.7
20	52 28.5	137 29.2	09.6	95 40.2	41.8	347 20.1	47.9	193 45.5	40.1		SHA	Mer.Pass.
21	67 30.9	152 28.2	09.6	110 40.6	41.2	2 22.7	47.9	208 47.8	40.1			h m
22	82 33.4	167 27.3	09.6	125 41.1	40.6	17 25.4	47.9	223 50.1	40.1	Venus	87 30.7	10 48
23	97 35.9	182 26.3	09.6	140 41.6	40.1	32 28.0	47.9	238 52.4	40.2	Mars	44 39.0	13 38
	h m									Jupiter	294 44.3	20 55
Mer. Pass.	16 34.6	v −0.9	d 0.0	v 0.5	d 0.6	v 2.6	d 0.0	v 2.3	d 0.0	Saturn	141 23.8	7 11

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		10	11	12	13
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
10 00	178 08.7	S21 57.6	205 37.8	3.3	S20 46.9	1.5	60.9	N 72	08 09	10 07				10 36	10 10
01	193 08.4	57.2	220 00.1	3.4	20 45.4	1.5	60.9	N 70	07 53	09 28				10 17	10 00	09 50
02	208 08.2	56.9	234 22.5	3.4	20 43.9	1.8	60.9	68	07 40	09 02	10 52	09 16	09 30	09 34	09 35
03	223 07.9	56.5	248 44.9	3.3	20 42.1	1.9	60.9	66	07 29	08 41	10 04	08 31	09 00	09 14	09 23
04	238 07.7	56.1	263 07.2	3.4	20 40.2	2.0	60.9	64	07 20	08 25	09 34	08 01	08 37	08 58	09 12
05	253 07.4	55.7	277 29.6	3.4	20 38.2	2.2	60.9	62	07 12	08 11	09 11	07 38	08 18	08 45	09 03
06	268 07.2	S21 55.4	291 52.0	3.4	S20 36.0	2.4	60.9	60	07 04	07 59	08 53	07 20	08 03	08 33	08 55
07	283 06.9	55.0	306 14.4	3.5	20 33.6	2.5	60.9	N 58	06 58	07 49	08 38	07 04	07 50	08 24	08 49
08	298 06.7	54.6	320 36.9	3.4	20 31.1	2.7	60.9	56	06 52	07 40	08 25	06 51	07 39	08 15	08 42
09	313 06.4	54.2	334 59.3	3.5	20 28.4	2.8	60.9	54	06 47	07 32	08 14	06 40	07 29	08 07	08 37
10	328 06.2	53.9	349 21.8	3.5	20 25.6	3.0	60.9	52	06 42	07 25	08 04	06 30	07 20	08 00	08 32
11	343 05.9	53.5	3 44.3	3.5	20 22.6	3.1	60.9	50	06 37	07 18	07 55	06 21	07 12	07 54	08 28
12	358 05.7	S21 53.1	18 06.8	3.5	S20 19.5	3.3	60.9	45	06 27	07 03	07 37	06 02	06 55	07 40	08 18
13	13 05.4	52.7	32 29.3	3.6	20 16.2	3.4	60.9	N 40	06 18	06 51	07 21	05 47	06 42	07 29	08 10
14	28 05.2	52.3	46 51.9	3.6	20 12.8	3.5	60.9	35	06 09	06 41	07 08	05 33	06 30	07 19	08 03
15	43 04.9	52.0	61 14.5	3.7	20 09.3	3.8	60.9	30	06 02	06 31	06 57	05 22	06 19	07 11	07 57
16	58 04.7	51.6	75 37.2	3.6	20 05.5	3.8	60.9	20	05 47	06 14	06 37	05 02	06 02	06 56	07 46
17	73 04.4	51.2	89 59.8	3.7	20 01.7	4.0	60.9	N 10	05 32	05 58	06 20	04 45	05 46	06 43	07 37
18	88 04.2	S21 50.8	104 22.5	3.8	S19 57.7	4.2	60.9	0	05 16	05 42	06 04	04 29	05 32	06 31	07 28
19	103 03.9	50.4	118 45.3	3.8	19 53.5	4.3	60.9	S 10	04 59	05 25	05 48	04 14	05 17	06 19	07 19
20	118 03.7	50.0	133 08.1	3.8	19 49.2	4.5	60.9	20	04 38	05 06	05 31	03 57	05 02	06 06	07 09
21	133 03.4	49.6	147 30.9	3.9	19 44.7	4.6	60.9	30	04 11	04 43	05 10	03 37	04 44	05 52	06 59
22	148 03.2	49.3	161 53.8	3.9	19 40.1	4.7	60.9	35	03 54	04 29	04 58	03 26	04 33	05 43	06 52
23	163 02.9	48.9	176 16.7	3.9	19 35.4	4.9	60.9	40	03 32	04 13	04 45	03 13	04 21	05 33	06 45
11 00	178 02.7	S21 48.5	190 39.6	4.0	S19 30.5	5.0	60.9	45	03 05	03 52	04 28	02 57	04 07	05 22	06 37
01	193 02.4	48.1	205 02.6	4.1	19 25.5	5.2	60.8	S 50	02 26	03 25	04 08	02 38	03 50	05 08	06 27
02	208 02.2	47.7	219 25.7	4.1	19 20.3	5.3	60.8	52	02 03	03 12	03 58	02 29	03 42	05 01	06 22
03	223 01.9	47.3	233 48.8	4.2	19 15.0	5.4	60.8	54	01 33	02 56	03 47	02 19	03 33	04 54	06 17
04	238 01.7	46.9	248 12.0	4.2	19 09.6	5.6	60.8	56	00 34	02 38	03 34	02 08	03 23	04 46	06 11
05	253 01.4	46.5	262 35.2	4.2	19 04.0	5.7	60.8	58	////	02 14	03 20	01 55	03 11	04 36	06 05
06	268 01.2	S21 46.1	276 58.4	4.4	S18 58.3	5.9	60.8	S 60	////	01 41	03 02	01 40	02 58	04 26	05 57
07	283 00.9	45.7	291 21.8	4.4	18 52.4	5.9	60.8								
08	298 00.7	45.3	305 45.2	4.4	18 46.5	6.2	60.8								
09	313 00.4	44.9	320 08.6	4.5	18 40.3	6.2	60.8								
10	328 00.2	44.5	334 32.1	4.6	18 34.1	6.4	60.8								
11	342 59.9	44.1	348 55.7	4.6	18 27.7	6.5	60.7								
12	357 59.7	S21 43.7	3 19.3	4.7	S18 21.2	6.6	60.7								
13	12 59.5	43.3	17 43.0	4.8	18 14.6	6.8	60.7								
14	27 59.2	42.9	32 06.8	4.8	18 07.8	6.9	60.7								
15	42 59.0	42.5	46 30.6	5.0	18 00.9	7.0	60.7								
16	57 58.7	42.1	60 54.6	4.9	17 53.9	7.1	60.7								
17	72 58.5	41.7	75 18.5	5.1	17 46.8	7.3	60.7								
18	87 58.2	S21 41.3	89 42.6	5.1	S17 39.5	7.3	60.6								
19	102 58.0	40.9	104 06.7	5.2	17 32.2	7.5	60.6								
20	117 57.7	40.5	118 30.9	5.3	17 24.7	7.6	60.6								
21	132 57.5	40.1	132 55.2	5.3	17 17.1	7.8	60.6								
22	147 57.3	39.7	147 19.5	5.4	17 09.3	7.8	60.6								
23	162 57.0	39.3	161 43.9	5.5	17 01.5	7.9	60.6								
12 00	177 56.8	S21 38.9	176 08.4	5.6	S16 53.6	8.1	60.5								
01	192 56.5	38.5	190 33.0	5.6	16 45.5	8.2	60.5								
02	207 56.3	38.1	204 57.6	5.8	16 37.3	8.3	60.5								
03	222 56.1	37.7	219 22.4	5.8	16 29.0	8.3	60.5								
04	237 55.8	37.3	233 47.2	5.9	16 20.7	8.5	60.5								
05	252 55.6	36.9	248 12.1	5.9	16 12.2	8.6	60.4								
06	267 55.3	S21 36.4	262 37.0	6.1	S16 03.6	8.7	60.4								
07	282 55.1	36.0	277 02.1	6.1	15 54.9	8.8	60.4								
08	297 54.9	35.6	291 27.2	6.2	15 46.1	8.9	60.4								
09	312 54.6	35.2	305 52.4	6.3	15 37.2	9.0	60.4								
10	327 54.4	34.8	320 17.7	6.4	15 28.2	9.1	60.3								
11	342 54.1	34.4	334 43.1	6.5	15 19.1	9.2	60.3								
12	357 53.9	S21 34.0	349 08.6	6.5	S15 09.9	9.2	60.3								
13	12 53.7	33.5	3 34.1	6.7	15 00.7	9.4	60.3								
14	27 53.4	33.1	17 59.8	6.7	14 51.3	9.4	60.2								
15	42 53.2	32.7	32 25.5	6.8	14 41.9	9.6	60.2								
16	57 52.9	32.3	46 51.3	6.9	14 32.3	9.6	60.2								
17	72 52.7	31.9	61 17.2	6.9	14 22.7	9.7	60.2								
18	87 52.5	S21 31.5	75 43.1	7.1	S14 13.0	9.8	60.1								
19	102 52.2	31.0	90 09.2	7.2	14 03.2	9.9	60.1								
20	117 52.0	30.6	104 35.4	7.2	13 53.3	9.9	60.1								
21	132 51.8	30.2	119 01.6	7.3	13 43.4	10.1	60.0								
22	147 51.5	29.8	133 27.9	7.4	13 33.3	10.1	60.0								
23	162 51.3	29.3	147 54.3	7.5	S13 23.2	10.1	60.0								
	SD 16.3	d 0.4	SD	16.6		16.5		16.4							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	10	11	12	13
°	h m	h m	h m	h m	h m	h m	h m
N 72		14 10	16 08			15 12	17 34
N 70		14 48	16 24		13 27	15 47	17 51
68	13 25	15 15	16 37	12 18	14 13	16 11	18 05
66	14 13	15 36	16 48	13 03	14 42	16 30	18 16
64	14 43	15 52	16 57	13 32	15 05	16 45	18 25
62	15 05	16 06	17 05	13 55	15 23	16 58	18 33
60	15 23	16 17	17 12	14 13	15 37	17 08	18 40
N 58	15 38	16 28	17 19	14 28	15 50	17 18	18 46
56	15 51	16 37	17 24	14 41	16 00	17 26	18 51
54	16 02	16 45	17 30	14 52	16 10	17 33	18 56
52	16 12	16 52	17 35	15 02	16 18	17 39	19 00
50	16 21	16 58	17 39	15 11	16 26	17 45	19 04
45	16 40	17 13	17 49	15 29	16 42	17 57	19 12
N 40	16 55	17 25	17 59	15 44	16 55	18 07	19 19
35	17 08	17 36	18 07	15 57	17 06	18 16	19 25
30	17 19	17 45	18 15	16 08	17 16	18 24	19 30
20	17 39	18 02	18 30	16 27	17 33	18 37	19 38
N 10	17 56	18 18	18 44	16 44	17 47	18 48	19 46
0	18 12	18 34	19 00	16 59	18 00	18 59	19 53
S 10	18 28	18 51	19 17	17 15	18 14	19 09	20 00
20	18 45	19 09	19 38	17 31	18 28	19 20	20 08
30	19 05	19 32	20 05	17 50	18 44	19 33	20 16
35	19 17	19 46	20 22	18 01	18 54	19 40	20 21
40	19 31	20 03	20 43	18 13	19 04	19 48	20 27
45	19 47	20 23	21 10	18 28	19 17	19 58	20 33
S 50	20 08	20 50	21 49	18 45	19 32	20 09	20 40
52	20 17	21 03	22 11	18 54	19 39	20 15	20 44
54	20 28	21 18	22 40	19 03	19 47	20 20	20 48
56	20 41	21 37	23 33	19 14	19 55	20 27	20 52
58	20 55	22 00	////	19 26	20 05	20 34	20 57
S 60	21 12	22 32	////	19 40	20 16	20 42	21 02

Day	SUN			MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
10	07 25	07 37	12 08	10 44	23 16	28	3
11	07 49	08 01	12 08	11 46	24 16	29	0
12	08 12	08 24	12 08	12 45	00 16	01	1

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.6		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
13 00	112 38.3	197 25.4	S23 09.6	155 42.1	S17 39.5	47 30.6	N20 47.9	253 54.7	S12 40.2	Acamar	315 18.4	S40 15.4
01	127 40.8	212 24.4	09.6	170 42.6	38.9	62 33.2	47.8	268 57.0	40.2	Achernar	335 27.0	S57 10.5
02	142 43.3	227 23.5	09.6	185 43.1	38.3	77 35.8	47.8	283 59.3	40.3	Acrux	173 09.3	S63 10.1
03	157 45.7	242 22.5	09.6	200 43.6	37.7	92 38.5	47.8	299 01.7	40.3	Adhara	255 12.3	S28 59.6
04	172 48.2	257 21.6	09.6	215 44.0	37.2	107 41.1	47.8	314 04.0	40.4	Aldebaran	290 49.4	N16 32.0
05	187 50.6	272 20.6	09.6	230 44.5	36.6	122 43.7	47.8	329 06.3	40.4			
06	202 53.1	287 19.7	S23 09.6	245 45.0	S17 36.0	137 46.3	N20 47.8	344 08.6	S12 40.4	Alioth	166 20.9	N55 53.0
07	217 55.6	302 18.7	09.5	260 45.5	35.4	152 48.9	47.8	359 10.9	40.5	Alkaid	152 59.2	N49 14.6
08	232 58.0	317 17.8	09.5	275 46.0	34.8	167 51.6	47.7	14 13.2	40.5	Al Na'ir	27 44.5	S46 53.9
S 09	248 00.5	332 16.9	09.5	290 46.5	34.2	182 54.2	47.7	29 15.5	40.6	Alnilam	275 46.3	S 1 11.8
U 10	263 03.0	347 15.9	09.5	305 47.0	33.7	197 56.8	47.7	44 17.9	40.6	Alphard	217 56.0	S 8 43.1
N 11	278 05.4	2 15.0	09.5	320 47.4	33.1	212 59.4	47.7	59 20.2	40.6			
D 12	293 07.9	17 14.0	S23 09.5	335 47.9	S17 32.5	228 02.0	N20 47.7	74 22.5	S12 40.7	Alphecca	126 11.4	N26 40.1
A 13	308 10.4	32 13.1	09.4	350 48.4	31.9	243 04.7	47.7	89 24.8	40.7	Alpheratz	357 43.9	N29 09.9
Y 14	323 12.8	47 12.1	09.4	5 48.9	31.3	258 07.3	47.6	104 27.1	40.7	Altair	62 08.8	N 8 54.3
15	338 15.3	62 11.2	09.4	20 49.4	30.7	273 09.9	47.6	119 29.4	40.8	Ankaa	353 16.1	S42 14.3
16	353 17.8	77 10.2	09.4	35 49.9	30.1	288 12.5	47.6	134 31.7	40.8	Antares	112 26.8	S26 27.5
17	8 20.2	92 09.3	09.3	50 50.4	29.6	303 15.1	47.6	149 34.1	40.9			
18	23 22.7	107 08.3	S23 09.3	65 50.9	S17 29.0	318 17.7	N20 47.6	164 36.4	S12 40.9	Arcturus	145 56.0	N19 06.7
19	38 25.1	122 07.4	09.3	80 51.4	28.4	333 20.3	47.6	179 38.7	40.9	Atria	107 29.3	S69 02.7
20	53 27.6	137 06.5	09.2	95 51.8	27.8	348 23.0	47.6	194 41.0	41.0	Avior	234 17.4	S59 33.2
21	68 30.1	152 05.5	09.2	110 52.3	27.2	3 25.6	47.6	209 43.3	41.0	Bellatrix	278 32.0	N 6 21.5
22	83 32.5	167 04.6	09.2	125 52.8	26.6	18 28.2	47.5	224 45.6	41.1	Betelgeuse	271 01.3	N 7 24.4
23	98 35.0	182 03.6	09.1	140 53.3	26.0	33 30.8	47.5	239 48.0	41.1			
14 00	113 37.5	197 02.7	S23 09.1	155 53.8	S17 25.4	48 33.4	N20 47.5	254 50.3	S12 41.1	Canopus	263 55.7	S52 42.4
01	128 39.9	212 01.7	09.1	170 54.3	24.8	63 36.0	47.5	269 52.6	41.2	Capella	280 34.4	N46 00.6
02	143 42.4	227 00.8	09.0	185 54.8	24.3	78 38.6	47.5	284 54.9	41.2	Deneb	49 32.1	N45 19.8
03	158 44.9	241 59.8	09.0	200 55.3	23.7	93 41.2	47.5	299 57.2	41.2	Denebola	182 33.8	N14 29.7
04	173 47.3	256 58.9	09.0	215 55.8	23.1	108 43.9	47.5	314 59.5	41.3	Diphda	348 56.2	S17 55.0
05	188 49.8	271 58.0	08.9	230 56.3	22.5	123 46.5	47.4	330 01.9	41.3			
06	203 52.3	286 57.0	S23 08.9	245 56.7	S17 21.9	138 49.1	N20 47.4	345 04.2	S12 41.3	Dubhe	193 51.6	N61 40.4
07	218 54.7	301 56.1	08.8	260 57.2	21.3	153 51.7	47.4	0 06.5	41.4	Elnath	278 12.6	N28 37.0
08	233 57.2	316 55.1	08.8	275 57.7	20.7	168 54.3	47.4	15 08.8	41.4	Eltanin	90 46.8	N51 29.2
M 09	248 59.6	331 54.2	08.7	290 58.2	20.1	183 56.9	47.4	30 11.1	41.5	Enif	33 47.7	N 9 56.2
O 10	264 02.1	346 53.2	08.7	305 58.7	19.5	198 59.5	47.4	45 13.4	41.5	Fomalhaut	15 24.5	S29 33.2
N 11	279 04.6	1 52.3	08.6	320 59.2	18.9	214 02.1	47.4	60 15.8	41.5			
D 12	294 07.0	16 51.3	S23 08.6	335 59.7	S17 18.3	229 04.7	N20 47.3	75 18.1	S12 41.6	Gacrux	172 01.0	S57 11.0
A 13	309 09.5	31 50.4	08.5	351 00.2	17.8	244 07.3	47.3	90 20.4	41.6	Gienah	175 52.4	S17 36.9
Y 14	324 12.0	46 49.4	08.5	6 00.7	17.2	259 10.0	47.3	105 22.7	41.6	Hadar	148 48.3	S60 25.9
15	339 14.4	61 48.5	08.4	21 01.2	16.6	274 12.6	47.3	120 25.0	41.7	Hamal	328 01.0	N23 31.5
16	354 16.9	76 47.6	08.4	36 01.7	16.0	289 15.2	47.3	135 27.4	41.7	Kaus Aust.	83 44.6	S34 22.5
17	9 19.4	91 46.6	08.3	51 02.2	15.4	304 17.8	47.3	150 29.7	41.8			
18	24 21.8	106 45.7	S23 08.3	66 02.6	S17 14.8	319 20.4	N20 47.3	165 32.0	S12 41.8	Kochab	137 20.5	N74 05.8
19	39 24.3	121 44.7	08.2	81 03.1	14.2	334 23.0	47.3	180 34.3	41.8	Markab	13 38.8	N15 16.7
20	54 26.7	136 43.8	08.2	96 03.6	13.6	349 25.6	47.2	195 36.6	41.9	Menkar	314 15.2	N 4 08.4
21	69 29.2	151 42.8	08.1	111 04.1	13.0	4 28.2	47.2	210 39.0	41.9	Menkent	148 07.9	S36 25.9
22	84 31.7	166 41.9	08.0	126 04.6	12.4	19 30.8	47.2	225 41.3	41.9	Miaplacidus	221 38.8	S69 46.3
23	99 34.1	181 40.9	08.0	141 05.1	11.8	34 33.4	47.2	240 43.6	42.0			
15 00	114 36.6	196 40.0	S23 07.9	156 05.6	S17 11.2	49 36.0	N20 47.2	255 45.9	S12 42.0	Mirfak	308 40.4	N49 54.6
01	129 39.1	211 39.1	07.8	171 06.1	10.6	64 38.6	47.2	270 48.2	42.0	Nunki	75 59.0	S26 16.7
02	144 41.5	226 38.1	07.8	186 06.6	10.0	79 41.2	47.2	285 50.6	42.1	Peacock	53 20.3	S56 41.5
03	159 44.0	241 37.2	07.7	201 07.1	09.4	94 43.8	47.2	300 52.9	42.1	Pollux	243 27.7	N27 59.4
04	174 46.5	256 36.2	07.6	216 07.6	08.8	109 46.4	47.1	315 55.2	42.2	Procyon	244 59.7	N 5 11.3
05	189 48.9	271 35.3	07.6	231 08.1	08.2	124 49.0	47.1	330 57.5	42.2			
06	204 51.4	286 34.3	S23 07.5	246 08.6	S17 07.6	139 51.6	N20 47.1	345 59.8	S12 42.2	Rasalhague	96 07.0	N12 33.1
07	219 53.9	301 33.4	07.4	261 09.1	07.0	154 54.2	47.1	1 02.2	42.3	Regulus	207 43.5	N11 53.9
08	234 56.3	316 32.5	07.3	276 09.6	06.4	169 56.8	47.1	16 04.5	42.3	Rigel	281 12.0	S 8 11.4
T 09	249 58.8	331 31.5	07.3	291 10.1	05.8	184 59.4	47.1	31 06.8	42.3	Rigil Kent.	139 52.2	S60 53.0
U 10	265 01.2	346 30.6	07.2	306 10.6	05.2	200 02.0	47.1	46 09.1	42.4	Sabik	102 13.1	S15 44.3
E 11	280 03.7	1 29.6	07.1	321 11.1	04.6	215 04.6	47.1	61 11.5	42.4			
S 12	295 06.2	16 28.7	S23 07.0	336 11.6	S17 04.0	230 07.2	N20 47.0	76 13.8	S12 42.4	Schedar	349 40.9	N56 36.8
D 13	310 08.6	31 27.7	07.0	351 12.1	03.4	245 09.8	47.0	91 16.1	42.5	Shaula	96 22.6	S37 06.6
A 14	325 11.1	46 26.8	06.9	6 12.6	02.8	260 12.4	47.0	106 18.4	42.5	Sirius	258 33.6	S16 44.3
Y 15	340 13.6	61 25.8	06.8	21 13.0	02.2	275 15.0	47.0	121 20.7	42.5	Spica	158 31.5	S11 13.8
16	355 16.0	76 24.9	06.7	36 13.5	01.6	290 17.6	47.0	136 23.1	42.6	Suhail	222 52.2	S43 29.2
17	10 18.5	91 24.0	06.6	51 14.0	01.0	305 20.2	47.0	151 25.4	42.6			
18	25 21.0	106 23.0	S23 06.5	66 14.5	S17 00.4	320 22.8	N20 47.0	166 27.7	S12 42.7	Vega	80 39.6	N38 47.8
19	40 23.4	121 22.1	06.4	81 15.0	16 59.8	335 25.4	47.0	181 30.0	42.7	Zuben'ubi	137 05.8	S16 05.7
20	55 25.9	136 21.1	06.4	96 15.5	59.2	350 28.0	47.0	196 32.4	42.7		SHA	Mer. Pass.
21	70 28.3	151 20.2	06.3	111 16.0	58.6	5 30.6	46.9	211 34.7	42.8		° ′	h m
22	85 30.8	166 19.2	06.2	126 16.5	58.0	20 33.2	46.9	226 37.0	42.8	Venus	83 25.2	10 53
23	100 33.3	181 18.3	06.1	141 17.0	57.4	35 35.8	46.9	241 39.3	42.8	Mars	42 16.3	13 36
	h m									Jupiter	294 55.9	20 42
Mer. Pass.	16 22.8	v −0.9	d 0.1	v 0.5	d 0.6	v 2.6	d 0.0	v 2.3	d 0.0	Saturn	141 12.8	7 00

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON						Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP			Naut.	Civil		13	14	15	16
d h	° ′	° ′	° ′	′	° ′	′	′		°	h m	h m	h m	h m	h m	h m	h m
13 00	177 51.0	S21 28.9	162 20.8	7.6	S13 13.1	10.3	60.0		N 72	08 02	09 55	▬	10 10	09 53	09 39	09 27
01	192 50.8	28.5	176 47.4	7.6	13 02.8	10.3	59.9		N 70	07 47	09 20	▬	09 50	09 43	09 36	09 30
02	207 50.6	28.1	191 14.0	7.8	12 52.5	10.4	59.9		68	07 35	08 55	10 37	09 35	09 35	09 34	09 32
03	222 50.3	27.6	205 40.8	7.8	12 42.1	10.5	59.9		66	07 25	08 36	09 55	09 23	09 28	09 31	09 35
04	237 50.1	27.2	220 07.6	7.9	12 31.6	10.5	59.8		64	07 16	08 20	09 27	09 12	09 22	09 30	09 37
05	252 49.9	26.8	234 34.5	8.1	12 21.1	10.6	59.8		62	07 08	08 07	09 06	09 03	09 17	09 28	09 38
06	267 49.6	S21 26.4	249 01.6	8.0	S12 10.5	10.6	59.8		60	07 02	07 56	08 49	08 55	09 12	09 27	09 40
07	282 49.4	25.9	263 28.6	8.2	11 59.9	10.8	59.8		N 58	06 56	07 46	08 34	08 49	09 08	09 25	09 41
08	297 49.2	25.5	277 55.8	8.3	11 49.1	10.7	59.7		56	06 50	07 37	08 22	08 42	09 05	09 24	09 42
S 09	312 48.9	25.1	292 23.1	8.3	11 38.4	10.9	59.7		54	06 45	07 30	08 11	08 37	09 02	09 23	09 43
U 10	327 48.7	24.6	306 50.4	8.5	11 27.5	10.9	59.7		52	06 40	07 23	08 02	08 32	08 59	09 22	09 44
N 11	342 48.5	24.2	321 17.9	8.5	11 16.6	10.9	59.6		50	06 36	07 16	07 53	08 28	08 56	09 21	09 45
D 12	357 48.2	S21 23.8	335 45.4	8.6	S11 05.7	11.0	59.6		45	06 26	07 02	07 35	08 18	08 50	09 20	09 47
A 13	12 48.0	23.3	350 13.0	8.7	10 54.7	11.1	59.6		N 40	06 17	06 51	07 20	08 10	08 46	09 18	09 49
Y 14	27 47.8	22.9	4 40.7	8.7	10 43.6	11.1	59.5		35	06 09	06 40	07 08	08 03	08 41	09 17	09 50
15	42 47.5	22.5	19 08.4	8.9	10 32.5	11.2	59.5		30	06 02	06 31	06 57	07 57	08 38	09 16	09 51
16	57 47.3	22.0	33 36.3	8.9	10 21.3	11.2	59.5		20	05 47	06 14	06 38	07 46	08 31	09 14	09 54
17	72 47.1	21.6	48 04.2	9.0	10 10.1	11.2	59.4		N 10	05 33	05 59	06 21	07 37	08 26	09 12	09 56
18	87 46.9	S21 21.2	62 32.2	9.1	S 9 58.9	11.3	59.4		0	05 17	05 43	06 05	07 28	08 20	09 10	09 57
19	102 46.6	20.7	77 00.3	9.2	9 47.6	11.3	59.4		S 10	05 00	05 27	05 50	07 19	08 15	09 08	09 59
20	117 46.4	20.3	91 28.5	9.2	9 36.3	11.4	59.3		20	04 40	05 09	05 33	07 09	08 09	09 07	10 01
21	132 46.2	19.8	105 56.7	9.4	9 24.9	11.4	59.3		30	04 14	04 46	05 13	06 59	08 03	09 05	10 04
22	147 45.9	19.4	120 25.1	9.4	9 13.5	11.5	59.3		35	03 57	04 32	05 01	06 52	07 59	09 04	10 05
23	162 45.7	19.0	134 53.5	9.5	9 02.0	11.5	59.2		40	03 36	04 16	04 48	06 45	07 55	09 02	10 07
14 00	177 45.5	S21 18.5	149 22.0	9.6	S 8 50.5	11.5	59.2		45	03 10	03 56	04 32	06 37	07 50	09 01	10 08
01	192 45.2	18.1	163 50.6	9.6	8 39.0	11.6	59.1		S 50	02 32	03 30	04 12	06 27	07 44	08 59	10 11
02	207 45.0	17.6	178 19.2	9.7	8 27.4	11.6	59.1		52	02 11	03 17	04 03	06 22	07 41	08 58	10 12
03	222 44.8	17.2	192 47.9	9.8	8 15.8	11.6	59.1		54	01 44	03 02	03 52	06 17	07 38	08 57	10 13
04	237 44.6	16.7	207 16.7	9.9	8 04.2	11.7	59.0		56	00 58	02 45	03 40	06 11	07 35	08 56	10 14
05	252 44.3	16.3	221 45.6	10.0	7 52.5	11.7	59.0		58	////	02 22	03 26	06 05	07 31	08 55	10 15
06	267 44.1	S21 15.8	236 14.6	10.0	S 7 40.8	11.7	59.0		S 60	////	01 53	03 09	05 57	07 27	08 54	10 17
07	282 43.9	15.4	250 43.6	10.1	7 29.1	11.7	58.9									
08	297 43.7	15.0	265 12.7	10.2	7 17.4	11.8	58.9									
M 09	312 43.4	14.5	279 41.9	10.2	7 05.6	11.8	58.9									
O 10	327 43.2	14.1	294 11.1	10.3	6 53.8	11.8	58.8									
N 11	342 43.0	13.6	308 40.4	10.4	6 42.0	11.9	58.8									
D 12	357 42.8	S21 13.2	323 09.8	10.5	S 6 30.1	11.8	58.7									
A 13	12 42.5	12.7	337 39.3	10.5	6 18.3	11.9	58.7									
Y 14	27 42.3	12.3	352 08.8	10.6	6 06.4	11.9	58.7									
15	42 42.1	11.8	6 38.4	10.7	5 54.5	11.9	58.6									
16	57 41.9	11.4	21 08.1	10.7	5 42.6	11.9	58.6									
17	72 41.6	10.9	35 37.8	10.8	5 30.7	11.9	58.6									
18	87 41.4	S21 10.4	50 07.6	10.9	S 5 18.8	12.0	58.5									
19	102 41.2	10.0	64 37.5	11.0	5 06.8	11.9	58.5									
20	117 41.0	09.5	79 07.5	11.0	4 54.9	12.0	58.4									
21	132 40.7	09.1	93 37.5	11.0	4 42.9	12.0	58.4									
22	147 40.5	08.6	108 07.5	11.2	4 30.9	11.9	58.4									
23	162 40.3	08.2	122 37.7	11.1	4 19.0	12.0	58.3									
15 00	177 40.1	S21 07.7	137 07.8	11.3	S 4 07.0	12.0	58.3									
01	192 39.9	07.2	151 38.1	11.3	3 55.0	12.0	58.2									
02	207 39.6	06.8	166 08.4	11.4	3 43.0	12.0	58.2									
03	222 39.4	06.3	180 38.8	11.4	3 31.0	12.0	58.2									
04	237 39.2	05.9	195 09.2	11.5	3 19.0	12.0	58.1									
05	252 39.0	05.4	209 39.7	11.5	3 07.0	12.0	58.1									
06	267 38.7	S21 04.9	224 10.2	11.6	S 2 55.0	12.0	58.1									
07	282 38.5	04.5	238 40.8	11.7	2 43.0	12.0	58.0									
08	297 38.3	04.0	253 11.5	11.7	2 31.0	11.9	58.0									
T 09	312 38.1	03.5	267 42.2	11.8	2 19.1	12.0	57.9									
U 10	327 37.9	03.1	282 13.0	11.8	2 07.1	12.0	57.9									
E 11	342 37.7	02.6	296 43.8	11.9	1 55.1	12.0	57.9									
S 12	357 37.4	S21 02.1	311 14.7	11.9	S 1 43.1	11.9	57.8									
D 13	12 37.2	01.7	325 45.6	12.0	1 31.2	12.0	57.8									
A 14	27 37.0	01.2	340 16.6	12.0	1 19.2	11.9	57.7									
Y 15	42 36.8	00.7	354 47.6	12.1	1 07.3	11.9	57.7									
16	57 36.6	21 00.3	9 18.7	12.1	0 55.4	11.9	57.7									
17	72 36.3	20 59.8	23 49.8	12.2	0 43.5	11.9	57.6									
18	87 36.1	S20 59.3	38 21.0	12.2	S 0 31.6	11.9	57.6									
19	102 35.9	58.9	52 52.2	12.2	0 19.7	11.9	57.5									
20	117 35.7	58.4	67 23.4	12.4	S 0 07.8	11.8	57.5									
21	132 35.5	57.9	81 54.8	12.3	N 0 04.0	11.9	57.5									
22	147 35.3	57.4	96 26.1	12.4	0 15.9	11.8	57.4									
23	162 35.1	57.0	110 57.5	12.4	N 0 27.7	11.8	57.4									
	SD 16.3	d 0.5	SD	16.2		16.0		15.8								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	13	14	15	16
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 24	16 17	17 34	19 39	21 34	23 25
N 70	▬	14 59	16 32	17 51	19 46	21 34	23 17
68	13 42	15 24	16 44	18 05	19 52	21 34	23 11
66	14 24	15 43	16 54	18 16	19 57	21 34	23 06
64	14 51	15 59	17 03	18 25	20 02	21 34	23 02
62	15 13	16 12	17 10	18 33	20 05	21 34	22 58
60	15 30	16 23	17 17	18 40	20 09	21 34	22 55
N 58	15 44	16 33	17 23	18 46	20 11	21 34	22 53
56	15 57	16 41	17 29	18 51	20 14	21 34	22 50
54	16 07	16 49	17 34	18 56	20 16	21 34	22 48
52	16 17	16 56	17 38	19 00	20 18	21 33	22 46
50	16 25	17 02	17 43	19 04	20 20	21 33	22 44
45	16 43	17 16	17 53	19 12	20 24	21 33	22 40
N 40	16 58	17 28	18 01	19 19	20 27	21 33	22 37
35	17 11	17 38	18 09	19 25	20 30	21 33	22 34
30	17 22	17 48	18 17	19 30	20 33	21 33	22 31
20	17 41	18 04	18 31	19 38	20 37	21 33	22 27
N 10	17 57	18 20	18 46	19 46	20 41	21 33	22 23
0	18 13	18 35	19 01	19 53	20 44	21 33	22 19
S 10	18 29	18 51	19 18	20 00	20 48	21 33	22 16
20	18 46	19 10	19 38	20 08	20 52	21 33	22 12
30	19 05	19 32	20 04	20 16	20 56	21 32	22 08
35	19 17	19 46	20 21	20 21	20 58	21 32	22 05
40	19 30	20 02	20 41	20 27	21 01	21 32	22 02
45	19 46	20 22	21 08	20 33	21 04	21 32	21 59
S 50	20 05	20 47	21 45	20 40	21 07	21 32	21 55
52	20 15	21 00	22 05	20 44	21 09	21 32	21 53
54	20 25	21 15	22 32	20 48	21 11	21 32	21 51
56	20 37	21 32	23 15	20 52	21 13	21 31	21 49
58	20 51	21 54	////	20 57	21 15	21 31	21 47
S 60	21 07	22 23	////	21 02	21 17	21 31	21 44

Day	SUN		MOON			
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00^h	12^h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
13	08 35	08 47	12 09	13 41	01 13	02	4
14	08 58	09 09	12 09	14 33	02 07	03	10
15	09 19	09 30	12 09	15 22	02 57	04	17

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.6		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
16 00	115 35.7	196 17.4	S23 06.0	156 17.5	S16 56.8	50 38.4	N20 46.9	256 41.6	S12 42.9	Acamar	315 18.4	S40 15.4
01	130 38.2	211 16.4	05.9	171 18.0	56.2	65 41.0	46.9	271 44.0	42.9	Achernar	335 27.0	S57 10.5
02	145 40.7	226 15.5	05.8	186 18.5	55.6	80 43.6	46.9	286 46.3	42.9	Acrux	173 09.3	S63 10.1
03	160 43.1	241 14.5	. . 05.7	201 19.0	. . 55.0	95 46.2	. . 46.9	301 48.6	. . 43.0	Adhara	255 12.3	S28 59.6
04	175 45.6	256 13.6	05.6	216 19.5	54.4	110 48.8	46.9	316 50.9	43.0	Aldebaran	290 49.4	N16 32.0
05	190 48.1	271 12.7	05.5	231 20.0	53.8	125 51.4	46.9	331 53.3	43.0			
06	205 50.5	286 11.7	S23 05.4	246 20.5	S16 53.2	140 54.0	N20 46.8	346 55.6	S12 43.1	Alioth	166 20.8	N55 53.0
W 07	220 53.0	301 10.8	05.3	261 21.0	52.6	155 56.6	46.8	1 57.9	43.1	Alkaid	152 59.1	N49 14.6
E 08	235 55.5	316 09.8	05.2	276 21.5	52.0	170 59.2	46.8	17 00.2	43.1	Al Na'ir	27 44.5	S46 53.9
D 09	250 57.9	331 08.9	. . 05.1	291 22.0	. . 51.3	186 01.7	. . 46.8	32 02.6	. . 43.2	Alnilam	275 46.3	S 1 11.8
N 10	266 00.4	346 07.9	05.0	306 22.5	50.7	201 04.3	46.8	47 04.9	43.2	Alphard	217 56.0	S 8 43.1
E 11	281 02.8	1 07.0	04.9	321 23.0	50.1	216 06.9	46.8	62 07.2	43.2			
S 12	296 05.3	16 06.1	S23 04.8	336 23.5	S16 49.5	231 09.5	N20 46.8	77 09.5	S12 43.3	Alphecca	126 11.4	N26 40.1
D 13	311 07.8	31 05.1	04.6	351 24.0	48.9	246 12.1	46.8	92 11.9	43.3	Alpheratz	357 43.9	N29 09.9
A 14	326 10.2	46 04.2	04.5	6 24.5	48.3	261 14.7	46.8	107 14.2	43.3	Altair	62 08.8	N 8 54.3
Y 15	341 12.7	61 03.2	. . 04.4	21 25.0	. . 47.7	276 17.3	. . 46.8	122 16.5	. . 43.4	Ankaa	353 16.1	S42 14.3
16	356 15.2	76 02.3	04.3	36 25.5	47.1	291 19.9	46.7	137 18.9	43.4	Antares	112 26.8	S26 27.5
17	11 17.6	91 01.4	04.2	51 26.0	46.5	306 22.5	46.7	152 21.2	43.5			
18	26 20.1	106 00.4	S23 04.1	66 26.5	S16 45.9	321 25.1	N20 46.7	167 23.5	S12 43.5	Arcturus	145 56.0	N19 06.7
19	41 22.6	120 59.5	04.0	81 27.0	45.3	336 27.6	46.7	182 25.8	43.5	Atria	107 29.3	S69 02.7
20	56 25.0	135 58.5	03.8	96 27.6	44.7	351 30.2	46.7	197 28.2	43.6	Avior	234 17.4	S59 33.2
21	71 27.5	150 57.6	. . 03.7	111 28.1	. . 44.0	6 32.8	. . 46.7	212 30.5	. . 43.6	Bellatrix	278 32.0	N 6 21.5
22	86 30.0	165 56.6	03.6	126 28.6	43.4	21 35.4	46.7	227 32.8	43.6	Betelgeuse	271 01.3	N 7 24.4
23	101 32.4	180 55.7	03.5	141 29.1	42.8	36 38.0	46.7	242 35.1	43.7			
17 00	116 34.9	195 54.8	S23 03.4	156 29.6	S16 42.2	51 40.6	N20 46.7	257 37.5	S12 43.7	Canopus	263 55.7	S52 42.4
01	131 37.3	210 53.8	03.2	171 30.1	41.6	66 43.2	46.7	272 39.8	43.7	Capella	280 34.4	N46 00.6
02	146 39.8	225 52.9	03.1	186 30.6	41.0	81 45.8	46.6	287 42.1	43.8	Deneb	49 32.1	N45 19.8
03	161 42.3	240 51.9	. . 03.0	201 31.1	. . 40.4	96 48.3	. . 46.6	302 44.4	. . 43.8	Denebola	182 33.8	N14 29.7
04	176 44.7	255 51.0	02.8	216 31.6	39.8	111 50.9	46.6	317 46.8	43.8	Diphda	348 56.2	S17 55.0
05	191 47.2	270 50.1	02.7	231 32.1	39.1	126 53.5	46.6	332 49.1	43.9			
06	206 49.7	285 49.1	S23 02.6	246 32.6	S16 38.5	141 56.1	N20 46.6	347 51.4	S12 43.9	Dubhe	193 51.6	N61 40.4
T 07	221 52.1	300 48.2	02.5	261 33.1	37.9	156 58.7	46.6	2 53.8	43.9	Elnath	278 12.6	N28 37.0
H 08	236 54.6	315 47.3	02.3	276 33.6	37.3	172 01.3	46.6	17 56.1	44.0	Eltanin	90 46.7	N51 29.2
U 09	251 57.1	330 46.3	. . 02.2	291 34.1	. . 36.7	187 03.8	. . 46.6	32 58.4	. . 44.0	Enif	33 47.7	N 9 56.2
R 10	266 59.5	345 45.4	02.1	306 34.6	36.1	202 06.4	46.6	48 00.8	44.0	Fomalhaut	15 24.5	S29 33.2
S 11	282 02.0	0 44.4	01.9	321 35.1	35.5	217 09.0	46.6	63 03.1	44.1			
D 12	297 04.4	15 43.5	S23 01.8	336 35.6	S16 34.8	232 11.6	N20 46.5	78 05.4	S12 44.1	Gacrux	172 01.0	S57 11.0
A 13	312 06.9	30 42.6	01.6	351 36.1	34.2	247 14.2	46.5	93 07.7	44.1	Gienah	175 52.4	S17 36.9
Y 14	327 09.4	45 41.6	01.5	6 36.6	33.6	262 16.8	46.5	108 10.1	44.2	Hadar	148 48.3	S60 25.9
15	342 11.8	60 40.7	. . 01.4	21 37.1	. . 33.0	277 19.3	. . 46.5	123 12.4	. . 44.2	Hamal	328 01.0	N23 31.5
16	357 14.3	75 39.7	01.2	36 37.6	32.4	292 21.9	46.5	138 14.7	44.2	Kaus Aust.	83 44.5	S34 22.5
17	12 16.8	90 38.8	01.1	51 38.2	31.8	307 24.5	46.5	153 17.1	44.3			
18	27 19.2	105 37.9	S23 00.9	66 38.7	S16 31.2	322 27.1	N20 46.5	168 19.4	S12 44.3	Kochab	137 20.4	N74 05.8
19	42 21.7	120 36.9	00.8	81 39.2	30.5	337 29.7	46.5	183 21.7	44.3	Markab	13 38.8	N15 16.7
20	57 24.2	135 36.0	00.6	96 39.7	29.9	352 32.2	46.5	198 24.0	44.3	Menkar	314 15.2	N 4 08.4
21	72 26.6	150 35.1	. . 00.5	111 40.2	. . 29.3	7 34.8	. . 46.5	213 26.4	. . 44.4	Menkent	148 07.9	S36 25.9
22	87 29.1	165 34.1	00.3	126 40.7	28.7	22 37.4	46.5	228 28.7	44.4	Miaplacidus	221 38.8	S69 46.3
23	102 31.6	180 33.2	00.2	141 41.2	28.1	37 40.0	46.5	243 31.0	44.4			
18 00	117 34.0	195 32.2	S23 00.0	156 41.7	S16 27.4	52 42.6	N20 46.4	258 33.4	S12 44.5	Mirfak	308 40.5	N49 54.6
01	132 36.5	210 31.3	22 59.9	171 42.2	26.8	67 45.1	46.4	273 35.7	44.5	Nunki	75 59.0	S26 16.7
02	147 38.9	225 30.4	59.7	186 42.7	26.2	82 47.7	46.4	288 38.0	44.5	Peacock	53 20.3	S56 41.5
03	162 41.4	240 29.4	. . 59.6	201 43.2	. . 25.6	97 50.3	. . 46.4	303 40.4	. . 44.6	Pollux	243 27.7	N27 59.4
04	177 43.9	255 28.5	59.4	216 43.7	25.0	112 52.9	46.4	318 42.7	44.6	Procyon	244 59.7	N 5 11.2
05	192 46.3	270 27.6	59.2	231 44.3	24.4	127 55.4	46.4	333 45.0	44.6			
06	207 48.8	285 26.6	S22 59.1	246 44.8	S16 23.7	142 58.0	N20 46.4	348 47.4	S12 44.7	Rasalhague	96 07.0	N12 33.1
F 07	222 51.3	300 25.7	58.9	261 45.3	23.1	158 00.6	46.4	3 49.7	44.7	Regulus	207 43.5	N11 53.9
R 08	237 53.7	315 24.7	58.7	276 45.8	22.5	173 03.2	46.4	18 52.0	44.7	Rigel	281 12.0	S 8 11.4
I 09	252 56.2	330 23.8	. . 58.6	291 46.3	. . 21.9	188 05.7	. . 46.4	33 54.4	. . 44.8	Rigil Kent.	139 52.2	S60 53.0
D 10	267 58.7	345 22.9	58.4	306 46.8	21.2	203 08.3	46.4	48 56.7	44.8	Sabik	102 13.1	S15 44.3
A 11	283 01.1	0 21.9	58.3	321 47.3	20.6	218 10.9	46.4	63 59.0	44.8			
Y 12	298 03.6	15 21.0	S22 58.1	336 47.8	S16 20.0	233 13.5	N20 46.3	79 01.4	S12 44.9	Schedar	349 40.9	N56 36.8
13	313 06.1	30 20.1	57.9	351 48.3	19.4	248 16.0	46.3	94 03.7	44.9	Shaula	96 22.6	S37 06.6
14	328 08.5	45 19.1	57.7	6 48.8	18.8	263 18.6	46.3	109 06.0	44.9	Sirius	258 33.6	S16 44.3
15	343 11.0	60 18.2	. . 57.6	21 49.4	. . 18.1	278 21.2	. . 46.3	124 08.4	. . 45.0	Spica	158 31.5	S11 13.8
16	358 13.4	75 17.3	57.4	36 49.9	17.5	293 23.7	46.3	139 10.7	45.0	Suhail	222 52.2	S43 29.2
17	13 15.9	90 16.3	57.2	51 50.4	16.9	308 26.3	46.3	154 13.0	45.0			
18	28 18.4	105 15.4	S22 57.0	66 50.9	S16 16.3	323 28.9	N20 46.3	169 15.4	S12 45.1	Vega	80 39.5	N38 47.8
19	43 20.8	120 14.5	56.9	81 51.4	15.6	338 31.5	46.3	184 17.7	45.1	Zuben'ubi	137 05.8	S16 05.7
20	58 23.3	135 13.5	56.7	96 51.9	15.0	353 34.0	46.3	199 20.0	45.1		SHA	Mer.Pass.
21	73 25.8	150 12.6	. . 56.5	111 52.4	. . 14.4	8 36.6	. . 46.3	214 22.4	. . 45.1		° ′	h m
22	88 28.2	165 11.7	56.3	126 52.9	13.8	23 39.2	46.3	229 24.7	45.2	Venus	79 19.9	10 57
23	103 30.7	180 10.7	56.2	141 53.4	13.1	38 41.7	46.3	244 27.0	45.2	Mars	39 54.7	13 34
	h m									Jupiter	295 05.7	20 30
Mer.Pass.	16 11.0	v −0.9	d 0.1	v 0.5	d 0.6	v 2.6	d 0.0	v 2.3	d 0.0	Saturn	141 02.6	6 48

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
									Naut.	Civil		16	17	18	19
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
16 00	177 34.8	S20 56.5	125 28.9	12.5	N 0 39.5	11.7	57.4	N 72	07 55	09 42	▬	09 27	09 14	09 00	08 41
01	192 34.6	56.0	140 00.4	12.5	0 51.2	11.8	57.3	N 70	07 41	09 11	11 38	09 30	09 24	09 17	09 10
02	207 34.4	55.5	154 31.9	12.6	1 03.0	11.7	57.3	68	07 30	08 48	10 23	09 32	09 32	09 31	09 31
03	222 34.2	. . 55.1	169 03.5	12.6	1 14.7	11.7	57.2	66	07 20	08 30	09 46	09 35	09 38	09 42	09 48
04	237 34.0	54.6	183 35.1	12.6	1 26.4	11.7	57.2	64	07 12	08 15	09 20	09 37	09 44	09 52	10 02
05	252 33.8	54.1	198 06.7	12.7	1 38.1	11.7	57.2	62	07 05	08 03	09 00	09 38	09 49	10 00	10 14
06	267 33.6	S20 53.6	212 38.4	12.7	N 1 49.8	11.6	57.1	60	06 59	07 52	08 44	09 40	09 53	10 07	10 24
W 07	282 33.3	53.1	227 10.1	12.7	2 01.4	11.6	57.1	N 58	06 53	07 43	08 30	09 41	09 57	10 14	10 33
E 08	297 33.1	52.7	241 41.8	12.8	2 13.0	11.6	57.1	56	06 48	07 35	08 19	09 42	10 00	10 19	10 41
D 09	312 32.9	. . 52.2	256 13.6	12.8	2 24.6	11.6	57.0	54	06 43	07 27	08 08	09 43	10 03	10 24	10 48
N 10	327 32.7	51.7	270 45.4	12.8	2 36.2	11.5	57.0	52	06 38	07 20	07 59	09 44	10 06	10 29	10 54
E 11	342 32.5	51.2	285 17.2	12.9	2 47.7	11.5	56.9	50	06 34	07 14	07 51	09 45	10 08	10 33	10 59
S 12	357 32.3	S20 50.7	299 49.1	12.9	N 2 59.2	11.5	56.9	45	06 25	07 01	07 33	09 47	10 14	10 42	11 12
D 13	12 32.1	50.2	314 21.0	13.0	3 10.7	11.4	56.9	N 40	06 16	06 50	07 19	09 49	10 19	10 49	11 22
A 14	27 31.9	49.8	328 53.0	12.9	3 22.1	11.4	56.8	35	06 09	06 40	07 07	09 50	10 23	10 56	11 31
Y 15	42 31.7	. . 49.3	343 24.9	13.0	3 33.5	11.4	56.8	30	06 01	06 31	06 56	09 51	10 26	11 02	11 38
16	57 31.4	48.8	357 56.9	13.0	3 44.9	11.3	56.8	20	05 47	06 14	06 38	09 54	10 33	11 12	11 52
17	72 31.2	48.3	12 28.9	13.1	3 56.2	11.3	56.7	N 10	05 33	05 59	06 22	09 56	10 38	11 20	12 03
18	87 31.0	S20 47.8	27 01.0	13.1	N 4 07.5	11.3	56.7	0	05 19	05 44	06 07	09 57	10 43	11 29	12 14
19	102 30.8	47.3	41 33.1	13.1	4 18.8	11.2	56.6	S 10	05 02	05 29	05 51	09 59	10 49	11 37	12 25
20	117 30.6	46.8	56 05.2	13.1	4 30.0	11.2	56.6	20	04 42	05 11	05 35	10 01	10 54	11 46	12 37
21	132 30.4	. . 46.3	70 37.3	13.1	4 41.2	11.2	56.6	30	04 17	04 49	05 15	10 04	11 01	11 56	12 51
22	147 30.2	45.9	85 09.4	13.2	4 52.4	11.1	56.5	35	04 00	04 35	05 04	10 05	11 05	12 02	12 59
23	162 30.0	45.4	99 41.6	13.2	5 03.5	11.1	56.5	40	03 40	04 20	04 51	10 07	11 09	12 09	13 08
17 00	177 29.8	S20 44.9	114 13.8	13.2	N 5 14.6	11.1	56.5	45	03 15	04 00	04 36	10 08	11 14	12 17	13 18
01	192 29.6	44.4	128 46.0	13.3	5 25.7	11.0	56.4	S 50	02 39	03 35	04 17	10 11	11 20	12 27	13 31
02	207 29.4	43.9	143 18.3	13.2	5 36.7	10.9	56.4	52	02 19	03 23	04 08	10 12	11 23	12 31	13 37
03	222 29.2	. . 43.4	157 50.5	13.3	5 47.6	11.0	56.4	54	01 54	03 09	03 57	10 13	11 26	12 36	13 44
04	237 29.0	42.9	172 22.8	13.3	5 58.6	10.9	56.3	56	01 16	02 52	03 46	10 14	11 29	12 41	13 51
05	252 28.7	42.4	186 55.1	13.3	6 09.5	10.8	56.3	58	////	02 31	03 32	10 15	11 33	12 48	14 00
06	267 28.5	S20 41.9	201 27.4	13.3	N 6 20.3	10.8	56.3	S 60	////	02 04	03 17	10 17	11 37	12 55	14 09
T 07	282 28.3	41.4	215 59.7	13.4	6 31.1	10.8	56.2								
H 08	297 28.1	40.9	230 32.1	13.3	6 41.9	10.7	56.2								
U 09	312 27.9	. . 40.4	245 04.4	13.4	6 52.6	10.6	56.2								
R 10	327 27.7	39.9	259 36.8	13.4	7 03.2	10.7	56.1								
S 11	342 27.5	39.4	274 09.2	13.4	7 13.9	10.6	56.1								
D 12	357 27.3	S20 38.9	288 41.6	13.4	N 7 24.5	10.5	56.1								
A 13	12 27.1	38.4	303 14.0	13.4	7 35.0	10.5	56.0								
Y 14	27 26.9	37.9	317 46.4	13.5	7 45.5	10.4	56.0								
15	42 26.7	. . 37.4	332 18.9	13.4	7 55.9	10.4	56.0								
16	57 26.5	36.9	346 51.3	13.5	8 06.3	10.3	55.9								
17	72 26.3	36.4	1 23.8	13.5	8 16.6	10.3	55.9								
18	87 26.1	S20 35.9	15 56.3	13.4	N 8 26.9	10.3	55.9								
19	102 25.9	35.4	30 28.7	13.5	8 37.2	10.2	55.8								
20	117 25.7	34.9	45 01.2	13.5	8 47.4	10.1	55.8								
21	132 25.5	. . 34.4	59 33.7	13.5	8 57.5	10.1	55.8								
22	147 25.3	33.9	74 06.2	13.5	9 07.6	10.0	55.7								
23	162 25.1	33.4	88 38.7	13.5	9 17.6	10.0	55.7								
18 00	177 24.9	S20 32.9	103 11.2	13.5	N 9 27.6	9.9	55.7								
01	192 24.7	32.4	117 43.7	13.5	9 37.5	9.9	55.7								
02	207 24.5	31.8	132 16.2	13.5	9 47.4	9.8	55.6								
03	222 24.3	. . 31.3	146 48.7	13.6	9 57.2	9.8	55.6								
04	237 24.1	30.8	161 21.3	13.5	10 07.0	9.7	55.6								
05	252 23.9	30.3	175 53.8	13.5	10 16.7	9.7	55.5								
06	267 23.7	S20 29.8	190 26.3	13.5	N10 26.4	9.5	55.5								
F 07	282 23.5	29.3	204 58.8	13.5	10 35.9	9.6	55.5								
R 08	297 23.3	28.8	219 31.3	13.6	10 45.5	9.5	55.5								
I 09	312 23.1	. . 28.3	234 03.9	13.5	10 55.0	9.4	55.4								
D 10	327 22.9	27.7	248 36.4	13.5	11 04.4	9.4	55.4								
A 11	342 22.7	27.2	263 08.9	13.5	11 13.8	9.3	55.4								
Y 12	357 22.5	S20 26.7	277 41.4	13.5	N11 23.1	9.2	55.3								
13	12 22.3	26.2	292 13.9	13.5	11 32.3	9.2	55.3								
14	27 22.1	25.7	306 46.4	13.5	11 41.5	9.1	55.3								
15	42 21.9	. . 25.2	321 18.9	13.5	11 50.6	9.1	55.3								
16	57 21.8	24.6	335 51.4	13.5	11 59.7	9.0	55.2								
17	72 21.6	24.1	350 23.9	13.5	12 08.7	8.9	55.2								
18	87 21.4	S20 23.6	4 56.4	13.5	N12 17.6	8.9	55.2								
19	102 21.2	23.1	19 28.9	13.5	12 26.5	8.8	55.2								
20	117 21.0	22.6	34 01.4	13.4	12 35.3	8.8	55.1								
21	132 20.8	. . 22.0	48 33.8	13.5	12 44.1	8.7	55.1								
22	147 20.6	21.5	63 06.3	13.4	12 52.8	8.6	55.1								
23	162 20.4	21.0	77 38.7	13.5	N13 01.4	8.5	55.1								
	SD 16.3	d 0.5	SD 15.5		15.3		15.1								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	16	17	18	19
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 39	16 26	23 25	25 14	01 14	03 08
N 70	12 43	15 10	16 40	23 17	24 59	00 59	02 40
68	13 58	15 33	16 51	23 11	24 46	00 46	02 20
66	14 35	15 51	17 01	23 06	24 36	00 36	02 04
64	15 01	16 06	17 09	23 02	24 28	00 28	01 51
62	15 21	16 18	17 16	22 58	24 20	00 20	01 40
60	15 37	16 29	17 22	22 55	24 14	00 14	01 30
N 58	15 50	16 38	17 28	22 53	24 09	00 09	01 22
56	16 02	16 46	17 33	22 50	24 04	00 04	01 15
54	16 13	16 54	17 38	22 48	23 59	25 09	01 09
52	16 22	17 00	17 43	22 46	23 56	25 03	01 03
50	16 30	17 07	17 47	22 44	23 52	24 58	00 58
45	16 47	17 20	17 56	22 40	23 44	24 47	00 47
N 40	17 02	17 31	18 04	22 37	23 38	24 37	00 37
35	17 14	17 41	18 12	22 34	23 32	24 30	00 30
30	17 24	17 50	18 19	22 31	23 28	24 23	00 23
20	17 43	18 06	18 33	22 27	23 19	24 11	00 11
N 10	17 59	18 21	18 47	22 23	23 12	24 00	00 00
0	18 14	18 36	19 02	22 19	23 05	23 51	24 36
S 10	18 29	18 52	19 18	22 16	22 58	23 41	24 24
20	18 46	19 09	19 38	22 12	22 51	23 30	24 11
30	19 05	19 31	20 03	22 08	22 43	23 19	23 56
35	19 16	19 44	20 19	22 05	22 38	23 12	23 48
40	19 29	20 00	20 39	22 02	22 33	23 04	23 38
45	19 44	20 19	21 05	21 59	22 26	22 55	23 27
S 50	20 03	20 44	21 40	21 55	22 19	22 44	23 13
52	20 12	20 56	21 59	21 53	22 16	22 39	23 06
54	20 22	21 10	22 24	21 51	22 12	22 34	22 59
56	20 33	21 27	23 00	21 49	22 08	22 28	22 51
58	20 47	21 47	////	21 47	22 03	22 21	22 42
S 60	21 02	22 14	////	21 44	21 58	22 14	22 32

Day	SUN		MOON		
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00^h	12^h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
16	09 40	09 50	12 10	16 08	03 45	05	26
17	10 00	10 10	12 10	16 54	04 31	06	36
18	10 20	10 29	12 10	17 40	05 17	07	45

Tilbage til Menuen

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.6		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
19 00	118 33.2	195 09.8	S22 56.0	156 54.0	S16 12.5	53 44.3	N20 46.3	259 29.4	S12 45.2
01	133 35.6	210 08.9	55.8	171 54.5	11.9	68 46.9	46.3	274 31.7	45.3
02	148 38.1	225 07.9	55.6	186 55.0	11.3	83 49.4	46.2	289 34.0	45.3
03	163 40.5	240 07.0	55.4	201 55.5	10.6	98 52.0	46.2	304 36.4	45.3
04	178 43.0	255 06.1	55.2	216 56.0	10.0	113 54.6	46.2	319 38.7	45.4
05	193 45.5	270 05.1	55.0	231 56.5	09.4	128 57.1	46.2	334 41.0	45.4
06	208 47.9	285 04.2	S22 54.8	246 57.0	S16 08.8	143 59.7	N20 46.2	349 43.4	S12 45.4
07	223 50.4	300 03.3	54.7	261 57.6	08.1	159 02.3	46.2	4 45.7	45.5
S 08	238 52.9	315 02.3	54.5	276 58.1	07.5	174 04.8	46.2	19 48.1	45.5
A 09	253 55.3	330 01.4	54.3	291 58.6	06.9	189 07.4	46.2	34 50.4	45.5
T 10	268 57.8	345 00.5	54.1	306 59.1	06.2	204 10.0	46.2	49 52.7	45.5
U 11	284 00.3	359 59.5	53.9	321 59.6	05.6	219 12.5	46.2	64 55.1	45.6
R 12	299 02.7	14 58.6	S22 53.7	337 00.1	S16 05.0	234 15.1	N20 46.2	79 57.4	S12 45.6
D 13	314 05.2	29 57.7	53.5	352 00.6	04.4	249 17.7	46.2	94 59.7	45.6
A 14	329 07.7	44 56.7	53.3	7 01.2	03.7	264 20.2	46.2	110 02.1	45.7
Y 15	344 10.1	59 55.8	53.1	22 01.7	03.1	279 22.8	46.2	125 04.4	45.7
16	359 12.6	74 54.9	52.9	37 02.2	02.5	294 25.4	46.2	140 06.8	45.7
17	14 15.0	89 53.9	52.7	52 02.7	01.8	309 27.9	46.2	155 09.1	45.8
18	29 17.5	104 53.0	S22 52.5	67 03.2	S16 01.2	324 30.5	N20 46.1	170 11.4	S12 45.8
19	44 20.0	119 52.1	52.3	82 03.7	16 00.6	339 33.1	46.1	185 13.8	45.8
20	59 22.4	134 51.1	52.1	97 04.3	15 59.9	354 35.6	46.1	200 16.1	45.9
21	74 24.9	149 50.2	51.9	112 04.8	59.3	9 38.2	46.1	215 18.4	45.9
22	89 27.4	164 49.3	51.6	127 05.3	58.7	24 40.7	46.1	230 20.8	45.9
23	104 29.8	179 48.4	51.4	142 05.8	58.0	39 43.3	46.1	245 23.1	45.9
20 00	119 32.3	194 47.4	S22 51.2	157 06.3	S15 57.4	54 45.9	N20 46.1	260 25.5	S12 46.0
01	134 34.8	209 46.5	51.0	172 06.8	56.8	69 48.4	46.1	275 27.8	46.0
02	149 37.2	224 45.6	50.8	187 07.4	56.1	84 51.0	46.1	290 30.1	46.0
03	164 39.7	239 44.6	50.6	202 07.9	55.5	99 53.5	46.1	305 32.5	46.1
04	179 42.2	254 43.7	50.4	217 08.4	54.9	114 56.1	46.1	320 34.8	46.1
05	194 44.6	269 42.8	50.1	232 08.9	54.2	129 58.6	46.1	335 37.2	46.1
06	209 47.1	284 41.8	S22 49.9	247 09.4	S15 53.6	145 01.2	N20 46.1	350 39.5	S12 46.1
07	224 49.5	299 40.9	49.7	262 10.0	53.0	160 03.8	46.1	5 41.8	46.2
S 08	239 52.0	314 40.0	49.5	277 10.5	52.3	175 06.3	46.1	20 44.2	46.2
U 09	254 54.5	329 39.1	49.3	292 11.0	51.7	190 08.9	46.1	35 46.5	46.2
N 10	269 56.9	344 38.1	49.0	307 11.5	51.1	205 11.4	46.1	50 48.9	46.3
D 11	284 59.4	359 37.2	48.8	322 12.0	50.4	220 14.0	46.1	65 51.2	46.3
A 12	300 01.9	14 36.3	S22 48.6	337 12.6	S15 49.8	235 16.5	N20 46.0	80 53.5	S12 46.3
Y 13	315 04.3	29 35.4	48.4	352 13.1	49.2	250 19.1	46.0	95 55.9	46.4
14	330 06.8	44 34.4	48.1	7 13.6	48.5	265 21.7	46.0	110 58.2	46.4
15	345 09.3	59 33.5	47.9	22 14.1	47.9	280 24.2	46.0	126 00.6	46.4
16	0 11.7	74 32.6	47.7	37 14.6	47.3	295 26.8	46.0	141 02.9	46.4
17	15 14.2	89 31.6	47.4	52 15.2	46.6	310 29.3	46.0	156 05.2	46.5
18	30 16.6	104 30.7	S22 47.2	67 15.7	S15 46.0	325 31.9	N20 46.0	171 07.6	S12 46.5
19	45 19.1	119 29.8	47.0	82 16.2	45.3	340 34.4	46.0	186 09.9	46.5
20	60 21.6	134 28.9	46.7	97 16.7	44.7	355 37.0	46.0	201 12.3	46.6
21	75 24.0	149 27.9	46.5	112 17.2	44.1	10 39.5	46.0	216 14.6	46.6
22	90 26.5	164 27.0	46.3	127 17.8	43.4	25 42.1	46.0	231 16.9	46.6
23	105 29.0	179 26.1	46.0	142 18.3	42.8	40 44.6	46.0	246 19.3	46.6
21 00	120 31.4	194 25.2	S22 45.8	157 18.8	S15 42.2	55 47.2	N20 46.0	261 21.6	S12 46.7
01	135 33.9	209 24.2	45.5	172 19.3	41.5	70 49.7	46.0	276 24.0	46.7
02	150 36.4	224 23.3	45.3	187 19.9	40.9	85 52.3	46.0	291 26.3	46.7
03	165 38.8	239 22.4	45.0	202 20.4	40.2	100 54.8	46.0	306 28.7	46.8
04	180 41.3	254 21.5	44.8	217 20.9	39.6	115 57.4	46.0	321 31.0	46.8
05	195 43.8	269 20.5	44.5	232 21.4	39.0	130 59.9	46.0	336 33.3	46.8
06	210 46.2	284 19.6	S22 44.3	247 21.9	S15 38.3	146 02.5	N20 46.0	351 35.7	S12 46.8
07	225 48.7	299 18.7	44.0	262 22.5	37.7	161 05.0	46.0	6 38.0	46.9
08	240 51.1	314 17.8	43.8	277 23.0	37.0	176 07.6	46.0	21 40.4	46.9
M 09	255 53.6	329 16.9	43.5	292 23.5	36.4	191 10.1	46.0	36 42.7	46.9
O 10	270 56.1	344 15.9	43.3	307 24.0	35.7	206 12.7	46.0	51 45.1	47.0
N 11	285 58.5	359 15.0	43.0	322 24.6	35.1	221 15.2	46.0	66 47.4	47.0
D 12	301 01.0	14 14.1	S22 42.8	337 25.1	S15 34.5	236 17.8	N20 46.0	81 49.8	S12 47.0
A 13	316 03.5	29 13.2	42.5	352 25.6	33.8	251 20.3	45.9	96 52.1	47.0
Y 14	331 05.9	44 12.2	42.3	7 26.1	33.2	266 22.9	45.9	111 54.4	47.1
15	346 08.4	59 11.3	42.0	22 26.7	32.5	281 25.4	45.9	126 56.8	47.1
16	1 10.9	74 10.4	41.7	37 27.2	31.9	296 28.0	45.9	141 59.1	47.1
17	16 13.3	89 09.5	41.5	52 27.7	31.2	311 30.5	45.9	157 01.5	47.1
18	31 15.8	104 08.6	S22 41.2	67 28.2	S15 30.6	326 33.0	N20 45.9	172 03.8	S12 47.2
19	46 18.3	119 07.6	41.0	82 28.8	30.0	341 35.6	45.9	187 06.2	47.2
20	61 20.7	134 06.7	40.7	97 29.3	29.3	356 38.1	45.9	202 08.5	47.2
21	76 23.2	149 05.8	40.4	112 29.8	28.7	11 40.7	45.9	217 10.9	47.3
22	91 25.6	164 04.9	40.2	127 30.3	28.0	26 43.2	45.9	232 13.2	47.3
23	106 28.1	179 03.9	39.9	142 30.9	27.4	41 45.8	45.9	247 15.6	47.3
	h m								
Mer. Pass.	15 59.2	v −0.9	d 0.2	v 0.5	d 0.6	v 2.6	d 0.0	v 2.3	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.4	S40 15.4
Achernar	335 27.0	S57 10.5
Acrux	173 09.2	S63 10.1
Adhara	255 12.3	S28 59.7
Aldebaran	290 49.4	N16 32.0
Alioth	166 20.8	N55 53.0
Alkaid	152 59.1	N49 14.6
Al Na'ir	27 44.5	S46 53.9
Alnilam	275 46.3	S 1 11.8
Alphard	217 56.0	S 8 43.1
Alphecca	126 11.4	N26 40.1
Alpheratz	357 43.9	N29 09.9
Altair	62 08.8	N 8 54.3
Ankaa	353 16.1	S42 14.3
Antares	112 26.8	S26 27.5
Arcturus	145 56.0	N19 06.7
Atria	107 29.2	S69 02.7
Avior	234 17.4	S59 33.2
Bellatrix	278 32.0	N 6 21.5
Betelgeuse	271 01.3	N 7 24.4
Canopus	263 55.7	S52 42.4
Capella	280 34.4	N46 00.6
Deneb	49 32.1	N45 19.8
Denebola	182 33.7	N14 29.7
Diphda	348 56.3	S17 55.0
Dubhe	193 51.6	N61 40.4
Elnath	278 12.6	N28 37.0
Eltanin	90 46.7	N51 29.2
Enif	33 47.7	N 9 56.2
Fomalhaut	15 24.5	S29 33.2
Gacrux	172 00.9	S57 11.0
Gienah	175 52.4	S17 36.9
Hadar	148 48.2	S60 25.9
Hamal	328 01.0	N23 31.5
Kaus Aust.	83 44.5	S34 22.5
Kochab	137 20.4	N74 05.8
Markab	13 38.8	N15 16.7
Menkar	314 15.2	N 4 08.4
Menkent	148 07.9	S36 25.9
Miaplacidus	221 38.8	S69 46.3
Mirfak	308 40.5	N49 54.6
Nunki	75 59.0	S26 16.7
Peacock	53 20.3	S56 41.5
Pollux	243 27.7	N27 59.4
Procyon	244 59.7	N 5 11.2
Rasalhague	96 07.0	N12 33.1
Regulus	207 43.5	N11 53.9
Rigel	281 12.0	S 8 11.4
Rigil Kent.	139 52.1	S60 53.0
Sabik	102 13.1	S15 44.3
Schedar	349 41.0	N56 36.8
Shaula	96 22.6	S37 06.6
Sirius	258 33.6	S16 44.3
Spica	158 31.5	S11 13.8
Suhail	222 52.2	S43 29.3
Vega	80 39.5	N38 47.8
Zuben'ubi	137 05.8	S16 05.7

	SHA	Mer. Pass.
	° ′	h m
Venus	75 15.1	11 02
Mars	37 34.0	13 31
Jupiter	295 13.6	20 17
Saturn	140 53.2	6 37

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		19	20	21	22
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
19 00	177 20.2	S20 20.5	92 11.2	13.4	N13 09.9	8.5	55.0	N 72	07 47	09 30	▬	08 41	08 09	▭	▭
01	192 20.0	19.9	106 43.6	13.4	13 18.4	8.5	55.0	N 70	07 34	09 02	11 03	09 10	09 01	08 46	▭
02	207 19.8	19.4	121 16.0	13.4	13 26.9	8.3	55.0	68	07 24	08 40	10 09	09 31	09 34	09 40	09 57
03	222 19.6	18.9	135 48.4	13.4	13 35.2	8.3	55.0	66	07 15	08 23	09 37	09 48	09 58	10 13	10 39
04	237 19.4	18.4	150 20.8	13.4	13 43.5	8.2	55.0	64	07 08	08 10	09 13	10 02	10 17	10 37	11 08
05	252 19.3	17.8	164 53.2	13.4	13 51.7	8.2	54.9	62	07 01	07 58	08 54	10 14	10 32	10 57	11 30
06	267 19.1	S20 17.3	179 25.6	13.4	N13 59.9	8.1	54.9	60	06 55	07 48	08 39	10 24	10 45	11 12	11 48
07	282 18.9	16.8	193 58.0	13.3	14 08.0	8.0	54.9	N 58	06 49	07 39	08 26	10 33	10 56	11 26	12 03
S 08	297 18.7	16.3	208 30.3	13.4	14 16.0	8.0	54.9	56	06 45	07 31	08 15	10 41	11 06	11 37	12 16
A 09	312 18.5	15.7	223 02.7	13.3	14 24.0	7.9	54.8	54	06 40	07 24	08 05	10 48	11 15	11 47	12 27
T 10	327 18.3	15.2	237 35.0	13.3	14 31.9	7.8	54.8	52	06 36	07 18	07 56	10 54	11 23	11 56	12 36
U 11	342 18.1	14.7	252 07.3	13.3	14 39.7	7.7	54.8	50	06 32	07 12	07 48	10 59	11 30	12 04	12 45
R 12	357 17.9	S20 14.1	266 39.6	13.3	N14 47.4	7.7	54.8	45	06 23	06 59	07 31	11 12	11 45	12 22	13 04
D 13	12 17.7	13.6	281 11.9	13.3	14 55.1	7.6	54.8	N 40	06 15	06 48	07 18	11 22	11 57	12 36	13 19
A 14	27 17.6	13.1	295 44.2	13.2	15 02.7	7.5	54.7	35	06 08	06 39	07 06	11 31	12 08	12 48	13 32
Y 15	42 17.4	12.5	310 16.4	13.3	15 10.2	7.5	54.7	30	06 01	06 30	06 56	11 38	12 17	12 58	13 43
16	57 17.2	12.0	324 48.7	13.2	15 17.7	7.4	54.7	20	05 47	06 14	06 38	11 52	12 33	13 17	14 02
17	72 17.0	11.5	339 20.9	13.2	15 25.1	7.3	54.7	N 10	05 34	06 00	06 22	12 03	12 47	13 32	14 19
18	87 16.8	S20 10.9	353 53.1	13.2	N15 32.4	7.2	54.7	0	05 20	05 45	06 07	12 14	13 00	13 47	14 35
19	102 16.6	10.4	8 25.3	13.2	15 39.6	7.2	54.7	S 10	05 04	05 30	05 53	12 25	13 14	14 02	14 51
20	117 16.4	09.8	22 57.5	13.1	15 46.8	7.1	54.6	20	04 44	05 13	05 37	12 37	13 28	14 18	15 08
21	132 16.3	09.3	37 29.6	13.2	15 53.9	7.0	54.6	30	04 20	04 52	05 18	12 51	13 44	14 36	15 27
22	147 16.1	08.8	52 01.8	13.1	16 00.9	6.9	54.6	35	04 04	04 39	05 07	12 59	13 54	14 47	15 38
23	162 15.9	08.2	66 33.9	13.1	16 07.8	6.9	54.6	40	03 45	04 23	04 55	13 08	14 05	14 59	15 51
20 00	177 15.7	S20 07.7	81 06.0	13.1	N16 14.7	6.8	54.6	45	03 20	04 05	04 40	13 18	14 18	15 14	16 07
01	192 15.5	07.2	95 38.1	13.1	16 21.5	6.7	54.6	S 50	02 46	03 41	04 21	13 31	14 33	15 32	16 26
02	207 15.3	06.6	110 10.2	13.0	16 28.2	6.6	54.5	52	02 27	03 29	04 13	13 37	14 41	15 40	16 35
03	222 15.2	06.1	124 42.2	13.1	16 34.8	6.6	54.5	54	02 04	03 16	04 03	13 44	14 49	15 50	16 45
04	237 15.0	05.5	139 14.3	13.0	16 41.4	6.5	54.5	56	01 31	03 00	03 52	13 51	14 58	16 00	16 56
05	252 14.8	05.0	153 46.3	13.0	16 47.9	6.4	54.5	58	////	02 40	03 39	14 00	15 09	16 12	17 09
06	267 14.6	S20 04.4	168 18.3	13.0	N16 54.3	6.3	54.5	S 60	////	02 15	03 24	14 09	15 21	16 27	17 25
07	282 14.4	03.9	182 50.3	12.9	17 00.6	6.3	54.5								
S 08	297 14.2	03.3	197 22.2	13.0	17 06.9	6.1	54.4								
U 09	312 14.1	02.8	211 54.2	12.9	17 13.0	6.1	54.4								
N 10	327 13.9	02.3	226 26.1	12.9	17 19.1	6.0	54.4								
D 11	342 13.7	01.7	240 58.0	12.9	17 25.1	6.0	54.4								
A 12	357 13.5	S20 01.2	255 29.9	12.8	N17 31.1	5.8	54.4								
Y 13	12 13.3	00.6	270 01.7	12.9	17 36.9	5.8	54.4								
14	27 13.2	20 00.1	284 33.6	12.8	17 42.7	5.7	54.4								
15	42 13.0	19 59.5	299 05.4	12.8	17 48.4	5.6	54.4								
16	57 12.8	59.0	313 37.2	12.8	17 54.0	5.5	54.3								
17	72 12.6	58.4	328 09.0	12.7	17 59.5	5.4	54.3								
18	87 12.5	S19 57.9	342 40.7	12.8	N18 04.9	5.4	54.3								
19	102 12.3	57.3	357 12.5	12.7	18 10.3	5.3	54.3								
20	117 12.1	56.8	11 44.2	12.7	18 15.6	5.2	54.3								
21	132 11.9	56.2	26 15.9	12.6	18 20.8	5.1	54.3								
22	147 11.7	55.6	40 47.5	12.7	18 25.9	5.0	54.3								
23	162 11.6	55.1	55 19.2	12.6	18 30.9	4.9	54.3								
21 00	177 11.4	S19 54.5	69 50.8	12.6	N18 35.8	4.9	54.3								
01	192 11.2	54.0	84 22.4	12.6	18 40.7	4.7	54.3								
02	207 11.0	53.4	98 54.0	12.6	18 45.4	4.7	54.2								
03	222 10.9	52.9	113 25.6	12.5	18 50.1	4.6	54.2								
04	237 10.7	52.3	127 57.1	12.6	18 54.7	4.5	54.2								
05	252 10.5	51.8	142 28.7	12.5	18 59.2	4.5	54.2								
06	267 10.3	S19 51.2	157 00.2	12.5	N19 03.7	4.3	54.2								
07	282 10.2	50.6	171 31.7	12.4	19 08.0	4.3	54.2								
M 08	297 10.0	50.1	186 03.1	12.5	19 12.3	4.1	54.2								
O 09	312 09.8	49.5	200 34.6	12.4	19 16.4	4.1	54.2								
N 10	327 09.7	48.9	215 06.0	12.4	19 20.5	4.0	54.2								
D 11	342 09.5	48.4	229 37.4	12.4	19 24.5	3.9	54.2								
A 12	357 09.3	S19 47.8	244 08.8	12.4	N19 28.4	3.8	54.2								
Y 13	12 09.1	47.3	258 40.2	12.3	19 32.2	3.7	54.2								
14	27 09.0	46.7	273 11.5	12.3	19 35.9	3.7	54.2								
15	42 08.8	46.1	287 42.8	12.3	19 39.6	3.5	54.2								
16	57 08.6	45.6	302 14.1	12.3	19 43.1	3.4	54.1								
17	72 08.5	45.0	316 45.4	12.3	19 46.5	3.4	54.1								
18	87 08.3	S19 44.4	331 16.7	12.2	N19 49.9	3.3	54.1								
19	102 08.1	43.9	345 47.9	12.3	19 53.2	3.2	54.1								
20	117 07.9	43.3	0 19.2	12.2	19 56.4	3.1	54.1								
21	132 07.8	42.7	14 50.4	12.2	19 59.5	3.0	54.1								
22	147 07.6	42.2	29 21.6	12.1	20 02.5	2.9	54.1								
23	162 07.4	41.6	43 52.7	12.2	N20 05.4	2.8	54.1								
	SD 16.3	d 0.5	SD	14.9	14.8		14.8								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	19	20	21	22
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 53	16 36	03 08	05 16	▭	▭
N 70	13 20	15 22	16 49	02 40	04 25	06 17	▭
68	14 14	15 43	16 59	02 20	03 53	05 23	06 45
66	14 46	16 00	17 08	02 04	03 29	04 51	06 03
64	15 10	16 13	17 16	01 51	03 11	04 27	05 34
62	15 29	16 25	17 22	01 40	02 56	04 08	05 12
60	15 44	16 35	17 28	01 30	02 44	03 53	04 55
N 58	15 57	16 44	17 33	01 22	02 33	03 39	04 40
56	16 08	16 52	17 38	01 15	02 24	03 28	04 27
54	16 18	16 59	17 43	01 09	02 15	03 18	04 16
52	16 27	17 05	17 47	01 03	02 08	03 10	04 07
50	16 35	17 11	17 51	00 58	02 01	03 02	03 58
45	16 51	17 24	18 00	00 47	01 47	02 45	03 40
N 40	17 05	17 34	18 07	00 37	01 35	02 31	03 25
35	17 17	17 44	18 15	00 30	01 25	02 20	03 12
30	17 27	17 53	18 22	00 23	01 17	02 10	03 01
20	17 45	18 08	18 35	00 11	01 02	01 52	02 42
N 10	18 00	18 22	18 48	00 00	00 49	01 37	02 26
0	18 15	18 37	19 02	24 36	00 36	01 23	02 10
S 10	18 29	18 52	19 18	24 24	00 24	01 09	01 55
20	18 45	19 09	19 37	24 11	00 11	00 54	01 38
30	19 04	19 30	20 02	23 56	24 36	00 36	01 19
35	19 15	19 43	20 18	23 48	24 26	00 26	01 08
40	19 27	19 58	20 37	23 38	24 15	00 15	00 56
45	19 42	20 17	21 01	23 27	24 01	00 01	00 41
S 50	20 00	20 40	21 35	23 13	23 45	24 23	00 23
52	20 08	20 52	21 53	23 06	23 37	24 14	00 14
54	20 18	21 05	22 15	22 59	23 29	24 05	00 05
56	20 29	21 21	22 47	22 51	23 19	23 54	24 36
58	20 41	21 40	23 53	22 42	23 08	23 41	24 23
S 60	20 56	22 04	////	22 32	22 56	23 27	24 08

Day	SUN			MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
19	10 39	10 48	12 11	18 25	06 02	08	55
20	10 57	11 06	12 11	19 12	06 48	09	64
21	11 14	11 22	12 11	19 59	07 35	10	73

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.6		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
22 00	121 30.6	194 03.0	S22 39.6	157 31.4	S15 26.7	56 48.3	N20 45.9	262 17.9	S12 47.3	Acamar	315 18.4	S40 15.4
01	136 33.0	209 02.1	39.3	172 31.9	26.1	71 50.8	45.9	277 20.2	47.4	Achernar	335 27.1	S57 10.5
02	151 35.5	224 01.2	39.1	187 32.5	25.4	86 53.4	45.9	292 22.6	47.4	Acrux	173 09.2	S63 10.1
03	166 38.0	239 00.3	. . 38.8	202 33.0	. . 24.8	101 55.9	. . 45.9	307 24.9	. . 47.4	Adhara	255 12.3	S28 59.7
04	181 40.4	253 59.4	38.5	217 33.5	24.1	116 58.5	45.9	322 27.3	47.4	Aldebaran	290 49.4	N16 32.0
05	196 42.9	268 58.4	38.3	232 34.0	23.5	132 01.0	45.9	337 29.6	47.5			
06	211 45.4	283 57.5	S22 38.0	247 34.6	S15 22.8	147 03.5	N20 45.9	352 32.0	S12 47.5	Alioth	166 20.8	N55 53.0
07	226 47.8	298 56.6	37.7	262 35.1	22.2	162 06.1	45.9	7 34.3	47.5	Alkaid	152 59.1	N49 14.6
08	241 50.3	313 55.7	37.4	277 35.6	21.6	177 08.6	45.9	22 36.7	47.6	Al Na'ir	27 44.5	S46 53.9
09	256 52.8	328 54.8	. . 37.1	292 36.1	. . 20.9	192 11.2	. . 45.9	37 39.0	. . 47.6	Alnilam	275 46.3	S 1 11.8
10	271 55.2	343 53.8	36.9	307 36.7	20.3	207 13.7	45.9	52 41.4	47.6	Alphard	217 56.0	S 8 43.1
11	286 57.7	358 52.9	36.6	322 37.2	19.6	222 16.2	45.9	67 43.7	47.6			
12	302 00.1	13 52.0	S22 36.3	337 37.7	S15 19.0	237 18.8	N20 45.9	82 46.1	S12 47.7	Alphecca	126 11.4	N26 40.1
13	317 02.6	28 51.1	36.0	352 38.3	18.3	252 21.3	45.9	97 48.4	47.7	Alpheratz	357 43.9	N29 09.9
14	332 05.1	43 50.2	35.7	7 38.8	17.7	267 23.9	45.9	112 50.8	47.7	Altair	62 08.8	N 8 54.3
15	347 07.5	58 49.3	. . 35.4	22 39.3	. . 17.0	282 26.4	. . 45.9	127 53.1	. . 47.7	Ankaa	353 16.1	S42 14.3
16	2 10.0	73 48.3	35.1	37 39.9	16.4	297 28.9	45.9	142 55.5	47.8	Antares	112 26.8	S26 27.5
17	17 12.5	88 47.4	34.8	52 40.4	15.7	312 31.5	45.9	157 57.8	47.8			
18	32 14.9	103 46.5	S22 34.6	67 40.9	S15 15.1	327 34.0	N20 45.9	173 00.2	S12 47.8	Arcturus	145 56.0	N19 06.7
19	47 17.4	118 45.6	34.3	82 41.4	14.4	342 36.5	45.9	188 02.5	47.8	Atria	107 29.2	S69 02.7
20	62 19.9	133 44.7	34.0	97 42.0	13.8	357 39.1	45.9	203 04.9	47.9	Avior	234 17.4	S59 33.3
21	77 22.3	148 43.8	. . 33.7	112 42.5	. . 13.1	12 41.6	. . 45.9	218 07.2	. . 47.9	Bellatrix	278 32.0	N 6 21.5
22	92 24.8	163 42.9	33.4	127 43.0	12.5	27 44.1	45.9	233 09.6	47.9	Betelgeuse	271 01.3	N 7 24.4
23	107 27.2	178 41.9	33.1	142 43.6	11.8	42 46.7	45.9	248 11.9	48.0			
23 00	122 29.7	193 41.0	S22 32.8	157 44.1	S15 11.1	57 49.2	N20 45.9	263 14.3	S12 48.0	Canopus	263 55.7	S52 42.5
01	137 32.2	208 40.1	32.5	172 44.6	10.5	72 51.7	45.9	278 16.6	48.0	Capella	280 34.4	N46 00.6
02	152 34.6	223 39.2	32.2	187 45.2	09.8	87 54.3	45.9	293 19.0	48.0	Deneb	49 32.1	N45 19.8
03	167 37.1	238 38.3	. . 31.9	202 45.7	. . 09.2	102 56.8	. . 45.9	308 21.3	. . 48.1	Denebola	182 33.7	N14 29.7
04	182 39.6	253 37.4	31.6	217 46.2	08.5	117 59.3	45.9	323 23.7	48.1	Diphda	348 56.3	S17 55.0
05	197 42.0	268 36.5	31.3	232 46.8	07.9	133 01.9	45.9	338 26.0	48.1			
06	212 44.5	283 35.5	S22 31.0	247 47.3	S15 07.2	148 04.4	N20 45.9	353 28.4	S12 48.1	Dubhe	193 51.5	N61 40.5
07	227 47.0	298 34.6	30.7	262 47.8	06.6	163 06.9	45.9	8 30.7	48.2	Elnath	278 12.6	N28 37.0
08	242 49.4	313 33.7	30.3	277 48.4	05.9	178 09.5	45.9	23 33.1	48.2	Eltanin	90 46.7	N51 29.2
09	257 51.9	328 32.8	. . 30.0	292 48.9	. . 05.3	193 12.0	. . 45.9	38 35.4	. . 48.2	Enif	33 47.7	N 9 56.2
10	272 54.4	343 31.9	29.7	307 49.4	04.6	208 14.5	45.9	53 37.8	48.2	Fomalhaut	15 24.5	S29 33.2
11	287 56.8	358 31.0	29.4	322 50.0	04.0	223 17.0	45.9	68 40.1	48.3			
12	302 59.3	13 30.1	S22 29.1	337 50.5	S15 03.3	238 19.6	N20 45.9	83 42.5	S12 48.3	Gacrux	172 00.9	S57 11.0
13	318 01.7	28 29.2	28.8	352 51.0	02.6	253 22.1	45.9	98 44.8	48.3	Gienah	175 52.4	S17 36.9
14	333 04.2	43 28.3	28.5	7 51.6	02.0	268 24.6	45.9	113 47.2	48.3	Hadar	148 48.2	S60 25.9
15	348 06.7	58 27.3	. . 28.2	22 52.1	. . 01.3	283 27.2	. . 45.9	128 49.5	. . 48.4	Hamal	328 01.0	N23 31.5
16	3 09.1	73 26.4	27.8	37 52.6	00.7	298 29.7	45.9	143 51.9	48.4	Kaus Aust.	83 44.5	S34 22.5
17	18 11.6	88 25.5	27.5	52 53.2	15 00.0	313 32.2	45.9	158 54.2	48.4			
18	33 14.1	103 24.6	S22 27.2	67 53.7	S14 59.4	328 34.7	N20 45.9	173 56.6	S12 48.4	Kochab	137 20.3	N74 05.8
19	48 16.5	118 23.7	26.9	82 54.2	58.7	343 37.3	45.9	188 58.9	48.5	Markab	13 38.8	N15 16.7
20	63 19.0	133 22.8	26.5	97 54.8	58.0	358 39.8	45.9	204 01.3	48.5	Menkar	314 15.2	N 4 08.4
21	78 21.5	148 21.9	. . 26.2	112 55.3	. . 57.4	13 42.3	. . 45.9	219 03.7	. . 48.5	Menkent	148 07.8	S36 25.9
22	93 23.9	163 21.0	25.9	127 55.8	56.7	28 44.8	45.9	234 06.0	48.5	Miaplacidus	221 38.7	S69 46.3
23	108 26.4	178 20.1	25.6	142 56.4	56.1	43 47.4	45.9	249 08.4	48.6			
24 00	123 28.9	193 19.2	S22 25.2	157 56.9	S14 55.4	58 49.9	N20 45.9	264 10.7	S12 48.6	Mirfak	308 40.5	N49 54.6
01	138 31.3	208 18.3	24.9	172 57.5	54.8	73 52.4	45.9	279 13.1	48.6	Nunki	75 59.0	S26 16.7
02	153 33.8	223 17.3	24.6	187 58.0	54.1	88 54.9	45.9	294 15.4	48.6	Peacock	53 20.3	S56 41.5
03	168 36.2	238 16.4	. . 24.3	202 58.5	. . 53.4	103 57.5	. . 45.9	309 17.8	. . 48.7	Pollux	243 27.7	N27 59.4
04	183 38.7	253 15.5	23.9	217 59.1	52.8	119 00.0	45.9	324 20.1	48.7	Procyon	244 59.7	N 5 11.2
05	198 41.2	268 14.6	23.6	232 59.6	52.1	134 02.5	45.9	339 22.5	48.7			
06	213 43.6	283 13.7	S22 23.3	248 00.1	S14 51.5	149 05.0	N20 45.9	354 24.8	S12 48.7	Rasalhague	96 07.0	N12 33.1
07	228 46.1	298 12.8	22.9	263 00.7	50.8	164 07.5	45.9	9 27.2	48.8	Regulus	207 43.5	N11 53.9
08	243 48.6	313 11.9	22.6	278 01.2	50.1	179 10.1	45.9	24 29.6	48.8	Rigel	281 12.0	S 8 11.4
09	258 51.0	328 11.0	. . 22.2	293 01.7	. . 49.5	194 12.6	. . 45.9	39 31.9	. . 48.8	Rigil Kent.	139 52.1	S60 53.0
10	273 53.5	343 10.1	21.9	308 02.3	48.8	209 15.1	45.9	54 34.3	48.8	Sabik	102 13.1	S15 44.3
11	288 56.0	358 09.2	21.6	323 02.8	48.2	224 17.6	45.9	69 36.6	48.9			
12	303 58.4	13 08.3	S22 21.2	338 03.4	S14 47.5	239 20.1	N20 45.9	84 39.0	S12 48.9	Schedar	349 41.0	N56 36.8
13	319 00.9	28 07.4	20.9	353 03.9	46.8	254 22.7	45.9	99 41.3	48.9	Shaula	96 22.6	S37 06.6
14	334 03.4	43 06.5	20.5	8 04.4	46.2	269 25.2	45.9	114 43.7	48.9	Sirius	258 33.6	S16 44.3
15	349 05.8	58 05.6	. . 20.2	23 05.0	. . 45.5	284 27.7	. . 45.9	129 46.0	. . 48.9	Spica	158 31.4	S11 13.8
16	4 08.3	73 04.7	19.8	38 05.5	44.8	299 30.2	45.9	144 48.4	49.0	Suhail	222 52.2	S43 29.3
17	19 10.7	88 03.8	19.5	53 06.1	44.2	314 32.7	45.9	159 50.8	49.0			
18	34 13.2	103 02.9	S22 19.1	68 06.6	S14 43.5	329 35.3	N20 45.9	174 53.1	S12 49.0	Vega	80 39.5	N38 47.8
19	49 15.7	118 02.0	18.8	83 07.1	42.9	344 37.8	45.9	189 55.5	49.0	Zuben'ubi	137 05.7	S16 05.7
20	64 18.1	133 01.1	18.4	98 07.7	42.2	359 40.3	45.9	204 57.8	49.1		SHA	Mer.Pass.
21	79 20.6	148 00.2	. . 18.1	113 08.2	. . 41.5	14 42.8	. . 45.9	220 00.2	. . 49.1		° ′	h m
22	94 23.1	162 59.3	17.7	128 08.8	40.9	29 45.3	45.9	235 02.5	49.1	Venus	71 11.3	11 06
23	109 25.5	177 58.4	17.4	143 09.3	40.2	44 47.8	45.9	250 04.9	49.1	Mars	35 14.4	13 29
	h m									Jupiter	295 19.5	20 05
Mer.Pass.	15 47.4	v −0.9	d 0.3	v 0.5	d 0.7	v 2.5	d 0.0	v 2.4	d 0.0	Saturn	140 44.5	6 26

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 22	Moonrise 23	Moonrise 24	Moonrise 25
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
22 00	177 07.3	S19 41.0	58 23.9	12.1	N20 08.2	2.7	54.1	N 72	07 39	09 17					
01	192 07.1	40.4	72 55.0	12.2	20 10.9	2.6	54.1	N 70	07 27	08 52	10 39				12 31
02	207 06.9	39.9	87 26.2	12.1	20 13.5	2.6	54.1	68	07 17	08 32	09 56	09 57	10 36	11 46	13 14
03	222 06.8	. . 39.3	101 57.3	12.0	20 16.1	2.4	54.1	66	07 09	08 16	09 27	10 39	11 23	12 26	13 43
04	237 06.6	38.7	116 28.3	12.1	20 18.5	2.4	54.1	64	07 02	08 04	09 05	11 08	11 53	12 53	14 05
05	252 06.4	38.1	130 59.4	12.1	20 20.9	2.2	54.1	62	06 56	07 53	08 48	11 30	12 16	13 14	14 23
06	267 06.3	S19 37.6	145 30.5	12.0	N20 23.1	2.2	54.1	60	06 51	07 43	08 33	11 48	12 34	13 31	14 37
07	282 06.1	37.0	160 01.5	12.0	20 25.3	2.1	54.1	N 58	06 46	07 35	08 21	12 03	12 49	13 45	14 50
08	297 05.9	36.4	174 32.5	12.0	20 27.4	2.0	54.1	56	06 41	07 27	08 10	12 16	13 02	13 58	15 00
09	312 05.8	. . 35.8	189 03.5	12.0	20 29.4	1.8	54.1	54	06 37	07 21	08 01	12 27	13 14	14 08	15 10
10	327 05.6	35.3	203 34.5	12.0	20 31.2	1.8	54.1	52	06 33	07 15	07 52	12 36	13 24	14 18	15 18
11	342 05.5	34.7	218 05.5	11.9	20 33.0	1.7	54.1	50	06 29	07 09	07 45	12 45	13 33	14 26	15 25
12	357 05.3	S19 34.1	232 36.4	12.0	N20 34.7	1.6	54.1	45	06 21	06 57	07 29	13 04	13 51	14 44	15 41
13	12 05.1	33.5	247 07.4	11.9	20 36.3	1.5	54.1	N 40	06 14	06 46	07 16	13 19	14 07	14 59	15 54
14	27 05.0	33.0	261 38.3	11.9	20 37.8	1.5	54.1	35	06 07	06 37	07 04	13 32	14 20	15 11	16 06
15	42 04.8	. . 32.4	276 09.2	11.9	20 39.3	1.3	54.1	30	06 00	06 29	06 55	13 43	14 31	15 22	16 15
16	57 04.6	31.8	290 40.1	11.9	20 40.6	1.2	54.1	20	05 47	06 14	06 37	14 02	14 51	15 41	16 32
17	72 04.5	31.2	305 11.0	11.9	20 41.8	1.1	54.1	N 10	05 35	06 00	06 22	14 19	15 07	15 57	16 46
18	87 04.3	S19 30.6	319 41.9	11.9	N20 42.9	1.0	54.1	0	05 21	05 46	06 08	14 35	15 23	16 12	17 00
19	102 04.2	30.0	334 12.8	11.8	20 43.9	1.0	54.1	S 10	05 05	05 32	05 54	14 51	15 39	16 27	17 13
20	117 04.0	29.5	348 43.6	11.8	20 44.9	0.8	54.1	20	04 47	05 15	05 39	15 08	15 56	16 43	17 28
21	132 03.8	. . 28.9	3 14.4	11.9	20 45.7	0.8	54.1	30	04 23	04 54	05 21	15 27	16 15	17 01	17 44
22	147 03.7	28.3	17 45.3	11.8	20 46.5	0.6	54.1	35	04 08	04 42	05 10	15 38	16 27	17 12	17 54
23	162 03.5	27.7	32 16.1	11.8	20 47.1	0.6	54.1	40	03 49	04 27	04 58	15 51	16 40	17 24	18 05
23 00	177 03.3	S19 27.1	46 46.9	11.8	N20 47.7	0.4	54.1	45	03 25	04 09	04 44	16 07	16 55	17 39	18 18
01	192 03.2	26.5	61 17.7	11.8	20 48.1	0.4	54.1	S 50	02 53	03 46	04 26	16 26	17 14	17 57	18 33
02	207 03.0	26.0	75 48.5	11.8	20 48.5	0.2	54.1	52	02 36	03 35	04 18	16 35	17 23	18 05	18 41
03	222 02.9	. . 25.4	90 19.3	11.7	20 48.7	0.2	54.1	54	02 14	03 22	04 09	16 45	17 33	18 14	18 49
04	237 02.7	24.8	104 50.0	11.8	20 48.9	0.1	54.1	56	01 46	03 07	03 58	16 56	17 45	18 25	18 58
05	252 02.6	24.2	119 20.8	11.7	20 49.0	0.1	54.1	58	00 57	02 49	03 46	17 09	17 58	18 37	19 08
06	267 02.4	S19 23.6	133 51.5	11.8	N20 48.9	0.1	54.1	S 60	////	02 26	03 32	17 25	18 13	18 51	19 20
07	282 02.2	23.0	148 22.3	11.7	20 48.8	0.2	54.1								
08	297 02.1	22.4	162 53.0	11.7	20 48.6	0.3	54.2								
09	312 01.9	. . 21.8	177 23.7	11.8	20 48.3	0.4	54.2								
10	327 01.8	21.2	191 54.5	11.7	20 47.9	0.6	54.2								
11	342 01.6	20.6	206 25.2	11.7	20 47.3	0.6	54.2								
12	357 01.5	S19 20.0	220 55.9	11.7	N20 46.7	0.7	54.2								
13	12 01.3	19.5	235 26.6	11.7	20 46.0	0.8	54.2								
14	27 01.2	18.9	249 57.3	11.7	20 45.2	0.9	54.2								
15	42 01.0	. . 18.3	264 28.0	11.7	20 44.3	1.0	54.2								
16	57 00.8	17.7	278 58.7	11.7	20 43.3	1.1	54.2								
17	72 00.7	17.1	293 29.4	11.7	20 42.2	1.2	54.2								
18	87 00.5	S19 16.5	308 00.1	11.7	N20 41.0	1.3	54.2								
19	102 00.4	15.9	322 30.8	11.7	20 39.7	1.3	54.2								
20	117 00.2	15.3	337 01.5	11.6	20 38.4	1.5	54.2								
21	132 00.1	. . 14.7	351 32.1	11.7	20 36.9	1.6	54.2								
22	146 59.9	14.1	6 02.8	11.7	20 35.3	1.7	54.2								
23	161 59.8	13.5	20 33.5	11.7	20 33.6	1.8	54.2								
24 00	176 59.6	S19 12.9	35 04.2	11.7	N20 31.8	1.8	54.3								
01	191 59.5	12.3	49 34.9	11.6	20 30.0	2.0	54.3								
02	206 59.3	11.7	64 05.5	11.7	20 28.0	2.1	54.3								
03	221 59.2	. . 11.1	78 36.2	11.7	20 25.9	2.1	54.3								
04	236 59.0	10.5	93 06.9	11.7	20 23.8	2.3	54.3								
05	251 58.9	09.9	107 37.6	11.7	20 21.5	2.4	54.3								
06	266 58.7	S19 09.3	122 08.3	11.7	N20 19.1	2.4	54.3								
07	281 58.6	08.7	136 39.0	11.7	20 16.7	2.6	54.3								
08	296 58.4	08.0	151 09.7	11.7	20 14.1	2.6	54.3								
09	311 58.3	. . 07.4	165 40.4	11.7	20 11.5	2.7	54.3								
10	326 58.1	06.8	180 11.1	11.7	20 08.8	2.9	54.4								
11	341 58.0	06.2	194 41.8	11.7	20 05.9	2.9	54.4								
12	356 57.8	S19 05.6	209 12.5	11.7	N20 03.0	3.0	54.4								
13	11 57.7	05.0	223 43.2	11.7	20 00.0	3.2	54.4								
14	26 57.5	04.4	238 13.9	11.8	19 56.8	3.2	54.4								
15	41 57.4	. . 03.8	252 44.7	11.7	19 53.6	3.3	54.4								
16	56 57.3	03.2	267 15.4	11.7	19 50.3	3.4	54.4								
17	71 57.1	02.6	281 46.1	11.8	19 46.9	3.5	54.4								
18	86 57.0	S19 02.0	296 16.9	11.7	N19 43.4	3.6	54.4								
19	101 56.8	01.3	310 47.6	11.8	19 39.8	3.7	54.4								
20	116 56.7	00.7	325 18.4	11.8	19 36.1	3.8	54.5								
21	131 56.5	19 00.1	339 49.2	11.8	19 32.3	3.8	54.5								
22	146 56.4	18 59.5	354 20.0	11.8	19 28.5	4.0	54.5								
23	161 56.2	S18 58.9	8 50.8	11.8	N19 24.5	4.1	54.5								
	SD 16.3	d 0.6	SD	14.7		14.8		14.8							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 22	Moonset 23	Moonset 24	Moonset 25
°	h m	h m	h m	h m	h m	h m	h m
N 72		15 08	16 47				
N 70	13 45	15 33	16 58				09 13
68	14 29	15 53	17 07	06 45	07 46	08 16	08 29
66	14 58	16 08	17 15	06 03	06 59	07 37	07 59
64	15 20	16 21	17 22	05 34	06 29	07 09	07 37
62	15 37	16 32	17 28	05 12	06 06	06 48	07 19
60	15 51	16 41	17 34	04 55	05 48	06 31	07 04
N 58	16 04	16 50	17 39	04 40	05 33	06 16	06 51
56	16 14	16 57	17 43	04 27	05 20	06 04	06 40
54	16 24	17 04	17 47	04 16	05 08	05 53	06 31
52	16 32	17 10	17 51	04 07	04 58	05 43	06 22
50	16 39	17 15	17 55	03 58	04 49	05 35	06 14
45	16 55	17 27	18 03	03 40	04 30	05 17	05 58
N 40	17 08	17 38	18 11	03 25	04 15	05 02	05 44
35	17 20	17 47	18 17	03 12	04 02	04 49	05 32
30	17 30	17 55	18 24	03 01	03 51	04 38	05 22
20	17 46	18 10	18 37	02 42	03 31	04 19	05 05
N 10	18 01	18 24	18 49	02 26	03 14	04 02	04 49
0	18 15	18 37	19 03	02 10	02 58	03 47	04 35
S 10	18 30	18 52	19 18	01 55	02 42	03 31	04 21
20	18 45	19 09	19 37	01 38	02 25	03 14	04 05
30	19 03	19 29	20 00	01 19	02 06	02 55	03 47
35	19 13	19 41	20 16	01 08	01 54	02 44	03 37
40	19 25	19 56	20 34	00 56	01 41	02 31	03 25
45	19 39	20 14	20 57	00 41	01 26	02 16	03 11
S 50	19 56	20 36	21 29	00 23	01 07	01 57	02 54
52	20 05	20 47	21 46	00 14	00 58	01 48	02 46
54	20 14	21 00	22 07	00 05	00 48	01 38	02 37
56	20 24	21 15	22 35	24 36	00 36	01 27	02 26
58	20 36	21 32	23 19	24 23	00 23	01 14	02 15
S 60	20 50	21 55	////	24 08	00 08	00 59	02 01

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
22	11 31	11 39	12 12	20 47	08 23	11	81
23	11 46	11 54	12 12	21 35	09 11	12	88
24	12 01	12 08	12 12	22 23	09 59	13	93

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.6		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
25 00	124 28.0	192 57.5	S22 17.0	158 09.8	S14 39.5	59 50.4	N20 45.9	265 07.3	S12 49.2	Acamar	315 18.5	S40 15.4
01	139 30.5	207 56.6	16.7	173 10.4	38.9	74 52.9	45.9	280 09.6	49.2	Achernar	335 27.1	S57 10.5
02	154 32.9	222 55.7	16.3	188 10.9	38.2	89 55.4	45.9	295 12.0	49.2	Acrux	173 09.1	S63 10.2
03	169 35.4	237 54.8	. . 16.0	203 11.5	. . 37.5	104 57.9	. . 45.9	310 14.3	. . 49.2	Adhara	255 12.3	S28 59.7
04	184 37.8	252 53.9	15.6	218 12.0	36.9	120 00.4	45.9	325 16.7	49.3	Aldebaran	290 49.4	N16 32.0
05	199 40.3	267 53.0	15.2	233 12.5	36.2	135 02.9	45.9	340 19.1	49.3			
06	214 42.8	282 52.1	S22 14.9	248 13.1	S14 35.5	150 05.4	N20 45.9	355 21.4	S12 49.3	Alioth	166 20.7	N55 53.0
07	229 45.2	297 51.2	14.5	263 13.6	34.9	165 08.0	45.9	10 23.8	49.3	Alkaid	152 59.0	N49 14.5
08	244 47.7	312 50.3	14.1	278 14.2	34.2	180 10.5	45.9	25 26.1	49.3	Al Na'ir	27 44.5	S46 53.9
09	259 50.2	327 49.4	. . 13.8	293 14.7	. . 33.5	195 13.0	. . 45.9	40 28.5	. . 49.4	Alnilam	275 46.3	S 1 11.8
10	274 52.6	342 48.5	13.4	308 15.3	32.9	210 15.5	45.9	55 30.9	49.4	Alphard	217 56.0	S 8 43.2
11	289 55.1	357 47.6	13.0	323 15.8	32.2	225 18.0	45.9	70 33.2	49.4			
12	304 57.6	12 46.7	S22 12.7	338 16.3	S14 31.5	240 20.5	N20 45.9	85 35.6	S12 49.4	Alphecca	126 11.3	N26 40.1
13	320 00.0	27 45.8	12.3	353 16.9	30.9	255 23.0	45.9	100 37.9	49.5	Alpheratz	357 43.9	N29 09.9
14	335 02.5	42 44.9	11.9	8 17.4	30.2	270 25.5	45.9	115 40.3	49.5	Altair	62 08.8	N 8 54.3
15	350 05.0	57 44.0	. . 11.6	23 18.0	. . 29.5	285 28.0	. . 45.9	130 42.7	. . 49.5	Ankaa	353 16.2	S42 14.3
16	5 07.4	72 43.1	11.2	38 18.5	28.9	300 30.5	45.9	145 45.0	49.5	Antares	112 26.7	S26 27.5
17	20 09.9	87 42.2	10.8	53 19.1	28.2	315 33.1	45.9	160 47.4	49.5			
18	35 12.3	102 41.3	S22 10.4	68 19.6	S14 27.5	330 35.6	N20 45.9	175 49.7	S12 49.6	Arcturus	145 55.9	N19 06.7
19	50 14.8	117 40.4	10.0	83 20.1	26.9	345 38.1	45.9	190 52.1	49.6	Atria	107 29.1	S69 02.7
20	65 17.3	132 39.5	09.7	98 20.7	26.2	0 40.6	45.9	205 54.5	49.6	Avior	234 17.4	S59 33.3
21	80 19.7	147 38.6	. . 09.3	113 21.2	. . 25.5	15 43.1	. . 45.9	220 56.8	. . 49.6	Bellatrix	278 32.0	N 6 21.5
22	95 22.2	162 37.7	08.9	128 21.8	24.8	30 45.6	45.9	235 59.2	49.7	Betelgeuse	271 01.3	N 7 24.4
23	110 24.7	177 36.8	08.5	143 22.3	24.2	45 48.1	45.9	251 01.5	49.7			
26 00	125 27.1	192 35.9	S22 08.1	158 22.9	S14 23.5	60 50.6	N20 45.9	266 03.9	S12 49.7	Canopus	263 55.8	S52 42.5
01	140 29.6	207 35.0	07.8	173 23.4	22.8	75 53.1	45.9	281 06.3	49.7	Capella	280 34.4	N46 00.6
02	155 32.1	222 34.1	07.4	188 24.0	22.2	90 55.6	45.9	296 08.6	49.7	Deneb	49 32.1	N45 19.8
03	170 34.5	237 33.2	. . 07.0	203 24.5	. . 21.5	105 58.1	. . 45.9	311 11.0	. . 49.8	Denebola	182 33.7	N14 29.7
04	185 37.0	252 32.4	06.6	218 25.1	20.8	121 00.6	45.9	326 13.4	49.8	Diphda	348 56.3	S17 55.0
05	200 39.5	267 31.5	06.2	233 25.6	20.1	136 03.1	46.0	341 15.7	49.8			
06	215 41.9	282 30.6	S22 05.8	248 26.1	S14 19.5	151 05.6	N20 46.0	356 18.1	S12 49.8	Dubhe	193 51.5	N61 40.5
07	230 44.4	297 29.7	05.4	263 26.7	18.8	166 08.1	46.0	11 20.4	49.9	Elnath	278 12.6	N28 37.0
08	245 46.8	312 28.8	05.0	278 27.2	18.1	181 10.6	46.0	26 22.8	49.9	Eltanin	90 46.7	N51 29.2
09	260 49.3	327 27.9	. . 04.6	293 27.8	. . 17.5	196 13.2	. . 46.0	41 25.2	. . 49.9	Enif	33 47.7	N 9 56.2
10	275 51.8	342 27.0	04.2	308 28.3	16.8	211 15.7	46.0	56 27.5	49.9	Fomalhaut	15 24.5	S29 33.2
11	290 54.2	357 26.1	03.8	323 28.9	16.1	226 18.2	46.0	71 29.9	49.9			
12	305 56.7	12 25.2	S22 03.4	338 29.4	S14 15.4	241 20.7	N20 46.0	86 32.3	S12 50.0	Gacrux	172 00.8	S57 11.1
13	320 59.2	27 24.3	03.0	353 30.0	14.8	256 23.2	46.0	101 34.6	50.0	Gienah	175 52.4	S17 36.9
14	336 01.6	42 23.4	02.6	8 30.5	14.1	271 25.7	46.0	116 37.0	50.0	Hadar	148 48.1	S60 25.9
15	351 04.1	57 22.6	. . 02.2	23 31.1	. . 13.4	286 28.2	. . 46.0	131 39.4	. . 50.0	Hamal	328 01.0	N23 31.5
16	6 06.6	72 21.7	01.8	38 31.6	12.7	301 30.7	46.0	146 41.7	50.1	Kaus Aust.	83 44.5	S34 22.5
17	21 09.0	87 20.8	01.4	53 32.2	12.1	316 33.2	46.0	161 44.1	50.1			
18	36 11.5	102 19.9	S22 01.0	68 32.7	S14 11.4	331 35.7	N20 46.0	176 46.4	S12 50.1	Kochab	137 20.2	N74 05.8
19	51 14.0	117 19.0	00.6	83 33.3	10.7	346 38.2	46.0	191 48.8	50.1	Markab	13 38.8	N15 16.6
20	66 16.4	132 18.1	22 00.2	98 33.8	10.0	1 40.7	46.0	206 51.2	50.1	Menkar	314 15.2	N 4 08.4
21	81 18.9	147 17.2	21 59.8	113 34.4	. . 09.4	16 43.2	. . 46.0	221 53.5	. . 50.2	Menkent	148 07.8	S36 25.9
22	96 21.3	162 16.3	59.4	128 34.9	08.7	31 45.7	46.0	236 55.9	50.2	Miaplacidus	221 38.7	S69 46.4
23	111 23.8	177 15.5	59.0	143 35.5	08.0	46 48.2	46.0	251 58.3	50.2			
27 00	126 26.3	192 14.6	S21 58.6	158 36.0	S14 07.3	61 50.6	N20 46.0	267 00.6	S12 50.2	Mirfak	308 40.5	N49 54.6
01	141 28.7	207 13.7	58.2	173 36.6	06.7	76 53.1	46.0	282 03.0	50.2	Nunki	75 59.0	S26 16.7
02	156 31.2	222 12.8	57.7	188 37.1	06.0	91 55.6	46.0	297 05.4	50.3	Peacock	53 20.2	S56 41.4
03	171 33.7	237 11.9	. . 57.3	203 37.7	. . 05.3	106 58.1	. . 46.0	312 07.7	. . 50.3	Pollux	243 27.7	N27 59.4
04	186 36.1	252 11.0	56.9	218 38.2	04.6	122 00.6	46.0	327 10.1	50.3	Procyon	244 59.6	N 5 11.2
05	201 38.6	267 10.2	56.5	233 38.8	03.9	137 03.1	46.1	342 12.5	50.3			
06	216 41.1	282 09.3	S21 56.1	248 39.3	S14 03.3	152 05.6	N20 46.1	357 14.8	S12 50.3	Rasalhague	96 06.9	N12 33.0
07	231 43.5	297 08.4	55.7	263 39.9	02.6	167 08.1	46.1	12 17.2	50.4	Regulus	207 43.5	N11 53.9
08	246 46.0	312 07.5	55.2	278 40.4	01.9	182 10.6	46.1	27 19.6	50.4	Rigel	281 12.0	S 8 11.4
09	261 48.4	327 06.6	. . 54.8	293 41.0	. . 01.2	197 13.1	. . 46.1	42 21.9	. . 50.4	Rigil Kent.	139 52.0	S60 53.0
10	276 50.9	342 05.7	54.4	308 41.5	14 00.5	212 15.6	46.1	57 24.3	50.4	Sabik	102 13.0	S15 44.3
11	291 53.4	357 04.9	54.0	323 42.1	13 59.9	227 18.1	46.1	72 26.7	50.4			
12	306 55.8	12 04.0	S21 53.5	338 42.6	S13 59.2	242 20.6	N20 46.1	87 29.0	S12 50.5	Schedar	349 41.0	N56 36.8
13	321 58.3	27 03.1	53.1	353 43.2	58.5	257 23.1	46.1	102 31.4	50.5	Shaula	96 22.5	S37 06.6
14	337 00.8	42 02.2	52.7	8 43.7	57.8	272 25.6	46.1	117 33.8	50.5	Sirius	258 33.6	S16 44.3
15	352 03.2	57 01.3	. . 52.3	23 44.3	. . 57.1	287 28.1	. . 46.1	132 36.1	. . 50.5	Spica	158 31.4	S11 13.8
16	7 05.7	72 00.4	51.8	38 44.8	56.5	302 30.6	46.1	147 38.5	50.5	Suhail	222 52.1	S43 29.3
17	22 08.2	86 59.6	51.4	53 45.4	55.8	317 33.0	46.1	162 40.9	50.6			
18	37 10.6	101 58.7	S21 51.0	68 45.9	S13 55.1	332 35.5	N20 46.1	177 43.3	S12 50.6	Vega	80 39.5	N38 47.7
19	52 13.1	116 57.8	50.5	83 46.5	54.4	347 38.0	46.1	192 45.6	50.6	Zuben'ubi	137 05.7	S16 05.7
20	67 15.6	131 56.9	50.1	98 47.0	53.7	2 40.5	46.1	207 48.0	50.6		SHA	Mer.Pass.
21	82 18.0	146 56.0	. . 49.7	113 47.6	. . 53.1	17 43.0	. . 46.1	222 50.4	. . 50.6		° ′	h m
22	97 20.5	161 55.2	49.2	128 48.2	52.4	32 45.5	46.1	237 52.7	50.7	Venus	67 08.8	11 10
23	112 22.9	176 54.3	48.8	143 48.7	51.7	47 48.0	46.2	252 55.1	50.7	Mars	32 55.7	13 26
	h m									Jupiter	295 23.5	19 53
Mer.Pass.	15 35.6	v −0.9	d 0.4	v 0.5	d 0.7	v 2.5	d 0.0	v 2.4	d 0.0	Saturn	140 36.8	6 15

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON				Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 25	Moonrise 26	Moonrise 27	Moonrise 28
	GHA	Dec	GHA	v	Dec	d	HP							
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
25 00	176 56.1	S18 58.3	23 21.6	11.8	N19 20.4	4.1	54.5	N 72	07 29	09 04	11 34		13 42	15 45	17 38
01	191 56.0	57.7	37 52.4	11.8	19 16.3	4.3	54.5	N 70	07 19	08 41	10 19	12 31	14 22	16 07	17 50
02	206 55.8	57.0	52 23.2	11.8	19 12.0	4.3	54.5	68	07 10	08 23	09 42	13 14	14 48	16 24	18 00
03	221 55.7	. . 56.4	66 54.0	11.9	19 07.7	4.5	54.5	66	07 03	08 09	09 17	13 43	15 09	16 38	18 08
04	236 55.5	55.8	81 24.9	11.8	19 03.2	4.5	54.6	64	06 57	07 57	08 57	14 05	15 25	16 49	18 14
05	251 55.4	55.2	95 55.7	11.9	18 58.7	4.6	54.6	62	06 51	07 47	08 40	14 23	15 39	16 58	18 20
06	266 55.2	S18 54.6	110 26.6	11.9	N18 54.1	4.7	54.6	60	06 46	07 38	08 27	14 37	15 50	17 06	18 25
07	281 55.1	54.0	124 57.5	11.9	18 49.4	4.8	54.6	N 58	06 42	07 30	08 15	14 50	16 00	17 14	18 29
08	296 55.0	53.3	139 28.4	11.9	18 44.6	4.9	54.6	56	06 37	07 23	08 05	15 00	16 08	17 20	18 33
09	311 54.8	. . 52.7	153 59.3	11.9	18 39.7	5.0	54.6	54	06 33	07 17	07 56	15 10	16 16	17 25	18 37
10	326 54.7	52.1	168 30.2	11.9	18 34.7	5.0	54.6	52	06 30	07 11	07 49	15 18	16 23	17 30	18 40
11	341 54.5	51.5	183 01.1	12.0	18 29.7	5.2	54.7	50	06 27	07 06	07 41	15 25	16 29	17 35	18 43
12	356 54.4	S18 50.8	197 32.1	11.9	N18 24.5	5.2	54.7	45	06 19	06 54	07 26	15 41	16 42	17 45	18 49
13	11 54.3	50.2	212 03.0	12.0	18 19.3	5.4	54.7	N 40	06 12	06 45	07 14	15 54	16 53	17 53	18 54
14	26 54.1	49.6	226 34.0	12.0	18 13.9	5.4	54.7	35	06 05	06 36	07 03	16 06	17 02	18 00	18 59
15	41 54.0	. . 49.0	241 05.0	12.0	18 08.5	5.5	54.7	30	05 59	06 28	06 53	16 15	17 10	18 06	19 02
16	56 53.9	48.3	255 36.0	12.0	18 03.0	5.6	54.7	20	05 47	06 14	06 37	16 32	17 24	18 16	19 09
17	71 53.7	47.7	270 07.0	12.1	17 57.4	5.7	54.7	N 10	05 35	06 00	06 23	16 46	17 36	18 26	19 15
18	86 53.6	S18 47.1	284 38.1	12.0	N17 51.7	5.8	54.8	0	05 22	05 47	06 09	17 00	17 48	18 34	19 21
19	101 53.4	46.5	299 09.1	12.1	17 45.9	5.8	54.8	S 10	05 07	05 33	05 55	17 13	17 59	18 43	19 26
20	116 53.3	45.8	313 40.2	12.0	17 40.1	6.0	54.8	20	04 49	05 17	05 41	17 28	18 11	18 52	19 32
21	131 53.2	. . 45.2	328 11.2	12.1	17 34.1	6.0	54.8	30	04 26	04 57	05 23	17 44	18 25	19 03	19 39
22	146 53.0	44.6	342 42.3	12.2	17 28.1	6.1	54.8	35	04 11	04 45	05 13	17 54	18 33	19 09	19 42
23	161 52.9	44.0	357 13.5	12.1	17 22.0	6.2	54.8	40	03 53	04 31	05 02	18 05	18 42	19 15	19 47
26 00	176 52.8	S18 43.3	11 44.6	12.1	N17 15.8	6.3	54.8	45	03 31	04 14	04 48	18 18	18 52	19 23	19 52
01	191 52.6	42.7	26 15.7	12.2	17 09.5	6.4	54.9	S 50	03 00	03 52	04 31	18 33	19 05	19 33	19 58
02	206 52.5	42.1	40 46.9	12.2	17 03.1	6.4	54.9	52	02 44	03 42	04 24	18 41	19 11	19 37	20 01
03	221 52.4	. . 41.4	55 18.1	12.2	16 56.7	6.6	54.9	54	02 24	03 29	04 15	18 49	19 17	19 42	20 04
04	236 52.2	40.8	69 49.3	12.2	16 50.1	6.6	54.9	56	01 59	03 15	04 05	18 58	19 25	19 47	20 07
05	251 52.1	40.2	84 20.5	12.2	16 43.5	6.7	54.9	58	01 21	02 58	03 53	19 08	19 33	19 53	20 11
06	266 52.0	S18 39.5	98 51.7	12.2	N16 36.8	6.8	54.9	S 60	////	02 37	03 40	19 20	19 42	20 00	20 15
07	281 51.8	38.9	113 22.9	12.3	16 30.0	6.8	55.0								
08	296 51.7	38.3	127 54.2	12.3	16 23.2	7.0	55.0								
09	311 51.6	. . 37.6	142 25.5	12.3	16 16.2	7.0	55.0								
10	326 51.4	37.0	156 56.8	12.3	16 09.2	7.1	55.0								
11	341 51.3	36.4	171 28.1	12.3	16 02.1	7.2	55.0								
12	356 51.2	S18 35.7	185 59.4	12.4	N15 54.9	7.2	55.0								
13	11 51.1	35.1	200 30.8	12.4	15 47.7	7.4	55.0								
14	26 50.9	34.5	215 02.2	12.3	15 40.3	7.4	55.1								
15	41 50.8	. . 33.8	229 33.5	12.5	15 32.9	7.5	55.1								
16	56 50.7	33.2	244 05.0	12.4	15 25.4	7.5	55.1								
17	71 50.5	32.5	258 36.4	12.4	15 17.9	7.7	55.1								
18	86 50.4	S18 31.9	273 07.8	12.5	N15 10.2	7.7	55.1								
19	101 50.3	31.3	287 39.3	12.5	15 02.5	7.8	55.1								
20	116 50.2	30.6	302 10.8	12.4	14 54.7	7.8	55.2								
21	131 50.0	. . 30.0	316 42.2	12.6	14 46.9	8.0	55.2								
22	146 49.9	29.3	331 13.8	12.5	14 38.9	8.0	55.2								
23	161 49.8	28.7	345 45.3	12.5	14 30.9	8.1	55.2								
27 00	176 49.6	S18 28.0	0 16.8	12.6	N14 22.8	8.1	55.2								
01	191 49.5	27.4	14 48.4	12.6	14 14.7	8.3	55.3								
02	206 49.4	26.8	29 20.0	12.6	14 06.4	8.2	55.3								
03	221 49.3	. . 26.1	43 51.6	12.6	13 58.2	8.4	55.3								
04	236 49.1	25.5	58 23.2	12.6	13 49.8	8.4	55.3								
05	251 49.0	24.8	72 54.8	12.7	13 41.4	8.6	55.3								
06	266 48.9	S18 24.2	87 26.5	12.7	N13 32.8	8.5	55.3								
07	281 48.8	23.5	101 58.2	12.6	13 24.3	8.7	55.4								
08	296 48.7	22.9	116 29.8	12.7	13 15.6	8.7	55.4								
09	311 48.5	. . 22.2	131 01.5	12.8	13 06.9	8.7	55.4								
10	326 48.4	21.6	145 33.3	12.7	12 58.2	8.9	55.4								
11	341 48.3	20.9	160 05.0	12.7	12 49.3	8.9	55.4								
12	356 48.2	S18 20.3	174 36.7	12.8	N12 40.4	8.9	55.4								
13	11 48.0	19.6	189 08.5	12.8	12 31.5	9.1	55.5								
14	26 47.9	19.0	203 40.3	12.8	12 22.4	9.1	55.5								
15	41 47.8	. . 18.3	218 12.1	12.8	12 13.3	9.1	55.5								
16	56 47.7	17.7	232 43.9	12.8	12 04.2	9.2	55.5								
17	71 47.6	17.0	247 15.7	12.9	11 55.0	9.3	55.5								
18	86 47.4	S18 16.4	261 47.6	12.8	N11 45.7	9.4	55.6								
19	101 47.3	15.7	276 19.4	12.9	11 36.3	9.3	55.6								
20	116 47.2	15.0	290 51.3	12.9	11 27.0	9.5	55.6								
21	131 47.1	. . 14.4	305 23.2	12.9	11 17.5	9.5	55.6								
22	146 47.0	13.7	319 55.1	12.9	11 08.0	9.6	55.6								
23	161 46.8	13.1	334 27.0	12.9	N10 58.4	9.6	55.7								
	SD 16.3	d 0.6	SD	14.9		15.0	15.1								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 25	Moonset 26	Moonset 27	Moonset 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	12 52	15 22	16 57		09 42	09 17	09 01
N 70	14 07	15 45	17 08	09 13	09 01	08 53	08 47
68	14 44	16 03	17 16	08 29	08 34	08 35	08 36
66	15 10	16 17	17 23	07 59	08 12	08 21	08 26
64	15 29	16 29	17 29	07 37	07 55	08 09	08 18
62	15 46	16 39	17 35	07 19	07 41	07 58	08 11
60	15 59	16 48	17 40	07 04	07 29	07 49	08 06
N 58	16 10	16 56	17 44	06 51	07 19	07 41	08 00
56	16 20	17 03	17 49	06 40	07 10	07 35	07 56
54	16 29	17 09	17 52	06 31	07 02	07 28	07 51
52	16 37	17 15	17 56	06 22	06 55	07 23	07 48
50	16 44	17 20	17 59	06 14	06 48	07 18	07 44
45	16 59	17 31	18 07	05 58	06 34	07 07	07 36
N 40	17 12	17 41	18 14	05 44	06 23	06 58	07 30
35	17 23	17 50	18 20	05 32	06 13	06 50	07 25
30	17 32	17 57	18 26	05 22	06 04	06 43	07 20
20	17 48	18 12	18 38	05 05	05 49	06 31	07 11
N 10	18 03	18 25	18 50	04 49	05 35	06 20	07 04
0	18 16	18 38	19 03	04 35	05 23	06 10	06 57
S 10	18 30	18 52	19 18	04 21	05 10	06 00	06 49
20	18 44	19 08	19 36	04 05	04 57	05 49	06 42
30	19 01	19 27	19 59	03 47	04 42	05 37	06 33
35	19 11	19 39	20 13	03 37	04 32	05 30	06 28
40	19 23	19 53	20 31	03 25	04 22	05 21	06 22
45	19 36	20 10	20 53	03 11	04 10	05 12	06 15
S 50	19 53	20 32	21 23	02 54	03 55	05 00	06 07
52	20 01	20 42	21 39	02 46	03 48	04 55	06 03
54	20 09	20 54	21 58	02 37	03 41	04 49	05 59
56	20 19	21 08	22 23	02 26	03 32	04 42	05 55
58	20 30	21 25	22 59	02 15	03 22	04 34	05 49
S 60	20 43	21 45	////	02 01	03 11	04 26	05 44

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
25	12 15	12 22	12 12	23 11	10 48	14	97
26	12 29	12 35	12 13	23 59	11 35	15	99
27	12 41	12 47	12 13	24 45	12 22	16	100

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.5		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
28 00	127 25.4	191 53.4	S21 48.3	158 49.3	S13 51.0	62 50.5	N20 46.2	267 57.5	S12 50.7	Acamar	315 18.5	S40 15.4
01	142 27.9	206 52.5	47.9	173 49.8	50.3	77 53.0	46.2	282 59.8	50.7	Achernar	335 27.1	S57 10.5
02	157 30.3	221 51.7	47.5	188 50.4	49.6	92 55.4	46.2	298 02.2	50.7	Acrux	173 09.1	S63 10.2
03	172 32.8	236 50.8	47.0	203 50.9	49.0	107 57.9	46.2	313 04.6	50.8	Adhara	255 12.4	S28 59.7
04	187 35.3	251 49.9	46.6	218 51.5	48.3	123 00.4	46.2	328 07.0	50.8	Aldebaran	290 49.5	N16 32.0
05	202 37.7	266 49.0	46.1	233 52.0	47.6	138 02.9	46.2	343 09.3	50.8			
06	217 40.2	281 48.2	S21 45.7	248 52.6	S13 46.9	153 05.4	N20 46.2	358 11.7	S12 50.8	Alioth	166 20.7	N55 53.0
07	232 42.7	296 47.3	45.2	263 53.1	46.2	168 07.9	46.2	13 14.1	50.8	Alkaid	152 59.0	N49 14.5
08	247 45.1	311 46.4	44.8	278 53.7	45.5	183 10.4	46.2	28 16.4	50.9	Al Na'ir	27 44.5	S46 53.9
M 09	262 47.6	326 45.5	44.3	293 54.3	44.9	198 12.8	46.2	43 18.8	50.9	Alnilam	275 46.4	S 1 11.8
O 10	277 50.1	341 44.7	43.9	308 54.8	44.2	213 15.3	46.2	58 21.2	50.9	Alphard	217 56.0	S 8 43.2
N 11	292 52.5	356 43.8	43.4	323 55.4	43.5	228 17.8	46.2	73 23.6	50.9			
D 12	307 55.0	11 42.9	S21 43.0	338 55.9	S13 42.8	243 20.3	N20 46.2	88 25.9	S12 50.9	Alphecca	126 11.3	N26 40.1
A 13	322 57.4	26 42.0	42.5	353 56.5	42.1	258 22.8	46.2	103 28.3	50.9	Alpheratz	357 43.9	N29 09.9
Y 14	337 59.9	41 41.2	42.1	8 57.0	41.4	273 25.3	46.2	118 30.7	51.0	Altair	62 08.8	N 8 54.3
15	353 02.4	56 40.3	41.6	23 57.6	40.8	288 27.8	46.3	133 33.0	51.0	Ankaa	353 16.2	S42 14.3
16	8 04.8	71 39.4	41.1	38 58.2	40.1	303 30.2	46.3	148 35.4	51.0	Antares	112 26.7	S26 27.5
17	23 07.3	86 38.5	40.7	53 58.7	39.4	318 32.7	46.3	163 37.8	51.0			
18	38 09.8	101 37.7	S21 40.2	68 59.3	S13 38.7	333 35.2	N20 46.3	178 40.2	S12 51.0	Arcturus	145 55.9	N19 06.7
19	53 12.2	116 36.8	39.8	83 59.8	38.0	348 37.7	46.3	193 42.5	51.1	Atria	107 29.1	S69 02.7
20	68 14.7	131 35.9	39.3	99 00.4	37.3	3 40.2	46.3	208 44.9	51.1	Avior	234 17.4	S59 33.3
21	83 17.2	146 35.1	38.8	114 00.9	36.6	18 42.6	46.3	223 47.3	51.1	Bellatrix	278 32.0	N 6 21.5
22	98 19.6	161 34.2	38.4	129 01.5	35.9	33 45.1	46.3	238 49.7	51.1	Betelgeuse	271 01.3	N 7 24.4
23	113 22.1	176 33.3	37.9	144 02.1	35.3	48 47.6	46.3	253 52.0	51.1			
29 00	128 24.5	191 32.5	S21 37.4	159 02.6	S13 34.6	63 50.1	N20 46.3	268 54.4	S12 51.1	Canopus	263 55.8	S52 42.5
01	143 27.0	206 31.6	37.0	174 03.2	33.9	78 52.6	46.3	283 56.8	51.2	Capella	280 34.5	N46 00.6
02	158 29.5	221 30.7	36.5	189 03.7	33.2	93 55.0	46.3	298 59.1	51.2	Deneb	49 32.1	N45 19.7
03	173 31.9	236 29.9	36.0	204 04.3	32.5	108 57.5	46.3	314 01.5	51.2	Denebola	182 33.7	N14 29.7
04	188 34.4	251 29.0	35.6	219 04.9	31.8	124 00.0	46.3	329 03.9	51.2	Diphda	348 56.3	S17 55.0
05	203 36.9	266 28.1	35.1	234 05.4	31.1	139 02.5	46.4	344 06.3	51.2			
06	218 39.3	281 27.3	S21 34.6	249 06.0	S13 30.4	154 04.9	N20 46.4	359 08.6	S12 51.3	Dubhe	193 51.5	N61 40.5
07	233 41.8	296 26.4	34.1	264 06.5	29.7	169 07.4	46.4	14 11.0	51.3	Elnath	278 12.6	N28 37.0
T 08	248 44.3	311 25.5	33.7	279 07.1	29.1	184 09.9	46.4	29 13.4	51.3	Eltanin	90 46.7	N51 29.1
U 09	263 46.7	326 24.7	33.2	294 07.7	28.4	199 12.4	46.4	44 15.8	51.3	Enif	33 47.7	N 9 56.2
E 10	278 49.2	341 23.8	32.7	309 08.2	27.7	214 14.9	46.4	59 18.1	51.3	Fomalhaut	15 24.5	S29 33.2
S 11	293 51.7	356 22.9	32.2	324 08.8	27.0	229 17.3	46.4	74 20.5	51.3			
D 12	308 54.1	11 22.1	S21 31.8	339 09.3	S13 26.3	244 19.8	N20 46.4	89 22.9	S12 51.4	Gacrux	172 00.8	S57 11.1
A 13	323 56.6	26 21.2	31.3	354 09.9	25.6	259 22.3	46.4	104 25.3	51.4	Gienah	175 52.3	S17 37.0
Y 14	338 59.0	41 20.3	30.8	9 10.5	24.9	274 24.8	46.4	119 27.7	51.4	Hadar	148 48.1	S60 25.9
15	354 01.5	56 19.5	30.3	24 11.0	24.2	289 27.2	46.4	134 30.0	51.4	Hamal	328 01.0	N23 31.5
16	9 04.0	71 18.6	29.8	39 11.6	23.5	304 29.7	46.4	149 32.4	51.4	Kaus Aust.	83 44.5	S34 22.5
17	24 06.4	86 17.7	29.3	54 12.1	22.8	319 32.2	46.5	164 34.8	51.4			
18	39 08.9	101 16.9	S21 28.8	69 12.7	S13 22.1	334 34.6	N20 46.5	179 37.2	S12 51.5	Kochab	137 20.2	N74 05.8
19	54 11.4	116 16.0	28.4	84 13.3	21.4	349 37.1	46.5	194 39.5	51.5	Markab	13 38.8	N15 16.6
20	69 13.8	131 15.2	27.9	99 13.8	20.8	4 39.6	46.5	209 41.9	51.5	Menkar	314 15.2	N 4 08.4
21	84 16.3	146 14.3	27.4	114 14.4	20.1	19 42.1	46.5	224 44.3	51.5	Menkent	148 07.8	S36 25.9
22	99 18.8	161 13.4	26.9	129 15.0	19.4	34 44.5	46.5	239 46.7	51.5	Miaplacidus	221 38.7	S69 46.4
23	114 21.2	176 12.6	26.4	144 15.5	18.7	49 47.0	46.5	254 49.0	51.5			
30 00	129 23.7	191 11.7	S21 25.9	159 16.1	S13 18.0	64 49.5	N20 46.5	269 51.4	S12 51.6	Mirfak	308 40.5	N49 54.6
01	144 26.2	206 10.9	25.4	174 16.6	17.3	79 51.9	46.5	284 53.8	51.6	Nunki	75 58.9	S26 16.7
02	159 28.6	221 10.0	24.9	189 17.2	16.6	94 54.4	46.5	299 56.2	51.6	Peacock	53 20.2	S56 41.4
03	174 31.1	236 09.1	24.4	204 17.8	15.9	109 56.9	46.5	314 58.6	51.6	Pollux	243 27.7	N27 59.4
04	189 33.5	251 08.3	23.9	219 18.3	15.2	124 59.3	46.5	330 00.9	51.6	Procyon	244 59.6	N 5 11.2
05	204 36.0	266 07.4	23.4	234 18.9	14.5	140 01.8	46.6	345 03.3	51.6			
06	219 38.5	281 06.6	S21 22.9	249 19.5	S13 13.8	155 04.3	N20 46.6	0 05.7	S12 51.7	Rasalhague	96 06.9	N12 33.0
W 07	234 40.9	296 05.7	22.4	264 20.0	13.1	170 06.8	46.6	15 08.1	51.7	Regulus	207 43.5	N11 53.9
E 08	249 43.4	311 04.8	21.9	279 20.6	12.4	185 09.2	46.6	30 10.5	51.7	Rigel	281 12.1	S 8 11.4
D 09	264 45.9	326 04.0	21.4	294 21.2	11.7	200 11.7	46.6	45 12.8	51.7	Rigil Kent.	139 52.0	S60 53.0
N 10	279 48.3	341 03.1	20.9	309 21.7	11.0	215 14.2	46.6	60 15.2	51.7	Sabik	102 13.0	S15 44.3
E 11	294 50.8	356 02.3	20.4	324 22.3	10.3	230 16.6	46.6	75 17.6	51.7			
S 12	309 53.3	11 01.4	S21 19.9	339 22.8	S13 09.6	245 19.1	N20 46.6	90 20.0	S12 51.8	Schedar	349 41.0	N56 36.8
D 13	324 55.7	26 00.6	19.4	354 23.4	08.9	260 21.6	46.6	105 22.4	51.8	Shaula	96 22.5	S37 06.6
A 14	339 58.2	40 59.7	18.9	9 24.0	08.3	275 24.0	46.6	120 24.7	51.8	Sirius	258 33.6	S16 44.3
Y 15	355 00.6	55 58.9	18.4	24 24.5	07.6	290 26.5	46.7	135 27.1	51.8	Spica	158 31.4	S11 13.8
16	10 03.1	70 58.0	17.8	39 25.1	06.9	305 28.9	46.7	150 29.5	51.8	Suhail	222 52.1	S43 29.3
17	25 05.6	85 57.1	17.3	54 25.7	06.2	320 31.4	46.7	165 31.9	51.8			
18	40 08.0	100 56.3	S21 16.8	69 26.2	S13 05.5	335 33.9	N20 46.7	180 34.3	S12 51.9	Vega	80 39.5	N38 47.7
19	55 10.5	115 55.4	16.3	84 26.8	04.8	350 36.3	46.7	195 36.6	51.9	Zuben'ubi	137 05.7	S16 05.7
20	70 13.0	130 54.6	15.8	99 27.4	04.1	5 38.8	46.7	210 39.0	51.9		SHA	Mer.Pass.
21	85 15.4	145 53.7	15.3	114 27.9	03.4	20 41.3	46.7	225 41.4	51.9		° ′	h m
22	100 17.9	160 52.9	14.7	129 28.5	02.7	35 43.7	46.7	240 43.8	51.9	Venus	63 07.9	11 14
23	115 20.4	175 52.0	14.2	144 29.1	02.0	50 46.2	46.7	255 46.2	51.9	Mars	30 38.1	13 23
										Jupiter	295 25.5	19 41
Mer.Pass.	h m 15 23.8	v −0.9	d 0.5	v 0.6	d 0.7	v 2.5	d 0.0	v 2.4	d 0.0	Saturn	140 29.8	6 03

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 28	Moonrise 29	Moonrise 30	Moonrise 31
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
28 00	176 46.7	S18 12.4	348 58.9	13.0	N10 48.8	9.7	55.7	N 72	07 19	08 51	10 53	17 38	19 28	21 18	23 11
01	191 46.6	11.8	3 30.9	12.9	10 39.1	9.7	55.7	N 70	07 10	08 30	10 01	17 50	19 32	21 15	23 01
02	206 46.5	11.1	18 02.8	13.0	10 29.4	9.8	55.7	68	07 03	08 14	09 29	18 00	19 36	21 13	22 52
03	221 46.4	10.4	32 34.8	13.0	10 19.6	9.9	55.7	66	06 56	08 01	09 06	18 08	19 39	21 11	22 45
04	236 46.3	09.8	47 06.8	12.9	10 09.7	9.9	55.7	64	06 51	07 50	08 48	18 14	19 41	21 09	22 39
05	251 46.1	09.1	61 38.7	13.0	9 59.8	9.9	55.8	62	06 46	07 40	08 33	18 20	19 43	21 08	22 34
06	266 46.0	S18 08.5	76 10.7	13.0	N 9 49.9	10.0	55.8	60	06 41	07 32	08 20	18 25	19 45	21 07	22 30
07	281 45.9	07.8	90 42.7	13.1	9 39.9	10.1	55.8	N 58	06 37	07 25	08 10	18 29	19 47	21 06	22 26
08	296 45.8	07.1	105 14.8	13.0	9 29.8	10.1	55.8	56	06 33	07 18	08 00	18 33	19 48	21 05	22 22
M 09	311 45.7	06.5	119 46.8	13.0	9 19.7	10.1	55.8	54	06 30	07 13	07 52	18 37	19 50	21 04	22 19
O 10	326 45.6	05.8	134 18.8	13.1	9 09.6	10.2	55.9	52	06 26	07 07	07 44	18 40	19 51	21 03	22 16
N 11	341 45.5	05.1	148 50.9	13.0	8 59.4	10.3	55.9	50	06 23	07 02	07 38	18 43	19 52	21 02	22 14
D 12	356 45.3	S18 04.5	163 22.9	13.1	N 8 49.1	10.3	55.9	45	06 16	06 52	07 23	18 49	19 54	21 01	22 08
A 13	11 45.2	03.8	177 55.0	13.1	8 38.8	10.3	55.9	N 40	06 10	06 42	07 11	18 54	19 56	20 59	22 04
Y 14	26 45.1	03.2	192 27.1	13.0	8 28.5	10.4	55.9	35	06 04	06 34	07 01	18 59	19 58	20 58	22 00
15	41 45.0	02.5	206 59.1	13.1	8 18.1	10.4	56.0	30	05 58	06 27	06 52	19 02	20 00	20 57	21 57
16	56 44.9	01.8	221 31.2	13.1	8 07.7	10.5	56.0	20	05 47	06 13	06 36	19 09	20 02	20 56	21 51
17	71 44.8	01.2	236 03.3	13.1	7 57.2	10.5	56.0	N 10	05 35	06 01	06 23	19 15	20 04	20 54	21 45
18	86 44.7	S18 00.5	250 35.4	13.1	N 7 46.7	10.6	56.0	0	05 23	05 48	06 10	19 21	20 07	20 53	21 41
19	101 44.6	17 59.8	265 07.5	13.1	7 36.1	10.6	56.0	S 10	05 08	05 34	05 57	19 26	20 09	20 52	21 36
20	116 44.4	59.2	279 39.6	13.2	7 25.5	10.6	56.1	20	04 51	05 19	05 42	19 32	20 11	20 50	21 31
21	131 44.3	58.5	294 11.8	13.1	7 14.9	10.7	56.1	30	04 29	05 00	05 26	19 39	20 14	20 49	21 25
22	146 44.2	57.8	308 43.9	13.1	7 04.2	10.7	56.1	35	04 15	04 49	05 16	19 42	20 15	20 48	21 22
23	161 44.1	57.1	323 16.0	13.1	6 53.5	10.8	56.1	40	03 58	04 35	05 05	19 47	20 17	20 47	21 18
29 00	176 44.0	S17 56.5	337 48.1	13.2	N 6 42.7	10.8	56.1	45	03 36	04 19	04 53	19 52	20 19	20 46	21 14
01	191 43.9	55.8	352 20.3	13.1	6 31.9	10.8	56.2	S 50	03 07	03 58	04 37	19 58	20 21	20 45	21 09
02	206 43.8	55.1	6 52.4	13.1	6 21.1	10.9	56.2	52	02 52	03 48	04 29	20 01	20 23	20 44	21 07
03	221 43.7	54.5	21 24.5	13.1	6 10.2	10.9	56.2	54	02 34	03 36	04 21	20 04	20 24	20 44	21 04
04	236 43.6	53.8	35 56.6	13.2	5 59.3	10.9	56.2	56	02 11	03 23	04 11	20 07	20 25	20 43	21 02
05	251 43.5	53.1	50 28.8	13.1	5 48.4	11.0	56.2	58	01 39	03 07	04 01	20 11	20 26	20 42	20 59
06	266 43.4	S17 52.4	65 00.9	13.1	N 5 37.4	11.0	56.3	S 60	00 29	02 48	03 48	20 15	20 28	20 41	20 55
07	281 43.3	51.8	79 33.0	13.2	5 26.4	11.0	56.3								
T 08	296 43.1	51.1	94 05.2	13.1	5 15.4	11.1	56.3								
U 09	311 43.0	50.4	108 37.3	13.1	5 04.3	11.1	56.3								
E 10	326 42.9	49.7	123 09.4	13.2	4 53.2	11.1	56.3								
S 11	341 42.8	49.1	137 41.6	13.1	4 42.1	11.2	56.4								
D 12	356 42.7	S17 48.4	152 13.7	13.1	N 4 30.9	11.2	56.4								
A 13	11 42.6	47.7	166 45.8	13.1	4 19.7	11.2	56.4								
Y 14	26 42.5	47.0	181 17.9	13.1	4 08.5	11.2	56.4								
15	41 42.4	46.3	195 50.0	13.1	3 57.3	11.3	56.4								
16	56 42.3	45.7	210 22.1	13.1	3 46.0	11.3	56.5								
17	71 42.2	45.0	224 54.2	13.1	3 34.7	11.3	56.5								
18	86 42.1	S17 44.3	239 26.3	13.1	N 3 23.4	11.3	56.5								
19	101 42.0	43.6	253 58.4	13.1	3 12.1	11.4	56.5								
20	116 41.9	42.9	268 30.5	13.0	3 00.7	11.4	56.5								
21	131 41.8	42.2	283 02.5	13.1	2 49.3	11.4	56.6								
22	146 41.7	41.6	297 34.6	13.0	2 37.9	11.4	56.6								
23	161 41.6	40.9	312 06.6	13.1	2 26.5	11.4	56.6								
30 00	176 41.5	S17 40.2	326 38.7	13.0	N 2 15.1	11.5	56.6								
01	191 41.4	39.5	341 10.7	13.0	2 03.6	11.4	56.6								
02	206 41.3	38.8	355 42.7	13.0	1 52.2	11.5	56.7								
03	221 41.2	38.1	10 14.7	13.0	1 40.7	11.5	56.7								
04	236 41.1	37.5	24 46.7	12.9	1 29.2	11.5	56.7								
05	251 41.0	36.8	39 18.6	13.0	1 17.7	11.6	56.7								
06	266 40.9	S17 36.1	53 50.6	12.9	N 1 06.1	11.5	56.7								
W 07	281 40.8	35.4	68 22.5	12.9	0 54.6	11.6	56.8								
E 08	296 40.7	34.7	82 54.4	12.9	0 43.0	11.5	56.8								
D 09	311 40.6	34.0	97 26.3	12.9	0 31.5	11.6	56.8								
N 10	326 40.5	33.3	111 58.2	12.9	0 19.9	11.6	56.8								
E 11	341 40.4	32.6	126 30.1	12.9	N 0 08.3	11.6	56.8								
S 12	356 40.3	S17 31.9	141 02.0	12.8	S 0 03.3	11.5	56.9								
D 13	11 40.2	31.3	155 33.8	12.8	0 14.8	11.6	56.9								
A 14	26 40.1	30.6	170 05.6	12.8	0 26.4	11.7	56.9								
Y 15	41 40.0	29.9	184 37.4	12.7	0 38.1	11.6	56.9								
16	56 39.9	29.2	199 09.1	12.8	0 49.7	11.6	56.9								
17	71 39.8	28.5	213 40.9	12.7	1 01.3	11.6	57.0								
18	86 39.7	S17 27.8	228 12.6	12.7	S 1 12.9	11.6	57.0								
19	101 39.6	27.1	242 44.3	12.7	1 24.5	11.6	57.0								
20	116 39.5	26.4	257 16.0	12.6	1 36.1	11.6	57.0								
21	131 39.5	25.7	271 47.6	12.6	1 47.7	11.6	57.0								
22	146 39.4	25.0	286 19.2	12.6	1 59.3	11.7	57.1								
23	161 39.3	24.3	300 50.8	12.6	S 2 11.0	11.6	57.1								
	SD 16.3	d 0.7	SD	15.2		15.4		15.5							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 28	Moonset 29	Moonset 30	Moonset 31
°	h m	h m	h m	h m	h m	h m	h m
N 72	13 34	15 37	17 08	09 01	08 47	08 35	08 23
N 70	14 26	15 57	17 17	08 47	08 41	08 35	08 29
68	14 58	16 13	17 25	08 36	08 35	08 34	08 33
66	15 21	16 26	17 31	08 26	08 30	08 34	08 37
64	15 39	16 37	17 37	08 18	08 26	08 33	08 40
62	15 54	16 47	17 42	08 11	08 23	08 33	08 43
60	16 07	16 55	17 46	08 06	08 20	08 33	08 46
N 58	16 17	17 02	17 50	08 00	08 17	08 32	08 48
56	16 27	17 09	17 54	07 56	08 14	08 32	08 50
54	16 35	17 14	17 57	07 51	08 12	08 32	08 52
52	16 43	17 20	18 01	07 48	08 10	08 32	08 54
50	16 49	17 25	18 04	07 44	08 08	08 32	08 55
45	17 04	17 35	18 11	07 36	08 04	08 31	08 58
N 40	17 16	17 44	18 17	07 30	08 01	08 31	09 01
35	17 26	17 53	18 23	07 25	07 58	08 30	09 04
30	17 35	18 00	18 29	07 20	07 55	08 30	09 06
20	17 50	18 13	18 40	07 11	07 51	08 30	09 09
N 10	18 04	18 26	18 51	07 04	07 47	08 29	09 13
0	18 17	18 38	19 04	06 57	07 43	08 29	09 16
S 10	18 30	18 52	19 18	06 49	07 39	08 28	09 19
20	18 44	19 07	19 35	06 42	07 35	08 28	09 22
30	19 00	19 26	19 57	06 33	07 30	08 27	09 26
35	19 09	19 37	20 11	06 28	07 27	08 27	09 28
40	19 20	19 50	20 27	06 22	07 24	08 26	09 30
45	19 33	20 07	20 49	06 15	07 20	08 26	09 33
S 50	19 49	20 27	21 17	06 07	07 16	08 25	09 36
52	19 56	20 37	21 32	06 03	07 14	08 25	09 38
54	20 04	20 48	21 50	05 59	07 11	08 25	09 39
56	20 13	21 01	22 12	05 55	07 09	08 24	09 41
58	20 24	21 17	22 42	05 49	07 06	08 24	09 43
S 60	20 36	21 35	23 38	05 44	07 03	08 24	09 46

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
28	12 53	12 58	12 13	00 45	13 09	17	98
29	13 04	13 09	12 13	01 32	13 55	18	94
30	13 14	13 19	12 13	02 18	14 41	19	89

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.5		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
31 00	130 22.8	190 51.2	S21 13.7	159 29.6	S13 01.3	65 48.6	N20 46.7	270 48.5	S12 51.9
01	145 25.3	205 50.3	13.2	174 30.2	13 00.6	80 51.1	46.8	285 50.9	52.0
02	160 27.8	220 49.5	12.7	189 30.8	12 59.9	95 53.6	46.8	300 53.3	52.0
03	175 30.2	235 48.6	. . 12.1	204 31.3	. . 59.2	110 56.0	. . 46.8	315 55.7	. . 52.0
04	190 32.7	250 47.8	11.6	219 31.9	58.5	125 58.5	46.8	330 58.1	52.0
05	205 35.1	265 46.9	11.1	234 32.5	57.8	141 00.9	46.8	346 00.5	52.0
06	220 37.6	280 46.1	S21 10.6	249 33.1	S12 57.1	156 03.4	N20 46.8	1 02.8	S12 52.0
07	235 40.1	295 45.2	10.0	264 33.6	56.4	171 05.9	46.8	16 05.2	52.1
T 08	250 42.5	310 44.4	09.5	279 34.2	55.7	186 08.3	46.8	31 07.6	52.1
H 09	265 45.0	325 43.5	. . 09.0	294 34.8	. . 55.0	201 10.8	. . 46.8	46 10.0	. . 52.1
U 10	280 47.5	340 42.7	08.4	309 35.3	54.3	216 13.2	46.8	61 12.4	52.1
R 11	295 49.9	355 41.9	07.9	324 35.9	53.6	231 15.7	46.9	76 14.8	52.1
S 12	310 52.4	10 41.0	S21 07.4	339 36.5	S12 52.9	246 18.2	N20 46.9	91 17.1	S12 52.1
D 13	325 54.9	25 40.2	06.8	354 37.0	52.2	261 20.6	46.9	106 19.5	52.1
A 14	340 57.3	40 39.3	06.3	9 37.6	51.5	276 23.1	46.9	121 21.9	52.2
Y 15	355 59.8	55 38.5	. . 05.8	24 38.2	. . 50.8	291 25.5	. . 46.9	136 24.3	. . 52.2
16	11 02.2	70 37.6	05.2	39 38.7	50.1	306 28.0	46.9	151 26.7	52.2
17	26 04.7	85 36.8	04.7	54 39.3	49.4	321 30.4	46.9	166 29.1	52.2
18	41 07.2	100 35.9	S21 04.1	69 39.9	S12 48.7	336 32.9	N20 46.9	181 31.4	S12 52.2
19	56 09.6	115 35.1	03.6	84 40.5	48.0	351 35.3	47.0	196 33.8	52.2
20	71 12.1	130 34.3	03.1	99 41.0	47.2	6 37.8	47.0	211 36.2	52.2
21	86 14.6	145 33.4	. . 02.5	114 41.6	. . 46.5	21 40.3	. . 47.0	226 38.6	. . 52.3
22	101 17.0	160 32.6	02.0	129 42.2	45.8	36 42.7	47.0	241 41.0	52.3
23	116 19.5	175 31.7	01.4	144 42.7	45.1	51 45.2	47.0	256 43.4	52.3
1 00	131 22.0	190 30.9	S21 00.9	159 43.3	S12 44.4	66 47.6	N20 47.0	271 45.8	S12 52.3
01	146 24.4	205 30.1	21 00.3	174 43.9	43.7	81 50.1	47.0	286 48.1	52.3
02	161 26.9	220 29.2	20 59.8	189 44.5	43.0	96 52.5	47.0	301 50.5	52.3
03	176 29.4	235 28.4	. . 59.2	204 45.0	. . 42.3	111 55.0	. . 47.0	316 52.9	. . 52.3
04	191 31.8	250 27.5	58.7	219 45.6	41.6	126 57.4	47.1	331 55.3	52.4
05	206 34.3	265 26.7	58.1	234 46.2	40.9	141 59.9	47.1	346 57.7	52.4
06	221 36.7	280 25.9	S20 57.6	249 46.7	S12 40.2	157 02.3	N20 47.1	2 00.1	S12 52.4
07	236 39.2	295 25.0	57.0	264 47.3	39.5	172 04.8	47.1	17 02.5	52.4
08	251 41.7	310 24.2	56.5	279 47.9	38.8	187 07.2	47.1	32 04.9	52.4
F 09	266 44.1	325 23.3	. . 55.9	294 48.5	. . 38.1	202 09.7	. . 47.1	47 07.2	. . 52.4
R 10	281 46.6	340 22.5	55.4	309 49.0	37.4	217 12.1	47.1	62 09.6	52.4
I 11	296 49.1	355 21.7	54.8	324 49.6	36.7	232 14.6	47.1	77 12.0	52.5
D 12	311 51.5	10 20.8	S20 54.2	339 50.2	S12 36.0	247 17.0	N20 47.2	92 14.4	S12 52.5
A 13	326 54.0	25 20.0	53.7	354 50.8	35.3	262 19.5	47.2	107 16.8	52.5
Y 14	341 56.5	40 19.2	53.1	9 51.3	34.6	277 21.9	47.2	122 19.2	52.5
15	356 58.9	55 18.3	. . 52.5	24 51.9	. . 33.8	292 24.4	. . 47.2	137 21.6	. . 52.5
16	12 01.4	70 17.5	52.0	39 52.5	33.1	307 26.8	47.2	152 24.0	52.5
17	27 03.9	85 16.7	51.4	54 53.1	32.4	322 29.2	47.2	167 26.3	52.5
18	42 06.3	100 15.8	S20 50.8	69 53.6	S12 31.7	337 31.7	N20 47.2	182 28.7	S12 52.5
19	57 08.8	115 15.0	50.3	84 54.2	31.0	352 34.1	47.2	197 31.1	52.6
20	72 11.2	130 14.2	49.7	99 54.8	30.3	7 36.6	47.3	212 33.5	52.6
21	87 13.7	145 13.3	. . 49.1	114 55.4	. . 29.6	22 39.0	. . 47.3	227 35.9	. . 52.6
22	102 16.2	160 12.5	48.6	129 55.9	28.9	37 41.5	47.3	242 38.3	52.6
23	117 18.6	175 11.7	48.0	144 56.5	28.2	52 43.9	47.3	257 40.7	52.6
2 00	132 21.1	190 10.8	S20 47.4	159 57.1	S12 27.5	67 46.4	N20 47.3	272 43.1	S12 52.6
01	147 23.6	205 10.0	46.9	174 57.7	26.8	82 48.8	47.3	287 45.5	52.6
02	162 26.0	220 09.2	46.3	189 58.2	26.1	97 51.2	47.3	302 47.9	52.6
03	177 28.5	235 08.3	. . 45.7	204 58.8	. . 25.3	112 53.7	. . 47.3	317 50.2	. . 52.7
04	192 31.0	250 07.5	45.1	219 59.4	24.6	127 56.1	47.4	332 52.6	52.7
05	207 33.4	265 06.7	44.5	235 00.0	23.9	142 58.6	47.4	347 55.0	52.7
06	222 35.9	280 05.9	S20 44.0	250 00.5	S12 23.2	158 01.0	N20 47.4	2 57.4	S12 52.7
07	237 38.3	295 05.0	43.4	265 01.1	22.5	173 03.4	47.4	17 59.8	52.7
S 08	252 40.8	310 04.2	42.8	280 01.7	21.8	188 05.9	47.4	33 02.2	52.7
A 09	267 43.3	325 03.4	. . 42.2	295 02.3	. . 21.1	203 08.3	. . 47.4	48 04.6	. . 52.7
T 10	282 45.7	340 02.6	41.6	310 02.9	20.4	218 10.8	47.4	63 07.0	52.7
U 11	297 48.2	355 01.7	41.1	325 03.4	19.7	233 13.2	47.5	78 09.4	52.8
R 12	312 50.7	10 00.9	S20 40.5	340 04.0	S12 18.9	248 15.6	N20 47.5	93 11.8	S12 52.8
D 13	327 53.1	25 00.1	39.9	355 04.6	18.2	263 18.1	47.5	108 14.2	52.8
A 14	342 55.6	39 59.3	39.3	10 05.2	17.5	278 20.5	47.5	123 16.6	52.8
Y 15	357 58.1	54 58.4	. . 38.7	25 05.7	. . 16.8	293 23.0	. . 47.5	138 18.9	. . 52.8
16	13 00.5	69 57.6	38.1	40 06.3	16.1	308 25.4	47.5	153 21.3	52.8
17	28 03.0	84 56.8	37.5	55 06.9	15.4	323 27.8	47.5	168 23.7	52.8
18	43 05.5	99 56.0	S20 36.9	70 07.5	S12 14.7	338 30.3	N20 47.6	183 26.1	S12 52.8
19	58 07.9	114 55.1	36.3	85 08.1	14.0	353 32.7	47.6	198 28.5	52.9
20	73 10.4	129 54.3	35.7	100 08.6	13.2	8 35.1	47.6	213 30.9	52.9
21	88 12.8	144 53.5	. . 35.1	115 09.2	. . 12.5	23 37.6	. . 47.6	228 33.3	. . 52.9
22	103 15.3	159 52.7	34.5	130 09.8	11.8	38 40.0	47.6	243 35.7	52.9
23	118 17.8	174 51.8	33.9	145 10.4	11.1	53 42.5	47.6	258 38.1	52.9
Mer. Pass.	h m 15 12.0	v −0.8	d 0.6	v 0.6	d 0.7	v 2.4	d 0.0	v 2.4	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.5	S40 15.4
Achernar	335 27.1	S57 10.5
Acrux	173 09.1	S63 10.2
Adhara	255 12.4	S28 59.7
Aldebaran	290 49.5	N16 32.0
Alioth	166 20.7	N55 53.0
Alkaid	152 59.0	N49 14.5
Al Na'ir	27 44.5	S46 53.9
Alnilam	275 46.4	S 1 11.9
Alphard	217 56.0	S 8 43.2
Alphecca	126 11.3	N26 40.1
Alpheratz	357 43.9	N29 09.9
Altair	62 08.8	N 8 54.2
Ankaa	353 16.2	S42 14.3
Antares	112 26.7	S26 27.5
Arcturus	145 55.9	N19 06.7
Atria	107 29.0	S69 02.7
Avior	234 17.4	S59 33.3
Bellatrix	278 32.0	N 6 21.5
Betelgeuse	271 01.3	N 7 24.4
Canopus	263 55.8	S52 42.5
Capella	280 34.5	N46 00.6
Deneb	49 32.1	N45 19.7
Denebola	182 33.7	N14 29.7
Diphda	348 56.3	S17 55.0
Dubhe	193 51.5	N61 40.5
Elnath	278 12.7	N28 37.0
Eltanin	90 46.6	N51 29.1
Enif	33 47.7	N 9 56.2
Fomalhaut	15 24.6	S29 33.2
Gacrux	172 00.8	S57 11.1
Gienah	175 52.3	S17 37.0
Hadar	148 48.1	S60 25.9
Hamal	328 01.1	N23 31.5
Kaus Aust.	83 44.4	S34 22.5
Kochab	137 20.1	N74 05.8
Markab	13 38.8	N15 16.6
Menkar	314 15.3	N 4 08.4
Menkent	148 07.8	S36 25.9
Miaplacidus	221 38.7	S69 46.4
Mirfak	308 40.6	N49 54.6
Nunki	75 58.9	S26 16.7
Peacock	53 20.2	S56 41.4
Pollux	243 27.7	N27 59.4
Procyon	244 59.6	N 5 11.2
Rasalhague	96 06.9	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.1	S 8 11.4
Rigil Kent.	139 52.0	S60 53.1
Sabik	102 13.0	S15 44.4
Schedar	349 41.0	N56 36.8
Shaula	96 22.5	S37 06.6
Sirius	258 33.6	S16 44.3
Spica	158 31.4	S11 13.8
Suhail	222 52.1	S43 29.3
Vega	80 39.5	N38 47.7
Zuben'ubi	137 05.7	S16 05.7

	SHA	Mer. Pass.
	° ′	h m
Venus	59 08.9	11 19
Mars	28 21.4	13 21
Jupiter	295 25.6	19 30
Saturn	140 23.8	5 52

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 31	Moonrise 1	Moonrise 2	Moonrise 3
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
31 00	176 39.2	S17 23.6	315 22.4	12.5	S 2 22.6	11.6	57.1	N 72	07 09	08 38	10 26	23 11	25 12	01 12	03 30
01	191 39.1	22.9	329 53.9	12.5	2 34.2	11.6	57.1	N 70	07 01	08 19	09 44	23 01	24 51	00 51	02 49
02	206 39.0	22.2	344 25.4	12.5	2 45.8	11.6	57.1	68	06 54	08 05	09 17	22 52	24 35	00 35	02 22
03	221 38.9	. . 21.5	358 56.9	12.4	2 57.4	11.5	57.2	66	06 49	07 53	08 56	22 45	24 22	00 22	02 01
04	236 38.8	20.8	13 28.3	12.4	3 08.9	11.6	57.2	64	06 44	07 42	08 39	22 39	24 11	00 11	01 45
05	251 38.7	20.1	27 59.7	12.4	3 20.5	11.6	57.2	62	06 40	07 34	08 25	22 34	24 02	00 02	01 31
06	266 38.6	S17 19.4	42 31.1	12.4	S 3 32.1	11.5	57.2	60	06 36	07 26	08 13	22 30	23 54	25 20	01 20
07	281 38.5	18.7	57 02.5	12.3	3 43.6	11.6	57.3	N 58	06 32	07 20	08 03	22 26	23 47	25 10	01 10
T 08	296 38.4	18.0	71 33.8	12.3	3 55.2	11.5	57.3	56	06 29	07 13	07 55	22 22	23 41	25 01	01 01
H 09	311 38.4	. . 17.3	86 05.1	12.2	4 06.7	11.5	57.3	54	06 25	07 08	07 47	22 19	23 36	24 54	00 54
U 10	326 38.3	16.6	100 36.3	12.2	4 18.2	11.5	57.3	52	06 23	07 03	07 40	22 16	23 31	24 47	00 47
R 11	341 38.2	15.9	115 07.5	12.2	4 29.7	11.5	57.3	50	06 20	06 59	07 33	22 14	23 27	24 41	00 41
S 12	356 38.1	S17 15.2	129 38.7	12.1	S 4 41.2	11.5	57.4	45	06 13	06 48	07 20	22 08	23 17	24 27	00 27
D 13	11 38.0	14.5	144 09.8	12.1	4 52.7	11.5	57.4	N 40	06 07	06 40	07 08	22 04	23 10	24 17	00 17
A 14	26 37.9	13.8	158 40.9	12.1	5 04.2	11.4	57.4	35	06 02	06 32	06 59	22 00	23 03	24 07	00 07
Y 15	41 37.8	. . 13.1	173 12.0	12.0	5 15.6	11.4	57.4	30	05 57	06 25	06 50	21 57	22 57	23 59	25 03
16	56 37.7	12.4	187 43.0	12.0	5 27.0	11.4	57.4	20	05 46	06 12	06 35	21 51	22 47	23 45	24 46
17	71 37.7	11.7	202 14.0	11.9	5 38.4	11.4	57.5	N 10	05 35	06 00	06 22	21 45	22 38	23 33	24 31
18	86 37.6	S17 11.0	216 44.9	11.9	S 5 49.8	11.4	57.5	0	05 23	05 48	06 10	21 41	22 30	23 22	24 17
19	101 37.5	10.3	231 15.8	11.8	6 01.2	11.3	57.5	S 10	05 10	05 36	05 58	21 36	22 22	23 11	24 03
20	116 37.4	09.6	245 46.6	11.9	6 12.5	11.3	57.5	20	04 53	05 21	05 44	21 31	22 13	22 59	23 49
21	131 37.3	. . 08.8	260 17.5	11.7	6 23.8	11.3	57.5	30	04 32	05 03	05 29	21 25	22 04	22 46	23 32
22	146 37.2	08.1	274 48.2	11.7	6 35.1	11.2	57.6	35	04 19	04 52	05 20	21 22	21 58	22 38	23 23
23	161 37.1	07.4	289 18.9	11.7	6 46.3	11.3	57.6	40	04 02	04 39	05 09	21 18	21 52	22 29	23 12
1 00	176 37.1	S17 06.7	303 49.6	11.6	S 6 57.6	11.2	57.6	45	03 42	04 24	04 57	21 14	21 45	22 19	22 59
01	191 37.0	06.0	318 20.2	11.6	7 08.8	11.2	57.6	S 50	03 14	04 04	04 42	21 09	21 36	22 07	22 43
02	206 36.9	05.3	332 50.8	11.6	7 20.0	11.1	57.6	52	03 00	03 54	04 35	21 07	21 32	22 01	22 36
03	221 36.8	. . 04.6	347 21.4	11.4	7 31.1	11.1	57.7	54	02 44	03 44	04 27	21 04	21 27	21 55	22 28
04	236 36.7	03.9	1 51.8	11.5	7 42.2	11.1	57.7	56	02 23	03 31	04 18	21 02	21 23	21 48	22 19
05	251 36.6	03.2	16 22.3	11.4	7 53.3	11.0	57.7	58	01 56	03 17	04 08	20 59	21 17	21 40	22 09
06	266 36.6	S17 02.4	30 52.7	11.3	S 8 04.3	11.0	57.7	S 60	01 12	02 59	03 57	20 55	21 11	21 31	21 57
07	281 36.5	01.7	45 23.0	11.3	8 15.3	11.0	57.8								
08	296 36.4	01.0	59 53.3	11.2	8 26.3	11.0	57.8								
F 09	311 36.3	17 00.3	74 23.5	11.2	8 37.3	10.9	57.8								
R 10	326 36.2	16 59.6	88 53.7	11.1	8 48.2	10.8	57.8								
I 11	341 36.2	58.9	103 23.8	11.1	8 59.0	10.8	57.8								
D 12	356 36.1	S16 58.2	117 53.9	11.0	S 9 09.8	10.8	57.9								
A 13	11 36.0	57.4	132 23.9	11.0	9 20.6	10.7	57.9								
Y 14	26 35.9	56.7	146 53.9	10.9	9 31.3	10.7	57.9								
15	41 35.8	. . 56.0	161 23.8	10.8	9 42.0	10.7	57.9								
16	56 35.8	55.3	175 53.6	10.8	9 52.7	10.6	57.9								
17	71 35.7	54.6	190 23.4	10.8	10 03.3	10.6	58.0								
18	86 35.6	S16 53.8	204 53.2	10.7	S10 13.9	10.5	58.0								
19	101 35.5	53.1	219 22.9	10.6	10 24.4	10.4	58.0								
20	116 35.4	52.4	233 52.5	10.5	10 34.8	10.4	58.0								
21	131 35.4	. . 51.7	248 22.0	10.5	10 45.2	10.4	58.0								
22	146 35.3	51.0	262 51.5	10.5	10 55.6	10.3	58.1								
23	161 35.2	50.2	277 21.0	10.4	11 05.9	10.3	58.1								
2 00	176 35.1	S16 49.5	291 50.4	10.3	S11 16.2	10.2	58.1								
01	191 35.1	48.8	306 19.7	10.2	11 26.4	10.1	58.1								
02	206 35.0	48.1	320 48.9	10.2	11 36.5	10.1	58.2								
03	221 34.9	. . 47.3	335 18.1	10.2	11 46.6	10.0	58.2								
04	236 34.8	46.6	349 47.3	10.0	11 56.6	10.0	58.2								
05	251 34.8	45.9	4 16.3	10.0	12 06.6	9.9	58.2								
06	266 34.7	S16 45.2	18 45.3	10.0	S12 16.5	9.8	58.2								
07	281 34.6	44.4	33 14.3	9.9	12 26.3	9.8	58.3								
S 08	296 34.5	43.7	47 43.2	9.8	12 36.1	9.8	58.3								
A 09	311 34.5	. . 43.0	62 12.0	9.7	12 45.9	9.6	58.3								
T 10	326 34.4	42.3	76 40.7	9.7	12 55.5	9.6	58.3								
U 11	341 34.3	41.5	91 09.4	9.6	13 05.1	9.5	58.3								
R 12	356 34.3	S16 40.8	105 38.0	9.6	S13 14.6	9.5	58.4								
D 13	11 34.2	40.1	120 06.6	9.4	13 24.1	9.4	58.4								
A 14	26 34.1	39.3	134 35.0	9.4	13 33.5	9.3	58.4								
Y 15	41 34.0	. . 38.6	149 03.4	9.4	13 42.8	9.2	58.4								
16	56 34.0	37.9	163 31.8	9.3	13 52.0	9.2	58.4								
17	71 33.9	37.2	178 00.1	9.2	14 01.2	9.1	58.5								
18	86 33.8	S16 36.4	192 28.3	9.1	S14 10.3	9.0	58.5								
19	101 33.8	35.7	206 56.4	9.1	14 19.3	9.0	58.5								
20	116 33.7	35.0	221 24.5	9.0	14 28.3	8.9	58.5								
21	131 33.6	. . 34.2	235 52.5	8.9	14 37.2	8.7	58.5								
22	146 33.6	33.5	250 20.4	8.9	14 45.9	8.8	58.6								
23	161 33.5	32.8	264 48.3	8.8	S14 54.7	8.6	58.6								
	SD 16.3	d 0.7	SD	15.6		15.8		15.9							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 31	Moonset 1	Moonset 2	Moonset 3
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 03	15 51	17 20	08 23	08 10	07 53	07 25
N 70	14 44	16 09	17 28	08 29	08 22	08 15	08 06
68	15 12	16 24	17 34	08 33	08 33	08 33	08 35
66	15 33	16 36	17 40	08 37	08 41	08 47	08 56
64	15 49	16 46	17 44	08 40	08 49	08 59	09 14
62	16 03	16 54	17 49	08 43	08 55	09 09	09 28
60	16 15	17 02	17 53	08 46	09 00	09 18	09 40
N 58	16 25	17 09	17 56	08 48	09 05	09 25	09 51
56	16 33	17 14	17 59	08 50	09 10	09 32	10 00
54	16 41	17 20	18 03	08 52	09 14	09 38	10 08
52	16 48	17 25	18 05	08 54	09 17	09 44	10 15
50	16 54	17 29	18 08	08 55	09 20	09 49	10 22
45	17 08	17 39	18 14	08 58	09 27	09 59	10 36
N 40	17 19	17 48	18 20	09 01	09 33	10 08	10 48
35	17 29	17 55	18 26	09 04	09 38	10 16	10 58
30	17 37	18 02	18 31	09 06	09 43	10 23	11 07
20	17 52	18 15	18 41	09 09	09 51	10 35	11 22
N 10	18 05	18 27	18 52	09 13	09 58	10 45	11 35
0	18 17	18 39	19 04	09 16	10 04	10 55	11 48
S 10	18 29	18 51	19 17	09 19	10 10	11 04	12 01
20	18 43	19 06	19 34	09 22	10 17	11 15	12 14
30	18 58	19 24	19 54	09 26	10 25	11 27	12 29
35	19 07	19 35	20 08	09 28	10 30	11 34	12 38
40	19 17	19 47	20 24	09 30	10 35	11 41	12 49
45	19 29	20 03	20 44	09 33	10 41	11 51	13 01
S 50	19 44	20 22	21 11	09 36	10 48	12 02	13 15
52	19 51	20 31	21 25	09 38	10 52	12 07	13 22
54	19 59	20 42	21 41	09 39	10 56	12 13	13 30
56	20 08	20 54	22 01	09 41	11 00	12 19	13 38
58	20 17	21 09	22 27	09 43	11 04	12 26	13 48
S 60	20 29	21 26	23 07	09 46	11 09	12 34	13 59

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
31	13 23	13 27	12 13	03 04	15 28	20	81
1	13 32	13 36	12 14	03 52	16 17	21	72
2	13 39	13 43	12 14	04 42	17 08	22	62

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.5		SATURN +0.5		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
3 00	133 20.2	189 51.0	S20 33.4	160 11.0	S12 10.4	68 44.9	N20 47.6	273 40.5	S12 52.9	Acamar	315 18.5	S40 15.4
01	148 22.7	204 50.2	32.8	175 11.5	09.7	83 47.3	47.7	288 42.9	52.9	Achernar	335 27.2	S57 10.5
02	163 25.2	219 49.4	32.1	190 12.1	09.0	98 49.8	47.7	303 45.3	52.9	Acrux	173 09.0	S63 10.2
03	178 27.6	234 48.6	. . 31.5	205 12.7	. . 08.2	113 52.2	. . 47.7	318 47.7	. . 52.9	Adhara	255 12.4	S28 59.7
04	193 30.1	249 47.8	30.9	220 13.3	07.5	128 54.6	47.7	333 50.1	53.0	Aldebaran	290 49.5	N16 32.0
05	208 32.6	264 46.9	30.3	235 13.9	06.8	143 57.1	47.7	348 52.5	53.0			
06	223 35.0	279 46.1	S20 29.7	250 14.4	S12 06.1	158 59.5	N20 47.7	3 54.9	S12 53.0	Alioth	166 20.6	N55 53.0
07	238 37.5	294 45.3	29.1	265 15.0	05.4	174 01.9	47.7	18 57.3	53.0	Alkaid	152 59.0	N49 14.5
08	253 40.0	309 44.5	28.5	280 15.6	04.7	189 04.4	47.8	33 59.7	53.0	Al Na'ir	27 44.5	S46 53.8
S 09	268 42.4	324 43.7	. . 27.9	295 16.2	. . 04.0	204 06.8	. . 47.8	49 02.0	. . 53.0	Alnilam	275 46.4	S 1 11.9
U 10	283 44.9	339 42.8	27.3	310 16.8	03.2	219 09.2	47.8	64 04.4	53.0	Alphard	217 56.0	S 8 43.2
N 11	298 47.3	354 42.0	26.7	325 17.3	02.5	234 11.6	47.8	79 06.8	53.0			
D 12	313 49.8	9 41.2	S20 26.1	340 17.9	S12 01.8	249 14.1	N20 47.8	94 09.2	S12 53.0	Alphecca	126 11.3	N26 40.1
A 13	328 52.3	24 40.4	25.5	355 18.5	01.1	264 16.5	47.8	109 11.6	53.1	Alpheratz	357 44.0	N29 09.9
Y 14	343 54.7	39 39.6	24.9	10 19.1	12 00.4	279 18.9	47.8	124 14.0	53.1	Altair	62 08.8	N 8 54.2
15	358 57.2	54 38.8	. . 24.2	25 19.7	11 59.7	294 21.4	. . 47.9	139 16.4	. . 53.1	Ankaa	353 16.2	S42 14.3
16	13 59.7	69 38.0	23.6	40 20.3	58.9	309 23.8	47.9	154 18.8	53.1	Antares	112 26.7	S26 27.5
17	29 02.1	84 37.1	23.0	55 20.8	58.2	324 26.2	47.9	169 21.2	53.1			
18	44 04.6	99 36.3	S20 22.4	70 21.4	S11 57.5	339 28.6	N20 47.9	184 23.6	S12 53.1	Arcturus	145 55.9	N19 06.7
19	59 07.1	114 35.5	21.8	85 22.0	56.8	354 31.1	47.9	199 26.0	53.1	Atria	107 29.0	S69 02.7
20	74 09.5	129 34.7	21.2	100 22.6	56.1	9 33.5	47.9	214 28.4	53.1	Avior	234 17.4	S59 33.3
21	89 12.0	144 33.9	. . 20.5	115 23.2	. . 55.3	24 35.9	. . 48.0	229 30.8	. . 53.1	Bellatrix	278 32.0	N 6 21.5
22	104 14.4	159 33.1	19.9	130 23.8	54.6	39 38.4	48.0	244 33.2	53.1	Betelgeuse	271 01.3	N 7 24.4
23	119 16.9	174 32.3	19.3	145 24.3	53.9	54 40.8	48.0	259 35.6	53.2			
4 00	134 19.4	189 31.5	S20 18.7	160 24.9	S11 53.2	69 43.2	N20 48.0	274 38.0	S12 53.2	Canopus	263 55.8	S52 42.5
01	149 21.8	204 30.7	18.0	175 25.5	52.5	84 45.6	48.0	289 40.4	53.2	Capella	280 34.5	N46 00.6
02	164 24.3	219 29.9	17.4	190 26.1	51.8	99 48.1	48.0	304 42.8	53.2	Deneb	49 32.1	N45 19.7
03	179 26.8	234 29.0	. . 16.8	205 26.7	. . 51.0	114 50.5	. . 48.1	319 45.2	. . 53.2	Denebola	182 33.6	N14 29.7
04	194 29.2	249 28.2	16.2	220 27.3	50.3	129 52.9	48.1	334 47.6	53.2	Diphda	348 56.3	S17 55.0
05	209 31.7	264 27.4	15.5	235 27.8	49.6	144 55.3	48.1	349 50.0	53.2			
06	224 34.2	279 26.6	S20 14.9	250 28.4	S11 48.9	159 57.8	N20 48.1	4 52.4	S12 53.2	Dubhe	193 51.4	N61 40.5
07	239 36.6	294 25.8	14.3	265 29.0	48.2	175 00.2	48.1	19 54.8	53.2	Elnath	278 12.7	N28 37.0
08	254 39.1	309 25.0	13.6	280 29.6	47.4	190 02.6	48.1	34 57.2	53.2	Eltanin	90 46.6	N51 29.1
M 09	269 41.6	324 24.2	. . 13.0	295 30.2	. . 46.7	205 05.0	. . 48.2	49 59.6	. . 53.3	Enif	33 47.7	N 9 56.2
O 10	284 44.0	339 23.4	12.4	310 30.8	46.0	220 07.4	48.2	65 02.0	53.3	Fomalhaut	15 24.6	S29 33.2
N 11	299 46.5	354 22.6	11.7	325 31.4	45.3	235 09.9	48.2	80 04.4	53.3			
D 12	314 48.9	9 21.8	S20 11.1	340 31.9	S11 44.5	250 12.3	N20 48.2	95 06.8	S12 53.3	Gacrux	172 00.8	S57 11.1
A 13	329 51.4	24 21.0	10.5	355 32.5	43.8	265 14.7	48.2	110 09.2	53.3	Gienah	175 52.3	S17 37.0
Y 14	344 53.9	39 20.2	09.8	10 33.1	43.1	280 17.1	48.2	125 11.6	53.3	Hadar	148 48.0	S60 25.9
15	359 56.3	54 19.4	. . 09.2	25 33.7	. . 42.4	295 19.5	. . 48.3	140 14.0	. . 53.3	Hamal	328 01.1	N23 31.5
16	14 58.8	69 18.6	08.5	40 34.3	41.7	310 22.0	48.3	155 16.4	53.3	Kaus Aust.	83 44.4	S34 22.5
17	30 01.3	84 17.8	07.9	55 34.9	40.9	325 24.4	48.3	170 18.8	53.3			
18	45 03.7	99 17.0	S20 07.3	70 35.5	S11 40.2	340 26.8	N20 48.3	185 21.2	S12 53.3	Kochab	137 20.1	N74 05.8
19	60 06.2	114 16.2	06.6	85 36.1	39.5	355 29.2	48.3	200 23.6	53.3	Markab	13 38.8	N15 16.6
20	75 08.7	129 15.4	06.0	100 36.6	38.8	10 31.6	48.3	215 26.0	53.4	Menkar	314 15.3	N 4 08.4
21	90 11.1	144 14.6	. . 05.3	115 37.2	. . 38.0	25 34.1	. . 48.4	230 28.4	. . 53.4	Menkent	148 07.7	S36 25.9
22	105 13.6	159 13.8	04.7	130 37.8	37.3	40 36.5	48.4	245 30.8	53.4	Miaplacidus	221 38.7	S69 46.4
23	120 16.1	174 13.0	04.0	145 38.4	36.6	55 38.9	48.4	260 33.2	53.4			
5 00	135 18.5	189 12.2	S20 03.4	160 39.0	S11 35.9	70 41.3	N20 48.4	275 35.6	S12 53.4	Mirfak	308 40.6	N49 54.6
01	150 21.0	204 11.4	02.7	175 39.6	35.2	85 43.7	48.4	290 38.0	53.4	Nunki	75 58.9	S26 16.7
02	165 23.4	219 10.6	02.1	190 40.2	34.4	100 46.1	48.4	305 40.4	53.4	Peacock	53 20.2	S56 41.4
03	180 25.9	234 09.8	. . 01.4	205 40.8	. . 33.7	115 48.6	. . 48.5	320 42.8	. . 53.4	Pollux	243 27.7	N27 59.4
04	195 28.4	249 09.0	00.8	220 41.3	33.0	130 51.0	48.5	335 45.2	53.4	Procyon	244 59.7	N 5 11.2
05	210 30.8	264 08.2	20 00.1	235 41.9	32.3	145 53.4	48.5	350 47.6	53.4			
06	225 33.3	279 07.4	S19 59.5	250 42.5	S11 31.5	160 55.8	N20 48.5	5 50.0	S12 53.4	Rasalhague	96 06.9	N12 33.0
07	240 35.8	294 06.6	58.8	265 43.1	30.8	175 58.2	48.5	20 52.4	53.5	Regulus	207 43.4	N11 53.9
08	255 38.2	309 05.8	58.2	280 43.7	30.1	191 00.6	48.5	35 54.8	53.5	Rigel	281 12.1	S 8 11.5
T 09	270 40.7	324 05.0	. . 57.5	295 44.3	. . 29.4	206 03.0	. . 48.6	50 57.3	. . 53.5	Rigil Kent.	139 51.9	S60 53.1
U 10	285 43.2	339 04.2	56.8	310 44.9	28.6	221 05.5	48.6	65 59.7	53.5	Sabik	102 13.0	S15 44.4
E 11	300 45.6	354 03.4	56.2	325 45.5	27.9	236 07.9	48.6	81 02.1	53.5			
S 12	315 48.1	9 02.6	S19 55.5	340 46.1	S11 27.2	251 10.3	N20 48.6	96 04.5	S12 53.5	Schedar	349 41.1	N56 36.8
D 13	330 50.6	24 01.8	54.9	355 46.7	26.5	266 12.7	48.6	111 06.9	53.5	Shaula	96 22.5	S37 06.6
A 14	345 53.0	39 01.0	54.2	10 47.2	25.7	281 15.1	48.7	126 09.3	53.5	Sirius	258 33.6	S16 44.4
Y 15	0 55.5	54 00.3	. . 53.5	25 47.8	. . 25.0	296 17.5	. . 48.7	141 11.7	. . 53.5	Spica	158 31.4	S11 13.9
16	15 57.9	68 59.5	52.9	40 48.4	24.3	311 19.9	48.7	156 14.1	53.5	Suhail	222 52.1	S43 29.3
17	31 00.4	83 58.7	52.2	55 49.0	23.6	326 22.3	48.7	171 16.5	53.5			
18	46 02.9	98 57.9	S19 51.5	70 49.6	S11 22.8	341 24.7	N20 48.7	186 18.9	S12 53.5	Vega	80 39.5	N38 47.7
19	61 05.3	113 57.1	50.9	85 50.2	22.1	356 27.2	48.7	201 21.3	53.5	Zuben'ubi	137 05.7	S16 05.7
20	76 07.8	128 56.3	50.2	100 50.8	21.4	11 29.6	48.8	216 23.7	53.6		SHA	Mer.Pass.
21	91 10.3	143 55.5	. . 49.5	115 51.4	. . 20.6	26 32.0	. . 48.8	231 26.1	. . 53.6		° ′	h m
22	106 12.7	158 54.7	48.8	130 52.0	19.9	41 34.4	48.8	246 28.5	53.6	Venus	55 12.1	11 23
23	121 15.2	173 53.9	48.2	145 52.6	19.2	56 36.8	48.8	261 30.9	53.6	Mars	26 05.5	13 18
	h m									Jupiter	295 23.8	19 18
Mer. Pass.	15 00.2	v −0.8	d 0.6	v 0.6	d 0.7	v 2.4	d 0.0	v 2.4	d 0.0	Saturn	140 18.6	5 41

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 3	Moonrise 4	Moonrise 5	Moonrise 6
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
3 00	176 33.4	S16 32.0	279 16.1	8.7	S15 03.3	8.5	58.6	N 72	06 58	08 24	10 02	03 30			
01	191 33.4	31.3	293 43.8	8.6	15 11.8	8.5	58.6	N 70	06 51	08 08	09 28	02 49	05 01		
02	206 33.3	30.5	308 11.4	8.6	15 20.3	8.4	58.6	68	06 46	07 55	09 04	02 22	04 12	05 55	07 06
03	221 33.2	. . 29.8	322 39.0	8.5	15 28.7	8.3	58.7	66	06 41	07 44	08 45	02 01	03 40	05 11	06 19
04	236 33.2	29.1	337 06.5	8.5	15 37.0	8.2	58.7	64	06 37	07 35	08 30	01 45	03 17	04 41	05 48
05	251 33.1	28.3	351 34.0	8.3	15 45.2	8.1	58.7	62	06 33	07 27	08 17	01 31	02 59	04 19	05 25
06	266 33.0	S16 27.6	6 01.3	8.3	S15 53.3	8.0	58.7	60	06 30	07 20	08 06	01 20	02 44	04 01	05 06
07	281 33.0	26.9	20 28.6	8.2	16 01.3	8.0	58.7	N 58	06 27	07 14	07 57	01 10	02 31	03 46	04 51
08	296 32.9	26.1	34 55.8	8.2	16 09.3	7.8	58.8	56	06 24	07 08	07 49	01 01	02 20	03 33	04 37
S 09	311 32.8	. . 25.4	49 23.0	8.1	16 17.1	7.8	58.8	54	06 21	07 03	07 41	00 54	02 10	03 22	04 26
U 10	326 32.8	24.6	63 50.1	8.0	16 24.9	7.6	58.8	52	06 18	06 59	07 35	00 47	02 02	03 12	04 16
N 11	341 32.7	23.9	78 17.1	7.9	16 32.5	7.6	58.8	50	06 16	06 54	07 29	00 41	01 54	03 04	04 07
D 12	356 32.6	S16 23.2	92 44.0	7.9	S16 40.1	7.5	58.8	45	06 10	06 45	07 16	00 27	01 37	02 45	03 48
A 13	11 32.6	22.4	107 10.9	7.8	16 47.6	7.4	58.9	N 40	06 05	06 37	07 05	00 17	01 24	02 30	03 32
Y 14	26 32.5	21.7	121 37.7	7.8	16 55.0	7.2	58.9	35	06 00	06 30	06 56	00 07	01 13	02 17	03 19
15	41 32.5	. . 20.9	136 04.5	7.6	17 02.2	7.2	58.9	30	05 55	06 23	06 48	25 03	01 03	02 06	03 07
16	56 32.4	20.2	150 31.1	7.6	17 09.4	7.1	58.9	20	05 45	06 12	06 34	24 46	00 46	01 47	02 48
17	71 32.3	19.4	164 57.7	7.5	17 16.5	7.0	58.9	N 10	05 35	06 00	06 22	24 31	00 31	01 30	02 31
18	86 32.3	S16 18.7	179 24.2	7.5	S17 23.5	6.8	59.0	0	05 24	05 49	06 10	24 17	00 17	01 15	02 15
19	101 32.2	18.0	193 50.7	7.4	17 30.3	6.8	59.0	S 10	05 11	05 37	05 59	24 03	00 03	01 00	01 59
20	116 32.1	17.2	208 17.1	7.3	17 37.1	6.7	59.0	20	04 55	05 23	05 46	23 49	24 43	00 43	01 42
21	131 32.1	. . 16.5	222 43.4	7.3	17 43.8	6.5	59.0	30	04 35	05 06	05 31	23 32	24 24	00 24	01 22
22	146 32.0	15.7	237 09.7	7.1	17 50.3	6.5	59.0	35	04 22	04 55	05 23	23 23	24 14	00 14	01 11
23	161 32.0	15.0	251 35.8	7.2	17 56.8	6.3	59.1	40	04 07	04 43	05 13	23 12	24 01	00 01	00 58
4 00	176 31.9	S16 14.2	266 02.0	7.0	S18 03.1	6.2	59.1	45	03 47	04 28	05 01	22 59	23 46	24 43	00 43
01	191 31.8	13.5	280 28.0	7.0	18 09.3	6.2	59.1	S 50	03 22	04 10	04 47	22 43	23 29	24 24	00 24
02	206 31.8	12.7	294 54.0	6.9	18 15.5	6.0	59.1	52	03 09	04 01	04 41	22 36	23 20	24 15	00 15
03	221 31.7	. . 12.0	309 19.9	6.9	18 21.5	5.9	59.1	54	02 53	03 51	04 33	22 28	23 11	24 05	00 05
04	236 31.7	11.2	323 45.8	6.7	18 27.4	5.8	59.2	56	02 34	03 39	04 25	22 19	23 00	23 54	25 00
05	251 31.6	10.5	338 11.5	6.8	18 33.2	5.6	59.2	58	02 10	03 26	04 16	22 09	22 48	23 41	24 48
06	266 31.6	S16 09.7	352 37.3	6.6	S18 38.8	5.6	59.2	S 60	01 36	03 09	04 05	21 57	22 34	23 26	24 33
07	281 31.5	09.0	7 02.9	6.6	18 44.4	5.4	59.2								
08	296 31.4	08.2	21 28.5	6.6	18 49.8	5.3	59.2								
M 09	311 31.4	. . 07.5	35 54.1	6.4	18 55.1	5.2	59.2								
O 10	326 31.3	06.7	50 19.5	6.4	19 00.3	5.1	59.3								
N 11	341 31.3	06.0	64 44.9	6.4	19 05.4	5.0	59.3								
D 12	356 31.2	S16 05.2	79 10.3	6.3	S19 10.4	4.8	59.3								
A 13	11 31.2	04.5	93 35.6	6.2	19 15.2	4.7	59.3								
Y 14	26 31.1	03.7	108 00.8	6.2	19 19.9	4.6	59.3								
15	41 31.1	. . 03.0	122 26.0	6.1	19 24.5	4.5	59.3								
16	56 31.0	02.2	136 51.1	6.0	19 29.0	4.4	59.4								
17	71 31.0	01.5	151 16.1	6.0	19 33.4	4.2	59.4								
18	86 30.9	S16 00.7	165 41.1	6.0	S19 37.6	4.1	59.4								
19	101 30.8	16 00.0	180 06.1	5.9	19 41.7	3.9	59.4								
20	116 30.8	15 59.2	194 31.0	5.8	19 45.6	3.9	59.4								
21	131 30.7	. . 58.4	208 55.8	5.8	19 49.5	3.7	59.4								
22	146 30.7	57.7	223 20.6	5.7	19 53.2	3.6	59.5								
23	161 30.6	56.9	237 45.3	5.7	19 56.8	3.4	59.5								
5 00	176 30.6	S15 56.2	252 10.0	5.7	S20 00.2	3.3	59.5								
01	191 30.5	55.4	266 34.7	5.5	20 03.5	3.2	59.5								
02	206 30.5	54.6	280 59.2	5.6	20 06.7	3.1	59.5								
03	221 30.4	. . 53.9	295 23.8	5.5	20 09.8	2.9	59.5								
04	236 30.4	53.1	309 48.3	5.4	20 12.7	2.8	59.6								
05	251 30.3	52.4	324 12.7	5.5	20 15.5	2.6	59.6								
06	266 30.3	S15 51.6	338 37.2	5.3	S20 18.1	2.5	59.6								
07	281 30.2	50.8	353 01.5	5.4	20 20.6	2.4	59.6								
08	296 30.2	50.1	7 25.9	5.2	20 23.0	2.2	59.6								
T 09	311 30.1	. . 49.3	21 50.1	5.3	20 25.2	2.1	59.6								
U 10	326 30.1	48.6	36 14.4	5.2	20 27.3	2.0	59.6								
E 11	341 30.0	47.8	50 38.6	5.2	20 29.3	1.8	59.7								
S 12	356 30.0	S15 47.0	65 02.8	5.1	S20 31.1	1.7	59.7								
D 13	11 30.0	46.3	79 26.9	5.1	20 32.8	1.6	59.7								
A 14	26 29.9	45.5	93 51.0	5.1	20 34.4	1.4	59.7								
Y 15	41 29.9	. . 44.7	108 15.1	5.1	20 35.8	1.2	59.7								
16	56 29.8	44.0	122 39.2	5.0	20 37.0	1.1	59.7								
17	71 29.8	43.2	137 03.2	5.0	20 38.1	1.0	59.7								
18	86 29.7	S15 42.4	151 27.2	5.0	S20 39.1	0.9	59.7								
19	101 29.7	41.7	165 51.2	4.9	20 40.0	0.7	59.8								
20	116 29.6	40.9	180 15.1	4.9	20 40.7	0.5	59.8								
21	131 29.6	. . 40.1	194 39.0	4.9	20 41.2	0.5	59.8								
22	146 29.5	39.4	209 02.9	4.9	20 41.7	0.2	59.8								
23	161 29.5	38.6	223 26.8	4.9	S20 41.9	0.2	59.8								
	SD 16.3	d 0.8	SD	16.0		16.2		16.3							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 3	Moonset 4	Moonset 5	Moonset 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 27	16 05	17 32	07 25			
N 70	15 01	16 21	17 38	08 06	07 51		
68	15 25	16 34	17 43	08 35	08 41	08 59	09 54
66	15 44	16 45	17 48	08 56	09 13	09 44	10 41
64	15 59	16 54	17 52	09 14	09 36	10 14	11 12
62	16 12	17 02	17 56	09 28	09 55	10 36	11 35
60	16 22	17 09	17 59	09 40	10 11	10 54	11 54
N 58	16 32	17 15	18 02	09 51	10 24	11 09	12 09
56	16 40	17 20	18 05	10 00	10 36	11 22	12 22
54	16 47	17 25	18 08	10 08	10 46	11 34	12 34
52	16 54	17 30	18 10	10 15	10 54	11 43	12 44
50	17 00	17 34	18 13	10 22	11 03	11 52	12 53
45	17 12	17 43	18 18	10 36	11 20	12 11	13 12
N 40	17 23	17 51	18 23	10 48	11 34	12 27	13 27
35	17 32	17 58	18 28	10 58	11 46	12 40	13 40
30	17 40	18 05	18 33	11 07	11 56	12 51	13 51
20	17 54	18 17	18 43	11 22	12 14	13 11	14 11
N 10	18 06	18 28	18 53	11 35	12 30	13 27	14 28
0	18 17	18 39	19 04	11 48	12 44	13 43	14 43
S 10	18 29	18 51	19 17	12 01	12 59	13 59	14 59
20	18 42	19 05	19 32	12 14	13 15	14 16	15 16
30	18 56	19 22	19 52	12 29	13 33	14 35	15 35
35	19 05	19 32	20 05	12 38	13 43	14 47	15 46
40	19 14	19 44	20 20	12 49	13 55	15 00	15 59
45	19 26	19 58	20 39	13 01	14 10	15 15	16 14
S 50	19 40	20 17	21 05	13 15	14 27	15 34	16 33
52	19 46	20 26	21 17	13 22	14 35	15 43	16 41
54	19 53	20 35	21 32	13 30	14 44	15 52	16 51
56	20 01	20 47	21 51	13 38	14 55	16 04	17 02
58	20 11	21 00	22 14	13 48	15 06	16 17	17 14
S 60	20 21	21 16	22 46	13 59	15 20	16 32	17 29

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
3	13 46	13 49	12 14	05 35	18 02	23	51
4	13 52	13 55	12 14	06 31	19 00	24	40
5	13 58	14 00	12 14	07 29	19 59	25	29

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.5		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
6 00	136 17.7	188 53.1	S19 47.5	160 53.2	S11 18.5	71 39.2	N20 48.8	276 33.3	S12 53.6
01	151 20.1	203 52.4	46.8	175 53.7	17.7	86 41.6	48.9	291 35.7	53.6
02	166 22.6	218 51.6	46.2	190 54.3	17.0	101 44.0	48.9	306 38.1	53.6
03	181 25.0	233 50.8	. . 45.5	205 54.9	. . 16.3	116 46.4	. . 48.9	321 40.6	. . 53.6
04	196 27.5	248 50.0	44.8	220 55.5	15.5	131 48.8	48.9	336 43.0	53.6
05	211 30.0	263 49.2	44.1	235 56.1	14.8	146 51.2	48.9	351 45.4	53.6
06	226 32.4	278 48.4	S19 43.4	250 56.7	S11 14.1	161 53.6	N20 49.0	6 47.8	S12 53.6
W 07	241 34.9	293 47.6	42.8	265 57.3	13.4	176 56.0	49.0	21 50.2	53.6
E 08	256 37.4	308 46.9	42.1	280 57.9	12.6	191 58.4	49.0	36 52.6	53.6
D 09	271 39.8	323 46.1	. . 41.4	295 58.5	. . 11.9	207 00.9	. . 49.0	51 55.0	. . 53.7
N 10	286 42.3	338 45.3	40.7	310 59.1	11.2	222 03.3	49.0	66 57.4	53.7
E 11	301 44.8	353 44.5	40.0	325 59.7	10.4	237 05.7	49.1	81 59.8	53.7
S 12	316 47.2	8 43.7	S19 39.3	341 00.3	S11 09.7	252 08.1	N20 49.1	97 02.2	S12 53.7
D 13	331 49.7	23 43.0	38.7	356 00.9	09.0	267 10.5	49.1	112 04.6	53.7
A 14	346 52.2	38 42.2	38.0	11 01.5	08.2	282 12.9	49.1	127 07.0	53.7
Y 15	1 54.6	53 41.4	. . 37.3	26 02.1	. . 07.5	297 15.3	. . 49.1	142 09.5	. . 53.7
16	16 57.1	68 40.6	36.6	41 02.7	06.8	312 17.7	49.1	157 11.9	53.7
17	31 59.5	83 39.8	35.9	56 03.2	06.1	327 20.1	49.2	172 14.3	53.7
18	47 02.0	98 39.1	S19 35.2	71 03.8	S11 05.3	342 22.5	N20 49.2	187 16.7	S12 53.7
19	62 04.5	113 38.3	34.5	86 04.4	04.6	357 24.9	49.2	202 19.1	53.7
20	77 06.9	128 37.5	33.8	101 05.0	03.9	12 27.3	49.2	217 21.5	53.7
21	92 09.4	143 36.7	. . 33.1	116 05.6	. . 03.1	27 29.7	. . 49.2	232 23.9	. . 53.7
22	107 11.9	158 35.9	32.4	131 06.2	02.4	42 32.1	49.3	247 26.3	53.7
23	122 14.3	173 35.2	31.7	146 06.8	01.7	57 34.5	49.3	262 28.7	53.7
7 00	137 16.8	188 34.4	S19 31.0	161 07.4	S11 00.9	72 36.9	N20 49.3	277 31.2	S12 53.7
01	152 19.3	203 33.6	30.3	176 08.0	11 00.2	87 39.3	49.3	292 33.6	53.8
02	167 21.7	218 32.8	29.6	191 08.6	10 59.5	102 41.7	49.4	307 36.0	53.8
03	182 24.2	233 32.1	. . 28.9	206 09.2	. . 58.7	117 44.1	. . 49.4	322 38.4	. . 53.8
04	197 26.7	248 31.3	28.2	221 09.8	58.0	132 46.5	49.4	337 40.8	53.8
05	212 29.1	263 30.5	27.5	236 10.4	57.3	147 48.9	49.4	352 43.2	53.8
06	227 31.6	278 29.7	S19 26.8	251 11.0	S10 56.5	162 51.3	N20 49.4	7 45.6	S12 53.8
T 07	242 34.0	293 29.0	26.1	266 11.6	55.8	177 53.7	49.5	22 48.0	53.8
H 08	257 36.5	308 28.2	25.4	281 12.2	55.1	192 56.1	49.5	37 50.4	53.8
U 09	272 39.0	323 27.4	. . 24.7	296 12.8	. . 54.3	207 58.4	. . 49.5	52 52.9	. . 53.8
R 10	287 41.4	338 26.7	24.0	311 13.4	53.6	223 00.8	49.5	67 55.3	53.8
S 11	302 43.9	353 25.9	23.3	326 14.0	52.9	238 03.2	49.5	82 57.7	53.8
D 12	317 46.4	8 25.1	S19 22.6	341 14.6	S10 52.1	253 05.6	N20 49.6	98 00.1	S12 53.8
A 13	332 48.8	23 24.3	21.9	356 15.2	51.4	268 08.0	49.6	113 02.5	53.8
Y 14	347 51.3	38 23.6	21.2	11 15.8	50.7	283 10.4	49.6	128 04.9	53.8
15	2 53.8	53 22.8	. . 20.5	26 16.4	. . 49.9	298 12.8	. . 49.6	143 07.3	. . 53.8
16	17 56.2	68 22.0	19.8	41 17.0	49.2	313 15.2	49.6	158 09.8	53.8
17	32 58.7	83 21.3	19.0	56 17.6	48.5	328 17.6	49.7	173 12.2	53.8
18	48 01.2	98 20.5	S19 18.3	71 18.2	S10 47.7	343 20.0	N20 49.7	188 14.6	S12 53.8
19	63 03.6	113 19.7	17.6	86 18.8	47.0	358 22.4	49.7	203 17.0	53.9
20	78 06.1	128 19.0	16.9	101 19.4	46.3	13 24.8	49.7	218 19.4	53.9
21	93 08.5	143 18.2	. . 16.2	116 20.0	. . 45.5	28 27.2	. . 49.7	233 21.8	. . 53.9
22	108 11.0	158 17.4	15.5	131 20.6	44.8	43 29.6	49.8	248 24.2	53.9
23	123 13.5	173 16.7	14.7	146 21.2	44.0	58 31.9	49.8	263 26.7	53.9
8 00	138 15.9	188 15.9	S19 14.0	161 21.8	S10 43.3	73 34.3	N20 49.8	278 29.1	S12 53.9
01	153 18.4	203 15.2	13.3	176 22.4	42.6	88 36.7	49.8	293 31.5	53.9
02	168 20.9	218 14.4	12.6	191 23.0	41.8	103 39.1	49.9	308 33.9	53.9
03	183 23.3	233 13.6	. . 11.8	206 23.6	. . 41.1	118 41.5	. . 49.9	323 36.3	. . 53.9
04	198 25.8	248 12.9	11.1	221 24.2	40.4	133 43.9	49.9	338 38.7	53.9
05	213 28.3	263 12.1	10.4	236 24.8	39.6	148 46.3	49.9	353 41.1	53.9
06	228 30.7	278 11.3	S19 09.7	251 25.4	S10 38.9	163 48.7	N20 49.9	8 43.6	S12 53.9
F 07	243 33.2	293 10.6	08.9	266 26.0	38.1	178 51.1	50.0	23 46.0	53.9
R 08	258 35.7	308 09.8	08.2	281 26.6	37.4	193 53.4	50.0	38 48.4	53.9
I 09	273 38.1	323 09.1	. . 07.5	296 27.2	. . 36.7	208 55.8	. . 50.0	53 50.8	. . 53.9
D 10	288 40.6	338 08.3	06.8	311 27.8	35.9	223 58.2	50.0	68 53.2	53.9
A 11	303 43.0	353 07.5	06.0	326 28.4	35.2	239 00.6	50.1	83 55.6	53.9
Y 12	318 45.5	8 06.8	S19 05.3	341 29.0	S10 34.5	254 03.0	N20 50.1	98 58.1	S12 53.9
13	333 48.0	23 06.0	04.6	356 29.6	33.7	269 05.4	50.1	114 00.5	53.9
14	348 50.4	38 05.3	03.8	11 30.2	33.0	284 07.8	50.1	129 02.9	53.9
15	3 52.9	53 04.5	. . 03.1	26 30.8	. . 32.2	299 10.1	. . 50.1	144 05.3	. . 53.9
16	18 55.4	68 03.8	02.4	41 31.4	31.5	314 12.5	50.2	159 07.7	53.9
17	33 57.8	83 03.0	01.6	56 32.0	30.8	329 14.9	50.2	174 10.2	54.0
18	49 00.3	98 02.2	S19 00.9	71 32.6	S10 30.0	344 17.3	N20 50.2	189 12.6	S12 54.0
19	64 02.8	113 01.5	19 00.1	86 33.2	29.3	359 19.7	50.2	204 15.0	54.0
20	79 05.2	128 00.7	18 59.4	101 33.8	28.5	14 22.1	50.3	219 17.4	54.0
21	94 07.7	143 00.0	. . 58.7	116 34.4	. . 27.8	29 24.4	. . 50.3	234 19.8	. . 54.0
22	109 10.1	157 59.2	57.9	131 35.0	27.1	44 26.8	50.3	249 22.2	54.0
23	124 12.6	172 58.5	57.2	146 35.6	26.3	59 29.2	50.3	264 24.7	54.0

Mer. Pass.	h m 14 48.4	v −0.8	d 0.7	v 0.6	d 0.7	v 2.4	d 0.0	v 2.4	d 0.0

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.5	S40 15.4
Achernar	335 27.2	S57 10.5
Acrux	173 09.0	S63 10.2
Adhara	255 12.4	S28 59.7
Aldebaran	290 49.5	N16 32.0
Alioth	166 20.6	N55 53.0
Alkaid	152 58.9	N49 14.5
Al Na'ir	27 44.5	S46 53.8
Alnilam	275 46.4	S 1 11.9
Alphard	217 56.0	S 8 43.2
Alphecca	126 11.2	N26 40.1
Alpheratz	357 44.0	N29 09.9
Altair	62 08.8	N 8 54.2
Ankaa	353 16.2	S42 14.2
Antares	112 26.6	S26 27.5
Arcturus	145 55.9	N19 06.6
Atria	107 28.9	S69 02.7
Avior	234 17.4	S59 33.4
Bellatrix	278 32.0	N 6 21.5
Betelgeuse	271 01.3	N 7 24.3
Canopus	263 55.8	S52 42.5
Capella	280 34.5	N46 00.7
Deneb	49 32.1	N45 19.7
Denebola	182 33.6	N14 29.7
Diphda	348 56.3	S17 55.0
Dubhe	193 51.4	N61 40.5
Elnath	278 12.7	N28 37.0
Eltanin	90 46.6	N51 29.1
Enif	33 47.6	N 9 56.2
Fomalhaut	15 24.6	S29 33.2
Gacrux	172 00.7	S57 11.1
Gienah	175 52.3	S17 37.0
Hadar	148 48.0	S60 25.9
Hamal	328 01.1	N23 31.5
Kaus Aust.	83 44.4	S34 22.5
Kochab	137 20.0	N74 05.8
Markab	13 38.8	N15 16.6
Menkar	314 15.3	N 4 08.3
Menkent	148 07.7	S36 26.0
Miaplacidus	221 38.7	S69 46.4
Mirfak	308 40.6	N49 54.6
Nunki	75 58.9	S26 16.7
Peacock	53 20.2	S56 41.4
Pollux	243 27.6	N27 59.4
Procyon	244 59.6	N 5 11.2
Rasalhague	96 06.9	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.1	S 8 11.5
Rigil Kent.	139 51.9	S60 53.1
Sabik	102 13.0	S15 44.4
Schedar	349 41.1	N56 36.8
Shaula	96 22.4	S37 06.6
Sirius	258 33.6	S16 44.4
Spica	158 31.3	S11 13.9
Suhail	222 52.1	S43 29.4
Vega	80 39.4	N38 47.7
Zuben'ubi	137 05.6	S16 05.7

	SHA	Mer.Pass.
	° ′	h m
Venus	51 17.6	11 26
Mars	23 50.6	13 15
Jupiter	295 20.1	19 06
Saturn	140 14.4	5 29

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 6	Moonrise 7	Moonrise 8	Moonrise 9
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
6 00	176 29.5	S15 37.8	237 50.7	4.8	S20 42.1	0.1	59.8	N 72	06 46	08 11	09 42	▬	▬	09 11	08 33
01	191 29.4	37.1	252 14.5	4.8	20 42.0	0.1	59.8	N 70	06 41	07 56	09 13	▬	08 41	08 17	08 07
02	206 29.4	36.3	266 38.3	4.8	20 41.9	0.3	59.8	68	06 37	07 44	08 51	07 06	07 35	07 44	07 47
03	221 29.3	. . 35.5	281 02.1	4.9	20 41.6	0.5	59.8	66	06 33	07 35	08 34	06 19	06 58	07 19	07 31
04	236 29.3	34.7	295 26.0	4.7	20 41.1	0.5	59.9	64	06 29	07 27	08 20	05 48	06 32	07 00	07 18
05	251 29.3	34.0	309 49.7	4.8	20 40.6	0.8	59.9	62	06 26	07 19	08 09	05 25	06 12	06 44	07 06
06	266 29.2	S15 33.2	324 13.5	4.8	S20 39.8	0.8	59.9	60	06 23	07 13	07 59	05 06	05 55	06 31	06 57
W 07	281 29.2	32.4	338 37.3	4.8	20 39.0	1.1	59.9	N 58	06 21	07 08	07 50	04 51	05 41	06 20	06 49
E 08	296 29.1	31.6	353 01.1	4.7	20 37.9	1.1	59.9	56	06 18	07 03	07 43	04 37	05 29	06 10	06 41
D 09	311 29.1	. . 30.9	7 24.8	4.8	20 36.8	1.3	59.9	54	06 16	06 58	07 36	04 26	05 19	06 01	06 34
N 10	326 29.1	30.1	21 48.6	4.7	20 35.5	1.5	59.9	52	06 14	06 54	07 30	04 16	05 09	05 53	06 29
E 11	341 29.0	29.3	36 12.3	4.8	20 34.0	1.6	59.9	50	06 12	06 50	07 24	04 07	05 01	05 46	06 23
S 12	356 29.0	S15 28.5	50 36.1	4.8	S20 32.4	1.7	59.9	45	06 07	06 41	07 12	03 48	04 43	05 31	06 11
D 13	11 28.9	27.8	64 59.9	4.7	20 30.7	1.9	59.9	N 40	06 02	06 34	07 02	03 32	04 28	05 18	06 02
A 14	26 28.9	27.0	79 23.6	4.8	20 28.8	2.0	59.9	35	05 58	06 28	06 54	03 19	04 16	05 07	05 53
Y 15	41 28.9	. . 26.2	93 47.4	4.8	20 26.8	2.2	59.9	30	05 53	06 21	06 46	03 07	04 05	04 58	05 46
16	56 28.8	25.4	108 11.2	4.7	20 24.6	2.3	60.0	20	05 44	06 10	06 33	02 48	03 47	04 42	05 33
17	71 28.8	24.7	122 34.9	4.8	20 22.3	2.4	60.0	N 10	05 35	06 00	06 22	02 31	03 30	04 28	05 22
18	86 28.7	S15 23.9	136 58.7	4.8	S20 19.9	2.6	60.0	0	05 24	05 49	06 11	02 15	03 15	04 14	05 11
19	101 28.7	23.1	151 22.5	4.8	20 17.3	2.8	60.0	S 10	05 12	05 38	06 00	01 59	03 00	04 01	05 01
20	116 28.7	22.3	165 46.3	4.8	20 14.5	2.8	60.0	20	04 57	05 25	05 48	01 42	02 44	03 47	04 50
21	131 28.6	. . 21.6	180 10.1	4.9	20 11.7	3.1	60.0	30	04 38	05 08	05 34	01 22	02 25	03 30	04 37
22	146 28.6	20.8	194 34.0	4.8	20 08.6	3.1	60.0	35	04 26	04 59	05 26	01 11	02 14	03 21	04 29
23	161 28.6	20.0	208 57.8	4.9	20 05.5	3.3	60.0	40	04 11	04 47	05 17	00 58	02 02	03 10	04 21
7 00	176 28.5	S15 19.2	223 21.7	4.9	S20 02.2	3.4	60.0	45	03 53	04 33	05 06	00 43	01 47	02 57	04 11
01	191 28.5	18.4	237 45.6	4.9	19 58.8	3.6	60.0	S 50	03 29	04 16	04 53	00 24	01 29	02 42	03 58
02	206 28.5	17.6	252 09.5	5.0	19 55.2	3.7	60.0	52	03 16	04 07	04 46	00 15	01 20	02 34	03 53
03	221 28.4	. . 16.9	266 33.5	4.9	19 51.5	3.9	60.0	54	03 02	03 58	04 40	00 05	01 11	02 26	03 47
04	236 28.4	16.1	280 57.4	5.0	19 47.6	4.0	60.0	56	02 45	03 47	04 32	25 00	01 00	02 17	03 40
05	251 28.4	15.3	295 21.4	5.0	19 43.6	4.1	60.0	58	02 24	03 34	04 23	24 48	00 48	02 06	03 32
06	266 28.3	S15 14.5	309 45.4	5.0	S19 39.5	4.3	60.0	S 60	01 55	03 20	04 13	24 33	00 33	01 54	03 23
T 07	281 28.3	13.7	324 09.4	5.1	19 35.2	4.4	60.0								
H 08	296 28.3	12.9	338 33.5	5.1	19 30.8	4.5	60.0								
U 09	311 28.2	. . 12.2	352 57.6	5.1	19 26.3	4.7	60.0								
R 10	326 28.2	11.4	7 21.7	5.2	19 21.6	4.8	60.0								
S 11	341 28.2	10.6	21 45.9	5.2	19 16.8	4.9	60.0								
D 12	356 28.1	S15 09.8	36 10.1	5.2	S19 11.9	5.1	60.0								
A 13	11 28.1	09.0	50 34.3	5.3	19 06.8	5.2	60.0								
Y 14	26 28.1	08.2	64 58.6	5.3	19 01.6	5.3	60.0								
15	41 28.1	. . 07.4	79 22.9	5.4	18 56.3	5.5	60.0								
16	56 28.0	06.7	93 47.3	5.4	18 50.8	5.6	60.0								
17	71 28.0	05.9	108 11.7	5.4	18 45.2	5.7	60.0								
18	86 28.0	S15 05.1	122 36.1	5.5	S18 39.5	5.8	60.0								
19	101 27.9	04.3	137 00.6	5.5	18 33.7	6.0	60.0								
20	116 27.9	03.5	151 25.1	5.6	18 27.7	6.1	60.0								
21	131 27.9	. . 02.7	165 49.7	5.6	18 21.6	6.2	60.0								
22	146 27.9	01.9	180 14.3	5.6	18 15.4	6.3	60.0								
23	161 27.8	01.1	194 38.9	5.7	18 09.1	6.5	60.0								
8 00	176 27.8	S15 00.3	209 03.6	5.8	S18 02.6	6.6	60.0								
01	191 27.8	14 59.5	223 28.4	5.8	17 56.0	6.7	60.0								
02	206 27.7	58.8	237 53.2	5.8	17 49.3	6.8	60.0								
03	221 27.7	. . 58.0	252 18.0	5.9	17 42.5	7.0	60.0								
04	236 27.7	57.2	266 42.9	6.0	17 35.5	7.0	60.0								
05	251 27.7	56.4	281 07.9	6.0	17 28.5	7.2	60.0								
06	266 27.6	S14 55.6	295 32.9	6.1	S17 21.3	7.3	60.0								
F 07	281 27.6	54.8	309 58.0	6.1	17 14.0	7.4	60.0								
R 08	296 27.6	54.0	324 23.1	6.2	17 06.6	7.5	60.0								
I 09	311 27.6	. . 53.2	338 48.3	6.2	16 59.1	7.6	59.9								
D 10	326 27.6	52.4	353 13.5	6.3	16 51.5	7.8	59.9								
A 11	341 27.5	51.6	7 38.8	6.4	16 43.7	7.8	59.9								
Y 12	356 27.5	S14 50.8	22 04.2	6.4	S16 35.9	8.0	59.9								
13	11 27.5	50.0	36 29.6	6.5	16 27.9	8.0	59.9								
14	26 27.5	49.2	50 55.1	6.5	16 19.9	8.2	59.9								
15	41 27.4	. . 48.4	65 20.6	6.6	16 11.7	8.3	59.9								
16	56 27.4	47.6	79 46.2	6.7	16 03.4	8.3	59.9								
17	71 27.4	46.8	94 11.9	6.7	15 55.1	8.5	59.9								
18	86 27.4	S14 46.0	108 37.6	6.8	S15 46.6	8.6	59.9								
19	101 27.4	45.2	123 03.4	6.8	15 38.0	8.6	59.9								
20	116 27.3	44.4	137 29.2	6.9	15 29.4	8.8	59.8								
21	131 27.3	. . 43.6	151 55.1	7.0	15 20.6	8.8	59.8								
22	146 27.3	42.8	166 21.1	7.0	15 11.8	9.0	59.8								
23	161 27.3	42.0	180 47.1	7.1	S15 02.8	9.0	59.8								
	SD 16.2	d 0.8	SD	16.3		16.4		16.3							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 6	Moonset 7	Moonset 8	Moonset 9
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 48	16 19	17 44	▬	▬	12 00	14 36
N 70	15 17	16 34	17 49	▬	10 26	12 53	15 01
68	15 38	16 45	17 53	09 54	11 32	13 25	15 19
66	15 55	16 55	17 57	10 41	12 07	13 49	15 34
64	16 09	17 03	18 00	11 12	12 33	14 07	15 46
62	16 21	17 10	18 03	11 35	12 53	14 22	15 56
60	16 30	17 16	18 06	11 54	13 09	14 35	16 05
N 58	16 39	17 22	18 08	12 09	13 23	14 46	16 12
56	16 47	17 27	18 11	12 22	13 34	14 55	16 19
54	16 53	17 31	18 13	12 34	13 45	15 03	16 25
52	16 59	17 35	18 15	12 44	13 54	15 11	16 30
50	17 05	17 39	18 17	12 53	14 02	15 17	16 35
45	17 17	17 47	18 22	13 12	14 19	15 32	16 46
N 40	17 26	17 55	18 27	13 27	14 33	15 43	16 54
35	17 35	18 01	18 31	13 40	14 45	15 53	17 02
30	17 42	18 07	18 36	13 51	14 56	16 02	17 08
20	17 55	18 18	18 44	14 11	15 14	16 17	17 19
N 10	18 07	18 28	18 54	14 28	15 29	16 30	17 29
0	18 18	18 39	19 04	14 43	15 44	16 42	17 38
S 10	18 29	18 50	19 16	14 59	15 58	16 54	17 46
20	18 40	19 03	19 31	15 16	16 13	17 07	17 56
30	18 54	19 19	19 49	15 35	16 31	17 21	18 07
35	19 02	19 29	20 01	15 46	16 41	17 29	18 13
40	19 11	19 40	20 16	15 59	16 52	17 39	18 20
45	19 22	19 54	20 34	16 14	17 06	17 50	18 28
S 50	19 35	20 11	20 58	16 33	17 22	18 03	18 37
52	19 41	20 19	21 10	16 41	17 30	18 09	18 42
54	19 47	20 29	21 24	16 51	17 38	18 16	18 47
56	19 55	20 39	21 40	17 02	17 48	18 24	18 52
58	20 03	20 52	22 01	17 14	17 59	18 32	18 58
S 60	20 13	21 06	22 28	17 29	18 11	18 42	19 05

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
6	14 02	14 04	12 14	08 29	20 59	26	19
7	14 06	14 07	12 14	09 29	21 59	27	11
8	14 09	14 10	12 14	10 28	22 57	28	5

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.4		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
9 00	139 15.1	187 57.7	S18 56.4	161 36.2	S10 25.6	74 31.6	N20 50.3	279 27.1	S12 54.0
01	154 17.5	202 57.0	55.7	176 36.8	24.8	89 34.0	50.4	294 29.5	54.0
02	169 20.0	217 56.2	54.9	191 37.4	24.1	104 36.4	50.4	309 31.9	54.0
03	184 22.5	232 55.5	54.2	206 38.0	23.4	119 38.7	50.4	324 34.3	54.0
04	199 24.9	247 54.7	53.4	221 38.6	22.6	134 41.1	50.4	339 36.8	54.0
05	214 27.4	262 54.0	52.7	236 39.2	21.9	149 43.5	50.5	354 39.2	54.0
06	229 29.9	277 53.2	S18 51.9	251 39.8	S10 21.1	164 45.9	N20 50.5	9 41.6	S12 54.0
07	244 32.3	292 52.5	51.2	266 40.4	20.4	179 48.3	50.5	24 44.0	54.0
S 08	259 34.8	307 51.7	50.4	281 41.0	19.7	194 50.6	50.5	39 46.4	54.0
A 09	274 37.3	322 51.0	49.7	296 41.6	18.9	209 53.0	50.6	54 48.9	54.0
T 10	289 39.7	337 50.2	48.9	311 42.3	18.2	224 55.4	50.6	69 51.3	54.0
U 11	304 42.2	352 49.5	48.2	326 42.9	17.4	239 57.8	50.6	84 53.7	54.0
R 12	319 44.6	7 48.7	S18 47.4	341 43.5	S10 16.7	255 00.1	N20 50.6	99 56.1	S12 54.0
D 13	334 47.1	22 48.0	46.7	356 44.1	15.9	270 02.5	50.7	114 58.6	54.0
A 14	349 49.6	37 47.2	45.9	11 44.7	15.2	285 04.9	50.7	130 01.0	54.0
Y 15	4 52.0	52 46.5	45.2	26 45.3	14.5	300 07.3	50.7	145 03.4	54.0
16	19 54.5	67 45.8	44.4	41 45.9	13.7	315 09.6	50.7	160 05.8	54.0
17	34 57.0	82 45.0	43.6	56 46.5	13.0	330 12.0	50.7	175 08.2	54.0
18	49 59.4	97 44.3	S18 42.9	71 47.1	S10 12.2	345 14.4	N20 50.8	190 10.7	S12 54.0
19	65 01.9	112 43.5	42.1	86 47.7	11.5	0 16.8	50.8	205 13.1	54.0
20	80 04.4	127 42.8	41.4	101 48.3	10.7	15 19.1	50.8	220 15.5	54.0
21	95 06.8	142 42.0	40.6	116 48.9	10.0	30 21.5	50.8	235 17.9	54.0
22	110 09.3	157 41.3	39.8	131 49.5	09.2	45 23.9	50.9	250 20.4	54.0
23	125 11.8	172 40.6	39.1	146 50.1	08.5	60 26.3	50.9	265 22.8	54.0
10 00	140 14.2	187 39.8	S18 38.3	161 50.7	S10 07.8	75 28.6	N20 50.9	280 25.2	S12 54.0
01	155 16.7	202 39.1	37.5	176 51.4	07.0	90 31.0	50.9	295 27.6	54.0
02	170 19.1	217 38.3	36.8	191 52.0	06.3	105 33.4	51.0	310 30.1	54.0
03	185 21.6	232 37.6	36.0	206 52.6	05.5	120 35.7	51.0	325 32.5	54.0
04	200 24.1	247 36.9	35.2	221 53.2	04.8	135 38.1	51.0	340 34.9	54.0
05	215 26.5	262 36.1	34.4	236 53.8	04.0	150 40.5	51.0	355 37.3	54.1
06	230 29.0	277 35.4	S18 33.7	251 54.4	S10 03.3	165 42.9	N20 51.1	10 39.8	S12 54.1
07	245 31.5	292 34.6	32.9	266 55.0	02.5	180 45.2	51.1	25 42.2	54.1
S 08	260 33.9	307 33.9	32.1	281 55.6	01.8	195 47.6	51.1	40 44.6	54.1
U 09	275 36.4	322 33.2	31.4	296 56.2	01.1	210 50.0	51.1	55 47.0	54.1
N 10	290 38.9	337 32.4	30.6	311 56.8	10 00.3	225 52.3	51.2	70 49.5	54.1
D 11	305 41.3	352 31.7	29.8	326 57.4	9 59.6	240 54.7	51.2	85 51.9	54.1
A 12	320 43.8	7 31.0	S18 29.0	341 58.0	S 9 58.8	255 57.1	N20 51.2	100 54.3	S12 54.1
Y 13	335 46.2	22 30.2	28.2	356 58.7	58.1	270 59.4	51.2	115 56.7	54.1
14	350 48.7	37 29.5	27.5	11 59.3	57.3	286 01.8	51.3	130 59.2	54.1
15	5 51.2	52 28.8	26.7	26 59.9	56.6	301 04.2	51.3	146 01.6	54.1
16	20 53.6	67 28.0	25.9	42 00.5	55.8	316 06.5	51.3	161 04.0	54.1
17	35 56.1	82 27.3	25.1	57 01.1	55.1	331 08.9	51.3	176 06.4	54.1
18	50 58.6	97 26.6	S18 24.3	72 01.7	S 9 54.3	346 11.3	N20 51.4	191 08.9	S12 54.1
19	66 01.0	112 25.8	23.6	87 02.3	53.6	1 13.6	51.4	206 11.3	54.1
20	81 03.5	127 25.1	22.8	102 02.9	52.8	16 16.0	51.4	221 13.7	54.1
21	96 06.0	142 24.4	22.0	117 03.5	52.1	31 18.4	51.4	236 16.1	54.1
22	111 08.4	157 23.7	21.2	132 04.1	51.3	46 20.7	51.5	251 18.6	54.1
23	126 10.9	172 22.9	20.4	147 04.8	50.6	61 23.1	51.5	266 21.0	54.1
11 00	141 13.4	187 22.2	S18 19.6	162 05.4	S 9 49.9	76 25.5	N20 51.5	281 23.4	S12 54.1
01	156 15.8	202 21.5	18.8	177 06.0	49.1	91 27.8	51.5	296 25.9	54.1
02	171 18.3	217 20.7	18.0	192 06.6	48.4	106 30.2	51.6	311 28.3	54.1
03	186 20.7	232 20.0	17.3	207 07.2	47.6	121 32.6	51.6	326 30.7	54.1
04	201 23.2	247 19.3	16.5	222 07.8	46.9	136 34.9	51.6	341 33.1	54.1
05	216 25.7	262 18.6	15.7	237 08.4	46.1	151 37.3	51.6	356 35.6	54.1
06	231 28.1	277 17.8	S18 14.9	252 09.0	S 9 45.4	166 39.6	N20 51.7	11 38.0	S12 54.1
07	246 30.6	292 17.1	14.1	267 09.7	44.6	181 42.0	51.7	26 40.4	54.1
08	261 33.1	307 16.4	13.3	282 10.3	43.9	196 44.4	51.7	41 42.9	54.1
M 09	276 35.5	322 15.7	12.5	297 10.9	43.1	211 46.7	51.7	56 45.3	54.1
O 10	291 38.0	337 14.9	11.7	312 11.5	42.4	226 49.1	51.8	71 47.7	54.1
N 11	306 40.5	352 14.2	10.9	327 12.1	41.6	241 51.4	51.8	86 50.2	54.1
D 12	321 42.9	7 13.5	S18 10.1	342 12.7	S 9 40.9	256 53.8	N20 51.8	101 52.6	S12 54.1
A 13	336 45.4	22 12.8	09.3	357 13.3	40.1	271 56.2	51.9	116 55.0	54.1
Y 14	351 47.9	37 12.1	08.5	12 13.9	39.4	286 58.5	51.9	131 57.4	54.1
15	6 50.3	52 11.3	07.7	27 14.6	38.6	302 00.9	51.9	146 59.9	54.1
16	21 52.8	67 10.6	06.9	42 15.2	37.9	317 03.2	51.9	162 02.3	54.1
17	36 55.2	82 09.9	06.1	57 15.8	37.1	332 05.6	52.0	177 04.7	54.1
18	51 57.7	97 09.2	S18 05.3	72 16.4	S 9 36.4	347 08.0	N20 52.0	192 07.2	S12 54.1
19	67 00.2	112 08.5	04.5	87 17.0	35.6	2 10.3	52.0	207 09.6	54.1
20	82 02.6	127 07.7	03.7	102 17.6	34.9	17 12.7	52.0	222 12.0	54.1
21	97 05.1	142 07.0	02.9	117 18.2	34.1	32 15.0	52.1	237 14.5	54.1
22	112 07.6	157 06.3	02.0	132 18.9	33.4	47 17.4	52.1	252 16.9	54.1
23	127 10.0	172 05.6	01.2	147 19.5	32.6	62 19.7	52.1	267 19.3	54.1
	h m								
Mer. Pass.	14 36.7	v −0.7	d 0.8	v 0.6	d 0.7	v 2.4	d 0.0	v 2.4	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.5	S40 15.4
Achernar	335 27.2	S57 10.5
Acrux	173 09.0	S63 10.2
Adhara	255 12.4	S28 59.7
Aldebaran	290 49.5	N16 32.0
Alioth	166 20.6	N55 53.0
Alkaid	152 58.9	N49 14.5
Al Na'ir	27 44.5	S46 53.8
Alnilam	275 46.4	S 1 11.9
Alphard	217 56.0	S 8 43.2
Alphecca	126 11.2	N26 40.0
Alpheratz	357 44.0	N29 09.9
Altair	62 08.7	N 8 54.2
Ankaa	353 16.2	S42 14.2
Antares	112 26.6	S26 27.5
Arcturus	145 55.8	N19 06.6
Atria	107 28.9	S69 02.7
Avior	234 17.5	S59 33.4
Bellatrix	278 32.0	N 6 21.5
Betelgeuse	271 01.3	N 7 24.3
Canopus	263 55.8	S52 42.5
Capella	280 34.5	N46 00.7
Deneb	49 32.1	N45 19.7
Denebola	182 33.6	N14 29.7
Diphda	348 56.3	S17 55.0
Dubhe	193 51.4	N61 40.5
Elnath	278 12.7	N28 37.0
Eltanin	90 46.6	N51 29.1
Enif	33 47.6	N 9 56.2
Fomalhaut	15 24.6	S29 33.2
Gacrux	172 00.7	S57 11.1
Gienah	175 52.3	S17 37.0
Hadar	148 47.9	S60 26.0
Hamal	328 01.1	N23 31.5
Kaus Aust.	83 44.4	S34 22.5
Kochab	137 19.9	N74 05.8
Markab	13 38.8	N15 16.6
Menkar	314 15.3	N 4 08.3
Menkent	148 07.7	S36 26.0
Miaplacidus	221 38.7	S69 46.5
Mirfak	308 40.6	N49 54.6
Nunki	75 58.9	S26 16.7
Peacock	53 20.2	S56 41.4
Pollux	243 27.6	N27 59.4
Procyon	244 59.6	N 5 11.2
Rasalhague	96 06.8	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.1	S 8 11.5
Rigil Kent.	139 51.8	S60 53.1
Sabik	102 12.9	S15 44.4
Schedar	349 41.1	N56 36.8
Shaula	96 22.4	S37 06.6
Sirius	258 33.6	S16 44.4
Spica	158 31.3	S11 13.9
Suhail	222 52.1	S43 29.4
Vega	80 39.4	N38 47.7
Zuben'ubi	137 05.6	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	47 25.6	11 30
Mars	21 36.5	13 12
Jupiter	295 14.4	18 55
Saturn	140 11.0	5 17

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 9	Moonrise 10	Moonrise 11	Moonrise 12
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
9 00	176 27.3	S14 41.2	195 13.2	7.2	S14 53.8	9.2	59.8	N 72	06 35	07 57	09 23	08 33	08 14	07 59	07 47
01	191 27.2	40.4	209 39.4	7.2	14 44.6	9.2	59.8	N 70	06 31	07 44	08 57	08 07	07 59	07 53	07 47
02	206 27.2	39.6	224 05.6	7.3	14 35.4	9.3	59.8	68	06 27	07 34	08 38	07 47	07 48	07 47	07 47
03	221 27.2	38.8	238 31.9	7.4	14 26.1	9.4	59.8	66	06 24	07 25	08 23	07 31	07 38	07 43	07 47
04	236 27.2	38.0	252 58.3	7.4	14 16.7	9.5	59.7	64	06 22	07 18	08 11	07 18	07 30	07 39	07 47
05	251 27.2	37.2	267 24.7	7.5	14 07.2	9.6	59.7	62	06 19	07 12	08 00	07 06	07 23	07 35	07 47
06	266 27.2	S14 36.4	281 51.2	7.6	S13 57.6	9.6	59.7	60	06 17	07 06	07 51	06 57	07 16	07 32	07 47
07	281 27.1	35.6	296 17.8	7.6	13 48.0	9.8	59.7	N 58	06 15	07 01	07 43	06 49	07 11	07 30	07 47
S 08	296 27.1	34.8	310 44.4	7.7	13 38.2	9.8	59.7	56	06 13	06 57	07 36	06 41	07 06	07 27	07 47
A 09	311 27.1	34.0	325 11.1	7.8	13 28.4	9.9	59.7	54	06 11	06 53	07 30	06 34	07 02	07 25	07 47
T 10	326 27.1	33.2	339 37.9	7.8	13 18.5	10.0	59.6	52	06 09	06 49	07 24	06 29	06 58	07 23	07 47
U 11	341 27.1	32.4	354 04.7	7.9	13 08.5	10.0	59.6	50	06 07	06 45	07 19	06 23	06 54	07 21	07 46
R 12	356 27.1	S14 31.6	8 31.6	8.0	S12 58.5	10.1	59.6	45	06 03	06 38	07 08	06 11	06 46	07 18	07 46
D 13	11 27.1	30.7	22 58.6	8.0	12 48.4	10.2	59.6	N 40	05 59	06 31	06 59	06 02	06 40	07 14	07 46
A 14	26 27.0	29.9	37 25.6	8.1	12 38.2	10.3	59.6	35	05 55	06 25	06 51	05 53	06 34	07 11	07 46
Y 15	41 27.0	29.1	51 52.7	8.2	12 27.9	10.3	59.6	30	05 51	06 19	06 44	05 46	06 29	07 09	07 46
16	56 27.0	28.3	66 19.9	8.2	12 17.6	10.4	59.5	20	05 43	06 09	06 32	05 33	06 21	07 05	07 46
17	71 27.0	27.5	80 47.1	8.3	12 07.2	10.5	59.5	N 10	05 34	05 59	06 21	05 22	06 13	07 01	07 46
18	86 27.0	S14 26.7	95 14.4	8.4	S11 56.7	10.6	59.5	0	05 25	05 49	06 11	05 11	06 06	06 57	07 46
19	101 27.0	25.9	109 41.8	8.4	11 46.1	10.6	59.5	S 10	05 13	05 39	06 00	05 01	05 58	06 54	07 46
20	116 27.0	25.1	124 09.2	8.6	11 35.5	10.6	59.5	20	04 59	05 26	05 49	04 50	05 51	06 50	07 46
21	131 27.0	24.3	138 36.8	8.5	11 24.9	10.7	59.4	30	04 41	05 11	05 36	04 37	05 42	06 45	07 47
22	146 26.9	23.5	153 04.3	8.7	11 14.2	10.8	59.4	35	04 30	05 02	05 29	04 29	05 37	06 43	07 47
23	161 26.9	22.7	167 32.0	8.7	11 03.4	10.9	59.4	40	04 16	04 51	05 20	04 21	05 31	06 40	07 47
10 00	176 26.9	S14 21.8	181 59.7	8.7	S10 52.5	10.9	59.4	45	03 58	04 38	05 10	04 11	05 24	06 37	07 47
01	191 26.9	21.0	196 27.4	8.9	10 41.6	10.9	59.4	S 50	03 36	04 22	04 58	03 58	05 16	06 33	07 47
02	206 26.9	20.2	210 55.3	8.9	10 30.7	11.0	59.3	52	03 24	04 14	04 52	03 53	05 12	06 31	07 47
03	221 26.9	19.4	225 23.2	9.0	10 19.7	11.1	59.3	54	03 11	04 05	04 46	03 47	05 08	06 29	07 47
04	236 26.9	18.6	239 51.2	9.0	10 08.6	11.1	59.3	56	02 56	03 55	04 39	03 40	05 04	06 27	07 47
05	251 26.9	17.8	254 19.2	9.1	9 57.5	11.2	59.3	58	02 36	03 43	04 31	03 32	04 59	06 24	07 47
06	266 26.9	S14 17.0	268 47.3	9.2	S 9 46.3	11.2	59.2	S 60	02 12	03 30	04 22	03 23	04 53	06 21	07 47
07	281 26.9	16.1	283 15.5	9.2	9 35.1	11.3	59.2								
08	296 26.8	15.3	297 43.7	9.3	9 23.8	11.3	59.2								
S 09	311 26.8	14.5	312 12.0	9.4	9 12.5	11.3	59.2								
U 10	326 26.8	13.7	326 40.4	9.4	9 01.2	11.4	59.2								
N 11	341 26.8	12.9	341 08.8	9.5	8 49.8	11.4	59.1								
D 12	356 26.8	S14 12.1	355 37.3	9.5	S 8 38.4	11.5	59.1								
A 13	11 26.8	11.2	10 05.8	9.6	8 26.9	11.5	59.1								
Y 14	26 26.8	10.4	24 34.4	9.7	8 15.4	11.6	59.1								
15	41 26.8	09.6	39 03.1	9.7	8 03.8	11.6	59.0								
16	56 26.8	08.8	53 31.8	9.8	7 52.2	11.6	59.0								
17	71 26.8	08.0	68 00.6	9.9	7 40.6	11.6	59.0								
18	86 26.8	S14 07.2	82 29.5	9.9	S 7 29.0	11.7	59.0								
19	101 26.8	06.3	96 58.4	10.0	7 17.3	11.7	58.9								
20	116 26.8	05.5	111 27.4	10.0	7 05.6	11.7	58.9								
21	131 26.8	04.7	125 56.4	10.1	6 53.9	11.8	58.9								
22	146 26.8	03.9	140 25.5	10.2	6 42.1	11.8	58.8								
23	161 26.8	03.0	154 54.7	10.2	6 30.3	11.8	58.8								
11 00	176 26.8	S14 02.2	169 23.9	10.3	S 6 18.5	11.9	58.8								
01	191 26.8	01.4	183 53.2	10.3	6 06.6	11.8	58.8								
02	206 26.8	14 00.6	198 22.5	10.4	5 54.8	11.9	58.7								
03	221 26.8	13 59.8	212 51.9	10.4	5 42.9	11.9	58.7								
04	236 26.8	58.9	227 21.3	10.5	5 31.0	11.9	58.7								
05	251 26.8	58.1	241 50.8	10.6	5 19.1	12.0	58.6								
06	266 26.8	S13 57.3	256 20.4	10.6	S 5 07.1	11.9	58.6								
07	281 26.8	56.5	270 50.0	10.6	4 55.2	12.0	58.6								
08	296 26.8	55.6	285 19.6	10.7	4 43.2	11.9	58.6								
M 09	311 26.8	54.8	299 49.3	10.8	4 31.3	12.0	58.5								
O 10	326 26.8	54.0	314 19.1	10.8	4 19.3	12.0	58.5								
N 11	341 26.8	53.2	328 48.9	10.9	4 07.3	12.0	58.5								
D 12	356 26.8	S13 52.3	343 18.8	10.9	S 3 55.3	12.1	58.4								
A 13	11 26.8	51.5	357 48.7	11.0	3 43.2	12.0	58.4								
Y 14	26 26.8	50.7	12 18.7	11.0	3 31.2	12.0	58.4								
15	41 26.8	49.9	26 48.7	11.0	3 19.2	12.0	58.3								
16	56 26.8	49.0	41 18.7	11.2	3 07.2	12.1	58.3								
17	71 26.8	48.2	55 48.9	11.1	2 55.1	12.0	58.3								
18	86 26.8	S13 47.4	70 19.0	11.2	S 2 43.1	12.0	58.3								
19	101 26.8	46.5	84 49.2	11.3	2 31.1	12.1	58.2								
20	116 26.8	45.7	99 19.5	11.3	2 19.0	12.0	58.2								
21	131 26.8	44.9	113 49.8	11.3	2 07.0	12.0	58.2								
22	146 26.8	44.0	128 20.1	11.4	1 55.0	12.1	58.1								
23	161 26.8	43.2	142 50.5	11.4	S 1 42.9	12.0	58.1								
	SD 16.2	d 0.8	SD	16.2		16.1	15.9								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 9	Moonset 10	Moonset 11	Moonset 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 07	16 33	17 56	14 36	16 47	18 47	20 41
N 70	15 32	16 46	17 59	15 01	16 59	18 51	20 37
68	15 51	16 56	18 03	15 19	17 09	18 54	20 35
66	16 06	17 04	18 06	15 34	17 17	18 56	20 32
64	16 19	17 11	18 08	15 46	17 24	18 59	20 30
62	16 29	17 18	18 10	15 56	17 30	19 01	20 28
60	16 38	17 23	18 13	16 05	17 35	19 02	20 27
N 58	16 46	17 28	18 15	16 12	17 39	19 04	20 26
56	16 53	17 33	18 17	16 19	17 43	19 05	20 24
54	16 59	17 37	18 18	16 25	17 47	19 06	20 23
52	17 05	17 40	18 20	16 30	17 50	19 07	20 22
50	17 10	17 44	18 22	16 35	17 53	19 08	20 21
45	17 21	17 51	18 26	16 46	17 59	19 10	20 19
N 40	17 30	17 58	18 30	16 54	18 04	19 12	20 18
35	17 38	18 04	18 34	17 02	18 09	19 14	20 16
30	17 45	18 09	18 38	17 08	18 12	19 15	20 15
20	17 57	18 20	18 46	17 19	18 19	19 17	20 13
N 10	18 08	18 29	18 54	17 29	18 25	19 19	20 11
0	18 18	18 39	19 04	17 38	18 30	19 21	20 09
S 10	18 28	18 50	19 15	17 46	18 36	19 23	20 07
20	18 39	19 02	19 29	17 56	18 42	19 24	20 06
30	18 52	19 17	19 47	18 07	18 48	19 27	20 03
35	18 59	19 26	19 58	18 13	18 52	19 28	20 02
40	19 07	19 37	20 12	18 20	18 56	19 29	20 01
45	19 17	19 49	20 29	18 28	19 01	19 31	19 59
S 50	19 30	20 06	20 51	18 37	19 06	19 32	19 57
52	19 35	20 13	21 02	18 42	19 09	19 33	19 56
54	19 41	20 22	21 15	18 47	19 12	19 34	19 55
56	19 48	20 32	21 30	18 52	19 15	19 35	19 54
58	19 56	20 43	21 49	18 58	19 18	19 36	19 53
S 60	20 05	20 56	22 13	19 05	19 22	19 37	19 51

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
9	14 11	14 12	12 14	11 25	23 52	29	1
10	14 12	14 13	12 14	12 18	24 44	00	0
11	14 13	14 13	12 14	13 09	00 44	01	2

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.4		SATURN +0.5		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
12 00	142 12.5	187 04.9	S18 00.4	162 20.1	S 9 31.9	77 22.1	N20 52.1	282 21.8	S12 54.1	Acamar	315 18.6	S40 15.4
01	157 15.0	202 04.2	17 59.6	177 20.7	31.1	92 24.4	52.2	297 24.2	54.1	Achernar	335 27.2	S57 10.5
02	172 17.4	217 03.4	58.8	192 21.3	30.4	107 26.8	52.2	312 26.6	54.1	Acrux	173 08.9	S63 10.2
03	187 19.9	232 02.7	. . 58.0	207 21.9	. . 29.6	122 29.2	. . 52.2	327 29.1	. . 54.1	Adhara	255 12.4	S28 59.7
04	202 22.3	247 02.0	57.2	222 22.5	28.8	137 31.5	52.3	342 31.5	54.1	Aldebaran	290 49.5	N16 32.0
05	217 24.8	262 01.3	56.4	237 23.2	28.1	152 33.9	52.3	357 33.9	54.1			
06	232 27.3	277 00.6	S17 55.5	252 23.8	S 9 27.3	167 36.2	N20 52.3	12 36.4	S12 54.1	Alioth	166 20.5	N55 53.0
07	247 29.7	291 59.9	54.7	267 24.4	26.6	182 38.6	52.3	27 38.8	54.1	Alkaid	152 58.9	N49 14.5
08	262 32.2	306 59.2	53.9	282 25.0	25.8	197 40.9	52.4	42 41.2	54.1	Al Na'ir	27 44.5	S46 53.8
09	277 34.7	321 58.5	. . 53.1	297 25.6	. . 25.1	212 43.3	. . 52.4	57 43.7	. . 54.1	Alnilam	275 46.4	S 1 11.9
10	292 37.1	336 57.7	52.3	312 26.2	24.3	227 45.6	52.4	72 46.1	54.1	Alphard	217 56.0	S 8 43.2
11	307 39.6	351 57.0	51.5	327 26.9	23.6	242 48.0	52.4	87 48.5	54.1			
12	322 42.1	6 56.3	S17 50.6	342 27.5	S 9 22.8	257 50.3	N20 52.5	102 51.0	S12 54.1	Alphecca	126 11.2	N26 40.0
13	337 44.5	21 55.6	49.8	357 28.1	22.1	272 52.7	52.5	117 53.4	54.1	Alpheratz	357 44.0	N29 09.9
14	352 47.0	36 54.9	49.0	12 28.7	21.3	287 55.0	52.5	132 55.8	54.1	Altair	62 08.7	N 8 54.2
15	7 49.5	51 54.2	. . 48.2	27 29.3	. . 20.6	302 57.4	. . 52.6	147 58.3	. . 54.1	Ankaa	353 16.2	S42 14.2
16	22 51.9	66 53.5	47.3	42 29.9	19.8	317 59.7	52.6	163 00.7	54.1	Antares	112 26.6	S26 27.5
17	37 54.4	81 52.8	46.5	57 30.6	19.1	333 02.1	52.6	178 03.1	54.1			
18	52 56.8	96 52.1	S17 45.7	72 31.2	S 9 18.3	348 04.4	N20 52.6	193 05.6	S12 54.1	Arcturus	145 55.8	N19 06.6
19	67 59.3	111 51.4	44.9	87 31.8	17.5	3 06.8	52.7	208 08.0	54.1	Atria	107 28.8	S69 02.7
20	83 01.8	126 50.7	44.0	102 32.4	16.8	18 09.1	52.7	223 10.4	54.0	Avior	234 17.5	S59 33.4
21	98 04.2	141 50.0	. . 43.2	117 33.0	. . 16.0	33 11.5	. . 52.7	238 12.9	. . 54.0	Bellatrix	278 32.1	N 6 21.5
22	113 06.7	156 49.3	42.4	132 33.7	15.3	48 13.8	52.7	253 15.3	54.0	Betelgeuse	271 01.3	N 7 24.3
23	128 09.2	171 48.6	41.5	147 34.3	14.5	63 16.2	52.8	268 17.7	54.0			
13 00	143 11.6	186 47.9	S17 40.7	162 34.9	S 9 13.8	78 18.5	N20 52.8	283 20.2	S12 54.0	Canopus	263 55.9	S52 42.6
01	158 14.1	201 47.1	39.9	177 35.5	13.0	93 20.8	52.8	298 22.6	54.0	Capella	280 34.5	N46 00.7
02	173 16.6	216 46.4	39.1	192 36.1	12.3	108 23.2	52.9	313 25.1	54.0	Deneb	49 32.1	N45 19.7
03	188 19.0	231 45.7	. . 38.2	207 36.7	. . 11.5	123 25.5	. . 52.9	328 27.5	. . 54.0	Denebola	182 33.6	N14 29.7
04	203 21.5	246 45.0	37.4	222 37.4	10.8	138 27.9	52.9	343 29.9	54.0	Diphda	348 56.3	S17 55.0
05	218 23.9	261 44.3	36.5	237 38.0	10.0	153 30.2	52.9	358 32.4	54.0			
06	233 26.4	276 43.6	S17 35.7	252 38.6	S 9 09.2	168 32.6	N20 53.0	13 34.8	S12 54.0	Dubhe	193 51.4	N61 40.5
07	248 28.9	291 42.9	34.9	267 39.2	08.5	183 34.9	53.0	28 37.2	54.0	Elnath	278 12.7	N28 37.0
08	263 31.3	306 42.2	34.0	282 39.8	07.7	198 37.3	53.0	43 39.7	54.0	Eltanin	90 46.5	N51 29.1
09	278 33.8	321 41.5	. . 33.2	297 40.5	. . 07.0	213 39.6	. . 53.1	58 42.1	. . 54.0	Enif	33 47.6	N 9 56.2
10	293 36.3	336 40.8	32.4	312 41.1	06.2	228 41.9	53.1	73 44.6	54.0	Fomalhaut	15 24.6	S29 33.2
11	308 38.7	351 40.1	31.5	327 41.7	05.5	243 44.3	53.1	88 47.0	54.0			
12	323 41.2	6 39.5	S17 30.7	342 42.3	S 9 04.7	258 46.6	N20 53.1	103 49.4	S12 54.0	Gacrux	172 00.7	S57 11.1
13	338 43.7	21 38.8	29.8	357 42.9	03.9	273 49.0	53.2	118 51.9	54.0	Gienah	175 52.2	S17 37.0
14	353 46.1	36 38.1	29.0	12 43.6	03.2	288 51.3	53.2	133 54.3	54.0	Hadar	148 47.9	S60 26.0
15	8 48.6	51 37.4	. . 28.1	27 44.2	. . 02.4	303 53.7	. . 53.2	148 56.8	. . 54.0	Hamal	328 01.1	N23 31.5
16	23 51.1	66 36.7	27.3	42 44.8	01.7	318 56.0	53.3	163 59.2	54.0	Kaus Aust.	83 44.4	S34 22.5
17	38 53.5	81 36.0	26.4	57 45.4	00.9	333 58.3	53.3	179 01.6	54.0			
18	53 56.0	96 35.3	S17 25.6	72 46.1	S 9 00.2	349 00.7	N20 53.3	194 04.1	S12 54.0	Kochab	137 19.9	N74 05.8
19	68 58.4	111 34.6	24.8	87 46.7	8 59.4	4 03.0	53.4	209 06.5	54.0	Markab	13 38.8	N15 16.6
20	84 00.9	126 33.9	23.9	102 47.3	58.6	19 05.4	53.4	224 09.0	54.0	Menkar	314 15.3	N 4 08.3
21	99 03.4	141 33.2	. . 23.1	117 47.9	. . 57.9	34 07.7	. . 53.4	239 11.4	. . 54.0	Menkent	148 07.7	S36 26.0
22	114 05.8	156 32.5	22.2	132 48.5	57.1	49 10.0	53.4	254 13.8	54.0	Miaplacidus	221 38.7	S69 46.5
23	129 08.3	171 31.8	21.4	147 49.2	56.4	64 12.4	53.5	269 16.3	54.0			
14 00	144 10.8	186 31.1	S17 20.5	162 49.8	S 8 55.6	79 14.7	N20 53.5	284 18.7	S12 54.0	Mirfak	308 40.6	N49 54.6
01	159 13.2	201 30.4	19.7	177 50.4	54.9	94 17.0	53.5	299 21.2	54.0	Nunki	75 58.9	S26 16.7
02	174 15.7	216 29.7	18.8	192 51.0	54.1	109 19.4	53.6	314 23.6	54.0	Peacock	53 20.1	S56 41.4
03	189 18.2	231 29.1	. . 17.9	207 51.7	. . 53.3	124 21.7	. . 53.6	329 26.0	. . 54.0	Pollux	243 27.7	N27 59.5
04	204 20.6	246 28.4	17.1	222 52.3	52.6	139 24.1	53.6	344 28.5	54.0	Procyon	244 59.7	N 5 11.2
05	219 23.1	261 27.7	16.2	237 52.9	51.8	154 26.4	53.6	359 30.9	54.0			
06	234 25.6	276 27.0	S17 15.4	252 53.5	S 8 51.1	169 28.7	N20 53.7	14 33.4	S12 54.0	Rasalhague	96 06.8	N12 33.0
07	249 28.0	291 26.3	14.5	267 54.1	50.3	184 31.1	53.7	29 35.8	54.0	Regulus	207 43.4	N11 53.9
08	264 30.5	306 25.6	13.7	282 54.8	49.5	199 33.4	53.7	44 38.3	53.9	Rigel	281 12.1	S 8 11.5
09	279 32.9	321 24.9	. . 12.8	297 55.4	. . 48.8	214 35.7	. . 53.8	59 40.7	. . 53.9	Rigil Kent.	139 51.8	S60 53.1
10	294 35.4	336 24.2	11.9	312 56.0	48.0	229 38.1	53.8	74 43.1	53.9	Sabik	102 12.9	S15 44.4
11	309 37.9	351 23.6	11.1	327 56.6	47.3	244 40.4	53.8	89 45.6	53.9			
12	324 40.3	6 22.9	S17 10.2	342 57.3	S 8 46.5	259 42.7	N20 53.9	104 48.0	S12 53.9	Schedar	349 41.1	N56 36.8
13	339 42.8	21 22.2	09.3	357 57.9	45.7	274 45.1	53.9	119 50.5	53.9	Shaula	96 22.4	S37 06.6
14	354 45.3	36 21.5	08.5	12 58.5	45.0	289 47.4	53.9	134 52.9	53.9	Sirius	258 33.6	S16 44.4
15	9 47.7	51 20.8	. . 07.6	27 59.1	. . 44.2	304 49.7	. . 53.9	149 55.4	. . 53.9	Spica	158 31.3	S11 13.9
16	24 50.2	66 20.1	06.8	42 59.8	43.5	319 52.1	54.0	164 57.8	53.9	Suhail	222 52.1	S43 29.4
17	39 52.7	81 19.5	05.9	58 00.4	42.7	334 54.4	54.0	180 00.2	53.9			
18	54 55.1	96 18.8	S17 05.0	73 01.0	S 8 41.9	349 56.7	N20 54.0	195 02.7	S12 53.9	Vega	80 39.4	N38 47.7
19	69 57.6	111 18.1	04.2	88 01.6	41.2	4 59.1	54.1	210 05.1	53.9	Zuben'ubi	137 05.6	S16 05.8
20	85 00.0	126 17.4	03.3	103 02.3	40.4	20 01.4	54.1	225 07.6	53.9		SHA	Mer.Pass.
21	100 02.5	141 16.7	. . 02.4	118 02.9	. . 39.7	35 03.7	. . 54.1	240 10.0	. . 53.9		° ′	h m
22	115 05.0	156 16.1	01.5	133 03.5	38.9	50 06.1	54.2	255 12.5	53.9	Venus	43 36.2	11 33
23	130 07.4	171 15.4	00.7	148 04.1	38.1	65 08.4	54.2	270 14.9	53.9	Mars	19 23.3	13 09
	h m									Jupiter	295 06.9	18 44
Mer. Pass.	14 24.9	v −0.7	d 0.8	v 0.6	d 0.8	v 2.3	d 0.0	v 2.4	d 0.0	Saturn	140 08.6	5 06

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 12	Moonrise 13	Moonrise 14	Moonrise 15
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
12 00	176 26.8	S13 42.4	157 20.9	11.5	S 1 30.9	12.0	58.1	N 72	06 22	07 43	09 04	07 47	07 35	07 22	07 07
01	191 26.8	41.6	171 51.4	11.5	1 18.9	12.0	58.0	N 70	06 20	07 32	08 43	07 47	07 41	07 36	07 30
02	206 26.8	40.7	186 21.9	11.6	1 06.9	12.0	58.0	68	06 17	07 23	08 26	07 47	07 46	07 46	07 47
03	221 26.8	. . 39.9	200 52.5	11.6	0 54.9	12.0	58.0	66	06 15	07 16	08 12	07 47	07 51	07 55	08 01
04	236 26.8	39.1	215 23.1	11.6	0 42.9	12.0	57.9	64	06 13	07 09	08 01	07 47	07 54	08 03	08 13
05	251 26.8	38.2	229 53.7	11.7	0 30.9	11.9	57.9	62	06 12	07 04	07 51	07 47	07 58	08 09	08 23
06	266 26.9	S13 37.4	244 24.4	11.7	S 0 19.0	12.0	57.9	60	06 10	06 59	07 43	07 47	08 00	08 15	08 31
07	281 26.9	36.6	258 55.1	11.8	S 0 07.0	11.9	57.8	N 58	06 08	06 54	07 36	07 47	08 03	08 20	08 39
08	296 26.9	35.7	273 25.9	11.7	N 0 04.9	12.0	57.8	56	06 07	06 50	07 30	07 47	08 05	08 24	08 45
09	311 26.9	. . 34.9	287 56.6	11.9	0 16.9	11.9	57.8	54	06 05	06 47	07 24	07 47	08 07	08 28	08 51
10	326 26.9	34.1	302 27.5	11.8	0 28.8	11.8	57.7	52	06 04	06 44	07 19	07 47	08 09	08 32	08 57
11	341 26.9	33.2	316 58.3	11.9	0 40.6	11.9	57.7	50	06 03	06 40	07 14	07 46	08 11	08 35	09 02
12	356 26.9	S13 32.4	331 29.2	12.0	N 0 52.5	11.9	57.7	45	05 59	06 33	07 04	07 46	08 14	08 43	09 12
13	11 26.9	31.5	346 00.2	11.9	1 04.4	11.8	57.6	N 40	05 56	06 27	06 55	07 46	08 17	08 49	09 21
14	26 26.9	30.7	0 31.1	12.0	1 16.2	11.8	57.6	35	05 52	06 22	06 48	07 46	08 20	08 54	09 29
15	41 26.9	. . 29.9	15 02.1	12.1	1 28.0	11.8	57.6	30	05 49	06 17	06 42	07 46	08 23	08 59	09 35
16	56 26.9	29.0	29 33.2	12.0	1 39.8	11.8	57.5	20	05 42	06 08	06 30	07 46	08 27	09 07	09 47
17	71 27.0	28.2	44 04.2	12.1	1 51.6	11.7	57.5	N 10	05 34	05 59	06 20	07 46	08 30	09 14	09 57
18	86 27.0	S13 27.4	58 35.3	12.2	N 2 03.3	11.7	57.5	0	05 25	05 50	06 11	07 46	08 34	09 21	10 07
19	101 27.0	26.5	73 06.5	12.1	2 15.0	11.7	57.4	S 10	05 14	05 40	06 01	07 46	08 38	09 28	10 17
20	116 27.0	25.7	87 37.6	12.2	2 26.7	11.7	57.4	20	05 01	05 28	05 51	07 46	08 41	09 35	10 27
21	131 27.0	. . 24.8	102 08.8	12.2	2 38.4	11.6	57.4	30	04 44	05 14	05 39	07 47	08 46	09 43	10 39
22	146 27.0	24.0	116 40.0	12.3	2 50.0	11.6	57.3	35	04 33	05 05	05 32	07 47	08 48	09 48	10 46
23	161 27.0	23.2	131 11.3	12.3	3 01.6	11.6	57.3	40	04 20	04 55	05 24	07 47	08 51	09 54	10 54
13 00	176 27.0	S13 22.3	145 42.6	12.3	N 3 13.2	11.5	57.3	45	04 04	04 43	05 15	07 47	08 55	10 00	11 04
01	191 27.1	21.5	160 13.9	12.3	3 24.7	11.6	57.2	S 50	03 43	04 27	05 03	07 47	08 59	10 08	11 15
02	206 27.1	20.6	174 45.2	12.3	3 36.3	11.4	57.2	52	03 32	04 20	04 58	07 47	09 01	10 12	11 20
03	221 27.1	. . 19.8	189 16.5	12.4	3 47.7	11.5	57.2	54	03 20	04 12	04 52	07 47	09 03	10 16	11 26
04	236 27.1	19.0	203 47.9	12.4	3 59.2	11.4	57.1	56	03 06	04 03	04 46	07 47	09 05	10 20	11 33
05	251 27.1	18.1	218 19.3	12.4	4 10.6	11.4	57.1	58	02 48	03 52	04 38	07 47	09 07	10 25	11 40
06	266 27.1	S13 17.3	232 50.7	12.5	N 4 22.0	11.3	57.1	S 60	02 26	03 39	04 30	07 47	09 10	10 31	11 48
07	281 27.1	16.4	247 22.2	12.5	4 33.3	11.3	57.0								
08	296 27.2	15.6	261 53.7	12.4	4 44.6	11.3	57.0								
09	311 27.2	. . 14.7	276 25.1	12.6	4 55.9	11.2	57.0								
10	326 27.2	13.9	290 56.7	12.5	5 07.1	11.2	56.9								
11	341 27.2	13.0	305 28.2	12.5	5 18.3	11.2	56.9								
12	356 27.2	S13 12.2	319 59.7	12.6	N 5 29.5	11.1	56.9								
13	11 27.3	11.4	334 31.3	12.6	5 40.6	11.1	56.8								
14	26 27.3	10.5	349 02.9	12.6	5 51.7	11.0	56.8								
15	41 27.3	. . 09.7	3 34.5	12.6	6 02.7	11.0	56.8								
16	56 27.3	08.8	18 06.1	12.7	6 13.7	10.9	56.7								
17	71 27.3	08.0	32 37.8	12.6	6 24.6	10.9	56.7								
18	86 27.3	S13 07.1	47 09.4	12.7	N 6 35.5	10.9	56.7								
19	101 27.4	06.3	61 41.1	12.7	6 46.4	10.8	56.6								
20	116 27.4	05.4	76 12.8	12.7	6 57.2	10.8	56.6								
21	131 27.4	. . 04.6	90 44.5	12.7	7 08.0	10.7	56.6								
22	146 27.4	03.7	105 16.2	12.7	7 18.7	10.6	56.5								
23	161 27.4	02.9	119 47.9	12.8	7 29.3	10.6	56.5								
14 00	176 27.5	S13 02.0	134 19.7	12.7	N 7 39.9	10.6	56.5								
01	191 27.5	01.2	148 51.4	12.8	7 50.5	10.5	56.5								
02	206 27.5	13 00.3	163 23.2	12.8	8 01.0	10.5	56.4								
03	221 27.5	12 59.5	177 55.0	12.7	8 11.5	10.4	56.4								
04	236 27.6	58.6	192 26.7	12.8	8 21.9	10.4	56.4								
05	251 27.6	57.8	206 58.5	12.8	8 32.3	10.3	56.3								
06	266 27.6	S12 56.9	221 30.3	12.9	N 8 42.6	10.2	56.3								
07	281 27.6	56.1	236 02.2	12.8	8 52.8	10.2	56.3								
08	296 27.7	55.2	250 34.0	12.8	9 03.0	10.2	56.2								
09	311 27.7	. . 54.4	265 05.8	12.8	9 13.2	10.1	56.2								
10	326 27.7	53.5	279 37.6	12.9	9 23.3	10.0	56.2								
11	341 27.7	52.7	294 09.5	12.8	9 33.3	10.0	56.1								
12	356 27.7	S12 51.8	308 41.3	12.9	N 9 43.3	9.9	56.1								
13	11 27.8	51.0	323 13.2	12.8	9 53.2	9.9	56.1								
14	26 27.8	50.1	337 45.0	12.9	10 03.1	9.8	56.0								
15	41 27.8	. . 49.2	352 16.9	12.9	10 12.9	9.7	56.0								
16	56 27.9	48.4	6 48.8	12.8	10 22.6	9.7	56.0								
17	71 27.9	47.5	21 20.6	12.9	10 32.3	9.6	56.0								
18	86 27.9	S12 46.7	35 52.5	12.9	N10 41.9	9.6	55.9								
19	101 27.9	45.8	50 24.4	12.8	10 51.5	9.5	55.9								
20	116 28.0	45.0	64 56.2	12.9	11 01.0	9.4	55.9								
21	131 28.0	. . 44.1	79 28.1	12.9	11 10.4	9.4	55.8								
22	146 28.0	43.3	94 00.0	12.9	11 19.8	9.3	55.8								
23	161 28.0	42.4	108 31.9	12.9	N11 29.1	9.3	55.8								
	SD 16.2	d 0.8	SD	15.7		15.5		15.3							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 12	Moonset 13	Moonset 14	Moonset 15
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 26	16 47	18 08	20 41	22 33	24 25	00 25
N 70	15 47	16 58	18 11	20 37	22 21	24 04	00 04
68	16 04	17 07	18 13	20 35	22 12	23 48	25 23
66	16 17	17 14	18 15	20 32	22 05	23 35	25 03
64	16 29	17 20	18 16	20 30	21 59	23 25	24 47
62	16 38	17 26	18 18	20 28	21 53	23 16	24 35
60	16 46	17 31	18 20	20 27	21 49	23 08	24 24
N 58	16 53	17 35	18 21	20 26	21 45	23 01	24 14
56	17 00	17 39	18 23	20 24	21 41	22 55	24 06
54	17 05	17 42	18 24	20 23	21 38	22 50	23 59
52	17 10	17 46	18 25	20 22	21 35	22 45	23 52
50	17 15	17 49	18 27	20 21	21 32	22 40	23 46
45	17 25	17 56	18 30	20 19	21 26	22 31	23 33
N 40	17 34	18 01	18 33	20 18	21 21	22 23	23 23
35	17 41	18 07	18 37	20 16	21 17	22 16	23 14
30	17 47	18 12	18 40	20 15	21 14	22 10	23 06
20	17 58	18 21	18 47	20 13	21 07	22 00	22 52
N 10	18 08	18 30	18 55	20 11	21 02	21 51	22 41
0	18 18	18 39	19 03	20 09	20 56	21 43	22 30
S 10	18 27	18 49	19 14	20 07	20 51	21 35	22 19
20	18 37	19 00	19 27	20 06	20 46	21 26	22 07
30	18 49	19 14	19 44	20 03	20 39	21 16	21 53
35	18 56	19 23	19 54	20 02	20 36	21 10	21 46
40	19 04	19 33	20 07	20 01	20 32	21 03	21 37
45	19 13	19 45	20 23	19 59	20 27	20 56	21 27
S 50	19 24	20 00	20 44	19 57	20 21	20 47	21 14
52	19 29	20 07	20 55	19 56	20 19	20 43	21 09
54	19 35	20 15	21 06	19 55	20 16	20 38	21 02
56	19 41	20 24	21 20	19 54	20 13	20 33	20 55
58	19 49	20 34	21 37	19 53	20 09	20 27	20 47
S 60	19 57	20 47	21 58	19 51	20 05	20 21	20 39

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
12	14 13	14 12	12 14	13 58	01 34	02	6
13	14 12	14 11	12 14	14 45	02 22	03	12
14	14 10	14 09	12 14	15 32	03 09	04	20

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.4		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
15 00	145 09.9	186 14.7	S16 59.8	163 04.8	S 8 37.4	80 10.7	N20 54.2	285 17.4	S12 53.9
01	160 12.4	201 14.0	58.9	178 05.4	36.6	95 13.0	54.3	300 19.8	53.9
02	175 14.8	216 13.3	58.1	193 06.0	35.9	110 15.4	54.3	315 22.2	53.9
03	190 17.3	231 12.7 . .	57.2	208 06.6 . .	35.1	125 17.7 . .	54.3	330 24.7 . .	53.9
04	205 19.8	246 12.0	56.3	223 07.3	34.3	140 20.0	54.3	345 27.1	53.9
05	220 22.2	261 11.3	55.4	238 07.9	33.6	155 22.4	54.4	0 29.6	53.9
06	235 24.7	276 10.6	S16 54.5	253 08.5	S 8 32.8	170 24.7	N20 54.4	15 32.0	S12 53.9
07	250 27.2	291 10.0	53.7	268 09.1	32.0	185 27.0	54.4	30 34.5	53.8
08	265 29.6	306 09.3	52.8	283 09.8	31.3	200 29.3	54.5	45 36.9	53.8
F 09	280 32.1	321 08.6 . .	51.9	298 10.4 . .	30.5	215 31.7 . .	54.5	60 39.4 . .	53.8
R 10	295 34.5	336 07.9	51.0	313 11.0	29.8	230 34.0	54.5	75 41.8	53.8
I 11	310 37.0	351 07.3	50.1	328 11.7	29.0	245 36.3	54.6	90 44.3	53.8
D 12	325 39.5	6 06.6	S16 49.3	343 12.3	S 8 28.2	260 38.6	N20 54.6	105 46.7	S12 53.8
A 13	340 41.9	21 05.9	48.4	358 12.9	27.5	275 41.0	54.6	120 49.2	53.8
Y 14	355 44.4	36 05.3	47.5	13 13.5	26.7	290 43.3	54.7	135 51.6	53.8
15	10 46.9	51 04.6 . .	46.6	28 14.2 . .	25.9	305 45.6 . .	54.7	150 54.0 . .	53.8
16	25 49.3	66 03.9	45.7	43 14.8	25.2	320 47.9	54.7	165 56.5	53.8
17	40 51.8	81 03.2	44.8	58 15.4	24.4	335 50.3	54.8	180 58.9	53.8
18	55 54.3	96 02.6	S16 44.0	73 16.1	S 8 23.7	350 52.6	N20 54.8	196 01.4	S12 53.8
19	70 56.7	111 01.9	43.1	88 16.7	22.9	5 54.9	54.8	211 03.8	53.8
20	85 59.2	126 01.2	42.2	103 17.3	22.1	20 57.2	54.8	226 06.3	53.8
21	101 01.6	141 00.6 . .	41.3	118 17.9 . .	21.4	35 59.6 . .	54.9	241 08.7 . .	53.8
22	116 04.1	155 59.9	40.4	133 18.6	20.6	51 01.9	54.9	256 11.2	53.8
23	131 06.6	170 59.2	39.5	148 19.2	19.8	66 04.2	54.9	271 13.6	53.8
16 00	146 09.0	185 58.6	S16 38.6	163 19.8	S 8 19.1	81 06.5	N20 55.0	286 16.1	S12 53.8
01	161 11.5	200 57.9	37.7	178 20.5	18.3	96 08.8	55.0	301 18.5	53.7
02	176 14.0	215 57.2	36.8	193 21.1	17.5	111 11.2	55.0	316 21.0	53.7
03	191 16.4	230 56.6 . .	35.9	208 21.7 . .	16.8	126 13.5 . .	55.1	331 23.4 . .	53.7
04	206 18.9	245 55.9	35.0	223 22.3	16.0	141 15.8	55.1	346 25.9	53.7
05	221 21.4	260 55.2	34.1	238 23.0	15.2	156 18.1	55.1	1 28.3	53.7
06	236 23.8	275 54.6	S16 33.2	253 23.6	S 8 14.5	171 20.4	N20 55.2	16 30.8	S12 53.7
07	251 26.3	290 53.9	32.4	268 24.2	13.7	186 22.8	55.2	31 33.2	53.7
S 08	266 28.8	305 53.3	31.5	283 24.9	13.0	201 25.1	55.2	46 35.7	53.7
A 09	281 31.2	320 52.6 . .	30.6	298 25.5 . .	12.2	216 27.4 . .	55.3	61 38.1 . .	53.7
T 10	296 33.7	335 51.9	29.7	313 26.1	11.4	231 29.7	55.3	76 40.6	53.7
U 11	311 36.1	350 51.3	28.8	328 26.8	10.7	246 32.0	55.3	91 43.0	53.7
R 12	326 38.6	5 50.6	S16 27.8	343 27.4	S 8 09.9	261 34.3	N20 55.4	106 45.5	S12 53.7
D 13	341 41.1	20 50.0	26.9	358 28.0	09.1	276 36.7	55.4	121 47.9	53.7
A 14	356 43.5	35 49.3	26.0	13 28.7	08.4	291 39.0	55.4	136 50.4	53.7
Y 15	11 46.0	50 48.6 . .	25.1	28 29.3 . .	07.6	306 41.3 . .	55.5	151 52.9 . .	53.7
16	26 48.5	65 48.0	24.2	43 29.9	06.8	321 43.6	55.5	166 55.3	53.7
17	41 50.9	80 47.3	23.3	58 30.5	06.1	336 45.9	55.5	181 57.8	53.6
18	56 53.4	95 46.7	S16 22.4	73 31.2	S 8 05.3	351 48.2	N20 55.6	197 00.2	S12 53.6
19	71 55.9	110 46.0	21.5	88 31.8	04.5	6 50.5	55.6	212 02.7	53.6
20	86 58.3	125 45.4	20.6	103 32.4	03.8	21 52.9	55.6	227 05.1	53.6
21	102 00.8	140 44.7 . .	19.7	118 33.1 . .	03.0	36 55.2 . .	55.7	242 07.6 . .	53.6
22	117 03.3	155 44.0	18.8	133 33.7	02.2	51 57.5	55.7	257 10.0	53.6
23	132 05.7	170 43.4	17.9	148 34.3	01.5	66 59.8	55.7	272 12.5	53.6
17 00	147 08.2	185 42.7	S16 17.0	163 35.0	S 8 00.7	82 02.1	N20 55.8	287 14.9	S12 53.6
01	162 10.6	200 42.1	16.1	178 35.6	7 59.9	97 04.4	55.8	302 17.4	53.6
02	177 13.1	215 41.4	15.1	193 36.2	59.2	112 06.7	55.8	317 19.8	53.6
03	192 15.6	230 40.8 . .	14.2	208 36.9 . .	58.4	127 09.1 . .	55.9	332 22.3 . .	53.6
04	207 18.0	245 40.1	13.3	223 37.5	57.6	142 11.4	55.9	347 24.7	53.6
05	222 20.5	260 39.5	12.4	238 38.1	56.9	157 13.7	55.9	2 27.2	53.6
06	237 23.0	275 38.8	S16 11.5	253 38.8	S 7 56.1	172 16.0	N20 56.0	17 29.7	S12 53.6
07	252 25.4	290 38.2	10.6	268 39.4	55.3	187 18.3	56.0	32 32.1	53.5
08	267 27.9	305 37.5	09.6	283 40.0	54.6	202 20.6	56.0	47 34.6	53.5
S 09	282 30.4	320 36.9 . .	08.7	298 40.7 . .	53.8	217 22.9 . .	56.1	62 37.0 . .	53.5
U 10	297 32.8	335 36.2	07.8	313 41.3	53.0	232 25.2	56.1	77 39.5	53.5
N 11	312 35.3	350 35.6	06.9	328 41.9	52.2	247 27.5	56.1	92 41.9	53.5
D 12	327 37.7	5 34.9	S16 06.0	343 42.6	S 7 51.5	262 29.8	N20 56.2	107 44.4	S12 53.5
A 13	342 40.2	20 34.3	05.1	358 43.2	50.7	277 32.1	56.2	122 46.8	53.5
Y 14	357 42.7	35 33.6	04.1	13 43.8	49.9	292 34.5	56.2	137 49.3	53.5
15	12 45.1	50 33.0 . .	03.2	28 44.5 . .	49.2	307 36.8 . .	56.3	152 51.8 . .	53.5
16	27 47.6	65 32.3	02.3	43 45.1	48.4	322 39.1	56.3	167 54.2	53.5
17	42 50.1	80 31.7	01.4	58 45.8	47.6	337 41.4	56.3	182 56.7	53.5
18	57 52.5	95 31.1	S16 00.4	73 46.4	S 7 46.9	352 43.7	N20 56.4	197 59.1	S12 53.5
19	72 55.0	110 30.4	15 59.5	88 47.0	46.1	7 46.0	56.4	213 01.6	53.4
20	87 57.5	125 29.8	58.6	103 47.7	45.3	22 48.3	56.4	228 04.0	53.4
21	102 59.9	140 29.1 . .	57.7	118 48.3 . .	44.6	37 50.6 . .	56.5	243 06.5 . .	53.4
22	118 02.4	155 28.5	56.7	133 48.9	43.8	52 52.9	56.5	258 09.0	53.4
23	133 04.9	170 27.8	55.8	148 49.6	43.0	67 55.2	56.5	273 11.4	53.4
	h m								
Mer.Pass.	14 13.1	v −0.7	d 0.9	v 0.6	d 0.8	v 2.3	d 0.0	v 2.5	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.6	S40 15.4
Achernar	335 27.3	S57 10.5
Acrux	173 08.9	S63 10.3
Adhara	255 12.4	S28 59.8
Aldebaran	290 49.5	N16 32.0
Alioth	166 20.5	N55 53.0
Alkaid	152 58.8	N49 14.5
Al Na'ir	27 44.5	S46 53.8
Alnilam	275 46.4	S 1 11.9
Alphard	217 56.0	S 8 43.2
Alphecca	126 11.2	N26 40.0
Alpheratz	357 44.0	N29 09.9
Altair	62 08.7	N 8 54.2
Ankaa	353 16.2	S42 14.2
Antares	112 26.6	S26 27.5
Arcturus	145 55.8	N19 06.6
Atria	107 28.7	S69 02.7
Avior	234 17.5	S59 33.4
Bellatrix	278 32.1	N 6 21.5
Betelgeuse	271 01.3	N 7 24.3
Canopus	263 55.9	S52 42.6
Capella	280 34.5	N46 00.7
Deneb	49 32.0	N45 19.7
Denebola	182 33.6	N14 29.7
Diphda	348 56.3	S17 55.0
Dubhe	193 51.3	N61 40.5
Elnath	278 12.7	N28 37.0
Eltanin	90 46.5	N51 29.1
Enif	33 47.6	N 9 56.2
Fomalhaut	15 24.6	S29 33.2
Gacrux	172 00.6	S57 11.2
Gienah	175 52.2	S17 37.0
Hadar	148 47.9	S60 26.0
Hamal	328 01.1	N23 31.5
Kaus Aust.	83 44.3	S34 22.5
Kochab	137 19.8	N74 05.8
Markab	13 38.8	N15 16.6
Menkar	314 15.3	N 4 08.3
Menkent	148 07.6	S36 26.0
Miaplacidus	221 38.7	S69 46.5
Mirfak	308 40.6	N49 54.6
Nunki	75 58.8	S26 16.7
Peacock	53 20.1	S56 41.4
Pollux	243 27.7	N27 59.5
Procyon	244 59.7	N 5 11.2
Rasalhague	96 06.8	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.1	S 8 11.5
Rigil Kent.	139 51.8	S60 53.1
Sabik	102 12.9	S15 44.4
Schedar	349 41.1	N56 36.8
Shaula	96 22.4	S37 06.6
Sirius	258 33.7	S16 44.4
Spica	158 31.3	S11 13.9
Suhail	222 52.1	S43 29.4
Vega	80 39.4	N38 47.7
Zuben'ubi	137 05.6	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	39 49.5	11 37
Mars	17 10.8	13 06
Jupiter	294 57.5	18 33
Saturn	140 07.0	4 54

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 15	Moonrise 16	Moonrise 17	Moonrise 18
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
15 00	176 28.1	S12 41.5	123 03.8	12.8	N11 38.4	9.2	55.8	N 72	06 10	07 29	08 47	07 07	06 45		
01	191 28.1	40.7	137 35.6	12.9	11 47.6	9.1	55.7	N 70	06 08	07 20	08 28	07 30	07 23	07 14	06 55
02	206 28.1	39.8	152 07.5	12.9	11 56.7	9.1	55.7	68	06 07	07 12	08 13	07 47	07 49	07 55	08 08
03	221 28.2 . .	39.0	166 39.4	12.9	12 05.8	8.9	55.7	66	06 06	07 06	08 01	08 01	08 09	08 23	08 44
04	236 28.2	38.1	181 11.3	12.8	12 14.7	9.0	55.6	64	06 05	07 00	07 51	08 13	08 26	08 44	09 11
05	251 28.2	37.2	195 43.1	12.9	12 23.7	8.8	55.6	62	06 04	06 56	07 42	08 23	08 39	09 01	09 31
06	266 28.3	S12 36.4	210 15.0	12.9	N12 32.5	8.8	55.6	60	06 03	06 51	07 35	08 31	08 51	09 16	09 48
07	281 28.3	35.5	224 46.9	12.8	12 41.3	8.7	55.6	N 58	06 02	06 48	07 28	08 39	09 01	09 28	10 02
08	296 28.3	34.7	239 18.7	12.9	12 50.0	8.7	55.5	56	06 01	06 44	07 23	08 45	09 10	09 39	10 14
F 09	311 28.4 . .	33.8	253 50.6	12.9	12 58.7	8.6	55.5	54	06 00	06 41	07 18	08 51	09 17	09 48	10 25
R 10	326 28.4	32.9	268 22.5	12.8	13 07.3	8.5	55.5	52	05 59	06 38	07 13	08 57	09 24	09 56	10 34
I 11	341 28.4	32.1	282 54.3	12.9	13 15.8	8.5	55.5	50	05 58	06 35	07 09	09 02	09 31	10 04	10 42
D 12	356 28.5	S12 31.2	297 26.2	12.8	N13 24.3	8.3	55.4	45	05 55	06 29	06 59	09 12	09 44	10 20	11 00
A 13	11 28.5	30.3	311 58.0	12.8	13 32.6	8.3	55.4	N 40	05 52	06 24	06 52	09 21	09 56	10 33	11 15
Y 14	26 28.5	29.5	326 29.8	12.9	13 40.9	8.3	55.4	35	05 49	06 19	06 45	09 29	10 05	10 45	11 27
15	41 28.6 . .	28.6	341 01.7	12.8	13 49.2	8.1	55.4	30	05 46	06 14	06 39	09 35	10 14	10 55	11 38
16	56 28.6	27.8	355 33.5	12.8	13 57.3	8.1	55.3	20	05 40	06 06	06 29	09 47	10 29	11 12	11 57
17	71 28.6	26.9	10 05.3	12.8	14 05.4	8.1	55.3	N 10	05 33	05 58	06 19	09 57	10 42	11 27	12 13
18	86 28.7	S12 26.0	24 37.1	12.8	N14 13.5	7.9	55.3	0	05 25	05 49	06 11	10 07	10 54	11 41	12 28
19	101 28.7	25.2	39 08.9	12.8	14 21.4	7.9	55.3	S 10	05 15	05 40	06 02	10 17	11 06	11 55	12 44
20	116 28.7	24.3	53 40.7	12.8	14 29.3	7.8	55.2	20	05 03	05 30	05 52	10 27	11 19	12 10	13 00
21	131 28.8 . .	23.4	68 12.5	12.8	14 37.1	7.7	55.2	30	04 47	05 16	05 41	10 39	11 34	12 27	13 19
22	146 28.8	22.6	82 44.3	12.8	14 44.8	7.7	55.2	35	04 37	05 08	05 35	10 46	11 43	12 38	13 30
23	161 28.8	21.7	97 16.1	12.7	14 52.5	7.5	55.2	40	04 24	04 59	05 27	10 54	11 53	12 49	13 43
16 00	176 28.9	S12 20.8	111 47.8	12.8	N15 00.0	7.5	55.1	45	04 09	04 47	05 19	11 04	12 05	13 03	13 58
01	191 28.9	20.0	126 19.6	12.7	15 07.5	7.5	55.1	S 50	03 49	04 33	05 08	11 15	12 19	13 20	14 16
02	206 28.9	19.1	140 51.3	12.8	15 15.0	7.3	55.1	52	03 39	04 26	05 04	11 20	12 26	13 28	14 25
03	221 29.0 . .	18.2	155 23.1	12.7	15 22.3	7.3	55.1	54	03 28	04 19	04 58	11 26	12 33	13 37	14 34
04	236 29.0	17.4	169 54.8	12.7	15 29.6	7.2	55.0	56	03 15	04 10	04 52	11 33	12 42	13 46	14 45
05	251 29.1	16.5	184 26.5	12.7	15 36.8	7.1	55.0	58	02 59	04 00	04 46	11 40	12 51	13 58	14 58
06	266 29.1	S12 15.6	198 58.2	12.7	N15 43.9	7.0	55.0	S 60	02 40	03 49	04 38	11 48	13 02	14 11	15 13
07	281 29.1	14.8	213 29.9	12.7	15 50.9	7.0	55.0								
S 08	296 29.2	13.9	228 01.6	12.7	15 57.9	6.9	55.0								
A 09	311 29.2 . .	13.0	242 33.3	12.7	16 04.8	6.8	54.9								
T 10	326 29.3	12.2	257 05.0	12.6	16 11.6	6.7	54.9								
U 11	341 29.3	11.3	271 36.6	12.7	16 18.3	6.7	54.9								
R 12	356 29.3	S12 10.4	286 08.3	12.6	N16 25.0	6.5	54.9								
D 13	11 29.4	09.5	300 39.9	12.6	16 31.5	6.5	54.9								
A 14	26 29.4	08.7	315 11.5	12.6	16 38.0	6.4	54.8								
Y 15	41 29.5 . .	07.8	329 43.1	12.6	16 44.4	6.3	54.8								
16	56 29.5	06.9	344 14.7	12.6	16 50.7	6.3	54.8								
17	71 29.5	06.1	358 46.3	12.6	16 57.0	6.1	54.8								
18	86 29.6	S12 05.2	13 17.9	12.6	N17 03.1	6.1	54.8								
19	101 29.6	04.3	27 49.5	12.5	17 09.2	6.0	54.7								
20	116 29.7	03.4	42 21.0	12.5	17 15.2	5.9	54.7								
21	131 29.7 . .	02.6	56 52.5	12.6	17 21.1	5.9	54.7								
22	146 29.8	01.7	71 24.1	12.5	17 27.0	5.7	54.7								
23	161 29.8 12	00.8	85 55.6	12.5	17 32.7	5.7	54.7								
17 00	176 29.8	S11 59.9	100 27.1	12.5	N17 38.4	5.5	54.7								
01	191 29.9	59.1	114 58.6	12.4	17 43.9	5.5	54.6								
02	206 29.9	58.2	129 30.0	12.5	17 49.4	5.4	54.6								
03	221 30.0 . .	57.3	144 01.5	12.5	17 54.8	5.4	54.6								
04	236 30.0	56.4	158 33.0	12.4	18 00.2	5.2	54.6								
05	251 30.1	55.6	173 04.4	12.4	18 05.4	5.2	54.6								
06	266 30.1	S11 54.7	187 35.8	12.4	N18 10.6	5.0	54.6								
07	281 30.2	53.8	202 07.2	12.4	18 15.6	5.0	54.6								
08	296 30.2	52.9	216 38.6	12.4	18 20.6	4.9	54.5								
S 09	311 30.3 . .	52.1	231 10.0	12.4	18 25.5	4.8	54.5								
U 10	326 30.3	51.2	245 41.4	12.3	18 30.3	4.7	54.5								
N 11	341 30.4	50.3	260 12.7	12.4	18 35.0	4.6	54.5								
D 12	356 30.4	S11 49.4	274 44.1	12.3	N18 39.6	4.6	54.5								
A 13	11 30.5	48.5	289 15.4	12.3	18 44.2	4.4	54.5								
Y 14	26 30.5	47.7	303 46.7	12.3	18 48.6	4.4	54.5								
15	41 30.6 . .	46.8	318 18.0	12.3	18 53.0	4.3	54.4								
16	56 30.6	45.9	332 49.3	12.3	18 57.3	4.2	54.4								
17	71 30.6	45.0	347 20.6	12.3	19 01.5	4.1	54.4								
18	86 30.7	S11 44.1	1 51.9	12.2	N19 05.6	4.0	54.4								
19	101 30.7	43.3	16 23.1	12.3	19 09.6	3.9	54.4								
20	116 30.8	42.4	30 54.4	12.2	19 13.5	3.8	54.4								
21	131 30.9 . .	41.5	45 25.6	12.2	19 17.3	3.8	54.4								
22	146 30.9	40.6	59 56.8	12.2	19 21.1	3.6	54.4								
23	161 31.0	39.7	74 28.0	12.2	N19 24.7	3.6	54.4								
	SD 16.2	d 0.9	SD	15.1	15.0		14.8								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 15	Moonset 16	Moonset 17	Moonset 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 43	17 01	18 21	00 25	02 24		
N 70	16 02	17 10	18 22	00 04	01 48	03 34	05 32
68	16 16	17 17	18 23	25 23	01 23	02 54	04 20
66	16 28	17 24	18 24	25 03	01 03	02 27	03 43
64	16 38	17 29	18 25	24 47	00 47	02 06	03 17
62	16 47	17 34	18 26	24 35	00 35	01 49	02 57
60	16 54	17 38	18 27	24 24	00 24	01 35	02 41
N 58	17 01	17 42	18 27	24 14	00 14	01 23	02 27
56	17 06	17 45	18 28	24 06	00 06	01 13	02 15
54	17 11	17 48	18 29	23 59	25 04	01 04	02 05
52	17 16	17 51	18 30	23 52	24 56	00 56	01 55
50	17 20	17 54	18 31	23 46	24 49	00 49	01 47
45	17 29	18 00	18 34	23 33	24 33	00 33	01 30
N 40	17 37	18 05	18 37	23 23	24 20	00 20	01 15
35	17 44	18 10	18 39	23 14	24 09	00 09	01 03
30	17 50	18 14	18 42	23 06	24 00	00 00	00 53
20	18 00	18 22	18 48	22 52	23 44	24 34	00 34
N 10	18 09	18 30	18 55	22 41	23 30	24 19	00 19
0	18 17	18 39	19 03	22 30	23 16	24 04	00 04
S 10	18 26	18 48	19 13	22 19	23 03	23 49	24 36
20	18 36	18 58	19 25	22 07	22 49	23 33	24 19
30	18 46	19 11	19 41	21 53	22 33	23 15	24 00
35	18 53	19 19	19 51	21 46	22 24	23 05	23 49
40	19 00	19 28	20 03	21 37	22 13	22 53	23 36
45	19 08	19 40	20 18	21 27	22 01	22 38	23 21
S 50	19 19	19 54	20 37	21 14	21 45	22 21	23 03
52	19 23	20 00	20 47	21 09	21 38	22 13	22 54
54	19 29	20 08	20 58	21 02	21 30	22 04	22 44
56	19 34	20 16	21 11	20 55	21 22	21 54	22 33
58	19 41	20 26	21 26	20 47	21 12	21 42	22 20
S 60	19 48	20 37	21 44	20 39	21 00	21 29	22 05

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
15	14 08	14 06	12 14	16 18	03 55	05	28
16	14 05	14 03	12 14	17 05	04 42	06	37
17	14 01	13 58	12 14	17 52	05 29	07	47

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.4		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
18 00	148 07.3	185 27.2	S15 54.9	163 50.2	S 7 42.3	82 57.5	N20 56.6	288 13.9	S12 53.4
01	163 09.8	200 26.6	53.9	178 50.8	41.5	97 59.8	56.6	303 16.3	53.4
02	178 12.2	215 25.9	53.0	193 51.5	40.7	113 02.1	56.6	318 18.8	53.4
03	193 14.7	230 25.3	52.1	208 52.1	39.9	128 04.4	56.7	333 21.2	53.4
04	208 17.2	245 24.6	51.1	223 52.8	39.2	143 06.7	56.7	348 23.7	53.4
05	223 19.6	260 24.0	50.2	238 53.4	38.4	158 09.0	56.7	3 26.2	53.4
06	238 22.1	275 23.4	S15 49.3	253 54.0	S 7 37.6	173 11.3	N20 56.8	18 28.6	S12 53.4
07	253 24.6	290 22.7	48.3	268 54.7	36.9	188 13.6	56.8	33 31.1	53.3
08	268 27.0	305 22.1	47.4	283 55.3	36.1	203 15.9	56.8	48 33.5	53.3
M 09	283 29.5	320 21.4	46.5	298 55.9	35.3	218 18.2	56.9	63 36.0	53.3
O 10	298 32.0	335 20.8	45.5	313 56.6	34.5	233 20.5	56.9	78 38.5	53.3
N 11	313 34.4	350 20.2	44.6	328 57.2	33.8	248 22.8	57.0	93 40.9	53.3
D 12	328 36.9	5 19.5	S15 43.6	343 57.8	S 7 33.0	263 25.1	N20 57.0	108 43.4	S12 53.3
A 13	343 39.4	20 18.9	42.7	358 58.5	32.2	278 27.4	57.0	123 45.8	53.3
Y 14	358 41.8	35 18.3	41.8	13 59.1	31.5	293 29.7	57.1	138 48.3	53.3
15	13 44.3	50 17.6	40.8	28 59.8	30.7	308 32.0	57.1	153 50.8	53.3
16	28 46.7	65 17.0	39.9	44 00.4	29.9	323 34.3	57.1	168 53.2	53.3
17	43 49.2	80 16.4	38.9	59 01.0	29.1	338 36.6	57.2	183 55.7	53.3
18	58 51.7	95 15.7	S15 38.0	74 01.7	S 7 28.4	353 38.9	N20 57.2	198 58.1	S12 53.2
19	73 54.1	110 15.1	37.1	89 02.3	27.6	8 41.2	57.2	214 00.6	53.2
20	88 56.6	125 14.5	36.1	104 03.0	26.8	23 43.5	57.3	229 03.1	53.2
21	103 59.1	140 13.8	35.2	119 03.6	26.1	38 45.8	57.3	244 05.5	53.2
22	119 01.5	155 13.2	34.2	134 04.2	25.3	53 48.1	57.3	259 08.0	53.2
23	134 04.0	170 12.6	33.3	149 04.9	24.5	68 50.4	57.4	274 10.4	53.2
19 00	149 06.5	185 12.0	S15 32.3	164 05.5	S 7 23.7	83 52.7	N20 57.4	289 12.9	S12 53.2
01	164 08.9	200 11.3	31.4	179 06.2	23.0	98 55.0	57.4	304 15.4	53.2
02	179 11.4	215 10.7	30.4	194 06.8	22.2	113 57.3	57.5	319 17.8	53.2
03	194 13.8	230 10.1	29.5	209 07.4	21.4	128 59.6	57.5	334 20.3	53.2
04	209 16.3	245 09.4	28.5	224 08.1	20.7	144 01.9	57.6	349 22.8	53.1
05	224 18.8	260 08.8	27.6	239 08.7	19.9	159 04.2	57.6	4 25.2	53.1
06	239 21.2	275 08.2	S15 26.6	254 09.4	S 7 19.1	174 06.5	N20 57.6	19 27.7	S12 53.1
07	254 23.7	290 07.6	25.7	269 10.0	18.3	189 08.8	57.7	34 30.2	53.1
08	269 26.2	305 06.9	24.7	284 10.6	17.6	204 11.1	57.7	49 32.6	53.1
T 09	284 28.6	320 06.3	23.8	299 11.3	16.8	219 13.4	57.7	64 35.1	53.1
U 10	299 31.1	335 05.7	22.8	314 11.9	16.0	234 15.7	57.8	79 37.5	53.1
E 11	314 33.6	350 05.1	21.8	329 12.6	15.2	249 17.9	57.8	94 40.0	53.1
S 12	329 36.0	5 04.4	S15 20.9	344 13.2	S 7 14.5	264 20.2	N20 57.8	109 42.5	S12 53.1
D 13	344 38.5	20 03.8	19.9	359 13.8	13.7	279 22.5	57.9	124 44.9	53.1
A 14	359 41.0	35 03.2	19.0	14 14.5	12.9	294 24.8	57.9	139 47.4	53.0
Y 15	14 43.4	50 02.6	18.0	29 15.1	12.1	309 27.1	58.0	154 49.9	53.0
16	29 45.9	65 02.0	17.0	44 15.8	11.4	324 29.4	58.0	169 52.3	53.0
17	44 48.3	80 01.3	16.1	59 16.4	10.6	339 31.7	58.0	184 54.8	53.0
18	59 50.8	95 00.7	S15 15.1	74 17.0	S 7 09.8	354 34.0	N20 58.1	199 57.3	S12 53.0
19	74 53.3	110 00.1	14.2	89 17.7	09.1	9 36.3	58.1	214 59.7	53.0
20	89 55.7	124 59.5	13.2	104 18.3	08.3	24 38.6	58.1	230 02.2	53.0
21	104 58.2	139 58.9	12.2	119 19.0	07.5	39 40.9	58.2	245 04.7	53.0
22	120 00.7	154 58.2	11.3	134 19.6	06.7	54 43.1	58.2	260 07.1	53.0
23	135 03.1	169 57.6	10.3	149 20.3	06.0	69 45.4	58.2	275 09.6	52.9
20 00	150 05.6	184 57.0	S15 09.3	164 20.9	S 7 05.2	84 47.7	N20 58.3	290 12.1	S12 52.9
01	165 08.1	199 56.4	08.4	179 21.5	04.4	99 50.0	58.3	305 14.5	52.9
02	180 10.5	214 55.8	07.4	194 22.2	03.6	114 52.3	58.4	320 17.0	52.9
03	195 13.0	229 55.2	06.4	209 22.8	02.9	129 54.6	58.4	335 19.5	52.9
04	210 15.5	244 54.5	05.5	224 23.5	02.1	144 56.9	58.4	350 21.9	52.9
05	225 17.9	259 53.9	04.5	239 24.1	01.3	159 59.2	58.5	5 24.4	52.9
06	240 20.4	274 53.3	S15 03.5	254 24.8	S 7 00.5	175 01.4	N20 58.5	20 26.9	S12 52.9
W 07	255 22.8	289 52.7	02.6	269 25.4	6 59.8	190 03.7	58.5	35 29.3	52.9
E 08	270 25.3	304 52.1	01.6	284 26.0	59.0	205 06.0	58.6	50 31.8	52.8
D 09	285 27.8	319 51.5	15 00.6	299 26.7	58.2	220 08.3	58.6	65 34.3	52.8
N 10	300 30.2	334 50.9	14 59.6	314 27.3	57.4	235 10.6	58.7	80 36.7	52.8
E 11	315 32.7	349 50.3	58.7	329 28.0	56.7	250 12.9	58.7	95 39.2	52.8
S 12	330 35.2	4 49.6	S14 57.7	344 28.6	S 6 55.9	265 15.1	N20 58.7	110 41.7	S12 52.8
D 13	345 37.6	19 49.0	56.7	359 29.3	55.1	280 17.4	58.8	125 44.1	52.8
A 14	0 40.1	34 48.4	55.7	14 29.9	54.3	295 19.7	58.8	140 46.6	52.8
Y 15	15 42.6	49 47.8	54.8	29 30.6	53.6	310 22.0	58.8	155 49.1	52.8
16	30 45.0	64 47.2	53.8	44 31.2	52.8	325 24.3	58.9	170 51.5	52.8
17	45 47.5	79 46.6	52.8	59 31.8	52.0	340 26.6	58.9	185 54.0	52.7
18	60 50.0	94 46.0	S14 51.8	74 32.5	S 6 51.2	355 28.8	N20 59.0	200 56.5	S12 52.7
19	75 52.4	109 45.4	50.9	89 33.1	50.4	10 31.1	59.0	215 59.0	52.7
20	90 54.9	124 44.8	49.9	104 33.8	49.7	25 33.4	59.0	231 01.4	52.7
21	105 57.3	139 44.2	48.9	119 34.4	48.9	40 35.7	59.1	246 03.9	52.7
22	120 59.8	154 43.6	47.9	134 35.1	48.1	55 38.0	59.1	261 06.4	52.7
23	136 02.3	169 43.0	46.9	149 35.7	47.3	70 40.2	59.1	276 08.8	52.7
	h m								
Mer.Pass.	14 01.3	v −0.6	d 1.0	v 0.6	d 0.8	v 2.3	d 0.0	v 2.5	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.6	S40 15.4
Achernar	335 27.3	S57 10.5
Acrux	173 08.9	S63 10.3
Adhara	255 12.4	S28 59.8
Aldebaran	290 49.5	N16 32.0
Alioth	166 20.5	N55 53.0
Alkaid	152 58.8	N49 14.5
Al Na'ir	27 44.5	S46 53.8
Alnilam	275 46.4	S 1 11.9
Alphard	217 56.0	S 8 43.2
Alphecca	126 11.1	N26 40.0
Alpheratz	357 44.0	N29 09.9
Altair	62 08.7	N 8 54.2
Ankaa	353 16.2	S42 14.2
Antares	112 26.5	S26 27.5
Arcturus	145 55.8	N19 06.6
Atria	107 28.7	S69 02.7
Avior	234 17.5	S59 33.4
Bellatrix	278 32.1	N 6 21.5
Betelgeuse	271 01.3	N 7 24.3
Canopus	263 55.9	S52 42.6
Capella	280 34.6	N46 00.7
Deneb	49 32.0	N45 19.6
Denebola	182 33.6	N14 29.7
Diphda	348 56.3	S17 55.0
Dubhe	193 51.3	N61 40.5
Elnath	278 12.7	N28 37.0
Eltanin	90 46.5	N51 29.1
Enif	33 47.6	N 9 56.2
Fomalhaut	15 24.6	S29 33.2
Gacrux	172 00.6	S57 11.2
Gienah	175 52.2	S17 37.0
Hadar	148 47.8	S60 26.0
Hamal	328 01.1	N23 31.5
Kaus Aust.	83 44.3	S34 22.5
Kochab	137 19.7	N74 05.8
Markab	13 38.8	N15 16.6
Menkar	314 15.3	N 4 08.3
Menkent	148 07.6	S36 26.0
Miaplacidus	221 38.8	S69 46.5
Mirfak	308 40.7	N49 54.6
Nunki	75 58.8	S26 16.7
Peacock	53 20.1	S56 41.3
Pollux	243 27.7	N27 59.5
Procyon	244 59.7	N 5 11.2
Rasalhague	96 06.8	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.1	S 8 11.5
Rigil Kent.	139 51.7	S60 53.1
Sabik	102 12.9	S15 44.4
Schedar	349 41.1	N56 36.7
Shaula	96 22.3	S37 06.6
Sirius	258 33.7	S16 44.4
Spica	158 31.3	S11 13.9
Suhail	222 52.1	S43 29.4
Vega	80 39.4	N38 47.7
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	36 05.5	11 40
Mars	14 59.1	13 03
Jupiter	294 46.3	18 22
Saturn	140 06.5	4 42

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 18	Moonrise 19	Moonrise 20	Moonrise 21
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
18 00	176 31.0	S11 38.9	88 59.2	12.2	N19 28.3	3.5	54.4	N 72	05 56	07 15	08 30				
01	191 31.1	38.0	103 30.4	12.2	19 31.8	3.4	54.3	N 70	05 57	07 07	08 14	06 55			10 02
02	206 31.1	37.1	118 01.6	12.1	19 35.2	3.2	54.3	68	05 57	07 01	08 01	08 08	08 37	09 34	10 54
03	221 31.2	36.2	132 32.7	12.2	19 38.4	3.2	54.3	66	05 56	06 56	07 50	08 44	09 20	10 15	11 26
04	236 31.2	35.3	147 03.9	12.1	19 41.6	3.2	54.3	64	05 56	06 51	07 41	09 11	09 50	10 43	11 50
05	251 31.3	34.4	161 35.0	12.1	19 44.8	3.0	54.3	62	05 56	06 47	07 33	09 31	10 12	11 04	12 08
06	266 31.3	S11 33.6	176 06.1	12.2	N19 47.8	2.9	54.3	60	05 55	06 44	07 27	09 48	10 30	11 22	12 24
07	281 31.4	32.7	190 37.3	12.1	19 50.7	2.8	54.3	N 58	05 55	06 40	07 21	10 02	10 44	11 36	12 37
08	296 31.4	31.8	205 08.4	12.0	19 53.5	2.8	54.3	56	05 54	06 37	07 16	10 14	10 57	11 49	12 48
M 09	311 31.5	30.9	219 39.4	12.1	19 56.3	2.6	54.3	54	05 54	06 35	07 11	10 25	11 08	11 59	12 58
O 10	326 31.5	30.0	234 10.5	12.1	19 58.9	2.6	54.3	52	05 53	06 32	07 07	10 34	11 18	12 09	13 06
N 11	341 31.6	29.1	248 41.6	12.0	20 01.5	2.4	54.3	50	05 52	06 30	07 03	10 42	11 27	12 18	13 14
D 12	356 31.6	S11 28.2	263 12.6	12.1	N20 03.9	2.4	54.3	45	05 50	06 25	06 55	11 00	11 46	12 36	13 31
A 13	11 31.7	27.4	277 43.7	12.0	20 06.3	2.3	54.3	N 40	05 48	06 20	06 48	11 15	12 01	12 51	13 45
Y 14	26 31.8	26.5	292 14.7	12.1	20 08.6	2.2	54.3	35	05 46	06 16	06 41	11 27	12 14	13 03	13 56
15	41 31.8	25.6	306 45.8	12.0	20 10.8	2.0	54.2	30	05 44	06 12	06 36	11 38	12 25	13 14	14 06
16	56 31.9	24.7	321 16.8	12.0	20 12.8	2.0	54.2	20	05 39	06 04	06 27	11 57	12 44	13 33	14 24
17	71 31.9	23.8	335 47.8	12.0	20 14.8	1.9	54.2	N 10	05 32	05 57	06 18	12 13	13 01	13 49	14 39
18	86 32.0	S11 22.9	350 18.8	12.0	N20 16.7	1.9	54.2	0	05 25	05 49	06 10	12 28	13 17	14 05	14 53
19	101 32.0	22.0	4 49.8	11.9	20 18.6	1.7	54.2	S 10	05 16	05 41	06 02	12 44	13 32	14 20	15 07
20	116 32.1	21.1	19 20.7	12.0	20 20.3	1.6	54.2	20	05 05	05 31	05 54	13 00	13 49	14 36	15 22
21	131 32.2	20.3	33 51.7	12.0	20 21.9	1.5	54.2	30	04 50	05 19	05 44	13 19	14 08	14 55	15 39
22	146 32.2	19.4	48 22.7	11.9	20 23.4	1.5	54.2	35	04 40	05 11	05 38	13 30	14 20	15 06	15 49
23	161 32.3	18.5	62 53.6	12.0	20 24.9	1.3	54.2	40	04 29	05 03	05 31	13 43	14 33	15 19	16 01
19 00	176 32.3	S11 17.6	77 24.6	11.9	N20 26.2	1.2	54.2	45	04 14	04 52	05 23	13 58	14 48	15 33	16 14
01	191 32.4	16.7	91 55.5	11.9	20 27.4	1.2	54.2	S 50	03 56	04 39	05 14	14 16	15 07	15 52	16 30
02	206 32.5	15.8	106 26.4	12.0	20 28.6	1.0	54.2	52	03 47	04 33	05 09	14 25	15 16	16 00	16 38
03	221 32.5	14.9	120 57.4	11.9	20 29.6	1.0	54.2	54	03 36	04 26	05 04	14 34	15 26	16 10	16 47
04	236 32.6	14.0	135 28.3	11.9	20 30.6	0.9	54.2	56	03 24	04 18	04 59	14 45	15 37	16 20	16 56
05	251 32.6	13.1	149 59.2	11.9	20 31.5	0.7	54.2	58	03 10	04 09	04 53	14 58	15 50	16 33	17 07
06	266 32.7	S11 12.2	164 30.1	11.9	N20 32.2	0.7	54.2	S 60	02 53	03 58	04 46	15 13	16 05	16 47	17 20
07	281 32.8	11.4	179 01.0	11.9	20 32.9	0.6	54.2								
08	296 32.8	10.5	193 31.9	11.9	20 33.5	0.5	54.2								
T 09	311 32.9	09.6	208 02.8	11.8	20 34.0	0.4	54.2								
U 10	326 32.9	08.7	222 33.6	11.9	20 34.4	0.2	54.2								
E 11	341 33.0	07.8	237 04.5	11.9	20 34.6	0.2	54.2								
S 12	356 33.1	S11 06.9	251 35.4	11.9	N20 34.8	0.1	54.2								
D 13	11 33.1	06.0	266 06.3	11.8	20 34.9	0.1	54.2								
A 14	26 33.2	05.1	280 37.1	11.9	20 35.0	0.1	54.2								
Y 15	41 33.3	04.2	295 08.0	11.8	20 34.9	0.2	54.2								
16	56 33.3	03.3	309 38.8	11.9	20 34.7	0.3	54.2								
17	71 33.4	02.4	324 09.7	11.8	20 34.4	0.4	54.2								
18	86 33.4	S11 01.5	338 40.5	11.9	N20 34.0	0.4	54.2								
19	101 33.5	11 00.6	353 11.4	11.8	20 33.6	0.6	54.2								
20	116 33.6	10 59.7	7 42.2	11.8	20 33.0	0.7	54.2								
21	131 33.6	58.8	22 13.0	11.9	20 32.3	0.7	54.2								
22	146 33.7	57.9	36 43.9	11.8	20 31.6	0.9	54.2								
23	161 33.8	57.0	51 14.7	11.8	20 30.7	0.9	54.3								
20 00	176 33.8	S10 56.1	65 45.5	11.9	N20 29.8	1.1	54.3								
01	191 33.9	55.3	80 16.4	11.8	20 28.7	1.1	54.3								
02	206 34.0	54.4	94 47.2	11.8	20 27.6	1.2	54.3								
03	221 34.0	53.5	109 18.0	11.9	20 26.4	1.4	54.3								
04	236 34.1	52.6	123 48.9	11.8	20 25.0	1.4	54.3								
05	251 34.2	51.7	138 19.7	11.8	20 23.6	1.5	54.3								
06	266 34.2	S10 50.8	152 50.5	11.9	N20 22.1	1.6	54.3								
W 07	281 34.3	49.9	167 21.4	11.8	20 20.5	1.8	54.3								
E 08	296 34.4	49.0	181 52.2	11.8	20 18.7	1.8	54.3								
D 09	311 34.4	48.1	196 23.0	11.8	20 16.9	1.9	54.3								
N 10	326 34.5	47.2	210 53.8	11.9	20 15.0	2.0	54.3								
E 11	341 34.6	46.3	225 24.7	11.8	20 13.0	2.1	54.3								
S 12	356 34.7	S10 45.4	239 55.5	11.9	N20 10.9	2.1	54.3								
D 13	11 34.7	44.5	254 26.4	11.8	20 08.8	2.3	54.3								
A 14	26 34.8	43.6	268 57.2	11.9	20 06.5	2.4	54.4								
Y 15	41 34.9	42.7	283 28.1	11.8	20 04.1	2.5	54.4								
16	56 34.9	41.8	297 58.9	11.9	20 01.6	2.5	54.4								
17	71 35.0	40.9	312 29.8	11.8	19 59.1	2.7	54.4								
18	86 35.1	S10 40.0	327 00.6	11.9	N19 56.4	2.7	54.4								
19	101 35.1	39.1	341 31.5	11.8	19 53.7	2.9	54.4								
20	116 35.2	38.2	356 02.3	11.9	19 50.8	2.9	54.4								
21	131 35.3	37.2	10 33.2	11.9	19 47.9	3.1	54.4								
22	146 35.4	36.3	25 04.1	11.9	19 44.8	3.1	54.4								
23	161 35.4	35.4	39 35.0	11.8	N19 41.7	3.2	54.4								
	SD 16.2	d 0.9	SD	14.8		14.8									

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 18	Moonset 19	Moonset 20	Moonset 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 59	17 15	18 34				
N 70	16 16	17 22	18 33	05 32			07 26
68	16 28	17 28	18 33	04 20	05 30	06 13	06 33
66	16 39	17 33	18 33	03 43	04 47	05 32	06 01
64	16 48	17 38	18 33	03 17	04 18	05 04	05 37
62	16 55	17 42	18 33	02 57	03 56	04 42	05 18
60	17 02	17 45	18 34	02 41	03 38	04 25	05 02
N 58	17 08	17 48	18 34	02 27	03 23	04 10	04 49
56	17 13	17 51	18 34	02 15	03 10	03 58	04 37
54	17 17	17 54	18 35	02 05	02 59	03 47	04 27
52	17 22	17 56	18 36	01 55	02 49	03 37	04 18
50	17 25	17 59	18 36	01 47	02 41	03 28	04 10
45	17 34	18 04	18 38	01 30	02 22	03 10	03 53
N 40	17 41	18 08	18 40	01 15	02 07	02 55	03 39
35	17 47	18 12	18 42	01 03	01 54	02 42	03 27
30	17 52	18 16	18 44	00 53	01 43	02 31	03 17
20	18 01	18 24	18 49	00 34	01 24	02 12	02 59
N 10	18 09	18 31	18 55	00 19	01 07	01 55	02 43
0	18 17	18 38	19 03	00 04	00 52	01 40	02 28
S 10	18 25	18 47	19 12	24 36	00 36	01 24	02 13
20	18 34	18 56	19 23	24 19	00 19	01 07	01 57
30	18 44	19 08	19 37	24 00	00 00	00 48	01 39
35	18 49	19 16	19 47	23 49	24 37	00 37	01 28
40	18 56	19 24	19 58	23 36	24 24	00 24	01 16
45	19 04	19 34	20 12	23 21	24 09	00 09	01 02
S 50	19 13	19 47	20 30	23 03	23 50	24 44	00 44
52	19 17	19 54	20 39	22 54	23 41	24 36	00 36
54	19 22	20 00	20 49	22 44	23 31	24 26	00 26
56	19 27	20 08	21 01	22 33	23 20	24 16	00 16
58	19 33	20 17	21 15	22 20	23 07	24 04	00 04
S 60	19 40	20 27	21 31	22 05	22 52	23 49	24 56

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
18	13 56	13 54	12 14	18 40	06 16	08	56
19	13 51	13 48	12 14	19 28	07 04	09	65
20	13 45	13 42	12 14	20 16	07 52	10	74

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.4		SATURN +0.5		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
21 00	151 04.7	184 42.4	S14 45.9	164 36.4	S 6 46.6	85 42.5	N20 59.2	291 11.3	S12 52.7	Acamar	315 18.6	S40 15.4
01	166 07.2	199 41.7	45.0	179 37.0	45.8	100 44.8	59.2	306 13.8	52.6	Achernar	335 27.3	S57 10.5
02	181 09.7	214 41.1	44.0	194 37.7	45.0	115 47.1	59.3	321 16.2	52.6	Acrux	173 08.9	S63 10.3
03	196 12.1	229 40.5	. . 43.0	209 38.3	. . 44.2	130 49.4	. . 59.3	336 18.7	. . 52.6	Adhara	255 12.4	S28 59.8
04	211 14.6	244 39.9	42.0	224 38.9	43.5	145 51.6	59.3	351 21.2	52.6	Aldebaran	290 49.5	N16 32.0
05	226 17.1	259 39.3	41.0	239 39.6	42.7	160 53.9	59.4	6 23.7	52.6			
06	241 19.5	274 38.7	S14 40.0	254 40.2	S 6 41.9	175 56.2	N20 59.4	21 26.1	S12 52.6	Alioth	166 20.5	N55 53.0
07	256 22.0	289 38.1	39.0	269 40.9	41.1	190 58.5	59.4	36 28.6	52.6	Alkaid	152 58.8	N49 14.6
08	271 24.4	304 37.5	38.1	284 41.5	40.3	206 00.8	59.5	51 31.1	52.6	Al Na'ir	27 44.4	S46 53.8
09	286 26.9	319 36.9	. . 37.1	299 42.2	. . 39.6	221 03.0	. . 59.5	66 33.5	. . 52.5	Alnilam	275 46.4	S 1 11.9
10	301 29.4	334 36.3	36.1	314 42.8	38.8	236 05.3	59.6	81 36.0	52.5	Alphard	217 55.9	S 8 43.2
11	316 31.8	349 35.7	35.1	329 43.5	38.0	251 07.6	59.6	96 38.5	52.5			
12	331 34.3	4 35.1	S14 34.1	344 44.1	S 6 37.2	266 09.9	N20 59.6	111 41.0	S12 52.5	Alphecca	126 11.1	N26 40.0
13	346 36.8	19 34.5	33.1	359 44.8	36.5	281 12.1	59.7	126 43.4	52.5	Alpheratz	357 44.0	N29 09.8
14	1 39.2	34 33.9	32.1	14 45.4	35.7	296 14.4	59.7	141 45.9	52.5	Altair	62 08.7	N 8 54.2
15	16 41.7	49 33.3	. . 31.1	29 46.1	. . 34.9	311 16.7	. . 59.8	156 48.4	. . 52.5	Ankaa	353 16.2	S42 14.2
16	31 44.2	64 32.7	30.1	44 46.7	34.1	326 19.0	59.8	171 50.9	52.4	Antares	112 26.5	S26 27.5
17	46 46.6	79 32.1	29.1	59 47.4	33.3	341 21.2	59.8	186 53.3	52.4			
18	61 49.1	94 31.5	S14 28.1	74 48.0	S 6 32.6	356 23.5	N20 59.9	201 55.8	S12 52.4	Arcturus	145 55.7	N19 06.6
19	76 51.6	109 31.0	27.1	89 48.7	31.8	11 25.8	59.9	216 58.3	52.4	Atria	107 28.6	S69 02.7
20	91 54.0	124 30.4	26.1	104 49.3	31.0	26 28.1	20 59.9	232 00.8	52.4	Avior	234 17.5	S59 33.4
21	106 56.5	139 29.8	. . 25.1	119 50.0	. . 30.2	41 30.3	21 00.0	247 03.2	. . 52.4	Bellatrix	278 32.1	N 6 21.5
22	121 58.9	154 29.2	24.1	134 50.6	29.4	56 32.6	00.0	262 05.7	52.4	Betelgeuse	271 01.4	N 7 24.3
23	137 01.4	169 28.6	23.1	149 51.3	28.7	71 34.9	00.1	277 08.2	52.4			
22 00	152 03.9	184 28.0	S14 22.1	164 51.9	S 6 27.9	86 37.1	N21 00.1	292 10.7	S12 52.3	Canopus	263 55.9	S52 42.6
01	167 06.3	199 27.4	21.1	179 52.6	27.1	101 39.4	00.1	307 13.1	52.3	Capella	280 34.6	N46 00.7
02	182 08.8	214 26.8	20.1	194 53.2	26.3	116 41.7	00.2	322 15.6	52.3	Deneb	49 32.0	N45 19.6
03	197 11.3	229 26.2	. . 19.1	209 53.8	. . 25.6	131 44.0	. . 00.2	337 18.1	. . 52.3	Denebola	182 33.6	N14 29.7
04	212 13.7	244 25.6	18.1	224 54.5	24.8	146 46.2	00.3	352 20.6	52.3	Diphda	348 56.3	S17 55.0
05	227 16.2	259 25.0	17.1	239 55.1	24.0	161 48.5	00.3	7 23.0	52.3			
06	242 18.7	274 24.4	S14 16.1	254 55.8	S 6 23.2	176 50.8	N21 00.3	22 25.5	S12 52.3	Dubhe	193 51.3	N61 40.5
07	257 21.1	289 23.8	15.1	269 56.4	22.4	191 53.0	00.4	37 28.0	52.2	Elnath	278 12.7	N28 37.0
08	272 23.6	304 23.3	14.1	284 57.1	21.7	206 55.3	00.4	52 30.5	52.2	Eltanin	90 46.5	N51 29.1
09	287 26.1	319 22.7	. . 13.1	299 57.7	. . 20.9	221 57.6	. . 00.5	67 32.9	. . 52.2	Enif	33 47.6	N 9 56.2
10	302 28.5	334 22.1	12.1	314 58.4	20.1	236 59.8	00.5	82 35.4	52.2	Fomalhaut	15 24.6	S29 33.2
11	317 31.0	349 21.5	11.1	329 59.0	19.3	252 02.1	00.5	97 37.9	52.2			
12	332 33.4	4 20.9	S14 10.1	344 59.7	S 6 18.5	267 04.4	N21 00.6	112 40.4	S12 52.2	Gacrux	172 00.6	S57 11.2
13	347 35.9	19 20.3	09.1	0 00.3	17.8	282 06.6	00.6	127 42.8	52.2	Gienah	175 52.2	S17 37.0
14	2 38.4	34 19.7	08.1	15 01.0	17.0	297 08.9	00.7	142 45.3	52.1	Hadar	148 47.8	S60 26.0
15	17 40.8	49 19.1	. . 07.1	30 01.7	. . 16.2	312 11.2	. . 00.7	157 47.8	. . 52.1	Hamal	328 01.1	N23 31.5
16	32 43.3	64 18.6	06.1	45 02.3	15.4	327 13.4	00.7	172 50.3	52.1	Kaus Aust.	83 44.3	S34 22.5
17	47 45.8	79 18.0	05.1	60 03.0	14.6	342 15.7	00.8	187 52.7	52.1			
18	62 48.2	94 17.4	S14 04.0	75 03.6	S 6 13.9	357 18.0	N21 00.8	202 55.2	S12 52.1	Kochab	137 19.7	N74 05.8
19	77 50.7	109 16.8	03.0	90 04.3	13.1	12 20.2	00.9	217 57.7	52.1	Markab	13 38.8	N15 16.6
20	92 53.2	124 16.2	02.0	105 04.9	12.3	27 22.5	00.9	233 00.2	52.1	Menkar	314 15.3	N 4 08.3
21	107 55.6	139 15.6	. . 01.0	120 05.6	. . 11.5	42 24.8	. . 00.9	248 02.7	. . 52.0	Menkent	148 07.6	S36 26.0
22	122 58.1	154 15.1	14 00.0	135 06.2	10.7	57 27.0	01.0	263 05.1	52.0	Miaplacidus	221 38.8	S69 46.5
23	138 00.5	169 14.5	13 59.0	150 06.9	10.0	72 29.3	01.0	278 07.6	52.0			
23 00	153 03.0	184 13.9	S13 58.0	165 07.5	S 6 09.2	87 31.6	N21 01.1	293 10.1	S12 52.0	Mirfak	308 40.7	N49 54.6
01	168 05.5	199 13.3	56.9	180 08.2	08.4	102 33.8	01.1	308 12.6	52.0	Nunki	75 58.8	S26 16.7
02	183 07.9	214 12.7	55.9	195 08.8	07.6	117 36.1	01.1	323 15.1	52.0	Peacock	53 20.1	S56 41.3
03	198 10.4	229 12.1	. . 54.9	210 09.5	. . 06.8	132 38.4	. . 01.2	338 17.5	. . 52.0	Pollux	243 27.7	N27 59.5
04	213 12.9	244 11.6	53.9	225 10.1	06.0	147 40.6	01.2	353 20.0	51.9	Procyon	244 59.7	N 5 11.2
05	228 15.3	259 11.0	52.9	240 10.8	05.3	162 42.9	01.3	8 22.5	51.9			
06	243 17.8	274 10.4	S13 51.8	255 11.4	S 6 04.5	177 45.1	N21 01.3	23 25.0	S12 51.9	Rasalhague	96 06.7	N12 33.0
07	258 20.3	289 09.8	50.8	270 12.1	03.7	192 47.4	01.3	38 27.5	51.9	Regulus	207 43.4	N11 53.9
08	273 22.7	304 09.3	49.8	285 12.7	02.9	207 49.7	01.4	53 29.9	51.9	Rigel	281 12.1	S 8 11.5
09	288 25.2	319 08.7	. . 48.8	300 13.4	. . 02.1	222 51.9	. . 01.4	68 32.4	. . 51.9	Rigil Kent.	139 51.7	S60 53.1
10	303 27.7	334 08.1	47.8	315 14.0	01.4	237 54.2	01.5	83 34.9	51.8	Sabik	102 12.8	S15 44.4
11	318 30.1	349 07.5	46.7	330 14.7	6 00.6	252 56.5	01.5	98 37.4	51.8			
12	333 32.6	4 07.0	S13 45.7	345 15.3	S 5 59.8	267 58.7	N21 01.5	113 39.9	S12 51.8	Schedar	349 41.1	N56 36.7
13	348 35.0	19 06.4	44.7	0 16.0	59.0	283 01.0	01.6	128 42.3	51.8	Shaula	96 22.3	S37 06.6
14	3 37.5	34 05.8	43.7	15 16.7	58.2	298 03.2	01.6	143 44.8	51.8	Sirius	258 33.7	S16 44.4
15	18 40.0	49 05.2	. . 42.6	30 17.3	. . 57.4	313 05.5	. . 01.7	158 47.3	. . 51.8	Spica	158 31.2	S11 13.9
16	33 42.4	64 04.7	41.6	45 18.0	56.7	328 07.7	01.7	173 49.8	51.8	Suhail	222 52.1	S43 29.4
17	48 44.9	79 04.1	40.6	60 18.6	55.9	343 10.0	01.7	188 52.3	51.7			
18	63 47.4	94 03.5	S13 39.6	75 19.3	S 5 55.1	358 12.3	N21 01.8	203 54.8	S12 51.7	Vega	80 39.3	N38 47.6
19	78 49.8	109 02.9	38.5	90 19.9	54.3	13 14.5	01.8	218 57.2	51.7	Zuben'ubi	137 05.5	S16 05.8
20	93 52.3	124 02.4	37.5	105 20.6	53.5	28 16.8	01.9	233 59.7	51.7		SHA	Mer.Pass.
21	108 54.8	139 01.8	. . 36.5	120 21.2	. . 52.8	43 19.0	. . 01.9	249 02.2	. . 51.7		° ′	h m
22	123 57.2	154 01.2	35.4	135 21.9	52.0	58 21.3	01.9	264 04.7	51.7	Venus	32 24.1	11 43
23	138 59.7	169 00.6	34.4	150 22.5	51.2	73 23.6	02.0	279 07.2	51.6	Mars	12 48.0	13 00
	h m									Jupiter	294 33.3	18 11
Mer. Pass.	13 49.5	*v* −0.6	*d* 1.0	*v* 0.7	*d* 0.8	*v* 2.3	*d* 0.0	*v* 2.5	*d* 0.0	Saturn	140 06.8	4 31

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON						Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	*v*	Dec	*d*	HP			Naut.	Civil		21	22	23	24
d h	° ′	° ′	° ′	′	° ′	′	′		°	h m	h m	h m	h m	h m	h m	h m
21 00	176 35.5	S10 34.5	54 05.8	11.9	N19 38.5	3.3	54.5		N 72	05 43	07 01	08 13		11 01	13 11	15 07
01	191 35.6	33.6	68 36.7	11.9	19 35.2	3.4	54.5		N 70	05 44	06 55	07 59	10 02	11 53	13 39	15 22
02	206 35.7	32.7	83 07.6	11.9	19 31.8	3.5	54.5		68	05 46	06 50	07 48	10 54	12 24	13 59	15 35
03	221 35.7	. . 31.8	97 38.5	11.9	19 28.3	3.6	54.5		66	05 46	06 46	07 39	11 26	12 48	14 15	15 45
04	236 35.8	30.9	112 09.4	11.9	19 24.7	3.7	54.5		64	05 47	06 42	07 31	11 50	13 06	14 28	15 53
05	251 35.9	30.0	126 40.3	12.0	19 21.0	3.8	54.5		62	05 47	06 39	07 24	12 08	13 21	14 39	16 00
06	266 36.0	S10 29.1	141 11.3	11.9	N19 17.2	3.9	54.5		60	05 48	06 36	07 18	12 24	13 33	14 48	16 06
07	281 36.0	28.2	155 42.2	11.9	19 13.3	3.9	54.5		N 58	05 48	06 33	07 13	12 37	13 44	14 56	16 12
08	296 36.1	27.3	170 13.1	12.0	19 09.4	4.1	54.6		56	05 48	06 31	07 08	12 48	13 53	15 04	16 17
09	311 36.2	. . 26.4	184 44.1	11.9	19 05.3	4.1	54.6		54	05 47	06 28	07 04	12 58	14 02	15 10	16 21
10	326 36.3	25.5	199 15.0	12.0	19 01.2	4.3	54.6		52	05 47	06 26	07 01	13 06	14 09	15 16	16 25
11	341 36.3	24.6	213 46.0	12.0	18 56.9	4.3	54.6		50	05 47	06 24	06 57	13 14	14 16	15 21	16 28
12	356 36.4	S10 23.7	228 17.0	11.9	N18 52.6	4.4	54.6		45	05 46	06 20	06 50	13 31	14 30	15 32	16 36
13	11 36.5	22.8	242 47.9	12.0	18 48.2	4.5	54.6		N 40	05 45	06 16	06 43	13 45	14 42	15 41	16 42
14	26 36.6	21.9	257 18.9	12.0	18 43.7	4.6	54.6		35	05 43	06 12	06 38	13 56	14 52	15 49	16 48
15	41 36.6	. . 20.9	271 49.9	12.0	18 39.1	4.7	54.7		30	05 41	06 09	06 33	14 06	15 00	15 56	16 53
16	56 36.7	20.0	286 20.9	12.0	18 34.4	4.8	54.7		20	05 37	06 02	06 25	14 24	15 15	16 08	17 01
17	71 36.8	19.1	300 51.9	12.0	18 29.6	4.8	54.7		N 10	05 31	05 56	06 17	14 39	15 28	16 18	17 08
18	86 36.9	S10 18.2	315 22.9	12.1	N18 24.8	5.0	54.7		0	05 25	05 49	06 10	14 53	15 41	16 28	17 15
19	101 37.0	17.3	329 54.0	12.0	18 19.8	5.0	54.7		S 10	05 17	05 41	06 03	15 07	15 53	16 38	17 22
20	116 37.0	16.4	344 25.0	12.0	18 14.8	5.2	54.7		20	05 06	05 32	05 55	15 22	16 06	16 48	17 29
21	131 37.1	. . 15.5	358 56.0	12.1	18 09.6	5.2	54.7		30	04 52	05 21	05 46	15 39	16 21	17 00	17 37
22	146 37.2	14.6	13 27.1	12.1	18 04.4	5.3	54.8		35	04 43	05 14	05 41	15 49	16 29	17 07	17 42
23	161 37.3	13.7	27 58.2	12.0	17 59.1	5.4	54.8		40	04 33	05 06	05 35	16 01	16 39	17 14	17 47
22 00	176 37.3	S10 12.8	42 29.2	12.1	N17 53.7	5.5	54.8		45	04 19	04 57	05 27	16 14	16 50	17 23	17 53
01	191 37.4	11.9	57 00.3	12.1	17 48.2	5.6	54.8		S 50	04 02	04 45	05 19	16 30	17 04	17 34	18 01
02	206 37.5	10.9	71 31.4	12.1	17 42.6	5.6	54.8		52	03 54	04 39	05 15	16 38	17 11	17 39	18 04
03	221 37.6	. . 10.0	86 02.5	12.1	17 37.0	5.8	54.8		54	03 44	04 32	05 11	16 47	17 18	17 44	18 08
04	236 37.7	09.1	100 33.6	12.2	17 31.2	5.8	54.9		56	03 33	04 25	05 06	16 56	17 26	17 50	18 12
05	251 37.7	08.2	115 04.8	12.1	17 25.4	5.9	54.9		58	03 20	04 17	05 00	17 07	17 35	17 57	18 16
06	266 37.8	S10 07.3	129 35.9	12.2	N17 19.5	6.0	54.9		S 60	03 05	04 07	04 54	17 20	17 45	18 05	18 21
07	281 37.9	06.4	144 07.1	12.1	17 13.5	6.1	54.9									
08	296 38.0	05.5	158 38.2	12.2	17 07.4	6.2	54.9									
09	311 38.1	. . 04.6	173 09.4	12.2	17 01.2	6.2	55.0									
10	326 38.2	03.6	187 40.6	12.2	16 55.0	6.4	55.0									
11	341 38.2	02.7	202 11.8	12.2	16 48.6	6.4	55.0									
12	356 38.3	S10 01.8	216 43.0	12.2	N16 42.2	6.5	55.0									
13	11 38.4	00.9	231 14.2	12.2	16 35.7	6.6	55.0									
14	26 38.5	10 00.0	245 45.4	12.3	16 29.1	6.6	55.0									
15	41 38.6	9 59.1	260 16.7	12.2	16 22.5	6.8	55.1									
16	56 38.7	58.2	274 47.9	12.3	16 15.7	6.8	55.1									
17	71 38.7	57.2	289 19.2	12.2	16 08.9	6.9	55.1									
18	86 38.8	S 9 56.3	303 50.4	12.3	N16 02.0	7.0	55.1									
19	101 38.9	55.4	318 21.7	12.3	15 55.0	7.1	55.1									
20	116 39.0	54.5	332 53.0	12.3	15 47.9	7.1	55.2									
21	131 39.1	. . 53.6	347 24.3	12.3	15 40.8	7.3	55.2									
22	146 39.2	52.7	1 55.6	12.4	15 33.5	7.3	55.2									
23	161 39.3	51.8	16 27.0	12.3	15 26.2	7.4	55.2									
23 00	176 39.3	S 9 50.8	30 58.3	12.3	N15 18.8	7.4	55.2									
01	191 39.4	49.9	45 29.6	12.4	15 11.4	7.6	55.3									
02	206 39.5	49.0	60 01.0	12.4	15 03.8	7.6	55.3									
03	221 39.6	. . 48.1	74 32.4	12.4	14 56.2	7.7	55.3									
04	236 39.7	47.2	89 03.8	12.3	14 48.5	7.8	55.3									
05	251 39.8	46.2	103 35.1	12.4	14 40.7	7.8	55.3									
06	266 39.9	S 9 45.3	118 06.5	12.5	N14 32.9	7.9	55.4									
07	281 40.0	44.4	132 38.0	12.4	14 25.0	8.0	55.4									
08	296 40.0	43.5	147 09.4	12.4	14 17.0	8.1	55.4									
09	311 40.1	. . 42.6	161 40.8	12.5	14 08.9	8.1	55.4									
10	326 40.2	41.7	176 12.3	12.4	14 00.8	8.2	55.5									
11	341 40.3	40.7	190 43.7	12.5	13 52.6	8.3	55.5									
12	356 40.4	S 9 39.8	205 15.2	12.5	N13 44.3	8.4	55.5									
13	11 40.5	38.9	219 46.7	12.4	13 35.9	8.4	55.5									
14	26 40.6	38.0	234 18.1	12.5	13 27.5	8.5	55.5									
15	41 40.7	. . 37.1	248 49.6	12.5	13 19.0	8.6	55.6									
16	56 40.8	36.1	263 21.1	12.5	13 10.4	8.6	55.6									
17	71 40.8	35.2	277 52.6	12.6	13 01.8	8.7	55.6									
18	86 40.9	S 9 34.3	292 24.2	12.5	N12 53.1	8.8	55.6									
19	101 41.0	33.4	306 55.7	12.5	12 44.3	8.8	55.7									
20	116 41.1	32.4	321 27.2	12.6	12 35.5	8.9	55.7									
21	131 41.2	. . 31.5	335 58.8	12.5	12 26.6	9.0	55.7									
22	146 41.3	30.6	350 30.3	12.6	12 17.6	9.0	55.7									
23	161 41.4	29.7	5 01.9	12.5	N12 08.6	9.1	55.7									
	SD 16.2	*d* 0.9	SD	14.9		15.0		15.1								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	21	22	23	24
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 15	17 28	18 47		08 07	07 36	07 18
N 70	16 29	17 34	18 45	07 26	07 15	07 07	07 01
68	16 40	17 39	18 43	06 33	06 42	06 46	06 47
66	16 50	17 43	18 42	06 01	06 18	06 29	06 36
64	16 57	17 46	18 42	05 37	05 59	06 15	06 27
62	17 04	17 50	18 41	05 18	05 44	06 03	06 19
60	17 10	17 52	18 41	05 02	05 31	05 53	06 11
N 58	17 15	17 55	18 41	04 49	05 20	05 45	06 05
56	17 19	17 57	18 41	04 37	05 10	05 37	06 00
54	17 23	18 00	18 41	04 27	05 01	05 30	05 55
52	17 27	18 02	18 41	04 18	04 54	05 24	05 50
50	17 31	18 03	18 41	04 10	04 47	05 18	05 46
45	17 38	18 08	18 42	03 53	04 32	05 06	05 37
N 40	17 44	18 11	18 43	03 39	04 19	04 56	05 30
35	17 49	18 15	18 44	03 27	04 09	04 47	05 23
30	17 54	18 18	18 46	03 17	03 59	04 39	05 17
20	18 02	18 25	18 50	02 59	03 43	04 26	05 08
N 10	18 10	18 31	18 56	02 43	03 29	04 14	04 59
0	18 17	18 38	19 02	02 28	03 16	04 03	04 50
S 10	18 24	18 45	19 10	02 13	03 03	03 52	04 42
20	18 32	18 54	19 20	01 57	02 48	03 41	04 33
30	18 41	19 05	19 34	01 39	02 32	03 27	04 23
35	18 46	19 12	19 43	01 28	02 23	03 19	04 17
40	18 52	19 20	19 53	01 16	02 12	03 10	04 10
45	18 59	19 29	20 06	01 02	01 59	02 59	04 02
S 50	19 07	19 41	20 23	00 44	01 43	02 46	03 53
52	19 11	19 47	20 31	00 36	01 36	02 40	03 48
54	19 15	19 53	20 41	00 26	01 27	02 34	03 43
56	19 20	20 00	20 51	00 16	01 18	02 26	03 38
58	19 25	20 08	21 04	00 04	01 08	02 18	03 32
S 60	19 31	20 17	21 19	24 56	00 56	02 08	03 25

Day	SUN			MOON		
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
21	13 38	13 35	12 14	21 04	08 40	11	82
22	13 31	13 27	12 13	21 52	09 28	12	89
23	13 23	13 19	12 13	22 39	10 16	13	94

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.3		SATURN +0.4		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
24 00	154 02.2	184 00.1	S13 33.4	165 23.2	S 5 50.4	88 25.8	N21 02.0	294 09.6	S12 51.6	Acamar	315 18.6	S40 15.4
01	169 04.6	198 59.5	32.3	180 23.8	49.6	103 28.1	02.1	309 12.1	51.6	Achernar	335 27.3	S57 10.4
02	184 07.1	213 58.9	31.3	195 24.5	48.8	118 30.3	02.1	324 14.6	51.6	Acrux	173 08.8	S63 10.3
03	199 09.5	228 58.4	. . 30.3	210 25.2	. . 48.1	133 32.6	. . 02.2	339 17.1	. . 51.6	Adhara	255 12.4	S28 59.8
04	214 12.0	243 57.8	29.2	225 25.8	47.3	148 34.8	02.2	354 19.6	51.6	Aldebaran	290 49.6	N16 32.0
05	229 14.5	258 57.2	28.2	240 26.5	46.5	163 37.1	02.2	9 22.1	51.5			
06	244 16.9	273 56.7	S13 27.2	255 27.1	S 5 45.7	178 39.3	N21 02.3	24 24.6	S12 51.5	Alioth	166 20.4	N55 53.0
07	259 19.4	288 56.1	26.1	270 27.8	44.9	193 41.6	02.3	39 27.0	51.5	Alkaid	152 58.8	N49 14.6
08	274 21.9	303 55.5	25.1	285 28.4	44.1	208 43.8	02.4	54 29.5	51.5	Al Na'ir	27 44.4	S46 53.8
S 09	289 24.3	318 55.0	. . 24.1	300 29.1	. . 43.4	223 46.1	. . 02.4	69 32.0	. . 51.5	Alnilam	275 46.4	S 1 11.9
U 10	304 26.8	333 54.4	23.0	315 29.7	42.6	238 48.4	02.4	84 34.5	51.5	Alphard	217 56.0	S 8 43.2
N 11	319 29.3	348 53.8	22.0	330 30.4	41.8	253 50.6	02.5	99 37.0	51.4			
D 12	334 31.7	3 53.3	S13 21.0	345 31.1	S 5 41.0	268 52.9	N21 02.5	114 39.5	S12 51.4	Alphecca	126 11.1	N26 40.0
A 13	349 34.2	18 52.7	19.9	0 31.7	40.2	283 55.1	02.6	129 41.9	51.4	Alpheratz	357 44.0	N29 09.8
Y 14	4 36.6	33 52.1	18.9	15 32.4	39.4	298 57.4	02.6	144 44.4	51.4	Altair	62 08.7	N 8 54.2
15	19 39.1	48 51.6	. . 17.8	30 33.0	. . 38.7	313 59.6	. . 02.7	159 46.9	. . 51.4	Ankaa	353 16.3	S42 14.2
16	34 41.6	63 51.0	16.8	45 33.7	37.9	329 01.9	02.7	174 49.4	51.4	Antares	112 26.5	S26 27.5
17	49 44.0	78 50.5	15.8	60 34.3	37.1	344 04.1	02.7	189 51.9	51.3			
18	64 46.5	93 49.9	S13 14.7	75 35.0	S 5 36.3	359 06.4	N21 02.8	204 54.4	S12 51.3	Arcturus	145 55.7	N19 06.6
19	79 49.0	108 49.3	13.7	90 35.7	35.5	14 08.6	02.8	219 56.9	51.3	Atria	107 28.6	S69 02.7
20	94 51.4	123 48.8	12.6	105 36.3	34.7	29 10.9	02.9	234 59.4	51.3	Avior	234 17.5	S59 33.5
21	109 53.9	138 48.2	. . 11.6	120 37.0	. . 34.0	44 13.1	. . 02.9	250 01.8	. . 51.3	Bellatrix	278 32.1	N 6 21.5
22	124 56.4	153 47.7	10.5	135 37.6	33.2	59 15.4	02.9	265 04.3	51.3	Betelgeuse	271 01.4	N 7 24.3
23	139 58.8	168 47.1	09.5	150 38.3	32.4	74 17.6	03.0	280 06.8	51.2			
25 00	155 01.3	183 46.5	S13 08.4	165 38.9	S 5 31.6	89 19.9	N21 03.0	295 09.3	S12 51.2	Canopus	263 56.0	S52 42.6
01	170 03.8	198 46.0	07.4	180 39.6	30.8	104 22.1	03.1	310 11.8	51.2	Capella	280 34.6	N46 00.7
02	185 06.2	213 45.4	06.3	195 40.3	30.0	119 24.4	03.1	325 14.3	51.2	Deneb	49 32.0	N45 19.6
03	200 08.7	228 44.9	. . 05.3	210 40.9	. . 29.2	134 26.6	. . 03.2	340 16.8	. . 51.2	Denebola	182 33.5	N14 29.7
04	215 11.1	243 44.3	04.2	225 41.6	28.5	149 28.8	03.2	355 19.3	51.1	Diphda	348 56.3	S17 55.0
05	230 13.6	258 43.8	03.2	240 42.2	27.7	164 31.1	03.2	10 21.7	51.1			
06	245 16.1	273 43.2	S13 02.1	255 42.9	S 5 26.9	179 33.3	N21 03.3	25 24.2	S12 51.1	Dubhe	193 51.3	N61 40.6
07	260 18.5	288 42.6	01.1	270 43.5	26.1	194 35.6	03.3	40 26.7	51.1	Elnath	278 12.7	N28 37.0
08	275 21.0	303 42.1	13 00.0	285 44.2	25.3	209 37.8	03.4	55 29.2	51.1	Eltanin	90 46.4	N51 29.0
M 09	290 23.5	318 41.5	12 59.0	300 44.9	. . 24.5	224 40.1	. . 03.4	70 31.7	. . 51.1	Enif	33 47.6	N 9 56.1
O 10	305 25.9	333 41.0	57.9	315 45.5	23.8	239 42.3	03.5	85 34.2	51.0	Fomalhaut	15 24.6	S29 33.2
N 11	320 28.4	348 40.4	56.9	330 46.2	23.0	254 44.6	03.5	100 36.7	51.0			
D 12	335 30.9	3 39.9	S12 55.8	345 46.8	S 5 22.2	269 46.8	N21 03.5	115 39.2	S12 51.0	Gacrux	172 00.6	S57 11.2
A 13	350 33.3	18 39.3	54.8	0 47.5	21.4	284 49.1	03.6	130 41.7	51.0	Gienah	175 52.2	S17 37.1
Y 14	5 35.8	33 38.8	53.7	15 48.2	20.6	299 51.3	03.6	145 44.1	51.0	Hadar	148 47.8	S60 26.0
15	20 38.3	48 38.2	. . 52.7	30 48.8	. . 19.8	314 53.5	. . 03.7	160 46.6	. . 51.0	Hamal	328 01.1	N23 31.5
16	35 40.7	63 37.7	51.6	45 49.5	19.0	329 55.8	03.7	175 49.1	50.9	Kaus Aust.	83 44.3	S34 22.5
17	50 43.2	78 37.1	50.6	60 50.1	18.3	344 58.0	03.8	190 51.6	50.9			
18	65 45.6	93 36.6	S12 49.5	75 50.8	S 5 17.5	0 00.3	N21 03.8	205 54.1	S12 50.9	Kochab	137 19.6	N74 05.8
19	80 48.1	108 36.0	48.4	90 51.5	16.7	15 02.5	03.8	220 56.6	50.9	Markab	13 38.8	N15 16.6
20	95 50.6	123 35.5	47.4	105 52.1	15.9	30 04.8	03.9	235 59.1	50.9	Menkar	314 15.3	N 4 08.3
21	110 53.0	138 34.9	. . 46.3	120 52.8	. . 15.1	45 07.0	. . 03.9	251 01.6	. . 50.8	Menkent	148 07.6	S36 26.0
22	125 55.5	153 34.4	45.3	135 53.4	14.3	60 09.2	04.0	266 04.1	50.8	Miaplacidus	221 38.8	S69 46.5
23	140 58.0	168 33.8	44.2	150 54.1	13.5	75 11.5	04.0	281 06.6	50.8			
26 00	156 00.4	183 33.3	S12 43.1	165 54.8	S 5 12.8	90 13.7	N21 04.1	296 09.1	S12 50.8	Mirfak	308 40.7	N49 54.6
01	171 02.9	198 32.7	42.1	180 55.4	12.0	105 16.0	04.1	311 11.5	50.8	Nunki	75 58.8	S26 16.7
02	186 05.4	213 32.2	41.0	195 56.1	11.2	120 18.2	04.1	326 14.0	50.7	Peacock	53 20.1	S56 41.3
03	201 07.8	228 31.6	. . 40.0	210 56.7	. . 10.4	135 20.4	. . 04.2	341 16.5	. . 50.7	Pollux	243 27.7	N27 59.5
04	216 10.3	243 31.1	38.9	225 57.4	09.6	150 22.7	04.2	356 19.0	50.7	Procyon	244 59.7	N 5 11.2
05	231 12.7	258 30.5	37.8	240 58.1	08.8	165 24.9	04.3	11 21.5	50.7			
06	246 15.2	273 30.0	S12 36.8	255 58.7	S 5 08.0	180 27.2	N21 04.3	26 24.0	S12 50.7	Rasalhague	96 06.7	N12 33.0
07	261 17.7	288 29.4	35.7	270 59.4	07.3	195 29.4	04.4	41 26.5	50.7	Regulus	207 43.4	N11 53.9
T 08	276 20.1	303 28.9	34.6	286 00.0	06.5	210 31.6	04.4	56 29.0	50.6	Rigel	281 12.2	S 8 11.5
U 09	291 22.6	318 28.4	. . 33.6	301 00.7	. . 05.7	225 33.9	. . 04.4	71 31.5	. . 50.6	Rigil Kent.	139 51.6	S60 53.1
E 10	306 25.1	333 27.8	32.5	316 01.4	04.9	240 36.1	04.5	86 34.0	50.6	Sabik	102 12.8	S15 44.4
S 11	321 27.5	348 27.3	31.4	331 02.0	04.1	255 38.3	04.5	101 36.5	50.6			
D 12	336 30.0	3 26.7	S12 30.4	346 02.7	S 5 03.3	270 40.6	N21 04.6	116 39.0	S12 50.6	Schedar	349 41.2	N56 36.7
A 13	351 32.5	18 26.2	29.3	1 03.4	02.5	285 42.8	04.6	131 41.5	50.5	Shaula	96 22.3	S37 06.6
Y 14	6 34.9	33 25.6	28.2	16 04.0	01.7	300 45.1	04.7	146 44.0	50.5	Sirius	258 33.7	S16 44.4
15	21 37.4	48 25.1	. . 27.2	31 04.7	. . 01.0	315 47.3	. . 04.7	161 46.4	. . 50.5	Spica	158 31.2	S11 13.9
16	36 39.9	63 24.6	26.1	46 05.3	5 00.2	330 49.5	04.8	176 48.9	50.5	Suhail	222 52.1	S43 29.5
17	51 42.3	78 24.0	25.0	61 06.0	4 59.4	345 51.8	04.8	191 51.4	50.5			
18	66 44.8	93 23.5	S12 23.9	76 06.7	S 4 58.6	0 54.0	N21 04.8	206 53.9	S12 50.4	Vega	80 39.3	N38 47.6
19	81 47.2	108 22.9	22.9	91 07.3	57.8	15 56.2	04.9	221 56.4	50.4	Zuben'ubi	137 05.5	S16 05.8
20	96 49.7	123 22.4	21.8	106 08.0	57.0	30 58.5	04.9	236 58.9	50.4		SHA	Mer.Pass.
21	111 52.2	138 21.9	. . 20.7	121 08.6	. . 56.2	46 00.7	. . 05.0	252 01.4	. . 50.4		° ′	h m
22	126 54.6	153 21.3	19.6	136 09.3	55.5	61 02.9	05.0	267 03.9	50.4	Venus	28 45.2	11 45
23	141 57.1	168 20.8	18.6	151 10.0	54.7	76 05.2	05.1	282 06.4	50.3	Mars	10 37.7	12 57
	h m									Jupiter	294 18.6	18 00
Mer. Pass.	13 37.7									Saturn	140 08.0	4 19
		v −0.6	d 1.1	v 0.7	d 0.8	v 2.2	d 0.0	v 2.5	d 0.0			

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 24	Moonrise 25	Moonrise 26	Moonrise 27
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
24 00	176 41.5	S 9 28.8	19 33.4	12.6	N11 59.5	9.2	55.8	N 72	05 29	06 46	07 57	15 07	16 59	18 50	20 43
01	191 41.6	27.8	34 05.0	12.6	11 50.3	9.2	55.8	N 70	05 32	06 42	07 45	15 22	17 06	18 50	20 36
02	206 41.7	26.9	48 36.6	12.6	11 41.1	9.3	55.8	68	05 34	06 38	07 36	15 35	17 11	18 49	20 30
03	221 41.8	. . 26.0	63 08.2	12.6	11 31.8	9.3	55.8	66	05 36	06 35	07 28	15 45	17 16	18 49	20 24
04	236 41.9	25.1	77 39.8	12.6	11 22.5	9.5	55.9	64	05 37	06 32	07 21	15 53	17 20	18 49	20 20
05	251 42.0	24.1	92 11.4	12.6	11 13.0	9.4	55.9	62	05 39	06 30	07 15	16 00	17 24	18 49	20 16
06	266 42.1	S 9 23.2	106 43.0	12.6	N11 03.6	9.6	55.9	60	05 39	06 27	07 10	16 06	17 27	18 49	20 13
07	281 42.1	22.3	121 14.6	12.6	10 54.0	9.6	55.9	N 58	05 40	06 25	07 05	16 12	17 30	18 49	20 10
08	296 42.2	21.4	135 46.2	12.7	10 44.4	9.6	56.0	56	05 41	06 24	07 01	16 17	17 32	18 49	20 08
S 09	311 42.3	. . 20.4	150 17.9	12.6	10 34.8	9.7	56.0	54	05 41	06 22	06 58	16 21	17 34	18 49	20 06
U 10	326 42.4	19.5	164 49.5	12.6	10 25.1	9.8	56.0	52	05 41	06 20	06 54	16 25	17 36	18 49	20 04
N 11	341 42.5	18.6	179 21.1	12.7	10 15.3	9.8	56.0	50	05 41	06 19	06 51	16 28	17 38	18 49	20 02
D 12	356 42.6	S 9 17.7	193 52.8	12.6	N10 05.5	9.9	56.1	45	05 41	06 15	06 45	16 36	17 42	18 49	19 58
A 13	11 42.7	16.7	208 24.4	12.6	9 55.6	9.9	56.1	N 40	05 40	06 12	06 39	16 42	17 45	18 49	19 54
Y 14	26 42.8	15.8	222 56.0	12.7	9 45.7	10.0	56.1	35	05 40	06 09	06 34	16 48	17 48	18 49	19 51
15	41 42.9	. . 14.9	237 27.7	12.6	9 35.7	10.1	56.1	30	05 38	06 06	06 30	16 53	17 50	18 49	19 49
16	56 43.0	14.0	251 59.3	12.7	9 25.6	10.1	56.1	20	05 35	06 00	06 23	17 01	17 55	18 49	19 45
17	71 43.1	13.0	266 31.0	12.7	9 15.5	10.1	56.2	N 10	05 30	05 55	06 16	17 08	17 58	18 49	19 41
18	86 43.2	S 9 12.1	281 02.7	12.6	N 9 05.4	10.2	56.2	0	05 24	05 49	06 10	17 15	18 02	18 49	19 37
19	101 43.3	11.2	295 34.3	12.7	8 55.2	10.3	56.2	S 10	05 17	05 42	06 03	17 22	18 05	18 49	19 34
20	116 43.4	10.3	310 06.0	12.6	8 44.9	10.3	56.2	20	05 08	05 34	05 56	17 29	18 09	18 49	19 30
21	131 43.5	. . 09.3	324 37.6	12.7	8 34.6	10.4	56.3	30	04 55	05 24	05 48	17 37	18 13	18 49	19 26
22	146 43.6	08.4	339 09.3	12.7	8 24.2	10.4	56.3	35	04 47	05 17	05 43	17 42	18 16	18 49	19 24
23	161 43.7	07.5	353 41.0	12.6	8 13.8	10.4	56.3	40	04 37	05 10	05 38	17 47	18 18	18 49	19 21
25 00	176 43.8	S 9 06.5	8 12.6	12.7	N 8 03.4	10.5	56.3	45	04 24	05 01	05 32	17 53	18 22	18 49	19 18
01	191 43.9	05.6	22 44.3	12.6	7 52.9	10.6	56.4	S 50	04 08	04 50	05 24	18 01	18 25	18 50	19 14
02	206 44.0	04.7	37 15.9	12.7	7 42.3	10.5	56.4	52	04 01	04 45	05 21	18 04	18 27	18 50	19 13
03	221 44.1	. . 03.8	51 47.6	12.6	7 31.8	10.7	56.4	54	03 52	04 39	05 17	18 08	18 29	18 50	19 11
04	236 44.2	02.8	66 19.2	12.7	7 21.1	10.7	56.4	56	03 42	04 32	05 12	18 12	18 31	18 50	19 09
05	251 44.3	01.9	80 50.9	12.6	7 10.4	10.7	56.5	58	03 30	04 25	05 08	18 16	18 33	18 50	19 07
06	266 44.4	S 9 01.0	95 22.5	12.7	N 6 59.7	10.7	56.5	S 60	03 16	04 16	05 02	18 21	18 36	18 50	19 04
07	281 44.5	9 00.0	109 54.2	12.6	6 49.0	10.8	56.5								
08	296 44.6	8 59.1	124 25.8	12.7	6 38.2	10.9	56.5								
M 09	311 44.7	. . 58.2	138 57.5	12.6	6 27.3	10.9	56.6								
O 10	326 44.8	57.2	153 29.1	12.6	6 16.4	10.9	56.6								
N 11	341 44.9	56.3	168 00.7	12.7	6 05.5	11.0	56.6								
D 12	356 45.0	S 8 55.4	182 32.4	12.6	N 5 54.5	11.0	56.6								
A 13	11 45.1	54.4	197 04.0	12.6	5 43.5	11.0	56.7								
Y 14	26 45.2	53.5	211 35.6	12.6	5 32.5	11.1	56.7								
15	41 45.3	. . 52.6	226 07.2	12.6	5 21.4	11.1	56.7								
16	56 45.4	51.6	240 38.8	12.6	5 10.3	11.1	56.7								
17	71 45.5	50.7	255 10.4	12.5	4 59.2	11.2	56.7								
18	86 45.6	S 8 49.8	269 41.9	12.6	N 4 48.0	11.2	56.8								
19	101 45.7	48.9	284 13.5	12.6	4 36.8	11.2	56.8								
20	116 45.8	47.9	298 45.1	12.5	4 25.6	11.3	56.8								
21	131 45.9	. . 47.0	313 16.6	12.6	4 14.3	11.3	56.8								
22	146 46.0	46.0	327 48.2	12.5	4 03.0	11.3	56.9								
23	161 46.1	45.1	342 19.7	12.5	3 51.7	11.4	56.9								
26 00	176 46.2	S 8 44.2	356 51.2	12.5	N 3 40.3	11.4	56.9								
01	191 46.3	43.2	11 22.7	12.5	3 28.9	11.4	56.9								
02	206 46.4	42.3	25 54.2	12.5	3 17.5	11.4	57.0								
03	221 46.6	. . 41.4	40 25.7	12.4	3 06.1	11.4	57.0								
04	236 46.7	40.4	54 57.1	12.5	2 54.7	11.5	57.0								
05	251 46.8	39.5	69 28.6	12.4	2 43.2	11.5	57.0								
06	266 46.9	S 8 38.6	84 00.0	12.5	N 2 31.7	11.5	57.0								
07	281 47.0	37.6	98 31.5	12.4	2 20.2	11.6	57.1								
T 08	296 47.1	36.7	113 02.9	12.3	2 08.6	11.5	57.1								
U 09	311 47.2	. . 35.8	127 34.2	12.4	1 57.1	11.6	57.1								
E 10	326 47.3	34.8	142 05.6	12.4	1 45.5	11.6	57.1								
S 11	341 47.4	33.9	156 37.0	12.3	1 33.9	11.6	57.2								
D 12	356 47.5	S 8 33.0	171 08.3	12.3	N 1 22.3	11.6	57.2								
A 13	11 47.6	32.0	185 39.6	12.3	1 10.7	11.7	57.2								
Y 14	26 47.7	31.1	200 10.9	12.3	0 59.0	11.6	57.2								
15	41 47.8	. . 30.1	214 42.2	12.2	0 47.4	11.7	57.3								
16	56 47.9	29.2	229 13.4	12.3	0 35.7	11.7	57.3								
17	71 48.1	28.3	243 44.7	12.2	0 24.0	11.7	57.3								
18	86 48.2	S 8 27.3	258 15.9	12.2	N 0 12.3	11.7	57.3								
19	101 48.3	26.4	272 47.1	12.1	N 0 00.6	11.7	57.3								
20	116 48.4	25.5	287 18.2	12.2	S 0 11.1	11.7	57.4								
21	131 48.5	. . 24.5	301 49.4	12.1	0 22.8	11.7	57.4								
22	146 48.6	23.6	316 20.5	12.1	0 34.5	11.7	57.4								
23	161 48.7	22.6	330 51.6	12.0	S 0 46.2	11.7	57.4								
	SD 16.2	d 0.9	SD 15.3		15.4		15.6								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 24	Moonset 25	Moonset 26	Moonset 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 31	17 42	19 00	07 18	07 05	06 53	06 42
N 70	16 42	17 46	18 57	07 01	06 56	06 50	06 45
68	16 52	17 49	18 54	06 47	06 48	06 48	06 47
66	17 00	17 53	18 52	06 36	06 41	06 46	06 50
64	17 07	17 55	18 50	06 27	06 36	06 44	06 52
62	17 12	17 58	18 49	06 19	06 31	06 42	06 53
60	17 17	18 00	18 48	06 11	06 27	06 41	06 55
N 58	17 22	18 02	18 47	06 05	06 23	06 40	06 56
56	17 26	18 04	18 47	06 00	06 20	06 39	06 57
54	17 29	18 05	18 46	05 55	06 17	06 38	06 58
52	17 33	18 07	18 46	05 50	06 14	06 37	06 59
50	17 36	18 08	18 46	05 46	06 12	06 36	07 00
45	17 42	18 12	18 46	05 37	06 06	06 34	07 02
N 40	17 47	18 15	18 46	05 30	06 02	06 33	07 04
35	17 52	18 18	18 47	05 23	05 58	06 31	07 05
30	17 56	18 20	18 48	05 17	05 54	06 30	07 06
20	18 04	18 26	18 52	05 08	05 48	06 28	07 08
N 10	18 10	18 31	18 56	04 59	05 42	06 26	07 10
0	18 16	18 37	19 02	04 50	05 37	06 24	07 12
S 10	18 23	18 44	19 09	04 42	05 32	06 22	07 14
20	18 30	18 52	19 18	04 33	05 27	06 21	07 15
30	18 37	19 02	19 31	04 23	05 20	06 18	07 18
35	18 42	19 08	19 39	04 17	05 16	06 17	07 19
40	18 47	19 15	19 48	04 10	05 12	06 16	07 20
45	18 53	19 24	20 01	04 02	05 07	06 14	07 22
S 50	19 01	19 35	20 16	03 53	05 01	06 12	07 23
52	19 04	19 40	20 24	03 48	04 59	06 11	07 24
54	19 08	19 46	20 32	03 43	04 56	06 10	07 25
56	19 12	19 52	20 42	03 38	04 52	06 09	07 26
58	19 17	19 59	20 53	03 32	04 49	06 07	07 27
S 60	19 22	20 08	21 07	03 25	04 44	06 06	07 29

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
24	13 14	13 10	12 13	23 26	11 03	14	98
25	13 05	13 00	12 13	24 13	11 50	15	100
26	12 55	12 50	12 13	00 13	12 37	16	99

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.3		SATURN +0.4		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
27 00	156 59.6	183 20.3	S12 17.5	166 10.6	S 4 53.9	91 07.4	N21 05.1	297 08.9	S12 50.3	Acamar	315 18.7	S40 15.4
01	172 02.0	198 19.7	16.4	181 11.3	53.1	106 09.6	05.2	312 11.4	50.3	Achernar	335 27.3	S57 10.4
02	187 04.5	213 19.2	15.3	196 12.0	52.3	121 11.9	05.2	327 13.9	50.3	Acrux	173 08.8	S63 10.3
03	202 07.0	228 18.6 . .	14.3	211 12.6 . .	51.5	136 14.1 . .	05.2	342 16.4 . .	50.3	Adhara	255 12.4	S28 59.8
04	217 09.4	243 18.1	13.2	226 13.3	50.7	151 16.3	05.3	357 18.9	50.2	Aldebaran	290 49.6	N16 32.0
05	232 11.9	258 17.6	12.1	241 14.0	49.9	166 18.6	05.3	12 21.4	50.2			
06	247 14.3	273 17.0	S12 11.0	256 14.6	S 4 49.2	181 20.8	N21 05.4	27 23.9	S12 50.2	Alioth	166 20.4	N55 53.0
W 07	262 16.8	288 16.5	10.0	271 15.3	48.4	196 23.0	05.4	42 26.4	50.2	Alkaid	152 58.7	N49 14.6
E 08	277 19.3	303 16.0	08.9	286 15.9	47.6	211 25.3	05.5	57 28.9	50.2	Al Na'ir	27 44.4	S46 53.7
D 09	292 21.7	318 15.4 . .	07.8	301 16.6 . .	46.8	226 27.5 . .	05.5	72 31.4 . .	50.1	Alnilam	275 46.5	S 1 11.9
N 10	307 24.2	333 14.9	06.7	316 17.3	46.0	241 29.7	05.6	87 33.9	50.1	Alphard	217 56.0	S 8 43.2
E 11	322 26.7	348 14.4	05.6	331 17.9	45.2	256 31.9	05.6	102 36.4	50.1			
S 12	337 29.1	3 13.8	S12 04.6	346 18.6	S 4 44.4	271 34.2	N21 05.6	117 38.9	S12 50.1	Alphecca	126 11.1	N26 40.0
D 13	352 31.6	18 13.3	03.5	1 19.3	43.6	286 36.4	05.7	132 41.4	50.1	Alpheratz	357 44.0	N29 09.8
A 14	7 34.1	33 12.8	02.4	16 19.9	42.8	301 38.6	05.7	147 43.9	50.0	Altair	62 08.7	N 8 54.2
Y 15	22 36.5	48 12.2 . .	01.3	31 20.6 . .	42.1	316 40.9 . .	05.8	162 46.4 . .	50.0	Ankaa	353 16.3	S42 14.2
16	37 39.0	63 11.7	12 00.2	46 21.3	41.3	331 43.1	05.8	177 48.9	50.0	Antares	112 26.5	S26 27.5
17	52 41.5	78 11.2	11 59.1	61 21.9	40.5	346 45.3	05.9	192 51.4	50.0			
18	67 43.9	93 10.7	S11 58.0	76 22.6	S 4 39.7	1 47.5	N21 05.9	207 53.9	S12 50.0	Arcturus	145 55.7	N19 06.6
19	82 46.4	108 10.1	57.0	91 23.3	38.9	16 49.8	06.0	222 56.4	49.9	Atria	107 28.5	S69 02.7
20	97 48.8	123 09.6	55.9	106 23.9	38.1	31 52.0	06.0	237 58.9	49.9	Avior	234 17.5	S59 33.5
21	112 51.3	138 09.1 . .	54.8	121 24.6 . .	37.3	46 54.2 . .	06.0	253 01.4 . .	49.9	Bellatrix	278 32.1	N 6 21.5
22	127 53.8	153 08.5	53.7	136 25.2	36.5	61 56.4	06.1	268 03.9	49.9	Betelgeuse	271 01.4	N 7 24.3
23	142 56.2	168 08.0	52.6	151 25.9	35.8	76 58.7	06.1	283 06.4	49.8			
28 00	157 58.7	183 07.5	S11 51.5	166 26.6	S 4 35.0	92 00.9	N21 06.2	298 08.9	S12 49.8	Canopus	263 56.0	S52 42.6
01	173 01.2	198 07.0	50.4	181 27.2	34.2	107 03.1	06.2	313 11.4	49.8	Capella	280 34.6	N46 00.7
02	188 03.6	213 06.4	49.3	196 27.9	33.4	122 05.4	06.3	328 13.9	49.8	Deneb	49 32.0	N45 19.6
03	203 06.1	228 05.9 . .	48.3	211 28.6 . .	32.6	137 07.6 . .	06.3	343 16.4 . .	49.8	Denebola	182 33.5	N14 29.7
04	218 08.6	243 05.4	47.2	226 29.2	31.8	152 09.8	06.4	358 18.9	49.7	Diphda	348 56.4	S17 55.0
05	233 11.0	258 04.9	46.1	241 29.9	31.0	167 12.0	06.4	13 21.4	49.7			
06	248 13.5	273 04.3	S11 45.0	256 30.6	S 4 30.2	182 14.2	N21 06.5	28 23.9	S12 49.7	Dubhe	193 51.3	N61 40.6
T 07	263 15.9	288 03.8	43.9	271 31.2	29.4	197 16.5	06.5	43 26.4	49.7	Elnath	278 12.8	N28 37.0
H 08	278 18.4	303 03.3	42.8	286 31.9	28.7	212 18.7	06.5	58 28.9	49.7	Eltanin	90 46.4	N51 29.0
U 09	293 20.9	318 02.8 . .	41.7	301 32.6 . .	27.9	227 20.9 . .	06.6	73 31.4 . .	49.6	Enif	33 47.6	N 9 56.1
R 10	308 23.3	333 02.3	40.6	316 33.2	27.1	242 23.1	06.6	88 33.9	49.6	Fomalhaut	15 24.6	S29 33.1
S 11	323 25.8	348 01.7	39.5	331 33.9	26.3	257 25.4	06.7	103 36.4	49.6			
D 12	338 28.3	3 01.2	S11 38.4	346 34.6	S 4 25.5	272 27.6	N21 06.7	118 38.9	S12 49.6	Gacrux	172 00.6	S57 11.2
A 13	353 30.7	18 00.7	37.3	1 35.2	24.7	287 29.8	06.8	133 41.4	49.5	Gienah	175 52.2	S17 37.1
Y 14	8 33.2	33 00.2	36.2	16 35.9	23.9	302 32.0	06.8	148 43.9	49.5	Hadar	148 47.7	S60 26.0
15	23 35.7	47 59.6 . .	35.1	31 36.6 . .	23.1	317 34.2 . .	06.9	163 46.4 . .	49.5	Hamal	328 01.2	N23 31.5
16	38 38.1	62 59.1	34.0	46 37.2	22.3	332 36.5	06.9	178 48.9	49.5	Kaus Aust.	83 44.2	S34 22.5
17	53 40.6	77 58.6	32.9	61 37.9	21.5	347 38.7	07.0	193 51.4	49.5			
18	68 43.1	92 58.1	S11 31.8	76 38.6	S 4 20.8	2 40.9	N21 07.0	208 53.9	S12 49.4	Kochab	137 19.5	N74 05.8
19	83 45.5	107 57.6	30.7	91 39.2	20.0	17 43.1	07.0	223 56.4	49.4	Markab	13 38.8	N15 16.6
20	98 48.0	122 57.0	29.6	106 39.9	19.2	32 45.3	07.1	238 58.9	49.4	Menkar	314 15.4	N 4 08.3
21	113 50.4	137 56.5 . .	28.5	121 40.6 . .	18.4	47 47.6 . .	07.1	254 01.4 . .	49.4	Menkent	148 07.5	S36 26.0
22	128 52.9	152 56.0	27.4	136 41.2	17.6	62 49.8	07.2	269 03.9	49.3	Miaplacidus	221 38.8	S69 46.6
23	143 55.4	167 55.5	26.3	151 41.9	16.8	77 52.0	07.2	284 06.4	49.3			
1 00	158 57.8	182 55.0	S11 25.2	166 42.6	S 4 16.0	92 54.2	N21 07.3	299 08.9	S12 49.3	Mirfak	308 40.7	N49 54.6
01	174 00.3	197 54.5	24.1	181 43.2	15.2	107 56.4	07.3	314 11.4	49.3	Nunki	75 58.7	S26 16.6
02	189 02.8	212 53.9	23.0	196 43.9	14.4	122 58.7	07.4	329 13.9	49.3	Peacock	53 20.0	S56 41.3
03	204 05.2	227 53.4 . .	21.9	211 44.6 . .	13.7	138 00.9 . .	07.4	344 16.4 . .	49.2	Pollux	243 27.7	N27 59.5
04	219 07.7	242 52.9	20.8	226 45.2	12.9	153 03.1	07.5	359 18.9	49.2	Procyon	244 59.7	N 5 11.2
05	234 10.2	257 52.4	19.7	241 45.9	12.1	168 05.3	07.5	14 21.4	49.2			
06	249 12.6	272 51.9	S11 18.6	256 46.6	S 4 11.3	183 07.5	N21 07.6	29 23.9	S12 49.2	Rasalhague	96 06.7	N12 33.0
07	264 15.1	287 51.4	17.5	271 47.3	10.5	198 09.7	07.6	44 26.4	49.1	Regulus	207 43.4	N11 53.9
08	279 17.6	302 50.9	16.4	286 47.9	09.7	213 12.0	07.6	59 28.9	49.1	Rigel	281 12.2	S 8 11.5
F 09	294 20.0	317 50.4 . .	15.3	301 48.6 . .	08.9	228 14.2 . .	07.7	74 31.4 . .	49.1	Rigil Kent.	139 51.6	S60 53.1
R 10	309 22.5	332 49.8	14.2	316 49.3	08.1	243 16.4	07.7	89 33.9	49.1	Sabik	102 12.8	S15 44.4
I 11	324 24.9	347 49.3	13.1	331 49.9	07.3	258 18.6	07.8	104 36.5	49.1			
D 12	339 27.4	2 48.8	S11 12.0	346 50.6	S 4 06.5	273 20.8	N21 07.8	119 39.0	S12 49.0	Schedar	349 41.2	N56 36.7
A 13	354 29.9	17 48.3	10.9	1 51.3	05.7	288 23.0	07.9	134 41.5	49.0	Shaula	96 22.3	S37 06.6
Y 14	9 32.3	32 47.8	09.8	16 51.9	05.0	303 25.2	07.9	149 44.0	49.0	Sirius	258 33.7	S16 44.4
15	24 34.8	47 47.3 . .	08.6	31 52.6 . .	04.2	318 27.5 . .	08.0	164 46.5 . .	49.0	Spica	158 31.2	S11 13.9
16	39 37.3	62 46.8	07.5	46 53.3	03.4	333 29.7	08.0	179 49.0	48.9	Suhail	222 52.2	S43 29.5
17	54 39.7	77 46.3	06.4	61 53.9	02.6	348 31.9	08.1	194 51.5	48.9			
18	69 42.2	92 45.8	S11 05.3	76 54.6	S 4 01.8	3 34.1	N21 08.1	209 54.0	S12 48.9	Vega	80 39.3	N38 47.6
19	84 44.7	107 45.2	04.2	91 55.3	01.0	18 36.3	08.2	224 56.5	48.9	Zuben'ubi	137 05.5	S16 05.8
20	99 47.1	122 44.7	03.1	106 56.0	4 00.2	33 38.5	08.2	239 59.0	48.8		SHA	Mer.Pass.
21	114 49.6	137 44.2 . .	02.0	121 56.6	3 59.4	48 40.7 . .	08.3	255 01.5 . .	48.8		° ′	h m
22	129 52.0	152 43.7	11 00.9	136 57.3	58.6	63 42.9	08.3	270 04.0	48.8	Venus	25 08.8	11 48
23	144 54.5	167 43.2	S10 59.7	151 58.0	57.8	78 45.1	08.3	285 06.5	48.8	Mars	8 27.9	12 54
	h m									Jupiter	294 02.2	17 49
Mer.Pass.	13 25.9	v −0.5	d 1.1	v 0.7	d 0.8	v 2.2	d 0.0	v 2.5	d 0.0	Saturn	140 10.2	4 07

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		27	28	1	2
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
27 00	176 48.8	S 8 21.7	345 22.6	12.1	S 0 57.9	11.8	57.5	N 72	05 14	06 32	07 41	20 43	22 42	24 53	00 53
01	191 48.9	20.8	359 53.7	12.0	1 09.7	11.7	57.5	N 70	05 19	06 29	07 31	20 36	22 26	24 22	00 22
02	206 49.0	19.8	14 24.7	12.0	1 21.4	11.7	57.5	68	05 22	06 27	07 23	20 30	22 13	23 59	25 47
03	221 49.2 . .	18.9	28 55.7	11.9	1 33.1	11.8	57.5	66	05 25	06 24	07 16	20 24	22 02	23 41	25 20
04	236 49.3	17.9	43 26.6	12.0	1 44.9	11.7	57.5	64	05 28	06 22	07 10	20 20	21 53	23 27	25 00
05	251 49.4	17.0	57 57.6	11.9	1 56.6	11.7	57.6	62	05 30	06 21	07 05	20 16	21 45	23 15	24 44
06	266 49.5	S 8 16.1	72 28.5	11.8	S 2 08.3	11.8	57.6	60	05 31	06 19	07 01	20 13	21 39	23 05	24 30
W 07	281 49.6	15.1	86 59.3	11.9	2 20.1	11.7	57.6	N 58	05 32	06 18	06 57	20 10	21 33	22 56	24 18
E 08	296 49.7	14.2	101 30.2	11.8	2 31.8	11.7	57.6	56	05 33	06 16	06 54	20 08	21 28	22 49	24 08
D 09	311 49.8 . .	13.2	116 01.0	11.8	2 43.5	11.7	57.6	54	05 34	06 15	06 51	20 06	21 23	22 42	23 59
N 10	326 49.9	12.3	130 31.8	11.7	2 55.2	11.7	57.7	52	05 35	06 14	06 48	20 04	21 19	22 36	23 51
E 11	341 50.1	11.3	145 02.5	11.7	3 06.9	11.7	57.7	50	05 35	06 13	06 45	20 02	21 16	22 30	23 44
S 12	356 50.2	S 8 10.4	159 33.2	11.7	S 3 18.6	11.7	57.7	45	05 36	06 10	06 40	19 58	21 08	22 18	23 29
D 13	11 50.3	09.5	174 03.9	11.7	3 30.3	11.7	57.7	N 40	05 36	06 08	06 35	19 54	21 01	22 08	23 16
A 14	26 50.4	08.5	188 34.6	11.6	3 42.0	11.6	57.7	35	05 36	06 05	06 31	19 51	20 55	22 00	23 05
Y 15	41 50.5 . .	07.6	203 05.2	11.5	3 53.6	11.7	57.8	30	05 35	06 03	06 27	19 49	20 50	21 53	22 56
16	56 50.6	06.6	217 35.7	11.6	4 05.3	11.6	57.8	20	05 33	05 58	06 20	19 45	20 42	21 40	22 40
17	71 50.7	05.7	232 06.3	11.5	4 16.9	11.6	57.8	N 10	05 29	05 54	06 15	19 41	20 34	21 29	22 26
18	86 50.9	S 8 04.7	246 36.8	11.5	S 4 28.5	11.6	57.8	0	05 24	05 48	06 09	19 37	20 27	21 19	22 13
19	101 51.0	03.8	261 07.3	11.4	4 40.1	11.6	57.8	S 10	05 18	05 42	06 04	19 34	20 20	21 09	22 01
20	116 51.1	02.9	275 37.7	11.4	4 51.7	11.6	57.9	20	05 09	05 35	05 57	19 30	20 13	20 58	21 47
21	131 51.2 . .	01.9	290 08.1	11.3	5 03.3	11.5	57.9	30	04 57	05 26	05 50	19 26	20 05	20 46	21 32
22	146 51.3	01.0	304 38.4	11.4	5 14.8	11.6	57.9	35	04 50	05 20	05 46	19 24	20 00	20 39	21 23
23	161 51.4	8 00.0	319 08.8	11.2	5 26.4	11.5	57.9	40	04 41	05 14	05 41	19 21	19 54	20 31	21 12
28 00	176 51.5	S 7 59.1	333 39.0	11.3	S 5 37.9	11.4	57.9	45	04 29	05 06	05 36	19 18	19 48	20 22	21 00
01	191 51.7	58.1	348 09.3	11.2	5 49.3	11.5	58.0	S 50	04 15	04 56	05 29	19 14	19 41	20 11	20 46
02	206 51.8	57.2	2 39.5	11.1	6 00.8	11.4	58.0	52	04 07	04 51	05 26	19 13	19 37	20 06	20 39
03	221 51.9 . .	56.3	17 09.6	11.1	6 12.2	11.4	58.0	54	03 59	04 45	05 23	19 11	19 34	20 00	20 32
04	236 52.0	55.3	31 39.7	11.1	6 23.6	11.4	58.0	56	03 50	04 40	05 19	19 09	19 30	19 54	20 24
05	251 52.1	54.4	46 09.8	11.0	6 35.0	11.4	58.0	58	03 40	04 33	05 15	19 07	19 25	19 47	20 14
06	266 52.2	S 7 53.4	60 39.8	11.0	S 6 46.4	11.3	58.0	S 60	03 27	04 25	05 10	19 04	19 20	19 39	20 04
T 07	281 52.4	52.5	75 09.8	11.0	6 57.7	11.3	58.1								
H 08	296 52.5	51.5	89 39.8	10.9	7 09.0	11.2	58.1								
U 09	311 52.6 . .	50.6	104 09.7	10.8	7 20.2	11.2	58.1								
R 10	326 52.7	49.6	118 39.5	10.8	7 31.4	11.2	58.1								
S 11	341 52.8	48.7	133 09.3	10.8	7 42.6	11.2	58.1								
D 12	356 53.0	S 7 47.7	147 39.1	10.7	S 7 53.8	11.1	58.1								
A 13	11 53.1	46.8	162 08.8	10.7	8 04.9	11.1	58.2								
Y 14	26 53.2	45.8	176 38.5	10.6	8 16.0	11.0	58.2								
15	41 53.3 . .	44.9	191 08.1	10.5	8 27.0	11.0	58.2								
16	56 53.4	43.9	205 37.6	10.6	8 38.0	11.0	58.2								
17	71 53.6	43.0	220 07.2	10.4	8 49.0	10.9	58.2								
18	86 53.7	S 7 42.1	234 36.6	10.5	S 8 59.9	10.8	58.3								
19	101 53.8	41.1	249 06.1	10.3	9 10.7	10.9	58.3								
20	116 53.9	40.2	263 35.4	10.4	9 21.6	10.7	58.3								
21	131 54.0 . .	39.2	278 04.8	10.2	9 32.3	10.8	58.3								
22	146 54.2	38.3	292 34.0	10.3	9 43.1	10.6	58.3								
23	161 54.3	37.3	307 03.3	10.1	9 53.7	10.7	58.3								
1 00	176 54.4	S 7 36.4	321 32.4	10.1	S10 04.4	10.5	58.3								
01	191 54.5	35.4	336 01.5	10.1	10 14.9	10.6	58.4								
02	206 54.6	34.5	350 30.6	10.0	10 25.5	10.4	58.4								
03	221 54.8 . .	33.5	4 59.6	10.0	10 35.9	10.5	58.4								
04	236 54.9	32.6	19 28.6	9.9	10 46.4	10.3	58.4								
05	251 55.0	31.6	33 57.5	9.9	10 56.7	10.3	58.4								
06	266 55.1	S 7 30.7	48 26.4	9.8	S11 07.0	10.3	58.4								
07	281 55.3	29.7	62 55.2	9.7	11 17.3	10.2	58.5								
08	296 55.4	28.8	77 23.9	9.7	11 27.5	10.1	58.5								
F 09	311 55.5 . .	27.8	91 52.6	9.6	11 37.6	10.1	58.5								
R 10	326 55.6	26.9	106 21.2	9.6	11 47.7	10.0	58.5								
I 11	341 55.7	25.9	120 49.8	9.5	11 57.7	9.9	58.5								
D 12	356 55.9	S 7 25.0	135 18.3	9.5	S12 07.6	9.9	58.5								
A 13	11 56.0	24.0	149 46.8	9.4	12 17.5	9.8	58.5								
Y 14	26 56.1	23.0	164 15.2	9.4	12 27.3	9.7	58.6								
15	41 56.2 . .	22.1	178 43.6	9.3	12 37.0	9.7	58.6								
16	56 56.4	21.1	193 11.9	9.2	12 46.7	9.6	58.6								
17	71 56.5	20.2	207 40.1	9.2	12 56.3	9.5	58.6								
18	86 56.6	S 7 19.2	222 08.3	9.1	S13 05.8	9.5	58.6								
19	101 56.7	18.3	236 36.4	9.1	13 15.3	9.4	58.6								
20	116 56.9	17.3	251 04.5	9.0	13 24.7	9.3	58.6								
21	131 57.0 . .	16.4	265 32.5	9.0	13 34.0	9.2	58.6								
22	146 57.1	15.4	280 00.5	8.9	13 43.2	9.2	58.7								
23	161 57.2	14.5	294 28.4	8.8	S13 52.4	9.0	58.7								
	SD 16.2	d 0.9	SD	15.7		15.8									

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	27	28	1	2
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 46	17 55	19 14	06 42	06 29	06 15	05 54
N 70	16 55	17 58	19 09	06 45	06 39	06 33	06 26
68	17 04	18 00	19 05	06 47	06 47	06 48	06 50
66	17 10	18 02	19 02	06 50	06 54	07 00	07 09
64	17 16	18 04	18 59	06 52	07 00	07 10	07 24
62	17 21	18 06	18 57	06 53	07 05	07 19	07 37
60	17 25	18 07	18 55	06 55	07 09	07 27	07 48
N 58	17 29	18 08	18 54	06 56	07 13	07 33	07 57
56	17 32	18 10	18 53	06 57	07 17	07 39	08 06
54	17 35	18 11	18 52	06 58	07 20	07 44	08 13
52	17 38	18 12	18 51	06 59	07 23	07 49	08 20
50	17 41	18 13	18 51	07 00	07 25	07 53	08 26
45	17 46	18 16	18 50	07 02	07 31	08 03	08 39
N 40	17 51	18 18	18 49	07 04	07 36	08 11	08 49
35	17 55	18 20	18 50	07 05	07 40	08 18	08 59
30	17 58	18 22	18 50	07 06	07 44	08 24	09 07
20	18 05	18 27	18 53	07 08	07 50	08 34	09 21
N 10	18 10	18 32	18 56	07 10	07 56	08 43	09 33
0	18 16	18 37	19 01	07 12	08 01	08 52	09 45
S 10	18 21	18 43	19 07	07 14	08 06	09 00	09 56
20	18 27	18 50	19 16	07 15	08 12	09 09	10 09
30	18 34	18 58	19 27	07 18	08 18	09 20	10 23
35	18 38	19 04	19 34	07 19	08 22	09 26	10 31
40	18 43	19 11	19 43	07 20	08 26	09 33	10 41
45	18 48	19 18	19 55	07 22	08 31	09 41	10 52
S 50	18 55	19 28	20 09	07 23	08 37	09 51	11 05
52	18 58	19 33	20 16	07 24	08 39	09 55	11 11
54	19 01	19 38	20 24	07 25	08 42	10 00	11 18
56	19 05	19 44	20 33	07 26	08 46	10 06	11 26
58	19 09	19 50	20 43	07 27	08 49	10 12	11 35
S 60	19 13	19 58	20 55	07 29	08 53	10 19	11 45

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
27	12 45	12 40	12 13	01 00	13 25	17	97
28	12 34	12 28	12 12	01 49	14 14	18	92
1	12 23	12 17	12 12	02 39	15 05	19	85

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.3		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
2 00	159 57.0	182 42.7	S10 58.6	166 58.6	S 3 57.1	93 47.4	N21 08.4	300 09.0	S12 48.7
01	174 59.4	197 42.2	57.5	181 59.3	56.3	108 49.6	08.4	315 11.6	48.7
02	190 01.9	212 41.7	56.4	197 00.0	55.5	123 51.8	08.5	330 14.1	48.7
03	205 04.4	227 41.2	55.3	212 00.6	54.7	138 54.0	08.5	345 16.6	48.7
04	220 06.8	242 40.7	54.2	227 01.3	53.9	153 56.2	08.6	0 19.1	48.7
05	235 09.3	257 40.2	53.1	242 02.0	53.1	168 58.4	08.6	15 21.6	48.6
06	250 11.8	272 39.7	S10 51.9	257 02.7	S 3 52.3	184 00.6	N21 08.7	30 24.1	S12 48.6
07	265 14.2	287 39.2	50.8	272 03.3	51.5	199 02.8	08.7	45 26.6	48.6
S 08	280 16.7	302 38.7	49.7	287 04.0	50.7	214 05.0	08.8	60 29.1	48.6
A 09	295 19.2	317 38.2	48.6	302 04.7	49.9	229 07.2	08.8	75 31.6	48.5
T 10	310 21.6	332 37.7	47.5	317 05.3	49.1	244 09.4	08.9	90 34.1	48.5
U 11	325 24.1	347 37.2	46.3	332 06.0	48.4	259 11.7	08.9	105 36.6	48.5
R 12	340 26.5	2 36.7	S10 45.2	347 06.7	S 3 47.6	274 13.9	N21 09.0	120 39.2	S12 48.5
D 13	355 29.0	17 36.2	44.1	2 07.3	46.8	289 16.1	09.0	135 41.7	48.4
A 14	10 31.5	32 35.7	43.0	17 08.0	46.0	304 18.3	09.1	150 44.2	48.4
Y 15	25 33.9	47 35.2	41.9	32 08.7	45.2	319 20.5	09.1	165 46.7	48.4
16	40 36.4	62 34.7	40.7	47 09.4	44.4	334 22.7	09.2	180 49.2	48.4
17	55 38.9	77 34.2	39.6	62 10.0	43.6	349 24.9	09.2	195 51.7	48.3
18	70 41.3	92 33.7	S10 38.5	77 10.7	S 3 42.8	4 27.1	N21 09.2	210 54.2	S12 48.3
19	85 43.8	107 33.2	37.4	92 11.4	42.0	19 29.3	09.3	225 56.7	48.3
20	100 46.3	122 32.7	36.2	107 12.1	41.2	34 31.5	09.3	240 59.2	48.3
21	115 48.7	137 32.2	35.1	122 12.7	40.4	49 33.7	09.4	256 01.8	48.2
22	130 51.2	152 31.7	34.0	137 13.4	39.6	64 35.9	09.4	271 04.3	48.2
23	145 53.6	167 31.2	32.9	152 14.1	38.9	79 38.1	09.5	286 06.8	48.2
3 00	160 56.1	182 30.7	S10 31.7	167 14.7	S 3 38.1	94 40.3	N21 09.5	301 09.3	S12 48.2
01	175 58.6	197 30.2	30.6	182 15.4	37.3	109 42.5	09.6	316 11.8	48.1
02	191 01.0	212 29.7	29.5	197 16.1	36.5	124 44.7	09.6	331 14.3	48.1
03	206 03.5	227 29.2	28.4	212 16.8	35.7	139 46.9	09.7	346 16.8	48.1
04	221 06.0	242 28.7	27.2	227 17.4	34.9	154 49.1	09.7	1 19.3	48.1
05	236 08.4	257 28.2	26.1	242 18.1	34.1	169 51.3	09.8	16 21.9	48.0
06	251 10.9	272 27.7	S10 25.0	257 18.8	S 3 33.3	184 53.5	N21 09.8	31 24.4	S12 48.0
07	266 13.4	287 27.2	23.8	272 19.4	32.5	199 55.7	09.9	46 26.9	48.0
08	281 15.8	302 26.7	22.7	287 20.1	31.7	214 57.9	09.9	61 29.4	48.0
S 09	296 18.3	317 26.2	21.6	302 20.8	30.9	230 00.1	10.0	76 31.9	47.9
U 10	311 20.8	332 25.7	20.4	317 21.5	30.1	245 02.3	10.0	91 34.4	47.9
N 11	326 23.2	347 25.2	19.3	332 22.1	29.3	260 04.5	10.1	106 36.9	47.9
D 12	341 25.7	2 24.7	S10 18.2	347 22.8	S 3 28.6	275 06.7	N21 10.1	121 39.5	S12 47.9
A 13	356 28.1	17 24.2	17.1	2 23.5	27.8	290 08.9	10.2	136 42.0	47.8
Y 14	11 30.6	32 23.8	15.9	17 24.2	27.0	305 11.1	10.2	151 44.5	47.8
15	26 33.1	47 23.3	14.8	32 24.8	26.2	320 13.3	10.3	166 47.0	47.8
16	41 35.5	62 22.8	13.7	47 25.5	25.4	335 15.5	10.3	181 49.5	47.8
17	56 38.0	77 22.3	12.5	62 26.2	24.6	350 17.7	10.4	196 52.0	47.7
18	71 40.5	92 21.8	S10 11.4	77 26.9	S 3 23.8	5 19.9	N21 10.4	211 54.5	S12 47.7
19	86 42.9	107 21.3	10.2	92 27.5	23.0	20 22.1	10.5	226 57.1	47.7
20	101 45.4	122 20.8	09.1	107 28.2	22.2	35 24.3	10.5	241 59.6	47.7
21	116 47.9	137 20.3	08.0	122 28.9	21.4	50 26.5	10.6	257 02.1	47.6
22	131 50.3	152 19.8	06.8	137 29.6	20.6	65 28.7	10.6	272 04.6	47.6
23	146 52.8	167 19.3	05.7	152 30.2	19.8	80 30.9	10.6	287 07.1	47.6
4 00	161 55.3	182 18.9	S10 04.6	167 30.9	S 3 19.0	95 33.1	N21 10.7	302 09.6	S12 47.6
01	176 57.7	197 18.4	03.4	182 31.6	18.3	110 35.3	10.7	317 12.2	47.5
02	192 00.2	212 17.9	02.3	197 32.2	17.5	125 37.5	10.8	332 14.7	47.5
03	207 02.6	227 17.4	01.1	212 32.9	16.7	140 39.7	10.8	347 17.2	47.5
04	222 05.1	242 16.9	10 00.0	227 33.6	15.9	155 41.9	10.9	2 19.7	47.5
05	237 07.6	257 16.4	9 58.9	242 34.3	15.1	170 44.1	10.9	17 22.2	47.4
06	252 10.0	272 15.9	S 9 57.7	257 34.9	S 3 14.3	185 46.3	N21 11.0	32 24.7	S12 47.4
07	267 12.5	287 15.5	56.6	272 35.6	13.5	200 48.5	11.0	47 27.3	47.4
08	282 15.0	302 15.0	55.4	287 36.3	12.7	215 50.7	11.1	62 29.8	47.3
M 09	297 17.4	317 14.5	54.3	302 37.0	11.9	230 52.9	11.1	77 32.3	47.3
O 10	312 19.9	332 14.0	53.2	317 37.6	11.1	245 55.1	11.2	92 34.8	47.3
N 11	327 22.4	347 13.5	52.0	332 38.3	10.3	260 57.2	11.2	107 37.3	47.3
D 12	342 24.8	2 13.0	S 9 50.9	347 39.0	S 3 09.5	275 59.4	N21 11.3	122 39.8	S12 47.2
A 13	357 27.3	17 12.6	49.7	2 39.7	08.7	291 01.6	11.3	137 42.4	47.2
Y 14	12 29.8	32 12.1	48.6	17 40.3	08.0	306 03.8	11.4	152 44.9	47.2
15	27 32.2	47 11.6	47.4	32 41.0	07.2	321 06.0	11.4	167 47.4	47.2
16	42 34.7	62 11.1	46.3	47 41.7	06.4	336 08.2	11.5	182 49.9	47.1
17	57 37.1	77 10.6	45.1	62 42.4	05.6	351 10.4	11.5	197 52.4	47.1
18	72 39.6	92 10.1	S 9 44.0	77 43.1	S 3 04.8	6 12.6	N21 11.6	212 55.0	S12 47.1
19	87 42.1	107 09.7	42.9	92 43.7	04.0	21 14.8	11.6	227 57.5	47.1
20	102 44.5	122 09.2	41.7	107 44.4	03.2	36 17.0	11.7	243 00.0	47.0
21	117 47.0	137 08.7	40.6	122 45.1	02.4	51 19.2	11.7	258 02.5	47.0
22	132 49.5	152 08.2	39.4	137 45.8	01.6	66 21.3	11.8	273 05.0	47.0
23	147 51.9	167 07.7	38.3	152 46.4	00.8	81 23.5	11.8	288 07.6	46.9
Mer.Pass.	h m 13 14.1	v −0.5	d 1.1	v 0.7	d 0.8	v 2.2	d 0.0	v 2.5	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.7	S40 15.4
Achernar	335 27.4	S57 10.4
Acrux	173 08.8	S63 10.3
Adhara	255 12.5	S28 59.8
Aldebaran	290 49.6	N16 32.0
Alioth	166 20.4	N55 53.0
Alkaid	152 58.7	N49 14.6
Al Na'ir	27 44.4	S46 53.7
Alnilam	275 46.5	S 1 11.9
Alphard	217 56.0	S 8 43.2
Alphecca	126 11.1	N26 40.0
Alpheratz	357 44.0	N29 09.8
Altair	62 08.6	N 8 54.2
Ankaa	353 16.3	S42 14.2
Antares	112 26.4	S26 27.5
Arcturus	145 55.7	N19 06.6
Atria	107 28.5	S69 02.7
Avior	234 17.6	S59 33.5
Bellatrix	278 32.1	N 6 21.5
Betelgeuse	271 01.4	N 7 24.3
Canopus	263 56.0	S52 42.6
Capella	280 34.6	N46 00.7
Deneb	49 32.0	N45 19.6
Denebola	182 33.5	N14 29.7
Diphda	348 56.4	S17 55.0
Dubhe	193 51.3	N61 40.6
Elnath	278 12.8	N28 37.0
Eltanin	90 46.4	N51 29.0
Enif	33 47.6	N 9 56.1
Fomalhaut	15 24.5	S29 33.1
Gacrux	172 00.5	S57 11.2
Gienah	175 52.2	S17 37.1
Hadar	148 47.7	S60 26.0
Hamal	328 01.2	N23 31.5
Kaus Aust.	83 44.2	S34 22.5
Kochab	137 19.5	N74 05.8
Markab	13 38.8	N15 16.6
Menkar	314 15.4	N 4 08.3
Menkent	148 07.5	S36 26.0
Miaplacidus	221 38.8	S69 46.6
Mirfak	308 40.8	N49 54.6
Nunki	75 58.7	S26 16.6
Peacock	53 20.0	S56 41.3
Pollux	243 27.7	N27 59.5
Procyon	244 59.7	N 5 11.2
Rasalhague	96 06.7	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.2	S 8 11.5
Rigil Kent.	139 51.6	S60 53.1
Sabik	102 12.8	S15 44.4
Schedar	349 41.2	N56 36.7
Shaula	96 22.2	S37 06.6
Sirius	258 33.7	S16 44.4
Spica	158 31.2	S11 13.9
Suhail	222 52.2	S43 29.5
Vega	80 39.3	N38 47.6
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	21 34.6	11 50
Mars	6 18.6	12 50
Jupiter	293 44.2	17 39
Saturn	140 13.2	3 55

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 2	Moonrise 3	Moonrise 4	Moonrise 5
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
2 00	176 57.4	S 7 13.5	308 56.2	8.8	S14 01.4	9.0	58.7	N 72	04 59	06 17	07 25	00 53	03 49	▬	▬
01	191 57.5	12.6	323 24.0	8.8	14 10.4	8.9	58.7	N 70	05 05	06 16	07 17	00 22	02 26	04 55	▬
02	206 57.6	11.6	337 51.8	8.6	14 19.3	8.9	58.7	68	05 10	06 15	07 11	25 47	01 47	03 31	04 53
03	221 57.8	10.7	352 19.4	8.7	14 28.2	8.7	58.7	66	05 14	06 13	07 05	25 20	01 20	02 53	04 07
04	236 57.9	09.7	6 47.1	8.5	14 36.9	8.7	58.7	64	05 18	06 12	07 00	25 00	01 00	02 26	03 38
05	251 58.0	08.7	21 14.6	8.5	14 45.6	8.6	58.7	62	05 20	06 12	06 56	24 44	00 44	02 06	03 15
06	266 58.1	S 7 07.8	35 42.1	8.5	S14 54.2	8.5	58.8	60	05 23	06 11	06 52	24 30	00 30	01 49	02 57
07	281 58.3	06.8	50 09.6	8.3	15 02.7	8.4	58.8	N 58	05 24	06 10	06 49	24 18	00 18	01 35	02 42
S 08	296 58.4	05.9	64 36.9	8.4	15 11.1	8.3	58.8	56	05 26	06 09	06 46	24 08	00 08	01 23	02 29
A 09	311 58.5	04.9	79 04.3	8.2	15 19.4	8.3	58.8	54	05 27	06 08	06 44	23 59	25 12	01 12	02 17
T 10	326 58.6	04.0	93 31.5	8.3	15 27.7	8.1	58.8	52	05 28	06 07	06 41	23 51	25 03	01 03	02 08
U 11	341 58.8	03.0	107 58.8	8.1	15 35.8	8.1	58.8	50	05 29	06 07	06 39	23 44	24 54	00 54	01 59
R 12	356 58.9	S 7 02.1	122 25.9	8.1	S15 43.9	7.9	58.8	45	05 31	06 05	06 34	23 29	24 36	00 36	01 40
D 13	11 59.0	01.1	136 53.0	8.1	15 51.8	7.9	58.8	N 40	05 32	06 03	06 30	23 16	24 22	00 22	01 24
A 14	26 59.2	7 00.1	151 20.1	8.0	15 59.7	7.8	58.8	35	05 32	06 01	06 27	23 05	24 10	00 10	01 11
Y 15	41 59.3	6 59.2	165 47.1	7.9	16 07.5	7.6	58.8	30	05 32	06 00	06 24	22 56	23 59	25 00	01 00
16	56 59.4	58.2	180 14.0	7.9	16 15.1	7.6	58.9	20	05 31	05 56	06 18	22 40	23 41	24 41	00 41
17	71 59.6	57.3	194 40.9	7.8	16 22.7	7.5	58.9	N 10	05 28	05 52	06 13	22 26	23 25	24 24	00 24
18	86 59.7	S 6 56.3	209 07.7	7.7	S16 30.2	7.4	58.9	0	05 24	05 48	06 09	22 13	23 10	24 08	00 08
19	101 59.8	55.4	223 34.4	7.7	16 37.6	7.2	58.9	S 10	05 18	05 43	06 04	22 01	22 55	23 53	24 52
20	116 59.9	54.4	238 01.1	7.7	16 44.8	7.2	58.9	20	05 10	05 36	05 58	21 47	22 40	23 36	24 35
21	132 00.1	53.4	252 27.8	7.6	16 52.0	7.1	58.9	30	05 00	05 28	05 52	21 32	22 22	23 17	24 16
22	147 00.2	52.5	266 54.4	7.5	16 59.1	7.0	58.9	35	04 53	05 23	05 49	21 23	22 11	23 06	24 05
23	162 00.3	51.5	281 20.9	7.5	17 06.1	6.9	58.9	40	04 44	05 17	05 45	21 12	21 59	22 53	23 53
3 00	177 00.5	S 6 50.6	295 47.4	7.5	S17 13.0	6.7	58.9	45	04 34	05 10	05 40	21 00	21 45	22 38	23 38
01	192 00.6	49.6	310 13.9	7.4	17 19.7	6.7	58.9	S 50	04 21	05 01	05 34	20 46	21 28	22 20	23 20
02	207 00.7	48.7	324 40.3	7.3	17 26.4	6.5	59.0	52	04 14	04 57	05 32	20 39	21 20	22 11	23 11
03	222 00.9	47.7	339 06.6	7.3	17 32.9	6.5	59.0	54	04 07	04 52	05 29	20 32	21 12	22 01	23 02
04	237 01.0	46.7	353 32.9	7.2	17 39.4	6.3	59.0	56	03 58	04 47	05 25	20 24	21 02	21 50	22 51
05	252 01.1	45.8	7 59.1	7.2	17 45.7	6.2	59.0	58	03 49	04 40	05 22	20 14	20 50	21 38	22 38
06	267 01.3	S 6 44.8	22 25.3	7.1	S17 51.9	6.2	59.0	S 60	03 37	04 34	05 18	20 04	20 37	21 23	22 24
07	282 01.4	43.9	36 51.4	7.1	17 58.1	6.0	59.0								
08	297 01.5	42.9	51 17.5	7.0	18 04.1	5.8	59.0								
S 09	312 01.7	41.9	65 43.5	7.0	18 09.9	5.8	59.0								
U 10	327 01.8	41.0	80 09.5	6.9	18 15.7	5.7	59.0								
N 11	342 01.9	40.0	94 35.4	6.9	18 21.4	5.5	59.0								
D 12	357 02.1	S 6 39.1	109 01.3	6.9	S18 26.9	5.5	59.0								
A 13	12 02.2	38.1	123 27.2	6.7	18 32.4	5.3	59.0								
Y 14	27 02.3	37.1	137 52.9	6.8	18 37.7	5.2	59.1								
15	42 02.5	36.2	152 18.7	6.7	18 42.9	5.1	59.1								
16	57 02.6	35.2	166 44.4	6.6	18 48.0	4.9	59.1								
17	72 02.7	34.3	181 10.0	6.7	18 52.9	4.9	59.1								
18	87 02.9	S 6 33.3	195 35.7	6.5	S18 57.8	4.7	59.1								
19	102 03.0	32.3	210 01.2	6.6	19 02.5	4.6	59.1								
20	117 03.1	31.4	224 26.8	6.5	19 07.1	4.5	59.1								
21	132 03.3	30.4	238 52.3	6.4	19 11.6	4.3	59.1								
22	147 03.4	29.5	253 17.7	6.4	19 15.9	4.2	59.1								
23	162 03.5	28.5	267 43.1	6.4	19 20.1	4.2	59.1								
4 00	177 03.7	S 6 27.5	282 08.5	6.3	S19 24.3	3.9	59.1								
01	192 03.8	26.6	296 33.8	6.3	19 28.2	3.9	59.1								
02	207 03.9	25.6	310 59.1	6.3	19 32.1	3.7	59.1								
03	222 04.1	24.6	325 24.4	6.2	19 35.8	3.6	59.1								
04	237 04.2	23.7	339 49.6	6.2	19 39.4	3.5	59.1								
05	252 04.4	22.7	354 14.8	6.2	19 42.9	3.3	59.1								
06	267 04.5	S 6 21.8	8 40.0	6.1	S19 46.2	3.3	59.2								
07	282 04.6	20.8	23 05.1	6.1	19 49.5	3.0	59.2								
M 08	297 04.8	19.8	37 30.2	6.1	19 52.5	3.0	59.2								
O 09	312 04.9	18.9	51 55.3	6.0	19 55.5	2.8	59.2								
N 10	327 05.0	17.9	66 20.3	6.0	19 58.3	2.7	59.2								
D 11	342 05.2	16.9	80 45.3	6.0	20 01.0	2.6	59.2								
A 12	357 05.3	S 6 16.0	95 10.3	6.0	S20 03.6	2.4	59.2								
Y 13	12 05.5	15.0	109 35.3	5.9	20 06.0	2.3	59.2								
14	27 05.6	14.0	124 00.2	5.9	20 08.3	2.2	59.2								
15	42 05.7	13.1	138 25.1	5.9	20 10.5	2.1	59.2								
16	57 05.9	12.1	152 50.0	5.9	20 12.6	1.9	59.2								
17	72 06.0	11.2	167 14.9	5.8	20 14.5	1.7	59.2								
18	87 06.1	S 6 10.2	181 39.7	5.9	S20 16.2	1.7	59.2								
19	102 06.3	09.2	196 04.6	5.8	20 17.9	1.5	59.2								
20	117 06.4	08.3	210 29.4	5.8	20 19.4	1.4	59.2								
21	132 06.6	07.3	224 54.2	5.8	20 20.8	1.2	59.2								
22	147 06.7	06.3	239 19.0	5.7	20 22.0	1.1	59.2								
23	162 06.8	05.4	253 43.7	5.8	S20 23.1	1.0	59.2								
	SD 16.2	d 1.0	SD	16.0		16.1									

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 2	Moonset 3	Moonset 4	Moonset 5
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 00	18 09	19 28	05 54	04 53	▬	▬
N 70	17 08	18 10	19 21	06 26	06 17	05 47	▬
68	17 15	18 11	19 16	06 50	06 56	07 11	07 52
66	17 20	18 12	19 11	07 09	07 24	07 50	08 37
64	17 25	18 13	19 08	07 24	07 45	08 17	09 07
62	17 29	18 14	19 05	07 37	08 02	08 38	09 30
60	17 33	18 14	19 03	07 48	08 16	08 55	09 48
N 58	17 36	18 15	19 01	07 57	08 28	09 09	10 03
56	17 39	18 16	18 59	08 06	08 39	09 22	10 16
54	17 41	18 17	18 58	08 13	08 48	09 32	10 27
52	17 43	18 17	18 56	08 20	08 57	09 42	10 37
50	17 46	18 18	18 55	08 26	09 04	09 51	10 46
45	17 50	18 20	18 54	08 39	09 20	10 09	11 05
N 40	17 54	18 21	18 53	08 49	09 33	10 24	11 20
35	17 57	18 23	18 52	08 59	09 45	10 36	11 33
30	18 00	18 24	18 52	09 07	09 55	10 47	11 45
20	18 06	18 28	18 54	09 21	10 12	11 06	12 04
N 10	18 11	18 32	18 56	09 33	10 26	11 22	12 21
0	18 15	18 36	19 00	09 45	10 40	11 38	12 36
S 10	18 20	18 41	19 06	09 56	10 54	11 53	12 52
20	18 25	18 47	19 13	10 09	11 09	12 10	13 09
30	18 31	18 55	19 23	10 23	11 26	12 28	13 28
35	18 34	19 00	19 30	10 31	11 36	12 39	13 39
40	18 38	19 06	19 38	10 41	11 48	12 52	13 52
45	18 43	19 13	19 49	10 52	12 01	13 07	14 07
S 50	18 49	19 22	20 02	11 05	12 17	13 25	14 25
52	18 51	19 26	20 08	11 11	12 25	13 34	14 34
54	18 54	19 30	20 15	11 18	12 34	13 43	14 44
56	18 57	19 36	20 24	11 26	12 43	13 54	14 55
58	19 01	19 42	20 33	11 35	12 54	14 07	15 07
S 60	19 04	19 48	20 44	11 45	13 07	14 21	15 22

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
2	12 11	12 05	12 12	03 32	15 59	20	76
3	11 58	11 52	12 12	04 27	16 55	21	66
4	11 46	11 39	12 12	05 24	17 53	22	55

UT	ARIES	VENUS −3.9	MARS +1.2	JUPITER −2.3	SATURN +0.4
	GHA	GHA Dec	GHA Dec	GHA Dec	GHA Dec
d h	° ′	° ′ ° ′	° ′ ° ′	° ′ ° ′	° ′ ° ′
5 00	162 54.4	182 07.3 S 9 37.1	167 47.1 S 3 00.0	96 25.7 N21 11.9	303 10.1 S12 46.9
01	177 56.9	197 06.8 36.0	182 47.8 2 59.2	111 27.9 11.9	318 12.6 46.9
02	192 59.3	212 06.3 34.8	197 48.5 58.4	126 30.1 12.0	333 15.1 46.9
03	208 01.8	227 05.8 . . 33.7	212 49.1 . . 57.6	141 32.3 . . 12.0	348 17.6 . . 46.8
04	223 04.2	242 05.4 32.5	227 49.8 56.8	156 34.5 12.1	3 20.2 46.8
05	238 06.7	257 04.9 31.4	242 50.5 56.1	171 36.7 12.1	18 22.7 46.8
06	253 09.2	272 04.4 S 9 30.2	257 51.2 S 2 55.3	186 38.8 N21 12.2	33 25.2 S12 46.8
07	268 11.6	287 03.9 29.1	272 51.8 54.5	201 41.0 12.2	48 27.7 46.7
08	283 14.1	302 03.5 27.9	287 52.5 53.7	216 43.2 12.3	63 30.2 46.7
09	298 16.6	317 03.0 . . 26.8	302 53.2 . . 52.9	231 45.4 . . 12.3	78 32.8 . . 46.7
10	313 19.0	332 02.5 25.6	317 53.9 52.1	246 47.6 12.4	93 35.3 46.6
11	328 21.5	347 02.0 24.5	332 54.6 51.3	261 49.8 12.4	108 37.8 46.6
12	343 24.0	2 01.6 S 9 23.3	347 55.2 S 2 50.5	276 52.0 N21 12.5	123 40.3 S12 46.6
13	358 26.4	17 01.1 22.1	2 55.9 49.7	291 54.2 12.5	138 42.9 46.6
14	13 28.9	32 00.6 21.0	17 56.6 48.9	306 56.3 12.6	153 45.4 46.5
15	28 31.4	47 00.1 . . 19.8	32 57.3 . . 48.1	321 58.5 . . 12.6	168 47.9 . . 46.5
16	43 33.8	61 59.7 18.7	47 57.9 47.3	337 00.7 12.7	183 50.4 46.5
17	58 36.3	76 59.2 17.5	62 58.6 46.5	352 02.9 12.7	198 52.9 46.4
18	73 38.7	91 58.7 S 9 16.4	77 59.3 S 2 45.7	7 05.1 N21 12.8	213 55.5 S12 46.4
19	88 41.2	106 58.2 15.2	93 00.0 44.9	22 07.3 12.8	228 58.0 46.4
20	103 43.7	121 57.8 14.0	108 00.7 44.2	37 09.4 12.9	244 00.5 46.4
21	118 46.1	136 57.3 . . 12.9	123 01.3 . . 43.4	52 11.6 . . 12.9	259 03.0 . . 46.3
22	133 48.6	151 56.8 11.7	138 02.0 42.6	67 13.8 13.0	274 05.6 46.3
23	148 51.1	166 56.4 10.6	153 02.7 41.8	82 16.0 13.0	289 08.1 46.3
6 00	163 53.5	181 55.9 S 9 09.4	168 03.4 S 2 41.0	97 18.2 N21 13.1	304 10.6 S12 46.3
01	178 56.0	196 55.4 08.3	183 04.0 40.2	112 20.3 13.1	319 13.1 46.2
02	193 58.5	211 54.9 07.1	198 04.7 39.4	127 22.5 13.2	334 15.7 46.2
03	209 00.9	226 54.5 . . 05.9	213 05.4 . . 38.6	142 24.7 . . 13.2	349 18.2 . . 46.2
04	224 03.4	241 54.0 04.8	228 06.1 37.8	157 26.9 13.3	4 20.7 46.1
05	239 05.9	256 53.5 03.6	243 06.8 37.0	172 29.1 13.3	19 23.2 46.1
06	254 08.3	271 53.1 S 9 02.4	258 07.4 S 2 36.2	187 31.2 N21 13.4	34 25.8 S12 46.1
07	269 10.8	286 52.6 01.3	273 08.1 35.4	202 33.4 13.4	49 28.3 46.1
08	284 13.2	301 52.1 9 00.1	288 08.8 34.6	217 35.6 13.5	64 30.8 46.0
09	299 15.7	316 51.7 8 59.0	303 09.5 . . 33.8	232 37.8 . . 13.5	79 33.3 . . 46.0
10	314 18.2	331 51.2 57.8	318 10.2 33.0	247 40.0 13.6	94 35.9 46.0
11	329 20.6	346 50.7 56.6	333 10.8 32.2	262 42.1 13.6	109 38.4 45.9
12	344 23.1	1 50.3 S 8 55.5	348 11.5 S 2 31.5	277 44.3 N21 13.7	124 40.9 S12 45.9
13	359 25.6	16 49.8 54.3	3 12.2 30.7	292 46.5 13.7	139 43.4 45.9
14	14 28.0	31 49.3 53.1	18 12.9 29.9	307 48.7 13.8	154 46.0 45.8
15	29 30.5	46 48.9 . . 52.0	33 13.5 . . 29.1	322 50.9 . . 13.8	169 48.5 . . 45.8
16	44 33.0	61 48.4 50.8	48 14.2 28.3	337 53.0 13.9	184 51.0 45.8
17	59 35.4	76 47.9 49.6	63 14.9 27.5	352 55.2 13.9	199 53.5 45.8
18	74 37.9	91 47.5 S 8 48.5	78 15.6 S 2 26.7	7 57.4 N21 14.0	214 56.1 S12 45.7
19	89 40.4	106 47.0 47.3	93 16.3 25.9	22 59.6 14.0	229 58.6 45.7
20	104 42.8	121 46.6 46.1	108 16.9 25.1	38 01.7 14.1	245 01.1 45.7
21	119 45.3	136 46.1 . . 45.0	123 17.6 . . 24.3	53 03.9 . . 14.1	260 03.7 . . 45.6
22	134 47.7	151 45.6 43.8	138 18.3 23.5	68 06.1 14.2	275 06.2 45.6
23	149 50.2	166 45.2 42.6	153 19.0 22.7	83 08.3 14.2	290 08.7 45.6
7 00	164 52.7	181 44.7 S 8 41.5	168 19.7 S 2 21.9	98 10.4 N21 14.3	305 11.2 S12 45.6
01	179 55.1	196 44.2 40.3	183 20.3 21.1	113 12.6 14.4	320 13.8 45.5
02	194 57.6	211 43.8 39.1	198 21.0 20.3	128 14.8 14.4	335 16.3 45.5
03	210 00.1	226 43.3 . . 38.0	213 21.7 . . 19.5	143 17.0 . . 14.5	350 18.8 . . 45.5
04	225 02.5	241 42.9 36.8	228 22.4 18.8	158 19.1 14.5	5 21.4 45.4
05	240 05.0	256 42.4 35.6	243 23.1 18.0	173 21.3 14.6	20 23.9 45.4
06	255 07.5	271 41.9 S 8 34.4	258 23.7 S 2 17.2	188 23.5 N21 14.6	35 26.4 S12 45.4
07	270 09.9	286 41.5 33.3	273 24.4 16.4	203 25.7 14.7	50 28.9 45.3
08	285 12.4	301 41.0 32.1	288 25.1 15.6	218 27.8 14.7	65 31.5 45.3
09	300 14.8	316 40.6 . . 30.9	303 25.8 . . 14.8	233 30.0 . . 14.8	80 34.0 . . 45.3
10	315 17.3	331 40.1 29.8	318 26.5 14.0	248 32.2 14.8	95 36.5 45.3
11	330 19.8	346 39.6 28.6	333 27.2 13.2	263 34.3 14.9	110 39.1 45.2
12	345 22.2	1 39.2 S 8 27.4	348 27.8 S 2 12.4	278 36.5 N21 14.9	125 41.6 S12 45.2
13	0 24.7	16 38.7 26.2	3 28.5 11.6	293 38.7 15.0	140 44.1 45.2
14	15 27.2	31 38.3 25.1	18 29.2 10.8	308 40.9 15.0	155 46.7 45.1
15	30 29.6	46 37.8 . . 23.9	33 29.9 . . 10.0	323 43.0 . . 15.1	170 49.2 . . 45.1
16	45 32.1	61 37.4 22.7	48 30.6 09.2	338 45.2 15.1	185 51.7 45.1
17	60 34.6	76 36.9 21.5	63 31.2 08.4	353 47.4 15.2	200 54.2 45.0
18	75 37.0	91 36.4 S 8 20.4	78 31.9 S 2 07.6	8 49.5 N21 15.2	215 56.8 S12 45.0
19	90 39.5	106 36.0 19.2	93 32.6 06.8	23 51.7 15.3	230 59.3 45.0
20	105 42.0	121 35.5 18.0	108 33.3 06.0	38 53.9 15.3	246 01.8 45.0
21	120 44.4	136 35.1 . . 16.8	123 34.0 . . 05.3	53 56.0 . . 15.4	261 04.4 . . 44.9
22	135 46.9	151 34.6 15.6	138 34.6 04.5	68 58.2 15.4	276 06.9 44.9
23	150 49.3	166 34.2 14.5	153 35.3 03.7	84 00.4 15.5	291 09.4 44.9
Mer.Pass.	h m 13 02.3	v −0.5 d 1.2	v 0.7 d 0.8	v 2.2 d 0.1	v 2.5 d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.7	S40 15.4
Achernar	335 27.4	S57 10.4
Acrux	173 08.8	S63 10.4
Adhara	255 12.5	S28 59.8
Aldebaran	290 49.6	N16 32.0
Alioth	166 20.4	N55 53.0
Alkaid	152 58.7	N49 14.6
Al Na'ir	27 44.4	S46 53.7
Alnilam	275 46.5	S 1 11.9
Alphard	217 56.0	S 8 43.3
Alphecca	126 11.0	N26 40.0
Alpheratz	357 44.0	N29 09.8
Altair	62 08.6	N 8 54.2
Ankaa	353 16.3	S42 14.2
Antares	112 26.4	S26 27.5
Arcturus	145 55.7	N19 06.6
Atria	107 28.4	S69 02.7
Avior	234 17.6	S59 33.5
Bellatrix	278 32.1	N 6 21.5
Betelgeuse	271 01.4	N 7 24.3
Canopus	263 56.0	S52 42.6
Capella	280 34.7	N46 00.7
Deneb	49 31.9	N45 19.6
Denebola	182 33.5	N14 29.7
Diphda	348 56.4	S17 55.0
Dubhe	193 51.3	N61 40.6
Elnath	278 12.8	N28 37.0
Eltanin	90 46.3	N51 29.0
Enif	33 47.6	N 9 56.1
Fomalhaut	15 24.5	S29 33.1
Gacrux	172 00.5	S57 11.3
Gienah	175 52.2	S17 37.1
Hadar	148 47.7	S60 26.1
Hamal	328 01.2	N23 31.5
Kaus Aust.	83 44.2	S34 22.5
Kochab	137 19.4	N74 05.8
Markab	13 38.8	N15 16.6
Menkar	314 15.4	N 4 08.3
Menkent	148 07.5	S36 26.1
Miaplacidus	221 38.8	S69 46.6
Mirfak	308 40.8	N49 54.6
Nunki	75 58.7	S26 16.6
Peacock	53 20.0	S56 41.3
Pollux	243 27.7	N27 59.5
Procyon	244 59.7	N 5 11.2
Rasalhague	96 06.7	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.2	S 8 11.5
Rigil Kent.	139 51.5	S60 53.2
Sabik	102 12.7	S15 44.4
Schedar	349 41.2	N56 36.7
Shaula	96 22.2	S37 06.6
Sirius	258 33.7	S16 44.4
Spica	158 31.2	S11 13.9
Suhail	222 52.2	S43 29.5
Vega	80 39.2	N38 47.6
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	18 02.4	11 53
Mars	4 09.8	12 47
Jupiter	293 24.6	17 28
Saturn	140 17.1	3 43

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON				Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 5	Moonrise 6	Moonrise 7	Moonrise 8
	GHA	Dec	GHA	v	Dec	d HP								
d h	° ′	° ′	° ′	′	° ′	′ ′	°	h m	h m	h m	h m	h m	h m	h m
5 00	177 07.0	S 6 04.4	268 08.5	5.7	S20 24.1	0.8 59.2	N 72	04 43	06 02	07 10	▬	▬	07 57	06 53
01	192 07.1	03.4	282 33.2	5.8	20 24.9	0.7 59.2	N 70	04 52	06 02	07 03	▬	07 01	06 30	06 20
02	207 07.3	02.5	296 58.0	5.7	20 25.6	0.6 59.2	68	04 58	06 03	06 58	04 53	05 34	05 50	05 56
03	222 07.4 . .	01.5	311 22.7	5.7	20 26.2	0.4 59.2	66	05 03	06 02	06 53	04 07	04 56	05 22	05 37
04	237 07.6	6 00.5	325 47.4	5.7	20 26.6	0.3 59.2	64	05 07	06 02	06 50	03 38	04 28	05 01	05 22
05	252 07.7	5 59.6	340 12.1	5.7	20 26.9	0.1 59.2	62	05 11	06 02	06 46	03 15	04 07	04 44	05 09
06	267 07.8	S 5 58.6	354 36.8	5.7	S20 27.0	0.1 59.2	60	05 14	06 02	06 43	02 57	03 50	04 30	04 58
07	282 08.0	57.6	9 01.5	5.8	20 27.1	0.2 59.3	N 58	05 16	06 02	06 41	02 42	03 36	04 17	04 49
08	297 08.1	56.7	23 26.3	5.6	20 26.9	0.2 59.3	56	05 18	06 01	06 39	02 29	03 24	04 07	04 41
09	312 08.3 . .	55.7	37 50.9	5.7	20 26.7	0.4 59.3	54	05 20	06 01	06 36	02 17	03 13	03 57	04 33
10	327 08.4	54.7	52 15.6	5.7	20 26.3	0.5 59.3	52	05 22	06 01	06 35	02 08	03 03	03 49	04 26
11	342 08.5	53.8	66 40.3	5.7	20 25.8	0.7 59.3	50	05 23	06 01	06 33	01 59	02 55	03 41	04 20
12	357 08.7	S 5 52.8	81 05.0	5.7	S20 25.1	0.8 59.3	45	05 26	06 00	06 29	01 40	02 36	03 25	04 07
13	12 08.8	51.8	95 29.7	5.8	20 24.3	0.9 59.3	N 40	05 27	05 59	06 26	01 24	02 21	03 12	03 57
14	27 09.0	50.9	109 54.5	5.7	20 23.4	1.1 59.3	35	05 28	05 58	06 23	01 11	02 09	03 01	03 47
15	42 09.1 . .	49.9	124 19.2	5.7	20 22.3	1.2 59.3	30	05 29	05 56	06 20	01 00	01 58	02 51	03 39
16	57 09.3	48.9	138 43.9	5.7	20 21.1	1.3 59.3	20	05 28	05 54	06 16	00 41	01 39	02 34	03 25
17	72 09.4	48.0	153 08.6	5.8	20 19.8	1.5 59.3	N 10	05 26	05 51	06 12	00 24	01 23	02 19	03 13
18	87 09.5	S 5 47.0	167 33.4	5.7	S20 18.3	1.6 59.3	0	05 23	05 47	06 08	00 08	01 07	02 05	03 01
19	102 09.7	46.0	181 58.1	5.8	20 16.7	1.7 59.3	S 10	05 18	05 43	06 04	24 52	00 52	01 51	02 50
20	117 09.8	45.1	196 22.9	5.7	20 15.0	1.9 59.3	20	05 11	05 37	06 00	24 35	00 35	01 36	02 37
21	132 10.0 . .	44.1	210 47.6	5.8	20 13.1	2.0 59.3	30	05 02	05 30	05 54	24 16	00 16	01 19	02 23
22	147 10.1	43.1	225 12.4	5.8	20 11.1	2.1 59.3	35	04 56	05 26	05 51	24 05	00 05	01 09	02 15
23	162 10.3	42.1	239 37.2	5.8	20 09.0	2.3 59.3	40	04 48	05 21	05 48	23 53	24 58	00 58	02 05
6 00	177 10.4	S 5 41.2	254 02.0	5.9	S20 06.7	2.4 59.3	45	04 39	05 14	05 44	23 38	24 44	00 44	01 54
01	192 10.6	40.2	268 26.9	5.8	20 04.3	2.6 59.3	S 50	04 26	05 06	05 39	23 20	24 28	00 28	01 41
02	207 10.7	39.2	282 51.7	5.9	20 01.7	2.6 59.3	52	04 20	05 02	05 37	23 11	24 20	00 20	01 34
03	222 10.8 . .	38.3	297 16.6	5.9	19 59.1	2.8 59.3	54	04 14	04 58	05 34	23 02	24 11	00 11	01 27
04	237 11.0	37.3	311 41.5	5.9	19 56.3	3.0 59.3	56	04 06	04 53	05 32	22 51	24 02	00 02	01 20
05	252 11.1	36.3	326 06.4	6.0	19 53.3	3.0 59.3	58	03 57	04 48	05 29	22 38	23 51	25 11	01 11
06	267 11.3	S 5 35.4	340 31.4	5.9	S19 50.3	3.2 59.3	S 60	03 47	04 42	05 25	22 24	23 38	25 01	01 01
07	282 11.4	34.4	354 56.3	6.0	19 47.1	3.4 59.3								
08	297 11.6	33.4	9 21.3	6.0	19 43.7	3.4 59.3								
09	312 11.7 . .	32.5	23 46.3	6.1	19 40.3	3.6 59.3								
10	327 11.9	31.5	38 11.4	6.1	19 36.7	3.7 59.3								
11	342 12.0	30.5	52 36.5	6.1	19 33.0	3.9 59.3								
12	357 12.2	S 5 29.5	67 01.6	6.1	S19 29.1	3.9 59.3								
13	12 12.3	28.6	81 26.7	6.2	19 25.2	4.1 59.3								
14	27 12.4	27.6	95 51.9	6.1	19 21.1	4.2 59.3								
15	42 12.6 . .	26.6	110 17.0	6.3	19 16.9	4.4 59.3								
16	57 12.7	25.7	124 42.3	6.2	19 12.5	4.5 59.2								
17	72 12.9	24.7	139 07.5	6.3	19 08.0	4.6 59.2								
18	87 13.0	S 5 23.7	153 32.8	6.4	S19 03.4	4.7 59.2								
19	102 13.2	22.7	167 58.2	6.4	18 58.7	4.8 59.2								
20	117 13.3	21.8	182 23.6	6.4	18 53.9	5.0 59.2								
21	132 13.5 . .	20.8	196 49.0	6.4	18 48.9	5.1 59.2								
22	147 13.6	19.8	211 14.4	6.5	18 43.8	5.2 59.2								
23	162 13.8	18.9	225 39.9	6.5	18 38.6	5.3 59.2								
7 00	177 13.9	S 5 17.9	240 05.4	6.6	S18 33.3	5.5 59.2								
01	192 14.1	16.9	254 31.0	6.6	18 27.8	5.5 59.2								
02	207 14.2	15.9	268 56.6	6.7	18 22.3	5.7 59.2								
03	222 14.4 . .	15.0	283 22.3	6.7	18 16.6	5.8 59.2								
04	237 14.5	14.0	297 48.0	6.7	18 10.8	5.9 59.2								
05	252 14.7	13.0	312 13.7	6.8	18 04.9	6.1 59.2								
06	267 14.8	S 5 12.0	326 39.5	6.8	S17 58.8	6.1 59.2								
07	282 15.0	11.1	341 05.3	6.9	17 52.7	6.3 59.2								
08	297 15.1	10.1	355 31.2	6.9	17 46.4	6.3 59.2								
09	312 15.3 . .	09.1	9 57.1	7.0	17 40.1	6.5 59.2								
10	327 15.4	08.2	24 23.1	7.0	17 33.6	6.6 59.2								
11	342 15.6	07.2	38 49.1	7.1	17 27.0	6.7 59.2								
12	357 15.7	S 5 06.2	53 15.2	7.1	S17 20.3	6.8 59.2								
13	12 15.9	05.2	67 41.3	7.2	17 13.5	6.9 59.2								
14	27 16.0	04.3	82 07.5	7.2	17 06.6	7.0 59.2								
15	42 16.2 . .	03.3	96 33.7	7.3	16 59.6	7.2 59.1								
16	57 16.3	02.3	111 00.0	7.3	16 52.4	7.2 59.1								
17	72 16.5	01.3	125 26.3	7.4	16 45.2	7.3 59.1								
18	87 16.6	S 5 00.4	139 52.7	7.4	S16 37.9	7.5 59.1								
19	102 16.8	4 59.4	154 19.1	7.5	16 30.4	7.5 59.1								
20	117 16.9	58.4	168 45.6	7.6	16 22.9	7.6 59.1								
21	132 17.1 . .	57.4	183 12.2	7.5	16 15.3	7.8 59.1								
22	147 17.2	56.5	197 38.7	7.7	16 07.5	7.8 59.1								
23	162 17.4	55.5	212 05.4	7.7	S15 59.7	7.9 59.1								
	SD 16.1	d 1.0	SD	16.1		16.1								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 5	Moonset 6	Moonset 7	Moonset 8
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 15	18 22	19 42	▬	▬	08 52	11 53
N 70	17 21	18 22	19 34	▬	07 47	10 19	12 24
68	17 26	18 22	19 27	07 52	09 13	10 58	12 47
66	17 30	18 22	19 21	08 37	09 51	11 24	13 05
64	17 34	18 22	19 17	09 07	10 18	11 45	13 19
62	17 37	18 22	19 13	09 30	10 39	12 02	13 31
60	17 40	18 22	19 10	09 48	10 56	12 15	13 41
N 58	17 43	18 22	19 07	10 03	11 10	12 27	13 50
56	17 45	18 22	19 05	10 16	11 22	12 37	13 57
54	17 47	18 22	19 03	10 27	11 33	12 46	14 04
52	17 49	18 23	19 02	10 37	11 42	12 54	14 10
50	17 51	18 23	19 00	10 46	11 51	13 02	14 16
45	17 54	18 24	18 58	11 05	12 08	13 17	14 28
N 40	17 57	18 24	18 56	11 20	12 23	13 29	14 38
35	18 00	18 25	18 55	11 33	12 35	13 40	14 46
30	18 03	18 26	18 54	11 45	12 46	13 49	14 53
20	18 07	18 29	18 54	12 04	13 04	14 05	15 06
N 10	18 11	18 32	18 56	12 21	13 20	14 19	15 17
0	18 14	18 35	18 59	12 36	13 35	14 32	15 27
S 10	18 18	18 39	19 04	12 52	13 50	14 45	15 37
20	18 23	18 45	19 11	13 09	14 05	14 59	15 48
30	18 27	18 52	19 20	13 28	14 23	15 14	16 00
35	18 30	18 56	19 26	13 39	14 34	15 23	16 07
40	18 34	19 01	19 33	13 52	14 46	15 33	16 15
45	18 38	19 07	19 43	14 07	15 00	15 45	16 24
S 50	18 42	19 15	19 55	14 25	15 17	16 00	16 35
52	18 44	19 19	20 00	14 34	15 25	16 06	16 41
54	18 47	19 23	20 07	14 44	15 34	16 14	16 46
56	18 49	19 28	20 14	14 55	15 44	16 22	16 52
58	18 52	19 33	20 23	15 07	15 55	16 31	16 59
S 60	18 55	19 39	20 33	15 22	16 08	16 42	17 07

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
5	11 32	11 26	12 11	06 22	18 52	23	43
6	11 19	11 12	12 11	07 21	19 50	24	32
7	11 05	10 57	12 11	08 19	20 47	25	22

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.2		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
8 00	165 51.8	181 33.7	S 8 13.3	168 36.0	S 2 02.9	99 02.5	N21 15.5	306 12.0	S12 44.8
01	180 54.3	196 33.3	12.1	183 36.7	02.1	114 04.7	15.6	321 14.5	44.8
02	195 56.7	211 32.8	10.9	198 37.4	01.3	129 06.9	15.6	336 17.0	44.8
03	210 59.2	226 32.4	. . 09.8	213 38.1	2 00.5	144 09.0	. . 15.7	351 19.6	. . 44.7
04	226 01.7	241 31.9	08.6	228 38.7	1 59.7	159 11.2	15.7	6 22.1	44.7
05	241 04.1	256 31.4	07.4	243 39.4	58.9	174 13.4	15.8	21 24.6	44.7
06	256 06.6	271 31.0	S 8 06.2	258 40.1	S 1 58.1	189 15.5	N21 15.9	36 27.2	S12 44.6
07	271 09.1	286 30.5	05.0	273 40.8	57.3	204 17.7	15.9	51 29.7	44.6
08	286 11.5	301 30.1	03.8	288 41.5	56.5	219 19.9	16.0	66 32.2	44.6
F 09	301 14.0	316 29.6	. . 02.7	303 42.1	. . 55.7	234 22.0	. . 16.0	81 34.8	. . 44.6
R 10	316 16.5	331 29.2	01.5	318 42.8	54.9	249 24.2	16.1	96 37.3	44.5
I 11	331 18.9	346 28.7	8 00.3	333 43.5	54.1	264 26.4	16.1	111 39.8	44.5
D 12	346 21.4	1 28.3	S 7 59.1	348 44.2	S 1 53.3	279 28.5	N21 16.2	126 42.4	S12 44.5
A 13	1 23.8	16 27.8	57.9	3 44.9	52.5	294 30.7	16.2	141 44.9	44.4
Y 14	16 26.3	31 27.4	56.8	18 45.6	51.7	309 32.9	16.3	156 47.4	44.4
15	31 28.8	46 26.9	. . 55.6	33 46.2	. . 51.0	324 35.0	. . 16.3	171 50.0	. . 44.4
16	46 31.2	61 26.5	54.4	48 46.9	50.2	339 37.2	16.4	186 52.5	44.3
17	61 33.7	76 26.0	53.2	63 47.6	49.4	354 39.3	16.4	201 55.0	44.3
18	76 36.2	91 25.6	S 7 52.0	78 48.3	S 1 48.6	9 41.5	N21 16.5	216 57.6	S12 44.3
19	91 38.6	106 25.1	50.8	93 49.0	47.8	24 43.7	16.5	232 00.1	44.2
20	106 41.1	121 24.7	49.6	108 49.7	47.0	39 45.8	16.6	247 02.7	44.2
21	121 43.6	136 24.3	. . 48.5	123 50.3	. . 46.2	54 48.0	. . 16.6	262 05.2	. . 44.2
22	136 46.0	151 23.8	47.3	138 51.0	45.4	69 50.2	16.7	277 07.7	44.1
23	151 48.5	166 23.4	46.1	153 51.7	44.6	84 52.3	16.7	292 10.3	44.1
9 00	166 50.9	181 22.9	S 7 44.9	168 52.4	S 1 43.8	99 54.5	N21 16.8	307 12.8	S12 44.1
01	181 53.4	196 22.5	43.7	183 53.1	43.0	114 56.6	16.9	322 15.3	44.1
02	196 55.9	211 22.0	42.5	198 53.8	42.2	129 58.8	16.9	337 17.9	44.0
03	211 58.3	226 21.6	. . 41.3	213 54.4	. . 41.4	145 01.0	. . 17.0	352 20.4	. . 44.0
04	227 00.8	241 21.1	40.1	228 55.1	40.6	160 03.1	17.0	7 22.9	44.0
05	242 03.3	256 20.7	39.0	243 55.8	39.8	175 05.3	17.1	22 25.5	43.9
06	257 05.7	271 20.2	S 7 37.8	258 56.5	S 1 39.0	190 07.4	N21 17.1	37 28.0	S12 43.9
S 07	272 08.2	286 19.8	36.6	273 57.2	38.2	205 09.6	17.2	52 30.6	43.9
A 08	287 10.7	301 19.4	35.4	288 57.9	37.5	220 11.7	17.2	67 33.1	43.8
T 09	302 13.1	316 18.9	. . 34.2	303 58.5	. . 36.7	235 13.9	. . 17.3	82 35.6	. . 43.8
U 10	317 15.6	331 18.5	33.0	318 59.2	35.9	250 16.1	17.3	97 38.2	43.8
R 11	332 18.1	346 18.0	31.8	333 59.9	35.1	265 18.2	17.4	112 40.7	43.7
D 12	347 20.5	1 17.6	S 7 30.6	349 00.6	S 1 34.3	280 20.4	N21 17.4	127 43.2	S12 43.7
A 13	2 23.0	16 17.1	29.4	4 01.3	33.5	295 22.5	17.5	142 45.8	43.7
Y 14	17 25.4	31 16.7	28.2	19 02.0	32.7	310 24.7	17.5	157 48.3	43.6
15	32 27.9	46 16.3	. . 27.0	34 02.7	. . 31.9	325 26.9	. . 17.6	172 50.9	. . 43.6
16	47 30.4	61 15.8	25.8	49 03.3	31.1	340 29.0	17.6	187 53.4	43.6
17	62 32.8	76 15.4	24.7	64 04.0	30.3	355 31.2	17.7	202 55.9	43.5
18	77 35.3	91 14.9	S 7 23.5	79 04.7	S 1 29.5	10 33.3	N21 17.8	217 58.5	S12 43.5
19	92 37.8	106 14.5	22.3	94 05.4	28.7	25 35.5	17.8	233 01.0	43.5
20	107 40.2	121 14.0	21.1	109 06.1	27.9	40 37.6	17.9	248 03.6	43.4
21	122 42.7	136 13.6	. . 19.9	124 06.8	. . 27.1	55 39.8	. . 17.9	263 06.1	. . 43.4
22	137 45.2	151 13.2	18.7	139 07.4	26.3	70 41.9	18.0	278 08.6	43.4
23	152 47.6	166 12.7	17.5	154 08.1	25.5	85 44.1	18.0	293 11.2	43.3
10 00	167 50.1	181 12.3	S 7 16.3	169 08.8	S 1 24.7	100 46.2	N21 18.1	308 13.7	S12 43.3
01	182 52.6	196 11.9	15.1	184 09.5	24.0	115 48.4	18.1	323 16.3	43.3
02	197 55.0	211 11.4	13.9	199 10.2	23.2	130 50.6	18.2	338 18.8	43.2
03	212 57.5	226 11.0	. . 12.7	214 10.9	. . 22.4	145 52.7	. . 18.2	353 21.3	. . 43.2
04	227 59.9	241 10.5	11.5	229 11.6	21.6	160 54.9	18.3	8 23.9	43.2
05	243 02.4	256 10.1	10.3	244 12.2	20.8	175 57.0	18.3	23 26.4	43.1
06	258 04.9	271 09.7	S 7 09.1	259 12.9	S 1 20.0	190 59.2	N21 18.4	38 29.0	S12 43.1
S 07	273 07.3	286 09.2	07.9	274 13.6	19.2	206 01.3	18.4	53 31.5	43.1
U 08	288 09.8	301 08.8	06.7	289 14.3	18.4	221 03.5	18.5	68 34.0	43.0
N 09	303 12.3	316 08.4	. . 05.5	304 15.0	. . 17.6	236 05.6	. . 18.6	83 36.6	. . 43.0
D 10	318 14.7	331 07.9	04.3	319 15.7	16.8	251 07.8	18.6	98 39.1	43.0
A 11	333 17.2	346 07.5	03.1	334 16.4	16.0	266 09.9	18.7	113 41.7	42.9
Y 12	348 19.7	1 07.0	S 7 01.9	349 17.0	S 1 15.2	281 12.1	N21 18.7	128 44.2	S12 42.9
13	3 22.1	16 06.6	7 00.7	4 17.7	14.4	296 14.2	18.8	143 46.7	42.9
14	18 24.6	31 06.2	6 59.5	19 18.4	13.6	311 16.4	18.8	158 49.3	42.8
15	33 27.0	46 05.7	. . 58.3	34 19.1	. . 12.8	326 18.5	. . 18.9	173 51.8	. . 42.8
16	48 29.5	61 05.3	57.1	49 19.8	12.0	341 20.7	18.9	188 54.4	42.8
17	63 32.0	76 04.9	55.9	64 20.5	11.2	356 22.8	19.0	203 56.9	42.7
18	78 34.4	91 04.4	S 6 54.7	79 21.2	S 1 10.5	11 25.0	N21 19.0	218 59.5	S12 42.7
19	93 36.9	106 04.0	53.5	94 21.8	09.7	26 27.1	19.1	234 02.0	42.7
20	108 39.4	121 03.6	52.3	109 22.5	08.9	41 29.3	19.1	249 04.5	42.6
21	123 41.8	136 03.1	. . 51.1	124 23.2	. . 08.1	56 31.4	. . 19.2	264 07.1	. . 42.6
22	138 44.3	151 02.7	49.9	139 23.9	07.3	71 33.6	19.3	279 09.6	42.6
23	153 46.8	166 02.3	48.7	154 24.6	06.5	86 35.7	19.3	294 12.2	42.5
Mer.Pass.	h m 12 50.5	v −0.4	d 1.2	v 0.7	d 0.8	v 2.2	d 0.1	v 2.5	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.7	S40 15.4
Achernar	335 27.4	S57 10.4
Acrux	173 08.8	S63 10.4
Adhara	255 12.5	S28 59.8
Aldebaran	290 49.6	N16 32.0
Alioth	166 20.3	N55 53.0
Alkaid	152 58.7	N49 14.6
Al Na'ir	27 44.4	S46 53.7
Alnilam	275 46.5	S 1 11.9
Alphard	217 56.0	S 8 43.3
Alphecca	126 11.0	N26 40.0
Alpheratz	357 44.0	N29 09.8
Altair	62 08.6	N 8 54.2
Ankaa	353 16.3	S42 14.1
Antares	112 26.4	S26 27.5
Arcturus	145 55.6	N19 06.6
Atria	107 28.3	S69 02.7
Avior	234 17.6	S59 33.5
Bellatrix	278 32.2	N 6 21.5
Betelgeuse	271 01.4	N 7 24.3
Canopus	263 56.1	S52 42.6
Capella	280 34.7	N46 00.7
Deneb	49 31.9	N45 19.6
Denebola	182 33.5	N14 29.7
Diphda	348 56.4	S17 55.0
Dubhe	193 51.3	N61 40.6
Elnath	278 12.8	N28 37.0
Eltanin	90 46.3	N51 29.0
Enif	33 47.6	N 9 56.1
Fomalhaut	15 24.5	S29 33.1
Gacrux	172 00.5	S57 11.3
Gienah	175 52.1	S17 37.1
Hadar	148 47.6	S60 26.1
Hamal	328 01.2	N23 31.5
Kaus Aust.	83 44.1	S34 22.5
Kochab	137 19.4	N74 05.8
Markab	13 38.8	N15 16.6
Menkar	314 15.4	N 4 08.3
Menkent	148 07.5	S36 26.1
Miaplacidus	221 38.9	S69 46.6
Mirfak	308 40.8	N49 54.5
Nunki	75 58.7	S26 16.6
Peacock	53 19.9	S56 41.3
Pollux	243 27.7	N27 59.5
Procyon	244 59.7	N 5 11.2
Rasalhague	96 06.6	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.2	S 8 11.5
Rigil Kent.	139 51.5	S60 53.2
Sabik	102 12.7	S15 44.4
Schedar	349 41.2	N56 36.7
Shaula	96 22.2	S37 06.6
Sirius	258 33.7	S16 44.4
Spica	158 31.2	S11 13.9
Suhail	222 52.2	S43 29.5
Vega	80 39.2	N38 47.6
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	14 32.0	11 55
Mars	2 01.4	12 44
Jupiter	293 03.5	17 18
Saturn	140 21.8	3 31

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
									Naut.	Civil		8	9	10	11
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
8 00	177 17.5	S 4 54.5	226 32.1	7.7	S15 51.8	8.1	59.1	N 72	04 27	05 47	06 54	06 53	06 32	06 17	06 05
01	192 17.7	53.5	240 58.8	7.8	15 43.7	8.1	59.1	N 70	04 37	05 49	06 49	06 20	06 13	06 07	06 02
02	207 17.8	52.6	255 25.6	7.9	15 35.6	8.2	59.1	68	04 45	05 50	06 45	05 56	05 58	05 59	05 59
03	222 18.0	. . 51.6	269 52.5	7.9	15 27.4	8.3	59.1	66	04 51	05 51	06 42	05 37	05 46	05 53	05 57
04	237 18.1	50.6	284 19.4	8.0	15 19.1	8.4	59.0	64	04 57	05 52	06 39	05 22	05 36	05 47	05 55
05	252 18.3	49.6	298 46.4	8.0	15 10.7	8.5	59.0	62	05 01	05 53	06 37	05 09	05 28	05 42	05 54
06	267 18.5	S 4 48.7	313 13.4	8.1	S15 02.2	8.6	59.0	60	05 05	05 53	06 34	04 58	05 20	05 37	05 52
07	282 18.6	47.7	327 40.5	8.1	14 53.6	8.7	59.0	N 58	05 08	05 54	06 33	04 49	05 13	05 34	05 51
08	297 18.8	46.7	342 07.6	8.2	14 44.9	8.7	59.0	56	05 11	05 54	06 31	04 41	05 08	05 30	05 50
F 09	312 18.9	. . 45.7	356 34.8	8.2	14 36.2	8.9	59.0	54	05 13	05 54	06 29	04 33	05 02	05 27	05 49
R 10	327 19.1	44.8	11 02.0	8.3	14 27.3	8.9	59.0	52	05 15	05 54	06 28	04 26	04 57	05 24	05 48
I 11	342 19.2	43.8	25 29.3	8.4	14 18.4	9.0	59.0	50	05 17	05 54	06 26	04 20	04 53	05 22	05 47
D 12	357 19.4	S 4 42.8	39 56.7	8.4	S14 09.4	9.1	59.0	45	05 20	05 54	06 23	04 07	04 44	05 16	05 45
A 13	12 19.5	41.8	54 24.1	8.5	14 00.3	9.1	59.0	N 40	05 23	05 54	06 21	03 57	04 36	05 11	05 44
Y 14	27 19.7	40.9	68 51.6	8.5	13 51.2	9.3	58.9	35	05 24	05 54	06 19	03 47	04 29	05 07	05 43
15	42 19.8	. . 39.9	83 19.1	8.6	13 41.9	9.3	58.9	30	05 25	05 53	06 17	03 39	04 23	05 03	05 41
16	57 20.0	38.9	97 46.7	8.7	13 32.6	9.4	58.9	20	05 26	05 51	06 13	03 25	04 13	04 57	05 39
17	72 20.1	37.9	112 14.4	8.6	13 23.2	9.5	58.9	N 10	05 25	05 49	06 10	03 13	04 04	04 52	05 38
18	87 20.3	S 4 36.9	126 42.0	8.8	S13 13.7	9.6	58.9	0	05 22	05 46	06 07	03 01	03 55	04 46	05 36
19	102 20.5	36.0	141 09.8	8.8	13 04.1	9.6	58.9	S 10	05 18	05 43	06 04	02 50	03 46	04 41	05 34
20	117 20.6	35.0	155 37.6	8.9	12 54.5	9.7	58.9	20	05 13	05 38	06 01	02 37	03 37	04 36	05 32
21	132 20.8	. . 34.0	170 05.5	8.9	12 44.8	9.8	58.9	30	05 04	05 32	05 56	02 23	03 27	04 29	05 30
22	147 20.9	33.0	184 33.4	9.0	12 35.0	9.8	58.9	35	04 59	05 29	05 54	02 15	03 21	04 26	05 29
23	162 21.1	32.1	199 01.4	9.0	12 25.2	9.9	58.8	40	04 52	05 24	05 51	02 05	03 14	04 21	05 28
9 00	177 21.2	S 4 31.1	213 29.4	9.1	S12 15.3	10.0	58.8	45	04 43	05 18	05 48	01 54	03 06	04 17	05 27
01	192 21.4	30.1	227 57.5	9.2	12 05.3	10.1	58.8	S 50	04 32	05 11	05 44	01 41	02 56	04 11	05 25
02	207 21.5	29.1	242 25.7	9.2	11 55.2	10.1	58.8	52	04 27	05 08	05 42	01 34	02 51	04 08	05 24
03	222 21.7	. . 28.1	256 53.9	9.2	11 45.1	10.1	58.8	54	04 21	05 04	05 40	01 27	02 46	04 05	05 23
04	237 21.9	27.2	271 22.1	9.3	11 35.0	10.3	58.8	56	04 14	05 00	05 38	01 20	02 41	04 02	05 22
05	252 22.0	26.2	285 50.4	9.4	11 24.7	10.3	58.8	58	04 06	04 55	05 36	01 11	02 34	03 58	05 21
06	267 22.2	S 4 25.2	300 18.8	9.4	S11 14.4	10.3	58.7	S 60	03 57	04 50	05 33	01 01	02 27	03 54	05 20
S 07	282 22.3	24.2	314 47.2	9.5	11 04.1	10.4	58.7								
A 08	297 22.5	23.3	329 15.7	9.5	10 53.7	10.5	58.7								
T 09	312 22.6	. . 22.3	343 44.2	9.6	10 43.2	10.6	58.7								
U 10	327 22.8	21.3	358 12.8	9.6	10 32.6	10.5	58.7								
R 11	342 23.0	20.3	12 41.4	9.7	10 22.1	10.7	58.7								
D 12	357 23.1	S 4 19.3	27 10.1	9.8	S10 11.4	10.7	58.7								
A 13	12 23.3	18.4	41 38.9	9.8	10 00.7	10.7	58.6								
Y 14	27 23.4	17.4	56 07.7	9.8	9 50.0	10.8	58.6								
15	42 23.6	. . 16.4	70 36.5	9.9	9 39.2	10.8	58.6								
16	57 23.7	15.4	85 05.4	10.0	9 28.4	10.9	58.6								
17	72 23.9	14.4	99 34.4	10.0	9 17.5	11.0	58.6								
18	87 24.1	S 4 13.5	114 03.4	10.0	S 9 06.5	11.0	58.6								
19	102 24.2	12.5	128 32.4	10.1	8 55.5	11.0	58.5								
20	117 24.4	11.5	143 01.5	10.2	8 44.5	11.0	58.5								
21	132 24.5	. . 10.5	157 30.7	10.2	8 33.5	11.2	58.5								
22	147 24.7	09.5	171 59.9	10.2	8 22.3	11.1	58.5								
23	162 24.9	08.6	186 29.1	10.3	8 11.2	11.2	58.5								
10 00	177 25.0	S 4 07.6	200 58.4	10.4	S 8 00.0	11.2	58.5								
01	192 25.2	06.6	215 27.8	10.4	7 48.8	11.3	58.4								
02	207 25.3	05.6	229 57.2	10.4	7 37.5	11.3	58.4								
03	222 25.5	. . 04.6	244 26.6	10.5	7 26.2	11.3	58.4								
04	237 25.7	03.7	258 56.1	10.5	7 14.9	11.4	58.4								
05	252 25.8	02.7	273 25.6	10.6	7 03.5	11.4	58.4								
06	267 26.0	S 4 01.7	287 55.2	10.6	S 6 52.1	11.4	58.4								
S 07	282 26.1	4 00.7	302 24.8	10.7	6 40.7	11.4	58.3								
U 08	297 26.3	3 59.7	316 54.5	10.7	6 29.3	11.5	58.3								
N 09	312 26.5	. . 58.8	331 24.2	10.8	6 17.8	11.5	58.3								
D 10	327 26.6	57.8	345 54.0	10.8	6 06.3	11.6	58.3								
A 11	342 26.8	56.8	0 23.8	10.9	5 54.7	11.5	58.3								
Y 12	357 26.9	S 3 55.8	14 53.7	10.9	S 5 43.2	11.6	58.2								
13	12 27.1	54.8	29 23.6	10.9	5 31.6	11.6	58.2								
14	27 27.3	53.9	43 53.5	11.0	5 20.0	11.6	58.2								
15	42 27.4	. . 52.9	58 23.5	11.0	5 08.4	11.7	58.2								
16	57 27.6	51.9	72 53.5	11.0	4 56.7	11.6	58.2								
17	72 27.8	50.9	87 23.5	11.1	4 45.1	11.7	58.1								
18	87 27.9	S 3 49.9	101 53.6	11.2	S 4 33.4	11.7	58.1								
19	102 28.1	49.0	116 23.8	11.2	4 21.7	11.7	58.1								
20	117 28.2	48.0	130 54.0	11.2	4 10.0	11.7	58.1								
21	132 28.4	. . 47.0	145 24.2	11.2	3 58.3	11.7	58.1								
22	147 28.6	46.0	159 54.4	11.3	3 46.6	11.8	58.0								
23	162 28.7	45.0	174 24.7	11.3	S 3 34.8	11.7	58.0								
	SD 16.1	d 1.0	SD	16.1	16.0		15.9								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	8	9	10	11
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 29	18 36	19 57	11 53	14 05	16 05	18 00
N 70	17 33	18 34	19 47	12 24	14 21	16 13	18 00
68	17 37	18 33	19 38	12 47	14 34	16 19	18 00
66	17 40	18 32	19 32	13 05	14 45	16 24	18 00
64	17 43	18 31	19 26	13 19	14 54	16 28	18 00
62	17 46	18 30	19 22	13 31	15 02	16 32	18 00
60	17 48	18 29	19 18	13 41	15 08	16 35	18 00
N 58	17 50	18 29	19 14	13 50	15 14	16 38	17 59
56	17 51	18 28	19 12	13 57	15 19	16 40	17 59
54	17 53	18 28	19 09	14 04	15 24	16 42	17 59
52	17 54	18 28	19 07	14 10	15 28	16 44	17 59
50	17 55	18 28	19 05	14 16	15 31	16 46	17 59
45	17 58	18 27	19 02	14 28	15 39	16 50	17 59
N 40	18 01	18 28	18 59	14 38	15 46	16 53	17 59
35	18 03	18 28	18 57	14 46	15 52	16 56	17 59
30	18 04	18 28	18 56	14 53	15 57	16 59	17 59
20	18 08	18 30	18 55	15 06	16 05	17 03	17 59
N 10	18 11	18 32	18 56	15 17	16 13	17 07	17 59
0	18 14	18 34	18 59	15 27	16 20	17 10	17 59
S 10	18 17	18 38	19 02	15 37	16 27	17 14	17 59
20	18 20	18 42	19 08	15 48	16 34	17 17	17 59
30	18 24	18 48	19 16	16 00	16 42	17 21	17 59
35	18 26	18 52	19 22	16 07	16 47	17 24	17 58
40	18 29	18 56	19 28	16 15	16 52	17 26	17 58
45	18 32	19 02	19 37	16 24	16 59	17 29	17 58
S 50	18 36	19 08	19 48	16 35	17 06	17 33	17 58
52	18 38	19 12	19 53	16 41	17 09	17 35	17 58
54	18 39	19 15	19 59	16 46	17 13	17 36	17 58
56	18 41	19 19	20 05	16 52	17 17	17 38	17 58
58	18 44	19 24	20 13	16 59	17 22	17 40	17 58
S 60	18 46	19 29	20 22	17 07	17 27	17 43	17 57

Day	SUN			MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
8	10 50	10 43	12 11	09 14	21 41	26	14
9	10 35	10 28	12 10	10 07	22 33	27	7
10	10 20	10 13	12 10	10 58	23 23	28	2

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.2		SATURN +0.4		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
11 00	168 49.2	181 01.8	S 6 47.5	169 25.3	S 1 05.7	101 37.9	N21 19.4	309 14.7	S12 42.5	Acamar	315 18.7	S40 15.4
01	183 51.7	196 01.4	46.3	184 26.0	04.9	116 40.0	19.4	324 17.3	42.5	Achernar	335 27.4	S57 10.4
02	198 54.2	211 01.0	45.1	199 26.7	04.1	131 42.1	19.5	339 19.8	42.4	Acrux	173 08.8	S63 10.4
03	213 56.6	226 00.5 . .	43.9	214 27.3 . .	03.3	146 44.3 . .	19.5	354 22.4 . .	42.4	Adhara	255 12.5	S28 59.8
04	228 59.1	241 00.1	42.7	229 28.0	02.5	161 46.4	19.6	9 24.9	42.4	Aldebaran	290 49.6	N16 32.0
05	244 01.5	255 59.7	41.5	244 28.7	01.7	176 48.6	19.6	24 27.4	42.3			
06	259 04.0	270 59.2	S 6 40.3	259 29.4	S 1 00.9	191 50.7	N21 19.7	39 30.0	S12 42.3	Alioth	166 20.3	N55 53.1
07	274 06.5	285 58.8	39.1	274 30.1	1 00.1	206 52.9	19.7	54 32.5	42.3	Alkaid	152 58.6	N49 14.6
08	289 08.9	300 58.4	37.9	289 30.8	0 59.3	221 55.0	19.8	69 35.1	42.2	Al Na'ir	27 44.4	S46 53.7
M 09	304 11.4	315 58.0 . .	36.7	304 31.5 . .	58.5	236 57.2 . .	19.9	84 37.6 . .	42.2	Alnilam	275 46.5	S 1 11.9
O 10	319 13.9	330 57.5	35.4	319 32.1	57.8	251 59.3	19.9	99 40.2	42.2	Alphard	217 56.0	S 8 43.3
N 11	334 16.3	345 57.1	34.2	334 32.8	57.0	267 01.5	20.0	114 42.7	42.1			
D 12	349 18.8	0 56.7	S 6 33.0	349 33.5	S 0 56.2	282 03.6	N21 20.0	129 45.3	S12 42.1	Alphecca	126 11.0	N26 40.0
A 13	4 21.3	15 56.2	31.8	4 34.2	55.4	297 05.7	20.1	144 47.8	42.1	Alpheratz	357 44.0	N29 09.8
Y 14	19 23.7	30 55.8	30.6	19 34.9	54.6	312 07.9	20.1	159 50.4	42.0	Altair	62 08.6	N 8 54.2
15	34 26.2	45 55.4 . .	29.4	34 35.6 . .	53.8	327 10.0 . .	20.2	174 52.9 . .	42.0	Ankaa	353 16.3	S42 14.1
16	49 28.6	60 55.0	28.2	49 36.3	53.0	342 12.2	20.2	189 55.4	42.0	Antares	112 26.4	S26 27.6
17	64 31.1	75 54.5	27.0	64 37.0	52.2	357 14.3	20.3	204 58.0	41.9			
18	79 33.6	90 54.1	S 6 25.8	79 37.6	S 0 51.4	12 16.5	N21 20.3	220 00.5	S12 41.9	Arcturus	145 55.6	N19 06.6
19	94 36.0	105 53.7	24.6	94 38.3	50.6	27 18.6	20.4	235 03.1	41.8	Atria	107 28.3	S69 02.7
20	109 38.5	120 53.2	23.4	109 39.0	49.8	42 20.7	20.5	250 05.6	41.8	Avior	234 17.6	S59 33.5
21	124 41.0	135 52.8 . .	22.2	124 39.7 . .	49.0	57 22.9 . .	20.5	265 08.2 . .	41.8	Bellatrix	278 32.2	N 6 21.5
22	139 43.4	150 52.4	20.9	139 40.4	48.2	72 25.0	20.6	280 10.7	41.7	Betelgeuse	271 01.4	N 7 24.3
23	154 45.9	165 52.0	19.7	154 41.1	47.4	87 27.2	20.6	295 13.3	41.7			
12 00	169 48.4	180 51.5	S 6 18.5	169 41.8	S 0 46.6	102 29.3	N21 20.7	310 15.8	S12 41.7	Canopus	263 56.1	S52 42.6
01	184 50.8	195 51.1	17.3	184 42.5	45.8	117 31.4	20.7	325 18.4	41.6	Capella	280 34.7	N46 00.7
02	199 53.3	210 50.7	16.1	199 43.2	45.1	132 33.6	20.8	340 20.9	41.6	Deneb	49 31.9	N45 19.6
03	214 55.8	225 50.3 . .	14.9	214 43.8 . .	44.3	147 35.7 . .	20.8	355 23.5 . .	41.6	Denebola	182 33.5	N14 29.7
04	229 58.2	240 49.8	13.7	229 44.5	43.5	162 37.9	20.9	10 26.0	41.5	Diphda	348 56.4	S17 55.0
05	245 00.7	255 49.4	12.5	244 45.2	42.7	177 40.0	20.9	25 28.6	41.5			
06	260 03.1	270 49.0	S 6 11.2	259 45.9	S 0 41.9	192 42.1	N21 21.0	40 31.1	S12 41.5	Dubhe	193 51.3	N61 40.6
07	275 05.6	285 48.6	10.0	274 46.6	41.1	207 44.3	21.1	55 33.7	41.4	Elnath	278 12.8	N28 37.0
T 08	290 08.1	300 48.1	08.8	289 47.3	40.3	222 46.4	21.1	70 36.2	41.4	Eltanin	90 46.3	N51 29.0
U 09	305 10.5	315 47.7 . .	07.6	304 48.0 . .	39.5	237 48.5 . .	21.2	85 38.8 . .	41.4	Enif	33 47.6	N 9 56.1
E 10	320 13.0	330 47.3	06.4	319 48.7	38.7	252 50.7	21.2	100 41.3	41.3	Fomalhaut	15 24.5	S29 33.1
S 11	335 15.5	345 46.9	05.2	334 49.3	37.9	267 52.8	21.3	115 43.9	41.3			
D 12	350 17.9	0 46.5	S 6 04.0	349 50.0	S 0 37.1	282 55.0	N21 21.3	130 46.4	S12 41.2	Gacrux	172 00.5	S57 11.3
A 13	5 20.4	15 46.0	02.8	4 50.7	36.3	297 57.1	21.4	145 49.0	41.2	Gienah	175 52.1	S17 37.1
Y 14	20 22.9	30 45.6	01.5	19 51.4	35.5	312 59.2	21.4	160 51.5	41.2	Hadar	148 47.6	S60 26.1
15	35 25.3	45 45.2	6 00.3	34 52.1 . .	34.7	328 01.4 . .	21.5	175 54.1 . .	41.1	Hamal	328 01.2	N23 31.4
16	50 27.8	60 44.8	5 59.1	49 52.8	33.9	343 03.5	21.5	190 56.6	41.1	Kaus Aust.	83 44.1	S34 22.5
17	65 30.2	75 44.3	57.9	64 53.5	33.2	358 05.6	21.6	205 59.2	41.1			
18	80 32.7	90 43.9	S 5 56.7	79 54.2	S 0 32.4	13 07.8	N21 21.7	221 01.7	S12 41.0	Kochab	137 19.3	N74 05.8
19	95 35.2	105 43.5	55.5	94 54.9	31.6	28 09.9	21.7	236 04.3	41.0	Markab	13 38.8	N15 16.6
20	110 37.6	120 43.1	54.2	109 55.5	30.8	43 12.0	21.8	251 06.8	41.0	Menkar	314 15.4	N 4 08.3
21	125 40.1	135 42.7 . .	53.0	124 56.2 . .	30.0	58 14.2 . .	21.8	266 09.4 . .	40.9	Menkent	148 07.5	S36 26.1
22	140 42.6	150 42.2	51.8	139 56.9	29.2	73 16.3	21.9	281 11.9	40.9	Miaplacidus	221 38.9	S69 46.6
23	155 45.0	165 41.8	50.6	154 57.6	28.4	88 18.4	21.9	296 14.5	40.9			
13 00	170 47.5	180 41.4	S 5 49.4	169 58.3	S 0 27.6	103 20.6	N21 22.0	311 17.0	S12 40.8	Mirfak	308 40.8	N49 54.5
01	185 50.0	195 41.0	48.2	184 59.0	26.8	118 22.7	22.0	326 19.6	40.8	Nunki	75 58.7	S26 16.6
02	200 52.4	210 40.6	46.9	199 59.7	26.0	133 24.9	22.1	341 22.1	40.7	Peacock	53 19.9	S56 41.3
03	215 54.9	225 40.1 . .	45.7	215 00.4 . .	25.2	148 27.0 . .	22.2	356 24.7 . .	40.7	Pollux	243 27.7	N27 59.5
04	230 57.4	240 39.7	44.5	230 01.1	24.4	163 29.1	22.2	11 27.2	40.7	Procyon	244 59.7	N 5 11.2
05	245 59.8	255 39.3	43.3	245 01.8	23.6	178 31.2	22.3	26 29.8	40.6			
06	261 02.3	270 38.9	S 5 42.1	260 02.4	S 0 22.8	193 33.4	N21 22.3	41 32.3	S12 40.6	Rasalhague	96 06.6	N12 33.0
W 07	276 04.7	285 38.5	40.8	275 03.1	22.0	208 35.5	22.4	56 34.9	40.6	Regulus	207 43.4	N11 53.9
E 08	291 07.2	300 38.1	39.6	290 03.8	21.3	223 37.6	22.4	71 37.4	40.5	Rigel	281 12.2	S 8 11.5
D 09	306 09.7	315 37.6 . .	38.4	305 04.5 . .	20.5	238 39.8 . .	22.5	86 40.0 . .	40.5	Rigil Kent.	139 51.5	S60 53.2
N 10	321 12.1	330 37.2	37.2	320 05.2	19.7	253 41.9	22.5	101 42.5	40.5	Sabik	102 12.7	S15 44.4
E 11	336 14.6	345 36.8	36.0	335 05.9	18.9	268 44.0	22.6	116 45.1	40.4			
S 12	351 17.1	0 36.4	S 5 34.7	350 06.6	S 0 18.1	283 46.2	N21 22.7	131 47.6	S12 40.4	Schedar	349 41.2	N56 36.7
D 13	6 19.5	15 36.0	33.5	5 07.3	17.3	298 48.3	22.7	146 50.2	40.3	Shaula	96 22.2	S37 06.6
A 14	21 22.0	30 35.6	32.3	20 08.0	16.5	313 50.4	22.8	161 52.7	40.3	Sirius	258 33.7	S16 44.4
Y 15	36 24.5	45 35.1 . .	31.1	35 08.7 . .	15.7	328 52.6 . .	22.8	176 55.3 . .	40.3	Spica	158 31.1	S11 13.9
16	51 26.9	60 34.7	29.9	50 09.3	14.9	343 54.7	22.9	191 57.9	40.2	Suhail	222 52.2	S43 29.5
17	66 29.4	75 34.3	28.6	65 10.0	14.1	358 56.8	22.9	207 00.4	40.2			
18	81 31.9	90 33.9	S 5 27.4	80 10.7	S 0 13.3	13 58.9	N21 23.0	222 03.0	S12 40.2	Vega	80 39.2	N38 47.6
19	96 34.3	105 33.5	26.2	95 11.4	12.5	29 01.1	23.0	237 05.5	40.1	Zuben'ubi	137 05.4	S16 05.8
20	111 36.8	120 33.1	25.0	110 12.1	11.7	44 03.2	23.1	252 08.1	40.1		SHA	Mer.Pass.
21	126 39.2	135 32.6 . .	23.7	125 12.8 . .	10.9	59 05.3 . .	23.2	267 10.6 . .	40.0		° ′	h m
22	141 41.7	150 32.2	22.5	140 13.5	10.2	74 07.5	23.2	282 13.2	40.0	Venus	11 03.2	11 57
23	156 44.2	165 31.8	21.3	155 14.2	09.4	89 09.6	23.3	297 15.7	40.0	Mars	359 53.4	12 41
	h m									Jupiter	292 40.9	17 08
Mer. Pass.	12 38.7	v −0.4	d 1.2	v 0.7	d 0.8	v 2.1	d 0.1	v 2.5	d 0.0	Saturn	140 27.5	3 18

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		11	12	13	14
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
								N 72	04 10	05 32	06 39	06 05	05 54	05 42	05 30
11 00	177 28.9	S 3 44.0	188 55.0	11.4	S 3 23.1	11.8	58.0	N 70	04 22	05 35	06 36	06 02	05 57	05 52	05 47
01	192 29.1	43.1	203 25.4	11.4	3 11.3	11.8	58.0	68	04 32	05 38	06 33	05 59	05 59	06 00	06 01
02	207 29.2	42.1	217 55.8	11.4	2 59.5	11.7	57.9	66	04 39	05 40	06 31	05 57	06 02	06 06	06 12
03	222 29.4 . .	41.1	232 26.2	11.5	2 47.8	11.8	57.9	64	04 46	05 42	06 29	05 55	06 04	06 12	06 22
04	237 29.5	40.1	246 56.7	11.5	2 36.0	11.8	57.9	62	04 51	05 43	06 27	05 54	06 05	06 17	06 30
05	252 29.7	39.1	261 27.2	11.5	2 24.2	11.8	57.9	60	04 56	05 44	06 26	05 52	06 07	06 21	06 37
06	267 29.9	S 3 38.1	275 57.7	11.6	S 2 12.4	11.8	57.9	N 58	04 59	05 45	06 24	05 51	06 08	06 25	06 43
07	282 30.0	37.2	290 28.3	11.6	2 00.6	11.8	57.8	56	05 03	05 46	06 23	05 50	06 09	06 28	06 49
08	297 30.2	36.2	304 58.9	11.6	1 48.8	11.8	57.8	54	05 06	05 47	06 22	05 49	06 10	06 31	06 54
M 09	312 30.4 . .	35.2	319 29.5	11.7	1 37.0	11.8	57.8	52	05 08	05 47	06 21	05 48	06 11	06 34	06 58
O 10	327 30.5	34.2	334 00.2	11.7	1 25.2	11.8	57.8	50	05 10	05 48	06 20	05 47	06 12	06 37	07 03
N 11	342 30.7	33.2	348 30.9	11.7	1 13.4	11.7	57.7	45	05 15	05 49	06 18	05 45	06 14	06 42	07 11
D 12	357 30.9	S 3 32.3	3 01.6	11.8	S 1 01.7	11.8	57.7	N 40	05 18	05 49	06 16	05 44	06 15	06 47	07 19
A 13	12 31.0	31.3	17 32.4	11.7	0 49.9	11.8	57.7	35	05 20	05 50	06 15	05 43	06 17	06 51	07 26
Y 14	27 31.2	30.3	32 03.1	11.9	0 38.1	11.8	57.7	30	05 22	05 50	06 13	05 41	06 18	06 54	07 31
15	42 31.3 . .	29.3	46 34.0	11.8	0 26.3	11.7	57.6	20	05 23	05 49	06 11	05 39	06 20	07 01	07 41
16	57 31.5	28.3	61 04.8	11.9	0 14.6	11.8	57.6	N 10	05 23	05 48	06 09	05 38	06 22	07 06	07 50
17	72 31.7	27.3	75 35.7	11.8	S 0 02.8	11.7	57.6	0	05 22	05 46	06 06	05 36	06 24	07 11	07 58
18	87 31.8	S 3 26.4	90 06.5	12.0	N 0 08.9	11.7	57.6	S 10	05 19	05 43	06 04	05 34	06 26	07 17	08 07
19	102 32.0	25.4	104 37.5	11.9	0 20.6	11.8	57.5	20	05 14	05 39	06 01	05 32	06 28	07 22	08 16
20	117 32.2	24.4	119 08.4	12.0	0 32.4	11.7	57.5	30	05 06	05 34	05 58	05 30	06 30	07 29	08 26
21	132 32.3 . .	23.4	133 39.4	12.0	0 44.1	11.6	57.5	35	05 01	05 31	05 57	05 29	06 32	07 32	08 32
22	147 32.5	22.4	148 10.4	12.0	0 55.7	11.7	57.5	40	04 55	05 27	05 54	05 28	06 33	07 37	08 39
23	162 32.7	21.4	162 41.4	12.0	1 07.4	11.7	57.4	45	04 47	05 22	05 52	05 27	06 35	07 42	08 47
12 00	177 32.8	S 3 20.5	177 12.4	12.1	N 1 19.1	11.6	57.4	S 50	04 37	05 16	05 49	05 25	06 37	07 48	08 56
01	192 33.0	19.5	191 43.5	12.0	1 30.7	11.6	57.4	52	04 33	05 14	05 48	05 24	06 38	07 50	09 01
02	207 33.2	18.5	206 14.5	12.1	1 42.3	11.7	57.4	54	04 27	05 10	05 46	05 23	06 39	07 54	09 06
03	222 33.3 . .	17.5	220 45.6	12.2	1 54.0	11.5	57.3	56	04 21	05 07	05 44	05 22	06 40	07 57	09 11
04	237 33.5	16.5	235 16.8	12.1	2 05.5	11.6	57.3	58	04 14	05 03	05 43	05 21	06 42	08 01	09 17
05	252 33.7	15.5	249 47.9	12.2	2 17.1	11.5	57.3	S 60	04 06	04 58	05 40	05 20	06 43	08 05	09 24
06	267 33.8	S 3 14.6	264 19.1	12.2	N 2 28.6	11.6	57.3								
07	282 34.0	13.6	278 50.3	12.2	2 40.2	11.5	57.2								
T 08	297 34.2	12.6	293 21.5	12.2	2 51.7	11.4	57.2								
U 09	312 34.3 . .	11.6	307 52.7	12.2	3 03.1	11.5	57.2								
E 10	327 34.5	10.6	322 23.9	12.3	3 14.6	11.4	57.2								
S 11	342 34.7	09.6	336 55.2	12.2	3 26.0	11.4	57.1								
D 12	357 34.8	S 3 08.6	351 26.4	12.3	N 3 37.4	11.3	57.1								
A 13	12 35.0	07.7	5 57.7	12.3	3 48.7	11.4	57.1								
Y 14	27 35.2	06.7	20 29.0	12.3	4 00.1	11.3	57.1								
15	42 35.3 . .	05.7	35 00.3	12.3	4 11.4	11.2	57.0								
16	57 35.5	04.7	49 31.6	12.4	4 22.6	11.3	57.0								
17	72 35.7	03.7	64 03.0	12.3	4 33.9	11.2	57.0								
18	87 35.8	S 3 02.7	78 34.3	12.4	N 4 45.1	11.1	57.0								
19	102 36.0	01.8	93 05.7	12.4	4 56.2	11.2	56.9								
20	117 36.2	3 00.8	107 37.1	12.4	5 07.4	11.1	56.9								
21	132 36.3	2 59.8	122 08.5	12.4	5 18.5	11.0	56.9								
22	147 36.5	58.8	136 39.9	12.4	5 29.5	11.0	56.9								
23	162 36.7	57.8	151 11.3	12.4	5 40.5	11.0	56.8								
13 00	177 36.9	S 2 56.8	165 42.7	12.5	N 5 51.5	11.0	56.8								
01	192 37.0	55.8	180 14.2	12.4	6 02.5	10.9	56.8								
02	207 37.2	54.9	194 45.6	12.5	6 13.4	10.8	56.7								
03	222 37.4 . .	53.9	209 17.1	12.4	6 24.2	10.8	56.7								
04	237 37.5	52.9	223 48.5	12.5	6 35.0	10.8	56.7								
05	252 37.7	51.9	238 20.0	12.5	6 45.8	10.8	56.7								
06	267 37.9	S 2 50.9	252 51.5	12.4	N 6 56.6	10.6	56.6								
W 07	282 38.0	49.9	267 22.9	12.5	7 07.2	10.7	56.6								
E 08	297 38.2	48.9	281 54.4	12.5	7 17.9	10.6	56.6								
D 09	312 38.4 . .	48.0	296 25.9	12.5	7 28.5	10.5	56.6								
N 10	327 38.6	47.0	310 57.4	12.5	7 39.0	10.5	56.5								
E 11	342 38.7	46.0	325 28.9	12.5	7 49.5	10.5	56.5								
S 12	357 38.9	S 2 45.0	340 00.4	12.5	N 8 00.0	10.4	56.5								
D 13	12 39.1	44.0	354 31.9	12.6	8 10.4	10.4	56.5								
A 14	27 39.2	43.0	9 03.5	12.5	8 20.8	10.3	56.4								
Y 15	42 39.4 . .	42.0	23 35.0	12.5	8 31.1	10.2	56.4								
16	57 39.6	41.1	38 06.5	12.5	8 41.3	10.2	56.4								
17	72 39.7	40.1	52 38.0	12.6	8 51.5	10.2	56.4								
18	87 39.9	S 2 39.1	67 09.6	12.5	N 9 01.7	10.1	56.3								
19	102 40.1	38.1	81 41.1	12.5	9 11.8	10.0	56.3								
20	117 40.3	37.1	96 12.6	12.5	9 21.8	10.0	56.3								
21	132 40.4 . .	36.1	110 44.1	12.6	9 31.8	9.9	56.2								
22	147 40.6	35.1	125 15.7	12.5	9 41.7	9.9	56.2								
23	162 40.8	34.2	139 47.2	12.5	N 9 51.6	9.8	56.2								
	SD 16.1	d 1.0	SD 15.7		15.6		15.4								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 11	Moonset 12	Moonset 13	Moonset 14
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 43	18 50	20 13	18 00	19 51	21 43	23 38
N 70	17 46	18 47	20 00	18 00	19 44	21 27	23 11
68	17 48	18 44	19 50	18 00	19 38	21 15	22 50
66	17 50	18 41	19 42	18 00	19 33	21 05	22 34
64	17 52	18 40	19 36	18 00	19 29	20 56	22 21
62	17 54	18 38	19 30	18 00	19 25	20 49	22 10
60	17 55	18 37	19 25	18 00	19 22	20 43	22 01
N 58	17 56	18 35	19 21	17 59	19 19	20 37	21 53
56	17 57	18 35	19 18	17 59	19 17	20 32	21 45
54	17 59	18 34	19 15	17 59	19 15	20 28	21 39
52	17 59	18 33	19 12	17 59	19 13	20 24	21 33
50	18 00	18 32	19 10	17 59	19 11	20 21	21 28
45	18 02	18 31	19 06	17 59	19 07	20 13	21 17
N 40	18 04	18 31	19 02	17 59	19 04	20 07	21 08
35	18 05	18 30	19 00	17 59	19 01	20 01	21 00
30	18 06	18 30	18 58	17 59	18 58	19 56	20 53
20	18 09	18 31	18 56	17 59	18 54	19 48	20 41
N 10	18 11	18 32	18 56	17 59	18 50	19 41	20 31
0	18 13	18 34	18 58	17 59	18 47	19 34	20 21
S 10	18 15	18 36	19 01	17 59	18 43	19 27	20 11
20	18 18	18 40	19 05	17 59	18 39	19 20	20 01
30	18 20	18 44	19 12	17 59	18 35	19 12	19 49
35	18 22	18 48	19 17	17 58	18 33	19 07	19 42
40	18 24	18 51	19 23	17 58	18 30	19 01	19 35
45	18 27	18 56	19 31	17 58	18 26	18 55	19 26
S 50	18 29	19 02	19 41	17 58	18 23	18 48	19 15
52	18 31	19 05	19 45	17 58	18 21	18 44	19 10
54	18 32	19 08	19 51	17 58	18 19	18 41	19 04
56	18 34	19 11	19 57	17 58	18 17	18 37	18 58
58	18 35	19 15	20 04	17 58	18 14	18 32	18 52
S 60	18 37	19 20	20 12	17 57	18 12	18 27	18 44

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
11	10 05	09 57	12 10	11 47	24 12	29	0
12	09 49	09 41	12 10	12 35	00 12	01	1
13	09 33	09 25	12 09	13 23	00 59	02	3

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.2		SATURN +0.3		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
14 00	171 46.6	180 31.4	S 5 20.1	170 14.9	S 0 08.6	104 11.7	N21 23.3	312 18.3	S12 39.9	Acamar	315 18.7	S40 15.4
01	186 49.1	195 31.0	18.8	185 15.6	07.8	119 13.8	23.4	327 20.8	39.9	Achernar	335 27.4	S57 10.4
02	201 51.6	210 30.6	17.6	200 16.3	07.0	134 16.0	23.4	342 23.4	39.9	Acrux	173 08.7	S63 10.4
03	216 54.0	225 30.2	. . 16.4	215 16.9	. . 06.2	149 18.1	. . 23.5	357 26.0	. . 39.8	Adhara	255 12.5	S28 59.8
04	231 56.5	240 29.8	15.2	230 17.6	05.4	164 20.2	23.6	12 28.5	39.8	Aldebaran	290 49.6	N16 32.0
05	246 59.0	255 29.3	14.0	245 18.3	04.6	179 22.3	23.6	27 31.1	39.7			
06	262 01.4	270 28.9	S 5 12.7	260 19.0	S 0 03.8	194 24.5	N21 23.7	42 33.6	S12 39.7	Alioth	166 20.3	N55 53.1
07	277 03.9	285 28.5	11.5	275 19.7	03.0	209 26.6	23.7	57 36.2	39.7	Alkaid	152 58.6	N49 14.6
08	292 06.3	300 28.1	10.3	290 20.4	02.2	224 28.7	23.8	72 38.7	39.6	Al Na'ir	27 44.4	S46 53.7
09	307 08.8	315 27.7	. . 09.0	305 21.1	. . 01.4	239 30.8	. . 23.8	87 41.3	. . 39.6	Alnilam	275 46.5	S 1 11.9
10	322 11.3	330 27.3	07.8	320 21.8	S 00.6	254 33.0	23.9	102 43.9	39.6	Alphard	217 56.0	S 8 43.3
11	337 13.7	345 26.9	06.6	335 22.5	N 00.1	269 35.1	23.9	117 46.4	39.5			
12	352 16.2	0 26.5	S 5 05.4	350 23.2	N 0 00.9	284 37.2	N21 24.0	132 49.0	S12 39.5	Alphecca	126 11.0	N26 40.0
13	7 18.7	15 26.0	04.1	5 23.9	01.7	299 39.3	24.1	147 51.5	39.4	Alpheratz	357 44.0	N29 09.8
14	22 21.1	30 25.6	02.9	20 24.5	02.5	314 41.5	24.1	162 54.1	39.4	Altair	62 08.6	N 8 54.2
15	37 23.6	45 25.2	. . 01.7	35 25.2	. . 03.3	329 43.6	. . 24.2	177 56.6	. . 39.4	Ankaa	353 16.3	S42 14.1
16	52 26.1	60 24.8	5 00.5	50 25.9	04.1	344 45.7	24.2	192 59.2	39.3	Antares	112 26.3	S26 27.6
17	67 28.5	75 24.4	4 59.2	65 26.6	04.9	359 47.8	24.3	208 01.8	39.3			
18	82 31.0	90 24.0	S 4 58.0	80 27.3	N 0 05.7	14 50.0	N21 24.3	223 04.3	S12 39.3	Arcturus	145 55.6	N19 06.6
19	97 33.5	105 23.6	56.8	95 28.0	06.5	29 52.1	24.4	238 06.9	39.2	Atria	107 28.2	S69 02.7
20	112 35.9	120 23.2	55.5	110 28.7	07.3	44 54.2	24.4	253 09.4	39.2	Avior	234 17.7	S59 33.5
21	127 38.4	135 22.8	. . 54.3	125 29.4	. . 08.1	59 56.3	. . 24.5	268 12.0	. . 39.1	Bellatrix	278 32.2	N 6 21.5
22	142 40.8	150 22.4	53.1	140 30.1	08.9	74 58.4	24.6	283 14.5	39.1	Betelgeuse	271 01.4	N 7 24.3
23	157 43.3	165 21.9	51.9	155 30.8	09.6	90 00.6	24.6	298 17.1	39.1			
15 00	172 45.8	180 21.5	S 4 50.6	170 31.5	N 0 10.4	105 02.7	N21 24.7	313 19.7	S12 39.0	Canopus	263 56.1	S52 42.6
01	187 48.2	195 21.1	49.4	185 32.2	11.2	120 04.8	24.7	328 22.2	39.0	Capella	280 34.7	N46 00.7
02	202 50.7	210 20.7	48.2	200 32.8	12.0	135 06.9	24.8	343 24.8	39.0	Deneb	49 31.9	N45 19.6
03	217 53.2	225 20.3	. . 46.9	215 33.5	. . 12.8	150 09.0	. . 24.8	358 27.3	. . 38.9	Denebola	182 33.5	N14 29.7
04	232 55.6	240 19.9	45.7	230 34.2	13.6	165 11.2	24.9	13 29.9	38.9	Diphda	348 56.4	S17 54.9
05	247 58.1	255 19.5	44.5	245 34.9	14.4	180 13.3	25.0	28 32.5	38.8			
06	263 00.6	270 19.1	S 4 43.2	260 35.6	N 0 15.2	195 15.4	N21 25.0	43 35.0	S12 38.8	Dubhe	193 51.3	N61 40.6
07	278 03.0	285 18.7	42.0	275 36.3	16.0	210 17.5	25.1	58 37.6	38.8	Elnath	278 12.8	N28 37.0
08	293 05.5	300 18.3	40.8	290 37.0	16.8	225 19.6	25.1	73 40.1	38.7	Eltanin	90 46.3	N51 29.0
09	308 07.9	315 17.9	. . 39.6	305 37.7	. . 17.6	240 21.8	. . 25.2	88 42.7	. . 38.7	Enif	33 47.6	N 9 56.1
10	323 10.4	330 17.5	38.3	320 38.4	18.4	255 23.9	25.2	103 45.3	38.6	Fomalhaut	15 24.5	S29 33.1
11	338 12.9	345 17.1	37.1	335 39.1	19.1	270 26.0	25.3	118 47.8	38.6			
12	353 15.3	0 16.7	S 4 35.9	350 39.8	N 0 19.9	285 28.1	N21 25.4	133 50.4	S12 38.6	Gacrux	172 00.5	S57 11.3
13	8 17.8	15 16.2	34.6	5 40.5	20.7	300 30.2	25.4	148 52.9	38.5	Gienah	175 52.1	S17 37.1
14	23 20.3	30 15.8	33.4	20 41.2	21.5	315 32.3	25.5	163 55.5	38.5	Hadar	148 47.6	S60 26.1
15	38 22.7	45 15.4	. . 32.2	35 41.9	. . 22.3	330 34.5	. . 25.5	178 58.1	. . 38.4	Hamal	328 01.2	N23 31.4
16	53 25.2	60 15.0	30.9	50 42.5	23.1	345 36.6	25.6	194 00.6	38.4	Kaus Aust.	83 44.1	S34 22.5
17	68 27.7	75 14.6	29.7	65 43.2	23.9	0 38.7	25.6	209 03.2	38.4			
18	83 30.1	90 14.2	S 4 28.5	80 43.9	N 0 24.7	15 40.8	N21 25.7	224 05.7	S12 38.3	Kochab	137 19.3	N74 05.8
19	98 32.6	105 13.8	27.2	95 44.6	25.5	30 42.9	25.8	239 08.3	38.3	Markab	13 38.8	N15 16.6
20	113 35.1	120 13.4	26.0	110 45.3	26.3	45 45.0	25.8	254 10.9	38.3	Menkar	314 15.4	N 4 08.3
21	128 37.5	135 13.0	. . 24.8	125 46.0	. . 27.1	60 47.2	. . 25.9	269 13.4	. . 38.2	Menkent	148 07.4	S36 26.1
22	143 40.0	150 12.6	23.5	140 46.7	27.8	75 49.3	25.9	284 16.0	38.2	Miaplacidus	221 38.9	S69 46.6
23	158 42.4	165 12.2	22.3	155 47.4	28.6	90 51.4	26.0	299 18.6	38.1			
16 00	173 44.9	180 11.8	S 4 21.1	170 48.1	N 0 29.4	105 53.5	N21 26.0	314 21.1	S12 38.1	Mirfak	308 40.8	N49 54.5
01	188 47.4	195 11.4	19.8	185 48.8	30.2	120 55.6	26.1	329 23.7	38.1	Nunki	75 58.6	S26 16.6
02	203 49.8	210 11.0	18.6	200 49.5	31.0	135 57.7	26.2	344 26.2	38.0	Peacock	53 19.9	S56 41.3
03	218 52.3	225 10.6	. . 17.3	215 50.2	. . 31.8	150 59.8	. . 26.2	359 28.8	. . 38.0	Pollux	243 27.7	N27 59.5
04	233 54.8	240 10.2	16.1	230 50.9	32.6	166 02.0	26.3	14 31.4	37.9	Procyon	244 59.7	N 5 11.2
05	248 57.2	255 09.8	14.9	245 51.6	33.4	181 04.1	26.3	29 33.9	37.9			
06	263 59.7	270 09.4	S 4 13.6	260 52.3	N 0 34.2	196 06.2	N21 26.4	44 36.5	S12 37.9	Rasalhague	96 06.6	N12 33.0
07	279 02.2	285 09.0	12.4	275 52.9	35.0	211 08.3	26.4	59 39.1	37.8	Regulus	207 43.4	N11 53.9
08	294 04.6	300 08.6	11.2	290 53.6	35.8	226 10.4	26.5	74 41.6	37.8	Rigel	281 12.2	S 8 11.5
09	309 07.1	315 08.2	. . 09.9	305 54.3	. . 36.5	241 12.5	. . 26.6	89 44.2	. . 37.7	Rigil Kent.	139 51.4	S60 53.2
10	324 09.6	330 07.8	08.7	320 55.0	37.3	256 14.6	26.6	104 46.7	37.7	Sabik	102 12.7	S15 44.4
11	339 12.0	345 07.4	07.5	335 55.7	38.1	271 16.7	26.7	119 49.3	37.7			
12	354 14.5	0 07.0	S 4 06.2	350 56.4	N 0 38.9	286 18.9	N21 26.7	134 51.9	S12 37.6	Schedar	349 41.2	N56 36.6
13	9 16.9	15 06.6	05.0	5 57.1	39.7	301 21.0	26.8	149 54.4	37.6	Shaula	96 22.1	S37 06.6
14	24 19.4	30 06.2	03.7	20 57.8	40.5	316 23.1	26.8	164 57.0	37.5	Sirius	258 33.8	S16 44.4
15	39 21.9	45 05.8	. . 02.5	35 58.5	. . 41.3	331 25.2	. . 26.9	179 59.6	. . 37.5	Spica	158 31.1	S11 13.9
16	54 24.3	60 05.4	01.3	50 59.2	42.1	346 27.3	27.0	195 02.1	37.5	Suhail	222 52.2	S43 29.5
17	69 26.8	75 05.0	4 00.0	65 59.9	42.9	1 29.4	27.0	210 04.7	37.4			
18	84 29.3	90 04.6	S 3 58.8	81 00.6	N 0 43.7	16 31.5	N21 27.1	225 07.3	S12 37.4	Vega	80 39.2	N38 47.6
19	99 31.7	105 04.2	57.6	96 01.3	44.4	31 33.6	27.1	240 09.8	37.3	Zuben'ubi	137 05.4	S16 05.8
20	114 34.2	120 03.8	56.3	111 02.0	45.2	46 35.7	27.2	255 12.4	37.3		SHA	Mer. Pass.
21	129 36.7	135 03.4	. . 55.1	126 02.7	. . 46.0	61 37.8	. . 27.2	270 15.0	. . 37.3		° ′	h m
22	144 39.1	150 03.0	53.8	141 03.4	46.8	76 40.0	27.3	285 17.5	37.2	Venus	7 35.8	11 59
23	159 41.6	165 02.6	52.6	156 04.0	47.6	91 42.1	27.4	300 20.1	37.2	Mars	357 45.7	12 37
	h m									Jupiter	292 16.9	16 57
Mer. Pass.	12 26.9	v −0.4	d 1.2	v 0.7	d 0.8	v 2.1	d 0.1	v 2.6	d 0.0	Saturn	140 33.9	3 06

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 14	Moonrise 15	Moonrise 16	Moonrise 17
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
14 00	177 40.9	S 2 33.2	154 18.7	12.6	N10 01.4	9.8	56.2	N 72	03 53	05 16	06 23	05 30	05 13	04 45	
01	192 41.1	32.2	168 50.3	12.5	10 11.2	9.7	56.1	N 70	04 07	05 21	06 22	05 47	05 42	05 36	05 28
02	207 41.3	31.2	183 21.8	12.5	10 20.9	9.6	56.1	68	04 18	05 25	06 20	06 01	06 03	06 08	06 18
03	222 41.5	. . 30.2	197 53.3	12.6	10 30.5	9.6	56.1	66	04 27	05 28	06 19	06 12	06 20	06 32	06 50
04	237 41.6	29.2	212 24.9	12.5	10 40.1	9.5	56.1	64	04 35	05 31	06 18	06 22	06 34	06 50	07 14
05	252 41.8	28.2	226 56.4	12.5	10 49.6	9.5	56.0	62	04 41	05 33	06 17	06 30	06 46	07 06	07 33
06	267 42.0	S 2 27.2	241 27.9	12.5	N10 59.1	9.4	56.0	60	04 46	05 35	06 16	06 37	06 56	07 19	07 48
07	282 42.1	26.3	255 59.4	12.6	11 08.5	9.3	56.0	N 58	04 51	05 37	06 16	06 43	07 04	07 30	08 01
08	297 42.3	25.3	270 31.0	12.5	11 17.8	9.3	56.0	56	04 55	05 38	06 15	06 49	07 12	07 40	08 13
09	312 42.5	. . 24.3	285 02.5	12.5	11 27.1	9.2	55.9	54	04 58	05 39	06 15	06 54	07 19	07 48	08 23
10	327 42.7	23.3	299 34.0	12.5	11 36.3	9.2	55.9	52	05 01	05 40	06 14	06 58	07 25	07 56	08 31
11	342 42.8	22.3	314 05.5	12.5	11 45.5	9.0	55.9	50	05 04	05 41	06 14	07 03	07 31	08 03	08 39
12	357 43.0	S 2 21.3	328 37.0	12.5	N11 54.5	9.1	55.9	45	05 09	05 43	06 12	07 11	07 43	08 18	08 56
13	12 43.2	20.3	343 08.5	12.5	12 03.6	8.9	55.8	N 40	05 13	05 45	06 11	07 19	07 53	08 30	09 10
14	27 43.4	19.4	357 40.0	12.5	12 12.5	8.9	55.8	35	05 16	05 45	06 11	07 26	08 02	08 41	09 22
15	42 43.5	. . 18.4	12 11.5	12.5	12 21.4	8.8	55.8	30	05 18	05 46	06 10	07 31	08 10	08 50	09 33
16	57 43.7	17.4	26 43.0	12.5	12 30.2	8.8	55.8	20	05 21	05 46	06 08	07 41	08 23	09 06	09 51
17	72 43.9	16.4	41 14.5	12.4	12 39.0	8.6	55.7	N 10	05 22	05 46	06 07	07 50	08 34	09 20	10 06
18	87 44.1	S 2 15.4	55 45.9	12.5	N12 47.6	8.6	55.7	0	05 21	05 45	06 06	07 58	08 45	09 33	10 21
19	102 44.2	14.4	70 17.4	12.5	12 56.2	8.6	55.7	S 10	05 19	05 43	06 04	08 07	08 57	09 46	10 36
20	117 44.4	13.4	84 48.9	12.4	13 04.8	8.5	55.7	20	05 15	05 40	06 02	08 16	09 08	10 00	10 51
21	132 44.6	. . 12.4	99 20.3	12.5	13 13.3	8.4	55.6	30	05 08	05 36	06 00	08 26	09 22	10 17	11 09
22	147 44.8	11.5	113 51.8	12.4	13 21.7	8.3	55.6	35	05 04	05 34	05 59	08 32	09 30	10 26	11 20
23	162 44.9	10.5	128 23.2	12.5	13 30.0	8.2	55.6	40	04 59	05 31	05 58	08 39	09 39	10 37	11 32
15 00	177 45.1	S 2 09.5	142 54.7	12.4	N13 38.2	8.2	55.6	45	04 52	05 27	05 56	08 47	09 50	10 50	11 46
01	192 45.3	08.5	157 26.1	12.4	13 46.4	8.1	55.5	S 50	04 43	05 21	05 54	08 56	10 02	11 05	12 04
02	207 45.4	07.5	171 57.5	12.4	13 54.5	8.1	55.5	52	04 39	05 19	05 53	09 01	10 08	11 13	12 12
03	222 45.6	. . 06.5	186 28.9	12.4	14 02.6	7.9	55.5	54	04 34	05 16	05 52	09 06	10 15	11 21	12 21
04	237 45.8	05.5	201 00.3	12.4	14 10.5	7.9	55.5	56	04 28	05 13	05 51	09 11	10 23	11 30	12 32
05	252 46.0	04.5	215 31.7	12.4	14 18.4	7.9	55.4	58	04 22	05 10	05 49	09 17	10 31	11 40	12 44
06	267 46.1	S 2 03.6	230 03.1	12.4	N14 26.3	7.7	55.4	S 60	04 14	05 06	05 48	09 24	10 41	11 52	12 58
07	282 46.3	02.6	244 34.5	12.4	14 34.0	7.7	55.4								
08	297 46.5	01.6	259 05.9	12.4	14 41.7	7.6	55.4								
09	312 46.7	2 00.6	273 37.3	12.3	14 49.3	7.5	55.4								
10	327 46.8	1 59.6	288 08.6	12.4	14 56.8	7.4	55.3								
11	342 47.0	58.6	302 40.0	12.3	15 04.2	7.4	55.3								
12	357 47.2	S 1 57.6	317 11.3	12.4	N15 11.6	7.2	55.3								
13	12 47.4	56.6	331 42.7	12.3	15 18.8	7.2	55.3								
14	27 47.6	55.7	346 14.0	12.3	15 26.0	7.2	55.2								
15	42 47.7	. . 54.7	0 45.3	12.3	15 33.2	7.0	55.2								
16	57 47.9	53.7	15 16.6	12.3	15 40.2	7.0	55.2								
17	72 48.1	52.7	29 47.9	12.3	15 47.2	6.9	55.2								
18	87 48.3	S 1 51.7	44 19.2	12.3	N15 54.1	6.8	55.2								
19	102 48.4	50.7	58 50.5	12.3	16 00.9	6.7	55.1								
20	117 48.6	49.7	73 21.8	12.3	16 07.6	6.6	55.1								
21	132 48.8	. . 48.7	87 53.1	12.2	16 14.2	6.6	55.1								
22	147 49.0	47.8	102 24.3	12.3	16 20.8	6.5	55.1								
23	162 49.1	46.8	116 55.6	12.2	16 27.3	6.4	55.1								
16 00	177 49.3	S 1 45.8	131 26.8	12.2	N16 33.7	6.3	55.0								
01	192 49.5	44.8	145 58.0	12.3	16 40.0	6.2	55.0								
02	207 49.7	43.8	160 29.3	12.2	16 46.2	6.1	55.0								
03	222 49.8	. . 42.8	175 00.5	12.2	16 52.3	6.1	55.0								
04	237 50.0	41.8	189 31.7	12.2	16 58.4	6.0	55.0								
05	252 50.2	40.8	204 02.9	12.2	17 04.4	5.9	54.9								
06	267 50.4	S 1 39.9	218 34.1	12.1	N17 10.3	5.8	54.9								
07	282 50.6	38.9	233 05.2	12.2	17 16.1	5.7	54.9								
08	297 50.7	37.9	247 36.4	12.2	17 21.8	5.6	54.9								
09	312 50.9	. . 36.9	262 07.6	12.1	17 27.4	5.6	54.9								
10	327 51.1	35.9	276 38.7	12.1	17 33.0	5.4	54.8								
11	342 51.3	34.9	291 09.8	12.2	17 38.4	5.4	54.8								
12	357 51.4	S 1 33.9	305 41.0	12.1	N17 43.8	5.3	54.8								
13	12 51.6	32.9	320 12.1	12.1	17 49.1	5.2	54.8								
14	27 51.8	31.9	334 43.2	12.1	17 54.3	5.1	54.8								
15	42 52.0	. . 31.0	349 14.3	12.1	17 59.4	5.1	54.8								
16	57 52.2	30.0	3 45.4	12.1	18 04.5	4.9	54.7								
17	72 52.3	29.0	18 16.5	12.1	18 09.4	4.9	54.7								
18	87 52.5	S 1 28.0	32 47.6	12.1	N18 14.3	4.7	54.7								
19	102 52.7	27.0	47 18.7	12.0	18 19.0	4.7	54.7								
20	117 52.9	26.0	61 49.7	12.1	18 23.7	4.6	54.7								
21	132 53.1	. . 25.0	76 20.8	12.0	18 28.3	4.5	54.7								
22	147 53.2	24.0	90 51.8	12.1	18 32.8	4.4	54.7								
23	162 53.4	23.1	105 22.9	12.0	N18 37.2	4.3	54.6								
	SD 16.1	d 1.0	SD	15.2		15.1		14.9							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 14	Moonset 15	Moonset 16	Moonset 17
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 57	19 04	20 29	23 38	25 45	01 45	
N 70	17 58	18 59	20 14	23 11	24 55	00 55	02 42
68	17 59	18 55	20 03	22 50	24 24	00 24	01 52
66	18 00	18 51	19 53	22 34	24 00	00 00	01 21
64	18 01	18 48	19 45	22 21	23 42	24 58	00 58
62	18 02	18 46	19 39	22 10	23 28	24 39	00 39
60	18 03	18 44	19 33	22 01	23 15	24 24	00 24
N 58	18 03	18 42	19 29	21 53	23 04	24 11	00 11
56	18 04	18 41	19 24	21 45	22 55	24 00	00 00
54	18 04	18 39	19 21	21 39	22 47	23 50	24 48
52	18 05	18 38	19 18	21 33	22 40	23 42	24 38
50	18 05	18 37	19 15	21 28	22 33	23 34	24 30
45	18 06	18 35	19 10	21 17	22 19	23 17	24 12
N 40	18 07	18 34	19 05	21 08	22 07	23 04	23 57
35	18 08	18 33	19 02	21 00	21 57	22 52	23 45
30	18 08	18 32	19 00	20 53	21 48	22 42	23 34
20	18 10	18 32	18 57	20 41	21 34	22 25	23 15
N 10	18 11	18 32	18 56	20 31	21 20	22 10	22 59
0	18 12	18 33	18 57	20 21	21 08	21 56	22 44
S 10	18 13	18 34	18 59	20 11	20 56	21 42	22 29
20	18 15	18 37	19 03	20 01	20 43	21 27	22 13
30	18 17	18 41	19 09	19 49	20 28	21 10	21 54
35	18 18	18 43	19 13	19 42	20 20	21 00	21 43
40	18 19	18 46	19 18	19 35	20 10	20 49	21 31
45	18 21	18 50	19 25	19 26	19 59	20 35	21 16
S 50	18 23	18 55	19 34	19 15	19 45	20 19	20 58
52	18 24	18 58	19 38	19 10	19 38	20 11	20 50
54	18 25	19 00	19 43	19 04	19 31	20 03	20 41
56	18 26	19 03	19 48	18 58	19 24	19 54	20 30
58	18 27	19 06	19 54	18 52	19 15	19 43	20 18
S 60	18 28	19 10	20 01	18 44	19 04	19 30	20 04

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
14	09 17	09 08	12 09	14 10	01 46	03	8
15	09 00	08 52	12 09	14 57	02 33	04	14
16	08 43	08 35	12 09	15 44	03 21	05	21

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.2		SATURN +0.3		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
17 00	174 44.0	180 02.2	S 3 51.4	171 04.7	N 0 48.4	106 44.2	N21 27.4	315 22.7	S12 37.1	Acamar	315 18.7	S40 15.4
01	189 46.5	195 01.8	50.1	186 05.4	49.2	121 46.3	27.5	330 25.2	37.1	Achernar	335 27.4	S57 10.4
02	204 49.0	210 01.4	48.9	201 06.1	50.0	136 48.4	27.5	345 27.8	37.1	Acrux	173 08.7	S63 10.4
03	219 51.4	225 01.0 . .	47.6	216 06.8 . .	50.8	151 50.5 . .	27.6	0 30.4 . .	37.0	Adhara	255 12.5	S28 59.8
04	234 53.9	240 00.6	46.4	231 07.5	51.6	166 52.6	27.6	15 32.9	37.0	Aldebaran	290 49.7	N16 32.0
05	249 56.4	255 00.2	45.2	246 08.2	52.3	181 54.7	27.7	30 35.5	36.9			
06	264 58.8	269 59.8	S 3 43.9	261 08.9	N 0 53.1	196 56.8	N21 27.8	45 38.1	S12 36.9	Alioth	166 20.3	N55 53.1
07	280 01.3	284 59.4	42.7	276 09.6	53.9	211 58.9	27.8	60 40.6	36.9	Alkaid	152 58.6	N49 14.6
08	295 03.8	299 59.0	41.4	291 10.3	54.7	227 01.0	27.9	75 43.2	36.8	Al Na'ir	27 44.4	S46 53.7
S 09	310 06.2	314 58.6 . .	40.2	306 11.0 . .	55.5	242 03.1 . .	27.9	90 45.8 . .	36.8	Alnilam	275 46.5	S 1 11.9
U 10	325 08.7	329 58.2	39.0	321 11.7	56.3	257 05.2	28.0	105 48.3	36.7	Alphard	217 56.0	S 8 43.3
N 11	340 11.2	344 57.8	37.7	336 12.4	57.1	272 07.3	28.0	120 50.9	36.7			
D 12	355 13.6	359 57.4	S 3 36.5	351 13.1	N 0 57.9	287 09.5	N21 28.1	135 53.5	S12 36.7	Alphecca	126 11.0	N26 40.0
A 13	10 16.1	14 57.0	35.2	6 13.8	58.7	302 11.6	28.2	150 56.0	36.6	Alpheratz	357 44.0	N29 09.8
Y 14	25 18.5	29 56.6	34.0	21 14.5	0 59.5	317 13.7	28.2	165 58.6	36.6	Altair	62 08.5	N 8 54.2
15	40 21.0	44 56.2 . .	32.7	36 15.2	1 00.2	332 15.8 . .	28.3	181 01.2 . .	36.5	Ankaa	353 16.3	S42 14.1
16	55 23.5	59 55.8	31.5	51 15.9	01.0	347 17.9	28.3	196 03.7	36.5	Antares	112 26.3	S26 27.6
17	70 25.9	74 55.4	30.3	66 16.6	01.8	2 20.0	28.4	211 06.3	36.5			
18	85 28.4	89 55.0	S 3 29.0	81 17.2	N 1 02.6	17 22.1	N21 28.5	226 08.9	S12 36.4	Arcturus	145 55.6	N19 06.6
19	100 30.9	104 54.6	27.8	96 17.9	03.4	32 24.2	28.5	241 11.4	36.4	Atria	107 28.2	S69 02.7
20	115 33.3	119 54.2	26.5	111 18.6	04.2	47 26.3	28.6	256 14.0	36.3	Avior	234 17.7	S59 33.5
21	130 35.8	134 53.8 . .	25.3	126 19.3 . .	05.0	62 28.4 . .	28.6	271 16.6 . .	36.3	Bellatrix	278 32.2	N 6 21.5
22	145 38.3	149 53.4	24.0	141 20.0	05.8	77 30.5	28.7	286 19.1	36.2	Betelgeuse	271 01.5	N 7 24.3
23	160 40.7	164 53.0	22.8	156 20.7	06.6	92 32.6	28.7	301 21.7	36.2			
18 00	175 43.2	179 52.7	S 3 21.6	171 21.4	N 1 07.3	107 34.7	N21 28.8	316 24.3	S12 36.2	Canopus	263 56.1	S52 42.6
01	190 45.7	194 52.3	20.3	186 22.1	08.1	122 36.8	28.9	331 26.9	36.1	Capella	280 34.7	N46 00.7
02	205 48.1	209 51.9	19.1	201 22.8	08.9	137 38.9	28.9	346 29.4	36.1	Deneb	49 31.9	N45 19.6
03	220 50.6	224 51.5 . .	17.8	216 23.5 . .	09.7	152 41.0 . .	29.0	1 32.0 . .	36.0	Denebola	182 33.5	N14 29.7
04	235 53.0	239 51.1	16.6	231 24.2	10.5	167 43.1	29.0	16 34.6	36.0	Diphda	348 56.4	S17 54.9
05	250 55.5	254 50.7	15.3	246 24.9	11.3	182 45.2	29.1	31 37.1	36.0			
06	265 58.0	269 50.3	S 3 14.1	261 25.6	N 1 12.1	197 47.3	N21 29.1	46 39.7	S12 35.9	Dubhe	193 51.3	N61 40.7
07	281 00.4	284 49.9	12.8	276 26.3	12.9	212 49.4	29.2	61 42.3	35.9	Elnath	278 12.9	N28 37.0
08	296 02.9	299 49.5	11.6	291 27.0	13.7	227 51.5	29.3	76 44.8	35.8	Eltanin	90 46.2	N51 29.0
M 09	311 05.4	314 49.1 . .	10.4	306 27.7 . .	14.4	242 53.6 . .	29.3	91 47.4 . .	35.8	Enif	33 47.5	N 9 56.1
O 10	326 07.8	329 48.7	09.1	321 28.4	15.2	257 55.7	29.4	106 50.0	35.7	Fomalhaut	15 24.5	S29 33.1
N 11	341 10.3	344 48.3	07.9	336 29.1	16.0	272 57.8	29.4	121 52.6	35.7			
D 12	356 12.8	359 47.9	S 3 06.6	351 29.8	N 1 16.8	287 59.9	N21 29.5	136 55.1	S12 35.7	Gacrux	172 00.5	S57 11.3
A 13	11 15.2	14 47.5	05.4	6 30.5	17.6	303 02.0	29.6	151 57.7	35.6	Gienah	175 52.1	S17 37.1
Y 14	26 17.7	29 47.1	04.1	21 31.2	18.4	318 04.1	29.6	167 00.3	35.6	Hadar	148 47.5	S60 26.1
15	41 20.1	44 46.8 . .	02.9	36 31.9 . .	19.2	333 06.2 . .	29.7	182 02.8 . .	35.5	Hamal	328 01.2	N23 31.4
16	56 22.6	59 46.4	01.6	51 32.6	20.0	348 08.3	29.7	197 05.4	35.5	Kaus Aust.	83 44.1	S34 22.5
17	71 25.1	74 46.0	3 00.4	66 33.2	20.7	3 10.4	29.8	212 08.0	35.5			
18	86 27.5	89 45.6	S 2 59.1	81 33.9	N 1 21.5	18 12.5	N21 29.8	227 10.6	S12 35.4	Kochab	137 19.2	N74 05.8
19	101 30.0	104 45.2	57.9	96 34.6	22.3	33 14.6	29.9	242 13.1	35.4	Markab	13 38.8	N15 16.6
20	116 32.5	119 44.8	56.6	111 35.3	23.1	48 16.7	30.0	257 15.7	35.3	Menkar	314 15.4	N 4 08.3
21	131 34.9	134 44.4 . .	55.4	126 36.0 . .	23.9	63 18.8 . .	30.0	272 18.3 . .	35.3	Menkent	148 07.4	S36 26.1
22	146 37.4	149 44.0	54.2	141 36.7	24.7	78 20.9	30.1	287 20.8	35.2	Miaplacidus	221 39.0	S69 46.7
23	161 39.9	164 43.6	52.9	156 37.4	25.5	93 23.0	30.1	302 23.4	35.2			
19 00	176 42.3	179 43.2	S 2 51.7	171 38.1	N 1 26.3	108 25.1	N21 30.2	317 26.0	S12 35.2	Mirfak	308 40.8	N49 54.5
01	191 44.8	194 42.8	50.4	186 38.8	27.0	123 27.2	30.3	332 28.6	35.1	Nunki	75 58.6	S26 16.6
02	206 47.3	209 42.4	49.2	201 39.5	27.8	138 29.3	30.3	347 31.1	35.1	Peacock	53 19.9	S56 41.2
03	221 49.7	224 42.1 . .	47.9	216 40.2 . .	28.6	153 31.4 . .	30.4	2 33.7 . .	35.0	Pollux	243 27.8	N27 59.5
04	236 52.2	239 41.7	46.7	231 40.9	29.4	168 33.4	30.4	17 36.3	35.0	Procyon	244 59.8	N 5 11.2
05	251 54.6	254 41.3	45.4	246 41.6	30.2	183 35.5	30.5	32 38.9	34.9			
06	266 57.1	269 40.9	S 2 44.2	261 42.3	N 1 31.0	198 37.6	N21 30.5	47 41.4	S12 34.9	Rasalhague	96 06.6	N12 33.0
07	281 59.6	284 40.5	42.9	276 43.0	31.8	213 39.7	30.6	62 44.0	34.9	Regulus	207 43.4	N11 53.9
T 08	297 02.0	299 40.1	41.7	291 43.7	32.6	228 41.8	30.7	77 46.6	34.8	Rigel	281 12.3	S 8 11.5
U 09	312 04.5	314 39.7 . .	40.4	306 44.4 . .	33.3	243 43.9 . .	30.7	92 49.2 . .	34.8	Rigil Kent.	139 51.4	S60 53.2
E 10	327 07.0	329 39.3	39.2	321 45.1	34.1	258 46.0	30.8	107 51.7	34.7	Sabik	102 12.7	S15 44.4
S 11	342 09.4	344 38.9	37.9	336 45.8	34.9	273 48.1	30.8	122 54.3	34.7			
D 12	357 11.9	359 38.6	S 2 36.7	351 46.5	N 1 35.7	288 50.2	N21 30.9	137 56.9	S12 34.7	Schedar	349 41.2	N56 36.6
A 13	12 14.4	14 38.2	35.4	6 47.2	36.5	303 52.3	31.0	152 59.5	34.6	Shaula	96 22.1	S37 06.6
Y 14	27 16.8	29 37.8	34.2	21 47.9	37.3	318 54.4	31.0	168 02.0	34.6	Sirius	258 33.8	S16 44.4
15	42 19.3	44 37.4 . .	32.9	36 48.6 . .	38.1	333 56.5 . .	31.1	183 04.6 . .	34.5	Spica	158 31.1	S11 14.0
16	57 21.8	59 37.0	31.7	51 49.3	38.8	348 58.6	31.1	198 07.2	34.5	Suhail	222 52.2	S43 29.5
17	72 24.2	74 36.6	30.4	66 50.0	39.6	4 00.7	31.2	213 09.8	34.4			
18	87 26.7	89 36.2	S 2 29.2	81 50.7	N 1 40.4	19 02.8	N21 31.3	228 12.3	S12 34.4	Vega	80 39.1	N38 47.6
19	102 29.1	104 35.8	27.9	96 51.4	41.2	34 04.8	31.3	243 14.9	34.4	Zuben'ubi	137 05.4	S16 05.8
20	117 31.6	119 35.4	26.7	111 52.1	42.0	49 06.9	31.4	258 17.5	34.3		SHA	Mer.Pass.
21	132 34.1	134 35.1 . .	25.4	126 52.8 . .	42.8	64 09.0 . .	31.4	273 20.1 . .	34.3		° ′	h m
22	147 36.5	149 34.7	24.2	141 53.5	43.6	79 11.1	31.5	288 22.6	34.2	Venus	4 09.5	12 01
23	162 39.0	164 34.3	22.9	156 54.1	44.4	94 13.2	31.5	303 25.2	34.2	Mars	355 38.2	12 34
	h m									Jupiter	291 51.5	16 47
Mer.Pass.	12 15.1	v −0.4	d 1.2	v 0.7	d 0.8	v 2.1	d 0.1	v 2.6	d 0.0	Saturn	140 41.1	2 54

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 17	Moonrise 18	Moonrise 19	Moonrise 20
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
17 00	177 53.6	S 1 22.1	119 53.9	12.0	N18 41.5	4.2	54.6	N 72	03 34	05 01	06 08				
01	192 53.8	21.1	134 24.9	12.0	18 45.7	4.2	54.6	N 70	03 51	05 07	06 08	05 28			07 35
02	207 53.9	20.1	148 55.9	12.1	18 49.9	4.0	54.6	68	04 04	05 12	06 08	06 18	06 41	07 26	08 36
03	222 54.1 . .	19.1	163 27.0	12.0	18 53.9	4.0	54.6	66	04 14	05 17	06 08	06 50	07 20	08 07	09 11
04	237 54.3	18.1	177 58.0	12.0	18 57.9	3.8	54.6	64	04 23	05 20	06 08	07 14	07 48	08 35	09 36
05	252 54.5	17.1	192 29.0	12.0	19 01.7	3.8	54.6	62	04 30	05 23	06 08	07 33	08 09	08 56	09 55
06	267 54.7	S 1 16.1	207 00.0	11.9	N19 05.5	3.7	54.5	60	04 37	05 26	06 07	07 48	08 26	09 14	10 11
07	282 54.8	15.1	221 30.9	12.0	19 09.2	3.6	54.5	N 58	04 42	05 28	06 07	08 01	08 40	09 28	10 25
08	297 55.0	14.2	236 01.9	12.0	19 12.8	3.5	54.5	56	04 46	05 30	06 07	08 13	08 53	09 41	10 36
S 09	312 55.2 . .	13.2	250 32.9	12.0	19 16.3	3.4	54.5	54	04 50	05 32	06 07	08 23	09 03	09 51	10 46
U 10	327 55.4	12.2	265 03.9	11.9	19 19.7	3.3	54.5	52	04 54	05 34	06 07	08 31	09 13	10 01	10 55
N 11	342 55.6	11.2	279 34.8	12.0	19 23.0	3.2	54.5	50	04 57	05 35	06 07	08 39	09 22	10 10	11 03
D 12	357 55.7	S 1 10.2	294 05.8	11.9	N19 26.2	3.1	54.5	45	05 03	05 38	06 07	08 56	09 40	10 28	11 21
A 13	12 55.9	09.2	308 36.7	12.0	19 29.3	3.1	54.5	N 40	05 08	05 40	06 07	09 10	09 55	10 43	11 35
Y 14	27 56.1	08.2	323 07.7	11.9	19 32.4	2.9	54.4	35	05 12	05 41	06 06	09 22	10 07	10 55	11 47
15	42 56.3 . .	07.2	337 38.6	11.9	19 35.3	2.9	54.4	30	05 15	05 42	06 06	09 33	10 18	11 06	11 57
16	57 56.5	06.2	352 09.5	12.0	19 38.2	2.7	54.4	20	05 18	05 44	06 06	09 51	10 37	11 25	12 15
17	72 56.6	05.3	6 40.5	11.9	19 40.9	2.7	54.4	N 10	05 20	05 44	06 05	10 06	10 53	11 42	12 30
18	87 56.8	S 1 04.3	21 11.4	11.9	N19 43.6	2.6	54.4	0	05 20	05 44	06 05	10 21	11 09	11 57	12 45
19	102 57.0	03.3	35 42.3	11.9	19 46.2	2.4	54.4	S 10	05 19	05 43	06 04	10 36	11 24	12 12	12 59
20	117 57.2	02.3	50 13.2	12.0	19 48.6	2.4	54.4	20	05 16	05 41	06 03	10 51	11 41	12 29	13 15
21	132 57.4 . .	01.3	64 44.2	11.9	19 51.0	2.3	54.4	30	05 10	05 38	06 02	11 09	12 00	12 48	13 33
22	147 57.6	1 00.3	79 15.1	11.9	19 53.3	2.2	54.4	35	05 07	05 36	06 02	11 20	12 11	12 59	13 43
23	162 57.7	0 59.3	93 46.0	11.9	19 55.5	2.1	54.4	40	05 02	05 34	06 01	11 32	12 24	13 11	13 55
18 00	177 57.9	S 0 58.3	108 16.9	11.9	N19 57.6	2.0	54.4	45	04 56	05 31	06 00	11 46	12 39	13 26	14 09
01	192 58.1	57.4	122 47.8	11.9	19 59.6	2.0	54.3	S 50	04 48	05 26	05 59	12 04	12 57	13 44	14 26
02	207 58.3	56.4	137 18.7	11.9	20 01.6	1.8	54.3	52	04 44	05 24	05 58	12 12	13 06	13 53	14 34
03	222 58.5 . .	55.4	151 49.6	11.9	20 03.4	1.7	54.3	54	04 40	05 22	05 58	12 21	13 16	14 03	14 42
04	237 58.6	54.4	166 20.5	11.9	20 05.1	1.6	54.3	56	04 35	05 20	05 57	12 32	13 27	14 13	14 52
05	252 58.8	53.4	180 51.4	11.9	20 06.7	1.6	54.3	58	04 29	05 17	05 56	12 44	13 39	14 26	15 04
06	267 59.0	S 0 52.4	195 22.3	11.9	N20 08.3	1.4	54.3	S 60	04 23	05 14	05 55	12 58	13 54	14 40	15 17
07	282 59.2	51.4	209 53.2	11.9	20 09.7	1.4	54.3								
08	297 59.4	50.4	224 24.1	11.8	20 11.1	1.2	54.3								
M 09	312 59.5 . .	49.4	238 54.9	11.9	20 12.3	1.2	54.3								
O 10	327 59.7	48.5	253 25.8	11.9	20 13.5	1.1	54.3								
N 11	342 59.9	47.5	267 56.7	11.9	20 14.6	1.0	54.3								
D 12	358 00.1	S 0 46.5	282 27.6	11.9	N20 15.6	0.8	54.3								
A 13	13 00.3	45.5	296 58.5	11.9	20 16.4	0.8	54.3								
Y 14	28 00.5	44.5	311 29.4	11.9	20 17.2	0.7	54.3								
15	43 00.6 . .	43.5	326 00.3	11.9	20 17.9	0.6	54.3								
16	58 00.8	42.5	340 31.2	11.9	20 18.5	0.5	54.3								
17	73 01.0	41.5	355 02.1	11.9	20 19.0	0.4	54.3								
18	88 01.2	S 0 40.5	9 33.0	11.9	N20 19.4	0.3	54.3								
19	103 01.4	39.6	24 03.9	11.9	20 19.7	0.3	54.3								
20	118 01.6	38.6	38 34.8	11.9	20 20.0	0.1	54.2								
21	133 01.7 . .	37.6	53 05.7	11.9	20 20.1	0.0	54.2								
22	148 01.9	36.6	67 36.6	11.9	20 20.1	0.1	54.2								
23	163 02.1	35.6	82 07.5	11.9	20 20.0	0.1	54.2								
19 00	178 02.3	S 0 34.6	96 38.4	11.9	N20 19.9	0.3	54.2								
01	193 02.5	33.6	111 09.3	11.9	20 19.6	0.3	54.2								
02	208 02.7	32.6	125 40.2	12.0	20 19.3	0.5	54.2								
03	223 02.8 . .	31.7	140 11.2	11.9	20 18.8	0.5	54.2								
04	238 03.0	30.7	154 42.1	11.9	20 18.3	0.6	54.2								
05	253 03.2	29.7	169 13.0	11.9	20 17.7	0.7	54.2								
06	268 03.4	S 0 28.7	183 43.9	12.0	N20 17.0	0.9	54.2								
07	283 03.6	27.7	198 14.9	11.9	20 16.1	0.9	54.2								
T 08	298 03.8	26.7	212 45.8	12.0	20 15.2	1.0	54.2								
U 09	313 03.9 . .	25.7	227 16.8	11.9	20 14.2	1.1	54.2								
E 10	328 04.1	24.7	241 47.7	12.0	20 13.1	1.2	54.2								
S 11	343 04.3	23.7	256 18.7	11.9	20 11.9	1.3	54.2								
D 12	358 04.5	S 0 22.8	270 49.6	12.0	N20 10.6	1.3	54.3								
A 13	13 04.7	21.8	285 20.6	12.0	20 09.3	1.5	54.3								
Y 14	28 04.9	20.8	299 51.6	12.0	20 07.8	1.6	54.3								
15	43 05.0 . .	19.8	314 22.6	12.0	20 06.2	1.6	54.3								
16	58 05.2	18.8	328 53.6	12.0	20 04.6	1.8	54.3								
17	73 05.4	17.8	343 24.6	12.0	20 02.8	1.8	54.3								
18	88 05.6	S 0 16.8	357 55.6	12.0	N20 01.0	2.0	54.3								
19	103 05.8	15.8	12 26.6	12.0	19 59.0	2.0	54.3								
20	118 06.0	14.9	26 57.6	12.0	19 57.0	2.1	54.3								
21	133 06.1 . .	13.9	41 28.6	12.1	19 54.9	2.3	54.3								
22	148 06.3	12.9	55 59.7	12.0	19 52.6	2.3	54.3								
23	163 06.5	11.9	70 30.7	12.1	N19 50.3	2.4	54.3								
	SD 16.1	d 1.0	SD	14.8		14.8									

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 17	Moonset 18	Moonset 19	Moonset 20
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 10	19 18	20 47				
N 70	18 10	19 12	20 29	02 42			05 35
68	18 10	19 06	20 15	01 52	03 09	04 04	04 34
66	18 10	19 01	20 04	01 21	02 30	03 23	03 59
64	18 10	18 58	19 55	00 58	02 03	02 55	03 34
62	18 10	18 54	19 48	00 39	01 42	02 34	03 14
60	18 10	18 52	19 41	00 24	01 25	02 16	02 58
N 58	18 10	18 49	19 36	00 11	01 11	02 02	02 44
56	18 10	18 47	19 31	00 00	00 59	01 49	02 32
54	18 10	18 45	19 27	24 48	00 48	01 38	02 22
52	18 10	18 44	19 23	24 38	00 38	01 29	02 13
50	18 10	18 42	19 20	24 30	00 30	01 20	02 04
45	18 10	18 39	19 14	24 12	00 12	01 02	01 47
N 40	18 10	18 37	19 09	23 57	24 47	00 47	01 32
35	18 10	18 35	19 05	23 45	24 34	00 34	01 20
30	18 10	18 34	19 02	23 34	24 23	00 23	01 10
20	18 10	18 32	18 58	23 15	24 04	00 04	00 51
N 10	18 11	18 32	18 56	22 59	23 48	24 35	00 35
0	18 11	18 32	18 56	22 44	23 32	24 20	00 20
S 10	18 12	18 33	18 57	22 29	23 17	24 05	00 05
20	18 12	18 34	19 00	22 13	23 00	23 49	24 39
30	18 13	18 37	19 05	21 54	22 41	23 30	24 22
35	18 14	18 39	19 09	21 43	22 30	23 20	24 12
40	18 15	18 42	19 13	21 31	22 17	23 07	24 01
45	18 15	18 45	19 19	21 16	22 02	22 52	23 47
S 50	18 16	18 49	19 27	20 58	21 44	22 34	23 31
52	18 17	18 50	19 30	20 50	21 35	22 26	23 23
54	18 17	18 53	19 35	20 41	21 25	22 16	23 14
56	18 18	18 55	19 39	20 30	21 14	22 06	23 05
58	18 19	18 58	19 45	20 18	21 01	21 53	22 54
S 60	18 19	19 01	19 51	20 04	20 46	21 39	22 41

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
17	08 26	08 17	12 08	16 32	04 08	06	30
18	08 09	08 00	12 08	17 21	04 56	07	39
19	07 51	07 42	12 08	18 09	05 45	08	48

UT	ARIES	VENUS −4.0		MARS +1.2		JUPITER −2.2		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
20 00	177 41.5	179 33.9	S 2 21.7	171 54.8	N 1 45.1	109 15.3	N21 31.6	318 27.8	S12 34.1
01	192 43.9	194 33.5	20.4	186 55.5	45.9	124 17.4	31.7	333 30.4	34.1
02	207 46.4	209 33.1	19.2	201 56.2	46.7	139 19.5	31.7	348 32.9	34.0
03	222 48.9	224 32.7	. . 17.9	216 56.9	. . 47.5	154 21.6	. . 31.8	3 35.5	. . 34.0
04	237 51.3	239 32.3	16.7	231 57.6	48.3	169 23.7	31.8	18 38.1	34.0
05	252 53.8	254 32.0	15.4	246 58.3	49.1	184 25.7	31.9	33 40.7	33.9
06	267 56.2	269 31.6	S 2 14.2	261 59.0	N 1 49.9	199 27.8	N21 32.0	48 43.2	S12 33.9
W 07	282 58.7	284 31.2	12.9	276 59.7	50.6	214 29.9	32.0	63 45.8	33.8
E 08	298 01.2	299 30.8	11.7	292 00.4	51.4	229 32.0	32.1	78 48.4	33.8
D 09	313 03.6	314 30.4	. . 10.4	307 01.1	. . 52.2	244 34.1	. . 32.1	93 51.0	. . 33.7
N 10	328 06.1	329 30.0	09.2	322 01.8	53.0	259 36.2	32.2	108 53.6	33.7
E 11	343 08.6	344 29.6	07.9	337 02.5	53.8	274 38.3	32.3	123 56.1	33.7
S 12	358 11.0	359 29.2	S 2 06.7	352 03.2	N 1 54.6	289 40.4	N21 32.3	138 58.7	S12 33.6
D 13	13 13.5	14 28.9	05.4	7 03.9	55.4	304 42.4	32.4	154 01.3	33.6
A 14	28 16.0	29 28.5	04.2	22 04.6	56.1	319 44.5	32.4	169 03.9	33.5
Y 15	43 18.4	44 28.1	. . 02.9	37 05.3	. . 56.9	334 46.6	. . 32.5	184 06.4	. . 33.5
16	58 20.9	59 27.7	01.7	52 06.0	57.7	349 48.7	32.6	199 09.0	33.4
17	73 23.4	74 27.3	2 00.4	67 06.7	58.5	4 50.8	32.6	214 11.6	33.4
18	88 25.8	89 26.9	S 1 59.2	82 07.4	N 1 59.3	19 52.9	N21 32.7	229 14.2	S12 33.4
19	103 28.3	104 26.5	57.9	97 08.1	2 00.1	34 55.0	32.7	244 16.8	33.3
20	118 30.7	119 26.2	56.6	112 08.8	00.8	49 57.0	32.8	259 19.3	33.3
21	133 33.2	134 25.8	. . 55.4	127 09.5	. . 01.6	64 59.1	. . 32.8	274 21.9	. . 33.2
22	148 35.7	149 25.4	54.1	142 10.2	02.4	80 01.2	32.9	289 24.5	33.2
23	163 38.1	164 25.0	52.9	157 10.9	03.2	95 03.3	33.0	304 27.1	33.1
21 00	178 40.6	179 24.6	S 1 51.6	172 11.6	N 2 04.0	110 05.4	N21 33.0	319 29.7	S12 33.1
01	193 43.1	194 24.2	50.4	187 12.3	04.8	125 07.5	33.1	334 32.2	33.0
02	208 45.5	209 23.9	49.1	202 13.0	05.6	140 09.5	33.1	349 34.8	33.0
03	223 48.0	224 23.5	. . 47.9	217 13.7	. . 06.3	155 11.6	. . 33.2	4 37.4	. . 33.0
04	238 50.5	239 23.1	46.6	232 14.4	07.1	170 13.7	33.3	19 40.0	32.9
05	253 52.9	254 22.7	45.4	247 15.1	07.9	185 15.8	33.3	34 42.6	32.9
06	268 55.4	269 22.3	S 1 44.1	262 15.8	N 2 08.7	200 17.9	N21 33.4	49 45.1	S12 32.8
T 07	283 57.9	284 21.9	42.9	277 16.5	09.5	215 20.0	33.4	64 47.7	32.8
H 08	299 00.3	299 21.6	41.6	292 17.2	10.3	230 22.0	33.5	79 50.3	32.7
U 09	314 02.8	314 21.2	. . 40.3	307 17.9	. . 11.0	245 24.1	. . 33.6	94 52.9	. . 32.7
R 10	329 05.2	329 20.8	39.1	322 18.6	11.8	260 26.2	33.6	109 55.5	32.6
S 11	344 07.7	344 20.4	37.8	337 19.3	12.6	275 28.3	33.7	124 58.0	32.6
D 12	359 10.2	359 20.0	S 1 36.6	352 20.0	N 2 13.4	290 30.4	N21 33.7	140 00.6	S12 32.6
A 13	14 12.6	14 19.6	35.3	7 20.7	14.2	305 32.5	33.8	155 03.2	32.5
Y 14	29 15.1	29 19.3	34.1	22 21.4	15.0	320 34.5	33.9	170 05.8	32.5
15	44 17.6	44 18.9	. . 32.8	37 22.1	. . 15.7	335 36.6	. . 33.9	185 08.4	. . 32.4
16	59 20.0	59 18.5	31.6	52 22.8	16.5	350 38.7	34.0	200 10.9	32.4
17	74 22.5	74 18.1	30.3	67 23.5	17.3	5 40.8	34.0	215 13.5	32.3
18	89 25.0	89 17.7	S 1 29.1	82 24.2	N 2 18.1	20 42.9	N21 34.1	230 16.1	S12 32.3
19	104 27.4	104 17.3	27.8	97 24.9	18.9	35 44.9	34.2	245 18.7	32.2
20	119 29.9	119 17.0	26.5	112 25.6	19.7	50 47.0	34.2	260 21.3	32.2
21	134 32.3	134 16.6	. . 25.3	127 26.3	. . 20.4	65 49.1	. . 34.3	275 23.9	. . 32.2
22	149 34.8	149 16.2	24.0	142 27.0	21.2	80 51.2	34.3	290 26.4	32.1
23	164 37.3	164 15.8	22.8	157 27.7	22.0	95 53.2	34.4	305 29.0	32.1
22 00	179 39.7	179 15.4	S 1 21.5	172 28.4	N 2 22.8	110 55.3	N21 34.5	320 31.6	S12 32.0
01	194 42.2	194 15.0	20.3	187 29.0	23.6	125 57.4	34.5	335 34.2	32.0
02	209 44.7	209 14.7	19.0	202 29.7	24.4	140 59.5	34.6	350 36.8	31.9
03	224 47.1	224 14.3	. . 17.8	217 30.4	. . 25.1	156 01.6	. . 34.6	5 39.3	. . 31.9
04	239 49.6	239 13.9	16.5	232 31.1	25.9	171 03.6	34.7	20 41.9	31.8
05	254 52.1	254 13.5	15.2	247 31.8	26.7	186 05.7	34.8	35 44.5	31.8
06	269 54.5	269 13.1	S 1 14.0	262 32.5	N 2 27.5	201 07.8	N21 34.8	50 47.1	S12 31.8
07	284 57.0	284 12.8	12.7	277 33.2	28.3	216 09.9	34.9	65 49.7	31.7
F 08	299 59.5	299 12.4	11.5	292 33.9	29.1	231 11.9	34.9	80 52.3	31.7
R 09	315 01.9	314 12.0	. . 10.2	307 34.6	. . 29.8	246 14.0	. . 35.0	95 54.8	. . 31.6
I 10	330 04.4	329 11.6	09.0	322 35.3	30.6	261 16.1	35.1	110 57.4	31.6
D 11	345 06.8	344 11.2	07.7	337 36.0	31.4	276 18.2	35.1	126 00.0	31.5
A 12	0 09.3	359 10.8	S 1 06.5	352 36.7	N 2 32.2	291 20.2	N21 35.2	141 02.6	S12 31.5
Y 13	15 11.8	14 10.5	05.2	7 37.4	33.0	306 22.3	35.2	156 05.2	31.4
14	30 14.2	29 10.1	03.9	22 38.1	33.7	321 24.4	35.3	171 07.8	31.4
15	45 16.7	44 09.7	. . 02.7	37 38.8	. . 34.5	336 26.5	. . 35.4	186 10.4	. . 31.3
16	60 19.2	59 09.3	01.4	52 39.5	35.3	351 28.5	35.4	201 12.9	31.3
17	75 21.6	74 08.9	1 00.2	67 40.2	36.1	6 30.6	35.5	216 15.5	31.3
18	90 24.1	89 08.6	S 0 58.9	82 40.9	N 2 36.9	21 32.7	N21 35.5	231 18.1	S12 31.2
19	105 26.6	104 08.2	57.7	97 41.6	37.7	36 34.8	35.6	246 20.7	31.2
20	120 29.0	119 07.8	56.4	112 42.3	38.4	51 36.8	35.6	261 23.3	31.1
21	135 31.5	134 07.4	. . 55.1	127 43.0	. . 39.2	66 38.9	. . 35.7	276 25.9	. . 31.1
22	150 34.0	149 07.0	53.9	142 43.7	40.0	81 41.0	35.8	291 28.5	31.0
23	165 36.4	164 06.7	52.6	157 44.4	40.8	96 43.1	35.8	306 31.0	31.0
	h m								
Mer. Pass.	12 03.3	v −0.4	d 1.3	v 0.7	d 0.8	v 2.1	d 0.1	v 2.6	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.4
Achernar	335 27.4	S57 10.3
Acrux	173 08.7	S63 10.4
Adhara	255 12.6	S28 59.8
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.3	N55 53.1
Alkaid	152 58.6	N49 14.6
Al Na'ir	27 44.3	S46 53.7
Alnilam	275 46.6	S 1 11.9
Alphard	217 56.0	S 8 43.3
Alphecca	126 10.9	N26 40.0
Alpheratz	357 44.0	N29 09.8
Altair	62 08.5	N 8 54.2
Ankaa	353 16.3	S42 14.1
Antares	112 26.3	S26 27.6
Arcturus	145 55.6	N19 06.6
Atria	107 28.1	S69 02.7
Avior	234 17.7	S59 33.6
Bellatrix	278 32.2	N 6 21.5
Betelgeuse	271 01.5	N 7 24.3
Canopus	263 56.2	S52 42.6
Capella	280 34.8	N46 00.7
Deneb	49 31.8	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.4	S17 54.9
Dubhe	193 51.3	N61 40.7
Elnath	278 12.9	N28 37.0
Eltanin	90 46.2	N51 29.0
Enif	33 47.5	N 9 56.1
Fomalhaut	15 24.5	S29 33.1
Gacrux	172 00.5	S57 11.3
Gienah	175 52.1	S17 37.1
Hadar	148 47.5	S60 26.1
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 44.0	S34 22.5
Kochab	137 19.2	N74 05.8
Markab	13 38.8	N15 16.6
Menkar	314 15.4	N 4 08.3
Menkent	148 07.4	S36 26.1
Miaplacidus	221 39.0	S69 46.7
Mirfak	308 40.9	N49 54.5
Nunki	75 58.6	S26 16.6
Peacock	53 19.8	S56 41.2
Pollux	243 27.8	N27 59.5
Procyon	244 59.8	N 5 11.2
Rasalhague	96 06.6	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.3	S 8 11.5
Rigil Kent.	139 51.4	S60 53.2
Sabik	102 12.6	S15 44.4
Schedar	349 41.2	N56 36.6
Shaula	96 22.1	S37 06.6
Sirius	258 33.8	S16 44.4
Spica	158 31.1	S11 14.0
Suhail	222 52.2	S43 29.6
Vega	80 39.1	N38 47.6
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	0 44.0	12 03
Mars	353 31.0	12 31
Jupiter	291 24.8	16 37
Saturn	140 49.0	2 42

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		20	21	22	23
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
20 00	178 06.7	S 0 10.9	85 01.8	12.0	N19 47.9	2.5	54.3	N 72	03 14	04 44	05 53	⸺	08 11	10 34	12 31
01	193 06.9	09.9	99 32.8	12.1	19 45.4	2.6	54.3	N 70	03 34	04 53	05 54	07 35	09 24	11 08	12 50
02	208 07.1	08.9	114 03.9	12.1	19 42.8	2.6	54.3	68	03 49	04 59	05 55	08 36	10 01	11 32	13 06
03	223 07.3	. . 07.9	128 35.0	12.1	19 40.2	2.8	54.3	66	04 01	05 05	05 56	09 11	10 27	11 50	13 18
04	238 07.4	06.9	143 06.1	12.1	19 37.4	2.9	54.3	64	04 11	05 09	05 57	09 36	10 47	12 05	13 28
05	253 07.6	06.0	157 37.2	12.1	19 34.5	2.9	54.3	62	04 20	05 13	05 58	09 55	11 03	12 18	13 37
06	268 07.8	S 0 05.0	172 08.3	12.1	N19 31.6	3.1	54.3	60	04 27	05 17	05 58	10 11	11 17	12 28	13 44
W 07	283 08.0	04.0	186 39.4	12.1	19 28.5	3.1	54.4	N 58	04 33	05 20	05 59	10 25	11 28	12 38	13 51
E 08	298 08.2	03.0	201 10.5	12.2	19 25.4	3.2	54.4	56	04 38	05 22	05 59	10 36	11 38	12 46	13 57
D 09	313 08.4	. . 02.0	215 41.7	12.1	19 22.2	3.3	54.4	54	04 43	05 25	06 00	10 46	11 47	12 53	14 02
N 10	328 08.5	S 01.0	230 12.8	12.1	19 18.9	3.4	54.4	52	04 47	05 27	06 00	10 55	11 55	12 59	14 06
E 11	343 08.7	00.0	244 43.9	12.2	19 15.5	3.5	54.4	50	04 50	05 28	06 01	11 03	12 02	13 05	14 11
S 12	358 08.9	N 0 01.0	259 15.1	12.2	N19 12.0	3.6	54.4	45	04 58	05 32	06 01	11 21	12 17	13 17	14 20
D 13	13 09.1	01.9	273 46.3	12.2	19 08.4	3.7	54.4	N 40	05 03	05 35	06 02	11 35	12 30	13 27	14 27
A 14	28 09.3	02.9	288 17.5	12.2	19 04.7	3.8	54.4	35	05 08	05 37	06 02	11 47	12 40	13 36	14 34
Y 15	43 09.5	. . 03.9	302 48.7	12.2	19 00.9	3.8	54.4	30	05 11	05 39	06 03	11 57	12 50	13 44	14 39
16	58 09.7	04.9	317 19.9	12.2	18 57.1	4.0	54.4	20	05 16	05 41	06 03	12 15	13 05	13 57	14 49
17	73 09.8	05.9	331 51.1	12.2	18 53.1	4.0	54.5	N 10	05 18	05 43	06 04	12 30	13 19	14 08	14 58
18	88 10.0	N 0 06.9	346 22.3	12.3	N18 49.1	4.1	54.5	0	05 19	05 43	06 04	12 45	13 32	14 19	15 06
19	103 10.2	07.9	0 53.6	12.2	18 45.0	4.2	54.5	S 10	05 19	05 43	06 04	12 59	13 45	14 30	15 14
20	118 10.4	08.9	15 24.8	12.3	18 40.8	4.3	54.5	20	05 17	05 42	06 04	13 15	13 59	14 41	15 23
21	133 10.6	. . 09.8	29 56.1	12.2	18 36.5	4.4	54.5	30	05 12	05 40	06 04	13 33	14 15	14 54	15 32
22	148 10.8	10.8	44 27.3	12.3	18 32.1	4.5	54.5	35	05 09	05 39	06 04	13 43	14 24	15 02	15 38
23	163 11.0	11.8	58 58.6	12.3	18 27.6	4.5	54.5	40	05 05	05 37	06 04	13 55	14 34	15 10	15 44
21 00	178 11.1	N 0 12.8	73 29.9	12.3	N18 23.1	4.7	54.5	45	05 00	05 34	06 04	14 09	14 46	15 20	15 51
01	193 11.3	13.8	88 01.2	12.3	18 18.4	4.7	54.6	S 50	04 53	05 31	06 03	14 26	15 01	15 32	16 00
02	208 11.5	14.8	102 32.5	12.4	18 13.7	4.8	54.6	52	04 50	05 30	06 03	14 34	15 08	15 38	16 04
03	223 11.7	. . 15.8	117 03.9	12.3	18 08.9	4.9	54.6	54	04 46	05 28	06 03	14 42	15 16	15 44	16 09
04	238 11.9	16.8	131 35.2	12.3	18 04.0	5.0	54.6	56	04 42	05 26	06 03	14 52	15 24	15 51	16 14
05	253 12.1	17.7	146 06.5	12.4	17 59.0	5.1	54.6	58	04 37	05 24	06 03	15 04	15 34	15 59	16 19
06	268 12.3	N 0 18.7	160 37.9	12.4	N17 53.9	5.1	54.6	S 60	04 31	05 21	06 03	15 17	15 45	16 07	16 25
T 07	283 12.5	19.7	175 09.3	12.3	17 48.8	5.3	54.6								
H 08	298 12.6	20.7	189 40.6	12.4	17 43.5	5.3	54.7								
U 09	313 12.8	. . 21.7	204 12.0	12.4	17 38.2	5.4	54.7								
R 10	328 13.0	22.7	218 43.4	12.5	17 32.8	5.5	54.7								
S 11	343 13.2	23.7	233 14.9	12.4	17 27.3	5.6	54.7								
D 12	358 13.4	N 0 24.7	247 46.3	12.4	N17 21.7	5.7	54.7								
A 13	13 13.6	25.6	262 17.7	12.5	17 16.0	5.7	54.7								
Y 14	28 13.8	26.6	276 49.2	12.4	17 10.3	5.9	54.8								
15	43 13.9	. . 27.6	291 20.6	12.5	17 04.4	5.9	54.8								
16	58 14.1	28.6	305 52.1	12.5	16 58.5	6.0	54.8								
17	73 14.3	29.6	320 23.6	12.5	16 52.5	6.0	54.8								
18	88 14.5	N 0 30.6	334 55.1	12.5	N16 46.5	6.2	54.8								
19	103 14.7	31.6	349 26.6	12.5	16 40.3	6.2	54.9								
20	118 14.9	32.5	3 58.1	12.5	16 34.1	6.4	54.9								
21	133 15.1	. . 33.5	18 29.6	12.5	16 27.7	6.4	54.9								
22	148 15.3	34.5	33 01.1	12.6	16 21.3	6.4	54.9								
23	163 15.4	35.5	47 32.7	12.5	16 14.9	6.6	54.9								
22 00	178 15.6	N 0 36.5	62 04.2	12.6	N16 08.3	6.6	54.9								
01	193 15.8	37.5	76 35.8	12.6	16 01.7	6.8	55.0								
02	208 16.0	38.5	91 07.4	12.5	15 54.9	6.8	55.0								
03	223 16.2	. . 39.5	105 38.9	12.6	15 48.1	6.8	55.0								
04	238 16.4	40.4	120 10.5	12.6	15 41.3	7.0	55.0								
05	253 16.6	41.4	134 42.1	12.6	15 34.3	7.0	55.0								
06	268 16.8	N 0 42.4	149 13.7	12.7	N15 27.3	7.1	55.1								
07	283 16.9	43.4	163 45.4	12.6	15 20.2	7.2	55.1								
F 08	298 17.1	44.4	178 17.0	12.6	15 13.0	7.3	55.1								
R 09	313 17.3	. . 45.4	192 48.6	12.7	15 05.7	7.3	55.1								
I 10	328 17.5	46.4	207 20.3	12.6	14 58.4	7.4	55.2								
D 11	343 17.7	47.3	221 51.9	12.7	14 51.0	7.5	55.2								
A 12	358 17.9	N 0 48.3	236 23.6	12.6	N14 43.5	7.6	55.2								
Y 13	13 18.1	49.3	250 55.2	12.7	14 35.9	7.6	55.2								
14	28 18.3	50.3	265 26.9	12.7	14 28.3	7.7	55.2								
15	43 18.4	. . 51.3	279 58.6	12.7	14 20.6	7.8	55.3								
16	58 18.6	52.3	294 30.3	12.7	14 12.8	7.9	55.3								
17	73 18.8	53.3	309 02.0	12.7	14 04.9	7.9	55.3								
18	88 19.0	N 0 54.2	323 33.7	12.7	N13 57.0	8.0	55.3								
19	103 19.2	55.2	338 05.4	12.7	13 49.0	8.0	55.4								
20	118 19.4	56.2	352 37.1	12.7	13 41.0	8.2	55.4								
21	133 19.6	. . 57.2	7 08.8	12.8	13 32.8	8.2	55.4								
22	148 19.8	58.2	21 40.6	12.7	13 24.6	8.3	55.4								
23	163 20.0	59.2	36 12.3	12.7	N13 16.3	8.3	55.5								
	SD 16.1	d 1.0	SD	14.8		14.9		15.0							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	20	21	22	23
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 24	19 33	21 06	⸺	06 39	05 54	05 35
N 70	18 22	19 24	20 45	05 35	05 25	05 19	05 14
68	18 21	19 17	20 28	04 34	04 48	04 54	04 57
66	18 20	19 12	20 16	03 59	04 21	04 35	04 44
64	18 19	19 07	20 05	03 34	04 00	04 19	04 32
62	18 18	19 03	19 57	03 14	03 44	04 06	04 23
60	18 17	18 59	19 49	02 58	03 30	03 55	04 15
N 58	18 17	18 56	19 43	02 44	03 18	03 45	04 07
56	18 16	18 53	19 38	02 32	03 07	03 36	04 01
54	18 16	18 51	19 33	02 22	02 58	03 29	03 55
52	18 15	18 49	19 29	02 13	02 50	03 22	03 50
50	18 15	18 47	19 25	02 04	02 43	03 16	03 45
45	18 14	18 43	19 18	01 47	02 27	03 03	03 35
N 40	18 13	18 40	19 12	01 32	02 14	02 52	03 26
35	18 13	18 38	19 07	01 20	02 03	02 42	03 19
30	18 12	18 36	19 04	01 10	01 53	02 34	03 12
20	18 11	18 33	18 59	00 51	01 36	02 19	03 01
N 10	18 11	18 32	18 56	00 35	01 22	02 07	02 51
0	18 10	18 31	18 55	00 20	01 08	01 55	02 42
S 10	18 10	18 31	18 55	00 05	00 54	01 43	02 32
20	18 10	18 32	18 57	24 39	00 39	01 30	02 22
30	18 10	18 34	19 01	24 22	00 22	01 16	02 10
35	18 10	18 35	19 04	24 12	00 12	01 07	02 04
40	18 10	18 37	19 08	24 01	00 01	00 57	01 56
45	18 10	18 39	19 13	23 47	24 46	00 46	01 47
S 50	18 10	18 42	19 20	23 31	24 32	00 32	01 36
52	18 10	18 43	19 23	23 23	24 25	00 25	01 31
54	18 10	18 45	19 27	23 14	24 18	00 18	01 25
56	18 10	18 47	19 31	23 05	24 10	00 10	01 19
58	18 10	18 49	19 36	22 54	24 01	00 01	01 12
S 60	18 10	18 52	19 41	22 41	23 50	25 04	01 04

Day	SUN		MOON		
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00^h	12^h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
20	07 34	07 25	12 07	18 56	06 32	09	57
21	07 16	07 07	12 07	19 44	07 20	10	67
22	06 58	06 49	12 07	20 30	08 07	11	75

UT	ARIES	VENUS −4.0		MARS +1.2		JUPITER −2.2		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
23 00	180 38.9	179 06.3	S 0 51.4	172 45.1	N 2 41.6	111 45.1	N21 35.9	321 33.6	S12 30.9
01	195 41.3	194 05.9	50.1	187 45.8	42.3	126 47.2	35.9	336 36.2	30.9
02	210 43.8	209 05.5	48.9	202 46.5	43.1	141 49.3	36.0	351 38.8	30.8
03	225 46.3	224 05.1	47.6	217 47.2	43.9	156 51.3	36.1	6 41.4	30.8
04	240 48.7	239 04.8	46.3	232 47.9	44.7	171 53.4	36.1	21 44.0	30.7
05	255 51.2	254 04.4	45.1	247 48.6	45.5	186 55.5	36.2	36 46.6	30.7
06	270 53.7	269 04.0	S 0 43.8	262 49.3	N 2 46.2	201 57.6	N21 36.3	51 49.1	S12 30.7
07	285 56.1	284 03.6	42.6	277 50.0	47.0	216 59.6	36.3	66 51.7	30.6
08	300 58.6	299 03.2	41.3	292 50.7	47.8	232 01.7	36.4	81 54.3	30.6
09	316 01.1	314 02.9	40.1	307 51.4	48.6	247 03.8	36.4	96 56.9	30.5
10	331 03.5	329 02.5	38.8	322 52.1	49.4	262 05.8	36.5	111 59.5	30.5
11	346 06.0	344 02.1	37.5	337 52.8	50.1	277 07.9	36.6	127 02.1	30.4
12	1 08.4	359 01.7	S 0 36.3	352 53.5	N 2 50.9	292 10.0	N21 36.6	142 04.7	S12 30.4
13	16 10.9	14 01.3	35.0	7 54.2	51.7	307 12.1	36.7	157 07.3	30.3
14	31 13.4	29 01.0	33.8	22 54.9	52.5	322 14.1	36.7	172 09.8	30.3
15	46 15.8	44 00.6	32.5	37 55.6	53.3	337 16.2	36.8	187 12.4	30.2
16	61 18.3	59 00.2	31.2	52 56.3	54.1	352 18.3	36.9	202 15.0	30.2
17	76 20.8	73 59.8	30.0	67 57.0	54.8	7 20.3	36.9	217 17.6	30.1
18	91 23.2	88 59.4	S 0 28.7	82 57.7	N 2 55.6	22 22.4	N21 37.0	232 20.2	S12 30.1
19	106 25.7	103 59.1	27.5	97 58.4	56.4	37 24.5	37.0	247 22.8	30.1
20	121 28.2	118 58.7	26.2	112 59.1	57.2	52 26.5	37.1	262 25.4	30.0
21	136 30.6	133 58.3	25.0	127 59.8	57.9	67 28.6	37.2	277 28.0	30.0
22	151 33.1	148 57.9	23.7	143 00.5	58.7	82 30.7	37.2	292 30.5	29.9
23	166 35.6	163 57.6	22.4	158 01.2	2 59.5	97 32.7	37.3	307 33.1	29.9
24 00	181 38.0	178 57.2	S 0 21.2	173 01.9	N 3 00.3	112 34.8	N21 37.3	322 35.7	S12 29.8
01	196 40.5	193 56.8	19.9	188 02.6	01.1	127 36.9	37.4	337 38.3	29.8
02	211 42.9	208 56.4	18.7	203 03.3	01.8	142 38.9	37.5	352 40.9	29.7
03	226 45.4	223 56.0	17.4	218 04.0	02.6	157 41.0	37.5	7 43.5	29.7
04	241 47.9	238 55.7	16.1	233 04.7	03.4	172 43.1	37.6	22 46.1	29.6
05	256 50.3	253 55.3	14.9	248 05.4	04.2	187 45.1	37.6	37 48.7	29.6
06	271 52.8	268 54.9	S 0 13.6	263 06.1	N 3 05.0	202 47.2	N21 37.7	52 51.3	S12 29.5
07	286 55.3	283 54.5	12.4	278 06.8	05.7	217 49.3	37.8	67 53.9	29.5
08	301 57.7	298 54.1	11.1	293 07.5	06.5	232 51.3	37.8	82 56.4	29.4
09	317 00.2	313 53.8	09.9	308 08.2	07.3	247 53.4	37.9	97 59.0	29.4
10	332 02.7	328 53.4	08.6	323 08.9	08.1	262 55.5	37.9	113 01.6	29.4
11	347 05.1	343 53.0	07.3	338 09.6	08.9	277 57.5	38.0	128 04.2	29.3
12	2 07.6	358 52.6	S 0 06.1	353 10.3	N 3 09.6	292 59.6	N21 38.1	143 06.8	S12 29.3
13	17 10.1	13 52.3	04.8	8 11.0	10.4	308 01.7	38.1	158 09.4	29.2
14	32 12.5	28 51.9	03.6	23 11.7	11.2	323 03.7	38.2	173 12.0	29.2
15	47 15.0	43 51.5	02.3	38 12.4	12.0	338 05.8	38.2	188 14.6	29.1
16	62 17.4	58 51.1	S 01.0	53 13.1	12.7	353 07.8	38.3	203 17.2	29.1
17	77 19.9	73 50.7	N 00.2	68 13.8	13.5	8 09.9	38.4	218 19.8	29.0
18	92 22.4	88 50.4	N 0 01.5	83 14.5	N 3 14.3	23 12.0	N21 38.4	233 22.3	S12 29.0
19	107 24.8	103 50.0	02.7	98 15.2	15.1	38 14.0	38.5	248 24.9	28.9
20	122 27.3	118 49.6	04.0	113 15.9	15.9	53 16.1	38.5	263 27.5	28.9
21	137 29.8	133 49.2	05.2	128 16.6	16.6	68 18.2	38.6	278 30.1	28.8
22	152 32.2	148 48.9	06.5	143 17.3	17.4	83 20.2	38.7	293 32.7	28.8
23	167 34.7	163 48.5	07.8	158 18.0	18.2	98 22.3	38.7	308 35.3	28.7
25 00	182 37.2	178 48.1	N 0 09.0	173 18.7	N 3 19.0	113 24.3	N21 38.8	323 37.9	S12 28.7
01	197 39.6	193 47.7	10.3	188 19.4	19.7	128 26.4	38.8	338 40.5	28.6
02	212 42.1	208 47.3	11.5	203 20.1	20.5	143 28.5	38.9	353 43.1	28.6
03	227 44.5	223 47.0	12.8	218 20.8	21.3	158 30.5	39.0	8 45.7	28.5
04	242 47.0	238 46.6	14.1	233 21.5	22.1	173 32.6	39.0	23 48.3	28.5
05	257 49.5	253 46.2	15.3	248 22.2	22.8	188 34.6	39.1	38 50.9	28.5
06	272 51.9	268 45.8	N 0 16.6	263 22.9	N 3 23.6	203 36.7	N21 39.1	53 53.5	S12 28.4
07	287 54.4	283 45.5	17.8	278 23.6	24.4	218 38.8	39.2	68 56.0	28.4
08	302 56.9	298 45.1	19.1	293 24.3	25.2	233 40.8	39.3	83 58.6	28.3
09	317 59.3	313 44.7	20.4	308 25.0	26.0	248 42.9	39.3	99 01.2	28.3
10	333 01.8	328 44.3	21.6	323 25.7	26.7	263 44.9	39.4	114 03.8	28.2
11	348 04.3	343 43.9	22.9	338 26.4	27.5	278 47.0	39.5	129 06.4	28.2
12	3 06.7	358 43.6	N 0 24.1	353 27.1	N 3 28.3	293 49.1	N21 39.5	144 09.0	S12 28.1
13	18 09.2	13 43.2	25.4	8 27.8	29.1	308 51.1	39.6	159 11.6	28.1
14	33 11.7	28 42.8	26.7	23 28.5	29.8	323 53.2	39.6	174 14.2	28.0
15	48 14.1	43 42.4	27.9	38 29.2	30.6	338 55.2	39.7	189 16.8	28.0
16	63 16.6	58 42.1	29.2	53 29.9	31.4	353 57.3	39.8	204 19.4	27.9
17	78 19.0	73 41.7	30.4	68 30.6	32.2	8 59.4	39.8	219 22.0	27.9
18	93 21.5	88 41.3	N 0 31.7	83 31.3	N 3 32.9	24 01.4	N21 39.9	234 24.6	S12 27.8
19	108 24.0	103 40.9	33.0	98 32.0	33.7	39 03.5	39.9	249 27.2	27.8
20	123 26.4	118 40.6	34.2	113 32.7	34.5	54 05.5	40.0	264 29.8	27.7
21	138 28.9	133 40.2	35.5	128 33.4	35.3	69 07.6	40.1	279 32.4	27.7
22	153 31.4	148 39.8	36.7	143 34.1	36.0	84 09.6	40.1	294 35.0	27.6
23	168 33.8	163 39.4	38.0	158 34.8	36.8	99 11.7	40.2	309 37.5	27.6
	h m								
Mer.Pass.	11 51.5	v −0.4	d 1.3	v 0.7	d 0.8	v 2.1	d 0.1	v 2.6	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.4
Achernar	335 27.4	S57 10.3
Acrux	173 08.7	S63 10.5
Adhara	255 12.6	S28 59.8
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.3	N55 53.1
Alkaid	152 58.6	N49 14.6
Al Na'ir	27 44.3	S46 53.6
Alnilam	275 46.6	S 1 11.9
Alphard	217 56.0	S 8 43.3
Alphecca	126 10.9	N26 40.0
Alpheratz	357 44.0	N29 09.8
Altair	62 08.5	N 8 54.2
Ankaa	353 16.3	S42 14.1
Antares	112 26.3	S26 27.6
Arcturus	145 55.6	N19 06.6
Atria	107 28.1	S69 02.7
Avior	234 17.7	S59 33.6
Bellatrix	278 32.2	N 6 21.5
Betelgeuse	271 01.5	N 7 24.3
Canopus	263 56.2	S52 42.6
Capella	280 34.8	N46 00.7
Deneb	49 31.8	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.4	S17 54.9
Dubhe	193 51.3	N61 40.7
Elnath	278 12.9	N28 37.0
Eltanin	90 46.2	N51 29.0
Enif	33 47.5	N 9 56.1
Fomalhaut	15 24.5	S29 33.1
Gacrux	172 00.5	S57 11.4
Gienah	175 52.1	S17 37.1
Hadar	148 47.5	S60 26.1
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 44.0	S34 22.5
Kochab	137 19.2	N74 05.9
Markab	13 38.8	N15 16.5
Menkar	314 15.4	N 4 08.3
Menkent	148 07.4	S36 26.1
Miaplacidus	221 39.0	S69 46.7
Mirfak	308 40.9	N49 54.5
Nunki	75 58.6	S26 16.6
Peacock	53 19.8	S56 41.2
Pollux	243 27.8	N27 59.5
Procyon	244 59.8	N 5 11.2
Rasalhague	96 06.5	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.3	S 8 11.5
Rigil Kent.	139 51.4	S60 53.2
Sabik	102 12.6	S15 44.4
Schedar	349 41.2	N56 36.6
Shaula	96 22.0	S37 06.6
Sirius	258 33.8	S16 44.4
Spica	158 31.1	S11 14.0
Suhail	222 52.2	S43 29.6
Vega	80 39.1	N38 47.6
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	357 19.2	12 04
Mars	351 23.9	12 27
Jupiter	290 56.8	16 27
Saturn	140 57.7	2 29

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		23	24	25	26
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
23 00	178 20.1	N 1 00.2	50 44.0	12.8	N13 08.0	8.4	55.5	N 72	02 52	04 28	05 37	12 31	14 22	16 13	18 06
01	193 20.3	01.1	65 15.8	12.7	12 59.6	8.5	55.5	N 70	03 16	04 38	05 40	12 50	14 33	16 16	18 02
02	208 20.5	02.1	79 47.5	12.8	12 51.1	8.6	55.5	68	03 34	04 46	05 43	13 06	14 41	16 18	17 58
03	223 20.7	03.1	94 19.3	12.7	12 42.5	8.6	55.6	66	03 48	04 53	05 45	13 18	14 48	16 20	17 55
04	238 20.9	04.1	108 51.0	12.8	12 33.9	8.7	55.6	64	03 59	04 59	05 46	13 28	14 54	16 22	17 53
05	253 21.1	05.1	123 22.8	12.7	12 25.2	8.8	55.6	62	04 09	05 03	05 48	13 37	14 59	16 24	17 51
06	268 21.3	N 1 06.1	137 54.5	12.8	N12 16.4	8.8	55.6	60	04 17	05 07	05 49	13 44	15 03	16 25	17 49
07	283 21.5	07.1	152 26.3	12.7	12 07.6	8.9	55.7	N 58	04 24	05 11	05 50	13 51	15 07	16 26	17 47
08	298 21.7	08.0	166 58.0	12.8	11 58.7	8.9	55.7	56	04 29	05 14	05 51	13 57	15 11	16 27	17 46
09	313 21.8	09.0	181 29.8	12.8	11 49.8	9.0	55.7	54	04 35	05 17	05 52	14 02	15 14	16 28	17 45
10	328 22.0	10.0	196 01.6	12.7	11 40.8	9.1	55.8	52	04 39	05 19	05 53	14 06	15 16	16 29	17 43
11	343 22.2	11.0	210 33.3	12.8	11 31.7	9.2	55.8	50	04 43	05 22	05 54	14 11	15 19	16 30	17 42
12	358 22.4	N 1 12.0	225 05.1	12.8	N11 22.5	9.2	55.8	45	04 52	05 26	05 56	14 20	15 25	16 31	17 40
13	13 22.6	13.0	239 36.9	12.7	11 13.3	9.2	55.8	N 40	04 58	05 30	05 57	14 27	15 29	16 33	17 38
14	28 22.8	13.9	254 08.6	12.8	11 04.1	9.4	55.9	35	05 03	05 33	05 58	14 34	15 33	16 34	17 36
15	43 23.0	14.9	268 40.4	12.8	10 54.7	9.3	55.9	30	05 07	05 35	05 59	14 39	15 36	16 35	17 35
16	58 23.2	15.9	283 12.2	12.7	10 45.4	9.5	55.9	20	05 13	05 39	06 01	14 49	15 43	16 37	17 33
17	73 23.3	16.9	297 43.9	12.8	10 35.9	9.5	55.9	N 10	05 16	05 41	06 02	14 58	15 48	16 38	17 30
18	88 23.5	N 1 17.9	312 15.7	12.8	N10 26.4	9.6	56.0	0	05 18	05 42	06 03	15 06	15 53	16 40	17 28
19	103 23.7	18.9	326 47.5	12.7	10 16.8	9.6	56.0	S 10	05 19	05 43	06 04	15 14	15 58	16 42	17 27
20	118 23.9	19.9	341 19.2	12.8	10 07.2	9.7	56.0	20	05 17	05 43	06 05	15 23	16 03	16 43	17 24
21	133 24.1	20.8	355 51.0	12.7	9 57.5	9.7	56.1	30	05 14	05 42	06 06	15 32	16 09	16 45	17 22
22	148 24.3	21.8	10 22.7	12.8	9 47.8	9.8	56.1	35	05 12	05 41	06 06	15 38	16 12	16 46	17 21
23	163 24.5	22.8	24 54.5	12.7	9 38.0	9.9	56.1	40	05 08	05 40	06 07	15 44	16 16	16 48	17 19
24 00	178 24.7	N 1 23.8	39 26.2	12.8	N 9 28.1	9.9	56.1	45	05 04	05 38	06 08	15 51	16 21	16 49	17 18
01	193 24.9	24.8	53 58.0	12.7	9 18.2	9.9	56.2	S 50	04 58	05 36	06 08	16 00	16 26	16 51	17 16
02	208 25.1	25.8	68 29.7	12.7	9 08.3	10.1	56.2	52	04 55	05 35	06 09	16 04	16 28	16 52	17 15
03	223 25.2	26.7	83 01.4	12.8	8 58.2	10.0	56.2	54	04 52	05 34	06 09	16 09	16 31	16 52	17 14
04	238 25.4	27.7	97 33.2	12.7	8 48.2	10.2	56.3	56	04 48	05 32	06 09	16 14	16 34	16 53	17 13
05	253 25.6	28.7	112 04.9	12.7	8 38.0	10.1	56.3	58	04 44	05 30	06 10	16 19	16 37	16 54	17 11
06	268 25.8	N 1 29.7	126 36.6	12.7	N 8 27.9	10.3	56.3	S 60	04 39	05 28	06 10	16 25	16 41	16 56	17 10
07	283 26.0	30.7	141 08.3	12.7	8 17.6	10.2	56.3								
08	298 26.2	31.7	155 40.0	12.7	8 07.4	10.4	56.4								
09	313 26.4	32.6	170 11.7	12.6	7 57.0	10.3	56.4								
10	328 26.6	33.6	184 43.3	12.7	7 46.7	10.5	56.4								
11	343 26.8	34.6	199 15.0	12.7	7 36.2	10.4	56.5								
12	358 26.9	N 1 35.6	213 46.7	12.6	N 7 25.8	10.6	56.5								
13	13 27.1	36.6	228 18.3	12.6	7 15.2	10.5	56.5								
14	28 27.3	37.6	242 49.9	12.7	7 04.7	10.6	56.6								
15	43 27.5	38.5	257 21.6	12.6	6 54.1	10.7	56.6								
16	58 27.7	39.5	271 53.2	12.6	6 43.4	10.7	56.6								
17	73 27.9	40.5	286 24.8	12.6	6 32.7	10.7	56.6								
18	88 28.1	N 1 41.5	300 56.4	12.5	N 6 22.0	10.8	56.7								
19	103 28.3	42.5	315 27.9	12.6	6 11.2	10.9	56.7								
20	118 28.5	43.5	329 59.5	12.5	6 00.3	10.8	56.7								
21	133 28.7	44.4	344 31.0	12.5	5 49.5	10.9	56.8								
22	148 28.8	45.4	359 02.5	12.6	5 38.6	11.0	56.8								
23	163 29.0	46.4	13 34.1	12.4	5 27.6	11.0	56.8								
25 00	178 29.2	N 1 47.4	28 05.5	12.5	N 5 16.6	11.0	56.9								
01	193 29.4	48.4	42 37.0	12.5	5 05.6	11.1	56.9								
02	208 29.6	49.3	57 08.5	12.4	4 54.5	11.1	56.9								
03	223 29.8	50.3	71 39.9	12.4	4 43.4	11.1	57.0								
04	238 30.0	51.3	86 11.3	12.4	4 32.3	11.2	57.0								
05	253 30.2	52.3	100 42.7	12.4	4 21.1	11.2	57.0								
06	268 30.4	N 1 53.3	115 14.1	12.4	N 4 09.9	11.2	57.0								
07	283 30.5	54.3	129 45.5	12.3	3 58.7	11.3	57.1								
08	298 30.7	55.2	144 16.8	12.3	3 47.4	11.3	57.1								
09	313 30.9	56.2	158 48.1	12.3	3 36.1	11.3	57.1								
10	328 31.1	57.2	173 19.4	12.3	3 24.8	11.4	57.2								
11	343 31.3	58.2	187 50.7	12.3	3 13.4	11.3	57.2								
12	358 31.5	N 1 59.2	202 22.0	12.2	N 3 02.1	11.5	57.2								
13	13 31.7	2 00.2	216 53.2	12.2	2 50.6	11.4	57.3								
14	28 31.9	01.1	231 24.4	12.2	2 39.2	11.5	57.3								
15	43 32.1	02.1	245 55.6	12.1	2 27.7	11.5	57.3								
16	58 32.3	03.1	260 26.7	12.1	2 16.2	11.5	57.3								
17	73 32.4	04.1	274 57.8	12.1	2 04.7	11.5	57.4								
18	88 32.6	N 2 05.1	289 28.9	12.1	N 1 53.2	11.6	57.4								
19	103 32.8	06.0	304 00.0	12.0	1 41.6	11.6	57.4								
20	118 33.0	07.0	318 31.0	12.0	1 30.0	11.6	57.5								
21	133 33.2	08.0	333 02.0	12.0	1 18.4	11.6	57.5								
22	148 33.4	09.0	347 33.0	12.0	1 06.8	11.6	57.5								
23	163 33.6	10.0	2 04.0	11.9	N 0 55.2	11.7	57.6								
	SD 16.1	d 1.0	SD 15.2		15.4		15.6								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	23	24	25	26
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 38	19 48	21 26	05 35	05 21	05 10	04 59
N 70	18 35	19 37	21 01	05 14	05 09	05 04	04 59
68	18 32	19 29	20 42	04 57	04 59	04 59	04 59
66	18 30	19 22	20 28	04 44	04 50	04 55	05 00
64	18 28	19 16	20 16	04 32	04 43	04 52	05 00
62	18 26	19 11	20 06	04 23	04 37	04 49	05 00
60	18 25	19 07	19 58	04 15	04 31	04 46	05 01
N 58	18 23	19 03	19 51	04 07	04 27	04 44	05 01
56	18 22	19 00	19 45	04 01	04 22	04 42	05 01
54	18 21	18 57	19 39	03 55	04 18	04 40	05 01
52	18 20	18 54	19 35	03 50	04 15	04 38	05 01
50	18 19	18 52	19 30	03 45	04 12	04 37	05 01
45	18 18	18 47	19 22	03 35	04 05	04 33	05 02
N 40	18 16	18 43	19 15	03 26	03 59	04 31	05 02
35	18 15	18 40	19 10	03 19	03 54	04 28	05 02
30	18 14	18 38	19 06	03 12	03 49	04 26	05 02
20	18 12	18 34	19 00	03 01	03 42	04 22	05 03
N 10	18 11	18 32	18 56	02 51	03 35	04 18	05 03
0	18 09	18 30	18 54	02 42	03 28	04 15	05 03
S 10	18 08	18 29	18 54	02 32	03 22	04 12	05 03
20	18 07	18 29	18 55	02 22	03 15	04 08	05 03
30	18 06	18 30	18 58	02 10	03 07	04 04	05 04
35	18 05	18 31	19 00	02 04	03 02	04 02	05 04
40	18 05	18 32	19 03	01 56	02 57	03 59	05 04
45	18 04	18 33	19 07	01 47	02 50	03 56	05 04
S 50	18 03	18 35	19 13	01 36	02 43	03 52	05 04
52	18 03	18 36	19 16	01 31	02 40	03 51	05 04
54	18 02	18 38	19 19	01 25	02 36	03 49	05 04
56	18 02	18 39	19 23	01 19	02 32	03 47	05 04
58	18 02	18 41	19 27	01 12	02 27	03 44	05 04
S 60	18 01	18 42	19 32	01 04	02 21	03 42	05 04

Day	SUN			MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00^h	12^h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
23	06 40	06 31	12 07	21 17	08 54	12	83
24	06 22	06 13	12 06	22 04	09 40	13	90
25	06 04	05 54	12 06	22 51	10 28	14	96

UT	ARIES	VENUS −4.0		MARS +1.2		JUPITER −2.1		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
26 00	183 36.3	178 39.0	N 0 39.2	173 35.5	N 3 37.6	114 13.7	N21 40.2	324 40.1	S12 27.5
01	198 38.8	193 38.7	40.5	188 36.2	38.4	129 15.8	40.3	339 42.7	27.5
02	213 41.2	208 38.3	41.8	203 36.9	39.1	144 17.9	40.4	354 45.3	27.4
03	228 43.7	223 37.9	. . 43.0	218 37.6	. . 39.9	159 19.9	. . 40.4	9 47.9	. . 27.4
04	243 46.1	238 37.5	44.3	233 38.3	40.7	174 22.0	40.5	24 50.5	27.3
05	258 48.6	253 37.2	45.5	248 39.0	41.5	189 24.0	40.5	39 53.1	27.3
06	273 51.1	268 36.8	N 0 46.8	263 39.7	N 3 42.2	204 26.1	N21 40.6	54 55.7	S12 27.2
07	288 53.5	283 36.4	48.1	278 40.4	43.0	219 28.1	40.7	69 58.3	27.2
08	303 56.0	298 36.0	49.3	293 41.1	43.8	234 30.2	40.7	85 00.9	27.2
09	318 58.5	313 35.7	. . 50.6	308 41.8	. . 44.6	249 32.2	. . 40.8	100 03.5	. . 27.1
10	334 00.9	328 35.3	51.8	323 42.5	45.3	264 34.3	40.9	115 06.1	27.1
11	349 03.4	343 34.9	53.1	338 43.2	46.1	279 36.3	40.9	130 08.7	27.0
12	4 05.9	358 34.5	N 0 54.4	353 43.9	N 3 46.9	294 38.4	N21 41.0	145 11.3	S12 27.0
13	19 08.3	13 34.2	55.6	8 44.6	47.7	309 40.5	41.0	160 13.9	26.9
14	34 10.8	28 33.8	56.9	23 45.3	48.4	324 42.5	41.1	175 16.5	26.9
15	49 13.3	43 33.4	. . 58.1	38 46.0	. . 49.2	339 44.6	. . 41.2	190 19.1	. . 26.8
16	64 15.7	58 33.0	0 59.4	53 46.7	50.0	354 46.6	41.2	205 21.7	26.8
17	79 18.2	73 32.6	1 00.7	68 47.4	50.8	9 48.7	41.3	220 24.3	26.7
18	94 20.6	88 32.3	N 1 01.9	83 48.1	N 3 51.5	24 50.7	N21 41.3	235 26.9	S12 26.7
19	109 23.1	103 31.9	03.2	98 48.9	52.3	39 52.8	41.4	250 29.5	26.6
20	124 25.6	118 31.5	04.4	113 49.6	53.1	54 54.8	41.5	265 32.1	26.6
21	139 28.0	133 31.1	. . 05.7	128 50.3	. . 53.8	69 56.9	. . 41.5	280 34.7	. . 26.5
22	154 30.5	148 30.8	06.9	143 51.0	54.6	84 58.9	41.6	295 37.3	26.5
23	169 33.0	163 30.4	08.2	158 51.7	55.4	100 01.0	41.6	310 39.9	26.4
27 00	184 35.4	178 30.0	N 1 09.5	173 52.4	N 3 56.2	115 03.0	N21 41.7	325 42.5	S12 26.4
01	199 37.9	193 29.6	10.7	188 53.1	56.9	130 05.1	41.8	340 45.1	26.3
02	214 40.4	208 29.3	12.0	203 53.8	57.7	145 07.1	41.8	355 47.7	26.3
03	229 42.8	223 28.9	. . 13.2	218 54.5	. . 58.5	160 09.2	. . 41.9	10 50.3	. . 26.2
04	244 45.3	238 28.5	14.5	233 55.2	3 59.3	175 11.2	41.9	25 52.9	26.2
05	259 47.7	253 28.1	15.8	248 55.9	4 00.0	190 13.3	42.0	40 55.5	26.1
06	274 50.2	268 27.7	N 1 17.0	263 56.6	N 4 00.8	205 15.3	N21 42.1	55 58.1	S12 26.1
07	289 52.7	283 27.4	18.3	278 57.3	01.6	220 17.4	42.1	71 00.7	26.0
08	304 55.1	298 27.0	19.5	293 58.0	02.3	235 19.4	42.2	86 03.2	26.0
09	319 57.6	313 26.6	. . 20.8	308 58.7	. . 03.1	250 21.5	. . 42.3	101 05.8	. . 25.9
10	335 00.1	328 26.2	22.1	323 59.4	03.9	265 23.5	42.3	116 08.4	25.9
11	350 02.5	343 25.9	23.3	339 00.1	04.7	280 25.6	42.4	131 11.0	25.8
12	5 05.0	358 25.5	N 1 24.6	354 00.8	N 4 05.4	295 27.6	N21 42.4	146 13.6	S12 25.8
13	20 07.5	13 25.1	25.8	9 01.5	06.2	310 29.7	42.5	161 16.2	25.7
14	35 09.9	28 24.7	27.1	24 02.2	07.0	325 31.7	42.6	176 18.8	25.7
15	50 12.4	43 24.4	. . 28.3	39 02.9	. . 07.7	340 33.8	. . 42.6	191 21.4	. . 25.6
16	65 14.9	58 24.0	29.6	54 03.6	08.5	355 35.8	42.7	206 24.0	25.6
17	80 17.3	73 23.6	30.9	69 04.3	09.3	10 37.8	42.7	221 26.6	25.5
18	95 19.8	88 23.2	N 1 32.1	84 05.0	N 4 10.1	25 39.9	N21 42.8	236 29.2	S12 25.5
19	110 22.2	103 22.9	33.4	99 05.7	10.8	40 41.9	42.9	251 31.8	25.4
20	125 24.7	118 22.5	34.6	114 06.4	11.6	55 44.0	42.9	266 34.4	25.4
21	140 27.2	133 22.1	. . 35.9	129 07.1	. . 12.4	70 46.0	. . 43.0	281 37.0	. . 25.3
22	155 29.6	148 21.7	37.2	144 07.8	13.1	85 48.1	43.0	296 39.6	25.3
23	170 32.1	163 21.3	38.4	159 08.5	13.9	100 50.1	43.1	311 42.2	25.2
28 00	185 34.6	178 21.0	N 1 39.7	174 09.2	N 4 14.7	115 52.2	N21 43.2	326 44.8	S12 25.2
01	200 37.0	193 20.6	40.9	189 09.9	15.5	130 54.2	43.2	341 47.4	25.1
02	215 39.5	208 20.2	42.2	204 10.6	16.2	145 56.3	43.3	356 50.0	25.1
03	230 42.0	223 19.8	. . 43.4	219 11.3	. . 17.0	160 58.3	. . 43.4	11 52.7	. . 25.0
04	245 44.4	238 19.5	44.7	234 12.0	17.8	176 00.3	43.4	26 55.3	25.0
05	260 46.9	253 19.1	46.0	249 12.7	18.5	191 02.4	43.5	41 57.9	24.9
06	275 49.3	268 18.7	N 1 47.2	264 13.4	N 4 19.3	206 04.4	N21 43.5	57 00.5	S12 24.9
07	290 51.8	283 18.3	48.5	279 14.1	20.1	221 06.5	43.6	72 03.1	24.8
08	305 54.3	298 18.0	49.7	294 14.8	20.8	236 08.5	43.7	87 05.7	24.8
09	320 56.7	313 17.6	. . 51.0	309 15.5	. . 21.6	251 10.6	. . 43.7	102 08.3	. . 24.7
10	335 59.2	328 17.2	52.3	324 16.2	22.4	266 12.6	43.8	117 10.9	24.7
11	351 01.7	343 16.8	53.5	339 16.9	23.2	281 14.7	43.8	132 13.5	24.6
12	6 04.1	358 16.4	N 1 54.8	354 17.6	N 4 23.9	296 16.7	N21 43.9	147 16.1	S12 24.6
13	21 06.6	13 16.1	56.0	9 18.3	24.7	311 18.7	44.0	162 18.7	24.5
14	36 09.1	28 15.7	57.3	24 19.0	25.5	326 20.8	44.0	177 21.3	24.5
15	51 11.5	43 15.3	. . 58.5	39 19.7	. . 26.2	341 22.8	. . 44.1	192 23.9	. . 24.4
16	66 14.0	58 14.9	1 59.8	54 20.4	27.0	356 24.9	44.2	207 26.5	24.4
17	81 16.5	73 14.6	2 01.1	69 21.1	27.8	11 26.9	44.2	222 29.1	24.3
18	96 18.9	88 14.2	N 2 02.3	84 21.8	N 4 28.5	26 28.9	N21 44.3	237 31.7	S12 24.3
19	111 21.4	103 13.8	03.6	99 22.5	29.3	41 31.0	44.3	252 34.3	24.2
20	126 23.8	118 13.4	04.8	114 23.2	30.1	56 33.0	44.4	267 36.9	24.2
21	141 26.3	133 13.0	. . 06.1	129 23.9	. . 30.8	71 35.1	. . 44.5	282 39.5	. . 24.1
22	156 28.8	148 12.7	07.3	144 24.6	31.6	86 37.1	44.5	297 42.1	24.1
23	171 31.2	163 12.3	08.6	159 25.3	32.4	101 39.1	44.6	312 44.7	24.0
Mer. Pass.	h m 11 39.7	v −0.4	d 1.3	v 0.7	d 0.8	v 2.0	d 0.1	v 2.6	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.4
Achernar	335 27.5	S57 10.3
Acrux	173 08.7	S63 10.5
Adhara	255 12.6	S28 59.8
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.3	N55 53.1
Alkaid	152 58.6	N49 14.6
Al Na'ir	27 44.3	S46 53.6
Alnilam	275 46.6	S 1 11.9
Alphard	217 56.0	S 8 43.3
Alphecca	126 10.9	N26 40.0
Alpheratz	357 44.0	N29 09.8
Altair	62 08.5	N 8 54.2
Ankaa	353 16.3	S42 14.1
Antares	112 26.3	S26 27.6
Arcturus	145 55.6	N19 06.6
Atria	107 28.0	S69 02.7
Avior	234 17.8	S59 33.6
Bellatrix	278 32.2	N 6 21.5
Betelgeuse	271 01.5	N 7 24.3
Canopus	263 56.2	S52 42.6
Capella	280 34.8	N46 00.7
Deneb	49 31.8	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.4	S17 54.9
Dubhe	193 51.3	N61 40.7
Elnath	278 12.9	N28 37.0
Eltanin	90 46.1	N51 29.0
Enif	33 47.5	N 9 56.1
Fomalhaut	15 24.5	S29 33.1
Gacrux	172 00.5	S57 11.4
Gienah	175 52.1	S17 37.1
Hadar	148 47.5	S60 26.2
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 44.0	S34 22.5
Kochab	137 19.1	N74 05.9
Markab	13 38.8	N15 16.5
Menkar	314 15.4	N 4 08.3
Menkent	148 07.4	S36 26.1
Miaplacidus	221 39.1	S69 46.7
Mirfak	308 40.9	N49 54.5
Nunki	75 58.5	S26 16.6
Peacock	53 19.8	S56 41.2
Pollux	243 27.8	N27 59.5
Procyon	244 59.8	N 5 11.2
Rasalhague	96 06.5	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.3	S 8 11.5
Rigil Kent.	139 51.3	S60 53.2
Sabik	102 12.6	S15 44.4
Schedar	349 41.2	N56 36.6
Shaula	96 22.0	S37 06.6
Sirius	258 33.8	S16 44.4
Spica	158 31.1	S11 14.0
Suhail	222 52.3	S43 29.6
Vega	80 39.1	N38 47.6
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	353 54.6	12 06
Mars	349 16.9	12 24
Jupiter	290 27.6	16 18
Saturn	141 07.0	2 17

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON						Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP			Naut.	Civil		26	27	28	29
d h	° ′	° ′	° ′	′	° ′	′	′		°	h m	h m	h m	h m	h m	h m	h m
26 00	178 33.8	N 2 10.9	16 34.9	11.9	N 0 43.5	11.6	57.6		N 72	02 27	04 10	05 22	18 06	20 04	22 12	24 39
01	193 34.0	11.9	31 05.8	11.8	0 31.9	11.7	57.6		N 70	02 56	04 23	05 26	18 02	19 52	21 47	23 50
02	208 34.2	12.9	45 36.6	11.9	0 20.2	11.7	57.6		68	03 17	04 33	05 30	17 58	19 42	21 29	23 19
03	223 34.3	. . 13.9	60 07.5	11.8	N 0 08.5	11.7	57.7		66	03 34	04 41	05 33	17 55	19 33	21 14	22 56
04	238 34.5	14.9	74 38.3	11.7	S 0 03.2	11.8	57.7		64	03 47	04 47	05 36	17 53	19 26	21 02	22 38
05	253 34.7	15.8	89 09.0	11.7	0 15.0	11.7	57.7		62	03 57	04 53	05 38	17 51	19 20	20 52	22 24
06	268 34.9	N 2 16.8	103 39.7	11.7	S 0 26.7	11.7	57.8		60	04 06	04 58	05 40	17 49	19 15	20 44	22 11
07	283 35.1	17.8	118 10.4	11.7	0 38.4	11.8	57.8		N 58	04 14	05 02	05 42	17 47	19 11	20 36	22 01
08	298 35.3	18.8	132 41.1	11.6	0 50.2	11.8	57.8		56	04 21	05 06	05 44	17 46	19 07	20 29	21 52
09	313 35.5	. . 19.8	147 11.7	11.6	1 02.0	11.7	57.8		54	04 27	05 09	05 45	17 45	19 03	20 23	21 43
10	328 35.7	20.7	161 42.3	11.5	1 13.7	11.8	57.9		52	04 32	05 12	05 46	17 43	19 00	20 18	21 36
11	343 35.9	21.7	176 12.8	11.5	1 25.5	11.8	57.9		50	04 36	05 15	05 47	17 42	18 57	20 13	21 30
12	358 36.1	N 2 22.7	190 43.3	11.5	S 1 37.3	11.8	57.9		45	04 46	05 21	05 50	17 40	18 51	20 03	21 16
13	13 36.2	23.7	205 13.8	11.4	1 49.1	11.7	58.0		N 40	04 53	05 25	05 52	17 38	18 45	19 54	21 04
14	28 36.4	24.7	219 44.2	11.4	2 00.8	11.8	58.0		35	04 59	05 28	05 54	17 36	18 41	19 47	20 54
15	43 36.6	. . 25.6	234 14.6	11.3	2 12.6	11.8	58.0		30	05 03	05 31	05 55	17 35	18 37	19 41	20 46
16	58 36.8	26.6	248 44.9	11.3	2 24.4	11.8	58.0		20	05 10	05 36	05 58	17 33	18 30	19 30	20 31
17	73 37.0	27.6	263 15.2	11.3	2 36.2	11.8	58.1		N 10	05 15	05 39	06 00	17 30	18 24	19 20	20 18
18	88 37.2	N 2 28.6	277 45.5	11.2	S 2 48.0	11.8	58.1		0	05 17	05 41	06 02	17 28	18 19	19 11	20 06
19	103 37.4	29.6	292 15.7	11.2	2 59.8	11.7	58.1		S 10	05 18	05 43	06 04	17 27	18 13	19 02	19 55
20	118 37.6	30.5	306 45.9	11.1	3 11.5	11.8	58.2		20	05 18	05 44	06 06	17 24	18 07	18 53	19 42
21	133 37.8	. . 31.5	321 16.0	11.1	3 23.3	11.8	58.2		30	05 16	05 44	06 08	17 22	18 01	18 42	19 28
22	148 38.0	32.5	335 46.1	11.0	3 35.1	11.7	58.2		35	05 14	05 44	06 09	17 21	17 57	18 36	19 20
23	163 38.1	33.5	350 16.1	11.0	3 46.8	11.7	58.2		40	05 12	05 43	06 10	17 19	17 53	18 29	19 10
27 00	178 38.3	N 2 34.5	4 46.1	11.0	S 3 58.5	11.8	58.3		45	05 08	05 42	06 11	17 18	17 48	18 21	18 59
01	193 38.5	35.4	19 16.1	10.9	4 10.3	11.7	58.3		S 50	05 03	05 41	06 13	17 16	17 42	18 12	18 46
02	208 38.7	36.4	33 46.0	10.9	4 22.0	11.7	58.3		52	05 01	05 40	06 14	17 15	17 40	18 07	18 40
03	223 38.9	. . 37.4	48 15.9	10.8	4 33.7	11.7	58.3		54	04 58	05 39	06 14	17 14	17 37	18 03	18 33
04	238 39.1	38.4	62 45.7	10.7	4 45.4	11.7	58.4		56	04 55	05 38	06 15	17 13	17 33	17 57	18 26
05	253 39.3	39.3	77 15.4	10.7	4 57.1	11.6	58.4		58	04 51	05 37	06 16	17 11	17 30	17 51	18 17
06	268 39.5	N 2 40.3	91 45.1	10.7	S 5 08.7	11.7	58.4		S 60	04 47	05 36	06 17	17 10	17 26	17 45	18 08
07	283 39.7	41.3	106 14.8	10.6	5 20.4	11.6	58.4									
08	298 39.9	42.3	120 44.4	10.6	5 32.0	11.6	58.5									
09	313 40.0	. . 43.3	135 14.0	10.5	5 43.6	11.6	58.5									
10	328 40.2	44.2	149 43.5	10.5	5 55.2	11.5	58.5									
11	343 40.4	45.2	164 13.0	10.4	6 06.7	11.6	58.5									
12	358 40.6	N 2 46.2	178 42.4	10.4	S 6 18.3	11.5	58.6									
13	13 40.8	47.2	193 11.8	10.3	6 29.8	11.4	58.6									
14	28 41.0	48.1	207 41.1	10.2	6 41.2	11.5	58.6									
15	43 41.2	. . 49.1	222 10.3	10.2	6 52.7	11.4	58.6									
16	58 41.4	50.1	236 39.5	10.2	7 04.1	11.4	58.7									
17	73 41.6	51.1	251 08.7	10.1	7 15.5	11.4	58.7									
18	88 41.8	N 2 52.0	265 37.8	10.0	S 7 26.9	11.3	58.7									
19	103 41.9	53.0	280 06.8	10.0	7 38.2	11.3	58.7									
20	118 42.1	54.0	294 35.8	9.9	7 49.5	11.3	58.8									
21	133 42.3	. . 55.0	309 04.7	9.9	8 00.8	11.2	58.8									
22	148 42.5	56.0	323 33.6	9.8	8 12.0	11.2	58.8									
23	163 42.7	56.9	338 02.4	9.8	8 23.2	11.1	58.8									
28 00	178 42.9	N 2 57.9	352 31.2	9.7	S 8 34.3	11.1	58.8									
01	193 43.1	58.9	6 59.9	9.7	8 45.4	11.1	58.9									
02	208 43.3	2 59.9	21 28.6	9.5	8 56.5	11.0	58.9									
03	223 43.5	3 00.8	35 57.1	9.6	9 07.5	10.9	58.9									
04	238 43.7	01.8	50 25.7	9.5	9 18.4	11.0	58.9									
05	253 43.8	02.8	64 54.2	9.4	9 29.4	10.8	59.0									
06	268 44.0	N 3 03.8	79 22.6	9.3	S 9 40.2	10.9	59.0									
07	283 44.2	04.7	93 50.9	9.3	9 51.1	10.7	59.0									
08	298 44.4	05.7	108 19.2	9.3	10 01.8	10.8	59.0									
09	313 44.6	. . 06.7	122 47.5	9.1	10 12.6	10.6	59.0									
10	328 44.8	07.7	137 15.6	9.2	10 23.2	10.6	59.0									
11	343 45.0	08.6	151 43.8	9.0	10 33.8	10.6	59.1									
12	358 45.2	N 3 09.6	166 11.8	9.0	S10 44.4	10.5	59.1									
13	13 45.4	10.6	180 39.8	9.0	10 54.9	10.4	59.1									
14	28 45.6	11.6	195 07.8	8.8	11 05.3	10.4	59.1									
15	43 45.7	. . 12.5	209 35.6	8.9	11 15.7	10.3	59.1									
16	58 45.9	13.5	224 03.5	8.7	11 26.0	10.3	59.2									
17	73 46.1	14.5	238 31.2	8.7	11 36.3	10.2	59.2									
18	88 46.3	N 3 15.5	252 58.9	8.7	S11 46.5	10.1	59.2									
19	103 46.5	16.4	267 26.6	8.5	11 56.6	10.1	59.2									
20	118 46.7	17.4	281 54.1	8.5	12 06.7	10.0	59.2									
21	133 46.9	. . 18.4	296 21.6	8.5	12 16.7	9.9	59.2									
22	148 47.1	19.4	310 49.1	8.4	12 26.6	9.9	59.3									
23	163 47.3	20.3	325 16.5	8.3	S12 36.5	9.8	59.3									
	SD 16.1	d 1.0	SD	15.8		16.0		16.1								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	26	27	28	29
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 52	20 04	21 50	04 59	04 47	04 34	04 18
N 70	18 47	19 51	21 19	04 59	04 54	04 49	04 43
68	18 43	19 41	20 57	04 59	05 00	05 01	05 03
66	18 39	19 32	20 40	05 00	05 05	05 11	05 19
64	18 37	19 25	20 27	05 00	05 09	05 19	05 32
62	18 34	19 19	20 16	05 00	05 12	05 26	05 43
60	18 32	19 14	20 06	05 01	05 15	05 32	05 53
N 58	18 30	19 10	19 58	05 01	05 18	05 38	06 01
56	18 28	19 06	19 51	05 01	05 21	05 43	06 08
54	18 27	19 03	19 46	05 01	05 23	05 47	06 15
52	18 25	18 59	19 40	05 01	05 25	05 51	06 21
50	18 24	18 57	19 36	05 01	05 27	05 55	06 26
45	18 21	18 51	19 26	05 02	05 31	06 02	06 38
N 40	18 19	18 46	19 18	05 02	05 34	06 09	06 47
35	18 17	18 43	19 13	05 02	05 37	06 15	06 56
30	18 16	18 40	19 08	05 02	05 40	06 20	07 03
20	18 13	18 35	19 01	05 03	05 44	06 28	07 16
N 10	18 11	18 32	18 56	05 03	05 48	06 36	07 27
0	18 09	18 29	18 53	05 03	05 52	06 43	07 37
S 10	18 07	18 28	18 52	05 03	05 56	06 51	07 48
20	18 05	18 27	18 52	05 03	06 00	06 58	07 59
30	18 02	18 26	18 54	05 04	06 04	07 07	08 12
35	18 01	18 26	18 56	05 04	06 07	07 12	08 19
40	18 00	18 27	18 58	05 04	06 10	07 18	08 27
45	17 58	18 28	19 02	05 04	06 13	07 25	08 37
S 50	17 57	18 29	19 06	05 04	06 18	07 33	08 49
52	17 56	18 29	19 09	05 04	06 20	07 37	08 55
54	17 55	18 30	19 11	05 04	06 22	07 41	09 01
56	17 54	18 31	19 14	05 04	06 24	07 46	09 08
58	17 53	18 32	19 18	05 04	06 27	07 51	09 16
S 60	17 52	18 33	19 22	05 04	06 29	07 57	09 25

Day	SUN		MOON		
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00h	12h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
26	05 45	05 36	12 06	23 40	11 16	15	99
27	05 27	05 18	12 05	24 31	12 05	16	100
28	05 09	05 00	12 05	00 31	12 57	17	98

UT	ARIES	VENUS −4.0		MARS +1.2		JUPITER −2.1		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
29 00	186 33.7	178 11.9	N 2 09.9	174 26.0	N 4 33.1	116 41.2	N21 44.6	327 47.3	S12 24.0
01	201 36.2	193 11.5	11.1	189 26.7	33.9	131 43.2	44.7	342 49.9	23.9
02	216 38.6	208 11.2	12.4	204 27.4	34.7	146 45.3	44.8	357 52.5	23.9
03	231 41.1	223 10.8	. . 13.6	219 28.1	. . 35.5	161 47.3	. . 44.8	12 55.1	. . 23.8
04	246 43.6	238 10.4	14.9	234 28.8	36.2	176 49.3	44.9	27 57.7	23.8
05	261 46.0	253 10.0	16.1	249 29.5	37.0	191 51.4	44.9	43 00.3	23.7
06	276 48.5	268 09.6	N 2 17.4	264 30.2	N 4 37.8	206 53.4	N21 45.0	58 02.9	S12 23.7
07	291 51.0	283 09.3	18.6	279 30.9	38.5	221 55.5	45.1	73 05.5	23.6
08	306 53.4	298 08.9	19.9	294 31.6	39.3	236 57.5	45.1	88 08.1	23.6
F 09	321 55.9	313 08.5	. . 21.2	309 32.3	. . 40.1	251 59.5	. . 45.2	103 10.7	. . 23.5
R 10	336 58.3	328 08.1	22.4	324 33.0	40.8	267 01.6	45.3	118 13.3	23.5
I 11	352 00.8	343 07.8	23.7	339 33.7	41.6	282 03.6	45.3	133 15.9	23.4
D 12	7 03.3	358 07.4	N 2 24.9	354 34.4	N 4 42.4	297 05.7	N21 45.4	148 18.6	S12 23.4
A 13	22 05.7	13 07.0	26.2	9 35.1	43.1	312 07.7	45.4	163 21.2	23.3
Y 14	37 08.2	28 06.6	27.4	24 35.8	43.9	327 09.7	45.5	178 23.8	23.3
15	52 10.7	43 06.2	. . 28.7	39 36.5	. . 44.7	342 11.8	. . 45.6	193 26.4	. . 23.2
16	67 13.1	58 05.9	30.0	54 37.2	45.4	357 13.8	45.6	208 29.0	23.2
17	82 15.6	73 05.5	31.2	69 37.9	46.2	12 15.8	45.7	223 31.6	23.1
18	97 18.1	88 05.1	N 2 32.5	84 38.6	N 4 47.0	27 17.9	N21 45.7	238 34.2	S12 23.1
19	112 20.5	103 04.7	33.7	99 39.3	47.7	42 19.9	45.8	253 36.8	23.0
20	127 23.0	118 04.4	35.0	114 40.0	48.5	57 21.9	45.9	268 39.4	23.0
21	142 25.4	133 04.0	. . 36.2	129 40.7	. . 49.3	72 24.0	. . 45.9	283 42.0	. . 22.9
22	157 27.9	148 03.6	37.5	144 41.4	50.0	87 26.0	46.0	298 44.6	22.9
23	172 30.4	163 03.2	38.7	159 42.1	50.8	102 28.1	46.1	313 47.2	22.8
30 00	187 32.8	178 02.8	N 2 40.0	174 42.8	N 4 51.6	117 30.1	N21 46.1	328 49.8	S12 22.8
01	202 35.3	193 02.5	41.3	189 43.5	52.3	132 32.1	46.2	343 52.4	22.7
02	217 37.8	208 02.1	42.5	204 44.2	53.1	147 34.2	46.2	358 55.0	22.6
03	232 40.2	223 01.7	. . 43.8	219 44.9	. . 53.8	162 36.2	. . 46.3	13 57.6	. . 22.6
04	247 42.7	238 01.3	45.0	234 45.6	54.6	177 38.2	46.4	29 00.2	22.5
05	262 45.2	253 00.9	46.3	249 46.3	55.4	192 40.3	46.4	44 02.9	22.5
06	277 47.6	268 00.6	N 2 47.5	264 47.0	N 4 56.1	207 42.3	N21 46.5	59 05.5	S12 22.4
07	292 50.1	283 00.2	48.8	279 47.7	56.9	222 44.3	46.5	74 08.1	22.4
S 08	307 52.6	297 59.8	50.0	294 48.4	57.7	237 46.4	46.6	89 10.7	22.3
A 09	322 55.0	312 59.4	. . 51.3	309 49.1	. . 58.4	252 48.4	. . 46.7	104 13.3	. . 22.3
T 10	337 57.5	327 59.1	52.5	324 49.8	4 59.2	267 50.4	46.7	119 15.9	22.2
U 11	352 59.9	342 58.7	53.8	339 50.5	5 00.0	282 52.5	46.8	134 18.5	22.2
R 12	8 02.4	357 58.3	N 2 55.1	354 51.2	N 5 00.7	297 54.5	N21 46.9	149 21.1	S12 22.1
D 13	23 04.9	12 57.9	56.3	9 51.9	01.5	312 56.5	46.9	164 23.7	22.1
A 14	38 07.3	27 57.5	57.6	24 52.7	02.3	327 58.6	47.0	179 26.3	22.0
Y 15	53 09.8	42 57.2	2 58.8	39 53.4	. . 03.0	343 00.6	. . 47.0	194 28.9	. . 22.0
16	68 12.3	57 56.8	3 00.1	54 54.1	03.8	358 02.6	47.1	209 31.5	21.9
17	83 14.7	72 56.4	01.3	69 54.8	04.5	13 04.6	47.2	224 34.1	21.9
18	98 17.2	87 56.0	N 3 02.6	84 55.5	N 5 05.3	28 06.7	N21 47.2	239 36.8	S12 21.8
19	113 19.7	102 55.6	03.8	99 56.2	06.1	43 08.7	47.3	254 39.4	21.8
20	128 22.1	117 55.3	05.1	114 56.9	06.8	58 10.7	47.3	269 42.0	21.7
21	143 24.6	132 54.9	. . 06.3	129 57.6	. . 07.6	73 12.8	. . 47.4	284 44.6	. . 21.7
22	158 27.1	147 54.5	07.6	144 58.3	08.4	88 14.8	47.5	299 47.2	21.6
23	173 29.5	162 54.1	08.8	159 59.0	09.1	103 16.8	47.5	314 49.8	21.6
31 00	188 32.0	177 53.7	N 3 10.1	174 59.7	N 5 09.9	118 18.9	N21 47.6	329 52.4	S12 21.5
01	203 34.4	192 53.4	11.3	190 00.4	10.7	133 20.9	47.7	344 55.0	21.5
02	218 36.9	207 53.0	12.6	205 01.1	11.4	148 22.9	47.7	359 57.6	21.4
03	233 39.4	222 52.6	. . 13.9	220 01.8	. . 12.2	163 24.9	. . 47.8	15 00.2	. . 21.4
04	248 41.8	237 52.2	15.1	235 02.5	12.9	178 27.0	47.8	30 02.8	21.3
05	263 44.3	252 51.8	16.4	250 03.2	13.7	193 29.0	47.9	45 05.4	21.2
06	278 46.8	267 51.4	N 3 17.6	265 03.9	N 5 14.5	208 31.0	N21 48.0	60 08.1	S12 21.2
07	293 49.2	282 51.1	18.9	280 04.6	15.2	223 33.1	48.0	75 10.7	21.1
08	308 51.7	297 50.7	20.1	295 05.3	16.0	238 35.1	48.1	90 13.3	21.1
S 09	323 54.2	312 50.3	. . 21.4	310 06.0	. . 16.8	253 37.1	. . 48.1	105 15.9	. . 21.0
U 10	338 56.6	327 49.9	22.6	325 06.7	17.5	268 39.1	48.2	120 18.5	21.0
N 11	353 59.1	342 49.5	23.9	340 07.4	18.3	283 41.2	48.3	135 21.1	20.9
D 12	9 01.5	357 49.2	N 3 25.1	355 08.1	N 5 19.0	298 43.2	N21 48.3	150 23.7	S12 20.9
A 13	24 04.0	12 48.8	26.4	10 08.8	19.8	313 45.2	48.4	165 26.3	20.8
Y 14	39 06.5	27 48.4	27.6	25 09.5	20.6	328 47.3	48.5	180 28.9	20.8
15	54 08.9	42 48.0	. . 28.9	40 10.2	. . 21.3	343 49.3	. . 48.5	195 31.6	. . 20.7
16	69 11.4	57 47.6	30.1	55 10.9	22.1	358 51.3	48.6	210 34.2	20.7
17	84 13.9	72 47.3	31.4	70 11.6	22.8	13 53.3	48.6	225 36.8	20.6
18	99 16.3	87 46.9	N 3 32.6	85 12.3	N 5 23.6	28 55.4	N21 48.7	240 39.4	S12 20.6
19	114 18.8	102 46.5	33.9	100 13.0	24.4	43 57.4	48.8	255 42.0	20.5
20	129 21.3	117 46.1	35.1	115 13.7	25.1	58 59.4	48.8	270 44.6	20.5
21	144 23.7	132 45.7	. . 36.4	130 14.4	. . 25.9	74 01.4	. . 48.9	285 47.2	. . 20.4
22	159 26.2	147 45.3	37.6	145 15.1	26.6	89 03.5	49.0	300 49.8	20.4
23	174 28.7	162 45.0	38.9	160 15.8	27.4	104 05.5	49.0	315 52.4	20.3
Mer.Pass.	h m 11 27.9	v −0.4	d 1.3	v 0.7	d 0.8	v 2.0	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.4
Achernar	335 27.5	S57 10.3
Acrux	173 08.7	S63 10.5
Adhara	255 12.6	S28 59.8
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.3	N55 53.1
Alkaid	152 58.6	N49 14.7
Al Na'ir	27 44.3	S46 53.6
Alnilam	275 46.6	S 1 11.9
Alphard	217 56.0	S 8 43.3
Alphecca	126 10.9	N26 40.1
Alpheratz	357 44.0	N29 09.8
Altair	62 08.5	N 8 54.2
Ankaa	353 16.3	S42 14.1
Antares	112 26.2	S26 27.6
Arcturus	145 55.6	N19 06.6
Atria	107 28.0	S69 02.7
Avior	234 17.8	S59 33.6
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.5	N 7 24.3
Canopus	263 56.2	S52 42.6
Capella	280 34.8	N46 00.7
Deneb	49 31.8	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.4	S17 54.9
Dubhe	193 51.3	N61 40.7
Elnath	278 12.9	N28 37.0
Eltanin	90 46.1	N51 29.0
Enif	33 47.5	N 9 56.1
Fomalhaut	15 24.5	S29 33.1
Gacrux	172 00.4	S57 11.4
Gienah	175 52.1	S17 37.1
Hadar	148 47.5	S60 26.2
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 44.0	S34 22.5
Kochab	137 19.1	N74 05.9
Markab	13 38.8	N15 16.5
Menkar	314 15.5	N 4 08.3
Menkent	148 07.4	S36 26.1
Miaplacidus	221 39.1	S69 46.7
Mirfak	308 40.9	N49 54.5
Nunki	75 58.5	S26 16.6
Peacock	53 19.7	S56 41.2
Pollux	243 27.8	N27 59.5
Procyon	244 59.8	N 5 11.2
Rasalhague	96 06.5	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.3	S 8 11.5
Rigil Kent.	139 51.3	S60 53.3
Sabik	102 12.6	S15 44.4
Schedar	349 41.2	N56 36.6
Shaula	96 22.0	S37 06.6
Sirius	258 33.8	S16 44.4
Spica	158 31.1	S11 14.0
Suhail	222 52.3	S43 29.6
Vega	80 39.0	N38 47.6
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	350 30.0	12 08
Mars	347 10.0	12 21
Jupiter	289 57.2	16 08
Saturn	141 17.0	2 04

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 29	Moonrise 30	Moonrise 31	Moonrise 1
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
29 00	178 47.4	N 3 21.3	339 43.8	8.3	S12 46.3	9.7	59.3	N 72	01 59	03 53	05 06	24 39	00 39	▬	▬
01	193 47.6	22.3	354 11.1	8.2	12 56.0	9.6	59.3	N 70	02 35	04 07	05 12	23 50	26 03	02 03	▬
02	208 47.8	23.3	8 38.3	8.1	13 05.6	9.6	59.3	68	03 00	04 19	05 17	23 19	25 07	01 07	02 39
03	223 48.0	. . 24.2	23 05.4	8.1	13 15.2	9.4	59.3	66	03 19	04 28	05 22	22 56	24 34	00 34	01 56
04	238 48.2	25.2	37 32.5	8.0	13 24.6	9.4	59.3	64	03 34	04 36	05 25	22 38	24 09	00 09	01 27
05	253 48.4	26.2	51 59.5	8.0	13 34.0	9.4	59.4	62	03 46	04 43	05 28	22 24	23 50	25 06	01 06
06	268 48.6	N 3 27.1	66 26.5	7.9	S13 43.4	9.2	59.4	60	03 56	04 49	05 31	22 11	23 35	24 48	00 48
07	283 48.8	28.1	80 53.4	7.8	13 52.6	9.2	59.4	N 58	04 05	04 54	05 33	22 01	23 21	24 33	00 33
08	298 49.0	29.1	95 20.2	7.8	14 01.8	9.0	59.4	56	04 12	04 58	05 36	21 52	23 10	24 21	00 21
F 09	313 49.2	. . 30.1	109 47.0	7.7	14 10.8	9.0	59.4	54	04 18	05 02	05 38	21 43	23 00	24 09	00 09
R 10	328 49.3	31.0	124 13.7	7.7	14 19.8	8.9	59.4	52	04 24	05 05	05 39	21 36	22 51	24 00	00 00
I 11	343 49.5	32.0	138 40.4	7.6	14 28.7	8.8	59.4	50	04 29	05 08	05 41	21 30	22 43	23 51	24 50
D 12	358 49.7	N 3 33.0	153 07.0	7.5	S14 37.5	8.8	59.4	45	04 40	05 15	05 44	21 16	22 26	23 33	24 32
A 13	13 49.9	34.0	167 33.5	7.5	14 46.3	8.6	59.5	N 40	04 48	05 20	05 47	21 04	22 12	23 18	24 17
Y 14	28 50.1	34.9	182 00.0	7.5	14 54.9	8.5	59.5	35	04 54	05 24	05 50	20 54	22 01	23 05	24 04
15	43 50.3	. . 35.9	196 26.5	7.3	15 03.4	8.5	59.5	30	05 00	05 28	05 52	20 46	21 51	22 54	23 53
16	58 50.5	36.9	210 52.8	7.3	15 11.9	8.4	59.5	20	05 07	05 33	05 55	20 31	21 33	22 35	23 34
17	73 50.7	37.8	225 19.1	7.3	15 20.3	8.2	59.5	N 10	05 13	05 37	05 58	20 18	21 18	22 18	23 18
18	88 50.9	N 3 38.8	239 45.4	7.2	S15 28.5	8.2	59.5	0	05 16	05 40	06 01	20 06	21 04	22 03	23 02
19	103 51.0	39.8	254 11.6	7.1	15 36.7	8.1	59.5	S 10	05 18	05 43	06 04	19 55	20 50	21 48	22 47
20	118 51.2	40.8	268 37.7	7.1	15 44.8	7.9	59.5	20	05 19	05 44	06 07	19 42	20 35	21 31	22 30
21	133 51.4	. . 41.7	283 03.8	7.0	15 52.7	7.9	59.5	30	05 18	05 46	06 09	19 28	20 18	21 13	22 12
22	148 51.6	42.7	297 29.8	7.0	16 00.6	7.8	59.5	35	05 17	05 46	06 11	19 20	20 08	21 02	22 01
23	163 51.8	43.7	311 55.8	6.9	16 08.4	7.6	59.6	40	05 15	05 46	06 13	19 10	19 57	20 49	21 48
30 00	178 52.0	N 3 44.6	326 21.7	6.8	S16 16.0	7.6	59.6	45	05 12	05 46	06 15	18 59	19 43	20 34	21 33
01	193 52.2	45.6	340 47.5	6.8	16 23.6	7.5	59.6	S 50	05 08	05 45	06 18	18 46	19 27	20 17	21 15
02	208 52.4	46.6	355 13.3	6.8	16 31.1	7.3	59.6	52	05 06	05 45	06 19	18 40	19 20	20 08	21 06
03	223 52.5	. . 47.6	9 39.1	6.7	16 38.4	7.3	59.6	54	05 04	05 45	06 20	18 33	19 11	19 59	20 57
04	238 52.7	48.5	24 04.8	6.6	16 45.7	7.1	59.6	56	05 01	05 44	06 21	18 26	19 02	19 48	20 46
05	253 52.9	49.5	38 30.4	6.6	16 52.8	7.0	59.6	58	04 58	05 44	06 23	18 17	18 51	19 36	20 33
06	268 53.1	N 3 50.5	52 56.0	6.6	S16 59.8	6.9	59.6	S 60	04 54	05 43	06 25	18 08	18 39	19 22	20 19
07	283 53.3	51.4	67 21.6	6.5	17 06.7	6.8	59.6								
S 08	298 53.5	52.4	81 47.1	6.4	17 13.5	6.7	59.6								
A 09	313 53.7	. . 53.4	96 12.5	6.4	17 20.2	6.6	59.6								
T 10	328 53.9	54.4	110 37.9	6.4	17 26.8	6.5	59.6								
U 11	343 54.1	55.3	125 03.3	6.3	17 33.3	6.4	59.6								
R 12	358 54.2	N 3 56.3	139 28.6	6.2	S17 39.7	6.2	59.6								
D 13	13 54.4	57.3	153 53.8	6.2	17 45.9	6.1	59.6								
A 14	28 54.6	58.2	168 19.0	6.2	17 52.0	6.0	59.6								
Y 15	43 54.8	3 59.2	182 44.2	6.1	17 58.0	5.9	59.6								
16	58 55.0	4 00.2	197 09.3	6.1	18 03.9	5.8	59.6								
17	73 55.2	01.1	211 34.4	6.0	18 09.7	5.6	59.7								
18	88 55.4	N 4 02.1	225 59.4	6.0	S18 15.3	5.5	59.7								
19	103 55.6	03.1	240 24.4	6.0	18 20.8	5.4	59.7								
20	118 55.7	04.0	254 49.4	5.9	18 26.2	5.3	59.7								
21	133 55.9	. . 05.0	269 14.3	5.9	18 31.5	5.2	59.7								
22	148 56.1	06.0	283 39.2	5.8	18 36.7	5.0	59.7								
23	163 56.3	06.9	298 04.0	5.8	18 41.7	4.9	59.7								
31 00	178 56.5	N 4 07.9	312 28.8	5.8	S18 46.6	4.8	59.7								
01	193 56.7	08.9	326 53.6	5.8	18 51.4	4.6	59.7								
02	208 56.9	09.9	341 18.4	5.7	18 56.0	4.5	59.7								
03	223 57.1	. . 10.8	355 43.1	5.6	19 00.5	4.4	59.7								
04	238 57.3	11.8	10 07.7	5.7	19 04.9	4.3	59.7								
05	253 57.4	12.8	24 32.4	5.6	19 09.2	4.1	59.7								
06	268 57.6	N 4 13.7	38 57.0	5.6	S19 13.3	4.0	59.7								
07	283 57.8	14.7	53 21.6	5.6	19 17.3	3.9	59.7								
08	298 58.0	15.7	67 46.2	5.5	19 21.2	3.8	59.7								
S 09	313 58.2	. . 16.6	82 10.7	5.5	19 25.0	3.6	59.7								
U 10	328 58.4	17.6	96 35.2	5.5	19 28.6	3.4	59.7								
N 11	343 58.6	18.6	110 59.7	5.5	19 32.0	3.4	59.7								
D 12	358 58.7	N 4 19.5	125 24.2	5.4	S19 35.4	3.2	59.7								
A 13	13 58.9	20.5	139 48.6	5.4	19 38.6	3.1	59.7								
Y 14	28 59.1	21.5	154 13.0	5.4	19 41.7	2.9	59.7								
15	43 59.3	. . 22.4	168 37.4	5.4	19 44.6	2.8	59.7								
16	58 59.5	23.4	183 01.8	5.4	19 47.4	2.7	59.6								
17	73 59.7	24.4	197 26.2	5.4	19 50.1	2.6	59.6								
18	88 59.9	N 4 25.3	211 50.6	5.3	S19 52.7	2.4	59.6								
19	104 00.1	26.3	226 14.9	5.4	19 55.1	2.2	59.6								
20	119 00.2	27.2	240 39.3	5.3	19 57.3	2.2	59.6								
21	134 00.4	. . 28.2	255 03.6	5.3	19 59.5	2.0	59.6								
22	149 00.6	29.2	269 27.9	5.3	20 01.5	1.8	59.6								
23	164 00.8	30.1	283 52.2	5.3	S20 03.3	1.7	59.6								
	SD 16.0	d 1.0	SD	16.2		16.2		16.3							

Lat.	Sunset	Twilight Civil	Twilight Naut.
°	h m	h m	h m
N 72	19 06	20 20	22 19
N 70	18 59	20 05	21 39
68	18 54	19 53	21 13
66	18 49	19 43	20 53
64	18 45	19 35	20 38
62	18 42	19 28	20 26
60	18 39	19 22	20 15
N 58	18 37	19 17	20 06
56	18 34	19 12	19 59
54	18 32	19 08	19 52
52	18 31	19 05	19 46
50	18 29	19 02	19 41
45	18 25	18 55	19 30
N 40	18 22	18 50	19 22
35	18 20	18 45	19 15
30	18 18	18 42	19 10
20	18 14	18 36	19 02
N 10	18 11	18 32	18 56
0	18 08	18 28	18 52
S 10	18 05	18 26	18 50
20	18 02	18 24	18 50
30	17 59	18 23	18 50
35	17 57	18 22	18 52
40	17 55	18 22	18 53
45	17 53	18 22	18 56
S 50	17 50	18 22	19 00
52	17 49	18 23	19 02
54	17 48	18 23	19 04
56	17 46	18 23	19 06
58	17 45	18 24	19 09
S 60	17 43	18 24	19 13

Moonset	29	30	31	1
	h m	h m	h m	h m
N 72	04 18	03 47	▬	▬
N 70	04 43	04 37	04 25	▬
68	05 03	05 09	05 21	05 54
66	05 19	05 32	05 55	06 37
64	05 32	05 51	06 20	07 05
62	05 43	06 06	06 39	07 27
60	05 53	06 19	06 56	07 45
N 58	06 01	06 30	07 09	08 00
56	06 08	06 40	07 21	08 13
54	06 15	06 49	07 31	08 24
52	06 21	06 56	07 40	08 33
50	06 26	07 03	07 48	08 42
45	06 38	07 18	08 06	09 01
N 40	06 47	07 31	08 20	09 16
35	06 56	07 41	08 32	09 29
30	07 03	07 51	08 43	09 40
20	07 16	08 06	09 01	09 59
N 10	07 27	08 20	09 17	10 16
0	07 37	08 33	09 32	10 31
S 10	07 48	08 47	09 47	10 47
20	07 59	09 01	10 03	11 03
30	08 12	09 17	10 21	11 22
35	08 19	09 26	10 32	11 33
40	08 27	09 37	10 44	11 46
45	08 37	09 49	10 58	12 01
S 50	08 49	10 05	11 16	12 19
52	08 55	10 12	11 24	12 28
54	09 01	10 20	11 33	12 38
56	09 08	10 29	11 44	12 49
58	09 16	10 39	11 56	13 01
S 60	09 25	10 51	12 09	13 16

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
29	04 51	04 42	12 05	01 24	13 52	18	94
30	04 32	04 23	12 04	02 20	14 49	19	88
31	04 14	04 05	12 04	03 18	15 47	20	79

UT	ARIES	VENUS −4.0		MARS +1.2		JUPITER −2.1		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
1 00	189 31.1	177 44.6	N 3 40.1	175 16.5	N 5 28.2	119 07.5	N21 49.1	330 55.0	S12 20.3
01	204 33.6	192 44.2	41.4	190 17.2	28.9	134 09.5	49.1	345 57.7	20.2
02	219 36.0	207 43.8	42.6	205 17.9	29.7	149 11.6	49.2	1 00.3	20.1
03	234 38.5	222 43.4	. . 43.9	220 18.6	. . 30.4	164 13.6	. . 49.3	16 02.9	. . 20.1
04	249 41.0	237 43.0	45.1	235 19.3	31.2	179 15.6	49.3	31 05.5	20.0
05	264 43.4	252 42.7	46.4	250 20.0	32.0	194 17.6	49.4	46 08.1	20.0
06	279 45.9	267 42.3	N 3 47.6	265 20.7	N 5 32.7	209 19.7	N21 49.4	61 10.7	S12 19.9
07	294 48.4	282 41.9	48.9	280 21.4	33.5	224 21.7	49.5	76 13.3	19.9
08	309 50.8	297 41.5	50.1	295 22.1	34.2	239 23.7	49.6	91 15.9	19.8
M 09	324 53.3	312 41.1	. . 51.4	310 22.8	. . 35.0	254 25.7	. . 49.6	106 18.6	. . 19.8
O 10	339 55.8	327 40.7	52.6	325 23.5	35.8	269 27.7	49.7	121 21.2	19.7
N 11	354 58.2	342 40.4	53.9	340 24.2	36.5	284 29.8	49.8	136 23.8	19.7
D 12	10 00.7	357 40.0	N 3 55.1	355 24.9	N 5 37.3	299 31.8	N21 49.8	151 26.4	S12 19.6
A 13	25 03.2	12 39.6	56.4	10 25.6	38.0	314 33.8	49.9	166 29.0	19.6
Y 14	40 05.6	27 39.2	57.6	25 26.3	38.8	329 35.8	49.9	181 31.6	19.5
15	55 08.1	42 38.8	3 58.9	40 27.0	. . 39.6	344 37.9	. . 50.0	196 34.2	. . 19.5
16	70 10.5	57 38.4	4 00.1	55 27.7	40.3	359 39.9	50.1	211 36.8	19.4
17	85 13.0	72 38.1	01.4	70 28.4	41.1	14 41.9	50.1	226 39.5	19.4
18	100 15.5	87 37.7	N 4 02.6	85 29.1	N 5 41.8	29 43.9	N21 50.2	241 42.1	S12 19.3
19	115 17.9	102 37.3	03.9	100 29.8	42.6	44 45.9	50.2	256 44.7	19.2
20	130 20.4	117 36.9	05.1	115 30.5	43.3	59 48.0	50.3	271 47.3	19.2
21	145 22.9	132 36.5	. . 06.4	130 31.2	. . 44.1	74 50.0	. . 50.4	286 49.9	. . 19.1
22	160 25.3	147 36.1	07.6	145 31.9	44.9	89 52.0	50.4	301 52.5	19.1
23	175 27.8	162 35.8	08.8	160 32.6	45.6	104 54.0	50.5	316 55.1	19.0
2 00	190 30.3	177 35.4	N 4 10.1	175 33.3	N 5 46.4	119 56.0	N21 50.6	331 57.8	S12 19.0
01	205 32.7	192 35.0	11.3	190 34.0	47.1	134 58.1	50.6	347 00.4	18.9
02	220 35.2	207 34.6	12.6	205 34.7	47.9	150 00.1	50.7	2 03.0	18.9
03	235 37.7	222 34.2	. . 13.8	220 35.4	. . 48.6	165 02.1	. . 50.7	17 05.6	. . 18.8
04	250 40.1	237 33.8	15.1	235 36.1	49.4	180 04.1	50.8	32 08.2	18.8
05	265 42.6	252 33.4	16.3	250 36.8	50.2	195 06.1	50.9	47 10.8	18.7
06	280 45.0	267 33.1	N 4 17.6	265 37.5	N 5 50.9	210 08.2	N21 50.9	62 13.4	S12 18.7
07	295 47.5	282 32.7	18.8	280 38.2	51.7	225 10.2	51.0	77 16.1	18.6
T 08	310 50.0	297 32.3	20.1	295 38.9	52.4	240 12.2	51.1	92 18.7	18.6
U 09	325 52.4	312 31.9	. . 21.3	310 39.6	. . 53.2	255 14.2	. . 51.1	107 21.3	. . 18.5
E 10	340 54.9	327 31.5	22.6	325 40.3	53.9	270 16.2	51.2	122 23.9	18.4
S 11	355 57.4	342 31.1	23.8	340 41.0	54.7	285 18.2	51.2	137 26.5	18.4
D 12	10 59.8	357 30.7	N 4 25.0	355 41.7	N 5 55.4	300 20.3	N21 51.3	152 29.1	S12 18.3
A 13	26 02.3	12 30.4	26.3	10 42.4	56.2	315 22.3	51.4	167 31.7	18.3
Y 14	41 04.8	27 30.0	27.5	25 43.1	57.0	330 24.3	51.4	182 34.4	18.2
15	56 07.2	42 29.6	. . 28.8	40 43.8	. . 57.7	345 26.3	. . 51.5	197 37.0	. . 18.2
16	71 09.7	57 29.2	30.0	55 44.5	58.5	0 28.3	51.5	212 39.6	18.1
17	86 12.1	72 28.8	31.3	70 45.2	5 59.2	15 30.3	51.6	227 42.2	18.1
18	101 14.6	87 28.4	N 4 32.5	85 45.9	N 6 00.0	30 32.4	N21 51.7	242 44.8	S12 18.0
19	116 17.1	102 28.0	33.8	100 46.6	00.7	45 34.4	51.7	257 47.4	18.0
20	131 19.5	117 27.6	35.0	115 47.3	01.5	60 36.4	51.8	272 50.1	17.9
21	146 22.0	132 27.3	. . 36.2	130 48.0	. . 02.2	75 38.4	. . 51.9	287 52.7	. . 17.9
22	161 24.5	147 26.9	37.5	145 48.7	03.0	90 40.4	51.9	302 55.3	17.8
23	176 26.9	162 26.5	38.7	160 49.4	03.8	105 42.4	52.0	317 57.9	17.7
3 00	191 29.4	177 26.1	N 4 40.0	175 50.1	N 6 04.5	120 44.4	N21 52.0	333 00.5	S12 17.7
01	206 31.9	192 25.7	41.2	190 50.8	05.3	135 46.5	52.1	348 03.1	17.6
02	221 34.3	207 25.3	42.5	205 51.5	06.0	150 48.5	52.2	3 05.8	17.6
03	236 36.8	222 24.9	. . 43.7	220 52.2	. . 06.8	165 50.5	. . 52.2	18 08.4	. . 17.5
04	251 39.3	237 24.5	44.9	235 52.9	07.5	180 52.5	52.3	33 11.0	17.5
05	266 41.7	252 24.2	46.2	250 53.6	08.3	195 54.5	52.4	48 13.6	17.4
06	281 44.2	267 23.8	N 4 47.4	265 54.3	N 6 09.0	210 56.5	N21 52.4	63 16.2	S12 17.4
W 07	296 46.6	282 23.4	48.7	280 55.0	09.8	225 58.5	52.5	78 18.8	17.3
E 08	311 49.1	297 23.0	49.9	295 55.7	10.5	241 00.6	52.5	93 21.5	17.3
D 09	326 51.6	312 22.6	. . 51.2	310 56.4	. . 11.3	256 02.6	. . 52.6	108 24.1	. . 17.2
N 10	341 54.0	327 22.2	52.4	325 57.1	12.0	271 04.6	52.7	123 26.7	17.2
E 11	356 56.5	342 21.8	53.6	340 57.8	12.8	286 06.6	52.7	138 29.3	17.1
S 12	11 59.0	357 21.4	N 4 54.9	355 58.5	N 6 13.5	301 08.6	N21 52.8	153 31.9	S12 17.0
D 13	27 01.4	12 21.0	56.1	10 59.2	14.3	316 10.6	52.8	168 34.5	17.0
A 14	42 03.9	27 20.6	57.4	25 59.9	15.1	331 12.6	52.9	183 37.2	16.9
Y 15	57 06.4	42 20.3	. . 58.6	41 00.6	. . 15.8	346 14.6	. . 53.0	198 39.8	. . 16.9
16	72 08.8	57 19.9	4 59.8	56 01.3	16.6	1 16.7	53.0	213 42.4	16.8
17	87 11.3	72 19.5	5 01.1	71 02.0	17.3	16 18.7	53.1	228 45.0	16.8
18	102 13.8	87 19.1	N 5 02.3	86 02.7	N 6 18.1	31 20.7	N21 53.2	243 47.6	S12 16.7
19	117 16.2	102 18.7	03.6	101 03.4	18.8	46 22.7	53.2	258 50.3	16.7
20	132 18.7	117 18.3	04.8	116 04.1	19.6	61 24.7	53.3	273 52.9	16.6
21	147 21.1	132 17.9	. . 06.0	131 04.8	. . 20.3	76 26.7	. . 53.3	288 55.5	. . 16.6
22	162 23.6	147 17.5	07.3	146 05.5	21.1	91 28.7	53.4	303 58.1	16.5
23	177 26.1	162 17.1	08.5	161 06.2	21.8	106 30.7	53.5	319 00.7	16.4
	h m								
Mer.Pass.	11 16.1	v −0.4	d 1.2	v 0.7	d 0.8	v 2.0	d 0.1	v 2.6	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.3
Achernar	335 27.5	S57 10.3
Acrux	173 08.7	S63 10.5
Adhara	255 12.6	S28 59.8
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.3	N55 53.1
Alkaid	152 58.6	N49 14.7
Al Na'ir	27 44.3	S46 53.6
Alnilam	275 46.6	S 1 11.9
Alphard	217 56.0	S 8 43.3
Alphecca	126 10.9	N26 40.1
Alpheratz	357 44.0	N29 09.7
Altair	62 08.4	N 8 54.2
Ankaa	353 16.3	S42 14.0
Antares	112 26.2	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.9	S69 02.7
Avior	234 17.8	S59 33.6
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.5	N 7 24.3
Canopus	263 56.3	S52 42.6
Capella	280 34.8	N46 00.6
Deneb	49 31.8	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.4	S17 54.9
Dubhe	193 51.3	N61 40.7
Elnath	278 12.9	N28 37.0
Eltanin	90 46.1	N51 29.0
Enif	33 47.5	N 9 56.1
Fomalhaut	15 24.5	S29 33.0
Gacrux	172 00.4	S57 11.4
Gienah	175 52.1	S17 37.1
Hadar	148 47.4	S60 26.2
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.9	S34 22.5
Kochab	137 19.1	N74 05.9
Markab	13 38.7	N15 16.5
Menkar	314 15.5	N 4 08.3
Menkent	148 07.3	S36 26.1
Miaplacidus	221 39.1	S69 46.7
Mirfak	308 40.9	N49 54.5
Nunki	75 58.5	S26 16.6
Peacock	53 19.7	S56 41.2
Pollux	243 27.8	N27 59.5
Procyon	244 59.8	N 5 11.2
Rasalhague	96 06.5	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.3	S 8 11.5
Rigil Kent.	139 51.3	S60 53.3
Sabik	102 12.5	S15 44.4
Schedar	349 41.2	N56 36.6
Shaula	96 22.0	S37 06.6
Sirius	258 33.9	S16 44.4
Spica	158 31.1	S11 14.0
Suhail	222 52.3	S43 29.6
Vega	80 39.0	N38 47.6
Zuben'ubi	137 05.3	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	347 05.1	12 10
Mars	345 03.0	12 17
Jupiter	289 25.8	15 58
Saturn	141 27.5	1 52

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 1	Moonrise 2	Moonrise 3	Moonrise 4
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
1 00	179 01.0	N 4 31.1	298 16.5	5.3	S20 05.0	1.6	59.6	N 72	01 23	03 34	04 50	▬	▬	▬	05 10
01	194 01.2	32.1	312 40.8	5.3	20 06.6	1.5	59.6	N 70	02 12	03 51	04 58	▬	▬	04 40	04 31
02	209 01.4	33.0	327 05.1	5.3	20 08.1	1.3	59.6	68	02 42	04 05	05 05	02 39	03 33	03 55	04 04
03	224 01.6	. . 34.0	341 29.4	5.3	20 09.4	1.1	59.6	66	03 03	04 16	05 10	01 56	02 53	03 25	03 44
04	239 01.7	35.0	355 53.7	5.3	20 10.5	1.1	59.6	64	03 20	04 25	05 15	01 27	02 25	03 03	03 27
05	254 01.9	35.9	10 18.0	5.3	20 11.6	0.9	59.6	62	03 34	04 32	05 19	01 06	02 04	02 45	03 13
06	269 02.1	N 4 36.9	24 42.3	5.3	S20 12.5	0.7	59.6	60	03 45	04 39	05 22	00 48	01 46	02 30	03 01
07	284 02.3	37.9	39 06.6	5.3	20 13.2	0.7	59.6	N 58	03 55	04 45	05 25	00 33	01 32	02 17	02 51
08	299 02.5	38.8	53 30.9	5.3	20 13.9	0.4	59.6	56	04 03	04 50	05 28	00 21	01 19	02 06	02 42
M 09	314 02.7	. . 39.8	67 55.2	5.4	20 14.3	0.4	59.6	54	04 10	04 54	05 30	00 09	01 09	01 56	02 34
O 10	329 02.9	40.8	82 19.6	5.3	20 14.7	0.2	59.6	52	04 17	04 58	05 32	00 00	00 59	01 48	02 27
N 11	344 03.0	41.7	96 43.9	5.3	20 14.9	0.1	59.6	50	04 22	05 02	05 34	24 50	00 50	01 40	02 21
D 12	359 03.2	N 4 42.7	111 08.2	5.4	S20 15.0	0.1	59.5	45	04 34	05 09	05 39	24 32	00 32	01 23	02 07
A 13	14 03.4	43.6	125 32.6	5.3	20 14.9	0.2	59.5	N 40	04 43	05 15	05 42	24 17	00 17	01 09	01 55
Y 14	29 03.6	44.6	139 56.9	5.4	20 14.7	0.3	59.5	35	04 50	05 20	05 45	24 04	00 04	00 58	01 46
15	44 03.8	. . 45.6	154 21.3	5.4	20 14.4	0.5	59.5	30	04 56	05 24	05 48	23 53	24 48	00 48	01 37
16	59 04.0	46.5	168 45.7	5.4	20 13.9	0.6	59.5	20	05 05	05 31	05 53	23 34	24 30	00 30	01 22
17	74 04.2	47.5	183 10.1	5.4	20 13.3	0.8	59.5	N 10	05 11	05 36	05 57	23 18	24 15	00 15	01 09
18	89 04.3	N 4 48.5	197 34.5	5.5	S20 12.5	0.9	59.5	0	05 15	05 39	06 00	23 02	24 01	00 01	00 57
19	104 04.5	49.4	211 59.0	5.5	20 11.6	1.0	59.5	S 10	05 18	05 43	06 04	22 47	23 46	24 44	00 44
20	119 04.7	50.4	226 23.5	5.4	20 10.6	1.1	59.5	20	05 20	05 45	06 07	22 30	23 31	24 31	00 31
21	134 04.9	. . 51.3	240 47.9	5.5	20 09.5	1.3	59.5	30	05 20	05 47	06 11	22 12	23 13	24 16	00 16
22	149 05.1	52.3	255 12.4	5.6	20 08.2	1.5	59.5	35	05 19	05 48	06 14	22 01	23 03	24 08	00 08
23	164 05.3	53.3	269 37.0	5.5	20 06.7	1.5	59.5	40	05 18	05 49	06 16	21 48	22 51	23 58	25 05
2 00	179 05.5	N 4 54.2	284 01.5	5.6	S20 05.2	1.7	59.4	45	05 16	05 50	06 19	21 33	22 38	23 46	24 56
01	194 05.6	55.2	298 26.1	5.6	20 03.5	1.9	59.4	S 50	05 13	05 50	06 22	21 15	22 21	23 32	24 45
02	209 05.8	56.1	312 50.7	5.7	20 01.6	1.9	59.4	52	05 11	05 50	06 24	21 06	22 13	23 25	24 40
03	224 06.0	. . 57.1	327 15.4	5.7	19 59.7	2.1	59.4	54	05 09	05 50	06 26	20 57	22 04	23 17	24 34
04	239 06.2	58.1	341 40.1	5.7	19 57.6	2.2	59.4	56	05 07	05 50	06 27	20 46	21 54	23 09	24 28
05	254 06.4	4 59.0	356 04.8	5.7	19 55.4	2.4	59.4	58	05 05	05 50	06 29	20 33	21 42	23 00	24 21
06	269 06.6	N 5 00.0	10 29.5	5.8	S19 53.0	2.5	59.4	S 60	05 02	05 50	06 32	20 19	21 29	22 49	24 13
07	284 06.7	01.0	24 54.3	5.8	19 50.5	2.6	59.4								
T 08	299 06.9	01.9	39 19.1	5.8	19 47.9	2.8	59.4								
U 09	314 07.1	. . 02.9	53 43.9	5.9	19 45.1	2.9	59.4								
E 10	329 07.3	03.8	68 08.8	5.9	19 42.2	3.0	59.3								
S 11	344 07.5	04.8	82 33.7	6.0	19 39.2	3.1	59.3								
D 12	359 07.7	N 5 05.8	96 58.7	5.9	S19 36.1	3.3	59.3								
A 13	14 07.9	06.7	111 23.6	6.1	19 32.8	3.4	59.3								
Y 14	29 08.0	07.7	125 48.7	6.1	19 29.4	3.5	59.3								
15	44 08.2	. . 08.6	140 13.8	6.1	19 25.9	3.7	59.3								
16	59 08.4	09.6	154 38.9	6.1	19 22.2	3.7	59.3								
17	74 08.6	10.5	169 04.0	6.3	19 18.5	3.9	59.3								
18	89 08.8	N 5 11.5	183 29.3	6.2	S19 14.6	4.1	59.2								
19	104 09.0	12.5	197 54.5	6.3	19 10.5	4.1	59.2								
20	119 09.1	13.4	212 19.8	6.4	19 06.4	4.3	59.2								
21	134 09.3	. . 14.4	226 45.2	6.4	19 02.1	4.4	59.2								
22	149 09.5	15.3	241 10.6	6.4	18 57.7	4.5	59.2								
23	164 09.7	16.3	255 36.0	6.5	18 53.2	4.6	59.2								
3 00	179 09.9	N 5 17.3	270 01.5	6.5	S18 48.6	4.8	59.2								
01	194 10.1	18.2	284 27.0	6.6	18 43.8	4.8	59.2								
02	209 10.2	19.2	298 52.6	6.7	18 39.0	5.0	59.1								
03	224 10.4	. . 20.1	313 18.3	6.7	18 34.0	5.1	59.1								
04	239 10.6	21.1	327 44.0	6.7	18 28.9	5.2	59.1								
05	254 10.8	22.0	342 09.7	6.9	18 23.7	5.4	59.1								
06	269 11.0	N 5 23.0	356 35.6	6.8	S18 18.3	5.4	59.1								
W 07	284 11.2	24.0	11 01.4	6.9	18 12.9	5.6	59.1								
E 08	299 11.3	24.9	25 27.3	7.0	18 07.3	5.6	59.1								
D 09	314 11.5	. . 25.9	39 53.3	7.0	18 01.7	5.8	59.1								
N 10	329 11.7	26.8	54 19.3	7.1	17 55.9	5.9	59.0								
E 11	344 11.9	27.8	68 45.4	7.2	17 50.0	6.0	59.0								
S 12	359 12.1	N 5 28.7	83 11.6	7.2	S17 44.0	6.1	59.0								
D 13	14 12.3	29.7	97 37.8	7.2	17 37.9	6.3	59.0								
A 14	29 12.4	30.6	112 04.0	7.4	17 31.6	6.3	59.0								
Y 15	44 12.6	. . 31.6	126 30.4	7.3	17 25.3	6.4	59.0								
16	59 12.8	32.6	140 56.7	7.5	17 18.9	6.5	59.0								
17	74 13.0	33.5	155 23.2	7.5	17 12.4	6.7	58.9								
18	89 13.2	N 5 34.5	169 49.7	7.5	S17 05.7	6.7	58.9								
19	104 13.3	35.4	184 16.2	7.6	16 59.0	6.9	58.9								
20	119 13.5	36.4	198 42.8	7.7	16 52.1	6.9	58.9								
21	134 13.7	. . 37.3	213 09.5	7.8	16 45.2	7.0	58.9								
22	149 13.9	38.3	227 36.3	7.8	16 38.2	7.2	58.9								
23	164 14.1	39.2	242 03.1	7.8	S16 31.0	7.2	58.9								
	SD 16.0	d 1.0	SD	16.2		16.2		16.1							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 1	Moonset 2	Moonset 3	Moonset 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 20	20 37	22 58	▬	▬	▬	09 24
N 70	19 12	20 19	22 02	▬	▬	07 58	10 02
68	19 05	20 05	21 30	05 54	07 04	08 42	10 28
66	18 59	19 54	21 07	06 37	07 43	09 11	10 48
64	18 54	19 44	20 50	07 05	08 11	09 33	11 04
62	18 50	19 37	20 36	07 27	08 32	09 51	11 17
60	18 47	19 30	20 24	07 45	08 49	10 05	11 28
N 58	18 43	19 24	20 14	08 00	09 03	10 17	11 37
56	18 40	19 19	20 06	08 13	09 16	10 28	11 46
54	18 38	19 14	19 58	08 24	09 27	10 38	11 53
52	18 36	19 10	19 52	08 33	09 36	10 46	12 00
50	18 34	19 07	19 46	08 42	09 45	10 53	12 06
45	18 29	18 59	19 34	09 01	10 03	11 09	12 19
N 40	18 25	18 53	19 25	09 16	10 17	11 22	12 29
35	18 22	18 48	19 18	09 29	10 30	11 34	12 38
30	18 19	18 43	19 12	09 40	10 41	11 43	12 46
20	18 15	18 37	19 03	09 59	10 59	12 00	13 00
N 10	18 10	18 32	18 56	10 16	11 15	12 14	13 12
0	18 07	18 28	18 52	10 31	11 30	12 28	13 23
S 10	18 03	18 24	18 49	10 47	11 45	12 41	13 33
20	17 59	18 21	18 47	11 03	12 01	12 55	13 45
30	17 55	18 19	18 47	11 22	12 19	13 11	13 58
35	17 53	18 18	18 47	11 33	12 30	13 21	14 06
40	17 50	18 17	18 49	11 46	12 42	13 31	14 14
45	17 47	18 17	18 51	12 01	12 57	13 44	14 24
S 50	17 44	18 16	18 53	12 19	13 14	13 59	14 36
52	17 42	18 16	18 55	12 28	13 22	14 06	14 42
54	17 40	18 16	18 57	12 38	13 31	14 14	14 48
56	17 39	18 16	18 59	12 49	13 41	14 23	14 55
58	17 36	18 15	19 01	13 01	13 53	14 33	15 03
S 60	17 34	18 15	19 04	13 16	14 07	14 44	15 11

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
1	03 56	03 47	12 04	04 17	16 47	21	69
2	03 39	03 30	12 03	05 16	17 45	22	58
3	03 21	03 12	12 03	06 14	18 42	23	47

UT	ARIES	VENUS −4.0		MARS +1.2		JUPITER −2.1		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
4 00	192 28.5	177 16.7	N 5 09.8	176 06.9	N 6 22.6	121 32.7	N21 53.5	334 03.3	S12 16.4
01	207 31.0	192 16.4	11.0	191 07.6	23.3	136 34.8	53.6	349 06.0	16.3
02	222 33.5	207 16.0	12.2	206 08.3	24.1	151 36.8	53.7	4 08.6	16.3
03	237 35.9	222 15.6	. . 13.5	221 09.0	. . 24.8	166 38.8	. . 53.7	19 11.2	. . 16.2
04	252 38.4	237 15.2	14.7	236 09.7	25.6	181 40.8	53.8	34 13.8	16.2
05	267 40.9	252 14.8	15.9	251 10.4	26.3	196 42.8	53.8	49 16.4	16.1
06	282 43.3	267 14.4	N 5 17.2	266 11.1	N 6 27.1	211 44.8	N21 53.9	64 19.1	S12 16.1
07	297 45.8	282 14.0	18.4	281 11.8	27.8	226 46.8	54.0	79 21.7	16.0
08	312 48.3	297 13.6	19.7	296 12.5	28.6	241 48.8	54.0	94 24.3	16.0
09	327 50.7	312 13.2	. . 20.9	311 13.2	. . 29.3	256 50.8	. . 54.1	109 26.9	. . 15.9
10	342 53.2	327 12.8	22.1	326 13.9	30.1	271 52.8	54.1	124 29.5	15.8
11	357 55.6	342 12.4	23.4	341 14.6	30.8	286 54.8	54.2	139 32.2	15.8
12	12 58.1	357 12.0	N 5 24.6	356 15.3	N 6 31.6	301 56.8	N21 54.3	154 34.8	S12 15.7
13	28 00.6	12 11.6	25.8	11 16.0	32.3	316 58.9	54.3	169 37.4	15.7
14	43 03.0	27 11.2	27.1	26 16.7	33.1	332 00.9	54.4	184 40.0	15.6
15	58 05.5	42 10.9	. . 28.3	41 17.4	. . 33.8	347 02.9	. . 54.5	199 42.6	. . 15.6
16	73 08.0	57 10.5	29.6	56 18.1	34.6	2 04.9	54.5	214 45.3	15.5
17	88 10.4	72 10.1	30.8	71 18.8	35.3	17 06.9	54.6	229 47.9	15.5
18	103 12.9	87 09.7	N 5 32.0	86 19.5	N 6 36.1	32 08.9	N21 54.6	244 50.5	S12 15.4
19	118 15.4	102 09.3	33.3	101 20.2	36.8	47 10.9	54.7	259 53.1	15.4
20	133 17.8	117 08.9	34.5	116 20.9	37.6	62 12.9	54.8	274 55.7	15.3
21	148 20.3	132 08.5	. . 35.7	131 21.6	. . 38.3	77 14.9	. . 54.8	289 58.4	. . 15.2
22	163 22.7	147 08.1	37.0	146 22.3	39.1	92 16.9	54.9	305 01.0	15.2
23	178 25.2	162 07.7	38.2	161 23.0	39.8	107 18.9	55.0	320 03.6	15.1
5 00	193 27.7	177 07.3	N 5 39.4	176 23.7	N 6 40.6	122 20.9	N21 55.0	335 06.2	S12 15.1
01	208 30.1	192 06.9	40.7	191 24.4	41.3	137 22.9	55.1	350 08.8	15.0
02	223 32.6	207 06.5	41.9	206 25.1	42.0	152 24.9	55.1	5 11.5	15.0
03	238 35.1	222 06.1	. . 43.1	221 25.8	. . 42.8	167 26.9	. . 55.2	20 14.1	. . 14.9
04	253 37.5	237 05.7	44.4	236 26.5	43.5	182 28.9	55.3	35 16.7	14.9
05	268 40.0	252 05.3	45.6	251 27.2	44.3	197 30.9	55.3	50 19.3	14.8
06	283 42.5	267 04.9	N 5 46.8	266 27.9	N 6 45.0	212 33.0	N21 55.4	65 22.0	S12 14.7
07	298 44.9	282 04.5	48.1	281 28.6	45.8	227 35.0	55.4	80 24.6	14.7
08	313 47.4	297 04.1	49.3	296 29.3	46.5	242 37.0	55.5	95 27.2	14.6
09	328 49.9	312 03.7	. . 50.5	311 30.0	. . 47.3	257 39.0	. . 55.6	110 29.8	. . 14.6
10	343 52.3	327 03.3	51.8	326 30.7	48.0	272 41.0	55.6	125 32.4	14.5
11	358 54.8	342 02.9	53.0	341 31.4	48.8	287 43.0	55.7	140 35.1	14.5
12	13 57.2	357 02.6	N 5 54.2	356 32.1	N 6 49.5	302 45.0	N21 55.8	155 37.7	S12 14.4
13	28 59.7	12 02.2	55.5	11 32.8	50.3	317 47.0	55.8	170 40.3	14.4
14	44 02.2	27 01.8	56.7	26 33.5	51.0	332 49.0	55.9	185 42.9	14.3
15	59 04.6	42 01.4	. . 57.9	41 34.2	. . 51.8	347 51.0	. . 55.9	200 45.6	. . 14.2
16	74 07.1	57 01.0	S 59.1	56 34.9	52.5	2 53.0	56.0	215 48.2	14.2
17	89 09.6	72 00.6	S 00.4	71 35.6	53.2	17 55.0	56.1	230 50.8	14.1
18	104 12.0	87 00.2	N 6 01.6	86 36.3	N 6 54.0	32 57.0	N21 56.1	245 53.4	S12 14.1
19	119 14.5	101 59.8	02.8	101 37.0	54.7	47 59.0	56.2	260 56.0	14.0
20	134 17.0	116 59.4	04.1	116 37.7	55.5	63 01.0	56.3	275 58.7	14.0
21	149 19.4	131 59.0	. . 05.3	131 38.4	. . 56.2	78 03.0	. . 56.3	291 01.3	. . 13.9
22	164 21.9	146 58.6	06.5	146 39.1	57.0	93 05.0	56.4	306 03.9	13.9
23	179 24.3	161 58.2	07.8	161 39.7	57.7	108 07.0	56.4	321 06.5	13.8
6 00	194 26.8	176 57.8	N 6 09.0	176 40.4	N 6 58.5	123 09.0	N21 56.5	336 09.2	S12 13.7
01	209 29.3	191 57.4	10.2	191 41.1	59.2	138 11.0	56.6	351 11.8	13.7
02	224 31.7	206 57.0	11.4	206 41.8	6 59.9	153 13.0	56.6	6 14.4	13.6
03	239 34.2	221 56.6	. . 12.7	221 42.5	7 00.7	168 15.0	. . 56.7	21 17.0	. . 13.6
04	254 36.7	236 56.2	13.9	236 43.2	01.4	183 17.0	56.7	36 19.7	13.5
05	269 39.1	251 55.8	15.1	251 43.9	02.2	198 19.0	56.8	51 22.3	13.5
06	284 41.6	266 55.4	N 6 16.3	266 44.6	N 7 02.9	213 21.0	N21 56.9	66 24.9	S12 13.4
07	299 44.1	281 55.0	17.6	281 45.3	03.7	228 23.0	56.9	81 27.5	13.4
08	314 46.5	296 54.6	18.8	296 46.0	04.4	243 25.0	57.0	96 30.1	13.3
09	329 49.0	311 54.2	. . 20.0	311 46.7	. . 05.1	258 27.0	. . 57.1	111 32.8	. . 13.2
10	344 51.5	326 53.8	21.3	326 47.4	05.9	273 29.0	57.1	126 35.4	13.2
11	359 53.9	341 53.4	22.5	341 48.1	06.6	288 31.0	57.2	141 38.0	13.1
12	14 56.4	356 53.0	N 6 23.7	356 48.8	N 7 07.4	303 33.0	N21 57.2	156 40.6	S12 13.1
13	29 58.8	11 52.6	24.9	11 49.5	08.1	318 35.0	57.3	171 43.3	13.0
14	45 01.3	26 52.2	26.2	26 50.2	08.9	333 37.0	57.4	186 45.9	13.0
15	60 03.8	41 51.8	. . 27.4	41 50.9	. . 09.6	348 39.0	. . 57.4	201 48.5	. . 12.9
16	75 06.2	56 51.4	28.6	56 51.6	10.3	3 41.0	57.5	216 51.1	12.9
17	90 08.7	71 51.0	29.8	71 52.3	11.1	18 43.0	57.6	231 53.8	12.8
18	105 11.2	86 50.6	N 6 31.1	86 53.0	N 7 11.8	33 45.0	N21 57.6	246 56.4	S12 12.7
19	120 13.6	101 50.1	32.3	101 53.7	12.6	48 47.0	57.7	261 59.0	12.7
20	135 16.1	116 49.7	33.5	116 54.4	13.3	63 49.0	57.7	277 01.6	12.6
21	150 18.6	131 49.3	. . 34.7	131 55.1	. . 14.1	78 51.0	. . 57.8	292 04.3	. . 12.6
22	165 21.0	146 48.9	36.0	146 55.8	14.8	93 53.0	57.9	307 06.9	12.5
23	180 23.5	161 48.5	37.2	161 56.5	15.5	108 54.9	57.9	322 09.5	12.5
Mer. Pass.	h m 11 04.3	v −0.4	d 1.2	v 0.7	d 0.7	v 2.0	d 0.1	v 2.6	d 0.1

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.3
Achernar	335 27.5	S57 10.3
Acrux	173 08.7	S63 10.5
Adhara	255 12.6	S28 59.8
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.3	N55 53.2
Alkaid	152 58.5	N49 14.7
Al Na'ir	27 44.2	S46 53.6
Alnilam	275 46.6	S 1 11.9
Alphard	217 56.0	S 8 43.3
Alphecca	126 10.8	N26 40.1
Alpheratz	357 44.0	N29 09.7
Altair	62 08.4	N 8 54.2
Ankaa	353 16.3	S42 14.0
Antares	112 26.2	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.8	S69 02.8
Avior	234 17.8	S59 33.6
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.5	N 7 24.3
Canopus	263 56.3	S52 42.6
Capella	280 34.8	N46 00.6
Deneb	49 31.7	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.4	S17 54.9
Dubhe	193 51.3	N61 40.7
Elnath	278 12.9	N28 37.0
Eltanin	90 46.0	N51 29.0
Enif	33 47.4	N 9 56.1
Fomalhaut	15 24.4	S29 33.0
Gacrux	172 00.4	S57 11.4
Gienah	175 52.1	S17 37.2
Hadar	148 47.4	S60 26.2
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.9	S34 22.5
Kochab	137 19.0	N74 05.9
Markab	13 38.7	N15 16.5
Menkar	314 15.5	N 4 08.3
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.2	S69 46.7
Mirfak	308 40.9	N49 54.5
Nunki	75 58.5	S26 16.6
Peacock	53 19.7	S56 41.2
Pollux	243 27.8	N27 59.5
Procyon	244 59.8	N 5 11.2
Rasalhague	96 06.4	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.3	S 8 11.5
Rigil Kent.	139 51.3	S60 53.3
Sabik	102 12.5	S15 44.4
Schedar	349 41.2	N56 36.6
Shaula	96 21.9	S37 06.6
Sirius	258 33.9	S16 44.4
Spica	158 31.1	S11 14.0
Suhail	222 52.3	S43 29.6
Vega	80 39.0	N38 47.6
Zuben'ubi	137 05.3	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	343 39.6	12 12
Mars	342 56.0	12 14
Jupiter	288 53.2	15 48
Saturn	141 38.6	1 39

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		4	5	6	7
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
4 00	179 14.3	N 5 40.2	256 29.9	7.9	S16 23.8	7.4	58.8	N 72	////	03 15	04 34	05 10	04 47	04 32	04 21
01	194 14.4	41.1	270 56.8	8.0	16 16.4	7.4	58.8	N 70	01 44	03 35	04 44	04 31	04 25	04 20	04 15
02	209 14.6	42.1	285 23.8	8.1	16 09.0	7.5	58.8	68	02 22	03 50	04 52	04 04	04 08	04 10	04 11
03	224 14.8	. . 43.1	299 50.9	8.1	16 01.5	7.6	58.8	66	02 47	04 03	04 58	03 44	03 55	04 02	04 07
04	239 15.0	44.0	314 18.0	8.2	15 53.9	7.7	58.8	64	03 06	04 13	05 04	03 27	03 43	03 55	04 04
05	254 15.2	45.0	328 45.2	8.2	15 46.2	7.8	58.8	62	03 22	04 22	05 09	03 13	03 33	03 49	04 01
06	269 15.3	N 5 45.9	343 12.4	8.3	S15 38.4	7.9	58.7	60	03 34	04 29	05 13	03 01	03 25	03 43	03 59
07	284 15.5	46.9	357 39.7	8.4	15 30.5	8.0	58.7	N 58	03 45	04 36	05 17	02 51	03 17	03 38	03 57
08	299 15.7	47.8	12 07.1	8.4	15 22.5	8.0	58.7	56	03 54	04 41	05 20	02 42	03 11	03 34	03 55
09	314 15.9	. . 48.8	26 34.5	8.5	15 14.5	8.2	58.7	54	04 02	04 46	05 23	02 34	03 05	03 30	03 53
10	329 16.1	49.7	41 02.0	8.5	15 06.3	8.2	58.7	52	04 09	04 51	05 26	02 27	03 00	03 27	03 51
11	344 16.2	50.7	55 29.5	8.6	14 58.1	8.3	58.7	50	04 15	04 55	05 28	02 21	02 55	03 24	03 50
12	359 16.4	N 5 51.6	69 57.1	8.7	S14 49.8	8.4	58.7	45	04 28	05 03	05 33	02 07	02 44	03 17	03 47
13	14 16.6	52.6	84 24.8	8.7	14 41.4	8.5	58.6	N 40	04 38	05 10	05 38	01 55	02 35	03 11	03 44
14	29 16.8	53.5	98 52.5	8.8	14 32.9	8.6	58.6	35	04 46	05 16	05 41	01 46	02 28	03 06	03 42
15	44 17.0	. . 54.5	113 20.3	8.9	14 24.3	8.6	58.6	30	04 52	05 20	05 45	01 37	02 21	03 02	03 40
16	59 17.2	55.4	127 48.2	8.9	14 15.7	8.8	58.6	20	05 02	05 28	05 50	01 22	02 10	02 54	03 36
17	74 17.3	56.4	142 16.1	9.0	14 06.9	8.8	58.6	N 10	05 09	05 34	05 55	01 09	02 00	02 48	03 33
18	89 17.5	N 5 57.3	156 44.1	9.0	S13 58.1	8.8	58.6	0	05 14	05 39	05 59	00 57	01 50	02 41	03 30
19	104 17.7	58.3	171 12.1	9.1	13 49.3	9.0	58.5	S 10	05 18	05 43	06 04	00 44	01 41	02 35	03 27
20	119 17.9	5 59.2	185 40.2	9.2	13 40.3	9.0	58.5	20	05 20	05 46	06 08	00 31	01 31	02 28	03 24
21	134 18.1	6 00.2	200 08.4	9.2	13 31.3	9.1	58.5	30	05 21	05 49	06 13	00 16	01 19	02 20	03 21
22	149 18.2	01.1	214 36.6	9.3	13 22.2	9.2	58.5	35	05 21	05 51	06 16	00 08	01 12	02 16	03 19
23	164 18.4	02.1	229 04.9	9.4	13 13.0	9.2	58.5	40	05 21	05 52	06 19	25 05	01 05	02 11	03 16
5 00	179 18.6	N 6 03.0	243 33.3	9.4	S13 03.8	9.3	58.5	45	05 19	05 53	06 23	24 56	00 56	02 05	03 14
01	194 18.8	04.0	258 01.7	9.4	12 54.5	9.4	58.4	S 50	05 17	05 55	06 27	24 45	00 45	01 58	03 10
02	209 19.0	04.9	272 30.1	9.6	12 45.1	9.4	58.4	52	05 16	05 55	06 29	24 40	00 40	01 55	03 09
03	224 19.1	. . 05.9	286 58.7	9.6	12 35.7	9.6	58.4	54	05 15	05 56	06 31	24 34	00 34	01 51	03 07
04	239 19.3	06.8	301 27.3	9.6	12 26.1	9.5	58.4	56	05 13	05 56	06 33	24 28	00 28	01 47	03 06
05	254 19.5	07.8	315 55.9	9.7	12 16.6	9.7	58.4	58	05 11	05 57	06 36	24 21	00 21	01 43	03 04
06	269 19.7	N 6 08.7	330 24.6	9.8	S12 06.9	9.7	58.4	S 60	05 09	05 57	06 39	24 13	00 13	01 38	03 01
07	284 19.8	09.7	344 53.4	9.8	11 57.2	9.7	58.3								
08	299 20.0	10.6	359 22.2	9.9	11 47.5	9.9	58.3								
09	314 20.2	. . 11.6	13 51.1	9.9	11 37.6	9.8	58.3								
10	329 20.4	12.5	28 20.0	10.0	11 27.8	10.0	58.3								
11	344 20.6	13.5	42 49.0	10.1	11 17.8	10.0	58.3								
12	359 20.7	N 6 14.4	57 18.1	10.1	S11 07.8	10.0	58.2								
13	14 20.9	15.4	71 47.2	10.1	10 57.8	10.1	58.2								
14	29 21.1	16.3	86 16.3	10.3	10 47.7	10.2	58.2								
15	44 21.3	. . 17.3	100 45.6	10.2	10 37.5	10.2	58.2								
16	59 21.5	18.2	115 14.8	10.4	10 27.3	10.3	58.2								
17	74 21.6	19.1	129 44.2	10.3	10 17.0	10.3	58.2								
18	89 21.8	N 6 20.1	144 13.5	10.5	S10 06.7	10.4	58.1								
19	104 22.0	21.0	158 43.0	10.5	9 56.3	10.4	58.1								
20	119 22.2	22.0	173 12.5	10.5	9 45.9	10.5	58.1								
21	134 22.3	. . 22.9	187 42.0	10.6	9 35.4	10.5	58.1								
22	149 22.5	23.9	202 11.6	10.6	9 24.9	10.5	58.1								
23	164 22.7	24.8	216 41.2	10.7	9 14.4	10.6	58.1								
6 00	179 22.9	N 6 25.8	231 10.9	10.8	S 9 03.8	10.6	58.0								
01	194 23.1	26.7	245 40.7	10.8	8 53.2	10.7	58.0								
02	209 23.2	27.7	260 10.5	10.8	8 42.5	10.7	58.0								
03	224 23.4	. . 28.6	274 40.3	10.9	8 31.8	10.8	58.0								
04	239 23.6	29.5	289 10.2	11.0	8 21.0	10.8	58.0								
05	254 23.8	30.5	303 40.2	10.9	8 10.2	10.8	57.9								
06	269 23.9	N 6 31.4	318 10.1	11.1	S 7 59.4	10.9	57.9								
07	284 24.1	32.4	332 40.2	11.1	7 48.5	10.9	57.9								
08	299 24.3	33.3	347 10.3	11.1	7 37.6	11.0	57.9								
09	314 24.5	. . 34.3	1 40.4	11.2	7 26.6	10.9	57.9								
10	329 24.6	35.2	16 10.6	11.2	7 15.7	11.0	57.8								
11	344 24.8	36.2	30 40.8	11.2	7 04.7	11.1	57.8								
12	359 25.0	N 6 37.1	45 11.0	11.3	S 6 53.6	11.0	57.8								
13	14 25.2	38.0	59 41.3	11.4	6 42.6	11.1	57.8								
14	29 25.4	39.0	74 11.7	11.4	6 31.5	11.1	57.8								
15	44 25.5	. . 39.9	88 42.1	11.4	6 20.4	11.2	57.8								
16	59 25.7	40.9	103 12.5	11.5	6 09.2	11.2	57.7								
17	74 25.9	41.8	117 43.0	11.5	5 58.0	11.1	57.7								
18	89 26.1	N 6 42.7	132 13.5	11.5	S 5 46.9	11.3	57.7								
19	104 26.2	43.7	146 44.0	11.6	5 35.6	11.2	57.7								
20	119 26.4	44.6	161 14.6	11.7	5 24.4	11.3	57.7								
21	134 26.6	. . 45.6	175 45.3	11.6	5 13.1	11.2	57.6								
22	149 26.8	46.5	190 15.9	11.7	5 01.9	11.3	57.6								
23	164 26.9	47.5	204 46.6	11.8	S 4 50.6	11.4	57.6								
	SD 16.0	d 0.9	SD	16.0		15.9	15.8								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	4	5	6	7
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 34	20 55	////	09 24	11 38	13 37	15 30
N 70	19 24	20 34	22 30	10 02	11 58	13 47	15 33
68	19 16	20 18	21 49	10 28	12 13	13 56	15 35
66	19 09	20 05	21 22	10 48	12 26	14 02	15 37
64	19 03	19 54	21 02	11 04	12 36	14 08	15 38
62	18 58	19 45	20 46	11 17	12 45	14 13	15 39
60	18 54	19 38	20 33	11 28	12 53	14 17	15 41
N 58	18 50	19 31	20 23	11 37	12 59	14 21	15 42
56	18 47	19 25	20 13	11 46	13 05	14 24	15 42
54	18 44	19 20	20 05	11 53	13 11	14 27	15 43
52	18 41	19 16	19 58	12 00	13 15	14 30	15 44
50	18 38	19 11	19 52	12 06	13 20	14 33	15 45
45	18 33	19 03	19 39	12 19	13 29	14 38	15 46
N 40	18 28	18 56	19 29	12 29	13 36	14 42	15 47
35	18 25	18 50	19 20	12 38	13 43	14 46	15 48
30	18 21	18 45	19 14	12 46	13 49	14 49	15 49
20	18 15	18 38	19 04	13 00	13 58	14 55	15 51
N 10	18 10	18 32	18 56	13 12	14 07	15 00	15 52
0	18 06	18 27	18 51	13 23	14 15	15 05	15 53
S 10	18 01	18 23	18 47	13 33	14 23	15 09	15 54
20	17 57	18 19	18 45	13 45	14 31	15 14	15 55
30	17 52	18 16	18 43	13 58	14 41	15 20	15 57
35	17 49	18 14	18 43	14 06	14 46	15 23	15 58
40	17 46	18 13	18 44	14 14	14 52	15 26	15 58
45	17 42	18 11	18 45	14 24	14 59	15 31	15 59
S 50	17 37	18 10	18 47	14 36	15 08	15 35	16 01
52	17 35	18 09	18 48	14 42	15 12	15 38	16 01
54	17 33	18 09	18 49	14 48	15 16	15 40	16 02
56	17 31	18 08	18 51	14 55	15 21	15 43	16 02
58	17 28	18 07	18 53	15 03	15 26	15 46	16 03
S 60	17 25	18 07	18 55	15 11	15 32	15 49	16 04

Day	SUN		MOON			
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00h	12h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
4	03 03	02 55	12 03	07 10	19 36	24	36
5	02 46	02 37	12 03	08 03	20 28	25	25
6	02 29	02 20	12 02	08 53	21 18	26	16

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.1		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
7 00	195 26.0	176 48.1	N 6 38.4	176 57.2	N 7 16.3	123 56.9	N21 58.0	337 12.1	S12 12.4
01	210 28.4	191 47.7	39.6	191 57.9	17.0	138 58.9	58.0	352 14.8	12.3
02	225 30.9	206 47.3	40.8	206 58.6	17.8	154 00.9	58.1	7 17.4	12.3
03	240 33.3	221 46.9	. . 42.1	221 59.3	. . 18.5	169 02.9	. . 58.2	22 20.0	. . 12.2
04	255 35.8	236 46.5	43.3	237 00.0	19.2	184 04.9	58.2	37 22.6	12.2
05	270 38.3	251 46.1	44.5	252 00.7	20.0	199 06.9	58.3	52 25.3	12.1
06	285 40.7	266 45.7	N 6 45.7	267 01.4	N 7 20.7	214 08.9	N21 58.4	67 27.9	S12 12.1
07	300 43.2	281 45.3	47.0	282 02.1	21.5	229 10.9	58.4	82 30.5	12.0
08	315 45.7	296 44.9	48.2	297 02.8	22.2	244 12.9	58.5	97 33.2	12.0
S 09	330 48.1	311 44.5	. . 49.4	312 03.5	. . 22.9	259 14.9	. . 58.5	112 35.8	. . 11.9
U 10	345 50.6	326 44.1	50.6	327 04.2	23.7	274 16.9	58.6	127 38.4	11.8
N 11	0 53.1	341 43.7	51.8	342 04.9	24.4	289 18.9	58.7	142 41.0	11.8
D 12	15 55.5	356 43.3	N 6 53.1	357 05.6	N 7 25.2	304 20.9	N21 58.7	157 43.7	S12 11.7
A 13	30 58.0	11 42.9	54.3	12 06.3	25.9	319 22.9	58.8	172 46.3	11.7
Y 14	46 00.4	26 42.5	55.5	27 07.0	26.6	334 24.9	58.8	187 48.9	11.6
15	61 02.9	41 42.0	. . 56.7	42 07.7	. . 27.4	349 26.9	. . 58.9	202 51.5	. . 11.6
16	76 05.4	56 41.6	57.9	57 08.4	28.1	4 28.9	59.0	217 54.2	11.5
17	91 07.8	71 41.2	6 59.1	72 09.1	28.8	19 30.8	59.0	232 56.8	11.4
18	106 10.3	86 40.8	N 7 00.4	87 09.8	N 7 29.6	34 32.8	N21 59.1	247 59.4	S12 11.4
19	121 12.8	101 40.4	01.6	102 10.5	30.3	49 34.8	59.2	263 02.0	11.3
20	136 15.2	116 40.0	02.8	117 11.2	31.1	64 36.8	59.2	278 04.7	11.3
21	151 17.7	131 39.6	. . 04.0	132 11.8	. . 31.8	79 38.8	. . 59.3	293 07.3	. . 11.2
22	166 20.2	146 39.2	05.2	147 12.5	32.5	94 40.8	59.3	308 09.9	11.2
23	181 22.6	161 38.8	06.5	162 13.2	33.3	109 42.8	59.4	323 12.6	11.1
8 00	196 25.1	176 38.4	N 7 07.7	177 13.9	N 7 34.0	124 44.8	N21 59.5	338 15.2	S12 11.0
01	211 27.6	191 38.0	08.9	192 14.6	34.7	139 46.8	59.5	353 17.8	11.0
02	226 30.0	206 37.6	10.1	207 15.3	35.5	154 48.8	59.6	8 20.4	10.9
03	241 32.5	221 37.1	. . 11.3	222 16.0	. . 36.2	169 50.8	. . 59.7	23 23.1	. . 10.9
04	256 34.9	236 36.7	12.5	237 16.7	37.0	184 52.8	59.7	38 25.7	10.8
05	271 37.4	251 36.3	13.7	252 17.4	37.7	199 54.7	59.8	53 28.3	10.8
06	286 39.9	266 35.9	N 7 15.0	267 18.1	N 7 38.4	214 56.7	N21 59.8	68 30.9	S12 10.7
07	301 42.3	281 35.5	16.2	282 18.8	39.2	229 58.7	21 59.9	83 33.6	10.7
08	316 44.8	296 35.1	17.4	297 19.5	39.9	245 00.7	22 00.0	98 36.2	10.6
M 09	331 47.3	311 34.7	. . 18.6	312 20.2	. . 40.6	260 02.7	. . 00.0	113 38.8	. . 10.5
O 10	346 49.7	326 34.3	19.8	327 20.9	41.4	275 04.7	00.1	128 41.5	10.5
N 11	1 52.2	341 33.9	21.0	342 21.6	42.1	290 06.7	00.1	143 44.1	10.4
D 12	16 54.7	356 33.4	N 7 22.2	357 22.3	N 7 42.8	305 08.7	N22 00.2	158 46.7	S12 10.4
A 13	31 57.1	11 33.0	23.5	12 23.0	43.6	320 10.7	00.3	173 49.3	10.3
Y 14	46 59.6	26 32.6	24.7	27 23.7	44.3	335 12.6	00.3	188 52.0	10.3
15	62 02.0	41 32.2	. . 25.9	42 24.4	. . 45.1	350 14.6	. . 00.4	203 54.6	. . 10.2
16	77 04.5	56 31.8	27.1	57 25.1	45.8	5 16.6	00.5	218 57.2	10.1
17	92 07.0	71 31.4	28.3	72 25.8	46.5	20 18.6	00.5	233 59.9	10.1
18	107 09.4	86 31.0	N 7 29.5	87 26.5	N 7 47.3	35 20.6	N22 00.6	249 02.5	S12 10.0
19	122 11.9	101 30.6	30.7	102 27.2	48.0	50 22.6	00.6	264 05.1	10.0
20	137 14.4	116 30.1	31.9	117 27.9	48.7	65 24.6	00.7	279 07.7	09.9
21	152 16.8	131 29.7	. . 33.2	132 28.6	. . 49.5	80 26.6	. . 00.8	294 10.4	. . 09.9
22	167 19.3	146 29.3	34.4	147 29.3	50.2	95 28.6	00.8	309 13.0	09.8
23	182 21.8	161 28.9	35.6	162 30.0	50.9	110 30.5	00.9	324 15.6	09.7
9 00	197 24.2	176 28.5	N 7 36.8	177 30.7	N 7 51.7	125 32.5	N22 00.9	339 18.3	S12 09.7
01	212 26.7	191 28.1	38.0	192 31.4	52.4	140 34.5	01.0	354 20.9	09.6
02	227 29.2	206 27.7	39.2	207 32.1	53.1	155 36.5	01.1	9 23.5	09.6
03	242 31.6	221 27.2	. . 40.4	222 32.7	. . 53.9	170 38.5	. . 01.1	24 26.1	. . 09.5
04	257 34.1	236 26.8	41.6	237 33.4	54.6	185 40.5	01.2	39 28.8	09.5
05	272 36.5	251 26.4	42.8	252 34.1	55.3	200 42.5	01.3	54 31.4	09.4
06	287 39.0	266 26.0	N 7 44.0	267 34.8	N 7 56.1	215 44.4	N22 01.3	69 34.0	S12 09.3
07	302 41.5	281 25.6	45.2	282 35.5	56.8	230 46.4	01.4	84 36.7	09.3
T 08	317 43.9	296 25.2	46.4	297 36.2	57.5	245 48.4	01.4	99 39.3	09.2
U 09	332 46.4	311 24.8	. . 47.7	312 36.9	. . 58.3	260 50.4	. . 01.5	114 41.9	. . 09.2
E 10	347 48.9	326 24.3	48.9	327 37.6	59.0	275 52.4	01.6	129 44.6	09.1
S 11	2 51.3	341 23.9	50.1	342 38.3	7 59.7	290 54.4	01.6	144 47.2	09.1
D 12	17 53.8	356 23.5	N 7 51.3	357 39.0	N 8 00.5	305 56.4	N22 01.7	159 49.8	S12 09.0
A 13	32 56.3	11 23.1	52.5	12 39.7	01.2	320 58.3	01.7	174 52.4	08.9
Y 14	47 58.7	26 22.7	53.7	27 40.4	01.9	336 00.3	01.8	189 55.1	08.9
15	63 01.2	41 22.2	. . 54.9	42 41.1	. . 02.6	351 02.3	. . 01.9	204 57.7	. . 08.8
16	78 03.6	56 21.8	56.1	57 41.8	03.4	6 04.3	01.9	220 00.3	08.8
17	93 06.1	71 21.4	57.3	72 42.5	04.1	21 06.3	02.0	235 03.0	08.7
18	108 08.6	86 21.0	N 7 58.5	87 43.2	N 8 04.8	36 08.3	N22 02.1	250 05.6	S12 08.6
19	123 11.0	101 20.6	7 59.7	102 43.9	05.6	51 10.2	02.1	265 08.2	08.6
20	138 13.5	116 20.2	8 00.9	117 44.6	06.3	66 12.2	02.2	280 10.9	08.5
21	153 16.0	131 19.7	. . 02.1	132 45.3	. . 07.0	81 14.2	. . 02.2	295 13.5	. . 08.5
22	168 18.4	146 19.3	03.3	147 46.0	07.8	96 16.2	02.3	310 16.1	08.4
23	183 20.9	161 18.9	04.5	162 46.7	08.5	111 18.2	02.4	325 18.8	08.4
	h m								
Mer. Pass.	10 52.5	v −0.4	d 1.2	v 0.7	d 0.7	v 2.0	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.3
Achernar	335 27.5	S57 10.2
Acrux	173 08.7	S63 10.5
Adhara	255 12.7	S28 59.8
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.3	N55 53.2
Alkaid	152 58.5	N49 14.7
Al Na'ir	27 44.2	S46 53.6
Alnilam	275 46.6	S 1 11.9
Alphard	217 56.0	S 8 43.3
Alphecca	126 10.8	N26 40.1
Alpheratz	357 44.0	N29 09.7
Altair	62 08.4	N 8 54.2
Ankaa	353 16.3	S42 14.0
Antares	112 26.2	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.8	S69 02.8
Avior	234 17.9	S59 33.6
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.3	S52 42.6
Capella	280 34.9	N46 00.6
Deneb	49 31.7	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.9
Dubhe	193 51.3	N61 40.7
Elnath	278 12.9	N28 37.0
Eltanin	90 46.0	N51 29.0
Enif	33 47.4	N 9 56.1
Fomalhaut	15 24.4	S29 33.0
Gacrux	172 00.4	S57 11.4
Gienah	175 52.1	S17 37.2
Hadar	148 47.4	S60 26.2
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.9	S34 22.5
Kochab	137 19.0	N74 05.9
Markab	13 38.7	N15 16.5
Menkar	314 15.5	N 4 08.3
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.2	S69 46.7
Mirfak	308 40.9	N49 54.5
Nunki	75 58.4	S26 16.6
Peacock	53 19.6	S56 41.2
Pollux	243 27.9	N27 59.5
Procyon	244 59.8	N 5 11.2
Rasalhague	96 06.4	N12 33.0
Regulus	207 43.4	N11 53.9
Rigel	281 12.3	S 8 11.5
Rigil Kent.	139 51.2	S60 53.3
Sabik	102 12.5	S15 44.4
Schedar	349 41.2	N56 36.5
Shaula	96 21.9	S37 06.6
Sirius	258 33.9	S16 44.4
Spica	158 31.1	S11 14.0
Suhail	222 52.3	S43 29.6
Vega	80 39.0	N38 47.6
Zuben'ubi	137 05.3	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	340 13.3	12 14
Mars	340 48.9	12 11
Jupiter	288 19.7	15 39
Saturn	141 50.1	1 27

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 7	Moonrise 8	Moonrise 9	Moonrise 10
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
7 00	179 27.1	N 6 48.4	219 17.4	11.7	S 4 39.2	11.3	57.6	N 72	////	02 54	04 18	04 21	04 10	03 59	03 48
01	194 27.3	49.3	233 48.1	11.9	4 27.9	11.3	57.6	N 70	01 07	03 18	04 29	04 15	04 11	04 06	04 02
02	209 27.5	50.3	248 19.0	11.8	4 16.6	11.4	57.5	68	01 59	03 36	04 39	04 11	04 11	04 12	04 13
03	224 27.6	. . 51.2	262 49.8	11.9	4 05.2	11.4	57.5	66	02 29	03 50	04 47	04 07	04 12	04 17	04 22
04	239 27.8	52.2	277 20.7	11.9	3 53.8	11.4	57.5	64	02 52	04 02	04 53	04 04	04 12	04 21	04 30
05	254 28.0	53.1	291 51.6	11.9	3 42.4	11.4	57.5	62	03 09	04 11	04 59	04 01	04 13	04 24	04 37
06	269 28.2	N 6 54.0	306 22.5	12.0	S 3 31.0	11.4	57.5	60	03 23	04 20	05 04	03 59	04 13	04 27	04 43
07	284 28.3	55.0	320 53.5	12.0	3 19.6	11.4	57.4	N 58	03 35	04 27	05 08	03 57	04 13	04 30	04 48
08	299 28.5	55.9	335 24.5	12.1	3 08.2	11.4	57.4	56	03 45	04 33	05 12	03 55	04 14	04 33	04 52
S 09	314 28.7	. . 56.9	349 55.6	12.0	2 56.8	11.5	57.4	54	03 53	04 39	05 16	03 53	04 14	04 35	04 57
U 10	329 28.9	57.8	4 26.6	12.1	2 45.3	11.4	57.4	52	04 01	04 44	05 19	03 51	04 14	04 37	05 00
N 11	344 29.0	58.7	18 57.7	12.1	2 33.9	11.5	57.4	50	04 08	04 48	05 22	03 50	04 14	04 39	05 04
D 12	359 29.2	N 6 59.7	33 28.8	12.2	S 2 22.4	11.4	57.3	45	04 22	04 58	05 28	03 47	04 15	04 43	05 11
A 13	14 29.4	7 00.6	48 00.0	12.2	2 11.0	11.5	57.3	N 40	04 32	05 05	05 33	03 44	04 15	04 46	05 18
Y 14	29 29.5	01.5	62 31.2	12.2	1 59.5	11.5	57.3	35	04 41	05 12	05 37	03 42	04 16	04 49	05 23
15	44 29.7	. . 02.5	77 02.4	12.2	1 48.0	11.4	57.3	30	04 48	05 17	05 41	03 40	04 16	04 52	05 28
16	59 29.9	03.4	91 33.6	12.3	1 36.6	11.5	57.3	20	04 59	05 25	05 48	03 36	04 17	04 57	05 37
17	74 30.1	04.4	106 04.9	12.3	1 25.1	11.4	57.2	N 10	05 07	05 32	05 53	03 33	04 17	05 01	05 44
18	89 30.2	N 7 05.3	120 36.2	12.3	S 1 13.7	11.5	57.2	0	05 13	05 38	05 58	03 30	04 18	05 04	05 51
19	104 30.4	06.2	135 07.5	12.3	1 02.2	11.5	57.2	S 10	05 18	05 42	06 04	03 27	04 18	05 08	05 58
20	119 30.6	07.2	149 38.8	12.4	0 50.7	11.4	57.2	20	05 21	05 47	06 09	03 24	04 19	05 13	06 06
21	134 30.8	. . 08.1	164 10.2	12.3	0 39.3	11.5	57.2	30	05 23	05 51	06 15	03 21	04 20	05 17	06 15
22	149 30.9	09.0	178 41.5	12.4	0 27.8	11.4	57.1	35	05 23	05 53	06 18	03 19	04 20	05 20	06 20
23	164 31.1	10.0	193 12.9	12.4	0 16.4	11.5	57.1	40	05 23	05 55	06 22	03 16	04 20	05 23	06 25
8 00	179 31.3	N 7 10.9	207 44.3	12.5	S 0 04.9	11.4	57.1	45	05 23	05 57	06 26	03 14	04 21	05 27	06 32
01	194 31.5	11.8	222 15.8	12.4	N 0 06.5	11.4	57.1	S 50	05 22	05 59	06 32	03 10	04 22	05 32	06 40
02	209 31.6	12.8	236 47.2	12.5	0 17.9	11.4	57.1	52	05 21	06 00	06 34	03 09	04 22	05 34	06 44
03	224 31.8	. . 13.7	251 18.7	12.5	0 29.3	11.4	57.0	54	05 20	06 01	06 37	03 07	04 22	05 36	06 48
04	239 32.0	14.6	265 50.2	12.5	0 40.7	11.4	57.0	56	05 19	06 02	06 39	03 06	04 23	05 38	06 53
05	254 32.1	15.6	280 21.7	12.6	0 52.1	11.4	57.0	58	05 18	06 03	06 43	03 04	04 23	05 41	06 58
06	269 32.3	N 7 16.5	294 53.3	12.5	N 1 03.5	11.4	57.0	S 60	05 16	06 04	06 46	03 01	04 24	05 44	07 04
07	284 32.5	17.5	309 24.8	12.6	1 14.9	11.4	57.0								
08	299 32.7	18.4	323 56.4	12.5	1 26.3	11.3	56.9								
M 09	314 32.8	. . 19.3	338 27.9	12.6	1 37.6	11.3	56.9								
O 10	329 33.0	20.3	352 59.5	12.6	1 48.9	11.3	56.9								
N 11	344 33.2	21.2	7 31.1	12.6	2 00.2	11.3	56.9								
D 12	359 33.3	N 7 22.1	22 02.7	12.7	N 2 11.5	11.3	56.9								
A 13	14 33.5	23.1	36 34.4	12.6	2 22.8	11.3	56.8								
Y 14	29 33.7	24.0	51 06.0	12.7	2 34.1	11.2	56.8								
15	44 33.9	. . 24.9	65 37.7	12.6	2 45.3	11.2	56.8								
16	59 34.0	25.8	80 09.3	12.7	2 56.5	11.2	56.8								
17	74 34.2	26.8	94 41.0	12.7	3 07.7	11.2	56.8								
18	89 34.4	N 7 27.7	109 12.7	12.7	N 3 18.9	11.1	56.7								
19	104 34.5	28.6	123 44.4	12.7	3 30.0	11.1	56.7								
20	119 34.7	29.6	138 16.1	12.7	3 41.1	11.1	56.7								
21	134 34.9	. . 30.5	152 47.8	12.7	3 52.2	11.1	56.7								
22	149 35.1	31.4	167 19.5	12.8	4 03.3	11.0	56.7								
23	164 35.2	32.4	181 51.3	12.7	4 14.3	11.1	56.6								
9 00	179 35.4	N 7 33.3	196 23.0	12.7	N 4 25.4	10.9	56.6								
01	194 35.6	34.2	210 54.7	12.8	4 36.3	11.0	56.6								
02	209 35.7	35.2	225 26.5	12.7	4 47.3	10.9	56.6								
03	224 35.9	. . 36.1	239 58.2	12.8	4 58.2	10.9	56.5								
04	239 36.1	37.0	254 30.0	12.8	5 09.1	10.9	56.5								
05	254 36.2	37.9	269 01.8	12.7	5 20.0	10.8	56.5								
06	269 36.4	N 7 38.9	283 33.5	12.8	N 5 30.8	10.8	56.5								
07	284 36.6	39.8	298 05.3	12.8	5 41.6	10.8	56.5								
T 08	299 36.7	40.7	312 37.1	12.7	5 52.4	10.7	56.4								
U 09	314 36.9	. . 41.7	327 08.8	12.8	6 03.1	10.7	56.4								
E 10	329 37.1	42.6	341 40.6	12.8	6 13.8	10.6	56.4								
S 11	344 37.3	43.5	356 12.4	12.7	6 24.4	10.6	56.4								
D 12	359 37.4	N 7 44.4	10 44.1	12.8	N 6 35.0	10.6	56.4								
A 13	14 37.6	45.4	25 15.9	12.8	6 45.6	10.5	56.3								
Y 14	29 37.8	46.3	39 47.7	12.8	6 56.1	10.5	56.3								
15	44 37.9	. . 47.2	54 19.5	12.7	7 06.6	10.5	56.3								
16	59 38.1	48.2	68 51.2	12.8	7 17.1	10.4	56.3								
17	74 38.3	49.1	83 23.0	12.8	7 27.5	10.3	56.3								
18	89 38.4	N 7 50.0	97 54.8	12.7	N 7 37.8	10.4	56.2								
19	104 38.6	50.9	112 26.5	12.8	7 48.2	10.2	56.2								
20	119 38.8	51.9	126 58.3	12.7	7 58.4	10.3	56.2								
21	134 38.9	. . 52.8	141 30.0	12.8	8 08.7	10.2	56.2								
22	149 39.1	53.7	156 01.8	12.7	8 18.9	10.1	56.2								
23	164 39.3	54.6	170 33.5	12.8	N 8 29.0	10.1	56.1								
	SD 16.0	d 0.9	SD	15.6		15.5	15.4								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 7	Moonset 8	Moonset 9	Moonset 10
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 49	21 15	////	15 30	17 20	19 09	21 01
N 70	19 37	20 50	23 12	15 33	17 15	18 57	20 39
68	19 27	20 31	22 12	15 35	17 12	18 47	20 22
66	19 19	20 16	21 39	15 37	17 09	18 40	20 09
64	19 12	20 04	21 16	15 38	17 06	18 33	19 58
62	19 06	19 54	20 58	15 39	17 04	18 27	19 49
60	19 01	19 46	20 43	15 41	17 02	18 22	19 41
N 58	18 57	19 38	20 31	15 42	17 00	18 18	19 34
56	18 53	19 32	20 21	15 42	16 59	18 14	19 27
54	18 49	19 26	20 12	15 43	16 58	18 11	19 22
52	18 46	19 21	20 04	15 44	16 56	18 07	19 17
50	18 43	19 16	19 57	15 45	16 55	18 05	19 12
45	18 37	19 07	19 43	15 46	16 53	17 58	19 03
N 40	18 31	18 59	19 32	15 47	16 51	17 53	18 55
35	18 27	18 53	19 23	15 48	16 49	17 49	18 48
30	18 23	18 47	19 16	15 49	16 47	17 45	18 42
20	18 16	18 39	19 05	15 51	16 45	17 38	18 31
N 10	18 10	18 32	18 56	15 52	16 42	17 32	18 22
0	18 05	18 26	18 50	15 53	16 40	17 27	18 14
S 10	18 00	18 21	18 45	15 54	16 38	17 21	18 05
20	17 54	18 17	18 42	15 55	16 36	17 15	17 56
30	17 48	18 12	18 40	15 57	16 33	17 09	17 46
35	17 45	18 10	18 39	15 58	16 31	17 05	17 40
40	17 41	18 08	18 39	15 58	16 29	17 01	17 33
45	17 36	18 06	18 40	15 59	16 27	16 56	17 25
S 50	17 31	18 04	18 41	16 01	16 25	16 50	17 16
52	17 29	18 03	18 41	16 01	16 24	16 47	17 11
54	17 26	18 02	18 42	16 02	16 23	16 44	17 07
56	17 23	18 00	18 43	16 02	16 21	16 41	17 02
58	17 20	17 59	18 45	16 03	16 20	16 37	16 56
S 60	17 16	17 58	18 46	16 04	16 18	16 33	16 49

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
7	02 12	02 04	12 02	09 42	22 05	27	9
8	01 55	01 47	12 02	10 29	22 52	28	4
9	01 39	01 31	12 02	11 16	23 39	29	1

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.1		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
10 00	198 23.4	176 18.5	N 8 05.7	177 47.4	N 8 09.2	126 20.2	N22 02.4	340 21.4	S12 08.3
01	213 25.8	191 18.1	06.9	192 48.1	09.9	141 22.1	02.5	355 24.0	08.2
02	228 28.3	206 17.6	08.1	207 48.7	10.7	156 24.1	02.5	10 26.7	08.2
03	243 30.8	221 17.2	09.3	222 49.4	11.4	171 26.1	02.6	25 29.3	08.1
04	258 33.2	236 16.8	10.5	237 50.1	12.1	186 28.1	02.7	40 31.9	08.1
05	273 35.7	251 16.4	11.7	252 50.8	12.9	201 30.1	02.7	55 34.5	08.0
06	288 38.1	266 16.0	N 8 12.9	267 51.5	N 8 13.6	216 32.0	N22 02.8	70 37.2	S12 08.0
W 07	303 40.6	281 15.5	14.1	282 52.2	14.3	231 34.0	02.9	85 39.8	07.9
E 08	318 43.1	296 15.1	15.3	297 52.9	15.0	246 36.0	02.9	100 42.4	07.8
D 09	333 45.5	311 14.7	16.5	312 53.6	15.8	261 38.0	03.0	115 45.1	07.8
N 10	348 48.0	326 14.3	17.7	327 54.3	16.5	276 40.0	03.0	130 47.7	07.7
E 11	3 50.5	341 13.8	18.9	342 55.0	17.2	291 42.0	03.1	145 50.3	07.7
S 12	18 52.9	356 13.4	N 8 20.1	357 55.7	N 8 18.0	306 43.9	N22 03.2	160 53.0	S12 07.6
D 13	33 55.4	11 13.0	21.3	12 56.4	18.7	321 45.9	03.2	175 55.6	07.6
A 14	48 57.9	26 12.6	22.5	27 57.1	19.4	336 47.9	03.3	190 58.2	07.5
Y 15	64 00.3	41 12.1	23.7	42 57.8	20.1	351 49.9	03.3	206 00.9	07.4
16	79 02.8	56 11.7	24.9	57 58.5	20.9	6 51.9	03.4	221 03.5	07.4
17	94 05.3	71 11.3	26.1	72 59.2	21.6	21 53.8	03.5	236 06.1	07.3
18	109 07.7	86 10.9	N 8 27.3	87 59.9	N 8 22.3	36 55.8	N22 03.5	251 08.8	S12 07.3
19	124 10.2	101 10.4	28.5	103 00.6	23.1	51 57.8	03.6	266 11.4	07.2
20	139 12.6	116 10.0	29.7	118 01.3	23.8	66 59.8	03.6	281 14.0	07.1
21	154 15.1	131 09.6	30.9	133 02.0	24.5	82 01.7	03.7	296 16.7	07.1
22	169 17.6	146 09.2	32.1	148 02.6	25.2	97 03.7	03.8	311 19.3	07.0
23	184 20.0	161 08.7	33.3	163 03.3	26.0	112 05.7	03.8	326 21.9	07.0
11 00	199 22.5	176 08.3	N 8 34.5	178 04.0	N 8 26.7	127 07.7	N22 03.9	341 24.6	S12 06.9
01	214 25.0	191 07.9	35.7	193 04.7	27.4	142 09.7	04.0	356 27.2	06.9
02	229 27.4	206 07.5	36.9	208 05.4	28.1	157 11.6	04.0	11 29.8	06.8
03	244 29.9	221 07.0	38.1	223 06.1	28.9	172 13.6	04.1	26 32.5	06.7
04	259 32.4	236 06.6	39.3	238 06.8	29.6	187 15.6	04.1	41 35.1	06.7
05	274 34.8	251 06.2	40.4	253 07.5	30.3	202 17.6	04.2	56 37.7	06.6
06	289 37.3	266 05.8	N 8 41.6	268 08.2	N 8 31.0	217 19.5	N22 04.3	71 40.4	S12 06.6
T 07	304 39.7	281 05.3	42.8	283 08.9	31.8	232 21.5	04.3	86 43.0	06.5
H 08	319 42.2	296 04.9	44.0	298 09.6	32.5	247 23.5	04.4	101 45.6	06.5
U 09	334 44.7	311 04.5	45.2	313 10.3	33.2	262 25.5	04.4	116 48.3	06.4
R 10	349 47.1	326 04.0	46.4	328 11.0	33.9	277 27.5	04.5	131 50.9	06.3
S 11	4 49.6	341 03.6	47.6	343 11.7	34.7	292 29.4	04.6	146 53.5	06.3
D 12	19 52.1	356 03.2	N 8 48.8	358 12.4	N 8 35.4	307 31.4	N22 04.6	161 56.2	S12 06.2
A 13	34 54.5	11 02.8	50.0	13 13.1	36.1	322 33.4	04.7	176 58.8	06.2
Y 14	49 57.0	26 02.3	51.2	28 13.8	36.8	337 35.4	04.8	192 01.4	06.1
15	64 59.5	41 01.9	52.4	43 14.5	37.5	352 37.3	04.8	207 04.1	06.0
16	80 01.9	56 01.5	53.5	58 15.1	38.3	7 39.3	04.9	222 06.7	06.0
17	95 04.4	71 01.0	54.7	73 15.8	39.0	22 41.3	04.9	237 09.3	05.9
18	110 06.9	86 00.6	N 8 55.9	88 16.5	N 8 39.7	37 43.3	N22 05.0	252 12.0	S12 05.9
19	125 09.3	101 00.2	57.1	103 17.2	40.4	52 45.2	05.1	267 14.6	05.8
20	140 11.8	115 59.7	58.3	118 17.9	41.2	67 47.2	05.1	282 17.2	05.8
21	155 14.2	130 59.3	8 59.5	133 18.6	41.9	82 49.2	05.2	297 19.9	05.7
22	170 16.7	145 58.9	9 00.7	148 19.3	42.6	97 51.2	05.2	312 22.5	05.6
23	185 19.2	160 58.4	01.9	163 20.0	43.3	112 53.1	05.3	327 25.1	05.6
12 00	200 21.6	175 58.0	N 9 03.0	178 20.7	N 8 44.0	127 55.1	N22 05.4	342 27.8	S12 05.5
01	215 24.1	190 57.6	04.2	193 21.4	44.8	142 57.1	05.4	357 30.4	05.5
02	230 26.6	205 57.1	05.4	208 22.1	45.5	157 59.1	05.5	12 33.0	05.4
03	245 29.0	220 56.7	06.6	223 22.8	46.2	173 01.0	05.5	27 35.7	05.3
04	260 31.5	235 56.3	07.8	238 23.5	46.9	188 03.0	05.6	42 38.3	05.3
05	275 34.0	250 55.8	09.0	253 24.2	47.7	203 05.0	05.7	57 40.9	05.2
06	290 36.4	265 55.4	N 9 10.2	268 24.9	N 8 48.4	218 06.9	N22 05.7	72 43.6	S12 05.2
F 07	305 38.9	280 55.0	11.3	283 25.6	49.1	233 08.9	05.8	87 46.2	05.1
R 08	320 41.3	295 54.5	12.5	298 26.2	49.8	248 10.9	05.8	102 48.8	05.1
I 09	335 43.8	310 54.1	13.7	313 26.9	50.5	263 12.9	05.9	117 51.5	05.0
D 10	350 46.3	325 53.7	14.9	328 27.6	51.3	278 14.8	06.0	132 54.1	04.9
A 11	5 48.7	340 53.2	16.1	343 28.3	52.0	293 16.8	06.0	147 56.8	04.9
Y 12	20 51.2	355 52.8	N 9 17.3	358 29.0	N 8 52.7	308 18.8	N22 06.1	162 59.4	S12 04.8
13	35 53.7	10 52.4	18.4	13 29.7	53.4	323 20.8	06.2	178 02.0	04.8
14	50 56.1	25 51.9	19.6	28 30.4	54.1	338 22.7	06.2	193 04.7	04.7
15	65 58.6	40 51.5	20.8	43 31.1	54.9	353 24.7	06.3	208 07.3	04.6
16	81 01.1	55 51.0	22.0	58 31.8	55.6	8 26.7	06.3	223 09.9	04.6
17	96 03.5	70 50.6	23.2	73 32.5	56.3	23 28.6	06.4	238 12.6	04.5
18	111 06.0	85 50.2	N 9 24.3	88 33.2	N 8 57.0	38 30.6	N22 06.5	253 15.2	S12 04.5
19	126 08.5	100 49.7	25.5	103 33.9	57.7	53 32.6	06.5	268 17.8	04.4
20	141 10.9	115 49.3	26.7	118 34.6	58.4	68 34.5	06.6	283 20.5	04.4
21	156 13.4	130 48.9	27.9	133 35.3	59.2	83 36.5	06.6	298 23.1	04.3
22	171 15.8	145 48.4	29.0	148 35.9	8 59.9	98 38.5	06.7	313 25.7	04.2
23	186 18.3	160 48.0	30.2	163 36.6	N 9 00.6	113 40.5	06.8	328 28.4	04.2
	h m								
Mer. Pass.	10 40.7	v −0.4	d 1.2	v 0.7	d 0.7	v 2.0	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.3
Achernar	335 27.5	S57 10.2
Acrux	173 08.7	S63 10.6
Adhara	255 12.7	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.2
Alkaid	152 58.5	N49 14.7
Al Na'ir	27 44.2	S46 53.6
Alnilam	275 46.6	S 1 11.9
Alphard	217 56.1	S 8 43.3
Alphecca	126 10.8	N26 40.1
Alpheratz	357 44.0	N29 09.7
Altair	62 08.4	N 8 54.2
Ankaa	353 16.2	S42 14.0
Antares	112 26.2	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.8	S69 02.8
Avior	234 17.9	S59 33.6
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.4	S52 42.6
Capella	280 34.9	N46 00.6
Deneb	49 31.7	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.9
Dubhe	193 51.4	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 46.0	N51 29.1
Enif	33 47.4	N 9 56.1
Fomalhaut	15 24.4	S29 33.0
Gacrux	172 00.4	S57 11.4
Gienah	175 52.1	S17 37.2
Hadar	148 47.4	S60 26.2
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.9	S34 22.5
Kochab	137 19.0	N74 05.9
Markab	13 38.7	N15 16.5
Menkar	314 15.5	N 4 08.3
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.3	S69 46.8
Mirfak	308 40.9	N49 54.5
Nunki	75 58.4	S26 16.6
Peacock	53 19.6	S56 41.2
Pollux	243 27.9	N27 59.5
Procyon	244 59.9	N 5 11.2
Rasalhague	96 06.4	N12 33.0
Regulus	207 43.5	N11 53.9
Rigel	281 12.4	S 8 11.5
Rigil Kent.	139 51.2	S60 53.3
Sabik	102 12.5	S15 44.4
Schedar	349 41.2	N56 36.5
Shaula	96 21.9	S37 06.6
Sirius	258 33.9	S16 44.4
Spica	158 31.1	S11 14.0
Suhail	222 52.3	S43 29.6
Vega	80 38.9	N38 47.6
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	336 45.8	12 16
Mars	338 41.5	12 07
Jupiter	287 45.2	15 29
Saturn	142 02.1	1 14

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 10	Moonrise 11	Moonrise 12	Moonrise 13
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
								N 72	////	02 31	04 01	03 48	03 34	03 14	
10 00	179 39.4	N 7 55.6	185 05.3	12.7	N 8 39.1	10.0	56.1	N 70	////	03 00	04 15	04 02	03 57	03 52	03 47
01	194 39.6	56.5	199 37.0	12.8	8 49.1	10.0	56.1	68	01 32	03 20	04 26	04 13	04 15	04 19	04 28
02	209 39.8	57.4	214 08.8	12.7	8 59.1	10.0	56.1	66	02 10	03 37	04 35	04 22	04 29	04 40	04 56
03	224 39.9	58.3	228 40.5	12.7	9 09.1	9.9	56.0	64	02 36	03 50	04 43	04 30	04 41	04 56	05 17
04	239 40.1	7 59.3	243 12.2	12.7	9 19.0	9.8	56.0	62	02 56	04 01	04 49	04 37	04 51	05 10	05 34
05	254 40.3	8 00.2	257 43.9	12.7	9 28.8	9.8	56.0	60	03 11	04 10	04 55	04 43	05 00	05 21	05 48
06	269 40.4	N 8 01.1	272 15.6	12.7	N 9 38.6	9.7	56.0	N 58	03 24	04 18	05 00	04 48	05 08	05 32	06 01
W 07	284 40.6	02.0	286 47.3	12.7	9 48.3	9.7	56.0	56	03 35	04 25	05 04	04 52	05 15	05 40	06 11
E 08	299 40.8	02.9	301 19.0	12.7	9 58.0	9.6	55.9	54	03 45	04 31	05 08	04 57	05 21	05 48	06 21
D 09	314 40.9	03.9	315 50.7	12.7	10 07.6	9.6	55.9	52	03 53	04 37	05 12	05 00	05 26	05 55	06 29
N 10	329 41.1	04.8	330 22.4	12.7	10 17.2	9.5	55.9	50	04 01	04 42	05 15	05 04	05 31	06 02	06 37
E 11	344 41.3	05.7	344 54.1	12.6	10 26.7	9.5	55.9	45	04 16	04 52	05 22	05 11	05 42	06 16	06 53
S 12	359 41.4	N 8 06.6	359 25.7	12.7	N10 36.2	9.4	55.9	N 40	04 27	05 00	05 28	05 18	05 51	06 27	07 06
D 13	14 41.6	07.6	13 57.4	12.6	10 45.6	9.3	55.8	35	04 37	05 07	05 33	05 23	05 59	06 37	07 17
A 14	29 41.8	08.5	28 29.0	12.7	10 54.9	9.3	55.8	30	04 45	05 13	05 38	05 28	06 06	06 45	07 27
Y 15	44 41.9	09.4	43 00.7	12.6	11 04.2	9.2	55.8	20	04 57	05 23	05 45	05 37	06 18	07 00	07 44
16	59 42.1	10.3	57 32.3	12.6	11 13.4	9.2	55.8	N 10	05 06	05 30	05 52	05 44	06 28	07 13	07 59
17	74 42.3	11.2	72 03.9	12.6	11 22.6	9.1	55.8	0	05 13	05 37	05 58	05 51	06 38	07 25	08 13
18	89 42.4	N 8 12.2	86 35.5	12.6	N11 31.7	9.1	55.7	S 10	05 18	05 42	06 04	05 58	06 48	07 38	08 27
19	104 42.6	13.1	101 07.1	12.6	11 40.8	9.0	55.7	20	05 22	05 48	06 10	06 06	06 59	07 51	08 43
20	119 42.8	14.0	115 38.7	12.6	11 49.8	8.9	55.7	30	05 25	05 53	06 17	06 15	07 11	08 06	09 00
21	134 42.9	14.9	130 10.3	12.5	11 58.7	8.8	55.7	35	05 26	05 55	06 21	06 20	07 18	08 15	09 10
22	149 43.1	15.8	144 41.8	12.6	12 07.5	8.8	55.7	40	05 26	05 58	06 25	06 25	07 26	08 25	09 22
23	164 43.3	16.8	159 13.4	12.5	12 16.3	8.8	55.6	45	05 27	06 01	06 30	06 32	07 36	08 37	09 35
11 00	179 43.4	N 8 17.7	173 44.9	12.6	N12 25.1	8.6	55.6	S 50	05 26	06 04	06 36	06 40	07 47	08 51	09 52
01	194 43.6	18.6	188 16.5	12.5	12 33.7	8.6	55.6	52	05 26	06 05	06 39	06 44	07 52	08 58	10 00
02	209 43.7	19.5	202 48.0	12.5	12 42.3	8.6	55.6	54	05 25	06 06	06 42	06 48	07 58	09 06	10 09
03	224 43.9	20.4	217 19.5	12.5	12 50.9	8.4	55.6	56	05 25	06 08	06 45	06 53	08 05	09 14	10 19
04	239 44.1	21.4	231 51.0	12.5	12 59.3	8.4	55.5	58	05 24	06 09	06 49	06 58	08 12	09 24	10 30
05	254 44.2	22.3	246 22.5	12.4	13 07.7	8.4	55.5	S 60	05 23	06 11	06 53	07 04	08 21	09 35	10 43
06	269 44.4	N 8 23.2	260 53.9	12.5	N13 16.1	8.2	55.5								
T 07	284 44.6	24.1	275 25.4	12.4	13 24.3	8.2	55.5								
H 08	299 44.7	25.0	289 56.8	12.5	13 32.5	8.1	55.5								
U 09	314 44.9	26.0	304 28.3	12.4	13 40.6	8.1	55.4								
R 10	329 45.1	26.9	318 59.7	12.4	13 48.7	8.0	55.4								
S 11	344 45.2	27.8	333 31.1	12.4	13 56.7	7.9	55.4								
D 12	359 45.4	N 8 28.7	348 02.5	12.4	N14 04.6	7.8	55.4								
A 13	14 45.5	29.6	2 33.9	12.3	14 12.4	7.8	55.4								
Y 14	29 45.7	30.5	17 05.2	12.4	14 20.2	7.7	55.3								
15	44 45.9	31.4	31 36.6	12.3	14 27.9	7.6	55.3								
16	59 46.0	32.4	46 07.9	12.4	14 35.5	7.5	55.3								
17	74 46.2	33.3	60 39.3	12.3	14 43.0	7.5	55.3								
18	89 46.4	N 8 34.2	75 10.6	12.3	N14 50.5	7.4	55.3								
19	104 46.5	35.1	89 41.9	12.3	14 57.9	7.3	55.2								
20	119 46.7	36.0	104 13.2	12.3	15 05.2	7.2	55.2								
21	134 46.8	36.9	118 44.5	12.2	15 12.4	7.2	55.2								
22	149 47.0	37.8	133 15.7	12.3	15 19.6	7.1	55.2								
23	164 47.2	38.8	147 47.0	12.2	15 26.7	7.0	55.2								
12 00	179 47.3	N 8 39.7	162 18.2	12.2	N15 33.7	6.9	55.2								
01	194 47.5	40.6	176 49.4	12.2	15 40.6	6.9	55.1								
02	209 47.6	41.5	191 20.6	12.2	15 47.5	6.7	55.1								
03	224 47.8	42.4	205 51.8	12.2	15 54.2	6.7	55.1								
04	239 48.0	43.3	220 23.0	12.2	16 00.9	6.6	55.1								
05	254 48.1	44.2	234 54.2	12.2	16 07.5	6.6	55.1								
06	269 48.3	N 8 45.2	249 25.4	12.1	N16 14.1	6.4	55.0								
F 07	284 48.4	46.1	263 56.5	12.1	16 20.5	6.4	55.0								
R 08	299 48.6	47.0	278 27.6	12.2	16 26.9	6.3	55.0								
I 09	314 48.8	47.9	292 58.8	12.1	16 33.2	6.2	55.0								
D 10	329 48.9	48.8	307 29.9	12.1	16 39.4	6.1	55.0								
A 11	344 49.1	49.7	322 01.0	12.1	16 45.5	6.0	55.0								
Y 12	359 49.2	N 8 50.6	336 32.1	12.0	N16 51.5	6.0	54.9	S 50	17 25	17 57	18 35	17 16	17 45	18 17	18 55
13	14 49.4	51.5	351 03.1	12.1	16 57.5	5.8	54.9	52	17 22	17 56	18 35	17 11	17 39	18 10	18 47
14	29 49.6	52.4	5 34.2	12.1	17 03.3	5.8	54.9	54	17 19	17 55	18 35	17 07	17 32	18 02	18 38
15	44 49.7	53.3	20 05.3	12.0	17 09.1	5.7	54.9	56	17 16	17 53	18 36	17 02	17 25	17 53	18 28
16	59 49.9	54.3	34 36.3	12.0	17 14.8	5.6	54.9	58	17 12	17 51	18 37	16 56	17 17	17 44	18 16
17	74 50.0	55.2	49 07.3	12.0	17 20.4	5.6	54.9	S 60	17 07	17 50	18 38	16 49	17 08	17 32	18 03
18	89 50.2	N 8 56.1	63 38.3	12.0	N17 26.0	5.4	54.8								
19	104 50.4	57.0	78 09.3	12.0	17 31.4	5.4	54.8								
20	119 50.5	57.9	92 40.3	12.0	17 36.8	5.2	54.8								
21	134 50.7	58.8	107 11.3	12.0	17 42.0	5.2	54.8								
22	149 50.8	8 59.7	121 42.3	12.0	17 47.2	5.1	54.8								
23	164 51.0	N 9 00.6	136 13.3	11.9	N17 52.3	5.0	54.8								
	SD 16.0	d 0.9	SD	15.2	15.1		15.0								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 10	Moonset 11	Moonset 12	Moonset 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 04	21 37	////	21 01	22 59		
N 70	19 50	21 07	////	20 39	22 22	24 07	00 07
68	19 39	20 45	22 39	20 22	21 56	23 27	24 49
66	19 29	20 28	21 57	20 09	21 36	22 59	24 14
64	19 21	20 15	21 30	19 58	21 20	22 38	23 48
62	19 14	20 03	21 09	19 49	21 07	22 22	23 28
60	19 09	19 54	20 53	19 41	20 56	22 08	23 12
N 58	19 03	19 46	20 40	19 34	20 47	21 56	22 58
56	18 59	19 39	20 28	19 27	20 38	21 45	22 47
54	18 55	19 32	20 19	19 22	20 31	21 36	22 36
52	18 51	19 27	20 10	19 17	20 24	21 28	22 27
50	18 48	19 22	20 03	19 12	20 18	21 21	22 19
45	18 40	19 11	19 48	19 03	20 05	21 05	22 02
N 40	18 34	19 02	19 36	18 55	19 55	20 53	21 48
35	18 29	18 55	19 26	18 48	19 46	20 42	21 36
30	18 25	18 49	19 18	18 42	19 38	20 32	21 25
20	18 17	18 39	19 06	18 31	19 24	20 16	21 07
N 10	18 10	18 32	18 56	18 22	19 12	20 02	20 51
0	18 04	18 25	18 49	18 14	19 01	19 49	20 37
S 10	17 58	18 19	18 44	18 05	18 50	19 35	20 22
20	17 52	18 14	18 40	17 56	18 38	19 21	20 06
30	17 45	18 09	18 37	17 46	18 24	19 05	19 48
35	17 41	18 06	18 36	17 40	18 16	18 56	19 38
40	17 36	18 04	18 35	17 33	18 08	18 45	19 26
45	17 31	18 01	18 35	17 25	17 57	18 32	19 12
S 50	17 25	17 57	18 35	17 16	17 45	18 17	18 55
52	17 22	17 56	18 35	17 11	17 39	18 10	18 47
54	17 19	17 55	18 35	17 07	17 32	18 02	18 38
56	17 16	17 53	18 36	17 02	17 25	17 53	18 28
58	17 12	17 51	18 37	16 56	17 17	17 44	18 16
S 60	17 07	17 50	18 38	16 49	17 08	17 32	18 03

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
10	01 23	01 15	12 01	12 02	24 26	00	0
11	01 07	00 59	12 01	12 49	00 26	01	1
12	00 51	00 43	12 01	13 37	01 13	02	4

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.0		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
13 00	201 20.8	175 47.5	N 9 31.4	178 37.3	N 9 01.3	128 42.4	N22 06.8	343 31.0	S12 04.1
01	216 23.2	190 47.1	32.6	193 38.0	02.0	143 44.4	06.9	358 33.7	04.1
02	231 25.7	205 46.7	33.8	208 38.7	02.8	158 46.4	06.9	13 36.3	04.0
03	246 28.2	220 46.2	34.9	223 39.4	03.5	173 48.3	07.0	28 38.9	03.9
04	261 30.6	235 45.8	36.1	238 40.1	04.2	188 50.3	07.1	43 41.6	03.9
05	276 33.1	250 45.3	37.3	253 40.8	04.9	203 52.3	07.1	58 44.2	03.8
06	291 35.6	265 44.9	N 9 38.5	268 41.5	N 9 05.6	218 54.2	N22 07.2	73 46.8	S12 03.8
07	306 38.0	280 44.5	39.6	283 42.2	06.3	233 56.2	07.3	88 49.5	03.7
08	321 40.5	295 44.0	40.8	298 42.9	07.0	248 58.2	07.3	103 52.1	03.6
09	336 43.0	310 43.6	42.0	313 43.6	07.8	264 00.1	07.4	118 54.7	03.6
10	351 45.4	325 43.1	43.2	328 44.3	08.5	279 02.1	07.4	133 57.4	03.5
11	6 47.9	340 42.7	44.3	343 44.9	09.2	294 04.1	07.5	149 00.0	03.5
12	21 50.3	355 42.2	N 9 45.5	358 45.6	N 9 09.9	309 06.1	N22 07.6	164 02.7	S12 03.4
13	36 52.8	10 41.8	46.7	13 46.3	10.6	324 08.0	07.6	179 05.3	03.4
14	51 55.3	25 41.4	47.8	28 47.0	11.3	339 10.0	07.7	194 07.9	03.3
15	66 57.7	40 40.9	49.0	43 47.7	12.1	354 12.0	07.7	209 10.6	03.2
16	82 00.2	55 40.5	50.2	58 48.4	12.8	9 13.9	07.8	224 13.2	03.2
17	97 02.7	70 40.0	51.4	73 49.1	13.5	24 15.9	07.9	239 15.8	03.1
18	112 05.1	85 39.6	N 9 52.5	88 49.8	N 9 14.2	39 17.9	N22 07.9	254 18.5	S12 03.1
19	127 07.6	100 39.1	53.7	103 50.5	14.9	54 19.8	08.0	269 21.1	03.0
20	142 10.1	115 38.7	54.9	118 51.2	15.6	69 21.8	08.0	284 23.8	02.9
21	157 12.5	130 38.2	56.0	133 51.9	16.3	84 23.8	08.1	299 26.4	02.9
22	172 15.0	145 37.8	57.2	148 52.6	17.1	99 25.7	08.2	314 29.0	02.8
23	187 17.4	160 37.4	58.4	163 53.3	17.8	114 27.7	08.2	329 31.7	02.8
14 00	202 19.9	175 36.9	N 9 59.5	178 53.9	N 9 18.5	129 29.7	N22 08.3	344 34.3	S12 02.7
01	217 22.4	190 36.5	10 00.7	193 54.6	19.2	144 31.6	08.3	359 36.9	02.6
02	232 24.8	205 36.0	01.9	208 55.3	19.9	159 33.6	08.4	14 39.6	02.6
03	247 27.3	220 35.6	03.0	223 56.0	20.6	174 35.5	08.5	29 42.2	02.5
04	262 29.8	235 35.1	04.2	238 56.7	21.3	189 37.5	08.5	44 44.9	02.5
05	277 32.2	250 34.7	05.4	253 57.4	22.0	204 39.5	08.6	59 47.5	02.4
06	292 34.7	265 34.2	N10 06.5	268 58.1	N 9 22.8	219 41.4	N22 08.6	74 50.1	S12 02.4
07	307 37.2	280 33.8	07.7	283 58.8	23.5	234 43.4	08.7	89 52.8	02.3
08	322 39.6	295 33.3	08.9	298 59.5	24.2	249 45.4	08.8	104 55.4	02.2
09	337 42.1	310 32.9	10.0	314 00.2	24.9	264 47.3	08.8	119 58.0	02.2
10	352 44.6	325 32.4	11.2	329 00.9	25.6	279 49.3	08.9	135 00.7	02.1
11	7 47.0	340 32.0	12.4	344 01.5	26.3	294 51.3	09.0	150 03.3	02.1
12	22 49.5	355 31.5	N10 13.5	359 02.2	N 9 27.0	309 53.2	N22 09.0	165 06.0	S12 02.0
13	37 51.9	10 31.1	14.7	14 02.9	27.7	324 55.2	09.1	180 08.6	01.9
14	52 54.4	25 30.6	15.8	29 03.6	28.4	339 57.2	09.1	195 11.2	01.9
15	67 56.9	40 30.2	17.0	44 04.3	29.2	354 59.1	09.2	210 13.9	01.8
16	82 59.3	55 29.7	18.2	59 05.0	29.9	10 01.1	09.3	225 16.5	01.8
17	98 01.8	70 29.3	19.3	74 05.7	30.6	25 03.0	09.3	240 19.1	01.7
18	113 04.3	85 28.8	N10 20.5	89 06.4	N 9 31.3	40 05.0	N22 09.4	255 21.8	S12 01.6
19	128 06.7	100 28.4	21.6	104 07.1	32.0	55 07.0	09.4	270 24.4	01.6
20	143 09.2	115 27.9	22.8	119 07.8	32.7	70 08.9	09.5	285 27.1	01.5
21	158 11.7	130 27.5	24.0	134 08.5	33.4	85 10.9	09.6	300 29.7	01.5
22	173 14.1	145 27.0	25.1	149 09.2	34.1	100 12.9	09.6	315 32.3	01.4
23	188 16.6	160 26.5	26.3	164 09.8	34.8	115 14.8	09.7	330 35.0	01.3
15 00	203 19.1	175 26.1	N10 27.4	179 10.5	N 9 35.5	130 16.8	N22 09.7	345 37.6	S12 01.3
01	218 21.5	190 25.6	28.6	194 11.2	36.3	145 18.7	09.8	0 40.3	01.2
02	233 24.0	205 25.2	29.8	209 11.9	37.0	160 20.7	09.9	15 42.9	01.2
03	248 26.4	220 24.7	30.9	224 12.6	37.7	175 22.7	09.9	30 45.5	01.1
04	263 28.9	235 24.3	32.1	239 13.3	38.4	190 24.6	10.0	45 48.2	01.1
05	278 31.4	250 23.8	33.2	254 14.0	39.1	205 26.6	10.0	60 50.8	01.0
06	293 33.8	265 23.4	N10 34.4	269 14.7	N 9 39.8	220 28.5	N22 10.1	75 53.5	S12 00.9
07	308 36.3	280 22.9	35.5	284 15.4	40.5	235 30.5	10.2	90 56.1	00.9
08	323 38.8	295 22.4	36.7	299 16.1	41.2	250 32.5	10.2	105 58.7	00.8
09	338 41.2	310 22.0	37.8	314 16.7	41.9	265 34.4	10.3	121 01.4	00.8
10	353 43.7	325 21.5	39.0	329 17.4	42.6	280 36.4	10.3	136 04.0	00.7
11	8 46.2	340 21.1	40.1	344 18.1	43.3	295 38.3	10.4	151 06.6	00.6
12	23 48.6	355 20.6	N10 41.3	359 18.8	N 9 44.0	310 40.3	N22 10.5	166 09.3	S12 00.6
13	38 51.1	10 20.2	42.5	14 19.5	44.7	325 42.3	10.5	181 11.9	00.5
14	53 53.6	25 19.7	43.6	29 20.2	45.4	340 44.2	10.6	196 14.6	00.5
15	68 56.0	40 19.2	44.8	44 20.9	46.2	355 46.2	10.6	211 17.2	00.4
16	83 58.5	55 18.8	45.9	59 21.6	46.9	10 48.1	10.7	226 19.8	00.3
17	99 00.9	70 18.3	47.1	74 22.3	47.6	25 50.1	10.8	241 22.5	00.3
18	114 03.4	85 17.9	N10 48.2	89 23.0	N 9 48.3	40 52.1	N22 10.8	256 25.1	S12 00.2
19	129 05.9	100 17.4	49.4	104 23.6	49.0	55 54.0	10.9	271 27.8	00.2
20	144 08.3	115 16.9	50.5	119 24.3	49.7	70 56.0	10.9	286 30.4	00.1
21	159 10.8	130 16.5	51.7	134 25.0	50.4	85 57.9	11.0	301 33.0	00.0
22	174 13.3	145 16.0	52.8	149 25.7	51.1	100 59.9	11.1	316 35.7	12 00.0
23	189 15.7	160 15.6	54.0	164 26.4	51.8	116 01.9	11.1	331 38.3	S11 59.9
	h m								
Mer. Pass.	10 29.0	v −0.5	d 1.2	v 0.7	d 0.7	v 2.0	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.3
Achernar	335 27.5	S57 10.2
Acrux	173 08.7	S63 10.6
Adhara	255 12.7	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.2
Alkaid	152 58.5	N49 14.7
Al Na'ir	27 44.2	S46 53.6
Alnilam	275 46.7	S 1 11.9
Alphard	217 56.1	S 8 43.3
Alphecca	126 10.8	N26 40.1
Alpheratz	357 43.9	N29 09.7
Altair	62 08.4	N 8 54.2
Ankaa	353 16.2	S42 14.0
Antares	112 26.1	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.7	S69 02.8
Avior	234 17.9	S59 33.6
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.4	S52 42.6
Capella	280 34.9	N46 00.6
Deneb	49 31.7	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.9
Dubhe	193 51.4	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 46.0	N51 29.1
Enif	33 47.4	N 9 56.1
Fomalhaut	15 24.4	S29 33.0
Gacrux	172 00.4	S57 11.5
Gienah	175 52.1	S17 37.2
Hadar	148 47.4	S60 26.2
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 19.0	N74 06.0
Markab	13 38.7	N15 16.5
Menkar	314 15.5	N 4 08.3
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.3	S69 46.8
Mirfak	308 40.9	N49 54.4
Nunki	75 58.4	S26 16.6
Peacock	53 19.6	S56 41.2
Pollux	243 27.9	N27 59.5
Procyon	244 59.9	N 5 11.2
Rasalhague	96 06.4	N12 33.0
Regulus	207 43.5	N11 53.9
Rigel	281 12.4	S 8 11.5
Rigil Kent.	139 51.2	S60 53.3
Sabik	102 12.5	S15 44.4
Schedar	349 41.2	N56 36.5
Shaula	96 21.9	S37 06.6
Sirius	258 33.9	S16 44.4
Spica	158 31.1	S11 14.0
Suhail	222 52.4	S43 29.6
Vega	80 38.9	N38 47.6
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	333 17.0	12 18
Mars	336 34.0	12 04
Jupiter	287 09.7	15 20
Saturn	142 14.4	1 02

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		13	14	15	16
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
13 00	179 51.2	N 9 01.5	150 44.2	12.0	N17 57.3	4.9	54.7	N 72	////	02 06	03 44				
01	194 51.3	02.4	165 15.2	11.9	18 02.2	4.9	54.7	N 70	////	02 40	04 00	03 47	03 40		05 11
02	209 51.5	03.3	179 46.1	11.9	18 07.1	4.7	54.7	68	00 54	03 04	04 13	04 28	04 45	05 21	06 22
03	224 51.6	04.2	194 17.0	11.9	18 11.8	4.6	54.7	66	01 49	03 23	04 23	04 56	05 21	06 01	06 58
04	239 51.8	05.1	208 47.9	12.0	18 16.4	4.6	54.7	64	02 20	03 38	04 32	05 17	05 47	06 29	07 24
05	254 51.9	06.1	223 18.9	11.9	18 21.0	4.5	54.7	62	02 42	03 50	04 40	05 34	06 07	06 50	07 44
06	269 52.1	N 9 07.0	237 49.8	11.8	N18 25.5	4.4	54.7	60	03 00	04 00	04 46	05 48	06 23	07 07	08 01
07	284 52.3	07.9	252 20.6	11.9	18 29.9	4.3	54.6	N 58	03 14	04 09	04 52	06 01	06 37	07 21	08 14
08	299 52.4	08.8	266 51.5	11.9	18 34.2	4.2	54.6	56	03 26	04 17	04 57	06 11	06 49	07 34	08 26
09	314 52.6	09.7	281 22.4	11.9	18 38.4	4.1	54.6	54	03 36	04 24	05 01	06 21	06 59	07 45	08 37
10	329 52.7	10.6	295 53.3	11.8	18 42.5	4.0	54.6	52	03 45	04 30	05 05	06 29	07 09	07 54	08 46
11	344 52.9	11.5	310 24.1	11.9	18 46.5	3.9	54.6	50	03 53	04 35	05 09	06 37	07 17	08 03	08 54
12	359 53.0	N 9 12.4	324 55.0	11.9	N18 50.4	3.9	54.6	45	04 10	04 46	05 17	06 53	07 35	08 21	09 12
13	14 53.2	13.3	339 25.9	11.8	18 54.3	3.7	54.6	N 40	04 22	04 56	05 24	07 06	07 49	08 36	09 26
14	29 53.4	14.2	353 56.7	11.8	18 58.0	3.7	54.5	35	04 32	05 03	05 29	07 17	08 01	08 48	09 38
15	44 53.5	15.1	8 27.5	11.9	19 01.7	3.5	54.5	30	04 41	05 10	05 34	07 27	08 12	08 59	09 49
16	59 53.7	16.0	22 58.4	11.8	19 05.2	3.5	54.5	20	04 54	05 20	05 43	07 44	08 30	09 18	10 07
17	74 53.8	16.9	37 29.2	11.8	19 08.7	3.4	54.5	N 10	05 04	05 29	05 50	07 59	08 47	09 35	10 23
18	89 54.0	N 9 17.8	52 00.0	11.8	N19 12.1	3.3	54.5	0	05 12	05 36	05 57	08 13	09 02	09 50	10 38
19	104 54.1	18.7	66 30.8	11.8	19 15.4	3.2	54.5	S 10	05 18	05 42	06 04	08 27	09 17	10 05	10 53
20	119 54.3	19.6	81 01.6	11.9	19 18.6	3.1	54.5	20	05 23	05 48	06 11	08 43	09 33	10 22	11 08
21	134 54.4	20.5	95 32.5	11.8	19 21.7	3.0	54.5	30	05 26	05 54	06 18	09 00	09 52	10 41	11 27
22	149 54.6	21.4	110 03.3	11.8	19 24.7	2.9	54.5	35	05 28	05 57	06 23	09 10	10 02	10 52	11 37
23	164 54.8	22.3	124 34.1	11.8	19 27.6	2.8	54.4	40	05 29	06 01	06 28	09 22	10 15	11 04	11 49
14 00	179 54.9	N 9 23.2	139 04.9	11.8	N19 30.4	2.8	54.4	45	05 30	06 04	06 34	09 35	10 30	11 19	12 03
01	194 55.1	24.1	153 35.7	11.8	19 33.2	2.6	54.4	S 50	05 31	06 08	06 41	09 52	10 48	11 37	12 21
02	209 55.2	25.0	168 06.5	11.8	19 35.8	2.5	54.4	52	05 31	06 10	06 44	10 00	10 56	11 46	12 29
03	224 55.4	25.9	182 37.3	11.7	19 38.3	2.5	54.4	54	05 31	06 12	06 48	10 09	11 06	11 56	12 38
04	239 55.5	26.8	197 08.0	11.8	19 40.8	2.3	54.4	56	05 30	06 14	06 51	10 19	11 17	12 07	12 48
05	254 55.7	27.7	211 38.8	11.8	19 43.1	2.3	54.4	58	05 30	06 16	06 56	10 30	11 29	12 19	13 00
06	269 55.8	N 9 28.6	226 09.6	11.8	N19 45.4	2.2	54.4	S 60	05 30	06 18	07 01	10 43	11 43	12 34	13 14
07	284 56.0	29.5	240 40.4	11.8	19 47.6	2.0	54.4								
08	299 56.1	30.4	255 11.2	11.8	19 49.6	2.0	54.3								
09	314 56.3	31.3	269 42.0	11.8	19 51.6	1.9	54.3								
10	329 56.4	32.2	284 12.8	11.8	19 53.5	1.8	54.3								
11	344 56.6	33.1	298 43.6	11.8	19 55.3	1.7	54.3								
12	359 56.8	N 9 34.0	313 14.4	11.8	N19 57.0	1.6	54.3								
13	14 56.9	34.9	327 45.2	11.8	19 58.6	1.5	54.3								
14	29 57.1	35.8	342 16.0	11.8	20 00.1	1.4	54.3								
15	44 57.2	36.7	356 46.8	11.8	20 01.5	1.3	54.3								
16	59 57.4	37.6	11 17.6	11.8	20 02.8	1.3	54.3								
17	74 57.5	38.5	25 48.4	11.8	20 04.1	1.1	54.3								
18	89 57.7	N 9 39.4	40 19.2	11.8	N20 05.2	1.0	54.3								
19	104 57.8	40.3	54 50.0	11.8	20 06.2	1.0	54.3								
20	119 58.0	41.2	69 20.8	11.8	20 07.2	0.8	54.3								
21	134 58.1	42.1	83 51.6	11.8	20 08.0	0.8	54.2								
22	149 58.3	43.0	98 22.4	11.9	20 08.8	0.6	54.2								
23	164 58.4	43.9	112 53.3	11.8	20 09.4	0.6	54.2								
15 00	179 58.6	N 9 44.8	127 24.1	11.9	N20 10.0	0.5	54.2								
01	194 58.7	45.6	141 55.0	11.8	20 10.5	0.3	54.2								
02	209 58.9	46.5	156 25.8	11.9	20 10.8	0.3	54.2								
03	224 59.0	47.4	170 56.7	11.8	20 11.1	0.2	54.2								
04	239 59.2	48.3	185 27.5	11.9	20 11.3	0.1	54.2								
05	254 59.3	49.2	199 58.4	11.9	20 11.4	0.0	54.2								
06	269 59.5	N 9 50.1	214 29.3	11.9	N20 11.4	0.1	54.2								
07	284 59.6	51.0	229 00.2	11.8	20 11.3	0.2	54.2								
08	299 59.8	51.9	243 31.0	11.9	20 11.1	0.3	54.2								
09	314 59.9	52.8	258 01.9	12.0	20 10.8	0.4	54.2								
10	330 00.1	53.7	272 32.9	11.9	20 10.4	0.4	54.2								
11	345 00.2	54.6	287 03.8	11.9	20 10.0	0.6	54.2								
12	0 00.4	N 9 55.5	301 34.7	11.9	N20 09.4	0.6	54.2								
13	15 00.5	56.4	316 05.6	12.0	20 08.8	0.8	54.2								
14	30 00.7	57.2	330 36.6	12.0	20 08.0	0.8	54.2								
15	45 00.8	58.1	345 07.6	11.9	20 07.2	1.0	54.2								
16	60 01.0	59.0	359 38.5	12.0	20 06.2	1.0	54.2								
17	75 01.1	9 59.9	14 09.5	12.0	20 05.2	1.1	54.2								
18	90 01.3	N10 00.8	28 40.5	12.0	N20 04.1	1.3	54.2								
19	105 01.4	01.7	43 11.5	12.0	20 02.8	1.3	54.2								
20	120 01.6	02.6	57 42.5	12.0	20 01.5	1.4	54.2								
21	135 01.7	03.5	72 13.5	12.1	20 00.1	1.5	54.2								
22	150 01.9	04.4	86 44.6	12.0	19 58.6	1.6	54.2								
23	165 02.0	05.2	101 15.6	12.1	N19 57.0	1.6	54.2								
	SD 16.0	d 0.9	SD 14.9		14.8		14.8								

UT	Lat.	Sunset	Twilight		Moonset			
			Civil	Naut.	13	14	15	16
	°	h m	h m	h m	h m	h m	h m	h m
	N 72	20 20	22 02	////				
	N 70	20 03	21 25	////	00 07	01 54		03 44
	68	19 50	21 00	23 24	24 49	00 49	01 53	02 33
	66	19 39	20 41	22 19	24 14	00 14	01 14	01 56
	64	19 30	20 25	21 45	23 48	24 46	00 46	01 30
	62	19 23	20 13	21 22	23 28	24 25	00 25	01 09
	60	19 16	20 02	21 04	23 12	24 08	00 08	00 53
	N 58	19 10	19 53	20 49	22 58	23 53	24 39	00 39
	56	19 05	19 45	20 36	22 47	23 41	24 27	00 27
	54	19 00	19 38	20 26	22 36	23 30	24 16	00 16
	52	18 56	19 32	20 17	22 27	23 21	24 07	00 07
	50	18 52	19 27	20 09	22 19	23 12	23 59	24 39
	45	18 44	19 15	19 52	22 02	22 54	23 41	24 23
	N 40	18 37	19 06	19 39	21 48	22 39	23 26	24 09
	35	18 32	18 58	19 29	21 36	22 26	23 14	23 57
	30	18 27	18 51	19 20	21 25	22 15	23 03	23 47
	20	18 18	18 40	19 07	21 07	21 57	22 44	23 30
	N 10	18 10	18 32	18 57	20 51	21 40	22 28	23 15
	0	18 04	18 25	18 49	20 37	21 25	22 13	23 01
	S 10	17 57	18 18	18 43	20 22	21 10	21 58	22 46
	20	17 50	18 12	18 38	20 06	20 53	21 42	22 31
	30	17 42	18 06	18 34	19 48	20 34	21 23	22 13
	35	17 37	18 03	18 32	19 38	20 23	21 12	22 03
	40	17 32	17 59	18 31	19 26	20 11	20 59	21 51
	45	17 26	17 56	18 30	19 12	19 56	20 45	21 37
	S 50	17 19	17 52	18 29	18 55	19 38	20 26	21 20
	52	17 16	17 50	18 29	18 47	19 29	20 18	21 12
	54	17 12	17 48	18 29	18 38	19 19	20 08	21 03
	56	17 08	17 46	18 29	18 28	19 09	19 57	20 53
	58	17 04	17 44	18 29	18 16	18 56	19 45	20 42
	S 60	16 59	17 41	18 29	18 03	18 42	19 31	20 29

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
13	00 36	00 28	12 00	14 25	02 01	03	9
14	00 21	00 13	12 00	15 13	02 49	04	15
15	00 06	00 01	12 00	16 01	03 37	05	23

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.0		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
16 00	204 18.2	175 15.1	N10 55.1	179 27.1	N 9 52.5	131 03.8	N22 11.2	346 41.0	S11 59.9
01	219 20.7	190 14.6	56.2	194 27.8	53.2	146 05.8	11.2	1 43.6	59.8
02	234 23.1	205 14.2	57.4	209 28.5	53.9	161 07.7	11.3	16 46.2	59.7
03	249 25.6	220 13.7	58.5	224 29.2	54.6	176 09.7	11.4	31 48.9	59.7
04	264 28.0	235 13.2	10 59.7	239 29.9	55.3	191 11.6	11.4	46 51.5	59.6
05	279 30.5	250 12.8	11 00.8	254 30.5	56.0	206 13.6	11.5	61 54.2	59.6
06	294 33.0	265 12.3	N11 02.0	269 31.2	N 9 56.7	221 15.6	N22 11.5	76 56.8	S11 59.5
07	309 35.4	280 11.8	03.1	284 31.9	57.4	236 17.5	11.6	91 59.4	59.5
08	324 37.9	295 11.4	04.3	299 32.6	58.1	251 19.5	11.7	107 02.1	59.4
09	339 40.4	310 10.9	05.4	314 33.3	58.8	266 21.4	11.7	122 04.7	59.3
10	354 42.8	325 10.5	06.5	329 34.0	9 59.5	281 23.4	11.8	137 07.4	59.3
11	9 45.3	340 10.0	07.7	344 34.7	10 00.2	296 25.3	11.8	152 10.0	59.2
12	24 47.8	355 09.5	N11 08.8	359 35.4	N10 00.9	311 27.3	N22 11.9	167 12.7	S11 59.2
13	39 50.2	10 09.1	10.0	14 36.1	01.6	326 29.2	12.0	182 15.3	59.1
14	54 52.7	25 08.6	11.1	29 36.7	02.3	341 31.2	12.0	197 17.9	59.0
15	69 55.2	40 08.1	12.3	44 37.4	03.0	356 33.2	12.1	212 20.6	59.0
16	84 57.6	55 07.7	13.4	59 38.1	03.7	11 35.1	12.1	227 23.2	58.9
17	100 00.1	70 07.2	14.5	74 38.8	04.4	26 37.1	12.2	242 25.9	58.9
18	115 02.5	85 06.7	N11 15.7	89 39.5	N10 05.1	41 39.0	N22 12.3	257 28.5	S11 58.8
19	130 05.0	100 06.2	16.8	104 40.2	05.8	56 41.0	12.3	272 31.1	58.7
20	145 07.5	115 05.8	18.0	119 40.9	06.5	71 42.9	12.4	287 33.8	58.7
21	160 09.9	130 05.3	19.1	134 41.6	07.2	86 44.9	12.4	302 36.4	58.6
22	175 12.4	145 04.8	20.2	149 42.3	07.9	101 46.8	12.5	317 39.1	58.6
23	190 14.9	160 04.4	21.4	164 42.9	08.6	116 48.8	12.6	332 41.7	58.5
17 00	205 17.3	175 03.9	N11 22.5	179 43.6	N10 09.3	131 50.8	N22 12.6	347 44.3	S11 58.4
01	220 19.8	190 03.4	23.6	194 44.3	10.0	146 52.7	12.7	2 47.0	58.4
02	235 22.3	205 03.0	24.8	209 45.0	10.7	161 54.7	12.7	17 49.6	58.3
03	250 24.7	220 02.5	25.9	224 45.7	11.4	176 56.6	12.8	32 52.3	58.3
04	265 27.2	235 02.0	27.0	239 46.4	12.1	191 58.6	12.9	47 54.9	58.2
05	280 29.7	250 01.5	28.2	254 47.1	12.8	207 00.5	12.9	62 57.6	58.1
06	295 32.1	265 01.1	N11 29.3	269 47.8	N10 13.5	222 02.5	N22 13.0	78 00.2	S11 58.1
07	310 34.6	280 00.6	30.4	284 48.4	14.2	237 04.4	13.0	93 02.8	58.0
08	325 37.0	295 00.1	31.6	299 49.1	14.9	252 06.4	13.1	108 05.5	58.0
09	340 39.5	309 59.7	32.7	314 49.8	15.6	267 08.3	13.2	123 08.1	57.9
10	355 42.0	324 59.2	33.8	329 50.5	16.3	282 10.3	13.2	138 10.8	57.8
11	10 44.4	339 58.7	35.0	344 51.2	17.0	297 12.2	13.3	153 13.4	57.8
12	25 46.9	354 58.2	N11 36.1	359 51.9	N10 17.7	312 14.2	N22 13.3	168 16.0	S11 57.7
13	40 49.4	9 57.8	37.2	14 52.6	18.4	327 16.1	13.4	183 18.7	57.7
14	55 51.8	24 57.3	38.4	29 53.3	19.1	342 18.1	13.5	198 21.3	57.6
15	70 54.3	39 56.8	39.5	44 53.9	19.8	357 20.0	13.5	213 24.0	57.5
16	85 56.8	54 56.3	40.6	59 54.6	20.5	12 22.0	13.6	228 26.6	57.5
17	100 59.2	69 55.9	41.7	74 55.3	21.2	27 23.9	13.6	243 29.3	57.4
18	116 01.7	84 55.4	N11 42.9	89 56.0	N10 21.9	42 25.9	N22 13.7	258 31.9	S11 57.4
19	131 04.1	99 54.9	44.0	104 56.7	22.6	57 27.8	13.8	273 34.5	57.3
20	146 06.6	114 54.4	45.1	119 57.4	23.3	72 29.8	13.8	288 37.2	57.2
21	161 09.1	129 53.9	46.3	134 58.1	24.0	87 31.7	13.9	303 39.8	57.2
22	176 11.5	144 53.5	47.4	149 58.8	24.7	102 33.7	13.9	318 42.5	57.1
23	191 14.0	159 53.0	48.5	164 59.5	25.4	117 35.6	14.0	333 45.1	57.1
18 00	206 16.5	174 52.5	N11 49.6	180 00.1	N10 26.1	132 37.6	N22 14.1	348 47.8	S11 57.0
01	221 18.9	189 52.0	50.8	195 00.8	26.8	147 39.6	14.1	3 50.4	56.9
02	236 21.4	204 51.6	51.9	210 01.5	27.5	162 41.5	14.2	18 53.0	56.9
03	251 23.9	219 51.1	53.0	225 02.2	28.2	177 43.4	14.2	33 55.7	56.8
04	266 26.3	234 50.6	54.1	240 02.9	28.9	192 45.4	14.3	48 58.3	56.8
05	281 28.8	249 50.1	55.2	255 03.6	29.5	207 47.3	14.4	64 01.0	56.7
06	296 31.3	264 49.6	N11 56.4	270 04.3	N10 30.2	222 49.3	N22 14.4	79 03.6	S11 56.6
07	311 33.7	279 49.1	57.5	285 04.9	30.9	237 51.2	14.5	94 06.2	56.6
08	326 36.2	294 48.7	58.6	300 05.6	31.6	252 53.2	14.5	109 08.9	56.5
09	341 38.6	309 48.2	11 59.7	315 06.3	32.3	267 55.1	14.6	124 11.5	56.5
10	356 41.1	324 47.7	12 00.9	330 07.0	33.0	282 57.1	14.7	139 14.2	56.4
11	11 43.6	339 47.2	02.0	345 07.7	33.7	297 59.0	14.7	154 16.8	56.3
12	26 46.0	354 46.7	N12 03.1	0 08.4	N10 34.4	313 01.0	N22 14.8	169 19.5	S11 56.3
13	41 48.5	9 46.3	04.2	15 09.1	35.1	328 02.9	14.8	184 22.1	56.2
14	56 51.0	24 45.8	05.3	30 09.8	35.8	343 04.9	14.9	199 24.7	56.2
15	71 53.4	39 45.3	06.4	45 10.4	36.5	358 06.8	14.9	214 27.4	56.1
16	86 55.9	54 44.8	07.6	60 11.1	37.2	13 08.8	15.0	229 30.0	56.0
17	101 58.4	69 44.3	08.7	75 11.8	37.9	28 10.7	15.1	244 32.7	56.0
18	117 00.8	84 43.8	N12 09.8	90 12.5	N10 38.5	43 12.7	N22 15.1	259 35.3	S11 55.9
19	132 03.3	99 43.3	10.9	105 13.2	39.2	58 14.6	15.2	274 38.0	55.9
20	147 05.8	114 42.9	12.0	120 13.9	39.9	73 16.6	15.2	289 40.6	55.8
21	162 08.2	129 42.4	13.1	135 14.6	40.6	88 18.5	15.3	304 43.3	55.7
22	177 10.7	144 41.9	14.3	150 15.3	41.3	103 20.5	15.4	319 45.9	55.7
23	192 13.1	159 41.4	15.4	165 15.9	42.0	118 22.4	15.4	334 48.5	55.6
	h m								
Mer. Pass.	10 17.2	v −0.5	d 1.1	v 0.7	d 0.7	v 2.0	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.3
Achernar	335 27.5	S57 10.2
Acrux	173 08.7	S63 10.6
Adhara	255 12.7	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.2
Alkaid	152 58.5	N49 14.7
Al Na'ir	27 44.1	S46 53.5
Alnilam	275 46.7	S 1 11.9
Alphard	217 56.1	S 8 43.3
Alphecca	126 10.8	N26 40.1
Alpheratz	357 43.9	N29 09.7
Altair	62 08.3	N 8 54.2
Ankaa	353 16.2	S42 14.0
Antares	112 26.1	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.6	S69 02.8
Avior	234 18.0	S59 33.6
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.4	S52 42.6
Capella	280 34.9	N46 00.6
Deneb	49 31.6	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.9
Dubhe	193 51.4	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 45.9	N51 29.1
Enif	33 47.4	N 9 56.1
Fomalhaut	15 24.4	S29 33.0
Gacrux	172 00.4	S57 11.5
Gienah	175 52.1	S17 37.2
Hadar	148 47.4	S60 26.3
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 18.9	N74 06.0
Markab	13 38.7	N15 16.5
Menkar	314 15.5	N 4 08.3
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.3	S69 46.8
Mirfak	308 40.9	N49 54.4
Nunki	75 58.4	S26 16.6
Peacock	53 19.5	S56 41.2
Pollux	243 27.9	N27 59.5
Procyon	244 59.9	N 5 11.2
Rasalhague	96 06.4	N12 33.0
Regulus	207 43.5	N11 53.9
Rigel	281 12.4	S 8 11.5
Rigil Kent.	139 51.2	S60 53.3
Sabik	102 12.4	S15 44.4
Schedar	349 41.2	N56 36.5
Shaula	96 21.8	S37 06.6
Sirius	258 33.9	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.4	S43 29.6
Vega	80 38.9	N38 47.6
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	329 46.6	12 20
Mars	334 26.3	12 01
Jupiter	286 33.4	15 11
Saturn	142 27.0	0 49

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 16	Moonrise 17	Moonrise 18	Moonrise 19
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
16 00	180 02.2	N10 06.1	115 46.7	12.1	N19 55.4	1.8	54.2	N 72	////	01 36	03 27	▭	▭	07 57	09 55
01	195 02.3	07.0	130 17.8	12.1	19 53.6	1.9	54.2	N 70	////	02 19	03 45	05 11	06 57	08 39	10 20
02	210 02.5	07.9	144 48.9	12.1	19 51.7	1.9	54.2	68	////	02 48	04 00	06 22	07 40	09 07	10 38
03	225 02.6	08.8	159 20.0	12.1	19 49.8	2.1	54.2	66	01 23	03 09	04 12	06 58	08 09	09 29	10 53
04	240 02.8	09.7	173 51.1	12.1	19 47.7	2.1	54.2	64	02 02	03 26	04 22	07 24	08 31	09 45	11 05
05	255 02.9	10.6	188 22.2	12.2	19 45.6	2.2	54.2	62	02 28	03 39	04 30	07 44	08 48	09 59	11 15
06	270 03.1	N10 11.4	202 53.4	12.2	N19 43.4	2.4	54.2	60	02 47	03 50	04 37	08 01	09 03	10 11	11 24
07	285 03.2	12.3	217 24.6	12.1	19 41.0	2.4	54.2	N 58	03 03	04 00	04 44	08 14	09 15	10 21	11 31
08	300 03.3	13.2	231 55.7	12.2	19 38.6	2.5	54.2	56	03 17	04 09	04 49	08 26	09 25	10 30	11 38
09	315 03.5	14.1	246 26.9	12.2	19 36.1	2.5	54.2	54	03 28	04 16	04 54	08 37	09 35	10 38	11 44
10	330 03.6	15.0	260 58.1	12.3	19 33.6	2.7	54.2	52	03 38	04 23	04 59	08 46	09 43	10 45	11 49
11	345 03.8	15.9	275 29.4	12.2	19 30.9	2.8	54.2	50	03 46	04 29	05 03	08 54	09 51	10 51	11 54
12	0 03.9	N10 16.8	290 00.6	12.3	N19 28.1	2.9	54.2	45	04 04	04 41	05 12	09 12	10 06	11 04	12 05
13	15 04.1	17.6	304 31.9	12.2	19 25.2	2.9	54.2	N 40	04 17	04 51	05 19	09 26	10 19	11 15	12 13
14	30 04.2	18.5	319 03.1	12.3	19 22.3	3.0	54.2	35	04 28	04 59	05 25	09 38	10 31	11 25	12 21
15	45 04.4	19.4	333 34.4	12.3	19 19.3	3.2	54.2	30	04 37	05 06	05 31	09 49	10 40	11 33	12 27
16	60 04.5	20.3	348 05.7	12.3	19 16.1	3.2	54.2	20	04 52	05 18	05 40	10 07	10 57	11 47	12 38
17	75 04.7	21.2	2 37.0	12.4	19 12.9	3.3	54.2	N 10	05 02	05 27	05 49	10 23	11 11	12 00	12 48
18	90 04.8	N10 22.0	17 08.4	12.3	N19 09.6	3.4	54.2	0	05 11	05 35	05 56	10 38	11 25	12 11	12 57
19	105 04.9	22.9	31 39.7	12.4	19 06.2	3.4	54.2	S 10	05 18	05 42	06 04	10 53	11 38	12 23	13 07
20	120 05.1	23.8	46 11.1	12.4	19 02.8	3.6	54.2	20	05 23	05 49	06 11	11 08	11 53	12 35	13 16
21	135 05.2	24.7	60 42.5	12.4	18 59.2	3.7	54.2	30	05 28	05 56	06 20	11 27	12 09	12 50	13 27
22	150 05.4	25.6	75 13.9	12.4	18 55.5	3.7	54.2	35	05 30	06 00	06 25	11 37	12 19	12 58	13 34
23	165 05.5	26.5	89 45.3	12.4	18 51.8	3.8	54.2	40	05 32	06 04	06 31	11 49	12 30	13 07	13 41
17 00	180 05.7	N10 27.3	104 16.7	12.5	N18 48.0	3.9	54.3	45	05 34	06 08	06 38	12 03	12 43	13 18	13 50
01	195 05.8	28.2	118 48.2	12.5	18 44.1	4.0	54.3	S 50	05 35	06 13	06 45	12 21	12 58	13 31	14 00
02	210 06.0	29.1	133 19.7	12.4	18 40.1	4.1	54.3	52	05 35	06 15	06 49	12 29	13 06	13 37	14 04
03	225 06.1	30.0	147 51.1	12.5	18 36.0	4.2	54.3	54	05 36	06 17	06 53	12 38	13 14	13 44	14 09
04	240 06.2	30.9	162 22.6	12.6	18 31.8	4.2	54.3	56	05 36	06 19	06 57	12 48	13 23	13 51	14 15
05	255 06.4	31.7	176 54.2	12.5	18 27.6	4.4	54.3	58	05 36	06 22	07 02	13 00	13 33	14 00	14 21
06	270 06.5	N10 32.6	191 25.7	12.6	N18 23.2	4.4	54.3	S 60	05 36	06 25	07 08	13 14	13 45	14 09	14 29
07	285 06.7	33.5	205 57.3	12.5	18 18.8	4.5	54.3								
08	300 06.8	34.4	220 28.8	12.6	18 14.3	4.6	54.3								
09	315 07.0	35.2	235 00.4	12.6	18 09.7	4.7	54.3								
10	330 07.1	36.1	249 32.0	12.6	18 05.0	4.7	54.3								
11	345 07.2	37.0	264 03.6	12.7	18 00.3	4.8	54.3								
12	0 07.4	N10 37.9	278 35.3	12.6	N17 55.5	5.0	54.4								
13	15 07.5	38.7	293 06.9	12.7	17 50.5	5.0	54.4								
14	30 07.7	39.6	307 38.6	12.7	17 45.5	5.1	54.4								
15	45 07.8	40.5	322 10.3	12.7	17 40.4	5.1	54.4								
16	60 08.0	41.4	336 42.0	12.7	17 35.3	5.3	54.4								
17	75 08.1	42.2	351 13.7	12.8	17 30.0	5.3	54.4								
18	90 08.2	N10 43.1	5 45.5	12.7	N17 24.7	5.4	54.4								
19	105 08.4	44.0	20 17.2	12.8	17 19.3	5.5	54.4								
20	120 08.5	44.9	34 49.0	12.8	17 13.8	5.6	54.5								
21	135 08.7	45.7	49 20.8	12.8	17 08.2	5.6	54.5								
22	150 08.8	46.6	63 52.6	12.8	17 02.6	5.8	54.5								
23	165 08.9	47.5	78 24.4	12.9	16 56.8	5.8	54.5								
18 00	180 09.1	N10 48.4	92 56.3	12.8	N16 51.0	5.9	54.5								
01	195 09.2	49.2	107 28.1	12.9	16 45.1	5.9	54.5								
02	210 09.4	50.1	122 00.0	12.9	16 39.2	6.1	54.5								
03	225 09.5	51.0	136 31.9	12.9	16 33.1	6.1	54.6								
04	240 09.6	51.9	151 03.8	12.9	16 27.0	6.2	54.6								
05	255 09.8	52.7	165 35.7	13.0	16 20.8	6.3	54.6								
06	270 09.9	N10 53.6	180 07.7	12.9	N16 14.5	6.3	54.6								
07	285 10.1	54.5	194 39.6	13.0	16 08.2	6.5	54.6								
08	300 10.2	55.3	209 11.6	13.0	16 01.7	6.5	54.6								
09	315 10.3	56.2	223 43.6	12.9	15 55.2	6.6	54.7								
10	330 10.5	57.1	238 15.5	13.1	15 48.6	6.6	54.7								
11	345 10.6	57.9	252 47.6	13.0	15 42.0	6.7	54.7								
12	0 10.7	N10 58.8	267 19.6	13.0	N15 35.3	6.8	54.7								
13	15 10.9	10 59.7	281 51.6	13.1	15 28.5	6.9	54.7								
14	30 11.0	11 00.6	296 23.7	13.0	15 21.6	7.0	54.7								
15	45 11.2	01.4	310 55.7	13.1	15 14.6	7.0	54.8								
16	60 11.3	02.3	325 27.8	13.1	15 07.6	7.1	54.8								
17	75 11.4	03.2	339 59.9	13.1	15 00.5	7.2	54.8								
18	90 11.6	N11 04.0	354 32.0	13.1	N14 53.3	7.2	54.8								
19	105 11.7	04.9	9 04.1	13.1	14 46.1	7.3	54.8								
20	120 11.8	05.8	23 36.2	13.1	14 38.8	7.4	54.9								
21	135 12.0	06.6	38 08.3	13.2	14 31.4	7.5	54.9								
22	150 12.1	07.5	52 40.5	13.1	14 23.9	7.5	54.9								
23	165 12.3	08.4	67 12.6	13.2	N14 16.4	7.6	54.9								
	SD 16.0	d 0.9	SD	14.8		14.8		14.9							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 16	Moonset 17	Moonset 18	Moonset 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 36	22 34	////	▭	▭	04 14	03 52
N 70	20 17	21 45	////	03 44	03 36	03 31	03 26
68	20 02	21 15	////	02 33	02 52	03 02	03 06
66	19 50	20 53	22 45	01 56	02 23	02 40	02 51
64	19 39	20 36	22 03	01 30	02 01	02 22	02 38
62	19 31	20 22	21 35	01 09	01 43	02 08	02 27
60	19 23	20 11	21 15	00 53	01 28	01 56	02 17
N 58	19 17	20 01	20 58	00 39	01 16	01 45	02 09
56	19 11	19 52	20 45	00 27	01 05	01 36	02 02
54	19 06	19 44	20 33	00 16	00 55	01 28	01 55
52	19 01	19 38	20 23	00 07	00 47	01 21	01 50
50	18 57	19 32	20 14	24 39	00 39	01 14	01 44
45	18 48	19 19	19 57	24 23	00 23	01 00	01 33
N 40	18 41	19 09	19 43	24 09	00 09	00 48	01 23
35	18 34	19 00	19 32	23 57	24 38	00 38	01 15
30	18 29	18 53	19 22	23 47	24 29	00 29	01 08
20	18 19	18 41	19 08	23 30	24 14	00 14	00 55
N 10	18 11	18 32	18 57	23 15	24 00	00 00	00 44
0	18 03	18 24	18 48	23 01	23 47	24 34	00 34
S 10	17 55	18 17	18 41	22 46	23 35	24 23	00 23
20	17 47	18 10	18 35	22 31	23 21	24 12	00 12
30	17 38	18 03	18 30	22 13	23 06	23 59	24 54
35	17 33	17 59	18 28	22 03	22 56	23 52	24 48
40	17 27	17 55	18 26	21 51	22 46	23 43	24 42
45	17 21	17 51	18 25	21 37	22 34	23 33	24 34
S 50	17 13	17 46	18 23	21 20	22 19	23 21	24 25
52	17 09	17 44	18 23	21 12	22 12	23 15	24 21
54	17 05	17 41	18 22	21 03	22 04	23 09	24 17
56	17 01	17 39	18 22	20 53	21 55	23 02	24 12
58	16 56	17 36	18 22	20 42	21 45	22 54	24 06
S 60	16 50	17 33	18 21	20 29	21 34	22 45	23 59

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
16	00 08	00 15	12 00	16 49	04 25	06	31
17	00 22	00 29	12 00	17 36	05 13	07	40
18	00 36	00 43	11 59	18 23	05 59	08	50

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.0		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
19 00	207 15.6	174 40.9	N12 16.5	180 16.6	N10 42.7	133 24.4	N22 15.5	349 51.2	S11 55.6
01	222 18.1	189 40.4	17.6	195 17.3	43.4	148 26.3	15.5	4 53.8	55.5
02	237 20.5	204 39.9	18.7	210 18.0	44.1	163 28.3	15.6	19 56.5	55.4
03	252 23.0	219 39.4	. . 19.8	225 18.7	. . 44.8	178 30.2	. . 15.7	34 59.1	. . 55.4
04	267 25.5	234 39.0	20.9	240 19.4	45.5	193 32.1	15.7	50 01.8	55.3
05	282 27.9	249 38.5	22.0	255 20.1	46.1	208 34.1	15.8	65 04.4	55.3
06	297 30.4	264 38.0	N12 23.1	270 20.7	N10 46.8	223 36.0	N22 15.8	80 07.0	S11 55.2
07	312 32.9	279 37.5	24.3	285 21.4	47.5	238 38.0	15.9	95 09.7	55.1
08	327 35.3	294 37.0	25.4	300 22.1	48.2	253 39.9	16.0	110 12.3	55.1
F 09	342 37.8	309 36.5	. . 26.5	315 22.8	. . 48.9	268 41.9	. . 16.0	125 15.0	. . 55.0
R 10	357 40.2	324 36.0	27.6	330 23.5	49.6	283 43.8	16.1	140 17.6	55.0
I 11	12 42.7	339 35.5	28.7	345 24.2	50.3	298 45.8	16.1	155 20.3	54.9
D 12	27 45.2	354 35.0	N12 29.8	0 24.9	N10 51.0	313 47.7	N22 16.2	170 22.9	S11 54.8
A 13	42 47.6	9 34.5	30.9	15 25.5	51.7	328 49.7	16.3	185 25.5	54.8
Y 14	57 50.1	24 34.0	32.0	30 26.2	52.3	343 51.6	16.3	200 28.2	54.7
15	72 52.6	39 33.6	. . 33.1	45 26.9	. . 53.0	358 53.5	. . 16.4	215 30.8	. . 54.7
16	87 55.0	54 33.1	34.2	60 27.6	53.7	13 55.5	16.4	230 33.5	54.6
17	102 57.5	69 32.6	35.3	75 28.3	54.4	28 57.4	16.5	245 36.1	54.5
18	118 00.0	84 32.1	N12 36.4	90 29.0	N10 55.1	43 59.4	N22 16.5	260 38.8	S11 54.5
19	133 02.4	99 31.6	37.5	105 29.6	55.8	59 01.3	16.6	275 41.4	54.4
20	148 04.9	114 31.1	38.6	120 30.3	56.5	74 03.3	16.7	290 44.1	54.4
21	163 07.4	129 30.6	. . 39.7	135 31.0	. . 57.1	89 05.2	. . 16.7	305 46.7	. . 54.3
22	178 09.8	144 30.1	40.8	150 31.7	57.8	104 07.1	16.8	320 49.3	54.2
23	193 12.3	159 29.6	41.9	165 32.4	58.5	119 09.1	16.8	335 52.0	54.2
20 00	208 14.7	174 29.1	N12 43.0	180 33.1	N10 59.2	134 11.0	N22 16.9	350 54.6	S11 54.1
01	223 17.2	189 28.6	44.1	195 33.8	10 59.9	149 13.0	17.0	5 57.3	54.1
02	238 19.7	204 28.1	45.2	210 34.4	11 00.6	164 14.9	17.0	20 59.9	54.0
03	253 22.1	219 27.6	. . 46.3	225 35.1	. . 01.3	179 16.9	. . 17.1	36 02.6	. . 53.9
04	268 24.6	234 27.1	47.4	240 35.8	01.9	194 18.8	17.1	51 05.2	53.9
05	283 27.1	249 26.6	48.5	255 36.5	02.6	209 20.7	17.2	66 07.9	53.8
06	298 29.5	264 26.1	N12 49.6	270 37.2	N11 03.3	224 22.7	N22 17.3	81 10.5	S11 53.8
S 07	313 32.0	279 25.6	50.7	285 37.9	04.0	239 24.6	17.3	96 13.1	53.7
A 08	328 34.5	294 25.1	51.8	300 38.5	04.7	254 26.6	17.4	111 15.8	53.6
T 09	343 36.9	309 24.6	. . 52.9	315 39.2	. . 05.4	269 28.5	. . 17.4	126 18.4	. . 53.6
U 10	358 39.4	324 24.1	54.0	330 39.9	06.0	284 30.5	17.5	141 21.1	53.5
R 11	13 41.9	339 23.6	55.1	345 40.6	06.7	299 32.4	17.5	156 23.7	53.5
D 12	28 44.3	354 23.1	N12 56.2	0 41.3	N11 07.4	314 34.3	N22 17.6	171 26.4	S11 53.4
A 13	43 46.8	9 22.6	57.3	15 42.0	08.1	329 36.3	17.7	186 29.0	53.3
Y 14	58 49.2	24 22.1	58.4	30 42.7	08.8	344 38.2	17.7	201 31.7	53.3
15	73 51.7	39 21.6	12 59.5	45 43.3	. . 09.5	359 40.2	. . 17.8	216 34.3	. . 53.2
16	88 54.2	54 21.1	13 00.6	60 44.0	10.1	14 42.1	17.8	231 36.9	53.2
17	103 56.6	69 20.6	01.7	75 44.7	10.8	29 44.0	17.9	246 39.6	53.1
18	118 59.1	84 20.1	N13 02.7	90 45.4	N11 11.5	44 46.0	N22 18.0	261 42.2	S11 53.0
19	134 01.6	99 19.6	03.8	105 46.1	12.2	59 47.9	18.0	276 44.9	53.0
20	149 04.0	114 19.1	04.9	120 46.8	12.9	74 49.9	18.1	291 47.5	52.9
21	164 06.5	129 18.6	. . 06.0	135 47.4	. . 13.5	89 51.8	. . 18.1	306 50.2	. . 52.9
22	179 09.0	144 18.1	07.1	150 48.1	14.2	104 53.7	18.2	321 52.8	52.8
23	194 11.4	159 17.6	08.2	165 48.8	14.9	119 55.7	18.3	336 55.5	52.7
21 00	209 13.9	174 17.1	N13 09.3	180 49.5	N11 15.6	134 57.6	N22 18.3	351 58.1	S11 52.7
01	224 16.3	189 16.6	10.4	195 50.2	16.3	149 59.6	18.4	7 00.7	52.6
02	239 18.8	204 16.0	11.5	210 50.9	16.9	165 01.5	18.4	22 03.4	52.6
03	254 21.3	219 15.5	. . 12.5	225 51.5	. . 17.6	180 03.4	. . 18.5	37 06.0	. . 52.5
04	269 23.7	234 15.0	13.6	240 52.2	18.3	195 05.4	18.5	52 08.7	52.4
05	284 26.2	249 14.5	14.7	255 52.9	19.0	210 07.3	18.6	67 11.3	52.4
06	299 28.7	264 14.0	N13 15.8	270 53.6	N11 19.7	225 09.3	N22 18.7	82 14.0	S11 52.3
07	314 31.1	279 13.5	16.9	285 54.3	20.3	240 11.2	18.7	97 16.6	52.3
08	329 33.6	294 13.0	18.0	300 55.0	21.0	255 13.1	18.8	112 19.3	52.2
S 09	344 36.1	309 12.5	. . 19.0	315 55.6	. . 21.7	270 15.1	. . 18.8	127 21.9	. . 52.1
U 10	359 38.5	324 12.0	20.1	330 56.3	22.4	285 17.0	18.9	142 24.6	52.1
N 11	14 41.0	339 11.5	21.2	345 57.0	23.1	300 18.9	19.0	157 27.2	52.0
D 12	29 43.5	354 11.0	N13 22.3	0 57.7	N11 23.7	315 20.9	N22 19.0	172 29.8	S11 52.0
A 13	44 45.9	9 10.4	23.4	15 58.4	24.4	330 22.8	19.1	187 32.5	51.9
Y 14	59 48.4	24 09.9	24.4	30 59.1	25.1	345 24.8	19.1	202 35.1	51.8
15	74 50.8	39 09.4	. . 25.5	45 59.7	. . 25.8	0 26.7	. . 19.2	217 37.8	. . 51.8
16	89 53.3	54 08.9	26.6	61 00.4	26.4	15 28.6	19.2	232 40.4	51.7
17	104 55.8	69 08.4	27.7	76 01.1	27.1	30 30.6	19.3	247 43.1	51.7
18	119 58.2	84 07.9	N13 28.8	91 01.8	N11 27.8	45 32.5	N22 19.4	262 45.7	S11 51.6
19	135 00.7	99 07.4	29.8	106 02.5	28.5	60 34.4	19.4	277 48.4	51.5
20	150 03.2	114 06.9	30.9	121 03.1	29.1	75 36.4	19.5	292 51.0	51.5
21	165 05.6	129 06.3	. . 32.0	136 03.8	. . 29.8	90 38.3	. . 19.5	307 53.7	. . 51.4
22	180 08.1	144 05.8	33.1	151 04.5	30.5	105 40.2	19.6	322 56.3	51.4
23	195 10.6	159 05.3	34.1	166 05.2	31.2	120 42.2	19.6	337 58.9	51.3
	h m								
Mer.Pass.	10 05.4	v −0.5	d 1.1	v 0.7	d 0.7	v 1.9	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.3
Achernar	335 27.5	S57 10.2
Acrux	173 08.7	S63 10.6
Adhara	255 12.7	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.2
Alkaid	152 58.5	N49 14.7
Al Na'ir	27 44.1	S46 53.5
Alnilam	275 46.7	S 1 11.9
Alphard	217 56.1	S 8 43.3
Alphecca	126 10.8	N26 40.1
Alpheratz	357 43.9	N29 09.7
Altair	62 08.3	N 8 54.2
Ankaa	353 16.2	S42 14.0
Antares	112 26.1	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.6	S69 02.8
Avior	234 18.0	S59 33.6
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.4	S52 42.6
Capella	280 34.9	N46 00.6
Deneb	49 31.6	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.8
Dubhe	193 51.4	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 45.9	N51 29.1
Enif	33 47.4	N 9 56.1
Fomalhaut	15 24.4	S29 33.0
Gacrux	172 00.4	S57 11.5
Gienah	175 52.1	S17 37.2
Hadar	148 47.4	S60 26.3
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 18.9	N74 06.0
Markab	13 38.7	N15 16.5
Menkar	314 15.5	N 4 08.3
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.4	S69 46.8
Mirfak	308 41.0	N49 54.4
Nunki	75 58.3	S26 16.6
Peacock	53 19.5	S56 41.2
Pollux	243 27.9	N27 59.5
Procyon	244 59.9	N 5 11.2
Rasalhague	96 06.3	N12 33.0
Regulus	207 43.5	N11 53.9
Rigel	281 12.4	S 8 11.5
Rigil Kent.	139 51.2	S60 53.4
Sabik	102 12.4	S15 44.4
Schedar	349 41.1	N56 36.5
Shaula	96 21.8	S37 06.6
Sirius	258 33.9	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.4	S43 29.6
Vega	80 38.9	N38 47.6
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	326 14.3	12 22
Mars	332 18.3	11 57
Jupiter	285 56.3	15 01
Saturn	142 39.9	0 36

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		19	20	21	22
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
19 00	180 12.4	N11 09.2	81 44.8	13.2	N14 08.8	7.6	54.9	N 72	////	00 53	03 09	09 55	11 45	13 33	15 23
01	195 12.5	10.1	96 17.0	13.2	14 01.2	7.8	55.0	N 70	////	01 56	03 30	10 20	11 59	13 40	15 23
02	210 12.7	10.9	110 49.2	13.1	13 53.4	7.8	55.0	68	////	02 30	03 47	10 38	12 11	13 45	15 22
03	225 12.8	. . 11.8	125 21.3	13.2	13 45.6	7.8	55.0	66	00 46	02 54	04 00	10 53	12 20	13 49	15 21
04	240 12.9	12.7	139 53.5	13.3	13 37.8	8.0	55.0	64	01 41	03 13	04 11	11 05	12 27	13 53	15 21
05	255 13.1	13.5	154 25.8	13.2	13 29.8	8.0	55.1	62	02 12	03 28	04 21	11 15	12 34	13 56	15 21
06	270 13.2	N11 14.4	168 58.0	13.2	N13 21.8	8.1	55.1	60	02 35	03 41	04 29	11 24	12 40	13 59	15 20
07	285 13.3	15.3	183 30.2	13.2	13 13.7	8.1	55.1	N 58	02 52	03 51	04 36	11 31	12 45	14 01	15 20
08	300 13.5	16.1	198 02.4	13.3	13 05.6	8.2	55.1	56	03 07	04 01	04 42	11 38	12 49	14 03	15 20
F 09	315 13.6	. . 17.0	212 34.7	13.2	12 57.4	8.3	55.1	54	03 19	04 09	04 47	11 44	12 53	14 05	15 19
R 10	330 13.7	17.9	227 06.9	13.3	12 49.1	8.3	55.2	52	03 30	04 16	04 52	11 49	12 57	14 07	15 19
I 11	345 13.9	18.7	241 39.2	13.2	12 40.8	8.4	55.2	50	03 39	04 22	04 57	11 54	13 00	14 08	15 19
D 12	0 14.0	N11 19.6	256 11.4	13.3	N12 32.4	8.4	55.2	45	03 58	04 36	05 07	12 05	13 07	14 12	15 19
A 13	15 14.1	20.4	270 43.7	13.3	12 24.0	8.6	55.2	N 40	04 12	04 46	05 15	12 13	13 13	14 15	15 18
Y 14	30 14.3	21.3	285 16.0	13.2	12 15.4	8.6	55.3	35	04 24	04 55	05 22	12 21	13 18	14 17	15 18
15	45 14.4	. . 22.2	299 48.2	13.3	12 06.8	8.6	55.3	30	04 34	05 03	05 28	12 27	13 23	14 19	15 18
16	60 14.5	23.0	314 20.5	13.3	11 58.2	8.7	55.3	20	04 49	05 16	05 38	12 38	13 30	14 23	15 17
17	75 14.7	23.9	328 52.8	13.3	11 49.5	8.8	55.3	N 10	05 01	05 26	05 47	12 48	13 37	14 26	15 17
18	90 14.8	N11 24.7	343 25.1	13.2	N11 40.7	8.8	55.4	0	05 10	05 34	05 56	12 57	13 43	14 29	15 17
19	105 14.9	25.6	357 57.3	13.3	11 31.9	8.9	55.4	S 10	05 18	05 42	06 04	13 07	13 50	14 33	15 16
20	120 15.1	26.5	12 29.6	13.3	11 23.0	9.0	55.4	20	05 24	05 50	06 12	13 16	13 56	14 36	15 16
21	135 15.2	. . 27.3	27 01.9	13.3	11 14.0	9.0	55.4	30	05 30	05 58	06 22	13 27	14 04	14 40	15 16
22	150 15.3	28.2	41 34.2	13.3	11 05.0	9.1	55.5	35	05 32	06 02	06 28	13 34	14 08	14 42	15 16
23	165 15.5	29.0	56 06.5	13.3	10 55.9	9.1	55.5	40	05 35	06 06	06 34	13 41	14 13	14 44	15 15
20 00	180 15.6	N11 29.9	70 38.8	13.3	N10 46.8	9.2	55.5	45	05 37	06 11	06 41	13 50	14 19	14 47	15 15
01	195 15.7	30.7	85 11.1	13.2	10 37.6	9.2	55.6	S 50	05 39	06 17	06 50	14 00	14 26	14 50	15 15
02	210 15.9	31.6	99 43.3	13.3	10 28.4	9.3	55.6	52	05 40	06 19	06 54	14 04	14 29	14 52	15 15
03	225 16.0	. . 32.5	114 15.6	13.3	10 19.1	9.4	55.6	54	05 41	06 22	06 59	14 09	14 32	14 54	15 15
04	240 16.1	33.3	128 47.9	13.3	10 09.7	9.4	55.6	56	05 42	06 25	07 03	14 15	14 36	14 56	15 15
05	255 16.3	34.2	143 20.2	13.2	10 00.3	9.5	55.7	58	05 42	06 28	07 09	14 21	14 40	14 58	15 15
06	270 16.4	N11 35.0	157 52.4	13.3	N 9 50.8	9.5	55.7	S 60	05 43	06 32	07 15	14 29	14 45	15 00	15 14
S 07	285 16.5	35.9	172 24.7	13.3	9 41.3	9.6	55.7								
A 08	300 16.7	36.7	186 57.0	13.2	9 31.7	9.7	55.8								
T 09	315 16.8	. . 37.6	201 29.2	13.3	9 22.0	9.6	55.8								
U 10	330 16.9	38.4	216 01.5	13.2	9 12.4	9.8	55.8								
R 11	345 17.0	39.3	230 33.7	13.3	9 02.6	9.8	55.8								
D 12	0 17.2	N11 40.1	245 06.0	13.2	N 8 52.8	9.8	55.9								
A 13	15 17.3	41.0	259 38.2	13.2	8 43.0	9.9	55.9								
Y 14	30 17.4	41.9	274 10.4	13.3	8 33.1	10.0	55.9								
15	45 17.6	. . 42.7	288 42.7	13.2	8 23.1	10.0	56.0								
16	60 17.7	43.6	303 14.9	13.2	8 13.1	10.0	56.0								
17	75 17.8	44.4	317 47.1	13.1	8 03.1	10.1	56.0								
18	90 18.0	N11 45.3	332 19.2	13.2	N 7 53.0	10.2	56.1								
19	105 18.1	46.1	346 51.4	13.2	7 42.8	10.2	56.1								
20	120 18.2	47.0	1 23.6	13.1	7 32.6	10.2	56.1								
21	135 18.3	. . 47.8	15 55.7	13.2	7 22.4	10.3	56.2								
22	150 18.5	48.7	30 27.9	13.1	7 12.1	10.3	56.2								
23	165 18.6	49.5	45 00.0	13.1	7 01.8	10.4	56.2								
21 00	180 18.7	N11 50.4	59 32.1	13.1	N 6 51.4	10.4	56.3								
01	195 18.8	51.2	74 04.2	13.1	6 41.0	10.5	56.3								
02	210 19.0	52.1	88 36.3	13.0	6 30.5	10.5	56.3								
03	225 19.1	. . 52.9	103 08.3	13.1	6 20.0	10.6	56.4								
04	240 19.2	53.8	117 40.4	13.0	6 09.4	10.6	56.4								
05	255 19.4	54.6	132 12.4	13.0	5 58.8	10.6	56.4								
06	270 19.5	N11 55.5	146 44.4	13.0	N 5 48.2	10.7	56.5								
07	285 19.6	56.3	161 16.4	12.9	5 37.5	10.7	56.5								
08	300 19.7	57.1	175 48.3	13.0	5 26.8	10.8	56.5								
S 09	315 19.9	. . 58.0	190 20.3	12.9	5 16.0	10.7	56.6								
U 10	330 20.0	58.8	204 52.2	12.9	5 05.3	10.9	56.6								
N 11	345 20.1	11 59.7	219 24.1	12.9	4 54.4	10.8	56.6								
D 12	0 20.2	N12 00.5	233 56.0	12.8	N 4 43.6	11.0	56.7								
A 13	15 20.4	01.4	248 27.8	12.9	4 32.6	10.9	56.7								
Y 14	30 20.5	02.2	262 59.7	12.8	4 21.7	11.0	56.7								
15	45 20.6	. . 03.1	277 31.5	12.8	4 10.7	11.0	56.8								
16	60 20.7	03.9	292 03.3	12.7	3 59.7	11.0	56.8								
17	75 20.9	04.8	306 35.0	12.7	3 48.7	11.1	56.8								
18	90 21.0	N12 05.6	321 06.7	12.7	N 3 37.6	11.1	56.9								
19	105 21.1	06.4	335 38.4	12.7	3 26.5	11.1	56.9								
20	120 21.2	07.3	350 10.1	12.7	3 15.4	11.2	56.9								
21	135 21.4	. . 08.1	4 41.8	12.6	3 04.2	11.2	57.0								
22	150 21.5	09.0	19 13.4	12.5	2 53.0	11.2	57.0								
23	165 21.6	09.8	33 44.9	12.6	N 2 41.8	11.3	57.0								
	SD 15.9	d 0.9	SD	15.0		15.2		15.4							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	19	20	21	22
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 54	23 27	////	03 52	03 37	03 26	03 15
N 70	20 31	22 09	////	03 26	03 21	03 17	03 12
68	20 14	21 32	////	03 06	03 09	03 10	03 10
66	20 00	21 07	23 31	02 51	02 58	03 04	03 09
64	19 49	20 48	22 23	02 38	02 49	02 59	03 07
62	19 39	20 32	21 50	02 27	02 42	02 55	03 06
60	19 31	20 19	21 26	02 17	02 35	02 51	03 05
N 58	19 24	20 08	21 08	02 09	02 29	02 47	03 04
56	19 17	19 59	20 53	02 02	02 24	02 44	03 03
54	19 12	19 51	20 41	01 55	02 20	02 42	03 02
52	19 06	19 43	20 30	01 50	02 15	02 39	03 02
50	19 02	19 37	20 20	01 44	02 12	02 37	03 01
45	18 52	19 23	20 01	01 33	02 03	02 32	03 00
N 40	18 44	19 12	19 46	01 23	01 56	02 28	02 58
35	18 37	19 03	19 34	01 15	01 50	02 24	02 57
30	18 30	18 55	19 25	01 08	01 45	02 21	02 56
20	18 20	18 42	19 09	00 55	01 35	02 15	02 55
N 10	18 11	18 32	18 57	00 44	01 27	02 10	02 53
0	18 02	18 23	18 48	00 34	01 19	02 05	02 52
S 10	17 54	18 15	18 40	00 23	01 12	02 01	02 50
20	17 45	18 07	18 33	00 12	01 03	01 55	02 49
30	17 35	18 00	18 28	24 54	00 54	01 50	02 47
35	17 30	17 55	18 25	24 48	00 48	01 46	02 46
40	17 23	17 51	18 22	24 42	00 42	01 42	02 45
45	17 16	17 46	18 20	24 34	00 34	01 38	02 43
S 50	17 07	17 40	18 18	24 25	00 25	01 32	02 42
52	17 03	17 38	18 17	24 21	00 21	01 30	02 41
54	16 58	17 35	18 16	24 17	00 17	01 27	02 40
56	16 53	17 32	18 15	24 12	00 12	01 24	02 39
58	16 48	17 29	18 14	24 06	00 06	01 21	02 38
S 60	16 42	17 25	18 14	23 59	25 17	01 17	02 37

Day	SUN		Mer. Pass.	MOON		Age	Phase
	Eqn. of Time			Mer. Pass.			
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
19	00 49	00 56	11 59	19 08	06 46	09	60
20	01 02	01 08	11 59	19 54	07 31	10	69
21	01 15	01 21	11 59	20 41	08 17	11	78

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.0		SATURN +0.1	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
22 00	210 13.0	174 04.8	N13 35.2	181 05.9	N11 31.9	135 44.1	N22 19.7	353 01.6	S11 51.2
01	225 15.5	189 04.3	36.3	196 06.6	32.5	150 46.1	19.8	8 04.2	51.2
02	240 17.9	204 03.8	37.4	211 07.2	33.2	165 48.0	19.8	23 06.9	51.1
03	255 20.4	219 03.2 . .	38.4	226 07.9 . .	33.9	180 49.9 . .	19.9	38 09.5 . .	51.1
04	270 22.9	234 02.7	39.5	241 08.6	34.6	195 51.9	19.9	53 12.2	51.0
05	285 25.3	249 02.2	40.6	256 09.3	35.2	210 53.8	20.0	68 14.8	50.9
06	300 27.8	264 01.7	N13 41.6	271 10.0	N11 35.9	225 55.7	N22 20.1	83 17.5	S11 50.9
07	315 30.3	279 01.2	42.7	286 10.6	36.6	240 57.7	20.1	98 20.1	50.8
08	330 32.7	294 00.7	43.8	301 11.3	37.2	255 59.6	20.2	113 22.8	50.8
M 09	345 35.2	309 00.1 . .	44.8	316 12.0 . .	37.9	271 01.5 . .	20.2	128 25.4 . .	50.7
O 10	0 37.7	323 59.6	45.9	331 12.7	38.6	286 03.5	20.3	143 28.1	50.6
N 11	15 40.1	338 59.1	47.0	346 13.4	39.3	301 05.4	20.3	158 30.7	50.6
D 12	30 42.6	353 58.6	N13 48.0	1 14.1	N11 39.9	316 07.3	N22 20.4	173 33.3	S11 50.5
A 13	45 45.1	8 58.1	49.1	16 14.7	40.6	331 09.3	20.5	188 36.0	50.5
Y 14	60 47.5	23 57.5	50.2	31 15.4	41.3	346 11.2	20.5	203 38.6	50.4
15	75 50.0	38 57.0 . .	51.2	46 16.1 . .	42.0	1 13.1 . .	20.6	218 41.3 . .	50.3
16	90 52.4	53 56.5	52.3	61 16.8	42.6	16 15.1	20.6	233 43.9	50.3
17	105 54.9	68 56.0	53.4	76 17.5	43.3	31 17.0	20.7	248 46.6	50.2
18	120 57.4	83 55.4	N13 54.4	91 18.1	N11 44.0	46 18.9	N22 20.7	263 49.2	S11 50.2
19	135 59.8	98 54.9	55.5	106 18.8	44.6	61 20.9	20.8	278 51.9	50.1
20	151 02.3	113 54.4	56.6	121 19.5	45.3	76 22.8	20.9	293 54.5	50.0
21	166 04.8	128 53.9 . .	57.6	136 20.2 . .	46.0	91 24.7 . .	20.9	308 57.2 . .	50.0
22	181 07.2	143 53.4	58.7	151 20.9	46.7	106 26.7	21.0	323 59.8	49.9
23	196 09.7	158 52.8 13	59.7	166 21.5	47.3	121 28.6	21.0	339 02.4	49.9
23 00	211 12.2	173 52.3	N14 00.8	181 22.2	N11 48.0	136 30.5	N22 21.1	354 05.1	S11 49.8
01	226 14.6	188 51.8	01.9	196 22.9	48.7	151 32.5	21.2	9 07.7	49.7
02	241 17.1	203 51.2	02.9	211 23.6	49.3	166 34.4	21.2	24 10.4	49.7
03	256 19.6	218 50.7 . .	04.0	226 24.3 . .	50.0	181 36.3 . .	21.3	39 13.0 . .	49.6
04	271 22.0	233 50.2	05.0	241 24.9	50.7	196 38.3	21.3	54 15.7	49.6
05	286 24.5	248 49.7	06.1	256 25.6	51.3	211 40.2	21.4	69 18.3	49.5
06	301 26.9	263 49.1	N14 07.2	271 26.3	N11 52.0	226 42.1	N22 21.4	84 21.0	S11 49.4
07	316 29.4	278 48.6	08.2	286 27.0	52.7	241 44.1	21.5	99 23.6	49.4
08	331 31.9	293 48.1	09.3	301 27.7	53.3	256 46.0	21.6	114 26.3	49.3
T 09	346 34.3	308 47.6 . .	10.3	316 28.3 . .	54.0	271 47.9 . .	21.6	129 28.9 . .	49.3
U 10	1 36.8	323 47.0	11.4	331 29.0	54.7	286 49.9	21.7	144 31.6	49.2
E 11	16 39.3	338 46.5	12.4	346 29.7	55.3	301 51.8	21.7	159 34.2	49.1
S 12	31 41.7	353 46.0	N14 13.5	1 30.4	N11 56.0	316 53.7	N22 21.8	174 36.9	S11 49.1
D 13	46 44.2	8 45.4	14.5	16 31.1	56.7	331 55.7	21.8	189 39.5	49.0
A 14	61 46.7	23 44.9	15.6	31 31.7	57.3	346 57.6	21.9	204 42.1	49.0
Y 15	76 49.1	38 44.4 . .	16.6	46 32.4 . .	58.0	1 59.5 . .	22.0	219 44.8 . .	48.9
16	91 51.6	53 43.8	17.7	61 33.1	58.7	17 01.4	22.0	234 47.4	48.8
17	106 54.0	68 43.3	18.7	76 33.8	11 59.3	32 03.4	22.1	249 50.1	48.8
18	121 56.5	83 42.8	N14 19.8	91 34.5	N12 00.0	47 05.3	N22 22.1	264 52.7	S11 48.7
19	136 59.0	98 42.2	20.8	106 35.1	00.7	62 07.2	22.2	279 55.4	48.6
20	152 01.4	113 41.7	21.9	121 35.8	01.3	77 09.2	22.2	294 58.0	48.6
21	167 03.9	128 41.2 . .	22.9	136 36.5 . .	02.0	92 11.1 . .	22.3	310 00.7 . .	48.5
22	182 06.4	143 40.6	24.0	151 37.2	02.7	107 13.0	22.4	325 03.3	48.5
23	197 08.8	158 40.1	25.0	166 37.9	03.3	122 15.0	22.4	340 06.0	48.4
24 00	212 11.3	173 39.6	N14 26.1	181 38.5	N12 04.0	137 16.9	N22 22.5	355 08.6	S11 48.3
01	227 13.8	188 39.0	27.1	196 39.2	04.7	152 18.8	22.5	10 11.3	48.3
02	242 16.2	203 38.5	28.1	211 39.9	05.3	167 20.7	22.6	25 13.9	48.2
03	257 18.7	218 38.0 . .	29.2	226 40.6 . .	06.0	182 22.7 . .	22.6	40 16.6 . .	48.2
04	272 21.2	233 37.4	30.2	241 41.2	06.7	197 24.6	22.7	55 19.2	48.1
05	287 23.6	248 36.9	31.3	256 41.9	07.3	212 26.5	22.8	70 21.8	48.0
06	302 26.1	263 36.3	N14 32.3	271 42.6	N12 08.0	227 28.5	N22 22.8	85 24.5	S11 48.0
W 07	317 28.5	278 35.8	33.4	286 43.3	08.6	242 30.4	22.9	100 27.1	47.9
E 08	332 31.0	293 35.3	34.4	301 44.0	09.3	257 32.3	22.9	115 29.8	47.9
D 09	347 33.5	308 34.7 . .	35.4	316 44.6 . .	10.0	272 34.2 . .	23.0	130 32.4 . .	47.8
N 10	2 35.9	323 34.2	36.5	331 45.3	10.6	287 36.2	23.0	145 35.1	47.7
E 11	17 38.4	338 33.6	37.5	346 46.0	11.3	302 38.1	23.1	160 37.7	47.7
S 12	32 40.9	353 33.1	N14 38.5	1 46.7	N12 12.0	317 40.0	N22 23.2	175 40.4	S11 47.6
D 13	47 43.3	8 32.6	39.6	16 47.4	12.6	332 42.0	23.2	190 43.0	47.6
A 14	62 45.8	23 32.0	40.6	31 48.0	13.3	347 43.9	23.3	205 45.7	47.5
Y 15	77 48.3	38 31.5 . .	41.7	46 48.7 . .	13.9	2 45.8 . .	23.3	220 48.3 . .	47.4
16	92 50.7	53 30.9	42.7	61 49.4	14.6	17 47.7	23.4	235 51.0	47.4
17	107 53.2	68 30.4	43.7	76 50.1	15.3	32 49.7	23.4	250 53.6	47.3
18	122 55.6	83 29.8	N14 44.8	91 50.7	N12 15.9	47 51.6	N22 23.5	265 56.3	S11 47.3
19	137 58.1	98 29.3	45.8	106 51.4	16.6	62 53.5	23.6	280 58.9	47.2
20	153 00.6	113 28.8	46.8	121 52.1	17.2	77 55.4	23.6	296 01.6	47.1
21	168 03.0	128 28.2 . .	47.9	136 52.8 . .	17.9	92 57.4 . .	23.7	311 04.2 . .	47.1
22	183 05.5	143 27.7	48.9	151 53.5	18.6	107 59.3	23.7	326 06.8	47.0
23	198 08.0	158 27.1	49.9	166 54.1	19.2	123 01.2	23.8	341 09.5	47.0
	h m								
Mer. Pass.	9 53.6	v −0.5	d 1.1	v 0.7	d 0.7	v 1.9	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.9	S40 15.2
Achernar	335 27.5	S57 10.2
Acrux	173 08.7	S63 10.6
Adhara	255 12.7	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.2
Alkaid	152 58.5	N49 14.8
Al Na'ir	27 44.1	S46 53.5
Alnilam	275 46.7	S 1 11.9
Alphard	217 56.1	S 8 43.3
Alphecca	126 10.8	N26 40.1
Alpheratz	357 43.9	N29 09.7
Altair	62 08.3	N 8 54.2
Ankaa	353 16.2	S42 13.9
Antares	112 26.1	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.6	S69 02.8
Avior	234 18.0	S59 33.6
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.5	S52 42.6
Capella	280 34.9	N46 00.6
Deneb	49 31.6	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.8
Dubhe	193 51.4	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 45.9	N51 29.1
Enif	33 47.3	N 9 56.1
Fomalhaut	15 24.3	S29 33.0
Gacrux	172 00.5	S57 11.5
Gienah	175 52.1	S17 37.2
Hadar	148 47.3	S60 26.3
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 18.9	N74 06.0
Markab	13 38.6	N15 16.6
Menkar	314 15.5	N 4 08.3
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.4	S69 46.8
Mirfak	308 41.0	N49 54.4
Nunki	75 58.3	S26 16.6
Peacock	53 19.4	S56 41.1
Pollux	243 27.9	N27 59.5
Procyon	244 59.9	N 5 11.2
Rasalhague	96 06.3	N12 33.0
Regulus	207 43.5	N11 53.9
Rigel	281 12.4	S 8 11.5
Rigil Kent.	139 51.2	S60 53.4
Sabik	102 12.4	S15 44.4
Schedar	349 41.1	N56 36.5
Shaula	96 21.8	S37 06.6
Sirius	258 34.0	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.4	S43 29.6
Vega	80 38.8	N38 47.6
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	322 40.1	12 25
Mars	330 10.1	11 54
Jupiter	285 18.4	14 52
Saturn	142 52.9	0 24

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		22	23	24	25
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
22 00	180 21.7	N12 10.6	48 16.5	12.5	N 2 30.5	11.3	57.1	N 72	////	////	02 50	15 23	17 18	19 21	21 38
01	195 21.9	11.5	62 48.0	12.5	2 19.2	11.3	57.1	N 70	////	01 28	03 14	15 23	17 10	19 03	21 04
02	210 22.0	12.3	77 19.5	12.4	2 07.9	11.3	57.2	68	////	02 11	03 33	15 22	17 03	18 49	20 40
03	225 22.1 . .	13.2	91 50.9	12.5	1 56.6	11.4	57.2	66	////	02 39	03 48	15 21	16 57	18 37	20 21
04	240 22.2	14.0	106 22.4	12.3	1 45.2	11.4	57.2	64	01 17	03 00	04 01	15 21	16 53	18 28	20 06
05	255 22.3	14.8	120 53.7	12.4	1 33.8	11.4	57.3	62	01 56	03 17	04 11	15 21	16 49	18 20	19 53
06	270 22.5	N12 15.7	135 25.1	12.3	N 1 22.4	11.4	57.3	60	02 21	03 31	04 20	15 20	16 45	18 13	19 43
07	285 22.6	16.5	149 56.4	12.3	1 11.0	11.4	57.3	N 58	02 41	03 42	04 28	15 20	16 42	18 07	19 34
08	300 22.7	17.4	164 27.7	12.2	0 59.6	11.5	57.4	56	02 57	03 52	04 35	15 20	16 39	18 02	19 25
M 09	315 22.8 . .	18.2	178 58.9	12.2	0 48.1	11.5	57.4	54	03 10	04 01	04 41	15 19	16 37	17 57	19 18
O 10	330 23.0	19.0	193 30.1	12.1	0 36.6	11.5	57.4	52	03 22	04 09	04 46	15 19	16 35	17 52	19 12
N 11	345 23.1	19.9	208 01.2	12.1	0 25.1	11.5	57.5	50	03 32	04 16	04 51	15 19	16 32	17 49	19 06
D 12	0 23.2	N12 20.7	222 32.3	12.1	N 0 13.6	11.6	57.5	45	03 52	04 30	05 02	15 19	16 28	17 40	18 54
A 13	15 23.3	21.5	237 03.4	12.0	N 0 02.0	11.5	57.6	N 40	04 07	04 42	05 11	15 18	16 24	17 33	18 44
Y 14	30 23.4	22.4	251 34.4	12.0	S 0 09.5	11.6	57.6	35	04 20	04 52	05 18	15 18	16 21	17 27	18 35
15	45 23.6 . .	23.2	266 05.4	12.0	0 21.1	11.6	57.6	30	04 30	05 00	05 25	15 18	16 19	17 22	18 27
16	60 23.7	24.1	280 36.4	11.9	0 32.7	11.6	57.7	20	04 47	05 13	05 36	15 17	16 14	17 13	18 14
17	75 23.8	24.9	295 07.3	11.8	0 44.3	11.6	57.7	N 10	04 59	05 24	05 46	15 17	16 10	17 05	18 03
18	90 23.9	N12 25.7	309 38.1	11.8	S 0 55.9	11.6	57.7	0	05 09	05 34	05 55	15 17	16 06	16 58	17 52
19	105 24.0	26.6	324 08.9	11.8	1 07.5	11.6	57.8	S 10	05 18	05 42	06 04	15 16	16 02	16 50	17 42
20	120 24.2	27.4	338 39.7	11.7	1 19.1	11.7	57.8	20	05 25	05 51	06 13	15 16	15 58	16 43	17 31
21	135 24.3 . .	28.2	353 10.4	11.7	1 30.8	11.6	57.8	30	05 31	06 00	06 24	15 16	15 54	16 34	17 18
22	150 24.4	29.1	7 41.1	11.6	1 42.4	11.7	57.9	35	05 35	06 04	06 30	15 16	15 51	16 29	17 11
23	165 24.5	29.9	22 11.7	11.5	1 54.1	11.6	57.9	40	05 38	06 09	06 37	15 15	15 48	16 23	17 03
23 00	180 24.6	N12 30.7	36 42.2	11.6	S 2 05.7	11.7	58.0	45	05 40	06 15	06 45	15 15	15 45	16 17	16 53
01	195 24.7	31.6	51 12.8	11.4	2 17.4	11.7	58.0	S 50	05 43	06 21	06 55	15 15	15 41	16 09	16 42
02	210 24.9	32.4	65 43.2	11.4	2 29.1	11.6	58.0	52	05 45	06 24	06 59	15 15	15 39	16 05	16 36
03	225 25.0 . .	33.2	80 13.6	11.4	2 40.7	11.7	58.1	54	05 46	06 27	07 04	15 15	15 37	16 01	16 30
04	240 25.1	34.1	94 44.0	11.3	2 52.4	11.7	58.1	56	05 47	06 30	07 09	15 15	15 35	15 57	16 24
05	255 25.2	34.9	109 14.3	11.3	3 04.1	11.6	58.1	58	05 48	06 34	07 15	15 15	15 32	15 52	16 17
06	270 25.3	N12 35.7	123 44.6	11.2	S 3 15.7	11.7	58.2	S 60	05 49	06 38	07 22	15 14	15 30	15 47	16 08
07	285 25.5	36.5	138 14.8	11.1	3 27.4	11.7	58.2								
08	300 25.6	37.4	152 44.9	11.1	3 39.1	11.6	58.2								
T 09	315 25.7 . .	38.2	167 15.0	11.0	3 50.7	11.7	58.3								
U 10	330 25.8	39.0	181 45.0	11.0	4 02.4	11.6	58.3								
E 11	345 25.9	39.9	196 15.0	10.9	4 14.0	11.7	58.3								
S 12	0 26.0	N12 40.7	210 44.9	10.9	S 4 25.7	11.6	58.4								
D 13	15 26.2	41.5	225 14.8	10.8	4 37.3	11.6	58.4								
A 14	30 26.3	42.3	239 44.6	10.7	4 48.9	11.6	58.5								
Y 15	45 26.4 . .	43.2	254 14.3	10.7	5 00.5	11.6	58.5								
16	60 26.5	44.0	268 44.0	10.6	5 12.1	11.6	58.5								
17	75 26.6	44.8	283 13.6	10.6	5 23.7	11.6	58.6								
18	90 26.7	N12 45.7	297 43.2	10.5	S 5 35.3	11.5	58.6								
19	105 26.8	46.5	312 12.7	10.4	5 46.8	11.5	58.6								
20	120 27.0	47.3	326 42.1	10.4	5 58.3	11.6	58.7								
21	135 27.1 . .	48.1	341 11.5	10.3	6 09.9	11.5	58.7								
22	150 27.2	49.0	355 40.8	10.2	6 21.4	11.4	58.7								
23	165 27.3	49.8	10 10.0	10.2	6 32.8	11.5	58.8								
24 00	180 27.4	N12 50.6	24 39.2	10.1	S 6 44.3	11.4	58.8								
01	195 27.5	51.4	39 08.3	10.0	6 55.7	11.4	58.8								
02	210 27.6	52.2	53 37.3	10.0	7 07.1	11.4	58.9								
03	225 27.8 . .	53.1	68 06.3	9.9	7 18.5	11.3	58.9								
04	240 27.9	53.9	82 35.2	9.8	7 29.8	11.3	58.9								
05	255 28.0	54.7	97 04.0	9.8	7 41.1	11.3	59.0								
06	270 28.1	N12 55.5	111 32.8	9.7	S 7 52.4	11.3	59.0								
W 07	285 28.2	56.4	126 01.5	9.6	8 03.7	11.2	59.0								
E 08	300 28.3	57.2	140 30.1	9.6	8 14.9	11.2	59.1								
D 09	315 28.4 . .	58.0	154 58.7	9.5	8 26.1	11.1	59.1								
N 10	330 28.5	58.8	169 27.2	9.4	8 37.2	11.1	59.1								
E 11	345 28.7	12 59.6	183 55.6	9.3	8 48.3	11.1	59.2								
S 12	0 28.8	N13 00.5	198 23.9	9.3	S 8 59.4	11.0	59.2								
D 13	15 28.9	01.3	212 52.2	9.2	9 10.4	11.0	59.2								
A 14	30 29.0	02.1	227 20.4	9.1	9 21.4	11.0	59.2								
Y 15	45 29.1 . .	02.9	241 48.5	9.1	9 32.4	10.9	59.3								
16	60 29.2	03.7	256 16.6	8.9	9 43.3	10.8	59.3								
17	75 29.3	04.5	270 44.5	8.9	9 54.1	10.9	59.3								
18	90 29.4	N13 05.4	285 12.4	8.9	S10 05.0	10.7	59.4								
19	105 29.5	06.2	299 40.3	8.7	10 15.7	10.7	59.4								
20	120 29.7	07.0	314 08.0	8.7	10 26.4	10.7	59.4								
21	135 29.8 . .	07.8	328 35.7	8.6	10 37.1	10.6	59.5								
22	150 29.9	08.6	343 03.3	8.5	10 47.7	10.5	59.5								
23	165 30.0	09.4	357 30.8	8.5	S10 58.2	10.5	59.5								
	SD 15.9	d 0.8	SD	15.7		15.9		16.1							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	22	23	24	25
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 12	////	////	03 15	03 04	02 53	02 38
N 70	20 46	22 38	////	03 12	03 08	03 03	02 58
68	20 26	21 51	////	03 10	03 11	03 12	03 14
66	20 11	21 21	////	03 09	03 14	03 19	03 27
64	19 58	20 59	22 48	03 07	03 16	03 25	03 37
62	19 47	20 42	22 06	03 06	03 18	03 31	03 46
60	19 38	20 28	21 39	03 05	03 20	03 35	03 54
N 58	19 30	20 16	21 18	03 04	03 21	03 40	04 01
56	19 23	20 06	21 02	03 03	03 22	03 43	04 07
54	19 17	19 57	20 48	03 02	03 24	03 47	04 13
52	19 12	19 49	20 36	03 02	03 25	03 50	04 18
50	19 06	19 42	20 26	03 01	03 26	03 52	04 22
45	18 56	19 27	20 06	03 00	03 28	03 59	04 32
N 40	18 47	19 15	19 50	02 58	03 30	04 04	04 41
35	18 39	19 06	19 37	02 57	03 32	04 08	04 48
30	18 32	18 57	19 27	02 56	03 33	04 12	04 54
20	18 21	18 44	19 10	02 55	03 36	04 19	05 05
N 10	18 11	18 32	18 58	02 53	03 38	04 25	05 14
0	18 02	18 23	18 47	02 52	03 40	04 30	05 23
S 10	17 53	18 14	18 39	02 50	03 42	04 36	05 32
20	17 43	18 05	18 31	02 49	03 44	04 42	05 42
30	17 32	17 57	18 25	02 47	03 47	04 48	05 53
35	17 26	17 52	18 22	02 46	03 48	04 52	05 59
40	17 19	17 47	18 18	02 45	03 50	04 57	06 06
45	17 11	17 41	18 15	02 43	03 51	05 02	06 15
S 50	17 01	17 35	18 12	02 42	03 54	05 08	06 25
52	16 57	17 32	18 11	02 41	03 55	05 11	06 30
54	16 52	17 29	18 10	02 40	03 56	05 14	06 35
56	16 46	17 25	18 09	02 39	03 57	05 18	06 41
58	16 40	17 21	18 07	02 38	03 58	05 22	06 47
S 60	16 33	17 17	18 06	02 37	04 00	05 26	06 55

Day	SUN		Mer. Pass.	MOON			
	Eqn. of Time			Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
22	01 27	01 33	11 58	21 28	09 04	12	86
23	01 38	01 44	11 58	22 18	09 53	13	93
24	01 49	01 55	11 58	23 10	10 44	14	98

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.0		SATURN +0.1	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
25 00	213 10.4	173 26.6	N14 51.0	181 54.8	N12 19.9	138 03.1	N22 23.8	356 12.1	S11 46.9
01	228 12.9	188 26.0	52.0	196 55.5	20.5	153 05.1	23.9	11 14.8	46.8
02	243 15.4	203 25.5	53.0	211 56.2	21.2	168 07.0	24.0	26 17.4	46.8
03	258 17.8	218 24.9	54.0	226 56.8	21.9	183 08.9	24.0	41 20.1	46.7
04	273 20.3	233 24.4	55.1	241 57.5	22.5	198 10.8	24.1	56 22.7	46.7
05	288 22.8	248 23.8	56.1	256 58.2	23.2	213 12.8	24.1	71 25.4	46.6
06	303 25.2	263 23.3	N14 57.1	271 58.9	N12 23.8	228 14.7	N22 24.2	86 28.0	S11 46.5
07	318 27.7	278 22.7	58.1	286 59.6	24.5	243 16.6	24.2	101 30.7	46.5
08	333 30.1	293 22.2	14 59.2	302 00.2	25.2	258 18.5	24.3	116 33.3	46.4
09	348 32.6	308 21.6	15 00.2	317 00.9	25.8	273 20.5	24.3	131 36.0	46.4
10	3 35.1	323 21.1	01.2	332 01.6	26.5	288 22.4	24.4	146 38.6	46.3
11	18 37.5	338 20.5	02.2	347 02.3	27.1	303 24.3	24.5	161 41.3	46.2
12	33 40.0	353 20.0	N15 03.3	2 02.9	N12 27.8	318 26.2	N22 24.5	176 43.9	S11 46.2
13	48 42.5	8 19.4	04.3	17 03.6	28.4	333 28.2	24.6	191 46.6	46.1
14	63 44.9	23 18.9	05.3	32 04.3	29.1	348 30.1	24.6	206 49.2	46.1
15	78 47.4	38 18.3	06.3	47 05.0	29.7	3 32.0	24.7	221 51.9	46.0
16	93 49.9	53 17.8	07.3	62 05.6	30.4	18 33.9	24.7	236 54.5	45.9
17	108 52.3	68 17.2	08.4	77 06.3	31.1	33 35.9	24.8	251 57.1	45.9
18	123 54.8	83 16.7	N15 09.4	92 07.0	N12 31.7	48 37.8	N22 24.9	266 59.8	S11 45.8
19	138 57.3	98 16.1	10.4	107 07.7	32.4	63 39.7	24.9	282 02.4	45.8
20	153 59.7	113 15.6	11.4	122 08.3	33.0	78 41.6	25.0	297 05.1	45.7
21	169 02.2	128 15.0	12.4	137 09.0	33.7	93 43.6	25.0	312 07.7	45.6
22	184 04.6	143 14.4	13.4	152 09.7	34.3	108 45.5	25.1	327 10.4	45.6
23	199 07.1	158 13.9	14.5	167 10.4	35.0	123 47.4	25.1	342 13.0	45.5
26 00	214 09.6	173 13.3	N15 15.5	182 11.0	N12 35.6	138 49.3	N22 25.2	357 15.7	S11 45.5
01	229 12.0	188 12.8	16.5	197 11.7	36.3	153 51.3	25.2	12 18.3	45.4
02	244 14.5	203 12.2	17.5	212 12.4	36.9	168 53.2	25.3	27 21.0	45.3
03	259 17.0	218 11.7	18.5	227 13.1	37.6	183 55.1	25.4	42 23.6	45.3
04	274 19.4	233 11.1	19.5	242 13.8	38.3	198 57.0	25.4	57 26.3	45.2
05	289 21.9	248 10.5	20.5	257 14.4	38.9	213 58.9	25.5	72 28.9	45.2
06	304 24.4	263 10.0	N15 21.5	272 15.1	N12 39.6	229 00.9	N22 25.5	87 31.6	S11 45.1
07	319 26.8	278 09.4	22.6	287 15.8	40.2	244 02.8	25.6	102 34.2	45.0
08	334 29.3	293 08.9	23.6	302 16.5	40.9	259 04.7	25.6	117 36.9	45.0
09	349 31.7	308 08.3	24.6	317 17.1	41.5	274 06.6	25.7	132 39.5	44.9
10	4 34.2	323 07.7	25.6	332 17.8	42.2	289 08.6	25.8	147 42.2	44.9
11	19 36.7	338 07.2	26.6	347 18.5	42.8	304 10.5	25.8	162 44.8	44.8
12	34 39.1	353 06.6	N15 27.6	2 19.2	N12 43.5	319 12.4	N22 25.9	177 47.4	S11 44.7
13	49 41.6	8 06.1	28.6	17 19.8	44.1	334 14.3	25.9	192 50.1	44.7
14	64 44.1	23 05.5	29.6	32 20.5	44.8	349 16.2	26.0	207 52.7	44.6
15	79 46.5	38 04.9	30.6	47 21.2	45.4	4 18.2	26.0	222 55.4	44.6
16	94 49.0	53 04.4	31.6	62 21.9	46.1	19 20.1	26.1	237 58.0	44.5
17	109 51.5	68 03.8	32.6	77 22.5	46.7	34 22.0	26.1	253 00.7	44.4
18	124 53.9	83 03.2	N15 33.6	92 23.2	N12 47.4	49 23.9	N22 26.2	268 03.3	S11 44.4
19	139 56.4	98 02.7	34.6	107 23.9	48.0	64 25.8	26.3	283 06.0	44.3
20	154 58.9	113 02.1	35.6	122 24.5	48.7	79 27.8	26.3	298 08.6	44.3
21	170 01.3	128 01.5	36.6	137 25.2	49.3	94 29.7	26.4	313 11.3	44.2
22	185 03.8	143 01.0	37.6	152 25.9	50.0	109 31.6	26.4	328 13.9	44.1
23	200 06.2	158 00.4	38.6	167 26.6	50.6	124 33.5	26.5	343 16.6	44.1
27 00	215 08.7	172 59.8	N15 39.6	182 27.2	N12 51.3	139 35.4	N22 26.5	358 19.2	S11 44.0
01	230 11.2	187 59.3	40.6	197 27.9	51.9	154 37.4	26.6	13 21.9	44.0
02	245 13.6	202 58.7	41.6	212 28.6	52.6	169 39.3	26.6	28 24.5	43.9
03	260 16.1	217 58.1	42.6	227 29.3	53.2	184 41.2	26.7	43 27.2	43.8
04	275 18.6	232 57.6	43.6	242 29.9	53.9	199 43.1	26.8	58 29.8	43.8
05	290 21.0	247 57.0	44.6	257 30.6	54.5	214 45.0	26.8	73 32.5	43.7
06	305 23.5	262 56.4	N15 45.6	272 31.3	N12 55.1	229 47.0	N22 26.9	88 35.1	S11 43.7
07	320 26.0	277 55.9	46.6	287 32.0	55.8	244 48.9	26.9	103 37.8	43.6
08	335 28.4	292 55.3	47.6	302 32.6	56.4	259 50.8	27.0	118 40.4	43.5
09	350 30.9	307 54.7	48.6	317 33.3	57.1	274 52.7	27.0	133 43.0	43.5
10	5 33.4	322 54.1	49.6	332 34.0	57.7	289 54.6	27.1	148 45.7	43.4
11	20 35.8	337 53.6	50.6	347 34.7	58.4	304 56.5	27.1	163 48.3	43.4
12	35 38.3	352 53.0	N15 51.5	2 35.3	N12 59.0	319 58.5	N22 27.2	178 51.0	S11 43.3
13	50 40.7	7 52.4	52.5	17 36.0	12 59.7	335 00.4	27.3	193 53.6	43.2
14	65 43.2	22 51.8	53.5	32 36.7	13 00.3	350 02.3	27.3	208 56.3	43.2
15	80 45.7	37 51.3	54.5	47 37.3	01.0	5 04.2	27.4	223 58.9	43.1
16	95 48.1	52 50.7	55.5	62 38.0	01.6	20 06.1	27.4	239 01.6	43.1
17	110 50.6	67 50.1	56.5	77 38.7	02.2	35 08.1	27.5	254 04.2	43.0
18	125 53.1	82 49.5	N15 57.5	92 39.4	N13 02.9	50 10.0	N22 27.5	269 06.9	S11 42.9
19	140 55.5	97 49.0	58.5	107 40.0	03.5	65 11.9	27.6	284 09.5	42.9
20	155 58.0	112 48.4	15 59.4	122 40.7	04.2	80 13.8	27.6	299 12.2	42.8
21	171 00.5	127 47.8	16 00.4	137 41.4	04.8	95 15.7	27.7	314 14.8	42.8
22	186 02.9	142 47.2	01.4	152 42.1	05.5	110 17.6	27.8	329 17.5	42.7
23	201 05.4	157 46.7	02.4	167 42.7	06.1	125 19.6	27.8	344 20.1	42.6
Mer. Pass.	h m 9 41.8	v −0.6	d 1.0	v 0.7	d 0.7	v 1.9	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.9	S40 15.2
Achernar	335 27.5	S57 10.1
Acrux	173 08.7	S63 10.6
Adhara	255 12.8	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.3
Alkaid	152 58.5	N49 14.8
Al Na'ir	27 44.1	S46 53.5
Alnilam	275 46.7	S 1 11.9
Alphard	217 56.1	S 8 43.3
Alphecca	126 10.8	N26 40.1
Alpheratz	357 43.9	N29 09.7
Altair	62 08.3	N 8 54.2
Ankaa	353 16.2	S42 13.9
Antares	112 26.1	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.5	S69 02.8
Avior	234 18.1	S59 33.6
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.5	S52 42.6
Capella	280 34.9	N46 00.6
Deneb	49 31.5	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.8
Dubhe	193 51.5	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 45.9	N51 29.1
Enif	33 47.3	N 9 56.2
Fomalhaut	15 24.3	S29 33.0
Gacrux	172 00.5	S57 11.5
Gienah	175 52.1	S17 37.2
Hadar	148 47.3	S60 26.3
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.7	S34 22.5
Kochab	137 18.9	N74 06.0
Markab	13 38.6	N15 16.6
Menkar	314 15.5	N 4 08.3
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.5	S69 46.8
Mirfak	308 41.0	N49 54.4
Nunki	75 58.3	S26 16.6
Peacock	53 19.4	S56 41.1
Pollux	243 27.9	N27 59.5
Procyon	244 59.9	N 5 11.2
Rasalhague	96 06.3	N12 33.0
Regulus	207 43.5	N11 53.9
Rigel	281 12.4	S 8 11.5
Rigil Kent.	139 51.2	S60 53.4
Sabik	102 12.4	S15 44.4
Schedar	349 41.1	N56 36.5
Shaula	96 21.8	S37 06.6
Sirius	258 34.0	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.4	S43 29.6
Vega	80 38.8	N38 47.7
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	319 03.8	12 28
Mars	328 01.5	11 51
Jupiter	284 39.8	14 43
Saturn	143 06.1	0 11

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 25	Moonrise 26	Moonrise 27	Moonrise 28
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
25 00	180 30.1	N13 10.3	11 58.3	8.4	S11 08.7	10.5	59.5	N 72	////	////	02 29	21 38	▬	▬	▬
01	195 30.2	11.1	26 25.7	8.3	11 19.2	10.3	59.6	N 70	////	00 50	02 58	21 04	23 14	25 54	01 54
02	210 30.3	11.9	40 53.0	8.2	11 29.5	10.3	59.6	68	////	01 50	03 20	20 40	22 32	24 16	00 16
03	225 30.4	12.7	55 20.2	8.2	11 39.8	10.3	59.6	66	////	02 23	03 37	20 21	22 04	23 37	24 46
04	240 30.5	13.5	69 47.4	8.0	11 50.1	10.2	59.6	64	00 44	02 47	03 50	20 06	21 42	23 09	24 18
05	255 30.6	14.3	84 14.4	8.0	12 00.3	10.1	59.7	62	01 37	03 06	04 02	19 53	21 25	22 48	23 56
06	270 30.7	N13 15.1	98 41.4	8.0	S12 10.4	10.1	59.7	60	02 07	03 21	04 11	19 43	21 11	22 31	23 38
07	285 30.8	16.0	113 08.4	7.8	12 20.5	10.0	59.7	N 58	02 30	03 34	04 20	19 34	20 59	22 17	23 23
08	300 31.0	16.8	127 35.2	7.8	12 30.5	9.9	59.7	56	02 47	03 44	04 27	19 25	20 48	22 05	23 11
09	315 31.1	17.6	142 02.0	7.7	12 40.4	9.8	59.8	54	03 02	03 54	04 34	19 18	20 39	21 54	23 00
10	330 31.2	18.4	156 28.7	7.6	12 50.2	9.8	59.8	52	03 14	04 02	04 40	19 12	20 31	21 45	22 50
11	345 31.3	19.2	170 55.3	7.5	13 00.0	9.7	59.8	50	03 25	04 10	04 45	19 06	20 23	21 36	22 41
12	0 31.4	N13 20.0	185 21.8	7.5	S13 09.7	9.6	59.8	45	03 46	04 25	04 57	18 54	20 08	21 18	22 23
13	15 31.5	20.8	199 48.3	7.4	13 19.3	9.6	59.9	N 40	04 03	04 38	05 06	18 44	19 55	21 04	22 08
14	30 31.6	21.6	214 14.7	7.3	13 28.9	9.4	59.9	35	04 16	04 48	05 15	18 35	19 44	20 51	21 55
15	45 31.7	22.4	228 41.0	7.2	13 38.3	9.4	59.9	30	04 27	04 57	05 22	18 27	19 34	20 40	21 44
16	60 31.8	23.3	243 07.2	7.2	13 47.7	9.3	59.9	20	04 44	05 11	05 34	18 14	19 18	20 22	21 24
17	75 31.9	24.1	257 33.4	7.1	13 57.0	9.3	60.0	N 10	04 58	05 23	05 45	18 03	19 04	20 06	21 08
18	90 32.0	N13 24.9	271 59.5	7.0	S14 06.3	9.1	60.0	0	05 08	05 33	05 54	17 52	18 50	19 51	20 52
19	105 32.1	25.7	286 25.5	6.9	14 15.4	9.0	60.0	S 10	05 18	05 43	06 04	17 42	18 37	19 36	20 37
20	120 32.2	26.5	300 51.4	6.9	14 24.4	9.0	60.0	20	05 26	05 52	06 14	17 31	18 23	19 20	20 20
21	135 32.3	27.3	315 17.3	6.8	14 33.4	8.9	60.0	30	05 33	06 01	06 26	17 18	18 07	19 02	20 01
22	150 32.4	28.1	329 43.1	6.7	14 42.3	8.8	60.1	35	05 37	06 06	06 33	17 11	17 58	18 51	19 50
23	165 32.5	28.9	344 08.8	6.6	14 51.1	8.7	60.1	40	05 40	06 12	06 40	17 03	17 48	18 39	19 38
26 00	180 32.6	N13 29.7	358 34.4	6.6	S14 59.8	8.6	60.1	45	05 44	06 18	06 49	16 53	17 35	18 25	19 23
01	195 32.7	30.5	13 00.0	6.5	15 08.4	8.5	60.1	S 50	05 47	06 25	06 59	16 42	17 21	18 08	19 05
02	210 32.9	31.3	27 25.5	6.4	15 16.9	8.4	60.1	52	05 49	06 29	07 04	16 36	17 14	18 00	18 56
03	225 33.0	32.1	41 50.9	6.4	15 25.3	8.3	60.2	54	05 51	06 32	07 09	16 30	17 06	17 51	18 46
04	240 33.1	32.9	56 16.3	6.3	15 33.6	8.2	60.2	56	05 52	06 36	07 15	16 24	16 57	17 41	18 36
05	255 33.2	33.7	70 41.6	6.2	15 41.8	8.1	60.2	58	05 54	06 40	07 22	16 17	16 48	17 29	18 23
06	270 33.3	N13 34.5	85 06.8	6.1	S15 49.9	8.0	60.2	S 60	05 56	06 45	07 29	16 08	16 37	17 16	18 09
07	285 33.4	35.3	99 31.9	6.1	15 57.9	7.9	60.2								
08	300 33.5	36.1	113 57.0	6.0	16 05.8	7.8	60.2								
09	315 33.6	36.9	128 22.0	5.9	16 13.6	7.7	60.3								
10	330 33.7	37.7	142 46.9	5.9	16 21.3	7.6	60.3								
11	345 33.8	38.5	157 11.8	5.8	16 28.9	7.5	60.3								
12	0 33.9	N13 39.3	171 36.6	5.7	S16 36.4	7.4	60.3								
13	15 34.0	40.1	186 01.3	5.7	16 43.8	7.2	60.3								
14	30 34.1	40.9	200 26.0	5.6	16 51.0	7.2	60.3								
15	45 34.2	41.7	214 50.6	5.6	16 58.2	7.0	60.3								
16	60 34.3	42.5	229 15.2	5.5	17 05.2	6.9	60.4								
17	75 34.4	43.3	243 39.7	5.4	17 12.1	6.8	60.4								
18	90 34.5	N13 44.1	258 04.1	5.3	S17 18.9	6.7	60.4								
19	105 34.6	44.9	272 28.4	5.3	17 25.6	6.6	60.4								
20	120 34.7	45.7	286 52.7	5.3	17 32.2	6.4	60.4								
21	135 34.8	46.5	301 17.0	5.2	17 38.6	6.3	60.4								
22	150 34.9	47.3	315 41.2	5.1	17 44.9	6.2	60.4								
23	165 35.0	48.1	330 05.3	5.1	17 51.1	6.1	60.4								
27 00	180 35.1	N13 48.9	344 29.4	5.0	S17 57.2	6.0	60.4								
01	195 35.2	49.7	358 53.4	5.0	18 03.2	5.8	60.4								
02	210 35.3	50.5	13 17.4	4.9	18 09.0	5.7	60.5								
03	225 35.4	51.3	27 41.3	4.9	18 14.7	5.6	60.5								
04	240 35.5	52.1	42 05.2	4.8	18 20.3	5.4	60.5								
05	255 35.6	52.9	56 29.0	4.8	18 25.7	5.3	60.5								
06	270 35.7	N13 53.7	70 52.8	4.7	S18 31.0	5.2	60.5								
07	285 35.8	54.5	85 16.5	4.7	18 36.2	5.1	60.5								
08	300 35.9	55.3	99 40.2	4.7	18 41.3	4.9	60.5								
09	315 36.0	56.1	114 03.9	4.6	18 46.2	4.8	60.5								
10	330 36.1	56.9	128 27.5	4.5	18 51.0	4.6	60.5								
11	345 36.1	57.7	142 51.0	4.6	18 55.6	4.6	60.5								
12	0 36.2	N13 58.5	157 14.6	4.4	S19 00.2	4.3	60.5								
13	15 36.3	13 59.3	171 38.0	4.5	19 04.5	4.3	60.5								
14	30 36.4	14 00.0	186 01.5	4.4	19 08.8	4.1	60.5								
15	45 36.5	00.8	200 24.9	4.4	19 12.9	4.0	60.5								
16	60 36.6	01.6	214 48.3	4.4	19 16.9	3.8	60.5								
17	75 36.7	02.4	229 11.7	4.3	19 20.7	3.7	60.5								
18	90 36.8	N14 03.2	243 35.0	4.3	S19 24.4	3.6	60.5								
19	105 36.9	04.0	257 58.3	4.2	19 28.0	3.4	60.5								
20	120 37.0	04.8	272 21.5	4.3	19 31.4	3.2	60.5								
21	135 37.1	05.6	286 44.8	4.2	19 34.6	3.2	60.5								
22	150 37.2	06.4	301 08.0	4.2	19 37.8	3.0	60.5								
23	165 37.3	07.1	315 31.2	4.2	S19 40.8	2.8	60.5								
	SD 15.9	d 0.8	SD	16.3		16.4			16.5						

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 25	Moonset 26	Moonset 27	Moonset 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 32	////	////	02 38	02 17	▬	▬
N 70	21 01	23 25	////	02 58	02 52	02 45	02 13
68	20 39	22 12	////	03 14	03 18	03 28	03 51
66	20 22	21 36	////	03 27	03 38	03 57	04 31
64	20 07	21 11	23 29	03 37	03 54	04 19	04 58
62	19 56	20 52	22 24	03 46	04 07	04 36	05 19
60	19 46	20 37	21 52	03 54	04 18	04 51	05 37
N 58	19 37	20 24	21 29	04 01	04 28	05 04	05 51
56	19 29	20 13	21 11	04 07	04 37	05 15	06 03
54	19 23	20 03	20 56	04 13	04 45	05 24	06 14
52	19 17	19 55	20 43	04 18	04 52	05 33	06 24
50	19 11	19 47	20 32	04 22	04 58	05 41	06 33
45	18 59	19 31	20 11	04 32	05 11	05 57	06 51
N 40	18 50	19 19	19 54	04 41	05 22	06 11	07 06
35	18 41	19 08	19 40	04 48	05 32	06 22	07 18
30	18 34	18 59	19 29	04 54	05 40	06 32	07 29
20	18 22	18 45	19 12	05 05	05 55	06 50	07 48
N 10	18 11	18 33	18 58	05 14	06 08	07 05	08 05
0	18 01	18 22	18 47	05 23	06 20	07 19	08 20
S 10	17 51	18 13	18 38	05 32	06 32	07 33	08 36
20	17 41	18 04	18 30	05 42	06 44	07 48	08 52
30	17 29	17 54	18 22	05 53	06 59	08 06	09 11
35	17 23	17 49	18 18	05 59	07 08	08 16	09 22
40	17 15	17 43	18 15	06 06	07 17	08 28	09 34
45	17 06	17 37	18 11	06 15	07 29	08 41	09 49
S 50	16 56	17 29	18 07	06 25	07 43	08 58	10 07
52	16 51	17 26	18 06	06 30	07 49	09 06	10 16
54	16 45	17 22	18 04	06 35	07 56	09 15	10 25
56	16 39	17 19	18 02	06 41	08 04	09 25	10 36
58	16 33	17 14	18 01	06 47	08 14	09 36	10 49
S 60	16 25	17 10	17 59	06 55	08 24	09 49	11 03

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
25	02 00	02 05	11 58	24 06	11 38	15	100
26	02 10	02 15	11 58	00 06	12 35	16	99
27	02 20	02 25	11 58	01 05	13 35	17	96

UT	ARIES	VENUS −3.9		MARS +1.2		JUPITER −2.0		SATURN +0.1	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
28 00	216 07.9	172 46.1	N16 03.4	182 43.4	N13 06.7	140 21.5	N22 27.9	359 22.8	S11 42.6
01	231 10.3	187 45.5	04.4	197 44.1	07.4	155 23.4	27.9	14 25.4	42.5
02	246 12.8	202 44.9	05.3	212 44.7	08.0	170 25.3	28.0	29 28.1	42.5
03	261 15.2	217 44.3 . .	06.3	227 45.4 . .	08.7	185 27.2 . .	28.0	44 30.7 . .	42.4
04	276 17.7	232 43.8	07.3	242 46.1	09.3	200 29.1	28.1	59 33.4	42.3
05	291 20.2	247 43.2	08.3	257 46.8	10.0	215 31.1	28.1	74 36.0	42.3
06	306 22.6	262 42.6	N16 09.2	272 47.4	N13 10.6	230 33.0	N22 28.2	89 38.7	S11 42.2
07	321 25.1	277 42.0	10.2	287 48.1	11.2	245 34.9	28.3	104 41.3	42.2
08	336 27.6	292 41.4	11.2	302 48.8	11.9	260 36.8	28.3	119 43.9	42.1
S 09	351 30.0	307 40.8 . .	12.2	317 49.5 . .	12.5	275 38.7 . .	28.4	134 46.6 . .	42.0
U 10	6 32.5	322 40.3	13.2	332 50.1	13.2	290 40.6	28.4	149 49.2	42.0
N 11	21 35.0	337 39.7	14.1	347 50.8	13.8	305 42.5	28.5	164 51.9	41.9
D 12	36 37.4	352 39.1	N16 15.1	2 51.5	N13 14.4	320 44.5	N22 28.5	179 54.5	S11 41.9
A 13	51 39.9	7 38.5	16.1	17 52.1	15.1	335 46.4	28.6	194 57.2	41.8
Y 14	66 42.3	22 37.9	17.0	32 52.8	15.7	350 48.3	28.6	209 59.8	41.7
15	81 44.8	37 37.3 . .	18.0	47 53.5 . .	16.4	5 50.2 . .	28.7	225 02.5 . .	41.7
16	96 47.3	52 36.8	19.0	62 54.2	17.0	20 52.1	28.7	240 05.1	41.6
17	111 49.7	67 36.2	20.0	77 54.8	17.6	35 54.0	28.8	255 07.8	41.6
18	126 52.2	82 35.6	N16 20.9	92 55.5	N13 18.3	50 56.0	N22 28.9	270 10.4	S11 41.5
19	141 54.7	97 35.0	21.9	107 56.2	18.9	65 57.9	28.9	285 13.1	41.4
20	156 57.1	112 34.4	22.9	122 56.8	19.5	80 59.8	29.0	300 15.7	41.4
21	171 59.6	127 33.8 . .	23.8	137 57.5 . .	20.2	96 01.7 . .	29.0	315 18.4 . .	41.3
22	187 02.1	142 33.2	24.8	152 58.2	20.8	111 03.6	29.1	330 21.0	41.3
23	202 04.5	157 32.6	25.8	167 58.8	21.5	126 05.5	29.1	345 23.7	41.2
29 00	217 07.0	172 32.0	N16 26.7	182 59.5	N13 22.1	141 07.4	N22 29.2	0 26.3	S11 41.1
01	232 09.5	187 31.5	27.7	198 00.2	22.7	156 09.3	29.2	15 29.0	41.1
02	247 11.9	202 30.9	28.6	213 00.9	23.4	171 11.3	29.3	30 31.6	41.0
03	262 14.4	217 30.3 . .	29.6	228 01.5 . .	24.0	186 13.2 . .	29.3	45 34.3 . .	41.0
04	277 16.8	232 29.7	30.6	243 02.2	24.6	201 15.1	29.4	60 36.9	40.9
05	292 19.3	247 29.1	31.5	258 02.9	25.3	216 17.0	29.5	75 39.6	40.8
06	307 21.8	262 28.5	N16 32.5	273 03.5	N13 25.9	231 18.9	N22 29.5	90 42.2	S11 40.8
07	322 24.2	277 27.9	33.5	288 04.2	26.5	246 20.8	29.6	105 44.9	40.7
08	337 26.7	292 27.3	34.4	303 04.9	27.2	261 22.7	29.6	120 47.5	40.7
M 09	352 29.2	307 26.7 . .	35.4	318 05.5 . .	27.8	276 24.7 . .	29.7	135 50.1 . .	40.6
O 10	7 31.6	322 26.1	36.3	333 06.2	28.4	291 26.6	29.7	150 52.8	40.5
N 11	22 34.1	337 25.5	37.3	348 06.9	29.1	306 28.5	29.8	165 55.4	40.5
D 12	37 36.6	352 24.9	N16 38.2	3 07.6	N13 29.7	321 30.4	N22 29.8	180 58.1	S11 40.4
A 13	52 39.0	7 24.3	39.2	18 08.2	30.4	336 32.3	29.9	196 00.7	40.4
Y 14	67 41.5	22 23.7	40.1	33 08.9	31.0	351 34.2	29.9	211 03.4	40.3
15	82 44.0	37 23.1 . .	41.1	48 09.6 . .	31.6	6 36.1 . .	30.0	226 06.0 . .	40.2
16	97 46.4	52 22.5	42.1	63 10.2	32.2	21 38.0	30.1	241 08.7	40.2
17	112 48.9	67 21.9	43.0	78 10.9	32.9	36 39.9	30.1	256 11.3	40.1
18	127 51.3	82 21.3	N16 44.0	93 11.6	N13 33.5	51 41.9	N22 30.2	271 14.0	S11 40.1
19	142 53.8	97 20.7	44.9	108 12.2	34.1	66 43.8	30.2	286 16.6	40.0
20	157 56.3	112 20.2	45.9	123 12.9	34.8	81 45.7	30.3	301 19.3	40.0
21	172 58.7	127 19.6 . .	46.8	138 13.6 . .	35.4	96 47.6 . .	30.3	316 21.9 . .	39.9
22	188 01.2	142 19.0	47.8	153 14.3	36.0	111 49.5	30.4	331 24.6	39.8
23	203 03.7	157 18.3	48.7	168 14.9	36.7	126 51.4	30.4	346 27.2	39.8
30 00	218 06.1	172 17.7	N16 49.6	183 15.6	N13 37.3	141 53.3	N22 30.5	1 29.9	S11 39.7
01	233 08.6	187 17.1	50.6	198 16.3	37.9	156 55.2	30.5	16 32.5	39.7
02	248 11.1	202 16.5	51.5	213 16.9	38.6	171 57.1	30.6	31 35.2	39.6
03	263 13.5	217 15.9 . .	52.5	228 17.6 . .	39.2	186 59.1 . .	30.7	46 37.8 . .	39.5
04	278 16.0	232 15.3	53.4	243 18.3	39.8	202 01.0	30.7	61 40.5	39.5
05	293 18.5	247 14.7	54.4	258 18.9	40.5	217 02.9	30.8	76 43.1	39.4
06	308 20.9	262 14.1	N16 55.3	273 19.6	N13 41.1	232 04.8	N22 30.8	91 45.8	S11 39.4
07	323 23.4	277 13.5	56.3	288 20.3	41.7	247 06.7	30.9	106 48.4	39.3
T 08	338 25.8	292 12.9	57.2	303 20.9	42.3	262 08.6	30.9	121 51.0	39.2
U 09	353 28.3	307 12.3 . .	58.1	318 21.6 . .	43.0	277 10.5 . .	31.0	136 53.7 . .	39.2
E 10	8 30.8	322 11.7	16 59.1	333 22.3	43.6	292 12.4	31.0	151 56.3	39.1
S 11	23 33.2	337 11.1	17 00.0	348 22.9	44.2	307 14.3	31.1	166 59.0	39.1
D 12	38 35.7	352 10.5	N17 01.0	3 23.6	N13 44.9	322 16.2	N22 31.1	182 01.6	S11 39.0
A 13	53 38.2	7 09.9	01.9	18 24.3	45.5	337 18.2	31.2	197 04.3	38.9
Y 14	68 40.6	22 09.3	02.8	33 24.9	46.1	352 20.1	31.2	212 06.9	38.9
15	83 43.1	37 08.7 . .	03.8	48 25.6 . .	46.7	7 22.0 . .	31.3	227 09.6 . .	38.8
16	98 45.6	52 08.1	04.7	63 26.3	47.4	22 23.9	31.4	242 12.2	38.8
17	113 48.0	67 07.5	05.6	78 26.9	48.0	37 25.8	31.4	257 14.9	38.7
18	128 50.5	82 06.8	N17 06.6	93 27.6	N13 48.6	52 27.7	N22 31.5	272 17.5	S11 38.6
19	143 53.0	97 06.2	07.5	108 28.3	49.2	67 29.6	31.5	287 20.2	38.6
20	158 55.4	112 05.6	08.4	123 28.9	49.9	82 31.5	31.6	302 22.8	38.5
21	173 57.9	127 05.0 . .	09.4	138 29.6 . .	50.5	97 33.4 . .	31.6	317 25.5 . .	38.5
22	189 00.3	142 04.4	10.3	153 30.3	51.1	112 35.3	31.7	332 28.1	38.4
23	204 02.8	157 03.8	11.2	168 30.9	51.7	127 37.2	31.7	347 30.8	38.3
Mer.Pass.	h m 9 30.0	v −0.6	d 1.0	v 0.7	d 0.6	v 1.9	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.9	S40 15.2
Achernar	335 27.5	S57 10.1
Acrux	173 08.7	S63 10.7
Adhara	255 12.8	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.3
Alkaid	152 58.5	N49 14.8
Al Na'ir	27 44.0	S46 53.5
Alnilam	275 46.7	S 1 11.9
Alphard	217 56.1	S 8 43.3
Alphecca	126 10.7	N26 40.1
Alpheratz	357 43.9	N29 09.7
Altair	62 08.2	N 8 54.2
Ankaa	353 16.2	S42 13.9
Antares	112 26.0	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.5	S69 02.8
Avior	234 18.1	S59 33.6
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.5	S52 42.6
Capella	280 34.9	N46 00.6
Deneb	49 31.5	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.8
Dubhe	193 51.5	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 45.8	N51 29.1
Enif	33 47.3	N 9 56.2
Fomalhaut	15 24.3	S29 32.9
Gacrux	172 00.5	S57 11.5
Gienah	175 52.1	S17 37.2
Hadar	148 47.3	S60 26.3
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.7	S34 22.5
Kochab	137 18.9	N74 06.0
Markab	13 38.6	N15 16.6
Menkar	314 15.5	N 4 08.4
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.5	S69 46.8
Mirfak	308 41.0	N49 54.4
Nunki	75 58.3	S26 16.6
Peacock	53 19.4	S56 41.1
Pollux	243 28.0	N27 59.5
Procyon	244 59.9	N 5 11.2
Rasalhague	96 06.3	N12 33.0
Regulus	207 43.5	N11 53.9
Rigel	281 12.4	S 8 11.4
Rigil Kent.	139 51.1	S60 53.4
Sabik	102 12.4	S15 44.4
Schedar	349 41.1	N56 36.5
Shaula	96 21.7	S37 06.6
Sirius	258 34.0	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.4	S43 29.6
Vega	80 38.8	N38 47.7
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	315 25.1	12 30
Mars	325 52.5	11 48
Jupiter	284 00.4	14 34
Saturn	143 19.3	23 54

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 28	Moonrise 29	Moonrise 30	Moonrise 1
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
28 00	180 37.4	N14 07.9	329 54.4	4.2	S19 43.6	2.7	60.5	N 72	////	////	02 08	▬	▬	▬	03 32
01	195 37.5	08.7	344 17.6	4.1	19 46.3	2.6	60.5	N 70	////	////	02 42	01 54	▬	02 54	02 44
02	210 37.6	09.5	358 40.7	4.1	19 48.9	2.4	60.5	68	////	01 26	03 06	00 16	01 28	02 01	02 13
03	225 37.7 . .	10.3	13 03.8	4.2	19 51.3	2.3	60.5	66	////	02 07	03 25	24 46	00 46	01 28	01 50
04	240 37.7	11.1	27 27.0	4.1	19 53.6	2.1	60.5	64	////	02 34	03 40	24 18	00 18	01 03	01 32
05	255 37.8	11.9	41 50.1	4.1	19 55.7	2.0	60.5	62	01 16	02 55	03 52	23 56	24 44	00 44	01 17
06	270 37.9	N14 12.6	56 13.2	4.0	S19 57.7	1.8	60.5	60	01 53	03 11	04 03	23 38	24 28	00 28	01 04
07	285 38.0	13.4	70 36.2	4.1	19 59.5	1.7	60.5	N 58	02 18	03 25	04 12	23 23	24 15	00 15	00 53
08	300 38.1	14.2	84 59.3	4.1	20 01.2	1.5	60.5	56	02 37	03 37	04 20	23 11	24 03	00 03	00 44
S 09	315 38.2 . .	15.0	99 22.4	4.1	20 02.7	1.5	60.5	54	02 53	03 47	04 28	23 00	23 53	24 35	00 35
U 10	330 38.3	15.8	113 45.5	4.1	20 04.2	1.2	60.5	52	03 06	03 56	04 34	22 50	23 44	24 27	00 27
N 11	345 38.4	16.6	128 08.6	4.0	20 05.4	1.1	60.5	50	03 18	04 04	04 40	22 41	23 36	24 21	00 21
D 12	0 38.5	N14 17.3	142 31.6	4.1	S20 06.5	1.0	60.5	45	03 41	04 20	04 52	22 23	23 19	24 06	00 06
A 13	15 38.6	18.1	156 54.7	4.1	20 07.5	0.8	60.5	N 40	03 58	04 33	05 03	22 08	23 04	23 54	24 36
Y 14	30 38.7	18.9	171 17.8	4.1	20 08.3	0.7	60.5	35	04 12	04 44	05 11	21 55	22 52	23 43	24 28
15	45 38.8 . .	19.7	185 40.9	4.1	20 09.0	0.5	60.5	30	04 24	04 54	05 19	21 44	22 42	23 34	24 21
16	60 38.8	20.5	200 04.0	4.1	20 09.5	0.4	60.4	20	04 42	05 09	05 32	21 24	22 24	23 18	24 08
17	75 38.9	21.2	214 27.1	4.1	20 09.9	0.2	60.4	N 10	04 56	05 22	05 43	21 08	22 08	23 04	23 57
18	90 39.0	N14 22.0	228 50.2	4.2	S20 10.1	0.1	60.4	0	05 08	05 33	05 54	20 52	21 53	22 52	23 47
19	105 39.1	22.8	243 13.4	4.1	20 10.2	0.1	60.4	S 10	05 18	05 43	06 04	20 37	21 38	22 39	23 36
20	120 39.2	23.6	257 36.5	4.2	20 10.1	0.2	60.4	20	05 26	05 53	06 15	20 20	21 23	22 25	23 25
21	135 39.3 . .	24.4	271 59.7	4.2	20 09.9	0.3	60.4	30	05 35	06 03	06 28	20 01	21 04	22 09	23 13
22	150 39.4	25.1	286 22.9	4.2	20 09.6	0.5	60.4	35	05 39	06 09	06 35	19 50	20 54	22 00	23 05
23	165 39.5	25.9	300 46.1	4.2	20 09.1	0.7	60.4	40	05 43	06 15	06 43	19 38	20 42	21 49	22 57
29 00	180 39.6	N14 26.7	315 09.3	4.2	S20 08.4	0.7	60.4	45	05 47	06 22	06 52	19 23	20 28	21 37	22 47
01	195 39.6	27.5	329 32.5	4.3	20 07.7	1.0	60.4	S 50	05 51	06 30	07 04	19 05	20 10	21 21	22 35
02	210 39.7	28.2	343 55.8	4.3	20 06.7	1.0	60.3	52	05 53	06 33	07 09	18 56	20 02	21 14	22 30
03	225 39.8 . .	29.0	358 19.1	4.3	20 05.7	1.3	60.3	54	05 55	06 37	07 15	18 46	19 53	21 06	22 24
04	240 39.9	29.8	12 42.4	4.4	20 04.4	1.3	60.3	56	05 57	06 41	07 21	18 36	19 42	20 58	22 17
05	255 40.0	30.6	27 05.8	4.4	20 03.1	1.5	60.3	58	05 59	06 46	07 28	18 23	19 31	20 48	22 09
06	270 40.1	N14 31.4	41 29.2	4.4	S20 01.6	1.7	60.3	S 60	06 02	06 51	07 36	18 09	19 17	20 36	22 00
07	285 40.2	32.1	55 52.6	4.5	19 59.9	1.7	60.3								
08	300 40.2	32.9	70 16.1	4.5	19 58.2	2.0	60.3								
M 09	315 40.3 . .	33.7	84 39.6	4.5	19 56.2	2.0	60.2								
O 10	330 40.4	34.4	99 03.1	4.6	19 54.2	2.2	60.2								
N 11	345 40.5	35.2	113 26.7	4.6	19 52.0	2.4	60.2								
D 12	0 40.6	N14 36.0	127 50.3	4.6	S19 49.6	2.5	60.2								
A 13	15 40.7	36.8	142 13.9	4.7	19 47.1	2.6	60.2								
Y 14	30 40.8	37.5	156 37.6	4.8	19 44.5	2.7	60.2								
15	45 40.8 . .	38.3	171 01.4	4.7	19 41.8	2.9	60.2								
16	60 40.9	39.1	185 25.1	4.9	19 38.9	3.1	60.1								
17	75 41.0	39.8	199 49.0	4.9	19 35.8	3.1	60.1								
18	90 41.1	N14 40.6	214 12.9	4.9	S19 32.7	3.3	60.1								
19	105 41.2	41.4	228 36.8	5.0	19 29.4	3.5	60.1								
20	120 41.3	42.2	243 00.8	5.0	19 25.9	3.5	60.1								
21	135 41.3 . .	42.9	257 24.8	5.1	19 22.4	3.7	60.1								
22	150 41.4	43.7	271 48.9	5.2	19 18.7	3.9	60.0								
23	165 41.5	44.5	286 13.1	5.2	19 14.8	3.9	60.0								
30 00	180 41.6	N14 45.2	300 37.3	5.2	S19 10.9	4.1	60.0								
01	195 41.7	46.0	315 01.5	5.4	19 06.8	4.2	60.0								
02	210 41.8	46.8	329 25.9	5.3	19 02.6	4.4	60.0								
03	225 41.8 . .	47.5	343 50.2	5.5	18 58.2	4.4	59.9								
04	240 41.9	48.3	358 14.7	5.5	18 53.8	4.6	59.9								
05	255 42.0	49.1	12 39.2	5.5	18 49.2	4.8	59.9								
06	270 42.1	N14 49.8	27 03.7	5.7	S18 44.4	4.8	59.9								
07	285 42.2	50.6	41 28.4	5.7	18 39.6	5.0	59.9								
T 08	300 42.2	51.3	55 53.1	5.7	18 34.6	5.0	59.8								
U 09	315 42.3 . .	52.1	70 17.8	5.9	18 29.6	5.3	59.8								
E 10	330 42.4	52.9	84 42.7	5.8	18 24.3	5.3	59.8								
S 11	345 42.5	53.6	99 07.5	6.0	18 19.0	5.4	59.8								
D 12	0 42.6	N14 54.4	113 32.5	6.0	S18 13.6	5.6	59.8								
A 13	15 42.6	55.2	127 57.5	6.1	18 08.0	5.7	59.7								
Y 14	30 42.7	55.9	142 22.6	6.2	18 02.3	5.8	59.7								
15	45 42.8 . .	56.7	156 47.8	6.2	17 56.5	5.9	59.7								
16	60 42.9	57.4	171 13.0	6.3	17 50.6	6.0	59.7								
17	75 42.9	58.2	185 38.3	6.4	17 44.6	6.1	59.6								
18	90 43.0	N14 59.0	200 03.7	6.5	S17 38.5	6.3	59.6								
19	105 43.1	14 59.7	214 29.2	6.5	17 32.2	6.3	59.6								
20	120 43.2	15 00.5	228 54.7	6.6	17 25.9	6.5	59.6								
21	135 43.3 . .	01.2	243 20.3	6.7	17 19.4	6.5	59.6								
22	150 43.3	02.0	257 46.0	6.7	17 12.9	6.7	59.5								
23	165 43.4	02.8	272 11.7	6.9	S17 06.2	6.8	59.5								
	SD 15.9	d 0.8	SD 16.5		16.4		16.3								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 28	Moonset 29	Moonset 30	Moonset 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 53	////	////	▬	▬	▬	06 52
N 70	21 17	////	////	02 13	▬	05 28	07 38
68	20 52	22 37	////	03 51	04 48	06 21	08 08
66	20 32	21 53	////	04 31	05 30	06 54	08 31
64	20 17	21 24	////	04 58	05 58	07 18	08 48
62	20 04	21 03	22 46	05 19	06 20	07 37	09 03
60	19 53	20 46	22 06	05 37	06 37	07 52	09 15
N 58	19 44	20 32	21 40	05 51	06 52	08 05	09 25
56	19 36	20 20	21 20	06 03	07 05	08 16	09 34
54	19 28	20 09	21 04	06 14	07 16	08 26	09 42
52	19 22	20 00	20 50	06 24	07 25	08 35	09 50
50	19 16	19 52	20 39	06 33	07 34	08 43	09 56
45	19 03	19 35	20 15	06 51	07 52	09 00	10 10
N 40	18 53	19 22	19 57	07 06	08 07	09 13	10 21
35	18 44	19 11	19 43	07 18	08 20	09 25	10 31
30	18 36	19 01	19 31	07 29	08 31	09 35	10 39
20	18 23	18 46	19 13	07 48	08 50	09 52	10 54
N 10	18 11	18 33	18 59	08 05	09 06	10 07	11 07
0	18 01	18 22	18 47	08 20	09 22	10 21	11 18
S 10	17 50	18 12	18 37	08 36	09 37	10 35	11 30
20	17 39	18 02	18 28	08 52	09 53	10 50	11 42
30	17 27	17 51	18 20	09 11	10 12	11 07	11 56
35	17 19	17 45	18 15	09 22	10 23	11 17	12 05
40	17 11	17 39	18 11	09 34	10 35	11 28	12 14
45	17 02	17 32	18 07	09 49	10 50	11 41	12 25
S 50	16 50	17 24	18 02	10 07	11 07	11 57	12 38
52	16 45	17 21	18 00	10 16	11 16	12 04	12 44
54	16 39	17 17	17 58	10 25	11 25	12 13	12 50
56	16 33	17 12	17 56	10 36	11 36	12 22	12 58
58	16 25	17 08	17 54	10 49	11 48	12 32	13 06
S 60	16 17	17 02	17 52	11 03	12 02	12 44	13 15

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
28	02 29	02 34	11 57	02 06	14 36	18	90
29	02 38	02 42	11 57	03 07	15 37	19	82
30	02 46	02 50	11 57	04 07	16 37	20	72

UT	ARIES	VENUS −3.9		MARS +1.3		JUPITER −2.0		SATURN +0.1	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
1 00	219 05.3	172 03.2	N17 12.1	183 31.6	N13 52.4	142 39.1	N22 31.8	2 33.4	S11 38.3
01	234 07.7	187 02.6	13.1	198 32.3	53.0	157 41.1	31.8	17 36.1	38.2
02	249 10.2	202 01.9	14.0	213 32.9	53.6	172 43.0	31.9	32 38.7	38.2
03	264 12.7	217 01.3 . .	14.9	228 33.6 . .	54.2	187 44.9 . .	31.9	47 41.4 . .	38.1
04	279 15.1	232 00.7	15.9	243 34.3	54.9	202 46.8	32.0	62 44.0	38.1
05	294 17.6	247 00.1	16.8	258 34.9	55.5	217 48.7	32.1	77 46.7	38.0
06	309 20.1	261 59.5	N17 17.7	273 35.6	N13 56.1	232 50.6	N22 32.1	92 49.3	S11 37.9
W 07	324 22.5	276 58.9	18.6	288 36.3	56.7	247 52.5	32.2	107 51.9	37.9
E 08	339 25.0	291 58.3	19.6	303 36.9	57.4	262 54.4	32.2	122 54.6	37.8
D 09	354 27.4	306 57.6 . .	20.5	318 37.6 . .	58.0	277 56.3 . .	32.3	137 57.2 . .	37.8
N 10	9 29.9	321 57.0	21.4	333 38.3	58.6	292 58.2	32.3	152 59.9	37.7
E 11	24 32.4	336 56.4	22.3	348 38.9	59.2	308 00.1	32.4	168 02.5	37.6
S 12	39 34.8	351 55.8	N17 23.2	3 39.6	N13 59.9	323 02.0	N22 32.4	183 05.2	S11 37.6
D 13	54 37.3	6 55.2	24.2	18 40.3	14 00.5	338 03.9	32.5	198 07.8	37.5
A 14	69 39.8	21 54.5	25.1	33 40.9	01.1	353 05.8	32.5	213 10.5	37.5
Y 15	84 42.2	36 53.9 . .	26.0	48 41.6 . .	01.7	8 07.7 . .	32.6	228 13.1 . .	37.4
16	99 44.7	51 53.3	26.9	63 42.3	02.3	23 09.7	32.6	243 15.8	37.3
17	114 47.2	66 52.7	27.8	78 42.9	03.0	38 11.6	32.7	258 18.4	37.3
18	129 49.6	81 52.1	N17 28.7	93 43.6	N14 03.6	53 13.5	N22 32.7	273 21.1	S11 37.2
19	144 52.1	96 51.4	29.6	108 44.3	04.2	68 15.4	32.8	288 23.7	37.2
20	159 54.6	111 50.8	30.6	123 44.9	04.8	83 17.3	32.9	303 26.4	37.1
21	174 57.0	126 50.2 . .	31.5	138 45.6 . .	05.4	98 19.2 . .	32.9	318 29.0 . .	37.0
22	189 59.5	141 49.6	32.4	153 46.3	06.1	113 21.1	33.0	333 31.7	37.0
23	205 01.9	156 48.9	33.3	168 46.9	06.7	128 23.0	33.0	348 34.3	36.9
2 00	220 04.4	171 48.3	N17 34.2	183 47.6	N14 07.3	143 24.9	N22 33.1	3 37.0	S11 36.9
01	235 06.9	186 47.7	35.1	198 48.3	07.9	158 26.8	33.1	18 39.6	36.8
02	250 09.3	201 47.1	36.0	213 48.9	08.5	173 28.7	33.2	33 42.3	36.8
03	265 11.8	216 46.4 . .	36.9	228 49.6 . .	09.2	188 30.6 . .	33.2	48 44.9 . .	36.7
04	280 14.3	231 45.8	37.8	243 50.3	09.8	203 32.5	33.3	63 47.5	36.6
05	295 16.7	246 45.2	38.7	258 50.9	10.4	218 34.4	33.3	78 50.2	36.6
06	310 19.2	261 44.6	N17 39.6	273 51.6	N14 11.0	233 36.3	N22 33.4	93 52.8	S11 36.5
T 07	325 21.7	276 43.9	40.6	288 52.2	11.6	248 38.2	33.4	108 55.5	36.5
H 08	340 24.1	291 43.3	41.5	303 52.9	12.2	263 40.1	33.5	123 58.1	36.4
U 09	355 26.6	306 42.7 . .	42.4	318 53.6 . .	12.9	278 42.0 . .	33.5	139 00.8 . .	36.3
R 10	10 29.1	321 42.0	43.3	333 54.2	13.5	293 43.9	33.6	154 03.4	36.3
S 11	25 31.5	336 41.4	44.2	348 54.9	14.1	308 45.8	33.6	169 06.1	36.2
D 12	40 34.0	351 40.8	N17 45.1	3 55.6	N14 14.7	323 47.7	N22 33.7	184 08.7	S11 36.2
A 13	55 36.4	6 40.2	46.0	18 56.2	15.3	338 49.6	33.7	199 11.4	36.1
Y 14	70 38.9	21 39.5	46.9	33 56.9	15.9	353 51.5	33.8	214 14.0	36.0
15	85 41.4	36 38.9 . .	47.8	48 57.6 . .	16.5	8 53.5 . .	33.9	229 16.7 . .	36.0
16	100 43.8	51 38.3	48.7	63 58.2	17.2	23 55.4	33.9	244 19.3	35.9
17	115 46.3	66 37.6	49.6	78 58.9	17.8	38 57.3	34.0	259 22.0	35.9
18	130 48.8	81 37.0	N17 50.5	93 59.5	N14 18.4	53 59.2	N22 34.0	274 24.6	S11 35.8
19	145 51.2	96 36.4	51.3	109 00.2	19.0	69 01.1	34.1	289 27.3	35.7
20	160 53.7	111 35.7	52.2	124 00.9	19.6	84 03.0	34.1	304 29.9	35.7
21	175 56.2	126 35.1 . .	53.1	139 01.5 . .	20.2	99 04.9 . .	34.2	319 32.6 . .	35.6
22	190 58.6	141 34.5	54.0	154 02.2	20.8	114 06.8	34.2	334 35.2	35.6
23	206 01.1	156 33.8	54.9	169 02.9	21.5	129 08.7	34.3	349 37.8	35.5
3 00	221 03.5	171 33.2	N17 55.8	184 03.5	N14 22.1	144 10.6	N22 34.3	4 40.5	S11 35.5
01	236 06.0	186 32.5	56.7	199 04.2	22.7	159 12.5	34.4	19 43.1	35.4
02	251 08.5	201 31.9	57.6	214 04.9	23.3	174 14.4	34.4	34 45.8	35.3
03	266 10.9	216 31.3 . .	58.5	229 05.5 . .	23.9	189 16.3 . .	34.5	49 48.4 . .	35.3
04	281 13.4	231 30.6	17 59.4	244 06.2	24.5	204 18.2	34.5	64 51.1	35.2
05	296 15.9	246 30.0	18 00.3	259 06.8	25.1	219 20.1	34.6	79 53.7	35.2
06	311 18.3	261 29.4	N18 01.1	274 07.5	N14 25.7	234 22.0	N22 34.6	94 56.4	S11 35.1
07	326 20.8	276 28.7	02.0	289 08.2	26.4	249 23.9	34.7	109 59.0	35.0
F 08	341 23.3	291 28.1	02.9	304 08.8	27.0	264 25.8	34.7	125 01.7	35.0
R 09	356 25.7	306 27.4 . .	03.8	319 09.5 . .	27.6	279 27.7 . .	34.8	140 04.3 . .	34.9
I 10	11 28.2	321 26.8	04.7	334 10.2	28.2	294 29.6	34.8	155 07.0	34.9
D 11	26 30.7	336 26.2	05.6	349 10.8	28.8	309 31.5	34.9	170 09.6	34.8
A 12	41 33.1	351 25.5	N18 06.4	4 11.5	N14 29.4	324 33.4	N22 35.0	185 12.3	S11 34.8
Y 13	56 35.6	6 24.9	07.3	19 12.1	30.0	339 35.3	35.0	200 14.9	34.7
14	71 38.0	21 24.2	08.2	34 12.8	30.6	354 37.2	35.1	215 17.6	34.6
15	86 40.5	36 23.6 . .	09.1	49 13.5 . .	31.2	9 39.1 . .	35.1	230 20.2 . .	34.6
16	101 43.0	51 22.9	10.0	64 14.1	31.8	24 41.0	35.2	245 22.8	34.5
17	116 45.4	66 22.3	10.8	79 14.8	32.5	39 42.9	35.2	260 25.5	34.5
18	131 47.9	81 21.7	N18 11.7	94 15.4	N14 33.1	54 44.8	N22 35.3	275 28.1	S11 34.4
19	146 50.4	96 21.0	12.6	109 16.1	33.7	69 46.7	35.3	290 30.8	34.3
20	161 52.8	111 20.4	13.5	124 16.8	34.3	84 48.6	35.4	305 33.4	34.3
21	176 55.3	126 19.7 . .	14.3	139 17.4 . .	34.9	99 50.5 . .	35.4	320 36.1 . .	34.2
22	191 57.8	141 19.1	15.2	154 18.1	35.5	114 52.4	35.5	335 38.7	34.2
23	207 00.2	156 18.4	16.1	169 18.8	36.1	129 54.3	35.5	350 41.4	34.1
Mer.Pass.	h m 9 18.2	v -0.6	d 0.9	v 0.7	d 0.6	v 1.9	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.2
Achernar	335 27.4	S57 10.1
Acrux	173 08.7	S63 10.7
Adhara	255 12.8	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.3
Alkaid	152 58.5	N49 14.8
Al Na'ir	27 44.0	S46 53.5
Alnilam	275 46.7	S 1 11.9
Alphard	217 56.1	S 8 43.3
Alphecca	126 10.7	N26 40.1
Alpheratz	357 43.8	N29 09.7
Altair	62 08.2	N 8 54.2
Ankaa	353 16.2	S42 13.9
Antares	112 26.0	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.4	S69 02.8
Avior	234 18.1	S59 33.6
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.5	S52 42.6
Capella	280 35.0	N46 00.6
Deneb	49 31.5	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.8
Dubhe	193 51.5	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 45.8	N51 29.1
Enif	33 47.3	N 9 56.2
Fomalhaut	15 24.3	S29 32.9
Gacrux	172 00.5	S57 11.5
Gienah	175 52.1	S17 37.2
Hadar	148 47.3	S60 26.3
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.7	S34 22.5
Kochab	137 18.9	N74 06.0
Markab	13 38.6	N15 16.6
Menkar	314 15.5	N 4 08.4
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.6	S69 46.8
Mirfak	308 40.9	N49 54.4
Nunki	75 58.2	S26 16.6
Peacock	53 19.3	S56 41.1
Pollux	243 28.0	N27 59.5
Procyon	244 59.9	N 5 11.2
Rasalhague	96 06.3	N12 33.0
Regulus	207 43.5	N11 53.9
Rigel	281 12.4	S 8 11.4
Rigil Kent.	139 51.1	S60 53.4
Sabik	102 12.4	S15 44.4
Schedar	349 41.1	N56 36.5
Shaula	96 21.7	S37 06.6
Sirius	258 34.0	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.5	S43 29.6
Vega	80 38.8	N38 47.7
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	311 43.9	12 33
Mars	323 43.2	11 44
Jupiter	283 20.5	14 25
Saturn	143 32.5	23 41

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 1	Moonrise 2	Moonrise 3	Moonrise 4
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
1 00	180 43.5	N15 03.5	286 37.6	6.9	S16 59.4	6.9	59.5	N 72	////	////	01 43	03 32	03 04	02 48	02 36
01	195 43.6	04.3	301 03.5	6.9	16 52.5	6.9	59.5	N 70	////	////	02 24	02 44	02 38	02 33	02 28
02	210 43.6	05.0	315 29.4	7.1	16 45.6	7.1	59.4	68	////	00 53	02 52	02 13	02 19	02 21	02 23
03	225 43.7 . .	05.8	329 55.5	7.1	16 38.5	7.2	59.4	66	////	01 48	03 13	01 50	02 03	02 12	02 18
04	240 43.8	06.5	344 21.6	7.2	16 31.3	7.3	59.4	64	////	02 20	03 30	01 32	01 50	02 03	02 13
05	255 43.9	07.3	358 47.8	7.3	16 24.0	7.3	59.4	62	00 47	02 43	03 43	01 17	01 40	01 56	02 10
06	270 43.9	N15 08.0	13 14.1	7.3	S16 16.7	7.5	59.3	60	01 36	03 01	03 55	01 04	01 30	01 50	02 06
W 07	285 44.0	08.8	27 40.4	7.5	16 09.2	7.6	59.3	N 58	02 05	03 16	04 05	00 53	01 22	01 45	02 03
E 08	300 44.1	09.6	42 06.9	7.5	16 01.6	7.6	59.3	56	02 27	03 29	04 14	00 44	01 15	01 40	02 01
D 09	315 44.2 . .	10.3	56 33.4	7.6	15 54.0	7.8	59.3	54	02 44	03 40	04 21	00 35	01 08	01 35	01 59
N 10	330 44.2	11.1	71 00.0	7.6	15 46.2	7.8	59.2	52	02 58	03 49	04 28	00 27	01 02	01 31	01 56
E 11	345 44.3	11.8	85 26.6	7.8	15 38.4	8.0	59.2	50	03 11	03 58	04 35	00 21	00 57	01 28	01 54
S 12	0 44.4	N15 12.6	99 53.4	7.8	S15 30.4	8.0	59.2	45	03 35	04 15	04 48	00 06	00 46	01 20	01 50
D 13	15 44.5	13.3	114 20.2	7.9	15 22.4	8.1	59.2	N 40	03 54	04 29	04 59	24 36	00 36	01 13	01 47
A 14	30 44.5	14.1	128 47.1	8.0	15 14.3	8.2	59.1	35	04 08	04 41	05 08	24 28	00 28	01 07	01 44
Y 15	45 44.6 . .	14.8	143 14.1	8.0	15 06.1	8.3	59.1	30	04 21	04 51	05 16	24 21	00 21	01 02	01 41
16	60 44.7	15.6	157 41.1	8.2	14 57.8	8.3	59.1	20	04 40	05 07	05 30	24 08	00 08	00 54	01 36
17	75 44.8	16.3	172 08.3	8.2	14 49.5	8.5	59.1	N 10	04 55	05 20	05 42	23 57	24 46	00 46	01 32
18	90 44.8	N15 17.1	186 35.5	8.2	S14 41.0	8.5	59.0	0	05 07	05 32	05 54	23 47	24 39	00 39	01 28
19	105 44.9	17.8	201 02.7	8.4	14 32.5	8.6	59.0	S 10	05 18	05 43	06 05	23 36	24 32	00 32	01 24
20	120 45.0	18.6	215 30.1	8.4	14 23.9	8.7	59.0	20	05 27	05 54	06 16	23 25	24 24	00 24	01 20
21	135 45.0 . .	19.3	229 57.5	8.6	14 15.2	8.8	59.0	30	05 36	06 05	06 30	23 13	24 15	00 15	01 15
22	150 45.1	20.1	244 25.1	8.5	14 06.4	8.8	58.9	35	05 41	06 11	06 37	23 05	24 10	00 10	01 13
23	165 45.2	20.8	258 52.6	8.7	13 57.6	8.9	58.9	40	05 46	06 18	06 46	22 57	24 04	00 04	01 09
2 00	180 45.3	N15 21.5	273 20.3	8.7	S13 48.7	9.0	58.9	45	05 50	06 25	06 56	22 47	23 57	25 06	01 06
01	195 45.3	22.3	287 48.0	8.9	13 39.7	9.0	58.9	S 50	05 55	06 34	07 08	22 35	23 49	25 02	01 02
02	210 45.4	23.0	302 15.9	8.9	13 30.7	9.2	58.8	52	05 58	06 38	07 14	22 30	23 45	25 00	01 00
03	225 45.5 . .	23.8	316 43.8	8.9	13 21.5	9.2	58.8	54	06 00	06 42	07 20	22 24	23 41	24 57	00 57
04	240 45.5	24.5	331 11.7	9.1	13 12.3	9.2	58.8	56	06 02	06 47	07 27	22 17	23 37	24 55	00 55
05	255 45.6	25.3	345 39.8	9.1	13 03.1	9.4	58.8	58	06 05	06 52	07 35	22 09	23 31	24 52	00 52
06	270 45.7	N15 26.0	0 07.9	9.2	S12 53.7	9.4	58.7	S 60	06 08	06 58	07 44	22 00	23 26	24 49	00 49
T 07	285 45.7	26.8	14 36.1	9.2	12 44.3	9.4	58.7								
H 08	300 45.8	27.5	29 04.3	9.4	12 34.9	9.5	58.7								
U 09	315 45.9 . .	28.2	43 32.7	9.4	12 25.4	9.6	58.6								
R 10	330 45.9	29.0	58 01.1	9.5	12 15.8	9.7	58.6								
S 11	345 46.0	29.7	72 29.6	9.5	12 06.1	9.7	58.6								
D 12	0 46.1	N15 30.5	86 58.1	9.7	S11 56.4	9.8	58.6								
A 13	15 46.1	31.2	101 26.8	9.7	11 46.6	9.8	58.5								
Y 14	30 46.2	32.0	115 55.5	9.7	11 36.8	9.9	58.5								
15	45 46.3 . .	32.7	130 24.2	9.9	11 26.9	9.9	58.5								
16	60 46.3	33.4	144 53.1	9.9	11 17.0	10.0	58.5								
17	75 46.4	34.2	159 22.0	9.9	11 07.0	10.0	58.4								
18	90 46.5	N15 34.9	173 50.9	10.1	S10 57.0	10.1	58.4								
19	105 46.5	35.7	188 20.0	10.1	10 46.9	10.2	58.4								
20	120 46.6	36.4	202 49.1	10.2	10 36.7	10.2	58.4								
21	135 46.7 . .	37.1	217 18.3	10.2	10 26.5	10.2	58.3								
22	150 46.7	37.9	231 47.5	10.3	10 16.3	10.3	58.3								
23	165 46.8	38.6	246 16.8	10.4	10 06.0	10.4	58.3								
3 00	180 46.9	N15 39.3	260 46.2	10.4	S 9 55.6	10.3	58.2								
01	195 46.9	40.1	275 15.6	10.6	9 45.3	10.5	58.2								
02	210 47.0	40.8	289 45.2	10.5	9 34.8	10.4	58.2								
03	225 47.1 . .	41.5	304 14.7	10.7	9 24.4	10.5	58.2								
04	240 47.1	42.3	318 44.4	10.6	9 13.9	10.6	58.1								
05	255 47.2	43.0	333 14.0	10.8	9 03.3	10.6	58.1								
06	270 47.3	N15 43.7	347 43.8	10.8	S 8 52.7	10.6	58.1								
F 07	285 47.3	44.5	2 13.6	10.9	8 42.1	10.7	58.1								
R 08	300 47.4	45.2	16 43.5	10.9	8 31.4	10.6	58.0								
I 09	315 47.4 . .	45.9	31 13.4	11.0	8 20.8	10.8	58.0								
D 10	330 47.5	46.7	45 43.4	11.1	8 10.0	10.7	58.0								
A 11	345 47.6	47.4	60 13.5	11.1	7 59.3	10.8	58.0								
Y 12	0 47.6	N15 48.1	74 43.6	11.1	S 7 48.5	10.9	57.9								
13	15 47.7	48.9	89 13.7	11.3	7 37.6	10.8	57.9								
14	30 47.8	49.6	103 44.0	11.2	7 26.8	10.9	57.9								
15	45 47.8 . .	50.3	118 14.2	11.4	7 15.9	10.9	57.8								
16	60 47.9	51.0	132 44.6	11.3	7 05.0	11.0	57.8								
17	75 47.9	51.8	147 14.9	11.5	6 54.0	11.0	57.8								
18	90 48.0	N15 52.5	161 45.4	11.5	S 6 43.0	11.0	57.8								
19	105 48.1	53.2	176 15.9	11.5	6 32.0	11.0	57.7								
20	120 48.1	54.0	190 46.4	11.6	6 21.0	11.0	57.7								
21	135 48.2 . .	54.7	205 17.0	11.6	6 10.0	11.1	57.7								
22	150 48.2	55.4	219 47.6	11.7	5 58.9	11.1	57.7								
23	165 48.3	56.1	234 18.3	11.8	S 5 47.8	11.1	57.6								
	SD 15.9	d 0.7	SD	16.1		16.0	15.8								

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
1	02 54	02 57	11 57	05 05	17 33	21	61
2	03 01	03 04	11 57	05 59	18 25	22	50
3	03 07	03 10	11 57	06 51	19 15	23	39

UT	ARIES	VENUS −3.9		MARS +1.3		JUPITER −2.0		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
4 00	222 02.7	171 17.8	N18 16.9	184 19.4	N14 36.7	144 56.2	N22 35.6	5 44.0	S11 34.0
01	237 05.2	186 17.1	17.8	199 20.1	37.3	159 58.1	35.6	20 46.7	34.0
02	252 07.6	201 16.5	18.7	214 20.7	37.9	175 00.0	35.7	35 49.3	33.9
03	267 10.1	216 15.8	19.6	229 21.4	38.5	190 01.9	35.7	50 52.0	33.9
04	282 12.5	231 15.2	20.4	244 22.1	39.1	205 03.8	35.8	65 54.6	33.8
05	297 15.0	246 14.5	21.3	259 22.7	39.7	220 05.7	35.8	80 57.3	33.8
06	312 17.5	261 13.9	N18 22.2	274 23.4	N14 40.3	235 07.6	N22 35.9	95 59.9	S11 33.7
07	327 19.9	276 13.2	23.0	289 24.0	40.9	250 09.5	35.9	111 02.5	33.6
S 08	342 22.4	291 12.6	23.9	304 24.7	41.5	265 11.4	36.0	126 05.2	33.6
A 09	357 24.9	306 11.9	24.7	319 25.4	42.2	280 13.3	36.0	141 07.8	33.5
T 10	12 27.3	321 11.3	25.6	334 26.0	42.8	295 15.2	36.1	156 10.5	33.5
U 11	27 29.8	336 10.6	26.5	349 26.7	43.4	310 17.1	36.1	171 13.1	33.4
R 12	42 32.3	351 10.0	N18 27.3	4 27.3	N14 44.0	325 19.0	N22 36.2	186 15.8	S11 33.3
D 13	57 34.7	6 09.3	28.2	19 28.0	44.6	340 20.9	36.2	201 18.4	33.3
A 14	72 37.2	21 08.6	29.1	34 28.7	45.2	355 22.8	36.3	216 21.1	33.2
Y 15	87 39.6	36 08.0	29.9	49 29.3	45.8	10 24.7	36.3	231 23.7	33.2
16	102 42.1	51 07.3	30.8	64 30.0	46.4	25 26.6	36.4	246 26.4	33.1
17	117 44.6	66 06.7	31.6	79 30.6	47.0	40 28.5	36.5	261 29.0	33.1
18	132 47.0	81 06.0	N18 32.5	94 31.3	N14 47.6	55 30.4	N22 36.5	276 31.7	S11 33.0
19	147 49.5	96 05.4	33.3	109 32.0	48.2	70 32.3	36.6	291 34.3	32.9
20	162 52.0	111 04.7	34.2	124 32.6	48.8	85 34.2	36.6	306 37.0	32.9
21	177 54.4	126 04.1	35.0	139 33.3	49.4	100 36.1	36.7	321 39.6	32.8
22	192 56.9	141 03.4	35.9	154 33.9	50.0	115 37.9	36.7	336 42.2	32.8
23	207 59.4	156 02.7	36.8	169 34.6	50.6	130 39.8	36.8	351 44.9	32.7
5 00	223 01.8	171 02.1	N18 37.6	184 35.3	N14 51.2	145 41.7	N22 36.8	6 47.5	S11 32.7
01	238 04.3	186 01.4	38.5	199 35.9	51.8	160 43.6	36.9	21 50.2	32.6
02	253 06.8	201 00.8	39.3	214 36.6	52.4	175 45.5	36.9	36 52.8	32.5
03	268 09.2	216 00.1	40.2	229 37.2	53.0	190 47.4	37.0	51 55.5	32.5
04	283 11.7	230 59.4	41.0	244 37.9	53.6	205 49.3	37.0	66 58.1	32.4
05	298 14.1	245 58.8	41.8	259 38.5	54.2	220 51.2	37.1	82 00.8	32.4
06	313 16.6	260 58.1	N18 42.7	274 39.2	N14 54.8	235 53.1	N22 37.1	97 03.4	S11 32.3
07	328 19.1	275 57.4	43.5	289 39.9	55.4	250 55.0	37.2	112 06.1	32.2
S 08	343 21.5	290 56.8	44.4	304 40.5	56.0	265 56.9	37.2	127 08.7	32.2
U 09	358 24.0	305 56.1	45.2	319 41.2	56.6	280 58.8	37.3	142 11.4	32.1
N 10	13 26.5	320 55.4	46.1	334 41.8	57.2	296 00.7	37.3	157 14.0	32.1
D 11	28 28.9	335 54.8	46.9	349 42.5	57.8	311 02.6	37.4	172 16.6	32.0
A 12	43 31.4	350 54.1	N18 47.7	4 43.2	N14 58.4	326 04.5	N22 37.4	187 19.3	S11 32.0
Y 13	58 33.9	5 53.5	48.6	19 43.8	59.0	341 06.4	37.5	202 21.9	31.9
14	73 36.3	20 52.8	49.4	34 44.5	14 59.6	356 08.3	37.5	217 24.6	31.8
15	88 38.8	35 52.1	50.3	49 45.1	15 00.2	11 10.2	37.6	232 27.2	31.8
16	103 41.2	50 51.5	51.1	64 45.8	00.8	26 12.1	37.6	247 29.9	31.7
17	118 43.7	65 50.8	51.9	79 46.4	01.3	41 14.0	37.7	262 32.5	31.7
18	133 46.2	80 50.1	N18 52.8	94 47.1	N15 01.9	56 15.9	N22 37.7	277 35.2	S11 31.6
19	148 48.6	95 49.4	53.6	109 47.8	02.5	71 17.8	37.8	292 37.8	31.5
20	163 51.1	110 48.8	54.4	124 48.4	03.1	86 19.7	37.8	307 40.5	31.5
21	178 53.6	125 48.1	55.3	139 49.1	03.7	101 21.5	37.9	322 43.1	31.4
22	193 56.0	140 47.4	56.1	154 49.7	04.3	116 23.4	37.9	337 45.7	31.4
23	208 58.5	155 46.8	56.9	169 50.4	04.9	131 25.3	38.0	352 48.4	31.3
6 00	224 01.0	170 46.1	N18 57.8	184 51.0	N15 05.5	146 27.2	N22 38.0	7 51.0	S11 31.3
01	239 03.4	185 45.4	58.6	199 51.7	06.1	161 29.1	38.1	22 53.7	31.2
02	254 05.9	200 44.8	18 59.4	214 52.4	06.7	176 31.0	38.1	37 56.3	31.1
03	269 08.4	215 44.1	19 00.3	229 53.0	07.3	191 32.9	38.2	52 59.0	31.1
04	284 10.8	230 43.4	01.1	244 53.7	07.9	206 34.8	38.2	68 01.6	31.0
05	299 13.3	245 42.7	01.9	259 54.3	08.5	221 36.7	38.3	83 04.3	31.0
06	314 15.7	260 42.1	N19 02.7	274 55.0	N15 09.1	236 38.6	N22 38.3	98 06.9	S11 30.9
07	329 18.2	275 41.4	03.6	289 55.6	09.7	251 40.5	38.4	113 09.6	30.9
08	344 20.7	290 40.7	04.4	304 56.3	10.2	266 42.4	38.4	128 12.2	30.8
M 09	359 23.1	305 40.0	05.2	319 57.0	10.8	281 44.3	38.5	143 14.8	30.7
O 10	14 25.6	320 39.4	06.0	334 57.6	11.4	296 46.2	38.5	158 17.5	30.7
N 11	29 28.1	335 38.7	06.8	349 58.3	12.0	311 48.1	38.6	173 20.1	30.6
D 12	44 30.5	350 38.0	N19 07.7	4 58.9	N15 12.6	326 49.9	N22 38.6	188 22.8	S11 30.6
A 13	59 33.0	5 37.3	08.5	19 59.6	13.2	341 51.8	38.7	203 25.4	30.5
Y 14	74 35.5	20 36.6	09.3	35 00.2	13.8	356 53.7	38.7	218 28.1	30.5
15	89 37.9	35 36.0	10.1	50 00.9	14.4	11 55.6	38.8	233 30.7	30.4
16	104 40.4	50 35.3	10.9	65 01.5	15.0	26 57.5	38.8	248 33.4	30.3
17	119 42.9	65 34.6	11.8	80 02.2	15.6	41 59.4	38.9	263 36.0	30.3
18	134 45.3	80 33.9	N19 12.6	95 02.9	N15 16.2	57 01.3	N22 38.9	278 38.7	S11 30.2
19	149 47.8	95 33.2	13.4	110 03.5	16.7	72 03.2	39.0	293 41.3	30.2
20	164 50.2	110 32.6	14.2	125 04.2	17.3	87 05.1	39.0	308 43.9	30.1
21	179 52.7	125 31.9	15.0	140 04.8	17.9	102 07.0	39.1	323 46.6	30.1
22	194 55.2	140 31.2	15.8	155 05.5	18.5	117 08.9	39.1	338 49.2	30.0
23	209 57.6	155 30.5	16.6	170 06.1	19.1	132 10.8	39.2	353 51.9	29.9
Mer. Pass.	h m 9 06.4	v −0.7	d 0.8	v 0.7	d 0.6	v 1.9	d 0.1	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.2
Achernar	335 27.4	S57 10.1
Acrux	173 08.8	S63 10.7
Adhara	255 12.8	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.3
Alkaid	152 58.5	N49 14.8
Al Na'ir	27 44.0	S46 53.5
Alnilam	275 46.7	S 1 11.9
Alphard	217 56.1	S 8 43.3
Alphecca	126 10.7	N26 40.2
Alpheratz	357 43.8	N29 09.7
Altair	62 08.2	N 8 54.2
Ankaa	353 16.1	S42 13.9
Antares	112 26.0	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.4	S69 02.8
Avior	234 18.1	S59 33.6
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.5	S52 42.6
Capella	280 35.0	N46 00.6
Deneb	49 31.5	N45 19.5
Denebola	182 33.5	N14 29.7
Diphda	348 56.3	S17 54.8
Dubhe	193 51.5	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 45.8	N51 29.1
Enif	33 47.2	N 9 56.2
Fomalhaut	15 24.3	S29 32.9
Gacrux	172 00.5	S57 11.6
Gienah	175 52.1	S17 37.2
Hadar	148 47.3	S60 26.3
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.7	S34 22.5
Kochab	137 18.9	N74 06.1
Markab	13 38.6	N15 16.6
Menkar	314 15.5	N 4 08.4
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.6	S69 46.8
Mirfak	308 40.9	N49 54.4
Nunki	75 58.2	S26 16.6
Peacock	53 19.3	S56 41.1
Pollux	243 28.0	N27 59.5
Procyon	245 00.0	N 5 11.2
Rasalhague	96 06.3	N12 33.0
Regulus	207 43.5	N11 53.9
Rigel	281 12.4	S 8 11.4
Rigil Kent.	139 51.1	S60 53.4
Sabik	102 12.3	S15 44.4
Schedar	349 41.0	N56 36.5
Shaula	96 21.7	S37 06.6
Sirius	258 34.0	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.5	S43 29.6
Vega	80 38.8	N38 47.7
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	308 00.2	12 36
Mars	321 33.4	11 41
Jupiter	282 39.9	14 15
Saturn	143 45.7	23 29

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 4	Moonrise 5	Moonrise 6	Moonrise 7
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
4 00	180 48.4	N15 56.9	248 49.1	11.7	S 5 36.7	11.1	57.6	N 72	////	////	01 12	02 36	02 25	02 15	02 04
01	195 48.4	57.6	263 19.8	11.9	5 25.6	11.1	57.6	N 70	////	////	02 06	02 28	02 24	02 20	02 15
02	210 48.5	58.3	277 50.7	11.8	5 14.5	11.2	57.6	68	////	////	02 38	02 23	02 23	02 24	02 24
03	225 48.5	59.0	292 21.5	12.0	5 03.3	11.2	57.5	66	////	01 28	03 01	02 18	02 22	02 27	02 32
04	240 48.6	15 59.8	306 52.5	11.9	4 52.1	11.2	57.5	64	////	02 05	03 20	02 13	02 22	02 30	02 39
05	255 48.6	16 00.5	321 23.4	12.0	4 40.9	11.2	57.5	62	////	02 31	03 34	02 10	02 21	02 33	02 44
06	270 48.7	N16 01.2	335 54.4	12.1	S 4 29.7	11.2	57.5	60	01 18	02 51	03 47	02 06	02 21	02 35	02 49
07	285 48.8	01.9	350 25.5	12.1	4 18.5	11.2	57.4	N 58	01 52	03 08	03 58	02 03	02 20	02 37	02 54
S 08	300 48.8	02.6	4 56.6	12.1	4 07.3	11.3	57.4	56	02 16	03 21	04 07	02 01	02 20	02 39	02 58
A 09	315 48.9	03.4	19 27.7	12.2	3 56.0	11.2	57.4	54	02 35	03 33	04 15	01 59	02 20	02 40	03 01
T 10	330 48.9	04.1	33 58.9	12.2	3 44.8	11.3	57.4	52	02 51	03 43	04 23	01 56	02 19	02 42	03 05
U 11	345 49.0	04.8	48 30.1	12.2	3 33.5	11.2	57.3	50	03 04	03 52	04 29	01 54	02 19	02 43	03 07
R 12	0 49.0	N16 05.5	63 01.3	12.3	S 3 22.3	11.3	57.3	45	03 30	04 11	04 44	01 50	02 18	02 46	03 14
D 13	15 49.1	06.2	77 32.6	12.3	3 11.0	11.3	57.3	N 40	03 49	04 26	04 55	01 47	02 18	02 48	03 19
A 14	30 49.1	07.0	92 03.9	12.4	2 59.7	11.3	57.3	35	04 05	04 38	05 05	01 44	02 18	02 51	03 24
Y 15	45 49.2	07.7	106 35.3	12.4	2 48.4	11.3	57.2	30	04 18	04 48	05 14	01 41	02 17	02 53	03 28
16	60 49.3	08.4	121 06.7	12.4	2 37.1	11.3	57.2	20	04 38	05 05	05 29	01 36	02 17	02 56	03 35
17	75 49.3	09.1	135 38.1	12.5	2 25.8	11.3	57.2	N 10	04 54	05 19	05 41	01 32	02 16	02 59	03 42
18	90 49.4	N16 09.8	150 09.6	12.5	S 2 14.5	11.3	57.2	0	05 07	05 32	05 53	01 28	02 15	03 02	03 48
19	105 49.4	10.6	164 41.1	12.5	2 03.2	11.3	57.1	S 10	05 18	05 43	06 05	01 24	02 15	03 05	03 54
20	120 49.5	11.3	179 12.6	12.6	1 51.9	11.3	57.1	20	05 28	05 55	06 17	01 20	02 14	03 08	04 00
21	135 49.5	12.0	193 44.2	12.6	1 40.6	11.3	57.1	30	05 38	06 07	06 32	01 15	02 14	03 11	04 08
22	150 49.6	12.7	208 15.8	12.6	1 29.3	11.3	57.1	35	05 43	06 13	06 40	01 13	02 14	03 13	04 12
23	165 49.6	13.4	222 47.4	12.6	1 18.0	11.3	57.0	40	05 48	06 20	06 49	01 09	02 13	03 16	04 17
5 00	180 49.7	N16 14.1	237 19.0	12.7	S 1 06.7	11.2	57.0	45	05 53	06 29	07 00	01 06	02 13	03 18	04 23
01	195 49.7	14.8	251 50.7	12.7	0 55.5	11.3	57.0	S 50	05 59	06 38	07 13	01 02	02 12	03 22	04 29
02	210 49.8	15.6	266 22.4	12.7	0 44.2	11.3	57.0	52	06 02	06 42	07 19	01 00	02 12	03 23	04 33
03	225 49.8	16.3	280 54.1	12.8	0 32.9	11.3	56.9	54	06 04	06 47	07 25	00 57	02 12	03 25	04 36
04	240 49.9	17.0	295 25.9	12.8	0 21.6	11.3	56.9	56	06 07	06 52	07 33	00 55	02 12	03 27	04 40
05	255 49.9	17.7	309 57.7	12.8	S 0 10.3	11.2	56.9	58	06 10	06 58	07 41	00 52	02 11	03 29	04 44
06	270 50.0	N16 18.4	324 29.5	12.8	N 0 00.9	11.3	56.9	S 60	06 14	07 04	07 51	00 49	02 11	03 31	04 49
07	285 50.1	19.1	339 01.3	12.9	0 12.2	11.2	56.8								
S 08	300 50.1	19.8	353 33.2	12.9	0 23.4	11.3	56.8								
U 09	315 50.2	20.5	8 05.1	12.9	0 34.7	11.2	56.8								
N 10	330 50.2	21.2	22 37.0	12.9	0 45.9	11.2	56.8								
D 11	345 50.3	21.9	37 08.9	12.9	0 57.1	11.2	56.7								
A 12	0 50.3	N16 22.7	51 40.8	13.0	N 1 08.3	11.2	56.7								
Y 13	15 50.4	23.4	66 12.8	12.9	1 19.5	11.1	56.7								
14	30 50.4	24.1	80 44.7	13.0	1 30.6	11.2	56.7								
15	45 50.5	24.8	95 16.7	13.0	1 41.8	11.1	56.6								
16	60 50.5	25.5	109 48.7	13.1	1 52.9	11.1	56.6								
17	75 50.5	26.2	124 20.8	13.0	2 04.0	11.1	56.6								
18	90 50.6	N16 26.9	138 52.8	13.1	N 2 15.1	11.1	56.6								
19	105 50.6	27.6	153 24.9	13.0	2 26.2	11.1	56.6								
20	120 50.7	28.3	167 56.9	13.1	2 37.3	11.0	56.5								
21	135 50.7	29.0	182 29.0	13.1	2 48.3	11.0	56.5								
22	150 50.8	29.7	197 01.1	13.1	2 59.3	11.0	56.5								
23	165 50.8	30.4	211 33.2	13.1	3 10.3	11.0	56.5								
6 00	180 50.9	N16 31.1	226 05.3	13.2	N 3 21.3	11.0	56.4								
01	195 50.9	31.8	240 37.5	13.1	3 32.3	10.9	56.4								
02	210 51.0	32.5	255 09.6	13.1	3 43.2	10.9	56.4								
03	225 51.0	33.2	269 41.7	13.2	3 54.1	10.9	56.4								
04	240 51.1	33.9	284 13.9	13.2	4 05.0	10.8	56.3								
05	255 51.1	34.6	298 46.1	13.1	4 15.8	10.9	56.3								
06	270 51.2	N16 35.3	313 18.2	13.2	N 4 26.7	10.7	56.3								
07	285 51.2	36.0	327 50.4	13.2	4 37.4	10.8	56.3								
08	300 51.2	36.7	342 22.6	13.2	4 48.2	10.8	56.3								
M 09	315 51.3	37.4	356 54.8	13.2	4 59.0	10.7	56.2								
O 10	330 51.3	38.1	11 27.0	13.2	5 09.7	10.6	56.2								
N 11	345 51.4	38.8	25 59.2	13.2	5 20.3	10.7	56.2								
D 12	0 51.4	N16 39.5	40 31.4	13.2	N 5 31.0	10.6	56.2								
A 13	15 51.5	40.2	55 03.6	13.2	5 41.6	10.6	56.2								
Y 14	30 51.5	40.9	69 35.8	13.2	5 52.2	10.5	56.1								
15	45 51.6	41.6	84 08.0	13.2	6 02.7	10.5	56.1								
16	60 51.6	42.3	98 40.2	13.2	6 13.2	10.5	56.1								
17	75 51.6	43.0	113 12.4	13.2	6 23.7	10.4	56.1								
18	90 51.7	N16 43.7	127 44.6	13.2	N 6 34.1	10.4	56.0								
19	105 51.7	44.4	142 16.8	13.2	6 44.5	10.4	56.0								
20	120 51.8	45.1	156 49.0	13.2	6 54.9	10.3	56.0								
21	135 51.8	45.8	171 21.2	13.2	7 05.2	10.3	56.0								
22	150 51.8	46.5	185 53.4	13.2	7 15.5	10.2	56.0								
23	165 51.9	47.1	200 25.6	13.2	N 7 25.7	10.2	55.9								
	SD 15.9	d 0.7	SD	15.6		15.5	15.3								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 4	Moonset 5	Moonset 6	Moonset 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	22 52	////	////	13 09	14 58	16 45	18 34
N 70	21 53	////	////	13 14	14 56	16 36	18 16
68	21 19	////	////	13 18	14 54	16 28	18 02
66	20 55	22 33	////	13 21	14 53	16 22	17 51
64	20 36	21 52	////	13 24	14 51	16 17	17 41
62	20 21	21 25	////	13 26	14 50	16 12	17 33
60	20 08	21 04	22 42	13 28	14 49	16 08	17 26
N 58	19 57	20 48	22 05	13 30	14 48	16 05	17 20
56	19 48	20 34	21 40	13 32	14 47	16 02	17 15
54	19 39	20 22	21 20	13 33	14 47	15 59	17 10
52	19 32	20 12	21 04	13 34	14 46	15 56	17 05
50	19 25	20 02	20 51	13 35	14 46	15 54	17 01
45	19 11	19 44	20 25	13 38	14 44	15 49	16 53
N 40	18 59	19 29	20 05	13 40	14 43	15 45	16 46
35	18 49	19 16	19 49	13 42	14 42	15 42	16 40
30	18 40	19 06	19 36	13 44	14 42	15 38	16 35
20	18 25	18 48	19 16	13 46	14 40	15 33	16 25
N 10	18 12	18 34	19 00	13 49	14 39	15 28	16 17
0	18 00	18 22	18 47	13 51	14 38	15 24	16 10
S 10	17 48	18 10	18 35	13 53	14 37	15 19	16 02
20	17 36	17 59	18 25	13 55	14 35	15 15	15 54
30	17 21	17 46	18 15	13 58	14 34	15 09	15 45
35	17 13	17 40	18 10	14 00	14 33	15 06	15 40
40	17 04	17 32	18 05	14 01	14 32	15 03	15 34
45	16 53	17 24	17 59	14 03	14 31	14 58	15 27
S 50	16 40	17 15	17 53	14 05	14 30	14 54	15 19
52	16 34	17 10	17 51	14 06	14 29	14 51	15 15
54	16 27	17 06	17 48	14 08	14 28	14 49	15 11
56	16 20	17 01	17 45	14 09	14 28	14 46	15 06
58	16 11	16 55	17 42	14 10	14 27	14 43	15 01
S 60	16 02	16 48	17 39	14 12	14 26	14 40	14 55

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
4	03 13	03 16	11 57	07 40	20 03	24	29
5	03 19	03 21	11 57	08 27	20 50	25	20
6	03 23	03 26	11 57	09 13	21 36	26	12

UT	ARIES	VENUS −3.9		MARS +1.3		JUPITER −2.0		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
7 00	225 00.1	170 29.8	N19 17.4	185 06.8	N15 19.7	147 12.7	N22 39.2	8 54.5	S11 29.9
01	240 02.6	185 29.2	18.2	200 07.4	20.3	162 14.5	39.3	23 57.2	29.8
02	255 05.0	200 28.5	19.0	215 08.1	20.9	177 16.4	39.3	38 59.8	29.8
03	270 07.5	215 27.8	19.9	230 08.8	21.4	192 18.3	39.4	54 02.5	29.7
04	285 10.0	230 27.1	20.7	245 09.4	22.0	207 20.2	39.4	69 05.1	29.7
05	300 12.4	245 26.4	21.5	260 10.1	22.6	222 22.1	39.5	84 07.7	29.6
06	315 14.9	260 25.7	N19 22.3	275 10.7	N15 23.2	237 24.0	N22 39.5	99 10.4	S11 29.5
07	330 17.3	275 25.0	23.1	290 11.4	23.8	252 25.9	39.6	114 13.0	29.5
08	345 19.8	290 24.4	23.9	305 12.0	24.4	267 27.8	39.6	129 15.7	29.4
09	0 22.3	305 23.7	24.7	320 12.7	25.0	282 29.7	39.7	144 18.3	29.4
10	15 24.7	320 23.0	25.5	335 13.3	25.5	297 31.6	39.7	159 21.0	29.3
11	30 27.2	335 22.3	26.3	350 14.0	26.1	312 33.5	39.8	174 23.6	29.3
12	45 29.7	350 21.6	N19 27.1	5 14.6	N15 26.7	327 35.3	N22 39.8	189 26.3	S11 29.2
13	60 32.1	5 20.9	27.9	20 15.3	27.3	342 37.2	39.9	204 28.9	29.1
14	75 34.6	20 20.2	28.7	35 16.0	27.9	357 39.1	39.9	219 31.6	29.1
15	90 37.1	35 19.5	29.5	50 16.6	28.5	12 41.0	40.0	234 34.2	29.0
16	105 39.5	50 18.8	30.3	65 17.3	29.0	27 42.9	40.0	249 36.8	29.0
17	120 42.0	65 18.1	31.1	80 17.9	29.6	42 44.8	40.1	264 39.5	28.9
18	135 44.5	80 17.5	N19 31.8	95 18.6	N15 30.2	57 46.7	N22 40.1	279 42.1	S11 28.9
19	150 46.9	95 16.8	32.6	110 19.2	30.8	72 48.6	40.2	294 44.8	28.8
20	165 49.4	110 16.1	33.4	125 19.9	31.4	87 50.5	40.2	309 47.4	28.7
21	180 51.8	125 15.4	34.2	140 20.5	32.0	102 52.4	40.3	324 50.1	28.7
22	195 54.3	140 14.7	35.0	155 21.2	32.5	117 54.2	40.3	339 52.7	28.6
23	210 56.8	155 14.0	35.8	170 21.8	33.1	132 56.1	40.4	354 55.3	28.6
8 00	225 59.2	170 13.3	N19 36.6	185 22.5	N15 33.7	147 58.0	N22 40.4	9 58.0	S11 28.5
01	241 01.7	185 12.6	37.4	200 23.1	34.3	162 59.9	40.5	25 00.6	28.5
02	256 04.2	200 11.9	38.2	215 23.8	34.9	178 01.8	40.5	40 03.3	28.4
03	271 06.6	215 11.2	38.9	230 24.4	35.4	193 03.7	40.6	55 05.9	28.3
04	286 09.1	230 10.5	39.7	245 25.1	36.0	208 05.6	40.6	70 08.6	28.3
05	301 11.6	245 09.8	40.5	260 25.7	36.6	223 07.5	40.7	85 11.2	28.2
06	316 14.0	260 09.1	N19 41.3	275 26.4	N15 37.2	238 09.4	N22 40.7	100 13.9	S11 28.2
07	331 16.5	275 08.4	42.1	290 27.1	37.8	253 11.2	40.8	115 16.5	28.1
08	346 18.9	290 07.7	42.9	305 27.7	38.3	268 13.1	40.8	130 19.1	28.1
09	1 21.4	305 07.0	43.6	320 28.4	38.9	283 15.0	40.9	145 21.8	28.0
10	16 23.9	320 06.3	44.4	335 29.0	39.5	298 16.9	40.9	160 24.4	27.9
11	31 26.3	335 05.6	45.2	350 29.7	40.1	313 18.8	41.0	175 27.1	27.9
12	46 28.8	350 04.9	N19 46.0	5 30.3	N15 40.6	328 20.7	N22 41.0	190 29.7	S11 27.8
13	61 31.3	5 04.2	46.7	20 31.0	41.2	343 22.6	41.0	205 32.4	27.8
14	76 33.7	20 03.5	47.5	35 31.6	41.8	358 24.5	41.1	220 35.0	27.7
15	91 36.2	35 02.8	48.3	50 32.3	42.4	13 26.3	41.1	235 37.7	27.7
16	106 38.7	50 02.1	49.1	65 32.9	42.9	28 28.2	41.2	250 40.3	27.6
17	121 41.1	65 01.4	49.8	80 33.6	43.5	43 30.1	41.2	265 42.9	27.5
18	136 43.6	80 00.7	N19 50.6	95 34.2	N15 44.1	58 32.0	N22 41.3	280 45.6	S11 27.5
19	151 46.1	95 00.0	51.4	110 34.9	44.7	73 33.9	41.3	295 48.2	27.4
20	166 48.5	109 59.3	52.1	125 35.5	45.3	88 35.8	41.4	310 50.9	27.4
21	181 51.0	124 58.6	52.9	140 36.2	45.8	103 37.7	41.4	325 53.5	27.3
22	196 53.4	139 57.9	53.7	155 36.8	46.4	118 39.6	41.5	340 56.2	27.3
23	211 55.9	154 57.2	54.4	170 37.5	47.0	133 41.4	41.5	355 58.8	27.2
9 00	226 58.4	169 56.5	N19 55.2	185 38.1	N15 47.6	148 43.3	N22 41.6	11 01.4	S11 27.2
01	242 00.8	184 55.8	56.0	200 38.8	48.1	163 45.2	41.6	26 04.1	27.1
02	257 03.3	199 55.1	56.7	215 39.4	48.7	178 47.1	41.7	41 06.7	27.0
03	272 05.8	214 54.4	57.5	230 40.1	49.3	193 49.0	41.7	56 09.4	27.0
04	287 08.2	229 53.6	58.3	245 40.7	49.8	208 50.9	41.8	71 12.0	26.9
05	302 10.7	244 52.9	59.0	260 41.4	50.4	223 52.8	41.8	86 14.7	26.9
06	317 13.2	259 52.2	N19 59.8	275 42.0	N15 51.0	238 54.6	N22 41.9	101 17.3	S11 26.8
07	332 15.6	274 51.5	20 00.5	290 42.7	51.6	253 56.5	41.9	116 19.9	26.8
08	347 18.1	289 50.8	01.3	305 43.3	52.1	268 58.4	42.0	131 22.6	26.7
09	2 20.6	304 50.1	02.1	320 44.0	52.7	284 00.3	42.0	146 25.2	26.6
10	17 23.0	319 49.4	02.8	335 44.6	53.3	299 02.2	42.1	161 27.9	26.6
11	32 25.5	334 48.7	03.6	350 45.3	53.8	314 04.1	42.1	176 30.5	26.5
12	47 27.9	349 48.0	N20 04.3	5 45.9	N15 54.4	329 06.0	N22 42.2	191 33.2	S11 26.5
13	62 30.4	4 47.2	05.1	20 46.6	55.0	344 07.8	42.2	206 35.8	26.4
14	77 32.9	19 46.5	05.8	35 47.2	55.6	359 09.7	42.3	221 38.4	26.4
15	92 35.3	34 45.8	06.6	50 47.9	56.1	14 11.6	42.3	236 41.1	26.3
16	107 37.8	49 45.1	07.3	65 48.5	56.7	29 13.5	42.4	251 43.7	26.3
17	122 40.3	64 44.4	08.1	80 49.2	57.3	44 15.4	42.4	266 46.4	26.2
18	137 42.7	79 43.7	N20 08.8	95 49.8	N15 57.8	59 17.3	N22 42.4	281 49.0	S11 26.1
19	152 45.2	94 43.0	09.6	110 50.5	58.4	74 19.2	42.5	296 51.7	26.1
20	167 47.7	109 42.2	10.3	125 51.1	59.0	89 21.0	42.5	311 54.3	26.0
21	182 50.1	124 41.5	11.1	140 51.8	15 59.5	104 22.9	42.6	326 56.9	26.0
22	197 52.6	139 40.8	11.8	155 52.4	16 00.1	119 24.8	42.6	341 59.6	25.9
23	212 55.0	154 40.1	12.6	170 53.1	N16 00.7	134 26.7	42.7	357 02.2	25.9
Mer.Pass.	h m 8 54.6	v −0.7	d 0.8	v 0.7	d 0.6	v 1.9	d 0.0	v 2.6	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.2
Achernar	335 27.4	S57 10.1
Acrux	173 08.8	S63 10.7
Adhara	255 12.8	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.3	N55 53.3
Alkaid	152 58.5	N49 14.8
Al Na'ir	27 44.0	S46 53.5
Alnilam	275 46.7	S 1 11.9
Alphard	217 56.2	S 8 43.3
Alphecca	126 10.7	N26 40.2
Alpheratz	357 43.8	N29 09.7
Altair	62 08.2	N 8 54.3
Ankaa	353 16.1	S42 13.9
Antares	112 26.0	S26 27.6
Arcturus	145 55.5	N19 06.7
Atria	107 27.4	S69 02.9
Avior	234 18.2	S59 33.6
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.6	S52 42.6
Capella	280 35.0	N46 00.6
Deneb	49 31.4	N45 19.5
Denebola	182 33.6	N14 29.7
Diphda	348 56.2	S17 54.8
Dubhe	193 51.6	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 45.8	N51 29.2
Enif	33 47.2	N 9 56.2
Fomalhaut	15 24.2	S29 32.9
Gacrux	172 00.5	S57 11.6
Gienah	175 52.1	S17 37.2
Hadar	148 47.3	S60 26.4
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.6	S34 22.5
Kochab	137 18.9	N74 06.1
Markab	13 38.6	N15 16.6
Menkar	314 15.5	N 4 08.4
Menkent	148 07.3	S36 26.2
Miaplacidus	221 39.7	S69 46.8
Mirfak	308 40.9	N49 54.4
Nunki	75 58.2	S26 16.6
Peacock	53 19.3	S56 41.1
Pollux	243 28.0	N27 59.5
Procyon	245 00.0	N 5 11.2
Rasalhague	96 06.2	N12 33.0
Regulus	207 43.5	N11 54.0
Rigel	281 12.4	S 8 11.4
Rigil Kent.	139 51.1	S60 53.4
Sabik	102 12.3	S15 44.4
Schedar	349 41.0	N56 36.5
Shaula	96 21.7	S37 06.6
Sirius	258 34.0	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.5	S43 29.6
Vega	80 38.7	N38 47.7
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	304 14.1	12 40
Mars	319 23.2	11 38
Jupiter	281 58.8	14 06
Saturn	143 58.8	23 16

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 7	Moonrise 8	Moonrise 9	Moonrise 10
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
7 00	180 51.9	N16 47.8	214 57.8	13.2	N 7 35.9	10.2	55.9	N 72	////	////	00 20	02 04	01 51	01 35	01 03
01	195 52.0	48.5	229 30.0	13.2	7 46.1	10.1	55.9	N 70	////	////	01 45	02 15	02 11	02 06	02 02
02	210 52.0	49.2	244 02.2	13.2	7 56.2	10.1	55.9	68	////	////	02 23	02 24	02 26	02 29	02 36
03	225 52.0	49.9	258 34.4	13.1	8 06.3	10.0	55.9	66	////	01 02	02 49	02 32	02 39	02 48	03 01
04	240 52.1	50.6	273 06.5	13.2	8 16.3	10.0	55.8	64	////	01 50	03 10	02 39	02 49	03 02	03 21
05	255 52.1	51.3	287 38.7	13.2	8 26.3	9.9	55.8	62	////	02 20	03 26	02 44	02 58	03 15	03 37
06	270 52.2	N16 52.0	302 10.9	13.1	N 8 36.2	9.9	55.8	60	00 55	02 42	03 39	02 49	03 06	03 26	03 50
07	285 52.2	52.7	316 43.0	13.2	8 46.1	9.9	55.8	N 58	01 39	02 59	03 51	02 54	03 13	03 35	04 02
08	300 52.2	53.3	331 15.2	13.1	8 56.0	9.8	55.8	56	02 06	03 14	04 01	02 58	03 19	03 43	04 12
09	315 52.3	54.0	345 47.3	13.1	9 05.8	9.7	55.7	54	02 26	03 26	04 10	03 01	03 24	03 50	04 21
10	330 52.3	54.7	0 19.4	13.2	9 15.5	9.7	55.7	52	02 43	03 37	04 17	03 05	03 29	03 57	04 28
11	345 52.4	55.4	14 51.6	13.1	9 25.2	9.7	55.7	50	02 57	03 47	04 24	03 07	03 34	04 03	04 36
12	0 52.4	N16 56.1	29 23.7	13.1	N 9 34.9	9.6	55.7	45	03 25	04 06	04 39	03 14	03 43	04 15	04 51
13	15 52.4	56.8	43 55.8	13.1	9 44.5	9.5	55.7	N 40	03 45	04 22	04 52	03 19	03 51	04 26	05 04
14	30 52.5	57.5	58 27.9	13.1	9 54.0	9.5	55.6	35	04 01	04 35	05 02	03 24	03 58	04 35	05 14
15	45 52.5	58.1	73 00.0	13.0	10 03.5	9.5	55.6	30	04 15	04 46	05 11	03 28	04 05	04 43	05 24
16	60 52.5	58.8	87 32.0	13.1	10 13.0	9.4	55.6	20	04 36	05 04	05 27	03 35	04 15	04 57	05 40
17	75 52.6	16 59.5	102 04.1	13.1	10 22.4	9.3	55.6	N 10	04 53	05 18	05 40	03 42	04 25	05 09	05 55
18	90 52.6	N17 00.2	116 36.2	13.0	N10 31.7	9.3	55.6	0	05 06	05 31	05 53	03 48	04 34	05 20	06 08
19	105 52.7	00.9	131 08.2	13.0	10 41.0	9.2	55.5	S 10	05 18	05 43	06 05	03 54	04 43	05 32	06 21
20	120 52.7	01.6	145 40.2	13.0	10 50.2	9.2	55.5	20	05 29	05 56	06 19	04 00	04 52	05 44	06 36
21	135 52.7	02.2	160 12.2	13.0	10 59.4	9.1	55.5	30	05 40	06 08	06 33	04 08	05 03	05 58	06 53
22	150 52.8	02.9	174 44.2	13.0	11 08.5	9.1	55.5	35	05 45	06 15	06 42	04 12	05 10	06 07	07 02
23	165 52.8	03.6	189 16.2	13.0	11 17.6	9.0	55.5	40	05 51	06 23	06 52	04 17	05 17	06 16	07 13
8 00	180 52.8	N17 04.3	203 48.2	13.0	N11 26.6	9.0	55.5	45	05 57	06 32	07 03	04 23	05 26	06 27	07 26
01	195 52.9	05.0	218 20.2	12.9	11 35.6	8.8	55.4	S 50	06 03	06 42	07 17	04 29	05 36	06 41	07 42
02	210 52.9	05.6	232 52.1	12.9	11 44.4	8.9	55.4	52	06 06	06 47	07 23	04 33	05 41	06 47	07 50
03	225 52.9	06.3	247 24.0	13.0	11 53.3	8.8	55.4	54	06 09	06 52	07 31	04 36	05 46	06 54	07 58
04	240 53.0	07.0	261 56.0	12.9	12 02.1	8.7	55.4	56	06 12	06 57	07 38	04 40	05 52	07 02	08 08
05	255 53.0	07.7	276 27.9	12.9	12 10.8	8.6	55.4	58	06 16	07 03	07 47	04 44	05 59	07 11	08 18
06	270 53.0	N17 08.3	290 59.8	12.8	N12 19.4	8.6	55.3	S 60	06 19	07 10	07 58	04 49	06 06	07 21	08 31
07	285 53.1	09.0	305 31.6	12.9	12 28.0	8.5	55.3								
08	300 53.1	09.7	320 03.5	12.8	12 36.5	8.5	55.3								
09	315 53.1	10.4	334 35.3	12.8	12 45.0	8.4	55.3								
10	330 53.2	11.0	349 07.1	12.9	12 53.4	8.3	55.3								
11	345 53.2	11.7	3 39.0	12.7	13 01.7	8.3	55.3								
12	0 53.2	N17 12.4	18 10.7	12.8	N13 10.0	8.2	55.2								
13	15 53.3	13.1	32 42.5	12.8	13 18.2	8.1	55.2								
14	30 53.3	13.7	47 14.3	12.7	13 26.3	8.1	55.2								
15	45 53.3	14.4	61 46.0	12.8	13 34.4	8.0	55.2								
16	60 53.4	15.1	76 17.8	12.7	13 42.4	8.0	55.2								
17	75 53.4	15.7	90 49.5	12.6	13 50.4	7.8	55.2								
18	90 53.4	N17 16.4	105 21.1	12.7	N13 58.2	7.8	55.1								
19	105 53.4	17.1	119 52.8	12.7	14 06.0	7.8	55.1								
20	120 53.5	17.8	134 24.5	12.6	14 13.8	7.6	55.1								
21	135 53.5	18.4	148 56.1	12.6	14 21.4	7.6	55.1								
22	150 53.5	19.1	163 27.7	12.6	14 29.0	7.5	55.1								
23	165 53.6	19.8	177 59.3	12.6	14 36.5	7.5	55.1								
9 00	180 53.6	N17 20.4	192 30.9	12.6	N14 44.0	7.3	55.0								
01	195 53.6	21.1	207 02.5	12.5	14 51.3	7.3	55.0								
02	210 53.6	21.8	221 34.0	12.6	14 58.6	7.3	55.0								
03	225 53.7	22.4	236 05.6	12.5	15 05.9	7.1	55.0								
04	240 53.7	23.1	250 37.1	12.5	15 13.0	7.1	55.0								
05	255 53.7	23.8	265 08.6	12.5	15 20.1	7.0	55.0								
06	270 53.8	N17 24.4	279 40.1	12.4	N15 27.1	6.9	54.9								
07	285 53.8	25.1	294 11.5	12.5	15 34.0	6.9	54.9								
08	300 53.8	25.8	308 43.0	12.4	15 40.9	6.8	54.9								
09	315 53.8	26.4	323 14.4	12.4	15 47.7	6.7	54.9								
10	330 53.9	27.1	337 45.8	12.4	15 54.4	6.6	54.9								
11	345 53.9	27.7	352 17.2	12.3	16 01.0	6.5	54.9								
12	0 53.9	N17 28.4	6 48.5	12.4	N16 07.5	6.5	54.9								
13	15 53.9	29.1	21 19.9	12.3	16 14.0	6.4	54.8								
14	30 54.0	29.7	35 51.2	12.4	16 20.4	6.3	54.8								
15	45 54.0	30.4	50 22.6	12.3	16 26.7	6.2	54.8								
16	60 54.0	31.0	64 53.9	12.2	16 32.9	6.2	54.8								
17	75 54.0	31.7	79 25.1	12.3	16 39.1	6.0	54.8								
18	90 54.1	N17 32.4	93 56.4	12.3	N16 45.1	6.0	54.8								
19	105 54.1	33.0	108 27.7	12.2	16 51.1	5.9	54.7								
20	120 54.1	33.7	122 58.9	12.2	16 57.0	5.8	54.7								
21	135 54.1	34.3	137 30.1	12.2	17 02.8	5.8	54.7								
22	150 54.2	35.0	152 01.3	12.2	17 08.6	5.6	54.7								
23	165 54.2	35.6	166 32.5	12.2	N17 14.2	5.6	54.7								
	SD 15.9	d 0.7	SD	15.2		15.1	14.9								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 7	Moonset 8	Moonset 9	Moonset 10
°	h m	h m	h m	h m	h m	h m	h m
N 72				18 34	20 27	22 38	
N 70	22 14	////	////	18 16	19 57	21 40	23 25
68	21 34	////	////	18 02	19 35	21 06	22 32
66	21 06	23 00	////	17 51	19 18	20 42	21 59
64	20 46	22 07	////	17 41	19 04	20 23	21 36
62	20 29	21 37	////	17 33	18 52	20 07	21 17
60	20 15	21 14	23 06	17 26	18 42	19 54	21 01
N 58	20 04	20 56	22 19	17 20	18 33	19 43	20 48
56	19 53	20 41	21 50	17 15	18 26	19 34	20 37
54	19 45	20 28	21 29	17 10	18 19	19 25	20 27
52	19 37	20 17	21 12	17 05	18 13	19 17	20 18
50	19 29	20 08	20 57	17 01	18 07	19 11	20 10
45	19 14	19 48	20 30	16 53	17 55	18 56	19 54
N 40	19 02	19 32	20 09	16 46	17 46	18 44	19 40
35	18 51	19 19	19 52	16 40	17 37	18 34	19 28
30	18 42	19 08	19 39	16 35	17 30	18 25	19 18
20	18 26	18 50	19 17	16 25	17 17	18 09	19 01
N 10	18 13	18 35	19 01	16 17	17 06	17 56	18 45
0	18 00	18 22	18 47	16 10	16 56	17 43	18 31
S 10	17 47	18 09	18 35	16 02	16 46	17 31	18 17
20	17 34	17 57	18 24	15 54	16 35	17 17	18 02
30	17 19	17 44	18 13	15 45	16 23	17 02	17 44
35	17 11	17 37	18 07	15 40	16 15	16 53	17 34
40	17 01	17 29	18 02	15 34	16 07	16 43	17 23
45	16 49	17 21	17 56	15 27	15 58	16 31	17 09
S 50	16 35	17 10	17 49	15 19	15 46	16 17	16 53
52	16 29	17 06	17 46	15 15	15 41	16 11	16 45
54	16 22	17 01	17 43	15 11	15 35	16 03	16 36
56	16 14	16 55	17 40	15 06	15 29	15 55	16 27
58	16 05	16 49	17 37	15 01	15 21	15 46	16 16
S 60	15 54	16 42	17 33	14 55	15 13	15 35	16 03

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
7	03 28	03 30	11 57	09 59	22 22	27	6
8	03 31	03 33	11 56	10 45	23 08	28	2
9	03 34	03 36	11 56	11 32	23 56	29	0

2013 MAY 10, 11, 12 (FRI., SAT., SUN.)

UT	ARIES	VENUS −3.9		MARS +1.3		JUPITER −2.0		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
10 00	227 57.5	169 39.4	N20 13.3	185 53.7	N16 01.2	149 28.6	N22 42.7	12 04.9	S11 25.8
01	243 00.0	184 38.7	14.0	200 54.4	01.8	164 30.5	42.8	27 07.5	25.7
02	258 02.4	199 37.9	14.8	215 55.0	02.4	179 32.3	42.8	42 10.1	25.7
03	273 04.9	214 37.2	15.5	230 55.7	02.9	194 34.2	42.9	57 12.8	25.6
04	288 07.4	229 36.5	16.3	245 56.3	03.5	209 36.1	42.9	72 15.4	25.6
05	303 09.8	244 35.8	17.0	260 57.0	04.1	224 38.0	43.0	87 18.1	25.5
06	318 12.3	259 35.1	N20 17.7	275 57.6	N16 04.6	239 39.9	N22 43.0	102 20.7	S11 25.5
07	333 14.8	274 34.3	18.5	290 58.3	05.2	254 41.8	43.1	117 23.4	25.4
08	348 17.2	289 33.6	19.2	305 58.9	05.8	269 43.6	43.1	132 26.0	25.4
F 09	3 19.7	304 32.9	19.9	320 59.6	06.3	284 45.5	43.2	147 28.6	25.3
R 10	18 22.2	319 32.2	20.7	336 00.2	06.9	299 47.4	43.2	162 31.3	25.2
I 11	33 24.6	334 31.5	21.4	351 00.9	07.5	314 49.3	43.3	177 33.9	25.2
D 12	48 27.1	349 30.7	N20 22.1	6 01.5	N16 08.0	329 51.2	N22 43.3	192 36.6	S11 25.1
A 13	63 29.5	4 30.0	22.9	21 02.2	08.6	344 53.1	43.4	207 39.2	25.1
Y 14	78 32.0	19 29.3	23.6	36 02.8	09.2	359 54.9	43.4	222 41.9	25.0
15	93 34.5	34 28.6	24.3	51 03.5	09.7	14 56.8	43.4	237 44.5	25.0
16	108 36.9	49 27.8	25.1	66 04.1	10.3	29 58.7	43.5	252 47.1	24.9
17	123 39.4	64 27.1	25.8	81 04.8	10.8	45 00.6	43.5	267 49.8	24.9
18	138 41.9	79 26.4	N20 26.5	96 05.4	N16 11.4	60 02.5	N22 43.6	282 52.4	S11 24.8
19	153 44.3	94 25.7	27.2	111 06.1	12.0	75 04.4	43.6	297 55.1	24.7
20	168 46.8	109 24.9	28.0	126 06.7	12.5	90 06.2	43.7	312 57.7	24.7
21	183 49.3	124 24.2	28.7	141 07.3	13.1	105 08.1	43.7	328 00.3	24.6
22	198 51.7	139 23.5	29.4	156 08.0	13.7	120 10.0	43.8	343 03.0	24.6
23	213 54.2	154 22.7	30.1	171 08.6	14.2	135 11.9	43.8	358 05.6	24.5
11 00	228 56.7	169 22.0	N20 30.8	186 09.3	N16 14.8	150 13.8	N22 43.9	13 08.3	S11 24.5
01	243 59.1	184 21.3	31.6	201 09.9	15.3	165 15.7	43.9	28 10.9	24.4
02	259 01.6	199 20.6	32.3	216 10.6	15.9	180 17.5	44.0	43 13.5	24.4
03	274 04.0	214 19.8	33.0	231 11.2	16.5	195 19.4	44.0	58 16.2	24.3
04	289 06.5	229 19.1	33.7	246 11.9	17.0	210 21.3	44.1	73 18.8	24.2
05	304 09.0	244 18.4	34.4	261 12.5	17.6	225 23.2	44.1	88 21.5	24.2
06	319 11.4	259 17.6	N20 35.1	276 13.2	N16 18.1	240 25.1	N22 44.1	103 24.1	S11 24.1
S 07	334 13.9	274 16.9	35.9	291 13.8	18.7	255 26.9	44.2	118 26.8	24.1
A 08	349 16.4	289 16.2	36.6	306 14.5	19.3	270 28.8	44.2	133 29.4	24.0
T 09	4 18.8	304 15.4	37.3	321 15.1	19.8	285 30.7	44.3	148 32.0	24.0
U 10	19 21.3	319 14.7	38.0	336 15.8	20.4	300 32.6	44.3	163 34.7	23.9
R 11	34 23.8	334 14.0	38.7	351 16.4	20.9	315 34.5	44.4	178 37.3	23.9
D 12	49 26.2	349 13.2	N20 39.4	6 17.0	N16 21.5	330 36.3	N22 44.4	193 40.0	S11 23.8
A 13	64 28.7	4 12.5	40.1	21 17.7	22.0	345 38.2	44.5	208 42.6	23.8
Y 14	79 31.2	19 11.8	40.8	36 18.3	22.6	0 40.1	44.5	223 45.2	23.7
15	94 33.6	34 11.0	41.5	51 19.0	23.2	15 42.0	44.6	238 47.9	23.6
16	109 36.1	49 10.3	42.2	66 19.6	23.7	30 43.9	44.6	253 50.5	23.6
17	124 38.5	64 09.6	42.9	81 20.3	24.3	45 45.8	44.7	268 53.2	23.5
18	139 41.0	79 08.8	N20 43.6	96 20.9	N16 24.8	60 47.6	N22 44.7	283 55.8	S11 23.5
19	154 43.5	94 08.1	44.3	111 21.6	25.4	75 49.5	44.8	298 58.4	23.4
20	169 45.9	109 07.3	45.0	126 22.2	25.9	90 51.4	44.8	314 01.1	23.4
21	184 48.4	124 06.6	45.7	141 22.9	26.5	105 53.3	44.8	329 03.7	23.3
22	199 50.9	139 05.9	46.4	156 23.5	27.0	120 55.2	44.9	344 06.4	23.3
23	214 53.3	154 05.1	47.1	171 24.2	27.6	135 57.0	44.9	359 09.0	23.2
12 00	229 55.8	169 04.4	N20 47.8	186 24.8	N16 28.1	150 58.9	N22 45.0	14 11.6	S11 23.1
01	244 58.3	184 03.6	48.5	201 25.4	28.7	166 00.8	45.0	29 14.3	23.1
02	260 00.7	199 02.9	49.2	216 26.1	29.3	181 02.7	45.1	44 16.9	23.0
03	275 03.2	214 02.2	49.9	231 26.7	29.8	196 04.6	45.1	59 19.6	23.0
04	290 05.6	229 01.4	50.6	246 27.4	30.4	211 06.4	45.2	74 22.2	22.9
05	305 08.1	244 00.7	51.3	261 28.0	30.9	226 08.3	45.2	89 24.8	22.9
06	320 10.6	258 59.9	N20 52.0	276 28.7	N16 31.5	241 10.2	N22 45.3	104 27.5	S11 22.8
07	335 13.0	273 59.2	52.7	291 29.3	32.0	256 12.1	45.3	119 30.1	22.8
08	350 15.5	288 58.4	53.4	306 30.0	32.6	271 13.9	45.4	134 32.8	22.7
S 09	5 18.0	303 57.7	54.0	321 30.6	33.1	286 15.8	45.4	149 35.4	22.7
U 10	20 20.4	318 57.0	54.7	336 31.2	33.7	301 17.7	45.4	164 38.0	22.6
N 11	35 22.9	333 56.2	55.4	351 31.9	34.2	316 19.6	45.5	179 40.7	22.5
D 12	50 25.4	348 55.5	N20 56.1	6 32.5	N16 34.8	331 21.5	N22 45.5	194 43.3	S11 22.5
A 13	65 27.8	3 54.7	56.8	21 33.2	35.3	346 23.3	45.6	209 45.9	22.4
Y 14	80 30.3	18 54.0	57.5	36 33.8	35.9	1 25.2	45.6	224 48.6	22.4
15	95 32.8	33 53.2	58.1	51 34.5	36.4	16 27.1	45.7	239 51.2	22.3
16	110 35.2	48 52.5	58.8	66 35.1	37.0	31 29.0	45.7	254 53.9	22.3
17	125 37.7	63 51.7	20 59.5	81 35.8	37.5	46 30.9	45.8	269 56.5	22.2
18	140 40.1	78 51.0	N21 00.2	96 36.4	N16 38.1	61 32.7	N22 45.8	284 59.1	S11 22.2
19	155 42.6	93 50.2	00.9	111 37.0	38.6	76 34.6	45.9	300 01.8	22.1
20	170 45.1	108 49.5	01.5	126 37.7	39.2	91 36.5	45.9	315 04.4	22.1
21	185 47.5	123 48.7	02.2	141 38.3	39.7	106 38.4	45.9	330 07.1	22.0
22	200 50.0	138 48.0	02.9	156 39.0	40.3	121 40.2	46.0	345 09.7	22.0
23	215 52.5	153 47.2	03.6	171 39.6	40.8	136 42.1	46.0	0 12.3	21.9
Mer.Pass.	h m 8 42.8	v −0.7	d 0.7	v 0.6	d 0.6	v 1.9	d 0.0	v 2.6	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.2
Achernar	335 27.4	S57 10.0
Acrux	173 08.8	S63 10.7
Adhara	255 12.8	S28 59.8
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.4	N55 53.3
Alkaid	152 58.5	N49 14.8
Al Na'ir	27 43.9	S46 53.5
Alnilam	275 46.7	S 1 11.8
Alphard	217 56.2	S 8 43.3
Alphecca	126 10.7	N26 40.2
Alpheratz	357 43.8	N29 09.7
Altair	62 08.2	N 8 54.3
Ankaa	353 16.1	S42 13.8
Antares	112 26.0	S26 27.6
Arcturus	145 55.5	N19 06.8
Atria	107 27.3	S69 02.9
Avior	234 18.2	S59 33.6
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.6	N 7 24.3
Canopus	263 56.6	S52 42.5
Capella	280 35.0	N46 00.6
Deneb	49 31.4	N45 19.6
Denebola	182 33.6	N14 29.7
Diphda	348 56.2	S17 54.8
Dubhe	193 51.6	N61 40.8
Elnath	278 13.0	N28 37.0
Eltanin	90 45.7	N51 29.2
Enif	33 47.2	N 9 56.2
Fomalhaut	15 24.2	S29 32.9
Gacrux	172 00.5	S57 11.6
Gienah	175 52.1	S17 37.2
Hadar	148 47.3	S60 26.4
Hamal	328 01.2	N23 31.4
Kaus Aust.	83 43.6	S34 22.5
Kochab	137 18.9	N74 06.1
Markab	13 38.5	N15 16.6
Menkar	314 15.5	N 4 08.4
Menkent	148 07.3	S36 26.3
Miaplacidus	221 39.7	S69 46.8
Mirfak	308 40.9	N49 54.4
Nunki	75 58.2	S26 16.6
Peacock	53 19.2	S56 41.1
Pollux	243 28.0	N27 59.5
Procyon	245 00.0	N 5 11.2
Rasalhague	96 06.2	N12 33.1
Regulus	207 43.6	N11 54.0
Rigel	281 12.4	S 8 11.4
Rigil Kent.	139 51.1	S60 53.4
Sabik	102 12.3	S15 44.4
Schedar	349 41.0	N56 36.4
Shaula	96 21.7	S37 06.6
Sirius	258 34.0	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.5	S43 29.6
Vega	80 38.7	N38 47.7
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	300 25.4	12 43
Mars	317 12.6	11 35
Jupiter	281 17.1	13 57
Saturn	144 11.6	23 03

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					
	GHA	Dec	GHA	v	Dec	d	HP	
d h	° ′	° ′	° ′	′	° ′	′	′	
10 00	180 54.2	N17 36.3						
01	195 54.2	37.0						
02	210 54.2	37.6	An annular eclipse of the Sun occurs on this date. See page 5.					
03	225 54.3	38.3						
04	240 54.3	38.9						
05	255 54.3	39.6						
06	270 54.3	N17 40.2	268 10.3	12.1	N17 51.4	5.0	54.6	
07	285 54.4	40.9	282 41.4	12.1	17 56.4	4.9	54.6	
08	300 54.4	41.5	297 12.5	12.0	18 01.3	4.8	54.6	
F 09	315 54.4	42.2	311 43.5	12.0	18 06.1	4.7	54.6	
R 10	330 54.4	42.8	326 14.5	12.0	18 10.8	4.7	54.5	
I 11	345 54.4	43.5	340 45.5	12.0	18 15.5	4.5	54.5	
D 12	0 54.5	N17 44.1	355 16.5	12.0	N18 20.0	4.5	54.5	
A 13	15 54.5	44.8	9 47.5	12.0	18 24.5	4.3	54.5	
Y 14	30 54.5	45.4	24 18.5	11.9	18 28.8	4.3	54.5	
15	45 54.5	46.1	38 49.4	12.0	18 33.1	4.2	54.5	
16	60 54.5	46.7	53 20.4	11.9	18 37.3	4.1	54.5	
17	75 54.5	47.4	67 51.3	11.9	18 41.4	4.0	54.5	
18	90 54.6	N17 48.0	82 22.2	11.9	N18 45.4	3.9	54.5	
19	105 54.6	48.6	96 53.1	11.9	18 49.3	3.8	54.4	
20	120 54.6	49.3	111 24.0	11.9	18 53.1	3.8	54.4	
21	135 54.6	49.9	125 54.9	11.9	18 56.9	3.6	54.4	
22	150 54.6	50.6	140 25.8	11.9	19 00.5	3.6	54.4	
23	165 54.7	51.2	154 56.7	11.9	19 04.1	3.4	54.4	
11 00	180 54.7	N17 51.9	169 27.6	11.8	N19 07.5	3.4	54.4	
01	195 54.7	52.5	183 58.4	11.9	19 10.9	3.3	54.4	
02	210 54.7	53.2	198 29.3	11.8	19 14.2	3.2	54.4	
03	225 54.7	53.8	213 00.1	11.9	19 17.4	3.1	54.4	
04	240 54.7	54.4	227 31.0	11.8	19 20.5	3.0	54.3	
05	255 54.8	55.1	242 01.8	11.8	19 23.5	2.9	54.3	
06	270 54.8	N17 55.7	256 32.6	11.8	N19 26.4	2.8	54.3	
S 07	285 54.8	56.4	271 03.4	11.8	19 29.2	2.7	54.3	
A 08	300 54.8	57.0	285 34.2	11.8	19 31.9	2.7	54.3	
T 09	315 54.8	57.6	300 05.0	11.8	19 34.6	2.5	54.3	
U 10	330 54.8	58.3	314 35.8	11.8	19 37.1	2.5	54.3	
R 11	345 54.8	58.9	329 06.6	11.8	19 39.6	2.3	54.3	
D 12	0 54.9	N17 59.5	343 37.4	11.8	N19 41.9	2.3	54.3	
A 13	15 54.9	18 00.2	358 08.2	11.8	19 44.2	2.2	54.3	
Y 14	30 54.9	00.8	12 39.0	11.8	19 46.4	2.0	54.2	
15	45 54.9	01.4	27 09.8	11.8	19 48.4	2.0	54.2	
16	60 54.9	02.1	41 40.6	11.8	19 50.4	1.9	54.2	
17	75 54.9	02.7	56 11.4	11.7	19 52.3	1.8	54.2	
18	90 54.9	N18 03.3	70 42.1	11.8	N19 54.1	1.7	54.2	
19	105 54.9	04.0	85 12.9	11.8	19 55.8	1.6	54.2	
20	120 55.0	04.6	99 43.7	11.8	19 57.4	1.5	54.2	
21	135 55.0	05.2	114 14.5	11.8	19 58.9	1.4	54.2	
22	150 55.0	05.9	128 45.3	11.7	20 00.3	1.3	54.2	
23	165 55.0	06.5	143 16.0	11.8	20 01.6	1.3	54.2	
12 00	180 55.0	N18 07.1	157 46.8	11.8	N20 02.9	1.1	54.2	
01	195 55.0	07.8	172 17.6	11.8	20 04.0	1.0	54.2	
02	210 55.0	08.4	186 48.4	11.8	20 05.0	1.0	54.2	
03	225 55.0	09.0	201 19.2	11.8	20 06.0	0.8	54.2	
04	240 55.0	09.7	215 50.0	11.8	20 06.8	0.8	54.1	
05	255 55.1	10.3	230 20.8	11.8	20 07.6	0.7	54.1	
06	270 55.1	N18 10.9	244 51.6	11.8	N20 08.3	0.5	54.1	
07	285 55.1	11.5	259 22.4	11.8	20 08.8	0.5	54.1	
08	300 55.1	12.2	273 53.2	11.8	20 09.3	0.4	54.1	
S 09	315 55.1	12.8	288 24.0	11.9	20 09.7	0.3	54.1	
U 10	330 55.1	13.4	302 54.9	11.8	20 10.0	0.2	54.1	
N 11	345 55.1	14.0	317 25.7	11.9	20 10.2	0.1	54.1	
D 12	0 55.1	N18 14.7	331 56.6	11.8	N20 10.3	0.0	54.1	
A 13	15 55.1	15.3	346 27.4	11.9	20 10.3	0.1	54.1	
Y 14	30 55.1	15.9	0 58.3	11.8	20 10.2	0.2	54.1	
15	45 55.1	16.5	15 29.1	11.9	20 10.0	0.3	54.1	
16	60 55.1	17.1	30 00.0	11.9	20 09.7	0.4	54.1	
17	75 55.1	17.8	44 30.9	11.9	20 09.3	0.4	54.1	
18	90 55.2	N18 18.4	59 01.8	11.9	N20 08.9	0.6	54.1	
19	105 55.2	19.0	73 32.7	11.9	20 08.3	0.7	54.1	
20	120 55.2	19.6	88 03.6	11.9	20 07.6	0.7	54.1	
21	135 55.2	20.2	102 34.5	12.0	20 06.9	0.8	54.1	
22	150 55.2	20.9	117 05.5	11.9	20 06.1	1.0	54.1	
23	165 55.2	21.5	131 36.4	12.0	N20 05.1	1.0	54.1	
	SD 15.9	d 0.6	SD	14.9		14.8		14.7

Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 10	Moonrise 11	Moonrise 12	Moonrise 13
°	h m	h m	h m	h m	h m	h m	h m
N 72				01 03			
N 70	////	////	01 22	02 02	01 56	01 40	02 41
68	////	////	02 08	02 36	02 50	03 18	04 09
66	////	00 21	02 38	03 01	03 23	03 57	04 48
64	////	01 33	03 00	03 21	03 47	04 24	05 15
62	////	02 07	03 17	03 37	04 06	04 45	05 35
60	00 19	02 32	03 32	03 50	04 22	05 02	05 52
N 58	01 24	02 51	03 44	04 02	04 35	05 16	06 06
56	01 55	03 06	03 55	04 12	04 47	05 29	06 18
54	02 18	03 20	04 04	04 21	04 57	05 39	06 29
52	02 36	03 31	04 12	04 28	05 06	05 49	06 39
50	02 51	03 41	04 20	04 36	05 14	05 57	06 47
45	03 20	04 02	04 36	04 51	05 31	06 16	07 05
N 40	03 41	04 18	04 49	05 04	05 45	06 30	07 19
35	03 58	04 32	05 00	05 14	05 57	06 43	07 32
30	04 12	04 43	05 09	05 24	06 07	06 54	07 43
20	04 34	05 02	05 26	05 40	06 26	07 13	08 01
N 10	04 52	05 18	05 40	05 55	06 41	07 29	08 17
0	05 06	05 31	05 53	06 08	06 56	07 44	08 32
S 10	05 18	05 44	06 06	06 21	07 11	08 00	08 47
20	05 30	05 57	06 20	06 36	07 27	08 16	09 04
30	05 41	06 10	06 35	06 53	07 45	08 35	09 22
35	05 47	06 18	06 44	07 02	07 56	08 46	09 33
40	05 53	06 26	06 55	07 13	08 08	08 59	09 45
45	06 00	06 35	07 07	07 26	08 22	09 14	10 00
S 50	06 07	06 46	07 21	07 42	08 40	09 32	10 18
52	06 10	06 51	07 28	07 50	08 48	09 41	10 26
54	06 13	06 56	07 36	07 58	08 58	09 50	10 35
56	06 17	07 02	07 44	08 08	09 08	10 01	10 46
58	06 21	07 09	07 54	08 18	09 20	10 14	10 58
S 60	06 25	07 16	08 05	08 31	09 34	10 28	11 12

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 10	Moonset 11	Moonset 12	Moonset 13
°	h m	h m	h m	h m	h m	h m	h m
N 72							
N 70	22 39	////	////	23 25	25 22	01 22	02 01
68	21 49	////	////	22 32	23 44	24 33	00 33
66	21 18	////	////	21 59	23 05	23 54	24 26
64	20 55	22 25	////	21 36	22 38	23 27	24 03
62	20 38	21 49	////	21 17	22 17	23 06	23 44
60	20 23	21 24	////	21 01	22 00	22 49	23 28
N 58	20 10	21 04	22 34	20 48	21 46	22 35	23 15
56	19 59	20 48	22 01	20 37	21 34	22 23	23 04
54	19 50	20 34	21 37	20 27	21 23	22 12	22 54
52	19 41	20 23	21 19	20 18	21 14	22 03	22 45
50	19 34	20 13	21 04	20 10	21 05	21 54	22 37
45	19 18	19 52	20 34	19 54	20 47	21 36	22 20
N 40	19 05	19 35	20 12	19 40	20 33	21 21	22 06
35	18 54	19 21	19 55	19 28	20 20	21 09	21 54
30	18 44	19 10	19 41	19 18	20 09	20 58	21 44
20	18 27	18 51	19 19	19 01	19 51	20 39	21 26
N 10	18 13	18 35	19 01	18 45	19 35	20 23	21 10
0	18 00	18 22	18 47	18 31	19 19	20 08	20 55
S 10	17 47	18 09	18 34	18 17	19 04	19 52	20 41
20	17 33	17 56	18 23	18 02	18 48	19 36	20 25
30	17 17	17 42	18 11	17 44	18 29	19 17	20 07
35	17 08	17 35	18 05	17 34	18 19	19 06	19 56
40	16 58	17 26	17 59	17 23	18 06	18 53	19 44
45	16 46	17 17	17 53	17 09	17 51	18 38	19 30
S 50	16 31	17 06	17 45	16 53	17 34	18 20	19 12
52	16 24	17 01	17 42	16 45	17 25	18 12	19 04
54	16 16	16 56	17 39	16 36	17 16	18 02	18 55
56	16 08	16 50	17 35	16 27	17 05	17 51	18 44
58	15 58	16 43	17 31	16 16	16 53	17 38	18 32
S 60	15 47	16 36	17 27	16 03	16 39	17 24	18 19

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
10	03 37	03 38	11 56	12 20	24 44	00	0
11	03 39	03 39	11 56	13 08	00 44	01	2
12	03 40	03 40	11 56	13 56	01 32	02	6

UT	ARIES	VENUS −3.9		MARS +1.3		JUPITER −1.9		SATURN +0.2		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
13 00	230 54.9	168 46.5	N21 04.2	186 40.3	N16 41.3	151 44.0	N22 46.1	15 15.0	S11 21.8	Acamar	315 18.8	S40 15.1
01	245 57.4	183 45.7	04.9	201 40.9	41.9	166 45.9	46.1	30 17.6	21.8	Achernar	335 27.4	S57 10.0
02	260 59.9	198 45.0	05.6	216 41.5	42.4	181 47.8	46.2	45 20.3	21.7	Acrux	173 08.8	S63 10.7
03	276 02.3	213 44.2 . .	06.2	231 42.2 . .	43.0	196 49.6 . .	46.2	60 22.9 . .	21.7	Adhara	255 12.8	S28 59.8
04	291 04.8	228 43.5	06.9	246 42.8	43.5	211 51.5	46.3	75 25.5	21.6	Aldebaran	290 49.8	N16 32.0
05	306 07.3	243 42.7	07.6	261 43.5	44.1	226 53.4	46.3	90 28.2	21.6			
06	321 09.7	258 42.0	N21 08.2	276 44.1	N16 44.6	241 55.3	N22 46.4	105 30.8	S11 21.5	Alioth	166 20.4	N55 53.3
07	336 12.2	273 41.2	08.9	291 44.8	45.2	256 57.1	46.4	120 33.4	21.5	Alkaid	152 58.5	N49 14.9
08	351 14.6	288 40.5	09.6	306 45.4	45.7	271 59.0	46.4	135 36.1	21.4	Al Na'ir	27 43.9	S46 53.4
M 09	6 17.1	303 39.7 . .	10.2	321 46.0 . .	46.3	287 00.9 . .	46.5	150 38.7 . .	21.4	Alnilam	275 46.7	S 1 11.8
O 10	21 19.6	318 39.0	10.9	336 46.7	46.8	302 02.8	46.5	165 41.4	21.3	Alphard	217 56.2	S 8 43.3
N 11	36 22.0	333 38.2	11.6	351 47.3	47.3	317 04.7	46.6	180 44.0	21.2			
D 12	51 24.5	348 37.4	N21 12.2	6 48.0	N16 47.9	332 06.5	N22 46.6	195 46.6	S11 21.2	Alphecca	126 10.7	N26 40.2
A 13	66 27.0	3 36.7	12.9	21 48.6	48.4	347 08.4	46.7	210 49.3	21.1	Alpheratz	357 43.8	N29 09.7
Y 14	81 29.4	18 35.9	13.5	36 49.3	49.0	2 10.3	46.7	225 51.9	21.1	Altair	62 08.1	N 8 54.3
15	96 31.9	33 35.2 . .	14.2	51 49.9 . .	49.5	17 12.2 . .	46.8	240 54.6 . .	21.0	Ankaa	353 16.1	S42 13.8
16	111 34.4	48 34.4	14.9	66 50.5	50.1	32 14.0	46.8	255 57.2	21.0	Antares	112 26.0	S26 27.6
17	126 36.8	63 33.7	15.5	81 51.2	50.6	47 15.9	46.9	270 59.8	20.9			
18	141 39.3	78 32.9	N21 16.2	96 51.8	N16 51.1	62 17.8	N22 46.9	286 02.5	S11 20.9	Arcturus	145 55.5	N19 06.8
19	156 41.8	93 32.1	16.8	111 52.5	51.7	77 19.7	46.9	301 05.1	20.8	Atria	107 27.3	S69 02.9
20	171 44.2	108 31.4	17.5	126 53.1	52.2	92 21.5	47.0	316 07.7	20.8	Avior	234 18.2	S59 33.6
21	186 46.7	123 30.6 . .	18.1	141 53.7 . .	52.8	107 23.4 . .	47.0	331 10.4 . .	20.7	Bellatrix	278 32.4	N 6 21.5
22	201 49.1	138 29.9	18.8	156 54.4	53.3	122 25.3	47.1	346 13.0	20.7	Betelgeuse	271 01.7	N 7 24.3
23	216 51.6	153 29.1	19.4	171 55.0	53.8	137 27.2	47.1	1 15.6	20.6			
14 00	231 54.1	168 28.3	N21 20.1	186 55.7	N16 54.4	152 29.0	N22 47.2	16 18.3	S11 20.6	Canopus	263 56.6	S52 42.5
01	246 56.5	183 27.6	20.7	201 56.3	54.9	167 30.9	47.2	31 20.9	20.5	Capella	280 35.0	N46 00.6
02	261 59.0	198 26.8	21.4	216 57.0	55.5	182 32.8	47.3	46 23.6	20.4	Deneb	49 31.4	N45 19.6
03	277 01.5	213 26.0 . .	22.0	231 57.6 . .	56.0	197 34.7 . .	47.3	61 26.2 . .	20.4	Denebola	182 33.6	N14 29.7
04	292 03.9	228 25.3	22.7	246 58.2	56.5	212 36.5	47.3	76 28.8	20.3	Diphda	348 56.2	S17 54.8
05	307 06.4	243 24.5	23.3	261 58.9	57.1	227 38.4	47.4	91 31.5	20.3			
06	322 08.9	258 23.8	N21 23.9	276 59.5	N16 57.6	242 40.3	N22 47.4	106 34.1	S11 20.2	Dubhe	193 51.6	N61 40.9
07	337 11.3	273 23.0	24.6	292 00.2	58.1	257 42.2	47.5	121 36.7	20.2	Elnath	278 13.0	N28 37.0
T 08	352 13.8	288 22.2	25.2	307 00.8	58.7	272 44.0	47.5	136 39.4	20.1	Eltanin	90 45.7	N51 29.2
U 09	7 16.2	303 21.5 . .	25.9	322 01.4 . .	59.2	287 45.9 . .	47.6	151 42.0 . .	20.1	Enif	33 47.2	N 9 56.2
E 10	22 18.7	318 20.7	26.5	337 02.1	16 59.8	302 47.8	47.6	166 44.7	20.0	Fomalhaut	15 24.2	S29 32.9
S 11	37 21.2	333 19.9	27.1	352 02.7	17 00.3	317 49.7	47.7	181 47.3	20.0			
D 12	52 23.6	348 19.2	N21 27.8	7 03.4	N17 00.8	332 51.5	N22 47.7	196 49.9	S11 19.9	Gacrux	172 00.5	S57 11.6
A 13	67 26.1	3 18.4	28.4	22 04.0	01.4	347 53.4	47.7	211 52.6	19.9	Gienah	175 52.1	S17 37.2
Y 14	82 28.6	18 17.6	29.0	37 04.6	01.9	2 55.3	47.8	226 55.2	19.8	Hadar	148 47.3	S60 26.4
15	97 31.0	33 16.9 . .	29.7	52 05.3 . .	02.4	17 57.2 . .	47.8	241 57.8 . .	19.8	Hamal	328 01.1	N23 31.4
16	112 33.5	48 16.1	30.3	67 05.9	03.0	32 59.0	47.9	257 00.5	19.7	Kaus Aust.	83 43.6	S34 22.5
17	127 36.0	63 15.3	30.9	82 06.6	03.5	48 00.9	47.9	272 03.1	19.6			
18	142 38.4	78 14.6	N21 31.6	97 07.2	N17 04.0	63 02.8	N22 48.0	287 05.7	S11 19.6	Kochab	137 18.9	N74 06.1
19	157 40.9	93 13.8	32.2	112 07.8	04.6	78 04.7	48.0	302 08.4	19.5	Markab	13 38.5	N15 16.6
20	172 43.4	108 13.0	32.8	127 08.5	05.1	93 06.5	48.0	317 11.0	19.5	Menkar	314 15.4	N 4 08.4
21	187 45.8	123 12.2 . .	33.4	142 09.1 . .	05.6	108 08.4 . .	48.1	332 13.7 . .	19.4	Menkent	148 07.2	S36 26.3
22	202 48.3	138 11.5	34.1	157 09.8	06.2	123 10.3	48.1	347 16.3	19.4	Miaplacidus	221 39.7	S69 46.8
23	217 50.7	153 10.7	34.7	172 10.4	06.7	138 12.2	48.2	2 18.9	19.3			
15 00	232 53.2	168 09.9	N21 35.3	187 11.0	N17 07.2	153 14.0	N22 48.2	17 21.6	S11 19.3	Mirfak	308 40.9	N49 54.4
01	247 55.7	183 09.2	35.9	202 11.7	07.8	168 15.9	48.3	32 24.2	19.2	Nunki	75 58.2	S26 16.6
02	262 58.1	198 08.4	36.6	217 12.3	08.3	183 17.8	48.3	47 26.8	19.2	Peacock	53 19.2	S56 41.1
03	278 00.6	213 07.6 . .	37.2	232 13.0 . .	08.8	198 19.7 . .	48.4	62 29.5 . .	19.1	Pollux	243 28.0	N27 59.5
04	293 03.1	228 06.8	37.8	247 13.6	09.4	213 21.5	48.4	77 32.1	19.1	Procyon	245 00.0	N 5 11.2
05	308 05.5	243 06.1	38.4	262 14.2	09.9	228 23.4	48.4	92 34.7	19.0			
06	323 08.0	258 05.3	N21 39.0	277 14.9	N17 10.4	243 25.3	N22 48.5	107 37.4	S11 19.0	Rasalhague	96 06.2	N12 33.1
W 07	338 10.5	273 04.5	39.6	292 15.5	11.0	258 27.1	48.5	122 40.0	18.9	Regulus	207 43.6	N11 54.0
E 08	353 12.9	288 03.7	40.3	307 16.2	11.5	273 29.0	48.6	137 42.6	18.9	Rigel	281 12.4	S 8 11.4
D 09	8 15.4	303 03.0 . .	40.9	322 16.8 . .	12.0	288 30.9 . .	48.6	152 45.3 . .	18.8	Rigil Kent.	139 51.1	S60 53.5
N 10	23 17.9	318 02.2	41.5	337 17.4	12.5	303 32.8	48.7	167 47.9	18.7	Sabik	102 12.3	S15 44.4
E 11	38 20.3	333 01.4	42.1	352 18.1	13.1	318 34.6	48.7	182 50.6	18.7			
S 12	53 22.8	348 00.6	N21 42.7	7 18.7	N17 13.6	333 36.5	N22 48.7	197 53.2	S11 18.6	Schedar	349 41.0	N56 36.4
D 13	68 25.2	2 59.9	43.3	22 19.3	14.1	348 38.4	48.8	212 55.8	18.6	Shaula	96 21.6	S37 06.6
A 14	83 27.7	17 59.1	43.9	37 20.0	14.7	3 40.3	48.8	227 58.5	18.5	Sirius	258 34.0	S16 44.4
Y 15	98 30.2	32 58.3 . .	44.5	52 20.6 . .	15.2	18 42.1 . .	48.9	243 01.1 . .	18.5	Spica	158 31.0	S11 14.0
16	113 32.6	47 57.5	45.1	67 21.3	15.7	33 44.0	48.9	258 03.7	18.4	Suhail	222 52.5	S43 29.6
17	128 35.1	62 56.7	45.8	82 21.9	16.2	48 45.9	49.0	273 06.4	18.4			
18	143 37.6	77 56.0	N21 46.4	97 22.5	N17 16.8	63 47.7	N22 49.0	288 09.0	S11 18.3	Vega	80 38.7	N38 47.7
19	158 40.0	92 55.2	47.0	112 23.2	17.3	78 49.6	49.1	303 11.6	18.3	Zuben'ubi	137 05.1	S16 05.9
20	173 42.5	107 54.4	47.6	127 23.8	17.8	93 51.5	49.1	318 14.3	18.2			
21	188 45.0	122 53.6 . .	48.2	142 24.4 . .	18.3	108 53.4 . .	49.1	333 16.9 . .	18.2		SHA	Mer. Pass.
22	203 47.4	137 52.8	48.8	157 25.1	18.9	123 55.2	49.2	348 19.5	18.1		° ′	h m
23	218 49.9	152 52.1	49.4	172 25.7	19.4	138 57.1	49.2	3 22.2	18.1	Venus	296 34.3	12 47
	h m									Mars	315 01.6	11 32
Mer. Pass.	8 31.0	v −0.8	d 0.6	v 0.6	d 0.5	v 1.9	d 0.0	v 2.6	d 0.1	Jupiter	280 35.0	13 48
										Saturn	144 24.2	22 51

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 13	Moonrise 14	Moonrise 15	Moonrise 16
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
13 00	180 55.2	N18 22.1	146 07.4	12.0	N20 04.1	1.1	54.1	N 72						05 19	07 24
01	195 55.2	22.7	160 38.4	12.0	20 03.0	1.2	54.0	N 70	////	////	00 52	02 41	04 31	06 14	07 53
02	210 55.2	23.3	175 09.4	12.0	20 01.8	1.3	54.0	68	////	////	01 52	04 09	05 22	06 47	08 15
03	225 55.2 . .	24.0	189 40.4	12.0	20 00.5	1.4	54.0	66	////	////	02 26	04 48	05 54	07 10	08 32
04	240 55.2	24.6	204 11.4	12.0	19 59.1	1.5	54.0	64	////	01 14	02 50	05 15	06 17	07 29	08 46
05	255 55.2	25.2	218 42.4	12.1	19 57.6	1.6	54.0	62	////	01 55	03 09	05 35	06 36	07 44	08 58
06	270 55.2	N18 25.8	233 13.5	12.0	N19 56.0	1.7	54.0	60	////	02 22	03 24	05 52	06 51	07 57	09 07
07	285 55.2	26.4	247 44.5	12.1	19 54.3	1.7	54.0	N 58	01 07	02 43	03 38	06 06	07 04	08 08	09 16
08	300 55.2	27.0	262 15.6	12.1	19 52.6	1.9	54.0	56	01 44	02 59	03 49	06 18	07 15	08 17	09 23
M 09	315 55.2 . .	27.6	276 46.7	12.1	19 50.7	1.9	54.0	54	02 09	03 14	03 59	06 29	07 25	08 26	09 30
O 10	330 55.2	28.2	291 17.8	12.1	19 48.8	2.1	54.0	52	02 28	03 26	04 08	06 39	07 34	08 33	09 36
N 11	345 55.2	28.9	305 48.9	12.2	19 46.7	2.1	54.0	50	02 44	03 36	04 15	06 47	07 42	08 40	09 42
D 12	0 55.2	N18 29.5	320 20.1	12.1	N19 44.6	2.2	54.0	45	03 15	03 58	04 32	07 05	07 58	08 55	09 53
A 13	15 55.2	30.1	334 51.2	12.2	19 42.4	2.3	54.0	N 40	03 37	04 15	04 46	07 19	08 12	09 06	10 03
Y 14	30 55.2	30.7	349 22.4	12.2	19 40.1	2.4	54.0	35	03 55	04 29	04 57	07 32	08 23	09 17	10 11
15	45 55.2 . .	31.3	3 53.6	12.2	19 37.7	2.5	54.0	30	04 10	04 41	05 07	07 43	08 33	09 25	10 18
16	60 55.2	31.9	18 24.8	12.3	19 35.2	2.6	54.0	20	04 33	05 01	05 24	08 01	08 51	09 41	10 31
17	75 55.2	32.5	32 56.1	12.2	19 32.6	2.7	54.0	N 10	04 51	05 17	05 39	08 17	09 06	09 54	10 42
18	90 55.2	N18 33.1	47 27.3	12.3	N19 29.9	2.7	54.0	0	05 06	05 31	05 53	08 32	09 20	10 06	10 52
19	105 55.2	33.7	61 58.6	12.3	19 27.2	2.9	54.0	S 10	05 19	05 44	06 06	08 47	09 34	10 19	11 02
20	120 55.2	34.3	76 29.9	12.3	19 24.3	2.9	54.0	20	05 31	05 58	06 21	09 04	09 49	10 32	11 13
21	135 55.2 . .	34.9	91 01.2	12.3	19 21.4	3.0	54.0	30	05 43	06 12	06 37	09 22	10 06	10 47	11 25
22	150 55.2	35.5	105 32.5	12.4	19 18.4	3.1	54.0	35	05 49	06 20	06 47	09 33	10 16	10 56	11 32
23	165 55.2	36.2	120 03.9	12.4	19 15.3	3.2	54.0	40	05 56	06 28	06 57	09 45	10 27	11 06	11 40
14 00	180 55.2	N18 36.8	134 35.3	12.3	N19 12.1	3.3	54.0	45	06 03	06 38	07 10	10 00	10 41	11 17	11 50
01	195 55.2	37.4	149 06.6	12.5	19 08.8	3.4	54.0	S 50	06 10	06 50	07 25	10 18	10 57	11 31	12 01
02	210 55.2	38.0	163 38.1	12.4	19 05.4	3.4	54.0	52	06 14	06 55	07 33	10 26	11 05	11 38	12 06
03	225 55.2 . .	38.6	178 09.5	12.4	19 02.0	3.6	54.1	54	06 17	07 01	07 41	10 35	11 13	11 45	12 12
04	240 55.2	39.2	192 40.9	12.5	18 58.4	3.6	54.1	56	06 21	07 07	07 50	10 46	11 23	11 53	12 18
05	255 55.2	39.8	207 12.4	12.5	18 54.8	3.7	54.1	58	06 25	07 14	08 00	10 58	11 34	12 02	12 25
06	270 55.2	N18 40.4	221 43.9	12.5	N18 51.1	3.8	54.1	S 60	06 30	07 22	08 11	11 12	11 46	12 13	12 34
07	285 55.2	41.0	236 15.4	12.6	18 47.3	3.9	54.1								
T 08	300 55.2	41.6	250 47.0	12.5	18 43.4	4.0	54.1								
U 09	315 55.2 . .	42.2	265 18.5	12.6	18 39.4	4.0	54.1								
E 10	330 55.2	42.8	279 50.1	12.6	18 35.4	4.2	54.1								
S 11	345 55.2	43.4	294 21.7	12.6	18 31.2	4.2	54.1								
D 12	0 55.2	N18 44.0	308 53.3	12.7	N18 27.0	4.3	54.1								
A 13	15 55.2	44.6	323 25.0	12.7	18 22.7	4.4	54.1								
Y 14	30 55.2	45.2	337 56.7	12.7	18 18.3	4.5	54.1								
15	45 55.2 . .	45.8	352 28.4	12.7	18 13.8	4.5	54.1								
16	60 55.2	46.4	7 00.1	12.7	18 09.3	4.6	54.1								
17	75 55.2	46.9	21 31.8	12.8	18 04.7	4.8	54.1								
18	90 55.2	N18 47.5	36 03.6	12.8	N17 59.9	4.8	54.1								
19	105 55.2	48.1	50 35.4	12.8	17 55.1	4.8	54.1								
20	120 55.2	48.7	65 07.2	12.8	17 50.3	5.0	54.1								
21	135 55.2 . .	49.3	79 39.0	12.9	17 45.3	5.0	54.1								
22	150 55.2	49.9	94 10.9	12.8	17 40.3	5.2	54.2								
23	165 55.1	50.5	108 42.7	12.9	17 35.1	5.2	54.2								
15 00	180 55.1	N18 51.1	123 14.6	12.9	N17 29.9	5.2	54.2								
01	195 55.1	51.7	137 46.5	13.0	17 24.7	5.4	54.2								
02	210 55.1	52.3	152 18.5	13.0	17 19.3	5.4	54.2								
03	225 55.1 . .	52.9	166 50.5	12.9	17 13.9	5.5	54.2								
04	240 55.1	53.5	181 22.4	13.1	17 08.4	5.6	54.2								
05	255 55.1	54.0	195 54.5	13.0	17 02.8	5.7	54.2								
06	270 55.1	N18 54.6	210 26.5	13.0	N16 57.1	5.8	54.2								
W 07	285 55.1	55.2	224 58.5	13.1	16 51.3	5.8	54.2								
E 08	300 55.1	55.8	239 30.6	13.1	16 45.5	5.9	54.2								
D 09	315 55.1 . .	56.4	254 02.7	13.1	16 39.6	5.9	54.3								
N 10	330 55.1	57.0	268 34.8	13.2	16 33.7	6.1	54.3								
E 11	345 55.1	57.6	283 07.0	13.2	16 27.6	6.1	54.3								
S 12	0 55.0	N18 58.1	297 39.2	13.1	N16 21.5	6.2	54.3								
D 13	15 55.0	58.7	312 11.3	13.3	16 15.3	6.3	54.3								
A 14	30 55.0	59.3	326 43.6	13.2	16 09.0	6.3	54.3								
Y 15	45 55.0	18 59.9	341 15.8	13.2	16 02.7	6.4	54.3								
16	60 55.0	19 00.5	355 48.0	13.3	15 56.3	6.5	54.3								
17	75 55.0	01.1	10 20.3	13.3	15 49.8	6.6	54.3								
18	90 55.0	N19 01.6	24 52.6	13.3	N15 43.2	6.6	54.4								
19	105 55.0	02.2	39 24.9	13.4	15 36.6	6.7	54.4								
20	120 55.0	02.8	53 57.3	13.3	15 29.9	6.8	54.4								
21	135 54.9 . .	03.4	68 29.6	13.4	15 23.1	6.8	54.4								
22	150 54.9	04.0	83 02.0	13.4	15 16.3	6.9	54.4								
23	165 54.9	04.5	97 34.4	13.4	N15 09.4	7.0	54.4								
	SD 15.8	d 0.6	SD	14.7		14.7		14.8							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 13	Moonset 14	Moonset 15	Moonset 16
°	h m	h m	h m	h m	h m	h m	h m
N 72						02 40	02 11
N 70	23 14	////	////	02 01	01 50	01 45	01 40
68	22 05	////	////	00 33	00 59	01 11	01 17
66	21 30	////	////	24 26	00 26	00 47	00 59
64	21 05	22 45	////	24 03	00 03	00 27	00 45
62	20 46	22 01	////	23 44	24 12	00 12	00 32
60	20 30	21 33	////	23 28	23 58	24 22	00 22
N 58	20 17	21 12	22 52	23 15	23 47	24 13	00 13
56	20 05	20 55	22 12	23 04	23 37	24 05	00 05
54	19 55	20 41	21 46	22 54	23 29	23 58	24 23
52	19 46	20 28	21 26	22 45	23 21	23 51	24 18
50	19 38	20 18	21 10	22 37	23 14	23 45	24 13
45	19 21	19 55	20 39	22 20	22 58	23 33	24 04
N 40	19 08	19 38	20 16	22 06	22 46	23 22	23 56
35	18 56	19 24	19 58	21 54	22 35	23 13	23 49
30	18 46	19 12	19 43	21 44	22 26	23 05	23 42
20	18 29	18 52	19 20	21 26	22 10	22 52	23 32
N 10	18 14	18 36	19 02	21 10	21 56	22 40	23 22
0	18 00	18 22	18 47	20 55	21 42	22 28	23 14
S 10	17 46	18 08	18 34	20 41	21 29	22 17	23 05
20	17 32	17 55	18 22	20 25	21 15	22 05	22 55
30	17 15	17 41	18 09	20 07	20 58	21 51	22 44
35	17 06	17 33	18 03	19 56	20 49	21 43	22 38
40	16 55	17 24	17 57	19 44	20 38	21 33	22 31
45	16 42	17 14	17 50	19 30	20 25	21 22	22 22
S 50	16 27	17 02	17 42	19 12	20 09	21 09	22 12
52	16 19	16 57	17 38	19 04	20 02	21 03	22 07
54	16 11	16 51	17 35	18 55	19 53	20 56	22 02
56	16 03	16 45	17 31	18 44	19 44	20 48	21 56
58	15 52	16 38	17 26	18 32	19 34	20 40	21 49
S 60	15 41	16 30	17 22	18 19	19 21	20 30	21 42

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
13	03 41	03 41	11 56	14 44	02 20	03	11
14	03 41	03 41	11 56	15 31	03 08	04	17
15	03 41	03 40	11 56	16 17	03 54	05	25

UT	ARIES	VENUS −3.9		MARS +1.3		JUPITER −1.9		SATURN +0.2		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
16 00	233 52.4	167 51.3	N21 50.0	187 26.4	N17 19.9	153 59.0	N22 49.3	18 24.8	S11 18.0	Acamar	315 18.8	S40 15.1
01	248 54.8	182 50.5	50.6	202 27.0	20.4	169 00.8	49.3	33 27.4	18.0	Achernar	335 27.4	S57 10.0
02	263 57.3	197 49.7	51.2	217 27.6	21.0	184 02.7	49.4	48 30.1	17.9	Acrux	173 08.8	S63 10.7
03	278 59.7	212 48.9	51.7	232 28.3	21.5	199 04.6	49.4	63 32.7	17.9	Adhara	255 12.8	S28 59.8
04	294 02.2	227 48.1	52.3	247 28.9	22.0	214 06.5	49.4	78 35.3	17.8	Aldebaran	290 49.8	N16 32.0
05	309 04.7	242 47.4	52.9	262 29.5	22.5	229 08.3	49.5	93 38.0	17.8			
06	324 07.1	257 46.6	N21 53.5	277 30.2	N17 23.1	244 10.2	N22 49.5	108 40.6	S11 17.7	Alioth	166 20.4	N55 53.3
07	339 09.6	272 45.8	54.1	292 30.8	23.6	259 12.1	49.6	123 43.2	17.7	Alkaid	152 58.5	N49 14.9
T 08	354 12.1	287 45.0	54.7	307 31.5	24.1	274 13.9	49.6	138 45.9	17.6	Al Na'ir	27 43.9	S46 53.4
H 09	9 14.5	302 44.2	55.3	322 32.1	24.6	289 15.8	49.7	153 48.5	17.5	Alnilam	275 46.7	S 1 11.8
U 10	24 17.0	317 43.4	55.9	337 32.7	25.2	304 17.7	49.7	168 51.1	17.5	Alphard	217 56.2	S 8 43.3
R 11	39 19.5	332 42.6	56.5	352 33.4	25.7	319 19.6	49.7	183 53.8	17.4			
S 12	54 21.9	347 41.9	N21 57.1	7 34.0	N17 26.2	334 21.4	N22 49.8	198 56.4	S11 17.4	Alphecca	126 10.7	N26 40.2
D 13	69 24.4	2 41.1	57.6	22 34.6	26.7	349 23.3	49.8	213 59.0	17.3	Alpheratz	357 43.7	N29 09.7
A 14	84 26.8	17 40.3	58.2	37 35.3	27.2	4 25.2	49.9	229 01.7	17.3	Altair	62 08.1	N 8 54.3
Y 15	99 29.3	32 39.5	58.8	52 35.9	27.8	19 27.0	49.9	244 04.3	17.2	Ankaa	353 16.1	S42 13.8
16	114 31.8	47 38.7	21 59.4	67 36.6	28.3	34 28.9	50.0	259 06.9	17.2	Antares	112 26.0	S26 27.6
17	129 34.2	62 37.9	22 00.0	82 37.2	28.8	49 30.8	50.0	274 09.6	17.1			
18	144 36.7	77 37.1	N22 00.5	97 37.8	N17 29.3	64 32.7	N22 50.0	289 12.2	S11 17.1	Arcturus	145 55.5	N19 06.8
19	159 39.2	92 36.3	01.1	112 38.5	29.8	79 34.5	50.1	304 14.8	17.0	Atria	107 27.3	S69 02.9
20	174 41.6	107 35.6	01.7	127 39.1	30.4	94 36.4	50.1	319 17.5	17.0	Avior	234 18.3	S59 33.6
21	189 44.1	122 34.8	02.3	142 39.7	30.9	109 38.3	50.2	334 20.1	16.9	Bellatrix	278 32.4	N 6 21.5
22	204 46.6	137 34.0	02.8	157 40.4	31.4	124 40.1	50.2	349 22.7	16.9	Betelgeuse	271 01.7	N 7 24.4
23	219 49.0	152 33.2	03.4	172 41.0	31.9	139 42.0	50.3	4 25.4	16.8			
17 00	234 51.5	167 32.4	N22 04.0	187 41.6	N17 32.4	154 43.9	N22 50.3	19 28.0	S11 16.8	Canopus	263 56.6	S52 42.5
01	249 54.0	182 31.6	04.6	202 42.3	33.0	169 45.7	50.3	34 30.6	16.7	Capella	280 35.0	N46 00.6
02	264 56.4	197 30.8	05.1	217 42.9	33.5	184 47.6	50.4	49 33.3	16.7	Deneb	49 31.3	N45 19.6
03	279 58.9	212 30.0	05.7	232 43.5	34.0	199 49.5	50.4	64 35.9	16.6	Denebola	182 33.6	N14 29.8
04	295 01.3	227 29.2	06.3	247 44.2	34.5	214 51.3	50.5	79 38.5	16.6	Diphda	348 56.2	S17 54.7
05	310 03.8	242 28.4	06.8	262 44.8	35.0	229 53.2	50.5	94 41.2	16.5			
06	325 06.3	257 27.6	N22 07.4	277 45.5	N17 35.5	244 55.1	N22 50.5	109 43.8	S11 16.5	Dubhe	193 51.6	N61 40.9
07	340 08.7	272 26.8	08.0	292 46.1	36.1	259 57.0	50.6	124 46.4	16.4	Elnath	278 13.0	N28 37.0
08	355 11.2	287 26.0	08.5	307 46.7	36.6	274 58.8	50.6	139 49.1	16.4	Eltanin	90 45.7	N51 29.2
F 09	10 13.7	302 25.2	09.1	322 47.4	37.1	290 00.7	50.7	154 51.7	16.3	Enif	33 47.2	N 9 56.2
R 10	25 16.1	317 24.4	09.7	337 48.0	37.6	305 02.6	50.7	169 54.3	16.3	Fomalhaut	15 24.2	S29 32.9
I 11	40 18.6	332 23.7	10.2	352 48.6	38.1	320 04.4	50.8	184 57.0	16.2			
D 12	55 21.1	347 22.9	N22 10.8	7 49.3	N17 38.6	335 06.3	N22 50.8	199 59.6	S11 16.2	Gacrux	172 00.5	S57 11.6
A 13	70 23.5	2 22.1	11.3	22 49.9	39.1	350 08.2	50.8	215 02.2	16.1	Gienah	175 52.1	S17 37.2
Y 14	85 26.0	17 21.3	11.9	37 50.5	39.7	5 10.0	50.9	230 04.9	16.1	Hadar	148 47.3	S60 26.4
15	100 28.5	32 20.5	12.5	52 51.2	40.2	20 11.9	50.9	245 07.5	16.0	Hamal	328 01.1	N23 31.4
16	115 30.9	47 19.7	13.0	67 51.8	40.7	35 13.8	51.0	260 10.1	16.0	Kaus Aust.	83 43.6	S34 22.5
17	130 33.4	62 18.9	13.6	82 52.4	41.2	50 15.6	51.0	275 12.7	15.9			
18	145 35.8	77 18.1	N22 14.1	97 53.1	N17 41.7	65 17.5	N22 51.0	290 15.4	S11 15.9	Kochab	137 18.9	N74 06.1
19	160 38.3	92 17.3	14.7	112 53.7	42.2	80 19.4	51.1	305 18.0	15.8	Markab	13 38.5	N15 16.6
20	175 40.8	107 16.5	15.2	127 54.3	42.7	95 21.3	51.1	320 20.6	15.7	Menkar	314 15.4	N 4 08.4
21	190 43.2	122 15.7	15.8	142 55.0	43.2	110 23.1	51.2	335 23.3	15.7	Menkent	148 07.2	S36 26.3
22	205 45.7	137 14.9	16.3	157 55.6	43.8	125 25.0	51.2	350 25.9	15.6	Miaplacidus	221 39.8	S69 46.8
23	220 48.2	152 14.1	16.9	172 56.2	44.3	140 26.9	51.3	5 28.5	15.6			
18 00	235 50.6	167 13.3	N22 17.4	187 56.9	N17 44.8	155 28.7	N22 51.3	20 31.2	S11 15.5	Mirfak	308 40.9	N49 54.3
01	250 53.1	182 12.5	18.0	202 57.5	45.3	170 30.6	51.3	35 33.8	15.5	Nunki	75 58.1	S26 16.6
02	265 55.6	197 11.7	18.5	217 58.1	45.8	185 32.5	51.4	50 36.4	15.4	Peacock	53 19.1	S56 41.1
03	280 58.0	212 10.9	19.0	232 58.8	46.3	200 34.3	51.4	65 39.1	15.4	Pollux	243 28.0	N27 59.5
04	296 00.5	227 10.1	19.6	247 59.4	46.8	215 36.2	51.5	80 41.7	15.3	Procyon	245 00.0	N 5 11.2
05	311 02.9	242 09.3	20.1	263 00.0	47.3	230 38.1	51.5	95 44.3	15.3			
06	326 05.4	257 08.5	N22 20.7	278 00.7	N17 47.8	245 39.9	N22 51.5	110 46.9	S11 15.2	Rasalhague	96 06.2	N12 33.1
07	341 07.9	272 07.7	21.2	293 01.3	48.3	260 41.8	51.6	125 49.6	15.2	Regulus	207 43.6	N11 54.0
S 08	356 10.3	287 06.8	21.7	308 01.9	48.8	275 43.7	51.6	140 52.2	15.1	Rigel	281 12.4	S 8 11.4
A 09	11 12.8	302 06.0	22.3	323 02.6	49.4	290 45.5	51.7	155 54.8	15.1	Rigil Kent.	139 51.1	S60 53.5
T 10	26 15.3	317 05.2	22.8	338 03.2	49.9	305 47.4	51.7	170 57.5	15.0	Sabik	102 12.3	S15 44.4
U 11	41 17.7	332 04.4	23.3	353 03.8	50.4	320 49.3	51.8	186 00.1	15.0			
R 12	56 20.2	347 03.6	N22 23.9	8 04.5	N17 50.9	335 51.1	N22 51.8	201 02.7	S11 14.9	Schedar	349 40.9	N56 36.4
D 13	71 22.7	2 02.8	24.4	23 05.1	51.4	350 53.0	51.8	216 05.4	14.9	Shaula	96 21.6	S37 06.6
A 14	86 25.1	17 02.0	24.9	38 05.7	51.9	5 54.9	51.9	231 08.0	14.8	Sirius	258 34.0	S16 44.4
Y 15	101 27.6	32 01.2	25.5	53 06.4	52.4	20 56.7	51.9	246 10.6	14.8	Spica	158 31.0	S11 14.0
16	116 30.1	47 00.4	26.0	68 07.0	52.9	35 58.6	52.0	261 13.2	14.7	Suhail	222 52.6	S43 29.6
17	131 32.5	61 59.6	26.5	83 07.6	53.4	51 00.5	52.0	276 15.9	14.7			
18	146 35.0	76 58.8	N22 27.1	98 08.3	N17 53.9	66 02.3	N22 52.0	291 18.5	S11 14.6	Vega	80 38.7	N38 47.7
19	161 37.4	91 58.0	27.6	113 08.9	54.4	81 04.2	52.1	306 21.1	14.6	Zuben'ubi	137 05.1	S16 05.9
20	176 39.9	106 57.2	28.1	128 09.5	54.9	96 06.1	52.1	321 23.8	14.5		SHA	Mer. Pass.
21	191 42.4	121 56.4	28.6	143 10.2	55.4	111 07.9	52.2	336 26.4	14.5		° ′	h m
22	206 44.8	136 55.5	29.2	158 10.8	55.9	126 09.8	52.2	351 29.0	14.4	Venus	292 40.9	12 51
23	221 47.3	151 54.7	29.7	173 11.4	56.4	141 11.7	52.2	6 31.7	14.4	Mars	312 50.1	11 29
	h m									Jupiter	279 52.4	13 39
Mer. Pass.	8 19.2	v −0.8	d 0.6	v 0.6	d 0.5	v 1.9	d 0.0	v 2.6	d 0.1	Saturn	144 36.5	22 38

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 16	Moonrise 17	Moonrise 18	Moonrise 19
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
16 00	180 54.9	N19 05.1	112 06.8	13.4	N15 02.4	7.1	54.4	N 72	⌓	⌓	⌓	07 24	09 14	10 59	12 45
01	195 54.9	05.7	126 39.2	13.5	14 55.3	7.1	54.5	N 70	⌓	⌓	⌓	07 53	09 31	11 09	12 48
02	210 54.9	06.3	141 11.7	13.4	14 48.2	7.2	54.5	68	////	////	01 35	08 15	09 45	11 17	12 50
03	225 54.9	06.9	155 44.1	13.5	14 41.0	7.2	54.5	66	////	////	02 14	08 32	09 57	11 23	12 51
04	240 54.9	07.4	170 16.6	13.5	14 33.8	7.4	54.5	64	////	00 51	02 40	08 46	10 06	11 28	12 53
05	255 54.8	08.0	184 49.1	13.5	14 26.4	7.4	54.5	62	////	01 42	03 01	08 58	10 14	11 33	12 54
06	270 54.8	N19 08.6	199 21.6	13.6	N14 19.0	7.4	54.5	60	////	02 12	03 18	09 07	10 21	11 37	12 55
07	285 54.8	09.1	213 54.2	13.5	14 11.6	7.5	54.5	N 58	00 46	02 35	03 31	09 16	10 27	11 40	12 56
T 08	300 54.8	09.7	228 26.7	13.6	14 04.1	7.6	54.6	56	01 32	02 53	03 43	09 23	10 32	11 43	12 57
H 09	315 54.8	10.3	242 59.3	13.6	13 56.5	7.7	54.6	54	02 00	03 08	03 54	09 30	10 37	11 46	12 57
U 10	330 54.8	10.9	257 31.9	13.6	13 48.8	7.7	54.6	52	02 21	03 20	04 03	09 36	10 41	11 49	12 58
R 11	345 54.8	11.4	272 04.5	13.6	13 41.1	7.8	54.6	50	02 38	03 32	04 11	09 42	10 45	11 51	12 59
S 12	0 54.7	N19 12.0	286 37.1	13.6	N13 33.3	7.8	54.6	45	03 10	03 54	04 29	09 53	10 54	11 56	13 00
D 13	15 54.7	12.6	301 09.7	13.7	13 25.5	7.9	54.6	N 40	03 34	04 12	04 43	10 03	11 01	12 00	13 01
A 14	30 54.7	13.2	315 42.4	13.7	13 17.6	8.0	54.7	35	03 52	04 27	04 55	10 11	11 07	12 04	13 02
Y 15	45 54.7	13.7	330 15.1	13.6	13 09.6	8.0	54.7	30	04 08	04 39	05 05	10 18	11 12	12 07	13 03
16	60 54.7	14.3	344 47.7	13.7	13 01.6	8.1	54.7	20	04 31	04 59	05 23	10 31	11 21	12 12	13 05
17	75 54.7	14.9	359 20.4	13.7	12 53.5	8.2	54.7	N 10	04 50	05 16	05 39	10 42	11 29	12 17	13 06
18	90 54.6	N19 15.4	13 53.1	13.7	N12 45.3	8.2	54.7	0	05 05	05 31	05 53	10 52	11 37	12 22	13 07
19	105 54.6	16.0	28 25.8	13.8	12 37.1	8.3	54.8	S 10	05 19	05 45	06 07	11 02	11 44	12 26	13 08
20	120 54.6	16.6	42 58.6	13.7	12 28.8	8.3	54.8	20	05 32	05 59	06 22	11 13	11 52	12 31	13 10
21	135 54.6	17.1	57 31.3	13.7	12 20.5	8.4	54.8	30	05 45	06 14	06 39	11 25	12 01	12 36	13 11
22	150 54.6	17.7	72 04.0	13.8	12 12.1	8.5	54.8	35	05 51	06 22	06 49	11 32	12 07	12 40	13 12
23	165 54.6	18.3	86 36.8	13.8	12 03.6	8.5	54.8	40	05 58	06 31	07 00	11 40	12 12	12 43	13 13
17 00	180 54.5	N19 18.8	101 09.6	13.7	N11 55.1	8.6	54.9	45	06 06	06 41	07 13	11 50	12 19	12 47	13 14
01	195 54.5	19.4	115 42.3	13.8	11 46.5	8.6	54.9	S 50	06 14	06 54	07 30	12 01	12 27	12 52	13 16
02	210 54.5	19.9	130 15.1	13.8	11 37.9	8.7	54.9	52	06 18	06 59	07 37	12 06	12 31	12 54	13 17
03	225 54.5	20.5	144 47.9	13.8	11 29.2	8.7	54.9	54	06 21	07 05	07 45	12 12	12 35	12 57	13 17
04	240 54.5	21.1	159 20.7	13.8	11 20.5	8.8	55.0	56	06 26	07 12	07 55	12 18	12 40	12 59	13 18
05	255 54.4	21.6	173 53.5	13.9	11 11.7	8.9	55.0	58	06 30	07 19	08 06	12 25	12 45	13 02	13 19
06	270 54.4	N19 22.2	188 26.4	13.8	N11 02.8	8.9	55.0	S 60	06 35	07 28	08 18	12 34	12 51	13 06	13 20
07	285 54.4	22.8	202 59.2	13.8	10 53.9	9.0	55.0								
08	300 54.4	23.3	217 32.0	13.8	10 44.9	9.0	55.0								
F 09	315 54.4	23.9	232 04.8	13.9	10 35.9	9.1	55.1								
R 10	330 54.4	24.4	246 37.7	13.8	10 26.8	9.1	55.1								
I 11	345 54.3	25.0	261 10.5	13.9	10 17.7	9.2	55.1								
D 12	0 54.3	N19 25.5	275 43.4	13.8	N10 08.5	9.2	55.1								
A 13	15 54.3	26.1	290 16.2	13.9	9 59.3	9.3	55.2								
Y 14	30 54.3	26.7	304 49.1	13.8	9 50.0	9.3	55.2								
15	45 54.2	27.2	319 21.9	13.9	9 40.7	9.4	55.2								
16	60 54.2	27.8	333 54.8	13.8	9 31.3	9.4	55.2								
17	75 54.2	28.3	348 27.6	13.9	9 21.9	9.5	55.3								
18	90 54.2	N19 28.9	3 00.5	13.8	N 9 12.4	9.6	55.3								
19	105 54.2	29.4	17 33.3	13.9	9 02.8	9.5	55.3								
20	120 54.1	30.0	32 06.2	13.8	8 53.3	9.7	55.3								
21	135 54.1	30.5	46 39.0	13.9	8 43.6	9.7	55.4								
22	150 54.1	31.1	61 11.9	13.8	8 33.9	9.7	55.4								
23	165 54.1	31.6	75 44.7	13.9	8 24.2	9.7	55.4								
18 00	180 54.0	N19 32.2	90 17.6	13.8	N 8 14.5	9.9	55.4								
01	195 54.0	32.7	104 50.4	13.8	8 04.6	9.8	55.5								
02	210 54.0	33.3	119 23.2	13.9	7 54.8	9.9	55.5								
03	225 54.0	33.8	133 56.1	13.8	7 44.9	10.0	55.5								
04	240 53.9	34.4	148 28.9	13.8	7 34.9	10.0	55.6								
05	255 53.9	34.9	163 01.7	13.8	7 24.9	10.0	55.6								
06	270 53.9	N19 35.5	177 34.5	13.8	N 7 14.9	10.1	55.6								
07	285 53.9	36.0	192 07.3	13.7	7 04.8	10.1	55.6								
S 08	300 53.8	36.6	206 40.0	13.8	6 54.7	10.2	55.7								
A 09	315 53.8	37.1	221 12.8	13.8	6 44.5	10.2	55.7								
T 10	330 53.8	37.7	235 45.6	13.7	6 34.3	10.2	55.7								
U 11	345 53.8	38.2	250 18.3	13.8	6 24.1	10.3	55.8								
R 12	0 53.7	N19 38.7	264 51.1	13.7	N 6 13.8	10.4	55.8								
D 13	15 53.7	39.3	279 23.8	13.7	6 03.4	10.3	55.8								
A 14	30 53.7	39.8	293 56.5	13.7	5 53.1	10.4	55.9								
Y 15	45 53.7	40.4	308 29.2	13.7	5 42.7	10.5	55.9								
16	60 53.6	40.9	323 01.9	13.6	5 32.2	10.4	55.9								
17	75 53.6	41.5	337 34.5	13.7	5 21.8	10.5	56.0								
18	90 53.6	N19 42.0	352 07.2	13.6	N 5 11.3	10.6	56.0								
19	105 53.5	42.5	6 39.8	13.6	5 00.7	10.6	56.0								
20	120 53.5	43.1	21 12.4	13.6	4 50.1	10.6	56.1								
21	135 53.5	43.6	35 45.0	13.5	4 39.5	10.6	56.1								
22	150 53.5	44.2	50 17.5	13.6	4 28.9	10.7	56.1								
23	165 53.4	44.7	64 50.1	13.5	N 4 18.2	10.7	56.1								
	SD 15.8	d 0.6	SD	14.9		15.0		15.2							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 16	Moonset 17	Moonset 18	Moonset 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	⌓	⌓	⌓	02 11	01 55	01 42	01 32
N 70	⌓	⌓	⌓	01 40	01 35	01 31	01 27
68	22 23	////	////	01 17	01 20	01 22	01 22
66	21 42	////	////	00 59	01 08	01 14	01 19
64	21 15	23 11	////	00 45	00 57	01 07	01 16
62	20 54	22 15	////	00 32	00 48	01 02	01 13
60	20 37	21 43	////	00 22	00 41	00 57	01 11
N 58	20 23	21 20	23 15	00 13	00 34	00 52	01 09
56	20 11	21 02	22 24	00 05	00 28	00 48	01 07
54	20 00	20 47	21 55	24 23	00 23	00 45	01 05
52	19 51	20 34	21 34	24 18	00 18	00 42	01 04
50	19 42	20 22	21 16	24 13	00 13	00 39	01 02
45	19 25	19 59	20 43	24 04	00 04	00 32	00 59
N 40	19 10	19 41	20 20	23 56	24 27	00 27	00 57
35	18 58	19 27	20 01	23 49	24 22	00 22	00 55
30	18 48	19 14	19 46	23 42	24 18	00 18	00 53
20	18 30	18 54	19 22	23 32	24 11	00 11	00 49
N 10	18 14	18 37	19 03	23 22	24 04	00 04	00 46
0	18 00	18 22	18 47	23 14	23 58	24 43	00 43
S 10	17 46	18 08	18 34	23 05	23 52	24 40	00 40
20	17 31	17 54	18 21	22 55	23 46	24 37	00 37
30	17 13	17 39	18 08	22 44	23 38	24 34	00 34
35	17 03	17 31	18 01	22 38	23 34	24 32	00 32
40	16 52	17 21	17 54	22 31	23 29	24 29	00 29
45	16 39	17 11	17 47	22 22	23 23	24 26	00 26
S 50	16 23	16 59	17 38	22 12	23 17	24 23	00 23
52	16 15	16 53	17 35	22 07	23 13	24 22	00 22
54	16 07	16 47	17 31	22 02	23 10	24 20	00 20
56	15 57	16 40	17 27	21 56	23 06	24 18	00 18
58	15 47	16 33	17 22	21 49	23 02	24 16	00 16
S 60	15 34	16 24	17 17	21 42	22 57	24 14	00 14

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
16	03 40	03 39	11 56	17 03	04 40	06	34
17	03 38	03 37	11 56	17 48	05 25	07	43
18	03 36	03 35	11 56	18 33	06 10	08	53

UT	ARIES	VENUS −3.9		MARS +1.3		JUPITER −1.9		SATURN +0.3		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
19 00	236 49.8	166 53.9	N22 30.2	188 12.1	N17 56.9	156 13.5	N22 52.3	21 34.3	S11 14.3	Acamar	315 18.8	S40 15.1
01	251 52.2	181 53.1	30.7	203 12.7	57.4	171 15.4	52.3	36 36.9	14.3	Achernar	335 27.4	S57 10.0
02	266 54.7	196 52.3	31.2	218 13.3	57.9	186 17.3	52.4	51 39.5	14.2	Acrux	173 08.8	S63 10.7
03	281 57.2	211 51.5	31.8	233 14.0	58.4	201 19.1	52.4	66 42.2	14.2	Adhara	255 12.8	S28 59.8
04	296 59.6	226 50.7	32.3	248 14.6	58.9	216 21.0	52.4	81 44.8	14.1	Aldebaran	290 49.8	N16 32.0
05	312 02.1	241 49.9	32.8	263 15.2	59.4	231 22.9	52.5	96 47.4	14.1			
06	327 04.6	256 49.1	N22 33.3	278 15.8	N17 59.9	246 24.7	N22 52.5	111 50.1	S11 14.0	Alioth	166 20.4	N55 53.4
07	342 07.0	271 48.2	33.8	293 16.5	18 00.4	261 26.6	52.6	126 52.7	14.0	Alkaid	152 58.6	N49 14.9
08	357 09.5	286 47.4	34.3	308 17.1	00.9	276 28.5	52.6	141 55.3	13.9	Al Na'ir	27 43.8	S46 53.4
S 09	12 11.9	301 46.6	34.8	323 17.7	01.4	291 30.3	52.6	156 57.9	13.9	Alnilam	275 46.7	S 1 11.8
U 10	27 14.4	316 45.8	35.3	338 18.4	01.9	306 32.2	52.7	172 00.6	13.8	Alphard	217 56.2	S 8 43.3
N 11	42 16.9	331 45.0	35.8	353 19.0	02.4	321 34.1	52.7	187 03.2	13.8			
12	57 19.3	346 44.2	N22 36.4	8 19.6	N18 02.9	336 35.9	N22 52.8	202 05.8	S11 13.7	Alphecca	126 10.7	N26 40.2
D 13	72 21.8	1 43.4	36.9	23 20.3	03.4	351 37.8	52.8	217 08.5	13.7	Alpheratz	357 43.7	N29 09.7
A 14	87 24.3	16 42.5	37.4	38 20.9	03.9	6 39.7	52.8	232 11.1	13.6	Altair	62 08.1	N 8 54.3
Y 15	102 26.7	31 41.7	37.9	53 21.5	04.4	21 41.5	52.9	247 13.7	13.6	Ankaa	353 16.0	S42 13.8
16	117 29.2	46 40.9	38.4	68 22.2	04.9	36 43.4	52.9	262 16.3	13.5	Antares	112 25.9	S26 27.6
17	132 31.7	61 40.1	38.9	83 22.8	05.4	51 45.3	53.0	277 19.0	13.5			
18	147 34.1	76 39.3	N22 39.4	98 23.4	N18 05.9	66 47.1	N22 53.0	292 21.6	S11 13.4	Arcturus	145 55.5	N19 06.8
19	162 36.6	91 38.5	39.9	113 24.0	06.4	81 49.0	53.0	307 24.2	13.4	Atria	107 27.3	S69 02.9
20	177 39.0	106 37.6	40.4	128 24.7	06.9	96 50.8	53.1	322 26.8	13.3	Avior	234 18.3	S59 33.6
21	192 41.5	121 36.8	40.9	143 25.3	07.4	111 52.7	53.1	337 29.5	13.3	Bellatrix	278 32.4	N 6 21.5
22	207 44.0	136 36.0	41.4	158 25.9	07.9	126 54.6	53.2	352 32.1	13.2	Betelgeuse	271 01.7	N 7 24.4
23	222 46.4	151 35.2	41.9	173 26.6	08.4	141 56.4	53.2	7 34.7	13.2			
20 00	237 48.9	166 34.4	N22 42.3	188 27.2	N18 08.9	156 58.3	N22 53.2	22 37.4	S11 13.1	Canopus	263 56.6	S52 42.5
01	252 51.4	181 33.6	42.8	203 27.8	09.4	172 00.2	53.3	37 40.0	13.1	Capella	280 35.0	N46 00.5
02	267 53.8	196 32.7	43.3	218 28.5	09.9	187 02.0	53.3	52 42.6	13.1	Deneb	49 31.3	N45 19.6
03	282 56.3	211 31.9	43.8	233 29.1	10.4	202 03.9	53.4	67 45.2	13.0	Denebola	182 33.6	N14 29.8
04	297 58.8	226 31.1	44.3	248 29.7	10.9	217 05.8	53.4	82 47.9	13.0	Diphda	348 56.2	S17 54.7
05	313 01.2	241 30.3	44.8	263 30.4	11.4	232 07.6	53.4	97 50.5	12.9			
06	328 03.7	256 29.5	N22 45.3	278 31.0	N18 11.9	247 09.5	N22 53.5	112 53.1	S11 12.9	Dubhe	193 51.7	N61 40.9
07	343 06.2	271 28.6	45.8	293 31.6	12.4	262 11.4	53.5	127 55.7	12.8	Elnath	278 13.0	N28 37.0
08	358 08.6	286 27.8	46.3	308 32.2	12.9	277 13.2	53.6	142 58.4	12.8	Eltanin	90 45.7	N51 29.2
M 09	13 11.1	301 27.0	46.7	323 32.9	13.4	292 15.1	53.6	158 01.0	12.7	Enif	33 47.1	N 9 56.2
O 10	28 13.5	316 26.2	47.2	338 33.5	13.8	307 17.0	53.6	173 03.6	12.7	Fomalhaut	15 24.1	S29 32.9
N 11	43 16.0	331 25.3	47.7	353 34.1	14.3	322 18.8	53.7	188 06.2	12.6			
12	58 18.5	346 24.5	N22 48.2	8 34.8	N18 14.8	337 20.7	N22 53.7	203 08.9	S11 12.6	Gacrux	172 00.5	S57 11.6
D 13	73 20.9	1 23.7	48.7	23 35.4	15.3	352 22.5	53.8	218 11.5	12.5	Gienah	175 52.2	S17 37.2
A 14	88 23.4	16 22.9	49.1	38 36.0	15.8	7 24.4	53.8	233 14.1	12.5	Hadar	148 47.3	S60 26.4
Y 15	103 25.9	31 22.0	49.6	53 36.6	16.3	22 26.3	53.8	248 16.8	12.4	Hamal	328 01.1	N23 31.4
16	118 28.3	46 21.2	50.1	68 37.3	16.8	37 28.1	53.9	263 19.4	12.4	Kaus Aust.	83 43.6	S34 22.5
17	133 30.8	61 20.4	50.6	83 37.9	17.3	52 30.0	53.9	278 22.0	12.3			
18	148 33.3	76 19.6	N22 51.0	98 38.5	N18 17.8	67 31.9	N22 54.0	293 24.6	S11 12.3	Kochab	137 19.0	N74 06.1
19	163 35.7	91 18.7	51.5	113 39.2	18.3	82 33.7	54.0	308 27.3	12.2	Markab	13 38.5	N15 16.6
20	178 38.2	106 17.9	52.0	128 39.8	18.8	97 35.6	54.0	323 29.9	12.2	Menkar	314 15.4	N 4 08.4
21	193 40.6	121 17.1	52.5	143 40.4	19.2	112 37.4	54.1	338 32.5	12.1	Menkent	148 07.3	S36 26.3
22	208 43.1	136 16.3	52.9	158 41.0	19.7	127 39.3	54.1	353 35.1	12.1	Miaplacidus	221 39.8	S69 46.8
23	223 45.6	151 15.4	53.4	173 41.7	20.2	142 41.2	54.1	8 37.8	12.0			
21 00	238 48.0	166 14.6	N22 53.9	188 42.3	N18 20.7	157 43.0	N22 54.2	23 40.4	S11 12.0	Mirfak	308 40.9	N49 54.3
01	253 50.5	181 13.8	54.3	203 42.9	21.2	172 44.9	54.2	38 43.0	11.9	Nunki	75 58.1	S26 16.6
02	268 53.0	196 13.0	54.8	218 43.6	21.7	187 46.8	54.3	53 45.6	11.9	Peacock	53 19.1	S56 41.1
03	283 55.4	211 12.1	55.2	233 44.2	22.2	202 48.6	54.3	68 48.3	11.8	Pollux	243 28.0	N27 59.5
04	298 57.9	226 11.3	55.7	248 44.8	22.7	217 50.5	54.3	83 50.9	11.8	Procyon	245 00.0	N 5 11.2
05	314 00.4	241 10.5	56.2	263 45.4	23.1	232 52.4	54.4	98 53.5	11.7			
06	329 02.8	256 09.6	N22 56.6	278 46.1	N18 23.6	247 54.2	N22 54.4	113 56.1	S11 11.7	Rasalhague	96 06.2	N12 33.1
07	344 05.3	271 08.8	57.1	293 46.7	24.1	262 56.1	54.5	128 58.8	11.6	Regulus	207 43.6	N11 54.0
08	359 07.8	286 08.0	57.5	308 47.3	24.6	277 57.9	54.5	144 01.4	11.6	Rigel	281 12.4	S 8 11.4
T 09	14 10.2	301 07.2	58.0	323 48.0	25.1	292 59.8	54.5	159 04.0	11.5	Rigil Kent.	139 51.1	S60 53.5
U 10	29 12.7	316 06.3	58.5	338 48.6	25.6	308 01.7	54.6	174 06.6	11.5	Sabik	102 12.3	S15 44.4
E 11	44 15.1	331 05.5	58.9	353 49.2	26.1	323 03.5	54.6	189 09.3	11.4			
S 12	59 17.6	346 04.7	N22 59.4	8 49.8	N18 26.5	338 05.4	N22 54.7	204 11.9	S11 11.4	Schedar	349 40.9	N56 36.4
D 13	74 20.1	1 03.8	22 59.8	23 50.5	27.0	353 07.3	54.7	219 14.5	11.4	Shaula	96 21.6	S37 06.6
A 14	89 22.5	16 03.0	23 00.3	38 51.1	27.5	8 09.1	54.7	234 17.1	11.3	Sirius	258 34.0	S16 44.4
Y 15	104 25.0	31 02.2	00.7	53 51.7	28.0	23 11.0	54.8	249 19.7	11.3	Spica	158 31.0	S11 14.0
16	119 27.5	46 01.3	01.2	68 52.3	28.5	38 12.8	54.8	264 22.4	11.2	Suhail	222 52.6	S43 29.6
17	134 29.9	61 00.5	01.6	83 53.0	29.0	53 14.7	54.8	279 25.0	11.2			
18	149 32.4	75 59.7	N23 02.1	98 53.6	N18 29.4	68 16.6	N22 54.9	294 27.6	S11 11.1	Vega	80 38.7	N38 47.7
19	164 34.9	90 58.8	02.5	113 54.2	29.9	83 18.4	54.9	309 30.2	11.1	Zuben'ubi	137 05.1	S16 05.9
20	179 37.3	105 58.0	02.9	128 54.8	30.4	98 20.3	55.0	324 32.9	11.0		SHA	Mer.Pass.
21	194 39.8	120 57.2	03.4	143 55.5	30.9	113 22.1	55.0	339 35.5	11.0		° ′	h m
22	209 42.3	135 56.3	03.8	158 56.1	31.4	128 24.0	55.0	354 38.1	10.9	Venus	288 45.5	12 54
23	224 44.7	150 55.5	04.3	173 56.7	31.8	143 25.9	55.1	9 40.7	10.9	Mars	310 38.3	11 26
										Jupiter	279 09.4	13 30
Mer.Pass.	h m 8 07.4	v −0.8	d 0.5	v 0.6	d 0.5	v 1.9	d 0.0	v 2.6	d 0.0	Saturn	144 48.5	22 26

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON						Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 19	Moonrise 20	Moonrise 21	Moonrise 22
	GHA	Dec	GHA	v	Dec	d	HP									
d h	° ′	° ′	° ′	′	° ′	′	′		°	h m	h m	h m	h m	h m	h m	h m
19 00	180 53.4	N19 45.2	79 22.6	13.5	N 4 07.5	10.8	56.2		N 72				12 45	14 34	16 30	18 37
01	195 53.4	45.8	93 55.1	13.5	3 56.7	10.8	56.2		N 70				12 48	14 30	16 17	18 13
02	210 53.3	46.3	108 27.6	13.4	3 45.9	10.8	56.2		68	////	////	01 16	12 50	14 26	16 07	17 54
03	225 53.3	46.8	123 00.0	13.5	3 35.1	10.8	56.3		66	////	////	02 02	12 51	14 23	15 59	17 40
04	240 53.3	47.4	137 32.5	13.4	3 24.3	10.9	56.3		64	////	00 09	02 31	12 53	14 20	15 52	17 27
05	255 53.3	47.9	152 04.9	13.3	3 13.4	10.9	56.4		62	////	01 28	02 53	12 54	14 18	15 46	17 17
06	270 53.2	N19 48.4	166 37.2	13.4	N 3 02.5	10.9	56.4		60	////	02 03	03 11	12 55	14 16	15 41	17 09
07	285 53.2	49.0	181 09.6	13.3	2 51.6	11.0	56.4		N 58	00 07	02 27	03 26	12 56	14 14	15 36	17 01
08	300 53.2	49.5	195 41.9	13.3	2 40.6	10.9	56.5		56	01 20	02 46	03 38	12 57	14 13	15 32	16 54
S 09	315 53.1	50.0	210 14.2	13.2	2 29.7	11.0	56.5		54	01 51	03 02	03 49	12 57	14 11	15 28	16 48
U 10	330 53.1	50.6	224 46.4	13.3	2 18.7	11.1	56.5		52	02 14	03 15	03 59	12 58	14 10	15 25	16 43
N 11	345 53.1	51.1	239 18.7	13.2	2 07.6	11.0	56.6		50	02 32	03 27	04 08	12 59	14 09	15 22	16 38
12	0 53.0	N19 51.6	253 50.9	13.1	N 1 56.6	11.1	56.6		45	03 06	03 51	04 26	13 00	14 07	15 16	16 28
D 13	15 53.0	52.1	268 23.0	13.1	1 45.5	11.1	56.6		N 40	03 31	04 09	04 40	13 01	14 05	15 10	16 19
A 14	30 53.0	52.7	282 55.1	13.1	1 34.4	11.1	56.7		35	03 50	04 25	04 53	13 02	14 03	15 06	16 12
Y 15	45 52.9	53.2	297 27.2	13.1	1 23.3	11.2	56.7		30	04 05	04 37	05 04	13 03	14 01	15 02	16 05
16	60 52.9	53.7	311 59.3	13.0	1 12.1	11.1	56.7		20	04 30	04 58	05 22	13 05	13 59	14 55	15 54
17	75 52.9	54.3	326 31.3	13.0	1 01.0	11.2	56.8		N 10	04 49	05 16	05 38	13 06	13 56	14 49	15 45
18	90 52.8	N19 54.8	341 03.3	12.9	N 0 49.8	11.2	56.8		0	05 05	05 31	05 53	13 07	13 54	14 43	15 36
19	105 52.8	55.3	355 35.2	13.0	0 38.6	11.2	56.9		S 10	05 20	05 45	06 08	13 08	13 52	14 38	15 27
20	120 52.8	55.8	10 07.2	12.8	0 27.4	11.3	56.9		20	05 33	06 00	06 23	13 10	13 50	14 32	15 17
21	135 52.7	56.4	24 39.0	12.8	0 16.1	11.2	56.9		30	05 46	06 15	06 41	13 11	13 47	14 25	15 07
22	150 52.7	56.9	39 10.8	12.8	N 0 04.9	11.3	57.0		35	05 53	06 24	06 51	13 12	13 46	14 21	15 01
23	165 52.7	57.4	53 42.6	12.8	S 0 06.4	11.3	57.0		40	06 00	06 33	07 03	13 13	13 44	14 17	14 54
20 00	180 52.6	N19 57.9	68 14.4	12.7	S 0 17.7	11.3	57.0		45	06 08	06 44	07 17	13 14	13 42	14 12	14 46
01	195 52.6	58.4	82 46.1	12.6	0 29.0	11.3	57.1		S 50	06 17	06 57	07 33	13 16	13 40	14 06	14 36
02	210 52.6	59.0	97 17.7	12.6	0 40.3	11.3	57.1		52	06 21	07 03	07 41	13 17	13 39	14 04	14 32
03	225 52.5	19 59.5	111 49.3	12.6	0 51.6	11.3	57.2		54	06 25	07 09	07 50	13 17	13 38	14 01	14 27
04	240 52.5	20 00.0	126 20.9	12.5	1 02.9	11.4	57.2		56	06 30	07 16	08 00	13 18	13 37	13 57	14 21
05	255 52.5	00.5	140 52.4	12.5	1 14.3	11.3	57.2		58	06 35	07 24	08 11	13 19	13 36	13 54	14 15
06	270 52.4	N20 01.0	155 23.9	12.4	S 1 25.6	11.4	57.3		S 60	06 40	07 33	08 24	13 20	13 34	13 50	14 09
07	285 52.4	01.6	169 55.3	12.4	1 37.0	11.4	57.3									
08	300 52.4	02.1	184 26.7	12.3	1 48.4	11.4	57.3									
M 09	315 52.3	02.6	198 58.0	12.3	1 59.8	11.3	57.4									
O 10	330 52.3	03.1	213 29.3	12.2	2 11.1	11.4	57.4									
N 11	345 52.2	03.6	228 00.5	12.2	2 22.5	11.4	57.5									
12	0 52.2	N20 04.1	242 31.7	12.1	S 2 33.9	11.4	57.5									
D 13	15 52.2	04.7	257 02.8	12.0	2 45.3	11.4	57.5									
A 14	30 52.1	05.2	271 33.8	12.0	2 56.7	11.4	57.6									
Y 15	45 52.1	05.7	286 04.8	12.0	3 08.1	11.4	57.6									
16	60 52.1	06.2	300 35.8	11.9	3 19.5	11.4	57.7									
17	75 52.0	06.7	315 06.7	11.8	3 30.9	11.4	57.7									
18	90 52.0	N20 07.2	329 37.5	11.8	S 3 42.3	11.4	57.7									
19	105 51.9	07.7	344 08.3	11.7	3 53.7	11.4	57.8									
20	120 51.9	08.2	358 39.0	11.6	4 05.1	11.4	57.8									
21	135 51.9	08.8	13 09.6	11.6	4 16.5	11.4	57.9									
22	150 51.8	09.3	27 40.2	11.5	4 27.9	11.4	57.9									
23	165 51.8	09.8	42 10.7	11.5	4 39.3	11.4	57.9									
21 00	180 51.7	N20 10.3	56 41.2	11.4	S 4 50.7	11.3	58.0									
01	195 51.7	10.8	71 11.6	11.3	5 02.0	11.4	58.0									
02	210 51.7	11.3	85 41.9	11.3	5 13.4	11.3	58.1									
03	225 51.6	11.8	100 12.2	11.2	5 24.7	11.4	58.1									
04	240 51.6	12.3	114 42.4	11.1	5 36.1	11.3	58.1									
05	255 51.5	12.8	129 12.5	11.1	5 47.4	11.3	58.2									
06	270 51.5	N20 13.3	143 42.6	11.0	S 5 58.7	11.3	58.2									
07	285 51.5	13.8	158 12.6	10.9	6 10.0	11.3	58.3									
T 08	300 51.4	14.3	172 42.5	10.9	6 21.3	11.2	58.3									
U 09	315 51.4	14.8	187 12.4	10.8	6 32.5	11.2	58.3									
E 10	330 51.3	15.3	201 42.2	10.7	6 43.7	11.3	58.4									
S 11	345 51.3	15.8	216 11.9	10.6	6 55.0	11.2	58.4									
12	0 51.2	N20 16.3	230 41.5	10.6	S 7 06.2	11.1	58.4									
D 13	15 51.2	16.8	245 11.1	10.5	7 17.3	11.2	58.5									
A 14	30 51.2	17.3	259 40.6	10.4	7 28.5	11.1	58.5									
Y 15	45 51.1	17.8	274 10.0	10.3	7 39.6	11.1	58.6									
16	60 51.1	18.3	288 39.3	10.3	7 50.7	11.1	58.6									
17	75 51.0	18.8	303 08.6	10.2	8 01.8	11.0	58.6									
18	90 51.0	N20 19.3	317 37.8	10.1	S 8 12.8	11.0	58.7									
19	105 50.9	19.8	332 06.9	10.0	8 23.8	11.0	58.7									
20	120 50.9	20.3	346 35.9	10.0	8 34.8	10.9	58.8									
21	135 50.8	20.8	1 04.9	9.8	8 45.7	11.0	58.8									
22	150 50.8	21.3	15 33.7	9.8	8 56.7	10.8	58.8									
23	165 50.8	21.8	30 02.5	9.7	S 9 07.5	10.9	58.9									
	SD 15.8	d 0.5	SD	15.4		15.7		15.9								

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
19	03 34	03 32	11 56	19 18	06 55	09	63
20	03 31	03 29	11 57	20 06	07 42	10	73
21	03 27	03 25	11 57	20 56	08 30	11	82

UT	ARIES	VENUS −3.9		MARS +1.4		JUPITER −1.9		SATURN +0.3		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
22 00	239 47.2	165 54.7	N23 04.7	188 57.4	N18 32.3	158 27.7	N22 55.1	24 43.4	S11 10.8	Acamar	315 18.8	S40 15.1
01	254 49.6	180 53.8	05.1	203 58.0	32.8	173 29.6	55.1	39 46.0	10.8	Achernar	335 27.3	S57 10.0
02	269 52.1	195 53.0	05.6	218 58.6	33.3	188 31.5	55.2	54 48.6	10.7	Acrux	173 08.9	S63 10.7
03	284 54.6	210 52.2 . .	06.0	233 59.2 . .	33.8	203 33.3 . .	55.2	69 51.2 . .	10.7	Adhara	255 12.9	S28 59.7
04	299 57.0	225 51.3	06.5	248 59.9	34.2	218 35.2	55.3	84 53.9	10.6	Aldebaran	290 49.8	N16 32.0
05	314 59.5	240 50.5	06.9	264 00.5	34.7	233 37.0	55.3	99 56.5	10.6			
06	330 02.0	255 49.6	N23 07.3	279 01.1	N18 35.2	248 38.9	N22 55.3	114 59.1	S11 10.5	Alioth	166 20.4	N55 53.4
W 07	345 04.4	270 48.8	07.7	294 01.7	35.7	263 40.8	55.4	130 01.7	10.5	Alkaid	152 58.6	N49 14.9
E 08	0 06.9	285 48.0	08.2	309 02.4	36.2	278 42.6	55.4	145 04.3	10.4	Al Na'ir	27 43.8	S46 53.4
D 09	15 09.4	300 47.1 . .	08.6	324 03.0 . .	36.6	293 44.5 . .	55.5	160 07.0 . .	10.4	Alnilam	275 46.7	S 1 11.8
N 10	30 11.8	315 46.3	09.0	339 03.6	37.1	308 46.3	55.5	175 09.6	10.4	Alphard	217 56.2	S 8 43.3
E 11	45 14.3	330 45.5	09.5	354 04.2	37.6	323 48.2	55.5	190 12.2	10.3			
S 12	60 16.7	345 44.6	N23 09.9	9 04.9	N18 38.1	338 50.1	N22 55.6	205 14.8	S11 10.3	Alphecca	126 10.7	N26 40.2
D 13	75 19.2	0 43.8	10.3	24 05.5	38.5	353 51.9	55.6	220 17.5	10.2	Alpheratz	357 43.7	N29 09.7
A 14	90 21.7	15 42.9	10.7	39 06.1	39.0	8 53.8	55.6	235 20.1	10.2	Altair	62 08.1	N 8 54.3
Y 15	105 24.1	30 42.1 . .	11.2	54 06.7 . .	39.5	23 55.6 . .	55.7	250 22.7 . .	10.1	Ankaa	353 16.0	S42 13.8
16	120 26.6	45 41.3	11.6	69 07.4	40.0	38 57.5	55.7	265 25.3	10.1	Antares	112 25.9	S26 27.6
17	135 29.1	60 40.4	12.0	84 08.0	40.4	53 59.4	55.8	280 27.9	10.0			
18	150 31.5	75 39.6	N23 12.4	99 08.6	N18 40.9	69 01.2	N22 55.8	295 30.6	S11 10.0	Arcturus	145 55.5	N19 06.8
19	165 34.0	90 38.7	12.8	114 09.2	41.4	84 03.1	55.8	310 33.2	09.9	Atria	107 27.2	S69 02.9
20	180 36.5	105 37.9	13.2	129 09.9	41.9	99 04.9	55.9	325 35.8	09.9	Avior	234 18.3	S59 33.6
21	195 38.9	120 37.1 . .	13.7	144 10.5 . .	42.3	114 06.8 . .	55.9	340 38.4 . .	09.8	Bellatrix	278 32.4	N 6 21.5
22	210 41.4	135 36.2	14.1	159 11.1	42.8	129 08.7	55.9	355 41.0	09.8	Betelgeuse	271 01.7	N 7 24.4
23	225 43.9	150 35.4	14.5	174 11.7	43.3	144 10.5	56.0	10 43.7	09.7			
23 00	240 46.3	165 34.5	N23 14.9	189 12.4	N18 43.7	159 12.4	N22 56.0	25 46.3	S11 09.7	Canopus	263 56.6	S52 42.5
01	255 48.8	180 33.7	15.3	204 13.0	44.2	174 14.2	56.0	40 48.9	09.7	Capella	280 35.0	N46 00.5
02	270 51.2	195 32.8	15.7	219 13.6	44.7	189 16.1	56.1	55 51.5	09.6	Deneb	49 31.3	N45 19.6
03	285 53.7	210 32.0 . .	16.1	234 14.2 . .	45.2	204 18.0 . .	56.1	70 54.2 . .	09.6	Denebola	182 33.6	N14 29.8
04	300 56.2	225 31.2	16.5	249 14.9	45.6	219 19.8	56.2	85 56.8	09.5	Diphda	348 56.2	S17 54.7
05	315 58.6	240 30.3	16.9	264 15.5	46.1	234 21.7	56.2	100 59.4	09.5			
06	331 01.1	255 29.5	N23 17.3	279 16.1	N18 46.6	249 23.5	N22 56.2	116 02.0	S11 09.4	Dubhe	193 51.7	N61 40.9
T 07	346 03.6	270 28.6	17.7	294 16.7	47.0	264 25.4	56.3	131 04.6	09.4	Elnath	278 13.0	N28 36.9
H 08	1 06.0	285 27.8	18.1	309 17.4	47.5	279 27.3	56.3	146 07.3	09.3	Eltanin	90 45.7	N51 29.2
U 09	16 08.5	300 26.9 . .	18.5	324 18.0 . .	48.0	294 29.1 . .	56.3	161 09.9 . .	09.3	Enif	33 47.1	N 9 56.2
R 10	31 11.0	315 26.1	18.9	339 18.6	48.5	309 31.0	56.4	176 12.5	09.2	Fomalhaut	15 24.1	S29 32.9
S 11	46 13.4	330 25.2	19.3	354 19.2	48.9	324 32.8	56.4	191 15.1	09.2			
D 12	61 15.9	345 24.4	N23 19.7	9 19.9	N18 49.4	339 34.7	N22 56.5	206 17.7	S11 09.1	Gacrux	172 00.6	S57 11.6
A 13	76 18.4	0 23.6	20.1	24 20.5	49.9	354 36.6	56.5	221 20.4	09.1	Gienah	175 52.2	S17 37.2
Y 14	91 20.8	15 22.7	20.5	39 21.1	50.3	9 38.4	56.5	236 23.0	09.0	Hadar	148 47.3	S60 26.4
15	106 23.3	30 21.9 . .	20.9	54 21.7 . .	50.8	24 40.3 . .	56.6	251 25.6 . .	09.0	Hamal	328 01.1	N23 31.4
16	121 25.7	45 21.0	21.3	69 22.3	51.3	39 42.1	56.6	266 28.2	09.0	Kaus Aust.	83 43.5	S34 22.5
17	136 28.2	60 20.2	21.7	84 23.0	51.7	54 44.0	56.6	281 30.8	08.9			
18	151 30.7	75 19.3	N23 22.1	99 23.6	N18 52.2	69 45.9	N22 56.7	296 33.5	S11 08.9	Kochab	137 19.0	N74 06.2
19	166 33.1	90 18.5	22.5	114 24.2	52.7	84 47.7	56.7	311 36.1	08.8	Markab	13 38.4	N15 16.6
20	181 35.6	105 17.6	22.9	129 24.8	53.1	99 49.6	56.7	326 38.7	08.8	Menkar	314 15.4	N 4 08.4
21	196 38.1	120 16.8 . .	23.3	144 25.5 . .	53.6	114 51.4 . .	56.8	341 41.3 . .	08.7	Menkent	148 07.3	S36 26.3
22	211 40.5	135 15.9	23.7	159 26.1	54.1	129 53.3	56.8	356 43.9	08.7	Miaplacidus	221 39.9	S69 46.8
23	226 43.0	150 15.1	24.0	174 26.7	54.5	144 55.2	56.9	11 46.5	08.6			
24 00	241 45.5	165 14.2	N23 24.4	189 27.3	N18 55.0	159 57.0	N22 56.9	26 49.2	S11 08.6	Mirfak	308 40.9	N49 54.3
01	256 47.9	180 13.4	24.8	204 28.0	55.5	174 58.9	56.9	41 51.8	08.5	Nunki	75 58.1	S26 16.6
02	271 50.4	195 12.5	25.2	219 28.6	55.9	190 00.7	57.0	56 54.4	08.5	Peacock	53 19.1	S56 41.1
03	286 52.8	210 11.7 . .	25.6	234 29.2 . .	56.4	205 02.6 . .	57.0	71 57.0 . .	08.5	Pollux	243 28.0	N27 59.5
04	301 55.3	225 10.8	25.9	249 29.8	56.8	220 04.4	57.0	86 59.6	08.4	Procyon	245 00.0	N 5 11.2
05	316 57.8	240 10.0	26.3	264 30.4	57.3	235 06.3	57.1	102 02.3	08.4			
06	332 00.2	255 09.1	N23 26.7	279 31.1	N18 57.8	250 08.2	N22 57.1	117 04.9	S11 08.3	Rasalhague	96 06.2	N12 33.1
07	347 02.7	270 08.3	27.1	294 31.7	58.2	265 10.0	57.1	132 07.5	08.3	Regulus	207 43.6	N11 54.0
08	2 05.2	285 07.4	27.4	309 32.3	58.7	280 11.9	57.2	147 10.1	08.2	Rigel	281 12.4	S 8 11.4
F 09	17 07.6	300 06.6 . .	27.8	324 32.9 . .	59.2	295 13.7 . .	57.2	162 12.7 . .	08.2	Rigil Kent.	139 51.1	S60 53.5
R 10	32 10.1	315 05.7	28.2	339 33.6	18 59.6	310 15.6	57.3	177 15.4	08.1	Sabik	102 12.3	S15 44.4
I 11	47 12.6	330 04.9	28.6	354 34.2	19 00.1	325 17.5	57.3	192 18.0	08.1			
D 12	62 15.0	345 04.0	N23 28.9	9 34.8	N19 00.5	340 19.3	N22 57.3	207 20.6	S11 08.0	Schedar	349 40.9	N56 36.4
A 13	77 17.5	0 03.2	29.3	24 35.4	01.0	355 21.2	57.4	222 23.2	08.0	Shaula	96 21.6	S37 06.6
Y 14	92 20.0	15 02.3	29.7	39 36.0	01.5	10 23.0	57.4	237 25.8	08.0	Sirius	258 34.0	S16 44.4
15	107 22.4	30 01.4 . .	30.0	54 36.7 . .	01.9	25 24.9 . .	57.4	252 28.4 . .	07.9	Spica	158 31.0	S11 14.0
16	122 24.9	45 00.6	30.4	69 37.3	02.4	40 26.7	57.5	267 31.1	07.9	Suhail	222 52.6	S43 29.6
17	137 27.3	59 59.7	30.8	84 37.9	02.8	55 28.6	57.5	282 33.7	07.8			
18	152 29.8	74 58.9	N23 31.1	99 38.5	N19 03.3	70 30.5	N22 57.5	297 36.3	S11 07.8	Vega	80 38.6	N38 47.8
19	167 32.3	89 58.0	31.5	114 39.2	03.8	85 32.3	57.6	312 38.9	07.7	Zuben'ubi	137 05.1	S16 05.9
20	182 34.7	104 57.2	31.8	129 39.8	04.2	100 34.2	57.6	327 41.5	07.7		SHA	Mer. Pass.
21	197 37.2	119 56.3 . .	32.2	144 40.4 . .	04.7	115 36.0 . .	57.6	342 44.1 . .	07.6		° ′	h m
22	212 39.7	134 55.5	32.6	159 41.0	05.1	130 37.9	57.7	357 46.8	07.6	Venus	284 48.2	12 58
23	227 42.1	149 54.6	32.9	174 41.6	05.6	145 39.7	57.7	12 49.4	07.5	Mars	308 26.0	11 23
	h m									Jupiter	278 26.1	13 22
Mer. Pass.	7 55.6	v −0.8	d 0.4	v 0.6	d 0.5	v 1.9	d 0.0	v 2.6	d 0.0	Saturn	145 00.0	22 13

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 22	Moonrise 23	Moonrise 24	Moonrise 25
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
22 00	180 50.7	N20 22.3	44 31.2	9.7	S 9 18.4	10.8	58.9	N 72				18 37	21 08		
01	195 50.7	22.8	58 59.9	9.5	9 29.2	10.7	59.0	N 70				18 13	20 18	22 36	
02	210 50.6	23.3	73 28.4	9.5	9 39.9	10.8	59.0	68	////	////	00 53	17 54	19 46	21 38	23 11
03	225 50.6 . .	23.8	87 56.9	9.4	9 50.7	10.6	59.0	66	////	////	01 49	17 40	19 23	21 04	22 28
04	240 50.5	24.3	102 25.3	9.3	10 01.3	10.7	59.1	64	////	////	02 22	17 27	19 05	20 39	22 00
05	255 50.5	24.8	116 53.6	9.2	10 12.0	10.6	59.1	62	////	01 14	02 46	17 17	18 50	20 20	21 38
06	270 50.4	N20 25.2	131 21.8	9.1	S10 22.6	10.5	59.2	60	////	01 53	03 05	17 09	18 38	20 04	21 20
W 07	285 50.4	25.7	145 49.9	9.0	10 33.1	10.5	59.2	N 58	////	02 20	03 20	17 01	18 27	19 51	21 05
E 08	300 50.3	26.2	160 17.9	9.0	10 43.6	10.5	59.2	56	01 07	02 40	03 34	16 54	18 18	19 39	20 53
D 09	315 50.3 . .	26.7	174 45.9	8.9	10 54.1	10.4	59.3	54	01 43	02 57	03 45	16 48	18 10	19 29	20 41
N 10	330 50.2	27.2	189 13.8	8.7	11 04.5	10.3	59.3	52	02 08	03 11	03 55	16 43	18 02	19 20	20 32
E 11	345 50.2	27.7	203 41.5	8.7	11 14.8	10.3	59.3	50	02 27	03 23	04 04	16 38	17 56	19 12	20 23
S 12	0 50.2	N20 28.2	218 09.2	8.6	S11 25.1	10.3	59.4	45	03 02	03 48	04 23	16 28	17 42	18 55	20 04
D 13	15 50.1	28.7	232 36.8	8.6	11 35.4	10.1	59.4	N 40	03 28	04 07	04 38	16 19	17 30	18 41	19 49
A 14	30 50.1	29.1	247 04.4	8.4	11 45.5	10.2	59.4	35	03 48	04 23	04 51	16 12	17 20	18 29	19 37
Y 15	45 50.0 . .	29.6	261 31.8	8.3	11 55.7	10.0	59.5	30	04 04	04 36	05 02	16 05	17 12	18 19	19 25
16	60 50.0	30.1	275 59.1	8.3	12 05.7	10.0	59.5	20	04 29	04 57	05 21	15 54	16 57	18 01	19 06
17	75 49.9	30.6	290 26.4	8.1	12 15.7	10.0	59.6	N 10	04 49	05 15	05 38	15 45	16 44	17 46	18 50
18	90 49.9	N20 31.1	304 53.5	8.1	S12 25.7	9.9	59.6	0	05 05	05 31	05 53	15 36	16 32	17 32	18 34
19	105 49.8	31.6	319 20.6	8.0	12 35.6	9.8	59.6	S 10	05 20	05 46	06 08	15 27	16 20	17 18	18 19
20	120 49.8	32.0	333 47.6	7.9	12 45.4	9.7	59.7	20	05 34	06 01	06 24	15 17	16 08	17 03	18 03
21	135 49.7 . .	32.5	348 14.5	7.8	12 55.1	9.7	59.7	30	05 48	06 17	06 43	15 07	15 53	16 45	17 44
22	150 49.7	33.0	2 41.3	7.7	13 04.8	9.6	59.7	35	05 55	06 26	06 53	15 01	15 45	16 35	17 33
23	165 49.6	33.5	17 08.0	7.6	13 14.4	9.5	59.8	40	06 03	06 36	07 05	14 54	15 35	16 24	17 20
23 00	180 49.6	N20 34.0	31 34.6	7.6	S13 23.9	9.5	59.8	45	06 11	06 47	07 20	14 46	15 25	16 11	17 06
01	195 49.5	34.4	46 01.2	7.4	13 33.4	9.4	59.8	S 50	06 20	07 00	07 37	14 36	15 11	15 55	16 48
02	210 49.5	34.9	60 27.6	7.4	13 42.8	9.3	59.9	52	06 24	07 07	07 45	14 32	15 05	15 47	16 39
03	225 49.4 . .	35.4	74 54.0	7.2	13 52.1	9.2	59.9	54	06 29	07 13	07 55	14 27	14 58	15 39	16 30
04	240 49.4	35.9	89 20.2	7.2	14 01.3	9.2	59.9	56	06 34	07 21	08 05	14 21	14 51	15 29	16 19
05	255 49.3	36.3	103 46.4	7.1	14 10.5	9.1	60.0	58	06 39	07 29	08 17	14 15	14 43	15 18	16 07
06	270 49.2	N20 36.8	118 12.5	7.0	S14 19.6	9.0	60.0	S 60	06 45	07 38	08 30	14 09	14 33	15 06	15 53
T 07	285 49.2	37.3	132 38.5	6.9	14 28.6	8.9	60.0								
H 08	300 49.1	37.8	147 04.4	6.8	14 37.5	8.8	60.1								
U 09	315 49.1 . .	38.2	161 30.2	6.7	14 46.3	8.8	60.1								
R 10	330 49.0	38.7	175 55.9	6.7	14 55.1	8.6	60.1								
S 11	345 49.0	39.2	190 21.6	6.5	15 03.7	8.6	60.2								
D 12	0 48.9	N20 39.7	204 47.1	6.5	S15 12.3	8.4	60.2								
A 13	15 48.9	40.1	219 12.6	6.3	15 20.7	8.4	60.2								
Y 14	30 48.8	40.6	233 37.9	6.3	15 29.1	8.3	60.2								
15	45 48.8 . .	41.1	248 03.2	6.2	15 37.4	8.2	60.3								
16	60 48.7	41.5	262 28.4	6.1	15 45.6	8.1	60.3								
17	75 48.7	42.0	276 53.5	6.0	15 53.7	7.9	60.3								
18	90 48.6	N20 42.5	291 18.5	6.0	S16 01.6	7.9	60.4								
19	105 48.6	42.9	305 43.5	5.8	16 09.5	7.8	60.4								
20	120 48.5	43.4	320 08.3	5.8	16 17.3	7.7	60.4								
21	135 48.4 . .	43.9	334 33.1	5.7	16 25.0	7.6	60.4								
22	150 48.4	44.3	348 57.8	5.6	16 32.6	7.4	60.5								
23	165 48.3	44.8	3 22.4	5.5	16 40.0	7.4	60.5								
24 00	180 48.3	N20 45.3	17 46.9	5.4	S16 47.4	7.3	60.5								
01	195 48.2	45.7	32 11.3	5.3	16 54.7	7.1	60.5								
02	210 48.2	46.2	46 35.6	5.3	17 01.8	7.0	60.6								
03	225 48.1 . .	46.7	60 59.9	5.2	17 08.8	6.9	60.6								
04	240 48.1	47.1	75 24.1	5.1	17 15.7	6.8	60.6								
05	255 48.0	47.6	89 48.2	5.0	17 22.5	6.7	60.6								
06	270 47.9	N20 48.0	104 12.2	5.0	S17 29.2	6.6	60.7								
F 07	285 47.9	48.5	118 36.2	4.9	17 35.8	6.4	60.7								
R 08	300 47.8	49.0	133 00.1	4.8	17 42.2	6.4	60.7								
I 09	315 47.8 . .	49.4	147 23.9	4.7	17 48.6	6.2	60.7								
D 10	330 47.7	49.9	161 47.6	4.7	17 54.8	6.0	60.8								
A 11	345 47.6	50.3	176 11.3	4.6	18 00.8	6.0	60.8								
Y 12	0 47.6	N20 50.8	190 34.9	4.5	S18 06.8	5.8	60.8								
13	15 47.5	51.2	204 58.4	4.4	18 12.6	5.7	60.8								
14	30 47.5	51.7	219 21.8	4.4	18 18.3	5.6	60.8								
15	45 47.4 . .	52.2	233 45.2	4.3	18 23.9	5.4	60.9								
16	60 47.4	52.6	248 08.5	4.3	18 29.3	5.4	60.9								
17	75 47.3	53.1	262 31.8	4.1	18 34.7	5.1	60.9								
18	90 47.2	N20 53.5	276 54.9	4.2	S18 39.8	5.1	60.9								
19	105 47.2	54.0	291 18.1	4.0	18 44.9	4.9	60.9								
20	120 47.1	54.4	305 41.1	4.0	18 49.8	4.8	60.9								
21	135 47.1 . .	54.9	320 04.1	4.0	18 54.6	4.6	61.0								
22	150 47.0	55.3	334 27.1	3.9	18 59.2	4.5	61.0								
23	165 46.9	55.8	348 50.0	3.8	S19 03.7	4.4	61.0								
	SD 15.8	d 0.5	SD	16.2		16.4			16.6						

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 22	Moonset 23	Moonset 24	Moonset 25
°	h m	h m	h m	h m	h m	h m	h m
N 72				00 58	00 41	00 09	
N 70				01 13	01 07	01 01	00 49
68	23 10	////	////	01 25	01 27	01 33	01 48
66	22 08	////	////	01 34	01 43	01 57	02 23
64	21 34	////	////	01 43	01 56	02 16	02 48
62	21 09	22 44	////	01 50	02 07	02 32	03 08
60	20 50	22 03	////	01 56	02 17	02 45	03 24
N 58	20 34	21 36	////	02 02	02 25	02 56	03 37
56	20 21	21 15	22 51	02 07	02 33	03 06	03 49
54	20 09	20 58	22 13	02 11	02 39	03 15	04 00
52	19 59	20 44	21 48	02 15	02 45	03 22	04 09
50	19 50	20 31	21 28	02 19	02 51	03 29	04 17
45	19 31	20 07	20 52	02 27	03 02	03 44	04 35
N 40	19 16	19 47	20 26	02 33	03 12	03 57	04 49
35	19 03	19 31	20 06	02 39	03 20	04 07	05 01
30	18 51	19 18	19 50	02 44	03 28	04 17	05 12
20	18 32	18 56	19 25	02 53	03 40	04 33	05 30
N 10	18 16	18 38	19 05	03 01	03 52	04 47	05 46
0	18 00	18 22	18 48	03 08	04 02	05 00	06 01
S 10	17 45	18 07	18 33	03 15	04 13	05 13	06 16
20	17 29	17 52	18 19	03 23	04 24	05 27	06 32
30	17 11	17 36	18 06	03 32	04 37	05 44	06 51
35	17 00	17 27	17 58	03 37	04 44	05 53	07 01
40	16 48	17 17	17 51	03 43	04 53	06 04	07 14
45	16 33	17 06	17 42	03 50	05 03	06 16	07 28
S 50	16 16	16 53	17 33	03 58	05 15	06 32	07 46
52	16 08	16 46	17 29	04 02	05 20	06 39	07 54
54	15 58	16 40	17 24	04 06	05 27	06 47	08 03
56	15 48	16 32	17 19	04 11	05 33	06 56	08 14
58	15 36	16 24	17 14	04 16	05 41	07 06	08 26
S 60	15 23	16 15	17 08	04 22	05 50	07 18	08 40

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
22	03 23	03 21	11 57	21 49	09 22	12	90
23	03 18	03 16	11 57	22 46	10 17	13	96
24	03 13	03 10	11 57	23 47	11 16	14	99

UT	ARIES	VENUS −3.9		MARS +1.4		JUPITER −1.9		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
25 00	242 44.6	164 53.8	N23 33.3	189 42.3	N19 06.0	160 41.6	N22 57.8	27 52.0	S11 07.5
01	257 47.1	179 52.9	33.6	204 42.9	06.5	175 43.5	57.8	42 54.6	07.5
02	272 49.5	194 52.0	34.0	219 43.5	07.0	190 45.3	57.8	57 57.2	07.4
03	287 52.0	209 51.2	34.3	234 44.1	07.4	205 47.2	57.9	72 59.8	07.4
04	302 54.5	224 50.3	34.7	249 44.7	07.9	220 49.0	57.9	88 02.5	07.3
05	317 56.9	239 49.5	35.0	264 45.4	08.3	235 50.9	57.9	103 05.1	07.3
06	332 59.4	254 48.6	N23 35.4	279 46.0	N19 08.8	250 52.7	N22 58.0	118 07.7	S11 07.2
07	348 01.8	269 47.8	35.7	294 46.6	09.2	265 54.6	58.0	133 10.3	07.2
S 08	3 04.3	284 46.9	36.1	309 47.2	09.7	280 56.5	58.0	148 12.9	07.1
A 09	18 06.8	299 46.0	36.4	324 47.8	10.1	295 58.3	58.1	163 15.5	07.1
T 10	33 09.2	314 45.2	36.8	339 48.5	10.6	311 00.2	58.1	178 18.2	07.1
U 11	48 11.7	329 44.3	37.1	354 49.1	11.1	326 02.0	58.1	193 20.8	07.0
R 12	63 14.2	344 43.5	N23 37.4	9 49.7	N19 11.5	341 03.9	N22 58.2	208 23.4	S11 07.0
D 13	78 16.6	359 42.6	37.8	24 50.3	12.0	356 05.7	58.2	223 26.0	06.9
A 14	93 19.1	14 41.7	38.1	39 50.9	12.4	11 07.6	58.2	238 28.6	06.9
Y 15	108 21.6	29 40.9	38.5	54 51.6	12.9	26 09.4	58.3	253 31.2	06.8
16	123 24.0	44 40.0	38.8	69 52.2	13.3	41 11.3	58.3	268 33.8	06.8
17	138 26.5	59 39.2	39.1	84 52.8	13.8	56 13.2	58.3	283 36.5	06.7
18	153 29.0	74 38.3	N23 39.5	99 53.4	N19 14.2	71 15.0	N22 58.4	298 39.1	S11 06.7
19	168 31.4	89 37.4	39.8	114 54.0	14.7	86 16.9	58.4	313 41.7	06.7
20	183 33.9	104 36.6	40.1	129 54.7	15.1	101 18.7	58.5	328 44.3	06.6
21	198 36.3	119 35.7	40.5	144 55.3	15.6	116 20.6	58.5	343 46.9	06.6
22	213 38.8	134 34.9	40.8	159 55.9	16.0	131 22.4	58.5	358 49.5	06.5
23	228 41.3	149 34.0	41.1	174 56.5	16.5	146 24.3	58.6	13 52.2	06.5
26 00	243 43.7	164 33.1	N23 41.4	189 57.1	N19 16.9	161 26.2	N22 58.6	28 54.8	S11 06.4
01	258 46.2	179 32.3	41.8	204 57.8	17.4	176 28.0	58.6	43 57.4	06.4
02	273 48.7	194 31.4	42.1	219 58.4	17.8	191 29.9	58.7	59 00.0	06.4
03	288 51.1	209 30.5	42.4	234 59.0	18.3	206 31.7	58.7	74 02.6	06.3
04	303 53.6	224 29.7	42.7	249 59.6	18.7	221 33.6	58.7	89 05.2	06.3
05	318 56.1	239 28.8	43.1	265 00.2	19.2	236 35.4	58.8	104 07.8	06.2
06	333 58.5	254 28.0	N23 43.4	280 00.9	N19 19.6	251 37.3	N22 58.8	119 10.4	S11 06.2
07	349 01.0	269 27.1	43.7	295 01.5	20.0	266 39.1	58.8	134 13.1	06.1
08	4 03.5	284 26.2	44.0	310 02.1	20.5	281 41.0	58.9	149 15.7	06.1
S 09	19 05.9	299 25.4	44.3	325 02.7	20.9	296 42.9	58.9	164 18.3	06.0
U 10	34 08.4	314 24.5	44.6	340 03.3	21.4	311 44.7	58.9	179 20.9	06.0
N 11	49 10.8	329 23.6	45.0	355 03.9	21.8	326 46.6	59.0	194 23.5	06.0
D 12	64 13.3	344 22.8	N23 45.3	10 04.6	N19 22.3	341 48.4	N22 59.0	209 26.1	S11 05.9
A 13	79 15.8	359 21.9	45.6	25 05.2	22.7	356 50.3	59.0	224 28.7	05.9
Y 14	94 18.2	14 21.0	45.9	40 05.8	23.2	11 52.1	59.1	239 31.4	05.8
15	109 20.7	29 20.2	46.2	55 06.4	23.6	26 54.0	59.1	254 34.0	05.8
16	124 23.2	44 19.3	46.5	70 07.0	24.1	41 55.8	59.1	269 36.6	05.7
17	139 25.6	59 18.4	46.8	85 07.7	24.5	56 57.7	59.2	284 39.2	05.7
18	154 28.1	74 17.6	N23 47.1	100 08.3	N19 24.9	71 59.5	N22 59.2	299 41.8	S11 05.7
19	169 30.6	89 16.7	47.4	115 08.9	25.4	87 01.4	59.2	314 44.4	05.6
20	184 33.0	104 15.8	47.7	130 09.5	25.8	102 03.3	59.3	329 47.0	05.6
21	199 35.5	119 15.0	48.0	145 10.1	26.3	117 05.1	59.3	344 49.6	05.5
22	214 37.9	134 14.1	48.3	160 10.7	26.7	132 07.0	59.3	359 52.3	05.5
23	229 40.4	149 13.2	48.6	175 11.4	27.2	147 08.8	59.4	14 54.9	05.4
27 00	244 42.9	164 12.4	N23 48.9	190 12.0	N19 27.6	162 10.7	N22 59.4	29 57.5	S11 05.4
01	259 45.3	179 11.5	49.2	205 12.6	28.0	177 12.5	59.4	45 00.1	05.4
02	274 47.8	194 10.6	49.5	220 13.2	28.5	192 14.4	59.5	60 02.7	05.3
03	289 50.3	209 09.8	49.8	235 13.8	28.9	207 16.2	59.5	75 05.3	05.3
04	304 52.7	224 08.9	50.1	250 14.4	29.4	222 18.1	59.5	90 07.9	05.2
05	319 55.2	239 08.0	50.4	265 15.1	29.8	237 19.9	59.6	105 10.5	05.2
06	334 57.7	254 07.2	N23 50.7	280 15.7	N19 30.2	252 21.8	N22 59.6	120 13.1	S11 05.1
07	350 00.1	269 06.3	51.0	295 16.3	30.7	267 23.7	59.6	135 15.8	05.1
M 08	5 02.6	284 05.4	51.3	310 16.9	31.1	282 25.5	59.7	150 18.4	05.1
O 09	20 05.1	299 04.6	51.6	325 17.5	31.5	297 27.4	59.7	165 21.0	05.0
N 10	35 07.5	314 03.7	51.8	340 18.1	32.0	312 29.2	59.7	180 23.6	05.0
D 11	50 10.0	329 02.8	52.1	355 18.8	32.4	327 31.1	59.8	195 26.2	04.9
A 12	65 12.4	344 01.9	N23 52.4	10 19.4	N19 32.9	342 32.9	N22 59.8	210 28.8	S11 04.9
Y 13	80 14.9	359 01.1	52.7	25 20.0	33.3	357 34.8	59.8	225 31.4	04.8
14	95 17.4	14 00.2	53.0	40 20.6	33.7	12 36.6	59.9	240 34.0	04.8
15	110 19.8	28 59.3	53.3	55 21.2	34.2	27 38.5	59.9	255 36.6	04.8
16	125 22.3	43 58.5	53.5	70 21.8	34.6	42 40.3	22 59.9	270 39.3	04.7
17	140 24.8	58 57.6	53.8	85 22.5	35.0	57 42.2	23 00.0	285 41.9	04.7
18	155 27.2	73 56.7	N23 54.1	100 23.1	N19 35.5	72 44.0	N23 00.0	300 44.5	S11 04.6
19	170 29.7	88 55.9	54.4	115 23.7	35.9	87 45.9	00.0	315 47.1	04.6
20	185 32.2	103 55.0	54.6	130 24.3	36.3	102 47.8	00.1	330 49.7	04.5
21	200 34.6	118 54.1	54.9	145 24.9	36.8	117 49.6	00.1	345 52.3	04.5
22	215 37.1	133 53.2	55.2	160 25.5	37.2	132 51.5	00.1	0 54.9	04.5
23	230 39.6	148 52.4	55.4	175 26.2	37.6	147 53.3	00.2	15 57.5	04.4
Mer.Pass.	h m 7 43.8	v −0.9	d 0.3	v 0.6	d 0.4	v 1.9	d 0.0	v 2.6	d 0.4

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.1
Achernar	335 27.3	S57 10.0
Acrux	173 08.9	S63 10.7
Adhara	255 12.9	S28 59.7
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.4	N55 53.4
Alkaid	152 58.6	N49 14.9
Al Na'ir	27 43.8	S46 53.4
Alnilam	275 46.7	S 1 11.8
Alphard	217 56.2	S 8 43.3
Alphecca	126 10.7	N26 40.2
Alpheratz	357 43.7	N29 09.7
Altair	62 08.1	N 8 54.3
Ankaa	353 16.0	S42 13.8
Antares	112 25.9	S26 27.6
Arcturus	145 55.5	N19 06.8
Atria	107 27.2	S69 02.9
Avior	234 18.3	S59 33.6
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.7	N 7 24.4
Canopus	263 56.6	S52 42.5
Capella	280 35.0	N46 00.5
Deneb	49 31.3	N45 19.6
Denebola	182 33.6	N14 29.8
Diphda	348 56.1	S17 54.7
Dubhe	193 51.7	N61 40.9
Elnath	278 13.0	N28 36.9
Eltanin	90 45.7	N51 29.2
Enif	33 47.1	N 9 56.2
Fomalhaut	15 24.1	S29 32.8
Gacrux	172 00.6	S57 11.6
Gienah	175 52.2	S17 37.2
Hadar	148 47.3	S60 26.4
Hamal	328 01.1	N23 31.4
Kaus Aust.	83 43.5	S34 22.5
Kochab	137 19.0	N74 06.2
Markab	13 38.4	N15 16.6
Menkar	314 15.4	N 4 08.4
Menkent	148 07.3	S36 26.3
Miaplacidus	221 39.9	S69 46.8
Mirfak	308 40.9	N49 54.3
Nunki	75 58.1	S26 16.6
Peacock	53 19.0	S56 41.1
Pollux	243 28.0	N27 59.5
Procyon	245 00.0	N 5 11.2
Rasalhague	96 06.2	N12 33.1
Regulus	207 43.6	N11 54.0
Rigel	281 12.4	S 8 11.4
Rigil Kent.	139 51.1	S60 53.5
Sabik	102 12.2	S15 44.4
Schedar	349 40.8	N56 36.4
Shaula	96 21.6	S37 06.6
Sirius	258 34.0	S16 44.4
Spica	158 31.0	S11 14.0
Suhail	222 52.6	S43 29.6
Vega	80 38.6	N38 47.8
Zuben'ubi	137 05.1	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	280 49.4	13 03
Mars	306 13.4	11 20
Jupiter	277 42.4	13 13
Saturn	145 11.0	22 01

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 25	Moonrise 26	Moonrise 27	Moonrise 28
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
25 00	180 46.9	N20 56.2	3 12.8	3.8	S19 08.1	4.2	61.0	N 72							02 19
01	195 46.8	56.7	17 35.6	3.7	19 12.3	4.1	61.0	N 70						01 19	01 01
02	210 46.7	57.1	31 58.3	3.7	19 16.4	3.9	61.0	68	////	////	00 13	23 11	24 02	00 02	00 22
03	225 46.7	57.6	46 21.0	3.6	19 20.3	3.8	61.0	66	////	////	01 37	22 28	23 24	23 55	24 12
04	240 46.6	58.0	60 43.6	3.6	19 24.1	3.7	61.1	64	////	////	02 13	22 00	22 58	23 34	23 57
05	255 46.6	58.5	75 06.2	3.6	19 27.8	3.5	61.1	62	////	00 58	02 39	21 38	22 37	23 17	23 45
06	270 46.5	N20 58.9	89 28.8	3.5	S19 31.3	3.4	61.1	60	////	01 44	02 59	21 20	22 20	23 03	23 34
07	285 46.4	59.3	103 51.3	3.4	19 34.7	3.2	61.1	N 58	////	02 13	03 15	21 05	22 06	22 51	23 25
S 08	300 46.4	20 59.8	118 13.7	3.4	19 37.9	3.1	61.1	56	00 52	02 34	03 29	20 53	21 53	22 40	23 16
A 09	315 46.3	21 00.2	132 36.1	3.4	19 41.0	2.9	61.1	54	01 34	02 52	03 41	20 41	21 43	22 31	23 09
T 10	330 46.2	00.7	146 58.5	3.4	19 43.9	2.8	61.1	52	02 01	03 07	03 52	20 32	21 33	22 23	23 02
U 11	345 46.2	01.1	161 20.9	3.3	19 46.7	2.6	61.1	50	02 22	03 19	04 01	20 23	21 24	22 15	22 56
R 12	0 46.1	N21 01.6	175 43.2	3.3	S19 49.3	2.5	61.1	45	02 59	03 45	04 20	20 04	21 06	21 59	22 44
D 13	15 46.1	02.0	190 05.5	3.2	19 51.8	2.3	61.1	N 40	03 25	04 05	04 36	19 49	20 52	21 46	22 33
A 14	30 46.0	02.4	204 27.7	3.3	19 54.1	2.2	61.1	35	03 45	04 21	04 50	19 37	20 39	21 35	22 24
Y 15	45 45.9	02.9	218 50.0	3.2	19 56.3	2.1	61.2	30	04 02	04 34	05 01	19 25	20 28	21 25	22 16
16	60 45.9	03.3	233 12.2	3.1	19 58.4	1.8	61.2	20	04 28	04 57	05 21	19 06	20 09	21 08	22 02
17	75 45.8	03.8	247 34.3	3.2	20 00.2	1.8	61.2	N 10	04 48	05 15	05 38	18 50	19 53	20 53	21 50
18	90 45.7	N21 04.2	261 56.5	3.1	S20 02.0	1.6	61.2	0	05 05	05 31	05 53	18 34	19 38	20 39	21 38
19	105 45.7	04.6	276 18.6	3.2	20 03.6	1.4	61.2	S 10	05 21	05 47	06 09	18 19	19 22	20 26	21 27
20	120 45.6	05.1	290 40.8	3.1	20 05.0	1.3	61.2	20	05 35	06 02	06 26	18 03	19 06	20 11	21 14
21	135 45.5	05.5	305 02.9	3.1	20 06.3	1.1	61.2	30	05 49	06 19	06 44	17 44	18 47	19 54	21 00
22	150 45.5	05.9	319 25.0	3.1	20 07.4	1.0	61.2	35	05 57	06 28	06 55	17 33	18 36	19 44	20 52
23	165 45.4	06.4	333 47.1	3.0	20 08.4	0.8	61.2	40	06 05	06 38	07 08	17 20	18 24	19 32	20 43
26 00	180 45.3	N21 06.8	348 09.1	3.1	S20 09.2	0.6	61.2	45	06 13	06 50	07 23	17 06	18 09	19 19	20 32
01	195 45.3	07.2	2 31.2	3.1	20 09.8	0.5	61.2	S 50	06 23	07 04	07 41	16 48	17 51	19 03	20 19
02	210 45.2	07.7	16 53.3	3.0	20 10.3	0.4	61.2	52	06 28	07 10	07 49	16 39	17 43	18 55	20 13
03	225 45.1	08.1	31 15.3	3.1	20 10.7	0.2	61.2	54	06 32	07 17	07 59	16 30	17 33	18 47	20 06
04	240 45.1	08.5	45 37.4	3.1	20 10.9	0.1	61.2	56	06 37	07 25	08 09	16 19	17 22	18 37	19 58
05	255 45.0	09.0	59 59.5	3.0	20 11.0	0.1	61.2	58	06 43	07 33	08 22	16 07	17 10	18 26	19 49
06	270 44.9	N21 09.4	74 21.5	3.1	S20 10.9	0.3	61.2	S 60	06 49	07 43	08 36	15 53	16 56	18 13	19 40
07	285 44.9	09.8	88 43.6	3.1	20 10.6	0.4	61.2								
08	300 44.8	10.3	103 05.7	3.1	20 10.2	0.6	61.2								
S 09	315 44.7	10.7	117 27.8	3.1	20 09.6	0.7	61.2								
U 10	330 44.7	11.1	131 49.9	3.1	20 08.9	0.9	61.2								
N 11	345 44.6	11.5	146 12.0	3.1	20 08.0	1.0	61.2								
D 12	0 44.5	N21 12.0	160 34.1	3.2	S20 07.0	1.2	61.2								
A 13	15 44.5	12.4	174 56.3	3.2	20 05.8	1.3	61.2								
Y 14	30 44.4	12.8	189 18.5	3.2	20 04.5	1.5	61.1								
15	45 44.3	13.2	203 40.7	3.2	20 03.0	1.6	61.1								
16	60 44.3	13.7	218 02.9	3.2	20 01.4	1.8	61.1								
17	75 44.2	14.1	232 25.1	3.3	19 59.6	1.9	61.1								
18	90 44.1	N21 14.5	246 47.4	3.3	S19 57.7	2.1	61.1								
19	105 44.0	14.9	261 09.7	3.4	19 55.6	2.2	61.1								
20	120 44.0	15.4	275 32.1	3.3	19 53.4	2.4	61.1								
21	135 43.9	15.8	289 54.4	3.5	19 51.0	2.5	61.1								
22	150 43.8	16.2	304 16.9	3.4	19 48.5	2.7	61.1								
23	165 43.8	16.6	318 39.3	3.5	19 45.8	2.8	61.1								
27 00	180 43.7	N21 17.0	333 01.8	3.5	S19 43.0	3.0	61.1								
01	195 43.6	17.5	347 24.3	3.6	19 40.0	3.1	61.0								
02	210 43.5	17.9	1 46.9	3.6	19 36.9	3.3	61.0								
03	225 43.5	18.3	16 09.5	3.7	19 33.6	3.4	61.0								
04	240 43.4	18.7	30 32.2	3.7	19 30.2	3.5	61.0								
05	255 43.3	19.1	44 54.9	3.8	19 26.7	3.7	61.0								
06	270 43.3	N21 19.5	59 17.7	3.8	S19 23.0	3.8	61.0								
07	285 43.2	20.0	73 40.5	3.8	19 19.2	4.0	61.0								
M 08	300 43.1	20.4	88 03.3	4.0	19 15.2	4.1	60.9								
O 09	315 43.0	20.8	102 26.3	4.0	19 11.1	4.2	60.9								
N 10	330 43.0	21.2	116 49.3	4.0	19 06.9	4.4	60.9								
D 11	345 42.9	21.6	131 12.3	4.1	19 02.5	4.5	60.9								
A 12	0 42.8	N21 22.0	145 35.4	4.2	S18 58.0	4.7	60.9								
Y 13	15 42.7	22.4	159 58.6	4.2	18 53.3	4.8	60.9								
14	30 42.7	22.8	174 21.8	4.3	18 48.5	4.9	60.8								
15	45 42.6	23.2	188 45.1	4.3	18 43.6	5.1	60.8								
16	60 42.5	23.7	203 08.4	4.4	18 38.5	5.1	60.8								
17	75 42.4	24.1	217 31.8	4.5	18 33.4	5.4	60.8								
18	90 42.4	N21 24.5	231 55.3	4.6	S18 28.0	5.4	60.8								
19	105 42.3	24.9	246 18.9	4.6	18 22.6	5.6	60.7								
20	120 42.2	25.3	260 42.5	4.7	18 17.0	5.7	60.7								
21	135 42.1	25.7	275 06.2	4.8	18 11.3	5.8	60.7								
22	150 42.1	26.1	289 30.0	4.8	18 05.5	5.9	60.7								
23	165 42.0	26.5	303 53.8	4.9	S17 59.6	6.1	60.7								
	SD 15.8	d 0.4	SD	16.7		16.7		16.6							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 25	Moonset 26	Moonset 27	Moonset 28
°	h m	h m	h m	h m	h m	h m	h m
N 72							03 41
N 70				00 49		02 31	04 58
68				01 48	02 27	03 48	05 36
66	22 21	////	////	02 23	03 10	04 26	06 02
64	21 43	////	////	02 48	03 38	04 52	06 22
62	21 17	23 02	////	03 08	04 00	05 13	06 39
60	20 56	22 13	////	03 24	04 18	05 29	06 52
N 58	20 40	21 43	////	03 37	04 33	05 43	07 04
56	20 26	21 21	23 07	03 49	04 46	05 55	07 14
54	20 14	21 03	22 22	04 00	04 57	06 06	07 23
52	20 03	20 49	21 55	04 09	05 07	06 15	07 31
50	19 54	20 36	21 34	04 17	05 15	06 24	07 38
45	19 34	20 10	20 56	04 35	05 34	06 41	07 53
N 40	19 18	19 50	20 30	04 49	05 49	06 56	08 06
35	19 05	19 34	20 09	05 01	06 02	07 08	08 16
30	18 53	19 20	19 52	05 12	06 13	07 19	08 26
20	18 33	18 58	19 26	05 30	06 32	07 37	08 41
N 10	18 16	18 39	19 06	05 46	06 49	07 53	08 55
0	18 01	18 23	18 49	06 01	07 05	08 07	09 08
S 10	17 45	18 07	18 33	06 16	07 20	08 22	09 21
20	17 28	17 52	18 19	06 32	07 37	08 38	09 34
30	17 09	17 35	18 05	06 51	07 56	08 56	09 50
35	16 58	17 26	17 57	07 01	08 07	09 06	09 58
40	16 46	17 16	17 49	07 14	08 19	09 18	10 09
45	16 31	17 04	17 40	07 28	08 34	09 32	10 20
S 50	16 13	16 50	17 30	07 46	08 52	09 49	10 35
52	16 04	16 44	17 26	07 54	09 01	09 57	10 41
54	15 55	16 37	17 21	08 03	09 11	10 05	10 49
56	15 44	16 29	17 16	08 14	09 21	10 15	10 57
58	15 32	16 20	17 11	08 26	09 34	10 27	11 06
S 60	15 17	16 10	17 05	08 40	09 48	10 40	11 16

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
25	03 08	03 05	11 57	24 49	12 18	15	100
26	03 02	02 58	11 57	00 49	13 21	16	97
27	02 55	02 51	11 57	01 53	14 24	17	92

UT	ARIES	VENUS −3.8		MARS +1.4		JUPITER −1.9		SATURN +0.3		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
28 00	245 42.0	163 51.5	N23 55.7	190 26.8	N19 38.1	162 55.2	N23 00.2	31 00.1	S11 04.4	Acamar	315 18.8	S40 15.1
01	260 44.5	178 50.6	56.0	205 27.4	38.5	177 57.0	00.2	46 02.7	04.3	Achernar	335 27.3	S57 09.9
02	275 46.9	193 49.7	56.3	220 28.0	38.9	192 58.9	00.3	61 05.4	04.3	Acrux	173 08.9	S63 10.8
03	290 49.4	208 48.9	56.5	235 28.6	39.4	208 00.7	00.3	76 08.0	04.3	Adhara	255 12.9	S28 59.7
04	305 51.9	223 48.0	56.8	250 29.2	39.8	223 02.6	00.3	91 10.6	04.2	Aldebaran	290 49.8	N16 32.0
05	320 54.3	238 47.1	57.0	265 29.8	40.2	238 04.4	00.4	106 13.2	04.2			
06	335 56.8	253 46.3	N23 57.3	280 30.5	N19 40.7	253 06.3	N23 00.4	121 15.8	S11 04.1	Alioth	166 20.4	N55 53.4
07	350 59.3	268 45.4	57.6	295 31.1	41.1	268 08.1	00.4	136 18.4	04.1	Alkaid	152 58.6	N49 14.9
08	6 01.7	283 44.5	57.8	310 31.7	41.5	283 10.0	00.5	151 21.0	04.0	Al Na'ir	27 43.7	S46 53.4
09	21 04.2	298 43.6	58.1	325 32.3	42.0	298 11.8	00.5	166 23.6	04.0	Alnilam	275 46.7	S 1 11.8
10	36 06.7	313 42.8	58.3	340 32.9	42.4	313 13.7	00.5	181 26.2	04.0	Alphard	217 56.2	S 8 43.3
11	51 09.1	328 41.9	58.6	355 33.5	42.8	328 15.5	00.6	196 28.8	03.9			
12	66 11.6	343 41.0	N23 58.9	10 34.2	N19 43.2	343 17.4	N23 00.6	211 31.4	S11 03.9	Alphecca	126 10.7	N26 40.3
13	81 14.1	358 40.1	59.1	25 34.8	43.7	358 19.3	00.6	226 34.1	03.8	Alpheratz	357 43.6	N29 09.7
14	96 16.5	13 39.3	59.4	40 35.4	44.1	13 21.1	00.7	241 36.7	03.8	Altair	62 08.0	N 8 54.3
15	111 19.0	28 38.4	59.6	55 36.0	44.5	28 23.0	00.7	256 39.3	03.8	Ankaa	353 16.0	S42 13.8
16	126 21.4	43 37.5	23 59.9	70 36.6	45.0	43 24.8	00.7	271 41.9	03.7	Antares	112 25.9	S26 27.6
17	141 23.9	58 36.6	24 00.1	85 37.2	45.4	58 26.7	00.7	286 44.5	03.7			
18	156 26.4	73 35.8	N24 00.4	100 37.8	N19 45.8	73 28.5	N23 00.8	301 47.1	S11 03.6	Arcturus	145 55.5	N19 06.8
19	171 28.8	88 34.9	00.6	115 38.5	46.2	88 30.4	00.8	316 49.7	03.6	Atria	107 27.2	S69 02.9
20	186 31.3	103 34.0	00.8	130 39.1	46.7	103 32.2	00.8	331 52.3	03.6	Avior	234 18.4	S59 33.6
21	201 33.8	118 33.1	01.1	145 39.7	47.1	118 34.1	00.9	346 54.9	03.5	Bellatrix	278 32.4	N 6 21.5
22	216 36.2	133 32.2	01.3	160 40.3	47.5	133 35.9	00.9	1 57.5	03.5	Betelgeuse	271 01.7	N 7 24.4
23	231 38.7	148 31.4	01.6	175 40.9	47.9	148 37.8	00.9	17 00.1	03.4			
29 00	246 41.2	163 30.5	N24 01.8	190 41.5	N19 48.4	163 39.6	N23 01.0	32 02.7	S11 03.4	Canopus	263 56.7	S52 42.5
01	261 43.6	178 29.6	02.1	205 42.1	48.8	178 41.5	01.0	47 05.3	03.3	Capella	280 35.0	N46 00.5
02	276 46.1	193 28.7	02.3	220 42.8	49.2	193 43.3	01.0	62 07.9	03.3	Deneb	49 31.2	N45 19.6
03	291 48.6	208 27.9	02.5	235 43.4	49.6	208 45.2	01.1	77 10.6	03.3	Denebola	182 33.6	N14 29.8
04	306 51.0	223 27.0	02.8	250 44.0	50.1	223 47.0	01.1	92 13.2	03.2	Diphda	348 56.1	S17 54.7
05	321 53.5	238 26.1	03.0	265 44.6	50.5	238 48.9	01.1	107 15.8	03.2			
06	336 55.9	253 25.2	N24 03.2	280 45.2	N19 50.9	253 50.7	N23 01.2	122 18.4	S11 03.1	Dubhe	193 51.7	N61 40.9
07	351 58.4	268 24.3	03.5	295 45.8	51.3	268 52.6	01.2	137 21.0	03.1	Elnath	278 13.0	N28 36.9
08	7 00.9	283 23.5	03.7	310 46.4	51.8	283 54.4	01.2	152 23.6	03.1	Eltanin	90 45.6	N51 29.3
09	22 03.3	298 22.6	03.9	325 47.0	52.2	298 56.3	01.3	167 26.2	03.0	Enif	33 47.1	N 9 56.2
10	37 05.8	313 21.7	04.1	340 47.7	52.6	313 58.1	01.3	182 28.8	03.0	Fomalhaut	15 24.1	S29 32.8
11	52 08.3	328 20.8	04.4	355 48.3	53.0	329 00.0	01.3	197 31.4	02.9			
12	67 10.7	343 20.0	N24 04.6	10 48.9	N19 53.4	344 01.9	N23 01.3	212 34.0	S11 02.9	Gacrux	172 00.6	S57 11.6
13	82 13.2	358 19.1	04.8	25 49.5	53.9	359 03.7	01.4	227 36.6	02.9	Gienah	175 52.2	S17 37.2
14	97 15.7	13 18.2	05.0	40 50.1	54.3	14 05.6	01.4	242 39.2	02.8	Hadar	148 47.3	S60 26.4
15	112 18.1	28 17.3	05.3	55 50.7	54.7	29 07.4	01.4	257 41.8	02.8	Hamal	328 01.1	N23 31.4
16	127 20.6	43 16.4	05.5	70 51.3	55.1	44 09.3	01.5	272 44.4	02.7	Kaus Aust.	83 43.5	S34 22.5
17	142 23.0	58 15.6	05.7	85 51.9	55.5	59 11.1	01.5	287 47.0	02.7			
18	157 25.5	73 14.7	N24 05.9	100 52.6	N19 56.0	74 13.0	N23 01.5	302 49.6	S11 02.7	Kochab	137 19.0	N74 06.2
19	172 28.0	88 13.8	06.1	115 53.2	56.4	89 14.8	01.6	317 52.2	02.6	Markab	13 38.4	N15 16.6
20	187 30.4	103 12.9	06.4	130 53.8	56.8	104 16.7	01.6	332 54.9	02.6	Menkar	314 15.4	N 4 08.4
21	202 32.9	118 12.0	06.6	145 54.4	57.2	119 18.5	01.6	347 57.5	02.5	Menkent	148 07.2	S36 26.3
22	217 35.4	133 11.2	06.8	160 55.0	57.6	134 20.4	01.7	3 00.1	02.5	Miaplacidus	221 39.9	S69 46.8
23	232 37.8	148 10.3	07.0	175 55.6	58.1	149 22.2	01.7	18 02.7	02.5			
30 00	247 40.3	163 09.4	N24 07.2	190 56.2	N19 58.5	164 24.1	N23 01.7	33 05.3	S11 02.4	Mirfak	308 40.9	N49 54.3
01	262 42.8	178 08.5	07.4	205 56.8	58.9	179 25.9	01.8	48 07.9	02.4	Nunki	75 58.0	S26 16.6
02	277 45.2	193 07.6	07.6	220 57.5	59.3	194 27.8	01.8	63 10.5	02.3	Peacock	53 19.0	S56 41.1
03	292 47.7	208 06.8	07.8	235 58.1	19 59.7	209 29.6	01.8	78 13.1	02.3	Pollux	243 28.0	N27 59.5
04	307 50.2	223 05.9	08.0	250 58.7	20 00.1	224 31.5	01.8	93 15.7	02.3	Procyon	245 00.0	N 5 11.2
05	322 52.6	238 05.0	08.2	265 59.3	00.5	239 33.3	01.9	108 18.3	02.2			
06	337 55.1	253 04.1	N24 08.4	280 59.9	N20 01.0	254 35.2	N23 01.9	123 20.9	S11 02.2	Rasalhague	96 06.1	N12 33.1
07	352 57.5	268 03.2	08.6	296 00.5	01.4	269 37.0	01.9	138 23.5	02.1	Regulus	207 43.6	N11 54.0
08	8 00.0	283 02.3	08.8	311 01.1	01.8	284 38.9	02.0	153 26.1	02.1	Rigel	281 12.4	S 8 11.4
09	23 02.5	298 01.5	09.0	326 01.7	02.2	299 40.7	02.0	168 28.7	02.1	Rigil Kent.	139 51.1	S60 53.5
10	38 04.9	313 00.6	09.2	341 02.4	02.6	314 42.6	02.0	183 31.3	02.0	Sabik	102 12.2	S15 44.4
11	53 07.4	327 59.7	09.4	356 03.0	03.0	329 44.4	02.1	198 33.9	02.0			
12	68 09.9	342 58.8	N24 09.6	11 03.6	N20 03.4	344 46.3	N23 02.1	213 36.5	S11 01.9	Schedar	349 40.8	N56 36.4
13	83 12.3	357 57.9	09.8	26 04.2	03.9	359 48.1	02.1	228 39.1	01.9	Shaula	96 21.5	S37 06.6
14	98 14.8	12 57.0	10.0	41 04.8	04.3	14 50.0	02.1	243 41.7	01.9	Sirius	258 34.0	S16 44.3
15	113 17.3	27 56.2	10.2	56 05.4	04.7	29 51.8	02.2	258 44.3	01.8	Spica	158 31.0	S11 14.0
16	128 19.7	42 55.3	10.4	71 06.0	05.1	44 53.7	02.2	273 46.9	01.8	Suhail	222 52.6	S43 29.6
17	143 22.2	57 54.4	10.6	86 06.6	05.5	59 55.5	02.2	288 49.5	01.7			
18	158 24.7	72 53.5	N24 10.8	101 07.2	N20 05.9	74 57.4	N23 02.3	303 52.1	S11 01.7	Vega	80 38.6	N38 47.8
19	173 27.1	87 52.6	11.0	116 07.9	06.3	89 59.2	02.3	318 54.7	01.7	Zuben'ubi	137 05.1	S16 05.9
20	188 29.6	102 51.7	11.2	131 08.5	06.7	105 01.1	02.3	333 57.3	01.6			
21	203 32.0	117 50.9	11.3	146 09.1	07.1	120 02.9	02.4	348 59.9	01.6		SHA	Mer.Pass.
22	218 34.5	132 50.0	11.5	161 09.7	07.6	135 04.8	02.4	4 02.5	01.5		° ′	h m
23	233 37.0	147 49.1	11.7	176 10.3	08.0	150 06.6	02.4	19 05.1	01.5	Venus	276 49.3	13 07
	h m									Mars	304 00.4	11 17
Mer. Pass.	7 32.0	v −0.9	d 0.2	v 0.6	d 0.4	v 1.9	d 0.0	v 2.6	d 0.0	Jupiter	276 58.5	13 04
										Saturn	145 21.6	21 48

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		28	29	30	31
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
28 00	180 41.9	N21 26.9	318 17.7	5.0	S17 53.5	6.2	60.6	N 72				02 19	01 25	01 06	00 53
01	195 41.8	27.3	332 41.7	5.1	17 47.3	6.3	60.6	N 70				01 01	00 54	00 48	00 43
02	210 41.8	27.7	347 05.8	5.1	17 41.0	6.4	60.6	68				00 22	00 30	00 34	00 35
03	225 41.7	28.1	1 29.9	5.3	17 34.6	6.6	60.6	66	////	////	01 25	24 12	00 12	00 22	00 29
04	240 41.6	28.5	15 54.2	5.3	17 28.0	6.6	60.5	64	////	////	02 05	23 57	24 12	00 12	00 23
05	255 41.5	28.9	30 18.5	5.4	17 21.4	6.8	60.5	62	////	00 38	02 33	23 45	24 04	00 04	00 18
06	270 41.5	N21 29.3	44 42.9	5.4	S17 14.6	6.9	60.5	60	////	01 35	02 54	23 34	23 56	24 14	00 14
07	285 41.4	29.7	59 07.3	5.6	17 07.7	7.0	60.5	N 58	////	02 06	03 11	23 25	23 50	24 10	00 10
08	300 41.3	30.1	73 31.9	5.6	17 00.7	7.1	60.4	56	00 34	02 29	03 25	23 16	23 44	24 07	00 07
09	315 41.2	30.5	87 56.5	5.7	16 53.6	7.2	60.4	54	01 26	02 47	03 38	23 09	23 39	24 04	00 04
10	330 41.1	30.9	102 21.2	5.8	16 46.4	7.3	60.4	52	01 55	03 03	03 49	23 02	23 34	24 01	00 01
11	345 41.1	31.3	116 46.0	5.9	16 39.1	7.5	60.4	50	02 17	03 16	03 58	22 56	23 30	23 59	24 24
12	0 41.0	N21 31.7	131 10.9	5.9	S16 31.6	7.5	60.3	45	02 56	03 42	04 18	22 44	23 21	23 53	24 23
13	15 40.9	32.1	145 35.8	6.1	16 24.1	7.6	60.3	N 40	03 23	04 03	04 35	22 33	23 13	23 49	24 21
14	30 40.8	32.5	160 00.9	6.1	16 16.5	7.8	60.3	35	03 44	04 19	04 48	22 24	23 07	23 45	24 20
15	45 40.8	32.9	174 26.0	6.2	16 08.7	7.8	60.3	30	04 01	04 33	05 00	22 16	23 01	23 41	24 19
16	60 40.7	33.3	188 51.2	6.3	16 00.9	7.9	60.2	20	04 27	04 56	05 20	22 02	22 51	23 35	24 17
17	75 40.6	33.7	203 16.5	6.4	15 53.0	8.1	60.2	N 10	04 48	05 15	05 38	21 50	22 42	23 30	24 15
18	90 40.5	N21 34.1	217 41.9	6.5	S15 44.9	8.1	60.2	0	05 06	05 32	05 54	21 38	22 33	23 25	24 14
19	105 40.4	34.4	232 07.4	6.6	15 36.8	8.2	60.1	S 10	05 21	05 47	06 10	21 27	22 25	23 20	24 12
20	120 40.4	34.8	246 33.0	6.6	15 28.6	8.4	60.1	20	05 36	06 03	06 27	21 14	22 16	23 14	24 10
21	135 40.3	35.2	260 58.6	6.7	15 20.2	8.4	60.1	30	05 51	06 20	06 46	21 00	22 06	23 08	24 08
22	150 40.2	35.6	275 24.3	6.9	15 11.8	8.5	60.1	35	05 58	06 30	06 57	20 52	22 00	23 05	24 07
23	165 40.1	36.0	289 50.2	6.9	15 03.3	8.6	60.0	40	06 07	06 40	07 10	20 43	21 53	23 01	24 06
29 00	180 40.0	N21 36.4	304 16.1	7.0	S14 54.7	8.6	60.0	45	06 16	06 52	07 25	20 32	21 45	22 56	24 05
01	195 39.9	36.8	318 42.1	7.1	14 46.1	8.8	60.0	S 50	06 26	07 07	07 44	20 19	21 35	22 50	24 03
02	210 39.9	37.2	333 08.2	7.2	14 37.3	8.8	59.9	52	06 31	07 13	07 53	20 13	21 31	22 48	24 02
03	225 39.8	37.6	347 34.4	7.2	14 28.5	9.0	59.9	54	06 36	07 21	08 03	20 06	21 26	22 45	24 01
04	240 39.7	37.9	2 00.6	7.4	14 19.5	9.0	59.9	56	06 41	07 29	08 14	19 58	21 21	22 42	24 00
05	255 39.6	38.3	16 27.0	7.4	14 10.5	9.1	59.8	58	06 47	07 38	08 27	19 49	21 15	22 38	23 59
06	270 39.5	N21 38.7	30 53.4	7.5	S14 01.4	9.1	59.8	S 60	06 53	07 48	08 42	19 40	21 08	22 34	23 58
07	285 39.5	39.1	45 19.9	7.7	13 52.3	9.3	59.8								
08	300 39.4	39.5	59 46.6	7.7	13 43.0	9.3	59.7								
09	315 39.3	39.9	74 13.3	7.7	13 33.7	9.4	59.7								
10	330 39.2	40.2	88 40.0	7.9	13 24.3	9.5	59.7								
11	345 39.1	40.6	103 06.9	8.0	13 14.8	9.5	59.7								
12	0 39.0	N21 41.0	117 33.9	8.0	S13 05.3	9.6	59.6								
13	15 39.0	41.4	132 00.9	8.2	12 55.7	9.7	59.6								
14	30 38.9	41.8	146 28.1	8.2	12 46.0	9.7	59.6								
15	45 38.8	42.1	160 55.3	8.3	12 36.3	9.8	59.5								
16	60 38.7	42.5	175 22.6	8.4	12 26.5	9.9	59.5								
17	75 38.6	42.9	189 50.0	8.5	12 16.6	9.9	59.5								
18	90 38.5	N21 43.3	204 17.5	8.6	S12 06.7	10.0	59.4								
19	105 38.5	43.6	218 45.1	8.6	11 56.7	10.1	59.4								
20	120 38.4	44.0	233 12.7	8.7	11 46.6	10.1	59.4								
21	135 38.3	44.4	247 40.4	8.9	11 36.5	10.2	59.3								
22	150 38.2	44.8	262 08.3	8.8	11 26.3	10.2	59.3								
23	165 38.1	45.1	276 36.1	9.0	11 16.1	10.3	59.3								
30 00	180 38.0	N21 45.5	291 04.1	9.1	S11 05.8	10.3	59.2								
01	195 37.9	45.9	305 32.2	9.1	10 55.5	10.4	59.2								
02	210 37.9	46.3	320 00.3	9.3	10 45.1	10.4	59.2								
03	225 37.8	46.6	334 28.6	9.3	10 34.7	10.5	59.1								
04	240 37.7	47.0	348 56.9	9.4	10 24.2	10.5	59.1								
05	255 37.6	47.4	3 25.3	9.4	10 13.7	10.6	59.0								
06	270 37.5	N21 47.7	17 53.7	9.6	S10 03.1	10.6	59.0								
07	285 37.4	48.1	32 22.3	9.6	9 52.5	10.7	59.0								
08	300 37.3	48.5	46 50.9	9.7	9 41.8	10.7	58.9								
09	315 37.2	48.8	61 19.6	9.8	9 31.1	10.7	58.9								
10	330 37.2	49.2	75 48.4	9.8	9 20.4	10.8	58.9								
11	345 37.1	49.6	90 17.2	9.9	9 09.6	10.9	58.8								
12	0 37.0	N21 49.9	104 46.1	10.0	S 8 58.7	10.8	58.8								
13	15 36.9	50.3	119 15.1	10.1	8 47.9	10.9	58.8								
14	30 36.8	50.7	133 44.2	10.2	8 37.0	10.9	58.7								
15	45 36.7	51.0	148 13.4	10.2	8 26.1	11.0	58.7								
16	60 36.6	51.4	162 42.6	10.3	8 15.1	11.0	58.7								
17	75 36.5	51.7	177 11.9	10.3	8 04.1	11.0	58.6								
18	90 36.4	N21 52.1	191 41.2	10.5	S 7 53.1	11.1	58.6								
19	105 36.4	52.5	206 10.7	10.5	7 42.0	11.1	58.6								
20	120 36.3	52.8	220 40.2	10.5	7 30.9	11.1	58.5								
21	135 36.2	53.2	235 09.7	10.7	7 19.8	11.1	58.5								
22	150 36.1	53.5	249 39.4	10.7	7 08.7	11.2	58.5								
23	165 36.0	53.9	264 09.1	10.8	S 6 57.5	11.2	58.4								
	SD 15.8	d 0.4	SD	16.4		16.2		16.0							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	28	29	30	31
°	h m	h m	h m	h m	h m	h m	h m
N 72				03 41	06 35	08 47	10 46
N 70				04 58	07 06	09 03	10 53
68				05 36	07 28	09 16	10 59
66	22 34	////	////	06 02	07 45	09 26	11 04
64	21 52	////	////	06 22	07 59	09 35	11 08
62	21 24	23 25	////	06 39	08 11	09 42	11 11
60	21 02	22 23	////	06 52	08 21	09 49	11 14
N 58	20 45	21 51	////	07 04	08 29	09 54	11 17
56	20 30	21 27	23 28	07 14	08 37	09 59	11 19
54	20 18	21 08	22 31	07 23	08 44	10 04	11 21
52	20 07	20 53	22 01	07 31	08 50	10 08	11 23
50	19 57	20 40	21 39	07 38	08 55	10 11	11 25
45	19 37	20 13	21 00	07 53	09 07	10 19	11 29
N 40	19 21	19 53	20 33	08 06	09 16	10 25	11 32
35	19 07	19 36	20 12	08 16	09 25	10 31	11 35
30	18 55	19 22	19 54	08 26	09 32	10 36	11 37
20	18 35	18 59	19 28	08 41	09 44	10 44	11 41
N 10	18 17	18 40	19 07	08 55	09 55	10 51	11 45
0	18 01	18 23	18 49	09 08	10 05	10 58	11 48
S 10	17 45	18 08	18 34	09 21	10 15	11 05	11 52
20	17 28	17 52	18 19	09 34	10 25	11 12	11 55
30	17 08	17 34	18 04	09 50	10 37	11 20	11 59
35	16 57	17 25	17 56	09 58	10 44	11 25	12 01
40	16 44	17 14	17 48	10 09	10 52	11 30	12 04
45	16 29	17 02	17 39	10 20	11 01	11 36	12 07
S 50	16 10	16 48	17 28	10 35	11 12	11 43	12 10
52	16 02	16 41	17 24	10 41	11 17	11 46	12 12
54	15 52	16 34	17 19	10 49	11 22	11 50	12 13
56	15 41	16 26	17 14	10 57	11 29	11 54	12 15
58	15 28	16 17	17 08	11 06	11 35	11 58	12 17
S 60	15 13	16 07	17 01	11 16	11 43	12 03	12 20

Day	SUN			MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
28	02 48	02 44	11 57	02 54	15 23	18	84
29	02 40	02 36	11 57	03 52	16 19	19	75
30	02 32	02 28	11 58	04 46	17 12	20	64

UT	ARIES	VENUS −3.8		MARS +1.4		JUPITER −1.9		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
31 00	248 39.4	162 48.2	N24 11.9	191 10.9	N20 08.4	165 08.5	N23 02.4	34 07.7	S11 01.5
01	263 41.9	177 47.3	12.1	206 11.5	08.8	180 10.3	02.5	49 10.3	01.4
02	278 44.4	192 46.4	12.3	221 12.1	09.2	195 12.2	02.5	64 12.9	01.4
03	293 46.8	207 45.6	. . 12.4	236 12.7	. . 09.6	210 14.0	. . 02.5	79 15.6	. . 01.4
04	308 49.3	222 44.7	12.6	251 13.3	10.0	225 15.9	02.6	94 18.2	01.3
05	323 51.8	237 43.8	12.8	266 14.0	10.4	240 17.7	02.6	109 20.8	01.3
06	338 54.2	252 42.9	N24 13.0	281 14.6	N20 10.8	255 19.6	N23 02.6	124 23.4	S11 01.2
07	353 56.7	267 42.0	13.1	296 15.2	11.2	270 21.4	02.7	139 26.0	01.2
08	8 59.2	282 41.1	13.3	311 15.8	11.6	285 23.3	02.7	154 28.6	01.2
F 09	24 01.6	297 40.2	. . 13.5	326 16.4	. . 12.0	300 25.1	. . 02.7	169 31.2	. . 01.1
R 10	39 04.1	312 39.4	13.6	341 17.0	12.4	315 27.0	02.7	184 33.8	01.1
I 11	54 06.5	327 38.5	13.8	356 17.6	12.8	330 28.8	02.8	199 36.4	01.0
D 12	69 09.0	342 37.6	N24 14.0	11 18.2	N20 13.2	345 30.7	N23 02.8	214 39.0	S11 01.0
A 13	84 11.5	357 36.7	14.1	26 18.8	13.7	0 32.5	02.8	229 41.6	01.0
Y 14	99 13.9	12 35.8	14.3	41 19.4	14.1	15 34.4	02.9	244 44.2	00.9
15	114 16.4	27 34.9	. . 14.5	56 20.1	. . 14.5	30 36.2	. . 02.9	259 46.8	. . 00.9
16	129 18.9	42 34.0	14.6	71 20.7	14.9	45 38.1	02.9	274 49.4	00.9
17	144 21.3	57 33.2	14.8	86 21.3	15.3	60 39.9	03.0	289 52.0	00.8
18	159 23.8	72 32.3	N24 14.9	101 21.9	N20 15.7	75 41.8	N23 03.0	304 54.6	S11 00.8
19	174 26.3	87 31.4	15.1	116 22.5	16.1	90 43.6	03.0	319 57.2	00.7
20	189 28.7	102 30.5	15.3	131 23.1	16.5	105 45.5	03.0	334 59.8	00.7
21	204 31.2	117 29.6	. . 15.4	146 23.7	. . 16.9	120 47.3	. . 03.1	350 02.4	. . 00.7
22	219 33.6	132 28.7	15.6	161 24.3	17.3	135 49.2	03.1	5 05.0	00.6
23	234 36.1	147 27.8	15.7	176 24.9	17.7	150 51.0	03.1	20 07.6	00.6
1 00	249 38.6	162 26.9	N24 15.9	191 25.5	N20 18.1	165 52.9	N23 03.2	35 10.2	S11 00.5
01	264 41.0	177 26.1	16.0	206 26.1	18.5	180 54.7	03.2	50 12.8	00.5
02	279 43.5	192 25.2	16.2	221 26.8	18.9	195 56.5	03.2	65 15.4	00.5
03	294 46.0	207 24.3	. . 16.3	236 27.4	. . 19.3	210 58.4	. . 03.2	80 18.0	. . 00.4
04	309 48.4	222 23.4	16.5	251 28.0	19.7	226 00.2	03.3	95 20.6	00.4
05	324 50.9	237 22.5	16.6	266 28.6	20.1	241 02.1	03.3	110 23.2	00.4
06	339 53.4	252 21.6	N24 16.8	281 29.2	N20 20.5	256 03.9	N23 03.3	125 25.7	S11 00.3
S 07	354 55.8	267 20.7	16.9	296 29.8	20.9	271 05.8	03.4	140 28.3	00.3
A 08	9 58.3	282 19.8	17.0	311 30.4	21.3	286 07.6	03.4	155 30.9	00.2
T 09	25 00.8	297 19.0	. . 17.2	326 31.0	. . 21.7	301 09.5	. . 03.4	170 33.5	. . 00.2
U 10	40 03.2	312 18.1	17.3	341 31.6	22.1	316 11.3	03.4	185 36.1	00.2
R 11	55 05.7	327 17.2	17.5	356 32.2	22.5	331 13.2	03.5	200 38.7	00.1
D 12	70 08.1	342 16.3	N24 17.6	11 32.8	N20 22.9	346 15.0	N23 03.5	215 41.3	S11 00.1
A 13	85 10.6	357 15.4	17.7	26 33.4	23.3	1 16.9	03.5	230 43.9	00.1
Y 14	100 13.1	12 14.5	17.9	41 34.0	23.6	16 18.7	03.6	245 46.5	00.0
15	115 15.5	27 13.6	. . 18.0	56 34.7	. . 24.0	31 20.6	. . 03.6	260 49.1	11 00.0
16	130 18.0	42 12.7	18.1	71 35.3	24.4	46 22.4	03.6	275 51.7	10 59.9
17	145 20.5	57 11.9	18.3	86 35.9	24.8	61 24.3	03.6	290 54.3	59.9
18	160 22.9	72 11.0	N24 18.4	101 36.5	N20 25.2	76 26.1	N23 03.7	305 56.9	S10 59.9
19	175 25.4	87 10.1	18.5	116 37.1	25.6	91 28.0	03.7	320 59.5	59.8
20	190 27.9	102 09.2	18.6	131 37.7	26.0	106 29.8	03.7	336 02.1	59.8
21	205 30.3	117 08.3	. . 18.8	146 38.3	. . 26.4	121 31.7	. . 03.8	351 04.7	. . 59.8
22	220 32.8	132 07.4	18.9	161 38.9	26.8	136 33.5	03.8	6 07.3	59.7
23	235 35.2	147 06.5	19.0	176 39.5	27.2	151 35.4	03.8	21 09.9	59.7
2 00	250 37.7	162 05.6	N24 19.1	191 40.1	N20 27.6	166 37.2	N23 03.8	36 12.5	S10 59.7
01	265 40.2	177 04.7	19.3	206 40.7	28.0	181 39.1	03.9	51 15.1	59.6
02	280 42.6	192 03.9	19.4	221 41.3	28.4	196 40.9	03.9	66 17.7	59.6
03	295 45.1	207 03.0	. . 19.5	236 41.9	. . 28.8	211 42.8	. . 03.9	81 20.3	. . 59.5
04	310 47.6	222 02.1	19.6	251 42.6	29.1	226 44.6	03.9	96 22.9	59.5
05	325 50.0	237 01.2	19.7	266 43.2	29.5	241 46.4	04.0	111 25.5	59.5
06	340 52.5	252 00.3	N24 19.8	281 43.8	N20 29.9	256 48.3	N23 04.0	126 28.1	S10 59.4
07	355 55.0	266 59.4	20.0	296 44.4	30.3	271 50.1	04.0	141 30.7	59.4
S 08	10 57.4	281 58.5	20.1	311 45.0	30.7	286 52.0	04.1	156 33.3	59.4
U 09	25 59.9	296 57.6	. . 20.2	326 45.6	. . 31.1	301 53.8	. . 04.1	171 35.9	. . 59.3
N 10	41 02.4	311 56.7	20.3	341 46.2	31.5	316 55.7	04.1	186 38.5	59.3
D 11	56 04.8	326 55.8	20.4	356 46.8	31.9	331 57.5	04.1	201 41.1	59.3
A 12	71 07.3	341 55.0	N24 20.5	11 47.4	N20 32.3	346 59.4	N23 04.2	216 43.6	S10 59.2
Y 13	86 09.7	356 54.1	20.6	26 48.0	32.6	2 01.2	04.2	231 46.2	59.2
14	101 12.2	11 53.2	20.7	41 48.6	33.0	17 03.1	04.2	246 48.8	59.1
15	116 14.7	26 52.3	. . 20.8	56 49.2	. . 33.4	32 04.9	. . 04.2	261 51.4	. . 59.1
16	131 17.1	41 51.4	20.9	71 49.8	33.8	47 06.8	04.3	276 54.0	59.1
17	146 19.6	56 50.5	21.0	86 50.4	34.2	62 08.6	04.3	291 56.6	59.0
18	161 22.1	71 49.6	N24 21.1	101 51.0	N20 34.6	77 10.5	N23 04.3	306 59.2	S10 59.0
19	176 24.5	86 48.7	21.2	116 51.6	35.0	92 12.3	04.4	322 01.8	59.0
20	191 27.0	101 47.8	21.3	131 52.3	35.4	107 14.2	04.4	337 04.4	58.9
21	206 29.5	116 46.9	. . 21.4	146 52.9	. . 35.7	122 16.0	. . 04.4	352 07.0	. . 58.9
22	221 31.9	131 46.1	21.5	161 53.5	36.1	137 17.8	04.4	7 09.6	58.9
23	236 34.4	146 45.2	21.6	176 54.1	36.5	152 19.7	04.5	22 12.2	58.8
	h m								
Mer.Pass.	7 20.2	v −0.9	d 0.1	v 0.6	d 0.4	v 1.8	d 0.0	v 2.6	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.8	S40 15.0
Achernar	335 27.3	S57 09.9
Acrux	173 08.9	S63 10.8
Adhara	255 12.9	S28 59.7
Aldebaran	290 49.8	N16 32.0
Alioth	166 20.5	N55 53.4
Alkaid	152 58.6	N49 14.9
Al Na'ir	27 43.7	S46 53.4
Alnilam	275 46.7	S 1 11.8
Alphard	217 56.2	S 8 43.3
Alphecca	126 10.7	N26 40.3
Alpheratz	357 43.6	N29 09.7
Altair	62 08.0	N 8 54.3
Ankaa	353 15.9	S42 13.8
Antares	112 25.9	S26 27.6
Arcturus	145 55.5	N19 06.8
Atria	107 27.2	S69 03.0
Avior	234 18.4	S59 33.6
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.7	N 7 24.4
Canopus	263 56.7	S52 42.5
Capella	280 35.0	N46 00.5
Deneb	49 31.2	N45 19.6
Denebola	182 33.6	N14 29.8
Diphda	348 56.1	S17 54.7
Dubhe	193 51.8	N61 40.9
Elnath	278 13.0	N28 36.9
Eltanin	90 45.6	N51 29.3
Enif	33 47.0	N 9 56.3
Fomalhaut	15 24.0	S29 32.8
Gacrux	172 00.6	S57 11.6
Gienah	175 52.2	S17 37.2
Hadar	148 47.3	S60 26.4
Hamal	328 01.0	N23 31.4
Kaus Aust.	83 43.5	S34 22.5
Kochab	137 19.1	N74 06.2
Markab	13 38.4	N15 16.6
Menkar	314 15.4	N 4 08.4
Menkent	148 07.3	S36 26.3
Miaplacidus	221 40.0	S69 46.8
Mirfak	308 40.8	N49 54.3
Nunki	75 58.0	S26 16.6
Peacock	53 19.0	S56 41.1
Pollux	243 28.1	N27 59.5
Procyon	245 00.0	N 5 11.2
Rasalhague	96 06.1	N12 33.1
Regulus	207 43.6	N11 54.0
Rigel	281 12.4	S 8 11.4
Rigil Kent.	139 51.1	S60 53.5
Sabik	102 12.2	S15 44.4
Schedar	349 40.8	N56 36.4
Shaula	96 21.5	S37 06.6
Sirius	258 34.0	S16 44.3
Spica	158 31.1	S11 14.0
Suhail	222 52.6	S43 29.6
Vega	80 38.6	N38 47.8
Zuben'ubi	137 05.1	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	272 48.4	13 11
Mars	301 47.0	11 14
Jupiter	276 14.3	12 55
Saturn	145 31.6	21 36

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		31	1	2	3
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
								N 72				00 53	00 41	00 31	00 20
31 00	180 35.9	N21 54.2	278 38.9	10.8	S 6 46.3	11.2	58.4	N 70				00 43	00 39	00 34	00 30
01	195 35.8	54.6	293 08.7	10.9	6 35.1	11.2	58.3	68				00 35	00 36	00 37	00 37
02	210 35.7	55.0	307 38.6	11.0	6 23.9	11.3	58.3	66	////	////	01 12	00 29	00 34	00 39	00 44
03	225 35.6	. . 55.3	322 08.6	11.0	6 12.6	11.2	58.3	64	////	////	01 58	00 23	00 32	00 41	00 49
04	240 35.5	55.7	336 38.6	11.1	6 01.4	11.3	58.2	62	////	////	02 27	00 18	00 31	00 42	00 54
05	255 35.5	56.0	351 08.7	11.1	5 50.1	11.3	58.2	60	////	01 26	02 49	00 14	00 29	00 44	00 58
06	270 35.4	N21 56.4	5 38.8	11.2	S 5 38.8	11.3	58.2	N 58	////	02 00	03 07	00 10	00 28	00 45	01 01
07	285 35.3	56.7	20 09.0	11.3	5 27.5	11.4	58.1	56	////	02 24	03 22	00 07	00 27	00 46	01 05
08	300 35.2	57.1	34 39.3	11.3	5 16.1	11.3	58.1	54	01 18	02 44	03 35	00 04	00 26	00 47	01 08
F 09	315 35.1	. . 57.4	49 09.6	11.4	5 04.8	11.4	58.1	52	01 50	02 59	03 46	00 01	00 25	00 48	01 10
R 10	330 35.0	57.8	63 40.0	11.5	4 53.4	11.4	58.0	50	02 13	03 13	03 56	24 24	00 24	00 49	01 13
I 11	345 34.9	58.1	78 10.5	11.5	4 42.0	11.3	58.0	45	02 53	03 40	04 17	24 23	00 23	00 50	01 18
D 12	0 34.8	N21 58.5	92 41.0	11.5	S 4 30.7	11.4	58.0	N 40	03 21	04 01	04 33	24 21	00 21	00 52	01 23
A 13	15 34.7	58.8	107 11.5	11.6	4 19.3	11.4	57.9	35	03 42	04 18	04 47	24 20	00 20	00 53	01 27
Y 14	30 34.6	59.2	121 42.1	11.7	4 07.9	11.5	57.9	30	04 00	04 32	04 59	24 19	00 19	00 55	01 30
15	45 34.5	. . 59.5	136 12.8	11.7	3 56.4	11.4	57.9	20	04 27	04 56	05 20	24 17	00 17	00 57	01 36
16	60 34.4	21 59.9	150 43.5	11.8	3 45.0	11.4	57.8	N 10	04 48	05 15	05 38	24 15	00 15	00 59	01 41
17	75 34.3	22 00.2	165 14.3	11.8	3 33.6	11.4	57.8	0	05 06	05 32	05 54	24 14	00 14	01 00	01 46
18	90 34.2	N22 00.6	179 45.1	11.8	S 3 22.2	11.4	57.8	S 10	05 22	05 48	06 11	24 12	00 12	01 02	01 51
19	105 34.2	00.9	194 15.9	12.0	3 10.8	11.5	57.7	20	05 37	06 04	06 28	24 10	00 10	01 04	01 57
20	120 34.1	01.2	208 46.9	11.9	2 59.3	11.4	57.7	30	05 52	06 22	06 48	24 08	00 08	01 07	02 03
21	135 34.0	. . 01.6	223 17.8	12.0	2 47.9	11.5	57.7	35	06 00	06 31	06 59	24 07	00 07	01 08	02 07
22	150 33.9	01.9	237 48.8	12.1	2 36.4	11.4	57.6	40	06 09	06 42	07 12	24 06	00 06	01 09	02 11
23	165 33.8	02.3	252 19.9	12.1	2 25.0	11.4	57.6	45	06 18	06 55	07 28	24 05	00 05	01 11	02 16
1 00	180 33.7	N22 02.6	266 51.0	12.1	S 2 13.6	11.4	57.6	S 50	06 29	07 10	07 47	24 03	00 03	01 13	02 21
01	195 33.6	02.9	281 22.1	12.2	2 02.2	11.5	57.5	52	06 33	07 16	07 56	24 02	00 02	01 14	02 24
02	210 33.5	03.3	295 53.3	12.3	1 50.7	11.4	57.5	54	06 38	07 24	08 06	24 01	00 01	01 15	02 27
03	225 33.4	. . 03.6	310 24.6	12.2	1 39.3	11.4	57.5	56	06 44	07 32	08 18	24 00	00 00	01 16	02 30
04	240 33.3	04.0	324 55.8	12.4	1 27.9	11.4	57.4	58	06 50	07 41	08 31	23 59	25 18	01 18	02 34
05	255 33.2	04.3	339 27.2	12.3	1 16.5	11.4	57.4	S 60	06 57	07 52	08 47	23 58	25 19	01 19	02 38
06	270 33.1	N22 04.6	353 58.5	12.4	S 1 05.1	11.4	57.4								
S 07	285 33.0	05.0	8 29.9	12.4	0 53.7	11.4	57.3								
A 08	300 32.9	05.3	23 01.3	12.5	0 42.3	11.4	57.3								
T 09	315 32.8	. . 05.6	37 32.8	12.5	0 30.9	11.4	57.3								
U 10	330 32.7	06.0	52 04.3	12.6	0 19.5	11.3	57.2								
R 11	345 32.6	06.3	66 35.9	12.5	S 0 08.2	11.4	57.2								
D 12	0 32.5	N22 06.6	81 07.4	12.6	N 0 03.2	11.3	57.2								
A 13	15 32.4	07.0	95 39.0	12.7	0 14.5	11.3	57.1								
Y 14	30 32.3	07.3	110 10.7	12.7	0 25.8	11.4	57.1								
15	45 32.2	. . 07.6	124 42.4	12.7	0 37.2	11.2	57.1								
16	60 32.1	08.0	139 14.1	12.7	0 48.4	11.3	57.0								
17	75 32.0	08.3	153 45.8	12.8	0 59.7	11.3	57.0								
18	90 31.9	N22 08.6	168 17.6	12.8	N 1 11.0	11.2	57.0								
19	105 31.8	08.9	182 49.4	12.8	1 22.2	11.2	56.9								
20	120 31.7	09.3	197 21.2	12.9	1 33.4	11.2	56.9								
21	135 31.6	. . 09.6	211 53.1	12.8	1 44.6	11.2	56.9								
22	150 31.6	09.9	226 24.9	12.9	1 55.8	11.2	56.8								
23	165 31.5	10.3	240 56.8	13.0	2 07.0	11.1	56.8								
2 00	180 31.4	N22 10.6	255 28.8	12.9	N 2 18.1	11.2	56.8								
01	195 31.3	10.9	270 00.7	13.0	2 29.3	11.0	56.8								
02	210 31.2	11.2	284 32.7	13.0	2 40.3	11.1	56.7								
03	225 31.1	. . 11.5	299 04.7	13.0	2 51.4	11.1	56.7								
04	240 31.0	11.9	313 36.7	13.1	3 02.5	11.0	56.7								
05	255 30.9	12.2	328 08.8	13.0	3 13.5	11.0	56.6								
06	270 30.8	N22 12.5	342 40.8	13.1	N 3 24.5	11.0	56.6								
S 07	285 30.7	12.8	357 12.9	13.1	3 35.5	10.9	56.6								
U 08	300 30.6	13.1	11 45.0	13.1	3 46.4	10.9	56.5								
N 09	315 30.5	. . 13.5	26 17.1	13.1	3 57.3	10.9	56.5								
D 10	330 30.4	13.8	40 49.2	13.2	4 08.2	10.8	56.5								
A 11	345 30.3	14.1	55 21.4	13.1	4 19.0	10.9	56.5								
Y 12	0 30.1	N22 14.4	69 53.5	13.2	N 4 29.9	10.8	56.4								
13	15 30.0	14.7	84 25.7	13.2	4 40.7	10.7	56.4								
14	30 29.9	15.0	98 57.9	13.2	4 51.4	10.7	56.4								
15	45 29.8	. . 15.4	113 30.1	13.2	5 02.1	10.7	56.3								
16	60 29.7	15.7	128 02.3	13.3	5 12.8	10.7	56.3								
17	75 29.6	16.0	142 34.6	13.2	5 23.5	10.6	56.3								
18	90 29.5	N22 16.3	157 06.8	13.2	N 5 34.1	10.6	56.3								
19	105 29.4	16.6	171 39.0	13.3	5 44.7	10.6	56.2								
20	120 29.3	16.9	186 11.3	13.3	5 55.3	10.5	56.2								
21	135 29.2	. . 17.2	200 43.6	13.2	6 05.8	10.5	56.2								
22	150 29.1	17.5	215 15.8	13.3	6 16.3	10.4	56.1								
23	165 29.0	17.9	229 48.1	13.3	N 6 26.7	10.4	56.1								
	SD 15.8	d 0.3	SD	15.8		15.6		15.4							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	31	1	2	3
°	h m	h m	h m	h m	h m	h m	h m
N 72				10 46	12 37	14 25	16 12
N 70				10 53	12 37	14 18	15 57
68				10 59	12 37	14 12	15 46
66	22 48	////	////	11 04	12 37	14 07	15 36
64	22 00	////	////	11 08	12 37	14 03	15 28
62	21 30	////	////	11 11	12 37	14 00	15 21
60	21 08	22 33	////	11 14	12 37	13 57	15 15
N 58	20 50	21 57	////	11 17	12 37	13 54	15 10
56	20 35	21 33	////	11 19	12 37	13 52	15 05
54	20 22	21 13	22 40	11 21	12 37	13 50	15 01
52	20 10	20 57	22 07	11 23	12 37	13 48	14 57
50	20 00	20 43	21 44	11 25	12 37	13 46	14 54
45	19 40	20 16	21 04	11 29	12 37	13 42	14 46
N 40	19 23	19 55	20 35	11 32	12 37	13 39	14 40
35	19 09	19 38	20 14	11 35	12 37	13 36	14 35
30	18 57	19 24	19 56	11 37	12 36	13 34	14 30
20	18 36	19 00	19 29	11 41	12 36	13 30	14 22
N 10	18 18	18 41	19 08	11 45	12 36	13 26	14 15
0	18 01	18 24	18 50	11 48	12 36	13 23	14 08
S 10	17 45	18 08	18 34	11 52	12 36	13 19	14 02
20	17 28	17 51	18 19	11 55	12 36	13 15	13 55
30	17 08	17 34	18 03	11 59	12 36	13 11	13 47
35	16 56	17 24	17 55	12 01	12 36	13 09	13 42
40	16 43	17 13	17 47	12 04	12 35	13 06	13 37
45	16 27	17 01	17 37	12 07	12 35	13 03	13 31
S 50	16 08	16 46	17 27	12 10	12 35	12 59	13 24
52	15 59	16 39	17 22	12 12	12 35	12 57	13 20
54	15 49	16 32	17 17	12 13	12 35	12 56	13 17
56	15 37	16 23	17 11	12 15	12 35	12 53	13 13
58	15 24	16 14	17 05	12 17	12 35	12 51	13 08
S 60	15 09	16 03	16 59	12 20	12 34	12 49	13 03

Day	SUN		Mer.	MOON			
	Eqn. of Time		Pass.	Mer. Pass.		Age	Phase
	00^h	12^h		Upper	Lower		
	m s	m s	h m	h m	h m	d	%
31	02 24	02 19	11 58	05 37	18 01	21	53
1	02 15	02 10	11 58	06 25	18 48	22	43
2	02 06	02 01	11 58	07 11	19 34	23	32

UT	ARIES	VENUS −3.8		MARS +1.4		JUPITER −1.9		SATURN +0.4		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
3 00	251 36.9	161 44.3	N24 21.7	191 54.7	N20 36.9	167 21.5	N23 04.5	37 14.8	S10 58.8	Acamar	315 18.8	S40 15.0
01	266 39.3	176 43.4	21.8	206 55.3	37.3	182 23.4	04.5	52 17.4	58.7	Achernar	335 27.2	S57 09.9
02	281 41.8	191 42.5	21.9	221 55.9	37.7	197 25.2	04.5	67 20.0	58.7	Acrux	173 08.9	S63 10.8
03	296 44.2	206 41.6 . .	22.0	236 56.5 . .	38.0	212 27.1 . .	04.6	82 22.6 . .	58.7	Adhara	255 12.9	S28 59.7
04	311 46.7	221 40.7	22.0	251 57.1	38.4	227 28.9	04.6	97 25.2	58.6	Aldebaran	290 49.7	N16 32.0
05	326 49.2	236 39.8	22.1	266 57.7	38.8	242 30.8	04.6	112 27.7	58.6			
06	341 51.6	251 38.9	N24 22.2	281 58.3	N20 39.2	257 32.6	N23 04.7	127 30.3	S10 58.6	Alioth	166 20.5	N55 53.4
07	356 54.1	266 38.0	22.3	296 58.9	39.6	272 34.5	04.7	142 32.9	58.5	Alkaid	152 58.6	N49 14.9
08	11 56.6	281 37.1	22.4	311 59.5	39.9	287 36.3	04.7	157 35.5	58.5	Al Na'ir	27 43.7	S46 53.4
M 09	26 59.0	296 36.3 . .	22.5	327 00.1 . .	40.3	302 38.2 . .	04.7	172 38.1 . .	58.5	Alnilam	275 46.7	S 1 11.8
O 10	42 01.5	311 35.4	22.5	342 00.7	40.7	317 40.0	04.8	187 40.7	58.4	Alphard	217 56.2	S 8 43.3
N 11	57 04.0	326 34.5	22.6	357 01.3	41.1	332 41.9	04.8	202 43.3	58.4			
D 12	72 06.4	341 33.6	N24 22.7	12 01.9	N20 41.5	347 43.7	N23 04.8	217 45.9	S10 58.4	Alphecca	126 10.7	N26 40.3
A 13	87 08.9	356 32.7	22.8	27 02.5	41.8	2 45.5	04.8	232 48.5	58.3	Alpheratz	357 43.6	N29 09.8
Y 14	102 11.3	11 31.8	22.8	42 03.2	42.2	17 47.4	04.9	247 51.1	58.3	Altair	62 08.0	N 8 54.3
15	117 13.8	26 30.9 . .	22.9	57 03.8 . .	42.6	32 49.2 . .	04.9	262 53.7 . .	58.3	Ankaa	353 15.9	S42 13.7
16	132 16.3	41 30.0	23.0	72 04.4	43.0	47 51.1	04.9	277 56.3	58.2	Antares	112 25.9	S26 27.6
17	147 18.7	56 29.1	23.1	87 05.0	43.4	62 52.9	04.9	292 58.9	58.2			
18	162 21.2	71 28.2	N24 23.1	102 05.6	N20 43.7	77 54.8	N23 05.0	308 01.4	S10 58.1	Arcturus	145 55.5	N19 06.8
19	177 23.7	86 27.3	23.2	117 06.2	44.1	92 56.6	05.0	323 04.0	58.1	Atria	107 27.1	S69 03.0
20	192 26.1	101 26.5	23.3	132 06.8	44.5	107 58.5	05.0	338 06.6	58.1	Avior	234 18.4	S59 33.6
21	207 28.6	116 25.6 . .	23.3	147 07.4 . .	44.9	123 00.3 . .	05.0	353 09.2 . .	58.0	Bellatrix	278 32.4	N 6 21.5
22	222 31.1	131 24.7	23.4	162 08.0	45.2	138 02.2	05.1	8 11.8	58.0	Betelgeuse	271 01.7	N 7 24.4
23	237 33.5	146 23.8	23.5	177 08.6	45.6	153 04.0	05.1	23 14.4	58.0			
4 00	252 36.0	161 22.9	N24 23.5	192 09.2	N20 46.0	168 05.9	N23 05.1	38 17.0	S10 57.9	Canopus	263 56.7	S52 42.4
01	267 38.5	176 22.0	23.6	207 09.8	46.4	183 07.7	05.2	53 19.6	57.9	Capella	280 35.0	N46 00.5
02	282 40.9	191 21.1	23.6	222 10.4	46.7	198 09.5	05.2	68 22.2	57.9	Deneb	49 31.2	N45 19.6
03	297 43.4	206 20.2 . .	23.7	237 11.0 . .	47.1	213 11.4 . .	05.2	83 24.8 . .	57.8	Denebola	182 33.6	N14 29.8
04	312 45.8	221 19.3	23.8	252 11.6	47.5	228 13.2	05.2	98 27.4	57.8	Diphda	348 56.1	S17 54.7
05	327 48.3	236 18.4	23.8	267 12.2	47.9	243 15.1	05.3	113 29.9	57.8			
06	342 50.8	251 17.5	N24 23.9	282 12.8	N20 48.2	258 16.9	N23 05.3	128 32.5	S10 57.7	Dubhe	193 51.8	N61 40.9
T 07	357 53.2	266 16.6	23.9	297 13.4	48.6	273 18.8	05.3	143 35.1	57.7	Elnath	278 13.0	N28 36.9
U 08	12 55.7	281 15.8	24.0	312 14.0	49.0	288 20.6	05.3	158 37.7	57.7	Eltanin	90 45.6	N51 29.3
E 09	27 58.2	296 14.9 . .	24.0	327 14.6 . .	49.4	303 22.5 . .	05.4	173 40.3 . .	57.6	Enif	33 47.0	N 9 56.3
S 10	43 00.6	311 14.0	24.1	342 15.2	49.7	318 24.3	05.4	188 42.9	57.6	Fomalhaut	15 24.0	S29 32.8
D 11	58 03.1	326 13.1	24.1	357 15.8	50.1	333 26.2	05.4	203 45.5	57.6			
A 12	73 05.6	341 12.2	N24 24.2	12 16.4	N20 50.5	348 28.0	N23 05.4	218 48.1	S10 57.5	Gacrux	172 00.6	S57 11.6
Y 13	88 08.0	356 11.3	24.2	27 17.0	50.8	3 29.8	05.5	233 50.7	57.5	Gienah	175 52.2	S17 37.2
14	103 10.5	11 10.4	24.3	42 17.6	51.2	18 31.7	05.5	248 53.2	57.5	Hadar	148 47.4	S60 26.5
15	118 13.0	26 09.5 . .	24.3	57 18.3 . .	51.6	33 33.5 . .	05.5	263 55.8 . .	57.4	Hamal	328 01.0	N23 31.4
16	133 15.4	41 08.6	24.3	72 18.9	52.0	48 35.4	05.5	278 58.4	57.4	Kaus Aust.	83 43.5	S34 22.5
17	148 17.9	56 07.7	24.4	87 19.5	52.3	63 37.2	05.6	294 01.0	57.4			
18	163 20.3	71 06.8	N24 24.4	102 20.1	N20 52.7	78 39.1	N23 05.6	309 03.6	S10 57.3	Kochab	137 19.1	N74 06.2
19	178 22.8	86 05.9	24.5	117 20.7	53.1	93 40.9	05.6	324 06.2	57.3	Markab	13 38.3	N15 16.6
20	193 25.3	101 05.1	24.5	132 21.3	53.4	108 42.8	05.6	339 08.8	57.3	Menkar	314 15.4	N 4 08.4
21	208 27.7	116 04.2 . .	24.5	147 21.9 . .	53.8	123 44.6 . .	05.7	354 11.4 . .	57.2	Menkent	148 07.3	S36 26.3
22	223 30.2	131 03.3	24.6	162 22.5	54.2	138 46.5	05.7	9 14.0	57.2	Miaplacidus	221 40.0	S69 46.8
23	238 32.7	146 02.4	24.6	177 23.1	54.5	153 48.3	05.7	24 16.5	57.2			
5 00	253 35.1	161 01.5	N24 24.6	192 23.7	N20 54.9	168 50.1	N23 05.7	39 19.1	S10 57.1	Mirfak	308 40.8	N49 54.3
01	268 37.6	176 00.6	24.7	207 24.3	55.3	183 52.0	05.8	54 21.7	57.1	Nunki	75 58.0	S26 16.6
02	283 40.1	190 59.7	24.7	222 24.9	55.6	198 53.8	05.8	69 24.3	57.1	Peacock	53 18.9	S56 41.1
03	298 42.5	205 58.8 . .	24.7	237 25.5 . .	56.0	213 55.7 . .	05.8	84 26.9 . .	57.0	Pollux	243 28.1	N27 59.5
04	313 45.0	220 57.9	24.7	252 26.1	56.4	228 57.5	05.8	99 29.5	57.0	Procyon	245 00.0	N 5 11.2
05	328 47.4	235 57.0	24.8	267 26.7	56.7	243 59.4	05.9	114 32.1	57.0			
06	343 49.9	250 56.1	N24 24.8	282 27.3	N20 57.1	259 01.2	N23 05.9	129 34.7	S10 56.9	Rasalhague	96 06.1	N12 33.1
W 07	358 52.4	265 55.2	24.8	297 27.9	57.5	274 03.1	05.9	144 37.2	56.9	Regulus	207 43.6	N11 54.0
E 08	13 54.8	280 54.4	24.8	312 28.5	57.8	289 04.9	05.9	159 39.8	56.9	Rigel	281 12.4	S 8 11.4
D 09	28 57.3	295 53.5 . .	24.9	327 29.1 . .	58.2	304 06.7 . .	06.0	174 42.4 . .	56.8	Rigil Kent.	139 51.1	S60 53.5
N 10	43 59.8	310 52.6	24.9	342 29.7	58.5	319 08.6	06.0	189 45.0	56.8	Sabik	102 12.2	S15 44.4
E 11	59 02.2	325 51.7	24.9	357 30.3	58.9	334 10.4	06.0	204 47.6	56.8			
S 12	74 04.7	340 50.8	N24 24.9	12 30.9	N20 59.3	349 12.3	N23 06.0	219 50.2	S10 56.7	Schedar	349 40.7	N56 36.4
D 13	89 07.2	355 49.9	24.9	27 31.5	20 59.6	4 14.1	06.1	234 52.8	56.7	Shaula	96 21.5	S37 06.6
A 14	104 09.6	10 49.0	25.0	42 32.1	21 00.0	19 16.0	06.1	249 55.3	56.7	Sirius	258 34.1	S16 44.3
Y 15	119 12.1	25 48.1 . .	25.0	57 32.7 . .	00.4	34 17.8 . .	06.1	264 57.9 . .	56.6	Spica	158 31.1	S11 14.0
16	134 14.6	40 47.2	25.0	72 33.3	00.7	49 19.7	06.1	280 00.5	56.6	Suhail	222 52.6	S43 29.6
17	149 17.0	55 46.3	25.0	87 33.9	01.1	64 21.5	06.2	295 03.1	56.6			
18	164 19.5	70 45.4	N24 25.0	102 34.5	N21 01.4	79 23.3	N23 06.2	310 05.7	S10 56.5	Vega	80 38.6	N38 47.8
19	179 21.9	85 44.5	25.0	117 35.1	01.8	94 25.2	06.2	325 08.3	56.5	Zuben'ubi	137 05.1	S16 05.9
20	194 24.4	100 43.7	25.0	132 35.7	02.2	109 27.0	06.2	340 10.9	56.5		SHA	Mer.Pass.
21	209 26.9	115 42.8 . .	25.0	147 36.3 . .	02.5	124 28.9 . .	06.3	355 13.4 . .	56.4		° ′	h m
22	224 29.3	130 41.9	25.0	162 36.9	02.9	139 30.7	06.3	10 16.0	56.4	Venus	268 46.9	13 15
23	239 31.8	145 41.0	25.0	177 37.5	03.2	154 32.6	06.3	25 18.6	56.4	Mars	299 33.2	11 11
	h m									Jupiter	275 29.9	12 46
Mer.Pass.	7 08.4	v −0.9	d 0.0	v 0.6	d 0.4	v 1.8	d 0.0	v 2.6	d 0.0	Saturn	145 41.0	21 23

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 3	Moonrise 4	Moonrise 5	Moonrise 6
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
3 00	180 28.9	N22 18.2	244 20.4	13.3	N 6 37.1	10.4	56.1	N 72				00 20	(00 09 / 23 54)	23 30	
01	195 28.8	18.5	258 52.7	13.3	6 47.5	10.3	56.1	N 70				00 30	00 25	00 21	00 16
02	210 28.7	18.8	273 25.0	13.3	6 57.8	10.3	56.0	68				00 37	00 38	00 41	00 46
03	225 28.6 . .	19.1	287 57.3	13.3	7 08.1	10.2	56.0	66	////	////	00 58	00 44	00 49	00 57	01 09
04	240 28.5	19.4	302 29.6	13.3	7 18.3	10.2	56.0	64	////	////	01 51	00 49	00 59	01 11	01 27
05	255 28.4	19.7	317 01.9	13.3	7 28.5	10.2	56.0	62	////	////	02 22	00 54	01 07	01 22	01 42
06	270 28.3	N22 20.0	331 34.2	13.3	N 7 38.7	10.1	55.9	60	////	01 17	02 45	00 58	01 13	01 32	01 54
07	285 28.2	20.3	346 06.5	13.3	7 48.8	10.0	55.9	N 58	////	01 55	03 04	01 01	01 19	01 40	02 05
08	300 28.1	20.6	0 38.8	13.3	7 58.8	10.1	55.9	56	////	02 20	03 19	01 05	01 25	01 48	02 14
M 09	315 28.0 . .	20.9	15 11.1	13.3	8 08.9	9.9	55.9	54	01 10	02 40	03 32	01 08	01 30	01 54	02 23
O 10	330 27.9	21.2	29 43.4	13.4	8 18.8	10.0	55.8	52	01 45	02 57	03 44	01 10	01 34	02 00	02 30
N 11	345 27.8	21.5	44 15.8	13.3	8 28.8	9.9	55.8	50	02 09	03 11	03 54	01 13	01 38	02 06	02 37
D 12	0 27.7	N22 21.8	58 48.1	13.3	N 8 38.7	9.8	55.8	45	02 50	03 38	04 15	01 18	01 47	02 18	02 52
A 13	15 27.6	22.1	73 20.4	13.3	8 48.5	9.8	55.8	N 40	03 19	04 00	04 32	01 23	01 54	02 27	03 04
Y 14	30 27.5	22.4	87 52.7	13.3	8 58.3	9.7	55.7	35	03 41	04 17	04 46	01 27	02 00	02 36	03 14
15	45 27.4 . .	22.7	102 25.0	13.3	9 08.0	9.7	55.7	30	03 59	04 32	04 59	01 30	02 06	02 43	03 23
16	60 27.2	23.0	116 57.3	13.3	9 17.7	9.7	55.7	20	04 27	04 55	05 20	01 36	02 16	02 56	03 38
17	75 27.1	23.3	131 29.6	13.3	9 27.4	9.6	55.7	N 10	04 48	05 15	05 38	01 41	02 24	03 07	03 52
18	90 27.0	N22 23.6	146 01.9	13.3	N 9 37.0	9.5	55.6	0	05 06	05 32	05 55	01 46	02 32	03 18	04 05
19	105 26.9	23.9	160 34.2	13.2	9 46.5	9.5	55.6	S 10	05 22	05 49	06 11	01 51	02 40	03 29	04 18
20	120 26.8	24.2	175 06.4	13.3	9 56.0	9.4	55.6	20	05 38	06 05	06 29	01 57	02 49	03 40	04 32
21	135 26.7 . .	24.5	189 38.7	13.3	10 05.4	9.4	55.6	30	05 53	06 23	06 49	02 03	02 59	03 54	04 48
22	150 26.6	24.8	204 11.0	13.2	10 14.8	9.4	55.5	35	06 02	06 33	07 01	02 07	03 05	04 01	04 57
23	165 26.5	25.1	218 43.2	13.3	10 24.2	9.2	55.5	40	06 10	06 44	07 14	02 11	03 11	04 10	05 07
4 00	180 26.4	N22 25.4	233 15.5	13.2	N10 33.4	9.3	55.5	45	06 20	06 57	07 30	02 16	03 19	04 20	05 20
01	195 26.3	25.7	247 47.7	13.3	10 42.7	9.1	55.5	S 50	06 31	07 12	07 50	02 21	03 28	04 33	05 35
02	210 26.2	25.9	262 20.0	13.2	10 51.8	9.1	55.5	52	06 36	07 19	07 59	02 24	03 32	04 39	05 42
03	225 26.1 . .	26.2	276 52.2	13.2	11 00.9	9.1	55.4	54	06 41	07 27	08 10	02 27	03 37	04 45	05 50
04	240 26.0	26.5	291 24.4	13.2	11 10.0	9.0	55.4	56	06 47	07 35	08 21	02 30	03 42	04 52	05 59
05	255 25.9	26.8	305 56.6	13.2	11 19.0	8.9	55.4	58	06 53	07 45	08 35	02 34	03 48	05 00	06 09
06	270 25.8	N22 27.1	320 28.8	13.2	N11 27.9	8.9	55.4	S 60	07 00	07 56	08 51	02 38	03 55	05 10	06 21
T 07	285 25.6	27.4	335 01.0	13.2	11 36.8	8.9	55.4								
U 08	300 25.5	27.7	349 33.2	13.1	11 45.7	8.7	55.3								
E 09	315 25.4 . .	28.0	4 05.3	13.2	11 54.4	8.7	55.3								
S 10	330 25.3	28.2	18 37.5	13.1	12 03.1	8.7	55.3								
D 11	345 25.2	28.5	33 09.6	13.2	12 11.8	8.6	55.3								
A 12	0 25.1	N22 28.8	47 41.8	13.1	N12 20.4	8.5	55.2								
Y 13	15 25.0	29.1	62 13.9	13.1	12 28.9	8.4	55.2								
14	30 24.9	29.4	76 46.0	13.1	12 37.3	8.4	55.2								
15	45 24.8 . .	29.7	91 18.1	13.0	12 45.7	8.4	55.2								
16	60 24.7	29.9	105 50.1	13.1	12 54.1	8.3	55.2								
17	75 24.6	30.2	120 22.2	13.0	13 02.4	8.2	55.1								
18	90 24.4	N22 30.5	134 54.2	13.1	N13 10.6	8.1	55.1								
19	105 24.3	30.8	149 26.3	13.0	13 18.7	8.1	55.1								
20	120 24.2	31.1	163 58.3	13.0	13 26.8	8.0	55.1								
21	135 24.1 . .	31.3	178 30.3	13.0	13 34.8	8.0	55.1								
22	150 24.0	31.6	193 02.3	12.9	13 42.8	7.8	55.1								
23	165 23.9	31.9	207 34.2	13.0	13 50.6	7.9	55.0								
5 00	180 23.8	N22 32.2	222 06.2	12.9	N13 58.5	7.7	55.0								
01	195 23.7	32.4	236 38.1	12.9	14 06.2	7.7	55.0								
02	210 23.6	32.7	251 10.0	12.9	14 13.9	7.6	55.0								
03	225 23.4 . .	33.0	265 41.9	12.9	14 21.5	7.5	55.0								
04	240 23.3	33.3	280 13.8	12.9	14 29.0	7.5	54.9								
05	255 23.2	33.5	294 45.7	12.8	14 36.5	7.4	54.9								
06	270 23.1	N22 33.8	309 17.5	12.8	N14 43.9	7.3	54.9								
W 07	285 23.0	34.1	323 49.3	12.9	14 51.2	7.3	54.9								
E 08	300 22.9	34.3	338 21.2	12.7	14 58.5	7.2	54.9								
D 09	315 22.8 . .	34.6	352 52.9	12.8	15 05.7	7.1	54.9								
N 10	330 22.7	34.9	7 24.7	12.8	15 12.8	7.0	54.8								
E 11	345 22.6	35.1	21 56.5	12.7	15 19.8	7.0	54.8								
S 12	0 22.4	N22 35.4	36 28.2	12.7	N15 26.8	6.9	54.8								
D 13	15 22.3	35.7	50 59.9	12.8	15 33.7	6.8	54.8								
A 14	30 22.2	35.9	65 31.7	12.6	15 40.5	6.7	54.8								
Y 15	45 22.1 . .	36.2	80 03.3	12.7	15 47.2	6.7	54.8								
16	60 22.0	36.5	94 35.0	12.7	15 53.9	6.6	54.7								
17	75 21.9	36.7	109 06.7	12.6	16 00.5	6.5	54.7								
18	90 21.8	N22 37.0	123 38.3	12.6	N16 07.0	6.4	54.7								
19	105 21.6	37.3	138 09.9	12.6	16 13.4	6.4	54.7								
20	120 21.5	37.5	152 41.5	12.6	16 19.8	6.3	54.7								
21	135 21.4 . .	37.8	167 13.1	12.5	16 26.1	6.2	54.7								
22	150 21.3	38.1	181 44.6	12.6	16 32.3	6.1	54.6								
23	165 21.2	38.3	196 16.2	12.5	N16 38.4	6.0	54.6								
	SD 15.8	d 0.3	SD	15.2		15.1		14.9							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 3	Moonset 4	Moonset 5	Moonset 6
°	h m	h m	h m	h m	h m	h m	h m
N 72				16 12	18 03	20 04	
N 70				15 57	17 37	19 19	21 03
68				15 46	17 18	18 49	20 17
66	23 03	////	////	15 36	17 03	18 27	19 47
64	22 08	////	////	15 28	16 50	18 10	19 25
62	21 36	////	////	15 21	16 40	17 56	19 07
60	21 13	22 42	////	15 15	16 31	17 44	18 53
N 58	20 54	22 04	////	15 10	16 23	17 34	18 40
56	20 38	21 38	////	15 05	16 16	17 25	18 29
54	20 25	21 17	22 49	15 01	16 10	17 17	18 20
52	20 14	21 01	22 13	14 57	16 04	17 09	18 11
50	20 03	20 47	21 49	14 54	15 59	17 03	18 04
45	19 42	20 19	21 07	14 46	15 49	16 49	17 47
N 40	19 25	19 57	20 38	14 40	15 40	16 38	17 34
35	19 10	19 40	20 16	14 35	15 32	16 28	17 23
30	18 58	19 25	19 58	14 30	15 25	16 20	17 13
20	18 37	19 01	19 30	14 22	15 14	16 05	16 56
N 10	18 19	18 42	19 09	14 15	15 04	15 53	16 42
0	18 02	18 24	18 50	14 08	14 54	15 41	16 28
S 10	17 45	18 08	18 34	14 02	14 45	15 29	16 14
20	17 28	17 51	18 19	13 55	14 35	15 16	15 59
30	17 07	17 33	18 03	13 47	14 23	15 02	15 43
35	16 55	17 23	17 55	13 42	14 17	14 53	15 33
40	16 42	17 12	17 46	13 37	14 09	14 44	15 22
45	16 26	16 59	17 36	13 31	14 01	14 33	15 09
S 50	16 06	16 44	17 25	13 24	13 50	14 19	14 53
52	15 57	16 37	17 20	13 20	13 45	14 13	14 46
54	15 47	16 30	17 15	13 17	13 40	14 06	14 37
56	15 35	16 21	17 09	13 13	13 34	13 59	14 28
58	15 21	16 12	17 03	13 08	13 28	13 50	14 18
S 60	15 05	16 01	16 56	13 03	13 20	13 40	14 06

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
3	01 56	01 51	11 58	07 57	20 20	24	23
4	01 46	01 41	11 58	08 43	21 06	25	15
5	01 35	01 30	11 59	09 29	21 53	26	9

UT	ARIES	VENUS −3.8		MARS +1.4		JUPITER −1.9		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
6 00	254 34.3	160 40.1	N24 25.0	192 38.1	N21 03.6	169 34.4	N23 06.3	40 21.2	S10 56.3
01	269 36.7	175 39.2	25.0	207 38.7	04.0	184 36.3	06.3	55 23.8	56.3
02	284 39.2	190 38.3	25.0	222 39.3	04.3	199 38.1	06.4	70 26.4	56.3
03	299 41.7	205 37.4 . .	25.0	237 39.9 . .	04.7	214 39.9 . .	06.4	85 28.9 . .	56.2
04	314 44.1	220 36.5	25.0	252 40.5	05.0	229 41.8	06.4	100 31.5	56.2
05	329 46.6	235 35.6	25.0	267 41.1	05.4	244 43.6	06.4	115 34.1	56.2
06	344 49.1	250 34.7	N24 25.0	282 41.7	N21 05.7	259 45.5	N23 06.5	130 36.7	S10 56.1
07	359 51.5	265 33.9	25.0	297 42.3	06.1	274 47.3	06.5	145 39.3	56.1
T 08	14 54.0	280 33.0	25.0	312 42.9	06.5	289 49.2	06.5	160 41.9	56.1
H 09	29 56.4	295 32.1 . .	25.0	327 43.5 . .	06.8	304 51.0 . .	06.5	175 44.5 . .	56.0
U 10	44 58.9	310 31.2	25.0	342 44.1	07.2	319 52.9	06.6	190 47.0	56.0
R 11	60 01.4	325 30.3	25.0	357 44.7	07.5	334 54.7	06.6	205 49.6	56.0
S 12	75 03.8	340 29.4	N24 25.0	12 45.3	N21 07.9	349 56.5	N23 06.6	220 52.2	S10 56.0
D 13	90 06.3	355 28.5	24.9	27 45.9	08.2	4 58.4	06.6	235 54.8	55.9
A 14	105 08.8	10 27.6	24.9	42 46.5	08.6	20 00.2	06.7	250 57.4	55.9
Y 15	120 11.2	25 26.7 . .	24.9	57 47.1 . .	08.9	35 02.1 . .	06.7	266 00.0 . .	55.9
16	135 13.7	40 25.8	24.9	72 47.7	09.3	50 03.9	06.7	281 02.5	55.8
17	150 16.2	55 24.9	24.9	87 48.3	09.6	65 05.8	06.7	296 05.1	55.8
18	165 18.6	70 24.1	N24 24.9	102 48.9	N21 10.0	80 07.6	N23 06.8	311 07.7	S10 55.8
19	180 21.1	85 23.2	24.8	117 49.5	10.3	95 09.5	06.8	326 10.3	55.7
20	195 23.5	100 22.3	24.8	132 50.1	10.7	110 11.3	06.8	341 12.9	55.7
21	210 26.0	115 21.4 . .	24.8	147 50.7 . .	11.0	125 13.1 . .	06.8	356 15.4 . .	55.7
22	225 28.5	130 20.5	24.8	162 51.3	11.4	140 15.0	06.8	11 18.0	55.6
23	240 30.9	145 19.6	24.7	177 51.9	11.7	155 16.8	06.9	26 20.6	55.6
7 00	255 33.4	160 18.7	N24 24.7	192 52.5	N21 12.1	170 18.7	N23 06.9	41 23.2	S10 55.6
01	270 35.9	175 17.8	24.7	207 53.1	12.4	185 20.5	06.9	56 25.8	55.5
02	285 38.3	190 16.9	24.6	222 53.7	12.8	200 22.4	06.9	71 28.4	55.5
03	300 40.8	205 16.0 . .	24.6	237 54.3 . .	13.1	215 24.2 . .	07.0	86 30.9 . .	55.5
04	315 43.3	220 15.2	24.6	252 54.9	13.5	230 26.0	07.0	101 33.5	55.5
05	330 45.7	235 14.3	24.5	267 55.5	13.8	245 27.9	07.0	116 36.1	55.4
06	345 48.2	250 13.4	N24 24.5	282 56.1	N21 14.2	260 29.7	N23 07.0	131 38.7	S10 55.4
07	0 50.7	265 12.5	24.5	297 56.7	14.5	275 31.6	07.1	146 41.3	55.4
08	15 53.1	280 11.6	24.4	312 57.3	14.9	290 33.4	07.1	161 43.8	55.3
F 09	30 55.6	295 10.7 . .	24.4	327 57.9 . .	15.2	305 35.3 . .	07.1	176 46.4 . .	55.3
R 10	45 58.0	310 09.8	24.4	342 58.5	15.6	320 37.1	07.1	191 49.0	55.3
I 11	61 00.5	325 08.9	24.3	357 59.1	15.9	335 38.9	07.1	206 51.6	55.2
D 12	76 03.0	340 08.0	N24 24.3	12 59.7	N21 16.3	350 40.8	N23 07.2	221 54.2	S10 55.2
A 13	91 05.4	355 07.2	24.2	28 00.3	16.6	5 42.6	07.2	236 56.7	55.2
Y 14	106 07.9	10 06.3	24.2	43 00.9	17.0	20 44.5	07.2	251 59.3	55.1
15	121 10.4	25 05.4 . .	24.1	58 01.5 . .	17.3	35 46.3 . .	07.2	267 01.9 . .	55.1
16	136 12.8	40 04.5	24.1	73 02.1	17.6	50 48.2	07.3	282 04.5	55.1
17	151 15.3	55 03.6	24.0	88 02.7	18.0	65 50.0	07.3	297 07.1	55.1
18	166 17.8	70 02.7	N24 24.0	103 03.3	N21 18.3	80 51.8	N23 07.3	312 09.6	S10 55.0
19	181 20.2	85 01.8	23.9	118 03.9	18.7	95 53.7	07.3	327 12.2	55.0
20	196 22.7	100 00.9	23.9	133 04.5	19.0	110 55.5	07.3	342 14.8	55.0
21	211 25.2	115 00.0 . .	23.8	148 05.1 . .	19.4	125 57.4 . .	07.4	357 17.4 . .	54.9
22	226 27.6	129 59.2	23.8	163 05.7	19.7	140 59.2	07.4	12 20.0	54.9
23	241 30.1	144 58.3	23.7	178 06.3	20.0	156 01.1	07.4	27 22.5	54.9
8 00	256 32.5	159 57.4	N24 23.7	193 06.9	N21 20.4	171 02.9	N23 07.4	42 25.1	S10 54.8
01	271 35.0	174 56.5	23.6	208 07.5	20.7	186 04.7	07.5	57 27.7	54.8
02	286 37.5	189 55.6	23.5	223 08.1	21.1	201 06.6	07.5	72 30.3	54.8
03	301 39.9	204 54.7 . .	23.5	238 08.7 . .	21.4	216 08.4 . .	07.5	87 32.8 . .	54.8
04	316 42.4	219 53.8	23.4	253 09.3	21.7	231 10.3	07.5	102 35.4	54.7
05	331 44.9	234 52.9	23.4	268 09.9	22.1	246 12.1	07.5	117 38.0	54.7
06	346 47.3	249 52.0	N24 23.3	283 10.5	N21 22.4	261 14.0	N23 07.6	132 40.6	S10 54.7
07	1 49.8	264 51.2	23.2	298 11.1	22.8	276 15.8	07.6	147 43.2	54.6
S 08	16 52.3	279 50.3	23.2	313 11.7	23.1	291 17.6	07.6	162 45.7	54.6
A 09	31 54.7	294 49.4 . .	23.1	328 12.3 . .	23.4	306 19.5 . .	07.6	177 48.3 . .	54.6
T 10	46 57.2	309 48.5	23.0	343 12.9	23.8	321 21.3	07.6	192 50.9	54.6
U 11	61 59.7	324 47.6	22.9	358 13.5	24.1	336 23.2	07.7	207 53.5	54.5
R 12	77 02.1	339 46.7	N24 22.9	13 14.1	N21 24.5	351 25.0	N23 07.7	222 56.0	S10 54.5
D 13	92 04.6	354 45.8	22.8	28 14.7	24.8	6 26.9	07.7	237 58.6	54.5
A 14	107 07.0	9 44.9	22.7	43 15.3	25.1	21 28.7	07.7	253 01.2	54.4
Y 15	122 09.5	24 44.1 . .	22.6	58 15.9 . .	25.5	36 30.5 . .	07.8	268 03.8 . .	54.4
16	137 12.0	39 43.2	22.6	73 16.5	25.8	51 32.4	07.8	283 06.3	54.4
17	152 14.4	54 42.3	22.5	88 17.1	26.1	66 34.2	07.8	298 08.9	54.3
18	167 16.9	69 41.4	N24 22.4	103 17.7	N21 26.5	81 36.1	N23 07.8	313 11.5	S10 54.3
19	182 19.4	84 40.5	22.3	118 18.3	26.8	96 37.9	07.8	328 14.1	54.3
20	197 21.8	99 39.6	22.2	133 18.9	27.1	111 39.8	07.9	343 16.7	54.3
21	212 24.3	114 38.7 . .	22.2	148 19.5 . .	27.5	126 41.6 . .	07.9	358 19.2 . .	54.2
22	227 26.8	129 37.9	22.1	163 20.1	27.8	141 43.4	07.9	13 21.8	54.2
23	242 29.2	144 37.0	22.0	178 20.7	28.1	156 45.3	07.9	28 24.4	54.2
Mer. Pass.	h m 6 56.6	v −0.9	d 0.0	v 0.6	d 0.3	v 1.8	d 0.0	v 2.6	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.7	S40 15.0
Achernar	335 27.2	S57 09.9
Acrux	173 09.0	S63 10.8
Adhara	255 12.9	S28 59.7
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.5	N55 53.4
Alkaid	152 58.6	N49 15.0
Al Na'ir	27 43.7	S46 53.4
Alnilam	275 46.7	S 1 11.8
Alphard	217 56.2	S 8 43.3
Alphecca	126 10.7	N26 40.3
Alpheratz	357 43.6	N29 09.8
Altair	62 08.0	N 8 54.4
Ankaa	353 15.9	S42 13.7
Antares	112 25.9	S26 27.6
Arcturus	145 55.5	N19 06.8
Atria	107 27.1	S69 03.0
Avior	234 18.4	S59 33.6
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.6	N 7 24.4
Canopus	263 56.7	S52 42.4
Capella	280 34.9	N46 00.5
Deneb	49 31.2	N45 19.7
Denebola	182 33.6	N14 29.8
Diphda	348 56.1	S17 54.7
Dubhe	193 51.8	N61 40.9
Elnath	278 13.0	N28 36.9
Eltanin	90 45.6	N51 29.3
Enif	33 47.0	N 9 56.3
Fomalhaut	15 24.0	S29 32.8
Gacrux	172 00.6	S57 11.6
Gienah	175 52.2	S17 37.2
Hadar	148 47.4	S60 26.5
Hamal	328 01.0	N23 31.4
Kaus Aust.	83 43.4	S34 22.5
Kochab	137 19.1	N74 06.2
Markab	13 38.3	N15 16.6
Menkar	314 15.3	N 4 08.4
Menkent	148 07.3	S36 26.3
Miaplacidus	221 40.1	S69 46.8
Mirfak	308 40.8	N49 54.3
Nunki	75 58.0	S26 16.6
Peacock	53 18.9	S56 41.1
Pollux	243 28.1	N27 59.5
Procyon	245 00.0	N 5 11.2
Rasalhague	96 06.1	N12 33.1
Regulus	207 43.6	N11 54.0
Rigel	281 12.4	S 8 11.4
Rigil Kent.	139 51.1	S60 53.5
Sabik	102 12.2	S15 44.4
Schedar	349 40.7	N56 36.4
Shaula	96 21.5	S37 06.6
Sirius	258 34.1	S16 44.3
Spica	158 31.1	S11 14.0
Suhail	222 52.7	S43 29.6
Vega	80 38.6	N38 47.8
Zuben'ubi	137 05.1	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	264 45.3	13 20
Mars	297 19.1	11 08
Jupiter	274 45.3	12 37
Saturn	145 49.8	21 11

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 6	Moonrise 7	Moonrise 8	Moonrise 9
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
6 00	180 21.1	N22 38.6	210 47.7	12.5	N16 44.4	6.0	54.6	N 72							
01	195 21.0	38.8	225 19.2	12.5	16 50.4	5.9	54.6	N 70				00 16	00 10	00 01	
02	210 20.8	39.1	239 50.7	12.4	16 56.3	5.8	54.6	68				00 46	00 57	01 18	02 01
03	225 20.7 . .	39.3	254 22.1	12.5	17 02.1	5.7	54.6	66	////	////	00 44	01 09	01 27	01 56	02 40
04	240 20.6	39.6	268 53.6	12.4	17 07.8	5.7	54.6	64	////	////	01 44	01 27	01 50	02 22	03 08
05	255 20.5	39.9	283 25.0	12.4	17 13.5	5.5	54.6	62	////	////	02 18	01 42	02 08	02 43	03 29
06	270 20.4	N22 40.1	297 56.4	12.4	N17 19.0	5.5	54.5	60	////	01 09	02 42	01 54	02 23	03 00	03 46
07	285 20.3	40.4	312 27.8	12.4	17 24.5	5.4	54.5	N 58	////	01 50	03 01	02 05	02 36	03 14	04 01
T 08	300 20.2	40.6	326 59.2	12.3	17 29.9	5.3	54.5	56	////	02 17	03 17	02 14	02 47	03 26	04 13
H 09	315 20.0 . .	40.9	341 30.5	12.4	17 35.2	5.3	54.5	54	01 03	02 37	03 30	02 23	02 56	03 37	04 24
U 10	330 19.9	41.1	356 01.9	12.3	17 40.5	5.1	54.5	52	01 41	02 54	03 42	02 30	03 05	03 46	04 33
R 11	345 19.8	41.4	10 33.2	12.3	17 45.6	5.1	54.5	50	02 06	03 09	03 52	02 37	03 13	03 55	04 42
S 12	0 19.7	N22 41.6	25 04.5	12.3	N17 50.7	5.0	54.5	45	02 48	03 37	04 14	02 52	03 30	04 12	05 00
D 13	15 19.6	41.9	39 35.8	12.3	17 55.7	4.9	54.4	N 40	03 18	03 59	04 31	03 04	03 43	04 27	05 15
A 14	30 19.5	42.1	54 07.1	12.2	18 00.6	4.8	54.4	35	03 40	04 16	04 46	03 14	03 55	04 40	05 27
Y 15	45 19.3 . .	42.4	68 38.3	12.3	18 05.4	4.7	54.4	30	03 58	04 31	04 58	03 23	04 05	04 50	05 38
16	60 19.2	42.6	83 09.6	12.2	18 10.1	4.7	54.4	20	04 26	04 55	05 20	03 38	04 23	05 09	05 57
17	75 19.1	42.9	97 40.8	12.2	18 14.8	4.5	54.4	N 10	04 48	05 15	05 38	03 52	04 38	05 25	06 13
18	90 19.0	N22 43.1	112 12.0	12.2	N18 19.3	4.5	54.4	0	05 07	05 33	05 55	04 05	04 53	05 41	06 29
19	105 18.9	43.4	126 43.2	12.1	18 23.8	4.4	54.4	S 10	05 23	05 49	06 12	04 18	05 07	05 56	06 44
20	120 18.8	43.6	141 14.3	12.2	18 28.2	4.3	54.4	20	05 39	06 06	06 30	04 32	05 22	06 12	07 00
21	135 18.6 . .	43.9	155 45.5	12.2	18 32.5	4.2	54.4	30	05 55	06 24	06 51	04 48	05 40	06 31	07 19
22	150 18.5	44.1	170 16.7	12.1	18 36.7	4.1	54.3	35	06 03	06 35	07 03	04 57	05 51	06 42	07 30
23	165 18.4	44.3	184 47.8	12.1	18 40.8	4.0	54.3	40	06 12	06 46	07 16	05 07	06 03	06 55	07 43
7 00	180 18.3	N22 44.6	199 18.9	12.1	N18 44.8	4.0	54.3	45	06 22	06 59	07 33	05 20	06 17	07 09	07 57
01	195 18.2	44.8	213 50.0	12.1	18 48.8	3.8	54.3	S 50	06 33	07 14	07 52	05 35	06 34	07 28	08 16
02	210 18.1	45.1	228 21.1	12.1	18 52.6	3.8	54.3	52	06 38	07 22	08 02	05 42	06 42	07 36	08 24
03	225 17.9 . .	45.3	242 52.2	12.0	18 56.4	3.7	54.3	54	06 44	07 29	08 13	05 50	06 51	07 46	08 34
04	240 17.8	45.5	257 23.2	12.1	19 00.1	3.6	54.3	56	06 49	07 38	08 25	05 59	07 01	07 57	08 45
05	255 17.7	45.8	271 54.3	12.0	19 03.7	3.5	54.3	58	06 56	07 48	08 39	06 09	07 13	08 09	08 57
06	270 17.6	N22 46.0	286 25.3	12.1	N19 07.2	3.4	54.3	S 60	07 03	07 59	08 55	06 21	07 26	08 24	09 11
07	285 17.5	46.3	300 56.4	12.0	19 10.6	3.3	54.2								
08	300 17.4	46.5	315 27.4	12.0	19 13.9	3.2	54.2								
F 09	315 17.2 . .	46.7	329 58.4	12.0	19 17.1	3.2	54.2								
R 10	330 17.1	47.0	344 29.4	11.9	19 20.3	3.0	54.2								
I 11	345 17.0	47.2	359 00.3	12.0	19 23.3	3.0	54.2								
D 12	0 16.9	N22 47.4	13 31.3	12.0	N19 26.3	2.8	54.2								
A 13	15 16.8	47.7	28 02.3	11.9	19 29.1	2.8	54.2								
Y 14	30 16.6	47.9	42 33.2	12.0	19 31.9	2.7	54.2								
15	45 16.5 . .	48.1	57 04.2	11.9	19 34.6	2.6	54.2								
16	60 16.4	48.4	71 35.1	11.9	19 37.2	2.5	54.2								
17	75 16.3	48.6	86 06.0	12.0	19 39.7	2.4	54.2								
18	90 16.2	N22 48.8	100 37.0	11.9	N19 42.1	2.3	54.2								
19	105 16.0	49.1	115 07.9	11.9	19 44.4	2.2	54.1								
20	120 15.9	49.3	129 38.8	11.9	19 46.6	2.2	54.1								
21	135 15.8 . .	49.5	144 09.7	11.9	19 48.8	2.0	54.1								
22	150 15.7	49.7	158 40.6	11.9	19 50.8	1.9	54.1								
23	165 15.6	50.0	173 11.5	11.9	19 52.7	1.9	54.1								
8 00	180 15.4	N22 50.2	187 42.4	11.8	N19 54.6	1.8	54.1								
01	195 15.3	50.4	202 13.2	11.9	19 56.4	1.6	54.1								
02	210 15.2	50.6	216 44.1	11.9	19 58.0	1.6	54.1								
03	225 15.1 . .	50.9	231 15.0	11.9	19 59.6	1.5	54.1								
04	240 15.0	51.1	245 45.9	11.8	20 01.1	1.4	54.1								
05	255 14.8	51.3	260 16.7	11.9	20 02.5	1.3	54.1								
06	270 14.7	N22 51.5	274 47.6	11.9	N20 03.8	1.2	54.1								
07	285 14.6	51.8	289 18.5	11.8	20 05.0	1.1	54.1								
S 08	300 14.5	52.0	303 49.3	11.9	20 06.1	1.0	54.1								
A 09	315 14.4 . .	52.2	318 20.2	11.8	20 07.1	0.9	54.0								
T 10	330 14.2	52.4	332 51.0	11.9	20 08.0	0.8	54.0								
U 11	345 14.1	52.6	347 21.9	11.9	20 08.8	0.7	54.0								
R 12	0 14.0	N22 52.9	1 52.8	11.8	N20 09.5	0.7	54.0	S 50	16 05	16 43	17 24	14 53	15 32	16 16	17 06
D 13	15 13.9	53.1	16 23.6	11.9	20 10.2	0.5	54.0	52	15 56	16 36	17 19	14 46	15 23	16 07	16 58
A 14	30 13.7	53.3	30 54.5	11.9	20 10.7	0.5	54.0	54	15 45	16 28	17 14	14 37	15 14	15 58	16 48
Y 15	45 13.6 . .	53.5	45 25.4	11.8	20 11.2	0.3	54.0	56	15 33	16 19	17 08	14 28	15 04	15 47	16 38
16	60 13.5	53.7	59 56.2	11.9	20 11.5	0.3	54.0	58	15 19	16 10	17 02	14 18	14 52	15 34	16 25
17	75 13.4	53.9	74 27.1	11.9	20 11.8	0.1	54.0	S 60	15 02	15 59	16 55	14 06	14 38	15 20	16 11
18	90 13.3	N22 54.1	88 58.0	11.9	N20 11.9	0.1	54.0								
19	105 13.1	54.4	103 28.9	11.9	20 12.0	0.0	54.0								
20	120 13.0	54.6	117 59.8	11.9	20 12.0	0.1	54.0								
21	135 12.9 . .	54.8	132 30.7	11.9	20 11.9	0.2	54.0								
22	150 12.8	55.0	147 01.6	11.9	20 11.7	0.3	54.0								
23	165 12.6	55.2	161 32.5	11.9	N20 11.4	0.4	54.0								
	SD 15.8	d 0.2	SD	14.8		14.8		14.7							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 6	Moonset 7	Moonset 8	Moonset 9
°	h m	h m	h m	h m	h m	h m	h m
N 72							
N 70				21 03	22 52		
68				20 17	21 35	22 33	23 06
66	23 19	////	////	19 47	20 58	21 53	22 31
64	22 15	////	////	19 25	20 31	21 25	22 05
62	21 41	////	////	19 07	20 11	21 04	21 46
60	21 17	22 51	////	18 53	19 54	20 47	21 29
N 58	20 58	22 09	////	18 40	19 40	20 32	21 16
56	20 42	21 42	////	18 29	19 28	20 20	21 04
54	20 28	21 21	22 57	18 20	19 18	20 09	20 53
52	20 16	21 04	22 18	18 11	19 08	20 00	20 44
50	20 06	20 50	21 53	18 04	19 00	19 51	20 36
45	19 44	20 21	21 10	17 47	18 42	19 33	20 18
N 40	19 27	19 59	20 40	17 34	18 28	19 18	20 04
35	19 12	19 42	20 18	17 23	18 16	19 05	19 52
30	18 59	19 27	20 00	17 13	18 05	18 55	19 41
20	18 38	19 02	19 32	16 56	17 47	18 36	19 23
N 10	18 20	18 43	19 10	16 42	17 31	18 19	19 07
0	18 03	18 25	18 51	16 28	17 16	18 04	18 52
S 10	17 46	18 08	18 35	16 14	17 01	17 48	18 37
20	17 28	17 51	18 19	15 59	16 45	17 32	18 21
30	17 07	17 33	18 03	15 43	16 27	17 13	18 02
35	16 55	17 23	17 55	15 33	16 16	17 02	17 51
40	16 41	17 12	17 46	15 22	16 04	16 49	17 39
45	16 25	16 59	17 36	15 09	15 49	16 34	17 24
S 50	16 05	16 43	17 24	14 53	15 32	16 16	17 06
52	15 56	16 36	17 19	14 46	15 23	16 07	16 58
54	15 45	16 28	17 14	14 37	15 14	15 58	16 48
56	15 33	16 19	17 08	14 28	15 04	15 47	16 38
58	15 19	16 10	17 02	14 18	14 52	15 34	16 25
S 60	15 02	15 59	16 55	14 06	14 38	15 20	16 11

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
6	01 25	01 19	11 59	10 16	22 40	27	4
7	01 13	01 08	11 59	11 04	23 28	28	1
8	01 02	00 56	11 59	11 52	24 16	29	0

UT	ARIES	VENUS −3.8		MARS +1.4		JUPITER −1.9		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
9 00	257 31.7	159 36.1	N24 21.9	193 21.3	N21 28.5	171 47.1	N23 07.9	43 27.0	S10 54.1
01	272 34.2	174 35.2	21.8	208 21.9	28.8	186 49.0	08.0	58 29.5	54.1
02	287 36.6	189 34.3	21.7	223 22.5	29.1	201 50.8	08.0	73 32.1	54.1
03	302 39.1	204 33.4 . .	21.6	238 23.1 . .	29.5	216 52.7 . .	08.0	88 34.7 . .	54.1
04	317 41.5	219 32.5	21.5	253 23.7	29.8	231 54.5	08.0	103 37.3	54.0
05	332 44.0	234 31.7	21.4	268 24.3	30.1	246 56.3	08.1	118 39.8	54.0
06	347 46.5	249 30.8	N24 21.3	283 24.9	N21 30.5	261 58.2	N23 08.1	133 42.4	S10 54.0
07	2 48.9	264 29.9	21.2	298 25.5	30.8	277 00.0	08.1	148 45.0	53.9
08	17 51.4	279 29.0	21.2	313 26.1	31.1	292 01.9	08.1	163 47.6	53.9
09	32 53.9	294 28.1 . .	21.1	328 26.7 . .	31.5	307 03.7 . .	08.1	178 50.1 . .	53.9
10	47 56.3	309 27.2	21.0	343 27.3	31.8	322 05.6	08.2	193 52.7	53.9
11	62 58.8	324 26.3	20.9	358 27.9	32.1	337 07.4	08.2	208 55.3	53.8
12	78 01.3	339 25.5	N24 20.7	13 28.5	N21 32.4	352 09.2	N23 08.2	223 57.8	S10 53.8
13	93 03.7	354 24.6	20.6	28 29.1	32.8	7 11.1	08.2	239 00.4	53.8
14	108 06.2	9 23.7	20.5	43 29.7	33.1	22 12.9	08.2	254 03.0	53.7
15	123 08.6	24 22.8 . .	20.4	58 30.3 . .	33.4	37 14.8 . .	08.3	269 05.6 . .	53.7
16	138 11.1	39 21.9	20.3	73 30.9	33.7	52 16.6	08.3	284 08.1	53.7
17	153 13.6	54 21.0	20.2	88 31.5	34.1	67 18.4	08.3	299 10.7	53.7
18	168 16.0	69 20.2	N24 20.1	103 32.1	N21 34.4	82 20.3	N23 08.3	314 13.3	S10 53.6
19	183 18.5	84 19.3	20.0	118 32.7	34.7	97 22.1	08.3	329 15.9	53.6
20	198 21.0	99 18.4	19.9	133 33.3	35.1	112 24.0	08.4	344 18.4	53.6
21	213 23.4	114 17.5 . .	19.8	148 33.9 . .	35.4	127 25.8 . .	08.4	359 21.0 . .	53.6
22	228 25.9	129 16.6	19.7	163 34.4	35.7	142 27.7	08.4	14 23.6	53.5
23	243 28.4	144 15.7	19.5	178 35.0	36.0	157 29.5	08.4	29 26.1	53.5
10 00	258 30.8	159 14.9	N24 19.4	193 35.6	N21 36.4	172 31.3	N23 08.4	44 28.7	S10 53.5
01	273 33.3	174 14.0	19.3	208 36.2	36.7	187 33.2	08.5	59 31.3	53.4
02	288 35.8	189 13.1	19.2	223 36.8	37.0	202 35.0	08.5	74 33.9	53.4
03	303 38.2	204 12.2 . .	19.1	238 37.4 . .	37.3	217 36.9 . .	08.5	89 36.4 . .	53.4
04	318 40.7	219 11.3	18.9	253 38.0	37.6	232 38.7	08.5	104 39.0	53.4
05	333 43.1	234 10.5	18.8	268 38.6	38.0	247 40.5	08.5	119 41.6	53.3
06	348 45.6	249 09.6	N24 18.7	283 39.2	N21 38.3	262 42.4	N23 08.6	134 44.2	S10 53.3
07	3 48.1	264 08.7	18.6	298 39.8	38.6	277 44.2	08.6	149 46.7	53.3
08	18 50.5	279 07.8	18.4	313 40.4	38.9	292 46.1	08.6	164 49.3	53.3
09	33 53.0	294 06.9 . .	18.3	328 41.0 . .	39.3	307 47.9 . .	08.6	179 51.9 . .	53.2
10	48 55.5	309 06.0	18.2	343 41.6	39.6	322 49.8	08.6	194 54.4	53.2
11	63 57.9	324 05.2	18.0	358 42.2	39.9	337 51.6	08.7	209 57.0	53.2
12	79 00.4	339 04.3	N24 17.9	13 42.8	N21 40.2	352 53.4	N23 08.7	224 59.6	S10 53.1
13	94 02.9	354 03.4	17.8	28 43.4	40.5	7 55.3	08.7	240 02.1	53.1
14	109 05.3	9 02.5	17.6	43 44.0	40.9	22 57.1	08.7	255 04.7	53.1
15	124 07.8	24 01.6 . .	17.5	58 44.6 . .	41.2	37 59.0 . .	08.7	270 07.3 . .	53.1
16	139 10.3	39 00.8	17.4	73 45.2	41.5	53 00.8	08.8	285 09.9	53.0
17	154 12.7	53 59.9	17.2	88 45.8	41.8	68 02.6	08.8	300 12.4	53.0
18	169 15.2	68 59.0	N24 17.1	103 46.4	N21 42.1	83 04.5	N23 08.8	315 15.0	S10 53.0
19	184 17.6	83 58.1	17.0	118 47.0	42.4	98 06.3	08.8	330 17.6	53.0
20	199 20.1	98 57.2	16.8	133 47.6	42.8	113 08.2	08.8	345 20.1	52.9
21	214 22.6	113 56.4 . .	16.7	148 48.2 . .	43.1	128 10.0 . .	08.9	0 22.7 . .	52.9
22	229 25.0	128 55.5	16.5	163 48.8	43.4	143 11.9	08.9	15 25.3	52.9
23	244 27.5	143 54.6	16.4	178 49.4	43.7	158 13.7	08.9	30 27.8	52.9
11 00	259 30.0	158 53.7	N24 16.2	193 50.0	N21 44.0	173 15.5	N23 08.9	45 30.4	S10 52.8
01	274 32.4	173 52.8	16.1	208 50.6	44.3	188 17.4	08.9	60 33.0	52.8
02	289 34.9	188 52.0	15.9	223 51.1	44.7	203 19.2	08.9	75 35.5	52.8
03	304 37.4	203 51.1 . .	15.8	238 51.7 . .	45.0	218 21.1 . .	09.0	90 38.1 . .	52.8
04	319 39.8	218 50.2	15.6	253 52.3	45.3	233 22.9	09.0	105 40.7	52.7
05	334 42.3	233 49.3	15.5	268 52.9	45.6	248 24.7	09.0	120 43.3	52.7
06	349 44.8	248 48.5	N24 15.3	283 53.5	N21 45.9	263 26.6	N23 09.0	135 45.8	S10 52.7
07	4 47.2	263 47.6	15.2	298 54.1	46.2	278 28.4	09.0	150 48.4	52.6
08	19 49.7	278 46.7	15.0	313 54.7	46.5	293 30.3	09.1	165 51.0	52.6
09	34 52.1	293 45.8 . .	14.8	328 55.3 . .	46.8	308 32.1 . .	09.1	180 53.5 . .	52.6
10	49 54.6	308 44.9	14.7	343 55.9	47.2	323 34.0	09.1	195 56.1	52.6
11	64 57.1	323 44.1	14.5	358 56.5	47.5	338 35.8	09.1	210 58.7	52.5
12	79 59.5	338 43.2	N24 14.4	13 57.1	N21 47.8	353 37.6	N23 09.1	226 01.2	S10 52.5
13	95 02.0	353 42.3	14.2	28 57.7	48.1	8 39.5	09.2	241 03.8	52.5
14	110 04.5	8 41.4	14.0	43 58.3	48.4	23 41.3	09.2	256 06.4	52.5
15	125 06.9	23 40.6 . .	13.9	58 58.9 . .	48.7	38 43.2 . .	09.2	271 08.9 . .	52.4
16	140 09.4	38 39.7	13.7	73 59.5	49.0	53 45.0	09.2	286 11.5	52.4
17	155 11.9	53 38.8	13.5	89 00.1	49.3	68 46.8	09.2	301 14.1	52.4
18	170 14.3	68 37.9	N24 13.4	104 00.7	N21 49.6	83 48.7	N23 09.2	316 16.6	S10 52.4
19	185 16.8	83 37.1	13.2	119 01.3	49.9	98 50.5	09.3	331 19.2	52.3
20	200 19.2	98 36.2	13.0	134 01.9	50.3	113 52.4	09.3	346 21.8	52.3
21	215 21.7	113 35.3 . .	12.8	149 02.5 . .	50.6	128 54.2 . .	09.3	1 24.3 . .	52.3
22	230 24.2	128 34.4	12.7	164 03.1	50.9	143 56.0	09.3	16 26.9	52.3
23	245 26.6	143 33.6	12.5	179 03.7	51.2	158 57.9	09.3	31 29.5	52.2
Mer.Pass.	h m 6 44.8	v −0.9	d 0.1	v 0.6	d 0.3	v 1.8	d 0.0	v 2.6	d 0.0

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.7	S40 15.0
Achernar	335 27.2	S57 09.9
Acrux	173 09.0	S63 10.8
Adhara	255 12.9	S28 59.7
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.5	N55 53.4
Alkaid	152 58.6	N49 15.0
Al Na'ir	27 43.6	S46 53.4
Alnilam	275 46.7	S 1 11.8
Alphard	217 56.3	S 8 43.3
Alphecca	126 10.7	N26 40.3
Alpheratz	357 43.6	N29 09.8
Altair	62 08.0	N 8 54.4
Ankaa	353 15.9	S42 13.7
Antares	112 25.9	S26 27.6
Arcturus	145 55.5	N19 06.8
Atria	107 27.1	S69 03.0
Avior	234 18.4	S59 33.5
Bellatrix	278 32.4	N 6 21.5
Betelgeuse	271 01.6	N 7 24.4
Canopus	263 56.7	S52 42.4
Capella	280 34.9	N46 00.5
Deneb	49 31.1	N45 19.7
Denebola	182 33.6	N14 29.8
Diphda	348 56.0	S17 54.7
Dubhe	193 51.8	N61 40.9
Elnath	278 13.0	N28 36.9
Eltanin	90 45.6	N51 29.3
Enif	33 47.0	N 9 56.3
Fomalhaut	15 24.0	S29 32.8
Gacrux	172 00.6	S57 11.6
Gienah	175 52.2	S17 37.2
Hadar	148 47.4	S60 26.5
Hamal	328 01.0	N23 31.4
Kaus Aust.	83 43.4	S34 22.5
Kochab	137 19.2	N74 06.2
Markab	13 38.3	N15 16.7
Menkar	314 15.3	N 4 08.4
Menkent	148 07.3	S36 26.3
Miaplacidus	221 40.1	S69 46.8
Mirfak	308 40.8	N49 54.3
Nunki	75 58.0	S26 16.6
Peacock	53 18.9	S56 41.1
Pollux	243 28.1	N27 59.5
Procyon	245 00.0	N 5 11.2
Rasalhague	96 06.1	N12 33.1
Regulus	207 43.6	N11 54.0
Rigel	281 12.4	S 8 11.3
Rigil Kent.	139 51.1	S60 53.6
Sabik	102 12.2	S15 44.4
Schedar	349 40.7	N56 36.4
Shaula	96 21.5	S37 06.6
Sirius	258 34.1	S16 44.3
Spica	158 31.1	S11 14.0
Suhail	222 52.7	S43 29.6
Vega	80 38.5	N38 47.9
Zuben'ubi	137 05.1	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	260 44.0	13 24
Mars	295 04.8	11 05
Jupiter	274 00.5	12 28
Saturn	145 57.9	20 58

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		9	10	11	12
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
9 00	180 12.5	N22 55.4	176 03.4	11.9	N20 11.0	0.5	54.0	N 72						02 27	04 55
01	195 12.4	55.6	190 34.3	11.9	20 10.5	0.6	54.0	N 70					02 06	03 50	05 31
02	210 12.3	55.8	205 05.2	12.0	20 09.9	0.7	54.0	68				02 01	03 07	04 29	05 56
03	225 12.2 . .	56.0	219 36.2	11.9	20 09.2	0.7	54.0	66	////	////	00 28	02 40	03 42	04 55	06 16
04	240 12.0	56.2	234 07.1	12.0	20 08.5	0.9	54.0	64	////	////	01 39	03 08	04 07	05 16	06 31
05	255 11.9	56.4	248 38.1	11.9	20 07.6	1.0	54.0	62	////	////	02 14	03 29	04 26	05 32	06 44
06	270 11.8	N22 56.6	263 09.0	12.0	N20 06.6	1.0	54.0	60	////	01 02	02 39	03 46	04 42	05 46	06 55
07	285 11.7	56.9	277 40.0	12.0	20 05.6	1.2	54.0	N 58	////	01 46	02 59	04 01	04 56	05 58	07 04
08	300 11.5	57.1	292 11.0	12.0	20 04.4	1.2	54.0	56	////	02 14	03 15	04 13	05 07	06 08	07 13
09	315 11.4 . .	57.3	306 42.0	12.0	20 03.2	1.3	54.0	54	00 57	02 35	03 29	04 24	05 18	06 17	07 20
10	330 11.3	57.5	321 13.0	12.0	20 01.9	1.4	54.0	52	01 37	02 52	03 41	04 33	05 27	06 25	07 27
11	345 11.2	57.7	335 44.0	12.1	20 00.5	1.5	54.0	50	02 03	03 07	03 51	04 42	05 35	06 32	07 33
12	0 11.0	N22 57.9	350 15.1	12.0	N19 59.0	1.6	54.0	45	02 47	03 36	04 13	05 00	05 52	06 47	07 45
13	15 10.9	58.1	4 46.1	12.1	19 57.4	1.7	53.9	N 40	03 17	03 58	04 31	05 15	06 06	07 00	07 56
14	30 10.8	58.3	19 17.2	12.0	19 55.7	1.8	53.9	35	03 39	04 16	04 46	05 27	06 18	07 11	08 05
15	45 10.7 . .	58.5	33 48.2	12.1	19 53.9	1.9	53.9	30	03 58	04 31	04 58	05 38	06 28	07 20	08 13
16	60 10.5	58.7	48 19.3	12.1	19 52.0	2.0	53.9	20	04 26	04 55	05 20	05 57	06 46	07 36	08 26
17	75 10.4	58.9	62 50.4	12.1	19 50.0	2.0	53.9	N 10	04 49	05 16	05 39	06 13	07 02	07 50	08 38
18	90 10.3	N22 59.1	77 21.5	12.2	N19 48.0	2.2	53.9	0	05 07	05 33	05 56	06 29	07 16	08 03	08 49
19	105 10.2	59.2	91 52.7	12.1	19 45.8	2.2	53.9	S 10	05 24	05 50	06 13	06 44	07 31	08 16	09 00
20	120 10.0	59.4	106 23.8	12.2	19 43.6	2.3	53.9	20	05 40	06 07	06 31	07 00	07 46	08 30	09 12
21	135 09.9 . .	59.6	120 55.0	12.2	19 41.3	2.5	53.9	30	05 56	06 26	06 52	07 19	08 04	08 46	09 25
22	150 09.8	22 59.8	135 26.2	12.2	19 38.8	2.5	53.9	35	06 04	06 36	07 04	07 30	08 15	08 55	09 33
23	165 09.7	23 00.0	149 57.4	12.2	19 36.3	2.6	53.9	40	06 14	06 48	07 18	07 43	08 26	09 06	09 42
10 00	180 09.5	N23 00.2	164 28.6	12.2	N19 33.7	2.7	53.9	45	06 24	07 01	07 34	07 57	08 40	09 18	09 52
01	195 09.4	00.4	178 59.8	12.3	19 31.0	2.7	53.9	S 50	06 35	07 16	07 55	08 16	08 57	09 33	10 04
02	210 09.3	00.6	193 31.1	12.3	19 28.3	2.9	53.9	52	06 40	07 24	08 04	08 24	09 05	09 40	10 10
03	225 09.2 . .	00.8	208 02.4	12.2	19 25.4	3.0	53.9	54	06 46	07 32	08 15	08 34	09 14	09 48	10 16
04	240 09.0	01.0	222 33.6	12.4	19 22.4	3.0	53.9	56	06 52	07 41	08 27	08 45	09 24	09 57	10 23
05	255 08.9	01.2	237 05.0	12.3	19 19.4	3.1	53.9	58	06 58	07 51	08 42	08 57	09 36	10 07	10 31
06	270 08.8	N23 01.4	251 36.3	12.3	N19 16.3	3.2	53.9	S 60	07 05	08 02	08 59	09 11	09 49	10 18	10 40
07	285 08.7	01.5	266 07.6	12.4	19 13.1	3.3	54.0								
08	300 08.5	01.7	280 39.0	12.4	19 09.8	3.4	54.0								
09	315 08.4 . .	01.9	295 10.4	12.4	19 06.4	3.5	54.0								
10	330 08.3	02.1	309 41.8	12.4	19 02.9	3.6	54.0								
11	345 08.2	02.3	324 13.2	12.5	18 59.3	3.6	54.0								
12	0 08.0	N23 02.5	338 44.7	12.5	N18 55.7	3.8	54.0								
13	15 07.9	02.7	353 16.2	12.5	18 51.9	3.8	54.0								
14	30 07.8	02.8	7 47.7	12.5	18 48.1	3.9	54.0								
15	45 07.6 . .	03.0	22 19.2	12.5	18 44.2	4.0	54.0								
16	60 07.5	03.2	36 50.7	12.6	18 40.2	4.1	54.0								
17	75 07.4	03.4	51 22.3	12.6	18 36.1	4.1	54.0								
18	90 07.3	N23 03.6	65 53.9	12.6	N18 32.0	4.3	54.0								
19	105 07.1	03.7	80 25.5	12.6	18 27.7	4.3	54.0								
20	120 07.0	03.9	94 57.1	12.7	18 23.4	4.4	54.0								
21	135 06.9 . .	04.1	109 28.8	12.7	18 19.0	4.5	54.0								
22	150 06.8	04.3	124 00.5	12.7	18 14.5	4.6	54.0								
23	165 06.6	04.4	138 32.2	12.7	18 09.9	4.6	54.0								
11 00	180 06.5	N23 04.6	153 03.9	12.8	N18 05.3	4.8	54.0								
01	195 06.4	04.8	167 35.7	12.7	18 00.5	4.8	54.0								
02	210 06.2	05.0	182 07.4	12.9	17 55.7	4.9	54.0								
03	225 06.1 . .	05.1	196 39.3	12.8	17 50.8	5.0	54.0								
04	240 06.0	05.3	211 11.1	12.8	17 45.8	5.0	54.0								
05	255 05.9	05.5	225 42.9	12.9	17 40.8	5.1	54.0								
06	270 05.7	N23 05.7	240 14.8	12.9	N17 35.7	5.3	54.0								
07	285 05.6	05.8	254 46.7	12.9	17 30.4	5.3	54.0								
08	300 05.5	06.0	269 18.6	13.0	17 25.1	5.3	54.0								
09	315 05.3 . .	06.2	283 50.6	13.0	17 19.8	5.5	54.1								
10	330 05.2	06.3	298 22.6	13.0	17 14.3	5.5	54.1								
11	345 05.1	06.5	312 54.6	13.0	17 08.8	5.6	54.1								
12	0 05.0	N23 06.7	327 26.6	13.1	N17 03.2	5.7	54.1								
13	15 04.8	06.8	341 58.7	13.0	16 57.5	5.7	54.1								
14	30 04.7	07.0	356 30.7	13.1	16 51.8	5.9	54.1								
15	45 04.6 . .	07.2	11 02.8	13.2	16 45.9	5.9	54.1								
16	60 04.4	07.3	25 35.0	13.1	16 40.0	6.0	54.1								
17	75 04.3	07.5	40 07.1	13.2	16 34.0	6.0	54.1								
18	90 04.2	N23 07.7	54 39.3	13.2	N16 28.0	6.1	54.1								
19	105 04.1	07.8	69 11.5	13.2	16 21.9	6.2	54.1								
20	120 03.9	08.0	83 43.7	13.3	16 15.7	6.3	54.1								
21	135 03.8 . .	08.1	98 16.0	13.3	16 09.4	6.4	54.1								
22	150 03.7	08.3	112 48.3	13.3	16 03.0	6.4	54.1								
23	165 03.5	08.5	127 20.6	13.3	N15 56.6	6.5	54.2								
	SD 15.8	d 0.2	SD	14.7		14.7		14.7							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	9	10	11	12
°	h m	h m	h m	h m	h m	h m	h m
N 72						01 24	00 33
N 70					00 07	(00 01) (23 56)	23 51
68				23 06	23 22	23 29	23 33
66	23 38	////	////	22 31	22 54	23 09	23 19
64	22 21	////	////	22 05	22 33	22 53	23 07
62	21 46	////	////	21 46	22 16	22 39	22 57
60	21 21	22 59	////	21 29	22 02	22 28	22 48
N 58	21 01	22 14	////	21 16	21 50	22 18	22 40
56	20 45	21 46	////	21 04	21 40	22 09	22 34
54	20 31	21 24	23 04	20 53	21 30	22 01	22 28
52	20 19	21 07	22 23	20 44	21 22	21 54	22 22
50	20 08	20 52	21 56	20 36	21 15	21 48	22 17
45	19 46	20 23	21 12	20 18	20 59	21 35	22 06
N 40	19 28	20 01	20 42	20 04	20 46	21 23	21 57
35	19 14	19 43	20 20	19 52	20 35	21 14	21 50
30	19 01	19 28	20 01	19 41	20 25	21 05	21 43
20	18 39	19 04	19 33	19 23	20 08	20 50	21 31
N 10	18 20	18 43	19 10	19 07	19 53	20 38	21 21
0	18 03	18 26	18 52	18 52	19 39	20 25	21 11
S 10	17 46	18 09	18 35	18 37	19 25	20 13	21 01
20	17 28	17 52	18 19	18 21	19 10	20 00	20 50
30	17 07	17 33	18 03	18 02	18 53	19 45	20 38
35	16 55	17 23	17 54	17 51	18 43	19 37	20 31
40	16 41	17 11	17 45	17 39	18 32	19 27	20 23
45	16 24	16 58	17 35	17 24	18 18	19 15	20 14
S 50	16 04	16 42	17 24	17 06	18 02	19 01	20 02
52	15 54	16 35	17 19	16 58	17 54	18 54	19 57
54	15 44	16 27	17 13	16 48	17 45	18 47	19 51
56	15 31	16 18	17 07	16 38	17 35	18 38	19 45
58	15 17	16 08	17 00	16 25	17 24	18 29	19 37
S 60	15 00	15 57	16 53	16 11	17 11	18 18	19 29

Day	SUN			MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
9	00 50	00 44	11 59	12 40	00 16	01	1
10	00 38	00 32	11 59	13 28	01 04	02	3
11	00 26	00 20	12 00	14 14	01 51	03	7

UT	ARIES	VENUS −3.8		MARS +1.5		JUPITER −1.9		SATURN +0.4		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
12 00	260 29.1	158 32.7	N24 12.3	194 04.3	N21 51.5	173 59.7	N23 09.4	46 32.0	S10 52.2	Acamar	315 18.7	S40 15.0
01	275 31.6	173 31.8	12.1	209 04.8	51.8	189 01.6	09.4	61 34.6	52.2	Achernar	335 27.2	S57 09.9
02	290 34.0	188 30.9	12.0	224 05.4	52.1	204 03.4	09.4	76 37.1	52.2	Acrux	173 09.0	S63 10.8
03	305 36.5	203 30.1	. . 11.8	239 06.0	. . 52.4	219 05.2	. . 09.4	91 39.7	. . 52.1	Adhara	255 12.9	S28 59.7
04	320 39.0	218 29.2	11.6	254 06.6	52.7	234 07.1	09.4	106 42.3	52.1	Aldebaran	290 49.7	N16 32.0
05	335 41.4	233 28.3	11.4	269 07.2	53.0	249 08.9	09.4	121 44.8	52.1			
06	350 43.9	248 27.4	N24 11.2	284 07.8	N21 53.3	264 10.8	N23 09.5	136 47.4	S10 52.1	Alioth	166 20.5	N55 53.4
W 07	5 46.4	263 26.6	11.0	299 08.4	53.6	279 12.6	09.5	151 50.0	52.0	Alkaid	152 58.6	N49 15.0
E 08	20 48.8	278 25.7	10.9	314 09.0	53.9	294 14.5	09.5	166 52.5	52.0	Al Na'ir	27 43.6	S46 53.4
D 09	35 51.3	293 24.8	. . 10.7	329 09.6	. . 54.2	309 16.3	. . 09.5	181 55.1	. . 52.0	Alnilam	275 46.7	S 1 11.8
N 10	50 53.7	308 24.0	10.5	344 10.2	54.5	324 18.1	09.5	196 57.7	52.0	Alphard	217 56.3	S 8 43.2
E 11	65 56.2	323 23.1	10.3	359 10.8	54.8	339 20.0	09.6	212 00.2	51.9			
S 12	80 58.7	338 22.2	N24 10.1	14 11.4	N21 55.1	354 21.8	N23 09.6	227 02.8	S10 51.9	Alphecca	126 10.7	N26 40.3
D 13	96 01.1	353 21.3	09.9	29 12.0	55.4	9 23.7	09.6	242 05.4	51.9	Alpheratz	357 43.5	N29 09.8
A 14	111 03.6	8 20.5	09.7	44 12.6	55.7	24 25.5	09.6	257 07.9	51.9	Altair	62 07.9	N 8 54.4
Y 15	126 06.1	23 19.6	. . 09.5	59 13.2	. . 56.0	39 27.3	. . 09.6	272 10.5	. . 51.8	Ankaa	353 15.8	S42 13.7
16	141 08.5	38 18.7	09.3	74 13.8	56.3	54 29.2	09.6	287 13.0	51.8	Antares	112 25.9	S26 27.6
17	156 11.0	53 17.9	09.1	89 14.4	56.6	69 31.0	09.7	302 15.6	51.8			
18	171 13.5	68 17.0	N24 08.9	104 15.0	N21 56.9	84 32.9	N23 09.7	317 18.2	S10 51.8	Arcturus	145 55.5	N19 06.8
19	186 15.9	83 16.1	08.7	119 15.6	57.2	99 34.7	09.7	332 20.7	51.8	Atria	107 27.1	S69 03.0
20	201 18.4	98 15.2	08.5	134 16.1	57.5	114 36.5	09.7	347 23.3	51.7	Avior	234 18.5	S59 33.5
21	216 20.9	113 14.4	. . 08.3	149 16.7	. . 57.8	129 38.4	. . 09.7	2 25.9	. . 51.7	Bellatrix	278 32.3	N 6 21.5
22	231 23.3	128 13.5	08.1	164 17.3	58.1	144 40.2	09.7	17 28.4	51.7	Betelgeuse	271 01.6	N 7 24.4
23	246 25.8	143 12.6	07.9	179 17.9	58.4	159 42.1	09.8	32 31.0	51.7			
13 00	261 28.2	158 11.8	N24 07.7	194 18.5	N21 58.7	174 43.9	N23 09.8	47 33.5	S10 51.6	Canopus	263 56.7	S52 42.4
01	276 30.7	173 10.9	07.5	209 19.1	59.0	189 45.7	09.8	62 36.1	51.6	Capella	280 34.9	N46 00.5
02	291 33.2	188 10.0	07.3	224 19.7	59.3	204 47.6	09.8	77 38.7	51.6	Deneb	49 31.1	N45 19.7
03	306 35.6	203 09.2	. . 07.1	239 20.3	. . 59.6	219 49.4	. . 09.8	92 41.2	. . 51.6	Denebola	182 33.6	N14 29.8
04	321 38.1	218 08.3	06.9	254 20.9	21 59.9	234 51.3	09.8	107 43.8	51.5	Diphda	348 56.0	S17 54.6
05	336 40.6	233 07.4	06.7	269 21.5	22 00.2	249 53.1	09.9	122 46.4	51.5			
06	351 43.0	248 06.5	N24 06.4	284 22.1	N22 00.5	264 55.0	N23 09.9	137 48.9	S10 51.5	Dubhe	193 51.9	N61 40.9
T 07	6 45.5	263 05.7	06.2	299 22.7	00.8	279 56.8	09.9	152 51.5	51.5	Elnath	278 13.0	N28 36.9
H 08	21 48.0	278 04.8	06.0	314 23.3	01.1	294 58.6	09.9	167 54.0	51.4	Eltanin	90 45.6	N51 29.3
U 09	36 50.4	293 03.9	. . 05.8	329 23.9	. . 01.4	310 00.5	. . 09.9	182 56.6	. . 51.4	Enif	33 47.0	N 9 56.3
R 10	51 52.9	308 03.1	05.6	344 24.5	01.7	325 02.3	09.9	197 59.2	51.4	Fomalhaut	15 23.9	S29 32.8
S 11	66 55.4	323 02.2	05.4	359 25.1	02.0	340 04.2	10.0	213 01.7	51.4			
D 12	81 57.8	338 01.3	N24 05.1	14 25.7	N22 02.3	355 06.0	N23 10.0	228 04.3	S10 51.4	Gacrux	172 00.7	S57 11.6
A 13	97 00.3	353 00.5	04.9	29 26.3	02.6	10 07.8	10.0	243 06.8	51.3	Gienah	175 52.2	S17 37.2
Y 14	112 02.7	7 59.6	04.7	44 26.8	02.9	25 09.7	10.0	258 09.4	51.3	Hadar	148 47.4	S60 26.5
15	127 05.2	22 58.7	. . 04.5	59 27.4	. . 03.2	40 11.5	. . 10.0	273 12.0	. . 51.3	Hamal	328 01.0	N23 31.4
16	142 07.7	37 57.9	04.2	74 28.0	03.5	55 13.4	10.0	288 14.5	51.3	Kaus Aust.	83 43.4	S34 22.5
17	157 10.1	52 57.0	04.0	89 28.6	03.7	70 15.2	10.1	303 17.1	51.2			
18	172 12.6	67 56.2	N24 03.8	104 29.2	N22 04.0	85 17.0	N23 10.1	318 19.6	S10 51.2	Kochab	137 19.2	N74 06.3
19	187 15.1	82 55.3	03.5	119 29.8	04.3	100 18.9	10.1	333 22.2	51.2	Markab	13 38.3	N15 16.7
20	202 17.5	97 54.4	03.3	134 30.4	04.6	115 20.7	10.1	348 24.8	51.2	Menkar	314 15.3	N 4 08.4
21	217 20.0	112 53.6	. . 03.1	149 31.0	. . 04.9	130 22.6	. . 10.1	3 27.3	. . 51.1	Menkent	148 07.3	S36 26.3
22	232 22.5	127 52.7	02.8	164 31.6	05.2	145 24.4	10.1	18 29.9	51.1	Miaplacidus	221 40.1	S69 46.8
23	247 24.9	142 51.8	02.6	179 32.2	05.5	160 26.2	10.2	33 32.4	51.1			
14 00	262 27.4	157 51.0	N24 02.4	194 32.8	N22 05.8	175 28.1	N23 10.2	48 35.0	S10 51.1	Mirfak	308 40.8	N49 54.3
01	277 29.8	172 50.1	02.1	209 33.4	06.1	190 29.9	10.2	63 37.6	51.1	Nunki	75 58.0	S26 16.6
02	292 32.3	187 49.2	01.9	224 34.0	06.4	205 31.8	10.2	78 40.1	51.0	Peacock	53 18.8	S56 41.1
03	307 34.8	202 48.4	. . 01.7	239 34.6	. . 06.6	220 33.6	. . 10.2	93 42.7	. . 51.0	Pollux	243 28.1	N27 59.5
04	322 37.2	217 47.5	01.4	254 35.2	06.9	235 35.4	10.2	108 45.2	51.0	Procyon	245 00.0	N 5 11.2
05	337 39.7	232 46.7	01.2	269 35.8	07.2	250 37.3	10.3	123 47.8	51.0			
06	352 42.2	247 45.8	N24 00.9	284 36.3	N22 07.5	265 39.1	N23 10.3	138 50.3	S10 50.9	Rasalhague	96 06.1	N12 33.2
07	7 44.6	262 44.9	00.7	299 36.9	07.8	280 41.0	10.3	153 52.9	50.9	Regulus	207 43.6	N11 54.0
08	22 47.1	277 44.1	00.4	314 37.5	08.1	295 42.8	10.3	168 55.5	50.9	Rigel	281 12.4	S 8 11.3
F 09	37 49.6	292 43.2	. . 00.2	329 38.1	. . 08.4	310 44.6	. . 10.3	183 58.0	. . 50.9	Rigil Kent.	139 51.2	S60 53.6
R 10	52 52.0	307 42.3	24 00.0	344 38.7	08.7	325 46.5	10.3	199 00.6	50.9	Sabik	102 12.2	S15 44.4
I 11	67 54.5	322 41.5	23 59.7	359 39.3	08.9	340 48.3	10.4	214 03.1	50.8			
D 12	82 57.0	337 40.6	N23 59.5	14 39.9	N22 09.2	355 50.2	N23 10.4	229 05.7	S10 50.8	Schedar	349 40.6	N56 36.4
A 13	97 59.4	352 39.8	59.2	29 40.5	09.5	10 52.0	10.4	244 08.2	50.8	Shaula	96 21.5	S37 06.6
Y 14	113 01.9	7 38.9	58.9	44 41.1	09.8	25 53.8	10.4	259 10.8	50.8	Sirius	258 34.0	S16 44.3
15	128 04.3	22 38.0	. . 58.7	59 41.7	. . 10.1	40 55.7	. . 10.4	274 13.4	. . 50.8	Spica	158 31.1	S11 14.0
16	143 06.8	37 37.2	58.4	74 42.3	10.4	55 57.5	10.4	289 15.9	50.7	Suhail	222 52.7	S43 29.6
17	158 09.3	52 36.3	58.2	89 42.9	10.6	70 59.4	10.4	304 18.5	50.7			
18	173 11.7	67 35.5	N23 57.9	104 43.5	N22 10.9	86 01.2	N23 10.5	319 21.0	S10 50.7	Vega	80 38.5	N38 47.9
19	188 14.2	82 34.6	57.7	119 44.1	11.2	101 03.0	10.5	334 23.6	50.7	Zuben'ubi	137 05.1	S16 05.9
20	203 16.7	97 33.7	57.4	134 44.7	11.5	116 04.9	10.5	349 26.1	50.6		SHA	Mer.Pass.
21	218 19.1	112 32.9	. . 57.1	149 45.2	. . 11.8	131 06.7	. . 10.5	4 28.7	. . 50.6		° ′	h m
22	233 21.6	127 32.0	56.9	164 45.8	12.1	146 08.6	10.5	19 31.2	50.6	Venus	256 43.5	13 28
23	248 24.1	142 31.2	56.6	179 46.4	12.3	161 10.4	10.5	34 33.8	50.6	Mars	292 50.3	11 02
	h m									Jupiter	273 15.7	12 20
Mer. Pass.	6 33.0	v −0.9	d 0.2	v 0.6	d 0.3	v 1.8	d 0.0	v 2.6	d 0.0	Saturn	146 05.3	20 46

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 12	Moonrise 13	Moonrise 14	Moonrise 15
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
12 00	180 03.4	N23 08.6	141 52.9	13.4	N15 50.1	6.5	54.2	N 72				04 55	06 47	08 33	10 16
01	195 03.3	08.8	156 25.3	13.3	15 43.6	6.7	54.2	N 70				05 31	07 09	08 45	10 22
02	210 03.2	08.9	170 57.6	13.4	15 36.9	6.7	54.2	68				05 56	07 25	08 55	10 26
03	225 03.0	. . 09.1	185 30.0	13.5	15 30.2	6.7	54.2	66				06 16	07 39	09 03	10 29
04	240 02.9	09.2	200 02.5	13.4	15 23.5	6.9	54.2	64	////	////	01 35	06 31	07 50	09 10	10 32
05	255 02.8	09.4	214 34.9	13.5	15 16.6	6.9	54.2	62	////	////	02 11	06 44	07 59	09 16	10 35
06	270 02.6	N23 09.6	229 07.4	13.5	N15 09.7	7.0	54.2	60	////	00 56	02 37	06 55	08 07	09 21	10 37
W 07	285 02.5	09.7	243 39.9	13.5	15 02.7	7.0	54.2	N 58	////	01 43	02 57	07 04	08 14	09 26	10 39
E 08	300 02.4	09.9	258 12.4	13.6	14 55.7	7.1	54.2	56	////	02 12	03 14	07 13	08 20	09 30	10 41
D 09	315 02.2	. . 10.0	272 45.0	13.5	14 48.6	7.2	54.3	54	00 51	02 34	03 28	07 20	08 26	09 33	10 42
N 10	330 02.1	10.2	287 17.5	13.6	14 41.4	7.2	54.3	52	01 34	02 51	03 40	07 27	08 31	09 36	10 44
E 11	345 02.0	10.3	301 50.1	13.6	14 34.2	7.3	54.3	50	02 01	03 06	03 50	07 33	08 35	09 39	10 45
S 12	0 01.9	N23 10.5	316 22.7	13.7	N14 26.9	7.4	54.3	45	02 46	03 35	04 13	07 45	08 45	09 46	10 48
D 13	15 01.7	10.6	330 55.4	13.6	14 19.5	7.4	54.3	N 40	03 16	03 58	04 31	07 56	08 53	09 51	10 50
A 14	30 01.6	10.8	345 28.0	13.7	14 12.1	7.5	54.3	35	03 39	04 16	04 45	08 05	09 00	09 56	10 52
Y 15	45 01.5	. . 10.9	0 00.7	13.7	14 04.6	7.6	54.3	30	03 58	04 31	04 58	08 13	09 06	10 00	10 54
16	60 01.3	11.1	14 33.4	13.7	13 57.0	7.6	54.3	20	04 26	04 56	05 20	08 26	09 16	10 06	10 57
17	75 01.2	11.2	29 06.1	13.8	13 49.4	7.7	54.4	N 10	04 49	05 16	05 39	08 38	09 25	10 13	11 00
18	90 01.1	N23 11.3	43 38.9	13.7	N13 41.7	7.8	54.4	0	05 08	05 34	05 56	08 49	09 34	10 18	11 02
19	105 00.9	11.5	58 11.6	13.8	13 33.9	7.8	54.4	S 10	05 25	05 51	06 14	09 00	09 42	10 24	11 05
20	120 00.8	11.6	72 44.4	13.8	13 26.1	7.8	54.4	20	05 41	06 08	06 32	09 12	09 52	10 30	11 08
21	135 00.7	. . 11.8	87 17.2	13.9	13 18.3	8.0	54.4	30	05 57	06 27	06 53	09 25	10 02	10 37	11 11
22	150 00.5	11.9	101 50.1	13.8	13 10.3	8.0	54.4	35	06 06	06 37	07 05	09 33	10 08	10 41	11 13
23	165 00.4	12.1	116 22.9	13.9	13 02.3	8.0	54.4	40	06 15	06 49	07 19	09 42	10 14	10 45	11 15
13 00	180 00.3	N23 12.2	130 55.8	13.8	N12 54.3	8.1	54.4	45	06 25	07 02	07 36	09 52	10 22	10 50	11 17
01	195 00.2	12.3	145 28.6	13.9	12 46.2	8.2	54.5	S 50	06 37	07 18	07 57	10 04	10 32	10 56	11 20
02	210 00.0	12.5	160 01.5	14.0	12 38.0	8.2	54.5	52	06 42	07 26	08 06	10 10	10 36	10 59	11 21
03	224 59.9	. . 12.6	174 34.5	13.9	12 29.8	8.3	54.5	54	06 47	07 34	08 17	10 16	10 41	11 02	11 23
04	239 59.8	12.8	189 07.4	13.9	12 21.5	8.4	54.5	56	06 54	07 43	08 30	10 23	10 46	11 06	11 24
05	254 59.6	12.9	203 40.3	14.0	12 13.1	8.4	54.5	58	07 00	07 53	08 44	10 31	10 52	11 10	11 26
06	269 59.5	N23 13.0	218 13.3	14.0	N12 04.7	8.4	54.5	S 60	07 08	08 04	09 02	10 40	10 58	11 14	11 28
T 07	284 59.4	13.2	232 46.3	14.0	11 56.3	8.5	54.6								
H 08	299 59.2	13.3	247 19.3	14.0	11 47.8	8.6	54.6								
U 09	314 59.1	. . 13.4	261 52.3	14.1	11 39.2	8.6	54.6								
R 10	329 59.0	13.6	276 25.4	14.0	11 30.6	8.7	54.6								
S 11	344 58.8	13.7	290 58.4	14.1	11 21.9	8.7	54.6								
D 12	359 58.7	N23 13.8	305 31.5	14.0	N11 13.2	8.8	54.6								
A 13	14 58.6	14.0	320 04.5	14.1	11 04.4	8.8	54.7								
Y 14	29 58.4	14.1	334 37.6	14.1	10 55.6	8.9	54.7								
15	44 58.3	. . 14.2	349 10.7	14.1	10 46.7	8.9	54.7								
16	59 58.2	14.4	3 43.8	14.2	10 37.8	9.0	54.7								
17	74 58.0	14.5	18 17.0	14.1	10 28.8	9.0	54.7								
18	89 57.9	N23 14.6	32 50.1	14.2	N10 19.8	9.1	54.7								
19	104 57.8	14.8	47 23.3	14.1	10 10.7	9.1	54.8								
20	119 57.6	14.9	61 56.4	14.2	10 01.6	9.2	54.8								
21	134 57.5	. . 15.0	76 29.6	14.1	9 52.4	9.2	54.8								
22	149 57.4	15.1	91 02.7	14.2	9 43.2	9.3	54.8								
23	164 57.2	15.3	105 35.9	14.2	9 33.9	9.3	54.8								
14 00	179 57.1	N23 15.4	120 09.1	14.2	N 9 24.6	9.4	54.9								
01	194 57.0	15.5	134 42.3	14.2	9 15.2	9.4	54.9								
02	209 56.9	15.6	149 15.5	14.2	9 05.8	9.5	54.9								
03	224 56.7	. . 15.8	163 48.7	14.3	8 56.3	9.5	54.9								
04	239 56.6	15.9	178 22.0	14.2	8 46.8	9.5	54.9								
05	254 56.5	16.0	192 55.2	14.2	8 37.3	9.6	55.0								
06	269 56.3	N23 16.1	207 28.4	14.2	N 8 27.7	9.6	55.0								
F 07	284 56.2	16.2	222 01.6	14.3	8 18.1	9.7	55.0								
R 08	299 56.1	16.4	236 34.9	14.2	8 08.4	9.7	55.0								
I 09	314 55.9	. . 16.5	251 08.1	14.2	7 58.7	9.8	55.0								
D 10	329 55.8	16.6	265 41.3	14.3	7 48.9	9.8	55.1								
A 11	344 55.7	16.7	280 14.6	14.2	7 39.1	9.8	55.1								
Y 12	359 55.5	N23 16.8	294 47.8	14.3	N 7 29.3	9.9	55.1								
13	14 55.4	16.9	309 21.1	14.2	7 19.4	9.9	55.1								
14	29 55.3	17.1	323 54.3	14.2	7 09.5	10.0	55.2								
15	44 55.1	. . 17.2	338 27.5	14.3	6 59.5	10.0	55.2								
16	59 55.0	17.3	353 00.8	14.2	6 49.5	10.0	55.2								
17	74 54.9	17.4	7 34.0	14.2	6 39.5	10.1	55.2								
18	89 54.7	N23 17.5	22 07.2	14.2	N 6 29.4	10.1	55.3								
19	104 54.6	17.6	36 40.4	14.3	6 19.3	10.1	55.3								
20	119 54.5	17.7	51 13.7	14.2	6 09.2	10.2	55.3								
21	134 54.3	. . 17.8	65 46.9	14.2	5 59.0	10.2	55.3								
22	149 54.2	17.9	80 20.1	14.2	5 48.8	10.2	55.4								
23	164 54.1	18.1	94 53.3	14.2	N 5 38.6	10.3	55.4								
	SD 15.8	d 0.1	SD 14.8		14.9		15.0								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 12	Moonset 13	Moonset 14	Moonset 15
°	h m	h m	h m	h m	h m	h m	h m
N 72				00 33	00 14	01 00 (25 01 46)	23 39
N 70				23 51	23 46	23 42	23 38
68				23 33	23 35	23 36	23 36
66				23 19	23 26	23 31	23 35
64	22 26	////	////	23 07	23 18	23 26	23 34
62	21 49	////	////	22 57	23 11	23 23	23 33
60	21 24	23 06	////	22 48	23 05	23 19	23 33
N 58	21 04	22 18	////	22 40	22 59	23 16	23 32
56	20 47	21 49	////	22 34	22 55	23 14	23 32
54	20 33	21 27	23 10	22 28	22 50	23 11	23 31
52	20 21	21 09	22 26	22 22	22 47	23 09	23 31
50	20 10	20 54	21 59	22 17	22 43	23 07	23 30
45	19 48	20 25	21 14	22 06	22 35	23 03	23 29
N 40	19 30	20 03	20 44	21 57	22 29	22 59	23 28
35	19 15	19 44	20 21	21 50	22 23	22 56	23 28
30	19 02	19 29	20 03	21 43	22 18	22 53	23 27
20	18 40	19 05	19 34	21 31	22 10	22 48	23 26
N 10	18 21	18 44	19 11	21 21	22 02	22 44	23 25
0	18 04	18 26	18 52	21 11	21 55	22 39	23 24
S 10	17 46	18 09	18 36	21 01	21 48	22 35	23 23
20	17 28	17 52	18 20	20 50	21 40	22 31	23 22
30	17 07	17 33	18 03	20 38	21 32	22 26	23 21
35	16 55	17 23	17 55	20 31	21 27	22 23	23 20
40	16 41	17 11	17 45	20 23	21 21	22 19	23 19
45	16 24	16 58	17 35	20 14	21 14	22 15	23 18
S 50	16 04	16 42	17 23	20 02	21 06	22 11	23 17
52	15 54	16 35	17 18	19 57	21 02	22 08	23 16
54	15 43	16 26	17 13	19 51	20 58	22 06	23 16
56	15 30	16 17	17 06	19 45	20 53	22 03	23 15
58	15 16	16 07	17 00	19 37	20 48	22 00	23 14
S 60	14 59	15 56	16 52	19 29	20 42	21 57	23 14

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
12	00 14	00 08	12 00	15 00	02 37	04	13
13	00 01	00 05	12 00	15 45	03 22	05	20
14	00 11	00 18	12 00	16 29	04 07	06	28

UT	ARIES	VENUS −3.8		MARS +1.5		JUPITER −1.9		SATURN +0.4		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
15 00	263 26.5	157 30.3	N23 56.4	194 47.0	N22 12.6	176 12.2	N23 10.6	49 36.4	S10 50.6	Acamar	315 18.7	S40 15.0
01	278 29.0	172 29.5	56.1	209 47.6	12.9	191 14.1	10.6	64 38.9	50.5	Achernar	335 27.1	S57 09.9
02	293 31.5	187 28.6	55.8	224 48.2	13.2	206 15.9	10.6	79 41.5	50.5	Acrux	173 09.0	S63 10.8
03	308 33.9	202 27.7 . .	55.6	239 48.8 . .	13.5	221 17.8 . .	10.6	94 44.0 . .	50.5	Adhara	255 12.9	S28 59.7
04	323 36.4	217 26.9	55.3	254 49.4	13.7	236 19.6	10.6	109 46.6	50.5	Aldebaran	290 49.7	N16 32.0
05	338 38.8	232 26.0	55.0	269 50.0	14.0	251 21.4	10.6	124 49.1	50.5			
06	353 41.3	247 25.2	N23 54.7	284 50.6	N22 14.3	266 23.3	N23 10.6	139 51.7	S10 50.4	Alioth	166 20.6	N55 53.4
07	8 43.8	262 24.3	54.5	299 51.2	14.6	281 25.1	10.7	154 54.2	50.4	Alkaid	152 58.7	N49 15.0
S 08	23 46.2	277 23.5	54.2	314 51.8	14.8	296 27.0	10.7	169 56.8	50.4	Al Na'ir	27 43.6	S46 53.4
A 09	38 48.7	292 22.6 . .	53.9	329 52.4 . .	15.1	311 28.8 . .	10.7	184 59.3 . .	50.4	Alnilam	275 46.7	S 1 11.8
T 10	53 51.2	307 21.8	53.6	344 53.0	15.4	326 30.6	10.7	200 01.9	50.4	Alphard	217 56.3	S 8 43.2
U 11	68 53.6	322 20.9	53.4	359 53.6	15.7	341 32.5	10.7	215 04.5	50.3			
R 12	83 56.1	337 20.0	N23 53.1	14 54.1	N22 15.9	356 34.3	N23 10.7	230 07.0	S10 50.3	Alphecca	126 10.7	N26 40.3
D 13	98 58.6	352 19.2	52.8	29 54.7	16.2	11 36.2	10.7	245 09.6	50.3	Alpheratz	357 43.5	N29 09.8
A 14	114 01.0	7 18.3	52.5	44 55.3	16.5	26 38.0	10.8	260 12.1	50.3	Altair	62 07.9	N 8 54.4
Y 15	129 03.5	22 17.5 . .	52.2	59 55.9 . .	16.8	41 39.8 . .	10.8	275 14.7 . .	50.2	Ankaa	353 15.8	S42 13.7
16	144 05.9	37 16.6	51.9	74 56.5	17.0	56 41.7	10.8	290 17.2	50.2	Antares	112 25.9	S26 27.6
17	159 08.4	52 15.8	51.7	89 57.1	17.3	71 43.5	10.8	305 19.8	50.2			
18	174 10.9	67 14.9	N23 51.4	104 57.7	N22 17.6	86 45.4	N23 10.8	320 22.3	S10 50.2	Arcturus	145 55.5	N19 06.8
19	189 13.3	82 14.1	51.1	119 58.3	17.9	101 47.2	10.8	335 24.9	50.2	Atria	107 27.1	S69 03.0
20	204 15.8	97 13.2	50.8	134 58.9	18.1	116 49.0	10.8	350 27.4	50.1	Avior	234 18.5	S59 33.5
21	219 18.3	112 12.4 . .	50.5	149 59.5 . .	18.4	131 50.9 . .	10.9	5 30.0 . .	50.1	Bellatrix	278 32.3	N 6 21.5
22	234 20.7	127 11.5	50.2	165 00.1	18.7	146 52.7	10.9	20 32.5	50.1	Betelgeuse	271 01.6	N 7 24.4
23	249 23.2	142 10.7	49.9	180 00.7	19.0	161 54.6	10.9	35 35.1	50.1			
16 00	264 25.7	157 09.8	N23 49.6	195 01.3	N22 19.2	176 56.4	N23 10.9	50 37.6	S10 50.1	Canopus	263 56.7	S52 42.4
01	279 28.1	172 09.0	49.3	210 01.8	19.5	191 58.2	10.9	65 40.2	50.0	Capella	280 34.9	N46 00.5
02	294 30.6	187 08.1	49.0	225 02.4	19.8	207 00.1	10.9	80 42.7	50.0	Deneb	49 31.1	N45 19.7
03	309 33.1	202 07.3 . .	48.7	240 03.0 . .	20.0	222 01.9 . .	10.9	95 45.3 . .	50.0	Denebola	182 33.7	N14 29.8
04	324 35.5	217 06.4	48.4	255 03.6	20.3	237 03.8	11.0	110 47.8	50.0	Diphda	348 56.0	S17 54.6
05	339 38.0	232 05.6	48.1	270 04.2	20.6	252 05.6	11.0	125 50.4	50.0			
06	354 40.4	247 04.7	N23 47.8	285 04.8	N22 20.9	267 07.4	N23 11.0	140 52.9	S10 50.0	Dubhe	193 51.9	N61 40.9
07	9 42.9	262 03.9	47.5	300 05.4	21.1	282 09.3	11.0	155 55.5	49.9	Elnath	278 13.0	N28 36.9
08	24 45.4	277 03.0	47.2	315 06.0	21.4	297 11.1	11.0	170 58.0	49.9	Eltanin	90 45.6	N51 29.4
S 09	39 47.8	292 02.2 . .	46.9	330 06.6 . .	21.7	312 13.0 . .	11.0	186 00.6 . .	49.9	Enif	33 46.9	N 9 56.3
U 10	54 50.3	307 01.3	46.6	345 07.2	21.9	327 14.8	11.0	201 03.1	49.9	Fomalhaut	15 23.9	S29 32.8
N 11	69 52.8	322 00.5	46.3	0 07.8	22.2	342 16.6	11.1	216 05.7	49.9			
D 12	84 55.2	336 59.6	N23 46.0	15 08.4	N22 22.5	357 18.5	N23 11.1	231 08.2	S10 49.8	Gacrux	172 00.7	S57 11.6
A 13	99 57.7	351 58.8	45.7	30 09.0	22.7	12 20.3	11.1	246 10.8	49.8	Gienah	175 52.2	S17 37.2
Y 14	115 00.2	6 57.9	45.4	45 09.6	23.0	27 22.2	11.1	261 13.3	49.8	Hadar	148 47.4	S60 26.5
15	130 02.6	21 57.1 . .	45.1	60 10.1 . .	23.3	42 24.0 . .	11.1	276 15.9 . .	49.8	Hamal	328 00.9	N23 31.4
16	145 05.1	36 56.3	44.8	75 10.7	23.5	57 25.8	11.1	291 18.4	49.8	Kaus Aust.	83 43.4	S34 22.5
17	160 07.6	51 55.4	44.4	90 11.3	23.8	72 27.7	11.1	306 21.0	49.7			
18	175 10.0	66 54.6	N23 44.1	105 11.9	N22 24.1	87 29.5	N23 11.1	321 23.5	S10 49.7	Kochab	137 19.2	N74 06.3
19	190 12.5	81 53.7	43.8	120 12.5	24.3	102 31.4	11.2	336 26.1	49.7	Markab	13 38.3	N15 16.7
20	205 14.9	96 52.9	43.5	135 13.1	24.6	117 33.2	11.2	351 28.6	49.7	Menkar	314 15.3	N 4 08.5
21	220 17.4	111 52.0 . .	43.2	150 13.7 . .	24.8	132 35.0 . .	11.2	6 31.2 . .	49.7	Menkent	148 07.3	S36 26.3
22	235 19.9	126 51.2	42.9	165 14.3	25.1	147 36.9	11.2	21 33.7	49.6	Miaplacidus	221 40.2	S69 46.8
23	250 22.3	141 50.3	42.5	180 14.9	25.4	162 38.7	11.2	36 36.3	49.6			
17 00	265 24.8	156 49.5	N23 42.2	195 15.5	N22 25.6	177 40.6	N23 11.2	51 38.8	S10 49.6	Mirfak	308 40.7	N49 54.3
01	280 27.3	171 48.7	41.9	210 16.1	25.9	192 42.4	11.2	66 41.4	49.6	Nunki	75 58.0	S26 16.6
02	295 29.7	186 47.8	41.6	225 16.7	26.2	207 44.2	11.3	81 43.9	49.6	Peacock	53 18.8	S56 41.1
03	310 32.2	201 47.0 . .	41.2	240 17.3 . .	26.4	222 46.1 . .	11.3	96 46.5 . .	49.6	Pollux	243 28.1	N27 59.5
04	325 34.7	216 46.1	40.9	255 17.8	26.7	237 47.9	11.3	111 49.0	49.5	Procyon	245 00.0	N 5 11.2
05	340 37.1	231 45.3	40.6	270 18.4	26.9	252 49.8	11.3	126 51.6	49.5			
06	355 39.6	246 44.5	N23 40.2	285 19.0	N22 27.2	267 51.6	N23 11.3	141 54.1	S10 49.5	Rasalhague	96 06.1	N12 33.2
07	10 42.0	261 43.6	39.9	300 19.6	27.5	282 53.4	11.3	156 56.7	49.5	Regulus	207 43.7	N11 54.0
08	25 44.5	276 42.8	39.6	315 20.2	27.7	297 55.3	11.3	171 59.2	49.5	Rigel	281 12.4	S 8 11.3
M 09	40 47.0	291 41.9 . .	39.2	330 20.8 . .	28.0	312 57.1 . .	11.3	187 01.8 . .	49.4	Rigil Kent.	139 51.2	S60 53.6
O 10	55 49.4	306 41.1	38.9	345 21.4	28.2	327 59.0	11.4	202 04.3	49.4	Sabik	102 12.2	S15 44.4
N 11	70 51.9	321 40.3	38.6	0 22.0	28.5	343 00.8	11.4	217 06.9	49.4			
D 12	85 54.4	336 39.4	N23 38.2	15 22.6	N22 28.8	358 02.6	N23 11.4	232 09.4	S10 49.4	Schedar	349 40.6	N56 36.4
A 13	100 56.8	351 38.6	37.9	30 23.2	29.0	13 04.5	11.4	247 12.0	49.4	Shaula	96 21.5	S37 06.7
Y 14	115 59.3	6 37.7	37.6	45 23.8	29.3	28 06.3	11.4	262 14.5	49.4	Sirius	258 34.0	S16 44.3
15	131 01.8	21 36.9 . .	37.2	60 24.4 . .	29.5	43 08.2 . .	11.4	277 17.0 . .	49.3	Spica	158 31.1	S11 14.0
16	146 04.2	36 36.1	36.9	75 24.9	29.8	58 10.0	11.4	292 19.6	49.3	Suhail	222 52.7	S43 29.6
17	161 06.7	51 35.2	36.5	90 25.5	30.0	73 11.8	11.4	307 22.1	49.3			
18	176 09.2	66 34.4	N23 36.2	105 26.1	N22 30.3	88 13.7	N23 11.5	322 24.7	S10 49.3	Vega	80 38.5	N38 47.9
19	191 11.6	81 33.5	35.8	120 26.7	30.6	103 15.5	11.5	337 27.2	49.3	Zuben'ubi	137 05.1	S16 05.9
20	206 14.1	96 32.7	35.5	135 27.3	30.8	118 17.4	11.5	352 29.8	49.3		SHA	Mer. Pass.
21	221 16.5	111 31.9 . .	35.2	150 27.9 . .	31.1	133 19.2 . .	11.5	7 32.3 . .	49.2		° ′	h m
22	236 19.0	126 31.0	34.8	165 28.5	31.3	148 21.0	11.5	22 34.9	49.2	Venus	252 44.2	13 32
23	251 21.5	141 30.2	34.5	180 29.1	31.6	163 22.9	11.5	37 37.4	49.2	Mars	290 35.6	10 59
	h m									Jupiter	272 30.7	12 11
Mer. Pass.	6 21.2	v −0.8	d 0.3	v 0.6	d 0.3	v 1.8	d 0.0	v 2.5	d 0.0	Saturn	146 12.0	20 34

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		15	16	17	18
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
15 00	179 53.9	N23 18.2	109 26.5	14.1	N 5 28.3	10.3	55.4	N 72				10 16	12 01	13 50	15 47
01	194 53.8	18.3	123 59.6	14.2	5 18.0	10.3	55.4	N 70				10 22	11 59	13 41	15 29
02	209 53.7	18.4	138 32.8	14.2	5 07.7	10.4	55.5	68				10 26	11 58	13 34	15 15
03	224 53.5 . .	18.5	153 06.0	14.1	4 57.3	10.4	55.5	66				10 29	11 57	13 28	15 04
04	239 53.4	18.6	167 39.1	14.2	4 46.9	10.4	55.5	64	////	////	01 32	10 32	11 56	13 23	14 54
05	254 53.3	18.7	182 12.3	14.1	4 36.5	10.5	55.5	62	////	////	02 10	10 35	11 55	13 19	14 46
06	269 53.1	N23 18.8	196 45.4	14.1	N 4 26.0	10.5	55.6	60	////	00 52	02 36	10 37	11 55	13 15	14 39
07	284 53.0	18.9	211 18.5	14.1	4 15.5	10.5	55.6	N 58	////	01 41	02 56	10 39	11 54	13 12	14 33
S 08	299 52.9	19.0	225 51.6	14.1	4 05.0	10.6	55.6	56	////	02 11	03 13	10 41	11 54	13 09	14 28
A 09	314 52.7 . .	19.1	240 24.7	14.0	3 54.4	10.5	55.6	54	00 47	02 33	03 27	10 42	11 53	13 07	14 23
T 10	329 52.6	19.2	254 57.7	14.1	3 43.9	10.6	55.7	52	01 33	02 51	03 39	10 44	11 53	13 04	14 18
U 11	344 52.4	19.3	269 30.8	14.0	3 33.3	10.6	55.7	50	02 00	03 06	03 50	10 45	11 52	13 02	14 14
R 12	359 52.3	N23 19.4	284 03.8	14.0	N 3 22.7	10.7	55.7	45	02 46	03 35	04 13	10 48	11 52	12 58	14 06
D 13	14 52.2	19.5	298 36.8	14.0	3 12.0	10.7	55.8	N 40	03 16	03 58	04 31	10 50	11 51	12 54	13 59
A 14	29 52.0	19.6	313 09.8	14.0	3 01.3	10.7	55.8	35	03 39	04 16	04 46	10 52	11 50	12 50	13 53
Y 15	44 51.9 . .	19.7	327 42.8	14.0	2 50.6	10.7	55.8	30	03 58	04 31	04 59	10 54	11 50	12 48	13 48
16	59 51.8	19.8	342 15.8	13.9	2 39.9	10.7	55.8	20	04 27	04 56	05 21	10 57	11 49	12 43	13 39
17	74 51.6	19.9	356 48.7	13.9	2 29.2	10.8	55.9	N 10	04 49	05 16	05 40	11 00	11 48	12 38	13 31
18	89 51.5	N23 20.0	11 21.6	13.9	N 2 18.4	10.8	55.9	0	05 08	05 35	05 57	11 02	11 47	12 34	13 23
19	104 51.4	20.1	25 54.5	13.9	2 07.6	10.8	55.9	S 10	05 25	05 52	06 14	11 05	11 47	12 30	13 16
20	119 51.2	20.2	40 27.4	13.8	1 56.8	10.8	56.0	20	05 41	06 09	06 33	11 08	11 46	12 26	13 08
21	134 51.1 . .	20.2	55 00.2	13.8	1 46.0	10.9	56.0	30	05 58	06 28	06 54	11 11	11 45	12 21	13 00
22	149 51.0	20.3	69 33.0	13.8	1 35.1	10.8	56.0	35	06 07	06 38	07 06	11 13	11 45	12 18	12 55
23	164 50.8	20.4	84 05.8	13.8	1 24.3	10.9	56.1	40	06 16	06 50	07 21	11 15	11 44	12 15	12 49
16 00	179 50.7	N23 20.5	98 38.6	13.7	N 1 13.4	10.9	56.1	45	06 26	07 04	07 37	11 17	11 44	12 12	12 42
01	194 50.6	20.6	113 11.3	13.7	1 02.5	10.9	56.1	S 50	06 38	07 20	07 58	11 20	11 43	12 08	12 34
02	209 50.4	20.7	127 44.0	13.7	0 51.6	11.0	56.1	52	06 43	07 27	08 08	11 21	11 43	12 06	12 31
03	224 50.3 . .	20.8	142 16.7	13.6	0 40.6	10.9	56.2	54	06 49	07 35	08 19	11 23	11 43	12 04	12 27
04	239 50.2	20.9	156 49.3	13.6	0 29.7	11.0	56.2	56	06 55	07 44	08 32	11 24	11 42	12 01	12 23
05	254 50.0	21.0	171 21.9	13.6	0 18.7	11.0	56.2	58	07 02	07 54	08 46	11 26	11 42	11 59	12 18
06	269 49.9	N23 21.0	185 54.5	13.6	N 0 07.7	10.9	56.3	S 60	07 09	08 06	09 04	11 28	11 41	11 56	12 12
07	284 49.8	21.1	200 27.1	13.5	S 0 03.2	11.0	56.3								
08	299 49.6	21.2	214 59.6	13.4	0 14.2	11.1	56.3								
S 09	314 49.5 . .	21.3	229 32.0	13.5	0 25.3	11.0	56.4								
U 10	329 49.4	21.4	244 04.5	13.4	0 36.3	11.0	56.4								
N 11	344 49.2	21.5	258 36.9	13.3	0 47.3	11.1	56.4								
D 12	359 49.1	N23 21.5	273 09.2	13.4	S 0 58.4	11.0	56.5								
A 13	14 48.9	21.6	287 41.6	13.3	1 09.4	11.1	56.5								
Y 14	29 48.8	21.7	302 13.9	13.2	1 20.5	11.0	56.5								
15	44 48.7 . .	21.8	316 46.1	13.2	1 31.5	11.1	56.6								
16	59 48.5	21.9	331 18.3	13.2	1 42.6	11.1	56.6								
17	74 48.4	21.9	345 50.5	13.1	1 53.7	11.1	56.6								
18	89 48.3	N23 22.0	0 22.6	13.1	S 2 04.8	11.1	56.7								
19	104 48.1	22.1	14 54.7	13.0	2 15.9	11.1	56.7								
20	119 48.0	22.2	29 26.7	13.0	2 27.0	11.0	56.7								
21	134 47.9 . .	22.2	43 58.7	12.9	2 38.0	11.1	56.8								
22	149 47.7	22.3	58 30.6	12.9	2 49.1	11.1	56.8								
23	164 47.6	22.4	73 02.5	12.8	3 00.2	11.1	56.9								
17 00	179 47.5	N23 22.5	87 34.3	12.8	S 3 11.3	11.1	56.9								
01	194 47.3	22.5	102 06.1	12.7	3 22.4	11.1	56.9								
02	209 47.2	22.6	116 37.8	12.7	3 33.5	11.1	57.0								
03	224 47.1 . .	22.7	131 09.5	12.7	3 44.6	11.1	57.0								
04	239 46.9	22.7	145 41.2	12.5	3 55.7	11.1	57.0								
05	254 46.8	22.8	160 12.7	12.6	4 06.8	11.0	57.1								
06	269 46.7	N23 22.9	174 44.3	12.4	S 4 17.8	11.1	57.1								
07	284 46.5	23.0	189 15.7	12.5	4 28.9	11.1	57.1								
08	299 46.4	23.0	203 47.2	12.3	4 40.0	11.0	57.2								
M 09	314 46.2 . .	23.1	218 18.5	12.3	4 51.0	11.1	57.2								
O 10	329 46.1	23.2	232 49.8	12.2	5 02.1	11.0	57.3								
N 11	344 46.0	23.2	247 21.0	12.2	5 13.1	11.0	57.3								
D 12	359 45.8	N23 23.3	261 52.2	12.1	S 5 24.1	11.0	57.3								
A 13	14 45.7	23.3	276 23.3	12.1	5 35.1	11.0	57.4								
Y 14	29 45.6	23.4	290 54.4	12.0	5 46.1	11.0	57.4								
15	44 45.4 . .	23.5	305 25.4	11.9	5 57.1	11.0	57.4								
16	59 45.3	23.5	319 56.3	11.9	6 08.1	10.9	57.5								
17	74 45.2	23.6	334 27.2	11.8	6 19.0	11.0	57.5								
18	89 45.0	N23 23.7	348 58.0	11.7	S 6 30.0	10.9	57.6								
19	104 44.9	23.7	3 28.7	11.7	6 40.9	10.9	57.6								
20	119 44.8	23.8	17 59.4	11.6	6 51.8	10.9	57.6								
21	134 44.6 . .	23.8	32 30.0	11.5	7 02.7	10.8	57.7								
22	149 44.5	23.9	47 00.5	11.5	7 13.5	10.9	57.7								
23	164 44.4	23.9	61 31.0	11.4	S 7 24.4	10.8	57.8								
	SD 15.8	d 0.1	SD 15.2		15.4		15.6								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	15	16	17	18
°	h m	h m	h m	h m	h m	h m	h m
N 72				23 39	23 29	23 18	23 04
N 70				23 38	23 33	23 28	23 23
68				23 36	23 37	23 37	23 39
66				23 35	23 40	23 45	23 52
64	22 30	////	////	23 34	23 42	23 51	24 02
62	21 52	////	////	23 33	23 44	23 57	24 11
60	21 26	23 11	////	23 33	23 46	24 01	00 01
N 58	21 06	22 21	////	23 32	23 48	24 06	00 06
56	20 49	21 51	////	23 32	23 50	24 10	00 10
54	20 35	21 29	23 15	23 31	23 51	24 13	00 13
52	20 22	21 11	22 29	23 31	23 52	24 16	00 16
50	20 11	20 56	22 01	23 30	23 54	24 19	00 19
45	19 49	20 26	21 16	23 29	23 56	24 25	00 25
N 40	19 31	20 04	20 45	23 28	23 58	24 30	00 30
35	19 16	19 46	20 22	23 28	24 00	00 00	00 35
30	19 03	19 30	20 04	23 27	24 02	00 02	00 39
20	18 41	19 05	19 35	23 26	24 05	00 05	00 46
N 10	18 22	18 45	19 12	23 25	24 07	00 07	00 52
0	18 04	18 27	18 53	23 24	24 10	00 10	00 57
S 10	17 47	18 10	18 36	23 23	24 12	00 12	01 03
20	17 28	17 53	18 20	23 22	24 14	00 14	01 09
30	17 07	17 34	18 04	23 21	24 17	00 17	01 16
35	16 55	17 23	17 55	23 20	24 19	00 19	01 20
40	16 41	17 11	17 45	23 19	24 21	00 21	01 25
45	16 24	16 58	17 35	23 18	24 23	00 23	01 30
S 50	16 03	16 42	17 23	23 17	24 25	00 25	01 36
52	15 53	16 34	17 18	23 16	24 27	00 27	01 39
54	15 42	16 26	17 12	23 16	24 28	00 28	01 42
56	15 30	16 17	17 06	23 15	24 29	00 29	01 46
58	15 15	16 07	17 00	23 14	24 31	00 31	01 50
S 60	14 58	15 55	16 52	23 14	24 33	00 33	01 54

Day	SUN		Mer. Pass.	MOON			
	Eqn. of Time			Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
15	00 24	00 30	12 01	17 13	04 51	07	38
16	00 37	00 43	12 01	17 58	05 36	08	48
17	00 50	00 56	12 01	18 46	06 22	09	58

UT	ARIES	VENUS −3.8		MARS +1.5		JUPITER −1.9		SATURN +0.5		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
18 00	266 23.9	156 29.4	N23 34.1	195 29.7	N22 31.8	178 24.7	N23 11.5	52 39.9	S10 49.2	Acamar	315 18.7	S40 15.0
01	281 26.4	171 28.5	33.7	210 30.3	32.1	193 26.6	11.5	67 42.5	49.2	Achernar	335 27.1	S57 09.8
02	296 28.9	186 27.7	33.4	225 30.9	32.3	208 28.4	11.5	82 45.0	49.1	Acrux	173 09.1	S63 10.8
03	311 31.3	201 26.9	33.0	240 31.5	32.6	223 30.2	11.6	97 47.6	49.1	Adhara	255 12.9	S28 59.7
04	326 33.8	216 26.0	32.7	255 32.1	32.8	238 32.1	11.6	112 50.1	49.1	Aldebaran	290 49.7	N16 32.0
05	341 36.3	231 25.2	32.3	270 32.6	33.1	253 33.9	11.6	127 52.7	49.1			
06	356 38.7	246 24.4	N23 32.0	285 33.2	N22 33.3	268 35.8	N23 11.6	142 55.2	S10 49.1	Alioth	166 20.6	N55 53.4
07	11 41.2	261 23.5	31.6	300 33.8	33.6	283 37.6	11.6	157 57.8	49.1	Alkaid	152 58.7	N49 15.0
08	26 43.6	276 22.7	31.2	315 34.4	33.8	298 39.4	11.6	173 00.3	49.0	Al Na'ir	27 43.5	S46 53.4
09	41 46.1	291 21.9	30.9	330 35.0	34.1	313 41.3	11.6	188 02.8	49.0	Alnilam	275 46.7	S 1 11.8
10	56 48.6	306 21.0	30.5	345 35.6	34.3	328 43.1	11.6	203 05.4	49.0	Alphard	217 56.3	S 8 43.2
11	71 51.0	321 20.2	30.2	0 36.2	34.6	343 45.0	11.7	218 07.9	49.0			
12	86 53.5	336 19.4	N23 29.8	15 36.8	N22 34.8	358 46.8	N23 11.7	233 10.5	S10 49.0	Alphecca	126 10.7	N26 40.3
13	101 56.0	351 18.5	29.4	30 37.4	35.1	13 48.6	11.7	248 13.0	49.0	Alpheratz	357 43.5	N29 09.8
14	116 58.4	6 17.7	29.1	45 38.0	35.3	28 50.5	11.7	263 15.6	48.9	Altair	62 07.9	N 8 54.4
15	132 00.9	21 16.9	28.7	60 38.6	35.6	43 52.3	11.7	278 18.1	48.9	Ankaa	353 15.8	S42 13.7
16	147 03.4	36 16.1	28.3	75 39.2	35.8	58 54.2	11.7	293 20.6	48.9	Antares	112 25.9	S26 27.6
17	162 05.8	51 15.2	27.9	90 39.7	36.1	73 56.0	11.7	308 23.2	48.9			
18	177 08.3	66 14.4	N23 27.6	105 40.3	N22 36.3	88 57.8	N23 11.7	323 25.7	S10 48.9	Arcturus	145 55.5	N19 06.9
19	192 10.8	81 13.6	27.2	120 40.9	36.6	103 59.7	11.7	338 28.3	48.9	Atria	107 27.1	S69 03.0
20	207 13.2	96 12.7	26.8	135 41.5	36.8	119 01.5	11.8	353 30.8	48.8	Avior	234 18.5	S59 33.5
21	222 15.7	111 11.9	26.4	150 42.1	37.1	134 03.4	11.8	8 33.4	48.8	Bellatrix	278 32.3	N 6 21.5
22	237 18.1	126 11.1	26.1	165 42.7	37.3	149 05.2	11.8	23 35.9	48.8	Betelgeuse	271 01.6	N 7 24.4
23	252 20.6	141 10.3	25.7	180 43.3	37.6	164 07.0	11.8	38 38.4	48.8			
19 00	267 23.1	156 09.4	N23 25.3	195 43.9	N22 37.8	179 08.9	N23 11.8	53 41.0	S10 48.8	Canopus	263 56.7	S52 42.4
01	282 25.5	171 08.6	24.9	210 44.5	38.1	194 10.7	11.8	68 43.5	48.8	Capella	280 34.9	N46 00.5
02	297 28.0	186 07.8	24.5	225 45.1	38.3	209 12.6	11.8	83 46.1	48.8	Deneb	49 31.1	N45 19.7
03	312 30.5	201 07.0	24.2	240 45.7	38.5	224 14.4	11.8	98 48.6	48.7	Denebola	182 33.7	N14 29.8
04	327 32.9	216 06.1	23.8	255 46.3	38.8	239 16.2	11.8	113 51.1	48.7	Diphda	348 56.0	S17 54.6
05	342 35.4	231 05.3	23.4	270 46.8	39.0	254 18.1	11.8	128 53.7	48.7			
06	357 37.9	246 04.5	N23 23.0	285 47.4	N22 39.3	269 19.9	N23 11.9	143 56.2	S10 48.7	Dubhe	193 51.9	N61 40.9
07	12 40.3	261 03.7	22.6	300 48.0	39.5	284 21.8	11.9	158 58.8	48.7	Elnath	278 13.0	N28 36.9
08	27 42.8	276 02.8	22.2	315 48.6	39.8	299 23.6	11.9	174 01.3	48.7	Eltanin	90 45.6	N51 29.4
09	42 45.3	291 02.0	21.8	330 49.2	40.0	314 25.4	11.9	189 03.8	48.6	Enif	33 46.9	N 9 56.3
10	57 47.7	306 01.2	21.5	345 49.8	40.2	329 27.3	11.9	204 06.4	48.6	Fomalhaut	15 23.9	S29 32.8
11	72 50.2	321 00.4	21.1	0 50.4	40.5	344 29.1	11.9	219 08.9	48.6			
12	87 52.6	335 59.5	N23 20.7	15 51.0	N22 40.7	359 31.0	N23 11.9	234 11.5	S10 48.6	Gacrux	172 00.7	S57 11.6
13	102 55.1	350 58.7	20.3	30 51.6	41.0	14 32.8	11.9	249 14.0	48.6	Gienah	175 52.2	S17 37.2
14	117 57.6	5 57.9	19.9	45 52.2	41.2	29 34.6	11.9	264 16.5	48.6	Hadar	148 47.4	S60 26.5
15	133 00.0	20 57.1	19.5	60 52.8	41.4	44 36.5	11.9	279 19.1	48.6	Hamal	328 00.9	N23 31.4
16	148 02.5	35 56.3	19.1	75 53.3	41.7	59 38.3	11.9	294 21.6	48.5	Kaus Aust.	83 43.4	S34 22.5
17	163 05.0	50 55.4	18.7	90 53.9	41.9	74 40.2	12.0	309 24.1	48.5			
18	178 07.4	65 54.6	N23 18.3	105 54.5	N22 42.2	89 42.0	N23 12.0	324 26.7	S10 48.5	Kochab	137 19.3	N74 06.3
19	193 09.9	80 53.8	17.9	120 55.1	42.4	104 43.9	12.0	339 29.2	48.5	Markab	13 38.2	N15 16.7
20	208 12.4	95 53.0	17.5	135 55.7	42.6	119 45.7	12.0	354 31.8	48.5	Menkar	314 15.3	N 4 08.5
21	223 14.8	110 52.2	17.1	150 56.3	42.9	134 47.5	12.0	9 34.3	48.5	Menkent	148 07.3	S36 26.3
22	238 17.3	125 51.4	16.7	165 56.9	43.1	149 49.4	12.0	24 36.8	48.4	Miaplacidus	221 40.2	S69 46.7
23	253 19.8	140 50.5	16.3	180 57.5	43.3	164 51.2	12.0	39 39.4	48.4			
20 00	268 22.2	155 49.7	N23 15.8	195 58.1	N22 43.6	179 53.1	N23 12.0	54 41.9	S10 48.4	Mirfak	308 40.7	N49 54.3
01	283 24.7	170 48.9	15.4	210 58.7	43.8	194 54.9	12.1	69 44.5	48.4	Nunki	75 57.9	S26 16.6
02	298 27.1	185 48.1	15.0	225 59.3	44.0	209 56.7	12.1	84 47.0	48.4	Peacock	53 18.8	S56 41.1
03	313 29.6	200 47.3	14.6	240 59.9	44.3	224 58.6	12.1	99 49.5	48.4	Pollux	243 28.1	N27 59.5
04	328 32.1	215 46.5	14.2	256 00.4	44.5	240 00.4	12.1	114 52.1	48.4	Procyon	245 00.0	N 5 11.2
05	343 34.5	230 45.6	13.8	271 01.0	44.7	255 02.3	12.1	129 54.6	48.3			
06	358 37.0	245 44.8	N23 13.4	286 01.6	N22 45.0	270 04.1	N23 12.1	144 57.1	S10 48.3	Rasalhague	96 06.1	N12 33.2
07	13 39.5	260 44.0	13.0	301 02.2	45.2	285 05.9	12.1	159 59.7	48.3	Regulus	207 43.7	N11 54.0
08	28 41.9	275 43.2	12.5	316 02.8	45.4	300 07.8	12.1	175 02.2	48.3	Rigel	281 12.4	S 8 11.3
09	43 44.4	290 42.4	12.1	331 03.4	45.7	315 09.6	12.1	190 04.7	48.3	Rigil Kent.	139 51.2	S60 53.6
10	58 46.9	305 41.6	11.7	346 04.0	45.9	330 11.5	12.1	205 07.3	48.3	Sabik	102 12.2	S15 44.4
11	73 49.3	320 40.8	11.3	1 04.6	46.1	345 13.3	12.2	220 09.8	48.3			
12	88 51.8	335 39.9	N23 10.9	16 05.2	N22 46.4	0 15.1	N23 12.2	235 12.4	S10 48.2	Schedar	349 40.6	N56 36.4
13	103 54.2	350 39.1	10.4	31 05.8	46.6	15 17.0	12.2	250 14.9	48.2	Shaula	96 21.5	S37 06.7
14	118 56.7	5 38.3	10.0	46 06.4	46.8	30 18.8	12.2	265 17.4	48.2	Sirius	258 34.0	S16 44.3
15	133 59.2	20 37.5	09.6	61 06.9	47.1	45 20.7	12.2	280 20.0	48.2	Spica	158 31.1	S11 14.0
16	149 01.6	35 36.7	09.2	76 07.5	47.3	60 22.5	12.2	295 22.5	48.2	Suhail	222 52.7	S43 29.6
17	164 04.1	50 35.9	08.7	91 08.1	47.5	75 24.3	12.2	310 25.0	48.2			
18	179 06.6	65 35.1	N23 08.3	106 08.7	N22 47.8	90 26.2	N23 12.2	325 27.6	S10 48.2	Vega	80 38.5	N38 47.9
19	194 09.0	80 34.3	07.9	121 09.3	48.0	105 28.0	12.2	340 30.1	48.2	Zuben'ubi	137 05.1	S16 05.9
20	209 11.5	95 33.5	07.4	136 09.9	48.2	120 29.9	12.2	355 32.6	48.1			
21	224 14.0	110 32.6	07.0	151 10.5	48.4	135 31.7	12.3	10 35.2	48.1		SHA	Mer.Pass.
22	239 16.4	125 31.8	06.6	166 11.1	48.7	150 33.5	12.3	25 37.7	48.1		° ′	h m
23	254 18.9	140 31.0	06.1	181 11.7	48.9	165 35.4	12.3	40 40.2	48.1	Venus	248 46.4	13 36
	h m									Mars	288 20.8	10 57
Mer.Pass.	6 09.5	v −0.8	d 0.4	v 0.6	d 0.2	v 1.8	d 0.0	v 2.5	d 0.0	Jupiter	271 45.8	12 02
										Saturn	146 17.9	20 22

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 18	Moonrise 19	Moonrise 20	Moonrise 21
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
18 00	179 44.2	N23 24.0	76 01.4	11.3	S 7 35.2	10.8	57.8	N 72				15 47	17 59		
01	194 44.1	24.1	90 31.7	11.3	7 46.0	10.7	57.8	N 70				15 29	17 26	19 33	22 10
02	209 43.9	24.1	105 02.0	11.1	7 56.7	10.8	57.9	68				15 15	17 02	18 52	20 37
03	224 43.8	24.2	119 32.1	11.1	8 07.5	10.7	57.9	66				15 04	16 43	18 24	19 58
04	239 43.7	24.2	134 02.2	11.1	8 18.2	10.6	57.9	64	////	////	01 31	14 54	16 28	18 03	19 31
05	254 43.5	24.3	148 32.3	10.9	8 28.8	10.7	58.0	62	////	////	02 09	14 46	16 16	17 46	19 10
06	269 43.4	N23 24.3	163 02.2	10.9	S 8 39.5	10.6	58.0	60	////	00 49	02 36	14 39	16 05	17 32	18 53
07	284 43.3	24.4	177 32.1	10.8	8 50.1	10.6	58.1	N 58	////	01 40	02 56	14 33	15 56	17 20	18 39
08	299 43.1	24.4	192 01.9	10.7	9 00.7	10.6	58.1	56	////	02 10	03 13	14 28	15 48	17 10	18 27
09	314 43.0	24.5	206 31.6	10.7	9 11.3	10.5	58.1	54	00 45	02 33	03 27	14 23	15 41	17 00	18 16
10	329 42.9	24.5	221 01.3	10.5	9 21.8	10.5	58.2	52	01 32	02 51	03 39	14 18	15 35	16 52	18 07
11	344 42.7	24.6	235 30.8	10.5	9 32.3	10.4	58.2	50	02 00	03 06	03 50	14 14	15 29	16 45	17 58
12	359 42.6	N23 24.6	250 00.3	10.4	S 9 42.7	10.4	58.3	45	02 46	03 35	04 13	14 06	15 17	16 29	17 40
13	14 42.5	24.7	264 29.7	10.3	9 53.1	10.4	58.3	N 40	03 16	03 58	04 31	13 59	15 07	16 17	17 26
14	29 42.3	24.7	278 59.0	10.3	10 03.5	10.3	58.3	35	03 40	04 16	04 46	13 53	14 58	16 06	17 13
15	44 42.2	24.7	293 28.3	10.1	10 13.8	10.3	58.4	30	03 58	04 32	04 59	13 48	14 51	15 56	17 03
16	59 42.0	24.8	307 57.4	10.1	10 24.1	10.3	58.4	20	04 27	04 57	05 21	13 39	14 38	15 40	16 44
17	74 41.9	24.8	322 26.5	10.0	10 34.4	10.2	58.5	N 10	04 50	05 17	05 40	13 31	14 27	15 26	16 28
18	89 41.8	N23 24.9	336 55.5	9.9	S10 44.6	10.1	58.5	0	05 09	05 35	05 58	13 23	14 16	15 13	16 13
19	104 41.6	24.9	351 24.4	9.8	10 54.7	10.1	58.5	S 10	05 26	05 52	06 15	13 16	14 06	15 00	15 58
20	119 41.5	25.0	5 53.2	9.7	11 04.8	10.1	58.6	20	05 42	06 10	06 34	13 08	13 55	14 46	15 43
21	134 41.4	25.0	20 21.9	9.7	11 14.9	10.0	58.6	30	05 59	06 29	06 55	13 00	13 42	14 30	15 24
22	149 41.2	25.0	34 50.6	9.6	11 24.9	10.0	58.7	35	06 07	06 39	07 07	12 55	13 35	14 21	15 14
23	164 41.1	25.1	49 19.2	9.4	11 34.9	9.9	58.7	40	06 17	06 51	07 22	12 49	13 27	14 10	15 02
19 00	179 41.0	N23 25.1	63 47.6	9.4	S11 44.8	9.8	58.7	45	06 27	07 04	07 38	12 42	13 17	13 58	14 48
01	194 40.8	25.2	78 16.0	9.3	11 54.6	9.8	58.8	S 50	06 39	07 21	07 59	12 34	13 06	13 44	14 31
02	209 40.7	25.2	92 44.3	9.2	12 04.4	9.8	58.8	52	06 44	07 28	08 09	12 31	13 00	13 37	14 22
03	224 40.6	25.2	107 12.5	9.1	12 14.2	9.7	58.9	54	06 50	07 36	08 20	12 27	12 55	13 29	14 13
04	239 40.4	25.3	121 40.6	9.0	12 23.9	9.6	58.9	56	06 56	07 45	08 33	12 23	12 48	13 21	14 03
05	254 40.3	25.3	136 08.6	9.0	12 33.5	9.6	58.9	58	07 03	07 56	08 48	12 18	12 41	13 11	13 52
06	269 40.1	N23 25.3	150 36.6	8.8	S12 43.1	9.5	59.0	S 60	07 10	08 07	09 05	12 12	12 33	13 00	13 39
07	284 40.0	25.4	165 04.4	8.8	12 52.6	9.4	59.0								
08	299 39.9	25.4	179 32.2	8.6	13 02.0	9.4	59.0								
09	314 39.7	25.4	193 59.8	8.6	13 11.4	9.3	59.1								
10	329 39.6	25.5	208 27.4	8.5	13 20.7	9.3	59.1								
11	344 39.5	25.5	222 54.9	8.3	13 30.0	9.1	59.2								
12	359 39.3	N23 25.5	237 22.2	8.3	S13 39.1	9.2	59.2								
13	14 39.2	25.6	251 49.5	8.2	13 48.3	9.0	59.2								
14	29 39.1	25.6	266 16.7	8.1	13 57.3	9.0	59.3								
15	44 38.9	25.6	280 43.8	8.0	14 06.3	8.9	59.3								
16	59 38.8	25.6	295 10.8	7.9	14 15.2	8.8	59.4								
17	74 38.7	25.7	309 37.7	7.9	14 24.0	8.7	59.4								
18	89 38.5	N23 25.7	324 04.6	7.7	S14 32.7	8.7	59.4								
19	104 38.4	25.7	338 31.3	7.6	14 41.4	8.6	59.5								
20	119 38.2	25.7	352 57.9	7.5	14 50.0	8.5	59.5								
21	134 38.1	25.8	7 24.4	7.5	14 58.5	8.4	59.5								
22	149 38.0	25.8	21 50.9	7.3	15 06.9	8.3	59.6								
23	164 37.8	25.8	36 17.2	7.3	15 15.2	8.3	59.6								
20 00	179 37.7	N23 25.8	50 43.5	7.1	S15 23.5	8.2	59.7								
01	194 37.6	25.8	65 09.6	7.1	15 31.7	8.0	59.7								
02	209 37.4	25.9	79 35.7	6.9	15 39.7	8.0	59.7								
03	224 37.3	25.9	94 01.6	6.9	15 47.7	7.9	59.8								
04	239 37.2	25.9	108 27.5	6.8	15 55.6	7.8	59.8								
05	254 37.0	25.9	122 53.3	6.7	16 03.4	7.7	59.8								
06	269 36.9	N23 25.9	137 19.0	6.5	S16 11.1	7.6	59.9								
07	284 36.8	26.0	151 44.5	6.5	16 18.7	7.5	59.9								
08	299 36.6	26.0	166 10.0	6.4	16 26.2	7.5	59.9								
09	314 36.5	26.0	180 35.4	6.4	16 33.7	7.3	60.0								
10	329 36.3	26.0	195 00.8	6.2	16 41.0	7.2	60.0								
11	344 36.2	26.0	209 26.0	6.1	16 48.2	7.1	60.0								
12	359 36.1	N23 26.0	223 51.1	6.0	S16 55.3	7.0	60.1								
13	14 35.9	26.0	238 16.1	6.0	17 02.3	6.9	60.1								
14	29 35.8	26.1	252 41.1	5.8	17 09.2	6.8	60.1								
15	44 35.7	26.1	267 05.9	5.8	17 16.0	6.7	60.2								
16	59 35.5	26.1	281 30.7	5.7	17 22.7	6.5	60.2								
17	74 35.4	26.1	295 55.4	5.5	17 29.2	6.5	60.2								
18	89 35.3	N23 26.1	310 19.9	5.5	S17 35.7	6.4	60.3								
19	104 35.1	26.1	324 44.4	5.4	17 42.1	6.2	60.3								
20	119 35.0	26.1	339 08.8	5.4	17 48.3	6.1	60.3								
21	134 34.9	26.1	353 33.2	5.2	17 54.4	6.0	60.4								
22	149 34.7	26.1	7 57.4	5.2	18 00.4	5.9	60.4								
23	164 34.6	26.1	22 21.6	5.0	S18 06.3	5.8	60.4								
	SD 15.8	d 0.0	SD	15.9		16.1		16.4							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 18	Moonset 19	Moonset 20	Moonset 21
°	h m	h m	h m	h m	h m	h m	h m
N 72				23 04	22 43		
N 70				23 23	23 18	23 10	22 42
68				23 39	23 43	23 52	24 14
66				23 52	24 02	00 02	00 20
64	22 32	////	////	24 02	00 02	00 18	00 42
62	21 54	////	////	24 11	00 11	00 31	01 00
60	21 27	23 14	////	00 01	00 19	00 42	01 14
N 58	21 07	22 23	////	00 06	00 26	00 52	01 27
56	20 50	21 53	////	00 10	00 32	01 01	01 38
54	20 36	21 30	23 18	00 13	00 38	01 08	01 47
52	20 23	21 12	22 31	00 16	00 43	01 15	01 56
50	20 12	20 57	22 03	00 19	00 47	01 21	02 03
45	19 50	20 27	21 17	00 25	00 57	01 35	02 20
N 40	19 32	20 05	20 46	00 30	01 05	01 46	02 33
35	19 17	19 46	20 23	00 35	01 13	01 55	02 45
30	19 04	19 31	20 05	00 39	01 19	02 04	02 55
20	18 42	19 06	19 35	00 46	01 30	02 18	03 12
N 10	18 23	18 46	19 13	00 52	01 39	02 31	03 27
0	18 05	18 28	18 54	00 57	01 48	02 43	03 41
S 10	17 48	18 10	18 37	01 03	01 57	02 54	03 55
20	17 29	17 53	18 21	01 09	02 07	03 07	04 10
30	17 08	17 34	18 04	01 16	02 17	03 22	04 28
35	16 55	17 24	17 55	01 20	02 24	03 30	04 38
40	16 41	17 12	17 46	01 25	02 31	03 40	04 49
45	16 24	16 58	17 36	01 30	02 39	03 51	05 03
S 50	16 04	16 42	17 24	01 36	02 50	04 05	05 20
52	15 54	16 35	17 18	01 39	02 54	04 11	05 27
54	15 43	16 26	17 13	01 42	03 00	04 18	05 36
56	15 30	16 17	17 07	01 46	03 05	04 26	05 46
58	15 15	16 07	17 00	01 50	03 12	04 35	05 57
S 60	14 58	15 55	16 52	01 54	03 19	04 46	06 10

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
18	01 03	01 09	12 01	19 36	07 10	10	69
19	01 16	01 22	12 01	20 29	08 02	11	79
20	01 29	01 35	12 02	21 27	08 58	12	87

UT	ARIES	VENUS −3.8		MARS +1.5		JUPITER −1.9		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
21 00	269 21.4	155 30.2	N23 05.7	196 12.3	N22 49.1	180 37.2	N23 12.3	55 42.8	S10 48.1
01	284 23.8	170 29.4	05.3	211 12.9	49.4	195 39.1	12.3	70 45.3	48.1
02	299 26.3	185 28.6	04.8	226 13.5	49.6	210 40.9	12.3	85 47.8	48.1
03	314 28.7	200 27.8	. . 04.4	241 14.0	. . 49.8	225 42.7	. . 12.3	100 50.4	. . 48.0
04	329 31.2	215 27.0	04.0	256 14.6	50.0	240 44.6	12.3	115 52.9	48.0
05	344 33.7	230 26.2	03.5	271 15.2	50.3	255 46.4	12.3	130 55.4	48.0
06	359 36.1	245 25.4	N23 03.1	286 15.8	N22 50.5	270 48.3	N23 12.3	145 58.0	S10 48.0
07	14 38.6	260 24.6	02.6	301 16.4	50.7	285 50.1	12.3	161 00.5	48.0
08	29 41.1	275 23.8	02.2	316 17.0	50.9	300 51.9	12.4	176 03.0	48.0
F 09	44 43.5	290 23.0	. . 01.7	331 17.6	. . 51.2	315 53.8	. . 12.4	191 05.6	. . 48.0
R 10	59 46.0	305 22.2	01.3	346 18.2	51.4	330 55.6	12.4	206 08.1	48.0
I 11	74 48.5	320 21.4	00.8	1 18.8	51.6	345 57.5	12.4	221 10.6	47.9
D 12	89 50.9	335 20.6	N23 00.4	16 19.4	N22 51.8	0 59.3	N23 12.4	236 13.2	S10 47.9
A 13	104 53.4	350 19.8	22 59.9	31 20.0	52.0	16 01.1	12.4	251 15.7	47.9
Y 14	119 55.9	5 19.0	59.5	46 20.5	52.3	31 03.0	12.4	266 18.2	47.9
15	134 58.3	20 18.2	. . 59.0	61 21.1	. . 52.5	46 04.8	. . 12.4	281 20.8	. . 47.9
16	150 00.8	35 17.4	58.6	76 21.7	52.7	61 06.7	12.4	296 23.3	47.9
17	165 03.2	50 16.5	58.1	91 22.3	52.9	76 08.5	12.4	311 25.8	47.9
18	180 05.7	65 15.7	N22 57.7	106 22.9	N22 53.2	91 10.3	N23 12.4	326 28.3	S10 47.9
19	195 08.2	80 14.9	57.2	121 23.5	53.4	106 12.2	12.4	341 30.9	47.8
20	210 10.6	95 14.1	56.8	136 24.1	53.6	121 14.0	12.5	356 33.4	47.8
21	225 13.1	110 13.4	. . 56.3	151 24.7	. . 53.8	136 15.9	. . 12.5	11 35.9	. . 47.8
22	240 15.6	125 12.6	55.8	166 25.3	54.0	151 17.7	12.5	26 38.5	47.8
23	255 18.0	140 11.8	55.4	181 25.9	54.2	166 19.5	12.5	41 41.0	47.8
22 00	270 20.5	155 11.0	N22 54.9	196 26.5	N22 54.5	181 21.4	N23 12.5	56 43.5	S10 47.8
01	285 23.0	170 10.2	54.4	211 27.0	54.7	196 23.2	12.5	71 46.1	47.8
02	300 25.4	185 09.4	54.0	226 27.6	54.9	211 25.1	12.5	86 48.6	47.8
03	315 27.9	200 08.6	. . 53.5	241 28.2	. . 55.1	226 26.9	. . 12.5	101 51.1	. . 47.8
04	330 30.4	215 07.8	53.0	256 28.8	55.3	241 28.7	12.5	116 53.7	47.7
05	345 32.8	230 07.0	52.6	271 29.4	55.5	256 30.6	12.5	131 56.2	47.7
06	0 35.3	245 06.2	N22 52.1	286 30.0	N22 55.8	271 32.4	N23 12.5	146 58.7	S10 47.7
S 07	15 37.7	260 05.4	51.6	301 30.6	56.0	286 34.3	12.5	162 01.2	47.7
A 08	30 40.2	275 04.6	51.2	316 31.2	56.2	301 36.1	12.5	177 03.8	47.7
T 09	45 42.7	290 03.8	. . 50.7	331 31.8	. . 56.4	316 37.9	. . 12.6	192 06.3	. . 47.7
U 10	60 45.1	305 03.0	50.2	346 32.4	56.6	331 39.8	12.6	207 08.8	47.7
R 11	75 47.6	320 02.2	49.7	1 33.0	56.8	346 41.6	12.6	222 11.4	47.7
D 12	90 50.1	335 01.4	N22 49.3	16 33.6	N22 57.1	1 43.5	N23 12.6	237 13.9	S10 47.6
A 13	105 52.5	350 00.6	48.8	31 34.1	57.3	16 45.3	12.6	252 16.4	47.6
Y 14	120 55.0	4 59.8	48.3	46 34.7	57.5	31 47.1	12.6	267 18.9	47.6
15	135 57.5	19 59.0	. . 47.8	61 35.3	. . 57.7	46 49.0	. . 12.6	282 21.5	. . 47.6
16	150 59.9	34 58.2	47.3	76 35.9	57.9	61 50.8	12.6	297 24.0	47.6
17	166 02.4	49 57.5	46.9	91 36.5	58.1	76 52.7	12.6	312 26.5	47.6
18	181 04.9	64 56.7	N22 46.4	106 37.1	N22 58.3	91 54.5	N23 12.6	327 29.0	S10 47.6
19	196 07.3	79 55.9	45.9	121 37.7	58.5	106 56.3	12.6	342 31.6	47.6
20	211 09.8	94 55.1	45.4	136 38.3	58.7	121 58.2	12.6	357 34.1	47.6
21	226 12.2	109 54.3	. . 44.9	151 38.9	. . 59.0	137 00.0	. . 12.6	12 36.6	. . 47.6
22	241 14.7	124 53.5	44.4	166 39.5	59.2	152 01.9	12.6	27 39.2	47.5
23	256 17.2	139 52.7	43.9	181 40.1	59.4	167 03.7	12.7	42 41.7	47.5
23 00	271 19.6	154 51.9	N22 43.5	196 40.6	N22 59.6	182 05.6	N23 12.7	57 44.2	S10 47.5
01	286 22.1	169 51.2	43.0	211 41.2	22 59.8	197 07.4	12.7	72 46.7	47.5
02	301 24.6	184 50.4	42.5	226 41.8	23 00.0	212 09.2	12.7	87 49.3	47.5
03	316 27.0	199 49.6	. . 42.0	241 42.4	. . 00.2	227 11.1	. . 12.7	102 51.8	. . 47.5
04	331 29.5	214 48.8	41.5	256 43.0	00.4	242 12.9	12.7	117 54.3	47.5
05	346 32.0	229 48.0	41.0	271 43.6	00.6	257 14.8	12.7	132 56.8	47.5
06	1 34.4	244 47.2	N22 40.5	286 44.2	N23 00.8	272 16.6	N23 12.7	147 59.4	S10 47.5
S 07	16 36.9	259 46.4	40.0	301 44.8	01.0	287 18.4	12.7	163 01.9	47.4
U 08	31 39.4	274 45.7	39.5	316 45.4	01.2	302 20.3	12.7	178 04.4	47.4
N 09	46 41.8	289 44.9	. . 39.0	331 46.0	. . 01.5	317 22.1	. . 12.7	193 06.9	. . 47.4
D 10	61 44.3	304 44.1	38.5	346 46.6	01.7	332 24.0	12.7	208 09.5	47.4
A 11	76 46.7	319 43.3	38.0	1 47.1	01.9	347 25.8	12.7	223 12.0	47.4
Y 12	91 49.2	334 42.5	N22 37.5	16 47.7	N23 02.1	2 27.6	N23 12.7	238 14.5	S10 47.4
13	106 51.7	349 41.7	37.0	31 48.3	02.3	17 29.5	12.8	253 17.0	47.4
14	121 54.1	4 41.0	36.5	46 48.9	02.5	32 31.3	12.8	268 19.6	47.4
15	136 56.6	19 40.2	. . 36.0	61 49.5	. . 02.7	47 33.2	. . 12.8	283 22.1	. . 47.4
16	151 59.1	34 39.4	35.5	76 50.1	02.9	62 35.0	12.8	298 24.6	47.4
17	167 01.5	49 38.6	35.0	91 50.7	03.1	77 36.8	12.8	313 27.1	47.4
18	182 04.0	64 37.8	N22 34.4	106 51.3	N23 03.3	92 38.7	N23 12.8	328 29.7	S10 47.3
19	197 06.5	79 37.1	33.9	121 51.9	03.5	107 40.5	12.8	343 32.2	47.3
20	212 08.9	94 36.3	33.4	136 52.5	03.7	122 42.4	12.8	358 34.7	47.3
21	227 11.4	109 35.5	. . 32.9	151 53.1	. . 03.9	137 44.2	. . 12.8	13 37.2	. . 47.3
22	242 13.8	124 34.7	32.4	166 53.6	04.1	152 46.0	12.8	28 39.8	47.3
23	257 16.3	139 34.0	31.9	181 54.2	04.3	167 47.9	12.8	43 42.3	47.3
Mer. Pass.	h m 5 57.7	v −0.8	d 0.5	v 0.6	d 0.2	v 1.8	d 0.0	v 2.5	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.7	S40 14.9
Achernar	335 27.1	S57 09.8
Acrux	173 09.1	S63 10.8
Adhara	255 12.9	S28 59.6
Aldebaran	290 49.7	N16 32.0
Alioth	166 20.6	N55 53.4
Alkaid	152 58.7	N49 15.0
Al Na'ir	27 43.5	S46 53.4
Alnilam	275 46.7	S 1 11.8
Alphard	217 56.3	S 8 43.2
Alphecca	126 10.7	N26 40.3
Alpheratz	357 43.4	N29 09.8
Altair	62 07.9	N 8 54.4
Ankaa	353 15.8	S42 13.7
Antares	112 25.9	S26 27.6
Arcturus	145 55.5	N19 06.9
Atria	107 27.1	S69 03.0
Avior	234 18.5	S59 33.5
Bellatrix	278 32.3	N 6 21.5
Betelgeuse	271 01.6	N 7 24.4
Canopus	263 56.7	S52 42.4
Capella	280 34.9	N46 00.5
Deneb	49 31.1	N45 19.7
Denebola	182 33.7	N14 29.8
Diphda	348 55.9	S17 54.6
Dubhe	193 51.9	N61 40.9
Elnath	278 13.0	N28 36.9
Eltanin	90 45.6	N51 29.4
Enif	33 46.9	N 9 56.3
Fomalhaut	15 23.9	S29 32.8
Gacrux	172 00.7	S57 11.7
Gienah	175 52.2	S17 37.2
Hadar	148 47.4	S60 26.5
Hamal	328 00.9	N23 31.4
Kaus Aust.	83 43.4	S34 22.5
Kochab	137 19.3	N74 06.3
Markab	13 38.2	N15 16.7
Menkar	314 15.3	N 4 08.5
Menkent	148 07.3	S36 26.3
Miaplacidus	221 40.2	S69 46.7
Mirfak	308 40.7	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.7	S56 41.1
Pollux	243 28.1	N27 59.5
Procyon	245 00.0	N 5 11.2
Rasalhague	96 06.1	N12 33.2
Regulus	207 43.7	N11 54.0
Rigel	281 12.4	S 8 11.3
Rigil Kent.	139 51.2	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 40.5	N56 36.4
Shaula	96 21.5	S37 06.7
Sirius	258 34.0	S16 44.3
Spica	158 31.1	S11 14.0
Suhail	222 52.7	S43 29.6
Vega	80 38.5	N38 47.9
Zuben'ubi	137 05.1	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	244 50.5	13 40
Mars	286 06.0	10 54
Jupiter	271 00.9	11 53
Saturn	146 23.0	20 10

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 21	Moonrise 22	Moonrise 23	Moonrise 24
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
21 00	179 34.5	N23 26.1	36 45.6	5.0	S18 12.1	5.6	60.5	N 72							23 56
01	194 34.3	26.1	51 09.6	4.9	18 17.7	5.5	60.5	N 70				22 10		23 21	23 11
02	209 34.2	26.1	65 33.5	4.9	18 23.2	5.4	60.5	68					23 21	22 28	22 41
03	224 34.0	. . 26.1	79 57.4	4.7	18 28.6	5.3	60.6	66				19 58	21 11	21 55	22 18
04	239 33.9	26.1	94 21.1	4.7	18 33.9	5.1	60.6	64	////	////	01 31	19 31	20 42	21 30	22 00
05	254 33.8	26.1	108 44.8	4.6	18 39.0	5.0	60.6	62	////	////	02 10	19 10	20 20	21 11	21 45
06	269 33.6	N23 26.1	123 08.4	4.5	S18 44.0	4.9	60.6	60	////	00 49	02 36	18 53	20 03	20 55	21 33
07	284 33.5	26.1	137 31.9	4.4	18 48.9	4.8	60.7	N 58	////	01 41	02 57	18 39	19 48	20 42	21 22
08	299 33.4	26.1	151 55.3	4.4	18 53.7	4.6	60.7	56	////	02 11	03 13	18 27	19 35	20 30	21 13
F 09	314 33.2	. . 26.1	166 18.7	4.3	18 58.3	4.5	60.7	54	00 45	02 33	03 28	18 16	19 24	20 20	21 04
R 10	329 33.1	26.1	180 42.0	4.2	19 02.8	4.4	60.7	52	01 33	02 51	03 40	18 07	19 14	20 11	20 57
I 11	344 33.0	26.1	195 05.2	4.2	19 07.2	4.2	60.8	50	02 01	03 06	03 51	17 58	19 05	20 03	20 50
D 12	359 32.8	N23 26.1	209 28.4	4.1	S19 11.4	4.1	60.8	45	02 46	03 36	04 13	17 40	18 47	19 45	20 35
A 13	14 32.7	26.1	223 51.5	4.0	19 15.5	3.9	60.8	N 40	03 17	03 59	04 32	17 26	18 32	19 31	20 23
Y 14	29 32.6	26.1	238 14.5	3.9	19 19.4	3.8	60.8	35	03 40	04 17	04 47	17 13	18 19	19 19	20 13
15	44 32.4	. . 26.1	252 37.4	3.9	19 23.2	3.7	60.9	30	03 59	04 32	05 00	17 03	18 08	19 09	20 04
16	59 32.3	26.1	267 00.3	3.9	19 26.9	3.6	60.9	20	04 28	04 57	05 22	16 44	17 48	18 50	19 48
17	74 32.2	26.1	281 23.2	3.7	19 30.5	3.3	60.9	N 10	04 51	05 18	05 41	16 28	17 32	18 35	19 35
18	89 32.0	N23 26.1	295 45.9	3.7	S19 33.8	3.3	60.9	0	05 10	05 36	05 58	16 13	17 16	18 20	19 22
19	104 31.9	26.1	310 08.6	3.7	19 37.1	3.1	61.0	S 10	05 27	05 53	06 16	15 58	17 01	18 05	19 09
20	119 31.8	26.1	324 31.3	3.6	19 40.2	3.0	61.0	20	05 43	06 10	06 34	15 43	16 44	17 49	18 55
21	134 31.6	. . 26.0	338 53.9	3.5	19 43.2	2.8	61.0	30	05 59	06 29	06 56	15 24	16 25	17 31	18 40
22	149 31.5	26.0	353 16.4	3.5	19 46.0	2.7	61.0	35	06 08	06 40	07 08	15 14	16 14	17 21	18 30
23	164 31.3	26.0	7 38.9	3.5	19 48.7	2.5	61.0	40	06 18	06 52	07 22	15 02	16 02	17 08	18 20
22 00	179 31.2	N23 26.0	22 01.4	3.4	S19 51.2	2.4	61.1	45	06 28	07 05	07 39	14 48	15 47	16 54	18 08
01	194 31.1	26.0	36 23.8	3.3	19 53.6	2.2	61.1	S 50	06 40	07 21	08 00	14 31	15 28	16 37	17 53
02	209 30.9	26.0	50 46.1	3.3	19 55.8	2.1	61.1	52	06 45	07 29	08 10	14 22	15 20	16 28	17 46
03	224 30.8	. . 26.0	65 08.4	3.3	19 57.9	1.9	61.1	54	06 51	07 37	08 21	14 13	15 10	16 19	17 38
04	239 30.7	25.9	79 30.7	3.2	19 59.8	1.8	61.1	56	06 57	07 46	08 34	14 03	14 59	16 09	17 29
05	254 30.5	25.9	93 52.9	3.2	20 01.6	1.7	61.2	58	07 04	07 56	08 48	13 52	14 47	15 57	17 19
06	269 30.4	N23 25.9	108 15.1	3.1	S20 03.3	1.5	61.2	S 60	07 11	08 08	09 06	13 39	14 32	15 43	17 08
S 07	284 30.3	25.9	122 37.2	3.1	20 04.8	1.3	61.2								
A 08	299 30.1	25.9	136 59.3	3.1	20 06.1	1.2	61.2								
T 09	314 30.0	. . 25.9	151 21.4	3.1	20 07.3	1.0	61.2								
U 10	329 29.9	25.8	165 43.5	3.0	20 08.3	0.9	61.2								
R 11	344 29.7	25.8	180 05.5	3.0	20 09.2	0.7	61.3								
D 12	359 29.6	N23 25.8	194 27.5	2.9	S20 09.9	0.6	61.3								
A 13	14 29.5	25.8	208 49.4	3.0	20 10.5	0.4	61.3								
Y 14	29 29.3	25.7	223 11.4	2.9	20 10.9	0.2	61.3								
15	44 29.2	. . 25.7	237 33.3	2.9	20 11.1	0.2	61.3								
16	59 29.1	25.7	251 55.2	2.9	20 11.3	0.1	61.3								
17	74 28.9	25.7	266 17.1	2.9	20 11.2	0.2	61.3								
18	89 28.8	N23 25.6	280 39.0	2.8	S20 11.0	0.4	61.3								
19	104 28.7	25.6	295 00.8	2.9	20 10.6	0.5	61.3								
20	119 28.5	25.6	309 22.7	2.8	20 10.1	0.6	61.4								
21	134 28.4	. . 25.6	323 44.5	2.9	20 09.5	0.9	61.4								
22	149 28.3	25.5	338 06.4	2.8	20 08.6	0.9	61.4								
23	164 28.1	25.5	352 28.2	2.9	20 07.7	1.2	61.4								
23 00	179 28.0	N23 25.5	6 50.1	2.8	S20 06.5	1.3	61.4								
01	194 27.9	25.4	21 11.9	2.8	20 05.2	1.4	61.4								
02	209 27.7	25.4	35 33.7	2.9	20 03.8	1.6	61.4								
03	224 27.6	. . 25.4	49 55.6	2.8	20 02.2	1.7	61.4								
04	239 27.5	25.3	64 17.4	2.9	20 00.5	2.0	61.4								
05	254 27.3	25.3	78 39.3	2.9	19 58.5	2.0	61.4								
06	269 27.2	N23 25.3	93 01.2	2.9	S19 56.5	2.2	61.4								
S 07	284 27.1	25.2	107 23.1	2.9	19 54.3	2.4	61.4								
U 08	299 26.9	25.2	121 45.0	2.9	19 51.9	2.5	61.4								
N 09	314 26.8	. . 25.2	136 06.9	3.0	19 49.4	2.7	61.4								
D 10	329 26.7	25.1	150 28.9	2.9	19 46.7	2.8	61.4								
A 11	344 26.5	25.1	164 50.8	3.0	19 43.9	3.0	61.4								
Y 12	359 26.4	N23 25.1	179 12.8	3.0	S19 40.9	3.1	61.4								
13	14 26.3	25.0	193 34.8	3.1	19 37.8	3.3	61.4								
14	29 26.1	25.0	207 56.9	3.1	19 34.5	3.4	61.4								
15	44 26.0	. . 24.9	222 19.0	3.1	19 31.1	3.6	61.4								
16	59 25.9	24.9	236 41.1	3.1	19 27.5	3.7	61.4								
17	74 25.7	24.8	251 03.2	3.2	19 23.8	3.9	61.4								
18	89 25.6	N23 24.8	265 25.4	3.2	S19 19.9	4.0	61.4								
19	104 25.5	24.8	279 47.6	3.3	19 15.9	4.1	61.4								
20	119 25.3	24.7	294 09.9	3.3	19 11.8	4.3	61.4								
21	134 25.2	. . 24.7	308 32.2	3.3	19 07.5	4.5	61.4								
22	149 25.1	24.6	322 54.5	3.4	19 03.0	4.6	61.4								
23	164 24.9	24.6	337 16.9	3.4	S18 58.4	4.7	61.4								
	SD 15.8	d 0.0	SD	16.6		16.7									

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 21	Moonset 22	Moonset 23	Moonset 24
°	h m	h m	h m	h m	h m	h m	h m
N 72							01 57
N 70				22 42			02 50
68				24 14	00 14	01 12	03 22
66				00 20	00 54	01 54	03 46
64	22 32	////	////	00 42	01 21	02 22	03 46
62	21 54	////	////	01 00	01 42	02 44	04 05
60	21 28	23 14	////	01 14	01 59	03 02	04 20
N 58	21 07	22 23	////	01 27	02 14	03 16	04 34
56	20 51	21 53	////	01 38	02 26	03 29	04 45
54	20 36	21 31	23 18	01 47	02 37	03 40	04 55
52	20 24	21 13	22 31	01 56	02 47	03 50	05 04
50	20 13	20 58	22 03	02 03	02 55	03 59	05 11
45	19 51	20 28	21 18	02 20	03 14	04 17	05 28
N 40	19 32	20 05	20 47	02 33	03 29	04 32	05 42
35	19 17	19 47	20 24	02 45	03 41	04 45	05 53
30	19 04	19 32	20 05	02 55	03 52	04 56	06 03
20	18 42	19 07	19 36	03 12	04 11	05 15	06 21
N 10	18 23	18 46	19 13	03 27	04 28	05 31	06 36
0	18 06	18 28	18 54	03 41	04 43	05 47	06 50
S 10	17 48	18 11	18 37	03 55	04 58	06 02	07 04
20	17 30	17 54	18 21	04 10	05 15	06 18	07 18
30	17 08	17 35	18 05	04 28	05 34	06 37	07 35
35	16 56	17 24	17 56	04 38	05 45	06 48	07 45
40	16 42	17 12	17 47	04 49	05 57	07 00	07 56
45	16 25	16 59	17 36	05 03	06 12	07 15	08 09
S 50	16 04	16 43	17 24	05 20	06 30	07 33	08 25
52	15 54	16 35	17 19	05 27	06 39	07 41	08 32
54	15 43	16 27	17 13	05 36	06 48	07 50	08 41
56	15 31	16 18	17 07	05 46	06 59	08 01	08 50
58	15 16	16 08	17 00	05 57	07 12	08 13	09 00
S 60	14 58	15 56	16 53	06 10	07 26	08 27	09 12

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
21	01 42	01 48	12 02	22 28	09 57	13	94
22	01 55	02 01	12 02	23 31	11 00	14	98
23	02 08	02 14	12 02	24 35	12 03	15	100

UT	ARIES	VENUS −3.8		MARS +1.5		JUPITER −1.9		SATURN +0.5		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
24 00	272 18.8	154 33.2	N22 31.4	196 54.8	N23 04.5	182 49.7	N23 12.8	58 44.8	S10 47.3	Acamar	315 18.6	S40 14.9
01	287 21.2	169 32.4	30.8	211 55.4	04.7	197 51.6	12.8	73 47.3	47.3	Achernar	335 27.0	S57 09.8
02	302 23.7	184 31.6	30.3	226 56.0	04.9	212 53.4	12.8	88 49.8	47.3	Acrux	173 09.1	S63 10.8
03	317 26.2	199 30.8	. . 29.8	241 56.6	. . 05.1	227 55.2	. . 12.8	103 52.4	. . 47.3	Adhara	255 12.9	S28 59.6
04	332 28.6	214 30.1	29.3	256 57.2	05.3	242 57.1	12.8	118 54.9	47.2	Aldebaran	290 49.7	N16 32.0
05	347 31.1	229 29.3	28.8	271 57.8	05.5	257 58.9	12.8	133 57.4	47.2			
06	2 33.6	244 28.5	N22 28.2	286 58.4	N23 05.7	273 00.8	N23 12.9	148 59.9	S10 47.2	Alioth	166 20.6	N55 53.4
07	17 36.0	259 27.8	27.7	301 59.0	05.9	288 02.6	12.9	164 02.5	47.2	Alkaid	152 58.7	N49 15.0
08	32 38.5	274 27.0	27.2	316 59.6	06.1	303 04.5	12.9	179 05.0	47.2	Al Na'ir	27 43.5	S46 53.4
M 09	47 41.0	289 26.2	. . 26.7	332 00.2	. . 06.3	318 06.3	. . 12.9	194 07.5	. . 47.2	Alnilam	275 46.7	S 1 11.8
O 10	62 43.4	304 25.4	26.1	347 00.7	06.5	333 08.1	12.9	209 10.0	47.2	Alphard	217 56.3	S 8 43.2
N 11	77 45.9	319 24.7	25.6	2 01.3	06.7	348 10.0	12.9	224 12.5	47.2			
D 12	92 48.3	334 23.9	N22 25.1	17 01.9	N23 06.9	3 11.8	N23 12.9	239 15.1	S10 47.2	Alphecca	126 10.7	N26 40.4
A 13	107 50.8	349 23.1	24.5	32 02.5	07.1	18 13.7	12.9	254 17.6	47.2	Alpheratz	357 43.4	N29 09.8
Y 14	122 53.3	4 22.4	24.0	47 03.1	07.3	33 15.5	12.9	269 20.1	47.2	Altair	62 07.9	N 8 54.4
15	137 55.7	19 21.6	. . 23.5	62 03.7	. . 07.5	48 17.3	. . 12.9	284 22.6	. . 47.2	Ankaa	353 15.7	S42 13.7
16	152 58.2	34 20.8	22.9	77 04.3	07.6	63 19.2	12.9	299 25.1	47.1	Antares	112 25.9	S26 27.6
17	168 00.7	49 20.0	22.4	92 04.9	07.8	78 21.0	12.9	314 27.7	47.1			
18	183 03.1	64 19.3	N22 21.9	107 05.5	N23 08.0	93 22.9	N23 12.9	329 30.2	S10 47.1	Arcturus	145 55.5	N19 06.9
19	198 05.6	79 18.5	21.3	122 06.1	08.2	108 24.7	12.9	344 32.7	47.1	Atria	107 27.1	S69 03.1
20	213 08.1	94 17.7	20.8	137 06.7	08.4	123 26.5	12.9	359 35.2	47.1	Avior	234 18.5	S59 33.5
21	228 10.5	109 17.0	. . 20.2	152 07.2	. . 08.6	138 28.4	. . 12.9	14 37.7	. . 47.1	Bellatrix	278 32.3	N 6 21.5
22	243 13.0	124 16.2	19.7	167 07.8	08.8	153 30.2	12.9	29 40.3	47.1	Betelgeuse	271 01.6	N 7 24.4
23	258 15.5	139 15.4	19.2	182 08.4	09.0	168 32.1	12.9	44 42.8	47.1			
25 00	273 17.9	154 14.7	N22 18.6	197 09.0	N23 09.2	183 33.9	N23 13.0	59 45.3	S10 47.1	Canopus	263 56.7	S52 42.3
01	288 20.4	169 13.9	18.1	212 09.6	09.4	198 35.7	13.0	74 47.8	47.1	Capella	280 34.9	N46 00.5
02	303 22.8	184 13.1	17.5	227 10.2	09.6	213 37.6	13.0	89 50.3	47.1	Deneb	49 31.0	N45 19.7
03	318 25.3	199 12.4	. . 17.0	242 10.8	. . 09.8	228 39.4	. . 13.0	104 52.9	. . 47.1	Denebola	182 33.7	N14 29.8
04	333 27.8	214 11.6	16.4	257 11.4	09.9	243 41.3	13.0	119 55.4	47.1	Diphda	348 55.9	S17 54.6
05	348 30.2	229 10.9	15.9	272 12.0	10.1	258 43.1	13.0	134 57.9	47.0			
06	3 32.7	244 10.1	N22 15.3	287 12.6	N23 10.3	273 45.0	N23 13.0	150 00.4	S10 47.0	Dubhe	193 52.0	N61 40.9
07	18 35.2	259 09.3	14.8	302 13.2	10.5	288 46.8	13.0	165 02.9	47.0	Elnath	278 12.9	N28 36.9
08	33 37.6	274 08.6	14.2	317 13.7	10.7	303 48.6	13.0	180 05.4	47.0	Eltanin	90 45.6	N51 29.4
T 09	48 40.1	289 07.8	. . 13.7	332 14.3	. . 10.9	318 50.5	. . 13.0	195 08.0	. . 47.0	Enif	33 46.9	N 9 56.3
U 10	63 42.6	304 07.0	13.1	347 14.9	11.1	333 52.3	13.0	210 10.5	47.0	Fomalhaut	15 23.8	S29 32.8
E 11	78 45.0	319 06.3	12.6	2 15.5	11.3	348 54.2	13.0	225 13.0	47.0			
S 12	93 47.5	334 05.5	N22 12.0	17 16.1	N23 11.5	3 56.0	N23 13.0	240 15.5	S10 47.0	Gacrux	172 00.7	S57 11.7
D 13	108 50.0	349 04.8	11.4	32 16.7	11.6	18 57.8	13.0	255 18.0	47.0	Gienah	175 52.2	S17 37.2
A 14	123 52.4	4 04.0	10.9	47 17.3	11.8	33 59.7	13.0	270 20.5	47.0	Hadar	148 47.4	S60 26.5
Y 15	138 54.9	19 03.3	. . 10.3	62 17.9	. . 12.0	49 01.5	. . 13.0	285 23.1	. . 47.0	Hamal	328 00.9	N23 31.4
16	153 57.3	34 02.5	09.8	77 18.5	12.2	64 03.4	13.0	300 25.6	47.0	Kaus Aust.	83 43.4	S34 22.5
17	168 59.8	49 01.7	09.2	92 19.1	12.4	79 05.2	13.0	315 28.1	47.0			
18	184 02.3	64 01.0	N22 08.6	107 19.7	N23 12.6	94 07.0	N23 13.0	330 30.6	S10 47.0	Kochab	137 19.4	N74 06.3
19	199 04.7	79 00.2	08.1	122 20.3	12.8	109 08.9	13.0	345 33.1	46.9	Markab	13 38.2	N15 16.7
20	214 07.2	93 59.5	07.5	137 20.8	12.9	124 10.7	13.0	0 35.6	46.9	Menkar	314 15.2	N 4 08.5
21	229 09.7	108 58.7	. . 06.9	152 21.4	. . 13.1	139 12.6	. . 13.0	15 38.2	. . 46.9	Menkent	148 07.3	S36 26.3
22	244 12.1	123 58.0	06.4	167 22.0	13.3	154 14.4	13.1	30 40.7	46.9	Miaplacidus	221 40.3	S69 46.7
23	259 14.6	138 57.2	05.8	182 22.6	13.5	169 16.3	13.1	45 43.2	46.9			
26 00	274 17.1	153 56.4	N22 05.2	197 23.2	N23 13.7	184 18.1	N23 13.1	60 45.7	S10 46.9	Mirfak	308 40.6	N49 54.3
01	289 19.5	168 55.7	04.7	212 23.8	13.8	199 19.9	13.1	75 48.2	46.9	Nunki	75 57.9	S26 16.6
02	304 22.0	183 54.9	04.1	227 24.4	14.0	214 21.8	13.1	90 50.7	46.9	Peacock	53 18.7	S56 41.1
03	319 24.5	198 54.2	. . 03.5	242 25.0	. . 14.2	229 23.6	. . 13.1	105 53.3	. . 46.9	Pollux	243 28.1	N27 59.5
04	334 26.9	213 53.4	03.0	257 25.6	14.4	244 25.5	13.1	120 55.8	46.9	Procyon	245 00.0	N 5 11.2
05	349 29.4	228 52.7	02.4	272 26.2	14.6	259 27.3	13.1	135 58.3	46.9			
06	4 31.8	243 51.9	N22 01.8	287 26.8	N23 14.8	274 29.1	N23 13.1	151 00.8	S10 46.9	Rasalhague	96 06.1	N12 33.2
W 07	19 34.3	258 51.2	01.2	302 27.4	14.9	289 31.0	13.1	166 03.3	46.9	Regulus	207 43.7	N11 54.0
E 08	34 36.8	273 50.4	00.6	317 27.9	15.1	304 32.8	13.1	181 05.8	46.9	Rigel	281 12.4	S 8 11.3
D 09	49 39.2	288 49.7	22 00.1	332 28.5	. . 15.3	319 34.7	. . 13.1	196 08.3	. . 46.9	Rigil Kent.	139 51.2	S60 53.6
N 10	64 41.7	303 48.9	21 59.5	347 29.1	15.5	334 36.5	13.1	211 10.9	46.9	Sabik	102 12.2	S15 44.3
E 11	79 44.2	318 48.2	58.9	2 29.7	15.6	349 38.4	13.1	226 13.4	46.8			
S 12	94 46.6	333 47.4	N21 58.3	17 30.3	N23 15.8	4 40.2	N23 13.1	241 15.9	S10 46.8	Schedar	349 40.5	N56 36.5
D 13	109 49.1	348 46.7	57.7	32 30.9	16.0	19 42.0	13.1	256 18.4	46.8	Shaula	96 21.4	S37 06.7
A 14	124 51.6	3 45.9	57.2	47 31.5	16.2	34 43.9	13.1	271 20.9	46.8	Sirius	258 34.0	S16 44.3
Y 15	139 54.0	18 45.2	. . 56.6	62 32.1	. . 16.4	49 45.7	. . 13.1	286 23.4	. . 46.8	Spica	158 31.1	S11 14.0
16	154 56.5	33 44.5	56.0	77 32.7	16.5	64 47.6	13.1	301 25.9	46.8	Suhail	222 52.7	S43 29.5
17	169 58.9	48 43.7	55.4	92 33.3	16.7	79 49.4	13.1	316 28.4	46.8			
18	185 01.4	63 43.0	N21 54.8	107 33.9	N23 16.9	94 51.2	N23 13.1	331 31.0	S10 46.8	Vega	80 38.5	N38 47.9
19	200 03.9	78 42.2	54.2	122 34.4	17.1	109 53.1	13.1	346 33.5	46.8	Zuben'ubi	137 05.1	S16 05.9
20	215 06.3	93 41.5	53.6	137 35.0	17.2	124 54.9	13.1	1 36.0	46.8		SHA	Mer.Pass.
21	230 08.8	108 40.7	. . 53.0	152 35.6	. . 17.4	139 56.8	. . 13.1	16 38.5	. . 46.8		° ′	h m
22	245 11.3	123 40.0	52.4	167 36.2	17.6	154 58.6	13.1	31 41.0	46.8	Venus	240 56.8	13 44
23	260 13.7	138 39.2	51.8	182 36.8	17.8	170 00.5	13.1	46 43.5	46.8	Mars	283 51.1	10 51
	h m									Jupiter	270 16.0	11 44
Mer.Pass.	5 45.9	v −0.8	d 0.6	v 0.6	d 0.2	v 1.8	d 0.0	v 2.5	d 0.0	Saturn	146 27.4	19 58

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 24	25	26	27
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
24 00	179 24.8	N23 24.5	351 39.3	3.5	S18 53.7	4.9	61.4	N 72				23 56	23 28	23 12	23 00
01	194 24.7	24.5	6 01.8	3.5	18 48.8	5.0	61.4	N 70				23 11	23 05	22 59	22 55
02	209 24.5	24.4	20 24.3	3.6	18 43.8	5.2	61.4	68				22 41	22 46	22 49	22 50
03	224 24.4	. . 24.4	34 46.9	3.7	18 38.6	5.3	61.3	66				22 18	22 32	22 40	22 46
04	239 24.3	24.3	49 09.6	3.7	18 33.3	5.4	61.3	64	////	////	01 33	22 00	22 19	22 33	22 43
05	254 24.1	24.3	63 32.3	3.7	18 27.9	5.5	61.3	62	////	////	02 11	21 45	22 09	22 26	22 40
06	269 24.0	N23 24.2	77 55.0	3.8	S18 22.4	5.7	61.3	60	////	00 52	02 37	21 33	22 00	22 21	22 37
07	284 23.9	24.2	92 17.8	3.9	18 16.7	5.9	61.3	N 58	////	01 42	02 58	21 22	21 52	22 16	22 35
08	299 23.7	24.1	106 40.7	3.9	18 10.8	5.9	61.3	56	////	02 12	03 15	21 13	21 45	22 11	22 33
M 09	314 23.6	. . 24.1	121 03.6	4.0	18 04.9	6.1	61.3	54	00 48	02 34	03 29	21 04	21 39	22 07	22 31
O 10	329 23.5	24.0	135 26.6	4.1	17 58.8	6.3	61.3	52	01 34	02 52	03 41	20 57	21 33	22 04	22 30
N 11	344 23.3	24.0	149 49.7	4.1	17 52.5	6.3	61.3	50	02 02	03 07	03 52	20 50	21 28	22 00	22 28
D 12	359 23.2	N23 23.9	164 12.8	4.2	S17 46.2	6.5	61.2	45	02 47	03 37	04 14	20 35	21 17	21 53	22 25
A 13	14 23.1	23.8	178 36.0	4.2	17 39.7	6.6	61.2	N 40	03 18	04 00	04 32	20 23	21 08	21 47	22 22
Y 14	29 22.9	23.8	192 59.2	4.4	17 33.1	6.7	61.2	35	03 41	04 18	04 47	20 13	21 00	21 42	22 19
15	44 22.8	. . 23.7	207 22.6	4.4	17 26.4	6.9	61.2	30	04 00	04 33	05 00	20 04	20 53	21 37	22 17
16	59 22.7	23.7	221 46.0	4.4	17 19.5	7.0	61.2	20	04 29	04 58	05 22	19 48	20 41	21 29	22 14
17	74 22.5	23.6	236 09.4	4.6	17 12.5	7.1	61.2	N 10	04 51	05 18	05 41	19 35	20 31	21 22	22 10
18	89 22.4	N23 23.6	250 33.0	4.6	S17 05.4	7.2	61.1	0	05 10	05 36	05 59	19 22	20 21	21 16	22 07
19	104 22.3	23.5	264 56.6	4.7	16 58.2	7.3	61.1	S 10	05 27	05 54	06 16	19 09	20 11	21 09	22 04
20	119 22.1	23.4	279 20.3	4.7	16 50.9	7.5	61.1	20	05 43	06 11	06 35	18 55	20 00	21 02	22 01
21	134 22.0	. . 23.4	293 44.0	4.9	16 43.4	7.5	61.1	30	06 00	06 30	06 56	18 40	19 48	20 54	21 57
22	149 21.9	23.3	308 07.9	4.9	16 35.9	7.7	61.1	35	06 09	06 40	07 08	18 30	19 41	20 49	21 55
23	164 21.7	23.2	322 31.8	5.0	16 28.2	7.8	61.1	40	06 18	06 52	07 23	18 20	19 33	20 44	21 53
25 00	179 21.6	N23 23.2	336 55.8	5.1	S16 20.4	7.9	61.0	45	06 28	07 06	07 39	18 08	19 23	20 38	21 50
01	194 21.5	23.1	351 19.9	5.1	16 12.5	8.0	61.0	S 50	06 40	07 22	08 00	17 53	19 12	20 30	21 47
02	209 21.3	23.0	5 44.0	5.2	16 04.5	8.1	61.0	52	06 45	07 29	08 10	17 46	19 06	20 27	21 45
03	224 21.2	. . 23.0	20 08.2	5.4	15 56.4	8.2	61.0	54	06 51	07 37	08 21	17 38	19 01	20 23	21 43
04	239 21.1	22.9	34 32.6	5.4	15 48.2	8.3	60.9	56	06 57	07 46	08 34	17 29	18 54	20 19	21 42
05	254 20.9	22.8	48 57.0	5.4	15 39.9	8.5	60.9	58	07 04	07 57	08 48	17 19	18 47	20 14	21 40
06	269 20.8	N23 22.8	63 21.4	5.6	S15 31.4	8.5	60.9	S 60	07 11	08 08	09 06	17 08	18 38	20 09	21 37
07	284 20.7	22.7	77 46.0	5.6	15 22.9	8.6	60.9								
08	299 20.5	22.6	92 10.6	5.8	15 14.3	8.7	60.9								
T 09	314 20.4	. . 22.6	106 35.4	5.8	15 05.6	8.9	60.8								
U 10	329 20.3	22.5	121 00.2	5.9	14 56.7	8.9	60.8								
E 11	344 20.2	22.4	135 25.1	6.0	14 47.8	9.0	60.8								
S 12	359 20.0	N23 22.3	149 50.1	6.0	S14 38.8	9.1	60.8								
D 13	14 19.9	22.3	164 15.1	6.2	14 29.7	9.2	60.7								
A 14	29 19.8	22.2	178 40.3	6.2	14 20.5	9.2	60.7								
Y 15	44 19.6	. . 22.1	193 05.5	6.4	14 11.3	9.4	60.7								
16	59 19.5	22.0	207 30.9	6.4	14 01.9	9.4	60.6								
17	74 19.4	22.0	221 56.3	6.5	13 52.5	9.6	60.6								
18	89 19.2	N23 21.9	236 21.8	6.6	S13 42.9	9.6	60.6								
19	104 19.1	21.8	250 47.4	6.6	13 33.3	9.7	60.6								
20	119 19.0	21.7	265 13.0	6.8	13 23.6	9.7	60.5								
21	134 18.8	. . 21.7	279 38.8	6.9	13 13.9	9.9	60.5								
22	149 18.7	21.6	294 04.7	6.9	13 04.0	9.9	60.5								
23	164 18.6	21.5	308 30.6	7.0	12 54.1	10.0	60.4								
26 00	179 18.4	N23 21.4	322 56.6	7.1	S12 44.1	10.1	60.4								
01	194 18.3	21.3	337 22.7	7.2	12 34.0	10.1	60.4								
02	209 18.2	21.2	351 48.9	7.3	12 23.9	10.2	60.4								
03	224 18.1	. . 21.2	6 15.2	7.4	12 13.7	10.3	60.3								
04	239 17.9	21.1	20 41.6	7.4	12 03.4	10.3	60.3								
05	254 17.8	21.0	35 08.0	7.6	11 53.1	10.4	60.3								
06	269 17.7	N23 20.9	49 34.6	7.6	S11 42.7	10.5	60.2								
W 07	284 17.5	20.8	64 01.2	7.7	11 32.2	10.5	60.2								
E 08	299 17.4	20.7	78 27.9	7.8	11 21.7	10.6	60.2								
D 09	314 17.3	. . 20.6	92 54.7	7.9	11 11.1	10.6	60.1								
N 10	329 17.1	20.6	107 21.6	8.0	11 00.5	10.7	60.1								
E 11	344 17.0	20.5	121 48.6	8.1	10 49.8	10.8	60.1								
S 12	359 16.9	N23 20.4	136 15.7	8.1	S10 39.0	10.8	60.0								
D 13	14 16.8	20.3	150 42.8	8.2	10 28.2	10.8	60.0								
A 14	29 16.6	20.2	165 10.0	8.3	10 17.4	10.9	60.0								
Y 15	44 16.5	. . 20.1	179 37.3	8.4	10 06.5	11.0	59.9								
16	59 16.4	20.0	194 04.7	8.5	9 55.5	11.0	59.9								
17	74 16.2	19.9	208 32.2	8.6	9 44.5	11.0	59.8								
18	89 16.1	N23 19.8	222 59.8	8.6	S 9 33.5	11.1	59.8								
19	104 16.0	19.7	237 27.4	8.7	9 22.4	11.1	59.8								
20	119 15.8	19.6	251 55.1	8.8	9 11.3	11.2	59.7								
21	134 15.7	. . 19.5	266 22.9	8.9	9 00.1	11.2	59.7								
22	149 15.6	19.4	280 50.8	9.0	8 48.9	11.2	59.7								
23	164 15.5	19.3	295 18.8	9.0	S 8 37.7	11.3	59.6								
	SD 15.8	d 0.1	SD	16.7		16.6		16.4							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 24	25	26	27
°	h m	h m	h m	h m	h m	h m	h m
N 72					03 32	06 00	08 09
N 70				01 57	04 16	06 22	08 19
68				02 50	04 45	06 39	08 28
66				03 22	05 06	06 52	08 35
64	22 31	////	////	03 46	05 23	07 04	08 41
62	21 54	////	////	04 05	05 37	07 13	08 46
60	21 28	23 12	////	04 20	05 49	07 21	08 51
N 58	21 07	22 23	////	04 34	05 59	07 28	08 55
56	20 51	21 53	////	04 45	06 08	07 34	08 58
54	20 36	21 31	23 17	04 55	06 16	07 40	09 01
52	20 24	21 13	22 31	05 04	06 23	07 45	09 04
50	20 13	20 58	22 03	05 11	06 30	07 49	09 07
45	19 51	20 28	21 18	05 28	06 43	07 59	09 12
N 40	19 33	20 06	20 47	05 42	06 54	08 07	09 17
35	19 18	19 48	20 24	05 53	07 04	08 14	09 21
30	19 05	19 32	20 06	06 03	07 12	08 20	09 25
20	18 43	19 07	19 37	06 21	07 26	08 30	09 31
N 10	18 24	18 47	19 14	06 36	07 39	08 39	09 36
0	18 06	18 29	18 55	06 50	07 50	08 47	09 41
S 10	17 49	18 12	18 38	07 04	08 02	08 56	09 45
20	17 30	17 54	18 22	07 18	08 14	09 04	09 51
30	17 09	17 36	18 05	07 35	08 28	09 14	09 56
35	16 57	17 25	17 57	07 45	08 36	09 20	10 00
40	16 43	17 13	17 47	07 56	08 45	09 26	10 03
45	16 26	17 00	17 37	08 09	08 55	09 34	10 07
S 50	16 05	16 44	17 25	08 25	09 08	09 43	10 13
52	15 55	16 36	17 20	08 32	09 14	09 47	10 15
54	15 44	16 28	17 14	08 41	09 20	09 51	10 17
56	15 32	16 19	17 08	08 50	09 27	09 56	10 20
58	15 17	16 09	17 01	09 00	09 35	10 02	10 23
S 60	15 00	15 57	16 54	09 12	09 44	10 08	10 27

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
24	02 21	02 27	12 02	00 35	13 06	16	98
25	02 33	02 40	12 03	01 36	14 06	17	94
26	02 46	02 52	12 03	02 34	15 02	18	87

UT	ARIES	VENUS −3.8		MARS +1.5		JUPITER −1.9		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
27 00	275 16.2	153 38.5	N21 51.2	197 37.4	N23 17.9	185 02.3	N23 13.1	61 46.0	S10 46.8
01	290 18.7	168 37.8	50.6	212 38.0	18.1	200 04.1	13.1	76 48.5	46.8
02	305 21.1	183 37.0	50.1	227 38.6	18.3	215 06.0	13.1	91 51.0	46.8
03	320 23.6	198 36.3 . .	49.5	242 39.2 . .	18.4	230 07.8 . .	13.1	106 53.6 . .	46.8
04	335 26.1	213 35.5	48.9	257 39.8	18.6	245 09.7	13.2	121 56.1	46.8
05	350 28.5	228 34.8	48.3	272 40.4	18.8	260 11.5	13.2	136 58.6	46.8
06	5 31.0	243 34.1	N21 47.7	287 41.0	N23 19.0	275 13.3	N23 13.2	152 01.1	S10 46.7
07	20 33.4	258 33.3	47.0	302 41.5	19.1	290 15.2	13.2	167 03.6	46.7
08	35 35.9	273 32.6	46.4	317 42.1	19.3	305 17.0	13.2	182 06.1	46.7
09	50 38.4	288 31.8 . .	45.8	332 42.7 . .	19.5	320 18.9 . .	13.2	197 08.6 . .	46.7
10	65 40.8	303 31.1	45.2	347 43.3	19.6	335 20.7	13.2	212 11.1	46.7
11	80 43.3	318 30.4	44.6	2 43.9	19.8	350 22.6	13.2	227 13.6	46.7
12	95 45.8	333 29.6	N21 44.0	17 44.5	N23 20.0	5 24.4	N23 13.2	242 16.2	S10 46.7
13	110 48.2	348 28.9	43.4	32 45.1	20.1	20 26.2	13.2	257 18.7	46.7
14	125 50.7	3 28.2	42.8	47 45.7	20.3	35 28.1	13.2	272 21.2	46.7
15	140 53.2	18 27.4 . .	42.2	62 46.3 . .	20.5	50 29.9 . .	13.2	287 23.7 . .	46.7
16	155 55.6	33 26.7	41.6	77 46.9	20.6	65 31.8	13.2	302 26.2	46.7
17	170 58.1	48 26.0	41.0	92 47.5	20.8	80 33.6	13.2	317 28.7	46.7
18	186 00.6	63 25.2	N21 40.3	107 48.1	N23 21.0	95 35.4	N23 13.2	332 31.2	S10 46.7
19	201 03.0	78 24.5	39.7	122 48.7	21.1	110 37.3	13.2	347 33.7	46.7
20	216 05.5	93 23.8	39.1	137 49.2	21.3	125 39.1	13.2	2 36.2	46.7
21	231 07.9	108 23.0 . .	38.5	152 49.8 . .	21.5	140 41.0 . .	13.2	17 38.7 . .	46.7
22	246 10.4	123 22.3	37.9	167 50.4	21.6	155 42.8	13.2	32 41.2	46.7
23	261 12.9	138 21.6	37.3	182 51.0	21.8	170 44.7	13.2	47 43.7	46.7
28 00	276 15.3	153 20.8	N21 36.6	197 51.6	N23 22.0	185 46.5	N23 13.2	62 46.3	S10 46.7
01	291 17.8	168 20.1	36.0	212 52.2	22.1	200 48.3	13.2	77 48.8	46.7
02	306 20.3	183 19.4	35.4	227 52.8	22.3	215 50.2	13.2	92 51.3	46.7
03	321 22.7	198 18.6 . .	34.8	242 53.4 . .	22.5	230 52.0 . .	13.2	107 53.8 . .	46.7
04	336 25.2	213 17.9	34.1	257 54.0	22.6	245 53.9	13.2	122 56.3	46.7
05	351 27.7	228 17.2	33.5	272 54.6	22.8	260 55.7	13.2	137 58.8	46.7
06	6 30.1	243 16.5	N21 32.9	287 55.2	N23 23.0	275 57.6	N23 13.2	153 01.3	S10 46.7
07	21 32.6	258 15.7	32.3	302 55.8	23.1	290 59.4	13.2	168 03.8	46.6
08	36 35.0	273 15.0	31.6	317 56.3	23.3	306 01.2	13.2	183 06.3	46.6
09	51 37.5	288 14.3 . .	31.0	332 56.9 . .	23.4	321 03.1 . .	13.2	198 08.8 . .	46.6
10	66 40.0	303 13.6	30.4	347 57.5	23.6	336 04.9	13.2	213 11.3	46.6
11	81 42.4	318 12.8	29.7	2 58.1	23.8	351 06.8	13.2	228 13.8	46.6
12	96 44.9	333 12.1	N21 29.1	17 58.7	N23 23.9	6 08.6	N23 13.2	243 16.3	S10 46.6
13	111 47.4	348 11.4	28.5	32 59.3	24.1	21 10.5	13.2	258 18.8	46.6
14	126 49.8	3 10.7	27.8	47 59.9	24.2	36 12.3	13.2	273 21.3	46.6
15	141 52.3	18 09.9 . .	27.2	63 00.5 . .	24.4	51 14.1 . .	13.2	288 23.9 . .	46.6
16	156 54.8	33 09.2	26.6	78 01.1	24.5	66 16.0	13.2	303 26.4	46.6
17	171 57.2	48 08.5	25.9	93 01.7	24.7	81 17.8	13.2	318 28.9	46.6
18	186 59.7	63 07.8	N21 25.3	108 02.3	N23 24.9	96 19.7	N23 13.2	333 31.4	S10 46.6
19	202 02.2	78 07.1	24.6	123 02.9	25.0	111 21.5	13.2	348 33.9	46.6
20	217 04.6	93 06.3	24.0	138 03.5	25.2	126 23.4	13.2	3 36.4	46.6
21	232 07.1	108 05.6 . .	23.4	153 04.0 . .	25.3	141 25.2 . .	13.2	18 38.9 . .	46.6
22	247 09.5	123 04.9	22.7	168 04.6	25.5	156 27.0	13.2	33 41.4	46.6
23	262 12.0	138 04.2	22.1	183 05.2	25.6	171 28.9	13.2	48 43.9	46.6
29 00	277 14.5	153 03.5	N21 21.4	198 05.8	N23 25.8	186 30.7	N23 13.2	63 46.4	S10 46.6
01	292 16.9	168 02.7	20.8	213 06.4	26.0	201 32.6	13.2	78 48.9	46.6
02	307 19.4	183 02.0	20.1	228 07.0	26.1	216 34.4	13.2	93 51.4	46.6
03	322 21.9	198 01.3 . .	19.5	243 07.6 . .	26.3	231 36.3 . .	13.2	108 53.9 . .	46.6
04	337 24.3	213 00.6	18.8	258 08.2	26.4	246 38.1	13.2	123 56.4	46.6
05	352 26.8	227 59.9	18.2	273 08.8	26.6	261 39.9	13.2	138 58.9	46.6
06	7 29.3	242 59.2	N21 17.5	288 09.4	N23 26.7	276 41.8	N23 13.2	154 01.4	S10 46.6
07	22 31.7	257 58.5	16.9	303 10.0	26.9	291 43.6	13.2	169 03.9	46.6
08	37 34.2	272 57.7	16.2	318 10.6	27.0	306 45.5	13.2	184 06.4	46.6
09	52 36.7	287 57.0 . .	15.6	333 11.2 . .	27.2	321 47.3 . .	13.2	199 08.9 . .	46.6
10	67 39.1	302 56.3	14.9	348 11.8	27.3	336 49.2	13.2	214 11.4	46.6
11	82 41.6	317 55.6	14.2	3 12.3	27.5	351 51.0	13.2	229 13.9	46.6
12	97 44.0	332 54.9	N21 13.6	18 12.9	N23 27.6	6 52.8	N23 13.2	244 16.4	S10 46.6
13	112 46.5	347 54.2	12.9	33 13.5	27.8	21 54.7	13.2	259 18.9	46.6
14	127 49.0	2 53.5	12.3	48 14.1	27.9	36 56.5	13.2	274 21.4	46.6
15	142 51.4	17 52.8 . .	11.6	63 14.7 . .	28.1	51 58.4 . .	13.2	289 23.9 . .	46.6
16	157 53.9	32 52.1	10.9	78 15.3	28.2	67 00.2	13.2	304 26.4	46.6
17	172 56.4	47 51.3	10.3	93 15.9	28.4	82 02.1	13.2	319 28.9	46.6
18	187 58.8	62 50.6	N21 09.6	108 16.5	N23 28.5	97 03.9	N23 13.2	334 31.4	S10 46.6
19	203 01.3	77 49.9	09.0	123 17.1	28.7	112 05.7	13.2	349 33.9	46.6
20	218 03.8	92 49.2	08.3	138 17.7	28.8	127 07.6	13.2	4 36.4	46.6
21	233 06.2	107 48.5 . .	07.6	153 18.3 . .	29.0	142 09.4 . .	13.2	19 38.9 . .	46.6
22	248 08.7	122 47.8	07.0	168 18.9	29.1	157 11.3	13.2	34 41.4	46.6
23	263 11.1	137 47.1	06.3	183 19.5	29.3	172 13.1	13.2	49 43.9	46.6
	h m								
Mer.Pass.	5 34.1	v −0.7	d 0.6	v 0.6	d 0.2	v 1.8	d 0.0	v 2.5	d 0.0

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.6	S40 14.9
Achernar	335 27.0	S57 09.8
Acrux	173 09.1	S63 10.8
Adhara	255 12.9	S28 59.6
Aldebaran	290 49.6	N16 32.0
Alioth	166 20.6	N55 53.4
Alkaid	152 58.7	N49 15.0
Al Na'ir	27 43.4	S46 53.4
Alnilam	275 46.7	S 1 11.7
Alphard	217 56.3	S 8 43.2
Alphecca	126 10.7	N26 40.4
Alpheratz	357 43.4	N29 09.8
Altair	62 07.9	N 8 54.4
Ankaa	353 15.7	S42 13.7
Antares	112 25.9	S26 27.6
Arcturus	145 55.5	N19 06.9
Atria	107 27.1	S69 03.1
Avior	234 18.5	S59 33.5
Bellatrix	278 32.3	N 6 21.6
Betelgeuse	271 01.6	N 7 24.4
Canopus	263 56.7	S52 42.3
Capella	280 34.8	N46 00.5
Deneb	49 31.0	N45 19.8
Denebola	182 33.7	N14 29.8
Diphda	348 55.9	S17 54.6
Dubhe	193 52.0	N61 40.9
Elnath	278 12.9	N28 36.9
Eltanin	90 45.6	N51 29.4
Enif	33 46.9	N 9 56.3
Fomalhaut	15 23.8	S29 32.7
Gacrux	172 00.8	S57 11.7
Gienah	175 52.3	S17 37.2
Hadar	148 47.5	S60 26.5
Hamal	328 00.8	N23 31.4
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 19.4	N74 06.3
Markab	13 38.2	N15 16.7
Menkar	314 15.2	N 4 08.5
Menkent	148 07.3	S36 26.3
Miaplacidus	221 40.3	S69 46.7
Mirfak	308 40.6	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.7	S56 41.1
Pollux	243 28.1	N27 59.5
Procyon	245 00.0	N 5 11.3
Rasalhague	96 06.1	N12 33.2
Regulus	207 43.7	N11 54.0
Rigel	281 12.3	S 8 11.3
Rigil Kent.	139 51.2	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 40.4	N56 36.5
Shaula	96 21.4	S37 06.7
Sirius	258 34.0	S16 44.3
Spica	158 31.1	S11 14.0
Suhail	222 52.7	S43 29.5
Vega	80 38.5	N38 47.9
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	237 05.5	13 47
Mars	281 36.3	10 48
Jupiter	269 31.2	11 35
Saturn	146 30.9	19 46

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 27	Moonrise 28	Moonrise 29	Moonrise 30
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
27 00	179 15.3	N23 19.2	309 46.8	9.1	S 8 26.4	11.4	59.6	N 72				23 00	22 49	22 39	22 28
01	194 15.2	19.1	324 14.9	9.2	8 15.0	11.3	59.6	N 70				22 55	22 50	22 46	22 41
02	209 15.1	19.0	338 43.1	9.3	8 03.7	11.4	59.5	68				22 50	22 51	22 51	22 52
03	224 14.9 . .	18.9	353 11.4	9.4	7 52.3	11.4	59.5	66				22 46	22 51	22 56	23 02
04	239 14.8	18.8	7 39.8	9.4	7 40.9	11.4	59.4	64	////	////	01 37	22 43	22 52	23 00	23 09
05	254 14.7	18.7	22 08.2	9.5	7 29.5	11.5	59.4	62	////	////	02 14	22 40	22 52	23 04	23 16
06	269 14.6	N23 18.6	36 36.7	9.6	S 7 18.0	11.5	59.4	60	////	00 57	02 39	22 37	22 52	23 07	23 22
07	284 14.4	18.5	51 05.3	9.6	7 06.5	11.5	59.3	N 58	////	01 45	03 00	22 35	22 53	23 09	23 27
08	299 14.3	18.4	65 33.9	9.8	6 55.0	11.6	59.3	56	////	02 14	03 16	22 33	22 53	23 12	23 32
09	314 14.2 . .	18.3	80 02.7	9.8	6 43.4	11.6	59.3	54	00 52	02 36	03 30	22 31	22 53	23 14	23 36
10	329 14.0	18.2	94 31.5	9.8	6 31.8	11.5	59.2	52	01 37	02 54	03 42	22 30	22 53	23 16	23 40
11	344 13.9	18.1	109 00.3	10.0	6 20.3	11.7	59.2	50	02 04	03 09	03 53	22 28	22 53	23 18	23 43
12	359 13.8	N23 18.0	123 29.3	10.0	S 6 08.6	11.6	59.1	45	02 49	03 38	04 16	22 25	22 54	23 22	23 51
13	14 13.7	17.9	137 58.3	10.1	5 57.0	11.6	59.1	N 40	03 19	04 01	04 34	22 22	22 54	23 26	23 57
14	29 13.5	17.8	152 27.4	10.1	5 45.4	11.7	59.1	35	03 42	04 19	04 48	22 19	22 55	23 28	24 02
15	44 13.4 . .	17.7	166 56.5	10.2	5 33.7	11.7	59.0	30	04 01	04 34	05 01	22 17	22 55	23 31	24 07
16	59 13.3	17.6	181 25.7	10.3	5 22.0	11.7	59.0	20	04 30	04 59	05 23	22 14	22 55	23 36	24 16
17	74 13.1	17.4	195 55.0	10.4	5 10.3	11.7	58.9	N 10	04 52	05 19	05 42	22 10	22 56	23 40	24 23
18	89 13.0	N23 17.3	210 24.4	10.4	S 4 58.6	11.7	58.9	0	05 11	05 37	06 00	22 07	22 56	23 44	24 30
19	104 12.9	17.2	224 53.8	10.5	4 46.9	11.7	58.9	S 10	05 28	05 54	06 17	22 04	22 57	23 48	24 37
20	119 12.8	17.1	239 23.3	10.5	4 35.2	11.7	58.8	20	05 44	06 11	06 35	22 01	22 57	23 52	24 45
21	134 12.6 . .	17.0	253 52.8	10.6	4 23.5	11.8	58.8	30	06 00	06 30	06 56	21 57	22 58	23 57	24 53
22	149 12.5	16.9	268 22.4	10.7	4 11.7	11.7	58.7	35	06 09	06 41	07 09	21 55	22 58	23 59	24 58
23	164 12.4	16.8	282 52.1	10.7	4 00.0	11.8	58.7	40	06 18	06 52	07 23	21 53	22 59	24 03	00 03
28 00	179 12.2	N23 16.6	297 21.8	10.8	S 3 48.2	11.7	58.7	45	06 28	07 06	07 39	21 50	22 59	24 06	00 06
01	194 12.1	16.5	311 51.6	10.9	3 36.5	11.8	58.6	S 50	06 40	07 22	08 00	21 47	23 00	24 11	00 11
02	209 12.0	16.4	326 21.5	10.9	3 24.7	11.7	58.6	52	06 45	07 29	08 10	21 45	23 00	24 13	00 13
03	224 11.9 . .	16.3	340 51.4	11.0	3 13.0	11.8	58.6	54	06 51	07 37	08 21	21 43	23 01	24 15	00 15
04	239 11.7	16.2	355 21.4	11.0	3 01.2	11.8	58.5	56	06 57	07 46	08 33	21 42	23 01	24 17	00 17
05	254 11.6	16.1	9 51.4	11.1	2 49.4	11.7	58.5	58	07 04	07 56	08 48	21 40	23 01	24 20	00 20
06	269 11.5	N23 15.9	24 21.5	11.1	S 2 37.7	11.8	58.4	S 60	07 11	08 08	09 05	21 37	23 02	24 23	00 23
07	284 11.4	15.8	38 51.6	11.2	2 25.9	11.7	58.4								
08	299 11.2	15.7	53 21.8	11.3	2 14.2	11.8	58.4								
09	314 11.1 . .	15.6	67 52.1	11.3	2 02.4	11.7	58.3								
10	329 11.0	15.4	82 22.4	11.3	1 50.7	11.7	58.3								
11	344 10.8	15.3	96 52.7	11.4	1 39.0	11.8	58.2								
12	359 10.7	N23 15.2	111 23.1	11.5	S 1 27.2	11.7	58.2								
13	14 10.6	15.1	125 53.6	11.5	1 15.5	11.7	58.2								
14	29 10.5	14.9	140 24.1	11.5	1 03.8	11.7	58.1								
15	44 10.3 . .	14.8	154 54.6	11.6	0 52.1	11.7	58.1								
16	59 10.2	14.7	169 25.2	11.7	0 40.4	11.6	58.0								
17	74 10.1	14.6	183 55.9	11.7	0 28.8	11.7	58.0								
18	89 10.0	N23 14.4	198 26.6	11.7	S 0 17.1	11.6	58.0								
19	104 09.8	14.3	212 57.3	11.8	S 0 05.5	11.7	57.9								
20	119 09.7	14.2	227 28.1	11.8	N 0 06.2	11.6	57.9								
21	134 09.6 . .	14.0	241 58.9	11.9	0 17.8	11.6	57.8								
22	149 09.5	13.9	256 29.8	11.9	0 29.4	11.5	57.8								
23	164 09.3	13.8	271 00.7	12.0	0 40.9	11.6	57.8								
29 00	179 09.2	N23 13.6	285 31.7	12.0	N 0 52.5	11.5	57.7								
01	194 09.1	13.5	300 02.7	12.0	1 04.0	11.5	57.7								
02	209 09.0	13.4	314 33.7	12.1	1 15.5	11.5	57.7								
03	224 08.8 . .	13.2	329 04.8	12.1	1 27.0	11.5	57.6								
04	239 08.7	13.1	343 35.9	12.1	1 38.5	11.4	57.6								
05	254 08.6	13.0	358 07.0	12.2	1 49.9	11.5	57.5								
06	269 08.5	N23 12.8	12 38.2	12.2	N 2 01.4	11.4	57.5								
07	284 08.3	12.7	27 09.4	12.3	2 12.8	11.3	57.5								
08	299 08.2	12.6	41 40.7	12.3	2 24.1	11.4	57.4								
09	314 08.1 . .	12.4	56 12.0	12.3	2 35.5	11.3	57.4								
10	329 08.0	12.3	70 43.3	12.3	2 46.8	11.3	57.3								
11	344 07.8	12.1	85 14.6	12.4	2 58.1	11.2	57.3								
12	359 07.7	N23 12.0	99 46.0	12.4	N 3 09.3	11.2	57.3								
13	14 07.6	11.9	114 17.4	12.5	3 20.5	11.2	57.2								
14	29 07.5	11.7	128 48.9	12.4	3 31.7	11.2	57.2								
15	44 07.3 . .	11.6	143 20.3	12.5	3 42.9	11.1	57.2								
16	59 07.2	11.4	157 51.8	12.5	3 54.0	11.1	57.1								
17	74 07.1	11.3	172 23.3	12.6	4 05.1	11.1	57.1								
18	89 07.0	N23 11.1	186 54.9	12.6	N 4 16.2	11.0	57.0								
19	104 06.8	11.0	201 26.5	12.6	4 27.2	11.0	57.0								
20	119 06.7	10.8	215 58.1	12.6	4 38.2	10.9	57.0								
21	134 06.6 . .	10.7	230 29.7	12.6	4 49.1	10.9	56.9								
22	149 06.5	10.5	245 01.3	12.7	5 00.0	10.9	56.9								
23	164 06.3	10.4	259 33.0	12.7	N 5 10.9	10.9	56.9								
	SD 15.8	d 0.1	SD 16.1		15.9		15.6								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 27	Moonset 28	Moonset 29	Moonset 30
°	h m	h m	h m	h m	h m	h m	h m
N 72				08 09	10 06	11 58	13 47
N 70				08 19	10 09	11 54	13 36
68				08 28	10 11	11 50	13 26
66				08 35	10 13	11 47	13 18
64	22 29	////	////	08 41	10 15	11 45	13 12
62	21 52	////	////	08 46	10 16	11 43	13 06
60	21 27	23 08	////	08 51	10 18	11 41	13 01
N 58	21 07	22 21	////	08 55	10 19	11 39	12 57
56	20 50	21 52	////	08 58	10 20	11 38	12 53
54	20 36	21 30	23 13	09 01	10 20	11 36	12 49
52	20 24	21 12	22 29	09 04	10 21	11 35	12 46
50	20 13	20 57	22 02	09 07	10 22	11 34	12 43
45	19 51	20 28	21 17	09 12	10 23	11 32	12 37
N 40	19 33	20 06	20 47	09 17	10 25	11 30	12 32
35	19 18	19 48	20 24	09 21	10 26	11 28	12 28
30	19 05	19 32	20 06	09 25	10 27	11 26	12 24
20	18 43	19 08	19 37	09 31	10 28	11 24	12 17
N 10	18 24	18 47	19 14	09 36	10 30	11 21	12 11
0	18 07	18 29	18 56	09 41	10 31	11 19	12 06
S 10	17 50	18 12	18 39	09 45	10 32	11 17	12 00
20	17 31	17 55	18 23	09 51	10 34	11 15	11 55
30	17 10	17 37	18 06	09 56	10 35	11 12	11 48
35	16 58	17 26	17 58	10 00	10 36	11 10	11 44
40	16 44	17 14	17 48	10 03	10 37	11 09	11 40
45	16 27	17 01	17 38	10 07	10 38	11 07	11 35
S 50	16 07	16 45	17 27	10 13	10 39	11 04	11 29
52	15 57	16 38	17 21	10 15	10 40	11 03	11 26
54	15 46	16 30	17 16	10 17	10 40	11 02	11 23
56	15 33	16 21	17 10	10 20	10 41	11 00	11 20
58	15 19	16 10	17 03	10 23	10 42	10 59	11 16
S 60	15 02	15 59	16 56	10 27	10 43	10 57	11 12

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
27	02 58	03 05	12 03	03 28	15 54	19	78
28	03 11	03 17	12 03	04 19	16 44	20	68
29	03 23	03 29	12 03	05 08	17 31	21	58

UT	ARIES	VENUS −3.8		MARS +1.5		JUPITER −1.9		SATURN +0.5		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
30 00	278 13.6	152 46.4	N21 05.6	198 20.1	N23 29.4	187 15.0	N23 13.2	64 46.4	S10 46.6	Acamar	315 18.6	S40 14.9
01	293 16.1	167 45.7	04.9	213 20.6	29.6	202 16.8	13.2	79 48.9	46.6	Achernar	335 27.0	S57 09.8
02	308 18.5	182 45.0	04.3	228 21.2	29.7	217 18.6	13.2	94 51.4	46.6	Acrux	173 09.2	S63 10.8
03	323 21.0	197 44.3	. . 03.6	243 21.8	. . 29.9	232 20.5	. . 13.2	109 53.9	. . 46.6	Adhara	255 12.9	S28 59.6
04	338 23.5	212 43.6	02.9	258 22.4	30.0	247 22.3	13.2	124 56.4	46.6	Aldebaran	290 49.6	N16 32.0
05	353 25.9	227 42.9	02.2	273 23.0	30.1	262 24.2	13.2	139 58.9	46.6			
06	8 28.4	242 42.2	N21 01.6	288 23.6	N23 30.3	277 26.0	N23 13.2	155 01.4	S10 46.6	Alioth	166 20.7	N55 53.4
07	23 30.9	257 41.5	00.9	303 24.2	30.4	292 27.9	13.2	170 03.9	46.6	Alkaid	152 58.7	N49 15.0
08	38 33.3	272 40.8	21 00.2	318 24.8	30.6	307 29.7	13.2	185 06.4	46.6	Al Na'ir	27 43.4	S46 53.4
S 09	53 35.8	287 40.1	20 59.5	333 25.4	. . 30.7	322 31.5	. . 13.2	200 08.9	. . 46.6	Alnilam	275 46.6	S 1 11.7
U 10	68 38.3	302 39.4	58.9	348 26.0	30.9	337 33.4	13.2	215 11.4	46.6	Alphard	217 56.3	S 8 43.2
N 11	83 40.7	317 38.7	58.2	3 26.6	31.0	352 35.2	13.2	230 13.9	46.6			
D 12	98 43.2	332 38.0	N20 57.5	18 27.2	N23 31.1	7 37.1	N23 13.2	245 16.4	S10 46.6	Alphecca	126 10.7	N26 40.4
A 13	113 45.6	347 37.3	56.8	33 27.8	31.3	22 38.9	13.2	260 18.9	46.6	Alpheratz	357 43.4	N29 09.8
Y 14	128 48.1	2 36.6	56.1	48 28.4	31.4	37 40.8	13.2	275 21.4	46.6	Altair	62 07.9	N 8 54.4
15	143 50.6	17 35.9	. . 55.4	63 28.9	. . 31.6	52 42.6	. . 13.2	290 23.9	. . 46.6	Ankaa	353 15.7	S42 13.7
16	158 53.0	32 35.2	54.7	78 29.5	31.7	67 44.4	13.2	305 26.4	46.6	Antares	112 25.9	S26 27.6
17	173 55.5	47 34.5	54.1	93 30.1	31.8	82 46.3	13.2	320 28.9	46.6			
18	188 58.0	62 33.8	N20 53.4	108 30.7	N23 32.0	97 48.1	N23 13.2	335 31.4	S10 46.6	Arcturus	145 55.6	N19 06.9
19	204 00.4	77 33.1	52.7	123 31.3	32.1	112 50.0	13.2	350 33.9	46.6	Atria	107 27.1	S69 03.1
20	219 02.9	92 32.4	52.0	138 31.9	32.3	127 51.8	13.2	5 36.4	46.6	Avior	234 18.5	S59 33.5
21	234 05.4	107 31.7	. . 51.3	153 32.5	. . 32.4	142 53.7	. . 13.2	20 38.9	. . 46.6	Bellatrix	278 32.3	N 6 21.6
22	249 07.8	122 31.0	50.6	168 33.1	32.5	157 55.5	13.2	35 41.4	46.6	Betelgeuse	271 01.6	N 7 24.4
23	264 10.3	137 30.3	49.9	183 33.7	32.7	172 57.4	13.2	50 43.9	46.6			
1 00	279 12.7	152 29.6	N20 49.2	198 34.3	N23 32.8	187 59.2	N23 13.2	65 46.4	S10 46.6	Canopus	263 56.7	S52 42.3
01	294 15.2	167 28.9	48.5	213 34.9	32.9	203 01.0	13.2	80 48.9	46.6	Capella	280 34.8	N46 00.5
02	309 17.7	182 28.2	47.8	228 35.5	33.1	218 02.9	13.2	95 51.4	46.6	Deneb	49 31.0	N45 19.8
03	324 20.1	197 27.6	. . 47.1	243 36.1	. . 33.2	233 04.7	. . 13.2	110 53.9	. . 46.6	Denebola	182 33.7	N14 29.8
04	339 22.6	212 26.9	46.4	258 36.7	33.4	248 06.6	13.2	125 56.4	46.6	Diphda	348 55.9	S17 54.6
05	354 25.1	227 26.2	45.7	273 37.3	33.5	263 08.4	13.2	140 58.9	46.6			
06	9 27.5	242 25.5	N20 45.0	288 37.9	N23 33.6	278 10.3	N23 13.2	156 01.4	S10 46.6	Dubhe	193 52.0	N61 40.9
07	24 30.0	257 24.8	44.3	303 38.4	33.8	293 12.1	13.2	171 03.9	46.6	Elnath	278 12.9	N28 36.9
08	39 32.5	272 24.1	43.6	318 39.0	33.9	308 14.0	13.2	186 06.4	46.6	Eltanin	90 45.6	N51 29.4
M 09	54 34.9	287 23.4	. . 42.9	333 39.6	. . 34.0	323 15.8	. . 13.2	201 08.9	. . 46.6	Enif	33 46.8	N 9 56.4
O 10	69 37.4	302 22.7	42.2	348 40.2	34.2	338 17.6	13.2	216 11.3	46.6	Fomalhaut	15 23.8	S29 32.7
N 11	84 39.9	317 22.0	41.5	3 40.8	34.3	353 19.5	13.2	231 13.8	46.6			
D 12	99 42.3	332 21.4	N20 40.8	18 41.4	N23 34.4	8 21.3	N23 13.2	246 16.3	S10 46.6	Gacrux	172 00.8	S57 11.7
A 13	114 44.8	347 20.7	40.1	33 42.0	34.6	23 23.2	13.2	261 18.8	46.6	Gienah	175 52.3	S17 37.2
Y 14	129 47.2	2 20.0	39.4	48 42.6	34.7	38 25.0	13.2	276 21.3	46.6	Hadar	148 47.5	S60 26.5
15	144 49.7	17 19.3	. . 38.7	63 43.2	. . 34.8	53 26.9	. . 13.2	291 23.8	. . 46.6	Hamal	328 00.8	N23 31.4
16	159 52.2	32 18.6	38.0	78 43.8	35.0	68 28.7	13.2	306 26.3	46.6	Kaus Aust.	83 43.3	S34 22.5
17	174 54.6	47 17.9	37.3	93 44.4	35.1	83 30.5	13.2	321 28.8	46.6			
18	189 57.1	62 17.3	N20 36.5	108 45.0	N23 35.2	98 32.4	N23 13.2	336 31.3	S10 46.6	Kochab	137 19.5	N74 06.3
19	204 59.6	77 16.6	35.8	123 45.6	35.3	113 34.2	13.2	351 33.8	46.6	Markab	13 38.1	N15 16.7
20	220 02.0	92 15.9	35.1	138 46.2	35.5	128 36.1	13.2	6 36.3	46.6	Menkar	314 15.2	N 4 08.5
21	235 04.5	107 15.2	. . 34.4	153 46.8	. . 35.6	143 37.9	. . 13.2	21 38.8	. . 46.6	Menkent	148 07.3	S36 26.3
22	250 07.0	122 14.5	33.7	168 47.4	35.7	158 39.8	13.2	36 41.3	46.6	Miaplacidus	221 40.3	S69 46.7
23	265 09.4	137 13.9	33.0	183 48.0	35.9	173 41.6	13.2	51 43.8	46.6			
2 00	280 11.9	152 13.2	N20 32.2	198 48.5	N23 36.0	188 43.5	N23 13.2	66 46.3	S10 46.6	Mirfak	308 40.6	N49 54.3
01	295 14.4	167 12.5	31.5	213 49.1	36.1	203 45.3	13.2	81 48.7	46.6	Nunki	75 57.9	S26 16.6
02	310 16.8	182 11.8	30.8	228 49.7	36.2	218 47.1	13.2	96 51.2	46.6	Peacock	53 18.7	S56 41.2
03	325 19.3	197 11.1	. . 30.1	243 50.3	. . 36.4	233 49.0	. . 13.2	111 53.7	. . 46.6	Pollux	243 28.1	N27 59.5
04	340 21.7	212 10.5	29.4	258 50.9	36.5	248 50.8	13.2	126 56.2	46.6	Procyon	245 00.0	N 5 11.3
05	355 24.2	227 09.8	28.6	273 51.5	36.6	263 52.7	13.2	141 58.7	46.6			
06	10 26.7	242 09.1	N20 27.9	288 52.1	N23 36.8	278 54.5	N23 13.2	157 01.2	S10 46.6	Rasalhague	96 06.1	N12 33.2
07	25 29.1	257 08.4	27.2	303 52.7	36.9	293 56.4	13.2	172 03.7	46.6	Regulus	207 43.7	N11 54.0
08	40 31.6	272 07.8	26.5	318 53.3	37.0	308 58.2	13.2	187 06.2	46.6	Rigel	281 12.3	S 8 11.3
T 09	55 34.1	287 07.1	. . 25.7	333 53.9	. . 37.1	324 00.1	. . 13.2	202 08.7	. . 46.6	Rigil Kent.	139 51.2	S60 53.6
U 10	70 36.5	302 06.4	25.0	348 54.5	37.3	339 01.9	13.2	217 11.2	46.6	Sabik	102 12.2	S15 44.3
E 11	85 39.0	317 05.7	24.3	3 55.1	37.4	354 03.8	13.2	232 13.7	46.6			
S 12	100 41.5	332 05.1	N20 23.5	18 55.7	N23 37.5	9 05.6	N23 13.2	247 16.2	S10 46.6	Schedar	349 40.4	N56 36.5
D 13	115 43.9	347 04.4	22.8	33 56.3	37.6	24 07.4	13.2	262 18.6	46.6	Shaula	96 21.4	S37 06.7
A 14	130 46.4	2 03.7	22.1	48 56.9	37.8	39 09.3	13.2	277 21.1	46.6	Sirius	258 34.0	S16 44.2
Y 15	145 48.9	17 03.0	. . 21.4	63 57.5	. . 37.9	54 11.1	. . 13.2	292 23.6	. . 46.6	Spica	158 31.1	S11 14.0
16	160 51.3	32 02.4	20.6	78 58.1	38.0	69 13.0	13.2	307 26.1	46.6	Suhail	222 52.7	S43 29.5
17	175 53.8	47 01.7	19.9	93 58.7	38.1	84 14.8	13.2	322 28.6	46.6			
18	190 56.2	62 01.0	N20 19.1	108 59.2	N23 38.2	99 16.7	N23 13.1	337 31.1	S10 46.6	Vega	80 38.5	N38 48.0
19	205 58.7	77 00.4	18.4	123 59.8	38.4	114 18.5	13.1	352 33.6	46.6	Zuben'ubi	137 05.2	S16 05.9
20	221 01.2	91 59.7	17.7	139 00.4	38.5	129 20.4	13.1	7 36.1	46.6		SHA	Mer. Pass.
21	236 03.6	106 59.0	. . 16.9	154 01.0	. . 38.6	144 22.2	. . 13.1	22 38.6	. . 46.6		° ′	h m
22	251 06.1	121 58.4	16.2	169 01.6	38.7	159 24.0	13.1	37 41.0	46.6	Venus	233 16.9	13 51
23	266 08.6	136 57.7	15.5	184 02.2	38.8	174 25.9	13.1	52 43.5	46.6	Mars	279 21.5	10 45
	h m									Jupiter	268 46.5	11 27
Mer. Pass.	5 22.3	v −0.7	d 0.7	v 0.6	d 0.1	v 1.8	d 0.0	v 2.5	d 0.0	Saturn	146 33.6	19 34

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		30	1	2	3
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
30 00	179 06.2	N23 10.2	274 04.7	12.7	N 5 21.8	10.8	56.8	N 72				22 28	22 14	21 55	21 01
01	194 06.1	10.1	288 36.4	12.7	5 32.6	10.7	56.8	N 70				22 41	22 37	22 32	22 28
02	209 06.0	09.9	303 08.1	12.7	5 43.3	10.7	56.8	68				22 52	22 54	22 59	23 07
03	224 05.8	. . 09.8	317 39.8	12.8	5 54.0	10.7	56.7	66	////	////	00 21	23 02	23 09	23 19	23 34
04	239 05.7	09.6	332 11.6	12.8	6 04.7	10.6	56.7	64	////	////	01 41	23 09	23 21	23 35	23 55
05	254 05.6	09.5	346 43.4	12.8	6 15.3	10.6	56.7	62	////	////	02 17	23 16	23 31	23 49	24 12
06	269 05.5	N23 09.3	1 15.2	12.8	N 6 25.9	10.6	56.6	60	////	01 04	02 42	23 22	23 39	24 00	00 00
07	284 05.4	09.2	15 47.0	12.8	6 36.5	10.5	56.6	N 58	////	01 49	03 02	23 27	23 47	24 10	00 10
08	299 05.2	09.0	30 18.8	12.9	6 47.0	10.5	56.6	56	////	02 17	03 18	23 32	23 54	24 19	00 19
S 09	314 05.1	. . 08.9	44 50.7	12.8	6 57.5	10.4	56.5	54	00 58	02 39	03 32	23 36	24 00	00 00	00 27
U 10	329 05.0	08.7	59 22.5	12.9	7 07.9	10.3	56.5	52	01 40	02 56	03 44	23 40	24 05	00 05	00 34
N 11	344 04.9	08.5	73 54.4	12.9	7 18.2	10.4	56.5	50	02 07	03 11	03 55	23 43	24 10	00 10	00 40
D 12	359 04.7	N23 08.4	88 26.3	12.9	N 7 28.6	10.2	56.4	45	02 51	03 40	04 17	23 51	24 21	00 21	00 54
A 13	14 04.6	08.2	102 58.2	12.9	7 38.8	10.3	56.4	N 40	03 21	04 02	04 35	23 57	24 30	00 30	01 05
Y 14	29 04.5	08.1	117 30.1	12.9	7 49.1	10.1	56.4	35	03 44	04 20	04 50	24 02	00 02	00 38	01 15
15	44 04.4	. . 07.9	132 02.0	12.9	7 59.2	10.2	56.3	30	04 02	04 35	05 02	24 07	00 07	00 44	01 23
16	59 04.2	07.7	146 33.9	12.9	8 09.4	10.1	56.3	20	04 31	05 00	05 24	24 16	00 16	00 56	01 38
17	74 04.1	07.6	161 05.8	13.0	8 19.5	10.0	56.3	N 10	04 53	05 20	05 43	24 23	00 23	01 07	01 51
18	89 04.0	N23 07.4	175 37.8	12.9	N 8 29.5	10.0	56.2	0	05 12	05 38	06 00	24 30	00 30	01 16	02 03
19	104 03.9	07.3	190 09.7	13.0	8 39.5	9.9	56.2	S 10	05 28	05 55	06 17	24 37	00 37	01 26	02 15
20	119 03.8	07.1	204 41.7	13.0	8 49.4	9.9	56.2	20	05 44	06 12	06 36	24 45	00 45	01 37	02 28
21	134 03.6	. . 06.9	219 13.7	12.9	8 59.3	9.8	56.1	30	06 00	06 30	06 57	24 53	00 53	01 49	02 43
22	149 03.5	06.8	233 45.6	13.0	9 09.1	9.8	56.1	35	06 09	06 41	07 09	24 58	00 58	01 56	02 52
23	164 03.4	06.6	248 17.6	13.0	9 18.9	9.7	56.1	40	06 18	06 52	07 23	00 03	01 04	02 04	03 02
1 00	179 03.3	N23 06.4	262 49.6	13.0	N 9 28.6	9.7	56.0	45	06 28	07 05	07 39	00 06	01 11	02 13	03 14
01	194 03.2	06.3	277 21.6	13.0	9 38.3	9.6	56.0	S 50	06 40	07 21	07 59	00 11	01 19	02 25	03 28
02	209 03.0	06.1	291 53.6	12.9	9 47.9	9.5	56.0	52	06 45	07 28	08 09	00 13	01 23	02 30	03 35
03	224 02.9	. . 05.9	306 25.5	13.0	9 57.4	9.5	55.9	54	06 50	07 36	08 20	00 15	01 27	02 36	03 42
04	239 02.8	05.8	320 57.5	13.0	10 06.9	9.5	55.9	56	06 57	07 45	08 32	00 17	01 31	02 42	03 50
05	254 02.7	05.6	335 29.5	13.0	10 16.4	9.4	55.9	58	07 03	07 55	08 47	00 20	01 36	02 50	04 00
06	269 02.5	N23 05.4	350 01.5	13.0	N10 25.8	9.3	55.9	S 60	07 10	08 07	09 04	00 23	01 42	02 58	04 11
07	284 02.4	05.2	4 33.5	13.0	10 35.1	9.2	55.8								
08	299 02.3	05.1	19 05.5	13.0	10 44.3	9.3	55.8								
M 09	314 02.2	. . 04.9	33 37.5	13.0	10 53.6	9.1	55.8								
O 10	329 02.1	04.7	48 09.5	13.0	11 02.7	9.1	55.7								
N 11	344 01.9	04.5	62 41.5	13.0	11 11.8	9.0	55.7								
D 12	359 01.8	N23 04.4	77 13.5	13.0	N11 20.8	9.0	55.7								
A 13	14 01.7	04.2	91 45.5	13.0	11 29.8	8.9	55.7								
Y 14	29 01.6	04.0	106 17.5	12.9	11 38.7	8.9	55.6								
15	44 01.5	. . 03.8	120 49.4	13.0	11 47.6	8.7	55.6								
16	59 01.3	03.7	135 21.4	13.0	11 56.3	8.8	55.6								
17	74 01.2	03.5	149 53.4	12.9	12 05.1	8.6	55.5								
18	89 01.1	N23 03.3	164 25.3	13.0	N12 13.7	8.6	55.5								
19	104 01.0	03.1	178 57.3	13.0	12 22.3	8.6	55.5								
20	119 00.9	02.9	193 29.3	12.9	12 30.9	8.4	55.5								
21	134 00.8	. . 02.8	208 01.2	13.0	12 39.3	8.4	55.4								
22	149 00.6	02.6	222 33.2	12.9	12 47.7	8.4	55.4								
23	164 00.5	02.4	237 05.1	12.9	12 56.1	8.2	55.4								
2 00	179 00.4	N23 02.2	251 37.0	12.9	N13 04.3	8.2	55.4								
01	194 00.3	02.0	266 08.9	13.0	13 12.5	8.2	55.3								
02	209 00.2	01.8	280 40.9	12.9	13 20.7	8.0	55.3								
03	224 00.0	. . 01.7	295 12.8	12.9	13 28.7	8.0	55.3								
04	238 59.9	01.5	309 44.7	12.8	13 36.7	8.0	55.3								
05	253 59.8	01.3	324 16.5	12.9	13 44.7	7.8	55.2								
06	268 59.7	N23 01.1	338 48.4	12.9	N13 52.5	7.8	55.2								
07	283 59.6	00.9	353 20.3	12.9	14 00.3	7.7	55.2								
T 08	298 59.5	00.7	7 52.2	12.8	14 08.0	7.7	55.2								
U 09	313 59.3	. . 00.5	22 24.0	12.8	14 15.7	7.6	55.1								
E 10	328 59.2	00.3	36 55.8	12.9	14 23.3	7.5	55.1								
S 11	343 59.1	00.1	51 27.7	12.8	14 30.8	7.4	55.1								
D 12	358 59.0	N23 00.0	65 59.5	12.8	N14 38.2	7.4	55.1								
A 13	13 58.9	22 59.8	80 31.3	12.8	14 45.6	7.3	55.1								
Y 14	28 58.7	59.6	95 03.1	12.7	14 52.9	7.2	55.0								
15	43 58.6	. . 59.4	109 34.8	12.8	15 00.1	7.2	55.0								
16	58 58.5	59.2	124 06.6	12.8	15 07.3	7.0	55.0								
17	73 58.4	59.0	138 38.4	12.7	15 14.3	7.0	55.0								
18	88 58.3	N22 58.8	153 10.1	12.7	N15 21.3	7.0	54.9								
19	103 58.2	58.6	167 41.8	12.7	15 28.3	6.8	54.9								
20	118 58.0	58.4	182 13.5	12.8	15 35.1	6.8	54.9								
21	133 57.9	. . 58.2	196 45.3	12.6	15 41.9	6.7	54.9								
22	148 57.8	58.0	211 16.9	12.7	15 48.6	6.6	54.9								
23	163 57.7	57.8	225 48.6	12.7	N15 55.2	6.5	54.8								
	SD 15.8	d 0.2	SD	15.4		15.2		15.0							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	30	1	2	3
°	h m	h m	h m	h m	h m	h m	h m
N 72				13 47	15 37	17 34	20 06
N 70				13 36	15 16	16 57	18 40
68				13 26	15 00	16 32	18 01
66	23 39	////	////	13 18	14 47	16 12	17 34
64	22 25	////	////	13 12	14 36	15 57	17 14
62	21 50	////	////	13 06	14 26	15 44	16 57
60	21 25	23 02	////	13 01	14 18	15 33	16 43
N 58	21 05	22 18	////	12 57	14 12	15 23	16 31
56	20 49	21 50	////	12 53	14 05	15 15	16 21
54	20 35	21 29	23 07	12 49	14 00	15 08	16 12
52	20 23	21 11	22 27	12 46	13 55	15 01	16 04
50	20 12	20 56	22 01	12 43	13 51	14 55	15 57
45	19 50	20 27	21 17	12 37	13 41	14 43	15 42
N 40	19 33	20 05	20 47	12 32	13 33	14 32	15 29
35	19 18	19 47	20 24	12 28	13 26	14 23	15 18
30	19 05	19 32	20 06	12 24	13 20	14 15	15 09
20	18 43	19 08	19 37	12 17	13 10	14 02	14 53
N 10	18 25	18 48	19 15	12 11	13 01	13 50	14 39
0	18 08	18 30	18 56	12 06	12 52	13 39	14 26
S 10	17 50	18 13	18 39	12 00	12 44	13 28	14 12
20	17 32	17 56	18 24	11 55	12 35	13 16	13 58
30	17 11	17 38	18 07	11 48	12 25	13 02	13 42
35	16 59	17 27	17 59	11 44	12 19	12 55	13 33
40	16 45	17 16	17 50	11 40	12 12	12 46	13 23
45	16 29	17 02	17 40	11 35	12 04	12 36	13 10
S 50	16 08	16 47	17 28	11 29	11 55	12 23	12 55
52	15 59	16 39	17 23	11 26	11 51	12 18	12 48
54	15 48	16 31	17 17	11 23	11 46	12 11	12 40
56	15 36	16 23	17 11	11 20	11 41	12 04	12 32
58	15 21	16 13	17 05	11 16	11 35	11 56	12 22
S 60	15 04	16 01	16 58	11 12	11 28	11 47	12 11

Day	SUN		MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
30	03 35	03 41	12 04	05 55	18 18	22	47
1	03 47	03 52	12 04	06 41	19 04	23	37
2	03 58	04 04	12 04	07 28	19 51	24	28

UT	ARIES	VENUS −3.8		MARS +1.5		JUPITER −1.9		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
3 00	281 11.0	151 57.0	N20 14.7	199 02.8	N23 39.0	189 27.7	N23 13.1	67 46.0	S10 46.6
01	296 13.5	166 56.4	14.0	214 03.4	39.1	204 29.6	13.1	82 48.5	46.6
02	311 16.0	181 55.7	13.2	229 04.0	39.2	219 31.4	13.1	97 51.0	46.7
03	326 18.4	196 55.0	12.5	244 04.6	39.3	234 33.3	13.1	112 53.5	46.7
04	341 20.9	211 54.4	11.7	259 05.2	39.4	249 35.1	13.1	127 56.0	46.7
05	356 23.3	226 53.7	11.0	274 05.8	39.6	264 37.0	13.1	142 58.5	46.7
06	11 25.8	241 53.0	N20 10.2	289 06.4	N23 39.7	279 38.8	N23 13.1	158 01.0	S10 46.7
W 07	26 28.3	256 52.4	09.5	304 07.0	39.8	294 40.7	13.1	173 03.4	46.7
E 08	41 30.7	271 51.7	08.7	319 07.6	39.9	309 42.5	13.1	188 05.9	46.7
D 09	56 33.2	286 51.1	08.0	334 08.2	40.0	324 44.3	13.1	203 08.4	46.7
N 10	71 35.7	301 50.4	07.2	349 08.8	40.1	339 46.2	13.1	218 10.9	46.7
E 11	86 38.1	316 49.7	06.5	4 09.4	40.2	354 48.0	13.1	233 13.4	46.7
S 12	101 40.6	331 49.1	N20 05.7	19 10.0	N23 40.4	9 49.9	N23 13.1	248 15.9	S10 46.7
D 13	116 43.1	346 48.4	05.0	34 10.6	40.5	24 51.7	13.1	263 18.4	46.7
A 14	131 45.5	1 47.8	04.2	49 11.2	40.6	39 53.6	13.1	278 20.8	46.7
Y 15	146 48.0	16 47.1	03.5	64 11.8	40.7	54 55.4	13.1	293 23.3	46.7
16	161 50.5	31 46.4	02.7	79 12.3	40.8	69 57.3	13.1	308 25.8	46.7
17	176 52.9	46 45.8	02.0	94 12.9	40.9	84 59.1	13.1	323 28.3	46.7
18	191 55.4	61 45.1	N20 01.2	109 13.5	N23 41.0	100 01.0	N23 13.1	338 30.8	S10 46.7
19	206 57.8	76 44.5	20 00.4	124 14.1	41.2	115 02.8	13.1	353 33.3	46.7
20	222 00.3	91 43.8	19 59.7	139 14.7	41.3	130 04.6	13.1	8 35.8	46.7
21	237 02.8	106 43.2	58.9	154 15.3	41.4	145 06.5	13.1	23 38.2	46.7
22	252 05.2	121 42.5	58.2	169 15.9	41.5	160 08.3	13.1	38 40.7	46.7
23	267 07.7	136 41.9	57.4	184 16.5	41.6	175 10.2	13.0	53 43.2	46.7
4 00	282 10.2	151 41.2	N19 56.6	199 17.1	N23 41.7	190 12.0	N23 13.0	68 45.7	S10 46.7
01	297 12.6	166 40.6	55.9	214 17.7	41.8	205 13.9	13.0	83 48.2	46.7
02	312 15.1	181 39.9	55.1	229 18.3	41.9	220 15.7	13.0	98 50.7	46.7
03	327 17.6	196 39.2	54.3	244 18.9	42.0	235 17.6	13.0	113 53.2	46.8
04	342 20.0	211 38.6	53.6	259 19.5	42.1	250 19.4	13.0	128 55.6	46.8
05	357 22.5	226 37.9	52.8	274 20.1	42.3	265 21.3	13.0	143 58.1	46.8
06	12 25.0	241 37.3	N19 52.0	289 20.7	N23 42.4	280 23.1	N23 13.0	159 00.6	S10 46.8
T 07	27 27.4	256 36.6	51.2	304 21.3	42.5	295 25.0	13.0	174 03.1	46.8
H 08	42 29.9	271 36.0	50.5	319 21.9	42.6	310 26.8	13.0	189 05.6	46.8
U 09	57 32.3	286 35.4	49.7	334 22.5	42.7	325 28.6	13.0	204 08.1	46.8
R 10	72 34.8	301 34.7	48.9	349 23.1	42.8	340 30.5	13.0	219 10.5	46.8
S 11	87 37.3	316 34.1	48.1	4 23.7	42.9	355 32.3	13.0	234 13.0	46.8
D 12	102 39.7	331 33.4	N19 47.4	19 24.3	N23 43.0	10 34.2	N23 13.0	249 15.5	S10 46.8
A 13	117 42.2	346 32.8	46.6	34 24.9	43.1	25 36.0	13.0	264 18.0	46.8
Y 14	132 44.7	1 32.1	45.8	49 25.5	43.2	40 37.9	13.0	279 20.5	46.8
15	147 47.1	16 31.5	45.0	64 26.1	43.3	55 39.7	13.0	294 22.9	46.8
16	162 49.6	31 30.8	44.3	79 26.7	43.4	70 41.6	13.0	309 25.4	46.8
17	177 52.1	46 30.2	43.5	94 27.3	43.5	85 43.4	13.0	324 27.9	46.8
18	192 54.5	61 29.5	N19 42.7	109 27.9	N23 43.6	100 45.3	N23 13.0	339 30.4	S10 46.8
19	207 57.0	76 28.9	41.9	124 28.5	43.7	115 47.1	13.0	354 32.9	46.8
20	222 59.4	91 28.3	41.1	139 29.0	43.8	130 49.0	13.0	9 35.4	46.8
21	238 01.9	106 27.6	40.3	154 29.6	43.9	145 50.8	13.0	24 37.8	46.9
22	253 04.4	121 27.0	39.6	169 30.2	44.0	160 52.7	12.9	39 40.3	46.9
23	268 06.8	136 26.3	38.8	184 30.8	44.1	175 54.5	12.9	54 42.8	46.9
5 00	283 09.3	151 25.7	N19 38.0	199 31.4	N23 44.2	190 56.3	N23 12.9	69 45.3	S10 46.9
01	298 11.8	166 25.1	37.2	214 32.0	44.3	205 58.2	12.9	84 47.8	46.9
02	313 14.2	181 24.4	36.4	229 32.6	44.4	221 00.0	12.9	99 50.2	46.9
03	328 16.7	196 23.8	35.6	244 33.2	44.5	236 01.9	12.9	114 52.7	46.9
04	343 19.2	211 23.1	34.8	259 33.8	44.6	251 03.7	12.9	129 55.2	46.9
05	358 21.6	226 22.5	34.0	274 34.4	44.7	266 05.6	12.9	144 57.7	46.9
06	13 24.1	241 21.9	N19 33.2	289 35.0	N23 44.8	281 07.4	N23 12.9	160 00.2	S10 46.9
F 07	28 26.6	256 21.2	32.5	304 35.6	44.9	296 09.3	12.9	175 02.6	46.9
R 08	43 29.0	271 20.6	31.7	319 36.2	45.0	311 11.1	12.9	190 05.1	46.9
I 09	58 31.5	286 20.0	30.9	334 36.8	45.1	326 13.0	12.9	205 07.6	46.9
D 10	73 33.9	301 19.3	30.1	349 37.4	45.2	341 14.8	12.9	220 10.1	46.9
A 11	88 36.4	316 18.7	29.3	4 38.0	45.3	356 16.7	12.9	235 12.6	46.9
Y 12	103 38.9	331 18.1	N19 28.5	19 38.6	N23 45.4	11 18.5	N23 12.9	250 15.0	S10 46.9
13	118 41.3	346 17.4	27.7	34 39.2	45.5	26 20.4	12.9	265 17.5	47.0
14	133 43.8	1 16.8	26.9	49 39.8	45.6	41 22.2	12.9	280 20.0	47.0
15	148 46.3	16 16.2	26.1	64 40.4	45.7	56 24.1	12.9	295 22.5	47.0
16	163 48.7	31 15.5	25.3	79 41.0	45.8	71 25.9	12.9	310 25.0	47.0
17	178 51.2	46 14.9	24.5	94 41.6	45.9	86 27.7	12.8	325 27.4	47.0
18	193 53.7	61 14.3	N19 23.7	109 42.2	N23 46.0	101 29.6	N23 12.8	340 29.9	S10 47.0
19	208 56.1	76 13.7	22.9	124 42.8	46.1	116 31.4	12.8	355 32.4	47.0
20	223 58.6	91 13.0	22.1	139 43.4	46.2	131 33.3	12.8	10 34.9	47.0
21	239 01.1	106 12.4	21.2	154 44.0	46.3	146 35.1	12.8	25 37.3	47.0
22	254 03.5	121 11.8	20.4	169 44.6	46.4	161 37.0	12.8	40 39.8	47.0
23	269 06.0	136 11.1	19.6	184 45.2	46.5	176 38.8	12.8	55 42.3	47.0
Mer.Pass.	h m 5 10.5	v −0.6	d 0.8	v 0.6	d 0.1	v 1.8	d 0.0	v 2.5	d 0.0

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.6	S40 14.9
Achernar	335 26.9	S57 09.8
Acrux	173 09.2	S63 10.8
Adhara	255 12.9	S28 59.6
Aldebaran	290 49.6	N16 32.0
Alioth	166 20.7	N55 53.4
Alkaid	152 58.8	N49 15.0
Al Na'ir	27 43.4	S46 53.4
Alnilam	275 46.6	S 1 11.7
Alphard	217 56.3	S 8 43.2
Alphecca	126 10.7	N26 40.4
Alpheratz	357 43.3	N29 09.8
Altair	62 07.9	N 8 54.5
Ankaa	353 15.6	S42 13.6
Antares	112 25.9	S26 27.6
Arcturus	145 55.6	N19 06.9
Atria	107 27.1	S69 03.1
Avior	234 18.6	S59 33.4
Bellatrix	278 32.3	N 6 21.6
Betelgeuse	271 01.6	N 7 24.4
Canopus	263 56.7	S52 42.3
Capella	280 34.8	N46 00.4
Deneb	49 31.0	N45 19.8
Denebola	182 33.7	N14 29.8
Diphda	348 55.8	S17 54.6
Dubhe	193 52.0	N61 40.8
Elnath	278 12.9	N28 36.9
Eltanin	90 45.6	N51 29.5
Enif	33 46.8	N 9 56.4
Fomalhaut	15 23.8	S29 32.7
Gacrux	172 00.8	S57 11.7
Gienah	175 52.3	S17 37.2
Hadar	148 47.5	S60 26.5
Hamal	328 00.8	N23 31.5
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 19.5	N74 06.3
Markab	13 38.1	N15 16.7
Menkar	314 15.2	N 4 08.5
Menkent	148 07.3	S36 26.3
Miaplacidus	221 40.3	S69 46.7
Mirfak	308 40.6	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.6	S56 41.2
Pollux	243 28.1	N27 59.5
Procyon	245 00.0	N 5 11.3
Rasalhague	96 06.1	N12 33.2
Regulus	207 43.7	N11 54.0
Rigel	281 12.3	S 8 11.3
Rigil Kent.	139 51.3	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 40.4	N56 36.5
Shaula	96 21.4	S37 06.7
Sirius	258 34.0	S16 44.2
Spica	158 31.1	S11 14.0
Suhail	222 52.8	S43 29.5
Vega	80 38.5	N38 48.0
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	229 31.0	13 54
Mars	277 06.9	10 42
Jupiter	268 01.9	11 18
Saturn	146 35.5	19 22

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		3	4	5	6
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
3 00	178 57.6	N22 57.6	240 20.3	12.6	N16 01.7	6.5	54.8	N 72				21 01			
01	193 57.5	57.4	254 51.9	12.7	16 08.2	6.4	54.8	N 70					22 22		23 42
02	208 57.4	57.2	269 23.6	12.6	16 14.6	6.3	54.8	68				22 28	22 56	23 42	24 56
03	223 57.2	57.0	283 55.2	12.6	16 20.9	6.2	54.8	66	////	////	00 42	23 34	23 59	24 37	00 37
04	238 57.1	56.8	298 26.8	12.6	16 27.1	6.2	54.8	64	////	////	01 47	23 55	24 24	00 24	01 05
05	253 57.0	56.6	312 58.4	12.5	16 33.3	6.1	54.7	62	////	////	02 21	24 12	00 12	00 44	01 26
06	268 56.9	N22 56.4	327 29.9	12.6	N16 39.4	6.0	54.7	60	////	01 11	02 46	00 00	00 26	01 00	01 43
W 07	283 56.8	56.2	342 01.5	12.6	16 45.4	5.9	54.7	N 58	////	01 53	03 05	00 10	00 39	01 14	01 57
E 08	298 56.7	56.0	356 33.1	12.5	16 51.3	5.8	54.7	56	////	02 21	03 21	00 19	00 49	01 26	02 10
D 09	313 56.5	55.8	11 04.6	12.5	16 57.1	5.8	54.7	54	01 06	02 42	03 35	00 27	00 58	01 36	02 21
N 10	328 56.4	55.5	25 36.1	12.5	17 02.9	5.6	54.6	52	01 44	02 59	03 47	00 34	01 07	01 45	02 30
E 11	343 56.3	55.3	40 07.6	12.5	17 08.5	5.6	54.6	50	02 10	03 13	03 57	00 40	01 14	01 54	02 39
S 12	358 56.2	N22 55.1	54 39.1	12.5	N17 14.1	5.5	54.6	45	02 53	03 42	04 19	00 54	01 30	02 11	02 57
D 13	13 56.1	54.9	69 10.6	12.4	17 19.6	5.5	54.6	N 40	03 23	04 04	04 36	01 05	01 43	02 26	03 12
A 14	28 56.0	54.7	83 42.0	12.5	17 25.1	5.3	54.6	35	03 45	04 22	04 51	01 15	01 55	02 38	03 24
Y 15	43 55.9	54.5	98 13.5	12.4	17 30.4	5.3	54.6	30	04 03	04 36	05 04	01 23	02 04	02 48	03 35
16	58 55.7	54.3	112 44.9	12.4	17 35.7	5.1	54.5	20	04 32	05 01	05 25	01 38	02 21	03 07	03 54
17	73 55.6	54.1	127 16.3	12.4	17 40.8	5.1	54.5	N 10	04 54	05 21	05 44	01 51	02 36	03 23	04 10
18	88 55.5	N22 53.9	141 47.7	12.4	N17 45.9	5.1	54.5	0	05 12	05 38	06 01	02 03	02 50	03 38	04 26
19	103 55.4	53.6	156 19.1	12.4	17 51.0	4.9	54.5	S 10	05 29	05 55	06 18	02 15	03 04	03 53	04 41
20	118 55.3	53.4	170 50.5	12.4	17 55.9	4.8	54.5	20	05 44	06 12	06 36	02 28	03 19	04 09	04 58
21	133 55.2	53.2	185 21.9	12.3	18 00.7	4.8	54.5	30	06 00	06 30	06 56	02 43	03 36	04 27	05 16
22	148 55.1	53.0	199 53.2	12.3	18 05.5	4.7	54.5	35	06 09	06 40	07 08	02 52	03 46	04 38	05 27
23	163 55.0	52.8	214 24.5	12.4	18 10.2	4.6	54.4	40	06 18	06 52	07 22	03 02	03 58	04 51	05 40
4 00	178 54.8	N22 52.6	228 55.9	12.3	N18 14.8	4.5	54.4	45	06 28	07 05	07 38	03 14	04 11	05 05	05 55
01	193 54.7	52.4	243 27.2	12.3	18 19.3	4.4	54.4	S 50	06 39	07 20	07 59	03 28	04 28	05 23	06 13
02	208 54.6	52.1	257 58.5	12.2	18 23.7	4.3	54.4	52	06 44	07 28	08 08	03 35	04 36	05 32	06 22
03	223 54.5	51.9	272 29.7	12.3	18 28.0	4.2	54.4	54	06 50	07 35	08 19	03 42	04 44	05 41	06 32
04	238 54.4	51.7	287 01.0	12.3	18 32.2	4.2	54.4	56	06 56	07 44	08 31	03 50	04 54	05 52	06 42
05	253 54.3	51.5	301 32.3	12.2	18 36.4	4.1	54.4	58	07 02	07 54	08 45	04 00	05 05	06 04	06 55
06	268 54.2	N22 51.3	316 03.5	12.2	N18 40.5	4.0	54.3	S 60	07 09	08 05	09 01	04 11	05 18	06 19	07 10
T 07	283 54.1	51.0	330 34.7	12.2	18 44.5	3.9	54.3								
H 08	298 53.9	50.8	345 05.9	12.2	18 48.4	3.8	54.3								
U 09	313 53.8	50.6	359 37.1	12.2	18 52.2	3.7	54.3								
R 10	328 53.7	50.4	14 08.3	12.2	18 55.9	3.6	54.3								
S 11	343 53.6	50.1	28 39.5	12.2	18 59.5	3.6	54.3								
D 12	358 53.5	N22 49.9	43 10.7	12.1	N19 03.1	3.4	54.3								
A 13	13 53.4	49.7	57 41.8	12.2	19 06.5	3.4	54.3								
Y 14	28 53.3	49.5	72 13.0	12.1	19 09.9	3.2	54.3								
15	43 53.2	49.2	86 44.1	12.1	19 13.1	3.2	54.2								
16	58 53.1	49.0	101 15.2	12.1	19 16.3	3.1	54.2								
17	73 52.9	48.8	115 46.3	12.1	19 19.4	3.0	54.2								
18	88 52.8	N22 48.5	130 17.4	12.1	N19 22.4	3.0	54.2								
19	103 52.7	48.3	144 48.5	12.1	19 25.4	2.8	54.2								
20	118 52.6	48.1	159 19.6	12.1	19 28.2	2.7	54.2								
21	133 52.5	47.9	173 50.7	12.0	19 30.9	2.7	54.2								
22	148 52.4	47.6	188 21.7	12.1	19 33.6	2.5	54.2								
23	163 52.3	47.4	202 52.8	12.0	19 36.1	2.5	54.2								
5 00	178 52.2	N22 47.2	217 23.8	12.1	N19 38.6	2.3	54.2								
01	193 52.1	46.9	231 54.9	12.0	19 40.9	2.3	54.1								
02	208 52.0	46.7	246 25.9	12.0	19 43.2	2.2	54.1								
03	223 51.8	46.4	260 56.9	12.1	19 45.4	2.1	54.1								
04	238 51.7	46.2	275 28.0	12.0	19 47.5	2.0	54.1								
05	253 51.6	46.0	289 59.0	12.0	19 49.5	1.9	54.1								
06	268 51.5	N22 45.7	304 30.0	12.0	N19 51.4	1.8	54.1								
F 07	283 51.4	45.5	319 01.0	12.0	19 53.2	1.8	54.1								
R 08	298 51.3	45.3	333 32.0	11.9	19 55.0	1.6	54.1								
I 09	313 51.2	45.0	348 02.9	12.0	19 56.6	1.6	54.1								
D 10	328 51.1	44.8	2 33.9	12.0	19 58.2	1.4	54.1								
A 11	343 51.0	44.5	17 04.9	12.0	19 59.6	1.4	54.1								
Y 12	358 50.9	N22 44.3	31 35.9	12.0	N20 01.0	1.2	54.1								
13	13 50.8	44.0	46 06.9	11.9	20 02.2	1.2	54.1								
14	28 50.7	43.8	60 37.8	12.0	20 03.4	1.1	54.0								
15	43 50.5	43.6	75 08.8	12.0	20 04.5	1.0	54.0								
16	58 50.4	43.3	89 39.8	11.9	20 05.5	0.9	54.0								
17	73 50.3	43.1	104 10.7	12.0	20 06.4	0.8	54.0								
18	88 50.2	N22 42.8	118 41.7	11.9	N20 07.2	0.7	54.0								
19	103 50.1	42.6	133 12.6	12.0	20 07.9	0.6	54.0								
20	118 50.0	42.3	147 43.6	12.0	20 08.5	0.5	54.0								
21	133 49.9	42.1	162 14.6	11.9	20 09.0	0.4	54.0								
22	148 49.8	41.8	176 45.5	12.0	20 09.4	0.4	54.0								
23	163 49.7	41.6	191 16.5	11.9	N20 09.8	0.2	54.0								
	SD 15.8	d 0.2	SD	14.9	14.8		14.7								

UT	Sunset	Twilight		Moonset			
		Civil	Naut.	3	4	5	6
	h m	h m	h m	h m	h m	h m	h m
N 72				20 06			
N 70					20 25		22 24
68				18 40	20 29	21 10	
66	23 21	////	////	18 01	19 23	20 29	21 10
64	22 20	////	////	17 34	18 48	19 49	20 33
62	21 46	////	////	17 14	18 23	19 22	20 06
60	21 22	22 55	////	16 57	18 03	19 00	19 46
N 58	21 03	22 14	////	16 43	17 47	18 43	19 29
56	20 47	21 47	////	16 31	17 34	18 29	19 15
54	20 34	21 26	23 01	16 21	17 22	18 17	19 03
52	20 22	21 09	22 23	16 12	17 12	18 06	18 53
50	20 11	20 55	21 58	16 04	17 03	17 56	18 43
45	19 50	20 26	21 15	15 57	16 55	17 48	18 35
N 40	19 32	20 05	20 46	15 42	16 38	17 30	18 17
35	19 18	19 47	20 23	15 29	16 24	17 15	18 02
30	19 05	19 32	20 05	15 18	16 12	17 02	17 50
20	18 44	19 08	19 37	15 09	16 01	16 51	17 39
N 10	18 25	18 48	19 15	14 53	15 43	16 33	17 20
0	18 08	18 31	18 57	14 39	15 28	16 16	17 04
S 10	17 51	18 14	18 40	14 26	15 13	16 01	16 49
20	17 33	17 57	18 24	14 12	14 59	15 46	16 34
30	17 13	17 39	18 09	13 58	14 43	15 29	16 17
35	17 01	17 29	18 00	13 42	14 25	15 11	15 59
40	16 47	17 17	17 51	13 33	14 15	15 00	15 48
45	16 31	17 04	17 41	13 23	14 03	14 47	15 35
S 50	16 11	16 49	17 30	13 10	13 49	14 32	15 20
52	16 01	16 41	17 25	12 55	13 32	14 14	15 02
54	15 50	16 34	17 19	12 48	13 24	14 06	14 54
56	15 38	16 25	17 14	12 40	13 15	13 56	14 44
58	15 24	16 15	17 07	12 32	13 05	13 45	14 33
S 60	15 08	16 04	17 00	12 22	12 53	13 33	14 21
				12 11	12 40	13 18	14 06

Day	SUN			MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00^h	12^h		Upper	Lower		
	m s	m s	h m	h m	h m	d	%
3	04 09	04 15	12 04	08 14	20 38	25	20
4	04 20	04 26	12 04	09 02	21 25	26	13
5	04 31	04 36	12 05	09 49	22 13	27	7

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

UT	ARIES	VENUS −3.9		MARS +1.5		JUPITER −1.9		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
6 00	284 08.4	151 10.5	N19 18.8	199 45.8	N23 46.6	191 40.7	N23 12.8	70 44.8	S10 47.0
01	299 10.9	166 09.9	18.0	214 46.4	46.7	206 42.5	12.8	85 47.2	47.0
02	314 13.4	181 09.3	17.2	229 47.0	46.8	221 44.4	12.8	100 49.7	47.0
03	329 15.8	196 08.6	16.4	244 47.6	46.8	236 46.2	12.8	115 52.2	47.1
04	344 18.3	211 08.0	15.6	259 48.2	46.9	251 48.1	12.8	130 54.7	47.1
05	359 20.8	226 07.4	14.8	274 48.8	47.0	266 49.9	12.8	145 57.2	47.1
06	14 23.2	241 06.8	N19 14.0	289 49.4	N23 47.1	281 51.8	N23 12.8	160 59.6	S10 47.1
07	29 25.7	256 06.2	13.1	304 50.0	47.2	296 53.6	12.8	176 02.1	47.1
S 08	44 28.2	271 05.5	12.3	319 50.6	47.3	311 55.5	12.8	191 04.6	47.1
A 09	59 30.6	286 04.9	11.5	334 51.2	47.4	326 57.3	12.8	206 07.1	47.1
T 10	74 33.1	301 04.3	10.7	349 51.8	47.5	341 59.2	12.7	221 09.5	47.1
U 11	89 35.6	316 03.7	09.9	4 52.4	47.6	357 01.0	12.7	236 12.0	47.1
R 12	104 38.0	331 03.1	N19 09.0	19 53.0	N23 47.6	12 02.9	N23 12.7	251 14.5	S10 47.1
D 13	119 40.5	346 02.4	08.2	34 53.6	47.7	27 04.7	12.7	266 17.0	47.1
A 14	134 42.9	1 01.8	07.4	49 54.2	47.8	42 06.6	12.7	281 19.4	47.1
Y 15	149 45.4	16 01.2	06.6	64 54.8	47.9	57 08.4	12.7	296 21.9	47.1
16	164 47.9	31 00.6	05.8	79 55.4	48.0	72 10.2	12.7	311 24.4	47.2
17	179 50.3	46 00.0	04.9	94 56.0	48.1	87 12.1	12.7	326 26.8	47.2
18	194 52.8	60 59.4	N19 04.1	109 56.6	N23 48.2	102 13.9	N23 12.7	341 29.3	S10 47.2
19	209 55.3	75 58.7	03.3	124 57.2	48.3	117 15.8	12.7	356 31.8	47.2
20	224 57.7	90 58.1	02.5	139 57.8	48.3	132 17.6	12.7	11 34.3	47.2
21	240 00.2	105 57.5	01.6	154 58.4	48.4	147 19.5	12.7	26 36.7	47.2
22	255 02.7	120 56.9	00.8	169 59.0	48.5	162 21.3	12.7	41 39.2	47.2
23	270 05.1	135 56.3	19 00.0	184 59.6	48.6	177 23.2	12.7	56 41.7	47.2
7 00	285 07.6	150 55.7	N18 59.1	200 00.2	N23 48.7	192 25.0	N23 12.7	71 44.2	S10 47.2
01	300 10.1	165 55.1	58.3	215 00.8	48.8	207 26.9	12.6	86 46.6	47.2
02	315 12.5	180 54.4	57.5	230 01.4	48.8	222 28.7	12.6	101 49.1	47.2
03	330 15.0	195 53.8	56.6	245 02.0	48.9	237 30.6	12.6	116 51.6	47.3
04	345 17.4	210 53.2	55.8	260 02.6	49.0	252 32.4	12.6	131 54.1	47.3
05	0 19.9	225 52.6	55.0	275 03.2	49.1	267 34.3	12.6	146 56.5	47.3
06	15 22.4	240 52.0	N18 54.1	290 03.8	N23 49.2	282 36.1	N23 12.6	161 59.0	S10 47.3
07	30 24.8	255 51.4	53.3	305 04.4	49.3	297 38.0	12.6	177 01.5	47.3
08	45 27.3	270 50.8	52.5	320 05.0	49.3	312 39.8	12.6	192 03.9	47.3
S 09	60 29.8	285 50.2	51.6	335 05.6	49.4	327 41.7	12.6	207 06.4	47.3
U 10	75 32.2	300 49.6	50.8	350 06.2	49.5	342 43.5	12.6	222 08.9	47.3
N 11	90 34.7	315 49.0	49.9	5 06.8	49.6	357 45.4	12.6	237 11.4	47.3
D 12	105 37.2	330 48.4	N18 49.1	20 07.4	N23 49.7	12 47.2	N23 12.6	252 13.8	S10 47.3
A 13	120 39.6	345 47.8	48.3	35 08.0	49.7	27 49.1	12.6	267 16.3	47.3
Y 14	135 42.1	0 47.2	47.4	50 08.6	49.8	42 50.9	12.6	282 18.8	47.4
15	150 44.5	15 46.6	46.6	65 09.2	49.9	57 52.8	12.5	297 21.2	47.4
16	165 47.0	30 46.0	45.7	80 09.8	50.0	72 54.6	12.5	312 23.7	47.4
17	180 49.5	45 45.3	44.9	95 10.4	50.0	87 56.5	12.5	327 26.2	47.4
18	195 51.9	60 44.7	N18 44.0	110 11.0	N23 50.1	102 58.3	N23 12.5	342 28.6	S10 47.4
19	210 54.4	75 44.1	43.2	125 11.6	50.2	118 00.2	12.5	357 31.1	47.4
20	225 56.9	90 43.5	42.3	140 12.2	50.3	133 02.0	12.5	12 33.6	47.4
21	240 59.3	105 42.9	41.5	155 12.8	50.3	148 03.9	12.5	27 36.1	47.4
22	256 01.8	120 42.3	40.6	170 13.4	50.4	163 05.7	12.5	42 38.5	47.4
23	271 04.3	135 41.7	39.8	185 14.0	50.5	178 07.6	12.5	57 41.0	47.4
8 00	286 06.7	150 41.1	N18 38.9	200 14.6	N23 50.6	193 09.4	N23 12.5	72 43.5	S10 47.5
01	301 09.2	165 40.5	38.1	215 15.2	50.6	208 11.3	12.5	87 45.9	47.5
02	316 11.7	180 40.0	37.2	230 15.8	50.7	223 13.1	12.5	102 48.4	47.5
03	331 14.1	195 39.4	36.4	245 16.4	50.8	238 15.0	12.5	117 50.9	47.5
04	346 16.6	210 38.8	35.5	260 17.0	50.9	253 16.8	12.4	132 53.3	47.5
05	1 19.0	225 38.2	34.7	275 17.6	50.9	268 18.7	12.4	147 55.8	47.5
06	16 21.5	240 37.6	N18 33.8	290 18.2	N23 51.0	283 20.5	N23 12.4	162 58.3	S10 47.5
07	31 24.0	255 37.0	33.0	305 18.8	51.1	298 22.4	12.4	178 00.7	47.5
08	46 26.4	270 36.4	32.1	320 19.4	51.2	313 24.2	12.4	193 03.2	47.5
M 09	61 28.9	285 35.8	31.2	335 20.0	51.2	328 26.1	12.4	208 05.7	47.5
O 10	76 31.4	300 35.2	30.4	350 20.6	51.3	343 27.9	12.4	223 08.1	47.6
N 11	91 33.8	315 34.6	29.5	5 21.2	51.4	358 29.8	12.4	238 10.6	47.6
D 12	106 36.3	330 34.0	N18 28.7	20 21.8	N23 51.4	13 31.6	N23 12.4	253 13.1	S10 47.6
A 13	121 38.8	345 33.4	27.8	35 22.4	51.5	28 33.5	12.4	268 15.5	47.6
Y 14	136 41.2	0 32.8	26.9	50 23.0	51.6	43 35.3	12.4	283 18.0	47.6
15	151 43.7	15 32.2	26.1	65 23.6	51.6	58 37.2	12.4	298 20.5	47.6
16	166 46.2	30 31.6	25.2	80 24.2	51.7	73 39.0	12.3	313 22.9	47.6
17	181 48.6	45 31.1	24.3	95 24.8	51.8	88 40.9	12.3	328 25.4	47.6
18	196 51.1	60 30.5	N18 23.5	110 25.4	N23 51.9	103 42.7	N23 12.3	343 27.9	S10 47.6
19	211 53.5	75 29.9	22.6	125 26.0	51.9	118 44.6	12.3	358 30.3	47.7
20	226 56.0	90 29.3	21.7	140 26.6	52.0	133 46.4	12.3	13 32.8	47.7
21	241 58.5	105 28.7	20.9	155 27.2	52.1	148 48.3	12.3	28 35.3	47.7
22	257 00.9	120 28.1	20.0	170 27.8	52.1	163 50.1	12.3	43 37.7	47.7
23	272 03.4	135 27.5	19.1	185 28.4	52.2	178 52.0	12.3	58 40.2	47.7
	h m								
Mer. Pass.	4 58.7	v −0.6	d 0.8	v 0.6	d 0.1	v 1.8	d 0.0	v 2.5	d 0.0

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.5	S40 14.9
Achernar	335 26.9	S57 09.8
Acrux	173 09.2	S63 10.8
Adhara	255 12.9	S28 59.6
Aldebaran	290 49.6	N16 32.0
Alioth	166 20.7	N55 53.4
Alkaid	152 58.8	N49 15.0
Al Na'ir	27 43.4	S46 53.4
Alnilam	275 46.6	S 1 11.7
Alphard	217 56.3	S 8 43.2
Alphecca	126 10.7	N26 40.4
Alpheratz	357 43.3	N29 09.9
Altair	62 07.8	N 8 54.5
Ankaa	353 15.6	S42 13.6
Antares	112 25.9	S26 27.6
Arcturus	145 55.6	N19 06.9
Atria	107 27.1	S69 03.1
Avior	234 18.6	S59 33.4
Bellatrix	278 32.3	N 6 21.6
Betelgeuse	271 01.6	N 7 24.4
Canopus	263 56.7	S52 42.3
Capella	280 34.8	N46 00.4
Deneb	49 31.0	N45 19.8
Denebola	182 33.7	N14 29.8
Diphda	348 55.8	S17 54.6
Dubhe	193 52.1	N61 40.8
Elnath	278 12.9	N28 36.9
Eltanin	90 45.6	N51 29.5
Enif	33 46.8	N 9 56.4
Fomalhaut	15 23.7	S29 32.7
Gacrux	172 00.8	S57 11.7
Gienah	175 52.3	S17 37.2
Hadar	148 47.5	S60 26.5
Hamal	328 00.8	N23 31.5
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 19.6	N74 06.3
Markab	13 38.1	N15 16.8
Menkar	314 15.2	N 4 08.5
Menkent	148 07.3	S36 26.3
Miaplacidus	221 40.4	S69 46.7
Mirfak	308 40.5	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.6	S56 41.2
Pollux	243 28.0	N27 59.5
Procyon	245 00.0	N 5 11.3
Rasalhague	96 06.1	N12 33.2
Regulus	207 43.7	N11 54.0
Rigel	281 12.3	S 8 11.3
Rigil Kent.	139 51.3	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 40.3	N56 36.5
Shaula	96 21.4	S37 06.7
Sirius	258 34.0	S16 44.2
Spica	158 31.1	S11 14.0
Suhail	222 52.8	S43 29.5
Vega	80 38.5	N38 48.0
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	225 48.1	13 57
Mars	274 52.6	10 40
Jupiter	267 17.5	11 09
Saturn	146 36.6	19 10

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 6	Moonrise 7	Moonrise 8	Moonrise 9
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
6 00	178 49.6	N22 41.3	205 47.4	12.0	N20 10.0	0.2	54.0	N 72							02 26
01	193 49.5	41.1	220 18.4	12.0	20 10.2	0.0	54.0	N 70				23 42	25 28	01 28	03 10
02	208 49.4	40.8	234 49.4	11.9	20 10.2	0.0	54.0	68				24 56	00 56	02 13	03 39
03	223 49.3	40.6	249 20.3	12.0	20 10.2	0.1	54.0	66	////	////		00 58	00 37	01 33	02 43
04	238 49.2	40.3	263 51.3	12.0	20 10.1	0.2	54.0	64	////	////		01 54	01 05	01 59	03 05
05	253 49.1	40.1	278 22.3	11.9	20 09.9	0.4	54.0	62	////	////		02 26	01 26	02 19	03 22
06	268 49.0	N22 39.8	292 53.2	12.0	N20 09.5	0.4	54.0	60	////	01 20	02 50	02 50	01 43	02 36	03 37
07	283 48.8	39.6	307 24.2	12.0	20 09.1	0.5	54.0	N 58	////	01 59	03 09	03 09	01 57	02 50	03 49
S 08	298 48.7	39.3	321 55.2	12.0	20 08.6	0.6	54.0	56	////	02 25	03 24	03 24	02 10	03 02	04 00
A 09	313 48.6	39.1	336 26.2	12.0	20 08.0	0.7	54.0	54	01 14	02 45	03 38	03 38	02 21	03 12	04 10
T 10	328 48.5	38.8	350 57.2	12.0	20 07.3	0.7	54.0	52	01 49	03 02	03 49	03 49	02 30	03 21	04 18
U 11	343 48.4	38.5	5 28.2	12.0	20 06.6	0.9	54.0	50	02 14	03 16	04 00	04 00	02 39	03 30	04 26
R 12	358 48.3	N22 38.3	19 59.2	12.0	N20 05.7	1.0	54.0	45	02 56	03 44	04 21	04 21	02 57	03 47	04 42
D 13	13 48.2	38.0	34 30.2	12.1	20 04.7	1.0	54.0	N 40	03 25	04 06	04 38	04 38	03 12	04 02	04 55
A 14	28 48.1	37.8	49 01.3	12.0	20 03.7	1.2	54.0	35	03 47	04 23	04 53	04 53	03 24	04 14	05 06
Y 15	43 48.0	37.5	63 32.3	12.0	20 02.5	1.2	54.0	30	04 05	04 38	05 05	05 05	03 35	04 25	05 16
16	58 47.9	37.2	78 03.3	12.1	20 01.3	1.3	53.9	20	04 33	05 02	05 26	05 26	03 54	04 43	05 33
17	73 47.8	37.0	92 34.4	12.0	20 00.0	1.5	53.9	N 10	04 55	05 22	05 44	05 44	04 10	04 59	05 47
18	88 47.7	N22 36.7	107 05.4	12.1	N19 58.5	1.5	53.9	0	05 13	05 39	06 01	06 01	04 26	05 14	06 01
19	103 47.6	36.5	121 36.5	12.1	19 57.0	1.6	53.9	S 10	05 29	05 55	06 18	06 18	04 41	05 29	06 15
20	118 47.5	36.2	136 07.6	12.1	19 55.4	1.7	53.9	20	05 45	06 12	06 36	06 36	04 58	05 44	06 29
21	133 47.4	35.9	150 38.7	12.1	19 53.7	1.8	53.9	30	06 00	06 30	06 56	06 56	05 16	06 03	06 46
22	148 47.3	35.7	165 09.8	12.1	19 51.9	1.9	53.9	35	06 09	06 40	07 08	07 08	05 27	06 13	06 55
23	163 47.2	35.4	179 40.9	12.1	19 50.0	1.9	53.9	40	06 17	06 51	07 21	07 21	05 40	06 25	07 07
7 00	178 47.1	N22 35.1	194 12.0	12.1	N19 48.1	2.1	53.9	45	06 27	07 04	07 37	07 37	05 55	06 40	07 19
01	193 47.0	34.9	208 43.1	12.2	19 46.0	2.1	53.9	S 50	06 38	07 19	07 57	07 57	06 13	06 57	07 35
02	208 46.9	34.6	223 14.3	12.1	19 43.9	2.3	53.9	52	06 43	07 26	08 06	08 06	06 22	07 05	07 43
03	223 46.8	34.3	237 45.4	12.2	19 41.6	2.3	53.9	54	06 48	07 34	08 17	08 17	06 32	07 15	07 51
04	238 46.7	34.1	252 16.6	12.2	19 39.3	2.5	53.9	56	06 54	07 43	08 29	08 29	06 42	07 25	08 00
05	253 46.6	33.8	266 47.8	12.2	19 36.8	2.5	53.9	58	07 00	07 52	08 43	08 43	06 55	07 37	08 10
06	268 46.5	N22 33.5	281 19.0	12.2	N19 34.3	2.6	53.9	S 60	07 07	08 03	08 59	08 59	07 10	07 50	08 22
07	283 46.4	33.2	295 50.2	12.2	19 31.7	2.7	53.9								
08	298 46.3	33.0	310 21.4	12.3	19 29.0	2.7	53.9								
S 09	313 46.2	32.7	324 52.7	12.2	19 26.3	2.9	53.9								
U 10	328 46.1	32.4	339 23.9	12.3	19 23.4	3.0	54.0								
N 11	343 46.0	32.1	353 55.2	12.3	19 20.4	3.0	54.0								
D 12	358 45.9	N22 31.9	8 26.5	12.3	N19 17.4	3.2	54.0								
A 13	13 45.8	31.6	22 57.8	12.3	19 14.2	3.2	54.0								
Y 14	28 45.7	31.3	37 29.1	12.4	19 11.0	3.3	54.0								
15	43 45.6	31.0	52 00.5	12.3	19 07.7	3.4	54.0								
16	58 45.5	30.8	66 31.8	12.4	19 04.3	3.5	54.0								
17	73 45.4	30.5	81 03.2	12.4	19 00.8	3.5	54.0								
18	88 45.3	N22 30.2	95 34.6	12.4	N18 57.3	3.7	54.0								
19	103 45.2	29.9	110 06.0	12.5	18 53.6	3.7	54.0								
20	118 45.1	29.7	124 37.5	12.4	18 49.9	3.9	54.0								
21	133 45.0	29.4	139 08.9	12.5	18 46.0	3.9	54.0								
22	148 44.9	29.1	153 40.4	12.5	18 42.1	4.0	54.0								
23	163 44.8	28.8	168 11.9	12.5	18 38.1	4.1	54.0								
8 00	178 44.7	N22 28.5	182 43.4	12.5	N18 34.0	4.1	54.0								
01	193 44.6	28.2	197 14.9	12.6	18 29.9	4.3	54.0								
02	208 44.5	28.0	211 46.5	12.6	18 25.6	4.3	54.0								
03	223 44.4	27.7	226 18.1	12.6	18 21.3	4.4	54.0								
04	238 44.3	27.4	240 49.7	12.6	18 16.9	4.5	54.0								
05	253 44.2	27.1	255 21.3	12.6	18 12.4	4.6	54.0								
06	268 44.1	N22 26.8	269 52.9	12.7	N18 07.8	4.7	54.0								
07	283 44.0	26.5	284 24.6	12.7	18 03.1	4.7	54.0								
08	298 43.9	26.2	298 56.3	12.7	17 58.4	4.9	54.0								
M 09	313 43.8	26.0	313 28.0	12.7	17 53.5	4.9	54.0								
O 10	328 43.7	25.7	327 59.7	12.7	17 48.6	5.0	54.0								
N 11	343 43.6	25.4	342 31.4	12.8	17 43.6	5.0	54.0								
D 12	358 43.5	N22 25.1	357 03.2	12.8	N17 38.6	5.2	54.0								
A 13	13 43.4	24.8	11 35.0	12.8	17 33.4	5.2	54.0								
Y 14	28 43.3	24.5	26 06.8	12.9	17 28.2	5.3	54.1								
15	43 43.2	24.2	40 38.7	12.8	17 22.9	5.4	54.1								
16	58 43.1	23.9	55 10.5	12.9	17 17.5	5.5	54.1								
17	73 43.0	23.6	69 42.4	12.9	17 12.0	5.5	54.1								
18	88 42.9	N22 23.3	84 14.3	13.0	N17 06.5	5.6	54.1								
19	103 42.9	23.0	98 46.3	12.9	17 00.9	5.7	54.1								
20	118 42.8	22.7	113 18.2	13.0	16 55.2	5.8	54.1								
21	133 42.7	22.4	127 50.2	13.0	16 49.4	5.9	54.1								
22	148 42.6	22.1	142 22.2	13.0	16 43.5	5.9	54.1								
23	163 42.5	21.8	156 54.2	13.1	N16 37.6	6.0	54.1								
	SD 15.8	d 0.3	SD	14.7		14.7		14.7							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 6	Moonset 7	Moonset 8	Moonset 9
°	h m	h m	h m	h m	h m	h m	h m
N 72						22 57	22 34
N 70				22 24	22 16	22 11	22 07
68				21 10	21 31	21 41	21 46
66	23 07	////	////	20 33	21 01	21 19	21 30
64	22 14	////	////	20 06	20 38	21 01	21 17
62	21 42	////	////	19 46	20 20	20 46	21 05
60	21 19	22 47	////	19 29	20 06	20 34	20 56
N 58	21 00	22 10	////	19 15	19 53	20 23	20 47
56	20 45	21 44	////	19 03	19 42	20 14	20 40
54	20 32	21 24	22 54	18 53	19 32	20 05	20 33
52	20 20	21 07	22 19	18 43	19 23	19 58	20 27
50	20 10	20 53	21 55	18 35	19 16	19 51	20 22
45	19 48	20 25	21 13	18 17	18 59	19 37	20 10
N 40	19 31	20 04	20 45	18 02	18 45	19 25	20 00
35	19 17	19 46	20 23	17 50	18 34	19 14	19 52
30	19 05	19 32	20 05	17 39	18 24	19 05	19 44
20	18 44	19 08	19 37	17 20	18 06	18 50	19 31
N 10	18 25	18 48	19 15	17 04	17 51	18 36	19 20
0	18 09	18 31	18 57	16 49	17 37	18 23	19 09
S 10	17 52	18 15	18 41	16 34	17 22	18 11	18 59
20	17 34	17 58	18 25	16 17	17 07	17 57	18 47
30	17 14	17 40	18 10	15 59	16 49	17 41	18 34
35	17 02	17 30	18 01	15 48	16 39	17 32	18 26
40	16 49	17 19	17 53	15 35	16 27	17 21	18 17
45	16 33	17 06	17 43	15 20	16 13	17 09	18 07
S 50	16 13	16 51	17 32	15 02	15 56	16 54	17 55
52	16 04	16 44	17 27	14 54	15 48	16 47	17 49
54	15 53	16 36	17 22	14 44	15 39	16 39	17 43
56	15 41	16 28	17 16	14 33	15 29	16 30	17 35
58	15 28	16 18	17 10	14 21	15 17	16 20	17 27
S 60	15 12	16 07	17 03	14 06	15 03	16 08	17 18

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
6	04 41	04 46	12 05	10 37	23 01	28	3
7	04 51	04 56	12 05	11 25	23 49	29	1
8	05 01	05 06	12 05	12 12	24 35	00	0

Tilbage til Menuen

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
9 00	287 05.9	150 27.0	N18 18.3	200 29.0	N23 52.3	193 53.8	N23 12.3	73 42.7	S10 47.7
01	302 08.3	165 26.4	17.4	215 29.6	52.3	208 55.7	12.3	88 45.1	47.7
02	317 10.8	180 25.8	16.5	230 30.2	52.4	223 57.5	12.3	103 47.6	47.7
03	332 13.3	195 25.2	. . 15.6	245 30.8	. . 52.4	238 59.4	. . 12.2	118 50.1	. . 47.8
04	347 15.7	210 24.6	14.8	260 31.4	52.5	254 01.2	12.2	133 52.5	47.8
05	2 18.2	225 24.0	13.9	275 32.0	52.6	269 03.1	12.2	148 55.0	47.8
06	17 20.7	240 23.5	N18 13.0	290 32.6	N23 52.6	284 04.9	N23 12.2	163 57.5	S10 47.8
07	32 23.1	255 22.9	12.1	305 33.2	52.7	299 06.8	12.2	178 59.9	47.8
08	47 25.6	270 22.3	11.2	320 33.8	52.8	314 08.6	12.2	194 02.4	47.8
09	62 28.0	285 21.7	. . 10.4	335 34.4	. . 52.8	329 10.5	. . 12.2	209 04.8	. . 47.8
10	77 30.5	300 21.1	09.5	350 35.0	52.9	344 12.3	12.2	224 07.3	47.8
11	92 33.0	315 20.6	08.6	5 35.6	52.9	359 14.2	12.2	239 09.8	47.8
12	107 35.4	330 20.0	N18 07.7	20 36.3	N23 53.0	14 16.0	N23 12.2	254 12.2	S10 47.9
13	122 37.9	345 19.4	06.8	35 36.9	53.1	29 17.9	12.2	269 14.7	47.9
14	137 40.4	0 18.8	06.0	50 37.5	53.1	44 19.7	12.1	284 17.2	47.9
15	152 42.8	15 18.3	. . 05.1	65 38.1	. . 53.2	59 21.6	. . 12.1	299 19.6	. . 47.9
16	167 45.3	30 17.7	04.2	80 38.7	53.3	74 23.4	12.1	314 22.1	47.9
17	182 47.8	45 17.1	03.3	95 39.3	53.3	89 25.3	12.1	329 24.5	47.9
18	197 50.2	60 16.5	N18 02.4	110 39.9	N23 53.4	104 27.1	N23 12.1	344 27.0	S10 47.9
19	212 52.7	75 16.0	01.5	125 40.5	53.4	119 29.0	12.1	359 29.5	47.9
20	227 55.1	90 15.4	18 00.6	140 41.1	53.5	134 30.9	12.1	14 31.9	48.0
21	242 57.6	105 14.8	17 59.7	155 41.7	. . 53.5	149 32.7	. . 12.1	29 34.4	. . 48.0
22	258 00.1	120 14.2	58.9	170 42.3	53.6	164 34.6	12.1	44 36.9	48.0
23	273 02.5	135 13.7	58.0	185 42.9	53.7	179 36.4	12.1	59 39.3	48.0
10 00	288 05.0	150 13.1	N17 57.1	200 43.5	N23 53.7	194 38.3	N23 12.1	74 41.8	S10 48.0
01	303 07.5	165 12.5	56.2	215 44.1	53.8	209 40.1	12.0	89 44.2	48.0
02	318 09.9	180 12.0	55.3	230 44.7	53.8	224 42.0	12.0	104 46.7	48.0
03	333 12.4	195 11.4	. . 54.4	245 45.3	. . 53.9	239 43.8	. . 12.0	119 49.2	. . 48.1
04	348 14.9	210 10.8	53.5	260 45.9	53.9	254 45.7	12.0	134 51.6	48.1
05	3 17.3	225 10.2	52.6	275 46.5	54.0	269 47.5	12.0	149 54.1	48.1
06	18 19.8	240 09.7	N17 51.7	290 47.1	N23 54.1	284 49.4	N23 12.0	164 56.5	S10 48.1
07	33 22.3	255 09.1	50.8	305 47.7	54.1	299 51.2	12.0	179 59.0	48.1
08	48 24.7	270 08.5	49.9	320 48.3	54.2	314 53.1	12.0	195 01.5	48.1
09	63 27.2	285 08.0	. . 49.0	335 48.9	. . 54.2	329 54.9	. . 12.0	210 03.9	. . 48.1
10	78 29.6	300 07.4	48.1	350 49.5	54.3	344 56.8	12.0	225 06.4	48.1
11	93 32.1	315 06.8	47.2	5 50.2	54.3	359 58.6	11.9	240 08.8	48.2
12	108 34.6	330 06.3	N17 46.3	20 50.8	N23 54.4	15 00.5	N23 11.9	255 11.3	S10 48.2
13	123 37.0	345 05.7	45.4	35 51.4	54.4	30 02.3	11.9	270 13.8	48.2
14	138 39.5	0 05.2	44.5	50 52.0	54.5	45 04.2	11.9	285 16.2	48.2
15	153 42.0	15 04.6	. . 43.6	65 52.6	. . 54.5	60 06.0	. . 11.9	300 18.7	. . 48.2
16	168 44.4	30 04.0	42.7	80 53.2	54.6	75 07.9	11.9	315 21.1	48.2
17	183 46.9	45 03.5	41.8	95 53.8	54.6	90 09.7	11.9	330 23.6	48.2
18	198 49.4	60 02.9	N17 40.9	110 54.4	N23 54.7	105 11.6	N23 11.9	345 26.0	S10 48.3
19	213 51.8	75 02.4	40.0	125 55.0	54.7	120 13.5	11.9	0 28.5	48.3
20	228 54.3	90 01.8	39.1	140 55.6	54.8	135 15.3	11.8	15 31.0	48.3
21	243 56.8	105 01.2	. . 38.2	155 56.2	. . 54.8	150 17.2	. . 11.8	30 33.4	. . 48.3
22	258 59.2	120 00.7	37.2	170 56.8	54.9	165 19.0	11.8	45 35.9	48.3
23	274 01.7	135 00.1	36.3	185 57.4	54.9	180 20.9	11.8	60 38.3	48.3
11 00	289 04.1	149 59.6	N17 35.4	200 58.0	N23 55.0	195 22.7	N23 11.8	75 40.8	S10 48.3
01	304 06.6	164 59.0	34.5	215 58.6	55.0	210 24.6	11.8	90 43.2	48.4
02	319 09.1	179 58.4	33.6	230 59.2	55.1	225 26.4	11.8	105 45.7	48.4
03	334 11.5	194 57.9	. . 32.7	245 59.8	. . 55.1	240 28.3	. . 11.8	120 48.2	. . 48.4
04	349 14.0	209 57.3	31.8	261 00.4	55.2	255 30.1	11.8	135 50.6	48.4
05	4 16.5	224 56.8	30.9	276 01.1	55.2	270 32.0	11.8	150 53.1	48.4
06	19 18.9	239 56.2	N17 29.9	291 01.7	N23 55.3	285 33.8	N23 11.7	165 55.5	S10 48.4
07	34 21.4	254 55.7	29.0	306 02.3	55.3	300 35.7	11.7	180 58.0	48.4
08	49 23.9	269 55.1	28.1	321 02.9	55.3	315 37.5	11.7	196 00.4	48.5
09	64 26.3	284 54.6	. . 27.2	336 03.5	. . 55.4	330 39.4	. . 11.7	211 02.9	. . 48.5
10	79 28.8	299 54.0	26.3	351 04.1	55.4	345 41.3	11.7	226 05.3	48.5
11	94 31.3	314 53.5	25.3	6 04.7	55.5	0 43.1	11.7	241 07.8	48.5
12	109 33.7	329 52.9	N17 24.4	21 05.3	N23 55.5	15 45.0	N23 11.7	256 10.3	S10 48.5
13	124 36.2	344 52.4	23.5	36 05.9	55.6	30 46.8	11.7	271 12.7	48.5
14	139 38.6	359 51.8	22.6	51 06.5	55.6	45 48.7	11.7	286 15.2	48.5
15	154 41.1	14 51.3	. . 21.7	66 07.1	. . 55.7	60 50.5	. . 11.6	301 17.6	. . 48.6
16	169 43.6	29 50.7	20.7	81 07.7	55.7	75 52.4	11.6	316 20.1	48.6
17	184 46.0	44 50.2	19.8	96 08.3	55.7	90 54.2	11.6	331 22.5	48.6
18	199 48.5	59 49.6	N17 18.9	111 08.9	N23 55.8	105 56.1	N23 11.6	346 25.0	S10 48.6
19	214 51.0	74 49.1	18.0	126 09.6	55.8	120 57.9	11.6	1 27.4	48.6
20	229 53.4	89 48.5	17.0	141 10.2	55.9	135 59.8	11.6	16 29.9	48.6
21	244 55.9	104 48.0	. . 16.1	156 10.8	. . 55.9	151 01.6	. . 11.6	31 32.3	. . 48.7
22	259 58.4	119 47.4	15.2	171 11.4	55.9	166 03.5	11.6	46 34.8	48.7
23	275 00.8	134 46.9	14.2	186 12.0	56.0	181 05.4	11.6	61 37.3	48.7
	h m								
Mer. Pass.	4 46.9	v −0.6	d 0.9	v 0.6	d 0.1	v 1.9	d 0.0	v 2.5	d 0.0

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.5	S40 14.9
Achernar	335 26.9	S57 09.8
Acrux	173 09.2	S63 10.8
Adhara	255 12.8	S28 59.6
Aldebaran	290 49.6	N16 32.0
Alioth	166 20.7	N55 53.4
Alkaid	152 58.8	N49 15.0
Al Na'ir	27 43.3	S46 53.4
Alnilam	275 46.6	S 1 11.7
Alphard	217 56.3	S 8 43.2
Alphecca	126 10.7	N26 40.4
Alpheratz	357 43.3	N29 09.9
Altair	62 07.8	N 8 54.5
Ankaa	353 15.6	S42 13.6
Antares	112 25.9	S26 27.6
Arcturus	145 55.6	N19 06.9
Atria	107 27.1	S69 03.1
Avior	234 18.6	S59 33.4
Bellatrix	278 32.2	N 6 21.6
Betelgeuse	271 01.5	N 7 24.4
Canopus	263 56.7	S52 42.3
Capella	280 34.8	N46 00.4
Deneb	49 31.0	N45 19.8
Denebola	182 33.7	N14 29.8
Diphda	348 55.8	S17 54.6
Dubhe	193 52.1	N61 40.8
Elnath	278 12.9	N28 36.9
Eltanin	90 45.6	N51 29.5
Enif	33 46.8	N 9 56.4
Fomalhaut	15 23.7	S29 32.7
Gacrux	172 00.8	S57 11.6
Gienah	175 52.3	S17 37.2
Hadar	148 47.5	S60 26.5
Hamal	328 00.8	N23 31.5
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 19.6	N74 06.3
Markab	13 38.1	N15 16.8
Menkar	314 15.1	N 4 08.5
Menkent	148 07.3	S36 26.3
Miaplacidus	221 40.4	S69 46.7
Mirfak	308 40.5	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.6	S56 41.2
Pollux	243 28.0	N27 59.5
Procyon	245 00.0	N 5 11.3
Rasalhague	96 06.1	N12 33.2
Regulus	207 43.7	N11 54.0
Rigel	281 12.3	S 8 11.3
Rigil Kent.	139 51.3	S60 53.6
Sabik	102 12.1	S15 44.3
Schedar	349 40.3	N56 36.5
Shaula	96 21.4	S37 06.7
Sirius	258 34.0	S16 44.2
Spica	158 31.1	S11 14.0
Suhail	222 52.8	S43 29.5
Vega	80 38.5	N38 48.0
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer.Pass.
	° ′	h m
Venus	222 08.1	14 00
Mars	272 38.5	10 37
Jupiter	266 33.3	11 00
Saturn	146 36.8	18 58

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON				Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 9	Moonrise 10	Moonrise 11	Moonrise 12
	GHA	Dec	GHA	v	Dec	d	HP							
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
9 00	178 42.4	N22 21.5	171 26.3	13.1	N16 31.6	6.0	54.1	N 72				02 26	04 23	06 11	07 54
01	193 42.3	21.2	185 58.4	13.1	16 25.6	6.2	54.1	N 70				03 10	04 49	06 26	08 02
02	208 42.2	20.9	200 30.5	13.1	16 19.4	6.2	54.1	68				03 39	05 08	06 38	08 08
03	223 42.1	. . 20.6	215 02.6	13.1	16 13.2	6.3	54.1	66	////	////	01 13	04 01	05 24	06 48	08 13
04	238 42.0	20.3	229 34.7	13.2	16 06.9	6.4	54.2	64	////	////	02 02	04 18	05 36	06 56	08 17
05	253 41.9	20.0	244 06.9	13.2	16 00.5	6.4	54.2	62	////	////	02 32	04 33	05 47	07 03	08 21
06	268 41.8	N22 19.7	258 39.1	13.2	N15 54.1	6.5	54.2	60	////	01 29	02 55	04 45	05 56	07 09	08 24
07	283 41.7	19.4	273 11.3	13.3	15 47.6	6.6	54.2	N 58	////	02 05	03 13	04 55	06 04	07 15	08 27
08	298 41.6	19.1	287 43.6	13.3	15 41.0	6.7	54.2	56	////	02 30	03 28	05 04	06 11	07 20	08 30
09	313 41.5	. . 18.8	302 15.9	13.3	15 34.3	6.7	54.2	54	01 22	02 49	03 41	05 12	06 17	07 24	08 32
10	328 41.4	18.5	316 48.2	13.3	15 27.6	6.8	54.2	52	01 55	03 06	03 52	05 19	06 22	07 28	08 34
11	343 41.4	18.2	331 20.5	13.3	15 20.8	6.8	54.2	50	02 18	03 19	04 02	05 25	06 27	07 31	08 36
12	358 41.3	N22 17.9	345 52.8	13.4	N15 14.0	7.0	54.2	45	02 59	03 47	04 23	05 39	06 38	07 39	08 40
13	13 41.2	17.6	0 25.2	13.4	15 07.0	7.0	54.2	N 40	03 27	04 08	04 40	05 50	06 47	07 45	08 44
14	28 41.1	17.3	14 57.6	13.4	15 00.0	7.0	54.2	35	03 49	04 25	04 54	06 00	06 55	07 50	08 46
15	43 41.0	. . 17.0	29 30.0	13.4	14 53.0	7.1	54.2	30	04 07	04 39	05 07	06 08	07 01	07 55	08 49
16	58 40.9	16.7	44 02.4	13.5	14 45.9	7.2	54.3	20	04 34	05 03	05 27	06 23	07 13	08 03	08 54
17	73 40.8	16.4	58 34.9	13.5	14 38.7	7.3	54.3	N 10	04 56	05 22	05 45	06 35	07 23	08 10	08 58
18	88 40.7	N22 16.0	73 07.4	13.5	N14 31.4	7.3	54.3	0	05 13	05 39	06 02	06 47	07 33	08 17	09 01
19	103 40.6	15.7	87 39.9	13.5	14 24.1	7.4	54.3	S 10	05 29	05 56	06 18	06 59	07 42	08 24	09 05
20	118 40.5	15.4	102 12.4	13.5	14 16.7	7.5	54.3	20	05 45	06 12	06 36	07 12	07 52	08 31	09 09
21	133 40.4	. . 15.1	116 44.9	13.6	14 09.2	7.5	54.3	30	06 00	06 30	06 56	07 26	08 04	08 39	09 13
22	148 40.4	14.8	131 17.5	13.6	14 01.7	7.6	54.3	35	06 08	06 39	07 07	07 34	08 10	08 44	09 16
23	163 40.3	14.5	145 50.1	13.6	13 54.1	7.6	54.3	40	06 17	06 50	07 20	07 44	08 18	08 49	09 19
10 00	178 40.2	N22 14.2	160 22.7	13.7	N13 46.5	7.8	54.3	45	06 26	07 03	07 36	07 55	08 28	08 55	09 22
01	193 40.1	13.8	174 55.4	13.6	13 38.7	7.7	54.4	S 50	06 37	07 18	07 55	08 08	08 37	09 02	09 26
02	208 40.0	13.5	189 28.0	13.7	13 31.0	7.9	54.4	52	06 42	07 25	08 04	08 14	08 42	09 06	09 28
03	223 39.9	. . 13.2	204 00.7	13.7	13 23.1	7.9	54.4	54	06 47	07 32	08 15	08 21	08 47	09 09	09 30
04	238 39.8	12.9	218 33.4	13.8	13 15.2	7.9	54.4	56	06 52	07 40	08 26	08 29	08 53	09 13	09 32
05	253 39.7	12.6	233 06.2	13.7	13 07.3	8.0	54.4	58	06 58	07 50	08 40	08 37	08 59	09 18	09 35
06	268 39.6	N22 12.3	247 38.9	13.8	N12 59.3	8.1	54.4	S 60	07 05	08 00	08 55	08 47	09 07	09 23	09 37
07	283 39.6	11.9	262 11.7	13.8	12 51.2	8.1	54.4								
08	298 39.5	11.6	276 44.5	13.8	12 43.1	8.2	54.4								
09	313 39.4	. . 11.3	291 17.3	13.8	12 34.9	8.3	54.4								
10	328 39.3	11.0	305 50.1	13.9	12 26.6	8.3	54.5								
11	343 39.2	10.7	320 23.0	13.8	12 18.3	8.3	54.5								
12	358 39.1	N22 10.3	334 55.8	13.9	N12 10.0	8.4	54.5								
13	13 39.0	10.0	349 28.7	13.9	12 01.6	8.5	54.5								
14	28 38.9	09.7	4 01.6	13.9	11 53.1	8.5	54.5								
15	43 38.9	. . 09.4	18 34.5	14.0	11 44.6	8.6	54.5								
16	58 38.8	09.0	33 07.5	13.9	11 36.0	8.6	54.5								
17	73 38.7	08.7	47 40.4	14.0	11 27.4	8.7	54.6								
18	88 38.6	N22 08.4	62 13.4	14.0	N11 18.7	8.8	54.6								
19	103 38.5	08.1	76 46.4	14.0	11 09.9	8.7	54.6								
20	118 38.4	07.7	91 19.4	14.0	11 01.2	8.9	54.6								
21	133 38.3	. . 07.4	105 52.4	14.1	10 52.3	8.9	54.6								
22	148 38.3	07.1	120 25.5	14.0	10 43.4	8.9	54.6								
23	163 38.2	06.7	134 58.5	14.1	10 34.5	9.0	54.6								
11 00	178 38.1	N22 06.4	149 31.6	14.1	N10 25.5	9.0	54.6								
01	193 38.0	06.1	164 04.7	14.1	10 16.5	9.1	54.7								
02	208 37.9	05.7	178 37.8	14.1	10 07.4	9.1	54.7								
03	223 37.8	. . 05.4	193 10.9	14.1	9 58.3	9.2	54.7								
04	238 37.7	05.1	207 44.0	14.2	9 49.1	9.2	54.7								
05	253 37.7	04.7	222 17.2	14.1	9 39.9	9.3	54.7								
06	268 37.6	N22 04.4	236 50.3	14.2	N 9 30.6	9.3	54.7								
07	283 37.5	04.1	251 23.5	14.2	9 21.3	9.4	54.8								
08	298 37.4	03.7	265 56.7	14.2	9 11.9	9.4	54.8								
09	313 37.3	. . 03.4	280 29.9	14.1	9 02.5	9.4	54.8								
10	328 37.2	03.1	295 03.0	14.3	8 53.1	9.5	54.8								
11	343 37.2	02.7	309 36.3	14.2	8 43.6	9.6	54.8								
12	358 37.1	N22 02.4	324 09.5	14.2	N 8 34.0	9.5	54.8								
13	13 37.0	02.0	338 42.7	14.2	8 24.5	9.6	54.9								
14	28 36.9	01.7	353 15.9	14.3	8 14.9	9.7	54.9								
15	43 36.8	. . 01.4	7 49.2	14.2	8 05.2	9.7	54.9								
16	58 36.8	01.0	22 22.4	14.3	7 55.5	9.7	54.9								
17	73 36.7	00.7	36 55.7	14.2	7 45.8	9.8	54.9								
18	88 36.6	N22 00.3	51 28.9	14.3	N 7 36.0	9.8	54.9								
19	103 36.5	22 00.0	66 02.2	14.3	7 26.2	9.8	55.0								
20	118 36.4	21 59.7	80 35.5	14.2	7 16.4	9.9	55.0								
21	133 36.3	. . 59.3	95 08.7	14.3	7 06.5	9.9	55.0								
22	148 36.3	59.0	109 42.0	14.3	6 56.6	10.0	55.0								
23	163 36.2	58.6	124 15.3	14.3	N 6 46.6	10.0	55.0								
	SD 15.8	d 0.3	SD 14.8		14.8		14.9								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 9	Moonset 10	Moonset 11	Moonset 12
°	h m	h m	h m	h m	h m	h m	h m
N 72				22 34	22 19	22 08	21 58
N 70				22 07	22 02	21 58	21 54
68				21 46	21 49	21 50	21 51
66	22 54	////	////	21 30	21 38	21 44	21 48
64	22 07	////	////	21 17	21 29	21 38	21 46
62	21 37	////	////	21 05	21 21	21 33	21 44
60	21 15	22 39	////	20 56	21 14	21 29	21 43
N 58	20 57	22 04	////	20 47	21 07	21 25	21 41
56	20 42	21 40	////	20 40	21 02	21 22	21 40
54	20 29	21 20	22 46	20 33	20 57	21 19	21 39
52	20 18	21 04	22 14	20 27	20 53	21 16	21 37
50	20 08	20 51	21 51	20 22	20 49	21 13	21 36
45	19 47	20 23	21 11	20 10	20 40	21 08	21 34
N 40	19 30	20 02	20 43	20 00	20 33	21 03	21 32
35	19 16	19 45	20 21	19 52	20 26	20 59	21 31
30	19 04	19 31	20 04	19 44	20 21	20 55	21 29
20	18 43	19 08	19 36	19 31	20 11	20 49	21 27
N 10	18 26	18 48	19 15	19 20	20 02	20 44	21 25
0	18 09	18 31	18 57	19 09	19 54	20 38	21 22
S 10	17 53	18 15	18 41	18 59	19 46	20 33	21 20
20	17 35	17 59	18 26	18 47	19 37	20 27	21 18
30	17 15	17 41	18 11	18 34	19 27	20 21	21 15
35	17 04	17 32	18 03	18 26	19 21	20 17	21 14
40	16 51	17 21	17 54	18 17	19 15	20 13	21 12
45	16 35	17 08	17 45	18 07	19 07	20 08	21 10
S 50	16 16	16 53	17 34	17 55	18 58	20 02	21 08
52	16 07	16 46	17 29	17 49	18 53	19 59	21 06
54	15 56	16 39	17 24	17 43	18 49	19 56	21 05
56	15 45	16 31	17 19	17 35	18 43	19 53	21 04
58	15 32	16 21	17 13	17 27	18 37	19 49	21 02
S 60	15 16	16 11	17 06	17 18	18 31	19 45	21 01

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
9	05 10	05 15	12 05	12 58	00 35	01	1
10	05 19	05 23	12 05	13 43	01 21	02	5
11	05 27	05 32	12 06	14 28	02 06	03	9

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
12 00	290 03.3	149 46.4	N17 13.3	201 12.6	N23 56.0	196 07.2	N23 11.5	76 39.7	S10 48.7
01	305 05.7	164 45.8	12.4	216 13.2	56.1	211 09.1	11.5	91 42.2	48.7
02	320 08.2	179 45.3	11.4	231 13.8	56.1	226 10.9	11.5	106 44.6	48.7
03	335 10.7	194 44.7	. . 10.5	246 14.4	. . 56.1	241 12.8	. . 11.5	121 47.1	. . 48.8
04	350 13.1	209 44.2	09.6	261 15.0	56.2	256 14.6	11.5	136 49.5	48.8
05	5 15.6	224 43.7	08.6	276 15.6	56.2	271 16.5	11.5	151 52.0	48.8
06	20 18.1	239 43.1	N17 07.7	291 16.2	N23 56.2	286 18.3	N23 11.5	166 54.4	S10 48.8
07	35 20.5	254 42.6	06.8	306 16.8	56.3	301 20.2	11.5	181 56.9	48.8
08	50 23.0	269 42.0	05.8	321 17.5	56.3	316 22.0	11.4	196 59.3	48.8
F 09	65 25.5	284 41.5	. . 04.9	336 18.1	. . 56.4	331 23.9	. . 11.4	212 01.8	. . 48.8
R 10	80 27.9	299 41.0	04.0	351 18.7	56.4	346 25.8	11.4	227 04.2	48.9
I 11	95 30.4	314 40.4	03.0	6 19.3	56.4	1 27.6	11.4	242 06.7	48.9
D 12	110 32.9	329 39.9	N17 02.1	21 19.9	N23 56.5	16 29.5	N23 11.4	257 09.1	S10 48.9
A 13	125 35.3	344 39.4	01.1	36 20.5	56.5	31 31.3	11.4	272 11.6	48.9
Y 14	140 37.8	359 38.8	17 00.2	51 21.1	56.5	46 33.2	11.4	287 14.0	48.9
15	155 40.2	14 38.3	16 59.3	66 21.7	. . 56.6	61 35.0	. . 11.4	302 16.5	. . 48.9
16	170 42.7	29 37.7	58.3	81 22.3	56.6	76 36.9	11.3	317 18.9	49.0
17	185 45.2	44 37.2	57.4	96 22.9	56.6	91 38.7	11.3	332 21.4	49.0
18	200 47.6	59 36.7	N16 56.4	111 23.5	N23 56.7	106 40.6	N23 11.3	347 23.8	S10 49.0
19	215 50.1	74 36.1	55.5	126 24.2	56.7	121 42.5	11.3	2 26.3	49.0
20	230 52.6	89 35.6	54.5	141 24.8	56.7	136 44.3	11.3	17 28.7	49.0
21	245 55.0	104 35.1	. . 53.6	156 25.4	. . 56.8	151 46.2	. . 11.3	32 31.2	. . 49.0
22	260 57.5	119 34.6	52.6	171 26.0	56.8	166 48.0	11.3	47 33.6	49.1
23	276 00.0	134 34.0	51.7	186 26.6	56.8	181 49.9	11.3	62 36.1	49.1
13 00	291 02.4	149 33.5	N16 50.7	201 27.2	N23 56.8	196 51.7	N23 11.2	77 38.5	S10 49.1
01	306 04.9	164 33.0	49.8	216 27.8	56.9	211 53.6	11.2	92 41.0	49.1
02	321 07.3	179 32.4	48.8	231 28.4	56.9	226 55.4	11.2	107 43.4	49.1
03	336 09.8	194 31.9	. . 47.9	246 29.0	. . 56.9	241 57.3	. . 11.2	122 45.9	. . 49.1
04	351 12.3	209 31.4	46.9	261 29.6	57.0	256 59.2	11.2	137 48.3	49.2
05	6 14.7	224 30.9	46.0	276 30.3	57.0	272 01.0	11.2	152 50.8	49.2
06	21 17.2	239 30.3	N16 45.0	291 30.9	N23 57.0	287 02.9	N23 11.2	167 53.2	S10 49.2
07	36 19.7	254 29.8	44.1	306 31.5	57.1	302 04.7	11.2	182 55.7	49.2
S 08	51 22.1	269 29.3	43.1	321 32.1	57.1	317 06.6	11.1	197 58.1	49.2
A 09	66 24.6	284 28.8	. . 42.2	336 32.7	. . 57.1	332 08.4	. . 11.1	213 00.6	. . 49.3
T 10	81 27.1	299 28.2	41.2	351 33.3	57.1	347 10.3	11.1	228 03.0	49.3
U 11	96 29.5	314 27.7	40.3	6 33.9	57.2	2 12.2	11.1	243 05.5	49.3
R 12	111 32.0	329 27.2	N16 39.3	21 34.5	N23 57.2	17 14.0	N23 11.1	258 07.9	S10 49.3
D 13	126 34.5	344 26.7	38.3	36 35.1	57.2	32 15.9	11.1	273 10.4	49.3
A 14	141 36.9	359 26.1	37.4	51 35.7	57.2	47 17.7	11.1	288 12.8	49.3
Y 15	156 39.4	14 25.6	. . 36.4	66 36.4	. . 57.3	62 19.6	. . 11.1	303 15.2	. . 49.4
16	171 41.8	29 25.1	35.5	81 37.0	57.3	77 21.4	11.0	318 17.7	49.4
17	186 44.3	44 24.6	34.5	96 37.6	57.3	92 23.3	11.0	333 20.1	49.4
18	201 46.8	59 24.1	N16 33.5	111 38.2	N23 57.3	107 25.1	N23 11.0	348 22.6	S10 49.4
19	216 49.2	74 23.5	32.6	126 38.8	57.4	122 27.0	11.0	3 25.0	49.4
20	231 51.7	89 23.0	31.6	141 39.4	57.4	137 28.9	11.0	18 27.5	49.5
21	246 54.2	104 22.5	. . 30.6	156 40.0	. . 57.4	152 30.7	. . 11.0	33 29.9	. . 49.5
22	261 56.6	119 22.0	29.7	171 40.6	57.4	167 32.6	11.0	48 32.4	49.5
23	276 59.1	134 21.5	28.7	186 41.3	57.4	182 34.4	11.0	63 34.8	49.5
14 00	292 01.6	149 21.0	N16 27.7	201 41.9	N23 57.5	197 36.3	N23 10.9	78 37.3	S10 49.5
01	307 04.0	164 20.4	26.8	216 42.5	57.5	212 38.1	10.9	93 39.7	49.5
02	322 06.5	179 19.9	25.8	231 43.1	57.5	227 40.0	10.9	108 42.2	49.6
03	337 09.0	194 19.4	. . 24.8	246 43.7	. . 57.5	242 41.9	. . 10.9	123 44.6	. . 49.6
04	352 11.4	209 18.9	23.9	261 44.3	57.6	257 43.7	10.9	138 47.0	49.6
05	7 13.9	224 18.4	22.9	276 44.9	57.6	272 45.6	10.9	153 49.5	49.6
06	22 16.3	239 17.9	N16 21.9	291 45.5	N23 57.6	287 47.4	N23 10.9	168 51.9	S10 49.6
07	37 18.8	254 17.4	20.9	306 46.2	57.6	302 49.3	10.8	183 54.4	49.7
08	52 21.3	269 16.8	20.0	321 46.8	57.6	317 51.1	10.8	198 56.8	49.7
S 09	67 23.7	284 16.3	. . 19.0	336 47.4	. . 57.6	332 53.0	. . 10.8	213 59.3	. . 49.7
U 10	82 26.2	299 15.8	18.0	351 48.0	57.7	347 54.9	10.8	229 01.7	49.7
N 11	97 28.7	314 15.3	17.1	6 48.6	57.7	2 56.7	10.8	244 04.1	49.7
D 12	112 31.1	329 14.8	N16 16.1	21 49.2	N23 57.7	17 58.6	N23 10.8	259 06.6	S10 49.8
A 13	127 33.6	344 14.3	15.1	36 49.8	57.7	33 00.4	10.8	274 09.0	49.8
Y 14	142 36.1	359 13.8	14.1	51 50.4	57.7	48 02.3	10.7	289 11.5	49.8
15	157 38.5	14 13.3	. . 13.1	66 51.1	. . 57.8	63 04.2	. . 10.7	304 13.9	. . 49.8
16	172 41.0	29 12.8	12.2	81 51.7	57.8	78 06.0	10.7	319 16.4	49.8
17	187 43.4	44 12.3	11.2	96 52.3	57.8	93 07.9	10.7	334 18.8	49.8
18	202 45.9	59 11.8	N16 10.2	111 52.9	N23 57.8	108 09.7	N23 10.7	349 21.2	S10 49.9
19	217 48.4	74 11.3	09.2	126 53.5	57.8	123 11.6	10.7	4 23.7	49.9
20	232 50.8	89 10.8	08.2	141 54.1	57.8	138 13.4	10.7	19 26.1	49.9
21	247 53.3	104 10.3	. . 07.3	156 54.7	. . 57.8	153 15.3	. . 10.6	34 28.6	. . 49.9
22	262 55.8	119 09.7	06.3	171 55.3	57.9	168 17.2	10.6	49 31.0	49.9
23	277 58.2	134 09.2	05.3	186 56.0	57.9	183 19.0	10.6	64 33.5	50.0
	h m								
Mer. Pass.	4 35.1	v −0.5	d 1.0	v 0.6	d 0.0	v 1.9	d 0.0	v 2.4	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.5	S40 14.8
Achernar	335 26.8	S57 09.8
Acrux	173 09.3	S63 10.8
Adhara	255 12.8	S28 59.6
Aldebaran	290 49.6	N16 32.0
Alioth	166 20.8	N55 53.4
Alkaid	152 58.8	N49 15.0
Al Na'ir	27 43.3	S46 53.4
Alnilam	275 46.6	S 1 11.7
Alphard	217 56.3	S 8 43.2
Alphecca	126 10.7	N26 40.4
Alpheratz	357 43.3	N29 09.9
Altair	62 07.8	N 8 54.5
Ankaa	353 15.6	S42 13.6
Antares	112 25.9	S26 27.6
Arcturus	145 55.6	N19 06.9
Atria	107 27.1	S69 03.1
Avior	234 18.6	S59 33.4
Bellatrix	278 32.2	N 6 21.6
Betelgeuse	271 01.5	N 7 24.4
Canopus	263 56.6	S52 42.2
Capella	280 34.7	N46 00.4
Deneb	49 30.9	N45 19.8
Denebola	182 33.7	N14 29.8
Diphda	348 55.8	S17 54.5
Dubhe	193 52.1	N61 40.8
Elnath	278 12.9	N28 36.9
Eltanin	90 45.6	N51 29.5
Enif	33 46.8	N 9 56.4
Fomalhaut	15 23.7	S29 32.7
Gacrux	172 00.9	S57 11.6
Gienah	175 52.3	S17 37.1
Hadar	148 47.6	S60 26.5
Hamal	328 00.7	N23 31.5
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 19.7	N74 06.3
Markab	13 38.1	N15 16.8
Menkar	314 15.1	N 4 08.5
Menkent	148 07.4	S36 26.3
Miaplacidus	221 40.4	S69 46.7
Mirfak	308 40.5	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.6	S56 41.2
Pollux	243 28.0	N27 59.5
Procyon	245 00.0	N 5 11.3
Rasalhague	96 06.1	N12 33.3
Regulus	207 43.7	N11 54.0
Rigel	281 12.3	S 8 11.2
Rigil Kent.	139 51.3	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 40.3	N56 36.5
Shaula	96 21.4	S37 06.7
Sirius	258 34.0	S16 44.2
Spica	158 31.2	S11 13.9
Suhail	222 52.8	S43 29.5
Vega	80 38.5	N38 48.0
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	218 31.1	14 02
Mars	270 24.8	10 34
Jupiter	265 49.3	10 51
Saturn	146 36.1	18 46

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 12	Moonrise 13	Moonrise 14	Moonrise 15
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
12 00	178 36.1	N21 58.3	138 48.6	14.3	N 6 36.6	10.0	55.1	N 72				07 54	09 37	11 22	13 12
01	193 36.0	57.9	153 21.9	14.3	6 26.6	10.1	55.1	N 70				08 02	09 38	11 16	12 59
02	208 35.9	57.6	167 55.2	14.3	6 16.5	10.0	55.1	68				08 08	09 39	11 11	12 48
03	223 35.9	. . 57.2	182 28.5	14.2	6 06.5	10.2	55.1	66	////	////	01 27	08 13	09 39	11 07	12 39
04	238 35.8	56.9	197 01.7	14.3	5 56.3	10.1	55.1	64	////	////	02 10	08 17	09 40	11 04	12 31
05	253 35.7	56.5	211 35.0	14.3	5 46.2	10.2	55.1	62	////	00 33	02 38	08 21	09 40	11 01	12 25
06	268 35.6	N21 56.2	226 08.3	14.3	N 5 36.0	10.2	55.2	60	////	01 39	03 00	08 24	09 41	10 59	12 19
07	283 35.6	55.8	240 41.6	14.3	5 25.8	10.3	55.2	N 58	////	02 12	03 17	08 27	09 41	10 57	12 14
08	298 35.5	55.5	255 14.9	14.3	5 15.5	10.2	55.2	56	00 30	02 35	03 32	08 30	09 41	10 55	12 10
09	313 35.4	. . 55.1	269 48.2	14.2	5 05.3	10.3	55.2	54	01 31	02 54	03 45	08 32	09 42	10 53	12 06
10	328 35.3	54.8	284 21.4	14.3	4 55.0	10.4	55.2	52	02 01	03 10	03 56	08 34	09 42	10 51	12 03
11	343 35.2	54.4	298 54.7	14.3	4 44.6	10.3	55.3	50	02 23	03 23	04 05	08 36	09 42	10 50	11 59
12	358 35.2	N21 54.1	313 28.0	14.3	N 4 34.3	10.4	55.3	45	03 03	03 50	04 26	08 40	09 43	10 47	11 52
13	13 35.1	53.7	328 01.3	14.2	4 23.9	10.4	55.3	N 40	03 30	04 10	04 42	08 44	09 43	10 44	11 47
14	28 35.0	53.4	342 34.5	14.3	4 13.5	10.4	55.3	35	03 51	04 27	04 56	08 46	09 44	10 42	11 42
15	43 34.9	. . 53.0	357 07.8	14.2	4 03.1	10.5	55.4	30	04 08	04 41	05 08	08 48	09 44	10 40	11 38
16	58 34.9	52.6	11 41.0	14.2	3 52.6	10.5	55.4	20	04 35	05 04	05 28	08 54	09 44	10 36	11 30
17	73 34.8	52.3	26 14.2	14.3	3 42.1	10.5	55.4	N 10	04 56	05 23	05 46	08 58	09 45	10 33	11 24
18	88 34.7	N21 51.9	40 47.5	14.2	N 3 31.6	10.5	55.4	0	05 14	05 40	06 02	09 01	09 46	10 31	11 18
19	103 34.6	51.6	55 20.7	14.2	3 21.1	10.5	55.4	S 10	05 30	05 56	06 18	09 05	09 46	10 28	11 12
20	118 34.5	51.2	69 53.9	14.2	3 10.6	10.6	55.5	20	05 44	06 12	06 35	09 09	09 47	10 25	11 05
21	133 34.5	. . 50.8	84 27.1	14.2	3 00.0	10.6	55.5	30	05 59	06 29	06 55	09 13	09 47	10 22	10 58
22	148 34.4	50.5	99 00.3	14.1	2 49.4	10.6	55.5	35	06 07	06 39	07 06	09 16	09 48	10 20	10 54
23	163 34.3	50.1	113 33.4	14.2	2 38.8	10.6	55.5	40	06 16	06 49	07 19	09 19	09 48	10 18	10 50
13 00	178 34.2	N21 49.8	128 06.6	14.1	N 2 28.2	10.7	55.6	45	06 25	07 01	07 34	09 22	09 49	10 16	10 44
01	193 34.2	49.4	142 39.7	14.1	2 17.5	10.6	55.6	S 50	06 35	07 16	07 53	09 26	09 49	10 13	10 38
02	208 34.1	49.0	157 12.8	14.1	2 06.9	10.7	55.6	52	06 40	07 23	08 02	09 28	09 50	10 11	10 35
03	223 34.0	. . 48.7	171 45.9	14.1	1 56.2	10.7	55.6	54	06 45	07 30	08 12	09 30	09 50	10 10	10 32
04	238 33.9	48.3	186 19.0	14.1	1 45.5	10.7	55.6	56	06 50	07 38	08 23	09 32	09 50	10 09	10 28
05	253 33.9	47.9	200 52.1	14.1	1 34.8	10.8	55.7	58	06 56	07 47	08 36	09 35	09 51	10 07	10 24
06	268 33.8	N21 47.6	215 25.2	14.0	N 1 24.0	10.7	55.7	S 60	07 02	07 57	08 51	09 37	09 51	10 05	10 20
07	283 33.7	47.2	229 58.2	14.0	1 13.3	10.8	55.7								
08	298 33.7	46.8	244 31.2	14.0	1 02.5	10.7	55.7								
09	313 33.6	. . 46.5	259 04.2	14.0	0 51.8	10.8	55.8								
10	328 33.5	46.1	273 37.2	14.0	0 41.0	10.8	55.8								
11	343 33.4	45.7	288 10.2	13.9	0 30.2	10.8	55.8								
12	358 33.4	N21 45.4	302 43.1	13.9	N 0 19.4	10.8	55.8								
13	13 33.3	45.0	317 16.0	13.9	N 0 08.6	10.8	55.9								
14	28 33.2	44.6	331 48.9	13.9	S 0 02.2	10.9	55.9								
15	43 33.1	. . 44.3	346 21.8	13.8	0 13.1	10.8	55.9								
16	58 33.1	43.9	0 54.6	13.8	0 23.9	10.9	55.9								
17	73 33.0	43.5	15 27.4	13.8	0 34.8	10.8	56.0								
18	88 32.9	N21 43.1	30 00.2	13.8	S 0 45.6	10.9	56.0								
19	103 32.9	42.8	44 33.0	13.7	0 56.5	10.8	56.0								
20	118 32.8	42.4	59 05.7	13.7	1 07.3	10.9	56.0								
21	133 32.7	. . 42.0	73 38.4	13.6	1 18.2	10.9	56.1								
22	148 32.6	41.6	88 11.0	13.7	1 29.1	10.9	56.1								
23	163 32.6	41.3	102 43.7	13.6	1 40.0	10.8	56.1								
14 00	178 32.5	N21 40.9	117 16.3	13.5	S 1 50.8	10.9	56.2								
01	193 32.4	40.5	131 48.8	13.6	2 01.7	10.9	56.2								
02	208 32.4	40.1	146 21.4	13.5	2 12.6	10.9	56.2								
03	223 32.3	. . 39.7	160 53.9	13.4	2 23.5	10.9	56.2								
04	238 32.2	39.4	175 26.3	13.5	2 34.4	10.8	56.3								
05	253 32.2	39.0	189 58.8	13.4	2 45.2	10.9	56.3								
06	268 32.1	N21 38.6	204 31.2	13.3	S 2 56.1	10.9	56.3								
07	283 32.0	38.2	219 03.5	13.3	3 07.0	10.8	56.3								
08	298 32.0	37.8	233 35.8	13.3	3 17.8	10.9	56.4								
09	313 31.9	. . 37.4	248 08.1	13.2	3 28.7	10.9	56.4								
10	328 31.8	37.1	262 40.3	13.2	3 39.6	10.8	56.4								
11	343 31.8	36.7	277 12.5	13.2	3 50.4	10.8	56.5								
12	358 31.7	N21 36.3	291 44.7	13.1	S 4 01.2	10.9	56.5								
13	13 31.6	35.9	306 16.8	13.0	4 12.1	10.8	56.5								
14	28 31.6	35.5	320 48.8	13.0	4 22.9	10.8	56.5								
15	43 31.5	. . 35.1	335 20.8	13.0	4 33.7	10.8	56.6								
16	58 31.4	34.7	349 52.8	12.9	4 44.5	10.8	56.6								
17	73 31.4	34.4	4 24.7	12.9	4 55.3	10.8	56.6								
18	88 31.3	N21 34.0	18 56.6	12.8	S 5 06.1	10.8	56.7								
19	103 31.2	33.6	33 28.4	12.8	5 16.9	10.7	56.7								
20	118 31.2	33.2	48 00.2	12.7	5 27.6	10.7	56.7								
21	133 31.1	. . 32.8	62 31.9	12.7	5 38.3	10.8	56.8								
22	148 31.0	32.4	77 03.6	12.7	5 49.1	10.7	56.8								
23	163 31.0	32.0	91 35.3	12.5	S 5 59.8	10.7	56.8								
	SD 15.8	d 0.4	SD	15.1		15.2		15.4							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 12	Moonset 13	Moonset 14	Moonset 15
°	h m	h m	h m	h m	h m	h m	h m
N 72				21 58	21 48	21 37	21 25
N 70				21 54	21 50	21 45	21 41
68				21 51	21 51	21 52	21 53
66	22 41	////	////	21 48	21 53	21 58	22 04
64	21 59	////	////	21 46	21 54	22 02	22 12
62	21 31	23 29	////	21 44	21 55	22 07	22 20
60	21 10	22 30	////	21 43	21 56	22 10	22 26
N 58	20 53	21 58	////	21 41	21 57	22 13	22 32
56	20 39	21 35	23 33	21 40	21 58	22 16	22 37
54	20 26	21 16	22 38	21 39	21 58	22 19	22 42
52	20 15	21 01	22 09	21 37	21 59	22 21	22 46
50	20 05	20 48	21 47	21 36	21 59	22 23	22 50
45	19 45	20 21	21 08	21 34	22 01	22 28	22 58
N 40	19 29	20 01	20 41	21 32	22 02	22 32	23 05
35	19 15	19 44	20 20	21 31	22 03	22 36	23 11
30	19 03	19 30	20 03	21 29	22 03	22 39	23 16
20	18 43	19 07	19 36	21 27	22 05	22 44	23 25
N 10	18 26	18 48	19 15	21 25	22 06	22 49	23 33
0	18 09	18 32	18 58	21 22	22 07	22 53	23 41
S 10	17 53	18 16	18 42	21 20	22 08	22 57	23 49
20	17 36	18 00	18 27	21 18	22 09	23 02	23 57
30	17 17	17 43	18 12	21 15	22 11	23 07	24 06
35	17 06	17 33	18 04	21 14	22 11	23 10	24 11
40	16 53	17 23	17 56	21 12	22 12	23 14	24 17
45	16 37	17 10	17 47	21 10	22 13	23 18	24 25
S 50	16 19	16 56	17 37	21 08	22 14	23 23	24 33
52	16 10	16 49	17 32	21 06	22 15	23 25	24 37
54	16 00	16 42	17 27	21 05	22 15	23 27	24 41
56	15 49	16 34	17 22	21 04	22 16	23 30	24 46
58	15 36	16 25	17 16	21 02	22 17	23 33	24 52
S 60	15 21	16 15	17 10	21 01	22 18	23 36	24 58

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
12	05 35	05 39	12 06	15 12	02 50	04	16
13	05 43	05 46	12 06	15 56	03 34	05	24
14	05 50	05 53	12 06	16 42	04 19	06	33

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
15 00	293 00.7	149 08.7	N16 04.3	201 56.6	N23 57.9	198 20.9	N23 10.6	79 35.9	S10 50.0
01	308 03.2	164 08.2	03.3	216 57.2	57.9	213 22.7	10.6	94 38.3	50.0
02	323 05.6	179 07.7	02.3	231 57.8	57.9	228 24.6	10.6	109 40.8	50.0
03	338 08.1	194 07.2	01.4	246 58.4	57.9	243 26.5	10.6	124 43.2	50.0
04	353 10.6	209 06.7	16 00.4	261 59.0	57.9	258 28.3	10.5	139 45.7	50.1
05	8 13.0	224 06.2	15 59.4	276 59.6	57.9	273 30.2	10.5	154 48.1	50.1
06	23 15.5	239 05.7	N15 58.4	292 00.3	N23 58.0	288 32.0	N23 10.5	169 50.5	S10 50.1
07	38 17.9	254 05.2	57.4	307 00.9	58.0	303 33.9	10.5	184 53.0	50.1
08	53 20.4	269 04.7	56.4	322 01.5	58.0	318 35.8	10.5	199 55.4	50.1
09	68 22.9	284 04.2	55.4	337 02.1	58.0	333 37.6	10.5	214 57.9	50.2
10	83 25.3	299 03.7	54.4	352 02.7	58.0	348 39.5	10.5	230 00.3	50.2
11	98 27.8	314 03.3	53.4	7 03.3	58.0	3 41.3	10.4	245 02.7	50.2
12	113 30.3	329 02.8	N15 52.4	22 04.0	N23 58.0	18 43.2	N23 10.4	260 05.2	S10 50.2
13	128 32.7	344 02.3	51.4	37 04.6	58.0	33 45.0	10.4	275 07.6	50.2
14	143 35.2	359 01.8	50.4	52 05.2	58.0	48 46.9	10.4	290 10.1	50.3
15	158 37.7	14 01.3	49.5	67 05.8	58.0	63 48.8	10.4	305 12.5	50.3
16	173 40.1	29 00.8	48.5	82 06.4	58.0	78 50.6	10.4	320 14.9	50.3
17	188 42.6	44 00.3	47.5	97 07.0	58.0	93 52.5	10.4	335 17.4	50.3
18	203 45.1	58 59.8	N15 46.5	112 07.6	N23 58.1	108 54.3	N23 10.3	350 19.8	S10 50.4
19	218 47.5	73 59.3	45.5	127 08.3	58.1	123 56.2	10.3	5 22.2	50.4
20	233 50.0	88 58.8	44.5	142 08.9	58.1	138 58.1	10.3	20 24.7	50.4
21	248 52.4	103 58.3	43.5	157 09.5	58.1	153 59.9	10.3	35 27.1	50.4
22	263 54.9	118 57.8	42.5	172 10.1	58.1	169 01.8	10.3	50 29.6	50.4
23	278 57.4	133 57.3	41.5	187 10.7	58.1	184 03.6	10.3	65 32.0	50.5
16 00	293 59.8	148 56.9	N15 40.5	202 11.3	N23 58.1	199 05.5	N23 10.2	80 34.4	S10 50.5
01	309 02.3	163 56.4	39.5	217 12.0	58.1	214 07.4	10.2	95 36.9	50.5
02	324 04.8	178 55.9	38.5	232 12.6	58.1	229 09.2	10.2	110 39.3	50.5
03	339 07.2	193 55.4	37.5	247 13.2	58.1	244 11.1	10.2	125 41.7	50.5
04	354 09.7	208 54.9	36.5	262 13.8	58.1	259 12.9	10.2	140 44.2	50.6
05	9 12.2	223 54.4	35.4	277 14.4	58.1	274 14.8	10.2	155 46.6	50.6
06	24 14.6	238 53.9	N15 34.4	292 15.0	N23 58.1	289 16.7	N23 10.2	170 49.1	S10 50.6
07	39 17.1	253 53.4	33.4	307 15.7	58.1	304 18.5	10.1	185 51.5	50.6
08	54 19.5	268 53.0	32.4	322 16.3	58.1	319 20.4	10.1	200 53.9	50.6
09	69 22.0	283 52.5	31.4	337 16.9	58.1	334 22.2	10.1	215 56.4	50.7
10	84 24.5	298 52.0	30.4	352 17.5	58.1	349 24.1	10.1	230 58.8	50.7
11	99 26.9	313 51.5	29.4	7 18.1	58.1	4 26.0	10.1	246 01.2	50.7
12	114 29.4	328 51.0	N15 28.4	22 18.7	N23 58.1	19 27.8	N23 10.1	261 03.7	S10 50.7
13	129 31.9	343 50.6	27.4	37 19.4	58.1	34 29.7	10.0	276 06.1	50.8
14	144 34.3	358 50.1	26.4	52 20.0	58.1	49 31.6	10.0	291 08.5	50.8
15	159 36.8	13 49.6	25.4	67 20.6	58.1	64 33.4	10.0	306 11.0	50.8
16	174 39.3	28 49.1	24.3	82 21.2	58.1	79 35.3	10.0	321 13.4	50.8
17	189 41.7	43 48.6	23.3	97 21.8	58.1	94 37.1	10.0	336 15.8	50.8
18	204 44.2	58 48.2	N15 22.3	112 22.5	N23 58.1	109 39.0	N23 10.0	351 18.3	S10 50.9
19	219 46.7	73 47.7	21.3	127 23.1	58.1	124 40.9	10.0	6 20.7	50.9
20	234 49.1	88 47.2	20.3	142 23.7	58.1	139 42.7	09.9	21 23.1	50.9
21	249 51.6	103 46.7	19.3	157 24.3	58.1	154 44.6	09.9	36 25.6	50.9
22	264 54.0	118 46.2	18.3	172 24.9	58.1	169 46.4	09.9	51 28.0	51.0
23	279 56.5	133 45.8	17.2	187 25.5	58.1	184 48.3	09.9	66 30.4	51.0
17 00	294 59.0	148 45.3	N15 16.2	202 26.2	N23 58.1	199 50.2	N23 09.9	81 32.9	S10 51.0
01	310 01.4	163 44.8	15.2	217 26.8	58.1	214 52.0	09.9	96 35.3	51.0
02	325 03.9	178 44.3	14.2	232 27.4	58.1	229 53.9	09.8	111 37.7	51.0
03	340 06.4	193 43.9	13.2	247 28.0	58.1	244 55.8	09.8	126 40.2	51.1
04	355 08.8	208 43.4	12.1	262 28.6	58.1	259 57.6	09.8	141 42.6	51.1
05	10 11.3	223 42.9	11.1	277 29.3	58.1	274 59.5	09.8	156 45.0	51.1
06	25 13.8	238 42.5	N15 10.1	292 29.9	N23 58.0	290 01.3	N23 09.8	171 47.5	S10 51.1
07	40 16.2	253 42.0	09.1	307 30.5	58.0	305 03.2	09.8	186 49.9	51.2
08	55 18.7	268 41.5	08.0	322 31.1	58.0	320 05.1	09.7	201 52.3	51.2
09	70 21.2	283 41.0	07.0	337 31.7	58.0	335 06.9	09.7	216 54.8	51.2
10	85 23.6	298 40.6	06.0	352 32.4	58.0	350 08.8	09.7	231 57.2	51.2
11	100 26.1	313 40.1	05.0	7 33.0	58.0	5 10.6	09.7	246 59.6	51.3
12	115 28.5	328 39.6	N15 03.9	22 33.6	N23 58.0	20 12.5	N23 09.7	262 02.1	S10 51.3
13	130 31.0	343 39.2	02.9	37 34.2	58.0	35 14.4	09.7	277 04.5	51.3
14	145 33.5	358 38.7	01.9	52 34.8	58.0	50 16.2	09.6	292 06.9	51.3
15	160 35.9	13 38.2	15 00.9	67 35.5	58.0	65 18.1	09.6	307 09.4	51.3
16	175 38.4	28 37.8	14 59.8	82 36.1	58.0	80 20.0	09.6	322 11.8	51.4
17	190 40.9	43 37.3	58.8	97 36.7	57.9	95 21.8	09.6	337 14.2	51.4
18	205 43.3	58 36.8	N14 57.8	112 37.3	N23 57.9	110 23.7	N23 09.6	352 16.7	S10 51.4
19	220 45.8	73 36.4	56.7	127 37.9	57.9	125 25.6	09.6	7 19.1	51.4
20	235 48.3	88 35.9	55.7	142 38.6	57.9	140 27.4	09.5	22 21.5	51.5
21	250 50.7	103 35.4	54.7	157 39.2	57.9	155 29.3	09.5	37 23.9	51.5
22	265 53.2	118 35.0	53.6	172 39.8	57.9	170 31.1	09.5	52 26.4	51.5
23	280 55.6	133 34.5	52.6	187 40.4	57.9	185 33.0	09.5	67 28.8	51.5
Mer. Pass.	h m 4 23.3	v −0.5	d 1.0	v 0.6	d 0.0	v 1.9	d 0.0	v 2.4	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.5	S40 14.8
Achernar	335 26.8	S57 09.8
Acrux	173 09.3	S63 10.8
Adhara	255 12.8	S28 59.5
Aldebaran	290 49.5	N16 32.0
Alioth	166 20.8	N55 53.4
Alkaid	152 58.8	N49 15.0
Al Na'ir	27 43.3	S46 53.4
Alnilam	275 46.6	S 1 11.7
Alphard	217 56.3	S 8 43.2
Alphecca	126 10.8	N26 40.4
Alpheratz	357 43.3	N29 09.9
Altair	62 07.8	N 8 54.5
Ankaa	353 15.5	S42 13.6
Antares	112 25.9	S26 27.6
Arcturus	145 55.6	N19 06.9
Atria	107 27.2	S69 03.1
Avior	234 18.6	S59 33.4
Bellatrix	278 32.2	N 6 21.6
Betelgeuse	271 01.5	N 7 24.4
Canopus	263 56.6	S52 42.2
Capella	280 34.7	N46 00.4
Deneb	49 30.9	N45 19.9
Denebola	182 33.7	N14 29.8
Diphda	348 55.8	S17 54.5
Dubhe	193 52.1	N61 40.8
Elnath	278 12.8	N28 36.9
Eltanin	90 45.6	N51 29.5
Enif	33 46.8	N 9 56.4
Fomalhaut	15 23.7	S29 32.7
Gacrux	172 00.9	S57 11.6
Gienah	175 52.3	S17 37.1
Hadar	148 47.6	S60 26.5
Hamal	328 00.7	N23 31.5
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 19.7	N74 06.3
Markab	13 38.0	N15 16.8
Menkar	314 15.1	N 4 08.5
Menkent	148 07.4	S36 26.3
Miaplacidus	221 40.4	S69 46.6
Mirfak	308 40.4	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.6	S56 41.2
Pollux	243 28.0	N27 59.5
Procyon	245 00.0	N 5 11.3
Rasalhague	96 06.1	N12 33.3
Regulus	207 43.7	N11 54.0
Rigel	281 12.3	S 8 11.2
Rigil Kent.	139 51.4	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 40.2	N56 36.5
Shaula	96 21.4	S37 06.7
Sirius	258 34.0	S16 44.2
Spica	158 31.2	S11 13.9
Suhail	222 52.8	S43 29.5
Vega	80 38.5	N38 48.0
Zuben'ubi	137 05.2	S16 05.9

	SHA	Mer. Pass.
	° ′	h m
Venus	214 57.0	14 05
Mars	268 11.5	10 31
Jupiter	265 05.7	10 42
Saturn	146 34.6	18 35

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 15	Moonrise 16	Moonrise 17	Moonrise 18
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
15 00	178 30.9	N21 31.6	106 06.8	12.5	S 6 10.5	10.6	56.8	N 72				13 12	15 12	17 34	
01	193 30.8	31.2	120 38.3	12.5	6 21.1	10.7	56.9	N 70				12 59	14 47	16 44	18 53
02	208 30.8	30.8	135 09.8	12.4	6 31.8	10.6	56.9	68				12 48	14 28	16 13	17 59
03	223 30.7	30.4	149 41.2	12.4	6 42.4	10.6	56.9	66	////	////	01 40	12 39	14 13	15 51	17 26
04	238 30.6	30.0	164 12.6	12.3	6 53.0	10.6	57.0	64	////	////	02 19	12 31	14 01	15 33	17 02
05	253 30.6	29.6	178 43.9	12.2	7 03.6	10.6	57.0	62	////	00 58	02 45	12 25	13 51	15 18	16 43
06	268 30.5	N21 29.3	193 15.1	12.2	S 7 14.2	10.5	57.0	60	////	01 49	03 06	12 19	13 42	15 06	16 27
07	283 30.5	28.9	207 46.3	12.1	7 24.7	10.5	57.1	N 58	////	02 19	03 22	12 14	13 34	14 55	16 14
08	298 30.4	28.5	222 17.4	12.1	7 35.2	10.5	57.1	56	00 53	02 41	03 36	12 10	13 27	14 46	16 03
09	313 30.3	28.1	236 48.5	12.0	7 45.7	10.4	57.1	54	01 40	02 59	03 49	12 06	13 21	14 38	15 53
10	328 30.3	27.7	251 19.5	11.9	7 56.1	10.5	57.2	52	02 07	03 14	03 59	12 03	13 16	14 30	15 44
11	343 30.2	27.3	265 50.4	11.9	8 06.6	10.4	57.2	50	02 28	03 27	04 09	11 59	13 11	14 24	15 36
12	358 30.1	N21 26.9	280 21.3	11.8	S 8 17.0	10.4	57.2	45	03 06	03 53	04 29	11 52	13 00	14 10	15 19
13	13 30.1	26.5	294 52.1	11.8	8 27.4	10.3	57.3	N 40	03 33	04 13	04 45	11 47	12 52	13 58	15 05
14	28 30.0	26.1	309 22.9	11.7	8 37.7	10.3	57.3	35	03 54	04 29	04 58	11 42	12 44	13 48	14 54
15	43 30.0	25.7	323 53.6	11.6	8 48.0	10.3	57.3	30	04 10	04 43	05 10	11 38	12 38	13 40	14 44
16	58 29.9	25.3	338 24.2	11.6	8 58.3	10.2	57.4	20	04 37	05 05	05 30	11 30	12 26	13 25	14 26
17	73 29.8	24.8	352 54.8	11.5	9 08.5	10.2	57.4	N 10	04 57	05 24	05 47	11 24	12 16	13 12	14 11
18	88 29.8	N21 24.4	7 25.3	11.4	S 9 18.7	10.2	57.4	0	05 14	05 40	06 02	11 18	12 07	13 00	13 57
19	103 29.7	24.0	21 55.7	11.3	9 28.9	10.1	57.5	S 10	05 30	05 56	06 18	11 12	11 58	12 49	13 43
20	118 29.7	23.6	36 26.0	11.3	9 39.0	10.1	57.5	20	05 44	06 11	06 35	11 05	11 49	12 36	13 28
21	133 29.6	23.2	50 56.3	11.2	9 49.1	10.1	57.5	30	05 59	06 28	06 54	10 58	11 38	12 22	13 11
22	148 29.5	22.8	65 26.5	11.2	9 59.2	10.0	57.6	35	06 06	06 37	07 05	10 54	11 31	12 13	13 01
23	163 29.5	22.4	79 56.7	11.0	10 09.2	10.0	57.6	40	06 14	06 48	07 18	10 50	11 24	12 04	12 50
16 00	178 29.4	N21 22.0	94 26.7	11.0	S10 19.2	9.9	57.6	45	06 23	07 00	07 32	10 44	11 16	11 53	12 37
01	193 29.4	21.6	108 56.7	11.0	10 29.1	9.9	57.7	S 50	06 33	07 14	07 51	10 38	11 06	11 40	12 21
02	208 29.3	21.2	123 26.7	10.8	10 39.0	9.9	57.7	52	06 38	07 20	07 59	10 35	11 02	11 34	12 13
03	223 29.2	20.8	137 56.5	10.8	10 48.9	9.8	57.7	54	06 42	07 27	08 09	10 32	10 57	11 27	12 05
04	238 29.2	20.4	152 26.3	10.7	10 58.7	9.7	57.8	56	06 47	07 35	08 20	10 28	10 51	11 19	11 56
05	253 29.1	20.0	166 56.0	10.6	11 08.4	9.7	57.8	S 60	06 53	07 44	08 32	10 24	10 45	11 11	11 45
06	268 29.1	N21 19.5	181 25.6	10.6	S11 18.1	9.7	57.8		06 59	07 53	08 47	10 20	10 38	11 01	11 33
07	283 29.0	19.1	195 55.2	10.5	11 27.8	9.6	57.9								
08	298 29.0	18.7	210 24.7	10.4	11 37.4	9.5	57.9								
09	313 28.9	18.3	224 54.1	10.3	11 46.9	9.5	57.9								
10	328 28.8	17.9	239 23.4	10.2	11 56.4	9.5	58.0								
11	343 28.8	17.5	253 52.6	10.2	12 05.9	9.4	58.0								
12	358 28.7	N21 17.1	268 21.8	10.1	S12 15.3	9.3	58.0								
13	13 28.7	16.6	282 50.9	10.0	12 24.6	9.3	58.1								
14	28 28.6	16.2	297 19.9	9.9	12 33.9	9.2	58.1								
15	43 28.6	15.8	311 48.8	9.9	12 43.1	9.2	58.1								
16	58 28.5	15.4	326 17.7	9.7	12 52.3	9.1	58.2								
17	73 28.5	15.0	340 46.4	9.7	13 01.4	9.0	58.2								
18	88 28.4	N21 14.6	355 15.1	9.6	S13 10.4	9.0	58.2								
19	103 28.3	14.1	9 43.7	9.5	13 19.4	8.9	58.3								
20	118 28.3	13.7	24 12.2	9.4	13 28.3	8.9	58.3								
21	133 28.2	13.3	38 40.6	9.4	13 37.2	8.8	58.4								
22	148 28.2	12.9	53 09.0	9.3	13 46.0	8.7	58.4								
23	163 28.1	12.4	67 37.3	9.1	13 54.7	8.6	58.4								
17 00	178 28.1	N21 12.0	82 05.4	9.1	S14 03.3	8.6	58.5								
01	193 28.0	11.6	96 33.5	9.0	14 11.9	8.5	58.5								
02	208 28.0	11.2	111 01.5	8.9	14 20.4	8.5	58.5								
03	223 27.9	10.7	125 29.4	8.9	14 28.9	8.3	58.6								
04	238 27.9	10.3	139 57.3	8.7	14 37.2	8.3	58.6								
05	253 27.8	09.9	154 25.0	8.7	14 45.5	8.2	58.6								
06	268 27.8	N21 09.5	168 52.7	8.6	S14 53.7	8.1	58.7								
07	283 27.7	09.0	183 20.3	8.4	15 01.8	8.1	58.7								
08	298 27.7	08.6	197 47.7	8.4	15 09.9	8.0	58.7								
09	313 27.6	08.2	212 15.1	8.4	15 17.9	7.9	58.8								
10	328 27.6	07.8	226 42.5	8.2	15 25.8	7.8	58.8								
11	343 27.5	07.3	241 09.7	8.1	15 33.6	7.7	58.8								
12	358 27.5	N21 06.9	255 36.8	8.1	S15 41.3	7.6	58.9								
13	13 27.4	06.5	270 03.9	7.9	15 48.9	7.6	58.9								
14	28 27.4	06.0	284 30.8	7.9	15 56.5	7.4	58.9								
15	43 27.3	05.6	298 57.7	7.8	16 03.9	7.4	59.0								
16	58 27.3	05.2	313 24.5	7.7	16 11.3	7.3	59.0								
17	73 27.2	04.7	327 51.2	7.6	16 18.6	7.2	59.0								
18	88 27.2	N21 04.3	342 17.8	7.5	S16 25.8	7.1	59.1								
19	103 27.1	03.9	356 44.3	7.5	16 32.9	7.0	59.1								
20	118 27.1	03.4	11 10.8	7.3	16 39.9	6.9	59.2								
21	133 27.0	03.0	25 37.1	7.3	16 46.8	6.8	59.2								
22	148 27.0	02.6	40 03.4	7.2	16 53.6	6.7	59.2								
23	163 26.9	02.1	54 29.6	7.1	S17 00.3	6.7	59.3								
	SD 15.8	d 0.4	SD	15.6		15.8		16.0							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 15	Moonset 16	Moonset 17	Moonset 18
°	h m	h m	h m	h m	h m	h m	h m
N 72				21 25	21 09	20 40	
N 70				21 41	21 36	21 30	21 22
68				21 53	21 56	22 02	22 17
66	22 28	////	////	22 04	22 12	22 26	22 50
64	21 51	////	////	22 12	22 26	22 45	23 14
62	21 25	23 08	////	22 20	22 37	23 00	23 34
60	21 05	22 21	////	22 26	22 46	23 13	23 50
N 58	20 49	21 52	////	22 32	22 55	23 24	24 03
56	20 35	21 30	23 14	22 37	23 02	23 34	24 15
54	20 23	21 12	22 30	22 42	23 09	23 42	24 25
52	20 12	20 57	22 03	22 46	23 15	23 50	24 34
50	20 03	20 44	21 42	22 50	23 20	23 57	24 42
45	19 43	20 19	21 05	22 58	23 32	24 12	00 12
N 40	19 27	19 59	20 39	23 05	23 42	24 24	00 24
35	19 14	19 43	20 18	23 11	23 50	24 35	00 35
30	19 02	19 29	20 01	23 16	23 58	24 44	00 44
20	18 42	19 07	19 35	23 25	24 10	00 10	01 00
N 10	18 25	18 48	19 15	23 33	24 22	00 22	01 14
0	18 10	18 32	18 58	23 41	24 32	00 32	01 27
S 10	17 54	18 17	18 42	23 49	24 43	00 43	01 40
20	17 37	18 01	18 28	23 57	24 54	00 54	01 54
30	17 18	17 44	18 14	24 06	00 06	01 07	02 10
35	17 07	17 35	18 06	24 11	00 11	01 14	02 19
40	16 55	17 25	17 58	24 17	00 17	01 23	02 30
45	16 40	17 13	17 49	24 25	00 25	01 33	02 43
S 50	16 22	16 59	17 39	24 33	00 33	01 45	02 58
52	16 13	16 53	17 35	24 37	00 37	01 51	03 05
54	16 04	16 46	17 30	24 41	00 41	01 57	03 13
56	15 53	16 38	17 25	24 46	00 46	02 04	03 22
58	15 41	16 29	17 20	24 52	00 52	02 12	03 32
S 60	15 26	16 19	17 14	24 58	00 58	02 21	03 44

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
15	05 56	05 59	12 06	17 29	05 05	07	43
16	06 02	06 05	12 06	18 20	05 54	08	54
17	06 08	06 10	12 06	19 14	06 46	09	65

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
18 00	295 58.1	148 34.0	N14 51.6	202 41.0	N23 57.9	200 34.9	N23 09.5	82 31.2	S10 51.6	Acamar	315 18.4	S40 14.8
01	311 00.6	163 33.6	50.5	217 41.7	57.9	215 36.7	09.5	97 33.7	51.6	Achernar	335 26.8	S57 09.8
02	326 03.0	178 33.1	49.5	232 42.3	57.8	230 38.6	09.4	112 36.1	51.6	Acrux	173 09.3	S63 10.8
03	341 05.5	193 32.7 . .	48.5	247 42.9 . .	57.8	245 40.5 . .	09.4	127 38.5 . .	51.6	Adhara	255 12.8	S28 59.5
04	356 08.0	208 32.2	47.4	262 43.5	57.8	260 42.3	09.4	142 40.9	51.7	Aldebaran	290 49.5	N16 32.0
05	11 10.4	223 31.7	46.4	277 44.2	57.8	275 44.2	09.4	157 43.4	51.7			
06	26 12.9	238 31.3	N14 45.4	292 44.8	N23 57.8	290 46.0	N23 09.4	172 45.8	S10 51.7	Alioth	166 20.8	N55 53.4
07	41 15.4	253 30.8	44.3	307 45.4	57.8	305 47.9	09.4	187 48.2	51.7	Alkaid	152 58.9	N49 15.0
T 08	56 17.8	268 30.4	43.3	322 46.0	57.7	320 49.8	09.3	202 50.7	51.8	Al Na'ir	27 43.3	S46 53.4
H 09	71 20.3	283 29.9 . .	42.2	337 46.6 . .	57.7	335 51.6 . .	09.3	217 53.1 . .	51.8	Alnilam	275 46.6	S 1 11.7
U 10	86 22.8	298 29.5	41.2	352 47.3	57.7	350 53.5	09.3	232 55.5	51.8	Alphard	217 56.3	S 8 43.2
R 11	101 25.2	313 29.0	40.2	7 47.9	57.7	5 55.4	09.3	247 57.9	51.8			
S 12	116 27.7	328 28.5	N14 39.1	22 48.5	N23 57.7	20 57.2	N23 09.3	263 00.4	S10 51.9	Alphecca	126 10.8	N26 40.4
D 13	131 30.1	343 28.1	38.1	37 49.1	57.7	35 59.1	09.2	278 02.8	51.9	Alpheratz	357 43.2	N29 09.9
A 14	146 32.6	358 27.6	37.0	52 49.7	57.6	51 01.0	09.2	293 05.2	51.9	Altair	62 07.8	N 8 54.5
Y 15	161 35.1	13 27.2 . .	36.0	67 50.4 . .	57.6	66 02.8 . .	09.2	308 07.7 . .	51.9	Ankaa	353 15.5	S42 13.6
16	176 37.5	28 26.7	34.9	82 51.0	57.6	81 04.7	09.2	323 10.1	51.9	Antares	112 25.9	S26 27.6
17	191 40.0	43 26.3	33.9	97 51.6	57.6	96 06.6	09.2	338 12.5	52.0			
18	206 42.5	58 25.8	N14 32.9	112 52.2	N23 57.6	111 08.4	N23 09.2	353 14.9	S10 52.0	Arcturus	145 55.6	N19 06.9
19	221 44.9	73 25.4	31.8	127 52.9	57.5	126 10.3	09.1	8 17.4	52.0	Atria	107 27.2	S69 03.1
20	236 47.4	88 24.9	30.8	142 53.5	57.5	141 12.1	09.1	23 19.8	52.0	Avior	234 18.6	S59 33.4
21	251 49.9	103 24.5 . .	29.7	157 54.1 . .	57.5	156 14.0 . .	09.1	38 22.2 . .	52.1	Bellatrix	278 32.2	N 6 21.6
22	266 52.3	118 24.0	28.7	172 54.7	57.5	171 15.9	09.1	53 24.6	52.1	Betelgeuse	271 01.5	N 7 24.4
23	281 54.8	133 23.6	27.6	187 55.4	57.5	186 17.7	09.1	68 27.1	52.1			
19 00	296 57.3	148 23.1	N14 26.6	202 56.0	N23 57.4	201 19.6	N23 09.1	83 29.5	S10 52.1	Canopus	263 56.6	S52 42.2
01	311 59.7	163 22.7	25.5	217 56.6	57.4	216 21.5	09.0	98 31.9	52.2	Capella	280 34.7	N46 00.4
02	327 02.2	178 22.2	24.5	232 57.2	57.4	231 23.3	09.0	113 34.3	52.2	Deneb	49 30.9	N45 19.9
03	342 04.6	193 21.8 . .	23.4	247 57.9 . .	57.4	246 25.2 . .	09.0	128 36.8 . .	52.2	Denebola	182 33.7	N14 29.8
04	357 07.1	208 21.3	22.4	262 58.5	57.4	261 27.1	09.0	143 39.2	52.3	Diphda	348 55.7	S17 54.5
05	12 09.6	223 20.9	21.3	277 59.1	57.3	276 28.9	09.0	158 41.6	52.3			
06	27 12.0	238 20.4	N14 20.3	292 59.7	N23 57.3	291 30.8	N23 08.9	173 44.0	S10 52.3	Dubhe	193 52.1	N61 40.8
07	42 14.5	253 20.0	19.2	308 00.3	57.3	306 32.7	08.9	188 46.5	52.3	Elnath	278 12.8	N28 36.9
08	57 17.0	268 19.5	18.1	323 01.0	57.3	321 34.5	08.9	203 48.9	52.4	Eltanin	90 45.6	N51 29.5
F 09	72 19.4	283 19.1 . .	17.1	338 01.6 . .	57.2	336 36.4 . .	08.9	218 51.3 . .	52.4	Enif	33 46.7	N 9 56.4
R 10	87 21.9	298 18.7	16.0	353 02.2	57.2	351 38.3	08.9	233 53.7	52.4	Fomalhaut	15 23.7	S29 32.7
I 11	102 24.4	313 18.2	15.0	8 02.8	57.2	6 40.1	08.9	248 56.2	52.4			
D 12	117 26.8	328 17.8	N14 13.9	23 03.5	N23 57.2	21 42.0	N23 08.8	263 58.6	S10 52.5	Gacrux	172 00.9	S57 11.6
A 13	132 29.3	343 17.3	12.9	38 04.1	57.1	36 43.9	08.8	279 01.0	52.5	Gienah	175 52.3	S17 37.1
Y 14	147 31.8	358 16.9	11.8	53 04.7	57.1	51 45.7	08.8	294 03.4	52.5	Hadar	148 47.6	S60 26.5
15	162 34.2	13 16.4 . .	10.7	68 05.3 . .	57.1	66 47.6 . .	08.8	309 05.9 . .	52.5	Hamal	328 00.7	N23 31.5
16	177 36.7	28 16.0	09.7	83 06.0	57.0	81 49.5	08.8	324 08.3	52.6	Kaus Aust.	83 43.3	S34 22.5
17	192 39.1	43 15.6	08.6	98 06.6	57.0	96 51.3	08.7	339 10.7	52.6			
18	207 41.6	58 15.1	N14 07.6	113 07.2	N23 57.0	111 53.2	N23 08.7	354 13.1	S10 52.6	Kochab	137 19.8	N74 06.3
19	222 44.1	73 14.7	06.5	128 07.9	57.0	126 55.1	08.7	9 15.5	52.6	Markab	13 38.0	N15 16.8
20	237 46.5	88 14.2	05.4	143 08.5	56.9	141 56.9	08.7	24 18.0	52.7	Menkar	314 15.1	N 4 08.5
21	252 49.0	103 13.8 . .	04.4	158 09.1 . .	56.9	156 58.8 . .	08.7	39 20.4 . .	52.7	Menkent	148 07.4	S36 26.3
22	267 51.5	118 13.4	03.3	173 09.7	56.9	172 00.7	08.7	54 22.8	52.7	Miaplacidus	221 40.4	S69 46.6
23	282 53.9	133 12.9	02.2	188 10.4	56.8	187 02.5	08.6	69 25.2	52.7			
20 00	297 56.4	148 12.5	N14 01.2	203 11.0	N23 56.8	202 04.4	N23 08.6	84 27.7	S10 52.8	Mirfak	308 40.4	N49 54.3
01	312 58.9	163 12.1	14 00.1	218 11.6	56.8	217 06.3	08.6	99 30.1	52.8	Nunki	75 57.8	S26 16.6
02	328 01.3	178 11.6	13 59.1	233 12.2	56.8	232 08.1	08.6	114 32.5	52.8	Peacock	53 18.6	S56 41.2
03	343 03.8	193 11.2 . .	58.0	248 12.9 . .	56.7	247 10.0 . .	08.6	129 34.9 . .	52.9	Pollux	243 28.0	N27 59.5
04	358 06.3	208 10.8	56.9	263 13.5	56.7	262 11.9	08.5	144 37.3	52.9	Procyon	245 00.0	N 5 11.3
05	13 08.7	223 10.3	55.9	278 14.1	56.7	277 13.7	08.5	159 39.8	52.9			
06	28 11.2	238 09.9	N13 54.8	293 14.7	N23 56.6	292 15.6	N23 08.5	174 42.2	S10 52.9	Rasalhague	96 06.1	N12 33.3
07	43 13.6	253 09.5	53.7	308 15.4	56.6	307 17.5	08.5	189 44.6	53.0	Regulus	207 43.7	N11 54.0
S 08	58 16.1	268 09.0	52.6	323 16.0	56.6	322 19.3	08.5	204 47.0	53.0	Rigel	281 12.2	S 8 11.2
A 09	73 18.6	283 08.6 . .	51.6	338 16.6 . .	56.5	337 21.2 . .	08.4	219 49.4 . .	53.0	Rigil Kent.	139 51.4	S60 53.6
T 10	88 21.0	298 08.2	50.5	353 17.2	56.5	352 23.1	08.4	234 51.9	53.0	Sabik	102 12.2	S15 44.3
U 11	103 23.5	313 07.7	49.4	8 17.9	56.5	7 24.9	08.4	249 54.3	53.1			
R 12	118 26.0	328 07.3	N13 48.4	23 18.5	N23 56.4	22 26.8	N23 08.4	264 56.7	S10 53.1	Schedar	349 40.2	N56 36.5
D 13	133 28.4	343 06.9	47.3	38 19.1	56.4	37 28.7	08.4	279 59.1	53.1	Shaula	96 21.4	S37 06.7
A 14	148 30.9	358 06.4	46.2	53 19.8	56.4	52 30.5	08.3	295 01.5	53.1	Sirius	258 34.0	S16 44.2
Y 15	163 33.4	13 06.0 . .	45.1	68 20.4 . .	56.3	67 32.4 . .	08.3	310 04.0 . .	53.2	Spica	158 31.2	S11 13.9
16	178 35.8	28 05.6	44.1	83 21.0	56.3	82 34.3	08.3	325 06.4	53.2	Suhail	222 52.8	S43 29.4
17	193 38.3	43 05.2	43.0	98 21.6	56.3	97 36.1	08.3	340 08.8	53.2			
18	208 40.7	58 04.7	N13 41.9	113 22.3	N23 56.2	112 38.0	N23 08.3	355 11.2	S10 53.3	Vega	80 38.5	N38 48.1
19	223 43.2	73 04.3	40.8	128 22.9	56.2	127 39.9	08.3	10 13.6	53.3	Zuben'ubi	137 05.2	S16 05.9
20	238 45.7	88 03.9	39.8	143 23.5	56.1	142 41.7	08.2	25 16.1	53.3		SHA	Mer.Pass.
21	253 48.1	103 03.5 . .	38.7	158 24.2 . .	56.1	157 43.6 . .	08.2	40 18.5 . .	53.3		° ′	h m
22	268 50.6	118 03.0	37.6	173 24.8	56.1	172 45.5	08.2	55 20.9	53.4	Venus	211 25.9	14 07
23	283 53.1	133 02.6	36.5	188 25.4	56.0	187 47.3	08.2	70 23.3	53.4	Mars	265 58.7	10 28
	h m									Jupiter	264 22.4	10 33
Mer.Pass.	4 11.5	v −0.4	d 1.1	v 0.6	d 0.0	v 1.9	d 0.0	v 2.4	d 0.0	Saturn	146 32.2	18 23

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		18	19	20	21
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
18 00	178 26.9	N21 01.7	68 55.7	7.0	S17 07.0	6.5	59.3	N 72							22 55
01	193 26.8	01.2	83 21.7	6.9	17 13.5	6.4	59.3	N 70							
02	208 26.8	00.8	97 47.6	6.8	17 19.9	6.3	59.4	68						21 43	21 27
03	223 26.7	21 00.4	112 13.4	6.8	17 26.2	6.2	59.4	66	////	////	00 47	17 59	19 30	20 24	20 47
04	238 26.7	20 59.9	126 39.2	6.6	17 32.4	6.1	59.4	64	////	////	01 53	17 26	18 48	19 46	20 20
05	253 26.6	59.5	141 04.8	6.6	17 38.5	6.0	59.5	62	////	////	02 28	17 02	18 20	19 19	19 58
06	268 26.6	N20 59.0	155 30.4	6.5	S17 44.5	5.9	59.5	60	////	01 16	02 52	16 43	17 59	18 58	19 41
07	283 26.5	58.6	169 55.9	6.4	17 50.4	5.8	59.5	N 58	////	01 58	03 12	16 27	17 41	18 41	19 27
T 08	298 26.5	58.2	184 21.3	6.3	17 56.2	5.6	59.6	56	01 09	02 26	03 28	16 14	17 26	18 27	19 14
H 09	313 26.4 . .	57.7	198 46.6	6.3	18 01.8	5.6	59.6	54	01 48	02 47	03 41	16 03	17 14	18 15	19 04
U 10	328 26.4	57.3	213 11.9	6.1	18 07.4	5.4	59.6	52	02 14	03 04	03 53	15 53	17 03	18 04	18 54
R 11	343 26.4	56.8	227 37.0	6.1	18 12.8	5.4	59.7	50	02 34	03 18	04 03	15 44	16 53	17 55	18 46
S 12	358 26.3	N20 56.4	242 02.1	6.0	S18 18.2	5.2	59.7	45	03 10	03 31	04 12	15 36	16 45	17 46	18 38
D 13	13 26.3	55.9	256 27.1	5.9	18 23.4	5.1	59.7	40	03 36	03 56	04 31	15 19	16 26	17 28	18 22
A 14	28 26.2	55.5	270 52.0	5.9	18 28.5	5.0	59.7	35	03 56	04 15	04 47	15 05	16 11	17 13	18 09
Y 15	43 26.2 . .	55.0	285 16.9	5.8	18 33.5	4.8	59.8	30	04 12	04 31	04 59	14 54	15 59	17 01	17 58
16	58 26.1	54.6	299 41.7	5.6	18 38.3	4.8	59.8	20	04 38	04 45	05 11	14 44	15 48	16 50	17 48
17	73 26.1	54.1	314 06.3	5.6	18 43.1	4.6	59.8	N 10	04 58	05 07	05 25	14 26	15 29	16 31	17 31
18	88 26.0	N20 53.7	328 30.9	5.6	S18 47.7	4.5	59.9	0	05 15	05 25	05 47	14 11	15 12	16 15	17 16
19	103 26.0	53.2	342 55.5	5.4	18 52.2	4.4	59.9	S 10	05 30	05 41	06 03	13 57	14 57	15 59	17 02
20	118 26.0	52.8	357 19.9	5.4	18 56.6	4.2	59.9	20	05 44	05 56	06 18	13 43	14 42	15 44	16 48
21	133 25.9 . .	52.3	11 44.3	5.3	19 00.8	4.1	60.0	30	05 58	06 11	06 34	13 28	14 26	15 28	16 33
22	148 25.9	51.9	26 08.6	5.3	19 04.9	4.0	60.0	35	06 05	06 27	06 53	13 11	14 07	15 09	16 16
23	163 25.8	51.4	40 32.9	5.2	19 08.9	3.9	60.0	40	06 13	06 36	07 03	13 01	13 56	14 58	16 06
19 00	178 25.8	N20 51.0	54 57.1	5.1	S19 12.8	3.7	60.1	45	06 21	06 46	07 16	12 50	13 44	14 46	15 54
01	193 25.8	50.5	69 21.2	5.0	19 16.5	3.7	60.1	50	06 31	06 58	07 30	12 37	13 29	14 31	15 41
02	208 25.7	50.1	83 45.2	5.0	19 20.2	3.4	60.1	S 50	06 31	07 11	07 48	12 21	13 11	14 13	15 24
03	223 25.7 . .	49.6	98 09.2	4.9	19 23.6	3.4	60.1	52	06 35	07 17	07 56	12 13	13 03	14 04	15 16
04	238 25.6	49.2	112 33.1	4.8	19 27.0	3.2	60.2	54	06 40	07 24	08 05	12 05	12 54	13 55	15 08
05	253 25.6	48.7	126 56.9	4.8	19 30.2	3.1	60.2	56	06 44	07 31	08 16	11 56	12 43	13 44	14 58
06	268 25.5	N20 48.3	141 20.7	4.7	S19 33.3	2.9	60.2	58	06 50	07 40	08 28	11 45	12 31	13 32	14 47
07	283 25.5	47.8	155 44.4	4.6	19 36.2	2.9	60.3	S 60	06 56	07 49	08 41	11 33	12 17	13 18	14 34
08	298 25.5	47.3	170 08.0	4.6	19 39.1	2.6	60.3								
F 09	313 25.4 . .	46.9	184 31.6	4.5	19 41.7	2.6	60.3								
R 10	328 25.4	46.4	198 55.1	4.5	19 44.3	2.4	60.3								
I 11	343 25.4	46.0	213 18.6	4.4	19 46.7	2.2	60.4								
D 12	358 25.3	N20 45.5	227 42.0	4.4	S19 48.9	2.2	60.4								
A 13	13 25.3	45.0	242 05.4	4.3	19 51.1	2.0	60.4								
Y 14	28 25.2	44.6	256 28.7	4.2	19 53.1	1.8	60.4								
15	43 25.2 . .	44.1	270 51.9	4.2	19 54.9	1.7	60.5								
16	58 25.2	43.7	285 15.1	4.2	19 56.6	1.6	60.5								
17	73 25.1	43.2	299 38.3	4.1	19 58.2	1.4	60.5								
18	88 25.1	N20 42.7	314 01.4	4.1	S19 59.6	1.3	60.5								
19	103 25.0	42.3	328 24.5	4.0	20 00.9	1.1	60.6								
20	118 25.0	41.8	342 47.5	4.0	20 02.0	1.0	60.6								
21	133 25.0 . .	41.3	357 10.5	3.9	20 03.0	0.8	60.6								
22	148 24.9	40.9	11 33.4	3.9	20 03.8	0.7	60.6								
23	163 24.9	40.4	25 56.3	3.9	20 04.5	0.6	60.7								
20 00	178 24.9	N20 39.9	40 19.2	3.8	S20 05.1	0.4	60.7								
01	193 24.8	39.5	54 42.0	3.8	20 05.5	0.2	60.7								
02	208 24.8	39.0	69 04.8	3.8	20 05.7	0.1	60.7								
03	223 24.8 . .	38.5	83 27.6	3.7	20 05.8	0.0	60.7								
04	238 24.7	38.1	97 50.3	3.8	20 05.8	0.2	60.8								
05	253 24.7	37.6	112 13.1	3.6	20 05.6	0.3	60.8								
06	268 24.7	N20 37.1	126 35.7	3.7	S20 05.3	0.5	60.8								
07	283 24.6	36.7	140 58.4	3.6	20 04.8	0.6	60.8								
S 08	298 24.6	36.2	155 21.0	3.6	20 04.2	0.8	60.8								
A 09	313 24.6 . .	35.7	169 43.6	3.6	20 03.4	0.9	60.9								
T 10	328 24.5	35.2	184 06.2	3.6	20 02.5	1.1	60.9								
U 11	343 24.5	34.8	198 28.8	3.6	20 01.4	1.2	60.9								
R 12	358 24.5	N20 34.3	212 51.4	3.5	S20 00.2	1.4	60.9								
D 13	13 24.4	33.8	227 13.9	3.6	19 58.8	1.6	60.9								
A 14	28 24.4	33.3	241 36.5	3.5	19 57.2	1.6	60.9								
Y 15	43 24.4 . .	32.9	255 59.0	3.5	19 55.6	1.9	61.0								
16	58 24.3	32.4	270 21.5	3.6	19 53.7	1.9	61.0								
17	73 24.3	31.9	284 44.1	3.5	19 51.8	2.1	61.0								
18	88 24.3	N20 31.4	299 06.6	3.5	S19 49.7	2.3	61.0								
19	103 24.2	31.0	313 29.1	3.5	19 47.4	2.4	61.0								
20	118 24.2	30.5	327 51.6	3.5	19 45.0	2.6	61.0								
21	133 24.2 . .	30.0	342 14.1	3.5	19 42.4	2.7	61.0								
22	148 24.1	29.5	356 36.6	3.6	19 39.7	2.9	61.0								
23	163 24.1	29.0	10 59.2	3.5	S19 36.8	3.0	61.1								
	SD 15.8	d 0.5	SD	16.3		16.5		16.6							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	18	19	20	21
°	h m	h m	h m	h m	h m	h m	h m
N 72							23 49
N 70				21 22		22 50	25 17
68	23 15	////	////	22 17	22 52	24 09	00 09
66	22 16	////	////	22 50	23 34	24 46	00 46
64	21 43	////	////	23 14	24 02	00 02	01 13
62	21 18	22 52	////	23 34	24 24	00 24	01 34
60	20 59	22 12	////	23 50	24 41	00 41	01 50
N 58	20 44	21 45	////	24 03	00 03	00 56	02 04
56	20 30	21 24	22 59	24 15	00 15	01 09	02 16
54	20 19	21 07	22 22	24 25	00 25	01 20	02 27
52	20 09	20 53	21 57	24 34	00 34	01 29	02 36
50	20 00	20 41	21 37	24 42	00 42	01 38	02 45
45	19 41	20 16	21 01	00 12	01 00	01 57	03 03
N 40	19 25	19 57	20 36	00 24	01 14	02 12	03 17
35	19 12	19 41	20 16	00 35	01 26	02 24	03 29
30	19 01	19 28	20 00	00 44	01 37	02 36	03 40
20	18 42	19 06	19 34	01 00	01 55	02 55	03 58
N 10	18 25	18 48	19 14	01 14	02 11	03 11	04 14
0	18 10	18 32	18 58	01 27	02 25	03 27	04 29
S 10	17 55	18 17	18 43	01 40	02 40	03 42	04 44
20	17 39	18 02	18 29	01 54	02 56	03 58	04 59
30	17 20	17 46	18 15	02 10	03 14	04 17	05 17
35	17 09	17 37	18 08	02 19	03 25	04 28	05 28
40	16 57	17 27	18 00	02 30	03 37	04 41	05 40
45	16 43	17 15	17 52	02 43	03 51	04 56	05 54
S 50	16 25	17 02	17 42	02 58	04 09	05 14	06 11
52	16 17	16 56	17 38	03 05	04 17	05 22	06 19
54	16 08	16 49	17 34	03 13	04 26	05 32	06 28
56	15 57	16 42	17 29	03 22	04 36	05 43	06 38
58	15 46	16 33	17 23	03 32	04 48	05 55	06 49
S 60	15 32	16 24	17 18	03 44	05 02	06 09	07 02

Day	SUN			MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
18	06 12	06 15	12 06	20 11	07 42	10	75
19	06 17	06 19	12 06	21 12	08 41	11	85
20	06 20	06 22	12 06	22 14	09 43	12	92

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
21 00	298 55.5	148 02.2	N13 35.4	203 26.0	N23 56.0	202 49.2	N23 08.2	85 25.7	S10 53.4	Acamar	315 18.4	S40 14.8
01	313 58.0	163 01.8	34.4	218 26.7	55.9	217 51.1	08.1	100 28.1	53.5	Achernar	335 26.7	S57 09.8
02	329 00.5	178 01.3	33.3	233 27.3	55.9	232 52.9	08.1	115 30.6	53.5	Acrux	173 09.3	S63 10.8
03	344 02.9	193 00.9	. . 32.2	248 27.9	. . 55.9	247 54.8	. . 08.1	130 33.0	. . 53.5	Adhara	255 12.8	S28 59.5
04	359 05.4	208 00.5	31.1	263 28.6	55.8	262 56.7	08.1	145 35.4	53.5	Aldebaran	290 49.5	N16 32.0
05	14 07.9	223 00.1	30.0	278 29.2	55.8	277 58.6	08.1	160 37.8	53.6			
06	29 10.3	237 59.7	N13 29.0	293 29.8	N23 55.7	293 00.4	N23 08.0	175 40.2	S10 53.6	Alioth	166 20.8	N55 53.4
07	44 12.8	252 59.2	27.9	308 30.4	55.7	308 02.3	08.0	190 42.6	53.6	Alkaid	152 58.9	N49 15.0
08	59 15.2	267 58.8	26.8	323 31.1	55.7	323 04.2	08.0	205 45.1	53.7	Al Na'ir	27 43.2	S46 53.4
S 09	74 17.7	282 58.4	. . 25.7	338 31.7	. . 55.6	338 06.0	. . 08.0	220 47.5	. . 53.7	Alnilam	275 46.5	S 1 11.7
U 10	89 20.2	297 58.0	24.6	353 32.3	55.6	353 07.9	08.0	235 49.9	53.7	Alphard	217 56.3	S 8 43.2
N 11	104 22.6	312 57.6	23.5	8 33.0	55.5	8 09.8	07.9	250 52.3	53.7			
D 12	119 25.1	327 57.1	N13 22.5	23 33.6	N23 55.5	23 11.6	N23 07.9	265 54.7	S10 53.8	Alphecca	126 10.8	N26 40.4
A 13	134 27.6	342 56.7	21.4	38 34.2	55.5	38 13.5	07.9	280 57.1	53.8	Alpheratz	357 43.2	N29 09.9
Y 14	149 30.0	357 56.3	20.3	53 34.9	55.4	53 15.4	07.9	295 59.6	53.8	Altair	62 07.8	N 8 54.5
15	164 32.5	12 55.9	. . 19.2	68 35.5	. . 55.4	68 17.2	. . 07.9	311 02.0	. . 53.9	Ankaa	353 15.5	S42 13.6
16	179 35.0	27 55.5	18.1	83 36.1	55.3	83 19.1	07.8	326 04.4	53.9	Antares	112 25.9	S26 27.6
17	194 37.4	42 55.1	17.0	98 36.8	55.3	98 21.0	07.8	341 06.8	53.9			
18	209 39.9	57 54.7	N13 15.9	113 37.4	N23 55.2	113 22.9	N23 07.8	356 09.2	S10 53.9	Arcturus	145 55.6	N19 06.9
19	224 42.4	72 54.2	14.8	128 38.0	55.2	128 24.7	07.8	11 11.6	54.0	Atria	107 27.2	S69 03.2
20	239 44.8	87 53.8	13.7	143 38.6	55.1	143 26.6	07.8	26 14.0	54.0	Avior	234 18.6	S59 33.4
21	254 47.3	102 53.4	. . 12.6	158 39.3	. . 55.1	158 28.5	. . 07.7	41 16.5	. . 54.0	Bellatrix	278 32.2	N 6 21.6
22	269 49.7	117 53.0	11.6	173 39.9	55.0	173 30.3	07.7	56 18.9	54.1	Betelgeuse	271 01.5	N 7 24.4
23	284 52.2	132 52.6	10.5	188 40.5	55.0	188 32.2	07.7	71 21.3	54.1			
22 00	299 54.7	147 52.2	N13 09.4	203 41.2	N23 55.0	203 34.1	N23 07.7	86 23.7	S10 54.1	Canopus	263 56.6	S52 42.2
01	314 57.1	162 51.8	08.3	218 41.8	54.9	218 35.9	07.7	101 26.1	54.1	Capella	280 34.7	N46 00.4
02	329 59.6	177 51.4	07.2	233 42.4	54.9	233 37.8	07.6	116 28.5	54.2	Deneb	49 30.9	N45 19.9
03	345 02.1	192 50.9	. . 06.1	248 43.1	. . 54.8	248 39.7	. . 07.6	131 30.9	. . 54.2	Denebola	182 33.7	N14 29.8
04	0 04.5	207 50.5	05.0	263 43.7	54.8	263 41.6	07.6	146 33.4	54.2	Diphda	348 55.7	S17 54.5
05	15 07.0	222 50.1	03.9	278 44.3	54.7	278 43.4	07.6	161 35.8	54.3			
06	30 09.5	237 49.7	N13 02.8	293 45.0	N23 54.7	293 45.3	N23 07.6	176 38.2	S10 54.3	Dubhe	193 52.1	N61 40.8
07	45 11.9	252 49.3	01.7	308 45.6	54.6	308 47.2	07.5	191 40.6	54.3	Elnath	278 12.8	N28 36.9
08	60 14.4	267 48.9	13 00.6	323 46.2	54.6	323 49.0	07.5	206 43.0	54.3	Eltanin	90 45.6	N51 29.5
M 09	75 16.9	282 48.5	12 59.5	338 46.9	. . 54.5	338 50.9	. . 07.5	221 45.4	. . 54.4	Enif	33 46.7	N 9 56.4
O 10	90 19.3	297 48.1	58.4	353 47.5	54.5	353 52.8	07.5	236 47.8	54.4	Fomalhaut	15 23.6	S29 32.7
N 11	105 21.8	312 47.7	57.3	8 48.1	54.4	8 54.7	07.5	251 50.2	54.4			
D 12	120 24.2	327 47.3	N12 56.2	23 48.8	N23 54.4	23 56.5	N23 07.4	266 52.7	S10 54.5	Gacrux	172 00.9	S57 11.6
A 13	135 26.7	342 46.9	55.1	38 49.4	54.3	38 58.4	07.4	281 55.1	54.5	Gienah	175 52.3	S17 37.1
Y 14	150 29.2	357 46.5	54.0	53 50.0	54.3	54 00.3	07.4	296 57.5	54.5	Hadar	148 47.6	S60 26.5
15	165 31.6	12 46.1	. . 52.9	68 50.7	. . 54.2	69 02.1	. . 07.4	311 59.9	. . 54.6	Hamal	328 00.6	N23 31.5
16	180 34.1	27 45.7	51.8	83 51.3	54.2	84 04.0	07.3	327 02.3	54.6	Kaus Aust.	83 43.3	S34 22.5
17	195 36.6	42 45.3	50.7	98 51.9	54.1	99 05.9	07.3	342 04.7	54.6			
18	210 39.0	57 44.9	N12 49.6	113 52.6	N23 54.0	114 07.7	N23 07.3	357 07.1	S10 54.6	Kochab	137 19.8	N74 06.3
19	225 41.5	72 44.5	48.5	128 53.2	54.0	129 09.6	07.3	12 09.5	54.7	Markab	13 38.0	N15 16.8
20	240 44.0	87 44.1	47.4	143 53.8	53.9	144 11.5	07.3	27 12.0	54.7	Menkar	314 15.0	N 4 08.6
21	255 46.4	102 43.7	. . 46.3	158 54.5	. . 53.9	159 13.4	. . 07.2	42 14.4	. . 54.7	Menkent	148 07.4	S36 26.3
22	270 48.9	117 43.3	45.2	173 55.1	53.8	174 15.2	07.2	57 16.8	54.8	Miaplacidus	221 40.5	S69 46.6
23	285 51.4	132 42.9	44.1	188 55.7	53.8	189 17.1	07.2	72 19.2	54.8			
23 00	300 53.8	147 42.5	N12 43.0	203 56.4	N23 53.7	204 19.0	N23 07.2	87 21.6	S10 54.8	Mirfak	308 40.4	N49 54.3
01	315 56.3	162 42.1	41.9	218 57.0	53.7	219 20.9	07.2	102 24.0	54.9	Nunki	75 57.8	S26 16.6
02	330 58.7	177 41.7	40.7	233 57.6	53.6	234 22.7	07.1	117 26.4	54.9	Peacock	53 18.5	S56 41.2
03	346 01.2	192 41.3	. . 39.6	248 58.3	. . 53.6	249 24.6	. . 07.1	132 28.8	. . 54.9	Pollux	243 28.0	N27 59.5
04	1 03.7	207 40.9	38.5	263 58.9	53.5	264 26.5	07.1	147 31.2	55.0	Procyon	245 00.0	N 5 11.3
05	16 06.1	222 40.5	37.4	278 59.5	53.4	279 28.3	07.1	162 33.6	55.0			
06	31 08.6	237 40.1	N12 36.3	294 00.2	N23 53.4	294 30.2	N23 07.0	177 36.1	S10 55.0	Rasalhague	96 06.1	N12 33.3
07	46 11.1	252 39.7	35.2	309 00.8	53.3	309 32.1	07.0	192 38.5	55.0	Regulus	207 43.7	N11 54.0
08	61 13.5	267 39.3	34.1	324 01.4	53.3	324 34.0	07.0	207 40.9	55.1	Rigel	281 12.2	S 8 11.2
T 09	76 16.0	282 38.9	. . 33.0	339 02.1	. . 53.2	339 35.8	. . 07.0	222 43.3	. . 55.1	Rigil Kent.	139 51.4	S60 53.6
U 10	91 18.5	297 38.5	31.9	354 02.7	53.1	354 37.7	07.0	237 45.7	55.1	Sabik	102 12.2	S15 44.3
E 11	106 20.9	312 38.1	30.8	9 03.3	53.1	9 39.6	06.9	252 48.1	55.2			
S 12	121 23.4	327 37.7	N12 29.6	24 04.0	N23 53.0	24 41.5	N23 06.9	267 50.5	S10 55.2	Schedar	349 40.1	N56 36.5
D 13	136 25.8	342 37.3	28.5	39 04.6	53.0	39 43.3	06.9	282 52.9	55.2	Shaula	96 21.4	S37 06.7
A 14	151 28.3	357 36.9	27.4	54 05.3	52.9	54 45.2	06.9	297 55.3	55.3	Sirius	258 34.0	S16 44.2
Y 15	166 30.8	12 36.5	. . 26.3	69 05.9	. . 52.8	69 47.1	. . 06.9	312 57.7	. . 55.3	Spica	158 31.2	S11 13.9
16	181 33.2	27 36.1	25.2	84 06.5	52.8	84 48.9	06.8	328 00.1	55.3	Suhail	222 52.8	S43 29.4
17	196 35.7	42 35.8	24.1	99 07.2	52.7	99 50.8	06.8	343 02.5	55.4			
18	211 38.2	57 35.4	N12 22.9	114 07.8	N23 52.7	114 52.7	N23 06.8	358 04.9	S10 55.4	Vega	80 38.5	N38 48.1
19	226 40.6	72 35.0	21.8	129 08.4	52.6	129 54.6	06.8	13 07.4	55.4	Zuben'ubi	137 05.2	S16 05.9
20	241 43.1	87 34.6	20.7	144 09.1	52.5	144 56.4	06.7	28 09.8	55.4		SHA	Mer. Pass.
21	256 45.6	102 34.2	. . 19.6	159 09.7	. . 52.5	159 58.3	. . 06.7	43 12.2	. . 55.5		° ′	h m
22	271 48.0	117 33.8	18.5	174 10.3	52.4	175 00.2	06.7	58 14.6	55.5	Venus	207 57.5	14 09
23	286 50.5	132 33.4	17.4	189 11.0	52.3	190 02.1	06.7	73 17.0	55.5	Mars	263 46.5	10 25
										Jupiter	263 39.4	10 24
Mer. Pass.	h m 3 59.7	v −0.4	d 1.1	v 0.6	d 0.1	v 1.9	d 0.0	v 2.4	d 0.0	Saturn	146 29.0	18 11

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 21	Moonrise 22	Moonrise 23	Moonrise 24
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
21 00	178 24.1	N20 28.6	25 21.7	3.5	S19 33.8	3.2	61.1	N 72				22 55	21 53	21 33	21 20
01	193 24.1	28.1	39 44.2	3.6	19 30.6	3.3	61.1	N 70				21 27	21 21	21 15	21 11
02	208 24.0	27.6	54 06.8	3.6	19 27.3	3.4	61.1	68	////	////	01 15	20 47	20 57	21 01	21 03
03	223 24.0	. . 27.1	68 29.4	3.5	19 23.9	3.6	61.1	66	////	////	02 06	20 20	20 38	20 49	20 57
04	238 24.0	26.6	82 51.9	3.6	19 20.3	3.8	61.1	64	////	////	02 37	19 58	20 23	20 39	20 52
05	253 23.9	26.1	97 14.5	3.7	19 16.5	3.9	61.1	62	////	01 32	03 00	19 41	20 10	20 31	20 47
06	268 23.9	N20 25.6	111 37.2	3.6	S19 12.6	4.0	61.1	60	////	02 08	03 18	19 27	19 59	20 24	20 43
07	283 23.9	25.2	125 59.8	3.6	19 08.6	4.2	61.1	N 58	////	02 34	03 33	19 14	19 50	20 17	20 39
08	298 23.9	24.7	140 22.4	3.7	19 04.4	4.3	61.1	56	01 24	02 53	03 46	19 04	19 42	20 11	20 36
S 09	313 23.8	. . 24.2	154 45.1	3.7	19 00.1	4.5	61.1	54	01 57	03 10	03 57	18 54	19 34	20 06	20 33
U 10	328 23.8	23.7	169 07.8	3.8	18 55.6	4.6	61.2	52	02 21	03 23	04 07	18 46	19 28	20 02	20 30
N 11	343 23.8	23.2	183 30.6	3.7	18 51.0	4.7	61.2	50	02 40	03 35	04 16	18 38	19 22	19 57	20 28
D 12	358 23.7	N20 22.7	197 53.3	3.8	S18 46.3	4.9	61.2	45	03 14	03 59	04 34	18 22	19 08	19 48	20 23
A 13	13 23.7	22.2	212 16.1	3.8	18 41.4	5.0	61.2	N 40	03 39	04 18	04 49	18 09	18 58	19 40	20 18
Y 14	28 23.7	21.7	226 38.9	3.9	18 36.4	5.2	61.2	35	03 59	04 34	05 02	17 58	18 48	19 34	20 14
15	43 23.7	. . 21.3	241 01.8	3.9	18 31.2	5.3	61.2	30	04 15	04 47	05 13	17 48	18 40	19 28	20 11
16	58 23.6	20.8	255 24.7	3.9	18 25.9	5.4	61.2	20	04 40	05 08	05 32	17 31	18 26	19 18	20 05
17	73 23.6	20.3	269 47.6	4.0	18 20.5	5.6	61.2	N 10	04 59	05 25	05 48	17 16	18 14	19 09	20 00
18	88 23.6	N20 19.8	284 10.6	4.0	S18 14.9	5.7	61.2	0	05 15	05 41	06 03	17 02	18 02	19 00	19 55
19	103 23.6	19.3	298 33.6	4.0	18 09.2	5.8	61.2	S 10	05 30	05 55	06 18	16 48	17 51	18 52	19 50
20	118 23.5	18.8	312 56.6	4.1	18 03.4	6.0	61.2	20	05 43	06 10	06 33	16 33	17 38	18 43	19 45
21	133 23.5	. . 18.3	327 19.7	4.2	17 57.4	6.1	61.2	30	05 57	06 26	06 51	16 16	17 24	18 32	19 39
22	148 23.5	17.8	341 42.9	4.2	17 51.3	6.3	61.2	35	06 04	06 34	07 02	16 06	17 16	18 27	19 35
23	163 23.5	17.3	356 06.1	4.2	17 45.0	6.3	61.2	40	06 11	06 44	07 14	15 54	17 06	18 20	19 32
22 00	178 23.4	N20 16.8	10 29.3	4.3	S17 38.7	6.5	61.2	45	06 19	06 55	07 28	15 41	16 55	18 12	19 27
01	193 23.4	16.3	24 52.6	4.3	17 32.2	6.6	61.2	S 50	06 28	07 08	07 44	15 24	16 42	18 02	19 22
02	208 23.4	15.8	39 15.9	4.4	17 25.6	6.8	61.2	52	06 32	07 14	07 52	15 16	16 36	17 58	19 19
03	223 23.4	. . 15.3	53 39.3	4.4	17 18.8	6.9	61.2	54	06 36	07 20	08 01	15 08	16 29	17 53	19 16
04	238 23.3	14.8	68 02.7	4.5	17 11.9	7.0	61.2	56	06 41	07 28	08 11	14 58	16 21	17 47	19 13
05	253 23.3	14.3	82 26.2	4.5	17 04.9	7.1	61.2	58	06 46	07 36	08 23	14 47	16 12	17 41	19 10
06	268 23.3	N20 13.8	96 49.7	4.6	S16 57.8	7.2	61.2	S 60	06 51	07 45	08 36	14 34	16 02	17 34	19 06
07	283 23.3	13.3	111 13.3	4.6	16 50.6	7.4	61.2								
08	298 23.3	12.8	125 36.9	4.8	16 43.2	7.5	61.1								
M 09	313 23.2	. . 12.3	140 00.7	4.7	16 35.7	7.6	61.1								
O 10	328 23.2	11.8	154 24.4	4.8	16 28.1	7.7	61.1								
N 11	343 23.2	11.3	168 48.2	4.9	16 20.4	7.8	61.1								
D 12	358 23.2	N20 10.8	183 12.1	5.0	S16 12.6	7.9	61.1								
A 13	13 23.2	10.3	197 36.1	5.0	16 04.7	8.1	61.1								
Y 14	28 23.1	09.8	212 00.1	5.1	15 56.6	8.2	61.1								
15	43 23.1	. . 09.3	226 24.2	5.1	15 48.4	8.2	61.1								
16	58 23.1	08.8	240 48.3	5.2	15 40.2	8.4	61.1								
17	73 23.1	08.3	255 12.5	5.3	15 31.8	8.5	61.1								
18	88 23.1	N20 07.8	269 36.8	5.3	S15 23.3	8.6	61.1								
19	103 23.0	07.3	284 01.1	5.4	15 14.7	8.7	61.0								
20	118 23.0	06.8	298 25.5	5.5	15 06.0	8.8	61.0								
21	133 23.0	. . 06.3	312 50.0	5.5	14 57.2	8.9	61.0								
22	148 23.0	05.8	327 14.5	5.6	14 48.3	9.0	61.0								
23	163 23.0	05.3	341 39.1	5.7	14 39.3	9.1	61.0								
23 00	178 22.9	N20 04.7	356 03.8	5.8	S14 30.2	9.2	61.0								
01	193 22.9	04.2	10 28.6	5.8	14 21.0	9.2	61.0								
02	208 22.9	03.7	24 53.4	5.9	14 11.8	9.4	60.9								
03	223 22.9	. . 03.2	39 18.3	6.0	14 02.4	9.5	60.9								
04	238 22.9	02.7	53 43.3	6.0	13 52.9	9.5	60.9								
05	253 22.9	02.2	68 08.3	6.1	13 43.4	9.7	60.9								
06	268 22.8	N20 01.7	82 33.4	6.2	S13 33.7	9.7	60.9								
07	283 22.8	01.2	96 58.6	6.2	13 24.0	9.8	60.9								
T 08	298 22.8	00.6	111 23.8	6.4	13 14.2	9.9	60.8								
U 09	313 22.8	20 00.1	125 49.2	6.4	13 04.3	10.0	60.8								
E 10	328 22.8	19 59.6	140 14.6	6.5	12 54.3	10.0	60.8								
S 11	343 22.8	59.1	154 40.1	6.5	12 44.3	10.2	60.8								
D 12	358 22.7	N19 58.6	169 05.6	6.7	S12 34.1	10.2	60.8								
A 13	13 22.7	58.1	183 31.3	6.7	12 23.9	10.3	60.7								
Y 14	28 22.7	57.5	197 57.0	6.7	12 13.6	10.3	60.7								
15	43 22.7	. . 57.0	212 22.7	6.9	12 03.3	10.4	60.7								
16	58 22.7	56.5	226 48.6	6.9	11 52.9	10.5	60.7								
17	73 22.7	56.0	241 14.5	7.0	11 42.4	10.6	60.6								
18	88 22.7	N19 55.5	255 40.5	7.1	S11 31.8	10.6	60.6								
19	103 22.7	54.9	270 06.6	7.2	11 21.2	10.7	60.6								
20	118 22.6	54.4	284 32.8	7.2	11 10.5	10.8	60.6								
21	133 22.6	. . 53.9	298 59.0	7.3	10 59.7	10.8	60.6								
22	148 22.6	53.4	313 25.3	7.4	10 48.9	10.9	60.5								
23	163 22.6	52.9	327 51.7	7.4	S10 38.0	11.0	60.5								
	SD 15.8	d 0.5	SD	16.7		16.7		16.6							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 21	Moonset 22	Moonset 23	Moonset 24
°	h m	h m	h m	h m	h m	h m	h m
N 72				23 49	26 58	02 58	05 16
N 70				25 17	01 17	03 29	05 32
68	22 51	////	////	00 09	01 56	03 51	05 45
66	22 04	////	////	00 46	02 23	04 09	05 55
64	21 34	////	////	01 13	02 43	04 23	06 04
62	21 11	22 37	////	01 34	03 00	04 35	06 11
60	20 53	22 02	////	01 50	03 14	04 45	06 18
N 58	20 38	21 37	////	02 04	03 26	04 54	06 23
56	20 26	21 18	22 45	02 16	03 36	05 01	06 28
54	20 15	21 02	22 13	02 27	03 45	05 08	06 32
52	20 05	20 48	21 50	02 36	03 53	05 14	06 36
50	19 56	20 37	21 32	02 45	04 00	05 20	06 40
45	19 38	20 13	20 58	03 03	04 15	05 31	06 48
N 40	19 23	19 54	20 33	03 17	04 28	05 41	06 54
35	19 10	19 39	20 14	03 29	04 39	05 50	07 00
30	19 00	19 26	19 58	03 40	04 48	05 57	07 04
20	18 41	19 05	19 33	03 58	05 04	06 09	07 13
N 10	18 25	18 47	19 14	04 14	05 18	06 20	07 20
0	18 10	18 32	18 58	04 29	05 31	06 30	07 27
S 10	17 55	18 18	18 43	04 44	05 44	06 40	07 33
20	17 40	18 03	18 30	04 59	05 57	06 51	07 40
30	17 22	17 47	18 17	05 17	06 13	07 03	07 48
35	17 11	17 39	18 10	05 28	06 22	07 10	07 53
40	17 00	17 29	18 02	05 40	06 32	07 18	07 58
45	16 46	17 18	17 54	05 54	06 44	07 27	08 04
S 50	16 29	17 05	17 45	06 11	06 58	07 38	08 11
52	16 21	16 59	17 41	06 19	07 05	07 43	08 14
54	16 12	16 53	17 37	06 28	07 13	07 48	08 18
56	16 02	16 46	17 33	06 38	07 21	07 55	08 22
58	15 51	16 38	17 28	06 49	07 30	08 01	08 26
S 60	15 38	16 29	17 22	07 02	07 41	08 09	08 31

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
21	06 24	06 25	12 06	23 16	10 45	13	97
22	06 26	06 27	12 06	24 16	11 47	14	100
23	06 28	06 29	12 06	00 16	12 45	15	99

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
24 00	301 53.0	147 33.0	N12 16.2	204 11.6	N23 52.3	205 03.9	N23 06.7	88 19.4	S10 55.6
01	316 55.4	162 32.6	15.1	219 12.3	52.2	220 05.8	06.6	103 21.8	55.6
02	331 57.9	177 32.3	14.0	234 12.9	52.2	235 07.7	06.6	118 24.2	55.6
03	347 00.3	192 31.9	12.9	249 13.5	52.1	250 09.6	06.6	133 26.6	55.7
04	2 02.8	207 31.5	11.8	264 14.2	52.0	265 11.4	06.6	148 29.0	55.7
05	17 05.3	222 31.1	10.6	279 14.8	52.0	280 13.3	06.5	163 31.4	55.7
06	32 07.7	237 30.7	N12 09.5	294 15.4	N23 51.9	295 15.2	N23 06.5	178 33.8	S10 55.8
W 07	47 10.2	252 30.3	08.4	309 16.1	51.8	310 17.1	06.5	193 36.2	55.8
E 08	62 12.7	267 29.9	07.3	324 16.7	51.8	325 18.9	06.5	208 38.6	55.8
D 09	77 15.1	282 29.6	06.1	339 17.4	51.7	340 20.8	06.5	223 41.0	55.9
N 10	92 17.6	297 29.2	05.0	354 18.0	51.6	355 22.7	06.4	238 43.4	55.9
E 11	107 20.1	312 28.8	03.9	9 18.6	51.6	10 24.6	06.4	253 45.8	55.9
S 12	122 22.5	327 28.4	N12 02.8	24 19.3	N23 51.5	25 26.4	N23 06.4	268 48.3	S10 56.0
D 13	137 25.0	342 28.0	01.6	39 19.9	51.4	40 28.3	06.4	283 50.7	56.0
A 14	152 27.5	357 27.7	12 00.5	54 20.6	51.3	55 30.2	06.3	298 53.1	56.0
Y 15	167 29.9	12 27.3	11 59.4	69 21.2	51.3	70 32.1	06.3	313 55.5	56.1
16	182 32.4	27 26.9	58.2	84 21.8	51.2	85 33.9	06.3	328 57.9	56.1
17	197 34.8	42 26.5	57.1	99 22.5	51.1	100 35.8	06.3	344 00.3	56.1
18	212 37.3	57 26.1	N11 56.0	114 23.1	N23 51.1	115 37.7	N23 06.3	359 02.7	S10 56.2
19	227 39.8	72 25.8	54.9	129 23.8	51.0	130 39.6	06.2	14 05.1	56.2
20	242 42.2	87 25.4	53.7	144 24.4	50.9	145 41.4	06.2	29 07.5	56.2
21	257 44.7	102 25.0	52.6	159 25.0	50.9	160 43.3	06.2	44 09.9	56.3
22	272 47.2	117 24.6	51.5	174 25.7	50.8	175 45.2	06.2	59 12.3	56.3
23	287 49.6	132 24.3	50.3	189 26.3	50.7	190 47.1	06.1	74 14.7	56.3
25 00	302 52.1	147 23.9	N11 49.2	204 27.0	N23 50.6	205 48.9	N23 06.1	89 17.1	S10 56.4
01	317 54.6	162 23.5	48.1	219 27.6	50.6	220 50.8	06.1	104 19.5	56.4
02	332 57.0	177 23.1	46.9	234 28.2	50.5	235 52.7	06.1	119 21.9	56.4
03	347 59.5	192 22.8	45.8	249 28.9	50.4	250 54.6	06.1	134 24.3	56.5
04	3 01.9	207 22.4	44.7	264 29.5	50.4	265 56.4	06.0	149 26.7	56.5
05	18 04.4	222 22.0	43.5	279 30.2	50.3	280 58.3	06.0	164 29.1	56.5
06	33 06.9	237 21.6	N11 42.4	294 30.8	N23 50.2	296 00.2	N23 06.0	179 31.5	S10 56.6
T 07	48 09.3	252 21.3	41.3	309 31.4	50.1	311 02.1	06.0	194 33.9	56.6
H 08	63 11.8	267 20.9	40.1	324 32.1	50.1	326 03.9	05.9	209 36.3	56.6
U 09	78 14.3	282 20.5	39.0	339 32.7	50.0	341 05.8	05.9	224 38.7	56.7
R 10	93 16.7	297 20.2	37.9	354 33.4	49.9	356 07.7	05.9	239 41.1	56.7
S 11	108 19.2	312 19.8	36.7	9 34.0	49.8	11 09.6	05.9	254 43.5	56.7
D 12	123 21.7	327 19.4	N11 35.6	24 34.6	N23 49.7	26 11.5	N23 05.8	269 45.9	S10 56.8
A 13	138 24.1	342 19.0	34.4	39 35.3	49.7	41 13.3	05.8	284 48.3	56.8
Y 14	153 26.6	357 18.7	33.3	54 35.9	49.6	56 15.2	05.8	299 50.7	56.8
15	168 29.1	12 18.3	32.2	69 36.6	49.5	71 17.1	05.8	314 53.1	56.9
16	183 31.5	27 17.9	31.0	84 37.2	49.4	86 19.0	05.8	329 55.5	56.9
17	198 34.0	42 17.6	29.9	99 37.9	49.4	101 20.8	05.7	344 57.9	56.9
18	213 36.4	57 17.2	N11 28.7	114 38.5	N23 49.3	116 22.7	N23 05.7	0 00.3	S10 57.0
19	228 38.9	72 16.8	27.6	129 39.1	49.2	131 24.6	05.7	15 02.7	57.0
20	243 41.4	87 16.5	26.4	144 39.8	49.1	146 26.5	05.7	30 05.1	57.0
21	258 43.8	102 16.1	25.3	159 40.4	49.0	161 28.3	05.6	45 07.5	57.1
22	273 46.3	117 15.7	24.2	174 41.1	49.0	176 30.2	05.6	60 09.9	57.1
23	288 48.8	132 15.4	23.0	189 41.7	48.9	191 32.1	05.6	75 12.3	57.1
26 00	303 51.2	147 15.0	N11 21.9	204 42.4	N23 48.8	206 34.0	N23 05.6	90 14.7	S10 57.2
01	318 53.7	162 14.6	20.7	219 43.0	48.7	221 35.9	05.5	105 17.1	57.2
02	333 56.2	177 14.3	19.6	234 43.6	48.6	236 37.7	05.5	120 19.5	57.2
03	348 58.6	192 13.9	18.4	249 44.3	48.6	251 39.6	05.5	135 21.9	57.3
04	4 01.1	207 13.6	17.3	264 44.9	48.5	266 41.5	05.5	150 24.3	57.3
05	19 03.6	222 13.2	16.1	279 45.6	48.4	281 43.4	05.4	165 26.7	57.3
06	34 06.0	237 12.8	N11 15.0	294 46.2	N23 48.3	296 45.3	N23 05.4	180 29.1	S10 57.4
F 07	49 08.5	252 12.5	13.8	309 46.9	48.2	311 47.1	05.4	195 31.5	57.4
R 08	64 10.9	267 12.1	12.7	324 47.5	48.1	326 49.0	05.4	210 33.9	57.4
I 09	79 13.4	282 11.7	11.6	339 48.1	48.1	341 50.9	05.3	225 36.3	57.5
D 10	94 15.9	297 11.4	10.4	354 48.8	48.0	356 52.8	05.3	240 38.7	57.5
A 11	109 18.3	312 11.0	09.3	9 49.4	47.9	11 54.6	05.3	255 41.1	57.5
Y 12	124 20.8	327 10.7	N11 08.1	24 50.1	N23 47.8	26 56.5	N23 05.3	270 43.5	S10 57.6
13	139 23.3	342 10.3	07.0	39 50.7	47.7	41 58.4	05.3	285 45.9	57.6
14	154 25.7	357 10.0	05.8	54 51.4	47.6	57 00.3	05.2	300 48.3	57.6
15	169 28.2	12 09.6	04.6	69 52.0	47.6	72 02.2	05.2	315 50.7	57.7
16	184 30.7	27 09.2	03.5	84 52.7	47.5	87 04.0	05.2	330 53.1	57.7
17	199 33.1	42 08.9	02.3	99 53.3	47.4	102 05.9	05.2	345 55.5	57.8
18	214 35.6	57 08.5	N11 01.2	114 53.9	N23 47.3	117 07.8	N23 05.1	0 57.9	S10 57.8
19	229 38.0	72 08.2	11 00.0	129 54.6	47.2	132 09.7	05.1	16 00.2	57.8
20	244 40.5	87 07.8	10 58.9	144 55.2	47.1	147 11.6	05.1	31 02.6	57.9
21	259 43.0	102 07.5	57.7	159 55.9	47.0	162 13.4	05.1	46 05.0	57.9
22	274 45.4	117 07.1	56.6	174 56.5	46.9	177 15.3	05.0	61 07.4	57.9
23	289 47.9	132 06.8	55.4	189 57.2	46.9	192 17.2	05.0	76 09.8	58.0
	h m								
Mer.Pass.	3 47.9	v −0.4	d 1.1	v 0.6	d 0.1	v 1.9	d 0.0	v 2.4	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.4	S40 14.8
Achernar	335 26.7	S57 09.7
Acrux	173 09.4	S63 10.8
Adhara	255 12.8	S28 59.5
Aldebaran	290 49.5	N16 32.1
Alioth	166 20.8	N55 53.4
Alkaid	152 58.9	N49 15.0
Al Na'ir	27 43.2	S46 53.4
Alnilam	275 46.5	S 1 11.7
Alphard	217 56.3	S 8 43.2
Alphecca	126 10.8	N26 40.4
Alpheratz	357 43.2	N29 09.9
Altair	62 07.8	N 8 54.5
Ankaa	353 15.4	S42 13.6
Antares	112 25.9	S26 27.6
Arcturus	145 55.6	N19 06.9
Atria	107 27.2	S69 03.2
Avior	234 18.6	S59 33.3
Bellatrix	278 32.2	N 6 21.6
Betelgeuse	271 01.5	N 7 24.4
Canopus	263 56.6	S52 42.2
Capella	280 34.6	N46 00.4
Deneb	49 30.9	N45 19.9
Denebola	182 33.8	N14 29.8
Diphda	348 55.7	S17 54.5
Dubhe	193 52.1	N61 40.8
Elnath	278 12.8	N28 36.9
Eltanin	90 45.6	N51 29.6
Enif	33 46.7	N 9 56.4
Fomalhaut	15 23.6	S29 32.7
Gacrux	172 00.9	S57 11.6
Gienah	175 52.3	S17 37.1
Hadar	148 47.7	S60 26.5
Hamal	328 00.6	N23 31.5
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 19.9	N74 06.3
Markab	13 38.0	N15 16.8
Menkar	314 15.0	N 4 08.6
Menkent	148 07.4	S36 26.3
Miaplacidus	221 40.5	S69 46.6
Mirfak	308 40.3	N49 54.3
Nunki	75 57.8	S26 16.6
Peacock	53 18.5	S56 41.2
Pollux	243 28.0	N27 59.5
Procyon	245 00.0	N 5 11.3
Rasalhague	96 06.1	N12 33.3
Regulus	207 43.7	N11 54.0
Rigel	281 12.2	S 8 11.2
Rigil Kent.	139 51.4	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 40.1	N56 36.5
Shaula	96 21.4	S37 06.7
Sirius	258 33.9	S16 44.2
Spica	158 31.2	S11 13.9
Suhail	222 52.8	S43 29.4
Vega	80 38.5	N38 48.1
Zuben'ubi	137 05.2	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	204 31.8	14 11
Mars	261 34.9	10 22
Jupiter	262 56.8	10 15
Saturn	146 25.0	18 00

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 24	Moonrise 25	Moonrise 26	Moonrise 27
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
24 00	178 22.6	N19 52.3	342 18.1	7.6	S10 27.0	11.0	60.5	N 72				21 20	21 09	20 58	20 48
01	193 22.6	51.8	356 44.7	7.6	10 16.0	11.0	60.4	N 70				21 11	21 07	21 02	20 58
02	208 22.6	51.3	11 11.3	7.7	10 05.0	11.1	60.4	68	////	////	01 36	21 03	21 05	21 06	21 07
03	223 22.6	50.8	25 38.0	7.7	9 53.9	11.2	60.4	66	////	////	02 18	20 57	21 03	21 08	21 14
04	238 22.5	50.2	40 04.7	7.9	9 42.7	11.2	60.4	64	////	00 46	02 46	20 52	21 02	21 11	21 20
05	253 22.5	49.7	54 31.6	7.9	9 31.5	11.2	60.3	62	////	01 46	03 08	20 47	21 00	21 13	21 25
06	268 22.5	N19 49.2	68 58.5	7.9	S 9 20.3	11.4	60.3	60	////	02 18	03 25	20 43	20 59	21 15	21 30
W 07	283 22.5	48.7	83 25.4	8.1	9 08.9	11.3	60.3	N 58	00 42	02 41	03 39	20 39	20 58	21 16	21 34
E 08	298 22.5	48.1	97 52.5	8.1	8 57.6	11.4	60.3	56	01 36	03 00	03 51	20 36	20 57	21 18	21 38
D 09	313 22.5	47.6	112 19.6	8.2	8 46.2	11.4	60.2	54	02 06	03 15	04 02	20 33	20 57	21 19	21 41
N 10	328 22.5	47.1	126 46.8	8.3	8 34.8	11.5	60.2	52	02 28	03 28	04 11	20 30	20 56	21 20	21 44
E 11	343 22.5	46.5	141 14.1	8.3	8 23.3	11.5	60.2	50	02 46	03 40	04 20	20 28	20 55	21 21	21 47
S 12	358 22.5	N19 46.0	155 41.4	8.4	S 8 11.8	11.6	60.1	45	03 19	04 03	04 38	20 23	20 54	21 24	21 53
D 13	13 22.5	45.5	170 08.8	8.5	8 00.2	11.6	60.1	N 40	03 43	04 21	04 52	20 18	20 53	21 26	21 58
A 14	28 22.5	44.9	184 36.3	8.6	7 48.6	11.6	60.1	35	04 01	04 36	05 04	20 14	20 52	21 27	22 02
Y 15	43 22.4	44.4	199 03.9	8.6	7 37.0	11.7	60.0	30	04 17	04 48	05 15	20 11	20 51	21 29	22 06
16	58 22.4	43.9	213 31.5	8.7	7 25.3	11.7	60.0	20	04 41	05 09	05 33	20 05	20 49	21 32	22 13
17	73 22.4	43.3	227 59.2	8.7	7 13.6	11.7	60.0	N 10	05 00	05 26	05 49	20 00	20 48	21 34	22 19
18	88 22.4	N19 42.8	242 26.9	8.9	S 7 01.9	11.7	59.9	0	05 16	05 41	06 03	19 55	20 47	21 36	22 25
19	103 22.4	42.3	256 54.8	8.9	6 50.2	11.8	59.9	S 10	05 29	05 55	06 17	19 50	20 46	21 39	22 30
20	118 22.4	41.7	271 22.7	8.9	6 38.4	11.8	59.9	20	05 42	06 09	06 33	19 45	20 44	21 41	22 36
21	133 22.4	41.2	285 50.6	9.1	6 26.6	11.8	59.8	30	05 55	06 24	06 50	19 39	20 43	21 44	22 43
22	148 22.4	40.7	300 18.7	9.1	6 14.8	11.9	59.8	35	06 02	06 33	07 00	19 35	20 42	21 46	22 47
23	163 22.4	40.1	314 46.8	9.1	6 02.9	11.9	59.8	40	06 09	06 42	07 11	19 32	20 41	21 48	22 52
25 00	178 22.4	N19 39.6	329 14.9	9.3	S 5 51.0	11.9	59.7	45	06 17	06 52	07 25	19 27	20 40	21 50	22 57
01	193 22.4	39.1	343 43.2	9.3	5 39.1	11.9	59.7	S 50	06 25	07 05	07 41	19 22	20 39	21 53	23 04
02	208 22.4	38.5	358 11.5	9.3	5 27.2	11.9	59.7	52	06 29	07 10	07 48	19 19	20 38	21 54	23 07
03	223 22.4	38.0	12 39.8	9.5	5 15.3	11.9	59.6	54	06 33	07 17	07 57	19 16	20 37	21 55	23 10
04	238 22.4	37.4	27 08.3	9.5	5 03.4	12.0	59.6	56	06 37	07 23	08 06	19 13	20 37	21 57	23 14
05	253 22.4	36.9	41 36.8	9.5	4 51.4	12.0	59.6	58	06 42	07 31	08 17	19 10	20 36	21 58	23 18
06	268 22.4	N19 36.4	56 05.3	9.6	S 4 39.4	11.9	59.5	S 60	06 47	07 39	08 30	19 06	20 35	22 00	23 22
T 07	283 22.4	35.8	70 33.9	9.7	4 27.5	12.0	59.5								
H 08	298 22.3	35.3	85 02.6	9.7	4 15.5	12.0	59.5								
U 09	313 22.3	34.7	99 31.3	9.8	4 03.5	12.0	59.4								
R 10	328 22.3	34.2	114 00.1	9.9	3 51.5	12.1	59.4								
S 11	343 22.3	33.6	128 29.0	9.9	3 39.4	12.0	59.3								
D 12	358 22.3	N19 33.1	142 57.9	10.0	S 3 27.4	12.0	59.3								
A 13	13 22.3	32.6	157 26.9	10.0	3 15.4	12.0	59.3								
Y 14	28 22.3	32.0	171 55.9	10.1	3 03.4	12.0	59.2								
15	43 22.3	31.5	186 25.0	10.2	2 51.4	12.1	59.2								
16	58 22.3	30.9	200 54.2	10.2	2 39.3	12.0	59.2								
17	73 22.3	30.4	215 23.4	10.2	2 27.3	12.0	59.1								
18	88 22.3	N19 29.8	229 52.6	10.3	S 2 15.3	12.0	59.1								
19	103 22.3	29.3	244 21.9	10.4	2 03.3	12.0	59.0								
20	118 22.3	28.7	258 51.3	10.4	1 51.3	12.0	59.0								
21	133 22.3	28.2	273 20.7	10.5	1 39.3	12.0	59.0								
22	148 22.3	27.6	287 50.2	10.5	1 27.3	12.0	58.9								
23	163 22.3	27.1	302 19.7	10.6	1 15.3	12.0	58.9								
26 00	178 22.3	N19 26.5	316 49.3	10.6	S 1 03.3	12.0	58.9								
01	193 22.3	26.0	331 18.9	10.7	0 51.3	11.9	58.8								
02	208 22.3	25.4	345 48.6	10.7	0 39.4	12.0	58.8								
03	223 22.3	24.9	0 18.3	10.7	0 27.4	11.9	58.7								
04	238 22.3	24.3	14 48.0	10.9	0 15.5	11.9	58.7								
05	253 22.3	23.8	29 17.9	10.8	S 0 03.6	11.9	58.7								
06	268 22.3	N19 23.2	43 47.7	10.9	N 0 08.3	11.9	58.6								
F 07	283 22.3	22.7	58 17.6	11.0	0 20.2	11.8	58.6								
R 08	298 22.3	22.1	72 47.6	11.0	0 32.0	11.9	58.5								
I 09	313 22.3	21.5	87 17.6	11.0	0 43.9	11.8	58.5								
D 10	328 22.3	21.0	101 47.6	11.1	0 55.7	11.8	58.5								
A 11	343 22.3	20.4	116 17.7	11.1	1 07.5	11.7	58.4								
Y 12	358 22.3	N19 19.9	130 47.8	11.2	N 1 19.2	11.8	58.4								
13	13 22.4	19.3	145 18.0	11.2	1 31.0	11.7	58.3								
14	28 22.4	18.8	159 48.2	11.2	1 42.7	11.7	58.3								
15	43 22.4	18.2	174 18.4	11.3	1 54.4	11.7	58.3								
16	58 22.4	17.6	188 48.7	11.3	2 06.1	11.6	58.2								
17	73 22.4	17.1	203 19.0	11.4	2 17.7	11.6	58.2								
18	88 22.4	N19 16.5	217 49.4	11.3	N 2 29.3	11.6	58.1								
19	103 22.4	16.0	232 19.7	11.5	2 40.9	11.6	58.1								
20	118 22.4	15.4	246 50.2	11.4	2 52.5	11.5	58.1								
21	133 22.4	14.8	261 20.6	11.5	3 04.0	11.5	58.0								
22	148 22.4	14.3	275 51.1	11.6	3 15.5	11.4	58.0								
23	163 22.4	13.7	290 21.7	11.5	N 3 26.9	11.4	57.9								
	SD 15.8	d 0.5	SD	16.4		16.2		15.9							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 24	Moonset 25	Moonset 26	Moonset 27
°	h m	h m	h m	h m	h m	h m	h m
N 72				05 16	07 22	09 19	11 13
N 70				05 32	07 28	09 18	11 04
68	22 32	////	////	05 45	07 34	09 18	10 57
66	21 52	////	////	05 55	07 38	09 17	10 52
64	21 24	23 17	////	06 04	07 42	09 17	10 47
62	21 03	22 23	////	06 11	07 45	09 16	10 43
60	20 47	21 52	////	06 18	07 48	09 16	10 40
N 58	20 33	21 30	23 22	06 23	07 51	09 15	10 36
56	20 20	21 12	22 33	06 28	07 53	09 15	10 34
54	20 10	20 56	22 04	06 32	07 55	09 15	10 31
52	20 01	20 43	21 43	06 36	07 57	09 14	10 29
50	19 52	20 32	21 26	06 40	07 58	09 14	10 27
45	19 35	20 09	20 53	06 48	08 02	09 14	10 22
N 40	19 20	19 51	20 30	06 54	08 05	09 13	10 19
35	19 08	19 37	20 11	07 00	08 07	09 13	10 16
30	18 58	19 24	19 56	07 04	08 10	09 12	10 13
20	18 40	19 04	19 32	07 13	08 13	09 12	10 08
N 10	18 24	18 47	19 13	07 20	08 17	09 11	10 04
0	18 10	18 32	18 57	07 27	08 20	09 11	09 59
S 10	17 56	18 18	18 44	07 33	08 23	09 10	09 55
20	17 41	18 04	18 31	07 40	08 26	09 09	09 51
30	17 23	17 49	18 18	07 48	08 30	09 09	09 46
35	17 14	17 41	18 11	07 53	08 32	09 08	09 44
40	17 02	17 31	18 04	07 58	08 34	09 08	09 40
45	16 49	17 21	17 57	08 04	08 37	09 07	09 37
S 50	16 33	17 09	17 48	08 11	08 40	09 07	09 32
52	16 25	17 03	17 45	08 14	08 41	09 06	09 30
54	16 17	16 57	17 41	08 18	08 43	09 06	09 28
56	16 07	16 50	17 36	08 22	08 45	09 06	09 26
58	15 56	16 43	17 32	08 26	08 47	09 05	09 23
S 60	15 44	16 34	17 27	08 31	08 49	09 05	09 20

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
24	06 30	06 30	12 07	01 14	13 41	16	95
25	06 30	06 31	12 07	02 07	14 33	17	89
26	06 31	06 31	12 07	02 59	15 24	18	82

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
27 00	304 50.4	147 06.4	N10 54.3	204 57.8	N23 46.8	207 19.1	N23 05.0	91 12.2	S10 58.0	Acamar	315 18.4	S40 14.8
01	319 52.8	162 06.0	53.1	219 58.5	46.7	222 21.0	05.0	106 14.6	58.0	Achernar	335 26.7	S57 09.7
02	334 55.3	177 05.7	51.9	234 59.1	46.6	237 22.8	04.9	121 17.0	58.1	Acrux	173 09.4	S63 10.8
03	349 57.8	192 05.3 . .	50.8	249 59.8 . .	46.5	252 24.7 . .	04.9	136 19.4 . .	58.1	Adhara	255 12.8	S28 59.5
04	5 00.2	207 05.0	49.6	265 00.4	46.4	267 26.6	04.9	151 21.8	58.1	Aldebaran	290 49.5	N16 32.1
05	20 02.7	222 04.6	48.5	280 01.1	46.3	282 28.5	04.9	166 24.2	58.2			
06	35 05.2	237 04.3	N10 47.3	295 01.7	N23 46.2	297 30.4	N23 04.8	181 26.6	S10 58.2	Alioth	166 20.9	N55 53.4
07	50 07.6	252 03.9	46.2	310 02.3	46.1	312 32.2	04.8	196 29.0	58.3	Alkaid	152 58.9	N49 15.0
S 08	65 10.1	267 03.6	45.0	325 03.0	46.0	327 34.1	04.8	211 31.4	58.3	Al Na'ir	27 43.2	S46 53.4
A 09	80 12.5	282 03.2 . .	43.8	340 03.6 . .	46.0	342 36.0 . .	04.8	226 33.8 . .	58.3	Alnilam	275 46.5	S 1 11.7
T 10	95 15.0	297 02.9	42.7	355 04.3	45.9	357 37.9	04.7	241 36.2	58.4	Alphard	217 56.3	S 8 43.2
U 11	110 17.5	312 02.5	41.5	10 04.9	45.8	12 39.8	04.7	256 38.6	58.4			
R 12	125 19.9	327 02.2	N10 40.4	25 05.6	N23 45.7	27 41.6	N23 04.7	271 40.9	S10 58.4	Alphecca	126 10.8	N26 40.4
D 13	140 22.4	342 01.8	39.2	40 06.2	45.6	42 43.5	04.7	286 43.3	58.5	Alpheratz	357 43.2	N29 09.9
A 14	155 24.9	357 01.5	38.0	55 06.9	45.5	57 45.4	04.6	301 45.7	58.5	Altair	62 07.8	N 8 54.5
Y 15	170 27.3	12 01.1 . .	36.9	70 07.5 . .	45.4	72 47.3 . .	04.6	316 48.1 . .	58.5	Ankaa	353 15.4	S42 13.6
16	185 29.8	27 00.8	35.7	85 08.2	45.3	87 49.2	04.6	331 50.5	58.6	Antares	112 25.9	S26 27.6
17	200 32.3	42 00.5	34.5	100 08.8	45.2	102 51.1	04.6	346 52.9	58.6			
18	215 34.7	57 00.1	N10 33.4	115 09.5	N23 45.1	117 52.9	N23 04.5	1 55.3	S10 58.7	Arcturus	145 55.6	N19 06.9
19	230 37.2	71 59.8	32.2	130 10.1	45.0	132 54.8	04.5	16 57.7	58.7	Atria	107 27.2	S69 03.2
20	245 39.6	86 59.4	31.0	145 10.8	44.9	147 56.7	04.5	32 00.1	58.7	Avior	234 18.6	S59 33.3
21	260 42.1	101 59.1 . .	29.9	160 11.4 . .	44.8	162 58.6 . .	04.5	47 02.5 . .	58.8	Bellatrix	278 32.1	N 6 21.6
22	275 44.6	116 58.7	28.7	175 12.1	44.7	178 00.5	04.4	62 04.9	58.8	Betelgeuse	271 01.5	N 7 24.5
23	290 47.0	131 58.4	27.5	190 12.7	44.6	193 02.3	04.4	77 07.3	58.8			
28 00	305 49.5	146 58.0	N10 26.4	205 13.4	N23 44.5	208 04.2	N23 04.4	92 09.7	S10 58.9	Canopus	263 56.6	S52 42.2
01	320 52.0	161 57.7	25.2	220 14.0	44.4	223 06.1	04.4	107 12.0	58.9	Capella	280 34.6	N46 00.4
02	335 54.4	176 57.4	24.0	235 14.7	44.3	238 08.0	04.3	122 14.4	58.9	Deneb	49 30.9	N45 19.9
03	350 56.9	191 57.0 . .	22.9	250 15.3 . .	44.2	253 09.9 . .	04.3	137 16.8 . .	59.0	Denebola	182 33.8	N14 29.8
04	5 59.4	206 56.7	21.7	265 16.0	44.1	268 11.8	04.3	152 19.2	59.0	Diphda	348 55.7	S17 54.5
05	21 01.8	221 56.3	20.5	280 16.6	44.0	283 13.6	04.3	167 21.6	59.1			
06	36 04.3	236 56.0	N10 19.4	295 17.3	N23 43.9	298 15.5	N23 04.2	182 24.0	S10 59.1	Dubhe	193 52.2	N61 40.8
S 07	51 06.8	251 55.7	18.2	310 17.9	43.8	313 17.4	04.2	197 26.4	59.1	Elnath	278 12.8	N28 36.9
U 08	66 09.2	266 55.3	17.0	325 18.6	43.7	328 19.3	04.2	212 28.8	59.2	Eltanin	90 45.7	N51 29.6
N 09	81 11.7	281 55.0 . .	15.9	340 19.2 . .	43.6	343 21.2 . .	04.2	227 31.2 . .	59.2	Enif	33 46.7	N 9 56.5
D 10	96 14.1	296 54.6	14.7	355 19.9	43.5	358 23.1	04.1	242 33.6	59.2	Fomalhaut	15 23.6	S29 32.7
A 11	111 16.6	311 54.3	13.5	10 20.5	43.4	13 24.9	04.1	257 35.9	59.3			
Y 12	126 19.1	326 54.0	N10 12.3	25 21.2	N23 43.3	28 26.8	N23 04.1	272 38.3	S10 59.3	Gacrux	172 01.0	S57 11.6
13	141 21.5	341 53.6	11.2	40 21.8	43.2	43 28.7	04.1	287 40.7	59.4	Gienah	175 52.3	S17 37.1
14	156 24.0	356 53.3	10.0	55 22.5	43.1	58 30.6	04.0	302 43.1	59.4	Hadar	148 47.7	S60 26.5
15	171 26.5	11 53.0 . .	08.8	70 23.1 . .	43.0	73 32.5 . .	04.0	317 45.5 . .	59.4	Hamal	328 00.6	N23 31.5
16	186 28.9	26 52.6	07.6	85 23.8	42.9	88 34.4	04.0	332 47.9	59.5	Kaus Aust.	83 43.3	S34 22.5
17	201 31.4	41 52.3	06.5	100 24.4	42.8	103 36.2	04.0	347 50.3	59.5			
18	216 33.9	56 51.9	N10 05.3	115 25.1	N23 42.7	118 38.1	N23 03.9	2 52.7	S10 59.5	Kochab	137 19.9	N74 06.3
19	231 36.3	71 51.6	04.1	130 25.7	42.6	133 40.0	03.9	17 55.1	59.6	Markab	13 38.0	N15 16.8
20	246 38.8	86 51.3	02.9	145 26.4	42.5	148 41.9	03.9	32 57.4	59.6	Menkar	314 15.0	N 4 08.6
21	261 41.3	101 50.9 . .	01.8	160 27.0 . .	42.4	163 43.8 . .	03.9	47 59.8 . .	59.7	Menkent	148 07.4	S36 26.3
22	276 43.7	116 50.6	10 00.6	175 27.7	42.3	178 45.7	03.8	63 02.2	59.7	Miaplacidus	221 40.5	S69 46.6
23	291 46.2	131 50.3	9 59.4	190 28.3	42.2	193 47.5	03.8	78 04.6	59.7			
29 00	306 48.6	146 49.9	N 9 58.2	205 29.0	N23 42.1	208 49.4	N23 03.8	93 07.0	S10 59.8	Mirfak	308 40.3	N49 54.3
01	321 51.1	161 49.6	57.1	220 29.6	42.0	223 51.3	03.7	108 09.4	59.8	Nunki	75 57.8	S26 16.6
02	336 53.6	176 49.3	55.9	235 30.3	41.9	238 53.2	03.7	123 11.8	59.8	Peacock	53 18.5	S56 41.2
03	351 56.0	191 49.0 . .	54.7	250 31.0 . .	41.8	253 55.1 . .	03.7	138 14.2 . .	59.9	Pollux	243 28.0	N27 59.5
04	6 58.5	206 48.6	53.5	265 31.6	41.7	268 57.0	03.7	153 16.5	10 59.9	Procyon	244 59.9	N 5 11.3
05	22 01.0	221 48.3	52.3	280 32.3	41.6	283 58.8	03.6	168 18.9	11 00.0			
06	37 03.4	236 48.0	N 9 51.2	295 32.9	N23 41.5	299 00.7	N23 03.6	183 21.3	S11 00.0	Rasalhague	96 06.1	N12 33.3
07	52 05.9	251 47.6	50.0	310 33.6	41.4	314 02.6	03.6	198 23.7	00.0	Regulus	207 43.7	N11 54.0
08	67 08.4	266 47.3	48.8	325 34.2	41.2	329 04.5	03.6	213 26.1	00.1	Rigel	281 12.2	S 8 11.2
M 09	82 10.8	281 47.0 . .	47.6	340 34.9 . .	41.1	344 06.4 . .	03.5	228 28.5 . .	00.1	Rigil Kent.	139 51.5	S60 53.6
O 10	97 13.3	296 46.6	46.4	355 35.5	41.0	359 08.3	03.5	243 30.9	00.2	Sabik	102 12.2	S15 44.3
N 11	112 15.7	311 46.3	45.2	10 36.2	40.9	14 10.2	03.5	258 33.2	00.2			
D 12	127 18.2	326 46.0	N 9 44.1	25 36.8	N23 40.8	29 12.0	N23 03.5	273 35.6	S11 00.2	Schedar	349 40.1	N56 36.5
A 13	142 20.7	341 45.7	42.9	40 37.5	40.7	44 13.9	03.4	288 38.0	00.3	Shaula	96 21.4	S37 06.7
Y 14	157 23.1	356 45.3	41.7	55 38.1	40.6	59 15.8	03.4	303 40.4	00.3	Sirius	258 33.9	S16 44.2
15	172 25.6	11 45.0 . .	40.5	70 38.8 . .	40.5	74 17.7 . .	03.4	318 42.8 . .	00.3	Spica	158 31.2	S11 13.9
16	187 28.1	26 44.7	39.3	85 39.5	40.4	89 19.6	03.4	333 45.2	00.4	Suhail	222 52.8	S43 29.4
17	202 30.5	41 44.4	38.1	100 40.1	40.3	104 21.5	03.3	348 47.6	00.4			
18	217 33.0	56 44.0	N 9 37.0	115 40.8	N23 40.2	119 23.4	N23 03.3	3 49.9	S11 00.5	Vega	80 38.5	N38 48.1
19	232 35.5	71 43.7	35.8	130 41.4	40.0	134 25.2	03.3	18 52.3	00.5	Zuben'ubi	137 05.2	S16 05.8
20	247 37.9	86 43.4	34.6	145 42.1	39.9	149 27.1	03.2	33 54.7	00.5		SHA	Mer. Pass.
21	262 40.4	101 43.1 . .	33.4	160 42.7 . .	39.8	164 29.0 . .	03.2	48 57.1 . .	00.6		° ′	h m
22	277 42.9	116 42.7	32.2	175 43.4	39.7	179 30.9	03.2	63 59.5	00.6	Venus	201 08.5	14 12
23	292 45.3	131 42.4	31.0	190 44.0	39.6	194 32.8	03.2	79 01.9	00.7	Mars	259 23.9	10 19
										Jupiter	262 14.7	10 06
Mer. Pass.	h m 3 36.1	v −0.3	d 1.2	v 0.7	d 0.1	v 1.9	d 0.0	v 2.4	d 0.0	Saturn	146 20.1	17 49

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 27	Moonrise 28	Moonrise 29	Moonrise 30
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
27 00	178 22.4	N19 13.1	304 52.2	11.6	N 3 38.3	11.4	57.9	N 72				20 48	20 36	20 21	19 54
01	193 22.4	12.6	319 22.8	11.7	3 49.7	11.4	57.9	N 70	////	////	00 39	20 58	20 54	20 51	20 47
02	208 22.4	12.0	333 53.5	11.6	4 01.1	11.3	57.8	68	////	////	01 54	21 07	21 09	21 13	21 20
03	223 22.4 . .	11.4	348 24.1	11.7	4 12.4	11.3	57.8	66	////	////	02 30	21 14	21 21	21 30	21 44
04	238 22.4	10.9	2 54.8	11.7	4 23.7	11.2	57.7	64	////	01 14	02 56	21 20	21 31	21 45	22 03
05	253 22.4	10.3	17 25.5	11.8	4 34.9	11.2	57.7	62	////	01 59	03 15	21 25	21 40	21 57	22 18
06	268 22.5	N19 09.7	31 56.3	11.7	N 4 46.1	11.1	57.7	60	////	02 28	03 32	21 30	21 47	22 07	22 31
07	283 22.5	09.2	46 27.0	11.8	4 57.2	11.1	57.6	N 58	01 07	02 49	03 45	21 34	21 54	22 16	22 43
S 08	298 22.5	08.6	60 57.8	11.9	5 08.3	11.1	57.6	56	01 48	03 07	03 57	21 38	22 00	22 24	22 52
A 09	313 22.5 . .	08.0	75 28.7	11.8	5 19.4	11.0	57.5	54	02 15	03 21	04 07	21 41	22 05	22 31	23 01
T 10	328 22.5	07.5	89 59.5	11.9	5 30.4	11.0	57.5	52	02 35	03 33	04 16	21 44	22 09	22 37	23 09
U 11	343 22.5	06.9	104 30.4	11.9	5 41.4	11.0	57.5	50	02 52	03 44	04 24	21 47	22 14	22 43	23 16
R 12	358 22.5	N19 06.3	119 01.3	11.9	N 5 52.4	10.9	57.4	45	03 23	04 07	04 41	21 53	22 23	22 56	23 31
D 13	13 22.5	05.7	133 32.2	12.0	6 03.3	10.8	57.4	N 40	03 46	04 24	04 55	21 58	22 31	23 06	23 43
A 14	28 22.5	05.2	148 03.2	12.0	6 14.1	10.8	57.4	35	04 04	04 38	05 06	22 02	22 38	23 15	23 54
Y 15	43 22.5 . .	04.6	162 34.2	12.0	6 24.9	10.8	57.3	30	04 19	04 50	05 17	22 06	22 44	23 23	24 03
16	58 22.5	04.0	177 05.2	12.0	6 35.7	10.7	57.3	20	04 42	05 10	05 34	22 13	22 54	23 36	24 19
17	73 22.6	03.5	191 36.2	12.0	6 46.4	10.6	57.2	N 10	05 01	05 27	05 49	22 19	23 03	23 48	24 33
18	88 22.6	N19 02.9	206 07.2	12.1	N 6 57.0	10.6	57.2	0	05 16	05 41	06 03	22 25	23 12	23 59	24 47
19	103 22.6	02.3	220 38.3	12.1	7 07.6	10.6	57.2	S 10	05 29	05 55	06 17	22 30	23 21	24 10	00 10
20	118 22.6	01.7	235 09.4	12.1	7 18.2	10.5	57.1	20	05 41	06 08	06 31	22 36	23 30	24 23	00 23
21	133 22.6 . .	01.2	249 40.5	12.1	7 28.7	10.5	57.1	30	05 54	06 23	06 48	22 43	23 41	24 36	00 36
22	148 22.6	00.6	264 11.6	12.1	7 39.2	10.4	57.0	35	06 00	06 31	06 58	22 47	23 47	24 44	00 44
23	163 22.6	19 00.0	278 42.7	12.1	7 49.6	10.3	57.0	40	06 07	06 39	07 09	22 52	23 54	24 54	00 54
28 00	178 22.6	N18 59.4	293 13.8	12.2	N 7 59.9	10.3	57.0	45	06 14	06 49	07 21	22 57	24 02	00 02	01 04
01	193 22.7	58.8	307 45.0	12.2	8 10.2	10.3	56.9	S 50	06 22	07 01	07 37	23 04	24 12	00 12	01 18
02	208 22.7	58.3	322 16.2	12.2	8 20.5	10.2	56.9	52	06 25	07 07	07 44	23 07	24 17	00 17	01 24
03	223 22.7 . .	57.7	336 47.4	12.2	8 30.7	10.1	56.9	54	06 29	07 12	07 52	23 10	24 22	00 22	01 31
04	238 22.7	57.1	351 18.6	12.2	8 40.8	10.1	56.8	56	06 33	07 19	08 01	23 14	24 28	00 28	01 38
05	253 22.7	56.5	5 49.8	12.3	8 50.9	10.0	56.8	58	06 37	07 26	08 12	23 18	24 34	00 34	01 47
06	268 22.7	N18 55.9	20 21.1	12.2	N 9 00.9	10.0	56.8	S 60	06 42	07 34	08 23	23 22	24 41	00 41	01 56
07	283 22.7	55.4	34 52.3	12.3	9 10.9	9.9	56.7								
08	298 22.8	54.8	49 23.6	12.2	9 20.8	9.8	56.7								
S 09	313 22.8 . .	54.2	63 54.8	12.3	9 30.6	9.8	56.6								
U 10	328 22.8	53.6	78 26.1	12.3	9 40.4	9.7	56.6								
N 11	343 22.8	53.0	92 57.4	12.3	9 50.1	9.7	56.6								
D 12	358 22.8	N18 52.5	107 28.7	12.3	N 9 59.8	9.6	56.5								
A 13	13 22.8	51.9	122 00.0	12.4	10 09.4	9.5	56.5								
Y 14	28 22.8	51.3	136 31.4	12.3	10 18.9	9.5	56.5								
15	43 22.9 . .	50.7	151 02.7	12.3	10 28.4	9.4	56.4								
16	58 22.9	50.1	165 34.0	12.4	10 37.8	9.4	56.4								
17	73 22.9	49.5	180 05.4	12.3	10 47.2	9.3	56.4								
18	88 22.9	N18 48.9	194 36.7	12.4	N10 56.5	9.2	56.3								
19	103 22.9	48.3	209 08.1	12.3	11 05.7	9.2	56.3								
20	118 22.9	47.8	223 39.4	12.4	11 14.9	9.1	56.3								
21	133 23.0 . .	47.2	238 10.8	12.4	11 24.0	9.0	56.2								
22	148 23.0	46.6	252 42.2	12.4	11 33.0	9.0	56.2								
23	163 23.0	46.0	267 13.6	12.3	11 42.0	8.9	56.2								
29 00	178 23.0	N18 45.4	281 44.9	12.4	N11 50.9	8.8	56.1								
01	193 23.0	44.8	296 16.3	12.4	11 59.7	8.8	56.1								
02	208 23.1	44.2	310 47.7	12.4	12 08.5	8.7	56.1								
03	223 23.1 . .	43.6	325 19.1	12.4	12 17.2	8.6	56.0								
04	238 23.1	43.0	339 50.5	12.4	12 25.8	8.6	56.0								
05	253 23.1	42.4	354 21.9	12.4	12 34.4	8.5	56.0								
06	268 23.1	N18 41.8	8 53.3	12.4	N12 42.9	8.4	55.9								
07	283 23.2	41.3	23 24.7	12.4	12 51.3	8.4	55.9								
08	298 23.2	40.7	37 56.1	12.4	12 59.7	8.3	55.9								
M 09	313 23.2 . .	40.1	52 27.5	12.4	13 08.0	8.2	55.8								
O 10	328 23.2	39.5	66 58.9	12.4	13 16.2	8.1	55.8								
N 11	343 23.2	38.9	81 30.3	12.4	13 24.3	8.1	55.8								
D 12	358 23.3	N18 38.3	96 01.7	12.4	N13 32.4	8.0	55.7								
A 13	13 23.3	37.7	110 33.1	12.4	13 40.4	7.9	55.7								
Y 14	28 23.3	37.1	125 04.5	12.4	13 48.3	7.8	55.7								
15	43 23.3 . .	36.5	139 35.9	12.4	13 56.1	7.8	55.7								
16	58 23.4	35.9	154 07.3	12.4	14 03.9	7.7	55.6								
17	73 23.4	35.3	168 38.7	12.4	14 11.6	7.6	55.6								
18	88 23.4	N18 34.7	183 10.1	12.3	N14 19.2	7.6	55.6								
19	103 23.4	34.1	197 41.4	12.4	14 26.8	7.4	55.5								
20	118 23.4	33.5	212 12.8	12.4	14 34.2	7.4	55.5								
21	133 23.5 . .	32.9	226 44.2	12.4	14 41.6	7.4	55.5								
22	148 23.5	32.3	241 15.6	12.3	14 49.0	7.2	55.5								
23	163 23.5	31.7	255 46.9	12.4	N14 56.2	7.2	55.4								
	SD 15.8	d 0.6	SD 15.6		15.4		15.2								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 27	Moonset 28	Moonset 29	Moonset 30
°	h m	h m	h m	h m	h m	h m	h m
N 72				11 13	13 04	14 58	17 04
N 70	23 19	////	////	11 04	12 47	14 30	16 12
68	22 14	////	////	10 57	12 34	14 09	15 40
66	21 40	////	////	10 52	12 23	13 52	15 16
64	21 15	22 53	////	10 47	12 14	13 38	14 58
62	20 56	22 10	////	10 43	12 07	13 27	14 43
60	20 40	21 43	////	10 40	12 00	13 17	14 30
N 58	20 26	21 22	23 00	10 36	11 54	13 09	14 19
56	20 15	21 05	22 21	10 34	11 49	13 02	14 10
54	20 05	20 50	21 56	10 31	11 45	12 55	14 02
52	19 56	20 38	21 36	10 29	11 41	12 49	13 54
50	19 48	20 28	21 20	10 27	11 37	12 44	13 48
45	19 31	20 06	20 49	10 22	11 29	12 32	13 33
N 40	19 18	19 48	20 26	10 19	11 22	12 23	13 21
35	19 06	19 34	20 08	10 16	11 16	12 15	13 11
30	18 56	19 22	19 53	10 13	11 11	12 08	13 03
20	18 39	19 02	19 30	10 08	11 02	11 55	12 47
N 10	18 24	18 46	19 12	10 04	10 54	11 45	12 34
0	18 10	18 32	18 57	09 59	10 47	11 35	12 22
S 10	17 56	18 18	18 44	09 55	10 40	11 25	12 10
20	17 42	18 05	18 32	09 51	10 32	11 14	11 57
30	17 25	17 51	18 20	09 46	10 24	11 02	11 42
35	17 16	17 43	18 13	09 44	10 19	10 55	11 33
40	17 05	17 34	18 07	09 40	10 13	10 47	11 23
45	16 52	17 24	18 00	09 37	10 06	10 38	11 12
S 50	16 37	17 12	17 52	09 32	09 59	10 27	10 58
52	16 29	17 07	17 48	09 30	09 55	10 21	10 51
54	16 21	17 01	17 45	09 28	09 51	10 16	10 44
56	16 12	16 55	17 41	09 26	09 47	10 10	10 36
58	16 02	16 48	17 36	09 23	09 42	10 02	10 27
S 60	15 50	16 40	17 32	09 20	09 36	09 55	10 17

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
27	06 30	06 30	12 06	03 48	16 12	19	72
28	06 29	06 29	12 06	04 36	17 00	20	63
29	06 28	06 27	12 06	05 23	17 47	21	53

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
30 00	307 47.8	146 42.1	N 9 29.8	205 44.7	N23 39.5	209 34.7	N23 03.1	94 04.2	S11 00.7	Acamar	315 18.3	S40 14.8
01	322 50.2	161 41.8	28.6	220 45.4	39.4	224 36.6	03.1	109 06.6	00.7	Achernar	335 26.6	S57 09.7
02	337 52.7	176 41.4	27.5	235 46.0	39.3	239 38.4	03.1	124 09.0	00.8	Acrux	173 09.4	S63 10.7
03	352 55.2	191 41.1	. . 26.3	250 46.7	. . 39.1	254 40.3	. . 03.1	139 11.4	. . 00.8	Adhara	255 12.8	S28 59.5
04	7 57.6	206 40.8	25.1	265 47.3	39.0	269 42.2	03.0	154 13.8	00.9	Aldebaran	290 49.4	N16 32.1
05	23 00.1	221 40.5	23.9	280 48.0	38.9	284 44.1	03.0	169 16.2	00.9			
06	38 02.6	236 40.2	N 9 22.7	295 48.6	N23 38.8	299 46.0	N23 03.0	184 18.5	S11 00.9	Alioth	166 20.9	N55 53.4
07	53 05.0	251 39.8	21.5	310 49.3	38.7	314 47.9	03.0	199 20.9	01.0	Alkaid	152 58.9	N49 15.0
08	68 07.5	266 39.5	20.3	325 49.9	38.6	329 49.8	02.9	214 23.3	01.0	Al Na'ir	27 43.2	S46 53.4
09	83 10.0	281 39.2	. . 19.1	340 50.6	. . 38.4	344 51.7	. . 02.9	229 25.7	. . 01.1	Alnilam	275 46.5	S 1 11.7
10	98 12.4	296 38.9	17.9	355 51.3	38.3	359 53.5	02.9	244 28.1	01.1	Alphard	217 56.3	S 8 43.2
11	113 14.9	311 38.6	16.7	10 51.9	38.2	14 55.4	02.8	259 30.4	01.1			
12	128 17.4	326 38.2	N 9 15.5	25 52.6	N23 38.1	29 57.3	N23 02.8	274 32.8	S11 01.2	Alphecca	126 10.8	N26 40.4
13	143 19.8	341 37.9	14.4	40 53.2	38.0	44 59.2	02.8	289 35.2	01.2	Alpheratz	357 43.1	N29 09.9
14	158 22.3	356 37.6	13.2	55 53.9	37.9	60 01.1	02.8	304 37.6	01.3	Altair	62 07.8	N 8 54.5
15	173 24.7	11 37.3	. . 12.0	70 54.5	. . 37.7	75 03.0	. . 02.7	319 40.0	. . 01.3	Ankaa	353 15.4	S42 13.6
16	188 27.2	26 37.0	10.8	85 55.2	37.6	90 04.9	02.7	334 42.4	01.3	Antares	112 25.9	S26 27.6
17	203 29.7	41 36.7	09.6	100 55.9	37.5	105 06.8	02.7	349 44.7	01.4			
18	218 32.1	56 36.3	N 9 08.4	115 56.5	N23 37.4	120 08.6	N23 02.7	4 47.1	S11 01.4	Arcturus	145 55.7	N19 06.9
19	233 34.6	71 36.0	07.2	130 57.2	37.3	135 10.5	02.6	19 49.5	01.5	Atria	107 27.3	S69 03.2
20	248 37.1	86 35.7	06.0	145 57.8	37.1	150 12.4	02.6	34 51.9	01.5	Avior	234 18.6	S59 33.3
21	263 39.5	101 35.4	. . 04.8	160 58.5	. . 37.0	165 14.3	. . 02.6	49 54.3	. . 01.5	Bellatrix	278 32.1	N 6 21.6
22	278 42.0	116 35.1	03.6	175 59.2	36.9	180 16.2	02.5	64 56.6	01.6	Betelgeuse	271 01.4	N 7 24.5
23	293 44.5	131 34.8	02.4	190 59.8	36.8	195 18.1	02.5	79 59.0	01.6			
31 00	308 46.9	146 34.5	N 9 01.2	206 00.5	N23 36.7	210 20.0	N23 02.5	95 01.4	S11 01.7	Canopus	263 56.6	S52 42.2
01	323 49.4	161 34.1	9 00.0	221 01.1	36.5	225 21.9	02.5	110 03.8	01.7	Capella	280 34.6	N46 00.4
02	338 51.8	176 33.8	8 58.8	236 01.8	36.4	240 23.8	02.4	125 06.2	01.7	Deneb	49 30.9	N45 19.9
03	353 54.3	191 33.5	. . 57.6	251 02.5	. . 36.3	255 25.6	. . 02.4	140 08.5	. . 01.8	Denebola	182 33.8	N14 29.8
04	8 56.8	206 33.2	56.4	266 03.1	36.2	270 27.5	02.4	155 10.9	01.8	Diphda	348 55.6	S17 54.5
05	23 59.2	221 32.9	55.2	281 03.8	36.0	285 29.4	02.4	170 13.3	01.9			
06	39 01.7	236 32.6	N 8 54.0	296 04.4	N23 35.9	300 31.3	N23 02.3	185 15.7	S11 01.9	Dubhe	193 52.2	N61 40.8
07	54 04.2	251 32.3	52.8	311 05.1	35.8	315 33.2	02.3	200 18.1	01.9	Elnath	278 12.7	N28 36.9
08	69 06.6	266 32.0	51.6	326 05.8	35.7	330 35.1	02.3	215 20.4	02.0	Eltanin	90 45.7	N51 29.6
09	84 09.1	281 31.7	. . 50.4	341 06.4	. . 35.6	345 37.0	. . 02.2	230 22.8	. . 02.0	Enif	33 46.7	N 9 56.5
10	99 11.6	296 31.4	49.2	356 07.1	35.4	0 38.9	02.2	245 25.2	02.1	Fomalhaut	15 23.6	S29 32.7
11	114 14.0	311 31.0	48.0	11 07.7	35.3	15 40.8	02.2	260 27.6	02.1			
12	129 16.5	326 30.7	N 8 46.8	26 08.4	N23 35.2	30 42.7	N23 02.2	275 29.9	S11 02.2	Gacrux	172 01.0	S57 11.6
13	144 19.0	341 30.4	45.6	41 09.1	35.1	45 44.5	02.1	290 32.3	02.2	Gienah	175 52.4	S17 37.1
14	159 21.4	356 30.1	44.4	56 09.7	34.9	60 46.4	02.1	305 34.7	02.2	Hadar	148 47.7	S60 26.5
15	174 23.9	11 29.8	. . 43.2	71 10.4	. . 34.8	75 48.3	. . 02.1	320 37.1	. . 02.3	Hamal	328 00.6	N23 31.5
16	189 26.3	26 29.5	42.0	86 11.0	34.7	90 50.2	02.0	335 39.5	02.3	Kaus Aust.	83 43.3	S34 22.5
17	204 28.8	41 29.2	40.8	101 11.7	34.5	105 52.1	02.0	350 41.8	02.4			
18	219 31.3	56 28.9	N 8 39.6	116 12.4	N23 34.4	120 54.0	N23 02.0	5 44.2	S11 02.4	Kochab	137 20.0	N74 06.3
19	234 33.7	71 28.6	38.4	131 13.0	34.3	135 55.9	02.0	20 46.6	02.4	Markab	13 37.9	N15 16.8
20	249 36.2	86 28.3	37.2	146 13.7	34.2	150 57.8	01.9	35 49.0	02.5	Menkar	314 15.0	N 4 08.6
21	264 38.7	101 28.0	. . 36.0	161 14.4	. . 34.0	165 59.7	. . 01.9	50 51.3	. . 02.5	Menkent	148 07.4	S36 26.3
22	279 41.1	116 27.7	34.8	176 15.0	33.9	181 01.6	01.9	65 53.7	02.6	Miaplacidus	221 40.5	S69 46.6
23	294 43.6	131 27.4	33.6	191 15.7	33.8	196 03.5	01.9	80 56.1	02.6			
1 00	309 46.1	146 27.1	N 8 32.3	206 16.3	N23 33.7	211 05.3	N23 01.8	95 58.5	S11 02.6	Mirfak	308 40.3	N49 54.3
01	324 48.5	161 26.8	31.1	221 17.0	33.5	226 07.2	01.8	111 00.8	02.7	Nunki	75 57.8	S26 16.6
02	339 51.0	176 26.5	29.9	236 17.7	33.4	241 09.1	01.8	126 03.2	02.7	Peacock	53 18.5	S56 41.2
03	354 53.5	191 26.2	. . 28.7	251 18.3	. . 33.3	256 11.0	. . 01.7	141 05.6	. . 02.8	Pollux	243 28.0	N27 59.4
04	9 55.9	206 25.9	27.5	266 19.0	33.1	271 12.9	01.7	156 08.0	02.8	Procyon	244 59.9	N 5 11.3
05	24 58.4	221 25.5	26.3	281 19.7	33.0	286 14.8	01.7	171 10.3	02.9			
06	40 00.8	236 25.2	N 8 25.1	296 20.3	N23 32.9	301 16.7	N23 01.7	186 12.7	S11 02.9	Rasalhague	96 06.1	N12 33.3
07	55 03.3	251 24.9	23.9	311 21.0	32.7	316 18.6	01.6	201 15.1	02.9	Regulus	207 43.7	N11 54.0
08	70 05.8	266 24.6	22.7	326 21.6	32.6	331 20.5	01.6	216 17.5	03.0	Rigel	281 12.2	S 8 11.2
09	85 08.2	281 24.3	. . 21.5	341 22.3	. . 32.5	346 22.4	. . 01.6	231 19.8	. . 03.0	Rigil Kent.	139 51.5	S60 53.6
10	100 10.7	296 24.0	20.3	356 23.0	32.3	1 24.3	01.5	246 22.2	03.1	Sabik	102 12.2	S15 44.3
11	115 13.2	311 23.7	19.0	11 23.6	32.2	16 26.2	01.5	261 24.6	03.1			
12	130 15.6	326 23.4	N 8 17.8	26 24.3	N23 32.1	31 28.0	N23 01.5	276 27.0	S11 03.2	Schedar	349 40.1	N56 36.6
13	145 18.1	341 23.1	16.6	41 25.0	31.9	46 29.9	01.5	291 29.3	03.2	Shaula	96 21.5	S37 06.7
14	160 20.6	356 22.8	15.4	56 25.6	31.8	61 31.8	01.4	306 31.7	03.2	Sirius	258 33.9	S16 44.1
15	175 23.0	11 22.5	. . 14.2	71 26.3	. . 31.7	76 33.7	. . 01.4	321 34.1	. . 03.3	Spica	158 31.2	S11 13.9
16	190 25.5	26 22.3	13.0	86 27.0	31.5	91 35.6	01.4	336 36.5	03.3	Suhail	222 52.8	S43 29.4
17	205 28.0	41 22.0	11.8	101 27.6	31.4	106 37.5	01.3	351 38.8	03.4			
18	220 30.4	56 21.7	N 8 10.6	116 28.3	N23 31.3	121 39.4	N23 01.3	6 41.2	S11 03.4	Vega	80 38.5	N38 48.1
19	235 32.9	71 21.4	09.3	131 29.0	31.1	136 41.3	01.3	21 43.6	03.5	Zuben'ubi	137 05.2	S16 05.8
20	250 35.3	86 21.1	08.1	146 29.6	31.0	151 43.2	01.3	36 46.0	03.5		SHA	Mer.Pass.
21	265 37.8	101 20.8	. . 06.9	161 30.3	. . 30.9	166 45.1	. . 01.2	51 48.3	. . 03.5		° ′	h m
22	280 40.3	116 20.5	05.7	176 31.0	30.7	181 47.0	01.2	66 50.7	03.6	Venus	197 47.5	14 14
23	295 42.7	131 20.2	04.5	191 31.6	30.6	196 48.9	01.2	81 53.1	03.6	Mars	257 13.6	10 16
	h m									Jupiter	261 33.1	9 57
Mer. Pass.	3 24.3	v −0.3	d 1.2	v 0.7	d 0.1	v 1.9	d 0.0	v 2.4	d 0.0	Saturn	146 14.5	17 37

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		30	31	1	2
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
30 00	178 23.5	N18 31.1	270 18.3	12.4	N15 03.4	7.1	55.4	N 72				19 54			
01	193 23.6	30.5	284 49.7	12.3	15 10.5	7.0	55.4	N 70	////	////	01 18	20 47	20 44	20 44	21 31
02	208 23.6	29.9	299 21.0	12.4	15 17.5	6.9	55.4	68	////	////	02 10	21 20	21 33	22 01	22 49
03	223 23.6	. . 29.3	313 52.4	12.3	15 24.4	6.9	55.3	66	////	////	02 42	21 44	22 05	22 38	23 27
04	238 23.6	28.6	328 23.7	12.4	15 31.3	6.7	55.3	64	////	01 34	03 05	22 03	22 28	23 05	23 54
05	253 23.7	28.0	342 55.1	12.3	15 38.0	6.7	55.3	62	////	02 11	03 23	22 18	22 47	23 25	24 14
06	268 23.7	N18 27.4	357 26.4	12.3	N15 44.7	6.7	55.2	60	////	02 37	03 39	22 31	23 02	23 42	24 31
07	283 23.7	26.8	11 57.7	12.3	15 51.4	6.5	55.2	N 58	01 25	02 57	03 51	22 43	23 15	23 56	24 45
08	298 23.7	26.2	26 29.0	12.4	15 57.9	6.4	55.2	56	02 00	03 13	04 02	22 52	23 27	24 08	00 08
09	313 23.8	. . 25.6	41 00.4	12.3	16 04.3	6.4	55.2	54	02 24	03 27	04 12	23 01	23 37	24 19	00 19
10	328 23.8	25.0	55 31.7	12.3	16 10.7	6.3	55.1	52	02 42	03 39	04 20	23 09	23 46	24 28	00 28
11	343 23.8	24.4	70 03.0	12.3	16 17.0	6.2	55.1	50	02 58	03 49	04 28	23 16	23 53	24 37	00 37
12	358 23.9	N18 23.8	84 34.3	12.3	N16 23.2	6.2	55.1	45	03 27	04 10	04 44	23 31	24 10	00 10	00 54
13	13 23.9	23.2	99 05.6	12.3	16 29.4	6.0	55.1	N 40	03 50	04 27	04 57	23 43	24 24	00 24	01 09
14	28 23.9	22.6	113 36.9	12.2	16 35.4	6.0	55.1	35	04 07	04 41	05 09	23 54	24 36	00 36	01 21
15	43 23.9	. . 22.0	128 08.1	12.3	16 41.4	5.9	55.0	30	04 21	04 52	05 18	24 03	00 03	00 46	01 32
16	58 24.0	21.3	142 39.4	12.3	16 47.3	5.8	55.0	20	04 44	05 12	05 35	24 19	00 19	01 04	01 51
17	73 24.0	20.7	157 10.7	12.2	16 53.1	5.7	55.0	N 10	05 01	05 27	05 49	24 33	00 33	01 20	02 07
18	88 24.0	N18 20.1	171 41.9	12.3	N16 58.8	5.6	55.0	0	05 16	05 41	06 03	24 47	00 47	01 34	02 22
19	103 24.1	19.5	186 13.2	12.2	17 04.4	5.6	54.9	S 10	05 29	05 54	06 16	00 10	01 00	01 49	02 37
20	118 24.1	18.9	200 44.4	12.3	17 10.0	5.4	54.9	20	05 40	06 07	06 30	00 23	01 14	02 05	02 54
21	133 24.1	. . 18.3	215 15.7	12.2	17 15.4	5.4	54.9	30	05 52	06 21	06 46	00 36	01 30	02 23	03 12
22	148 24.2	17.7	229 46.9	12.2	17 20.8	5.3	54.9	35	05 58	06 28	06 55	00 44	01 40	02 33	03 23
23	163 24.2	17.0	244 18.1	12.2	17 26.1	5.2	54.9	40	06 04	06 37	07 06	00 54	01 51	02 45	03 36
31 00	178 24.2	N18 16.4	258 49.3	12.2	N17 31.3	5.2	54.8	45	06 11	06 46	07 18	01 04	02 04	02 59	03 51
01	193 24.2	15.8	273 20.5	12.2	17 36.5	5.0	54.8	S 50	06 18	06 57	07 33	01 18	02 19	03 17	04 09
02	208 24.3	15.2	287 51.7	12.2	17 41.5	5.0	54.8	52	06 21	07 02	07 40	01 24	02 27	03 25	04 17
03	223 24.3	. . 14.6	302 22.9	12.2	17 46.5	4.8	54.8	54	06 25	07 08	07 47	01 31	02 35	03 34	04 27
04	238 24.3	14.0	316 54.1	12.2	17 51.3	4.8	54.8	56	06 28	07 14	07 56	01 38	02 44	03 44	04 38
05	253 24.4	13.3	331 25.3	12.1	17 56.1	4.7	54.7	58	06 32	07 21	08 06	01 47	02 55	03 56	04 50
06	268 24.4	N18 12.7	345 56.4	12.2	N18 00.8	4.6	54.7	S 60	06 37	07 28	08 17	01 56	03 07	04 10	05 05
07	283 24.4	12.1	0 27.6	12.2	18 05.4	4.6	54.7								
08	298 24.5	11.5	14 58.8	12.1	18 10.0	4.4	54.7								
09	313 24.5	. . 10.9	29 29.9	12.2	18 14.4	4.4	54.7								
10	328 24.5	10.2	44 01.1	12.1	18 18.8	4.2	54.6								
11	343 24.6	09.6	58 32.2	12.1	18 23.0	4.2	54.6								
12	358 24.6	N18 09.0	73 03.3	12.1	N18 27.2	4.1	54.6								
13	13 24.6	08.4	87 34.4	12.1	18 31.3	4.0	54.6								
14	28 24.7	07.8	102 05.5	12.2	18 35.3	3.9	54.6								
15	43 24.7	. . 07.1	116 36.7	12.1	18 39.2	3.8	54.6								
16	58 24.7	06.5	131 07.8	12.0	18 43.0	3.7	54.5								
17	73 24.8	05.9	145 38.8	12.1	18 46.7	3.7	54.5								
18	88 24.8	N18 05.3	160 09.9	12.1	N18 50.4	3.5	54.5								
19	103 24.8	04.6	174 41.0	12.1	18 53.9	3.5	54.5								
20	118 24.9	04.0	189 12.1	12.1	18 57.4	3.4	54.5								
21	133 24.9	. . 03.4	203 43.2	12.0	19 00.8	3.3	54.5								
22	148 25.0	02.7	218 14.2	12.1	19 04.1	3.2	54.4								
23	163 25.0	02.1	232 45.3	12.0	19 07.3	3.1	54.4								
1 00	178 25.0	N18 01.5	247 16.3	12.1	N19 10.4	3.0	54.4								
01	193 25.1	00.9	261 47.4	12.0	19 13.4	2.9	54.4								
02	208 25.1	18 00.2	276 18.4	12.1	19 16.3	2.9	54.4								
03	223 25.1	17 59.6	290 49.5	12.0	19 19.2	2.7	54.4								
04	238 25.2	59.0	305 20.5	12.0	19 21.9	2.6	54.4								
05	253 25.2	58.3	319 51.5	12.0	19 24.5	2.6	54.3								
06	268 25.3	N17 57.7	334 22.5	12.1	N19 27.1	2.5	54.3								
07	283 25.3	57.1	348 53.6	12.0	19 29.6	2.4	54.3								
08	298 25.3	56.4	3 24.6	12.0	19 32.0	2.3	54.3								
09	313 25.4	. . 55.8	17 55.6	12.0	19 34.3	2.1	54.3								
10	328 25.4	55.2	32 26.6	12.0	19 36.4	2.2	54.3								
11	343 25.5	54.5	46 57.6	12.0	19 38.6	2.0	54.3								
12	358 25.5	N17 53.9	61 28.6	12.0	N19 40.6	1.9	54.3								
13	13 25.5	53.3	75 59.6	12.0	19 42.5	1.8	54.3								
14	28 25.6	52.6	90 30.6	12.0	19 44.3	1.8	54.2								
15	43 25.6	. . 52.0	105 01.6	12.0	19 46.1	1.6	54.2								
16	58 25.7	51.4	119 32.6	12.0	19 47.7	1.6	54.2								
17	73 25.7	50.7	134 03.6	12.0	19 49.3	1.4	54.2								
18	88 25.7	N17 50.1	148 34.6	12.0	N19 50.7	1.4	54.2								
19	103 25.8	49.5	163 05.6	11.9	19 52.1	1.3	54.2								
20	118 25.8	48.8	177 36.5	12.0	19 53.4	1.2	54.2								
21	133 25.9	. . 48.2	192 07.5	12.0	19 54.6	1.1	54.2								
22	148 25.9	47.5	206 38.5	12.0	19 55.7	1.0	54.2								
23	163 26.0	46.9	221 09.5	12.0	N19 56.7	0.9	54.2								
	SD 15.8	d 0.6	SD	15.0		14.9		14.8							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	30	31	1	2
°	h m	h m	h m	h m	h m	h m	h m
N 72				17 04			
N 70	22 46	////	////	16 12	17 54	19 34	20 27
68	21 58	////	////	15 40	17 05	18 17	19 08
66	21 28	////	////	15 16	16 34	17 40	18 30
64	21 05	22 33	////	14 58	16 11	17 14	18 04
62	20 47	21 58	////	14 43	15 52	16 53	17 43
60	20 33	21 33	////	14 30	15 37	16 36	17 26
N 58	20 20	21 14	22 42	14 19	15 24	16 22	17 12
56	20 09	20 58	22 10	14 10	15 13	16 10	17 00
54	20 00	20 44	21 47	14 02	15 04	16 00	16 49
52	19 51	20 33	21 29	13 54	14 55	15 51	16 40
50	19 44	20 22	21 13	13 48	14 47	15 42	16 31
45	19 28	20 02	20 44	13 33	14 31	15 24	16 13
N 40	19 15	19 45	20 22	13 21	14 17	15 10	15 59
35	19 04	19 31	20 05	13 11	14 06	14 58	15 46
30	18 54	19 20	19 51	13 03	13 56	14 47	15 36
20	18 37	19 01	19 29	12 47	13 39	14 29	15 17
N 10	18 23	18 45	19 11	12 34	13 24	14 12	15 01
0	18 10	18 32	18 57	12 22	13 10	13 57	14 45
S 10	17 57	18 19	18 44	12 10	12 56	13 42	14 30
20	17 43	18 06	18 33	11 57	12 41	13 26	14 14
30	17 27	17 52	18 21	11 42	12 24	13 08	13 55
35	17 18	17 45	18 15	11 33	12 14	12 57	13 44
40	17 07	17 36	18 09	11 23	12 02	12 45	13 32
45	16 55	17 27	18 02	11 12	11 49	12 31	13 17
S 50	16 41	17 16	17 55	10 58	11 33	12 13	12 59
52	16 34	17 11	17 52	10 51	11 25	12 05	12 50
54	16 26	17 05	17 49	10 44	11 17	11 55	12 41
56	16 17	16 59	17 45	10 36	11 07	11 45	12 30
58	16 08	16 53	17 41	10 27	10 56	11 33	12 18
S 60	15 57	16 45	17 37	10 17	10 44	11 19	12 03

Day	SUN		MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
30	06 26	06 25	12 06	06 11	18 34	22	43
31	06 23	06 22	12 06	06 58	19 22	23	33
1	06 20	06 18	12 06	07 46	20 10	24	25

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
2 00	310 45.2	146 19.9	N 8 03.3	206 32.3	N23 30.5	211 50.8	N23 01.1	96 55.4	S11 03.7
01	325 47.7	161 19.6	02.1	221 33.0	30.3	226 52.7	01.1	111 57.8	03.7
02	340 50.1	176 19.3	8 00.8	236 33.6	30.2	241 54.6	01.1	127 00.2	03.8
03	355 52.6	191 19.0	7 59.6	251 34.3	30.0	256 56.4	01.1	142 02.6	03.8
04	10 55.1	206 18.7	58.4	266 35.0	29.9	271 58.3	01.0	157 04.9	03.8
05	25 57.5	221 18.4	57.2	281 35.6	29.8	287 00.2	01.0	172 07.3	03.9
06	41 00.0	236 18.1	N 7 56.0	296 36.3	N23 29.6	302 02.1	N23 01.0	187 09.7	S11 03.9
07	56 02.4	251 17.8	54.8	311 37.0	29.5	317 04.0	00.9	202 12.0	04.0
08	71 04.9	266 17.5	53.5	326 37.6	29.3	332 05.9	00.9	217 14.4	04.0
F 09	86 07.4	281 17.2	52.3	341 38.3	29.2	347 07.8	00.9	232 16.8	04.1
R 10	101 09.8	296 17.0	51.1	356 39.0	29.1	2 09.7	00.9	247 19.2	04.1
I 11	116 12.3	311 16.7	49.9	11 39.6	28.9	17 11.6	00.8	262 21.5	04.1
D 12	131 14.8	326 16.4	N 7 48.7	26 40.3	N23 28.8	32 13.5	N23 00.8	277 23.9	S11 04.2
A 13	146 17.2	341 16.1	47.4	41 41.0	28.6	47 15.4	00.8	292 26.3	04.2
Y 14	161 19.7	356 15.8	46.2	56 41.6	28.5	62 17.3	00.7	307 28.6	04.3
15	176 22.2	11 15.5	45.0	71 42.3	28.4	77 19.2	00.7	322 31.0	04.3
16	191 24.6	26 15.2	43.8	86 43.0	28.2	92 21.1	00.7	337 33.4	04.4
17	206 27.1	41 14.9	42.6	101 43.6	28.1	107 23.0	00.6	352 35.8	04.4
18	221 29.6	56 14.6	N 7 41.3	116 44.3	N23 27.9	122 24.9	N23 00.6	7 38.1	S11 04.5
19	236 32.0	71 14.3	40.1	131 45.0	27.8	137 26.8	00.6	22 40.5	04.5
20	251 34.5	86 14.1	38.9	146 45.6	27.6	152 28.7	00.6	37 42.9	04.5
21	266 36.9	101 13.8	37.7	161 46.3	27.5	167 30.6	00.5	52 45.2	04.6
22	281 39.4	116 13.5	36.4	176 47.0	27.4	182 32.4	00.5	67 47.6	04.6
23	296 41.9	131 13.2	35.2	191 47.7	27.2	197 34.3	00.5	82 50.0	04.7
3 00	311 44.3	146 12.9	N 7 34.0	206 48.3	N23 27.1	212 36.2	N23 00.4	97 52.3	S11 04.7
01	326 46.8	161 12.6	32.8	221 49.0	26.9	227 38.1	00.4	112 54.7	04.8
02	341 49.3	176 12.3	31.6	236 49.7	26.8	242 40.0	00.4	127 57.1	04.8
03	356 51.7	191 12.1	30.3	251 50.3	26.6	257 41.9	00.4	142 59.4	04.8
04	11 54.2	206 11.8	29.1	266 51.0	26.5	272 43.8	00.3	158 01.8	04.9
05	26 56.7	221 11.5	27.9	281 51.7	26.3	287 45.7	00.3	173 04.2	04.9
06	41 59.1	236 11.2	N 7 26.6	296 52.4	N23 26.2	302 47.6	N23 00.3	188 06.5	S11 05.0
07	57 01.6	251 10.9	25.4	311 53.0	26.0	317 49.5	00.2	203 08.9	05.0
S 08	72 04.1	266 10.6	24.2	326 53.7	25.9	332 51.4	00.2	218 11.3	05.1
A 09	87 06.5	281 10.3	23.0	341 54.4	25.7	347 53.3	00.2	233 13.6	05.1
T 10	102 09.0	296 10.1	21.7	356 55.0	25.6	2 55.2	00.1	248 16.0	05.2
U 11	117 11.4	311 09.8	20.5	11 55.7	25.4	17 57.1	00.1	263 18.4	05.2
R 12	132 13.9	326 09.5	N 7 19.3	26 56.4	N23 25.3	32 59.0	N23 00.1	278 20.7	S11 05.3
D 13	147 16.4	341 09.2	18.1	41 57.1	25.1	48 00.9	00.1	293 23.1	05.3
A 14	162 18.8	356 08.9	16.8	56 57.7	25.0	63 02.8	00.0	308 25.5	05.3
Y 15	177 21.3	11 08.7	15.6	71 58.4	24.8	78 04.7	00.0	323 27.8	05.4
16	192 23.8	26 08.4	14.4	86 59.1	24.7	93 06.6	23 00.0	338 30.2	05.4
17	207 26.2	41 08.1	13.1	101 59.7	24.5	108 08.5	22 59.9	353 32.6	05.5
18	222 28.7	56 07.8	N 7 11.9	117 00.4	N23 24.4	123 10.4	N22 59.9	8 34.9	S11 05.5
19	237 31.2	71 07.5	10.7	132 01.1	24.2	138 12.3	59.9	23 37.3	05.6
20	252 33.6	86 07.3	09.5	147 01.8	24.1	153 14.2	59.8	38 39.7	05.6
21	267 36.1	101 07.0	08.2	162 02.4	23.9	168 16.1	59.8	53 42.0	05.7
22	282 38.6	116 06.7	07.0	177 03.1	23.8	183 18.0	59.8	68 44.4	05.7
23	297 41.0	131 06.4	05.8	192 03.8	23.6	198 19.9	59.8	83 46.8	05.7
4 00	312 43.5	146 06.1	N 7 04.5	207 04.5	N23 23.5	213 21.8	N22 59.7	98 49.1	S11 05.8
01	327 45.9	161 05.9	03.3	222 05.1	23.3	228 23.7	59.7	113 51.5	05.8
02	342 48.4	176 05.6	02.1	237 05.8	23.2	243 25.6	59.7	128 53.9	05.9
03	357 50.9	191 05.3	7 00.8	252 06.5	23.0	258 27.5	59.6	143 56.2	05.9
04	12 53.3	206 05.0	6 59.6	267 07.2	22.9	273 29.4	59.6	158 58.6	06.0
05	27 55.8	221 04.8	58.4	282 07.8	22.7	288 31.3	59.6	174 01.0	06.0
06	42 58.3	236 04.5	N 6 57.1	297 08.5	N23 22.6	303 33.2	N22 59.5	189 03.3	S11 06.1
07	58 00.7	251 04.2	55.9	312 09.2	22.4	318 35.1	59.5	204 05.7	06.1
08	73 03.2	266 03.9	54.7	327 09.8	22.3	333 37.0	59.5	219 08.0	06.2
S 09	88 05.7	281 03.6	53.4	342 10.5	22.1	348 38.9	59.5	234 10.4	06.2
U 10	103 08.1	296 03.4	52.2	357 11.2	21.9	3 40.8	59.4	249 12.8	06.3
N 11	118 10.6	311 03.1	51.0	12 11.9	21.8	18 42.7	59.4	264 15.1	06.3
D 12	133 13.0	326 02.8	N 6 49.7	27 12.6	N23 21.6	33 44.6	N22 59.4	279 17.5	S11 06.3
A 13	148 15.5	341 02.5	48.5	42 13.2	21.5	48 46.5	59.3	294 19.9	06.4
Y 14	163 18.0	356 02.3	47.3	57 13.9	21.3	63 48.4	59.3	309 22.2	06.4
15	178 20.4	11 02.0	46.0	72 14.6	21.2	78 50.3	59.3	324 24.6	06.5
16	193 22.9	26 01.7	44.8	87 15.3	21.0	93 52.2	59.2	339 27.0	06.5
17	208 25.4	41 01.5	43.6	102 15.9	20.8	108 54.1	59.2	354 29.3	06.6
18	223 27.8	56 01.2	N 6 42.3	117 16.6	N23 20.7	123 56.0	N22 59.2	9 31.7	S11 06.6
19	238 30.3	71 00.9	41.1	132 17.3	20.5	138 57.9	59.1	24 34.0	06.7
20	253 32.8	86 00.6	39.8	147 18.0	20.4	153 59.8	59.1	39 36.4	06.7
21	268 35.2	101 00.4	38.6	162 18.6	20.2	169 01.7	59.1	54 38.8	06.8
22	283 37.7	116 00.1	37.4	177 19.3	20.0	184 03.6	59.1	69 41.1	06.8
23	298 40.2	130 59.8	36.1	192 20.0	19.9	199 05.5	59.0	84 43.5	06.9
Mer.Pass.	h m 3 12.5	v −0.3	d 1.2	v 0.7	d 0.1	v 1.9	d 0.0	v 2.4	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.3	S40 14.8
Achernar	335 26.6	S57 09.7
Acrux	173 09.4	S63 10.7
Adhara	255 12.8	S28 59.5
Aldebaran	290 49.4	N16 32.1
Alioth	166 20.9	N55 53.4
Alkaid	152 58.9	N49 15.0
Al Na'ir	27 43.2	S46 53.4
Alnilam	275 46.5	S 1 11.7
Alphard	217 56.3	S 8 43.1
Alphecca	126 10.8	N26 40.4
Alpheratz	357 43.1	N29 10.0
Altair	62 07.8	N 8 54.5
Ankaa	353 15.4	S42 13.6
Antares	112 25.9	S26 27.6
Arcturus	145 55.7	N19 06.9
Atria	107 27.3	S69 03.2
Avior	234 18.6	S59 33.3
Bellatrix	278 32.1	N 6 21.6
Betelgeuse	271 01.4	N 7 24.5
Canopus	263 56.5	S52 42.1
Capella	280 34.6	N46 00.4
Deneb	49 30.9	N45 20.0
Denebola	182 33.8	N14 29.8
Diphda	348 55.6	S17 54.5
Dubhe	193 52.2	N61 40.8
Elnath	278 12.7	N28 36.9
Eltanin	90 45.7	N51 29.6
Enif	33 46.7	N 9 56.5
Fomalhaut	15 23.6	S29 32.7
Gacrux	172 01.0	S57 11.6
Gienah	175 52.4	S17 37.1
Hadar	148 47.7	S60 26.5
Hamal	328 00.6	N23 31.5
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 20.1	N74 06.3
Markab	13 37.9	N15 16.9
Menkar	314 15.0	N 4 08.6
Menkent	148 07.4	S36 26.3
Miaplacidus	221 40.5	S69 46.6
Mirfak	308 40.2	N49 54.3
Nunki	75 57.8	S26 16.6
Peacock	53 18.5	S56 41.2
Pollux	243 28.0	N27 59.4
Procyon	244 59.9	N 5 11.3
Rasalhague	96 06.1	N12 33.3
Regulus	207 43.7	N11 54.0
Rigel	281 12.2	S 8 11.2
Rigil Kent.	139 51.5	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 40.0	N56 36.6
Shaula	96 21.5	S37 06.7
Sirius	258 33.9	S16 44.1
Spica	158 31.2	S11 13.9
Suhail	222 52.8	S43 29.4
Vega	80 38.5	N38 48.1
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	194 28.6	14 15
Mars	255 04.0	10 12
Jupiter	260 51.9	9 48
Saturn	146 08.0	17 26

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		2	3	4	5
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
2 00	178 26.0	N17 46.3	235 40.5	12.0	N19 57.6	0.8	54.2	N 72						23 53	25 59
01	193 26.0	45.6	250 11.5	12.0	19 58.4	0.7	54.1	N 70	////	////	01 44	21 31	23 09	24 50	00 50
02	208 26.1	45.0	264 42.5	12.0	19 59.1	0.6	54.1	68	////	////	02 26	22 49	24 00	00 00	01 23
03	223 26.1	44.3	279 13.5	12.0	19 59.7	0.6	54.1	66	////	00 55	02 54	23 27	24 32	00 32	01 47
04	238 26.2	43.7	293 44.5	11.9	20 00.3	0.4	54.1	64	////	01 52	03 15	23 54	24 55	00 55	02 06
05	253 26.2	43.0	308 15.4	12.0	20 00.7	0.4	54.1	62	////	02 23	03 32	24 14	00 14	01 14	02 21
06	268 26.3	N17 42.4	322 46.4	12.0	N20 01.1	0.2	54.1	60	00 49	02 47	03 46	24 31	00 31	01 29	02 34
07	283 26.3	41.8	337 17.4	12.0	20 01.3	0.2	54.1	N 58	01 41	03 05	03 58	24 45	00 45	01 42	02 45
08	298 26.4	41.1	351 48.4	12.1	20 01.5	0.1	54.1	56	02 10	03 20	04 08	00 08	00 57	01 53	02 55
F 09	313 26.4	40.5	6 19.5	12.0	20 01.6	0.0	54.1	54	02 32	03 33	04 17	00 19	01 07	02 03	03 03
R 10	328 26.4	39.8	20 50.5	12.0	20 01.6	0.1	54.1	52	02 49	03 44	04 25	00 28	01 17	02 11	03 11
I 11	343 26.5	39.2	35 21.5	12.0	20 01.5	0.2	54.1	50	03 04	03 54	04 32	00 37	01 25	02 19	03 18
D 12	358 26.5	N17 38.5	49 52.5	12.0	N20 01.3	0.3	54.1	45	03 32	04 14	04 48	00 54	01 43	02 36	03 32
A 13	13 26.6	37.9	64 23.5	12.0	20 01.0	0.4	54.1	N 40	03 53	04 30	05 00	01 09	01 58	02 50	03 44
Y 14	28 26.6	37.2	78 54.5	12.1	20 00.6	0.5	54.1	35	04 10	04 43	05 11	01 21	02 10	03 01	03 54
15	43 26.7	36.6	93 25.6	12.0	20 00.1	0.5	54.1	30	04 23	04 54	05 20	01 32	02 21	03 11	04 03
16	58 26.7	35.9	107 56.6	12.1	19 59.6	0.7	54.1	20	04 45	05 13	05 36	01 51	02 39	03 28	04 19
17	73 26.8	35.3	122 27.7	12.0	19 58.9	0.8	54.1	N 10	05 02	05 28	05 50	02 07	02 55	03 44	04 32
18	88 26.8	N17 34.6	136 58.7	12.1	N19 58.1	0.8	54.1	0	05 16	05 41	06 03	02 22	03 10	03 58	04 44
19	103 26.9	34.0	151 29.8	12.0	19 57.3	0.9	54.1	S 10	05 28	05 53	06 15	02 37	03 25	04 12	04 57
20	118 26.9	33.3	166 00.8	12.1	19 56.4	1.1	54.0	20	05 39	06 06	06 29	02 54	03 41	04 27	05 10
21	133 27.0	32.7	180 31.9	12.1	19 55.3	1.1	54.0	30	05 50	06 19	06 44	03 12	04 00	04 44	05 25
22	148 27.0	32.0	195 03.0	12.0	19 54.2	1.2	54.0	35	05 56	06 26	06 53	03 23	04 10	04 54	05 34
23	163 27.1	31.4	209 34.0	12.1	19 53.0	1.3	54.0	40	06 01	06 34	07 03	03 36	04 23	05 05	05 44
3 00	178 27.1	N17 30.7	224 05.1	12.1	N19 51.7	1.4	54.0	45	06 08	06 43	07 14	03 51	04 37	05 19	05 56
01	193 27.2	30.1	238 36.2	12.2	19 50.3	1.5	54.0	S 50	06 14	06 53	07 28	04 09	04 55	05 35	06 10
02	208 27.2	29.4	253 07.4	12.1	19 48.8	1.5	54.0	52	06 17	06 58	07 35	04 17	05 03	05 43	06 17
03	223 27.3	28.8	267 38.5	12.1	19 47.3	1.7	54.0	54	06 20	07 03	07 42	04 27	05 13	05 51	06 24
04	238 27.3	28.1	282 09.6	12.1	19 45.6	1.8	54.0	56	06 24	07 09	07 50	04 38	05 23	06 01	06 32
05	253 27.4	27.5	296 40.7	12.2	19 43.8	1.8	54.0	58	06 27	07 15	07 59	04 50	05 35	06 12	06 41
06	268 27.4	N17 26.8	311 11.9	12.1	N19 42.0	1.9	54.0	S 60	06 31	07 22	08 10	05 05	05 49	06 24	06 52
07	283 27.5	26.2	325 43.0	12.2	19 40.1	2.1	54.0								
S 08	298 27.5	25.5	340 14.2	12.2	19 38.0	2.1	54.0								
A 09	313 27.6	24.8	354 45.4	12.2	19 35.9	2.2	54.0								
T 10	328 27.6	24.2	9 16.6	12.2	19 33.7	2.3	54.0								
U 11	343 27.7	23.5	23 47.8	12.2	19 31.4	2.4	54.0								
R 12	358 27.7	N17 22.9	38 19.0	12.2	N19 29.0	2.4	54.0								
D 13	13 27.8	22.2	52 50.2	12.3	19 26.6	2.6	54.0								
A 14	28 27.8	21.5	67 21.5	12.2	19 24.0	2.6	54.0								
Y 15	43 27.9	20.9	81 52.7	12.3	19 21.4	2.8	54.0								
16	58 27.9	20.2	96 24.0	12.3	19 18.6	2.8	54.0								
17	73 28.0	19.6	110 55.3	12.3	19 15.8	2.9	54.0								
18	88 28.0	N17 18.9	125 26.6	12.3	N19 12.9	3.0	54.0								
19	103 28.1	18.2	139 57.9	12.3	19 09.9	3.1	54.0								
20	118 28.2	17.6	154 29.2	12.3	19 06.8	3.2	54.0								
21	133 28.2	16.9	169 00.5	12.4	19 03.6	3.3	54.0								
22	148 28.3	16.3	183 31.9	12.4	19 00.3	3.3	54.0								
23	163 28.3	15.6	198 03.3	12.3	18 57.0	3.5	54.1								
4 00	178 28.4	N17 14.9	212 34.6	12.4	N18 53.5	3.5	54.1								
01	193 28.4	14.3	227 06.0	12.4	18 50.0	3.6	54.1								
02	208 28.5	13.6	241 37.4	12.5	18 46.4	3.7	54.1								
03	223 28.5	12.9	256 08.9	12.4	18 42.7	3.8	54.1								
04	238 28.6	12.3	270 40.3	12.5	18 38.9	3.9	54.1								
05	253 28.7	11.6	285 11.8	12.5	18 35.0	3.9	54.1								
06	268 28.7	N17 10.9	299 43.3	12.5	N18 31.1	4.0	54.1								
07	283 28.8	10.3	314 14.8	12.5	18 27.1	4.2	54.1								
08	298 28.8	09.6	328 46.3	12.5	18 22.9	4.2	54.1								
S 09	313 28.9	08.9	343 17.8	12.5	18 18.7	4.3	54.1								
U 10	328 28.9	08.3	357 49.3	12.6	18 14.4	4.3	54.1								
N 11	343 29.0	07.6	12 20.9	12.6	18 10.1	4.5	54.1								
D 12	358 29.1	N17 06.9	26 52.5	12.6	N18 05.6	4.5	54.1								
A 13	13 29.1	06.2	41 24.1	12.6	18 01.1	4.7	54.1								
Y 14	28 29.2	05.6	55 55.7	12.6	17 56.4	4.7	54.1								
15	43 29.2	04.9	70 27.3	12.7	17 51.7	4.7	54.1								
16	58 29.3	04.2	84 59.0	12.7	17 47.0	4.9	54.1								
17	73 29.4	03.6	99 30.7	12.7	17 42.1	5.0	54.1								
18	88 29.4	N17 02.9	114 02.4	12.7	N17 37.1	5.0	54.1								
19	103 29.5	02.2	128 34.1	12.7	17 32.1	5.1	54.1								
20	118 29.5	01.5	143 05.8	12.8	17 27.0	5.2	54.2								
21	133 29.6	00.9	157 37.6	12.7	17 21.8	5.2	54.2								
22	148 29.7	17 00.2	172 09.3	12.8	17 16.6	5.4	54.2								
23	163 29.7	N16 59.5	186 41.1	12.8	N17 11.2	5.4	54.2								
	SD 15.8	d 0.7	SD	14.7	14.7		14.7								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 2	Moonset 3	Moonset 4	Moonset 5
°	h m	h m	h m	h m	h m	h m	h m
N 72						21 21	20 52
N 70	22 22	////	////	20 27	20 27	20 24	20 21
68	21 43	////	////	19 08	19 36	19 50	19 58
66	21 16	23 07	////	18 30	19 04	19 26	19 39
64	20 55	22 16	////	18 04	18 40	19 06	19 25
62	20 39	21 46	////	17 43	18 21	18 50	19 12
60	20 25	21 23	23 13	17 26	18 06	18 37	19 02
N 58	20 13	21 05	22 27	17 12	17 53	18 26	18 52
56	20 03	20 50	21 59	17 00	17 41	18 16	18 44
54	19 54	20 38	21 38	16 49	17 31	18 07	18 37
52	19 46	20 27	21 21	16 40	17 23	17 59	18 30
50	19 39	20 17	21 07	16 31	17 15	17 52	18 24
45	19 24	19 57	20 39	16 13	16 57	17 37	18 12
N 40	19 11	19 41	20 18	15 59	16 44	17 24	18 01
35	19 01	19 28	20 02	15 46	16 32	17 14	17 52
30	18 52	19 17	19 48	15 36	16 21	17 04	17 44
20	18 36	18 59	19 27	15 17	16 03	16 48	17 30
N 10	18 22	18 44	19 10	15 01	15 48	16 34	17 18
0	18 10	18 31	18 56	14 45	15 33	16 20	17 07
S 10	17 57	18 19	18 44	14 30	15 18	16 07	16 55
20	17 44	18 07	18 33	14 14	15 03	15 53	16 43
30	17 29	17 54	18 23	13 55	14 45	15 36	16 29
35	17 20	17 47	18 17	13 44	14 34	15 26	16 21
40	17 10	17 39	18 11	13 32	14 22	15 15	16 11
45	16 59	17 30	18 05	13 17	14 08	15 03	16 00
S 50	16 45	17 20	17 59	12 59	13 50	14 47	15 47
52	16 38	17 15	17 56	12 50	13 42	14 39	15 41
54	16 31	17 10	17 53	12 41	13 33	14 31	15 34
56	16 23	17 04	17 49	12 30	13 22	14 22	15 26
58	16 14	16 58	17 46	12 18	13 11	14 11	15 17
S 60	16 03	16 51	17 42	12 03	12 57	13 59	15 07

Day	SUN Eqn. of Time 00^h	SUN Eqn. of Time 12^h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
2	06 16	06 14	12 06	08 34	20 58	25	17
3	06 12	06 09	12 06	09 22	21 45	26	11
4	06 07	06 04	12 06	10 09	22 32	27	5

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −1.9		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
5 00	313 42.6	145 59.6	N 6 34.9	207 20.7	N23 19.7	214 07.4	N22 59.0	99 45.8	S11 06.9
01	328 45.1	160 59.3	33.7	222 21.3	19.6	229 09.3	59.0	114 48.2	06.9
02	343 47.5	175 59.0	32.4	237 22.0	19.4	244 11.2	58.9	129 50.6	07.0
03	358 50.0	190 58.7	. . 31.2	252 22.7	. . 19.2	259 13.1	. . 58.9	144 52.9	. . 07.0
04	13 52.5	205 58.5	29.9	267 23.4	19.1	274 15.0	58.9	159 55.3	07.1
05	28 54.9	220 58.2	28.7	282 24.1	18.9	289 16.9	58.8	174 57.7	07.1
06	43 57.4	235 57.9	N 6 27.5	297 24.7	N23 18.8	304 18.8	N22 58.8	190 00.0	S11 07.2
07	58 59.9	250 57.7	26.2	312 25.4	18.6	319 20.7	58.8	205 02.4	07.2
08	74 02.3	265 57.4	25.0	327 26.1	18.4	334 22.6	58.7	220 04.7	07.3
M 09	89 04.8	280 57.1	. . 23.7	342 26.8	. . 18.3	349 24.5	. . 58.7	235 07.1	. . 07.3
O 10	104 07.3	295 56.9	22.5	357 27.5	18.1	4 26.4	58.7	250 09.5	07.4
N 11	119 09.7	310 56.6	21.2	12 28.1	17.9	19 28.3	58.7	265 11.8	07.4
D 12	134 12.2	325 56.3	N 6 20.0	27 28.8	N23 17.8	34 30.2	N22 58.6	280 14.2	S11 07.5
A 13	149 14.7	340 56.1	18.8	42 29.5	17.6	49 32.1	58.6	295 16.5	07.5
Y 14	164 17.1	355 55.8	17.5	57 30.2	17.4	64 34.0	58.6	310 18.9	07.6
15	179 19.6	10 55.5	. . 16.3	72 30.9	. . 17.3	79 35.9	. . 58.5	325 21.2	. . 07.6
16	194 22.0	25 55.3	15.0	87 31.5	17.1	94 37.8	58.5	340 23.6	07.7
17	209 24.5	40 55.0	13.8	102 32.2	17.0	109 39.7	58.5	355 26.0	07.7
18	224 27.0	55 54.7	N 6 12.5	117 32.9	N23 16.8	124 41.6	N22 58.4	10 28.3	S11 07.7
19	239 29.4	70 54.5	11.3	132 33.6	16.6	139 43.5	58.4	25 30.7	07.8
20	254 31.9	85 54.2	10.1	147 34.3	16.5	154 45.4	58.4	40 33.0	07.8
21	269 34.4	100 54.0	. . 08.8	162 34.9	. . 16.3	169 47.3	. . 58.3	55 35.4	. . 07.9
22	284 36.8	115 53.7	07.6	177 35.6	16.1	184 49.2	58.3	70 37.8	07.9
23	299 39.3	130 53.4	06.3	192 36.3	15.9	199 51.1	58.3	85 40.1	08.0
6 00	314 41.8	145 53.2	N 6 05.1	207 37.0	N23 15.8	214 53.1	N22 58.2	100 42.5	S11 08.0
01	329 44.2	160 52.9	03.8	222 37.7	15.6	229 55.0	58.2	115 44.8	08.1
02	344 46.7	175 52.6	02.6	237 38.3	15.4	244 56.9	58.2	130 47.2	08.1
03	359 49.2	190 52.4	. . 01.3	252 39.0	. . 15.3	259 58.8	. . 58.2	145 49.5	. . 08.2
04	14 51.6	205 52.1	6 00.1	267 39.7	15.1	275 00.7	58.1	160 51.9	08.2
05	29 54.1	220 51.9	5 58.9	282 40.4	14.9	290 02.6	58.1	175 54.3	08.3
06	44 56.5	235 51.6	N 5 57.6	297 41.1	N23 14.8	305 04.5	N22 58.1	190 56.6	S11 08.3
07	59 59.0	250 51.3	56.4	312 41.8	14.6	320 06.4	58.0	205 59.0	08.4
T 08	75 01.5	265 51.1	55.1	327 42.4	14.4	335 08.3	58.0	221 01.3	08.4
U 09	90 03.9	280 50.8	. . 53.9	342 43.1	. . 14.3	350 10.2	. . 58.0	236 03.7	. . 08.5
E 10	105 06.4	295 50.5	52.6	357 43.8	14.1	5 12.1	57.9	251 06.0	08.5
S 11	120 08.9	310 50.3	51.4	12 44.5	13.9	20 14.0	57.9	266 08.4	08.6
D 12	135 11.3	325 50.0	N 5 50.1	27 45.2	N23 13.7	35 15.9	N22 57.9	281 10.8	S11 08.6
A 13	150 13.8	340 49.8	48.9	42 45.9	13.6	50 17.8	57.8	296 13.1	08.7
Y 14	165 16.3	355 49.5	47.6	57 46.5	13.4	65 19.7	57.8	311 15.5	08.7
15	180 18.7	10 49.3	. . 46.4	72 47.2	. . 13.2	80 21.6	. . 57.8	326 17.8	. . 08.8
16	195 21.2	25 49.0	45.1	87 47.9	13.0	95 23.5	57.7	341 20.2	08.8
17	210 23.6	40 48.7	43.9	102 48.6	12.9	110 25.4	57.7	356 22.5	08.9
18	225 26.1	55 48.5	N 5 42.6	117 49.3	N23 12.7	125 27.3	N22 57.7	11 24.9	S11 08.9
19	240 28.6	70 48.2	41.4	132 50.0	12.5	140 29.3	57.6	26 27.2	08.9
20	255 31.0	85 48.0	40.1	147 50.6	12.4	155 31.2	57.6	41 29.6	09.0
21	270 33.5	100 47.7	. . 38.9	162 51.3	. . 12.2	170 33.1	. . 57.6	56 31.9	. . 09.0
22	285 36.0	115 47.5	37.6	177 52.0	12.0	185 35.0	57.5	71 34.3	09.1
23	300 38.4	130 47.2	36.4	192 52.7	11.8	200 36.9	57.5	86 36.7	09.1
7 00	315 40.9	145 46.9	N 5 35.1	207 53.4	N23 11.7	215 38.8	N22 57.5	101 39.0	S11 09.2
01	330 43.4	160 46.7	33.9	222 54.1	11.5	230 40.7	57.5	116 41.4	09.2
02	345 45.8	175 46.4	32.6	237 54.8	11.3	245 42.6	57.4	131 43.7	09.3
03	0 48.3	190 46.2	. . 31.4	252 55.4	. . 11.1	260 44.5	. . 57.4	146 46.1	. . 09.3
04	15 50.8	205 45.9	30.1	267 56.1	10.9	275 46.4	57.4	161 48.4	09.4
05	30 53.2	220 45.7	28.9	282 56.8	10.8	290 48.3	57.3	176 50.8	09.4
06	45 55.7	235 45.4	N 5 27.6	297 57.5	N23 10.6	305 50.2	N22 57.3	191 53.1	S11 09.5
W 07	60 58.1	250 45.2	26.3	312 58.2	10.4	320 52.1	57.3	206 55.5	09.5
E 08	76 00.6	265 44.9	25.1	327 58.9	10.2	335 54.0	57.2	221 57.8	09.6
D 09	91 03.1	280 44.7	. . 23.8	342 59.6	. . 10.1	350 56.0	. . 57.2	237 00.2	. . 09.6
N 10	106 05.5	295 44.4	22.6	358 00.3	09.9	5 57.9	57.2	252 02.5	09.7
E 11	121 08.0	310 44.1	21.3	13 00.9	09.7	20 59.8	57.1	267 04.9	09.7
S 12	136 10.5	325 43.9	N 5 20.1	28 01.6	N23 09.5	36 01.7	N22 57.1	282 07.2	S11 09.8
D 13	151 12.9	340 43.6	18.8	43 02.3	09.3	51 03.6	57.1	297 09.6	09.8
A 14	166 15.4	355 43.4	17.6	58 03.0	09.2	66 05.5	57.0	312 12.0	09.9
Y 15	181 17.9	10 43.1	. . 16.3	73 03.7	. . 09.0	81 07.4	. . 57.0	327 14.3	. . 09.9
16	196 20.3	25 42.9	15.1	88 04.4	08.8	96 09.3	57.0	342 16.7	10.0
17	211 22.8	40 42.6	13.8	103 05.1	08.6	111 11.2	56.9	357 19.0	10.0
18	226 25.2	55 42.4	N 5 12.5	118 05.8	N23 08.4	126 13.1	N22 56.9	12 21.4	S11 10.1
19	241 27.7	70 42.1	11.3	133 06.4	08.3	141 15.0	56.9	27 23.7	10.1
20	256 30.2	85 41.9	10.0	148 07.1	08.1	156 16.9	56.8	42 26.1	10.2
21	271 32.6	100 41.6	. . 08.8	163 07.8	. . 07.9	171 18.9	. . 56.8	57 28.4	. . 10.2
22	286 35.1	115 41.4	07.5	178 08.5	07.7	186 20.8	56.8	72 30.8	10.3
23	301 37.6	130 41.1	06.3	193 09.2	07.5	201 22.7	56.7	87 33.1	10.3
Mer.Pass.	h m 3 00.7	v −0.3	d 1.2	v 0.7	d 0.2	v 1.9	d 0.0	v 2.4	d 0.0

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.3	S40 14.8
Achernar	335 26.6	S57 09.7
Acrux	173 09.5	S63 10.7
Adhara	255 12.8	S28 59.5
Aldebaran	290 49.4	N16 32.1
Alioth	166 20.9	N55 53.4
Alkaid	152 59.0	N49 15.0
Al Na'ir	27 43.2	S46 53.4
Alnilam	275 46.5	S 1 11.7
Alphard	217 56.3	S 8 43.1
Alphecca	126 10.8	N26 40.4
Alpheratz	357 43.1	N29 10.0
Altair	62 07.8	N 8 54.6
Ankaa	353 15.4	S42 13.6
Antares	112 25.9	S26 27.6
Arcturus	145 55.7	N19 06.9
Atria	107 27.3	S69 03.2
Avior	234 18.6	S59 33.3
Bellatrix	278 32.1	N 6 21.6
Betelgeuse	271 01.4	N 7 24.5
Canopus	263 56.5	S52 42.1
Capella	280 34.5	N46 00.4
Deneb	49 30.9	N45 20.0
Denebola	182 33.8	N14 29.8
Diphda	348 55.6	S17 54.5
Dubhe	193 52.2	N61 40.7
Elnath	278 12.7	N28 36.9
Eltanin	90 45.7	N51 29.6
Enif	33 46.7	N 9 56.5
Fomalhaut	15 23.5	S29 32.7
Gacrux	172 01.0	S57 11.6
Gienah	175 52.4	S17 37.1
Hadar	148 47.8	S60 26.5
Hamal	328 00.5	N23 31.5
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 20.1	N74 06.3
Markab	13 37.9	N15 16.9
Menkar	314 14.9	N 4 08.6
Menkent	148 07.5	S36 26.3
Miaplacidus	221 40.5	S69 46.5
Mirfak	308 40.2	N49 54.3
Nunki	75 57.8	S26 16.6
Peacock	53 18.5	S56 41.3
Pollux	243 27.9	N27 59.4
Procyon	244 59.9	N 5 11.3
Rasalhague	96 06.1	N12 33.3
Regulus	207 43.7	N11 54.0
Rigel	281 12.1	S 8 11.2
Rigil Kent.	139 51.5	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 40.0	N56 36.6
Shaula	96 21.5	S37 06.7
Sirius	258 33.9	S16 44.1
Spica	158 31.2	S11 13.9
Suhail	222 52.8	S43 29.4
Vega	80 38.5	N38 48.1
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	191 11.4	14 17
Mars	252 55.2	10 09
Jupiter	260 11.3	9 39
Saturn	146 00.7	17 14

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 5	Moonrise 6	Moonrise 7	Moonrise 8
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
5 00	178 29.8	N16 58.8	201 12.9	12.9	N17 05.8	5.5	54.2	N 72	////	////	01 00	25 59	01 59	03 48	05 33
01	193 29.9	58.2	215 44.8	12.8	17 00.3	5.6	54.2	N 70	////	////	02 05	00 50	02 29	04 07	05 43
02	208 29.9	57.5	230 16.6	12.9	16 54.7	5.7	54.2	68	////	////	02 40	01 23	02 51	04 21	05 51
03	223 30.0	. . 56.8	244 48.5	12.9	16 49.0	5.7	54.2	66	////	01 24	03 05	01 47	03 09	04 33	05 58
04	238 30.0	56.1	259 20.4	12.9	16 43.3	5.8	54.2	64	////	02 07	03 24	02 06	03 23	04 42	06 04
05	253 30.1	55.5	273 52.3	12.9	16 37.5	5.9	54.2	62	////	02 35	03 40	02 21	03 34	04 51	06 08
06	268 30.2	N16 54.8	288 24.2	13.0	N16 31.6	6.0	54.2	60	01 16	02 56	03 53	02 34	03 44	04 58	06 13
07	283 30.2	54.1	302 56.2	12.9	16 25.6	6.0	54.2	N 58	01 55	03 13	04 04	02 45	03 53	05 04	06 16
08	298 30.3	53.4	317 28.1	13.0	16 19.6	6.1	54.2	56	02 21	03 27	04 14	02 55	04 01	05 09	06 20
M 09	313 30.4	. . 52.7	332 00.1	13.0	16 13.5	6.2	54.3	54	02 40	03 39	04 22	03 03	04 08	05 14	06 23
O 10	328 30.4	52.1	346 32.1	13.1	16 07.3	6.3	54.3	52	02 56	03 50	04 30	03 11	04 14	05 19	06 25
N 11	343 30.5	51.4	1 04.2	13.0	16 01.0	6.3	54.3	50	03 10	03 59	04 37	03 18	04 19	05 23	06 28
D 12	358 30.5	N16 50.7	15 36.2	13.1	N15 54.7	6.4	54.3	45	03 37	04 18	04 51	03 32	04 31	05 31	06 33
A 13	13 30.6	50.0	30 08.3	13.1	15 48.3	6.5	54.3	N 40	03 57	04 33	05 03	03 44	04 41	05 39	06 37
Y 14	28 30.7	49.3	44 40.4	13.1	15 41.8	6.5	54.3	35	04 13	04 46	05 13	03 54	04 49	05 45	06 41
15	43 30.7	. . 48.6	59 12.5	13.1	15 35.3	6.7	54.3	30	04 26	04 56	05 22	04 03	04 56	05 50	06 45
16	58 30.8	48.0	73 44.6	13.2	15 28.6	6.6	54.3	20	04 46	05 14	05 37	04 19	05 09	06 00	06 50
17	73 30.9	47.3	88 16.8	13.2	15 22.0	6.8	54.3	N 10	05 02	05 28	05 50	04 32	05 20	06 08	06 55
18	88 30.9	N16 46.6	102 49.0	13.1	N15 15.2	6.8	54.3	0	05 16	05 41	06 02	04 44	05 30	06 16	07 00
19	103 31.0	45.9	117 21.1	13.3	15 08.4	7.0	54.4	S 10	05 27	05 53	06 14	04 57	05 41	06 23	07 05
20	118 31.1	45.2	131 53.4	13.2	15 01.4	6.9	54.4	20	05 38	06 04	06 27	05 10	05 52	06 31	07 10
21	133 31.1	. . 44.5	146 25.6	13.2	14 54.5	7.1	54.4	30	05 48	06 17	06 42	05 25	06 04	06 41	07 16
22	148 31.2	43.8	160 57.8	13.3	14 47.4	7.1	54.4	35	05 53	06 23	06 50	05 34	06 11	06 46	07 19
23	163 31.3	43.2	175 30.1	13.3	14 40.3	7.2	54.4	40	05 58	06 31	06 59	05 44	06 19	06 52	07 23
6 00	178 31.3	N16 42.5	190 02.4	13.3	N14 33.1	7.2	54.4	45	06 04	06 39	07 10	05 56	06 29	06 59	07 27
01	193 31.4	41.8	204 34.7	13.4	14 25.9	7.3	54.4	S 50	06 10	06 49	07 23	06 10	06 40	07 07	07 32
02	208 31.5	41.1	219 07.1	13.3	14 18.6	7.4	54.4	52	06 13	06 53	07 30	06 17	06 46	07 11	07 35
03	223 31.6	. . 40.4	233 39.4	13.4	14 11.2	7.4	54.4	54	06 16	06 58	07 36	06 24	06 52	07 16	07 37
04	238 31.6	39.7	248 11.8	13.4	14 03.8	7.5	54.4	56	06 18	07 03	07 44	06 32	06 58	07 20	07 40
05	253 31.7	39.0	262 44.2	13.4	13 56.3	7.6	54.5	58	06 22	07 09	07 53	06 41	07 05	07 25	07 43
06	268 31.8	N16 38.3	277 16.6	13.4	N13 48.7	7.6	54.5	S 60	06 25	07 15	08 02	06 52	07 14	07 31	07 47
07	283 31.8	37.7	291 49.0	13.4	13 41.1	7.7	54.5								
T 08	298 31.9	37.0	306 21.4	13.5	13 33.4	7.8	54.5								
U 09	313 32.0	. . 36.3	320 53.9	13.5	13 25.6	7.8	54.5								
E 10	328 32.0	35.6	335 26.4	13.5	13 17.8	7.9	54.5								
S 11	343 32.1	34.9	349 58.9	13.5	13 09.9	8.0	54.5								
D 12	358 32.2	N16 34.2	4 31.4	13.5	N13 01.9	8.0	54.5								
A 13	13 32.3	33.5	19 03.9	13.6	12 53.9	8.0	54.6								
Y 14	28 32.3	32.8	33 36.5	13.6	12 45.9	8.2	54.6								
15	43 32.4	. . 32.1	48 09.1	13.6	12 37.7	8.2	54.6								
16	58 32.5	31.4	62 41.7	13.6	12 29.5	8.2	54.6								
17	73 32.5	30.7	77 14.3	13.6	12 21.3	8.3	54.6								
18	88 32.6	N16 30.0	91 46.9	13.6	N12 13.0	8.4	54.6								
19	103 32.7	29.3	106 19.5	13.7	12 04.6	8.4	54.6								
20	118 32.8	28.6	120 52.2	13.7	11 56.2	8.5	54.7								
21	133 32.8	. . 27.9	135 24.9	13.6	11 47.7	8.5	54.7								
22	148 32.9	27.2	149 57.5	13.7	11 39.2	8.6	54.7								
23	163 33.0	26.5	164 30.2	13.8	11 30.6	8.6	54.7								
7 00	178 33.1	N16 25.8	179 03.0	13.7	N11 22.0	8.7	54.7								
01	193 33.1	25.1	193 35.7	13.7	11 13.3	8.7	54.7								
02	208 33.2	24.4	208 08.4	13.8	11 04.6	8.8	54.7								
03	223 33.3	. . 23.7	222 41.2	13.8	10 55.8	8.9	54.7								
04	238 33.4	23.0	237 14.0	13.8	10 46.9	8.9	54.8								
05	253 33.4	22.3	251 46.8	13.8	10 38.0	8.9	54.8								
06	268 33.5	N16 21.6	266 19.6	13.8	N10 29.1	9.0	54.8								
W 07	283 33.6	20.9	280 52.4	13.8	10 20.1	9.1	54.8								
E 08	298 33.7	20.2	295 25.2	13.9	10 11.0	9.1	54.8								
D 09	313 33.7	. . 19.5	309 58.1	13.8	10 01.9	9.1	54.8								
N 10	328 33.8	18.8	324 30.9	13.9	9 52.8	9.2	54.9								
E 11	343 33.9	18.1	339 03.8	13.8	9 43.6	9.3	54.9								
S 12	358 34.0	N16 17.4	353 36.6	13.9	N 9 34.3	9.3	54.9								
D 13	13 34.0	16.7	8 09.5	13.9	9 25.0	9.3	54.9								
A 14	28 34.1	16.0	22 42.4	13.9	9 15.7	9.4	54.9								
Y 15	43 34.2	. . 15.3	37 15.3	14.0	9 06.3	9.4	54.9								
16	58 34.3	14.6	51 48.3	13.9	8 56.9	9.5	54.9								
17	73 34.4	13.9	66 21.2	13.9	8 47.4	9.5	55.0								
18	88 34.4	N16 13.2	80 54.1	14.0	N 8 37.9	9.5	55.0								
19	103 34.5	12.5	95 27.1	13.9	8 28.4	9.6	55.0								
20	118 34.6	11.8	110 00.0	14.0	8 18.8	9.7	55.0								
21	133 34.7	. . 11.1	124 33.0	13.9	8 09.1	9.6	55.0								
22	148 34.8	10.4	139 05.9	14.0	7 59.5	9.8	55.0								
23	163 34.8	09.7	153 38.9	14.0	N 7 49.7	9.7	55.1								
	SD 15.8	d 0.7	SD	14.8	14.9		15.0								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 5	Moonset 6	Moonset 7	Moonset 8
°	h m	h m	h m	h m	h m	h m	h m
N 72	22 59	////	////	20 52	20 37	20 25	20 15
N 70	22 01	////	////	20 21	20 17	20 13	20 10
68	21 28	////	////	19 58	20 02	20 04	20 05
66	21 04	22 40	////	19 39	19 49	19 56	20 01
64	20 45	22 00	////	19 25	19 38	19 49	19 58
62	20 30	21 34	////	19 12	19 29	19 43	19 55
60	20 17	21 13	22 49	19 02	19 21	19 38	19 52
N 58	20 06	20 57	22 13	18 52	19 14	19 33	19 50
56	19 57	20 43	21 48	18 44	19 08	19 29	19 48
54	19 48	20 31	21 29	18 37	19 03	19 25	19 46
52	19 41	20 21	21 13	18 30	18 58	19 22	19 44
50	19 34	20 12	21 00	18 24	18 53	19 19	19 43
45	19 20	19 53	20 34	18 12	18 43	19 12	19 39
N 40	19 08	19 38	20 14	18 01	18 35	19 07	19 37
35	18 58	19 25	19 58	17 52	18 28	19 02	19 34
30	18 49	19 15	19 45	17 44	18 22	18 57	19 32
20	18 34	18 58	19 25	17 30	18 11	18 50	19 28
N 10	18 21	18 43	19 09	17 18	18 01	18 43	19 25
0	18 09	18 31	18 56	17 07	17 52	18 37	19 22
S 10	17 57	18 19	18 45	16 55	17 43	18 31	19 18
20	17 45	18 08	18 34	16 43	17 33	18 24	19 15
30	17 30	17 55	18 24	16 29	17 22	18 16	19 11
35	17 22	17 49	18 19	16 21	17 16	18 12	19 09
40	17 13	17 41	18 14	16 11	17 08	18 07	19 06
45	17 02	17 33	18 08	16 00	17 00	18 01	19 03
S 50	16 49	17 24	18 02	15 47	16 49	17 54	18 59
52	16 43	17 19	18 00	15 41	16 45	17 50	18 58
54	16 36	17 14	17 57	15 34	16 39	17 47	18 56
56	16 28	17 09	17 54	15 26	16 33	17 43	18 54
58	16 20	17 03	17 51	15 17	16 27	17 38	18 51
S 60	16 10	16 57	17 48	15 07	16 19	17 33	18 49

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
5	06 01	05 58	12 06	10 56	23 19	28	2
6	05 55	05 51	12 06	11 41	24 04	29	0
7	05 48	05 44	12 06	12 26	00 04	01	1

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −2.0		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
8 00	316 40.0	145 40.9	N 5 05.0	208 09.9	N23 07.3	216 24.6	N22 56.7	102 35.5	S11 10.4	Acamar	315 18.3	S40 14.8
01	331 42.5	160 40.6	03.7	223 10.6	07.2	231 26.5	56.7	117 37.8	10.4	Achernar	335 26.5	S57 09.7
02	346 45.0	175 40.4	02.5	238 11.3	07.0	246 28.4	56.6	132 40.2	10.5	Acrux	173 09.5	S63 10.7
03	1 47.4	190 40.1	. . 01.2	253 12.0	. . 06.8	261 30.3	. . 56.6	147 42.5	. . 10.5	Adhara	255 12.7	S28 59.4
04	16 49.9	205 39.9	5 00.0	268 12.6	06.6	276 32.2	56.6	162 44.9	10.6	Aldebaran	290 49.4	N16 32.1
05	31 52.4	220 39.6	4 58.7	283 13.3	06.4	291 34.1	56.5	177 47.2	10.6			
06	46 54.8	235 39.4	N 4 57.5	298 14.0	N23 06.2	306 36.0	N22 56.5	192 49.6	S11 10.7	Alioth	166 20.9	N55 53.4
07	61 57.3	250 39.2	56.2	313 14.7	06.1	321 38.0	56.5	207 51.9	10.7	Alkaid	152 59.0	N49 15.0
T 08	76 59.7	265 38.9	54.9	328 15.4	05.9	336 39.9	56.4	222 54.3	10.8	Al Na'ir	27 43.1	S46 53.4
H 09	92 02.2	280 38.7	. . 53.7	343 16.1	. . 05.7	351 41.8	. . 56.4	237 56.6	. . 10.8	Alnilam	275 46.4	S 1 11.7
U 10	107 04.7	295 38.4	52.4	358 16.8	05.5	6 43.7	56.4	252 59.0	10.9	Alphard	217 56.3	S 8 43.1
R 11	122 07.1	310 38.2	51.2	13 17.5	05.3	21 45.6	56.3	268 01.3	10.9			
S 12	137 09.6	325 37.9	N 4 49.9	28 18.2	N23 05.1	36 47.5	N22 56.3	283 03.7	S11 11.0	Alphecca	126 10.9	N26 40.4
D 13	152 12.1	340 37.7	48.6	43 18.9	04.9	51 49.4	56.3	298 06.0	11.0	Alpheratz	357 43.1	N29 10.0
A 14	167 14.5	355 37.4	47.4	58 19.6	04.8	66 51.3	56.2	313 08.4	11.1	Altair	62 07.8	N 8 54.6
Y 15	182 17.0	10 37.2	. . 46.1	73 20.3	. . 04.6	81 53.2	. . 56.2	328 10.7	. . 11.1	Ankaa	353 15.3	S42 13.6
16	197 19.5	25 36.9	44.9	88 20.9	04.4	96 55.2	56.2	343 13.0	11.2	Antares	112 25.9	S26 27.6
17	212 21.9	40 36.7	43.6	103 21.6	04.2	111 57.1	56.1	358 15.4	11.2			
18	227 24.4	55 36.4	N 4 42.3	118 22.3	N23 04.0	126 59.0	N22 56.1	13 17.7	S11 11.3	Arcturus	145 55.7	N19 06.9
19	242 26.9	70 36.2	41.1	133 23.0	03.8	142 00.9	56.1	28 20.1	11.3	Atria	107 27.3	S69 03.2
20	257 29.3	85 36.0	39.8	148 23.7	03.6	157 02.8	56.0	43 22.4	11.4	Avior	234 18.6	S59 33.3
21	272 31.8	100 35.7	. . 38.6	163 24.4	. . 03.4	172 04.7	. . 56.0	58 24.8	. . 11.4	Bellatrix	278 32.1	N 6 21.6
22	287 34.2	115 35.5	37.3	178 25.1	03.2	187 06.6	56.0	73 27.1	11.5	Betelgeuse	271 01.4	N 7 24.5
23	302 36.7	130 35.2	36.0	193 25.8	03.0	202 08.5	55.9	88 29.5	11.5			
9 00	317 39.2	145 35.0	N 4 34.8	208 26.5	N23 02.9	217 10.5	N22 55.9	103 31.8	S11 11.6	Canopus	263 56.5	S52 42.1
01	332 41.6	160 34.7	33.5	223 27.2	02.7	232 12.4	55.9	118 34.2	11.6	Capella	280 34.5	N46 00.4
02	347 44.1	175 34.5	32.2	238 27.9	02.5	247 14.3	55.8	133 36.5	11.7	Deneb	49 30.9	N45 20.0
03	2 46.6	190 34.3	. . 31.0	253 28.6	. . 02.3	262 16.2	. . 55.8	148 38.9	. . 11.8	Denebola	182 33.8	N14 29.8
04	17 49.0	205 34.0	29.7	268 29.3	02.1	277 18.1	55.8	163 41.2	11.8	Diphda	348 55.6	S17 54.5
05	32 51.5	220 33.8	28.4	283 30.0	01.9	292 20.0	55.7	178 43.6	11.9			
06	47 54.0	235 33.5	N 4 27.2	298 30.7	N23 01.7	307 21.9	N22 55.7	193 45.9	S11 11.9	Dubhe	193 52.2	N61 40.7
07	62 56.4	250 33.3	25.9	313 31.4	01.5	322 23.8	55.7	208 48.3	12.0	Elnath	278 12.7	N28 36.9
08	77 58.9	265 33.1	24.7	328 32.0	01.3	337 25.8	55.6	223 50.6	12.0	Eltanin	90 45.7	N51 29.6
F 09	93 01.3	280 32.8	. . 23.4	343 32.7	. . 01.1	352 27.7	. . 55.6	238 52.9	. . 12.1	Enif	33 46.7	N 9 56.5
R 10	108 03.8	295 32.6	22.1	358 33.4	00.9	7 29.6	55.6	253 55.3	12.1	Fomalhaut	15 23.5	S29 32.7
I 11	123 06.3	310 32.3	20.9	13 34.1	00.7	22 31.5	55.5	268 57.6	12.2			
D 12	138 08.7	325 32.1	N 4 19.6	28 34.8	N23 00.5	37 33.4	N22 55.5	284 00.0	S11 12.2	Gacrux	172 01.0	S57 11.6
A 13	153 11.2	340 31.9	18.3	43 35.5	00.4	52 35.3	55.5	299 02.3	12.3	Gienah	175 52.4	S17 37.1
Y 14	168 13.7	355 31.6	17.1	58 36.2	00.2	67 37.2	55.4	314 04.7	12.3	Hadar	148 47.8	S60 26.5
15	183 16.1	10 31.4	. . 15.8	73 36.9	23 00.0	82 39.2	. . 55.4	329 07.0	. . 12.4	Hamal	328 00.5	N23 31.5
16	198 18.6	25 31.1	14.5	88 37.6	22 59.8	97 41.1	55.4	344 09.4	12.4	Kaus Aust.	83 43.3	S34 22.5
17	213 21.1	40 30.9	13.3	103 38.3	59.6	112 43.0	55.3	359 11.7	12.5			
18	228 23.5	55 30.7	N 4 12.0	118 39.0	N22 59.4	127 44.9	N22 55.3	14 14.0	S11 12.5	Kochab	137 20.2	N74 06.3
19	243 26.0	70 30.4	10.7	133 39.7	59.2	142 46.8	55.3	29 16.4	12.6	Markab	13 37.9	N15 16.9
20	258 28.5	85 30.2	09.5	148 40.4	59.0	157 48.7	55.2	44 18.7	12.6	Menkar	314 14.9	N 4 08.6
21	273 30.9	100 30.0	. . 08.2	163 41.1	. . 58.8	172 50.7	. . 55.2	59 21.1	. . 12.7	Menkent	148 07.5	S36 26.3
22	288 33.4	115 29.7	06.9	178 41.8	58.6	187 52.6	55.2	74 23.4	12.7	Miaplacidus	221 40.5	S69 46.5
23	303 35.8	130 29.5	05.7	193 42.5	58.4	202 54.5	55.1	89 25.8	12.8			
10 00	318 38.3	145 29.2	N 4 04.4	208 43.2	N22 58.2	217 56.4	N22 55.1	104 28.1	S11 12.8	Mirfak	308 40.2	N49 54.3
01	333 40.8	160 29.0	03.1	223 43.9	58.0	232 58.3	55.1	119 30.5	12.9	Nunki	75 57.8	S26 16.6
02	348 43.2	175 28.8	01.9	238 44.6	57.8	248 00.2	55.0	134 32.8	12.9	Peacock	53 18.5	S56 41.3
03	3 45.7	190 28.5	4 00.6	253 45.3	. . 57.6	263 02.1	. . 55.0	149 35.1	. . 13.0	Pollux	243 27.9	N27 59.4
04	18 48.2	205 28.3	3 59.3	268 46.0	57.4	278 04.1	55.0	164 37.5	13.0	Procyon	244 59.9	N 5 11.3
05	33 50.6	220 28.1	58.1	283 46.7	57.2	293 06.0	54.9	179 39.8	13.1			
06	48 53.1	235 27.8	N 3 56.8	298 47.4	N22 57.0	308 07.9	N22 54.9	194 42.2	S11 13.2	Rasalhague	96 06.1	N12 33.3
07	63 55.6	250 27.6	55.5	313 48.1	56.8	323 09.8	54.9	209 44.5	13.2	Regulus	207 43.7	N11 54.0
S 08	78 58.0	265 27.4	54.3	328 48.8	56.6	338 11.7	54.8	224 46.8	13.3	Rigel	281 12.1	S 8 11.2
A 09	94 00.5	280 27.1	. . 53.0	343 49.5	. . 56.4	353 13.6	. . 54.8	239 49.2	. . 13.3	Rigil Kent.	139 51.6	S60 53.6
T 10	109 02.9	295 26.9	51.7	358 50.2	56.2	8 15.6	54.8	254 51.5	13.4	Sabik	102 12.2	S15 44.3
U 11	124 05.4	310 26.7	50.4	13 50.9	56.0	23 17.5	54.7	269 53.9	13.4			
R 12	139 07.9	325 26.4	N 3 49.2	28 51.6	N22 55.8	38 19.4	N22 54.7	284 56.2	S11 13.5	Schedar	349 40.0	N56 36.6
D 13	154 10.3	340 26.2	47.9	43 52.3	55.6	53 21.3	54.7	299 58.6	13.5	Shaula	96 21.5	S37 06.7
A 14	169 12.8	355 26.0	46.6	58 53.0	55.4	68 23.2	54.6	315 00.9	13.6	Sirius	258 33.9	S16 44.1
Y 15	184 15.3	10 25.7	. . 45.4	73 53.7	. . 55.2	83 25.1	. . 54.6	330 03.2	. . 13.6	Spica	158 31.2	S11 13.9
16	199 17.7	25 25.5	44.1	88 54.4	55.0	98 27.1	54.6	345 05.6	13.7	Suhail	222 52.8	S43 29.4
17	214 20.2	40 25.3	42.8	103 55.1	54.8	113 29.0	54.5	0 07.9	13.7			
18	229 22.7	55 25.0	N 3 41.6	118 55.8	N22 54.6	128 30.9	N22 54.5	15 10.3	S11 13.8	Vega	80 38.5	N38 48.1
19	244 25.1	70 24.8	40.3	133 56.5	54.4	143 32.8	54.5	30 12.6	13.8	Zuben'ubi	137 05.3	S16 05.8
20	259 27.6	85 24.6	39.0	148 57.2	54.2	158 34.7	54.4	45 14.9	13.9		SHA	Mer.Pass.
21	274 30.1	100 24.3	. . 37.7	163 57.9	. . 54.0	173 36.7	. . 54.4	60 17.3	. . 13.9		° ′	h m
22	289 32.5	115 24.1	36.5	178 58.6	53.8	188 38.6	54.4	75 19.6	14.0	Venus	187 55.8	14 18
23	304 35.0	130 23.9	35.2	193 59.3	53.6	203 40.5	54.3	90 22.0	14.1	Mars	250 47.3	10 06
	h m									Jupiter	259 31.3	9 30
Mer. Pass.	2 48.9	v −0.2	d 1.3	v 0.7	d 0.2	v 1.9	d 0.0	v 2.3	d 0.1	Saturn	145 52.7	17 03

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 8	Moonrise 9	Moonrise 10	Moonrise 11
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
8 00	178 34.9	N16 08.9	168 11.9	14.0	N 7 40.0	9.8	55.1	N 72	////	////	01 36	05 33	07 16	09 00	10 48
01	193 35.0	08.2	182 44.9	13.9	7 30.2	9.8	55.1	N 70	////	////	02 24	05 43	07 19	08 57	10 37
02	208 35.1	07.5	197 17.8	14.0	7 20.4	9.9	55.1	68	////	00 32	02 54	05 51	07 22	08 54	10 28
03	223 35.2	. . 06.8	211 50.8	14.0	7 10.5	9.9	55.1	66	////	01 47	03 16	05 58	07 24	08 52	10 21
04	238 35.2	06.1	226 23.8	14.0	7 00.6	10.0	55.1	64	////	02 41	03 34	06 04	07 26	08 50	10 15
05	253 35.3	05.4	240 56.8	14.0	6 50.6	9.9	55.2	62	00 29	02 46	03 48	06 08	07 28	08 48	10 10
06	268 35.4	N16 04.7	255 29.8	14.1	N 6 40.7	10.0	55.2	60	01 36	03 05	04 00	06 13	07 29	08 47	10 06
07	283 35.5	04.0	270 02.9	14.0	6 30.7	10.1	55.2	N 58	02 07	03 21	04 10	06 16	07 30	08 45	10 02
T 08	298 35.6	03.3	284 35.9	14.0	6 20.6	10.1	55.2	56	02 30	03 34	04 19	06 20	07 31	08 44	09 58
H 09	313 35.6	. . 02.5	299 08.9	14.0	6 10.5	10.1	55.2	54	02 48	03 45	04 27	06 23	07 32	08 43	09 55
U 10	328 35.7	01.8	313 41.9	14.0	6 00.4	10.1	55.2	52	03 03	03 55	04 34	06 25	07 33	08 42	09 52
R 11	343 35.8	01.1	328 14.9	14.0	5 50.3	10.2	55.3	50	03 16	04 04	04 41	06 28	07 34	08 41	09 50
S 12	358 35.9	N16 00.4	342 47.9	14.0	N 5 40.1	10.2	55.3	45	03 41	04 22	04 55	06 33	07 36	08 39	09 44
D 13	13 36.0	15 59.7	357 20.9	14.0	5 29.9	10.2	55.3	N 40	04 00	04 36	05 06	06 37	07 37	08 38	09 40
A 14	28 36.1	59.0	11 53.9	14.1	5 19.7	10.3	55.3	35	04 15	04 48	05 15	06 41	07 38	08 36	09 36
Y 15	43 36.1	. . 58.3	26 27.0	14.0	5 09.4	10.3	55.3	30	04 28	04 58	05 24	06 45	07 40	08 35	09 32
16	58 36.2	57.5	41 00.0	14.0	4 59.1	10.3	55.4	20	04 48	05 15	05 38	06 50	07 41	08 33	09 26
17	73 36.3	56.8	55 33.0	14.0	4 48.8	10.4	55.4	N 10	05 03	05 29	05 51	06 55	07 43	08 32	09 21
18	88 36.4	N15 56.1	70 06.0	14.0	N 4 38.4	10.3	55.4	0	05 16	05 41	06 02	07 00	07 45	08 30	09 16
19	103 36.5	55.4	84 39.0	14.0	4 28.1	10.4	55.4	S 10	05 26	05 52	06 13	07 05	07 46	08 28	09 11
20	118 36.6	54.7	99 12.0	14.0	4 17.7	10.4	55.4	20	05 36	06 03	06 25	07 10	07 48	08 27	09 06
21	133 36.7	. . 54.0	113 45.0	14.0	4 07.3	10.5	55.4	30	05 46	06 14	06 39	07 16	07 50	08 25	09 00
22	148 36.7	53.2	128 18.0	13.9	3 56.8	10.5	55.5	35	05 50	06 20	06 47	07 19	07 51	08 24	08 57
23	163 36.8	52.5	142 50.9	14.0	3 46.3	10.5	55.5	40	05 55	06 27	06 56	07 23	07 53	08 22	08 53
9 00	178 36.9	N15 51.8	157 23.9	14.0	N 3 35.8	10.5	55.5	45	06 00	06 35	07 06	07 27	07 54	08 21	08 49
01	193 37.0	51.1	171 56.9	13.9	3 25.3	10.5	55.5	S 50	06 06	06 44	07 18	07 32	07 56	08 19	08 44
02	208 37.1	50.4	186 29.8	14.0	3 14.8	10.6	55.5	52	06 08	06 48	07 24	07 35	07 57	08 19	08 42
03	223 37.2	. . 49.6	201 02.8	13.9	3 04.2	10.5	55.6	54	06 10	06 53	07 31	07 37	07 58	08 18	08 39
04	238 37.3	48.9	215 35.7	14.0	2 53.7	10.6	55.6	56	06 13	06 57	07 38	07 40	07 59	08 17	08 36
05	253 37.4	48.2	230 08.7	13.9	2 43.1	10.6	55.6	58	06 16	07 03	07 46	07 43	08 00	08 16	08 33
06	268 37.4	N15 47.5	244 41.6	13.9	N 2 32.5	10.7	55.6	S 60	06 19	07 09	07 55	07 47	08 01	08 15	08 30
07	283 37.5	46.7	259 14.5	13.9	2 21.8	10.6	55.6								
08	298 37.6	46.0	273 47.4	13.9	2 11.2	10.7	55.7								
F 09	313 37.7	. . 45.3	288 20.3	13.9	2 00.5	10.7	55.7								
R 10	328 37.8	44.6	302 53.2	13.8	1 49.8	10.7	55.7								
I 11	343 37.9	43.8	317 26.0	13.9	1 39.1	10.7	55.7								
D 12	358 38.0	N15 43.1	331 58.9	13.8	N 1 28.4	10.7	55.7								
A 13	13 38.1	42.4	346 31.7	13.8	1 17.7	10.7	55.8								
Y 14	28 38.2	41.7	1 04.5	13.8	1 07.0	10.8	55.8								
15	43 38.2	. . 40.9	15 37.3	13.8	0 56.2	10.7	55.8								
16	58 38.3	40.2	30 10.1	13.8	0 45.5	10.8	55.8								
17	73 38.4	39.5	44 42.9	13.8	0 34.7	10.8	55.8								
18	88 38.5	N15 38.8	59 15.7	13.7	N 0 23.9	10.8	55.9								
19	103 38.6	38.0	73 48.4	13.7	0 13.1	10.7	55.9								
20	118 38.7	37.3	88 21.1	13.7	N 0 02.4	10.8	55.9								
21	133 38.8	. . 36.6	102 53.8	13.7	S 0 08.4	10.8	55.9								
22	148 38.9	35.8	117 26.5	13.6	0 19.2	10.9	55.9								
23	163 39.0	35.1	131 59.1	13.7	0 30.1	10.8	56.0								
10 00	178 39.1	N15 34.4	146 31.8	13.6	S 0 40.9	10.8	56.0								
01	193 39.2	33.7	161 04.4	13.6	0 51.7	10.8	56.0								
02	208 39.3	32.9	175 37.0	13.5	1 02.5	10.8	56.0								
03	223 39.3	. . 32.2	190 09.5	13.6	1 13.3	10.9	56.0								
04	238 39.4	31.5	204 42.1	13.5	1 24.2	10.8	56.1								
05	253 39.5	30.7	219 14.6	13.5	1 35.0	10.8	56.1								
06	268 39.6	N15 30.0	233 47.1	13.4	S 1 45.8	10.8	56.1								
07	283 39.7	29.3	248 19.5	13.5	1 56.6	10.9	56.1								
S 08	298 39.8	28.5	262 52.0	13.4	2 07.5	10.8	56.1								
A 09	313 39.9	. . 27.8	277 24.4	13.3	2 18.3	10.8	56.2								
T 10	328 40.0	27.1	291 56.7	13.4	2 29.1	10.8	56.2								
U 11	343 40.1	26.3	306 29.1	13.3	2 39.9	10.8	56.2								
R 12	358 40.2	N15 25.6	321 01.4	13.3	S 2 50.7	10.8	56.2								
D 13	13 40.3	24.9	335 33.7	13.3	3 01.5	10.8	56.3								
A 14	28 40.4	24.1	350 06.0	13.2	3 12.3	10.8	56.3								
Y 15	43 40.5	. . 23.4	4 38.2	13.2	3 23.1	10.8	56.3								
16	58 40.6	22.6	19 10.4	13.1	3 33.9	10.8	56.3								
17	73 40.7	21.9	33 42.5	13.2	3 44.7	10.7	56.3								
18	88 40.8	N15 21.2	48 14.7	13.0	S 3 55.4	10.8	56.4								
19	103 40.9	20.4	62 46.7	13.1	4 06.2	10.7	56.4								
20	118 41.0	19.7	77 18.8	13.0	4 16.9	10.7	56.4								
21	133 41.1	. . 19.0	91 50.8	13.0	4 27.6	10.7	56.4								
22	148 41.2	18.2	106 22.8	12.9	4 38.3	10.7	56.5								
23	163 41.3	17.5	120 54.7	12.9	S 4 49.0	10.7	56.5								
	SD 15.8	d 0.7	SD	15.1		15.2		15.3							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 8	Moonset 9	Moonset 10	Moonset 11
°	h m	h m	h m	h m	h m	h m	h m
N 72	22 26	////	////	20 15	20 06	19 56	19 45
N 70	21 42	////	////	20 10	20 06	20 02	19 58
68	21 14	23 19	////	20 05	20 06	20 07	20 08
66	20 52	22 19	////	20 01	20 06	20 11	20 17
64	20 35	21 46	////	19 58	20 06	20 14	20 24
62	20 21	21 22	23 25	19 55	20 06	20 18	20 30
60	20 09	21 03	22 30	19 52	20 06	20 20	20 36
N 58	19 59	20 48	22 00	19 50	20 06	20 23	20 41
56	19 50	20 35	21 38	19 48	20 06	20 25	20 45
54	19 42	20 24	21 20	19 46	20 06	20 27	20 49
52	19 35	20 15	21 06	19 44	20 06	20 28	20 52
50	19 29	20 06	20 53	19 43	20 06	20 30	20 56
45	19 16	19 48	20 29	19 39	20 06	20 34	21 03
N 40	19 04	19 34	20 10	19 37	20 06	20 36	21 08
35	18 55	19 22	19 55	19 34	20 06	20 39	21 13
30	18 47	19 12	19 42	19 32	20 06	20 41	21 18
20	18 33	18 56	19 23	19 28	20 06	20 45	21 26
N 10	18 20	18 42	19 08	19 25	20 06	20 49	21 33
0	18 09	18 30	18 55	19 22	20 06	20 52	21 39
S 10	17 58	18 19	18 45	19 18	20 06	20 55	21 45
20	17 46	18 09	18 35	19 15	20 06	20 59	21 52
30	17 32	17 57	18 26	19 11	20 06	21 02	22 00
35	17 24	17 51	18 21	19 09	20 06	21 05	22 05
40	17 16	17 44	18 16	19 06	20 06	21 07	22 10
45	17 05	17 36	18 11	19 03	20 06	21 10	22 16
S 50	16 53	17 27	18 06	18 59	20 06	21 14	22 23
52	16 47	17 23	18 04	18 58	20 06	21 15	22 26
54	16 41	17 19	18 01	18 56	20 06	21 17	22 30
56	16 34	17 14	17 59	18 54	20 06	21 19	22 34
58	16 26	17 09	17 56	18 51	20 06	21 21	22 39
S 60	16 17	17 03	17 53	18 49	20 06	21 24	22 44

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
8	05 41	05 37	12 06	13 11	00 49	02	3
9	05 33	05 28	12 05	13 56	01 33	03	7
10	05 24	05 19	12 05	14 41	02 18	04	13

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −2.0		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
11 00	319 37.4	145 23.6	N 3 33.9	209 00.0	N22 53.4	218 42.4	N22 54.3	105 24.3	S11 14.1	Acamar	315 18.2	S40 14.8
01	334 39.9	160 23.4	32.7	224 00.7	53.1	233 44.3	54.3	120 26.6	14.2	Achernar	335 26.5	S57 09.7
02	349 42.4	175 23.2	31.4	239 01.4	52.9	248 46.3	54.2	135 29.0	14.2	Acrux	173 09.5	S63 10.7
03	4 44.8	190 22.9	. . 30.1	254 02.1	. . 52.7	263 48.2	. . 54.2	150 31.3	. . 14.3	Adhara	255 12.7	S28 59.4
04	19 47.3	205 22.7	28.8	269 02.8	52.5	278 50.1	54.2	165 33.7	14.3	Aldebaran	290 49.3	N16 32.1
05	34 49.8	220 22.5	27.6	284 03.5	52.3	293 52.0	54.1	180 36.0	14.4			
06	49 52.2	235 22.3	N 3 26.3	299 04.2	N22 52.1	308 53.9	N22 54.1	195 38.3	S11 14.4	Alioth	166 21.0	N55 53.4
07	64 54.7	250 22.0	25.0	314 04.9	51.9	323 55.8	54.1	210 40.7	14.5	Alkaid	152 59.0	N49 15.0
08	79 57.2	265 21.8	23.7	329 05.6	51.7	338 57.8	54.0	225 43.0	14.5	Al Na'ir	27 43.1	S46 53.4
S 09	94 59.6	280 21.6	. . 22.5	344 06.3	. . 51.5	353 59.7	. . 54.0	240 45.4	. . 14.6	Alnilam	275 46.4	S 1 11.6
U 10	110 02.1	295 21.3	21.2	359 07.0	51.3	9 01.6	53.9	255 47.7	14.6	Alphard	217 56.3	S 8 43.1
N 11	125 04.6	310 21.1	19.9	14 07.7	51.1	24 03.5	53.9	270 50.0	14.7			
D 12	140 07.0	325 20.9	N 3 18.7	29 08.4	N22 50.9	39 05.4	N22 53.9	285 52.4	S11 14.8	Alphecca	126 10.9	N26 40.4
A 13	155 09.5	340 20.7	17.4	44 09.1	50.7	54 07.4	53.8	300 54.7	14.8	Alpheratz	357 43.1	N29 10.0
Y 14	170 11.9	355 20.4	16.1	59 09.9	50.5	69 09.3	53.8	315 57.0	14.9	Altair	62 07.8	N 8 54.6
15	185 14.4	10 20.2	. . 14.8	74 10.6	. . 50.2	84 11.2	. . 53.8	330 59.4	. . 14.9	Ankaa	353 15.3	S42 13.6
16	200 16.9	25 20.0	13.6	89 11.3	50.0	99 13.1	53.7	346 01.7	15.0	Antares	112 26.0	S26 27.6
17	215 19.3	40 19.7	12.3	104 12.0	49.8	114 15.1	53.7	1 04.1	15.0			
18	230 21.8	55 19.5	N 3 11.0	119 12.7	N22 49.6	129 17.0	N22 53.7	16 06.4	S11 15.1	Arcturus	145 55.7	N19 06.9
19	245 24.3	70 19.3	09.7	134 13.4	49.4	144 18.9	53.6	31 08.7	15.1	Atria	107 27.4	S69 03.2
20	260 26.7	85 19.1	08.5	149 14.1	49.2	159 20.8	53.6	46 11.1	15.2	Avior	234 18.5	S59 33.2
21	275 29.2	100 18.8	. . 07.2	164 14.8	. . 49.0	174 22.7	. . 53.6	61 13.4	. . 15.2	Bellatrix	278 32.0	N 6 21.6
22	290 31.7	115 18.6	05.9	179 15.5	48.8	189 24.7	53.5	76 15.7	15.3	Betelgeuse	271 01.4	N 7 24.5
23	305 34.1	130 18.4	04.6	194 16.2	48.6	204 26.6	53.5	91 18.1	15.3			
12 00	320 36.6	145 18.2	N 3 03.4	209 16.9	N22 48.3	219 28.5	N22 53.5	106 20.4	S11 15.4	Canopus	263 56.5	S52 42.1
01	335 39.0	160 17.9	02.1	224 17.6	48.1	234 30.4	53.4	121 22.7	15.5	Capella	280 34.5	N46 00.4
02	350 41.5	175 17.7	3 00.8	239 18.3	47.9	249 32.3	53.4	136 25.1	15.5	Deneb	49 30.9	N45 20.0
03	5 44.0	190 17.5	2 59.5	254 19.0	. . 47.7	264 34.3	. . 53.4	151 27.4	. . 15.6	Denebola	182 33.8	N14 29.8
04	20 46.4	205 17.3	58.3	269 19.7	47.5	279 36.2	53.3	166 29.8	15.6	Diphda	348 55.6	S17 54.5
05	35 48.9	220 17.0	57.0	284 20.4	47.3	294 38.1	53.3	181 32.1	15.7			
06	50 51.4	235 16.8	N 2 55.7	299 21.2	N22 47.1	309 40.0	N22 53.3	196 34.4	S11 15.7	Dubhe	193 52.2	N61 40.7
07	65 53.8	250 16.6	54.4	314 21.9	46.8	324 42.0	53.2	211 36.8	15.8	Elnath	278 12.7	N28 36.9
08	80 56.3	265 16.4	53.1	329 22.6	46.6	339 43.9	53.2	226 39.1	15.8	Eltanin	90 45.7	N51 29.6
M 09	95 58.8	280 16.1	. . 51.9	344 23.3	. . 46.4	354 45.8	. . 53.1	241 41.4	. . 15.9	Enif	33 46.7	N 9 56.5
O 10	111 01.2	295 15.9	50.6	359 24.0	46.2	9 47.7	53.1	256 43.8	15.9	Fomalhaut	15 23.5	S29 32.7
N 11	126 03.7	310 15.7	49.3	14 24.7	46.0	24 49.6	53.1	271 46.1	16.0			
D 12	141 06.2	325 15.5	N 2 48.0	29 25.4	N22 45.8	39 51.6	N22 53.0	286 48.4	S11 16.1	Gacrux	172 01.1	S57 11.6
A 13	156 08.6	340 15.2	46.8	44 26.1	45.6	54 53.5	53.0	301 50.8	16.1	Gienah	175 52.4	S17 37.1
Y 14	171 11.1	355 15.0	45.5	59 26.8	45.3	69 55.4	53.0	316 53.1	16.2	Hadar	148 47.8	S60 26.5
15	186 13.5	10 14.8	. . 44.2	74 27.5	. . 45.1	84 57.3	. . 52.9	331 55.4	. . 16.2	Hamal	328 00.5	N23 31.6
16	201 16.0	25 14.6	42.9	89 28.2	44.9	99 59.3	52.9	346 57.8	16.3	Kaus Aust.	83 43.3	S34 22.5
17	216 18.5	40 14.4	41.7	104 28.9	44.7	115 01.2	52.9	2 00.1	16.3			
18	231 20.9	55 14.1	N 2 40.4	119 29.7	N22 44.5	130 03.1	N22 52.8	17 02.4	S11 16.4	Kochab	137 20.2	N74 06.3
19	246 23.4	70 13.9	39.1	134 30.4	44.2	145 05.0	52.8	32 04.8	16.4	Markab	13 37.9	N15 16.9
20	261 25.9	85 13.7	37.8	149 31.1	44.0	160 07.0	52.8	47 07.1	16.5	Menkar	314 14.9	N 4 08.6
21	276 28.3	100 13.5	. . 36.5	164 31.8	. . 43.8	175 08.9	. . 52.7	62 09.4	. . 16.6	Menkent	148 07.5	S36 26.3
22	291 30.8	115 13.3	35.3	179 32.5	43.6	190 10.8	52.7	77 11.8	16.6	Miaplacidus	221 40.5	S69 46.5
23	306 33.3	130 13.0	34.0	194 33.2	43.4	205 12.7	52.7	92 14.1	16.7			
13 00	321 35.7	145 12.8	N 2 32.7	209 33.9	N22 43.2	220 14.7	N22 52.6	107 16.4	S11 16.7	Mirfak	308 40.2	N49 54.3
01	336 38.2	160 12.6	31.4	224 34.6	42.9	235 16.6	52.6	122 18.8	16.8	Nunki	75 57.9	S26 16.6
02	351 40.6	175 12.4	30.1	239 35.3	42.7	250 18.5	52.5	137 21.1	16.8	Peacock	53 18.5	S56 41.3
03	6 43.1	190 12.2	. . 28.9	254 36.1	. . 42.5	265 20.4	. . 52.5	152 23.4	. . 16.9	Poliux	243 27.9	N27 59.4
04	21 45.6	205 11.9	27.6	269 36.8	42.3	280 22.4	52.5	167 25.8	16.9	Procyon	244 59.9	N 5 11.3
05	36 48.0	220 11.7	26.3	284 37.5	42.1	295 24.3	52.4	182 28.1	17.0			
06	51 50.5	235 11.5	N 2 25.0	299 38.2	N22 41.8	310 26.2	N22 52.4	197 30.4	S11 17.1	Rasalhague	96 06.1	N12 33.3
07	66 53.0	250 11.3	23.7	314 38.9	41.6	325 28.1	52.4	212 32.8	17.1	Regulus	207 43.7	N11 54.0
08	81 55.4	265 11.1	22.5	329 39.6	41.4	340 30.1	52.3	227 35.1	17.2	Rigel	281 12.1	S 8 11.2
T 09	96 57.9	280 10.8	. . 21.2	344 40.3	. . 41.2	355 32.0	. . 52.3	242 37.4	. . 17.2	Rigil Kent.	139 51.6	S60 53.6
U 10	112 00.4	295 10.6	19.9	359 41.0	40.9	10 33.9	52.3	257 39.8	17.3	Sabik	102 12.2	S15 44.3
E 11	127 02.8	310 10.4	18.6	14 41.8	40.7	25 35.8	52.2	272 42.1	17.3			
S 12	142 05.3	325 10.2	N 2 17.3	29 42.5	N22 40.5	40 37.8	N22 52.2	287 44.4	S11 17.4	Schedar	349 39.9	N56 36.6
D 13	157 07.8	340 10.0	16.1	44 43.2	40.3	55 39.7	52.2	302 46.8	17.4	Shaula	96 21.5	S37 06.7
A 14	172 10.2	355 09.7	14.8	59 43.9	40.0	70 41.6	52.1	317 49.1	17.5	Sirius	258 33.9	S16 44.1
Y 15	187 12.7	10 09.5	. . 13.5	74 44.6	. . 39.8	85 43.6	. . 52.1	332 51.4	. . 17.6	Spica	158 31.2	S11 13.9
16	202 15.1	25 09.3	12.2	89 45.3	39.6	100 45.5	52.0	347 53.7	17.6	Suhail	222 52.8	S43 29.3
17	217 17.6	40 09.1	10.9	104 46.0	39.4	115 47.4	52.0	2 56.1	17.7			
18	232 20.1	55 08.9	N 2 09.7	119 46.8	N22 39.1	130 49.3	N22 52.0	17 58.4	S11 17.7	Vega	80 38.5	N38 48.2
19	247 22.5	70 08.7	08.4	134 47.5	38.9	145 51.3	51.9	33 00.7	17.8	Zuben'ubi	137 05.3	S16 05.8
20	262 25.0	85 08.4	07.1	149 48.2	38.7	160 53.2	51.9	48 03.1	17.8		SHA	Mer. Pass.
21	277 27.5	100 08.2	. . 05.8	164 48.9	. . 38.5	175 55.1	. . 51.9	63 05.4	. . 17.9		° ′	h m
22	292 29.9	115 08.0	04.5	179 49.6	38.2	190 57.0	51.8	78 07.7	18.0	Venus	184 41.6	14 19
23	307 32.4	130 07.8	03.3	194 50.3	38.0	205 59.0	51.8	93 10.1	18.0	Mars	248 40.3	10 02
	h m									Jupiter	258 51.9	9 21
Mer. Pass.	2 37.1	v −0.2	d 1.3	v 0.7	d 0.2	v 1.9	d 0.0	v 2.3	d 0.1	Saturn	145 43.8	16 52

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		11	12	13	14
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
11 00	178 41.4	N15 16.7	135 26.6	12.9	S 4 59.7	10.7	56.5	N 72	////	////	02 03	10 48	12 42	14 48	
01	193 41.5	16.0	149 58.5	12.8	5 10.4	10.6	56.5	N 70	////	////	02 41	10 37	12 22	14 12	16 10
02	208 41.6	15.2	164 30.3	12.8	5 21.0	10.7	56.5	68	////	01 18	03 07	10 28	12 06	13 47	15 29
03	223 41.7	. . 14.5	179 02.1	12.8	5 31.7	10.6	56.6	66	////	02 35	03 27	10 21	11 53	13 28	15 01
04	238 41.8	13.8	193 33.9	12.7	5 42.3	10.6	56.6	64	////	02 45	03 43	10 15	11 43	13 12	14 40
05	253 41.9	13.0	208 05.6	12.6	5 52.9	10.5	56.6	62	01 09	02 57	03 56	10 10	11 34	12 59	14 23
06	268 42.0	N15 12.3	222 37.2	12.6	S 6 03.4	10.6	56.6	60	01 52	03 14	04 07	10 06	11 27	12 48	14 09
07	283 42.1	11.5	237 08.8	12.6	6 14.0	10.5	56.7	N 58	02 19	03 29	04 17	10 02	11 20	12 39	13 57
08	298 42.2	10.8	251 40.4	12.5	6 24.5	10.5	56.7	56	02 40	03 41	04 25	09 58	11 14	12 31	13 46
S 09	313 42.3	. . 10.0	266 11.9	12.5	6 35.0	10.5	56.7	54	02 56	03 51	04 33	09 55	11 09	12 23	13 37
U 10	328 42.4	09.3	280 43.4	12.5	6 45.5	10.5	56.7	52	03 10	04 01	04 39	09 52	11 04	12 17	13 29
N 11	343 42.5	08.6	295 14.9	12.3	6 56.0	10.4	56.8	50	03 22	04 09	04 45	09 50	11 00	12 11	13 22
D 12	358 42.6	N15 07.8	309 46.2	12.4	S 7 06.4	10.4	56.8	45	03 46	04 26	04 58	09 44	10 51	11 58	13 06
A 13	13 42.7	07.1	324 17.6	12.3	7 16.8	10.4	56.8	N 40	04 04	04 39	05 09	09 40	10 43	11 48	12 53
Y 14	28 42.8	06.3	338 48.9	12.2	7 27.2	10.3	56.8	35	04 18	04 51	05 18	09 36	10 37	11 39	12 42
15	43 42.9	. . 05.6	353 20.1	12.2	7 37.5	10.4	56.9	30	04 30	05 00	05 26	09 32	10 31	11 31	12 33
16	58 43.0	04.8	7 51.3	12.2	7 47.9	10.2	56.9	20	04 49	05 16	05 39	09 26	10 21	11 18	12 16
17	73 43.1	04.1	22 22.5	12.1	7 58.1	10.3	56.9	N 10	05 03	05 29	05 51	09 21	10 12	11 06	12 02
18	88 43.2	N15 03.3	36 53.6	12.0	S 8 08.4	10.2	56.9	0	05 15	05 40	06 02	09 16	10 04	10 55	11 49
19	103 43.3	02.6	51 24.6	12.0	8 18.6	10.2	57.0	S 10	05 26	05 51	06 12	09 11	09 56	10 44	11 36
20	118 43.4	01.8	65 55.6	11.9	8 28.8	10.2	57.0	20	05 35	06 01	06 24	09 06	09 48	10 33	11 22
21	133 43.5	. . 01.1	80 26.5	11.9	8 39.0	10.1	57.0	30	05 43	06 12	06 36	09 00	09 39	10 20	11 06
22	148 43.6	15 00.3	94 57.4	11.8	8 49.1	10.1	57.0	35	05 48	06 17	06 44	08 57	09 33	10 12	10 57
23	163 43.7	14 59.6	109 28.2	11.8	8 59.2	10.0	57.0	40	05 52	06 24	06 52	08 53	09 27	10 04	10 46
12 00	178 43.8	N14 58.8	123 59.0	11.7	S 9 09.2	10.0	57.1	45	05 56	06 31	07 02	08 49	09 20	09 54	10 34
01	193 43.9	58.1	138 29.7	11.7	9 19.2	10.0	57.1	S 50	06 01	06 39	07 13	08 44	09 11	09 42	10 19
02	208 44.0	57.3	153 00.4	11.6	9 29.2	9.9	57.1	52	06 03	06 43	07 19	08 42	09 07	09 37	10 12
03	223 44.1	. . 56.6	167 31.0	11.6	9 39.1	9.9	57.1	54	06 05	06 47	07 25	08 39	09 03	09 31	10 05
04	238 44.2	55.8	182 01.6	11.4	9 49.0	9.9	57.2	56	06 07	06 51	07 31	08 36	08 58	09 24	09 56
05	253 44.3	55.1	196 32.0	11.5	9 58.9	9.8	57.2	58	06 10	06 56	07 39	08 33	08 53	09 16	09 46
06	268 44.4	N14 54.3	211 02.5	11.4	S10 08.7	9.7	57.2	S 60	06 12	07 02	07 47	08 30	08 47	09 08	09 35
07	283 44.5	53.6	225 32.9	11.3	10 18.4	9.7	57.2								
08	298 44.7	52.8	240 03.2	11.2	10 28.1	9.7	57.3								
M 09	313 44.8	. . 52.1	254 33.4	11.2	10 37.8	9.6	57.3								
O 10	328 44.9	51.3	269 03.6	11.2	10 47.4	9.6	57.3								
N 11	343 45.0	50.5	283 33.8	11.0	10 57.0	9.5	57.4								
D 12	358 45.1	N14 49.8	298 03.8	11.0	S11 06.5	9.5	57.4								
A 13	13 45.2	49.0	312 33.8	11.0	11 16.0	9.4	57.4								
Y 14	28 45.3	48.3	327 03.8	10.9	11 25.4	9.4	57.4								
15	43 45.4	. . 47.5	341 33.7	10.8	11 34.8	9.3	57.5								
16	58 45.5	46.8	356 03.5	10.7	11 44.1	9.3	57.5								
17	73 45.6	46.0	10 33.2	10.7	11 53.4	9.2	57.5								
18	88 45.7	N14 45.2	25 02.9	10.7	S12 02.6	9.2	57.5								
19	103 45.8	44.5	39 32.6	10.5	12 11.8	9.1	57.6								
20	118 45.9	43.7	54 02.1	10.5	12 20.9	9.0	57.6								
21	133 46.1	. . 43.0	68 31.6	10.4	12 29.9	9.0	57.6								
22	148 46.2	42.2	83 01.0	10.4	12 38.9	8.9	57.6								
23	163 46.3	41.5	97 30.4	10.3	12 47.8	8.8	57.7								
13 00	178 46.4	N14 40.7	111 59.7	10.2	S12 56.6	8.8	57.7								
01	193 46.5	39.9	126 28.9	10.2	13 05.4	8.8	57.7								
02	208 46.6	39.2	140 58.1	10.1	13 14.2	8.6	57.7								
03	223 46.7	. . 38.4	155 27.2	10.0	13 22.8	8.6	57.8								
04	238 46.8	37.6	169 56.2	9.9	13 31.4	8.6	57.8								
05	253 46.9	36.9	184 25.1	9.9	13 40.0	8.4	57.8								
06	268 47.1	N14 36.1	198 54.0	9.8	S13 48.4	8.4	57.8								
07	283 47.2	35.4	213 22.8	9.8	13 56.8	8.4	57.9								
T 08	298 47.3	34.6	227 51.6	9.6	14 05.2	8.2	57.9								
U 09	313 47.4	. . 33.8	242 20.2	9.6	14 13.4	8.2	57.9								
E 10	328 47.5	33.1	256 48.8	9.6	14 21.6	8.1	58.0								
S 11	343 47.6	32.3	271 17.4	9.4	14 29.7	8.0	58.0								
D 12	358 47.7	N14 31.5	285 45.8	9.4	S14 37.7	8.0	58.0								
A 13	13 47.9	30.8	300 14.2	9.3	14 45.7	7.9	58.0								
Y 14	28 48.0	30.0	314 42.5	9.2	14 53.6	7.8	58.1								
15	43 48.1	. . 29.2	329 10.7	9.2	15 01.4	7.7	58.1								
16	58 48.2	28.5	343 38.9	9.1	15 09.1	7.7	58.1								
17	73 48.3	27.7	358 07.0	9.0	15 16.8	7.5	58.1								
18	88 48.4	N14 26.9	12 35.0	9.0	S15 24.3	7.5	58.2								
19	103 48.5	26.2	27 03.0	8.9	15 31.8	7.4	58.2								
20	118 48.7	25.4	41 30.9	8.8	15 39.2	7.3	58.2								
21	133 48.8	. . 24.6	55 58.7	8.7	15 46.5	7.3	58.2								
22	148 48.9	23.9	70 26.4	8.7	15 53.8	7.1	58.3								
23	163 49.0	23.1	84 54.1	8.5	S16 00.9	7.1	58.3								
	SD 15.8	d 0.8	SD	15.5		15.6									

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	11	12	13	14
°	h m	h m	h m	h m	h m	h m	h m
N 72	22 01	////	////	19 45	19 32	19 13	
N 70	21 25	////	////	19 58	19 54	19 50	19 46
68	21 00	22 43	////	20 08	20 11	20 16	20 27
66	20 40	22 00	////	20 17	20 25	20 36	20 56
64	20 25	21 32	////	20 24	20 36	20 53	21 18
62	20 12	21 11	22 53	20 30	20 46	21 06	21 35
60	20 01	20 54	22 14	20 36	20 54	21 18	21 50
N 58	19 52	20 39	21 48	20 41	21 02	21 28	22 02
56	19 43	20 28	21 28	20 45	21 08	21 37	22 13
54	19 36	20 17	21 12	20 49	21 14	21 45	22 22
52	19 30	20 08	20 58	20 52	21 19	21 52	22 31
50	19 24	20 00	20 46	20 56	21 24	21 58	22 38
45	19 11	19 43	20 23	21 03	21 35	22 12	22 55
N 40	19 01	19 30	20 05	21 08	21 43	22 23	23 08
35	18 52	19 19	19 51	21 13	21 51	22 32	23 20
30	18 44	19 09	19 39	21 18	21 57	22 41	23 30
20	18 31	18 54	19 21	21 26	22 09	22 56	23 47
N 10	18 19	18 41	19 06	21 33	22 19	23 08	24 02
0	18 08	18 30	18 55	21 39	22 28	23 21	24 16
S 10	17 58	18 19	18 45	21 45	22 38	23 33	24 30
20	17 47	18 09	18 36	21 52	22 48	23 46	24 45
30	17 34	17 59	18 27	22 00	22 59	24 00	00 00
35	17 27	17 53	18 23	22 05	23 06	24 09	00 09
40	17 18	17 47	18 19	22 10	23 14	24 19	00 19
45	17 09	17 40	18 14	22 16	23 23	24 30	00 30
S 50	16 57	17 31	18 10	22 23	23 33	24 44	00 44
52	16 52	17 28	18 08	22 26	23 38	24 51	00 51
54	16 46	17 24	18 06	22 30	23 44	24 58	00 58
56	16 40	17 19	18 04	22 34	23 50	25 06	01 06
58	16 32	17 15	18 01	22 39	23 57	25 15	01 15
S 60	16 24	17 09	17 59	22 44	24 05	00 05	01 26

Day	SUN		MOON			
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00^h	12^h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
11	05 15	05 10	12 05	15 28	03 04	05	20
12	05 05	05 00	12 05	16 16	03 52	06	29
13	04 55	04 49	12 05	17 08	04 42	07	40

UT	ARIES	VENUS −3.9		MARS +1.6		JUPITER −2.0		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
14 00	322 34.9	145 07.6	N 2 02.0	209 51.0	N22 37.8	221 00.9	N22 51.8	108 12.4	S11 18.1
01	337 37.3	160 07.4	2 00.7	224 51.8	37.6	236 02.8	51.7	123 14.7	18.1
02	352 39.8	175 07.1	1 59.4	239 52.5	37.3	251 04.8	51.7	138 17.0	18.2
03	7 42.3	190 06.9	. . 58.1	254 53.2	. . 37.1	266 06.7	. . 51.7	153 19.4	. . 18.2
04	22 44.7	205 06.7	56.8	269 53.9	36.9	281 08.6	51.6	168 21.7	18.3
05	37 47.2	220 06.5	55.6	284 54.6	36.7	296 10.5	51.6	183 24.0	18.4
06	52 49.6	235 06.3	N 1 54.3	299 55.3	N22 36.4	311 12.5	N22 51.5	198 26.4	S11 18.4
W 07	67 52.1	250 06.1	53.0	314 56.1	36.2	326 14.4	51.5	213 28.7	18.5
E 08	82 54.6	265 05.9	51.7	329 56.8	36.0	341 16.3	51.5	228 31.0	18.5
D 09	97 57.0	280 05.6	. . 50.4	344 57.5	. . 35.7	356 18.3	. . 51.4	243 33.3	. . 18.6
N 10	112 59.5	295 05.4	49.1	359 58.2	35.5	11 20.2	51.4	258 35.7	18.6
E 11	128 02.0	310 05.2	47.9	14 58.9	35.3	26 22.1	51.4	273 38.0	18.7
S 12	143 04.4	325 05.0	N 1 46.6	29 59.6	N22 35.1	41 24.1	N22 51.3	288 40.3	S11 18.8
D 13	158 06.9	340 04.8	45.3	45 00.4	34.8	56 26.0	51.3	303 42.7	18.8
A 14	173 09.4	355 04.6	44.0	60 01.1	34.6	71 27.9	51.3	318 45.0	18.9
Y 15	188 11.8	10 04.4	. . 42.7	75 01.8	. . 34.4	86 29.8	. . 51.2	333 47.3	. . 18.9
16	203 14.3	25 04.1	41.4	90 02.5	34.1	101 31.8	51.2	348 49.6	19.0
17	218 16.7	40 03.9	40.2	105 03.2	33.9	116 33.7	51.1	3 52.0	19.0
18	233 19.2	55 03.7	N 1 38.9	120 04.0	N22 33.7	131 35.6	N22 51.1	18 54.3	S11 19.1
19	248 21.7	70 03.5	37.6	135 04.7	33.4	146 37.6	51.1	33 56.6	19.2
20	263 24.1	85 03.3	36.3	150 05.4	33.2	161 39.5	51.0	48 58.9	19.2
21	278 26.6	100 03.1	. . 35.0	165 06.1	. . 33.0	176 41.4	. . 51.0	64 01.3	. . 19.3
22	293 29.1	115 02.9	33.7	180 06.8	32.7	191 43.4	51.0	79 03.6	19.3
23	308 31.5	130 02.7	32.5	195 07.6	32.5	206 45.3	50.9	94 05.9	19.4
15 00	323 34.0	145 02.4	N 1 31.2	210 08.3	N22 32.3	221 47.2	N22 50.9	109 08.2	S11 19.4
01	338 36.5	160 02.2	29.9	225 09.0	32.0	236 49.2	50.9	124 10.6	19.5
02	353 38.9	175 02.0	28.6	240 09.7	31.8	251 51.1	50.8	139 12.9	19.6
03	8 41.4	190 01.8	. . 27.3	255 10.4	. . 31.6	266 53.0	. . 50.8	154 15.2	. . 19.6
04	23 43.9	205 01.6	26.0	270 11.2	31.3	281 55.0	50.7	169 17.6	19.7
05	38 46.3	220 01.4	24.8	285 11.9	31.1	296 56.9	50.7	184 19.9	19.7
06	53 48.8	235 01.2	N 1 23.5	300 12.6	N22 30.9	311 58.8	N22 50.7	199 22.2	S11 19.8
T 07	68 51.2	250 01.0	22.2	315 13.3	30.6	327 00.8	50.6	214 24.5	19.8
H 08	83 53.7	265 00.8	20.9	330 14.0	30.4	342 02.7	50.6	229 26.9	19.9
U 09	98 56.2	280 00.5	. . 19.6	345 14.8	. . 30.2	357 04.6	. . 50.6	244 29.2	. . 20.0
R 10	113 58.6	295 00.3	18.3	0 15.5	29.9	12 06.5	50.5	259 31.5	20.0
S 11	129 01.1	310 00.1	17.0	15 16.2	29.7	27 08.5	50.5	274 33.8	20.1
D 12	144 03.6	324 59.9	N 1 15.8	30 16.9	N22 29.4	42 10.4	N22 50.5	289 36.1	S11 20.1
A 13	159 06.0	339 59.7	14.5	45 17.7	29.2	57 12.3	50.4	304 38.5	20.2
Y 14	174 08.5	354 59.5	13.2	60 18.4	29.0	72 14.3	50.4	319 40.8	20.3
15	189 11.0	9 59.3	. . 11.9	75 19.1	. . 28.7	87 16.2	. . 50.3	334 43.1	. . 20.3
16	204 13.4	24 59.1	10.6	90 19.8	28.5	102 18.1	50.3	349 45.4	20.4
17	219 15.9	39 58.9	09.3	105 20.5	28.3	117 20.1	50.3	4 47.8	20.4
18	234 18.4	54 58.7	N 1 08.0	120 21.3	N22 28.0	132 22.0	N22 50.2	19 50.1	S11 20.5
19	249 20.8	69 58.5	06.8	135 22.0	27.8	147 24.0	50.2	34 52.4	20.5
20	264 23.3	84 58.2	05.5	150 22.7	27.5	162 25.9	50.2	49 54.7	20.6
21	279 25.7	99 58.0	. . 04.2	165 23.4	. . 27.3	177 27.8	. . 50.1	64 57.1	. . 20.7
22	294 28.2	114 57.8	02.9	180 24.2	27.1	192 29.8	50.1	79 59.4	20.7
23	309 30.7	129 57.6	01.6	195 24.9	26.8	207 31.7	50.1	95 01.7	20.8
16 00	324 33.1	144 57.4	N 1 00.3	210 25.6	N22 26.6	222 33.6	N22 50.0	110 04.0	S11 20.8
01	339 35.6	159 57.2	0 59.0	225 26.3	26.3	237 35.6	50.0	125 06.4	20.9
02	354 38.1	174 57.0	57.8	240 27.1	26.1	252 37.5	49.9	140 08.7	21.0
03	9 40.5	189 56.8	. . 56.5	255 27.8	. . 25.8	267 39.4	. . 49.9	155 11.0	. . 21.0
04	24 43.0	204 56.6	55.2	270 28.5	25.6	282 41.4	49.9	170 13.3	21.1
05	39 45.5	219 56.4	53.9	285 29.2	25.4	297 43.3	49.8	185 15.6	21.1
06	54 47.9	234 56.2	N 0 52.6	300 30.0	N22 25.1	312 45.2	N22 49.8	200 18.0	S11 21.2
07	69 50.4	249 56.0	51.3	315 30.7	24.9	327 47.2	49.8	215 20.3	21.3
08	84 52.9	264 55.8	50.0	330 31.4	24.6	342 49.1	49.7	230 22.6	21.3
F 09	99 55.3	279 55.5	. . 48.7	345 32.1	. . 24.4	357 51.0	. . 49.7	245 24.9	. . 21.4
R 10	114 57.8	294 55.3	47.5	0 32.9	24.2	12 53.0	49.6	260 27.2	21.4
I 11	130 00.2	309 55.1	46.2	15 33.6	23.9	27 54.9	49.6	275 29.6	21.5
D 12	145 02.7	324 54.9	N 0 44.9	30 34.3	N22 23.7	42 56.9	N22 49.6	290 31.9	S11 21.5
A 13	160 05.2	339 54.7	43.6	45 35.1	23.4	57 58.8	49.5	305 34.2	21.6
Y 14	175 07.6	354 54.5	42.3	60 35.8	23.2	73 00.7	49.5	320 36.5	21.7
15	190 10.1	9 54.3	. . 41.0	75 36.5	. . 22.9	88 02.7	. . 49.5	335 38.9	. . 21.7
16	205 12.6	24 54.1	39.7	90 37.2	22.7	103 04.6	49.4	350 41.2	21.8
17	220 15.0	39 53.9	38.4	105 38.0	22.4	118 06.5	49.4	5 43.5	21.8
18	235 17.5	54 53.7	N 0 37.2	120 38.7	N22 22.2	133 08.5	N22 49.3	20 45.8	S11 21.9
19	250 20.0	69 53.5	35.9	135 39.4	21.9	148 10.4	49.3	35 48.1	22.0
20	265 22.4	84 53.3	34.6	150 40.1	21.7	163 12.4	49.3	50 50.5	22.0
21	280 24.9	99 53.1	. . 33.3	165 40.9	. . 21.5	178 14.3	. . 49.2	65 52.8	. . 22.1
22	295 27.4	114 52.9	32.0	180 41.6	21.2	193 16.2	49.2	80 55.1	22.1
23	310 29.8	129 52.7	30.7	195 42.3	21.0	208 18.2	49.2	95 57.4	22.2
Mer.Pass.	h m 2 25.3	v −0.2	d 1.3	v 0.7	d 0.2	v 1.9	d 0.0	v 2.3	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.2	S40 14.8
Achernar	335 26.5	S57 09.7
Acrux	173 09.5	S63 10.7
Adhara	255 12.7	S28 59.4
Aldebaran	290 49.3	N16 32.1
Alioth	166 21.0	N55 53.4
Alkaid	152 59.0	N49 15.0
Al Na'ir	27 43.1	S46 53.4
Alnilam	275 46.4	S 1 11.6
Alphard	217 56.3	S 8 43.1
Alphecca	126 10.9	N26 40.5
Alpheratz	357 43.0	N29 10.0
Altair	62 07.8	N 8 54.6
Ankaa	353 15.3	S42 13.6
Antares	112 26.0	S26 27.6
Arcturus	145 55.7	N19 06.9
Atria	107 27.4	S69 03.2
Avior	234 18.5	S59 33.2
Bellatrix	278 32.0	N 6 21.6
Betelgeuse	271 01.3	N 7 24.5
Canopus	263 56.5	S52 42.1
Capella	280 34.5	N46 00.4
Deneb	49 30.9	N45 20.0
Denebola	182 33.8	N14 29.8
Diphda	348 55.5	S17 54.5
Dubhe	193 52.2	N61 40.7
Elnath	278 12.6	N28 36.9
Eltanin	90 45.8	N51 29.6
Enif	33 46.7	N 9 56.5
Fomalhaut	15 23.5	S29 32.7
Gacrux	172 01.1	S57 11.6
Gienah	175 52.4	S17 37.1
Hadar	148 47.8	S60 26.5
Hamal	328 00.5	N23 31.6
Kaus Aust.	83 43.3	S34 22.5
Kochab	137 20.3	N74 06.3
Markab	13 37.9	N15 16.9
Menkar	314 14.9	N 4 08.6
Menkent	148 07.5	S36 26.3
Miaplacidus	221 40.5	S69 46.5
Mirfak	308 40.1	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.5	S56 41.3
Pollux	243 27.9	N27 59.4
Procyon	244 59.9	N 5 11.3
Rasalhague	96 06.1	N12 33.3
Regulus	207 43.7	N11 54.0
Rigel	281 12.1	S 8 11.2
Rigil Kent.	139 51.6	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 39.9	N56 36.6
Shaula	96 21.5	S37 06.7
Sirius	258 33.8	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.8	S43 29.3
Vega	80 38.5	N38 48.2
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	181 28.4	14 20
Mars	246 34.3	9 59
Jupiter	258 13.2	9 12
Saturn	145 34.2	16 41

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 14	Moonrise 15	Moonrise 16	Moonrise 17
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
14 00	178 49.1	N14 22.3	99 21.6	8.6	S16 08.0	6.9	58.3	N 72	////	////	02 25	▬	▬	▬	▬
01	193 49.2	21.6	113 49.2	8.4	16 14.9	6.9	58.4	N 70	////	////	02 57	16 10	18 17	19 54	19 38
02	208 49.4	20.8	128 16.6	8.4	16 21.8	6.8	58.4	68	////	01 44	03 20	15 29	17 04	18 13	18 48
03	223 49.5	. . 20.0	142 44.0	8.3	16 28.6	6.7	58.4	66	////	02 22	03 38	15 01	16 27	17 33	18 16
04	238 49.6	19.2	157 11.3	8.2	16 35.3	6.6	58.4	64	////	02 47	03 52	14 40	16 00	17 06	17 53
05	253 49.7	18.5	171 38.5	8.1	16 41.9	6.5	58.5	62	01 33	03 07	04 04	14 23	15 40	16 45	17 34
06	268 49.8	N14 17.7	186 05.6	8.1	S16 48.4	6.5	58.5	60	02 07	03 23	04 14	14 09	15 24	16 28	17 18
W 07	283 49.9	16.9	200 32.7	8.0	16 54.9	6.3	58.5	N 58	02 30	03 36	04 23	13 57	15 10	16 13	17 05
E 08	298 50.1	16.2	214 59.7	8.0	17 01.2	6.2	58.5	56	02 49	03 48	04 31	13 46	14 58	16 01	16 54
D 09	313 50.2	. . 15.4	229 26.7	7.8	17 07.4	6.1	58.6	54	03 04	03 57	04 38	13 37	14 47	15 50	16 44
N 10	328 50.3	14.6	243 53.5	7.8	17 13.5	6.1	58.6	52	03 17	04 06	04 44	13 29	14 38	15 41	16 35
E 11	343 50.4	13.8	258 20.3	7.7	17 19.6	5.9	58.6	50	03 28	04 14	04 50	13 22	14 29	15 32	16 27
S 12	358 50.5	N14 13.1	272 47.0	7.7	S17 25.5	5.8	58.6	45	03 50	04 30	05 02	13 06	14 12	15 14	16 10
D 13	13 50.7	12.3	287 13.7	7.6	17 31.3	5.7	58.7	N 40	04 07	04 43	05 12	12 53	13 57	14 59	15 56
A 14	28 50.8	11.5	301 40.3	7.5	17 37.0	5.7	58.7	35	04 21	04 53	05 20	12 42	13 45	14 46	15 44
Y 15	43 50.9	. . 10.7	316 06.8	7.4	17 42.7	5.5	58.7	30	04 32	05 02	05 27	12 33	13 35	14 35	15 33
16	58 51.0	10.0	330 33.2	7.4	17 48.2	5.4	58.8	20	04 50	05 17	05 40	12 16	13 16	14 17	15 16
17	73 51.1	09.2	344 59.6	7.3	17 53.6	5.3	58.8	N 10	05 04	05 29	05 51	12 02	13 01	14 00	15 00
18	88 51.3	N14 08.4	359 25.9	7.2	S17 58.9	5.2	58.8	0	05 15	05 40	06 01	11 49	12 46	13 45	14 45
19	103 51.4	07.6	13 52.1	7.2	18 04.1	5.1	58.8	S 10	05 24	05 49	06 11	11 36	12 31	13 30	14 31
20	118 51.5	06.8	28 18.3	7.1	18 09.2	5.0	58.9	20	05 33	05 59	06 22	11 22	12 16	13 14	14 15
21	133 51.6	. . 06.1	42 44.4	7.0	18 14.2	4.8	58.9	30	05 41	06 09	06 34	11 06	11 58	12 55	13 57
22	148 51.7	05.3	57 10.4	7.0	18 19.0	4.8	58.9	35	05 44	06 14	06 40	10 57	11 47	12 44	13 47
23	163 51.9	04.5	71 36.4	6.9	18 23.8	4.7	58.9	40	05 48	06 20	06 48	10 46	11 35	12 32	13 35
15 00	178 52.0	N14 03.7	86 02.3	6.8	S18 28.5	4.5	59.0	45	05 52	06 27	06 57	10 34	11 21	12 17	13 21
01	193 52.1	02.9	100 28.1	6.8	18 33.0	4.4	59.0	S 50	05 56	06 34	07 08	10 19	11 04	11 59	13 04
02	208 52.2	02.2	114 53.9	6.7	18 37.4	4.3	59.0	52	05 58	06 38	07 13	10 12	10 56	11 51	12 56
03	223 52.4	. . 01.4	129 19.6	6.6	18 41.7	4.2	59.0	54	06 00	06 41	07 18	10 05	10 47	11 41	12 47
04	238 52.5	14 00.6	143 45.2	6.6	18 45.9	4.1	59.1	56	06 01	06 45	07 24	09 56	10 37	11 31	12 36
05	253 52.6	13 59.8	158 10.8	6.5	18 50.0	4.0	59.1	58	06 03	06 49	07 31	09 46	10 26	11 18	12 25
06	268 52.7	N13 59.0	172 36.3	6.4	S18 54.0	3.8	59.1	S 60	06 05	06 54	07 39	09 35	10 13	11 04	12 11
T 07	283 52.8	58.3	187 01.7	6.4	18 57.8	3.7	59.1								
H 08	298 53.0	57.5	201 27.1	6.4	19 01.5	3.6	59.2								
U 09	313 53.1	. . 56.7	215 52.5	6.2	19 05.1	3.5	59.2								
R 10	328 53.2	55.9	230 17.7	6.2	19 08.6	3.4	59.2								
S 11	343 53.3	55.1	244 42.9	6.2	19 12.0	3.2	59.2								
D 12	358 53.5	N13 54.3	259 08.1	6.1	S19 15.2	3.1	59.3								
A 13	13 53.6	53.6	273 33.2	6.0	19 18.3	3.0	59.3								
Y 14	28 53.7	52.8	287 58.2	6.0	19 21.3	2.9	59.3								
15	43 53.8	. . 52.0	302 23.2	6.0	19 24.2	2.7	59.3								
16	58 54.0	51.2	316 48.2	5.9	19 26.9	2.6	59.4								
17	73 54.1	50.4	331 13.1	5.8	19 29.5	2.5	59.4								
18	88 54.2	N13 49.6	345 37.9	5.8	S19 32.0	2.3	59.4								
19	103 54.4	48.8	0 02.7	5.7	19 34.3	2.3	59.4								
20	118 54.5	48.1	14 27.4	5.7	19 36.6	2.1	59.5								
21	133 54.6	. . 47.3	28 52.1	5.6	19 38.7	1.9	59.5								
22	148 54.7	46.5	43 16.7	5.6	19 40.6	1.9	59.5								
23	163 54.9	45.7	57 41.3	5.5	19 42.5	1.7	59.5								
16 00	178 55.0	N13 44.9	72 05.8	5.5	S19 44.2	1.6	59.6								
01	193 55.1	44.1	86 30.3	5.5	19 45.8	1.4	59.6								
02	208 55.3	43.3	100 54.8	5.4	19 47.2	1.3	59.6								
03	223 55.4	. . 42.5	115 19.2	5.4	19 48.5	1.2	59.6								
04	238 55.5	41.8	129 43.6	5.3	19 49.7	1.0	59.6								
05	253 55.6	41.0	144 07.9	5.3	19 50.7	0.9	59.7								
06	268 55.8	N13 40.2	158 32.2	5.3	S19 51.6	0.8	59.7								
F 07	283 55.9	39.4	172 56.5	5.2	19 52.4	0.7	59.7								
R 08	298 56.0	38.6	187 20.7	5.2	19 53.1	0.5	59.7								
I 09	313 56.2	. . 37.8	201 44.9	5.1	19 53.6	0.3	59.8								
D 10	328 56.3	37.0	216 09.0	5.2	19 53.9	0.3	59.8								
A 11	343 56.4	36.2	230 33.2	5.0	19 54.2	0.0	59.8								
Y 12	358 56.5	N13 35.4	244 57.2	5.1	S19 54.2	0.0	59.8								
13	13 56.7	34.6	259 21.3	5.0	19 54.2	0.2	59.8								
14	28 56.8	33.8	273 45.3	5.1	19 54.0	0.3	59.9								
15	43 56.9	. . 33.0	288 09.4	4.9	19 53.7	0.4	59.9								
16	58 57.1	32.2	302 33.3	5.0	19 53.3	0.6	59.9								
17	73 57.2	31.4	316 57.3	4.9	19 52.7	0.8	59.9								
18	88 57.3	N13 30.7	331 21.2	5.0	S19 51.9	0.8	59.9								
19	103 57.5	29.9	345 45.2	4.8	19 51.1	1.0	60.0								
20	118 57.6	29.1	0 09.0	4.9	19 50.1	1.2	60.0								
21	133 57.7	. . 28.3	14 32.9	4.9	19 48.9	1.3	60.0								
22	148 57.9	27.5	28 56.8	4.8	19 47.6	1.4	60.0								
23	163 58.0	26.7	43 20.6	4.9	S19 46.2	1.6	60.0								
	SD 15.8	d 0.8	SD	16.0		16.1		16.3							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 14	Moonset 15	Moonset 16	Moonset 17
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 38	////	////	▬	▬	▬	▬
N 70	21 08	23 28	////	19 46	19 39	20 06	22 29
68	20 46	22 18	////	20 27	20 52	21 48	23 19
66	20 29	21 43	////	20 56	21 30	22 27	23 50
64	20 14	21 18	23 32	21 18	21 56	22 54	24 13
62	20 03	20 59	22 30	21 35	22 16	23 15	24 32
60	19 53	20 44	21 58	21 50	22 33	23 32	24 47
N 58	19 44	20 31	21 36	22 02	22 47	23 47	25 00
56	19 36	20 20	21 18	22 13	23 00	23 59	25 11
54	19 30	20 10	21 03	22 22	23 10	24 10	00 10
52	19 24	20 02	20 50	22 31	23 20	24 19	00 19
50	19 18	19 54	20 39	22 38	23 28	24 28	00 28
45	19 06	19 38	20 17	22 55	23 46	24 46	00 46
N 40	18 57	19 26	20 01	23 08	24 01	00 01	01 01
35	18 48	19 15	19 47	23 20	24 13	00 13	01 13
30	18 41	19 06	19 36	23 30	24 24	00 24	01 24
20	18 29	18 51	19 18	23 47	24 43	00 43	01 42
N 10	18 18	18 40	19 05	24 02	00 02	00 59	01 59
0	18 08	18 29	18 54	24 16	00 16	01 14	02 14
S 10	17 58	18 20	18 44	24 30	00 30	01 29	02 29
20	17 47	18 10	18 36	24 45	00 45	01 45	02 45
30	17 36	18 00	18 29	00 00	01 02	02 04	03 03
35	17 29	17 55	18 25	00 09	01 12	02 14	03 14
40	17 21	17 49	18 21	00 19	01 24	02 27	03 26
45	17 12	17 43	18 17	00 30	01 37	02 41	03 40
S 50	17 02	17 35	18 14	00 44	01 54	02 59	03 58
52	16 57	17 32	18 12	00 51	02 02	03 08	04 06
54	16 51	17 29	18 10	00 58	02 10	03 17	04 15
56	16 45	17 25	18 09	01 06	02 20	03 28	04 26
58	16 38	17 20	18 07	01 15	02 31	03 40	04 38
S 60	16 31	17 16	18 05	01 26	02 44	03 54	04 51

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
14	04 44	04 38	12 05	18 02	05 35	08	51
15	04 32	04 26	12 04	19 00	06 31	09	62
16	04 20	04 14	12 04	19 59	07 29	10	73

UT	ARIES	VENUS −4.0		MARS +1.6		JUPITER −2.0		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
17 00	325 32.3	144 52.5	N 0 29.4	210 43.1	N22 20.7	223 20.1	N22 49.1	110 59.7	S11 22.3
01	340 34.7	159 52.3	28.1	225 43.8	20.5	238 22.0	49.1	126 02.1	22.3
02	355 37.2	174 52.1	26.9	240 44.5	20.2	253 24.0	49.1	141 04.4	22.4
03	10 39.7	189 51.9	. . 25.6	255 45.3	. . 20.0	268 25.9	. . 49.0	156 06.7	. . 22.4
04	25 42.1	204 51.7	24.3	270 46.0	19.7	283 27.9	49.0	171 09.0	22.5
05	40 44.6	219 51.4	23.0	285 46.7	19.5	298 29.8	48.9	186 11.3	22.6
06	55 47.1	234 51.2	N 0 21.7	300 47.4	N22 19.2	313 31.7	N22 48.9	201 13.6	S11 22.6
07	70 49.5	249 51.0	20.4	315 48.2	19.0	328 33.7	48.9	216 16.0	22.7
S 08	85 52.0	264 50.8	19.1	330 48.9	18.7	343 35.6	48.8	231 18.3	22.7
A 09	100 54.5	279 50.6	. . 17.8	345 49.6	. . 18.5	358 37.6	. . 48.8	246 20.6	. . 22.8
T 10	115 56.9	294 50.4	16.6	0 50.4	18.2	13 39.5	48.8	261 22.9	22.9
U 11	130 59.4	309 50.2	15.3	15 51.1	18.0	28 41.4	48.7	276 25.2	22.9
R 12	146 01.8	324 50.0	N 0 14.0	30 51.8	N22 17.7	43 43.4	N22 48.7	291 27.6	S11 23.0
D 13	161 04.3	339 49.8	12.7	45 52.6	17.5	58 45.3	48.6	306 29.9	23.0
A 14	176 06.8	354 49.6	11.4	60 53.3	17.2	73 47.3	48.6	321 32.2	23.1
Y 15	191 09.2	9 49.4	. . 10.1	75 54.0	. . 17.0	88 49.2	. . 48.6	336 34.5	. . 23.2
16	206 11.7	24 49.2	08.8	90 54.8	16.7	103 51.1	48.5	351 36.8	23.2
17	221 14.2	39 49.0	07.5	105 55.5	16.5	118 53.1	48.5	6 39.1	23.3
18	236 16.6	54 48.8	N 0 06.2	120 56.2	N22 16.2	133 55.0	N22 48.5	21 41.5	S11 23.3
19	251 19.1	69 48.6	05.0	135 57.0	16.0	148 57.0	48.4	36 43.8	23.4
20	266 21.6	84 48.4	03.7	150 57.7	15.7	163 58.9	48.4	51 46.1	23.5
21	281 24.0	99 48.2	. . 02.4	165 58.4	. . 15.5	179 00.8	. . 48.3	66 48.4	. . 23.5
22	296 26.5	114 48.0	N 01.1	180 59.2	15.2	194 02.8	48.3	81 50.7	23.6
23	311 29.0	129 47.8	S 00.2	195 59.9	14.9	209 04.7	48.3	96 53.0	23.6
18 00	326 31.4	144 47.6	S 0 01.5	211 00.6	N22 14.7	224 06.7	N22 48.2	111 55.4	S11 23.7
01	341 33.9	159 47.4	02.8	226 01.4	14.4	239 08.6	48.2	126 57.7	23.8
02	356 36.3	174 47.2	04.1	241 02.1	14.2	254 10.6	48.2	142 00.0	23.8
03	11 38.8	189 47.0	. . 05.4	256 02.8	. . 13.9	269 12.5	. . 48.1	157 02.3	. . 23.9
04	26 41.3	204 46.8	06.6	271 03.6	13.7	284 14.4	48.1	172 04.6	23.9
05	41 43.7	219 46.6	07.9	286 04.3	13.4	299 16.4	48.0	187 06.9	24.0
06	56 46.2	234 46.4	S 0 09.2	301 05.0	N22 13.2	314 18.3	N22 48.0	202 09.2	S11 24.1
07	71 48.7	249 46.2	10.5	316 05.8	12.9	329 20.3	48.0	217 11.6	24.1
08	86 51.1	264 46.0	11.8	331 06.5	12.6	344 22.2	47.9	232 13.9	24.2
S 09	101 53.6	279 45.8	. . 13.1	346 07.2	. . 12.4	359 24.2	. . 47.9	247 16.2	. . 24.3
U 10	116 56.1	294 45.6	14.4	1 08.0	12.1	14 26.1	47.8	262 18.5	24.3
N 11	131 58.5	309 45.4	15.7	16 08.7	11.9	29 28.0	47.8	277 20.8	24.4
D 12	147 01.0	324 45.2	S 0 17.0	31 09.4	N22 11.6	44 30.0	N22 47.8	292 23.1	S11 24.4
A 13	162 03.5	339 45.0	18.2	46 10.2	11.4	59 31.9	47.7	307 25.5	24.5
Y 14	177 05.9	354 44.8	19.5	61 10.9	11.1	74 33.9	47.7	322 27.8	24.6
15	192 08.4	9 44.6	. . 20.8	76 11.7	. . 10.8	89 35.8	. . 47.7	337 30.1	. . 24.6
16	207 10.8	24 44.4	22.1	91 12.4	10.6	104 37.8	47.6	352 32.4	24.7
17	222 13.3	39 44.2	23.4	106 13.1	10.3	119 39.7	47.6	7 34.7	24.7
18	237 15.8	54 44.0	S 0 24.7	121 13.9	N22 10.1	134 41.6	N22 47.5	22 37.0	S11 24.8
19	252 18.2	69 43.8	26.0	136 14.6	09.8	149 43.6	47.5	37 39.3	24.9
20	267 20.7	84 43.6	27.3	151 15.3	09.5	164 45.5	47.5	52 41.6	24.9
21	282 23.2	99 43.4	. . 28.6	166 16.1	. . 09.3	179 47.5	. . 47.4	67 44.0	. . 25.0
22	297 25.6	114 43.2	29.8	181 16.8	09.0	194 49.4	47.4	82 46.3	25.1
23	312 28.1	129 43.0	31.1	196 17.6	08.8	209 51.4	47.4	97 48.6	25.1
19 00	327 30.6	144 42.8	S 0 32.4	211 18.3	N22 08.5	224 53.3	N22 47.3	112 50.9	S11 25.2
01	342 33.0	159 42.6	33.7	226 19.0	08.2	239 55.3	47.3	127 53.2	25.2
02	357 35.5	174 42.4	35.0	241 19.8	08.0	254 57.2	47.2	142 55.5	25.3
03	12 38.0	189 42.2	. . 36.3	256 20.5	. . 07.7	269 59.2	. . 47.2	157 57.8	. . 25.4
04	27 40.4	204 42.0	37.6	271 21.2	07.5	285 01.1	47.2	173 00.1	25.4
05	42 42.9	219 41.8	38.9	286 22.0	07.2	300 03.0	47.1	188 02.5	25.5
06	57 45.3	234 41.6	S 0 40.2	301 22.7	N22 06.9	315 05.0	N22 47.1	203 04.8	S11 25.5
07	72 47.8	249 41.4	41.5	316 23.5	06.7	330 06.9	47.0	218 07.1	25.6
08	87 50.3	264 41.2	42.7	331 24.2	06.4	345 08.9	47.0	233 09.4	25.7
M 09	102 52.7	279 41.0	. . 44.0	346 24.9	. . 06.1	0 10.8	. . 47.0	248 11.7	. . 25.7
O 10	117 55.2	294 40.8	45.3	1 25.7	05.9	15 12.8	46.9	263 14.0	25.8
N 11	132 57.7	309 40.6	46.6	16 26.4	05.6	30 14.7	46.9	278 16.3	25.9
D 12	148 00.1	324 40.4	S 0 47.9	31 27.2	N22 05.4	45 16.7	N22 46.9	293 18.6	S11 25.9
A 13	163 02.6	339 40.2	49.2	46 27.9	05.1	60 18.6	46.8	308 21.0	26.0
Y 14	178 05.1	354 40.0	50.5	61 28.7	04.8	75 20.6	46.8	323 23.3	26.0
15	193 07.5	9 39.8	. . 51.8	76 29.4	. . 04.6	90 22.5	. . 46.7	338 25.6	. . 26.1
16	208 10.0	24 39.6	53.1	91 30.1	04.3	105 24.5	46.7	353 27.9	26.2
17	223 12.4	39 39.4	54.3	106 30.9	04.0	120 26.4	46.7	8 30.2	26.2
18	238 14.9	54 39.3	S 0 55.6	121 31.6	N22 03.8	135 28.4	N22 46.6	23 32.5	S11 26.3
19	253 17.4	69 39.1	56.9	136 32.4	03.5	150 30.3	46.6	38 34.8	26.4
20	268 19.8	84 38.9	58.2	151 33.1	03.2	165 32.3	46.6	53 37.1	26.4
21	283 22.3	99 38.7	0 59.5	166 33.8	. . 03.0	180 34.2	. . 46.5	68 39.4	. . 26.5
22	298 24.8	114 38.5	1 00.8	181 34.6	02.7	195 36.2	46.5	83 41.7	26.5
23	313 27.2	129 38.3	S 1 02.1	196 35.3	02.4	210 38.1	46.4	98 44.1	26.6
Mer. Pass.	h m 2 13.5	v −0.2	d 1.3	v 0.7	d 0.3	v 1.9	d 0.0	v 2.3	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.2	S40 14.8
Achernar	335 26.4	S57 09.7
Acrux	173 09.5	S63 10.7
Adhara	255 12.7	S28 59.4
Aldebaran	290 49.3	N16 32.1
Alioth	166 21.0	N55 53.4
Alkaid	152 59.0	N49 15.0
Al Na'ir	27 43.1	S46 53.4
Alnilam	275 46.4	S 1 11.6
Alphard	217 56.3	S 8 43.1
Alphecca	126 10.9	N26 40.5
Alpheratz	357 43.0	N29 10.0
Altair	62 07.8	N 8 54.6
Ankaa	353 15.3	S42 13.6
Antares	112 26.0	S26 27.6
Arcturus	145 55.7	N19 06.9
Atria	107 27.4	S69 03.2
Avior	234 18.5	S59 33.2
Bellatrix	278 32.0	N 6 21.6
Betelgeuse	271 01.3	N 7 24.5
Canopus	263 56.4	S52 42.1
Capella	280 34.4	N46 00.4
Deneb	49 30.9	N45 20.0
Denebola	182 33.8	N14 29.8
Diphda	348 55.5	S17 54.5
Dubhe	193 52.2	N61 40.7
Elnath	278 12.6	N28 36.9
Eltanin	90 45.8	N51 29.6
Enif	33 46.6	N 9 56.5
Fomalhaut	15 23.5	S29 32.7
Gacrux	172 01.1	S57 11.6
Gienah	175 52.4	S17 37.1
Hadar	148 47.9	S60 26.5
Hamal	328 00.4	N23 31.6
Kaus Aust.	83 43.4	S34 22.5
Kochab	137 20.3	N74 06.3
Markab	13 37.9	N15 16.9
Menkar	314 14.8	N 4 08.6
Menkent	148 07.5	S36 26.3
Miaplacidus	221 40.5	S69 46.5
Mirfak	308 40.1	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.5	S56 41.3
Pollux	243 27.9	N27 59.4
Procyon	244 59.9	N 5 11.3
Rasalhague	96 06.2	N12 33.3
Regulus	207 43.7	N11 54.0
Rigel	281 12.1	S 8 11.2
Rigil Kent.	139 51.6	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 39.9	N56 36.6
Shaula	96 21.5	S37 06.7
Sirius	258 33.8	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.7	S43 29.3
Vega	80 38.6	N38 48.2
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	178 16.2	14 21
Mars	244 29.2	9 55
Jupiter	257 35.3	9 02
Saturn	145 23.9	16 30

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 17	Moonrise 18	Moonrise 19	Moonrise 20
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
17 00	178 58.1	N13 25.9	57 44.5	4.8	S19 44.6	1.7	60.1	N 72	////	////	02 45	▬	20 19	19 53	19 39
01	193 58.3	25.1	72 08.3	4.8	19 42.9	1.8	60.1	N 70	////	01 15	03 12	19 38	19 34	19 29	19 26
02	208 58.4	24.3	86 32.1	4.8	19 41.1	2.0	60.1	68	////	02 06	03 32	18 48	19 04	19 11	19 15
03	223 58.5	. . 23.5	100 55.9	4.8	19 39.1	2.1	60.1	66	////	02 37	03 48	18 16	18 41	18 56	19 06
04	238 58.7	22.7	115 19.7	4.8	19 37.0	2.3	60.1	64	01 06	02 59	04 01	17 53	18 23	18 44	18 58
05	253 58.8	21.9	129 43.5	4.8	19 34.7	2.4	60.1	62	01 51	03 17	04 12	17 34	18 08	18 33	18 52
06	268 58.9	N13 21.1	144 07.3	4.7	S19 32.3	2.5	60.2	60	02 20	03 32	04 22	17 18	17 56	18 24	18 46
07	283 59.1	20.3	158 31.0	4.8	19 29.8	2.7	60.2	N 58	02 41	03 44	04 30	17 05	17 45	18 16	18 41
08	298 59.2	19.5	172 54.8	4.8	19 27.1	2.8	60.2	56	02 58	03 54	04 37	16 54	17 36	18 09	18 36
09	313 59.3	. . 18.7	187 18.6	4.8	19 24.3	2.9	60.2	54	03 12	04 03	04 43	16 44	17 27	18 03	18 32
10	328 59.5	17.9	201 42.4	4.7	19 21.4	3.1	60.2	52	03 24	04 11	04 49	16 35	17 20	17 57	18 28
11	343 59.6	17.1	216 06.1	4.8	19 18.3	3.2	60.2	50	03 34	04 19	04 54	16 27	17 13	17 52	18 25
12	358 59.8	N13 16.3	230 29.9	4.8	S19 15.1	3.4	60.2	45	03 55	04 34	05 05	16 10	16 59	17 41	18 18
13	13 59.9	15.5	244 53.7	4.8	19 11.7	3.5	60.3	N 40	04 11	04 46	05 14	15 56	16 46	17 31	18 12
14	29 00.0	14.7	259 17.5	4.8	19 08.2	3.6	60.3	35	04 24	04 56	05 22	15 44	16 36	17 24	18 06
15	44 00.2	. . 13.9	273 41.3	4.8	19 04.6	3.8	60.3	30	04 34	05 04	05 29	15 33	16 27	17 16	18 02
16	59 00.3	13.1	288 05.1	4.8	19 00.8	3.9	60.3	20	04 51	05 18	05 41	15 16	16 12	17 04	17 53
17	74 00.4	12.3	302 28.9	4.9	18 56.9	4.0	60.3	N 10	05 04	05 29	05 51	15 00	15 58	16 54	17 46
18	89 00.6	N13 11.5	316 52.8	4.8	S18 52.9	4.2	60.3	0	05 15	05 39	06 00	14 45	15 45	16 44	17 40
19	104 00.7	10.7	331 16.6	4.8	18 48.7	4.3	60.3	S 10	05 23	05 48	06 10	14 31	15 32	16 34	17 33
20	119 00.9	09.8	345 40.4	4.9	18 44.4	4.5	60.4	20	05 31	05 57	06 20	14 15	15 19	16 23	17 26
21	134 01.0	. . 09.0	0 04.3	4.9	18 39.9	4.5	60.4	30	05 38	06 06	06 31	13 57	15 03	16 10	17 17
22	149 01.1	08.2	14 28.2	4.9	18 35.4	4.7	60.4	35	05 41	06 11	06 37	13 47	14 54	16 03	17 13
23	164 01.3	07.4	28 52.1	4.9	18 30.7	4.9	60.4	40	05 45	06 16	06 44	13 35	14 44	15 55	17 07
18 00	179 01.4	N13 06.6	43 16.0	5.0	S18 25.8	5.0	60.4	45	05 48	06 22	06 52	13 21	14 31	15 46	17 01
01	194 01.5	05.8	57 40.0	5.0	18 20.8	5.1	60.4	S 50	05 51	06 29	07 02	13 04	14 16	15 34	16 53
02	209 01.7	05.0	72 04.0	5.0	18 15.7	5.2	60.4	52	05 52	06 32	07 07	12 56	14 10	15 29	16 50
03	224 01.8	. . 04.2	86 28.0	5.0	18 10.5	5.3	60.4	54	05 54	06 35	07 12	12 47	14 02	15 23	16 46
04	239 02.0	03.4	100 52.0	5.0	18 05.2	5.5	60.4	56	05 55	06 39	07 18	12 36	13 53	15 16	16 42
05	254 02.1	02.6	115 16.0	5.1	17 59.7	5.7	60.4	58	05 56	06 42	07 24	12 25	13 43	15 09	16 37
06	269 02.2	N13 01.8	129 40.1	5.1	S17 54.0	5.7	60.5	S 60	05 58	06 47	07 31	12 11	13 32	15 00	16 32
07	284 02.4	01.0	144 04.2	5.1	17 48.3	5.9	60.5								
08	299 02.5	13 00.2	158 28.3	5.2	17 42.4	6.0	60.5								
09	314 02.7	12 59.4	172 52.5	5.2	17 36.4	6.1	60.5								
10	329 02.8	58.5	187 16.7	5.2	17 30.3	6.2	60.5								
11	344 03.0	57.7	201 40.9	5.2	17 24.1	6.4	60.5								
12	359 03.1	N12 56.9	216 05.1	5.3	S17 17.7	6.5	60.5								
13	14 03.2	56.1	230 29.4	5.4	17 11.2	6.6	60.5								
14	29 03.4	55.3	244 53.8	5.3	17 04.6	6.7	60.5								
15	44 03.5	. . 54.5	259 18.1	5.4	16 57.9	6.9	60.5								
16	59 03.7	53.7	273 42.5	5.5	16 51.0	6.9	60.5								
17	74 03.8	52.9	288 07.0	5.5	16 44.1	7.1	60.5								
18	89 03.9	N12 52.1	302 31.5	5.5	S16 37.0	7.2	60.5								
19	104 04.1	51.2	316 56.0	5.5	16 29.8	7.3	60.5								
20	119 04.2	50.4	331 20.5	5.6	16 22.5	7.4	60.5								
21	134 04.4	. . 49.6	345 45.1	5.7	16 15.1	7.6	60.5								
22	149 04.5	48.8	0 09.8	5.7	16 07.5	7.6	60.5								
23	164 04.7	48.0	14 34.5	5.7	15 59.9	7.8	60.5								
19 00	179 04.8	N12 47.2	28 59.2	5.8	S15 52.1	7.8	60.5								
01	194 05.0	46.4	43 24.0	5.8	15 44.3	8.0	60.5								
02	209 05.1	45.5	57 48.8	5.9	15 36.3	8.1	60.5								
03	224 05.2	. . 44.7	72 13.7	5.9	15 28.2	8.2	60.5								
04	239 05.4	43.9	86 38.6	6.0	15 20.0	8.3	60.5								
05	254 05.5	43.1	101 03.6	6.0	15 11.7	8.4	60.5								
06	269 05.7	N12 42.3	115 28.6	6.1	S15 03.3	8.5	60.5								
07	284 05.8	41.5	129 53.7	6.1	14 54.8	8.6	60.5								
08	299 06.0	40.6	144 18.8	6.2	14 46.2	8.6	60.5								
09	314 06.1	. . 39.8	158 44.0	6.2	14 37.6	8.8	60.5								
10	329 06.3	39.0	173 09.2	6.3	14 28.8	8.9	60.5								
11	344 06.4	38.2	187 34.5	6.3	14 19.9	9.0	60.5								
12	359 06.6	N12 37.4	201 59.8	6.4	S14 10.9	9.1	60.5								
13	14 06.7	36.6	216 25.2	6.5	14 01.8	9.2	60.5								
14	29 06.9	35.7	230 50.7	6.5	13 52.6	9.2	60.5								
15	44 07.0	. . 34.9	245 16.2	6.5	13 43.4	9.4	60.5								
16	59 07.1	34.1	259 41.7	6.6	13 34.0	9.4	60.5								
17	74 07.3	33.3	274 07.3	6.7	13 24.6	9.5	60.5								
18	89 07.4	N12 32.5	288 33.0	6.7	S13 15.1	9.7	60.5								
19	104 07.6	31.6	302 58.7	6.7	13 05.4	9.7	60.5								
20	119 07.7	30.8	317 24.4	6.9	12 55.7	9.7	60.5								
21	134 07.9	. . 30.0	331 50.3	6.8	12 46.0	9.9	60.4								
22	149 08.0	29.2	346 16.1	7.0	12 36.1	9.9	60.4								
23	164 08.2	28.3	0 42.1	7.0	S12 26.2	10.1	60.4								
	SD 15.8	d 0.8	SD 16.4		16.5		16.5								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 17	Moonset 18	Moonset 19	Moonset 20
°	h m	h m	h m	h m	h m	h m	h m
N 72	21 18	////	////	▬	23 55	26 21	02 21
N 70	20 52	22 42	////	22 29	24 38	00 38	02 43
68	20 32	21 56	////	23 19	25 07	01 07	03 00
66	20 17	21 27	////	23 50	25 29	01 29	03 14
64	20 04	21 05	22 53	24 13	00 13	01 46	03 25
62	19 53	20 48	22 11	24 32	00 32	02 00	03 35
60	19 44	20 34	21 44	24 47	00 47	02 12	03 43
N 58	19 36	20 22	21 24	25 00	01 00	02 22	03 50
56	19 29	20 12	21 08	25 11	01 11	02 31	03 56
54	19 23	20 03	20 54	00 10	01 20	02 39	04 02
52	19 17	19 55	20 42	00 19	01 29	02 46	04 07
50	19 12	19 48	20 32	00 28	01 37	02 53	04 11
45	19 01	19 33	20 12	00 46	01 53	03 06	04 21
N 40	18 52	19 21	19 56	01 01	02 07	03 17	04 29
35	18 45	19 11	19 43	01 13	02 18	03 27	04 36
30	18 38	19 03	19 33	01 24	02 28	03 35	04 42
20	18 26	18 49	19 16	01 42	02 45	03 49	04 53
N 10	18 16	18 38	19 03	01 59	03 00	04 02	05 02
0	18 07	18 28	18 53	02 14	03 14	04 13	05 10
S 10	17 58	18 19	18 44	02 29	03 28	04 25	05 19
20	17 48	18 11	18 37	02 45	03 42	04 37	05 28
30	17 37	18 02	18 30	03 03	03 59	04 51	05 38
35	17 31	17 57	18 27	03 14	04 09	04 59	05 44
40	17 24	17 52	18 24	03 26	04 20	05 08	05 50
45	17 16	17 46	18 21	03 40	04 33	05 18	05 58
S 50	17 06	17 40	18 17	03 58	04 48	05 31	06 07
52	17 01	17 37	18 16	04 06	04 56	05 37	06 11
54	16 56	17 33	18 15	04 15	05 04	05 43	06 16
56	16 51	17 30	18 14	04 26	05 13	05 51	06 21
58	16 45	17 26	18 12	04 38	05 23	05 59	06 26
S 60	16 38	17 22	18 11	04 51	05 35	06 08	06 33

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
17	04 08	04 01	12 04	21 00	08 30	11	82
18	03 55	03 48	12 04	21 59	09 30	12	91
19	03 41	03 34	12 04	22 57	10 28	13	96

UT	ARIES	VENUS −4.0		MARS +1.6		JUPITER −2.0		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
20 00	328 29.7	144 38.1	S 1 03.4	211 36.1	N22 02.2	225 40.1	N22 46.4	113 46.4	S11 26.7
01	343 32.2	159 37.9	04.7	226 36.8	01.9	240 42.0	46.4	128 48.7	26.7
02	358 34.6	174 37.7	06.0	241 37.6	01.6	255 43.9	46.3	143 51.0	26.8
03	13 37.1	189 37.5	. . 07.2	256 38.3	. . 01.4	270 45.9	. . 46.3	158 53.3	. . 26.9
04	28 39.6	204 37.3	08.5	271 39.0	01.1	285 47.8	46.2	173 55.6	26.9
05	43 42.0	219 37.1	09.8	286 39.8	00.8	300 49.8	46.2	188 57.9	27.0
06	58 44.5	234 36.9	S 1 11.1	301 40.5	N22 00.5	315 51.7	N22 46.2	204 00.2	S11 27.0
07	73 46.9	249 36.7	12.4	316 41.3	00.3	330 53.7	46.1	219 02.5	27.1
08	88 49.4	264 36.5	13.7	331 42.0	22 00.0	345 55.6	46.1	234 04.8	27.2
09	103 51.9	279 36.3	. . 15.0	346 42.8	21 59.7	0 57.6	. . 46.1	249 07.1	. . 27.2
10	118 54.3	294 36.1	16.3	1 43.5	59.5	15 59.5	46.0	264 09.5	27.3
11	133 56.8	309 35.9	17.6	16 44.3	59.2	31 01.5	46.0	279 11.8	27.4
12	148 59.3	324 35.7	S 1 18.8	31 45.0	N21 58.9	46 03.4	N22 45.9	294 14.1	S11 27.4
13	164 01.7	339 35.5	20.1	46 45.8	58.7	61 05.4	45.9	309 16.4	27.5
14	179 04.2	354 35.3	21.4	61 46.5	58.4	76 07.4	45.9	324 18.7	27.6
15	194 06.7	9 35.1	. . 22.7	76 47.2	. . 58.1	91 09.3	. . 45.8	339 21.0	. . 27.6
16	209 09.1	24 34.9	24.0	91 48.0	57.8	106 11.3	45.8	354 23.3	27.7
17	224 11.6	39 34.7	25.3	106 48.7	57.6	121 13.2	45.7	9 25.6	27.7
18	239 14.1	54 34.6	S 1 26.6	121 49.5	N21 57.3	136 15.2	N22 45.7	24 27.9	S11 27.8
19	254 16.5	69 34.4	27.9	136 50.2	57.0	151 17.1	45.7	39 30.2	27.9
20	269 19.0	84 34.2	29.2	151 51.0	56.8	166 19.1	45.6	54 32.5	27.9
21	284 21.4	99 34.0	. . 30.5	166 51.7	. . 56.5	181 21.0	. . 45.6	69 34.8	. . 28.0
22	299 23.9	114 33.8	31.7	181 52.5	56.2	196 23.0	45.5	84 37.1	28.1
23	314 26.4	129 33.6	33.0	196 53.2	55.9	211 24.9	45.5	99 39.4	28.1
21 00	329 28.8	144 33.4	S 1 34.3	211 54.0	N21 55.7	226 26.9	N22 45.5	114 41.8	S11 28.2
01	344 31.3	159 33.2	35.6	226 54.7	55.4	241 28.8	45.4	129 44.1	28.2
02	359 33.8	174 33.0	36.9	241 55.5	55.1	256 30.8	45.4	144 46.4	28.3
03	14 36.2	189 32.8	. . 38.2	256 56.2	. . 54.8	271 32.7	. . 45.4	159 48.7	. . 28.4
04	29 38.7	204 32.6	39.5	271 57.0	54.6	286 34.7	45.3	174 51.0	28.4
05	44 41.2	219 32.4	40.8	286 57.7	54.3	301 36.6	45.3	189 53.3	28.5
06	59 43.6	234 32.2	S 1 42.1	301 58.5	N21 54.0	316 38.6	N22 45.2	204 55.6	S11 28.6
07	74 46.1	249 32.0	43.3	316 59.2	53.7	331 40.5	45.2	219 57.9	28.6
08	89 48.5	264 31.8	44.6	332 00.0	53.5	346 42.5	45.2	235 00.2	28.7
09	104 51.0	279 31.6	. . 45.9	347 00.7	. . 53.2	1 44.5	. . 45.1	250 02.5	. . 28.8
10	119 53.5	294 31.4	47.2	2 01.5	52.9	16 46.4	45.1	265 04.8	28.8
11	134 55.9	309 31.3	48.5	17 02.2	52.6	31 48.4	45.0	280 07.1	28.9
12	149 58.4	324 31.1	S 1 49.8	32 03.0	N21 52.3	46 50.3	N22 45.0	295 09.4	S11 29.0
13	165 00.9	339 30.9	51.1	47 03.7	52.1	61 52.3	45.0	310 11.7	29.0
14	180 03.3	354 30.7	52.4	62 04.5	51.8	76 54.2	44.9	325 14.0	29.1
15	195 05.8	9 30.5	. . 53.7	77 05.2	. . 51.5	91 56.2	. . 44.9	340 16.3	. . 29.1
16	210 08.3	24 30.3	54.9	92 06.0	51.2	106 58.1	44.8	355 18.6	29.2
17	225 10.7	39 30.1	56.2	107 06.7	51.0	122 00.1	44.8	10 20.9	29.3
18	240 13.2	54 29.9	S 1 57.5	122 07.5	N21 50.7	137 02.0	N22 44.8	25 23.2	S11 29.3
19	255 15.7	69 29.7	1 58.8	137 08.2	50.4	152 04.0	44.7	40 25.5	29.4
20	270 18.1	84 29.5	2 00.1	152 09.0	50.1	167 06.0	44.7	55 27.9	29.5
21	285 20.6	99 29.3	. . 01.4	167 09.7	. . 49.8	182 07.9	. . 44.7	70 30.2	. . 29.5
22	300 23.0	114 29.1	02.7	182 10.5	49.6	197 09.9	44.6	85 32.5	29.6
23	315 25.5	129 28.9	04.0	197 11.2	49.3	212 11.8	44.6	100 34.8	29.7
22 00	330 28.0	144 28.7	S 2 05.2	212 12.0	N21 49.0	227 13.8	N22 44.5	115 37.1	S11 29.7
01	345 30.4	159 28.5	06.5	227 12.7	48.7	242 15.7	44.5	130 39.4	29.8
02	0 32.9	174 28.4	07.8	242 13.5	48.4	257 17.7	44.5	145 41.7	29.9
03	15 35.4	189 28.2	. . 09.1	257 14.2	. . 48.2	272 19.6	. . 44.4	160 44.0	. . 29.9
04	30 37.8	204 28.0	10.4	272 15.0	47.9	287 21.6	44.4	175 46.3	30.0
05	45 40.3	219 27.8	11.7	287 15.7	47.6	302 23.6	44.3	190 48.6	30.0
06	60 42.8	234 27.6	S 2 13.0	302 16.5	N21 47.3	317 25.5	N22 44.3	205 50.9	S11 30.1
07	75 45.2	249 27.4	14.3	317 17.2	47.0	332 27.5	44.3	220 53.2	30.2
08	90 47.7	264 27.2	15.6	332 18.0	46.7	347 29.4	44.2	235 55.5	30.2
09	105 50.1	279 27.0	. . 16.8	347 18.8	. . 46.5	2 31.4	. . 44.2	250 57.8	. . 30.3
10	120 52.6	294 26.8	18.1	2 19.5	46.2	17 33.4	44.1	266 00.1	30.4
11	135 55.1	309 26.6	19.4	17 20.3	45.9	32 35.3	44.1	281 02.4	30.4
12	150 57.5	324 26.4	S 2 20.7	32 21.0	N21 45.6	47 37.3	N22 44.1	296 04.7	S11 30.5
13	166 00.0	339 26.2	22.0	47 21.8	45.3	62 39.2	44.0	311 07.0	30.6
14	181 02.5	354 26.0	23.3	62 22.5	45.0	77 41.2	44.0	326 09.3	30.6
15	196 04.9	9 25.9	. . 24.6	77 23.3	. . 44.8	92 43.1	. . 43.9	341 11.6	. . 30.7
16	211 07.4	24 25.7	25.9	92 24.0	44.5	107 45.1	43.9	356 13.9	30.8
17	226 09.9	39 25.5	27.1	107 24.8	44.2	122 47.1	43.9	11 16.2	30.8
18	241 12.3	54 25.3	S 2 28.4	122 25.5	N21 43.9	137 49.0	N22 43.8	26 18.5	S11 30.9
19	256 14.8	69 25.1	29.7	137 26.3	43.6	152 51.0	43.8	41 20.8	31.0
20	271 17.3	84 24.9	31.0	152 27.1	43.3	167 52.9	43.7	56 23.1	31.0
21	286 19.7	99 24.7	. . 32.3	167 27.8	. . 43.0	182 54.9	. . 43.7	71 25.4	. . 31.1
22	301 22.2	114 24.5	33.6	182 28.6	42.8	197 56.9	43.7	86 27.7	31.2
23	316 24.6	129 24.3	34.9	197 29.3	42.5	212 58.8	43.6	101 30.0	31.2
Mer. Pass.	h m 2 01.7	v −0.2	d 1.3	v 0.8	d 0.3	v 2.0	d 0.0	v 2.3	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.2	S40 14.8
Achernar	335 26.4	S57 09.8
Acrux	173 09.6	S63 10.7
Adhara	255 12.7	S28 59.4
Aldebaran	290 49.3	N16 32.1
Alioth	166 21.0	N55 53.4
Alkaid	152 59.1	N49 15.0
Al Na'ir	27 43.1	S46 53.4
Alnilam	275 46.4	S 1 11.6
Alphard	217 56.3	S 8 43.1
Alphecca	126 10.9	N26 40.5
Alpheratz	357 43.0	N29 10.0
Altair	62 07.8	N 8 54.6
Ankaa	353 15.2	S42 13.6
Antares	112 26.0	S26 27.6
Arcturus	145 55.7	N19 06.9
Atria	107 27.5	S69 03.2
Avior	234 18.5	S59 33.2
Bellatrix	278 32.0	N 6 21.6
Betelgeuse	271 01.3	N 7 24.5
Canopus	263 56.4	S52 42.1
Capella	280 34.4	N46 00.4
Deneb	49 30.9	N45 20.1
Denebola	182 33.8	N14 29.8
Diphda	348 55.5	S17 54.5
Dubhe	193 52.2	N61 40.7
Elnath	278 12.6	N28 36.9
Eltanin	90 45.8	N51 29.7
Enif	33 46.6	N 9 56.5
Fomalhaut	15 23.5	S29 32.7
Gacrux	172 01.1	S57 11.5
Gienah	175 52.4	S17 37.1
Hadar	148 47.9	S60 26.5
Hamal	328 00.4	N23 31.6
Kaus Aust.	83 43.4	S34 22.5
Kochab	137 20.4	N74 06.3
Markab	13 37.9	N15 16.9
Menkar	314 14.8	N 4 08.6
Menkent	148 07.5	S36 26.3
Miaplacidus	221 40.5	S69 46.5
Mirfak	308 40.0	N49 54.3
Nunki	75 57.9	S26 16.6
Peacock	53 18.5	S56 41.3
Pollux	243 27.9	N27 59.4
Procyon	244 59.8	N 5 11.3
Rasalhague	96 06.2	N12 33.3
Regulus	207 43.7	N11 54.0
Rigel	281 12.0	S 8 11.1
Rigil Kent.	139 51.7	S60 53.6
Sabik	102 12.2	S15 44.3
Schedar	349 39.9	N56 36.7
Shaula	96 21.5	S37 06.7
Sirius	258 33.8	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.7	S43 29.3
Vega	80 38.6	N38 48.2
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	175 04.6	14 22
Mars	242 25.1	9 52
Jupiter	256 58.0	8 53
Saturn	145 12.9	16 19

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		20	21	22	23
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
20 00	179 08.3	N12 27.5	15 08.1	7.0	S12 16.1	10.0	60.4	N 72	////	////	03 03	19 39	19 28	19 18	19 08
01	194 08.5	26.7	29 34.1	7.1	12 06.1	10.2	60.4	N 70	////	01 46	03 27	19 26	19 22	19 18	19 15
02	209 08.6	25.9	44 00.2	7.2	11 55.9	10.3	60.4	68	////	02 25	03 44	19 15	19 17	19 19	19 20
03	224 08.8	. . 25.0	58 26.4	7.2	11 45.6	10.3	60.4	66	////	02 51	03 59	19 06	19 13	19 19	19 25
04	239 08.9	24.2	72 52.6	7.3	11 35.3	10.4	60.4	64	01 33	03 11	04 10	18 58	19 10	19 20	19 30
05	254 09.1	23.4	87 18.9	7.3	11 24.9	10.4	60.4	62	02 08	03 27	04 20	18 52	19 07	19 20	19 33
06	269 09.2	N12 22.6	101 45.2	7.4	S11 14.5	10.5	60.3	60	02 32	03 40	04 29	18 46	19 04	19 20	19 36
07	284 09.4	21.8	116 11.6	7.5	11 04.0	10.6	60.3	N 58	02 51	03 51	04 36	18 41	19 02	19 21	19 39
08	299 09.5	20.9	130 38.1	7.5	10 53.4	10.7	60.3	56	03 06	04 01	04 43	18 36	19 00	19 21	19 42
09	314 09.7	. . 20.1	145 04.6	7.6	10 42.7	10.7	60.3	54	03 19	04 09	04 49	18 32	18 58	19 21	19 44
10	329 09.8	19.3	159 31.2	7.6	10 32.0	10.8	60.3	52	03 30	04 17	04 54	18 28	18 56	19 21	19 46
11	344 10.0	18.4	173 57.8	7.7	10 21.2	10.8	60.3	50	03 40	04 24	04 59	18 25	18 54	19 22	19 48
12	359 10.1	N12 17.6	188 24.5	7.7	S10 10.4	10.9	60.3	45	03 59	04 38	05 09	18 18	18 51	19 22	19 52
13	14 10.3	16.8	202 51.2	7.8	9 59.5	11.0	60.3	N 40	04 14	04 49	05 17	18 12	18 48	19 22	19 56
14	29 10.5	16.0	217 18.0	7.9	9 48.5	11.0	60.2	35	04 27	04 58	05 25	18 06	18 46	19 23	19 59
15	44 10.6	. . 15.1	231 44.9	7.9	9 37.5	11.1	60.2	30	04 37	05 06	05 31	18 02	18 43	19 23	20 01
16	59 10.8	14.3	246 11.8	8.0	9 26.4	11.1	60.2	20	04 52	05 19	05 42	17 53	18 40	19 24	20 06
17	74 10.9	13.5	260 38.8	8.0	9 15.3	11.2	60.2	N 10	05 04	05 30	05 51	17 46	18 36	19 24	20 10
18	89 11.1	N12 12.7	275 05.8	8.1	S 9 04.1	11.2	60.2	0	05 14	05 39	06 00	17 40	18 33	19 25	20 14
19	104 11.2	11.8	289 32.9	8.1	8 52.9	11.3	60.2	S 10	05 22	05 47	06 08	17 33	18 30	19 25	20 18
20	119 11.4	11.0	304 00.0	8.2	8 41.6	11.3	60.1	20	05 29	05 55	06 17	17 26	18 27	19 26	20 23
21	134 11.5	. . 10.2	318 27.2	8.3	8 30.3	11.4	60.1	30	05 35	06 03	06 27	17 17	18 23	19 26	20 28
22	149 11.7	09.3	332 54.5	8.3	8 18.9	11.4	60.1	35	05 38	06 07	06 33	17 13	18 21	19 27	20 31
23	164 11.8	08.5	347 21.8	8.4	8 07.5	11.4	60.1	40	05 41	06 12	06 40	17 07	18 18	19 27	20 34
21 00	179 12.0	N12 07.7	1 49.2	8.4	S 7 56.1	11.5	60.1	45	05 43	06 17	06 47	17 01	18 15	19 28	20 38
01	194 12.1	06.8	16 16.6	8.5	7 44.6	11.5	60.0	S 50	05 46	06 23	06 57	16 53	18 12	19 28	20 42
02	209 12.3	06.0	30 44.1	8.5	7 33.1	11.6	60.0	52	05 47	06 26	07 01	16 50	18 10	19 29	20 44
03	224 12.5	. . 05.2	45 11.6	8.6	7 21.5	11.6	60.0	54	05 48	06 29	07 05	16 46	18 08	19 29	20 47
04	239 12.6	04.3	59 39.2	8.6	7 09.9	11.7	60.0	56	05 49	06 32	07 10	16 42	18 06	19 29	20 49
05	254 12.8	03.5	74 06.8	8.7	6 58.2	11.6	59.9	58	05 49	06 35	07 16	16 37	18 04	19 30	20 52
06	269 12.9	N12 02.7	88 34.5	8.8	S 6 46.6	11.7	59.9	S 60	05 50	06 39	07 22	16 32	18 02	19 30	20 55
07	284 13.1	01.8	103 02.3	8.8	6 34.9	11.8	59.9								
08	299 13.2	01.0	117 30.1	8.8	6 23.1	11.7	59.9								
09	314 13.4	12 00.2	131 57.9	9.0	6 11.4	11.8	59.9								
10	329 13.5	11 59.3	146 25.9	8.9	5 59.6	11.8	59.8								
11	344 13.7	58.5	160 53.8	9.0	5 47.8	11.9	59.8								
12	359 13.9	N11 57.7	175 21.8	9.1	S 5 35.9	11.9	59.8								
13	14 14.0	56.8	189 49.9	9.1	5 24.0	11.8	59.8								
14	29 14.2	56.0	204 18.0	9.2	5 12.2	12.0	59.7								
15	44 14.3	. . 55.2	218 46.2	9.2	5 00.2	11.9	59.7								
16	59 14.5	54.3	233 14.4	9.3	4 48.3	11.9	59.7								
17	74 14.6	53.5	247 42.7	9.3	4 36.4	12.0	59.7								
18	89 14.8	N11 52.7	262 11.0	9.4	S 4 24.4	12.0	59.6								
19	104 15.0	51.8	276 39.4	9.4	4 12.4	11.9	59.6								
20	119 15.1	51.0	291 07.8	9.5	4 00.5	12.0	59.6								
21	134 15.3	. . 50.1	305 36.3	9.5	3 48.5	12.1	59.6								
22	149 15.4	49.3	320 04.8	9.6	3 36.4	12.0	59.5								
23	164 15.6	48.5	334 33.4	9.6	3 24.4	12.0	59.5								
22 00	179 15.8	N11 47.6	349 02.0	9.6	S 3 12.4	12.0	59.5								
01	194 15.9	46.8	3 30.6	9.7	3 00.4	12.1	59.4								
02	209 16.1	45.9	17 59.3	9.8	2 48.3	12.0	59.4								
03	224 16.2	. . 45.1	32 28.1	9.8	2 36.3	12.1	59.4								
04	239 16.4	44.3	46 56.9	9.8	2 24.2	12.0	59.4								
05	254 16.6	43.4	61 25.7	9.9	2 12.2	12.1	59.3								
06	269 16.7	N11 42.6	75 54.6	9.9	S 2 00.1	12.0	59.3								
07	284 16.9	41.7	90 23.5	10.0	1 48.1	12.0	59.3								
08	299 17.0	40.9	104 52.5	10.0	1 36.1	12.1	59.2								
09	314 17.2	. . 40.1	119 21.5	10.1	1 24.0	12.0	59.2								
10	329 17.4	39.2	133 50.6	10.1	1 12.0	12.0	59.2								
11	344 17.5	38.4	148 19.7	10.1	1 00.0	12.1	59.1								
12	359 17.7	N11 37.5	162 48.8	10.2	S 0 47.9	12.0	59.1								
13	14 17.8	36.7	177 18.0	10.2	0 35.9	12.0	59.1								
14	29 18.0	35.8	191 47.2	10.2	0 23.9	11.9	59.0								
15	44 18.2	. . 35.0	206 16.4	10.3	S 0 12.0	12.0	59.0								
16	59 18.3	34.2	220 45.7	10.4	0 00.0	12.0	59.0								
17	74 18.5	33.3	235 15.1	10.3	N 0 12.0	11.9	58.9								
18	89 18.6	N11 32.5	249 44.4	10.4	N 0 23.9	11.9	58.9								
19	104 18.8	31.6	264 13.8	10.5	0 35.8	12.0	58.9								
20	119 19.0	30.8	278 43.3	10.4	0 47.8	11.8	58.8								
21	134 19.1	. . 29.9	293 12.7	10.6	0 59.6	11.9	58.8								
22	149 19.3	29.1	307 42.3	10.5	1 11.5	11.9	58.8								
23	164 19.5	28.2	322 11.8	10.6	N 1 23.4	11.8	58.7								
	SD 15.8	d 0.8	SD 16.4		16.3		16.1								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	20	21	22	23
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 58	23 28	////	02 21	04 31	06 32	08 29
N 70	20 36	22 13	////	02 43	04 42	06 35	08 24
68	20 19	21 37	////	03 00	04 51	06 37	08 21
66	20 05	21 12	23 33	03 14	04 58	06 39	08 17
64	19 54	20 52	22 27	03 25	05 04	06 41	08 15
62	19 44	20 37	21 54	03 35	05 10	06 43	08 13
60	19 36	20 24	21 31	03 43	05 14	06 44	08 11
N 58	19 28	20 13	21 13	03 50	05 18	06 45	08 09
56	19 22	20 04	20 58	03 56	05 22	06 46	08 07
54	19 16	19 55	20 45	04 02	05 25	06 47	08 06
52	19 11	19 48	20 34	04 07	05 28	06 48	08 05
50	19 06	19 41	20 25	04 11	05 31	06 48	08 04
45	18 56	19 28	20 06	04 21	05 36	06 50	08 01
N 40	18 48	19 17	19 51	04 29	05 41	06 51	07 59
35	18 41	19 07	19 39	04 36	05 45	06 52	07 57
30	18 35	19 00	19 29	04 42	05 49	06 53	07 56
20	18 24	18 47	19 13	04 53	05 55	06 55	07 53
N 10	18 15	18 36	19 02	05 02	06 00	06 56	07 51
0	18 06	18 28	18 52	05 10	06 05	06 58	07 48
S 10	17 58	18 19	18 44	05 19	06 10	06 59	07 46
20	17 49	18 12	18 37	05 28	06 15	07 00	07 44
30	17 39	18 03	18 31	05 38	06 21	07 02	07 41
35	17 33	17 59	18 29	05 44	06 25	07 03	07 39
40	17 27	17 55	18 26	05 50	06 28	07 04	07 38
45	17 19	17 49	18 24	05 58	06 33	07 05	07 35
S 50	17 10	17 44	18 21	06 07	06 38	07 06	07 33
52	17 06	17 41	18 20	06 11	06 40	07 07	07 32
54	17 02	17 38	18 20	06 16	06 43	07 07	07 31
56	16 57	17 35	18 19	06 21	06 46	07 08	07 29
58	16 51	17 32	18 18	06 26	06 49	07 09	07 28
S 60	16 45	17 28	18 17	06 33	06 53	07 10	07 26

Day	SUN			MOON		
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
20	03 27	03 20	12 03	23 52	11 25	14	99
21	03 12	03 05	12 03	24 45	12 19	15	100
22	02 57	02 50	12 03	00 45	13 11	16	97

UT	ARIES	VENUS −4.0		MARS +1.6		JUPITER −2.0		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
23 00	331 27.1	144 24.1	S 2 36.2	212 30.1	N21 42.2	228 00.8	N22 43.6	116 32.3	S11 31.3	Acamar	315 18.1	S40 14.8
01	346 29.6	159 23.9	37.4	227 30.8	41.9	243 02.7	43.5	131 34.6	31.3	Achernar	335 26.4	S57 09.8
02	1 32.0	174 23.7	38.7	242 31.6	41.6	258 04.7	43.5	146 36.9	31.4	Acrux	173 09.6	S63 10.7
03	16 34.5	189 23.6	. . 40.0	257 32.4	. . 41.3	273 06.7	. . 43.5	161 39.2	. . 31.5	Adhara	255 12.7	S28 59.4
04	31 37.0	204 23.4	41.3	272 33.1	41.0	288 08.6	43.4	176 41.5	31.5	Aldebaran	290 49.2	N16 32.1
05	46 39.4	219 23.2	42.6	287 33.9	40.7	303 10.6	43.4	191 43.8	31.6			
06	61 41.9	234 23.0	S 2 43.9	302 34.6	N21 40.5	318 12.5	N22 43.4	206 46.1	S11 31.7	Alioth	166 21.0	N55 53.3
07	76 44.4	249 22.8	45.2	317 35.4	40.2	333 14.5	43.3	221 48.4	31.7	Alkaid	152 59.1	N49 15.0
08	91 46.8	264 22.6	46.5	332 36.2	39.9	348 16.5	43.3	236 50.7	31.8	Al Na'ir	27 43.1	S46 53.4
F 09	106 49.3	279 22.4	. . 47.7	347 36.9	. . 39.6	3 18.4	. . 43.2	251 53.0	. . 31.9	Alnilam	275 46.3	S 1 11.6
R 10	121 51.8	294 22.2	49.0	2 37.7	39.3	18 20.4	43.2	266 55.3	31.9	Alphard	217 56.3	S 8 43.1
I 11	136 54.2	309 22.0	50.3	17 38.4	39.0	33 22.3	43.2	281 57.6	32.0			
D 12	151 56.7	324 21.8	S 2 51.6	32 39.2	N21 38.7	48 24.3	N22 43.1	296 59.9	S11 32.1	Alphecca	126 10.9	N26 40.5
A 13	166 59.1	339 21.6	52.9	47 39.9	38.4	63 26.3	43.1	312 02.2	32.1	Alpheratz	357 43.0	N29 10.0
Y 14	182 01.6	354 21.4	54.2	62 40.7	38.1	78 28.2	43.0	327 04.5	32.2	Altair	62 07.8	N 8 54.6
15	197 04.1	9 21.3	. . 55.5	77 41.5	. . 37.8	93 30.2	. . 43.0	342 06.8	. . 32.3	Ankaa	353 15.2	S42 13.6
16	212 06.5	24 21.1	56.7	92 42.2	37.6	108 32.2	43.0	357 09.1	32.3	Antares	112 26.0	S26 27.6
17	227 09.0	39 20.9	58.0	107 43.0	37.3	123 34.1	42.9	12 11.4	32.4			
18	242 11.5	54 20.7	S 2 59.3	122 43.8	N21 37.0	138 36.1	N22 42.9	27 13.7	S11 32.5	Arcturus	145 55.7	N19 06.9
19	257 13.9	69 20.5	3 00.6	137 44.5	36.7	153 38.0	42.8	42 16.0	32.5	Atria	107 27.5	S69 03.2
20	272 16.4	84 20.3	01.9	152 45.3	36.4	168 40.0	42.8	57 18.3	32.6	Avior	234 18.5	S59 33.2
21	287 18.9	99 20.1	. . 03.2	167 46.0	. . 36.1	183 42.0	. . 42.8	72 20.6	. . 32.7	Bellatrix	278 32.0	N 6 21.7
22	302 21.3	114 19.9	04.5	182 46.8	35.8	198 43.9	42.7	87 22.9	32.7	Betelgeuse	271 01.3	N 7 24.5
23	317 23.8	129 19.7	05.7	197 47.6	35.5	213 45.9	42.7	102 25.2	32.8			
24 00	332 26.2	144 19.5	S 3 07.0	212 48.3	N21 35.2	228 47.9	N22 42.6	117 27.5	S11 32.9	Canopus	263 56.4	S52 42.1
01	347 28.7	159 19.3	08.3	227 49.1	34.9	243 49.8	42.6	132 29.8	32.9	Capella	280 34.4	N46 00.4
02	2 31.2	174 19.2	09.6	242 49.8	34.6	258 51.8	42.6	147 32.1	33.0	Deneb	49 30.9	N45 20.1
03	17 33.6	189 19.0	. . 10.9	257 50.6	. . 34.3	273 53.8	. . 42.5	162 34.4	. . 33.1	Denebola	182 33.8	N14 29.8
04	32 36.1	204 18.8	12.2	272 51.4	34.0	288 55.7	42.5	177 36.7	33.1	Diphda	348 55.5	S17 54.5
05	47 38.6	219 18.6	13.5	287 52.1	33.7	303 57.7	42.4	192 38.9	33.2			
06	62 41.0	234 18.4	S 3 14.7	302 52.9	N21 33.4	318 59.7	N22 42.4	207 41.2	S11 33.3	Dubhe	193 52.2	N61 40.7
07	77 43.5	249 18.2	16.0	317 53.7	33.2	334 01.6	42.4	222 43.5	33.3	Elnath	278 12.6	N28 36.9
S 08	92 46.0	264 18.0	17.3	332 54.4	32.9	349 03.6	42.3	237 45.8	33.4	Eltanin	90 45.8	N51 29.7
A 09	107 48.4	279 17.8	. . 18.6	347 55.2	. . 32.6	4 05.5	. . 42.3	252 48.1	. . 33.5	Enif	33 46.6	N 9 56.5
T 10	122 50.9	294 17.6	19.9	2 55.9	32.3	19 07.5	42.2	267 50.4	33.5	Fomalhaut	15 23.5	S29 32.7
U 11	137 53.4	309 17.4	21.2	17 56.7	32.0	34 09.5	42.2	282 52.7	33.6			
R 12	152 55.8	324 17.2	S 3 22.4	32 57.5	N21 31.7	49 11.4	N22 42.2	297 55.0	S11 33.7	Gacrux	172 01.1	S57 11.5
D 13	167 58.3	339 17.0	23.7	47 58.2	31.4	64 13.4	42.1	312 57.3	33.7	Gienah	175 52.4	S17 37.1
A 14	183 00.7	354 16.9	25.0	62 59.0	31.1	79 15.4	42.1	327 59.6	33.8	Hadar	148 47.9	S60 26.5
Y 15	198 03.2	9 16.7	. . 26.3	77 59.8	. . 30.8	94 17.3	. . 42.0	343 01.9	. . 33.9	Hamal	328 00.4	N23 31.6
16	213 05.7	24 16.5	27.6	93 00.5	30.5	109 19.3	42.0	358 04.2	33.9	Kaus Aust.	83 43.4	S34 22.5
17	228 08.1	39 16.3	28.9	108 01.3	30.2	124 21.3	42.0	13 06.5	34.0			
18	243 10.6	54 16.1	S 3 30.2	123 02.1	N21 29.9	139 23.2	N22 41.9	28 08.8	S11 34.1	Kochab	137 20.5	N74 06.3
19	258 13.1	69 15.9	31.4	138 02.8	29.6	154 25.2	41.9	43 11.1	34.1	Markab	13 37.8	N15 16.9
20	273 15.5	84 15.7	32.7	153 03.6	29.3	169 27.2	41.8	58 13.4	34.2	Menkar	314 14.8	N 4 08.6
21	288 18.0	99 15.5	. . 34.0	168 04.4	. . 29.0	184 29.1	. . 41.8	73 15.7	. . 34.3	Menkent	148 07.5	S36 26.3
22	303 20.5	114 15.3	35.3	183 05.1	28.7	199 31.1	41.8	88 18.0	34.3	Miaplacidus	221 40.5	S69 46.4
23	318 22.9	129 15.1	36.6	198 05.9	28.4	214 33.1	41.7	103 20.3	34.4			
25 00	333 25.4	144 14.9	S 3 37.9	213 06.7	N21 28.1	229 35.0	N22 41.7	118 22.6	S11 34.5	Mirfak	308 40.0	N49 54.3
01	348 27.8	159 14.8	39.1	228 07.4	27.8	244 37.0	41.6	133 24.8	34.5	Nunki	75 57.9	S26 16.6
02	3 30.3	174 14.6	40.4	243 08.2	27.5	259 39.0	41.6	148 27.1	34.6	Peacock	53 18.5	S56 41.3
03	18 32.8	189 14.4	. . 41.7	258 09.0	. . 27.2	274 41.0	. . 41.6	163 29.4	. . 34.7	Pollux	243 27.9	N27 59.4
04	33 35.2	204 14.2	43.0	273 09.7	26.9	289 42.9	41.5	178 31.7	34.7	Procyon	244 59.8	N 5 11.3
05	48 37.7	219 14.0	44.3	288 10.5	26.6	304 44.9	41.5	193 34.0	34.8			
06	63 40.2	234 13.8	S 3 45.6	303 11.3	N21 26.3	319 46.9	N22 41.4	208 36.3	S11 34.9	Rasalhague	96 06.2	N12 33.3
07	78 42.6	249 13.6	46.8	318 12.0	26.0	334 48.8	41.4	223 38.6	34.9	Regulus	207 43.7	N11 54.0
08	93 45.1	264 13.4	48.1	333 12.8	25.7	349 50.8	41.4	238 40.9	35.0	Rigel	281 12.0	S 8 11.1
S 09	108 47.6	279 13.2	. . 49.4	348 13.6	. . 25.4	4 52.8	. . 41.3	253 43.2	. . 35.1	Rigil Kent.	139 51.7	S60 53.6
U 10	123 50.0	294 13.0	50.7	3 14.3	25.1	19 54.7	41.3	268 45.5	35.1	Sabik	102 12.3	S15 44.3
N 11	138 52.5	309 12.8	52.0	18 15.1	24.8	34 56.7	41.2	283 47.8	35.2			
D 12	153 55.0	324 12.7	S 3 53.2	33 15.9	N21 24.5	49 58.7	N22 41.2	298 50.1	S11 35.3	Schedar	349 39.8	N56 36.7
A 13	168 57.4	339 12.5	54.5	48 16.6	24.2	65 00.6	41.2	313 52.4	35.3	Shaula	96 21.5	S37 06.7
Y 14	183 59.9	354 12.3	55.8	63 17.4	23.9	80 02.6	41.1	328 54.7	35.4	Sirius	258 33.8	S16 44.1
15	199 02.3	9 12.1	. . 57.1	78 18.2	. . 23.6	95 04.6	. . 41.1	343 56.9	. . 35.5	Spica	158 31.3	S11 13.9
16	214 04.8	24 11.9	58.4	93 19.0	23.3	110 06.6	41.0	358 59.2	35.5	Suhail	222 52.7	S43 29.3
17	229 07.3	39 11.7	3 59.7	108 19.7	23.0	125 08.5	41.0	14 01.5	35.6			
18	244 09.7	54 11.5	S 4 00.9	123 20.5	N21 22.7	140 10.5	N22 41.0	29 03.8	S11 35.7	Vega	80 38.6	N38 48.2
19	259 12.2	69 11.3	02.2	138 21.3	22.4	155 12.5	40.9	44 06.1	35.8	Zuben'ubi	137 05.3	S16 05.8
20	274 14.7	84 11.1	03.5	153 22.0	22.0	170 14.4	40.9	59 08.4	35.8		SHA	Mer.Pass.
21	289 17.1	99 10.9	. . 04.8	168 22.8	. . 21.7	185 16.4	. . 40.8	74 10.7	. . 35.9		° ′	h m
22	304 19.6	114 10.7	06.1	183 23.6	21.4	200 18.4	40.8	89 13.0	36.0	Venus	171 53.3	14 23
23	319 22.1	129 10.6	07.3	198 24.3	21.1	215 20.4	40.7	104 15.3	36.0	Mars	240 22.1	9 48
	h m									Jupiter	256 21.6	8 44
Mer.Pass.	1 49.9	v −0.2	d 1.3	v 0.8	d 0.3	v 2.0	d 0.0	v 2.3	d 0.1	Saturn	145 01.2	16 08

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 23	Moonrise 24	Moonrise 25	Moonrise 26
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
23 00	179 19.6	N11 27.4	336 41.4	10.6	N 1 35.2	11.8	58.7	N 72	////	01 16	03 20	19 08	18 57	18 45	18 27
01	194 19.8	26.5	351 11.0	10.6	1 47.0	11.8	58.7	N 70	////	02 10	03 40	19 15	19 11	19 08	19 06
02	209 20.0	25.7	5 40.6	10.7	1 58.8	11.7	58.6	68	////	02 41	03 56	19 20	19 23	19 26	19 33
03	224 20.1	. . 24.9	20 10.3	10.7	2 10.5	11.8	58.6	66	01 06	03 04	04 09	19 25	19 32	19 41	19 54
04	239 20.3	24.0	34 40.0	10.8	2 22.3	11.7	58.6	64	01 53	03 22	04 19	19 30	19 40	19 53	20 10
05	254 20.4	23.2	49 09.8	10.7	2 34.0	11.6	58.5	62	02 22	03 36	04 28	19 33	19 47	20 04	20 24
06	269 20.6	N11 22.3	63 39.5	10.8	N 2 45.6	11.7	58.5	60	02 44	03 48	04 36	19 36	19 53	20 13	20 36
07	284 20.8	21.5	78 09.3	10.9	2 57.3	11.6	58.5	N 58	03 00	03 59	04 43	19 39	19 59	20 20	20 46
08	299 20.9	20.6	92 39.2	10.8	3 08.9	11.6	58.4	56	03 14	04 08	04 49	19 42	20 03	20 27	20 55
F 09	314 21.1	. . 19.8	107 09.0	10.9	3 20.5	11.5	58.4	54	03 26	04 15	04 54	19 44	20 08	20 34	21 03
R 10	329 21.3	18.9	121 38.9	10.9	3 32.0	11.5	58.4	52	03 37	04 22	04 59	19 46	20 12	20 39	21 10
I 11	344 21.4	18.1	136 08.8	11.0	3 43.5	11.5	58.3	50	03 45	04 28	05 03	19 48	20 15	20 44	21 16
D 12	359 21.6	N11 17.2	150 38.8	10.9	N 3 55.0	11.4	58.3	45	04 04	04 41	05 12	19 52	20 23	20 55	21 30
A 13	14 21.8	16.4	165 08.7	11.0	4 06.4	11.4	58.3	N 40	04 18	04 52	05 20	19 56	20 29	21 04	21 42
Y 14	29 21.9	15.5	179 38.7	11.1	4 17.8	11.4	58.2	35	04 29	05 01	05 27	19 59	20 35	21 12	21 51
15	44 22.1	. . 14.7	194 08.8	11.0	4 29.2	11.3	58.2	30	04 39	05 08	05 33	20 01	20 40	21 19	22 00
16	59 22.3	13.8	208 38.8	11.1	4 40.5	11.3	58.2	20	04 53	05 20	05 42	20 06	20 49	21 31	22 15
17	74 22.4	13.0	223 08.9	11.1	4 51.8	11.3	58.1	N 10	05 05	05 30	05 51	20 10	20 56	21 42	22 28
18	89 22.6	N11 12.1	237 39.0	11.1	N 5 03.1	11.2	58.1	0	05 13	05 38	05 59	20 14	21 03	21 52	22 40
19	104 22.8	11.3	252 09.1	11.1	5 14.3	11.1	58.0	S 10	05 21	05 45	06 07	20 18	21 11	22 02	22 53
20	119 22.9	10.4	266 39.2	11.2	5 25.4	11.1	58.0	20	05 27	05 53	06 15	20 23	21 18	22 13	23 06
21	134 23.1	. . 09.5	281 09.4	11.2	5 36.5	11.1	58.0	30	05 32	06 00	06 24	20 28	21 27	22 25	23 21
22	149 23.3	08.7	295 39.6	11.2	5 47.6	11.0	57.9	35	05 34	06 04	06 30	20 31	21 32	22 32	23 30
23	164 23.4	07.8	310 09.8	11.2	5 58.6	11.0	57.9	40	05 36	06 08	06 35	20 34	21 38	22 41	23 40
24 00	179 23.6	N11 07.0	324 40.0	11.3	N 6 09.6	11.0	57.9	45	05 38	06 13	06 42	20 38	21 45	22 50	23 52
01	194 23.8	06.1	339 10.3	11.2	6 20.6	10.8	57.8	S 50	05 40	06 18	06 51	20 42	21 54	23 02	24 06
02	209 23.9	05.3	353 40.5	11.3	6 31.4	10.9	57.8	52	05 41	06 20	06 54	20 44	21 57	23 07	24 13
03	224 24.1	. . 04.4	8 10.8	11.3	6 42.3	10.8	57.8	54	05 41	06 22	06 59	20 47	22 02	23 13	24 21
04	239 24.3	03.6	22 41.1	11.4	6 53.1	10.7	57.7	56	05 42	06 25	07 03	20 49	22 06	23 20	24 29
05	254 24.5	02.7	37 11.5	11.3	7 03.8	10.7	57.7	58	05 42	06 28	07 08	20 52	22 12	23 27	24 39
06	269 24.6	N11 01.9	51 41.8	11.4	N 7 14.5	10.6	57.7	S 60	05 43	06 31	07 14	20 55	22 18	23 36	24 50
07	284 24.8	01.0	66 12.2	11.3	7 25.1	10.6	57.6								
S 08	299 25.0	11 00.1	80 42.5	11.4	7 35.7	10.5	57.6								
A 09	314 25.1	10 59.3	95 12.9	11.4	7 46.2	10.5	57.5								
T 10	329 25.3	58.4	109 43.3	11.5	7 56.7	10.4	57.5								
U 11	344 25.5	57.6	124 13.8	11.4	8 07.1	10.4	57.5								
R 12	359 25.6	N10 56.7	138 44.2	11.5	N 8 17.5	10.3	57.4								
D 13	14 25.8	55.9	153 14.7	11.4	8 27.8	10.3	57.4								
A 14	29 26.0	55.0	167 45.1	11.5	8 38.1	10.1	57.4								
Y 15	44 26.2	. . 54.1	182 15.6	11.5	8 48.2	10.2	57.3								
16	59 26.3	53.3	196 46.1	11.5	8 58.4	10.1	57.3								
17	74 26.5	52.4	211 16.6	11.5	9 08.5	10.0	57.3								
18	89 26.7	N10 51.6	225 47.1	11.6	N 9 18.5	9.9	57.2								
19	104 26.8	50.7	240 17.7	11.5	9 28.4	9.9	57.2								
20	119 27.0	49.8	254 48.2	11.6	9 38.3	9.8	57.1								
21	134 27.2	. . 49.0	269 18.8	11.5	9 48.1	9.8	57.1								
22	149 27.4	48.1	283 49.3	11.6	9 57.9	9.7	57.1								
23	164 27.5	47.3	298 19.9	11.6	10 07.6	9.6	57.0								
25 00	179 27.7	N10 46.4	312 50.5	11.6	N10 17.2	9.6	57.0								
01	194 27.9	45.5	327 21.1	11.6	10 26.8	9.5	57.0								
02	209 28.0	44.7	341 51.7	11.6	10 36.3	9.5	56.9								
03	224 28.2	. . 43.8	356 22.3	11.7	10 45.8	9.3	56.9								
04	239 28.4	42.9	10 53.0	11.6	10 55.1	9.3	56.9								
05	254 28.6	42.1	25 23.6	11.6	11 04.4	9.3	56.8								
06	269 28.7	N10 41.2	39 54.2	11.7	N11 13.7	9.1	56.8								
07	284 28.9	40.4	54 24.9	11.6	11 22.8	9.1	56.8								
08	299 29.1	39.5	68 55.5	11.7	11 31.9	9.1	56.7								
S 09	314 29.3	. . 38.6	83 26.2	11.7	11 41.0	8.9	56.7								
U 10	329 29.4	37.8	97 56.9	11.6	11 49.9	8.9	56.7								
N 11	344 29.6	36.9	112 27.5	11.7	11 58.8	8.8	56.6								
D 12	359 29.8	N10 36.0	126 58.2	11.7	N12 07.6	8.8	56.6								
A 13	14 30.0	35.2	141 28.9	11.7	12 16.4	8.7	56.5								
Y 14	29 30.1	34.3	155 59.6	11.7	12 25.1	8.6	56.5								
15	44 30.3	. . 33.4	170 30.3	11.7	12 33.7	8.5	56.5								
16	59 30.5	32.6	185 01.0	11.7	12 42.2	8.5	56.4								
17	74 30.7	31.7	199 31.7	11.7	12 50.7	8.3	56.4								
18	89 30.8	N10 30.8	214 02.4	11.7	N12 59.0	8.3	56.4								
19	104 31.0	30.0	228 33.1	11.8	13 07.3	8.3	56.3								
20	119 31.2	29.1	243 03.9	11.7	13 15.6	8.1	56.3								
21	134 31.4	. . 28.2	257 34.6	11.7	13 23.7	8.1	56.3								
22	149 31.5	27.4	272 05.3	11.7	13 31.8	8.0	56.3								
23	164 31.7	26.5	286 36.0	11.8	N13 39.8	7.9	56.2								
	SD 15.8	d 0.9	SD	15.9		15.6		15.4							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 23	Moonset 24	Moonset 25	Moonset 26
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 40	22 37	////	08 29	10 23	12 17	14 16
N 70	20 21	21 49	////	08 24	10 10	11 55	13 38
68	20 06	21 19	////	08 21	10 00	11 38	13 12
66	19 53	20 57	22 48	08 17	09 52	11 24	12 52
64	19 43	20 40	22 06	08 15	09 46	11 13	12 36
62	19 34	20 26	21 39	08 13	09 40	11 03	12 23
60	19 27	20 14	21 18	08 11	09 35	10 55	12 11
N 58	19 20	20 04	21 02	08 09	09 30	10 48	12 02
56	19 15	19 55	20 48	08 07	09 26	10 42	11 53
54	19 09	19 48	20 36	08 06	09 23	10 36	11 46
52	19 05	19 41	20 26	08 05	09 19	10 31	11 39
50	19 00	19 35	20 18	08 04	09 17	10 26	11 33
45	18 51	19 22	20 00	08 01	09 10	10 17	11 20
N 40	18 44	19 12	19 46	07 59	09 05	10 08	11 09
35	18 37	19 03	19 35	07 57	09 00	10 01	11 00
30	18 32	18 56	19 25	07 56	08 56	09 55	10 52
20	18 22	18 44	19 11	07 53	08 50	09 45	10 38
N 10	18 13	18 35	19 00	07 51	08 44	09 35	10 26
0	18 06	18 27	18 51	07 48	08 38	09 27	10 15
S 10	17 58	18 19	18 44	07 46	08 32	09 18	10 04
20	17 50	18 12	18 38	07 44	08 26	09 09	09 52
30	17 41	18 05	18 33	07 41	08 19	08 58	09 38
35	17 36	18 01	18 31	07 39	08 15	08 52	09 30
40	17 30	17 57	18 29	07 38	08 11	08 45	09 21
45	17 23	17 53	18 27	07 35	08 06	08 37	09 11
S 50	17 15	17 48	18 25	07 33	08 00	08 28	08 58
52	17 11	17 46	18 25	07 32	07 57	08 23	08 52
54	17 07	17 43	18 24	07 31	07 54	08 18	08 46
56	17 02	17 41	18 24	07 29	07 50	08 13	08 39
58	16 57	17 38	18 23	07 28	07 47	08 07	08 31
S 60	16 52	17 35	18 23	07 26	07 42	08 00	08 21

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
23	02 42	02 34	12 03	01 36	14 01	17	92
24	02 26	02 18	12 02	02 26	14 51	18	86
25	02 10	02 01	12 02	03 15	15 39	19	77

UT	ARIES	VENUS −4.0		MARS +1.6		JUPITER −2.0		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
26 00	334 24.5	144 10.4	S 4 08.6	213 25.1	N21 20.8	230 22.3	N22 40.7	119 17.6	S11 36.1	Acamar	315 18.1	S40 14.8
01	349 27.0	159 10.2	09.9	228 25.9	20.5	245 24.3	40.7	134 19.9	36.2	Achernar	335 26.3	S57 09.8
02	4 29.5	174 10.0	11.2	243 26.7	20.2	260 26.3	40.6	149 22.1	36.2	Acrux	173 09.6	S63 10.7
03	19 31.9	189 09.8	12.5	258 27.4	19.9	275 28.2	40.6	164 24.4	36.3	Adhara	255 12.6	S28 59.4
04	34 34.4	204 09.6	13.8	273 28.2	19.6	290 30.2	40.5	179 26.7	36.4	Aldebaran	290 49.2	N16 32.1
05	49 36.8	219 09.4	15.0	288 29.0	19.3	305 32.2	40.5	194 29.0	36.4			
06	64 39.3	234 09.2	S 4 16.3	303 29.8	N21 19.0	320 34.2	N22 40.5	209 31.3	S11 36.5	Alioth	166 21.0	N55 53.3
07	79 41.8	249 09.0	17.6	318 30.5	18.7	335 36.1	40.4	224 33.6	36.6	Alkaid	152 59.1	N49 15.0
08	94 44.2	264 08.8	18.9	333 31.3	18.4	350 38.1	40.4	239 35.9	36.6	Al Na'ir	27 43.1	S46 53.5
M 09	109 46.7	279 08.6	20.2	348 32.1	18.1	5 40.1	40.3	254 38.2	36.7	Alnilam	275 46.3	S 1 11.6
O 10	124 49.2	294 08.5	21.4	3 32.8	17.8	20 42.1	40.3	269 40.5	36.8	Alphard	217 56.2	S 8 43.1
N 11	139 51.6	309 08.3	22.7	18 33.6	17.4	35 44.0	40.3	284 42.8	36.8			
D 12	154 54.1	324 08.1	S 4 24.0	33 34.4	N21 17.1	50 46.0	N22 40.2	299 45.0	S11 36.9	Alphecca	126 10.9	N26 40.5
A 13	169 56.6	339 07.9	25.3	48 35.2	16.8	65 48.0	40.2	314 47.3	37.0	Alpheratz	357 43.0	N29 10.1
Y 14	184 59.0	354 07.7	26.5	63 35.9	16.5	80 49.9	40.1	329 49.6	37.1	Altair	62 07.8	N 8 54.6
15	200 01.5	9 07.5	27.8	78 36.7	16.2	95 51.9	40.1	344 51.9	37.1	Ankaa	353 15.2	S42 13.6
16	215 03.9	24 07.3	29.1	93 37.5	15.9	110 53.9	40.1	359 54.2	37.2	Antares	112 26.0	S26 27.6
17	230 06.4	39 07.1	30.4	108 38.3	15.6	125 55.9	40.0	14 56.5	37.3			
18	245 08.9	54 06.9	S 4 31.7	123 39.0	N21 15.3	140 57.8	N22 40.0	29 58.8	S11 37.3	Arcturus	145 55.8	N19 06.9
19	260 11.3	69 06.7	32.9	138 39.8	15.0	155 59.8	39.9	45 01.1	37.4	Atria	107 27.6	S69 03.2
20	275 13.8	84 06.5	34.2	153 40.6	14.7	171 01.8	39.9	60 03.4	37.5	Avior	234 18.5	S59 33.2
21	290 16.3	99 06.3	35.5	168 41.4	14.3	186 03.8	39.9	75 05.6	37.5	Bellatrix	278 31.9	N 6 21.7
22	305 18.7	114 06.2	36.8	183 42.1	14.0	201 05.7	39.8	90 07.9	37.6	Betelgeuse	271 01.3	N 7 24.5
23	320 21.2	129 06.0	38.1	198 42.9	13.7	216 07.7	39.8	105 10.2	37.7			
27 00	335 23.7	144 05.8	S 4 39.3	213 43.7	N21 13.4	231 09.7	N22 39.7	120 12.5	S11 37.7	Canopus	263 56.4	S52 42.0
01	350 26.1	159 05.6	40.6	228 44.5	13.1	246 11.7	39.7	135 14.8	37.8	Capella	280 34.3	N46 00.4
02	5 28.6	174 05.4	41.9	243 45.2	12.8	261 13.7	39.7	150 17.1	37.9	Deneb	49 30.9	N45 20.1
03	20 31.1	189 05.2	43.2	258 46.0	12.5	276 15.6	39.6	165 19.4	37.9	Denebola	182 33.8	N14 29.8
04	35 33.5	204 05.0	44.4	273 46.8	12.2	291 17.6	39.6	180 21.7	38.0	Diphda	348 55.5	S17 54.5
05	50 36.0	219 04.8	45.7	288 47.6	11.8	306 19.6	39.5	195 23.9	38.1			
06	65 38.4	234 04.6	S 4 47.0	303 48.4	N21 11.5	321 21.6	N22 39.5	210 26.2	S11 38.2	Dubhe	193 52.2	N61 40.6
07	80 40.9	249 04.4	48.3	318 49.1	11.2	336 23.5	39.5	225 28.5	38.2	Elnath	278 12.5	N28 36.9
T 08	95 43.4	264 04.2	49.6	333 49.9	10.9	351 25.5	39.4	240 30.8	38.3	Eltanin	90 45.8	N51 29.7
U 09	110 45.8	279 04.0	50.8	348 50.7	10.6	6 27.5	39.4	255 33.1	38.4	Enif	33 46.6	N 9 56.5
E 10	125 48.3	294 03.8	52.1	3 51.5	10.3	21 29.5	39.3	270 35.4	38.4	Fomalhaut	15 23.5	S29 32.7
S 11	140 50.8	309 03.7	53.4	18 52.2	10.0	36 31.4	39.3	285 37.7	38.5			
D 12	155 53.2	324 03.5	S 4 54.7	33 53.0	N21 09.6	51 33.4	N22 39.2	300 39.9	S11 38.6	Gacrux	172 01.1	S57 11.5
A 13	170 55.7	339 03.3	55.9	48 53.8	09.3	66 35.4	39.2	315 42.2	38.6	Gienah	175 52.4	S17 37.1
Y 14	185 58.2	354 03.1	57.2	63 54.6	09.0	81 37.4	39.2	330 44.5	38.7	Hadar	148 47.9	S60 26.5
15	201 00.6	9 02.9	58.5	78 55.4	08.7	96 39.4	39.1	345 46.8	38.8	Hamal	328 00.4	N23 31.6
16	216 03.1	24 02.7	4 59.8	93 56.1	08.4	111 41.3	39.1	0 49.1	38.8	Kaus Aust.	83 43.4	S34 22.5
17	231 05.6	39 02.5	5 01.0	108 56.9	08.1	126 43.3	39.0	15 51.4	38.9			
18	246 08.0	54 02.3	S 5 02.3	123 57.7	N21 07.7	141 45.3	N22 39.0	30 53.7	S11 39.0	Kochab	137 20.5	N74 06.3
19	261 10.5	69 02.1	03.6	138 58.5	07.4	156 47.3	39.0	45 55.9	39.1	Markab	13 37.8	N15 16.9
20	276 12.9	84 01.9	04.9	153 59.3	07.1	171 49.3	38.9	60 58.2	39.1	Menkar	314 14.8	N 4 08.6
21	291 15.4	99 01.7	06.1	169 00.0	06.8	186 51.2	38.9	76 00.5	39.2	Menkent	148 07.6	S36 26.3
22	306 17.9	114 01.5	07.4	184 00.8	06.5	201 53.2	38.8	91 02.8	39.3	Miaplacidus	221 40.4	S69 46.4
23	321 20.3	129 01.3	08.7	199 01.6	06.2	216 55.2	38.8	106 05.1	39.3			
28 00	336 22.8	144 01.2	S 5 10.0	214 02.4	N21 05.8	231 57.2	N22 38.8	121 07.4	S11 39.4	Mirfak	308 40.0	N49 54.3
01	351 25.3	159 01.0	11.2	229 03.2	05.5	246 59.1	38.7	136 09.7	39.5	Nunki	75 57.9	S26 16.6
02	6 27.7	174 00.8	12.5	244 03.9	05.2	262 01.1	38.7	151 11.9	39.5	Peacock	53 18.5	S56 41.3
03	21 30.2	189 00.6	13.8	259 04.7	04.9	277 03.1	38.6	166 14.2	39.6	Pollux	243 27.8	N27 59.4
04	36 32.7	204 00.4	15.1	274 05.5	04.6	292 05.1	38.6	181 16.5	39.7	Procyon	244 59.8	N 5 11.3
05	51 35.1	219 00.2	16.3	289 06.3	04.3	307 07.1	38.6	196 18.8	39.8			
06	66 37.6	234 00.0	S 5 17.6	304 07.1	N21 03.9	322 09.1	N22 38.5	211 21.1	S11 39.8	Rasalhague	96 06.2	N12 33.3
W 07	81 40.0	248 59.8	18.9	319 07.9	03.6	337 11.0	38.5	226 23.4	39.9	Regulus	207 43.7	N11 54.0
E 08	96 42.5	263 59.6	20.1	334 08.6	03.3	352 13.0	38.4	241 25.6	40.0	Rigel	281 12.0	S 8 11.1
D 09	111 45.0	278 59.4	21.4	349 09.4	03.0	7 15.0	38.4	256 27.9	40.0	Rigil Kent.	139 51.7	S60 53.6
N 10	126 47.4	293 59.2	22.7	4 10.2	02.7	22 17.0	38.3	271 30.2	40.1	Sabik	102 12.3	S15 44.3
E 11	141 49.9	308 59.0	24.0	19 11.0	02.3	37 19.0	38.3	286 32.5	40.2			
S 12	156 52.4	323 58.8	S 5 25.2	34 11.8	N21 02.0	52 20.9	N22 38.3	301 34.8	S11 40.2	Schedar	349 39.8	N56 36.7
D 13	171 54.8	338 58.6	26.5	49 12.6	01.7	67 22.9	38.2	316 37.1	40.3	Shaula	96 21.6	S37 06.7
A 14	186 57.3	353 58.5	27.8	64 13.3	01.4	82 24.9	38.2	331 39.3	40.4	Sirius	258 33.8	S16 44.1
Y 15	201 59.8	8 58.3	29.1	79 14.1	01.0	97 26.9	38.1	346 41.6	40.5	Spica	158 31.3	S11 13.9
16	217 02.2	23 58.1	30.3	94 14.9	00.7	112 28.9	38.1	1 43.9	40.5	Suhail	222 52.7	S43 29.3
17	232 04.7	38 57.9	31.6	109 15.7	00.4	127 30.9	38.1	16 46.2	40.6			
18	247 07.2	53 57.7	S 5 32.9	124 16.5	N21 00.1	142 32.8	N22 38.0	31 48.5	S11 40.7	Vega	80 38.6	N38 48.2
19	262 09.6	68 57.5	34.1	139 17.3	20 59.8	157 34.8	38.0	46 50.8	40.7	Zuben'ubi	137 05.3	S16 05.8
20	277 12.1	83 57.3	35.4	154 18.0	59.4	172 36.8	37.9	61 53.0	40.8		SHA	Mer.Pass.
21	292 14.5	98 57.1	36.7	169 18.8	59.1	187 38.8	37.9	76 55.3	40.9		° ′	h m
22	307 17.0	113 56.9	38.0	184 19.6	58.8	202 40.8	37.9	91 57.6	41.0	Venus	168 42.1	14 24
23	322 19.5	128 56.7	39.2	199 20.4	58.5	217 42.8	37.8	106 59.9	41.0	Mars	238 20.0	9 45
	h m									Jupiter	255 46.0	8 34
Mer. Pass.	1 38.2	v −0.2	d 1.3	v 0.8	d 0.3	v 2.0	d 0.0	v 2.3	d 0.1	Saturn	144 48.8	15 57

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		26	27	28	29
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
26 00	179 31.9	N10 25.6	301 06.8	11.7	N13 47.7	7.9	56.2	N 72	////	01 51	03 36	18 27	17 31		
01	194 32.1	24.8	315 37.5	11.7	13 55.6	7.8	56.2	N 70	////	02 30	03 54	19 06	19 05	19 08	19 35
02	209 32.2	23.9	330 08.2	11.8	14 03.4	7.6	56.1	68	////	02 57	04 08	19 33	19 44	20 06	20 47
03	224 32.4	23.0	344 39.0	11.7	14 11.0	7.7	56.1	66	01 35	03 17	04 19	19 54	20 12	20 41	21 23
04	239 32.6	22.2	359 09.7	11.8	14 18.7	7.5	56.1	64	02 11	03 33	04 28	20 10	20 33	21 05	21 49
05	254 32.8	21.3	13 40.5	11.7	14 26.2	7.4	56.0	62	02 36	03 46	04 36	20 24	20 50	21 25	22 10
06	269 32.9	N10 20.4	28 11.2	11.7	N14 33.6	7.4	56.0	60	02 54	03 57	04 43	20 36	21 05	21 41	22 26
07	284 33.1	19.5	42 41.9	11.8	14 41.0	7.3	56.0	N 58	03 10	04 06	04 49	20 46	21 17	21 54	22 40
08	299 33.3	18.7	57 12.7	11.7	14 48.3	7.2	55.9	56	03 22	04 14	04 55	20 55	21 27	22 06	22 52
M 09	314 33.5	17.8	71 43.4	11.8	14 55.5	7.1	55.9	54	03 33	04 21	04 59	21 03	21 37	22 16	23 03
O 10	329 33.7	16.9	86 14.2	11.7	15 02.6	7.1	55.9	52	03 43	04 28	05 04	21 10	21 45	22 26	23 12
N 11	344 33.8	16.1	100 44.9	11.8	15 09.7	7.0	55.8	50	03 51	04 33	05 08	21 16	21 52	22 34	23 20
D 12	359 34.0	N10 15.2	115 15.7	11.8	N15 16.7	6.8	55.8	45	04 08	04 45	05 16	21 30	22 08	22 51	23 38
A 13	14 34.2	14.3	129 46.5	11.7	15 23.5	6.9	55.8	N 40	04 21	04 55	05 23	21 42	22 22	23 05	23 53
Y 14	29 34.4	13.4	144 17.2	11.8	15 30.4	6.7	55.8	35	04 32	05 03	05 29	21 51	22 33	23 17	24 05
15	44 34.5	12.6	158 48.0	11.7	15 37.1	6.6	55.7	30	04 41	05 10	05 34	22 00	22 43	23 28	24 16
16	59 34.7	11.7	173 18.7	11.8	15 43.7	6.6	55.7	20	04 54	05 21	05 43	22 15	23 00	23 46	24 34
17	74 34.9	10.8	187 49.5	11.7	15 50.3	6.4	55.7	N 10	05 05	05 30	05 51	22 28	23 15	24 02	00 02
18	89 35.1	N10 10.0	202 20.2	11.8	N15 56.7	6.4	55.6	0	05 13	05 37	05 58	22 40	23 29	24 17	00 17
19	104 35.3	09.1	216 51.0	11.7	16 03.1	6.3	55.6	S 10	05 19	05 44	06 05	22 53	23 43	24 32	00 32
20	119 35.4	08.2	231 21.7	11.8	16 09.4	6.2	55.6	20	05 25	05 50	06 13	23 06	23 57	24 48	00 48
21	134 35.6	07.3	245 52.5	11.7	16 15.6	6.2	55.6	30	05 29	05 57	06 21	23 21	24 15	00 15	01 06
22	149 35.8	06.5	260 23.2	11.8	16 21.8	6.0	55.5	35	05 31	06 00	06 26	23 30	24 25	00 25	01 17
23	164 36.0	05.6	274 54.0	11.8	16 27.8	6.0	55.5	40	05 32	06 04	06 31	23 40	24 36	00 36	01 29
27 00	179 36.2	N10 04.7	289 24.8	11.7	N16 33.8	5.8	55.5	45	05 33	06 07	06 37	23 52	24 50	00 50	01 43
01	194 36.3	03.8	303 55.5	11.8	16 39.6	5.8	55.4	S 50	05 34	06 12	06 45	24 06	00 06	01 06	02 01
02	209 36.5	03.0	318 26.3	11.7	16 45.4	5.7	55.4	52	05 35	06 14	06 48	24 13	00 13	01 14	02 09
03	224 36.7	02.1	332 57.0	11.8	16 51.1	5.6	55.4	54	05 35	06 16	06 52	24 21	00 21	01 23	02 19
04	239 36.9	01.2	347 27.8	11.7	16 56.7	5.5	55.4	56	05 35	06 18	06 56	24 29	00 29	01 33	02 29
05	254 37.1	10 00.3	1 58.5	11.8	17 02.2	5.5	55.3	58	05 35	06 20	07 00	24 39	00 39	01 44	02 41
06	269 37.2	N 9 59.4	16 29.3	11.7	N17 07.7	5.3	55.3	S 60	05 35	06 23	07 05	24 50	00 50	01 57	02 55
07	284 37.4	58.6	31 00.0	11.8	17 13.0	5.3	55.3								
T 08	299 37.6	57.7	45 30.8	11.7	17 18.3	5.2	55.3								
U 09	314 37.8	56.8	60 01.5	11.8	17 23.5	5.1	55.2								
E 10	329 38.0	55.9	74 32.3	11.7	17 28.6	5.0	55.2								
S 11	344 38.2	55.1	89 03.0	11.8	17 33.6	4.9	55.2								
D 12	359 38.3	N 9 54.2	103 33.8	11.8	N17 38.5	4.8	55.2								
A 13	14 38.5	53.3	118 04.6	11.7	17 43.3	4.7	55.1								
Y 14	29 38.7	52.4	132 35.3	11.8	17 48.0	4.7	55.1								
15	44 38.9	51.5	147 06.1	11.7	17 52.7	4.5	55.1								
16	59 39.1	50.7	161 36.8	11.8	17 57.2	4.5	55.1								
17	74 39.3	49.8	176 07.6	11.7	18 01.7	4.3	55.0								
18	89 39.4	N 9 48.9	190 38.3	11.8	N18 06.0	4.3	55.0								
19	104 39.6	48.0	205 09.1	11.7	18 10.3	4.2	55.0								
20	119 39.8	47.1	219 39.8	11.8	18 14.5	4.1	55.0								
21	134 40.0	46.3	234 10.6	11.7	18 18.6	4.0	55.0								
22	149 40.2	45.4	248 41.3	11.8	18 22.6	3.9	54.9								
23	164 40.4	44.5	263 12.1	11.7	18 26.5	3.9	54.9								
28 00	179 40.5	N 9 43.6	277 42.8	11.8	N18 30.4	3.7	54.9								
01	194 40.7	42.7	292 13.6	11.8	18 34.1	3.7	54.9								
02	209 40.9	41.8	306 44.4	11.7	18 37.8	3.5	54.9								
03	224 41.1	41.0	321 15.1	11.8	18 41.3	3.5	54.8								
04	239 41.3	40.1	335 45.9	11.8	18 44.8	3.4	54.8								
05	254 41.5	39.2	350 16.7	11.7	18 48.2	3.2	54.8								
06	269 41.6	N 9 38.3	4 47.4	11.8	N18 51.4	3.2	54.8								
W 07	284 41.8	37.4	19 18.2	11.8	18 54.6	3.1	54.8								
E 08	299 42.0	36.5	33 49.0	11.7	18 57.7	3.0	54.7								
D 09	314 42.2	35.7	48 19.7	11.8	19 00.7	3.0	54.7								
N 10	329 42.4	34.8	62 50.5	11.8	19 03.7	2.8	54.7								
E 11	344 42.6	33.9	77 21.3	11.7	19 06.5	2.7	54.7								
S 12	359 42.8	N 9 33.0	91 52.0	11.8	N19 09.2	2.6	54.7								
D 13	14 42.9	32.1	106 22.8	11.8	19 11.8	2.6	54.7								
A 14	29 43.1	31.2	120 53.6	11.8	19 14.4	2.4	54.6								
Y 15	44 43.3	30.4	135 24.4	11.8	19 16.8	2.4	54.6								
16	59 43.5	29.5	149 55.2	11.8	19 19.2	2.3	54.6								
17	74 43.7	28.6	164 26.0	11.8	19 21.5	2.1	54.6								
18	89 43.9	N 9 27.7	178 56.8	11.8	N19 23.6	2.1	54.6								
19	104 44.1	26.8	193 27.6	11.8	19 25.7	2.0	54.6								
20	119 44.2	25.9	207 58.4	11.8	19 27.7	1.9	54.5								
21	134 44.4	25.0	222 29.2	11.8	19 29.6	1.8	54.5								
22	149 44.6	24.1	237 00.0	11.8	19 31.4	1.7	54.5								
23	164 44.8	23.3	251 30.8	11.9	N19 33.1	1.7	54.5								
	SD 15.9	d 0.9	SD	15.2		15.0		14.9							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	26	27	28	29
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 23	22 04	////	14 16	16 53		
N 70	20 06	21 27	////	13 38	15 20	16 57	18 10
68	19 53	21 02	23 25	13 12	14 41	15 59	16 59
66	19 42	20 43	22 20	12 52	14 13	15 25	16 22
64	19 33	20 27	21 47	12 36	13 53	15 00	15 56
62	19 25	20 15	21 24	12 23	13 36	14 41	15 36
60	19 18	20 04	21 06	12 11	13 22	14 25	15 19
N 58	19 12	19 55	20 51	12 02	13 10	14 12	15 05
56	19 07	19 47	20 38	11 53	13 00	14 00	14 53
54	19 02	19 40	20 28	11 46	12 51	13 50	14 42
52	18 58	19 34	20 18	11 39	12 43	13 41	14 33
50	18 54	19 28	20 10	11 33	12 36	13 33	14 25
45	18 46	19 17	19 54	11 20	12 20	13 16	14 07
N 40	18 39	19 07	19 41	11 09	12 07	13 02	13 53
35	18 33	18 59	19 30	11 00	11 57	12 50	13 40
30	18 28	18 53	19 22	10 52	11 47	12 40	13 30
20	18 19	18 42	19 08	10 38	11 31	12 22	13 11
N 10	18 12	18 33	18 58	10 26	11 17	12 06	12 55
0	18 05	18 26	18 50	10 15	11 03	11 52	12 40
S 10	17 58	18 19	18 44	10 04	10 50	11 37	12 25
20	17 51	18 13	18 39	09 52	10 36	11 22	12 09
30	17 42	18 07	18 34	09 38	10 20	11 04	11 50
35	17 38	18 03	18 33	09 30	10 11	10 54	11 40
40	17 32	18 00	18 31	09 21	10 00	10 42	11 27
45	17 26	17 56	18 30	09 11	09 47	10 28	11 13
S 50	17 19	17 52	18 29	08 58	09 32	10 11	10 55
52	17 16	17 50	18 29	08 52	09 25	10 03	10 47
54	17 12	17 48	18 29	08 46	09 17	09 54	10 37
56	17 08	17 46	18 29	08 39	09 09	09 44	10 27
58	17 04	17 44	18 29	08 31	08 59	09 33	10 14
S 60	16 59	17 41	18 30	08 21	08 47	09 20	10 00

Day	SUN				MOON				
	Eqn. of Time		Mer. Pass.		Mer. Pass.		Age	Phase
	00h	12h			Upper	Lower		
d	m s	m s	h m		h m	h m	d	%
26	01 53	01 44	12 02		04 03	16 28	20	68
27	01 36	01 27	12 01		04 52	17 16	21	59
28	01 18	01 09	12 01		05 40	18 04	22	49

UT	ARIES	VENUS −4.0		MARS +1.6		JUPITER −2.0		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
29 00	337 21.9	143 56.5	S 5 40.5	214 21.2	N20 58.1	232 44.7	N22 37.8	122 02.2	S11 41.1	Acamar	315 18.1	S40 14.8
01	352 24.4	158 56.3	41.8	229 22.0	57.8	247 46.7	37.7	137 04.4	41.2	Achernar	335 26.3	S57 09.8
02	7 26.9	173 56.1	43.0	244 22.8	57.5	262 48.7	37.7	152 06.7	41.2	Acrux	173 09.6	S63 10.6
03	22 29.3	188 55.9	. . 44.3	259 23.5	. . 57.2	277 50.7	. . 37.7	167 09.0	. . 41.3	Adhara	255 12.6	S28 59.4
04	37 31.8	203 55.7	45.6	274 24.3	56.8	292 52.7	37.6	182 11.3	41.4	Aldebaran	290 49.2	N16 32.1
05	52 34.3	218 55.5	46.8	289 25.1	56.5	307 54.7	37.6	197 13.6	41.4			
06	67 36.7	233 55.3	S 5 48.1	304 25.9	N20 56.2	322 56.6	N22 37.5	212 15.9	S11 41.5	Alioth	166 21.0	N55 53.3
07	82 39.2	248 55.2	49.4	319 26.7	55.9	337 58.6	37.5	227 18.1	41.6	Alkaid	152 59.1	N49 15.0
08	97 41.7	263 55.0	50.7	334 27.5	55.5	353 00.6	37.4	242 20.4	41.7	Al Na'ir	27 43.1	S46 53.5
09	112 44.1	278 54.8	. . 51.9	349 28.3	. . 55.2	8 02.6	. . 37.4	257 22.7	. . 41.7	Alnilam	275 46.3	S 1 11.6
10	127 46.6	293 54.6	53.2	4 29.1	54.9	23 04.6	37.4	272 25.0	41.8	Alphard	217 56.2	S 8 43.1
11	142 49.0	308 54.4	54.5	19 29.8	54.6	38 06.6	37.3	287 27.3	41.9			
12	157 51.5	323 54.2	S 5 55.7	34 30.6	N20 54.2	53 08.6	N22 37.3	302 29.5	S11 41.9	Alphecca	126 11.0	N26 40.5
13	172 54.0	338 54.0	57.0	49 31.4	53.9	68 10.5	37.2	317 31.8	42.0	Alpheratz	357 43.0	N29 10.1
14	187 56.4	353 53.8	58.3	64 32.2	53.6	83 12.5	37.2	332 34.1	42.1	Altair	62 07.8	N 8 54.6
15	202 58.9	8 53.6	5 59.5	79 33.0	. . 53.3	98 14.5	. . 37.2	347 36.4	. . 42.2	Ankaa	353 15.2	S42 13.6
16	218 01.4	23 53.4	6 00.8	94 33.8	52.9	113 16.5	37.1	2 38.7	42.2	Antares	112 26.0	S26 27.6
17	233 03.8	38 53.2	02.1	109 34.6	52.6	128 18.5	37.1	17 40.9	42.3			
18	248 06.3	53 53.0	S 6 03.3	124 35.4	N20 52.3	143 20.5	N22 37.0	32 43.2	S11 42.4	Arcturus	145 55.8	N19 06.9
19	263 08.8	68 52.8	04.6	139 36.2	51.9	158 22.5	37.0	47 45.5	42.4	Atria	107 27.6	S69 03.2
20	278 11.2	83 52.6	05.9	154 36.9	51.6	173 24.5	37.0	62 47.8	42.5	Avior	234 18.5	S59 33.2
21	293 13.7	98 52.4	. . 07.1	169 37.7	. . 51.3	188 26.4	. . 36.9	77 50.1	. . 42.6	Bellatrix	278 31.9	N 6 21.7
22	308 16.1	113 52.2	08.4	184 38.5	51.0	203 28.4	36.9	92 52.3	42.7	Betelgeuse	271 01.2	N 7 24.5
23	323 18.6	128 52.0	09.7	199 39.3	50.6	218 30.4	36.8	107 54.6	42.7			
30 00	338 21.1	143 51.8	S 6 10.9	214 40.1	N20 50.3	233 32.4	N22 36.8	122 56.9	S11 42.8	Canopus	263 56.3	S52 42.0
01	353 23.5	158 51.6	12.2	229 40.9	50.0	248 34.4	36.7	137 59.2	42.9	Capella	280 34.3	N46 00.4
02	8 26.0	173 51.4	13.5	244 41.7	49.6	263 36.4	36.7	153 01.4	42.9	Deneb	49 30.9	N45 20.1
03	23 28.5	188 51.2	. . 14.7	259 42.5	. . 49.3	278 38.4	. . 36.7	168 03.7	. . 43.0	Denebola	182 33.8	N14 29.8
04	38 30.9	203 51.0	16.0	274 43.3	49.0	293 40.4	36.6	183 06.0	43.1	Diphda	348 55.5	S17 54.5
05	53 33.4	218 50.9	17.3	289 44.1	48.6	308 42.4	36.6	198 08.3	43.2			
06	68 35.9	233 50.7	S 6 18.5	304 44.9	N20 48.3	323 44.3	N22 36.5	213 10.6	S11 43.2	Dubhe	193 52.2	N61 40.6
07	83 38.3	248 50.5	19.8	319 45.7	48.0	338 46.3	36.5	228 12.8	43.3	Elnath	278 12.5	N28 36.9
08	98 40.8	263 50.3	21.1	334 46.4	47.6	353 48.3	36.5	243 15.1	43.4	Eltanin	90 45.9	N51 29.7
09	113 43.3	278 50.1	. . 22.3	349 47.2	. . 47.3	8 50.3	. . 36.4	258 17.4	. . 43.4	Enif	33 46.6	N 9 56.6
10	128 45.7	293 49.9	23.6	4 48.0	47.0	23 52.3	36.4	273 19.7	43.5	Fomalhaut	15 23.5	S29 32.7
11	143 48.2	308 49.7	24.9	19 48.8	46.7	38 54.3	36.3	288 21.9	43.6			
12	158 50.6	323 49.5	S 6 26.1	34 49.6	N20 46.3	53 56.3	N22 36.3	303 24.2	S11 43.7	Gacrux	172 01.1	S57 11.5
13	173 53.1	338 49.3	27.4	49 50.4	46.0	68 58.3	36.3	318 26.5	43.7	Gienah	175 52.4	S17 37.1
14	188 55.6	353 49.1	28.6	64 51.2	45.7	84 00.3	36.2	333 28.8	43.8	Hadar	148 48.0	S60 26.5
15	203 58.0	8 48.9	. . 29.9	79 52.0	. . 45.3	99 02.3	. . 36.2	348 31.1	. . 43.9	Hamal	328 00.4	N23 31.6
16	219 00.5	23 48.7	31.2	94 52.8	45.0	114 04.2	36.1	3 33.3	44.0	Kaus Aust.	83 43.4	S34 22.5
17	234 03.0	38 48.5	32.4	109 53.6	44.7	129 06.2	36.1	18 35.6	44.0			
18	249 05.4	53 48.3	S 6 33.7	124 54.4	N20 44.3	144 08.2	N22 36.0	33 37.9	S11 44.1	Kochab	137 20.6	N74 06.3
19	264 07.9	68 48.1	35.0	139 55.2	44.0	159 10.2	36.0	48 40.2	44.2	Markab	13 37.8	N15 17.0
20	279 10.4	83 47.9	36.2	154 56.0	43.7	174 12.2	36.0	63 42.4	44.2	Menkar	314 14.8	N 4 08.6
21	294 12.8	98 47.7	. . 37.5	169 56.8	. . 43.3	189 14.2	. . 35.9	78 44.7	. . 44.3	Menkent	148 07.6	S36 26.3
22	309 15.3	113 47.5	38.7	184 57.6	43.0	204 16.2	35.9	93 47.0	44.4	Miaplacidus	221 40.4	S69 46.4
23	324 17.8	128 47.3	40.0	199 58.4	42.6	219 18.2	35.8	108 49.3	44.5			
31 00	339 20.2	143 47.1	S 6 41.3	214 59.1	N20 42.3	234 20.2	N22 35.8	123 51.5	S11 44.5	Mirfak	308 40.0	N49 54.3
01	354 22.7	158 46.9	42.5	229 59.9	42.0	249 22.2	35.8	138 53.8	44.6	Nunki	75 57.9	S26 16.6
02	9 25.1	173 46.7	43.8	245 00.7	41.6	264 24.2	35.7	153 56.1	44.7	Peacock	53 18.5	S56 41.3
03	24 27.6	188 46.5	. . 45.0	260 01.5	. . 41.3	279 26.2	. . 35.7	168 58.4	. . 44.7	Pollux	243 27.8	N27 59.4
04	39 30.1	203 46.3	46.3	275 02.3	41.0	294 28.2	35.6	184 00.6	44.8	Procyon	244 59.8	N 5 11.3
05	54 32.5	218 46.1	47.6	290 03.1	40.6	309 30.2	35.6	199 02.9	44.9			
06	69 35.0	233 45.9	S 6 48.8	305 03.9	N20 40.3	324 32.1	N22 35.5	214 05.2	S11 45.0	Rasalhague	96 06.2	N12 33.3
07	84 37.5	248 45.7	50.1	320 04.7	40.0	339 34.1	35.5	229 07.5	45.0	Regulus	207 43.7	N11 54.0
08	99 39.9	263 45.5	51.3	335 05.5	39.6	354 36.1	35.5	244 09.7	45.1	Rigel	281 12.0	S 8 11.1
09	114 42.4	278 45.3	. . 52.6	350 06.3	. . 39.3	9 38.1	. . 35.4	259 12.0	. . 45.2	Rigil Kent.	139 51.7	S60 53.6
10	129 44.9	293 45.1	53.9	5 07.1	38.9	24 40.1	35.4	274 14.3	45.3	Sabik	102 12.3	S15 44.3
11	144 47.3	308 44.9	55.1	20 07.9	38.6	39 42.1	35.3	289 16.6	45.3			
12	159 49.8	323 44.7	S 6 56.4	35 08.7	N20 38.3	54 44.1	N22 35.3	304 18.8	S11 45.4	Schedar	349 39.8	N56 36.7
13	174 52.2	338 44.5	57.6	50 09.5	37.9	69 46.1	35.3	319 21.1	45.5	Shaula	96 21.6	S37 06.7
14	189 54.7	353 44.3	6 58.9	65 10.3	37.6	84 48.1	35.2	334 23.4	45.5	Sirius	258 33.8	S16 44.1
15	204 57.2	8 44.1	7 00.2	80 11.1	. . 37.2	99 50.1	. . 35.2	349 25.7	. . 45.6	Spica	158 31.3	S11 13.9
16	219 59.6	23 43.9	01.4	95 11.9	36.9	114 52.1	35.1	4 27.9	45.7	Suhail	222 52.7	S43 29.3
17	235 02.1	38 43.7	02.7	110 12.7	36.6	129 54.1	35.1	19 30.2	45.8			
18	250 04.6	53 43.5	S 7 03.9	125 13.5	N20 36.2	144 56.1	N22 35.1	34 32.5	S11 45.8	Vega	80 38.6	N38 48.2
19	265 07.0	68 43.3	05.2	140 14.3	35.9	159 58.1	35.0	49 34.8	45.9	Zuben'ubi	137 05.4	S16 05.8
20	280 09.5	83 43.1	06.4	155 15.1	35.6	175 00.1	35.0	64 37.0	46.0		SHA	Mer.Pass.
21	295 12.0	98 42.9	. . 07.7	170 15.9	. . 35.2	190 02.1	. . 34.9	79 39.3	. . 46.1		° ′	h m
22	310 14.4	113 42.7	09.0	185 16.7	34.9	205 04.1	34.9	94 41.6	46.1	Venus	165 30.8	14 25
23	325 16.9	128 42.5	10.2	200 17.5	34.5	220 06.1	34.8	109 43.9	46.2	Mars	236 19.0	9 41
										Jupiter	255 11.3	8 25
Mer.Pass.	h m 1 26.4	v −0.2	d 1.3	v 0.8	d 0.3	v 2.0	d 0.0	v 2.3	d 0.1	Saturn	144 35.8	15 46

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 29	Moonrise 30	Moonrise 31	Moonrise 1
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
29 00	179 45.0	N 9 22.4	266 01.7	11.8	N19 34.8	1.5	54.5	N 72	////	02 17	03 52			21 14	23 31
01	194 45.2	21.5	280 32.5	11.8	19 36.3	1.4	54.5	N 70	////	02 49	04 07	19 35	20 53	22 29	24 07
02	209 45.4	20.6	295 03.3	11.9	19 37.7	1.4	54.5	68	01 11	03 11	04 19	20 47	21 49	23 07	24 32
03	224 45.6	. . 19.7	309 34.2	11.8	19 39.1	1.2	54.4	66	01 58	03 29	04 29	21 23	22 22	23 33	24 52
04	239 45.7	18.8	324 05.0	11.8	19 40.3	1.2	54.4	64	02 27	03 43	04 37	21 49	22 46	23 53	25 08
05	254 45.9	17.9	338 35.8	11.9	19 41.5	1.0	54.4	62	02 48	03 55	04 44	22 10	23 05	24 10	00 10
06	269 46.1	N 9 17.0	353 06.7	11.9	N19 42.5	1.0	54.4	60	03 05	04 05	04 50	22 26	23 21	24 23	00 23
07	284 46.3	16.1	7 37.6	11.8	19 43.5	0.9	54.4	N 58	03 19	04 13	04 56	22 40	23 34	24 35	00 35
08	299 46.5	15.3	22 08.4	11.9	19 44.4	0.8	54.4	56	03 30	04 21	05 00	22 52	23 45	24 45	00 45
09	314 46.7	. . 14.4	36 39.3	11.9	19 45.2	0.7	54.4	54	03 40	04 27	05 05	23 03	23 55	24 54	00 54
10	329 46.9	13.5	51 10.2	11.9	19 45.9	0.6	54.4	52	03 49	04 33	05 09	23 12	24 04	00 04	01 02
11	344 47.1	12.6	65 41.1	11.9	19 46.5	0.5	54.3	50	03 57	04 38	05 12	23 20	24 12	00 12	01 09
12	359 47.3	N 9 11.7	80 12.0	11.9	N19 47.0	0.4	54.3	45	04 12	04 49	05 20	23 38	24 29	00 29	01 24
13	14 47.4	10.8	94 42.9	11.9	19 47.4	0.3	54.3	N 40	04 25	04 58	05 26	23 53	24 43	00 43	01 37
14	29 47.6	09.9	109 13.8	11.9	19 47.7	0.3	54.3	35	04 34	05 05	05 31	24 05	00 05	00 55	01 47
15	44 47.8	. . 09.0	123 44.7	12.0	19 48.0	0.1	54.3	30	04 43	05 11	05 36	24 16	00 16	01 05	01 57
16	59 48.0	08.1	138 15.7	11.9	19 48.1	0.1	54.3	20	04 55	05 22	05 44	24 34	00 34	01 23	02 13
17	74 48.2	07.2	152 46.6	11.9	19 48.2	0.1	54.3	N 10	05 05	05 30	05 51	00 02	00 50	01 38	02 27
18	89 48.4	N 9 06.3	167 17.5	12.0	N19 48.1	0.1	54.3	0	05 12	05 36	05 57	00 17	01 05	01 53	02 40
19	104 48.6	05.4	181 48.5	12.0	19 48.0	0.2	54.3	S 10	05 18	05 42	06 04	00 32	01 20	02 07	02 53
20	119 48.8	04.5	196 19.5	11.9	19 47.8	0.4	54.3	20	05 22	05 48	06 10	00 48	01 36	02 22	03 06
21	134 49.0	. . 03.7	210 50.4	12.0	19 47.4	0.4	54.3	30	05 26	05 53	06 18	01 06	01 54	02 40	03 22
22	149 49.2	02.8	225 21.4	12.0	19 47.0	0.5	54.2	35	05 27	05 56	06 22	01 17	02 05	02 50	03 32
23	164 49.3	01.9	239 52.4	12.0	19 46.5	0.6	54.2	40	05 28	05 59	06 26	01 29	02 17	03 02	03 42
30 00	179 49.5	N 9 01.0	254 23.4	12.0	N19 45.9	0.7	54.2	45	05 28	06 02	06 32	01 43	02 32	03 16	03 54
01	194 49.7	9 00.1	268 54.4	12.1	19 45.2	0.7	54.2	S 50	05 28	06 06	06 38	02 01	02 50	03 32	04 09
02	209 49.9	8 59.2	283 25.5	12.0	19 44.5	0.9	54.2	52	05 28	06 07	06 41	02 09	02 58	03 40	04 16
03	224 50.1	. . 58.3	297 56.5	12.1	19 43.6	1.0	54.2	54	05 28	06 09	06 45	02 19	03 08	03 49	04 24
04	239 50.3	57.4	312 27.6	12.0	19 42.6	1.0	54.2	56	05 28	06 11	06 48	02 29	03 18	03 59	04 33
05	254 50.5	56.5	326 58.6	12.1	19 41.6	1.1	54.2	58	05 27	06 12	06 52	02 41	03 30	04 10	04 42
06	269 50.7	N 8 55.6	341 29.7	12.1	N19 40.5	1.3	54.2	S 60	05 26	06 14	06 57	02 55	03 44	04 23	04 53
07	284 50.9	54.7	356 00.8	12.1	19 39.2	1.3	54.2								
08	299 51.1	53.8	10 31.9	12.1	19 37.9	1.4	54.2								
09	314 51.3	. . 52.9	25 03.0	12.1	19 36.5	1.5	54.2								
10	329 51.4	52.0	39 34.1	12.1	19 35.0	1.6	54.2								
11	344 51.6	51.1	54 05.2	12.2	19 33.4	1.7	54.2								
12	359 51.8	N 8 50.2	68 36.4	12.1	N19 31.7	1.8	54.2								
13	14 52.0	49.3	83 07.5	12.2	19 29.9	1.8	54.2								
14	29 52.2	48.4	97 38.7	12.2	19 28.1	2.0	54.2								
15	44 52.4	. . 47.5	112 09.9	12.2	19 26.1	2.0	54.2								
16	59 52.6	46.6	126 41.1	12.2	19 24.1	2.1	54.2								
17	74 52.8	45.7	141 12.3	12.2	19 22.0	2.2	54.2								
18	89 53.0	N 8 44.8	155 43.5	12.3	N19 19.8	2.3	54.2								
19	104 53.2	43.9	170 14.8	12.2	19 17.5	2.4	54.2								
20	119 53.4	43.0	184 46.0	12.3	19 15.1	2.5	54.2								
21	134 53.6	. . 42.1	199 17.3	12.3	19 12.6	2.6	54.2								
22	149 53.8	41.2	213 48.6	12.3	19 10.0	2.6	54.2								
23	164 54.0	40.3	228 19.9	12.3	19 07.4	2.8	54.2								
31 00	179 54.2	N 8 39.4	242 51.2	12.3	N19 04.6	2.8	54.2								
01	194 54.3	38.5	257 22.5	12.3	19 01.8	2.9	54.2								
02	209 54.5	37.6	271 53.8	12.4	18 58.9	3.0	54.2								
03	224 54.7	. . 36.7	286 25.2	12.4	18 55.9	3.1	54.2								
04	239 54.9	35.8	300 56.6	12.4	18 52.8	3.2	54.2								
05	254 55.1	34.9	315 28.0	12.4	18 49.6	3.3	54.2								
06	269 55.3	N 8 34.0	329 59.4	12.4	N18 46.3	3.3	54.2								
07	284 55.5	33.1	344 30.8	12.4	18 43.0	3.4	54.2								
08	299 55.7	32.2	359 02.2	12.5	18 39.6	3.6	54.2								
09	314 55.9	. . 31.3	13 33.7	12.4	18 36.0	3.6	54.2								
10	329 56.1	30.4	28 05.1	12.5	18 32.4	3.7	54.2								
11	344 56.3	29.5	42 36.6	12.5	18 28.7	3.7	54.2								
12	359 56.5	N 8 28.6	57 08.1	12.6	N18 25.0	3.9	54.2								
13	14 56.7	27.7	71 39.7	12.5	18 21.1	3.9	54.2								
14	29 56.9	26.8	86 11.2	12.5	18 17.2	4.1	54.2								
15	44 57.1	. . 25.9	100 42.7	12.6	18 13.1	4.1	54.2								
16	59 57.3	25.0	115 14.3	12.6	18 09.0	4.2	54.2								
17	74 57.5	24.1	129 45.9	12.6	18 04.8	4.2	54.2								
18	89 57.7	N 8 23.2	144 17.5	12.6	N18 00.6	4.4	54.2								
19	104 57.9	22.3	158 49.1	12.7	17 56.2	4.4	54.2								
20	119 58.1	21.4	173 20.8	12.6	17 51.8	4.5	54.2								
21	134 58.3	. . 20.5	187 52.4	12.7	17 47.3	4.6	54.2								
22	149 58.5	19.6	202 24.1	12.7	17 42.7	4.7	54.2								
23	164 58.6	18.7	216 55.8	12.7	N17 38.0	4.8	54.2								
	SD 15.9	d 0.9	SD	14.8		14.8									

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 29	Moonset 30	Moonset 31	Moonset 1
°	h m	h m	h m	h m	h m	h m	h m
N 72	20 06	21 38	////			19 50	19 09
N 70	19 51	21 08	////	18 10	18 31	18 34	18 32
68	19 40	20 46	22 40	16 59	17 36	17 55	18 06
66	19 30	20 29	21 58	16 22	17 02	17 29	17 46
64	19 22	20 15	21 30	15 56	16 38	17 08	17 29
62	19 15	20 04	21 10	15 36	16 19	16 51	17 16
60	19 09	19 54	20 54	15 19	16 03	16 37	17 04
N 58	19 04	19 46	20 40	15 05	15 49	16 25	16 54
56	18 59	19 39	20 29	14 53	15 38	16 15	16 46
54	18 55	19 33	20 19	14 42	15 28	16 06	16 38
52	18 51	19 27	20 11	14 33	15 19	15 58	16 31
50	18 48	19 22	20 03	14 25	15 10	15 50	16 25
45	18 41	19 11	19 48	14 07	14 53	15 34	16 11
N 40	18 35	19 02	19 36	13 53	14 39	15 21	16 00
35	18 29	18 55	19 26	13 40	14 27	15 10	15 50
30	18 25	18 49	19 18	13 30	14 17	15 01	15 42
20	18 17	18 39	19 05	13 11	13 59	14 44	15 27
N 10	18 10	18 31	18 56	12 55	13 43	14 29	15 14
0	18 04	18 25	18 49	12 40	13 28	14 15	15 02
S 10	17 58	18 19	18 43	12 25	13 13	14 02	14 50
20	17 51	18 13	18 39	12 09	12 57	13 47	14 37
30	17 44	18 08	18 36	11 50	12 39	13 30	14 22
35	17 40	18 05	18 35	11 40	12 29	13 20	14 13
40	17 35	18 03	18 34	11 27	12 16	13 08	14 03
45	17 30	17 59	18 34	11 13	12 02	12 55	13 52
S 50	17 23	17 56	18 34	10 55	11 44	12 39	13 37
52	17 21	17 55	18 34	10 47	11 36	12 31	13 31
54	17 17	17 53	18 34	10 37	11 27	12 22	13 23
56	17 14	17 52	18 35	10 27	11 16	12 13	13 15
58	17 10	17 50	18 35	10 14	11 04	12 02	13 06
S 60	17 06	17 48	18 36	10 00	10 50	11 49	12 55

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
29	01 00	00 51	12 01	06 28	18 53	23	40
30	00 42	00 33	12 01	07 16	19 40	24	31
31	00 24	00 14	12 00	08 04	20 27	25	22

UT	ARIES	VENUS −4.0		MARS +1.6		JUPITER −2.0		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
1 00	340 19.4	143 42.3	S 7 11.5	215 18.3	N20 34.2	235 08.1	N22 34.8	124 46.1	S11 46.3	Acamar	315 18.1	S40 14.8
01	355 21.8	158 42.1	12.7	230 19.1	33.8	250 10.1	34.8	139 48.4	46.3	Achernar	335 26.3	S57 09.8
02	10 24.3	173 41.9	14.0	245 19.9	33.5	265 12.1	34.7	154 50.7	46.4	Acrux	173 09.6	S63 10.6
03	25 26.7	188 41.7	. . 15.2	260 20.7	. . 33.2	280 14.1	. . 34.7	169 52.9	. . 46.5	Adhara	255 12.6	S28 59.4
04	40 29.2	203 41.5	16.5	275 21.5	32.8	295 16.1	34.6	184 55.2	46.6	Aldebaran	290 49.2	N16 32.1
05	55 31.7	218 41.3	17.7	290 22.3	32.5	310 18.1	34.6	199 57.5	46.6			
06	70 34.1	233 41.1	S 7 19.0	305 23.1	N20 32.1	325 20.1	N22 34.6	214 59.8	S11 46.7	Alioth	166 21.1	N55 53.3
07	85 36.6	248 40.9	20.3	320 23.9	31.8	340 22.1	34.5	230 02.0	46.8	Alkaid	152 59.1	N49 15.0
08	100 39.1	263 40.7	21.5	335 24.7	31.5	355 24.1	34.5	245 04.3	46.9	Al Na'ir	27 43.1	S46 53.5
S 09	115 41.5	278 40.5	. . 22.8	350 25.5	. . 31.1	10 26.0	. . 34.4	260 06.6	. . 46.9	Alnilam	275 46.3	S 1 11.6
U 10	130 44.0	293 40.3	24.0	5 26.3	30.8	25 28.0	34.4	275 08.8	47.0	Alphard	217 56.2	S 8 43.1
N 11	145 46.5	308 40.1	25.3	20 27.1	30.4	40 30.0	34.3	290 11.1	47.1			
D 12	160 48.9	323 39.9	S 7 26.5	35 27.9	N20 30.1	55 32.0	N22 34.3	305 13.4	S11 47.2	Alphecca	126 11.0	N26 40.5
A 13	175 51.4	338 39.7	27.8	50 28.7	29.7	70 34.0	34.3	320 15.7	47.2	Alpheratz	357 43.0	N29 10.1
Y 14	190 53.9	353 39.5	29.0	65 29.5	29.4	85 36.0	34.2	335 17.9	47.3	Altair	62 07.8	N 8 54.6
15	205 56.3	8 39.3	. . 30.3	80 30.3	. . 29.0	100 38.0	. . 34.2	350 20.2	. . 47.4	Ankaa	353 15.2	S42 13.6
16	220 58.8	23 39.1	31.5	95 31.1	28.7	115 40.0	34.1	5 22.5	47.5	Antares	112 26.0	S26 27.6
17	236 01.2	38 38.9	32.8	110 32.0	28.4	130 42.0	34.1	20 24.7	47.5			
18	251 03.7	53 38.7	S 7 34.0	125 32.8	N20 28.0	145 44.0	N22 34.1	35 27.0	S11 47.6	Arcturus	145 55.8	N19 06.9
19	266 06.2	68 38.5	35.3	140 33.6	27.7	160 46.0	34.0	50 29.3	47.7	Atria	107 27.6	S69 03.2
20	281 08.6	83 38.3	36.5	155 34.4	27.3	175 48.0	34.0	65 31.6	47.7	Avior	234 18.4	S59 33.1
21	296 11.1	98 38.1	. . 37.8	170 35.2	. . 27.0	190 50.1	. . 33.9	80 33.8	. . 47.8	Bellatrix	278 31.9	N 6 21.7
22	311 13.6	113 37.9	39.0	185 36.0	26.6	205 52.1	33.9	95 36.1	47.9	Betelgeuse	271 01.2	N 7 24.5
23	326 16.0	128 37.7	40.3	200 36.8	26.3	220 54.1	33.8	110 38.4	48.0			
2 00	341 18.5	143 37.5	S 7 41.5	215 37.6	N20 25.9	235 56.1	N22 33.8	125 40.6	S11 48.0	Canopus	263 56.3	S52 42.0
01	356 21.0	158 37.3	42.8	230 38.4	25.6	250 58.1	33.8	140 42.9	48.1	Capella	280 34.3	N46 00.4
02	11 23.4	173 37.1	44.0	245 39.2	25.2	266 00.1	33.7	155 45.2	48.2	Deneb	49 30.9	N45 20.1
03	26 25.9	188 36.9	. . 45.3	260 40.0	. . 24.9	281 02.1	. . 33.7	170 47.5	. . 48.3	Denebola	182 33.8	N14 29.8
04	41 28.4	203 36.7	46.5	275 40.8	24.5	296 04.1	33.6	185 49.7	48.3	Diphda	348 55.4	S17 54.5
05	56 30.8	218 36.5	47.8	290 41.6	24.2	311 06.1	33.6	200 52.0	48.4			
06	71 33.3	233 36.3	S 7 49.0	305 42.4	N20 23.8	326 08.1	N22 33.6	215 54.3	S11 48.5	Dubhe	193 52.2	N61 40.6
07	86 35.7	248 36.1	50.3	320 43.2	23.5	341 10.1	33.5	230 56.5	48.6	Elnath	278 12.5	N28 36.9
08	101 38.2	263 35.8	51.5	335 44.0	23.2	356 12.1	33.5	245 58.8	48.6	Eltanin	90 45.9	N51 29.7
M 09	116 40.7	278 35.6	. . 52.8	350 44.8	. . 22.8	11 14.1	. . 33.4	261 01.1	. . 48.7	Enif	33 46.6	N 9 56.6
O 10	131 43.1	293 35.4	54.0	5 45.7	22.5	26 16.1	33.4	276 03.3	48.8	Fomalhaut	15 23.5	S29 32.7
N 11	146 45.6	308 35.2	55.3	20 46.5	22.1	41 18.1	33.4	291 05.6	48.9			
D 12	161 48.1	323 35.0	S 7 56.5	35 47.3	N20 21.8	56 20.1	N22 33.3	306 07.9	S11 48.9	Gacrux	172 01.2	S57 11.5
A 13	176 50.5	338 34.8	57.8	50 48.1	21.4	71 22.1	33.3	321 10.1	49.0	Gienah	175 52.4	S17 37.1
Y 14	191 53.0	353 34.6	7 59.0	65 48.9	21.1	86 24.1	33.2	336 12.4	49.1	Hadar	148 48.0	S60 26.5
15	206 55.5	8 34.4	8 00.3	80 49.7	. . 20.7	101 26.1	. . 33.2	351 14.7	. . 49.2	Hamal	328 00.3	N23 31.6
16	221 57.9	23 34.2	01.5	95 50.5	20.4	116 28.1	33.1	6 16.9	49.2	Kaus Aust.	83 43.4	S34 22.6
17	237 00.4	38 34.0	02.8	110 51.3	20.0	131 30.1	33.1	21 19.2	49.3			
18	252 02.8	53 33.8	S 8 04.0	125 52.1	N20 19.7	146 32.1	N22 33.1	36 21.5	S11 49.4	Kochab	137 20.6	N74 06.3
19	267 05.3	68 33.6	05.3	140 52.9	19.3	161 34.1	33.0	51 23.8	49.5	Markab	13 37.8	N15 17.0
20	282 07.8	83 33.4	06.5	155 53.7	19.0	176 36.1	33.0	66 26.0	49.5	Menkar	314 14.7	N 4 08.6
21	297 10.2	98 33.2	. . 07.7	170 54.6	. . 18.6	191 38.1	. . 32.9	81 28.3	. . 49.6	Menkent	148 07.6	S36 26.3
22	312 12.7	113 33.0	09.0	185 55.4	18.2	206 40.1	32.9	96 30.6	49.7	Miaplacidus	221 40.4	S69 46.4
23	327 15.2	128 32.8	10.2	200 56.2	17.9	221 42.1	32.9	111 32.8	49.8			
3 00	342 17.6	143 32.6	S 8 11.5	215 57.0	N20 17.5	236 44.2	N22 32.8	126 35.1	S11 49.8	Mirfak	308 39.9	N49 54.3
01	357 20.1	158 32.4	12.7	230 57.8	17.2	251 46.2	32.8	141 37.4	49.9	Nunki	75 57.9	S26 16.6
02	12 22.6	173 32.1	14.0	245 58.6	16.8	266 48.2	32.7	156 39.6	50.0	Peacock	53 18.5	S56 41.3
03	27 25.0	188 31.9	. . 15.2	260 59.4	. . 16.5	281 50.2	. . 32.7	171 41.9	. . 50.0	Pollux	243 27.8	N27 59.4
04	42 27.5	203 31.7	16.5	276 00.2	16.1	296 52.2	32.6	186 44.2	50.1	Procyon	244 59.8	N 5 11.3
05	57 30.0	218 31.5	17.7	291 01.0	15.8	311 54.2	32.6	201 46.4	50.2			
06	72 32.4	233 31.3	S 8 18.9	306 01.9	N20 15.4	326 56.2	N22 32.6	216 48.7	S11 50.3	Rasalhague	96 06.2	N12 33.4
07	87 34.9	248 31.1	20.2	321 02.7	15.1	341 58.2	32.5	231 51.0	50.3	Regulus	207 43.7	N11 54.0
T 08	102 37.3	263 30.9	21.4	336 03.5	14.7	357 00.2	32.5	246 53.2	50.4	Rigel	281 11.9	S 8 11.1
U 09	117 39.8	278 30.7	. . 22.7	351 04.3	. . 14.4	12 02.2	. . 32.4	261 55.5	. . 50.5	Rigil Kent.	139 51.8	S60 53.6
E 10	132 42.3	293 30.5	23.9	6 05.1	14.0	27 04.2	32.4	276 57.8	50.6	Sabik	102 12.3	S15 44.3
S 11	147 44.7	308 30.3	25.1	21 05.9	13.7	42 06.2	32.4	292 00.0	50.6			
D 12	162 47.2	323 30.1	S 8 26.4	36 06.7	N20 13.3	57 08.2	N22 32.3	307 02.3	S11 50.7	Schedar	349 39.8	N56 36.7
A 13	177 49.7	338 29.9	27.6	51 07.5	12.9	72 10.3	32.3	322 04.6	50.8	Shaula	96 21.6	S37 06.7
Y 14	192 52.1	353 29.7	28.9	66 08.4	12.6	87 12.3	32.2	337 06.8	50.9	Sirius	258 33.7	S16 44.1
15	207 54.6	8 29.4	. . 30.1	81 09.2	. . 12.2	102 14.3	. . 32.2	352 09.1	. . 50.9	Spica	158 31.3	S11 13.9
16	222 57.1	23 29.2	31.3	96 10.0	11.9	117 16.3	32.1	7 11.3	51.0	Suhail	222 52.7	S43 29.3
17	237 59.5	38 29.0	32.6	111 10.8	11.5	132 18.3	32.1	22 13.6	51.1			
18	253 02.0	53 28.8	S 8 33.8	126 11.6	N20 11.2	147 20.3	N22 32.1	37 15.9	S11 51.2	Vega	80 38.6	N38 48.2
19	268 04.4	68 28.6	35.1	141 12.4	10.8	162 22.3	32.0	52 18.1	51.2	Zuben'ubi	137 05.4	S16 05.8
20	283 06.9	83 28.4	36.3	156 13.2	10.5	177 24.3	32.0	67 20.4	51.3		SHA	Mer.Pass.
21	298 09.4	98 28.2	. . 37.5	171 14.1	. . 10.1	192 26.3	. . 31.9	82 22.7	. . 51.4		° ′	h m
22	313 11.8	113 28.0	38.8	186 14.9	09.7	207 28.3	31.9	97 24.9	51.5	Venus	162 19.0	14 26
23	328 14.3	128 27.8	40.0	201 15.7	09.4	222 30.3	31.9	112 27.2	51.6	Mars	234 19.1	9 37
	h m									Jupiter	254 37.6	8 15
Mer.Pass.	1 14.6	v −0.2	d 1.2	v 0.8	d 0.3	v 2.0	d 0.0	v 2.3	d 0.1	Saturn	144 22.1	15 35

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 1	Moonrise 2	Moonrise 3	Moonrise 4
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
1 00	179 58.8	N 8 17.7	231 27.5	12.7	N17 33.2	4.8	54.2	N 72	////	02 39	04 07	23 31	25 22	01 22	03 08
01	194 59.0	16.8	245 59.2	12.8	17 28.4	4.9	54.2	N 70	00 19	03 06	04 20	24 07	00 07	01 44	03 21
02	209 59.2	15.9	260 31.0	12.7	17 23.5	5.0	54.2	68	01 41	03 25	04 30	24 32	00 32	02 01	03 31
03	224 59.4	. . 15.0	275 02.7	12.8	17 18.5	5.1	54.3	66	02 16	03 41	04 39	24 52	00 52	02 15	03 40
04	239 59.6	14.1	289 34.5	12.8	17 13.4	5.2	54.3	64	02 41	03 53	04 46	25 08	01 08	02 26	03 47
05	254 59.8	13.2	304 06.3	12.8	17 08.2	5.2	54.3	62	03 00	04 04	04 52	00 10	01 20	02 35	03 53
06	270 00.0	N 8 12.3	318 38.1	12.9	N17 03.0	5.3	54.3	60	03 15	04 13	04 57	00 23	01 31	02 44	03 58
07	285 00.2	11.4	333 10.0	12.8	16 57.7	5.4	54.3	N 58	03 27	04 20	05 02	00 35	01 41	02 51	04 03
08	300 00.4	10.5	347 41.8	12.9	16 52.3	5.5	54.3	56	03 38	04 27	05 06	00 45	01 49	02 57	04 07
S 09	315 00.6	. . 09.6	2 13.7	12.9	16 46.8	5.6	54.3	54	03 47	04 33	05 10	00 54	01 57	03 02	04 10
U 10	330 00.8	08.7	16 45.6	12.9	16 41.2	5.6	54.3	52	03 55	04 38	05 13	01 02	02 03	03 07	04 14
N 11	345 01.0	07.8	31 17.5	12.9	16 35.6	5.7	54.3	50	04 02	04 43	05 17	01 09	02 09	03 12	04 17
D 12	0 01.2	N 8 06.9	45 49.4	12.9	N16 29.9	5.8	54.3	45	04 17	04 53	05 23	01 24	02 22	03 22	04 23
A 13	15 01.4	05.9	60 21.3	13.0	16 24.1	5.8	54.3	N 40	04 28	05 01	05 29	01 37	02 32	03 30	04 29
Y 14	30 01.6	05.0	74 53.3	12.9	16 18.3	5.9	54.3	35	04 37	05 08	05 33	01 47	02 41	03 37	04 33
15	45 01.8	. . 04.1	89 25.2	13.0	16 12.4	6.0	54.4	30	04 45	05 13	05 38	01 57	02 49	03 43	04 37
16	60 02.0	03.2	103 57.2	13.0	16 06.4	6.1	54.4	20	04 56	05 22	05 45	02 13	03 03	03 54	04 45
17	75 02.2	02.3	118 29.2	13.1	16 00.3	6.2	54.4	N 10	05 05	05 29	05 51	02 27	03 15	04 03	04 51
18	90 02.4	N 8 01.4	133 01.3	13.0	N15 54.1	6.2	54.4	0	05 11	05 35	05 56	02 40	03 26	04 11	04 57
19	105 02.6	8 00.5	147 33.3	13.1	15 47.9	6.3	54.4	S 10	05 16	05 41	06 02	02 53	03 37	04 20	05 02
20	120 02.8	7 59.6	162 05.4	13.0	15 41.6	6.4	54.4	20	05 20	05 45	06 08	03 06	03 49	04 29	05 09
21	135 03.0	. . 58.7	176 37.4	13.1	15 35.2	6.4	54.4	30	05 22	05 50	06 14	03 22	04 02	04 40	05 16
22	150 03.2	57.8	191 09.5	13.1	15 28.8	6.5	54.4	35	05 23	05 52	06 18	03 32	04 10	04 46	05 20
23	165 03.4	56.8	205 41.6	13.2	15 22.3	6.6	54.4	40	05 23	05 55	06 22	03 42	04 19	04 53	05 24
2 00	180 03.6	N 7 55.9	220 13.8	13.1	N15 15.7	6.7	54.4	45	05 23	05 57	06 27	03 54	04 29	05 00	05 30
01	195 03.8	55.0	234 45.9	13.2	15 09.0	6.7	54.5	S 50	05 22	06 00	06 32	04 09	04 41	05 10	05 36
02	210 04.0	54.1	249 18.1	13.1	15 02.3	6.8	54.5	52	05 22	06 01	06 35	04 16	04 47	05 14	05 39
03	225 04.2	. . 53.2	263 50.2	13.2	14 55.5	6.9	54.5	54	05 21	06 02	06 38	04 24	04 54	05 19	05 42
04	240 04.4	52.3	278 22.4	13.2	14 48.6	6.9	54.5	56	05 20	06 03	06 41	04 33	05 01	05 24	05 46
05	255 04.6	51.4	292 54.6	13.2	14 41.7	7.0	54.5	58	05 19	06 05	06 44	04 42	05 09	05 30	05 49
06	270 04.8	N 7 50.5	307 26.8	13.3	N14 34.7	7.1	54.5	S 60	05 18	06 06	06 48	04 53	05 18	05 37	05 54
07	285 05.0	49.5	321 59.1	13.2	14 27.6	7.1	54.5								
08	300 05.2	48.6	336 31.3	13.3	14 20.5	7.2	54.5								
M 09	315 05.4	. . 47.7	351 03.6	13.3	14 13.3	7.3	54.6								
O 10	330 05.6	46.8	5 35.9	13.3	14 06.0	7.4	54.6								
N 11	345 05.8	45.9	20 08.2	13.3	13 58.6	7.4	54.6								
D 12	0 06.0	N 7 45.0	34 40.5	13.3	N13 51.2	7.5	54.6								
A 13	15 06.2	44.1	49 12.8	13.4	13 43.7	7.5	54.6								
Y 14	30 06.4	43.1	63 45.2	13.3	13 36.2	7.6	54.6								
15	45 06.6	. . 42.2	78 17.5	13.4	13 28.6	7.7	54.6								
16	60 06.8	41.3	92 49.9	13.4	13 20.9	7.7	54.7								
17	75 07.0	40.4	107 22.3	13.4	13 13.2	7.8	54.7								
18	90 07.2	N 7 39.5	121 54.7	13.4	N13 05.4	7.8	54.7								
19	105 07.4	38.6	136 27.1	13.4	12 57.6	8.0	54.7								
20	120 07.6	37.7	150 59.5	13.5	12 49.6	7.9	54.7								
21	135 07.8	. . 36.7	165 32.0	13.4	12 41.7	8.1	54.7								
22	150 08.0	35.8	180 04.4	13.5	12 33.6	8.1	54.7								
23	165 08.2	34.9	194 36.9	13.5	12 25.5	8.1	54.8								
3 00	180 08.4	N 7 34.0	209 09.4	13.4	N12 17.4	8.3	54.8								
01	195 08.6	33.1	223 41.8	13.5	12 09.1	8.2	54.8								
02	210 08.9	32.2	238 14.3	13.6	12 00.9	8.4	54.8								
03	225 09.1	. . 31.2	252 46.9	13.5	11 52.5	8.4	54.8								
04	240 09.3	30.3	267 19.4	13.5	11 44.1	8.4	54.8								
05	255 09.5	29.4	281 51.9	13.5	11 35.7	8.5	54.9								
06	270 09.7	N 7 28.5	296 24.4	13.6	N11 27.2	8.6	54.9								
07	285 09.9	27.6	310 57.0	13.6	11 18.6	8.6	54.9								
T 08	300 10.1	26.6	325 29.6	13.5	11 10.0	8.7	54.9								
U 09	315 10.3	. . 25.7	340 02.1	13.6	11 01.3	8.7	54.9								
E 10	330 10.5	24.8	354 34.7	13.6	10 52.6	8.8	54.9								
S 11	345 10.7	23.9	9 07.3	13.6	10 43.8	8.8	55.0								
D 12	0 10.9	N 7 23.0	23 39.9	13.6	N10 35.0	8.9	55.0								
A 13	15 11.1	22.1	38 12.5	13.6	10 26.1	9.0	55.0								
Y 14	30 11.3	21.1	52 45.1	13.6	10 17.1	9.0	55.0								
15	45 11.5	. . 20.2	67 17.7	13.7	10 08.1	9.0	55.0								
16	60 11.7	19.3	81 50.4	13.6	9 59.1	9.1	55.0								
17	75 11.9	18.4	96 23.0	13.7	9 50.0	9.1	55.1								
18	90 12.1	N 7 17.5	110 55.7	13.6	N 9 40.9	9.2	55.1								
19	105 12.3	16.5	125 28.3	13.7	9 31.7	9.3	55.1								
20	120 12.5	15.6	140 01.0	13.6	9 22.4	9.3	55.1								
21	135 12.7	. . 14.7	154 33.6	13.7	9 13.1	9.3	55.1								
22	150 12.9	13.8	169 06.3	13.6	9 03.8	9.4	55.1								
23	165 13.1	12.8	183 38.9	13.7	N 8 54.4	9.4	55.2								
	SD 15.9	d 0.9	SD	14.8		14.9		15.0							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 1	Moonset 2	Moonset 3	Moonset 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 49	21 15	////	19 09	18 53	18 41	18 31
N 70	19 37	20 50	23 12	18 32	18 30	18 27	18 24
68	19 27	20 31	22 11	18 06	18 12	18 15	18 17
66	19 18	20 16	21 38	17 46	17 57	18 05	18 12
64	19 11	20 04	21 15	17 29	17 45	17 57	18 07
62	19 05	19 53	20 57	17 16	17 35	17 50	18 03
60	19 00	19 45	20 42	17 04	17 26	17 44	18 00
N 58	18 56	19 37	20 30	16 54	17 18	17 39	17 57
56	18 52	19 31	20 19	16 46	17 11	17 34	17 54
54	18 48	19 25	20 11	16 38	17 05	17 29	17 51
52	18 45	19 20	20 03	16 31	17 00	17 25	17 49
50	18 42	19 15	19 56	16 25	16 55	17 22	17 47
45	18 35	19 05	19 42	16 11	16 44	17 14	17 42
N 40	18 30	18 57	19 30	16 00	16 35	17 08	17 39
35	18 25	18 51	19 21	15 50	16 27	17 02	17 35
30	18 21	18 45	19 14	15 42	16 20	16 57	17 32
20	18 14	18 37	19 03	15 27	16 08	16 48	17 27
N 10	18 08	18 30	18 54	15 14	15 58	16 41	17 23
0	18 03	18 24	18 48	15 02	15 48	16 33	17 18
S 10	17 58	18 19	18 43	14 50	15 38	16 26	17 14
20	17 52	18 14	18 40	14 37	15 27	16 18	17 09
30	17 46	18 10	18 37	14 22	15 15	16 09	17 04
35	17 42	18 07	18 37	14 13	15 08	16 04	17 01
40	17 38	18 05	18 37	14 03	15 00	15 58	16 57
45	17 33	18 03	18 37	13 52	14 50	15 51	16 53
S 50	17 28	18 00	18 38	13 37	14 39	15 43	16 48
52	17 25	17 59	18 38	13 31	14 34	15 39	16 46
54	17 23	17 58	18 39	13 23	14 28	15 35	16 44
56	17 20	17 57	18 40	13 15	14 21	15 30	16 41
58	17 16	17 56	18 41	13 06	14 14	15 25	16 38
S 60	17 12	17 54	18 43	12 55	14 05	15 19	16 34

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
1	00 05	00 04	12 00	08 51	21 14	26	15
2	00 14	00 24	12 00	09 37	22 00	27	9
3	00 33	00 43	11 59	10 22	22 45	28	4

UT	ARIES	VENUS −4.1		MARS +1.6		JUPITER −2.1		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
4 00	343 16.8	143 27.6	S 8 41.3	216 16.5	N20 09.0	237 32.4	N22 31.8	127 29.5	S11 51.6
01	358 19.2	158 27.4	42.5	231 17.3	08.7	252 34.4	31.8	142 31.7	51.7
02	13 21.7	173 27.1	43.7	246 18.1	08.3	267 36.4	31.7	157 34.0	51.8
03	28 24.2	188 26.9	. . 45.0	261 19.0	. . 08.0	282 38.4	. . 31.7	172 36.3	. . 51.9
04	43 26.6	203 26.7	46.2	276 19.8	07.6	297 40.4	31.6	187 38.5	51.9
05	58 29.1	218 26.5	47.4	291 20.6	07.2	312 42.4	31.6	202 40.8	52.0
06	73 31.6	233 26.3	S 8 48.7	306 21.4	N20 06.9	327 44.4	N22 31.6	217 43.1	S11 52.1
W 07	88 34.0	248 26.1	49.9	321 22.2	06.5	342 46.4	31.5	232 45.3	52.2
E 08	103 36.5	263 25.9	51.1	336 23.0	06.2	357 48.5	31.5	247 47.6	52.2
D 09	118 38.9	278 25.7	. . 52.4	351 23.9	. . 05.8	12 50.5	. . 31.4	262 49.8	. . 52.3
N 10	133 41.4	293 25.5	53.6	6 24.7	05.4	27 52.5	31.4	277 52.1	52.4
E 11	148 43.9	308 25.2	54.8	21 25.5	05.1	42 54.5	31.4	292 54.4	52.5
S 12	163 46.3	323 25.0	S 8 56.1	36 26.3	N20 04.7	57 56.5	N22 31.3	307 56.6	S11 52.5
D 13	178 48.8	338 24.8	57.3	51 27.1	04.4	72 58.5	31.3	322 58.9	52.6
A 14	193 51.3	353 24.6	58.5	66 28.0	04.0	88 00.5	31.2	338 01.2	52.7
Y 15	208 53.7	8 24.4	8 59.8	81 28.8	. . 03.6	103 02.5	. . 31.2	353 03.4	. . 52.8
16	223 56.2	23 24.2	9 01.0	96 29.6	03.3	118 04.6	31.1	8 05.7	52.8
17	238 58.7	38 24.0	02.2	111 30.4	02.9	133 06.6	31.1	23 07.9	52.9
18	254 01.1	53 23.8	S 9 03.5	126 31.2	N20 02.6	148 08.6	N22 31.1	38 10.2	S11 53.0
19	269 03.6	68 23.5	04.7	141 32.0	02.2	163 10.6	31.0	53 12.5	53.1
20	284 06.1	83 23.3	05.9	156 32.9	01.8	178 12.6	31.0	68 14.7	53.1
21	299 08.5	98 23.1	. . 07.2	171 33.7	. . 01.5	193 14.6	. . 30.9	83 17.0	. . 53.2
22	314 11.0	113 22.9	08.4	186 34.5	01.1	208 16.7	30.9	98 19.3	53.3
23	329 13.4	128 22.7	09.6	201 35.3	00.7	223 18.7	30.9	113 21.5	53.4
5 00	344 15.9	143 22.5	S 9 10.9	216 36.2	N20 00.4	238 20.7	N22 30.8	128 23.8	S11 53.4
01	359 18.4	158 22.3	12.1	231 37.0	20 00.0	253 22.7	30.8	143 26.0	53.5
02	14 20.8	173 22.1	13.3	246 37.8	19 59.7	268 24.7	30.7	158 28.3	53.6
03	29 23.3	188 21.8	. . 14.6	261 38.6	. . 59.3	283 26.7	. . 30.7	173 30.6	. . 53.7
04	44 25.8	203 21.6	15.8	276 39.4	58.9	298 28.7	30.6	188 32.8	53.8
05	59 28.2	218 21.4	17.0	291 40.3	58.6	313 30.8	30.6	203 35.1	53.8
06	74 30.7	233 21.2	S 9 18.2	306 41.1	N19 58.2	328 32.8	N22 30.6	218 37.3	S11 53.9
T 07	89 33.2	248 21.0	19.5	321 41.9	57.8	343 34.8	30.5	233 39.6	54.0
H 08	104 35.6	263 20.8	20.7	336 42.7	57.5	358 36.8	30.5	248 41.9	54.1
U 09	119 38.1	278 20.5	. . 21.9	351 43.5	. . 57.1	13 38.8	. . 30.4	263 44.1	. . 54.1
R 10	134 40.5	293 20.3	23.1	6 44.4	56.7	28 40.9	30.4	278 46.4	54.2
S 11	149 43.0	308 20.1	24.4	21 45.2	56.4	43 42.9	30.4	293 48.7	54.3
D 12	164 45.5	323 19.9	S 9 25.6	36 46.0	N19 56.0	58 44.9	N22 30.3	308 50.9	S11 54.4
A 13	179 47.9	338 19.7	26.8	51 46.8	55.6	73 46.9	30.3	323 53.2	54.4
Y 14	194 50.4	353 19.5	28.1	66 47.7	55.3	88 48.9	30.2	338 55.4	54.5
15	209 52.9	8 19.3	. . 29.3	81 48.5	. . 54.9	103 50.9	. . 30.2	353 57.7	. . 54.6
16	224 55.3	23 19.0	30.5	96 49.3	54.5	118 53.0	30.1	9 00.0	54.7
17	239 57.8	38 18.8	31.7	111 50.1	54.2	133 55.0	30.1	24 02.2	54.7
18	255 00.3	53 18.6	S 9 33.0	126 51.0	N19 53.8	148 57.0	N22 30.1	39 04.5	S11 54.8
19	270 02.7	68 18.4	34.2	141 51.8	53.4	163 59.0	30.0	54 06.7	54.9
20	285 05.2	83 18.2	35.4	156 52.6	53.1	179 01.0	30.0	69 09.0	55.0
21	300 07.7	98 18.0	. . 36.6	171 53.4	. . 52.7	194 03.1	. . 29.9	84 11.2	. . 55.1
22	315 10.1	113 17.7	37.8	186 54.3	52.3	209 05.1	29.9	99 13.5	55.1
23	330 12.6	128 17.5	39.1	201 55.1	52.0	224 07.1	29.9	114 15.8	55.2
6 00	345 15.0	143 17.3	S 9 40.3	216 55.9	N19 51.6	239 09.1	N22 29.8	129 18.0	S11 55.3
01	0 17.5	158 17.1	41.5	231 56.7	51.2	254 11.1	29.8	144 20.3	55.4
02	15 20.0	173 16.9	42.7	246 57.6	50.9	269 13.2	29.7	159 22.5	55.4
03	30 22.4	188 16.6	. . 44.0	261 58.4	. . 50.5	284 15.2	. . 29.7	174 24.8	. . 55.5
04	45 24.9	203 16.4	45.2	276 59.2	50.1	299 17.2	29.6	189 27.1	55.6
05	60 27.4	218 16.2	46.4	292 00.1	49.8	314 19.2	29.6	204 29.3	55.7
06	75 29.8	233 16.0	S 9 47.6	307 00.9	N19 49.4	329 21.2	N22 29.6	219 31.6	S11 55.7
F 07	90 32.3	248 15.8	48.8	322 01.7	49.0	344 23.3	29.5	234 33.8	55.8
R 08	105 34.8	263 15.6	50.1	337 02.5	48.7	359 25.3	29.5	249 36.1	55.9
I 09	120 37.2	278 15.3	. . 51.3	352 03.4	. . 48.3	14 27.3	. . 29.4	264 38.4	. . 56.0
D 10	135 39.7	293 15.1	52.5	7 04.2	47.9	29 29.3	29.4	279 40.6	56.1
A 11	150 42.1	308 14.9	53.7	22 05.0	47.5	44 31.4	29.4	294 42.9	56.1
Y 12	165 44.6	323 14.7	S 9 54.9	37 05.8	N19 47.2	59 33.4	N22 29.3	309 45.1	S11 56.2
13	180 47.1	338 14.5	56.2	52 06.7	46.8	74 35.4	29.3	324 47.4	56.3
14	195 49.5	353 14.2	57.4	67 07.5	46.4	89 37.4	29.2	339 49.6	56.4
15	210 52.0	8 14.0	. . 58.6	82 08.3	. . 46.1	104 39.5	. . 29.2	354 51.9	. . 56.4
16	225 54.5	23 13.8	9 59.8	97 09.2	45.7	119 41.5	29.1	9 54.2	56.5
17	240 56.9	38 13.6	10 01.0	112 10.0	45.3	134 43.5	29.1	24 56.4	56.6
18	255 59.4	53 13.4	S10 02.2	127 10.8	N19 44.9	149 45.5	N22 29.1	39 58.7	S11 56.7
19	271 01.9	68 13.1	03.5	142 11.7	44.6	164 47.5	29.0	55 00.9	56.7
20	286 04.3	83 12.9	04.7	157 12.5	44.2	179 49.6	29.0	70 03.2	56.8
21	301 06.8	98 12.7	. . 05.9	172 13.3	. . 43.8	194 51.6	. . 28.9	85 05.4	. . 56.9
22	316 09.3	113 12.5	07.1	187 14.1	43.5	209 53.6	28.9	100 07.7	57.0
23	331 11.7	128 12.2	08.3	202 15.0	43.1	224 55.6	28.9	115 10.0	57.1
Mer.Pass.	h m 1 02.8	v −0.2	d 1.2	v 0.8	d 0.4	v 2.0	d 0.0	v 2.3	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 18.0	S40 14.8
Achernar	335 26.3	S57 09.8
Acrux	173 09.6	S63 10.6
Adhara	255 12.6	S28 59.4
Aldebaran	290 49.2	N16 32.1
Alioth	166 21.1	N55 53.3
Alkaid	152 59.1	N49 14.9
Al Na'ir	27 43.1	S46 53.5
Alnilam	275 46.3	S 1 11.6
Alphard	217 56.2	S 8 43.1
Alphecca	126 11.0	N26 40.4
Alpheratz	357 43.0	N29 10.1
Altair	62 07.8	N 8 54.6
Ankaa	353 15.2	S42 13.7
Antares	112 26.1	S26 27.6
Arcturus	145 55.8	N19 06.9
Atria	107 27.7	S69 03.2
Avior	234 18.4	S59 33.1
Bellatrix	278 31.9	N 6 21.7
Betelgeuse	271 01.2	N 7 24.5
Canopus	263 56.3	S52 42.0
Capella	280 34.2	N46 00.4
Deneb	49 31.0	N45 20.1
Denebola	182 33.8	N14 29.8
Diphda	348 55.4	S17 54.5
Dubhe	193 52.2	N61 40.6
Elnath	278 12.5	N28 36.9
Eltanin	90 45.9	N51 29.7
Enif	33 46.6	N 9 56.6
Fomalhaut	15 23.4	S29 32.7
Gacrux	172 01.2	S57 11.5
Gienah	175 52.4	S17 37.1
Hadar	148 48.0	S60 26.5
Hamal	328 00.3	N23 31.6
Kaus Aust.	83 43.4	S34 22.6
Kochab	137 20.7	N74 06.3
Markab	13 37.8	N15 17.0
Menkar	314 14.7	N 4 08.6
Menkent	148 07.6	S36 26.2
Miaplacidus	221 40.4	S69 46.4
Mirfak	308 39.9	N49 54.4
Nunki	75 57.9	S26 16.6
Peacock	53 18.5	S56 41.4
Pollux	243 27.8	N27 59.4
Procyon	244 59.8	N 5 11.3
Rasalhague	96 06.2	N12 33.4
Regulus	207 43.7	N11 54.0
Rigel	281 11.9	S 8 11.1
Rigil Kent.	139 51.8	S60 53.6
Sabik	102 12.3	S15 44.3
Schedar	349 39.8	N56 36.7
Shaula	96 21.6	S37 06.7
Sirius	258 33.7	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.7	S43 29.2
Vega	80 38.7	N38 48.2
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	159 06.6	14 27
Mars	232 20.2	9 33
Jupiter	254 04.8	8 06
Saturn	144 07.9	15 24

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		4	5	6	7
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
4 00	180 13.3	N 7 11.9	198 11.6	13.7	N 8 45.0	9.5	55.2	N 72	////	02 59	04 21	03 08	04 52	06 37	08 24
01	195 13.5	11.0	212 44.3	13.7	8 35.5	9.5	55.2	N 70	01 18	03 21	04 32	03 21	04 58	06 36	08 16
02	210 13.8	10.1	227 17.0	13.7	8 26.0	9.6	55.2	68	02 04	03 38	04 41	03 31	05 02	06 35	08 09
03	225 14.0	. . 09.2	241 49.7	13.6	8 16.4	9.6	55.2	66	02 33	03 52	04 48	03 40	05 06	06 34	08 04
04	240 14.2	08.2	256 22.3	13.7	8 06.8	9.6	55.3	64	02 54	04 03	04 55	03 47	05 09	06 34	07 59
05	255 14.4	07.3	270 55.0	13.7	7 57.2	9.7	55.3	62	03 11	04 12	05 00	03 53	05 12	06 33	07 56
06	270 14.6	N 7 06.4	285 27.7	13.7	N 7 47.5	9.7	55.3	60	03 24	04 20	05 05	03 58	05 15	06 33	07 52
W 07	285 14.8	05.5	300 00.4	13.7	7 37.8	9.8	55.3	N 58	03 35	04 27	05 09	04 03	05 17	06 32	07 49
E 08	300 15.0	04.5	314 33.1	13.7	7 28.0	9.8	55.3	56	03 45	04 33	05 12	04 07	05 18	06 32	07 46
D 09	315 15.2	. . 03.6	329 05.8	13.7	7 18.2	9.9	55.4	54	03 54	04 39	05 15	04 10	05 20	06 31	07 44
N 10	330 15.4	02.7	343 38.5	13.7	7 08.3	9.9	55.4	52	04 01	04 43	05 18	04 14	05 22	06 31	07 42
E 11	345 15.6	01.8	358 11.2	13.6	6 58.4	9.9	55.4	50	04 07	04 48	05 21	04 17	05 23	06 31	07 40
S 12	0 15.8	N 7 00.8	12 43.8	13.7	N 6 48.5	9.9	55.4	45	04 21	04 57	05 27	04 23	05 26	06 30	07 36
D 13	15 16.0	6 59.9	27 16.5	13.7	6 38.6	10.0	55.4	N 40	04 31	05 04	05 32	04 29	05 29	06 30	07 32
A 14	30 16.2	59.0	41 49.2	13.7	6 28.6	10.1	55.5	35	04 40	05 10	05 36	04 33	05 31	06 29	07 29
Y 15	45 16.4	. . 58.1	56 21.9	13.7	6 18.5	10.1	55.5	30	04 46	05 15	05 39	04 37	05 33	06 29	07 26
16	60 16.6	57.1	70 54.6	13.6	6 08.4	10.1	55.5	20	04 57	05 23	05 45	04 45	05 36	06 28	07 22
17	75 16.8	56.2	85 27.2	13.7	5 58.3	10.1	55.5	N 10	05 05	05 29	05 51	04 51	05 39	06 28	07 18
18	90 17.1	N 6 55.3	99 59.9	13.7	N 5 48.2	10.2	55.5	0	05 10	05 35	05 55	04 57	05 42	06 27	07 14
19	105 17.3	54.4	114 32.6	13.6	5 38.0	10.2	55.6	S 10	05 14	05 39	06 00	05 02	05 45	06 27	07 10
20	120 17.5	53.4	129 05.2	13.7	5 27.8	10.2	55.6	20	05 17	05 43	06 05	05 09	05 47	06 26	07 06
21	135 17.7	. . 52.5	143 37.9	13.7	5 17.6	10.3	55.6	30	05 19	05 46	06 10	05 16	05 51	06 26	07 02
22	150 17.9	51.6	158 10.6	13.6	5 07.3	10.3	55.6	35	05 19	05 48	06 14	05 20	05 53	06 26	06 59
23	165 18.1	50.7	172 43.2	13.6	4 57.0	10.3	55.6	40	05 19	05 50	06 17	05 24	05 55	06 25	06 57
5 00	180 18.3	N 6 49.7	187 15.8	13.7	N 4 46.7	10.4	55.7	45	05 18	05 52	06 21	05 30	05 57	06 25	06 53
01	195 18.5	48.8	201 48.5	13.6	4 36.3	10.4	55.7	S 50	05 16	05 53	06 26	05 36	06 00	06 25	06 49
02	210 18.7	47.9	216 21.1	13.6	4 25.9	10.4	55.7	52	05 15	05 54	06 28	05 39	06 02	06 24	06 48
03	225 18.9	. . 47.0	230 53.7	13.6	4 15.5	10.4	55.7	54	05 14	05 55	06 30	05 42	06 03	06 24	06 46
04	240 19.1	46.0	245 26.3	13.6	4 05.1	10.5	55.7	56	05 13	05 56	06 33	05 46	06 05	06 24	06 43
05	255 19.3	45.1	259 58.9	13.6	3 54.6	10.5	55.8	58	05 11	05 57	06 36	05 49	06 07	06 24	06 41
06	270 19.6	N 6 44.2	274 31.5	13.6	N 3 44.1	10.5	55.8	S 60	05 09	05 57	06 39	05 54	06 09	06 23	06 38
T 07	285 19.8	43.2	289 04.1	13.5	3 33.6	10.5	55.8								
H 08	300 20.0	42.3	303 36.6	13.6	3 23.1	10.6	55.8								
U 09	315 20.2	. . 41.4	318 09.2	13.5	3 12.5	10.6	55.8								
R 10	330 20.4	40.5	332 41.7	13.5	3 01.9	10.6	55.9								
S 11	345 20.6	39.5	347 14.2	13.5	2 51.3	10.6	55.9								
D 12	0 20.8	N 6 38.6	1 46.7	13.5	N 2 40.7	10.7	55.9								
A 13	15 21.0	37.7	16 19.2	13.5	2 30.0	10.6	55.9								
Y 14	30 21.2	36.7	30 51.7	13.5	2 19.4	10.7	55.9								
15	45 21.4	. . 35.8	45 24.2	13.4	2 08.7	10.7	56.0								
16	60 21.6	34.9	59 56.6	13.5	1 58.0	10.7	56.0								
17	75 21.8	34.0	74 29.1	13.4	1 47.3	10.8	56.0								
18	90 22.1	N 6 33.0	89 01.5	13.4	N 1 36.5	10.7	56.0								
19	105 22.3	32.1	103 33.9	13.4	1 25.8	10.8	56.0								
20	120 22.5	31.2	118 06.3	13.4	1 15.0	10.8	56.1								
21	135 22.7	. . 30.2	132 38.7	13.3	1 04.2	10.8	56.1								
22	150 22.9	29.3	147 11.0	13.3	0 53.4	10.8	56.1								
23	165 23.1	28.4	161 43.3	13.3	0 42.6	10.8	56.1								
6 00	180 23.3	N 6 27.4	176 15.6	13.3	N 0 31.8	10.8	56.2								
01	195 23.5	26.5	190 47.9	13.3	0 21.0	10.8	56.2								
02	210 23.7	25.6	205 20.2	13.2	N 0 10.2	10.9	56.2								
03	225 23.9	. . 24.7	219 52.4	13.3	S 0 00.7	10.8	56.2								
04	240 24.2	23.7	234 24.7	13.2	0 11.5	10.9	56.2								
05	255 24.4	22.8	248 56.9	13.1	0 22.4	10.8	56.3								
06	270 24.6	N 6 21.9	263 29.0	13.2	S 0 33.2	10.9	56.3								
F 07	285 24.8	20.9	278 01.2	13.1	0 44.1	10.9	56.3								
R 08	300 25.0	20.0	292 33.3	13.1	0 55.0	10.8	56.3								
I 09	315 25.2	. . 19.1	307 05.4	13.1	1 05.8	10.9	56.3								
D 10	330 25.4	18.1	321 37.5	13.1	1 16.7	10.9	56.4								
A 11	345 25.6	17.2	336 09.6	13.0	1 27.6	10.9	56.4								
Y 12	0 25.8	N 6 16.3	350 41.6	13.0	S 1 38.5	10.8	56.4								
13	15 26.1	15.3	5 13.6	12.9	1 49.3	10.9	56.4								
14	30 26.3	14.4	19 45.5	13.0	2 00.2	10.9	56.5								
15	45 26.5	. . 13.5	34 17.5	12.9	2 11.1	10.9	56.5								
16	60 26.7	12.5	48 49.4	12.9	2 22.0	10.8	56.5								
17	75 26.9	11.6	63 21.3	12.8	2 32.8	10.9	56.5								
18	90 27.1	N 6 10.7	77 53.1	12.8	S 2 43.7	10.8	56.5								
19	105 27.3	09.7	92 24.9	12.8	2 54.5	10.9	56.6								
20	120 27.5	08.8	106 56.7	12.8	3 05.4	10.8	56.6								
21	135 27.7	. . 07.9	121 28.5	12.7	3 16.2	10.9	56.6								
22	150 28.0	06.9	136 00.2	12.7	3 27.1	10.8	56.6								
23	165 28.2	06.0	150 31.9	12.6	S 3 37.9	10.8	56.6								
	SD 15.9	d 0.9	SD	15.1		15.2		15.4							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	4	5	6	7
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 33	20 53	////	18 31	18 22	18 13	18 04
N 70	19 22	20 32	22 28	18 24	18 20	18 17	18 14
68	19 14	20 16	21 47	18 17	18 19	18 20	18 22
66	19 07	20 03	21 20	18 12	18 17	18 23	18 29
64	19 01	19 52	21 00	18 07	18 16	18 25	18 35
62	18 56	19 43	20 44	18 03	18 15	18 27	18 40
60	18 51	19 35	20 31	18 00	18 14	18 29	18 45
N 58	18 47	19 28	20 20	17 57	18 14	18 30	18 48
56	18 44	19 22	20 10	17 54	18 13	18 32	18 52
54	18 41	19 17	20 02	17 51	18 12	18 33	18 55
52	18 38	19 13	19 55	17 49	18 12	18 34	18 58
50	18 35	19 08	19 49	17 47	18 11	18 35	19 01
45	18 30	19 00	19 35	17 42	18 10	18 38	19 07
N 40	18 25	18 53	19 25	17 39	18 09	18 40	19 11
35	18 21	18 47	19 17	17 35	18 08	18 41	19 16
30	18 18	18 42	19 10	17 32	18 07	18 43	19 19
20	18 12	18 34	19 00	17 27	18 06	18 45	19 26
N 10	18 07	18 28	18 52	17 23	18 05	18 47	19 32
0	18 02	18 23	18 47	17 18	18 04	18 50	19 37
S 10	17 57	18 18	18 43	17 14	18 02	18 52	19 42
20	17 53	18 15	18 40	17 09	18 01	18 54	19 48
30	17 47	18 11	18 39	17 04	18 00	18 56	19 54
35	17 44	18 10	18 39	17 01	17 59	18 58	19 58
40	17 41	18 08	18 39	16 57	17 58	18 59	20 02
45	17 37	18 06	18 40	16 53	17 57	19 01	20 07
S 50	17 32	18 05	18 42	16 48	17 55	19 04	20 13
52	17 30	18 04	18 43	16 46	17 55	19 05	20 16
54	17 28	18 03	18 44	16 44	17 54	19 06	20 19
56	17 25	18 03	18 46	16 41	17 53	19 07	20 22
58	17 23	18 02	18 47	16 38	17 52	19 09	20 26
S 60	17 19	18 01	18 49	16 34	17 51	19 10	20 30

Day	SUN		MOON			
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00^h	12^h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
4	00 53	01 03	11 59	11 07	23 30	29	1
5	01 13	01 23	11 59	11 53	24 15	00	0
6	01 33	01 43	11 58	12 38	00 15	01	1

UT	ARIES	VENUS −4.1		MARS +1.6		JUPITER −2.1		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
7 00	346 14.2	143 12.0	S10 09.5	217 15.8	N19 42.7	239 57.7	N22 28.8	130 12.2	S11 57.1	Acamar	315 18.0	S40 14.8
01	1 16.6	158 11.8	10.8	232 16.6	42.3	254 59.7	28.8	145 14.5	57.2	Achernar	335 26.2	S57 09.8
02	16 19.1	173 11.6	12.0	247 17.5	42.0	270 01.7	28.7	160 16.7	57.3	Acrux	173 09.7	S63 10.6
03	31 21.6	188 11.4	. . 13.2	262 18.3	. . 41.6	285 03.8	. . 28.7	175 19.0	. . 57.4	Adhara	255 12.6	S28 59.4
04	46 24.0	203 11.1	14.4	277 19.1	41.2	300 05.8	28.6	190 21.2	57.4	Aldebaran	290 49.1	N16 32.1
05	61 26.5	218 10.9	15.6	292 20.0	40.8	315 07.8	28.6	205 23.5	57.5			
06	76 29.0	233 10.7	S10 16.8	307 20.8	N19 40.5	330 09.8	N22 28.6	220 25.7	S11 57.6	Alioth	166 21.1	N55 53.3
07	91 31.4	248 10.5	18.0	322 21.6	40.1	345 11.9	28.5	235 28.0	57.7	Alkaid	152 59.2	N49 14.9
S 08	106 33.9	263 10.2	19.2	337 22.5	39.7	0 13.9	28.5	250 30.3	57.8	Al Na'ir	27 43.1	S46 53.5
A 09	121 36.4	278 10.0	. . 20.5	352 23.3	. . 39.3	15 15.9	. . 28.4	265 32.5	. . 57.8	Alnilam	275 46.2	S 1 11.6
T 10	136 38.8	293 09.8	21.7	7 24.1	39.0	30 17.9	28.4	280 34.8	57.9	Alphard	217 56.2	S 8 43.1
U 11	151 41.3	308 09.6	22.9	22 25.0	38.6	45 20.0	28.4	295 37.0	58.0			
R 12	166 43.7	323 09.3	S10 24.1	37 25.8	N19 38.2	60 22.0	N22 28.3	310 39.3	S11 58.1	Alphecca	126 11.0	N26 40.4
D 13	181 46.2	338 09.1	25.3	52 26.6	37.8	75 24.0	28.3	325 41.5	58.1	Alpheratz	357 42.9	N29 10.1
A 14	196 48.7	353 08.9	26.5	67 27.5	37.5	90 26.1	28.2	340 43.8	58.2	Altair	62 07.9	N 8 54.6
Y 15	211 51.1	8 08.7	. . 27.7	82 28.3	. . 37.1	105 28.1	. . 28.2	355 46.0	. . 58.3	Ankaa	353 15.2	S42 13.7
16	226 53.6	23 08.4	28.9	97 29.1	36.7	120 30.1	28.1	10 48.3	58.4	Antares	112 26.1	S26 27.6
17	241 56.1	38 08.2	30.1	112 30.0	36.3	135 32.1	28.1	25 50.5	58.5			
18	256 58.5	53 08.0	S10 31.3	127 30.8	N19 36.0	150 34.2	N22 28.1	40 52.8	S11 58.5	Arcturus	145 55.8	N19 06.9
19	272 01.0	68 07.8	32.5	142 31.6	35.6	165 36.2	28.0	55 55.1	58.6	Atria	107 27.7	S69 03.2
20	287 03.5	83 07.5	33.8	157 32.5	35.2	180 38.2	28.0	70 57.3	58.7	Avior	234 18.4	S59 33.1
21	302 05.9	98 07.3	. . 35.0	172 33.3	. . 34.8	195 40.3	. . 27.9	85 59.6	. . 58.8	Bellatrix	278 31.9	N 6 21.7
22	317 08.4	113 07.1	36.2	187 34.1	34.4	210 42.3	27.9	101 01.8	58.8	Betelgeuse	271 01.2	N 7 24.5
23	332 10.9	128 06.9	37.4	202 35.0	34.1	225 44.3	27.9	116 04.1	58.9			
8 00	347 13.3	143 06.6	S10 38.6	217 35.8	N19 33.7	240 46.3	N22 27.8	131 06.3	S11 59.0	Canopus	263 56.2	S52 42.0
01	2 15.8	158 06.4	39.8	232 36.7	33.3	255 48.4	27.8	146 08.6	59.1	Capella	280 34.2	N46 00.4
02	17 18.2	173 06.2	41.0	247 37.5	32.9	270 50.4	27.7	161 10.8	59.2	Deneb	49 31.0	N45 20.1
03	32 20.7	188 06.0	. . 42.2	262 38.3	. . 32.5	285 52.4	. . 27.7	176 13.1	. . 59.2	Denebola	182 33.8	N14 29.8
04	47 23.2	203 05.7	43.4	277 39.2	32.2	300 54.5	27.6	191 15.3	59.3	Diphda	348 55.4	S17 54.5
05	62 25.6	218 05.5	44.6	292 40.0	31.8	315 56.5	27.6	206 17.6	59.4			
06	77 28.1	233 05.3	S10 45.8	307 40.8	N19 31.4	330 58.5	N22 27.6	221 19.8	S11 59.5	Dubhe	193 52.2	N61 40.6
07	92 30.6	248 05.0	47.0	322 41.7	31.0	346 00.6	27.5	236 22.1	59.6	Elnath	278 12.4	N28 36.9
08	107 33.0	263 04.8	48.2	337 42.5	30.7	1 02.6	27.5	251 24.4	59.6	Eltanin	90 45.9	N51 29.7
S 09	122 35.5	278 04.6	. . 49.4	352 43.4	. . 30.3	16 04.6	. . 27.4	266 26.6	. . 59.7	Enif	33 46.6	N 9 56.6
U 10	137 38.0	293 04.4	50.6	7 44.2	29.9	31 06.7	27.4	281 28.9	59.8	Fomalhaut	15 23.4	S29 32.8
N 11	152 40.4	308 04.1	51.8	22 45.0	29.5	46 08.7	27.4	296 31.1	59.9			
D 12	167 42.9	323 03.9	S10 53.0	37 45.9	N19 29.1	61 10.7	N22 27.3	311 33.4	S11 59.9	Gacrux	172 01.2	S57 11.5
A 13	182 45.3	338 03.7	54.2	52 46.7	28.7	76 12.8	27.3	326 35.6	12 00.0	Gienah	175 52.4	S17 37.0
Y 14	197 47.8	353 03.4	55.4	67 47.6	28.4	91 14.8	27.2	341 37.9	00.1	Hadar	148 48.0	S60 26.4
15	212 50.3	8 03.2	. . 56.6	82 48.4	. . 28.0	106 16.8	. . 27.2	356 40.1	. . 00.2	Hamal	328 00.3	N23 31.6
16	227 52.7	23 03.0	57.8	97 49.2	27.6	121 18.9	27.1	11 42.4	00.3	Kaus Aust.	83 43.4	S34 22.6
17	242 55.2	38 02.7	10 59.0	112 50.1	27.2	136 20.9	27.1	26 44.6	00.3			
18	257 57.7	53 02.5	S11 00.2	127 50.9	N19 26.8	151 22.9	N22 27.1	41 46.9	S12 00.4	Kochab	137 20.7	N74 06.3
19	273 00.1	68 02.3	01.4	142 51.8	26.5	166 25.0	27.0	56 49.1	00.5	Markab	13 37.8	N15 17.0
20	288 02.6	83 02.1	02.6	157 52.6	26.1	181 27.0	27.0	71 51.4	00.6	Menkar	314 14.7	N 4 08.6
21	303 05.1	98 01.8	. . 03.8	172 53.4	. . 25.7	196 29.0	. . 26.9	86 53.6	. . 00.7	Menkent	148 07.6	S36 26.2
22	318 07.5	113 01.6	05.0	187 54.3	25.3	211 31.1	26.9	101 55.9	00.7	Miaplacidus	221 40.4	S69 46.4
23	333 10.0	128 01.4	06.2	202 55.1	24.9	226 33.1	26.9	116 58.1	00.8			
9 00	348 12.5	143 01.1	S11 07.4	217 56.0	N19 24.5	241 35.1	N22 26.8	132 00.4	S12 00.9	Mirfak	308 39.9	N49 54.4
01	3 14.9	158 00.9	08.6	232 56.8	24.2	256 37.2	26.8	147 02.6	01.0	Nunki	75 57.9	S26 16.6
02	18 17.4	173 00.7	09.8	247 57.6	23.8	271 39.2	26.7	162 04.9	01.0	Peacock	53 18.6	S56 41.4
03	33 19.8	188 00.4	. . 11.0	262 58.5	. . 23.4	286 41.2	. . 26.7	177 07.1	. . 01.1	Pollux	243 27.8	N27 59.4
04	48 22.3	203 00.2	12.2	277 59.3	23.0	301 43.3	26.6	192 09.4	01.2	Procyon	244 59.8	N 5 11.3
05	63 24.8	218 00.0	13.4	293 00.2	22.6	316 45.3	26.6	207 11.6	01.3			
06	78 27.2	232 59.7	S11 14.6	308 01.0	N19 22.2	331 47.4	N22 26.6	222 13.9	S12 01.4	Rasalhague	96 06.2	N12 33.4
07	93 29.7	247 59.5	15.8	323 01.9	21.9	346 49.4	26.5	237 16.1	01.4	Regulus	207 43.7	N11 54.0
08	108 32.2	262 59.3	17.0	338 02.7	21.5	1 51.4	26.5	252 18.4	01.5	Rigel	281 11.9	S 8 11.1
M 09	123 34.6	277 59.0	. . 18.2	353 03.5	. . 21.1	16 53.5	. . 26.4	267 20.6	. . 01.6	Rigil Kent.	139 51.8	S60 53.6
O 10	138 37.1	292 58.8	19.4	8 04.4	20.7	31 55.5	26.4	282 22.9	01.7	Sabik	102 12.3	S15 44.3
N 11	153 39.6	307 58.6	20.6	23 05.2	20.3	46 57.5	26.4	297 25.1	01.8			
D 12	168 42.0	322 58.3	S11 21.7	38 06.1	N19 19.9	61 59.6	N22 26.3	312 27.4	S12 01.8	Schedar	349 39.7	N56 36.8
A 13	183 44.5	337 58.1	22.9	53 06.9	19.5	77 01.6	26.3	327 29.6	01.9	Shaula	96 21.6	S37 06.7
Y 14	198 47.0	352 57.9	24.1	68 07.8	19.2	92 03.7	26.2	342 31.9	02.0	Sirius	258 33.7	S16 44.1
15	213 49.4	7 57.6	. . 25.3	83 08.6	. . 18.8	107 05.7	. . 26.2	357 34.1	. . 02.1	Spica	158 31.3	S11 13.9
16	228 51.9	22 57.4	26.5	98 09.5	18.4	122 07.7	26.1	12 36.4	02.2	Suhail	222 52.7	S43 29.2
17	243 54.3	37 57.2	27.7	113 10.3	18.0	137 09.8	26.1	27 38.6	02.2			
18	258 56.8	52 56.9	S11 28.9	128 11.1	N19 17.6	152 11.8	N22 26.1	42 40.9	S12 02.3	Vega	80 38.7	N38 48.2
19	273 59.3	67 56.7	30.1	143 12.0	17.2	167 13.9	26.0	57 43.1	02.4	Zuben'ubi	137 05.4	S16 05.8
20	289 01.7	82 56.5	31.3	158 12.8	16.8	182 15.9	26.0	72 45.4	02.5		SHA	Mer.Pass.
21	304 04.2	97 56.2	. . 32.5	173 13.7	. . 16.4	197 17.9	. . 25.9	87 47.6	. . 02.6		° ′	h m
22	319 06.7	112 56.0	33.6	188 14.5	16.1	212 20.0	25.9	102 49.9	02.6	Venus	155 53.3	14 28
23	334 09.1	127 55.7	34.8	203 15.4	15.7	227 22.0	25.9	117 52.1	02.7	Mars	230 22.5	9 29
	h m									Jupiter	253 33.0	7 56
Mer.Pass.	0 51.0	*v* −0.2	*d* 1.2	*v* 0.8	*d* 0.4	*v* 2.0	*d* 0.0	*v* 2.3	*d* 0.1	Saturn	143 53.0	15 13

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 7	Moonrise 8	Moonrise 9	Moonrise 10
	GHA	Dec	GHA	*v*	Dec	*d*	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
								N 72	00 40	03 17	04 35	08 24	10 16	12 17	14 40
7 00	180 28.4	N 6 05.0	165 03.5	12.7	S 3 48.7	10.8	56.7	N 70	01 49	03 36	04 45	08 16	10 00	11 48	13 42
01	195 28.6	04.1	179 35.2	12.5	3 59.5	10.8	56.7	68	02 24	03 51	04 52	08 09	09 47	11 27	13 08
02	210 28.8	03.2	194 06.7	12.6	4 10.3	10.8	56.7	66	02 48	04 03	04 58	08 04	09 36	11 10	12 43
03	225 29.0	. . 02.2	208 38.3	12.5	4 21.1	10.7	56.7	64	03 06	04 13	05 03	07 59	09 27	10 56	12 24
04	240 29.2	01.3	223 09.8	12.5	4 31.8	10.8	56.7	62	03 21	04 21	05 08	07 56	09 20	10 45	12 09
05	255 29.4	6 00.4	237 41.3	12.4	4 42.6	10.7	56.8	60	03 33	04 28	05 12	07 52	09 13	10 35	11 56
06	270 29.7	N 5 59.4	252 12.7	12.4	S 4 53.3	10.7	56.8	N 58	03 44	04 34	05 15	07 49	09 08	10 27	11 45
07	285 29.9	58.5	266 44.1	12.4	5 04.0	10.7	56.8	56	03 52	04 40	05 18	07 46	09 03	10 19	11 35
S 08	300 30.1	57.6	281 15.5	12.3	5 14.7	10.7	56.8	54	04 00	04 44	05 21	07 44	08 58	10 13	11 27
A 09	315 30.3	. . 56.6	295 46.8	12.3	5 25.4	10.7	56.9	52	04 07	04 49	05 23	07 42	08 54	10 07	11 19
T 10	330 30.5	55.7	310 18.1	12.2	5 36.1	10.6	56.9	50	04 13	04 52	05 25	07 40	08 50	10 02	11 12
U 11	345 30.7	54.7	324 49.3	12.2	5 46.7	10.6	56.9	45	04 25	05 00	05 30	07 36	08 42	09 50	10 58
R 12	0 30.9	N 5 53.8	339 20.5	12.2	S 5 57.3	10.6	56.9	N 40	04 34	05 07	05 34	07 32	08 36	09 41	10 46
D 13	15 31.2	52.9	353 51.7	12.1	6 07.9	10.6	56.9	35	04 42	05 12	05 38	07 29	08 30	09 32	10 35
A 14	30 31.4	51.9	8 22.8	12.1	6 18.5	10.6	57.0	30	04 48	05 17	05 41	07 26	08 25	09 25	10 27
Y 15	45 31.6	. . 51.0	22 53.9	12.0	6 29.1	10.5	57.0	20	04 58	05 24	05 46	07 22	08 17	09 13	10 11
16	60 31.8	50.1	37 24.9	12.0	6 39.6	10.5	57.0	N 10	05 05	05 29	05 50	07 18	08 09	09 03	09 58
17	75 32.0	49.1	51 55.9	11.9	6 50.1	10.4	57.0	0	05 09	05 34	05 54	07 14	08 02	08 53	09 46
18	90 32.2	N 5 48.2	66 26.8	11.9	S 7 00.5	10.5	57.0	S 10	05 13	05 37	05 58	07 10	07 55	08 43	09 33
19	105 32.4	47.2	80 57.7	11.9	7 11.0	10.4	57.1	20	05 15	05 40	06 02	07 06	07 48	08 32	09 20
20	120 32.6	46.3	95 28.6	11.8	7 21.4	10.4	57.1	30	05 15	05 43	06 07	07 02	07 40	08 21	09 05
21	135 32.9	. . 45.4	109 59.4	11.8	7 31.8	10.3	57.1	35	05 15	05 44	06 09	06 59	07 35	08 14	08 57
22	150 33.1	44.4	124 30.2	11.7	7 42.1	10.3	57.1	40	05 14	05 45	06 12	06 57	07 30	08 06	08 47
23	165 33.3	43.5	139 00.9	11.6	7 52.4	10.3	57.1	45	05 12	05 46	06 15	06 53	07 24	07 57	08 35
8 00	180 33.5	N 5 42.5	153 31.5	11.7	S 8 02.7	10.3	57.2	S 50	05 10	05 47	06 19	06 49	07 16	07 46	08 22
01	195 33.7	41.6	168 02.2	11.5	8 13.0	10.2	57.2	52	05 08	05 47	06 21	06 48	07 13	07 41	08 15
02	210 33.9	40.7	182 32.7	11.6	8 23.2	10.2	57.2	54	05 07	05 48	06 23	06 46	07 09	07 36	08 08
03	225 34.1	. . 39.7	197 03.3	11.4	8 33.4	10.1	57.2	56	05 05	05 48	06 25	06 43	07 05	07 30	08 00
04	240 34.4	38.8	211 33.7	11.5	8 43.5	10.1	57.2	58	05 03	05 48	06 27	06 41	07 00	07 23	07 51
05	255 34.6	37.8	226 04.2	11.3	8 53.6	10.1	57.3	S 60	05 00	05 49	06 30	06 38	06 55	07 15	07 41
06	270 34.8	N 5 36.9	240 34.5	11.4	S 9 03.7	10.0	57.3								
07	285 35.0	36.0	255 04.9	11.2	9 13.7	10.0	57.3								
08	300 35.2	35.0	269 35.1	11.3	9 23.7	9.9	57.3								
S 09	315 35.4	. . 34.1	284 05.4	11.1	9 33.6	9.9	57.3								
U 10	330 35.6	33.1	298 35.5	11.2	9 43.5	9.8	57.4								
N 11	345 35.9	32.2	313 05.7	11.0	9 53.3	9.9	57.4								
D 12	0 36.1	N 5 31.3	327 35.7	11.0	S10 03.2	9.7	57.4								
A 13	15 36.3	30.3	342 05.7	11.0	10 12.9	9.7	57.4								
Y 14	30 36.5	29.4	356 35.7	10.9	10 22.6	9.7	57.4								
15	45 36.7	. . 28.4	11 05.6	10.9	10 32.3	9.6	57.5								
16	60 36.9	27.5	25 35.5	10.7	10 41.9	9.5	57.5								
17	75 37.2	26.6	40 05.2	10.8	10 51.4	9.5	57.5								
18	90 37.4	N 5 25.6	54 35.0	10.7	S11 00.9	9.5	57.5								
19	105 37.6	24.7	69 04.7	10.6	11 10.4	9.4	57.5								
20	120 37.8	23.7	83 34.3	10.6	11 19.8	9.3	57.6								
21	135 38.0	. . 22.8	98 03.9	10.5	11 29.1	9.3	57.6								
22	150 38.2	21.8	112 33.4	10.5	11 38.4	9.3	57.6								
23	165 38.4	20.9	127 02.9	10.4	11 47.7	9.1	57.6								
9 00	180 38.7	N 5 20.0	141 32.3	10.3	S11 56.8	9.2	57.6								
01	195 38.9	19.0	156 01.6	10.3	12 06.0	9.0	57.7								
02	210 39.1	18.1	170 30.9	10.2	12 15.0	9.0	57.7								
03	225 39.3	. . 17.1	185 00.1	10.2	12 24.0	8.9	57.7								
04	240 39.5	16.2	199 29.3	10.1	12 32.9	8.9	57.7								
05	255 39.7	15.2	213 58.4	10.1	12 41.8	8.8	57.7								
06	270 40.0	N 5 14.3	228 27.5	10.0	S12 50.6	8.7	57.8								
07	285 40.2	13.3	242 56.5	9.9	12 59.3	8.7	57.8								
08	300 40.4	12.4	257 25.4	9.9	13 08.0	8.6	57.8								
M 09	315 40.6	. . 11.5	271 54.3	9.8	13 16.6	8.5	57.8								
O 10	330 40.8	10.5	286 23.1	9.8	13 25.1	8.5	57.8								
N 11	345 41.0	09.6	300 51.9	9.7	13 33.6	8.4	57.9								
D 12	0 41.3	N 5 08.6	315 20.6	9.7	S13 42.0	8.3	57.9								
A 13	15 41.5	07.7	329 49.3	9.5	13 50.3	8.3	57.9								
Y 14	30 41.7	06.7	344 17.8	9.6	13 58.6	8.1	57.9								
15	45 41.9	. . 05.8	358 46.4	9.4	14 06.7	8.1	57.9								
16	60 42.1	04.8	13 14.8	9.4	14 14.8	8.1	58.0								
17	75 42.3	03.9	27 43.2	9.4	14 22.9	7.9	58.0								
18	90 42.6	N 5 02.9	42 11.6	9.3	S14 30.8	7.9	58.0								
19	105 42.8	02.0	56 39.9	9.2	14 38.7	7.8	58.0								
20	120 43.0	01.1	71 08.1	9.2	14 46.5	7.7	58.0								
21	135 43.2	5 00.1	85 36.3	9.1	14 54.2	7.6	58.0								
22	150 43.4	4 59.2	100 04.4	9.0	15 01.8	7.5	58.1								
23	165 43.7	N 4 58.2	114 32.4	9.0	S15 09.3	7.5	58.1								
	SD 15.9	*d* 0.9	SD	15.5		15.6		15.8							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 7	Moonset 8	Moonset 9	Moonset 10
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 17	20 34	22 56	18 04	17 52	17 37	17 06
N 70	19 08	20 15	21 59	18 14	18 10	18 08	18 05
68	19 01	20 01	21 26	18 22	18 25	18 30	18 40
66	18 55	19 50	21 03	18 29	18 37	18 48	19 05
64	18 50	19 40	20 46	18 35	18 47	19 02	19 25
62	18 46	19 32	20 31	18 40	18 55	19 14	19 41
60	18 42	19 25	20 20	18 45	19 03	19 25	19 54
N 58	18 39	19 19	20 10	18 48	19 09	19 34	20 06
56	18 36	19 14	20 01	18 52	19 15	19 42	20 16
54	18 33	19 09	19 54	18 55	19 20	19 49	20 24
52	18 31	19 05	19 47	18 58	19 25	19 55	20 32
50	18 29	19 02	19 41	19 01	19 29	20 01	20 40
45	18 24	18 54	19 29	19 07	19 38	20 14	20 55
N 40	18 20	18 48	19 20	19 11	19 46	20 24	21 08
35	18 17	18 42	19 12	19 16	19 53	20 33	21 18
30	18 14	18 38	19 06	19 19	19 58	20 41	21 28
20	18 09	18 31	18 57	19 26	20 09	20 55	21 44
N 10	18 05	18 26	18 50	19 32	20 18	21 06	21 58
0	18 01	18 22	18 46	19 37	20 26	21 18	22 12
S 10	17 57	18 18	18 43	19 42	20 34	21 29	22 25
20	17 53	18 15	18 41	19 48	20 44	21 41	22 39
30	17 49	18 13	18 40	19 54	20 54	21 54	22 56
35	17 46	18 12	18 41	19 58	21 00	22 02	23 05
40	17 44	18 11	18 42	20 02	21 07	22 12	23 16
45	17 40	18 10	18 44	20 07	21 15	22 22	23 29
S 50	17 37	18 09	18 46	20 13	21 24	22 35	23 45
52	17 35	18 09	18 48	20 16	21 28	22 41	23 52
54	17 33	18 09	18 49	20 19	21 33	22 48	24 00
56	17 31	18 08	18 51	20 22	21 39	22 55	24 09
58	17 29	18 08	18 54	20 26	21 45	23 04	24 20
S 60	17 26	18 08	18 56	20 30	21 52	23 13	24 32

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
7	01 53	02 03	11 58	13 25	01 02	02	4
8	02 14	02 24	11 58	14 14	01 49	03	10
9	02 34	02 45	11 57	15 05	02 39	04	17

UT	ARIES	VENUS −4.1		MARS +1.6		JUPITER −2.1		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
10 00	349 11.6	142 55.5	S11 36.0	218 16.2	N19 15.3	242 24.1	N22 25.8	132 54.4	S12 02.8	Acamar	315 18.0	S40 14.8
01	4 14.1	157 55.3	37.2	233 17.1	14.9	257 26.1	25.8	147 56.6	02.9	Achernar	335 26.2	S57 09.8
02	19 16.5	172 55.0	38.4	248 17.9	14.5	272 28.1	25.7	162 58.9	02.9	Acrux	173 09.7	S63 10.6
03	34 19.0	187 54.8	. . 39.6	263 18.8	. . 14.1	287 30.2	. . 25.7	178 01.1	. . 03.0	Adhara	255 12.5	S28 59.4
04	49 21.4	202 54.6	40.8	278 19.6	13.7	302 32.2	25.6	193 03.4	03.1	Aldebaran	290 49.1	N16 32.1
05	64 23.9	217 54.3	42.0	293 20.5	13.3	317 34.3	25.6	208 05.6	03.2			
06	79 26.4	232 54.1	S11 43.1	308 21.3	N19 13.0	332 36.3	N22 25.6	223 07.9	S12 03.3	Alioth	166 21.1	N55 53.3
07	94 28.8	247 53.8	44.3	323 22.2	12.6	347 38.3	25.5	238 10.1	03.3	Alkaid	152 59.2	N49 14.9
08	109 31.3	262 53.6	45.5	338 23.0	12.2	2 40.4	25.5	253 12.4	03.4	Al Na'ir	27 43.1	S46 53.5
09	124 33.8	277 53.4	. . 46.7	353 23.9	. . 11.8	17 42.4	. . 25.4	268 14.6	. . 03.5	Alnilam	275 46.2	S 1 11.6
10	139 36.2	292 53.1	47.9	8 24.7	11.4	32 44.5	25.4	283 16.9	03.6	Alphard	217 56.2	S 8 43.1
11	154 38.7	307 52.9	49.1	23 25.5	11.0	47 46.5	25.4	298 19.1	03.7			
12	169 41.2	322 52.7	S11 50.2	38 26.4	N19 10.6	62 48.6	N22 25.3	313 21.4	S12 03.7	Alphecca	126 11.0	N26 40.4
13	184 43.6	337 52.4	51.4	53 27.2	10.2	77 50.6	25.3	328 23.6	03.8	Alpheratz	357 42.9	N29 10.1
14	199 46.1	352 52.2	52.6	68 28.1	09.8	92 52.6	25.2	343 25.8	03.9	Altair	62 07.9	N 8 54.6
15	214 48.6	7 51.9	. . 53.8	83 28.9	. . 09.4	107 54.7	. . 25.2	358 28.1	. . 04.0	Ankaa	353 15.1	S42 13.7
16	229 51.0	22 51.7	55.0	98 29.8	09.0	122 56.7	25.2	13 30.3	04.1	Antares	112 26.1	S26 27.6
17	244 53.5	37 51.5	56.1	113 30.6	08.7	137 58.8	25.1	28 32.6	04.1			
18	259 55.9	52 51.2	S11 57.3	128 31.5	N19 08.3	153 00.8	N22 25.1	43 34.8	S12 04.2	Arcturus	145 55.8	N19 06.9
19	274 58.4	67 51.0	58.5	143 32.4	07.9	168 02.9	25.0	58 37.1	04.3	Atria	107 27.8	S69 03.2
20	290 00.9	82 50.7	11 59.7	158 33.2	07.5	183 04.9	25.0	73 39.3	04.4	Avior	234 18.4	S59 33.1
21	305 03.3	97 50.5	12 00.9	173 34.1	. . 07.1	198 07.0	. . 24.9	88 41.6	. . 04.5	Bellatrix	278 31.8	N 6 21.7
22	320 05.8	112 50.3	02.0	188 34.9	06.7	213 09.0	24.9	103 43.8	04.5	Betelgeuse	271 01.2	N 7 24.5
23	335 08.3	127 50.0	03.2	203 35.8	06.3	228 11.0	24.9	118 46.1	04.6			
11 00	350 10.7	142 49.8	S12 04.4	218 36.6	N19 05.9	243 13.1	N22 24.8	133 48.3	S12 04.7	Canopus	263 56.2	S52 42.0
01	5 13.2	157 49.5	05.6	233 37.5	05.5	258 15.1	24.8	148 50.6	04.8	Capella	280 34.2	N46 00.4
02	20 15.7	172 49.3	06.8	248 38.3	05.1	273 17.2	24.7	163 52.8	04.9	Deneb	49 31.0	N45 20.2
03	35 18.1	187 49.0	. . 07.9	263 39.2	. . 04.7	288 19.2	. . 24.7	178 55.0	. . 04.9	Denebola	182 33.8	N14 29.8
04	50 20.6	202 48.8	09.1	278 40.0	04.3	303 21.3	24.7	193 57.3	05.0	Diphda	348 55.4	S17 54.5
05	65 23.1	217 48.6	10.3	293 40.9	03.9	318 23.3	24.6	208 59.5	05.1			
06	80 25.5	232 48.3	S12 11.5	308 41.7	N19 03.5	333 25.4	N22 24.6	224 01.8	S12 05.2	Dubhe	193 52.2	N61 40.6
07	95 28.0	247 48.1	12.6	323 42.6	03.2	348 27.4	24.5	239 04.0	05.3	Elnath	278 12.4	N28 36.9
08	110 30.4	262 47.8	13.8	338 43.4	02.8	3 29.5	24.5	254 06.3	05.3	Eltanin	90 46.0	N51 29.7
09	125 32.9	277 47.6	. . 15.0	353 44.3	. . 02.4	18 31.5	. . 24.4	269 08.5	. . 05.4	Enif	33 46.6	N 9 56.6
10	140 35.4	292 47.3	16.2	8 45.1	02.0	33 33.6	24.4	284 10.8	05.5	Fomalhaut	15 23.4	S29 32.8
11	155 37.8	307 47.1	17.3	23 46.0	01.6	48 35.6	24.4	299 13.0	05.6			
12	170 40.3	322 46.8	S12 18.5	38 46.8	N19 01.2	63 37.7	N22 24.3	314 15.3	S12 05.7	Gacrux	172 01.2	S57 11.5
13	185 42.8	337 46.6	19.7	53 47.7	00.8	78 39.7	24.3	329 17.5	05.8	Gienah	175 52.4	S17 37.0
14	200 45.2	352 46.4	20.8	68 48.6	00.4	93 41.8	24.2	344 19.7	05.8	Hadar	148 48.0	S60 26.4
15	215 47.7	7 46.1	. . 22.0	83 49.4	19 00.0	108 43.8	. . 24.2	359 22.0	. . 05.9	Hamal	328 00.3	N23 31.6
16	230 50.2	22 45.9	23.2	98 50.3	18 59.6	123 45.9	24.2	14 24.2	06.0	Kaus Aust.	83 43.5	S34 22.6
17	245 52.6	37 45.6	24.4	113 51.1	59.2	138 47.9	24.1	29 26.5	06.1			
18	260 55.1	52 45.4	S12 25.5	128 52.0	N18 58.8	153 50.0	N22 24.1	44 28.7	S12 06.2	Kochab	137 20.8	N74 06.3
19	275 57.5	67 45.1	26.7	143 52.8	58.4	168 52.0	24.0	59 31.0	06.2	Markab	13 37.8	N15 17.0
20	291 00.0	82 44.9	27.9	158 53.7	58.0	183 54.1	24.0	74 33.2	06.3	Menkar	314 14.7	N 4 08.7
21	306 02.5	97 44.6	. . 29.0	173 54.5	. . 57.6	198 56.1	. . 24.0	89 35.5	. . 06.4	Menkent	148 07.6	S36 26.2
22	321 04.9	112 44.4	30.2	188 55.4	57.2	213 58.2	23.9	104 37.7	06.5	Miaplacidus	221 40.3	S69 46.4
23	336 07.4	127 44.1	31.4	203 56.3	56.8	229 00.2	23.9	119 39.9	06.6			
12 00	351 09.9	142 43.9	S12 32.5	218 57.1	N18 56.4	244 02.3	N22 23.8	134 42.2	S12 06.6	Mirfak	308 39.8	N49 54.4
01	6 12.3	157 43.6	33.7	233 58.0	56.0	259 04.3	23.8	149 44.4	06.7	Nunki	75 57.9	S26 16.6
02	21 14.8	172 43.4	34.9	248 58.8	55.6	274 06.4	23.7	164 46.7	06.8	Peacock	53 18.6	S56 41.4
03	36 17.3	187 43.1	. . 36.0	263 59.7	. . 55.2	289 08.4	. . 23.7	179 48.9	. . 06.9	Pollux	243 27.7	N27 59.4
04	51 19.7	202 42.9	37.2	279 00.6	54.8	304 10.5	23.7	194 51.2	07.0	Procyon	244 59.7	N 5 11.3
05	66 22.2	217 42.7	38.4	294 01.4	54.4	319 12.5	23.6	209 53.4	07.0			
06	81 24.7	232 42.4	S12 39.5	309 02.3	N18 54.0	334 14.6	N22 23.6	224 55.6	S12 07.1	Rasalhague	96 06.3	N12 33.4
07	96 27.1	247 42.2	40.7	324 03.1	53.6	349 16.6	23.5	239 57.9	07.2	Regulus	207 43.6	N11 54.0
08	111 29.6	262 41.9	41.9	339 04.0	53.2	4 18.7	23.5	255 00.1	07.3	Rigel	281 11.9	S 8 11.1
09	126 32.0	277 41.7	. . 43.0	354 04.8	. . 52.8	19 20.7	. . 23.5	270 02.4	. . 07.4	Rigil Kent.	139 51.8	S60 53.6
10	141 34.5	292 41.4	44.2	9 05.7	52.4	34 22.8	23.4	285 04.6	07.4	Sabik	102 12.3	S15 44.3
11	156 37.0	307 41.2	45.3	24 06.6	52.0	49 24.8	23.4	300 06.9	07.5			
12	171 39.4	322 40.9	S12 46.5	39 07.4	N18 51.6	64 26.9	N22 23.3	315 09.1	S12 07.6	Schedar	349 39.7	N56 36.8
13	186 41.9	337 40.7	47.7	54 08.3	51.2	79 28.9	23.3	330 11.3	07.7	Shaula	96 21.6	S37 06.7
14	201 44.4	352 40.4	48.8	69 09.1	50.8	94 31.0	23.3	345 13.6	07.8	Sirius	258 33.7	S16 44.1
15	216 46.8	7 40.2	. . 50.0	84 10.0	. . 50.4	109 33.1	. . 23.2	0 15.8	. . 07.9	Spica	158 31.3	S11 13.9
16	231 49.3	22 39.9	51.1	99 10.9	50.0	124 35.1	23.2	15 18.1	07.9	Suhail	222 52.7	S43 29.2
17	246 51.8	37 39.6	52.3	114 11.7	49.6	139 37.2	23.1	30 20.3	08.0			
18	261 54.2	52 39.4	S12 53.5	129 12.6	N18 49.2	154 39.2	N22 23.1	45 22.5	S12 08.1	Vega	80 38.7	N38 48.2
19	276 56.7	67 39.1	54.6	144 13.4	48.8	169 41.3	23.1	60 24.8	08.2	Zuben'ubi	137 05.4	S16 05.8
20	291 59.2	82 38.9	55.8	159 14.3	48.4	184 43.3	23.0	75 27.0	08.3		SHA	Mer. Pass.
21	307 01.6	97 38.6	. . 56.9	174 15.2	. . 48.0	199 45.4	. . 23.0	90 29.3	. . 08.3		° ′	h m
22	322 04.1	112 38.4	58.1	189 16.0	47.6	214 47.4	22.9	105 31.5	08.4	Venus	152 39.0	14 29
23	337 06.5	127 38.1	59.3	204 16.9	47.2	229 49.5	22.9	120 33.8	08.5	Mars	228 25.9	9 25
	h m									Jupiter	253 02.4	7 46
Mer. Pass.	0 39.2	v −0.2	d 1.2	v 0.9	d 0.4	v 2.0	d 0.0	v 2.2	d 0.1	Saturn	143 37.6	15 03

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 10	Moonrise 11	Moonrise 12	Moonrise 13
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
10 00	180 43.9	N 4 57.3	129 00.4	8.9	S15 16.8	7.4	58.1	N 72	01 29	03 34	04 49	14 40	▬	▬	▬
01	195 44.1	56.3	143 28.3	8.9	15 24.2	7.3	58.1	N 70	02 13	03 50	04 57	13 42	15 38	17 20	17 43
02	210 44.3	55.4	157 56.2	8.8	15 31.5	7.2	58.1	68	02 41	04 03	05 03	13 08	14 44	16 01	16 46
03	225 44.5	. . 54.4	172 24.0	8.7	15 38.7	7.1	58.2	66	03 02	04 14	05 08	12 43	14 11	15 23	16 12
04	240 44.7	53.5	186 51.7	8.7	15 45.8	7.0	58.2	64	03 18	04 22	05 12	12 24	13 47	14 56	15 48
05	255 45.0	52.5	201 19.4	8.6	15 52.8	7.0	58.2	62	03 31	04 29	05 15	12 09	13 28	14 35	15 28
06	270 45.2	N 4 51.6	215 47.0	8.6	S15 59.8	6.8	58.2	60	03 42	04 36	05 19	11 56	13 12	14 18	15 12
07	285 45.4	50.6	230 14.6	8.5	16 06.6	6.8	58.2	N 58	03 51	04 41	05 21	11 45	12 59	14 04	14 59
08	300 45.6	49.7	244 42.1	8.5	16 13.4	6.7	58.2	56	03 59	04 46	05 24	11 35	12 47	13 52	14 47
09	315 45.8	. . 48.7	259 09.6	8.4	16 20.1	6.5	58.3	54	04 06	04 50	05 26	11 27	12 37	13 42	14 37
10	330 46.0	47.8	273 37.0	8.3	16 26.6	6.5	58.3	52	04 12	04 54	05 28	11 19	12 28	13 32	14 28
11	345 46.3	46.8	288 04.3	8.3	16 33.1	6.4	58.3	50	04 18	04 57	05 30	11 12	12 20	13 24	14 20
12	0 46.5	N 4 45.9	302 31.6	8.2	S16 39.5	6.3	58.3	45	04 29	05 04	05 34	10 58	12 04	13 06	14 02
13	15 46.7	44.9	316 58.8	8.1	16 45.8	6.2	58.3	N 40	04 38	05 10	05 37	10 46	11 50	12 51	13 48
14	30 46.9	44.0	331 25.9	8.1	16 52.0	6.1	58.4	35	04 44	05 14	05 40	10 35	11 38	12 39	13 36
15	45 47.1	. . 43.0	345 53.0	8.1	16 58.1	6.0	58.4	30	04 50	05 18	05 42	10 27	11 28	12 28	13 25
16	60 47.4	42.1	0 20.1	8.0	17 04.1	5.9	58.4	20	04 59	05 24	05 47	10 11	11 10	12 09	13 07
17	75 47.6	41.2	14 47.1	7.9	17 10.0	5.8	58.4	N 10	05 04	05 29	05 50	09 58	10 55	11 53	12 51
18	90 47.8	N 4 40.2	29 14.0	7.9	S17 15.8	5.7	58.4	0	05 09	05 33	05 53	09 46	10 41	11 38	12 37
19	105 48.0	39.3	43 40.9	7.8	17 21.5	5.6	58.4	S 10	05 11	05 35	05 56	09 33	10 27	11 23	12 22
20	120 48.2	38.3	58 07.7	7.7	17 27.1	5.5	58.5	20	05 12	05 38	06 00	09 20	10 12	11 07	12 06
21	135 48.5	. . 37.4	72 34.4	7.8	17 32.6	5.4	58.5	30	05 12	05 39	06 03	09 05	09 55	10 49	11 48
22	150 48.7	36.4	87 01.2	7.6	17 38.0	5.3	58.5	35	05 11	05 40	06 05	08 57	09 45	10 38	11 38
23	165 48.9	35.5	101 27.8	7.6	17 43.3	5.1	58.5	40	05 09	05 40	06 07	08 47	09 33	10 26	11 26
11 00	180 49.1	N 4 34.5	115 54.4	7.6	S17 48.4	5.1	58.5	45	05 07	05 41	06 10	08 35	09 20	10 12	11 11
01	195 49.3	33.6	130 21.0	7.5	17 53.5	5.0	58.5	S 50	05 03	05 41	06 13	08 22	09 04	09 54	10 54
02	210 49.6	32.6	144 47.5	7.4	17 58.5	4.8	58.6	52	05 02	05 41	06 14	08 15	08 56	09 46	10 46
03	225 49.8	. . 31.7	159 13.9	7.4	18 03.3	4.8	58.6	54	05 00	05 40	06 16	08 08	08 48	09 37	10 37
04	240 50.0	30.7	173 40.3	7.3	18 08.1	4.6	58.6	56	04 57	05 40	06 17	08 00	08 38	09 27	10 26
05	255 50.2	29.7	188 06.6	7.3	18 12.7	4.5	58.6	58	04 55	05 40	06 19	07 51	08 27	09 15	10 15
06	270 50.4	N 4 28.8	202 32.9	7.3	S18 17.2	4.4	58.6	S 60	04 51	05 40	06 21	07 41	08 15	09 01	10 01
07	285 50.6	27.8	216 59.2	7.2	18 21.6	4.4	58.6								
08	300 50.9	26.9	231 25.4	7.1	18 26.0	4.1	58.7								
09	315 51.1	. . 25.9	245 51.5	7.1	18 30.1	4.1	58.7								
10	330 51.3	25.0	260 17.6	7.0	18 34.2	4.0	58.7								
11	345 51.5	24.0	274 43.6	7.0	18 38.2	3.8	58.7								
12	0 51.7	N 4 23.1	289 09.6	7.0	S18 42.0	3.8	58.7								
13	15 52.0	22.1	303 35.6	6.9	18 45.8	3.6	58.7								
14	30 52.2	21.2	318 01.5	6.9	18 49.4	3.5	58.8								
15	45 52.4	. . 20.2	332 27.4	6.8	18 52.9	3.3	58.8								
16	60 52.6	19.3	346 53.2	6.8	18 56.2	3.3	58.8								
17	75 52.8	18.3	1 19.0	6.7	18 59.5	3.2	58.8								
18	90 53.1	N 4 17.4	15 44.7	6.7	S19 02.7	3.0	58.8								
19	105 53.3	16.4	30 10.4	6.7	19 05.7	2.9	58.8								
20	120 53.5	15.5	44 36.1	6.6	19 08.6	2.8	58.8								
21	135 53.7	. . 14.5	59 01.7	6.6	19 11.4	2.6	58.9								
22	150 53.9	13.6	73 27.3	6.5	19 14.0	2.6	58.9								
23	165 54.2	12.6	87 52.8	6.5	19 16.6	2.4	58.9								
12 00	180 54.4	N 4 11.7	102 18.3	6.5	S19 19.0	2.3	58.9								
01	195 54.6	10.7	116 43.8	6.4	19 21.3	2.1	58.9								
02	210 54.8	09.8	131 09.2	6.4	19 23.4	2.1	58.9								
03	225 55.0	. . 08.8	145 34.6	6.4	19 25.5	1.9	58.9								
04	240 55.3	07.8	160 00.0	6.3	19 27.4	1.8	59.0								
05	255 55.5	06.9	174 25.3	6.3	19 29.2	1.7	59.0								
06	270 55.7	N 4 05.9	188 50.6	6.3	S19 30.9	1.5	59.0								
07	285 55.9	05.0	203 15.9	6.3	19 32.4	1.4	59.0								
08	300 56.2	04.0	217 41.2	6.2	19 33.8	1.3	59.0								
09	315 56.4	. . 03.1	232 06.4	6.2	19 35.1	1.2	59.0								
10	330 56.6	02.1	246 31.6	6.2	19 36.3	1.0	59.1								
11	345 56.8	01.2	260 56.8	6.1	19 37.3	0.9	59.1								
12	0 57.0	N 4 00.2	275 21.9	6.1	S19 38.2	0.8	59.1								
13	15 57.3	3 59.3	289 47.0	6.1	19 39.0	0.7	59.1								
14	30 57.5	58.3	304 12.1	6.1	19 39.7	0.5	59.1								
15	45 57.7	. . 57.3	318 37.2	6.0	19 40.2	0.4	59.1								
16	60 57.9	56.4	333 02.2	6.1	19 40.6	0.2	59.1								
17	75 58.1	55.4	347 27.3	6.0	19 40.8	0.2	59.1								
18	90 58.4	N 3 54.5	1 52.3	6.0	S19 41.0	0.0	59.2								
19	105 58.6	53.5	16 17.3	6.0	19 41.0	0.1	59.2								
20	120 58.8	52.6	30 42.3	5.9	19 40.9	0.3	59.2								
21	135 59.0	. . 51.6	45 07.2	6.0	19 40.6	0.4	59.2								
22	150 59.3	50.7	59 32.2	5.9	19 40.2	0.5	59.2								
23	165 59.5	49.7	73 57.1	6.0	S19 39.7	0.6	59.2								
	SD 15.9	d 1.0	SD	15.9	16.0		16.1								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 10	Moonset 11	Moonset 12	Moonset 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	19 01	20 15	22 14	17 06	▬	▬	▬
N 70	18 54	19 59	21 34	18 05	18 05	18 24	20 04
68	18 48	19 47	21 07	18 40	19 00	19 44	21 00
66	18 44	19 37	20 48	19 05	19 34	20 22	21 33
64	18 39	19 29	20 32	19 25	19 58	20 48	21 58
62	18 36	19 22	20 19	19 41	20 17	21 09	22 17
60	18 33	19 16	20 09	19 54	20 33	21 26	22 33
N 58	18 30	19 10	20 00	20 06	20 47	21 40	22 46
56	18 28	19 06	19 52	20 16	20 58	21 52	22 58
54	18 26	19 02	19 45	20 24	21 08	22 03	23 08
52	18 24	18 58	19 39	20 32	21 18	22 12	23 17
50	18 22	18 55	19 34	20 40	21 26	22 21	23 25
45	18 18	18 48	19 23	20 55	21 43	22 39	23 42
N 40	18 15	18 43	19 15	21 08	21 57	22 53	23 55
35	18 13	18 38	19 08	21 18	22 09	23 06	24 07
30	18 10	18 34	19 02	21 28	22 20	23 16	24 17
20	18 06	18 28	18 54	21 44	22 38	23 35	24 35
N 10	18 03	18 24	18 48	21 58	22 53	23 51	24 50
0	18 00	18 21	18 45	22 12	23 08	24 06	00 06
S 10	17 57	18 18	18 42	22 25	23 23	24 21	00 21
20	17 54	18 16	18 41	22 39	23 39	24 37	00 37
30	17 50	18 14	18 42	22 56	23 57	24 55	00 55
35	17 49	18 14	18 43	23 05	24 07	00 07	01 06
40	17 46	18 13	18 45	23 16	24 19	00 19	01 18
45	17 44	18 13	18 47	23 29	24 33	00 33	01 33
S 50	17 41	18 13	18 51	23 45	24 51	00 51	01 50
52	17 40	18 14	18 53	23 52	24 59	00 59	01 59
54	17 38	18 14	18 55	24 00	00 00	01 08	02 08
56	17 37	18 14	18 57	24 09	00 09	01 18	02 18
58	17 35	18 14	19 00	24 20	00 20	01 30	02 30
S 60	17 33	18 15	19 03	24 32	00 32	01 43	02 44

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
10	02 55	03 06	11 57	15 59	03 32	05	26
11	03 16	03 27	11 57	16 55	04 26	06	37
12	03 37	03 48	11 56	17 52	05 23	07	48

UT	ARIES	VENUS −4.1		MARS +1.6		JUPITER −2.1		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
13 00	352 09.0	142 37.9	S13 00.4	219 17.8	N18 46.8	244 51.6	N22 22.8	135 36.0	S12 08.6	Acamar	315 18.0	S40 14.8
01	7 11.5	157 37.6	01.6	234 18.6	46.4	259 53.6	22.8	150 38.2	08.7	Achernar	335 26.2	S57 09.8
02	22 13.9	172 37.4	02.7	249 19.5	46.0	274 55.7	22.8	165 40.5	08.7	Acrux	173 09.7	S63 10.6
03	37 16.4	187 37.1	. . 03.9	264 20.3	. . 45.6	289 57.7	. . 22.7	180 42.7	. . 08.8	Adhara	255 12.5	S28 59.4
04	52 18.9	202 36.9	05.0	279 21.2	45.2	304 59.8	22.7	195 45.0	08.9	Aldebaran	290 49.1	N16 32.1
05	67 21.3	217 36.6	06.2	294 22.1	44.8	320 01.8	22.6	210 47.2	09.0			
06	82 23.8	232 36.4	S13 07.3	309 22.9	N18 44.4	335 03.9	N22 22.6	225 49.4	S12 09.1	Alioth	166 21.1	N55 53.3
07	97 26.3	247 36.1	08.5	324 23.8	44.0	350 06.0	22.6	240 51.7	09.2	Alkaid	152 59.2	N49 14.9
08	112 28.7	262 35.8	09.6	339 24.7	43.6	5 08.0	22.5	255 53.9	09.2	Al Na'ir	27 43.1	S46 53.5
F 09	127 31.2	277 35.6	. . 10.8	354 25.5	. . 43.2	20 10.1	. . 22.5	270 56.2	. . 09.3	Alnilam	275 46.2	S 1 11.6
R 10	142 33.7	292 35.3	11.9	9 26.4	42.8	35 12.1	22.4	285 58.4	09.4	Alphard	217 56.2	S 8 43.1
I 11	157 36.1	307 35.1	13.1	24 27.3	42.4	50 14.2	22.4	301 00.6	09.5			
D 12	172 38.6	322 34.8	S13 14.2	39 28.1	N18 42.0	65 16.2	N22 22.4	316 02.9	S12 09.6	Alphecca	126 11.0	N26 40.4
A 13	187 41.0	337 34.6	15.4	54 29.0	41.6	80 18.3	22.3	331 05.1	09.6	Alpheratz	357 42.9	N29 10.1
Y 14	202 43.5	352 34.3	16.5	69 29.9	41.2	95 20.4	22.3	346 07.4	09.7	Altair	62 07.9	N 8 54.6
15	217 46.0	7 34.1	. . 17.7	84 30.7	. . 40.8	110 22.4	. . 22.2	1 09.6	. . 09.8	Ankaa	353 15.1	S42 13.7
16	232 48.4	22 33.8	18.8	99 31.6	40.4	125 24.5	22.2	16 11.8	09.9	Antares	112 26.1	S26 27.6
17	247 50.9	37 33.5	20.0	114 32.5	40.0	140 26.5	22.1	31 14.1	10.0			
18	262 53.4	52 33.3	S13 21.1	129 33.3	N18 39.6	155 28.6	N22 22.1	46 16.3	S12 10.1	Arcturus	145 55.8	N19 06.9
19	277 55.8	67 33.0	22.3	144 34.2	39.1	170 30.7	22.1	61 18.6	10.1	Atria	107 27.8	S69 03.2
20	292 58.3	82 32.8	23.4	159 35.1	38.7	185 32.7	22.0	76 20.8	10.2	Avior	234 18.3	S59 33.1
21	308 00.8	97 32.5	. . 24.6	174 35.9	. . 38.3	200 34.8	. . 22.0	91 23.0	. . 10.3	Bellatrix	278 31.8	N 6 21.7
22	323 03.2	112 32.3	25.7	189 36.8	37.9	215 36.8	21.9	106 25.3	10.4	Betelgeuse	271 01.1	N 7 24.5
23	338 05.7	127 32.0	26.9	204 37.7	37.5	230 38.9	21.9	121 27.5	10.5			
14 00	353 08.1	142 31.7	S13 28.0	219 38.5	N18 37.1	245 41.0	N22 21.9	136 29.8	S12 10.5	Canopus	263 56.2	S52 42.0
01	8 10.6	157 31.5	29.2	234 39.4	36.7	260 43.0	21.8	151 32.0	10.6	Capella	280 34.1	N46 00.4
02	23 13.1	172 31.2	30.3	249 40.3	36.3	275 45.1	21.8	166 34.2	10.7	Deneb	49 31.0	N45 20.2
03	38 15.5	187 31.0	. . 31.4	264 41.1	. . 35.9	290 47.2	. . 21.7	181 36.5	. . 10.8	Denebola	182 33.8	N14 29.8
04	53 18.0	202 30.7	32.6	279 42.0	35.5	305 49.2	21.7	196 38.7	10.9	Diphda	348 55.4	S17 54.5
05	68 20.5	217 30.4	33.7	294 42.9	35.1	320 51.3	21.7	211 40.9	11.0			
06	83 22.9	232 30.2	S13 34.9	309 43.7	N18 34.7	335 53.3	N22 21.6	226 43.2	S12 11.0	Dubhe	193 52.2	N61 40.5
S 07	98 25.4	247 29.9	36.0	324 44.6	34.3	350 55.4	21.6	241 45.4	11.1	Elnath	278 12.4	N28 36.9
A 08	113 27.9	262 29.7	37.2	339 45.5	33.9	5 57.5	21.5	256 47.7	11.2	Eltanin	90 46.0	N51 29.7
T 09	128 30.3	277 29.4	. . 38.3	354 46.3	. . 33.4	20 59.5	. . 21.5	271 49.9	. . 11.3	Enif	33 46.6	N 9 56.6
U 10	143 32.8	292 29.1	39.4	9 47.2	33.0	36 01.6	21.5	286 52.1	11.4	Fomalhaut	15 23.4	S29 32.8
R 11	158 35.3	307 28.9	40.6	24 48.1	32.6	51 03.7	21.4	301 54.4	11.4			
D 12	173 37.7	322 28.6	S13 41.7	39 48.9	N18 32.2	66 05.7	N22 21.4	316 56.6	S12 11.5	Gacrux	172 01.2	S57 11.4
A 13	188 40.2	337 28.3	42.9	54 49.8	31.8	81 07.8	21.3	331 58.8	11.6	Gienah	175 52.4	S17 37.0
Y 14	203 42.6	352 28.1	44.0	69 50.7	31.4	96 09.9	21.3	347 01.1	11.7	Hadar	148 48.0	S60 26.4
15	218 45.1	7 27.8	. . 45.1	84 51.6	. . 31.0	111 11.9	. . 21.3	2 03.3	. . 11.8	Hamal	328 00.3	N23 31.6
16	233 47.6	22 27.6	46.3	99 52.4	30.6	126 14.0	21.2	17 05.6	11.9	Kaus Aust.	83 43.5	S34 22.6
17	248 50.0	37 27.3	47.4	114 53.3	30.2	141 16.1	21.2	32 07.8	11.9			
18	263 52.5	52 27.0	S13 48.5	129 54.2	N18 29.8	156 18.1	N22 21.1	47 10.0	S12 12.0	Kochab	137 20.8	N74 06.3
19	278 55.0	67 26.8	49.7	144 55.0	29.3	171 20.2	21.1	62 12.3	12.1	Markab	13 37.8	N15 17.0
20	293 57.4	82 26.5	50.8	159 55.9	28.9	186 22.3	21.0	77 14.5	12.2	Menkar	314 14.7	N 4 08.7
21	308 59.9	97 26.2	. . 51.9	174 56.8	. . 28.5	201 24.3	. . 21.0	92 16.7	. . 12.3	Menkent	148 07.6	S36 26.2
22	324 02.4	112 26.0	53.1	189 57.7	28.1	216 26.4	21.0	107 19.0	12.4	Miaplacidus	221 40.3	S69 46.3
23	339 04.8	127 25.7	54.2	204 58.5	27.7	231 28.5	20.9	122 21.2	12.4			
15 00	354 07.3	142 25.4	S13 55.3	219 59.4	N18 27.3	246 30.5	N22 20.9	137 23.5	S12 12.5	Mirfak	308 39.8	N49 54.4
01	9 09.8	157 25.2	56.5	235 00.3	26.9	261 32.6	20.8	152 25.7	12.6	Nunki	75 58.0	S26 16.6
02	24 12.2	172 24.9	57.6	250 01.2	26.5	276 34.7	20.8	167 27.9	12.7	Peacock	53 18.6	S56 41.4
03	39 14.7	187 24.6	. . 58.7	265 02.0	. . 26.1	291 36.7	. . 20.8	182 30.2	. . 12.8	Pollux	243 27.7	N27 59.4
04	54 17.1	202 24.4	13 59.9	280 02.9	25.6	306 38.8	20.7	197 32.4	12.8	Procyon	244 59.7	N 5 11.3
05	69 19.6	217 24.1	14 01.0	295 03.8	25.2	321 40.9	20.7	212 34.6	12.9			
06	84 22.1	232 23.8	S14 02.1	310 04.6	N18 24.8	336 42.9	N22 20.6	227 36.9	S12 13.0	Rasalhague	96 06.3	N12 33.4
07	99 24.5	247 23.6	03.3	325 05.5	24.4	351 45.0	20.6	242 39.1	13.1	Regulus	207 43.6	N11 54.0
08	114 27.0	262 23.3	04.4	340 06.4	24.0	6 47.1	20.6	257 41.3	13.2	Rigel	281 11.9	S 8 11.1
S 09	129 29.5	277 23.0	. . 05.5	355 07.3	. . 23.6	21 49.1	. . 20.5	272 43.6	. . 13.3	Rigil Kent.	139 51.9	S60 53.6
U 10	144 31.9	292 22.8	06.6	10 08.1	23.2	36 51.2	20.5	287 45.8	13.3	Sabik	102 12.3	S15 44.3
N 11	159 34.4	307 22.5	07.8	25 09.0	22.8	51 53.3	20.4	302 48.0	13.4			
D 12	174 36.9	322 22.2	S14 08.9	40 09.9	N18 22.3	66 55.4	N22 20.4	317 50.3	S12 13.5	Schedar	349 39.7	N56 36.8
A 13	189 39.3	337 22.0	10.0	55 10.8	21.9	81 57.4	20.4	332 52.5	13.6	Shaula	96 21.6	S37 06.7
Y 14	204 41.8	352 21.7	11.2	70 11.6	21.5	96 59.5	20.3	347 54.7	13.7	Sirius	258 33.7	S16 44.1
15	219 44.3	7 21.4	. . 12.3	85 12.5	. . 21.1	112 01.6	. . 20.3	2 57.0	. . 13.8	Spica	158 31.3	S11 13.9
16	234 46.7	22 21.2	13.4	100 13.4	20.7	127 03.6	20.2	17 59.2	13.8	Suhail	222 52.6	S43 29.2
17	249 49.2	37 20.9	14.5	115 14.3	20.3	142 05.7	20.2	33 01.5	13.9			
18	264 51.6	52 20.6	S14 15.6	130 15.2	N18 19.9	157 07.8	N22 20.2	48 03.7	S12 14.0	Vega	80 38.7	N38 48.2
19	279 54.1	67 20.4	16.8	145 16.0	19.4	172 09.8	20.1	63 05.9	14.1	Zuben'ubi	137 05.4	S16 05.8
20	294 56.6	82 20.1	17.9	160 16.9	19.0	187 11.9	20.1	78 08.2	14.2		SHA	Mer.Pass.
21	309 59.0	97 19.8	. . 19.0	175 17.8	. . 18.6	202 14.0	. . 20.0	93 10.4	. . 14.3		° ′	h m
22	325 01.5	112 19.5	20.1	190 18.7	18.2	217 16.1	20.0	108 12.6	14.3	Venus	149 23.6	14 30
23	340 04.0	127 19.3	21.3	205 19.5	17.8	232 18.1	20.0	123 14.9	14.4	Mars	226 30.4	9 21
	h m									Jupiter	252 32.8	7 36
Mer.Pass.	0 27.4	v −0.3	d 1.1	v 0.9	d 0.4	v 2.1	d 0.0	v 2.2	d 0.1	Saturn	143 21.6	14 52

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 13	14	15	16
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
13 00	180 59.7	N 3 48.7	88 22.1	5.9	S19 39.1	0.8	59.2	N 72	02 00	03 50	05 03	▬	18 43	18 11	17 55
01	195 59.9	47.8	102 47.0	5.9	19 38.3	0.9	59.2	N 70	02 34	04 04	05 09	17 43	17 43	17 41	17 38
02	211 00.1	46.8	117 11.9	5.9	19 37.4	1.0	59.3	68	02 57	04 15	05 13	16 46	17 08	17 19	17 24
03	226 00.4	. . 45.9	131 36.8	5.9	19 36.4	1.2	59.3	66	03 15	04 24	05 17	16 12	16 43	17 01	17 13
04	241 00.6	44.9	146 01.7	5.9	19 35.2	1.3	59.3	64	03 29	04 31	05 20	15 48	16 23	16 47	17 03
05	256 00.8	44.0	160 26.6	5.8	19 33.9	1.4	59.3	62	03 41	04 38	05 23	15 28	16 07	16 35	16 55
06	271 01.0	N 3 43.0	174 51.4	5.9	S19 32.5	1.6	59.3	60	03 51	04 43	05 26	15 12	15 53	16 24	16 48
07	286 01.2	42.0	189 16.3	5.9	19 30.9	1.6	59.3	N 58	03 59	04 48	05 28	14 59	15 42	16 15	16 42
08	301 01.5	41.1	203 41.2	5.9	19 29.3	1.8	59.3	56	04 06	04 52	05 30	14 47	15 32	16 07	16 36
F 09	316 01.7	. . 40.1	218 06.1	5.8	19 27.5	2.0	59.3	54	04 12	04 56	05 31	14 37	15 23	16 00	16 31
R 10	331 01.9	39.2	232 30.9	5.9	19 25.5	2.1	59.4	52	04 18	04 59	05 33	14 28	15 15	15 54	16 27
I 11	346 02.1	38.2	246 55.8	5.9	19 23.4	2.2	59.4	50	04 23	05 02	05 34	14 20	15 08	15 48	16 23
D 12	1 02.4	N 3 37.3	261 20.7	5.9	S19 21.2	2.3	59.4	45	04 33	05 08	05 37	14 02	14 52	15 36	16 14
A 13	16 02.6	36.3	275 45.6	5.9	19 18.9	2.4	59.4	N 40	04 41	05 13	05 40	13 48	14 39	15 25	16 06
Y 14	31 02.8	35.3	290 10.5	5.8	19 16.5	2.6	59.4	35	04 47	05 17	05 42	13 36	14 29	15 16	16 00
15	46 03.0	. . 34.4	304 35.3	5.9	19 13.9	2.8	59.4	30	04 52	05 20	05 44	13 25	14 19	15 08	15 54
16	61 03.2	33.4	319 00.2	5.9	19 11.1	2.8	59.4	20	04 59	05 25	05 47	13 07	14 03	14 55	15 44
17	76 03.5	32.5	333 25.1	5.9	19 08.3	3.0	59.4	N 10	05 04	05 29	05 50	12 51	13 48	14 43	15 35
18	91 03.7	N 3 31.5	347 50.0	6.0	S19 05.3	3.1	59.4	0	05 08	05 32	05 52	12 37	13 35	14 32	15 27
19	106 03.9	30.6	2 15.0	5.9	19 02.2	3.2	59.4	S 10	05 09	05 34	05 55	12 22	13 21	14 21	15 19
20	121 04.1	29.6	16 39.9	5.9	18 59.0	3.4	59.5	20	05 09	05 35	05 57	12 06	13 07	14 09	15 10
21	136 04.4	. . 28.6	31 04.8	6.0	18 55.6	3.4	59.5	30	05 08	05 36	05 59	11 48	12 51	13 55	15 00
22	151 04.6	27.7	45 29.8	5.9	18 52.2	3.7	59.5	35	05 06	05 36	06 01	11 38	12 41	13 47	14 55
23	166 04.8	26.7	59 54.7	6.0	18 48.5	3.7	59.5	40	05 04	05 35	06 02	11 26	12 30	13 38	14 48
14 00	181 05.0	N 3 25.8	74 19.7	6.0	S18 44.8	3.8	59.5	45	05 01	05 35	06 04	11 11	12 17	13 28	14 40
01	196 05.2	24.8	88 44.7	6.0	18 41.0	4.0	59.5	S 50	04 57	05 34	06 06	10 54	12 02	13 15	14 31
02	211 05.5	23.8	103 09.7	6.1	18 37.0	4.1	59.5	52	04 55	05 34	06 07	10 46	11 54	13 09	14 27
03	226 05.7	. . 22.9	117 34.8	6.0	18 32.9	4.3	59.5	54	04 52	05 33	06 08	10 37	11 46	13 02	14 22
04	241 05.9	21.9	131 59.8	6.1	18 28.6	4.3	59.5	56	04 49	05 32	06 09	10 26	11 37	12 55	14 17
05	256 06.1	21.0	146 24.9	6.1	18 24.3	4.5	59.5	58	04 46	05 32	06 11	10 15	11 26	12 46	14 11
06	271 06.4	N 3 20.0	160 50.0	6.1	S18 19.8	4.6	59.5	S 60	04 42	05 31	06 12	10 01	11 14	12 37	14 04
S 07	286 06.6	19.0	175 15.1	6.1	18 15.2	4.7	59.6								
A 08	301 06.8	18.1	189 40.2	6.2	18 10.5	4.9	59.6								
T 09	316 07.0	. . 17.1	204 05.4	6.1	18 05.6	5.0	59.6								
U 10	331 07.3	16.2	218 30.5	6.2	18 00.6	5.0	59.6								
R 11	346 07.5	15.2	232 55.7	6.3	17 55.6	5.3	59.6								
D 12	1 07.7	N 3 14.2	247 21.0	6.2	S17 50.3	5.3	59.6								
A 13	16 07.9	13.3	261 46.2	6.3	17 45.0	5.4	59.6								
Y 14	31 08.1	12.3	276 11.5	6.3	17 39.6	5.6	59.6								
15	46 08.4	. . 11.4	290 36.8	6.3	17 34.0	5.7	59.6								
16	61 08.6	10.4	305 02.1	6.4	17 28.3	5.8	59.6								
17	76 08.8	09.4	319 27.5	6.4	17 22.5	5.9	59.6								
18	91 09.0	N 3 08.5	333 52.9	6.4	S17 16.6	6.0	59.6								
19	106 09.3	07.5	348 18.3	6.5	17 10.6	6.1	59.6								
20	121 09.5	06.6	2 43.8	6.5	17 04.5	6.3	59.6								
21	136 09.7	. . 05.6	17 09.3	6.5	16 58.2	6.3	59.6								
22	151 09.9	04.6	31 34.8	6.6	16 51.9	6.5	59.6								
23	166 10.1	03.7	46 00.4	6.6	16 45.4	6.6	59.6								
15 00	181 10.4	N 3 02.7	60 26.0	6.6	S16 38.8	6.7	59.7								
01	196 10.6	01.8	74 51.6	6.7	16 32.1	6.8	59.7								
02	211 10.8	3 00.8	89 17.3	6.7	16 25.3	6.9	59.7								
03	226 11.0	2 59.8	103 43.0	6.7	16 18.4	7.0	59.7								
04	241 11.3	58.9	118 08.7	6.8	16 11.4	7.2	59.7								
05	256 11.5	57.9	132 34.5	6.8	16 04.2	7.2	59.7								
06	271 11.7	N 2 56.9	147 00.3	6.9	S15 57.0	7.3	59.7								
07	286 11.9	56.0	161 26.2	6.9	15 49.7	7.5	59.7								
08	301 12.2	55.0	175 52.1	6.9	15 42.2	7.5	59.7								
S 09	316 12.4	. . 54.1	190 18.0	7.0	15 34.7	7.6	59.7								
U 10	331 12.6	53.1	204 44.0	7.0	15 27.1	7.8	59.7								
N 11	346 12.8	52.1	219 10.0	7.0	15 19.3	7.8	59.7								
D 12	1 13.1	N 2 51.2	233 36.0	7.1	S15 11.5	7.9	59.7								
A 13	16 13.3	50.2	248 02.1	7.2	15 03.6	8.1	59.7								
Y 14	31 13.5	49.3	262 28.3	7.2	14 55.5	8.1	59.7								
15	46 13.7	. . 48.3	276 54.5	7.2	14 47.4	8.2	59.7								
16	61 13.9	47.3	291 20.7	7.2	14 39.2	8.4	59.7								
17	76 14.2	46.4	305 46.9	7.4	14 30.8	8.4	59.7								
18	91 14.4	N 2 45.4	320 13.3	7.3	S14 22.4	8.5	59.7								
19	106 14.6	44.4	334 39.6	7.4	14 13.9	8.6	59.7								
20	121 14.8	43.5	349 06.0	7.4	14 05.3	8.6	59.7								
21	136 15.1	. . 42.5	3 32.4	7.5	13 56.7	8.8	59.7								
22	151 15.3	41.5	17 58.9	7.5	13 47.9	8.9	59.7								
23	166 15.5	40.6	32 25.4	7.6	S13 39.0	8.9	59.7								
	SD 15.9	d 1.0	SD	16.2		16.2		16.3							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 13	14	15	16
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 45	19 57	21 44	▬	21 06	23 37	25 47
N 70	18 40	19 44	21 12	20 04	22 05	24 05	00 05
68	18 36	19 33	20 50	21 00	22 39	24 26	00 26
66	18 32	19 25	20 33	21 33	23 04	24 43	00 43
64	18 29	19 17	20 19	21 58	23 23	24 56	00 56
62	18 26	19 11	20 08	22 17	23 38	25 08	01 08
60	18 24	19 06	19 58	22 33	23 52	25 17	01 17
N 58	18 22	19 02	19 50	22 46	24 03	00 03	01 26
56	18 20	18 58	19 43	22 58	24 12	00 12	01 33
54	18 18	18 54	19 37	23 08	24 21	00 21	01 39
52	18 17	18 51	19 32	23 17	24 29	00 29	01 45
50	18 16	18 48	19 27	23 25	24 35	00 35	01 51
45	18 13	18 42	19 17	23 42	24 50	00 50	02 02
N 40	18 10	18 37	19 09	23 55	25 02	01 02	02 11
35	18 08	18 34	19 03	24 07	00 07	01 12	02 19
30	18 07	18 30	18 59	24 17	00 17	01 21	02 26
20	18 04	18 26	18 51	24 35	00 35	01 37	02 38
N 10	18 01	18 22	18 46	24 50	00 50	01 50	02 49
0	17 59	18 19	18 43	00 06	01 05	02 02	02 59
S 10	17 57	18 18	18 42	00 21	01 19	02 15	03 08
20	17 54	18 16	18 42	00 37	01 34	02 28	03 18
30	17 52	18 16	18 44	00 55	01 51	02 43	03 30
35	17 51	18 16	18 45	01 06	02 01	02 51	03 37
40	17 49	18 16	18 48	01 18	02 13	03 01	03 44
45	17 48	18 17	18 51	01 33	02 26	03 13	03 53
S 50	17 46	18 18	18 55	01 50	02 42	03 26	04 04
52	17 45	18 18	18 58	01 59	02 50	03 33	04 09
54	17 44	18 19	19 00	02 08	02 58	03 40	04 14
56	17 43	18 20	19 03	02 18	03 08	03 48	04 20
58	17 42	18 21	19 07	02 30	03 19	03 57	04 27
S 60	17 40	18 22	19 11	02 44	03 31	04 07	04 34

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
13	03 58	04 09	11 56	18 51	06 21	08	59
14	04 20	04 30	11 55	19 49	07 20	09	70
15	04 41	04 52	11 55	20 45	08 17	10	80

UT	ARIES	VENUS −4.1		MARS +1.6		JUPITER −2.1		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
16 00	355 06.4	142 19.0	S14 22.4	220 20.4	N18 17.4	247 20.2	N22 19.9	138 17.1	S12 14.5
01	10 08.9	157 18.7	23.5	235 21.3	17.0	262 22.3	19.9	153 19.3	14.6
02	25 11.4	172 18.5	24.6	250 22.2	16.5	277 24.4	19.8	168 21.6	14.7
03	40 13.8	187 18.2 . .	25.7	265 23.0 . .	16.1	292 26.4 . .	19.8	183 23.8 . .	14.8
04	55 16.3	202 17.9	26.9	280 23.9	15.7	307 28.5	19.8	198 26.0	14.8
05	70 18.7	217 17.6	28.0	295 24.8	15.3	322 30.6	19.7	213 28.3	14.9
06	85 21.2	232 17.4	S14 29.1	310 25.7	N18 14.9	337 32.7	N22 19.7	228 30.5	S12 15.0
07	100 23.7	247 17.1	30.2	325 26.6	14.5	352 34.7	19.6	243 32.7	15.1
08	115 26.1	262 16.8	31.3	340 27.4	14.0	7 36.8	19.6	258 35.0	15.2
M 09	130 28.6	277 16.6 . .	32.4	355 28.3 . .	13.6	22 38.9 . .	19.6	273 37.2 . .	15.3
O 10	145 31.1	292 16.3	33.6	10 29.2	13.2	37 41.0	19.5	288 39.4	15.3
N 11	160 33.5	307 16.0	34.7	25 30.1	12.8	52 43.0	19.5	303 41.7	15.4
D 12	175 36.0	322 15.7	S14 35.8	40 31.0	N18 12.4	67 45.1	N22 19.4	318 43.9	S12 15.5
A 13	190 38.5	337 15.5	36.9	55 31.8	12.0	82 47.2	19.4	333 46.1	15.6
Y 14	205 40.9	352 15.2	38.0	70 32.7	11.5	97 49.3	19.4	348 48.4	15.7
15	220 43.4	7 14.9 . .	39.1	85 33.6 . .	11.1	112 51.3 . .	19.3	3 50.6 . .	15.8
16	235 45.9	22 14.6	40.2	100 34.5	10.7	127 53.4	19.3	18 52.8	15.8
17	250 48.3	37 14.4	41.3	115 35.4	10.3	142 55.5	19.2	33 55.1	15.9
18	265 50.8	52 14.1	S14 42.5	130 36.3	N18 09.9	157 57.6	N22 19.2	48 57.3	S12 16.0
19	280 53.2	67 13.8	43.6	145 37.1	09.4	172 59.6	19.2	63 59.5	16.1
20	295 55.7	82 13.5	44.7	160 38.0	09.0	188 01.7	19.1	79 01.8	16.2
21	310 58.2	97 13.3 . .	45.8	175 38.9 . .	08.6	203 03.8 . .	19.1	94 04.0 . .	16.3
22	326 00.6	112 13.0	46.9	190 39.8	08.2	218 05.9	19.0	109 06.2	16.3
23	341 03.1	127 12.7	48.0	205 40.7	07.8	233 07.9	19.0	124 08.5	16.4
17 00	356 05.6	142 12.4	S14 49.1	220 41.5	N18 07.3	248 10.0	N22 19.0	139 10.7	S12 16.5
01	11 08.0	157 12.1	50.2	235 42.4	06.9	263 12.1	18.9	154 12.9	16.6
02	26 10.5	172 11.9	51.3	250 43.3	06.5	278 14.2	18.9	169 15.1	16.7
03	41 13.0	187 11.6 . .	52.4	265 44.2 . .	06.1	293 16.3 . .	18.8	184 17.4 . .	16.8
04	56 15.4	202 11.3	53.5	280 45.1	05.7	308 18.3	18.8	199 19.6	16.8
05	71 17.9	217 11.0	54.6	295 46.0	05.2	323 20.4	18.8	214 21.8	16.9
06	86 20.3	232 10.7	S14 55.8	310 46.8	N18 04.8	338 22.5	N22 18.7	229 24.1	S12 17.0
07	101 22.8	247 10.5	56.9	325 47.7	04.4	353 24.6	18.7	244 26.3	17.1
T 08	116 25.3	262 10.2	58.0	340 48.6	04.0	8 26.7	18.6	259 28.5	17.2
U 09	131 27.7	277 09.9	14 59.1	355 49.5 . .	03.6	23 28.7 . .	18.6	274 30.8 . .	17.3
E 10	146 30.2	292 09.6	15 00.2	10 50.4	03.1	38 30.8	18.6	289 33.0	17.3
S 11	161 32.7	307 09.3	01.3	25 51.3	02.7	53 32.9	18.5	304 35.2	17.4
D 12	176 35.1	322 09.1	S15 02.4	40 52.2	N18 02.3	68 35.0	N22 18.5	319 37.5	S12 17.5
A 13	191 37.6	337 08.8	03.5	55 53.0	01.9	83 37.1	18.4	334 39.7	17.6
Y 14	206 40.1	352 08.5	04.6	70 53.9	01.4	98 39.2	18.4	349 41.9	17.7
15	221 42.5	7 08.2 . .	05.7	85 54.8 . .	01.0	113 41.2 . .	18.4	4 44.1 . .	17.8
16	236 45.0	22 07.9	06.8	100 55.7	00.6	128 43.3	18.3	19 46.4	17.8
17	251 47.5	37 07.7	07.9	115 56.6	18 00.2	143 45.4	18.3	34 48.6	17.9
18	266 49.9	52 07.4	S15 09.0	130 57.5	N17 59.8	158 47.5	N22 18.2	49 50.8	S12 18.0
19	281 52.4	67 07.1	10.1	145 58.4	59.3	173 49.6	18.2	64 53.1	18.1
20	296 54.8	82 06.8	11.2	160 59.3	58.9	188 51.6	18.2	79 55.3	18.2
21	311 57.3	97 06.5 . .	12.3	176 00.1 . .	58.5	203 53.7 . .	18.1	94 57.5 . .	18.3
22	326 59.8	112 06.2	13.3	191 01.0	58.1	218 55.8	18.1	109 59.8	18.3
23	342 02.2	127 06.0	14.4	206 01.9	57.6	233 57.9	18.0	125 02.0	18.4
18 00	357 04.7	142 05.7	S15 15.5	221 02.8	N17 57.2	249 00.0	N22 18.0	140 04.2	S12 18.5
01	12 07.2	157 05.4	16.6	236 03.7	56.8	264 02.1	18.0	155 06.4	18.6
02	27 09.6	172 05.1	17.7	251 04.6	56.4	279 04.2	17.9	170 08.7	18.7
03	42 12.1	187 04.8 . .	18.8	266 05.5 . .	55.9	294 06.2 . .	17.9	185 10.9 . .	18.8
04	57 14.6	202 04.5	19.9	281 06.4	55.5	309 08.3	17.8	200 13.1	18.9
05	72 17.0	217 04.2	21.0	296 07.2	55.1	324 10.4	17.8	215 15.4	18.9
06	87 19.5	232 04.0	S15 22.1	311 08.1	N17 54.7	339 12.5	N22 17.8	230 17.6	S12 19.0
W 07	102 22.0	247 03.7	23.2	326 09.0	54.2	354 14.6	17.7	245 19.8	19.1
E 08	117 24.4	262 03.4	24.3	341 09.9	53.8	9 16.7	17.7	260 22.1	19.2
D 09	132 26.9	277 03.1 . .	25.4	356 10.8 . .	53.4	24 18.8 . .	17.6	275 24.3 . .	19.3
N 10	147 29.3	292 02.8	26.5	11 11.7	53.0	39 20.8	17.6	290 26.5	19.4
E 11	162 31.8	307 02.5	27.5	26 12.6	52.5	54 22.9	17.6	305 28.7	19.4
S 12	177 34.3	322 02.2	S15 28.6	41 13.5	N17 52.1	69 25.0	N22 17.5	320 31.0	S12 19.5
D 13	192 36.7	337 02.0	29.7	56 14.4	51.7	84 27.1	17.5	335 33.2	19.6
A 14	207 39.2	352 01.7	30.8	71 15.3	51.3	99 29.2	17.4	350 35.4	19.7
Y 15	222 41.7	7 01.4 . .	31.9	86 16.1 . .	50.8	114 31.3 . .	17.4	5 37.6 . .	19.8
16	237 44.1	22 01.1	33.0	101 17.0	50.4	129 33.4	17.4	20 39.9	19.9
17	252 46.6	37 00.8	34.1	116 17.9	50.0	144 35.4	17.3	35 42.1	19.9
18	267 49.1	52 00.5	S15 35.1	131 18.8	N17 49.6	159 37.5	N22 17.3	50 44.3	S12 20.0
19	282 51.5	67 00.2	36.2	146 19.7	49.1	174 39.6	17.2	65 46.6	20.1
20	297 54.0	81 59.9	37.3	161 20.6	48.7	189 41.7	17.2	80 48.8	20.2
21	312 56.4	96 59.6 . .	38.4	176 21.5 . .	48.3	204 43.8 . .	17.2	95 51.0 . .	20.3
22	327 58.9	111 59.4	39.5	191 22.4	47.8	219 45.9	17.1	110 53.2	20.4
23	343 01.4	126 59.1	40.6	206 23.3	47.4	234 48.0	17.1	125 55.5	20.5
Mer. Pass.	h m 0 15.6	v −0.3	d 1.1	v 0.9	d 0.4	v 2.1	d 0.0	v 2.2	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 18.0	S40 14.8
Achernar	335 26.2	S57 09.8
Acrux	173 09.7	S63 10.6
Adhara	255 12.5	S28 59.4
Aldebaran	290 49.1	N16 32.1
Alioth	166 21.1	N55 53.2
Alkaid	152 59.2	N49 14.9
Al Na'ir	27 43.1	S46 53.5
Alnilam	275 46.2	S 1 11.6
Alphard	217 56.2	S 8 43.1
Alphecca	126 11.0	N26 40.4
Alpheratz	357 42.9	N29 10.1
Altair	62 07.9	N 8 54.6
Ankaa	353 15.1	S42 13.7
Antares	112 26.1	S26 27.6
Arcturus	145 55.8	N19 06.9
Atria	107 27.8	S69 03.2
Avior	234 18.3	S59 33.1
Bellatrix	278 31.8	N 6 21.7
Betelgeuse	271 01.1	N 7 24.5
Canopus	263 56.2	S52 42.0
Capella	280 34.1	N46 00.4
Deneb	49 31.0	N45 20.2
Denebola	182 33.8	N14 29.8
Diphda	348 55.4	S17 54.5
Dubhe	193 52.2	N61 40.5
Elnath	278 12.4	N28 36.9
Eltanin	90 46.0	N51 29.7
Enif	33 46.6	N 9 56.6
Fomalhaut	15 23.4	S29 32.8
Gacrux	172 01.2	S57 11.4
Gienah	175 52.4	S17 37.0
Hadar	148 48.1	S60 26.4
Hamal	328 00.3	N23 31.7
Kaus Aust.	83 43.5	S34 22.6
Kochab	137 20.9	N74 06.2
Markab	13 37.8	N15 17.0
Menkar	314 14.6	N 4 08.7
Menkent	148 07.6	S36 26.2
Miaplacidus	221 40.3	S69 46.3
Mirfak	308 39.8	N49 54.4
Nunki	75 58.0	S26 16.6
Peacock	53 18.6	S56 41.4
Pollux	243 27.7	N27 59.4
Procyon	244 59.7	N 5 11.3
Rasalhague	96 06.3	N12 33.4
Regulus	207 43.6	N11 54.0
Rigel	281 11.8	S 8 11.1
Rigil Kent.	139 51.9	S60 53.5
Sabik	102 12.4	S15 44.3
Schedar	349 39.7	N56 36.8
Shaula	96 21.7	S37 06.7
Sirius	258 33.6	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.6	S43 29.2
Vega	80 38.7	N38 48.2
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	146 06.9	14 31
Mars	224 36.0	9 17
Jupiter	252 04.5	7 26
Saturn	143 05.1	14 41

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 16	Moonrise 17	Moonrise 18	Moonrise 19
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
16 00	181 15.7	N 2 39.6	46 52.0	7.6	S13 30.1	9.0	59.7	N 72	02 25	04 06	05 17	17 55	17 44	17 34	17 25
01	196 16.0	38.7	61 18.6	7.7	13 21.1	9.2	59.7	N 70	02 52	04 17	05 21	17 38	17 35	17 32	17 29
02	211 16.2	37.7	75 45.3	7.7	13 11.9	9.1	59.7	68	03 12	04 27	05 24	17 24	17 28	17 30	17 32
03	226 16.4 . .	36.7	90 12.0	7.8	13 02.8	9.3	59.7	66	03 27	04 34	05 27	17 13	17 21	17 28	17 35
04	241 16.6	35.8	104 38.8	7.8	12 53.5	9.4	59.7	64	03 40	04 41	05 29	17 03	17 16	17 27	17 37
05	256 16.9	34.8	119 05.6	7.8	12 44.1	9.4	59.7	62	03 50	04 46	05 31	16 55	17 12	17 26	17 39
06	271 17.1	N 2 33.8	133 32.4	7.9	S12 34.7	9.5	59.7	60	03 59	04 51	05 33	16 48	17 08	17 25	17 41
07	286 17.3	32.9	147 59.3	7.9	12 25.2	9.6	59.7	N 58	04 06	04 55	05 34	16 42	17 04	17 24	17 43
08	301 17.5	31.9	162 26.2	8.0	12 15.6	9.7	59.7	56	04 13	04 58	05 36	16 36	17 01	17 23	17 44
M 09	316 17.7 . .	30.9	176 53.2	8.0	12 05.9	9.7	59.6	54	04 18	05 01	05 37	16 31	16 58	17 22	17 45
O 10	331 18.0	30.0	191 20.2	8.1	11 56.2	9.8	59.6	52	04 23	05 04	05 38	16 27	16 55	17 21	17 47
N 11	346 18.2	29.0	205 47.3	8.1	11 46.4	9.9	59.6	50	04 28	05 06	05 39	16 23	16 53	17 21	17 48
D 12	1 18.4	N 2 28.1	220 14.4	8.2	S11 36.5	10.0	59.6	45	04 37	05 12	05 41	16 14	16 48	17 19	17 50
A 13	16 18.6	27.1	234 41.6	8.2	11 26.5	10.0	59.6	N 40	04 44	05 16	05 43	16 06	16 43	17 18	17 52
Y 14	31 18.9	26.1	249 08.8	8.2	11 16.5	10.1	59.6	35	04 49	05 19	05 44	16 00	16 40	17 17	17 54
15	46 19.1 . .	25.2	263 36.0	8.3	11 06.4	10.1	59.6	30	04 54	05 22	05 46	15 54	16 36	17 16	17 55
16	61 19.3	24.2	278 03.3	8.4	10 56.3	10.2	59.6	20	05 00	05 26	05 48	15 44	16 30	17 15	17 58
17	76 19.5	23.2	292 30.7	8.4	10 46.1	10.3	59.6	N 10	05 04	05 29	05 50	15 35	16 25	17 13	18 00
18	91 19.8	N 2 22.3	306 58.1	8.4	S10 35.8	10.4	59.6	0	05 06	05 31	05 51	15 27	16 21	17 12	18 03
19	106 20.0	21.3	321 25.5	8.5	10 25.4	10.4	59.6	S 10	05 07	05 32	05 53	15 19	16 16	17 11	18 05
20	121 20.2	20.3	335 53.0	8.5	10 15.0	10.5	59.6	20	05 07	05 32	05 54	15 10	16 11	17 10	18 07
21	136 20.4 . .	19.4	350 20.5	8.6	10 04.5	10.5	59.6	30	05 04	05 32	05 56	15 00	16 05	17 08	18 10
22	151 20.7	18.4	4 48.1	8.6	9 54.0	10.6	59.6	35	05 02	05 31	05 57	14 55	16 01	17 07	18 12
23	166 20.9	17.4	19 15.7	8.7	9 43.4	10.6	59.6	40	04 59	05 31	05 57	14 48	15 58	17 06	18 14
17 00	181 21.1	N 2 16.5	33 43.4	8.7	S 9 32.8	10.7	59.5	45	04 55	05 29	05 59	14 40	15 53	17 05	18 16
01	196 21.3	15.5	48 11.1	8.7	9 22.1	10.7	59.5	S 50	04 50	05 28	06 00	14 31	15 48	17 04	18 19
02	211 21.6	14.5	62 38.8	8.8	9 11.4	10.8	59.5	52	04 47	05 27	06 00	14 27	15 45	17 03	18 20
03	226 21.8 . .	13.6	77 06.6	8.9	9 00.6	10.9	59.5	54	04 44	05 26	06 01	14 22	15 43	17 03	18 21
04	241 22.0	12.6	91 34.5	8.8	8 49.7	10.9	59.5	56	04 41	05 25	06 01	14 17	15 40	17 02	18 23
05	256 22.2	11.6	106 02.3	9.0	8 38.8	10.9	59.5	58	04 37	05 23	06 02	14 11	15 36	17 01	18 24
06	271 22.5	N 2 10.7	120 30.3	8.9	S 8 27.9	11.0	59.5	S 60	04 33	05 22	06 03	14 04	15 33	17 00	18 26
07	286 22.7	09.7	134 58.2	9.0	8 16.9	11.1	59.5								
T 08	301 22.9	08.7	149 26.2	9.1	8 05.8	11.1	59.5								
U 09	316 23.1 . .	07.8	163 54.3	9.1	7 54.7	11.1	59.5								
E 10	331 23.3	06.8	178 22.4	9.1	7 43.6	11.2	59.4								
S 11	346 23.6	05.8	192 50.5	9.2	7 32.4	11.2	59.4								
D 12	1 23.8	N 2 04.9	207 18.7	9.2	S 7 21.2	11.2	59.4								
A 13	16 24.0	03.9	221 46.9	9.3	7 10.0	11.3	59.4								
Y 14	31 24.2	02.9	236 15.2	9.3	6 58.7	11.4	59.4								
15	46 24.5 . .	02.0	250 43.5	9.3	6 47.3	11.3	59.4								
16	61 24.7	01.0	265 11.8	9.4	6 36.0	11.4	59.4								
17	76 24.9	2 00.0	279 40.2	9.4	6 24.6	11.4	59.4								
18	91 25.1	N 1 59.1	294 08.6	9.4	S 6 13.2	11.5	59.3								
19	106 25.4	58.1	308 37.0	9.5	6 01.7	11.5	59.3								
20	121 25.6	57.1	323 05.5	9.6	5 50.2	11.5	59.3								
21	136 25.8 . .	56.2	337 34.1	9.5	5 38.7	11.5	59.3								
22	151 26.0	55.2	352 02.6	9.7	5 27.2	11.6	59.3								
23	166 26.3	54.2	6 31.3	9.6	5 15.6	11.6	59.3								
18 00	181 26.5	N 1 53.3	20 59.9	9.7	S 5 04.0	11.6	59.2								
01	196 26.7	52.3	35 28.6	9.7	4 52.4	11.6	59.2								
02	211 26.9	51.3	49 57.3	9.8	4 40.8	11.7	59.2								
03	226 27.2 . .	50.4	64 26.1	9.7	4 29.1	11.7	59.2								
04	241 27.4	49.4	78 54.8	9.9	4 17.4	11.7	59.2								
05	256 27.6	48.4	93 23.7	9.8	4 05.7	11.7	59.2								
06	271 27.8	N 1 47.5	107 52.5	9.9	S 3 54.0	11.7	59.1								
W 07	286 28.0	46.5	122 21.4	10.0	3 42.3	11.8	59.1								
E 08	301 28.3	45.5	136 50.4	9.9	3 30.5	11.7	59.1								
D 09	316 28.5 . .	44.6	151 19.3	10.0	3 18.8	11.8	59.1								
N 10	331 28.7	43.6	165 48.3	10.0	3 07.0	11.8	59.1								
E 11	346 28.9	42.6	180 17.3	10.1	2 55.2	11.8	59.1								
S 12	1 29.2	N 1 41.7	194 46.4	10.1	S 2 43.4	11.7	59.0								
D 13	16 29.4	40.7	209 15.5	10.1	2 31.7	11.8	59.0								
A 14	31 29.6	39.7	223 44.6	10.2	2 19.9	11.9	59.0								
Y 15	46 29.8 . .	38.8	238 13.8	10.1	2 08.0	11.8	59.0								
16	61 30.1	37.8	252 42.9	10.3	1 56.2	11.8	59.0								
17	76 30.3	36.8	267 12.2	10.2	1 44.4	11.8	58.9								
18	91 30.5	N 1 35.9	281 41.4	10.3	S 1 32.6	11.8	58.9								
19	106 30.7	34.9	296 10.7	10.3	1 20.8	11.8	58.9								
20	121 31.0	33.9	310 40.0	10.3	1 09.0	11.8	58.9								
21	136 31.2 . .	33.0	325 09.3	10.3	0 57.2	11.8	58.9								
22	151 31.4	32.0	339 38.6	10.4	0 45.4	11.8	58.8								
23	166 31.6	31.0	354 08.0	10.4	S 0 33.6	11.8	58.8								
	SD 15.9	d 1.0	SD	16.2		16.2		16.1							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 16	Moonset 17	Moonset 18	Moonset 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 30	19 40	21 18	25 47	01 47	03 48	05 45
N 70	18 26	19 29	20 52	00 05	02 02	03 55	05 44
68	18 23	19 20	20 33	00 26	02 14	04 00	05 43
66	18 20	19 12	20 18	00 43	02 24	04 04	05 43
64	18 18	19 06	20 06	00 56	02 32	04 08	05 42
62	18 16	19 01	19 56	01 08	02 40	04 11	05 42
60	18 15	18 57	19 48	01 17	02 46	04 14	05 41
N 58	18 13	18 53	19 41	01 26	02 51	04 17	05 41
56	18 12	18 49	19 34	01 33	02 56	04 19	05 40
54	18 11	18 46	19 29	01 39	03 00	04 21	05 40
52	18 10	18 44	19 24	01 45	03 04	04 22	05 40
50	18 09	18 41	19 20	01 51	03 07	04 24	05 40
45	18 07	18 36	19 11	02 02	03 15	04 28	05 39
N 40	18 05	18 32	19 04	02 11	03 21	04 31	05 39
35	18 04	18 29	18 59	02 19	03 26	04 33	05 38
30	18 03	18 27	18 55	02 26	03 31	04 35	05 38
20	18 01	18 23	18 48	02 38	03 39	04 39	05 37
N 10	17 59	18 20	18 45	02 49	03 46	04 42	05 37
0	17 58	18 18	18 42	02 59	03 53	04 45	05 36
S 10	17 56	18 17	18 42	03 08	03 59	04 48	05 36
20	17 55	18 17	18 43	03 18	04 06	04 51	05 35
30	17 54	18 17	18 45	03 30	04 14	04 55	05 34
35	17 53	18 18	18 47	03 37	04 18	04 57	05 34
40	17 52	18 19	18 51	03 44	04 23	04 59	05 34
45	17 51	18 20	18 55	03 53	04 29	05 02	05 33
S 50	17 50	18 22	19 00	04 04	04 36	05 05	05 32
52	17 50	18 23	19 03	04 09	04 39	05 07	05 32
54	17 49	18 24	19 06	04 14	04 43	05 08	05 32
56	17 49	18 26	19 09	04 20	04 47	05 10	05 31
58	17 48	18 27	19 13	04 27	04 51	05 12	05 31
S 60	17 47	18 29	19 18	04 34	04 56	05 14	05 31

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
16	05 02	05 13	11 55	21 40	09 13	11	89
17	05 24	05 35	11 54	22 33	10 07	12	95
18	05 45	05 56	11 54	23 24	10 59	13	99

UT	ARIES	VENUS −4.2		MARS +1.6		JUPITER −2.1		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
19 00	358 03.8	141 58.8	S15 41.6	221 24.2	N17 47.0	249 50.1	N22 17.0	140 57.7	S12 20.5
01	13 06.3	156 58.5	42.7	236 25.1	46.6	264 52.2	17.0	155 59.9	20.6
02	28 08.8	171 58.2	43.8	251 26.0	46.1	279 54.3	17.0	171 02.2	20.7
03	43 11.2	186 57.9	44.9	266 26.9	45.7	294 56.3	16.9	186 04.4	20.8
04	58 13.7	201 57.6	46.0	281 27.8	45.3	309 58.4	16.9	201 06.6	20.9
05	73 16.2	216 57.3	47.0	296 28.6	44.8	325 00.5	16.8	216 08.8	21.0
06	88 18.6	231 57.0	S15 48.1	311 29.5	N17 44.4	340 02.6	N22 16.8	231 11.1	S12 21.0
07	103 21.1	246 56.7	49.2	326 30.4	44.0	355 04.7	16.8	246 13.3	21.1
08	118 23.6	261 56.4	50.3	341 31.3	43.6	10 06.8	16.7	261 15.5	21.2
09	133 26.0	276 56.1	51.3	356 32.2	43.1	25 08.9	16.7	276 17.7	21.3
10	148 28.5	291 55.8	52.4	11 33.1	42.7	40 11.0	16.6	291 20.0	21.4
11	163 30.9	306 55.6	53.5	26 34.0	42.3	55 13.1	16.6	306 22.2	21.5
12	178 33.4	321 55.3	S15 54.6	41 34.9	N17 41.8	70 15.2	N22 16.6	321 24.4	S12 21.6
13	193 35.9	336 55.0	55.6	56 35.8	41.4	85 17.3	16.5	336 26.6	21.6
14	208 38.3	351 54.7	56.7	71 36.7	41.0	100 19.4	16.5	351 28.9	21.7
15	223 40.8	6 54.4	57.8	86 37.6	40.5	115 21.5	16.5	6 31.1	21.8
16	238 43.3	21 54.1	58.9	101 38.5	40.1	130 23.5	16.4	21 33.3	21.9
17	253 45.7	36 53.8	15 59.9	116 39.4	39.7	145 25.6	16.4	36 35.5	22.0
18	268 48.2	51 53.5	S16 01.0	131 40.3	N17 39.2	160 27.7	N22 16.3	51 37.8	S12 22.1
19	283 50.7	66 53.2	02.1	146 41.2	38.8	175 29.8	16.3	66 40.0	22.1
20	298 53.1	81 52.9	03.1	161 42.1	38.4	190 31.9	16.3	81 42.2	22.2
21	313 55.6	96 52.6	04.2	176 43.0	38.0	205 34.0	16.2	96 44.5	22.3
22	328 58.0	111 52.3	05.3	191 43.9	37.5	220 36.1	16.2	111 46.7	22.4
23	344 00.5	126 52.0	06.3	206 44.8	37.1	235 38.2	16.1	126 48.9	22.5
20 00	359 03.0	141 51.7	S16 07.4	221 45.7	N17 36.7	250 40.3	N22 16.1	141 51.1	S12 22.6
01	14 05.4	156 51.4	08.5	236 46.6	36.2	265 42.4	16.1	156 53.4	22.7
02	29 07.9	171 51.1	09.5	251 47.5	35.8	280 44.5	16.0	171 55.6	22.7
03	44 10.4	186 50.8	10.6	266 48.4	35.4	295 46.6	16.0	186 57.8	22.8
04	59 12.8	201 50.5	11.7	281 49.3	34.9	310 48.7	15.9	202 00.0	22.9
05	74 15.3	216 50.2	12.7	296 50.2	34.5	325 50.8	15.9	217 02.3	23.0
06	89 17.8	231 49.9	S16 13.8	311 51.1	N17 34.1	340 52.9	N22 15.9	232 04.5	S12 23.1
07	104 20.2	246 49.6	14.9	326 52.0	33.6	355 55.0	15.8	247 06.7	23.2
08	119 22.7	261 49.3	15.9	341 52.9	33.2	10 57.1	15.8	262 08.9	23.3
09	134 25.2	276 49.0	17.0	356 53.8	32.8	25 59.2	15.7	277 11.1	23.3
10	149 27.6	291 48.7	18.0	11 54.7	32.3	41 01.3	15.7	292 13.4	23.4
11	164 30.1	306 48.4	19.1	26 55.6	31.9	56 03.4	15.7	307 15.6	23.5
12	179 32.5	321 48.1	S16 20.2	41 56.5	N17 31.5	71 05.5	N22 15.6	322 17.8	S12 23.6
13	194 35.0	336 47.8	21.2	56 57.4	31.0	86 07.6	15.6	337 20.0	23.7
14	209 37.5	351 47.5	22.3	71 58.3	30.6	101 09.7	15.6	352 22.3	23.8
15	224 39.9	6 47.2	23.3	86 59.2	30.2	116 11.8	15.5	7 24.5	23.8
16	239 42.4	21 46.9	24.4	102 00.1	29.7	131 13.9	15.5	22 26.7	23.9
17	254 44.9	36 46.6	25.4	117 01.0	29.3	146 16.0	15.4	37 28.9	24.0
18	269 47.3	51 46.3	S16 26.5	132 01.9	N17 28.8	161 18.1	N22 15.4	52 31.2	S12 24.1
19	284 49.8	66 46.0	27.6	147 02.8	28.4	176 20.2	15.4	67 33.4	24.2
20	299 52.3	81 45.7	28.6	162 03.7	28.0	191 22.3	15.3	82 35.6	24.3
21	314 54.7	96 45.4	29.7	177 04.6	27.5	206 24.4	15.3	97 37.8	24.4
22	329 57.2	111 45.1	30.7	192 05.5	27.1	221 26.5	15.2	112 40.1	24.4
23	344 59.6	126 44.8	31.8	207 06.4	26.7	236 28.6	15.2	127 42.3	24.5
21 00	0 02.1	141 44.5	S16 32.8	222 07.3	N17 26.2	251 30.7	N22 15.2	142 44.5	S12 24.6
01	15 04.6	156 44.2	33.9	237 08.2	25.8	266 32.8	15.1	157 46.7	24.7
02	30 07.0	171 43.9	34.9	252 09.1	25.4	281 34.9	15.1	172 48.9	24.8
03	45 09.5	186 43.6	36.0	267 10.0	24.9	296 37.0	15.1	187 51.2	24.9
04	60 12.0	201 43.3	37.0	282 10.9	24.5	311 39.1	15.0	202 53.4	25.0
05	75 14.4	216 42.9	38.1	297 11.8	24.0	326 41.2	15.0	217 55.6	25.0
06	90 16.9	231 42.6	S16 39.1	312 12.7	N17 23.6	341 43.3	N22 14.9	232 57.8	S12 25.1
07	105 19.4	246 42.3	40.2	327 13.6	23.2	356 45.4	14.9	248 00.1	25.2
08	120 21.8	261 42.0	41.2	342 14.5	22.7	11 47.5	14.9	263 02.3	25.3
09	135 24.3	276 41.7	42.3	357 15.4	22.3	26 49.6	14.8	278 04.5	25.4
10	150 26.8	291 41.4	43.3	12 16.3	21.9	41 51.7	14.8	293 06.7	25.5
11	165 29.2	306 41.1	44.4	27 17.2	21.4	56 53.8	14.7	308 09.0	25.6
12	180 31.7	321 40.8	S16 45.4	42 18.1	N17 21.0	71 55.9	N22 14.7	323 11.2	S12 25.6
13	195 34.1	336 40.5	46.4	57 19.1	20.5	86 58.0	14.7	338 13.4	25.7
14	210 36.6	351 40.2	47.5	72 20.0	20.1	102 00.1	14.6	353 15.6	25.8
15	225 39.1	6 39.9	48.5	87 20.9	19.7	117 02.2	14.6	8 17.8	25.9
16	240 41.5	21 39.6	49.6	102 21.8	19.2	132 04.3	14.5	23 20.1	26.0
17	255 44.0	36 39.3	50.6	117 22.7	18.8	147 06.4	14.5	38 22.3	26.1
18	270 46.5	51 38.9	S16 51.7	132 23.6	N17 18.4	162 08.5	N22 14.5	53 24.5	S12 26.2
19	285 48.9	66 38.6	52.7	147 24.5	17.9	177 10.7	14.4	68 26.7	26.2
20	300 51.4	81 38.3	53.7	162 25.4	17.5	192 12.8	14.4	83 28.9	26.3
21	315 53.9	96 38.0	54.8	177 26.3	17.0	207 14.9	14.4	98 31.2	26.4
22	330 56.3	111 37.7	55.8	192 27.2	16.6	222 17.0	14.3	113 33.4	26.5
23	345 58.8	126 37.4	56.8	207 28.1	16.2	237 19.1	14.3	128 35.6	26.6
Mer. Pass.	h m 0 03.8	v −0.3	d 1.1	v 0.9	d 0.4	v 2.1	d 0.0	v 2.2	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 17.9	S40 14.8
Achernar	335 26.2	S57 09.8
Acrux	173 09.7	S63 10.5
Adhara	255 12.5	S28 59.3
Aldebaran	290 49.0	N16 32.1
Alioth	166 21.1	N55 53.2
Alkaid	152 59.2	N49 14.9
Al Na'ir	27 43.1	S46 53.5
Alnilam	275 46.2	S 1 11.6
Alphard	217 56.2	S 8 43.1
Alphecca	126 11.1	N26 40.4
Alpheratz	357 42.9	N29 10.1
Altair	62 07.9	N 8 54.6
Ankaa	353 15.1	S42 13.7
Antares	112 26.1	S26 27.6
Arcturus	145 55.8	N19 06.9
Atria	107 27.9	S69 03.2
Avior	234 18.3	S59 33.1
Bellatrix	278 31.8	N 6 21.7
Betelgeuse	271 01.1	N 7 24.5
Canopus	263 56.1	S52 42.0
Capella	280 34.1	N46 00.4
Deneb	49 31.0	N45 20.2
Denebola	182 33.8	N14 29.8
Diphda	348 55.4	S17 54.5
Dubhe	193 52.2	N61 40.5
Elnath	278 12.3	N28 36.9
Eltanin	90 46.0	N51 29.7
Enif	33 46.7	N 9 56.6
Fomalhaut	15 23.4	S29 32.8
Gacrux	172 01.2	S57 11.4
Gienah	175 52.4	S17 37.0
Hadar	148 48.1	S60 26.4
Hamal	328 00.2	N23 31.7
Kaus Aust.	83 43.5	S34 22.6
Kochab	137 20.9	N74 06.2
Markab	13 37.8	N15 17.0
Menkar	314 14.6	N 4 08.7
Menkent	148 07.6	S36 26.2
Miaplacidus	221 40.3	S69 46.3
Mirfak	308 39.8	N49 54.4
Nunki	75 58.0	S26 16.6
Peacock	53 18.6	S56 41.4
Pollux	243 27.7	N27 59.4
Procyon	244 59.7	N 5 11.3
Rasalhague	96 06.3	N12 33.4
Regulus	207 43.6	N11 54.0
Rigel	281 11.8	S 8 11.1
Rigil Kent.	139 51.9	S60 53.5
Sabik	102 12.4	S15 44.3
Schedar	349 39.7	N56 36.8
Shaula	96 21.7	S37 06.7
Sirius	258 33.6	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.6	S43 29.2
Vega	80 38.7	N38 48.2
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	142 48.7	14 33
Mars	222 42.7	9 12
Jupiter	251 37.3	7 16
Saturn	142 48.2	14 30

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		19	20	21	22
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
19 00	181 31.9	N 1 30.0	8 37.4	10.5	S 0 21.8	11.8	58.8	N 72	02 46	04 21	05 30	17 25	17 16	17 05	16 52
01	196 32.1	29.1	23 06.9	10.4	S 0 10.0	11.8	58.8	N 70	03 09	04 30	05 32	17 29	17 26	17 24	17 22
02	211 32.3	28.1	37 36.3	10.5	N 0 01.8	11.8	58.7	68	03 26	04 38	05 34	17 32	17 35	17 38	17 44
03	226 32.5	27.1	52 05.8	10.5	0 13.6	11.7	58.7	66	03 39	04 44	05 36	17 35	17 42	17 50	18 02
04	241 32.7	26.2	66 35.3	10.5	0 25.3	11.8	58.7	64	03 50	04 49	05 37	17 37	17 48	18 00	18 16
05	256 33.0	25.2	81 04.8	10.6	0 37.1	11.7	58.7	62	03 59	04 54	05 39	17 39	17 53	18 09	18 28
06	271 33.2	N 1 24.2	95 34.4	10.6	N 0 48.8	11.8	58.7	60	04 07	04 58	05 40	17 41	17 58	18 17	18 38
07	286 33.4	23.3	110 04.0	10.6	1 00.6	11.7	58.6	N 58	04 14	05 01	05 41	17 43	18 02	18 23	18 47
08	301 33.6	22.3	124 33.6	10.6	1 12.3	11.7	58.6	56	04 19	05 04	05 41	17 44	18 06	18 29	18 55
09	316 33.9	21.3	139 03.2	10.6	1 24.0	11.6	58.6	54	04 24	05 07	05 42	17 45	18 09	18 34	19 02
10	331 34.1	20.4	153 32.8	10.7	1 35.6	11.7	58.6	52	04 29	05 09	05 43	17 47	18 12	18 39	19 09
11	346 34.3	19.4	168 02.5	10.7	1 47.3	11.6	58.5	50	04 33	05 11	05 43	17 48	18 15	18 43	19 15
12	1 34.5	N 1 18.4	182 32.2	10.7	N 1 58.9	11.6	58.5	45	04 41	05 15	05 45	17 50	18 21	18 53	19 27
13	16 34.8	17.4	197 01.9	10.7	2 10.5	11.6	58.5	N 40	04 47	05 19	05 46	17 52	18 26	19 01	19 37
14	31 35.0	16.5	211 31.6	10.8	2 22.1	11.6	58.5	35	04 52	05 21	05 47	17 54	18 30	19 07	19 46
15	46 35.2	15.5	226 01.4	10.7	2 33.7	11.5	58.4	30	04 55	05 23	05 47	17 55	18 34	19 13	19 54
16	61 35.4	14.5	240 31.1	10.8	2 45.2	11.6	58.4	20	05 01	05 26	05 48	17 58	18 41	19 24	20 08
17	76 35.7	13.6	255 00.9	10.8	2 56.8	11.5	58.4	N 10	05 04	05 28	05 49	18 00	18 47	19 33	20 20
18	91 35.9	N 1 12.6	269 30.7	10.8	N 3 08.3	11.4	58.4	0	05 05	05 29	05 50	18 03	18 52	19 42	20 31
19	106 36.1	11.6	284 00.5	10.9	3 19.7	11.5	58.3	S 10	05 05	05 30	05 51	18 05	18 58	19 50	20 42
20	121 36.3	10.7	298 30.4	10.8	3 31.2	11.4	58.3	20	05 04	05 29	05 51	18 07	19 04	20 00	20 54
21	136 36.5	09.7	313 00.2	10.9	3 42.6	11.3	58.3	30	05 00	05 28	05 52	18 10	19 11	20 10	21 08
22	151 36.8	08.7	327 30.1	10.9	3 53.9	11.4	58.2	35	04 58	05 27	05 52	18 12	19 15	20 17	21 16
23	166 37.0	07.7	342 00.0	10.9	4 05.3	11.3	58.2	40	04 54	05 26	05 53	18 14	19 20	20 24	21 25
20 00	181 37.2	N 1 06.8	356 29.9	10.9	N 4 16.6	11.3	58.2	45	04 49	05 24	05 53	18 16	19 25	20 32	21 36
01	196 37.4	05.8	10 59.8	10.9	4 27.9	11.2	58.2	S 50	04 43	05 21	05 53	18 19	19 32	20 42	21 49
02	211 37.7	04.8	25 29.7	11.0	4 39.1	11.2	58.1	52	04 40	05 20	05 53	18 20	19 35	20 47	21 55
03	226 37.9	03.9	39 59.7	10.9	4 50.3	11.2	58.1	54	04 37	05 18	05 53	18 21	19 38	20 52	22 02
04	241 38.1	02.9	54 29.6	11.0	5 01.5	11.1	58.1	56	04 33	05 17	05 54	18 23	19 42	20 58	22 10
05	256 38.3	01.9	68 59.6	11.0	5 12.6	11.1	58.1	58	04 28	05 15	05 54	18 24	19 46	21 04	22 18
06	271 38.6	N 1 01.0	83 29.6	11.0	N 5 23.7	11.1	58.0	S 60	04 23	05 12	05 54	18 26	19 50	21 11	22 28
07	286 38.8	1 00.0	97 59.6	11.0	5 34.8	11.0	58.0								
08	301 39.0	0 59.0	112 29.6	11.0	5 45.8	10.9	58.0								
09	316 39.2	58.0	126 59.6	11.0	5 56.7	11.0	57.9								
10	331 39.4	57.1	141 29.6	11.1	6 07.7	10.8	57.9								
11	346 39.7	56.1	155 59.7	11.0	6 18.5	10.9	57.9								
12	1 39.9	N 0 55.1	170 29.7	11.1	N 6 29.4	10.8	57.9								
13	16 40.1	54.2	184 59.8	11.0	6 40.2	10.7	57.8								
14	31 40.3	53.2	199 29.8	11.1	6 50.9	10.7	57.8								
15	46 40.6	52.2	213 59.9	11.1	7 01.6	10.7	57.8								
16	61 40.8	51.3	228 30.0	11.1	7 12.3	10.6	57.7								
17	76 41.0	50.3	243 00.1	11.1	7 22.9	10.5	57.7								
18	91 41.2	N 0 49.3	257 30.2	11.1	N 7 33.4	10.5	57.7								
19	106 41.4	48.3	272 00.3	11.1	7 43.9	10.5	57.6								
20	121 41.7	47.4	286 30.4	11.2	7 54.4	10.3	57.6								
21	136 41.9	46.4	301 00.6	11.1	8 04.7	10.4	57.6								
22	151 42.1	45.4	315 30.7	11.2	8 15.1	10.3	57.6								
23	166 42.3	44.5	330 00.9	11.1	8 25.4	10.2	57.5								
21 00	181 42.6	N 0 43.5	344 31.0	11.2	N 8 35.6	10.2	57.5								
01	196 42.8	42.5	359 01.2	11.1	8 45.8	10.1	57.5								
02	211 43.0	41.5	13 31.3	11.2	8 55.9	10.0	57.4								
03	226 43.2	40.6	28 01.5	11.2	9 05.9	10.0	57.4								
04	241 43.4	39.6	42 31.7	11.1	9 15.9	10.0	57.4								
05	256 43.7	38.6	57 01.8	11.2	9 25.9	9.9	57.3								
06	271 43.9	N 0 37.7	71 32.0	11.2	N 9 35.8	9.8	57.3								
07	286 44.1	36.7	86 02.2	11.2	9 45.6	9.7	57.3								
08	301 44.3	35.7	100 32.4	11.2	9 55.3	9.7	57.3								
09	316 44.6	34.7	115 02.6	11.2	10 05.0	9.7	57.2								
10	331 44.8	33.8	129 32.8	11.2	10 14.7	9.5	57.2								
11	346 45.0	32.8	144 03.0	11.2	10 24.2	9.5	57.2								
12	1 45.2	N 0 31.8	158 33.2	11.2	N10 33.7	9.5	57.1								
13	16 45.4	30.9	173 03.4	11.2	10 43.2	9.3	57.1								
14	31 45.7	29.9	187 33.6	11.2	10 52.5	9.3	57.1								
15	46 45.9	28.9	202 03.8	11.3	11 01.8	9.3	57.0								
16	61 46.1	27.9	216 34.1	11.2	11 11.1	9.1	57.0								
17	76 46.3	27.0	231 04.3	11.2	11 20.2	9.1	57.0								
18	91 46.6	N 0 26.0	245 34.5	11.2	N11 29.3	9.1	57.0								
19	106 46.8	25.0	260 04.7	11.2	11 38.4	8.9	56.9								
20	121 47.0	24.0	274 34.9	11.3	11 47.3	8.9	56.9								
21	136 47.2	23.1	289 05.2	11.2	11 56.2	8.8	56.9								
22	151 47.4	22.1	303 35.4	11.2	12 05.0	8.8	56.8								
23	166 47.7	21.1	318 05.6	11.3	N12 13.8	8.7	56.8								
	SD 16.0	d 1.0	SD	15.9		15.8	15.6								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	19	20	21	22
°	h m	h m	h m	h m	h m	h m	h m
N 72	18 14	19 23	20 56	05 45	07 39	09 33	11 29
N 70	18 12	19 14	20 34	05 44	07 31	09 16	11 01
68	18 10	19 06	20 18	05 43	07 24	09 03	10 39
66	18 09	19 00	20 05	05 43	07 18	08 52	10 23
64	18 08	18 55	19 54	05 42	07 14	08 43	10 09
62	18 07	18 51	19 45	05 42	07 10	08 35	09 58
60	18 06	18 47	19 38	05 41	07 06	08 29	09 48
N 58	18 05	18 44	19 31	05 41	07 03	08 23	09 40
56	18 04	18 41	19 26	05 40	07 00	08 18	09 32
54	18 03	18 39	19 21	05 40	06 58	08 13	09 26
52	18 03	18 37	19 17	05 40	06 56	08 09	09 20
50	18 02	18 35	19 13	05 40	06 54	08 05	09 14
45	18 01	18 31	19 05	05 39	06 49	07 57	09 03
N 40	18 00	18 27	18 59	05 39	06 45	07 51	08 53
35	18 00	18 25	18 54	05 38	06 42	07 45	08 45
30	17 59	18 23	18 51	05 38	06 39	07 40	08 38
20	17 58	18 20	18 46	05 37	06 35	07 31	08 26
N 10	17 57	18 18	18 43	05 37	06 30	07 23	08 15
0	17 57	18 17	18 41	05 36	06 26	07 16	08 05
S 10	17 56	18 17	18 41	05 36	06 22	07 09	07 55
20	17 56	18 18	18 43	05 35	06 18	07 01	07 44
30	17 55	18 19	18 47	05 34	06 13	06 52	07 32
35	17 55	18 20	18 50	05 34	06 10	06 47	07 25
40	17 55	18 22	18 53	05 34	06 07	06 42	07 17
45	17 55	18 24	18 58	05 33	06 04	06 35	07 08
S 50	17 55	18 27	19 05	05 32	05 59	06 27	06 57
52	17 54	18 28	19 08	05 32	05 57	06 23	06 52
54	17 54	18 30	19 11	05 32	05 55	06 19	06 46
56	17 54	18 31	19 15	05 31	05 53	06 15	06 40
58	17 54	18 33	19 20	05 31	05 50	06 10	06 33
S 60	17 54	18 36	19 25	05 31	05 47	06 05	06 25

Day	SUN		Mer. Pass.	MOON			
	Eqn. of Time			Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
19	06 07	06 18	11 54	24 14	11 50	14	100
20	06 28	06 39	11 53	00 14	12 39	15	99
21	06 50	07 00	11 53	01 04	13 29	16	95

UT	ARIES	VENUS −4.2		MARS +1.6		JUPITER −2.1		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
22 00	1 01.2	141 37.1	S16 57.9	222 29.0	N17 15.7	252 21.2	N22 14.2	143 37.8	S12 26.7	Acamar	315 17.9	S40 14.8
01	16 03.7	156 36.8	16 58.9	237 29.9	15.3	267 23.3	14.2	158 40.1	26.8	Achernar	335 26.2	S57 09.8
02	31 06.2	171 36.5	17 00.0	252 30.8	14.8	282 25.4	14.2	173 42.3	26.8	Acrux	173 09.7	S63 10.5
03	46 08.6	186 36.1	01.0	267 31.8	14.4	297 27.5	14.1	188 44.5	26.9	Adhara	255 12.5	S28 59.3
04	61 11.1	201 35.8	02.0	282 32.7	14.0	312 29.6	14.1	203 46.7	27.0	Aldebaran	290 49.0	N16 32.1
05	76 13.6	216 35.5	03.1	297 33.6	13.5	327 31.7	14.0	218 48.9	27.1			
06	91 16.0	231 35.2	S17 04.1	312 34.5	N17 13.1	342 33.8	N22 14.0	233 51.2	S12 27.2	Alioth	166 21.1	N55 53.2
07	106 18.5	246 34.9	05.1	327 35.4	12.6	357 35.9	14.0	248 53.4	27.3	Alkaid	152 59.2	N49 14.9
08	121 21.0	261 34.6	06.2	342 36.3	12.2	12 38.1	13.9	263 55.6	27.4	Al Na'ir	27 43.1	S46 53.5
09	136 23.4	276 34.3	07.2	357 37.2	11.7	27 40.2	13.9	278 57.8	27.4	Alnilam	275 46.1	S 1 11.6
10	151 25.9	291 33.9	08.2	12 38.1	11.3	42 42.3	13.9	294 00.0	27.5	Alphard	217 56.1	S 8 43.1
11	166 28.4	306 33.6	09.2	27 39.0	10.9	57 44.4	13.8	309 02.3	27.6			
12	181 30.8	321 33.3	S17 10.3	42 39.9	N17 10.4	72 46.5	N22 13.8	324 04.5	S12 27.7	Alphecca	126 11.1	N26 40.4
13	196 33.3	336 33.0	11.3	57 40.9	10.0	87 48.6	13.7	339 06.7	27.8	Alpheratz	357 42.9	N29 10.2
14	211 35.7	351 32.7	12.3	72 41.8	09.5	102 50.7	13.7	354 08.9	27.9	Altair	62 07.9	N 8 54.6
15	226 38.2	6 32.4	13.4	87 42.7	09.1	117 52.8	13.7	9 11.1	28.0	Ankaa	353 15.1	S42 13.7
16	241 40.7	21 32.0	14.4	102 43.6	08.7	132 54.9	13.6	24 13.4	28.0	Antares	112 26.2	S26 27.6
17	256 43.1	36 31.7	15.4	117 44.5	08.2	147 57.1	13.6	39 15.6	28.1			
18	271 45.6	51 31.4	S17 16.4	132 45.4	N17 07.8	162 59.2	N22 13.6	54 17.8	S12 28.2	Arcturus	145 55.8	N19 06.9
19	286 48.1	66 31.1	17.5	147 46.3	07.3	178 01.3	13.5	69 20.0	28.3	Atria	107 27.9	S69 03.2
20	301 50.5	81 30.8	18.5	162 47.2	06.9	193 03.4	13.5	84 22.2	28.4	Avior	234 18.3	S59 33.1
21	316 53.0	96 30.5	19.5	177 48.1	06.4	208 05.5	13.4	99 24.4	28.5	Bellatrix	278 31.7	N 6 21.7
22	331 55.5	111 30.1	20.5	192 49.1	06.0	223 07.6	13.4	114 26.7	28.6	Betelgeuse	271 01.1	N 7 24.5
23	346 57.9	126 29.8	21.6	207 50.0	05.5	238 09.7	13.4	129 28.9	28.7			
23 00	2 00.4	141 29.5	S17 22.6	222 50.9	N17 05.1	253 11.8	N22 13.3	144 31.1	S12 28.7	Canopus	263 56.1	S52 42.0
01	17 02.9	156 29.2	23.6	237 51.8	04.7	268 14.0	13.3	159 33.3	28.8	Capella	280 34.1	N46 00.4
02	32 05.3	171 28.9	24.6	252 52.7	04.2	283 16.1	13.2	174 35.5	28.9	Deneb	49 31.0	N45 20.2
03	47 07.8	186 28.5	25.6	267 53.6	03.8	298 18.2	13.2	189 37.8	29.0	Denebola	182 33.8	N14 29.8
04	62 10.2	201 28.2	26.7	282 54.5	03.3	313 20.3	13.2	204 40.0	29.1	Diphda	348 55.4	S17 54.5
05	77 12.7	216 27.9	27.7	297 55.5	02.9	328 22.4	13.1	219 42.2	29.2			
06	92 15.2	231 27.6	S17 28.7	312 56.4	N17 02.4	343 24.5	N22 13.1	234 44.4	S12 29.3	Dubhe	193 52.2	N61 40.5
07	107 17.6	246 27.3	29.7	327 57.3	02.0	358 26.6	13.1	249 46.6	29.3	Elnath	278 12.3	N28 36.9
08	122 20.1	261 26.9	30.7	342 58.2	01.5	13 28.8	13.0	264 48.9	29.4	Eltanin	90 46.1	N51 29.7
09	137 22.6	276 26.6	31.7	357 59.1	01.1	28 30.9	13.0	279 51.1	29.5	Enif	33 46.7	N 9 56.6
10	152 25.0	291 26.3	32.8	13 00.0	00.7	43 33.0	12.9	294 53.3	29.6	Fomalhaut	15 23.4	S29 32.8
11	167 27.5	306 26.0	33.8	28 00.9	17 00.2	58 35.1	12.9	309 55.5	29.7			
12	182 30.0	321 25.7	S17 34.8	43 01.9	N16 59.8	73 37.2	N22 12.9	324 57.7	S12 29.8	Gacrux	172 01.2	S57 11.4
13	197 32.4	336 25.3	35.8	58 02.8	59.3	88 39.3	12.8	339 59.9	29.9	Gienah	175 52.4	S17 37.0
14	212 34.9	351 25.0	36.8	73 03.7	58.9	103 41.5	12.8	355 02.2	29.9	Hadar	148 48.1	S60 26.4
15	227 37.3	6 24.7	37.8	88 04.6	58.4	118 43.6	12.8	10 04.4	30.0	Hamal	328 00.2	N23 31.7
16	242 39.8	21 24.4	38.8	103 05.5	58.0	133 45.7	12.7	25 06.6	30.1	Kaus Aust.	83 43.5	S34 22.6
17	257 42.3	36 24.0	39.8	118 06.4	57.5	148 47.8	12.7	40 08.8	30.2			
18	272 44.7	51 23.7	S17 40.9	133 07.4	N16 57.1	163 49.9	N22 12.6	55 11.0	S12 30.3	Kochab	137 21.0	N74 06.2
19	287 47.2	66 23.4	41.9	148 08.3	56.6	178 52.0	12.6	70 13.2	30.4	Markab	13 37.8	N15 17.0
20	302 49.7	81 23.1	42.9	163 09.2	56.2	193 54.2	12.6	85 15.5	30.5	Menkar	314 14.6	N 4 08.7
21	317 52.1	96 22.7	43.9	178 10.1	55.7	208 56.3	12.5	100 17.7	30.6	Menkent	148 07.7	S36 26.2
22	332 54.6	111 22.4	44.9	193 11.0	55.3	223 58.4	12.5	115 19.9	30.6	Miaplacidus	221 40.2	S69 46.3
23	347 57.1	126 22.1	45.9	208 11.9	54.8	239 00.5	12.5	130 22.1	30.7			
24 00	2 59.5	141 21.8	S17 46.9	223 12.9	N16 54.4	254 02.6	N22 12.4	145 24.3	S12 30.8	Mirfak	308 39.7	N49 54.4
01	18 02.0	156 21.4	47.9	238 13.8	54.0	269 04.8	12.4	160 26.6	30.9	Nunki	75 58.0	S26 16.6
02	33 04.5	171 21.1	48.9	253 14.7	53.5	284 06.9	12.3	175 28.8	31.0	Peacock	53 18.6	S56 41.4
03	48 06.9	186 20.8	49.9	268 15.6	53.1	299 09.0	12.3	190 31.0	31.1	Pollux	243 27.7	N27 59.4
04	63 09.4	201 20.5	50.9	283 16.5	52.6	314 11.1	12.3	205 33.2	31.2	Procyon	244 59.7	N 5 11.3
05	78 11.8	216 20.1	51.9	298 17.5	52.2	329 13.2	12.2	220 35.4	31.2			
06	93 14.3	231 19.8	S17 52.9	313 18.4	N16 51.7	344 15.4	N22 12.2	235 37.6	S12 31.3	Rasalhague	96 06.3	N12 33.4
07	108 16.8	246 19.5	53.9	328 19.3	51.3	359 17.5	12.2	250 39.8	31.4	Regulus	207 43.6	N11 54.0
08	123 19.2	261 19.1	54.9	343 20.2	50.8	14 19.6	12.1	265 42.1	31.5	Rigel	281 11.8	S 8 11.1
09	138 21.7	276 18.8	55.9	358 21.1	50.4	29 21.7	12.1	280 44.3	31.6	Rigil Kent.	139 51.9	S60 53.5
10	153 24.2	291 18.5	56.9	13 22.1	49.9	44 23.9	12.0	295 46.5	31.7	Sabik	102 12.4	S15 44.3
11	168 26.6	306 18.2	57.9	28 23.0	49.5	59 26.0	12.0	310 48.7	31.8			
12	183 29.1	321 17.8	S17 58.9	43 23.9	N16 49.0	74 28.1	N22 12.0	325 50.9	S12 31.9	Schedar	349 39.7	N56 36.8
13	198 31.6	336 17.5	17 59.9	58 24.8	48.6	89 30.2	11.9	340 53.1	31.9	Shaula	96 21.7	S37 06.7
14	213 34.0	351 17.2	18 00.9	73 25.7	48.1	104 32.3	11.9	355 55.4	32.0	Sirius	258 33.6	S16 44.1
15	228 36.5	6 16.8	01.9	88 26.7	47.7	119 34.5	11.9	10 57.6	32.1	Spica	158 31.3	S11 13.9
16	243 39.0	21 16.5	02.9	103 27.6	47.2	134 36.6	11.8	25 59.8	32.2	Suhail	222 52.6	S43 29.2
17	258 41.4	36 16.2	03.9	118 28.5	46.8	149 38.7	11.8	41 02.0	32.3			
18	273 43.9	51 15.8	S18 04.9	133 29.4	N16 46.3	164 40.8	N22 11.7	56 04.2	S12 32.4	Vega	80 38.8	N38 48.2
19	288 46.3	66 15.5	05.9	148 30.3	45.9	179 43.0	11.7	71 06.4	32.5	Zuben'ubi	137 05.4	S16 05.8
20	303 48.8	81 15.2	06.9	163 31.3	45.4	194 45.1	11.7	86 08.7	32.6		SHA	Mer.Pass.
21	318 51.3	96 14.8	07.9	178 32.2	45.0	209 47.2	11.6	101 10.9	32.6		° ′	h m
22	333 53.7	111 14.5	08.8	193 33.1	44.5	224 49.3	11.6	116 13.1	32.7	Venus	139 29.1	14 34
23	348 56.2	126 14.2	09.8	208 34.0	44.1	239 51.5	11.6	131 15.3	32.8	Mars	220 50.5	9 08
	h m									Jupiter	251 11.5	7 06
Mer.Pass.	23 48.1	v −0.3	d 1.0	v 0.9	d 0.4	v 2.1	d 0.0	v 2.2	d 0.1	Saturn	142 30.7	14 20

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 22	Moonrise 23	Moonrise 24	Moonrise 25
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
22 00	181 47.9	N 0 20.2	332 35.9	11.2	N12 22.5	8.5	56.8	N 72	03 05	04 35	05 43	16 52	16 29		
01	196 48.1	19.2	347 06.1	11.2	12 31.0	8.6	56.7	N 70	03 24	04 43	05 44	17 22	17 22	17 25	17 42
02	211 48.3	18.2	1 36.3	11.3	12 39.6	8.4	56.7	68	03 39	04 49	05 45	17 44	17 54	18 12	18 45
03	226 48.5	17.2	16 06.6	11.2	12 48.0	8.4	56.7	66	03 51	04 54	05 45	18 02	18 18	18 43	19 20
04	241 48.8	16.3	30 36.8	11.2	12 56.4	8.3	56.6	64	04 00	04 58	05 46	18 16	18 37	19 06	19 45
05	256 49.0	15.3	45 07.0	11.3	13 04.7	8.2	56.6	62	04 08	05 02	05 46	18 28	18 52	19 24	20 05
06	271 49.2	N 0 14.3	59 37.3	11.2	N13 12.9	8.2	56.6	60	04 15	05 05	05 47	18 38	19 05	19 39	20 21
07	286 49.4	13.4	74 07.5	11.3	13 21.1	8.0	56.6	N 58	04 21	05 08	05 47	18 47	19 16	19 52	20 35
08	301 49.6	12.4	88 37.8	11.2	13 29.1	8.0	56.5	56	04 26	05 10	05 47	18 55	19 26	20 03	20 47
09	316 49.9	11.4	103 08.0	11.2	13 37.1	7.9	56.5	54	04 30	05 12	05 48	19 02	19 35	20 13	20 57
10	331 50.1	10.4	117 38.2	11.3	13 45.0	7.9	56.5	52	04 34	05 14	05 48	19 09	19 43	20 21	21 06
11	346 50.3	09.5	132 08.5	11.2	13 52.9	7.7	56.4	50	04 38	05 16	05 48	19 15	19 50	20 29	21 14
12	1 50.5	N 0 08.5	146 38.7	11.3	N14 00.6	7.7	56.4	45	04 45	05 19	05 48	19 27	20 05	20 46	21 32
13	16 50.8	07.5	161 09.0	11.2	14 08.3	7.6	56.4	N 40	04 50	05 21	05 49	19 37	20 17	21 00	21 46
14	31 51.0	06.5	175 39.2	11.3	14 15.9	7.5	56.4	35	04 54	05 23	05 49	19 46	20 28	21 11	21 58
15	46 51.2	05.6	190 09.5	11.2	14 23.4	7.4	56.3	30	04 57	05 25	05 49	19 54	20 37	21 22	22 09
16	61 51.4	04.6	204 39.7	11.2	14 30.8	7.4	56.3	20	05 01	05 27	05 49	20 08	20 53	21 39	22 27
17	76 51.6	03.6	219 09.9	11.3	14 38.2	7.2	56.3	N 10	05 04	05 28	05 49	20 20	21 07	21 55	22 43
18	91 51.9	N 0 02.7	233 40.2	11.2	N14 45.4	7.2	56.2	0	05 04	05 28	05 49	20 31	21 20	22 09	22 58
19	106 52.1	01.7	248 10.4	11.3	14 52.6	7.1	56.2	S 10	05 04	05 28	05 49	20 42	21 33	22 23	23 13
20	121 52.3	N 00.7	262 40.7	11.2	14 59.7	7.1	56.2	20	05 01	05 27	05 49	20 54	21 47	22 39	23 28
21	136 52.5	S 00.3	277 10.9	11.3	15 06.8	6.9	56.1	30	04 57	05 24	05 48	21 08	22 04	22 57	23 47
22	151 52.7	01.2	291 41.2	11.2	15 13.7	6.8	56.1	35	04 53	05 23	05 48	21 16	22 13	23 07	23 57
23	166 53.0	02.2	306 11.4	11.3	15 20.5	6.8	56.1	40	04 49	05 21	05 48	21 25	22 24	23 19	24 10
23 00	181 53.2	S 0 03.2	320 41.7	11.2	N15 27.3	6.7	56.1	45	04 43	05 18	05 47	21 36	22 37	23 33	24 24
01	196 53.4	04.2	335 11.9	11.2	15 34.0	6.6	56.0	S 50	04 36	05 14	05 46	21 49	22 52	23 50	24 42
02	211 53.6	05.1	349 42.1	11.3	15 40.6	6.5	56.0	52	04 33	05 13	05 46	21 55	23 00	23 58	24 50
03	226 53.8	06.1	4 12.4	11.2	15 47.1	6.4	56.0	54	04 29	05 11	05 46	22 02	23 08	24 07	00 07
04	241 54.1	07.1	18 42.6	11.3	15 53.5	6.3	55.9	56	04 24	05 08	05 46	22 10	23 17	24 17	00 17
05	256 54.3	08.0	33 12.9	11.2	15 59.8	6.3	55.9	58	04 19	05 06	05 45	22 18	23 27	24 29	00 29
06	271 54.5	S 0 09.0	47 43.1	11.3	N16 06.1	6.2	55.9	S 60	04 13	05 03	05 45	22 28	23 39	24 42	00 42
07	286 54.7	10.0	62 13.4	11.2	16 12.3	6.0	55.9								
08	301 54.9	11.0	76 43.6	11.3	16 18.3	6.0	55.8								
09	316 55.2	11.9	91 13.9	11.2	16 24.3	5.9	55.8								
10	331 55.4	12.9	105 44.1	11.3	16 30.2	5.8	55.8								
11	346 55.6	13.9	120 14.4	11.3	16 36.0	5.7	55.8								
12	1 55.8	S 0 14.9	134 44.7	11.2	N16 41.7	5.7	55.7								
13	16 56.0	15.8	149 14.9	11.3	16 47.4	5.5	55.7								
14	31 56.2	16.8	163 45.2	11.2	16 52.9	5.5	55.7								
15	46 56.5	17.8	178 15.4	11.3	16 58.4	5.3	55.6								
16	61 56.7	18.8	192 45.7	11.3	17 03.7	5.3	55.6								
17	76 56.9	19.7	207 16.0	11.2	17 09.0	5.2	55.6								
18	91 57.1	S 0 20.7	221 46.2	11.3	N17 14.2	5.1	55.6								
19	106 57.3	21.7	236 16.5	11.3	17 19.3	5.0	55.5								
20	121 57.6	22.6	250 46.8	11.3	17 24.3	4.9	55.5								
21	136 57.8	23.6	265 17.1	11.3	17 29.2	4.8	55.5								
22	151 58.0	24.6	279 47.4	11.2	17 34.0	4.7	55.5								
23	166 58.2	25.6	294 17.6	11.3	17 38.7	4.6	55.4								
24 00	181 58.4	S 0 26.5	308 47.9	11.3	N17 43.3	4.6	55.4								
01	196 58.7	27.5	323 18.2	11.3	17 47.9	4.4	55.4								
02	211 58.9	28.5	337 48.5	11.3	17 52.3	4.4	55.4								
03	226 59.1	29.5	352 18.8	11.3	17 56.7	4.3	55.3								
04	241 59.3	30.4	6 49.1	11.3	18 01.0	4.1	55.3								
05	256 59.5	31.4	21 19.4	11.3	18 05.1	4.1	55.3								
06	271 59.7	S 0 32.4	35 49.7	11.4	N18 09.2	4.0	55.3								
07	287 00.0	33.3	50 20.1	11.3	18 13.2	3.9	55.3								
08	302 00.2	34.3	64 50.4	11.3	18 17.1	3.8	55.2								
09	317 00.4	35.3	79 20.7	11.4	18 20.9	3.7	55.2								
10	332 00.6	36.3	93 51.1	11.3	18 24.6	3.6	55.2								
11	347 00.8	37.2	108 21.4	11.3	18 28.2	3.5	55.2								
12	2 01.1	S 0 38.2	122 51.7	11.4	N18 31.7	3.5	55.1								
13	17 01.3	39.2	137 22.1	11.3	18 35.2	3.3	55.1								
14	32 01.5	40.2	151 52.4	11.4	18 38.5	3.2	55.1								
15	47 01.7	41.1	166 22.8	11.4	18 41.7	3.2	55.1								
16	62 01.9	42.1	180 53.2	11.4	18 44.9	3.0	55.1								
17	77 02.1	43.1	195 23.6	11.4	18 47.9	3.0	55.0								
18	92 02.4	S 0 44.1	209 54.0	11.4	N18 50.9	2.9	55.0								
19	107 02.6	45.0	224 24.4	11.4	18 53.8	2.7	55.0								
20	122 02.8	46.0	238 54.8	11.4	18 56.5	2.7	55.0								
21	137 03.0	47.0	253 25.2	11.4	18 59.2	2.6	54.9								
22	152 03.2	48.0	267 55.6	11.4	19 01.8	2.5	54.9								
23	167 03.4	48.9	282 26.0	11.5	N19 04.3	2.4	54.9								
	SD 16.0	d 1.0	SD	15.4		15.2		15.0							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 22	Moonset 23	Moonset 24	Moonset 25
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 59	19 07	20 35	11 29	13 35		
N 70	17 58	18 59	20 17	11 01	12 44	14 22	15 47
68	17 58	18 53	20 03	10 39	12 12	13 36	14 44
66	17 57	18 48	19 51	10 23	11 48	13 05	14 09
64	17 57	18 44	19 42	10 09	11 30	12 43	13 44
62	17 57	18 41	19 34	09 58	11 15	12 25	13 24
60	17 56	18 38	19 28	09 48	11 02	12 10	13 08
N 58	17 56	18 35	19 22	09 40	10 52	11 57	12 55
56	17 56	18 33	19 17	09 32	10 42	11 46	12 43
54	17 56	18 31	19 13	09 26	10 34	11 37	12 33
52	17 56	18 29	19 09	09 20	10 27	11 28	12 24
50	17 56	18 28	19 06	09 14	10 20	11 20	12 15
45	17 56	18 25	18 59	09 03	10 06	11 04	11 58
N 40	17 55	18 22	18 54	08 53	09 54	10 51	11 44
35	17 55	18 21	18 50	08 45	09 44	10 39	11 32
30	17 55	18 19	18 47	08 38	09 35	10 29	11 21
20	17 55	18 17	18 43	08 26	09 20	10 12	11 03
N 10	17 55	18 16	18 41	08 15	09 07	09 58	10 47
0	17 56	18 16	18 40	08 05	08 54	09 44	10 33
S 10	17 56	18 17	18 41	07 55	08 42	09 30	10 18
20	17 56	18 18	18 44	07 44	08 29	09 15	10 02
30	17 57	18 21	18 49	07 32	08 14	08 58	09 44
35	17 57	18 23	18 52	07 25	08 05	08 48	09 33
40	17 58	18 25	18 56	07 17	07 56	08 37	09 21
45	17 58	18 28	19 02	07 08	07 44	08 23	09 07
S 50	17 59	18 31	19 10	06 57	07 30	08 07	08 50
52	17 59	18 33	19 13	06 52	07 23	08 00	08 41
54	18 00	18 35	19 17	06 46	07 16	07 51	08 32
56	18 00	18 37	19 22	06 40	07 08	07 42	08 22
58	18 01	18 40	19 27	06 33	06 59	07 31	08 10
S 60	18 01	18 43	19 33	06 25	06 49	07 19	07 57

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
22	07 11	07 22	11 53	01 53	14 18	17	90
23	07 32	07 43	11 52	02 43	15 07	18	83
24	07 53	08 04	11 52	03 32	15 56	19	75

UT	ARIES	VENUS −4.2		MARS +1.6		JUPITER −2.2		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
25 00	3 58.7	141 13.8	S18 10.8	223 35.0	N16 43.6	254 53.6	N22 11.5	146 17.5	S12 32.9	Acamar	315 17.9	S40 14.8
01	19 01.1	156 13.5	11.8	238 35.9	43.2	269 55.7	11.5	161 19.7	33.0	Achernar	335 26.1	S57 09.9
02	34 03.6	171 13.2	12.8	253 36.8	42.7	284 57.8	11.5	176 21.9	33.1	Acrux	173 09.7	S63 10.5
03	49 06.1	186 12.8	13.8	268 37.7	42.3	300 00.0	11.4	191 24.2	33.2	Adhara	255 12.4	S28 59.3
04	64 08.5	201 12.5	14.8	283 38.6	41.8	315 02.1	11.4	206 26.4	33.3	Aldebaran	290 49.0	N16 32.1
05	79 11.0	216 12.2	15.8	298 39.6	41.4	330 04.2	11.3	221 28.6	33.3			
06	94 13.4	231 11.8	S18 16.7	313 40.5	N16 40.9	345 06.4	N22 11.3	236 30.8	S12 33.4	Alioth	166 21.1	N55 53.2
W 07	109 15.9	246 11.5	17.7	328 41.4	40.4	0 08.5	11.3	251 33.0	33.5	Alkaid	152 59.2	N49 14.9
E 08	124 18.4	261 11.2	18.7	343 42.3	40.0	15 10.6	11.2	266 35.2	33.6	Al Na'ir	27 43.1	S46 53.6
D 09	139 20.8	276 10.8	19.7	358 43.3	39.5	30 12.7	11.2	281 37.4	33.7	Alnilam	275 46.1	S 1 11.6
N 10	154 23.3	291 10.5	20.7	13 44.2	39.1	45 14.9	11.2	296 39.7	33.8	Alphard	217 56.1	S 8 43.1
E 11	169 25.8	306 10.2	21.7	28 45.1	38.6	60 17.0	11.1	311 41.9	33.9			
S 12	184 28.2	321 09.8	S18 22.6	43 46.0	N16 38.2	75 19.1	N22 11.1	326 44.1	S12 33.9	Alphecca	126 11.1	N26 40.4
D 13	199 30.7	336 09.5	23.6	58 47.0	37.7	90 21.3	11.0	341 46.3	34.0	Alpheratz	357 42.9	N29 10.2
A 14	214 33.2	351 09.1	24.6	73 47.9	37.3	105 23.4	11.0	356 48.5	34.1	Altair	62 07.9	N 8 54.6
Y 15	229 35.6	6 08.8	25.6	88 48.8	36.8	120 25.5	11.0	11 50.7	34.2	Ankaa	353 15.1	S42 13.7
16	244 38.1	21 08.5	26.6	103 49.7	36.4	135 27.6	10.9	26 52.9	34.3	Antares	112 26.2	S26 27.6
17	259 40.6	36 08.1	27.5	118 50.7	35.9	150 29.8	10.9	41 55.2	34.4			
18	274 43.0	51 07.8	S18 28.5	133 51.6	N16 35.5	165 31.9	N22 10.9	56 57.4	S12 34.5	Arcturus	145 55.8	N19 06.9
19	289 45.5	66 07.4	29.5	148 52.5	35.0	180 34.0	10.8	71 59.6	34.6	Atria	107 27.9	S69 03.2
20	304 47.9	81 07.1	30.5	163 53.5	34.6	195 36.2	10.8	87 01.8	34.6	Avior	234 18.2	S59 33.1
21	319 50.4	96 06.8	31.4	178 54.4	34.1	210 38.3	10.8	102 04.0	34.7	Bellatrix	278 31.7	N 6 21.7
22	334 52.9	111 06.4	32.4	193 55.3	33.6	225 40.4	10.7	117 06.2	34.8	Betelgeuse	271 01.1	N 7 24.5
23	349 55.3	126 06.1	33.4	208 56.2	33.2	240 42.6	10.7	132 08.4	34.9			
26 00	4 57.8	141 05.7	S18 34.4	223 57.2	N16 32.7	255 44.7	N22 10.6	147 10.6	S12 35.0	Canopus	263 56.1	S52 42.0
01	20 00.3	156 05.4	35.3	238 58.1	32.3	270 46.8	10.6	162 12.9	35.1	Capella	280 34.0	N46 00.4
02	35 02.7	171 05.1	36.3	253 59.0	31.8	285 49.0	10.6	177 15.1	35.2	Deneb	49 31.0	N45 20.2
03	50 05.2	186 04.7	37.3	269 00.0	31.4	300 51.1	10.5	192 17.3	35.3	Denebola	182 33.8	N14 29.8
04	65 07.7	201 04.4	38.2	284 00.9	30.9	315 53.2	10.5	207 19.5	35.3	Diphda	348 55.4	S17 54.5
05	80 10.1	216 04.0	39.2	299 01.8	30.5	330 55.4	10.5	222 21.7	35.4			
06	95 12.6	231 03.7	S18 40.2	314 02.7	N16 30.0	345 57.5	N22 10.4	237 23.9	S12 35.5	Dubhe	193 52.2	N61 40.5
T 07	110 15.1	246 03.4	41.1	329 03.7	29.5	0 59.6	10.4	252 26.1	35.6	Elnath	278 12.3	N28 36.9
H 08	125 17.5	261 03.0	42.1	344 04.6	29.1	16 01.8	10.4	267 28.3	35.7	Eltanin	90 46.1	N51 29.7
U 09	140 20.0	276 02.7	43.1	359 05.5	28.6	31 03.9	10.3	282 30.6	35.8	Enif	33 46.7	N 9 56.6
R 10	155 22.4	291 02.3	44.0	14 06.5	28.2	46 06.0	10.3	297 32.8	35.9	Fomalhaut	15 23.4	S29 32.8
S 11	170 24.9	306 02.0	45.0	29 07.4	27.7	61 08.2	10.2	312 35.0	36.0			
D 12	185 27.4	321 01.6	S18 46.0	44 08.3	N16 27.3	76 10.3	N22 10.2	327 37.2	S12 36.1	Gacrux	172 01.2	S57 11.4
A 13	200 29.8	336 01.3	46.9	59 09.2	26.8	91 12.4	10.2	342 39.4	36.1	Gienah	175 52.4	S17 37.0
Y 14	215 32.3	351 00.9	47.9	74 10.2	26.4	106 14.6	10.1	357 41.6	36.2	Hadar	148 48.1	S60 26.4
15	230 34.8	6 00.6	48.9	89 11.1	25.9	121 16.7	10.1	12 43.8	36.3	Hamal	328 00.2	N23 31.7
16	245 37.2	21 00.3	49.8	104 12.0	25.4	136 18.8	10.1	27 46.0	36.4	Kaus Aust.	83 43.5	S34 22.6
17	260 39.7	35 59.9	50.8	119 13.0	25.0	151 21.0	10.0	42 48.3	36.5			
18	275 42.2	50 59.6	S18 51.7	134 13.9	N16 24.5	166 23.1	N22 10.0	57 50.5	S12 36.6	Kochab	137 21.0	N74 06.2
19	290 44.6	65 59.2	52.7	149 14.8	24.1	181 25.3	10.0	72 52.7	36.7	Markab	13 37.8	N15 17.0
20	305 47.1	80 58.9	53.7	164 15.8	23.6	196 27.4	09.9	87 54.9	36.8	Menkar	314 14.6	N 4 08.7
21	320 49.5	95 58.5	54.6	179 16.7	23.2	211 29.5	09.9	102 57.1	36.8	Menkent	148 07.7	S36 26.2
22	335 52.0	110 58.2	55.6	194 17.6	22.7	226 31.7	09.8	117 59.3	36.9	Miaplacidus	221 40.2	S69 46.3
23	350 54.5	125 57.8	56.5	209 18.6	22.2	241 33.8	09.8	133 01.5	37.0			
27 00	5 56.9	140 57.5	S18 57.5	224 19.5	N16 21.8	256 35.9	N22 09.8	148 03.7	S12 37.1	Mirfak	308 39.7	N49 54.4
01	20 59.4	155 57.1	58.4	239 20.4	21.3	271 38.1	09.7	163 05.9	37.2	Nunki	75 58.0	S26 16.6
02	36 01.9	170 56.8	18 59.4	254 21.4	20.9	286 40.2	09.7	178 08.1	37.3	Peacock	53 18.7	S56 41.4
03	51 04.3	185 56.4	19 00.3	269 22.3	20.4	301 42.4	09.7	193 10.4	37.4	Pollux	243 27.6	N27 59.4
04	66 06.8	200 56.1	01.3	284 23.2	19.9	316 44.5	09.6	208 12.6	37.5	Procyon	244 59.6	N 5 11.3
05	81 09.3	215 55.7	02.2	299 24.2	19.5	331 46.6	09.6	223 14.8	37.5			
06	96 11.7	230 55.4	S19 03.2	314 25.1	N16 19.0	346 48.8	N22 09.6	238 17.0	S12 37.6	Rasalhague	96 06.3	N12 33.4
07	111 14.2	245 55.0	04.1	329 26.0	18.6	1 50.9	09.5	253 19.2	37.7	Regulus	207 43.6	N11 54.0
08	126 16.7	260 54.7	05.1	344 27.0	18.1	16 53.1	09.5	268 21.4	37.8	Rigel	281 11.8	S 8 11.1
F 09	141 19.1	275 54.3	06.0	359 27.9	17.6	31 55.2	09.5	283 23.6	37.9	Rigil Kent.	139 51.9	S60 53.5
R 10	156 21.6	290 54.0	07.0	14 28.8	17.2	46 57.3	09.4	298 25.8	38.0	Sabik	102 12.4	S15 44.3
I 11	171 24.0	305 53.6	07.9	29 29.8	16.7	61 59.5	09.4	313 28.0	38.1			
D 12	186 26.5	320 53.3	S19 08.9	44 30.7	N16 16.3	77 01.6	N22 09.3	328 30.3	S12 38.2	Schedar	349 39.7	N56 36.8
A 13	201 29.0	335 52.9	09.8	59 31.6	15.8	92 03.8	09.3	343 32.5	38.2	Shaula	96 21.7	S37 06.7
Y 14	216 31.4	350 52.6	10.8	74 32.6	15.3	107 05.9	09.3	358 34.7	38.3	Sirius	258 33.6	S16 44.1
15	231 33.9	5 52.2	11.7	89 33.5	14.9	122 08.1	09.2	13 36.9	38.4	Spica	158 31.3	S11 13.9
16	246 36.4	20 51.9	12.7	104 34.5	14.4	137 10.2	09.2	28 39.1	38.5	Suhail	222 52.6	S43 29.2
17	261 38.8	35 51.5	13.6	119 35.4	14.0	152 12.3	09.2	43 41.3	38.6			
18	276 41.3	50 51.2	S19 14.5	134 36.3	N16 13.5	167 14.5	N22 09.1	58 43.5	S12 38.7	Vega	80 38.8	N38 48.3
19	291 43.8	65 50.8	15.5	149 37.3	13.0	182 16.6	09.1	73 45.7	38.8	Zuben'ubi	137 05.4	S16 05.8
20	306 46.2	80 50.5	16.4	164 38.2	12.6	197 18.8	09.1	88 47.9	38.9		SHA	Mer.Pass.
21	321 48.7	95 50.1	17.4	179 39.1	12.1	212 20.9	09.0	103 50.1	39.0		° ′	h m
22	336 51.2	110 49.7	18.3	194 40.1	11.7	227 23.1	09.0	118 52.3	39.0	Venus	136 07.9	14 36
23	351 53.6	125 49.4	19.2	209 41.0	11.2	242 25.2	09.0	133 54.6	39.1	Mars	218 59.4	9 04
	h m									Jupiter	250 46.9	6 56
Mer.Pass.	23 36.3	v −0.3	d 1.0	v 0.9	d 0.5	v 2.1	d 0.0	v 2.2	d 0.1	Saturn	142 12.8	14 09

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 25	Moonrise 26	Moonrise 27	Moonrise 28
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
25 00	182 03.7	S 0 49.9	296 56.5	11.4	N19 06.7	2.3	54.9	N 72	03 23	04 49	05 57				20 59
01	197 03.9	50.9	311 26.9	11.5	19 09.0	2.2	54.9	N 70	03 39	04 55	05 56	17 42	18 40	20 08	21 43
02	212 04.1	51.8	325 57.4	11.4	19 11.2	2.1	54.9	68	03 51	05 00	05 55	18 45	19 38	20 50	22 12
03	227 04.3	52.8	340 27.8	11.5	19 13.3	2.0	54.8	66	04 02	05 04	05 55	19 20	20 12	21 18	22 34
04	242 04.5	53.8	354 58.3	11.5	19 15.3	1.9	54.8	64	04 10	05 07	05 55	19 45	20 37	21 40	22 51
05	257 04.7	54.8	9 28.8	11.5	19 17.2	1.8	54.8	62	04 17	05 10	05 54	20 05	20 56	21 57	23 05
06	272 05.0	S 0 55.7	23 59.3	11.5	N19 19.0	1.8	54.8	60	04 23	05 12	05 54	20 21	21 12	22 11	23 17
W 07	287 05.2	56.7	38 29.8	11.5	19 20.8	1.6	54.8	N 58	04 28	05 14	05 53	20 35	21 26	22 23	23 27
E 08	302 05.4	57.7	53 00.3	11.6	19 22.4	1.6	54.7	56	04 32	05 16	05 53	20 47	21 37	22 34	23 36
D 09	317 05.6	58.7	67 30.9	11.5	19 24.0	1.4	54.7	54	04 36	05 18	05 53	20 57	21 47	22 43	23 44
N 10	332 05.8	0 59.6	82 01.4	11.5	19 25.4	1.4	54.7	52	04 39	05 19	05 53	21 06	21 56	22 52	23 51
E 11	347 06.0	1 00.6	96 31.9	11.6	19 26.8	1.2	54.7	50	04 42	05 20	05 52	21 14	22 04	22 59	23 57
S 12	2 06.3	S 1 01.6	111 02.5	11.6	N19 28.0	1.2	54.7	45	04 48	05 23	05 52	21 32	22 21	23 15	24 11
D 13	17 06.5	02.6	125 33.1	11.6	19 29.2	1.1	54.7	N 40	04 53	05 24	05 51	21 46	22 35	23 28	24 22
A 14	32 06.7	03.5	140 03.7	11.6	19 30.3	1.0	54.6	35	04 56	05 26	05 51	21 58	22 47	23 39	24 32
Y 15	47 06.9	04.5	154 34.3	11.6	19 31.3	0.9	54.6	30	04 59	05 27	05 51	22 09	22 58	23 48	24 40
16	62 07.1	05.5	169 04.9	11.6	19 32.2	0.8	54.6	20	05 02	05 28	05 50	22 27	23 16	24 05	00 05
17	77 07.3	06.4	183 35.5	11.7	19 33.0	0.7	54.6	N 10	05 04	05 28	05 49	22 43	23 31	24 19	00 19
18	92 07.5	S 1 07.4	198 06.2	11.6	N19 33.7	0.6	54.6	0	05 03	05 27	05 48	22 58	23 46	24 33	00 33
19	107 07.8	08.4	212 36.8	11.7	19 34.3	0.5	54.6	S 10	05 02	05 26	05 47	23 13	24 00	00 00	00 46
20	122 08.0	09.4	227 07.5	11.7	19 34.8	0.4	54.6	20	04 58	05 24	05 46	23 28	24 16	00 16	01 01
21	137 08.2	10.3	241 38.2	11.7	19 35.2	0.3	54.5	30	04 53	05 21	05 44	23 47	24 34	00 34	01 17
22	152 08.4	11.3	256 08.9	11.7	19 35.5	0.3	54.5	35	04 49	05 18	05 44	23 57	24 44	00 44	01 27
23	167 08.6	12.3	270 39.6	11.8	19 35.8	0.1	54.5	40	04 44	05 16	05 43	24 10	00 10	00 56	01 38
26 00	182 08.8	S 1 13.3	285 10.4	11.7	N19 35.9	0.1	54.5	45	04 37	05 12	05 41	24 24	00 24	01 10	01 51
01	197 09.0	14.2	299 41.1	11.8	19 36.0	0.1	54.5	S 50	04 29	05 08	05 40	24 42	00 42	01 27	02 06
02	212 09.3	15.2	314 11.9	11.7	19 35.9	0.1	54.5	52	04 25	05 05	05 39	24 50	00 50	01 35	02 13
03	227 09.5	16.2	328 42.6	11.8	19 35.8	0.2	54.5	54	04 21	05 03	05 38	00 07	00 59	01 44	02 22
04	242 09.7	17.2	343 13.4	11.8	19 35.6	0.3	54.5	56	04 16	05 00	05 38	00 17	01 10	01 54	02 31
05	257 09.9	18.1	357 44.2	11.9	19 35.3	0.5	54.4	58	04 10	04 57	05 37	00 29	01 22	02 06	02 41
06	272 10.1	S 1 19.1	12 15.1	11.8	N19 34.8	0.5	54.4	S 60	04 03	04 54	05 36	00 42	01 36	02 19	02 53
T 07	287 10.3	20.1	26 45.9	11.9	19 34.3	0.5	54.4								
H 08	302 10.5	21.1	41 16.8	11.9	19 33.8	0.7	54.4								
U 09	317 10.8	22.0	55 47.7	11.9	19 33.1	0.8	54.4								
R 10	332 11.0	23.0	70 18.6	11.9	19 32.3	0.9	54.4								
S 11	347 11.2	24.0	84 49.5	11.9	19 31.4	0.9	54.4								
D 12	2 11.4	S 1 24.9	99 20.4	11.9	N19 30.5	1.1	54.4								
A 13	17 11.6	25.9	113 51.3	12.0	19 29.4	1.1	54.4								
Y 14	32 11.8	26.9	128 22.3	12.0	19 28.3	1.2	54.4								
15	47 12.0	27.9	142 53.3	12.0	19 27.1	1.4	54.3								
16	62 12.3	28.8	157 24.3	12.0	19 25.7	1.4	54.3								
17	77 12.5	29.8	171 55.3	12.1	19 24.3	1.5	54.3								
18	92 12.7	S 1 30.8	186 26.4	12.0	N19 22.8	1.6	54.3								
19	107 12.9	31.8	200 57.4	12.1	19 21.2	1.6	54.3								
20	122 13.1	32.7	215 28.5	12.1	19 19.6	1.8	54.3								
21	137 13.3	33.7	229 59.6	12.1	19 17.8	1.9	54.3								
22	152 13.5	34.7	244 30.7	12.1	19 15.9	1.9	54.3								
23	167 13.7	35.7	259 01.8	12.2	19 14.0	2.0	54.3								
27 00	182 14.0	S 1 36.6	273 33.0	12.2	N19 12.0	2.1	54.3								
01	197 14.2	37.6	288 04.2	12.2	19 09.9	2.3	54.3								
02	212 14.4	38.6	302 35.4	12.2	19 07.6	2.2	54.3								
03	227 14.6	39.5	317 06.6	12.2	19 05.4	2.4	54.3								
04	242 14.8	40.5	331 37.8	12.3	19 03.0	2.5	54.3								
05	257 15.0	41.5	346 09.1	12.2	19 00.5	2.6	54.3								
06	272 15.2	S 1 42.5	0 40.3	12.3	N18 57.9	2.6	54.3								
F 07	287 15.4	43.4	15 11.6	12.4	18 55.3	2.7	54.3								
R 08	302 15.7	44.4	29 43.0	12.3	18 52.6	2.8	54.3								
I 09	317 15.9	45.4	44 14.3	12.4	18 49.8	2.9	54.2								
D 10	332 16.1	46.4	58 45.7	12.3	18 46.9	3.0	54.2								
A 11	347 16.3	47.3	73 17.0	12.4	18 43.9	3.1	54.2								
Y 12	2 16.5	S 1 48.3	87 48.4	12.5	N18 40.8	3.2	54.2								
13	17 16.7	49.3	102 19.9	12.4	18 37.6	3.2	54.2								
14	32 16.9	50.2	116 51.3	12.5	18 34.4	3.3	54.2								
15	47 17.1	51.2	131 22.8	12.4	18 31.1	3.4	54.2								
16	62 17.3	52.2	145 54.2	12.5	18 27.7	3.5	54.2								
17	77 17.6	53.2	160 25.7	12.6	18 24.2	3.6	54.2								
18	92 17.8	S 1 54.1	174 57.3	12.5	N18 20.6	3.7	54.2								
19	107 18.0	55.1	189 28.8	12.6	18 16.9	3.7	54.2								
20	122 18.2	56.1	204 00.4	12.6	18 13.2	3.8	54.2								
21	137 18.4	57.1	218 32.0	12.6	18 09.4	3.9	54.2								
22	152 18.6	58.0	233 03.6	12.6	18 05.5	4.0	54.2								
23	167 18.8	59.0	247 35.2	12.7	N18 01.5	4.1	54.2								
	SD 16.0	d 1.0	SD	14.9		14.8		14.8							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 25	Moonset 26	Moonset 27	Moonset 28
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 43	18 51	20 16				17 26
N 70	17 44	18 45	20 00	15 47	16 29	16 40	16 41
68	17 45	18 40	19 48	14 44	15 31	15 57	16 12
66	17 46	18 37	19 38	14 09	14 57	15 29	15 50
64	17 46	18 34	19 30	13 44	14 32	15 07	15 32
62	17 47	18 31	19 24	13 24	14 12	14 49	15 17
60	17 47	18 29	19 18	13 08	13 56	14 35	15 05
N 58	17 48	18 27	19 13	12 55	13 43	14 22	14 54
56	17 48	18 25	19 09	12 43	13 31	14 12	14 45
54	17 49	18 24	19 05	12 33	13 21	14 02	14 37
52	17 49	18 22	19 02	12 24	13 12	13 54	14 29
50	17 49	18 21	18 59	12 15	13 04	13 46	14 22
45	17 50	18 19	18 53	11 58	12 46	13 30	14 08
N 40	17 50	18 17	18 49	11 44	12 32	13 16	13 56
35	17 51	18 16	18 46	11 32	12 20	13 05	13 46
30	17 52	18 15	18 43	11 21	12 10	12 55	13 37
20	17 53	18 14	18 40	11 03	11 52	12 38	13 22
N 10	17 53	18 14	18 39	10 47	11 36	12 23	13 08
0	17 54	18 15	18 39	10 33	11 21	12 09	12 55
S 10	17 56	18 17	18 41	10 18	11 06	11 55	12 43
20	17 57	18 19	18 45	10 02	10 50	11 39	12 29
30	17 59	18 22	18 50	09 44	10 32	11 22	12 13
35	17 59	18 25	18 54	09 33	10 21	11 12	12 04
40	18 01	18 28	19 00	09 21	10 09	11 00	11 54
45	18 02	18 31	19 06	09 07	09 55	10 47	11 41
S 50	18 04	18 36	19 14	08 50	09 37	10 30	11 26
52	18 04	18 38	19 19	08 41	09 29	10 22	11 19
54	18 05	18 41	19 23	08 32	09 20	10 13	11 12
56	18 06	18 44	19 28	08 22	09 09	10 03	11 03
58	18 07	18 47	19 34	08 10	08 57	09 52	10 53
S 60	18 08	18 50	19 41	07 57	08 43	09 39	10 42

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
25	08 14	08 25	11 52	04 21	16 45	20	66
26	08 35	08 45	11 51	05 09	17 33	21	56
27	08 55	09 06	11 51	05 57	18 21	22	47

UT	ARIES	VENUS −4.2		MARS +1.6		JUPITER −2.2		SATURN +0.7		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
28 00	6 56.1	140 49.0	S19 20.2	224 41.9	N16 10.7	257 27.4	N22 08.9	148 56.8	S12 39.2	Acamar	315 17.9	S40 14.8
01	21 58.5	155 48.7	21.1	239 42.9	10.3	272 29.5	08.9	163 59.0	39.3	Achernar	335 26.1	S57 09.9
02	37 01.0	170 48.3	22.1	254 43.8	09.8	287 31.6	08.8	179 01.2	39.4	Acrux	173 09.7	S63 10.5
03	52 03.5	185 48.0	23.0	269 44.8	09.3	302 33.8	08.8	194 03.4	39.5	Adhara	255 12.4	S28 59.3
04	67 05.9	200 47.6	23.9	284 45.7	08.9	317 35.9	08.8	209 05.6	39.6	Aldebaran	290 49.0	N16 32.1
05	82 08.4	215 47.3	24.9	299 46.6	08.4	332 38.1	08.7	224 07.8	39.7			
06	97 10.9	230 46.9	S19 25.8	314 47.6	N16 08.0	347 40.2	N22 08.7	239 10.0	S12 39.7	Alioth	166 21.1	N55 53.2
07	112 13.3	245 46.5	26.7	329 48.5	07.5	2 42.4	08.7	254 12.2	39.8	Alkaid	152 59.2	N49 14.9
S 08	127 15.8	260 46.2	27.7	344 49.5	07.0	17 44.5	08.6	269 14.4	39.9	Al Na'ir	27 43.1	S46 53.6
A 09	142 18.3	275 45.8	28.6	359 50.4	06.6	32 46.7	08.6	284 16.6	40.0	Alnilam	275 46.1	S 1 11.6
T 10	157 20.7	290 45.5	29.5	14 51.3	06.1	47 48.8	08.6	299 18.9	40.1	Alphard	217 56.1	S 8 43.1
U 11	172 23.2	305 45.1	30.4	29 52.3	05.6	62 51.0	08.5	314 21.1	40.2			
R 12	187 25.7	320 44.7	S19 31.4	44 53.2	N16 05.2	77 53.1	N22 08.5	329 23.3	S12 40.3	Alphecca	126 11.1	N26 40.4
D 13	202 28.1	335 44.4	32.3	59 54.2	04.7	92 55.3	08.5	344 25.5	40.4	Alpheratz	357 42.9	N29 10.2
A 14	217 30.6	350 44.0	33.2	74 55.1	04.3	107 57.4	08.4	359 27.7	40.5	Altair	62 07.9	N 8 54.6
Y 15	232 33.0	5 43.7	34.2	89 56.0	03.8	122 59.6	08.4	14 29.9	40.5	Ankaa	353 15.1	S42 13.7
16	247 35.5	20 43.3	35.1	104 57.0	03.3	138 01.7	08.4	29 32.1	40.6	Antares	112 26.2	S26 27.6
17	262 38.0	35 42.9	36.0	119 57.9	02.9	153 03.9	08.3	44 34.3	40.7			
18	277 40.4	50 42.6	S19 36.9	134 58.9	N16 02.4	168 06.0	N22 08.3	59 36.5	S12 40.8	Arcturus	145 55.9	N19 06.9
19	292 42.9	65 42.2	37.9	149 59.8	01.9	183 08.2	08.2	74 38.7	40.9	Atria	107 28.0	S69 03.2
20	307 45.4	80 41.9	38.8	165 00.7	01.5	198 10.3	08.2	89 40.9	41.0	Avior	234 18.2	S59 33.1
21	322 47.8	95 41.5	39.7	180 01.7	01.0	213 12.5	08.2	104 43.1	41.1	Bellatrix	278 31.7	N 6 21.7
22	337 50.3	110 41.1	40.6	195 02.6	00.5	228 14.6	08.1	119 45.3	41.2	Betelgeuse	271 01.0	N 7 24.5
23	352 52.8	125 40.8	41.5	210 03.6	16 00.1	243 16.8	08.1	134 47.6	41.3			
29 00	7 55.2	140 40.4	S19 42.5	225 04.5	N15 59.6	258 18.9	N22 08.1	149 49.8	S12 41.3	Canopus	263 56.0	S52 42.0
01	22 57.7	155 40.1	43.4	240 05.5	59.2	273 21.1	08.0	164 52.0	41.4	Capella	280 34.0	N46 00.4
02	38 00.1	170 39.7	44.3	255 06.4	58.7	288 23.2	08.0	179 54.2	41.5	Deneb	49 31.1	N45 20.2
03	53 02.6	185 39.3	45.2	270 07.3	58.2	303 25.4	08.0	194 56.4	41.6	Denebola	182 33.8	N14 29.8
04	68 05.1	200 39.0	46.1	285 08.3	57.8	318 27.5	07.9	209 58.6	41.7	Diphda	348 55.4	S17 54.5
05	83 07.5	215 38.6	47.0	300 09.2	57.3	333 29.7	07.9	225 00.8	41.8			
06	98 10.0	230 38.2	S19 48.0	315 10.2	N15 56.8	348 31.8	N22 07.9	240 03.0	S12 41.9	Dubhe	193 52.1	N61 40.5
07	113 12.5	245 37.9	48.9	330 11.1	56.4	3 34.0	07.8	255 05.2	42.0	Elnath	278 12.3	N28 36.9
S 08	128 14.9	260 37.5	49.8	345 12.1	55.9	18 36.1	07.8	270 07.4	42.0	Eltanin	90 46.1	N51 29.7
U 09	143 17.4	275 37.1	50.7	0 13.0	55.4	33 38.3	07.8	285 09.6	42.1	Enif	33 46.7	N 9 56.6
N 10	158 19.9	290 36.8	51.6	15 14.0	55.0	48 40.5	07.7	300 11.8	42.2	Fomalhaut	15 23.4	S29 32.8
D 11	173 22.3	305 36.4	52.5	30 14.9	54.5	63 42.6	07.7	315 14.0	42.3			
A 12	188 24.8	320 36.0	S19 53.4	45 15.8	N15 54.0	78 44.8	N22 07.7	330 16.2	S12 42.4	Gacrux	172 01.2	S57 11.4
Y 13	203 27.3	335 35.7	54.3	60 16.8	53.6	93 46.9	07.6	345 18.4	42.5	Gienah	175 52.4	S17 37.0
14	218 29.7	350 35.3	55.2	75 17.7	53.1	108 49.1	07.6	0 20.7	42.6	Hadar	148 48.1	S60 26.4
15	233 32.2	5 34.9	56.2	90 18.7	52.6	123 51.2	07.6	15 22.9	42.7	Hamal	328 00.2	N23 31.7
16	248 34.6	20 34.6	57.1	105 19.6	52.2	138 53.4	07.5	30 25.1	42.8	Kaus Aust.	83 43.5	S34 22.6
17	263 37.1	35 34.2	58.0	120 20.6	51.7	153 55.5	07.5	45 27.3	42.8			
18	278 39.6	50 33.8	S19 58.9	135 21.5	N15 51.2	168 57.7	N22 07.5	60 29.5	S12 42.9	Kochab	137 21.1	N74 06.2
19	293 42.0	65 33.5	19 59.8	150 22.5	50.8	183 59.9	07.4	75 31.7	43.0	Markab	13 37.8	N15 17.0
20	308 44.5	80 33.1	20 00.7	165 23.4	50.3	199 02.0	07.4	90 33.9	43.1	Menkar	314 14.6	N 4 08.7
21	323 47.0	95 32.7	01.6	180 24.4	49.8	214 04.2	07.4	105 36.1	43.2	Menkent	148 07.7	S36 26.2
22	338 49.4	110 32.4	02.5	195 25.3	49.4	229 06.3	07.3	120 38.3	43.3	Miaplacidus	221 40.1	S69 46.3
23	353 51.9	125 32.0	03.4	210 26.3	48.9	244 08.5	07.3	135 40.5	43.4			
30 00	8 54.4	140 31.6	S20 04.3	225 27.2	N15 48.4	259 10.6	N22 07.2	150 42.7	S12 43.5	Mirfak	308 39.7	N49 54.4
01	23 56.8	155 31.3	05.2	240 28.1	48.0	274 12.8	07.2	165 44.9	43.6	Nunki	75 58.0	S26 16.6
02	38 59.3	170 30.9	06.1	255 29.1	47.5	289 15.0	07.2	180 47.1	43.6	Peacock	53 18.7	S56 41.4
03	54 01.8	185 30.5	07.0	270 30.0	47.0	304 17.1	07.1	195 49.3	43.7	Pollux	243 27.6	N27 59.4
04	69 04.2	200 30.1	07.9	285 31.0	46.5	319 19.3	07.1	210 51.5	43.8	Procyon	244 59.6	N 5 11.3
05	84 06.7	215 29.8	08.8	300 31.9	46.1	334 21.4	07.1	225 53.7	43.9			
06	99 09.1	230 29.4	S20 09.7	315 32.9	N15 45.6	349 23.6	N22 07.0	240 55.9	S12 44.0	Rasalhague	96 06.3	N12 33.4
07	114 11.6	245 29.0	10.6	330 33.8	45.1	4 25.8	07.0	255 58.1	44.1	Regulus	207 43.6	N11 54.0
08	129 14.1	260 28.7	11.5	345 34.8	44.7	19 27.9	07.0	271 00.4	44.2	Rigel	281 11.8	S 8 11.1
M 09	144 16.5	275 28.3	12.4	0 35.7	44.2	34 30.1	06.9	286 02.6	44.3	Rigil Kent.	139 51.9	S60 53.5
O 10	159 19.0	290 27.9	13.2	15 36.7	43.7	49 32.2	06.9	301 04.8	44.4	Sabik	102 12.4	S15 44.3
N 11	174 21.5	305 27.5	14.1	30 37.6	43.3	64 34.4	06.9	316 07.0	44.4			
D 12	189 23.9	320 27.2	S20 15.0	45 38.6	N15 42.8	79 36.6	N22 06.8	331 09.2	S12 44.5	Schedar	349 39.7	N56 36.9
A 13	204 26.4	335 26.8	15.9	60 39.5	42.3	94 38.7	06.8	346 11.4	44.6	Shaula	96 21.7	S37 06.7
Y 14	219 28.9	350 26.4	16.8	75 40.5	41.9	109 40.9	06.8	1 13.6	44.7	Sirius	258 33.6	S16 44.1
15	234 31.3	5 26.0	17.7	90 41.4	41.4	124 43.0	06.7	16 15.8	44.8	Spica	158 31.3	S11 13.9
16	249 33.8	20 25.7	18.6	105 42.4	40.9	139 45.2	06.7	31 18.0	44.9	Suhail	222 52.5	S43 29.2
17	264 36.2	35 25.3	19.5	120 43.3	40.4	154 47.4	06.7	46 20.2	45.0			
18	279 38.7	50 24.9	S20 20.4	135 44.3	N15 40.0	169 49.5	N22 06.6	61 22.4	S12 45.1	Vega	80 38.8	N38 48.3
19	294 41.2	65 24.5	21.2	150 45.2	39.5	184 51.7	06.6	76 24.6	45.2	Zuben'ubi	137 05.4	S16 05.8
20	309 43.6	80 24.2	22.1	165 46.2	39.0	199 53.9	06.6	91 26.8	45.3		SHA	Mer. Pass.
21	324 46.1	95 23.8	23.0	180 47.1	38.6	214 56.0	06.5	106 29.0	45.3		° ′	h m
22	339 48.6	110 23.4	23.9	195 48.1	38.1	229 58.2	06.5	121 31.2	45.4	Venus	132 45.2	14 38
23	354 51.0	125 23.0	24.8	210 49.1	37.6	245 00.4	06.5	136 33.4	45.5	Mars	217 09.3	8 59
	h m									Jupiter	250 23.7	6 46
Mer. Pass.	23 24.5	v −0.4	d 0.9	v 0.9	d 0.5	v 2.2	d 0.0	v 2.2	d 0.1	Saturn	141 54.5	13 59

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 28	Moonrise 29	Moonrise 30	Moonrise 1
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
28 00	182 19.0	S 2 00.0	262 06.9	12.6	N17 57.4	4.2	54.2	N 72	03 39	05 03	06 10	20 59	22 53	24 39	00 39
01	197 19.2	01.0	276 38.5	12.7	17 53.2	4.2	54.2	N 70	03 53	05 07	06 08	21 43	23 19	24 55	00 55
02	212 19.4	01.9	291 10.2	12.7	17 49.0	4.3	54.2	66	04 04	05 11	06 06	22 12	23 39	25 07	01 07
03	227 19.7	02.9	305 41.9	12.8	17 44.7	4.4	54.2	64	04 12	05 13	06 04	22 34	23 54	25 18	01 18
04	242 19.9	03.9	320 13.7	12.7	17 40.3	4.5	54.2	62	04 19	05 16	06 03	22 51	24 07	00 07	01 26
05	257 20.1	04.8	334 45.4	12.8	17 35.8	4.5	54.3	60	04 25	05 18	06 02	23 05	24 18	00 18	01 34
06	272 20.3	S 2 05.8	349 17.2	12.8	N17 31.3	4.7	54.3	N 58	04 30	05 19	06 01	23 17	24 27	00 27	01 40
07	287 20.5	06.8	3 49.0	12.8	17 26.6	4.7	54.3	56	04 35	05 21	06 00	23 27	24 35	00 35	01 45
S 08	302 20.7	07.8	18 20.8	12.9	17 21.9	4.8	54.3	54	04 38	05 22	05 59	23 36	24 42	00 42	01 50
A 09	317 20.9	08.7	32 52.7	12.8	17 17.1	4.8	54.3	52	04 42	05 23	05 58	23 44	24 48	00 48	01 55
T 10	332 21.1	09.7	47 24.5	12.9	17 12.3	5.0	54.3	50	04 45	05 24	05 58	23 51	24 54	00 54	01 59
U 11	347 21.3	10.7	61 56.4	12.9	17 07.3	5.0	54.3	45	04 47	05 25	05 57	23 57	24 59	00 59	02 02
R 12	2 21.5	S 2 11.6	76 28.3	12.9	N17 02.3	5.1	54.3	45	04 52	05 26	05 56	24 11	00 11	01 10	02 10
D 13	17 21.8	12.6	91 00.2	13.0	16 57.2	5.2	54.3	N 40	04 56	05 27	05 54	24 22	00 22	01 19	02 17
A 14	32 22.0	13.6	105 32.2	12.9	16 52.0	5.2	54.3	35	04 59	05 28	05 53	24 32	00 32	01 27	02 22
Y 15	47 22.2	14.6	120 04.1	13.0	16 46.8	5.4	54.3	30	05 01	05 28	05 52	24 40	00 40	01 33	02 27
16	62 22.4	15.5	134 36.1	13.0	16 41.4	5.4	54.3	20	05 03	05 28	05 50	00 05	00 55	01 45	02 36
17	77 22.6	16.5	149 08.1	13.0	16 36.0	5.4	54.3	N 10	05 03	05 28	05 49	00 19	01 08	01 55	02 43
18	92 22.8	S 2 17.5	163 40.1	13.1	N16 30.6	5.6	54.3	0	05 02	05 26	05 47	00 33	01 19	02 05	02 50
19	107 23.0	18.5	178 12.2	13.0	16 25.0	5.6	54.3	S 10	05 00	05 24	05 45	00 46	01 31	02 15	02 57
20	122 23.2	19.4	192 44.2	13.1	16 19.4	5.7	54.3	20	04 55	05 21	05 43	01 01	01 44	02 25	03 04
21	137 23.4	20.4	207 16.3	13.1	16 13.7	5.8	54.3	30	04 49	05 17	05 41	01 17	01 58	02 36	03 13
22	152 23.6	21.4	221 48.4	13.1	16 07.9	5.9	54.3	35	04 44	05 14	05 39	01 27	02 06	02 43	03 18
23	167 23.8	22.3	236 20.5	13.2	16 02.0	5.9	54.4	40	04 39	05 11	05 38	01 38	02 16	02 51	03 23
29 00	182 24.0	S 2 23.3	250 52.7	13.1	N15 56.1	6.0	54.4	45	04 31	05 06	05 36	01 51	02 27	02 59	03 29
01	197 24.2	24.3	265 24.8	13.2	15 50.1	6.1	54.4	S 50	04 22	05 01	05 33	02 06	02 40	03 10	03 37
02	212 24.5	25.3	279 57.0	13.2	15 44.0	6.1	54.4	52	04 18	04 58	05 32	02 13	02 46	03 15	03 41
03	227 24.7	26.2	294 29.2	13.2	15 37.9	6.2	54.4	54	04 13	04 55	05 31	02 22	02 53	03 20	03 44
04	242 24.9	27.2	309 01.4	13.2	15 31.7	6.3	54.4	56	04 07	04 52	05 30	02 31	03 01	03 26	03 49
05	257 25.1	28.2	323 33.6	13.3	15 25.4	6.4	54.4	58	04 00	04 49	05 28	02 41	03 09	03 33	03 53
06	272 25.3	S 2 29.1	338 05.9	13.2	N15 19.0	6.4	54.4	S 60	03 53	04 44	05 26	02 53	03 19	03 41	03 58
07	287 25.5	30.1	352 38.1	13.3	15 12.6	6.5	54.4								
08	302 25.7	31.1	7 10.4	13.3	15 06.1	6.6	54.4								
S 09	317 25.9	32.1	21 42.7	13.3	14 59.5	6.6	54.5								
U 10	332 26.1	33.0	36 15.0	13.3	14 52.9	6.7	54.5								
N 11	347 26.3	34.0	50 47.3	13.4	14 46.2	6.8	54.5								
D 12	2 26.5	S 2 35.0	65 19.7	13.4	N14 39.4	6.8	54.5								
A 13	17 26.7	35.9	79 52.1	13.3	14 32.6	6.9	54.5								
Y 14	32 26.9	36.9	94 24.4	13.4	14 25.7	7.0	54.5								
15	47 27.1	37.9	108 56.8	13.4	14 18.7	7.1	54.5								
16	62 27.3	38.9	123 29.2	13.4	14 11.6	7.1	54.5								
17	77 27.5	39.8	138 01.6	13.5	14 04.5	7.1	54.6								
18	92 27.8	S 2 40.8	152 34.1	13.4	N13 57.4	7.3	54.6								
19	107 28.0	41.8	167 06.5	13.5	13 50.1	7.3	54.6								
20	122 28.2	42.7	181 39.0	13.5	13 42.8	7.4	54.6								
21	137 28.4	43.7	196 11.5	13.5	13 35.4	7.4	54.6								
22	152 28.6	44.7	210 44.0	13.5	13 28.0	7.5	54.6								
23	167 28.8	45.7	225 16.5	13.5	13 20.5	7.5	54.6								
30 00	182 29.0	S 2 46.6	239 49.0	13.5	N13 13.0	7.7	54.7								
01	197 29.2	47.6	254 21.5	13.5	13 05.3	7.7	54.7								
02	212 29.4	48.6	268 54.0	13.6	12 57.6	7.7	54.7								
03	227 29.6	49.5	283 26.6	13.6	12 49.9	7.8	54.7								
04	242 29.8	50.5	297 59.2	13.5	12 42.1	7.9	54.7								
05	257 30.0	51.5	312 31.7	13.6	12 34.2	7.9	54.7								
06	272 30.2	S 2 52.5	327 04.3	13.6	N12 26.3	8.0	54.7								
07	287 30.4	53.4	341 36.9	13.6	12 18.3	8.0	54.8								
08	302 30.6	54.4	356 09.5	13.6	12 10.3	8.2	54.8								
M 09	317 30.8	55.4	10 42.1	13.7	12 02.1	8.1	54.8								
O 10	332 31.0	56.3	25 14.8	13.6	11 54.0	8.2	54.8								
N 11	347 31.2	57.3	39 47.4	13.6	11 45.8	8.3	54.8								
D 12	2 31.4	S 2 58.3	54 20.0	13.7	N11 37.5	8.4	54.9								
A 13	17 31.6	2 59.3	68 52.7	13.6	11 29.1	8.4	54.9								
Y 14	32 31.8	3 00.2	83 25.3	13.7	11 20.7	8.4	54.9								
15	47 32.0	01.2	97 58.0	13.6	11 12.3	8.5	54.9								
16	62 32.2	02.2	112 30.6	13.7	11 03.8	8.6	54.9								
17	77 32.4	03.1	127 03.3	13.7	10 55.2	8.6	54.9								
18	92 32.6	S 3 04.1	141 36.0	13.7	N10 46.6	8.7	55.0								
19	107 32.8	05.1	156 08.7	13.7	10 37.9	8.7	55.0								
20	122 33.1	06.0	170 41.4	13.7	10 29.2	8.8	55.0								
21	137 33.3	07.0	185 14.1	13.7	10 20.4	8.8	55.0								
22	152 33.5	08.0	199 46.8	13.7	10 11.6	8.9	55.0								
23	167 33.7	09.0	214 19.5	13.7	N10 02.7	8.9	55.1								
	SD 16.0	d 1.0	SD	14.8		14.8		14.9							

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
28	09 16	09 26	11 51	06 44	19 07	23	38
29	09 36	09 46	11 50	07 30	19 53	24	29
30	09 56	10 05	11 50	08 16	20 38	25	20

UT	ARIES	VENUS −4.2		MARS +1.6		JUPITER −2.2		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
1 00	9 53.5	140 22.7	S20 25.7	225 50.0	N15 37.1	260 02.5	N22 06.4	151 35.6	S12 45.6
01	24 56.0	155 22.3	26.5	240 51.0	36.7	275 04.7	06.4	166 37.8	45.7
02	39 58.4	170 21.9	27.4	255 51.9	36.2	290 06.9	06.4	181 40.0	45.8
03	55 00.9	185 21.5	28.3	270 52.9	35.7	305 09.0	06.3	196 42.2	45.9
04	70 03.4	200 21.2	29.2	285 53.8	35.3	320 11.2	06.3	211 44.4	46.0
05	85 05.8	215 20.8	30.1	300 54.8	34.8	335 13.4	06.3	226 46.6	46.1
06	100 08.3	230 20.4	S20 30.9	315 55.7	N15 34.3	350 15.5	N22 06.2	241 48.8	S12 46.1
07	115 10.7	245 20.0	31.8	330 56.7	33.8	5 17.7	06.2	256 51.0	46.2
08	130 13.2	260 19.6	32.7	345 57.6	33.4	20 19.9	06.2	271 53.2	46.3
09	145 15.7	275 19.3	33.6	0 58.6	32.9	35 22.0	06.1	286 55.4	46.4
10	160 18.1	290 18.9	34.4	15 59.5	32.4	50 24.2	06.1	301 57.7	46.5
11	175 20.6	305 18.5	35.3	31 00.5	32.0	65 26.4	06.1	316 59.9	46.6
12	190 23.1	320 18.1	S20 36.2	46 01.5	N15 31.5	80 28.5	N22 06.0	332 02.1	S12 46.7
13	205 25.5	335 17.7	37.1	61 02.4	31.0	95 30.7	06.0	347 04.3	46.8
14	220 28.0	350 17.4	37.9	76 03.4	30.5	110 32.9	06.0	2 06.5	46.9
15	235 30.5	5 17.0	38.8	91 04.3	30.1	125 35.0	05.9	17 08.7	46.9
16	250 32.9	20 16.6	39.7	106 05.3	29.6	140 37.2	05.9	32 10.9	47.0
17	265 35.4	35 16.2	40.5	121 06.2	29.1	155 39.4	05.9	47 13.1	47.1
18	280 37.8	50 15.8	S20 41.4	136 07.2	N15 28.6	170 41.5	N22 05.8	62 15.3	S12 47.2
19	295 40.3	65 15.5	42.3	151 08.1	28.2	185 43.7	05.8	77 17.5	47.3
20	310 42.8	80 15.1	43.1	166 09.1	27.7	200 45.9	05.8	92 19.7	47.4
21	325 45.2	95 14.7	44.0	181 10.1	27.2	215 48.1	05.7	107 21.9	47.5
22	340 47.7	110 14.3	44.9	196 11.0	26.8	230 50.2	05.7	122 24.1	47.6
23	355 50.2	125 13.9	45.7	211 12.0	26.3	245 52.4	05.7	137 26.3	47.7
2 00	10 52.6	140 13.5	S20 46.6	226 12.9	N15 25.8	260 54.6	N22 05.6	152 28.5	S12 47.8
01	25 55.1	155 13.2	47.4	241 13.9	25.3	275 56.7	05.6	167 30.7	47.8
02	40 57.6	170 12.8	48.3	256 14.8	24.9	290 58.9	05.6	182 32.9	47.9
03	56 00.0	185 12.4	49.2	271 15.8	24.4	306 01.1	05.5	197 35.1	48.0
04	71 02.5	200 12.0	50.0	286 16.8	23.9	321 03.3	05.5	212 37.3	48.1
05	86 05.0	215 11.6	50.9	301 17.7	23.4	336 05.4	05.5	227 39.5	48.2
06	101 07.4	230 11.2	S20 51.7	316 18.7	N15 23.0	351 07.6	N22 05.4	242 41.7	S12 48.3
07	116 09.9	245 10.9	52.6	331 19.6	22.5	6 09.8	05.4	257 43.9	48.4
08	131 12.3	260 10.5	53.5	346 20.6	22.0	21 12.0	05.4	272 46.1	48.5
09	146 14.8	275 10.1	54.3	1 21.6	21.5	36 14.1	05.3	287 48.3	48.6
10	161 17.3	290 09.7	55.2	16 22.5	21.1	51 16.3	05.3	302 50.5	48.6
11	176 19.7	305 09.3	56.0	31 23.5	20.6	66 18.5	05.3	317 52.7	48.7
12	191 22.2	320 08.9	S20 56.9	46 24.4	N15 20.1	81 20.7	N22 05.2	332 54.9	S12 48.8
13	206 24.7	335 08.5	57.7	61 25.4	19.6	96 22.8	05.2	347 57.1	48.9
14	221 27.1	350 08.1	58.6	76 26.4	19.2	111 25.0	05.2	2 59.3	49.0
15	236 29.6	5 07.8	20 59.4	91 27.3	18.7	126 27.2	05.1	18 01.5	49.1
16	251 32.1	20 07.4	21 00.3	106 28.3	18.2	141 29.4	05.1	33 03.7	49.2
17	266 34.5	35 07.0	01.1	121 29.2	17.7	156 31.5	05.1	48 05.9	49.3
18	281 37.0	50 06.6	S21 02.0	136 30.2	N15 17.2	171 33.7	N22 05.1	63 08.1	S12 49.4
19	296 39.4	65 06.2	02.8	151 31.2	16.8	186 35.9	05.0	78 10.3	49.5
20	311 41.9	80 05.8	03.7	166 32.1	16.3	201 38.1	05.0	93 12.5	49.5
21	326 44.4	95 05.4	04.5	181 33.1	15.8	216 40.2	05.0	108 14.7	49.6
22	341 46.8	110 05.0	05.3	196 34.0	15.3	231 42.4	04.9	123 16.9	49.7
23	356 49.3	125 04.6	06.2	211 35.0	14.9	246 44.6	04.9	138 19.1	49.8
3 00	11 51.8	140 04.3	S21 07.0	226 36.0	N15 14.4	261 46.8	N22 04.9	153 21.3	S12 49.9
01	26 54.2	155 03.9	07.9	241 36.9	13.9	276 49.0	04.8	168 23.5	50.0
02	41 56.7	170 03.5	08.7	256 37.9	13.4	291 51.1	04.8	183 25.7	50.1
03	56 59.2	185 03.1	09.6	271 38.9	13.0	306 53.3	04.8	198 27.9	50.2
04	72 01.6	200 02.7	10.4	286 39.8	12.5	321 55.5	04.7	213 30.1	50.3
05	87 04.1	215 02.3	11.2	301 40.8	12.0	336 57.7	04.7	228 32.3	50.4
06	102 06.6	230 01.9	S21 12.1	316 41.8	N15 11.5	351 59.9	N22 04.7	243 34.5	S12 50.4
07	117 09.0	245 01.5	12.9	331 42.7	11.0	7 02.0	04.6	258 36.7	50.5
08	132 11.5	260 01.1	13.7	346 43.7	10.6	22 04.2	04.6	273 38.9	50.6
09	147 13.9	275 00.7	14.6	1 44.6	10.1	37 06.4	04.6	288 41.1	50.7
10	162 16.4	290 00.3	15.4	16 45.6	09.6	52 08.6	04.5	303 43.3	50.8
11	177 18.9	305 00.0	16.2	31 46.6	09.1	67 10.8	04.5	318 45.5	50.9
12	192 21.3	319 59.6	S21 17.1	46 47.5	N15 08.7	82 12.9	N22 04.5	333 47.7	S12 51.0
13	207 23.8	334 59.2	17.9	61 48.5	08.2	97 15.1	04.4	348 49.9	51.1
14	222 26.3	349 58.8	18.7	76 49.5	07.7	112 17.3	04.4	3 52.1	51.2
15	237 28.7	4 58.4	19.6	91 50.4	07.2	127 19.5	04.4	18 54.3	51.2
16	252 31.2	19 58.0	20.4	106 51.4	06.7	142 21.7	04.3	33 56.5	51.3
17	267 33.7	34 57.6	21.2	121 52.4	06.3	157 23.9	04.3	48 58.7	51.4
18	282 36.1	49 57.2	S21 22.1	136 53.3	N15 05.8	172 26.0	N22 04.3	64 00.9	S12 51.5
19	297 38.6	64 56.8	22.9	151 54.3	05.3	187 28.2	04.3	79 03.1	51.6
20	312 41.1	79 56.4	23.7	166 55.3	04.8	202 30.4	04.2	94 05.3	51.7
21	327 43.5	94 56.0	24.5	181 56.2	04.3	217 32.6	04.2	109 07.5	51.8
22	342 46.0	109 55.6	25.4	196 57.2	03.9	232 34.8	04.2	124 09.7	51.9
23	357 48.4	124 55.2	26.2	211 58.2	03.4	247 37.0	04.1	139 11.9	52.0
Mer. Pass.	h m 23 12.7	v −0.4	d 0.9	v 1.0	d 0.5	v 2.2	d 0.0	v 2.2	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 17.9	S40 14.8
Achernar	335 26.1	S57 09.9
Acrux	173 09.7	S63 10.5
Adhara	255 12.4	S28 59.3
Aldebaran	290 49.0	N16 32.1
Alioth	166 21.1	N55 53.2
Alkaid	152 59.2	N49 14.8
Al Na'ir	27 43.1	S46 53.6
Alnilam	275 46.1	S 1 11.6
Alphard	217 56.1	S 8 43.1
Alphecca	126 11.1	N26 40.4
Alpheratz	357 42.9	N29 10.2
Altair	62 07.9	N 8 54.6
Ankaa	353 15.1	S42 13.7
Antares	112 26.2	S26 27.6
Arcturus	145 55.9	N19 06.8
Atria	107 28.0	S69 03.2
Avior	234 18.2	S59 33.1
Bellatrix	278 31.7	N 6 21.7
Betelgeuse	271 01.0	N 7 24.5
Canopus	263 56.0	S52 42.0
Capella	280 34.0	N46 00.4
Deneb	49 31.1	N45 20.2
Denebola	182 33.8	N14 29.7
Diphda	348 55.4	S17 54.5
Dubhe	193 52.1	N61 40.4
Elnath	278 12.2	N28 36.9
Eltanin	90 46.1	N51 29.7
Enif	33 46.7	N 9 56.6
Fomalhaut	15 23.4	S29 32.8
Gacrux	172 01.2	S57 11.4
Gienah	175 52.4	S17 37.0
Hadar	148 48.1	S60 26.4
Hamal	328 00.2	N23 31.7
Kaus Aust.	83 43.6	S34 22.6
Kochab	137 21.1	N74 06.2
Markab	13 37.8	N15 17.0
Menkar	314 14.6	N 4 08.7
Menkent	148 07.7	S36 26.2
Miaplacidus	221 40.1	S69 46.3
Mirfak	308 39.6	N49 54.4
Nunki	75 58.0	S26 16.6
Peacock	53 18.7	S56 41.4
Pollux	243 27.6	N27 59.4
Procyon	244 59.6	N 5 11.3
Rasalhague	96 06.4	N12 33.4
Regulus	207 43.6	N11 53.9
Rigel	281 11.7	S 8 11.1
Rigil Kent.	139 52.0	S60 53.5
Sabik	102 12.4	S15 44.3
Schedar	349 39.6	N56 36.9
Shaula	96 21.7	S37 06.7
Sirius	258 33.5	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.5	S43 29.2
Vega	80 38.8	N38 48.2
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	129 20.9	14 39
Mars	215 20.3	8 55
Jupiter	250 01.9	6 35
Saturn	141 35.9	13 48

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 1	Moonrise 2	Moonrise 3	Moonrise 4
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
1 00	182 33.9	S 3 09.9	228 52.2	13.7	N 9 53.8	9.0	55.1	N 72	03 55	05 16	06 24	00 39	02 23	04 07	05 53
01	197 34.1	10.9	243 24.9	13.7	9 44.8	9.0	55.1	N 70	04 06	05 19	06 20	00 55	02 31	04 08	05 48
02	212 34.3	11.9	257 57.6	13.7	9 35.8	9.1	55.1	68	04 15	05 21	06 17	01 07	02 38	04 09	05 44
03	227 34.5	12.8	272 30.3	13.7	9 26.7	9.1	55.1	66	04 23	05 23	06 14	01 18	02 43	04 11	05 40
04	242 34.7	13.8	287 03.0	13.7	9 17.6	9.2	55.2	64	04 29	05 24	06 12	01 26	02 48	04 11	05 37
05	257 34.9	14.8	301 35.7	13.7	9 08.4	9.3	55.2	62	04 34	05 26	06 10	01 34	02 52	04 12	05 35
06	272 35.1	S 3 15.7	316 08.4	13.7	N 8 59.1	9.2	55.2	60	04 38	05 27	06 08	01 40	02 55	04 13	05 33
07	287 35.3	16.7	330 41.1	13.7	8 49.9	9.4	55.2	N 58	04 42	05 27	06 06	01 45	02 58	04 13	05 31
08	302 35.5	17.7	345 13.8	13.7	8 40.5	9.3	55.2	56	04 45	05 28	06 05	01 50	03 01	04 14	05 29
09	317 35.7	18.6	359 46.5	13.8	8 31.2	9.4	55.3	54	04 47	05 29	06 04	01 55	03 04	04 14	05 27
10	332 35.9	19.6	14 19.3	13.7	8 21.8	9.5	55.3	52	04 50	05 29	06 03	01 59	03 06	04 15	05 26
11	347 36.1	20.6	28 52.0	13.7	8 12.3	9.5	55.3	50	04 52	05 29	06 02	02 02	03 08	04 15	05 25
12	2 36.3	S 3 21.6	43 24.7	13.7	N 8 02.8	9.6	55.3	45	04 56	05 30	06 00	02 10	03 12	04 16	05 22
13	17 36.5	22.5	57 57.4	13.7	7 53.2	9.6	55.4	N 40	04 59	05 30	05 57	02 17	03 16	04 17	05 19
14	32 36.7	23.5	72 30.1	13.6	7 43.6	9.6	55.4	35	05 01	05 30	05 56	02 22	03 19	04 18	05 17
15	47 36.9	24.5	87 02.7	13.7	7 34.0	9.7	55.4	30	05 02	05 30	05 54	02 27	03 22	04 18	05 16
16	62 37.1	25.4	101 35.4	13.7	7 24.3	9.7	55.4	20	05 04	05 29	05 51	02 36	03 27	04 19	05 13
17	77 37.3	26.4	116 08.1	13.7	7 14.6	9.8	55.5	N 10	05 03	05 28	05 49	02 43	03 31	04 20	05 10
18	92 37.5	S 3 27.4	130 40.8	13.6	N 7 04.8	9.8	55.5	0	05 01	05 25	05 46	02 50	03 35	04 21	05 08
19	107 37.7	28.3	145 13.4	13.7	6 55.0	9.8	55.5	S 10	04 58	05 22	05 43	02 57	03 39	04 22	05 05
20	122 37.9	29.3	159 46.1	13.7	6 45.2	9.9	55.5	20	04 53	05 18	05 40	03 04	03 43	04 23	05 03
21	137 38.1	30.3	174 18.8	13.6	6 35.3	9.9	55.5	30	04 45	05 13	05 37	03 13	03 48	04 24	05 00
22	152 38.3	31.2	188 51.4	13.6	6 25.4	10.0	55.6	35	04 40	05 10	05 35	03 18	03 51	04 24	04 58
23	167 38.5	32.2	203 24.0	13.7	6 15.4	9.9	55.6	40	04 33	05 06	05 33	03 23	03 54	04 25	04 56
2 00	182 38.7	S 3 33.2	217 56.7	13.6	N 6 05.5	10.1	55.6	45	04 25	05 00	05 30	03 29	03 58	04 26	04 54
01	197 38.9	34.1	232 29.3	13.6	5 55.4	10.0	55.6	S 50	04 15	04 54	05 27	03 37	04 02	04 27	04 52
02	212 39.1	35.1	247 01.9	13.6	5 45.4	10.2	55.7	52	04 10	04 51	05 25	03 41	04 04	04 27	04 50
03	227 39.3	36.1	261 34.5	13.6	5 35.2	10.1	55.7	54	04 05	04 48	05 24	03 44	04 06	04 28	04 49
04	242 39.4	37.0	276 07.1	13.5	5 25.1	10.2	55.7	56	03 58	04 44	05 22	03 49	04 09	04 28	04 48
05	257 39.6	38.0	290 39.6	13.6	5 14.9	10.2	55.7	58	03 51	04 40	05 20	03 53	04 11	04 29	04 46
06	272 39.8	S 3 39.0	305 12.2	13.5	N 5 04.7	10.2	55.8	S 60	03 42	04 35	05 17	03 58	04 14	04 29	04 45
07	287 40.0	40.0	319 44.7	13.6	4 54.5	10.3	55.8								
08	302 40.2	40.9	334 17.3	13.5	4 44.2	10.3	55.8								
09	317 40.4	41.9	348 49.8	13.5	4 33.9	10.3	55.8								
10	332 40.6	42.9	3 22.3	13.5	4 23.6	10.4	55.9								
11	347 40.8	43.8	17 54.8	13.5	4 13.2	10.4	55.9								
12	2 41.0	S 3 44.8	32 27.3	13.4	N 4 02.8	10.4	55.9								
13	17 41.2	45.8	46 59.7	13.4	3 52.4	10.4	55.9								
14	32 41.4	46.7	61 32.1	13.5	3 42.0	10.5	56.0								
15	47 41.6	47.7	76 04.6	13.4	3 31.5	10.5	56.0								
16	62 41.8	48.7	90 37.0	13.3	3 21.0	10.5	56.0								
17	77 42.0	49.6	105 09.3	13.4	3 10.5	10.6	56.0								
18	92 42.2	S 3 50.6	119 41.7	13.4	N 2 59.9	10.5	56.1								
19	107 42.4	51.6	134 14.1	13.3	2 49.4	10.6	56.1								
20	122 42.6	52.5	148 46.4	13.3	2 38.8	10.7	56.1								
21	137 42.8	53.5	163 18.7	13.2	2 28.1	10.6	56.1								
22	152 43.0	54.5	177 50.9	13.3	2 17.5	10.7	56.2								
23	167 43.2	55.4	192 23.2	13.2	2 06.8	10.6	56.2								
3 00	182 43.4	S 3 56.4	206 55.4	13.2	N 1 56.2	10.8	56.2								
01	197 43.6	57.4	221 27.6	13.2	1 45.4	10.7	56.3								
02	212 43.8	58.3	235 59.8	13.2	1 34.7	10.7	56.3								
03	227 44.0	3 59.3	250 32.0	13.1	1 24.0	10.8	56.3								
04	242 44.2	4 00.3	265 04.1	13.1	1 13.2	10.7	56.3								
05	257 44.4	01.2	279 36.2	13.1	1 02.5	10.8	56.4								
06	272 44.5	S 4 02.2	294 08.3	13.1	N 0 51.7	10.8	56.4								
07	287 44.7	03.2	308 40.4	13.0	0 40.9	10.8	56.4								
08	302 44.9	04.1	323 12.4	13.0	0 30.1	10.9	56.4								
09	317 45.1	05.1	337 44.4	13.0	0 19.2	10.8	56.5								
10	332 45.3	06.1	352 16.4	12.9	N 0 08.4	10.9	56.5								
11	347 45.5	07.0	6 48.3	12.9	S 0 02.5	10.8	56.5								
12	2 45.7	S 4 08.0	21 20.2	12.9	S 0 13.3	10.9	56.5								
13	17 45.9	08.9	35 52.1	12.8	0 24.2	10.9	56.6								
14	32 46.1	09.9	50 23.9	12.8	0 35.1	10.9	56.6								
15	47 46.3	10.9	64 55.7	12.8	0 46.0	10.9	56.6								
16	62 46.5	11.8	79 27.5	12.8	0 56.9	10.9	56.6								
17	77 46.7	12.8	93 59.3	12.7	1 07.8	10.9	56.7								
18	92 46.9	S 4 13.8	108 31.0	12.6	S 1 18.7	10.9	56.7								
19	107 47.1	14.7	123 02.6	12.7	1 29.6	10.9	56.7								
20	122 47.2	15.7	137 34.3	12.6	1 40.5	10.9	56.8								
21	137 47.4	16.7	152 05.9	12.6	1 51.4	10.9	56.8								
22	152 47.6	17.6	166 37.5	12.5	2 02.3	10.9	56.8								
23	167 47.8	18.6	181 09.0	12.5	S 2 13.2	11.0	56.8								
	SD 16.0	d 1.0	SD	15.1		15.2		15.4							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 1	Moonset 2	Moonset 3	Moonset 4
°	h m	h m	h m	h m	h m	h m	h m
N 72	17 13	18 20	19 40	16 46	16 37	16 29	16 20
N 70	17 17	18 17	19 29	16 36	16 33	16 30	16 27
68	17 20	18 15	19 21	16 28	16 30	16 32	16 34
66	17 23	18 14	19 14	16 21	16 27	16 33	16 39
64	17 25	18 12	19 08	16 15	16 24	16 34	16 43
62	17 27	18 11	19 03	16 09	16 22	16 34	16 47
60	17 29	18 11	18 59	16 05	16 20	16 35	16 51
N 58	17 31	18 10	18 55	16 01	16 18	16 36	16 54
56	17 32	18 09	18 52	15 57	16 17	16 36	16 56
54	17 34	18 09	18 50	15 54	16 15	16 37	16 59
52	17 35	18 08	18 48	15 51	16 14	16 37	17 01
50	17 36	18 08	18 46	15 48	16 13	16 38	17 03
45	17 39	18 08	18 42	15 43	16 11	16 38	17 07
N 40	17 41	18 08	18 39	15 38	16 08	16 39	17 11
35	17 43	18 08	18 37	15 33	16 07	16 40	17 14
30	17 44	18 08	18 36	15 30	16 05	16 40	17 17
20	17 47	18 09	18 35	15 23	16 02	16 41	17 22
N 10	17 50	18 11	18 35	15 17	15 59	16 42	17 26
0	17 53	18 13	18 37	15 12	15 57	16 43	17 31
S 10	17 55	18 16	18 41	15 06	15 55	16 44	17 35
20	17 58	18 20	18 46	15 00	15 52	16 45	17 39
30	18 02	18 26	18 54	14 53	15 49	16 46	17 44
35	18 04	18 30	18 59	14 50	15 47	16 46	17 47
40	18 06	18 34	19 06	14 45	15 45	16 47	17 50
45	18 09	18 39	19 14	14 40	15 43	16 47	17 54
S 50	18 13	18 46	19 25	14 34	15 40	16 48	17 58
52	18 14	18 49	19 30	14 31	15 39	16 49	18 00
54	18 16	18 52	19 36	14 27	15 37	16 49	18 03
56	18 18	18 56	19 42	14 24	15 36	16 49	18 05
58	18 20	19 00	19 50	14 20	15 34	16 50	18 08
S 60	18 23	19 05	19 58	14 16	15 32	16 50	18 11

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
1	10 15	10 25	11 50	09 01	21 23	26	13
2	10 34	10 44	11 49	09 46	22 09	27	7
3	10 53	11 02	11 49	10 32	22 55	28	3

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

UT	ARIES	VENUS −4.3		MARS +1.6		JUPITER −2.2		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
4 00	12 50.9	139 54.8	S21 27.0	226 59.1	N15 02.9	262 39.2	N22 04.1	154 14.1	S12 52.1
01	27 53.4	154 54.4	27.8	242 00.1	02.4	277 41.3	04.1	169 16.3	52.1
02	42 55.8	169 54.0	28.6	257 01.1	01.9	292 43.5	04.0	184 18.5	52.2
03	57 58.3	184 53.6	. . 29.5	272 02.0	. . 01.5	307 45.7	. . 04.0	199 20.7	. . 52.3
04	73 00.8	199 53.2	30.3	287 03.0	01.0	322 47.9	04.0	214 22.9	52.4
05	88 03.2	214 52.8	31.1	302 04.0	00.5	337 50.1	03.9	229 25.1	52.5
06	103 05.7	229 52.4	S21 31.9	317 04.9	N15 00.0	352 52.3	N22 03.9	244 27.3	S12 52.6
07	118 08.2	244 52.0	32.7	332 05.9	14 59.5	7 54.5	03.9	259 29.5	52.7
08	133 10.6	259 51.6	33.5	347 06.9	59.1	22 56.7	03.8	274 31.7	52.8
F 09	148 13.1	274 51.2	. . 34.4	2 07.9	. . 58.6	37 58.8	. . 03.8	289 33.9	. . 52.9
R 10	163 15.5	289 50.8	35.2	17 08.8	58.1	53 01.0	03.8	304 36.1	53.0
I 11	178 18.0	304 50.4	36.0	32 09.8	57.6	68 03.2	03.8	319 38.3	53.0
12	193 20.5	319 50.0	S21 36.8	47 10.8	N14 57.1	83 05.4	N22 03.7	334 40.5	S12 53.1
D 13	208 22.9	334 49.6	37.6	62 11.7	56.7	98 07.6	03.7	349 42.7	53.2
A 14	223 25.4	349 49.2	38.4	77 12.7	56.2	113 09.8	03.7	4 44.9	53.3
Y 15	238 27.9	4 48.8	. . 39.2	92 13.7	. . 55.7	128 12.0	. . 03.6	19 47.1	. . 53.4
16	253 30.3	19 48.4	40.0	107 14.6	55.2	143 14.2	03.6	34 49.3	53.5
17	268 32.8	34 48.0	40.8	122 15.6	54.7	158 16.4	03.6	49 51.5	53.6
18	283 35.3	49 47.6	S21 41.7	137 16.6	N14 54.2	173 18.6	N22 03.5	64 53.7	S12 53.7
19	298 37.7	64 47.2	42.5	152 17.6	53.8	188 20.7	03.5	79 55.9	53.8
20	313 40.2	79 46.8	43.3	167 18.5	53.3	203 22.9	03.5	94 58.1	53.9
21	328 42.7	94 46.4	. . 44.1	182 19.5	. . 52.8	218 25.1	. . 03.4	110 00.2	. . 53.9
22	343 45.1	109 46.0	44.9	197 20.5	52.3	233 27.3	03.4	125 02.4	54.0
23	358 47.6	124 45.6	45.7	212 21.4	51.8	248 29.5	03.4	140 04.6	54.1
5 00	13 50.0	139 45.2	S21 46.5	227 22.4	N14 51.4	263 31.7	N22 03.3	155 06.8	S12 54.2
01	28 52.5	154 44.8	47.3	242 23.4	50.9	278 33.9	03.3	170 09.0	54.3
02	43 55.0	169 44.4	48.1	257 24.4	50.4	293 36.1	03.3	185 11.2	54.4
03	58 57.4	184 44.0	. . 48.9	272 25.3	. . 49.9	308 38.3	. . 03.3	200 13.4	. . 54.5
04	73 59.9	199 43.6	49.7	287 26.3	49.4	323 40.5	03.2	215 15.6	54.6
05	89 02.4	214 43.2	50.5	302 27.3	48.9	338 42.7	03.2	230 17.8	54.7
06	104 04.8	229 42.8	S21 51.3	317 28.3	N14 48.5	353 44.9	N22 03.2	245 20.0	S12 54.8
07	119 07.3	244 42.4	52.1	332 29.2	48.0	8 47.1	03.1	260 22.2	54.9
S 08	134 09.8	259 42.0	52.9	347 30.2	47.5	23 49.3	03.1	275 24.4	54.9
A 09	149 12.2	274 41.6	. . 53.6	2 31.2	. . 47.0	38 51.5	. . 03.1	290 26.6	. . 55.0
T 10	164 14.7	289 41.2	54.4	17 32.2	46.5	53 53.6	03.0	305 28.8	55.1
U 11	179 17.1	304 40.8	55.2	32 33.1	46.0	68 55.8	03.0	320 31.0	55.2
R 12	194 19.6	319 40.4	S21 56.0	47 34.1	N14 45.6	83 58.0	N22 03.0	335 33.2	S12 55.3
D 13	209 22.1	334 40.0	56.8	62 35.1	45.1	99 00.2	03.0	350 35.4	55.4
A 14	224 24.5	349 39.6	57.6	77 36.1	44.6	114 02.4	02.9	5 37.6	55.5
Y 15	239 27.0	4 39.2	. . 58.4	92 37.0	. . 44.1	129 04.6	. . 02.9	20 39.8	. . 55.6
16	254 29.5	19 38.8	21 59.2	107 38.0	43.6	144 06.8	02.9	35 42.0	55.7
17	269 31.9	34 38.3	22 00.0	122 39.0	43.1	159 09.0	02.8	50 44.2	55.8
18	284 34.4	49 37.9	S22 00.8	137 40.0	N14 42.6	174 11.2	N22 02.8	65 46.4	S12 55.8
19	299 36.9	64 37.5	01.5	152 40.9	42.2	189 13.4	02.8	80 48.6	55.9
20	314 39.3	79 37.1	02.3	167 41.9	41.7	204 15.6	02.7	95 50.8	56.0
21	329 41.8	94 36.7	. . 03.1	182 42.9	. . 41.2	219 17.8	. . 02.7	110 53.0	. . 56.1
22	344 44.3	109 36.3	03.9	197 43.9	40.7	234 20.0	02.7	125 55.2	56.2
23	359 46.7	124 35.9	04.7	212 44.8	40.2	249 22.2	02.7	140 57.4	56.3
6 00	14 49.2	139 35.5	S22 05.5	227 45.8	N14 39.7	264 24.4	N22 02.6	155 59.5	S12 56.4
01	29 51.6	154 35.1	06.2	242 46.8	39.3	279 26.6	02.6	171 01.7	56.5
02	44 54.1	169 34.7	07.0	257 47.8	38.8	294 28.8	02.6	186 03.9	56.6
03	59 56.6	184 34.3	. . 07.8	272 48.7	. . 38.3	309 31.0	. . 02.5	201 06.1	. . 56.7
04	74 59.0	199 33.9	08.6	287 49.7	37.8	324 33.2	02.5	216 08.3	56.7
05	90 01.5	214 33.5	09.3	302 50.7	37.3	339 35.4	02.5	231 10.5	56.8
06	105 04.0	229 33.0	S22 10.1	317 51.7	N14 36.8	354 37.6	N22 02.4	246 12.7	S12 56.9
07	120 06.4	244 32.6	10.9	332 52.7	36.3	9 39.8	02.4	261 14.9	57.0
08	135 08.9	259 32.2	11.7	347 53.6	35.9	24 42.0	02.4	276 17.1	57.1
S 09	150 11.4	274 31.8	. . 12.4	2 54.6	. . 35.4	39 44.2	. . 02.4	291 19.3	. . 57.2
U 10	165 13.8	289 31.4	13.2	17 55.6	34.9	54 46.4	02.3	306 21.5	57.3
N 11	180 16.3	304 31.0	14.0	32 56.6	34.4	69 48.6	02.3	321 23.7	57.4
D 12	195 18.7	319 30.6	S22 14.7	47 57.6	N14 33.9	84 50.8	N22 02.3	336 25.9	S12 57.5
A 13	210 21.2	334 30.2	15.5	62 58.5	33.4	99 53.0	02.2	351 28.1	57.6
Y 14	225 23.7	349 29.8	16.3	77 59.5	32.9	114 55.3	02.2	6 30.3	57.7
15	240 26.1	4 29.3	. . 17.1	93 00.5	. . 32.4	129 57.5	. . 02.2	21 32.5	. . 57.7
16	255 28.6	19 28.9	17.8	108 01.5	32.0	144 59.7	02.1	36 34.7	57.8
17	270 31.1	34 28.5	18.6	123 02.5	31.5	160 01.9	02.1	51 36.9	57.9
18	285 33.5	49 28.1	S22 19.3	138 03.4	N14 31.0	175 04.1	N22 02.1	66 39.1	S12 58.0
19	300 36.0	64 27.7	20.1	153 04.4	30.5	190 06.3	02.1	81 41.2	58.1
20	315 38.5	79 27.3	20.9	168 05.4	30.0	205 08.5	02.0	96 43.4	58.2
21	330 40.9	94 26.9	. . 21.6	183 06.4	. . 29.5	220 10.7	. . 02.0	111 45.6	. . 58.3
22	345 43.4	109 26.5	22.4	198 07.4	29.0	235 12.9	02.0	126 47.8	58.4
23	0 45.9	124 26.0	23.2	213 08.4	28.5	250 15.1	01.9	141 50.0	58.5
	h m								
Mer. Pass.	23 00.9	v −0.4	d 0.8	v 1.0	d 0.5	v 2.2	d 0.0	v 2.2	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 17.8	S40 14.8
Achernar	335 26.1	S57 09.9
Acrux	173 09.7	S63 10.5
Adhara	255 12.4	S28 59.3
Aldebaran	290 48.9	N16 32.1
Alioth	166 21.1	N55 53.2
Alkaid	152 59.2	N49 14.8
Al Na'ir	27 43.2	S46 53.6
Alnilam	275 46.1	S 1 11.6
Alphard	217 56.1	S 8 43.1
Alphecca	126 11.1	N26 40.4
Alpheratz	357 42.9	N29 10.2
Altair	62 08.0	N 8 54.6
Ankaa	353 15.1	S42 13.8
Antares	112 26.2	S26 27.6
Arcturus	145 55.9	N19 06.8
Atria	107 28.1	S69 03.2
Avior	234 18.1	S59 33.1
Bellatrix	278 31.7	N 6 21.7
Betelgeuse	271 01.0	N 7 24.5
Canopus	263 56.0	S52 42.0
Capella	280 33.9	N46 00.4
Deneb	49 31.1	N45 20.2
Denebola	182 33.8	N14 29.7
Diphda	348 55.4	S17 54.5
Dubhe	193 52.1	N61 40.4
Elnath	278 12.2	N28 36.9
Eltanin	90 46.2	N51 29.7
Enif	33 46.7	N 9 56.6
Fomalhaut	15 23.5	S29 32.8
Gacrux	172 01.2	S57 11.4
Gienah	175 52.4	S17 37.0
Hadar	148 48.1	S60 26.3
Hamal	328 00.2	N23 31.7
Kaus Aust.	83 43.6	S34 22.6
Kochab	137 21.1	N74 06.2
Markab	13 37.8	N15 17.0
Menkar	314 14.6	N 4 08.7
Menkent	148 07.7	S36 26.2
Miaplacidus	221 40.1	S69 46.3
Mirfak	308 39.6	N49 54.4
Nunki	75 58.1	S26 16.6
Peacock	53 18.7	S56 41.4
Pollux	243 27.6	N27 59.4
Procyon	244 59.6	N 5 11.3
Rasalhague	96 06.4	N12 33.4
Regulus	207 43.5	N11 53.9
Rigel	281 11.7	S 8 11.1
Rigil Kent.	139 52.0	S60 53.5
Sabik	102 12.4	S15 44.3
Schedar	349 39.6	N56 36.9
Shaula	96 21.8	S37 06.7
Sirius	258 33.5	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.5	S43 29.2
Vega	80 38.8	N38 48.2
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	125 55.2	14 41
Mars	213 32.4	8 50
Jupiter	249 41.7	6 25
Saturn	141 16.8	13 38

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 4	Moonrise 5	Moonrise 6	Moonrise 7
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
4 00	182 48.0	S 4 19.6	195 40.5	12.4	S 2 24.2	10.9	56.9	N 72	04 10	05 30	06 37	05 53	07 45	09 44	11 57
01	197 48.2	20.5	210 11.9	12.5	2 35.1	10.9	56.9	N 70	04 19	05 31	06 32	05 48	07 32	09 20	11 14
02	212 48.4	21.5	224 43.4	12.3	2 46.0	10.9	56.9	68	04 27	05 32	06 27	05 44	07 21	09 02	10 45
03	227 48.6	. . 22.5	239 14.7	12.4	2 56.9	10.9	56.9	66	04 33	05 33	06 24	05 40	07 13	08 48	10 24
04	242 48.8	23.4	253 46.1	12.3	3 07.8	10.9	57.0	64	04 38	05 33	06 20	05 37	07 06	08 36	10 07
05	257 49.0	24.4	268 17.4	12.2	3 18.7	10.9	57.0	62	04 42	05 33	06 18	05 35	07 00	08 26	09 53
06	272 49.2	S 4 25.3	282 48.6	12.2	S 3 29.6	10.9	57.0	60	04 45	05 34	06 15	05 33	06 54	08 18	09 41
07	287 49.3	26.3	297 19.8	12.2	3 40.5	10.9	57.0	N 58	04 48	05 34	06 13	05 31	06 50	08 10	09 31
08	302 49.5	27.3	311 51.0	12.1	3 51.4	10.8	57.1	56	04 51	05 34	06 11	05 29	06 46	08 04	09 22
F 09	317 49.7	. . 28.2	326 22.1	12.1	4 02.2	10.9	57.1	54	04 53	05 34	06 09	05 27	06 42	07 58	09 14
R 10	332 49.9	29.2	340 53.2	12.1	4 13.1	10.9	57.1	52	04 55	05 34	06 08	05 26	06 39	07 53	09 07
I 11	347 50.1	30.2	355 24.3	12.0	4 24.0	10.8	57.1	50	04 56	05 34	06 06	05 25	06 36	07 48	09 01
12	2 50.3	S 4 31.1	9 55.3	11.9	S 4 34.8	10.8	57.2	45	05 00	05 34	06 03	05 22	06 29	07 38	08 47
D 13	17 50.5	32.1	24 26.2	11.9	4 45.6	10.8	57.2	N 40	05 02	05 33	06 00	05 19	06 24	07 30	08 36
A 14	32 50.7	33.1	38 57.1	11.9	4 56.4	10.8	57.2	35	05 03	05 33	05 58	05 17	06 19	07 22	08 27
Y 15	47 50.9	. . 34.0	53 28.0	11.8	5 07.2	10.8	57.3	30	05 04	05 32	05 56	05 16	06 15	07 16	08 18
16	62 51.1	35.0	67 58.8	11.8	5 18.0	10.8	57.3	20	05 04	05 30	05 52	05 13	06 08	07 05	08 04
17	77 51.2	35.9	82 29.6	11.7	5 28.8	10.7	57.3	N 10	05 03	05 27	05 48	05 10	06 02	06 56	07 52
18	92 51.4	S 4 36.9	97 00.3	11.7	S 5 39.5	10.7	57.3	0	05 00	05 24	05 45	05 08	05 56	06 47	07 40
19	107 51.6	37.9	111 31.0	11.6	5 50.2	10.7	57.4	S 10	04 56	05 21	05 42	05 05	05 50	06 38	07 29
20	122 51.8	38.8	126 01.6	11.6	6 00.9	10.7	57.4	20	04 50	05 16	05 38	05 03	05 44	06 29	07 16
21	137 52.0	. . 39.8	140 32.2	11.5	6 11.6	10.7	57.4	30	04 41	05 09	05 33	05 00	05 38	06 18	07 03
22	152 52.2	40.8	155 02.7	11.5	6 22.3	10.6	57.4	35	04 35	05 05	05 31	04 58	05 34	06 12	06 55
23	167 52.4	41.7	169 33.2	11.4	6 32.9	10.6	57.5	40	04 28	05 01	05 28	04 56	05 29	06 05	06 45
5 00	182 52.6	S 4 42.7	184 03.6	11.4	S 6 43.5	10.6	57.5	45	04 19	04 55	05 24	04 54	05 24	05 57	06 35
01	197 52.7	43.6	198 34.0	11.3	6 54.1	10.6	57.5	S 50	04 08	04 47	05 20	04 52	05 18	05 48	06 22
02	212 52.9	44.6	213 04.3	11.3	7 04.7	10.5	57.5	52	04 03	04 44	05 18	04 50	05 15	05 43	06 16
03	227 53.1	. . 45.6	227 34.6	11.2	7 15.2	10.5	57.6	54	03 56	04 40	05 16	04 49	05 12	05 39	06 10
04	242 53.3	46.5	242 04.8	11.1	7 25.7	10.5	57.6	56	03 49	04 36	05 14	04 48	05 09	05 33	06 02
05	257 53.5	47.5	256 34.9	11.2	7 36.2	10.4	57.6	58	03 41	04 31	05 11	04 46	05 05	05 27	05 54
06	272 53.7	S 4 48.5	271 05.1	11.0	S 7 46.6	10.4	57.6	S 60	03 32	04 25	05 08	04 45	05 01	05 21	05 45
S 07	287 53.9	49.4	285 35.1	11.0	7 57.0	10.4	57.6								
A 08	302 54.1	50.4	300 05.1	11.0	8 07.4	10.3	57.7								
T 09	317 54.2	. . 51.3	314 35.1	10.9	8 17.7	10.3	57.7								
U 10	332 54.4	52.3	329 05.0	10.8	8 28.0	10.3	57.7								
R 11	347 54.6	53.3	343 34.8	10.8	8 38.3	10.2	57.7								
D 12	2 54.8	S 4 54.2	358 04.6	10.7	S 8 48.5	10.2	57.8								
A 13	17 55.0	55.2	12 34.3	10.7	8 58.7	10.1	57.8								
Y 14	32 55.2	56.1	27 04.0	10.6	9 08.8	10.1	57.8								
15	47 55.4	. . 57.1	41 33.6	10.5	9 18.9	10.1	57.8								
16	62 55.5	58.1	56 03.1	10.5	9 29.0	10.0	57.9								
17	77 55.7	4 59.0	70 32.6	10.5	9 39.0	10.0	57.9								
18	92 55.9	S 5 00.0	85 02.1	10.4	S 9 49.0	9.9	57.9								
19	107 56.1	00.9	99 31.5	10.3	9 58.9	9.9	57.9								
20	122 56.3	01.9	114 00.8	10.3	10 08.8	9.8	57.9								
21	137 56.5	. . 02.9	128 30.1	10.2	10 18.6	9.8	58.0								
22	152 56.6	03.8	142 59.3	10.1	10 28.4	9.8	58.0								
23	167 56.8	04.8	157 28.4	10.1	10 38.2	9.6	58.0								
6 00	182 57.0	S 5 05.7	171 57.5	10.0	S10 47.8	9.7	58.0								
01	197 57.2	06.7	186 26.5	10.0	10 57.5	9.5	58.1								
02	212 57.4	07.7	200 55.5	9.9	11 07.0	9.6	58.1								
03	227 57.6	. . 08.6	215 24.4	9.9	11 16.6	9.4	58.1								
04	242 57.7	09.6	229 53.3	9.7	11 26.0	9.4	58.1								
05	257 57.9	10.5	244 22.0	9.8	11 35.4	9.4	58.1								
06	272 58.1	S 5 11.5	258 50.8	9.6	S11 44.8	9.3	58.2								
07	287 58.3	12.5	273 19.4	9.6	11 54.1	9.2	58.2								
S 08	302 58.5	13.4	287 48.0	9.6	12 03.3	9.1	58.2								
U 09	317 58.7	. . 14.4	302 16.6	9.5	12 12.4	9.1	58.2								
N 10	332 58.8	15.3	316 45.1	9.4	12 21.5	9.1	58.2								
D 11	347 59.0	16.3	331 13.5	9.3	12 30.6	8.9	58.3								
A 12	2 59.2	S 5 17.2	345 41.8	9.3	S12 39.5	8.9	58.3								
Y 13	17 59.4	18.2	0 10.1	9.3	12 48.4	8.9	58.3								
14	32 59.6	19.2	14 38.4	9.2	12 57.3	8.7	58.3								
15	47 59.8	. . 20.1	29 06.6	9.1	13 06.0	8.7	58.3								
16	62 59.9	21.1	43 34.7	9.0	13 14.7	8.6	58.4								
17	78 00.1	22.0	58 02.7	9.0	13 23.3	8.6	58.4								
18	93 00.3	S 5 23.0	72 30.7	9.0	S13 31.9	8.5	58.4								
19	108 00.5	24.0	86 58.7	8.8	13 40.4	8.4	58.4								
20	123 00.7	24.9	101 26.5	8.8	13 48.8	8.3	58.4								
21	138 00.8	. . 25.9	115 54.3	8.8	13 57.1	8.2	58.5								
22	153 01.0	26.8	130 22.1	8.7	14 05.3	8.2	58.5								
23	168 01.2	27.8	144 49.8	8.6	S14 13.5	8.1	58.5								
	SD 16.0	d 1.0	SD	15.6		15.7		15.9							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 4	Moonset 5	Moonset 6	Moonset 7
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 57	18 04	19 24	16 20	16 10	15 57	15 37
N 70	17 03	18 04	19 15	16 27	16 25	16 22	16 21
68	17 08	18 03	19 08	16 34	16 37	16 41	16 50
66	17 11	18 02	19 02	16 39	16 46	16 57	17 12
64	17 15	18 02	18 57	16 43	16 55	17 10	17 30
62	17 18	18 02	18 53	16 47	17 02	17 20	17 45
60	17 20	18 02	18 50	16 51	17 08	17 30	17 57
N 58	17 23	18 02	18 47	16 54	17 14	17 38	18 08
56	17 25	18 02	18 45	16 56	17 19	17 45	18 17
54	17 26	18 02	18 42	16 59	17 23	17 51	18 25
52	17 28	18 02	18 41	17 01	17 27	17 57	18 33
50	17 30	18 02	18 39	17 03	17 31	18 02	18 40
45	17 33	18 02	18 36	17 07	17 39	18 14	18 54
N 40	17 36	18 03	18 34	17 11	17 45	18 23	19 06
35	17 38	18 04	18 33	17 14	17 51	18 31	19 16
30	17 41	18 04	18 32	17 17	17 56	18 38	19 25
20	17 45	18 07	18 32	17 22	18 05	18 51	19 40
N 10	17 48	18 09	18 34	17 26	18 13	19 02	19 54
0	17 52	18 12	18 36	17 31	18 20	19 12	20 06
S 10	17 55	18 16	18 41	17 35	18 27	19 22	20 19
20	17 59	18 21	18 47	17 39	18 35	19 33	20 33
30	18 04	18 28	18 56	17 44	18 44	19 46	20 48
35	18 06	18 32	19 02	17 47	18 49	19 53	20 57
40	18 10	18 37	19 09	17 50	18 55	20 01	21 07
45	18 13	18 43	19 18	17 54	19 02	20 11	21 20
S 50	18 17	18 50	19 30	17 58	19 10	20 23	21 34
52	18 19	18 54	19 36	18 00	19 14	20 28	21 41
54	18 22	18 58	19 42	18 03	19 18	20 34	21 49
56	18 24	19 02	19 49	18 05	19 23	20 41	21 57
58	18 27	19 07	19 58	18 08	19 28	20 48	22 07
S 60	18 30	19 13	20 07	18 11	19 34	20 57	22 18

Day	SUN Eqn. of Time 00^h	SUN Eqn. of Time 12^h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
4	11 12	11 21	11 49	11 19	23 43	29	0
5	11 30	11 39	11 48	12 08	24 33	00	0
6	11 48	11 56	11 48	12 59	00 33	01	3

Tilbage til Menuen

UT	ARIES	VENUS −4.3		MARS +1.6		JUPITER −2.2		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
7 00	15 48.3	139 25.6	S22 23.9	228 09.3	N14 28.1	265 17.3	N22 01.9	156 52.2	S12 58.6
01	30 50.8	154 25.2	24.7	243 10.3	27.6	280 19.5	01.9	171 54.4	58.6
02	45 53.2	169 24.8	25.4	258 11.3	27.1	295 21.7	01.9	186 56.6	58.7
03	60 55.7	184 24.4	26.2	273 12.3	26.6	310 23.9	01.8	201 58.8	58.8
04	75 58.2	199 24.0	26.9	288 13.3	26.1	325 26.1	01.8	217 01.0	58.9
05	91 00.6	214 23.6	27.7	303 14.2	25.6	340 28.3	01.8	232 03.2	59.0
06	106 03.1	229 23.1	S22 28.5	318 15.2	N14 25.1	355 30.6	N22 01.7	247 05.4	S12 59.1
07	121 05.6	244 22.7	29.2	333 16.2	24.6	10 32.8	01.7	262 07.6	59.2
08	136 08.0	259 22.3	30.0	348 17.2	24.2	25 35.0	01.7	277 09.8	59.3
M 09	151 10.5	274 21.9	30.7	3 18.2	23.7	40 37.2	01.7	292 12.0	59.4
O 10	166 13.0	289 21.5	31.5	18 19.2	23.2	55 39.4	01.6	307 14.2	59.5
N 11	181 15.4	304 21.1	32.2	33 20.2	22.7	70 41.6	01.6	322 16.3	59.6
D 12	196 17.9	319 20.6	S22 33.0	48 21.1	N14 22.2	85 43.8	N22 01.6	337 18.5	S12 59.6
A 13	211 20.4	334 20.2	33.7	63 22.1	21.7	100 46.0	01.5	352 20.7	59.7
Y 14	226 22.8	349 19.8	34.5	78 23.1	21.2	115 48.2	01.5	7 22.9	59.8
15	241 25.3	4 19.4	35.2	93 24.1	20.7	130 50.5	01.5	22 25.1	12 59.9
16	256 27.7	19 19.0	35.9	108 25.1	20.2	145 52.7	01.4	37 27.3	13 00.0
17	271 30.2	34 18.6	36.7	123 26.1	19.8	160 54.9	01.4	52 29.5	00.1
18	286 32.7	49 18.1	S22 37.4	138 27.1	N14 19.3	175 57.1	N22 01.4	67 31.7	S13 00.2
19	301 35.1	64 17.7	38.2	153 28.0	18.8	190 59.3	01.4	82 33.9	00.3
20	316 37.6	79 17.3	38.9	168 29.0	18.3	206 01.5	01.3	97 36.1	00.4
21	331 40.1	94 16.9	39.7	183 30.0	17.8	221 03.7	01.3	112 38.3	00.5
22	346 42.5	109 16.5	40.4	198 31.0	17.3	236 05.9	01.3	127 40.5	00.6
23	1 45.0	124 16.1	41.1	213 32.0	16.8	251 08.2	01.3	142 42.7	00.6
8 00	16 47.5	139 15.6	S22 41.9	228 33.0	N14 16.3	266 10.4	N22 01.2	157 44.9	S13 00.7
01	31 49.9	154 15.2	42.6	243 34.0	15.8	281 12.6	01.2	172 47.0	00.8
02	46 52.4	169 14.8	43.3	258 34.9	15.3	296 14.8	01.2	187 49.2	00.9
03	61 54.8	184 14.4	44.1	273 35.9	14.9	311 17.0	01.1	202 51.4	01.0
04	76 57.3	199 14.0	44.8	288 36.9	14.4	326 19.2	01.1	217 53.6	01.1
05	91 59.8	214 13.5	45.5	303 37.9	13.9	341 21.4	01.1	232 55.8	01.2
06	107 02.2	229 13.1	S22 46.3	318 38.9	N14 13.4	356 23.7	N22 01.1	247 58.0	S13 01.3
07	122 04.7	244 12.7	47.0	333 39.9	12.9	11 25.9	01.0	263 00.2	01.4
T 08	137 07.2	259 12.3	47.7	348 40.9	12.4	26 28.1	01.0	278 02.4	01.5
U 09	152 09.6	274 11.9	48.5	3 41.9	11.9	41 30.3	01.0	293 04.6	01.6
E 10	167 12.1	289 11.4	49.2	18 42.9	11.4	56 32.5	00.9	308 06.8	01.6
S 11	182 14.6	304 11.0	49.9	33 43.8	10.9	71 34.8	00.9	323 09.0	01.7
D 12	197 17.0	319 10.6	S22 50.6	48 44.8	N14 10.4	86 37.0	N22 00.9	338 11.2	S13 01.8
A 13	212 19.5	334 10.2	51.4	63 45.8	09.9	101 39.2	00.9	353 13.4	01.9
Y 14	227 22.0	349 09.8	52.1	78 46.8	09.5	116 41.4	00.8	8 15.5	02.0
15	242 24.4	4 09.3	52.8	93 47.8	09.0	131 43.6	00.8	23 17.7	02.1
16	257 26.9	19 08.9	53.5	108 48.8	08.5	146 45.8	00.8	38 19.9	02.2
17	272 29.3	34 08.5	54.3	123 49.8	08.0	161 48.1	00.7	53 22.1	02.3
18	287 31.8	49 08.1	S22 55.0	138 50.8	N14 07.5	176 50.3	N22 00.7	68 24.3	S13 02.4
19	302 34.3	64 07.6	55.7	153 51.8	07.0	191 52.5	00.7	83 26.5	02.5
20	317 36.7	79 07.2	56.4	168 52.8	06.5	206 54.7	00.7	98 28.7	02.6
21	332 39.2	94 06.8	57.1	183 53.8	06.0	221 56.9	00.6	113 30.9	02.6
22	347 41.7	109 06.4	57.9	198 54.7	05.5	236 59.2	00.6	128 33.1	02.7
23	2 44.1	124 06.0	58.6	213 55.7	05.0	252 01.4	00.6	143 35.3	02.8
9 00	17 46.6	139 05.5	S22 59.3	228 56.7	N14 04.5	267 03.6	N22 00.6	158 37.5	S13 02.9
01	32 49.1	154 05.1	23 00.0	243 57.7	04.0	282 05.8	00.5	173 39.6	03.0
02	47 51.5	169 04.7	00.7	258 58.7	03.5	297 08.1	00.5	188 41.8	03.1
03	62 54.0	184 04.3	01.4	273 59.7	03.1	312 10.3	00.5	203 44.0	03.2
04	77 56.5	199 03.8	02.1	289 00.7	02.6	327 12.5	00.4	218 46.2	03.3
05	92 58.9	214 03.4	02.9	304 01.7	02.1	342 14.7	00.4	233 48.4	03.4
06	108 01.4	229 03.0	S23 03.6	319 02.7	N14 01.6	357 16.9	N22 00.4	248 50.6	S13 03.5
W 07	123 03.8	244 02.6	04.3	334 03.7	01.1	12 19.2	00.4	263 52.8	03.6
E 08	138 06.3	259 02.1	05.0	349 04.7	00.6	27 21.4	00.3	278 55.0	03.6
D 09	153 08.8	274 01.7	05.7	4 05.7	14 00.1	42 23.6	00.3	293 57.2	03.7
N 10	168 11.2	289 01.3	06.4	19 06.7	13 59.6	57 25.8	00.3	308 59.4	03.8
E 11	183 13.7	304 00.9	07.1	34 07.7	59.1	72 28.1	00.3	324 01.6	03.9
S 12	198 16.2	319 00.4	S23 07.8	49 08.6	N13 58.6	87 30.3	N22 00.2	339 03.7	S13 04.0
D 13	213 18.6	334 00.0	08.5	64 09.6	58.1	102 32.5	00.2	354 05.9	04.1
A 14	228 21.1	348 59.6	09.2	79 10.6	57.6	117 34.7	00.2	9 08.1	04.2
Y 15	243 23.6	3 59.2	09.9	94 11.6	57.1	132 37.0	00.1	24 10.3	04.3
16	258 26.0	18 58.7	10.6	109 12.6	56.6	147 39.2	00.1	39 12.5	04.4
17	273 28.5	33 58.3	11.3	124 13.6	56.1	162 41.4	00.1	54 14.7	04.5
18	288 30.9	48 57.9	S23 12.0	139 14.6	N13 55.6	177 43.7	N22 00.1	69 16.9	S13 04.6
19	303 33.4	63 57.5	12.7	154 15.6	55.2	192 45.9	00.0	84 19.1	04.6
20	318 35.9	78 57.0	13.4	169 16.6	54.7	207 48.1	00.0	99 21.3	04.7
21	333 38.3	93 56.6	14.1	184 17.6	54.2	222 50.3	00.0	114 23.5	04.8
22	348 40.8	108 56.2	14.8	199 18.6	53.7	237 52.6	22 00.0	129 25.6	04.9
23	3 43.3	123 55.8	15.5	214 19.6	53.2	252 54.8	N21 59.9	144 27.8	05.0
Mer. Pass.	h m 22 49.1	v −0.4	d 0.7	v 1.0	d 0.5	v 2.2	d 0.0	v 2.2	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 17.8	S40 14.8
Achernar	335 26.1	S57 09.9
Acrux	173 09.6	S63 10.5
Adhara	255 12.3	S28 59.4
Aldebaran	290 48.9	N16 32.1
Alioth	166 21.1	N55 53.1
Alkaid	152 59.2	N49 14.8
Al Na'ir	27 43.2	S46 53.6
Alnilam	275 46.0	S 1 11.6
Alphard	217 56.1	S 8 43.1
Alphecca	126 11.1	N26 40.4
Alpheratz	357 42.9	N29 10.2
Altair	62 08.0	N 8 54.6
Ankaa	353 15.1	S42 13.8
Antares	112 26.2	S26 27.6
Arcturus	145 55.9	N19 06.8
Atria	107 28.1	S69 03.2
Avior	234 18.1	S59 33.0
Bellatrix	278 31.6	N 6 21.7
Betelgeuse	271 01.0	N 7 24.5
Canopus	263 55.9	S52 42.0
Capella	280 33.9	N46 00.4
Deneb	49 31.1	N45 20.2
Denebola	182 33.8	N14 29.7
Diphda	348 55.4	S17 54.5
Dubhe	193 52.1	N61 40.4
Elnath	278 12.2	N28 36.9
Eltanin	90 46.2	N51 29.7
Enif	33 46.7	N 9 56.6
Fomalhaut	15 23.5	S29 32.8
Gacrux	172 01.2	S57 11.3
Gienah	175 52.4	S17 37.0
Hadar	148 48.1	S60 26.3
Hamal	328 00.2	N23 31.7
Kaus Aust.	83 43.6	S34 22.6
Kochab	137 21.2	N74 06.1
Markab	13 37.8	N15 17.0
Menkar	314 14.5	N 4 08.7
Menkent	148 07.7	S36 26.2
Miaplacidus	221 40.0	S69 46.3
Mirfak	308 39.6	N49 54.4
Nunki	75 58.1	S26 16.6
Peacock	53 18.8	S56 41.4
Pollux	243 27.5	N27 59.4
Procyon	244 59.6	N 5 11.3
Rasalhague	96 06.4	N12 33.4
Regulus	207 43.5	N11 53.9
Rigel	281 11.7	S 8 11.1
Rigil Kent.	139 52.0	S60 53.5
Sabik	102 12.5	S15 44.3
Schedar	349 39.6	N56 36.9
Shaula	96 21.8	S37 06.7
Sirius	258 33.5	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.5	S43 29.2
Vega	80 38.9	N38 48.2
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	122 28.2	14 43
Mars	211 45.5	8 45
Jupiter	249 22.9	6 14
Saturn	140 57.4	13 27

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 7	Moonrise 8	Moonrise 9	Moonrise 10
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
7 00	183 01.4	S 5 28.7	159 17.4	8.6	S14 21.6	8.0	58.5	N 72	04 24	05 43	06 51	11 57			
01	198 01.6	29.7	173 45.0	8.5	14 29.6	7.9	58.5	N 70	04 32	05 43	06 44	11 14	13 10	14 58	15 46
02	213 01.7	30.7	188 12.5	8.4	14 37.5	7.9	58.5	68	04 38	05 42	06 38	10 45	12 25	13 50	14 45
03	228 01.9	31.6	202 39.9	8.4	14 45.4	7.7	58.6	66	04 42	05 42	06 33	10 24	11 55	13 13	14 10
04	243 02.1	32.6	217 07.3	8.3	14 53.1	7.7	58.6	64	04 46	05 42	06 29	10 07	11 33	12 48	13 45
05	258 02.3	33.5	231 34.6	8.3	15 00.8	7.6	58.6	62	04 50	05 41	06 26	09 53	11 15	12 27	13 25
06	273 02.4	S 5 34.5	246 01.9	8.2	S15 08.4	7.5	58.6	60	04 53	05 41	06 22	09 41	11 00	12 11	13 09
07	288 02.6	35.4	260 29.1	8.2	15 15.9	7.4	58.6	N 58	04 55	05 40	06 20	09 31	10 48	11 57	12 55
08	303 02.8	36.4	274 56.3	8.1	15 23.3	7.3	58.6	56	04 57	05 40	06 17	09 22	10 37	11 45	12 43
M 09	318 03.0	37.3	289 23.4	8.0	15 30.6	7.2	58.7	54	04 59	05 39	06 15	09 14	10 27	11 35	12 33
O 10	333 03.2	38.3	303 50.4	8.0	15 37.8	7.2	58.7	52	05 00	05 39	06 13	09 07	10 19	11 25	12 24
N 11	348 03.3	39.3	318 17.4	7.9	15 45.0	7.0	58.7	50	05 01	05 39	06 11	09 01	10 11	11 17	12 16
D 12	3 03.5	S 5 40.2	332 44.3	7.8	S15 52.0	7.0	58.7	45	05 03	05 37	06 07	08 47	09 55	10 59	11 58
A 13	18 03.7	41.2	347 11.1	7.8	15 59.0	6.8	58.7	N 40	05 05	05 36	06 03	08 36	09 42	10 45	11 44
Y 14	33 03.9	42.1	1 37.9	7.8	16 05.8	6.8	58.7	35	05 06	05 35	06 00	08 27	09 31	10 33	11 32
15	48 04.0	43.1	16 04.7	7.7	16 12.6	6.6	58.7	30	05 06	05 34	05 57	08 18	09 21	10 22	11 21
16	63 04.2	44.0	30 31.4	7.6	16 19.2	6.6	58.8	20	05 05	05 31	05 53	08 04	09 04	10 04	11 03
17	78 04.4	45.0	44 58.0	7.6	16 25.8	6.5	58.8	N 10	05 03	05 27	05 48	07 52	08 50	09 48	10 47
18	93 04.6	S 5 45.9	59 24.6	7.5	S16 32.3	6.3	58.8	0	04 59	05 23	05 44	07 40	08 36	09 34	10 32
19	108 04.8	46.9	73 51.1	7.5	16 38.6	6.3	58.8	S 10	04 54	05 19	05 40	07 29	08 22	09 19	10 17
20	123 04.9	47.9	88 17.6	7.4	16 44.9	6.2	58.8	20	04 47	05 13	05 35	07 16	08 08	09 03	10 01
21	138 05.1	48.8	102 44.0	7.4	16 51.1	6.0	58.8	30	04 37	05 06	05 30	07 03	07 51	08 45	09 43
22	153 05.3	49.8	117 10.4	7.3	16 57.1	6.0	58.8	35	04 31	05 01	05 27	06 55	07 42	08 35	09 33
23	168 05.5	50.7	131 36.7	7.3	17 03.1	5.8	58.9	40	04 23	04 56	05 23	06 45	07 31	08 23	09 21
8 00	183 05.6	S 5 51.7	146 03.0	7.2	S17 08.9	5.8	58.9	45	04 13	04 49	05 19	06 35	07 18	08 09	09 06
01	198 05.8	52.6	160 29.2	7.2	17 14.7	5.6	58.9	S 50	04 01	04 41	05 14	06 22	07 03	07 52	08 49
02	213 06.0	53.6	174 55.4	7.1	17 20.3	5.5	58.9	52	03 55	04 37	05 11	06 16	06 56	07 44	08 41
03	228 06.2	54.5	189 21.5	7.0	17 25.8	5.5	58.9	54	03 48	04 32	05 09	06 10	06 48	07 35	08 32
04	243 06.3	55.5	203 47.5	7.1	17 31.3	5.3	58.9	56	03 40	04 28	05 06	06 02	06 39	07 25	08 21
05	258 06.5	56.4	218 13.6	6.9	17 36.6	5.2	58.9	58	03 31	04 22	05 03	05 54	06 29	07 13	08 09
06	273 06.7	S 5 57.4	232 39.5	7.0	S17 41.8	5.1	58.9	S 60	03 21	04 16	04 59	05 45	06 17	07 00	07 56
07	288 06.9	58.3	247 05.5	6.8	17 46.9	5.0	59.0								
T 08	303 07.0	5 59.3	261 31.3	6.9	17 51.9	4.8	59.0								
U 09	318 07.2	6 00.2	275 57.2	6.8	17 56.7	4.8	59.0								
E 10	333 07.4	01.2	290 23.0	6.7	18 01.5	4.6	59.0								
S 11	348 07.6	02.1	304 48.7	6.7	18 06.1	4.5	59.0								
D 12	3 07.7	S 6 03.1	319 14.4	6.7	S18 10.6	4.5	59.0								
A 13	18 07.9	04.1	333 40.1	6.6	18 15.1	4.3	59.0								
Y 14	33 08.1	05.0	348 05.7	6.6	18 19.4	4.1	59.0								
15	48 08.2	06.0	2 31.3	6.5	18 23.5	4.1	59.0								
16	63 08.4	06.9	16 56.8	6.5	18 27.6	3.9	59.0								
17	78 08.6	07.9	31 22.3	6.5	18 31.5	3.9	59.1								
18	93 08.8	S 6 08.8	45 47.8	6.5	S18 35.4	3.7	59.1								
19	108 08.9	09.8	60 13.3	6.4	18 39.1	3.5	59.1								
20	123 09.1	10.7	74 38.7	6.3	18 42.6	3.5	59.1								
21	138 09.3	11.7	89 04.0	6.4	18 46.1	3.3	59.1								
22	153 09.4	12.6	103 29.4	6.3	18 49.4	3.3	59.1								
23	168 09.6	13.6	117 54.7	6.2	18 52.7	3.1	59.1								
9 00	183 09.8	S 6 14.5	132 19.9	6.3	S18 55.8	2.9	59.1								
01	198 10.0	15.5	146 45.2	6.2	18 58.7	2.9	59.1								
02	213 10.1	16.4	161 10.4	6.2	19 01.6	2.7	59.1								
03	228 10.3	17.4	175 35.6	6.1	19 04.3	2.6	59.1								
04	243 10.5	18.3	190 00.7	6.2	19 06.9	2.5	59.1								
05	258 10.6	19.3	204 25.9	6.1	19 09.4	2.3	59.2								
06	273 10.8	S 6 20.2	218 51.0	6.0	S19 11.7	2.3	59.2								
W 07	288 11.0	21.2	233 16.0	6.1	19 14.0	2.1	59.2								
E 08	303 11.2	22.1	247 41.1	6.0	19 16.1	1.9	59.2								
D 09	318 11.3	23.1	262 06.1	6.1	19 18.0	1.9	59.2								
N 10	333 11.5	24.0	276 31.2	6.0	19 19.9	1.7	59.2								
E 11	348 11.7	25.0	290 56.2	6.0	19 21.6	1.6	59.2								
S 12	3 11.8	S 6 25.9	305 21.2	5.9	S19 23.2	1.4	59.2								
D 13	18 12.0	26.9	319 46.1	6.0	19 24.6	1.4	59.2								
A 14	33 12.2	27.8	334 11.1	5.9	19 26.0	1.2	59.2								
Y 15	48 12.3	28.8	348 36.0	5.9	19 27.2	1.1	59.2								
16	63 12.5	29.7	3 00.9	6.0	19 28.3	0.9	59.2								
17	78 12.7	30.7	17 25.9	5.9	19 29.2	0.8	59.2								
18	93 12.8	S 6 31.6	31 50.8	5.9	S19 30.0	0.7	59.2								
19	108 13.0	32.5	46 15.7	5.8	19 30.7	0.6	59.2								
20	123 13.2	33.5	60 40.5	5.9	19 31.3	0.4	59.2								
21	138 13.3	34.4	75 05.4	5.9	19 31.7	0.3	59.2								
22	153 13.5	35.4	89 30.3	5.9	19 32.0	0.2	59.2								
23	168 13.7	36.3	103 55.2	5.8	S19 32.2	0.0	59.2								
	SD 16.0	d 1.0	SD	16.0		16.1									

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 7	Moonset 8	Moonset 9	Moonset 10
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 42	17 49	19 08	15 37			
N 70	16 49	17 50	19 01	16 21	16 22	16 35	17 50
68	16 55	17 51	18 55	16 50	17 07	17 44	18 50
66	17 00	17 51	18 50	17 12	17 38	18 20	19 25
64	17 04	17 52	18 47	17 30	18 00	18 46	19 50
62	17 08	17 52	18 44	17 45	18 19	19 06	20 10
60	17 11	17 53	18 41	17 57	18 34	19 23	20 26
N 58	17 14	17 53	18 39	18 08	18 47	19 37	20 39
56	17 17	17 54	18 37	18 17	18 58	19 49	20 51
54	17 19	17 54	18 35	18 25	19 07	19 59	21 01
52	17 21	17 55	18 34	18 33	19 16	20 08	21 10
50	17 23	17 55	18 33	18 40	19 24	20 17	21 18
45	17 27	17 57	18 31	18 54	19 41	20 35	21 35
N 40	17 31	17 58	18 29	19 06	19 54	20 49	21 50
35	17 34	18 00	18 29	19 16	20 06	21 01	22 02
30	17 37	18 01	18 29	19 25	20 16	21 12	22 12
20	17 42	18 04	18 30	19 40	20 34	21 30	22 30
N 10	17 46	18 08	18 32	19 54	20 49	21 46	22 45
0	17 51	18 12	18 36	20 06	21 03	22 01	23 00
S 10	17 55	18 16	18 41	20 19	21 18	22 16	23 14
20	18 00	18 22	18 48	20 33	21 33	22 32	23 30
30	18 06	18 30	18 58	20 48	21 50	22 50	23 47
35	18 09	18 34	19 05	20 57	22 00	23 01	23 57
40	18 13	18 40	19 13	21 07	22 12	23 13	24 09
45	18 17	18 47	19 23	21 20	22 26	23 28	24 23
S 50	18 22	18 55	19 35	21 34	22 43	23 45	24 39
52	18 25	18 59	19 42	21 41	22 51	23 53	24 47
54	18 27	19 04	19 49	21 49	22 59	24 02	00 02
56	18 30	19 09	19 57	21 57	23 09	24 13	00 13
58	18 34	19 15	20 06	22 07	23 21	24 25	00 25
S 60	18 37	19 21	20 17	22 18	23 34	24 38	00 38

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
7	12 05	12 14	11 48	13 53	01 26	02	7
8	12 22	12 31	11 47	14 50	02 21	03	14
9	12 39	12 47	11 47	15 47	03 18	04	23

UT	ARIES	VENUS −4.3		MARS +1.6		JUPITER −2.2		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
10 00	18 45.7	138 55.3	S23 16.2	229 20.6	N13 52.7	267 57.0	N21 59.9	159 30.0	S13 05.1
01	33 48.2	153 54.9	16.9	244 21.6	52.2	282 59.3	59.9	174 32.2	05.2
02	48 50.7	168 54.5	17.6	259 22.6	51.7	298 01.5	59.8	189 34.4	05.3
03	63 53.1	183 54.0	. . 18.3	274 23.6	. . 51.2	313 03.7	. . 59.8	204 36.6	. . 05.4
04	78 55.6	198 53.6	18.9	289 24.6	50.7	328 05.9	59.8	219 38.8	05.5
05	93 58.1	213 53.2	19.6	304 25.6	50.2	343 08.2	59.8	234 41.0	05.6
06	109 00.5	228 52.8	S23 20.3	319 26.6	N13 49.7	358 10.4	N21 59.7	249 43.2	S13 05.6
07	124 03.0	243 52.3	21.0	334 27.6	49.2	13 12.6	59.7	264 45.3	05.7
T 08	139 05.4	258 51.9	21.7	349 28.6	48.7	28 14.9	59.7	279 47.5	05.8
H 09	154 07.9	273 51.5	. . 22.4	4 29.6	. . 48.2	43 17.1	. . 59.7	294 49.7	. . 05.9
U 10	169 10.4	288 51.0	23.1	19 30.6	47.7	58 19.3	59.6	309 51.9	06.0
R 11	184 12.8	303 50.6	23.7	34 31.6	47.2	73 21.6	59.6	324 54.1	06.1
S 12	199 15.3	318 50.2	S23 24.4	49 32.6	N13 46.7	88 23.8	N21 59.6	339 56.3	S13 06.2
D 13	214 17.8	333 49.8	25.1	64 33.6	46.2	103 26.0	59.6	354 58.5	06.3
A 14	229 20.2	348 49.3	25.8	79 34.6	45.7	118 28.3	59.5	10 00.7	06.4
Y 15	244 22.7	3 48.9	. . 26.5	94 35.6	. . 45.2	133 30.5	. . 59.5	25 02.9	. . 06.5
16	259 25.2	18 48.5	27.1	109 36.6	44.7	148 32.7	59.5	40 05.1	06.6
17	274 27.6	33 48.0	27.8	124 37.6	44.3	163 35.0	59.5	55 07.2	06.7
18	289 30.1	48 47.6	S23 28.5	139 38.6	N13 43.8	178 37.2	N21 59.4	70 09.4	S13 06.7
19	304 32.6	63 47.2	29.2	154 39.6	43.3	193 39.4	59.4	85 11.6	06.8
20	319 35.0	78 46.8	29.8	169 40.6	42.8	208 41.7	59.4	100 13.8	06.9
21	334 37.5	93 46.3	. . 30.5	184 41.6	. . 42.3	223 43.9	. . 59.4	115 16.0	. . 07.0
22	349 39.9	108 45.9	31.2	199 42.6	41.8	238 46.1	59.3	130 18.2	07.1
23	4 42.4	123 45.5	31.9	214 43.6	41.3	253 48.4	59.3	145 20.4	07.2
11 00	19 44.9	138 45.0	S23 32.5	229 44.6	N13 40.8	268 50.6	N21 59.3	160 22.6	S13 07.3
01	34 47.3	153 44.6	33.2	244 45.6	40.3	283 52.9	59.2	175 24.7	07.4
02	49 49.8	168 44.2	33.9	259 46.6	39.8	298 55.1	59.2	190 26.9	07.5
03	64 52.3	183 43.7	. . 34.5	274 47.6	. . 39.3	313 57.3	. . 59.2	205 29.1	. . 07.6
04	79 54.7	198 43.3	35.2	289 48.6	38.8	328 59.6	59.2	220 31.3	07.7
05	94 57.2	213 42.9	35.9	304 49.6	38.3	344 01.8	59.1	235 33.5	07.7
06	109 59.7	228 42.4	S23 36.5	319 50.6	N13 37.8	359 04.0	N21 59.1	250 35.7	S13 07.8
07	125 02.1	243 42.0	37.2	334 51.6	37.3	14 06.3	59.1	265 37.9	07.9
08	140 04.6	258 41.6	37.8	349 52.6	36.8	29 08.5	59.1	280 40.1	08.0
F 09	155 07.1	273 41.1	. . 38.5	4 53.6	. . 36.3	44 10.8	. . 59.0	295 42.3	. . 08.1
R 10	170 09.5	288 40.7	39.2	19 54.6	35.8	59 13.0	59.0	310 44.4	08.2
I 11	185 12.0	303 40.3	39.8	34 55.6	35.3	74 15.2	59.0	325 46.6	08.3
D 12	200 14.4	318 39.9	S23 40.5	49 56.6	N13 34.8	89 17.5	N21 59.0	340 48.8	S13 08.4
A 13	215 16.9	333 39.4	41.1	64 57.6	34.3	104 19.7	58.9	355 51.0	08.5
Y 14	230 19.4	348 39.0	41.8	79 58.6	33.8	119 22.0	58.9	10 53.2	08.6
15	245 21.8	3 38.6	. . 42.5	94 59.6	. . 33.3	134 24.2	. . 58.9	25 55.4	. . 08.7
16	260 24.3	18 38.1	43.1	110 00.7	32.8	149 26.5	58.9	40 57.6	08.8
17	275 26.8	33 37.7	43.8	125 01.7	32.3	164 28.7	58.8	55 59.8	08.8
18	290 29.2	48 37.3	S23 44.4	140 02.7	N13 31.8	179 30.9	N21 58.8	71 01.9	S13 08.9
19	305 31.7	63 36.8	45.1	155 03.7	31.3	194 33.2	58.8	86 04.1	09.0
20	320 34.2	78 36.4	45.7	170 04.7	30.8	209 35.4	58.8	101 06.3	09.1
21	335 36.6	93 36.0	. . 46.4	185 05.7	. . 30.3	224 37.7	. . 58.7	116 08.5	. . 09.2
22	350 39.1	108 35.5	47.0	200 06.7	29.8	239 39.9	58.7	131 10.7	09.3
23	5 41.5	123 35.1	47.7	215 07.7	29.3	254 42.2	58.7	146 12.9	09.4
12 00	20 44.0	138 34.7	S23 48.3	230 08.7	N13 28.8	269 44.4	N21 58.7	161 15.1	S13 09.5
01	35 46.5	153 34.2	49.0	245 09.7	28.3	284 46.6	58.6	176 17.3	09.6
02	50 48.9	168 33.8	49.6	260 10.7	27.8	299 48.9	58.6	191 19.4	09.7
03	65 51.4	183 33.4	. . 50.3	275 11.7	. . 27.3	314 51.1	. . 58.6	206 21.6	. . 09.8
04	80 53.9	198 32.9	50.9	290 12.7	26.8	329 53.4	58.6	221 23.8	09.8
05	95 56.3	213 32.5	51.5	305 13.7	26.3	344 55.6	58.5	236 26.0	09.9
06	110 58.8	228 32.1	S23 52.2	320 14.7	N13 25.8	359 57.9	N21 58.5	251 28.2	S13 10.0
07	126 01.3	243 31.6	52.8	335 15.8	25.3	15 00.1	58.5	266 30.4	10.1
S 08	141 03.7	258 31.2	53.5	350 16.8	24.8	30 02.4	58.5	281 32.6	10.2
A 09	156 06.2	273 30.8	. . 54.1	5 17.8	. . 24.3	45 04.6	. . 58.4	296 34.7	. . 10.3
T 10	171 08.7	288 30.3	54.7	20 18.8	23.8	60 06.9	58.4	311 36.9	10.4
U 11	186 11.1	303 29.9	55.4	35 19.8	23.3	75 09.1	58.4	326 39.1	10.5
R 12	201 13.6	318 29.4	S23 56.0	50 20.8	N13 22.8	90 11.4	N21 58.4	341 41.3	S13 10.6
D 13	216 16.0	333 29.0	56.6	65 21.8	22.3	105 13.6	58.3	356 43.5	10.7
A 14	231 18.5	348 28.6	57.3	80 22.8	21.8	120 15.8	58.3	11 45.7	10.8
Y 15	246 21.0	3 28.1	. . 57.9	95 23.8	. . 21.3	135 18.1	. . 58.3	26 47.9	. . 10.9
16	261 23.4	18 27.7	58.5	110 24.8	20.8	150 20.3	58.3	41 50.0	10.9
17	276 25.9	33 27.3	59.2	125 25.8	20.3	165 22.6	58.2	56 52.2	11.0
18	291 28.4	48 26.8	S23 59.8	140 26.9	N13 19.8	180 24.8	N21 58.2	71 54.4	S13 11.1
19	306 30.8	63 26.4	24 00.4	155 27.9	19.3	195 27.1	58.2	86 56.6	11.2
20	321 33.3	78 26.0	01.1	170 28.9	18.8	210 29.3	58.2	101 58.8	11.3
21	336 35.8	93 25.5	. . 01.7	185 29.9	. . 18.3	225 31.6	. . 58.2	117 01.0	. . 11.4
22	351 38.2	108 25.1	02.3	200 30.9	17.8	240 33.9	58.1	132 03.2	11.5
23	6 40.7	123 24.7	02.9	215 31.9	17.3	255 36.1	58.1	147 05.4	11.6
	h m								
Mer. Pass.	22 37.3	v −0.4	d 0.7	v 1.0	d 0.5	v 2.2	d 0.0	v 2.2	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.8	S40 14.9
Achernar	335 26.1	S57 09.9
Acrux	173 09.6	S63 10.5
Adhara	255 12.3	S28 59.4
Aldebaran	290 48.9	N16 32.1
Alioth	166 21.1	N55 53.1
Alkaid	152 59.2	N49 14.8
Al Na'ir	27 43.2	S46 53.6
Alnilam	275 46.0	S 1 11.6
Alphard	217 56.0	S 8 43.1
Alphecca	126 11.1	N26 40.4
Alpheratz	357 42.9	N29 10.2
Altair	62 08.0	N 8 54.6
Ankaa	353 15.1	S42 13.8
Antares	112 26.2	S26 27.6
Arcturus	145 55.9	N19 06.8
Atria	107 28.1	S69 03.2
Avior	234 18.1	S59 33.0
Bellatrix	278 31.6	N 6 21.7
Betelgeuse	271 00.9	N 7 24.5
Canopus	263 55.9	S52 42.0
Capella	280 33.9	N46 00.4
Deneb	49 31.1	N45 20.2
Denebola	182 33.8	N14 29.7
Diphda	348 55.4	S17 54.5
Dubhe	193 52.1	N61 40.4
Elnath	278 12.2	N28 36.9
Eltanin	90 46.2	N51 29.7
Enif	33 46.7	N 9 56.6
Fomalhaut	15 23.5	S29 32.8
Gacrux	172 01.2	S57 11.3
Gienah	175 52.4	S17 37.0
Hadar	148 48.1	S60 26.3
Hamal	328 00.2	N23 31.7
Kaus Aust.	83 43.6	S34 22.6
Kochab	137 21.2	N74 06.1
Markab	13 37.8	N15 17.0
Menkar	314 14.5	N 4 08.7
Menkent	148 07.7	S36 26.2
Miaplacidus	221 40.0	S69 46.3
Mirfak	308 39.6	N49 54.5
Nunki	75 58.1	S26 16.6
Peacock	53 18.8	S56 41.4
Pollux	243 27.5	N27 59.3
Procyon	244 59.5	N 5 11.3
Rasalhague	96 06.4	N12 33.3
Regulus	207 43.5	N11 53.9
Rigel	281 11.7	S 8 11.1
Rigil Kent.	139 52.0	S60 53.4
Sabik	102 12.5	S15 44.3
Schedar	349 39.6	N56 36.9
Shaula	96 21.8	S37 06.7
Sirius	258 33.5	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.5	S43 29.2
Vega	80 38.9	N38 48.2
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	119 00.2	14 45
Mars	209 59.7	8 40
Jupiter	249 05.7	6 04
Saturn	140 37.7	13 17

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 10	Moonrise 11	Moonrise 12	Moonrise 13
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
10 00	183 13.8	S 6 37.3	118 20.0	5.9	S19 32.2	0.1	59.3	N 72	04 38	05 56	07 05	▬	17 15	16 27	16 10
01	198 14.0	38.2	132 44.9	5.9	19 32.1	0.2	59.3	N 70	04 44	05 55	06 57	15 46	15 52	15 52	15 50
02	213 14.2	39.2	147 09.8	5.8	19 31.9	0.3	59.3	68	04 48	05 53	06 49	14 45	15 13	15 26	15 34
03	228 14.3	. . 40.1	161 34.6	5.9	19 31.6	0.5	59.3	66	04 52	05 51	06 43	14 10	14 46	15 07	15 20
04	243 14.5	41.1	175 59.5	5.9	19 31.1	0.6	59.3	64	04 55	05 50	06 38	13 45	14 25	14 51	15 09
05	258 14.7	42.0	190 24.4	5.8	19 30.5	0.7	59.3	62	04 58	05 49	06 34	13 25	14 08	14 38	15 00
06	273 14.8	S 6 43.0	204 49.2	5.9	S19 29.8	0.9	59.3	60	05 00	05 48	06 30	13 09	13 53	14 27	14 52
07	288 15.0	43.9	219 14.1	5.9	19 28.9	1.0	59.3	N 58	05 01	05 47	06 26	12 55	13 41	14 17	14 45
T 08	303 15.2	44.9	233 39.0	5.9	19 27.9	1.1	59.3	56	05 03	05 46	06 23	12 43	13 31	14 08	14 39
H 09	318 15.3	. . 45.8	248 03.9	5.9	19 26.8	1.3	59.3	54	05 04	05 45	06 20	12 33	13 21	14 01	14 33
U 10	333 15.5	46.7	262 28.8	5.9	19 25.5	1.4	59.3	52	05 05	05 44	06 18	12 24	13 13	13 54	14 28
R 11	348 15.7	47.7	276 53.7	5.9	19 24.1	1.5	59.3	50	05 06	05 43	06 16	12 16	13 06	13 48	14 23
S 12	3 15.8	S 6 48.6	291 18.6	5.9	S19 22.6	1.6	59.3	45	05 07	05 41	06 11	11 58	12 50	13 34	14 13
D 13	18 16.0	49.6	305 43.5	6.0	19 21.0	1.8	59.3	N 40	05 08	05 39	06 06	11 44	12 36	13 23	14 05
A 14	33 16.1	50.5	320 08.5	5.9	19 19.2	1.9	59.3	35	05 08	05 37	06 03	11 32	12 25	13 14	13 57
Y 15	48 16.3	. . 51.5	334 33.4	6.0	19 17.3	2.0	59.3	30	05 08	05 35	05 59	11 21	12 15	13 05	13 51
16	63 16.5	52.4	348 58.4	6.0	19 15.3	2.1	59.3	20	05 06	05 31	05 54	11 03	11 59	12 51	13 40
17	78 16.6	53.4	3 23.4	6.0	19 13.2	2.3	59.3	N 10	05 03	05 27	05 48	10 47	11 44	12 38	13 30
18	93 16.8	S 6 54.3	17 48.4	6.0	S19 10.9	2.4	59.3	0	04 58	05 23	05 43	10 32	11 30	12 27	13 21
19	108 17.0	55.2	32 13.4	6.0	19 08.5	2.5	59.3	S 10	04 52	05 17	05 38	10 17	11 16	12 15	13 12
20	123 17.1	56.2	46 38.4	6.1	19 06.0	2.7	59.3	20	04 45	05 11	05 33	10 01	11 01	12 02	13 02
21	138 17.3	. . 57.1	61 03.5	6.1	19 03.3	2.8	59.3	30	04 34	05 02	05 26	09 43	10 44	11 48	12 51
22	153 17.5	58.1	75 28.6	6.1	19 00.5	2.9	59.3	35	04 27	04 57	05 23	09 33	10 35	11 39	12 45
23	168 17.6	6 59.0	89 53.7	6.1	18 57.6	3.0	59.3	40	04 18	04 51	05 18	09 21	10 23	11 30	12 37
11 00	183 17.8	S 7 00.0	104 18.8	6.2	S18 54.6	3.2	59.3	45	04 07	04 43	05 13	09 06	10 10	11 18	12 29
01	198 17.9	00.9	118 44.0	6.1	18 51.4	3.2	59.3	S 50	03 54	04 34	05 07	08 49	09 54	11 05	12 18
02	213 18.1	01.8	133 09.1	6.2	18 48.2	3.4	59.3	52	03 47	04 30	05 05	08 41	09 46	10 58	12 13
03	228 18.3	. . 02.8	147 34.3	6.3	18 44.8	3.6	59.3	54	03 40	04 25	05 02	08 32	09 38	10 51	12 08
04	243 18.4	03.7	161 59.6	6.2	18 41.2	3.6	59.3	56	03 31	04 19	04 58	08 21	09 28	10 43	12 02
05	258 18.6	04.7	176 24.8	6.3	18 37.6	3.8	59.3	58	03 21	04 13	04 54	08 09	09 18	10 34	11 55
06	273 18.7	S 7 05.6	190 50.1	6.3	S18 33.8	3.9	59.3	S 60	03 10	04 06	04 50	07 56	09 05	10 24	11 48
07	288 18.9	06.6	205 15.4	6.4	18 29.9	4.0	59.3								
F 08	303 19.1	07.5	219 40.8	6.4	18 25.9	4.1	59.3								
R 09	318 19.2	. . 08.4	234 06.2	6.4	18 21.8	4.3	59.3								
I 10	333 19.4	09.4	248 31.6	6.4	18 17.5	4.3	59.3								
D 11	348 19.5	10.3	262 57.0	6.5	18 13.2	4.5	59.3								
A 12	3 19.7	S 7 11.3	277 22.5	6.5	S18 08.7	4.6	59.3								
Y 13	18 19.9	12.2	291 48.0	6.6	18 04.1	4.7	59.3								
14	33 20.0	13.1	306 13.6	6.6	17 59.4	4.9	59.3								
15	48 20.2	. . 14.1	320 39.2	6.6	17 54.5	4.9	59.3								
16	63 20.3	15.0	335 04.8	6.6	17 49.6	5.1	59.3								
17	78 20.5	16.0	349 30.4	6.7	17 44.5	5.2	59.3								
18	93 20.7	S 7 16.9	3 56.1	6.8	S17 39.3	5.2	59.3								
19	108 20.8	17.8	18 21.9	6.8	17 34.1	5.5	59.3								
20	123 21.0	18.8	32 47.7	6.8	17 28.6	5.5	59.3								
21	138 21.1	. . 19.7	47 13.5	6.8	17 23.1	5.6	59.3								
22	153 21.3	20.7	61 39.3	6.9	17 17.5	5.7	59.3								
23	168 21.4	21.6	76 05.2	7.0	17 11.8	5.9	59.3								
12 00	183 21.6	S 7 22.5	90 31.2	7.0	S17 05.9	5.9	59.3								
01	198 21.8	23.5	104 57.2	7.0	17 00.0	6.1	59.2								
02	213 21.9	24.4	119 23.2	7.1	16 53.9	6.2	59.2								
03	228 22.1	. . 25.4	133 49.3	7.1	16 47.7	6.2	59.2								
04	243 22.2	26.3	148 15.4	7.2	16 41.5	6.4	59.2								
05	258 22.4	27.2	162 41.6	7.2	16 35.1	6.5	59.2								
06	273 22.5	S 7 28.2	177 07.8	7.2	S16 28.6	6.6	59.2								
07	288 22.7	29.1	191 34.0	7.3	16 22.0	6.7	59.2								
S 08	303 22.8	30.0	206 00.3	7.4	16 15.3	6.7	59.2								
A 09	318 23.0	. . 31.0	220 26.7	7.4	16 08.6	6.9	59.2								
T 10	333 23.2	31.9	234 53.1	7.4	16 01.7	7.0	59.2								
U 11	348 23.3	32.9	249 19.5	7.5	15 54.7	7.1	59.2								
R 12	3 23.5	S 7 33.8	263 46.0	7.5	S15 47.6	7.2	59.2								
D 13	18 23.6	34.7	278 12.5	7.6	15 40.4	7.3	59.2								
A 14	33 23.8	35.7	292 39.1	7.6	15 33.1	7.3	59.2								
Y 15	48 23.9	. . 36.6	307 05.7	7.7	15 25.8	7.5	59.2								
16	63 24.1	37.5	321 32.4	7.7	15 18.3	7.6	59.2								
17	78 24.2	38.5	335 59.1	7.8	15 10.7	7.6	59.2								
18	93 24.4	S 7 39.4	350 25.9	7.8	S15 03.1	7.8	59.2								
19	108 24.5	40.3	4 52.7	7.9	14 55.3	7.8	59.2								
20	123 24.7	41.3	19 19.6	7.9	14 47.5	7.9	59.2								
21	138 24.8	. . 42.2	33 46.5	8.0	14 39.6	8.0	59.1								
22	153 25.0	43.1	48 13.5	8.0	14 31.6	8.1	59.1								
23	168 25.1	44.1	62 40.5	8.1	S14 23.5	8.2	59.1								
	SD 16.0	d 0.9	SD	16.2		16.2		16.1							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 10	Moonset 11	Moonset 12	Moonset 13
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 26	17 35	18 53	▬	18 22	21 08	23 17
N 70	16 35	17 37	18 47	17 50	19 44	21 42	23 36
68	16 42	17 39	18 43	18 50	20 23	22 06	23 50
66	16 49	17 40	18 39	19 25	20 49	22 24	24 02
64	16 54	17 42	18 36	19 50	21 10	22 39	24 12
62	16 58	17 43	18 34	20 10	21 27	22 52	24 21
60	17 02	17 44	18 32	20 26	21 40	23 02	24 28
N 58	17 06	17 45	18 31	20 39	21 52	23 12	24 34
56	17 09	17 46	18 29	20 51	22 02	23 20	24 40
54	17 12	17 47	18 28	21 01	22 11	23 27	24 45
52	17 15	17 48	18 27	21 10	22 19	23 33	24 49
50	17 17	17 49	18 27	21 18	22 26	23 39	24 53
45	17 22	17 52	18 25	21 35	22 42	23 51	25 02
N 40	17 26	17 54	18 25	21 50	22 54	24 01	00 01
35	17 30	17 56	18 25	22 02	23 05	24 10	00 10
30	17 34	17 58	18 25	22 12	23 14	24 18	00 18
20	17 40	18 02	18 27	22 30	23 30	24 31	00 31
N 10	17 45	18 06	18 31	22 45	23 44	24 42	00 42
0	17 50	18 11	18 35	23 00	23 57	24 53	00 53
S 10	17 55	18 16	18 41	23 14	24 10	00 10	01 03
20	18 01	18 23	18 49	23 30	24 24	00 24	01 15
30	18 07	18 32	19 00	23 47	24 39	00 39	01 27
35	18 11	18 37	19 07	23 57	24 48	00 48	01 35
40	18 16	18 43	19 16	24 09	00 09	00 59	01 43
45	18 21	18 51	19 27	24 23	00 23	01 11	01 52
S 50	18 27	19 00	19 41	24 39	00 39	01 25	02 04
52	18 30	19 05	19 48	24 47	00 47	01 32	02 09
54	18 33	19 10	19 56	00 02	00 56	01 40	02 15
56	18 36	19 16	20 04	00 13	01 06	01 48	02 22
58	18 40	19 22	20 14	00 25	01 17	01 57	02 29
S 60	18 45	19 29	20 26	00 38	01 29	02 08	02 37

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
10	12 55	13 03	11 47	16 46	04 17	05	34
11	13 11	13 18	11 47	17 44	05 15	06	45
12	13 26	13 34	11 46	18 40	06 12	07	56

UT	ARIES	VENUS −4.5		MARS +1.5		JUPITER −2.4		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
28 00	36 30.2	135 51.2	S26 41.1	236 49.7	N10 11.9	284 30.6	N21 52.3	175 11.7	S13 44.6
01	51 32.7	150 50.8	41.4	251 50.8	11.4	299 32.9	52.3	190 13.9	44.7
02	66 35.2	165 50.4	41.6	266 51.8	10.9	314 35.3	52.3	205 16.1	44.8
03	81 37.6	180 50.0	. . 41.8	281 52.9	. . 10.4	329 37.7	. . 52.2	220 18.2	. . 44.9
04	96 40.1	195 49.7	42.1	296 54.0	09.8	344 40.1	52.2	235 20.4	45.0
05	111 42.5	210 49.3	42.3	311 55.1	09.3	359 42.4	52.2	250 22.6	45.1
06	126 45.0	225 48.9	S26 42.6	326 56.2	N10 08.8	14 44.8	N21 52.2	265 24.8	S13 45.2
07	141 47.5	240 48.5	42.8	341 57.2	08.3	29 47.2	52.2	280 26.9	45.3
08	156 49.9	255 48.1	43.0	356 58.3	07.8	44 49.6	52.2	295 29.1	45.3
M 09	171 52.4	270 47.7	. . 43.3	11 59.4	. . 07.2	59 51.9	. . 52.2	310 31.3	. . 45.4
O 10	186 54.9	285 47.4	43.5	27 00.5	06.7	74 54.3	52.2	325 33.4	45.5
N 11	201 57.3	300 47.0	43.8	42 01.6	06.2	89 56.7	52.2	340 35.6	45.6
D 12	216 59.8	315 46.6	S26 44.0	57 02.7	N10 05.7	104 59.1	N21 52.2	355 37.8	S13 45.7
A 13	232 02.3	330 46.2	44.2	72 03.7	05.1	120 01.4	52.2	10 40.0	45.8
Y 14	247 04.7	345 45.8	44.5	87 04.8	04.6	135 03.8	52.2	25 42.1	45.9
15	262 07.2	0 45.5	. . 44.7	102 05.9	. . 04.1	150 06.2	. . 52.2	40 44.3	. . 46.0
16	277 09.7	15 45.1	44.9	117 07.0	03.6	165 08.6	52.2	55 46.5	46.1
17	292 12.1	30 44.7	45.1	132 08.1	03.0	180 11.0	52.1	70 48.6	46.2
18	307 14.6	45 44.3	S26 45.4	147 09.2	N10 02.5	195 13.3	N21 52.1	85 50.8	S13 46.3
19	322 17.0	60 44.0	45.6	162 10.2	02.0	210 15.7	52.1	100 53.0	46.3
20	337 19.5	75 43.6	45.8	177 11.3	01.5	225 18.1	52.1	115 55.2	46.4
21	352 22.0	90 43.2	. . 46.0	192 12.4	. . 00.9	240 20.5	. . 52.1	130 57.3	. . 46.5
22	7 24.4	105 42.8	46.3	207 13.5	10 00.4	255 22.9	52.1	145 59.5	46.6
23	22 26.9	120 42.5	46.5	222 14.6	9 59.9	270 25.2	52.1	161 01.7	46.7
29 00	37 29.4	135 42.1	S26 46.7	237 15.7	N 9 59.4	285 27.6	N21 52.1	176 03.8	S13 46.8
01	52 31.8	150 41.7	46.9	252 16.7	58.9	300 30.0	52.1	191 06.0	46.9
02	67 34.3	165 41.3	47.2	267 17.8	58.3	315 32.4	52.1	206 08.2	47.0
03	82 36.8	180 41.0	. . 47.4	282 18.9	. . 57.8	330 34.8	. . 52.1	221 10.4	. . 47.1
04	97 39.2	195 40.6	47.6	297 20.0	57.3	345 37.2	52.1	236 12.5	47.2
05	112 41.7	210 40.2	47.8	312 21.1	56.8	0 39.5	52.1	251 14.7	47.3
06	127 44.1	225 39.8	S26 48.0	327 22.2	N 9 56.2	15 41.9	N21 52.1	266 16.9	S13 47.3
07	142 46.6	240 39.5	48.2	342 23.3	55.7	30 44.3	52.1	281 19.0	47.4
08	157 49.1	255 39.1	48.4	357 24.3	55.2	45 46.7	52.0	296 21.2	47.5
T 09	172 51.5	270 38.7	. . 48.7	12 25.4	. . 54.7	60 49.1	. . 52.0	311 23.4	. . 47.6
U 10	187 54.0	285 38.4	48.9	27 26.5	54.1	75 51.5	52.0	326 25.6	47.7
E 11	202 56.5	300 38.0	49.1	42 27.6	53.6	90 53.9	52.0	341 27.7	47.8
S 12	217 58.9	315 37.6	S26 49.3	57 28.7	N 9 53.1	105 56.2	N21 52.0	356 29.9	S13 47.9
D 13	233 01.4	330 37.3	49.5	72 29.8	52.6	120 58.6	52.0	11 32.1	48.0
A 14	248 03.9	345 36.9	49.7	87 30.9	52.0	136 01.0	52.0	26 34.2	48.1
Y 15	263 06.3	0 36.5	. . 49.9	102 32.0	. . 51.5	151 03.4	. . 52.0	41 36.4	. . 48.2
16	278 08.8	15 36.2	50.1	117 33.0	51.0	166 05.8	52.0	56 38.6	48.3
17	293 11.3	30 35.8	50.3	132 34.1	50.5	181 08.2	52.0	71 40.8	48.3
18	308 13.7	45 35.4	S26 50.5	147 35.2	N 9 50.0	196 10.6	N21 52.0	86 42.9	S13 48.4
19	323 16.2	60 35.1	50.7	162 36.3	49.4	211 13.0	52.0	101 45.1	48.5
20	338 18.6	75 34.7	50.9	177 37.4	48.9	226 15.3	52.0	116 47.3	48.6
21	353 21.1	90 34.3	. . 51.1	192 38.5	. . 48.4	241 17.7	. . 52.0	131 49.4	. . 48.7
22	8 23.6	105 34.0	51.3	207 39.6	47.9	256 20.1	52.0	146 51.6	48.8
23	23 26.0	120 33.6	51.5	222 40.7	47.3	271 22.5	52.0	161 53.8	48.9
30 00	38 28.5	135 33.2	S26 51.7	237 41.7	N 9 46.8	286 24.9	N21 52.0	176 56.0	S13 49.0
01	53 31.0	150 32.9	51.9	252 42.8	46.3	301 27.3	52.0	191 58.1	49.1
02	68 33.4	165 32.5	52.1	267 43.9	45.8	316 29.7	51.9	207 00.3	49.2
03	83 35.9	180 32.2	. . 52.3	282 45.0	. . 45.2	331 32.1	. . 51.9	222 02.5	. . 49.3
04	98 38.4	195 31.8	52.5	297 46.1	44.7	346 34.5	51.9	237 04.6	49.3
05	113 40.8	210 31.4	52.7	312 47.2	44.2	1 36.9	51.9	252 06.8	49.4
06	128 43.3	225 31.1	S26 52.9	327 48.3	N 9 43.7	16 39.3	N21 51.9	267 09.0	S13 49.5
W 07	143 45.7	240 30.7	53.0	342 49.4	43.1	31 41.7	51.9	282 11.2	49.6
E 08	158 48.2	255 30.4	53.2	357 50.5	42.6	46 44.0	51.9	297 13.3	49.7
D 09	173 50.7	270 30.0	. . 53.4	12 51.6	. . 42.1	61 46.4	. . 51.9	312 15.5	. . 49.8
N 10	188 53.1	285 29.6	53.6	27 52.7	41.6	76 48.8	51.9	327 17.7	49.9
E 11	203 55.6	300 29.3	53.8	42 53.7	41.0	91 51.2	51.9	342 19.8	50.0
S 12	218 58.1	315 28.9	S26 54.0	57 54.8	N 9 40.5	106 53.6	N21 51.9	357 22.0	S13 50.1
D 13	234 00.5	330 28.6	54.1	72 55.9	40.0	121 56.0	51.9	12 24.2	50.2
A 14	249 03.0	345 28.2	54.3	87 57.0	39.5	136 58.4	51.9	27 26.4	50.3
Y 15	264 05.5	0 27.9	. . 54.5	102 58.1	. . 38.9	152 00.8	. . 51.9	42 28.5	. . 50.3
16	279 07.9	15 27.5	54.7	117 59.2	38.4	167 03.2	51.9	57 30.7	50.4
17	294 10.4	30 27.2	54.9	133 00.3	37.9	182 05.6	51.9	72 32.9	50.5
18	309 12.9	45 26.8	S26 55.0	148 01.4	N 9 37.4	197 08.0	N21 51.9	87 35.0	S13 50.6
19	324 15.3	60 26.4	55.2	163 02.5	36.8	212 10.4	51.9	102 37.2	50.7
20	339 17.8	75 26.1	55.4	178 03.6	36.3	227 12.8	51.9	117 39.4	50.8
21	354 20.2	90 25.7	. . 55.6	193 04.7	. . 35.8	242 15.2	. . 51.9	132 41.6	. . 50.9
22	9 22.7	105 25.4	55.7	208 05.8	35.3	257 17.6	51.9	147 43.7	51.0
23	24 25.2	120 25.0	55.9	223 06.9	34.7	272 20.0	51.9	162 45.9	51.1
Mer.Pass.	h m 21 26.5	v −0.4	d 0.2	v 1.1	d 0.5	v 2.4	d 0.0	v 2.2	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.8	S40 14.9
Achernar	335 26.1	S57 10.0
Acrux	173 09.5	S63 10.4
Adhara	255 12.2	S28 59.4
Aldebaran	290 48.8	N16 32.1
Alioth	166 21.1	N55 53.0
Alkaid	152 59.2	N49 14.7
Al Na'ir	27 43.3	S46 53.6
Alnilam	275 45.9	S 1 11.6
Alphard	217 55.9	S 8 43.1
Alphecca	126 11.2	N26 40.3
Alpheratz	357 42.9	N29 10.3
Altair	62 08.1	N 8 54.6
Ankaa	353 15.1	S42 13.8
Antares	112 26.3	S26 27.6
Arcturus	145 55.9	N19 06.8
Atria	107 28.3	S69 03.1
Avior	234 17.8	S59 33.1
Bellatrix	278 31.5	N 6 21.6
Betelgeuse	271 00.8	N 7 24.5
Canopus	263 55.7	S52 42.1
Capella	280 33.7	N46 00.5
Deneb	49 31.3	N45 20.3
Denebola	182 33.7	N14 29.7
Diphda	348 55.4	S17 54.6
Dubhe	193 51.9	N61 40.3
Elnath	278 12.0	N28 37.0
Eltanin	90 46.4	N51 29.6
Enif	33 46.8	N 9 56.6
Fomalhaut	15 23.5	S29 32.9
Gacrux	172 01.1	S57 11.3
Gienah	175 52.3	S17 37.0
Hadar	148 48.1	S60 26.2
Hamal	328 00.1	N23 31.7
Kaus Aust.	83 43.7	S34 22.6
Kochab	137 21.3	N74 06.0
Markab	13 37.9	N15 17.1
Menkar	314 14.5	N 4 08.7
Menkent	148 07.7	S36 26.1
Miaplacidus	221 39.7	S69 46.2
Mirfak	308 39.5	N49 54.5
Nunki	75 58.2	S26 16.6
Peacock	53 18.9	S56 41.5
Pollux	243 27.4	N27 59.3
Procyon	244 59.4	N 5 11.3
Rasalhague	96 06.5	N12 33.3
Regulus	207 43.4	N11 53.9
Rigel	281 11.6	S 8 11.2
Rigil Kent.	139 52.0	S60 53.4
Sabik	102 12.5	S15 44.3
Schedar	349 39.6	N56 37.0
Shaula	96 21.9	S37 06.7
Sirius	258 33.3	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.3	S43 29.2
Vega	80 39.0	N38 48.2
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	98 12.7	14 58
Mars	199 46.3	8 10
Jupiter	247 58.3	4 57
Saturn	138 34.5	12 14

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		28	29	30	31
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
								N 72	05 55	07 16	08 39	23 50	25 32	01 32	03 16
28 00	184 02.9	S13 05.7	259 44.6	14.0	N11 04.1	8.4	54.7	N 70	05 52	07 05	08 16	24 01	00 01	01 36	03 14
01	199 03.0	06.6	274 17.6	14.1	10 55.7	8.5	54.7	68	05 49	06 56	07 59	24 10	00 10	01 40	03 12
02	214 03.0	07.4	288 50.7	14.0	10 47.2	8.5	54.7	66	05 47	06 48	07 45	24 18	00 18	01 43	03 11
03	229 03.1	. . 08.2	303 23.7	14.0	10 38.7	8.6	54.8	64	05 45	06 41	07 33	24 24	00 24	01 45	03 09
04	244 03.1	09.1	317 56.7	14.1	10 30.1	8.6	54.8	62	05 43	06 35	07 23	24 29	00 29	01 48	03 08
05	259 03.2	09.9	332 29.8	14.0	10 21.5	8.6	54.8	60	05 41	06 30	07 15	24 34	00 34	01 50	03 08
06	274 03.2	S13 10.8	347 02.8	14.1	N10 12.9	8.7	54.8	N 58	05 39	06 26	07 07	24 38	00 38	01 51	03 07
07	289 03.3	11.6	1 35.9	14.0	10 04.2	8.8	54.8	56	05 38	06 22	07 01	24 42	00 42	01 53	03 06
08	304 03.3	12.4	16 08.9	14.1	9 55.4	8.8	54.8	54	05 36	06 18	06 55	24 45	00 45	01 54	03 05
M 09	319 03.4	. . 13.3	30 42.0	14.1	9 46.6	8.9	54.9	52	05 35	06 14	06 50	24 48	00 48	01 55	03 05
O 10	334 03.4	14.1	45 15.1	14.1	9 37.7	8.9	54.9	50	05 33	06 11	06 45	24 51	00 51	01 57	03 04
N 11	349 03.5	14.9	59 48.2	14.0	9 28.8	9.0	54.9	45	05 29	06 04	06 34	24 57	00 57	01 59	03 03
D 12	4 03.5	S13 15.8	74 21.2	14.1	N 9 19.8	9.0	54.9	N 40	05 26	05 58	06 26	00 04	01 02	02 01	03 02
A 13	19 03.5	16.6	88 54.3	14.1	9 10.8	9.0	55.0	35	05 22	05 52	06 18	00 10	01 06	02 03	03 02
Y 14	34 03.6	17.4	103 27.4	14.1	9 01.8	9.1	55.0	30	05 19	05 47	06 12	00 16	01 10	02 04	03 01
15	49 03.6	. . 18.3	118 00.5	14.0	8 52.7	9.2	55.0	20	05 11	05 38	06 00	00 26	01 16	02 07	03 00
16	64 03.7	19.1	132 33.5	14.1	8 43.5	9.2	55.0	N 10	05 03	05 28	05 50	00 35	01 22	02 10	02 59
17	79 03.7	19.9	147 06.6	14.1	8 34.3	9.2	55.0	0	04 54	05 19	05 40	00 43	01 27	02 12	02 58
18	94 03.8	S13 20.8	161 39.7	14.1	N 8 25.1	9.3	55.1	S 10	04 44	05 09	05 31	00 51	01 32	02 14	02 57
19	109 03.8	21.6	176 12.8	14.0	8 15.8	9.3	55.1	20	04 30	04 57	05 20	00 59	01 38	02 17	02 56
20	124 03.9	22.4	190 45.8	14.1	8 06.5	9.4	55.1	30	04 13	04 43	05 08	01 09	01 44	02 19	02 55
21	139 03.9	. . 23.2	205 18.9	14.1	7 57.1	9.4	55.1	35	04 02	04 34	05 01	01 15	01 48	02 21	02 54
22	154 03.9	24.1	219 52.0	14.0	7 47.7	9.4	55.1	40	03 49	04 24	04 53	01 21	01 52	02 23	02 53
23	169 04.0	24.9	234 25.0	14.1	7 38.3	9.5	55.2	45	03 32	04 11	04 43	01 28	01 57	02 25	02 53
29 00	184 04.0	S13 25.7	248 58.1	14.0	N 7 28.8	9.6	55.2	S 50	03 11	03 56	04 32	01 37	02 03	02 27	02 52
01	199 04.1	26.6	263 31.1	14.1	7 19.2	9.5	55.2	52	03 00	03 49	04 26	01 41	02 06	02 28	02 51
02	214 04.1	27.4	278 04.2	14.0	7 09.7	9.7	55.2	54	02 48	03 40	04 20	01 46	02 08	02 30	02 51
03	229 04.2	. . 28.2	292 37.2	14.0	7 00.0	9.6	55.3	56	02 34	03 31	04 14	01 51	02 12	02 31	02 50
04	244 04.2	29.0	307 10.2	14.0	6 50.4	9.7	55.3	58	02 16	03 20	04 06	01 56	02 15	02 33	02 50
05	259 04.2	29.9	321 43.2	14.0	6 40.7	9.8	55.3	S 60	01 54	03 08	03 58	02 03	02 19	02 34	02 49
06	274 04.3	S13 30.7	336 16.2	14.0	N 6 30.9	9.7	55.3								
07	289 04.3	31.5	350 49.2	14.0	6 21.2	9.8	55.4								
08	304 04.4	32.4	5 22.2	14.0	6 11.4	9.9	55.4								
T 09	319 04.4	. . 33.2	19 55.2	14.0	6 01.5	9.9	55.4								
U 10	334 04.4	34.0	34 28.2	13.9	5 51.6	9.9	55.4								
E 11	349 04.5	34.8	49 01.1	14.0	5 41.7	9.9	55.5								
S 12	4 04.5	S13 35.7	63 34.1	13.9	N 5 31.8	10.0	55.5								
D 13	19 04.5	36.5	78 07.0	13.9	5 21.8	10.0	55.5								
A 14	34 04.6	37.3	92 39.9	13.9	5 11.8	10.1	55.6								
Y 15	49 04.6	. . 38.1	107 12.8	13.9	5 01.7	10.1	55.6								
16	64 04.7	39.0	121 45.7	13.9	4 51.6	10.1	55.6								
17	79 04.7	39.8	136 18.6	13.8	4 41.5	10.2	55.6								
18	94 04.7	S13 40.6	150 51.4	13.8	N 4 31.3	10.2	55.7								
19	109 04.8	41.4	165 24.2	13.9	4 21.1	10.2	55.7								
20	124 04.8	42.2	179 57.1	13.7	4 10.9	10.2	55.7								
21	139 04.8	. . 43.1	194 29.8	13.8	4 00.7	10.3	55.7								
22	154 04.9	43.9	209 02.6	13.8	3 50.4	10.3	55.8								
23	169 04.9	44.7	223 35.4	13.7	3 40.1	10.3	55.8								
30 00	184 04.9	S13 45.5	238 08.1	13.7	N 3 29.8	10.4	55.8	N 40	17 01	17 29	18 01	13 36	14 06	14 37	15 08
01	199 05.0	46.3	252 40.8	13.7	3 19.4	10.4	55.9	35	17 09	17 35	18 05	13 31	14 03	14 36	15 10
02	214 05.0	47.2	267 13.5	13.7	3 09.0	10.4	55.9	30	17 15	17 40	18 08	13 26	14 01	14 36	15 12
03	229 05.0	. . 48.0	281 46.2	13.6	2 58.6	10.4	55.9	20	17 27	17 50	18 16	13 18	13 56	14 35	15 15
04	244 05.1	48.8	296 18.8	13.6	2 48.2	10.5	55.9	N 10	17 37	17 59	18 24	13 11	13 52	14 34	15 18
05	259 05.1	49.6	310 51.4	13.6	2 37.7	10.4	56.0	0	17 47	18 08	18 33	13 04	13 49	14 34	15 20
06	274 05.1	S13 50.4	325 24.0	13.5	N 2 27.3	10.5	56.0	S 10	17 57	18 19	18 44	12 57	13 45	14 33	15 23
W 07	289 05.2	51.3	339 56.5	13.6	2 16.8	10.6	56.0	20	18 08	18 31	18 57	12 50	13 41	14 32	15 25
E 08	304 05.2	52.1	354 29.1	13.5	2 06.2	10.5	56.1	30	18 20	18 45	19 15	12 42	13 36	14 31	15 29
D 09	319 05.2	. . 52.9	9 01.6	13.5	1 55.7	10.6	56.1	35	18 27	18 54	19 26	12 37	13 33	14 31	15 30
N 10	334 05.3	53.7	23 34.1	13.4	1 45.1	10.6	56.1	40	18 35	19 04	19 39	12 32	13 30	14 30	15 32
E 11	349 05.3	54.5	38 06.5	13.4	1 34.5	10.6	56.2	45	18 45	19 17	19 56	12 25	13 26	14 30	15 35
S 12	4 05.3	S13 55.3	52 38.9	13.4	N 1 23.9	10.6	56.2	S 50	18 57	19 33	20 18	12 18	13 22	14 29	15 37
D 13	19 05.4	56.1	67 11.3	13.4	1 13.3	10.7	56.2	52	19 02	19 40	20 29	12 14	13 20	14 28	15 39
A 14	34 05.4	57.0	81 43.7	13.3	1 02.6	10.6	56.3	54	19 08	19 49	20 41	12 10	13 18	14 28	15 40
Y 15	49 05.4	. . 57.8	96 16.0	13.3	0 52.0	10.7	56.3	56	19 15	19 58	20 56	12 06	13 15	14 27	15 42
16	64 05.4	58.6	110 48.3	13.2	0 41.3	10.7	56.3	58	19 23	20 09	21 14	12 01	13 13	14 27	15 43
17	79 05.5	13 59.4	125 20.5	13.2	0 30.6	10.7	56.3	S 60	19 31	20 22	21 37	11 55	13 10	14 26	15 45
18	94 05.5	S14 00.2	139 52.7	13.2	N 0 19.9	10.8	56.4								
19	109 05.5	01.0	154 24.9	13.2	N 0 09.1	10.7	56.4								
20	124 05.6	01.8	168 57.1	13.1	S 0 01.6	10.8	56.4								
21	139 05.6	.. 02.7	183 29.2	13.0	0 12.4	10.7	56.5								
22	154 05.6	03.5	198 01.2	13.1	0 23.1	10.8	56.5								
23	169 05.6	04.3	212 33.3	13.0	S 0 33.9	10.8	56.5								
	SD 16.1	d 0.8	SD	15.0		15.1		15.3							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	28	29	30	31
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 47	16 10	17 31	15 01	14 53	14 44	14 36
N 70	15 10	16 21	17 34	14 48	14 46	14 43	14 40
68	15 27	16 30	17 37	14 38	14 40	14 42	14 44
66	15 41	16 38	17 39	14 29	14 36	14 42	14 48
64	15 53	16 45	17 41	14 21	14 32	14 41	14 50
62	16 03	16 51	17 43	14 15	14 28	14 40	14 53
60	16 12	16 56	17 45	14 09	14 25	14 40	14 55
N 58	16 19	17 01	17 47	14 04	14 22	14 39	14 57
56	16 26	17 05	17 49	14 00	14 20	14 39	14 59
54	16 32	17 09	17 50	13 56	14 18	14 39	15 00
52	16 37	17 12	17 52	13 52	14 16	14 38	15 01
50	16 42	17 16	17 54	13 49	14 14	14 38	15 03
45	16 52	17 23	17 57	13 42	14 10	14 37	15 06
N 40	17 01	17 29	18 01	13 36	14 06	14 37	15 08
35	17 09	17 35	18 05	13 31	14 03	14 36	15 10
30	17 15	17 40	18 08	13 26	14 01	14 36	15 12
20	17 27	17 50	18 16	13 18	13 56	14 35	15 15
N 10	17 37	17 59	18 24	13 11	13 52	14 34	15 18
0	17 47	18 08	18 33	13 04	13 49	14 34	15 20
S 10	17 57	18 19	18 44	12 57	13 45	14 33	15 23
20	18 08	18 31	18 57	12 50	13 41	14 32	15 25
30	18 20	18 45	19 15	12 42	13 36	14 31	15 29
35	18 27	18 54	19 26	12 37	13 33	14 31	15 30
40	18 35	19 04	19 39	12 32	13 30	14 30	15 32
45	18 45	19 17	19 56	12 25	13 26	14 30	15 35
S 50	18 57	19 33	20 18	12 18	13 22	14 29	15 37
52	19 02	19 40	20 29	12 14	13 20	14 28	15 39
54	19 08	19 49	20 41	12 10	13 18	14 28	15 40
56	19 15	19 58	20 56	12 06	13 15	14 27	15 42
58	19 23	20 09	21 14	12 01	13 13	14 27	15 43
S 60	19 31	20 22	21 37	11 55	13 10	14 26	15 45

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
28	16 12	16 14	11 44	06 53	19 16	23	36
29	16 16	16 18	11 44	07 38	20 00	24	27
30	16 20	16 21	11 44	08 23	20 46	25	18

UT	ARIES	VENUS −4.4		MARS +1.6		JUPITER −2.3		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
13 00	21 43.2	138 24.2	S24 03.6	230 32.9	N13 16.8	270 38.4	N21 58.1	162 07.5	S13 11.7
01	36 45.6	153 23.8	04.2	245 33.9	16.3	285 40.6	58.1	177 09.7	11.8
02	51 48.1	168 23.3	04.8	260 35.0	15.8	300 42.9	58.0	192 11.9	11.9
03	66 50.5	183 22.9	05.4	275 36.0	15.3	315 45.1	58.0	207 14.1	11.9
04	81 53.0	198 22.5	06.0	290 37.0	14.8	330 47.4	58.0	222 16.3	12.0
05	96 55.5	213 22.0	06.7	305 38.0	14.3	345 49.6	58.0	237 18.5	12.1
06	111 57.9	228 21.6	S24 07.3	320 39.0	N13 13.8	0 51.9	N21 57.9	252 20.7	S13 12.2
07	127 00.4	243 21.2	07.9	335 40.0	13.3	15 54.1	57.9	267 22.8	12.3
08	142 02.9	258 20.7	08.5	350 41.0	12.8	30 56.4	57.9	282 25.0	12.4
S 09	157 05.3	273 20.3	09.1	5 42.0	12.3	45 58.6	57.9	297 27.2	12.5
U 10	172 07.8	288 19.9	09.7	20 43.1	11.8	61 00.9	57.8	312 29.4	12.6
N 11	187 10.3	303 19.4	10.3	35 44.1	11.3	76 03.1	57.8	327 31.6	12.7
D 12	202 12.7	318 19.0	S24 11.0	50 45.1	N13 10.8	91 05.4	N21 57.8	342 33.8	S13 12.8
A 13	217 15.2	333 18.5	11.6	65 46.1	10.3	106 07.7	57.8	357 35.9	12.9
Y 14	232 17.7	348 18.1	12.2	80 47.1	09.8	121 09.9	57.8	12 38.1	13.0
15	247 20.1	3 17.7	12.8	95 48.1	09.3	136 12.2	57.7	27 40.3	13.0
16	262 22.6	18 17.2	13.4	110 49.1	08.8	151 14.4	57.7	42 42.5	13.1
17	277 25.0	33 16.8	14.0	125 50.2	08.3	166 16.7	57.7	57 44.7	13.2
18	292 27.5	48 16.4	S24 14.6	140 51.2	N13 07.8	181 18.9	N21 57.7	72 46.9	S13 13.3
19	307 30.0	63 15.9	15.2	155 52.2	07.3	196 21.2	57.6	87 49.1	13.4
20	322 32.4	78 15.5	15.8	170 53.2	06.8	211 23.5	57.6	102 51.2	13.5
21	337 34.9	93 15.0	16.4	185 54.2	06.3	226 25.7	57.6	117 53.4	13.6
22	352 37.4	108 14.6	17.0	200 55.2	05.8	241 28.0	57.6	132 55.6	13.7
23	7 39.8	123 14.2	17.6	215 56.3	05.3	256 30.2	57.5	147 57.8	13.8
14 00	22 42.3	138 13.7	S24 18.2	230 57.3	N13 04.8	271 32.5	N21 57.5	163 00.0	S13 13.9
01	37 44.8	153 13.3	18.8	245 58.3	04.3	286 34.8	57.5	178 02.2	14.0
02	52 47.2	168 12.9	19.4	260 59.3	03.7	301 37.0	57.5	193 04.4	14.1
03	67 49.7	183 12.4	20.0	276 00.3	03.2	316 39.3	57.5	208 06.5	14.1
04	82 52.1	198 12.0	20.6	291 01.3	02.7	331 41.5	57.4	223 08.7	14.2
05	97 54.6	213 11.5	21.2	306 02.4	02.2	346 43.8	57.4	238 10.9	14.3
06	112 57.1	228 11.1	S24 21.8	321 03.4	N13 01.7	1 46.1	N21 57.4	253 13.1	S13 14.4
07	127 59.5	243 10.7	22.4	336 04.4	01.2	16 48.3	57.4	268 15.3	14.5
08	143 02.0	258 10.2	23.0	351 05.4	00.7	31 50.6	57.3	283 17.5	14.6
M 09	158 04.5	273 09.8	23.6	6 06.4	13 00.2	46 52.8	57.3	298 19.6	14.7
O 10	173 06.9	288 09.4	24.2	21 07.4	12 59.7	61 55.1	57.3	313 21.8	14.8
N 11	188 09.4	303 08.9	24.8	36 08.5	59.2	76 57.4	57.3	328 24.0	14.9
D 12	203 11.9	318 08.5	S24 25.3	51 09.5	N12 58.7	91 59.6	N21 57.2	343 26.2	S13 15.0
A 13	218 14.3	333 08.0	25.9	66 10.5	58.2	107 01.9	57.2	358 28.4	15.1
Y 14	233 16.8	348 07.6	26.5	81 11.5	57.7	122 04.2	57.2	13 30.6	15.2
15	248 19.3	3 07.2	27.1	96 12.5	57.2	137 06.4	57.2	28 32.7	15.2
16	263 21.7	18 06.7	27.7	111 13.6	56.7	152 08.7	57.2	43 34.9	15.3
17	278 24.2	33 06.3	28.3	126 14.6	56.2	167 11.0	57.1	58 37.1	15.4
18	293 26.6	48 05.9	S24 28.8	141 15.6	N12 55.7	182 13.2	N21 57.1	73 39.3	S13 15.5
19	308 29.1	63 05.4	29.4	156 16.6	55.2	197 15.5	57.1	88 41.5	15.6
20	323 31.6	78 05.0	30.0	171 17.6	54.7	212 17.8	57.1	103 43.7	15.7
21	338 34.0	93 04.5	30.6	186 18.7	54.2	227 20.0	57.0	118 45.9	15.8
22	353 36.5	108 04.1	31.2	201 19.7	53.7	242 22.3	57.0	133 48.0	15.9
23	8 39.0	123 03.7	31.7	216 20.7	53.2	257 24.6	57.0	148 50.2	16.0
15 00	23 41.4	138 03.2	S24 32.3	231 21.7	N12 52.7	272 26.8	N21 57.0	163 52.4	S13 16.1
01	38 43.9	153 02.8	32.9	246 22.7	52.1	287 29.1	57.0	178 54.6	16.2
02	53 46.4	168 02.3	33.5	261 23.8	51.6	302 31.4	56.9	193 56.8	16.3
03	68 48.8	183 01.9	34.0	276 24.8	51.1	317 33.6	56.9	208 59.0	16.3
04	83 51.3	198 01.5	34.6	291 25.8	50.6	332 35.9	56.9	224 01.1	16.4
05	98 53.7	213 01.0	35.2	306 26.8	50.1	347 38.2	56.9	239 03.3	16.5
06	113 56.2	228 00.6	S24 35.7	321 27.9	N12 49.6	2 40.4	N21 56.8	254 05.5	S13 16.6
07	128 58.7	243 00.1	36.3	336 28.9	49.1	17 42.7	56.8	269 07.7	16.7
T 08	144 01.1	257 59.7	36.9	351 29.9	48.6	32 45.0	56.8	284 09.9	16.8
U 09	159 03.6	272 59.3	37.5	6 30.9	48.1	47 47.2	56.8	299 12.1	16.9
E 10	174 06.1	287 58.8	38.0	21 31.9	47.6	62 49.5	56.8	314 14.2	17.0
S 11	189 08.5	302 58.4	38.6	36 33.0	47.1	77 51.8	56.7	329 16.4	17.1
D 12	204 11.0	317 58.0	S24 39.1	51 34.0	N12 46.6	92 54.1	N21 56.7	344 18.6	S13 17.2
A 13	219 13.5	332 57.5	39.7	66 35.0	46.1	107 56.3	56.7	359 20.8	17.3
Y 14	234 15.9	347 57.1	40.3	81 36.0	45.6	122 58.6	56.7	14 23.0	17.4
15	249 18.4	2 56.6	40.8	96 37.1	45.1	138 00.9	56.7	29 25.1	17.4
16	264 20.9	17 56.2	41.4	111 38.1	44.6	153 03.1	56.6	44 27.3	17.5
17	279 23.3	32 55.8	42.0	126 39.1	44.1	168 05.4	56.6	59 29.5	17.6
18	294 25.8	47 55.3	S24 42.5	141 40.1	N12 43.5	183 07.7	N21 56.6	74 31.7	S13 17.7
19	309 28.2	62 54.9	43.1	156 41.2	43.0	198 10.0	56.6	89 33.9	17.8
20	324 30.7	77 54.4	43.6	171 42.2	42.5	213 12.2	56.5	104 36.1	17.9
21	339 33.2	92 54.0	44.2	186 43.2	42.0	228 14.5	56.5	119 38.2	18.0
22	354 35.6	107 53.6	44.7	201 44.2	41.5	243 16.8	56.5	134 40.4	18.1
23	9 38.1	122 53.1	45.3	216 45.3	41.0	258 19.1	56.5	149 42.6	18.2
Mer. Pass.	h m 22 25.5	v −0.4	d 0.6	v 1.0	d 0.5	v 2.3	d 0.0	v 2.2	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 17.8	S40 14.9
Achernar	335 26.1	S57 09.9
Acrux	173 09.6	S63 10.4
Adhara	255 12.3	S28 59.4
Aldebaran	290 48.9	N16 32.1
Alioth	166 21.1	N55 53.1
Alkaid	152 59.2	N49 14.8
Al Na'ir	27 43.2	S46 53.6
Alnilam	275 46.0	S 1 11.6
Alphard	217 56.0	S 8 43.1
Alphecca	126 11.1	N26 40.4
Alpheratz	357 42.9	N29 10.2
Altair	62 08.0	N 8 54.6
Ankaa	353 15.1	S42 13.8
Antares	112 26.2	S26 27.6
Arcturus	145 55.9	N19 06.8
Atria	107 28.1	S69 03.2
Avior	234 18.0	S59 33.0
Bellatrix	278 31.6	N 6 21.7
Betelgeuse	271 00.9	N 7 24.5
Canopus	263 55.9	S52 42.0
Capella	280 33.8	N46 00.4
Deneb	49 31.2	N45 20.2
Denebola	182 33.7	N14 29.7
Diphda	348 55.3	S17 54.5
Dubhe	193 52.0	N61 40.4
Elnath	278 12.1	N28 37.0
Eltanin	90 46.2	N51 29.7
Enif	33 46.7	N 9 56.6
Fomalhaut	15 23.5	S29 32.8
Gacrux	172 01.1	S57 11.3
Gienah	175 52.4	S17 37.0
Hadar	148 48.1	S60 26.3
Hamal	328 00.1	N23 31.7
Kaus Aust.	83 43.6	S34 22.6
Kochab	137 21.2	N74 06.1
Markab	13 37.8	N15 17.0
Menkar	314 14.5	N 4 08.7
Menkent	148 07.7	S36 26.2
Miaplacidus	221 39.9	S69 46.3
Mirfak	308 39.6	N49 54.5
Nunki	75 58.1	S26 16.6
Peacock	53 18.8	S56 41.4
Pollux	243 27.5	N27 59.3
Procyon	244 59.5	N 5 11.3
Rasalhague	96 06.4	N12 33.3
Regulus	207 43.5	N11 53.9
Rigel	281 11.7	S 8 11.1
Rigil Kent.	139 52.0	S60 53.4
Sabik	102 12.5	S15 44.3
Schedar	349 39.6	N56 36.9
Shaula	96 21.8	S37 06.7
Sirius	258 33.4	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.4	S43 29.2
Vega	80 38.9	N38 48.2
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	115 31.4	14 48
Mars	208 15.0	8 36
Jupiter	248 50.2	5 53
Saturn	140 17.7	13 06

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		13	14	15	16
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
13 00	183 25.3	S 7 45.0	77 07.6	8.1	S14 15.3	8.3	59.1	N 72	04 51	06 10	07 20	16 10	15 59	15 49	15 41
01	198 25.4	46.0	91 34.7	8.2	14 07.0	8.4	59.1	N 70	04 56	06 06	07 09	15 50	15 47	15 45	15 42
02	213 25.6	46.9	106 01.9	8.2	13 58.6	8.4	59.1	68	04 59	06 03	07 00	15 34	15 38	15 41	15 43
03	228 25.8	47.8	120 29.1	8.3	13 50.2	8.5	59.1	66	05 02	06 01	06 53	15 20	15 30	15 37	15 44
04	243 25.9	48.8	134 56.4	8.3	13 41.7	8.6	59.1	64	05 04	05 59	06 47	15 09	15 23	15 35	15 45
05	258 26.1	49.7	149 23.7	8.4	13 33.1	8.7	59.1	62	05 05	05 57	06 42	15 00	15 17	15 32	15 46
06	273 26.2	S 7 50.6	163 51.1	8.4	S13 24.4	8.8	59.1	60	05 07	05 55	06 37	14 52	15 12	15 30	15 46
07	288 26.4	51.6	178 18.5	8.5	13 15.6	8.8	59.1	N 58	05 08	05 53	06 33	14 45	15 08	15 28	15 47
08	303 26.5	52.5	192 46.0	8.5	13 06.8	8.9	59.1	56	05 09	05 52	06 29	14 39	15 04	15 26	15 47
S 09	318 26.7	53.4	207 13.5	8.6	12 57.9	9.0	59.1	54	05 09	05 50	06 26	14 33	15 00	15 25	15 48
U 10	333 26.8	54.4	221 41.1	8.6	12 48.9	9.1	59.1	52	05 10	05 49	06 23	14 28	14 57	15 23	15 48
N 11	348 27.0	55.3	236 08.7	8.6	12 39.8	9.1	59.1	50	05 10	05 48	06 20	14 23	14 54	15 22	15 48
D 12	3 27.1	S 7 56.2	250 36.3	8.7	S12 30.7	9.2	59.0	45	05 11	05 45	06 14	14 13	14 48	15 19	15 49
A 13	18 27.2	57.1	265 04.0	8.8	12 21.5	9.3	59.0	N 40	05 11	05 42	06 09	14 05	14 42	15 17	15 50
Y 14	33 27.4	58.1	279 31.8	8.8	12 12.2	9.4	59.0	35	05 10	05 40	06 05	13 57	14 37	15 15	15 51
15	48 27.5	59.0	293 59.6	8.9	12 02.8	9.4	59.0	30	05 09	05 37	06 01	13 51	14 33	15 13	15 51
16	63 27.7	7 59.9	308 27.5	8.9	11 53.4	9.5	59.0	20	05 07	05 32	05 54	13 40	14 26	15 10	15 52
17	78 27.8	8 00.9	322 55.4	9.0	11 43.9	9.6	59.0	N 10	05 03	05 27	05 48	13 30	14 20	15 07	15 53
18	93 28.0	S 8 01.8	337 23.4	9.0	S11 34.3	9.6	59.0	0	04 58	05 22	05 43	13 21	14 14	15 04	15 54
19	108 28.1	02.7	351 51.4	9.0	11 24.7	9.7	59.0	S 10	04 51	05 16	05 37	13 12	14 08	15 02	15 55
20	123 28.3	03.7	6 19.4	9.1	11 15.0	9.7	59.0	20	04 42	05 08	05 30	13 02	14 01	14 59	15 56
21	138 28.4	04.6	20 47.5	9.2	11 05.3	9.8	59.0	30	04 30	04 59	05 23	12 51	13 54	14 56	15 57
22	153 28.6	05.5	35 15.7	9.1	10 55.5	9.9	59.0	35	04 22	04 53	05 19	12 45	13 50	14 54	15 58
23	168 28.7	06.5	49 43.8	9.3	10 45.6	9.9	58.9	40	04 13	04 46	05 14	12 37	13 45	14 52	15 58
14 00	183 28.9	S 8 07.4	64 12.1	9.3	S10 35.7	10.0	58.9	45	04 01	04 38	05 08	12 29	13 39	14 50	15 59
01	198 29.0	08.3	78 40.4	9.3	10 25.7	10.1	58.9	S 50	03 47	04 28	05 01	12 18	13 33	14 47	16 00
02	213 29.2	09.2	93 08.7	9.4	10 15.6	10.1	58.9	52	03 39	04 23	04 58	12 13	13 30	14 46	16 01
03	228 29.3	10.2	107 37.1	9.4	10 05.5	10.1	58.9	54	03 31	04 17	04 54	12 08	13 26	14 44	16 01
04	243 29.5	11.1	122 05.5	9.5	9 55.4	10.3	58.9	56	03 22	04 11	04 51	12 02	13 22	14 43	16 02
05	258 29.6	12.0	136 34.0	9.5	9 45.1	10.2	58.9	58	03 11	04 04	04 46	11 55	13 18	14 41	16 03
06	273 29.7	S 8 13.0	151 02.5	9.5	S 9 34.9	10.4	58.9	S 60	02 58	03 56	04 41	11 48	13 13	14 39	16 03
07	288 29.9	13.9	165 31.0	9.6	9 24.5	10.3	58.9								
08	303 30.0	14.8	179 59.6	9.7	9 14.2	10.5	58.9								
M 09	318 30.2	15.7	194 28.3	9.7	9 03.7	10.4	58.8								
O 10	333 30.3	16.7	208 57.0	9.7	8 53.3	10.5	58.8								
N 11	348 30.5	17.6	223 25.7	9.8	8 42.8	10.6	58.8								
D 12	3 30.6	S 8 18.5	237 54.5	9.8	S 8 32.2	10.6	58.8								
A 13	18 30.8	19.5	252 23.3	9.8	8 21.6	10.7	58.8								
Y 14	33 30.9	20.4	266 52.1	9.9	8 10.9	10.7	58.8								
15	48 31.0	21.3	281 21.0	10.0	8 00.2	10.7	58.8								
16	63 31.2	22.2	295 50.0	9.9	7 49.5	10.8	58.8								
17	78 31.3	23.2	310 18.9	10.0	7 38.7	10.8	58.8								
18	93 31.5	S 8 24.1	324 47.9	10.1	S 7 27.9	10.8	58.7								
19	108 31.6	25.0	339 17.0	10.1	7 17.1	10.9	58.7								
20	123 31.8	25.9	353 46.1	10.1	7 06.2	11.0	58.7								
21	138 31.9	26.9	8 15.2	10.2	6 55.2	10.9	58.7								
22	153 32.0	27.8	22 44.4	10.2	6 44.3	11.0	58.7								
23	168 32.2	28.7	37 13.6	10.2	6 33.3	11.1	58.7								
15 00	183 32.3	S 8 29.6	51 42.8	10.3	S 6 22.2	11.0	58.7								
01	198 32.5	30.6	66 12.1	10.3	6 11.2	11.1	58.7								
02	213 32.6	31.5	80 41.4	10.3	6 00.1	11.1	58.6								
03	228 32.7	32.4	95 10.7	10.4	5 49.0	11.2	58.6								
04	243 32.9	33.3	109 40.1	10.4	5 37.8	11.1	58.6								
05	258 33.0	34.3	124 09.5	10.5	5 26.7	11.2	58.6								
06	273 33.2	S 8 35.2	138 39.0	10.5	S 5 15.5	11.3	58.6								
07	288 33.3	36.1	153 08.5	10.5	5 04.2	11.2	58.6								
T 08	303 33.4	37.0	167 38.0	10.5	4 53.0	11.3	58.6								
U 09	318 33.6	38.0	182 07.5	10.6	4 41.7	11.3	58.5								
E 10	333 33.7	38.9	196 37.1	10.6	4 30.4	11.3	58.5								
S 11	348 33.8	39.8	211 06.7	10.6	4 19.1	11.3	58.5								
D 12	3 34.0	S 8 40.7	225 36.3	10.7	S 4 07.8	11.4	58.5								
A 13	18 34.1	41.6	240 06.0	10.7	3 56.4	11.3	58.5								
Y 14	33 34.3	42.6	254 35.7	10.7	3 45.1	11.4	58.5								
15	48 34.4	43.5	269 05.4	10.7	3 33.7	11.4	58.5								
16	63 34.5	44.4	283 35.1	10.8	3 22.3	11.4	58.4								
17	78 34.7	45.3	298 04.9	10.8	3 10.9	11.4	58.4								
18	93 34.8	S 8 46.3	312 34.7	10.9	S 2 59.5	11.5	58.4								
19	108 34.9	47.2	327 04.6	10.8	2 48.0	11.4	58.4								
20	123 35.1	48.1	341 34.4	10.9	2 36.6	11.4	58.4								
21	138 35.2	49.0	356 04.3	10.9	2 25.2	11.5	58.4								
22	153 35.4	49.9	10 34.2	10.9	2 13.7	11.5	58.4								
23	168 35.5	50.9	25 04.1	11.0	S 2 02.2	11.4	58.3								
	SD 16.1	d 0.9	SD	16.1	16.0		15.9								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	13	14	15	16
°	h m	h m	h m	h m	h m	h m	h m
N 72	16 10	17 20	18 38	23 17	25 16	01 16	03 11
N 70	16 21	17 24	18 34	23 36	25 26	01 26	03 13
68	16 30	17 27	18 31	23 50	25 34	01 34	03 15
66	16 37	17 29	18 28	24 02	00 02	01 40	03 16
64	16 44	17 32	18 27	24 12	00 12	01 45	03 17
62	16 49	17 34	18 25	24 21	00 21	01 50	03 18
60	16 54	17 36	18 24	24 28	00 28	01 54	03 19
N 58	16 58	17 37	18 23	24 34	00 34	01 57	03 20
56	17 02	17 39	18 22	24 40	00 40	02 00	03 20
54	17 05	17 41	18 21	24 45	00 45	02 03	03 21
52	17 08	17 42	18 21	24 49	00 49	02 06	03 21
50	17 11	17 43	18 21	24 53	00 53	02 08	03 22
45	17 17	17 46	18 20	25 02	01 02	02 13	03 23
N 40	17 22	17 49	18 20	00 01	01 09	02 17	03 24
35	17 26	17 52	18 21	00 10	01 16	02 21	03 25
30	17 30	17 54	18 22	00 18	01 21	02 24	03 25
20	17 37	17 59	18 25	00 31	01 31	02 29	03 26
N 10	17 43	18 05	18 29	00 42	01 39	02 34	03 27
0	17 49	18 10	18 34	00 53	01 46	02 38	03 28
S 10	17 55	18 17	18 41	01 03	01 54	02 42	03 29
20	18 02	18 24	18 50	01 15	02 02	02 47	03 30
30	18 09	18 34	19 03	01 27	02 11	02 52	03 31
35	18 14	18 40	19 10	01 35	02 16	02 55	03 31
40	18 19	18 47	19 20	01 43	02 22	02 58	03 32
45	18 25	18 55	19 32	01 52	02 29	03 02	03 33
S 50	18 32	19 06	19 47	02 04	02 37	03 06	03 34
52	18 35	19 11	19 54	02 09	02 41	03 08	03 34
54	18 39	19 16	20 03	02 15	02 45	03 11	03 34
56	18 43	19 22	20 12	02 22	02 49	03 13	03 35
58	18 47	19 29	20 23	02 29	02 54	03 16	03 35
S 60	18 52	19 37	20 36	02 37	03 00	03 19	03 36

Day	SUN			MOON			
	Eqn. of Time		Mer. Pass.	Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
13	13 41	13 48	11 46	19 34	07 07	08	67
14	13 55	14 02	11 46	20 26	08 00	09	77
15	14 09	14 16	11 46	21 16	08 51	10	86

UT	ARIES	VENUS −4.4		MARS +1.6		JUPITER −2.3		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
16 00	24 40.6	137 52.7	S24 45.8	231 46.3	N12 40.5	273 21.3	N21 56.5	164 44.8	S13 18.3
01	39 43.0	152 52.2	46.4	246 47.3	40.0	288 23.6	56.4	179 47.0	18.4
02	54 45.5	167 51.8	46.9	261 48.3	39.5	303 25.9	56.4	194 49.2	18.4
03	69 48.0	182 51.4	. . 47.5	276 49.4	. . 39.0	318 28.2	. . 56.4	209 51.3	. . 18.5
04	84 50.4	197 50.9	48.0	291 50.4	38.5	333 30.4	56.4	224 53.5	18.6
05	99 52.9	212 50.5	48.6	306 51.4	38.0	348 32.7	56.4	239 55.7	18.7
06	114 55.4	227 50.0	S24 49.1	321 52.4	N12 37.5	3 35.0	N21 56.3	254 57.9	S13 18.8
W 07	129 57.8	242 49.6	49.7	336 53.5	37.0	18 37.3	56.3	270 00.1	18.9
E 08	145 00.3	257 49.2	50.2	351 54.5	36.4	33 39.5	56.3	285 02.2	19.0
D 09	160 02.7	272 48.7	. . 50.8	6 55.5	. . 35.9	48 41.8	. . 56.3	300 04.4	. . 19.1
N 10	175 05.2	287 48.3	51.3	21 56.6	35.4	63 44.1	56.3	315 06.6	19.2
E 11	190 07.7	302 47.9	51.8	36 57.6	34.9	78 46.4	56.2	330 08.8	19.3
S 12	205 10.1	317 47.4	S24 52.4	51 58.6	N12 34.4	93 48.7	N21 56.2	345 11.0	S13 19.4
D 13	220 12.6	332 47.0	52.9	66 59.6	33.9	108 50.9	56.2	0 13.2	19.5
A 14	235 15.1	347 46.5	53.4	82 00.7	33.4	123 53.2	56.2	15 15.3	19.5
Y 15	250 17.5	2 46.1	. . 54.0	97 01.7	. . 32.9	138 55.5	. . 56.2	30 17.5	. . 19.6
16	265 20.0	17 45.7	54.5	112 02.7	32.4	153 57.8	56.1	45 19.7	19.7
17	280 22.5	32 45.2	55.1	127 03.8	31.9	169 00.1	56.1	60 21.9	19.8
18	295 24.9	47 44.8	S24 55.6	142 04.8	N12 31.4	184 02.3	N21 56.1	75 24.1	S13 19.9
19	310 27.4	62 44.3	56.1	157 05.8	30.9	199 04.6	56.1	90 26.2	20.0
20	325 29.8	77 43.9	56.6	172 06.8	30.4	214 06.9	56.1	105 28.4	20.1
21	340 32.3	92 43.5	. . 57.2	187 07.9	. . 29.8	229 09.2	. . 56.0	120 30.6	. . 20.2
22	355 34.8	107 43.0	57.7	202 08.9	29.3	244 11.5	56.0	135 32.8	20.3
23	10 37.2	122 42.6	58.2	217 09.9	28.8	259 13.8	56.0	150 35.0	20.4
17 00	25 39.7	137 42.1	S24 58.8	232 11.0	N12 28.3	274 16.0	N21 56.0	165 37.2	S13 20.5
01	40 42.2	152 41.7	59.3	247 12.0	27.8	289 18.3	56.0	180 39.3	20.6
02	55 44.6	167 41.3	24 59.8	262 13.0	27.3	304 20.6	55.9	195 41.5	20.6
03	70 47.1	182 40.8	25 00.3	277 14.1	. . 26.8	319 22.9	. . 55.9	210 43.7	. . 20.7
04	85 49.6	197 40.4	00.9	292 15.1	26.3	334 25.2	55.9	225 45.9	20.8
05	100 52.0	212 39.9	01.4	307 16.1	25.8	349 27.5	55.9	240 48.1	20.9
06	115 54.5	227 39.5	S25 01.9	322 17.2	N12 25.3	4 29.7	N21 55.9	255 50.2	S13 21.0
T 07	130 57.0	242 39.1	02.4	337 18.2	24.8	19 32.0	55.8	270 52.4	21.1
H 08	145 59.4	257 38.6	02.9	352 19.2	24.2	34 34.3	55.8	285 54.6	21.2
U 09	161 01.9	272 38.2	. . 03.5	7 20.3	. . 23.7	49 36.6	. . 55.8	300 56.8	. . 21.3
R 10	176 04.3	287 37.8	04.0	22 21.3	23.2	64 38.9	55.8	315 59.0	21.4
S 11	191 06.8	302 37.3	04.5	37 22.3	22.7	79 41.2	55.8	331 01.1	21.5
D 12	206 09.3	317 36.9	S25 05.0	52 23.4	N12 22.2	94 43.5	N21 55.7	346 03.3	S13 21.6
A 13	221 11.7	332 36.4	05.5	67 24.4	21.7	109 45.7	55.7	1 05.5	21.7
Y 14	236 14.2	347 36.0	06.0	82 25.4	21.2	124 48.0	55.7	16 07.7	21.7
15	251 16.7	2 35.6	. . 06.5	97 26.5	. . 20.7	139 50.3	. . 55.7	31 09.9	. . 21.8
16	266 19.1	17 35.1	07.1	112 27.5	20.2	154 52.6	55.7	46 12.1	21.9
17	281 21.6	32 34.7	07.6	127 28.5	19.7	169 54.9	55.6	61 14.2	22.0
18	296 24.1	47 34.2	S25 08.1	142 29.6	N12 19.1	184 57.2	N21 55.6	76 16.4	S13 22.1
19	311 26.5	62 33.8	08.6	157 30.6	18.6	199 59.5	55.6	91 18.6	22.2
20	326 29.0	77 33.4	09.1	172 31.6	18.1	215 01.8	55.6	106 20.8	22.3
21	341 31.4	92 32.9	. . 09.6	187 32.7	. . 17.6	230 04.1	. . 55.6	121 23.0	. . 22.4
22	356 33.9	107 32.5	10.1	202 33.7	17.1	245 06.3	55.5	136 25.1	22.5
23	11 36.4	122 32.1	10.6	217 34.7	16.6	260 08.6	55.5	151 27.3	22.6
18 00	26 38.8	137 31.6	S25 11.1	232 35.8	N12 16.1	275 10.9	N21 55.5	166 29.5	S13 22.7
01	41 41.3	152 31.2	11.6	247 36.8	15.6	290 13.2	55.5	181 31.7	22.8
02	56 43.8	167 30.7	12.1	262 37.8	15.1	305 15.5	55.5	196 33.9	22.8
03	71 46.2	182 30.3	. . 12.6	277 38.9	. . 14.6	320 17.8	. . 55.4	211 36.0	. . 22.9
04	86 48.7	197 29.9	13.1	292 39.9	14.0	335 20.1	55.4	226 38.2	23.0
05	101 51.2	212 29.4	13.6	307 40.9	13.5	350 22.4	55.4	241 40.4	23.1
06	116 53.6	227 29.0	S25 14.1	322 42.0	N12 13.0	5 24.7	N21 55.4	256 42.6	S13 23.2
F 07	131 56.1	242 28.6	14.6	337 43.0	12.5	20 27.0	55.4	271 44.8	23.3
R 08	146 58.6	257 28.1	15.1	352 44.0	12.0	35 29.3	55.4	286 46.9	23.4
I 09	162 01.0	272 27.7	. . 15.6	7 45.1	. . 11.5	50 31.6	. . 55.3	301 49.1	. . 23.5
D 10	177 03.5	287 27.2	16.1	22 46.1	11.0	65 33.9	55.3	316 51.3	23.6
A 11	192 05.9	302 26.8	16.6	37 47.2	10.5	80 36.1	55.3	331 53.5	23.7
Y 12	207 08.4	317 26.4	S25 17.0	52 48.2	N12 10.0	95 38.4	N21 55.3	346 55.7	S13 23.8
13	222 10.9	332 25.9	17.5	67 49.2	09.4	110 40.7	55.3	1 57.8	23.9
14	237 13.3	347 25.5	18.0	82 50.3	08.9	125 43.0	55.2	17 00.0	23.9
15	252 15.8	2 25.1	. . 18.5	97 51.3	. . 08.4	140 45.3	. . 55.2	32 02.2	. . 24.0
16	267 18.3	17 24.6	19.0	112 52.4	07.9	155 47.6	55.2	47 04.4	24.1
17	282 20.7	32 24.2	19.5	127 53.4	07.4	170 49.9	55.2	62 06.6	24.2
18	297 23.2	47 23.7	S25 20.0	142 54.4	N12 06.9	185 52.2	N21 55.2	77 08.7	S13 24.3
19	312 25.7	62 23.3	20.4	157 55.5	06.4	200 54.5	55.2	92 10.9	24.4
20	327 28.1	77 22.9	20.9	172 56.5	05.9	215 56.8	55.1	107 13.1	24.5
21	342 30.6	92 22.4	. . 21.4	187 57.5	. . 05.4	230 59.1	. . 55.1	122 15.3	. . 24.6
22	357 33.0	107 22.0	21.9	202 58.6	04.8	246 01.4	55.1	137 17.5	24.7
23	12 35.5	122 21.6	22.4	217 59.6	04.3	261 03.7	55.1	152 19.6	24.8
Mer. Pass.	h m 22 13.7	v −0.4	d 0.5	v 1.0	d 0.5	v 2.3	d 0.0	v 2.2	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 17.8	S40 14.9
Achernar	335 26.1	S57 10.0
Acrux	173 09.6	S63 10.4
Adhara	255 12.3	S28 59.4
Aldebaran	290 48.9	N16 32.1
Alioth	166 21.1	N55 53.1
Alkaid	152 59.2	N49 14.8
Al Na'ir	27 43.2	S46 53.6
Alnilam	275 46.0	S 1 11.6
Alphard	217 56.0	S 8 43.1
Alphecca	126 11.1	N26 40.4
Alpheratz	357 42.9	N29 10.2
Altair	62 08.0	N 8 54.6
Ankaa	353 15.1	S42 13.8
Antares	112 26.2	S26 27.6
Arcturus	145 55.9	N19 06.8
Atria	107 28.2	S69 03.1
Avior	234 18.0	S59 33.0
Bellatrix	278 31.6	N 6 21.7
Betelgeuse	271 00.9	N 7 24.5
Canopus	263 55.9	S52 42.0
Capella	280 33.8	N46 00.4
Deneb	49 31.2	N45 20.2
Denebola	182 33.7	N14 29.7
Diphda	348 55.4	S17 54.5
Dubhe	193 52.0	N61 40.4
Elnath	278 12.1	N28 37.0
Eltanin	90 46.3	N51 29.7
Enif	33 46.7	N 9 56.6
Fomalhaut	15 23.5	S29 32.8
Gacrux	172 01.1	S57 11.3
Gienah	175 52.4	S17 37.0
Hadar	148 48.1	S60 26.3
Hamal	328 00.1	N23 31.7
Kaus Aust.	83 43.6	S34 22.6
Kochab	137 21.2	N74 06.1
Markab	13 37.8	N15 17.0
Menkar	314 14.5	N 4 08.7
Menkent	148 07.7	S36 26.1
Miaplacidus	221 39.9	S69 46.2
Mirfak	308 39.5	N49 54.5
Nunki	75 58.1	S26 16.6
Peacock	53 18.8	S56 41.4
Pollux	243 27.5	N27 59.3
Procyon	244 59.5	N 5 11.3
Rasalhague	96 06.4	N12 33.3
Regulus	207 43.5	N11 53.9
Rigel	281 11.6	S 8 11.1
Rigil Kent.	139 52.0	S60 53.4
Sabik	102 12.5	S15 44.3
Schedar	349 39.6	N56 37.0
Shaula	96 21.8	S37 06.7
Sirius	258 33.4	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.4	S43 29.2
Vega	80 38.9	N38 48.2
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	112 02.4	14 50
Mars	206 31.3	8 31
Jupiter	248 36.3	5 42
Saturn	139 57.5	12 56

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 16	Moonrise 17	Moonrise 18	Moonrise 19
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
16 00	183 35.6	S 8 51.8	39 34.1	10.9	S 1 50.8	11.5	58.3	N 72	05 04	06 23	07 35	15 41	15 32	15 22	15 11
01	198 35.8	52.7	54 04.0	11.0	1 39.3	11.5	58.3	N 70	05 07	06 18	07 22	15 42	15 39	15 37	15 35
02	213 35.9	53.6	68 34.0	11.0	1 27.8	11.4	58.3	68	05 09	06 14	07 12	15 43	15 46	15 49	15 54
03	228 36.0	. . 54.5	83 04.0	11.1	1 16.4	11.5	58.3	66	05 11	06 10	07 03	15 44	15 51	15 59	16 09
04	243 36.2	55.5	97 34.1	11.0	1 04.9	11.5	58.3	64	05 12	06 07	06 56	15 45	15 55	16 07	16 21
05	258 36.3	56.4	112 04.1	11.1	0 53.4	11.5	58.2	62	05 13	06 04	06 50	15 46	15 59	16 14	16 32
06	273 36.4	S 8 57.3	126 34.2	11.1	S 0 41.9	11.4	58.2	60	05 14	06 02	06 44	15 46	16 03	16 20	16 41
W 07	288 36.6	58.2	141 04.3	11.1	0 30.5	11.5	58.2	N 58	05 14	06 00	06 40	15 47	16 06	16 26	16 49
E 08	303 36.7	8 59.1	155 34.4	11.1	0 19.0	11.5	58.2	56	05 15	05 58	06 36	15 47	16 08	16 31	16 56
D 09	318 36.8	9 00.0	170 04.5	11.2	S 0 07.5	11.4	58.2	54	05 15	05 56	06 32	15 48	16 11	16 35	17 02
N 10	333 37.0	01.0	184 34.7	11.2	N 0 03.9	11.5	58.1	52	05 15	05 54	06 28	15 48	16 13	16 39	17 07
E 11	348 37.1	01.9	199 04.9	11.1	0 15.4	11.4	58.1	50	05 15	05 52	06 25	15 48	16 15	16 43	17 13
S 12	3 37.2	S 9 02.8	213 35.0	11.2	N 0 26.8	11.5	58.1	45	05 15	05 49	06 18	15 49	16 19	16 50	17 24
D 13	18 37.4	03.7	228 05.2	11.3	0 38.3	11.4	58.1	N 40	05 14	05 45	06 13	15 50	16 23	16 57	17 33
A 14	33 37.5	04.6	242 35.5	11.2	0 49.7	11.4	58.1	35	05 13	05 42	06 08	15 51	16 26	17 03	17 41
Y 15	48 37.6	. . 05.5	257 05.7	11.2	1 01.1	11.4	58.1	30	05 11	05 39	06 03	15 51	16 29	17 08	17 48
16	63 37.8	06.5	271 35.9	11.3	1 12.5	11.4	58.0	20	05 07	05 33	05 55	15 52	16 34	17 17	18 00
17	78 37.9	07.4	286 06.2	11.3	1 23.9	11.4	58.0	N 10	05 03	05 27	05 49	15 53	16 39	17 25	18 11
18	93 38.0	S 9 08.3	300 36.5	11.2	N 1 35.3	11.4	58.0	0	04 57	05 21	05 42	15 54	16 43	17 32	18 21
19	108 38.1	09.2	315 06.7	11.3	1 46.7	11.3	58.0	S 10	04 49	05 14	05 35	15 55	16 47	17 39	18 31
20	123 38.3	10.1	329 37.0	11.3	1 58.0	11.3	58.0	20	04 39	05 06	05 28	15 56	16 52	17 47	18 42
21	138 38.4	. . 11.0	344 07.3	11.4	2 09.3	11.4	57.9	30	04 26	04 55	05 20	15 57	16 57	17 56	18 55
22	153 38.5	12.0	358 37.7	11.3	2 20.7	11.3	57.9	35	04 18	04 49	05 15	15 58	17 00	18 02	19 02
23	168 38.7	12.9	13 08.0	11.3	2 32.0	11.2	57.9	40	04 08	04 41	05 09	15 58	17 04	18 08	19 10
17 00	183 38.8	S 9 13.8	27 38.3	11.4	N 2 43.2	11.3	57.9	45	03 55	04 32	05 03	15 59	17 08	18 15	19 20
01	198 38.9	14.7	42 08.7	11.3	2 54.5	11.2	57.9	S 50	03 39	04 21	04 55	16 00	17 12	18 23	19 32
02	213 39.0	15.6	56 39.0	11.4	3 05.7	11.2	57.9	52	03 32	04 16	04 51	16 01	17 15	18 27	19 37
03	228 39.2	. . 16.5	71 09.4	11.4	3 16.9	11.2	57.8	54	03 23	04 10	04 47	16 01	17 17	18 31	19 43
04	243 39.3	17.4	85 39.8	11.3	3 28.1	11.2	57.8	56	03 12	04 03	04 43	16 02	17 20	18 36	19 50
05	258 39.4	18.4	100 10.1	11.4	3 39.3	11.1	57.8	58	03 01	03 55	04 38	16 03	17 23	18 42	19 58
06	273 39.6	S 9 19.3	114 40.5	11.4	N 3 50.4	11.1	57.8	S 60	02 46	03 47	04 32	16 03	17 26	18 48	20 06
T 07	288 39.7	20.2	129 10.9	11.4	4 01.5	11.1	57.8								
H 08	303 39.8	21.1	143 41.3	11.4	4 12.6	11.0	57.7								
U 09	318 39.9	. . 22.0	158 11.7	11.4	4 23.6	11.0	57.7								
R 10	333 40.1	22.9	172 42.1	11.5	4 34.6	11.0	57.7								
S 11	348 40.2	23.8	187 12.6	11.4	4 45.6	11.0	57.7								
D 12	3 40.3	S 9 24.7	201 43.0	11.4	N 4 56.6	10.9	57.6								
A 13	18 40.4	25.6	216 13.4	11.4	5 07.5	10.9	57.6								
Y 14	33 40.6	26.6	230 43.8	11.5	5 18.4	10.8	57.6								
15	48 40.7	. . 27.5	245 14.3	11.4	5 29.2	10.8	57.6								
16	63 40.8	28.4	259 44.7	11.4	5 40.0	10.8	57.6								
17	78 40.9	29.3	274 15.1	11.5	5 50.8	10.7	57.5								
18	93 41.1	S 9 30.2	288 45.6	11.4	N 6 01.5	10.7	57.5								
19	108 41.2	31.1	303 16.0	11.5	6 12.2	10.7	57.5								
20	123 41.3	32.0	317 46.5	11.4	6 22.9	10.6	57.5								
21	138 41.4	. . 32.9	332 16.9	11.4	6 33.5	10.6	57.5								
22	153 41.6	33.8	346 47.3	11.5	6 44.1	10.5	57.4								
23	168 41.7	34.7	1 17.8	11.4	6 54.6	10.5	57.4								
18 00	183 41.8	S 9 35.7	15 48.2	11.5	N 7 05.1	10.5	57.4								
01	198 41.9	36.6	30 18.7	11.4	7 15.6	10.4	57.4								
02	213 42.1	37.5	44 49.1	11.4	7 26.0	10.3	57.3								
03	228 42.2	. . 38.4	59 19.5	11.5	7 36.3	10.4	57.3								
04	243 42.3	39.3	73 50.0	11.4	7 46.7	10.2	57.3								
05	258 42.4	40.2	88 20.4	11.4	7 56.9	10.2	57.3								
06	273 42.5	S 9 41.1	102 50.8	11.5	N 8 07.1	10.2	57.3								
F 07	288 42.7	42.0	117 21.3	11.4	8 17.3	10.1	57.2								
R 08	303 42.8	42.9	131 51.7	11.4	8 27.4	10.1	57.2								
I 09	318 42.9	. . 43.8	146 22.1	11.4	8 37.5	10.0	57.2								
D 10	333 43.0	44.7	160 52.5	11.4	8 47.5	9.9	57.2								
A 11	348 43.1	45.6	175 22.9	11.5	8 57.4	9.9	57.1								
Y 12	3 43.3	S 9 46.5	189 53.4	11.4	N 9 07.3	9.9	57.1								
13	18 43.4	47.4	204 23.8	11.4	9 17.2	9.8	57.1								
14	33 43.5	48.4	218 54.2	11.4	9 27.0	9.7	57.1								
15	48 43.6	. . 49.3	233 24.6	11.4	9 36.7	9.7	57.1								
16	63 43.7	50.2	247 55.0	11.3	9 46.4	9.6	57.0								
17	78 43.9	51.1	262 25.3	11.4	9 56.0	9.6	57.0								
18	93 44.0	S 9 52.0	276 55.7	11.4	N10 05.6	9.5	57.0								
19	108 44.1	52.9	291 26.1	11.4	10 15.1	9.4	57.0								
20	123 44.2	53.8	305 56.5	11.3	10 24.5	9.4	56.9								
21	138 44.3	. . 54.7	320 26.8	11.4	10 33.9	9.3	56.9								
22	153 44.5	55.6	334 57.2	11.3	10 43.2	9.3	56.9								
23	168 44.6	56.5	349 27.5	11.4	N10 52.5	9.2	56.9								
	SD 16.1	d 0.9	SD	15.8		15.7									

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 16	Moonset 17	Moonset 18	Moonset 19
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 54	17 06	18 24	03 11	05 03	06 55	08 49
N 70	16 07	17 11	18 21	03 13	04 58	06 42	08 26
68	16 17	17 15	18 19	03 15	04 54	06 32	08 09
66	16 26	17 19	18 18	03 16	04 50	06 23	07 55
64	16 33	17 22	18 17	03 17	04 47	06 16	07 43
62	16 40	17 25	18 16	03 18	04 45	06 10	07 34
60	16 45	17 27	18 15	03 19	04 43	06 05	07 25
N 58	16 50	17 30	18 15	03 20	04 41	06 00	07 18
56	16 54	17 32	18 15	03 20	04 39	05 56	07 12
54	16 58	17 34	18 15	03 21	04 37	05 53	07 06
52	17 01	17 36	18 15	03 21	04 36	05 49	07 01
50	17 05	17 37	18 15	03 22	04 35	05 46	06 56
45	17 12	17 41	18 15	03 23	04 32	05 40	06 46
N 40	17 17	17 45	18 16	03 24	04 30	05 34	06 38
35	17 23	17 48	18 17	03 25	04 28	05 30	06 31
30	17 27	17 51	18 19	03 25	04 26	05 26	06 24
20	17 35	17 57	18 23	03 26	04 23	05 18	06 14
N 10	17 42	18 03	18 28	03 27	04 20	05 12	06 04
0	17 49	18 10	18 34	03 28	04 17	05 06	05 55
S 10	17 55	18 17	18 42	03 29	04 15	05 00	05 47
20	18 03	18 25	18 52	03 30	04 12	04 54	05 37
30	18 11	18 36	19 05	03 31	04 09	04 47	05 27
35	18 16	18 42	19 13	03 31	04 07	04 43	05 20
40	18 22	18 50	19 24	03 32	04 05	04 39	05 13
45	18 29	18 59	19 36	03 33	04 03	04 33	05 05
S 50	18 37	19 11	19 53	03 34	04 00	04 27	04 56
52	18 40	19 16	20 01	03 34	03 59	04 24	04 51
54	18 45	19 22	20 10	03 34	03 57	04 21	04 46
56	18 49	19 29	20 20	03 35	03 56	04 17	04 41
58	18 54	19 37	20 33	03 35	03 54	04 13	04 35
S 60	19 00	19 46	20 47	03 36	03 52	04 09	04 28

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
16	14 22	14 29	11 46	22 06	09 41	11	93
17	14 35	14 41	11 45	22 55	10 30	12	97
18	14 47	14 53	11 45	23 44	11 19	13	100

UT	ARIES	VENUS −4.4		MARS +1.5		JUPITER −2.3		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
19 00	27 38.0	137 21.1	S25 22.8	233 00.7	N12 03.8	276 06.0	N21 55.1	167 21.8	S13 24.9	Acamar	315 17.8	S40 14.9
01	42 40.4	152 20.7	23.3	248 01.7	03.3	291 08.3	55.0	182 24.0	25.0	Achernar	335 26.1	S57 10.0
02	57 42.9	167 20.3	23.8	263 02.7	02.8	306 10.6	55.0	197 26.2	25.0	Acrux	173 09.6	S63 10.4
03	72 45.4	182 19.8 . .	24.3	278 03.8 . .	02.3	321 12.9 . .	55.0	212 28.3 . .	25.1	Adhara	255 12.2	S28 59.4
04	87 47.8	197 19.4	24.7	293 04.8	01.8	336 15.2	55.0	227 30.5	25.2	Aldebaran	290 48.9	N16 32.1
05	102 50.3	212 18.9	25.2	308 05.9	01.3	351 17.5	55.0	242 32.7	25.3			
06	117 52.8	227 18.5	S25 25.7	323 06.9	N12 00.7	6 19.8	N21 55.0	257 34.9	S13 25.4	Alioth	166 21.1	N55 53.1
07	132 55.2	242 18.1	26.2	338 07.9	12 00.2	21 22.1	54.9	272 37.1	25.5	Alkaid	152 59.3	N49 14.7
S 08	147 57.7	257 17.6	26.6	353 09.0	11 59.7	36 24.4	54.9	287 39.2	25.6	Al Na'ir	27 43.2	S46 53.6
A 09	163 00.2	272 17.2 . .	27.1	8 10.0 . .	59.2	51 26.7 . .	54.9	302 41.4 . .	25.7	Alnilam	275 46.0	S 1 11.6
T 10	178 02.6	287 16.8	27.6	23 11.1	58.7	66 29.0	54.9	317 43.6	25.8	Alphard	217 56.0	S 8 43.1
U 11	193 05.1	302 16.3	28.0	38 12.1	58.2	81 31.3	54.9	332 45.8	25.9			
R 12	208 07.5	317 15.9	S25 28.5	53 13.2	N11 57.7	96 33.6	N21 54.8	347 48.0	S13 26.0	Alphecca	126 11.2	N26 40.4
D 13	223 10.0	332 15.5	29.0	68 14.2	57.2	111 35.9	54.8	2 50.1	26.1	Alpheratz	357 42.9	N29 10.2
A 14	238 12.5	347 15.0	29.4	83 15.2	56.6	126 38.2	54.8	17 52.3	26.1	Altair	62 08.0	N 8 54.6
Y 15	253 14.9	2 14.6 . .	29.9	98 16.3 . .	56.1	141 40.5 . .	54.8	32 54.5 . .	26.2	Ankaa	353 15.1	S42 13.8
16	268 17.4	17 14.2	30.3	113 17.3	55.6	156 42.8	54.8	47 56.7	26.3	Antares	112 26.2	S26 27.6
17	283 19.9	32 13.7	30.8	128 18.4	55.1	171 45.1	54.8	62 58.9	26.4			
18	298 22.3	47 13.3	S25 31.3	143 19.4	N11 54.6	186 47.4	N21 54.7	78 01.0	S13 26.5	Arcturus	145 55.9	N19 06.8
19	313 24.8	62 12.9	31.7	158 20.5	54.1	201 49.7	54.7	93 03.2	26.6	Atria	107 28.2	S69 03.1
20	328 27.3	77 12.4	32.2	173 21.5	53.6	216 52.1	54.7	108 05.4	26.7	Avior	234 17.9	S59 33.0
21	343 29.7	92 12.0 . .	32.6	188 22.5 . .	53.0	231 54.4 . .	54.7	123 07.6 . .	26.8	Bellatrix	278 31.6	N 6 21.7
22	358 32.2	107 11.5	33.1	203 23.6	52.5	246 56.7	54.7	138 09.7	26.9	Betelgeuse	271 00.9	N 7 24.5
23	13 34.7	122 11.1	33.5	218 24.6	52.0	261 59.0	54.7	153 11.9	27.0			
20 00	28 37.1	137 10.7	S25 34.0	233 25.7	N11 51.5	277 01.3	N21 54.6	168 14.1	S13 27.1	Canopus	263 55.8	S52 42.0
01	43 39.6	152 10.2	34.4	248 26.7	51.0	292 03.6	54.6	183 16.3	27.2	Capella	280 33.8	N46 00.4
02	58 42.0	167 09.8	34.9	263 27.8	50.5	307 05.9	54.6	198 18.5	27.2	Deneb	49 31.2	N45 20.2
03	73 44.5	182 09.4 . .	35.3	278 28.8 . .	50.0	322 08.2 . .	54.6	213 20.6 . .	27.3	Denebola	182 33.7	N14 29.7
04	88 47.0	197 08.9	35.8	293 29.9	49.5	337 10.5	54.6	228 22.8	27.4	Diphda	348 55.4	S17 54.5
05	103 49.4	212 08.5	36.2	308 30.9	48.9	352 12.8	54.6	243 25.0	27.5			
06	118 51.9	227 08.1	S25 36.7	323 31.9	N11 48.4	7 15.1	N21 54.5	258 27.2	S13 27.6	Dubhe	193 52.0	N61 40.4
07	133 54.4	242 07.6	37.1	338 33.0	47.9	22 17.4	54.5	273 29.4	27.7	Elnath	278 12.1	N28 37.0
08	148 56.8	257 07.2	37.6	353 34.0	47.4	37 19.7	54.5	288 31.5	27.8	Eltanin	90 46.3	N51 29.7
S 09	163 59.3	272 06.8 . .	38.0	8 35.1 . .	46.9	52 22.1 . .	54.5	303 33.7 . .	27.9	Enif	33 46.7	N 9 56.6
U 10	179 01.8	287 06.3	38.5	23 36.1	46.4	67 24.4	54.5	318 35.9	28.0	Fomalhaut	15 23.5	S29 32.8
N 11	194 04.2	302 05.9	38.9	38 37.2	45.9	82 26.7	54.5	333 38.1	28.1			
D 12	209 06.7	317 05.5	S25 39.3	53 38.2	N11 45.3	97 29.0	N21 54.4	348 40.2	S13 28.2	Gacrux	172 01.1	S57 11.3
A 13	224 09.1	332 05.0	39.8	68 39.3	44.8	112 31.3	54.4	3 42.4	28.3	Gienah	175 52.4	S17 37.0
Y 14	239 11.6	347 04.6	40.2	83 40.3	44.3	127 33.6	54.4	18 44.6	28.3	Hadar	148 48.1	S60 26.3
15	254 14.1	2 04.2 . .	40.6	98 41.4 . .	43.8	142 35.9 . .	54.4	33 46.8 . .	28.4	Hamal	328 00.1	N23 31.7
16	269 16.5	17 03.8	41.1	113 42.4	43.3	157 38.2	54.4	48 49.0	28.5	Kaus Aust.	83 43.7	S34 22.6
17	284 19.0	32 03.3	41.5	128 43.5	42.8	172 40.5	54.4	63 51.1	28.6			
18	299 21.5	47 02.9	S25 41.9	143 44.5	N11 42.3	187 42.9	N21 54.3	78 53.3	S13 28.7	Kochab	137 21.3	N74 06.1
19	314 23.9	62 02.5	42.4	158 45.6	41.7	202 45.2	54.3	93 55.5	28.8	Markab	13 37.8	N15 17.0
20	329 26.4	77 02.0	42.8	173 46.6	41.2	217 47.5	54.3	108 57.7	28.9	Menkar	314 14.5	N 4 08.7
21	344 28.9	92 01.6 . .	43.2	188 47.7 . .	40.7	232 49.8 . .	54.3	123 59.8 . .	29.0	Menkent	148 07.7	S36 26.1
22	359 31.3	107 01.2	43.7	203 48.7	40.2	247 52.1	54.3	139 02.0	29.1	Miaplacidus	221 39.8	S69 46.2
23	14 33.8	122 00.7	44.1	218 49.7	39.7	262 54.4	54.3	154 04.2	29.2			
21 00	29 36.3	137 00.3	S25 44.5	233 50.8	N11 39.2	277 56.7	N21 54.3	169 06.4	S13 29.3	Mirfak	308 39.5	N49 54.5
01	44 38.7	151 59.9	45.0	248 51.8	38.7	292 59.1	54.2	184 08.6	29.4	Nunki	75 58.1	S26 16.6
02	59 41.2	166 59.4	45.4	263 52.9	38.1	308 01.4	54.2	199 10.7	29.4	Peacock	53 18.9	S56 41.5
03	74 43.6	181 59.0 . .	45.8	278 53.9 . .	37.6	323 03.7 . .	54.2	214 12.9 . .	29.5	Pollux	243 27.4	N27 59.3
04	89 46.1	196 58.6	46.2	293 55.0	37.1	338 06.0	54.2	229 15.1	29.6	Procyon	244 59.5	N 5 11.3
05	104 48.6	211 58.1	46.6	308 56.0	36.6	353 08.3	54.2	244 17.3	29.7			
06	119 51.0	226 57.7	S25 47.1	323 57.1	N11 36.1	8 10.6	N21 54.2	259 19.4	S13 29.8	Rasalhague	96 06.4	N12 33.3
07	134 53.5	241 57.3	47.5	338 58.1	35.6	23 13.0	54.1	274 21.6	29.9	Regulus	207 43.5	N11 53.9
08	149 56.0	256 56.9	47.9	353 59.2	35.0	38 15.3	54.1	289 23.8	30.0	Rigel	281 11.6	S 8 11.1
M 09	164 58.4	271 56.4 . .	48.3	9 00.2 . .	34.5	53 17.6 . .	54.1	304 26.0 . .	30.1	Rigil Kent.	139 52.0	S60 53.4
O 10	180 00.9	286 56.0	48.7	24 01.3	34.0	68 19.9	54.1	319 28.1	30.2	Sabik	102 12.5	S15 44.3
N 11	195 03.4	301 55.6	49.2	39 02.3	33.5	83 22.2	54.1	334 30.3	30.3			
D 12	210 05.8	316 55.1	S25 49.6	54 03.4	N11 33.0	98 24.5	N21 54.1	349 32.5	S13 30.4	Schedar	349 39.6	N56 37.0
A 13	225 08.3	331 54.7	50.0	69 04.4	32.5	113 26.9	54.0	4 34.7	30.5	Shaula	96 21.8	S37 06.7
Y 14	240 10.8	346 54.3	50.4	84 05.5	31.9	128 29.2	54.0	19 36.9	30.5	Sirius	258 33.4	S16 44.1
15	255 13.2	1 53.9 . .	50.8	99 06.6 . .	31.4	143 31.5 . .	54.0	34 39.0 . .	30.6	Spica	158 31.3	S11 13.9
16	270 15.7	16 53.4	51.2	114 07.6	30.9	158 33.8	54.0	49 41.2	30.7	Suhail	222 52.4	S43 29.2
17	285 18.1	31 53.0	51.6	129 08.7	30.4	173 36.1	54.0	64 43.4	30.8			
18	300 20.6	46 52.6	S25 52.0	144 09.7	N11 29.9	188 38.5	N21 54.0	79 45.6	S13 30.9	Vega	80 38.9	N38 48.2
19	315 23.1	61 52.1	52.4	159 10.8	29.4	203 40.8	54.0	94 47.7	31.0	Zuben'ubi	137 05.5	S16 05.8
20	330 25.5	76 51.7	52.8	174 11.8	28.9	218 43.1	53.9	109 49.9	31.1		SHA	Mer.Pass.
21	345 28.0	91 51.3 . .	53.2	189 12.9 . .	28.3	233 45.4 . .	53.9	124 52.1 . .	31.2		° ′	h m
22	0 30.5	106 50.9	53.7	204 13.9	27.8	248 47.8	53.9	139 54.3	31.3	Venus	108 33.6	14 52
23	15 32.9	121 50.4	54.1	219 15.0	27.3	263 50.1	53.9	154 56.4	31.4	Mars	204 48.6	8 26
	h m									Jupiter	248 24.2	5 31
Mer.Pass.	22 01.9	v −0.4	d 0.4	v 1.0	d 0.5	v 2.3	d 0.0	v 2.2	d 0.1	Saturn	139 37.0	12 45

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 19	Moonrise 20	Moonrise 21	Moonrise 22
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
19 00	183 44.7	S 9 57.4	3 57.9	11.3	N11 01.7	9.1	56.8	N 72	05 17	06 36	07 50	15 11	14 55	14 07	
01	198 44.8	58.3	18 28.2	11.4	11 10.8	9.1	56.8	N 70	05 19	06 30	07 35	15 35	15 35	15 37	15 48
02	213 44.9	9 59.2	32 58.6	11.3	11 19.9	9.0	56.8	68	05 19	06 24	07 23	15 54	16 02	16 16	16 43
03	228 45.0	10 00.1	47 28.9	11.3	11 28.9	8.9	56.8	66	05 20	06 20	07 13	16 09	16 23	16 44	17 16
04	243 45.1	01.0	61 59.2	11.3	11 37.8	8.9	56.7	64	05 20	06 16	07 05	16 21	16 40	17 05	17 40
05	258 45.3	01.9	76 29.5	11.3	11 46.7	8.8	56.7	62	05 21	06 12	06 58	16 32	16 54	17 22	17 59
06	273 45.4	S10 02.8	90 59.8	11.3	N11 55.5	8.7	56.7	60	05 21	06 09	06 52	16 41	17 05	17 36	18 15
07	288 45.5	03.7	105 30.1	11.3	12 04.2	8.7	56.7	N 58	05 21	06 06	06 47	16 49	17 16	17 48	18 28
S 08	303 45.6	04.6	120 00.4	11.3	12 12.9	8.6	56.7	56	05 20	06 04	06 42	16 56	17 25	17 59	18 40
A 09	318 45.7 . .	05.5	134 30.7	11.3	12 21.5	8.5	56.6	54	05 20	06 01	06 37	17 02	17 32	18 08	18 50
T 10	333 45.8	06.4	149 01.0	11.2	12 30.0	8.4	56.6	52	05 20	05 59	06 34	17 07	17 40	18 17	18 59
U 11	348 45.9	07.3	163 31.2	11.3	12 38.4	8.4	56.6	50	05 19	05 57	06 30	17 13	17 46	18 24	19 07
R 12	3 46.1	S10 08.2	178 01.5	11.2	N12 46.8	8.3	56.6	45	05 18	05 52	06 22	17 24	18 00	18 40	19 24
D 13	18 46.2	09.1	192 31.7	11.3	12 55.1	8.2	56.5	N 40	05 17	05 48	06 16	17 33	18 11	18 53	19 38
A 14	33 46.3	10.0	207 02.0	11.2	13 03.3	8.2	56.5	35	05 15	05 45	06 10	17 41	18 21	19 04	19 50
Y 15	48 46.4 . .	10.9	221 32.2	11.3	13 11.5	8.1	56.5	30	05 13	05 41	06 05	17 48	18 30	19 14	20 01
16	63 46.5	11.8	236 02.5	11.2	13 19.6	8.0	56.5	20	05 08	05 34	05 57	18 00	18 45	19 31	20 19
17	78 46.6	12.7	250 32.7	11.2	13 27.6	7.9	56.4	N 10	05 03	05 27	05 49	18 11	18 58	19 46	20 35
18	93 46.7	S10 13.6	265 02.9	11.2	N13 35.5	7.9	56.4	0	04 56	05 20	05 41	18 21	19 10	20 00	20 49
19	108 46.8	14.5	279 33.1	11.2	13 43.4	7.8	56.4	S 10	04 48	05 13	05 34	18 31	19 23	20 14	21 04
20	123 47.0	15.4	294 03.3	11.2	13 51.2	7.7	56.4	20	04 37	05 03	05 26	18 42	19 36	20 29	21 20
21	138 47.1 . .	16.3	308 33.5	11.2	13 58.9	7.6	56.3	30	04 23	04 52	05 17	18 55	19 51	20 46	21 38
22	153 47.2	17.2	323 03.7	11.2	14 06.5	7.5	56.3	35	04 14	04 45	05 11	19 02	20 00	20 56	21 48
23	168 47.3	18.1	337 33.9	11.1	14 14.0	7.5	56.3	40	04 03	04 37	05 05	19 10	20 10	21 07	22 01
20 00	183 47.4	S10 19.0	352 04.0	11.2	N14 21.5	7.4	56.3	45	03 50	04 27	04 58	19 20	20 22	21 21	22 15
01	198 47.5	19.9	6 34.2	11.2	14 28.9	7.3	56.2	S 50	03 32	04 15	04 49	19 32	20 37	21 38	22 32
02	213 47.6	20.8	21 04.4	11.1	14 36.2	7.2	56.2	52	03 24	04 09	04 45	19 37	20 44	21 45	22 41
03	228 47.7 . .	21.7	35 34.5	11.2	14 43.4	7.2	56.2	54	03 14	04 02	04 40	19 43	20 51	21 54	22 50
04	243 47.8	22.6	50 04.7	11.1	14 50.6	7.1	56.2	56	03 03	03 55	04 35	19 50	21 00	22 04	23 00
05	258 47.9	23.5	64 34.8	11.1	14 57.7	6.9	56.1	58	02 50	03 47	04 30	19 58	21 09	22 15	23 12
06	273 48.1	S10 24.4	79 04.9	11.2	N15 04.6	6.9	56.1	S 60	02 34	03 37	04 24	20 06	21 20	22 28	23 26
07	288 48.2	25.3	93 35.1	11.1	15 11.5	6.8	56.1								
S 08	303 48.3	26.1	108 05.2	11.1	15 18.3	6.8	56.1								
U 09	318 48.4 . .	27.0	122 35.3	11.1	15 25.1	6.6	56.0								
N 10	333 48.5	27.9	137 05.4	11.1	15 31.7	6.6	56.0								
D 11	348 48.6	28.8	151 35.5	11.1	15 38.3	6.5	56.0								
A 12	3 48.7	S10 29.7	166 05.6	11.1	N15 44.8	6.4	56.0								
Y 13	18 48.8	30.6	180 35.7	11.1	15 51.2	6.3	56.0								
14	33 48.9	31.5	195 05.8	11.1	15 57.5	6.2	55.9								
15	48 49.0 . .	32.4	209 35.9	11.0	16 03.7	6.1	55.9								
16	63 49.1	33.3	224 05.9	11.1	16 09.8	6.1	55.9								
17	78 49.2	34.2	238 36.0	11.1	16 15.9	5.9	55.9								
18	93 49.3	S10 35.1	253 06.1	11.1	N16 21.8	5.9	55.8								
19	108 49.4	36.0	267 36.2	11.0	16 27.7	5.8	55.8								
20	123 49.5	36.9	282 06.2	11.1	16 33.5	5.7	55.8								
21	138 49.6 . .	37.8	296 36.3	11.0	16 39.2	5.6	55.8								
22	153 49.7	38.6	311 06.3	11.1	16 44.8	5.5	55.7								
23	168 49.8	39.5	325 36.4	11.0	16 50.3	5.4	55.7								
21 00	183 50.0	S10 40.4	340 06.4	11.1	N16 55.7	5.4	55.7								
01	198 50.1	41.3	354 36.5	11.0	17 01.1	5.2	55.7								
02	213 50.2	42.2	9 06.5	11.1	17 06.3	5.2	55.6								
03	228 50.3 . .	43.1	23 36.6	11.0	17 11.5	5.0	55.6								
04	243 50.4	44.0	38 06.6	11.1	17 16.5	5.0	55.6								
05	258 50.5	44.9	52 36.7	11.0	17 21.5	4.9	55.6								
06	273 50.6	S10 45.8	67 06.7	11.1	N17 26.4	4.8	55.6								
07	288 50.7	46.6	81 36.8	11.0	17 31.2	4.7	55.5								
08	303 50.8	47.5	96 06.8	11.1	17 35.9	4.6	55.5								
M 09	318 50.9 . .	48.4	110 36.9	11.0	17 40.5	4.5	55.5								
O 10	333 51.0	49.3	125 06.9	11.0	17 45.0	4.4	55.5								
N 11	348 51.1	50.2	139 36.9	11.1	17 49.4	4.4	55.4								
D 12	3 51.2	S10 51.1	154 07.0	11.0	N17 53.8	4.2	55.4								
A 13	18 51.3	52.0	168 37.0	11.1	17 58.0	4.1	55.4								
Y 14	33 51.4	52.9	183 07.1	11.0	18 02.1	4.1	55.4								
15	48 51.5 . .	53.7	197 37.1	11.1	18 06.2	4.0	55.4								
16	63 51.6	54.6	212 07.2	11.1	18 10.2	3.8	55.3								
17	78 51.7	55.5	226 37.3	11.0	18 14.0	3.8	55.3								
18	93 51.8	S10 56.4	241 07.3	11.1	N18 17.8	3.7	55.3								
19	108 51.9	57.3	255 37.4	11.1	18 21.5	3.5	55.3								
20	123 52.0	58.2	270 07.5	11.0	18 25.0	3.5	55.3								
21	138 52.0 . .	59.1	284 37.5	11.1	18 28.5	3.4	55.2								
22	153 52.1	10 59.9	299 07.6	11.1	18 31.9	3.3	55.2								
23	168 52.2	S11 00.8	313 37.7	11.1	N18 35.2	3.2	55.2								
	SD 16.1	d 0.9	SD	15.4		15.3		15.1							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 19	Moonset 20	Moonset 21	Moonset 22
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 38	16 52	18 10	08 49	10 48	13 19	
N 70	15 53	16 58	18 09	08 26	10 09	11 50	13 22
68	16 05	17 04	18 08	08 09	09 43	11 11	12 28
66	16 15	17 08	18 08	07 55	09 23	10 44	11 55
64	16 23	17 12	18 08	07 43	09 06	10 23	11 30
62	16 30	17 16	18 07	07 34	08 53	10 07	11 11
60	16 36	17 19	18 08	07 25	08 42	09 53	10 56
N 58	16 42	17 22	18 08	07 18	08 32	09 41	10 43
56	16 47	17 25	18 08	07 12	08 24	09 31	10 31
54	16 51	17 27	18 08	07 06	08 16	09 22	10 21
52	16 55	17 30	18 09	07 01	08 09	09 14	10 12
50	16 59	17 32	18 09	06 56	08 03	09 06	10 04
45	17 07	17 36	18 10	06 46	07 50	08 51	09 47
N 40	17 13	17 41	18 12	06 38	07 39	08 38	09 33
35	17 19	17 44	18 14	06 31	07 30	08 27	09 22
30	17 24	17 48	18 16	06 24	07 22	08 18	09 11
20	17 33	17 55	18 21	06 14	07 08	08 02	08 54
N 10	17 41	18 02	18 27	06 04	06 56	07 47	08 38
0	17 48	18 09	18 34	05 55	06 45	07 34	08 24
S 10	17 56	18 17	18 42	05 47	06 33	07 21	08 09
20	18 04	18 26	18 53	05 37	06 21	07 07	07 54
30	18 13	18 38	19 07	05 27	06 08	06 51	07 36
35	18 19	18 45	19 16	05 20	06 00	06 41	07 26
40	18 25	18 54	19 27	05 13	05 51	06 31	07 14
45	18 33	19 04	19 41	05 05	05 40	06 18	07 00
S 50	18 42	19 16	19 59	04 56	05 27	06 03	06 43
52	18 46	19 22	20 07	04 51	05 21	05 56	06 36
54	18 50	19 29	20 17	04 46	05 15	05 48	06 27
56	18 55	19 36	20 29	04 41	05 08	05 39	06 17
58	19 01	19 45	20 42	04 35	04 59	05 29	06 05
S 60	19 08	19 55	20 58	04 28	04 50	05 18	05 52

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
19	14 59	15 04	11 45	24 33	12 08	14	100
20	15 09	15 15	11 45	00 33	12 58	15	98
21	15 20	15 24	11 45	01 22	13 47	16	94

UT	ARIES	VENUS −4.4		MARS +1.5		JUPITER −2.3		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
22 00	30 35.4	136 50.0	S25 54.5	234 16.0	N11 26.8	278 52.4	N21 53.9	169 58.6	S13 31.5	Acamar	315 17.8	S40 14.9
01	45 37.9	151 49.6	54.9	249 17.1	26.3	293 54.7	53.9	185 00.8	31.6	Achernar	335 26.1	S57 10.0
02	60 40.3	166 49.2	55.3	264 18.1	25.8	308 57.1	53.9	200 03.0	31.6	Acrux	173 09.6	S63 10.4
03	75 42.8	181 48.7	.. 55.7	279 19.2	.. 25.2	323 59.4	.. 53.8	215 05.2	.. 31.7	Adhara	255 12.2	S28 59.4
04	90 45.2	196 48.3	56.1	294 20.2	24.7	339 01.7	53.8	230 07.3	31.8	Aldebaran	290 48.8	N16 32.1
05	105 47.7	211 47.9	56.4	309 21.3	24.2	354 04.0	53.8	245 09.5	31.9			
06	120 50.2	226 47.5	S25 56.8	324 22.4	N11 23.7	9 06.3	N21 53.8	260 11.7	S13 32.0	Alioth	166 21.1	N55 53.0
07	135 52.6	241 47.0	57.2	339 23.4	23.2	24 08.7	53.8	275 13.9	32.1	Alkaid	152 59.2	N49 14.7
08	150 55.1	256 46.6	57.6	354 24.5	22.7	39 11.0	53.8	290 16.0	32.2	Al Na'ir	27 43.2	S46 53.6
09	165 57.6	271 46.2	.. 58.0	9 25.5	.. 22.1	54 13.3	.. 53.8	305 18.2	.. 32.3	Alnilam	275 45.9	S 1 11.6
10	181 00.0	286 45.7	58.4	24 26.6	21.6	69 15.7	53.7	320 20.4	32.4	Alphard	217 56.0	S 8 43.1
11	196 02.5	301 45.3	58.8	39 27.6	21.1	84 18.0	53.7	335 22.6	32.5			
12	211 05.0	316 44.9	S25 59.2	54 28.7	N11 20.6	99 20.3	N21 53.7	350 24.7	S13 32.6	Alphecca	126 11.2	N26 40.3
13	226 07.4	331 44.5	25 59.6	69 29.7	20.1	114 22.6	53.7	5 26.9	32.7	Alpheratz	357 42.9	N29 10.2
14	241 09.9	346 44.1	26 00.0	84 30.8	19.6	129 25.0	53.7	20 29.1	32.7	Altair	62 08.0	N 8 54.6
15	256 12.4	1 43.6	.. 00.4	99 31.9	.. 19.0	144 27.3	.. 53.7	35 31.3	.. 32.8	Ankaa	353 15.1	S42 13.8
16	271 14.8	16 43.2	00.7	114 32.9	18.5	159 29.6	53.7	50 33.4	32.9	Antares	112 26.3	S26 27.6
17	286 17.3	31 42.8	01.1	129 34.0	18.0	174 31.9	53.6	65 35.6	33.0			
18	301 19.7	46 42.4	S26 01.5	144 35.0	N11 17.5	189 34.3	N21 53.6	80 37.8	S13 33.1	Arcturus	145 55.9	N19 06.8
19	316 22.2	61 41.9	01.9	159 36.1	17.0	204 36.6	53.6	95 40.0	33.2	Atria	107 28.2	S69 03.1
20	331 24.7	76 41.5	02.3	174 37.1	16.4	219 38.9	53.6	110 42.1	33.3	Avior	234 17.9	S59 33.0
21	346 27.1	91 41.1	.. 02.6	189 38.2	.. 15.9	234 41.3	.. 53.6	125 44.3	.. 33.4	Bellatrix	278 31.5	N 6 21.7
22	1 29.6	106 40.7	03.0	204 39.2	15.4	249 43.6	53.6	140 46.5	33.5	Betelgeuse	271 00.9	N 7 24.5
23	16 32.1	121 40.2	03.4	219 40.3	14.9	264 45.9	53.6	155 48.7	33.6			
23 00	31 34.5	136 39.8	S26 03.8	234 41.4	N11 14.4	279 48.3	N21 53.5	170 50.8	S13 33.7	Canopus	263 55.8	S52 42.0
01	46 37.0	151 39.4	04.1	249 42.4	13.9	294 50.6	53.5	185 53.0	33.8	Capella	280 33.8	N46 00.4
02	61 39.5	166 39.0	04.5	264 43.5	13.3	309 52.9	53.5	200 55.2	33.8	Deneb	49 31.2	N45 20.3
03	76 41.9	181 38.6	.. 04.9	279 44.5	.. 12.8	324 55.3	.. 53.5	215 57.4	.. 33.9	Denebola	182 33.7	N14 29.7
04	91 44.4	196 38.1	05.3	294 45.6	12.3	339 57.6	53.5	230 59.6	34.0	Diphda	348 55.4	S17 54.5
05	106 46.9	211 37.7	05.6	309 46.7	11.8	354 59.9	53.5	246 01.7	34.1			
06	121 49.3	226 37.3	S26 06.0	324 47.7	N11 11.3	10 02.3	N21 53.5	261 03.9	S13 34.2	Dubhe	193 52.0	N61 40.3
07	136 51.8	241 36.9	06.4	339 48.8	10.8	25 04.6	53.5	276 06.1	34.3	Elnath	278 12.1	N28 37.0
08	151 54.2	256 36.5	06.7	354 49.8	10.2	40 06.9	53.4	291 08.3	34.4	Eltanin	90 46.3	N51 29.7
09	166 56.7	271 36.0	.. 07.1	9 50.9	.. 09.7	55 09.3	.. 53.4	306 10.4	.. 34.5	Enif	33 46.8	N 9 56.6
10	181 59.2	286 35.6	07.5	24 52.0	09.2	70 11.6	53.4	321 12.6	34.6	Fomalhaut	15 23.5	S29 32.9
11	197 01.6	301 35.2	07.8	39 53.0	08.7	85 13.9	53.4	336 14.8	34.7			
12	212 04.1	316 34.8	S26 08.2	54 54.1	N11 08.2	100 16.3	N21 53.4	351 17.0	S13 34.8	Gacrux	172 01.1	S57 11.3
13	227 06.6	331 34.4	08.6	69 55.1	07.6	115 18.6	53.4	6 19.1	34.8	Gienah	175 52.3	S17 37.0
14	242 09.0	346 33.9	08.9	84 56.2	07.1	130 20.9	53.4	21 21.3	34.9	Hadar	148 48.1	S60 26.3
15	257 11.5	1 33.5	.. 09.3	99 57.3	.. 06.6	145 23.3	.. 53.3	36 23.5	.. 35.0	Hamal	328 00.1	N23 31.7
16	272 14.0	16 33.1	09.6	114 58.3	06.1	160 25.6	53.3	51 25.7	35.1	Kaus Aust.	83 43.7	S34 22.6
17	287 16.4	31 32.7	10.0	129 59.4	05.6	175 27.9	53.3	66 27.8	35.2			
18	302 18.9	46 32.3	S26 10.4	145 00.4	N11 05.1	190 30.3	N21 53.3	81 30.0	S13 35.3	Kochab	137 21.3	N74 06.1
19	317 21.3	61 31.8	10.7	160 01.5	04.5	205 32.6	53.3	96 32.2	35.4	Markab	13 37.9	N15 17.1
20	332 23.8	76 31.4	11.1	175 02.6	04.0	220 35.0	53.3	111 34.4	35.5	Menkar	314 14.5	N 4 08.7
21	347 26.3	91 31.0	.. 11.4	190 03.6	.. 03.5	235 37.3	.. 53.3	126 36.5	.. 35.6	Menkent	148 07.7	S36 26.1
22	2 28.7	106 30.6	11.8	205 04.7	03.0	250 39.6	53.3	141 38.7	35.7	Miaplacidus	221 39.8	S69 46.2
23	17 31.2	121 30.2	12.1	220 05.7	02.5	265 42.0	53.2	156 40.9	35.8			
24 00	32 33.7	136 29.8	S26 12.5	235 06.8	N11 01.9	280 44.3	N21 53.2	171 43.1	S13 35.9	Mirfak	308 39.5	N49 54.5
01	47 36.1	151 29.3	12.8	250 07.9	01.4	295 46.7	53.2	186 45.2	35.9	Nunki	75 58.1	S26 16.6
02	62 38.6	166 28.9	13.2	265 08.9	00.9	310 49.0	53.2	201 47.4	36.0	Peacock	53 18.9	S56 41.5
03	77 41.1	181 28.5	.. 13.5	280 10.0	11 00.4	325 51.3	.. 53.2	216 49.6	.. 36.1	Pollux	243 27.4	N27 59.3
04	92 43.5	196 28.1	13.9	295 11.1	10 59.9	340 53.7	53.2	231 51.8	36.2	Procyon	244 59.4	N 5 11.3
05	107 46.0	211 27.7	14.2	310 12.1	59.3	355 56.0	53.2	246 53.9	36.3			
06	122 48.5	226 27.3	S26 14.6	325 13.2	N10 58.8	10 58.4	N21 53.2	261 56.1	S13 36.4	Rasalhague	96 06.4	N12 33.3
07	137 50.9	241 26.8	14.9	340 14.3	58.3	26 00.7	53.1	276 58.3	36.5	Regulus	207 43.4	N11 53.9
08	152 53.4	256 26.4	15.2	355 15.3	57.8	41 03.0	53.1	292 00.5	36.6	Rigel	281 11.6	S 8 11.2
09	167 55.8	271 26.0	.. 15.6	10 16.4	.. 57.3	56 05.4	.. 53.1	307 02.6	.. 36.7	Rigil Kent.	139 52.0	S60 53.4
10	182 58.3	286 25.6	15.9	25 17.4	56.7	71 07.7	53.1	322 04.8	36.8	Sabik	102 12.5	S15 44.3
11	198 00.8	301 25.2	16.3	40 18.5	56.2	86 10.1	53.1	337 07.0	36.9			
12	213 03.2	316 24.8	S26 16.6	55 19.6	N10 55.7	101 12.4	N21 53.1	352 09.2	S13 37.0	Schedar	349 39.6	N56 37.0
13	228 05.7	331 24.4	16.9	70 20.6	55.2	116 14.8	53.1	7 11.3	37.0	Shaula	96 21.8	S37 06.7
14	243 08.2	346 24.0	17.3	85 21.7	54.7	131 17.1	53.1	22 13.5	37.1	Sirius	258 33.4	S16 44.1
15	258 10.6	1 23.5	.. 17.6	100 22.8	.. 54.2	146 19.5	.. 53.1	37 15.7	.. 37.2	Spica	158 31.3	S11 13.9
16	273 13.1	16 23.1	17.9	115 23.8	53.6	161 21.8	53.0	52 17.9	37.3	Suhail	222 52.3	S43 29.2
17	288 15.6	31 22.7	18.3	130 24.9	53.1	176 24.1	53.0	67 20.0	37.4			
18	303 18.0	46 22.3	S26 18.6	145 26.0	N10 52.6	191 26.5	N21 53.0	82 22.2	S13 37.5	Vega	80 39.0	N38 48.2
19	318 20.5	61 21.9	18.9	160 27.0	52.1	206 28.8	53.0	97 24.4	37.6	Zuben'ubi	137 05.5	S16 05.8
20	333 23.0	76 21.5	19.3	175 28.1	51.6	221 31.2	53.0	112 26.6	37.7		SHA	Mer.Pass.
21	348 25.4	91 21.1	.. 19.6	190 29.2	.. 51.0	236 33.5	.. 53.0	127 28.7	.. 37.8		° ′	h m
22	3 27.9	106 20.7	19.9	205 30.2	50.5	251 35.9	53.0	142 30.9	37.9	Venus	105 05.3	14 54
23	18 30.3	121 20.2	20.2	220 31.3	50.0	266 38.2	53.0	157 33.1	38.0	Mars	203 06.8	8 21
	h m									Jupiter	248 13.7	5 20
Mer.Pass.	21 50.1	v −0.4	d 0.4	v 1.1	d 0.5	v 2.3	d 0.0	v 2.2	d 0.1	Saturn	139 16.3	12 35

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 22	23	24	25
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
22 00	183 52.3	S11 01.7	328 07.8	11.1	N18 38.4	3.1	55.2	N 72	05 30	06 49	08 06				18 22
01	198 52.4	02.6	342 37.9	11.1	18 41.5	3.0	55.2	N 70	05 30	06 41	07 48	15 48	16 27	17 46	19 18
02	213 52.5	03.5	357 08.0	11.1	18 44.5	2.9	55.1	68	05 30	06 35	07 35	16 43	17 28	18 33	19 51
03	228 52.6	.. 04.4	11 38.1	11.2	18 47.4	2.8	55.1	66	05 29	06 29	07 24	17 16	18 02	19 03	20 15
04	243 52.7	05.2	26 08.3	11.1	18 50.2	2.8	55.1	64	05 29	06 24	07 14	17 40	18 27	19 26	20 34
05	258 52.8	06.1	40 38.4	11.1	18 53.0	2.6	55.1	62	05 28	06 20	07 06	17 59	18 47	19 44	20 49
06	273 52.9	S11 07.0	55 08.5	11.2	N18 55.6	2.5	55.1	60	05 28	06 16	06 59	18 15	19 03	19 59	21 02
07	288 53.0	07.9	69 38.7	11.1	18 58.1	2.5	55.0	N 58	05 27	06 13	06 53	18 28	19 16	20 12	21 13
08	303 53.1	08.8	84 08.8	11.2	19 00.6	2.3	55.0	56	05 26	06 10	06 48	18 40	19 28	20 23	21 23
09	318 53.2	.. 09.6	98 39.0	11.2	19 02.9	2.3	55.0	54	05 26	06 07	06 43	18 50	19 38	20 32	21 31
10	333 53.3	10.5	113 09.2	11.2	19 05.2	2.1	55.0	52	05 25	06 04	06 39	18 59	19 47	20 41	21 39
11	348 53.4	11.4	127 39.4	11.2	19 07.3	2.1	55.0	50	05 24	06 02	06 35	19 07	19 56	20 49	21 46
12	3 53.5	S11 12.3	142 09.6	11.2	N19 09.4	1.9	54.9	45	05 22	05 56	06 26	19 24	20 13	21 05	22 00
13	18 53.6	13.2	156 39.8	11.2	19 11.3	1.9	54.9	N 40	05 20	05 51	06 19	19 38	20 27	21 18	22 12
14	33 53.7	14.0	171 10.0	11.2	19 13.2	1.8	54.9	35	05 17	05 47	06 13	19 50	20 39	21 30	22 22
15	48 53.7	.. 14.9	185 40.2	11.3	19 15.0	1.6	54.9	30	05 15	05 43	06 07	20 01	20 50	21 40	22 31
16	63 53.8	15.8	200 10.5	11.2	19 16.6	1.6	54.9	20	05 09	05 35	05 58	20 19	21 08	21 57	22 46
17	78 53.9	16.7	214 40.7	11.3	19 18.2	1.5	54.9	N 10	05 03	05 28	05 49	20 35	21 23	22 12	23 00
18	93 54.0	S11 17.6	229 11.0	11.3	N19 19.7	1.4	54.8	0	04 55	05 20	05 41	20 49	21 38	22 26	23 12
19	108 54.1	18.4	243 41.3	11.3	19 21.1	1.3	54.8	S 10	04 46	05 11	05 33	21 04	21 53	22 40	23 25
20	123 54.2	19.3	258 11.6	11.3	19 22.4	1.2	54.8	20	04 35	05 01	05 24	21 20	22 08	22 55	23 38
21	138 54.3	.. 20.2	272 41.9	11.3	19 23.6	1.1	54.8	30	04 19	04 49	05 13	21 38	22 26	23 12	23 53
22	153 54.4	21.1	287 12.2	11.4	19 24.7	1.0	54.8	35	04 10	04 41	05 08	21 48	22 37	23 22	24 02
23	168 54.5	22.0	301 42.6	11.3	19 25.7	0.9	54.7	40	03 58	04 32	05 01	22 01	22 49	23 33	24 12
23 00	183 54.6	S11 22.8	316 12.9	11.4	N19 26.6	0.8	54.7	45	03 44	04 22	04 53	22 15	23 03	23 46	24 24
01	198 54.6	23.7	330 43.3	11.4	19 27.4	0.8	54.7	S 50	03 25	04 08	04 43	22 32	23 21	24 02	00 02
02	213 54.7	24.6	345 13.7	11.4	19 28.2	0.6	54.7	52	03 16	04 02	04 39	22 41	23 29	24 10	00 10
03	228 54.8	.. 25.5	359 44.1	11.4	19 28.8	0.5	54.7	54	03 05	03 55	04 34	22 50	23 38	24 18	00 18
04	243 54.9	26.3	14 14.5	11.5	19 29.3	0.5	54.7	56	02 53	03 47	04 28	23 00	23 48	24 28	00 28
05	258 55.0	27.2	28 45.0	11.4	19 29.8	0.3	54.7	58	02 39	03 38	04 22	23 12	24 00	00 00	00 39
06	273 55.1	S11 28.1	43 15.4	11.5	N19 30.1	0.3	54.6	S 60	02 22	03 27	04 15	23 26	24 13	00 13	00 51
07	288 55.2	29.0	57 45.9	11.5	19 30.4	0.1	54.6								
08	303 55.3	29.8	72 16.4	11.5	19 30.5	0.1	54.6								
09	318 55.3	.. 30.7	86 46.9	11.6	19 30.6	0.0	54.6								
10	333 55.4	31.6	101 17.5	11.5	19 30.6	0.1	54.6								
11	348 55.5	32.5	115 48.0	11.6	19 30.5	0.3	54.6								
12	3 55.6	S11 33.3	130 18.6	11.6	N19 30.2	0.3	54.6								
13	18 55.7	34.2	144 49.2	11.6	19 29.9	0.4	54.5								
14	33 55.8	35.1	159 19.8	11.6	19 29.5	0.4	54.5								
15	48 55.8	.. 35.9	173 50.4	11.7	19 29.1	0.6	54.5								
16	63 55.9	36.8	188 21.1	11.7	19 28.5	0.7	54.5								
17	78 56.0	37.7	202 51.8	11.7	19 27.8	0.8	54.5								
18	93 56.1	S11 38.6	217 22.5	11.7	N19 27.0	0.8	54.5								
19	108 56.2	39.4	231 53.2	11.8	19 26.2	1.0	54.5								
20	123 56.3	40.3	246 24.0	11.7	19 25.2	1.0	54.5								
21	138 56.3	.. 41.2	260 54.7	11.8	19 24.2	1.2	54.4								
22	153 56.4	42.0	275 25.5	11.8	19 23.0	1.2	54.4								
23	168 56.5	42.9	289 56.3	11.9	19 21.8	1.3	54.4								
24 00	183 56.6	S11 43.8	304 27.2	11.8	N19 20.5	1.4	54.4								
01	198 56.7	44.6	318 58.0	11.9	19 19.1	1.5	54.4								
02	213 56.8	45.5	333 28.9	11.9	19 17.6	1.6	54.4								
03	228 56.8	.. 46.4	347 59.8	12.0	19 16.0	1.7	54.4								
04	243 56.9	47.3	2 30.8	11.9	19 14.3	1.7	54.4								
05	258 57.0	48.1	17 01.7	12.0	19 12.6	1.9	54.4								
06	273 57.1	S11 49.0	31 32.7	12.0	N19 10.7	1.9	54.4								
07	288 57.2	49.9	46 03.7	12.0	19 08.8	2.0	54.3								
08	303 57.2	50.7	60 34.7	12.1	19 06.8	2.2	54.3								
09	318 57.3	.. 51.6	75 05.8	12.1	19 04.6	2.2	54.3								
10	333 57.4	52.5	89 36.9	12.1	19 02.4	2.2	54.3								
11	348 57.5	53.3	104 08.0	12.1	19 00.2	2.4	54.3								
12	3 57.5	S11 54.2	118 39.1	12.2	N18 57.8	2.5	54.3								
13	18 57.6	55.1	133 10.3	12.2	18 55.3	2.5	54.3								
14	33 57.7	55.9	147 41.5	12.2	18 52.8	2.7	54.3								
15	48 57.8	.. 56.8	162 12.7	12.3	18 50.1	2.7	54.3								
16	63 57.9	57.6	176 44.0	12.2	18 47.4	2.8	54.3								
17	78 57.9	58.5	191 15.2	12.3	18 44.6	2.9	54.3								
18	93 58.0	S11 59.4	205 46.5	12.3	N18 41.7	3.0	54.3								
19	108 58.1	12 00.2	220 17.8	12.4	18 38.7	3.1	54.3								
20	123 58.2	01.1	234 49.2	12.4	18 35.6	3.1	54.3								
21	138 58.2	.. 02.0	249 20.6	12.4	18 32.5	3.2	54.2								
22	153 58.3	02.8	263 52.0	12.4	18 29.3	3.4	54.2								
23	168 58.4	03.7	278 23.4	12.5	N18 25.9	3.4	54.2								
	SD 16.1	d 0.9	SD	15.0		14.9		14.8							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 22	23	24	25
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 21	16 37	17 56				15 48
N 70	15 39	16 46	17 57	13 22	14 25	14 46	14 51
68	15 52	16 52	17 57	12 28	13 24	13 59	14 18
66	16 04	16 58	17 58	11 55	12 50	13 28	13 53
64	16 13	17 03	17 58	11 30	12 24	13 05	13 34
62	16 21	17 07	17 59	11 11	12 05	12 46	13 18
60	16 28	17 11	18 00	10 56	11 49	12 31	13 05
N 58	16 34	17 15	18 01	10 43	11 35	12 18	12 53
56	16 40	17 18	18 01	10 31	11 23	12 07	12 43
54	16 44	17 21	18 02	10 21	11 13	11 57	12 35
52	16 49	17 24	18 03	10 12	11 04	11 49	12 27
50	16 53	17 26	18 04	10 04	10 56	11 41	12 20
45	17 02	17 32	18 06	09 47	10 38	11 24	12 05
N 40	17 09	17 37	18 08	09 33	10 24	11 10	11 52
35	17 15	17 41	18 11	09 22	10 12	10 59	11 41
30	17 21	17 45	18 13	09 11	10 02	10 49	11 32
20	17 31	17 53	18 19	08 54	09 43	10 31	11 16
N 10	17 39	18 01	18 26	08 38	09 28	10 16	11 02
0	17 48	18 09	18 33	08 24	09 13	10 01	10 48
S 10	17 56	18 18	18 43	08 09	08 58	09 47	10 35
20	18 05	18 28	18 54	07 54	08 42	09 31	10 21
30	18 16	18 40	19 10	07 36	08 24	09 14	10 04
35	18 22	18 48	19 19	07 26	08 13	09 03	09 55
40	18 29	18 57	19 31	07 14	08 01	08 51	09 44
45	18 37	19 08	19 46	07 00	07 47	08 37	09 31
S 50	18 47	19 22	20 05	06 43	07 29	08 20	09 15
52	18 51	19 28	20 14	06 36	07 21	08 12	09 08
54	18 56	19 35	20 25	06 27	07 12	08 03	09 00
56	19 02	19 43	20 38	06 17	07 01	07 53	08 51
58	19 08	19 53	20 52	06 05	06 50	07 41	08 40
S 60	19 15	20 04	21 10	05 52	06 36	07 28	08 28

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
22	15 29	15 34	11 44	02 12	14 37	17	88
23	15 38	15 42	11 44	03 01	15 25	18	81
24	15 46	15 50	11 44	03 50	16 14	19	73

UT	ARIES	VENUS −4.5		MARS +1.5		JUPITER −2.3		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
25 00	33 32.8	136 19.8	S26 20.6	235 32.4	N10 49.5	281 40.6	N21 52.9	172 35.2	S13 38.1
01	48 35.3	151 19.4	20.9	250 33.4	49.0	296 42.9	52.9	187 37.4	38.1
02	63 37.7	166 19.0	21.2	265 34.5	48.4	311 45.3	52.9	202 39.6	38.2
03	78 40.2	181 18.6	21.5	280 35.6	47.9	326 47.6	52.9	217 41.8	38.3
04	93 42.7	196 18.2	21.9	295 36.6	47.4	341 50.0	52.9	232 43.9	38.4
05	108 45.1	211 17.8	22.2	310 37.7	46.9	356 52.3	52.9	247 46.1	38.5
06	123 47.6	226 17.4	S26 22.5	325 38.8	N10 46.4	11 54.7	N21 52.9	262 48.3	S13 38.6
07	138 50.1	241 17.0	22.8	340 39.8	45.8	26 57.0	52.9	277 50.5	38.7
08	153 52.5	256 16.6	23.1	355 40.9	45.3	41 59.4	52.9	292 52.6	38.8
F 09	168 55.0	271 16.2	23.4	10 42.0	44.8	57 01.7	52.8	307 54.8	38.9
R 10	183 57.5	286 15.8	23.8	25 43.0	44.3	72 04.1	52.8	322 57.0	39.0
I 11	198 59.9	301 15.3	24.1	40 44.1	43.8	87 06.4	52.8	337 59.2	39.1
D 12	214 02.4	316 14.9	S26 24.4	55 45.2	N10 43.2	102 08.8	N21 52.8	353 01.3	S13 39.1
A 13	229 04.8	331 14.5	24.7	70 46.3	42.7	117 11.1	52.8	8 03.5	39.2
Y 14	244 07.3	346 14.1	25.0	85 47.3	42.2	132 13.5	52.8	23 05.7	39.3
15	259 09.8	1 13.7	25.3	100 48.4	41.7	147 15.8	52.8	38 07.9	39.4
16	274 12.2	16 13.3	25.6	115 49.5	41.1	162 18.2	52.8	53 10.0	39.5
17	289 14.7	31 12.9	25.9	130 50.5	40.6	177 20.5	52.8	68 12.2	39.6
18	304 17.2	46 12.5	S26 26.2	145 51.6	N10 40.1	192 22.9	N21 52.8	83 14.4	S13 39.7
19	319 19.6	61 12.1	26.5	160 52.7	39.6	207 25.3	52.7	98 16.6	39.8
20	334 22.1	76 11.7	26.8	175 53.7	39.1	222 27.6	52.7	113 18.7	39.9
21	349 24.6	91 11.3	27.1	190 54.8	38.5	237 30.0	52.7	128 20.9	40.0
22	4 27.0	106 10.9	27.4	205 55.9	38.0	252 32.3	52.7	143 23.1	40.1
23	19 29.5	121 10.5	27.7	220 57.0	37.5	267 34.7	52.7	158 25.2	40.2
26 00	34 31.9	136 10.1	S26 28.0	235 58.0	N10 37.0	282 37.0	N21 52.7	173 27.4	S13 40.2
01	49 34.4	151 09.7	28.3	250 59.1	36.5	297 39.4	52.7	188 29.6	40.3
02	64 36.9	166 09.3	28.6	266 00.2	35.9	312 41.7	52.7	203 31.8	40.4
03	79 39.3	181 08.9	28.9	281 01.2	35.4	327 44.1	52.7	218 33.9	40.5
04	94 41.8	196 08.5	29.2	296 02.3	34.9	342 46.5	52.7	233 36.1	40.6
05	109 44.3	211 08.1	29.5	311 03.4	34.4	357 48.8	52.6	248 38.3	40.7
06	124 46.7	226 07.7	S26 29.8	326 04.5	N10 33.9	12 51.2	N21 52.6	263 40.5	S13 40.8
S 07	139 49.2	241 07.3	30.1	341 05.5	33.3	27 53.5	52.6	278 42.6	40.9
A 08	154 51.7	256 06.9	30.4	356 06.6	32.8	42 55.9	52.6	293 44.8	41.0
T 09	169 54.1	271 06.5	30.7	11 07.7	32.3	57 58.3	52.6	308 47.0	41.1
U 10	184 56.6	286 06.1	31.0	26 08.8	31.8	73 00.6	52.6	323 49.2	41.2
R 11	199 59.1	301 05.7	31.2	41 09.8	31.2	88 03.0	52.6	338 51.3	41.2
D 12	215 01.5	316 05.3	S26 31.5	56 10.9	N10 30.7	103 05.3	N21 52.6	353 53.5	S13 41.3
A 13	230 04.0	331 04.9	31.8	71 12.0	30.2	118 07.7	52.6	8 55.7	41.4
Y 14	245 06.4	346 04.5	32.1	86 13.0	29.7	133 10.1	52.6	23 57.8	41.5
15	260 08.9	1 04.1	32.4	101 14.1	29.2	148 12.4	52.5	39 00.0	41.6
16	275 11.4	16 03.7	32.7	116 15.2	28.6	163 14.8	52.5	54 02.2	41.7
17	290 13.8	31 03.3	32.9	131 16.3	28.1	178 17.1	52.5	69 04.4	41.8
18	305 16.3	46 02.9	S26 33.2	146 17.3	N10 27.6	193 19.5	N21 52.5	84 06.5	S13 41.9
19	320 18.8	61 02.5	33.5	161 18.4	27.1	208 21.9	52.5	99 08.7	42.0
20	335 21.2	76 02.1	33.8	176 19.5	26.6	223 24.2	52.5	114 10.9	42.1
21	350 23.7	91 01.7	34.1	191 20.6	26.0	238 26.6	52.5	129 13.1	42.2
22	5 26.2	106 01.3	34.3	206 21.6	25.5	253 29.0	52.5	144 15.2	42.3
23	20 28.6	121 00.9	34.6	221 22.7	25.0	268 31.3	52.5	159 17.4	42.3
27 00	35 31.1	136 00.5	S26 34.9	236 23.8	N10 24.5	283 33.7	N21 52.5	174 19.6	S13 42.4
01	50 33.6	151 00.1	35.2	251 24.9	23.9	298 36.1	52.5	189 21.8	42.5
02	65 36.0	165 59.7	35.4	266 25.9	23.4	313 38.4	52.4	204 23.9	42.6
03	80 38.5	180 59.4	35.7	281 27.0	22.9	328 40.8	52.4	219 26.1	42.7
04	95 40.9	195 59.0	36.0	296 28.1	22.4	343 43.2	52.4	234 28.3	42.8
05	110 43.4	210 58.6	36.2	311 29.2	21.9	358 45.5	52.4	249 30.4	42.9
06	125 45.9	225 58.2	S26 36.5	326 30.3	N10 21.3	13 47.9	N21 52.4	264 32.6	S13 43.0
S 07	140 48.3	240 57.8	36.8	341 31.3	20.8	28 50.3	52.4	279 34.8	43.1
U 08	155 50.8	255 57.4	37.0	356 32.4	20.3	43 52.6	52.4	294 37.0	43.2
N 09	170 53.3	270 57.0	37.3	11 33.5	19.8	58 55.0	52.4	309 39.1	43.3
D 10	185 55.7	285 56.6	37.6	26 34.6	19.2	73 57.4	52.4	324 41.3	43.3
A 11	200 58.2	300 56.2	37.8	41 35.6	18.7	88 59.7	52.4	339 43.5	43.4
Y 12	216 00.7	315 55.8	S26 38.1	56 36.7	N10 18.2	104 02.1	N21 52.4	354 45.7	S13 43.5
13	231 03.1	330 55.4	38.3	71 37.8	17.7	119 04.5	52.4	9 47.8	43.6
14	246 05.6	345 55.1	38.6	86 38.9	17.2	134 06.8	52.3	24 50.0	43.7
15	261 08.0	0 54.7	38.8	101 40.0	16.6	149 09.2	52.3	39 52.2	43.8
16	276 10.5	15 54.3	39.1	116 41.0	16.1	164 11.6	52.3	54 54.3	43.9
17	291 13.0	30 53.9	39.4	131 42.1	15.6	179 14.0	52.3	69 56.5	44.0
18	306 15.4	45 53.5	S26 39.6	146 43.2	N10 15.1	194 16.3	N21 52.3	84 58.7	S13 44.1
19	321 17.9	60 53.1	39.9	161 44.3	14.5	209 18.7	52.3	100 00.9	44.2
20	336 20.4	75 52.7	40.1	176 45.4	14.0	224 21.1	52.3	115 03.0	44.3
21	351 22.8	90 52.3	40.4	191 46.4	13.5	239 23.4	52.3	130 05.2	44.3
22	6 25.3	105 52.0	40.6	206 47.5	13.0	254 25.8	52.3	145 07.4	44.4
23	21 27.8	120 51.6	40.9	221 48.6	12.5	269 28.2	52.3	160 09.5	44.5
	h m								
Mer.Pass.	21 38.3	v −0.4	d 0.3	v 1.1	d 0.5	v 2.4	d 0.0	v 2.2	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.8	S40 14.9
Achernar	335 26.1	S57 10.0
Acrux	173 09.5	S63 10.4
Adhara	255 12.2	S28 59.4
Aldebaran	290 48.8	N16 32.1
Alioth	166 21.1	N55 53.0
Alkaid	152 59.2	N49 14.7
Al Na'ir	27 43.3	S46 53.6
Alnilam	275 45.9	S 1 11.6
Alphard	217 55.9	S 8 43.1
Alphecca	126 11.2	N26 40.3
Alpheratz	357 42.9	N29 10.2
Altair	62 08.0	N 8 54.6
Ankaa	353 15.1	S42 13.8
Antares	112 26.3	S26 27.6
Arcturus	145 55.9	N19 06.8
Atria	107 28.2	S69 03.1
Avior	234 17.9	S59 33.1
Bellatrix	278 31.5	N 6 21.7
Betelgeuse	271 00.8	N 7 24.5
Canopus	263 55.8	S52 42.1
Capella	280 33.7	N46 00.5
Deneb	49 31.2	N45 20.3
Denebola	182 33.7	N14 29.7
Diphda	348 55.4	S17 54.6
Dubhe	193 51.9	N61 40.3
Elnath	278 12.1	N28 37.0
Eltanin	90 46.3	N51 29.7
Enif	33 46.8	N 9 56.6
Fomalhaut	15 23.5	S29 32.9
Gacrux	172 01.1	S57 11.3
Gienah	175 52.3	S17 37.0
Hadar	148 48.1	S60 26.3
Hamal	328 00.1	N23 31.7
Kaus Aust.	83 43.7	S34 22.6
Kochab	137 21.3	N74 06.0
Markab	13 37.9	N15 17.1
Menkar	314 14.5	N 4 08.7
Menkent	148 07.7	S36 26.1
Miaplacidus	221 39.7	S69 46.2
Mirfak	308 39.5	N49 54.5
Nunki	75 58.2	S26 16.6
Peacock	53 18.9	S56 41.5
Pollux	243 27.4	N27 59.3
Procyon	244 59.4	N 5 11.3
Rasalhague	96 06.5	N12 33.3
Regulus	207 43.4	N11 53.9
Rigel	281 11.6	S 8 11.2
Rigil Kent.	139 52.0	S60 53.4
Sabik	102 12.5	S15 44.3
Schedar	349 39.6	N56 37.0
Shaula	96 21.9	S37 06.7
Sirius	258 33.4	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.3	S43 29.2
Vega	80 39.0	N38 48.2
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	101 38.1	14 56
Mars	201 26.1	8 16
Jupiter	248 05.1	5 09
Saturn	138 55.5	12 24

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		25	26	27	28
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
25 00	183 58.5	S12 04.5	292 54.9	12.5	N18 22.5	3.4	54.2	N 72	05 42	07 03	08 22	18 22	20 21	22 07	23 50
01	198 58.5	05.4	307 26.4	12.5	18 19.1	3.6	54.2	N 70	05 41	06 53	08 02	19 18	20 52	22 27	24 01
02	213 58.6	06.3	321 57.9	12.5	18 15.5	3.6	54.2	68	05 39	06 45	07 47	19 51	21 15	22 42	24 10
03	228 58.7	07.1	336 29.4	12.6	18 11.9	3.8	54.2	66	05 38	06 38	07 34	20 15	21 33	22 54	24 18
04	243 58.7	08.0	351 01.0	12.6	18 08.1	3.8	54.2	64	05 37	06 33	07 24	20 34	21 48	23 05	24 24
05	258 58.8	08.9	5 32.6	12.6	18 04.3	3.9	54.2	62	05 36	06 28	07 15	20 49	22 00	23 13	24 29
06	273 58.9	S12 09.7	20 04.2	12.6	N18 00.4	4.0	54.2	60	05 34	06 23	07 07	21 02	22 10	23 21	24 34
07	288 59.0	10.6	34 35.8	12.7	17 56.4	4.0	54.2	N 58	05 33	06 19	07 00	21 13	22 19	23 27	24 38
08	303 59.0	11.4	49 07.5	12.7	17 52.4	4.1	54.2	56	05 32	06 16	06 54	21 23	22 26	23 33	24 42
F 09	318 59.1	12.3	63 39.2	12.8	17 48.3	4.2	54.2	54	05 31	06 12	06 49	21 31	22 33	23 38	24 45
R 10	333 59.2	13.2	78 11.0	12.7	17 44.1	4.3	54.2	52	05 30	06 09	06 44	21 39	22 40	23 43	24 48
I 11	348 59.2	14.0	92 42.7	12.8	17 39.8	4.4	54.2	50	05 29	06 06	06 40	21 46	22 45	23 47	24 51
D 12	3 59.3	S12 14.9	107 14.5	12.8	N17 35.4	4.5	54.2	45	05 26	06 00	06 30	22 00	22 57	23 56	24 57
A 13	18 59.4	15.7	121 46.3	12.9	17 30.9	4.5	54.2	N 40	05 23	05 55	06 22	22 12	23 07	24 04	00 04
Y 14	33 59.5	16.6	136 18.2	12.8	17 26.4	4.6	54.2	35	05 20	05 50	06 15	22 22	23 16	24 10	00 10
15	48 59.5	17.4	150 50.0	12.9	17 21.8	4.7	54.2	30	05 17	05 45	06 09	22 31	23 23	24 16	00 16
16	63 59.6	18.3	165 21.9	13.0	17 17.1	4.7	54.2	20	05 10	05 36	05 59	22 46	23 36	24 26	00 26
17	78 59.7	19.2	179 53.9	12.9	17 12.4	4.9	54.2	N 10	05 03	05 28	05 49	23 00	23 47	24 35	00 35
18	93 59.7	S12 20.0	194 25.8	13.0	N17 07.5	4.9	54.2	0	04 55	05 19	05 41	23 12	23 58	24 43	00 43
19	108 59.8	20.9	208 57.8	13.0	17 02.6	5.0	54.2	S 10	04 45	05 10	05 32	23 25	24 08	00 08	00 51
20	123 59.9	21.7	223 29.8	13.0	16 57.6	5.0	54.2	20	04 32	04 59	05 22	23 38	24 20	00 20	00 59
21	138 59.9	22.6	238 01.8	13.1	16 52.6	5.2	54.2	30	04 16	04 46	05 11	23 53	24 32	00 32	01 09
22	154 00.0	23.4	252 33.9	13.0	16 47.4	5.2	54.2	35	04 06	04 38	05 04	24 02	00 02	00 40	01 15
23	169 00.1	24.3	267 05.9	13.2	16 42.2	5.3	54.2	40	03 53	04 28	04 57	24 12	00 12	00 48	01 21
26 00	184 00.1	S12 25.1	281 38.1	13.1	N16 36.9	5.3	54.2	45	03 38	04 16	04 48	24 24	00 24	00 58	01 28
01	199 00.2	26.0	296 10.2	13.1	16 31.6	5.5	54.2	S 50	03 18	04 02	04 37	00 02	00 38	01 10	01 37
02	214 00.3	26.8	310 42.3	13.2	16 26.1	5.5	54.2	52	03 08	03 55	04 32	00 10	00 45	01 15	01 41
03	229 00.3	27.7	325 14.5	13.2	16 20.6	5.5	54.2	54	02 57	03 48	04 27	00 18	00 52	01 21	01 46
04	244 00.4	28.6	339 46.7	13.3	16 15.1	5.7	54.2	56	02 44	03 39	04 21	00 28	01 00	01 28	01 51
05	259 00.5	29.4	354 19.0	13.2	16 09.4	5.7	54.2	58	02 28	03 29	04 14	00 39	01 10	01 35	01 56
06	274 00.5	S12 30.3	8 51.2	13.3	N16 03.7	5.8	54.2	S 60	02 08	03 17	04 06	00 51	01 20	01 43	02 03
S 07	289 00.6	31.1	23 23.5	13.3	15 57.9	5.9	54.2								
A 08	304 00.6	32.0	37 55.8	13.4	15 52.0	5.9	54.2								
T 09	319 00.7	32.8	52 28.2	13.3	15 46.1	6.0	54.3								
U 10	334 00.8	33.7	67 00.5	13.4	15 40.1	6.1	54.3								
R 11	349 00.8	34.5	81 32.9	13.4	15 34.0	6.1	54.3								
D 12	4 00.9	S12 35.4	96 05.3	13.4	N15 27.9	6.2	54.3								
A 13	19 01.0	36.2	110 37.7	13.5	15 21.7	6.3	54.3								
Y 14	34 01.0	37.1	125 10.2	13.5	15 15.4	6.4	54.3								
15	49 01.1	37.9	139 42.7	13.5	15 09.0	6.4	54.3								
16	64 01.1	38.8	154 15.2	13.5	15 02.6	6.5	54.3								
17	79 01.2	39.6	168 47.7	13.5	14 56.1	6.5	54.3								
18	94 01.3	S12 40.5	183 20.2	13.6	N14 49.6	6.7	54.3								
19	109 01.3	41.3	197 52.8	13.6	14 42.9	6.6	54.3								
20	124 01.4	42.1	212 25.4	13.6	14 36.3	6.8	54.3								
21	139 01.4	43.0	226 58.0	13.6	14 29.5	6.8	54.3								
22	154 01.5	43.8	241 30.6	13.6	14 22.7	6.9	54.4								
23	169 01.6	44.7	256 03.2	13.7	14 15.8	6.9	54.4								
27 00	184 01.6	S12 45.5	270 35.9	13.7	N14 08.9	7.0	54.4								
01	199 01.7	46.4	285 08.6	13.7	14 01.9	7.1	54.4								
02	214 01.7	47.2	299 41.3	13.7	13 54.8	7.1	54.4								
03	229 01.8	48.1	314 14.0	13.7	13 47.7	7.2	54.4								
04	244 01.9	48.9	328 46.7	13.8	13 40.5	7.3	54.4								
05	259 01.9	49.8	343 19.5	13.7	13 33.2	7.3	54.4								
06	274 02.0	S12 50.6	357 52.2	13.8	N13 25.9	7.4	54.4								
S 07	289 02.0	51.4	12 25.0	13.8	13 18.5	7.4	54.5								
U 08	304 02.1	52.3	26 57.8	13.9	13 11.1	7.5	54.5								
N 09	319 02.1	53.1	41 30.7	13.8	13 03.6	7.6	54.5								
D 10	334 02.2	54.0	56 03.5	13.9	12 56.0	7.6	54.5								
A 11	349 02.2	54.8	70 36.4	13.8	12 48.4	7.7	54.5								
Y 12	4 02.3	S12 55.7	85 09.2	13.9	N12 40.7	7.7	54.5								
13	19 02.4	56.5	99 42.1	13.9	12 33.0	7.8	54.5								
14	34 02.4	57.3	114 15.0	13.9	12 25.2	7.9	54.5								
15	49 02.5	58.2	128 47.9	13.9	12 17.3	7.9	54.6								
16	64 02.5	59.0	143 20.8	14.0	12 09.4	8.0	54.6								
17	79 02.6	12 59.9	157 53.8	13.9	12 01.4	8.0	54.6								
18	94 02.6	S13 00.7	172 26.7	14.0	N11 53.4	8.1	54.6								
19	109 02.7	01.5	186 59.7	13.9	11 45.3	8.1	54.6								
20	124 02.7	02.4	201 32.6	14.0	11 37.2	8.2	54.6								
21	139 02.8	03.2	216 05.6	14.0	11 29.0	8.3	54.7								
22	154 02.8	04.1	230 38.6	14.0	11 20.7	8.3	54.7								
23	169 02.9	04.9	245 11.6	14.0	N11 12.4	8.3	54.7								
	SD 16.1	d 0.8	SD	14.8		14.8		14.9							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	25	26	27	28
°	h m	h m	h m	h m	h m	h m	h m
N 72	15 04	16 23	17 43	15 48	15 24	15 11	15 01
N 70	15 24	16 33	17 45	14 51	14 52	14 50	14 48
68	15 40	16 41	17 47	14 18	14 28	14 34	14 38
66	15 53	16 48	17 48	13 53	14 09	14 21	14 29
64	16 03	16 54	17 50	13 34	13 54	14 09	14 21
62	16 12	16 59	17 51	13 18	13 42	14 00	14 15
60	16 20	17 04	17 52	13 05	13 31	13 52	14 09
N 58	16 27	17 08	17 54	12 53	13 21	13 45	14 04
56	16 33	17 11	17 55	12 43	13 13	13 38	14 00
54	16 38	17 15	17 56	12 35	13 06	13 32	13 56
52	16 43	17 18	17 57	12 27	12 59	13 27	13 52
50	16 47	17 21	17 58	12 20	12 53	13 23	13 49
45	16 57	17 27	18 01	12 05	12 40	13 12	13 42
N 40	17 05	17 33	18 04	11 52	12 30	13 04	13 36
35	17 12	17 38	18 07	11 41	12 20	12 56	13 31
30	17 18	17 43	18 11	11 32	12 12	12 50	13 26
20	17 29	17 51	18 17	11 16	11 58	12 39	13 18
N 10	17 38	18 00	18 25	11 02	11 46	12 29	13 11
0	17 47	18 09	18 33	10 48	11 34	12 20	13 04
S 10	17 56	18 18	18 43	10 35	11 23	12 10	12 57
20	18 06	18 29	18 56	10 21	11 10	12 00	12 50
30	18 18	18 43	19 12	10 04	10 56	11 49	12 42
35	18 24	18 51	19 23	09 55	10 48	11 42	12 37
40	18 32	19 01	19 35	09 44	10 38	11 34	12 32
45	18 41	19 12	19 51	09 31	10 27	11 25	12 25
S 50	18 52	19 27	20 11	09 15	10 14	11 15	12 18
52	18 57	19 34	20 22	09 08	10 07	11 10	12 14
54	19 02	19 42	20 33	09 00	10 00	11 04	12 10
56	19 08	19 51	20 47	08 51	09 53	10 58	12 06
58	19 15	20 01	21 03	08 40	09 44	10 51	12 01
S 60	19 23	20 13	21 23	08 28	09 34	10 43	11 55

Day	SUN		MOON		
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00^h	12^h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
25	15 54	15 57	11 44	04 37	17 00	20	64
26	16 00	16 03	11 44	05 23	17 46	21	55
27	16 06	16 09	11 44	06 09	18 31	22	45

UT	ARIES	VENUS −4.5		MARS +1.5		JUPITER −2.4		SATURN +0.5		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
31 00	39 27.6	135 24.7	S26 56.1	238 08.0	N 9 34.2	287 22.4	N21 51.8	177 48.1	S13 51.2	Acamar	315 17.8	S40 14.9
01	54 30.1	150 24.3	56.2	253 09.0	33.7	302 24.8	51.8	192 50.2	51.2	Achernar	335 26.1	S57 10.0
02	69 32.6	165 24.0	56.4	268 10.1	33.2	317 27.2	51.8	207 52.4	51.3	Acrux	173 09.5	S63 10.4
03	84 35.0	180 23.6 . .	56.6	283 11.2 . .	32.6	332 29.6 . .	51.8	222 54.6 . .	51.4	Adhara	255 12.2	S28 59.4
04	99 37.5	195 23.3	56.7	298 12.3	32.1	347 32.0	51.8	237 56.7	51.5	Aldebaran	290 48.8	N16 32.1
05	114 40.0	210 22.9	56.9	313 13.4	31.6	2 34.4	51.8	252 58.9	51.6			
06	129 42.4	225 22.6	S26 57.1	328 14.5	N 9 31.1	17 36.8	N21 51.8	268 01.1	S13 51.7	Alioth	166 21.1	N55 53.0
07	144 44.9	240 22.3	57.2	343 15.6	30.5	32 39.2	51.8	283 03.3	51.8	Alkaid	152 59.2	N49 14.7
T 08	159 47.4	255 21.9	57.4	358 16.7	30.0	47 41.6	51.8	298 05.4	51.9	Al Na'ir	27 43.3	S46 53.7
H 09	174 49.8	270 21.6 . .	57.6	13 17.8 . .	29.5	62 44.0 . .	51.8	313 07.6 . .	52.0	Alnilam	275 45.9	S 1 11.6
U 10	189 52.3	285 21.2	57.7	28 18.9	29.0	77 46.4	51.8	328 09.8	52.1	Alphard	217 55.9	S 8 43.1
R 11	204 54.7	300 20.9	57.9	43 20.0	28.4	92 48.8	51.8	343 11.9	52.2			
S 12	219 57.2	315 20.5	S26 58.0	58 21.1	N 9 27.9	107 51.2	N21 51.8	358 14.1	S13 52.2	Alphecca	126 11.2	N26 40.3
D 13	234 59.7	330 20.2	58.2	73 22.2	27.4	122 53.6	51.8	13 16.3	52.3	Alpheratz	357 42.9	N29 10.3
A 14	250 02.1	345 19.8	58.3	88 23.3	26.9	137 56.0	51.8	28 18.5	52.4	Altair	62 08.1	N 8 54.6
Y 15	265 04.6	0 19.5 . .	58.5	103 24.4 . .	26.3	152 58.4 . .	51.8	43 20.6 . .	52.5	Ankaa	353 15.1	S42 13.9
16	280 07.1	15 19.2	58.6	118 25.5	25.8	168 00.8	51.8	58 22.8	52.6	Antares	112 26.3	S26 27.6
17	295 09.5	30 18.8	58.8	133 26.6	25.3	183 03.2	51.8	73 25.0	52.7			
18	310 12.0	45 18.5	S26 58.9	148 27.7	N 9 24.8	198 05.6	N21 51.8	88 27.1	S13 52.8	Arcturus	145 55.9	N19 06.8
19	325 14.5	60 18.1	59.1	163 28.8	24.2	213 08.1	51.8	103 29.3	52.9	Atria	107 28.3	S69 03.1
20	340 16.9	75 17.8	59.2	178 29.9	23.7	228 10.5	51.8	118 31.5	53.0	Avior	234 17.8	S59 33.1
21	355 19.4	90 17.5 . .	59.4	193 31.0 . .	23.2	243 12.9 . .	51.8	133 33.6 . .	53.1	Bellatrix	278 31.5	N 6 21.6
22	10 21.8	105 17.1	59.5	208 32.1	22.7	258 15.3	51.8	148 35.8	53.1	Betelgeuse	271 00.8	N 7 24.5
23	25 24.3	120 16.8	59.7	223 33.2	22.1	273 17.7	51.8	163 38.0	53.2			
1 00	40 26.8	135 16.4	S26 59.8	238 34.3	N 9 21.6	288 20.1	N21 51.8	178 40.2	S13 53.3	Canopus	263 55.7	S52 42.1
01	55 29.2	150 16.1	27 00.0	253 35.4	21.1	303 22.5	51.8	193 42.3	53.4	Capella	280 33.7	N46 00.5
02	70 31.7	165 15.8	00.1	268 36.5	20.6	318 24.9	51.8	208 44.5	53.5	Deneb	49 31.3	N45 20.3
03	85 34.2	180 15.4 . .	00.2	283 37.6 . .	20.0	333 27.3 . .	51.8	223 46.7 . .	53.6	Denebola	182 33.7	N14 29.7
04	100 36.6	195 15.1	00.4	298 38.7	19.5	348 29.7	51.8	238 48.8	53.7	Diphda	348 55.4	S17 54.6
05	115 39.1	210 14.8	00.5	313 39.8	19.0	3 32.1	51.8	253 51.0	53.8			
06	130 41.6	225 14.4	S27 00.7	328 40.9	N 9 18.5	18 34.5	N21 51.8	268 53.2	S13 53.9	Dubhe	193 51.9	N61 40.3
07	145 44.0	240 14.1	00.8	343 42.0	17.9	33 37.0	51.8	283 55.3	54.0	Elnath	278 12.0	N28 37.0
08	160 46.5	255 13.8	00.9	358 43.1	17.4	48 39.4	51.7	298 57.5	54.0	Eltanin	90 46.4	N51 29.6
F 09	175 49.0	270 13.4 . .	01.1	13 44.2 . .	16.9	63 41.8 . .	51.7	313 59.7 . .	54.1	Enif	33 46.8	N 9 56.6
R 10	190 51.4	285 13.1	01.2	28 45.3	16.4	78 44.2	51.7	329 01.9	54.2	Fomalhaut	15 23.5	S29 32.9
I 11	205 53.9	300 12.8	01.3	43 46.4	15.8	93 46.6	51.7	344 04.0	54.3			
D 12	220 56.3	315 12.5	S27 01.5	58 47.5	N 9 15.3	108 49.0	N21 51.7	359 06.2	S13 54.4	Gacrux	172 01.0	S57 11.3
A 13	235 58.8	330 12.1	01.6	73 48.6	14.8	123 51.4	51.7	14 08.4	54.5	Gienah	175 52.3	S17 37.0
Y 14	251 01.3	345 11.8	01.7	88 49.7	14.3	138 53.8	51.7	29 10.5	54.6	Hadar	148 48.1	S60 26.2
15	266 03.7	0 11.5 . .	01.9	103 50.8 . .	13.7	153 56.3 . .	51.7	44 12.7 . .	54.7	Hamal	328 00.1	N23 31.7
16	281 06.2	15 11.1	02.0	118 51.9	13.2	168 58.7	51.7	59 14.9	54.8	Kaus Aust.	83 43.7	S34 22.5
17	296 08.7	30 10.8	02.1	133 53.0	12.7	184 01.1	51.7	74 17.0	54.9			
18	311 11.1	45 10.5	S27 02.2	148 54.1	N 9 12.2	199 03.5	N21 51.7	89 19.2	S13 55.0	Kochab	137 21.3	N74 06.0
19	326 13.6	60 10.2	02.4	163 55.2	11.6	214 05.9	51.7	104 21.4	55.0	Markab	13 37.9	N15 17.1
20	341 16.1	75 09.8	02.5	178 56.3	11.1	229 08.3	51.7	119 23.6	55.1	Menkar	314 14.5	N 4 08.7
21	356 18.5	90 09.5 . .	02.6	193 57.4 . .	10.6	244 10.7 . .	51.7	134 25.7 . .	55.2	Menkent	148 07.6	S36 26.1
22	11 21.0	105 09.2	02.7	208 58.5	10.1	259 13.2	51.7	149 27.9	55.3	Miaplacidus	221 39.6	S69 46.2
23	26 23.4	120 08.9	02.8	223 59.6	09.5	274 15.6	51.7	164 30.1	55.4			
2 00	41 25.9	135 08.6	S27 03.0	239 00.7	N 9 09.0	289 18.0	N21 51.7	179 32.2	S13 55.5	Mirfak	308 39.5	N49 54.5
01	56 28.4	150 08.2	03.1	254 01.8	08.5	304 20.4	51.7	194 34.4	55.6	Nunki	75 58.2	S26 16.6
02	71 30.8	165 07.9	03.2	269 02.9	08.0	319 22.8	51.7	209 36.6	55.7	Peacock	53 19.0	S56 41.5
03	86 33.3	180 07.6 . .	03.3	284 04.0 . .	07.4	334 25.3 . .	51.7	224 38.7 . .	55.8	Pollux	243 27.3	N27 59.3
04	101 35.8	195 07.3	03.4	299 05.1	06.9	349 27.7	51.7	239 40.9	55.9	Procyon	244 59.4	N 5 11.3
05	116 38.2	210 07.0	03.5	314 06.2	06.4	4 30.1	51.7	254 43.1	55.9			
06	131 40.7	225 06.6	S27 03.6	329 07.3	N 9 05.9	19 32.5	N21 51.7	269 45.3	S13 56.0	Rasalhague	96 06.5	N12 33.3
07	146 43.2	240 06.3	03.8	344 08.4	05.3	34 34.9	51.7	284 47.4	56.1	Regulus	207 43.4	N11 53.9
S 08	161 45.6	255 06.0	03.9	359 09.5	04.8	49 37.3	51.7	299 49.6	56.2	Rigel	281 11.6	S 8 11.2
A 09	176 48.1	270 05.7 . .	04.0	14 10.6 . .	04.3	64 39.8 . .	51.7	314 51.8 . .	56.3	Rigil Kent.	139 52.0	S60 53.4
T 10	191 50.6	285 05.4	04.1	29 11.7	03.8	79 42.2	51.7	329 53.9	56.4	Sabik	102 12.5	S15 44.3
U 11	206 53.0	300 05.1	04.2	44 12.8	03.2	94 44.6	51.7	344 56.1	56.5			
R 12	221 55.5	315 04.7	S27 04.3	59 13.9	N 9 02.7	109 47.0	N21 51.7	359 58.3	S13 56.6	Schedar	349 39.7	N56 37.0
D 13	236 57.9	330 04.4	04.4	74 15.0	02.2	124 49.5	51.7	15 00.4	56.7	Shaula	96 21.9	S37 06.7
A 14	252 00.4	345 04.1	04.5	89 16.1	01.7	139 51.9	51.7	30 02.6	56.8	Sirius	258 33.3	S16 44.1
Y 15	267 02.9	0 03.8 . .	04.6	104 17.2 . .	01.1	154 54.3 . .	51.7	45 04.8 . .	56.8	Spica	158 31.3	S11 13.9
16	282 05.3	15 03.5	04.7	119 18.4	00.6	169 56.7	51.7	60 07.0	56.9	Suhail	222 52.3	S43 29.2
17	297 07.8	30 03.2	04.8	134 19.5	9 00.1	184 59.1	51.7	75 09.1	57.0			
18	312 10.3	45 02.9	S27 04.9	149 20.6	N 8 59.5	200 01.6	N21 51.7	90 11.3	S13 57.1	Vega	80 39.0	N38 48.2
19	327 12.7	60 02.6	05.0	164 21.7	59.0	215 04.0	51.7	105 13.5	57.2	Zuben'ubi	137 05.5	S16 05.8
20	342 15.2	75 02.3	05.1	179 22.8	58.5	230 06.4	51.7	120 15.6	57.3		SHA	Mer. Pass.
21	357 17.7	90 02.0 . .	05.2	194 23.9 . .	58.0	245 08.8 . .	51.7	135 17.8 . .	57.4		° ′	h m
22	12 20.1	105 01.6	05.3	209 25.0	57.4	260 11.3	51.7	150 20.0	57.5	Venus	94 49.7	14 59
23	27 22.6	120 01.3	05.4	224 26.1	56.9	275 13.7	51.7	165 22.1	57.6	Mars	198 07.5	8 05
	h m									Jupiter	247 53.3	4 46
Mer. Pass.	21 14.7	v −0.3	d 0.1	v 1.1	d 0.5	v 2.4	d 0.0	v 2.2	d 0.1	Saturn	138 13.4	12 04

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN			MOON						Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 31	Moonrise 1	Moonrise 2	Moonrise 3
	GHA	Dec		GHA	v	Dec	d	HP									
d h	° ′	° ′		° ′	′	° ′	′	′		°	h m	h m	h m	h m	h m	h m	h m
31 00	184 05.7	S14 05.1		227 05.3	12.9	S 0 44.7	10.8	56.6		N 72	06 07	07 30	08 58	03 16	05 04	07 00	09 08
01	199 05.7	05.9		241 37.2	12.9	0 55.5	10.8	56.6		N 70	06 02	07 17	08 31	03 14	04 55	06 42	08 35
02	214 05.7	06.7		256 09.1	12.9	1 06.3	10.8	56.6		68	05 59	07 06	08 11	03 12	04 48	06 28	08 12
03	229 05.7 . .	07.5		270 41.0	12.8	1 17.1	10.8	56.7		66	05 56	06 57	07 56	03 11	04 42	06 16	07 54
04	244 05.8	08.3		285 12.8	12.8	1 27.9	10.9	56.7		64	05 53	06 50	07 43	03 09	04 37	06 07	07 39
05	259 05.8	09.1		299 44.6	12.8	1 38.8	10.8	56.7		62	05 50	06 43	07 32	03 08	04 32	05 59	07 27
06	274 05.8	S14 09.9		314 16.4	12.7	S 1 49.6	10.8	56.8		60	05 48	06 37	07 22	03 08	04 28	05 52	07 17
T 07	289 05.8	10.8		328 48.1	12.6	2 00.4	10.9	56.8		N 58	05 45	06 32	07 14	03 07	04 25	05 46	07 08
H 08	304 05.8	11.6		343 19.7	12.6	2 11.3	10.8	56.8		56	05 43	06 27	07 07	03 06	04 22	05 40	07 00
U 09	319 05.9 . .	12.4		357 51.3	12.6	2 22.1	10.9	56.9		54	05 41	06 23	07 01	03 05	04 19	05 35	06 53
R 10	334 05.9	13.2		12 22.9	12.5	2 33.0	10.8	56.9		52	05 39	06 19	06 55	03 05	04 17	05 31	06 47
S 11	349 05.9	14.0		26 54.4	12.5	2 43.8	10.9	56.9		50	05 38	06 16	06 50	03 04	04 14	05 27	06 41
12	4 05.9	S14 14.8		41 25.9	12.4	S 2 54.7	10.8	57.0		45	05 33	06 08	06 38	03 03	04 10	05 18	06 29
D 13	19 06.0	15.6		55 57.3	12.4	3 05.5	10.9	57.0		N 40	05 29	06 01	06 29	03 02	04 06	05 11	06 19
A 14	34 06.0	16.4		70 28.7	12.3	3 16.4	10.8	57.0		35	05 25	05 55	06 21	03 02	04 02	05 05	06 10
Y 15	49 06.0 . .	17.2		85 00.0	12.2	3 27.2	10.9	57.1		30	05 21	05 49	06 14	03 01	03 59	05 00	06 03
16	64 06.0	18.0		99 31.2	12.3	3 38.1	10.8	57.1		20	05 13	05 39	06 01	03 00	03 54	04 51	05 50
17	79 06.0	18.8		114 02.5	12.1	3 48.9	10.8	57.1		N 10	05 04	05 29	05 51	02 59	03 49	04 43	05 39
18	94 06.1	S14 19.6		128 33.6	12.1	S 3 59.7	10.9	57.2		0	04 54	05 19	05 40	02 58	03 45	04 35	05 28
19	109 06.1	20.4		143 04.7	12.1	4 10.6	10.8	57.2		S 10	04 42	05 08	05 30	02 57	03 41	04 28	05 18
20	124 06.1	21.2		157 35.8	12.0	4 21.4	10.8	57.2		20	04 28	04 55	05 18	02 56	03 37	04 20	05 07
21	139 06.1 . .	22.0		172 06.8	12.0	4 32.2	10.8	57.3		30	04 10	04 40	05 05	02 55	03 32	04 11	04 55
22	154 06.1	22.8		186 37.8	11.9	4 43.0	10.8	57.3		35	03 58	04 31	04 58	02 54	03 29	04 06	04 47
23	169 06.2	23.6		201 08.7	11.8	4 53.8	10.7	57.3		40	03 44	04 20	04 49	02 53	03 26	04 00	04 39
1 00	184 06.2	S14 24.4		215 39.5	11.8	S 5 04.5	10.8	57.4		45	03 27	04 07	04 39	02 53	03 22	03 54	04 30
01	199 06.2	25.2		230 10.3	11.7	5 15.3	10.8	57.4		S 50	03 04	03 50	04 26	02 52	03 17	03 46	04 18
02	214 06.2	26.0		244 41.0	11.7	5 26.1	10.7	57.4		52	02 53	03 42	04 21	02 51	03 15	03 42	04 13
03	229 06.2 . .	26.8		259 11.7	11.6	5 36.8	10.7	57.5		54	02 39	03 33	04 14	02 51	03 13	03 38	04 07
04	244 06.2	27.6		273 42.3	11.5	5 47.5	10.7	57.5		56	02 24	03 23	04 07	02 50	03 11	03 34	04 01
05	259 06.3	28.4		288 12.8	11.5	5 58.2	10.7	57.5		58	02 04	03 11	03 59	02 50	03 08	03 29	03 54
06	274 06.3	S14 29.2		302 43.3	11.4	S 6 08.9	10.7	57.6		S 60	01 39	02 58	03 50	02 49	03 05	03 23	03 46
F 07	289 06.3	30.0		317 13.7	11.4	6 19.6	10.6	57.6									
R 08	304 06.3	30.8		331 44.1	11.3	6 30.2	10.7	57.6									
I 09	319 06.3 . .	31.6		346 14.4	11.3	6 40.9	10.6	57.7									
D 10	334 06.3	32.4		0 44.7	11.1	6 51.5	10.6	57.7									
A 11	349 06.3	33.2		15 14.8	11.2	7 02.1	10.5	57.7									
Y 12	4 06.3	S14 34.0		29 45.0	11.0	S 7 12.6	10.6	57.8									
13	19 06.4	34.8		44 15.0	11.0	7 23.2	10.5	57.8									
14	34 06.4	35.6		58 45.0	10.9	7 33.7	10.4	57.8									
15	49 06.4 . .	36.4		73 14.9	10.9	7 44.1	10.5	57.9									
16	64 06.4	37.2		87 44.8	10.8	7 54.6	10.4	57.9									
17	79 06.4	38.0		102 14.6	10.7	8 05.0	10.4	57.9									
18	94 06.4	S14 38.8		116 44.3	10.7	S 8 15.4	10.4	58.0									
19	109 06.4	39.6		131 14.0	10.6	8 25.8	10.3	58.0									
20	124 06.4	40.4		145 43.6	10.5	8 36.1	10.3	58.0									
21	139 06.5 . .	41.2		160 13.1	10.4	8 46.4	10.2	58.1									
22	154 06.5	42.0		174 42.5	10.4	8 56.6	10.3	58.1									
23	169 06.5	42.8		189 11.9	10.3	9 06.9	10.1	58.1									
2 00	184 06.5	S14 43.6		203 41.2	10.3	S 9 17.0	10.2	58.1									
01	199 06.5	44.3		218 10.5	10.2	9 27.2	10.1	58.2									
02	214 06.5	45.1		232 39.7	10.1	9 37.3	10.0	58.2									
03	229 06.5 . .	45.9		247 08.8	10.0	9 47.3	10.0	58.2									
04	244 06.5	46.7		261 37.8	10.0	9 57.3	10.0	58.3									
05	259 06.5	47.5		276 06.8	9.9	10 07.3	9.9	58.3									
06	274 06.5	S14 48.3		290 35.7	9.8	S10 17.2	9.9	58.3									
S 07	289 06.5	49.1		305 04.5	9.7	10 27.1	9.8	58.4									
A 08	304 06.5	49.9		319 33.2	9.7	10 36.9	9.8	58.4									
T 09	319 06.5 . .	50.7		334 01.9	9.6	10 46.7	9.8	58.4									
U 10	334 06.5	51.4		348 30.5	9.5	10 56.5	9.6	58.5									
R 11	349 06.6	52.2		2 59.0	9.5	11 06.1	9.7	58.5									
D 12	4 06.6	S14 53.0		17 27.5	9.4	S11 15.8	9.5	58.5									
A 13	19 06.6	53.8		31 55.9	9.3	11 25.3	9.5	58.5									
Y 14	34 06.6	54.6		46 24.2	9.2	11 34.8	9.5	58.6									
15	49 06.6 . .	55.4		60 52.4	9.2	11 44.3	9.4	58.6									
16	64 06.6	56.2		75 20.6	9.1	11 53.7	9.3	58.6									
17	79 06.6	56.9		89 48.7	9.0	12 03.0	9.3	58.7									
18	94 06.6	S14 57.7		104 16.7	8.9	S12 12.3	9.2	58.7									
19	109 06.6	58.5		118 44.6	8.9	12 21.5	9.2	58.7									
20	124 06.6	14 59.3		133 12.5	8.8	12 30.7	9.1	58.7									
21	139 06.6	15 00.1		147 40.3	8.7	12 39.8	9.0	58.8									
22	154 06.6	00.9		162 08.0	8.6	12 48.8	8.9	58.8									
23	169 06.6	01.6		176 35.6	8.6	S12 57.7	8.9	58.8									
	SD 16.1	d 0.8		SD	15.5		15.7		15.9								

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
31	16 23	16 24	11 44	09 09	21 33	26	11
1	16 25	16 25	11 44	09 57	22 22	27	5
2	16 26	16 26	11 44	10 48	23 14	28	1

UT	ARIES	VENUS −4.6		MARS +1.5		JUPITER −2.4		SATURN +0.5		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
3 00	42 25.1	135 01.0	S27 05.5	239 27.2	N 8 56.4	290 16.1	N21 51.7	180 24.3	S13 57.7	Acamar	315 17.7	S40 15.0
01	57 27.5	150 00.7	05.6	254 28.3	55.9	305 18.5	51.7	195 26.5	57.7	Achernar	335 26.1	S57 10.0
02	72 30.0	165 00.4	05.7	269 29.4	55.3	320 21.0	51.7	210 28.6	57.8	Acrux	173 09.5	S63 10.4
03	87 32.4	180 00.1 . .	05.8	284 30.5 . .	54.8	335 23.4 . .	51.7	225 30.8 . .	57.9	Adhara	255 12.1	S28 59.4
04	102 34.9	194 59.8	05.8	299 31.6	54.3	350 25.8	51.7	240 33.0	58.0	Aldebaran	290 48.8	N16 32.1
05	117 37.4	209 59.5	05.9	314 32.7	53.8	5 28.3	51.7	255 35.2	58.1			
06	132 39.8	224 59.2	S27 06.0	329 33.9	N 8 53.2	20 30.7	N21 51.7	270 37.3	S13 58.2	Alioth	166 21.0	N55 53.0
07	147 42.3	239 58.9	06.1	344 35.0	52.7	35 33.1	51.7	285 39.5	58.3	Alkaid	152 59.2	N49 14.7
08	162 44.8	254 58.6	06.2	359 36.1	52.2	50 35.5	51.7	300 41.7	58.4	Al Na'ir	27 43.3	S46 53.7
S 09	177 47.2	269 58.3 . .	06.3	14 37.2 . .	51.7	65 38.0 . .	51.7	315 43.8 . .	58.5	Alnilam	275 45.9	S 1 11.7
U 10	192 49.7	284 58.0	06.4	29 38.3	51.1	80 40.4	51.7	330 46.0	58.6	Alphard	217 55.9	S 8 43.1
N 11	207 52.2	299 57.7	06.4	44 39.4	50.6	95 42.8	51.7	345 48.2	58.6			
D 12	222 54.6	314 57.4	S27 06.5	59 40.5	N 8 50.1	110 45.3	N21 51.7	0 50.3	S13 58.7	Alphecca	126 11.2	N26 40.3
A 13	237 57.1	329 57.1	06.6	74 41.6	49.6	125 47.7	51.7	15 52.5	58.8	Alpheratz	357 42.9	N29 10.3
Y 14	252 59.5	344 56.8	06.7	89 42.7	49.0	140 50.1	51.7	30 54.7	58.9	Altair	62 08.1	N 8 54.6
15	268 02.0	359 56.5 . .	06.8	104 43.8 . .	48.5	155 52.5 . .	51.7	45 56.8 . .	59.0	Ankaa	353 15.1	S42 13.9
16	283 04.5	14 56.2	06.8	119 45.0	48.0	170 55.0	51.7	60 59.0	59.1	Antares	112 26.3	S26 27.6
17	298 06.9	29 55.9	06.9	134 46.1	47.5	185 57.4	51.7	76 01.2	59.2			
18	313 09.4	44 55.7	S27 07.0	149 47.2	N 8 46.9	200 59.8	N21 51.7	91 03.4	S13 59.3	Arcturus	145 55.9	N19 06.7
19	328 11.9	59 55.4	07.1	164 48.3	46.4	216 02.3	51.7	106 05.5	59.4	Atria	107 28.3	S69 03.1
20	343 14.3	74 55.1	07.1	179 49.4	45.9	231 04.7	51.7	121 07.7	59.4	Avior	234 17.8	S59 33.1
21	358 16.8	89 54.8 . .	07.2	194 50.5 . .	45.3	246 07.1 . .	51.7	136 09.9 . .	59.5	Bellatrix	278 31.5	N 6 21.6
22	13 19.3	104 54.5	07.3	209 51.6	44.8	261 09.6	51.7	151 12.0	59.6	Betelgeuse	271 00.8	N 7 24.5
23	28 21.7	119 54.2	07.3	224 52.7	44.3	276 12.0	51.7	166 14.2	59.7			
4 00	43 24.2	134 53.9	S27 07.4	239 53.8	N 8 43.8	291 14.4	N21 51.7	181 16.4	S13 59.8	Canopus	263 55.7	S52 42.1
01	58 26.7	149 53.6	07.5	254 55.0	43.2	306 16.9	51.7	196 18.5	13 59.9	Capella	280 33.7	N46 00.5
02	73 29.1	164 53.3	07.5	269 56.1	42.7	321 19.3	51.7	211 20.7	14 00.0	Deneb	49 31.3	N45 20.3
03	88 31.6	179 53.0 . .	07.6	284 57.2 . .	42.2	336 21.8 . .	51.7	226 22.9 . .	00.1	Denebola	182 33.6	N14 29.6
04	103 34.0	194 52.8	07.7	299 58.3	41.7	351 24.2	51.7	241 25.0	00.2	Diphda	348 55.4	S17 54.6
05	118 36.5	209 52.5	07.7	314 59.4	41.1	6 26.6	51.7	256 27.2	00.3			
06	133 39.0	224 52.2	S27 07.8	330 00.5	N 8 40.6	21 29.1	N21 51.7	271 29.4	S14 00.3	Dubhe	193 51.8	N61 40.3
07	148 41.4	239 51.9	07.8	345 01.6	40.1	36 31.5	51.7	286 31.6	00.4	Elnath	278 12.0	N28 37.0
08	163 43.9	254 51.6	07.9	0 02.7	39.6	51 33.9	51.7	301 33.7	00.5	Eltanin	90 46.4	N51 29.6
M 09	178 46.4	269 51.3 . .	08.0	15 03.9 . .	39.0	66 36.4 . .	51.7	316 35.9 . .	00.6	Enif	33 46.8	N 9 56.6
O 10	193 48.8	284 51.1	08.0	30 05.0	38.5	81 38.8	51.7	331 38.1	00.7	Fomalhaut	15 23.5	S29 32.9
N 11	208 51.3	299 50.8	08.1	45 06.1	38.0	96 41.3	51.7	346 40.2	00.8			
D 12	223 53.8	314 50.5	S27 08.1	60 07.2	N 8 37.5	111 43.7	N21 51.7	1 42.4	S14 00.9	Gacrux	172 01.0	S57 11.3
A 13	238 56.2	329 50.2	08.2	75 08.3	36.9	126 46.1	51.7	16 44.6	01.0	Gienah	175 52.3	S17 37.0
Y 14	253 58.7	344 50.0	08.2	90 09.4	36.4	141 48.6	51.7	31 46.7	01.1	Hadar	148 48.1	S60 26.2
15	269 01.2	359 49.7 . .	08.3	105 10.5 . .	35.9	156 51.0 . .	51.7	46 48.9 . .	01.2	Hamal	328 00.1	N23 31.7
16	284 03.6	14 49.4	08.3	120 11.7	35.3	171 53.4	51.7	61 51.1	01.2	Kaus Aust.	83 43.7	S34 22.5
17	299 06.1	29 49.1	08.4	135 12.8	34.8	186 55.9	51.7	76 53.2	01.3			
18	314 08.5	44 48.8	S27 08.4	150 13.9	N 8 34.3	201 58.3	N21 51.7	91 55.4	S14 01.4	Kochab	137 21.3	N74 06.0
19	329 11.0	59 48.6	08.5	165 15.0	33.8	217 00.8	51.7	106 57.6	01.5	Markab	13 37.9	N15 17.1
20	344 13.5	74 48.3	08.5	180 16.1	33.2	232 03.2	51.7	121 59.8	01.6	Menkar	314 14.5	N 4 08.7
21	359 15.9	89 48.0 . .	08.6	195 17.2 . .	32.7	247 05.7 . .	51.7	137 01.9 . .	01.7	Menkent	148 07.6	S36 26.1
22	14 18.4	104 47.8	08.6	210 18.4	32.2	262 08.1	51.7	152 04.1	01.8	Miaplacidus	221 39.6	S69 46.2
23	29 20.9	119 47.5	08.7	225 19.5	31.7	277 10.5	51.7	167 06.3	01.9			
5 00	44 23.3	134 47.2	S27 08.7	240 20.6	N 8 31.1	292 13.0	N21 51.7	182 08.4	S14 02.0	Mirfak	308 39.4	N49 54.5
01	59 25.8	149 47.0	08.8	255 21.7	30.6	307 15.4	51.7	197 10.6	02.0	Nunki	75 58.2	S26 16.6
02	74 28.3	164 46.7	08.8	270 22.8	30.1	322 17.9	51.8	212 12.8	02.1	Peacock	53 19.0	S56 41.5
03	89 30.7	179 46.4 . .	08.8	285 23.9 . .	29.6	337 20.3 . .	51.8	227 14.9 . .	02.2	Pollux	243 27.3	N27 59.3
04	104 33.2	194 46.1	08.9	300 25.1	29.0	352 22.8	51.8	242 17.1	02.3	Procyon	244 59.4	N 5 11.2
05	119 35.6	209 45.9	08.9	315 26.2	28.5	7 25.2	51.8	257 19.3	02.4			
06	134 38.1	224 45.6	S27 08.9	330 27.3	N 8 28.0	22 27.7	N21 51.8	272 21.4	S14 02.5	Rasalhague	96 06.5	N12 33.3
07	149 40.6	239 45.4	09.0	345 28.4	27.5	37 30.1	51.8	287 23.6	02.6	Regulus	207 43.4	N11 53.9
T 08	164 43.0	254 45.1	09.0	0 29.5	26.9	52 32.5	51.8	302 25.8	02.7	Rigel	281 11.5	S 8 11.2
U 09	179 45.5	269 44.8 . .	09.1	15 30.7 . .	26.4	67 35.0 . .	51.8	317 28.0 . .	02.8	Rigil Kent.	139 52.0	S60 53.4
E 10	194 48.0	284 44.6	09.1	30 31.8	25.9	82 37.4	51.8	332 30.1	02.8	Sabik	102 12.5	S15 44.3
S 11	209 50.4	299 44.3	09.1	45 32.9	25.3	97 39.9	51.8	347 32.3	02.9			
D 12	224 52.9	314 44.0	S27 09.1	60 34.0	N 8 24.8	112 42.3	N21 51.8	2 34.5	S14 03.0	Schedar	349 39.7	N56 37.0
A 13	239 55.4	329 43.8	09.2	75 35.1	24.3	127 44.8	51.8	17 36.6	03.1	Shaula	96 21.9	S37 06.7
Y 14	254 57.8	344 43.5	09.2	90 36.2	23.8	142 47.2	51.8	32 38.8	03.2	Sirius	258 33.3	S16 44.1
15	270 00.3	359 43.3 . .	09.2	105 37.4 . .	23.2	157 49.7 . .	51.8	47 41.0 . .	03.3	Spica	158 31.3	S11 13.9
16	285 02.8	14 43.0	09.3	120 38.5	22.7	172 52.1	51.8	62 43.1	03.4	Suhail	222 52.2	S43 29.2
17	300 05.2	29 42.8	09.3	135 39.6	22.2	187 54.6	51.8	77 45.3	03.5			
18	315 07.7	44 42.5	S27 09.3	150 40.7	N 8 21.7	202 57.0	N21 51.8	92 47.5	S14 03.6	Vega	80 39.0	N38 48.2
19	330 10.1	59 42.3	09.3	165 41.8	21.1	217 59.5	51.8	107 49.6	03.7	Zuben'ubi	137 05.5	S16 05.8
20	345 12.6	74 42.0	09.4	180 43.0	20.6	233 01.9	51.8	122 51.8	03.7		SHA	Mer.Pass.
21	0 15.1	89 41.7 . .	09.4	195 44.1 . .	20.1	248 04.4 . .	51.8	137 54.0 . .	03.8		° ′	h m
22	15 17.5	104 41.5	09.4	210 45.2	19.6	263 06.8	51.8	152 56.1	03.9	Venus	91 29.7	15 01
23	30 20.0	119 41.2	09.4	225 46.3	19.0	278 09.3	51.8	167 58.3	04.0	Mars	196 29.7	8 00
	h m									Jupiter	247 50.3	4 34
Mer. Pass.	21 02.9	v −0.3	d 0.1	v 1.1	d 0.5	v 2.4	d 0.0	v 2.2	d 0.1	Saturn	137 52.2	11 53

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 3	Moonrise 4	Moonrise 5	Moonrise 6
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
3 00	184 06.6	S15 02.4	191 03.2	8.5	S13 06.6	8.8	58.9	N 72	06 18	07 43	09 17	09 08	11 49	▬	▬
01	199 06.6	03.2	205 30.7	8.4	13 15.4	8.8	58.9	N 70	06 13	07 29	08 46	08 35	10 34	12 32	13 49
02	214 06.6	04.0	219 58.1	8.3	13 24.2	8.7	58.9	68	06 08	07 16	08 24	08 12	09 57	11 32	12 41
03	229 06.6 . .	04.8	234 25.4	8.3	13 32.9	8.6	58.9	66	06 04	07 06	08 06	07 54	09 30	10 58	12 05
04	244 06.6	05.5	248 52.7	8.2	13 41.5	8.5	59.0	64	06 01	06 58	07 52	07 39	09 10	10 33	11 39
05	259 06.6	06.3	263 19.9	8.1	13 50.0	8.4	59.0	62	05 57	06 51	07 40	07 27	08 54	10 13	11 19
06	274 06.6	S15 07.1	277 47.0	8.0	S13 58.4	8.4	59.0	60	05 54	06 44	07 30	07 17	08 40	09 57	11 02
07	289 06.6	07.9	292 14.0	8.0	14 06.8	8.3	59.0	N 58	05 51	06 38	07 21	07 08	08 29	09 44	10 48
08	304 06.6	08.7	306 41.0	7.9	14 15.1	8.2	59.1	56	05 49	06 33	07 14	07 00	08 18	09 32	10 36
S 09	319 06.6 . .	09.4	321 07.9	7.8	14 23.3	8.1	59.1	54	05 47	06 29	07 07	06 53	08 10	09 22	10 26
U 10	334 06.6	10.2	335 34.7	7.8	14 31.4	8.0	59.1	52	05 44	06 24	07 00	06 47	08 02	09 13	10 16
N 11	349 06.6	11.0	350 01.5	7.6	S14 39.4	8.0	59.1	50	05 42	06 20	06 55	06 41	07 54	09 05	10 08
D 12	4 06.6	S15 11.8						45	05 37	06 12	06 43	06 29	07 39	08 47	09 50
A 13	19 06.6	12.6						N 40	05 32	06 04	06 33	06 19	07 27	08 33	09 36
Y 14	34 06.6	13.3	A total eclipse of the Sun occurs on this date. See page 5.					35	05 27	05 58	06 24	06 10	07 16	08 21	09 24
15	49 06.5 . .	14.1						30	05 23	05 51	06 16	06 03	07 07	08 11	09 13
16	64 06.5	14.9						20	05 14	05 40	06 03	05 50	06 51	07 53	08 54
17	79 06.5	15.7						N 10	05 04	05 29	05 51	05 39	06 37	07 38	08 38
18	94 06.5	S15 16.4	91 06.7	7.2	S15 33.3	7.3	59.3	0	04 54	05 19	05 40	05 28	06 25	07 23	08 23
19	109 06.5	17.2	105 32.9	7.1	15 40.6	7.3	59.3	S 10	04 41	05 07	05 29	05 18	06 12	07 09	08 09
20	124 06.5	18.0	119 59.0	7.0	15 47.9	7.1	59.3	20	04 27	04 54	05 17	05 07	05 58	06 54	07 53
21	139 06.5 . .	18.7	134 25.0	7.0	15 55.0	7.1	59.4	30	04 07	04 37	05 03	04 55	05 43	06 36	07 34
22	154 06.5	19.5	148 51.0	6.9	16 02.1	6.9	59.4	35	03 55	04 28	04 55	04 47	05 34	06 26	07 24
23	169 06.5	20.3	163 16.9	6.8	16 09.0	6.8	59.4	40	03 40	04 16	04 45	04 39	05 23	06 14	07 12
4 00	184 06.5	S15 21.1	177 42.7	6.8	S16 15.8	6.8	59.4	45	03 22	04 02	04 34	04 30	05 12	06 01	06 57
01	199 06.5	21.8	192 08.5	6.7	16 22.6	6.6	59.5	S 50	02 57	03 44	04 21	04 18	04 57	05 44	06 40
02	214 06.5	22.6	206 34.2	6.6	16 29.2	6.6	59.5	52	02 45	03 36	04 15	04 13	04 50	05 36	06 32
03	229 06.5 . .	23.4	220 59.8	6.6	16 35.8	6.4	59.5	54	02 31	03 26	04 08	04 07	04 43	05 28	06 22
04	244 06.5	24.1	235 25.4	6.5	16 42.2	6.3	59.5	56	02 14	03 16	04 00	04 01	04 35	05 18	06 12
05	259 06.4	24.9	249 50.9	6.4	16 48.5	6.3	59.5	58	01 52	03 03	03 52	03 54	04 26	05 07	06 00
06	274 06.4	S15 25.7	264 16.3	6.4	S16 54.8	6.1	59.5	S 60	01 23	02 48	03 42	03 46	04 15	04 54	05 47
07	289 06.4	26.4	278 41.7	6.3	17 00.9	6.0	59.6								
08	304 06.4	27.2	293 07.0	6.3	17 06.9	5.9	59.6								
M 09	319 06.4 . .	28.0	307 32.3	6.2	17 12.8	5.8	59.6								
O 10	334 06.4	28.7	321 57.5	6.1	17 18.6	5.7	59.6								
N 11	349 06.4	29.5	336 22.6	6.1	17 24.3	5.5	59.6								
D 12	4 06.4	S15 30.3	350 47.7	6.0	S17 29.8	5.5	59.6								
A 13	19 06.4	31.0	5 12.7	6.0	17 35.3	5.3	59.7								
Y 14	34 06.3	31.8	19 37.7	5.9	17 40.6	5.2	59.7								
15	49 06.3 . .	32.6	34 02.6	5.9	17 45.8	5.1	59.7								
16	64 06.3	33.3	48 27.5	5.8	17 50.9	5.0	59.7								
17	79 06.3	34.1	62 52.3	5.7	17 55.9	4.9	59.7								
18	94 06.3	S15 34.9	77 17.0	5.7	S18 00.8	4.7	59.7								
19	109 06.3	35.6	91 41.7	5.7	18 05.5	4.7	59.8								
20	124 06.3	36.4	106 06.4	5.6	18 10.2	4.5	59.8								
21	139 06.2 . .	37.2	120 31.0	5.6	18 14.7	4.3	59.8								
22	154 06.2	37.9	134 55.6	5.5	18 19.0	4.3	59.8								
23	169 06.2	38.7	149 20.1	5.4	18 23.3	4.1	59.8								
5 00	184 06.2	S15 39.4	163 44.5	5.5	S18 27.4	4.1	59.8								
01	199 06.2	40.2	178 09.0	5.4	18 31.5	3.8	59.8								
02	214 06.2	41.0	192 33.4	5.3	18 35.3	3.8	59.8								
03	229 06.1 . .	41.7	206 57.7	5.3	18 39.1	3.6	59.9								
04	244 06.1	42.5	221 22.0	5.3	18 42.7	3.5	59.9								
05	259 06.1	43.2	235 46.3	5.2	18 46.2	3.4	59.9								
06	274 06.1	S15 44.0	250 10.5	5.2	S18 49.6	3.2	59.9								
07	289 06.1	44.8	264 34.7	5.2	18 52.8	3.2	59.9								
T 08	304 06.0	45.5	278 58.9	5.1	18 56.0	3.0	59.9								
U 09	319 06.0 . .	46.3	293 23.0	5.1	18 59.0	2.8	59.9								
E 10	334 06.0	47.0	307 47.1	5.0	19 01.8	2.7	59.9								
S 11	349 06.0	47.8	322 11.1	5.1	19 04.5	2.6	59.9								
D 12	4 06.0	S15 48.5	336 35.2	5.0	S19 07.1	2.5	59.9								
A 13	19 05.9	49.3	350 59.2	5.0	19 09.6	2.3	59.9								
Y 14	34 05.9	50.0	5 23.2	4.9	19 11.9	2.2	60.0								
15	49 05.9 . .	50.8	19 47.1	5.0	19 14.1	2.1	60.0								
16	64 05.9	51.5	34 11.1	4.9	19 16.2	1.9	60.0								
17	79 05.8	52.3	48 35.0	4.9	19 18.1	1.8	60.0								
18	94 05.8	S15 53.1	62 58.9	4.9	S19 19.9	1.6	60.0								
19	109 05.8	53.8	77 22.8	4.8	19 21.5	1.5	60.0								
20	124 05.8	54.6	91 46.6	4.9	19 23.0	1.4	60.0								
21	139 05.8 . .	55.3	106 10.5	4.8	19 24.4	1.3	60.0								
22	154 05.7	56.1	120 34.3	4.8	19 25.7	1.1	60.0								
23	169 05.7	56.8	134 58.1	4.8	S19 26.8	1.0	60.0								
	SD 16.2	d 0.8	SD	16.1		16.3									

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 3	Moonset 4	Moonset 5	Moonset 6
°	h m	h m	h m	h m	h m	h m	h m
N 72	14 09	15 42	17 07	14 00	13 18	▬	▬
N 70	14 39	15 57	17 13	14 33	14 33	14 39	15 29
68	15 02	16 09	17 17	14 58	15 11	15 39	16 36
66	15 20	16 20	17 22	15 17	15 38	16 14	17 12
64	15 34	16 28	17 25	15 32	15 59	16 39	17 38
62	15 46	16 36	17 29	15 45	16 16	16 59	17 58
60	15 56	16 42	17 32	15 56	16 30	17 15	18 15
N 58	16 05	16 48	17 35	16 06	16 42	17 29	18 29
56	16 13	16 53	17 37	16 14	16 52	17 41	18 41
54	16 20	16 58	17 40	16 22	17 02	17 51	18 51
52	16 26	17 02	17 42	16 29	17 10	18 00	19 00
50	16 32	17 06	17 44	16 35	17 17	18 08	19 09
45	16 44	17 15	17 50	16 48	17 33	18 26	19 26
N 40	16 54	17 22	17 55	16 59	17 46	18 40	19 41
35	17 03	17 29	17 59	17 08	17 57	18 52	19 53
30	17 11	17 35	18 04	17 16	18 07	19 03	20 03
20	17 24	17 47	18 13	17 31	18 24	19 21	20 22
N 10	17 36	17 58	18 23	17 43	18 39	19 37	20 37
0	17 47	18 09	18 33	17 55	18 52	19 52	20 52
S 10	17 58	18 20	18 46	18 06	19 06	20 07	21 07
20	18 11	18 34	19 01	18 19	19 21	20 22	21 23
30	18 25	18 50	19 21	18 33	19 38	20 41	21 41
35	18 33	19 00	19 33	18 42	19 47	20 51	21 51
40	18 42	19 12	19 48	18 51	19 59	21 03	22 03
45	18 54	19 26	20 07	19 02	20 12	21 18	22 17
S 50	19 07	19 44	20 32	19 16	20 28	21 35	22 34
52	19 13	19 53	20 44	19 22	20 35	21 43	22 42
54	19 20	20 02	20 59	19 29	20 44	21 52	22 51
56	19 28	20 13	21 16	19 37	20 53	22 02	23 01
58	19 37	20 26	21 39	19 46	21 04	22 14	23 12
S 60	19 47	20 42	22 09	19 56	21 16	22 28	23 26

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
3	16 26	16 26	11 44	11 41	24 10	29	0
4	16 26	16 25	11 44	12 38	00 10	01	1
5	16 25	16 24	11 44	13 38	01 08	02	5

UT	ARIES	VENUS −4.6		MARS +1.4		JUPITER −2.4		SATURN +0.5		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
6 00	45 22.5	134 41.0	S27 09.4	240 47.5	N 8 18.5	293 11.7	N21 51.8	183 00.5	S14 04.1	Acamar	315 17.7	S40 15.0
01	60 24.9	149 40.7	09.4	255 48.6	18.0	308 14.2	51.8	198 02.7	04.2	Achernar	335 26.1	S57 10.1
02	75 27.4	164 40.5	09.5	270 49.7	17.5	323 16.6	51.8	213 04.8	04.3	Acrux	173 09.4	S63 10.4
03	90 29.9	179 40.2	09.5	285 50.8	16.9	338 19.1	51.8	228 07.0	04.4	Adhara	255 12.1	S28 59.4
04	105 32.3	194 40.0	09.5	300 51.9	16.4	353 21.6	51.8	243 09.2	04.5	Aldebaran	290 48.8	N16 32.1
05	120 34.8	209 39.8	09.5	315 53.1	15.9	8 24.0	51.8	258 11.3	04.5			
06	135 37.3	224 39.5	S27 09.5	330 54.2	N 8 15.3	23 26.5	N21 51.8	273 13.5	S14 04.6	Alioth	166 21.0	N55 53.0
W 07	150 39.7	239 39.3	09.5	345 55.3	14.8	38 28.9	51.8	288 15.7	04.7	Alkaid	152 59.2	N49 14.6
E 08	165 42.2	254 39.0	09.5	0 56.4	14.3	53 31.4	51.8	303 17.8	04.8	Al Na'ir	27 43.3	S46 53.7
D 09	180 44.6	269 38.8	09.5	15 57.6	13.8	68 33.8	51.9	318 20.0	04.9	Alnilam	275 45.8	S 1 11.7
N 10	195 47.1	284 38.5	09.6	30 58.7	13.2	83 36.3	51.9	333 22.2	05.0	Alphard	217 55.9	S 8 43.1
E 11	210 49.6	299 38.3	09.6	45 59.8	12.7	98 38.7	51.9	348 24.3	05.1			
S 12	225 52.0	314 38.1	S27 09.6	61 00.9	N 8 12.2	113 41.2	N21 51.9	3 26.5	S14 05.2	Alphecca	126 11.2	N26 40.3
D 13	240 54.5	329 37.8	09.6	76 02.0	11.7	128 43.7	51.9	18 28.7	05.3	Alpheratz	357 42.9	N29 10.3
A 14	255 57.0	344 37.6	09.6	91 03.2	11.1	143 46.1	51.9	33 30.8	05.3	Altair	62 08.1	N 8 54.6
Y 15	270 59.4	359 37.4	09.6	106 04.3	10.6	158 48.6	51.9	48 33.0	05.4	Ankaa	353 15.1	S42 13.9
16	286 01.9	14 37.1	09.6	121 05.4	10.1	173 51.0	51.9	63 35.2	05.5	Antares	112 26.3	S26 27.6
17	301 04.4	29 36.9	09.6	136 06.5	09.6	188 53.5	51.9	78 37.4	05.6			
18	316 06.8	44 36.6	S27 09.6	151 07.7	N 8 09.0	203 55.9	N21 51.9	93 39.5	S14 05.7	Arcturus	145 55.8	N19 06.7
19	331 09.3	59 36.4	09.6	166 08.8	08.5	218 58.4	51.9	108 41.7	05.8	Atria	107 28.3	S69 03.1
20	346 11.8	74 36.2	09.6	181 09.9	08.0	234 00.9	51.9	123 43.9	05.9	Avior	234 17.7	S59 33.1
21	1 14.2	89 36.0	09.6	196 11.0	07.4	249 03.3	51.9	138 46.0	06.0	Bellatrix	278 31.4	N 6 21.6
22	16 16.7	104 35.7	09.6	211 12.2	06.9	264 05.8	51.9	153 48.2	06.1	Betelgeuse	271 00.8	N 7 24.5
23	31 19.1	119 35.5	09.6	226 13.3	06.4	279 08.3	51.9	168 50.4	06.1			
7 00	46 21.6	134 35.3	S27 09.6	241 14.4	N 8 05.9	294 10.7	N21 51.9	183 52.5	S14 06.2	Canopus	263 55.7	S52 42.1
01	61 24.1	149 35.0	09.5	256 15.5	05.3	309 13.2	51.9	198 54.7	06.3	Capella	280 33.6	N46 00.5
02	76 26.5	164 34.8	09.5	271 16.7	04.8	324 15.6	51.9	213 56.9	06.4	Deneb	49 31.3	N45 20.3
03	91 29.0	179 34.6	09.5	286 17.8	04.3	339 18.1	51.9	228 59.0	06.5	Denebola	182 33.6	N14 29.6
04	106 31.5	194 34.4	09.5	301 18.9	03.8	354 20.6	51.9	244 01.2	06.6	Diphda	348 55.4	S17 54.6
05	121 33.9	209 34.1	09.5	316 20.1	03.2	9 23.0	51.9	259 03.4	06.7			
06	136 36.4	224 33.9	S27 09.5	331 21.2	N 8 02.7	24 25.5	N21 52.0	274 05.5	S14 06.8	Dubhe	193 51.8	N61 40.3
T 07	151 38.9	239 33.7	09.5	346 22.3	02.2	39 28.0	52.0	289 07.7	06.9	Elnath	278 12.0	N28 37.0
H 08	166 41.3	254 33.5	09.5	1 23.4	01.7	54 30.4	52.0	304 09.9	06.9	Eltanin	90 46.4	N51 29.6
U 09	181 43.8	269 33.2	09.4	16 24.6	01.1	69 32.9	52.0	319 12.1	07.0	Enif	33 46.8	N 9 56.6
R 10	196 46.3	284 33.0	09.4	31 25.7	00.6	84 35.3	52.0	334 14.2	07.1	Fomalhaut	15 23.6	S29 32.9
S 11	211 48.7	299 32.8	09.4	46 26.8	8 00.1	99 37.8	52.0	349 16.4	07.2			
D 12	226 51.2	314 32.6	S27 09.4	61 27.9	N 7 59.6	114 40.3	N21 52.0	4 18.6	S14 07.3	Gacrux	172 01.0	S57 11.2
A 13	241 53.6	329 32.4	09.4	76 29.1	59.0	129 42.7	52.0	19 20.7	07.4	Gienah	175 52.3	S17 37.0
Y 14	256 56.1	344 32.2	09.4	91 30.2	58.5	144 45.2	52.0	34 22.9	07.5	Hadar	148 48.1	S60 26.2
15	271 58.6	359 31.9	09.3	106 31.3	58.0	159 47.7	52.0	49 25.1	07.6	Hamal	328 00.1	N23 31.8
16	287 01.0	14 31.7	09.3	121 32.5	57.4	174 50.1	52.0	64 27.2	07.7	Kaus Aust.	83 43.7	S34 22.5
17	302 03.5	29 31.5	09.3	136 33.6	56.9	189 52.6	52.0	79 29.4	07.7			
18	317 06.0	44 31.3	S27 09.3	151 34.7	N 7 56.4	204 55.1	N21 52.0	94 31.6	S14 07.8	Kochab	137 21.4	N74 06.0
19	332 08.4	59 31.1	09.2	166 35.8	55.9	219 57.5	52.0	109 33.7	07.9	Markab	13 37.9	N15 17.1
20	347 10.9	74 30.9	09.2	181 37.0	55.3	235 00.0	52.0	124 35.9	08.0	Menkar	314 14.4	N 4 08.6
21	2 13.4	89 30.7	09.2	196 38.1	54.8	250 02.5	52.0	139 38.1	08.1	Menkent	148 07.6	S36 26.1
22	17 15.8	104 30.5	09.1	211 39.2	54.3	265 05.0	52.0	154 40.2	08.2	Miaplacidus	221 39.5	S69 46.2
23	32 18.3	119 30.3	09.1	226 40.4	53.8	280 07.4	52.0	169 42.4	08.3			
8 00	47 20.7	134 30.1	S27 09.1	241 41.5	N 7 53.2	295 09.9	N21 52.1	184 44.6	S14 08.4	Mirfak	308 39.4	N49 54.6
01	62 23.2	149 29.9	09.1	256 42.6	52.7	310 12.4	52.1	199 46.8	08.5	Nunki	75 58.2	S26 16.6
02	77 25.7	164 29.7	09.0	271 43.8	52.2	325 14.8	52.1	214 48.9	08.5	Peacock	53 19.0	S56 41.5
03	92 28.1	179 29.5	09.0	286 44.9	51.7	340 17.3	52.1	229 51.1	08.6	Pollux	243 27.3	N27 59.3
04	107 30.6	194 29.3	09.0	301 46.0	51.1	355 19.8	52.1	244 53.3	08.7	Procyon	244 59.3	N 5 11.2
05	122 33.1	209 29.1	08.9	316 47.2	50.6	10 22.2	52.1	259 55.4	08.8			
06	137 35.5	224 28.9	S27 08.9	331 48.3	N 7 50.1	25 24.7	N21 52.1	274 57.6	S14 08.9	Rasalhague	96 06.5	N12 33.3
07	152 38.0	239 28.7	08.8	346 49.4	49.6	40 27.2	52.1	289 59.8	09.0	Regulus	207 43.3	N11 53.9
F 08	167 40.5	254 28.5	08.8	1 50.6	49.0	55 29.7	52.1	305 01.9	09.1	Rigel	281 11.5	S 8 11.2
R 09	182 42.9	269 28.3	08.8	16 51.7	48.5	70 32.1	52.1	320 04.1	09.2	Rigil Kent.	139 52.0	S60 53.3
I 10	197 45.4	284 28.1	08.7	31 52.8	48.0	85 34.6	52.1	335 06.3	09.3	Sabik	102 12.5	S15 44.3
D 11	212 47.9	299 27.9	08.7	46 53.9	47.4	100 37.1	52.1	350 08.4	09.3			
A 12	227 50.3	314 27.7	S27 08.6	61 55.1	N 7 46.9	115 39.6	N21 52.1	5 10.6	S14 09.4	Schedar	349 39.7	N56 37.0
Y 13	242 52.8	329 27.5	08.6	76 56.2	46.4	130 42.0	52.1	20 12.8	09.5	Shaula	96 21.9	S37 06.7
14	257 55.2	344 27.3	08.5	91 57.3	45.9	145 44.5	52.1	35 14.9	09.6	Sirius	258 33.3	S16 44.1
15	272 57.7	359 27.1	08.5	106 58.5	45.3	160 47.0	52.2	50 17.1	09.7	Spica	158 31.3	S11 13.9
16	288 00.2	14 26.9	08.5	121 59.6	44.8	175 49.5	52.2	65 19.3	09.8	Suhail	222 52.2	S43 29.2
17	303 02.6	29 26.7	08.4	137 00.7	44.3	190 51.9	52.2	80 21.5	09.9			
18	318 05.1	44 26.5	S27 08.4	152 01.9	N 7 43.8	205 54.4	N21 52.2	95 23.6	S14 10.0	Vega	80 39.0	N38 48.2
19	333 07.6	59 26.3	08.3	167 03.0	43.2	220 56.9	52.2	110 25.8	10.0	Zuben'ubi	137 05.4	S16 05.8
20	348 10.0	74 26.2	08.3	182 04.2	42.7	235 59.4	52.2	125 28.0	10.1			
21	3 12.5	89 26.0	08.2	197 05.3	42.2	251 01.9	52.2	140 30.1	10.2		SHA	Mer. Pass.
22	18 15.0	104 25.8	08.2	212 06.4	41.7	266 04.3	52.2	155 32.3	10.3		° ′	h m
23	33 17.4	119 25.6	08.1	227 07.6	41.1	281 06.8	52.2	170 34.5	10.4	Venus	88 13.7	15 02
	h m									Mars	194 52.8	7 54
Mer. Pass.	20 51.1	v −0.2	d 0.0	v 1.1	d 0.5	v 2.5	d 0.0	v 2.2	d 0.1	Jupiter	247 49.1	4 23
										Saturn	137 30.9	11 43

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		6	7	8	9
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
6 00	184 05.7	S15 57.6	149 21.9	4.8	S19 27.8	0.8	60.0	N 72	06 30	07 57	09 39	▬	▬	14 47	14 27
01	199 05.7	58.3	163 45.7	4.8	19 28.6	0.7	60.0	N 70	06 23	07 40	09 02	13 49	14 03	14 04	14 03
02	214 05.6	59.1	178 09.5	4.8	19 29.3	0.6	60.0	68	06 17	07 27	08 37	12 41	13 18	13 36	13 44
03	229 05.6	15 59.8	192 33.3	4.8	19 29.9	0.4	60.0	66	06 13	07 16	08 18	12 05	12 48	13 14	13 29
04	244 05.6	16 00.6	206 57.1	4.8	19 30.3	0.3	60.0	64	06 08	07 06	08 02	11 39	12 26	12 56	13 17
05	259 05.5	01.3	221 20.9	4.8	19 30.6	0.2	60.0	62	06 04	06 58	07 49	11 19	12 08	12 42	13 07
06	274 05.5	S16 02.0	235 44.7	4.8	S19 30.8	0.0	60.0	60	06 01	06 51	07 38	11 02	11 53	12 30	12 58
W 07	289 05.5	02.8	250 08.5	4.7	19 30.8	0.1	60.0	N 58	05 57	06 45	07 28	10 48	11 40	12 19	12 50
E 08	304 05.5	03.5	264 32.2	4.8	19 30.7	0.3	60.0	56	05 54	06 39	07 20	10 36	11 29	12 10	12 43
D 09	319 05.4	04.3	278 56.0	4.8	19 30.4	0.4	60.0	54	05 52	06 34	07 12	10 26	11 19	12 02	12 36
N 10	334 05.4	05.0	293 19.8	4.8	19 30.0	0.5	60.0	52	05 49	06 29	07 06	10 16	11 10	11 55	12 31
E 11	349 05.4	05.8	307 43.6	4.8	19 29.5	0.7	60.0	50	05 46	06 25	07 00	10 08	11 02	11 48	12 26
S 12	4 05.3	S16 06.5	322 07.4	4.9	S19 28.8	0.8	60.0	45	05 41	06 16	06 47	09 50	10 46	11 34	12 15
D 13	19 05.3	07.3	336 31.3	4.8	19 28.0	0.9	60.0	N 40	05 35	06 07	06 36	09 36	10 32	11 22	12 05
A 14	34 05.3	08.0	350 55.1	4.8	19 27.1	1.1	60.0	35	05 30	06 00	06 27	09 24	10 21	11 12	11 57
Y 15	49 05.3	08.7	5 18.9	4.9	19 26.0	1.2	60.0	30	05 25	05 54	06 19	09 13	10 10	11 03	11 50
16	64 05.2	09.5	19 42.8	4.9	19 24.8	1.4	60.0	20	05 15	05 42	06 04	08 54	09 53	10 48	11 38
17	79 05.2	10.2	34 06.7	4.9	19 23.4	1.4	60.0	N 10	05 05	05 30	05 52	08 38	09 38	10 34	11 28
18	94 05.2	S16 11.0	48 30.6	4.9	S19 22.0	1.7	60.0	0	04 54	05 19	05 40	08 23	09 23	10 22	11 18
19	109 05.1	11.7	62 54.5	4.9	19 20.3	1.7	60.0	S 10	04 41	05 06	05 28	08 09	09 09	10 09	11 08
20	124 05.1	12.5	77 18.4	4.9	19 18.6	1.9	60.0	20	04 25	04 52	05 15	07 53	08 54	09 56	10 57
21	139 05.1	13.2	91 42.3	5.0	19 16.7	2.0	60.0	30	04 05	04 35	05 01	07 34	08 37	09 41	10 45
22	154 05.0	13.9	106 06.3	5.0	19 14.7	2.2	60.0	35	03 52	04 25	04 52	07 24	08 26	09 32	10 38
23	169 05.0	14.7	120 30.3	5.0	19 12.5	2.3	60.0	40	03 36	04 12	04 42	07 12	08 15	09 21	10 30
7 00	184 05.0	S16 15.4	134 54.3	5.1	S19 10.2	2.4	60.0	45	03 17	03 58	04 30	06 57	08 01	09 09	10 20
01	199 04.9	16.2	149 18.4	5.1	19 07.8	2.5	60.0	S 50	02 51	03 39	04 16	06 40	07 44	08 55	10 09
02	214 04.9	16.9	163 42.5	5.1	19 05.3	2.7	60.0	52	02 38	03 30	04 10	06 32	07 36	08 48	10 03
03	229 04.9	17.6	178 06.6	5.1	19 02.6	2.8	60.0	54	02 22	03 20	04 02	06 22	07 28	08 40	09 57
04	244 04.8	18.4	192 30.7	5.2	18 59.8	3.0	60.0	56	02 03	03 08	03 54	06 12	07 18	08 32	09 51
05	259 04.8	19.1	206 54.9	5.2	18 56.8	3.0	60.0	58	01 39	02 54	03 45	06 00	07 07	08 22	09 44
06	274 04.8	S16 19.8	221 19.1	5.2	S18 53.8	3.2	59.9	S 60	01 04	02 38	03 34	05 47	06 54	08 11	09 35
T 07	289 04.7	20.6	235 43.3	5.3	18 50.6	3.4	59.9								
H 08	304 04.7	21.3	250 07.6	5.3	18 47.2	3.4	59.9								
U 09	319 04.6	22.0	264 31.9	5.4	18 43.8	3.6	59.9								
R 10	334 04.6	22.8	278 56.3	5.4	18 40.2	3.7	59.9								
S 11	349 04.6	23.5	293 20.7	5.4	18 36.5	3.9	59.9								
D 12	4 04.5	S16 24.2	307 45.1	5.5	S18 32.6	3.9	59.9								
A 13	19 04.5	25.0	322 09.6	5.5	18 28.7	4.1	59.9								
Y 14	34 04.5	25.7	336 34.1	5.6	18 24.6	4.3	59.9								
15	49 04.4	26.4	350 58.7	5.6	18 20.3	4.3	59.9								
16	64 04.4	27.2	5 23.3	5.7	18 16.0	4.5	59.9								
17	79 04.3	27.9	19 48.0	5.7	18 11.5	4.5	59.9								
18	94 04.3	S16 28.6	34 12.7	5.7	S18 07.0	4.7	59.8								
19	109 04.3	29.4	48 37.4	5.8	18 02.3	4.9	59.8								
20	124 04.2	30.1	63 02.2	5.9	17 57.4	4.9	59.8								
21	139 04.2	30.8	77 27.1	5.9	17 52.5	5.1	59.8								
22	154 04.1	31.5	91 52.0	5.9	17 47.4	5.1	59.8								
23	169 04.1	32.3	106 16.9	6.0	17 42.3	5.3	59.8								
8 00	184 04.0	S16 33.0	120 41.9	6.1	S17 37.0	5.4	59.8								
01	199 04.0	33.7	135 07.0	6.1	17 31.6	5.5	59.8								
02	214 04.0	34.4	149 32.1	6.2	17 26.1	5.7	59.8								
03	229 03.9	35.2	163 57.3	6.2	17 20.4	5.7	59.8								
04	244 03.9	35.9	178 22.5	6.3	17 14.7	5.9	59.7								
05	259 03.8	36.6	192 47.8	6.3	17 08.8	5.9	59.7								
06	274 03.8	S16 37.3	207 13.1	6.4	S17 02.9	6.1	59.7								
F 07	289 03.7	38.1	221 38.5	6.5	16 56.8	6.2	59.7								
R 08	304 03.7	38.8	236 04.0	6.5	16 50.6	6.3	59.7								
I 09	319 03.6	39.5	250 29.5	6.6	16 44.3	6.4	59.7								
D 10	334 03.6	40.2	264 55.1	6.6	16 37.9	6.5	59.7								
A 11	349 03.6	41.0	279 20.7	6.7	16 31.4	6.6	59.6								
Y 12	4 03.5	S16 41.7	293 46.4	6.8	S16 24.8	6.7	59.6								
13	19 03.5	42.4	308 12.2	6.8	16 18.1	6.8	59.6								
14	34 03.4	43.1	322 38.0	6.9	16 11.3	6.9	59.6								
15	49 03.4	43.8	337 03.9	6.9	16 04.4	7.1	59.6								
16	64 03.3	44.6	351 29.8	7.0	15 57.3	7.1	59.6								
17	79 03.3	45.3	5 55.8	7.1	15 50.2	7.2	59.6								
18	94 03.2	S16 46.0	20 21.9	7.1	S15 43.0	7.3	59.5								
19	109 03.2	46.7	34 48.0	7.2	15 35.7	7.4	59.5								
20	124 03.1	47.4	49 14.2	7.3	15 28.3	7.5	59.5								
21	139 03.1	48.2	63 40.5	7.3	15 20.8	7.6	59.5								
22	154 03.0	48.9	78 06.8	7.4	15 13.2	7.6	59.5								
23	169 03.0	49.6	92 33.2	7.4	S15 05.6	7.8	59.5								
	SD 16.2	d 0.7	SD	16.4		16.3		16.2							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	6	7	8	9
°	h m	h m	h m	h m	h m	h m	h m
N 72	13 47	15 29	16 56	▬	▬	18 38	20 53
N 70	14 24	15 46	17 03	15 29	17 19	19 19	21 15
68	14 49	15 59	17 09	16 36	18 04	19 47	21 32
66	15 09	16 11	17 14	17 12	18 33	20 08	21 46
64	15 25	16 20	17 18	17 38	18 56	20 24	21 57
62	15 38	16 28	17 22	17 58	19 13	20 38	22 07
60	15 49	16 35	17 26	18 15	19 28	20 50	22 15
N 58	15 58	16 42	17 29	18 29	19 40	21 00	22 22
56	16 07	16 47	17 32	18 41	19 51	21 08	22 29
54	16 14	16 53	17 35	18 51	20 01	21 16	22 34
52	16 21	16 57	17 38	19 00	20 09	21 23	22 39
50	16 27	17 02	17 40	19 09	20 17	21 29	22 44
45	16 40	17 11	17 46	19 26	20 33	21 43	22 54
N 40	16 51	17 19	17 52	19 41	20 46	21 54	23 02
35	17 00	17 27	17 57	19 53	20 57	22 03	23 09
30	17 08	17 33	18 02	20 03	21 07	22 11	23 15
20	17 23	17 46	18 12	20 22	21 23	22 25	23 25
N 10	17 35	17 57	18 22	20 37	21 38	22 37	23 35
0	17 47	18 09	18 34	20 52	21 52	22 49	23 43
S 10	17 59	18 21	18 47	21 07	22 05	23 00	23 52
20	18 12	18 35	19 03	21 23	22 19	23 12	24 01
30	18 27	18 53	19 23	21 41	22 36	23 26	24 11
35	18 36	19 03	19 36	21 51	22 45	23 34	24 17
40	18 46	19 16	19 52	22 03	22 56	23 42	24 23
45	18 58	19 31	20 12	22 17	23 09	23 53	24 31
S 50	19 12	19 50	20 38	22 34	23 24	24 05	00 05
52	19 19	19 59	20 52	22 42	23 31	24 11	00 11
54	19 26	20 09	21 08	22 51	23 39	24 18	00 18
56	19 35	20 21	21 27	23 01	23 48	24 25	00 25
58	19 44	20 35	21 52	23 12	23 58	24 33	00 33
S 60	19 55	20 52	22 29	23 26	24 09	00 09	00 42

Day	SUN		MOON		
	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase
	00h	12h	Pass.	Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
6	16 23	16 21	11 44	14 38	02 08	03	12
7	16 20	16 18	11 44	15 38	03 08	04	20
8	16 16	16 14	11 44	16 35	04 07	05	31

UT	ARIES	VENUS −4.8		MARS +1.3		JUPITER −2.6		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
27 00	66 04.4	135 19.8	S25 21.0	250 36.7	N 3 55.8	314 34.4	N22 00.3	201 14.5	S14 47.1
01	81 06.9	150 20.3	20.6	265 37.9	55.3	329 37.1	00.3	216 16.7	47.1
02	96 09.3	165 20.8	20.2	280 39.1	54.7	344 39.7	00.3	231 18.9	47.2
03	111 11.8	180 21.3	19.7	295 40.3	54.2	359 42.4	00.4	246 21.0	47.3
04	126 14.2	195 21.9	19.3	310 41.5	53.7	14 45.0	00.4	261 23.2	47.4
05	141 16.7	210 22.4	18.9	325 42.8	53.2	29 47.6	00.4	276 25.4	47.5
06	156 19.2	225 22.9	S25 18.5	340 44.0	N 3 52.7	44 50.3	N22 00.5	291 27.6	S14 47.5
W 07	171 21.6	240 23.4	18.1	355 45.2	52.2	59 52.9	00.5	306 29.7	47.6
E 08	186 24.1	255 24.0	17.7	10 46.4	51.7	74 55.5	00.5	321 31.9	47.7
D 09	201 26.6	270 24.5	17.2	25 47.6	51.2	89 58.2	00.5	336 34.1	47.8
N 10	216 29.0	285 25.1	16.8	40 48.8	50.7	105 00.8	00.6	351 36.3	47.9
E 11	231 31.5	300 25.6	16.4	55 50.1	50.1	120 03.5	00.6	6 38.4	47.9
S 12	246 34.0	315 26.1	S25 16.0	70 51.3	N 3 49.6	135 06.1	N22 00.6	21 40.6	S14 48.0
D 13	261 36.4	330 26.7	15.6	85 52.5	49.1	150 08.7	00.7	36 42.8	48.1
A 14	276 38.9	345 27.2	15.1	100 53.7	48.6	165 11.4	00.7	51 45.0	48.2
Y 15	291 41.3	0 27.8	14.7	115 54.9	48.1	180 14.0	00.7	66 47.2	48.3
16	306 43.8	15 28.3	14.3	130 56.2	47.6	195 16.7	00.8	81 49.3	48.3
17	321 46.3	30 28.9	13.9	145 57.4	47.1	210 19.3	00.8	96 51.5	48.4
18	336 48.7	45 29.5	S25 13.5	160 58.6	N 3 46.6	225 21.9	N22 00.8	111 53.7	S14 48.5
19	351 51.2	60 30.0	13.0	175 59.8	46.1	240 24.6	00.8	126 55.9	48.6
20	6 53.7	75 30.6	12.6	191 01.0	45.6	255 27.2	00.9	141 58.0	48.7
21	21 56.1	90 31.2	12.2	206 02.3	45.1	270 29.9	00.9	157 00.2	48.7
22	36 58.6	105 31.7	11.8	221 03.5	44.5	285 32.5	00.9	172 02.4	48.8
23	52 01.1	120 32.3	11.3	236 04.7	44.0	300 35.2	01.0	187 04.6	48.9
28 00	67 03.5	135 32.9	S25 10.9	251 05.9	N 3 43.5	315 37.8	N22 01.0	202 06.7	S14 49.0
01	82 06.0	150 33.4	10.5	266 07.2	43.0	330 40.4	01.0	217 08.9	49.1
02	97 08.5	165 34.0	10.1	281 08.4	42.5	345 43.1	01.1	232 11.1	49.1
03	112 10.9	180 34.6	09.6	296 09.6	42.0	0 45.7	01.1	247 13.3	49.2
04	127 13.4	195 35.2	09.2	311 10.8	41.5	15 48.4	01.1	262 15.5	49.3
05	142 15.8	210 35.8	08.8	326 12.0	41.0	30 51.0	01.2	277 17.6	49.4
06	157 18.3	225 36.3	S25 08.3	341 13.3	N 3 40.5	45 53.7	N22 01.2	292 19.8	S14 49.5
T 07	172 20.8	240 36.9	07.9	356 14.5	40.0	60 56.3	01.2	307 22.0	49.5
H 08	187 23.2	255 37.5	07.5	11 15.7	39.5	75 59.0	01.2	322 24.2	49.6
U 09	202 25.7	270 38.1	07.0	26 16.9	38.9	91 01.6	01.3	337 26.3	49.7
R 10	217 28.2	285 38.7	06.6	41 18.2	38.4	106 04.3	01.3	352 28.5	49.8
S 11	232 30.6	300 39.3	06.2	56 19.4	37.9	121 06.9	01.3	7 30.7	49.9
D 12	247 33.1	315 39.9	S25 05.7	71 20.6	N 3 37.4	136 09.5	N22 01.4	22 32.9	S14 49.9
A 13	262 35.6	330 40.5	05.3	86 21.8	36.9	151 12.2	01.4	37 35.0	50.0
Y 14	277 38.0	345 41.1	04.9	101 23.1	36.4	166 14.8	01.4	52 37.2	50.1
15	292 40.5	0 41.7	04.4	116 24.3	35.9	181 17.5	01.5	67 39.4	50.2
16	307 42.9	15 42.3	04.0	131 25.5	35.4	196 20.1	01.5	82 41.6	50.3
17	322 45.4	30 42.9	03.6	146 26.7	34.9	211 22.8	01.5	97 43.8	50.3
18	337 47.9	45 43.6	S25 03.1	161 28.0	N 3 34.4	226 25.4	N22 01.6	112 45.9	S14 50.4
19	352 50.3	60 44.2	02.7	176 29.2	33.9	241 28.1	01.6	127 48.1	50.5
20	7 52.8	75 44.8	02.3	191 30.4	33.4	256 30.7	01.6	142 50.3	50.6
21	22 55.3	90 45.4	01.8	206 31.6	32.9	271 33.4	01.6	157 52.5	50.7
22	37 57.7	105 46.0	01.4	221 32.9	32.3	286 36.0	01.7	172 54.6	50.7
23	53 00.2	120 46.7	00.9	236 34.1	31.8	301 38.7	01.7	187 56.8	50.8
29 00	68 02.7	135 47.3	S25 00.5	251 35.3	N 3 31.3	316 41.3	N22 01.7	202 59.0	S14 50.9
01	83 05.1	150 47.9	25 00.1	266 36.5	30.8	331 44.0	01.8	218 01.2	51.0
02	98 07.6	165 48.6	24 59.6	281 37.8	30.3	346 46.6	01.8	233 03.4	51.0
03	113 10.1	180 49.2	59.2	296 39.0	29.8	1 49.3	01.8	248 05.5	51.1
04	128 12.5	195 49.8	58.7	311 40.2	29.3	16 52.0	01.9	263 07.7	51.2
05	143 15.0	210 50.5	58.3	326 41.5	28.8	31 54.6	01.9	278 09.9	51.3
06	158 17.4	225 51.1	S24 57.8	341 42.7	N 3 28.3	46 57.3	N22 01.9	293 12.1	S14 51.4
F 07	173 19.9	240 51.8	57.4	356 43.9	27.8	61 59.9	02.0	308 14.2	51.4
R 08	188 22.4	255 52.4	57.0	11 45.1	27.3	77 02.6	02.0	323 16.4	51.5
I 09	203 24.8	270 53.1	56.5	26 46.4	26.8	92 05.2	02.0	338 18.6	51.6
D 10	218 27.3	285 53.7	56.1	41 47.6	26.3	107 07.9	02.1	353 20.8	51.7
A 11	233 29.8	300 54.4	55.6	56 48.8	25.8	122 10.5	02.1	8 23.0	51.8
Y 12	248 32.2	315 55.0	S24 55.2	71 50.1	N 3 25.2	137 13.2	N22 02.1	23 25.1	S14 51.8
13	263 34.7	330 55.7	54.7	86 51.3	24.7	152 15.8	02.2	38 27.3	51.9
14	278 37.2	345 56.4	54.3	101 52.5	24.2	167 18.5	02.2	53 29.5	52.0
15	293 39.6	0 57.0	53.8	116 53.7	23.7	182 21.2	02.2	68 31.7	52.1
16	308 42.1	15 57.7	53.4	131 55.0	23.2	197 23.8	02.2	83 33.8	52.2
17	323 44.6	30 58.4	52.9	146 56.2	22.7	212 26.5	02.3	98 36.0	52.2
18	338 47.0	45 59.0	S24 52.5	161 57.4	N 3 22.2	227 29.1	N22 02.3	113 38.2	S14 52.3
19	353 49.5	60 59.7	52.0	176 58.7	21.7	242 31.8	02.3	128 40.4	52.4
20	8 51.9	76 00.4	51.6	191 59.9	21.2	257 34.4	02.4	143 42.6	52.5
21	23 54.4	91 01.1	51.1	207 01.1	20.7	272 37.1	02.4	158 44.7	52.5
22	38 56.9	106 01.7	50.7	222 02.4	20.2	287 39.8	02.4	173 46.9	52.6
23	53 59.3	121 02.4	50.2	237 03.6	19.7	302 42.4	02.5	188 49.1	52.7
	h m								
Mer. Pass.	19 28.6	v 0.6	d 0.4	v 1.2	d 0.5	v 2.6	d 0.0	v 2.2	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 17.7	S40 15.1
Achernar	335 26.2	S57 10.2
Acrux	173 09.2	S63 10.3
Adhara	255 12.0	S28 59.5
Aldebaran	290 48.7	N16 32.1
Alioth	166 20.9	N55 52.8
Alkaid	152 59.1	N49 14.5
Al Na'ir	27 43.5	S46 53.7
Alnilam	275 45.7	S 1 11.7
Alphard	217 55.7	S 8 43.2
Alphecca	126 11.1	N26 40.2
Alpheratz	357 43.0	N29 10.3
Altair	62 08.2	N 8 54.6
Ankaa	353 15.2	S42 13.9
Antares	112 26.3	S26 27.6
Arcturus	145 55.8	N19 06.6
Atria	107 28.3	S69 03.0
Avior	234 17.5	S59 33.1
Bellatrix	278 31.3	N 6 21.6
Betelgeuse	271 00.7	N 7 24.4
Canopus	263 55.5	S52 42.2
Capella	280 33.5	N46 00.5
Deneb	49 31.5	N45 20.2
Denebola	182 33.5	N14 29.6
Diphda	348 55.4	S17 54.6
Dubhe	193 51.5	N61 40.2
Elnath	278 11.9	N28 37.0
Eltanin	90 46.5	N51 29.5
Enif	33 46.9	N 9 56.6
Fomalhaut	15 23.6	S29 32.9
Gacrux	172 00.8	S57 11.2
Gienah	175 52.1	S17 37.1
Hadar	148 47.9	S60 26.1
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 21.3	N74 05.8
Markab	13 38.0	N15 17.0
Menkar	314 14.4	N 4 08.6
Menkent	148 07.5	S36 26.1
Miaplacidus	221 39.2	S69 46.3
Mirfak	308 39.4	N49 54.6
Nunki	75 58.3	S26 16.6
Peacock	53 19.1	S56 41.4
Pollux	243 27.1	N27 59.3
Procyon	244 59.2	N 5 11.2
Rasalhague	96 06.5	N12 33.2
Regulus	207 43.2	N11 53.8
Rigel	281 11.4	S 8 11.2
Rigil Kent.	139 51.8	S60 53.3
Sabik	102 12.5	S15 44.3
Schedar	349 39.8	N56 37.1
Shaula	96 21.9	S37 06.6
Sirius	258 33.1	S16 44.2
Spica	158 31.2	S11 13.9
Suhail	222 52.0	S43 29.2
Vega	80 39.1	N38 48.1
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	68 29.3	14 57
Mars	184 02.4	7 15
Jupiter	248 34.3	2 57
Saturn	135 03.2	10 30

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 27	Moonrise 28	Moonrise 29	Moonrise 30
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
27 00	183 07.4	S21 06.6	258 18.3	13.9	N 0 57.0	10.5	55.8	N 72	07 43	09 37	▬	00 39	02 23	04 13	06 12
01	198 07.2	07.0	272 51.2	14.0	0 46.5	10.4	55.8	N 70	07 28	09 01	▬	00 40	02 17	03 59	05 48
02	213 07.0	07.5	287 24.2	13.8	0 36.1	10.5	55.8	68	07 15	08 36	10 20	00 41	02 13	03 49	05 30
03	228 06.8	07.9	301 57.0	13.9	0 25.6	10.5	55.9	66	07 05	08 16	09 37	00 42	02 09	03 40	05 15
04	243 06.6	08.4	316 29.9	13.8	0 15.1	10.5	55.9	64	06 56	08 00	09 08	00 42	02 06	03 33	05 03
05	258 06.4	08.8	331 02.7	13.8	N 0 04.6	10.6	55.9	62	06 48	07 47	08 46	00 43	02 03	03 27	04 53
06	273 06.2	S21 09.3	345 35.5	13.7	S 0 06.0	10.5	56.0	60	06 41	07 36	08 29	00 43	02 01	03 21	04 45
W 07	288 05.9	09.7	0 08.2	13.7	0 16.5	10.5	56.0	N 58	06 35	07 26	08 14	00 44	01 59	03 17	04 37
E 08	303 05.7	10.2	14 40.9	13.7	0 27.0	10.6	56.0	56	06 29	07 17	08 02	00 44	01 57	03 12	04 31
D 09	318 05.5	10.6	29 13.6	13.6	0 37.6	10.6	56.1	54	06 24	07 09	07 51	00 44	01 55	03 09	04 25
N 10	333 05.3	11.1	43 46.2	13.6	0 48.2	10.6	56.1	52	06 20	07 02	07 41	00 45	01 54	03 05	04 19
E 11	348 05.1	11.5	58 18.8	13.6	0 58.8	10.5	56.1	50	06 15	06 56	07 33	00 45	01 52	03 02	04 15
S 12	3 04.9	S21 12.0	72 51.4	13.5	S 1 09.3	10.6	56.2	45	06 05	06 42	07 14	00 45	01 49	02 56	04 04
D 13	18 04.7	12.4	87 23.9	13.5	1 19.9	10.7	56.2	N 40	05 56	06 30	07 00	00 46	01 47	02 50	03 56
A 14	33 04.5	12.9	101 56.4	13.4	1 30.6	10.6	56.2	35	05 48	06 19	06 47	00 46	01 45	02 45	03 49
Y 15	48 04.3	13.3	116 28.8	13.4	1 41.2	10.6	56.3	30	05 41	06 10	06 36	00 47	01 43	02 41	03 42
16	63 04.1	13.8	131 01.2	13.3	1 51.8	10.6	56.3	20	05 26	05 53	06 17	00 47	01 40	02 34	03 31
17	78 03.9	14.2	145 33.5	13.3	2 02.4	10.6	56.3	N 10	05 12	05 38	06 00	00 48	01 37	02 28	03 22
18	93 03.7	S21 14.7	160 05.8	13.2	S 2 13.0	10.7	56.4	0	04 56	05 22	05 44	00 49	01 34	02 22	03 13
19	108 03.5	15.1	174 38.0	13.2	2 23.7	10.6	56.4	S 10	04 39	05 06	05 28	00 49	01 32	02 16	03 04
20	123 03.2	15.6	189 10.2	13.2	2 34.3	10.6	56.4	20	04 19	04 47	05 11	00 50	01 29	02 10	02 54
21	138 03.0	16.0	203 42.4	13.1	2 44.9	10.7	56.5	30	03 52	04 25	04 52	00 51	01 26	02 03	02 44
22	153 02.8	16.5	218 14.5	13.1	2 55.6	10.6	56.5	35	03 36	04 11	04 40	00 51	01 24	01 59	02 38
23	168 02.6	16.9	232 46.6	13.0	3 06.2	10.6	56.6	40	03 15	03 55	04 26	00 52	01 22	01 55	02 31
28 00	183 02.4	S21 17.3	247 18.6	12.9	S 3 16.8	10.7	56.6	45	02 48	03 35	04 10	00 52	01 20	01 50	02 23
01	198 02.2	17.8	261 50.5	12.9	3 27.5	10.6	56.6	S 50	02 11	03 09	03 51	00 53	01 17	01 43	02 13
02	213 02.0	18.2	276 22.4	12.9	3 38.1	10.6	56.7	52	01 50	02 56	03 41	00 53	01 16	01 41	02 09
03	228 01.8	18.7	290 54.3	12.7	3 48.7	10.7	56.7	54	01 22	02 41	03 31	00 54	01 15	01 37	02 04
04	243 01.5	19.1	305 26.0	12.8	3 59.4	10.6	56.7	56	00 37	02 23	03 19	00 54	01 13	01 34	01 58
05	258 01.3	19.5	319 57.8	12.7	4 10.0	10.6	56.8	58	////	02 01	03 05	00 54	01 11	01 30	01 53
06	273 01.1	S21 20.0	334 29.5	12.6	S 4 20.6	10.6	56.8	S 60	////	01 31	02 48	00 55	01 10	01 26	01 46
T 07	288 00.9	20.4	349 01.1	12.6	4 31.2	10.6	56.8								
H 08	303 00.7	20.8	3 32.7	12.5	4 41.8	10.6	56.9								
U 09	318 00.5	21.3	18 04.2	12.4	4 52.4	10.6	56.9								
R 10	333 00.3	21.7	32 35.6	12.4	5 03.0	10.6	57.0								
S 11	348 00.1	22.1	47 07.0	12.3	5 13.6	10.5	57.0								
D 12	2 59.8	S21 22.6	61 38.3	12.3	S 5 24.1	10.6	57.0								
A 13	17 59.6	23.0	76 09.6	12.2	5 34.7	10.5	57.1								
Y 14	32 59.4	23.4	90 40.8	12.2	5 45.2	10.6	57.1								
15	47 59.2	23.9	105 12.0	12.0	5 55.8	10.5	57.1								
16	62 59.0	24.3	119 43.0	12.1	6 06.3	10.5	57.2								
17	77 58.8	24.7	134 14.1	11.9	6 16.8	10.4	57.2								
18	92 58.5	S21 25.2	148 45.0	11.9	S 6 27.2	10.5	57.3								
19	107 58.3	25.6	163 15.9	11.8	6 37.7	10.5	57.3								
20	122 58.1	26.0	177 46.7	11.8	6 48.2	10.4	57.3								
21	137 57.9	26.4	192 17.5	11.6	6 58.6	10.4	57.4								
22	152 57.7	26.9	206 48.1	11.7	7 09.0	10.4	57.4								
23	167 57.5	27.3	221 18.8	11.5	7 19.4	10.3	57.4								
29 00	182 57.2	S21 27.7	235 49.3	11.5	S 7 29.7	10.4	57.5								
01	197 57.0	28.1	250 19.8	11.4	7 40.1	10.3	57.5								
02	212 56.8	28.6	264 50.2	11.3	7 50.4	10.3	57.6								
03	227 56.6	29.0	279 20.5	11.3	8 00.7	10.2	57.6								
04	242 56.4	29.4	293 50.8	11.1	8 10.9	10.3	57.6								
05	257 56.1	29.8	308 20.9	11.1	8 21.2	10.2	57.7								
06	272 55.9	S21 30.2	322 51.0	11.1	S 8 31.4	10.1	57.7								
F 07	287 55.7	30.7	337 21.1	10.9	8 41.5	10.2	57.8								
R 08	302 55.5	31.1	351 51.0	10.9	8 51.7	10.1	57.8								
I 09	317 55.2	31.5	6 20.9	10.8	9 01.8	10.1	57.8								
D 10	332 55.0	31.9	20 50.7	10.7	9 11.9	10.0	57.9								
A 11	347 54.8	32.3	35 20.4	10.7	9 21.9	10.0	57.9								
Y 12	2 54.6	S21 32.8	49 50.1	10.6	S 9 31.9	10.0	58.0								
13	17 54.4	33.2	64 19.7	10.4	9 41.9	9.9	58.0								
14	32 54.1	33.6	78 49.1	10.5	9 51.8	9.9	58.0								
15	47 53.9	34.0	93 18.6	10.3	10 01.7	9.9	58.1								
16	62 53.7	34.4	107 47.9	10.2	10 11.6	9.8	58.1								
17	77 53.5	34.8	122 17.1	10.2	10 21.4	9.7	58.1								
18	92 53.2	S21 35.2	136 46.3	10.1	S10 31.1	9.8	58.2								
19	107 53.0	35.6	151 15.4	10.0	10 40.9	9.6	58.2								
20	122 52.8	36.1	165 44.4	9.9	10 50.5	9.7	58.3								
21	137 52.6	36.5	180 13.3	9.8	11 00.2	9.6	58.3								
22	152 52.3	36.9	194 42.1	9.8	11 09.8	9.5	58.3								
23	167 52.1	37.3	209 10.9	9.6	S11 19.3	9.5	58.4								
	SD 16.2	d 0.4	SD	15.3		15.5	15.8								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 27	Moonset 28	Moonset 29	Moonset 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 59	15 52	12 53	12 44	12 34	12 21
N 70	▬	14 34	16 08	12 54	12 52	12 49	12 46
68	13 16	15 00	16 20	12 56	12 58	13 01	13 06
66	13 59	15 19	16 31	12 57	13 03	13 11	13 22
64	14 27	15 35	16 40	12 58	13 08	13 19	13 34
62	14 49	15 49	16 47	12 59	13 12	13 27	13 45
60	15 07	16 00	16 54	13 00	13 16	13 33	13 55
N 58	15 21	16 10	17 00	13 01	13 19	13 39	14 03
56	15 34	16 19	17 06	13 02	13 21	13 44	14 10
54	15 45	16 26	17 11	13 02	13 24	13 48	14 17
52	15 54	16 34	17 16	13 03	13 26	13 52	14 23
50	16 03	16 40	17 21	13 03	13 28	13 56	14 28
45	16 21	16 54	17 31	13 05	13 33	14 04	14 39
N 40	16 36	17 06	17 39	13 05	13 37	14 11	14 49
35	16 49	17 16	17 48	13 06	13 40	14 16	14 57
30	17 00	17 26	17 55	13 07	13 43	14 22	15 04
20	17 19	17 43	18 10	13 08	13 48	14 31	15 17
N 10	17 36	17 58	18 24	13 09	13 52	14 38	15 28
0	17 52	18 14	18 40	13 10	13 57	14 46	15 38
S 10	18 08	18 30	18 57	13 11	14 01	14 53	15 48
20	18 25	18 49	19 18	13 12	14 05	15 01	16 00
30	18 45	19 12	19 44	13 13	14 10	15 10	16 12
35	18 56	19 25	20 01	13 14	14 13	15 15	16 20
40	19 10	19 42	20 22	13 15	14 17	15 21	16 28
45	19 26	20 02	20 49	13 16	14 21	15 28	16 38
S 50	19 46	20 28	21 27	13 17	14 25	15 36	16 49
52	19 56	20 41	21 48	13 17	14 27	15 40	16 55
54	20 06	20 56	22 16	13 18	14 30	15 44	17 01
56	20 18	21 14	23 05	13 18	14 32	15 49	17 08
58	20 33	21 37	////	13 19	14 35	15 54	17 16
S 60	20 50	22 07	////	13 20	14 38	16 00	17 24

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
27	12 30	12 20	11 48	06 59	19 22	24	34
28	12 10	12 00	11 48	07 45	20 09	25	24
29	11 49	11 39	11 48	08 34	20 59	26	16

UT	ARIES	VENUS −4.6		MARS +1.4		JUPITER −2.5		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
9 00	48 19.9	134 25.4	S27 08.0	242 08.7	N 7 40.6	296 09.3	N21 52.2	185 36.6	S14 10.5
01	63 22.4	149 25.2	08.0	257 09.8	40.1	311 11.8	52.2	200 38.8	10.6
02	78 24.8	164 25.1	07.9	272 11.0	39.6	326 14.2	52.2	215 41.0	10.7
03	93 27.3	179 24.9	07.9	287 12.1	39.0	341 16.7	52.2	230 43.1	10.8
04	108 29.7	194 24.7	07.8	302 13.2	38.5	356 19.2	52.2	245 45.3	10.8
05	123 32.2	209 24.5	07.8	317 14.4	38.0	11 21.7	52.3	260 47.5	10.9
06	138 34.7	224 24.4	S27 07.7	332 15.5	N 7 37.5	26 24.2	N21 52.3	275 49.6	S14 11.0
07	153 37.1	239 24.2	07.6	347 16.6	36.9	41 26.7	52.3	290 51.8	11.1
S 08	168 39.6	254 24.0	07.6	2 17.8	36.4	56 29.1	52.3	305 54.0	11.2
A 09	183 42.1	269 23.8	07.5	17 18.9	35.9	71 31.6	52.3	320 56.1	11.3
T 10	198 44.5	284 23.7	07.4	32 20.1	35.3	86 34.1	52.3	335 58.3	11.4
U 11	213 47.0	299 23.5	07.4	47 21.2	34.8	101 36.6	52.3	351 00.5	11.5
R 12	228 49.5	314 23.3	S27 07.3	62 22.3	N 7 34.3	116 39.1	N21 52.3	6 02.7	S14 11.5
D 13	243 51.9	329 23.2	07.2	77 23.5	33.8	131 41.6	52.3	21 04.8	11.6
A 14	258 54.4	344 23.0	07.2	92 24.6	33.2	146 44.0	52.3	36 07.0	11.7
Y 15	273 56.9	359 22.8	07.1	107 25.7	32.7	161 46.5	52.3	51 09.2	11.8
16	288 59.3	14 22.7	07.0	122 26.9	32.2	176 49.0	52.3	66 11.3	11.9
17	304 01.8	29 22.5	07.0	137 28.0	31.7	191 51.5	52.4	81 13.5	12.0
18	319 04.2	44 22.3	S27 06.9	152 29.2	N 7 31.1	206 54.0	N21 52.4	96 15.7	S14 12.1
19	334 06.7	59 22.2	06.8	167 30.3	30.6	221 56.5	52.4	111 17.8	12.2
20	349 09.2	74 22.0	06.7	182 31.4	30.1	236 58.9	52.4	126 20.0	12.3
21	4 11.6	89 21.9	06.7	197 32.6	29.6	252 01.4	52.4	141 22.2	12.3
22	19 14.1	104 21.7	06.6	212 33.7	29.0	267 03.9	52.4	156 24.3	12.4
23	34 16.6	119 21.6	06.5	227 34.8	28.5	282 06.4	52.4	171 26.5	12.5
10 00	49 19.0	134 21.4	S27 06.4	242 36.0	N 7 28.0	297 08.9	N21 52.4	186 28.7	S14 12.6
01	64 21.5	149 21.2	06.3	257 37.1	27.5	312 11.4	52.4	201 30.8	12.7
02	79 24.0	164 21.1	06.3	272 38.3	26.9	327 13.9	52.4	216 33.0	12.8
03	94 26.4	179 20.9	06.2	287 39.4	26.4	342 16.4	52.4	231 35.2	12.9
04	109 28.9	194 20.8	06.1	302 40.5	25.9	357 18.9	52.5	246 37.4	13.0
05	124 31.3	209 20.6	06.0	317 41.7	25.4	12 21.3	52.5	261 39.5	13.0
06	139 33.8	224 20.5	S27 05.9	332 42.8	N 7 24.8	27 23.8	N21 52.5	276 41.7	S14 13.1
07	154 36.3	239 20.3	05.8	347 44.0	24.3	42 26.3	52.5	291 43.9	13.2
08	169 38.7	254 20.2	05.8	2 45.1	23.8	57 28.8	52.5	306 46.0	13.3
S 09	184 41.2	269 20.0	05.7	17 46.3	23.3	72 31.3	52.5	321 48.2	13.4
U 10	199 43.7	284 19.9	05.6	32 47.4	22.7	87 33.8	52.5	336 50.4	13.5
N 11	214 46.1	299 19.8	05.5	47 48.5	22.2	102 36.3	52.5	351 52.5	13.6
D 12	229 48.6	314 19.6	S27 05.4	62 49.7	N 7 21.7	117 38.8	N21 52.5	6 54.7	S14 13.7
A 13	244 51.1	329 19.5	05.3	77 50.8	21.1	132 41.3	52.5	21 56.9	13.7
Y 14	259 53.5	344 19.3	05.2	92 52.0	20.6	147 43.8	52.5	36 59.0	13.8
15	274 56.0	359 19.2	05.1	107 53.1	20.1	162 46.3	52.6	52 01.2	13.9
16	289 58.5	14 19.1	05.0	122 54.2	19.6	177 48.8	52.6	67 03.4	14.0
17	305 00.9	29 18.9	04.9	137 55.4	19.0	192 51.2	52.6	82 05.5	14.1
18	320 03.4	44 18.8	S27 04.8	152 56.5	N 7 18.5	207 53.7	N21 52.6	97 07.7	S14 14.2
19	335 05.8	59 18.7	04.7	167 57.7	18.0	222 56.2	52.6	112 09.9	14.3
20	350 08.3	74 18.5	04.6	182 58.8	17.5	237 58.7	52.6	127 12.1	14.4
21	5 10.8	89 18.4	04.5	198 00.0	16.9	253 01.2	52.6	142 14.2	14.4
22	20 13.2	104 18.3	04.4	213 01.1	16.4	268 03.7	52.6	157 16.4	14.5
23	35 15.7	119 18.1	04.3	228 02.3	15.9	283 06.2	52.6	172 18.6	14.6
11 00	50 18.2	134 18.0	S27 04.2	243 03.4	N 7 15.4	298 08.7	N21 52.6	187 20.7	S14 14.7
01	65 20.6	149 17.9	04.1	258 04.5	14.8	313 11.2	52.7	202 22.9	14.8
02	80 23.1	164 17.7	04.0	273 05.7	14.3	328 13.7	52.7	217 25.1	14.9
03	95 25.6	179 17.6	03.9	288 06.8	13.8	343 16.2	52.7	232 27.2	15.0
04	110 28.0	194 17.5	03.8	303 08.0	13.3	358 18.7	52.7	247 29.4	15.1
05	125 30.5	209 17.4	03.7	318 09.1	12.7	13 21.2	52.7	262 31.6	15.1
06	140 33.0	224 17.3	S27 03.6	333 10.3	N 7 12.2	28 23.7	N21 52.7	277 33.7	S14 15.2
07	155 35.4	239 17.1	03.5	348 11.4	11.7	43 26.2	52.7	292 35.9	15.3
08	170 37.9	254 17.0	03.4	3 12.6	11.2	58 28.7	52.7	307 38.1	15.4
M 09	185 40.3	269 16.9	03.3	18 13.7	10.6	73 31.2	52.7	322 40.2	15.5
O 10	200 42.8	284 16.8	03.2	33 14.8	10.1	88 33.7	52.7	337 42.4	15.6
N 11	215 45.3	299 16.7	03.1	48 16.0	09.6	103 36.2	52.8	352 44.6	15.7
D 12	230 47.7	314 16.5	S27 02.9	63 17.1	N 7 09.1	118 38.7	N21 52.8	7 46.8	S14 15.8
A 13	245 50.2	329 16.4	02.8	78 18.3	08.5	133 41.2	52.8	22 48.9	15.8
Y 14	260 52.7	344 16.3	02.7	93 19.4	08.0	148 43.7	52.8	37 51.1	15.9
15	275 55.1	359 16.2	02.6	108 20.6	07.5	163 46.2	52.8	52 53.3	16.0
16	290 57.6	14 16.1	02.5	123 21.7	07.0	178 48.7	52.8	67 55.4	16.1
17	306 00.1	29 16.0	02.4	138 22.9	06.4	193 51.2	52.8	82 57.6	16.2
18	321 02.5	44 15.9	S27 02.2	153 24.0	N 7 05.9	208 53.7	N21 52.8	97 59.8	S14 16.3
19	336 05.0	59 15.8	02.1	168 25.2	05.4	223 56.2	52.8	113 01.9	16.4
20	351 07.4	74 15.7	02.0	183 26.3	04.9	238 58.7	52.9	128 04.1	16.5
21	6 09.9	89 15.6	01.9	198 27.5	04.3	254 01.2	52.9	143 06.3	16.5
22	21 12.4	104 15.5	01.8	213 28.6	03.8	269 03.7	52.9	158 08.4	16.6
23	36 14.8	119 15.4	01.6	228 29.8	03.3	284 06.2	52.9	173 10.6	16.7
Mer.Pass.	h m 20 39.3	v −0.1	d 0.1	v 1.1	d 0.5	v 2.5	d 0.0	v 2.2	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.7	S40 15.0
Achernar	335 26.1	S57 10.1
Acrux	173 09.4	S63 10.4
Adhara	255 12.1	S28 59.4
Aldebaran	290 48.7	N16 32.1
Alioth	166 21.0	N55 52.9
Alkaid	152 59.2	N49 14.6
Al Na'ir	27 43.3	S46 53.7
Alnilam	275 45.8	S 1 11.7
Alphard	217 55.8	S 8 43.1
Alphecca	126 11.2	N26 40.3
Alpheratz	357 42.9	N29 10.3
Altair	62 08.1	N 8 54.6
Ankaa	353 15.2	S42 13.9
Antares	112 26.3	S26 27.6
Arcturus	145 55.8	N19 06.7
Atria	107 28.3	S69 03.1
Avior	234 17.7	S59 33.1
Bellatrix	278 31.4	N 6 21.6
Betelgeuse	271 00.7	N 7 24.5
Canopus	263 55.6	S52 42.1
Capella	280 33.6	N46 00.5
Deneb	49 31.3	N45 20.3
Denebola	182 33.6	N14 29.6
Diphda	348 55.4	S17 54.6
Dubhe	193 51.8	N61 40.2
Elnath	278 11.9	N28 37.0
Eltanin	90 46.4	N51 29.6
Enif	33 46.8	N 9 56.6
Fomalhaut	15 23.6	S29 32.9
Gacrux	172 01.0	S57 11.2
Gienah	175 52.2	S17 37.0
Hadar	148 48.1	S60 26.2
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.7	S34 22.5
Kochab	137 21.4	N74 05.9
Markab	13 37.9	N15 17.1
Menkar	314 14.4	N 4 08.6
Menkent	148 07.6	S36 26.1
Miaplacidus	221 39.5	S69 46.2
Mirfak	308 39.4	N49 54.6
Nunki	75 58.2	S26 16.6
Peacock	53 19.0	S56 41.5
Pollux	243 27.3	N27 59.3
Procyon	244 59.3	N 5 11.2
Rasalhague	96 06.5	N12 33.3
Regulus	207 43.3	N11 53.8
Rigel	281 11.5	S 8 11.2
Rigil Kent.	139 51.9	S60 53.3
Sabik	102 12.5	S15 44.3
Schedar	349 39.7	N56 37.1
Shaula	96 21.9	S37 06.7
Sirius	258 33.3	S16 44.1
Spica	158 31.3	S11 13.9
Suhail	222 52.2	S43 29.2
Vega	80 39.1	N38 48.2
Zuben'ubi	137 05.5	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	85 02.4	15 03
Mars	193 17.0	7 49
Jupiter	247 49.9	4 11
Saturn	137 09.7	11 32

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 9	Moonrise 10	Moonrise 11	Moonrise 12
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
9 00	184 02.9	S16 50.3	106 59.6	7.5	S14 57.8	7.9	59.5	N 72	06 41	08 11	10 04	14 27	14 14	14 05	13 56
01	199 02.9	51.0	121 26.1	7.6	14 49.9	7.9	59.4	N 70	06 33	07 52	09 19	14 03	14 00	13 58	13 55
02	214 02.8	51.7	135 52.7	7.6	14 42.0	8.1	59.4	68	06 27	07 37	08 50	13 44	13 49	13 52	13 55
03	229 02.8	52.4	150 19.3	7.8	14 33.9	8.1	59.4	66	06 21	07 25	08 29	13 29	13 40	13 48	13 54
04	244 02.7	53.2	164 46.1	7.7	14 25.8	8.2	59.4	64	06 16	07 15	08 12	13 17	13 32	13 44	13 54
05	259 02.7	53.9	179 12.8	7.9	14 17.6	8.3	59.4	62	06 11	07 06	07 57	13 07	13 25	13 40	13 54
06	274 02.6	S16 54.6	193 39.7	7.9	S14 09.3	8.3	59.4	60	06 07	06 58	07 46	12 58	13 19	13 37	13 53
07	289 02.6	55.3	208 06.6	7.9	14 01.0	8.5	59.3	N 58	06 03	06 51	07 35	12 50	13 14	13 34	13 53
S 08	304 02.5	56.0	222 33.5	8.1	13 52.5	8.5	59.3	56	06 00	06 45	07 26	12 43	13 09	13 32	13 53
A 09	319 02.4	56.7	237 00.6	8.1	13 44.0	8.6	59.3	54	05 57	06 39	07 18	12 36	13 05	13 30	13 53
T 10	334 02.4	57.4	251 27.7	8.1	13 35.4	8.7	59.3	52	05 54	06 34	07 11	12 31	13 01	13 28	13 53
U 11	349 02.3	58.1	265 54.8	8.2	13 26.7	8.8	59.3	50	05 51	06 30	07 05	12 26	12 58	13 26	13 52
R 12	4 02.3	S16 58.8	280 22.0	8.3	S13 17.9	8.8	59.3	45	05 44	06 20	06 51	12 15	12 50	13 22	13 52
D 13	19 02.2	16 59.6	294 49.3	8.4	13 09.1	8.9	59.2	N 40	05 38	06 11	06 39	12 05	12 44	13 19	13 52
A 14	34 02.2	17 00.3	309 16.7	8.4	13 00.2	9.0	59.2	35	05 33	06 03	06 30	11 57	12 38	13 16	13 52
Y 15	49 02.1	01.0	323 44.1	8.5	12 51.2	9.1	59.2	30	05 27	05 56	06 21	11 50	12 33	13 13	13 51
16	64 02.1	01.7	338 11.6	8.5	12 42.1	9.1	59.2	20	05 17	05 43	06 06	11 38	12 25	13 09	13 51
17	79 02.0	02.4	352 39.1	8.6	12 33.0	9.2	59.2	N 10	05 06	05 31	05 53	11 28	12 18	13 05	13 51
18	94 01.9	S17 03.1	7 06.7	8.7	S12 23.8	9.3	59.1	0	04 54	05 19	05 40	11 18	12 11	13 01	13 50
19	109 01.9	03.8	21 34.4	8.8	12 14.5	9.3	59.1	S 10	04 40	05 06	05 28	11 08	12 04	12 58	13 50
20	124 01.8	04.5	36 02.2	8.7	12 05.2	9.4	59.1	20	04 23	04 51	05 14	10 57	11 56	12 54	13 50
21	139 01.8	05.2	50 29.9	8.9	11 55.8	9.5	59.1	30	04 02	04 33	04 59	10 45	11 48	12 49	13 50
22	154 01.7	05.9	64 57.8	8.9	11 46.3	9.5	59.1	35	03 49	04 22	04 50	10 38	11 43	12 47	13 50
23	169 01.6	06.6	79 25.7	9.0	11 36.8	9.6	59.1	40	03 32	04 09	04 39	10 30	11 37	12 44	13 49
10 00	184 01.6	S17 07.3	93 53.7	9.1	S11 27.2	9.6	59.0	45	03 12	03 53	04 27	10 20	11 31	12 41	13 49
01	199 01.5	08.0	108 21.8	9.1	11 17.6	9.8	59.0	S 50	02 44	03 34	04 12	10 09	11 23	12 37	13 49
02	214 01.5	08.7	122 49.9	9.1	11 07.8	9.7	59.0	52	02 30	03 24	04 05	10 03	11 19	12 35	13 49
03	229 01.4	09.4	137 18.0	9.3	10 58.1	9.8	59.0	54	02 13	03 13	03 57	09 57	11 15	12 33	13 49
04	244 01.3	10.1	151 46.3	9.2	10 48.3	9.9	59.0	56	01 53	03 01	03 48	09 51	11 11	12 31	13 49
05	259 01.3	10.8	166 14.5	9.4	10 38.4	10.0	58.9	58	01 25	02 46	03 38	09 44	11 06	12 28	13 49
06	274 01.2	S17 11.5	180 42.9	9.4	S10 28.4	10.0	58.9	S 60	00 41	02 28	03 26	09 35	11 01	12 25	13 48
07	289 01.2	12.2	195 11.3	9.5	10 18.4	10.0	58.9								
08	304 01.1	12.9	209 39.8	9.5	10 08.4	10.1	58.9								
S 09	319 01.0	13.6	224 08.3	9.6	9 58.3	10.1	58.9								
U 10	334 01.0	14.3	238 36.9	9.6	9 48.2	10.2	58.8								
N 11	349 00.9	15.0	253 05.5	9.7	9 38.0	10.3	58.8								
D 12	4 00.8	S17 15.7	267 34.2	9.7	S 9 27.7	10.3	58.8								
A 13	19 00.8	16.4	282 02.9	9.8	9 17.4	10.3	58.8								
Y 14	34 00.7	17.1	296 31.7	9.9	9 07.1	10.4	58.8								
15	49 00.7	17.8	311 00.6	9.9	8 56.7	10.4	58.7								
16	64 00.6	18.5	325 29.5	10.0	8 46.3	10.5	58.7								
17	79 00.5	19.2	339 58.5	10.0	8 35.8	10.5	58.7								
18	94 00.5	S17 19.9	354 27.5	10.1	S 8 25.3	10.5	58.7								
19	109 00.4	20.6	8 56.6	10.1	8 14.8	10.6	58.7								
20	124 00.3	21.3	23 25.7	10.2	8 04.2	10.6	58.6								
21	139 00.3	22.0	37 54.9	10.2	7 53.6	10.7	58.6								
22	154 00.2	22.7	52 24.1	10.3	7 42.9	10.7	58.6								
23	169 00.1	23.3	66 53.4	10.3	7 32.2	10.7	58.6								
11 00	184 00.1	S17 24.0	81 22.7	10.4	S 7 21.5	10.8	58.6								
01	199 00.0	24.7	95 52.1	10.4	7 10.7	10.8	58.5								
02	213 59.9	25.4	110 21.5	10.5	6 59.9	10.8	58.5								
03	228 59.8	26.1	124 51.0	10.5	6 49.1	10.9	58.5								
04	243 59.8	26.8	139 20.5	10.5	6 38.2	10.9	58.5								
05	258 59.7	27.5	153 50.0	10.6	6 27.3	10.9	58.5								
06	273 59.6	S17 28.2	168 19.6	10.7	S 6 16.4	10.9	58.4								
07	288 59.6	28.9	182 49.3	10.7	6 05.5	11.0	58.4								
08	303 59.5	29.5	197 19.0	10.7	5 54.5	11.0	58.4								
M 09	318 59.4	30.2	211 48.7	10.8	5 43.5	11.0	58.4								
O 10	333 59.4	30.9	226 18.5	10.8	5 32.5	11.0	58.4								
N 11	348 59.3	31.6	240 48.3	10.9	5 21.5	11.1	58.3								
D 12	3 59.2	S17 32.3	255 18.2	10.9	S 5 10.4	11.1	58.3								
A 13	18 59.1	33.0	269 48.1	11.0	4 59.3	11.1	58.3								
Y 14	33 59.1	33.7	284 18.1	11.0	4 48.2	11.1	58.3								
15	48 59.0	34.3	298 48.1	11.0	4 37.1	11.1	58.3								
16	63 58.9	35.0	313 18.1	11.0	4 26.0	11.2	58.2								
17	78 58.8	35.7	327 48.1	11.1	4 14.8	11.1	58.2								
18	93 58.8	S17 36.4	342 18.2	11.2	S 4 03.7	11.2	58.2								
19	108 58.7	37.1	356 48.4	11.2	3 52.5	11.2	58.2								
20	123 58.6	37.7	11 18.6	11.2	3 41.3	11.2	58.2								
21	138 58.5	38.4	25 48.8	11.2	3 30.1	11.2	58.1								
22	153 58.5	39.1	40 19.0	11.3	3 18.9	11.3	58.1								
23	168 58.4	39.8	54 49.3	11.3	S 3 07.6	11.2	58.1								
	SD 16.2	d 0.7	SD	16.1		16.0		15.9							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 9	Moonset 10	Moonset 11	Moonset 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	13 23	15 15	16 45	20 53	22 54	24 48	00 48
N 70	14 07	15 34	16 53	21 15	23 06	24 52	00 52
68	14 36	15 49	17 00	21 32	23 15	24 56	00 56
66	14 58	16 02	17 06	21 46	23 23	24 58	00 58
64	15 15	16 12	17 11	21 57	23 30	25 01	01 01
62	15 30	16 21	17 16	22 07	23 36	25 03	01 03
60	15 42	16 29	17 20	22 15	23 41	25 05	01 05
N 58	15 52	16 36	17 24	22 22	23 45	25 06	01 06
56	16 01	16 42	17 27	22 29	23 49	25 08	01 08
54	16 09	16 48	17 30	22 34	23 52	25 09	01 09
52	16 16	16 53	17 34	22 39	23 55	25 10	01 10
50	16 23	16 58	17 36	22 44	23 58	25 11	01 11
45	16 36	17 08	17 43	22 54	24 04	00 04	01 13
N 40	16 48	17 17	17 49	23 02	24 09	00 09	01 15
35	16 58	17 25	17 55	23 09	24 14	00 14	01 17
30	17 07	17 32	18 00	23 15	24 17	00 17	01 18
20	17 22	17 45	18 11	23 25	24 24	00 24	01 21
N 10	17 35	17 57	18 22	23 35	24 30	00 30	01 23
0	17 47	18 09	18 34	23 43	24 35	00 35	01 25
S 10	18 00	18 22	18 48	23 52	24 40	00 40	01 27
20	18 14	18 37	19 05	24 01	00 01	00 46	01 29
30	18 30	18 55	19 26	24 11	00 11	00 52	01 31
35	18 39	19 07	19 40	24 17	00 17	00 56	01 32
40	18 49	19 20	19 57	24 23	00 23	01 00	01 34
45	19 02	19 35	20 17	24 31	00 31	01 05	01 36
S 50	19 17	19 55	20 45	00 05	00 40	01 10	01 38
52	19 24	20 05	21 00	00 11	00 44	01 13	01 39
54	19 32	20 16	21 17	00 18	00 49	01 16	01 40
56	19 41	20 29	21 38	00 25	00 54	01 19	01 41
58	19 52	20 44	22 07	00 33	01 00	01 22	01 42
S 60	20 03	21 02	22 56	00 42	01 06	01 26	01 43

Day	SUN Eqn. of Time 00^h	SUN Eqn. of Time 12^h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
9	16 12	16 09	11 44	17 30	05 03	06	42
10	16 06	16 04	11 44	18 23	05 57	07	53
11	16 00	15 57	11 44	19 13	06 48	08	64

UT	ARIES	VENUS −4.7		MARS +1.4		JUPITER −2.5		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
12 00	51 17.3	134 15.3	S27 01.5	243 30.9	N 7 02.8	299 08.8	N21 52.9	188 12.8	S14 16.8
01	66 19.8	149 15.2	01.4	258 32.1	02.2	314 11.3	52.9	203 14.9	16.9
02	81 22.2	164 15.1	01.3	273 33.2	01.7	329 13.8	52.9	218 17.1	17.0
03	96 24.7	179 15.0	01.1	288 34.4	01.2	344 16.3	52.9	233 19.3	17.1
04	111 27.2	194 14.9	01.0	303 35.5	00.7	359 18.8	52.9	248 21.5	17.2
05	126 29.6	209 14.8	00.9	318 36.7	7 00.1	14 21.3	53.0	263 23.6	17.2
06	141 32.1	224 14.7	S27 00.7	333 37.8	N 6 59.6	29 23.8	N21 53.0	278 25.8	S14 17.3
07	156 34.6	239 14.6	00.6	348 39.0	59.1	44 26.3	53.0	293 28.0	17.4
08	171 37.0	254 14.5	00.5	3 40.1	58.6	59 28.8	53.0	308 30.1	17.5
09	186 39.5	269 14.4	00.3	18 41.3	58.0	74 31.3	53.0	323 32.3	17.6
10	201 41.9	284 14.3	00.2	33 42.4	57.5	89 33.8	53.0	338 34.5	17.7
11	216 44.4	299 14.3	27 00.1	48 43.6	57.0	104 36.3	53.0	353 36.6	17.8
12	231 46.9	314 14.2	S26 59.9	63 44.7	N 6 56.5	119 38.9	N21 53.0	8 38.8	S14 17.9
13	246 49.3	329 14.1	59.8	78 45.9	55.9	134 41.4	53.0	23 41.0	17.9
14	261 51.8	344 14.0	59.7	93 47.0	55.4	149 43.9	53.1	38 43.1	18.0
15	276 54.3	359 13.9	59.5	108 48.2	54.9	164 46.4	53.1	53 45.3	18.1
16	291 56.7	14 13.8	59.4	123 49.3	54.4	179 48.9	53.1	68 47.5	18.2
17	306 59.2	29 13.8	59.2	138 50.5	53.8	194 51.4	53.1	83 49.6	18.3
18	322 01.7	44 13.7	S26 59.1	153 51.6	N 6 53.3	209 53.9	N21 53.1	98 51.8	S14 18.4
19	337 04.1	59 13.6	58.9	168 52.8	52.8	224 56.4	53.1	113 54.0	18.5
20	352 06.6	74 13.5	58.8	183 53.9	52.3	239 58.9	53.1	128 56.2	18.5
21	7 09.0	89 13.5	58.7	198 55.1	51.7	255 01.5	53.1	143 58.3	18.6
22	22 11.5	104 13.4	58.5	213 56.2	51.2	270 04.0	53.2	159 00.5	18.7
23	37 14.0	119 13.3	58.4	228 57.4	50.7	285 06.5	53.2	174 02.7	18.8
13 00	52 16.4	134 13.2	S26 58.2	243 58.5	N 6 50.2	300 09.0	N21 53.2	189 04.8	S14 18.9
01	67 18.9	149 13.2	58.1	258 59.7	49.6	315 11.5	53.2	204 07.0	19.0
02	82 21.4	164 13.1	57.9	274 00.8	49.1	330 14.0	53.2	219 09.2	19.1
03	97 23.8	179 13.0	57.8	289 02.0	48.6	345 16.5	53.2	234 11.3	19.2
04	112 26.3	194 13.0	57.6	304 03.2	48.1	0 19.1	53.2	249 13.5	19.2
05	127 28.8	209 12.9	57.5	319 04.3	47.5	15 21.6	53.2	264 15.7	19.3
06	142 31.2	224 12.9	S26 57.3	334 05.5	N 6 47.0	30 24.1	N21 53.3	279 17.8	S14 19.4
07	157 33.7	239 12.8	57.2	349 06.6	46.5	45 26.6	53.3	294 20.0	19.5
08	172 36.2	254 12.7	57.0	4 07.8	46.0	60 29.1	53.3	309 22.2	19.6
09	187 38.6	269 12.7	56.8	19 08.9	45.4	75 31.6	53.3	324 24.4	19.7
10	202 41.1	284 12.6	56.7	34 10.1	44.9	90 34.2	53.3	339 26.5	19.8
11	217 43.5	299 12.6	56.5	49 11.2	44.4	105 36.7	53.3	354 28.7	19.9
12	232 46.0	314 12.5	S26 56.4	64 12.4	N 6 43.9	120 39.2	N21 53.3	9 30.9	S14 19.9
13	247 48.5	329 12.5	56.2	79 13.6	43.3	135 41.7	53.4	24 33.0	20.0
14	262 50.9	344 12.4	56.1	94 14.7	42.8	150 44.2	53.4	39 35.2	20.1
15	277 53.4	359 12.4	55.9	109 15.9	42.3	165 46.8	53.4	54 37.4	20.2
16	292 55.9	14 12.3	55.7	124 17.0	41.8	180 49.3	53.4	69 39.5	20.3
17	307 58.3	29 12.3	55.6	139 18.2	41.2	195 51.8	53.4	84 41.7	20.4
18	323 00.8	44 12.2	S26 55.4	154 19.3	N 6 40.7	210 54.3	N21 53.4	99 43.9	S14 20.5
19	338 03.3	59 12.2	55.2	169 20.5	40.2	225 56.8	53.4	114 46.0	20.5
20	353 05.7	74 12.1	55.1	184 21.6	39.7	240 59.4	53.4	129 48.2	20.6
21	8 08.2	89 12.1	54.9	199 22.8	39.1	256 01.9	53.5	144 50.4	20.7
22	23 10.7	104 12.0	54.7	214 24.0	38.6	271 04.4	53.5	159 52.6	20.8
23	38 13.1	119 12.0	54.6	229 25.1	38.1	286 06.9	53.5	174 54.7	20.9
14 00	53 15.6	134 12.0	S26 54.4	244 26.3	N 6 37.6	301 09.5	N21 53.5	189 56.9	S14 21.0
01	68 18.0	149 11.9	54.2	259 27.4	37.0	316 12.0	53.5	204 59.1	21.1
02	83 20.5	164 11.9	54.1	274 28.6	36.5	331 14.5	53.5	220 01.2	21.1
03	98 23.0	179 11.9	53.9	289 29.7	36.0	346 17.0	53.5	235 03.4	21.2
04	113 25.4	194 11.8	53.7	304 30.9	35.5	1 19.6	53.6	250 05.6	21.3
05	128 27.9	209 11.8	53.5	319 32.1	34.9	16 22.1	53.6	265 07.7	21.4
06	143 30.4	224 11.8	S26 53.4	334 33.2	N 6 34.4	31 24.6	N21 53.6	280 09.9	S14 21.5
07	158 32.8	239 11.7	53.2	349 34.4	33.9	46 27.1	53.6	295 12.1	21.6
08	173 35.3	254 11.7	53.0	4 35.5	33.4	61 29.7	53.6	310 14.2	21.7
09	188 37.8	269 11.7	52.8	19 36.7	32.8	76 32.2	53.6	325 16.4	21.8
10	203 40.2	284 11.7	52.6	34 37.9	32.3	91 34.7	53.6	340 18.6	21.8
11	218 42.7	299 11.6	52.5	49 39.0	31.8	106 37.2	53.7	355 20.7	21.9
12	233 45.1	314 11.6	S26 52.3	64 40.2	N 6 31.3	121 39.8	N21 53.7	10 22.9	S14 22.0
13	248 47.6	329 11.6	52.1	79 41.3	30.8	136 42.3	53.7	25 25.1	22.1
14	263 50.1	344 11.6	51.9	94 42.5	30.2	151 44.8	53.7	40 27.3	22.2
15	278 52.5	359 11.6	51.7	109 43.7	29.7	166 47.4	53.7	55 29.4	22.3
16	293 55.0	14 11.5	51.6	124 44.8	29.2	181 49.9	53.7	70 31.6	22.4
17	308 57.5	29 11.5	51.4	139 46.0	28.7	196 52.4	53.7	85 33.8	22.4
18	323 59.9	44 11.5	S26 51.2	154 47.1	N 6 28.1	211 54.9	N21 53.8	100 35.9	S14 22.5
19	339 02.4	59 11.5	51.0	169 48.3	27.6	226 57.5	53.8	115 38.1	22.6
20	354 04.9	74 11.5	50.8	184 49.5	27.1	242 00.0	53.8	130 40.3	22.7
21	9 07.3	89 11.5	50.6	199 50.6	26.6	257 02.5	53.8	145 42.4	22.8
22	24 09.8	104 11.5	50.4	214 51.8	26.0	272 05.1	53.8	160 44.6	22.9
23	39 12.3	119 11.5	50.2	229 53.0	25.5	287 07.6	53.8	175 46.8	23.0
Mer. Pass.	h m 20 27.5	v −0.1	d 0.2	v 1.2	d 0.5	v 2.5	d 0.0	v 2.2	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.7	S40 15.0
Achernar	335 26.1	S57 10.1
Acrux	173 09.4	S63 10.3
Adhara	255 12.1	S28 59.4
Aldebaran	290 48.7	N16 32.1
Alioth	166 21.0	N55 52.9
Alkaid	152 59.2	N49 14.6
Al Na'ir	27 43.4	S46 53.7
Alnilam	275 45.8	S 1 11.7
Alphard	217 55.8	S 8 43.1
Alphecca	126 11.2	N26 40.3
Alpheratz	357 42.9	N29 10.3
Altair	62 08.1	N 8 54.6
Ankaa	353 15.2	S42 13.9
Antares	112 26.3	S26 27.6
Arcturus	145 55.8	N19 06.7
Atria	107 28.3	S69 03.0
Avior	234 17.6	S59 33.1
Bellatrix	278 31.4	N 6 21.6
Betelgeuse	271 00.7	N 7 24.5
Canopus	263 55.6	S52 42.1
Capella	280 33.6	N46 00.5
Deneb	49 31.4	N45 20.2
Denebola	182 33.6	N14 29.6
Diphda	348 55.4	S17 54.6
Dubhe	193 51.7	N61 40.2
Elnath	278 11.9	N28 37.0
Eltanin	90 46.5	N51 29.6
Enif	33 46.8	N 9 56.6
Fomalhaut	15 23.6	S29 32.9
Gacrux	172 00.9	S57 11.2
Gienah	175 52.2	S17 37.0
Hadar	148 48.0	S60 26.2
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 21.3	N74 05.9
Markab	13 37.9	N15 17.1
Menkar	314 14.4	N 4 08.6
Menkent	148 07.6	S36 26.1
Miaplacidus	221 39.4	S69 46.3
Mirfak	308 39.4	N49 54.6
Nunki	75 58.2	S26 16.6
Peacock	53 19.0	S56 41.5
Pollux	243 27.2	N27 59.3
Procyon	244 59.3	N 5 11.2
Rasalhague	96 06.5	N12 33.3
Regulus	207 43.3	N11 53.8
Rigel	281 11.5	S 8 11.2
Rigil Kent.	139 51.9	S60 53.3
Sabik	102 12.5	S15 44.3
Schedar	349 39.7	N56 37.1
Shaula	96 21.9	S37 06.7
Sirius	258 33.2	S16 44.1
Spica	158 31.2	S11 13.9
Suhail	222 52.2	S43 29.2
Vega	80 39.1	N38 48.2
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	81 56.8	15 03
Mars	191 42.1	7 44
Jupiter	247 52.6	3 59
Saturn	136 48.4	11 22

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 12	Moonrise 13	Moonrise 14	Moonrise 15
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
12 00	183 58.3	S17 40.5	69 19.6	11.3	S 2 56.4	11.2	58.1	N 72	06 53	08 25	10 35	13 56	13 47	13 38	13 28
01	198 58.2	41.1	83 49.9	11.4	2 45.2	11.3	58.0	N 70	06 43	08 04	09 37	13 55	13 53	13 50	13 48
02	213 58.2	41.8	98 20.3	11.4	2 33.9	11.2	58.0	68	06 35	07 48	09 04	13 55	13 57	14 00	14 04
03	228 58.1	42.5	112 50.7	11.5	2 22.7	11.3	58.0	66	06 29	07 34	08 40	13 54	14 01	14 08	14 17
04	243 58.0	43.2	127 21.2	11.4	2 11.4	11.3	58.0	64	06 23	07 23	08 21	13 54	14 04	14 15	14 28
05	258 57.9	43.8	141 51.6	11.5	2 00.1	11.2	58.0	62	06 18	07 13	08 06	13 54	14 07	14 21	14 37
06	273 57.8	S17 44.5	156 22.1	11.5	S 1 48.9	11.3	57.9	60	06 13	07 05	07 53	13 53	14 09	14 26	14 45
07	288 57.8	45.2	170 52.6	11.6	1 37.6	11.3	57.9	N 58	06 09	06 57	07 42	13 53	14 11	14 30	14 52
08	303 57.7	45.9	185 23.2	11.5	1 26.3	11.2	57.9	56	06 05	06 51	07 33	13 53	14 13	14 35	14 58
09	318 57.6	46.5	199 53.7	11.6	1 15.1	11.3	57.9	54	06 02	06 45	07 24	13 53	14 15	14 38	15 03
10	333 57.5	47.2	214 24.3	11.7	1 03.8	11.3	57.9	52	05 58	06 39	07 17	13 53	14 17	14 42	15 08
11	348 57.4	47.9	228 55.0	11.6	0 52.5	11.2	57.8	50	05 55	06 34	07 10	13 52	14 18	14 45	15 13
12	3 57.4	S17 48.6	243 25.6	11.7	S 0 41.3	11.3	57.8	45	05 48	06 23	06 55	13 52	14 21	14 51	15 23
13	18 57.3	49.2	257 56.3	11.7	0 30.0	11.3	57.8	N 40	05 41	06 14	06 43	13 52	14 24	14 57	15 31
14	33 57.2	49.9	272 27.0	11.7	0 18.7	11.2	57.8	35	05 35	06 06	06 33	13 52	14 26	15 02	15 38
15	48 57.1	50.6	286 57.7	11.7	S 0 07.5	11.3	57.8	30	05 29	05 58	06 23	13 51	14 29	15 06	15 45
16	63 57.0	51.2	301 28.4	11.8	N 0 03.8	11.2	57.7	20	05 18	05 45	06 08	13 51	14 32	15 13	15 56
17	78 56.9	51.9	315 59.2	11.8	0 15.0	11.2	57.7	N 10	05 06	05 32	05 54	13 51	14 35	15 20	16 05
18	93 56.9	S17 52.6	330 30.0	11.8	N 0 26.2	11.2	57.7	0	04 54	05 19	05 41	13 50	14 39	15 26	16 14
19	108 56.8	53.2	345 00.8	11.8	0 37.4	11.3	57.7	S 10	04 39	05 05	05 28	13 50	14 42	15 33	16 24
20	123 56.7	53.9	359 31.6	11.8	0 48.7	11.1	57.6	20	04 22	04 50	05 13	13 50	14 45	15 39	16 33
21	138 56.6	54.6	14 02.4	11.8	0 59.8	11.2	57.6	30	04 00	04 31	04 57	13 50	14 49	15 47	16 45
22	153 56.5	55.2	28 33.2	11.9	1 11.0	11.2	57.6	35	03 46	04 19	04 47	13 50	14 51	15 52	16 51
23	168 56.4	55.9	43 04.1	11.9	1 22.2	11.2	57.6	40	03 29	04 06	04 36	13 49	14 54	15 57	16 59
13 00	183 56.4	S17 56.6	57 35.0	11.9	N 1 33.4	11.1	57.6	45	03 07	03 50	04 23	13 49	14 57	16 03	17 07
01	198 56.3	57.2	72 05.9	11.9	1 44.5	11.1	57.5	S 50	02 38	03 29	04 07	13 49	15 00	16 10	17 18
02	213 56.2	57.9	86 36.8	11.9	1 55.6	11.1	57.5	52	02 23	03 19	04 00	13 49	15 02	16 13	17 23
03	228 56.1	58.6	101 07.7	12.0	2 06.7	11.1	57.5	54	02 05	03 07	03 51	13 49	15 04	16 17	17 28
04	243 56.0	59.2	115 38.7	11.9	2 17.8	11.1	57.5	56	01 42	02 54	03 42	13 49	15 06	16 21	17 34
05	258 55.9	17 59.9	130 09.6	12.0	2 28.9	11.1	57.5	58	01 10	02 38	03 31	13 49	15 08	16 25	17 41
06	273 55.8	S18 00.6	144 40.6	11.9	N 2 40.0	11.0	57.4	S 60	////	02 19	03 19	13 48	15 10	16 31	17 49
07	288 55.7	01.2	159 11.5	12.0	2 51.0	11.0	57.4								
08	303 55.7	01.9	173 42.5	12.0	3 02.0	11.0	57.4								
09	318 55.6	02.5	188 13.5	12.0	3 13.0	11.0	57.4								
10	333 55.5	03.2	202 44.5	12.0	3 24.0	10.9	57.4								
11	348 55.4	03.9	217 15.5	12.1	3 34.9	10.9	57.3								
12	3 55.3	S18 04.5	231 46.6	12.0	N 3 45.8	10.9	57.3								
13	18 55.2	05.2	246 17.6	12.0	3 56.7	10.9	57.3								
14	33 55.1	05.8	260 48.6	12.1	4 07.6	10.8	57.3								
15	48 55.0	06.5	275 19.7	12.0	4 18.4	10.8	57.3								
16	63 54.9	07.1	289 50.7	12.0	4 29.2	10.8	57.2								
17	78 54.8	07.8	304 21.7	12.1	4 40.0	10.7	57.2								
18	93 54.8	S18 08.5	318 52.8	12.1	N 4 50.7	10.8	57.2								
19	108 54.7	09.1	333 23.9	12.0	5 01.5	10.6	57.2								
20	123 54.6	09.8	347 54.9	12.1	5 12.1	10.7	57.1								
21	138 54.5	10.4	2 26.0	12.0	5 22.8	10.6	57.1								
22	153 54.4	11.1	16 57.0	12.1	5 33.4	10.6	57.1								
23	168 54.3	11.7	31 28.1	12.1	5 44.0	10.5	57.1								
14 00	183 54.2	S18 12.4	45 59.2	12.0	N 5 54.5	10.6	57.1								
01	198 54.1	13.0	60 30.2	12.1	6 05.1	10.4	57.0								
02	213 54.0	13.7	75 01.3	12.1	6 15.5	10.5	57.0								
03	228 53.9	14.3	89 32.4	12.0	6 26.0	10.4	57.0								
04	243 53.8	15.0	104 03.4	12.1	6 36.4	10.3	57.0								
05	258 53.7	15.6	118 34.5	12.1	6 46.7	10.4	57.0								
06	273 53.6	S18 16.3	133 05.6	12.0	N 6 57.1	10.2	56.9								
07	288 53.5	16.9	147 36.6	12.1	7 07.3	10.3	56.9								
08	303 53.4	17.6	162 07.7	12.0	7 17.6	10.2	56.9								
09	318 53.3	18.2	176 38.7	12.1	7 27.8	10.1	56.9								
10	333 53.2	18.9	191 09.8	12.0	7 37.9	10.1	56.9								
11	348 53.1	19.5	205 40.8	12.1	7 48.0	10.1	56.8								
12	3 53.0	S18 20.2	220 11.9	12.0	N 7 58.1	10.0	56.8	S 50	19 22	20 01	20 52	01 38	02 04	02 30	02 57
13	18 52.9	20.8	234 42.9	12.0	8 08.1	10.0	56.8	52	19 30	20 11	21 08	01 39	02 03	02 27	02 53
14	33 52.8	21.4	249 13.9	12.0	8 18.1	9.9	56.8	54	19 38	20 23	21 26	01 40	02 02	02 25	02 49
15	48 52.7	22.1	263 44.9	12.0	8 28.0	9.9	56.8	56	19 48	20 37	21 50	01 41	02 01	02 22	02 44
16	63 52.6	22.7	278 15.9	12.1	8 37.9	9.8	56.7	58	19 59	20 53	22 24	01 42	02 00	02 19	02 39
17	78 52.5	23.4	292 47.0	12.0	8 47.7	9.8	56.7	S 60	20 12	21 13	////	01 43	01 59	02 15	02 33
18	93 52.4	S18 24.0	307 18.0	11.9	N 8 57.5	9.7	56.7								
19	108 52.3	24.7	321 48.9	12.0	9 07.2	9.7	56.7								
20	123 52.2	25.3	336 19.9	12.0	9 16.9	9.6	56.7								
21	138 52.1	25.9	350 50.9	12.0	9 26.5	9.6	56.6								
22	153 52.0	26.6	5 21.9	11.9	9 36.1	9.5	56.6								
23	168 51.9	27.2	19 52.8	12.0	N 9 45.6	9.4	56.6								
	SD 16.2	d 0.7	SD	15.8		15.6	15.5								

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
12	15 53	15 50	11 44	20 02	07 38	09	74
13	15 46	15 41	11 44	20 50	08 26	10	83
14	15 37	15 32	11 44	21 38	09 14	11	90

UT	ARIES	VENUS −4.7		MARS +1.4		JUPITER −2.5		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
15 00	54 14.7	134 11.5	S26 50.0	244 54.1	N 6 25.0	302 10.1	N21 53.8	190 49.0	S14 23.0
01	69 17.2	149 11.5	49.9	259 55.3	24.5	317 12.7	53.9	205 51.1	23.1
02	84 19.6	164 11.5	49.7	274 56.4	23.9	332 15.2	53.9	220 53.3	23.2
03	99 22.1	179 11.5 . .	49.5	289 57.6 . .	23.4	347 17.7 . .	53.9	235 55.5 . .	23.3
04	114 24.6	194 11.5	49.3	304 58.8	22.9	2 20.3	53.9	250 57.6	23.4
05	129 27.0	209 11.5	49.1	319 59.9	22.4	17 22.8	53.9	265 59.8	23.5
06	144 29.5	224 11.5	S26 48.9	335 01.1	N 6 21.8	32 25.3	N21 53.9	281 02.0	S14 23.6
07	159 32.0	239 11.5	48.7	350 02.3	21.3	47 27.9	54.0	296 04.1	23.6
08	174 34.4	254 11.5	48.5	5 03.4	20.8	62 30.4	54.0	311 06.3	23.7
09	189 36.9	269 11.5 . .	48.3	20 04.6 . .	20.3	77 32.9 . .	54.0	326 08.5 . .	23.8
10	204 39.4	284 11.5	48.1	35 05.7	19.8	92 35.5	54.0	341 10.6	23.9
11	219 41.8	299 11.5	47.9	50 06.9	19.2	107 38.0	54.0	356 12.8	24.0
12	234 44.3	314 11.5	S26 47.7	65 08.1	N 6 18.7	122 40.5	N21 54.0	11 15.0	S14 24.1
13	249 46.8	329 11.5	47.5	80 09.2	18.2	137 43.1	54.0	26 17.2	24.2
14	264 49.2	344 11.5	47.3	95 10.4	17.7	152 45.6	54.1	41 19.3	24.3
15	279 51.7	359 11.6 . .	47.1	110 11.6 . .	17.1	167 48.2 . .	54.1	56 21.5 . .	24.3
16	294 54.1	14 11.6	46.9	125 12.7	16.6	182 50.7	54.1	71 23.7	24.4
17	309 56.6	29 11.6	46.6	140 13.9	16.1	197 53.2	54.1	86 25.8	24.5
18	324 59.1	44 11.6	S26 46.4	155 15.1	N 6 15.6	212 55.8	N21 54.1	101 28.0	S14 24.6
19	340 01.5	59 11.6	46.2	170 16.2	15.0	227 58.3	54.1	116 30.2	24.7
20	355 04.0	74 11.7	46.0	185 17.4	14.5	243 00.9	54.2	131 32.3	24.8
21	10 06.5	89 11.7 . .	45.8	200 18.6 . .	14.0	258 03.4 . .	54.2	146 34.5 . .	24.9
22	25 08.9	104 11.7	45.6	215 19.7	13.5	273 05.9	54.2	161 36.7	24.9
23	40 11.4	119 11.7	45.4	230 20.9	13.0	288 08.5	54.2	176 38.9	25.0
16 00	55 13.9	134 11.8	S26 45.2	245 22.1	N 6 12.4	303 11.0	N21 54.2	191 41.0	S14 25.1
01	70 16.3	149 11.8	45.0	260 23.2	11.9	318 13.6	54.2	206 43.2	25.2
02	85 18.8	164 11.8	44.7	275 24.4	11.4	333 16.1	54.3	221 45.4	25.3
03	100 21.2	179 11.9 . .	44.5	290 25.6 . .	10.9	348 18.6 . .	54.3	236 47.5 . .	25.4
04	115 23.7	194 11.9	44.3	305 26.7	10.3	3 21.2	54.3	251 49.7	25.4
05	130 26.2	209 11.9	44.1	320 27.9	09.8	18 23.7	54.3	266 51.9	25.5
06	145 28.6	224 12.0	S26 43.9	335 29.1	N 6 09.3	33 26.3	N21 54.3	281 54.0	S14 25.6
07	160 31.1	239 12.0	43.7	350 30.2	08.8	48 28.8	54.3	296 56.2	25.7
08	175 33.6	254 12.1	43.4	5 31.4	08.2	63 31.4	54.4	311 58.4	25.8
09	190 36.0	269 12.1 . .	43.2	20 32.6 . .	07.7	78 33.9 . .	54.4	327 00.5 . .	25.9
10	205 38.5	284 12.2	43.0	35 33.7	07.2	93 36.4	54.4	342 02.7	26.0
11	220 41.0	299 12.2	42.8	50 34.9	06.7	108 39.0	54.4	357 04.9	26.0
12	235 43.4	314 12.3	S26 42.5	65 36.1	N 6 06.2	123 41.5	N21 54.4	12 07.1	S14 26.1
13	250 45.9	329 12.3	42.3	80 37.3	05.6	138 44.1	54.4	27 09.2	26.2
14	265 48.4	344 12.4	42.1	95 38.4	05.1	153 46.6	54.5	42 11.4	26.3
15	280 50.8	359 12.4 . .	41.9	110 39.6 . .	04.6	168 49.2 . .	54.5	57 13.6 . .	26.4
16	295 53.3	14 12.5	41.6	125 40.8	04.1	183 51.7	54.5	72 15.7	26.5
17	310 55.7	29 12.5	41.4	140 41.9	03.5	198 54.3	54.5	87 17.9	26.6
18	325 58.2	44 12.6	S26 41.2	155 43.1	N 6 03.0	213 56.8	N21 54.5	102 20.1	S14 26.6
19	341 00.7	59 12.6	41.0	170 44.3	02.5	228 59.4	54.5	117 22.2	26.7
20	356 03.1	74 12.7	40.7	185 45.4	02.0	244 01.9	54.6	132 24.4	26.8
21	11 05.6	89 12.7 . .	40.5	200 46.6 . .	01.5	259 04.5 . .	54.6	147 26.6 . .	26.9
22	26 08.1	104 12.8	40.3	215 47.8	00.9	274 07.0	54.6	162 28.8	27.0
23	41 10.5	119 12.9	40.0	230 49.0	6 00.4	289 09.6	54.6	177 30.9	27.1
17 00	56 13.0	134 12.9	S26 39.8	245 50.1	N 5 59.9	304 12.1	N21 54.6	192 33.1	S14 27.2
01	71 15.5	149 13.0	39.6	260 51.3	59.4	319 14.7	54.6	207 35.3	27.2
02	86 17.9	164 13.1	39.3	275 52.5	58.8	334 17.2	54.7	222 37.4	27.3
03	101 20.4	179 13.1 . .	39.1	290 53.6 . .	58.3	349 19.8 . .	54.7	237 39.6 . .	27.4
04	116 22.9	194 13.2	38.9	305 54.8	57.8	4 22.3	54.7	252 41.8	27.5
05	131 25.3	209 13.3	38.6	320 56.0	57.3	19 24.9	54.7	267 43.9	27.6
06	146 27.8	224 13.4	S26 38.4	335 57.2	N 5 56.8	34 27.4	N21 54.7	282 46.1	S14 27.7
07	161 30.2	239 13.4	38.1	350 58.3	56.2	49 30.0	54.8	297 48.3	27.8
08	176 32.7	254 13.5	37.9	5 59.5	55.7	64 32.5	54.8	312 50.5	27.8
09	191 35.2	269 13.6 . .	37.7	21 00.7 . .	55.2	79 35.1 . .	54.8	327 52.6 . .	27.9
10	206 37.6	284 13.7	37.4	36 01.8	54.7	94 37.6	54.8	342 54.8	28.0
11	221 40.1	299 13.8	37.2	51 03.0	54.1	109 40.2	54.8	357 57.0	28.1
12	236 42.6	314 13.9	S26 36.9	66 04.2	N 5 53.6	124 42.7	N21 54.8	12 59.1	S14 28.2
13	251 45.0	329 13.9	36.7	81 05.4	53.1	139 45.3	54.9	28 01.3	28.3
14	266 47.5	344 14.0	36.4	96 06.5	52.6	154 47.8	54.9	43 03.5	28.3
15	281 50.0	359 14.1 . .	36.2	111 07.7 . .	52.1	169 50.4 . .	54.9	58 05.6 . .	28.4
16	296 52.4	14 14.2	35.9	126 08.9	51.5	184 52.9	54.9	73 07.8	28.5
17	311 54.9	29 14.3	35.7	141 10.1	51.0	199 55.5	54.9	88 10.0	28.6
18	326 57.3	44 14.4	S26 35.4	156 11.2	N 5 50.5	214 58.1	N21 55.0	103 12.2	S14 28.7
19	341 59.8	59 14.5	35.2	171 12.4	50.0	230 00.6	55.0	118 14.3	28.8
20	357 02.3	74 14.6	34.9	186 13.6	49.4	245 03.2	55.0	133 16.5	28.9
21	12 04.7	89 14.7 . .	34.7	201 14.8 . .	48.9	260 05.7 . .	55.0	148 18.7 . .	28.9
22	27 07.2	104 14.8	34.4	216 15.9	48.4	275 08.3	55.0	163 20.8	29.0
23	42 09.7	119 14.9	34.2	231 17.1	47.9	290 10.8	55.0	178 23.0	29.1
	h m								
Mer. Pass.	20 15.7	v 0.0	d 0.2	v 1.2	d 0.5	v 2.5	d 0.0	v 2.2	d 0.1

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.7	S40 15.0
Achernar	335 26.1	S57 10.1
Acrux	173 09.3	S63 10.3
Adhara	255 12.0	S28 59.5
Aldebaran	290 48.7	N16 32.1
Alioth	166 21.0	N55 52.9
Alkaid	152 59.2	N49 14.6
Al Na'ir	27 43.4	S46 53.7
Alnilam	275 45.8	S 1 11.7
Alphard	217 55.8	S 8 43.2
Alphecca	126 11.2	N26 40.2
Alpheratz	357 43.0	N29 10.3
Altair	62 08.1	N 8 54.6
Ankaa	353 15.2	S42 13.9
Antares	112 26.3	S26 27.6
Arcturus	145 55.8	N19 06.7
Atria	107 28.3	S69 03.0
Avior	234 17.6	S59 33.1
Bellatrix	278 31.4	N 6 21.6
Betelgeuse	271 00.7	N 7 24.4
Canopus	263 55.6	S52 42.1
Capella	280 33.6	N46 00.5
Deneb	49 31.4	N45 20.2
Denebola	182 33.6	N14 29.6
Diphda	348 55.4	S17 54.6
Dubhe	193 51.7	N61 40.2
Elnath	278 11.9	N28 37.0
Eltanin	90 46.5	N51 29.6
Enif	33 46.8	N 9 56.6
Fomalhaut	15 23.6	S29 32.9
Gacrux	172 00.9	S57 11.2
Gienah	175 52.2	S17 37.0
Hadar	148 48.0	S60 26.2
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 21.3	N74 05.9
Markab	13 37.9	N15 17.1
Menkar	314 14.4	N 4 08.6
Menkent	148 07.6	S36 26.1
Miaplacidus	221 39.4	S69 46.3
Mirfak	308 39.4	N49 54.6
Nunki	75 58.2	S26 16.6
Peacock	53 19.1	S56 41.4
Pollux	243 27.2	N27 59.3
Procyon	244 59.3	N 5 11.2
Rasalhague	96 06.5	N12 33.3
Regulus	207 43.3	N11 53.8
Rigel	281 11.5	S 8 11.2
Rigil Kent.	139 51.9	S60 53.3
Sabik	102 12.5	S15 44.3
Schedar	349 39.7	N56 37.1
Shaula	96 21.9	S37 06.7
Sirius	258 33.2	S16 44.2
Spica	158 31.2	S11 13.9
Suhail	222 52.1	S43 29.2
Vega	80 39.1	N38 48.2
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	78 57.9	15 03
Mars	190 08.2	7 38
Jupiter	247 57.2	3 47
Saturn	136 27.2	11 12

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 15	Moonrise 16	Moonrise 17	Moonrise 18
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
15 00	183 51.8	S18 27.9	34 23.8	11.9	N 9 55.0	9.4	56.6	N 72	07 03	08 40	▬	13 28	13 15	12 50	▭
01	198 51.7	28.5	48 54.7	11.9	10 04.4	9.4	56.5	N 70	06 53	08 16	09 57	13 48	13 47	13 47	13 53
02	213 51.6	29.1	63 25.6	12.0	10 13.8	9.3	56.5	68	06 44	07 58	09 18	14 04	14 10	14 22	14 42
03	228 51.5 . .	29.8	77 56.6	11.9	10 23.1	9.2	56.5	66	06 37	07 43	08 51	14 17	14 29	14 46	15 13
04	243 51.4	30.4	92 27.5	11.9	10 32.3	9.2	56.5	64	06 30	07 31	08 31	14 28	14 44	15 06	15 37
05	258 51.3	31.0	106 58.4	11.9	10 41.5	9.1	56.5	62	06 24	07 20	08 14	14 37	14 56	15 22	15 55
06	273 51.2	S18 31.7	121 29.3	11.8	N10 50.6	9.1	56.4	60	06 19	07 11	08 01	14 45	15 07	15 35	16 10
07	288 51.1	32.3	136 00.1	11.9	10 59.7	9.0	56.4	N 58	06 15	07 03	07 49	14 52	15 16	15 47	16 23
08	303 51.0	33.0	150 31.0	11.8	11 08.7	8.9	56.4	56	06 10	06 56	07 39	14 58	15 25	15 57	16 35
09	318 50.9 . .	33.6	165 01.8	11.9	11 17.6	8.9	56.4	54	06 06	06 50	07 30	15 03	15 32	16 05	16 45
10	333 50.8	34.2	179 32.7	11.8	11 26.5	8.8	56.4	52	06 03	06 44	07 22	15 08	15 39	16 13	16 53
11	348 50.7	34.8	194 03.5	11.8	11 35.3	8.8	56.3	50	05 59	06 39	07 15	15 13	15 45	16 20	17 01
12	3 50.6	S18 35.5	208 34.3	11.8	N11 44.1	8.7	56.3	45	05 52	06 27	06 59	15 23	15 57	16 36	17 18
13	18 50.5	36.1	223 05.1	11.8	11 52.8	8.6	56.3	N 40	05 44	06 17	06 46	15 31	16 08	16 48	17 32
14	33 50.4	36.7	237 35.9	11.8	12 01.4	8.5	56.3	35	05 38	06 08	06 35	15 38	16 17	16 59	17 44
15	48 50.2 . .	37.4	252 06.7	11.7	12 09.9	8.5	56.3	30	05 32	06 01	06 26	15 45	16 25	17 08	17 54
16	63 50.1	38.0	266 37.4	11.8	12 18.4	8.5	56.2	20	05 19	05 46	06 09	15 56	16 39	17 25	18 12
17	78 50.0	38.6	281 08.2	11.7	12 26.9	8.3	56.2	N 10	05 07	05 33	05 55	16 05	16 52	17 39	18 27
18	93 49.9	S18 39.3	295 38.9	11.8	N12 35.2	8.3	56.2	0	04 54	05 19	05 41	16 14	17 03	17 52	18 42
19	108 49.8	39.9	310 09.7	11.7	12 43.5	8.2	56.2	S 10	04 39	05 05	05 27	16 24	17 15	18 06	18 56
20	123 49.7	40.5	324 40.4	11.7	12 51.7	8.2	56.2	20	04 21	04 49	05 13	16 33	17 27	18 20	19 12
21	138 49.6 . .	41.1	339 11.1	11.6	12 59.9	8.1	56.1	30	03 58	04 29	04 55	16 45	17 41	18 37	19 30
22	153 49.5	41.8	353 41.7	11.7	13 08.0	8.0	56.1	35	03 43	04 17	04 45	16 51	17 50	18 46	19 40
23	168 49.4	42.4	8 12.4	11.7	13 16.0	8.0	56.1	40	03 25	04 03	04 34	16 59	17 59	18 57	19 52
16 00	183 49.3	S18 43.0	22 43.1	11.6	N13 24.0	7.8	56.1	45	03 03	03 46	04 20	17 07	18 10	19 10	20 06
01	198 49.1	43.6	37 13.7	11.6	13 31.8	7.8	56.1	S 50	02 32	03 24	04 03	17 18	18 24	19 26	20 23
02	213 49.0	44.3	51 44.3	11.6	13 39.6	7.8	56.0	52	02 16	03 13	03 55	17 23	18 30	19 34	20 31
03	228 48.9 . .	44.9	66 14.9	11.6	13 47.4	7.6	56.0	54	01 56	03 01	03 46	17 28	18 37	19 42	20 41
04	243 48.8	45.5	80 45.5	11.6	13 55.0	7.6	56.0	56	01 31	02 47	03 36	17 34	18 45	19 51	20 51
05	258 48.7	46.1	95 16.1	11.6	14 02.6	7.5	56.0	58	00 52	02 30	03 25	17 41	18 54	20 02	21 02
06	273 48.6	S18 46.8	109 46.7	11.5	N14 10.1	7.4	56.0	S 60	////	02 09	03 12	17 49	19 04	20 14	21 16
07	288 48.5	47.4	124 17.2	11.6	14 17.5	7.4	55.9								
08	303 48.3	48.0	138 47.8	11.5	14 24.9	7.3	55.9								
09	318 48.2 . .	48.6	153 18.3	11.5	14 32.2	7.2	55.9								
10	333 48.1	49.2	167 48.8	11.5	14 39.4	7.1	55.9								
11	348 48.0	49.9	182 19.3	11.5	14 46.5	7.1	55.9								
12	3 47.9	S18 50.5	196 49.8	11.5	N14 53.6	6.9	55.8								
13	18 47.8	51.1	211 20.3	11.4	15 00.5	6.9	55.8								
14	33 47.7	51.7	225 50.7	11.5	15 07.4	6.8	55.8								
15	48 47.5 . .	52.3	240 21.2	11.4	15 14.2	6.8	55.8								
16	63 47.4	52.9	254 51.6	11.4	15 21.0	6.6	55.8								
17	78 47.3	53.6	269 22.0	11.4	15 27.6	6.6	55.8								
18	93 47.2	S18 54.2	283 52.4	11.4	N15 34.2	6.5	55.7								
19	108 47.1	54.8	298 22.8	11.4	15 40.7	6.4	55.7								
20	123 46.9	55.4	312 53.2	11.4	15 47.1	6.3	55.7								
21	138 46.8 . .	56.0	327 23.6	11.4	15 53.4	6.2	55.7								
22	153 46.7	56.6	341 54.0	11.3	15 59.6	6.2	55.7								
23	168 46.6	57.2	356 24.3	11.3	16 05.8	6.1	55.6								
17 00	183 46.5	S18 57.8	10 54.6	11.4	N16 11.9	6.0	55.6								
01	198 46.3	58.5	25 25.0	11.3	16 17.9	5.9	55.6								
02	213 46.2	59.1	39 55.3	11.3	16 23.8	5.8	55.6								
03	228 46.1	18 59.7	54 25.6	11.3	16 29.6	5.7	55.6								
04	243 46.0	19 00.3	68 55.9	11.2	16 35.3	5.7	55.5								
05	258 45.9	00.9	83 26.1	11.3	16 41.0	5.5	55.5								
06	273 45.7	S19 01.5	97 56.4	11.3	N16 46.5	5.5	55.5								
07	288 45.6	02.1	112 26.7	11.2	16 52.0	5.4	55.5								
08	303 45.5	02.7	126 56.9	11.3	16 57.4	5.3	55.5								
09	318 45.4 . .	03.3	141 27.2	11.2	17 02.7	5.2	55.4								
10	333 45.2	03.9	155 57.4	11.2	17 07.9	5.1	55.4								
11	348 45.1	04.5	170 27.6	11.2	17 13.0	5.1	55.4								
12	3 45.0	S19 05.1	184 57.8	11.2	N17 18.1	4.9	55.4								
13	18 44.9	05.7	199 28.0	11.2	17 23.0	4.9	55.4								
14	33 44.7	06.3	213 58.2	11.2	17 27.9	4.7	55.4								
15	48 44.6 . .	06.9	228 28.4	11.2	17 32.6	4.7	55.3								
16	63 44.5	07.5	242 58.6	11.2	17 37.3	4.6	55.3								
17	78 44.4	08.1	257 28.8	11.2	17 41.9	4.5	55.3								
18	93 44.2	S19 08.7	271 59.0	11.1	N17 46.4	4.4	55.3								
19	108 44.1	09.3	286 29.1	11.2	17 50.8	4.3	55.3								
20	123 44.0	09.9	300 59.3	11.2	17 55.1	4.2	55.2								
21	138 43.9 . .	10.5	315 29.5	11.1	17 59.3	4.2	55.2								
22	153 43.7	11.1	329 59.6	11.2	18 03.5	4.0	55.2								
23	168 43.6	11.7	344 29.8	11.1	N18 07.5	3.9	55.2								
	SD 16.2	d 0.6	SD	15.3		15.2		15.1							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 15	Moonset 16	Moonset 17	Moonset 18
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 49	16 25	06 18	08 12	10 20	▭
N 70	13 32	15 13	16 36	05 59	07 41	09 23	11 00
68	14 11	15 31	16 44	05 45	07 19	08 49	10 11
66	14 37	15 46	16 52	05 33	07 01	08 25	09 40
64	14 58	15 58	16 59	05 23	06 47	08 06	09 17
62	15 14	16 09	17 04	05 15	06 35	07 51	08 59
60	15 28	16 18	17 10	05 08	06 25	07 38	08 44
N 58	15 40	16 26	17 14	05 02	06 16	07 27	08 31
56	15 50	16 33	17 19	04 56	06 08	07 17	08 20
54	15 59	16 39	17 23	04 51	06 01	07 08	08 10
52	16 07	16 45	17 26	04 47	05 55	07 01	08 02
50	16 15	16 50	17 30	04 43	05 50	06 54	07 54
45	16 30	17 02	17 38	04 34	05 38	06 39	07 37
N 40	16 43	17 12	17 45	04 27	05 28	06 27	07 24
35	16 54	17 21	17 51	04 20	05 19	06 17	07 12
30	17 03	17 29	17 58	04 15	05 12	06 08	07 02
20	17 20	17 43	18 10	04 05	04 59	05 53	06 45
N 10	17 35	17 57	18 22	03 57	04 48	05 39	06 30
0	17 48	18 10	18 36	03 49	04 38	05 27	06 16
S 10	18 02	18 25	18 51	03 42	04 27	05 14	06 02
20	18 17	18 41	19 09	03 33	04 16	05 01	05 47
30	18 35	19 01	19 32	03 24	04 04	04 45	05 30
35	18 45	19 13	19 47	03 19	03 56	04 37	05 20
40	18 57	19 27	20 05	03 12	03 48	04 26	05 08
45	19 10	19 45	20 28	03 05	03 38	04 15	04 55
S 50	19 27	20 07	20 59	02 57	03 27	04 00	04 39
52	19 35	20 18	21 16	02 53	03 21	03 54	04 31
54	19 44	20 30	21 36	02 49	03 15	03 46	04 22
56	19 54	20 45	22 03	02 44	03 09	03 38	04 13
58	20 06	21 02	22 44	02 39	03 02	03 29	04 02
S 60	20 19	21 23	////	02 33	02 53	03 18	03 50

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
15	15 28	15 22	11 45	22 26	10 02	12	95
16	15 17	15 12	11 45	23 15	10 50	13	99
17	15 06	15 00	11 45	24 04	11 39	14	100

UT	ARIES	VENUS −4.7		MARS +1.3		JUPITER −2.5		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
18 00	57 12.1	134 15.0	S26 33.9	246 18.3	N 5 47.4	305 13.4	N21 55.1	193 25.2	S14 29.2
01	72 14.6	149 15.1	33.7	261 19.5	46.8	320 16.0	55.1	208 27.4	29.3
02	87 17.1	164 15.2	33.4	276 20.6	46.3	335 18.5	55.1	223 29.5	29.4
03	102 19.5	179 15.3	. . 33.2	291 21.8	. . 45.8	350 21.1	. . 55.1	238 31.7	. . 29.5
04	117 22.0	194 15.4	32.9	306 23.0	45.3	5 23.6	55.1	253 33.9	29.5
05	132 24.5	209 15.5	32.6	321 24.2	44.8	20 26.2	55.2	268 36.0	29.6
06	147 26.9	224 15.6	S26 32.4	336 25.3	N 5 44.2	35 28.8	N21 55.2	283 38.2	S14 29.7
07	162 29.4	239 15.8	32.1	351 26.5	43.7	50 31.3	55.2	298 40.4	29.8
08	177 31.8	254 15.9	31.9	6 27.7	43.2	65 33.9	55.2	313 42.5	29.9
M 09	192 34.3	269 16.0	. . 31.6	21 28.9	. . 42.7	80 36.4	. . 55.2	328 44.7	. . 30.0
O 10	207 36.8	284 16.1	31.3	36 30.1	42.1	95 39.0	55.3	343 46.9	30.0
N 11	222 39.2	299 16.2	31.1	51 31.2	41.6	110 41.6	55.3	358 49.1	30.1
D 12	237 41.7	314 16.4	S26 30.8	66 32.4	N 5 41.1	125 44.1	N21 55.3	13 51.2	S14 30.2
A 13	252 44.2	329 16.5	30.5	81 33.6	40.6	140 46.7	55.3	28 53.4	30.3
Y 14	267 46.6	344 16.6	30.3	96 34.8	40.1	155 49.3	55.3	43 55.6	30.4
15	282 49.1	359 16.7	. . 30.0	111 35.9	. . 39.5	170 51.8	. . 55.4	58 57.7	. . 30.5
16	297 51.6	14 16.9	29.7	126 37.1	39.0	185 54.4	55.4	73 59.9	30.6
17	312 54.0	29 17.0	29.5	141 38.3	38.5	200 57.0	55.4	89 02.1	30.6
18	327 56.5	44 17.1	S26 29.2	156 39.5	N 5 38.0	215 59.5	N21 55.4	104 04.3	S14 30.7
19	342 59.0	59 17.3	28.9	171 40.7	37.5	231 02.1	55.4	119 06.4	30.8
20	358 01.4	74 17.4	28.7	186 41.8	36.9	246 04.7	55.5	134 08.6	30.9
21	13 03.9	89 17.5	. . 28.4	201 43.0	. . 36.4	261 07.2	. . 55.5	149 10.8	. . 31.0
22	28 06.3	104 17.7	28.1	216 44.2	35.9	276 09.8	55.5	164 12.9	31.1
23	43 08.8	119 17.8	27.8	231 45.4	35.4	291 12.4	55.5	179 15.1	31.1
19 00	58 11.3	134 18.0	S26 27.6	246 46.6	N 5 34.9	306 14.9	N21 55.5	194 17.3	S14 31.2
01	73 13.7	149 18.1	27.3	261 47.7	34.3	321 17.5	55.6	209 19.4	31.3
02	88 16.2	164 18.3	27.0	276 48.9	33.8	336 20.1	55.6	224 21.6	31.4
03	103 18.7	179 18.4	. . 26.7	291 50.1	. . 33.3	351 22.6	. . 55.6	239 23.8	. . 31.5
04	118 21.1	194 18.6	26.5	306 51.3	32.8	6 25.2	55.6	254 26.0	31.6
05	133 23.6	209 18.7	26.2	321 52.5	32.2	21 27.8	55.6	269 28.1	31.7
06	148 26.1	224 18.9	S26 25.9	336 53.6	N 5 31.7	36 30.3	N21 55.7	284 30.3	S14 31.7
T 07	163 28.5	239 19.0	25.6	351 54.8	31.2	51 32.9	55.7	299 32.5	31.8
U 08	178 31.0	254 19.2	25.3	6 56.0	30.7	66 35.5	55.7	314 34.6	31.9
E 09	193 33.5	269 19.3	. . 25.1	21 57.2	. . 30.2	81 38.0	. . 55.7	329 36.8	. . 32.0
S 10	208 35.9	284 19.5	24.8	36 58.4	29.6	96 40.6	55.7	344 39.0	32.1
D 11	223 38.4	299 19.7	24.5	51 59.6	29.1	111 43.2	55.8	359 41.2	32.2
A 12	238 40.8	314 19.8	S26 24.2	67 00.7	N 5 28.6	126 45.8	N21 55.8	14 43.3	S14 32.2
Y 13	253 43.3	329 20.0	23.9	82 01.9	28.1	141 48.3	55.8	29 45.5	32.3
14	268 45.8	344 20.1	23.6	97 03.1	27.6	156 50.9	55.8	44 47.7	32.4
15	283 48.2	359 20.3	. . 23.4	112 04.3	. . 27.0	171 53.5	. . 55.8	59 49.8	. . 32.5
16	298 50.7	14 20.5	23.1	127 05.5	26.5	186 56.0	55.9	74 52.0	32.6
17	313 53.2	29 20.7	22.8	142 06.6	26.0	201 58.6	55.9	89 54.2	32.7
18	328 55.6	44 20.8	S26 22.5	157 07.8	N 5 25.5	217 01.2	N21 55.9	104 56.4	S14 32.7
19	343 58.1	59 21.0	22.2	172 09.0	25.0	232 03.8	55.9	119 58.5	32.8
20	359 00.6	74 21.2	21.9	187 10.2	24.4	247 06.3	55.9	135 00.7	32.9
21	14 03.0	89 21.4	. . 21.6	202 11.4	. . 23.9	262 08.9	. . 56.0	150 02.9	. . 33.0
22	29 05.5	104 21.5	21.3	217 12.6	23.4	277 11.5	56.0	165 05.0	33.1
23	44 07.9	119 21.7	21.0	232 13.8	22.9	292 14.1	56.0	180 07.2	33.2
20 00	59 10.4	134 21.9	S26 20.7	247 14.9	N 5 22.4	307 16.6	N21 56.0	195 09.4	S14 33.2
01	74 12.9	149 22.1	20.5	262 16.1	21.8	322 19.2	56.0	210 11.6	33.3
02	89 15.3	164 22.3	20.2	277 17.3	21.3	337 21.8	56.1	225 13.7	33.4
03	104 17.8	179 22.5	. . 19.9	292 18.5	. . 20.8	352 24.4	. . 56.1	240 15.9	. . 33.5
04	119 20.3	194 22.7	19.6	307 19.7	20.3	7 26.9	56.1	255 18.1	33.6
05	134 22.7	209 22.9	19.3	322 20.9	19.8	22 29.5	56.1	270 20.2	33.7
06	149 25.2	224 23.0	S26 19.0	337 22.0	N 5 19.2	37 32.1	N21 56.2	285 22.4	S14 33.8
W 07	164 27.7	239 23.2	18.7	352 23.2	18.7	52 34.7	56.2	300 24.6	33.8
E 08	179 30.1	254 23.4	18.4	7 24.4	18.2	67 37.3	56.2	315 26.8	33.9
D 09	194 32.6	269 23.6	. . 18.1	22 25.6	. . 17.7	82 39.8	. . 56.2	330 28.9	. . 34.0
N 10	209 35.1	284 23.8	17.8	37 26.8	17.2	97 42.4	56.2	345 31.1	34.1
E 11	224 37.5	299 24.0	17.5	52 28.0	16.7	112 45.0	56.3	0 33.3	34.2
S 12	239 40.0	314 24.2	S26 17.2	67 29.2	N 5 16.1	127 47.6	N21 56.3	15 35.4	S14 34.3
D 13	254 42.4	329 24.5	16.9	82 30.4	15.6	142 50.2	56.3	30 37.6	34.3
A 14	269 44.9	344 24.7	16.6	97 31.5	15.1	157 52.7	56.3	45 39.8	34.4
Y 15	284 47.4	359 24.9	. . 16.3	112 32.7	. . 14.6	172 55.3	. . 56.4	60 42.0	. . 34.5
16	299 49.8	14 25.1	15.9	127 33.9	14.1	187 57.9	56.4	75 44.1	34.6
17	314 52.3	29 25.3	15.6	142 35.1	13.5	203 00.5	56.4	90 46.3	34.7
18	329 54.8	44 25.5	S26 15.3	157 36.3	N 5 13.0	218 03.1	N21 56.4	105 48.5	S14 34.8
19	344 57.2	59 25.7	15.0	172 37.5	12.5	233 05.6	56.4	120 50.6	34.8
20	359 59.7	74 26.0	14.7	187 38.7	12.0	248 08.2	56.5	135 52.8	34.9
21	15 02.2	89 26.2	. . 14.4	202 39.9	. . 11.5	263 10.8	. . 56.5	150 55.0	. . 35.0
22	30 04.6	104 26.4	14.1	217 41.0	10.9	278 13.4	56.5	165 57.2	35.1
23	45 07.1	119 26.6	13.8	232 42.2	10.4	293 16.0	56.5	180 59.3	35.2
	h m								
Mer.Pass.	20 04.0	v 0.2	d 0.3	v 1.2	d 0.5	v 2.6	d 0.0	v 2.2	d 0.1

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.7	S40 15.0
Achernar	335 26.1	S57 10.1
Acrux	173 09.3	S63 10.3
Adhara	255 12.0	S28 59.5
Aldebaran	290 48.7	N16 32.1
Alioth	166 20.9	N55 52.9
Alkaid	152 59.2	N49 14.6
Al Na'ir	27 43.4	S46 53.7
Alnilam	275 45.8	S 1 11.7
Alphard	217 55.8	S 8 43.2
Alphecca	126 11.2	N26 40.2
Alpheratz	357 43.0	N29 10.3
Altair	62 08.1	N 8 54.6
Ankaa	353 15.2	S42 13.9
Antares	112 26.3	S26 27.6
Arcturus	145 55.8	N19 06.7
Atria	107 28.3	S69 03.0
Avior	234 17.6	S59 33.1
Bellatrix	278 31.4	N 6 21.6
Betelgeuse	271 00.7	N 7 24.4
Canopus	263 55.6	S52 42.2
Capella	280 33.6	N46 00.5
Deneb	49 31.4	N45 20.2
Denebola	182 33.5	N14 29.6
Diphda	348 55.4	S17 54.6
Dubhe	193 51.7	N61 40.2
Elnath	278 11.9	N28 37.0
Eltanin	90 46.5	N51 29.6
Enif	33 46.9	N 9 56.6
Fomalhaut	15 23.6	S29 32.9
Gacrux	172 00.9	S57 11.2
Gienah	175 52.2	S17 37.0
Hadar	148 48.0	S60 26.2
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 21.3	N74 05.9
Markab	13 37.9	N15 17.1
Menkar	314 14.4	N 4 08.6
Menkent	148 07.6	S36 26.1
Miaplacidus	221 39.3	S69 46.3
Mirfak	308 39.4	N49 54.6
Nunki	75 58.2	S26 16.6
Peacock	53 19.1	S56 41.4
Pollux	243 27.2	N27 59.3
Procyon	244 59.2	N 5 11.2
Rasalhague	96 06.5	N12 33.3
Regulus	207 43.2	N11 53.8
Rigel	281 11.5	S 8 11.2
Rigil Kent.	139 51.9	S60 53.3
Sabik	102 12.5	S15 44.3
Schedar	349 39.7	N56 37.1
Shaula	96 21.9	S37 06.7
Sirius	258 33.2	S16 44.2
Spica	158 31.2	S11 13.9
Suhail	222 52.1	S43 29.2
Vega	80 39.1	N38 48.2
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	76 06.7	15 03
Mars	188 35.3	7 32
Jupiter	248 03.6	3 34
Saturn	136 06.0	11 01

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 18	Moonrise 19	Moonrise 20	Moonrise 21
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
18 00	183 43.5	S19 12.3	358 59.9	11.1	N18 11.4	3.9	55.2	N 72	07 14	08 54	▬	▭	▭	▭	15 27
01	198 43.3	12.9	13 30.0	11.2	18 15.3	3.8	55.2	N 70	07 02	08 28	10 19	13 53	14 17	15 22	16 52
02	213 43.2	13.5	28 00.2	11.1	18 19.1	3.6	55.1	68	06 52	08 08	09 33	14 42	15 19	16 16	17 31
03	228 43.1	. . 14.1	42 30.3	11.2	18 22.7	3.6	55.1	66	06 44	07 52	09 03	15 13	15 54	16 49	17 57
04	243 43.0	14.7	57 00.5	11.1	18 26.3	3.5	55.1	64	06 37	07 38	08 41	15 37	16 19	17 13	18 18
05	258 42.8	15.3	71 30.6	11.1	18 29.8	3.4	55.1	62	06 31	07 27	08 23	15 55	16 38	17 32	18 35
06	273 42.7	S19 15.9	86 00.7	11.2	N18 33.2	3.3	55.1	60	06 25	07 18	08 08	16 10	16 55	17 48	18 48
07	288 42.6	16.5	100 30.9	11.1	18 36.5	3.2	55.1	N 58	06 20	07 09	07 56	16 23	17 08	18 01	19 00
08	303 42.4	17.1	115 01.0	11.1	18 39.7	3.1	55.0	56	06 15	07 02	07 45	16 35	17 20	18 12	19 10
M 09	318 42.3	. . 17.7	129 31.1	11.2	18 42.8	3.0	55.0	54	06 11	06 55	07 35	16 45	17 30	18 22	19 19
O 10	333 42.2	18.3	144 01.3	11.1	18 45.8	2.9	55.0	52	06 07	06 49	07 27	16 53	17 39	18 31	19 27
N 11	348 42.0	18.9	158 31.4	11.1	18 48.7	2.8	55.0	50	06 03	06 43	07 19	17 01	17 48	18 39	19 35
D 12	3 41.9	S19 19.5	173 01.5	11.2	N18 51.5	2.8	55.0	45	05 55	06 31	07 03	17 18	18 05	18 56	19 50
A 13	18 41.8	20.0	187 31.7	11.1	18 54.3	2.6	55.0	N 40	05 47	06 20	06 50	17 32	18 19	19 10	20 03
Y 14	33 41.6	20.6	202 01.8	11.2	18 56.9	2.5	54.9	35	05 40	06 11	06 38	17 44	18 31	19 22	20 13
15	48 41.5	. . 21.2	216 32.0	11.1	18 59.4	2.5	54.9	30	05 34	06 03	06 28	17 54	18 42	19 32	20 23
16	63 41.4	21.8	231 02.1	11.2	19 01.9	2.3	54.9	20	05 21	05 48	06 11	18 12	19 00	19 49	20 39
17	78 41.2	22.4	245 32.3	11.1	19 04.2	2.3	54.9	N 10	05 08	05 34	05 56	18 27	19 16	20 05	20 53
18	93 41.1	S19 23.0	260 02.4	11.2	N19 06.5	2.1	54.9	0	04 54	05 20	05 42	18 42	19 31	20 19	21 06
19	108 41.0	23.6	274 32.6	11.2	19 08.6	2.1	54.9	S 10	04 39	05 05	05 27	18 56	19 46	20 33	21 20
20	123 40.8	24.1	289 02.8	11.1	19 10.7	2.0	54.8	20	04 20	04 48	05 12	19 12	20 01	20 49	21 34
21	138 40.7	. . 24.7	303 32.9	11.2	19 12.7	1.8	54.8	30	03 56	04 28	04 54	19 30	20 20	21 06	21 50
22	153 40.5	25.3	318 03.1	11.2	19 14.5	1.8	54.8	35	03 41	04 15	04 44	19 40	20 30	21 17	21 59
23	168 40.4	25.9	332 33.3	11.2	19 16.3	1.7	54.8	40	03 22	04 01	04 31	19 52	20 43	21 28	22 10
19 00	183 40.3	S19 26.5	347 03.5	11.2	N19 18.0	1.6	54.8	45	02 58	03 43	04 17	20 06	20 57	21 42	22 22
01	198 40.1	27.1	1 33.7	11.3	19 19.6	1.5	54.8	S 50	02 26	03 20	04 00	20 23	21 14	21 59	22 37
02	213 40.0	27.6	16 04.0	11.2	19 21.1	1.4	54.8	52	02 09	03 08	03 51	20 31	21 23	22 07	22 44
03	228 39.9	. . 28.2	30 34.2	11.2	19 22.5	1.3	54.7	54	01 47	02 55	03 42	20 41	21 32	22 16	22 52
04	243 39.7	28.8	45 04.4	11.3	19 23.8	1.2	54.7	56	01 19	02 40	03 31	20 51	21 42	22 26	23 01
05	258 39.6	29.4	59 34.7	11.2	19 25.0	1.1	54.7	58	00 30	02 22	03 19	21 02	21 54	22 37	23 11
06	273 39.4	S19 30.0	74 04.9	11.3	N19 26.1	1.0	54.7	S 60	////	01 59	03 05	21 16	22 08	22 50	23 22
T 07	288 39.3	30.5	88 35.2	11.3	19 27.1	1.0	54.7								
U 08	303 39.2	31.1	103 05.5	11.3	19 28.1	0.8	54.7								
E 09	318 39.0	. . 31.7	117 35.8	11.3	19 28.9	0.7	54.7								
S 10	333 38.9	32.3	132 06.1	11.3	19 29.6	0.7	54.6								
D 11	348 38.7	32.8	146 36.4	11.4	19 30.3	0.5	54.6								
A 12	3 38.6	S19 33.4	161 06.8	11.3	N19 30.8	0.4	54.6								
Y 13	18 38.5	34.0	175 37.1	11.4	19 31.2	0.4	54.6								
14	33 38.3	34.6	190 07.5	11.4	19 31.6	0.3	54.6								
15	48 38.2	. . 35.1	204 37.9	11.4	19 31.9	0.1	54.6								
16	63 38.0	35.7	219 08.3	11.4	19 32.0	0.1	54.6								
17	78 37.9	36.3	233 38.7	11.4	19 32.1	0.0	54.5								
18	93 37.7	S19 36.9	248 09.1	11.5	N19 32.1	0.1	54.5								
19	108 37.6	37.4	262 39.6	11.5	19 32.0	0.3	54.5								
20	123 37.4	38.0	277 10.1	11.4	19 31.7	0.3	54.5								
21	138 37.3	. . 38.6	291 40.5	11.6	19 31.4	0.4	54.5								
22	153 37.2	39.1	306 11.1	11.5	19 31.0	0.4	54.5								
23	168 37.0	39.7	320 41.6	11.5	19 30.6	0.6	54.5								
20 00	183 36.9	S19 40.3	335 12.1	11.6	N19 30.0	0.7	54.5								
01	198 36.7	40.8	349 42.7	11.6	19 29.3	0.8	54.4								
02	213 36.6	41.4	4 13.3	11.6	19 28.5	0.8	54.4								
03	228 36.4	. . 42.0	18 43.9	11.6	19 27.7	1.0	54.4								
04	243 36.3	42.5	33 14.5	11.7	19 26.7	1.0	54.4								
05	258 36.1	43.1	47 45.2	11.7	19 25.7	1.2	54.4								
06	273 36.0	S19 43.7	62 15.9	11.7	N19 24.5	1.2	54.4								
W 07	288 35.8	44.2	76 46.6	11.7	19 23.3	1.3	54.4								
E 08	303 35.7	44.8	91 17.3	11.7	19 22.0	1.4	54.4								
D 09	318 35.5	. . 45.4	105 48.0	11.8	19 20.6	1.5	54.4								
N 10	333 35.4	45.9	120 18.8	11.8	19 19.1	1.6	54.3								
E 11	348 35.2	46.5	134 49.6	11.8	19 17.5	1.7	54.3								
S 12	3 35.1	S19 47.0	149 20.4	11.9	N19 15.8	1.8	54.3								
D 13	18 34.9	47.6	163 51.3	11.9	19 14.0	1.8	54.3								
A 14	33 34.8	48.2	178 22.2	11.9	19 12.2	2.0	54.3								
Y 15	48 34.6	. . 48.7	192 53.1	11.9	19 10.2	2.0	54.3								
16	63 34.5	49.3	207 24.0	11.9	19 08.2	2.1	54.3								
17	78 34.3	49.8	221 54.9	12.0	19 06.1	2.2	54.3								
18	93 34.2	S19 50.4	236 25.9	12.0	N19 03.9	2.3	54.3								
19	108 34.0	50.9	250 56.9	12.0	19 01.6	2.4	54.3								
20	123 33.9	51.5	265 27.9	12.1	18 59.2	2.5	54.2								
21	138 33.7	. . 52.1	279 59.0	12.1	18 56.7	2.6	54.2								
22	153 33.6	52.6	294 30.1	12.1	18 54.1	2.6	54.2								
23	168 33.4	53.2	309 01.2	12.2	N18 51.5	2.8	54.2								
	SD 16.2	d 0.6	SD 15.0		14.9		14.8								

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
18	14 54	14 48	11 45	00 04	12 29	15	99
19	14 41	14 35	11 45	00 54	13 18	16	97
20	14 28	14 21	11 46	01 43	14 07	17	92

UT	ARIES	VENUS −4.8		MARS +1.3		JUPITER −2.5		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
21 00	60 09.6	134 26.8	S26 13.5	247 43.4	N 5 09.9	308 18.6	N21 56.5	196 01.5	S14 35.3
01	75 12.0	149 27.1	13.2	262 44.6	09.4	323 21.2	56.6	211 03.7	35.3
02	90 14.5	164 27.3	12.8	277 45.8	08.9	338 23.7	56.6	226 05.8	35.4
03	105 16.9	179 27.5	12.5	292 47.0	08.3	353 26.3	56.6	241 08.0	35.5
04	120 19.4	194 27.8	12.2	307 48.2	07.8	8 28.9	56.6	256 10.2	35.6
05	135 21.9	209 28.0	11.9	322 49.4	07.3	23 31.5	56.7	271 12.4	35.7
06	150 24.3	224 28.2	S26 11.6	337 50.6	N 5 06.8	38 34.1	N21 56.7	286 14.5	S14 35.8
07	165 26.8	239 28.5	11.3	352 51.8	06.3	53 36.7	56.7	301 16.7	35.8
08	180 29.3	254 28.7	10.9	7 52.9	05.8	68 39.3	56.7	316 18.9	35.9
09	195 31.7	269 29.0	10.6	22 54.1	05.2	83 41.8	56.8	331 21.0	36.0
10	210 34.2	284 29.2	10.3	37 55.3	04.7	98 44.4	56.8	346 23.2	36.1
11	225 36.7	299 29.5	10.0	52 56.5	04.2	113 47.0	56.8	1 25.4	36.2
12	240 39.1	314 29.7	S26 09.7	67 57.7	N 5 03.7	128 49.6	N21 56.8	16 27.6	S14 36.3
13	255 41.6	329 30.0	09.3	82 58.9	03.2	143 52.2	56.8	31 29.7	36.3
14	270 44.1	344 30.2	09.0	98 00.1	02.6	158 54.8	56.9	46 31.9	36.4
15	285 46.5	359 30.5	08.7	113 01.3	02.1	173 57.4	56.9	61 34.1	36.5
16	300 49.0	14 30.7	08.4	128 02.5	01.6	189 00.0	56.9	76 36.3	36.6
17	315 51.4	29 31.0	08.0	143 03.7	01.1	204 02.6	56.9	91 38.4	36.7
18	330 53.9	44 31.2	S26 07.7	158 04.9	N 5 00.6	219 05.2	N21 57.0	106 40.6	S14 36.8
19	345 56.4	59 31.5	07.4	173 06.1	5 00.1	234 07.7	57.0	121 42.8	36.8
20	0 58.8	74 31.8	07.1	188 07.2	4 59.5	249 10.3	57.0	136 44.9	36.9
21	16 01.3	89 32.0	06.7	203 08.4	59.0	264 12.9	57.0	151 47.1	37.0
22	31 03.8	104 32.3	06.4	218 09.6	58.5	279 15.5	57.1	166 49.3	37.1
23	46 06.2	119 32.6	06.1	233 10.8	58.0	294 18.1	57.1	181 51.5	37.2
22 00	61 08.7	134 32.8	S26 05.7	248 12.0	N 4 57.5	309 20.7	N21 57.1	196 53.6	S14 37.3
01	76 11.2	149 33.1	05.4	263 13.2	57.0	324 23.3	57.1	211 55.8	37.3
02	91 13.6	164 33.4	05.1	278 14.4	56.4	339 25.9	57.2	226 58.0	37.4
03	106 16.1	179 33.6	04.7	293 15.6	55.9	354 28.5	57.2	242 00.1	37.5
04	121 18.5	194 33.9	04.4	308 16.8	55.4	9 31.1	57.2	257 02.3	37.6
05	136 21.0	209 34.2	04.1	323 18.0	54.9	24 33.7	57.2	272 04.5	37.7
06	151 23.5	224 34.5	S26 03.7	338 19.2	N 4 54.4	39 36.3	N21 57.2	287 06.7	S14 37.8
07	166 25.9	239 34.8	03.4	353 20.4	53.8	54 38.9	57.3	302 08.8	37.8
08	181 28.4	254 35.1	03.1	8 21.6	53.3	69 41.5	57.3	317 11.0	37.9
09	196 30.9	269 35.3	02.7	23 22.8	52.8	84 44.1	57.3	332 13.2	38.0
10	211 33.3	284 35.6	02.4	38 24.0	52.3	99 46.7	57.3	347 15.4	38.1
11	226 35.8	299 35.9	02.1	53 25.2	51.8	114 49.3	57.4	2 17.5	38.2
12	241 38.3	314 36.2	S26 01.7	68 26.4	N 4 51.3	129 51.8	N21 57.4	17 19.7	S14 38.2
13	256 40.7	329 36.5	01.4	83 27.6	50.7	144 54.4	57.4	32 21.9	38.3
14	271 43.2	344 36.8	01.0	98 28.8	50.2	159 57.0	57.4	47 24.0	38.4
15	286 45.7	359 37.1	00.7	113 29.9	49.7	174 59.6	57.5	62 26.2	38.5
16	301 48.1	14 37.4	00.4	128 31.1	49.2	190 02.2	57.5	77 28.4	38.6
17	316 50.6	29 37.7	26 00.0	143 32.3	48.7	205 04.8	57.5	92 30.6	38.7
18	331 53.0	44 38.0	S25 59.7	158 33.5	N 4 48.2	220 07.4	N21 57.5	107 32.7	S14 38.7
19	346 55.5	59 38.3	59.3	173 34.7	47.6	235 10.0	57.6	122 34.9	38.8
20	1 58.0	74 38.6	59.0	188 35.9	47.1	250 12.6	57.6	137 37.1	38.9
21	17 00.4	89 38.9	58.6	203 37.1	46.6	265 15.2	57.6	152 39.3	39.0
22	32 02.9	104 39.3	58.3	218 38.3	46.1	280 17.8	57.6	167 41.4	39.1
23	47 05.4	119 39.6	57.9	233 39.5	45.6	295 20.4	57.7	182 43.6	39.2
23 00	62 07.8	134 39.9	S25 57.6	248 40.7	N 4 45.1	310 23.0	N21 57.7	197 45.8	S14 39.2
01	77 10.3	149 40.2	57.2	263 41.9	44.5	325 25.6	57.7	212 47.9	39.3
02	92 12.8	164 40.5	56.9	278 43.1	44.0	340 28.3	57.7	227 50.1	39.4
03	107 15.2	179 40.8	56.5	293 44.3	43.5	355 30.9	57.8	242 52.3	39.5
04	122 17.7	194 41.2	56.2	308 45.5	43.0	10 33.5	57.8	257 54.5	39.6
05	137 20.2	209 41.5	55.8	323 46.7	42.5	25 36.1	57.8	272 56.6	39.7
06	152 22.6	224 41.8	S25 55.5	338 47.9	N 4 42.0	40 38.7	N21 57.8	287 58.8	S14 39.7
07	167 25.1	239 42.2	55.1	353 49.1	41.5	55 41.3	57.9	303 01.0	39.8
08	182 27.5	254 42.5	54.8	8 50.3	40.9	70 43.9	57.9	318 03.2	39.9
09	197 30.0	269 42.8	54.4	23 51.5	40.4	85 46.5	57.9	333 05.3	40.0
10	212 32.5	284 43.2	54.1	38 52.7	39.9	100 49.1	57.9	348 07.5	40.1
11	227 34.9	299 43.5	53.7	53 53.9	39.4	115 51.7	58.0	3 09.7	40.1
12	242 37.4	314 43.8	S25 53.4	68 55.1	N 4 38.9	130 54.3	N21 58.0	18 11.9	S14 40.2
13	257 39.9	329 44.2	53.0	83 56.3	38.4	145 56.9	58.0	33 14.0	40.3
14	272 42.3	344 44.5	52.6	98 57.5	37.8	160 59.5	58.0	48 16.2	40.4
15	287 44.8	359 44.9	52.3	113 58.7	37.3	176 02.1	58.1	63 18.4	40.5
16	302 47.3	14 45.2	51.9	128 59.9	36.8	191 04.7	58.1	78 20.5	40.6
17	317 49.7	29 45.6	51.6	144 01.1	36.3	206 07.3	58.1	93 22.7	40.6
18	332 52.2	44 45.9	S25 51.2	159 02.3	N 4 35.8	221 09.9	N21 58.1	108 24.9	S14 40.7
19	347 54.7	59 46.3	50.8	174 03.5	35.3	236 12.5	58.2	123 27.1	40.8
20	2 57.1	74 46.6	50.5	189 04.7	34.7	251 15.2	58.2	138 29.2	40.9
21	17 59.6	89 47.0	50.1	204 05.9	34.2	266 17.8	58.2	153 31.4	41.0
22	33 02.0	104 47.3	49.8	219 07.1	33.7	281 20.4	58.2	168 33.6	41.1
23	48 04.5	119 47.7	49.4	234 08.3	33.2	296 23.0	58.3	183 35.8	41.1
Mer. Pass.	h m 19 52.2	v 0.3	d 0.3	v 1.2	d 0.5	v 2.6	d 0.0	v 2.2	d 0.1

STARS		
Name	SHA	Dec
	° ′	° ′
Acamar	315 17.7	S40 15.0
Achernar	335 26.1	S57 10.1
Acrux	173 09.2	S63 10.3
Adhara	255 12.0	S28 59.5
Aldebaran	290 48.7	N16 32.1
Alioth	166 20.9	N55 52.9
Alkaid	152 59.1	N49 14.6
Al Na'ir	27 43.4	S46 53.7
Alnilam	275 45.8	S 1 11.7
Alphard	217 55.7	S 8 43.2
Alphecca	126 11.1	N26 40.2
Alpheratz	357 43.0	N29 10.3
Altair	62 08.1	N 8 54.6
Ankaa	353 15.2	S42 13.9
Antares	112 26.3	S26 27.6
Arcturus	145 55.8	N19 06.7
Atria	107 28.3	S69 03.0
Avior	234 17.5	S59 33.1
Bellatrix	278 31.4	N 6 21.6
Betelgeuse	271 00.7	N 7 24.4
Canopus	263 55.5	S52 42.2
Capella	280 33.5	N46 00.5
Deneb	49 31.4	N45 20.2
Denebola	182 33.5	N14 29.6
Diphda	348 55.4	S17 54.6
Dubhe	193 51.6	N61 40.2
Elnath	278 11.9	N28 37.0
Eltanin	90 46.5	N51 29.6
Enif	33 46.9	N 9 56.6
Fomalhaut	15 23.6	S29 32.9
Gacrux	172 00.8	S57 11.2
Gienah	175 52.2	S17 37.0
Hadar	148 48.0	S60 26.2
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 21.3	N74 05.9
Markab	13 37.9	N15 17.1
Menkar	314 14.4	N 4 08.6
Menkent	148 07.5	S36 26.1
Miaplacidus	221 39.3	S69 46.3
Mirfak	308 39.4	N49 54.6
Nunki	75 58.2	S26 16.6
Peacock	53 19.1	S56 41.4
Pollux	243 27.2	N27 59.3
Procyon	244 59.2	N 5 11.2
Rasalhague	96 06.5	N12 33.3
Regulus	207 43.2	N11 53.8
Rigel	281 11.4	S 8 11.2
Rigil Kent.	139 51.9	S60 53.3
Sabik	102 12.5	S15 44.3
Schedar	349 39.7	N56 37.1
Shaula	96 21.9	S37 06.7
Sirius	258 33.2	S16 44.2
Spica	158 31.2	S11 13.9
Suhail	222 52.1	S43 29.2
Vega	80 39.1	N38 48.2
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	73 24.1	15 02
Mars	187 03.3	7 27
Jupiter	248 12.0	3 22
Saturn	135 44.9	10 51

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 21	Moonrise 22	Moonrise 23	Moonrise 24
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
21 00	183 33.3	S19 53.7	323 32.4	12.1	N18 48.7	2.8	54.2	N 72	07 24	09 08	▬	15 27	17 47	19 36	21 18
01	198 33.1	54.3	338 03.5	12.2	18 45.9	2.9	54.2	N 70	07 11	08 39	10 46	16 52	18 26	20 00	21 33
02	213 32.9	54.8	352 34.7	12.3	18 43.0	3.0	54.2	68	07 00	08 17	09 48	17 31	18 53	20 18	21 45
03	228 32.8	55.4	7 06.0	12.2	18 40.0	3.1	54.2	66	06 51	08 00	09 14	17 57	19 13	20 33	21 54
04	243 32.6	55.9	21 37.2	12.3	18 36.9	3.1	54.2	64	06 44	07 46	08 50	18 18	19 30	20 45	22 02
05	258 32.5	56.5	36 08.5	12.3	18 33.8	3.3	54.2	62	06 37	07 34	08 31	18 35	19 43	20 55	22 09
06	273 32.3	S19 57.0	50 39.8	12.4	N18 30.5	3.3	54.2	60	06 31	07 24	08 15	18 48	19 54	21 04	22 15
07	288 32.2	57.6	65 11.2	12.4	18 27.2	3.4	54.2	N 58	06 25	07 15	08 02	19 00	20 04	21 11	22 20
08	303 32.0	58.1	79 42.6	12.4	18 23.8	3.5	54.2	56	06 20	07 07	07 51	19 10	20 13	21 18	22 25
09	318 31.8	58.7	94 14.0	12.4	18 20.3	3.6	54.2	54	06 16	07 00	07 41	19 19	20 20	21 24	22 29
10	333 31.7	59.2	108 45.4	12.5	18 16.7	3.6	54.2	52	06 11	06 53	07 32	19 27	20 27	21 29	22 33
11	348 31.5	19 59.8	123 16.9	12.5	18 13.1	3.8	54.1	50	06 07	06 47	07 24	19 35	20 33	21 34	22 36
12	3 31.4	S20 00.3	137 48.4	12.6	N18 09.3	3.8	54.1	45	05 58	06 35	07 07	19 50	20 46	21 44	22 43
13	18 31.2	00.8	152 20.0	12.5	18 05.5	3.9	54.1	N 40	05 50	06 24	06 53	20 03	20 57	21 53	22 50
14	33 31.1	01.4	166 51.5	12.6	18 01.6	4.0	54.1	35	05 43	06 14	06 41	20 13	21 07	22 00	22 55
15	48 30.9	01.9	181 23.1	12.7	17 57.6	4.1	54.1	30	05 36	06 05	06 31	20 23	21 15	22 07	22 59
16	63 30.7	02.5	195 54.8	12.6	17 53.5	4.1	54.1	20	05 23	05 50	06 13	20 39	21 29	22 18	23 07
17	78 30.6	03.0	210 26.4	12.7	17 49.4	4.2	54.1	N 10	05 09	05 35	05 57	20 53	21 41	22 28	23 14
18	93 30.4	S20 03.6	224 58.1	12.7	N17 45.2	4.3	54.1	0	04 55	05 21	05 43	21 06	21 52	22 37	23 21
19	108 30.2	04.1	239 29.8	12.8	17 40.9	4.4	54.1	S 10	04 39	05 05	05 28	21 20	22 04	22 46	23 27
20	123 30.1	04.6	254 01.6	12.8	17 36.5	4.5	54.1	20	04 19	04 48	05 12	21 34	22 16	22 56	23 34
21	138 29.9	05.2	268 33.4	12.8	17 32.0	4.5	54.1	30	03 55	04 26	04 53	21 50	22 30	23 07	23 42
22	153 29.8	05.7	283 05.2	12.9	17 27.5	4.6	54.1	35	03 39	04 14	04 42	21 59	22 38	23 13	23 47
23	168 29.6	06.3	297 37.1	12.8	17 22.9	4.7	54.1	40	03 19	03 58	04 29	22 10	22 47	23 20	23 52
22 00	183 29.4	S20 06.8	312 08.9	13.0	N17 18.2	4.8	54.1	45	02 55	03 40	04 15	22 22	22 57	23 29	23 58
01	198 29.3	07.3	326 40.9	12.9	17 13.4	4.8	54.1	S 50	02 20	03 16	03 56	22 37	23 10	23 39	24 05
02	213 29.1	07.9	341 12.8	13.0	17 08.6	4.9	54.1	52	02 02	03 04	03 47	22 44	23 16	23 44	24 08
03	228 28.9	08.4	355 44.8	13.0	17 03.7	5.0	54.1	54	01 39	02 50	03 38	22 52	23 23	23 49	24 12
04	243 28.8	08.9	10 16.8	13.0	16 58.7	5.1	54.1	56	01 06	02 34	03 27	23 01	23 30	23 54	24 16
05	258 28.6	09.5	24 48.8	13.1	16 53.6	5.1	54.1	58	////	02 15	03 14	23 11	23 38	24 01	00 01
06	273 28.5	S20 10.0	39 20.9	13.1	N16 48.5	5.2	54.1	S 60	////	01 50	02 59	23 22	23 48	24 08	00 08
07	288 28.3	10.5	53 53.0	13.1	16 43.3	5.3	54.1								
08	303 28.1	11.1	68 25.1	13.2	16 38.0	5.4	54.1								
09	318 28.0	11.6	82 57.3	13.2	16 32.6	5.4	54.1								
10	333 27.8	12.1	97 29.5	13.2	16 27.2	5.5	54.1								
11	348 27.6	12.7	112 01.7	13.3	16 21.7	5.6	54.1								
12	3 27.5	S20 13.2	126 34.0	13.3	N16 16.1	5.6	54.1								
13	18 27.3	13.7	141 06.3	13.3	16 10.5	5.7	54.1								
14	33 27.1	14.3	155 38.6	13.4	16 04.8	5.8	54.1								
15	48 26.9	14.8	170 11.0	13.4	15 59.0	5.9	54.1								
16	63 26.8	15.3	184 43.4	13.4	15 53.1	5.9	54.1								
17	78 26.6	15.8	199 15.8	13.4	15 47.2	6.0	54.1								
18	93 26.4	S20 16.4	213 48.2	13.5	N15 41.2	6.1	54.1								
19	108 26.3	16.9	228 20.7	13.5	15 35.1	6.1	54.1								
20	123 26.1	17.4	242 53.2	13.5	15 29.0	6.2	54.1								
21	138 25.9	17.9	257 25.7	13.6	15 22.8	6.2	54.1								
22	153 25.8	18.5	271 58.3	13.6	15 16.6	6.4	54.1								
23	168 25.6	19.0	286 30.9	13.6	15 10.2	6.4	54.1								
23 00	183 25.4	S20 19.5	301 03.5	13.6	N15 03.8	6.4	54.1								
01	198 25.2	20.0	315 36.1	13.7	14 57.4	6.5	54.1								
02	213 25.1	20.5	330 08.8	13.7	14 50.9	6.6	54.1								
03	228 24.9	21.1	344 41.5	13.7	14 44.3	6.7	54.1								
04	243 24.7	21.6	359 14.2	13.8	14 37.6	6.7	54.1								
05	258 24.6	22.1	13 47.0	13.8	14 30.9	6.8	54.1								
06	273 24.4	S20 22.6	28 19.8	13.8	N14 24.1	6.8	54.1								
07	288 24.2	23.1	42 52.6	13.8	14 17.3	6.9	54.1								
08	303 24.0	23.7	57 25.4	13.9	14 10.4	7.0	54.1								
09	318 23.9	24.2	71 58.3	13.9	14 03.4	7.0	54.2								
10	333 23.7	24.7	86 31.2	13.9	13 56.4	7.1	54.2								
11	348 23.5	25.2	101 04.1	13.9	13 49.3	7.1	54.2								
12	3 23.3	S20 25.7	115 37.0	14.0	N13 42.2	7.2	54.2								
13	18 23.2	26.2	130 10.0	14.0	13 35.0	7.3	54.2								
14	33 23.0	26.7	144 43.0	14.0	13 27.7	7.3	54.2								
15	48 22.8	27.3	159 16.0	14.0	13 20.4	7.4	54.2								
16	63 22.6	27.8	173 49.0	14.1	13 13.0	7.4	54.2								
17	78 22.5	28.3	188 22.1	14.1	13 05.6	7.5	54.2								
18	93 22.3	S20 28.8	202 55.2	14.1	N12 58.1	7.6	54.2								
19	108 22.1	29.3	217 28.3	14.1	12 50.5	7.6	54.2								
20	123 21.9	29.8	232 01.4	14.1	12 42.9	7.6	54.2								
21	138 21.7	30.3	246 34.5	14.2	12 35.3	7.8	54.2								
22	153 21.6	30.8	261 07.7	14.2	12 27.5	7.7	54.3								
23	168 21.4	31.3	275 40.9	14.2	N12 19.8	7.9	54.3								
	SD 16.2	d 0.5	SD	14.8		14.7		14.8							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 21	Moonset 22	Moonset 23	Moonset 24
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 23	16 07	14 29	13 45	13 29	13 19
N 70	12 45	14 52	16 20	13 04	13 05	13 04	13 02
68	13 44	15 14	16 31	12 24	12 38	12 45	12 49
66	14 17	15 31	16 40	11 57	12 17	12 29	12 39
64	14 42	15 46	16 48	11 36	12 00	12 17	12 30
62	15 01	15 58	16 55	11 19	11 46	12 06	12 22
60	15 16	16 08	17 01	11 05	11 34	11 57	12 15
N 58	15 30	16 17	17 06	10 53	11 24	11 48	12 09
56	15 41	16 25	17 11	10 42	11 15	11 41	12 04
54	15 51	16 32	17 16	10 33	11 07	11 35	11 59
52	16 00	16 38	17 20	10 25	11 00	11 29	11 55
50	16 08	16 44	17 24	10 18	10 53	11 24	11 51
45	16 25	16 57	17 33	10 02	10 39	11 12	11 43
N 40	16 39	17 08	17 42	09 48	10 28	11 03	11 35
35	16 51	17 18	17 49	09 37	10 18	10 55	11 29
30	17 01	17 27	17 56	09 28	10 09	10 48	11 24
20	17 19	17 43	18 10	09 11	09 54	10 35	11 14
N 10	17 35	17 57	18 23	08 56	09 41	10 24	11 06
0	17 50	18 12	18 37	08 42	09 29	10 14	10 58
S 10	18 05	18 27	18 54	08 28	09 16	10 04	10 50
20	18 21	18 45	19 13	08 13	09 03	09 53	10 42
30	18 40	19 06	19 38	07 56	08 48	09 40	10 32
35	18 51	19 19	19 54	07 46	08 39	09 32	10 27
40	19 03	19 35	20 14	07 35	08 29	09 24	10 20
45	19 18	19 54	20 39	07 21	08 17	09 14	10 13
S 50	19 37	20 18	21 13	07 05	08 02	09 02	10 04
52	19 46	20 30	21 32	06 57	07 56	08 57	09 59
54	19 56	20 44	21 56	06 49	07 48	08 50	09 55
56	20 07	21 00	22 30	06 39	07 40	08 44	09 50
58	20 20	21 20	////	06 28	07 30	08 36	09 44
S 60	20 35	21 45	////	06 15	07 19	08 27	09 37

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
21	14 13	14 06	11 46	02 31	14 54	18	87
22	13 58	13 50	11 46	03 18	15 41	19	80
23	13 42	13 34	11 46	04 03	16 25	20	71

UT	ARIES	VENUS −4.8		MARS +1.3		JUPITER −2.5		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
24 00	63 07.0	134 48.1	S25 49.0	249 09.5	N 4 32.7	311 25.6	N21 58.3	198 37.9	S14 41.2
01	78 09.4	149 48.4	48.7	264 10.7	32.2	326 28.2	58.3	213 40.1	41.3
02	93 11.9	164 48.8	48.3	279 11.9	31.7	341 30.8	58.3	228 42.3	41.4
03	108 14.4	179 49.2	47.9	294 13.2	31.1	356 33.4	58.4	243 44.5	41.5
04	123 16.8	194 49.5	47.6	309 14.4	30.6	11 36.0	58.4	258 46.6	41.5
05	138 19.3	209 49.9	47.2	324 15.6	30.1	26 38.6	58.4	273 48.8	41.6
06	153 21.8	224 50.3	S25 46.8	339 16.8	N 4 29.6	41 41.3	N21 58.4	288 51.0	S14 41.7
07	168 24.2	239 50.7	46.5	354 18.0	29.1	56 43.9	58.5	303 53.1	41.8
08	183 26.7	254 51.1	46.1	9 19.2	28.6	71 46.5	58.5	318 55.3	41.9
S 09	198 29.1	269 51.4	45.7	24 20.4	28.1	86 49.1	58.5	333 57.5	42.0
U 10	213 31.6	284 51.8	45.3	39 21.6	27.5	101 51.7	58.6	348 59.7	42.0
N 11	228 34.1	299 52.2	45.0	54 22.8	27.0	116 54.3	58.6	4 01.8	42.1
D 12	243 36.5	314 52.6	S25 44.6	69 24.0	N 4 26.5	131 56.9	N21 58.6	19 04.0	S14 42.2
A 13	258 39.0	329 53.0	44.2	84 25.2	26.0	146 59.6	58.6	34 06.2	42.3
Y 14	273 41.5	344 53.4	43.8	99 26.4	25.5	162 02.2	58.7	49 08.4	42.4
15	288 43.9	359 53.8	43.5	114 27.6	25.0	177 04.8	58.7	64 10.5	42.4
16	303 46.4	14 54.2	43.1	129 28.8	24.5	192 07.4	58.7	79 12.7	42.5
17	318 48.9	29 54.6	42.7	144 30.0	23.9	207 10.0	58.7	94 14.9	42.6
18	333 51.3	44 55.0	S25 42.3	159 31.2	N 4 23.4	222 12.6	N21 58.8	109 17.1	S14 42.7
19	348 53.8	59 55.4	42.0	174 32.4	22.9	237 15.3	58.8	124 19.2	42.8
20	3 56.3	74 55.8	41.6	189 33.6	22.4	252 17.9	58.8	139 21.4	42.8
21	18 58.7	89 56.2	41.2	204 34.8	21.9	267 20.5	58.8	154 23.6	42.9
22	34 01.2	104 56.6	40.8	219 36.1	21.4	282 23.1	58.9	169 25.8	43.0
23	49 03.6	119 57.0	40.4	234 37.3	20.9	297 25.7	58.9	184 27.9	43.1
25 00	64 06.1	134 57.4	S25 40.1	249 38.5	N 4 20.3	312 28.3	N21 58.9	199 30.1	S14 43.2
01	79 08.6	149 57.8	39.7	264 39.7	19.8	327 31.0	59.0	214 32.3	43.3
02	94 11.0	164 58.2	39.3	279 40.9	19.3	342 33.6	59.0	229 34.5	43.3
03	109 13.5	179 58.7	38.9	294 42.1	18.8	357 36.2	59.0	244 36.6	43.4
04	124 16.0	194 59.1	38.5	309 43.3	18.3	12 38.8	59.0	259 38.8	43.5
05	139 18.4	209 59.5	38.1	324 44.5	17.8	27 41.4	59.1	274 41.0	43.6
06	154 20.9	224 59.9	S25 37.8	339 45.7	N 4 17.3	42 44.1	N21 59.1	289 43.2	S14 43.7
07	169 23.4	240 00.4	37.4	354 46.9	16.8	57 46.7	59.1	304 45.3	43.7
08	184 25.8	255 00.8	37.0	9 48.1	16.2	72 49.3	59.1	319 47.5	43.8
M 09	199 28.3	270 01.2	36.6	24 49.3	15.7	87 51.9	59.2	334 49.7	43.9
O 10	214 30.8	285 01.7	36.2	39 50.6	15.2	102 54.5	59.2	349 51.9	44.0
N 11	229 33.2	300 02.1	35.8	54 51.8	14.7	117 57.2	59.2	4 54.0	44.1
D 12	244 35.7	315 02.5	S25 35.4	69 53.0	N 4 14.2	132 59.8	N21 59.3	19 56.2	S14 44.2
A 13	259 38.1	330 03.0	35.0	84 54.2	13.7	148 02.4	59.3	34 58.4	44.2
Y 14	274 40.6	345 03.4	34.6	99 55.4	13.2	163 05.0	59.3	50 00.6	44.3
15	289 43.1	0 03.9	34.3	114 56.6	12.6	178 07.7	59.3	65 02.7	44.4
16	304 45.5	15 04.3	33.9	129 57.8	12.1	193 10.3	59.4	80 04.9	44.5
17	319 48.0	30 04.8	33.5	144 59.0	11.6	208 12.9	59.4	95 07.1	44.6
18	334 50.5	45 05.2	S25 33.1	160 00.2	N 4 11.1	223 15.5	N21 59.4	110 09.3	S14 44.6
19	349 52.9	60 05.7	32.7	175 01.5	10.6	238 18.2	59.5	125 11.4	44.7
20	4 55.4	75 06.1	32.3	190 02.7	10.1	253 20.8	59.5	140 13.6	44.8
21	19 57.9	90 06.6	31.9	205 03.9	09.6	268 23.4	59.5	155 15.8	44.9
22	35 00.3	105 07.0	31.5	220 05.1	09.1	283 26.0	59.5	170 18.0	45.0
23	50 02.8	120 07.5	31.1	235 06.3	08.5	298 28.7	59.6	185 20.1	45.0
26 00	65 05.2	135 08.0	S25 30.7	250 07.5	N 4 08.0	313 31.3	N21 59.6	200 22.3	S14 45.1
01	80 07.7	150 08.4	30.3	265 08.7	07.5	328 33.9	59.6	215 24.5	45.2
02	95 10.2	165 08.9	29.9	280 09.9	07.0	343 36.5	59.6	230 26.7	45.3
03	110 12.6	180 09.4	29.5	295 11.1	06.5	358 39.2	59.7	245 28.8	45.4
04	125 15.1	195 09.8	29.1	310 12.4	06.0	13 41.8	59.7	260 31.0	45.4
05	140 17.6	210 10.3	28.7	325 13.6	05.5	28 44.4	59.7	275 33.2	45.5
06	155 20.0	225 10.8	S25 28.3	340 14.8	N 4 05.0	43 47.1	N21 59.8	290 35.4	S14 45.6
07	170 22.5	240 11.3	27.9	355 16.0	04.5	58 49.7	59.8	305 37.5	45.7
T 08	185 25.0	255 11.8	27.5	10 17.2	03.9	73 52.3	59.8	320 39.7	45.8
U 09	200 27.4	270 12.2	27.1	25 18.4	03.4	88 55.0	59.8	335 41.9	45.9
E 10	215 29.9	285 12.7	26.7	40 19.6	02.9	103 57.6	59.9	350 44.1	45.9
S 11	230 32.4	300 13.2	26.3	55 20.9	02.4	119 00.2	59.9	5 46.2	46.0
D 12	245 34.8	315 13.7	S25 25.9	70 22.1	N 4 01.9	134 02.8	N21 59.9	20 48.4	S14 46.1
A 13	260 37.3	330 14.2	25.5	85 23.3	01.4	149 05.5	22 00.0	35 50.6	46.2
Y 14	275 39.7	345 14.7	25.1	100 24.5	00.9	164 08.1	00.0	50 52.8	46.3
15	290 42.2	0 15.2	24.7	115 25.7	4 00.4	179 10.7	00.0	65 54.9	46.3
16	305 44.7	15 15.7	24.3	130 26.9	3 59.8	194 13.4	00.1	80 57.1	46.4
17	320 47.1	30 16.2	23.9	145 28.1	59.3	209 16.0	00.1	95 59.3	46.5
18	335 49.6	45 16.7	S25 23.4	160 29.4	N 3 58.8	224 18.6	N22 00.1	111 01.5	S14 46.6
19	350 52.1	60 17.2	23.0	175 30.6	58.3	239 21.3	00.1	126 03.6	46.7
20	5 54.5	75 17.7	22.6	190 31.8	57.8	254 23.9	00.2	141 05.8	46.7
21	20 57.0	90 18.2	22.2	205 33.0	57.3	269 26.5	00.2	156 08.0	46.8
22	35 59.5	105 18.7	21.8	220 34.2	56.8	284 29.2	00.2	171 10.2	46.9
23	51 01.9	120 19.2	21.4	235 35.4	56.3	299 31.8	00.3	186 12.3	47.0
	h m								
Mer.Pass.	19 40.4	v 0.4	d 0.4	v 1.2	d 0.5	v 2.6	d 0.0	v 2.2	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.7	S40 15.1
Achernar	335 26.2	S57 10.1
Acrux	173 09.2	S63 10.3
Adhara	255 12.0	S28 59.5
Aldebaran	290 48.7	N16 32.1
Alioth	166 20.9	N55 52.9
Alkaid	152 59.1	N49 14.5
Al Na'ir	27 43.4	S46 53.7
Alnilam	275 45.7	S 1 11.7
Alphard	217 55.7	S 8 43.2
Alphecca	126 11.1	N26 40.2
Alpheratz	357 43.0	N29 10.3
Altair	62 08.2	N 8 54.6
Ankaa	353 15.2	S42 13.9
Antares	112 26.3	S26 27.6
Arcturus	145 55.8	N19 06.7
Atria	107 28.3	S69 03.0
Avior	234 17.5	S59 33.1
Bellatrix	278 31.4	N 6 21.6
Betelgeuse	271 00.7	N 7 24.4
Canopus	263 55.5	S52 42.2
Capella	280 33.5	N46 00.5
Deneb	49 31.4	N45 20.2
Denebola	182 33.5	N14 29.6
Diphda	348 55.4	S17 54.6
Dubhe	193 51.6	N61 40.2
Elnath	278 11.9	N28 37.0
Eltanin	90 46.5	N51 29.5
Enif	33 46.9	N 9 56.6
Fomalhaut	15 23.6	S29 32.9
Gacrux	172 00.8	S57 11.2
Gienah	175 52.1	S17 37.0
Hadar	148 47.9	S60 26.2
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 21.3	N74 05.8
Markab	13 38.0	N15 17.1
Menkar	314 14.4	N 4 08.6
Menkent	148 07.5	S36 26.1
Miaplacidus	221 39.2	S69 46.3
Mirfak	308 39.4	N49 54.6
Nunki	75 58.2	S26 16.6
Peacock	53 19.1	S56 41.4
Pollux	243 27.1	N27 59.3
Procyon	244 59.2	N 5 11.2
Rasalhague	96 06.5	N12 33.3
Regulus	207 43.2	N11 53.8
Rigel	281 11.4	S 8 11.2
Rigil Kent.	139 51.9	S60 53.3
Sabik	102 12.5	S15 44.3
Schedar	349 39.7	N56 37.1
Shaula	96 21.9	S37 06.7
Sirius	258 33.2	S16 44.2
Spica	158 31.2	S11 13.9
Suhail	222 52.0	S43 29.2
Vega	80 39.1	N38 48.1
Zuben'ubi	137 05.4	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	70 51.3	15 00
Mars	185 32.4	7 21
Jupiter	248 22.2	3 10
Saturn	135 24.0	10 40

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 24	Moonrise 25	Moonrise 26	Moonrise 27
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
24 00	183 21.2	S20 31.8	290 14.1	14.2	N12 11.9	7.8	54.3	N 72	07 34	09 22	▬	21 18	22 59	24 39	00 39
01	198 21.0	32.3	304 47.3	14.2	12 04.1	8.0	54.3	N 70	07 19	08 50	11 40	21 33	23 06	24 40	00 40
02	213 20.8	32.9	319 20.5	14.3	11 56.1	8.0	54.3	68	07 08	08 27	10 03	21 45	23 12	24 41	00 41
03	228 20.7	33.4	333 53.8	14.3	11 48.1	8.0	54.3	66	06 58	08 08	09 25	21 54	23 17	24 42	00 42
04	243 20.5	33.9	348 27.1	14.3	11 40.1	8.1	54.3	64	06 50	07 53	08 59	22 02	23 21	24 42	00 42
05	258 20.3	34.4	3 00.4	14.3	11 32.0	8.2	54.3	62	06 43	07 41	08 39	22 09	23 25	24 43	00 43
06	273 20.1	S20 34.9	17 33.7	14.3	N11 23.8	8.1	54.3	60	06 36	07 30	08 22	22 15	23 28	24 43	00 43
07	288 19.9	35.4	32 07.0	14.4	11 15.7	8.3	54.4	N 58	06 30	07 20	08 08	22 20	23 31	24 44	00 44
08	303 19.7	35.9	46 40.4	14.3	11 07.4	8.3	54.4	56	06 25	07 12	07 56	22 25	23 34	24 44	00 44
S 09	318 19.6	36.4	61 13.7	14.4	10 59.1	8.3	54.4	54	06 20	07 05	07 46	22 29	23 36	24 44	00 44
U 10	333 19.4	36.9	75 47.1	14.4	10 50.8	8.4	54.4	52	06 16	06 58	07 37	22 33	23 38	24 45	00 45
N 11	348 19.2	37.4	90 20.5	14.4	10 42.4	8.5	54.4	50	06 11	06 52	07 28	22 36	23 40	24 45	00 45
D 12	3 19.0	S20 37.9	104 53.9	14.4	N10 33.9	8.5	54.4	45	06 02	06 38	07 11	22 43	23 44	24 45	00 45
A 13	18 18.8	38.4	119 27.3	14.4	10 25.4	8.5	54.4	N 40	05 53	06 27	06 56	22 50	23 47	24 46	00 46
Y 14	33 18.6	38.9	134 00.7	14.5	10 16.9	8.6	54.5	35	05 46	06 17	06 44	22 55	23 50	24 46	00 46
15	48 18.5	39.4	148 34.2	14.4	10 08.3	8.6	54.5	30	05 38	06 08	06 33	22 59	23 53	24 47	00 47
16	63 18.3	39.9	163 07.6	14.5	9 59.7	8.7	54.5	20	05 24	05 51	06 15	23 07	23 57	24 47	00 47
17	78 18.1	40.4	177 41.1	14.5	9 51.0	8.7	54.5	N 10	05 10	05 36	05 59	23 14	24 01	00 01	00 48
18	93 17.9	S20 40.8	192 14.6	14.5	N 9 42.3	8.8	54.5	0	04 56	05 21	05 43	23 21	24 05	00 05	00 49
19	108 17.7	41.3	206 48.1	14.4	9 33.5	8.8	54.5	S 10	04 39	05 05	05 28	23 27	24 08	00 08	00 49
20	123 17.5	41.8	221 21.5	14.5	9 24.7	8.9	54.5	20	04 19	04 47	05 11	23 34	24 12	00 12	00 50
21	138 17.3	42.3	235 55.0	14.6	9 15.8	8.9	54.6	30	03 53	04 25	04 52	23 42	24 16	00 16	00 51
22	153 17.2	42.8	250 28.6	14.5	9 06.9	8.9	54.6	35	03 37	04 12	04 41	23 47	24 19	00 19	00 51
23	168 17.0	43.3	265 02.1	14.5	8 58.0	9.0	54.6	40	03 17	03 56	04 28	23 52	24 22	00 22	00 52
25 00	183 16.8	S20 43.8	279 35.6	14.5	N 8 49.0	9.0	54.6	45	02 51	03 37	04 12	23 58	24 25	00 25	00 52
01	198 16.6	44.3	294 09.1	14.5	8 40.0	9.1	54.6	S 50	02 15	03 12	03 53	24 05	00 05	00 29	00 53
02	213 16.4	44.8	308 42.6	14.6	8 30.9	9.1	54.6	52	01 56	03 00	03 44	24 08	00 08	00 31	00 53
03	228 16.2	45.3	323 16.2	14.5	8 21.8	9.2	54.7	54	01 31	02 45	03 34	24 12	00 12	00 33	00 54
04	243 16.0	45.8	337 49.7	14.6	8 12.6	9.2	54.7	56	00 53	02 28	03 22	24 16	00 16	00 35	00 54
05	258 15.8	46.2	352 23.3	14.5	8 03.4	9.2	54.7	58	////	02 08	03 09	00 01	00 20	00 38	00 54
06	273 15.7	S20 46.7	6 56.8	14.6	N 7 54.2	9.3	54.7	S 60	////	01 41	02 53	00 08	00 25	00 40	00 55
07	288 15.5	47.2	21 30.4	14.5	7 44.9	9.3	54.7								
08	303 15.3	47.7	36 03.9	14.6	7 35.6	9.4	54.8								
M 09	318 15.1	48.2	50 37.5	14.5	7 26.2	9.4	54.8								
O 10	333 14.9	48.7	65 11.0	14.6	7 16.8	9.4	54.8								
N 11	348 14.7	49.2	79 44.6	14.5	7 07.4	9.5	54.8								
D 12	3 14.5	S20 49.6	94 18.1	14.5	N 6 57.9	9.5	54.8								
A 13	18 14.3	50.1	108 51.6	14.6	6 48.4	9.5	54.9								
Y 14	33 14.1	50.6	123 25.2	14.5	6 38.9	9.6	54.9								
15	48 13.9	51.1	137 58.7	14.6	6 29.3	9.6	54.9								
16	63 13.7	51.6	152 32.3	14.5	6 19.7	9.6	54.9								
17	78 13.5	52.0	167 05.8	14.5	6 10.1	9.7	55.0								
18	93 13.3	S20 52.5	181 39.3	14.5	N 6 00.4	9.7	55.0								
19	108 13.2	53.0	196 12.8	14.5	5 50.7	9.8	55.0								
20	123 13.0	53.5	210 46.3	14.5	5 40.9	9.7	55.0								
21	138 12.8	53.9	225 19.8	14.5	5 31.2	9.8	55.0								
22	153 12.6	54.4	239 53.3	14.5	5 21.4	9.9	55.1								
23	168 12.4	54.9	254 26.8	14.5	5 11.5	9.9	55.1								
26 00	183 12.2	S20 55.4	269 00.3	14.4	N 5 01.6	9.9	55.1								
01	198 12.0	55.8	283 33.7	14.5	4 51.7	9.9	55.1								
02	213 11.8	56.3	298 07.2	14.4	4 41.8	9.9	55.2								
03	228 11.6	56.8	312 40.6	14.4	4 31.9	10.0	55.2								
04	243 11.4	57.3	327 14.0	14.4	4 21.9	10.0	55.2								
05	258 11.2	57.7	341 47.4	14.4	4 11.9	10.1	55.2								
06	273 11.0	S20 58.2	356 20.8	14.4	N 4 01.8	10.1	55.3								
07	288 10.8	58.7	10 54.2	14.3	3 51.7	10.1	55.3								
T 08	303 10.6	59.1	25 27.5	14.4	3 41.6	10.1	55.3								
U 09	318 10.4	20 59.6	40 00.9	14.3	3 31.5	10.1	55.4								
E 10	333 10.2	21 00.1	54 34.2	14.3	3 21.4	10.2	55.4								
S 11	348 10.0	00.5	69 07.5	14.3	3 11.2	10.2	55.4								
D 12	3 09.8	S21 01.0	83 40.8	14.2	N 3 01.0	10.2	55.4								
A 13	18 09.6	01.5	98 14.0	14.3	2 50.8	10.3	55.5								
Y 14	33 09.4	01.9	112 47.3	14.2	2 40.5	10.2	55.5								
15	48 09.2	02.4	127 20.5	14.2	2 30.3	10.3	55.5								
16	63 09.0	02.9	141 53.7	14.2	2 20.0	10.3	55.5								
17	78 08.8	03.3	156 26.9	14.1	2 09.7	10.3	55.6								
18	93 08.6	S21 03.8	171 00.0	14.1	N 1 59.4	10.4	55.6								
19	108 08.4	04.3	185 33.1	14.1	1 49.0	10.4	55.6								
20	123 08.2	04.7	200 06.2	14.1	1 38.6	10.3	55.7								
21	138 08.0	05.2	214 39.3	14.0	1 28.3	10.4	55.7								
22	153 07.8	05.6	229 12.3	14.0	1 17.9	10.5	55.7								
23	168 07.6	06.1	243 45.3	14.0	N 1 07.4	10.4	55.8								
	SD 16.2	d 0.5	SD	14.8		14.9		15.1							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 24	Moonset 25	Moonset 26	Moonset 27
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	14 11	15 59	13 19	13 09	13 01	12 53
N 70	11 53	14 43	16 14	13 02	13 00	12 57	12 54
68	13 30	15 07	16 25	12 49	12 52	12 54	12 56
66	14 08	15 25	16 35	12 39	12 46	12 52	12 57
64	14 34	15 40	16 43	12 30	12 40	12 49	12 58
62	14 55	15 53	16 51	12 22	12 35	12 48	12 59
60	15 11	16 04	16 57	12 15	12 31	12 46	13 00
N 58	15 25	16 13	17 03	12 09	12 27	12 44	13 01
56	15 37	16 21	17 09	12 04	12 24	12 43	13 02
54	15 48	16 29	17 13	11 59	12 21	12 42	13 02
52	15 57	16 36	17 18	11 55	12 18	12 41	13 03
50	16 05	16 42	17 22	11 51	12 16	12 40	13 03
45	16 23	16 56	17 32	11 43	12 10	12 37	13 05
N 40	16 37	17 07	17 40	11 35	12 06	12 36	13 05
35	16 50	17 17	17 48	11 29	12 02	12 34	13 06
30	17 00	17 26	17 56	11 24	11 58	12 33	13 07
20	17 19	17 43	18 10	11 14	11 52	12 30	13 08
N 10	17 35	17 58	18 24	11 06	11 47	12 28	13 09
0	17 51	18 13	18 39	10 58	11 42	12 26	13 10
S 10	18 06	18 29	18 55	10 50	11 37	12 23	13 11
20	18 23	18 47	19 15	10 42	11 31	12 21	13 12
30	18 42	19 09	19 41	10 32	11 25	12 18	13 13
35	18 54	19 22	19 58	10 27	11 21	12 17	13 14
40	19 07	19 38	20 18	10 20	11 17	12 15	13 15
45	19 22	19 58	20 44	10 13	11 12	12 13	13 16
S 50	19 42	20 23	21 20	10 04	11 06	12 11	13 17
52	19 51	20 36	21 40	09 59	11 04	12 10	13 17
54	20 01	20 50	22 06	09 55	11 01	12 08	13 18
56	20 13	21 07	22 46	09 50	10 57	12 07	13 18
58	20 26	21 28	////	09 44	10 54	12 05	13 19
S 60	20 42	21 56	////	09 37	10 50	12 04	13 20

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
	m s	m s	h m	h m	h m	d	%
24	13 25	13 16	11 47	04 48	17 10	21	63
25	13 08	12 58	11 47	05 31	17 53	22	53
26	12 49	12 40	11 47	06 15	18 37	23	43

UT	ARIES	VENUS −4.9		MARS +1.2		JUPITER −2.6		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
30 00	69 01.8	136 03.1	S24 49.8	252 04.8	N 3 19.2	317 45.1	N22 02.5	203 51.3	S14 52.8	Acamar	315 17.7	S40 15.1
01	84 04.3	151 03.8	49.3	267 06.1	18.7	332 47.7	02.5	218 53.4	52.9	Achernar	335 26.2	S57 10.2
02	99 06.7	166 04.5	48.9	282 07.3	18.2	347 50.4	02.6	233 55.6	52.9	Acrux	173 09.1	S63 10.3
03	114 09.2	181 05.2 . .	48.4	297 08.5 . .	17.7	2 53.1 . .	02.6	248 57.8 . .	53.0	Adhara	255 12.0	S28 59.5
04	129 11.7	196 05.9	48.0	312 09.7	17.2	17 55.7	02.6	264 00.0	53.1	Aldebaran	290 48.7	N16 32.1
05	144 14.1	211 06.6	47.5	327 11.0	16.7	32 58.4	02.7	279 02.2	53.2			
06	159 16.6	226 07.3	S24 47.0	342 12.2	N 3 16.1	48 01.0	N22 02.7	294 04.3	S14 53.3	Alioth	166 20.8	N55 52.8
07	174 19.0	241 08.0	46.6	357 13.4	15.6	63 03.7	02.7	309 06.5	53.3	Alkaid	152 59.1	N49 14.5
S 08	189 21.5	256 08.7	46.1	12 14.7	15.1	78 06.4	02.8	324 08.7	53.4	Al Na'ir	27 43.5	S46 53.7
A 09	204 24.0	271 09.4 . .	45.7	27 15.9 . .	14.6	93 09.0 . .	02.8	339 10.9 . .	53.5	Alnilam	275 45.7	S 1 11.7
T 10	219 26.4	286 10.1	45.2	42 17.1	14.1	108 11.7	02.8	354 13.1	53.6	Alphard	217 55.7	S 8 43.2
U 11	234 28.9	301 10.8	44.8	57 18.4	13.6	123 14.4	02.9	9 15.2	53.6			
R 12	249 31.4	316 11.6	S24 44.3	72 19.6	N 3 13.1	138 17.0	N22 02.9	24 17.4	S14 53.7	Alphecca	126 11.1	N26 40.2
D 13	264 33.8	331 12.3	43.8	87 20.9	12.6	153 19.7	02.9	39 19.6	53.8	Alpheratz	357 43.0	N29 10.3
A 14	279 36.3	346 13.0	43.4	102 22.1	12.1	168 22.4	03.0	54 21.8	53.9	Altair	62 08.2	N 8 54.6
Y 15	294 38.8	1 13.7 . .	42.9	117 23.3 . .	11.6	183 25.0 . .	03.0	69 24.0 . .	54.0	Ankaa	353 15.2	S42 14.0
16	309 41.2	16 14.5	42.5	132 24.6	11.1	198 27.7	03.0	84 26.1	54.0	Antares	112 26.2	S26 27.6
17	324 43.7	31 15.2	42.0	147 25.8	10.6	213 30.3	03.1	99 28.3	54.1			
18	339 46.2	46 15.9	S24 41.5	162 27.0	N 3 10.1	228 33.0	N22 03.1	114 30.5	S14 54.2	Arcturus	145 55.8	N19 06.6
19	354 48.6	61 16.7	41.1	177 28.3	09.6	243 35.7	03.1	129 32.7	54.3	Atria	107 28.3	S69 03.0
20	9 51.1	76 17.4	40.6	192 29.5	09.1	258 38.3	03.2	144 34.8	54.3	Avior	234 17.4	S59 33.2
21	24 53.5	91 18.1 . .	40.1	207 30.7 . .	08.6	273 41.0 . .	03.2	159 37.0 . .	54.4	Bellatrix	278 31.3	N 6 21.6
22	39 56.0	106 18.9	39.7	222 32.0	08.1	288 43.7	03.2	174 39.2	54.5	Betelgeuse	271 00.6	N 7 24.4
23	54 58.5	121 19.6	39.2	237 33.2	07.6	303 46.3	03.3	189 41.4	54.6			
1 00	70 00.9	136 20.4	S24 38.7	252 34.4	N 3 07.1	318 49.0	N22 03.3	204 43.6	S14 54.7	Canopus	263 55.5	S52 42.2
01	85 03.4	151 21.1	38.3	267 35.7	06.6	333 51.7	03.3	219 45.7	54.7	Capella	280 33.5	N46 00.5
02	100 05.9	166 21.9	37.8	282 36.9	06.1	348 54.4	03.4	234 47.9	54.8	Deneb	49 31.5	N45 20.2
03	115 08.3	181 22.6 . .	37.3	297 38.2 . .	05.6	3 57.0 . .	03.4	249 50.1 . .	54.9	Denebola	182 33.5	N14 29.6
04	130 10.8	196 23.4	36.9	312 39.4	05.1	18 59.7	03.4	264 52.3	55.0	Diphda	348 55.4	S17 54.6
05	145 13.3	211 24.2	36.4	327 40.6	04.6	34 02.4	03.5	279 54.5	55.1			
06	160 15.7	226 24.9	S24 35.9	342 41.9	N 3 04.0	49 05.0	N22 03.5	294 56.6	S14 55.1	Dubhe	193 51.5	N61 40.2
07	175 18.2	241 25.7	35.5	357 43.1	03.5	64 07.7	03.5	309 58.8	55.2	Elnath	278 11.8	N28 37.0
08	190 20.7	256 26.5	35.0	12 44.3	03.0	79 10.4	03.6	325 01.0	55.3	Eltanin	90 46.5	N51 29.5
S 09	205 23.1	271 27.2 . .	34.5	27 45.6 . .	02.5	94 13.0 . .	03.6	340 03.2 . .	55.4	Enif	33 46.9	N 9 56.6
U 10	220 25.6	286 28.0	34.1	42 46.8	02.0	109 15.7	03.6	355 05.4	55.4	Fomalhaut	15 23.7	S29 32.9
N 11	235 28.0	301 28.8	33.6	57 48.1	01.5	124 18.4	03.7	10 07.5	55.5			
D 12	250 30.5	316 29.6	S24 33.1	72 49.3	N 3 01.0	139 21.1	N22 03.7	25 09.7	S14 55.6	Gacrux	172 00.7	S57 11.2
A 13	265 33.0	331 30.3	32.6	87 50.5	00.5	154 23.7	03.7	40 11.9	55.7	Gienah	175 52.1	S17 37.1
Y 14	280 35.4	346 31.1	32.2	102 51.8	3 00.0	169 26.4	03.8	55 14.1	55.8	Hadar	148 47.9	S60 26.1
15	295 37.9	1 31.9 . .	31.7	117 53.0	2 59.5	184 29.1 . .	03.8	70 16.3 . .	55.8	Hamal	328 00.1	N23 31.8
16	310 40.4	16 32.7	31.2	132 54.3	59.0	199 31.7	03.8	85 18.4	55.9	Kaus Aust.	83 43.8	S34 22.5
17	325 42.8	31 33.5	30.8	147 55.5	58.5	214 34.4	03.9	100 20.6	56.0			
18	340 45.3	46 34.3	S24 30.3	162 56.7	N 2 58.0	229 37.1	N22 03.9	115 22.8	S14 56.1	Kochab	137 21.3	N74 05.8
19	355 47.8	61 35.1	29.8	177 58.0	57.5	244 39.8	03.9	130 25.0	56.1	Markab	13 38.0	N15 17.0
20	10 50.2	76 35.9	29.3	192 59.2	57.0	259 42.4	04.0	145 27.2	56.2	Menkar	314 14.4	N 4 08.6
21	25 52.7	91 36.7 . .	28.9	208 00.5 . .	56.5	274 45.1 . .	04.0	160 29.3 . .	56.3	Menkent	148 07.5	S36 26.1
22	40 55.2	106 37.5	28.4	223 01.7	56.0	289 47.8	04.0	175 31.5	56.4	Miaplacidus	221 39.1	S69 46.3
23	55 57.6	121 38.3	27.9	238 02.9	55.5	304 50.5	04.1	190 33.7	56.5			
2 00	71 00.1	136 39.1	S24 27.4	253 04.2	N 2 55.0	319 53.1	N22 04.1	205 35.9	S14 56.5	Mirfak	308 39.4	N49 54.6
01	86 02.5	151 39.9	27.0	268 05.4	54.5	334 55.8	04.1	220 38.1	56.6	Nunki	75 58.3	S26 16.6
02	101 05.0	166 40.8	26.5	283 06.7	54.0	349 58.5	04.2	235 40.3	56.7	Peacock	53 19.2	S56 41.4
03	116 07.5	181 41.6 . .	26.0	298 07.9 . .	53.5	5 01.2 . .	04.2	250 42.4 . .	56.8	Pollux	243 27.1	N27 59.3
04	131 09.9	196 42.4	25.5	313 09.2	53.0	20 03.8	04.2	265 44.6	56.8	Procyon	244 59.2	N 5 11.2
05	146 12.4	211 43.2	25.0	328 10.4	52.5	35 06.5	04.3	280 46.8	56.9			
06	161 14.9	226 44.1	S24 24.6	343 11.6	N 2 52.0	50 09.2	N22 04.3	295 49.0	S14 57.0	Rasalhague	96 06.5	N12 33.2
07	176 17.3	241 44.9	24.1	358 12.9	51.5	65 11.9	04.3	310 51.2	57.1	Regulus	207 43.1	N11 53.8
08	191 19.8	256 45.7	23.6	13 14.1	51.0	80 14.6	04.4	325 53.3	57.1	Rigel	281 11.4	S 8 11.3
M 09	206 22.3	271 46.6 . .	23.1	28 15.4 . .	50.5	95 17.2 . .	04.4	340 55.5 . .	57.2	Rigil Kent.	139 51.8	S60 53.3
O 10	221 24.7	286 47.4	22.6	43 16.6	50.0	110 19.9	04.5	355 57.7	57.3	Sabik	102 12.5	S15 44.3
N 11	236 27.2	301 48.2	22.2	58 17.9	49.5	125 22.6	04.5	10 59.9	57.4			
D 12	251 29.6	316 49.1	S24 21.7	73 19.1	N 2 49.0	140 25.3	N22 04.5	26 02.1	S14 57.5	Schedar	349 39.8	N56 37.1
A 13	266 32.1	331 49.9	21.2	88 20.4	48.5	155 27.9	04.6	41 04.2	57.5	Shaula	96 21.9	S37 06.6
Y 14	281 34.6	346 50.8	20.7	103 21.6	48.0	170 30.6	04.6	56 06.4	57.6	Sirius	258 33.1	S16 44.2
15	296 37.0	1 51.6 . .	20.2	118 22.8 . .	47.5	185 33.3 . .	04.6	71 08.6 . .	57.7	Spica	158 31.1	S11 13.9
16	311 39.5	16 52.5	19.7	133 24.1	47.0	200 36.0	04.7	86 10.8	57.8	Suhail	222 52.0	S43 29.2
17	326 42.0	31 53.3	19.3	148 25.3	46.5	215 38.7	04.7	101 13.0	57.8			
18	341 44.4	46 54.2	S24 18.8	163 26.6	N 2 46.0	230 41.4	N22 04.7	116 15.1	S14 57.9	Vega	80 39.1	N38 48.1
19	356 46.9	61 55.1	18.3	178 27.8	45.5	245 44.0	04.8	131 17.3	58.0	Zuben'ubi	137 05.4	S16 05.8
20	11 49.4	76 55.9	17.8	193 29.1	45.0	260 46.7	04.8	146 19.5	58.1		SHA	Mer.Pass.
21	26 51.8	91 56.8 . .	17.3	208 30.3 . .	44.5	275 49.4 . .	04.8	161 21.7 . .	58.1		° ′	h m
22	41 54.3	106 57.7	16.8	223 31.6	44.0	290 52.1	04.9	176 23.9	58.2	Venus	66 19.4	14 54
23	56 56.8	121 58.5	16.3	238 32.8	43.5	305 54.8	04.9	191 26.1	58.3	Mars	182 33.5	7 09
	h m									Jupiter	248 48.1	2 44
Mer.Pass.	19 16.8	v 0.8	d 0.5	v 1.2	d 0.5	v 2.7	d 0.0	v 2.2	d 0.1	Saturn	134 42.6	10 20

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON				Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 30	Moonrise 1	Moonrise 2	Moonrise 3
	GHA	Dec	GHA	v	Dec	d	HP							
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
30 00	182 51.9	S21 37.7	223 39.5	9.6	S11 28.8	9.4	58.4	N 72	07 51	09 51		06 12	08 29		
01	197 51.7	38.1	238 08.1	9.5	11 38.2	9.4	58.5	N 70	07 35	09 11		05 48	07 44	09 46	11 37
02	212 51.4	38.5	252 36.6	9.4	11 47.6	9.3	58.5	68	07 22	08 44	10 37	05 30	07 15	08 58	10 25
03	227 51.2 . .	38.9	267 05.0	9.4	11 56.9	9.3	58.5	66	07 11	08 23	09 47	05 15	06 53	08 28	09 48
04	242 51.0	39.3	281 33.4	9.2	12 06.2	9.2	58.6	64	07 01	08 07	09 16	05 03	06 36	08 05	09 22
05	257 50.8	39.7	296 01.6	9.1	12 15.4	9.2	58.6	62	06 53	07 53	08 53	04 53	06 21	07 47	09 02
06	272 50.5	S21 40.1	310 29.7	9.1	S12 24.6	9.1	58.6	60	06 46	07 41	08 35	04 45	06 10	07 32	08 45
07	287 50.3	40.5	324 57.8	9.0	12 33.7	9.0	58.7	N 58	06 39	07 31	08 20	04 37	05 59	07 19	08 31
S 08	302 50.1	40.9	339 25.8	8.9	12 42.7	9.0	58.7	56	06 34	07 21	08 07	04 31	05 50	07 08	08 19
A 09	317 49.8 . .	41.3	353 53.7	8.8	12 51.7	8.9	58.8	54	06 28	07 13	07 56	04 25	05 42	06 58	08 08
T 10	332 49.6	41.7	8 21.5	8.7	13 00.6	8.8	58.8	52	06 23	07 06	07 46	04 19	05 35	06 50	07 59
U 11	347 49.4	42.1	22 49.2	8.6	13 09.4	8.8	58.8	50	06 19	06 59	07 37	04 15	05 29	06 42	07 51
R 12	2 49.2	S21 42.5	37 16.8	8.5	S13 18.2	8.7	58.9	45	06 08	06 45	07 18	04 04	05 15	06 26	07 33
D 13	17 48.9	42.9	51 44.3	8.5	13 26.9	8.7	58.9	N 40	05 59	06 33	07 03	03 56	05 04	06 12	07 18
A 14	32 48.7	43.3	66 11.8	8.3	13 35.6	8.5	58.9	35	05 51	06 22	06 50	03 49	04 54	06 01	07 06
Y 15	47 48.5 . .	43.7	80 39.1	8.3	13 44.1	8.5	59.0	30	05 43	06 12	06 38	03 42	04 46	05 51	06 55
16	62 48.2	44.1	95 06.4	8.2	13 52.6	8.5	59.0	20	05 28	05 55	06 19	03 31	04 31	05 34	06 37
17	77 48.0	44.5	109 33.6	8.1	14 01.1	8.3	59.1	N 10	05 13	05 39	06 02	03 22	04 19	05 19	06 21
18	92 47.8	S21 44.9	124 00.7	8.0	S14 09.4	8.3	59.1	0	04 57	05 23	05 45	03 13	04 07	05 05	06 06
19	107 47.5	45.3	138 27.7	7.9	14 17.7	8.2	59.1	S 10	04 40	05 06	05 29	03 04	03 56	04 52	05 51
20	122 47.3	45.7	152 54.6	7.8	14 25.9	8.1	59.2	20	04 19	04 47	05 12	02 54	03 43	04 37	05 36
21	137 47.1 . .	46.1	167 21.4	7.7	14 34.0	8.1	59.2	30	03 52	04 24	04 51	02 44	03 29	04 20	05 17
22	152 46.8	46.5	181 48.1	7.7	14 42.1	7.9	59.2	35	03 34	04 10	04 39	02 38	03 21	04 11	05 07
23	167 46.6	46.9	196 14.8	7.6	14 50.0	7.9	59.3	40	03 13	03 53	04 25	02 31	03 12	04 00	04 55
1 00	182 46.4	S21 47.3	210 41.4	7.4	S14 57.9	7.8	59.3	45	02 46	03 33	04 09	02 23	03 01	03 47	04 41
01	197 46.1	47.6	225 07.8	7.4	15 05.7	7.7	59.3	S 50	02 07	03 06	03 49	02 13	02 48	03 31	04 23
02	212 45.9	48.0	239 34.2	7.3	15 13.4	7.6	59.4	52	01 44	02 53	03 39	02 09	02 42	03 24	04 15
03	227 45.7 . .	48.4	254 00.5	7.2	15 21.0	7.6	59.4	54	01 14	02 37	03 28	02 04	02 36	03 16	04 06
04	242 45.4	48.8	268 26.7	7.1	15 28.6	7.4	59.4	56	00 16	02 19	03 15	01 58	02 28	03 07	03 56
05	257 45.2	49.2	282 52.8	7.1	15 36.0	7.4	59.5	58	////	01 55	03 01	01 53	02 20	02 56	03 44
06	272 45.0	S21 49.6	297 18.9	6.9	S15 43.4	7.2	59.5	S 60	////	01 22	02 43	01 46	02 11	02 45	03 31
07	287 44.7	50.0	311 44.8	6.9	15 50.6	7.2	59.5								
08	302 44.5	50.4	326 10.7	6.7	15 57.8	7.1	59.6								
S 09	317 44.3 . .	50.7	340 36.4	6.7	16 04.9	7.0	59.6								
U 10	332 44.0	51.1	355 02.1	6.6	16 11.9	6.8	59.6								
N 11	347 43.8	51.5	9 27.7	6.6	16 18.7	6.8	59.7								
D 12	2 43.6	S21 51.9	23 53.3	6.4	S16 25.5	6.7	59.7								
A 13	17 43.3	52.3	38 18.7	6.3	16 32.2	6.6	59.7								
Y 14	32 43.1	52.6	52 44.0	6.3	16 38.8	6.5	59.8								
15	47 42.9 . .	53.0	67 09.3	6.2	16 45.3	6.4	59.8								
16	62 42.6	53.4	81 34.5	6.1	16 51.7	6.2	59.8								
17	77 42.4	53.8	95 59.6	6.0	16 57.9	6.2	59.9								
18	92 42.1	S21 54.2	110 24.6	6.0	S17 04.1	6.0	59.9								
19	107 41.9	54.5	124 49.6	5.9	17 10.1	6.0	59.9								
20	122 41.7	54.9	139 14.5	5.7	17 16.1	5.8	59.9								
21	137 41.4 . .	55.3	153 39.2	5.8	17 21.9	5.7	60.0								
22	152 41.2	55.7	168 04.0	5.6	17 27.6	5.7	60.0								
23	167 40.9	56.0	182 28.6	5.6	17 33.3	5.4	60.0								
2 00	182 40.7	S21 56.4	196 53.2	5.4	S17 38.7	5.4	60.1								
01	197 40.5	56.8	211 17.6	5.5	17 44.1	5.3	60.1								
02	212 40.2	57.1	225 42.1	5.3	17 49.4	5.1	60.1								
03	227 40.0 . .	57.5	240 06.4	5.3	17 54.5	5.1	60.1								
04	242 39.7	57.9	254 30.7	5.2	17 59.6	4.9	60.2								
05	257 39.5	58.3	268 54.9	5.1	18 04.5	4.8	60.2								
06	272 39.3	S21 58.6	283 19.0	5.1	S18 09.3	4.6	60.2								
07	287 39.0	59.0	297 43.1	5.0	18 13.9	4.6	60.2								
08	302 38.8	59.4	312 07.1	4.9	18 18.5	4.4	60.3								
M 09	317 38.5 21	59.7	326 31.0	4.9	18 22.9	4.3	60.3								
O 10	332 38.3 22	00.1	340 54.9	4.8	18 27.2	4.1	60.3								
N 11	347 38.0	00.5	355 18.7	4.7	18 31.3	4.1	60.3								
D 12	2 37.8	S22 00.8	9 42.4	4.7	S18 35.4	3.9	60.4								
A 13	17 37.6	01.2	24 06.1	4.6	18 39.3	3.7	60.4								
Y 14	32 37.3	01.5	38 29.7	4.6	18 43.0	3.7	60.4								
15	47 37.1 . .	01.9	52 53.3	4.5	18 46.7	3.5	60.4								
16	62 36.8	02.3	67 16.8	4.5	18 50.2	3.4	60.4								
17	77 36.6	02.6	81 40.3	4.4	18 53.6	3.2	60.5								
18	92 36.3	S22 03.0	96 03.7	4.3	S18 56.8	3.1	60.5								
19	107 36.1	03.3	110 27.0	4.4	18 59.9	3.0	60.5								
20	122 35.9	03.7	124 50.4	4.2	19 02.9	2.9	60.5								
21	137 35.6 . .	04.1	139 13.6	4.2	19 05.8	2.7	60.5								
22	152 35.4	04.4	153 36.8	4.2	19 08.5	2.5	60.6								
23	167 35.1	04.8	168 00.0	4.1	S19 11.0	2.5	60.6								
	SD 16.2	d 0.4	SD	16.0		16.3		16.4							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 30	Moonset 1	Moonset 2	Moonset 3
°	h m	h m	h m	h m	h m	h m	h m
N 72		13 47	15 46	12 21	11 59		
N 70		14 26	16 02	12 46	12 45	12 46	13 04
68	13 01	14 54	16 16	13 06	13 15	13 34	14 16
66	13 50	15 14	16 27	13 22	13 38	14 05	14 53
64	14 21	15 31	16 36	13 34	13 56	14 29	15 19
62	14 44	15 45	16 44	13 45	14 11	14 47	15 40
60	15 03	15 57	16 52	13 55	14 23	15 02	15 56
N 58	15 18	16 07	16 58	14 03	14 34	15 16	16 10
56	15 31	16 16	17 04	14 10	14 44	15 27	16 22
54	15 42	16 24	17 10	14 17	14 52	15 37	16 33
52	15 52	16 32	17 15	14 23	15 00	15 46	16 42
50	16 01	16 38	17 19	14 28	15 06	15 54	16 51
45	16 20	16 53	17 30	14 39	15 21	16 10	17 09
N 40	16 35	17 05	17 39	14 49	15 33	16 24	17 23
35	16 48	17 16	17 47	14 57	15 43	16 36	17 36
30	17 00	17 26	17 55	15 04	15 52	16 46	17 46
20	17 19	17 43	18 10	15 17	16 08	17 04	18 05
N 10	17 37	17 59	18 25	15 28	16 22	17 20	18 21
0	17 53	18 15	18 41	15 38	16 34	17 34	18 36
S 10	18 09	18 32	18 59	15 48	16 47	17 48	18 51
20	18 27	18 51	19 20	16 00	17 01	18 04	19 07
30	18 47	19 14	19 47	16 12	17 17	18 22	19 25
35	18 59	19 28	20 04	16 20	17 26	18 32	19 36
40	19 13	19 45	20 25	16 28	17 36	18 44	19 48
45	19 30	20 06	20 53	16 38	17 48	18 58	20 02
S 50	19 50	20 33	21 33	16 49	18 03	19 15	20 20
52	20 00	20 46	21 55	16 55	18 10	19 23	20 28
54	20 11	21 02	22 26	17 01	18 18	19 31	20 37
56	20 24	21 21	23 35	17 08	18 27	19 41	20 47
58	20 39	21 45	////	17 16	18 37	19 53	20 59
S 60	20 56	22 19	////	17 24	18 48	20 06	21 13

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
30	11 28	11 17	11 49	09 25	21 53	27	9
1	11 06	10 55	11 49	10 21	22 50	28	3
2	10 43	10 32	11 49	11 20	23 50	29	0

UT	ARIES	VENUS −4.9		MARS +1.2		JUPITER −2.6		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
3 00	71 59.2	136 59.4	S24 15.9	253 34.1	N 2 43.0	320 57.4	N22 04.9	206 28.2	S14 58.4	Acamar	315 17.7	S40 15.1
01	87 01.7	152 00.3	15.4	268 35.3	42.5	336 00.1	05.0	221 30.4	58.5	Achernar	335 26.2	S57 10.2
02	102 04.1	167 01.2	14.9	283 36.6	42.0	351 02.8	05.0	236 32.6	58.5	Acrux	173 09.1	S63 10.3
03	117 06.6	182 02.1	14.4	298 37.8	41.5	6 05.5	05.0	251 34.8	58.6	Adhara	255 11.9	S28 59.5
04	132 09.1	197 03.0	13.9	313 39.0	41.0	21 08.2	05.1	266 37.0	58.7	Aldebaran	290 48.6	N16 32.1
05	147 11.5	212 03.9	13.4	328 40.3	40.5	36 10.9	05.1	281 39.1	58.8			
06	162 14.0	227 04.7	S24 12.9	343 41.5	N 2 40.0	51 13.6	N22 05.2	296 41.3	S14 58.8	Alioth	166 20.8	N55 52.8
07	177 16.5	242 05.6	12.4	358 42.8	39.5	66 16.2	05.2	311 43.5	58.9	Alkaid	152 59.1	N49 14.5
08	192 18.9	257 06.5	11.9	13 44.0	39.0	81 18.9	05.2	326 45.7	59.0	Al Na'ir	27 43.5	S46 53.7
09	207 21.4	272 07.4	11.4	28 45.3	38.5	96 21.6	05.3	341 47.9	59.1	Alnilam	275 45.7	S 1 11.7
10	222 23.9	287 08.3	11.0	43 46.5	38.0	111 24.3	05.3	356 50.1	59.1	Alphard	217 55.6	S 8 43.2
11	237 26.3	302 09.3	10.5	58 47.8	37.5	126 27.0	05.3	11 52.2	59.2			
12	252 28.8	317 10.2	S24 10.0	73 49.0	N 2 37.0	141 29.7	N22 05.4	26 54.4	S14 59.3	Alphecca	126 11.1	N26 40.2
13	267 31.3	332 11.1	09.5	88 50.3	36.5	156 32.4	05.4	41 56.6	59.4	Alpheratz	357 43.0	N29 10.3
14	282 33.7	347 12.0	09.0	103 51.5	36.0	171 35.0	05.4	56 58.8	59.5	Altair	62 08.2	N 8 54.6
15	297 36.2	2 12.9	08.5	118 52.8	35.5	186 37.7	05.5	72 01.0	59.5	Ankaa	353 15.3	S42 14.0
16	312 38.6	17 13.8	08.0	133 54.0	35.0	201 40.4	05.5	87 03.2	59.6	Antares	112 26.2	S26 27.6
17	327 41.1	32 14.8	07.5	148 55.3	34.5	216 43.1	05.5	102 05.3	59.7			
18	342 43.6	47 15.7	S24 07.0	163 56.5	N 2 34.0	231 45.8	N22 05.6	117 07.5	S14 59.8	Arcturus	145 55.7	N19 06.6
19	357 46.0	62 16.6	06.5	178 57.8	33.5	246 48.5	05.6	132 09.7	59.8	Atria	107 28.3	S69 02.9
20	12 48.5	77 17.6	06.0	193 59.0	33.0	261 51.2	05.7	147 11.9	14 59.9	Avior	234 17.4	S59 33.2
21	27 51.0	92 18.5	05.5	209 00.3	32.5	276 53.9	05.7	162 14.1	15 00.0	Bellatrix	278 31.3	N 6 21.6
22	42 53.4	107 19.4	05.0	224 01.5	32.0	291 56.6	05.7	177 16.2	00.1	Betelgeuse	271 00.6	N 7 24.4
23	57 55.9	122 20.4	04.5	239 02.8	31.5	306 59.2	05.8	192 18.4	00.1			
4 00	72 58.4	137 21.3	S24 04.0	254 04.0	N 2 31.0	322 01.9	N22 05.8	207 20.6	S15 00.2	Canopus	263 55.5	S52 42.2
01	88 00.8	152 22.3	03.5	269 05.3	30.5	337 04.6	05.8	222 22.8	00.3	Capella	280 33.5	N46 00.5
02	103 03.3	167 23.2	03.0	284 06.6	30.0	352 07.3	05.9	237 25.0	00.4	Deneb	49 31.5	N45 20.2
03	118 05.8	182 24.2	02.5	299 07.8	29.5	7 10.0	05.9	252 27.2	00.4	Denebola	182 33.4	N14 29.5
04	133 08.2	197 25.1	02.0	314 09.1	29.0	22 12.7	05.9	267 29.3	00.5	Diphda	348 55.4	S17 54.6
05	148 10.7	212 26.1	01.5	329 10.3	28.5	37 15.4	06.0	282 31.5	00.6			
06	163 13.1	227 27.0	S24 01.0	344 11.6	N 2 28.0	52 18.1	N22 06.0	297 33.7	S15 00.7	Dubhe	193 51.5	N61 40.2
07	178 15.6	242 28.0	00.5	359 12.8	27.5	67 20.8	06.1	312 35.9	00.7	Elnath	278 11.8	N28 37.0
08	193 18.1	257 29.0	24 00.0	14 14.1	27.1	82 23.5	06.1	327 38.1	00.8	Eltanin	90 46.5	N51 29.5
09	208 20.5	272 30.0	23 59.5	29 15.3	26.6	97 26.2	06.1	342 40.3	00.9	Enif	33 46.9	N 9 56.6
10	223 23.0	287 30.9	59.0	44 16.6	26.1	112 28.9	06.2	357 42.4	01.0	Fomalhaut	15 23.7	S29 32.9
11	238 25.5	302 31.9	58.5	59 17.8	25.6	127 31.6	06.2	12 44.6	01.1			
12	253 27.9	317 32.9	S23 58.0	74 19.1	N 2 25.1	142 34.2	N22 06.2	27 46.8	S15 01.1	Gacrux	172 00.7	S57 11.2
13	268 30.4	332 33.9	57.5	89 20.3	24.6	157 36.9	06.3	42 49.0	01.2	Gienah	175 52.1	S17 37.1
14	283 32.9	347 34.8	57.0	104 21.6	24.1	172 39.6	06.3	57 51.2	01.3	Hadar	148 47.8	S60 26.1
15	298 35.3	2 35.8	56.5	119 22.9	23.6	187 42.3	06.3	72 53.4	01.4	Hamal	328 00.1	N23 31.8
16	313 37.8	17 36.8	56.0	134 24.1	23.1	202 45.0	06.4	87 55.5	01.4	Kaus Aust.	83 43.8	S34 22.5
17	328 40.3	32 37.8	55.5	149 25.4	22.6	217 47.7	06.4	102 57.7	01.5			
18	343 42.7	47 38.8	S23 55.0	164 26.6	N 2 22.1	232 50.4	N22 06.5	117 59.9	S15 01.6	Kochab	137 21.2	N74 05.8
19	358 45.2	62 39.8	54.5	179 27.9	21.6	247 53.1	06.5	133 02.1	01.7	Markab	13 38.0	N15 17.0
20	13 47.6	77 40.8	54.0	194 29.1	21.1	262 55.8	06.5	148 04.3	01.7	Menkar	314 14.4	N 4 08.6
21	28 50.1	92 41.8	53.5	209 30.4	20.6	277 58.5	06.6	163 06.5	01.8	Menkent	148 07.5	S36 26.1
22	43 52.6	107 42.8	53.0	224 31.7	20.1	293 01.2	06.6	178 08.6	01.9	Miaplacidus	221 39.0	S69 46.3
23	58 55.0	122 43.8	52.5	239 32.9	19.6	308 03.9	06.6	193 10.8	02.0			
5 00	73 57.5	137 44.9	S23 52.0	254 34.2	N 2 19.1	323 06.6	N22 06.7	208 13.0	S15 02.0	Mirfak	308 39.3	N49 54.6
01	89 00.0	152 45.9	51.5	269 35.4	18.6	338 09.3	06.7	223 15.2	02.1	Nunki	75 58.3	S26 16.6
02	104 02.4	167 46.9	51.0	284 36.7	18.1	353 12.0	06.8	238 17.4	02.2	Peacock	53 19.2	S56 41.4
03	119 04.9	182 47.9	50.5	299 37.9	17.6	8 14.7	06.8	253 19.6	02.3	Pollux	243 27.1	N27 59.3
04	134 07.4	197 49.0	50.0	314 39.2	17.1	23 17.4	06.8	268 21.8	02.3	Procyon	244 59.1	N 5 11.2
05	149 09.8	212 50.0	49.5	329 40.5	16.6	38 20.1	06.9	283 23.9	02.4			
06	164 12.3	227 51.0	S23 48.9	344 41.7	N 2 16.1	53 22.8	N22 06.9	298 26.1	S15 02.5	Rasalhague	96 06.5	N12 33.2
07	179 14.8	242 52.1	48.4	359 43.0	15.7	68 25.5	06.9	313 28.3	02.6	Regulus	207 43.1	N11 53.8
08	194 17.2	257 53.1	47.9	14 44.2	15.2	83 28.2	07.0	328 30.5	02.6	Rigel	281 11.4	S 8 11.3
09	209 19.7	272 54.1	47.4	29 45.5	14.7	98 30.9	07.0	343 32.7	02.7	Rigil Kent.	139 51.8	S60 53.3
10	224 22.1	287 55.2	46.9	44 46.8	14.2	113 33.6	07.1	358 34.9	02.8	Sabik	102 12.5	S15 44.3
11	239 24.6	302 56.2	46.4	59 48.0	13.7	128 36.3	07.1	13 37.0	02.9			
12	254 27.1	317 57.3	S23 45.9	74 49.3	N 2 13.2	143 39.0	N22 07.1	28 39.2	S15 02.9	Schedar	349 39.8	N56 37.1
13	269 29.5	332 58.3	45.4	89 50.5	12.7	158 41.7	07.2	43 41.4	03.0	Shaula	96 21.9	S37 06.6
14	284 32.0	347 59.4	44.9	104 51.8	12.2	173 44.4	07.2	58 43.6	03.1	Sirius	258 33.1	S16 44.2
15	299 34.5	3 00.5	44.4	119 53.1	11.7	188 47.1	07.2	73 45.8	03.2	Spica	158 31.1	S11 13.9
16	314 36.9	18 01.5	43.8	134 54.3	11.2	203 49.8	07.3	88 48.0	03.2	Suhail	222 52.0	S43 29.3
17	329 39.4	33 02.6	43.3	149 55.6	10.7	218 52.5	07.3	103 50.2	03.3			
18	344 41.9	48 03.6	S23 42.8	164 56.8	N 2 10.2	233 55.2	N22 07.4	118 52.3	S15 03.4	Vega	80 39.1	N38 48.1
19	359 44.3	63 04.7	42.3	179 58.1	09.7	248 57.9	07.4	133 54.5	03.5	Zuben'ubi	137 05.4	S16 05.8
20	14 46.8	78 05.8	41.8	194 59.4	09.2	264 00.6	07.4	148 56.7	03.5		SHA	Mer.Pass.
21	29 49.3	93 06.9	41.3	210 00.6	08.7	279 03.3	07.5	163 58.9	03.6		° ′	h m
22	44 51.7	108 08.0	40.8	225 01.9	08.2	294 06.0	07.5	179 01.1	03.7	Venus	64 23.0	14 50
23	59 54.2	123 09.0	40.3	240 03.2	07.8	309 08.7	07.5	194 03.3	03.8	Mars	181 05.7	7 03
	h m									Jupiter	249 03.6	2 31
Mer.Pass.	19 05.0	v 1.0	d 0.5	v 1.3	d 0.5	v 2.7	d 0.0	v 2.2	d 0.1	Saturn	134 22.3	10 09

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		3	4	5	6
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
3 00	182 34.9	S22 05.1	182 23.1	4.1	S19 13.5	2.3	60.6	N 72	07 59	10 04				13 19	12 47
01	197 34.6	05.5	196 46.2	4.0	19 15.8	2.1	60.6	N 70	07 42	09 21		11 37	12 15	12 19	12 18
02	212 34.4	05.8	211 09.2	4.1	19 17.9	2.0	60.6	68	07 28	08 52	10 56	10 25	11 19	11 44	11 56
03	227 34.1	06.2	225 32.3	3.9	19 19.9	1.9	60.7	66	07 16	08 30	09 58	09 48	10 45	11 18	11 38
04	242 33.9	06.5	239 55.2	4.0	19 21.8	1.7	60.7	64	07 07	08 13	09 24	09 22	10 20	10 59	11 24
05	257 33.6	06.9	254 18.2	3.9	19 23.5	1.6	60.7	62	06 58	07 58	09 00	09 02	10 00	10 42	11 12
06	272 33.4	S22 07.2	268 41.1	3.8	S19 25.1	1.5	60.7	60	06 50	07 46	08 41	08 45	09 44	10 29	11 01
07	287 33.1	07.6	283 03.9	3.9	19 26.6	1.3	60.7	N 58	06 44	07 35	08 25	08 31	09 31	10 17	10 52
08	302 32.9	07.9	297 26.8	3.8	19 27.9	1.2	60.7	56	06 38	07 26	08 12	08 19	09 19	10 07	10 44
09	317 32.6	08.3	311 49.6	3.8	19 29.1	1.0	60.7	54	06 32	07 17	08 00	08 08	09 09	09 58	10 37
10	332 32.4	08.6	326 12.4	3.8	19 30.1	0.9	60.7	52	06 27	07 10	07 50	07 59	09 00	09 50	10 31
11	347 32.1	09.0	340 35.2	3.7	19 31.0	0.7	60.8	50	06 22	07 03	07 41	07 51	08 52	09 43	10 25
12	2 31.9	S22 09.3	354 57.9	3.7	S19 31.7	0.6	60.8	45	06 11	06 48	07 21	07 33	08 34	09 27	10 13
13	17 31.6	09.7	9 20.6	3.7	19 32.3	0.4	60.8	N 40	06 02	06 35	07 06	07 18	08 20	09 15	10 02
14	32 31.4	10.0	23 43.3	3.7	19 32.7	0.3	60.8	35	05 53	06 24	06 52	07 06	08 08	09 04	09 53
15	47 31.1	10.4	38 06.0	3.7	19 33.0	0.2	60.8	30	05 45	06 14	06 41	06 55	07 57	08 54	09 46
16	62 30.9	10.7	52 28.7	3.7	19 33.2	0.0	60.8	20	05 29	05 57	06 21	06 37	07 39	08 38	09 32
17	77 30.6	11.1	66 51.4	3.6	19 33.2	0.1	60.8	N 10	05 14	05 40	06 03	06 21	07 23	08 24	09 20
18	92 30.4	S22 11.4	81 14.0	3.7	S19 33.1	0.3	60.8	0	04 58	05 24	05 47	06 06	07 09	08 10	09 09
19	107 30.1	11.7	95 36.7	3.6	19 32.8	0.4	60.8	S 10	04 40	05 07	05 30	05 51	06 54	07 57	08 58
20	122 29.9	12.1	109 59.3	3.7	19 32.4	0.6	60.8	20	04 19	04 48	05 12	05 36	06 38	07 42	08 46
21	137 29.6	12.4	124 22.0	3.6	19 31.8	0.7	60.9	30	03 51	04 24	04 51	05 17	06 20	07 26	08 33
22	152 29.4	12.8	138 44.6	3.7	19 31.1	0.9	60.9	35	03 34	04 10	04 39	05 07	06 09	07 16	08 25
23	167 29.1	13.1	153 07.3	3.6	19 30.2	1.0	60.9	40	03 12	03 53	04 25	04 55	05 57	07 05	08 16
4 00	182 28.9	S22 13.4	167 29.9	3.6	S19 29.2	1.1	60.9	45	02 44	03 31	04 08	04 41	05 43	06 52	08 05
01	197 28.6	13.8	181 52.5	3.7	19 28.1	1.3	60.9	S 50	02 03	03 04	03 47	04 23	05 26	06 37	07 52
02	212 28.4	14.1	196 15.2	3.6	19 26.8	1.4	60.9	52	01 40	02 50	03 37	04 15	05 18	06 29	07 46
03	227 28.1	14.4	210 37.8	3.7	19 25.4	1.6	60.9	54	01 07	02 34	03 26	04 06	05 09	06 21	07 40
04	242 27.9	14.8	225 00.5	3.7	19 23.8	1.8	60.9	56	////	02 14	03 13	03 56	04 58	06 12	07 32
05	257 27.6	15.1	239 23.2	3.7	19 22.0	1.8	60.9	58	////	01 50	02 57	03 44	04 47	06 01	07 24
06	272 27.4	S22 15.4	253 45.9	3.7	S19 20.2	2.0	60.9	S 60	////	01 14	02 39	03 31	04 33	05 49	07 14
07	287 27.1	15.8	268 08.6	3.7	19 18.2	2.2	60.9								
08	302 26.9	16.1	282 31.3	3.7	19 16.0	2.3	60.9								
09	317 26.6	16.4	296 54.0	3.8	19 13.7	2.4	60.9								
10	332 26.3	16.8	311 16.8	3.8	19 11.3	2.6	60.9								
11	347 26.1	17.1	325 39.6	3.8	19 08.7	2.7	60.9								
12	2 25.8	S22 17.4	340 02.4	3.8	S19 06.0	2.9	60.9								
13	17 25.6	17.7	354 25.2	3.8	19 03.1	3.0	60.9								
14	32 25.3	18.1	8 48.0	3.9	19 00.1	3.2	60.9								
15	47 25.1	18.4	23 10.9	3.9	18 56.9	3.2	60.9								
16	62 24.8	18.7	37 33.8	4.0	18 53.7	3.5	60.9								
17	77 24.6	19.0	51 56.8	4.0	18 50.2	3.5	60.9								
18	92 24.3	S22 19.4	66 19.8	4.0	S18 46.7	3.7	60.9								
19	107 24.0	19.7	80 42.8	4.0	18 43.0	3.9	60.9								
20	122 23.8	20.0	95 05.8	4.1	18 39.1	3.9	60.9								
21	137 23.5	20.3	109 28.9	4.2	18 35.2	4.1	60.9								
22	152 23.3	20.7	123 52.1	4.1	18 31.1	4.3	60.9								
23	167 23.0	21.0	138 15.2	4.3	18 26.8	4.4	60.9								
5 00	182 22.8	S22 21.3	152 38.5	4.2	S18 22.4	4.5	60.9								
01	197 22.5	21.6	167 01.7	4.3	18 17.9	4.6	60.8								
02	212 22.2	21.9	181 25.0	4.4	18 13.3	4.8	60.8								
03	227 22.0	22.3	195 48.4	4.4	18 08.5	4.9	60.8								
04	242 21.7	22.6	210 11.8	4.5	18 03.6	5.0	60.8								
05	257 21.5	22.9	224 35.3	4.5	17 58.6	5.1	60.8								
06	272 21.2	S22 23.2	238 58.8	4.5	S17 53.5	5.3	60.8								
07	287 20.9	23.5	253 22.3	4.6	17 48.2	5.4	60.8								
08	302 20.7	23.8	267 45.9	4.7	17 42.8	5.6	60.8								
09	317 20.4	24.1	282 09.6	4.7	17 37.2	5.6	60.8								
10	332 20.2	24.5	296 33.3	4.8	17 31.6	5.8	60.8								
11	347 19.9	24.8	310 57.1	4.9	17 25.8	5.9	60.7								
12	2 19.6	S22 25.1	325 21.0	4.9	S17 19.9	6.0	60.7								
13	17 19.4	25.4	339 44.9	4.9	17 13.9	6.1	60.7								
14	32 19.1	25.7	354 08.8	5.1	17 07.8	6.3	60.7								
15	47 18.9	26.0	8 32.9	5.1	17 01.5	6.4	60.7								
16	62 18.6	26.3	22 57.0	5.1	16 55.1	6.5	60.7								
17	77 18.3	26.6	37 21.1	5.2	16 48.6	6.6	60.7								
18	92 18.1	S22 26.9	51 45.3	5.3	S16 42.0	6.7	60.7								
19	107 17.8	27.2	66 09.6	5.4	16 35.3	6.8	60.6								
20	122 17.5	27.5	80 34.0	5.4	16 28.5	6.9	60.6								
21	137 17.3	27.8	94 58.4	5.5	16 21.6	7.1	60.6								
22	152 17.0	28.1	109 22.9	5.6	16 14.5	7.1	60.6								
23	167 16.8	28.4	123 47.5	5.6	S16 07.4	7.3	60.6								
	SD 16.3	d 0.3	SD	16.6		16.6		16.5							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	3	4	5	6
°	h m	h m	h m	h m	h m	h m	h m
N 72		13 35	15 41			15 42	18 15
N 70		14 19	15 58	13 04	14 36	16 41	18 44
68	12 44	14 48	16 12	14 16	15 33	17 15	19 05
66	13 43	15 10	16 24	14 53	16 06	17 40	19 21
64	14 16	15 28	16 34	15 19	16 31	17 59	19 35
62	14 40	15 42	16 42	15 40	16 50	18 15	19 46
60	14 59	15 54	16 50	15 56	17 06	18 28	19 55
N 58	15 15	16 05	16 57	16 10	17 19	18 39	20 04
56	15 28	16 14	17 03	16 22	17 31	18 48	20 11
54	15 40	16 23	17 08	16 33	17 41	18 57	20 17
52	15 50	16 30	17 13	16 42	17 50	19 05	20 23
50	16 00	16 37	17 18	16 51	17 58	19 12	20 29
45	16 19	16 52	17 29	17 09	18 15	19 26	20 40
N 40	16 35	17 05	17 39	17 23	18 29	19 38	20 49
35	16 48	17 16	17 47	17 36	18 40	19 49	20 57
30	17 00	17 26	17 56	17 46	18 51	19 57	21 04
20	17 20	17 44	18 11	18 05	19 08	20 13	21 16
N 10	17 37	18 00	18 26	18 21	19 24	20 26	21 27
0	17 54	18 16	18 42	18 36	19 38	20 39	21 36
S 10	18 11	18 34	19 00	18 51	19 52	20 51	21 46
20	18 29	18 53	19 22	19 07	20 07	21 04	21 56
30	18 50	19 17	19 50	19 25	20 25	21 19	22 08
35	19 02	19 31	20 07	19 36	20 35	21 28	22 14
40	19 16	19 48	20 29	19 48	20 46	21 37	22 22
45	19 33	20 10	20 58	20 02	21 00	21 49	22 31
S 50	19 54	20 37	21 39	20 20	21 16	22 03	22 41
52	20 04	20 51	22 03	20 28	21 24	22 09	22 46
54	20 16	21 08	22 36	20 37	21 32	22 16	22 51
56	20 29	21 27	////	20 47	21 42	22 24	22 57
58	20 44	21 53	////	20 59	21 52	22 33	23 04
S 60	21 02	22 29	////	21 13	22 05	22 43	23 11

Day	SUN		Mer. Pass.	MOON			
	Eqn. of Time			Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
3	10 20	10 08	11 50	12 21	24 52	00	0
4	09 56	09 44	11 50	13 23	00 52	01	3
5	09 32	09 19	11 51	14 24	01 54	02	9

UT	ARIES	VENUS −4.9		MARS +1.2		JUPITER −2.6		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
6 00	74 56.6	138 10.1	S23 39.7	255 04.4	N 2 07.3	324 11.4	N22 07.6	209 05.5	S15 03.8
01	89 59.1	153 11.2	39.2	270 05.7	06.8	339 14.2	07.6	224 07.6	03.9
02	105 01.6	168 12.3	38.7	285 06.9	06.3	354 16.9	07.7	239 09.8	04.0
03	120 04.0	183 13.4	. . 38.2	300 08.2	. . 05.8	9 19.6	. . 07.7	254 12.0	. . 04.1
04	135 06.5	198 14.5	37.7	315 09.5	05.3	24 22.3	07.7	269 14.2	04.1
05	150 09.0	213 15.6	37.2	330 10.7	04.8	39 25.0	07.8	284 16.4	04.2
06	165 11.4	228 16.7	S23 36.6	345 12.0	N 2 04.3	54 27.7	N22 07.8	299 18.6	S15 04.3
07	180 13.9	243 17.8	36.1	0 13.3	03.8	69 30.4	07.8	314 20.8	04.4
08	195 16.4	258 18.9	35.6	15 14.5	03.3	84 33.1	07.9	329 22.9	04.4
F 09	210 18.8	273 20.1	. . 35.1	30 15.8	. . 02.8	99 35.8	. . 07.9	344 25.1	. . 04.5
R 10	225 21.3	288 21.2	34.6	45 17.1	02.3	114 38.5	08.0	359 27.3	04.6
I 11	240 23.7	303 22.3	34.1	60 18.3	01.8	129 41.2	08.0	14 29.5	04.7
D 12	255 26.2	318 23.4	S23 33.5	75 19.6	N 2 01.4	144 43.9	N22 08.0	29 31.7	S15 04.7
A 13	270 28.7	333 24.6	33.0	90 20.9	00.9	159 46.6	08.1	44 33.9	04.8
Y 14	285 31.1	348 25.7	32.5	105 22.1	2 00.4	174 49.4	08.1	59 36.1	04.9
15	300 33.6	3 26.8	. . 32.0	120 23.4	1 59.9	189 52.1	. . 08.1	74 38.2	. . 05.0
16	315 36.1	18 28.0	31.5	135 24.7	59.4	204 54.8	08.2	89 40.4	05.0
17	330 38.5	33 29.1	30.9	150 25.9	58.9	219 57.5	08.2	104 42.6	05.1
18	345 41.0	48 30.2	S23 30.4	165 27.2	N 1 58.4	235 00.2	N22 08.3	119 44.8	S15 05.2
19	0 43.5	63 31.4	29.9	180 28.5	57.9	250 02.9	08.3	134 47.0	05.3
20	15 45.9	78 32.5	29.4	195 29.7	57.4	265 05.6	08.3	149 49.2	05.3
21	30 48.4	93 33.7	. . 28.9	210 31.0	. . 56.9	280 08.3	. . 08.4	164 51.4	. . 05.4
22	45 50.9	108 34.8	28.3	225 32.3	56.4	295 11.0	08.4	179 53.5	05.5
23	60 53.3	123 36.0	27.8	240 33.5	56.0	310 13.8	08.5	194 55.7	05.6
7 00	75 55.8	138 37.2	S23 27.3	255 34.8	N 1 55.5	325 16.5	N22 08.5	209 57.9	S15 05.6
01	90 58.2	153 38.3	26.8	270 36.1	55.0	340 19.2	08.5	225 00.1	05.7
02	106 00.7	168 39.5	26.3	285 37.3	54.5	355 21.9	08.6	240 02.3	05.8
03	121 03.2	183 40.7	. . 25.7	300 38.6	. . 54.0	10 24.6	. . 08.6	255 04.5	. . 05.9
04	136 05.6	198 41.9	25.2	315 39.9	53.5	25 27.3	08.7	270 06.7	05.9
05	151 08.1	213 43.0	24.7	330 41.1	53.0	40 30.0	08.7	285 08.9	06.0
06	166 10.6	228 44.2	S23 24.2	345 42.4	N 1 52.5	55 32.7	N22 08.7	300 11.0	S15 06.1
07	181 13.0	243 45.4	23.6	0 43.7	52.0	70 35.5	08.8	315 13.2	06.2
S 08	196 15.5	258 46.6	23.1	15 44.9	51.5	85 38.2	08.8	330 15.4	06.2
A 09	211 18.0	273 47.8	. . 22.6	30 46.2	. . 51.1	100 40.9	. . 08.8	345 17.6	. . 06.3
T 10	226 20.4	288 49.0	22.1	45 47.5	50.6	115 43.6	08.9	0 19.8	06.4
U 11	241 22.9	303 50.2	21.5	60 48.8	50.1	130 46.3	08.9	15 22.0	06.4
R 12	256 25.4	318 51.4	S23 21.0	75 50.0	N 1 49.6	145 49.0	N22 09.0	30 24.2	S15 06.5
D 13	271 27.8	333 52.6	20.5	90 51.3	49.1	160 51.8	09.0	45 26.4	06.6
A 14	286 30.3	348 53.8	20.0	105 52.6	48.6	175 54.5	09.0	60 28.5	06.7
Y 15	301 32.7	3 55.0	. . 19.4	120 53.8	. . 48.1	190 57.2	. . 09.1	75 30.7	. . 06.7
16	316 35.2	18 56.2	18.9	135 55.1	47.6	205 59.9	09.1	90 32.9	06.8
17	331 37.7	33 57.4	18.4	150 56.4	47.1	221 02.6	09.2	105 35.1	06.9
18	346 40.1	48 58.7	S23 17.9	165 57.7	N 1 46.6	236 05.3	N22 09.2	120 37.3	S15 07.0
19	1 42.6	63 59.9	17.3	180 58.9	46.2	251 08.1	09.2	135 39.5	07.0
20	16 45.1	79 01.1	16.8	196 00.2	45.7	266 10.8	09.3	150 41.7	07.1
21	31 47.5	94 02.3	. . 16.3	211 01.5	. . 45.2	281 13.5	. . 09.3	165 43.9	. . 07.2
22	46 50.0	109 03.6	15.8	226 02.8	44.7	296 16.2	09.4	180 46.0	07.3
23	61 52.5	124 04.8	15.2	241 04.0	44.2	311 18.9	09.4	195 48.2	07.3
8 00	76 54.9	139 06.1	S23 14.7	256 05.3	N 1 43.7	326 21.7	N22 09.4	210 50.4	S15 07.4
01	91 57.4	154 07.3	14.2	271 06.6	43.2	341 24.4	09.5	225 52.6	07.5
02	106 59.9	169 08.5	13.6	286 07.8	42.7	356 27.1	09.5	240 54.8	07.6
03	122 02.3	184 09.8	. . 13.1	301 09.1	. . 42.3	11 29.8	. . 09.6	255 57.0	. . 07.6
04	137 04.8	199 11.1	12.6	316 10.4	41.8	26 32.5	09.6	270 59.2	07.7
05	152 07.2	214 12.3	12.1	331 11.7	41.3	41 35.3	09.6	286 01.4	07.8
06	167 09.7	229 13.6	S23 11.5	346 12.9	N 1 40.8	56 38.0	N22 09.7	301 03.5	S15 07.8
07	182 12.2	244 14.8	11.0	1 14.2	40.3	71 40.7	09.7	316 05.7	07.9
08	197 14.6	259 16.1	10.5	16 15.5	39.8	86 43.4	09.8	331 07.9	08.0
S 09	212 17.1	274 17.4	. . 09.9	31 16.8	. . 39.3	101 46.1	. . 09.8	346 10.1	. . 08.1
U 10	227 19.6	289 18.6	09.4	46 18.1	38.8	116 48.9	09.8	1 12.3	08.1
N 11	242 22.0	304 19.9	08.9	61 19.3	38.4	131 51.6	09.9	16 14.5	08.2
D 12	257 24.5	319 21.2	S23 08.3	76 20.6	N 1 37.9	146 54.3	N22 09.9	31 16.7	S15 08.3
A 13	272 27.0	334 22.5	07.8	91 21.9	37.4	161 57.0	09.9	46 18.9	08.4
Y 14	287 29.4	349 23.8	07.3	106 23.2	36.9	176 59.8	10.0	61 21.1	08.4
15	302 31.9	4 25.1	. . 06.8	121 24.4	. . 36.4	192 02.5	. . 10.0	76 23.2	. . 08.5
16	317 34.3	19 26.4	06.2	136 25.7	35.9	207 05.2	10.1	91 25.4	08.6
17	332 36.8	34 27.7	05.7	151 27.0	35.4	222 07.9	10.1	106 27.6	08.7
18	347 39.3	49 29.0	S23 05.2	166 28.3	N 1 35.0	237 10.6	N22 10.1	121 29.8	S15 08.7
19	2 41.7	64 30.3	04.6	181 29.5	34.5	252 13.4	10.2	136 32.0	08.8
20	17 44.2	79 31.6	04.1	196 30.8	34.0	267 16.1	10.2	151 34.2	08.9
21	32 46.7	94 32.9	. . 03.6	211 32.1	. . 33.5	282 18.8	. . 10.3	166 36.4	. . 08.9
22	47 49.1	109 34.2	03.0	226 33.4	33.0	297 21.5	10.3	181 38.6	09.0
23	62 51.6	124 35.5	02.5	241 34.7	32.5	312 24.3	10.3	196 40.8	09.1
Mer. Pass.	h m 18 53.2	v 1.2	d 0.5	v 1.3	d 0.5	v 2.7	d 0.0	v 2.2	d 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.7	S40 15.1
Achernar	335 26.2	S57 10.2
Acrux	173 09.0	S63 10.3
Adhara	255 11.9	S28 59.5
Aldebaran	290 48.6	N16 32.1
Alioth	166 20.8	N55 52.8
Alkaid	152 59.0	N49 14.5
Al Na'ir	27 43.5	S46 53.7
Alnilam	275 45.7	S 1 11.7
Alphard	217 55.6	S 8 43.2
Alphecca	126 11.1	N26 40.1
Alpheratz	357 43.0	N29 10.3
Altair	62 08.2	N 8 54.6
Ankaa	353 15.3	S42 14.0
Antares	112 26.2	S26 27.6
Arcturus	145 55.7	N19 06.6
Atria	107 28.3	S69 02.9
Avior	234 17.4	S59 33.2
Bellatrix	278 31.3	N 6 21.6
Betelgeuse	271 00.6	N 7 24.4
Canopus	263 55.5	S52 42.3
Capella	280 33.5	N46 00.5
Deneb	49 31.5	N45 20.2
Denebola	182 33.4	N14 29.5
Diphda	348 55.4	S17 54.6
Dubhe	193 51.4	N61 40.2
Elnath	278 11.8	N28 37.0
Eltanin	90 46.5	N51 29.5
Enif	33 46.9	N 9 56.6
Fomalhaut	15 23.7	S29 32.9
Gacrux	172 00.7	S57 11.2
Gienah	175 52.0	S17 37.1
Hadar	148 47.8	S60 26.1
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 21.2	N74 05.8
Markab	13 38.0	N15 17.0
Menkar	314 14.4	N 4 08.6
Menkent	148 07.4	S36 26.1
Miaplacidus	221 39.0	S69 46.3
Mirfak	308 39.3	N49 54.7
Nunki	75 58.3	S26 16.6
Peacock	53 19.2	S56 41.4
Pollux	243 27.0	N27 59.3
Procyon	244 59.1	N 5 11.2
Rasalhague	96 06.5	N12 33.2
Regulus	207 43.1	N11 53.8
Rigel	281 11.4	S 8 11.3
Rigil Kent.	139 51.7	S60 53.3
Sabik	102 12.5	S15 44.3
Schedar	349 39.8	N56 37.1
Shaula	96 21.9	S37 06.6
Sirius	258 33.1	S16 44.2
Spica	158 31.1	S11 13.9
Suhail	222 51.9	S43 29.3
Vega	80 39.1	N38 48.1
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer. Pass.
	° ′	h m
Venus	62 41.4	14 44
Mars	179 39.0	6 57
Jupiter	249 20.7	2 18
Saturn	134 02.1	9 59

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		6	7	8	9
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
6 00	182 16.5	S22 28.7	138 12.1	5.7	S16 00.1	7.3	60.6	N 72	08 06	10 18	▬	12 47	12 33	12 22	12 13
01	197 16.2	29.0	152 36.8	5.7	15 52.8	7.5	60.5	N 70	07 48	09 30	▬	12 18	12 15	12 13	12 10
02	212 16.0	29.3	167 01.5	5.9	15 45.3	7.6	60.5	68	07 33	08 59	11 20	11 56	12 02	12 05	12 08
03	227 15.7	. . 29.6	181 26.4	5.9	15 37.7	7.7	60.5	66	07 21	08 36	10 07	11 38	11 50	11 59	12 06
04	242 15.4	29.9	195 51.3	6.0	15 30.0	7.7	60.5	64	07 11	08 18	09 32	11 24	11 41	11 54	12 05
05	257 15.2	30.2	210 16.3	6.0	15 22.3	7.9	60.5	62	07 02	08 03	09 06	11 12	11 33	11 49	12 03
06	272 14.9	S22 30.5	224 41.3	6.2	S15 14.4	8.0	60.4	60	06 54	07 50	08 46	11 01	11 26	11 45	12 02
07	287 14.6	30.8	239 06.5	6.2	15 06.4	8.0	60.4	N 58	06 47	07 39	08 30	10 52	11 19	11 42	12 01
08	302 14.4	31.1	253 31.7	6.3	14 58.4	8.2	60.4	56	06 41	07 30	08 16	10 44	11 14	11 38	12 00
F 09	317 14.1	. . 31.4	267 57.0	6.3	14 50.2	8.2	60.4	54	06 35	07 21	08 04	10 37	11 09	11 36	11 59
R 10	332 13.8	31.7	282 22.3	6.4	14 42.0	8.4	60.4	52	06 30	07 13	07 54	10 31	11 04	11 33	11 59
I 11	347 13.6	32.0	296 47.7	6.6	14 33.6	8.4	60.3	50	06 25	07 06	07 44	10 25	11 00	11 31	11 58
D 12	2 13.3	S22 32.3	311 13.3	6.5	S14 25.2	8.5	60.3	45	06 14	06 51	07 24	10 13	10 51	11 25	11 56
A 13	17 13.0	32.6	325 38.8	6.7	14 16.7	8.6	60.3	N 40	06 04	06 38	07 08	10 02	10 44	11 21	11 55
Y 14	32 12.8	32.9	340 04.5	6.7	14 08.1	8.7	60.3	35	05 55	06 27	06 55	09 53	10 38	11 17	11 54
15	47 12.5	. . 33.2	354 30.2	6.8	13 59.4	8.8	60.3	30	05 47	06 17	06 43	09 46	10 32	11 14	11 53
16	62 12.2	33.5	8 56.0	6.9	13 50.6	8.9	60.2	20	05 31	05 59	06 22	09 32	10 22	11 08	11 51
17	77 12.0	33.7	23 21.9	7.0	13 41.7	8.9	60.2	N 10	05 16	05 42	06 05	09 20	10 13	11 03	11 50
18	92 11.7	S22 34.0	37 47.9	7.0	S13 32.8	9.0	60.2	0	04 59	05 25	05 48	09 09	10 05	10 58	11 48
19	107 11.4	34.3	52 13.9	7.1	13 23.8	9.1	60.2	S 10	04 41	05 08	05 31	08 58	09 57	10 53	11 47
20	122 11.2	34.6	66 40.0	7.2	13 14.7	9.2	60.1	20	04 19	04 48	05 13	08 46	09 48	10 48	11 46
21	137 10.9	. . 34.9	81 06.2	7.3	13 05.5	9.3	60.1	30	03 51	04 24	04 51	08 33	09 38	10 42	11 44
22	152 10.6	35.2	95 32.5	7.4	12 56.2	9.3	60.1	35	03 33	04 10	04 39	08 25	09 33	10 39	11 43
23	167 10.4	35.5	109 58.9	7.4	12 46.9	9.4	60.1	40	03 11	03 52	04 25	08 16	09 26	10 35	11 42
7 00	182 10.1	S22 35.7	124 25.3	7.5	S12 37.5	9.5	60.0	45	02 42	03 31	04 07	08 05	09 19	10 31	11 41
01	197 09.8	36.0	138 51.8	7.6	12 28.0	9.5	60.0	S 50	02 00	03 02	03 46	07 52	09 09	10 25	11 39
02	212 09.6	36.3	153 18.4	7.6	12 18.5	9.6	60.0	52	01 35	02 48	03 36	07 46	09 05	10 23	11 39
03	227 09.3	. . 36.6	167 45.0	7.7	12 08.9	9.7	60.0	54	01 00	02 31	03 24	07 40	09 00	10 20	11 38
04	242 09.0	36.9	182 11.7	7.9	11 59.2	9.8	59.9	56	////	02 11	03 11	07 32	08 55	10 17	11 37
05	257 08.8	37.1	196 38.6	7.8	11 49.4	9.8	59.9	58	////	01 45	02 55	07 24	08 49	10 14	11 36
06	272 08.5	S22 37.4	211 05.4	8.0	S11 39.6	9.9	59.9	S 60	////	01 06	02 36	07 14	08 43	10 10	11 35
07	287 08.2	37.7	225 32.4	8.0	11 29.7	9.9	59.9								
S 08	302 07.9	38.0	239 59.4	8.1	11 19.8	10.0	59.8								
A 09	317 07.7	. . 38.2	254 26.5	8.2	11 09.8	10.1	59.8								
T 10	332 07.4	38.5	268 53.7	8.3	10 59.7	10.1	59.8								
U 11	347 07.1	38.8	283 21.0	8.3	10 49.6	10.2	59.8								
R 12	2 06.9	S22 39.1	297 48.3	8.4	S10 39.4	10.2	59.7								
D 13	17 06.6	39.3	312 15.7	8.5	10 29.2	10.3	59.7								
A 14	32 06.3	39.6	326 43.2	8.5	10 18.9	10.3	59.7								
Y 15	47 06.0	. . 39.9	341 10.7	8.7	10 08.6	10.4	59.6								
16	62 05.8	40.2	355 38.4	8.7	9 58.2	10.4	59.6								
17	77 05.5	40.4	10 06.1	8.7	9 47.8	10.5	59.6								
18	92 05.2	S22 40.7	24 33.8	8.9	S 9 37.3	10.5	59.6								
19	107 05.0	41.0	39 01.7	8.9	9 26.8	10.6	59.5								
20	122 04.7	41.2	53 29.6	9.0	9 16.2	10.6	59.5								
21	137 04.4	. . 41.5	67 57.6	9.0	9 05.6	10.7	59.5								
22	152 04.1	41.8	82 25.6	9.1	8 54.9	10.7	59.4								
23	167 03.9	42.0	96 53.7	9.2	8 44.2	10.7	59.4								
8 00	182 03.6	S22 42.3	111 21.9	9.3	S 8 33.5	10.8	59.4								
01	197 03.3	42.6	125 50.2	9.3	8 22.7	10.8	59.4								
02	212 03.0	42.8	140 18.5	9.4	8 11.9	10.9	59.3								
03	227 02.8	. . 43.1	154 46.9	9.4	8 01.0	10.9	59.3								
04	242 02.5	43.3	169 15.3	9.5	7 50.1	10.9	59.3								
05	257 02.2	43.6	183 43.8	9.6	7 39.2	10.9	59.2								
06	272 01.9	S22 43.9	198 12.4	9.7	S 7 28.3	11.0	59.2								
07	287 01.7	44.1	212 41.1	9.7	7 17.3	11.0	59.2								
08	302 01.4	44.4	227 09.8	9.8	7 06.3	11.1	59.1								
S 09	317 01.1	. . 44.6	241 38.6	9.8	6 55.2	11.1	59.1								
U 10	332 00.8	44.9	256 07.4	9.9	6 44.1	11.1	59.1								
N 11	347 00.6	45.1	270 36.3	10.0	6 33.0	11.1	59.1								
D 12	2 00.3	S22 45.4	285 05.3	10.0	S 6 21.9	11.1	59.0								
A 13	17 00.0	45.7	299 34.3	10.1	6 10.8	11.2	59.0								
Y 14	31 59.7	45.9	314 03.4	10.1	5 59.6	11.2	59.0								
15	46 59.5	. . 46.2	328 32.5	10.2	5 48.4	11.2	58.9								
16	61 59.2	46.4	343 01.7	10.3	5 37.2	11.2	58.9								
17	76 58.9	46.7	357 31.0	10.3	5 26.0	11.3	58.9								
18	91 58.6	S22 46.9	12 00.3	10.3	S 5 14.7	11.3	58.8								
19	106 58.3	47.2	26 29.6	10.4	5 03.4	11.2	58.8								
20	121 58.1	47.4	40 59.0	10.5	4 52.2	11.3	58.8								
21	136 57.8	. . 47.7	55 28.5	10.6	4 40.9	11.3	58.8								
22	151 57.5	47.9	69 58.1	10.5	4 29.6	11.4	58.7								
23	166 57.2	48.2	84 27.6	10.7	S 4 18.2	11.3	58.7								
	SD 16.3	d 0.3	SD	16.4		16.3		16.1							

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 6	Moonset 7	Moonset 8	Moonset 9
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 25	15 36	18 15	20 25	22 24	24 17
N 70	▬	14 13	15 55	18 44	20 40	22 31	24 16
68	12 23	14 44	16 09	19 05	20 52	22 36	24 16
66	13 36	15 07	16 21	19 21	21 02	22 41	24 15
64	14 11	15 25	16 32	19 35	21 11	22 44	24 15
62	14 37	15 40	16 40	19 46	21 18	22 48	24 15
60	14 57	15 52	16 48	19 55	21 24	22 50	24 15
N 58	15 13	16 03	16 55	20 04	21 29	22 53	24 14
56	15 27	16 13	17 02	20 11	21 34	22 55	24 14
54	15 39	16 22	17 07	20 17	21 38	22 57	24 14
52	15 49	16 30	17 13	20 23	21 42	22 59	24 14
50	15 59	16 37	17 18	20 29	21 45	23 01	24 14
45	16 18	16 52	17 29	20 40	21 53	23 04	24 13
N 40	16 35	17 05	17 39	20 49	21 59	23 07	24 13
35	16 48	17 16	17 48	20 57	22 04	23 10	24 13
30	17 00	17 26	17 56	21 04	22 09	23 12	24 13
20	17 21	17 44	18 12	21 16	22 17	23 16	24 12
N 10	17 38	18 01	18 27	21 27	22 24	23 19	24 12
0	17 55	18 18	18 44	21 36	22 31	23 22	24 12
S 10	18 12	18 35	19 02	21 46	22 37	23 25	24 11
20	18 31	18 55	19 24	21 56	22 44	23 29	24 11
30	18 52	19 19	19 52	22 08	22 52	23 32	24 11
35	19 04	19 34	20 10	22 14	22 56	23 34	24 10
40	19 19	19 51	20 32	22 22	23 01	23 37	24 10
45	19 36	20 13	21 02	22 31	23 07	23 39	24 10
S 50	19 58	20 41	21 44	22 41	23 14	23 43	24 09
52	20 08	20 56	22 09	22 46	23 17	23 44	24 09
54	20 20	21 13	22 46	22 51	23 21	23 46	24 09
56	20 33	21 33	////	22 57	23 24	23 47	24 08
58	20 49	22 00	////	23 04	23 29	23 49	24 08
S 60	21 08	22 40	////	23 11	23 33	23 52	24 08

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
6	09 06	08 54	11 51	15 23	02 54	03	17
7	08 41	08 28	11 52	16 18	03 51	04	27
8	08 15	08 02	11 52	17 10	04 45	05	38

UT	ARIES	VENUS −4.9		MARS +1.1		JUPITER −2.6		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
9 00	77 54.1	139 36.8	S23 02.0	256 35.9	N 1 32.0	327 27.0	N22 10.4	211 43.0	S15 09.2
01	92 56.5	154 38.2	01.4	271 37.2	31.6	342 29.7	10.4	226 45.1	09.2
02	107 59.0	169 39.5	00.9	286 38.5	31.1	357 32.5	10.5	241 47.3	09.3
03	123 01.5	184 40.8	23 00.4	301 39.8	. . 30.6	12 35.2	. . 10.5	256 49.5	. . 09.4
04	138 03.9	199 42.2	22 59.8	316 41.1	30.1	27 37.9	10.5	271 51.7	09.5
05	153 06.4	214 43.5	59.3	331 42.3	29.6	42 40.6	10.6	286 53.9	09.5
06	168 08.8	229 44.8	S22 58.8	346 43.6	N 1 29.1	57 43.4	N22 10.6	301 56.1	S15 09.6
07	183 11.3	244 46.2	58.2	1 44.9	28.6	72 46.1	10.7	316 58.3	09.7
08	198 13.8	259 47.5	57.7	16 46.2	28.2	87 48.8	10.7	332 00.5	09.7
M 09	213 16.2	274 48.9	. . 57.1	31 47.5	. . 27.7	102 51.5	. . 10.8	347 02.7	. . 09.8
O 10	228 18.7	289 50.2	56.6	46 48.7	27.2	117 54.3	10.8	2 04.9	09.9
N 11	243 21.2	304 51.6	56.1	61 50.0	26.7	132 57.0	10.8	17 07.0	10.0
D 12	258 23.6	319 53.0	S22 55.5	76 51.3	N 1 26.2	147 59.7	N22 10.9	32 09.2	S15 10.0
A 13	273 26.1	334 54.3	55.0	91 52.6	25.7	163 02.5	10.9	47 11.4	10.1
Y 14	288 28.6	349 55.7	54.5	106 53.9	25.2	178 05.2	11.0	62 13.6	10.2
15	303 31.0	4 57.1	. . 53.9	121 55.2	. . 24.8	193 07.9	. . 11.0	77 15.8	. . 10.3
16	318 33.5	19 58.5	53.4	136 56.4	24.3	208 10.7	11.0	92 18.0	10.3
17	333 36.0	34 59.8	52.9	151 57.7	23.8	223 13.4	11.1	107 20.2	10.4
18	348 38.4	50 01.2	S22 52.3	166 59.0	N 1 23.3	238 16.1	N22 11.1	122 22.4	S15 10.5
19	3 40.9	65 02.6	51.8	182 00.3	22.8	253 18.8	11.2	137 24.6	10.5
20	18 43.3	80 04.0	51.2	197 01.6	22.3	268 21.6	11.2	152 26.8	10.6
21	33 45.8	95 05.4	. . 50.7	212 02.9	. . 21.9	283 24.3	. . 11.2	167 28.9	. . 10.7
22	48 48.3	110 06.8	50.2	227 04.1	21.4	298 27.0	11.3	182 31.1	10.8
23	63 50.7	125 08.2	49.6	242 05.4	20.9	313 29.8	11.3	197 33.3	10.8
10 00	78 53.2	140 09.6	S22 49.1	257 06.7	N 1 20.4	328 32.5	N22 11.4	212 35.5	S15 10.9
01	93 55.7	155 11.0	48.6	272 08.0	19.9	343 35.2	11.4	227 37.7	11.0
02	108 58.1	170 12.4	48.0	287 09.3	19.4	358 38.0	11.4	242 39.9	11.0
03	124 00.6	185 13.8	. . 47.5	302 10.6	. . 19.0	13 40.7	. . 11.5	257 42.1	. . 11.1
04	139 03.1	200 15.3	46.9	317 11.9	18.5	28 43.4	11.5	272 44.3	11.2
05	154 05.5	215 16.7	46.4	332 13.1	18.0	43 46.2	11.6	287 46.5	11.3
06	169 08.0	230 18.1	S22 45.9	347 14.4	N 1 17.5	58 48.9	N22 11.6	302 48.7	S15 11.3
07	184 10.4	245 19.5	45.3	2 15.7	17.0	73 51.6	11.6	317 50.9	11.4
T 08	199 12.9	260 21.0	44.8	17 17.0	16.6	88 54.4	11.7	332 53.0	11.5
U 09	214 15.4	275 22.4	. . 44.2	32 18.3	. . 16.1	103 57.1	. . 11.7	347 55.2	. . 11.5
E 10	229 17.8	290 23.8	43.7	47 19.6	15.6	118 59.8	11.8	2 57.4	11.6
S 11	244 20.3	305 25.3	43.2	62 20.9	15.1	134 02.6	11.8	17 59.6	11.7
D 12	259 22.8	320 26.7	S22 42.6	77 22.1	N 1 14.6	149 05.3	N22 11.9	33 01.8	S15 11.8
A 13	274 25.2	335 28.2	42.1	92 23.4	14.1	164 08.1	11.9	48 04.0	11.8
Y 14	289 27.7	350 29.6	41.5	107 24.7	13.7	179 10.8	11.9	63 06.2	11.9
15	304 30.2	5 31.1	. . 41.0	122 26.0	. . 13.2	194 13.5	. . 12.0	78 08.4	. . 12.0
16	319 32.6	20 32.6	40.5	137 27.3	12.7	209 16.3	12.0	93 10.6	12.1
17	334 35.1	35 34.0	39.9	152 28.6	12.2	224 19.0	12.1	108 12.8	12.1
18	349 37.6	50 35.5	S22 39.4	167 29.9	N 1 11.7	239 21.7	N22 12.1	123 15.0	S15 12.2
19	4 40.0	65 37.0	38.8	182 31.2	11.3	254 24.5	12.1	138 17.2	12.3
20	19 42.5	80 38.4	38.3	197 32.5	10.8	269 27.2	12.2	153 19.4	12.3
21	34 44.9	95 39.9	. . 37.7	212 33.7	. . 10.3	284 30.0	. . 12.2	168 21.5	. . 12.4
22	49 47.4	110 41.4	37.2	227 35.0	09.8	299 32.7	12.3	183 23.7	12.5
23	64 49.9	125 42.9	36.7	242 36.3	09.3	314 35.4	12.3	198 25.9	12.6
11 00	79 52.3	140 44.4	S22 36.1	257 37.6	N 1 08.9	329 38.2	N22 12.3	213 28.1	S15 12.6
01	94 54.8	155 45.9	35.6	272 38.9	08.4	344 40.9	12.4	228 30.3	12.7
02	109 57.3	170 47.4	35.0	287 40.2	07.9	359 43.7	12.4	243 32.5	12.8
03	124 59.7	185 48.9	. . 34.5	302 41.5	. . 07.4	14 46.4	. . 12.5	258 34.7	. . 12.8
04	140 02.2	200 50.4	33.9	317 42.8	06.9	29 49.1	12.5	273 36.9	12.9
05	155 04.7	215 51.9	33.4	332 44.1	06.5	44 51.9	12.6	288 39.1	13.0
06	170 07.1	230 53.4	S22 32.9	347 45.4	N 1 06.0	59 54.6	N22 12.6	303 41.3	S15 13.1
W 07	185 09.6	245 54.9	32.3	2 46.7	05.5	74 57.4	12.6	318 43.5	13.1
E 08	200 12.0	260 56.4	31.8	17 47.9	05.0	90 00.1	12.7	333 45.7	13.2
D 09	215 14.5	275 58.0	. . 31.2	32 49.2	. . 04.5	105 02.8	. . 12.7	348 47.9	. . 13.3
N 10	230 17.0	290 59.5	30.7	47 50.5	04.1	120 05.6	12.8	3 50.1	13.3
E 11	245 19.4	306 01.0	30.1	62 51.8	03.6	135 08.3	12.8	18 52.2	13.4
S 12	260 21.9	321 02.6	S22 29.6	77 53.1	N 1 03.1	150 11.1	N22 12.8	33 54.4	S15 13.5
D 13	275 24.4	336 04.1	29.1	92 54.4	02.6	165 13.8	12.9	48 56.6	13.5
A 14	290 26.8	351 05.6	28.5	107 55.7	02.1	180 16.5	12.9	63 58.8	13.6
Y 15	305 29.3	6 07.2	. . 28.0	122 57.0	. . 01.7	195 19.3	. . 13.0	79 01.0	. . 13.7
16	320 31.8	21 08.7	27.4	137 58.3	01.2	210 22.0	13.0	94 03.2	13.8
17	335 34.2	36 10.3	26.9	152 59.6	00.7	225 24.8	13.1	109 05.4	13.8
18	350 36.7	51 11.8	S22 26.3	168 00.9	N 1 00.2	240 27.5	N22 13.1	124 07.6	S15 13.9
19	5 39.2	66 13.4	25.8	183 02.2	0 59.7	255 30.3	13.1	139 09.8	14.0
20	20 41.6	81 15.0	25.2	198 03.5	59.3	270 33.0	13.2	154 12.0	14.0
21	35 44.1	96 16.5	. . 24.7	213 04.8	. . 58.8	285 35.8	. . 13.2	169 14.2	. . 14.1
22	50 46.5	111 18.1	24.1	228 06.1	58.3	300 38.5	13.3	184 16.4	14.2
23	65 49.0	126 19.7	23.6	243 07.4	57.8	315 41.2	13.3	199 18.6	14.3
	h m								
Mer. Pass.	18 41.4	*v* 1.4	*d* 0.5	*v* 1.3	*d* 0.5	*v* 2.7	*d* 0.0	*v* 2.2	*d* 0.1

STARS

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.8	S40 15.1
Achernar	335 26.2	S57 10.2
Acrux	173 09.0	S63 10.3
Adhara	255 11.9	S28 59.6
Aldebaran	290 48.6	N16 32.1
Alioth	166 20.7	N55 52.8
Alkaid	152 59.0	N49 14.5
Al Na'ir	27 43.5	S46 53.7
Alnilam	275 45.7	S 1 11.7
Alphard	217 55.6	S 8 43.2
Alphecca	126 11.1	N26 40.1
Alpheratz	357 43.0	N29 10.3
Altair	62 08.2	N 8 54.6
Ankaa	353 15.3	S42 14.0
Antares	112 26.2	S26 27.6
Arcturus	145 55.7	N19 06.6
Atria	107 28.3	S69 02.9
Avior	234 17.3	S59 33.2
Bellatrix	278 31.3	N 6 21.6
Betelgeuse	271 00.6	N 7 24.4
Canopus	263 55.4	S52 42.3
Capella	280 33.4	N46 00.5
Deneb	49 31.5	N45 20.2
Denebola	182 33.4	N14 29.5
Diphda	348 55.4	S17 54.7
Dubhe	193 51.4	N61 40.1
Elnath	278 11.8	N28 37.0
Eltanin	90 46.5	N51 29.5
Enif	33 46.9	N 9 56.6
Fomalhaut	15 23.7	S29 32.9
Gacrux	172 00.6	S57 11.2
Gienah	175 52.0	S17 37.1
Hadar	148 47.8	S60 26.1
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 21.2	N74 05.8
Markab	13 38.0	N15 17.0
Menkar	314 14.4	N 4 08.6
Menkent	148 07.4	S36 26.1
Miaplacidus	221 39.0	S69 46.3
Mirfak	308 39.3	N49 54.7
Nunki	75 58.3	S26 16.6
Peacock	53 19.2	S56 41.4
Pollux	243 27.0	N27 59.3
Procyon	244 59.1	N 5 11.2
Rasalhague	96 06.5	N12 33.2
Regulus	207 43.1	N11 53.8
Rigel	281 11.4	S 8 11.3
Rigil Kent.	139 51.7	S60 53.2
Sabik	102 12.5	S15 44.3
Schedar	349 39.8	N56 37.1
Shaula	96 21.9	S37 06.6
Sirius	258 33.1	S16 44.3
Spica	158 31.1	S11 13.9
Suhail	222 51.9	S43 29.3
Vega	80 39.1	N38 48.1
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	61 16.4	14 38
Mars	178 13.5	6 51
Jupiter	249 39.3	2 05
Saturn	133 42.3	9 48

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON				
	GHA	Dec	GHA	*v*	Dec	*d*	HP
d h	° ′	° ′	° ′	′	° ′	′	′
9 00	181 57.0	S22 48.4	98 57.3	10.6	S 4 06.9	11.3	58.7
01	196 56.7	48.6	113 26.9	10.8	3 55.6	11.4	58.6
02	211 56.4	48.9	127 56.7	10.8	3 44.2	11.4	58.6
03	226 56.1	. . 49.1	142 26.5	10.8	3 32.8	11.3	58.6
04	241 55.8	49.4	156 56.3	10.9	3 21.5	11.4	58.5
05	256 55.6	49.6	171 26.2	10.9	3 10.1	11.4	58.5
06	271 55.3	S22 49.9	185 56.1	11.0	S 2 58.7	11.4	58.5
07	286 55.0	50.1	200 26.1	11.0	2 47.3	11.3	58.4
08	301 54.7	50.3	214 56.1	11.1	2 36.0	11.4	58.4
M 09	316 54.4	. . 50.6	229 26.2	11.1	2 24.6	11.4	58.4
O 10	331 54.2	50.8	243 56.3	11.1	2 13.2	11.4	58.3
N 11	346 53.9	51.1	258 26.4	11.2	2 01.8	11.4	58.3
D 12	1 53.6	S22 51.3	272 56.6	11.2	S 1 50.4	11.4	58.3
A 13	16 53.3	51.5	287 26.8	11.3	1 39.0	11.4	58.3
Y 14	31 53.0	51.8	301 57.1	11.3	1 27.6	11.3	58.2
15	46 52.8	. . 52.0	316 27.4	11.4	1 16.3	11.4	58.2
16	61 52.5	52.2	330 57.8	11.4	1 04.9	11.4	58.2
17	76 52.2	52.5	345 28.2	11.4	0 53.5	11.3	58.1
18	91 51.9	S22 52.7	359 58.6	11.5	S 0 42.2	11.4	58.1
19	106 51.6	52.9	14 29.1	11.5	0 30.8	11.3	58.1
20	121 51.4	53.2	28 59.6	11.5	0 19.5	11.3	58.0
21	136 51.1	. . 53.4	43 30.1	11.6	S 0 08.2	11.3	58.0
22	151 50.8	53.6	58 00.7	11.6	N 0 03.1	11.4	58.0
23	166 50.5	53.8	72 31.3	11.6	0 14.5	11.2	57.9
10 00	181 50.2	S22 54.1	87 01.9	11.7	N 0 25.7	11.3	57.9
01	196 49.9	54.3	101 32.6	11.7	0 37.0	11.3	57.9
02	211 49.7	54.5	116 03.3	11.7	0 48.3	11.2	57.9
03	226 49.4	. . 54.7	130 34.0	11.7	0 59.5	11.3	57.8
04	241 49.1	55.0	145 04.7	11.8	1 10.8	11.2	57.8
05	256 48.8	55.2	159 35.5	11.8	1 22.0	11.2	57.8
06	271 48.5	S22 55.4	174 06.3	11.9	N 1 33.2	11.1	57.7
07	286 48.2	55.6	188 37.2	11.8	1 44.3	11.2	57.7
T 08	301 48.0	55.9	203 08.0	11.9	1 55.5	11.1	57.7
U 09	316 47.7	. . 56.1	217 38.9	11.9	2 06.6	11.1	57.6
E 10	331 47.4	56.3	232 09.8	12.0	2 17.7	11.1	57.6
S 11	346 47.1	56.5	246 40.8	11.9	2 28.8	11.1	57.6
D 12	1 46.8	S22 56.7	261 11.7	12.0	N 2 39.9	11.0	57.6
A 13	16 46.5	56.9	275 42.7	12.0	2 50.9	11.1	57.5
Y 14	31 46.3	57.2	290 13.7	12.0	3 02.0	10.9	57.5
15	46 46.0	. . 57.4	304 44.7	12.1	3 12.9	11.0	57.5
16	61 45.7	57.6	319 15.8	12.0	3 23.9	10.9	57.4
17	76 45.4	57.8	333 46.8	12.1	3 34.8	11.0	57.4
18	91 45.1	S22 58.0	348 17.9	12.1	N 3 45.8	10.8	57.4
19	106 44.8	58.2	2 49.0	12.1	3 56.6	10.9	57.3
20	121 44.5	58.4	17 20.1	12.2	4 07.5	10.8	57.3
21	136 44.3	. . 58.6	31 51.3	12.1	4 18.3	10.8	57.3
22	151 44.0	58.9	46 22.4	12.2	4 29.1	10.7	57.3
23	166 43.7	59.1	60 53.6	12.1	4 39.8	10.8	57.2
11 00	181 43.4	S22 59.3	75 24.7	12.2	N 4 50.6	10.6	57.2
01	196 43.1	59.5	89 55.9	12.2	5 01.2	10.7	57.2
02	211 42.8	59.7	104 27.1	12.3	5 11.9	10.6	57.1
03	226 42.5	22 59.9	118 58.4	12.2	5 22.5	10.6	57.1
04	241 42.3	23 00.1	133 29.6	12.2	5 33.1	10.5	57.1
05	256 42.0	00.3	148 00.8	12.3	5 43.6	10.5	57.1
06	271 41.7	S23 00.5	162 32.1	12.2	N 5 54.1	10.5	57.0
W 07	286 41.4	00.7	177 03.3	12.3	6 04.6	10.4	57.0
E 08	301 41.1	00.9	191 34.6	12.2	6 15.0	10.4	57.0
D 09	316 40.8	. . 01.1	206 05.8	12.3	6 25.4	10.4	57.0
N 10	331 40.5	01.3	220 37.1	12.3	6 35.8	10.3	56.9
E 11	346 40.2	01.5	235 08.4	12.3	6 46.1	10.2	56.9
S 12	1 39.9	S23 01.7	249 39.7	12.3	N 6 56.3	10.2	56.9
D 13	16 39.7	01.9	264 11.0	12.3	7 06.5	10.2	56.8
A 14	31 39.4	02.1	278 42.3	12.3	7 16.7	10.1	56.8
Y 15	46 39.1	. . 02.3	293 13.6	12.3	7 26.8	10.1	56.8
16	61 38.8	02.5	307 44.9	12.3	7 36.9	10.1	56.8
17	76 38.5	02.7	322 16.2	12.3	7 47.0	10.0	56.7
18	91 38.2	S23 02.9	336 47.5	12.3	N 7 57.0	9.9	56.7
19	106 37.9	03.1	351 18.8	12.3	8 06.9	9.9	56.7
20	121 37.6	03.3	5 50.1	12.4	8 16.8	9.9	56.7
21	136 37.3	. . 03.5	20 21.5	12.3	8 26.7	9.8	56.6
22	151 37.1	03.6	34 52.8	12.3	8 36.5	9.7	56.6
23	166 36.8	03.8	49 24.1	12.3	N 8 46.2	9.7	56.6
	SD 16.3	*d* 0.2	SD	15.9		15.7	15.5

Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 9	Moonrise 10	Moonrise 11	Moonrise 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	08 12	10 30	▬	12 13	12 04	11 55	11 45
N 70	07 53	09 38	▬	12 10	12 07	12 05	12 02
68	07 38	09 05	▬	12 08	12 10	12 13	12 16
66	07 26	08 41	10 16	12 06	12 13	12 19	12 27
64	07 15	08 23	09 38	12 05	12 15	12 25	12 37
62	07 06	08 07	09 11	12 03	12 16	12 30	12 45
60	06 58	07 54	08 51	12 02	12 18	12 34	12 52
N 58	06 51	07 43	08 34	12 01	12 19	12 38	12 58
56	06 44	07 33	08 20	12 00	12 21	12 41	13 03
54	06 38	07 24	08 08	11 59	12 22	12 44	13 08
52	06 33	07 16	07 57	11 59	12 23	12 47	13 13
50	06 28	07 09	07 47	11 58	12 24	12 50	13 17
45	06 17	06 54	07 27	11 56	12 26	12 55	13 26
N 40	06 07	06 40	07 11	11 55	12 28	13 00	13 33
35	05 57	06 29	06 57	11 54	12 29	13 04	13 40
30	05 49	06 19	06 45	11 53	12 30	13 08	13 45
20	05 33	06 00	06 24	11 51	12 33	13 14	13 55
N 10	05 17	05 43	06 06	11 50	12 35	13 19	14 04
0	05 01	05 27	05 49	11 48	12 37	13 25	14 12
S 10	04 42	05 09	05 32	11 47	12 39	13 30	14 20
20	04 20	04 49	05 13	11 46	12 41	13 35	14 29
30	03 51	04 25	04 52	11 44	12 44	13 42	14 39
35	03 33	04 10	04 39	11 43	12 45	13 46	14 45
40	03 11	03 52	04 25	11 42	12 47	13 50	14 52
45	02 41	03 30	04 07	11 41	12 49	13 55	15 00
S 50	01 58	03 01	03 45	11 39	12 51	14 01	15 09
52	01 32	02 47	03 35	11 39	12 52	14 04	15 13
54	00 53	02 30	03 23	11 38	12 53	14 07	15 18
56	////	02 09	03 09	11 37	12 55	14 10	15 24
58	////	01 41	02 53	11 36	12 56	14 14	15 30
S 60	////	00 59	02 34	11 35	12 58	14 18	15 36

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 9	Moonset 10	Moonset 11	Moonset 12
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 15	15 33	24 17	00 17	02 06	03 55
N 70	▬	14 08	15 52	24 16	00 16	01 58	03 39
68	▬	14 40	16 07	24 16	00 16	01 52	03 27
66	13 30	15 04	16 20	24 15	00 15	01 47	03 17
64	14 08	15 23	16 30	24 15	00 15	01 43	03 09
62	14 34	15 38	16 39	24 15	00 15	01 39	03 02
60	14 55	15 51	16 47	24 15	00 15	01 36	02 56
N 58	15 11	16 02	16 55	24 14	00 14	01 33	02 50
56	15 26	16 12	17 01	24 14	00 14	01 31	02 45
54	15 38	16 21	17 07	24 14	00 14	01 29	02 41
52	15 49	16 29	17 13	24 14	00 14	01 27	02 37
50	15 58	16 36	17 18	24 14	00 14	01 25	02 34
45	16 18	16 52	17 29	24 13	00 13	01 21	02 26
N 40	16 35	17 05	17 39	24 13	00 13	01 17	02 20
35	16 49	17 17	17 48	24 13	00 13	01 14	02 14
30	17 01	17 27	17 57	24 13	00 13	01 12	02 10
20	17 21	17 45	18 13	24 12	00 12	01 07	02 01
N 10	17 40	18 02	18 29	24 12	00 12	01 03	01 54
0	17 57	18 19	18 45	24 12	00 12	01 00	01 47
S 10	18 14	18 37	19 04	24 11	00 11	00 56	01 40
20	18 32	18 57	19 26	24 11	00 11	00 52	01 33
30	18 54	19 21	19 54	24 11	00 11	00 48	01 25
35	19 07	19 36	20 13	24 10	00 10	00 45	01 20
40	19 21	19 54	20 35	24 10	00 10	00 42	01 15
45	19 39	20 16	21 05	24 10	00 10	00 39	01 09
S 50	20 01	20 45	21 49	24 09	00 09	00 35	01 01
52	20 12	21 00	22 15	24 09	00 09	00 33	00 58
54	20 24	21 17	22 55	24 09	00 09	00 31	00 54
56	20 37	21 38	////	24 08	00 08	00 29	00 50
58	20 53	22 06	////	24 08	00 08	00 27	00 46
S 60	21 13	22 49	////	24 08	00 08	00 24	00 41

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
9	07 48	07 35	11 52	18 00	05 35	06	49
10	07 21	07 08	11 53	18 48	06 24	07	59
11	06 54	06 40	11 53	19 36	07 12	08	70

UT	ARIES	VENUS −4.9		MARS +1.1		JUPITER −2.6		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
12 00	80 51.5	141 21.3	S22 23.1	258 08.7	N 0 57.4	330 44.0	N22 13.3	214 20.8	S15 14.3
01	95 53.9	156 22.8	22.5	273 09.9	56.9	345 46.7	13.4	229 23.0	14.4
02	110 56.4	171 24.4	22.0	288 11.2	56.4	0 49.5	13.4	244 25.2	14.5
03	125 58.9	186 26.0	21.4	303 12.5	55.9	15 52.2	13.5	259 27.3	14.5
04	141 01.3	201 27.6	20.9	318 13.8	55.4	30 55.0	13.5	274 29.5	14.6
05	156 03.8	216 29.2	20.3	333 15.1	55.0	45 57.7	13.6	289 31.7	14.7
06	171 06.3	231 30.8	S22 19.8	348 16.4	N 0 54.5	61 00.5	N22 13.6	304 33.9	S15 14.8
07	186 08.7	246 32.4	19.2	3 17.7	54.0	76 03.2	13.6	319 36.1	14.8
08	201 11.2	261 34.0	18.7	18 19.0	53.5	91 06.0	13.7	334 38.3	14.9
09	216 13.7	276 35.6	18.1	33 20.3	53.1	106 08.7	13.7	349 40.5	15.0
10	231 16.1	291 37.3	17.6	48 21.6	52.6	121 11.5	13.8	4 42.7	15.0
11	246 18.6	306 38.9	17.0	63 22.9	52.1	136 14.2	13.8	19 44.9	15.1
12	261 21.0	321 40.5	S22 16.5	78 24.2	N 0 51.6	151 16.9	N22 13.9	34 47.1	S15 15.2
13	276 23.5	336 42.1	16.0	93 25.5	51.2	166 19.7	13.9	49 49.3	15.2
14	291 26.0	351 43.8	15.4	108 26.8	50.7	181 22.4	13.9	64 51.5	15.3
15	306 28.4	6 45.4	14.9	123 28.1	50.2	196 25.2	14.0	79 53.7	15.4
16	321 30.9	21 47.0	14.3	138 29.4	49.7	211 27.9	14.0	94 55.9	15.5
17	336 33.4	36 48.7	13.8	153 30.7	49.3	226 30.7	14.1	109 58.1	15.5
18	351 35.8	51 50.3	S22 13.2	168 32.0	N 0 48.8	241 33.4	N22 14.1	125 00.3	S15 15.6
19	6 38.3	66 52.0	12.7	183 33.3	48.3	256 36.2	14.2	140 02.5	15.7
20	21 40.8	81 53.6	12.1	198 34.6	47.8	271 38.9	14.2	155 04.7	15.7
21	36 43.2	96 55.3	11.6	213 35.9	47.4	286 41.7	14.2	170 06.9	15.8
22	51 45.7	111 57.0	11.0	228 37.2	46.9	301 44.4	14.3	185 09.1	15.9
23	66 48.1	126 58.6	10.5	243 38.5	46.4	316 47.2	14.3	200 11.2	15.9
13 00	81 50.6	142 00.3	S22 09.9	258 39.8	N 0 45.9	331 49.9	N22 14.4	215 13.4	S15 16.0
01	96 53.1	157 02.0	09.4	273 41.1	45.5	346 52.7	14.4	230 15.6	16.1
02	111 55.5	172 03.7	08.8	288 42.4	45.0	1 55.4	14.4	245 17.8	16.2
03	126 58.0	187 05.3	08.3	303 43.7	44.5	16 58.2	14.5	260 20.0	16.2
04	142 00.5	202 07.0	07.7	318 45.0	44.0	32 01.0	14.5	275 22.2	16.3
05	157 02.9	217 08.7	07.2	333 46.3	43.6	47 03.7	14.6	290 24.4	16.4
06	172 05.4	232 10.4	S22 06.6	348 47.6	N 0 43.1	62 06.5	N22 14.6	305 26.6	S15 16.4
07	187 07.9	247 12.1	06.1	3 48.9	42.6	77 09.2	14.7	320 28.8	16.5
08	202 10.3	262 13.8	05.5	18 50.2	42.1	92 12.0	14.7	335 31.0	16.6
09	217 12.8	277 15.5	05.0	33 51.6	41.7	107 14.7	14.7	350 33.2	16.6
10	232 15.3	292 17.2	04.5	48 52.9	41.2	122 17.5	14.8	5 35.4	16.7
11	247 17.7	307 18.9	03.9	63 54.2	40.7	137 20.2	14.8	20 37.6	16.8
12	262 20.2	322 20.7	S22 03.4	78 55.5	N 0 40.2	152 23.0	N22 14.9	35 39.8	S15 16.9
13	277 22.6	337 22.4	02.8	93 56.8	39.8	167 25.7	14.9	50 42.0	16.9
14	292 25.1	352 24.1	02.3	108 58.1	39.3	182 28.5	15.0	65 44.2	17.0
15	307 27.6	7 25.8	01.7	123 59.4	38.8	197 31.2	15.0	80 46.4	17.1
16	322 30.0	22 27.6	01.2	139 00.7	38.3	212 34.0	15.0	95 48.6	17.1
17	337 32.5	37 29.3	00.6	154 02.0	37.9	227 36.8	15.1	110 50.8	17.2
18	352 35.0	52 31.0	S22 00.1	169 03.3	N 0 37.4	242 39.5	N22 15.1	125 53.0	S15 17.3
19	7 37.4	67 32.8	21 59.5	184 04.6	36.9	257 42.3	15.2	140 55.2	17.3
20	22 39.9	82 34.5	59.0	199 05.9	36.5	272 45.0	15.2	155 57.4	17.4
21	37 42.4	97 36.3	58.4	214 07.2	36.0	287 47.8	15.3	170 59.6	17.5
22	52 44.8	112 38.0	57.9	229 08.5	35.5	302 50.5	15.3	186 01.8	17.5
23	67 47.3	127 39.8	57.3	244 09.8	35.0	317 53.3	15.3	201 04.0	17.6
14 00	82 49.8	142 41.6	S21 56.8	259 11.1	N 0 34.6	332 56.0	N22 15.4	216 06.2	S15 17.7
01	97 52.2	157 43.3	56.2	274 12.4	34.1	347 58.8	15.4	231 08.4	17.8
02	112 54.7	172 45.1	55.7	289 13.8	33.6	3 01.6	15.5	246 10.6	17.8
03	127 57.1	187 46.9	55.1	304 15.1	33.2	18 04.3	15.5	261 12.8	17.9
04	142 59.6	202 48.7	54.6	319 16.4	32.7	33 07.1	15.6	276 15.0	18.0
05	158 02.1	217 50.4	54.0	334 17.7	32.2	48 09.8	15.6	291 17.2	18.0
06	173 04.5	232 52.2	S21 53.5	349 19.0	N 0 31.7	63 12.6	N22 15.7	306 19.3	S15 18.1
07	188 07.0	247 54.0	52.9	4 20.3	31.3	78 15.4	15.7	321 21.5	18.2
08	203 09.5	262 55.8	52.4	19 21.6	30.8	93 18.1	15.7	336 23.7	18.2
09	218 11.9	277 57.6	51.8	34 22.9	30.3	108 20.9	15.8	351 25.9	18.3
10	233 14.4	292 59.4	51.3	49 24.2	29.9	123 23.6	15.8	6 28.1	18.4
11	248 16.9	308 01.2	50.7	64 25.5	29.4	138 26.4	15.9	21 30.3	18.4
12	263 19.3	323 03.0	S21 50.2	79 26.8	N 0 28.9	153 29.2	N22 15.9	36 32.5	S15 18.5
13	278 21.8	338 04.9	49.6	94 28.2	28.4	168 31.9	16.0	51 34.7	18.6
14	293 24.3	353 06.7	49.1	109 29.5	28.0	183 34.7	16.0	66 36.9	18.7
15	308 26.7	8 08.5	48.5	124 30.8	27.5	198 37.4	16.0	81 39.1	18.7
16	323 29.2	23 10.3	48.0	139 32.1	27.0	213 40.2	16.1	96 41.3	18.8
17	338 31.6	38 12.2	47.4	154 33.4	26.6	228 43.0	16.1	111 43.5	18.9
18	353 34.1	53 14.0	S21 46.9	169 34.7	N 0 26.1	243 45.7	N22 16.2	126 45.7	S15 18.9
19	8 36.6	68 15.8	46.3	184 36.0	25.6	258 48.5	16.2	141 47.9	19.0
20	23 39.0	83 17.7	45.8	199 37.3	25.2	273 51.2	16.3	156 50.1	19.1
21	38 41.5	98 19.5	45.2	214 38.7	24.7	288 54.0	16.3	171 52.3	19.1
22	53 44.0	113 21.4	44.7	229 40.0	24.2	303 56.8	16.3	186 54.5	19.2
23	68 46.4	128 23.2	44.1	244 41.3	23.7	318 59.5	16.4	201 56.7	19.3
Mer.Pass.	h m 18 29.6	v 1.7	d 0.5	v 1.3	d 0.5	v 2.8	d 0.0	v 2.2	d 0.1

Name	SHA	Dec
	° ′	° ′
Acamar	315 17.8	S40 15.1
Achernar	335 26.3	S57 10.2
Acrux	173 09.0	S63 10.3
Adhara	255 11.9	S28 59.6
Aldebaran	290 48.6	N16 32.1
Alioth	166 20.7	N55 52.8
Alkaid	152 59.0	N49 14.4
Al Na'ir	27 43.5	S46 53.7
Alnilam	275 45.7	S 1 11.7
Alphard	217 55.6	S 8 43.2
Alphecca	126 11.1	N26 40.1
Alpheratz	357 43.0	N29 10.3
Altair	62 08.2	N 8 54.6
Ankaa	353 15.3	S42 14.0
Antares	112 26.2	S26 27.6
Arcturus	145 55.7	N19 06.6
Atria	107 28.2	S69 02.9
Avior	234 17.3	S59 33.2
Bellatrix	278 31.3	N 6 21.6
Betelgeuse	271 00.6	N 7 24.4
Canopus	263 55.4	S52 42.3
Capella	280 33.4	N46 00.6
Deneb	49 31.5	N45 20.2
Denebola	182 33.4	N14 29.5
Diphda	348 55.5	S17 54.7
Dubhe	193 51.3	N61 40.1
Elnath	278 11.8	N28 37.0
Eltanin	90 46.5	N51 29.4
Enif	33 46.9	N 9 56.6
Fomalhaut	15 23.7	S29 32.9
Gacrux	172 00.6	S57 11.2
Gienah	175 52.0	S17 37.1
Hadar	148 47.7	S60 26.1
Hamal	328 00.1	N23 31.8
Kaus Aust.	83 43.8	S34 22.5
Kochab	137 21.1	N74 05.7
Markab	13 38.0	N15 17.0
Menkar	314 14.4	N 4 08.6
Menkent	148 07.4	S36 26.1
Miaplacidus	221 38.9	S69 46.3
Mirfak	308 39.4	N49 54.7
Nunki	75 58.3	S26 16.6
Peacock	53 19.2	S56 41.4
Pollux	243 27.0	N27 59.3
Procyon	244 59.1	N 5 11.1
Rasalhague	96 06.5	N12 33.2
Regulus	207 43.0	N11 53.7
Rigel	281 11.4	S 8 11.3
Rigil Kent.	139 51.7	S60 53.2
Sabik	102 12.5	S15 44.3
Schedar	349 39.8	N56 37.1
Shaula	96 21.9	S37 06.6
Sirius	258 33.1	S16 44.3
Spica	158 31.1	S11 14.0
Suhail	222 51.9	S43 29.3
Vega	80 39.1	N38 48.1
Zuben'ubi	137 05.3	S16 05.8

	SHA	Mer.Pass.
	° ′	h m
Venus	60 09.7	14 30
Mars	176 49.2	6 45
Jupiter	249 59.3	1 52
Saturn	133 22.8	9 38

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 12	Moonrise 13	Moonrise 14	Moonrise 15
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
12 00	181 36.5	S23 04.0	63 55.4	12.3	N 8 55.9	9.7	56.6	N 72	08 17	10 41		11 45	11 33	11 15	
01	196 36.2	04.2	78 26.7	12.3	9 05.6	9.6	56.5	N 70	07 58	09 44		12 02	12 01	12 00	12 03
02	211 35.9	04.4	92 58.0	12.3	9 15.2	9.5	56.5	68	07 42	09 10		12 16	12 21	12 30	12 46
03	226 35.6	04.6	107 29.3	12.3	9 24.7	9.5	56.5	66	07 30	08 46	10 23	12 27	12 38	12 53	13 15
04	241 35.3	04.8	122 00.6	12.3	9 34.2	9.4	56.5	64	07 19	08 27	09 43	12 37	12 51	13 11	13 37
05	256 35.0	05.0	136 31.9	12.3	9 43.6	9.4	56.4	62	07 09	08 11	09 16	12 45	13 03	13 25	13 55
06	271 34.7	S23 05.1	151 03.2	12.3	N 9 53.0	9.4	56.4	60	07 01	07 58	08 55	12 52	13 12	13 38	14 10
07	286 34.4	05.3	165 34.5	12.3	10 02.4	9.2	56.4	N 58	06 54	07 46	08 38	12 58	13 21	13 48	14 22
08	301 34.2	05.5	180 05.8	12.3	10 11.6	9.2	56.4	56	06 47	07 36	08 23	13 03	13 28	13 58	14 33
09	316 33.9	05.7	194 37.1	12.3	10 20.8	9.2	56.3	54	06 41	07 27	08 11	13 08	13 35	14 06	14 43
10	331 33.6	05.9	209 08.4	12.2	10 30.0	9.1	56.3	52	06 36	07 19	08 00	13 13	13 41	14 14	14 51
11	346 33.3	06.1	223 39.6	12.3	10 39.1	9.0	56.3	50	06 30	07 12	07 50	13 17	13 47	14 20	14 59
12	1 33.0	S23 06.2	238 10.9	12.3	N10 48.1	9.0	56.3	45	06 19	06 56	07 30	13 26	13 59	14 35	15 15
13	16 32.7	06.4	252 42.2	12.2	10 57.1	9.0	56.2	N 40	06 09	06 43	07 13	13 33	14 09	14 47	15 29
14	31 32.4	06.6	267 13.4	12.3	11 06.1	8.8	56.2	35	06 00	06 31	06 59	13 40	14 17	14 57	15 40
15	46 32.1	06.8	281 44.7	12.2	11 14.9	8.8	56.2	30	05 51	06 21	06 47	13 45	14 25	15 06	15 50
16	61 31.8	06.9	296 15.9	12.2	11 23.7	8.8	56.2	20	05 35	06 02	06 26	13 55	14 38	15 22	16 07
17	76 31.5	07.1	310 47.1	12.2	11 32.5	8.6	56.1	N 10	05 19	05 45	06 08	14 04	14 49	15 35	16 23
18	91 31.2	S23 07.3	325 18.3	12.2	N11 41.1	8.7	56.1	0	05 02	05 28	05 51	14 12	15 00	15 48	16 37
19	106 30.9	07.5	339 49.5	12.2	11 49.8	8.5	56.1	S 10	04 43	05 10	05 33	14 20	15 10	16 01	16 51
20	121 30.6	07.6	354 20.7	12.2	11 58.3	8.5	56.1	20	04 21	04 50	05 14	14 29	15 22	16 15	17 06
21	136 30.4	07.8	8 51.9	12.2	12 06.8	8.4	56.0	30	03 52	04 25	04 53	14 39	15 35	16 30	17 24
22	151 30.1	08.0	23 23.1	12.2	12 15.2	8.4	56.0	35	03 34	04 10	04 40	14 45	15 43	16 40	17 34
23	166 29.8	08.2	37 54.3	12.1	12 23.6	8.3	56.0	40	03 11	03 52	04 25	14 52	15 52	16 50	17 46
13 00	181 29.5	S23 08.3	52 25.4	12.2	N12 31.9	8.2	56.0	45	02 41	03 30	04 07	15 00	16 02	17 02	17 59
01	196 29.2	08.5	66 56.6	12.1	12 40.1	8.2	56.0	S 50	01 56	03 01	03 45	15 09	16 15	17 18	18 16
02	211 28.9	08.7	81 27.7	12.2	12 48.3	8.1	55.9	52	01 30	02 46	03 34	15 13	16 21	17 25	18 24
03	226 28.6	08.8	95 58.9	12.1	12 56.4	8.0	55.9	54	00 48	02 28	03 22	15 18	16 27	17 33	18 33
04	241 28.3	09.0	110 30.0	12.1	13 04.4	8.0	55.9	56	////	02 07	03 08	15 24	16 34	17 41	18 43
05	256 28.0	09.2	125 01.1	12.1	13 12.4	7.8	55.9	58	////	01 38	02 52	15 30	16 43	17 51	18 54
06	271 27.7	S23 09.3	139 32.2	12.0	N13 20.2	7.9	55.8	S 60	////	00 53	02 32	15 36	16 52	18 03	19 08
07	286 27.4	09.5	154 03.2	12.1	13 28.1	7.7	55.8								
08	301 27.1	09.7	168 34.3	12.1	13 35.8	7.7	55.8								
09	316 26.8	09.8	183 05.4	12.0	13 43.5	7.6	55.8								
10	331 26.5	10.0	197 36.4	12.0	13 51.1	7.5	55.8								
11	346 26.2	10.1	212 07.4	12.0	13 58.6	7.5	55.7								
12	1 25.9	S23 10.3	226 38.4	12.0	N14 06.1	7.4	55.7								
13	16 25.6	10.5	241 09.4	12.0	14 13.5	7.3	55.7								
14	31 25.3	10.6	255 40.4	12.0	14 20.8	7.3	55.7								
15	46 25.1	10.8	270 11.4	12.0	14 28.1	7.1	55.7								
16	61 24.8	10.9	284 42.4	11.9	14 35.2	7.1	55.6								
17	76 24.5	11.1	299 13.3	11.9	14 42.3	7.1	55.6								
18	91 24.2	S23 11.2	313 44.2	12.0	N14 49.4	6.9	55.6								
19	106 23.9	11.4	328 15.2	11.9	14 56.3	6.9	55.6								
20	121 23.6	11.6	342 46.1	11.9	15 03.2	6.8	55.5								
21	136 23.3	11.7	357 17.0	11.8	15 10.0	6.7	55.5								
22	151 23.0	11.9	11 47.8	11.9	15 16.7	6.6	55.5								
23	166 22.7	12.0	26 18.7	11.9	15 23.3	6.6	55.5								
14 00	181 22.4	S23 12.2	40 49.6	11.8	N15 29.9	6.5	55.5								
01	196 22.1	12.3	55 20.4	11.8	15 36.4	6.4	55.5								
02	211 21.8	12.5	69 51.2	11.8	15 42.8	6.3	55.4								
03	226 21.5	12.6	84 22.0	11.8	15 49.1	6.2	55.4								
04	241 21.2	12.8	98 52.8	11.8	15 55.3	6.2	55.4								
05	256 20.9	12.9	113 23.6	11.8	16 01.5	6.1	55.4								
06	271 20.6	S23 13.1	127 54.4	11.7	N16 07.6	6.0	55.4								
07	286 20.3	13.2	142 25.1	11.8	16 13.6	5.9	55.3								
08	301 20.0	13.3	156 55.9	11.7	16 19.5	5.8	55.3								
09	316 19.7	13.5	171 26.6	11.7	16 25.3	5.8	55.3								
10	331 19.4	13.6	185 57.3	11.7	16 31.1	5.6	55.3								
11	346 19.1	13.8	200 28.0	11.7	16 36.7	5.6	55.3								
12	1 18.8	S23 13.9	214 58.7	11.7	N16 42.3	5.5	55.2								
13	16 18.5	14.0	229 29.4	11.7	16 47.8	5.4	55.2								
14	31 18.2	14.2	244 00.1	11.6	16 53.2	5.4	55.2								
15	46 17.9	14.3	258 30.7	11.7	16 58.6	5.2	55.2								
16	61 17.6	14.5	273 01.4	11.6	17 03.8	5.2	55.2								
17	76 17.3	14.6	287 32.0	11.6	17 09.0	5.1	55.2								
18	91 17.0	S23 14.7	302 02.6	11.6	N17 14.1	5.0	55.1								
19	106 16.7	14.9	316 33.2	11.6	17 19.1	4.9	55.1								
20	121 16.4	15.0	331 03.8	11.6	17 24.0	4.8	55.1								
21	136 16.1	15.1	345 34.4	11.6	17 28.8	4.7	55.1								
22	151 15.8	15.3	0 05.0	11.5	17 33.5	4.7	55.1								
23	166 15.5	15.4	14 35.5	11.6	N17 38.2	4.5	55.1								
	SD 16.3	d 0.2	SD 15.3		15.2		15.1								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 12	Moonset 13	Moonset 14	Moonset 15
°	h m	h m	h m	h m	h m	h m	h m
N 72		13 07	15 31	03 55	05 46	07 45	
N 70		14 04	15 50	03 39	05 20	07 01	08 39
68		14 38	16 06	03 27	05 01	06 31	07 56
66	13 25	15 02	16 19	03 17	04 45	06 09	07 28
64	14 05	15 21	16 29	03 09	04 32	05 52	07 06
62	14 32	15 37	16 39	03 02	04 22	05 38	06 49
60	14 53	15 51	16 47	02 56	04 13	05 26	06 34
N 58	15 11	16 02	16 54	02 50	04 05	05 16	06 22
56	15 25	16 12	17 01	02 45	03 58	05 07	06 11
54	15 37	16 21	17 07	02 41	03 51	04 59	06 02
52	15 48	16 29	17 13	02 37	03 46	04 52	05 54
50	15 58	16 36	17 18	02 34	03 41	04 45	05 46
45	16 19	16 52	17 29	02 26	03 30	04 31	05 30
N 40	16 35	17 06	17 40	02 20	03 21	04 20	05 17
35	16 49	17 17	17 49	02 14	03 13	04 10	05 06
30	17 01	17 28	17 58	02 10	03 06	04 02	04 56
20	17 22	17 46	18 14	02 01	02 55	03 47	04 40
N 10	17 41	18 04	18 30	01 54	02 44	03 35	04 25
0	17 58	18 21	18 47	01 47	02 35	03 23	04 11
S 10	18 15	18 38	19 05	01 40	02 25	03 11	03 58
20	18 34	18 59	19 28	01 33	02 15	02 58	03 43
30	18 56	19 23	19 57	01 25	02 04	02 44	03 27
35	19 09	19 39	20 15	01 20	01 57	02 36	03 17
40	19 24	19 57	20 38	01 15	01 49	02 26	03 06
45	19 42	20 19	21 08	01 09	01 41	02 15	02 53
S 50	20 04	20 48	21 53	01 01	01 30	02 02	02 37
52	20 15	21 03	22 20	00 58	01 25	01 55	02 30
54	20 27	21 21	23 03	00 54	01 20	01 48	02 22
56	20 41	21 42	////	00 50	01 14	01 41	02 13
58	20 57	22 11	////	00 46	01 07	01 32	02 02
S 60	21 17	22 58	////	00 41	01 00	01 22	01 51

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
12	06 26	06 13	11 54	20 23	08 00	09	79
13	05 58	05 44	11 54	21 11	08 47	10	86
14	05 30	05 16	11 55	22 00	09 35	11	92

UT	ARIES	VENUS −4.9		MARS +1.1		JUPITER −2.7		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
15 00	83 48.9	143 25.1	S21 43.6	259 42.6	N 0 23.3	334 02.3	N22 16.4	216 58.9	S15 19.3	Acamar	315 17.8	S40 15.1
01	98 51.4	158 27.0	43.0	274 43.9	22.8	349 05.1	16.5	232 01.1	19.4	Achernar	335 26.3	S57 10.2
02	113 53.8	173 28.8	42.5	289 45.2	22.3	4 07.8	16.5	247 03.3	19.5	Acrux	173 08.9	S63 10.3
03	128 56.3	188 30.7 . .	41.9	304 46.5 . .	21.9	19 10.6 . .	16.6	262 05.5 . .	19.5	Adhara	255 11.9	S28 59.6
04	143 58.7	203 32.6	41.4	319 47.8	21.4	34 13.3	16.6	277 07.7	19.6	Aldebaran	290 48.6	N16 32.1
05	159 01.2	218 34.5	40.8	334 49.2	20.9	49 16.1	16.7	292 09.9	19.7			
06	174 03.7	233 36.3	S21 40.3	349 50.5	N 0 20.5	64 18.9	N22 16.7	307 12.1	S15 19.7	Alioth	166 20.7	N55 52.8
07	189 06.1	248 38.2	39.7	4 51.8	20.0	79 21.6	16.7	322 14.3	19.8	Alkaid	152 59.0	N49 14.4
08	204 08.6	263 40.1	39.2	19 53.1	19.5	94 24.4	16.8	337 16.5	19.9	Al Na'ir	27 43.6	S46 53.7
S 09	219 11.1	278 42.0 . .	38.6	34 54.4 . .	19.1	109 27.2 . .	16.8	352 18.7 . .	20.0	Alnilam	275 45.7	S 1 11.8
U 10	234 13.5	293 43.9	38.1	49 55.7	18.6	124 29.9	16.9	7 20.9	20.0	Alphard	217 55.5	S 8 43.3
N 11	249 16.0	308 45.8	37.5	64 57.1	18.1	139 32.7	16.9	22 23.1	20.1			
D 12	264 18.5	323 47.7	S21 37.0	79 58.4	N 0 17.7	154 35.5	N22 17.0	37 25.3	S15 20.2	Alphecca	126 11.1	N26 40.1
A 13	279 20.9	338 49.7	36.4	94 59.7	17.2	169 38.2	17.0	52 27.5	20.2	Alpheratz	357 43.0	N29 10.3
Y 14	294 23.4	353 51.6	35.9	110 01.0	16.7	184 41.0	17.0	67 29.7	20.3	Altair	62 08.2	N 8 54.6
15	309 25.9	8 53.5 . .	35.3	125 02.3 . .	16.3	199 43.8 . .	17.1	82 31.9 . .	20.4	Ankaa	353 15.3	S42 14.0
16	324 28.3	23 55.4	34.8	140 03.6	15.8	214 46.5	17.1	97 34.1	20.4	Antares	112 26.2	S26 27.6
17	339 30.8	38 57.4	34.2	155 05.0	15.3	229 49.3	17.2	112 36.3	20.5			
18	354 33.2	53 59.3	S21 33.7	170 06.3	N 0 14.8	244 52.1	N22 17.2	127 38.5	S15 20.6	Arcturus	145 55.7	N19 06.6
19	9 35.7	69 01.2	33.1	185 07.6	14.4	259 54.8	17.3	142 40.7	20.6	Atria	107 28.2	S69 02.9
20	24 38.2	84 03.2	32.6	200 08.9	13.9	274 57.6	17.3	157 42.9	20.7	Avior	234 17.3	S59 33.2
21	39 40.6	99 05.1 . .	32.0	215 10.2 . .	13.4	290 00.4 . .	17.4	172 45.1 . .	20.8	Bellatrix	278 31.3	N 6 21.6
22	54 43.1	114 07.1	31.5	230 11.5	13.0	305 03.1	17.4	187 47.3	20.8	Betelgeuse	271 00.6	N 7 24.4
23	69 45.6	129 09.0	30.9	245 12.9	12.5	320 05.9	17.4	202 49.5	20.9			
16 00	84 48.0	144 11.0	S21 30.4	260 14.2	N 0 12.1	335 08.7	N22 17.5	217 51.7	S15 21.0	Canopus	263 55.4	S52 42.3
01	99 50.5	159 12.9	29.8	275 15.5	11.6	350 11.4	17.5	232 53.9	21.0	Capella	280 33.4	N46 00.6
02	114 53.0	174 14.9	29.3	290 16.8	11.1	5 14.2	17.6	247 56.1	21.1	Deneb	49 31.5	N45 20.2
03	129 55.4	189 16.9 . .	28.7	305 18.1 . .	10.7	20 17.0 . .	17.6	262 58.3 . .	21.2	Denebola	182 33.3	N14 29.5
04	144 57.9	204 18.9	28.2	320 19.5	10.2	35 19.7	17.7	278 00.5	21.2	Diphda	348 55.5	S17 54.7
05	160 00.4	219 20.8	27.6	335 20.8	09.7	50 22.5	17.7	293 02.7	21.3			
06	175 02.8	234 22.8	S21 27.1	350 22.1	N 0 09.3	65 25.3	N22 17.8	308 04.9	S15 21.4	Dubhe	193 51.3	N61 40.1
07	190 05.3	249 24.8	26.5	5 23.4	08.8	80 28.0	17.8	323 07.1	21.4	Elnath	278 11.8	N28 37.0
08	205 07.7	264 26.8	26.0	20 24.7	08.3	95 30.8	17.8	338 09.3	21.5	Eltanin	90 46.5	N51 29.4
M 09	220 10.2	279 28.8 . .	25.4	35 26.1 . .	07.9	110 33.6 . .	17.9	353 11.5 . .	21.6	Enif	33 46.9	N 9 56.6
O 10	235 12.7	294 30.8	24.9	50 27.4	07.4	125 36.4	17.9	8 13.7	21.6	Fomalhaut	15 23.7	S29 32.9
N 11	250 15.1	309 32.8	24.3	65 28.7	06.9	140 39.1	18.0	23 15.9	21.7			
D 12	265 17.6	324 34.8	S21 23.8	80 30.0	N 0 06.5	155 41.9	N22 18.0	38 18.1	S15 21.8	Gacrux	172 00.5	S57 11.2
A 13	280 20.1	339 36.8	23.2	95 31.3	06.0	170 44.7	18.1	53 20.3	21.9	Gienah	175 52.0	S17 37.1
Y 14	295 22.5	354 38.8	22.7	110 32.7	05.5	185 47.4	18.1	68 22.5	21.9	Hadar	148 47.7	S60 26.1
15	310 25.0	9 40.9 . .	22.1	125 34.0 . .	05.1	200 50.2 . .	18.1	83 24.7 . .	22.0	Hamal	328 00.1	N23 31.8
16	325 27.5	24 42.9	21.6	140 35.3	04.6	215 53.0	18.2	98 26.9	22.1	Kaus Aust.	83 43.8	S34 22.5
17	340 29.9	39 44.9	21.0	155 36.6	04.1	230 55.8	18.2	113 29.2	22.1			
18	355 32.4	54 47.0	S21 20.5	170 38.0	N 0 03.7	245 58.5	N22 18.3	128 31.4	S15 22.2	Kochab	137 21.1	N74 05.7
19	10 34.9	69 49.0	19.9	185 39.3	03.2	261 01.3	18.3	143 33.6	22.3	Markab	13 38.0	N15 17.0
20	25 37.3	84 51.0	19.4	200 40.6	02.8	276 04.1	18.4	158 35.8	22.3	Menkar	314 14.4	N 4 08.6
21	40 39.8	99 53.1 . .	18.8	215 41.9 . .	02.3	291 06.8 . .	18.4	173 38.0 . .	22.4	Menkent	148 07.4	S36 26.1
22	55 42.2	114 55.1	18.3	230 43.3	01.8	306 09.6	18.5	188 40.2	22.5	Miaplacidus	221 38.9	S69 46.4
23	70 44.7	129 57.2	17.7	245 44.6	01.4	321 12.4	18.5	203 42.4	22.5			
17 00	85 47.2	144 59.2	S21 17.2	260 45.9	N 0 00.9	336 15.2	N22 18.5	218 44.6	S15 22.6	Mirfak	308 39.3	N49 54.7
01	100 49.6	160 01.3	16.6	275 47.2	N 00.4	351 17.9	18.6	233 46.8	22.7	Nunki	75 58.3	S26 16.6
02	115 52.1	175 03.4	16.1	290 48.6	00.0	6 20.7	18.6	248 49.0	22.7	Peacock	53 19.2	S56 41.4
03	130 54.6	190 05.5 . .	15.5	305 49.9	S 00.5	21 23.5 . .	18.7	263 51.2 . .	22.8	Pollux	243 27.0	N27 59.3
04	145 57.0	205 07.5	15.0	320 51.2	01.0	36 26.3	18.7	278 53.4	22.9	Procyon	244 59.1	N 5 11.1
05	160 59.5	220 09.6	14.4	335 52.5	01.4	51 29.0	18.8	293 55.6	22.9			
06	176 02.0	235 11.7	S21 13.9	350 53.9	S 0 01.9	66 31.8	N22 18.8	308 57.8	S15 23.0	Rasalhague	96 06.5	N12 33.2
07	191 04.4	250 13.8	13.3	5 55.2	02.3	81 34.6	18.9	324 00.0	23.1	Regulus	207 43.0	N11 53.7
08	206 06.9	265 15.9	12.8	20 56.5	02.8	96 37.4	18.9	339 02.2	23.1	Rigel	281 11.4	S 8 11.3
T 09	221 09.4	280 18.0 . .	12.2	35 57.8 . .	03.3	111 40.1 . .	19.0	354 04.4 . .	23.2	Rigil Kent.	139 51.6	S60 53.2
U 10	236 11.8	295 20.1	11.7	50 59.2	03.7	126 42.9	19.0	9 06.6	23.3	Sabik	102 12.5	S15 44.3
E 11	251 14.3	310 22.2	11.2	66 00.5	04.2	141 45.7	19.0	24 08.8	23.3			
S 12	266 16.7	325 24.3	S21 10.6	81 01.8	S 0 04.6	156 48.5	N22 19.1	39 11.0	S15 23.4	Schedar	349 39.9	N56 37.1
D 13	281 19.2	340 26.4	10.1	96 03.2	05.1	171 51.2	19.1	54 13.2	23.5	Shaula	96 21.9	S37 06.6
A 14	296 21.7	355 28.5	09.5	111 04.5	05.6	186 54.0	19.2	69 15.4	23.5	Sirius	258 33.1	S16 44.3
Y 15	311 24.1	10 30.7 . .	09.0	126 05.8 . .	06.0	201 56.8 . .	19.2	84 17.6 . .	23.6	Spica	158 31.0	S11 14.0
16	326 26.6	25 32.8	08.4	141 07.1	06.5	216 59.6	19.3	99 19.8	23.7	Suhail	222 51.8	S43 29.3
17	341 29.1	40 34.9	07.9	156 08.5	07.0	232 02.3	19.3	114 22.0	23.7			
18	356 31.5	55 37.1	S21 07.3	171 09.8	S 0 07.4	247 05.1	N22 19.4	129 24.2	S15 23.8	Vega	80 39.1	N38 48.0
19	11 34.0	70 39.2	06.8	186 11.1	07.9	262 07.9	19.4	144 26.4	23.9	Zuben'ubi	137 05.3	S16 05.8
20	26 36.5	85 41.3	06.2	201 12.5	08.3	277 10.7	19.4	159 28.6	23.9		SHA	Mer. Pass.
21	41 38.9	100 43.5 . .	05.7	216 13.8 . .	08.8	292 13.5 . .	19.5	174 30.8 . .	24.0		° ′	h m
22	56 41.4	115 45.6	05.1	231 15.1	09.3	307 16.2	19.5	189 33.0	24.1	Venus	59 22.9	14 21
23	71 43.8	130 47.8	04.6	246 16.5	09.7	322 19.0	19.6	204 35.3	24.1	Mars	175 26.1	6 38
	h m									Jupiter	250 20.6	1 39
Mer. Pass.	18 17.8	v 2.0	d 0.5	v 1.3	d 0.5	v 2.8	d 0.0	v 2.2	d 0.1	Saturn	133 03.7	9 27

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		15	16	17	18
d h	° ′	° ′	° ′	° ′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
15 00	181 15.2	S23 15.5	29 06.1	11.5	N17 42.7	4.5	55.0	N 72	08 21	10 50	■				
01	196 14.9	15.7	43 36.6	11.6	17 47.2	4.4	55.0	N 70	08 02	09 49	■	12 03	12 16	13 04	14 28
02	211 14.6	15.8	58 07.2	11.5	17 51.6	4.3	55.0	68	07 46	09 15	■	12 46	13 15	14 04	15 13
03	226 14.3 . .	15.9	72 37.7	11.5	17 55.9	4.2	55.0	66	07 33	08 50	10 29	13 15	13 49	14 39	15 43
04	241 14.0	16.1	87 08.2	11.5	18 00.1	4.1	55.0	64	07 22	08 30	09 48	13 37	14 14	15 04	16 05
05	256 13.7	16.2	101 38.7	11.5	18 04.2	4.0	55.0	62	07 12	08 14	09 20	13 55	14 34	15 23	16 23
06	271 13.4	S23 16.3	116 09.2	11.5	N18 08.2	3.9	54.9	60	07 04	08 01	08 58	14 10	14 50	15 39	16 37
07	286 13.1	16.4	130 39.7	11.5	18 12.1	3.9	54.9	N 58	06 57	07 49	08 41	14 22	15 03	15 53	16 50
08	301 12.8	16.6	145 10.2	11.5	18 16.0	3.8	54.9	56	06 50	07 39	08 26	14 33	15 15	16 05	17 01
S 09	316 12.5 . .	16.7	159 40.7	11.4	18 19.8	3.6	54.9	54	06 44	07 30	08 14	14 43	15 25	16 15	17 10
U 10	331 12.2	16.8	174 11.1	11.5	18 23.4	3.6	54.9	52	06 38	07 22	08 03	14 51	15 34	16 24	17 18
N 11	346 11.9	16.9	188 41.6	11.4	18 27.0	3.5	54.9	50	06 33	07 14	07 53	14 59	15 43	16 32	17 26
D 12	1 11.6	S23 17.1	203 12.0	11.5	N18 30.5	3.4	54.8	45	06 21	06 58	07 32	15 15	16 00	16 49	17 42
A 13	16 11.3	17.2	217 42.5	11.4	18 33.9	3.3	54.8	N 40	06 11	06 45	07 15	15 29	16 14	17 03	17 55
Y 14	31 11.0	17.3	232 12.9	11.5	18 37.2	3.2	54.8	35	06 01	06 33	07 01	15 40	16 26	17 15	18 07
15	46 10.7 . .	17.4	246 43.4	11.4	18 40.4	3.1	54.8	30	05 53	06 23	06 49	15 50	16 37	17 26	18 16
16	61 10.4	17.5	261 13.8	11.4	18 43.5	3.0	54.8	20	05 36	06 04	06 28	16 07	16 55	17 44	18 33
17	76 10.1	17.7	275 44.2	11.5	18 46.5	3.0	54.8	N 10	05 20	05 46	06 09	16 23	17 11	17 59	18 48
18	91 09.8	S23 17.8	290 14.7	11.4	N18 49.5	2.8	54.8	0	05 03	05 29	05 52	16 37	17 26	18 14	19 02
19	106 09.5	17.9	304 45.1	11.4	18 52.3	2.8	54.7	S 10	04 44	05 11	05 34	16 51	17 40	18 29	19 16
20	121 09.2	18.0	319 15.5	11.4	18 55.1	2.6	54.7	20	04 22	04 51	05 16	17 06	17 56	18 44	19 30
21	136 08.9 . .	18.1	333 45.9	11.5	18 57.7	2.6	54.7	30	03 53	04 26	04 54	17 24	18 15	19 02	19 47
22	151 08.6	18.2	348 16.4	11.4	19 00.3	2.4	54.7	35	03 34	04 11	04 41	17 34	18 25	19 13	19 57
23	166 08.3	18.3	2 46.8	11.4	19 02.7	2.4	54.7	40	03 11	03 53	04 26	17 46	18 37	19 25	20 08
16 00	181 08.0	S23 18.5	17 17.2	11.4	N19 05.1	2.3	54.7	45	02 41	03 30	04 08	17 59	18 52	19 39	20 21
01	196 07.7	18.6	31 47.6	11.4	19 07.4	2.2	54.7	S 50	01 56	03 01	03 45	18 16	19 09	19 56	20 37
02	211 07.4	18.7	46 18.0	11.4	19 09.6	2.1	54.7	52	01 28	02 46	03 34	18 24	19 18	20 04	20 44
03	226 07.1 . .	18.8	60 48.4	11.5	19 11.7	2.0	54.6	54	00 43	02 28	03 22	18 33	19 27	20 14	20 53
04	241 06.8	18.9	75 18.9	11.4	19 13.7	1.9	54.6	56	////	02 06	03 08	18 43	19 37	20 24	21 02
05	256 06.5	19.0	89 49.3	11.4	19 15.6	1.8	54.6	58	////	01 37	02 51	18 54	19 49	20 35	21 13
06	271 06.2	S23 19.1	104 19.7	11.4	N19 17.4	1.8	54.6	S 60	////	00 48	02 31	19 08	20 03	20 49	21 25
07	286 05.9	19.2	118 50.1	11.4	19 19.2	1.6	54.6								
08	301 05.6	19.3	133 20.5	11.5	19 20.8	1.5	54.6								
M 09	316 05.3 . .	19.4	147 51.0	11.4	19 22.3	1.5	54.6								
O 10	331 05.0	19.5	162 21.4	11.4	19 23.8	1.3	54.5								
N 11	346 04.7	19.6	176 51.8	11.5	19 25.1	1.3	54.5								
D 12	1 04.4	S23 19.7	191 22.3	11.4	N19 26.4	1.2	54.5								
A 13	16 04.1	19.8	205 52.7	11.5	19 27.6	1.0	54.5								
Y 14	31 03.8	19.9	220 23.2	11.4	19 28.6	1.0	54.5								
15	46 03.5 . .	20.0	234 53.6	11.5	19 29.6	0.9	54.5								
16	61 03.2	20.1	249 24.1	11.5	19 30.5	0.8	54.5								
17	76 02.9	20.2	263 54.6	11.5	19 31.3	0.7	54.5								
18	91 02.6	S23 20.3	278 25.1	11.5	N19 32.0	0.6	54.5								
19	106 02.3	20.4	292 55.6	11.5	19 32.6	0.5	54.4								
20	121 02.0	20.5	307 26.1	11.5	19 33.1	0.4	54.4								
21	136 01.7 . .	20.6	321 56.6	11.5	19 33.5	0.3	54.4								
22	151 01.4	20.7	336 27.1	11.5	19 33.8	0.2	54.4								
23	166 01.0	20.8	350 57.6	11.5	19 34.0	0.2	54.4								
17 00	181 00.7	S23 20.9	5 28.1	11.6	N19 34.2	0.0	54.4								
01	196 00.4	21.0	19 58.7	11.6	19 34.2	0.0	54.4								
02	211 00.1	21.1	34 29.3	11.5	19 34.2	0.2	54.4								
03	225 59.8 . .	21.2	48 59.8	11.6	19 34.0	0.2	54.4								
04	240 59.5	21.3	63 30.4	11.6	19 33.8	0.3	54.3								
05	255 59.2	21.3	78 01.0	11.7	19 33.5	0.5	54.3								
06	270 58.9	S23 21.4	92 31.7	11.6	N19 33.0	0.5	54.3								
07	285 58.6	21.5	107 02.3	11.6	19 32.5	0.6	54.3								
T 08	300 58.3	21.6	121 32.9	11.7	19 31.9	0.7	54.3								
U 09	315 58.0 . .	21.7	136 03.6	11.7	19 31.2	0.8	54.3								
E 10	330 57.7	21.8	150 34.3	11.7	19 30.4	0.9	54.3								
S 11	345 57.4	21.9	165 05.0	11.7	19 29.5	0.9	54.3								
D 12	0 57.1	S23 21.9	179 35.7	11.7	N19 28.6	1.1	54.3								
A 13	15 56.8	22.0	194 06.4	11.8	19 27.5	1.2	54.3								
Y 14	30 56.5	22.1	208 37.2	11.7	19 26.3	1.2	54.2								
15	45 56.2 . .	22.2	223 07.9	11.8	19 25.1	1.4	54.2								
16	60 55.9	22.3	237 38.7	11.8	19 23.7	1.4	54.2								
17	75 55.6	22.3	252 09.5	11.9	19 22.3	1.5	54.2								
18	90 55.3	S23 22.4	266 40.4	11.8	N19 20.8	1.6	54.2								
19	105 55.0	22.5	281 11.2	11.9	19 19.2	1.7	54.2								
20	120 54.6	22.6	295 42.1	11.9	19 17.5	1.8	54.2								
21	135 54.3 . .	22.7	310 13.0	11.9	19 15.7	1.9	54.2								
22	150 54.0	22.7	324 43.9	11.9	19 13.8	2.0	54.2								
23	165 53.7	22.8	339 14.8	12.0	N19 11.8	2.0	54.2								
	SD 16.3	d 0.1	SD	14.9		14.9		14.8							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	15	16	17	18
°	h m	h m	h m	h m	h m	h m	h m
N 72	■	13 02	15 30				
N 70	■	14 02	15 50	08 39	10 08	11 01	11 17
68	■	14 37	16 05	07 56	09 09	10 01	10 31
66	13 22	15 02	16 18	07 28	08 35	09 26	10 01
64	14 04	15 21	16 29	07 06	08 10	09 01	09 39
62	14 32	15 37	16 39	06 49	07 50	08 41	09 21
60	14 53	15 51	16 47	06 34	07 34	08 25	09 06
N 58	15 10	16 02	16 55	06 22	07 21	08 12	08 53
56	15 25	16 12	17 02	06 11	07 09	08 00	08 42
54	15 38	16 21	17 08	06 02	06 59	07 50	08 33
52	15 49	16 30	17 13	05 54	06 50	07 40	08 24
50	15 59	16 37	17 19	05 46	06 42	07 32	08 16
45	16 19	16 53	17 30	05 30	06 25	07 15	08 00
N 40	16 36	17 07	17 41	05 17	06 11	07 01	07 46
35	16 50	17 18	17 50	05 06	05 59	06 49	07 34
30	17 02	17 29	17 59	04 56	05 48	06 38	07 24
20	17 24	17 48	18 15	04 40	05 31	06 20	07 07
N 10	17 42	18 05	18 31	04 25	05 15	06 04	06 52
0	17 59	18 22	18 48	04 11	05 00	05 49	06 37
S 10	18 17	18 40	19 07	03 58	04 46	05 34	06 23
20	18 36	19 00	19 30	03 43	04 30	05 18	06 08
30	18 58	19 25	19 59	03 27	04 12	05 00	05 50
35	19 11	19 41	20 17	03 17	04 02	04 49	05 40
40	19 26	19 59	20 40	03 06	03 50	04 37	05 28
45	19 44	20 21	21 11	02 53	03 36	04 23	05 14
S 50	20 06	20 51	21 56	02 37	03 19	04 05	04 57
52	20 17	21 06	22 24	02 30	03 10	03 57	04 49
54	20 29	21 24	23 09	02 22	03 02	03 48	04 40
56	20 44	21 46	////	02 13	02 51	03 37	04 30
58	21 00	22 16	////	02 02	02 40	03 25	04 19
S 60	21 21	23 05	////	01 51	02 27	03 11	04 05

Day	SUN		Mer. Pass.	MOON			
	Eqn. of Time			Mer. Pass.		Age	Phase
	00h	12h		Upper	Lower		
d	m s	m s	h m	h m	h m	d	%
15	05 02	04 47	11 55	22 49	10 24	12	97
16	04 33	04 18	11 56	23 37	11 13	13	99
17	04 04	03 49	11 56	24 26	12 02	14	100

UT	ARIES	VENUS −4.8		MARS +1.0		JUPITER −2.7		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
18 00	86 46.3	145 50.0	S21 04.0	261 17.8	S 0 10.2	337 21.8	N22 19.6	219 37.5	S15 24.2	Acamar	315 17.8	S40 15.2
01	101 48.8	160 52.1	03.5	276 19.1	10.6	352 24.6	19.7	234 39.7	24.3	Achernar	335 26.3	S57 10.2
02	116 51.2	175 54.3	02.9	291 20.5	11.1	7 27.3	19.7	249 41.9	24.3	Acrux	173 08.9	S63 10.3
03	131 53.7	190 56.5 . .	02.4	306 21.8 . .	11.6	22 30.1 . .	19.8	264 44.1 . .	24.4	Adhara	255 11.9	S28 59.6
04	146 56.2	205 58.7	01.8	321 23.1	12.0	37 32.9	19.8	279 46.3	24.5	Aldebaran	290 48.6	N16 32.1
05	161 58.6	221 00.8	01.3	336 24.4	12.5	52 35.7	19.8	294 48.5	24.5			
06	177 01.1	236 03.0	S21 00.8	351 25.8	S 0 12.9	67 38.5	N22 19.9	309 50.7	S15 24.6	Alioth	166 20.6	N55 52.7
W 07	192 03.6	251 05.2	21 00.2	6 27.1	13.4	82 41.2	19.9	324 52.9	24.6	Alkaid	152 58.9	N49 14.4
E 08	207 06.0	266 07.4	20 59.7	21 28.4	13.8	97 44.0	20.0	339 55.1	24.7	Al Na'ir	27 43.6	S46 53.7
D 09	222 08.5	281 09.6 . .	59.1	36 29.8 . .	14.3	112 46.8 . .	20.0	354 57.3 . .	24.8	Alnilam	275 45.7	S 1 11.8
N 10	237 11.0	296 11.8	58.6	51 31.1	14.8	127 49.6	20.1	9 59.5	24.8	Alphard	217 55.5	S 8 43.3
E 11	252 13.4	311 14.0	58.0	66 32.4	15.2	142 52.4	20.1	25 01.7	24.9			
S 12	267 15.9	326 16.3	S20 57.5	81 33.8	S 0 15.7	157 55.1	N22 20.2	40 03.9	S15 25.0	Alphecca	126 11.0	N26 40.1
D 13	282 18.3	341 18.5	56.9	96 35.1	16.1	172 57.9	20.2	55 06.1	25.0	Alpheratz	357 43.1	N29 10.3
A 14	297 20.8	356 20.7	56.4	111 36.5	16.6	188 00.7	20.3	70 08.3	25.1	Altair	62 08.2	N 8 54.5
Y 15	312 23.3	11 22.9 . .	55.8	126 37.8 . .	17.1	203 03.5 . .	20.3	85 10.5 . .	25.2	Ankaa	353 15.3	S42 14.0
16	327 25.7	26 25.2	55.3	141 39.1	17.5	218 06.3	20.3	100 12.7	25.2	Antares	112 26.2	S26 27.6
17	342 28.2	41 27.4	54.7	156 40.5	18.0	233 09.1	20.4	115 14.9	25.3			
18	357 30.7	56 29.6	S20 54.2	171 41.8	S 0 18.4	248 11.8	N22 20.4	130 17.2	S15 25.4	Arcturus	145 55.6	N19 06.5
19	12 33.1	71 31.9	53.7	186 43.1	18.9	263 14.6	20.5	145 19.4	25.4	Atria	107 28.2	S69 02.9
20	27 35.6	86 34.1	53.1	201 44.5	19.3	278 17.4	20.5	160 21.6	25.5	Avior	234 17.3	S59 33.2
21	42 38.1	101 36.4 . .	52.6	216 45.8 . .	19.8	293 20.2 . .	20.6	175 23.8 . .	25.6	Bellatrix	278 31.3	N 6 21.6
22	57 40.5	116 38.6	52.0	231 47.1	20.3	308 23.0	20.6	190 26.0	25.6	Betelgeuse	271 00.6	N 7 24.4
23	72 43.0	131 40.9	51.5	246 48.5	20.7	323 25.7	20.7	205 28.2	25.7			
19 00	87 45.5	146 43.2	S20 50.9	261 49.8	S 0 21.2	338 28.5	N22 20.7	220 30.4	S15 25.8	Canopus	263 55.4	S52 42.3
01	102 47.9	161 45.4	50.4	276 51.1	21.6	353 31.3	20.7	235 32.6	25.8	Capella	280 33.4	N46 00.6
02	117 50.4	176 47.7	49.8	291 52.5	22.1	8 34.1	20.8	250 34.8	25.9	Deneb	49 31.5	N45 20.2
03	132 52.8	191 50.0 . .	49.3	306 53.8 . .	22.5	23 36.9 . .	20.8	265 37.0 . .	26.0	Denebola	182 33.3	N14 29.5
04	147 55.3	206 52.3	48.8	321 55.2	23.0	38 39.7	20.9	280 39.2	26.0	Diphda	348 55.5	S17 54.7
05	162 57.8	221 54.6	48.2	336 56.5	23.5	53 42.4	20.9	295 41.4	26.1			
06	178 00.2	236 56.9	S20 47.7	351 57.8	S 0 23.9	68 45.2	N22 21.0	310 43.6	S15 26.2	Dubhe	193 51.2	N61 40.1
T 07	193 02.7	251 59.2	47.1	6 59.2	24.4	83 48.0	21.0	325 45.8	26.2	Elnath	278 11.8	N28 37.0
H 08	208 05.2	267 01.5	46.6	22 00.5	24.8	98 50.8	21.1	340 48.0	26.3	Eltanin	90 46.5	N51 29.4
U 09	223 07.6	282 03.8 . .	46.0	37 01.9 . .	25.3	113 53.6 . .	21.1	355 50.2 . .	26.4	Enif	33 46.9	N 9 56.6
R 10	238 10.1	297 06.1	45.5	52 03.2	25.7	128 56.4	21.2	10 52.5	26.4	Fomalhaut	15 23.7	S29 32.9
S 11	253 12.6	312 08.4	44.9	67 04.5	26.2	143 59.2	21.2	25 54.7	26.5			
D 12	268 15.0	327 10.7	S20 44.4	82 05.9	S 0 26.6	159 01.9	N22 21.2	40 56.9	S15 26.5	Gacrux	172 00.5	S57 11.2
A 13	283 17.5	342 13.1	43.9	97 07.2	27.1	174 04.7	21.3	55 59.1	26.6	Gienah	175 51.9	S17 37.1
Y 14	298 20.0	357 15.4	43.3	112 08.6	27.6	189 07.5	21.3	71 01.3	26.7	Hadar	148 47.7	S60 26.1
15	313 22.4	12 17.7 . .	42.8	127 09.9 . .	28.0	204 10.3 . .	21.4	86 03.5 . .	26.7	Hamal	328 00.1	N23 31.8
16	328 24.9	27 20.1	42.2	142 11.2	28.5	219 13.1	21.4	101 05.7	26.8	Kaus Aust.	83 43.7	S34 22.5
17	343 27.3	42 22.4	41.7	157 12.6	28.9	234 15.9	21.5	116 07.9	26.9			
18	358 29.8	57 24.7	S20 41.1	172 13.9	S 0 29.4	249 18.7	N22 21.5	131 10.1	S15 26.9	Kochab	137 21.1	N74 05.7
19	13 32.3	72 27.1	40.6	187 15.3	29.8	264 21.4	21.6	146 12.3	27.0	Markab	13 38.0	N15 17.0
20	28 34.7	87 29.5	40.1	202 16.6	30.3	279 24.2	21.6	161 14.5	27.1	Menkar	314 14.4	N 4 08.6
21	43 37.2	102 31.8 . .	39.5	217 18.0 . .	30.7	294 27.0 . .	21.7	176 16.7 . .	27.1	Menkent	148 07.3	S36 26.1
22	58 39.7	117 34.2	39.0	232 19.3	31.2	309 29.8	21.7	191 19.0	27.2	Miaplacidus	221 38.8	S69 46.4
23	73 42.1	132 36.5	38.4	247 20.6	31.6	324 32.6	21.7	206 21.2	27.3			
20 00	88 44.6	147 38.9	S20 37.9	262 22.0	S 0 32.1	339 35.4	N22 21.8	221 23.4	S15 27.3	Mirfak	308 39.3	N49 54.7
01	103 47.1	162 41.3	37.4	277 23.3	32.5	354 38.2	21.8	236 25.6	27.4	Nunki	75 58.2	S26 16.6
02	118 49.5	177 43.7	36.8	292 24.7	33.0	9 41.0	21.9	251 27.8	27.5	Peacock	53 19.2	S56 41.4
03	133 52.0	192 46.1 . .	36.3	307 26.0 . .	33.5	24 43.7 . .	21.9	266 30.0 . .	27.5	Pollux	243 27.0	N27 59.3
04	148 54.4	207 48.5	35.7	322 27.4	33.9	39 46.5	22.0	281 32.2	27.6	Procyon	244 59.1	N 5 11.1
05	163 56.9	222 50.9	35.2	337 28.7	34.4	54 49.3	22.0	296 34.4	27.6			
06	178 59.4	237 53.3	S20 34.7	352 30.1	S 0 34.8	69 52.1	N22 22.1	311 36.6	S15 27.7	Rasalhague	96 06.5	N12 33.2
07	194 01.8	252 55.7	34.1	7 31.4	35.3	84 54.9	22.1	326 38.8	27.8	Regulus	207 43.0	N11 53.7
08	209 04.3	267 58.1	33.6	22 32.7	35.7	99 57.7	22.2	341 41.0	27.8	Rigel	281 11.4	S 8 11.3
F 09	224 06.8	283 00.5 . .	33.0	37 34.1 . .	36.2	115 00.5 . .	22.2	356 43.2 . .	27.9	Rigil Kent.	139 51.6	S60 53.2
R 10	239 09.2	298 02.9	32.5	52 35.4	36.6	130 03.3	22.2	11 45.5	28.0	Sabik	102 12.5	S15 44.3
I 11	254 11.7	313 05.3	32.0	67 36.8	37.1	145 06.1	22.3	26 47.7	28.0			
D 12	269 14.2	328 07.8	S20 31.4	82 38.1	S 0 37.5	160 08.9	N22 22.3	41 49.9	S15 28.1	Schedar	349 39.9	N56 37.1
A 13	284 16.6	343 10.2	30.9	97 39.5	38.0	175 11.6	22.4	56 52.1	28.2	Shaula	96 21.8	S37 06.6
Y 14	299 19.1	358 12.6	30.3	112 40.8	38.4	190 14.4	22.4	71 54.3	28.2	Sirius	258 33.0	S16 44.3
15	314 21.6	13 15.1 . .	29.8	127 42.2 . .	38.9	205 17.2 . .	22.5	86 56.5 . .	28.3	Spica	158 31.0	S11 14.0
16	329 24.0	28 17.5	29.3	142 43.5	39.3	220 20.0	22.5	101 58.7	28.4	Suhail	222 51.8	S43 29.3
17	344 26.5	43 20.0	28.7	157 44.9	39.8	235 22.8	22.6	117 00.9	28.4			
18	359 28.9	58 22.4	S20 28.2	172 46.2	S 0 40.2	250 25.6	N22 22.6	132 03.1	S15 28.5	Vega	80 39.1	N38 48.0
19	14 31.4	73 24.9	27.6	187 47.6	40.7	265 28.4	22.7	147 05.3	28.5	Zuben'ubi	137 05.3	S16 05.8
20	29 33.9	88 27.3	27.1	202 48.9	41.1	280 31.2	22.7	162 07.6	28.6		SHA	Mer.Pass.
21	44 36.3	103 29.8 . .	26.6	217 50.3 . .	41.6	295 34.0 . .	22.8	177 09.8 . .	28.7		° ′	h m
22	59 38.8	118 32.3	26.0	232 51.6	42.0	310 36.8	22.8	192 12.0	28.7	Venus	58 57.7	14 11
23	74 41.3	133 34.8	25.5	247 53.0	42.5	325 39.6	22.8	207 14.2	28.8	Mars	174 04.4	6 32
	h m									Jupiter	250 43.1	1 26
Mer. Pass.	18 06.0	v 2.3	d 0.5	v 1.3	d 0.5	v 2.8	d 0.0	v 2.2	d 0.1	Saturn	132 44.9	9 17

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 18	Moonrise 19	Moonrise 20	Moonrise 21
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
18 00	180 53.4	S23 22.9	353 45.8	11.9	N19 09.8	2.2	54.2	N 72	08 24	10 56	▬	▭	15 12	17 07	18 52
01	195 53.1	23.0	8 16.7	12.0	19 07.6	2.2	54.2	N 70	08 04	09 53	▬	14 28	16 02	17 37	19 10
02	210 52.8	23.0	22 47.7	12.1	19 05.4	2.3	54.1	68	07 48	09 18	▬	15 13	16 33	17 58	19 24
03	225 52.5 . .	23.1	37 18.8	12.0	19 03.1	2.4	54.1	66	07 35	08 52	10 33	15 43	16 56	18 15	19 35
04	240 52.2	23.2	51 49.8	12.1	19 00.7	2.5	54.1	64	07 24	08 33	09 51	16 05	17 14	18 29	19 45
05	255 51.9	23.2	66 20.9	12.1	18 58.2	2.6	54.1	62	07 15	08 17	09 22	16 23	17 29	18 40	19 53
06	270 51.6	S23 23.3	80 52.0	12.1	N18 55.6	2.7	54.1	60	07 06	08 03	09 01	16 37	17 42	18 50	20 00
W 07	285 51.3	23.4	95 23.1	12.1	18 52.9	2.7	54.1	N 58	06 59	07 51	08 43	16 50	17 52	18 58	20 06
E 08	300 51.0	23.4	109 54.2	12.2	18 50.2	2.9	54.1	56	06 52	07 41	08 29	17 01	18 01	19 06	20 12
D 09	315 50.7 . .	23.5	124 25.4	12.2	18 47.3	2.9	54.1	54	06 46	07 32	08 16	17 10	18 10	19 12	20 17
N 10	330 50.4	23.6	138 56.6	12.2	18 44.4	3.0	54.1	52	06 40	07 24	08 05	17 18	18 17	19 18	20 21
E 11	345 50.1	23.6	153 27.8	12.3	18 41.4	3.1	54.1	50	06 35	07 16	07 55	17 26	18 24	19 24	20 25
S 12	0 49.7	S23 23.7	167 59.1	12.3	N18 38.3	3.2	54.1	45	06 23	07 00	07 34	17 42	18 38	19 35	20 34
D 13	15 49.4	23.8	182 30.4	12.3	18 35.1	3.3	54.1	N 40	06 13	06 47	07 17	17 55	18 50	19 45	20 41
A 14	30 49.1	23.8	197 01.7	12.3	18 31.8	3.3	54.1	35	06 03	06 35	07 03	18 07	18 59	19 53	20 47
Y 15	45 48.8 . .	23.9	211 33.0	12.4	18 28.5	3.4	54.1	30	05 54	06 24	06 51	18 16	19 08	20 00	20 52
16	60 48.5	23.9	226 04.4	12.4	18 25.1	3.6	54.1	20	05 38	06 05	06 29	18 33	19 23	20 13	21 02
17	75 48.2	24.0	240 35.8	12.4	18 21.5	3.6	54.1	N 10	05 22	05 48	06 11	18 48	19 36	20 23	21 10
18	90 47.9	S23 24.1	255 07.2	12.5	N18 17.9	3.6	54.0	0	05 05	05 31	05 53	19 02	19 48	20 34	21 18
19	105 47.6	24.1	269 38.7	12.4	18 14.3	3.8	54.0	S 10	04 46	05 13	05 36	19 16	20 01	20 44	21 25
20	120 47.3	24.2	284 10.1	12.5	18 10.5	3.9	54.0	20	04 23	04 52	05 17	19 30	20 14	20 54	21 33
21	135 47.0 . .	24.2	298 41.6	12.6	18 06.6	3.9	54.0	30	03 54	04 27	04 55	19 47	20 28	21 07	21 43
22	150 46.7	24.3	313 13.2	12.6	18 02.7	4.0	54.0	35	03 35	04 12	04 42	19 57	20 37	21 14	21 48
23	165 46.4	24.3	327 44.8	12.6	17 58.7	4.1	54.0	40	03 12	03 54	04 27	20 08	20 47	21 22	21 54
19 00	180 46.1	S23 24.4	342 16.4	12.6	N17 54.6	4.1	54.0	45	02 41	03 31	04 09	20 21	20 58	21 31	22 01
01	195 45.8	24.4	356 48.0	12.6	17 50.5	4.3	54.0	S 50	01 56	03 01	03 46	20 37	21 12	21 42	22 09
02	210 45.4	24.5	11 19.6	12.7	17 46.2	4.3	54.0	52	01 28	02 46	03 35	20 44	21 18	21 48	22 13
03	225 45.1 . .	24.5	25 51.3	12.8	17 41.9	4.4	54.0	54	00 41	02 28	03 23	20 53	21 26	21 53	22 17
04	240 44.8	24.6	40 23.1	12.7	17 37.5	4.5	54.0	56	////	02 06	03 09	21 02	21 34	22 00	22 22
05	255 44.5	24.6	54 54.8	12.8	17 33.0	4.6	54.0	58	////	01 36	02 52	21 13	21 42	22 07	22 27
06	270 44.2	S23 24.7	69 26.6	12.8	N17 28.4	4.6	54.0	S 60	////	00 46	02 31	21 25	21 53	22 15	22 33
T 07	285 43.9	24.7	83 58.4	12.8	17 23.8	4.7	54.0								
H 08	300 43.6	24.8	98 30.2	12.9	17 19.1	4.8	54.0								
U 09	315 43.3 . .	24.8	113 02.1	12.9	17 14.3	4.9	54.0								
R 10	330 43.0	24.9	127 34.0	13.0	17 09.4	4.9	54.0								
S 11	345 42.7	24.9	142 06.0	12.9	17 04.5	5.0	54.0								
D 12	0 42.4	S23 25.0	156 37.9	13.0	N16 59.5	5.1	54.0								
A 13	15 42.1	25.0	171 09.9	13.1	16 54.4	5.2	54.0								
Y 14	30 41.8	25.1	185 42.0	13.0	16 49.2	5.2	54.0								
15	45 41.4 . .	25.1	200 14.0	13.1	16 44.0	5.3	54.0								
16	60 41.1	25.1	214 46.1	13.2	16 38.7	5.4	54.0								
17	75 40.8	25.2	229 18.3	13.1	16 33.3	5.5	54.0								
18	90 40.5	S23 25.2	243 50.4	13.2	N16 27.8	5.5	54.0								
19	105 40.2	25.3	258 22.6	13.3	16 22.3	5.6	54.0								
20	120 39.9	25.3	272 54.9	13.2	16 16.7	5.7	54.0								
21	135 39.6 . .	25.3	287 27.1	13.3	16 11.0	5.7	54.0								
22	150 39.3	25.4	301 59.4	13.3	16 05.3	5.8	54.0								
23	165 39.0	25.4	316 31.7	13.4	15 59.5	5.9	54.0								
20 00	180 38.7	S23 25.4	331 04.1	13.4	N15 53.6	5.9	54.0								
01	195 38.4	25.5	345 36.5	13.4	15 47.7	6.0	54.0								
02	210 38.0	25.5	0 08.9	13.4	15 41.7	6.1	54.0								
03	225 37.7 . .	25.5	14 41.3	13.5	15 35.6	6.2	54.0								
04	240 37.4	25.6	29 13.8	13.5	15 29.4	6.2	54.0								
05	255 37.1	25.6	43 46.3	13.6	15 23.2	6.3	54.0								
06	270 36.8	S23 25.6	58 18.9	13.5	N15 16.9	6.3	54.0								
F 07	285 36.5	25.6	72 51.4	13.6	15 10.6	6.4	54.0								
R 08	300 36.2	25.7	87 24.0	13.7	15 04.2	6.5	54.0								
I 09	315 35.9 . .	25.7	101 56.7	13.6	14 57.7	6.5	54.0								
D 10	330 35.6	25.7	116 29.3	13.7	14 51.2	6.7	54.0								
A 11	345 35.3	25.8	131 02.0	13.8	14 44.5	6.6	54.0								
D 12	0 35.0	S23 25.8	145 34.8	13.7	N14 37.9	6.8	54.0								
A 13	15 34.6	25.8	160 07.5	13.8	14 31.1	6.7	54.0								
Y 14	30 34.3	25.8	174 40.3	13.8	14 24.4	6.9	54.0								
15	45 34.0 . .	25.8	189 13.1	13.9	14 17.5	6.9	54.0								
16	60 33.7	25.9	203 46.0	13.8	14 10.6	7.0	54.0								
17	75 33.4	25.9	218 18.8	14.0	14 03.6	7.0	54.0								
18	90 33.1	S23 25.9	232 51.8	13.9	N13 56.6	7.1	54.0								
19	105 32.8	25.9	247 24.7	13.9	13 49.5	7.2	54.0								
20	120 32.5	25.9	261 57.6	14.0	13 42.3	7.2	54.0								
21	135 32.2 . .	26.0	276 30.6	14.1	13 35.1	7.2	54.0								
22	150 31.9	26.0	291 03.7	14.0	13 27.9	7.4	54.0								
23	165 31.6	26.0	305 36.7	14.1	N13 20.5	7.4	54.0								
	SD 16.3	d 0.0	SD	14.7		14.7									

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 18	Moonset 19	Moonset 20	Moonset 21
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	12 59	15 30	▭	12 10	11 50	11 37
N 70	▬	14 01	15 50	11 17	11 20	11 20	11 18
68	▬	14 37	16 06	10 31	10 48	10 57	11 02
66	13 21	15 02	16 19	10 01	10 24	10 39	10 50
64	14 04	15 22	16 30	09 39	10 06	10 25	10 39
62	14 32	15 38	16 40	09 21	09 51	10 13	10 30
60	14 54	15 51	16 48	09 06	09 38	10 03	10 23
N 58	15 11	16 03	16 56	08 53	09 27	09 54	10 16
56	15 26	16 13	17 02	08 42	09 17	09 46	10 10
54	15 38	16 22	17 09	08 33	09 08	09 39	10 04
52	15 50	16 31	17 14	08 24	09 01	09 32	09 59
50	15 59	16 38	17 20	08 16	08 54	09 26	09 55
45	16 20	16 54	17 31	08 00	08 39	09 14	09 45
N 40	16 37	17 08	17 42	07 46	08 27	09 04	09 37
35	16 51	17 19	17 51	07 34	08 16	08 55	09 30
30	17 04	17 30	18 00	07 24	08 07	08 47	09 24
20	17 25	17 49	18 16	07 07	07 51	08 33	09 13
N 10	17 43	18 06	18 33	06 52	07 38	08 22	09 04
0	18 01	18 23	18 50	06 37	07 25	08 10	08 55
S 10	18 19	18 42	19 09	06 23	07 11	07 59	08 46
20	18 38	19 02	19 31	06 08	06 57	07 47	08 36
30	19 00	19 27	20 00	05 50	06 41	07 33	08 25
35	19 13	19 42	20 19	05 40	06 32	07 25	08 19
40	19 28	20 01	20 42	05 28	06 21	07 16	08 12
45	19 46	20 23	21 13	05 14	06 09	07 05	08 03
S 50	20 08	20 53	21 59	04 57	05 53	06 52	07 53
52	20 19	21 08	22 27	04 49	05 46	06 46	07 48
54	20 32	21 26	23 14	04 40	05 38	06 39	07 43
56	20 46	21 48	////	04 30	05 29	06 32	07 37
58	21 03	22 18	////	04 19	05 19	06 23	07 31
S 60	21 23	23 09	////	04 05	05 07	06 14	07 23

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
18	03 34	03 20	11 57	00 26	12 50	15	99
19	03 05	02 50	11 57	01 13	13 36	16	96
20	02 35	02 20	11 58	01 59	14 22	17	91

UT	ARIES	VENUS −4.8		MARS +1.0		JUPITER −2.7		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
21 00	89 43.7	148 37.2	S20 24.9	262 54.3	S 0 42.9	340 42.3	N22 22.9	222 16.4	S15 28.9	Acamar	315 17.8	S40 15.2
01	104 46.2	163 39.7	24.4	277 55.7	43.4	355 45.1	22.9	237 18.6	28.9	Achernar	335 26.3	S57 10.2
02	119 48.7	178 42.2	23.9	292 57.0	43.8	10 47.9	23.0	252 20.8	29.0	Acrux	173 08.8	S63 10.3
03	134 51.1	193 44.7	23.3	307 58.4	44.3	25 50.7	23.0	267 23.0	29.1	Adhara	255 11.8	S28 59.6
04	149 53.6	208 47.2	22.8	322 59.7	44.7	40 53.5	23.1	282 25.2	29.1	Aldebaran	290 48.6	N16 32.1
05	164 56.1	223 49.7	22.3	338 01.1	45.2	55 56.3	23.1	297 27.4	29.2			
06	179 58.5	238 52.2	S20 21.7	353 02.4	S 0 45.6	70 59.1	N22 23.2	312 29.7	S15 29.3	Alioth	166 20.6	N55 52.7
07	195 01.0	253 54.7	21.2	8 03.8	46.1	86 01.9	23.2	327 31.9	29.3	Alkaid	152 58.9	N49 14.4
S 08	210 03.4	268 57.3	20.7	23 05.1	46.5	101 04.7	23.3	342 34.1	29.4	Al Na'ir	27 43.6	S46 53.7
A 09	225 05.9	283 59.8	20.1	38 06.5	47.0	116 07.5	23.3	357 36.3	29.4	Alnilam	275 45.7	S 1 11.8
T 10	240 08.4	299 02.3	19.6	53 07.8	47.4	131 10.3	23.3	12 38.5	29.5	Alphard	217 55.5	S 8 43.3
U 11	255 10.8	314 04.8	19.0	68 09.2	47.9	146 13.1	23.4	27 40.7	29.6			
R 12	270 13.3	329 07.4	S20 18.5	83 10.5	S 0 48.3	161 15.9	N22 23.4	42 42.9	S15 29.6	Alphecca	126 11.0	N26 40.1
D 13	285 15.8	344 09.9	18.0	98 11.9	48.8	176 18.7	23.5	57 45.1	29.7	Alpheratz	357 43.1	N29 10.3
A 14	300 18.2	359 12.5	17.4	113 13.2	49.2	191 21.5	23.5	72 47.3	29.8	Altair	62 08.2	N 8 54.5
Y 15	315 20.7	14 15.0	16.9	128 14.6	49.7	206 24.3	23.6	87 49.6	29.8	Ankaa	353 15.3	S42 14.0
16	330 23.2	29 17.6	16.4	143 15.9	50.1	221 27.0	23.6	102 51.8	29.9	Antares	112 26.1	S26 27.6
17	345 25.6	44 20.1	15.8	158 17.3	50.6	236 29.8	23.7	117 54.0	29.9			
18	0 28.1	59 22.7	S20 15.3	173 18.7	S 0 51.0	251 32.6	N22 23.7	132 56.2	S15 30.0	Arcturus	145 55.6	N19 06.5
19	15 30.6	74 25.3	14.8	188 20.0	51.5	266 35.4	23.8	147 58.4	30.1	Atria	107 28.2	S69 02.9
20	30 33.0	89 27.8	14.2	203 21.4	51.9	281 38.2	23.8	163 00.6	30.1	Avior	234 17.2	S59 33.3
21	45 35.5	104 30.4	13.7	218 22.7	52.3	296 41.0	23.9	178 02.8	30.2	Bellatrix	278 31.3	N 6 21.6
22	60 37.9	119 33.0	13.2	233 24.1	52.8	311 43.8	23.9	193 05.0	30.3	Betelgeuse	271 00.6	N 7 24.4
23	75 40.4	134 35.6	12.6	248 25.4	53.2	326 46.6	23.9	208 07.3	30.3			
22 00	90 42.9	149 38.2	S20 12.1	263 26.8	S 0 53.7	341 49.4	N22 24.0	223 09.5	S15 30.4	Canopus	263 55.4	S52 42.3
01	105 45.3	164 40.8	11.6	278 28.1	54.1	356 52.2	24.0	238 11.7	30.5	Capella	280 33.4	N46 00.6
02	120 47.8	179 43.4	11.0	293 29.5	54.6	11 55.0	24.1	253 13.9	30.5	Deneb	49 31.6	N45 20.1
03	135 50.3	194 46.0	10.5	308 30.9	55.0	26 57.8	24.1	268 16.1	30.6	Denebola	182 33.3	N14 29.5
04	150 52.7	209 48.6	10.0	323 32.2	55.5	42 00.6	24.2	283 18.3	30.6	Diphda	348 55.5	S17 54.7
05	165 55.2	224 51.2	09.4	338 33.6	55.9	57 03.4	24.2	298 20.5	30.7			
06	180 57.7	239 53.8	S20 08.9	353 34.9	S 0 56.4	72 06.2	N22 24.3	313 22.7	S15 30.8	Dubhe	193 51.2	N61 40.1
07	196 00.1	254 56.4	08.4	8 36.3	56.8	87 09.0	24.3	328 25.0	30.8	Elnath	278 11.8	N28 37.0
S 08	211 02.6	269 59.1	07.9	23 37.6	57.3	102 11.8	24.4	343 27.2	30.9	Eltanin	90 46.5	N51 29.4
U 09	226 05.0	285 01.7	07.3	38 39.0	57.7	117 14.6	24.4	358 29.4	31.0	Enif	33 46.9	N 9 56.6
N 10	241 07.5	300 04.3	06.8	53 40.4	58.1	132 17.4	24.5	13 31.6	31.0	Fomalhaut	15 23.7	S29 32.9
D 11	256 10.0	315 07.0	06.3	68 41.7	58.6	147 20.2	24.5	28 33.8	31.1			
A 12	271 12.4	330 09.6	S20 05.7	83 43.1	S 0 59.0	162 23.0	N22 24.5	43 36.0	S15 31.1	Gacrux	172 00.5	S57 11.2
Y 13	286 14.9	345 12.3	05.2	98 44.4	59.5	177 25.8	24.6	58 38.2	31.2	Gienah	175 51.9	S17 37.1
14	301 17.4	0 14.9	04.7	113 45.8	0 59.9	192 28.6	24.6	73 40.5	31.3	Hadar	148 47.6	S60 26.1
15	316 19.8	15 17.6	04.1	128 47.2	1 00.4	207 31.4	24.7	88 42.7	31.3	Hamal	328 00.1	N23 31.8
16	331 22.3	30 20.3	03.6	143 48.5	00.8	222 34.2	24.7	103 44.9	31.4	Kaus Aust.	83 43.7	S34 22.5
17	346 24.8	45 22.9	03.1	158 49.9	01.3	237 37.0	24.8	118 47.1	31.5			
18	1 27.2	60 25.6	S20 02.6	173 51.3	S 1 01.7	252 39.8	N22 24.8	133 49.3	S15 31.5	Kochab	137 21.0	N74 05.7
19	16 29.7	75 28.3	02.0	188 52.6	02.1	267 42.6	24.9	148 51.5	31.6	Markab	13 38.0	N15 17.0
20	31 32.2	90 31.0	01.5	203 54.0	02.6	282 45.4	24.9	163 53.7	31.6	Menkar	314 14.4	N 4 08.6
21	46 34.6	105 33.6	01.0	218 55.3	03.0	297 48.2	25.0	178 55.9	31.7	Menkent	148 07.3	S36 26.1
22	61 37.1	120 36.3	20 00.4	233 56.7	03.5	312 51.0	25.0	193 58.2	31.8	Miaplacidus	221 38.8	S69 46.4
23	76 39.5	135 39.0	19 59.9	248 58.1	03.9	327 53.8	25.1	209 00.4	31.8			
23 00	91 42.0	150 41.7	S19 59.4	263 59.4	S 1 04.4	342 56.6	N22 25.1	224 02.6	S15 31.9	Mirfak	308 39.4	N49 54.7
01	106 44.5	165 44.4	58.9	279 00.8	04.8	357 59.4	25.1	239 04.8	32.0	Nunki	75 58.2	S26 16.6
02	121 46.9	180 47.1	58.3	294 02.2	05.2	13 02.2	25.2	254 07.0	32.0	Peacock	53 19.2	S56 41.4
03	136 49.4	195 49.9	57.8	309 03.5	05.7	28 05.0	25.2	269 09.2	32.1	Pollux	243 27.0	N27 59.3
04	151 51.9	210 52.6	57.3	324 04.9	06.1	43 07.8	25.3	284 11.5	32.1	Procyon	244 59.0	N 5 11.1
05	166 54.3	225 55.3	56.8	339 06.2	06.6	58 10.6	25.3	299 13.7	32.2			
06	181 56.8	240 58.0	S19 56.2	354 07.6	S 1 07.0	73 13.4	N22 25.4	314 15.9	S15 32.3	Rasalhague	96 06.5	N12 33.2
07	196 59.3	256 00.8	55.7	9 09.0	07.5	88 16.2	25.4	329 18.1	32.3	Regulus	207 43.0	N11 53.7
08	212 01.7	271 03.5	55.2	24 10.3	07.9	103 19.0	25.5	344 20.3	32.4	Rigel	281 11.4	S 8 11.3
M 09	227 04.2	286 06.2	54.7	39 11.7	08.3	118 21.8	25.5	359 22.5	32.4	Rigil Kent.	139 51.6	S60 53.2
O 10	242 06.7	301 09.0	54.1	54 13.1	08.8	133 24.6	25.6	14 24.7	32.5	Sabik	102 12.5	S15 44.3
N 11	257 09.1	316 11.7	53.6	69 14.4	09.2	148 27.4	25.6	29 27.0	32.6			
D 12	272 11.6	331 14.5	S19 53.1	84 15.8	S 1 09.7	163 30.2	N22 25.7	44 29.2	S15 32.6	Schedar	349 39.9	N56 37.2
A 13	287 14.0	346 17.3	52.6	99 17.2	10.1	178 33.0	25.7	59 31.4	32.7	Shaula	96 21.8	S37 06.6
Y 14	302 16.5	1 20.0	52.0	114 18.5	10.5	193 35.8	25.7	74 33.6	32.8	Sirius	258 33.0	S16 44.3
15	317 19.0	16 22.8	51.5	129 19.9	11.0	208 38.6	25.8	89 35.8	32.8	Spica	158 31.0	S11 14.0
16	332 21.4	31 25.6	51.0	144 21.3	11.4	223 41.4	25.8	104 38.0	32.9	Suhail	222 51.8	S43 29.3
17	347 23.9	46 28.3	50.5	159 22.6	11.9	238 44.2	25.9	119 40.3	32.9			
18	2 26.4	61 31.1	S19 49.9	174 24.0	S 1 12.3	253 47.0	N22 25.9	134 42.5	S15 33.0	Vega	80 39.1	N38 48.0
19	17 28.8	76 33.9	49.4	189 25.4	12.7	268 49.8	26.0	149 44.7	33.1	Zuben'ubi	137 05.2	S16 05.8
20	32 31.3	91 36.7	48.9	204 26.7	13.2	283 52.6	26.0	164 46.9	33.1		SHA	Mer.Pass.
21	47 33.8	106 39.5	48.4	219 28.1	13.6	298 55.4	26.1	179 49.1	33.2		° ′	h m
22	62 36.2	121 42.3	47.9	234 29.5	14.1	313 58.2	26.1	194 51.3	33.2	Venus	58 55.3	13 59
23	77 38.7	136 45.1	47.3	249 30.9	14.5	329 01.0	26.2	209 53.6	33.3	Mars	172 43.9	6 26
	h m									Jupiter	251 06.5	1 12
Mer.Pass.	17 54.2	v 2.6	d 0.5	v 1.4	d 0.4	v 2.8	d 0.0	v 2.2	d 0.1	Saturn	132 26.6	9 06

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		21	22	23	24
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
21 00	180 31.2	S23 26.0	320 09.8	14.1	N13 13.1	7.4	54.0	N 72	08 26	10 58	▬	18 52	20 31	22 10	23 49
01	195 30.9	26.0	334 42.9	14.1	13 05.7	7.5	54.0	N 70	08 06	09 55	▬	19 10	20 42	22 14	23 47
02	210 30.6	26.0	349 16.0	14.2	12 58.2	7.5	54.0	68	07 50	09 20	▬	19 24	20 50	22 17	23 45
03	225 30.3	26.0	3 49.2	14.1	12 50.7	7.6	54.0	66	07 37	08 54	10 35	19 35	20 57	22 19	23 43
04	240 30.0	26.1	18 22.3	14.2	12 43.1	7.7	54.1	64	07 26	08 34	09 53	19 45	21 03	22 21	23 42
05	255 29.7	26.1	32 55.5	14.3	12 35.4	7.7	54.1	62	07 16	08 18	09 24	19 53	21 08	22 23	23 41
06	270 29.4	S23 26.1	47 28.8	14.2	N12 27.7	7.8	54.1	60	07 08	08 05	09 02	20 00	21 12	22 25	23 40
07	285 29.1	26.1	62 02.0	14.3	12 19.9	7.8	54.1	N 58	07 00	07 53	08 45	20 06	21 16	22 26	23 39
S 08	300 28.8	26.1	76 35.3	14.3	12 12.1	7.9	54.1	56	06 53	07 43	08 30	20 12	21 19	22 28	23 38
A 09	315 28.5	26.1	91 08.6	14.3	12 04.2	7.9	54.1	54	06 47	07 34	08 17	20 17	21 22	22 29	23 37
T 10	330 28.1	26.1	105 41.9	14.4	11 56.3	8.0	54.1	52	06 42	07 25	08 06	20 21	21 25	22 30	23 36
U 11	345 27.8	26.1	120 15.3	14.4	11 48.3	8.0	54.1	50	06 36	07 18	07 56	20 25	21 28	22 31	23 36
R 12	0 27.5	S23 26.1	134 48.7	14.4	N11 40.3	8.1	54.1	45	06 24	07 02	07 36	20 34	21 33	22 33	23 34
D 13	15 27.2	26.1	149 22.1	14.4	11 32.2	8.1	54.1	N 40	06 14	06 48	07 19	20 41	21 37	22 35	23 33
A 14	30 26.9	26.1	163 55.5	14.4	11 24.1	8.2	54.1	35	06 05	06 36	07 05	20 47	21 41	22 36	23 32
Y 15	45 26.6	26.1	178 28.9	14.5	11 15.9	8.2	54.1	30	05 56	06 26	06 52	20 52	21 45	22 38	23 32
16	60 26.3	26.1	193 02.4	14.5	11 07.7	8.2	54.1	20	05 39	06 07	06 31	21 02	21 51	22 40	23 30
17	75 26.0	26.1	207 35.9	14.5	10 59.5	8.4	54.1	N 10	05 23	05 50	06 12	21 10	21 56	22 42	23 29
18	90 25.7	S23 26.1	222 09.4	14.5	N10 51.1	8.3	54.2	0	05 06	05 32	05 55	21 18	22 01	22 44	23 28
19	105 25.4	26.1	236 42.9	14.6	10 42.8	8.4	54.2	S 10	04 47	05 14	05 37	21 25	22 06	22 46	23 27
20	120 25.0	26.1	251 16.5	14.5	10 34.4	8.5	54.2	20	04 24	04 54	05 18	21 33	22 11	22 48	23 25
21	135 24.7	26.1	265 50.0	14.6	10 25.9	8.5	54.2	30	03 55	04 29	04 56	21 43	22 17	22 50	23 24
22	150 24.4	26.1	280 23.6	14.6	10 17.4	8.5	54.2	35	03 37	04 13	04 43	21 48	22 20	22 52	23 23
23	165 24.1	26.1	294 57.2	14.6	10 08.9	8.6	54.2	40	03 13	03 55	04 28	21 54	22 24	22 53	23 22
22 00	180 23.8	S23 26.1	309 30.8	14.7	N10 00.3	8.6	54.2	45	02 43	03 33	04 10	22 01	22 28	22 55	23 21
01	195 23.5	26.1	324 04.5	14.6	9 51.7	8.7	54.2	S 50	01 57	03 03	03 47	22 09	22 34	22 57	23 20
02	210 23.2	26.1	338 38.1	14.7	9 43.0	8.7	54.2	52	01 29	02 48	03 37	22 13	22 36	22 58	23 20
03	225 22.9	26.1	353 11.8	14.7	9 34.3	8.8	54.2	54	00 42	02 30	03 24	22 17	22 39	22 59	23 19
04	240 22.6	26.1	7 45.5	14.7	9 25.5	8.8	54.3	56	////	02 07	03 10	22 22	22 42	23 00	23 19
05	255 22.3	26.1	22 19.2	14.7	9 16.7	8.8	54.3	58	////	01 37	02 53	22 27	22 45	23 02	23 18
06	270 21.9	S23 26.1	36 52.9	14.7	N 9 07.9	8.9	54.3	S 60	////	00 46	02 33	22 33	22 49	23 03	23 17
07	285 21.6	26.0	51 26.6	14.7	8 59.0	8.9	54.3								
S 08	300 21.3	26.0	66 00.3	14.8	8 50.1	9.0	54.3								
U 09	315 21.0	26.0	80 34.1	14.8	8 41.1	9.0	54.3								
N 10	330 20.7	26.0	95 07.9	14.7	8 32.1	9.0	54.3								
D 11	345 20.4	26.0	109 41.6	14.8	8 23.1	9.1	54.3								
A 12	0 20.1	S23 26.0	124 15.4	14.8	N 8 14.0	9.1	54.4								
Y 13	15 19.8	26.0	138 49.2	14.8	8 04.9	9.2	54.4								
14	30 19.5	25.9	153 23.0	14.8	7 55.7	9.2	54.4								
15	45 19.2	25.9	167 56.8	14.9	7 46.5	9.2	54.4								
16	60 18.8	25.9	182 30.7	14.8	7 37.3	9.3	54.4								
17	75 18.5	25.9	197 04.5	14.8	7 28.0	9.2	54.4								
18	90 18.2	S23 25.9	211 38.3	14.9	N 7 18.8	9.4	54.4								
19	105 17.9	25.9	226 12.2	14.8	7 09.4	9.3	54.5								
20	120 17.6	25.8	240 46.0	14.9	7 00.1	9.4	54.5								
21	135 17.3	25.8	255 19.9	14.9	6 50.7	9.5	54.5								
22	150 17.0	25.8	269 53.8	14.8	6 41.2	9.4	54.5								
23	165 16.7	25.8	284 27.6	14.9	6 31.8	9.5	54.5								
23 00	180 16.4	S23 25.7	299 01.5	14.9	N 6 22.3	9.5	54.5								
01	195 16.0	25.7	313 35.4	14.8	6 12.8	9.6	54.5								
02	210 15.7	25.7	328 09.2	14.9	6 03.2	9.6	54.6								
03	225 15.4	25.7	342 43.1	14.9	5 53.6	9.6	54.6								
04	240 15.1	25.6	357 17.0	14.9	5 44.0	9.6	54.6								
05	255 14.8	25.6	11 50.9	14.8	5 34.4	9.7	54.6								
06	270 14.5	S23 25.6	26 24.7	14.9	N 5 24.7	9.7	54.6								
07	285 14.2	25.5	40 58.6	14.9	5 15.0	9.7	54.7								
08	300 13.9	25.5	55 32.5	14.9	5 05.3	9.7	54.7								
M 09	315 13.6	25.5	70 06.4	14.8	4 55.6	9.8	54.7								
O 10	330 13.3	25.4	84 40.2	14.9	4 45.8	9.8	54.7								
N 11	345 12.9	25.4	99 14.1	14.8	4 36.0	9.8	54.7								
D 12	0 12.6	S23 25.4	113 47.9	14.9	N 4 26.2	9.9	54.7								
A 13	15 12.3	25.3	128 21.8	14.8	4 16.3	9.9	54.8								
Y 14	30 12.0	25.3	142 55.6	14.9	4 06.4	9.9	54.8								
15	45 11.7	25.3	157 29.5	14.8	3 56.5	9.9	54.8								
16	60 11.4	25.2	172 03.3	14.8	3 46.6	9.9	54.8								
17	75 11.1	25.2	186 37.1	14.8	3 36.7	10.0	54.8								
18	90 10.8	S23 25.2	201 10.9	14.8	N 3 26.7	10.0	54.9								
19	105 10.5	25.1	215 44.7	14.8	3 16.7	10.0	54.9								
20	120 10.1	25.1	230 18.5	14.8	3 06.7	10.0	54.9								
21	135 09.8	25.0	244 52.3	14.8	2 56.7	10.1	54.9								
22	150 09.5	25.0	259 26.1	14.7	2 46.6	10.0	55.0								
23	165 09.2	24.9	273 59.8	14.7	N 2 36.6	10.1	55.0								
	SD 16.3	d 0.0	SD	14.7		14.8		14.9							

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	21	22	23	24
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	12 59	15 31	11 37	11 28	11 19	11 11
N 70	▬	14 02	15 51	11 18	11 16	11 13	11 10
68	▬	14 38	16 07	11 02	11 06	11 08	11 10
66	13 22	15 03	16 20	10 50	10 58	11 04	11 09
64	14 05	15 23	16 31	10 39	10 51	11 00	11 09
62	14 33	15 39	16 41	10 30	10 45	10 57	11 09
60	14 55	15 53	16 50	10 23	10 39	10 54	11 08
N 58	15 12	16 04	16 57	10 16	10 35	10 52	11 08
56	15 27	16 15	17 04	10 10	10 31	10 50	11 08
54	15 40	16 24	17 10	10 04	10 27	10 48	11 08
52	15 51	16 32	17 16	09 59	10 24	10 46	11 07
50	16 01	16 39	17 21	09 55	10 20	10 44	11 07
45	16 22	16 56	17 33	09 45	10 14	10 41	11 07
N 40	16 39	17 09	17 43	09 37	10 08	10 38	11 07
35	16 53	17 21	17 53	09 30	10 03	10 35	11 06
30	17 05	17 32	18 01	09 24	09 59	10 33	11 06
20	17 26	17 50	18 18	09 13	09 51	10 29	11 06
N 10	17 45	18 08	18 34	09 04	09 45	10 25	11 05
0	18 02	18 25	18 51	08 55	09 38	10 22	11 05
S 10	18 20	18 43	19 10	08 46	09 32	10 18	11 04
20	18 39	19 04	19 33	08 36	09 25	10 14	11 04
30	19 01	19 29	20 02	08 25	09 18	10 10	11 03
35	19 14	19 44	20 21	08 19	09 13	10 08	11 03
40	19 29	20 02	20 44	08 12	09 08	10 05	11 03
45	19 47	20 25	21 15	08 03	09 02	10 02	11 02
S 50	20 10	20 55	22 00	07 53	08 55	09 58	11 02
52	20 21	21 10	22 28	07 48	08 52	09 56	11 02
54	20 33	21 28	23 15	07 43	08 48	09 54	11 01
56	20 47	21 50	////	07 37	08 44	09 52	11 01
58	21 04	22 20	////	07 31	08 39	09 49	11 01
S 60	21 25	23 11	////	07 23	08 34	09 47	11 00

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
21	02 06	01 51	11 58	02 44	15 06	18	85
22	01 36	01 21	11 59	03 28	15 50	19	78
23	01 06	00 51	11 59	04 11	16 33	20	70

UT	ARIES	VENUS −4.7		MARS +0.9		JUPITER −2.7		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
24 00	92 41.1	151 47.9	S19 46.8	264 32.2	S 1 14.9	344 03.8	N22 26.2	224 55.8	S15 33.4	Acamar	315 17.8	S40 15.2
01	107 43.6	166 50.7	46.3	279 33.6	15.4	359 06.6	26.3	239 58.0	33.4	Achernar	335 26.4	S57 10.2
02	122 46.1	181 53.6	45.8	294 35.0	15.8	14 09.4	26.3	255 00.2	33.5	Acrux	173 08.8	S63 10.3
03	137 48.5	196 56.4 . .	45.2	309 36.3 . .	16.3	29 12.2 . .	26.3	270 02.4 . .	33.6	Adhara	255 11.8	S28 59.6
04	152 51.0	211 59.2	44.7	324 37.7	16.7	44 15.0	26.4	285 04.6	33.6	Aldebaran	290 48.6	N16 32.1
05	167 53.5	227 02.1	44.2	339 39.1	17.1	59 17.9	26.4	300 06.9	33.7			
06	182 55.9	242 04.9	S19 43.7	354 40.4	S 1 17.6	74 20.7	N22 26.5	315 09.1	S15 33.7	Alioth	166 20.6	N55 52.7
07	197 58.4	257 07.7	43.2	9 41.8	18.0	89 23.5	26.5	330 11.3	33.8	Alkaid	152 58.9	N49 14.4
08	213 00.9	272 10.6	42.6	24 43.2	18.5	104 26.3	26.6	345 13.5	33.9	Al Na'ir	27 43.6	S46 53.7
09	228 03.3	287 13.4 . .	42.1	39 44.6 . .	18.9	119 29.1 . .	26.6	0 15.7 . .	33.9	Alnilam	275 45.7	S 1 11.8
10	243 05.8	302 16.3	41.6	54 45.9	19.3	134 31.9	26.7	15 17.9	34.0	Alphard	217 55.5	S 8 43.3
11	258 08.3	317 19.2	41.1	69 47.3	19.8	149 34.7	26.7	30 20.2	34.0			
12	273 10.7	332 22.0	S19 40.6	84 48.7	S 1 20.2	164 37.5	N22 26.8	45 22.4	S15 34.1	Alphecca	126 11.0	N26 40.1
13	288 13.2	347 24.9	40.1	99 50.1	20.6	179 40.3	26.8	60 24.6	34.2	Alpheratz	357 43.1	N29 10.3
14	303 15.6	2 27.8	39.5	114 51.4	21.1	194 43.1	26.9	75 26.8	34.2	Altair	62 08.2	N 8 54.5
15	318 18.1	17 30.6 . .	39.0	129 52.8 . .	21.5	209 45.9 . .	26.9	90 29.0 . .	34.3	Ankaa	353 15.4	S42 14.0
16	333 20.6	32 33.5	38.5	144 54.2	21.9	224 48.7	27.0	105 31.2	34.3	Antares	112 26.1	S26 27.6
17	348 23.0	47 36.4	38.0	159 55.6	22.4	239 51.5	27.0	120 33.5	34.4			
18	3 25.5	62 39.3	S19 37.5	174 56.9	S 1 22.8	254 54.3	N22 27.0	135 35.7	S15 34.5	Arcturus	145 55.6	N19 06.5
19	18 28.0	77 42.2	37.0	189 58.3	23.3	269 57.1	27.1	150 37.9	34.5	Atria	107 28.1	S69 02.9
20	33 30.4	92 45.1	36.4	204 59.7	23.7	284 59.9	27.1	165 40.1	34.6	Avior	234 17.2	S59 33.3
21	48 32.9	107 48.0 . .	35.9	220 01.1 . .	24.1	300 02.7 . .	27.2	180 42.3 . .	34.7	Bellatrix	278 31.3	N 6 21.6
22	63 35.4	122 50.9	35.4	235 02.4	24.6	315 05.6	27.2	195 44.6	34.7	Betelgeuse	271 00.6	N 7 24.4
23	78 37.8	137 53.8	34.9	250 03.8	25.0	330 08.4	27.3	210 46.8	34.8			
25 00	93 40.3	152 56.8	S19 34.4	265 05.2	S 1 25.4	345 11.2	N22 27.3	225 49.0	S15 34.8	Canopus	263 55.4	S52 42.4
01	108 42.8	167 59.7	33.9	280 06.6	25.9	0 14.0	27.4	240 51.2	34.9	Capella	280 33.4	N46 00.6
02	123 45.2	183 02.6	33.4	295 07.9	26.3	15 16.8	27.4	255 53.4	35.0	Deneb	49 31.6	N45 20.1
03	138 47.7	198 05.6 . .	32.8	310 09.3 . .	26.7	30 19.6 . .	27.5	270 55.7 . .	35.0	Denebola	182 33.3	N14 29.5
04	153 50.1	213 08.5	32.3	325 10.7	27.2	45 22.4	27.5	285 57.9	35.1	Diphda	348 55.5	S17 54.7
05	168 52.6	228 11.4	31.8	340 12.1	27.6	60 25.2	27.6	301 00.1	35.1			
06	183 55.1	243 14.4	S19 31.3	355 13.5	S 1 28.0	75 28.0	N22 27.6	316 02.3	S15 35.2	Dubhe	193 51.1	N61 40.1
07	198 57.5	258 17.3	30.8	10 14.8	28.5	90 30.8	27.6	331 04.5	35.3	Elnath	278 11.8	N28 37.0
08	214 00.0	273 20.3	30.3	25 16.2	28.9	105 33.6	27.7	346 06.7	35.3	Eltanin	90 46.5	N51 29.4
09	229 02.5	288 23.3 . .	29.8	40 17.6 . .	29.4	120 36.4 . .	27.7	1 09.0 . .	35.4	Enif	33 47.0	N 9 56.5
10	244 04.9	303 26.2	29.3	55 19.0	29.8	135 39.2	27.8	16 11.2	35.4	Fomalhaut	15 23.7	S29 32.9
11	259 07.4	318 29.2	28.7	70 20.4	30.2	150 42.1	27.8	31 13.4	35.5			
12	274 09.9	333 32.2	S19 28.2	85 21.7	S 1 30.7	165 44.9	N22 27.9	46 15.6	S15 35.6	Gacrux	172 00.4	S57 11.2
13	289 12.3	348 35.2	27.7	100 23.1	31.1	180 47.7	27.9	61 17.8	35.6	Gienah	175 51.9	S17 37.1
14	304 14.8	3 38.1	27.2	115 24.5	31.5	195 50.5	28.0	76 20.1	35.7	Hadar	148 47.6	S60 26.1
15	319 17.2	18 41.1 . .	26.7	130 25.9 . .	32.0	210 53.3 . .	28.0	91 22.3 . .	35.7	Hamal	328 00.1	N23 31.8
16	334 19.7	33 44.1	26.2	145 27.3	32.4	225 56.1	28.1	106 24.5	35.8	Kaus Aust.	83 43.7	S34 22.5
17	349 22.2	48 47.1	25.7	160 28.6	32.8	240 58.9	28.1	121 26.7	35.9			
18	4 24.6	63 50.1	S19 25.2	175 30.0	S 1 33.3	256 01.7	N22 28.2	136 28.9	S15 35.9	Kochab	137 21.0	N74 05.7
19	19 27.1	78 53.1	24.7	190 31.4	33.7	271 04.5	28.2	151 31.2	36.0	Markab	13 38.0	N15 17.0
20	34 29.6	93 56.1	24.2	205 32.8	34.1	286 07.3	28.3	166 33.4	36.0	Menkar	314 14.4	N 4 08.6
21	49 32.0	108 59.2 . .	23.6	220 34.2 . .	34.5	301 10.2 . .	28.3	181 35.6 . .	36.1	Menkent	148 07.3	S36 26.1
22	64 34.5	124 02.2	23.1	235 35.6	35.0	316 13.0	28.3	196 37.8	36.2	Miaplacidus	221 38.8	S69 46.4
23	79 37.0	139 05.2	22.6	250 36.9	35.4	331 15.8	28.4	211 40.1	36.2			
26 00	94 39.4	154 08.2	S19 22.1	265 38.3	S 1 35.8	346 18.6	N22 28.4	226 42.3	S15 36.3	Mirfak	308 39.4	N49 54.7
01	109 41.9	169 11.3	21.6	280 39.7	36.3	1 21.4	28.5	241 44.5	36.3	Nunki	75 58.2	S26 16.6
02	124 44.4	184 14.3	21.1	295 41.1	36.7	16 24.2	28.5	256 46.7	36.4	Peacock	53 19.2	S56 41.4
03	139 46.8	199 17.4 . .	20.6	310 42.5 . .	37.1	31 27.0 . .	28.6	271 48.9 . .	36.5	Pollux	243 26.9	N27 59.3
04	154 49.3	214 20.4	20.1	325 43.9	37.6	46 29.8	28.6	286 51.2	36.5	Procyon	244 59.0	N 5 11.1
05	169 51.7	229 23.5	19.6	340 45.2	38.0	61 32.6	28.7	301 53.4	36.6			
06	184 54.2	244 26.5	S19 19.1	355 46.6	S 1 38.4	76 35.5	N22 28.7	316 55.6	S15 36.6	Rasalhague	96 06.5	N12 33.2
07	199 56.7	259 29.6	18.6	10 48.0	38.9	91 38.3	28.8	331 57.8	36.7	Regulus	207 43.0	N11 53.7
08	214 59.1	274 32.6	18.1	25 49.4	39.3	106 41.1	28.8	347 00.0	36.8	Rigel	281 11.4	S 8 11.3
09	230 01.6	289 35.7 . .	17.6	40 50.8 . .	39.7	121 43.9 . .	28.9	2 02.3 . .	36.8	Rigil Kent.	139 51.5	S60 53.2
10	245 04.1	304 38.8	17.1	55 52.2	40.2	136 46.7	28.9	17 04.5	36.9	Sabik	102 12.5	S15 44.3
11	260 06.5	319 41.9	16.6	70 53.6	40.6	151 49.5	29.0	32 06.7	36.9			
12	275 09.0	334 45.0	S19 16.1	85 54.9	S 1 41.0	166 52.3	N22 29.0	47 08.9	S15 37.0	Schedar	349 39.9	N56 37.2
13	290 11.5	349 48.0	15.6	100 56.3	41.4	181 55.1	29.0	62 11.2	37.0	Shaula	96 21.8	S37 06.6
14	305 13.9	4 51.1	15.1	115 57.7	41.9	196 57.9	29.1	77 13.4	37.1	Sirius	258 33.0	S16 44.3
15	320 16.4	19 54.2 . .	14.6	130 59.1 . .	42.3	212 00.8 . .	29.1	92 15.6 . .	37.2	Spica	158 31.0	S11 14.0
16	335 18.9	34 57.3	14.1	146 00.5	42.7	227 03.6	29.2	107 17.8	37.2	Suhail	222 51.8	S43 29.4
17	350 21.3	50 00.5	13.6	161 01.9	43.2	242 06.4	29.2	122 20.0	37.3			
18	5 23.8	65 03.6	S19 13.1	176 03.3	S 1 43.6	257 09.2	N22 29.3	137 22.3	S15 37.3	Vega	80 39.1	N38 48.0
19	20 26.2	80 06.7	12.6	191 04.7	44.0	272 12.0	29.3	152 24.5	37.4	Zuben'ubi	137 05.2	S16 05.8
20	35 28.7	95 09.8	12.1	206 06.1	44.4	287 14.8	29.4	167 26.7	37.5		SHA	Mer.Pass.
21	50 31.2	110 12.9 . .	11.6	221 07.4 . .	44.9	302 17.6 . .	29.4	182 28.9 . .	37.5		° ′	h m
22	65 33.6	125 16.1	11.1	236 08.8	45.3	317 20.5	29.5	197 31.2	37.6	Venus	59 16.5	13 46
23	80 36.1	140 19.2	10.6	251 10.2	45.7	332 23.3	29.5	212 33.4	37.6	Mars	171 24.9	6 19
	h m									Jupiter	251 30.9	0 59
Mer.Pass.	17 42.4	v 3.0	d 0.5	v 1.4	d 0.4	v 2.8	d 0.0	v 2.2	d 0.1	Saturn	132 08.7	8 55

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 24	Moonrise 25	Moonrise 26	Moonrise 27
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
24 00	180 08.9	S23 24.9	288 33.5	14.8	N 2 26.5	10.1	55.0	N 72	08 27	10 57		23 49	25 33	01 33	03 23
01	195 08.6	24.9	303 07.3	14.7	2 16.4	10.2	55.0	N 70	08 07	09 55		23 47	25 24	01 24	03 05
02	210 08.3	24.8	317 41.0	14.7	2 06.2	10.1	55.0	68	07 51	09 20		23 45	25 16	01 16	02 51
03	225 08.0 . .	24.8	332 14.7	14.6	1 56.1	10.1	55.1	66	07 38	08 55	10 35	23 43	25 10	01 10	02 40
04	240 07.7	24.7	346 48.3	14.7	1 46.0	10.2	55.1	64	07 27	08 35	09 53	23 42	25 05	01 05	02 31
05	255 07.4	24.7	1 22.0	14.6	1 35.8	10.2	55.1	62	07 17	08 19	09 25	23 41	25 00	01 00	02 23
06	270 07.0	S23 24.6	15 55.6	14.6	N 1 25.6	10.2	55.1	60	07 09	08 06	09 03	23 40	24 56	00 56	02 16
07	285 06.7	24.6	30 29.2	14.6	1 15.4	10.2	55.2	N 58	07 01	07 54	08 46	23 39	24 53	00 53	02 10
08	300 06.4	24.5	45 02.8	14.6	1 05.2	10.2	55.2	56	06 55	07 44	08 31	23 38	24 50	00 50	02 04
09	315 06.1 . .	24.5	59 36.4	14.5	0 55.0	10.3	55.2	54	06 48	07 35	08 19	23 37	24 47	00 47	02 00
10	330 05.8	24.4	74 09.9	14.6	0 44.7	10.2	55.2	52	06 43	07 27	08 07	23 36	24 45	00 45	01 55
11	345 05.5	24.4	88 43.5	14.5	0 34.5	10.3	55.3	50	06 38	07 19	07 58	23 36	24 42	00 42	01 51
12	0 05.2	S23 24.3	103 17.0	14.4	N 0 24.2	10.3	55.3	45	06 26	07 03	07 37	23 34	24 38	00 38	01 43
13	15 04.9	24.2	117 50.4	14.5	0 13.9	10.2	55.3	N 40	06 15	06 50	07 20	23 33	24 34	00 34	01 36
14	30 04.6	24.2	132 23.9	14.4	N 0 03.7	10.3	55.3	35	06 06	06 38	07 06	23 32	24 30	00 30	01 30
15	45 04.3 . .	24.1	146 57.3	14.4	S 0 06.6	10.3	55.4	30	05 57	06 27	06 54	23 32	24 27	00 27	01 25
16	60 03.9	24.1	161 30.7	14.4	0 16.9	10.4	55.4	20	05 41	06 08	06 32	23 30	24 22	00 22	01 16
17	75 03.6	24.0	176 04.1	14.3	0 27.3	10.3	55.4	N 10	05 25	05 51	06 14	23 29	24 17	00 17	01 08
18	90 03.3	S23 24.0	190 37.4	14.3	S 0 37.6	10.3	55.5	0	05 08	05 34	05 56	23 28	24 13	00 13	01 00
19	105 03.0	23.9	205 10.7	14.3	0 47.9	10.3	55.5	S 10	04 49	05 16	05 39	23 27	24 09	00 09	00 53
20	120 02.7	23.8	219 44.0	14.2	0 58.2	10.4	55.5	20	04 26	04 55	05 20	23 25	24 04	00 04	00 45
21	135 02.4 . .	23.8	234 17.2	14.2	1 08.6	10.3	55.5	30	03 57	04 30	04 58	23 24	23 59	24 37	00 37
22	150 02.1	23.7	248 50.4	14.2	1 18.9	10.4	55.6	35	03 38	04 15	04 45	23 23	23 56	24 32	00 32
23	165 01.8	23.6	263 23.6	14.2	1 29.3	10.3	55.6	40	03 15	03 57	04 30	23 22	23 53	24 26	00 26
25 00	180 01.5	S23 23.6	277 56.8	14.1	S 1 39.6	10.4	55.6	45	02 45	03 34	04 12	23 21	23 49	24 19	00 19
01	195 01.2	23.5	292 29.9	14.1	1 50.0	10.3	55.7	S 50	01 59	03 05	03 49	23 20	23 45	24 12	00 12
02	210 00.8	23.5	307 03.0	14.0	2 00.3	10.4	55.7	52	01 31	02 50	03 38	23 20	23 43	24 08	00 08
03	225 00.5 . .	23.4	321 36.0	14.0	2 10.7	10.3	55.7	54	00 45	02 32	03 26	23 19	23 40	24 04	00 04
04	240 00.2	23.3	336 09.0	13.9	2 21.0	10.4	55.7	56	////	02 09	03 12	23 19	23 38	24 00	00 00
05	254 59.9	23.3	350 41.9	14.0	2 31.4	10.4	55.8	58	////	01 39	02 55	23 18	23 35	23 55	24 19
06	269 59.6	S23 23.2	5 14.9	13.8	S 2 41.8	10.3	55.8	S 60	////	00 49	02 35	23 17	23 32	23 49	24 11
07	284 59.3	23.1	19 47.7	13.9	2 52.1	10.4	55.8								
08	299 59.0	23.0	34 20.6	13.8	3 02.5	10.3	55.9								
09	314 58.7 . .	23.0	48 53.4	13.7	3 12.8	10.4	55.9								
10	329 58.4	22.9	63 26.1	13.7	3 23.2	10.4	55.9								
11	344 58.1	22.8	77 58.8	13.7	3 33.6	10.3	56.0								
12	359 57.7	S23 22.8	92 31.5	13.6	S 3 43.9	10.3	56.0								
13	14 57.4	22.7	107 04.1	13.6	3 54.2	10.4	56.0								
14	29 57.1	22.6	121 36.7	13.5	4 04.6	10.3	56.1								
15	44 56.8 . .	22.5	136 09.2	13.5	4 14.9	10.3	56.1								
16	59 56.5	22.4	150 41.7	13.4	4 25.2	10.3	56.1								
17	74 56.2	22.4	165 14.1	13.4	4 35.5	10.4	56.2								
18	89 55.9	S23 22.3	179 46.5	13.3	S 4 45.9	10.2	56.2								
19	104 55.6	22.2	194 18.8	13.3	4 56.1	10.3	56.2								
20	119 55.3	22.1	208 51.1	13.2	5 06.4	10.3	56.3								
21	134 55.0 . .	22.1	223 23.3	13.2	5 16.7	10.3	56.3								
22	149 54.7	22.0	237 55.5	13.1	5 27.0	10.2	56.3								
23	164 54.3	21.9	252 27.6	13.1	5 37.2	10.3	56.4								
26 00	179 54.0	S23 21.8	266 59.7	13.0	S 5 47.5	10.2	56.4								
01	194 53.7	21.7	281 31.7	12.9	5 57.7	10.2	56.4								
02	209 53.4	21.6	296 03.6	12.9	6 07.9	10.2	56.5								
03	224 53.1 . .	21.5	310 35.5	12.8	6 18.1	10.2	56.5								
04	239 52.8	21.5	325 07.3	12.8	6 28.3	10.1	56.5								
05	254 52.5	21.4	339 39.1	12.7	6 38.4	10.2	56.6								
06	269 52.2	S23 21.3	354 10.8	12.6	S 6 48.6	10.1	56.6								
07	284 51.9	21.2	8 42.4	12.6	6 58.7	10.1	56.6								
08	299 51.6	21.1	23 14.0	12.5	7 08.8	10.1	56.7								
09	314 51.3 . .	21.0	37 45.5	12.5	7 18.9	10.0	56.7								
10	329 50.9	20.9	52 17.0	12.4	7 28.9	10.0	56.7								
11	344 50.6	20.8	66 48.4	12.3	7 38.9	10.1	56.8								
12	359 50.3	S23 20.7	81 19.7	12.3	S 7 49.0	9.9	56.8								
13	14 50.0	20.6	95 51.0	12.1	7 58.9	10.0	56.9								
14	29 49.7	20.5	110 22.1	12.2	8 08.9	9.9	56.9								
15	44 49.4 . .	20.4	124 53.3	12.0	8 18.8	9.9	56.9								
16	59 49.1	20.4	139 24.3	12.0	8 28.7	9.9	57.0								
17	74 48.8	20.3	153 55.3	11.9	8 38.6	9.9	57.0								
18	89 48.5	S23 20.2	168 26.2	11.9	S 8 48.5	9.8	57.0								
19	104 48.2	20.1	182 57.1	11.7	8 58.3	9.8	57.1								
20	119 47.9	20.0	197 27.8	11.7	9 08.1	9.7	57.1								
21	134 47.6 . .	19.9	211 58.5	11.6	9 17.8	9.8	57.2								
22	149 47.2	19.8	226 29.1	11.6	9 27.6	9.6	57.2								
23	164 46.9	19.7	240 59.7	11.5	S 9 37.2	9.7	57.2								
	SD 16.3	d 0.1	SD 15.1		15.3		15.5								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 24	Moonset 25	Moonset 26	Moonset 27
°	h m	h m	h m	h m	h m	h m	h m
N 72		13 04	15 34	11 11	11 02	10 53	10 43
N 70		14 05	15 53	11 10	11 07	11 05	11 02
68		14 40	16 09	11 10	11 11	11 14	11 17
66	13 25	15 05	16 22	11 09	11 15	11 21	11 30
64	14 07	15 25	16 34	11 09	11 18	11 28	11 40
62	14 35	15 41	16 43	11 09	11 20	11 33	11 49
60	14 57	15 55	16 51	11 08	11 23	11 38	11 57
N 58	15 14	16 06	16 59	11 08	11 25	11 43	12 04
56	15 29	16 17	17 06	11 08	11 26	11 47	12 10
54	15 42	16 26	17 12	11 08	11 28	11 50	12 15
52	15 53	16 34	17 18	11 07	11 30	11 53	12 20
50	16 03	16 41	17 23	11 07	11 31	11 56	12 25
45	16 23	16 57	17 35	11 07	11 34	12 02	12 34
N 40	16 40	17 11	17 45	11 07	11 36	12 08	12 42
35	16 54	17 23	17 54	11 06	11 38	12 12	12 49
30	17 07	17 33	18 03	11 06	11 40	12 16	12 56
20	17 28	17 52	18 19	11 06	11 44	12 23	13 06
N 10	17 46	18 09	18 36	11 05	11 46	12 30	13 16
0	18 04	18 26	18 53	11 05	11 49	12 35	13 24
S 10	18 21	18 45	19 12	11 04	11 52	12 41	13 33
20	18 40	19 05	19 34	11 04	11 55	12 47	13 43
30	19 02	19 30	20 03	11 03	11 58	12 54	13 53
35	19 15	19 45	20 22	11 03	12 00	12 58	14 00
40	19 30	20 03	20 45	11 03	12 02	13 03	14 07
45	19 48	20 26	21 16	11 02	12 04	13 09	14 15
S 50	20 11	20 55	22 01	11 02	12 07	13 15	14 25
52	20 22	21 11	22 29	11 02	12 09	13 18	14 30
54	20 34	21 28	23 14	11 01	12 10	13 21	14 35
56	20 48	21 51	////	11 01	12 12	13 25	14 40
58	21 05	22 20	////	11 01	12 14	13 29	14 47
S 60	21 25	23 10	////	11 00	12 16	13 34	14 54

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
24	00 36	00 21	12 00	04 54	17 16	21	61
25	00 06	00 08	12 00	05 38	18 01	22	51
26	00 23	00 38	12 01	06 24	18 48	23	41

UT	ARIES	VENUS −4.6		MARS +0.9		JUPITER −2.7		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
27 00	95 38.6	155 22.3	S19 10.1	266 11.6	S 1 46.2	347 26.1	N22 29.6	227 35.6	S15 37.7	Acamar	315 17.8	S40 15.2
01	110 41.0	170 25.5	09.6	281 13.0	46.6	2 28.9	29.6	242 37.8	37.8	Achernar	335 26.4	S57 10.2
02	125 43.5	185 28.6	09.1	296 14.4	47.0	17 31.7	29.6	257 40.1	37.8	Acrux	173 08.7	S63 10.3
03	140 46.0	200 31.8	. . 08.6	311 15.8	. . 47.4	32 34.5	. . 29.7	272 42.3	. . 37.9	Adhara	255 11.8	S28 59.7
04	155 48.4	215 34.9	08.1	326 17.2	47.9	47 37.3	29.7	287 44.5	37.9	Aldebaran	290 48.6	N16 32.1
05	170 50.9	230 38.1	07.6	341 18.6	48.3	62 40.1	29.8	302 46.7	38.0			
06	185 53.3	245 41.3	S19 07.1	356 20.0	S 1 48.7	77 43.0	N22 29.8	317 49.0	S15 38.0	Alioth	166 20.5	N55 52.7
07	200 55.8	260 44.4	06.6	11 21.4	49.1	92 45.8	29.9	332 51.2	38.1	Alkaid	152 58.8	N49 14.4
08	215 58.3	275 47.6	06.1	26 22.8	49.6	107 48.6	29.9	347 53.4	38.2	Al Na'ir	27 43.6	S46 53.7
F 09	231 00.7	290 50.8	. . 05.6	41 24.2	. . 50.0	122 51.4	. . 30.0	2 55.6	. . 38.2	Alnilam	275 45.6	S 1 11.8
R 10	246 03.2	305 54.0	05.1	56 25.6	50.4	137 54.2	30.0	17 57.8	38.3	Alphard	217 55.5	S 8 43.3
I 11	261 05.7	320 57.1	04.6	71 26.9	50.8	152 57.0	30.1	33 00.1	38.3			
D 12	276 08.1	336 00.3	S19 04.1	86 28.3	S 1 51.3	167 59.9	N22 30.1	48 02.3	S15 38.4	Alphecca	126 11.0	N26 40.0
A 13	291 10.6	351 03.5	03.6	101 29.7	51.7	183 02.7	30.2	63 04.5	38.5	Alpheratz	357 43.1	N29 10.3
Y 14	306 13.1	6 06.7	03.1	116 31.1	52.1	198 05.5	30.2	78 06.7	38.5	Altair	62 08.2	N 8 54.5
15	321 15.5	21 09.9	. . 02.6	131 32.5	. . 52.6	213 08.3	. . 30.3	93 09.0	. . 38.6	Ankaa	353 15.4	S42 14.0
16	336 18.0	36 13.1	02.1	146 33.9	53.0	228 11.1	30.3	108 11.2	38.6	Antares	112 26.1	S26 27.6
17	351 20.5	51 16.4	01.6	161 35.3	53.4	243 13.9	30.3	123 13.4	38.7			
18	6 22.9	66 19.6	S19 01.1	176 36.7	S 1 53.8	258 16.7	N22 30.4	138 15.6	S15 38.7	Arcturus	145 55.6	N19 06.5
19	21 25.4	81 22.8	00.6	191 38.1	54.2	273 19.6	30.4	153 17.9	38.8	Atria	107 28.1	S69 02.9
20	36 27.8	96 26.0	19 00.2	206 39.5	54.7	288 22.4	30.5	168 20.1	38.9	Avior	234 17.2	S59 33.3
21	51 30.3	111 29.3	18 59.7	221 40.9	. . 55.1	303 25.2	. . 30.5	183 22.3	. . 38.9	Bellatrix	278 31.3	N 6 21.5
22	66 32.8	126 32.5	59.2	236 42.3	55.5	318 28.0	30.6	198 24.5	39.0	Betelgeuse	271 00.5	N 7 24.4
23	81 35.2	141 35.7	58.7	251 43.7	55.9	333 30.8	30.6	213 26.8	39.0			
28 00	96 37.7	156 39.0	S18 58.2	266 45.1	S 1 56.4	348 33.6	N22 30.7	228 29.0	S15 39.1	Canopus	263 55.4	S52 42.4
01	111 40.2	171 42.2	57.7	281 46.5	56.8	3 36.5	30.7	243 31.2	39.2	Capella	280 33.4	N46 00.6
02	126 42.6	186 45.5	57.2	296 47.9	57.2	18 39.3	30.8	258 33.5	39.2	Deneb	49 31.6	N45 20.1
03	141 45.1	201 48.7	. . 56.7	311 49.3	. . 57.6	33 42.1	. . 30.8	273 35.7	. . 39.3	Denebola	182 33.2	N14 29.5
04	156 47.6	216 52.0	56.2	326 50.7	58.1	48 44.9	30.9	288 37.9	39.3	Diphda	348 55.5	S17 54.7
05	171 50.0	231 55.3	55.7	341 52.1	58.5	63 47.7	30.9	303 40.1	39.4			
06	186 52.5	246 58.5	S18 55.3	356 53.5	S 1 58.9	78 50.5	N22 30.9	318 42.4	S15 39.4	Dubhe	193 51.1	N61 40.1
07	201 55.0	262 01.8	54.8	11 54.9	59.3	93 53.4	31.0	333 44.6	39.5	Elnath	278 11.8	N28 37.0
S 08	216 57.4	277 05.1	54.3	26 56.3	1 59.8	108 56.2	31.0	348 46.8	39.6	Eltanin	90 46.5	N51 29.4
A 09	231 59.9	292 08.4	. . 53.8	41 57.7	2 00.2	123 59.0	. . 31.1	3 49.0	. . 39.6	Enif	33 47.0	N 9 56.5
T 10	247 02.3	307 11.7	53.3	56 59.1	00.6	139 01.8	31.1	18 51.3	39.7	Fomalhaut	15 23.7	S29 32.9
U 11	262 04.8	322 15.0	52.8	72 00.5	01.0	154 04.6	31.2	33 53.5	39.7			
R 12	277 07.3	337 18.3	S18 52.3	87 01.9	S 2 01.4	169 07.4	N22 31.2	48 55.7	S15 39.8	Gacrux	172 00.4	S57 11.2
D 13	292 09.7	352 21.6	51.9	102 03.3	01.9	184 10.3	31.3	63 57.9	39.8	Gienah	175 51.9	S17 37.1
A 14	307 12.2	7 24.9	51.4	117 04.7	02.3	199 13.1	31.3	79 00.2	39.9	Hadar	148 47.5	S60 26.1
Y 15	322 14.7	22 28.2	. . 50.9	132 06.1	. . 02.7	214 15.9	. . 31.4	94 02.4	. . 40.0	Hamal	328 00.1	N23 31.8
16	337 17.1	37 31.5	50.4	147 07.5	03.1	229 18.7	31.4	109 04.6	40.0	Kaus Aust.	83 43.7	S34 22.5
17	352 19.6	52 34.8	49.9	162 08.9	03.5	244 21.5	31.5	124 06.9	40.1			
18	7 22.1	67 38.1	S18 49.4	177 10.3	S 2 04.0	259 24.3	N22 31.5	139 09.1	S15 40.1	Kochab	137 20.9	N74 05.7
19	22 24.5	82 41.5	49.0	192 11.7	04.4	274 27.2	31.6	154 11.3	40.2	Markab	13 38.1	N15 17.0
20	37 27.0	97 44.8	48.5	207 13.1	04.8	289 30.0	31.6	169 13.5	40.2	Menkar	314 14.4	N 4 08.6
21	52 29.4	112 48.1	. . 48.0	222 14.5	. . 05.2	304 32.8	. . 31.6	184 15.8	. . 40.3	Menkent	148 07.3	S36 26.1
22	67 31.9	127 51.5	47.5	237 16.0	05.6	319 35.6	31.7	199 18.0	40.4	Miaplacidus	221 38.7	S69 46.4
23	82 34.4	142 54.8	47.0	252 17.4	06.1	334 38.4	31.7	214 20.2	40.4			
29 00	97 36.8	157 58.2	S18 46.5	267 18.8	S 2 06.5	349 41.3	N22 31.8	229 22.4	S15 40.5	Mirfak	308 39.4	N49 54.7
01	112 39.3	173 01.5	46.1	282 20.2	06.9	4 44.1	31.8	244 24.7	40.5	Nunki	75 58.2	S26 16.6
02	127 41.8	188 04.9	45.6	297 21.6	07.3	19 46.9	31.9	259 26.9	40.6	Peacock	53 19.2	S56 41.3
03	142 44.2	203 08.2	. . 45.1	312 23.0	. . 07.7	34 49.7	. . 31.9	274 29.1	. . 40.6	Pollux	243 26.9	N27 59.3
04	157 46.7	218 11.6	44.6	327 24.4	08.2	49 52.5	32.0	289 31.4	40.7	Procyon	244 59.0	N 5 11.1
05	172 49.2	233 15.0	44.2	342 25.8	08.6	64 55.4	32.0	304 33.6	40.8			
06	187 51.6	248 18.3	S18 43.7	357 27.2	S 2 09.0	79 58.2	N22 32.1	319 35.8	S15 40.8	Rasalhague	96 06.4	N12 33.1
07	202 54.1	263 21.7	43.2	12 28.6	09.4	95 01.0	32.1	334 38.0	40.9	Regulus	207 42.9	N11 53.7
08	217 56.6	278 25.1	42.7	27 30.0	09.8	110 03.8	32.2	349 40.3	40.9	Rigel	281 11.4	S 8 11.3
S 09	232 59.0	293 28.5	. . 42.2	42 31.4	. . 10.3	125 06.6	. . 32.2	4 42.5	. . 41.0	Rigil Kent.	139 51.5	S60 53.2
U 10	248 01.5	308 31.9	41.8	57 32.8	10.7	140 09.5	32.2	19 44.7	41.0	Sabik	102 12.4	S15 44.3
N 11	263 03.9	323 35.3	41.3	72 34.3	11.1	155 12.3	32.3	34 47.0	41.1			
D 12	278 06.4	338 38.7	S18 40.8	87 35.7	S 2 11.5	170 15.1	N22 32.3	49 49.2	S15 41.2	Schedar	349 39.9	N56 37.2
A 13	293 08.9	353 42.1	40.3	102 37.1	11.9	185 17.9	32.4	64 51.4	41.2	Shaula	96 21.8	S37 06.6
Y 14	308 11.3	8 45.5	39.9	117 38.5	12.3	200 20.7	32.4	79 53.7	41.3	Sirius	258 33.0	S16 44.3
15	323 13.8	23 48.9	. . 39.4	132 39.9	. . 12.8	215 23.5	. . 32.5	94 55.9	. . 41.3	Spica	158 30.9	S11 14.0
16	338 16.3	38 52.3	38.9	147 41.3	13.2	230 26.4	32.5	109 58.1	41.4	Suhail	222 51.8	S43 29.4
17	353 18.7	53 55.7	38.4	162 42.7	13.6	245 29.2	32.6	125 00.3	41.4			
18	8 21.2	68 59.2	S18 38.0	177 44.1	S 2 14.0	260 32.0	N22 32.6	140 02.6	S15 41.5	Vega	80 39.1	N38 48.0
19	23 23.7	84 02.6	37.5	192 45.5	14.4	275 34.8	32.7	155 04.8	41.5	Zuben'ubi	137 05.2	S16 05.8
20	38 26.1	99 06.0	37.0	207 47.0	14.8	290 37.7	32.7	170 07.0	41.6		SHA	Mer.Pass.
21	53 28.6	114 09.5	. . 36.5	222 48.4	. . 15.3	305 40.5	. . 32.8	185 09.3	. . 41.7		° ′	h m
22	68 31.1	129 12.9	36.1	237 49.8	15.7	320 43.3	32.8	200 11.5	41.7	Venus	60 01.3	13 30
23	83 33.5	144 16.3	35.6	252 51.2	16.1	335 46.1	32.9	215 13.7	41.8	Mars	170 07.4	6 12
	h m									Jupiter	251 55.9	0 46
Mer.Pass.	17 30.6	v 3.3	d 0.5	v 1.4	d 0.4	v 2.8	d 0.0	v 2.2	d 0.1	Saturn	131 51.3	8 45

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight Naut.	Twilight Civil	Sunrise	Moonrise 27	Moonrise 28	Moonrise 29	Moonrise 30
	GHA	Dec	GHA	v	Dec	d	HP								
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
27 00	179 46.6	S23 19.5	255 30.2	11.3	S 9 46.9	9.6	57.3	N 72	08 26	10 52	▬	03 23	05 25	07 57	▬
01	194 46.3	19.4	270 00.5	11.4	9 56.5	9.6	57.3	N 70	08 07	09 54	▬	03 05	04 54	06 50	08 50
02	209 46.0	19.3	284 30.9	11.2	10 06.1	9.5	57.4	68	07 51	09 19	▬	02 51	04 32	06 14	07 52
03	224 45.7	. . 19.2	299 01.1	11.2	10 15.6	9.5	57.4	66	07 38	08 55	10 33	02 40	04 14	05 49	07 18
04	239 45.4	19.1	313 31.3	11.0	10 25.1	9.5	57.4	64	07 27	08 35	09 52	02 31	04 00	05 29	06 53
05	254 45.1	19.0	328 01.3	11.1	10 34.6	9.4	57.5	62	07 18	08 19	09 25	02 23	03 48	05 13	06 34
06	269 44.8	S23 18.9	342 31.4	10.9	S10 44.0	9.4	57.5	60	07 09	08 06	09 03	02 16	03 38	05 00	06 18
07	284 44.5	18.8	357 01.3	10.8	10 53.4	9.3	57.6	N 58	07 02	07 55	08 46	02 10	03 29	04 48	06 04
08	299 44.2	18.7	11 31.1	10.8	11 02.7	9.3	57.6	56	06 55	07 44	08 32	02 04	03 21	04 38	05 53
F 09	314 43.9	. . 18.6	26 00.9	10.7	11 12.0	9.2	57.6	54	06 49	07 35	08 19	02 00	03 14	04 30	05 43
R 10	329 43.6	18.5	40 30.6	10.5	11 21.2	9.2	57.7	52	06 44	07 27	08 08	01 55	03 08	04 22	05 34
I 11	344 43.2	18.4	55 00.1	10.6	11 30.4	9.2	57.7	50	06 38	07 20	07 58	01 51	03 03	04 15	05 25
D 12	359 42.9	S23 18.2	69 29.7	10.4	S11 39.6	9.1	57.8	45	06 27	07 04	07 38	01 43	02 51	04 00	05 08
A 13	14 42.6	18.1	83 59.1	10.3	11 48.7	9.0	57.8	N 40	06 16	06 51	07 21	01 36	02 41	03 48	04 54
Y 14	29 42.3	18.0	98 28.4	10.3	11 57.7	9.0	57.8	35	06 07	06 39	07 07	01 30	02 32	03 37	04 42
15	44 42.0	. . 17.9	112 57.7	10.2	12 06.7	9.0	57.9	30	05 59	06 28	06 55	01 25	02 25	03 28	04 32
16	59 41.7	17.8	127 26.9	10.0	12 15.7	8.9	57.9	20	05 42	06 10	06 34	01 16	02 13	03 12	04 14
17	74 41.4	17.7	141 55.9	10.0	12 24.6	8.8	58.0	N 10	05 26	05 52	06 15	01 08	02 02	02 59	03 59
18	89 41.1	S23 17.6	156 24.9	9.9	S12 33.4	8.8	58.0	0	05 09	05 35	05 58	01 00	01 51	02 46	03 45
19	104 40.8	17.4	170 53.8	9.9	12 42.2	8.7	58.0	S 10	04 50	05 17	05 40	00 53	01 41	02 33	03 30
20	119 40.5	17.3	185 22.7	9.7	12 50.9	8.7	58.1	20	04 28	04 57	05 22	00 45	01 30	02 20	03 15
21	134 40.2	. . 17.2	199 51.4	9.6	12 59.6	8.6	58.1	30	03 59	04 32	05 00	00 37	01 18	02 05	02 58
22	149 39.9	17.1	214 20.0	9.6	13 08.2	8.5	58.2	35	03 40	04 17	04 47	00 32	01 11	01 56	02 48
23	164 39.6	17.0	228 48.6	9.5	13 16.7	8.5	58.2	40	03 17	03 59	04 32	00 26	01 03	01 46	02 36
28 00	179 39.3	S23 16.8	243 17.1	9.3	S13 25.2	8.4	58.2	45	02 47	03 37	04 14	00 19	00 54	01 34	02 22
01	194 38.9	16.7	257 45.4	9.3	13 33.6	8.4	58.3	S 50	02 02	03 07	03 51	00 12	00 43	01 20	02 06
02	209 38.6	16.6	272 13.7	9.2	13 42.0	8.2	58.3	52	01 35	02 52	03 41	00 08	00 38	01 13	01 58
03	224 38.3	. . 16.5	286 41.9	9.1	13 50.2	8.3	58.4	54	00 50	02 34	03 28	00 04	00 32	01 06	01 50
04	239 38.0	16.3	301 10.0	9.0	13 58.5	8.1	58.4	56	////	02 12	03 14	00 00	00 26	00 58	01 40
05	254 37.7	16.2	315 38.0	8.9	14 06.6	8.1	58.5	58	////	01 43	02 58	24 19	00 19	00 49	01 29
06	269 37.4	S23 16.1	330 05.9	8.9	S14 14.7	8.0	58.5	S 60	////	00 55	02 38	24 11	00 11	00 38	01 17
07	284 37.1	15.9	344 33.8	8.7	14 22.7	7.9	58.5								
S 08	299 36.8	15.8	359 01.5	8.7	14 30.6	7.9	58.6								
A 09	314 36.5	. . 15.7	13 29.2	8.5	14 38.5	7.8	58.6								
T 10	329 36.2	15.6	27 56.7	8.5	14 46.3	7.7	58.7								
U 11	344 35.9	15.4	42 24.2	8.3	14 54.0	7.6	58.7								
R 12	359 35.6	S23 15.3	56 51.5	8.3	S15 01.6	7.6	58.7								
D 13	14 35.3	15.2	71 18.8	8.2	15 09.2	7.5	58.8								
A 14	29 35.0	15.0	85 46.0	8.0	15 16.7	7.4	58.8								
Y 15	44 34.7	. . 14.9	100 13.0	8.0	15 24.1	7.3	58.9								
16	59 34.4	14.8	114 40.0	7.9	15 31.4	7.2	58.9								
17	74 34.1	14.6	129 06.9	7.8	15 38.6	7.2	58.9								
18	89 33.7	S23 14.5	143 33.7	7.7	S15 45.8	7.0	59.0								
19	104 33.4	14.3	158 00.4	7.7	15 52.8	7.0	59.0								
20	119 33.1	14.2	172 27.1	7.5	15 59.8	6.9	59.1								
21	134 32.8	. . 14.1	186 53.6	7.4	16 06.7	6.8	59.1								
22	149 32.5	13.9	201 20.0	7.4	16 13.5	6.7	59.1								
23	164 32.2	13.8	215 46.4	7.2	16 20.2	6.6	59.2								
29 00	179 31.9	S23 13.6	230 12.6	7.1	S16 26.8	6.5	59.2								
01	194 31.6	13.5	244 38.7	7.1	16 33.3	6.4	59.3								
02	209 31.3	13.4	259 04.8	7.0	16 39.7	6.3	59.3								
03	224 31.0	. . 13.2	273 30.8	6.9	16 46.0	6.2	59.3								
04	239 30.7	13.1	287 56.7	6.7	16 52.2	6.2	59.4								
05	254 30.4	12.9	302 22.4	6.7	16 58.4	6.0	59.4								
06	269 30.1	S23 12.8	316 48.1	6.6	S17 04.4	5.9	59.5								
07	284 29.8	12.6	331 13.7	6.6	17 10.3	5.8	59.5								
S 08	299 29.5	12.5	345 39.3	6.4	17 16.1	5.7	59.5								
U 09	314 29.2	. . 12.3	0 04.7	6.3	17 21.8	5.6	59.6								
N 10	329 28.9	12.2	14 30.0	6.3	17 27.4	5.5	59.6								
D 11	344 28.6	12.0	28 55.3	6.1	17 32.9	5.4	59.7								
A 12	359 28.3	S23 11.9	43 20.4	6.1	S17 38.3	5.3	59.7								
Y 13	14 28.0	11.7	57 45.5	6.0	17 43.6	5.2	59.7								
14	29 27.7	11.6	72 10.5	5.9	17 48.8	5.0	59.8								
15	44 27.4	. . 11.4	86 35.4	5.8	17 53.8	5.0	59.8								
16	59 27.1	11.3	101 00.2	5.8	17 58.8	4.8	59.8								
17	74 26.7	11.1	115 25.0	5.6	18 03.6	4.7	59.9								
18	89 26.4	S23 10.9	129 49.6	5.6	S18 08.3	4.6	59.9								
19	104 26.1	10.8	144 14.2	5.5	18 12.9	4.5	59.9								
20	119 25.8	10.6	158 38.7	5.4	18 17.4	4.4	60.0								
21	134 25.5	. . 10.5	173 03.1	5.3	18 21.8	4.2	60.0								
22	149 25.2	10.3	187 27.4	5.3	18 26.0	4.1	60.1								
23	164 24.9	10.1	201 51.7	5.2	S18 30.1	4.0	60.1								
	SD 16.3	d 0.1	SD	15.7	16.0		16.3								

Lat.	Sunset	Twilight Civil	Twilight Naut.	Moonset 27	Moonset 28	Moonset 29	Moonset 30
°	h m	h m	h m	h m	h m	h m	h m
N 72	▬	13 11	15 37	10 43	10 27	09 52	▬
N 70	▬	14 10	15 57	11 02	11 00	10 59	11 04
68	▬	14 44	16 12	11 17	11 24	11 36	12 02
66	13 30	15 09	16 25	11 30	11 42	12 02	12 36
64	14 11	15 28	16 36	11 40	11 57	12 22	13 01
62	14 39	15 44	16 46	11 49	12 10	12 39	13 21
60	15 00	15 57	16 54	11 57	12 21	12 53	13 37
N 58	15 17	16 09	17 01	12 04	12 30	13 05	13 51
56	15 32	16 19	17 08	12 10	12 38	13 15	14 03
54	15 44	16 28	17 14	12 15	12 46	13 24	14 13
52	15 55	16 36	17 20	12 20	12 52	13 32	14 22
50	16 05	16 43	17 25	12 25	12 58	13 39	14 30
45	16 26	16 59	17 37	12 34	13 11	13 55	14 48
N 40	16 42	17 13	17 47	12 42	13 22	14 08	15 02
35	16 56	17 24	17 56	12 49	13 31	14 19	15 14
30	17 09	17 35	18 05	12 56	13 39	14 29	15 25
20	17 30	17 54	18 21	13 06	13 53	14 45	15 43
N 10	17 48	18 11	18 37	13 16	14 05	15 00	15 59
0	18 05	18 28	18 54	13 24	14 17	15 13	16 14
S 10	18 23	18 46	19 13	13 33	14 28	15 27	16 28
20	18 42	19 06	19 35	13 43	14 41	15 42	16 44
30	19 04	19 31	20 04	13 53	14 55	15 58	17 02
35	19 16	19 46	20 23	14 00	15 03	16 08	17 13
40	19 31	20 04	20 46	14 07	15 12	16 19	17 25
45	19 49	20 26	21 16	14 15	15 23	16 32	17 39
S 50	20 12	20 56	22 01	14 25	15 37	16 48	17 57
52	20 22	21 11	22 28	14 30	15 43	16 56	18 05
54	20 34	21 28	23 11	14 35	15 50	17 04	18 14
56	20 48	21 50	////	14 40	15 57	17 13	18 24
58	21 05	22 19	////	14 47	16 06	17 24	18 36
S 60	21 25	23 06	////	14 54	16 16	17 36	18 49

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
27	00 53	01 08	12 01	07 12	19 38	24 31	
28	01 22	01 37	12 02	08 04	20 31	25 21	
29	01 52	02 06	12 02	09 00	21 29	26 13	

UT	ARIES	VENUS −4.4		MARS +0.9		JUPITER −2.7		SATURN +0.6		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
d h	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		° ′	° ′
30 00	98 36.0	159 19.8	S18 35.1	267 52.6	S 2 16.5	350 48.9	N22 32.9	230 16.0	S15 41.8	Acamar	315 17.8	S40 15.2
01	113 38.4	174 23.2	34.7	282 54.0	16.9	5 51.8	32.9	245 18.2	41.9	Achernar	335 26.4	S57 10.2
02	128 40.9	189 26.7	34.2	297 55.4	17.3	20 54.6	33.0	260 20.4	41.9	Acrux	173 08.7	S63 10.4
03	143 43.4	204 30.2	33.7	312 56.9	17.8	35 57.4	33.0	275 22.6	42.0	Adhara	255 11.8	S28 59.7
04	158 45.8	219 33.6	33.3	327 58.3	18.2	51 00.2	33.1	290 24.9	42.1	Aldebaran	290 48.6	N16 32.1
05	173 48.3	234 37.1	32.8	342 59.7	18.6	66 03.0	33.1	305 27.1	42.1			
06	188 50.8	249 40.6	S18 32.3	358 01.1	S 2 19.0	81 05.9	N22 33.2	320 29.3	S15 42.2	Alioth	166 20.5	N55 52.7
07	203 53.2	264 44.0	31.9	13 02.5	19.4	96 08.7	33.2	335 31.6	42.2	Alkaid	152 58.8	N49 14.4
08	218 55.7	279 47.5	31.4	28 03.9	19.8	111 11.5	33.3	350 33.8	42.3	Al Na'ir	27 43.6	S46 53.7
09	233 58.2	294 51.0	30.9	43 05.4	20.2	126 14.3	33.3	5 36.0	42.3	Alnilam	275 45.6	S 1 11.8
10	249 00.6	309 54.5	30.5	58 06.8	20.7	141 17.1	33.4	20 38.3	42.4	Alphard	217 55.4	S 8 43.3
11	264 03.1	324 58.0	30.0	73 08.2	21.1	156 20.0	33.4	35 40.5	42.4			
12	279 05.6	340 01.5	S18 29.5	88 09.6	S 2 21.5	171 22.8	N22 33.5	50 42.7	S15 42.5	Alphecca	126 11.0	N26 40.0
13	294 08.0	355 05.0	29.1	103 11.0	21.9	186 25.6	33.5	65 45.0	42.6	Alpheratz	357 43.1	N29 10.3
14	309 10.5	10 08.5	28.6	118 12.4	22.3	201 28.4	33.5	80 47.2	42.6	Altair	62 08.2	N 8 54.5
15	324 12.9	25 12.0	28.1	133 13.9	22.7	216 31.3	33.6	95 49.4	42.7	Ankaa	353 15.4	S42 14.0
16	339 15.4	40 15.5	27.7	148 15.3	23.1	231 34.1	33.6	110 51.7	42.7	Antares	112 26.1	S26 27.6
17	354 17.9	55 19.0	27.2	163 16.7	23.5	246 36.9	33.7	125 53.9	42.8			
18	9 20.3	70 22.6	S18 26.7	178 18.1	S 2 24.0	261 39.7	N22 33.7	140 56.1	S15 42.8	Arcturus	145 55.5	N19 06.5
19	24 22.8	85 26.1	26.3	193 19.5	24.4	276 42.5	33.8	155 58.4	42.9	Atria	107 28.1	S69 02.8
20	39 25.3	100 29.6	25.8	208 21.0	24.8	291 45.4	33.8	171 00.6	42.9	Avior	234 17.2	S59 33.3
21	54 27.7	115 33.2	25.4	223 22.4	25.2	306 48.2	33.9	186 02.8	43.0	Bellatrix	278 31.3	N 6 21.5
22	69 30.2	130 36.7	24.9	238 23.8	25.6	321 51.0	33.9	201 05.1	43.1	Betelgeuse	271 00.5	N 7 24.4
23	84 32.7	145 40.2	24.4	253 25.2	26.0	336 53.8	34.0	216 07.3	43.1			
31 00	99 35.1	160 43.8	S18 24.0	268 26.6	S 2 26.4	351 56.7	N22 34.0	231 09.5	S15 43.2	Canopus	263 55.4	S52 42.4
01	114 37.6	175 47.3	23.5	283 28.1	26.8	6 59.5	34.1	246 11.8	43.2	Capella	280 33.4	N46 00.6
02	129 40.1	190 50.9	23.1	298 29.5	27.2	22 02.3	34.1	261 14.0	43.3	Deneb	49 31.6	N45 20.1
03	144 42.5	205 54.4	22.6	313 30.9	27.7	37 05.1	34.1	276 16.2	43.3	Denebola	182 33.2	N14 29.4
04	159 45.0	220 58.0	22.1	328 32.3	28.1	52 07.9	34.2	291 18.5	43.4	Diphda	348 55.5	S17 54.7
05	174 47.4	236 01.6	21.7	343 33.8	28.5	67 10.8	34.2	306 20.7	43.4			
06	189 49.9	251 05.1	S18 21.2	358 35.2	S 2 28.9	82 13.6	N22 34.3	321 22.9	S15 43.5	Dubhe	193 51.1	N61 40.1
07	204 52.4	266 08.7	20.8	13 36.6	29.3	97 16.4	34.3	336 25.2	43.6	Elnath	278 11.7	N28 37.0
08	219 54.8	281 12.3	20.3	28 38.0	29.7	112 19.2	34.4	351 27.4	43.6	Eltanin	90 46.5	N51 29.3
09	234 57.3	296 15.9	19.9	43 39.5	30.1	127 22.1	34.4	6 29.6	43.7	Enif	33 47.0	N 9 56.5
10	249 59.8	311 19.5	19.4	58 40.9	30.5	142 24.9	34.5	21 31.9	43.7	Fomalhaut	15 23.8	S29 32.9
11	265 02.2	326 23.0	18.9	73 42.3	30.9	157 27.7	34.5	36 34.1	43.8			
12	280 04.7	341 26.6	S18 18.5	88 43.7	S 2 31.3	172 30.5	N22 34.6	51 36.3	S15 43.8	Gacrux	172 00.3	S57 11.3
13	295 07.2	356 30.2	18.0	103 45.2	31.8	187 33.4	34.6	66 38.6	43.9	Gienah	175 51.8	S17 37.2
14	310 09.6	11 33.8	17.6	118 46.6	32.2	202 36.2	34.7	81 40.8	43.9	Hadar	148 47.5	S60 26.1
15	325 12.1	26 37.4	17.1	133 48.0	32.6	217 39.0	34.7	96 43.0	44.0	Hamal	328 00.1	N23 31.8
16	340 14.6	41 41.0	16.7	148 49.4	33.0	232 41.8	34.7	111 45.3	44.0	Kaus Aust.	83 43.7	S34 22.5
17	355 17.0	56 44.7	16.2	163 50.9	33.4	247 44.7	34.8	126 47.5	44.1			
18	10 19.5	71 48.3	S18 15.8	178 52.3	S 2 33.8	262 47.5	N22 34.8	141 49.7	S15 44.2	Kochab	137 20.9	N74 05.7
19	25 21.9	86 51.9	15.3	193 53.7	34.2	277 50.3	34.9	156 52.0	44.2	Markab	13 38.1	N15 17.0
20	40 24.4	101 55.5	14.9	208 55.2	34.6	292 53.1	34.9	171 54.2	44.3	Menkar	314 14.4	N 4 08.6
21	55 26.9	116 59.1	14.4	223 56.6	35.0	307 55.9	35.0	186 56.4	44.3	Menkent	148 07.2	S36 26.1
22	70 29.3	132 02.8	14.0	238 58.0	35.4	322 58.8	35.0	201 58.7	44.4	Miaplacidus	221 38.7	S69 46.4
23	85 31.8	147 06.4	13.5	253 59.5	35.8	338 01.6	35.1	217 00.9	44.4			
1 00	100 34.3	162 10.0	S18 13.1	269 00.9	S 2 36.2	353 04.4	N22 35.1	232 03.1	S15 44.5	Mirfak	308 39.4	N49 54.7
01	115 36.7	177 13.7	12.6	284 02.3	36.6	8 07.2	35.2	247 05.4	44.5	Nunki	75 58.2	S26 16.6
02	130 39.2	192 17.3	12.2	299 03.7	37.1	23 10.1	35.2	262 07.6	44.6	Peacock	53 19.2	S56 41.3
03	145 41.7	207 21.0	11.7	314 05.2	37.5	38 12.9	35.3	277 09.9	44.6	Pollux	243 26.9	N27 59.3
04	160 44.1	222 24.6	11.3	329 06.6	37.9	53 15.7	35.3	292 12.1	44.7	Procyon	244 59.0	N 5 11.1
05	175 46.6	237 28.3	10.8	344 08.0	38.3	68 18.5	35.3	307 14.3	44.8			
06	190 49.0	252 31.9	S18 10.4	359 09.5	S 2 38.7	83 21.4	N22 35.4	322 16.6	S15 44.8	Rasalhague	96 06.4	N12 33.1
07	205 51.5	267 35.6	10.0	14 10.9	39.1	98 24.2	35.4	337 18.8	44.9	Regulus	207 42.9	N11 53.7
08	220 54.0	282 39.3	09.5	29 12.3	39.5	113 27.0	35.5	352 21.0	44.9	Rigel	281 11.4	S 8 11.3
09	235 56.4	297 42.9	09.1	44 13.8	39.9	128 29.8	35.5	7 23.3	45.0	Rigil Kent.	139 51.4	S60 53.2
10	250 58.9	312 46.6	08.6	59 15.2	40.3	143 32.7	35.6	22 25.5	45.0	Sabik	102 12.4	S15 44.3
11	266 01.4	327 50.3	08.2	74 16.6	40.7	158 35.5	35.6	37 27.7	45.1			
12	281 03.8	342 54.0	S18 07.7	89 18.1	S 2 41.1	173 38.3	N22 35.7	52 30.0	S15 45.1	Schedar	349 40.0	N56 37.2
13	296 06.3	357 57.7	07.3	104 19.5	41.5	188 41.1	35.7	67 32.2	45.2	Shaula	96 21.8	S37 06.6
14	311 08.8	13 01.4	06.9	119 20.9	41.9	203 44.0	35.8	82 34.5	45.2	Sirius	258 33.0	S16 44.3
15	326 11.2	28 05.0	06.4	134 22.4	42.3	218 46.8	35.8	97 36.7	45.3	Spica	158 30.9	S11 14.0
16	341 13.7	43 08.7	06.0	149 23.8	42.7	233 49.6	35.9	112 38.9	45.3	Suhail	222 51.7	S43 29.4
17	356 16.2	58 12.4	05.5	164 25.3	43.1	248 52.4	35.9	127 41.2	45.4			
18	11 18.6	73 16.1	S18 05.1	179 26.7	S 2 43.5	263 55.3	N22 35.9	142 43.4	S15 45.5	Vega	80 39.1	N38 48.0
19	26 21.1	88 19.8	04.7	194 28.1	43.9	278 58.1	36.0	157 45.6	45.5	Zuben'ubi	137 05.2	S16 05.9
20	41 23.5	103 23.6	04.2	209 29.6	44.3	294 00.9	36.0	172 47.9	45.6		SHA	Mer.Pass.
21	56 26.0	118 27.3	03.8	224 31.0	44.7	309 03.7	36.1	187 50.1	45.6		° ′	h m
22	71 28.5	133 31.0	03.3	239 32.4	45.1	324 06.6	36.1	202 52.4	45.7	Venus	61 08.7	13 14
23	86 30.9	148 34.7	02.9	254 33.9	45.5	339 09.4	36.2	217 54.6	45.7	Mars	168 51.5	6 06
	h m									Jupiter	252 21.5	0 32
Mer. Pass.	17 18.8	v 3.6	d 0.5	v 1.4	d 0.4	v 2.8	d 0.0	v 2.2	d 0.1	Saturn	131 34.4	8 34

Minutter

0-1	2-3
4-5	6-7
8-9	10-11
12-13	14-15
16-17	18-19
20-21	22-23
24-25	26-27
28-29	30-31
32-33	34-35
36-37	38-39
40-41	42-43
44-45	46-47
48-49	50-51
52-53	54-55
56-57	58-59

Tilbage til Menuen

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	v	Dec	d	HP		Naut.	Civil		30	31	1	2
d h	° ′	° ′	° ′	′	° ′	′	′	°	h m	h m	h m	h m	h m	h m	h m
30 00	179 24.6	S23 10.0	216 15.9	5.1	S18 34.1	3.9	60.1	N 72	08 25	10 45					11 14
01	194 24.3	09.8	230 40.0	5.0	18 38.0	3.7	60.2	N 70	08 06	09 51		08 50	10 16	10 32	10 33
02	209 24.0	09.7	245 04.0	4.9	18 41.7	3.6	60.2	68	07 50	09 18		07 52	09 06	09 46	10 04
03	224 23.7	09.5	259 27.9	4.9	18 45.3	3.5	60.2	66	07 38	08 54	10 29	07 18	08 29	09 15	09 43
04	239 23.4	09.3	273 51.8	4.8	18 48.8	3.4	60.3	64	07 27	08 35	09 50	06 53	08 03	08 53	09 25
05	254 23.1	09.2	288 15.6	4.7	18 52.2	3.2	60.3	62	07 18	08 19	09 23	06 34	07 42	08 34	09 11
06	269 22.8	S23 09.0	302 39.3	4.7	S18 55.4	3.1	60.3	60	07 09	08 06	09 03	06 18	07 26	08 19	08 59
07	284 22.5	08.8	317 03.0	4.6	18 58.5	3.0	60.4	N 58	07 02	07 54	08 46	06 04	07 12	08 06	08 48
08	299 22.2	08.7	331 26.6	4.6	19 01.5	2.9	60.4	56	06 56	07 44	08 31	05 53	07 00	07 55	08 39
09	314 21.9	08.5	345 50.2	4.4	19 04.4	2.7	60.4	54	06 50	07 36	08 19	05 43	06 49	07 45	08 31
10	329 21.6	08.3	0 13.6	4.4	19 07.1	2.5	60.5	52	06 44	07 28	08 08	05 34	06 40	07 37	08 24
11	344 21.3	08.2	14 37.0	4.4	19 09.6	2.5	60.5	50	06 39	07 20	07 59	05 25	06 31	07 29	08 17
12	359 21.0	S23 08.0	29 00.4	4.3	S19 12.1	2.3	60.5	45	06 27	07 05	07 38	05 08	06 13	07 12	08 03
13	14 20.7	07.8	43 23.7	4.2	19 14.4	2.2	60.5	N 40	06 17	06 51	07 22	04 54	05 59	06 58	07 51
14	29 20.4	07.6	57 46.9	4.1	19 16.6	2.0	60.6	35	06 08	06 40	07 08	04 42	05 46	06 47	07 41
15	44 20.1	07.5	72 10.0	4.2	19 18.6	1.9	60.6	30	06 00	06 29	06 56	04 32	05 36	06 36	07 32
16	59 19.8	07.3	86 33.2	4.0	19 20.5	1.7	60.6	20	05 43	06 11	06 35	04 14	05 17	06 19	07 17
17	74 19.5	07.1	100 56.2	4.0	19 22.2	1.6	60.7	N 10	05 27	05 54	06 17	03 59	05 01	06 03	07 04
18	89 19.2	S23 06.9	115 19.2	4.0	S19 23.8	1.5	60.7	0	05 11	05 37	05 59	03 45	04 46	05 49	06 51
19	104 18.9	06.8	129 42.2	3.9	19 25.3	1.4	60.7	S 10	04 52	05 19	05 42	03 30	04 31	05 35	06 39
20	119 18.6	06.6	144 05.1	3.8	19 26.7	1.1	60.7	20	04 30	04 59	05 23	03 15	04 15	05 19	06 25
21	134 18.3	06.4	158 27.9	3.9	19 27.8	1.1	60.8	30	04 01	04 34	05 02	02 58	03 57	05 02	06 10
22	149 18.0	06.2	172 50.8	3.7	19 28.9	0.9	60.8	35	03 43	04 19	04 49	02 48	03 46	04 52	06 01
23	164 17.7	06.0	187 13.5	3.7	19 29.8	0.8	60.8	40	03 20	04 01	04 34	02 36	03 34	04 40	05 51
31 00	179 17.4	S23 05.9	201 36.2	3.7	S19 30.6	0.6	60.8	45	02 50	03 39	04 16	02 22	03 20	04 26	05 39
01	194 17.1	05.7	215 58.9	3.7	19 31.2	0.5	60.9	S 50	02 06	03 10	03 54	02 06	03 02	04 09	05 25
02	209 16.8	05.5	230 21.6	3.6	19 31.7	0.3	60.9	52	01 39	02 55	03 44	01 58	02 54	04 01	05 18
03	224 16.5	05.3	244 44.2	3.6	19 32.0	0.2	60.9	54	00 58	02 38	03 31	01 50	02 45	03 53	05 10
04	239 16.2	05.1	259 06.8	3.5	19 32.2	0.0	60.9	56	////	02 16	03 18	01 40	02 35	03 43	05 02
05	254 15.9	05.0	273 29.3	3.5	19 32.2	0.1	61.0	58	////	01 48	03 01	01 29	02 23	03 31	04 52
06	269 15.6	S23 04.8	287 51.8	3.5	S19 32.1	0.2	61.0	S 60	////	01 03	02 41	01 17	02 09	03 18	04 41
07	284 15.3	04.6	302 14.3	3.4	19 31.9	0.4	61.0								
08	299 15.0	04.4	316 36.7	3.5	19 31.5	0.6	61.0								
09	314 14.7	04.2	330 59.2	3.4	19 30.9	0.7	61.1								
10	329 14.4	04.0	345 21.6	3.4	19 30.2	0.8	61.1								
11	344 14.1	03.8	359 44.0	3.3	19 29.4	1.0	61.1								
12	359 13.8	S23 03.6	14 06.3	3.4	S19 28.4	1.1	61.1								
13	14 13.5	03.4	28 28.7	3.3	19 27.3	1.3	61.1								
14	29 13.2	03.3	42 51.0	3.3	19 26.0	1.4	61.2								
15	44 12.9	03.1	57 13.3	3.3	19 24.6	1.6	61.2								
16	59 12.6	02.9	71 35.6	3.3	19 23.0	1.7	61.2								
17	74 12.3	02.7	85 57.9	3.3	19 21.3	1.9	61.2								
18	89 12.0	S23 02.5	100 20.2	3.3	S19 19.4	2.0	61.2								
19	104 11.7	02.3	114 42.5	3.3	19 17.4	2.2	61.2								
20	119 11.4	02.1	129 04.8	3.2	19 15.2	2.3	61.2								
21	134 11.1	01.9	143 27.0	3.3	19 12.9	2.4	61.3								
22	149 10.8	01.7	157 49.3	3.3	19 10.5	2.6	61.3								
23	164 10.5	01.5	172 11.6	3.3	19 07.9	2.8	61.3								
1 00	179 10.2	S23 01.3	186 33.9	3.3	S19 05.1	2.9	61.3								
01	194 09.9	01.1	200 56.2	3.2	19 02.2	3.0	61.3								
02	209 09.6	00.9	215 18.4	3.3	18 59.2	3.2	61.3								
03	224 09.3	00.7	229 40.7	3.4	18 56.0	3.3	61.3								
04	239 09.0	00.5	244 03.1	3.3	18 52.7	3.5	61.3								
05	254 08.8	00.3	258 25.4	3.3	18 49.2	3.6	61.4								
06	269 08.5	S23 00.1	272 47.7	3.4	S18 45.6	3.8	61.4								
07	284 08.2	22 59.9	287 10.1	3.4	18 41.8	3.9	61.4								
08	299 07.9	59.7	301 32.5	3.4	18 37.9	4.0	61.4								
09	314 07.6	59.5	315 54.9	3.4	18 33.9	4.2	61.4								
10	329 07.3	59.2	330 17.3	3.4	18 29.7	4.4	61.4								
11	344 07.0	59.0	344 39.7	3.5	18 25.3	4.4	61.4								
12	359 06.7	S22 58.8	359 02.2	3.5	S18 20.9	4.6	61.4								
13	14 06.4	58.6	13 24.7	3.6	18 16.3	4.8	61.4								
14	29 06.1	58.4	27 47.3	3.5	18 11.5	4.9	61.4								
15	44 05.8	58.2	42 09.8	3.6	18 06.6	5.0	61.4								
16	59 05.5	58.0	56 32.4	3.6	18 01.6	5.2	61.4								
17	74 05.2	57.8	70 55.0	3.7	17 56.4	5.2	61.4								
18	89 04.9	S22 57.6	85 17.7	3.7	S17 51.2	5.5	61.4								
19	104 04.6	57.3	99 40.4	3.8	17 45.7	5.5	61.4								
20	119 04.3	57.1	114 03.2	3.7	17 40.2	5.7	61.4								
21	134 04.0	56.9	128 25.9	3.9	17 34.5	5.8	61.4								
22	149 03.7	56.7	142 48.8	3.8	17 28.7	6.0	61.4								
23	164 03.4	56.5	157 11.6	4.0	S17 22.7	6.1	61.4								
	SD 16.3	d 0.2	SD 16.5		16.7		16.7								

Lat.	Sunset	Twilight		Moonset			
		Civil	Naut.	30	31	1	2
°	h m	h m	h m	h m	h m	h m	h m
N 72		13 21	15 42				15 12
N 70		14 16	16 01	11 04	11 48	13 44	15 52
68		14 49	16 16	12 02	12 58	14 30	16 20
66	13 37	15 13	16 29	12 36	13 35	14 59	16 41
64	14 16	15 32	16 40	13 01	14 01	15 22	16 57
62	14 43	15 47	16 49	13 21	14 21	15 40	17 11
60	15 04	16 01	16 57	13 37	14 38	15 54	17 22
N 58	15 21	16 12	17 04	13 51	14 52	16 07	17 32
56	15 35	16 22	17 11	14 03	15 04	16 18	17 41
54	15 47	16 31	17 17	14 13	15 14	16 27	17 48
52	15 58	16 39	17 22	14 22	15 24	16 36	17 55
50	16 08	16 46	17 27	14 30	15 32	16 43	18 01
45	16 28	17 02	17 39	14 48	15 50	17 00	18 15
N 40	16 45	17 15	17 49	15 02	16 04	17 13	18 25
35	16 58	17 27	17 58	15 14	16 16	17 24	18 35
30	17 11	17 37	18 07	15 25	16 27	17 34	18 43
20	17 31	17 55	18 23	15 43	16 45	17 51	18 57
N 10	17 50	18 12	18 39	15 59	17 01	18 05	19 09
0	18 07	18 29	18 55	16 14	17 16	18 19	19 20
S 10	18 24	18 47	19 14	16 28	17 31	18 32	19 31
20	18 43	19 07	19 36	16 44	17 47	18 47	19 43
30	19 04	19 32	20 05	17 02	18 05	19 03	19 57
35	19 17	19 47	20 23	17 13	18 15	19 13	20 04
40	19 32	20 05	20 46	17 25	18 27	19 23	20 13
45	19 50	20 27	21 16	17 39	18 41	19 36	20 23
S 50	20 12	20 56	22 00	17 57	18 58	19 51	20 36
52	20 22	21 10	22 26	18 05	19 07	19 59	20 41
54	20 34	21 28	23 06	18 14	19 15	20 07	20 48
56	20 48	21 49	////	18 24	19 26	20 15	20 55
58	21 04	22 17	////	18 36	19 37	20 25	21 03
S 60	21 24	23 01	////	18 49	19 50	20 37	21 11

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age	MOON Phase
d	m s	m s	h m	h m	h m	d	%
30	02 21	02 35	12 03	09 59	22 30	27	6
31	02 50	03 04	12 03	11 01	23 33	28	2
1	03 18	03 33	12 04	12 04	24 35	00	0

Forklaring

Astronomiske data

	Minutter	
Astronomiske elementer - daglige sider	0-1	2-3
	4-5	6-7
	8-9	10-11
Minuttabeller	12-13	14-15
	16-17	18-19
Supplerende tabeller	20-21	22-23
	24-25	26-27
	28-29	30-31
Stjerne- og formørkelsekort, planeter	32-33	34-35
	36-37	38-39
	40-41	42-43
	44-45	46-47
	48-49	50-51
	52-53	54-55
	56-57	58-59

m 0	SUN PLANETS	ARIES	MOON	v or Corr n d		v or Corr n d		v or Corr n d	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	0 00·0	0 00·0	0 00·0	0·0	0·0	6·0	0·1	12·0	0·1
01	0 00·3	0 00·3	0 00·2	0·1	0·0	6·1	0·1	12·1	0·1
02	0 00·5	0 00·5	0 00·5	0·2	0·0	6·2	0·1	12·2	0·1
03	0 00·8	0 00·8	0 00·7	0·3	0·0	6·3	0·1	12·3	0·1
04	0 01·0	0 01·0	0 01·0	0·4	0·0	6·4	0·1	12·4	0·1
05	0 01·3	0 01·3	0 01·2	0·5	0·0	6·5	0·1	12·5	0·1
06	0 01·5	0 01·5	0 01·4	0·6	0·0	6·6	0·1	12·6	0·1
07	0 01·8	0 01·8	0 01·7	0·7	0·0	6·7	0·1	12·7	0·1
08	0 02·0	0 02·0	0 01·9	0·8	0·0	6·8	0·1	12·8	0·1
09	0 02·3	0 02·3	0 02·1	0·9	0·0	6·9	0·1	12·9	0·1
10	0 02·5	0 02·5	0 02·4	1·0	0·0	7·0	0·1	13·0	0·1
11	0 02·8	0 02·8	0 02·6	1·1	0·0	7·1	0·1	13·1	0·1
12	0 03·0	0 03·0	0 02·9	1·2	0·0	7·2	0·1	13·2	0·1
13	0 03·3	0 03·3	0 03·1	1·3	0·0	7·3	0·1	13·3	0·1
14	0 03·5	0 03·5	0 03·3	1·4	0·0	7·4	0·1	13·4	0·1
15	0 03·8	0 03·8	0 03·6	1·5	0·0	7·5	0·1	13·5	0·1
16	0 04·0	0 04·0	0 03·8	1·6	0·0	7·6	0·1	13·6	0·1
17	0 04·3	0 04·3	0 04·1	1·7	0·0	7·7	0·1	13·7	0·1
18	0 04·5	0 04·5	0 04·3	1·8	0·0	7·8	0·1	13·8	0·1
19	0 04·8	0 04·8	0 04·5	1·9	0·0	7·9	0·1	13·9	0·1
20	0 05·0	0 05·0	0 04·8	2·0	0·0	8·0	0·1	14·0	0·1
21	0 05·3	0 05·3	0 05·0	2·1	0·0	8·1	0·1	14·1	0·1
22	0 05·5	0 05·5	0 05·2	2·2	0·0	8·2	0·1	14·2	0·1
23	0 05·8	0 05·8	0 05·5	2·3	0·0	8·3	0·1	14·3	0·1
24	0 06·0	0 06·0	0 05·7	2·4	0·0	8·4	0·1	14·4	0·1
25	0 06·3	0 06·3	0 06·0	2·5	0·0	8·5	0·1	14·5	0·1
26	0 06·5	0 06·5	0 06·2	2·6	0·0	8·6	0·1	14·6	0·1
27	0 06·8	0 06·8	0 06·4	2·7	0·0	8·7	0·1	14·7	0·1
28	0 07·0	0 07·0	0 06·7	2·8	0·0	8·8	0·1	14·8	0·1
29	0 07·3	0 07·3	0 06·9	2·9	0·0	8·9	0·1	14·9	0·1
30	0 07·5	0 07·5	0 07·2	3·0	0·0	9·0	0·1	15·0	0·1
31	0 07·8	0 07·8	0 07·4	3·1	0·0	9·1	0·1	15·1	0·1
32	0 08·0	0 08·0	0 07·6	3·2	0·0	9·2	0·1	15·2	0·1
33	0 08·3	0 08·3	0 07·9	3·3	0·0	9·3	0·1	15·3	0·1
34	0 08·5	0 08·5	0 08·1	3·4	0·0	9·4	0·1	15·4	0·1
35	0 08·8	0 08·8	0 08·4	3·5	0·0	9·5	0·1	15·5	0·1
36	0 09·0	0 09·0	0 08·6	3·6	0·0	9·6	0·1	15·6	0·1
37	0 09·3	0 09·3	0 08·8	3·7	0·0	9·7	0·1	15·7	0·1
38	0 09·5	0 09·5	0 09·1	3·8	0·0	9·8	0·1	15·8	0·1
39	0 09·8	0 09·8	0 09·3	3·9	0·0	9·9	0·1	15·9	0·1
40	0 10·0	0 10·0	0 09·5	4·0	0·0	10·0	0·1	16·0	0·1
41	0 10·3	0 10·3	0 09·8	4·1	0·0	10·1	0·1	16·1	0·1
42	0 10·5	0 10·5	0 10·0	4·2	0·0	10·2	0·1	16·2	0·1
43	0 10·8	0 10·8	0 10·3	4·3	0·0	10·3	0·1	16·3	0·1
44	0 11·0	0 11·0	0 10·5	4·4	0·0	10·4	0·1	16·4	0·1
45	0 11·3	0 11·3	0 10·7	4·5	0·0	10·5	0·1	16·5	0·1
46	0 11·5	0 11·5	0 11·0	4·6	0·0	10·6	0·1	16·6	0·1
47	0 11·8	0 11·8	0 11·2	4·7	0·0	10·7	0·1	16·7	0·1
48	0 12·0	0 12·0	0 11·5	4·8	0·0	10·8	0·1	16·8	0·1
49	0 12·3	0 12·3	0 11·7	4·9	0·0	10·9	0·1	16·9	0·1
50	0 12·5	0 12·5	0 11·9	5·0	0·0	11·0	0·1	17·0	0·1
51	0 12·8	0 12·8	0 12·2	5·1	0·0	11·1	0·1	17·1	0·1
52	0 13·0	0 13·0	0 12·4	5·2	0·0	11·2	0·1	17·2	0·1
53	0 13·3	0 13·3	0 12·6	5·3	0·0	11·3	0·1	17·3	0·1
54	0 13·5	0 13·5	0 12·9	5·4	0·0	11·4	0·1	17·4	0·1
55	0 13·8	0 13·8	0 13·1	5·5	0·0	11·5	0·1	17·5	0·1
56	0 14·0	0 14·0	0 13·4	5·6	0·0	11·6	0·1	17·6	0·1
57	0 14·3	0 14·3	0 13·6	5·7	0·0	11·7	0·1	17·7	0·1
58	0 14·5	0 14·5	0 13·8	5·8	0·0	11·8	0·1	17·8	0·1
59	0 14·8	0 14·8	0 14·1	5·9	0·0	11·9	0·1	17·9	0·1
60	0 15·0	0 15·0	0 14·3	6·0	0·1	12·0	0·1	18·0	0·2

m 1	SUN PLANETS	ARIES	MOON	v or Corr n d		v or Corr n d		v or Corr n d	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	0 15·0	0 15·0	0 14·3	0·0	0·0	6·0	0·2	12·0	0·3
01	0 15·3	0 15·3	0 14·6	0·1	0·0	6·1	0·2	12·1	0·3
02	0 15·5	0 15·5	0 14·8	0·2	0·0	6·2	0·2	12·2	0·3
03	0 15·8	0 15·8	0 15·0	0·3	0·0	6·3	0·2	12·3	0·3
04	0 16·0	0 16·0	0 15·3	0·4	0·0	6·4	0·2	12·4	0·3
05	0 16·3	0 16·3	0 15·5	0·5	0·0	6·5	0·2	12·5	0·3
06	0 16·5	0 16·5	0 15·7	0·6	0·0	6·6	0·2	12·6	0·3
07	0 16·8	0 16·8	0 16·0	0·7	0·0	6·7	0·2	12·7	0·3
08	0 17·0	0 17·0	0 16·2	0·8	0·0	6·8	0·2	12·8	0·3
09	0 17·3	0 17·3	0 16·5	0·9	0·0	6·9	0·2	12·9	0·3
10	0 17·5	0 17·5	0 16·7	1·0	0·0	7·0	0·2	13·0	0·3
11	0 17·8	0 17·8	0 16·9	1·1	0·0	7·1	0·2	13·1	0·3
12	0 18·0	0 18·0	0 17·2	1·2	0·0	7·2	0·2	13·2	0·3
13	0 18·3	0 18·3	0 17·4	1·3	0·0	7·3	0·2	13·3	0·3
14	0 18·5	0 18·6	0 17·7	1·4	0·0	7·4	0·2	13·4	0·3
15	0 18·8	0 18·8	0 17·9	1·5	0·0	7·5	0·2	13·5	0·3
16	0 19·0	0 19·1	0 18·1	1·6	0·0	7·6	0·2	13·6	0·3
17	0 19·3	0 19·3	0 18·4	1·7	0·0	7·7	0·2	13·7	0·3
18	0 19·5	0 19·6	0 18·6	1·8	0·0	7·8	0·2	13·8	0·3
19	0 19·8	0 19·8	0 18·9	1·9	0·0	7·9	0·2	13·9	0·3
20	0 20·0	0 20·1	0 19·1	2·0	0·1	8·0	0·2	14·0	0·4
21	0 20·3	0 20·3	0 19·3	2·1	0·1	8·1	0·2	14·1	0·4
22	0 20·5	0 20·6	0 19·6	2·2	0·1	8·2	0·2	14·2	0·4
23	0 20·8	0 20·8	0 19·8	2·3	0·1	8·3	0·2	14·3	0·4
24	0 21·0	0 21·1	0 20·0	2·4	0·1	8·4	0·2	14·4	0·4
25	0 21·3	0 21·3	0 20·3	2·5	0·1	8·5	0·2	14·5	0·4
26	0 21·5	0 21·6	0 20·5	2·6	0·1	8·6	0·2	14·6	0·4
27	0 21·8	0 21·8	0 20·8	2·7	0·1	8·7	0·2	14·7	0·4
28	0 22·0	0 22·1	0 21·0	2·8	0·1	8·8	0·2	14·8	0·4
29	0 22·3	0 22·3	0 21·2	2·9	0·1	8·9	0·2	14·9	0·4
30	0 22·5	0 22·6	0 21·5	3·0	0·1	9·0	0·2	15·0	0·4
31	0 22·8	0 22·8	0 21·7	3·1	0·1	9·1	0·2	15·1	0·4
32	0 23·0	0 23·1	0 22·0	3·2	0·1	9·2	0·2	15·2	0·4
33	0 23·3	0 23·3	0 22·2	3·3	0·1	9·3	0·2	15·3	0·4
34	0 23·5	0 23·6	0 22·4	3·4	0·1	9·4	0·2	15·4	0·4
35	0 23·8	0 23·8	0 22·7	3·5	0·1	9·5	0·2	15·5	0·4
36	0 24·0	0 24·1	0 22·9	3·6	0·1	9·6	0·2	15·6	0·4
37	0 24·3	0 24·3	0 23·1	3·7	0·1	9·7	0·2	15·7	0·4
38	0 24·5	0 24·6	0 23·4	3·8	0·1	9·8	0·2	15·8	0·4
39	0 24·8	0 24·8	0 23·6	3·9	0·1	9·9	0·2	15·9	0·4
40	0 25·0	0 25·1	0 23·9	4·0	0·1	10·0	0·3	16·0	0·4
41	0 25·3	0 25·3	0 24·1	4·1	0·1	10·1	0·3	16·1	0·4
42	0 25·5	0 25·6	0 24·3	4·2	0·1	10·2	0·3	16·2	0·4
43	0 25·8	0 25·8	0 24·6	4·3	0·1	10·3	0·3	16·3	0·4
44	0 26·0	0 26·1	0 24·8	4·4	0·1	10·4	0·3	16·4	0·4
45	0 26·3	0 26·3	0 25·1	4·5	0·1	10·5	0·3	16·5	0·4
46	0 26·5	0 26·6	0 25·3	4·6	0·1	10·6	0·3	16·6	0·4
47	0 26·8	0 26·8	0 25·5	4·7	0·1	10·7	0·3	16·7	0·4
48	0 27·0	0 27·1	0 25·8	4·8	0·1	10·8	0·3	16·8	0·4
49	0 27·3	0 27·3	0 26·0	4·9	0·1	10·9	0·3	16·9	0·4
50	0 27·5	0 27·6	0 26·2	5·0	0·1	11·0	0·3	17·0	0·4
51	0 27·8	0 27·8	0 26·5	5·1	0·1	11·1	0·3	17·1	0·4
52	0 28·0	0 28·1	0 26·7	5·2	0·1	11·2	0·3	17·2	0·4
53	0 28·3	0 28·3	0 27·0	5·3	0·1	11·3	0·3	17·3	0·4
54	0 28·5	0 28·6	0 27·2	5·4	0·1	11·4	0·3	17·4	0·4
55	0 28·8	0 28·8	0 27·4	5·5	0·1	11·5	0·3	17·5	0·4
56	0 29·0	0 29·1	0 27·7	5·6	0·1	11·6	0·3	17·6	0·4
57	0 29·3	0 29·3	0 27·9	5·7	0·1	11·7	0·3	17·7	0·4
58	0 29·5	0 29·6	0 28·2	5·8	0·1	11·8	0·3	17·8	0·4
59	0 29·8	0 29·8	0 28·4	5·9	0·1	11·9	0·3	17·9	0·4
60	0 30·0	0 30·1	0 28·6	6·0	0·2	12·0	0·3	18·0	0·5

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

2	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	0 30·0	0 30·1	0 28·6	0·0 0·0	6·0 0·3	12·0 0·5
01	0 30·3	0 30·3	0 28·9	0·1 0·0	6·1 0·3	12·1 0·5
02	0 30·5	0 30·6	0 29·1	0·2 0·0	6·2 0·3	12·2 0·5
03	0 30·8	0 30·8	0 29·3	0·3 0·0	6·3 0·3	12·3 0·5
04	0 31·0	0 31·1	0 29·6	0·4 0·0	6·4 0·3	12·4 0·5
05	0 31·3	0 31·3	0 29·8	0·5 0·0	6·5 0·3	12·5 0·5
06	0 31·5	0 31·6	0 30·1	0·6 0·0	6·6 0·3	12·6 0·5
07	0 31·8	0 31·8	0 30·3	0·7 0·0	6·7 0·3	12·7 0·5
08	0 32·0	0 32·1	0 30·5	0·8 0·0	6·8 0·3	12·8 0·5
09	0 32·3	0 32·3	0 30·8	0·9 0·0	6·9 0·3	12·9 0·5
10	0 32·5	0 32·6	0 31·0	1·0 0·0	7·0 0·3	13·0 0·5
11	0 32·8	0 32·8	0 31·3	1·1 0·0	7·1 0·3	13·1 0·5
12	0 33·0	0 33·1	0 31·5	1·2 0·1	7·2 0·3	13·2 0·6
13	0 33·3	0 33·3	0 31·7	1·3 0·1	7·3 0·3	13·3 0·6
14	0 33·5	0 33·6	0 32·0	1·4 0·1	7·4 0·3	13·4 0·6
15	0 33·8	0 33·8	0 32·2	1·5 0·1	7·5 0·3	13·5 0·6
16	0 34·0	0 34·1	0 32·5	1·6 0·1	7·6 0·3	13·6 0·6
17	0 34·3	0 34·3	0 32·7	1·7 0·1	7·7 0·3	13·7 0·6
18	0 34·5	0 34·6	0 32·9	1·8 0·1	7·8 0·3	13·8 0·6
19	0 34·8	0 34·8	0 33·2	1·9 0·1	7·9 0·3	13·9 0·6
20	0 35·0	0 35·1	0 33·4	2·0 0·1	8·0 0·3	14·0 0·6
21	0 35·3	0 35·3	0 33·6	2·1 0·1	8·1 0·3	14·1 0·6
22	0 35·5	0 35·6	0 33·9	2·2 0·1	8·2 0·3	14·2 0·6
23	0 35·8	0 35·8	0 34·1	2·3 0·1	8·3 0·3	14·3 0·6
24	0 36·0	0 36·1	0 34·4	2·4 0·1	8·4 0·4	14·4 0·6
25	0 36·3	0 36·3	0 34·6	2·5 0·1	8·5 0·4	14·5 0·6
26	0 36·5	0 36·6	0 34·8	2·6 0·1	8·6 0·4	14·6 0·6
27	0 36·8	0 36·9	0 35·1	2·7 0·1	8·7 0·4	14·7 0·6
28	0 37·0	0 37·1	0 35·3	2·8 0·1	8·8 0·4	14·8 0·6
29	0 37·3	0 37·4	0 35·6	2·9 0·1	8·9 0·4	14·9 0·6
30	0 37·5	0 37·6	0 35·8	3·0 0·1	9·0 0·4	15·0 0·6
31	0 37·8	0 37·9	0 36·0	3·1 0·1	9·1 0·4	15·1 0·6
32	0 38·0	0 38·1	0 36·3	3·2 0·1	9·2 0·4	15·2 0·6
33	0 38·3	0 38·4	0 36·5	3·3 0·1	9·3 0·4	15·3 0·6
34	0 38·5	0 38·6	0 36·7	3·4 0·1	9·4 0·4	15·4 0·6
35	0 38·8	0 38·9	0 37·0	3·5 0·1	9·5 0·4	15·5 0·6
36	0 39·0	0 39·1	0 37·2	3·6 0·2	9·6 0·4	15·6 0·7
37	0 39·3	0 39·4	0 37·5	3·7 0·2	9·7 0·4	15·7 0·7
38	0 39·5	0 39·6	0 37·7	3·8 0·2	9·8 0·4	15·8 0·7
39	0 39·8	0 39·9	0 37·9	3·9 0·2	9·9 0·4	15·9 0·7
40	0 40·0	0 40·1	0 38·2	4·0 0·2	10·0 0·4	16·0 0·7
41	0 40·3	0 40·4	0 38·4	4·1 0·2	10·1 0·4	16·1 0·7
42	0 40·5	0 40·6	0 38·7	4·2 0·2	10·2 0·4	16·2 0·7
43	0 40·8	0 40·9	0 38·9	4·3 0·2	10·3 0·4	16·3 0·7
44	0 41·0	0 41·1	0 39·1	4·4 0·2	10·4 0·4	16·4 0·7
45	0 41·3	0 41·4	0 39·4	4·5 0·2	10·5 0·4	16·5 0·7
46	0 41·5	0 41·6	0 39·6	4·6 0·2	10·6 0·4	16·6 0·7
47	0 41·8	0 41·9	0 39·8	4·7 0·2	10·7 0·4	16·7 0·7
48	0 42·0	0 42·1	0 40·1	4·8 0·2	10·8 0·5	16·8 0·7
49	0 42·3	0 42·4	0 40·3	4·9 0·2	10·9 0·5	16·9 0·7
50	0 42·5	0 42·6	0 40·6	5·0 0·2	11·0 0·5	17·0 0·7
51	0 42·8	0 42·9	0 40·8	5·1 0·2	11·1 0·5	17·1 0·7
52	0 43·0	0 43·1	0 41·0	5·2 0·2	11·2 0·5	17·2 0·7
53	0 43·3	0 43·4	0 41·3	5·3 0·2	11·3 0·5	17·3 0·7
54	0 43·5	0 43·6	0 41·5	5·4 0·2	11·4 0·5	17·4 0·7
55	0 43·8	0 43·9	0 41·8	5·5 0·2	11·5 0·5	17·5 0·7
56	0 44·0	0 44·1	0 42·0	5·6 0·2	11·6 0·5	17·6 0·7
57	0 44·3	0 44·4	0 42·2	5·7 0·2	11·7 0·5	17·7 0·7
58	0 44·5	0 44·6	0 42·5	5·8 0·2	11·8 0·5	17·8 0·7
59	0 44·8	0 44·9	0 42·7	5·9 0·2	11·9 0·5	17·9 0·7
60	0 45·0	0 45·1	0 43·0	6·0 0·3	12·0 0·5	18·0 0·8

3	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	0 45·0	0 45·1	0 43·0	0·0 0·0	6·0 0·4	12·0 0·7
01	0 45·3	0 45·4	0 43·2	0·1 0·0	6·1 0·4	12·1 0·7
02	0 45·5	0 45·6	0 43·4	0·2 0·0	6·2 0·4	12·2 0·7
03	0 45·8	0 45·9	0 43·7	0·3 0·0	6·3 0·4	12·3 0·7
04	0 46·0	0 46·1	0 43·9	0·4 0·0	6·4 0·4	12·4 0·7
05	0 46·3	0 46·4	0 44·1	0·5 0·0	6·5 0·4	12·5 0·7
06	0 46·5	0 46·6	0 44·4	0·6 0·0	6·6 0·4	12·6 0·7
07	0 46·8	0 46·9	0 44·6	0·7 0·0	6·7 0·4	12·7 0·7
08	0 47·0	0 47·1	0 44·9	0·8 0·0	6·8 0·4	12·8 0·7
09	0 47·3	0 47·4	0 45·1	0·9 0·1	6·9 0·4	12·9 0·8
10	0 47·5	0 47·6	0 45·3	1·0 0·1	7·0 0·4	13·0 0·8
11	0 47·8	0 47·9	0 45·6	1·1 0·1	7·1 0·4	13·1 0·8
12	0 48·0	0 48·1	0 45·8	1·2 0·1	7·2 0·4	13·2 0·8
13	0 48·3	0 48·4	0 46·1	1·3 0·1	7·3 0·4	13·3 0·8
14	0 48·5	0 48·6	0 46·3	1·4 0·1	7·4 0·4	13·4 0·8
15	0 48·8	0 48·9	0 46·5	1·5 0·1	7·5 0·4	13·5 0·8
16	0 49·0	0 49·1	0 46·8	1·6 0·1	7·6 0·4	13·6 0·8
17	0 49·3	0 49·4	0 47·0	1·7 0·1	7·7 0·4	13·7 0·8
18	0 49·5	0 49·6	0 47·2	1·8 0·1	7·8 0·5	13·8 0·8
19	0 49·8	0 49·9	0 47·5	1·9 0·1	7·9 0·5	13·9 0·8
20	0 50·0	0 50·1	0 47·7	2·0 0·1	8·0 0·5	14·0 0·8
21	0 50·3	0 50·4	0 48·0	2·1 0·1	8·1 0·5	14·1 0·8
22	0 50·5	0 50·6	0 48·2	2·2 0·1	8·2 0·5	14·2 0·8
23	0 50·8	0 50·9	0 48·4	2·3 0·1	8·3 0·5	14·3 0·8
24	0 51·0	0 51·1	0 48·7	2·4 0·1	8·4 0·5	14·4 0·8
25	0 51·3	0 51·4	0 48·9	2·5 0·1	8·5 0·5	14·5 0·8
26	0 51·5	0 51·6	0 49·2	2·6 0·2	8·6 0·5	14·6 0·9
27	0 51·8	0 51·9	0 49·4	2·7 0·2	8·7 0·5	14·7 0·9
28	0 52·0	0 52·1	0 49·6	2·8 0·2	8·8 0·5	14·8 0·9
29	0 52·3	0 52·4	0 49·9	2·9 0·2	8·9 0·5	14·9 0·9
30	0 52·5	0 52·6	0 50·1	3·0 0·2	9·0 0·5	15·0 0·9
31	0 52·8	0 52·9	0 50·3	3·1 0·2	9·1 0·5	15·1 0·9
32	0 53·0	0 53·1	0 50·6	3·2 0·2	9·2 0·5	15·2 0·9
33	0 53·3	0 53·4	0 50·8	3·3 0·2	9·3 0·5	15·3 0·9
34	0 53·5	0 53·6	0 51·1	3·4 0·2	9·4 0·5	15·4 0·9
35	0 53·8	0 53·9	0 51·3	3·5 0·2	9·5 0·6	15·5 0·9
36	0 54·0	0 54·1	0 51·5	3·6 0·2	9·6 0·6	15·6 0·9
37	0 54·3	0 54·4	0 51·8	3·7 0·2	9·7 0·6	15·7 0·9
38	0 54·5	0 54·6	0 52·0	3·8 0·2	9·8 0·6	15·8 0·9
39	0 54·8	0 54·9	0 52·3	3·9 0·2	9·9 0·6	15·9 0·9
40	0 55·0	0 55·2	0 52·5	4·0 0·2	10·0 0·6	16·0 0·9
41	0 55·3	0 55·4	0 52·7	4·1 0·2	10·1 0·6	16·1 0·9
42	0 55·5	0 55·7	0 53·0	4·2 0·2	10·2 0·6	16·2 0·9
43	0 55·8	0 55·9	0 53·2	4·3 0·3	10·3 0·6	16·3 1·0
44	0 56·0	0 56·2	0 53·4	4·4 0·3	10·4 0·6	16·4 1·0
45	0 56·3	0 56·4	0 53·7	4·5 0·3	10·5 0·6	16·5 1·0
46	0 56·5	0 56·7	0 53·9	4·6 0·3	10·6 0·6	16·6 1·0
47	0 56·8	0 56·9	0 54·2	4·7 0·3	10·7 0·6	16·7 1·0
48	0 57·0	0 57·2	0 54·4	4·8 0·3	10·8 0·6	16·8 1·0
49	0 57·3	0 57·4	0 54·6	4·9 0·3	10·9 0·6	16·9 1·0
50	0 57·5	0 57·7	0 54·9	5·0 0·3	11·0 0·6	17·0 1·0
51	0 57·8	0 57·9	0 55·1	5·1 0·3	11·1 0·6	17·1 1·0
52	0 58·0	0 58·2	0 55·4	5·2 0·3	11·2 0·7	17·2 1·0
53	0 58·3	0 58·4	0 55·6	5·3 0·3	11·3 0·7	17·3 1·0
54	0 58·5	0 58·7	0 55·8	5·4 0·3	11·4 0·7	17·4 1·0
55	0 58·8	0 58·9	0 56·1	5·5 0·3	11·5 0·7	17·5 1·0
56	0 59·0	0 59·2	0 56·3	5·6 0·3	11·6 0·7	17·6 1·0
57	0 59·3	0 59·4	0 56·6	5·7 0·3	11·7 0·7	17·7 1·0
58	0 59·5	0 59·7	0 56·8	5·8 0·3	11·8 0·7	17·8 1·0
59	0 59·8	0 59·9	0 57·0	5·9 0·3	11·9 0·7	17·9 1·0
60	1 00·0	1 00·2	0 57·3	6·0 0·4	12·0 0·7	18·0 1·1

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

m 4	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	1 00·0	1 00·2	0 57·3	0·0 0·0	6·0 0·5	12·0 0·9
01	1 00·3	1 00·4	0 57·5	0·1 0·0	6·1 0·5	12·1 0·9
02	1 00·5	1 00·7	0 57·7	0·2 0·0	6·2 0·5	12·2 0·9
03	1 00·8	1 00·9	0 58·0	0·3 0·0	6·3 0·5	12·3 0·9
04	1 01·0	1 01·2	0 58·2	0·4 0·0	6·4 0·5	12·4 0·9
05	1 01·3	1 01·4	0 58·5	0·5 0·0	6·5 0·5	12·5 0·9
06	1 01·5	1 01·7	0 58·7	0·6 0·0	6·6 0·5	12·6 0·9
07	1 01·8	1 01·9	0 58·9	0·7 0·1	6·7 0·5	12·7 1·0
08	1 02·0	1 02·2	0 59·2	0·8 0·1	6·8 0·5	12·8 1·0
09	1 02·3	1 02·4	0 59·4	0·9 0·1	6·9 0·5	12·9 1·0
10	1 02·5	1 02·7	0 59·7	1·0 0·1	7·0 0·5	13·0 1·0
11	1 02·8	1 02·9	0 59·9	1·1 0·1	7·1 0·5	13·1 1·0
12	1 03·0	1 03·2	1 00·1	1·2 0·1	7·2 0·5	13·2 1·0
13	1 03·3	1 03·4	1 00·4	1·3 0·1	7·3 0·5	13·3 1·0
14	1 03·5	1 03·7	1 00·6	1·4 0·1	7·4 0·6	13·4 1·0
15	1 03·8	1 03·9	1 00·8	1·5 0·1	7·5 0·6	13·5 1·0
16	1 04·0	1 04·2	1 01·1	1·6 0·1	7·6 0·6	13·6 1·0
17	1 04·3	1 04·4	1 01·3	1·7 0·1	7·7 0·6	13·7 1·0
18	1 04·5	1 04·7	1 01·6	1·8 0·1	7·8 0·6	13·8 1·0
19	1 04·8	1 04·9	1 01·8	1·9 0·1	7·9 0·6	13·9 1·0
20	1 05·0	1 05·2	1 02·0	2·0 0·2	8·0 0·6	14·0 1·1
21	1 05·3	1 05·4	1 02·3	2·1 0·2	8·1 0·6	14·1 1·1
22	1 05·5	1 05·7	1 02·5	2·2 0·2	8·2 0·6	14·2 1·1
23	1 05·8	1 05·9	1 02·8	2·3 0·2	8·3 0·6	14·3 1·1
24	1 06·0	1 06·2	1 03·0	2·4 0·2	8·4 0·6	14·4 1·1
25	1 06·3	1 06·4	1 03·2	2·5 0·2	8·5 0·6	14·5 1·1
26	1 06·5	1 06·7	1 03·5	2·6 0·2	8·6 0·6	14·6 1·1
27	1 06·8	1 06·9	1 03·7	2·7 0·2	8·7 0·7	14·7 1·1
28	1 07·0	1 07·2	1 03·9	2·8 0·2	8·8 0·7	14·8 1·1
29	1 07·3	1 07·4	1 04·2	2·9 0·2	8·9 0·7	14·9 1·1
30	1 07·5	1 07·7	1 04·4	3·0 0·2	9·0 0·7	15·0 1·1
31	1 07·8	1 07·9	1 04·7	3·1 0·2	9·1 0·7	15·1 1·1
32	1 08·0	1 08·2	1 04·9	3·2 0·2	9·2 0·7	15·2 1·1
33	1 08·3	1 08·4	1 05·1	3·3 0·2	9·3 0·7	15·3 1·1
34	1 08·5	1 08·7	1 05·4	3·4 0·3	9·4 0·7	15·4 1·2
35	1 08·8	1 08·9	1 05·6	3·5 0·3	9·5 0·7	15·5 1·2
36	1 09·0	1 09·2	1 05·9	3·6 0·3	9·6 0·7	15·6 1·2
37	1 09·3	1 09·4	1 06·1	3·7 0·3	9·7 0·7	15·7 1·2
38	1 09·5	1 09·7	1 06·3	3·8 0·3	9·8 0·7	15·8 1·2
39	1 09·8	1 09·9	1 06·6	3·9 0·3	9·9 0·7	15·9 1·2
40	1 10·0	1 10·2	1 06·8	4·0 0·3	10·0 0·8	16·0 1·2
41	1 10·3	1 10·4	1 07·0	4·1 0·3	10·1 0·8	16·1 1·2
42	1 10·5	1 10·7	1 07·3	4·2 0·3	10·2 0·8	16·2 1·2
43	1 10·8	1·10·9	1 07·5	4·3 0·3	10·3 0·8	16·3 1·2
44	1 11·0	1 11·2	1 07·8	4·4 0·3	10·4 0·8	16·4 1·2
45	1 11·3	1 11·4	1 08·0	4·5 0·3	10·5 0·8	16·5 1·2
46	1 11·5	1 11·7	1 08·2	4·6 0·3	10·6 0·8	16·6 1·2
47	1 11·8	1 11·9	1 08·5	4·7 0·4	10·7 0·8	16·7 1·3
48	1 12·0	1 12·2	1 08·7	4·8 0·4	10·8 0·8	16·8 1·3
49	1 12·3	1 12·4	1 09·0	4·9 0·4	10·9 0·8	16·9 1·3
50	1 12·5	1 12·7	1 09·2	5·0 0·4	11·0 0·8	17·0 1·3
51	1 12·8	1 12·9	1 09·4	5·1 0·4	11·1 0·8	17·1 1·3
52	1 13·0	1 13·2	1 09·7	5·2 0·4	11·2 0·8	17·2 1·3
53	1 13·3	1 13·5	1 09·9	5·3 0·4	11·3 0·8	17·3 1·3
54	1 13·5	1 13·7	1 10·2	5·4 0·4	11·4 0·9	17·4 1·3
55	1 13·8	1 14·0	1 10·4	5·5 0·4	11·5 0·9	17·5 1·3
56	1 14·0	1 14·2	1 10·6	5·6 0·4	11·6 0·9	17·6 1·3
57	1 14·3	1 14·5	1 10·9	5·7 0·4	11·7 0·9	17·7 1·3
58	1 14·5	1 14·7	1 11·1	5·8 0·4	11·8 0·9	17·8 1·3
59	1 14·8	1 15·0	1 11·3	5·9 0·4	11·9 0·9	17·9 1·3
60	1 15·0	1 15·2	1 11·6	6·0 0·5	12·0 0·9	18·0 1·4

m 5	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	1 15·0	1 15·2	1 11·6	0·0 0·0	6·0 0·6	12·0 1·1
01	1 15·3	1 15·5	1 11·8	0·1 0·0	6·1 0·6	12·1 1·1
02	1 15·5	1 15·7	1 12·1	0·2 0·0	6·2 0·6	12·2 1·1
03	1 15·8	1 16·0	1 12·3	0·3 0·0	6·3 0·6	12·3 1·1
04	1 16·0	1 16·2	1 12·5	0·4 0·0	6·4 0·6	12·4 1·1
05	1 16·3	1 16·5	1 12·8	0·5 0·0	6·5 0·6	12·5 1·1
06	1 16·5	1 16·7	1 13·0	0·6 0·1	6·6 0·6	12·6 1·2
07	1 16·8	1 17·0	1 13·3	0·7 0·1	6·7 0·6	12·7 1·2
08	1 17·0	1 17·2	1 13·5	0·8 0·1	6·8 0·6	12·8 1·2
09	1 17·3	1 17·5	1 13·7	0·9 0·1	6·9 0·6	12·9 1·2
10	1 17·5	1 17·7	1 14·0	1·0 0·1	7·0 0·6	13·0 1·2
11	1 17·8	1 18·0	1 14·2	1·1 0·1	7·1 0·7	13·1 1·2
12	1 18·0	1 18·2	1 14·4	1·2 0·1	7·2 0·7	13·2 1·2
13	1 18·3	1 18·5	1 14·7	1·3 0·1	7·3 0·7	13·3 1·2
14	1 18·5	1 18·7	1 14·9	1·4 0·1	7·4 0·7	13·4 1·2
15	1 18·8	1 19·0	1 15·2	1·5 0·1	7·5 0·7	13·5 1·2
16	1 19·0	1 19·2	1 15·4	1·6 0·1	7·6 0·7	13·6 1·2
17	1 19·3	1 19·5	1 15·6	1·7 0·2	7·7 0·7	13·7 1·3
18	1 19·5	1 19·7	1 15·9	1·8 0·2	7·8 0·7	13·8 1·3
19	1 19·8	1 20·0	1 16·1	1·9 0·2	7·9 0·7	13·9 1·3
20	1 20·0	1 20·2	1 16·4	2·0 0·2	8·0 0·7	14·0 1·3
21	1 20·3	1 20·5	1 16·6	2·1 0·2	8·1 0·7	14·1 1·3
22	1 20·5	1 20·7	1 16·8	2·2 0·2	8·2 0·8	14·2 1·3
23	1 20·8	1 21·0	1 17·1	2·3 0·2	8·3 0·8	14·3 1·3
24	1 21·0	1 21·2	1 17·3	2·4 0·2	8·4 0·8	14·4 1·3
25	1 21·3	1 21·5	1 17·5	2·5 0·2	8·5 0·8	14·5 1·3
26	1 21·5	1 21·7	1 17·8	2·6 0·2	8·6 0·8	14·6 1·3
27	1 21·8	1 22·0	1 18·0	2·7 0·2	8·7 0·8	14·7 1·3
28	1 22·0	1 22·2	1 18·3	2·8 0·3	8·8 0·8	14·8 1·4
29	1 22·3	1 22·5	1 18·5	2·9 0·3	8·9 0·8	14·9 1·4
30	1 22·5	1 22·7	1 18·7	3·0 0·3	9·0 0·8	15·0 1·4
31	1 22·8	1 23·0	1 19·0	3·1 0·3	9·1 0·8	15·1 1·4
32	1 23·0	1 23·2	1 19·2	3·2 0·3	9·2 0·8	15·2 1·4
33	1 23·3	1 23·5	1 19·5	3·3 0·3	9·3 0·9	15·3 1·4
34	1 23·5	1 23·7	1 19·7	3·4 0·3	9·4 0·9	15·4 1·4
35	1 23·8	1 24·0	1 19·9	3·5 0·3	9·5 0·9	15·5 1·4
36	1 24·0	1 24·2	1 20·2	3·6 0·3	9·6 0·9	15·6 1·4
37	1 24·3	1 24·5	1 20·4	3·7 0·3	9·7 0·9	15·7 1·4
38	1 24·5	1 24·7	1 20·7	3·8 0·3	9·8 0·9	15·8 1·4
39	1 24·8	1 25·0	1 20·9	3·9 0·4	9·9 0·9	15·9 1·5
40	1 25·0	1 25·2	1 21·1	4·0 0·4	10·0 0·9	16·0 1·5
41	1 25·3	1 25·5	1 21·4	4·1 0·4	10·1 0·9	16·1 1·5
42	1 25·5	1 25·7	1 21·6	4·2 0·4	10·2 0·9	16·2 1·5
43	1 25·8	1 26·0	1 21·8	4·3 0·4	10·3 0·9	16·3 1·5
44	1 26·0	1 26·2	1 22·1	4·4 0·4	10·4 1·0	16·4 1·5
45	1 26·3	1 26·5	1 22·3	4·5 0·4	10·5 1·0	16·5 1·5
46	1 26·5	1 26·7	1 22·6	4·6 0·4	10·6 1·0	16·6 1·5
47	1 26·8	1 27·0	1 22·8	4·7 0·4	10·7 1·0	16·7 1·5
48	1 27·0	1 27·2	1 23·0	4·8 0·4	10·8 1·0	16·8 1·5
49	1 27·3	1 27·5	1 23·3	4·9 0·4	10·9 1·0	16·9 1·5
50	1 27·5	1 27·7	1 23·5	5·0 0·5	11·0 1·0	17·0 1·6
51	1 27·8	1 28·0	1 23·8	5·1 0·5	11·1 1·0	17·1 1·6
52	1 28·0	1 28·2	1 24·0	5·2 0·5	11·2 1·0	17·2 1·6
53	1 28·3	1 28·5	1 24·2	5·3 0·5	11·3 1·0	17·3 1·6
54	1 28·5	1 28·7	1 24·5	5·4 0·5	11·4 1·0	17·4 1·6
55	1 28·8	1 29·0	1 24·7	5·5 0·5	11·5 1·1	17·5 1·6
56	1 29·0	1 29·2	1 24·9	5·6 0·5	11·6 1·1	17·6 1·6
57	1 29·3	1 29·5	1 25·2	5·7 0·5	11·7 1·1	17·7 1·6
58	1 29·5	1 29·7	1 25·4	5·8 0·5	11·8 1·1	17·8 1·6
59	1 29·8	1 30·0	1 25·7	5·9 0·5	11·9 1·1	17·9 1·6
60	1 30·0	1 30·2	1 25·9	6·0 0·6	12·0 1·1	18·0 1·7

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

m 6	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	1 30·0	1 30·2	1 25·9	0·0 0·0	6·0 0·7	12·0 1·3
01	1 30·3	1 30·5	1 26·1	0·1 0·0	6·1 0·7	12·1 1·3
02	1 30·5	1 30·7	1 26·4	0·2 0·0	6·2 0·7	12·2 1·3
03	1 30·8	1 31·0	1 26·6	0·3 0·0	6·3 0·7	12·3 1·3
04	1 31·0	1 31·2	1 26·9	0·4 0·0	6·4 0·7	12·4 1·3
05	1 31·3	1 31·5	1 27·1	0·5 0·1	6·5 0·7	12·5 1·4
06	1 31·5	1 31·8	1 27·3	0·6 0·1	6·6 0·7	12·6 1·4
07	1 31·8	1 32·0	1 27·6	0·7 0·1	6·7 0·7	12·7 1·4
08	1 32·0	1 32·3	1 27·8	0·8 0·1	6·8 0·7	12·8 1·4
09	1 32·3	1 32·5	1 28·0	0·9 0·1	6·9 0·7	12·9 1·4
10	1 32·5	1 32·8	1 28·3	1·0 0·1	7·0 0·8	13·0 1·4
11	1 32·8	1 33·0	1 28·5	1·1 0·1	7·1 0·8	13·1 1·4
12	1 33·0	1 33·3	1 28·8	1·2 0·1	7·2 0·8	13·2 1·4
13	1 33·3	1 33·5	1 29·0	1·3 0·1	7·3 0·8	13·3 1·4
14	1 33·5	1 33·8	1 29·2	1·4 0·2	7·4 0·8	13·4 1·5
15	1 33·8	1 34·0	1 29·5	1·5 0·2	7·5 0·8	13·5 1·5
16	1 34·0	1 34·3	1 29·7	1·6 0·2	7·6 0·8	13·6 1·5
17	1 34·3	1 34·5	1 30·0	1·7 0·2	7·7 0·8	13·7 1·5
18	1 34·5	1 34·8	1 30·2	1·8 0·2	7·8 0·8	13·8 1·5
19	1 34·8	1 35·0	1 30·4	1·9 0·2	7·9 0·9	13·9 1·5
20	1 35·0	1 35·3	1 30·7	2·0 0·2	8·0 0·9	14·0 1·5
21	1 35·3	1 35·5	1 30·9	2·1 0·2	8·1 0·9	14·1 1·5
22	1 35·5	1 35·8	1 31·1	2·2 0·2	8·2 0·9	14·2 1·5
23	1 35·8	1 36·0	1 31·4	2·3 0·2	8·3 0·9	14·3 1·5
24	1 36·0	1 36·3	1 31·6	2·4 0·3	8·4 0·9	14·4 1·6
25	1 36·3	1 36·5	1 31·9	2·5 0·3	8·5 0·9	14·5 1·6
26	1 36·5	1 36·8	1 32·1	2·6 0·3	8·6 0·9	14·6 1·6
27	1 36·8	1 37·0	1 32·3	2·7 0·3	8·7 0·9	14·7 1·6
28	1 37·0	1 37·3	1 32·6	2·8 0·3	8·8 1·0	14·8 1·6
29	1 37·3	1 37·5	1 32·8	2·9 0·3	8·9 1·0	14·9 1·6
30	1 37·5	1 37·8	1 33·1	3·0 0·3	9·0 1·0	15·0 1·6
31	1 37·8	1 38·0	1 33·3	3·1 0·3	9·1 1·0	15·1 1·6
32	1 38·0	1 38·3	1 33·5	3·2 0·3	9·2 1·0	15·2 1·6
33	1 38·3	1 38·5	1 33·8	3·3 0·4	9·3 1·0	15·3 1·7
34	1 38·5	1 38·8	1 34·0	3·4 0·4	9·4 1·0	15·4 1·7
35	1 38·8	1 39·0	1 34·3	3·5 0·4	9·5 1·0	15·5 1·7
36	1 39·0	1 39·3	1 34·5	3·6 0·4	9·6 1·0	15·6 1·7
37	1 39·3	1 39·5	1 34·7	3·7 0·4	9·7 1·1	15·7 1·7
38	1 39·5	1 39·8	1 35·0	3·8 0·4	9·8 1·1	15·8 1·7
39	1 39·8	1 40·0	1 35·2	3·9 0·4	9·9 1·1	15·9 1·7
40	1 40·0	1 40·3	1 35·4	4·0 0·4	10·0 1·1	16·0 1·7
41	1 40·3	1 40·5	1 35·7	4·1 0·4	10·1 1·1	16·1 1·7
42	1 40·5	1 40·8	1 35·9	4·2 0·5	10·2 1·1	16·2 1·8
43	1 40·8	1 41·0	1 36·2	4·3 0·5	10·3 1·1	16·3 1·8
44	1 41·0	1 41·3	1 36·4	4·4 0·5	10·4 1·1	16·4 1·8
45	1 41·3	1 41·5	1 36·6	4·5 0·5	10·5 1·1	16·5 1·8
46	1 41·5	1 41·8	1 36·9	4·6 0·5	10·6 1·1	16·6 1·8
47	1 41·8	1 42·0	1 37·1	4·7 0·5	10·7 1·2	16·7 1·8
48	1 42·0	1 42·3	1 37·4	4·8 0·5	10·8 1·2	16·8 1·8
49	1 42·3	1 42·5	1 37·6	4·9 0·5	10·9 1·2	16·9 1·8
50	1 42·5	1 42·8	1 37·8	5·0 0·5	11·0 1·2	17·0 1·8
51	1 42·8	1 43·0	1 38·1	5·1 0·6	11·1 1·2	17·1 1·9
52	1 43·0	1 43·3	1 38·3	5·2 0·6	11·2 1·2	17·2 1·9
53	1 43·3	1 43·5	1 38·5	5·3 0·6	11·3 1·2	17·3 1·9
54	1 43·5	1 43·8	1 38·8	5·4 0·6	11·4 1·2	17·4 1·9
55	1 43·8	1 44·0	1 39·0	5·5 0·6	11·5 1·2	17·5 1·9
56	1 44·0	1 44·3	1 39·3	5·6 0·6	11·6 1·3	17·6 1·9
57	1 44·3	1 44·5	1 39·5	5·7 0·6	11·7 1·3	17·7 1·9
58	1 44·5	1 44·8	1 39·7	5·8 0·6	11·8 1·3	17·8 1·9
59	1 44·8	1 45·0	1 40·0	5·9 0·6	11·9 1·3	17·9 1·9
60	1 45·0	1 45·3	1 40·2	6·0 0·7	12·0 1·3	18·0 2·0

m 7	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	1 45·0	1 45·3	1 40·2	0·0 0·0	6·0 0·8	12·0 1·5
01	1 45·3	1 45·5	1 40·5	0·1 0·0	6·1 0·8	12·1 1·5
02	1 45·5	1 45·8	1 40·7	0·2 0·0	6·2 0·8	12·2 1·5
03	1 45·8	1 46·0	1 40·9	0·3 0·0	6·3 0·8	12·3 1·5
04	1 46·0	1 46·3	1 41·2	0·4 0·1	6·4 0·8	12·4 1·6
05	1 46·3	1 46·5	1 41·4	0·5 0·1	6·5 0·8	12·5 1·6
06	1 46·5	1 46·8	1 41·6	0·6 0·1	6·6 0·8	12·6 1·6
07	1 46·8	1 47·0	1 41·9	0·7 0·1	6·7 0·8	12·7 1·6
08	1 47·0	1 47·3	1 42·1	0·8 0·1	6·8 0·9	12·8 1·6
09	1 47·3	1 47·5	1 42·4	0·9 0·1	6·9 0·9	12·9 1·6
10	1 47·5	1 47·8	1 42·6	1·0 0·1	7·0 0·9	13·0 1·6
11	1 47·8	1 48·0	1 42·8	1·1 0·1	7·1 0·9	13·1 1·6
12	1 48·0	1 48·3	1 43·1	1·2 0·2	7·2 0·9	13·2 1·7
13	1 48·3	1 48·5	1 43·3	1·3 0·2	7·3 0·9	13·3 1·7
14	1 48·5	1 48·8	1 43·6	1·4 0·2	7·4 0·9	13·4 1·7
15	1 48·8	1 49·0	1 43·8	1·5 0·2	7·5 0·9	13·5 1·7
16	1 49·0	1 49·3	1 44·0	1·6 0·2	7·6 1·0	13·6 1·7
17	1 49·3	1 49·5	1 44·3	1·7 0·2	7·7 1·0	13·7 1·7
18	1 49·5	1 49·8	1 44·5	1·8 0·2	7·8 1·0	13·8 1·7
19	1 49·8	1 50·1	1 44·8	1·9 0·2	7·9 1·0	13·9 1·7
20	1 50·0	1 50·3	1 45·0	2·0 0·3	8·0 1·0	14·0 1·8
21	1 50·3	1 50·6	1 45·2	2·1 0·3	8·1 1·0	14·1 1·8
22	1 50·5	1 50·8	1 45·5	2·2 0·3	8·2 1·0	14·2 1·8
23	1 50·8	1 51·1	1 45·7	2·3 0·3	8·3 1·0	14·3 1·8
24	1 51·0	1 51·3	1 45·9	2·4 0·3	8·4 1·1	14·4 1·8
25	1 51·3	1 51·6	1 46·2	2·5 0·3	8·5 1·1	14·5 1·8
26	1 51·5	1 51·8	1 46·4	2·6 0·3	8·6 1·1	14·6 1·8
27	1 51·8	1 52·1	1 46·7	2·7 0·3	8·7 1·1	14·7 1·8
28	1 52·0	1 52·3	1 46·9	2·8 0·4	8·8 1·1	14·8 1·9
29	1 52·3	1 52·6	1 47·1	2·9 0·4	8·9 1·1	14·9 1·9
30	1 52·5	1 52·8	1 47·4	3·0 0·4	9·0 1·1	15·0 1·9
31	1 52·8	1 53·1	1 47·6	3·1 0·4	9·1 1·1	15·1 1·9
32	1 53·0	1 53·3	1 47·9	3·2 0·4	9·2 1·2	15·2 1·9
33	1 53·3	1 53·6	1 48·1	3·3 0·4	9·3 1·2	15·3 1·9
34	1 53·5	1 53·8	1 48·3	3·4 0·4	9·4 1·2	15·4 1·9
35	1 53·8	1 54·1	1 48·6	3·5 0·4	9·5 1·2	15·5 1·9
36	1 54·0	1 54·3	1 48·8	3·6 0·5	9·6 1·2	15·6 2·0
37	1 54·3	1 54·6	1 49·0	3·7 0·5	9·7 1·2	15·7 2·0
38	1 54·5	1 54·8	1 49·3	3·8 0·5	9·8 1·2	15·8 2·0
39	1 54·8	1 55·1	1 49·5	3·9 0·5	9·9 1·2	15·9 2·0
40	1 55·0	1 55·3	1 49·8	4·0 0·5	10·0 1·3	16·0 2·0
41	1 55·3	1 55·6	1 50·0	4·1 0·5	10·1 1·3	16·1 2·0
42	1 55·5	1 55·8	1 50·2	4·2 0·5	10·2 1·3	16·2 2·0
43	1 55·8	1 56·1	1 50·5	4·3 0·5	10·3 1·3	16·3 2·0
44	1 56·0	1 56·3	1 50·7	4·4 0·6	10·4 1·3	16·4 2·1
45	1 56·3	1 56·6	1 51·0	4·5 0·6	10·5 1·3	16·5 2·1
46	1 56·5	1 56·8	1 51·2	4·6 0·6	10·6 1·3	16·6 2·1
47	1 56·8	1 57·1	1 51·4	4·7 0·6	10·7 1·3	16·7 2·1
48	1 57·0	1 57·3	1 51·7	4·8 0·6	10·8 1·4	16·8 2·1
49	1 57·3	1 57·6	1 51·9	4·9 0·6	10·9 1·4	16·9 2·1
50	1 57·5	1 57·8	1 52·1	5·0 0·6	11·0 1·4	17·0 2·1
51	1 57·8	1 58·1	1 52·4	5·1 0·6	11·1 1·4	17·1 2·1
52	1 58·0	1 58·3	1 52·6	5·2 0·7	11·2 1·4	17·2 2·2
53	1 58·3	1 58·6	1 52·9	5·3 0·7	11·3 1·4	17·3 2·2
54	1 58·5	1 58·8	1 53·1	5·4 0·7	11·4 1·4	17·4 2·2
55	1 58·8	1 59·1	1 53·3	5·5 0·7	11·5 1·4	17·5 2·2
56	1 59·0	1 59·3	1 53·6	5·6 0·7	11·6 1·5	17·6 2·2
57	1 59·3	1 59·6	1 53·8	5·7 0·7	11·7 1·5	17·7 2·2
58	1 59·5	1 59·8	1 54·1	5·8 0·7	11·8 1·5	17·8 2·2
59	1 59·8	2 00·1	1 54·3	5·9 0·7	11·9 1·5	17·9 2·2
60	2 00·0	2 00·3	1 54·5	6·0 0·8	12·0 1·5	18·0 2·3

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

m 8 s	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	2 00·0	2 00·3	1 54·5	0·0 0·0	6·0 0·9	12·0 1·7
01	2 00·3	2 00·6	1 54·8	0·1 0·0	6·1 0·9	12·1 1·7
02	2 00·5	2 00·8	1 55·0	0·2 0·0	6·2 0·9	12·2 1·7
03	2 00·8	2 01·1	1 55·2	0·3 0·0	6·3 0·9	12·3 1·7
04	2 01·0	2 01·3	1 55·5	0·4 0·1	6·4 0·9	12·4 1·8
05	2 01·3	2 01·6	1 55·7	0·5 0·1	6·5 0·9	12·5 1·8
06	2 01·5	2 01·8	1 56·0	0·6 0·1	6·6 0·9	12·6 1·8
07	2 01·8	2 02·1	1 56·2	0·7 0·1	6·7 0·9	12·7 1·8
08	2 02·0	2 02·3	1 56·4	0·8 0·1	6·8 1·0	12·8 1·8
09	2 02·3	2 02·6	1 56·7	0·9 0·1	6·9 1·0	12·9 1·8
10	2 02·5	2 02·8	1 56·9	1·0 0·1	7·0 1·0	13·0 1·8
11	2 02·8	2 03·1	1 57·2	1·1 0·2	7·1 1·0	13·1 1·9
12	2 03·0	2 03·3	1 57·4	1·2 0·2	7·2 1·0	13·2 1·9
13	2 03·3	2 03·6	1 57·6	1·3 0·2	7·3 1·0	13·3 1·9
14	2 03·5	2 03·8	1 57·9	1·4 0·2	7·4 1·0	13·4 1·9
15	2 03·8	2 04·1	1 58·1	1·5 0·2	7·5 1·1	13·5 1·9
16	2 04·0	2 04·3	1 58·4	1·6 0·2	7·6 1·1	13·6 1·9
17	2 04·3	2 04·6	1 58·6	1·7 0·2	7·7 1·1	13·7 1·9
18	2 04·5	2 04·8	1 58·8	1·8 0·3	7·8 1·1	13·8 2·0
19	2 04·8	2 05·1	1 59·1	1·9 0·3	7·9 1·1	13·9 2·0
20	2 05·0	2 05·3	1 59·3	2·0 0·3	8·0 1·1	14·0 2·0
21	2 05·3	2 05·6	1 59·5	2·1 0·3	8·1 1·1	14·1 2·0
22	2 05·5	2 05·8	1 59·8	2·2 0·3	8·2 1·2	14·2 2·0
23	2 05·8	2 06·1	2 00·0	2·3 0·3	8·3 1·2	14·3 2·0
24	2 06·0	2 06·3	2 00·3	2·4 0·3	8·4 1·2	14·4 2·0
25	2 06·3	2 06·6	2 00·5	2·5 0·4	8·5 1·2	14·5 2·1
26	2 06·5	2 06·8	2 00·7	2·6 0·4	8·6 1·2	14·6 2·1
27	2 06·8	2 07·1	2 01·0	2·7 0·4	8·7 1·2	14·7 2·1
28	2 07·0	2 07·3	2 01·2	2·8 0·4	8·8 1·2	14·8 2·1
29	2 07·3	2 07·6	2 01·5	2·9 0·4	8·9 1·3	14·9 2·1
30	2 07·5	2 07·8	2 01·7	3·0 0·4	9·0 1·3	15·0 2·1
31	2 07·8	2 08·1	2 01·9	3·1 0·4	9·1 1·3	15·1 2·1
32	2 08·0	2 08·4	2 02·2	3·2 0·5	9·2 1·3	15·2 2·2
33	2 08·3	2 08·6	2 02·4	3·3 0·5	9·3 1·3	15·3 2·2
34	2 08·5	2 08·9	2 02·6	3·4 0·5	9·4 1·3	15·4 2·2
35	2 08·8	2 09·1	2 02·9	3·5 0·5	9·5 1·3	15·5 2·2
36	2 09·0	2 09·4	2 03·1	3·6 0·5	9·6 1·4	15·6 2·2
37	2 09·3	2 09·6	2 03·4	3·7 0·5	9·7 1·4	15·7 2·2
38	2 09·5	2 09·9	2 03·6	3·8 0·5	9·8 1·4	15·8 2·2
39	2 09·8	2 10·1	2 03·8	3·9 0·6	9·9 1·4	15·9 2·3
40	2 10·0	2 10·4	2 04·1	4·0 0·6	10·0 1·4	16·0 2·3
41	2 10·3	2 10·6	2 04·3	4·1 0·6	10·1 1·4	16·1 2·3
42	2 10·5	2 10·9	2 04·6	4·2 0·6	10·2 1·4	16·2 2·3
43	2 10·8	2 11·1	2 04·8	4·3 0·6	10·3 1·5	16·3 2·3
44	2 11·0	2 11·4	2 05·0	4·4 0·6	10·4 1·5	16·4 2·3
45	2 11·3	2 11·6	2 05·3	4·5 0·6	10·5 1·5	16·5 2·3
46	2 11·5	2 11·9	2 05·5	4·6 0·7	10·6 1·5	16·6 2·4
47	2 11·8	2 12·1	2 05·7	4·7 0·7	10·7 1·5	16·7 2·4
48	2 12·0	2 12·4	2 06·0	4·8 0·7	10·8 1·5	16·8 2·4
49	2 12·3	2 12·6	2 06·2	4·9 0·7	10·9 1·5	16·9 2·4
50	2 12·5	2 12·9	2 06·5	5·0 0·7	11·0 1·6	17·0 2·4
51	2 12·8	2 13·1	2 06·7	5·1 0·7	11·1 1·6	17·1 2·4
52	2 13·0	2 13·4	2 06·9	5·2 0·7	11·2 1·6	17·2 2·4
53	2 13·3	2 13·6	2 07·2	5·3 0·8	11·3 1·6	17·3 2·5
54	2 13·5	2 13·9	2 07·4	5·4 0·8	11·4 1·6	17·4 2·5
55	2 13·8	2 14·1	2 07·7	5·5 0·8	11·5 1·6	17·5 2·5
56	2 14·0	2 14·4	2 07·9	5·6 0·8	11·6 1·6	17·6 2·5
57	2 14·3	2 14·6	2 08·1	5·7 0·8	11·7 1·7	17·7 2·5
58	2 14·5	2 14·9	2 08·4	5·8 0·8	11·8 1·7	17·8 2·5
59	2 14·8	2 15·1	2 08·6	5·9 0·8	11·9 1·7	17·9 2·5
60	2 15·0	2 15·4	2 08·9	6·0 0·9	12·0 1·7	18·0 2·6

m 9 s	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	2 15·0	2 15·4	2 08·9	0·0 0·0	6·0 1·0	12·0 1·9
01	2 15·3	2 15·6	2 09·1	0·1 0·0	6·1 1·0	12·1 1·9
02	2 15·5	2 15·9	2 09·3	0·2 0·0	6·2 1·0	12·2 1·9
03	2 15·8	2 16·1	2 09·6	0·3 0·0	6·3 1·0	12·3 1·9
04	2 16·0	2 16·4	2 09·8	0·4 0·1	6·4 1·0	12·4 2·0
05	2 16·3	2 16·6	2 10·0	0·5 0·1	6·5 1·0	12·5 2·0
06	2 16·5	2 16·9	2 10·3	0·6 0·1	6·6 1·0	12·6 2·0
07	2 16·8	2 17·1	2 10·5	0·7 0·1	6·7 1·1	12·7 2·0
08	2 17·0	2 17·4	2 10·8	0·8 0·1	6·8 1·1	12·8 2·0
09	2 17·3	2 17·6	2 11·0	0·9 0·1	6·9 1·1	12·9 2·0
10	2 17·5	2 17·9	2 11·2	1·0 0·2	7·0 1·1	13·0 2·1
11	2 17·8	2 18·1	2 11·5	1·1 0·2	7·1 1·1	13·1 2·1
12	2 18·0	2 18·4	2 11·7	1·2 0·2	7·2 1·1	13·2 2·1
13	2 18·3	2 18·6	2 12·0	1·3 0·2	7·3 1·2	13·3 2·1
14	2 18·5	2 18·9	2 12·2	1·4 0·2	7·4 1·2	13·4 2·1
15	2 18·8	2 19·1	2 12·4	1·5 0·2	7·5 1·2	13·5 2·1
16	2 19·0	2 19·4	2 12·7	1·6 0·3	7·6 1·2	13·6 2·2
17	2 19·3	2 19·6	2 12·9	1·7 0·3	7·7 1·2	13·7 2·2
18	2 19·5	2 19·9	2 13·1	1·8 0·3	7·8 1·2	13·8 2·2
19	2 19·8	2 20·1	2 13·4	1·9 0·3	7·9 1·3	13·9 2·2
20	2 20·0	2 20·4	2 13·6	2·0 0·3	8·0 1·3	14·0 2·2
21	2 20·3	2 20·6	2 13·9	2·1 0·3	8·1 1·3	14·1 2·2
22	2 20·5	2 20·9	2 14·1	2·2 0·3	8·2 1·3	14·2 2·2
23	2 20·8	2 21·1	2 14·3	2·3 0·4	8·3 1·3	14·3 2·3
24	2 21·0	2 21·4	2 14·6	2·4 0·4	8·4 1·3	14·4 2·3
25	2 21·3	2 21·6	2 14·8	2·5 0·4	8·5 1·3	14·5 2·3
26	2 21·5	2 21·9	2 15·1	2·6 0·4	8·6 1·4	14·6 2·3
27	2 21·8	2 22·1	2 15·3	2·7 0·4	8·7 1·4	14·7 2·3
28	2 22·0	2 22·4	2 15·5	2·8 0·4	8·8 1·4	14·8 2·3
29	2 22·3	2 22·6	2 15·8	2·9 0·5	8·9 1·4	14·9 2·4
30	2 22·5	2 22·9	2 16·0	3·0 0·5	9·0 1·4	15·0 2·4
31	2 22·8	2 23·1	2 16·2	3·1 0·5	9·1 1·4	15·1 2·4
32	2 23·0	2 23·4	2 16·5	3·2 0·5	9·2 1·5	15·2 2·4
33	2 23·3	2 23·6	2 16·7	3·3 0·5	9·3 1·5	15·3 2·4
34	2 23·5	2 23·9	2 17·0	3·4 0·5	9·4 1·5	15·4 2·4
35	2 23·8	2 24·1	2 17·2	3·5 0·6	9·5 1·5	15·5 2·5
36	2 24·0	2 24·4	2 17·4	3·6 0·6	9·6 1·5	15·6 2·5
37	2 24·3	2 24·6	2 17·7	3·7 0·6	9·7 1·5	15·7 2·5
38	2 24·5	2 24·9	2 17·9	3·8 0·6	9·8 1·6	15·8 2·5
39	2 24·8	2 25·1	2 18·2	3·9 0·6	9·9 1·6	15·9 2·5
40	2 25·0	2 25·4	2 18·4	4·0 0·6	10·0 1·6	16·0 2·5
41	2 25·3	2 25·6	2 18·6	4·1 0·6	10·1 1·6	16·1 2·5
42	2 25·5	2 25·9	2 18·9	4·2 0·7	10·2 1·6	16·2 2·6
43	2 25·8	2 26·1	2 19·1	4·3 0·7	10·3 1·6	16·3 2·6
44	2 26·0	2 26·4	2 19·3	4·4 0·7	10·4 1·6	16·4 2·6
45	2 26·3	2 26·7	2 19·6	4·5 0·7	10·5 1·7	16·5 2·6
46	2 26·5	2 26·9	2 19·8	4·6 0·7	10·6 1·7	16·6 2·6
47	2 26·8	2 27·2	2 20·1	4·7 0·7	10·7 1·7	16·7 2·6
48	2 27·0	2 27·4	2 20·3	4·8 0·8	10·8 1·7	16·8 2·7
49	2 27·3	2 27·7	2 20·5	4·9 0·8	10·9 1·7	16·9 2·7
50	2 27·5	2 27·9	2 20·8	5·0 0·8	11·0 1·7	17·0 2·7
51	2 27·8	2 28·2	2 21·0	5·1 0·8	11·1 1·8	17·1 2·7
52	2 28·0	2 28·4	2 21·3	5·2 0·8	11·2 1·8	17·2 2·7
53	2 28·3	2 28·7	2 21·5	5·3 0·8	11·3 1·8	17·3 2·7
54	2 28·5	2 28·9	2 21·7	5·4 0·9	11·4 1·8	17·4 2·8
55	2 28·8	2 29·2	2 22·0	5·5 0·9	11·5 1·8	17·5 2·8
56	2 29·0	2 29·4	2 22·2	5·6 0·9	11·6 1·8	17·6 2·8
57	2 29·3	2 29·7	2 22·5	5·7 0·9	11·7 1·9	17·7 2·8
58	2 29·5	2 29·9	2 22·7	5·8 0·9	11·8 1·9	17·8 2·8
59	2 29·8	2 30·2	2 22·9	5·9 0·9	11·9 1·9	17·9 2·8
60	2 30·0	2 30·4	2 23·2	6·0 1·0	12·0 1·9	18·0 2·9

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

Astronomiske elementer - daglige sider

10	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	2 30·0	2 30·4	2 23·2	0·0 0·0	6·0 1·1	12·0 2·1
01	2 30·3	2 30·7	2 23·4	0·1 0·0	6·1 1·1	12·1 2·1
02	2 30·5	2 30·9	2 23·6	0·2 0·0	6·2 1·1	12·2 2·1
03	2 30·8	2 31·2	2 23·9	0·3 0·1	6·3 1·1	12·3 2·2
04	2 31·0	2 31·4	2 24·1	0·4 0·1	6·4 1·1	12·4 2·2
05	2 31·3	2 31·7	2 24·4	0·5 0·1	6·5 1·1	12·5 2·2
06	2 31·5	2 31·9	2 24·6	0·6 0·1	6·6 1·2	12·6 2·2
07	2 31·8	2 32·2	2 24·8	0·7 0·1	6·7 1·2	12·7 2·2
08	2 32·0	2 32·4	2 25·1	0·8 0·1	6·8 1·2	12·8 2·2
09	2 32·3	2 32·7	2 25·3	0·9 0·2	6·9 1·2	12·9 2·3
10	2 32·5	2 32·9	2 25·6	1·0 0·2	7·0 1·2	13·0 2·3
11	2 32·8	2 33·2	2 25·8	1·1 0·2	7·1 1·2	13·1 2·3
12	2 33·0	2 33·4	2 26·0	1·2 0·2	7·2 1·3	13·2 2·3
13	2 33·3	2 33·7	2 26·3	1·3 0·2	7·3 1·3	13·3 2·3
14	2 33·5	2 33·9	2 26·5	1·4 0·2	7·4 1·3	13·4 2·3
15	2 33·8	2 34·2	2 26·7	1·5 0·3	7·5 1·3	13·5 2·4
16	2 34·0	2 34·4	2 27·0	1·6 0·3	7·6 1·3	13·6 2·4
17	2 34·3	2 34·7	2 27·2	1·7 0·3	7·7 1·3	13·7 2·4
18	2 34·5	2 34·9	2 27·5	1·8 0·3	7·8 1·4	13·8 2·4
19	2 34·8	2 35·2	2 27·7	1·9 0·3	7·9 1·4	13·9 2·4
20	2 35·0	2 35·4	2 27·9	2·0 0·4	8·0 1·4	14·0 2·5
21	2 35·3	2 35·7	2 28·2	2·1 0·4	8·1 1·4	14·1 2·5
22	2 35·5	2 35·9	2 28·4	2·2 0·4	8·2 1·4	14·2 2·5
23	2 35·8	2 36·2	2 28·7	2·3 0·4	8·3 1·5	14·3 2·5
24	2 36·0	2 36·4	2 28·9	2·4 0·4	8·4 1·5	14·4 2·5
25	2 36·3	2 36·7	2 29·1	2·5 0·4	8·5 1·5	14·5 2·5
26	2 36·5	2 36·9	2 29·4	2·6 0·5	8·6 1·5	14·6 2·6
27	2 36·8	2 37·2	2 29·6	2·7 0·5	8·7 1·5	14·7 2·6
28	2 37·0	2 37·4	2 29·8	2·8 0·5	8·8 1·5	14·8 2·6
29	2 37·3	2 37·7	2 30·1	2·9 0·5	8·9 1·6	14·9 2·6
30	2 37·5	2 37·9	2 30·3	3·0 0·5	9·0 1·6	15·0 2·6
31	2 37·8	2 38·2	2 30·6	3·1 0·5	9·1 1·6	15·1 2·6
32	2 38·0	2 38·4	2 30·8	3·2 0·6	9·2 1·6	15·2 2·7
33	2 38·3	2 38·7	2 31·0	3·3 0·6	9·3 1·6	15·3 2·7
34	2 38·5	2 38·9	2 31·3	3·4 0·6	9·4 1·6	15·4 2·7
35	2 38·8	2 39·2	2 31·5	3·5 0·6	9·5 1·7	15·5 2·7
36	2 39·0	2 39·4	2 31·8	3·6 0·6	9·6 1·7	15·6 2·7
37	2 39·3	2 39·7	2 32·0	3·7 0·6	9·7 1·7	15·7 2·7
38	2 39·5	2 39·9	2 32·2	3·8 0·7	9·8 1·7	15·8 2·8
39	2 39·8	2 40·2	2 32·5	3·9 0·7	9·9 1·7	15·9 2·8
40	2 40·0	2 40·4	2 32·7	4·0 0·7	10·0 1·8	16·0 2·8
41	2 40·3	2 40·7	2 32·9	4·1 0·7	10·1 1·8	16·1 2·8
42	2 40·5	2 40·9	2 33·2	4·2 0·7	10·2 1·8	16·2 2·8
43	2 40·8	2 41·2	2 33·4	4·3 0·8	10·3 1·8	16·3 2·9
44	2 41·0	2 41·4	2 33·7	4·4 0·8	10·4 1·8	16·4 2·9
45	2 41·3	2 41·7	2 33·9	4·5 0·8	10·5 1·8	16·5 2·9
46	2 41·5	2 41·9	2 34·1	4·6 0·8	10·6 1·9	16·6 2·9
47	2 41·8	2 42·2	2 34·4	4·7 0·8	10·7 1·9	16·7 2·9
48	2 42·0	2 42·4	2 34·6	4·8 0·8	10·8 1·9	16·8 2·9
49	2 42·3	2 42·7	2 34·9	4·9 0·9	10·9 1·9	16·9 3·0
50	2 42·5	2 42·9	2 35·1	5·0 0·9	11·0 1·9	17·0 3·0
51	2 42·8	2 43·2	2 35·3	5·1 0·9	11·1 1·9	17·1 3·0
52	2 43·0	2 43·4	2 35·6	5·2 0·9	11·2 2·0	17·2 3·0
53	2 43·3	2 43·7	2 35·8	5·3 0·9	11·3 2·0	17·3 3·0
54	2 43·5	2 43·9	2 36·1	5·4 0·9	11·4 2·0	17·4 3·0
55	2 43·8	2 44·2	2 36·3	5·5 1·0	11·5 2·0	17·5 3·1
56	2 44·0	2 44·4	2 36·5	5·6 1·0	11·6 2·0	17·6 3·1
57	2 44·3	2 44·7	2 36·8	5·7 1·0	11·7 2·0	17·7 3·1
58	2 44·5	2 45·0	2 37·0	5·8 1·0	11·8 2·1	17·8 3·1
59	2 44·8	2 45·2	2 37·2	5·9 1·0	11·9 2·1	17·9 3·1
60	2 45·0	2 45·5	2 37·5	6·0 1·1	12·0 2·1	18·0 3·2

11	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	2 45·0	2 45·5	2 37·5	0·0 0·0	6·0 1·2	12·0 2·3
01	2 45·3	2 45·7	2 37·7	0·1 0·0	6·1 1·2	12·1 2·3
02	2 45·5	2 46·0	2 38·0	0·2 0·0	6·2 1·2	12·2 2·3
03	2 45·8	2 46·2	2 38·2	0·3 0·1	6·3 1·2	12·3 2·4
04	2 46·0	2 46·5	2 38·4	0·4 0·1	6·4 1·2	12·4 2·4
05	2 46·3	2 46·7	2 38·7	0·5 0·1	6·5 1·2	12·5 2·4
06	2 46·5	2 47·0	2 38·9	0·6 0·1	6·6 1·3	12·6 2·4
07	2 46·8	2 47·2	2 39·2	0·7 0·1	6·7 1·3	12·7 2·4
08	2 47·0	2 47·5	2 39·4	0·8 0·2	6·8 1·3	12·8 2·5
09	2 47·3	2 47·7	2 39·6	0·9 0·2	6·9 1·3	12·9 2·5
10	2 47·5	2 48·0	2 39·9	1·0 0·2	7·0 1·3	13·0 2·5
11	2 47·8	2 48·2	2 40·1	1·1 0·2	7·1 1·4	13·1 2·5
12	2 48·0	2 48·5	2 40·3	1·2 0·2	7·2 1·4	13·2 2·5
13	2 48·3	2 48·7	2 40·6	1·3 0·2	7·3 1·4	13·3 2·5
14	2 48·5	2 49·0	2 40·8	1·4 0·3	7·4 1·4	13·4 2·6
15	2 48·8	2 49·2	2 41·1	1·5 0·3	7·5 1·4	13·5 2·6
16	2 49·0	2 49·5	2 41·3	1·6 0·3	7·6 1·5	13·6 2·6
17	2 49·3	2 49·7	2 41·5	1·7 0·3	7·7 1·5	13·7 2·6
18	2 49·5	2 50·0	2 41·8	1·8 0·3	7·8 1·5	13·8 2·6
19	2 49·8	2 50·2	2 42·0	1·9 0·4	7·9 1·5	13·9 2·7
20	2 50·0	2 50·5	2 42·3	2·0 0·4	8·0 1·5	14·0 2·7
21	2 50·3	2 50·7	2 42·5	2·1 0·4	8·1 1·6	14·1 2·7
22	2 50·5	2 51·0	2 42·7	2·2 0·4	8·2 1·6	14·2 2·7
23	2 50·8	2 51·2	2 43·0	2·3 0·4	8·3 1·6	14·3 2·7
24	2 51·0	2 51·5	2 43·2	2·4 0·5	8·4 1·6	14·4 2·8
25	2 51·3	2 51·7	2 43·4	2·5 0·5	8·5 1·6	14·5 2·8
26	2 51·5	2 52·0	2 43·7	2·6 0·5	8·6 1·6	14·6 2·8
27	2 51·8	2 52·2	2 43·9	2·7 0·5	8·7 1·7	14·7 2·8
28	2 52·0	2 52·5	2 44·2	2·8 0·5	8·8 1·7	14·8 2·8
29	2 52·3	2 52·7	2 44·4	2·9 0·6	8·9 1·7	14·9 2·9
30	2 52·5	2 53·0	2 44·6	3·0 0·6	9·0 1·7	15·0 2·9
31	2 52·8	2 53·2	2 44·9	3·1 0·6	9·1 1·7	15·1 2·9
32	2 53·0	2 53·5	2 45·1	3·2 0·6	9·2 1·8	15·2 2·9
33	2 53·3	2 53·7	2 45·4	3·3 0·6	9·3 1·8	15·3 2·9
34	2 53·5	2 54·0	2 45·6	3·4 0·7	9·4 1·8	15·4 3·0
35	2 53·8	2 54·2	2 45·8	3·5 0·7	9·5 1·8	15·5 3·0
36	2 54·0	2 54·5	2 46·1	3·6 0·7	9·6 1·8	15·6 3·0
37	2 54·3	2 54·7	2 46·3	3·7 0·7	9·7 1·9	15·7 3·0
38	2 54·5	2 55·0	2 46·6	3·8 0·7	9·8 1·9	15·8 3·0
39	2 54·8	2 55·2	2 46·8	3·9 0·7	9·9 1·9	15·9 3·0
40	2 55·0	2 55·5	2 47·0	4·0 0·8	10·0 1·9	16·0 3·1
41	2 55·3	2 55·7	2 47·3	4·1 0·8	10·1 1·9	16·1 3·1
42	2 55·5	2 56·0	2 47·5	4·2 0·8	10·2 2·0	16·2 3·1
43	2 55·8	2 56·2	2 47·7	4·3 0·8	10·3 2·0	16·3 3·1
44	2 56·0	2 56·5	2 48·0	4·4 0·8	10·4 2·0	16·4 3·1
45	2 56·3	2 56·7	2 48·2	4·5 0·9	10·5 2·0	16·5 3·2
46	2 56·5	2 57·0	2 48·5	4·6 0·9	10·6 2·0	16·6 3·2
47	2 56·8	2 57·2	2 48·7	4·7 0·9	10·7 2·1	16·7 3·2
48	2 57·0	2 57·5	2 48·9	4·8 0·9	10·8 2·1	16·8 3·2
49	2 57·3	2 57·7	2 49·2	4·9 0·9	10·9 2·1	16·9 3·2
50	2 57·5	2 58·0	2 49·4	5·0 1·0	11·0 2·1	17·0 3·3
51	2 57·8	2 58·2	2 49·7	5·1 1·0	11·1 2·1	17·1 3·3
52	2 58·0	2 58·5	2 49·9	5·2 1·0	11·2 2·1	17·2 3·3
53	2 58·3	2 58·7	2 50·1	5·3 1·0	11·3 2·2	17·3 3·3
54	2 58·5	2 59·0	2 50·4	5·4 1·0	11·4 2·2	17·4 3·3
55	2 58·8	2 59·2	2 50·6	5·5 1·1	11·5 2·2	17·5 3·4
56	2 59·0	2 59·5	2 50·8	5·6 1·1	11·6 2·2	17·6 3·4
57	2 59·3	2 59·7	2 51·1	5·7 1·1	11·7 2·2	17·7 3·4
58	2 59·5	3 00·0	2 51·3	5·8 1·1	11·8 2·3	17·8 3·4
59	2 59·8	3 00·2	2 51·6	5·9 1·1	11·9 2·3	17·9 3·4
60	3 00·0	3 00·5	2 51·8	6·0 1·2	12·0 2·3	18·0 3·5

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

12m INCREMENTS AND CORRECTIONS 13m

12h	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	3 00·0	3 00·5	2 51·8	0·0 0·0	6·0 1·3	12·0 2·5
01	3 00·3	3 00·7	2 52·0	0·1 0·0	6·1 1·3	12·1 2·5
02	3 00·5	3 01·0	2 52·3	0·2 0·0	6·2 1·3	12·2 2·5
03	3 00·8	3 01·2	2 52·5	0·3 0·1	6·3 1·3	12·3 2·6
04	3 01·0	3 01·5	2 52·8	0·4 0·1	6·4 1·3	12·4 2·6
05	3 01·3	3 01·7	2 53·0	0·5 0·1	6·5 1·4	12·5 2·6
06	3 01·5	3 02·0	2 53·2	0·6 0·1	6·6 1·4	12·6 2·6
07	3 01·8	3 02·2	2 53·5	0·7 0·1	6·7 1·4	12·7 2·6
08	3 02·0	3 02·5	2 53·7	0·8 0·2	6·8 1·4	12·8 2·7
09	3 02·3	3 02·7	2 53·9	0·9 0·2	6·9 1·4	12·9 2·7
10	3 02·5	3 03·0	2 54·2	1·0 0·2	7·0 1·5	13·0 2·7
11	3 02·8	3 03·3	2 54·4	1·1 0·2	7·1 1·5	13·1 2·7
12	3 03·0	3 03·5	2 54·7	1·2 0·3	7·2 1·5	13·2 2·8
13	3 03·3	3 03·8	2 54·9	1·3 0·3	7·3 1·5	13·3 2·8
14	3 03·5	3 04·0	2 55·1	1·4 0·3	7·4 1·5	13·4 2·8
15	3 03·8	3 04·3	2 55·4	1·5 0·3	7·5 1·6	13·5 2·8
16	3 04·0	3 04·5	2 55·6	1·6 0·3	7·6 1·6	13·6 2·8
17	3 04·3	3 04·8	2 55·9	1·7 0·4	7·7 1·6	13·7 2·9
18	3 04·5	3 05·0	2 56·1	1·8 0·4	7·8 1·6	13·8 2·9
19	3 04·8	3 05·3	2 56·3	1·9 0·4	7·9 1·6	13·9 2·9
20	3 05·0	3 05·5	2 56·6	2·0 0·4	8·0 1·7	14·0 2·9
21	3 05·3	3 05·8	2 56·8	2·1 0·4	8·1 1·7	14·1 2·9
22	3 05·5	3 06·0	2 57·0	2·2 0·5	8·2 1·7	14·2 3·0
23	3 05·8	3 06·3	2 57·3	2·3 0·5	8·3 1·7	14·3 3·0
24	3 06·0	3 06·5	2 57·5	2·4 0·5	8·4 1·8	14·4 3·0
25	3 06·3	3 06·8	2 57·8	2·5 0·5	8·5 1·8	14·5 3·0
26	3 06·5	3 07·0	2 58·0	2·6 0·5	8·6 1·8	14·6 3·0
27	3 06·8	3 07·3	2 58·2	2·7 0·6	8·7 1·8	14·7 3·1
28	3 07·0	3 07·5	2 58·5	2·8 0·6	8·8 1·8	14·8 3·1
29	3 07·3	3 07·8	2 58·7	2·9 0·6	8·9 1·9	14·9 3·1
30	3 07·5	3 08·0	2 59·0	3·0 0·6	9·0 1·9	15·0 3·1
31	3 07·8	3 08·3	2 59·2	3·1 0·6	9·1 1·9	15·1 3·1
32	3 08·0	3 08·5	2 59·4	3·2 0·7	9·2 1·9	15·2 3·2
33	3 08·3	3 08·8	2 59·7	3·3 0·7	9·3 1·9	15·3 3·2
34	3 08·5	3 09·0	2 59·9	3·4 0·7	9·4 2·0	15·4 3·2
35	3 08·8	3 09·3	3 00·2	3·5 0·7	9·5 2·0	15·5 3·2
36	3 09·0	3 09·5	3 00·4	3·6 0·8	9·6 2·0	15·6 3·3
37	3 09·3	3 09·8	3 00·6	3·7 0·8	9·7 2·0	15·7 3·3
38	3 09·5	3 10·0	3 00·9	3·8 0·8	9·8 2·0	15·8 3·3
39	3 09·8	3 10·3	3 01·1	3·9 0·8	9·9 2·1	15·9 3·3
40	3 10·0	3 10·5	3 01·3	4·0 0·8	10·0 2·1	16·0 3·3
41	3 10·3	3 10·8	3 01·6	4·1 0·9	10·1 2·1	16·1 3·4
42	3 10·5	3 11·0	3 01·8	4·2 0·9	10·2 2·1	16·2 3·4
43	3 10·8	3 11·3	3 02·1	4·3 0·9	10·3 2·1	16·3 3·4
44	3 11·0	3 11·5	3 02·3	4·4 0·9	10·4 2·2	16·4 3·4
45	3 11·3	3 11·8	3 02·5	4·5 0·9	10·5 2·2	16·5 3·4
46	3 11·5	3 12·0	3 02·8	4·6 1·0	10·6 2·2	16·6 3·5
47	3 11·8	3 12·3	3 03·0	4·7 1·0	10·7 2·2	16·7 3·5
48	3 12·0	3 12·5	3 03·3	4·8 1·0	10·8 2·3	16·8 3·5
49	3 12·3	3 12·8	3 03·5	4·9 1·0	10·9 2·3	16·9 3·5
50	3 12·5	3 13·0	3 03·7	5·0 1·0	11·0 2·3	17·0 3·5
51	3 12·8	3 13·3	3 04·0	5·1 1·1	11·1 2·3	17·1 3·6
52	3 13·0	3 13·5	3 04·2	5·2 1·1	11·2 2·3	17·2 3·6
53	3 13·3	3 13·8	3 04·4	5·3 1·1	11·3 2·4	17·3 3·6
54	3 13·5	3 14·0	3 04·7	5·4 1·1	11·4 2·4	17·4 3·6
55	3 13·8	3 14·3	3 04·9	5·5 1·1	11·5 2·4	17·5 3·6
56	3 14·0	3 14·5	3 05·2	5·6 1·2	11·6 2·4	17·6 3·7
57	3 14·3	3 14·8	3 05·4	5·7 1·2	11·7 2·4	17·7 3·7
58	3 14·5	3 15·0	3 05·6	5·8 1·2	11·8 2·5	17·8 3·7
59	3 14·8	3 15·3	3 05·9	5·9 1·2	11·9 2·5	17·9 3·7
60	3 15·0	3 15·5	3 06·1	6·0 1·3	12·0 2·5	18·0 3·8

13h	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	3 15·0	3 15·5	3 06·1	0·0 0·0	6·0 1·4	12·0 2·7
01	3 15·3	3 15·8	3 06·4	0·1 0·0	6·1 1·4	12·1 2·7
02	3 15·5	3 16·0	3 06·6	0·2 0·0	6·2 1·4	12·2 2·7
03	3 15·8	3 16·3	3 06·8	0·3 0·1	6·3 1·4	12·3 2·8
04	3 16·0	3 16·5	3 07·1	0·4 0·1	6·4 1·4	12·4 2·8
05	3 16·3	3 16·8	3 07·3	0·5 0·1	6·5 1·5	12·5 2·8
06	3 16·5	3 17·0	3 07·5	0·6 0·1	6·6 1·5	12·6 2·8
07	3 16·8	3 17·3	3 07·8	0·7 0·2	6·7 1·5	12·7 2·9
08	3 17·0	3 17·5	3 08·0	0·8 0·2	6·8 1·5	12·8 2·9
09	3 17·3	3 17·8	3 08·3	0·9 0·2	6·9 1·6	12·9 2·9
10	3 17·5	3 18·0	3 08·5	1·0 0·2	7·0 1·6	13·0 2·9
11	3 17·8	3 18·3	3 08·7	1·1 0·2	7·1 1·6	13·1 2·9
12	3 18·0	3 18·5	3 09·0	1·2 0·3	7·2 1·6	13·2 3·0
13	3 18·3	3 18·8	3 09·2	1·3 0·3	7·3 1·6	13·3 3·0
14	3 18·5	3 19·0	3 09·5	1·4 0·3	7·4 1·7	13·4 3·0
15	3 18·8	3 19·3	3 09·7	1·5 0·3	7·5 1·7	13·5 3·0
16	3 19·0	3 19·5	3 09·9	1·6 0·4	7·6 1·7	13·6 3·1
17	3 19·3	3 19·8	3 10·2	1·7 0·4	7·7 1·7	13·7 3·1
18	3 19·5	3 20·0	3 10·4	1·8 0·4	7·8 1·8	13·8 3·1
19	3 19·8	3 20·3	3 10·7	1·9 0·4	7·9 1·8	13·9 3·1
20	3 20·0	3 20·5	3 10·9	2·0 0·5	8·0 1·8	14·0 3·2
21	3 20·3	3 20·8	3 11·1	2·1 0·5	8·1 1·8	14·1 3·2
22	3 20·5	3 21·0	3 11·4	2·2 0·5	8·2 1·8	14·2 3·2
23	3 20·8	3 21·3	3 11·6	2·3 0·5	8·3 1·9	14·3 3·2
24	3 21·0	3 21·6	3 11·8	2·4 0·5	8·4 1·9	14·4 3·2
25	3 21·3	3 21·8	3 12·1	2·5 0·6	8·5 1·9	14·5 3·3
26	3 21·5	3 22·1	3 12·3	2·6 0·6	8·6 1·9	14·6 3·3
27	3 21·8	3 22·3	3 12·6	2·7 0·6	8·7 2·0	14·7 3·3
28	3 22·0	3 22·6	3 12·8	2·8 0·6	8·8 2·0	14·8 3·3
29	3 22·3	3 22·8	3 13·0	2·9 0·7	8·9 2·0	14·9 3·4
30	3 22·5	3 23·1	3 13·3	3·0 0·7	9·0 2·0	15·0 3·4
31	3 22·8	3 23·3	3 13·5	3·1 0·7	9·1 2·0	15·1 3·4
32	3 23·0	3 23·6	3 13·8	3·2 0·7	9·2 2·1	15·2 3·4
33	3 23·3	3 23·8	3 14·0	3·3 0·7	9·3 2·1	15·3 3·4
34	3 23·5	3 24·1	3 14·2	3·4 0·8	9·4 2·1	15·4 3·5
35	3 23·8	3 24·3	3 14·5	3·5 0·8	9·5 2·1	15·5 3·5
36	3 24·0	3 24·6	3 14·7	3·6 0·8	9·6 2·2	15·6 3·5
37	3 24·3	3 24·8	3 14·9	3·7 0·8	9·7 2·2	15·7 3·5
38	3 24·5	3 25·1	3 15·2	3·8 0·9	9·8 2·2	15·8 3·6
39	3 24·8	3 25·3	3 15·4	3·9 0·9	9·9 2·2	15·9 3·6
40	3 25·0	3 25·6	3 15·7	4·0 0·9	10·0 2·3	16·0 3·6
41	3 25·3	3 25·8	3 15·9	4·1 0·9	10·1 2·3	16·1 3·6
42	3 25·5	3 26·1	3 16·1	4·2 0·9	10·2 2·3	16·2 3·6
43	3 25·8	3 26·3	3 16·4	4·3 1·0	10·3 2·3	16·3 3·7
44	3 26·0	3 26·6	3 16·6	4·4 1·0	10·4 2·3	16·4 3·7
45	3 26·3	3 26·8	3 16·9	4·5 1·0	10·5 2·4	16·5 3·7
46	3 26·5	3 27·1	3 17·1	4·6 1·0	10·6 2·4	16·6 3·7
47	3 26·8	3 27·3	3 17·3	4·7 1·1	10·7 2·4	16·7 3·8
48	3 27·0	3 27·6	3 17·6	4·8 1·1	10·8 2·4	16·8 3·8
49	3 27·3	3 27·8	3 17·8	4·9 1·1	10·9 2·5	16·9 3·8
50	3 27·5	3 28·1	3 18·0	5·0 1·1	11·0 2·5	17·0 3·8
51	3 27·8	3 28·3	3 18·3	5·1 1·1	11·1 2·5	17·1 3·8
52	3 28·0	3 28·6	3 18·5	5·2 1·2	11·2 2·5	17·2 3·9
53	3 28·3	3 28·8	3 18·8	5·3 1·2	11·3 2·5	17·3 3·9
54	3 28·5	3 29·1	3 19·0	5·4 1·2	11·4 2·6	17·4 3·9
55	3 28·8	3 29·3	3 19·2	5·5 1·2	11·5 2·6	17·5 3·9
56	3 29·0	3 29·6	3 19·5	5·6 1·3	11·6 2·6	17·6 4·0
57	3 29·3	3 29·8	3 19·7	5·7 1·3	11·7 2·6	17·7 4·0
58	3 29·5	3 30·1	3 20·0	5·8 1·3	11·8 2·7	17·8 4·0
59	3 29·8	3 30·3	3 20·2	5·9 1·3	11·9 2·7	17·9 4·0
60	3 30·0	3 30·6	3 20·4	6·0 1·4	12·0 2·7	18·0 4·1

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

14	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	3 30·0	3 30·6	3 20·4	0·0 0·0	6·0 1·5	12·0 2·9
01	3 30·3	3 30·8	3 20·7	0·1 0·0	6·1 1·5	12·1 2·9
02	3 30·5	3 31·1	3 20·9	0·2 0·0	6·2 1·5	12·2 2·9
03	3 30·8	3 31·3	3 21·1	0·3 0·1	6·3 1·5	12·3 3·0
04	3 31·0	3 31·6	3 21·4	0·4 0·1	6·4 1·5	12·4 3·0
05	3 31·3	3 31·8	3 21·6	0·5 0·1	6·5 1·6	12·5 3·0
06	3 31·5	3 32·1	3 21·9	0·6 0·1	6·6 1·6	12·6 3·0
07	3 31·8	3 32·3	3 22·1	0·7 0·2	6·7 1·6	12·7 3·1
08	3 32·0	3 32·6	3 22·3	0·8 0·2	6·8 1·6	12·8 3·1
09	3 32·3	3 32·8	3 22·6	0·9 0·2	6·9 1·7	12·9 3·1
10	3 32·5	3 33·1	3 22·8	1·0 0·2	7·0 1·7	13·0 3·1
11	3 32·8	3 33·3	3 23·1	1·1 0·3	7·1 1·7	13·1 3·2
12	3 33·0	3 33·6	3 23·3	1·2 0·3	7·2 1·7	13·2 3·2
13	3 33·3	3 33·8	3 23·5	1·3 0·3	7·3 1·8	13·3 3·2
14	3 33·5	3 34·1	3 23·8	1·4 0·3	7·4 1·8	13·4 3·2
15	3 33·8	3 34·3	3 24·0	1·5 0·4	7·5 1·8	13·5 3·3
16	3 34·0	3 34·6	3 24·3	1·6 0·4	7·6 1·8	13·6 3·3
17	3 34·3	3 34·8	3 24·5	1·7 0·4	7·7 1·9	13·7 3·3
18	3 34·5	3 35·1	3 24·7	1·8 0·4	7·8 1·9	13·8 3·3
19	3 34·8	3 35·3	3 25·0	1·9 0·5	7·9 1·9	13·9 3·4
20	3 35·0	3 35·6	3 25·2	2·0 0·5	8·0 1·9	14·0 3·4
21	3 35·3	3 35·8	3 25·4	2·1 0·5	8·1 2·0	14·1 3·4
22	3 35·5	3 36·1	3 25·7	2·2 0·5	8·2 2·0	14·2 3·4
23	3 35·8	3 36·3	3 25·9	2·3 0·6	8·3 2·0	14·3 3·5
24	3 36·0	3 36·6	3 26·2	2·4 0·6	8·4 2·0	14·4 3·5
25	3 36·3	3 36·8	3 26·4	2·5 0·6	8·5 2·1	14·5 3·5
26	3 36·5	3 37·1	3 26·6	2·6 0·6	8·6 2·1	14·6 3·5
27	3 36·8	3 37·3	3 26·9	2·7 0·7	8·7 2·1	14·7 3·6
28	3 37·0	3 37·6	3 27·1	2·8 0·7	8·8 2·1	14·8 3·6
29	3 37·3	3 37·8	3 27·4	2·9 0·7	8·9 2·2	14·9 3·6
30	3 37·5	3 38·1	3 27·6	3·0 0·7	9·0 2·2	15·0 3·6
31	3 37·8	3 38·3	3 27·8	3·1 0·7	9·1 2·2	15·1 3·6
32	3 38·0	3 38·6	3 28·1	3·2 0·8	9·2 2·2	15·2 3·7
33	3 38·3	3 38·8	3 28·3	3·3 0·8	9·3 2·2	15·3 3·7
34	3 38·5	3 39·1	3 28·5	3·4 0·8	9·4 2·3	15·4 3·7
35	3 38·8	3 39·3	3 28·8	3·5 0·8	9·5 2·3	15·5 3·7
36	3 39·0	3 39·6	3 29·0	3·6 0·9	9·6 2·3	15·6 3·8
37	3 39·3	3 39·9	3 29·3	3·7 0·9	9·7 2·3	15·7 3·8
38	3 39·5	3 40·1	3 29·5	3·8 0·9	9·8 2·4	15·8 3·8
39	3 39·8	3 40·4	3 29·7	3·9 0·9	9·9 2·4	15·9 3·8
40	3 40·0	3 40·6	3 30·0	4·0 1·0	10·0 2·4	16·0 3·9
41	3 40·3	3 40·9	3 30·2	4·1 1·0	10·1 2·4	16·1 3·9
42	3 40·5	3 41·1	3 30·5	4·2 1·0	10·2 2·5	16·2 3·9
43	3 40·8	3 41·4	3 30·7	4·3 1·0	10·3 2·5	16·3 3·9
44	3 41·0	3 41·6	3 30·9	4·4 1·1	10·4 2·5	16·4 4·0
45	3 41·3	3 41·9	3 31·2	4·5 1·1	10·5 2·5	16·5 4·0
46	3 41·5	3 42·1	3 31·4	4·6 1·1	10·6 2·6	16·6 4·0
47	3 41·8	3 42·4	3 31·6	4·7 1·1	10·7 2·6	16·7 4·0
48	3 42·0	3 42·6	3 31·9	4·8 1·2	10·8 2·6	16·8 4·1
49	3 42·3	3 42·9	3 32·1	4·9 1·2	10·9 2·6	16·9 4·1
50	3 42·5	3 43·1	3 32·4	5·0 1·2	11·0 2·7	17·0 4·1
51	3 42·8	3 43·4	3 32·6	5·1 1·2	11·1 2·7	17·1 4·1
52	3 43·0	3 43·6	3 32·8	5·2 1·3	11·2 2·7	17·2 4·2
53	3 43·3	3 43·9	3 33·1	5·3 1·3	11·3 2·7	17·3 4·2
54	3 43·5	3 44·1	3 33·3	5·4 1·3	11·4 2·8	17·4 4·2
55	3 43·8	3 44·4	3 33·6	5·5 1·3	11·5 2·8	17·5 4·2
56	3 44·0	3 44·6	3 33·8	5·6 1·4	11·6 2·8	17·6 4·3
57	3 44·3	3 44·9	3 34·0	5·7 1·4	11·7 2·8	17·7 4·3
58	3 44·5	3 45·1	3 34·3	5·8 1·4	11·8 2·9	17·8 4·3
59	3 44·8	3 45·4	3 34·5	5·9 1·4	11·9 2·9	17·9 4·3
60	3 45·0	3 45·6	3 34·8	6·0 1·5	12·0 2·9	18·0 4·4

15	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	3 45·0	3 45·6	3 34·8	0·0 0·0	6·0 1·6	12·0 3·1
01	3 45·3	3 45·9	3 35·0	0·1 0·0	6·1 1·6	12·1 3·1
02	3 45·5	3 46·1	3 35·2	0·2 0·1	6·2 1·6	12·2 3·2
03	3 45·8	3 46·4	3 35·5	0·3 0·1	6·3 1·6	12·3 3·2
04	3 46·0	3 46·6	3 35·7	0·4 0·1	6·4 1·7	12·4 3·2
05	3 46·3	3 46·9	3 35·9	0·5 0·1	6·5 1·7	12·5 3·2
06	3 46·5	3 47·1	3 36·2	0·6 0·2	6·6 1·7	12·6 3·3
07	3 46·8	3 47·4	3 36·4	0·7 0·2	6·7 1·7	12·7 3·3
08	3 47·0	3 47·6	3 36·7	0·8 0·2	6·8 1·8	12·8 3·3
09	3 47·3	3 47·9	3 36·9	0·9 0·2	6·9 1·8	12·9 3·3
10	3 47·5	3 48·1	3 37·1	1·0 0·3	7·0 1·8	13·0 3·4
11	3 47·8	3 48·4	3 37·4	1·1 0·3	7·1 1·8	13·1 3·4
12	3 48·0	3 48·6	3 37·6	1·2 0·3	7·2 1·9	13·2 3·4
13	3 48·3	3 48·9	3 37·9	1·3 0·3	7·3 1·9	13·3 3·4
14	3 48·5	3 49·1	3 38·1	1·4 0·4	7·4 1·9	13·4 3·5
15	3 48·8	3 49·4	3 38·3	1·5 0·4	7·5 1·9	13·5 3·5
16	3 49·0	3 49·6	3 38·6	1·6 0·4	7·6 2·0	13·6 3·5
17	3 49·3	3 49·9	3 38·8	1·7 0·4	7·7 2·0	13·7 3·5
18	3 49·5	3 50·1	3 39·0	1·8 0·5	7·8 2·0	13·8 3·6
19	3 49·8	3 50·4	3 39·3	1·9 0·5	7·9 2·0	13·9 3·6
20	3 50·0	3 50·6	3 39·5	2·0 0·5	8·0 2·1	14·0 3·6
21	3 50·3	3 50·9	3 39·8	2·1 0·5	8·1 2·1	14·1 3·6
22	3 50·5	3 51·1	3 40·0	2·2 0·6	8·2 2·1	14·2 3·7
23	3 50·8	3 51·4	3 40·2	2·3 0·6	8·3 2·1	14·3 3·7
24	3 51·0	3 51·6	3 40·5	2·4 0·6	8·4 2·2	14·4 3·7
25	3 51·3	3 51·9	3 40·7	2·5 0·6	8·5 2·2	14·5 3·7
26	3 51·5	3 52·1	3 41·0	2·6 0·7	8·6 2·2	14·6 3·8
27	3 51·8	3 52·4	3 41·2	2·7 0·7	8·7 2·2	14·7 3·8
28	3 52·0	3 52·6	3 41·4	2·8 0·7	8·8 2·3	14·8 3·8
29	3 52·3	3 52·9	3 41·7	2·9 0·7	8·9 2·3	14·9 3·8
30	3 52·5	3 53·1	3 41·9	3·0 0·8	9·0 2·3	15·0 3·9
31	3 52·8	3 53·4	3 42·1	3·1 0·8	9·1 2·4	15·1 3·9
32	3 53·0	3 53·6	3 42·4	3·2 0·8	9·2 2·4	15·2 3·9
33	3 53·3	3 53·9	3 42·6	3·3 0·9	9·3 2·4	15·3 4·0
34	3 53·5	3 54·1	3 42·9	3·4 0·9	9·4 2·4	15·4 4·0
35	3 53·8	3 54·4	3 43·1	3·5 0·9	9·5 2·5	15·5 4·0
36	3 54·0	3 54·6	3 43·3	3·6 0·9	9·6 2·5	15·6 4·0
37	3 54·3	3 54·9	3 43·6	3·7 1·0	9·7 2·5	15·7 4·1
38	3 54·5	3 55·1	3 43·8	3·8 1·0	9·8 2·5	15·8 4·1
39	3 54·8	3 55·4	3 44·1	3·9 1·0	9·9 2·6	15·9 4·1
40	3 55·0	3 55·6	3 44·3	4·0 1·0	10·0 2·6	16·0 4·1
41	3 55·3	3 55·9	3 44·5	4·1 1·1	10·1 2·6	16·1 4·2
42	3 55·5	3 56·1	3 44·8	4·2 1·1	10·2 2·6	16·2 4·2
43	3 55·8	3 56·4	3 45·0	4·3 1·1	10·3 2·7	16·3 4·2
44	3 56·0	3 56·6	3 45·2	4·4 1·1	10·4 2·7	16·4 4·2
45	3 56·3	3 56·9	3 45·5	4·5 1·2	10·5 2·7	16·5 4·3
46	3 56·5	3 57·1	3 45·7	4·6 1·2	10·6 2·7	16·6 4·3
47	3 56·8	3 57·4	3 46·0	4·7 1·2	10·7 2·8	16·7 4·3
48	3 57·0	3 57·6	3 46·2	4·8 1·2	10·8 2·8	16·8 4·3
49	3 57·3	3 57·9	3 46·4	4·9 1·3	10·9 2·8	16·9 4·4
50	3 57·5	3 58·2	3 46·7	5·0 1·3	11·0 2·8	17·0 4·4
51	3 57·8	3 58·4	3 46·9	5·1 1·3	11·1 2·9	17·1 4·4
52	3 58·0	3 58·7	3 47·2	5·2 1·3	11·2 2·9	17·2 4·4
53	3 58·3	3 58·9	3 47·4	5·3 1·4	11·3 2·9	17·3 4·5
54	3 58·5	3 59·2	3 47·6	5·4 1·4	11·4 2·9	17·4 4·5
55	3 58·8	3 59·4	3 47·9	5·5 1·4	11·5 3·0	17·5 4·5
56	3 59·0	3 59·7	3 48·1	5·6 1·4	11·6 3·0	17·6 4·5
57	3 59·3	3 59·9	3 48·4	5·7 1·5	11·7 3·0	17·7 4·6
58	3 59·5	4 00·2	3 48·6	5·8 1·5	11·8 3·0	17·8 4·6
59	3 59·8	4 00·4	3 48·8	5·9 1·5	11·9 3·1	17·9 4·6
60	4 00·0	4 00·7	3 49·1	6·0 1·6	12·0 3·1	18·0 4·7

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

16h	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	4 00·0	4 00·7	3 49·1	0·0 0·0	6·0 1·7	12·0 3·3
01	4 00·3	4 00·9	3 49·3	0·1 0·0	6·1 1·7	12·1 3·3
02	4 00·5	4 01·2	3 49·5	0·2 0·1	6·2 1·7	12·2 3·4
03	4 00·8	4 01·4	3 49·8	0·3 0·1	6·3 1·7	12·3 3·4
04	4 01·0	4 01·7	3 50·0	0·4 0·1	6·4 1·8	12·4 3·4
05	4 01·3	4 01·9	3 50·3	0·5 0·1	6·5 1·8	12·5 3·4
06	4 01·5	4 02·2	3 50·5	0·6 0·2	6·6 1·8	12·6 3·5
07	4 01·8	4 02·4	3 50·7	0·7 0·2	6·7 1·8	12·7 3·5
08	4 02·0	4 02·7	3 51·0	0·8 0·2	6·8 1·9	12·8 3·5
09	4 02·3	4 02·9	3 51·2	0·9 0·2	6·9 1·9	12·9 3·5
10	4 02·5	4 03·2	3 51·5	1·0 0·3	7·0 1·9	13·0 3·6
11	4 02·8	4 03·4	3 51·7	1·1 0·3	7·1 2·0	13·1 3·6
12	4 03·0	4 03·7	3 51·9	1·2 0·3	7·2 2·0	13·2 3·6
13	4 03·3	4 03·9	3 52·2	1·3 0·4	7·3 2·0	13·3 3·7
14	4 03·5	4 04·2	3 52·4	1·4 0·4	7·4 2·0	13·4 3·7
15	4 03·8	4 04·4	3 52·6	1·5 0·4	7·5 2·1	13·5 3·7
16	4 04·0	4 04·7	3 52·9	1·6 0·4	7·6 2·1	13·6 3·7
17	4 04·3	4 04·9	3 53·1	1·7 0·5	7·7 2·1	13·7 3·8
18	4 04·5	4 05·2	3 53·4	1·8 0·5	7·8 2·1	13·8 3·8
19	4 04·8	4 05·4	3 53·6	1·9 0·5	7·9 2·2	13·9 3·8
20	4 05·0	4 05·7	3 53·8	2·0 0·6	8·0 2·2	14·0 3·9
21	4 05·3	4 05·9	3 54·1	2·1 0·6	8·1 2·2	14·1 3·9
22	4 05·5	4 06·2	3 54·3	2·2 0·6	8·2 2·3	14·2 3·9
23	4 05·8	4 06·4	3 54·6	2·3 0·6	8·3 2·3	14·3 3·9
24	4 06·0	4 06·7	3 54·8	2·4 0·7	8·4 2·3	14·4 4·0
25	4 06·3	4 06·9	3 55·0	2·5 0·7	8·5 2·3	14·5 4·0
26	4 06·5	4 07·2	3 55·3	2·6 0·7	8·6 2·4	14·6 4·0
27	4 06·8	4 07·4	3 55·5	2·7 0·7	8·7 2·4	14·7 4·0
28	4 07·0	4 07·7	3 55·7	2·8 0·8	8·8 2·4	14·8 4·1
29	4 07·3	4 07·9	3 56·0	2·9 0·8	8·9 2·4	14·9 4·1
30	4 07·5	4 08·2	3 56·2	3·0 0·8	9·0 2·5	15·0 4·1
31	4 07·8	4 08·4	3 56·5	3·1 0·9	9·1 2·5	15·1 4·2
32	4 08·0	4 08·7	3 56·7	3·2 0·9	9·2 2·5	15·2 4·2
33	4 08·3	4 08·9	3 56·9	3·3 0·9	9·3 2·6	15·3 4·2
34	4 08·5	4 09·2	3 57·2	3·4 0·9	9·4 2·6	15·4 4·2
35	4 08·8	4 09·4	3 57·4	3·5 1·0	9·5 2·6	15·5 4·3
36	4 09·0	4 09·7	3 57·7	3·6 1·0	9·6 2·6	15·6 4·3
37	4 09·3	4 09·9	3 57·9	3·7 1·0	9·7 2·7	15·7 4·3
38	4 09·5	4 10·2	3 58·1	3·8 1·0	9·8 2·7	15·8 4·3
39	4 09·8	4 10·4	3 58·4	3·9 1·1	9·9 2·7	15·9 4·4
40	4 10·0	4 10·7	3 58·6	4·0 1·1	10·0 2·8	16·0 4·4
41	4 10·3	4 10·9	3 58·8	4·1 1·1	10·1 2·8	16·1 4·4
42	4 10·5	4 11·2	3 59·1	4·2 1·2	10·2 2·8	16·2 4·5
43	4 10·8	4 11·4	3 59·3	4·3 1·2	10·3 2·8	16·3 4·5
44	4 11·0	4 11·7	3 59·6	4·4 1·2	10·4 2·9	16·4 4·5
45	4 11·3	4 11·9	3 59·8	4·5 1·2	10·5 2·9	16·5 4·5
46	4 11·5	4 12·2	4 00·0	4·6 1·3	10·6 2·9	16·6 4·6
47	4 11·8	4 12·4	4 00·3	4·7 1·3	10·7 2·9	16·7 4·6
48	4 12·0	4 12·7	4 00·5	4·8 1·3	10·8 3·0	16·8 4·6
49	4 12·3	4 12·9	4 00·8	4·9 1·3	10·9 3·0	16·9 4·6
50	4 12·5	4 13·2	4 01·0	5·0 1·4	11·0 3·0	17·0 4·7
51	4 12·8	4 13·4	4 01·2	5·1 1·4	11·1 3·1	17·1 4·7
52	4 13·0	4 13·7	4 01·5	5·2 1·4	11·2 3·1	17·2 4·7
53	4 13·3	4 13·9	4 01·7	5·3 1·5	11·3 3·1	17·3 4·8
54	4 13·5	4 14·2	4 02·0	5·4 1·5	11·4 3·1	17·4 4·8
55	4 13·8	4 14·4	4 02·2	5·5 1·5	11·5 3·2	17·5 4·8
56	4 14·0	4 14·7	4 02·4	5·6 1·5	11·6 3·2	17·6 4·8
57	4 14·3	4 14·9	4 02·7	5·7 1·6	11·7 3·2	17·7 4·9
58	4 14·5	4 15·2	4 02·9	5·8 1·6	11·8 3·2	17·8 4·9
59	4 14·8	4 15·4	4 03·1	5·9 1·6	11·9 3·3	17·9 4·9
60	4 15·0	4 15·7	4 03·4	6·0 1·7	12·0 3·3	18·0 5·0

17h	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	4 15·0	4 15·7	4 03·4	0·0 0·0	6·0 1·8	12·0 3·5
01	4 15·3	4 15·9	4 03·6	0·1 0·0	6·1 1·8	12·1 3·5
02	4 15·5	4 16·2	4 03·9	0·2 0·1	6·2 1·8	12·2 3·6
03	4 15·8	4 16·5	4 04·1	0·3 0·1	6·3 1·8	12·3 3·6
04	4 16·0	4 16·7	4 04·3	0·4 0·1	6·4 1·9	12·4 3·6
05	4 16·3	4 17·0	4 04·6	0·5 0·1	6·5 1·9	12·5 3·6
06	4 16·5	4 17·2	4 04·8	0·6 0·2	6·6 1·9	12·6 3·7
07	4 16·8	4 17·5	4 05·1	0·7 0·2	6·7 2·0	12·7 3·7
08	4 17·0	4 17·7	4 05·3	0·8 0·2	6·8 2·0	12·8 3·7
09	4 17·3	4 18·0	4 05·5	0·9 0·3	6·9 2·0	12·9 3·8
10	4 17·5	4 18·2	4 05·8	1·0 0·3	7·0 2·0	13·0 3·8
11	4 17·8	4 18·5	4 06·0	1·1 0·3	7·1 2·1	13·1 3·8
12	4 18·0	4 18·7	4 06·2	1·2 0·4	7·2 2·1	13·2 3·9
13	4 18·3	4 19·0	4 06·5	1·3 0·4	7·3 2·1	13·3 3·9
14	4 18·5	4 19·2	4 06·7	1·4 0·4	7·4 2·2	13·4 3·9
15	4 18·8	4 19·5	4 07·0	1·5 0·4	7·5 2·2	13·5 3·9
16	4 19·0	4 19·7	4 07·2	1·6 0·5	7·6 2·2	13·6 4·0
17	4 19·3	4 20·0	4 07·4	1·7 0·5	7·7 2·2	13·7 4·0
18	4 19·5	4 20·2	4 07·7	1·8 0·5	7·8 2·3	13·8 4·0
19	4 19·8	4 20·5	4 07·9	1·9 0·6	7·9 2·3	13·9 4·1
20	4 20·0	4 20·7	4 08·2	2·0 0·6	8·0 2·3	14·0 4·1
21	4 20·3	4 21·0	4 08·4	2·1 0·6	8·1 2·4	14·1 4·1
22	4 20·5	4 21·2	4 08·6	2·2 0·6	8·2 2·4	14·2 4·1
23	4 20·8	4 21·5	4 08·9	2·3 0·7	8·3 2·4	14·3 4·2
24	4 21·0	4 21·7	4 09·1	2·4 0·7	8·4 2·5	14·4 4·2
25	4 21·3	4 22·0	4 09·3	2·5 0·7	8·5 2·5	14·5 4·2
26	4 21·5	4 22·2	4 09·6	2·6 0·8	8·6 2·5	14·6 4·3
27	4 21·8	4 22·5	4 09·8	2·7 0·8	8·7 2·5	14·7 4·3
28	4 22·0	4 22·7	4 10·1	2·8 0·8	8·8 2·6	14·8 4·3
29	4 22·3	4 23·0	4 10·3	2·9 0·8	8·9 2·6	14·9 4·3
30	4 22·5	4 23·2	4 10·5	3·0 0·9	9·0 2·6	15·0 4·4
31	4 22·8	4 23·5	4 10·8	3·1 0·9	9·1 2·7	15·1 4·4
32	4 23·0	4 23·7	4 11·0	3·2 0·9	9·2 2·7	15·2 4·4
33	4 23·3	4 24·0	4 11·3	3·3 1·0	9·3 2·7	15·3 4·5
34	4 23·5	4 24·2	4 11·5	3·4 1·0	9·4 2·7	15·4 4·5
35	4 23·8	4 24·5	4 11·7	3·5 1·0	9·5 2·8	15·5 4·5
36	4 24·0	4 24·7	4 12·0	3·6 1·1	9·6 2·8	15·6 4·6
37	4 24·3	4 25·0	4 12·2	3·7 1·1	9·7 2·8	15·7 4·6
38	4 24·5	4 25·2	4 12·5	3·8 1·1	9·8 2·9	15·8 4·6
39	4 24·8	4 25·5	4 12·7	3·9 1·1	9·9 2·9	15·9 4·6
40	4 25·0	4 25·7	4 12·9	4·0 1·2	10·0 2·9	16·0 4·7
41	4 25·3	4 26·0	4 13·2	4·1 1·2	10·1 2·9	16·1 4·7
42	4 25·5	4 26·2	4 13·4	4·2 1·2	10·2 3·0	16·2 4·7
43	4 25·8	4 26·5	4 13·6	4·3 1·3	10·3 3·0	16·3 4·8
44	4 26·0	4 26·7	4 13·9	4·4 1·3	10·4 3·0	16·4 4·8
45	4 26·3	4 27·0	4 14·1	4·5 1·3	10·5 3·1	16·5 4·8
46	4 26·5	4 27·2	4 14·4	4·6 1·3	10·6 3·1	16·6 4·8
47	4 26·8	4 27·5	4 14·6	4·7 1·4	10·7 3·1	16·7 4·9
48	4 27·0	4 27·7	4 14·8	4·8 1·4	10·8 3·2	16·8 4·9
49	4 27·3	4 28·0	4 15·1	4·9 1·4	10·9 3·2	16·9 4·9
50	4 27·5	4 28·2	4 15·3	5·0 1·5	11·0 3·2	17·0 5·0
51	4 27·8	4 28·5	4 15·6	5·1 1·5	11·1 3·2	17·1 5·0
52	4 28·0	4 28·7	4 15·8	5·2 1·5	11·2 3·3	17·2 5·0
53	4 28·3	4 29·0	4 16·0	5·3 1·5	11·3 3·3	17·3 5·0
54	4 28·5	4 29·2	4 16·3	5·4 1·6	11·4 3·3	17·4 5·1
55	4 28·8	4 29·5	4 16·5	5·5 1·6	11·5 3·4	17·5 5·1
56	4 29·0	4 29·7	4 16·7	5·6 1·6	11·6 3·4	17·6 5·1
57	4 29·3	4 30·0	4 17·0	5·7 1·7	11·7 3·4	17·7 5·2
58	4 29·5	4 30·2	4 17·2	5·8 1·7	11·8 3·4	17·8 5·2
59	4 29·8	4 30·5	4 17·5	5·9 1·7	11·9 3·5	17·9 5·2
60	4 30·0	4 30·7	4 17·7	6·0 1·8	12·0 3·5	18·0 5·3

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

Astronomiske elementer - daglige sider

18m	SUN PLANETS	ARIES	MOON	v or d	Corr n	v or d	Corr n	v or d	Corr n
s	° ′	° ′	° ′	′	′	′	′	′	′
00	4 30·0	4 30·7	4 17·7	0·0	0·0	6·0	1·9	12·0	3·7
01	4 30·3	4 31·0	4 17·9	0·1	0·0	6·1	1·9	12·1	3·7
02	4 30·5	4 31·2	4 18·2	0·2	0·1	6·2	1·9	12·2	3·8
03	4 30·8	4 31·5	4 18·4	0·3	0·1	6·3	1·9	12·3	3·8
04	4 31·0	4 31·7	4 18·7	0·4	0·1	6·4	2·0	12·4	3·8
05	4 31·3	4 32·0	4 18·9	0·5	0·2	6·5	2·0	12·5	3·9
06	4 31·5	4 32·2	4 19·1	0·6	0·2	6·6	2·0	12·6	3·9
07	4 31·8	4 32·5	4 19·4	0·7	0·2	6·7	2·1	12·7	3·9
08	4 32·0	4 32·7	4 19·6	0·8	0·2	6·8	2·1	12·8	3·9
09	4 32·3	4 33·0	4 19·8	0·9	0·3	6·9	2·1	12·9	4·0
10	4 32·5	4 33·2	4 20·1	1·0	0·3	7·0	2·2	13·0	4·0
11	4 32·8	4 33·5	4 20·3	1·1	0·3	7·1	2·2	13·1	4·0
12	4 33·0	4 33·7	4 20·6	1·2	0·4	7·2	2·2	13·2	4·1
13	4 33·3	4 34·0	4 20·8	1·3	0·4	7·3	2·3	13·3	4·1
14	4 33·5	4 34·2	4 21·0	1·4	0·4	7·4	2·3	13·4	4·1
15	4 33·8	4 34·5	4 21·3	1·5	0·5	7·5	2·3	13·5	4·2
16	4 34·0	4 34·8	4 21·5	1·6	0·5	7·6	2·3	13·6	4·2
17	4 34·3	4 35·0	4 21·8	1·7	0·5	7·7	2·4	13·7	4·2
18	4 34·5	4 35·3	4 22·0	1·8	0·6	7·8	2·4	13·8	4·3
19	4 34·8	4 35·5	4 22·2	1·9	0·6	7·9	2·4	13·9	4·3
20	4 35·0	4 35·8	4 22·5	2·0	0·6	8·0	2·5	14·0	4·3
21	4 35·3	4 36·0	4 22·7	2·1	0·6	8·1	2·5	14·1	4·3
22	4 35·5	4 36·3	4 22·9	2·2	0·7	8·2	2·5	14·2	4·4
23	4 35·8	4 36·5	4 23·2	2·3	0·7	8·3	2·6	14·3	4·4
24	4 36·0	4 36·8	4 23·4	2·4	0·7	8·4	2·6	14·4	4·4
25	4 36·3	4 37·0	4 23·7	2·5	0·8	8·5	2·6	14·5	4·5
26	4 36·5	4 37·3	4 23·9	2·6	0·8	8·6	2·7	14·6	4·5
27	4 36·8	4 37·5	4 24·1	2·7	0·8	8·7	2·7	14·7	4·5
28	4 37·0	4 37·8	4 24·4	2·8	0·9	8·8	2·7	14·8	4·6
29	4 37·3	4 38·0	4 24·6	2·9	0·9	8·9	2·7	14·9	4·6
30	4 37·5	4 38·3	4 24·9	3·0	0·9	9·0	2·8	15·0	4·6
31	4 37·8	4 38·5	4 25·1	3·1	1·0	9·1	2·8	15·1	4·7
32	4 38·0	4 38·8	4 25·3	3·2	1·0	9·2	2·8	15·2	4·7
33	4 38·3	4 39·0	4 25·6	3·3	1·0	9·3	2·9	15·3	4·7
34	4 38·5	4 39·3	4 25·8	3·4	1·0	9·4	2·9	15·4	4·7
35	4 38·8	4 39·5	4 26·1	3·5	1·1	9·5	2·9	15·5	4·8
36	4 39·0	4 39·8	4 26·3	3·6	1·1	9·6	3·0	15·6	4·8
37	4 39·3	4 40·0	4 26·5	3·7	1·1	9·7	3·0	15·7	4·8
38	4 39·5	4 40·3	4 26·8	3·8	1·2	9·8	3·0	15·8	4·9
39	4 39·8	4 40·5	4 27·0	3·9	1·2	9·9	3·1	15·9	4·9
40	4 40·0	4 40·8	4 27·2	4·0	1·2	10·0	3·1	16·0	4·9
41	4 40·3	4 41·0	4 27·5	4·1	1·3	10·1	3·1	16·1	5·0
42	4 40·5	4 41·3	4 27·7	4·2	1·3	10·2	3·1	16·2	5·0
43	4 40·8	4 41·5	4 28·0	4·3	1·3	10·3	3·2	16·3	5·0
44	4 41·0	4 41·8	4 28·2	4·4	1·4	10·4	3·2	16·4	5·1
45	4 41·3	4 42·0	4 28·4	4·5	1·4	10·5	3·2	16·5	5·1
46	4 41·5	4 42·3	4 28·7	4·6	1·4	10·6	3·3	16·6	5·1
47	4 41·8	4 42·5	4 28·9	4·7	1·4	10·7	3·3	16·7	5·1
48	4 42·0	4 42·8	4 29·2	4·8	1·5	10·8	3·3	16·8	5·2
49	4 42·3	4 43·0	4 29·4	4·9	1·5	10·9	3·4	16·9	5·2
50	4 42·5	4 43·3	4 29·6	5·0	1·5	11·0	3·4	17·0	5·2
51	4 42·8	4 43·5	4 29·9	5·1	1·6	11·1	3·4	17·1	5·3
52	4 43·0	4 43·8	4 30·1	5·2	1·6	11·2	3·5	17·2	5·3
53	4 43·3	4 44·0	4 30·3	5·3	1·6	11·3	3·5	17·3	5·3
54	4 43·5	4 44·3	4 30·6	5·4	1·7	11·4	3·5	17·4	5·4
55	4 43·8	4 44·5	4 30·8	5·5	1·7	11·5	3·5	17·5	5·4
56	4 44·0	4 44·8	4 31·1	5·6	1·7	11·6	3·6	17·6	5·4
57	4 44·3	4 45·0	4 31·3	5·7	1·8	11·7	3·6	17·7	5·5
58	4 44·5	4 45·3	4 31·5	5·8	1·8	11·8	3·6	17·8	5·5
59	4 44·8	4 45·5	4 31·8	5·9	1·8	11·9	3·7	17·9	5·5
60	4 45·0	4 45·8	4 32·0	6·0	1·9	12·0	3·7	18·0	5·6

19m	SUN PLANETS	ARIES	MOON	v or d	Corr n	v or d	Corr n	v or d	Corr n
s	° ′	° ′	° ′	′	′	′	′	′	′
00	4 45·0	4 45·8	4 32·0	0·0	0·0	6·0	2·0	12·0	3·9
01	4 45·3	4 46·0	4 32·3	0·1	0·0	6·1	2·0	12·1	3·9
02	4 45·5	4 46·3	4 32·5	0·2	0·1	6·2	2·0	12·2	4·0
03	4 45·8	4 46·5	4 32·7	0·3	0·1	6·3	2·0	12·3	4·0
04	4 46·0	4 46·8	4 33·0	0·4	0·1	6·4	2·1	12·4	4·0
05	4 46·3	4 47·0	4 33·2	0·5	0·2	6·5	2·1	12·5	4·1
06	4 46·5	4 47·3	4 33·4	0·6	0·2	6·6	2·1	12·6	4·1
07	4 46·8	4 47·5	4 33·7	0·7	0·2	6·7	2·2	12·7	4·1
08	4 47·0	4 47·8	4 33·9	0·8	0·3	6·8	2·2	12·8	4·2
09	4 47·3	4 48·0	4 34·2	0·9	0·3	6·9	2·2	12·9	4·2
10	4 47·5	4 48·3	4 34·4	1·0	0·3	7·0	2·3	13·0	4·2
11	4 47·8	4 48·5	4 34·6	1·1	0·4	7·1	2·3	13·1	4·3
12	4 48·0	4 48·8	4 34·9	1·2	0·4	7·2	2·3	13·2	4·3
13	4 48·3	4 49·0	4 35·1	1·3	0·4	7·3	2·4	13·3	4·3
14	4 48·5	4 49·3	4 35·4	1·4	0·5	7·4	2·4	13·4	4·4
15	4 48·8	4 49·5	4 35·6	1·5	0·5	7·5	2·4	13·5	4·4
16	4 49·0	4 49·8	4 35·8	1·6	0·5	7·6	2·5	13·6	4·4
17	4 49·3	4 50·0	4 36·1	1·7	0·6	7·7	2·5	13·7	4·5
18	4 49·5	4 50·3	4 36·3	1·8	0·6	7·8	2·5	13·8	4·5
19	4 49·8	4 50·5	4 36·6	1·9	0·6	7·9	2·6	13·9	4·5
20	4 50·0	4 50·8	4 36·8	2·0	0·7	8·0	2·6	14·0	4·6
21	4 50·3	4 51·0	4 37·0	2·1	0·7	8·1	2·6	14·1	4·6
22	4 50·5	4 51·3	4 37·3	2·2	0·7	8·2	2·7	14·2	4·6
23	4 50·8	4 51·5	4 37·5	2·3	0·7	8·3	2·7	14·3	4·6
24	4 51·0	4 51·8	4 37·7	2·4	0·8	8·4	2·7	14·4	4·7
25	4 51·3	4 52·0	4 38·0	2·5	0·8	8·5	2·8	14·5	4·7
26	4 51·5	4 52·3	4 38·2	2·6	0·8	8·6	2·8	14·6	4·7
27	4 51·8	4 52·5	4 38·5	2·7	0·9	8·7	2·8	14·7	4·8
28	4 52·0	4 52·8	4 38·7	2·8	0·9	8·8	2·9	14·8	4·8
29	4 52·3	4 53·1	4 38·9	2·9	0·9	8·9	2·9	14·9	4·8
30	4 52·5	4 53·3	4 39·2	3·0	1·0	9·0	2·9	15·0	4·9
31	4 52·8	4 53·6	4 39·4	3·1	1·0	9·1	3·0	15·1	4·9
32	4 53·0	4 53·8	4 39·7	3·2	1·0	9·2	3·0	15·2	4·9
33	4 53·3	4 54·1	4 39·9	3·3	1·1	9·3	3·0	15·3	5·0
34	4 53·5	4 54·3	4 40·1	3·4	1·1	9·4	3·1	15·4	5·0
35	4 53·8	4 54·6	4 40·4	3·5	1·1	9·5	3·1	15·5	5·0
36	4 54·0	4 54·8	4 40·6	3·6	1·2	9·6	3·1	15·6	5·1
37	4 54·3	4 55·1	4 40·8	3·7	1·2	9·7	3·2	15·7	5·1
38	4 54·5	4 55·3	4 41·1	3·8	1·2	9·8	3·2	15·8	5·1
39	4 54·8	4 55·6	4 41·3	3·9	1·3	9·9	3·2	15·9	5·2
40	4 55·0	4 55·8	4 41·6	4·0	1·3	10·0	3·3	16·0	5·2
41	4 55·3	4 56·1	4 41·8	4·1	1·3	10·1	3·3	16·1	5·2
42	4 55·5	4 56·3	4 42·0	4·2	1·4	10·2	3·3	16·2	5·3
43	4 55·8	4 56·6	4 42·3	4·3	1·4	10·3	3·3	16·3	5·3
44	4 56·0	4 56·8	4 42·5	4·4	1·4	10·4	3·4	16·4	5·3
45	4 56·3	4 57·1	4 42·8	4·5	1·5	10·5	3·4	16·5	5·4
46	4 56·5	4 57·3	4 43·0	4·6	1·5	10·6	3·4	16·6	5·4
47	4 56·8	4 57·6	4 43·2	4·7	1·5	10·7	3·5	16·7	5·4
48	4 57·0	4 57·8	4 43·5	4·8	1·6	10·8	3·5	16·8	5·5
49	4 57·3	4 58·1	4 43·7	4·9	1·6	10·9	3·5	16·9	5·5
50	4 57·5	4 58·3	4 43·9	5·0	1·6	11·0	3·6	17·0	5·5
51	4 57·8	4 58·6	4 44·2	5·1	1·7	11·1	3·6	17·1	5·6
52	4 58·0	4 58·8	4 44·4	5·2	1·7	11·2	3·6	17·2	5·6
53	4 58·3	4 59·1	4 44·7	5·3	1·7	11·3	3·7	17·3	5·6
54	4 58·5	4 59·3	4 44·9	5·4	1·8	11·4	3·7	17·4	5·7
55	4 58·8	4 59·6	4 45·1	5·5	1·8	11·5	3·7	17·5	5·7
56	4 59·0	4 59·8	4 45·4	5·6	1·8	11·6	3·8	17·6	5·7
57	4 59·3	5 00·1	4 45·6	5·7	1·9	11·7	3·8	17·7	5·8
58	4 59·5	5 00·3	4 45·9	5·8	1·9	11·8	3·8	17·8	5·8
59	4 59·8	5 00·6	4 46·1	5·9	1·9	11·9	3·9	17·9	5·8
60	5 00·0	5 00·8	4 46·3	6·0	2·0	12·0	3·9	18·0	5·9

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

20h	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	5 00·0	5 00·8	4 46·3	0·0 0·0	6·0 2·1	12·0 4·1
01	5 00·3	5 01·1	4 46·6	0·1 0·0	6·1 2·1	12·1 4·1
02	5 00·5	5 01·3	4 46·8	0·2 0·1	6·2 2·1	12·2 4·2
03	5 00·8	5 01·6	4 47·0	0·3 0·1	6·3 2·2	12·3 4·2
04	5 01·0	5 01·8	4 47·3	0·4 0·1	6·4 2·2	12·4 4·2
05	5 01·3	5 02·1	4 47·5	0·5 0·2	6·5 2·2	12·5 4·3
06	5 01·5	5 02·3	4 47·8	0·6 0·2	6·6 2·3	12·6 4·3
07	5 01·8	5 02·6	4 48·0	0·7 0·2	6·7 2·3	12·7 4·3
08	5 02·0	5 02·8	4 48·2	0·8 0·3	6·8 2·3	12·8 4·4
09	5 02·3	5 03·1	4 48·5	0·9 0·3	6·9 2·4	12·9 4·4
10	5 02·5	5 03·3	4 48·7	1·0 0·3	7·0 2·4	13·0 4·4
11	5 02·8	5 03·6	4 49·0	1·1 0·4	7·1 2·4	13·1 4·5
12	5 03·0	5 03·8	4 49·2	1·2 0·4	7·2 2·5	13·2 4·5
13	5 03·3	5 04·1	4 49·4	1·3 0·4	7·3 2·5	13·3 4·5
14	5 03·5	5 04·3	4 49·7	1·4 0·5	7·4 2·5	13·4 4·6
15	5 03·8	5 04·6	4 49·9	1·5 0·5	7·5 2·6	13·5 4·6
16	5 04·0	5 04·8	4 50·2	1·6 0·5	7·6 2·6	13·6 4·6
17	5 04·3	5 05·1	4 50·4	1·7 0·6	7·7 2·6	13·7 4·7
18	5 04·5	5 05·3	4 50·6	1·8 0·6	7·8 2·7	13·8 4·7
19	5 04·8	5 05·6	4 50·9	1·9 0·6	7·9 2·7	13·9 4·7
20	5 05·0	5 05·8	4 51·1	2·0 0·7	8·0 2·7	14·0 4·8
21	5 05·3	5 06·1	4 51·3	2·1 0·7	8·1 2·8	14·1 4·8
22	5 05·5	5 06·3	4 51·6	2·2 0·8	8·2 2·8	14·2 4·9
23	5 05·8	5 06·6	4 51·8	2·3 0·8	8·3 2·8	14·3 4·9
24	5 06·0	5 06·8	4 52·1	2·4 0·8	8·4 2·9	14·4 4·9
25	5 06·3	5 07·1	4 52·3	2·5 0·9	8·5 2·9	14·5 5·0
26	5 06·5	5 07·3	4 52·5	2·6 0·9	8·6 2·9	14·6 5·0
27	5 06·8	5 07·6	4 52·8	2·7 0·9	8·7 3·0	14·7 5·0
28	5 07·0	5 07·8	4 53·0	2·8 1·0	8·8 3·0	14·8 5·1
29	5 07·3	5 08·1	4 53·3	2·9 1·0	8·9 3·0	14·9 5·1
30	5 07·5	5 08·3	4 53·5	3·0 1·0	9·0 3·1	15·0 5·1
31	5 07·8	5 08·6	4 53·7	3·1 1·1	9·1 3·1	15·1 5·2
32	5 08·0	5 08·8	4 54·0	3·2 1·1	9·2 3·1	15·2 5·2
33	5 08·3	5 09·1	4 54·2	3·3 1·1	9·3 3·2	15·3 5·2
34	5 08·5	5 09·3	4 54·4	3·4 1·2	9·4 3·2	15·4 5·3
35	5 08·8	5 09·6	4 54·7	3·5 1·2	9·5 3·2	15·5 5·3
36	5 09·0	5 09·8	4 54·9	3·6 1·2	9·6 3·3	15·6 5·3
37	5 09·3	5 10·1	4 55·2	3·7 1·3	9·7 3·3	15·7 5·4
38	5 09·5	5 10·3	4 55·4	3·8 1·3	9·8 3·3	15·8 5·4
39	5 09·8	5 10·6	4 55·6	3·9 1·3	9·9 3·4	15·9 5·4
40	5 10·0	5 10·8	4 55·9	4·0 1·4	10·0 3·4	16·0 5·5
41	5 10·3	5 11·1	4 56·1	4·1 1·4	10·1 3·5	16·1 5·5
42	5 10·5	5 11·4	4 56·4	4·2 1·4	10·2 3·5	16·2 5·5
43	5 10·8	5 11·6	4 56·6	4·3 1·5	10·3 3·5	16·3 5·6
44	5 11·0	5 11·9	4 56·8	4·4 1·5	10·4 3·6	16·4 5·6
45	5 11·3	5 12·1	4 57·1	4·5 1·5	10·5 3·6	16·5 5·6
46	5 11·5	5 12·4	4 57·3	4·6 1·6	10·6 3·6	16·6 5·7
47	5 11·8	5 12·6	4 57·5	4·7 1·6	10·7 3·7	16·7 5·7
48	5 12·0	5 12·9	4 57·8	4·8 1·6	10·8 3·7	16·8 5·7
49	5 12·3	5 13·1	4 58·0	4·9 1·7	10·9 3·7	16·9 5·8
50	5 12·5	5 13·4	4 58·3	5·0 1·7	11·0 3·8	17·0 5·8
51	5 12·8	5 13·6	4 58·5	5·1 1·7	11·1 3·8	17·1 5·8
52	5 13·0	5 13·9	4 58·7	5·2 1·8	11·2 3·8	17·2 5·9
53	5 13·3	5 14·1	4 59·0	5·3 1·8	11·3 3·9	17·3 5·9
54	5 13·5	5 14·4	4 59·2	5·4 1·8	11·4 3·9	17·4 5·9
55	5 13·8	5 14·6	4 59·5	5·5 1·9	11·5 3·9	17·5 6·0
56	5 14·0	5 14·9	4 59·7	5·6 1·9	11·6 4·0	17·6 6·0
57	5 14·3	5 15·1	4 59·9	5·7 1·9	11·7 4·0	17·7 6·0
58	5 14·5	5 15·4	5 00·2	5·8 2·0	11·8 4·0	17·8 6·1
59	5 14·8	5 15·6	5 00·4	5·9 2·0	11·9 4·1	17·9 6·1
60	5 15·0	5 15·9	5 00·7	6·0 2·1	12·0 4·1	18·0 6·2

21h	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	5 15·0	5 15·9	5 00·7	0·0 0·0	6·0 2·2	12·0 4·3
01	5 15·3	5 16·1	5 00·9	0·1 0·0	6·1 2·2	12·1 4·3
02	5 15·5	5 16·4	5 01·1	0·2 0·1	6·2 2·2	12·2 4·4
03	5 15·8	5 16·6	5 01·4	0·3 0·1	6·3 2·3	12·3 4·4
04	5 16·0	5 16·9	5 01·6	0·4 0·1	6·4 2·3	12·4 4·4
05	5 16·3	5 17·1	5 01·8	0·5 0·2	6·5 2·3	12·5 4·5
06	5 16·5	5 17·4	5 02·1	0·6 0·2	6·6 2·4	12·6 4·5
07	5 16·8	5 17·6	5 02·3	0·7 0·3	6·7 2·4	12·7 4·6
08	5 17·0	5 17·9	5 02·6	0·8 0·3	6·8 2·4	12·8 4·6
09	5 17·3	5 18·1	5 02·8	0·9 0·3	6·9 2·5	12·9 4·6
10	5 17·5	5 18·4	5 03·0	1·0 0·4	7·0 2·5	13·0 4·7
11	5 17·8	5 18·6	5 03·3	1·1 0·4	7·1 2·5	13·1 4·7
12	5 18·0	5 18·9	5 03·5	1·2 0·4	7·2 2·6	13·2 4·7
13	5 18·3	5 19·1	5 03·8	1·3 0·5	7·3 2·6	13·3 4·8
14	5 18·5	5 19·4	5 04·0	1·4 0·5	7·4 2·7	13·4 4·8
15	5 18·8	5 19·6	5 04·2	1·5 0·5	7·5 2·7	13·5 4·8
16	5 19·0	5 19·9	5 04·5	1·6 0·6	7·6 2·7	13·6 4·9
17	5 19·3	5 20·1	5 04·7	1·7 0·6	7·7 2·8	13·7 4·9
18	5 19·5	5 20·4	5 04·9	1·8 0·6	7·8 2·8	13·8 4·9
19	5 19·8	5 20·6	5 05·2	1·9 0·7	7·9 2·8	13·9 5·0
20	5 20·0	5 20·9	5 05·4	2·0 0·7	8·0 2·9	14·0 5·0
21	5 20·3	5 21·1	5 05·7	2·1 0·8	8·1 2·9	14·1 5·1
22	5 20·5	5 21·4	5 05·9	2·2 0·8	8·2 2·9	14·2 5·1
23	5 20·8	5 21·6	5 06·1	2·3 0·8	8·3 3·0	14·3 5·1
24	5 21·0	5 21·9	5 06·4	2·4 0·9	8·4 3·0	14·4 5·2
25	5 21·3	5 22·1	5 06·6	2·5 0·9	8·5 3·0	14·5 5·2
26	5 21·5	5 22·4	5 06·9	2·6 0·9	8·6 3·1	14·6 5·2
27	5 21·8	5 22·6	5 07·1	2·7 1·0	8·7 3·1	14·7 5·3
28	5 22·0	5 22·9	5 07·3	2·8 1·0	8·8 3·2	14·8 5·3
29	5 22·3	5 23·1	5 07·6	2·9 1·0	8·9 3·2	14·9 5·3
30	5 22·5	5 23·4	5 07·8	3·0 1·1	9·0 3·2	15·0 5·4
31	5 22·8	5 23·6	5 08·0	3·1 1·1	9·1 3·3	15·1 5·4
32	5 23·0	5 23·9	5 08·3	3·2 1·1	9·2 3·3	15·2 5·4
33	5 23·3	5 24·1	5 08·5	3·3 1·2	9·3 3·3	15·3 5·5
34	5 23·5	5 24·4	5 08·8	3·4 1·2	9·4 3·4	15·4 5·5
35	5 23·8	5 24·6	5 09·0	3·5 1·3	9·5 3·4	15·5 5·6
36	5 24·0	5 24·9	5 09·2	3·6 1·3	9·6 3·4	15·6 5·6
37	5 24·3	5 25·1	5 09·5	3·7 1·3	9·7 3·5	15·7 5·6
38	5 24·5	5 25·4	5 09·7	3·8 1·4	9·8 3·5	15·8 5·7
39	5 24·8	5 25·6	5 10·0	3·9 1·4	9·9 3·5	15·9 5·7
40	5 25·0	5 25·9	5 10·2	4·0 1·4	10·0 3·6	16·0 5·7
41	5 25·3	5 26·1	5 10·4	4·1 1·5	10·1 3·6	16·1 5·8
42	5 25·5	5 26·4	5 10·7	4·2 1·5	10·2 3·7	16·2 5·8
43	5 25·8	5 26·6	5 10·9	4·3 1·5	10·3 3·7	16·3 5·8
44	5 26·0	5 26·9	5 11·1	4·4 1·6	10·4 3·7	16·4 5·9
45	5 26·3	5 27·1	5 11·4	4·5 1·6	10·5 3·8	16·5 5·9
46	5 26·5	5 27·4	5 11·6	4·6 1·6	10·6 3·8	16·6 5·9
47	5 26·8	5 27·6	5 11·9	4·7 1·7	10·7 3·8	16·7 6·0
48	5 27·0	5 27·9	5 12·1	4·8 1·7	10·8 3·9	16·8 6·0
49	5 27·3	5 28·1	5 12·3	4·9 1·8	10·9 3·9	16·9 6·1
50	5 27·5	5 28·4	5 12·6	5·0 1·8	11·0 3·9	17·0 6·1
51	5 27·8	5 28·6	5 12·8	5·1 1·8	11·1 4·0	17·1 6·1
52	5 28·0	5 28·9	5 13·1	5·2 1·9	11·2 4·0	17·2 6·2
53	5 28·3	5 29·1	5 13·3	5·3 1·9	11·3 4·0	17·3 6·2
54	5 28·5	5 29·4	5 13·5	5·4 1·9	11·4 4·1	17·4 6·2
55	5 28·8	5 29·7	5 13·8	5·5 2·0	11·5 4·1	17·5 6·3
56	5 29·0	5 29·9	5 14·0	5·6 2·0	11·6 4·2	17·6 6·3
57	5 29·3	5 30·2	5 14·3	5·7 2·0	11·7 4·2	17·7 6·3
58	5 29·5	5 30·4	5 14·5	5·8 2·1	11·8 4·2	17·8 6·4
59	5 29·8	5 30·7	5 14·7	5·9 2·1	11·9 4·3	17·9 6·4
60	5 30·0	5 30·9	5 15·0	6·0 2·2	12·0 4·3	18·0 6·5

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

Astronomiske elementer - daglige sider

22	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	5 30·0	5 30·9	5 15·0	0·0 0·0	6·0 2·3	12·0 4·5
01	5 30·3	5 31·2	5 15·2	0·1 0·0	6·1 2·3	12·1 4·5
02	5 30·5	5 31·4	5 15·4	0·2 0·1	6·2 2·3	12·2 4·6
03	5 30·8	5 31·7	5 15·7	0·3 0·1	6·3 2·4	12·3 4·6
04	5 31·0	5 31·9	5 15·9	0·4 0·2	6·4 2·4	12·4 4·7
05	5 31·3	5 32·2	5 16·2	0·5 0·2	6·5 2·4	12·5 4·7
06	5 31·5	5 32·4	5 16·4	0·6 0·2	6·6 2·5	12·6 4·7
07	5 31·8	5 32·7	5 16·6	0·7 0·3	6·7 2·5	12·7 4·8
08	5 32·0	5 32·9	5 16·9	0·8 0·3	6·8 2·6	12·8 4·8
09	5 32·3	5 33·2	5 17·1	0·9 0·3	6·9 2·6	12·9 4·8
10	5 32·5	5 33·4	5 17·4	1·0 0·4	7·0 2·6	13·0 4·9
11	5 32·8	5 33·7	5 17·6	1·1 0·4	7·1 2·7	13·1 4·9
12	5 33·0	5 33·9	5 17·8	1·2 0·5	7·2 2·7	13·2 5·0
13	5 33·3	5 34·2	5 18·1	1·3 0·5	7·3 2·7	13·3 5·0
14	5 33·5	5 34·4	5 18·3	1·4 0·5	7·4 2·8	13·4 5·0
15	5 33·8	5 34·7	5 18·5	1·5 0·6	7·5 2·8	13·5 5·1
16	5 34·0	5 34·9	5 18·8	1·6 0·6	7·6 2·9	13·6 5·1
17	5 34·3	5 35·2	5 19·0	1·7 0·6	7·7 2·9	13·7 5·1
18	5 34·5	5 35·4	5 19·3	1·8 0·7	7·8 2·9	13·8 5·2
19	5 34·8	5 35·7	5 19·5	1·9 0·7	7·9 3·0	13·9 5·2
20	5 35·0	5 35·9	5 19·7	2·0 0·8	8·0 3·0	14·0 5·3
21	5 35·3	5 36·2	5 20·0	2·1 0·8	8·1 3·0	14·1 5·3
22	5 35·5	5 36·4	5 20·2	2·2 0·8	8·2 3·1	14·2 5·3
23	5 35·8	5 36·7	5 20·5	2·3 0·9	8·3 3·1	14·3 5·4
24	5 36·0	5 36·9	5 20·7	2·4 0·9	8·4 3·2	14·4 5·4
25	5 36·3	5 37·2	5 20·9	2·5 0·9	8·5 3·2	14·5 5·4
26	5 36·5	5 37·4	5 21·2	2·6 1·0	8·6 3·2	14·6 5·5
27	5 36·8	5 37·7	5 21·4	2·7 1·0	8·7 3·3	14·7 5·5
28	5 37·0	5 37·9	5 21·6	2·8 1·1	8·8 3·3	14·8 5·6
29	5 37·3	5 38·2	5 21·9	2·9 1·1	8·9 3·3	14·9 5·6
30	5 37·5	5 38·4	5 22·1	3·0 1·1	9·0 3·4	15·0 5·6
31	5 37·8	5 38·7	5 22·4	3·1 1·2	9·1 3·4	15·1 5·7
32	5 38·0	5 38·9	5 22·6	3·2 1·2	9·2 3·5	15·2 5·7
33	5 38·3	5 39·2	5 22·8	3·3 1·2	9·3 3·5	15·3 5·7
34	5 38·5	5 39·4	5 23·1	3·4 1·3	9·4 3·5	15·4 5·8
35	5 38·8	5 39·7	5 23·3	3·5 1·3	9·5 3·6	15·5 5·8
36	5 39·0	5 39·9	5 23·6	3·6 1·4	9·6 3·6	15·6 5·9
37	5 39·3	5 40·2	5 23·8	3·7 1·4	9·7 3·6	15·7 5·9
38	5 39·5	5 40·4	5 24·0	3·8 1·4	9·8 3·7	15·8 5·9
39	5 39·8	5 40·7	5 24·3	3·9 1·5	9·9 3·7	15·9 6·0
40	5 40·0	5 40·9	5 24·5	4·0 1·5	10·0 3·8	16·0 6·0
41	5 40·3	5 41·2	5 24·7	4·1 1·5	10·1 3·8	16·1 6·0
42	5 40·5	5 41·4	5 25·0	4·2 1·6	10·2 3·8	16·2 6·1
43	5 40·8	5 41·7	5 25·2	4·3 1·6	10·3 3·9	16·3 6·1
44	5 41·0	5 41·9	5 25·5	4·4 1·7	10·4 3·9	16·4 6·2
45	5 41·3	5 42·2	5 25·7	4·5 1·7	10·5 3·9	16·5 6·2
46	5 41·5	5 42·4	5 25·9	4·6 1·7	10·6 4·0	16·6 6·2
47	5 41·8	5 42·7	5 26·2	4·7 1·8	10·7 4·0	16·7 6·3
48	5 42·0	5 42·9	5 26·4	4·8 1·8	10·8 4·1	16·8 6·3
49	5 42·3	5 43·2	5 26·7	4·9 1·8	10·9 4·1	16·9 6·3
50	5 42·5	5 43·4	5 26·9	5·0 1·9	11·0 4·1	17·0 6·4
51	5 42·8	5 43·7	5 27·1	5·1 1·9	11·1 4·2	17·1 6·4
52	5 43·0	5 43·9	5 27·4	5·2 2·0	11·2 4·2	17·2 6·5
53	5 43·3	5 44·2	5 27·6	5·3 2·0	11·3 4·2	17·3 6·5
54	5 43·5	5 44·4	5 27·9	5·4 2·0	11·4 4·3	17·4 6·5
55	5 43·8	5 44·7	5 28·1	5·5 2·1	11·5 4·3	17·5 6·6
56	5 44·0	5 44·9	5 28·3	5·6 2·1	11·6 4·4	17·6 6·6
57	5 44·3	5 45·2	5 28·6	5·7 2·1	11·7 4·4	17·7 6·6
58	5 44·5	5 45·4	5 28·8	5·8 2·2	11·8 4·4	17·8 6·7
59	5 44·8	5 45·7	5 29·0	5·9 2·2	11·9 4·5	17·9 6·7
60	5 45·0	5 45·9	5 29·3	6·0 2·3	12·0 4·5	18·0 6·8

23	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	5 45·0	5 45·9	5 29·3	0·0 0·0	6·0 2·4	12·0 4·7
01	5 45·3	5 46·2	5 29·5	0·1 0·0	6·1 2·4	12·1 4·7
02	5 45·5	5 46·4	5 29·8	0·2 0·1	6·2 2·4	12·2 4·8
03	5 45·8	5 46·7	5 30·0	0·3 0·1	6·3 2·5	12·3 4·8
04	5 46·0	5 46·9	5 30·2	0·4 0·2	6·4 2·5	12·4 4·9
05	5 46·3	5 47·2	5 30·5	0·5 0·2	6·5 2·5	12·5 4·9
06	5 46·5	5 47·4	5 30·7	0·6 0·2	6·6 2·6	12·6 4·9
07	5 46·8	5 47·7	5 31·0	0·7 0·3	6·7 2·6	12·7 5·0
08	5 47·0	5 48·0	5 31·2	0·8 0·3	6·8 2·7	12·8 5·0
09	5 47·3	5 48·2	5 31·4	0·9 0·4	6·9 2·7	12·9 5·1
10	5 47·5	5 48·5	5 31·7	1·0 0·4	7·0 2·7	13·0 5·1
11	5 47·8	5 48·7	5 31·9	1·1 0·4	7·1 2·8	13·1 5·1
12	5 48·0	5 49·0	5 32·1	1·2 0·5	7·2 2·8	13·2 5·2
13	5 48·3	5 49·2	5 32·4	1·3 0·5	7·3 2·9	13·3 5·2
14	5 48·5	5 49·5	5 32·6	1·4 0·5	7·4 2·9	13·4 5·2
15	5 48·8	5 49·7	5 32·9	1·5 0·6	7·5 2·9	13·5 5·3
16	5 49·0	5 50·0	5 33·1	1·6 0·6	7·6 3·0	13·6 5·3
17	5 49·3	5 50·2	5 33·3	1·7 0·7	7·7 3·0	13·7 5·4
18	5 49·5	5 50·5	5 33·6	1·8 0·7	7·8 3·1	13·8 5·4
19	5 49·8	5 50·7	5 33·8	1·9 0·7	7·9 3·1	13·9 5·4
20	5 50·0	5 51·0	5 34·1	2·0 0·8	8·0 3·1	14·0 5·5
21	5 50·3	5 51·2	5 34·3	2·1 0·8	8·1 3·2	14·1 5·5
22	5 50·5	5 51·5	5 34·5	2·2 0·9	8·2 3·2	14·2 5·6
23	5 50·8	5 51·7	5 34·8	2·3 0·9	8·3 3·3	14·3 5·6
24	5 51·0	5 52·0	5 35·0	2·4 0·9	8·4 3·3	14·4 5·6
25	5 51·3	5 52·2	5 35·2	2·5 1·0	8·5 3·3	14·5 5·7
26	5 51·5	5 52·5	5 35·5	2·6 1·0	8·6 3·4	14·6 5·7
27	5 51·8	5 52·7	5 35·7	2·7 1·1	8·7 3·4	14·7 5·8
28	5 52·0	5 53·0	5 36·0	2·8 1·1	8·8 3·4	14·8 5·8
29	5 52·3	5 53·2	5 36·2	2·9 1·1	8·9 3·5	14·9 5·8
30	5 52·5	5 53·5	5 36·4	3·0 1·2	9·0 3·5	15·0 5·9
31	5 52·8	5 53·7	5 36·7	3·1 1·2	9·1 3·6	15·1 5·9
32	5 53·0	5 54·0	5 36·9	3·2 1·3	9·2 3·6	15·2 6·0
33	5 53·3	5 54·2	5 37·2	3·3 1·3	9·3 3·6	15·3 6·0
34	5 53·5	5 54·5	5 37·4	3·4 1·3	9·4 3·7	15·4 6·0
35	5 53·8	5 54·7	5 37·6	3·5 1·4	9·5 3·7	15·5 6·1
36	5 54·0	5 55·0	5 37·9	3·6 1·4	9·6 3·8	15·6 6·1
37	5 54·3	5 55·2	5 38·1	3·7 1·4	9·7 3·8	15·7 6·1
38	5 54·5	5 55·5	5 38·4	3·8 1·5	9·8 3·8	15·8 6·2
39	5 54·8	5 55·7	5 38·6	3·9 1·5	9·9 3·9	15·9 6·2
40	5 55·0	5 56·0	5 38·8	4·0 1·6	10·0 3·9	16·0 6·3
41	5 55·3	5 56·2	5 39·1	4·1 1·6	10·1 4·0	16·1 6·3
42	5 55·5	5 56·5	5 39·3	4·2 1·6	10·2 4·0	16·2 6·3
43	5 55·8	5 56·7	5 39·5	4·3 1·7	10·3 4·0	16·3 6·4
44	5 56·0	5 57·0	5 39·8	4·4 1·7	10·4 4·1	16·4 6·4
45	5 56·3	5 57·2	5 40·0	4·5 1·8	10·5 4·1	16·5 6·5
46	5 56·5	5 57·5	5 40·3	4·6 1·8	10·6 4·2	16·6 6·5
47	5 56·8	5 57·7	5 40·5	4·7 1·8	10·7 4·2	16·7 6·5
48	5 57·0	5 58·0	5 40·7	4·8 1·9	10·8 4·2	16·8 6·6
49	5 57·3	5 58·2	5 41·0	4·9 1·9	10·9 4·3	16·9 6·6
50	5 57·5	5 58·5	5 41·2	5·0 2·0	11·0 4·3	17·0 6·7
51	5 57·8	5 58·7	5 41·5	5·1 2·0	11·1 4·3	17·1 6·7
52	5 58·0	5 59·0	5 41·7	5·2 2·0	11·2 4·4	17·2 6·7
53	5 58·3	5 59·2	5 41·9	5·3 2·1	11·3 4·4	17·3 6·8
54	5 58·5	5 59·5	5 42·2	5·4 2·1	11·4 4·5	17·4 6·8
55	5 58·8	5 59·7	5 42·4	5·5 2·2	11·5 4·5	17·5 6·9
56	5 59·0	6 00·0	5 42·6	5·6 2·2	11·6 4·5	17·6 6·9
57	5 59·3	6 00·2	5 42·9	5·7 2·2	11·7 4·6	17·7 6·9
58	5 59·5	6 00·5	5 43·1	5·8 2·3	11·8 4·6	17·8 7·0
59	5 59·8	6 00·7	5 43·4	5·9 2·3	11·9 4·7	17·9 7·0
60	6 00·0	6 01·0	5 43·6	6·0 2·4	12·0 4·7	18·0 7·1

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

24	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	6 00·0	6 01·0	5 43·6	0·0 0·0	6·0 2·5	12·0 4·9
01	6 00·3	6 01·2	5 43·8	0·1 0·0	6·1 2·5	12·1 4·9
02	6 00·5	6 01·5	5 44·1	0·2 0·1	6·2 2·5	12·2 5·0
03	6 00·8	6 01·7	5 44·3	0·3 0·1	6·3 2·6	12·3 5·0
04	6 01·0	6 02·0	5 44·6	0·4 0·2	6·4 2·6	12·4 5·1
05	6 01·3	6 02·2	5 44·8	0·5 0·2	6·5 2·7	12·5 5·1
06	6 01·5	6 02·5	5 45·0	0·6 0·2	6·6 2·7	12·6 5·1
07	6 01·8	6 02·7	5 45·3	0·7 0·3	6·7 2·7	12·7 5·2
08	6 02·0	6 03·0	5 45·5	0·8 0·3	6·8 2·8	12·8 5·2
09	6 02·3	6 03·2	5 45·7	0·9 0·4	6·9 2·8	12·9 5·3
10	6 02·5	6 03·5	5 46·0	1·0 0·4	7·0 2·9	13·0 5·3
11	6 02·8	6 03·7	5 46·2	1·1 0·4	7·1 2·9	13·1 5·3
12	6 03·0	6 04·0	5 46·5	1·2 0·5	7·2 2·9	13·2 5·4
13	6 03·3	6 04·2	5 46·7	1·3 0·5	7·3 3·0	13·3 5·4
14	6 03·5	6 04·5	5 46·9	1·4 0·6	7·4 3·0	13·4 5·5
15	6 03·8	6 04·7	5 47·2	1·5 0·6	7·5 3·1	13·5 5·5
16	6 04·0	6 05·0	5 47·4	1·6 0·7	7·6 3·1	13·6 5·6
17	6 04·3	6 05·2	5 47·7	1·7 0·7	7·7 3·1	13·7 5·6
18	6 04·5	6 05·5	5 47·9	1·8 0·7	7·8 3·2	13·8 5·6
19	6 04·8	6 05·7	5 48·1	1·9 0·8	7·9 3·2	13·9 5·7
20	6 05·0	6 06·0	5 48·4	2·0 0·8	8·0 3·3	14·0 5·7
21	6 05·3	6 06·3	5 48·6	2·1 0·9	8·1 3·3	14·1 5·8
22	6 05·5	6 06·5	5 48·8	2·2 0·9	8·2 3·3	14·2 5·8
23	6 05·8	6 06·8	5 49·1	2·3 0·9	8·3 3·4	14·3 5·8
24	6 06·0	6 07·0	5 49·3	2·4 1·0	8·4 3·4	14·4 5·9
25	6 06·3	6 07·3	5 49·6	2·5 1·0	8·5 3·5	14·5 5·9
26	6 06·5	6 07·5	5 49·8	2·6 1·1	8·6 3·5	14·6 6·0
27	6 06·8	6 07·8	5 50·0	2·7 1·1	8·7 3·6	14·7 6·0
28	6 07·0	6 08·0	5 50·3	2·8 1·1	8·8 3·6	14·8 6·0
29	6 07·3	6 08·3	5 50·5	2·9 1·2	8·9 3·6	14·9 6·1
30	6 07·5	6 08·5	5 50·8	3·0 1·2	9·0 3·7	15·0 6·1
31	6 07·8	6 08·8	5 51·0	3·1 1·3	9·1 3·7	15·1 6·2
32	6 08·0	6 09·0	5 51·2	3·2 1·3	9·2 3·8	15·2 6·2
33	6 08·3	6 09·3	5 51·5	3·3 1·3	9·3 3·8	15·3 6·2
34	6 08·5	6 09·5	5 51·7	3·4 1·4	9·4 3·8	15·4 6·3
35	6 08·8	6 09·8	5 52·0	3·5 1·4	9·5 3·9	15·5 6·3
36	6 09·0	6 10·0	5 52·2	3·6 1·5	9·6 3·9	15·6 6·4
37	6 09·3	6 10·3	5 52·4	3·7 1·5	9·7 4·0	15·7 6·4
38	6 09·5	6 10·5	5 52·7	3·8 1·6	9·8 4·0	15·8 6·5
39	6 09·8	6 10·8	5 52·9	3·9 1·6	9·9 4·0	15·9 6·5
40	6 10·0	6 11·0	5 53·1	4·0 1·6	10·0 4·1	16·0 6·5
41	6 10·3	6 11·3	5 53·4	4·1 1·7	10·1 4·1	16·1 6·6
42	6 10·5	6 11·5	5 53·6	4·2 1·7	10·2 4·2	16·2 6·6
43	6 10·8	6 11·8	5 53·9	4·3 1·8	10·3 4·2	16·3 6·7
44	6 11·0	6 12·0	5 54·1	4·4 1·8	10·4 4·2	16·4 6·7
45	6 11·3	6 12·3	5 54·3	4·5 1·8	10·5 4·3	16·5 6·7
46	6 11·5	6 12·5	5 54·6	4·6 1·9	10·6 4·3	16·6 6·8
47	6 11·8	6 12·8	5 54·8	4·7 1·9	10·7 4·4	16·7 6·8
48	6 12·0	6 13·0	5 55·1	4·8 2·0	10·8 4·4	16·8 6·9
49	6 12·3	6 13·3	5 55·3	4·9 2·0	10·9 4·5	16·9 6·9
50	6 12·5	6 13·5	5 55·5	5·0 2·0	11·0 4·5	17·0 6·9
51	6 12·8	6 13·8	5 55·8	5·1 2·1	11·1 4·5	17·1 7·0
52	6 13·0	6 14·0	5 56·0	5·2 2·1	11·2 4·6	17·2 7·0
53	6 13·3	6 14·3	5 56·2	5·3 2·2	11·3 4·6	17·3 7·1
54	6 13·5	6 14·5	5 56·5	5·4 2·2	11·4 4·7	17·4 7·1
55	6 13·8	6 14·8	5 56·7	5·5 2·2	11·5 4·7	17·5 7·1
56	6 14·0	6 15·0	5 57·0	5·6 2·3	11·6 4·7	17·6 7·2
57	6 14·3	6 15·3	5 57·2	5·7 2·3	11·7 4·8	17·7 7·2
58	6 14·5	6 15·5	5 57·4	5·8 2·4	11·8 4·8	17·8 7·3
59	6 14·8	6 15·8	5 57·7	5·9 2·4	11·9 4·9	17·9 7·3
60	6 15·0	6 16·0	5 57·9	6·0 2·5	12·0 4·9	18·0 7·4

25	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	6 15·0	6 16·0	5 57·9	0·0 0·0	6·0 2·6	12·0 5·1
01	6 15·3	6 16·3	5 58·2	0·1 0·0	6·1 2·6	12·1 5·1
02	6 15·5	6 16·5	5 58·4	0·2 0·1	6·2 2·6	12·2 5·2
03	6 15·8	6 16·8	5 58·6	0·3 0·1	6·3 2·7	12·3 5·2
04	6 16·0	6 17·0	5 58·9	0·4 0·2	6·4 2·7	12·4 5·3
05	6 16·3	6 17·3	5 59·1	0·5 0·2	6·5 2·8	12·5 5·3
06	6 16·5	6 17·5	5 59·3	0·6 0·3	6·6 2·8	12·6 5·4
07	6 16·8	6 17·8	5 59·6	0·7 0·3	6·7 2·8	12·7 5·4
08	6 17·0	6 18·0	5 59·8	0·8 0·3	6·8 2·9	12·8 5·4
09	6 17·3	6 18·3	6 00·1	0·9 0·4	6·9 2·9	12·9 5·5
10	6 17·5	6 18·5	6 00·3	1·0 0·4	7·0 3·0	13·0 5·5
11	6 17·8	6 18·8	6 00·5	1·1 0·5	7·1 3·0	13·1 5·6
12	6 18·0	6 19·0	6 00·8	1·2 0·5	7·2 3·1	13·2 5·6
13	6 18·3	6 19·3	6 01·0	1·3 0·6	7·3 3·1	13·3 5·7
14	6 18·5	6 19·5	6 01·3	1·4 0·6	7·4 3·1	13·4 5·7
15	6 18·8	6 19·8	6 01·5	1·5 0·6	7·5 3·2	13·5 5·7
16	6 19·0	6 20·0	6 01·7	1·6 0·7	7·6 3·2	13·6 5·8
17	6 19·3	6 20·3	6 02·0	1·7 0·7	7·7 3·3	13·7 5·8
18	6 19·5	6 20·5	6 02·2	1·8 0·8	7·8 3·3	13·8 5·9
19	6 19·8	6 20·8	6 02·5	1·9 0·8	7·9 3·4	13·9 5·9
20	6 20·0	6 21·0	6 02·7	2·0 0·9	8·0 3·4	14·0 6·0
21	6 20·3	6 21·3	6 02·9	2·1 0·9	8·1 3·4	14·1 6·0
22	6 20·5	6 21·5	6 03·2	2·2 0·9	8·2 3·5	14·2 6·0
23	6 20·8	6 21·8	6 03·4	2·3 1·0	8·3 3·5	14·3 6·1
24	6 21·0	6 22·0	6 03·6	2·4 1·0	8·4 3·6	14·4 6·1
25	6 21·3	6 22·3	6 03·9	2·5 1·1	8·5 3·6	14·5 6·2
26	6 21·5	6 22·5	6 04·1	2·6 1·1	8·6 3·7	14·6 6·2
27	6 21·8	6 22·8	6 04·4	2·7 1·1	8·7 3·7	14·7 6·2
28	6 22·0	6 23·0	6 04·6	2·8 1·2	8·8 3·7	14·8 6·3
29	6 22·3	6 23·3	6 04·8	2·9 1·2	8·9 3·8	14·9 6·3
30	6 22·5	6 23·5	6 05·1	3·0 1·3	9·0 3·8	15·0 6·4
31	6 22·8	6 23·8	6 05·3	3·1 1·3	9·1 3·9	15·1 6·4
32	6 23·0	6 24·0	6 05·6	3·2 1·4	9·2 3·9	15·2 6·5
33	6 23·3	6 24·3	6 05·8	3·3 1·4	9·3 4·0	15·3 6·5
34	6 23·5	6 24·5	6 06·0	3·4 1·4	9·4 4·0	15·4 6·5
35	6 23·8	6 24·8	6 06·3	3·5 1·5	9·5 4·0	15·5 6·6
36	6 24·0	6 25·1	6 06·5	3·6 1·5	9·6 4·1	15·6 6·6
37	6 24·3	6 25·3	6 06·7	3·7 1·6	9·7 4·1	15·7 6·7
38	6 24·5	6 25·6	6 07·0	3·8 1·6	9·8 4·2	15·8 6·7
39	6 24·8	6 25·8	6 07·2	3·9 1·7	9·9 4·2	15·9 6·8
40	6 25·0	6 26·1	6 07·5	4·0 1·7	10·0 4·3	16·0 6·8
41	6 25·3	6 26·3	6 07·7	4·1 1·7	10·1 4·3	16·1 6·8
42	6 25·5	6 26·6	6 07·9	4·2 1·8	10·2 4·3	16·2 6·9
43	6 25·8	6 26·8	6 08·2	4·3 1·8	10·3 4·4	16·3 6·9
44	6 26·0	6 27·1	6 08·4	4·4 1·9	10·4 4·4	16·4 7·0
45	6 26·3	6 27·3	6 08·7	4·5 1·9	10·5 4·5	16·5 7·0
46	6 26·5	6 27·6	6 08·9	4·6 2·0	10·6 4·5	16·6 7·1
47	6 26·8	6 27·8	6 09·1	4·7 2·0	10·7 4·5	16·7 7·1
48	6 27·0	6 28·1	6 09·4	4·8 2·0	10·8 4·6	16·8 7·1
49	6 27·3	6 28·3	6 09·6	4·9 2·1	10·9 4·6	16·9 7·2
50	6 27·5	6 28·6	6 09·8	5·0 2·1	11·0 4·7	17·0 7·2
51	6 27·8	6 28·8	6 10·1	5·1 2·2	11·1 4·7	17·1 7·3
52	6 28·0	6 29·1	6 10·3	5·2 2·2	11·2 4·8	17·2 7·3
53	6 28·3	6 29·3	6 10·6	5·3 2·3	11·3 4·8	17·3 7·4
54	6 28·5	6 29·6	6 10·8	5·4 2·3	11·4 4·8	17·4 7·4
55	6 28·8	6 29·8	6 11·0	5·5 2·3	11·5 4·9	17·5 7·4
56	6 29·0	6 30·1	6 11·3	5·6 2·4	11·6 4·9	17·6 7·5
57	6 29·3	6 30·3	6 11·5	5·7 2·4	11·7 5·0	17·7 7·5
58	6 29·5	6 30·6	6 11·8	5·8 2·5	11·8 5·0	17·8 7·6
59	6 29·8	6 30·8	6 12·0	5·9 2·5	11·9 5·1	17·9 7·6
60	6 30·0	6 31·1	6 12·2	6·0 2·6	12·0 5·1	18·0 7·7

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

Astronomiske elementer - daglige sider

26m	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	6 30·0	6 31·1	6 12·2	0·0 0·0	6·0 2·7	12·0 5·3
01	6 30·3	6 31·3	6 12·5	0·1 0·0	6·1 2·7	12·1 5·3
02	6 30·5	6 31·6	6 12·7	0·2 0·1	6·2 2·7	12·2 5·4
03	6 30·8	6 31·8	6 12·9	0·3 0·1	6·3 2·8	12·3 5·4
04	6 31·0	6 32·1	6 13·2	0·4 0·2	6·4 2·8	12·4 5·5
05	6 31·3	6 32·3	6 13·4	0·5 0·2	6·5 2·9	12·5 5·5
06	6 31·5	6 32·6	6 13·7	0·6 0·3	6·6 2·9	12·6 5·6
07	6 31·8	6 32·8	6 13·9	0·7 0·3	6·7 3·0	12·7 5·6
08	6 32·0	6 33·1	6 14·1	0·8 0·4	6·8 3·0	12·8 5·7
09	6 32·3	6 33·3	6 14·4	0·9 0·4	6·9 3·0	12·9 5·7
10	6 32·5	6 33·6	6 14·6	1·0 0·4	7·0 3·1	13·0 5·7
11	6 32·8	6 33·8	6 14·9	1·1 0·5	7·1 3·1	13·1 5·8
12	6 33·0	6 34·1	6 15·1	1·2 0·5	7·2 3·2	13·2 5·8
13	6 33·3	6 34·3	6 15·3	1·3 0·6	7·3 3·2	13·3 5·9
14	6 33·5	6 34·6	6 15·6	1·4 0·6	7·4 3·3	13·4 5·9
15	6 33·8	6 34·8	6 15·8	1·5 0·7	7·5 3·3	13·5 6·0
16	6 34·0	6 35·1	6 16·1	1·6 0·7	7·6 3·4	13·6 6·0
17	6 34·3	6 35·3	6 16·3	1·7 0·8	7·7 3·4	13·7 6·1
18	6 34·5	6 35·6	6 16·5	1·8 0·8	7·8 3·4	13·8 6·1
19	6 34·8	6 35·8	6 16·8	1·9 0·8	7·9 3·5	13·9 6·1
20	6 35·0	6 36·1	6 17·0	2·0 0·9	8·0 3·5	14·0 6·2
21	6 35·3	6 36·3	6 17·2	2·1 0·9	8·1 3·6	14·1 6·2
22	6 35·5	6 36·6	6 17·5	2·2 1·0	8·2 3·6	14·2 6·3
23	6 35·8	6 36·8	6 17·7	2·3 1·0	8·3 3·7	14·3 6·3
24	6 36·0	6 37·1	6 18·0	2·4 1·1	8·4 3·7	14·4 6·4
25	6 36·3	6 37·3	6 18·2	2·5 1·1	8·5 3·8	14·5 6·4
26	6 36·5	6 37·6	6 18·4	2·6 1·1	8·6 3·8	14·6 6·4
27	6 36·8	6 37·8	6 18·7	2·7 1·2	8·7 3·8	14·7 6·5
28	6 37·0	6 38·1	6 18·9	2·8 1·2	8·8 3·9	14·8 6·5
29	6 37·3	6 38·3	6 19·2	2·9 1·3	8·9 3·9	14·9 6·6
30	6 37·5	6 38·6	6 19·4	3·0 1·3	9·0 4·0	15·0 6·6
31	6 37·8	6 38·8	6 19·6	3·1 1·4	9·1 4·0	15·1 6·7
32	6 38·0	6 39·1	6 19·9	3·2 1·4	9·2 4·1	15·2 6·7
33	6 38·3	6 39·3	6 20·1	3·3 1·5	9·3 4·1	15·3 6·8
34	6 38·5	6 39·6	6 20·3	3·4 1·5	9·4 4·2	15·4 6·8
35	6 38·8	6 39·8	6 20·6	3·5 1·5	9·5 4·2	15·5 6·8
36	6 39·0	6 40·1	6 20·8	3·6 1·6	9·6 4·2	15·6 6·9
37	6 39·3	6 40·3	6 21·1	3·7 1·6	9·7 4·3	15·7 6·9
38	6 39·5	6 40·6	6 21·3	3·8 1·7	9·8 4·3	15·8 7·0
39	6 39·8	6 40·8	6 21·5	3·9 1·7	9·9 4·4	15·9 7·0
40	6 40·0	6 41·1	6 21·8	4·0 1·8	10·0 4·4	16·0 7·1
41	6 40·3	6 41·3	6 22·0	4·1 1·8	10·1 4·5	16·1 7·1
42	6 40·5	6 41·6	6 22·3	4·2 1·9	10·2 4·5	16·2 7·2
43	6 40·8	6 41·8	6 22·5	4·3 1·9	10·3 4·5	16·3 7·2
44	6 41·0	6 42·1	6 22·7	4·4 1·9	10·4 4·6	16·4 7·2
45	6 41·3	6 42·3	6 23·0	4·5 2·0	10·5 4·6	16·5 7·3
46	6 41·5	6 42·6	6 23·2	4·6 2·0	10·6 4·7	16·6 7·3
47	6 41·8	6 42·8	6 23·4	4·7 2·1	10·7 4·7	16·7 7·4
48	6 42·0	6 43·1	6 23·7	4·8 2·1	10·8 4·8	16·8 7·4
49	6 42·3	6 43·4	6 23·9	4·9 2·2	10·9 4·8	16·9 7·5
50	6 42·5	6 43·6	6 24·2	5·0 2·2	11·0 4·9	17·0 7·5
51	6 42·8	6 43·9	6 24·4	5·1 2·3	11·1 4·9	17·1 7·6
52	6 43·0	6 44·1	6 24·6	5·2 2·3	11·2 4·9	17·2 7·6
53	6 43·3	6 44·4	6 24·9	5·3 2·3	11·3 5·0	17·3 7·6
54	6 43·5	6 44·6	6 25·1	5·4 2·4	11·4 5·0	17·4 7·7
55	6 43·8	6 44·9	6 25·4	5·5 2·4	11·5 5·1	17·5 7·7
56	6 44·0	6 45·1	6 25·6	5·6 2·5	11·6 5·1	17·6 7·8
57	6 44·3	6 45·4	6 25·8	5·7 2·5	11·7 5·2	17·7 7·8
58	6 44·5	6 45·6	6 26·1	5·8 2·6	11·8 5·2	17·8 7·9
59	6 44·8	6 45·9	6 26·3	5·9 2·6	11·9 5·3	17·9 7·9
60	6 45·0	6 46·1	6 26·6	6·0 2·7	12·0 5·3	18·0 8·0

27m	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	6 45·0	6 46·1	6 26·6	0·0 0·0	6·0 2·8	12·0 5·5
01	6 45·3	6 46·4	6 26·8	0·1 0·0	6·1 2·8	12·1 5·5
02	6 45·5	6 46·6	6 27·0	0·2 0·1	6·2 2·8	12·2 5·6
03	6 45·8	6 46·9	6 27·3	0·3 0·1	6·3 2·9	12·3 5·6
04	6 46·0	6 47·1	6 27·5	0·4 0·2	6·4 2·9	12·4 5·7
05	6 46·3	6 47·4	6 27·7	0·5 0·2	6·5 3·0	12·5 5·7
06	6 46·5	6 47·6	6 28·0	0·6 0·3	6·6 3·0	12·6 5·8
07	6 46·8	6 47·9	6 28·2	0·7 0·3	6·7 3·1	12·7 5·8
08	6 47·0	6 48·1	6 28·5	0·8 0·4	6·8 3·1	12·8 5·9
09	6 47·3	6 48·4	6 28·7	0·9 0·4	6·9 3·2	12·9 5·9
10	6 47·5	6 48·6	6 28·9	1·0 0·5	7·0 3·2	13·0 6·0
11	6 47·8	6 48·9	6 29·2	1·1 0·5	7·1 3·3	13·1 6·0
12	6 48·0	6 49·1	6 29·4	1·2 0·6	7·2 3·3	13·2 6·1
13	6 48·3	6 49·4	6 29·7	1·3 0·6	7·3 3·3	13·3 6·1
14	6 48·5	6 49·6	6 29·9	1·4 0·6	7·4 3·4	13·4 6·1
15	6 48·8	6 49·9	6 30·1	1·5 0·7	7·5 3·4	13·5 6·2
16	6 49·0	6 50·1	6 30·4	1·6 0·7	7·6 3·5	13·6 6·2
17	6 49·3	6 50·4	6 30·6	1·7 0·8	7·7 3·5	13·7 6·3
18	6 49·5	6 50·6	6 30·8	1·8 0·8	7·8 3·6	13·8 6·3
19	6 49·8	6 50·9	6 31·1	1·9 0·9	7·9 3·6	13·9 6·4
20	6 50·0	6 51·1	6 31·3	2·0 0·9	8·0 3·7	14·0 6·4
21	6 50·3	6 51·4	6 31·6	2·1 1·0	8·1 3·7	14·1 6·5
22	6 50·5	6 51·6	6 31·8	2·2 1·0	8·2 3·8	14·2 6·5
23	6 50·8	6 51·9	6 32·0	2·3 1·1	8·3 3·8	14·3 6·6
24	6 51·0	6 52·1	6 32·3	2·4 1·1	8·4 3·9	14·4 6·6
25	6 51·3	6 52·4	6 32·5	2·5 1·1	8·5 3·9	14·5 6·6
26	6 51·5	6 52·6	6 32·8	2·6 1·2	8·6 3·9	14·6 6·7
27	6 51·8	6 52·9	6 33·0	2·7 1·2	8·7 4·0	14·7 6·7
28	6 52·0	6 53·1	6 33·2	2·8 1·3	8·8 4·0	14·8 6·8
29	6 52·3	6 53·4	6 33·5	2·9 1·3	8·9 4·1	14·9 6·8
30	6 52·5	6 53·6	6 33·7	3·0 1·4	9·0 4·1	15·0 6·9
31	6 52·8	6 53·9	6 33·9	3·1 1·4	9·1 4·2	15·1 6·9
32	6 53·0	6 54·1	6 34·2	3·2 1·5	9·2 4·2	15·2 7·0
33	6 53·3	6 54·4	6 34·4	3·3 1·5	9·3 4·3	15·3 7·0
34	6 53·5	6 54·6	6 34·7	3·4 1·6	9·4 4·3	15·4 7·1
35	6 53·8	6 54·9	6 34·9	3·5 1·6	9·5 4·4	15·5 7·1
36	6 54·0	6 55·1	6 35·1	3·6 1·7	9·6 4·4	15·6 7·2
37	6 54·3	6 55·4	6 35·4	3·7 1·7	9·7 4·4	15·7 7·2
38	6 54·5	6 55·6	6 35·6	3·8 1·7	9·8 4·5	15·8 7·2
39	6 54·8	6 55·9	6 35·9	3·9 1·8	9·9 4·5	15·9 7·3
40	6 55·0	6 56·1	6 36·1	4·0 1·8	10·0 4·6	16·0 7·3
41	6 55·3	6 56·4	6 36·3	4·1 1·9	10·1 4·6	16·1 7·4
42	6 55·5	6 56·6	6 36·6	4·2 1·9	10·2 4·7	16·2 7·4
43	6 55·8	6 56·9	6 36·8	4·3 2·0	10·3 4·7	16·3 7·5
44	6 56·0	6 57·1	6 37·0	4·4 2·0	10·4 4·8	16·4 7·5
45	6 56·3	6 57·4	6 37·3	4·5 2·1	10·5 4·8	16·5 7·6
46	6 56·5	6 57·6	6 37·5	4·6 2·1	10·6 4·9	16·6 7·6
47	6 56·8	6 57·9	6 37·8	4·7 2·2	10·7 4·9	16·7 7·7
48	6 57·0	6 58·1	6 38·0	4·8 2·2	10·8 5·0	16·8 7·7
49	6 57·3	6 58·4	6 38·2	4·9 2·2	10·9 5·0	16·9 7·7
50	6 57·5	6 58·6	6 38·5	5·0 2·3	11·0 5·0	17·0 7·8
51	6 57·8	6 58·9	6 38·7	5·1 2·3	11·1 5·1	17·1 7·8
52	6 58·0	6 59·1	6 39·0	5·2 2·4	11·2 5·1	17·2 7·9
53	6 58·3	6 59·4	6 39·2	5·3 2·4	11·3 5·2	17·3 7·9
54	6 58·5	6 59·6	6 39·4	5·4 2·5	11·4 5·2	17·4 8·0
55	6 58·8	6 59·9	6 39·7	5·5 2·5	11·5 5·3	17·5 8·0
56	6 59·0	7 00·1	6 39·9	5·6 2·6	11·6 5·3	17·6 8·1
57	6 59·3	7 00·4	6 40·2	5·7 2·6	11·7 5·4	17·7 8·1
58	6 59·5	7 00·6	6 40·4	5·8 2·7	11·8 5·4	17·8 8·2
59	6 59·8	7 00·9	6 40·6	5·9 2·7	11·9 5·5	17·9 8·2
60	7 00·0	7 01·1	6 40·9	6·0 2·8	12·0 5·5	18·0 8·3

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

Astronomiske elementer - daglige sider

28h	SUN PLANETS	ARIES	MOON	v or d	Corr^n	v or d	Corr^n	v or d	Corr^n
s	° ′	° ′	° ′	′	′	′	′	′	′
00	7 00·0	7 01·1	6 40·9	0·0	0·0	6·0	2·9	12·0	5·7
01	7 00·3	7 01·4	6 41·1	0·1	0·0	6·1	2·9	12·1	5·7
02	7 00·5	7 01·7	6 41·3	0·2	0·1	6·2	2·9	12·2	5·8
03	7 00·8	7 01·9	6 41·6	0·3	0·1	6·3	3·0	12·3	5·8
04	7 01·0	7 02·2	6 41·8	0·4	0·2	6·4	3·0	12·4	5·9
05	7 01·3	7 02·4	6 42·1	0·5	0·2	6·5	3·1	12·5	5·9
06	7 01·5	7 02·7	6 42·3	0·6	0·3	6·6	3·1	12·6	6·0
07	7 01·8	7 02·9	6 42·5	0·7	0·3	6·7	3·2	12·7	6·0
08	7 02·0	7 03·2	6 42·8	0·8	0·4	6·8	3·2	12·8	6·1
09	7 02·3	7 03·4	6 43·0	0·9	0·4	6·9	3·3	12·9	6·1
10	7 02·5	7 03·7	6 43·3	1·0	0·5	7·0	3·3	13·0	6·2
11	7 02·8	7 03·9	6 43·5	1·1	0·5	7·1	3·4	13·1	6·2
12	7 03·0	7 04·2	6 43·7	1·2	0·6	7·2	3·4	13·2	6·3
13	7 03·3	7 04·4	6 44·0	1·3	0·6	7·3	3·5	13·3	6·3
14	7 03·5	7 04·7	6 44·2	1·4	0·7	7·4	3·5	13·4	6·4
15	7 03·8	7 04·9	6 44·4	1·5	0·7	7·5	3·6	13·5	6·4
16	7 04·0	7 05·2	6 44·7	1·6	0·8	7·6	3·6	13·6	6·5
17	7 04·3	7 05·4	6 44·9	1·7	0·8	7·7	3·7	13·7	6·5
18	7 04·5	7 05·7	6 45·2	1·8	0·9	7·8	3·7	13·8	6·6
19	7 04·8	7 05·9	6 45·4	1·9	0·9	7·9	3·8	13·9	6·6
20	7 05·0	7 06·2	6 45·6	2·0	1·0	8·0	3·8	14·0	6·7
21	7 05·3	7 06·4	6 45·9	2·1	1·0	8·1	3·8	14·1	6·7
22	7 05·5	7 06·7	6 46·1	2·2	1·0	8·2	3·9	14·2	6·7
23	7 05·8	7 06·9	6 46·4	2·3	1·1	8·3	3·9	14·3	6·8
24	7 06·0	7 07·2	6 46·6	2·4	1·1	8·4	4·0	14·4	6·8
25	7 06·3	7 07·4	6 46·8	2·5	1·2	8·5	4·0	14·5	6·9
26	7 06·5	7 07·7	6 47·1	2·6	1·2	8·6	4·1	14·6	6·9
27	7 06·8	7 07·9	6 47·3	2·7	1·3	8·7	4·1	14·7	7·0
28	7 07·0	7 08·2	6 47·5	2·8	1·3	8·8	4·2	14·8	7·0
29	7 07·3	7 08·4	6 47·8	2·9	1·4	8·9	4·2	14·9	7·1
30	7 07·5	7 08·7	6 48·0	3·0	1·4	9·0	4·3	15·0	7·1
31	7 07·8	7 08·9	6 48·3	3·1	1·5	9·1	4·3	15·1	7·2
32	7 08·0	7 09·2	6 48·5	3·2	1·5	9·2	4·4	15·2	7·2
33	7 08·3	7 09·4	6 48·7	3·3	1·6	9·3	4·4	15·3	7·3
34	7 08·5	7 09·7	6 49·0	3·4	1·6	9·4	4·5	15·4	7·3
35	7 08·8	7 09·9	6 49·2	3·5	1·7	9·5	4·5	15·5	7·4
36	7 09·0	7 10·2	6 49·5	3·6	1·7	9·6	4·6	15·6	7·4
37	7 09·3	7 10·4	6 49·7	3·7	1·8	9·7	4·6	15·7	7·5
38	7 09·5	7 10·7	6 49·9	3·8	1·8	9·8	4·7	15·8	7·5
39	7 09·8	7 10·9	6 50·2	3·9	1·9	9·9	4·7	15·9	7·6
40	7 10·0	7 11·2	6 50·4	4·0	1·9	10·0	4·8	16·0	7·6
41	7 10·3	7 11·4	6 50·6	4·1	1·9	10·1	4·8	16·1	7·6
42	7 10·5	7 11·7	6 50·9	4·2	2·0	10·2	4·8	16·2	7·7
43	7 10·8	7 11·9	6 51·1	4·3	2·0	10·3	4·9	16·3	7·7
44	7 11·0	7 12·2	6 51·4	4·4	2·1	10·4	4·9	16·4	7·8
45	7 11·3	7 12·4	6 51·6	4·5	2·1	10·5	5·0	16·5	7·8
46	7 11·5	7 12·7	6 51·8	4·6	2·2	10·6	5·0	16·6	7·9
47	7 11·8	7 12·9	6 52·1	4·7	2·2	10·7	5·1	16·7	7·9
48	7 12·0	7 13·2	6 52·3	4·8	2·3	10·8	5·1	16·8	8·0
49	7 12·3	7 13·4	6 52·6	4·9	2·3	10·9	5·2	16·9	8·0
50	7 12·5	7 13·7	6 52·8	5·0	2·4	11·0	5·2	17·0	8·1
51	7 12·8	7 13·9	6 53·0	5·1	2·4	11·1	5·3	17·1	8·1
52	7 13·0	7 14·2	6 53·3	5·2	2·5	11·2	5·3	17·2	8·2
53	7 13·3	7 14·4	6 53·5	5·3	2·5	11·3	5·4	17·3	8·2
54	7 13·5	7 14·7	6 53·8	5·4	2·6	11·4	5·4	17·4	8·3
55	7 13·8	7 14·9	6 54·0	5·5	2·6	11·5	5·5	17·5	8·3
56	7 14·0	7 15·2	6 54·2	5·6	2·7	11·6	5·5	17·6	8·4
57	7 14·3	7 15·4	6 54·5	5·7	2·7	11·7	5·6	17·7	8·4
58	7 14·5	7 15·7	6 54·7	5·8	2·8	11·8	5·6	17·8	8·5
59	7 14·8	7 15·9	6 54·9	5·9	2·8	11·9	5·7	17·9	8·5
60	7 15·0	7 16·2	6 55·2	6·0	2·9	12·0	5·7	18·0	8·6

29h	SUN PLANETS	ARIES	MOON	v or d	Corr^n	v or d	Corr^n	v or d	Corr^n
s	° ′	° ′	° ′	′	′	′	′	′	′
00	7 15·0	7 16·2	6 55·2	0·0	0·0	6·0	3·0	12·0	5·9
01	7 15·3	7 16·4	6 55·4	0·1	0·0	6·1	3·0	12·1	5·9
02	7 15·5	7 16·7	6 55·7	0·2	0·1	6·2	3·0	12·2	6·0
03	7 15·8	7 16·9	6 55·9	0·3	0·1	6·3	3·1	12·3	6·0
04	7 16·0	7 17·2	6 56·1	0·4	0·2	6·4	3·1	12·4	6·1
05	7 16·3	7 17·4	6 56·4	0·5	0·2	6·5	3·2	12·5	6·1
06	7 16·5	7 17·7	6 56·6	0·6	0·3	6·6	3·2	12·6	6·2
07	7 16·8	7 17·9	6 56·9	0·7	0·3	6·7	3·3	12·7	6·2
08	7 17·0	7 18·2	6 57·1	0·8	0·4	6·8	3·3	12·8	6·3
09	7 17·3	7 18·4	6 57·3	0·9	0·4	6·9	3·4	12·9	6·3
10	7 17·5	7 18·7	6 57·6	1·0	0·5	7·0	3·4	13·0	6·4
11	7 17·8	7 18·9	6 57·8	1·1	0·5	7·1	3·5	13·1	6·4
12	7 18·0	7 19·2	6 58·0	1·2	0·6	7·2	3·5	13·2	6·5
13	7 18·3	7 19·4	6 58·3	1·3	0·6	7·3	3·6	13·3	6·5
14	7 18·5	7 19·7	6 58·5	1·4	0·7	7·4	3·6	13·4	6·6
15	7 18·8	7 20·0	6 58·8	1·5	0·7	7·5	3·7	13·5	6·6
16	7 19·0	7 20·2	6 59·0	1·6	0·8	7·6	3·7	13·6	6·7
17	7 19·3	7 20·5	6 59·2	1·7	0·8	7·7	3·8	13·7	6·7
18	7 19·5	7 20·7	6 59·5	1·8	0·9	7·8	3·8	13·8	6·8
19	7 19·8	7 21·0	6 59·7	1·9	0·9	7·9	3·9	13·9	6·8
20	7 20·0	7 21·2	7 00·0	2·0	1·0	8·0	3·9	14·0	6·9
21	7 20·3	7 21·5	7 00·2	2·1	1·0	8·1	4·0	14·1	6·9
22	7 20·5	7 21·7	7 00·4	2·2	1·1	8·2	4·0	14·2	7·0
23	7 20·8	7 22·0	7 00·7	2·3	1·1	8·3	4·1	14·3	7·0
24	7 21·0	7 22·2	7 00·9	2·4	1·2	8·4	4·1	14·4	7·1
25	7 21·3	7 22·5	7 01·1	2·5	1·2	8·5	4·2	14·5	7·1
26	7 21·5	7 22·7	7 01·4	2·6	1·3	8·6	4·2	14·6	7·2
27	7 21·8	7 23·0	7 01·6	2·7	1·3	8·7	4·3	14·7	7·2
28	7 22·0	7 23·2	7 01·9	2·8	1·4	8·8	4·3	14·8	7·3
29	7 22·3	7 23·5	7 02·1	2·9	1·4	8·9	4·4	14·9	7·3
30	7 22·5	7 23·7	7 02·3	3·0	1·5	9·0	4·4	15·0	7·4
31	7 22·8	7 24·0	7 02·6	3·1	1·5	9·1	4·5	15·1	7·4
32	7 23·0	7 24·2	7 02·8	3·2	1·6	9·2	4·5	15·2	7·5
33	7 23·3	7 24·5	7 03·1	3·3	1·6	9·3	4·6	15·3	7·5
34	7 23·5	7 24·7	7 03·3	3·4	1·7	9·4	4·6	15·4	7·6
35	7 23·8	7 25·0	7 03·5	3·5	1·7	9·5	4·7	15·5	7·6
36	7 24·0	7 25·2	7 03·8	3·6	1·8	9·6	4·7	15·6	7·7
37	7 24·3	7 25·5	7 04·0	3·7	1·8	9·7	4·8	15·7	7·7
38	7 24·5	7 25·7	7 04·3	3·8	1·9	9·8	4·8	15·8	7·8
39	7 24·8	7 26·0	7 04·5	3·9	1·9	9·9	4·9	15·9	7·8
40	7 25·0	7 26·2	7 04·7	4·0	2·0	10·0	4·9	16·0	7·9
41	7 25·3	7 26·5	7 05·0	4·1	2·0	10·1	5·0	16·1	7·9
42	7 25·5	7 26·7	7 05·2	4·2	2·1	10·2	5·0	16·2	8·0
43	7 25·8	7 27·0	7 05·4	4·3	2·1	10·3	5·1	16·3	8·0
44	7 26·0	7 27·2	7 05·7	4·4	2·2	10·4	5·1	16·4	8·1
45	7 26·3	7 27·5	7 05·9	4·5	2·2	10·5	5·2	16·5	8·1
46	7 26·5	7 27·7	7 06·2	4·6	2·3	10·6	5·2	16·6	8·2
47	7 26·8	7 28·0	7 06·4	4·7	2·3	10·7	5·3	16·7	8·2
48	7 27·0	7 28·2	7 06·6	4·8	2·4	10·8	5·3	16·8	8·3
49	7 27·3	7 28·5	7 06·9	4·9	2·4	10·9	5·4	16·9	8·3
50	7 27·5	7 28·7	7 07·1	5·0	2·5	11·0	5·4	17·0	8·4
51	7 27·8	7 29·0	7 07·4	5·1	2·5	11·1	5·5	17·1	8·4
52	7 28·0	7 29·2	7 07·6	5·2	2·6	11·2	5·5	17·2	8·5
53	7 28·3	7 29·5	7 07·8	5·3	2·6	11·3	5·6	17·3	8·5
54	7 28·5	7 29·7	7 08·1	5·4	2·7	11·4	5·6	17·4	8·6
55	7 28·8	7 30·0	7 08·3	5·5	2·7	11·5	5·7	17·5	8·6
56	7 29·0	7 30·2	7 08·5	5·6	2·8	11·6	5·7	17·6	8·7
57	7 29·3	7 30·5	7 08·8	5·7	2·8	11·7	5·8	17·7	8·7
58	7 29·5	7 30·7	7 09·0	5·8	2·9	11·8	5·8	17·8	8·8
59	7 29·8	7 31·0	7 09·3	5·9	2·9	11·9	5·9	17·9	8·8
60	7 30·0	7 31·2	7 09·5	6·0	3·0	12·0	5·9	18·0	8·9

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

30m	SUN PLANETS	ARIES	MOON	v or d	Corr	v or d	Corr	v or d	Corr
s	° ′	° ′	° ′	′	′	′	′	′	′
00	7 30·0	7 31·2	7 09·5	0·0	0·0	6·0	3·1	12·0	6·1
01	7 30·3	7 31·5	7 09·7	0·1	0·1	6·1	3·1	12·1	6·2
02	7 30·5	7 31·7	7 10·0	0·2	0·1	6·2	3·2	12·2	6·2
03	7 30·8	7 32·0	7 10·2	0·3	0·2	6·3	3·2	12·3	6·3
04	7 31·0	7 32·2	7 10·5	0·4	0·2	6·4	3·3	12·4	6·3
05	7 31·3	7 32·5	7 10·7	0·5	0·3	6·5	3·3	12·5	6·4
06	7 31·5	7 32·7	7 10·9	0·6	0·3	6·6	3·4	12·6	6·4
07	7 31·8	7 33·0	7 11·2	0·7	0·4	6·7	3·4	12·7	6·5
08	7 32·0	7 33·2	7 11·4	0·8	0·4	6·8	3·5	12·8	6·5
09	7 32·3	7 33·5	7 11·6	0·9	0·5	6·9	3·5	12·9	6·6
10	7 32·5	7 33·7	7 11·9	1·0	0·5	7·0	3·6	13·0	6·6
11	7 32·8	7 34·0	7 12·1	1·1	0·6	7·1	3·6	13·1	6·7
12	7 33·0	7 34·2	7 12·4	1·2	0·6	7·2	3·7	13·2	6·7
13	7 33·3	7 34·5	7 12·6	1·3	0·7	7·3	3·7	13·3	6·8
14	7 33·5	7 34·7	7 12·8	1·4	0·7	7·4	3·8	13·4	6·8
15	7 33·8	7 35·0	7 13·1	1·5	0·8	7·5	3·8	13·5	6·9
16	7 34·0	7 35·2	7 13·3	1·6	0·8	7·6	3·9	13·6	6·9
17	7 34·3	7 35·5	7 13·6	1·7	0·9	7·7	3·9	13·7	7·0
18	7 34·5	7 35·7	7 13·8	1·8	0·9	7·8	4·0	13·8	7·0
19	7 34·8	7 36·0	7 14·0	1·9	1·0	7·9	4·0	13·9	7·1
20	7 35·0	7 36·2	7 14·3	2·0	1·0	8·0	4·1	14·0	7·1
21	7 35·3	7 36·5	7 14·5	2·1	1·1	8·1	4·1	14·1	7·2
22	7 35·5	7 36·7	7 14·7	2·2	1·1	8·2	4·2	14·2	7·2
23	7 35·8	7 37·0	7 15·0	2·3	1·2	8·3	4·2	14·3	7·3
24	7 36·0	7 37·2	7 15·2	2·4	1·2	8·4	4·3	14·4	7·3
25	7 36·3	7 37·5	7 15·5	2·5	1·3	8·5	4·3	14·5	7·4
26	7 36·5	7 37·7	7 15·7	2·6	1·3	8·6	4·4	14·6	7·4
27	7 36·8	7 38·0	7 15·9	2·7	1·4	8·7	4·4	14·7	7·5
28	7 37·0	7 38·3	7 16·2	2·8	1·4	8·8	4·5	14·8	7·5
29	7 37·3	7 38·5	7 16·4	2·9	1·5	8·9	4·5	14·9	7·6
30	7 37·5	7 38·8	7 16·7	3·0	1·5	9·0	4·6	15·0	7·6
31	7 37·8	7 39·0	7 16·9	3·1	1·6	9·1	4·6	15·1	7·7
32	7 38·0	7 39·3	7 17·1	3·2	1·6	9·2	4·7	15·2	7·7
33	7 38·3	7 39·5	7 17·4	3·3	1·7	9·3	4·7	15·3	7·8
34	7 38·5	7 39·8	7 17·6	3·4	1·7	9·4	4·8	15·4	7·8
35	7 38·8	7 40·0	7 17·9	3·5	1·8	9·5	4·8	15·5	7·9
36	7 39·0	7 40·3	7 18·1	3·6	1·8	9·6	4·9	15·6	7·9
37	7 39·3	7 40·5	7 18·3	3·7	1·9	9·7	4·9	15·7	8·0
38	7 39·5	7 40·8	7 18·6	3·8	1·9	9·8	5·0	15·8	8·0
39	7 39·8	7 41·0	7 18·8	3·9	2·0	9·9	5·0	15·9	8·1
40	7 40·0	7 41·3	7 19·0	4·0	2·0	10·0	5·1	16·0	8·1
41	7 40·3	7 41·5	7 19·3	4·1	2·1	10·1	5·1	16·1	8·2
42	7 40·5	7 41·8	7 19·5	4·2	2·1	10·2	5·2	16·2	8·2
43	7 40·8	7 42·0	7 19·8	4·3	2·2	10·3	5·2	16·3	8·3
44	7 41·0	7 42·3	7 20·0	4·4	2·2	10·4	5·3	16·4	8·3
45	7 41·3	7 42·5	7 20·2	4·5	2·3	10·5	5·3	16·5	8·4
46	7 41·5	7 42·8	7 20·5	4·6	2·3	10·6	5·4	16·6	8·4
47	7 41·8	7 43·0	7 20·7	4·7	2·4	10·7	5·4	16·7	8·5
48	7 42·0	7 43·3	7 21·0	4·8	2·4	10·8	5·5	16·8	8·5
49	7 42·3	7 43·5	7 21·2	4·9	2·5	10·9	5·5	16·9	8·6
50	7 42·5	7 43·8	7 21·4	5·0	2·5	11·0	5·6	17·0	8·6
51	7 42·8	7 44·0	7 21·7	5·1	2·6	11·1	5·6	17·1	8·7
52	7 43·0	7 44·3	7 21·9	5·2	2·6	11·2	5·7	17·2	8·7
53	7 43·3	7 44·5	7 22·1	5·3	2·7	11·3	5·7	17·3	8·8
54	7 43·5	7 44·8	7 22·4	5·4	2·7	11·4	5·8	17·4	8·8
55	7 43·8	7 45·0	7 22·6	5·5	2·8	11·5	5·8	17·5	8·9
56	7 44·0	7 45·3	7 22·9	5·6	2·8	11·6	5·9	17·6	8·9
57	7 44·3	7 45·5	7 23·1	5·7	2·9	11·7	5·9	17·7	9·0
58	7 44·5	7 45·8	7 23·3	5·8	2·9	11·8	6·0	17·8	9·0
59	7 44·8	7 46·0	7 23·6	5·9	3·0	11·9	6·0	17·9	9·1
60	7 45·0	7 46·3	7 23·8	6·0	3·1	12·0	6·1	18·0	9·2

31m	SUN PLANETS	ARIES	MOON	v or d	Corr	v or d	Corr	v or d	Corr
s	° ′	° ′	° ′	′	′	′	′	′	′
00	7 45·0	7 46·3	7 23·8	0·0	0·0	6·0	3·2	12·0	6·3
01	7 45·3	7 46·5	7 24·1	0·1	0·1	6·1	3·2	12·1	6·4
02	7 45·5	7 46·8	7 24·3	0·2	0·1	6·2	3·3	12·2	6·4
03	7 45·8	7 47·0	7 24·5	0·3	0·2	6·3	3·3	12·3	6·5
04	7 46·0	7 47·3	7 24·8	0·4	0·2	6·4	3·4	12·4	6·5
05	7 46·3	7 47·5	7 25·0	0·5	0·3	6·5	3·4	12·5	6·6
06	7 46·5	7 47·8	7 25·2	0·6	0·3	6·6	3·5	12·6	6·6
07	7 46·8	7 48·0	7 25·5	0·7	0·4	6·7	3·5	12·7	6·7
08	7 47·0	7 48·3	7 25·7	0·8	0·4	6·8	3·6	12·8	6·7
09	7 47·3	7 48·5	7 26·0	0·9	0·5	6·9	3·6	12·9	6·8
10	7 47·5	7 48·8	7 26·2	1·0	0·5	7·0	3·7	13·0	6·8
11	7 47·8	7 49·0	7 26·4	1·1	0·6	7·1	3·7	13·1	6·9
12	7 48·0	7 49·3	7 26·7	1·2	0·6	7·2	3·8	13·2	6·9
13	7 48·3	7 49·5	7 26·9	1·3	0·7	7·3	3·8	13·3	7·0
14	7 48·5	7 49·8	7 27·2	1·4	0·7	7·4	3·9	13·4	7·0
15	7 48·8	7 50·0	7 27·4	1·5	0·8	7·5	3·9	13·5	7·1
16	7 49·0	7 50·3	7 27·6	1·6	0·8	7·6	4·0	13·6	7·1
17	7 49·3	7 50·5	7 27·9	1·7	0·9	7·7	4·0	13·7	7·2
18	7 49·5	7 50·8	7 28·1	1·8	0·9	7·8	4·1	13·8	7·2
19	7 49·8	7 51·0	7 28·4	1·9	1·0	7·9	4·1	13·9	7·3
20	7 50·0	7 51·3	7 28·6	2·0	1·1	8·0	4·2	14·0	7·4
21	7 50·3	7 51·5	7 28·8	2·1	1·1	8·1	4·3	14·1	7·4
22	7 50·5	7 51·8	7 29·1	2·2	1·2	8·2	4·3	14·2	7·5
23	7 50·8	7 52·0	7 29·3	2·3	1·2	8·3	4·4	14·3	7·5
24	7 51·0	7 52·3	7 29·5	2·4	1·3	8·4	4·4	14·4	7·6
25	7 51·3	7 52·5	7 29·8	2·5	1·3	8·5	4·5	14·5	7·6
26	7 51·5	7 52·8	7 30·0	2·6	1·4	8·6	4·5	14·6	7·7
27	7 51·8	7 53·0	7 30·3	2·7	1·4	8·7	4·6	14·7	7·7
28	7 52·0	7 53·3	7 30·5	2·8	1·5	8·8	4·6	14·8	7·8
29	7 52·3	7 53·5	7 30·7	2·9	1·5	8·9	4·7	14·9	7·8
30	7 52·5	7 53·8	7 31·0	3·0	1·6	9·0	4·7	15·0	7·9
31	7 52·8	7 54·0	7 31·2	3·1	1·6	9·1	4·8	15·1	7·9
32	7 53·0	7 54·3	7 31·5	3·2	1·7	9·2	4·8	15·2	8·0
33	7 53·3	7 54·5	7 31·7	3·3	1·7	9·3	4·9	15·3	8·0
34	7 53·5	7 54·8	7 31·9	3·4	1·8	9·4	4·9	15·4	8·1
35	7 53·8	7 55·0	7 32·2	3·5	1·8	9·5	5·0	15·5	8·1
36	7 54·0	7 55·3	7 32·4	3·6	1·9	9·6	5·0	15·6	8·2
37	7 54·3	7 55·5	7 32·6	3·7	1·9	9·7	5·1	15·7	8·2
38	7 54·5	7 55·8	7 32·9	3·8	2·0	9·8	5·1	15·8	8·3
39	7 54·8	7 56·0	7 33·1	3·9	2·0	9·9	5·2	15·9	8·3
40	7 55·0	7 56·3	7 33·4	4·0	2·1	10·0	5·3	16·0	8·4
41	7 55·3	7 56·6	7 33·6	4·1	2·2	10·1	5·3	16·1	8·5
42	7 55·5	7 56·8	7 33·8	4·2	2·2	10·2	5·4	16·2	8·5
43	7 55·8	7 57·1	7 34·1	4·3	2·3	10·3	5·4	16·3	8·6
44	7 56·0	7 57·3	7 34·3	4·4	2·3	10·4	5·5	16·4	8·6
45	7 56·3	7 57·6	7 34·6	4·5	2·4	10·5	5·5	16·5	8·7
46	7 56·5	7 57·8	7 34·8	4·6	2·4	10·6	5·6	16·6	8·7
47	7 56·8	7 58·1	7 35·0	4·7	2·5	10·7	5·6	16·7	8·8
48	7 57·0	7 58·3	7 35·3	4·8	2·5	10·8	5·7	16·8	8·8
49	7 57·3	7 58·6	7 35·5	4·9	2·6	10·9	5·7	16·9	8·9
50	7 57·5	7 58·8	7 35·7	5·0	2·6	11·0	5·8	17·0	8·9
51	7 57·8	7 59·1	7 36·0	5·1	2·7	11·1	5·8	17·1	9·0
52	7 58·0	7 59·3	7 36·2	5·2	2·7	11·2	5·9	17·2	9·0
53	7 58·3	7 59·6	7 36·5	5·3	2·8	11·3	5·9	17·3	9·1
54	7 58·5	7 59·8	7 36·7	5·4	2·8	11·4	6·0	17·4	9·1
55	7 58·8	8 00·1	7 36·9	5·5	2·9	11·5	6·0	17·5	9·2
56	7 59·0	8 00·3	7 37·2	5·6	2·9	11·6	6·1	17·6	9·2
57	7 59·3	8 00·6	7 37·4	5·7	3·0	11·7	6·1	17·7	9·3
58	7 59·5	8 00·8	7 37·7	5·8	3·0	11·8	6·2	17·8	9·3
59	7 59·8	8 01·1	7 37·9	5·9	3·1	11·9	6·2	17·9	9·4
60	8 00·0	8 01·3	7 38·1	6·0	3·2	12·0	6·3	18·0	9·5

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

32	SUN PLANETS	ARIES	MOON	v or d	Corr	v or d	Corr	v or d	Corr
s	° ′	° ′	° ′	′	′	′	′	′	′
00	8 00·0	8 01·3	7 38·1	0·0	0·0	6·0	3·3	12·0	6·5
01	8 00·3	8 01·6	7 38·4	0·1	0·1	6·1	3·3	12·1	6·6
02	8 00·5	8 01·8	7 38·6	0·2	0·1	6·2	3·4	12·2	6·6
03	8 00·8	8 02·1	7 38·8	0·3	0·2	6·3	3·4	12·3	6·7
04	8 01·0	8 02·3	7 39·1	0·4	0·2	6·4	3·5	12·4	6·7
05	8 01·3	8 02·6	7 39·3	0·5	0·3	6·5	3·5	12·5	6·8
06	8 01·5	8 02·8	7 39·6	0·6	0·3	6·6	3·6	12·6	6·8
07	8 01·8	8 03·1	7 39·8	0·7	0·4	6·7	3·6	12·7	6·9
08	8 02·0	8 03·3	7 40·0	0·8	0·4	6·8	3·7	12·8	6·9
09	8 02·3	8 03·6	7 40·3	0·9	0·5	6·9	3·7	12·9	7·0
10	8 02·5	8 03·8	7 40·5	1·0	0·5	7·0	3·8	13·0	7·0
11	8 02·8	8 04·1	7 40·8	1·1	0·6	7·1	3·8	13·1	7·1
12	8 03·0	8 04·3	7 41·0	1·2	0·7	7·2	3·9	13·2	7·2
13	8 03·3	8 04·6	7 41·2	1·3	0·7	7·3	4·0	13·3	7·2
14	8 03·5	8 04·8	7 41·5	1·4	0·8	7·4	4·0	13·4	7·3
15	8 03·8	8 05·1	7 41·7	1·5	0·8	7·5	4·1	13·5	7·3
16	8 04·0	8 05·3	7 42·0	1·6	0·9	7·6	4·1	13·6	7·4
17	8 04·3	8 05·6	7 42·2	1·7	0·9	7·7	4·2	13·7	7·4
18	8 04·5	8 05·8	7 42·4	1·8	1·0	7·8	4·2	13·8	7·5
19	8 04·8	8 06·1	7 42·7	1·9	1·0	7·9	4·3	13·9	7·5
20	8 05·0	8 06·3	7 42·9	2·0	1·1	8·0	4·3	14·0	7·6
21	8 05·3	8 06·6	7 43·1	2·1	1·1	8·1	4·4	14·1	7·6
22	8 05·5	8 06·8	7 43·4	2·2	1·2	8·2	4·4	14·2	7·7
23	8 05·8	8 07·1	7 43·6	2·3	1·2	8·3	4·5	14·3	7·7
24	8 06·0	8 07·3	7 43·9	2·4	1·3	8·4	4·6	14·4	7·8
25	8 06·3	8 07·6	7 44·1	2·5	1·4	8·5	4·6	14·5	7·9
26	8 06·5	8 07·8	7 44·3	2·6	1·4	8·6	4·7	14·6	7·9
27	8 06·8	8 08·1	7 44·6	2·7	1·5	8·7	4·7	14·7	8·0
28	8 07·0	8 08·3	7 44·8	2·8	1·5	8·8	4·8	14·8	8·0
29	8 07·3	8 08·6	7 45·1	2·9	1·6	8·9	4·8	14·9	8·1
30	8 07·5	8 08·8	7 45·3	3·0	1·6	9·0	4·9	15·0	8·1
31	8 07·8	8 09·1	7 45·5	3·1	1·7	9·1	4·9	15·1	8·2
32	8 08·0	8 09·3	7 45·8	3·2	1·7	9·2	5·0	15·2	8·2
33	8 08·3	8 09·6	7 46·0	3·3	1·8	9·3	5·0	15·3	8·3
34	8 08·5	8 09·8	7 46·2	3·4	1·8	9·4	5·1	15·4	8·3
35	8 08·8	8 10·1	7 46·5	3·5	1·9	9·5	5·1	15·5	8·4
36	8 09·0	8 10·3	7 46·7	3·6	2·0	9·6	5·2	15·6	8·5
37	8 09·3	8 10·6	7 47·0	3·7	2·0	9·7	5·3	15·7	8·5
38	8 09·5	8 10·8	7 47·2	3·8	2·1	9·8	5·3	15·8	8·6
39	8 09·8	8 11·1	7 47·4	3·9	2·1	9·9	5·4	15·9	8·6
40	8 10·0	8 11·3	7 47·7	4·0	2·2	10·0	5·4	16·0	8·7
41	8 10·3	8 11·6	7 47·9	4·1	2·2	10·1	5·5	16·1	8·7
42	8 10·5	8 11·8	7 48·2	4·2	2·3	10·2	5·5	16·2	8·8
43	8 10·8	8 12·1	7 48·4	4·3	2·3	10·3	5·6	16·3	8·8
44	8 11·0	8 12·3	7 48·6	4·4	2·4	10·4	5·6	16·4	8·9
45	8 11·3	8 12·6	7 48·9	4·5	2·4	10·5	5·7	16·5	8·9
46	8 11·5	8 12·8	7 49·1	4·6	2·5	10·6	5·7	16·6	9·0
47	8 11·8	8 13·1	7 49·3	4·7	2·5	10·7	5·8	16·7	9·0
48	8 12·0	8 13·3	7 49·6	4·8	2·6	10·8	5·9	16·8	9·1
49	8 12·3	8 13·6	7 49·8	4·9	2·7	10·9	5·9	16·9	9·2
50	8 12·5	8 13·8	7 50·1	5·0	2·7	11·0	6·0	17·0	9·2
51	8 12·8	8 14·1	7 50·3	5·1	2·8	11·1	6·0	17·1	9·3
52	8 13·0	8 14·3	7 50·5	5·2	2·8	11·2	6·1	17·2	9·3
53	8 13·3	8 14·6	7 50·8	5·3	2·9	11·3	6·1	17·3	9·4
54	8 13·5	8 14·9	7 51·0	5·4	2·9	11·4	6·2	17·4	9·4
55	8 13·8	8 15·1	7 51·3	5·5	3·0	11·5	6·2	17·5	9·5
56	8 14·0	8 15·4	7 51·5	5·6	3·0	11·6	6·3	17·6	9·5
57	8 14·3	8 15·6	7 51·7	5·7	3·1	11·7	6·3	17·7	9·6
58	8 14·5	8 15·9	7 52·0	5·8	3·1	11·8	6·4	17·8	9·6
59	8 14·8	8 16·1	7 52·2	5·9	3·2	11·9	6·4	17·9	9·7
60	8 15·0	8 16·4	7 52·5	6·0	3·3	12·0	6·5	18·0	9·8

33	SUN PLANETS	ARIES	MOON	v or d	Corr	v or d	Corr	v or d	Corr
s	° ′	° ′	° ′	′	′	′	′	′	′
00	8 15·0	8 16·4	7 52·5	0·0	0·0	6·0	3·4	12·0	6·7
01	8 15·3	8 16·6	7 52·7	0·1	0·1	6·1	3·4	12·1	6·8
02	8 15·5	8 16·9	7 52·9	0·2	0·1	6·2	3·5	12·2	6·8
03	8 15·8	8 17·1	7 53·2	0·3	0·2	6·3	3·5	12·3	6·9
04	8 16·0	8 17·4	7 53·4	0·4	0·2	6·4	3·6	12·4	6·9
05	8 16·3	8 17·6	7 53·6	0·5	0·3	6·5	3·6	12·5	7·0
06	8 16·5	8 17·9	7 53·9	0·6	0·3	6·6	3·7	12·6	7·0
07	8 16·8	8 18·1	7 54·1	0·7	0·4	6·7	3·7	12·7	7·1
08	8 17·0	8 18·4	7 54·4	0·8	0·4	6·8	3·8	12·8	7·1
09	8 17·3	8 18·6	7 54·6	0·9	0·5	6·9	3·9	12·9	7·2
10	8 17·5	8 18·9	7 54·8	1·0	0·6	7·0	3·9	13·0	7·3
11	8 17·8	8 19·1	7 55·1	1·1	0·6	7·1	4·0	13·1	7·3
12	8 18·0	8 19·4	7 55·3	1·2	0·7	7·2	4·0	13·2	7·4
13	8 18·3	8 19·6	7 55·6	1·3	0·7	7·3	4·1	13·3	7·4
14	8 18·5	8 19·9	7 55·8	1·4	0·8	7·4	4·1	13·4	7·5
15	8 18·8	8 20·1	7 56·0	1·5	0·8	7·5	4·2	13·5	7·5
16	8 19·0	8 20·4	7 56·3	1·6	0·9	7·6	4·2	13·6	7·6
17	8 19·3	8 20·6	7 56·5	1·7	0·9	7·7	4·3	13·7	7·6
18	8 19·5	8 20·9	7 56·7	1·8	1·0	7·8	4·4	13·8	7·7
19	8 19·8	8 21·1	7 57·0	1·9	1·1	7·9	4·4	13·9	7·8
20	8 20·0	8 21·4	7 57·2	2·0	1·1	8·0	4·5	14·0	7·8
21	8 20·3	8 21·6	7 57·5	2·1	1·2	8·1	4·5	14·1	7·9
22	8 20·5	8 21·9	7 57·7	2·2	1·2	8·2	4·6	14·2	7·9
23	8 20·8	8 22·1	7 57·9	2·3	1·3	8·3	4·6	14·3	8·0
24	8 21·0	8 22·4	7 58·2	2·4	1·3	8·4	4·7	14·4	8·0
25	8 21·3	8 22·6	7 58·4	2·5	1·4	8·5	4·7	14·5	8·1
26	8 21·5	8 22·9	7 58·7	2·6	1·5	8·6	4·8	14·6	8·2
27	8 21·8	8 23·1	7 58·9	2·7	1·5	8·7	4·9	14·7	8·2
28	8 22·0	8 23·4	7 59·1	2·8	1·6	8·8	4·9	14·8	8·3
29	8 22·3	8 23·6	7 59·4	2·9	1·6	8·9	5·0	14·9	8·3
30	8 22·5	8 23·9	7 59·6	3·0	1·7	9·0	5·0	15·0	8·4
31	8 22·8	8 24·1	7 59·8	3·1	1·7	9·1	5·1	15·1	8·4
32	8 23·0	8 24·4	8 00·1	3·2	1·8	9·2	5·1	15·2	8·5
33	8 23·3	8 24·6	8 00·3	3·3	1·8	9·3	5·2	15·3	8·5
34	8 23·5	8 24·9	8 00·6	3·4	1·9	9·4	5·2	15·4	8·6
35	8 23·8	8 25·1	8 00·8	3·5	2·0	9·5	5·3	15·5	8·7
36	8 24·0	8 25·4	8 01·0	3·6	2·0	9·6	5·4	15·6	8·7
37	8 24·3	8 25·6	8 01·3	3·7	2·1	9·7	5·4	15·7	8·8
38	8 24·5	8 25·9	8 01·5	3·8	2·1	9·8	5·5	15·8	8·8
39	8 24·8	8 26·1	8 01·8	3·9	2·2	9·9	5·5	15·9	8·9
40	8 25·0	8 26·4	8 02·0	4·0	2·2	10·0	5·6	16·0	8·9
41	8 25·3	8 26·6	8 02·2	4·1	2·3	10·1	5·6	16·1	9·0
42	8 25·5	8 26·9	8 02·5	4·2	2·3	10·2	5·7	16·2	9·0
43	8 25·8	8 27·1	8 02·7	4·3	2·4	10·3	5·8	16·3	9·1
44	8 26·0	8 27·4	8 02·9	4·4	2·5	10·4	5·8	16·4	9·2
45	8 26·3	8 27·6	8 03·2	4·5	2·5	10·5	5·9	16·5	9·2
46	8 26·5	8 27·9	8 03·4	4·6	2·6	10·6	5·9	16·6	9·3
47	8 26·8	8 28·1	8 03·7	4·7	2·6	10·7	6·0	16·7	9·3
48	8 27·0	8 28·4	8 03·9	4·8	2·7	10·8	6·0	16·8	9·4
49	8 27·3	8 28·6	8 04·1	4·9	2·7	10·9	6·1	16·9	9·4
50	8 27·5	8 28·9	8 04·4	5·0	2·8	11·0	6·1	17·0	9·5
51	8 27·8	8 29·1	8 04·6	5·1	2·8	11·1	6·2	17·1	9·5
52	8 28·0	8 29·4	8 04·9	5·2	2·9	11·2	6·3	17·2	9·6
53	8 28·3	8 29·6	8 05·1	5·3	3·0	11·3	6·3	17·3	9·7
54	8 28·5	8 29·9	8 05·3	5·4	3·0	11·4	6·4	17·4	9·7
55	8 28·8	8 30·1	8 05·6	5·5	3·1	11·5	6·4	17·5	9·8
56	8 29·0	8 30·4	8 05·8	5·6	3·1	11·6	6·5	17·6	9·8
57	8 29·3	8 30·6	8 06·1	5·7	3·2	11·7	6·5	17·7	9·9
58	8 29·5	8 30·9	8 06·3	5·8	3·2	11·8	6·6	17·8	9·9
59	8 29·8	8 31·1	8 06·5	5·9	3·3	11·9	6·6	17·9	10·0
60	8 30·0	8 31·4	8 06·8	6·0	3·4	12·0	6·7	18·0	10·1

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

34m	SUN PLANETS	ARIES	MOON	v or Corr d	v or Corr d	v or Corr d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	8 30·0	8 31·4	8 06·8	0·0 0·0	6·0 3·5	12·0 6·9
01	8 30·3	8 31·6	8 07·0	0·1 0·1	6·1 3·5	12·1 7·0
02	8 30·5	8 31·9	8 07·2	0·2 0·1	6·2 3·6	12·2 7·0
03	8 30·8	8 32·1	8 07·5	0·3 0·2	6·3 3·6	12·3 7·1
04	8 31·0	8 32·4	8 07·7	0·4 0·2	6·4 3·7	12·4 7·1
05	8 31·3	8 32·6	8 08·0	0·5 0·3	6·5 3·7	12·5 7·2
06	8 31·5	8 32·9	8 08·2	0·6 0·3	6·6 3·8	12·6 7·2
07	8 31·8	8 33·2	8 08·4	0·7 0·4	6·7 3·9	12·7 7·3
08	8 32·0	8 33·4	8 08·7	0·8 0·5	6·8 3·9	12·8 7·4
09	8 32·3	8 33·7	8 08·9	0·9 0·5	6·9 4·0	12·9 7·4
10	8 32·5	8 33·9	8 09·2	1·0 0·6	7·0 4·0	13·0 7·5
11	8 32·8	8 34·2	8 09·4	1·1 0·6	7·1 4·1	13·1 7·5
12	8 33·0	8 34·4	8 09·6	1·2 0·7	7·2 4·1	13·2 7·6
13	8 33·3	8 34·7	8 09·9	1·3 0·7	7·3 4·2	13·3 7·6
14	8 33·5	8 34·9	8 10·1	1·4 0·8	7·4 4·3	13·4 7·7
15	8 33·8	8 35·2	8 10·3	1·5 0·9	7·5 4·3	13·5 7·8
16	8 34·0	8 35·4	8 10·6	1·6 0·9	7·6 4·4	13·6 7·8
17	8 34·3	8 35·7	8 10·8	1·7 1·0	7·7 4·4	13·7 7·9
18	8 34·5	8 35·9	8 11·1	1·8 1·0	7·8 4·5	13·8 7·9
19	8 34·8	8 36·2	8 11·3	1·9 1·1	7·9 4·5	13·9 8·0
20	8 35·0	8 36·4	8 11·5	2·0 1·2	8·0 4·6	14·0 8·1
21	8 35·3	8 36·7	8 11·8	2·1 1·2	8·1 4·7	14·1 8·1
22	8 35·5	8 36·9	8 12·0	2·2 1·3	8·2 4·7	14·2 8·2
23	8 35·8	8 37·2	8 12·3	2·3 1·3	8·3 4·8	14·3 8·2
24	8 36·0	8 37·4	8 12·5	2·4 1·4	8·4 4·8	14·4 8·3
25	8 36·3	8 37·7	8 12·7	2·5 1·4	8·5 4·9	14·5 8·3
26	8 36·5	8 37·9	8 13·0	2·6 1·5	8·6 4·9	14·6 8·4
27	8 36·8	8 38·2	8 13·2	2·7 1·6	8·7 5·0	14·7 8·5
28	8 37·0	8 38·4	8 13·4	2·8 1·6	8·8 5·1	14·8 8·5
29	8 37·3	8 38·7	8 13·7	2·9 1·7	8·9 5·1	14·9 8·6
30	8 37·5	8 38·9	8 13·9	3·0 1·7	9·0 5·2	15·0 8·6
31	8 37·8	8 39·2	8 14·2	3·1 1·8	9·1 5·2	15·1 8·7
32	8 38·0	8 39·4	8 14·4	3·2 1·8	9·2 5·3	15·2 8·7
33	8 38·3	8 39·7	8 14·6	3·3 1·9	9·3 5·3	15·3 8·8
34	8 38·5	8 39·9	8 14·9	3·4 2·0	9·4 5·4	15·4 8·9
35	8 38·8	8 40·2	8 15·1	3·5 2·0	9·5 5·5	15·5 8·9
36	8 39·0	8 40·4	8 15·4	3·6 2·1	9·6 5·5	15·6 9·0
37	8 39·3	8 40·7	8 15·6	3·7 2·1	9·7 5·6	15·7 9·0
38	8 39·5	8 40·9	8 15·8	3·8 2·2	9·8 5·6	15·8 9·1
39	8 39·8	8 41·2	8 16·1	3·9 2·2	9·9 5·7	15·9 9·1
40	8 40·0	8 41·4	8 16·3	4·0 2·3	10·0 5·8	16·0 9·2
41	8 40·3	8 41·7	8 16·5	4·1 2·4	10·1 5·8	16·1 9·3
42	8 40·5	8 41·9	8 16·8	4·2 2·4	10·2 5·9	16·2 9·3
43	8 40·8	8 42·2	8 17·0	4·3 2·5	10·3 5·9	16·3 9·4
44	8 41·0	8 42·4	8 17·3	4·4 2·5	10·4 6·0	16·4 9·4
45	8 41·3	8 42·7	8 17·5	4·5 2·6	10·5 6·0	16·5 9·5
46	8 41·5	8 42·9	8 17·7	4·6 2·6	10·6 6·1	16·6 9·5
47	8 41·8	8 43·2	8 18·0	4·7 2·7	10·7 6·2	16·7 9·6
48	8 42·0	8 43·4	8 18·2	4·8 2·8	10·8 6·2	16·8 9·7
49	8 42·3	8 43·7	8 18·5	4·9 2·8	10·9 6·3	16·9 9·7
50	8 42·5	8 43·9	8 18·7	5·0 2·9	11·0 6·3	17·0 9·8
51	8 42·8	8 44·2	8 18·9	5·1 2·9	11·1 6·4	17·1 9·8
52	8 43·0	8 44·4	8 19·2	5·2 3·0	11·2 6·4	17·2 9·9
53	8 43·3	8 44·7	8 19·4	5·3 3·0	11·3 6·5	17·3 9·9
54	8 43·5	8 44·9	8 19·7	5·4 3·1	11·4 6·6	17·4 10·0
55	8 43·8	8 45·2	8 19·9	5·5 3·2	11·5 6·6	17·5 10·1
56	8 44·0	8 45·4	8 20·1	5·6 3·2	11·6 6·7	17·6 10·1
57	8 44·3	8 45·7	8 20·4	5·7 3·3	11·7 6·7	17·7 10·2
58	8 44·5	8 45·9	8 20·6	5·8 3·3	11·8 6·8	17·8 10·2
59	8 44·8	8 46·2	8 20·8	5·9 3·4	11·9 6·8	17·9 10·3
60	8 45·0	8 46·4	8 21·1	6·0 3·5	12·0 6·9	18·0 10·4

35m	SUN PLANETS	ARIES	MOON	v or Corr d	v or Corr d	v or Corr d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	8 45·0	8 46·4	8 21·1	0·0 0·0	6·0 3·6	12·0 7·1
01	8 45·3	8 46·7	8 21·3	0·1 0·1	6·1 3·6	12·1 7·2
02	8 45·5	8 46·9	8 21·6	0·2 0·1	6·2 3·7	12·2 7·2
03	8 45·8	8 47·2	8 21·8	0·3 0·2	6·3 3·7	12·3 7·3
04	8 46·0	8 47·4	8 22·0	0·4 0·2	6·4 3·8	12·4 7·3
05	8 46·3	8 47·7	8 22·3	0·5 0·3	6·5 3·8	12·5 7·4
06	8 46·5	8 47·9	8 22·5	0·6 0·4	6·6 3·9	12·6 7·5
07	8 46·8	8 48·2	8 22·8	0·7 0·4	6·7 4·0	12·7 7·5
08	8 47·0	8 48·4	8 23·0	0·8 0·5	6·8 4·0	12·8 7·6
09	8 47·3	8 48·7	8 23·2	0·9 0·5	6·9 4·1	12·9 7·6
10	8 47·5	8 48·9	8 23·5	1·0 0·6	7·0 4·1	13·0 7·7
11	8 47·8	8 49·2	8 23·7	1·1 0·7	7·1 4·2	13·1 7·8
12	8 48·0	8 49·4	8 23·9	1·2 0·7	7·2 4·3	13·2 7·8
13	8 48·3	8 49·7	8 24·2	1·3 0·8	7·3 4·3	13·3 7·9
14	8 48·5	8 49·9	8 24·4	1·4 0·8	7·4 4·4	13·4 7·9
15	8 48·8	8 50·2	8 24·7	1·5 0·9	7·5 4·4	13·5 8·0
16	8 49·0	8 50·4	8 24·9	1·6 0·9	7·6 4·5	13·6 8·0
17	8 49·3	8 50·7	8 25·1	1·7 1·0	7·7 4·6	13·7 8·1
18	8 49·5	8 50·9	8 25·4	1·8 1·1	7·8 4·6	13·8 8·2
19	8 49·8	8 51·2	8 25·6	1·9 1·1	7·9 4·7	13·9 8·2
20	8 50·0	8 51·5	8 25·9	2·0 1·2	8·0 4·7	14·0 8·3
21	8 50·3	8 51·7	8 26·1	2·1 1·2	8·1 4·8	14·1 8·3
22	8 50·5	8 52·0	8 26·3	2·2 1·3	8·2 4·9	14·2 8·4
23	8 50·8	8 52·2	8 26·6	2·3 1·4	8·3 4·9	14·3 8·5
24	8 51·0	8 52·5	8 26·8	2·4 1·4	8·4 5·0	14·4 8·5
25	8 51·3	8 52·7	8 27·0	2·5 1·5	8·5 5·0	14·5 8·6
26	8 51·5	8 53·0	8 27·3	2·6 1·5	8·6 5·1	14·6 8·6
27	8 51·8	8 53·2	8 27·5	2·7 1·6	8·7 5·1	14·7 8·7
28	8 52·0	8 53·5	8 27·8	2·8 1·7	8·8 5·2	14·8 8·8
29	8 52·3	8 53·7	8 28·0	2·9 1·7	8·9 5·3	14·9 8·8
30	8 52·5	8 54·0	8 28·2	3·0 1·8	9·0 5·3	15·0 8·9
31	8 52·8	8 54·2	8 28·5	3·1 1·8	9·1 5·4	15·1 8·9
32	8 53·0	8 54·5	8 28·7	3·2 1·9	9·2 5·4	15·2 9·0
33	8 53·3	8 54·7	8 29·0	3·3 2·0	9·3 5·5	15·3 9·1
34	8 53·5	8 55·0	8 29·2	3·4 2·0	9·4 5·6	15·4 9·1
35	8 53·8	8 55·2	8 29·4	3·5 2·1	9·5 5·6	15·5 9·2
36	8 54·0	8 55·5	8 29·7	3·6 2·1	9·6 5·7	15·6 9·2
37	8 54·3	8 55·7	8 29·9	3·7 2·2	9·7 5·7	15·7 9·3
38	8 54·5	8 56·0	8 30·2	3·8 2·2	9·8 5·8	15·8 9·3
39	8 54·8	8 56·2	8 30·4	3·9 2·3	9·9 5·9	15·9 9·4
40	8 55·0	8 56·5	8 30·6	4·0 2·4	10·0 5·9	16·0 9·5
41	8 55·3	8 56·7	8 30·9	4·1 2·4	10·1 6·0	16·1 9·5
42	8 55·5	8 57·0	8 31·1	4·2 2·5	10·2 6·0	16·2 9·6
43	8 55·8	8 57·2	8 31·3	4·3 2·5	10·3 6·1	16·3 9·6
44	8 56·0	8 57·5	8 31·6	4·4 2·6	10·4 6·2	16·4 9·7
45	8 56·3	8 57·7	8 31·8	4·5 2·7	10·5 6·2	16·5 9·8
46	8 56·5	8 58·0	8 32·1	4·6 2·7	10·6 6·3	16·6 9·8
47	8 56·8	8 58·2	8 32·3	4·7 2·8	10·7 6·3	16·7 9·9
48	8 57·0	8 58·5	8 32·5	4·8 2·8	10·8 6·4	16·8 9·9
49	8 57·3	8 58·7	8 32·8	4·9 2·9	10·9 6·4	16·9 10·0
50	8 57·5	8 59·0	8 33·0	5·0 3·0	11·0 6·5	17·0 10·1
51	8 57·8	8 59·2	8 33·3	5·1 3·0	11·1 6·6	17·1 10·1
52	8 58·0	8 59·5	8 33·5	5·2 3·1	11·2 6·6	17·2 10·2
53	8 58·3	8 59·7	8 33·7	5·3 3·1	11·3 6·7	17·3 10·2
54	8 58·5	9 00·0	8 34·0	5·4 3·2	11·4 6·7	17·4 10·3
55	8 58·8	9 00·2	8 34·2	5·5 3·3	11·5 6·8	17·5 10·4
56	8 59·0	9 00·5	8 34·4	5·6 3·3	11·6 6·9	17·6 10·4
57	8 59·3	9 00·7	8 34·7	5·7 3·4	11·7 6·9	17·7 10·5
58	8 59·5	9 01·0	8 34·9	5·8 3·4	11·8 7·0	17·8 10·5
59	8 59·8	9 01·2	8 35·2	5·9 3·5	11·9 7·0	17·9 10·6
60	9 00·0	9 01·5	8 35·4	6·0 3·6	12·0 7·1	18·0 10·7

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

Astronomiske elementer - daglige sider

36	SUN PLANETS	ARIES	MOON	v or Corr n d		v or Corr n d		v or Corr n d	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	9 00·0	9 01·5	8 35·4	0·0	0·0	6·0	3·7	12·0	7·3
01	9 00·3	9 01·7	8 35·6	0·1	0·1	6·1	3·7	12·1	7·4
02	9 00·5	9 02·0	8 35·9	0·2	0·1	6·2	3·8	12·2	7·4
03	9 00·8	9 02·2	8 36·1	0·3	0·2	6·3	3·8	12·3	7·5
04	9 01·0	9 02·5	8 36·4	0·4	0·2	6·4	3·9	12·4	7·5
05	9 01·3	9 02·7	8 36·6	0·5	0·3	6·5	4·0	12·5	7·6
06	9 01·5	9 03·0	8 36·8	0·6	0·4	6·6	4·0	12·6	7·7
07	9 01·8	9 03·2	8 37·1	0·7	0·4	6·7	4·1	12·7	7·7
08	9 02·0	9 03·5	8 37·3	0·8	0·5	6·8	4·1	12·8	7·8
09	9 02·3	9 03·7	8 37·5	0·9	0·5	6·9	4·2	12·9	7·8
10	9 02·5	9 04·0	8 37·8	1·0	0·6	7·0	4·3	13·0	7·9
11	9 02·8	9 04·2	8 38·0	1·1	0·7	7·1	4·3	13·1	8·0
12	9 03·0	9 04·5	8 38·3	1·2	0·7	7·2	4·4	13·2	8·0
13	9 03·3	9 04·7	8 38·5	1·3	0·8	7·3	4·4	13·3	8·1
14	9 03·5	9 05·0	8 38·7	1·4	0·9	7·4	4·5	13·4	8·2
15	9 03·8	9 05·2	8 39·0	1·5	0·9	7·5	4·6	13·5	8·2
16	9 04·0	9 05·5	8 39·2	1·6	1·0	7·6	4·6	13·6	8·3
17	9 04·3	9 05·7	8 39·5	1·7	1·0	7·7	4·7	13·7	8·3
18	9 04·5	9 06·0	8 39·7	1·8	1·1	7·8	4·7	13·8	8·4
19	9 04·8	9 06·2	8 39·9	1·9	1·2	7·9	4·8	13·9	8·5
20	9 05·0	9 06·5	8 40·2	2·0	1·2	8·0	4·9	14·0	8·5
21	9 05·3	9 06·7	8 40·4	2·1	1·3	8·1	4·9	14·1	8·6
22	9 05·5	9 07·0	8 40·6	2·2	1·3	8·2	5·0	14·2	8·6
23	9 05·8	9 07·2	8 40·9	2·3	1·4	8·3	5·0	14·3	8·7
24	9 06·0	9 07·5	8 41·1	2·4	1·5	8·4	5·1	14·4	8·8
25	9 06·3	9 07·7	8 41·4	2·5	1·5	8·5	5·2	14·5	8·8
26	9 06·5	9 08·0	8 41·6	2·6	1·6	8·6	5·2	14·6	8·9
27	9 06·8	9 08·2	8 41·8	2·7	1·6	8·7	5·3	14·7	8·9
28	9 07·0	9 08·5	8 42·1	2·8	1·7	8·8	5·4	14·8	9·0
29	9 07·3	9 08·7	8 42·3	2·9	1·8	8·9	5·4	14·9	9·1
30	9 07·5	9 09·0	8 42·6	3·0	1·8	9·0	5·5	15·0	9·1
31	9 07·8	9 09·2	8 42·8	3·1	1·9	9·1	5·5	15·1	9·2
32	9 08·0	9 09·5	8 43·0	3·2	1·9	9·2	5·6	15·2	9·2
33	9 08·3	9 09·8	8 43·3	3·3	2·0	9·3	5·7	15·3	9·3
34	9 08·5	9 10·0	8 43·5	3·4	2·1	9·4	5·7	15·4	9·4
35	9 08·8	9 10·3	8 43·8	3·5	2·1	9·5	5·8	15·5	9·4
36	9 09·0	9 10·5	8 44·0	3·6	2·2	9·6	5·8	15·6	9·5
37	9 09·3	9 10·8	8 44·2	3·7	2·3	9·7	5·9	15·7	9·6
38	9 09·5	9 11·0	8 44·5	3·8	2·3	9·8	6·0	15·8	9·6
39	9 09·8	9 11·3	8 44·7	3·9	2·4	9·9	6·0	15·9	9·7
40	9 10·0	9 11·5	8 44·9	4·0	2·4	10·0	6·1	16·0	9·7
41	9 10·3	9 11·8	8 45·2	4·1	2·5	10·1	6·1	16·1	9·8
42	9 10·5	9 12·0	8 45·4	4·2	2·6	10·2	6·2	16·2	9·9
43	9 10·8	9 12·3	8 45·7	4·3	2·6	10·3	6·3	16·3	9·9
44	9 11·0	9 12·5	8 45·9	4·4	2·7	10·4	6·3	16·4	10·0
45	9 11·3	9 12·8	8 46·1	4·5	2·7	10·5	6·4	16·5	10·0
46	9 11·5	9 13·0	8 46·4	4·6	2·8	10·6	6·4	16·6	10·1
47	9 11·8	9 13·3	8 46·6	4·7	2·9	10·7	6·5	16·7	10·2
48	9 12·0	9 13·5	8 46·9	4·8	2·9	10·8	6·6	16·8	10·2
49	9 12·3	9 13·8	8 47·1	4·9	3·0	10·9	6·6	16·9	10·3
50	9 12·5	9 14·0	8 47·3	5·0	3·0	11·0	6·7	17·0	10·3
51	9 12·8	9 14·3	8 47·6	5·1	3·1	11·1	6·8	17·1	10·4
52	9 13·0	9 14·5	8 47·8	5·2	3·2	11·2	6·8	17·2	10·5
53	9 13·3	9 14·8	8 48·0	5·3	3·2	11·3	6·9	17·3	10·5
54	9 13·5	9 15·0	8 48·3	5·4	3·3	11·4	6·9	17·4	10·6
55	9 13·8	9 15·3	8 48·5	5·5	3·3	11·5	7·0	17·5	10·6
56	9 14·0	9 15·5	8 48·8	5·6	3·4	11·6	7·1	17·6	10·7
57	9 14·3	9 15·8	8 49·0	5·7	3·5	11·7	7·1	17·7	10·8
58	9 14·5	9 16·0	8 49·2	5·8	3·5	11·8	7·2	17·8	10·8
59	9 14·8	9 16·3	8 49·5	5·9	3·6	11·9	7·2	17·9	10·9
60	9 15·0	9 16·5	8 49·7	6·0	3·7	12·0	7·3	18·0	11·0

37	SUN PLANETS	ARIES	MOON	v or Corr n d		v or Corr n d		v or Corr n d	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	9 15·0	9 16·5	8 49·7	0·0	0·0	6·0	3·8	12·0	7·5
01	9 15·3	9 16·8	8 50·0	0·1	0·1	6·1	3·8	12·1	7·6
02	9 15·5	9 17·0	8 50·2	0·2	0·1	6·2	3·9	12·2	7·6
03	9 15·8	9 17·3	8 50·4	0·3	0·2	6·3	3·9	12·3	7·7
04	9 16·0	9 17·5	8 50·7	0·4	0·3	6·4	4·0	12·4	7·8
05	9 16·3	9 17·8	8 50·9	0·5	0·3	6·5	4·1	12·5	7·8
06	9 16·5	9 18·0	8 51·1	0·6	0·4	6·6	4·1	12·6	7·9
07	9 16·8	9 18·3	8 51·4	0·7	0·4	6·7	4·2	12·7	7·9
08	9 17·0	9 18·5	8 51·6	0·8	0·5	6·8	4·3	12·8	8·0
09	9 17·3	9 18·8	8 51·9	0·9	0·6	6·9	4·3	12·9	8·1
10	9 17·5	9 19·0	8 52·1	1·0	0·6	7·0	4·4	13·0	8·1
11	9 17·8	9 19·3	8 52·3	1·1	0·7	7·1	4·4	13·1	8·2
12	9 18·0	9 19·5	8 52·6	1·2	0·8	7·2	4·5	13·2	8·3
13	9 18·3	9 19·8	8 52·8	1·3	0·8	7·3	4·6	13·3	8·3
14	9 18·5	9 20·0	8 53·1	1·4	0·9	7·4	4·6	13·4	8·4
15	9 18·8	9 20·3	8 53·3	1·5	0·9	7·5	4·7	13·5	8·4
16	9 19·0	9 20·5	8 53·5	1·6	1·0	7·6	4·8	13·6	8·5
17	9 19·3	9 20·8	8 53·8	1·7	1·1	7·7	4·8	13·7	8·6
18	9 19·5	9 21·0	8 54·0	1·8	1·1	7·8	4·9	13·8	8·6
19	9 19·8	9 21·3	8 54·3	1·9	1·2	7·9	4·9	13·9	8·7
20	9 20·0	9 21·5	8 54·5	2·0	1·3	8·0	5·0	14·0	8·8
21	9 20·3	9 21·8	8 54·7	2·1	1·3	8·1	5·1	14·1	8·8
22	9 20·5	9 22·0	8 55·0	2·2	1·4	8·2	5·1	14·2	8·9
23	9 20·8	9 22·3	8 55·2	2·3	1·4	8·3	5·2	14·3	8·9
24	9 21·0	9 22·5	8 55·4	2·4	1·5	8·4	5·3	14·4	9·0
25	9 21·3	9 22·8	8 55·7	2·5	1·6	8·5	5·3	14·5	9·1
26	9 21·5	9 23·0	8 55·9	2·6	1·6	8·6	5·4	14·6	9·1
27	9 21·8	9 23·3	8 56·2	2·7	1·7	8·7	5·4	14·7	9·2
28	9 22·0	9 23·5	8 56·4	2·8	1·8	8·8	5·5	14·8	9·3
29	9 22·3	9 23·8	8 56·6	2·9	1·8	8·9	5·6	14·9	9·3
30	9 22·5	9 24·0	8 56·9	3·0	1·9	9·0	5·6	15·0	9·4
31	9 22·8	9 24·3	8 57·1	3·1	1·9	9·1	5·7	15·1	9·4
32	9 23·0	9 24·5	8 57·4	3·2	2·0	9·2	5·8	15·2	9·5
33	9 23·3	9 24·8	8 57·6	3·3	2·1	9·3	5·8	15·3	9·6
34	9 23·5	9 25·0	8 57·8	3·4	2·1	9·4	5·9	15·4	9·6
35	9 23·8	9 25·3	8 58·1	3·5	2·2	9·5	5·9	15·5	9·7
36	9 24·0	9 25·5	8 58·3	3·6	2·3	9·6	6·0	15·6	9·8
37	9 24·3	9 25·8	8 58·5	3·7	2·3	9·7	6·1	15·7	9·8
38	9 24·5	9 26·0	8 58·8	3·8	2·4	9·8	6·1	15·8	9·9
39	9 24·8	9 26·3	8 59·0	3·9	2·4	9·9	6·2	15·9	9·9
40	9 25·0	9 26·5	8 59·3	4·0	2·5	10·0	6·3	16·0	10·0
41	9 25·3	9 26·8	8 59·5	4·1	2·6	10·1	6·3	16·1	10·1
42	9 25·5	9 27·0	8 59·7	4·2	2·6	10·2	6·4	16·2	10·1
43	9 25·8	9 27·3	9 00·0	4·3	2·7	10·3	6·4	16·3	10·2
44	9 26·0	9 27·5	9 00·2	4·4	2·8	10·4	6·5	16·4	10·3
45	9 26·3	9 27·8	9 00·5	4·5	2·8	10·5	6·6	16·5	10·3
46	9 26·5	9 28·1	9 00·7	4·6	2·9	10·6	6·6	16·6	10·4
47	9 26·8	9 28·3	9 00·9	4·7	2·9	10·7	6·7	16·7	10·4
48	9 27·0	9 28·6	9 01·2	4·8	3·0	10·8	6·8	16·8	10·5
49	9 27·3	9 28·8	9 01·4	4·9	3·1	10·9	6·8	16·9	10·6
50	9 27·5	9 29·1	9 01·6	5·0	3·1	11·0	6·9	17·0	10·6
51	9 27·8	9 29·3	9 01·9	5·1	3·2	11·1	6·9	17·1	10·7
52	9 28·0	9 29·6	9 02·1	5·2	3·3	11·2	7·0	17·2	10·8
53	9 28·3	9 29·8	9 02·4	5·3	3·3	11·3	7·1	17·3	10·8
54	9 28·5	9 30·1	9 02·6	5·4	3·4	11·4	7·1	17·4	10·9
55	9 28·8	9 30·3	9 02·8	5·5	3·4	11·5	7·2	17·5	10·9
56	9 29·0	9 30·6	9 03·1	5·6	3·5	11·6	7·3	17·6	11·0
57	9 29·3	9 30·8	9 03·3	5·7	3·6	11·7	7·3	17·7	11·1
58	9 29·5	9 31·1	9 03·6	5·8	3·6	11·8	7·4	17·8	11·1
59	9 29·8	9 31·3	9 03·8	5·9	3·7	11·9	7·4	17·9	11·2
60	9 30·0	9 31·6	9 04·0	6·0	3·8	12·0	7·5	18·0	11·3

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

Astronomiske elementer - daglige sider

38m s	SUN PLANETS ° ′	ARIES ° ′	MOON ° ′	v or d ′	Corr^n ′	v or d ′	Corr^n ′	v or d ′	Corr^n ′
00	9 30·0	9 31·6	9 04·0	0·0	0·0	6·0	3·9	12·0	7·7
01	9 30·3	9 31·8	9 04·3	0·1	0·1	6·1	3·9	12·1	7·8
02	9 30·5	9 32·1	9 04·5	0·2	0·1	6·2	4·0	12·2	7·8
03	9 30·8	9 32·3	9 04·7	0·3	0·2	6·3	4·0	12·3	7·9
04	9 31·0	9 32·6	9 05·0	0·4	0·3	6·4	4·1	12·4	8·0
05	9 31·3	9 32·8	9 05·2	0·5	0·3	6·5	4·2	12·5	8·0
06	9 31·5	9 33·1	9 05·5	0·6	0·4	6·6	4·2	12·6	8·1
07	9 31·8	9 33·3	9 05·7	0·7	0·4	6·7	4·3	12·7	8·1
08	9 32·0	9 33·6	9 05·9	0·8	0·5	6·8	4·4	12·8	8·2
09	9 32·3	9 33·8	9 06·2	0·9	0·6	6·9	4·4	12·9	8·3
10	9 32·5	9 34·1	9 06·4	1·0	0·6	7·0	4·5	13·0	8·3
11	9 32·8	9 34·3	9 06·7	1·1	0·7	7·1	4·6	13·1	8·4
12	9 33·0	9 34·6	9 06·9	1·2	0·8	7·2	4·6	13·2	8·5
13	9 33·3	9 34·8	9 07·1	1·3	0·8	7·3	4·7	13·3	8·5
14	9 33·5	9 35·1	9 07·4	1·4	0·9	7·4	4·7	13·4	8·6
15	9 33·8	9 35·3	9 07·6	1·5	1·0	7·5	4·8	13·5	8·7
16	9 34·0	9 35·6	9 07·9	1·6	1·0	7·6	4·9	13·6	8·7
17	9 34·3	9 35·8	9 08·1	1·7	1·1	7·7	4·9	13·7	8·8
18	9 34·5	9 36·1	9 08·3	1·8	1·2	7·8	5·0	13·8	8·9
19	9 34·8	9 36·3	9 08·6	1·9	1·2	7·9	5·1	13·9	8·9
20	9 35·0	9 36·6	9 08·8	2·0	1·3	8·0	5·1	14·0	9·0
21	9 35·3	9 36·8	9 09·0	2·1	1·3	8·1	5·2	14·1	9·0
22	9 35·5	9 37·1	9 09·3	2·2	1·4	8·2	5·3	14·2	9·1
23	9 35·8	9 37·3	9 09·5	2·3	1·5	8·3	5·3	14·3	9·2
24	9 36·0	9 37·6	9 09·8	2·4	1·5	8·4	5·4	14·4	9·2
25	9 36·3	9 37·8	9 10·0	2·5	1·6	8·5	5·5	14·5	9·3
26	9 36·5	9 38·1	9 10·2	2·6	1·7	8·6	5·5	14·6	9·4
27	9 36·8	9 38·3	9 10·5	2·7	1·7	8·7	5·6	14·7	9·4
28	9 37·0	9 38·6	9 10·7	2·8	1·8	8·8	5·6	14·8	9·5
29	9 37·3	9 38·8	9 11·0	2·9	1·9	8·9	5·7	14·9	9·6
30	9 37·5	9 39·1	9 11·2	3·0	1·9	9·0	5·8	15·0	9·6
31	9 37·8	9 39·3	9 11·4	3·1	2·0	9·1	5·8	15·1	9·7
32	9 38·0	9 39·6	9 11·7	3·2	2·1	9·2	5·9	15·2	9·8
33	9 38·3	9 39·8	9 11·9	3·3	2·1	9·3	6·0	15·3	9·8
34	9 38·5	9 40·1	9 12·1	3·4	2·2	9·4	6·0	15·4	9·9
35	9 38·8	9 40·3	9 12·4	3·5	2·2	9·5	6·1	15·5	9·9
36	9 39·0	9 40·6	9 12·6	3·6	2·3	9·6	6·2	15·6	10·0
37	9 39·3	9 40·8	9 12·9	3·7	2·4	9·7	6·2	15·7	10·1
38	9 39·5	9 41·1	9 13·1	3·8	2·4	9·8	6·3	15·8	10·1
39	9 39·8	9 41·3	9 13·3	3·9	2·5	9·9	6·4	15·9	10·2
40	9 40·0	9 41·6	9 13·6	4·0	2·6	10·0	6·4	16·0	10·3
41	9 40·3	9 41·8	9 13·8	4·1	2·6	10·1	6·5	16·1	10·3
42	9 40·5	9 42·1	9 14·1	4·2	2·7	10·2	6·5	16·2	10·4
43	9 40·8	9 42·3	9 14·3	4·3	2·8	10·3	6·6	16·3	10·5
44	9 41·0	9 42·6	9 14·5	4·4	2·8	10·4	6·7	16·4	10·5
45	9 41·3	9 42·8	9 14·8	4·5	2·9	10·5	6·7	16·5	10·6
46	9 41·5	9 43·1	9 15·0	4·6	3·0	10·6	6·8	16·6	10·7
47	9 41·8	9 43·3	9 15·2	4·7	3·0	10·7	6·9	16·7	10·7
48	9 42·0	9 43·6	9 15·5	4·8	3·1	10·8	6·9	16·8	10·8
49	9 42·3	9 43·8	9 15·7	4·9	3·1	10·9	7·0	16·9	10·8
50	9 42·5	9 44·1	9 16·0	5·0	3·2	11·0	7·1	17·0	10·9
51	9 42·8	9 44·3	9 16·2	5·1	3·3	11·1	7·1	17·1	11·0
52	9 43·0	9 44·6	9 16·4	5·2	3·3	11·2	7·2	17·2	11·0
53	9 43·3	9 44·8	9 16·7	5·3	3·4	11·3	7·3	17·3	11·1
54	9 43·5	9 45·1	9 16·9	5·4	3·5	11·4	7·3	17·4	11·2
55	9 43·8	9 45·3	9 17·2	5·5	3·5	11·5	7·4	17·5	11·2
56	9 44·0	9 45·6	9 17·4	5·6	3·6	11·6	7·4	17·6	11·3
57	9 44·3	9 45·8	9 17·6	5·7	3·7	11·7	7·5	17·7	11·4
58	9 44·5	9 46·1	9 17·9	5·8	3·7	11·8	7·6	17·8	11·4
59	9 44·8	9 46·4	9 18·1	5·9	3·8	11·9	7·6	17·9	11·5
60	9 45·0	9 46·6	9 18·4	6·0	3·9	12·0	7·7	18·0	11·6

39m s	SUN PLANETS ° ′	ARIES ° ′	MOON ° ′	v or d ′	Corr^n ′	v or d ′	Corr^n ′	v or d ′	Corr^n ′
00	9 45·0	9 46·6	9 18·4	0·0	0·0	6·0	4·0	12·0	7·9
01	9 45·3	9 46·9	9 18·6	0·1	0·1	6·1	4·0	12·1	8·0
02	9 45·5	9 47·1	9 18·8	0·2	0·1	6·2	4·1	12·2	8·0
03	9 45·8	9 47·4	9 19·1	0·3	0·2	6·3	4·1	12·3	8·1
04	9 46·0	9 47·6	9 19·3	0·4	0·3	6·4	4·2	12·4	8·2
05	9 46·3	9 47·9	9 19·5	0·5	0·3	6·5	4·3	12·5	8·2
06	9 46·5	9 48·1	9 19·8	0·6	0·4	6·6	4·3	12·6	8·3
07	9 46·8	9 48·4	9 20·0	0·7	0·5	6·7	4·4	12·7	8·4
08	9 47·0	9 48·6	9 20·3	0·8	0·5	6·8	4·5	12·8	8·4
09	9 47·3	9 48·9	9 20·5	0·9	0·6	6·9	4·5	12·9	8·5
10	9 47·5	9 49·1	9 20·7	1·0	0·7	7·0	4·6	13·0	8·6
11	9 47·8	9 49·4	9 21·0	1·1	0·7	7·1	4·7	13·1	8·6
12	9 48·0	9 49·6	9 21·2	1·2	0·8	7·2	4·7	13·2	8·7
13	9 48·3	9 49·9	9 21·5	1·3	0·9	7·3	4·8	13·3	8·8
14	9 48·5	9 50·1	9 21·7	1·4	0·9	7·4	4·9	13·4	8·8
15	9 48·8	9 50·4	9 21·9	1·5	1·0	7·5	4·9	13·5	8·9
16	9 49·0	9 50·6	9 22·2	1·6	1·1	7·6	5·0	13·6	9·0
17	9 49·3	9 50·9	9 22·4	1·7	1·1	7·7	5·1	13·7	9·0
18	9 49·5	9 51·1	9 22·6	1·8	1·2	7·8	5·1	13·8	9·1
19	9 49·8	9 51·4	9 22·9	1·9	1·3	7·9	5·2	13·9	9·2
20	9 50·0	9 51·6	9 23·1	2·0	1·3	8·0	5·3	14·0	9·2
21	9 50·3	9 51·9	9 23·4	2·1	1·4	8·1	5·3	14·1	9·3
22	9 50·5	9 52·1	9 23·6	2·2	1·4	8·2	5·4	14·2	9·3
23	9 50·8	9 52·4	9 23·8	2·3	1·5	8·3	5·5	14·3	9·4
24	9 51·0	9 52·6	9 24·1	2·4	1·6	8·4	5·5	14·4	9·5
25	9 51·3	9 52·9	9 24·3	2·5	1·6	8·5	5·6	14·5	9·5
26	9 51·5	9 53·1	9 24·6	2·6	1·7	8·6	5·7	14·6	9·6
27	9 51·8	9 53·4	9 24·8	2·7	1·8	8·7	5·7	14·7	9·7
28	9 52·0	9 53·6	9 25·0	2·8	1·8	8·8	5·8	14·8	9·7
29	9 52·3	9 53·9	9 25·3	2·9	1·9	8·9	5·9	14·9	9·8
30	9 52·5	9 54·1	9 25·5	3·0	2·0	9·0	5·9	15·0	9·9
31	9 52·8	9 54·4	9 25·7	3·1	2·0	9·1	6·0	15·1	9·9
32	9 53·0	9 54·6	9 26·0	3·2	2·1	9·2	6·1	15·2	10·0
33	9 53·3	9 54·9	9 26·2	3·3	2·2	9·3	6·1	15·3	10·1
34	9 53·5	9 55·1	9 26·5	3·4	2·2	9·4	6·2	15·4	10·1
35	9 53·8	9 55·4	9 26·7	3·5	2·3	9·5	6·3	15·5	10·2
36	9 54·0	9 55·6	9 26·9	3·6	2·4	9·6	6·3	15·6	10·3
37	9 54·3	9 55·9	9 27·2	3·7	2·4	9·7	6·4	15·7	10·3
38	9 54·5	9 56·1	9 27·4	3·8	2·5	9·8	6·5	15·8	10·4
39	9 54·8	9 56·4	9 27·7	3·9	2·6	9·9	6·5	15·9	10·5
40	9 55·0	9 56·6	9 27·9	4·0	2·6	10·0	6·6	16·0	10·5
41	9 55·3	9 56·9	9 28·1	4·1	2·7	10·1	6·6	16·1	10·6
42	9 55·5	9 57·1	9 28·4	4·2	2·8	10·2	6·7	16·2	10·7
43	9 55·8	9 57·4	9 28·6	4·3	2·8	10·3	6·8	16·3	10·7
44	9 56·0	9 57·6	9 28·8	4·4	2·9	10·4	6·8	16·4	10·8
45	9 56·3	9 57·9	9 29·1	4·5	3·0	10·5	6·9	16·5	10·9
46	9 56·5	9 58·1	9 29·3	4·6	3·0	10·6	7·0	16·6	10·9
47	9 56·8	9 58·4	9 29·6	4·7	3·1	10·7	7·0	16·7	11·0
48	9 57·0	9 58·6	9 29·8	4·8	3·2	10·8	7·1	16·8	11·1
49	9 57·3	9 58·9	9 30·0	4·9	3·2	10·9	7·2	16·9	11·1
50	9 57·5	9 59·1	9 30·3	5·0	3·3	11·0	7·2	17·0	11·2
51	9 57·8	9 59·4	9 30·5	5·1	3·4	11·1	7·3	17·1	11·3
52	9 58·0	9 59·6	9 30·8	5·2	3·4	11·2	7·4	17·2	11·3
53	9 58·3	9 59·9	9 31·0	5·3	3·5	11·3	7·4	17·3	11·4
54	9 58·5	10 00·1	9 31·2	5·4	3·6	11·4	7·5	17·4	11·5
55	9 58·8	10 00·4	9 31·5	5·5	3·6	11·5	7·6	17·5	11·5
56	9 59·0	10 00·6	9 31·7	5·6	3·7	11·6	7·6	17·6	11·6
57	9 59·3	10 00·9	9 32·0	5·7	3·8	11·7	7·7	17·7	11·7
58	9 59·5	10 01·1	9 32·2	5·8	3·8	11·8	7·8	17·8	11·7
59	9 59·8	10 01·4	9 32·4	5·9	3·9	11·9	7·8	17·9	11·8
60	10 00·0	10 01·6	9 32·7	6·0	4·0	12·0	7·9	18·0	11·9

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

m 40	SUN PLANETS	ARIES	MOON	v or Corr^n d		v or Corr^n d		v or Corr^n d	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	10 00·0	10 01·6	9 32·7	0·0	0·0	6·0	4·1	12·0	8·1
01	10 00·3	10 01·9	9 32·9	0·1	0·1	6·1	4·1	12·1	8·2
02	10 00·5	10 02·1	9 33·1	0·2	0·1	6·2	4·2	12·2	8·2
03	10 00·8	10 02·4	9 33·4	0·3	0·2	6·3	4·3	12·3	8·3
04	10 01·0	10 02·6	9 33·6	0·4	0·3	6·4	4·3	12·4	8·4
05	10 01·3	10 02·9	9 33·9	0·5	0·3	6·5	4·4	12·5	8·4
06	10 01·5	10 03·1	9 34·1	0·6	0·4	6·6	4·5	12·6	8·5
07	10 01·8	10 03·4	9 34·3	0·7	0·5	6·7	4·5	12·7	8·6
08	10 02·0	10 03·6	9 34·6	0·8	0·5	6·8	4·6	12·8	8·6
09	10 02·3	10 03·9	9 34·8	0·9	0·6	6·9	4·7	12·9	8·7
10	10 02·5	10 04·1	9 35·1	1·0	0·7	7·0	4·7	13·0	8·8
11	10 02·8	10 04·4	9 35·3	1·1	0·7	7·1	4·8	13·1	8·8
12	10 03·0	10 04·7	9 35·5	1·2	0·8	7·2	4·9	13·2	8·9
13	10 03·3	10 04·9	9 35·8	1·3	0·9	7·3	4·9	13·3	9·0
14	10 03·5	10 05·2	9 36·0	1·4	0·9	7·4	5·0	13·4	9·0
15	10 03·8	10 05·4	9 36·2	1·5	1·0	7·5	5·1	13·5	9·1
16	10 04·0	10 05·7	9 36·5	1·6	1·1	7·6	5·1	13·6	9·2
17	10 04·3	10 05·9	9 36·7	1·7	1·1	7·7	5·2	13·7	9·2
18	10 04·5	10 06·2	9 37·0	1·8	1·2	7·8	5·3	13·8	9·3
19	10 04·8	10 06·4	9 37·2	1·9	1·3	7·9	5·3	13·9	9·4
20	10 05·0	10 06·7	9 37·4	2·0	1·4	8·0	5·4	14·0	9·5
21	10 05·3	10 06·9	9 37·7	2·1	1·4	8·1	5·5	14·1	9·5
22	10 05·5	10 07·2	9 37·9	2·2	1·5	8·2	5·5	14·2	9·6
23	10 05·8	10 07·4	9 38·2	2·3	1·6	8·3	5·6	14·3	9·7
24	10 06·0	10 07·7	9 38·4	2·4	1·6	8·4	5·7	14·4	9·7
25	10 06·3	10 07·9	9 38·6	2·5	1·7	8·5	5·7	14·5	9·8
26	10 06·5	10 08·2	9 38·9	2·6	1·8	8·6	5·8	14·6	9·9
27	10 06·8	10 08·4	9 39·1	2·7	1·8	8·7	5·9	14·7	9·9
28	10 07·0	10 08·7	9 39·3	2·8	1·9	8·8	5·9	14·8	10·0
29	10 07·3	10 08·9	9 39·6	2·9	2·0	8·9	6·0	14·9	10·1
30	10 07·5	10 09·2	9 39·8	3·0	2·0	9·0	6·1	15·0	10·1
31	10 07·8	10 09·4	9 40·1	3·1	2·1	9·1	6·1	15·1	10·2
32	10 08·0	10 09·7	9 40·3	3·2	2·2	9·2	6·2	15·2	10·3
33	10 08·3	10 09·9	9 40·5	3·3	2·2	9·3	6·3	15·3	10·3
34	10 08·5	10 10·2	9 40·8	3·4	2·3	9·4	6·3	15·4	10·4
35	10 08·8	10 10·4	9 41·0	3·5	2·4	9·5	6·4	15·5	10·5
36	10 09·0	10 10·7	9 41·3	3·6	2·4	9·6	6·5	15·6	10·5
37	10 09·3	10 10·9	9 41·5	3·7	2·5	9·7	6·5	15·7	10·6
38	10 09·5	10 11·2	9 41·7	3·8	2·6	9·8	6·6	15·8	10·7
39	10 09·8	10 11·4	9 42·0	3·9	2·6	9·9	6·7	15·9	10·7
40	10 10·0	10 11·7	9 42·2	4·0	2·7	10·0	6·8	16·0	10·8
41	10 10·3	10 11·9	9 42·4	4·1	2·8	10·1	6·8	16·1	10·9
42	10 10·5	10 12·2	9 42·7	4·2	2·8	10·2	6·9	16·2	10·9
43	10 10·8	10 12·4	9 42·9	4·3	2·9	10·3	7·0	16·3	11·0
44	10 11·0	10 12·7	9 43·2	4·4	3·0	10·4	7·0	16·4	11·1
45	10 11·3	10 12·9	9 43·4	4·5	3·0	10·5	7·1	16·5	11·1
46	10 11·5	10 13·2	9 43·6	4·6	3·1	10·6	7·2	16·6	11·2
47	10 11·8	10 13·4	9 43·9	4·7	3·2	10·7	7·2	16·7	11·3
48	10 12·0	10 13·7	9 44·1	4·8	3·2	10·8	7·3	16·8	11·3
49	10 12·3	10 13·9	9 44·4	4·9	3·3	10·9	7·4	16·9	11·4
50	10 12·5	10 14·2	9 44·6	5·0	3·4	11·0	7·4	17·0	11·5
51	10 12·8	10 14·4	9 44·8	5·1	3·4	11·1	7·5	17·1	11·5
52	10 13·0	10 14·7	9 45·1	5·2	3·5	11·2	7·6	17·2	11·6
53	10 13·3	10 14·9	9 45·3	5·3	3·6	11·3	7·6	17·3	11·7
54	10 13·5	10 15·2	9 45·6	5·4	3·6	11·4	7·7	17·4	11·7
55	10 13·8	10 15·4	9 45·8	5·5	3·7	11·5	7·8	17·5	11·8
56	10 14·0	10 15·7	9 46·0	5·6	3·8	11·6	7·8	17·6	11·9
57	10 14·3	10 15·9	9 46·3	5·7	3·8	11·7	7·9	17·7	11·9
58	10 14·5	10 16·2	9 46·5	5·8	3·9	11·8	8·0	17·8	12·0
59	10 14·8	10 16·4	9 46·7	5·9	4·0	11·9	8·0	17·9	12·1
60	10 15·0	10 16·7	9 47·0	6·0	4·1	12·0	8·1	18·0	12·2

m 41	SUN PLANETS	ARIES	MOON	v or Corr^n d		v or Corr^n d		v or Corr^n d	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	10 15·0	10 16·7	9 47·0	0·0	0·0	6·0	4·2	12·0	8·3
01	10 15·3	10 16·9	9 47·2	0·1	0·1	6·1	4·2	12·1	8·4
02	10 15·5	10 17·2	9 47·5	0·2	0·1	6·2	4·3	12·2	8·4
03	10 15·8	10 17·4	9 47·7	0·3	0·2	6·3	4·4	12·3	8·5
04	10 16·0	10 17·7	9 47·9	0·4	0·3	6·4	4·4	12·4	8·6
05	10 16·3	10 17·9	9 48·2	0·5	0·3	6·5	4·5	12·5	8·6
06	10 16·5	10 18·2	9 48·4	0·6	0·4	6·6	4·6	12·6	8·7
07	10 16·8	10 18·4	9 48·7	0·7	0·5	6·7	4·6	12·7	8·8
08	10 17·0	10 18·7	9 48·9	0·8	0·6	6·8	4·7	12·8	8·9
09	10 17·3	10 18·9	9 49·1	0·9	0·6	6·9	4·8	12·9	8·9
10	10 17·5	10 19·2	9 49·4	1·0	0·7	7·0	4·8	13·0	9·0
11	10 17·8	10 19·4	9 49·6	1·1	0·8	7·1	4·9	13·1	9·1
12	10 18·0	10 19·7	9 49·8	1·2	0·8	7·2	5·0	13·2	9·1
13	10 18·3	10 19·9	9 50·1	1·3	0·9	7·3	5·0	13·3	9·2
14	10 18·5	10 20·2	9 50·3	1·4	1·0	7·4	5·1	13·4	9·3
15	10 18·8	10 20·4	9 50·6	1·5	1·0	7·5	5·2	13·5	9·3
16	10 19·0	10 20·7	9 50·8	1·6	1·1	7·6	5·3	13·6	9·4
17	10 19·3	10 20·9	9 51·0	1·7	1·2	7·7	5·3	13·7	9·5
18	10 19·5	10 21·2	9 51·3	1·8	1·2	7·8	5·4	13·8	9·5
19	10 19·8	10 21·4	9 51·5	1·9	1·3	7·9	5·5	13·9	9·6
20	10 20·0	10 21·7	9 51·8	2·0	1·4	8·0	5·5	14·0	9·7
21	10 20·3	10 21·9	9 52·0	2·1	1·5	8·1	5·6	14·1	9·8
22	10 20·5	10 22·2	9 52·2	2·2	1·5	8·2	5·7	14·2	9·8
23	10 20·8	10 22·4	9 52·5	2·3	1·6	8·3	5·7	14·3	9·9
24	10 21·0	10 22·7	9 52·7	2·4	1·7	8·4	5·8	14·4	10·0
25	10 21·3	10 23·0	9 52·9	2·5	1·7	8·5	5·9	14·5	10·0
26	10 21·5	10 23·2	9 53·2	2·6	1·8	8·6	5·9	14·6	10·1
27	10 21·8	10 23·5	9 53·4	2·7	1·9	8·7	6·0	14·7	10·2
28	10 22·0	10 23·7	9 53·7	2·8	1·9	8·8	6·1	14·8	10·2
29	10 22·3	10 24·0	9 53·9	2·9	2·0	8·9	6·2	14·9	10·3
30	10 22·5	10 24·2	9 54·1	3·0	2·1	9·0	6·2	15·0	10·4
31	10 22·8	10 24·5	9 54·4	3·1	2·1	9·1	6·3	15·1	10·4
32	10 23·0	10 24·7	9 54·6	3·2	2·2	9·2	6·4	15·2	10·5
33	10 23·3	10 25·0	9 54·9	3·3	2·3	9·3	6·4	15·3	10·6
34	10 23·5	10 25·2	9 55·1	3·4	2·4	9·4	6·5	15·4	10·7
35	10 23·8	10 25·5	9 55·3	3·5	2·4	9·5	6·6	15·5	10·7
36	10 24·0	10 25·7	9 55·6	3·6	2·5	9·6	6·6	15·6	10·8
37	10 24·3	10 26·0	9 55·8	3·7	2·6	9·7	6·7	15·7	10·9
38	10 24·5	10 26·2	9 56·1	3·8	2·6	9·8	6·8	15·8	10·9
39	10 24·8	10 26·5	9 56·3	3·9	2·7	9·9	6·8	15·9	11·0
40	10 25·0	10 26·7	9 56·5	4·0	2·8	10·0	6·9	16·0	11·1
41	10 25·3	10 27·0	9 56·8	4·1	2·8	10·1	7·0	16·1	11·1
42	10 25·5	10 27·2	9 57·0	4·2	2·9	10·2	7·1	16·2	11·2
43	10 25·8	10 27·5	9 57·2	4·3	3·0	10·3	7·1	16·3	11·3
44	10 26·0	10 27·7	9 57·5	4·4	3·0	10·4	7·2	16·4	11·3
45	10 26·3	10 28·0	9 57·7	4·5	3·1	10·5	7·3	16·5	11·4
46	10 26·5	10 28·2	9 58·0	4·6	3·2	10·6	7·3	16·6	11·5
47	10 26·8	10 28·5	9 58·2	4·7	3·3	10·7	7·4	16·7	11·6
48	10 27·0	10 28·7	9 58·4	4·8	3·3	10·8	7·5	16·8	11·6
49	10 27·3	10 29·0	9 58·7	4·9	3·4	10·9	7·5	16·9	11·7
50	10 27·5	10 29·2	9 58·9	5·0	3·5	11·0	7·6	17·0	11·8
51	10 27·8	10 29·5	9 59·2	5·1	3·5	11·1	7·7	17·1	11·8
52	10 28·0	10 29·7	9 59·4	5·2	3·6	11·2	7·7	17·2	11·9
53	10 28·3	10 30·0	9 59·6	5·3	3·7	11·3	7·8	17·3	12·0
54	10 28·5	10 30·2	9 59·9	5·4	3·7	11·4	7·9	17·4	12·0
55	10 28·8	10 30·5	10 00·1	5·5	3·8	11·5	8·0	17·5	12·1
56	10 29·0	10 30·7	10 00·3	5·6	3·9	11·6	8·0	17·6	12·2
57	10 29·3	10 31·0	10 00·6	5·7	3·9	11·7	8·1	17·7	12·2
58	10 29·5	10 31·2	10 00·8	5·8	4·0	11·8	8·2	17·8	12·3
59	10 29·8	10 31·5	10 01·1	5·9	4·1	11·9	8·2	17·9	12·4
60	10 30·0	10 31·7	10 01·3	6·0	4·2	12·0	8·3	18·0	12·5

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

42m	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	10 30·0	10 31·7	10 01·3	0·0 0·0	6·0 4·3	12·0 8·5
01	10 30·3	10 32·0	10 01·5	0·1 0·1	6·1 4·3	12·1 8·6
02	10 30·5	10 32·2	10 01·8	0·2 0·1	6·2 4·4	12·2 8·6
03	10 30·8	10 32·5	10 02·0	0·3 0·2	6·3 4·5	12·3 8·7
04	10 31·0	10 32·7	10 02·3	0·4 0·3	6·4 4·5	12·4 8·8
05	10 31·3	10 33·0	10 02·5	0·5 0·4	6·5 4·6	12·5 8·9
06	10 31·5	10 33·2	10 02·7	0·6 0·4	6·6 4·7	12·6 8·9
07	10 31·8	10 33·5	10 03·0	0·7 0·5	6·7 4·7	12·7 9·0
08	10 32·0	10 33·7	10 03·2	0·8 0·6	6·8 4·8	12·8 9·1
09	10 32·3	10 34·0	10 03·4	0·9 0·6	6·9 4·9	12·9 9·1
10	10 32·5	10 34·2	10 03·7	1·0 0·7	7·0 5·0	13·0 9·2
11	10 32·8	10 34·5	10 03·9	1·1 0·8	7·1 5·0	13·1 9·3
12	10 33·0	10 34·7	10 04·2	1·2 0·9	7·2 5·1	13·2 9·4
13	10 33·3	10 35·0	10 04·4	1·3 0·9	7·3 5·2	13·3 9·4
14	10 33·5	10 35·2	10 04·6	1·4 1·0	7·4 5·2	13·4 9·5
15	10 33·8	10 35·5	10 04·9	1·5 1·1	7·5 5·3	13·5 9·6
16	10 34·0	10 35·7	10 05·1	1·6 1·1	7·6 5·4	13·6 9·6
17	10 34·3	10 36·0	10 05·4	1·7 1·2	7·7 5·5	13·7 9·7
18	10 34·5	10 36·2	10 05·6	1·8 1·3	7·8 5·5	13·8 9·8
19	10 34·8	10 36·5	10 05·8	1·9 1·3	7·9 5·6	13·9 9·8
20	10 35·0	10 36·7	10 06·1	2·0 1·4	8·0 5·7	14·0 9·9
21	10 35·3	10 37·0	10 06·3	2·1 1·5	8·1 5·7	14·1 10·0
22	10 35·5	10 37·2	10 06·5	2·2 1·6	8·2 5·8	14·2 10·1
23	10 35·8	10 37·5	10 06·8	2·3 1·6	8·3 5·9	14·3 10·1
24	10 36·0	10 37·7	10 07·0	2·4 1·7	8·4 6·0	14·4 10·2
25	10 36·3	10 38·0	10 07·3	2·5 1·8	8·5 6·0	14·5 10·3
26	10 36·5	10 38·2	10 07·5	2·6 1·8	8·6 6·1	14·6 10·3
27	10 36·8	10 38·5	10 07·7	2·7 1·9	8·7 6·2	14·7 10·4
28	10 37·0	10 38·7	10 08·0	2·8 2·0	8·8 6·2	14·8 10·5
29	10 37·3	10 39·0	10 08·2	2·9 2·1	8·9 6·3	14·9 10·6
30	10 37·5	10 39·2	10 08·5	3·0 2·1	9·0 6·4	15·0 10·6
31	10 37·8	10 39·5	10 08·7	3·1 2·2	9·1 6·4	15·1 10·7
32	10 38·0	10 39·7	10 08·9	3·2 2·3	9·2 6·5	15·2 10·8
33	10 38·3	10 40·0	10 09·2	3·3 2·3	9·3 6·6	15·3 10·8
34	10 38·5	10 40·2	10 09·4	3·4 2·4	9·4 6·7	15·4 10·9
35	10 38·8	10 40·5	10 09·7	3·5 2·5	9·5 6·7	15·5 11·0
36	10 39·0	10 40·7	10 09·9	3·6 2·6	9·6 6·8	15·6 11·1
37	10 39·3	10 41·0	10 10·1	3·7 2·6	9·7 6·9	15·7 11·1
38	10 39·5	10 41·3	10 10·4	3·8 2·7	9·8 6·9	15·8 11·2
39	10 39·8	10 41·5	10 10·6	3·9 2·8	9·9 7·0	15·9 11·3
40	10 40·0	10 41·8	10 10·8	4·0 2·8	10·0 7·1	16·0 11·3
41	10 40·3	10 42·0	10 11·1	4·1 2·9	10·1 7·2	16·1 11·4
42	10 40·5	10 42·3	10 11·3	4·2 3·0	10·2 7·2	16·2 11·5
43	10 40·8	10 42·5	10 11·6	4·3 3·0	10·3 7·3	16·3 11·5
44	10 41·0	10 42·8	10 11·8	4·4 3·1	10·4 7·4	16·4 11·6
45	10 41·3	10 43·0	10 12·0	4·5 3·2	10·5 7·4	16·5 11·7
46	10 41·5	10 43·3	10 12·3	4·6 3·3	10·6 7·5	16·6 11·8
47	10 41·8	10 43·5	10 12·5	4·7 3·3	10·7 7·6	16·7 11·8
48	10 42·0	10 43·8	10 12·8	4·8 3·4	10·8 7·7	16·8 11·9
49	10 42·3	10 44·0	10 13·0	4·9 3·5	10·9 7·7	16·9 12·0
50	10 42·5	10 44·3	10 13·2	5·0 3·5	11·0 7·8	17·0 12·0
51	10 42·8	10 44·5	10 13·5	5·1 3·6	11·1 7·9	17·1 12·1
52	10 43·0	10 44·8	10 13·7	5·2 3·7	11·2 7·9	17·2 12·2
53	10 43·3	10 45·0	10 13·9	5·3 3·8	11·3 8·0	17·3 12·3
54	10 43·5	10 45·3	10 14·2	5·4 3·8	11·4 8·1	17·4 12·3
55	10 43·8	10 45·5	10 14·4	5·5 3·9	11·5 8·1	17·5 12·4
56	10 44·0	10 45·8	10 14·7	5·6 4·0	11·6 8·2	17·6 12·5
57	10 44·3	10 46·0	10 14·9	5·7 4·0	11·7 8·3	17·7 12·5
58	10 44·5	10 46·3	10 15·1	5·8 4·1	11·8 8·4	17·8 12·6
59	10 44·8	10 46·5	10 15·4	5·9 4·2	11·9 8·4	17·9 12·7
60	10 45·0	10 46·8	10 15·6	6·0 4·3	12·0 8·5	18·0 12·8

43m	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	10 45·0	10 46·8	10 15·6	0·0 0·0	6·0 4·4	12·0 8·7
01	10 45·3	10 47·0	10 15·9	0·1 0·1	6·1 4·4	12·1 8·8
02	10 45·5	10 47·3	10 16·1	0·2 0·1	6·2 4·5	12·2 8·8
03	10 45·8	10 47·5	10 16·3	0·3 0·2	6·3 4·6	12·3 8·9
04	10 46·0	10 47·8	10 16·6	0·4 0·3	6·4 4·6	12·4 9·0
05	10 46·3	10 48·0	10 16·8	0·5 0·4	6·5 4·7	12·5 9·1
06	10 46·5	10 48·3	10 17·0	0·6 0·4	6·6 4·8	12·6 9·1
07	10 46·8	10 48·5	10 17·3	0·7 0·5	6·7 4·9	12·7 9·2
08	10 47·0	10 48·8	10 17·5	0·8 0·6	6·8 4·9	12·8 9·3
09	10 47·3	10 49·0	10 17·8	0·9 0·7	6·9 5·0	12·9 9·4
10	10 47·5	10 49·3	10 18·0	1·0 0·7	7·0 5·1	13·0 9·4
11	10 47·8	10 49·5	10 18·2	1·1 0·8	7·1 5·1	13·1 9·5
12	10 48·0	10 49·8	10 18·5	1·2 0·9	7·2 5·2	13·2 9·6
13	10 48·3	10 50·0	10 18·7	1·3 0·9	7·3 5·3	13·3 9·6
14	10 48·5	10 50·3	10 19·0	1·4 1·0	7·4 5·4	13·4 9·7
15	10 48·8	10 50·5	10 19·2	1·5 1·1	7·5 5·4	13·5 9·8
16	10 49·0	10 50·8	10 19·4	1·6 1·2	7·6 5·5	13·6 9·9
17	10 49·3	10 51·0	10 19·7	1·7 1·2	7·7 5·6	13·7 9·9
18	10 49·5	10 51·3	10 19·9	1·8 1·3	7·8 5·7	13·8 10·0
19	10 49·8	10 51·5	10 20·2	1·9 1·4	7·9 5·7	13·9 10·1
20	10 50·0	10 51·8	10 20·4	2·0 1·5	8·0 5·8	14·0 10·2
21	10 50·3	10 52·0	10 20·6	2·1 1·5	8·1 5·9	14·1 10·2
22	10 50·5	10 52·3	10 20·9	2·2 1·6	8·2 5·9	14·2 10·3
23	10 50·8	10 52·5	10 21·1	2·3 1·7	8·3 6·0	14·3 10·4
24	10 51·0	10 52·8	10 21·3	2·4 1·7	8·4 6·1	14·4 10·4
25	10 51·3	10 53·0	10 21·6	2·5 1·8	8·5 6·2	14·5 10·5
26	10 51·5	10 53·3	10 21·8	2·6 1·9	8·6 6·2	14·6 10·6
27	10 51·8	10 53·5	10 22·1	2·7 2·0	8·7 6·3	14·7 10·7
28	10 52·0	10 53·8	10 22·3	2·8 2·0	8·8 6·4	14·8 10·7
29	10 52·3	10 54·0	10 22·5	2·9 2·1	8·9 6·5	14·9 10·8
30	10 52·5	10 54·3	10 22·8	3·0 2·2	9·0 6·5	15·0 10·9
31	10 52·8	10 54·5	10 23·0	3·1 2·2	9·1 6·6	15·1 10·9
32	10 53·0	10 54·8	10 23·3	3·2 2·3	9·2 6·7	15·2 11·0
33	10 53·3	10 55·0	10 23·5	3·3 2·4	9·3 6·7	15·3 11·1
34	10 53·5	10 55·3	10 23·7	3·4 2·5	9·4 6·8	15·4 11·2
35	10 53·8	10 55·5	10 24·0	3·5 2·5	9·5 6·9	15·5 11·2
36	10 54·0	10 55·8	10 24·2	3·6 2·6	9·6 7·0	15·6 11·3
37	10 54·3	10 56·0	10 24·4	3·7 2·7	9·7 7·0	15·7 11·4
38	10 54·5	10 56·3	10 24·7	3·8 2·8	9·8 7·1	15·8 11·5
39	10 54·8	10 56·5	10 24·9	3·9 2·8	9·9 7·2	15·9 11·5
40	10 55·0	10 56·8	10 25·2	4·0 2·9	10·0 7·3	16·0 11·6
41	10 55·3	10 57·0	10 25·4	4·1 3·0	10·1 7·3	16·1 11·7
42	10 55·5	10 57·3	10 25·6	4·2 3·0	10·2 7·4	16·2 11·7
43	10 55·8	10 57·5	10 25·9	4·3 3·1	10·3 7·5	16·3 11·8
44	10 56·0	10 57·8	10 26·1	4·4 3·2	10·4 7·5	16·4 11·9
45	10 56·3	10 58·0	10 26·4	4·5 3·3	10·5 7·6	16·5 12·0
46	10 56·5	10 58·3	10 26·6	4·6 3·3	10·6 7·7	16·6 12·0
47	10 56·8	10 58·5	10 26·8	4·7 3·4	10·7 7·8	16·7 12·1
48	10 57·0	10 58·8	10 27·1	4·8 3·5	10·8 7·8	16·8 12·2
49	10 57·3	10 59·0	10 27·3	4·9 3·6	10·9 7·9	16·9 12·3
50	10 57·5	10 59·3	10 27·5	5·0 3·6	11·0 8·0	17·0 12·3
51	10 57·8	10 59·6	10 27·8	5·1 3·7	11·1 8·0	17·1 12·4
52	10 58·0	10 59·8	10 28·0	5·2 3·8	11·2 8·1	17·2 12·5
53	10 58·3	11 00·1	10 28·3	5·3 3·8	11·3 8·2	17·3 12·5
54	10 58·5	11 00·3	10 28·5	5·4 3·9	11·4 8·3	17·4 12·6
55	10 58·8	11 00·6	10 28·7	5·5 4·0	11·5 8·3	17·5 12·7
56	10 59·0	11 00·8	10 29·0	5·6 4·1	11·6 8·4	17·6 12·8
57	10 59·3	11 01·1	10 29·2	5·7 4·1	11·7 8·5	17·7 12·8
58	10 59·5	11 01·3	10 29·5	5·8 4·2	11·8 8·6	17·8 12·9
59	10 59·8	11 01·6	10 29·7	5·9 4·3	11·9 8·6	17·9 13·0
60	11 00·0	11 01·8	10 29·9	6·0 4·4	12·0 8·7	18·0 13·1

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

44m	SUN PLANETS	ARIES	MOON	v or d	Corr^n	v or d	Corr^n	v or d	Corr^n
s	° ′	° ′	° ′	′	′	′	′	′	′
00	11 00·0	11 01·8	10 29·9	0·0	0·0	6·0	4·5	12·0	8·9
01	11 00·3	11 02·1	10 30·2	0·1	0·1	6·1	4·5	12·1	9·0
02	11 00·5	11 02·3	10 30·4	0·2	0·1	6·2	4·6	12·2	9·0
03	11 00·8	11 02·6	10 30·6	0·3	0·2	6·3	4·7	12·3	9·1
04	11 01·0	11 02·8	10 30·9	0·4	0·3	6·4	4·7	12·4	9·2
05	11 01·3	11 03·1	10 31·1	0·5	0·4	6·5	4·8	12·5	9·3
06	11 01·5	11 03·3	10 31·4	0·6	0·4	6·6	4·9	12·6	9·3
07	11 01·8	11 03·6	10 31·6	0·7	0·5	6·7	5·0	12·7	9·4
08	11 02·0	11 03·8	10 31·8	0·8	0·6	6·8	5·0	12·8	9·5
09	11 02·3	11 04·1	10 32·1	0·9	0·7	6·9	5·1	12·9	9·6
10	11 02·5	11 04·3	10 32·3	1·0	0·7	7·0	5·2	13·0	9·6
11	11 02·8	11 04·6	10 32·6	1·1	0·8	7·1	5·3	13·1	9·7
12	11 03·0	11 04·8	10 32·8	1·2	0·9	7·2	5·3	13·2	9·8
13	11 03·3	11 05·1	10 33·0	1·3	1·0	7·3	5·4	13·3	9·9
14	11 03·5	11 05·3	10 33·3	1·4	1·0	7·4	5·5	13·4	9·9
15	11 03·8	11 05·6	10 33·5	1·5	1·1	7·5	5·6	13·5	10·0
16	11 04·0	11 05·8	10 33·8	1·6	1·2	7·6	5·6	13·6	10·1
17	11 04·3	11 06·1	10 34·0	1·7	1·3	7·7	5·7	13·7	10·2
18	11 04·5	11 06·3	10 34·2	1·8	1·3	7·8	5·8	13·8	10·2
19	11 04·8	11 06·6	10 34·5	1·9	1·4	7·9	5·9	13·9	10·3
20	11 05·0	11 06·8	10 34·7	2·0	1·5	8·0	5·9	14·0	10·4
21	11 05·3	11 07·1	10 34·9	2·1	1·6	8·1	6·0	14·1	10·5
22	11 05·5	11 07·3	10 35·2	2·2	1·6	8·2	6·1	14·2	10·5
23	11 05·8	11 07·6	10 35·4	2·3	1·7	8·3	6·2	14·3	10·6
24	11 06·0	11 07·8	10 35·7	2·4	1·8	8·4	6·2	14·4	10·7
25	11 06·3	11 08·1	10 35·9	2·5	1·9	8·5	6·3	14·5	10·8
26	11 06·5	11 08·3	10 36·1	2·6	1·9	8·6	6·4	14·6	10·8
27	11 06·8	11 08·6	10 36·4	2·7	2·0	8·7	6·5	14·7	10·9
28	11 07·0	11 08·8	10 36·6	2·8	2·1	8·8	6·5	14·8	11·0
29	11 07·3	11 09·1	10 36·9	2·9	2·2	8·9	6·6	14·9	11·1
30	11 07·5	11 09·3	10 37·1	3·0	2·2	9·0	6·7	15·0	11·1
31	11 07·8	11 09·6	10 37·3	3·1	2·3	9·1	6·7	15·1	11·2
32	11 08·0	11 09·8	10 37·6	3·2	2·4	9·2	6·8	15·2	11·3
33	11 08·3	11 10·1	10 37·8	3·3	2·4	9·3	6·9	15·3	11·3
34	11 08·5	11 10·3	10 38·0	3·4	2·5	9·4	7·0	15·4	11·4
35	11 08·8	11 10·6	10 38·3	3·5	2·6	9·5	7·0	15·5	11·5
36	11 09·0	11 10·8	10 38·5	3·6	2·7	9·6	7·1	15·6	11·6
37	11 09·3	11 11·1	10 38·8	3·7	2·7	9·7	7·2	15·7	11·6
38	11 09·5	11 11·3	10 39·0	3·8	2·8	9·8	7·3	15·8	11·7
39	11 09·8	11 11·6	10 39·2	3·9	2·9	9·9	7·3	15·9	11·8
40	11 10·0	11 11·8	10 39·5	4·0	3·0	10·0	7·4	16·0	11·9
41	11 10·3	11 12·1	10 39·7	4·1	3·0	10·1	7·5	16·1	11·9
42	11 10·5	11 12·3	10 40·0	4·2	3·1	10·2	7·6	16·2	12·0
43	11 10·8	11 12·6	10 40·2	4·3	3·2	10·3	7·6	16·3	12·1
44	11 11·0	11 12·8	10 40·4	4·4	3·3	10·4	7·7	16·4	12·2
45	11 11·3	11 13·1	10 40·7	4·5	3·3	10·5	7·8	16·5	12·2
46	11 11·5	11 13·3	10 40·9	4·6	3·4	10·6	7·9	16·6	12·3
47	11 11·8	11 13·6	10 41·1	4·7	3·5	10·7	7·9	16·7	12·4
48	11 12·0	11 13·8	10 41·4	4·8	3·6	10·8	8·0	16·8	12·5
49	11 12·3	11 14·1	10 41·6	4·9	3·6	10·9	8·1	16·9	12·5
50	11 12·5	11 14·3	10 41·9	5·0	3·7	11·0	8·2	17·0	12·6
51	11 12·8	11 14·6	10 42·1	5·1	3·8	11·1	8·2	17·1	12·7
52	11 13·0	11 14·8	10 42·3	5·2	3·9	11·2	8·3	17·2	12·8
53	11 13·3	11 15·1	10 42·6	5·3	3·9	11·3	8·4	17·3	12·8
54	11 13·5	11 15·3	10 42·8	5·4	4·0	11·4	8·5	17·4	12·9
55	11 13·8	11 15·6	10 43·1	5·5	4·1	11·5	8·5	17·5	13·0
56	11 14·0	11 15·8	10 43·3	5·6	4·2	11·6	8·6	17·6	13·1
57	11 14·3	11 16·1	10 43·5	5·7	4·2	11·7	8·7	17·7	13·1
58	11 14·5	11 16·3	10 43·8	5·8	4·3	11·8	8·8	17·8	13·2
59	11 14·8	11 16·6	10 44·0	5·9	4·4	11·9	8·8	17·9	13·3
60	11 15·0	11 16·8	10 44·3	6·0	4·5	12·0	8·9	18·0	13·4

45m	SUN PLANETS	ARIES	MOON	v or d	Corr^n	v or d	Corr^n	v or d	Corr^n
s	° ′	° ′	° ′	′	′	′	′	′	′
00	11 15·0	11 16·8	10 44·3	0·0	0·0	6·0	4·6	12·0	9·1
01	11 15·3	11 17·1	10 44·5	0·1	0·1	6·1	4·6	12·1	9·2
02	11 15·5	11 17·3	10 44·7	0·2	0·2	6·2	4·7	12·2	9·3
03	11 15·8	11 17·6	10 45·0	0·3	0·2	6·3	4·8	12·3	9·3
04	11 16·0	11 17·9	10 45·2	0·4	0·3	6·4	4·9	12·4	9·4
05	11 16·3	11 18·1	10 45·4	0·5	0·4	6·5	4·9	12·5	9·5
06	11 16·5	11 18·4	10 45·7	0·6	0·5	6·6	5·0	12·6	9·6
07	11 16·8	11 18·6	10 45·9	0·7	0·5	6·7	5·1	12·7	9·6
08	11 17·0	11 18·9	10 46·2	0·8	0·6	6·8	5·2	12·8	9·7
09	11 17·3	11 19·1	10 46·4	0·9	0·7	6·9	5·2	12·9	9·8
10	11 17·5	11 19·4	10 46·6	1·0	0·8	7·0	5·3	13·0	9·9
11	11 17·8	11 19·6	10 46·9	1·1	0·8	7·1	5·4	13·1	9·9
12	11 18·0	11 19·9	10 47·1	1·2	0·9	7·2	5·5	13·2	10·0
13	11 18·3	11 20·1	10 47·4	1·3	1·0	7·3	5·5	13·3	10·1
14	11 18·5	11 20·4	10 47·6	1·4	1·1	7·4	5·6	13·4	10·2
15	11 18·8	11 20·6	10 47·8	1·5	1·1	7·5	5·7	13·5	10·2
16	11 19·0	11 20·9	10 48·1	1·6	1·2	7·6	5·8	13·6	10·3
17	11 19·3	11 21·1	10 48·3	1·7	1·3	7·7	5·8	13·7	10·4
18	11 19·5	11 21·4	10 48·5	1·8	1·4	7·8	5·9	13·8	10·5
19	11 19·8	11 21·6	10 48·8	1·9	1·4	7·9	6·0	13·9	10·5
20	11 20·0	11 21·9	10 49·0	2·0	1·5	8·0	6·1	14·0	10·6
21	11 20·3	11 22·1	10 49·3	2·1	1·6	8·1	6·1	14·1	10·7
22	11 20·5	11 22·4	10 49·5	2·2	1·7	8·2	6·2	14·2	10·8
23	11 20·8	11 22·6	10 49·7	2·3	1·7	8·3	6·3	14·3	10·8
24	11 21·0	11 22·9	10 50·0	2·4	1·8	8·4	6·4	14·4	10·9
25	11 21·3	11 23·1	10 50·2	2·5	1·9	8·5	6·4	14·5	11·0
26	11 21·5	11 23·4	10 50·5	2·6	2·0	8·6	6·5	14·6	11·1
27	11 21·8	11 23·6	10 50·7	2·7	2·0	8·7	6·6	14·7	11·1
28	11 22·0	11 23·9	10 50·9	2·8	2·1	8·8	6·7	14·8	11·2
29	11 22·3	11 24·1	10 51·2	2·9	2·2	8·9	6·7	14·9	11·3
30	11 22·5	11 24·4	10 51·4	3·0	2·3	9·0	6·8	15·0	11·4
31	11 22·8	11 24·6	10 51·6	3·1	2·4	9·1	6·9	15·1	11·5
32	11 23·0	11 24·9	10 51·9	3·2	2·4	9·2	7·0	15·2	11·5
33	11 23·3	11 25·1	10 52·1	3·3	2·5	9·3	7·1	15·3	11·6
34	11 23·5	11 25·4	10 52·4	3·4	2·6	9·4	7·1	15·4	11·7
35	11 23·8	11 25·6	10 52·6	3·5	2·7	9·5	7·2	15·5	11·8
36	11 24·0	11 25·9	10 52·8	3·6	2·7	9·6	7·3	15·6	11·8
37	11 24·3	11 26·1	10 53·1	3·7	2·8	9·7	7·4	15·7	11·9
38	11 24·5	11 26·4	10 53·3	3·8	2·9	9·8	7·4	15·8	12·0
39	11 24·8	11 26·6	10 53·6	3·9	3·0	9·9	7·5	15·9	12·1
40	11 25·0	11 26·9	10 53·8	4·0	3·0	10·0	7·6	16·0	12·1
41	11 25·3	11 27·1	10 54·0	4·1	3·1	10·1	7·7	16·1	12·2
42	11 25·5	11 27·4	10 54·3	4·2	3·2	10·2	7·7	16·2	12·3
43	11 25·8	11 27·6	10 54·5	4·3	3·3	10·3	7·8	16·3	12·4
44	11 26·0	11 27·9	10 54·7	4·4	3·3	10·4	7·9	16·4	12·4
45	11 26·3	11 28·1	10 55·0	4·5	3·4	10·5	8·0	16·5	12·5
46	11 26·5	11 28·4	10 55·2	4·6	3·5	10·6	8·0	16·6	12·6
47	11 26·8	11 28·6	10 55·5	4·7	3·6	10·7	8·1	16·7	12·7
48	11 27·0	11 28·9	10 55·7	4·8	3·6	10·8	8·2	16·8	12·7
49	11 27·3	11 29·1	10 55·9	4·9	3·7	10·9	8·3	16·9	12·8
50	11 27·5	11 29·4	10 56·2	5·0	3·8	11·0	8·3	17·0	12·9
51	11 27·8	11 29·6	10 56·4	5·1	3·9	11·1	8·4	17·1	13·0
52	11 28·0	11 29·9	10 56·7	5·2	3·9	11·2	8·5	17·2	13·0
53	11 28·3	11 30·1	10 56·9	5·3	4·0	11·3	8·6	17·3	13·1
54	11 28·5	11 30·4	10 57·1	5·4	4·1	11·4	8·6	17·4	13·2
55	11 28·8	11 30·6	10 57·4	5·5	4·2	11·5	8·7	17·5	13·3
56	11 29·0	11 30·9	10 57·6	5·6	4·2	11·6	8·8	17·6	13·3
57	11 29·3	11 31·1	10 57·9	5·7	4·3	11·7	8·9	17·7	13·4
58	11 29·5	11 31·4	10 58·1	5·8	4·4	11·8	8·9	17·8	13·5
59	11 29·8	11 31·6	10 58·3	5·9	4·5	11·9	9·0	17·9	13·6
60	11 30·0	11 31·9	10 58·6	6·0	4·6	12·0	9·1	18·0	13·7

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

46m	SUN PLANETS	ARIES	MOON	v or Corr n d	v or Corr n d	v or Corr n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	11 30·0	11 31·9	10 58·6	0·0 0·0	6·0 4·7	12·0 9·3
01	11 30·3	11 32·1	10 58·8	0·1 0·1	6·1 4·7	12·1 9·4
02	11 30·5	11 32·4	10 59·0	0·2 0·2	6·2 4·8	12·2 9·5
03	11 30·8	11 32·6	10 59·3	0·3 0·2	6·3 4·9	12·3 9·5
04	11 31·0	11 32·9	10 59·5	0·4 0·3	6·4 5·0	12·4 9·6
05	11 31·3	11 33·1	10 59·8	0·5 0·4	6·5 5·0	12·5 9·7
06	11 31·5	11 33·4	11 00·0	0·6 0·5	6·6 5·1	12·6 9·8
07	11 31·8	11 33·6	11 00·2	0·7 0·5	6·7 5·2	12·7 9·8
08	11 32·0	11 33·9	11 00·5	0·8 0·6	6·8 5·3	12·8 9·9
09	11 32·3	11 34·1	11 00·7	0·9 0·7	6·9 5·3	12·9 10·0
10	11 32·5	11 34·4	11 01·0	1·0 0·8	7·0 5·4	13·0 10·1
11	11 32·8	11 34·6	11 01·2	1·1 0·9	7·1 5·5	13·1 10·2
12	11 33·0	11 34·9	11 01·4	1·2 0·9	7·2 5·6	13·2 10·2
13	11 33·3	11 35·1	11 01·7	1·3 1·0	7·3 5·7	13·3 10·3
14	11 33·5	11 35·4	11 01·9	1·4 1·1	7·4 5·7	13·4 10·4
15	11 33·8	11 35·6	11 02·1	1·5 1·2	7·5 5·8	13·5 10·5
16	11 34·0	11 35·9	11 02·4	1·6 1·2	7·6 5·9	13·6 10·5
17	11 34·3	11 36·2	11 02·6	1·7 1·3	7·7 6·0	13·7 10·6
18	11 34·5	11 36·4	11 02·9	1·8 1·4	7·8 6·0	13·8 10·7
19	11 34·8	11 36·7	11 03·1	1·9 1·5	7·9 6·1	13·9 10·8
20	11 35·0	11 36·9	11 03·3	2·0 1·6	8·0 6·2	14·0 10·9
21	11 35·3	11 37·2	11 03·6	2·1 1·6	8·1 6·3	14·1 10·9
22	11 35·5	11 37·4	11 03·8	2·2 1·7	8·2 6·4	14·2 11·0
23	11 35·8	11 37·7	11 04·1	2·3 1·8	8·3 6·4	14·3 11·1
24	11 36·0	11 37·9	11 04·3	2·4 1·9	8·4 6·5	14·4 11·2
25	11 36·3	11 38·2	11 04·5	2·5 1·9	8·5 6·6	14·5 11·2
26	11 36·5	11 38·4	11 04·8	2·6 2·0	8·6 6·7	14·6 11·3
27	11 36·8	11 38·7	11 05·0	2·7 2·1	8·7 6·7	14·7 11·4
28	11 37·0	11 38·9	11 05·2	2·8 2·2	8·8 6·8	14·8 11·5
29	11 37·3	11 39·2	11 05·5	2·9 2·2	8·9 6·9	14·9 11·5
30	11 37·5	11 39·4	11 05·7	3·0 2·3	9·0 7·0	15·0 11·6
31	11 37·8	11 39·7	11 06·0	3·1 2·4	9·1 7·1	15·1 11·7
32	11 38·0	11 39·9	11 06·2	3·2 2·5	9·2 7·1	15·2 11·8
33	11 38·3	11 40·2	11 06·4	3·3 2·6	9·3 7·2	15·3 11·9
34	11 38·5	11 40·4	11 06·7	3·4 2·6	9·4 7·3	15·4 11·9
35	11 38·8	11 40·7	11 06·9	3·5 2·7	9·5 7·4	15·5 12·0
36	11 39·0	11 40·9	11 07·2	3·6 2·8	9·6 7·4	15·6 12·1
37	11 39·3	11 41·2	11 07·4	3·7 2·9	9·7 7·5	15·7 12·2
38	11 39·5	11 41·4	11 07·6	3·8 2·9	9·8 7·6	15·8 12·2
39	11 39·8	11 41·7	11 07·9	3·9 3·0	9·9 7·7	15·9 12·3
40	11 40·0	11 41·9	11 08·1	4·0 3·1	10·0 7·8	16·0 12·4
41	11 40·3	11 42·2	11 08·3	4·1 3·2	10·1 7·8	16·1 12·5
42	11 40·5	11 42·4	11 08·6	4·2 3·3	10·2 7·9	16·2 12·6
43	11 40·8	11 42·7	11 08·8	4·3 3·3	10·3 8·0	16·3 12·6
44	11 41·0	11 42·9	11 09·1	4·4 3·4	10·4 8·1	16·4 12·7
45	11 41·3	11 43·2	11 09·3	4·5 3·5	10·5 8·1	16·5 12·8
46	11 41·5	11 43·4	11 09·5	4·6 3·6	10·6 8·2	16·6 12·9
47	11 41·8	11 43·7	11 09·8	4·7 3·6	10·7 8·3	16·7 12·9
48	11 42·0	11 43·9	11 10·0	4·8 3·7	10·8 8·4	16·8 13·0
49	11 42·3	11 44·2	11 10·3	4·9 3·8	10·9 8·4	16·9 13·1
50	11 42·5	11 44·4	11 10·5	5·0 3·9	11·0 8·5	17·0 13·2
51	11 42·8	11 44·7	11 10·7	5·1 4·0	11·1 8·6	17·1 13·3
52	11 43·0	11 44·9	11 11·0	5·2 4·0	11·2 8·7	17·2 13·3
53	11 43·3	11 45·2	11 11·2	5·3 4·1	11·3 8·8	17·3 13·4
54	11 43·5	11 45·4	11 11·5	5·4 4·2	11·4 8·8	17·4 13·5
55	11 43·8	11 45·7	11 11·7	5·5 4·3	11·5 8·9	17·5 13·6
56	11 44·0	11 45·9	11 11·9	5·6 4·3	11·6 9·0	17·6 13·6
57	11 44·3	11 46·2	11 12·2	5·7 4·4	11·7 9·1	17·7 13·7
58	11 44·5	11 46·4	11 12·4	5·8 4·5	11·8 9·1	17·8 13·8
59	11 44·8	11 46·7	11 12·6	5·9 4·6	11·9 9·2	17·9 13·9
60	11 45·0	11 46·9	11 12·9	6·0 4·7	12·0 9·3	18·0 14·0

47	SUN PLANETS	ARIES	MOON	v or Corr n d	v or Corr n d	v or Corr n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	11 45·0	11 46·9	11 12·9	0·0 0·0	6·0 4·8	12·0 9·5
01	11 45·3	11 47·2	11 13·1	0·1 0·1	6·1 4·8	12·1 9·6
02	11 45·5	11 47·4	11 13·4	0·2 0·2	6·2 4·9	12·2 9·7
03	11 45·8	11 47·7	11 13·6	0·3 0·2	6·3 5·0	12·3 9·7
04	11 46·0	11 47·9	11 13·8	0·4 0·3	6·4 5·1	12·4 9·8
05	11 46·3	11 48·2	11 14·1	0·5 0·4	6·5 5·1	12·5 9·9
06	11 46·5	11 48·4	11 14·3	0·6 0·5	6·6 5·2	12·6 10·0
07	11 46·8	11 48·7	11 14·6	0·7 0·6	6·7 5·3	12·7 10·1
08	11 47·0	11 48·9	11 14·8	0·8 0·6	6·8 5·4	12·8 10·1
09	11 47·3	11 49·2	11 15·0	0·9 0·7	6·9 5·5	12·9 10·2
10	11 47·5	11 49·4	11 15·3	1·0 0·8	7·0 5·5	13·0 10·3
11	11 47·8	11 49·7	11 15·5	1·1 0·9	7·1 5·6	13·1 10·4
12	11 48·0	11 49·9	11 15·7	1·2 1·0	7·2 5·7	13·2 10·5
13	11 48·3	11 50·2	11 16·0	1·3 1·0	7·3 5·8	13·3 10·5
14	11 48·5	11 50·4	11 16·2	1·4 1·1	7·4 5·9	13·4 10·6
15	11 48·8	11 50·7	11 16·5	1·5 1·2	7·5 5·9	13·5 10·7
16	11 49·0	11 50·9	11 16·7	1·6 1·3	7·6 6·0	13·6 10·8
17	11 49·3	11 51·2	11 16·9	1·7 1·3	7·7 6·1	13·7 10·8
18	11 49·5	11 51·4	11 17·2	1·8 1·4	7·8 6·2	13·8 10·9
19	11 49·8	11 51·7	11 17·4	1·9 1·5	7·9 6·3	13·9 11·0
20	11 50·0	11 51·9	11 17·7	2·0 1·6	8·0 6·3	14·0 11·1
21	11 50·3	11 52·2	11 17·9	2·1 1·7	8·1 6·4	14·1 11·2
22	11 50·5	11 52·4	11 18·1	2·2 1·7	8·2 6·5	14·2 11·2
23	11 50·8	11 52·7	11 18·4	2·3 1·8	8·3 6·6	14·3 11·3
24	11 51·0	11 52·9	11 18·6	2·4 1·9	8·4 6·7	14·4 11·4
25	11 51·3	11 53·2	11 18·8	2·5 2·0	8·5 6·7	14·5 11·5
26	11 51·5	11 53·4	11 19·1	2·6 2·1	8·6 6·8	14·6 11·6
27	11 51·8	11 53·7	11 19·3	2·7 2·1	8·7 6·9	14·7 11·6
28	11 52·0	11 53·9	11 19·6	2·8 2·2	8·8 7·0	14·8 11·7
29	11 52·3	11 54·2	11 19·8	2·9 2·3	8·9 7·0	14·9 11·8
30	11 52·5	11 54·5	11 20·0	3·0 2·4	9·0 7·1	15·0 11·9
31	11 52·8	11 54·7	11 20·3	3·1 2·5	9·1 7·2	15·1 12·0
32	11 53·0	11 55·0	11 20·5	3·2 2·5	9·2 7·3	15·2 12·0
33	11 53·3	11 55·2	11 20·8	3·3 2·6	9·3 7·4	15·3 12·1
34	11 53·5	11 55·5	11 21·0	3·4 2·7	9·4 7·4	15·4 12·2
35	11 53·8	11 55·7	11 21·2	3·5 2·8	9·5 7·5	15·5 12·3
36	11 54·0	11 56·0	11 21·5	3·6 2·9	9·6 7·6	15·6 12·4
37	11 54·3	11 56·2	11 21·7	3·7 2·9	9·7 7·7	15·7 12·4
38	11 54·5	11 56·5	11 22·0	3·8 3·0	9·8 7·8	15·8 12·5
39	11 54·8	11 56·7	11 22·2	3·9 3·1	9·9 7·8	15·9 12·6
40	11 55·0	11 57·0	11 22·4	4·0 3·2	10·0 7·9	16·0 12·7
41	11 55·3	11 57·2	11 22·7	4·1 3·2	10·1 8·0	16·1 12·7
42	11 55·5	11 57·5	11 22·9	4·2 3·3	10·2 8·1	16·2 12·8
43	11 55·8	11 57·7	11 23·1	4·3 3·4	10·3 8·2	16·3 12·9
44	11 56·0	11 58·0	11 23·4	4·4 3·5	10·4 8·2	16·4 13·0
45	11 56·3	11 58·2	11 23·6	4·5 3·6	10·5 8·3	16·5 13·1
46	11 56·5	11 58·5	11 23·9	4·6 3·6	10·6 8·4	16·6 13·1
47	11 56·8	11 58·7	11 24·1	4·7 3·7	10·7 8·5	16·7 13·2
48	11 57·0	11 59·0	11 24·3	4·8 3·8	10·8 8·6	16·8 13·3
49	11 57·3	11 59·2	11 24·6	4·9 3·9	10·9 8·6	16·9 13·4
50	11 57·5	11 59·5	11 24·8	5·0 4·0	11·0 8·7	17·0 13·5
51	11 57·8	11 59·7	11 25·1	5·1 4·0	11·1 8·8	17·1 13·5
52	11 58·0	12 00·0	11 25·3	5·2 4·1	11·2 8·9	17·2 13·6
53	11 58·3	12 00·2	11 25·5	5·3 4·2	11·3 8·9	17·3 13·7
54	11 58·5	12 00·5	11 25·8	5·4 4·3	11·4 9·0	17·4 13·8
55	11 58·8	12 00·7	11 26·0	5·5 4·4	11·5 9·1	17·5 13·9
56	11 59·0	12 01·0	11 26·2	5·6 4·4	11·6 9·2	17·6 13·9
57	11 59·3	12 01·2	11 26·5	5·7 4·5	11·7 9·3	17·7 14·0
58	11 59·5	12 01·5	11 26·7	5·8 4·6	11·8 9·3	17·8 14·1
59	11 59·8	12 01·7	11 27·0	5·9 4·7	11·9 9·4	17·9 14·2
60	12 00·0	12 02·0	11 27·2	6·0 4·8	12·0 9·5	18·0 14·3

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

m 48	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	12 00·0	12 02·0	11 27·2	0·0 0·0	6·0 4·9	12·0 9·7
01	12 00·3	12 02·2	11 27·4	0·1 0·1	6·1 4·9	12·1 9·8
02	12 00·5	12 02·5	11 27·7	0·2 0·2	6·2 5·0	12·2 9·9
03	12 00·8	12 02·7	11 27·9	0·3 0·2	6·3 5·1	12·3 9·9
04	12 01·0	12 03·0	11 28·2	0·4 0·3	6·4 5·2	12·4 10·0
05	12 01·3	12 03·2	11 28·4	0·5 0·4	6·5 5·3	12·5 10·1
06	12 01·5	12 03·5	11 28·6	0·6 0·5	6·6 5·3	12·6 10·2
07	12 01·8	12 03·7	11 28·9	0·7 0·6	6·7 5·4	12·7 10·3
08	12 02·0	12 04·0	11 29·1	0·8 0·6	6·8 5·5	12·8 10·3
09	12 02·3	12 04·2	11 29·3	0·9 0·7	6·9 5·6	12·9 10·4
10	12 02·5	12 04·5	11 29·6	1·0 0·8	7·0 5·7	13·0 10·5
11	12 02·8	12 04·7	11 29·8	1·1 0·9	7·1 5·7	13·1 10·6
12	12 03·0	12 05·0	11 30·1	1·2 1·0	7·2 5·8	13·2 10·7
13	12 03·3	12 05·2	11 30·3	1·3 1·1	7·3 5·9	13·3 10·8
14	12 03·5	12 05·5	11 30·5	1·4 1·1	7·4 6·0	13·4 10·8
15	12 03·8	12 05·7	11 30·8	1·5 1·2	7·5 6·1	13·5 10·9
16	12 04·0	12 06·0	11 31·0	1·6 1·3	7·6 6·1	13·6 11·0
17	12 04·3	12 06·2	11 31·3	1·7 1·4	7·7 6·2	13·7 11·1
18	12 04·5	12 06·5	11 31·5	1·8 1·5	7·8 6·3	13·8 11·2
19	12 04·8	12 06·7	11 31·7	1·9 1·5	7·9 6·4	13·9 11·2
20	12 05·0	12 07·0	11 32·0	2·0 1·6	8·0 6·5	14·0 11·3
21	12 05·3	12 07·2	11 32·2	2·1 1·7	8·1 6·5	14·1 11·4
22	12 05·5	12 07·5	11 32·4	2·2 1·8	8·2 6·6	14·2 11·5
23	12 05·8	12 07·7	11 32·7	2·3 1·9	8·3 6·7	14·3 11·6
24	12 06·0	12 08·0	11 32·9	2·4 1·9	8·4 6·8	14·4 11·6
25	12 06·3	12 08·2	11 33·2	2·5 2·0	8·5 6·9	14·5 11·7
26	12 06·5	12 08·5	11 33·4	2·6 2·1	8·6 7·0	14·6 11·8
27	12 06·8	12 08·7	11 33·6	2·7 2·2	8·7 7·0	14·7 11·9
28	12 07·0	12 09·0	11 33·9	2·8 2·3	8·8 7·1	14·8 12·0
29	12 07·3	12 09·2	11 34·1	2·9 2·3	8·9 7·2	14·9 12·0
30	12 07·5	12 09·5	11 34·4	3·0 2·4	9·0 7·3	15·0 12·1
31	12 07·8	12 09·7	11 34·6	3·1 2·5	9·1 7·4	15·1 12·2
32	12 08·0	12 10·0	11 34·8	3·2 2·6	9·2 7·4	15·2 12·3
33	12 08·3	12 10·2	11 35·1	3·3 2·7	9·3 7·5	15·3 12·4
34	12 08·5	12 10·5	11 35·3	3·4 2·7	9·4 7·6	15·4 12·4
35	12 08·8	12 10·7	11 35·6	3·5 2·8	9·5 7·7	15·5 12·5
36	12 09·0	12 11·0	11 35·8	3·6 2·9	9·6 7·8	15·6 12·6
37	12 09·3	12 11·2	11 36·0	3·7 3·0	9·7 7·8	15·7 12·7
38	12 09·5	12 11·5	11 36·3	3·8 3·1	9·8 7·9	15·8 12·8
39	12 09·8	12 11·7	11 36·5	3·9 3·2	9·9 8·0	15·9 12·9
40	12 10·0	12 12·0	11 36·7	4·0 3·2	10·0 8·1	16·0 12·9
41	12 10·3	12 12·2	11 37·0	4·1 3·3	10·1 8·2	16·1 13·0
42	12 10·5	12 12·5	11 37·2	4·2 3·4	10·2 8·2	16·2 13·1
43	12 10·8	12 12·8	11 37·5	4·3 3·5	10·3 8·3	16·3 13·2
44	12 11·0	12 13·0	11 37·7	4·4 3·6	10·4 8·4	16·4 13·3
45	12 11·3	12 13·3	11 37·9	4·5 3·6	10·5 8·5	16·5 13·3
46	12 11·5	12 13·5	11 38·2	4·6 3·7	10·6 8·6	16·6 13·4
47	12 11·8	12 13·8	11 38·4	4·7 3·8	10·7 8·6	16·7 13·5
48	12 12·0	12 14·0	11 38·7	4·8 3·9	10·8 8·7	16·8 13·6
49	12 12·3	12 14·3	11 38·9	4·9 4·0	10·9 8·8	16·9 13·7
50	12 12·5	12 14·5	11 39·1	5·0 4·0	11·0 8·9	17·0 13·7
51	12 12·8	12 14·8	11 39·4	5·1 4·1	11·1 9·0	17·1 13·8
52	12 13·0	12 15·0	11 39·6	5·2 4·2	11·2 9·1	17·2 13·9
53	12 13·3	12 15·3	11 39·8	5·3 4·3	11·3 9·1	17·3 14·0
54	12 13·5	12 15·5	11 40·1	5·4 4·4	11·4 9·2	17·4 14·1
55	12 13·8	12 15·8	11 40·3	5·5 4·4	11·5 9·3	17·5 14·1
56	12 14·0	12 16·0	11 40·6	5·6 4·5	11·6 9·4	17·6 14·2
57	12 14·3	12 16·3	11 40·8	5·7 4·6	11·7 9·5	17·7 14·3
58	12 14·5	12 16·5	11 41·0	5·8 4·7	11·8 9·5	17·8 14·4
59	12 14·8	12 16·8	11 41·3	5·9 4·8	11·9 9·6	17·9 14·5
60	12 15·0	12 17·0	11 41·5	6·0 4·9	12·0 9·7	18·0 14·6

m 49	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	12 15·0	12 17·0	11 41·5	0·0 0·0	6·0 5·0	12·0 9·9
01	12 15·3	12 17·3	11 41·8	0·1 0·1	6·1 5·0	12·1 10·0
02	12 15·5	12 17·5	11 42·0	0·2 0·2	6·2 5·1	12·2 10·1
03	12 15·8	12 17·8	11 42·2	0·3 0·2	6·3 5·2	12·3 10·1
04	12 16·0	12 18·0	11 42·5	0·4 0·3	6·4 5·3	12·4 10·2
05	12 16·3	12 18·3	11 42·7	0·5 0·4	6·5 5·4	12·5 10·3
06	12 16·5	12 18·5	11 42·9	0·6 0·5	6·6 5·4	12·6 10·4
07	12 16·8	12 18·8	11 43·2	0·7 0·6	6·7 5·5	12·7 10·5
08	12 17·0	12 19·0	11 43·4	0·8 0·7	6·8 5·6	12·8 10·6
09	12 17·3	12 19·3	11 43·7	0·9 0·7	6·9 5·7	12·9 10·6
10	12 17·5	12 19·5	11 43·9	1·0 0·8	7·0 5·8	13·0 10·7
11	12 17·8	12 19·8	11 44·1	1·1 0·9	7·1 5·9	13·1 10·8
12	12 18·0	12 20·0	11 44·4	1·2 1·0	7·2 5·9	13·2 10·9
13	12 18·3	12 20·3	11 44·6	1·3 1·1	7·3 6·0	13·3 11·0
14	12 18·5	12 20·5	11 44·9	1·4 1·2	7·4 6·1	13·4 11·1
15	12 18·8	12 20·8	11 45·1	1·5 1·2	7·5 6·2	13·5 11·1
16	12 19·0	12 21·0	11 45·3	1·6 1·3	7·6 6·3	13·6 11·2
17	12 19·3	12 21·3	11 45·6	1·7 1·4	7·7 6·4	13·7 11·3
18	12 19·5	12 21·5	11 45·8	1·8 1·5	7·8 6·4	13·8 11·4
19	12 19·8	12 21·8	11 46·1	1·9 1·6	7·9 6·5	13·9 11·5
20	12 20·0	12 22·0	11 46·3	2·0 1·7	8·0 6·6	14·0 11·6
21	12 20·3	12 22·3	11 46·5	2·1 1·7	8·1 6·7	14·1 11·6
22	12 20·5	12 22·5	11 46·8	2·2 1·8	8·2 6·8	14·2 11·7
23	12 20·8	12 22·8	11 47·0	2·3 1·9	8·3 6·8	14·3 11·8
24	12 21·0	12 23·0	11 47·2	2·4 2·0	8·4 6·9	14·4 11·9
25	12 21·3	12 23·3	11 47·5	2·5 2·1	8·5 7·0	14·5 12·0
26	12 21·5	12 23·5	11 47·7	2·6 2·1	8·6 7·1	14·6 12·0
27	12 21·8	12 23·8	11 48·0	2·7 2·2	8·7 7·2	14·7 12·1
28	12 22·0	12 24·0	11 48·2	2·8 2·3	8·8 7·3	14·8 12·2
29	12 22·3	12 24·3	11 48·4	2·9 2·4	8·9 7·3	14·9 12·3
30	12 22·5	12 24·5	11 48·7	3·0 2·5	9·0 7·4	15·0 12·4
31	12 22·8	12 24·8	11 48·9	3·1 2·6	9·1 7·5	15·1 12·5
32	12 23·0	12 25·0	11 49·2	3·2 2·6	9·2 7·6	15·2 12·5
33	12 23·3	12 25·3	11 49·4	3·3 2·7	9·3 7·7	15·3 12·6
34	12 23·5	12 25·5	11 49·6	3·4 2·8	9·4 7·8	15·4 12·7
35	12 23·8	12 25·8	11 49·9	3·5 2·9	9·5 7·8	15·5 12·8
36	12 24·0	12 26·0	11 50·1	3·6 3·0	9·6 7·9	15·6 12·9
37	12 24·3	12 26·3	11 50·3	3·7 3·1	9·7 8·0	15·7 13·0
38	12 24·5	12 26·5	11 50·6	3·8 3·1	9·8 8·1	15·8 13·0
39	12 24·8	12 26·8	11 50·8	3·9 3·2	9·9 8·2	15·9 13·1
40	12 25·0	12 27·0	11 51·1	4·0 3·3	10·0 8·3	16·0 13·2
41	12 25·3	12 27·3	11 51·3	4·1 3·4	10·1 8·3	16·1 13·3
42	12 25·5	12 27·5	11 51·5	4·2 3·5	10·2 8·4	16·2 13·4
43	12 25·8	12 27·8	11 51·8	4·3 3·5	10·3 8·5	16·3 13·4
44	12 26·0	12 28·0	11 52·0	4·4 3·6	10·4 8·6	16·4 13·5
45	12 26·3	12 28·3	11 52·3	4·5 3·7	10·5 8·7	16·5 13·6
46	12 26·5	12 28·5	11 52·5	4·6 3·8	10·6 8·7	16·6 13·7
47	12 26·8	12 28·8	11 52·7	4·7 3·9	10·7 8·8	16·7 13·8
48	12 27·0	12 29·0	11 53·0	4·8 4·0	10·8 8·9	16·8 13·9
49	12 27·3	12 29·3	11 53·2	4·9 4·0	10·9 9·0	16·9 13·9
50	12 27·5	12 29·5	11 53·4	5·0 4·1	11·0 9·1	17·0 14·0
51	12 27·8	12 29·8	11 53·7	5·1 4·2	11·1 9·2	17·1 14·1
52	12 28·0	12 30·0	11 53·9	5·2 4·3	11·2 9·2	17·2 14·2
53	12 28·3	12 30·3	11 54·2	5·3 4·4	11·3 9·3	17·3 14·3
54	12 28·5	12 30·5	11 54·4	5·4 4·5	11·4 9·4	17·4 14·4
55	12 28·8	12 30·8	11 54·6	5·5 4·5	11·5 9·5	17·5 14·4
56	12 29·0	12 31·1	11 54·9	5·6 4·6	11·6 9·6	17·6 14·5
57	12 29·3	12 31·3	11 55·1	5·7 4·7	11·7 9·7	17·7 14·6
58	12 29·5	12 31·6	11 55·4	5·8 4·8	11·8 9·7	17·8 14·7
59	12 29·8	12 31·8	11 55·6	5·9 4·9	11·9 9·8	17·9 14·8
60	12 30·0	12 32·1	11 55·8	6·0 5·0	12·0 9·9	18·0 14·9

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

50	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	12 30·0	12 32·1	11 55·8	0·0 0·0	6·0 5·1	12·0 10·1
01	12 30·3	12 32·3	11 56·1	0·1 0·1	6·1 5·1	12·1 10·2
02	12 30·5	12 32·6	11 56·3	0·2 0·2	6·2 5·2	12·2 10·3
03	12 30·8	12 32·8	11 56·5	0·3 0·3	6·3 5·3	12·3 10·4
04	12 31·0	12 33·1	11 56·8	0·4 0·3	6·4 5·4	12·4 10·4
05	12 31·3	12 33·3	11 57·0	0·5 0·4	6·5 5·5	12·5 10·5
06	12 31·5	12 33·6	11 57·3	0·6 0·5	6·6 5·6	12·6 10·6
07	12 31·8	12 33·8	11 57·5	0·7 0·6	6·7 5·6	12·7 10·7
08	12 32·0	12 34·1	11 57·7	0·8 0·7	6·8 5·7	12·8 10·8
09	12 32·3	12 34·3	11 58·0	0·9 0·8	6·9 5·8	12·9 10·9
10	12 32·5	12 34·6	11 58·2	1·0 0·8	7·0 5·9	13·0 10·9
11	12 32·8	12 34·8	11 58·5	1·1 0·9	7·1 6·0	13·1 11·0
12	12 33·0	12 35·1	11 58·7	1·2 1·0	7·2 6·1	13·2 11·1
13	12 33·3	12 35·3	11 58·9	1·3 1·1	7·3 6·1	13·3 11·2
14	12 33·5	12 35·6	11 59·2	1·4 1·2	7·4 6·2	13·4 11·3
15	12 33·8	12 35·8	11 59·4	1·5 1·3	7·5 6·3	13·5 11·4
16	12 34·0	12 36·1	11 59·7	1·6 1·3	7·6 6·4	13·6 11·4
17	12 34·3	12 36·3	11 59·9	1·7 1·4	7·7 6·5	13·7 11·5
18	12 34·5	12 36·6	12 00·1	1·8 1·5	7·8 6·6	13·8 11·6
19	12 34·8	12 36·8	12 00·4	1·9 1·6	7·9 6·6	13·9 11·7
20	12 35·0	12 37·1	12 00·6	2·0 1·7	8·0 6·7	14·0 11·8
21	12 35·3	12 37·3	12 00·8	2·1 1·8	8·1 6·8	14·1 11·9
22	12 35·5	12 37·6	12 01·1	2·2 1·9	8·2 6·9	14·2 12·0
23	12 35·8	12 37·8	12 01·3	2·3 1·9	8·3 7·0	14·3 12·0
24	12 36·0	12 38·1	12 01·6	2·4 2·0	8·4 7·1	14·4 12·1
25	12 36·3	12 38·3	12 01·8	2·5 2·1	8·5 7·2	14·5 12·2
26	12 36·5	12 38·6	12 02·0	2·6 2·2	8·6 7·2	14·6 12·3
27	12 36·8	12 38·8	12 02·3	2·7 2·3	8·7 7·3	14·7 12·4
28	12 37·0	12 39·1	12 02·5	2·8 2·4	8·8 7·4	14·8 12·5
29	12 37·3	12 39·3	12 02·8	2·9 2·4	8·9 7·5	14·9 12·5
30	12 37·5	12 39·6	12 03·0	3·0 2·5	9·0 7·6	15·0 12·6
31	12 37·8	12 39·8	12 03·2	3·1 2·6	9·1 7·7	15·1 12·7
32	12 38·0	12 40·1	12 03·5	3·2 2·7	9·2 7·7	15·2 12·8
33	12 38·3	12 40·3	12 03·7	3·3 2·8	9·3 7·8	15·3 12·9
34	12 38·5	12 40·6	12 03·9	3·4 2·9	9·4 7·9	15·4 13·0
35	12 38·8	12 40·8	12 04·2	3·5 2·9	9·5 8·0	15·5 13·0
36	12 39·0	12 41·1	12 04·4	3·6 3·0	9·6 8·1	15·6 13·1
37	12 39·3	12 41·3	12 04·7	3·7 3·1	9·7 8·2	15·7 13·2
38	12 39·5	12 41·6	12 04·9	3·8 3·2	9·8 8·2	15·8 13·3
39	12 39·8	12 41·8	12 05·1	3·9 3·3	9·9 8·3	15·9 13·4
40	12 40·0	12 42·1	12 05·4	4·0 3·4	10·0 8·4	16·0 13·5
41	12 40·3	12 42·3	12 05·6	4·1 3·5	10·1 8·5	16·1 13·6
42	12 40·5	12 42·6	12 05·9	4·2 3·5	10·2 8·6	16·2 13·6
43	12 40·8	12 42·8	12 06·1	4·3 3·6	10·3 8·7	16·3 13·7
44	12 41·0	12 43·1	12 06·3	4·4 3·7	10·4 8·8	16·4 13·8
45	12 41·3	12 43·3	12 06·6	4·5 3·8	10·5 8·8	16·5 13·9
46	12 41·5	12 43·6	12 06·8	4·6 3·9	10·6 8·9	16·6 14·0
47	12 41·8	12 43·8	12 07·0	4·7 4·0	10·7 9·0	16·7 14·1
48	12 42·0	12 44·1	12 07·3	4·8 4·0	10·8 9·1	16·8 14·1
49	12 42·3	12 44·3	12 07·5	4·9 4·1	10·9 9·2	16·9 14·2
50	12 42·5	12 44·6	12 07·8	5·0 4·2	11·0 9·3	17·0 14·3
51	12 42·8	12 44·8	12 08·0	5·1 4·3	11·1 9·3	17·1 14·4
52	12 43·0	12 45·1	12 08·2	5·2 4·4	11·2 9·4	17·2 14·5
53	12 43·3	12 45·3	12 08·5	5·3 4·5	11·3 9·5	17·3 14·6
54	12 43·5	12 45·6	12 08·7	5·4 4·5	11·4 9·6	17·4 14·6
55	12 43·8	12 45·8	12 09·0	5·5 4·6	11·5 9·7	17·5 14·7
56	12 44·0	12 46·1	12 09·2	5·6 4·7	11·6 9·8	17·6 14·8
57	12 44·3	12 46·3	12 09·4	5·7 4·8	11·7 9·8	17·7 14·9
58	12 44·5	12 46·6	12 09·7	5·8 4·9	11·8 9·9	17·8 15·0
59	12 44·8	12 46·8	12 09·9	5·9 5·0	11·9 10·0	17·9 15·1
60	12 45·0	12 47·1	12 10·2	6·0 5·1	12·0 10·1	18·0 15·2

51	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	12 45·0	12 47·1	12 10·2	0·0 0·0	6·0 5·2	12·0 10·3
01	12 45·3	12 47·3	12 10·4	0·1 0·1	6·1 5·2	12·1 10·4
02	12 45·5	12 47·6	12 10·6	0·2 0·2	6·2 5·3	12·2 10·5
03	12 45·8	12 47·8	12 10·9	0·3 0·3	6·3 5·4	12·3 10·6
04	12 46·0	12 48·1	12 11·1	0·4 0·3	6·4 5·5	12·4 10·6
05	12 46·3	12 48·3	12 11·3	0·5 0·4	6·5 5·6	12·5 10·7
06	12 46·5	12 48·6	12 11·6	0·6 0·5	6·6 5·7	12·6 10·8
07	12 46·8	12 48·8	12 11·8	0·7 0·6	6·7 5·8	12·7 10·9
08	12 47·0	12 49·1	12 12·1	0·8 0·7	6·8 5·8	12·8 11·0
09	12 47·3	12 49·4	12 12·3	0·9 0·8	6·9 5·9	12·9 11·1
10	12 47·5	12 49·6	12 12·5	1·0 0·9	7·0 6·0	13·0 11·2
11	12 47·8	12 49·9	12 12·8	1·1 0·9	7·1 6·1	13·1 11·2
12	12 48·0	12 50·1	12 13·0	1·2 1·0	7·2 6·2	13·2 11·3
13	12 48·3	12 50·4	12 13·3	1·3 1·1	7·3 6·3	13·3 11·4
14	12 48·5	12 50·6	12 13·5	1·4 1·2	7·4 6·4	13·4 11·5
15	12 48·8	12 50·9	12 13·7	1·5 1·3	7·5 6·4	13·5 11·6
16	12 49·0	12 51·1	12 14·0	1·6 1·4	7·6 6·5	13·6 11·7
17	12 49·3	12 51·4	12 14·2	1·7 1·5	7·7 6·6	13·7 11·8
18	12 49·5	12 51·6	12 14·4	1·8 1·5	7·8 6·7	13·8 11·8
19	12 49·8	12 51·9	12 14·7	1·9 1·6	7·9 6·8	13·9 11·9
20	12 50·0	12 52·1	12 14·9	2·0 1·7	8·0 6·9	14·0 12·0
21	12 50·3	12 52·4	12 15·2	2·1 1·8	8·1 7·0	14·1 12·1
22	12 50·5	12 52·6	12 15·4	2·2 1·9	8·2 7·0	14·2 12·2
23	12 50·8	12 52·9	12 15·6	2·3 2·0	8·3 7·1	14·3 12·3
24	12 51·0	12 53·1	12 15·9	2·4 2·1	8·4 7·2	14·4 12·4
25	12 51·3	12 53·4	12 16·1	2·5 2·1	8·5 7·3	14·5 12·4
26	12 51·5	12 53·6	12 16·4	2·6 2·2	8·6 7·4	14·6 12·5
27	12 51·8	12 53·9	12 16·6	2·7 2·3	8·7 7·5	14·7 12·6
28	12 52·0	12 54·1	12 16·8	2·8 2·4	8·8 7·6	14·8 12·7
29	12 52·3	12 54·4	12 17·1	2·9 2·5	8·9 7·6	14·9 12·8
30	12 52·5	12 54·6	12 17·3	3·0 2·6	9·0 7·7	15·0 12·9
31	12 52·8	12 54·9	12 17·5	3·1 2·7	9·1 7·8	15·1 13·0
32	12 53·0	12 55·1	12 17·8	3·2 2·7	9·2 7·9	15·2 13·0
33	12 53·3	12 55·4	12 18·0	3·3 2·8	9·3 8·0	15·3 13·1
34	12 53·5	12 55·6	12 18·3	3·4 2·9	9·4 8·1	15·4 13·2
35	12 53·8	12 55·9	12 18·5	3·5 3·0	9·5 8·2	15·5 13·3
36	12 54·0	12 56·1	12 18·7	3·6 3·1	9·6 8·2	15·6 13·4
37	12 54·3	12 56·4	12 19·0	3·7 3·2	9·7 8·3	15·7 13·5
38	12 54·5	12 56·6	12 19·2	3·8 3·3	9·8 8·4	15·8 13·6
39	12 54·8	12 56·9	12 19·5	3·9 3·3	9·9 8·5	15·9 13·6
40	12 55·0	12 57·1	12 19·7	4·0 3·4	10·0 8·6	16·0 13·7
41	12 55·3	12 57·4	12 19·9	4·1 3·5	10·1 8·7	16·1 13·8
42	12 55·5	12 57·6	12 20·2	4·2 3·6	10·2 8·8	16·2 13·9
43	12 55·8	12 57·9	12 20·4	4·3 3·7	10·3 8·8	16·3 14·0
44	12 56·0	12 58·1	12 20·6	4·4 3·8	10·4 8·9	16·4 14·1
45	12 56·3	12 58·4	12 20·9	4·5 3·9	10·5 9·0	16·5 14·2
46	12 56·5	12 58·6	12 21·1	4·6 3·9	10·6 9·1	16·6 14·2
47	12 56·8	12 58·9	12 21·4	4·7 4·0	10·7 9·2	16·7 14·3
48	12 57·0	12 59·1	12 21·6	4·8 4·1	10·8 9·3	16·8 14·4
49	12 57·3	12 59·4	12 21·8	4·9 4·2	10·9 9·4	16·9 14·5
50	12 57·5	12 59·6	12 22·1	5·0 4·3	11·0 9·4	17·0 14·6
51	12 57·8	12 59·9	12 22·3	5·1 4·4	11·1 9·5	17·1 14·7
52	12 58·0	13 00·1	12 22·6	5·2 4·5	11·2 9·6	17·2 14·8
53	12 58·3	13 00·4	12 22·8	5·3 4·5	11·3 9·7	17·3 14·8
54	12 58·5	13 00·6	12 23·0	5·4 4·6	11·4 9·8	17·4 14·9
55	12 58·8	13 00·9	12 23·3	5·5 4·7	11·5 9·9	17·5 15·0
56	12 59·0	13 01·1	12 23·5	5·6 4·8	11·6 10·0	17·6 15·1
57	12 59·3	13 01·4	12 23·8	5·7 4·9	11·7 10·0	17·7 15·2
58	12 59·5	13 01·6	12 24·0	5·8 5·0	11·8 10·1	17·8 15·3
59	12 59·8	13 01·9	12 24·2	5·9 5·1	11·9 10·2	17·9 15·4
60	13 00·0	13 02·1	12 24·5	6·0 5·2	12·0 10·3	18·0 15·5

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

Astronomiske elementer - daglige sider

52	SUN PLANETS	ARIES	MOON	v or d	Corr	v or d	Corr	v or d	Corr
s	° ′	° ′	° ′	′	′	′	′	′	′
00	13 00·0	13 02·1	12 24·5	0·0	0·0	6·0	5·3	12·0	10·5
01	13 00·3	13 02·4	12 24·7	0·1	0·1	6·1	5·3	12·1	10·6
02	13 00·5	13 02·6	12 24·9	0·2	0·2	6·2	5·4	12·2	10·7
03	13 00·8	13 02·9	12 25·2	0·3	0·3	6·3	5·5	12·3	10·8
04	13 01·0	13 03·1	12 25·4	0·4	0·4	6·4	5·6	12·4	10·9
05	13 01·3	13 03·4	12 25·7	0·5	0·4	6·5	5·7	12·5	10·9
06	13 01·5	13 03·6	12 25·9	0·6	0·5	6·6	5·8	12·6	11·0
07	13 01·8	13 03·9	12 26·1	0·7	0·6	6·7	5·9	12·7	11·1
08	13 02·0	13 04·1	12 26·4	0·8	0·7	6·8	6·0	12·8	11·2
09	13 02·3	13 04·4	12 26·6	0·9	0·8	6·9	6·0	12·9	11·3
10	13 02·5	13 04·6	12 26·9	1·0	0·9	7·0	6·1	13·0	11·4
11	13 02·8	13 04·9	12 27·1	1·1	1·0	7·1	6·2	13·1	11·5
12	13 03·0	13 05·1	12 27·3	1·2	1·1	7·2	6·3	13·2	11·6
13	13 03·3	13 05·4	12 27·6	1·3	1·1	7·3	6·4	13·3	11·6
14	13 03·5	13 05·6	12 27·8	1·4	1·2	7·4	6·5	13·4	11·7
15	13 03·8	13 05·9	12 28·0	1·5	1·3	7·5	6·6	13·5	11·8
16	13 04·0	13 06·1	12 28·3	1·6	1·4	7·6	6·7	13·6	11·9
17	13 04·3	13 06·4	12 28·5	1·7	1·5	7·7	6·7	13·7	12·0
18	13 04·5	13 06·6	12 28·8	1·8	1·6	7·8	6·8	13·8	12·1
19	13 04·8	13 06·9	12 29·0	1·9	1·7	7·9	6·9	13·9	12·2
20	13 05·0	13 07·1	12 29·2	2·0	1·8	8·0	7·0	14·0	12·3
21	13 05·3	13 07·4	12 29·5	2·1	1·8	8·1	7·1	14·1	12·3
22	13 05·5	13 07·7	12 29·7	2·2	1·9	8·2	7·2	14·2	12·4
23	13 05·8	13 07·9	12 30·0	2·3	2·0	8·3	7·3	14·3	12·5
24	13 06·0	13 08·2	12 30·2	2·4	2·1	8·4	7·4	14·4	12·6
25	13 06·3	13 08·4	12 30·4	2·5	2·2	8·5	7·4	14·5	12·7
26	13 06·5	13 08·7	12 30·7	2·6	2·3	8·6	7·5	14·6	12·8
27	13 06·8	13 08·9	12 30·9	2·7	2·4	8·7	7·6	14·7	12·9
28	13 07·0	13 09·2	12 31·1	2·8	2·5	8·8	7·7	14·8	13·0
29	13 07·3	13 09·4	12 31·4	2·9	2·5	8·9	7·8	14·9	13·0
30	13 07·5	13 09·7	12 31·6	3·0	2·6	9·0	7·9	15·0	13·1
31	13 07·8	13 09·9	12 31·9	3·1	2·7	9·1	8·0	15·1	13·2
32	13 08·0	13 10·2	12 32·1	3·2	2·8	9·2	8·1	15·2	13·3
33	13 08·3	13 10·4	12 32·3	3·3	2·9	9·3	8·1	15·3	13·4
34	13 08·5	13 10·7	12 32·6	3·4	3·0	9·4	8·2	15·4	13·5
35	13 08·8	13 10·9	12 32·8	3·5	3·1	9·5	8·3	15·5	13·6
36	13 09·0	13 11·2	12 33·1	3·6	3·2	9·6	8·4	15·6	13·7
37	13 09·3	13 11·4	12 33·3	3·7	3·2	9·7	8·5	15·7	13·7
38	13 09·5	13 11·7	12 33·5	3·8	3·3	9·8	8·6	15·8	13·8
39	13 09·8	13 11·9	12 33·8	3·9	3·4	9·9	8·7	15·9	13·9
40	13 10·0	13 12·2	12 34·0	4·0	3·5	10·0	8·8	16·0	14·0
41	13 10·3	13 12·4	12 34·2	4·1	3·6	10·1	8·8	16·1	14·1
42	13 10·5	13 12·7	12 34·5	4·2	3·7	10·2	8·9	16·2	14·2
43	13 10·8	13 12·9	12 34·7	4·3	3·8	10·3	9·0	16·3	14·3
44	13 11·0	13 13·2	12 35·0	4·4	3·9	10·4	9·1	16·4	14·4
45	13 11·3	13 13·4	12 35·2	4·5	3·9	10·5	9·2	16·5	14·4
46	13 11·5	13 13·7	12 35·4	4·6	4·0	10·6	9·3	16·6	14·5
47	13 11·8	13 13·9	12 35·7	4·7	4·1	10·7	9·4	16·7	14·6
48	13 12·0	13 14·2	12 35·9	4·8	4·2	10·8	9·5	16·8	14·7
49	13 12·3	13 14·4	12 36·2	4·9	4·3	10·9	9·5	16·9	14·8
50	13 12·5	13 14·7	12 36·4	5·0	4·4	11·0	9·6	17·0	14·9
51	13 12·8	13 14·9	12 36·6	5·1	4·5	11·1	9·7	17·1	15·0
52	13 13·0	13 15·2	12 36·9	5·2	4·6	11·2	9·8	17·2	15·1
53	13 13·3	13 15·4	12 37·1	5·3	4·6	11·3	9·9	17·3	15·1
54	13 13·5	13 15·7	12 37·4	5·4	4·7	11·4	10·0	17·4	15·2
55	13 13·8	13 15·9	12 37·6	5·5	4·8	11·5	10·1	17·5	15·3
56	13 14·0	13 16·2	12 37·8	5·6	4·9	11·6	10·2	17·6	15·4
57	13 14·3	13 16·4	12 38·1	5·7	5·0	11·7	10·2	17·7	15·5
58	13 14·5	13 16·7	12 38·3	5·8	5·1	11·8	10·3	17·8	15·6
59	13 14·8	13 16·9	12 38·5	5·9	5·2	11·9	10·4	17·9	15·7
60	13 15·0	13 17·2	12 38·8	6·0	5·3	12·0	10·5	18·0	15·8

53	SUN PLANETS	ARIES	MOON	v or d	Corr	v or d	Corr	v or d	Corr
s	° ′	° ′	° ′	′	′	′	′	′	′
00	13 15·0	13 17·2	12 38·8	0·0	0·0	6·0	5·4	12·0	10·7
01	13 15·3	13 17·4	12 39·0	0·1	0·1	6·1	5·4	12·1	10·8
02	13 15·5	13 17·7	12 39·3	0·2	0·2	6·2	5·5	12·2	10·9
03	13 15·8	13 17·9	12 39·5	0·3	0·3	6·3	5·6	12·3	11·0
04	13 16·0	13 18·2	12 39·7	0·4	0·4	6·4	5·7	12·4	11·1
05	13 16·3	13 18·4	12 40·0	0·5	0·4	6·5	5·8	12·5	11·1
06	13 16·5	13 18·7	12 40·2	0·6	0·5	6·6	5·9	12·6	11·2
07	13 16·8	13 18·9	12 40·5	0·7	0·6	6·7	6·0	12·7	11·3
08	13 17·0	13 19·2	12 40·7	0·8	0·7	6·8	6·1	12·8	11·4
09	13 17·3	13 19·4	12 40·9	0·9	0·8	6·9	6·2	12·9	11·5
10	13 17·5	13 19·7	12 41·2	1·0	0·9	7·0	6·2	13·0	11·6
11	13 17·8	13 19·9	12 41·4	1·1	1·0	7·1	6·3	13·1	11·7
12	13 18·0	13 20·2	12 41·6	1·2	1·1	7·2	6·4	13·2	11·8
13	13 18·3	13 20·4	12 41·9	1·3	1·2	7·3	6·5	13·3	11·9
14	13 18·5	13 20·7	12 42·1	1·4	1·2	7·4	6·6	13·4	11·9
15	13 18·8	13 20·9	12 42·4	1·5	1·3	7·5	6·7	13·5	12·0
16	13 19·0	13 21·2	12 42·6	1·6	1·4	7·6	6·8	13·6	12·1
17	13 19·3	13 21·4	12 42·8	1·7	1·5	7·7	6·9	13·7	12·2
18	13 19·5	13 21·7	12 43·1	1·8	1·6	7·8	7·0	13·8	12·3
19	13 19·8	13 21·9	12 43·3	1·9	1·7	7·9	7·0	13·9	12·4
20	13 20·0	13 22·2	12 43·6	2·0	1·8	8·0	7·1	14·0	12·5
21	13 20·3	13 22·4	12 43·8	2·1	1·9	8·1	7·2	14·1	12·6
22	13 20·5	13 22·7	12 44·0	2·2	2·0	8·2	7·3	14·2	12·7
23	13 20·8	13 22·9	12 44·3	2·3	2·1	8·3	7·4	14·3	12·8
24	13 21·0	13 23·2	12 44·5	2·4	2·1	8·4	7·5	14·4	12·8
25	13 21·3	13 23·4	12 44·7	2·5	2·2	8·5	7·6	14·5	12·9
26	13 21·5	13 23·7	12 45·0	2·6	2·3	8·6	7·7	14·6	13·0
27	13 21·8	13 23·9	12 45·2	2·7	2·4	8·7	7·8	14·7	13·1
28	13 22·0	13 24·2	12 45·5	2·8	2·5	8·8	7·8	14·8	13·2
29	13 22·3	13 24·4	12 45·7	2·9	2·6	8·9	7·9	14·9	13·3
30	13 22·5	13 24·7	12 45·9	3·0	2·7	9·0	8·0	15·0	13·4
31	13 22·8	13 24·9	12 46·2	3·1	2·8	9·1	8·1	15·1	13·5
32	13 23·0	13 25·2	12 46·4	3·2	2·9	9·2	8·2	15·2	13·6
33	13 23·3	13 25·4	12 46·7	3·3	2·9	9·3	8·3	15·3	13·6
34	13 23·5	13 25·7	12 46·9	3·4	3·0	9·4	8·4	15·4	13·7
35	13 23·8	13 26·0	12 47·1	3·5	3·1	9·5	8·5	15·5	13·8
36	13 24·0	13 26·2	12 47·4	3·6	3·2	9·6	8·6	15·6	13·9
37	13 24·3	13 26·5	12 47·6	3·7	3·3	9·7	8·6	15·7	14·0
38	13 24·5	13 26·7	12 47·9	3·8	3·4	9·8	8·7	15·8	14·1
39	13 24·8	13 27·0	12 48·1	3·9	3·5	9·9	8·8	15·9	14·2
40	13 25·0	13 27·2	12 48·3	4·0	3·6	10·0	8·9	16·0	14·3
41	13 25·3	13 27·5	12 48·6	4·1	3·7	10·1	9·0	16·1	14·4
42	13 25·5	13 27·7	12 48·8	4·2	3·7	10·2	9·1	16·2	14·4
43	13 25·8	13 28·0	12 49·0	4·3	3·8	10·3	9·2	16·3	14·5
44	13 26·0	13 28·2	12 49·3	4·4	3·9	10·4	9·3	16·4	14·6
45	13 26·3	13 28·5	12 49·5	4·5	4·0	10·5	9·4	16·5	14·7
46	13 26·5	13 28·7	12 49·8	4·6	4·1	10·6	9·5	16·6	14·8
47	13 26·8	13 29·0	12 50·0	4·7	4·2	10·7	9·5	16·7	14·9
48	13 27·0	13 29·2	12 50·2	4·8	4·3	10·8	9·6	16·8	15·0
49	13 27·3	13 29·5	12 50·5	4·9	4·4	10·9	9·7	16·9	15·1
50	13 27·5	13 29·7	12 50·7	5·0	4·5	11·0	9·8	17·0	15·2
51	13 27·8	13 30·0	12 51·0	5·1	4·5	11·1	9·9	17·1	15·2
52	13 28·0	13 30·2	12 51·2	5·2	4·6	11·2	10·0	17·2	15·3
53	13 28·3	13 30·5	12 51·4	5·3	4·7	11·3	10·1	17·3	15·4
54	13 28·5	13 30·7	12 51·7	5·4	4·8	11·4	10·2	17·4	15·5
55	13 28·8	13 31·0	12 51·9	5·5	4·9	11·5	10·3	17·5	15·6
56	13 29·0	13 31·2	12 52·1	5·6	5·0	11·6	10·3	17·6	15·7
57	13 29·3	13 31·5	12 52·4	5·7	5·1	11·7	10·4	17·7	15·8
58	13 29·5	13 31·7	12 52·6	5·8	5·2	11·8	10·5	17·8	15·9
59	13 29·8	13 32·0	12 52·9	5·9	5·3	11·9	10·6	17·9	16·0
60	13 30·0	13 32·2	12 53·1	6·0	5·4	12·0	10·7	18·0	16·1

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

54m	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	13 30·0	13 32·2	12 53·1	0·0 0·0	6·0 5·5	12·0 10·9
01	13 30·3	13 32·5	12 53·3	0·1 0·1	6·1 5·5	12·1 11·0
02	13 30·5	13 32·7	12 53·6	0·2 0·2	6·2 5·6	12·2 11·1
03	13 30·8	13 33·0	12 53·8	0·3 0·3	6·3 5·7	12·3 11·2
04	13 31·0	13 33·2	12 54·1	0·4 0·4	6·4 5·8	12·4 11·3
05	13 31·3	13 33·5	12 54·3	0·5 0·5	6·5 5·9	12·5 11·4
06	13 31·5	13 33·7	12 54·5	0·6 0·5	6·6 6·0	12·6 11·4
07	13 31·8	13 34·0	12 54·8	0·7 0·6	6·7 6·1	12·7 11·5
08	13 32·0	13 34·2	12 55·0	0·8 0·7	6·8 6·2	12·8 11·6
09	13 32·3	13 34·5	12 55·2	0·9 0·8	6·9 6·3	12·9 11·7
10	13 32·5	13 34·7	12 55·5	1·0 0·9	7·0 6·4	13·0 11·8
11	13 32·8	13 35·0	12 55·7	1·1 1·0	7·1 6·4	13·1 11·9
12	13 33·0	13 35·2	12 56·0	1·2 1·1	7·2 6·5	13·2 12·0
13	13 33·3	13 35·5	12 56·2	1·3 1·2	7·3 6·6	13·3 12·1
14	13 33·5	13 35·7	12 56·4	1·4 1·3	7·4 6·7	13·4 12·2
15	13 33·8	13 36·0	12 56·7	1·5 1·4	7·5 6·8	13·5 12·3
16	13 34·0	13 36·2	12 56·9	1·6 1·5	7·6 6·9	13·6 12·4
17	13 34·3	13 36·5	12 57·2	1·7 1·5	7·7 7·0	13·7 12·4
18	13 34·5	13 36·7	12 57·4	1·8 1·6	7·8 7·1	13·8 12·5
19	13 34·8	13 37·0	12 57·6	1·9 1·7	7·9 7·2	13·9 12·6
20	13 35·0	13 37·2	12 57·9	2·0 1·8	8·0 7·3	14·0 12·7
21	13 35·3	13 37·5	12 58·1	2·1 1·9	8·1 7·4	14·1 12·8
22	13 35·5	13 37·7	12 58·3	2·2 2·0	8·2 7·4	14·2 12·9
23	13 35·8	13 38·0	12 58·6	2·3 2·1	8·3 7·5	14·3 13·0
24	13 36·0	13 38·2	12 58·8	2·4 2·2	8·4 7·6	14·4 13·1
25	13 36·3	13 38·5	12 59·1	2·5 2·3	8·5 7·7	14·5 13·2
26	13 36·5	13 38·7	12 59·3	2·6 2·4	8·6 7·8	14·6 13·3
27	13 36·8	13 39·0	12 59·5	2·7 2·5	8·7 7·9	14·7 13·4
28	13 37·0	13 39·2	12 59·8	2·8 2·5	8·8 8·0	14·8 13·4
29	13 37·3	13 39·5	13 00·0	2·9 2·6	8·9 8·1	14·9 13·5
30	13 37·5	13 39·7	13 00·3	3·0 2·7	9·0 8·2	15·0 13·6
31	13 37·8	13 40·0	13 00·5	3·1 2·8	9·1 8·3	15·1 13·7
32	13 38·0	13 40·2	13 00·7	3·2 2·9	9·2 8·4	15·2 13·8
33	13 38·3	13 40·5	13 01·0	3·3 3·0	9·3 8·4	15·3 13·9
34	13 38·5	13 40·7	13 01·2	3·4 3·1	9·4 8·5	15·4 14·0
35	13 38·8	13 41·0	13 01·5	3·5 3·2	9·5 8·6	15·5 14·1
36	13 39·0	13 41·2	13 01·7	3·6 3·3	9·6 8·7	15·6 14·2
37	13 39·3	13 41·5	13 01·9	3·7 3·4	9·7 8·8	15·7 14·3
38	13 39·5	13 41·7	13 02·2	3·8 3·5	9·8 8·9	15·8 14·4
39	13 39·8	13 42·0	13 02·4	3·9 3·5	9·9 9·0	15·9 14·4
40	13 40·0	13 42·2	13 02·6	4·0 3·6	10·0 9·1	16·0 14·5
41	13 40·3	13 42·5	13 02·9	4·1 3·7	10·1 9·2	16·1 14·6
42	13 40·5	13 42·7	13 03·1	4·2 3·8	10·2 9·3	16·2 14·7
43	13 40·8	13 43·0	13 03·4	4·3 3·9	10·3 9·4	16·3 14·8
44	13 41·0	13 43·2	13 03·6	4·4 4·0	10·4 9·4	16·4 14·9
45	13 41·3	13 43·5	13 03·8	4·5 4·1	10·5 9·5	16·5 15·0
46	13 41·5	13 43·7	13 04·1	4·6 4·2	10·6 9·6	16·6 15·1
47	13 41·8	13 44·0	13 04·3	4·7 4·3	10·7 9·7	16·7 15·2
48	13 42·0	13 44·3	13 04·6	4·8 4·4	10·8 9·8	16·8 15·3
49	13 42·3	13 44·5	13 04·8	4·9 4·5	10·9 9·9	16·9 15·4
50	13 42·5	13 44·8	13 05·0	5·0 4·5	11·0 10·0	17·0 15·4
51	13 42·8	13 45·0	13 05·3	5·1 4·6	11·1 10·1	17·1 15·5
52	13 43·0	13 45·3	13 05·5	5·2 4·7	11·2 10·2	17·2 15·6
53	13 43·3	13 45·5	13 05·7	5·3 4·8	11·3 10·3	17·3 15·7
54	13 43·5	13 45·8	13 06·0	5·4 4·9	11·4 10·4	17·4 15·8
55	13 43·8	13 46·0	13 06·2	5·5 5·0	11·5 10·4	17·5 15·9
56	13 44·0	13 46·3	13 06·5	5·6 5·1	11·6 10·5	17·6 16·0
57	13 44·3	13 46·5	13 06·7	5·7 5·2	11·7 10·6	17·7 16·1
58	13 44·5	13 46·8	13 06·9	5·8 5·3	11·8 10·7	17·8 16·2
59	13 44·8	13 47·0	13 07·2	5·9 5·4	11·9 10·8	17·9 16·3
60	13 45·0	13 47·3	13 07·4	6·0 5·5	12·0 10·9	18·0 16·4

55m	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′ ′	′ ′	′ ′
00	13 45·0	13 47·3	13 07·4	0·0 0·0	6·0 5·6	12·0 11·1
01	13 45·3	13 47·5	13 07·7	0·1 0·1	6·1 5·6	12·1 11·2
02	13 45·5	13 47·8	13 07·9	0·2 0·2	6·2 5·7	12·2 11·3
03	13 45·8	13 48·0	13 08·1	0·3 0·3	6·3 5·8	12·3 11·4
04	13 46·0	13 48·3	13 08·4	0·4 0·4	6·4 5·9	12·4 11·5
05	13 46·3	13 48·5	13 08·6	0·5 0·5	6·5 6·0	12·5 11·6
06	13 46·5	13 48·8	13 08·8	0·6 0·6	6·6 6·1	12·6 11·7
07	13 46·8	13 49·0	13 09·1	0·7 0·6	6·7 6·2	12·7 11·7
08	13 47·0	13 49·3	13 09·3	0·8 0·7	6·8 6·3	12·8 11·8
09	13 47·3	13 49·5	13 09·6	0·9 0·8	6·9 6·4	12·9 11·9
10	13 47·5	13 49·8	13 09·8	1·0 0·9	7·0 6·5	13·0 12·0
11	13 47·8	13 50·0	13 10·0	1·1 1·0	7·1 6·6	13·1 12·1
12	13 48·0	13 50·3	13 10·3	1·2 1·1	7·2 6·7	13·2 12·2
13	13 48·3	13 50·5	13 10·5	1·3 1·2	7·3 6·8	13·3 12·3
14	13 48·5	13 50·8	13 10·8	1·4 1·3	7·4 6·8	13·4 12·4
15	13 48·8	13 51·0	13 11·0	1·5 1·4	7·5 6·9	13·5 12·5
16	13 49·0	13 51·3	13 11·2	1·6 1·5	7·6 7·0	13·6 12·6
17	13 49·3	13 51·5	13 11·5	1·7 1·6	7·7 7·1	13·7 12·7
18	13 49·5	13 51·8	13 11·7	1·8 1·7	7·8 7·2	13·8 12·8
19	13 49·8	13 52·0	13 12·0	1·9 1·8	7·9 7·3	13·9 12·9
20	13 50·0	13 52·3	13 12·2	2·0 1·9	8·0 7·4	14·0 13·0
21	13 50·3	13 52·5	13 12·4	2·1 1·9	8·1 7·5	14·1 13·0
22	13 50·5	13 52·8	13 12·7	2·2 2·0	8·2 7·6	14·2 13·1
23	13 50·8	13 53·0	13 12·9	2·3 2·1	8·3 7·7	14·3 13·2
24	13 51·0	13 53·3	13 13·1	2·4 2·2	8·4 7·8	14·4 13·3
25	13 51·3	13 53·5	13 13·4	2·5 2·3	8·5 7·9	14·5 13·4
26	13 51·5	13 53·8	13 13·6	2·6 2·4	8·6 8·0	14·6 13·5
27	13 51·8	13 54·0	13 13·9	2·7 2·5	8·7 8·0	14·7 13·6
28	13 52·0	13 54·3	13 14·1	2·8 2·6	8·8 8·1	14·8 13·7
29	13 52·3	13 54·5	13 14·3	2·9 2·7	8·9 8·2	14·9 13·8
30	13 52·5	13 54·8	13 14·6	3·0 2·8	9·0 8·3	15·0 13·9
31	13 52·8	13 55·0	13 14·8	3·1 2·9	9·1 8·4	15·1 14·0
32	13 53·0	13 55·3	13 15·1	3·2 3·0	9·2 8·5	15·2 14·1
33	13 53·3	13 55·5	13 15·3	3·3 3·1	9·3 8·6	15·3 14·2
34	13 53·5	13 55·8	13 15·5	3·4 3·1	9·4 8·7	15·4 14·2
35	13 53·8	13 56·0	13 15·8	3·5 3·2	9·5 8·8	15·5 14·3
36	13 54·0	13 56·3	13 16·0	3·6 3·3	9·6 8·9	15·6 14·4
37	13 54·3	13 56·5	13 16·2	3·7 3·4	9·7 9·0	15·7 14·5
38	13 54·5	13 56·8	13 16·5	3·8 3·5	9·8 9·1	15·8 14·6
39	13 54·8	13 57·0	13 16·7	3·9 3·6	9·9 9·2	15·9 14·7
40	13 55·0	13 57·3	13 17·0	4·0 3·7	10·0 9·3	16·0 14·8
41	13 55·3	13 57·5	13 17·2	4·1 3·8	10·1 9·3	16·1 14·9
42	13 55·5	13 57·8	13 17·4	4·2 3·9	10·2 9·4	16·2 15·0
43	13 55·8	13 58·0	13 17·7	4·3 4·0	10·3 9·5	16·3 15·1
44	13 56·0	13 58·3	13 17·9	4·4 4·1	10·4 9·6	16·4 15·2
45	13 56·3	13 58·5	13 18·2	4·5 4·2	10·5 9·7	16·5 15·3
46	13 56·5	13 58·8	13 18·4	4·6 4·3	10·6 9·8	16·6 15·4
47	13 56·8	13 59·0	13 18·6	4·7 4·3	10·7 9·9	16·7 15·4
48	13 57·0	13 59·3	13 18·9	4·8 4·4	10·8 10·0	16·8 15·5
49	13 57·3	13 59·5	13 19·1	4·9 4·5	10·9 10·1	16·9 15·6
50	13 57·5	13 59·8	13 19·3	5·0 4·6	11·0 10·2	17·0 15·7
51	13 57·8	14 00·0	13 19·6	5·1 4·7	11·1 10·3	17·1 15·8
52	13 58·0	14 00·3	13 19·8	5·2 4·8	11·2 10·4	17·2 15·9
53	13 58·3	14 00·5	13 20·1	5·3 4·9	11·3 10·5	17·3 16·0
54	13 58·5	14 00·8	13 20·3	5·4 5·0	11·4 10·5	17·4 16·1
55	13 58·8	14 01·0	13 20·5	5·5 5·1	11·5 10·6	17·5 16·2
56	13 59·0	14 01·3	13 20·8	5·6 5·2	11·6 10·7	17·6 16·3
57	13 59·3	14 01·5	13 21·0	5·7 5·3	11·7 10·8	17·7 16·4
58	13 59·5	14 01·8	13 21·3	5·8 5·4	11·8 10·9	17·8 16·5
59	13 59·8	14 02·0	13 21·5	5·9 5·5	11·9 11·0	17·9 16·6
60	14 00·0	14 02·3	13 21·7	6·0 5·6	12·0 11·1	18·0 16·7

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

56m	SUN PLANETS	ARIES	MOON	v or Corr^n d		v or Corr^n d		v or Corr^n d	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	14 00·0	14 02·3	13 21·7	0·0	0·0	6·0	5·7	12·0	11·3
01	14 00·3	14 02·6	13 22·0	0·1	0·1	6·1	5·7	12·1	11·4
02	14 00·5	14 02·8	13 22·2	0·2	0·2	6·2	5·8	12·2	11·5
03	14 00·8	14 03·1	13 22·4	0·3	0·3	6·3	5·9	12·3	11·6
04	14 01·0	14 03·3	13 22·7	0·4	0·4	6·4	6·0	12·4	11·7
05	14 01·3	14 03·6	13 22·9	0·5	0·5	6·5	6·1	12·5	11·8
06	14 01·5	14 03·8	13 23·2	0·6	0·6	6·6	6·2	12·6	11·9
07	14 01·8	14 04·1	13 23·4	0·7	0·7	6·7	6·3	12·7	12·0
08	14 02·0	14 04·3	13 23·6	0·8	0·8	6·8	6·4	12·8	12·1
09	14 02·3	14 04·6	13 23·9	0·9	0·8	6·9	6·5	12·9	12·1
10	14 02·5	14 04·8	13 24·1	1·0	0·9	7·0	6·6	13·0	12·2
11	14 02·8	14 05·1	13 24·4	1·1	1·0	7·1	6·7	13·1	12·3
12	14 03·0	14 05·3	13 24·6	1·2	1·1	7·2	6·8	13·2	12·4
13	14 03·3	14 05·6	13 24·8	1·3	1·2	7·3	6·9	13·3	12·5
14	14 03·5	14 05·8	13 25·1	1·4	1·3	7·4	7·0	13·4	12·6
15	14 03·8	14 06·1	13 25·3	1·5	1·4	7·5	7·1	13·5	12·7
16	14 04·0	14 06·3	13 25·6	1·6	1·5	7·6	7·2	13·6	12·8
17	14 04·3	14 06·6	13 25·8	1·7	1·6	7·7	7·3	13·7	12·9
18	14 04·5	14 06·8	13 26·0	1·8	1·7	7·8	7·3	13·8	13·0
19	14 04·8	14 07·1	13 26·3	1·9	1·8	7·9	7·4	13·9	13·1
20	14 05·0	14 07·3	13 26·5	2·0	1·9	8·0	7·5	14·0	13·2
21	14 05·3	14 07·6	13 26·7	2·1	2·0	8·1	7·6	14·1	13·3
22	14 05·5	14 07·8	13 27·0	2·2	2·1	8·2	7·7	14·2	13·4
23	14 05·8	14 08·1	13 27·2	2·3	2·2	8·3	7·8	14·3	13·5
24	14 06·0	14 08·3	13 27·5	2·4	2·3	8·4	7·9	14·4	13·6
25	14 06·3	14 08·6	13 27·7	2·5	2·4	8·5	8·0	14·5	13·7
26	14 06·5	14 08·8	13 27·9	2·6	2·4	8·6	8·1	14·6	13·7
27	14 06·8	14 09·1	13 28·2	2·7	2·5	8·7	8·2	14·7	13·8
28	14 07·0	14 09·3	13 28·4	2·8	2·6	8·8	8·3	14·8	13·9
29	14 07·3	14 09·6	13 28·7	2·9	2·7	8·9	8·4	14·9	14·0
30	14 07·5	14 09·8	13 28·9	3·0	2·8	9·0	8·5	15·0	14·1
31	14 07·8	14 10·1	13 29·1	3·1	2·9	9·1	8·6	15·1	14·2
32	14 08·0	14 10·3	13 29·4	3·2	3·0	9·2	8·7	15·2	14·3
33	14 08·3	14 10·6	13 29·6	3·3	3·1	9·3	8·8	15·3	14·4
34	14 08·5	14 10·8	13 29·8	3·4	3·2	9·4	8·9	15·4	14·5
35	14 08·8	14 11·1	13 30·1	3·5	3·3	9·5	8·9	15·5	14·6
36	14 09·0	14 11·3	13 30·3	3·6	3·4	9·6	9·0	15·6	14·7
37	14 09·3	14 11·6	13 30·6	3·7	3·5	9·7	9·1	15·7	14·8
38	14 09·5	14 11·8	13 30·8	3·8	3·6	9·8	9·2	15·8	14·9
39	14 09·8	14 12·1	13 31·0	3·9	3·7	9·9	9·3	15·9	15·0
40	14 10·0	14 12·3	13 31·3	4·0	3·8	10·0	9·4	16·0	15·1
41	14 10·3	14 12·6	13 31·5	4·1	3·9	10·1	9·5	16·1	15·2
42	14 10·5	14 12·8	13 31·8	4·2	4·0	10·2	9·6	16·2	15·3
43	14 10·8	14 13·1	13 32·0	4·3	4·0	10·3	9·7	16·3	15·3
44	14 11·0	14 13·3	13 32·2	4·4	4·1	10·4	9·8	16·4	15·4
45	14 11·3	14 13·6	13 32·5	4·5	4·2	10·5	9·9	16·5	15·5
46	14 11·5	14 13·8	13 32·7	4·6	4·3	10·6	10·0	16·6	15·6
47	14 11·8	14 14·1	13 32·9	4·7	4·4	10·7	10·1	16·7	15·7
48	14 12·0	14 14·3	13 33·2	4·8	4·5	10·8	10·2	16·8	15·8
49	14 12·3	14 14·6	13 33·4	4·9	4·6	10·9	10·3	16·9	15·9
50	14 12·5	14 14·8	13 33·7	5·0	4·7	11·0	10·4	17·0	16·0
51	14 12·8	14 15·1	13 33·9	5·1	4·8	11·1	10·5	17·1	16·1
52	14 13·0	14 15·3	13 34·1	5·2	4·9	11·2	10·5	17·2	16·2
53	14 13·3	14 15·6	13 34·4	5·3	5·0	11·3	10·6	17·3	16·3
54	14 13·5	14 15·8	13 34·6	5·4	5·1	11·4	10·7	17·4	16·4
55	14 13·8	14 16·1	13 34·9	5·5	5·2	11·5	10·8	17·5	16·5
56	14 14·0	14 16·3	13 35·1	5·6	5·3	11·6	10·9	17·6	16·6
57	14 14·3	14 16·6	13 35·3	5·7	5·4	11·7	11·0	17·7	16·7
58	14 14·5	14 16·8	13 35·6	5·8	5·5	11·8	11·1	17·8	16·8
59	14 14·8	14 17·1	13 35·8	5·9	5·6	11·9	11·2	17·9	16·9
60	14 15·0	14 17·3	13 36·1	6·0	5·7	12·0	11·3	18·0	17·0

57m	SUN PLANETS	ARIES	MOON	v or Corr^n d		v or Corr^n d		v or Corr^n d	
s	° ′	° ′	° ′	′	′	′	′	′	′
00	14 15·0	14 17·3	13 36·1	0·0	0·0	6·0	5·8	12·0	11·5
01	14 15·3	14 17·6	13 36·3	0·1	0·1	6·1	5·8	12·1	11·6
02	14 15·5	14 17·8	13 36·5	0·2	0·2	6·2	5·9	12·2	11·7
03	14 15·8	14 18·1	13 36·8	0·3	0·3	6·3	6·0	12·3	11·8
04	14 16·0	14 18·3	13 37·0	0·4	0·4	6·4	6·1	12·4	11·9
05	14 16·3	14 18·6	13 37·2	0·5	0·5	6·5	6·2	12·5	12·0
06	14 16·5	14 18·8	13 37·5	0·6	0·6	6·6	6·3	12·6	12·1
07	14 16·8	14 19·1	13 37·7	0·7	0·7	6·7	6·4	12·7	12·2
08	14 17·0	14 19·3	13 38·0	0·8	0·8	6·8	6·5	12·8	12·3
09	14 17·3	14 19·6	13 38·2	0·9	0·9	6·9	6·6	12·9	12·4
10	14 17·5	14 19·8	13 38·4	1·0	1·0	7·0	6·7	13·0	12·5
11	14 17·8	14 20·1	13 38·7	1·1	1·1	7·1	6·8	13·1	12·6
12	14 18·0	14 20·3	13 38·9	1·2	1·2	7·2	6·9	13·2	12·7
13	14 18·3	14 20·6	13 39·2	1·3	1·2	7·3	7·0	13·3	12·7
14	14 18·5	14 20·9	13 39·4	1·4	1·3	7·4	7·1	13·4	12·8
15	14 18·8	14 21·1	13 39·6	1·5	1·4	7·5	7·2	13·5	12·9
16	14 19·0	14 21·4	13 39·9	1·6	1·5	7·6	7·3	13·6	13·0
17	14 19·3	14 21·6	13 40·1	1·7	1·6	7·7	7·4	13·7	13·1
18	14 19·5	14 21·9	13 40·3	1·8	1·7	7·8	7·5	13·8	13·2
19	14 19·8	14 22·1	13 40·6	1·9	1·8	7·9	7·6	13·9	13·3
20	14 20·0	14 22·4	13 40·8	2·0	1·9	8·0	7·7	14·0	13·4
21	14 20·3	14 22·6	13 41·1	2·1	2·0	8·1	7·8	14·1	13·5
22	14 20·5	14 22·9	13 41·3	2·2	2·1	8·2	7·9	14·2	13·6
23	14 20·8	14 23·1	13 41·5	2·3	2·2	8·3	8·0	14·3	13·7
24	14 21·0	14 23·4	13 41·8	2·4	2·3	8·4	8·1	14·4	13·8
25	14 21·3	14 23·6	13 42·0	2·5	2·4	8·5	8·1	14·5	13·9
26	14 21·5	14 23·9	13 42·3	2·6	2·5	8·6	8·2	14·6	14·0
27	14 21·8	14 24·1	13 42·5	2·7	2·6	8·7	8·3	14·7	14·1
28	14 22·0	14 24·4	13 42·7	2·8	2·7	8·8	8·4	14·8	14·2
29	14 22·3	14 24·6	13 43·0	2·9	2·8	8·9	8·5	14·9	14·3
30	14 22·5	14 24·9	13 43·2	3·0	2·9	9·0	8·6	15·0	14·4
31	14 22·8	14 25·1	13 43·4	3·1	3·0	9·1	8·7	15·1	14·5
32	14 23·0	14 25·4	13 43·7	3·2	3·1	9·2	8·8	15·2	14·6
33	14 23·3	14 25·6	13 43·9	3·3	3·2	9·3	8·9	15·3	14·7
34	14 23·5	14 25·9	13 44·2	3·4	3·3	9·4	9·0	15·4	14·8
35	14 23·8	14 26·1	13 44·4	3·5	3·4	9·5	9·1	15·5	14·9
36	14 24·0	14 26·4	13 44·6	3·6	3·5	9·6	9·2	15·6	15·0
37	14 24·3	14 26·6	13 44·9	3·7	3·5	9·7	9·3	15·7	15·0
38	14 24·5	14 26·9	13 45·1	3·8	3·6	9·8	9·4	15·8	15·1
39	14 24·8	14 27·1	13 45·4	3·9	3·7	9·9	9·5	15·9	15·2
40	14 25·0	14 27·4	13 45·6	4·0	3·8	10·0	9·6	16·0	15·3
41	14 25·3	14 27·6	13 45·8	4·1	3·9	10·1	9·7	16·1	15·4
42	14 25·5	14 27·9	13 46·1	4·2	4·0	10·2	9·8	16·2	15·5
43	14 25·8	14 28·1	13 46·3	4·3	4·1	10·3	9·9	16·3	15·6
44	14 26·0	14 28·4	13 46·5	4·4	4·2	10·4	10·0	16·4	15·7
45	14 26·3	14 28·6	13 46·8	4·5	4·3	10·5	10·1	16·5	15·8
46	14 26·5	14 28·9	13 47·0	4·6	4·4	10·6	10·2	16·6	15·9
47	14 26·8	14 29·1	13 47·3	4·7	4·5	10·7	10·3	16·7	16·0
48	14 27·0	14 29·4	13 47·5	4·8	4·6	10·8	10·4	16·8	16·1
49	14 27·3	14 29·6	13 47·7	4·9	4·7	10·9	10·4	16·9	16·2
50	14 27·5	14 29·9	13 48·0	5·0	4·8	11·0	10·5	17·0	16·3
51	14 27·8	14 30·1	13 48·2	5·1	4·9	11·1	10·6	17·1	16·4
52	14 28·0	14 30·4	13 48·5	5·2	5·0	11·2	10·7	17·2	16·5
53	14 28·3	14 30·6	13 48·7	5·3	5·1	11·3	10·8	17·3	16·6
54	14 28·5	14 30·9	13 48·9	5·4	5·2	11·4	10·9	17·4	16·7
55	14 28·8	14 31·1	13 49·2	5·5	5·3	11·5	11·0	17·5	16·8
56	14 29·0	14 31·4	13 49·4	5·6	5·4	11·6	11·1	17·6	16·9
57	14 29·3	14 31·6	13 49·7	5·7	5·5	11·7	11·2	17·7	17·0
58	14 29·5	14 31·9	13 49·9	5·8	5·6	11·8	11·3	17·8	17·1
59	14 29·8	14 32·1	13 50·1	5·9	5·7	11·9	11·4	17·9	17·2
60	14 30·0	14 32·4	13 50·4	6·0	5·8	12·0	11·5	18·0	17·3

0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29
30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51	52-53	54-55	56-57	58-59

Astronomiske elementer - daglige sider

58m	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′	′	′	′
00	14 30·0	14 32·4	13 50·4	0·0	0·0	6·0	5·9	12·0	11·7
01	14 30·3	14 32·6	13 50·6	0·1	0·1	6·1	5·9	12·1	11·8
02	14 30·5	14 32·9	13 50·8	0·2	0·2	6·2	6·0	12·2	11·9
03	14 30·8	14 33·1	13 51·1	0·3	0·3	6·3	6·1	12·3	12·0
04	14 31·0	14 33·4	13 51·3	0·4	0·4	6·4	6·2	12·4	12·1
05	14 31·3	14 33·6	13 51·6	0·5	0·5	6·5	6·3	12·5	12·2
06	14 31·5	14 33·9	13 51·8	0·6	0·6	6·6	6·4	12·6	12·3
07	14 31·8	14 34·1	13 52·0	0·7	0·7	6·7	6·5	12·7	12·4
08	14 32·0	14 34·4	13 52·3	0·8	0·8	6·8	6·6	12·8	12·5
09	14 32·3	14 34·6	13 52·5	0·9	0·9	6·9	6·7	12·9	12·6
10	14 32·5	14 34·9	13 52·8	1·0	1·0	7·0	6·8	13·0	12·7
11	14 32·8	14 35·1	13 53·0	1·1	1·1	7·1	6·9	13·1	12·8
12	14 33·0	14 35·4	13 53·2	1·2	1·2	7·2	7·0	13·2	12·9
13	14 33·3	14 35·6	13 53·5	1·3	1·3	7·3	7·1	13·3	13·0
14	14 33·5	14 35·9	13 53·7	1·4	1·4	7·4	7·2	13·4	13·1
15	14 33·8	14 36·1	13 53·9	1·5	1·5	7·5	7·3	13·5	13·2
16	14 34·0	14 36·4	13 54·2	1·6	1·6	7·6	7·4	13·6	13·3
17	14 34·3	14 36·6	13 54·4	1·7	1·7	7·7	7·5	13·7	13·4
18	14 34·5	14 36·9	13 54·7	1·8	1·8	7·8	7·6	13·8	13·5
19	14 34·8	14 37·1	13 54·9	1·9	1·9	7·9	7·7	13·9	13·6
20	14 35·0	14 37·4	13 55·1	2·0	2·0	8·0	7·8	14·0	13·7
21	14 35·3	14 37·6	13 55·4	2·1	2·0	8·1	7·9	14·1	13·7
22	14 35·5	14 37·9	13 55·6	2·2	2·1	8·2	8·0	14·2	13·8
23	14 35·8	14 38·1	13 55·9	2·3	2·2	8·3	8·1	14·3	13·9
24	14 36·0	14 38·4	13 56·1	2·4	2·3	8·4	8·2	14·4	14·0
25	14 36·3	14 38·6	13 56·3	2·5	2·4	8·5	8·3	14·5	14·1
26	14 36·5	14 38·9	13 56·6	2·6	2·5	8·6	8·4	14·6	14·2
27	14 36·8	14 39·2	13 56·8	2·7	2·6	8·7	8·5	14·7	14·3
28	14 37·0	14 39·4	13 57·0	2·8	2·7	8·8	8·6	14·8	14·4
29	14 37·3	14 39·7	13 57·3	2·9	2·8	8·9	8·7	14·9	14·5
30	14 37·5	14 39·9	13 57·5	3·0	2·9	9·0	8·8	15·0	14·6
31	14 37·8	14 40·2	13 57·8	3·1	3·0	9·1	8·9	15·1	14·7
32	14 38·0	14 40·4	13 58·0	3·2	3·1	9·2	9·0	15·2	14·8
33	14 38·3	14 40·7	13 58·2	3·3	3·2	9·3	9·1	15·3	14·9
34	14 38·5	14 40·9	13 58·5	3·4	3·3	9·4	9·2	15·4	15·0
35	14 38·8	14 41·2	13 58·7	3·5	3·4	9·5	9·3	15·5	15·1
36	14 39·0	14 41·4	13 59·0	3·6	3·5	9·6	9·4	15·6	15·2
37	14 39·3	14 41·7	13 59·2	3·7	3·6	9·7	9·5	15·7	15·3
38	14 39·5	14 41·9	13 59·4	3·8	3·7	9·8	9·6	15·8	15·4
39	14 39·8	14 42·2	13 59·7	3·9	3·8	9·9	9·7	15·9	15·5
40	14 40·0	14 42·4	13 59·9	4·0	3·9	10·0	9·8	16·0	15·6
41	14 40·3	14 42·7	14 00·1	4·1	4·0	10·1	9·8	16·1	15·7
42	14 40·5	14 42·9	14 00·4	4·2	4·1	10·2	9·9	16·2	15·8
43	14 40·8	14 43·2	14 00·6	4·3	4·2	10·3	10·0	16·3	15·9
44	14 41·0	14 43·4	14 00·9	4·4	4·3	10·4	10·1	16·4	16·0
45	14 41·3	14 43·7	14 01·1	4·5	4·4	10·5	10·2	16·5	16·1
46	14 41·5	14 43·9	14 01·3	4·6	4·5	10·6	10·3	16·6	16·2
47	14 41·8	14 44·2	14 01·6	4·7	4·6	10·7	10·4	16·7	16·3
48	14 42·0	14 44·4	14 01·8	4·8	4·7	10·8	10·5	16·8	16·4
49	14 42·3	14 44·7	14 02·1	4·9	4·8	10·9	10·6	16·9	16·5
50	14 42·5	14 44·9	14 02·3	5·0	4·9	11·0	10·7	17·0	16·6
51	14 42·8	14 45·2	14 02·5	5·1	5·0	11·1	10·8	17·1	16·7
52	14 43·0	14 45·4	14 02·8	5·2	5·1	11·2	10·9	17·2	16·8
53	14 43·3	14 45·7	14 03·0	5·3	5·2	11·3	11·0	17·3	16·9
54	14 43·5	14 45·9	14 03·3	5·4	5·3	11·4	11·1	17·4	17·0
55	14 43·8	14 46·2	14 03·5	5·5	5·4	11·5	11·2	17·5	17·1
56	14 44·0	14 46·4	14 03·7	5·6	5·5	11·6	11·3	17·6	17·2
57	14 44·3	14 46·7	14 04·0	5·7	5·6	11·7	11·4	17·7	17·3
58	14 44·5	14 46·9	14 04·2	5·8	5·7	11·8	11·5	17·8	17·4
59	14 44·8	14 47·2	14 04·4	5·9	5·8	11·9	11·6	17·9	17·5
60	14 45·0	14 47·4	14 04·7	6·0	5·9	12·0	11·7	18·0	17·6

59m	SUN PLANETS	ARIES	MOON	v or Corr^n d	v or Corr^n d	v or Corr^n d	v or Corr^n d
s	° ′	° ′	° ′	′	′	′	′
00	14 45·0	14 47·4	14 04·7	0·0	0·0	6·0	6·0	12·0	11·9
01	14 45·3	14 47·7	14 04·9	0·1	0·1	6·1	6·0	12·1	12·0
02	14 45·5	14 47·9	14 05·2	0·2	0·2	6·2	6·1	12·2	12·1
03	14 45·8	14 48·2	14 05·4	0·3	0·3	6·3	6·2	12·3	12·2
04	14 46·0	14 48·4	14 05·6	0·4	0·4	6·4	6·3	12·4	12·3
05	14 46·3	14 48·7	14 05·9	0·5	0·5	6·5	6·4	12·5	12·4
06	14 46·5	14 48·9	14 06·1	0·6	0·6	6·6	6·5	12·6	12·5
07	14 46·8	14 49·2	14 06·4	0·7	0·7	6·7	6·6	12·7	12·6
08	14 47·0	14 49·4	14 06·6	0·8	0·8	6·8	6·7	12·8	12·7
09	14 47·3	14 49·7	14 06·8	0·9	0·9	6·9	6·8	12·9	12·8
10	14 47·5	14 49·9	14 07·1	1·0	1·0	7·0	6·9	13·0	12·9
11	14 47·8	14 50·2	14 07·3	1·1	1·1	7·1	7·0	13·1	13·0
12	14 48·0	14 50·4	14 07·5	1·2	1·2	7·2	7·1	13·2	13·1
13	14 48·3	14 50·7	14 07·8	1·3	1·3	7·3	7·2	13·3	13·2
14	14 48·5	14 50·9	14 08·0	1·4	1·4	7·4	7·3	13·4	13·3
15	14 48·8	14 51·2	14 08·3	1·5	1·5	7·5	7·4	13·5	13·4
16	14 49·0	14 51·4	14 08·5	1·6	1·6	7·6	7·5	13·6	13·5
17	14 49·3	14 51·7	14 08·7	1·7	1·7	7·7	7·6	13·7	13·6
18	14 49·5	14 51·9	14 09·0	1·8	1·8	7·8	7·7	13·8	13·7
19	14 49·8	14 52·2	14 09·2	1·9	1·9	7·9	7·8	13·9	13·8
20	14 50·0	14 52·4	14 09·5	2·0	2·0	8·0	7·9	14·0	13·9
21	14 50·3	14 52·7	14 09·7	2·1	2·1	8·1	8·0	14·1	14·0
22	14 50·5	14 52·9	14 09·9	2·2	2·2	8·2	8·1	14·2	14·1
23	14 50·8	14 53·2	14 10·2	2·3	2·3	8·3	8·2	14·3	14·2
24	14 51·0	14 53·4	14 10·4	2·4	2·4	8·4	8·3	14·4	14·3
25	14 51·3	14 53·7	14 10·6	2·5	2·5	8·5	8·4	14·5	14·4
26	14 51·5	14 53·9	14 10·9	2·6	2·6	8·6	8·5	14·6	14·5
27	14 51·8	14 54·2	14 11·1	2·7	2·7	8·7	8·6	14·7	14·6
28	14 52·0	14 54·4	14 11·4	2·8	2·8	8·8	8·7	14·8	14·7
29	14 52·3	14 54·7	14 11·6	2·9	2·9	8·9	8·8	14·9	14·8
30	14 52·5	14 54·9	14 11·8	3·0	3·0	9·0	8·9	15·0	14·9
31	14 52·8	14 55·2	14 12·1	3·1	3·1	9·1	9·0	15·1	15·0
32	14 53·0	14 55·4	14 12·3	3·2	3·2	9·2	9·1	15·2	15·1
33	14 53·3	14 55·7	14 12·6	3·3	3·3	9·3	9·2	15·3	15·2
34	14 53·5	14 55·9	14 12·8	3·4	3·4	9·4	9·3	15·4	15·3
35	14 53·8	14 56·2	14 13·0	3·5	3·5	9·5	9·4	15·5	15·4
36	14 54·0	14 56·4	14 13·3	3·6	3·6	9·6	9·5	15·6	15·5
37	14 54·3	14 56·7	14 13·5	3·7	3·7	9·7	9·6	15·7	15·6
38	14 54·5	14 56·9	14 13·8	3·8	3·8	9·8	9·7	15·8	15·7
39	14 54·8	14 57·2	14 14·0	3·9	3·9	9·9	9·8	15·9	15·8
40	14 55·0	14 57·5	14 14·2	4·0	4·0	10·0	9·9	16·0	15·9
41	14 55·3	14 57·7	14 14·5	4·1	4·1	10·1	10·0	16·1	16·0
42	14 55·5	14 58·0	14 14·7	4·2	4·2	10·2	10·1	16·2	16·1
43	14 55·8	14 58·2	14 14·9	4·3	4·3	10·3	10·2	16·3	16·2
44	14 56·0	14 58·5	14 15·2	4·4	4·4	10·4	10·3	16·4	16·3
45	14 56·3	14 58·7	14 15·4	4·5	4·5	10·5	10·4	16·5	16·4
46	14 56·5	14 59·0	14 15·7	4·6	4·6	10·6	10·5	16·6	16·5
47	14 56·8	14 59·2	14 15·9	4·7	4·7	10·7	10·6	16·7	16·6
48	14 57·0	14 59·5	14 16·1	4·8	4·8	10·8	10·7	16·8	16·7
49	14 57·3	14 59·7	14 16·4	4·9	4·9	10·9	10·8	16·9	16·8
50	14 57·5	15 00·0	14 16·6	5·0	5·0	11·0	10·9	17·0	16·9
51	14 57·8	15 00·2	14 16·9	5·1	5·1	11·1	11·0	17·1	17·0
52	14 58·0	15 00·5	14 17·1	5·2	5·2	11·2	11·1	17·2	17·1
53	14 58·3	15 00·7	14 17·3	5·3	5·3	11·3	11·2	17·3	17·2
54	14 58·5	15 01·0	14 17·6	5·4	5·4	11·4	11·3	17·4	17·3
55	14 58·8	15 01·2	14 17·8	5·5	5·5	11·5	11·4	17·5	17·4
56	14 59·0	15 01·5	14 18·0	5·6	5·6	11·6	11·5	17·6	17·5
57	14 59·3	15 01·7	14 18·3	5·7	5·7	11·7	11·6	17·7	17·6
58	14 59·5	15 02·0	14 18·5	5·8	5·8	11·8	11·7	17·8	17·7
59	14 59·8	15 02·2	14 18·8	5·9	5·9	11·9	11·8	17·9	17·8
60	15 00·0	15 02·5	14 19·0	6·0	6·0	12·0	11·9	18·0	17·9

Forklaring

Astronomiske data

CONVERSION OF ARC TO TIME

0°–59°		60°–119°		120°–179°		180°–239°		240°–299°		300°–359°			0′·00	0′·25	0′·50	0′·75
°	h m	°	h m	°	h m	°	h m	°	h m	°	h m	′	m s	m s	m s	m s
0	0 00	60	4 00	120	8 00	180	12 00	240	16 00	300	20 00	0	0 00	0 01	0 02	0 03
1	0 04	61	4 04	121	8 04	181	12 04	241	16 04	301	20 04	1	0 04	0 05	0 06	0 07
2	0 08	62	4 08	122	8 08	182	12 08	242	16 08	302	20 08	2	0 08	0 09	0 10	0 11
3	0 12	63	4 12	123	8 12	183	12 12	243	16 12	303	20 12	3	0 12	0 13	0 14	0 15
4	0 16	64	4 16	124	8 16	184	12 16	244	16 16	304	20 16	4	0 16	0 17	0 18	0 19
5	0 20	65	4 20	125	8 20	185	12 20	245	16 20	305	20 20	5	0 20	0 21	0 22	0 23
6	0 24	66	4 24	126	8 24	186	12 24	246	16 24	306	20 24	6	0 24	0 25	0 26	0 27
7	0 28	67	4 28	127	8 28	187	12 28	247	16 28	307	20 28	7	0 28	0 29	0 30	0 31
8	0 32	68	4 32	128	8 32	188	12 32	248	16 32	308	20 32	8	0 32	0 33	0 34	0 35
9	0 36	69	4 36	129	8 36	189	12 36	249	16 36	309	20 36	9	0 36	0 37	0 38	0 39
10	0 40	70	4 40	130	8 40	190	12 40	250	16 40	310	20 40	10	0 40	0 41	0 42	0 43
11	0 44	71	4 44	131	8 44	191	12 44	251	16 44	311	20 44	11	0 44	0 45	0 46	0 47
12	0 48	72	4 48	132	8 48	192	12 48	252	16 48	312	20 48	12	0 48	0 49	0 50	0 51
13	0 52	73	4 52	133	8 52	193	12 52	253	16 52	313	20 52	13	0 52	0 53	0 54	0 55
14	0 56	74	4 56	134	8 56	194	12 56	254	16 56	314	20 56	14	0 56	0 57	0 58	0 59
15	1 00	75	5 00	135	9 00	195	13 00	255	17 00	315	21 00	15	1 00	1 01	1 02	1 03
16	1 04	76	5 04	136	9 04	196	13 04	256	17 04	316	21 04	16	1 04	1 05	1 06	1 07
17	1 08	77	5 08	137	9 08	197	13 08	257	17 08	317	21 08	17	1 08	1 09	1 10	1 11
18	1 12	78	5 12	138	9 12	198	13 12	258	17 12	318	21 12	18	1 12	1 13	1 14	1 15
19	1 16	79	5 16	139	9 16	199	13 16	259	17 16	319	21 16	19	1 16	1 17	1 18	1 19
20	1 20	80	5 20	140	9 20	200	13 20	260	17 20	320	21 20	20	1 20	1 21	1 22	1 23
21	1 24	81	5 24	141	9 24	201	13 24	261	17 24	321	21 24	21	1 24	1 25	1 26	1 27
22	1 28	82	5 28	142	9 28	202	13 28	262	17 28	322	21 28	22	1 28	1 29	1 30	1 31
23	1 32	83	5 32	143	9 32	203	13 32	263	17 32	323	21 32	23	1 32	1 33	1 34	1 35
24	1 36	84	5 36	144	9 36	204	13 36	264	17 36	324	21 36	24	1 36	1 37	1 38	1 39
25	1 40	85	5 40	145	9 40	205	13 40	265	17 40	325	21 40	25	1 40	1 41	1 42	1 43
26	1 44	86	5 44	146	9 44	206	13 44	266	17 44	326	21 44	26	1 44	1 45	1 46	1 47
27	1 48	87	5 48	147	9 48	207	13 48	267	17 48	327	21 48	27	1 48	1 49	1 50	1 51
28	1 52	88	5 52	148	9 52	208	13 52	268	17 52	328	21 52	28	1 52	1 53	1 54	1 55
29	1 56	89	5 56	149	9 56	209	13 56	269	17 56	329	21 56	29	1 56	1 57	1 58	1 59
30	2 00	90	6 00	150	10 00	210	14 00	270	18 00	330	22 00	30	2 00	2 01	2 02	2 03
31	2 04	91	6 04	151	10 04	211	14 04	271	18 04	331	22 04	31	2 04	2 05	2 06	2 07
32	2 08	92	6 08	152	10 08	212	14 08	272	18 08	332	22 08	32	2 08	2 09	2 10	2 11
33	2 12	93	6 12	153	10 12	213	14 12	273	18 12	333	22 12	33	2 12	2 13	2 14	2 15
34	2 16	94	6 16	154	10 16	214	14 16	274	18 16	334	22 16	34	2 16	2 17	2 18	2 19
35	2 20	95	6 20	155	10 20	215	14 20	275	18 20	335	22 20	35	2 20	2 21	2 22	2 23
36	2 24	96	6 24	156	10 24	216	14 24	276	18 24	336	22 24	36	2 24	2 25	2 26	2 27
37	2 28	97	6 28	157	10 28	217	14 28	277	18 28	337	22 28	37	2 28	2 29	2 30	2 31
38	2 32	98	6 32	158	10 32	218	14 32	278	18 32	338	22 32	38	2 32	2 33	2 34	2 35
39	2 36	99	6 36	159	10 36	219	14 36	279	18 36	339	22 36	39	2 36	2 37	2 38	2 39
40	2 40	100	6 40	160	10 40	220	14 40	280	18 40	340	22 40	40	2 40	2 41	2 42	2 43
41	2 44	101	6 44	161	10 44	221	14 44	281	18 44	341	22 44	41	2 44	2 45	2 46	2 47
42	2 48	102	6 48	162	10 48	222	14 48	282	18 48	342	22 48	42	2 48	2 49	2 50	2 51
43	2 52	103	6 52	163	10 52	223	14 52	283	18 52	343	22 52	43	2 52	2 53	2 54	2 55
44	2 56	104	6 56	164	10 56	224	14 56	284	18 56	344	22 56	44	2 56	2 57	2 58	2 59
45	3 00	105	7 00	165	11 00	225	15 00	285	19 00	345	23 00	45	3 00	3 01	3 02	3 03
46	3 04	106	7 04	166	11 04	226	15 04	286	19 04	346	23 04	46	3 04	3 05	3 06	3 07
47	3 08	107	7 08	167	11 08	227	15 08	287	19 08	347	23 08	47	3 08	3 09	3 10	3 11
48	3 12	108	7 12	168	11 12	228	15 12	288	19 12	348	23 12	48	3 12	3 13	3 14	3 15
49	3 16	109	7 16	169	11 16	229	15 16	289	19 16	349	23 16	49	3 16	3 17	3 18	3 19
50	3 20	110	7 20	170	11 20	230	15 20	290	19 20	350	23 20	50	3 20	3 21	3 22	3 23
51	3 24	111	7 24	171	11 24	231	15 24	291	19 24	351	23 24	51	3 24	3 25	3 26	3 27
52	3 28	112	7 28	172	11 28	232	15 28	292	19 28	352	23 28	52	3 28	3 29	3 30	3 31
53	3 32	113	7 32	173	11 32	233	15 32	293	19 32	353	23 32	53	3 32	3 33	3 34	3 35
54	3 36	114	7 36	174	11 36	234	15 36	294	19 36	354	23 36	54	3 36	3 37	3 38	3 39
55	3 40	115	7 40	175	11 40	235	15 40	295	19 40	355	23 40	55	3 40	3 41	3 42	3 43
56	3 44	116	7 44	176	11 44	236	15 44	296	19 44	356	23 44	56	3 44	3 45	3 46	3 47
57	3 48	117	7 48	177	11 48	237	15 48	297	19 48	357	23 48	57	3 48	3 49	3 50	3 51
58	3 52	118	7 52	178	11 52	238	15 52	298	19 52	358	23 52	58	3 52	3 53	3 54	3 55
59	3 56	119	7 56	179	11 56	239	15 56	299	19 56	359	23 56	59	3 56	3 57	3 58	3 59

The above table is for converting expressions in arc to their equivalent in time; its main use in this Almanac is for the conversion of longitude for application to L.M.T. (*added* if *west*, *subtracted* if *east*) to give UT or vice versa, particularly in the case of sunrise, sunset, etc.

ALTITUDE CORRECTION TABLES 10°-90°—SUN, STARS, PLANETS

SUN

OCT.—MAR. App. Alt.	Lower Limb	Upper Limb	APR.—SEPT. App. Alt.	Lower Limb	Upper Limb
° ′	′	′	° ′	′	′
9 33	+10·8	−21·5	9 39	+10·6	−21·2
9 45	+10·9	−21·4	9 50	+10·7	−21·1
9 56	+11·0	−21·3	10 02	+10·8	−21·0
10 08	+11·1	−21·2	10 14	+10·9	−20·9
10 20	+11·2	−21·1	10 27	+11·0	−20·8
10 33	+11·3	−21·0	10 40	+11·1	−20·7
10 46	+11·4	−20·9	10 53	+11·2	−20·6
11 00	+11·5	−20·8	11 07	+11·3	−20·5
11 15	+11·6	−20·7	11 22	+11·4	−20·4
11 30	+11·7	−20·6	11 37	+11·5	−20·3
11 45	+11·8	−20·5	11 53	+11·6	−20·2
12 01	+11·9	−20·4	12 10	+11·7	−20·1
12 18	+12·0	−20·3	12 27	+11·8	−20·0
12 36	+12·1	−20·2	12 45	+11·9	−19·9
12 54	+12·2	−20·1	13 04	+12·0	−19·8
13 14	+12·3	−20·0	13 24	+12·1	−19·7
13 34	+12·4	−19·9	13 44	+12·2	−19·6
13 55	+12·5	−19·8	14 06	+12·3	−19·5
14 17	+12·6	−19·7	14 29	+12·4	−19·4
14 41	+12·7	−19·6	14 53	+12·5	−19·3
15 05	+12·8	−19·5	15 18	+12·6	−19·2
15 31	+12·9	−19·4	15 45	+12·7	−19·1
15 59	+13·0	−19·3	16 13	+12·8	−19·0
16 27	+13·1	−19·2	16 43	+12·9	−18·9
16 58	+13·2	−19·1	17 14	+13·0	−18·8
17 30	+13·3	−19·0	17 47	+13·1	−18·7
18 05	+13·4	−18·9	18 23	+13·2	−18·6
18 41	+13·5	−18·8	19 00	+13·3	−18·5
19 20	+13·6	−18·7	19 41	+13·4	−18·4
20 02	+13·7	−18·6	20 24	+13·5	−18·3
20 46	+13·8	−18·5	21 10	+13·6	−18·2
21 34	+13·9	−18·4	21 59	+13·7	−18·1
22 25	+14·0	−18·3	22 52	+13·8	−18·0
23 20	+14·1	−18·2	23 49	+13·9	−17·9
24 20	+14·2	−18·1	24 51	+14·0	−17·8
25 24	+14·3	−18·0	25 58	+14·1	−17·7
26 34	+14·4	−17·9	27 11	+14·2	−17·6
27 50	+14·5	−17·8	28 31	+14·3	−17·5
29 13	+14·6	−17·7	29 58	+14·4	−17·4
30 44	+14·7	−17·6	31 33	+14·5	−17·3
32 24	+14·8	−17·5	33 18	+14·6	−17·2
34 15	+14·9	−17·4	35 15	+14·7	−17·1
36 17	+15·0	−17·3	37 24	+14·8	−17·0
38 34	+15·1	−17·2	39 48	+14·9	−16·9
41 06	+15·2	−17·1	42 28	+15·0	−16·8
43 56	+15·3	−17·0	45 29	+15·1	−16·7
47 07	+15·4	−16·9	48 52	+15·2	−16·6
50 43	+15·5	−16·8	52 41	+15·3	−16·5
54 46	+15·6	−16·7	56 59	+15·4	−16·4
59 21	+15·7	−16·6	61 50	+15·5	−16·3
64 28	+15·8	−16·5	67 15	+15·6	−16·2
70 10	+15·9	−16·4	73 14	+15·7	−16·1
76 24	+16·0	−16·3	79 42	+15·8	−16·0
83 05	+16·1	−16·2	86 31	+15·9	−15·9
90 00			90 00		

STARS AND PLANETS

App. Alt.	Corrⁿ
° ′	′
9 55	−5·3
10 07	−5·2
10 20	−5·1
10 32	−5·0
10 46	−4·9
10 59	−4·8
11 14	−4·7
11 29	−4·6
11 44	−4·5
12 00	−4·4
12 17	−4·3
12 35	−4·2
12 53	−4·1
13 12	−4·0
13 32	−3·9
13 53	−3·8
14 16	−3·7
14 39	−3·6
15 03	−3·5
15 29	−3·4
15 56	−3·3
16 25	−3·2
16 55	−3·1
17 27	−3·0
18 01	−2·9
18 37	−2·8
19 16	−2·7
19 56	−2·6
20 40	−2·5
21 27	−2·4
22 17	−2·3
23 11	−2·2
24 09	−2·1
25 12	−2·0
26 20	−1·9
27 34	−1·8
28 54	−1·7
30 22	−1·6
31 58	−1·5
33 43	−1·4
35 38	−1·3
37 45	−1·2
40 06	−1·1
42 42	−1·0
45 34	−0·9
48 45	−0·8
52 16	−0·7
56 09	−0·6
60 26	−0·5
65 06	−0·4
70 09	−0·3
75 32	−0·2
81 12	−0·1
87 03	0·0
90 00	

App. Alt.	Additional Corrⁿ
	2013
	VENUS
Jan. 1–Sept. 21	
°	′
0	+0·1
60	
Sept. 22–Nov. 11	
°	′
0	+0·2
41	+0·1
76	
Nov. 12–Dec. 5	
°	′
0	+0·3
34	+0·2
60	+0·1
80	
Dec. 6–Dec. 20	
°	′
0	+0·4
29	+0·3
51	+0·2
68	+0·1
83	
Dec. 21–Dec. 31	
°	′
0	+0·5
26	+0·4
46	+0·3
60	+0·2
73	+0·1
84	
	MARS
Jan. 1–Dec. 31	
°	′
0	+0·1
60	

DIP

Ht. of Eye	Corrⁿ	Ht. of Eye
m	′	ft.
2·4	−2·8	8·0
2·6	−2·9	8·6
2·8	−3·0	9·2
3·0	−3·1	9·8
3·2	−3·2	10·5
3·4	−3·3	11·2
3·6	−3·4	11·9
3·8	−3·5	12·6
4·0	−3·6	13·3
4·3	−3·7	14·1
4·5	−3·8	14·9
4·7	−3·9	15·7
5·0	−4·0	16·5
5·2	−4·1	17·4
5·5	−4·2	18·3
5·8	−4·3	19·1
6·1	−4·4	20·1
6·3	−4·5	21·0
6·6	−4·6	22·0
6·9	−4·7	22·9
7·2	−4·8	23·9
7·5	−4·9	24·9
7·9	−5·0	26·0
8·2	−5·1	27·1
8·5	−5·2	28·1
8·8	−5·3	29·2
9·2	−5·4	30·4
9·5	−5·5	31·5
9·9	−5·6	32·7
10·3	−5·7	33·9
10·6	−5·8	35·1
11·0	−5·9	36·3
11·4	−6·0	37·6
11·8	−6·1	38·9
12·2	−6·2	40·1
12·6	−6·3	41·5
13·0	−6·4	42·8
13·4	−6·5	44·2
13·8	−6·6	45·5
14·2	−6·7	46·9
14·7	−6·8	48·4
15·1	−6·9	49·8
15·5	−7·0	51·3
16·0	−7·1	52·8
16·5	−7·2	54·3
16·9	−7·3	55·8
17·4	−7·4	57·4
17·9	−7·5	58·9
18·4	−7·6	60·5
18·8	−7·7	62·1
19·3	−7·8	63·8
19·8	−7·9	65·4
20·4	−8·0	67·1
20·9	−8·1	68·8
21·4		70·5

Ht. of Eye	Corrⁿ
m	′
1·0 – 1·8	
1·5 – 2·2	
2·0 – 2·5	
2·5 – 2·8	
3·0 – 3·0	
See table ←	
m	′
20 – 7·9	
22 – 8·3	
24 – 8·6	
26 – 9·0	
28 – 9·3	
30 – 9·6	
32 – 10·0	
34 – 10·3	
36 – 10·6	
38 – 10·8	
40 – 11·1	
42 – 11·4	
44 – 11·7	
46 – 11·9	
48 – 12·2	
ft.	′
2 – 1·4	
4 – 1·9	
6 – 2·4	
8 – 2·7	
10 – 3·1	
See table ←	
ft.	′
70 – 8·1	
75 – 8·4	
80 – 8·7	
85 – 8·9	
90 – 9·2	
95 – 9·5	
100 – 9·7	
105 – 9·9	
110 – 10·2	
115 – 10·4	
120 – 10·6	
125 – 10·8	
130 – 11·1	
135 – 11·3	
140 – 11·5	
145 – 11·7	
150 – 11·9	
155 – 12·1	

App. Alt. = Apparent altitude = Sextant altitude corrected for index error and dip.

Tilbage til Menuen

App. Alt.	OCT.—MAR. SUN Lower Limb	OCT.—MAR. SUN Upper Limb	APR.—SEPT. SUN Lower Limb	APR.—SEPT. SUN Upper Limb	STARS PLANETS
° ′	′	′	′	′	′
0 00	−17·5	−49·8	−17·8	−49·6	−33·8
0 03	16·9	49·2	17·2	49·0	33·2
0 06	16·3	48·6	16·6	48·4	32·6
0 09	15·7	48·0	16·0	47·8	32·0
0 12	15·2	47·5	15·4	47·2	31·5
0 15	14·6	46·9	14·8	46·6	30·9
0 18	−14·1	−46·4	−14·3	−46·1	−30·4
0 21	13·5	45·8	13·8	45·6	29·8
0 24	13·0	45·3	13·3	45·1	29·3
0 27	12·5	44·8	12·8	44·6	28·8
0 30	12·0	44·3	12·3	44·1	28·3
0 33	11·6	43·9	11·8	43·6	27·9
0 36	−11·1	−43·4	−11·3	−43·1	−27·4
0 39	10·6	42·9	10·9	42·7	26·9
0 42	10·2	42·5	10·5	42·3	26·5
0 45	9·8	42·1	10·0	41·8	26·1
0 48	9·4	41·7	9·6	41·4	25·7
0 51	9·0	41·3	9·2	41·0	25·3
0 54	− 8·6	−40·9	− 8·8	−40·6	−24·9
0 57	8·2	40·5	8·4	40·2	24·5
1 00	7·8	40·1	8·0	39·8	24·1
1 03	7·4	39·7	7·7	39·5	23·7
1 06	7·1	39·4	7·3	39·1	23·4
1 09	6·7	39·0	7·0	38·8	23·0
1 12	− 6·4	−38·7	− 6·6	−38·4	−22·7
1 15	6·0	38·3	6·3	38·1	22·3
1 18	5·7	38·0	6·0	37·8	22·0
1 21	5·4	37·7	5·7	37·5	21·7
1 24	5·1	37·4	5·3	37·1	21·4
1 27	4·8	37·1	5·0	36·8	21·1
1 30	− 4·5	−36·8	− 4·7	−36·5	−20·8
1 35	4·0	36·3	4·3	36·1	20·3
1 40	3·6	35·9	3·8	35·6	19·9
1 45	3·1	35·4	3·4	35·2	19·4
1 50	2·7	35·0	2·9	34·7	19·0
1 55	2·3	34·6	2·5	34·3	18·6
2 00	− 1·9	−34·2	− 2·1	−33·9	−18·2
2 05	1·5	33·8	1·7	33·5	17·8
2 10	1·1	33·4	1·4	33·2	17·4
2 15	0·8	33·1	1·0	32·8	17·1
2 20	0·4	32·7	0·7	32·5	16·7
2 25	− 0·1	32·4	− 0·3	32·1	16·4
2 30	+ 0·2	−32·1	0·0	−31·8	−16·1
2 35	0·5	31·8	+ 0·3	31·5	15·8
2 40	0·8	31·5	0·6	31·2	15·4
2 45	1·1	31·2	0·9	30·9	15·2
2 50	1·4	30·9	1·2	30·6	14·9
2 55	1·7	30·6	1·4	30·4	14·6
3 00	+ 2·0	−30·3	+ 1·7	−30·1	−14·3
3 05	2·2	30·1	2·0	29·8	14·1
3 10	2·5	29·8	2·2	29·6	13·8
3 15	2·7	29·6	2·5	29·3	13·6
3 20	2·9	29·4	2·7	29·1	13·4
3 25	3·2	29·1	2·9	28·9	13·1
3 30	+ 3·4	−28·9	+ 3·1	−28·7	−12·9

App. Alt.	OCT.—MAR. SUN Lower Limb	OCT.—MAR. SUN Upper Limb	APR.—SEPT. SUN Lower Limb	APR.—SEPT. SUN Upper Limb	STARS PLANETS
° ′	′	′	′	′	′
3 30	+ 3·4	−28·9	+ 3·1	−28·7	−12·9
3 35	3·6	28·7	3·3	28·5	12·7
3 40	3·8	28·5	3·6	28·2	12·5
3 45	4·0	28·3	3·8	28·0	12·3
3 50	4·2	28·1	4·0	27·8	12·1
3 55	4·4	27·9	4·1	27·7	11·9
4 00	+ 4·6	−27·7	+ 4·3	−27·5	−11·7
4 05	4·8	27·5	4·5	27·3	11·5
4 10	4·9	27·4	4·7	27·1	11·4
4 15	5·1	27·2	4·9	26·9	11·2
4 20	5·3	27·0	5·0	26·8	11·0
4 25	5·4	26·9	5·2	26·6	10·9
4 30	+ 5·6	−26·7	+ 5·3	−26·5	−10·7
4 35	5·7	26·6	5·5	26·3	10·6
4 40	5·9	26·4	5·6	26·2	10·4
4 45	6·0	26·3	5·8	26·0	10·3
4 50	6·2	26·1	5·9	25·9	10·1
4 55	6·3	26·0	6·1	25·7	10·0
5 00	+ 6·4	−25·9	+ 6·2	−25·6	− 9·8
5 05	6·6	25·7	6·3	25·5	9·7
5 10	6·7	25·6	6·5	25·3	9·6
5 15	6·8	25·5	6·6	25·2	9·5
5 20	7·0	25·3	6·7	25·1	9·3
5 25	7·1	25·2	6·8	25·0	9·2
5 30	+ 7·2	−25·1	+ 6·9	−24·9	− 9·1
5 35	7·3	25·0	7·1	24·7	9·0
5 40	7·4	24·9	7·2	24·6	8·9
5 45	7·5	24·8	7·3	24·5	8·8
5 50	7·6	24·7	7·4	24·4	8·7
5 55	7·7	24·6	7·5	24·3	8·6
6 00	+ 7·8	−24·5	+ 7·6	−24·2	− 8·5
6 10	8·0	24·3	7·8	24·0	8·3
6 20	8·2	24·1	8·0	23·8	8·1
6 30	8·4	23·9	8·2	23·6	7·9
6 40	8·6	23·7	8·3	23·5	7·7
6 50	8·7	23·6	8·5	23·3	7·6
7 00	+ 8·9	−23·4	+ 8·7	−23·1	− 7·4
7 10	9·1	23·2	8·8	23·0	7·2
7 20	9·2	23·1	9·0	22·8	7·1
7 30	9·3	23·0	9·1	22·7	6·9
7 40	9·5	22·8	9·2	22·6	6·8
7 50	9·6	22·7	9·4	22·4	6·7
8 00	+ 9·7	−22·6	+ 9·5	−22·3	− 6·6
8 10	9·9	22·4	9·6	22·2	6·4
8 20	10·0	22·3	9·7	22·1	6·3
8 30	10·1	22·2	9·9	21·9	6·2
8 40	10·2	22·1	10·0	21·8	6·1
8 50	10·3	22·0	10·1	21·7	6·0
9 00	+10·4	−21·9	+10·2	−21·6	− 5·9
9 10	10·5	21·8	10·3	21·5	5·8
9 20	10·6	21·7	10·4	21·4	5·7
9 30	10·7	21·6	10·5	21·3	5·6
9 40	10·8	21·5	10·6	21·2	5·5
9 50	10·9	21·4	10·6	21·2	5·4
10 00	+11·0	−21·3	+10·7	−21·1	− 5·3

Additional corrections for temperature and pressure are given on the following page.

For bubble sextant observations ignore dip and use the star corrections for Sun, planets and stars.

Tilbage til Menuen

App. Alt.	0°–4° Corr^{n}	5°–9° Corr^{n}	10°–14° Corr^{n}	15°–19° Corr^{n}	20°–24° Corr^{n}	25°–29° Corr^{n}	30°–34° Corr^{n}	App. Alt.
′	☾	☾	☾	☾	☾	☾	☾	′
00	0 34·5	5 58·2	10 62·1	15 62·8	20 62·2	25 60·8	30 58·9	00
10	36·5	58·5	62·2	62·8	62·2	60·8	58·8	10
20	38·3	58·7	62·2	62·8	62·1	60·7	58·8	20
30	40·0	58·9	62·3	62·8	62·1	60·7	58·7	30
40	41·5	59·1	62·3	62·8	62·0	60·6	58·6	40
50	42·9	59·3	62·4	62·7	62·0	60·6	58·5	50
00	1 44·2	6 59·5	11 62·4	16 62·7	21 62·0	26 60·5	31 58·5	00
10	45·4	59·7	62·4	62·7	61·9	60·4	58·4	10
20	46·5	59·9	62·5	62·7	61·9	60·4	58·3	20
30	47·5	60·0	62·5	62·7	61·9	60·3	58·2	30
40	48·4	60·2	62·5	62·7	61·8	60·3	58·2	40
50	49·3	60·3	62·6	62·7	61·8	60·2	58·1	50
00	2 50·1	7 60·5	12 62·6	17 62·7	22 61·7	27 60·1	32 58·0	00
10	50·8	60·6	62·6	62·6	61·7	60·1	57·9	10
20	51·5	60·7	62·6	62·6	61·6	60·0	57·8	20
30	52·2	60·9	62·7	62·6	61·6	59·9	57·8	30
40	52·8	61·0	62·7	62·6	61·6	59·9	57·7	40
50	53·4	61·1	62·7	62·6	61·5	59·8	57·6	50
00	3 53·9	8 61·2	13 62·7	18 62·5	23 61·5	28 59·7	33 57·5	00
10	54·4	61·3	62·7	62·5	61·4	59·7	57·4	10
20	54·9	61·4	62·7	62·5	61·4	59·6	57·4	20
30	55·3	61·5	62·8	62·5	61·3	59·5	57·3	30
40	55·7	61·6	62·8	62·4	61·3	59·5	57·2	40
50	56·1	61·6	62·8	62·4	61·2	59·4	57·1	50
00	4 56·4	9 61·7	14 62·8	19 62·4	24 61·2	29 59·3	34 57·0	00
10	56·8	61·8	62·8	62·4	61·1	59·3	56·9	10
20	57·1	61·9	62·8	62·3	61·1	59·2	56·9	20
30	57·4	61·9	62·8	62·3	61·0	59·1	56·8	30
40	57·7	62·0	62·8	62·3	61·0	59·1	56·7	40
50	58·0	62·1	62·8	62·2	60·9	59·0	56·6	50

HP	L	U	L	U	L	U	L	U	L	U	L	U	L	U	HP
′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
54·0	0·3	0·9	0·3	0·9	0·4	1·0	0·5	1·1	0·6	1·2	0·7	1·3	0·9	1·5	54·0
54·3	0·7	1·1	0·7	1·2	0·8	1·2	0·8	1·3	0·9	1·4	1·1	1·5	1·2	1·7	54·3
54·6	1·1	1·4	1·1	1·4	1·1	1·4	1·2	1·5	1·3	1·6	1·4	1·7	1·5	1·8	54·6
54·9	1·4	1·6	1·5	1·6	1·5	1·6	1·6	1·7	1·6	1·8	1·8	1·9	1·9	2·0	54·9
55·2	1·8	1·8	1·8	1·8	1·9	1·8	1·9	1·9	2·0	2·0	2·1	2·1	2·2	2·2	55·2
55·5	2·2	2·0	2·2	2·0	2·3	2·1	2·3	2·1	2·4	2·2	2·4	2·3	2·5	2·4	55·5
55·8	2·6	2·2	2·6	2·2	2·6	2·3	2·7	2·3	2·7	2·4	2·8	2·4	2·9	2·5	55·8
56·1	3·0	2·4	3·0	2·5	3·0	2·5	3·0	2·5	3·1	2·6	3·1	2·6	3·2	2·7	56·1
56·4	3·3	2·7	3·4	2·7	3·4	2·7	3·4	2·7	3·4	2·8	3·5	2·8	3·5	2·9	56·4
56·7	3·7	2·9	3·7	2·9	3·8	2·9	3·8	2·9	3·8	3·0	3·8	3·0	3·9	3·0	56·7
57·0	4·1	3·1	4·1	3·1	4·1	3·1	4·1	3·1	4·2	3·2	4·2	3·2	4·2	3·2	57·0
57·3	4·5	3·3	4·5	3·3	4·5	3·3	4·5	3·3	4·5	3·3	4·5	3·4	4·6	3·4	57·3
57·6	4·9	3·5	4·9	3·5	4·9	3·5	4·9	3·5	4·9	3·5	4·9	3·5	4·9	3·6	57·6
57·9	5·3	3·8	5·3	3·8	5·2	3·8	5·2	3·7	5·2	3·7	5·2	3·7	5·2	3·7	57·9
58·2	5·6	4·0	5·6	4·0	5·6	4·0	5·6	4·0	5·6	3·9	5·6	3·9	5·6	3·9	58·2
58·5	6·0	4·2	6·0	4·2	6·0	4·2	6·0	4·2	6·0	4·1	5·9	4·1	5·9	4·1	58·5
58·8	6·4	4·4	6·4	4·4	6·4	4·4	6·3	4·4	6·3	4·3	6·3	4·3	6·2	4·2	58·8
59·1	6·8	4·6	6·8	4·6	6·7	4·6	6·7	4·6	6·7	4·5	6·6	4·5	6·6	4·4	59·1
59·4	7·2	4·8	7·1	4·8	7·1	4·8	7·1	4·8	7·0	4·7	7·0	4·7	6·9	4·6	59·4
59·7	7·5	5·1	7·5	5·0	7·5	5·0	7·5	5·0	7·4	4·9	7·3	4·8	7·2	4·8	59·7
60·0	7·9	5·3	7·9	5·3	7·9	5·2	7·8	5·2	7·8	5·1	7·7	5·0	7·6	4·9	60·0
60·3	8·3	5·5	8·3	5·5	8·2	5·4	8·2	5·4	8·1	5·3	8·0	5·2	7·9	5·1	60·3
60·6	8·7	5·7	8·7	5·7	8·6	5·7	8·6	5·6	8·5	5·5	8·4	5·4	8·2	5·3	60·6
60·9	9·1	5·9	9·0	5·9	9·0	5·9	8·9	5·8	8·8	5·7	8·7	5·6	8·6	5·4	60·9
61·2	9·5	6·2	9·4	6·1	9·4	6·1	9·3	6·0	9·2	5·9	9·1	5·8	8·9	5·6	61·2
61·5	9·8	6·4	9·8	6·3	9·7	6·3	9·7	6·2	9·5	6·1	9·4	5·9	9·2	5·8	61·5

DIP					
Ht. of Eye	Corr^{n}	Ht. of Eye	Ht. of Eye	Corr^{n}	Ht. of Eye
m	′	ft.	m	′	ft.
2·4	−2·8	8·0	9·5	−5·5	31·5
2·6	−2·9	8·6	9·9	−5·6	32·7
2·8	−3·0	9·2	10·3	−5·7	33·9
3·0	−3·1	9·8	10·6	−5·8	35·1
3·2	−3·2	10·5	11·0	−5·9	36·3
3·4	−3·3	11·2	11·4	−6·0	37·6
3·6	−3·4	11·9	11·8	−6·1	38·9
3·8	−3·5	12·6	12·2	−6·2	40·1
4·0	−3·6	13·3	12·6	−6·3	41·5
4·3	−3·7	14·1	13·0	−6·4	42·8
4·5	−3·8	14·9	13·4	−6·5	44·2
4·7	−3·9	15·7	13·8	−6·6	45·5
5·0	−4·0	16·5	14·2	−6·7	46·9
5·2	−4·1	17·4	14·7	−6·8	48·4
5·5	−4·2	18·3	15·1	−6·9	49·8
5·8	−4·3	19·1	15·5	−7·0	51·3
6·1	−4·4	20·1	16·0	−7·1	52·8
6·3	−4·5	21·0	16·5	−7·2	54·3
6·6	−4·6	22·0	16·9	−7·3	55·8
6·9	−4·7	22·9	17·4	−7·4	57·4
7·2	−4·8	23·9	17·9	−7·5	58·9
7·5	−4·9	24·9	18·4	−7·6	60·5
7·9	−5·0	26·0	18·8	−7·7	62·1
8·2	−5·1	27·1	19·3	−7·8	63·8
8·5	−5·2	28·1	19·8	−7·9	65·4
8·8	−5·3	29·2	20·4	−8·0	67·1
9·2	−5·4	30·4	20·9	−8·1	68·8
9·5		31·5	21·4		70·5

MOON CORRECTION TABLE

The correction is in two parts; the first correction is taken from the upper part of the table with argument apparent altitude, and the second from the lower part, with argument HP, in the same column as that from which the first correction was taken. Separate corrections are given in the lower part for lower (L) and upper(U) limbs. All corrections are to be **added** to apparent altitude, *but 30′ is to be subtracted from the altitude of the upper limb.*

For corrections for pressure and temperature see page A4.

For bubble sextant observations ignore dip, take the mean of upper and lower limb corrections and subtract 15′ from the altitude.

App. Alt. = Apparent altitude = Sextant altitude corrected for index error and dip.

Tilbage til Menuen

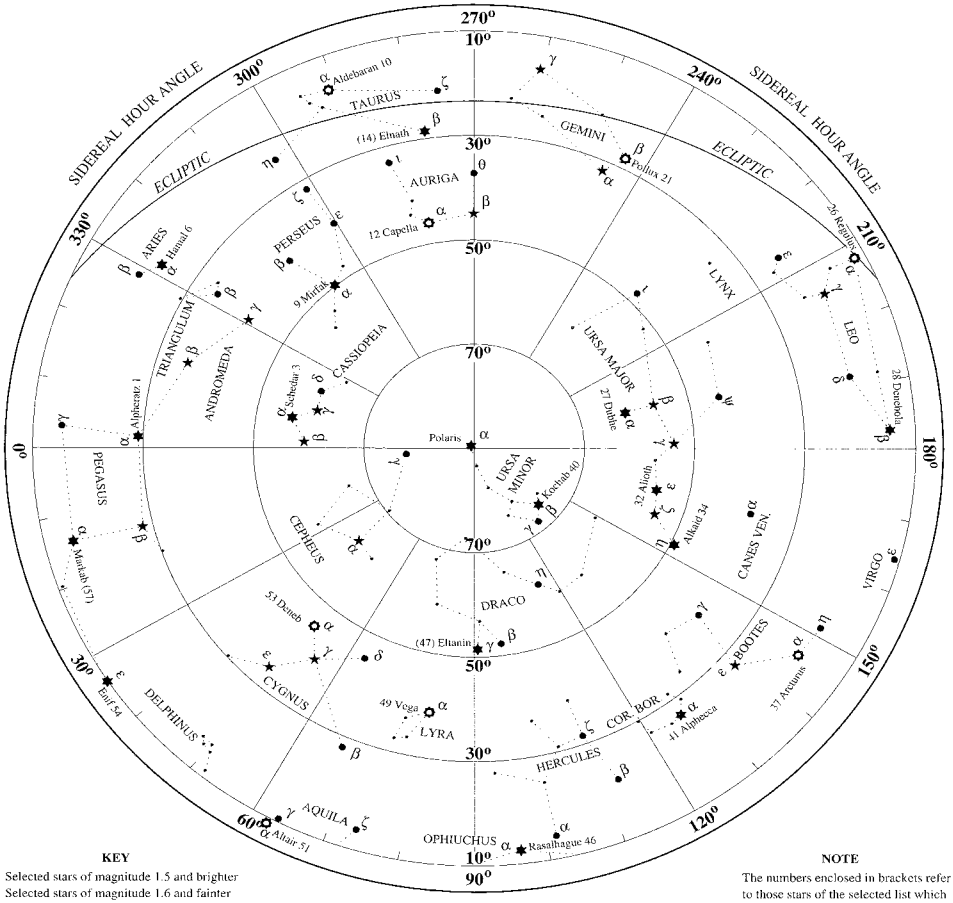
App. Alt.	35°–39°	40°–44°	45°–49°	50°–54°	55°–59°	60°–64°	65°–69°	70°–74°	75°–79°	80°–84°	85°–89°	App. Alt.
	Corrⁿ	Corrⁿ	Corrⁿ	Corrⁿ	Corrⁿ	Corrⁿ	Corrⁿ	Corrⁿ	Corrⁿ	Corrⁿ	Corrⁿ	
′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	′
00	35 56·5	40 53·7	45 50·5	50 46·9	55 43·1	60 38·9	65 34·6	70 30·0	75 25·3	80 20·5	85 15·6	00
10	56·4	53·6	50·4	46·8	42·9	38·8	34·4	29·9	25·2	20·4	15·5	10
20	56·3	53·5	50·2	46·7	42·8	38·7	34·3	29·7	25·0	20·2	15·3	20
30	56·2	53·4	50·1	46·5	42·7	38·5	34·1	29·6	24·9	20·0	15·1	30
40	56·2	53·3	50·0	46·4	42·5	38·4	34·0	29·4	24·7	19·9	15·0	40
50	56·1	53·2	49·9	46·3	42·4	38·2	33·8	29·3	24·5	19·7	14·8	50
00	36 56·0	41 53·1	46 49·8	51 46·2	56 42·3	61 38·1	66 33·7	71 29·1	76 24·4	81 19·6	86 14·6	00
10	55·9	53·0	49·7	46·0	42·1	37·9	33·5	29·0	24·2	19·4	14·5	10
20	55·8	52·9	49·5	45·9	42·0	37·8	33·4	28·8	24·1	19·2	14·3	20
30	55·7	52·8	49·4	45·8	41·9	37·7	33·2	28·7	23·9	19·1	14·2	30
40	55·6	52·6	49·3	45·7	41·7	37·5	33·1	28·5	23·8	18·9	14·0	40
50	55·5	52·5	49·2	45·5	41·6	37·4	32·9	28·3	23·6	18·7	13·8	50
00	37 55·4	42 52·4	47 49·1	52 45·4	57 41·4	62 37·2	67 32·8	72 28·2	77 23·4	82 18·6	87 13·7	00
10	55·3	52·3	49·0	45·3	41·3	37·1	32·6	28·0	23·3	18·4	13·5	10
20	55·2	52·2	48·8	45·2	41·2	36·9	32·5	27·9	23·1	18·2	13·3	20
30	55·1	52·1	48·7	45·0	41·0	36·8	32·3	27·7	22·9	18·1	13·2	30
40	55·0	52·0	48·6	44·9	40·9	36·6	32·2	27·6	22·8	17·9	13·0	40
50	55·0	51·9	48·5	44·8	40·8	36·5	32·0	27·4	22·6	17·8	12·8	50
00	38 54·9	43 51·8	48 48·4	53 44·6	58 40·6	63 36·4	68 31·9	73 27·2	78 22·5	83 17·6	88 12·7	00
10	54·8	51·7	48·3	44·5	40·5	36·2	31·7	27·1	22·3	17·4	12·5	10
20	54·7	51·6	48·1	44·4	40·3	36·1	31·6	26·9	22·1	17·3	12·3	20
30	54·6	51·5	48·0	44·2	40·2	35·9	31·4	26·8	22·0	17·1	12·2	30
40	54·5	51·4	47·9	44·1	40·1	35·8	31·3	26·6	21·8	16·9	12·0	40
50	54·4	51·2	47·8	44·0	39·9	35·6	31·1	26·5	21·7	16·8	11·8	50
00	39 54·3	44 51·1	49 47·7	54 43·9	59 39·8	64 35·5	69 31·0	74 26·3	79 21·5	84 16·6	89 11·7	00
10	54·2	51·0	47·5	43·7	39·6	35·3	30·8	26·1	21·3	16·4	11·5	10
20	54·1	50·9	47·4	43·6	39·5	35·2	30·7	26·0	21·2	16·3	11·4	20
30	54·0	50·8	47·3	43·5	39·4	35·0	30·5	25·8	21·0	16·1	11·2	30
40	53·9	50·7	47·2	43·3	39·2	34·9	30·4	25·7	20·9	16·0	11·0	40
50	53·8	50·6	47·0	43·2	39·1	34·7	30·2	25·5	20·7	15·8	10·9	50
HP	L U	L U	L U	L U	L U	L U	L U	L U	L U	L U	L U	HP
′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′ ′	′
54·0	1·1 1·7	1·3 1·9	1·5 2·1	1·7 2·4	2·0 2·6	2·3 2·9	2·6 3·2	2·9 3·5	3·2 3·8	3·5 4·1	3·8 4·5	54·0
54·3	1·4 1·8	1·6 2·0	1·8 2·2	2·0 2·5	2·2 2·7	2·5 3·0	2·8 3·2	3·1 3·5	3·3 3·8	3·6 4·1	3·9 4·4	54·3
54·6	1·7 2·0	1·9 2·2	2·1 2·4	2·3 2·6	2·5 2·8	2·7 3·0	3·0 3·3	3·2 3·5	3·5 3·8	3·8 4·0	4·0 4·3	54·6
54·9	2·0 2·2	2·2 2·3	2·3 2·5	2·5 2·7	2·7 2·9	2·9 3·1	3·2 3·3	3·4 3·5	3·6 3·8	3·9 4·0	4·1 4·3	54·9
55·2	2·3 2·3	2·5 2·4	2·6 2·6	2·8 2·8	3·0 2·9	3·2 3·1	3·4 3·3	3·6 3·5	3·8 3·7	4·0 4·0	4·2 4·2	55·2
55·5	2·7 2·5	2·8 2·6	2·9 2·7	3·1 2·9	3·2 3·0	3·4 3·2	3·6 3·4	3·7 3·5	3·9 3·7	4·1 3·9	4·3 4·1	55·5
55·8	3·0 2·6	3·1 2·7	3·2 2·8	3·3 3·0	3·5 3·1	3·6 3·3	3·8 3·4	3·9 3·6	4·1 3·7	4·2 3·9	4·4 4·0	55·8
56·1	3·3 2·8	3·4 2·9	3·5 3·0	3·6 3·1	3·7 3·2	3·8 3·3	4·0 3·4	4·1 3·6	4·2 3·7	4·4 3·8	4·5 4·0	56·1
56·4	3·6 2·9	3·7 3·0	3·8 3·1	3·9 3·2	3·9 3·3	4·0 3·4	4·1 3·5	4·3 3·6	4·4 3·7	4·5 3·8	4·6 3·9	56·4
56·7	3·9 3·1	4·0 3·1	4·1 3·2	4·1 3·3	4·2 3·3	4·3 3·4	4·3 3·5	4·4 3·6	4·5 3·7	4·6 3·8	4·7 3·8	56·7
57·0	4·3 3·2	4·3 3·3	4·3 3·3	4·4 3·4	4·4 3·4	4·5 3·5	4·5 3·5	4·6 3·6	4·7 3·6	4·7 3·7	4·8 3·8	57·0
57·3	4·6 3·4	4·6 3·4	4·6 3·4	4·6 3·5	4·7 3·5	4·7 3·5	4·7 3·6	4·8 3·6	4·8 3·6	4·8 3·7	4·9 3·7	57·3
57·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	4·9 3·6	5·0 3·6	5·0 3·6	5·0 3·6	57·6
57·9	5·2 3·7	5·2 3·7	5·2 3·7	5·2 3·7	5·2 3·7	5·1 3·6	5·1 3·6	5·1 3·6	5·1 3·6	5·1 3·6	5·1 3·6	57·9
58·2	5·5 3·9	5·5 3·8	5·5 3·8	5·4 3·8	5·4 3·7	5·4 3·7	5·3 3·7	5·3 3·6	5·2 3·6	5·2 3·5	5·2 3·5	58·2
58·5	5·9 4·0	5·8 4·0	5·8 3·9	5·7 3·9	5·6 3·8	5·6 3·8	5·5 3·7	5·5 3·6	5·4 3·6	5·3 3·5	5·3 3·4	58·5
58·8	6·2 4·2	6·1 4·1	6·0 4·1	6·0 4·0	5·9 3·9	5·8 3·8	5·7 3·7	5·6 3·6	5·5 3·5	5·4 3·5	5·3 3·4	58·8
59·1	6·5 4·3	6·4 4·3	6·3 4·2	6·2 4·1	6·1 4·0	6·0 3·9	5·9 3·8	5·8 3·6	5·7 3·5	5·6 3·4	5·4 3·3	59·1
59·4	6·8 4·5	6·7 4·4	6·6 4·3	6·5 4·2	6·4 4·1	6·2 3·9	6·1 3·8	6·0 3·7	5·8 3·5	5·7 3·4	5·5 3·2	59·4
59·7	7·1 4·7	7·0 4·5	6·9 4·4	6·8 4·3	6·6 4·1	6·5 4·0	6·3 3·8	6·1 3·7	6·0 3·5	5·8 3·3	5·6 3·2	59·7
60·0	7·5 4·8	7·3 4·7	7·2 4·5	7·0 4·4	6·9 4·2	6·7 4·0	6·5 3·9	6·3 3·7	6·1 3·5	5·9 3·3	5·7 3·1	60·0
60·3	7·8 5·0	7·6 4·8	7·5 4·7	7·3 4·5	7·1 4·3	6·9 4·1	6·7 3·9	6·5 3·7	6·3 3·5	6·0 3·2	5·8 3·0	60·3
60·6	8·1 5·1	7·9 5·0	7·7 4·8	7·6 4·6	7·3 4·4	7·1 4·2	6·9 3·9	6·7 3·7	6·4 3·4	6·2 3·2	5·9 2·9	60·6
60·9	8·4 5·3	8·2 5·1	8·0 4·9	7·8 4·7	7·6 4·5	7·3 4·2	7·1 4·0	6·8 3·7	6·6 3·4	6·3 3·2	6·0 2·9	60·9
61·2	8·7 5·4	8·5 5·2	8·3 5·0	8·1 4·8	7·8 4·5	7·6 4·3	7·3 4·0	7·0 3·7	6·7 3·4	6·4 3·1	6·1 2·8	61·2
61·5	9·1 5·6	8·8 5·4	8·6 5·1	8·3 4·9	8·1 4·6	7·8 4·3	7·5 4·0	7·2 3·7	6·9 3·4	6·5 3·1	6·2 2·7	61·5

Tilbage til Menuen

Forklaring

Astronomiske data

NORTHERN STARS



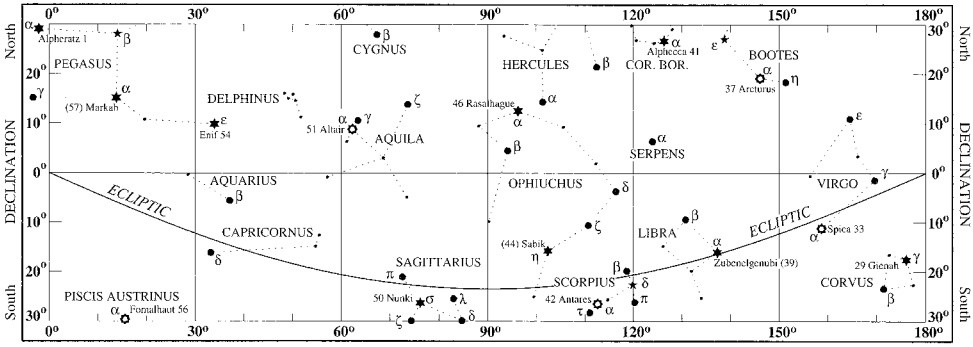
KEY

- Selected stars of magnitude 1.5 and brighter
- Selected stars of magnitude 1.6 and fainter
- Other tabulated stars of magnitude 2.5 and brighter
- Other tabulated stars of magnitude 2.6 and fainter
- Untabulated stars

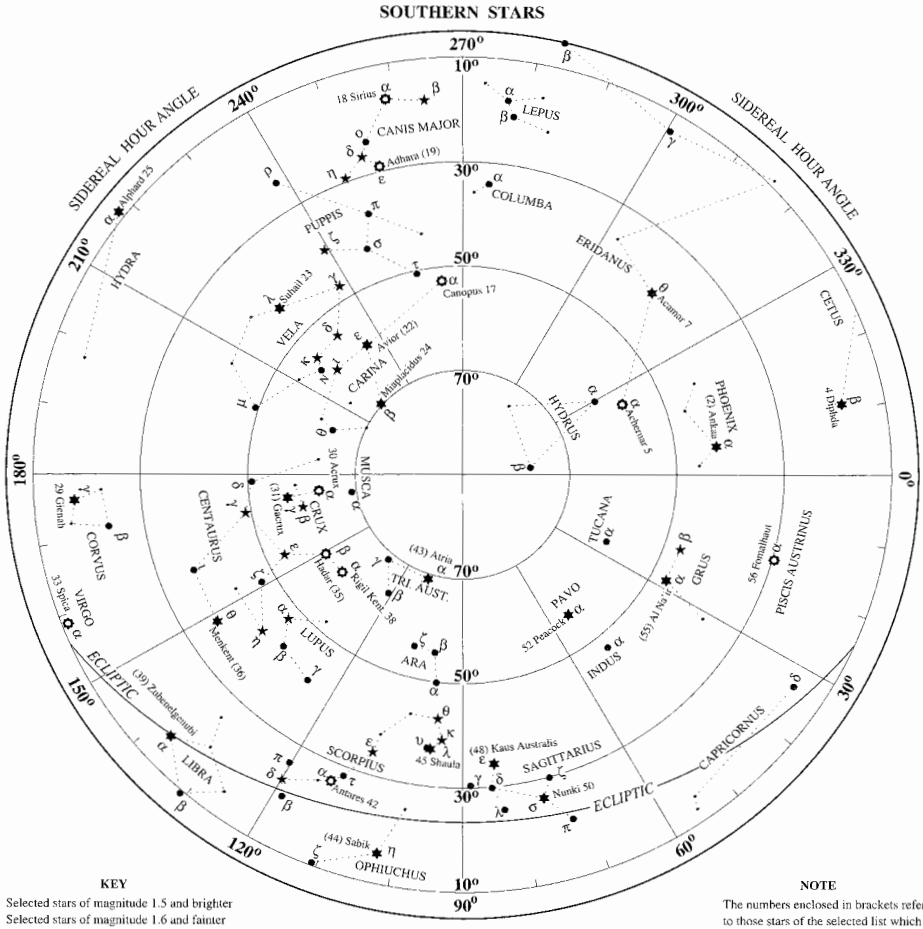
NOTE

The numbers enclosed in brackets refer to those stars of the selected list which are not used in Sight Reduction Tables H.O. 249, A.P. 3270, N.P. 303.

EQUATORIAL STARS (SHA 0° to 180°)



Tilbage til Menuen



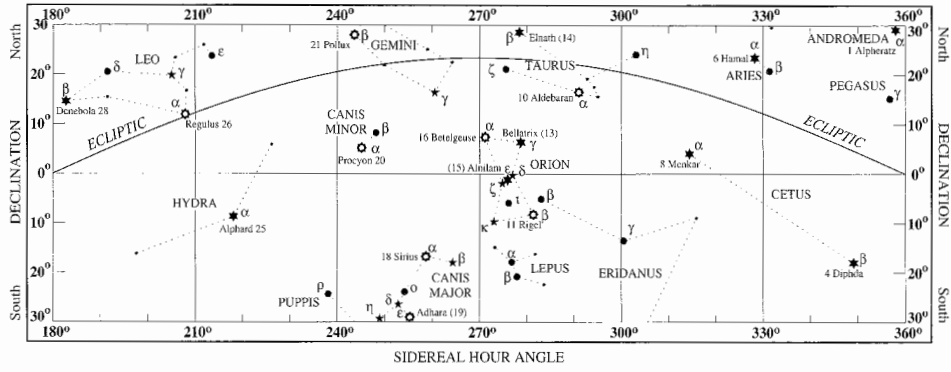
KEY

- Selected stars of magnitude 1.5 and brighter
- Selected stars of magnitude 1.6 and fainter
- Other tabulated stars of magnitude 2.5 and brighter
- Other tabulated stars of magnitude 2.6 and fainter
- Untabulated stars

NOTE

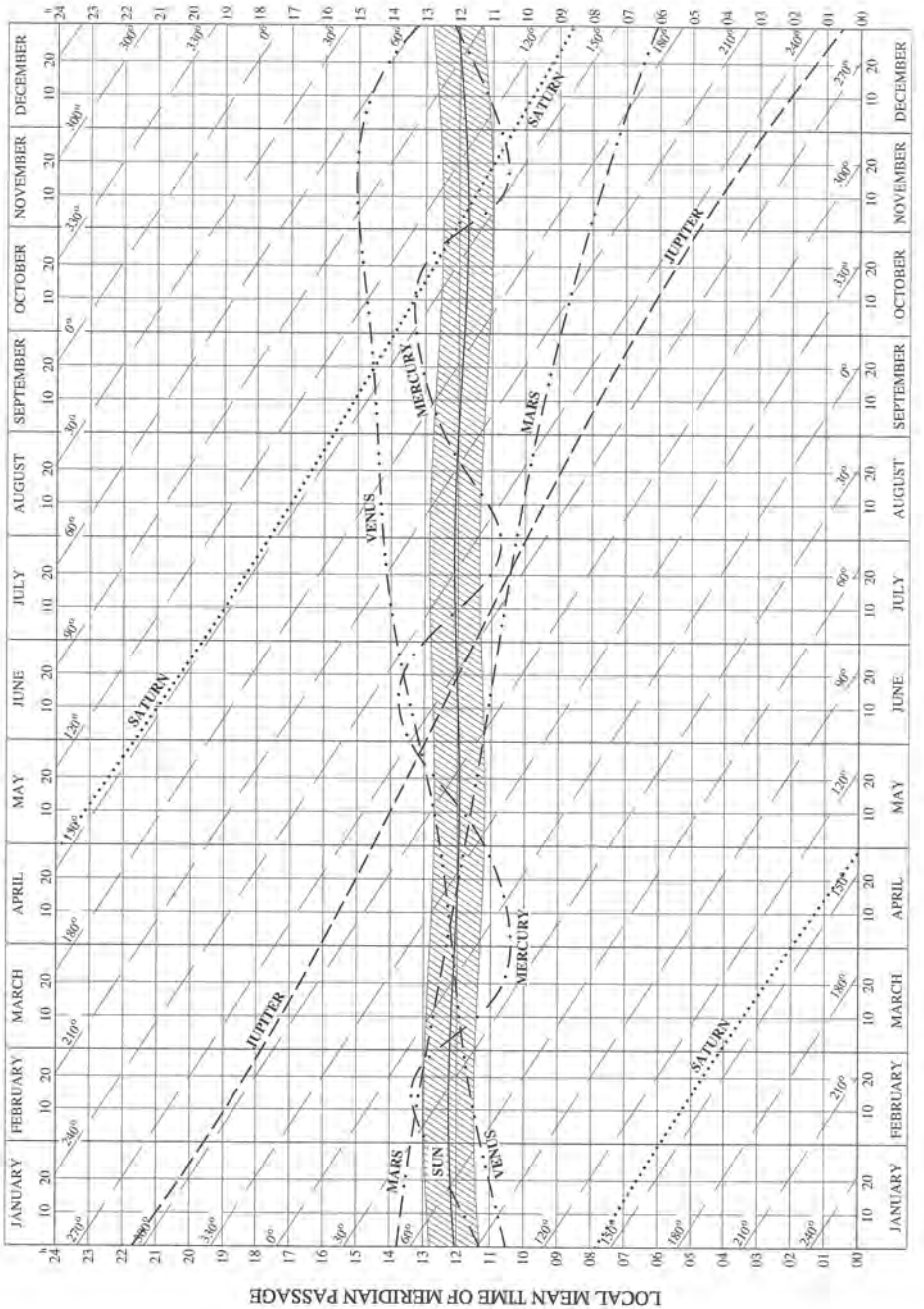
The numbers enclosed in brackets refer to those stars of the selected list which are not used in Sight Reduction Tables H.O. 249, A.P. 3270, N.P. 303.

EQUATORIAL STARS (SHA 180°to 360°)



Tilbage til Menuen

LOCAL MEAN TIME OF MERIDIAN PASSAGE



Tilbage til Menuen

VISIBILITY OF PLANETS

VENUS is a brilliant object in the morning sky from the beginning of the year until mid-February when it becomes too close to the Sun for observation. From the end of the first week of May it reappears in the evening sky where it stays until the end of the year. Venus is in conjunction with Mercury on May 25 and June 20, with Jupiter on May 28 and with Saturn on September 20.

MARS can be seen in the evening sky in Capricornus and in Aquarius from late January until in the second week of February it becomes too close to the Sun for observation. It reappears in the morning sky during the second half of June in Taurus and moves into Gemini from mid-July (passing 6° S of *Pollux* on August 19). It remains in the morning sky for the rest of the year moving into Cancer from late August, Leo in late September (passing 1° N of *Regulus* on October 14) and Virgo from the end of November. Mars is in conjunction with Mercury on February 8 and with Jupiter on July 22.

JUPITER is in Taurus at the beginning of the year, and can be seen for more than half the night until late February after which it can only be seen in the evening sky (passing 5° N of *Aldebaran* on March 24). In the first week of June it becomes too close to the Sun for observation. It reappears in the morning sky in early July in Gemini in which constellation it remains throughout the rest of the year. Jupiter is in conjunction with Mercury on May 27, with Venus on May 28 and with Mars on July 22.

SATURN rises shortly after midnight at the beginning of the year in Libra, passes into Virgo in mid-May and once again into Libra in early September. It is at opposition on April 28 when it can be seen throughout the night, and from late July until mid-October it is visible only in the evening sky. It then becomes too close to the Sun for observation until in the second half of November it reappears, and can be seen in the morning sky for the rest of the year. Saturn is in conjunction with Venus on September 20 and with Mercury on October 10 and November 26.

MERCURY can only be seen low in the east before sunrise, or low in the west after sunset (about the time of beginning or end of civil twilight). It is visible in the mornings between the following approximate dates: January 1 (−0·6) to January 2 (−0·7), March 11 (+2·8) to May 4 (−1·3), July 19 (+2·7) to August 16 (−1·4) and November 8 (+1·5) to December 12 (−0·7) ; the planet is brighter at the end of each period. It is visible in the evenings between the following approximate dates: January 31 (−1·2) to February 26 (+2·0), May 19 (−1·5) to July 1 (+3·2) and September 4 (−0·9) to October 27 (+2·1); the planet is brighter at the beginning of each period. The figures in parentheses are the magnitudes.

PLANET DIAGRAM

General Description. The diagram on the opposite page shows, in graphical form for any date during the year, the local mean time of meridian passage of the Sun, of the five planets Mercury, Venus, Mars, Jupiter, and Saturn, and of each 30° of SHA; intermediate lines corresponding to particular stars, may be drawn in by the user if desired. It is intended to provide a general picture of the availability of planets and stars for observation.

On each side of the line marking the time of meridian passage of the Sun a band, 45^m wide, is shaded to indicate that planets and most stars crossing the meridian within 45^m of the Sun are too close to the Sun for observation.

Method of use and interpretation. For any date the diagram provides immediately the local mean times of meridian passage of the Sun, planets and stars, and thus the following information:

(a) whether a planet or star is too close to the Sun for observation;

(b) some indication of its position in the sky, especially during twilight;

(c) the proximity of other planets.

When the meridian passage of an outer planet occurs at midnight the body is in opposition to the Sun and is visible all night; a planet may then be observable during both morning and evening twilights. As the time of meridian passage decreases, the body eventually ceases to be observable in the morning, but its altitude above the eastern horizon at sunset gradually increases; this continues until the body is on the meridian during evening twilight. From then onwards the body is observable above the western horizon and its altitude at sunset gradually decreases; eventually the body becomes too close to the Sun for observation. When the body again becomes visible it is seen low in the east during morning twilight; its altitude at sunrise increases until meridian passage occurs during morning twilight. Then, as the time of meridian passage decreases to 0^h, the body is observable in the west during morning twilight with a gradually decreasing altitude, until it once again reaches opposition.

DO NOT CONFUSE

Mercury with Mars in early February and with Saturn in early October and late November; on all occasions Mercury is the brighter object.

Venus with Mercury in mid-May to early June and again in mid-June, with Jupiter in late May to early June and with Saturn in mid-September; on all occasions Venus is the brighter object.

Jupiter with Mercury in late May and with Mars in mid-July to early August; on both occasions Jupiter is the brighter object.

Astronomiske data

Forklaring

Forklaring til almanakken	**Forklaring til almanakken**
	Om universal time

EXPLANATION

PRINCIPLE AND ARRANGEMENT

1. *Object.* The object of this Almanac is to provide, in a convenient form, the data required for the practice of astronomical navigation at sea.

2. *Principle.* The main contents of the Almanac consist of data from which the *Greenwich Hour Angle* (GHA) and the *Declination* (Dec) of all the bodies used for navigation can be obtained for any instant of *Universal Time* (UT, specifically UT1, or previously Greenwich Mean Time (GMT)).

The *Local Hour Angle* (LHA) can then be obtained by means of the formula:

$$\text{LHA} = \text{GHA} \begin{matrix} - \text{ west} \\ + \text{ east} \end{matrix} \text{ longitude}$$

The remaining data consist of: times of rising and setting of the Sun and Moon, and times of twilight; miscellaneous calendarial and planning data and auxiliary tables, including a list of Standard Times; corrections to be applied to observed altitude.

For the Sun, Moon, and planets the GHA and Dec are tabulated directly for each hour of UT throughout the year. For the stars the *Sidereal Hour Angle* (SHA) is given, and the GHA is obtained from:

$$\text{GHA Star} = \text{GHA Aries} + \text{SHA Star}$$

The SHA and Dec of the stars change slowly and may be regarded as constant over periods of several days. GHA Aries, or the Greenwich Hour Angle of the first point of Aries (the Vernal Equinox), is tabulated for each hour. Permanent tables give the appropriate increments and corrections to the tabulated hourly values of GHA and Dec for the minutes and seconds of UT.

The six-volume series of *Sight Reduction Tables for Marine Navigation* (published in U.S.A. as Pub. No. 229 and in U.K. as N.P. 401) has been designed for the solution of the navigational triangle and is intended for use with *The Nautical Almanac*.

Two alternative procedures for sight reduction are described on pages 277–318. The first requires the use of programmable calculators or computers, while the second uses a set of concise tables that is given on pages 286–317.

The tabular accuracy is 0′.1 throughout. The time argument on the daily pages of this Almanac is UT1 denoted throughout by UT. This scale may differ from the broadcast time signals (UTC) by an amount which, if ignored, will introduce an error of up to 0′.2 in longitude determined from astronomical observations. The difference arises because the time argument depends on the variable rate of rotation of the Earth while the broadcast time signals are based on an atomic time-scale. Step adjustments of exactly one second are made to the time signals as required (normally at 24^h on December 31 and June 30) so that the difference between the time signals and UT, as used in this Almanac, may not exceed $0^s.9$. Those who require to reduce observations to a precision of better than 1^s must therefore obtain the correction (DUT1) to the time signals from coding in the signal, or from other sources; the required time is given by UT1=UTC+DUT1 to a precision of $0^s.1$. Alternatively, the longitude, when determined from astronomical observations, may be corrected by the corresponding amount shown in the following table:

Correction to time signals	Correction to longitude
$-0^s.9$ to $-0^s.7$	0′.2 to east
$-0^s.6$ to $-0^s.3$	0′.1 to east
$-0^s.2$ to $+0^s.2$	no correction
$+0^s.3$ to $+0^s.6$	0′.1 to west
$+0^s.7$ to $+0^s.9$	0′.2 to west

3. *Lay-out.* The ephemeral data for three days are presented on an opening of two pages: the left-hand page contains the data for the planets and stars; the right-hand page contains the data for the Sun and Moon, together with times of twilight, sunrise, sunset, moonrise and moonset.

The remaining contents are arranged as follows: for ease of reference the altitude-correction tables are given on pages A2, A3, A4, xxxiv and xxxv; calendar, Moon's phases, eclipses, and planet notes (i.e. data of general interest) precede the main tabulations. The Explanation is followed by information on standard times, star charts and list of star positions, sight reduction procedures and concise sight reduction tables, tables of increments and corrections and other auxiliary tables that are frequently used.

MAIN DATA

4. *Daily pages.* The daily pages give the GHA of Aries, the GHA and Dec of the Sun, Moon, and the four navigational planets, for each hour of UT. For the Moon, values of v and d are also tabulated for each hour to facilitate the correction of GHA and Dec to intermediate times; v and d for the Sun and planets change so slowly that they are given, at the foot of the appropriate columns, once only on the page; v is zero for Aries and negligible for the Sun, and is omitted. The SHA and Dec of the 57 selected stars, arranged in alphabetical order of proper name, are also given.

5. *Stars.* The SHA and Dec of 173 stars, including the 57 selected stars, are tabulated for each month on pages 268–273; no interpolation is required and the data can be used in precisely the same way as those for the selected stars on the daily pages. The stars are arranged in order of SHA.

The list of 173 includes all stars down to magnitude 3·0, together with a few fainter ones to fill the larger gaps. The 57 selected stars have been chosen from amongst these on account of brightness and distribution in the sky; they will suffice for the majority of observations.

The 57 selected stars are known by their proper names, but they are also numbered in descending order of SHA. In the list of 173 stars, the constellation names are always given on the left-hand page; on the facing page proper names are given where well-known names exist. Numbers for the selected stars are given in both columns.

An index to the selected stars, containing lists in both alphabetical and numerical order, is given on page xxxiii and is also reprinted on the bookmark.

6. *Increments and corrections.* The tables printed on tinted paper (pages ii–xxxi) at the back of the Almanac provide the increments and corrections for minutes and seconds to be applied to the hourly values of GHA and Dec. They consist of sixty tables, one for each minute, separated into two parts: increments to GHA for Sun and planets, Aries, and Moon for every minute and second; and, for each minute, corrections to be applied to GHA and Dec corresponding to the values of v and d given on the daily pages.

The increments are based on the following adopted hourly rates of increase of the GHA: Sun and planets, 15° precisely; Aries, 15° 02′.46; Moon, 14° 19′.0. The values of v on the daily pages are the excesses of the actual hourly motions over the adopted values; they are generally positive, except for Venus. The tabulated hourly values of the Sun's GHA have been adjusted to reduce to a minimum the error caused by treating v as negligible. The values of d on the daily pages are the hourly differences of the Dec. For the Moon, the true values of v and d are given for each hour; otherwise mean values are given for the three days on the page.

7. *Method of entry.* The UT of an observation is expressed as a day and hour, followed by a number of minutes and seconds. The tabular values of GHA and Dec, and, where necessary, the corresponding values of v and d, are taken directly from the daily pages for the day and hour of UT; this hour is always *before* the time of observation. SHA and Dec of the selected stars are also taken from the daily pages.

The table of Increments and Corrections for the minute of UT is then selected. For the GHA, the increment for minutes and seconds is taken from the appropriate column opposite the seconds of UT; the v-correction is taken from the second part of the same table opposite the value of v as given on the daily pages. Both increment and v-correction are to be added to the GHA, except for Venus when v is prefixed by a minus sign and the v-correction is to be subtracted. For the Dec there is no increment, but a d-correction is applied in the same way as the v-correction; d is given without sign on the daily pages and the sign of the correction is to be supplied by inspection of the Dec column. In many cases the correction may be applied mentally.

8. *Examples.* (a) Sun and Moon. Required the GHA and Dec of the Sun and Moon on 2013 November 13 at $15^h\ 47^m\ 13^s$ UT.

		SUN			MOON			
		GHA	Dec	d	GHA	v	Dec	d
		° ′	° ′	′	° ′	′	° ′	′
Daily page, November $13^d\ 15^h$		48 55·0	S 18 06·5	0·7	275 19·7	12·0	N 4 18·4	10·8
Increments for	$47^m\ 13^s$	11 48·3			11 16·0			
v or d corrections for	47^m		+0·6		+9·5		+8·6	
Sum for November $13^d\ 15^h\ 47^m\ 13^s$		60 43·3	S 18 07·1		286 45·2		N 4 27·0	

(b) Planets. Required the LHA and Dec of (i) Venus on 2013 November 13 at $13^h\ 58^m\ 16^s$ UT in longitude E 70° 19′; (ii) Mars on 2013 November 13 at $8^h\ 44^m\ 06^s$ UT in longitude W 53° 11′.

		VENUS				MARS			
		GHA	v	Dec	d		GHA	v	Dec	d
		° ′	′	° ′	′		° ′	′	° ′	′
Daily page, Nov. 13^d	(13^h)	329 12·5	−0·1	S 26 56·2	0·2	(8^h)	4 07·8	1·2	N 6 46·0	0·5
Increments (planets)	$(58^m\ 16^s)$	14 34·0				$(44^m\ 06^s)$	11 01·5			
v or d corrections	(58^m)	−0·1		−0·2		(44^m)	+0·9		−0·4	
Sum = GHA and Dec.		343 46·4		S 26 56·0			15 10·2		N 6 45·6	
Longitude	(east)	+ 70 19·0				(west)	− 53 11·0			
Multiples of 360°		−360					+360			
LHA planet		54 05·4					321 59·2			

(c) Stars. Required the GHA and Dec of (i) *Sirius* on 2013 November 13 at $8^h\ 44^m\ 06^s$ UT; (ii) *Vega* on 2013 November 13 at $21^h\ 45^m\ 38^s$ UT.

		Sirius				*Vega*		
		GHA		Dec		GHA		Dec
		°	′	° ′		°	′	° ′
Daily page (SHA and Dec)		258	33·2	S 16 44.1		80	39·1	N 38 48.2
Daily page (GHA Aries)	(8^h)	172	36·2		(21^h)	8	08·2	
Increments (Aries)	$(44^m\ 06^s)$	11	03·3		$(45^m\ 38^s)$	11	26·4	
Sum = GHA star		442	12·7			100	13·7	
Multiples of 360°		−360						
GHA star		82	12·7			100	13·7	

9. *Polaris (Pole Star) tables.* The tables on pages 274–276 provide means by which the latitude can be deduced from an observed altitude of *Polaris*, and they also give its azimuth; their use is explained and illustrated on those pages. They are based on the following formula:

$$\text{Latitude} - H_O = -p\cos h + \tfrac{1}{2}p\sin p\sin^2 h\tan(\text{latitude})$$

where H_O = Apparent altitude (corrected for refraction)

p = polar distance of *Polaris* = 90° − Dec

h = local hour angle of *Polaris* = LHA Aries + SHA

a_0, which is a function of LHA Aries only, is the value of both terms of the above formula calculated for mean values of the SHA (317° 43′) and Dec (N 89° 19′3) of *Polaris*, for a mean latitude of 50°, and adjusted by the addition of a constant (58′8).

a_1, which is a function of LHA Aries and latitude, is the excess of the value of the second term over its mean value for latitude 50°, increased by a constant (0′.6) to make it always positive. a_2, which is a function of LHA Aries and date, is the correction to the first term for the variation of *Polaris* from its adopted mean position; it is increased by a constant (0′.6) to make it positive. The sum of the added constants is 1°, so that:

$$\text{Latitude} = \text{Apparent altitude (corrected for refraction)} - 1^\circ + a_0 + a_1 + a_2$$

RISING AND SETTING PHENOMENA

10. *General.* On the right-hand daily pages are given the times of sunrise and sunset, of the beginning and end of civil and nautical twilights, and of moonrise and moonset for a range of latitudes from N 72° to S 60°. These times, which are given to the nearest minute, are strictly the UT of the phenomena on the Greenwich meridian; they are given for every day for moonrise and moonset, but only for the middle day of the three on each page for the solar phenomena.

They are approximately the Local Mean Times (LMT) of the corresponding phenomena on other meridians; they can be formally interpolated if desired. The UT of a phenomenon is obtained from the LMT by:

$$\text{UT} = \text{LMT} \begin{matrix} + \text{ west} \\ - \text{ east} \end{matrix} \text{ longitude}$$

in which the longitude must first be converted to time by the table on page i or otherwise.

Interpolation for latitude can be done mentally or with the aid of Table I on page xxxii.

The following symbols are used to indicate the conditions under which, in high latitudes, some of the phenomena do not occur:

☐ Sun or Moon remains continuously above the horizon;

■ Sun or Moon remains continuously below the horizon;

//// twilight lasts all night.

Basis of the tabulations. At sunrise and sunset 16′ is allowed for semi-diameter and 34′ for horizontal refraction, so that at the times given the Sun's upper limb is on the visible horizon; all times refer to phenomena as seen from sea level with a clear horizon.

At the times given for the beginning and end of twilight, the Sun's zenith distance is 96° for civil, and 102° for nautical twilight. The degree of illumination at the times given for civil twilight (in good conditions and in the absence of other illumination) is such that the brightest stars are visible and the horizon is clearly defined. At the times given for nautical twilight the horizon is in general not visible, and it is too dark for observation with a marine sextant.

Times corresponding to other depressions of the Sun may be obtained by interpolation or, for depressions of more than 12°, less reliably, by extrapolation; times so obtained will be subject to considerable uncertainty near extreme conditions.

At moonrise and moonset allowance is made for semi-diameter, parallax, and refraction (34′), so that at the times given the Moon's upper limb is on the visible horizon as seen from sea level.

11. *Sunrise, sunset, twilight.* The tabulated times may be regarded, without serious error, as the LMT of the phenomena on any of the three days on the page and in any longitude. Precise times may normally be obtained by interpolating the tabular values for latitude and to the correct day and longitude, the latter being expressed as a fraction of a day by dividing it by 360°, positive for west and negative for east longitudes. In the extreme conditions near ☐, ■ or //// interpolation may not be possible in one direction, but accurate times are of little value in these circumstances.

Examples. Required the UT of (a) the beginning of morning twilights and sunrise on 2013 January 13 for latitude S 48° 55′, longitude E 75° 18′; (b) sunset and the end of evening twilights on 2013 January 15 for latitude N 67° 10′, longitude W 168° 05′.

	(a)	Twilight Nautical	Twilight Civil	Sunrise	(b)	Sunset	Twilight Civil	Twilight Nautical
		d h m	d h m	d h m		d h m	d h m	d h m
From p. 19								
LMT for Lat	S 45°	13 03 10	13 03 56	13 04 32	N 66°	15 14 24	15 15 43	15 16 54
Corr. to (p. xxxii, Table I)	S 48° 55′	−30	−20	−16	N 67° 10′	−22	−12	−6
Long (p. i)	E 75° 18′	−5 01	−5 01	−5 01	W 168° 05′	+11 12	+11 12	+11 12
UT		12 21 39	12 22 35	12 23 15		16 01 14	16 02 43	16 04 00

The LMT are strictly for January 14 (middle date on page) and 0° longitude; for more precise times it is necessary to interpolate, but rounding errors may accumulate to about 2^m.

(a) to January $13^d - 75°/360° = \text{Jan. } 12^d8$, i.e. $\frac{1}{3}(1{\cdot}2) = 0{\cdot}4$ backwards towards the data for the same latitude interpolated similarly from page 17; the corrections are -2^m to nautical twilight, -2^m to civil twilight and -2^m to sunrise.

(b) to January $15^d + 168°/360° = \text{Jan. } 15^d5$, i.e. $\frac{1}{3}(1{\cdot}5) = 0{\cdot}5$ forwards towards the data for the same latitude interpolated similarly from page 21; the corrections are $+7^m$ to sunset, $+4^m$ to civil twilight, and $+4^m$ to nautical twilight.

12. *Moonrise, moonset.* Precise times of moonrise and moonset are rarely needed; a glance at the tables will generally give sufficient indication of whether the Moon is available for observation and of the hours of rising and setting. If needed, precise times may be obtained as follows. Interpolate for latitude, using Table I on page xxxii, on the day wanted and also on the preceding day in east longitudes or the following day in west longitudes; take the difference between these times and interpolate for longitude by applying to the time for the day wanted the correction from Table II on page xxxii, so that the resulting time is between the two times used. In extreme conditions near ☐ or ■ interpolation for latitude or longitude may be possible only in one direction; accurate times are of little value in these circumstances.

To facilitate this interpolation the times of moonrise and moonset are given for four days on each page; where no phenomenon occurs during a particular day (as happens once a month) the time of the phenomenon on the following day, increased by 24^h, is given; extra care must be taken when interpolating between two values, when one of those values exceeds 24^h. In practice it suffices to use the daily difference between the times for the nearest tabular latitude, and generally, to enter Table II with the nearest tabular arguments as in the examples below.

Examples. Required the UT of moonrise and moonset in latitude S 47° 10′, longitudes E 124° 00′ and W 78° 31′ on 2013 January 17.

	Longitude E 124° 00′ Moonrise	Moonset	Longitude W 78° 31′ Moonrise	Moonset
	d h m	d h m	d h m	d h m
LMT for Lat. S 45°	17 11 14	17 22 26	17 11 14	17 22 26
Lat correction (p. xxxii, Table I)	+02	−02	+02	−02
Long correction (p. xxxii, Table II)	−23	−10	+16	+07
Correct LMT	17 10 53	17 22 14	17 11 32	17 22 31
Longitude (p. i)	−8 16	−8 16	+5 14	+5 14
UT	17 02 37	17 13 58	17 16 46	18 03 45

ALTITUDE CORRECTION TABLES

13. *General.* In general two corrections are given for application to altitudes observed with a marine sextant; additional corrections are required for Venus and Mars and also for very low altitudes.

Tables of the correction for dip of the horizon, due to height of eye above sea level, are given on pages A2 and xxxiv. Strictly this correction should be applied first and subtracted from the sextant altitude to give apparent altitude, which is the correct argument for the other tables.

Separate tables are given of the second correction for the Sun, for stars and planets (on pages A2 and A3), and for the Moon (on pages xxxiv and xxxv). For the Sun, values are given for both lower and upper limbs, for two periods of the year. The star tables are used for the planets, but additional corrections for parallax (page A2) are required for Venus and Mars. The Moon tables are in two parts: the main correction is a function of apparent altitude only and is tabulated for the lower limb (30′ must be subtracted to obtain the correction for the upper limb); the other, which is given for both lower and upper limbs, depends also on the horizontal parallax, which has to be taken from the daily pages.

An additional correction, given on page A4, is required for the change in the refraction, due to variations of pressure and temperature from the adopted standard conditions; it may generally be ignored for altitudes greater than 10°, except possibly in extreme conditions. The correction tables for the Sun, stars, and planets are in two parts; only those for altitudes greater than 10° are reprinted on the bookmark.

14. *Critical tables.* Some of the altitude correction tables are arranged as critical tables. In these an interval of apparent altitude (or height of eye) corresponds to a single value of the correction; no interpolation is required. At a "critical" entry the upper of the two possible values of the correction is to be taken. For example, in the table of dip, a correction of −4′.1 corresponds to all values of the height of eye from 5·3 to 5·5 metres (17·5 to 18·3 feet) inclusive.

15. *Examples.* The following examples illustrate the use of the altitude correction tables; the sextant altitudes given are assumed to be taken on 2013 August 12 with a marine sextant at height 5·4 metres (18 feet), temperature −3°C and pressure 982 mb, the Moon sights being taken at about 10^h UT.

	SUN lower limb	SUN upper limb	MOON lower limb	MOON upper limb	VENUS	*Polaris*
	° ′	° ′	° ′	° ′	° ′	° ′
Sextant altitude	21 19·7	3 20·2	33 27·6	26 06·7	4 32·6	49 36·5
Dip, height 5·4 metres (18 feet)	−4·1	−4·1	−4·1	−4·1	−4·1	−4·1
Main correction	+13·6	−29·3	+57·4	+60·5	−10·8	−0·8
−30′ for upper limb (Moon)	—	—	—	−30·0	—	—
L, U correction for Moon	—	—	+4·6	+3·4	—	—
Additional correction for Venus	—	—	—	—	+0·1	—
Additional refraction correction	−0·1	−0·6	−0·1	−0·1	−0·5	0·0
Corrected sextant altitude	21 29·1	2 46·2	34 25·4	26 36·4	4 17·3	49 31·6

The main corrections have been taken out with apparent altitude (sextant altitude corrected for index error and dip) as argument, interpolating where possible. These refinements are rarely necessary.

16. *Composition of the Corrections.* The table for the dip of the sea horizon is based on the formula:

$$\text{Correction for dip} = -1'.76\sqrt{(\text{height of eye in metres})} = -0'.97\sqrt{(\text{height of eye in feet})}$$

The correction table for the Sun includes the effects of semi-diameter, parallax and mean refraction.

The correction tables for the stars and planets allow for the effect of mean refraction.

The phase correction for Venus has been incorporated in the tabulations for GHA and Dec, and no correction for phase is required. The additional corrections for Venus and Mars allow for parallax. Alternatively, the correction for parallax may be calculated from $p \cos H$, where p is the parallax and H is the altitude. In 2013 the values for p are:

Venus	Jan. 1	0′.1	Sept. 21	0′.2	Nov. 11	0′.3	Dec. 5	0′.4	Dec. 20	0′.5	Dec. 31
Mars	Jan. 1	0′.1	Dec. 31								

The correction table for the Moon includes the effect of semi-diameter, parallax, augmentation and mean refraction.

Mean refraction is calculated for a temperature of 10°C (50°F), a pressure of 1010 mb (29·83 inches), humidity of 80% and wavelength 0·50169 μm.

17. *Bubble sextant observations.* When observing with a bubble sextant no correction is necessary for dip, semi-diameter, or augmentation. The altitude corrections for the stars and planets on page A2 and on the bookmark should be used for the Sun as well as for the stars and planets; for the Moon it is easiest to take the mean of the corrections for lower and upper limbs and subtract 15′ from the altitude; the correction for dip must not be applied.

AUXILIARY AND PLANNING DATA

18. *Sun and Moon.* On the daily pages are given: hourly values of the horizontal parallax of the Moon; the semi-diameters and the times of meridian passage of both Sun and Moon over the Greenwich meridian; the equation of time; the age of the Moon, the percent (%) illuminated and a symbol indicating the phase. The times of the phases of the Moon are given in UT on page 4. For the Moon, the semi-diameters for each of the three days are given at the foot of the column; for the Sun a single value is sufficient. Table II on page xxxii may be used for interpolating the time of the Moon's meridian passage for longitude. The equation of time is given daily at 00^h and 12^h UT. The sign is *positive* for unshaded values and *negative* for shaded values. To obtain apparent time add the equation of time to mean time when the sign is *positive*. Subtract the equation of time from mean time when the sign is *negative*. At 12^h UT, when the sign is *positive*, meridian passage of the Sun occurs *before* 12^h UT, otherwise it occurs *after* 12^h UT.

19. *Planets.* The magnitudes of the planets are given immediately following their names in the headings on the daily pages; also given, for the middle day of the three on the page, are their SHA at 00^h UT and their times of meridian passage.

The planet notes and diagram on pages 8 and 9 provide descriptive information as to the suitability of the planets for observation during the year, and of their positions and movements.

20. *Stars.* The time of meridian passage of the first point of Aries over the Greenwich meridian is given on the daily pages, for the middle day of the three on the page, to 0^m1. The interval between successive meridian passages is $23^h\ 56^m1$ (24^h less 3^m9) so that times for intermediate days and other meridians can readily be derived. If a precise time is required it may be obtained by finding the UT at which LHA Aries is zero.

The meridian passage of a star occurs when its LHA is zero, that is when LHA Aries + SHA = 360°. An approximate time can be obtained from the planet diagram on page 9.

The star charts on pages 266 and 267 are intended to assist identification. They show the relative positions of the stars in the sky as seen from the Earth and include all 173 stars used in the Almanac, together with a few others to complete the main constellation configurations. The local meridian at any time may be located on the chart by means of its SHA which is 360° − LHA Aries, or west longitude − GHA Aries.

21. *Star globe.* To set a star globe on which is printed a scale of LHA Aries, first set the globe for latitude and then rotate about the polar axis until the scale under the edge of the meridian circle reads LHA Aries.

To mark the positions of the Sun, Moon, and planets on the star globe, take the difference GHA Aries − GHA body and use this along the LHA Aries scale, in conjunction with the declination, to plot the position. GHA Aries − GHA body is most conveniently found by taking the difference when the GHA of the body is small (less than 15°), which happens once a day.

22. *Calendar.* On page 4 are given lists of ecclesiastical festivals, and of the principal anniversaries and holidays in the United Kingdom and the United States of America. The calendar on page 5 includes the day of the year as well as the day of the week.

Brief particulars are given, at the foot of page 5, of the solar and lunar eclipses occurring during the year; the times given are in UT. The principal features of the more important solar eclipses are shown on the maps on pages 6 and 7.

23. *Standard times.* The lists on pages 262–265 give the standard times used in most countries. In general no attempt is made to give details of the beginning and end of summer time, since they are liable to frequent changes at short notice. For the latest information consult Admiralty List of Radio Signals Volume 2 (NP 282) corrected by Section VI of the weekly edition of Admiralty Notices to Mariners.

The Date or Calendar Line is an arbitrary line, on either side of which the date differs by one day; when crossing this line on a westerly course, the date must be advanced one day; when crossing it on an easterly course, the date must be put back one day. The line is a modification of the line of the 180th meridian, and is drawn so as to include, as far as possible, islands of any one group, etc., on the same side of the line. It may be traced by starting at the South Pole and joining up to the following positions:

Lat	S	51·0	S	45·0	S	15·0	S	5·0	N	48·0	N	53·0	N	65·5
Long		180·0	W	172·5	W	172·5		180·0		180·0	E	170·0	W	169·0

thence through the middle of the Diomede Islands to Lat N 68°·0, Long W 169°·0, passing east of Ostrov Vrangelya (Wrangel Island) to Lat N 75°·0, Long 180°·0, and thence to the North Pole.

ACCURACY

24. *Main data.* The quantities tabulated in this Almanac are generally correct to the nearest 0′·1; the exception is the Sun's GHA which is deliberately adjusted by up to 0′·15 to reduce the error due to ignoring the v-correction. The GHA and Dec at intermediate times cannot be obtained to this precision, since at least two quantities must be added; moreover, the v- and d-corrections are based on mean values of v and d and are taken from tables for the whole minute only. The largest error that can occur in the GHA or Dec of any body other than the Sun or Moon is less than 0′·2; it may reach 0′·25 for the GHA of the Sun and 0′·3 for that of the Moon.

In practice it may be expected that only one third of the values of GHA and Dec taken out will have errors larger than 0′·05 and less than one tenth will have errors larger than 0′·1.

25. *Altitude corrections.* The errors in the altitude corrections are nominally of the same order as those in GHA and Dec, as they result from the addition of several quantities each correctly rounded off to 0′·1. But the actual values of the dip and of the refraction at low altitudes may, in extreme atmospheric conditions, differ considerably from the mean values used in the tables.

USE OF THIS ALMANAC IN 2014

This Almanac may be used for the Sun and stars in 2014 in the following manner.

For the Sun, take out the GHA and Dec for the same date but for a time $5^h\ 48^m\ 00^s$ *earlier* than the UT of observation; add 87° 00′ to the GHA so obtained. The error, mainly due to planetary perturbations of the Earth, is unlikely to exceed 0′·4.

For the stars, calculate the GHA and Dec for the same date and the same time, but *subtract* 15′·1 from the GHA so found. The error, due to incomplete correction for precession and nutation, is unlikely to exceed 0′·4. If preferred, the same result can be obtained by using a time $5^h\ 48^m\ 00^s$ earlier than the UT of observation (as for the Sun) and adding 86° 59′·2 to the GHA (or adding 87° as for the Sun and subtracting 0′·8, for precession, from the SHA of the star).

The Almanac cannot be so used for the Moon or planets.

OM UNIVERSAL TIME

Tidsargumentet i nautiske almanakker har gennem århundreder været Greenwich Mean Time (GMT). GMT baserer sig på en tænkt sols (middelsols) jævne bevægelse omkring jorden i et middelsolår og angiver i ethvert øjeblik middelsolens timevinkel vest for Greenwich meridianen + 12 timer.

På grund af ganske små variationer i jordens rotationsakses stilling i verdensrummet er ikke alle middelsoldøgn præcis lige lange. Selvom der er tale om forskelle på brøkdele af sekunder, så har udviklingen bl.a. inden for de tekniske navigationssystemer medført et behov for en nøjagtigere og mere konstant tidsmåling.

I dag defineres et tidssekund som et antal perioder i cæsium-133 atomets stråling ved overgangen fra en bestemt energitilstand til en anden. Tidsangivelse på grundlag heraf kaldes Universal Time Coordinated (UTC). I praksis benyttes dog Universal Time Uncorrected (UT0, i nærværende almanak betegnet UT).

UT kan i praktisk navigation sættes lig GMT. Den største fejl der derved vil kunne indføres i et klokkeslæt bliver 0,9 sekund, hvilket svarer til 0,2' i en længde beregnet ved en astronomisk observation. Når forskellen mellem UT (GMT) og UTC bliver nøjagtigt 1 sekund rettes de over radioen udsendte tidssignaler. Dette sker efter behov normalt kl. 2400 den 30. juni og den 31. december.

Tilbage til Menuen

TIDE TABLES 2013

INSTRUCTIONS FOR THE USE OF TABLES

TO FIND THE TIMES AND HEIGHTS OF HIGH AND LOW WATER

Standard Ports

The times and heights of high and low water are tabulated for every day of the year. The zone time used for the predicted times is usually the standard time for the area and is given at the top of each page. Care should be taken to ensure that this is the actual time zone in use on that date, the predicted time being corrected if necessary. Special care is needed for those ports whose time is changed during the year. In the British Isles, Greenwich Mean Time is shown throughout the year and a correction must be applied during the period of "Summer Time".

The heights are shown in metres referred to the chart datum of the port concerned.

Secondary Ports

The times of high and low water are obtained by applying the time differences tabulated in Part II to the daily prediction for the most suitable (not necessarily the closest) Standard Port. The Standard Port to be used is that which appears in **bold type** at the head of the subsection in Part II. Other Standard Ports may occur within a subsection in their correct geographical sequence but full data for these are not shown. The times obtained by applying these corrections are in the zone time shown next above the Secondary Port irrespective of the zone time used for the Standard Port predictions. Special care is needed when considering adjacent ports in different countries which may not be keeping the same time.

The time differences given are approximately the maximum and minimum differences which will be found to occur under normal weather conditions. Although these differences are normally shown to the nearest minute it must not be assumed that the resulting predictions will be to this accuracy.

Predictions which fall between the times given for the Standard Port at the head of each column can be obtained by simple interpolation between the columns. Time differences must not be extrapolated but only interpolated between the given values for times at Standard Ports which give values throughout a 24 hour period. Thus for secondary ports referred to SHOREHAM:

				HW		LW	
				0500 and 1700	1000 and 2200	0000 and 1200	0600 and 1800
81	**SHOREHAM**	(see page 42)					
75	Worthing	50 48	0 22	+0010	0000	-0005	-0010

the HW time difference for a tide which occurs at SHOREHAM at 1230 must be interpolated between the values tabulated for 1000 and 1700. High waters which occur at SHOREHAM at both 2330 and at 0300 must have their time differences interpolated between those values tabulated for 2200 and 0500. If a number of tides are required stretching over a period a graphical solution is a convenient method of obtaining this interpolation.

The heights of high and low water are obtained by applying the height differences tabulated in Part II to the daily predictions for the same Standard Port as is used for the times. These differences are tabulated for mean spring and mean neap levels at the Standard Port. Unless there is a statement to the contrary in Part II it may be assumed that the variation is linear and differences for heights other than springs and neaps may be obtained by interpolation or extrapolation. It MUST be noted that the predictions for the Standard Ports include the seasonal changes for the Standard Port which may be different from those for the Secondary Port. The seasonal changes tabulated in Part II (and Part III) are shown for the first day of each month (i.e. Jan 1 is the first of January, and so on). They should be suitably interpolated for the day of the prediction. The first step is therefore to SUBTRACT algebraically the seasonal change for the Standard Port from the predicted height obtained from Part I . The next step is to apply the height difference corresponding to this corrected height at the Standard Port, interpolating or extrapolating as necessary. The final step is to ADD algebraically the seasonal change for the Secondary Port. In both cases great care must be taken to ensure that the signs of the seasonal changes are correctly applied. Where no seasonal changes are given they are less than 0·1 m and can be ignored. Allowance has been made in the preparation of the tables for any difference in the level of chart datum between the Standard and Secondary Port and the resulting heights are referred to *chart datum at the Secondary Port concerned.* See Example I.

Programmable Calculators can be used with advantage for the arithmetic of the Simplified Harmonic Method of Tidal Prediction. A recommended method with a form and worked example for use when programming can be found on page xxxi.

The accuracy of a prediction for a Secondary Port will depend on the amount of work involved. The less work undertaken, the less accurate the prediction is likely to be. All the data necessary for a more accurate prediction are published in this volume where such data exists.

TO FIND THE HEIGHT OF TIDE AT TIMES BETWEEN HIGH AND LOW WATER

Standard Ports

Intermediate times and heights may best be predicted by the use of the Mean Spring and Neap Curves which are given before the daily predictions for each port. See Examples II and III.

Secondary Ports

For Secondary Ports on a stretch of coast where there is little change of shape between adjacent Standard Port curves and where the duration of rise or fall at the Secondary Port is not markedly different from that of the appropriate Standard Port (i.e. where HW and LW time differences in Part II are nearly the same) intermediate times and heights may be obtained by using the Mean Spring and Neap Curves for the appropriate Standard Port. See Examples IV and V.

Between Swanage and Selsey the tide is of considerable complexity and justifies the inclusion of individual curves - shown on pages xxvii to xxix.

In some other cases the use of the Simplified Harmonic Method of Tidal Prediction is recommended where the intermediate heights are important; these ports are indicated in Part II by "c". This method may sometimes be improved by adjusting the curve to fit high and low waters derived from the time and height differences, particularly when a large range of tide is involved.

See page xxxi for instructions on the use of calculators and the Simplified Harmonic Method of Tidal Prediction. The harmonic constants required for this method will be found in Part III of these tables, the Tidal Angles and Factors in Table VII, and Forms A and B at the back of the book. The remainder of this section is therefore devoted to the descriptions of and instructions for the use of the Mean Spring and Neap Curves in Admiralty Tide Tables.

CURVE INTERPOLATION

Mean Spring and Neap Curves for Standard Ports show the factor of the range attained at given time intervals relative to that of HW: thus by definition HW=1 and LW=0

The spring curve is shown in solid line and the neap curve, where it differs from the spring in pecked. Interpolation can be made by eye using the plotted positions of the predicted heights with reference to the levels of MHWS etc. *No attempt should be made to extrapolate beyond the spring or neap curves:* for ranges greater than springs the spring curve should be used, while for ranges less than neaps the neap curve should be used.

Where there is an appreciable change in duration between spring and neap tides the results obtained may have a slight error. This error will normally be greatest near LW but in the few cases where the times are plotted relative to LW it will be greatest near HW.

MEAN LEVELS

The values of MLWS, MLWN, MSL, MHWN and MHWS are shown for Standard Ports in Table V and Part II. The equivalent values for Secondary Ports may be found by the direct application of the appropriate height differences tabulated in Part II.

HIGHEST AND LOWEST LEVELS

The values of HAT and LAT for Standard Ports are shown in Table V, Part 1. The values of HAT for Secondary Ports are shown in Table V, Part 2. The values of LAT at Secondary Ports may be *inferred* by linear extrapolation beyond the given height differences tabulated in Part II for a tide that reaches the appropriate level at the Standard Port using the graphical solution for the examples on the following pages.

OFFSHORE AREAS AND PLACES BETWEEN SECONDARY PORTS

Tidal predictions for offshore areas and stretches of coastline between Secondary Ports should be obtained by the use of Co-Tidal Charts. For details of Co-Tidal Charts available see page 368 and the Catalogue of Admiralty Charts. Full instructions for their use are contained on the body of the charts.

DETAILED INSTRUCTIONS AND EXAMPLES

The Tidal Prediction Form is intended to assist with time and height calculations. The examples have been carried out on these forms and the instructions refer to the boxes. Copies of the form are bound in the back of Admiralty Tide Tables.

Example I. *To find the time and height of HW and LW at a Secondary Port*

I. Complete heading of the Tidal Prediction Form.

II. Transfer data from ATT Part I to boxes (1), (2), (3) and (4).

III. Interpolate data from ATT Part II and insert in boxes (7), (8), (9) and (10).

IV. Enter Seasonal Changes for Standard and Secondary Ports from ATT Part II in boxes (6) and (11).

V. Apply results of Steps III and IV to obtain boxes (12), (13), (14) and (15).

Example:

Find the time (BST) and height of the afternoon HW and LW at ST. MARY'S (Isles of Scilly) on 14th July.
Note: The data used in this example do not refer to the year of these tables.

Extract from ATT Part I.

PLYMOUTH (DEVONPORT)

JULY

14	0309	1.0
	0927	5.3
SA	1532	1.1
	2149	5.0

Extract from ATT Part II.

No	PLACE	Lat N	Long W	TIME DIFFERENCES High Water		Low Water		HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS
				Zone UT(GMT)							
14	**PLYMOUTH (DEVONPORT)** (see page 6)			**0000 and 1200**	**0600 and 1800**	**0000 and 1200**	**0600 and 1800**	**5.5**	**4.4**	**2.2**	**0.8**
	Isles of Scilly										
1	St. Mary's	49 55	6 19	-0035	-0100	-0040	-0025	+0.2	-0.1	-0.2	-0.1

SEASONAL CHANGES IN MEAN LEVEL

No	Jan 1	Feb 1	Mar 1	Apr 1	May 1	June 1	July 1	Aug 1	Sep 1	Oct 1	Nov 1	Dec 1
1-60b	Negligible											

TIDAL PREDICTION FORM

STANDARD PORT **Plymouth (Devonport)** TIME/HEIGHT REQUIRED **p.m.**
SECONDARY PORT **St. Mary's** DATE **14 July** TIME ZONE **BST**

	TIME		HEIGHT		
STANDARD PORT	HW	LW	HW	LW	RANGE
	1 **2149**	2 **1532**	3 **5.0**	4 **1.1**	5 **3.9**
Seasonal change	Standard Port		6 **0.0**	6 **0.0**	
DIFFERENCES	7 **-0044**	8 **-0031**	9 **+0.1**	10 **-0.1**	
Seasonal change	Secondary Port		11 **0.0**	11 **0.0**	
SECONDARY PORT	12 **2105**	13 **1501**	14 **5.1**	15 **1.0**	
Duration	16 **0604**				

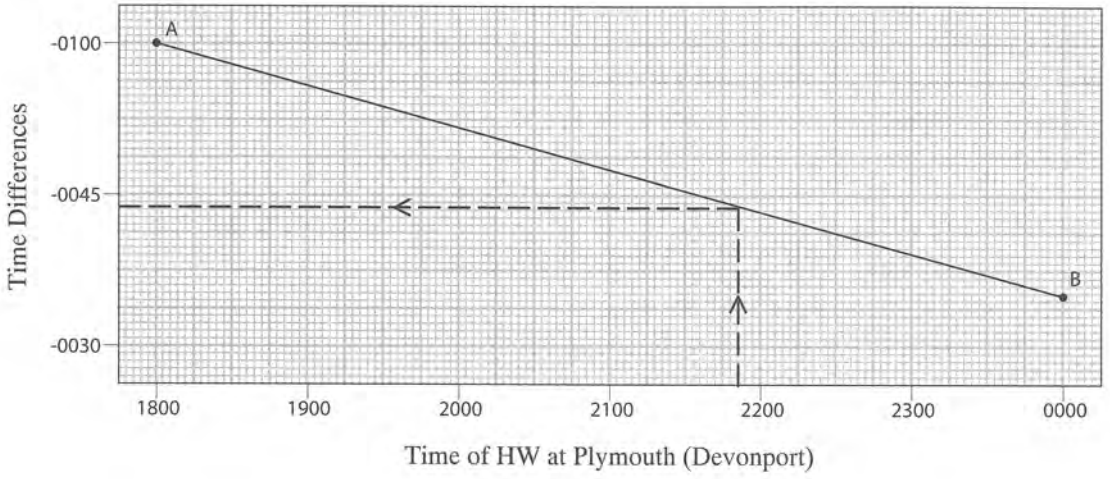
LW 1501 GMT = 1601 BST
HW 2105 GMT = 2205 BST

SECONDARY PORT TIME AND HEIGHT DIFFERENCE INTERPOLATION

In most cases interpolation can be carried out by eye. For complex examples or where greater accuracy is required the use of a pocket calculator may be preferred. These interpolations can also be shown graphically at any convenient scale.

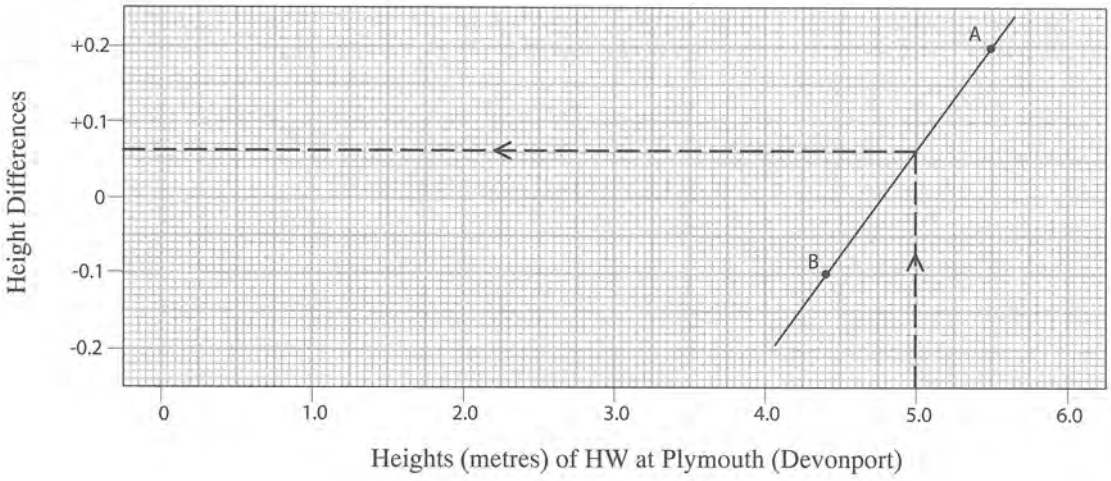
Plot the two High Water time differences A (-0100 at 1800) and B (-0035 at 0000) and join AB. Read off the time difference for St. Mary's corresponding to a HW time at Plymouth (Devonport) of 2149 = -0044.

In a similar way plot the two Low Water time differences (-0040 at 1200) and (-0025 at 1800) and derive the time difference for St. Mary's corresponding to a LW time at Plymouth (Devonport) of 1532 = -0031.



The height difference can be plotted in the same way. Plot A (MHWS of 5.5 and +0.2) and B (MHWN of 4.4 and -0.1). Draw a line through A and B. Read off the height difference for St. Mary's corresponding to a height at Plymouth (Devonport) of 5.0m = +0.1m.

In a similar way plot the two Low Water height differences (MLWN of 2.2 and -0.2) and (MLWS of 0.8 and -0.1) and derive the height difference for St. Mary's corresponding to a height at Plymouth (Devonport) of 1.1m = -0.1m.



Example II. *To find the height at a given time (Standard Port)*

I. On Standard Curve diagram, plot heights of HW and LW occurring either side of required time and join by sloping line.

II. Enter HW time and sufficient others to embrace required time.

III. From required time, proceed vertically to curves, using heights plotted in I to assist interpolation between springs and neaps. Do NOT extrapolate.

IV. Proceed horizontally to sloping line, thence vertically to height scale.

V. Read off height.

Example:

Find the height of tide at ULLAPOOL at 1900 on 6th January.

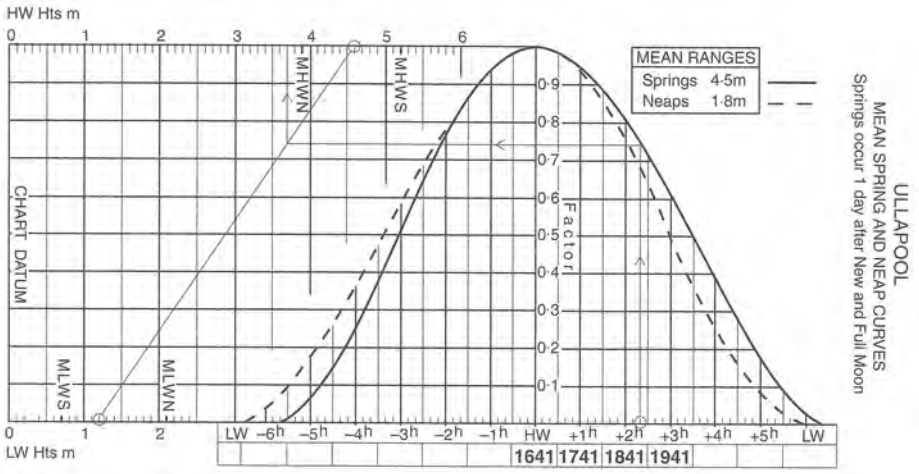
Note: The data used in this example do not refer to the year of these tables.

Extract from ATT Part I.

JANUARY

6 0420 4.6
1033 1.6
F 1641 4.6
2308 1.2

ULLAPOOL



height 3.7m

Example III. *To find the time for a given height (Standard Port)*

I. On Standard Curve diagram, plot heights of HW and LW occurring either side of required event and join by sloping line.

II. Enter HW time and those for half-tidal cycle covering required event.

III. From required height, proceed vertically to sloping line, thence horizontally to curves, using heights plotted in I to assist interpolation between springs and neaps. Do NOT extrapolate.

IV. Proceed vertically to time scale.

V. Read off time.

Example:

Find the time at which the afternoon tide at ULLAPOOL falls to 3·7 m on 6th January.

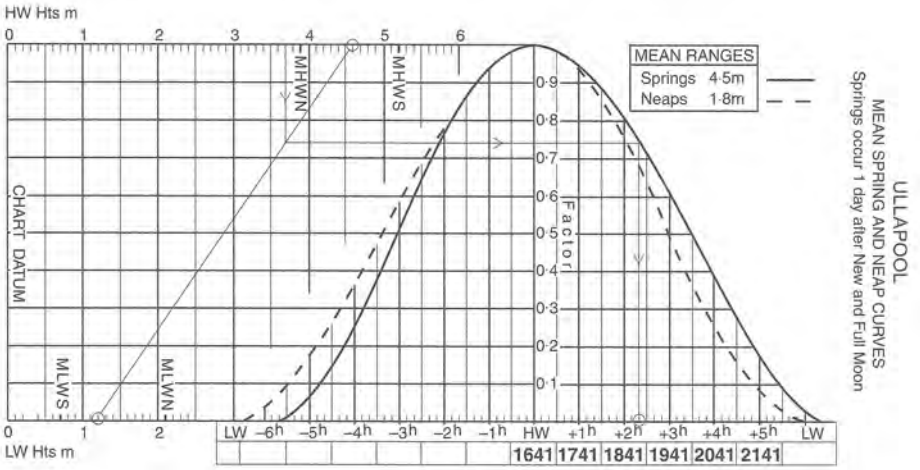
Note: The data used in this example do not refer to the year of these tables.

Extract from ATT Part I.

JANUARY

6	0420	4.6
	1033	1.6
F	1641	4.6
	2308	1.2

ULLAPOOL



Time 1900

Examples IV and V. Intermediate Times/Heights (Secondary Port)

These are the same as the appropriate calculations for a Standard Port (Examples *II* and *III*) except that the Standard Curve diagram for the Standard Port must be entered with HW and LW heights and times for the Secondary Port obtained on the Tidal Prediction Form (Example *I*). When interpolating between the spring and neap curves (see para. III of Examples *II* and *III*) the range at the Standard Port must be used.

Examples:

Find the height of the tide at PADSTOW at 1100 on 28th February. Find the time at which the morning tide at PADSTOW falls to 4.9m on 28th February.

Notes: The data used in these examples do not refer to the year of these tables.
For Instructions on graphical interpolation of differences, see page xx.

Extract from ATT Part I.

FEBRUARY

MILFORD HAVEN

28 0315 1.1
0922 6.6
TU 1538 1.3
2145 6.3

Extract from ATT Part II.

				0100 and 1300	0700 and 1900	0100 and 1300	0700 and 1900				
496	**MILFORD HAVEN**	(see page 162)						**7.0**	**5.2**	**2.5**	**0.7**
545	Padstow	50 33	4 56	-0055	-0050	-0040	-0050	+0.3	+0.4	+0.1	+0.1

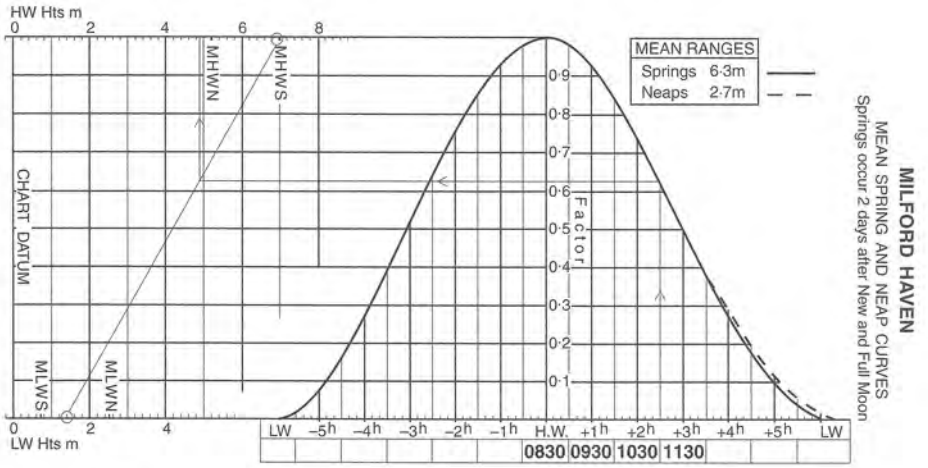
SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1
496	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	+0.1	+0.1
545-548	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1

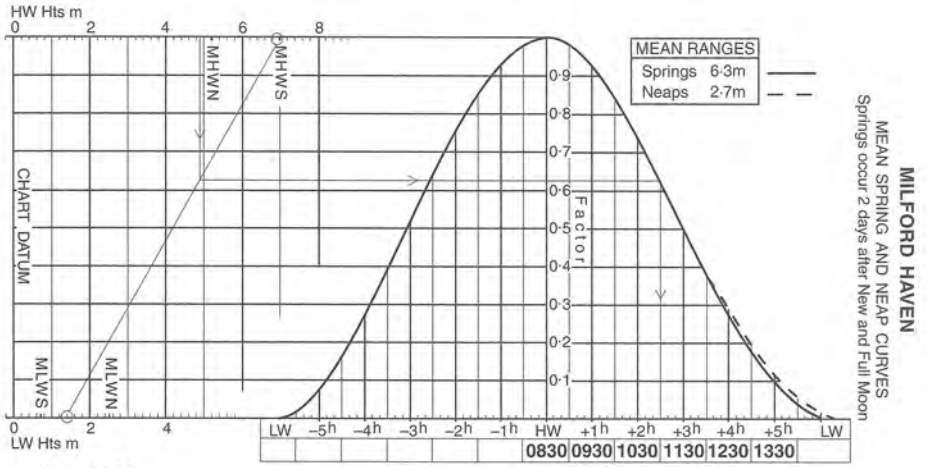
TIDAL PREDICTION FORM

STANDARD PORT..... **Milford Haven** .....TIME/HEIGHT REQUIRED..... **1100 : 4.9** .....
SECONDARY PORT..... **Padstow** .....DATE..... **28 Feb** .....TIME ZONE..... **GMT** .....

	TIME		HEIGHT		
STANDARD PORT	HW	LW	HW	LW	RANGE
	1 **0922**	2 **1538**	3 **6.6**	4 **1.3**	5 **5.3**
Seasonal change	Standard Port		6 **0.0**	6 **0.0**	
DIFFERENCES	7 **-0052**	8 —	9 **+0.3**	10 **+0.1**	
Seasonal change	Secondary Port		11 **0.0**	11 **0.0**	
SECONDARY PORT	12 **0830**	13 —	14 **6.9**	15 **1.4**	
Duration	16 —				



Height 4·9m



Time 1100

SPECIAL INSTRUCTIONS FOR PLACES BETWEEN SWANAGE AND SELSEY

Owing to the rapid change of tidal characteristics and distortion of the tidal curve in this area curves are shown for individual ports. It is a characteristic of the tide here that low water is more sharply defined than high water and these curves have therefore been drawn with *their times relative to that of* ***low water***. The curves appear on pages xxvii to xxix.

Apart from differences caused by referring the times to low water the procedure for obtaining intermediate heights at places whose curves are shown on pages xxvii to xxix is identical to that used for normal Secondary Ports.

The height differences in Part II for ports between Bournemouth and Yarmouth always refer to the higher high water, i.e. that which is shown as reaching a factor of 1.0 on the curves. Note that the time differences which are not required for this calculation, also refer to the higher high water.

The tide at ports whose curves appear on page xxvii shows considerable change of shape and duration between springs and neaps and it is not practical to define the tide with only two curves. A third curve has therefore been drawn for the range at Portsmouth at which the two high waters are equal at the port concerned - this range being marked on the body of the graph. Interpolation here should be between this "critical" curve and either the spring or neap curve as appropriate. It will be noticed that while the critical curve extends throughout the tidal cycle the spring and neap curves stop at the higher high water. Thus for a range at Portsmouth of 3.5 m the factor for 7 hrs after low water at Bournemouth should be referred to the following low water, whereas had the range at Portsmouth been 2.5 m it should be referred to the preceding low water.

Notes:

1. NEWPORT. Owing to the constriction of the River Medina, Newport requires slightly different treatment since the harbour dries out at 1.4 m. The calculation should be performed using the Low Water times and heights for Cowes and the High Water height differences for Newport. Any calculated heights which fall below 1.4 m should be treated as 1.4 m.
2. WAREHAM and TUCKTON. Low Waters do not fall below 0.7 m except under very low river flow conditions.

Example VI. *To Find the Height at a given time at a Secondary Port between Bournemouth and Selsey*

I. Complete top section of the Tidal Prediction Form. Omit HW time column (Boxes 1, 7, 12).
II. On Standard Curve diagram, plot Secondary Port HW and LW heights and join by sloping line.
III. From time required, using Secondary Port LW time, proceed vertically to curve, interpolating as necessary using range at Portsmouth. Do NOT extrapolate.
IV. Proceed horizontally to sloping line, thence vertically to height scale.
V. Read off height.

Example:

Find the height of tide at BOURNEMOUTH at 0200 on 18th November.

Notes: The data used in this example do not refer to the year of these tables.
For Instructions on graphical interpolation of differences, see page xx.

Extract from ATT Part I

NOVEMBER

PORTSMOUTH

18	0110	4.6
	0613	1.1
SA	1318	4.6
	1833	1.0

Extract from ATT Part II

65	**PORTSMOUTH** ..... (see page 34)		**0000 and 1200**	**0600 and 1800**	**0500 and 1700**	**1100 and 2300**	**4.7**	**3.8**	**1.9**	**0.8**
37	Bournemouth	50 43 1 52	-0240	+0055	-0050	-0030	-2.7	-2.2	-0.8	-0.3

SEASONAL CHANGES IN MEAN LEVEL

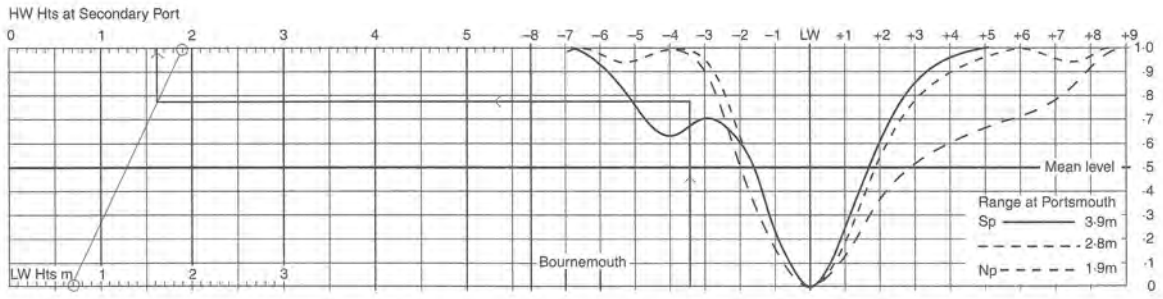
No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1
1-60b						Negligible						

TIDAL PREDICTION FORM

STANDARD PORT..... **Portsmouth** .....TIME/~~HEIGHT~~ REQUIRED..... **0200** .....

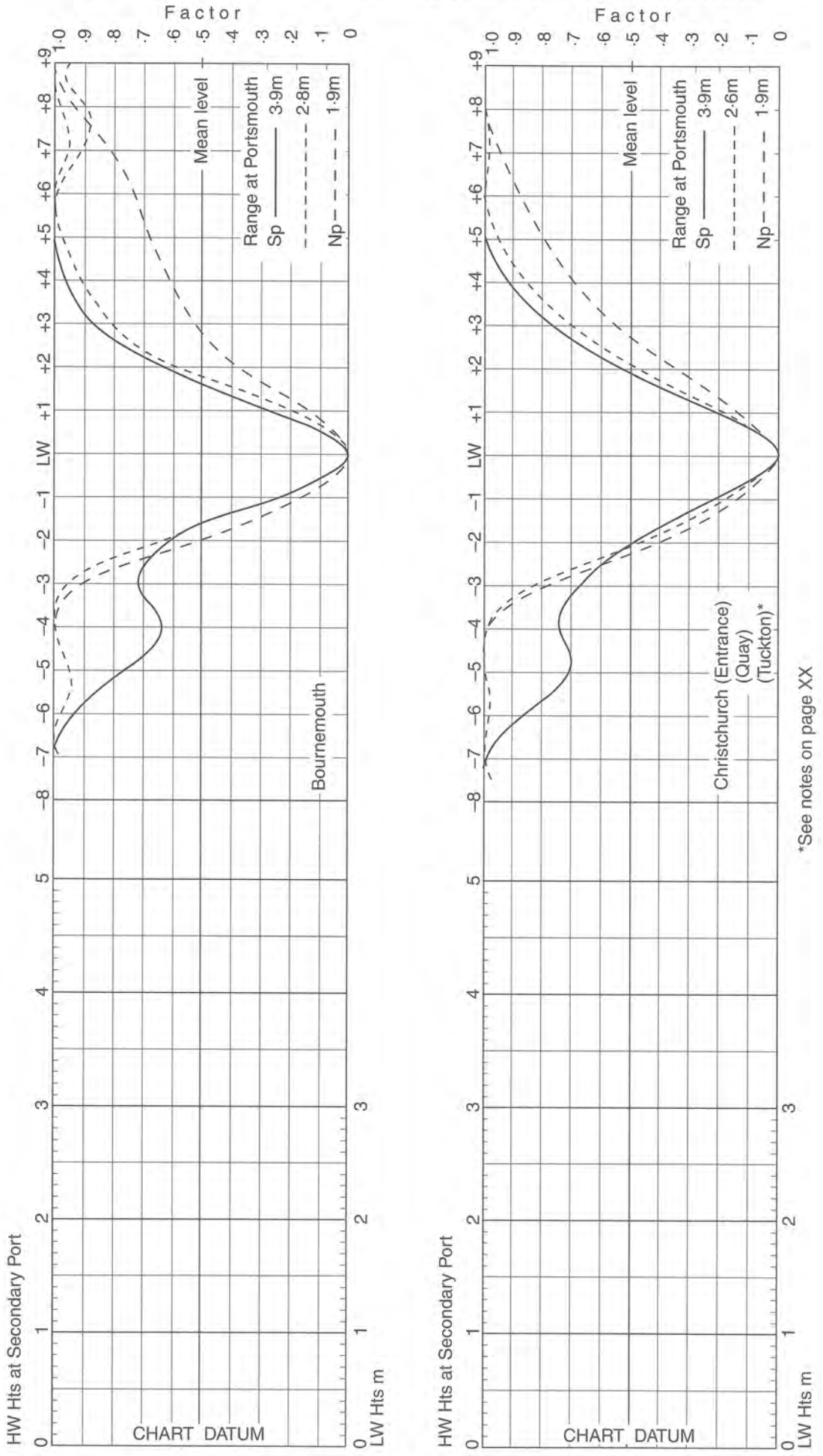
SECONDARY PORT..... **Bournemouth** ..DATE..... **18 Nov** .....TIME ZONE..... **GMT** .....

	TIME		HEIGHT		
STANDARD PORT	HW	LW	HW	LW	RANGE
	1 —	2 **0613**	3 **4.6**	4 **1.1**	5 **3.5**
Seasonal change	Standard Port		6 **0.0**	6 **0.0**	
DIFFERENCES	7 —	8 **-0046**	9 **-2.7**	10 **-0.4**	
Seasonal change	Secondary Port		11 **0.0**	11 **0.0**	
SECONDARY PORT	12 —	13 **0527**	14 **1.9**	15 **0.7**	
Duration	16 —				



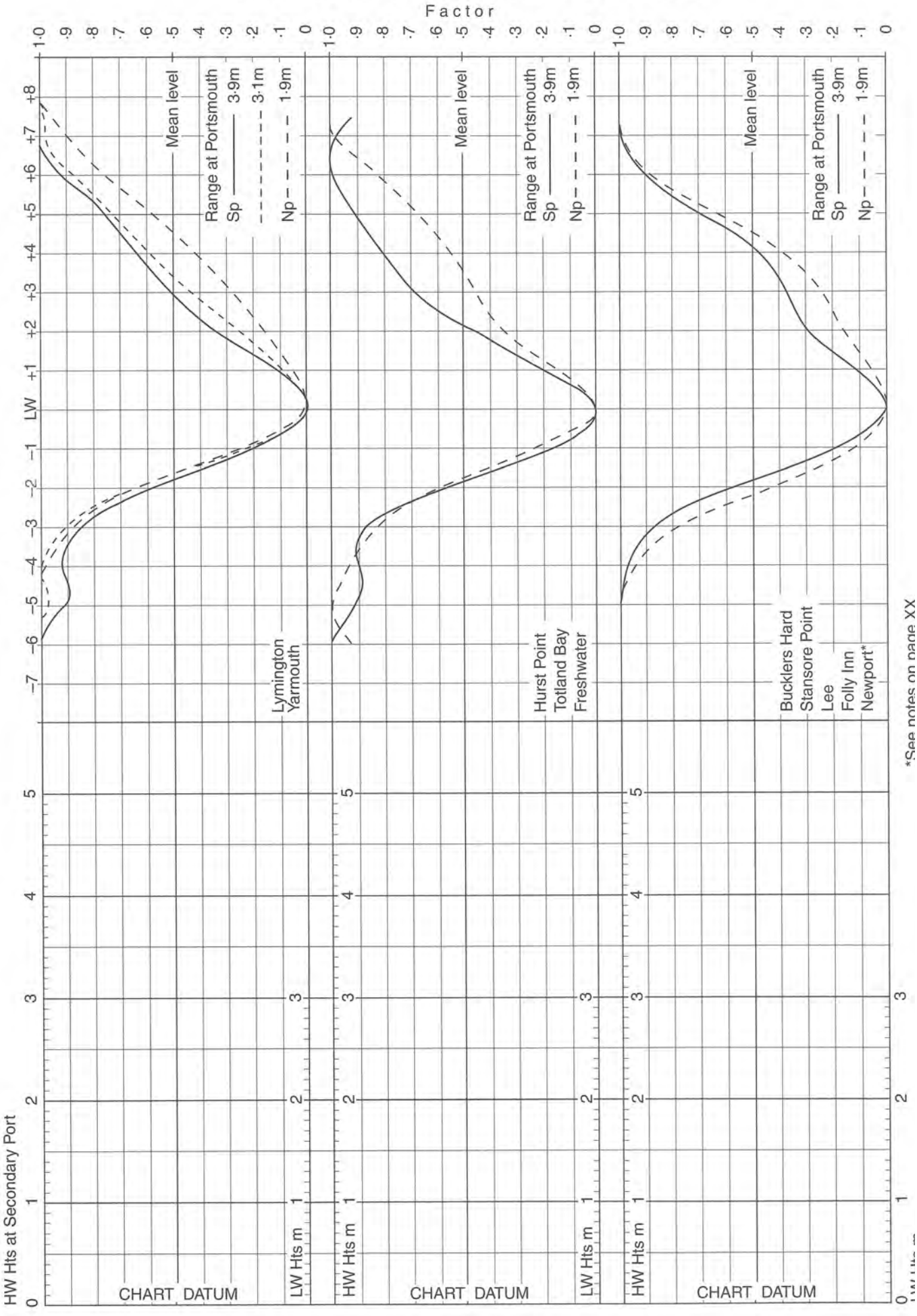
Height 1·6m

TIDAL CURVES – BOURNEMOUTH TO CHRISTCHURCH

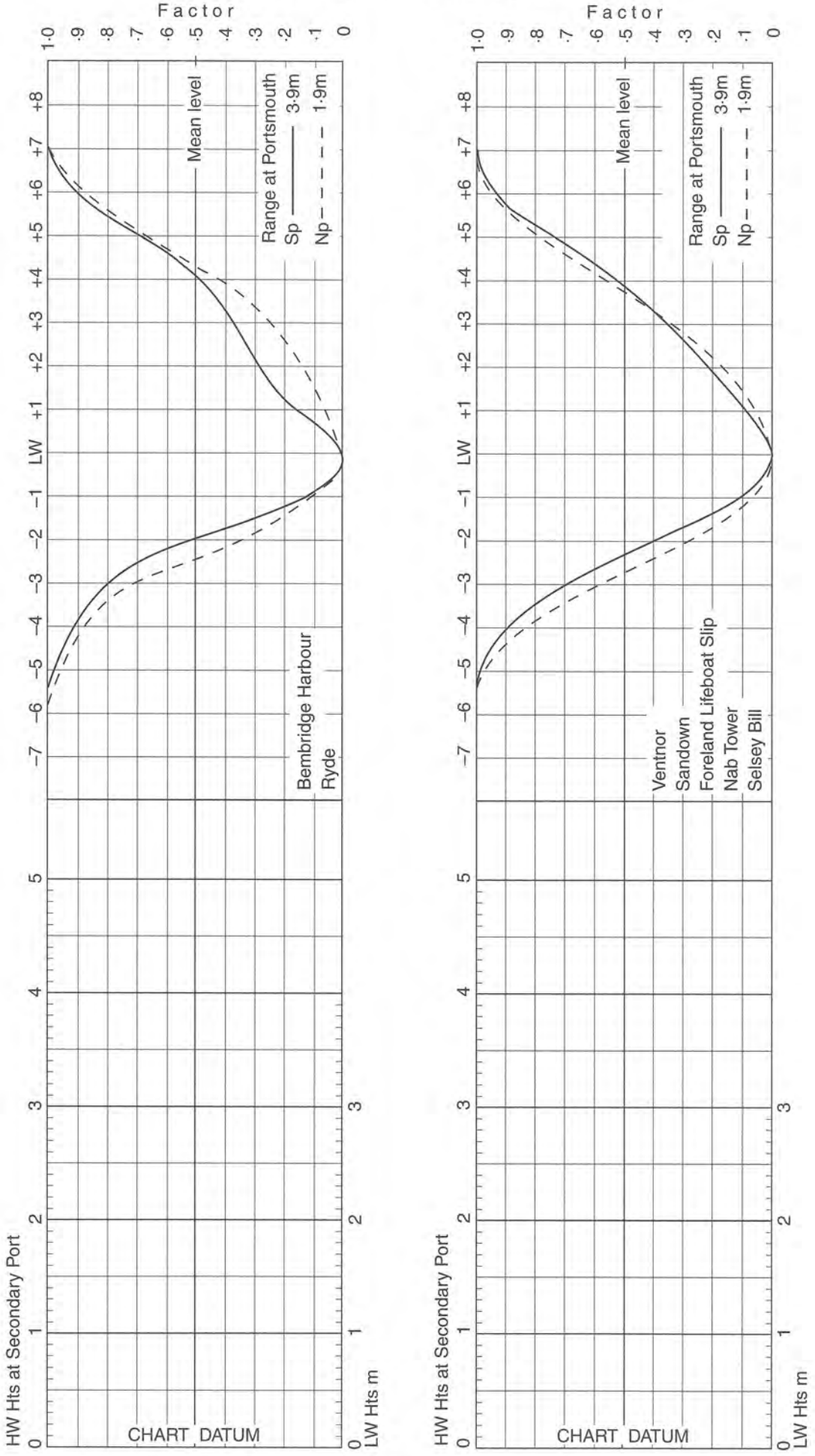


*See notes on page XX

TIDAL CURVES – LYMINGTON TO COWES



TIDAL CURVES – RYDE TO SELSEY



CONNECTION BETWEEN CHART DATUM AND LAND SURVEY DATUM

In order to determine the manner in which tidal levels vary along any given stretch of coastline, it is necessary to refer all levels to a common horizontal plane. Chart Datum, being dependent on the range of the tide, which varies from place to place, is not a suitable reference plane.

Ordnance Datum (Newlyn) can be regarded as a horizontal plane and, where comparisons of absolute heights are required on the mainland of England, Scotland and Wales, this should be used. The earlier Land Levelling System, based on Liverpool, is now obsolete and should not be used. Other countries have their own Land Survey Datum.

If absolute heights are required at a point on the coast where no tidal data are given, or where there is no connection given to Land Survey Datum they should be obtained by interpolation from heights obtained from places on either side where the necessary data are available.

Table III gives the connection between Chart Datum and Ordnance Datum (Newlyn) for all Standard Ports and many Secondary Ports in the United Kingdom, while Table IV gives the equivalent figures for other countries.

Example: It is required to find the height of MHWS above Ordnance Datum (Newlyn) at Happisburgh and Mundesley. This can be done by interpolation between Winterton-on-Sea and Cromer.

	Winterton	Cromer
MHWS above Chart Datum (Part II)	3.2	5.2
Chart Datum relative to OD(N) (Table III)	-1.8	-2.7
MHWS relative to OD(N)	+1.4	+2.5

Happisburgh is approximately half and Mundesley approximately three-quarters of the distance between Winterton and Cromer. By inspection, therefore, the height of MHWS at Happisburgh is +2.0(N) and at Mundesley +2.2(N).

When interpolating along the open coast, care must be taken to choose places where tidal levels are not impounded by bars or narrow entrances or unduly affected by river water. At Exmouth and Littlehampton, for example, the absolute heights of MLWS are higher than the values for the open coast, due to impounding.

Results obtained by this method are approximate only. More accurate information is often available either from the United Kingdom Hydrographic Office or from the National Land Survey Office.

A

Port	**Example**
ATT No.	-
Date	**10 September 2005**
Time Zone	**+0400**

	Mean Level	
1.	Zo (Part III) or (Tab VI)	**0.67**
2.	Seasonal Corr. (Part III)	**0.0**
3.	Sum = ML	**0.67**

		M_2	S_2	K_1	O_1
4.	A1 (Tab VII)	**140**	**005**	**117**	**038**
5.	A2 (Tab VII)	**164**	**004**	**115**	**064**
6.	A1 - A2	**-024**	**001**	**002**	**-026**
*7.	360.n	**720**	**720**	**360**	**360**
8.	(A1 - A2) + 360.n = p	**696**	**721**	**362**	**334**
9.	p/24	**29.00**	**30.04**	**15.08**	**13.92**
10.	A1 (Line 4)	**140**	**005**	**117**	**038**
11	g (Part III)	**243**	**267**	**127**	**137**
12.	A1 + g	**023**	**272**	**244**	**175**
13.	F2 (Tab VII)	**0.96**	**1.31**	**0.89**	**1.25**
14.	F1 (Tab VII)	**0.93**	**1.30**	**0.88**	**1.20**
15.	F2 - F1 = P	**+0.03**	**+0.01**	**+0.01**	**+0.05**
16.	P/24	**+0.0013**	**+0.0004**	**+0.0004**	**+0.0021**

*n = 0 or smallest integer necessary to make Line 8 > 600° in M_2 and S_2 columns and > 300° in K_1 and O_1 columns.

† R Sin r = sum of H.Ft Sin θ for M_2 and S_2

R Cos r = sum of H.Ft Cos θ for M_2 and S_2

‡ H.Ft Cos θ (K_1)

§ H.Ft Cos θ (O_1)

B

17.	Time = T	**0800**			
	H.C.	M_2	S_2	K_1	O_1
18.	p/24 (Line 9)	**29.00**	**30.04**	**15.08**	**13.92**
19.	p/24 x T	**232**	**240**	**121**	**111**
20.	(A1 + g) (Line 12)	**023**	**272**	**244**	**175**
21.	(A1 + g) - p.T/24 = θ	**151**	**032**	**123**	**064**
22.	Sin θ	**0.485**	**0.530**		
23.	Cos θ	**-0.875**	**+0.848**	**-0.545**	**+0.438**
24.	P/24 (Line 16)	**+0.0013**	**+0.0004**	**+0.0004**	**+0.0021**
25.	P/24 x T	**+0.0104**	**+0.0032**	**+0.0032**	**+0.0168**
26.	F1 (Line 14)	**0.93**	**1.30**	**0.88**	**1.20**
27.	F1 + P.T/24 = Ft	**0.94**	**1.30**	**0.88**	**1.22**
28.	H (Part III)	**0.35**	**0.08**	**0.07**	**0.05**
29.	H x Ft	**0.329**	**0.104**	**0.062**	**0.061**
30.	(H x Ft) Sin θ	**+0.160**	**+0.055**	‡	**-0.034**
31.	(H x Ft) Cos θ	**-0.288**	**+0.088**	§	**+0.027**
†32.	R Sin r : R Cos r	**+0.215**	**-0.200**	→	**-0.200**
33.	r : R	**133**	**0.294**	ML (line 3)	**0.67**
34.	2r : R^2	**266**	**0.086**		
35.	f_4 (Part III) : F_4 (Part III)	**238**	**0.013**		
36.	$2r + f_4 = d_4$; $R^2.F_4 = D_4$	**144**	**0.001**	$D_4 \cos d_4$	**-0.001**
37.	3r : R^3	**039**	**0.025**		
38.	f_6 (Part III) : F_6 (Part III)	**133**	**0.022**		
39.	$3r + f_6 = d_6$; $R^3.F_6 = D_6$	**172**	**0.001**	$D_6 \cos d_6$	**-0.001**
40.		Sum lines 30 - 39 = Height			**0.46**

This variation of the Simplified Harmonic Method of Tidal Prediction has been designed primarily for use with a pocket calculator. When performed in this manner there will be no saving in time required to predict a full 24 hours but there will be a slight gain in accuracy (see also note 4). However this method is probably quicker when only a short period of prediction is required, and prediction at fractions of an hour are easier. The box diagram has also been found useful to assist in programming a pocket calculator and to assist in this some additional notes have been added.

DETAILED INSTRUCTION FOR MANUAL COMPLETION OF FORM

The example shows the number of decimal places required.

Section A. To be completed once for each day on which predictions are required.

1. Complete heading section (Port, No., Date and Time Zone).
2. From ATT Part III enter:
   - Z_o (or from Tab VI) ..... Line 1
   - Seasonal Change ..... Line 2
   - Values of g ..... Line 11
3. From ATT, Tab VII enter:
   - Values of A on required day (A1) ..... Lines 4 and 10
   - Values of A on succeeding day (A2) ..... Line 5
   - Values of F on required day (F1) ..... Line 14
   - Values of F on succeeding day (F2) ..... Line 13
4. Sum Lines 1 and 2 to obtain days value of Mean Level in Line 3.

For each column in turn:

5. Obtain Line 6 by subtracting A2 from A1 .
6. Enter 360.n in Line 7. (See note under section A and Note 5).
7. Add Lines 6 and 7 to obtain daily rate of change of A (p) in Line 8.
8. Insert p/24 in Line 9.
9. Add Lines 10 and 11 to obtain (A1 +g) in Line 12.
10. Subtract Line 14 from Line 13 to obtain daily rate of change of F (P) in Line 15.
11. Insert P/24 in Line 16.

Section B. To be completed for each time for which a prediction is required.

12. Enter Time (T) in Line 17. If your calculator has not got conversion between Hrs/Mins/Sec and Dec. Hrs it is probably best to work in decimals e.g. 1812=18.2.
13. From ATT Part III enter:

Values of H		Line 28.
f_4	If no data are given, enter zero	Line 35 Col 1
F_4		Line 35 Col 2
f_6		Line 38 Col 1
F_6		Line 38 Col 2

14. From Section A enter:

p/24 (Line 9)	Line 18
(A1+g) (Line 12)	Line 20
P/24 (Line 16)	Line 24
F1 (Line 14 or direct from ATT Tab VII)	Line 26
ML (Line 3)	Line 33 Col 4

15. Multiply p/24 by T in Line 19.
16. *Subtract* (see note 4) Line 19 from Line 20 to obtain θ in Line 21.
17. Enter Sin θ in M_2 and S_2 columns only of Line 22.
18. Enter Cos θ in all columns of Line 23.
19. Multiply P/24 by T in Line 25 and add to Line 26 to obtain interpolated value of F (=Ft) in Line 27.
20. Multiply H (Line 28) by Ft (Line 27). Enter result in Line 29.
21. Multiply Line 29 by Line 22 to obtain H.Ft.sin θ in M_2 and S_2 columns only.
22. Multiply Line 29 by Line 23 to obtain H.Ft.cos θ. Insert results for M_2, S_2 and O_1 in appropriate columns of Line 31. Insert result for K_1 in Line 30 (Col 4).

N.B.From here on the columns no longer refer to H.C.s and are referred to by their numbers.

23. Sum columns 1 and 2 of Line 30 and enter in Line 32, Col 1 (=R.sin r).
24. Sum columns 1 and 2 of Line 31 and enter in Line 32, Col 2 (=R.cos r), and Col 4.
25. From R.sin r and R.cos r obtain values of r (Line 33, Col 1) and R (Line 33 Col 2).
26. Obtain 2r in Line 34, Col 1 and 3r in Line 37, Col 1.
27. Obtain R^2 in Line 34 Col 2 and R^3 in Line 37 Col 2.
28. Add Lines 34 and 35 (Col 1) to obtain d_4 in Line 36.
29. Add Lines 37 and 38 (Col 1) to obtain d_6 in Line 39.
30. Multiply Lines 34 and 35 (Col 2) to obtain D_4 in Line 36.
31. Multiply Lines 37 and 38 (Col 2) to obtain D_6 in Line 39.
32. Obtain D_4.cos d_4 and insert in Line 36, Col 4.
33. Obtain D_6.cos d_6 and insert in Line 39, Col 4.
34. Finally sum Col 4, Lines 30, 31, 32, 33, 36 and 39; enter the result in Line 40.

Notes.

1. It is strongly recommended that calculations should bracket the required time and the results be plotted on any suitable squared paper. A single prediction is seldom of value as it gives no indication of the rate of rise or fall (in complicated ports it will not even be possible to ascertain whether it is rising or falling).

2. Although the box diagrams allow for entry of every step the capabilities of the calculator and the skill of the operator may enable many boxes to be left blank or placed in Memory. POLAR/RECTANGULAR conversion is particularly valuable and with this facility one can go from Line 17 to 31 without any intermediate writing down and with no ambiguity of quadrant.

3. In many cases interpolation between F1 and F2 can be carried out with sufficient accuracy by eye thus enabling Lines 13, 14, 15, 16, 24 and 25 to be omitted.

4. In order to simplify the calculation (or if being programmed to save steps and/or stores) the following approximations may be made. These are given in the order of their effect on the accuracy that with the least effect being given first:

(a) Omit lines 4 to 9. Insert the following rates in Line 18:

M_2	29.0 deg/hr
S_2	30.0 deg/hr
K_1	15.0 deg/hr
O_1	13.9 deg/hr

(b) As (a) but using the following rates:

M_2, S_2 } -29.32 deg/hr.

K_1, O_1 } -Half this figure i.e. 14.66 deg/hr.

(c) Omit interpolation of F. Hence omit Lines 13, 14, 15, 16, 24, 25 and 26 and insert Ft=F (direct from ATT Tab VII) in Line 27.

5. *Interpolation Between Tabulated Values of A and F.*

The hourly rates of change of A for each constituent can be calculated from consecutive tabulated values, care being taken to apply sufficient multiples of 360° to the tabulated values to ensure that these rates approximate to the astronomical values for each constituent - i.e. 30 deg/hr for M_2 and S_2 and 15 deg/hr for K_1 and O_1. This can be done as follows:

$$\text{Daily Rate } (p)=(A1+360.n) - A2$$

where n=o or the smallest integer which makes p>600 in the case of M_2 and S_2 and p>300 in the case of K_1 and O_1. Then for each of the four constituents:

$$At=A1 - (T \times p)/24$$

(The values of A in Table VII are published in a form designed to simplify the arithmetic of the original graphical version of the Simplified Harmonic Method of Tidal Prediction (the tabulated value is 360° minus the astronomical value). The second term in the above expression is, therefore, SUBTRACTED.)

The interpolation for F for any given time is simpler:

$$Ft=F1 +(T \times P)/24 \text{ where } P=F2-F1$$

6. *Vectorial Addition of SD components*

The SD tide (R, r) at any time consists of the sum of the M_2 and S_2 tides. Thus:

$R.\sin r=H.Ft.\sin(At+g)$ for $M_2+H.Ft.\sin(At+g)$ for S_2

$R.\cos r=H.Ft.\cos(At+g)$ for $M_2+H.Ft.\cos(At+g)$ for S_2

and from this R and r may be obtained. If using a programmed calculator POLAR/RECTANGULAR conversion *must* be used to avoid ambiguity of sign or quadrant, but if the calculation is being done manually ordinary trig (and inverse trig) functions may be used provided great care is taken to resolve this ambiguity.

Shallow Water Corrections

The quarterdiurnal tide has phase ..... $d_4 = 2r+f_4$

and amplitude ..... $D_4 = R^2 \times F_4$

and the height correction due to the

quarterdiurnal effect ..... $h_4 = D_4.\cos d_4$

The sixthdiurnal tide has phase ..... $d_6 = 3r+f_6$

and amplitude ..... $D_6 = R^3 \times F_6$

and hence height ..... $h_6 = D_6.\cos d_6$

h4 and h6 must be summed algebraically to the combined SD and D tide to give a corrected height for the required time.

ADDITIONAL NOTES MORE APPLICABLE TO PROGRAMMABLE CALCULATORS

7. Although the boxes show a possible route through the problem this may not be the best route for every calculator.

8. If storage is limited, parameters can often be combined and placed each side of the decimal place after application of suitable multipliers e.g. g and H can be stored together: thus a g of 312 and H of 2.45 might be stored as 312.245. Strangely in some cases this not only reduces the number of stores required but also the program steps.

9. Given sufficient facilities on the calculator the following are recommended:
   (a) Automatic stepping of TIME at both fixed and variable intervals.
   (b) Ability to change Start Time of a series of predictions.
   (c) Prediction of successive days without re-entry of Harmonic Constants for each day.
   (d) Prediction for second port on same day without re-entry of astronomical data (A and F)
   (e) Recording of Harmonic Constants for any port. Steps should be allocated for amendment of carded data to allow for any changes.

Although possible to program for the derivation of a time of HW or of LW this has been found to be of little value. In a large number of ports where this method is of greatest use the curve may be so flat at these points that the actual time derived is meaningless: at ports where a double HW or LW or intermediate stand occurs there may well be ambiguity as to the point on the curve obtained. In most cases it is preferable to plot a short portion of the curve from the results of successive calculations.

10. It is sometimes more convenient to work in centimetres rather than metres provided there are no Shallow Water Corrections.

TIDE TABLES 2013

PART I

TIDAL PREDICTIONS

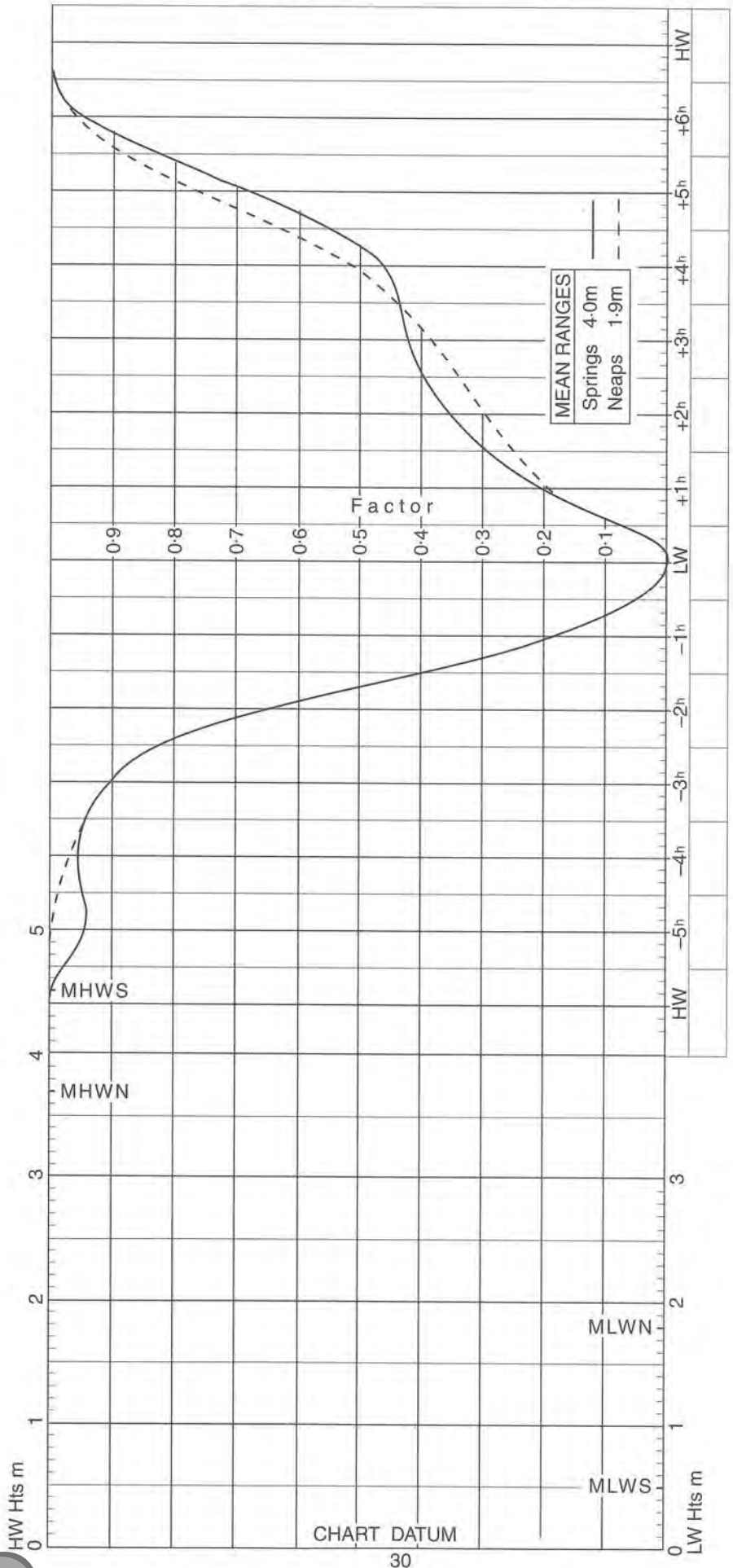
FOR

STANDARD PORTS

SOUTHAMPTON

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon



Tilbage til Menuen

ENGLAND — SOUTHAMPTON

LAT 50°53'N LONG 1°24'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

JANUARY

	Time	m		Time	m
1 TU	0059 4.4 0630 1.2 1307 4.4 1846 1.0		**16** W	0144 4.5 0720 0.8 1355 4.4 1940 0.7	
2 W	0132 4.5 0706 1.2 1345 4.4 1923 1.0		**17** TH	0426 4.5 0803 1.1 1449 4.2 2023 1.1	
3 TH	0213 4.4 0746 1.2 1429 4.4 2005 1.1		**18** F ☽	0451 4.3 0848 1.4 1558 4.0 2111 1.4	
4 F	0300 4.4 0832 1.3 1519 4.3 2054 1.3		**19** SA	0458 4.1 0939 1.7 1701 3.9 2207 1.8	
5 SA ☾	0353 4.3 0926 1.5 1616 4.1 2153 1.5		**20** SU	0531 4.0 1042 1.9 1755 3.7 2313 2.0	
6 SU	0454 4.2 1034 1.7 1722 4.0 2306 1.7		**21** M	0621 3.8 1157 2.0 1855 3.6	
7 M	0609 4.1 1153 1.7 1947 4.0		**22** TU	0028 2.1 0720 3.8 1310 2.0 2117 3.7	
8 TU	0027 1.7 0805 4.2 1311 1.5 2035 4.1		**23** W	0135 2.0 0825 3.9 1408 1.8 2219 3.9	
9 W	0142 1.5 0847 4.4 1417 1.2 2115 4.3		**24** TH	0229 1.8 0921 4.0 1455 1.5 2258 4.1	
10 TH	0243 1.2 0928 4.6 1512 0.9 2156 4.5		**25** F	0315 1.5 1003 4.2 1537 1.2 2237 4.2	
11 F ●	0335 0.9 1011 4.7 1602 0.6 2239 4.6		**26** SA	0356 1.3 1041 4.4 1617 1.0 2311 4.4	
12 SA	0424 0.7 1054 4.8 1648 0.4 2324 4.7		**27** SU O	0434 1.1 1116 4.4 1653 0.8 2343 4.4	
13 SU	0510 0.5 1138 4.8 1733 0.3		**28** M	0509 1.0 1147 4.5 1727 0.8	
14 M	0008 4.7 0554 0.5 1222 4.7 1816 0.3		**29** TU	0009 4.5 0541 0.9 1214 4.5 1759 0.7	
15 TU	0055 4.6 0637 0.6 1307 4.6 1858 0.5		**30** W	0036 4.5 0614 0.8 1246 4.6 1830 0.7	
			31 TH	0110 4.6 0648 0.8 1324 4.6 1905 0.7	

FEBRUARY

	Time	m		Time	m
1 F	0149 4.6 0726 0.8 1406 4.5 1944 0.8		**16** SA	0412 4.3 0810 1.2 1507 4.1 2029 1.4	
2 SA	0234 4.5 0808 1.0 1454 4.4 2029 1.0		**17** SU ☽	0427 4.1 0850 1.5 1639 3.9 2114 1.7	
3 SU ☾	0325 4.3 0856 1.2 1550 4.2 2120 1.3		**18** M	0455 3.9 0941 1.9 1725 3.7 2217 2.1	
4 M	0426 4.2 0957 1.6 1658 3.9 2230 1.7		**19** TU	0545 3.7 1055 2.1 1822 3.6 2342 2.2	
5 TU	0550 4.0 1123 1.8 1927 3.9		**20** W	0644 3.6 1234 2.1 1928 3.6	
6 W	0011 1.8 0747 4.1 1306 1.7 2027 4.0		**21** TH	0115 2.1 0750 3.7 1343 1.9 2143 3.8	
7 TH	0142 1.6 0839 4.2 1413 1.3 2115 4.2		**22** F	0209 1.9 0851 3.9 1430 1.6 2226 4.0	
8 F	0239 1.3 0921 4.4 1504 0.9 2153 4.4		**23** SA	0252 1.6 0937 4.1 1512 1.3 2207 4.2	
9 SA	0327 0.9 1000 4.5 1551 0.6 2231 4.5		**24** SU	0332 1.3 1014 4.3 1551 0.9 2240 4.4	
10 SU ●	0413 0.6 1040 4.6 1635 0.3 2311 4.6		**25** M O	0409 1.0 1049 4.4 1628 0.7 2311 4.5	
11 M	0455 0.4 1122 4.6 1716 0.2 2353 4.6		**26** TU	0444 0.7 1119 4.5 1703 0.5 2340 4.6	
12 TU	0536 0.3 1203 4.6 1756 0.2		**27** W	0519 0.6 1150 4.6 1737 0.4	
13 W	0034 4.5 0617 0.4 1245 4.5 1836 0.4		**28** TH	0011 4.6 0553 0.5 1224 4.7 1811 0.4	
14 TH	0117 4.5 0656 0.6 1327 4.4 1914 0.6				
15 F	0202 4.4 0732 0.9 1413 4.2 1951 1.0				

MARCH

	Time	m		Time	m
1 F	0047 4.7 0629 0.5 1303 4.7 1846 0.5		**16** SA	0125 4.3 0704 0.8 1341 4.2 1920 1.0	
2 SA	0126 4.6 0706 0.5 1346 4.6 1925 0.6		**17** SU	0202 4.2 0733 1.1 1423 4.1 1950 1.3	
3 SU	0211 4.5 0747 0.8 1434 4.4 2008 0.9		**18** M	0244 4.1 0804 1.4 1515 3.9 2024 1.7	
4 M ☾	0303 4.3 0833 1.1 1533 4.2 2058 1.4		**19** TU ☽	0337 3.9 0844 1.7 1658 3.8 2114 2.0	
5 TU	0409 4.1 0933 1.5 1658 3.9 2211 1.8		**20** W	0505 3.7 0951 2.0 1750 3.6 2243 2.3	
6 W	0608 3.9 1111 1.8 1905 3.9		**21** TH	0609 3.5 1123 2.1 1853 3.6	
7 TH	0024 1.9 0723 3.9 1301 1.6 2011 4.0		**22** F	0034 2.2 0716 3.6 1257 2.0 2001 3.7	
8 F	0135 1.7 0823 4.0 1400 1.3 2106 4.2		**23** SA	0138 2.0 0819 3.7 1354 1.7 2058 4.0	
9 SA	0226 1.3 0908 4.2 1448 1.0 2143 4.4		**24** SU	0221 1.7 0908 4.0 1438 1.3 2135 4.2	
10 SU	0311 0.9 0946 4.4 1532 0.6 2218 4.5		**25** M	0300 1.3 0945 4.2 1518 0.9 2208 4.4	
11 M	0354 0.6 1024 4.5 1614 0.4 2255 4.5		**26** TU	0338 0.9 1018 4.4 1557 0.6 2239 4.5	
12 TU	0435 0.4 1103 4.5 1655 0.2 2334 4.5		**27** W O	0416 0.6 1050 4.6 1635 0.4 2311 4.7	
13 W	0515 0.3 1143 4.5 1734 0.3		**28** TH	0453 0.4 1125 4.7 1712 0.3 2346 4.7	
14 TH	0012 4.5 0554 0.4 1222 4.4 1812 0.5		**29** F	0530 0.3 1203 4.8 1749 0.3	
15 F	0049 4.4 0630 0.6 1301 4.3 1848 0.7		**30** SA	0024 4.8 0609 0.3 1244 4.7 1828 0.4	
			31 SU	0106 4.7 0648 0.4 1329 4.6 1908 0.6	

APRIL

	Time	m		Time	m
1 M	0152 4.5 0731 0.7 1421 4.4 1954 1.0		**16** TU	0207 4.1 0732 1.3 1438 4.1 1952 1.6	
2 TU	0248 4.3 0819 1.1 1530 4.2 2048 1.4		**17** W	0250 4.0 0811 1.5 1533 3.9 2037 1.9	
3 W ☾	0405 4.1 0924 1.5 1745 4.0 2211 1.8		**18** TH ☽	0343 3.8 0905 1.8 1718 3.8 2148 2.1	
4 TH	0537 3.9 1100 1.7 1848 4.0 2356 1.8		**19** F	0519 3.6 1027 2.0 1818 3.7 2311 2.2	
5 F	0654 3.9 1229 1.6 2001 4.1		**20** SA	0639 3.6 1145 1.9 1923 3.8	
6 SA	0107 1.7 0807 3.9 1331 1.4 2105 4.2		**21** SU	0025 2.0 0745 3.7 1254 1.7 2021 4.0	
7 SU	0200 1.4 0853 4.1 1421 1.1 2137 4.3		**22** M	0129 1.7 0837 3.9 1351 1.4 2102 4.2	
8 M	0247 1.0 0929 4.2 1506 0.8 2203 4.4		**23** TU	0218 1.3 0914 4.2 1439 1.0 2135 4.4	
9 TU	0330 0.7 1006 4.3 1549 0.6 2237 4.5		**24** W	0303 0.9 0947 4.4 1523 0.7 2207 4.6	
10 W ●	0411 0.5 1045 4.3 1630 0.5 2314 4.4		**25** TH O	0345 0.6 1022 4.6 1606 0.5 2242 4.7	
11 TH	0451 0.5 1125 4.3 1709 0.5 2349 4.4		**26** F	0427 0.4 1100 4.7 1648 0.3 2321 4.8	
12 F	0530 0.5 1204 4.3 1747 0.7		**27** SA	0508 0.2 1141 4.8 1729 0.3	
13 SA	0022 4.4 0606 0.7 1240 4.3 1822 0.9		**28** SU	0003 4.8 0551 0.2 1227 4.8 1811 0.4	
14 SU	0054 4.3 0637 0.9 1316 4.2 1852 1.1		**29** M	0048 4.7 0634 0.4 1316 4.6 1857 0.7	
15 M	0129 4.2 0702 1.1 1355 4.2 1918 1.4		**30** TU	0138 4.6 0720 0.6 1413 4.5 1946 1.0	

HIGH WATERS - IMPORTANT NOTE. DOUBLE HIGH WATERS OCCUR AT SOUTHAMPTON. THE PREDICTIONS ARE FOR THE FIRST HIGH WATER. USERS ARE ADVISED TO CONSULT PART 1A OR THE UKHO 'EASYTIDE' WEBSITE (WWW.EASYTIDE.COM).

ENGLAND — SOUTHAMPTON

LAT 50°53'N LONG 1°24'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

MAY

	Time	m		Time	m
1 W	0237	4.3	**16** TH	0220	4.1
	0812	1.0		0748	1.3
	1530	4.3		1456	4.1
	2045	1.4		2014	1.7
2 TH	0350	4.1	**17** F	0306	3.9
	0916	1.3		0836	1.5
	1744	4.2		1547	4.0
☾	2157	1.6		2110	1.8
3 F	0506	4.0	**18** SA	0401	3.8
	1031	1.5		0939	1.7
	1841	4.1		1648	3.9
	2313	1.7	☽	2219	1.9
4 SA	0617	3.9	**19** SU	0504	3.7
	1144	1.6		1051	1.7
	1953	4.1		1848	3.9
				2329	1.9
5 SU	0024	1.7	**20** M	0709	3.7
	0821	3.9		1159	1.7
	1249	1.5		1946	4.0
	2106	4.2			
6 M	0125	1.5	**21** TU	0033	1.7
	0958	4.0		0805	3.9
	1346	1.3		1302	1.4
	2226	4.3		2029	4.2
7 TU	0216	1.2	**22** W	0134	1.4
	0913	4.1		0841	4.1
	1435	1.1		1359	1.2
	2147	4.3		2101	4.4
8 W	0302	1.0	**23** TH	0227	1.0
	0950	4.1		0917	4.4
	1520	0.9		1451	0.9
	2217	4.4		2137	4.6
9 TH	0345	0.8	**24** F	0317	0.7
	1030	4.2		0956	4.6
	1604	0.8		1539	0.6
	2253	4.4		2217	4.8
10 F	0427	0.7	**25** SA	0404	0.4
	1114	4.2		1039	4.7
	1645	0.8		1626	0.5
●	2328	4.4	O	2300	4.8
11 SA	0506	0.8	**26** SU	0451	0.3
	1322	4.3		1125	4.8
	1724	0.9		1712	0.4
				2345	4.8
12 SU	0002	4.3	**27** M	0536	0.3
	0543	0.9		1213	4.7
	1356	4.3		1759	0.5
	1800	1.1			
13 M	0034	4.3	**28** TU	0032	4.7
	0614	1.0		0623	0.4
	1310	4.2		1304	4.7
	1830	1.3		1847	0.7
14 TU	0107	4.2	**29** W	0123	4.6
	0640	1.1		0711	0.5
	1337	4.2		1401	4.5
	1856	1.4		1937	0.9
15 W	0141	4.2	**30** TH	0220	4.4
	0710	1.2		0802	0.8
	1413	4.2		1512	4.4
	1930	1.5		2031	1.2
			31 F	0324	4.2
				0858	1.1
				1740	4.4
			☾	2131	1.4

JUNE

	Time	m		Time	m
1 SA	0434	4.0	**16** SU	0325	4.0
	0958	1.3		0903	1.4
	1827	4.3		1600	4.1
	2234	1.6	☽	2137	1.6
2 SU	0540	3.9	**17** M	0420	3.9
	1102	1.5		1003	1.5
	1921	4.2		1658	4.1
	2340	1.7		2242	1.7
3 M	0647	3.8	**18** TU	0521	3.9
	1206	1.6		1111	1.6
	2024	4.1		1805	4.1
				2349	1.6
4 TU	0044	1.6	**19** W	0638	3.9
	0918	3.9		1219	1.5
	1307	1.5		1955	4.2
	2134	4.1			
5 W	0142	1.5	**20** TH	0056	1.4
	1031	4.0		0816	4.1
	1403	1.4		1324	1.3
	2243	4.2		2034	4.4
6 TH	0233	1.3	**21** F	0158	1.2
	0946	4.0		0857	4.3
	1453	1.3		1425	1.1
	2153	4.2		2115	4.5
7 F	0320	1.1	**22** SA	0255	0.9
	1026	4.1		0941	4.5
	1539	1.2		1520	0.9
	2230	4.3		2159	4.7
8 SA	0404	1.0	**23** SU	0348	0.6
	1118	4.2		1026	4.6
	1623	1.1		1612	0.6
●	2309	4.3	O	2244	4.8
9 SU	0445	0.9	**24** M	0437	0.4
	1234	4.3		1112	4.7
	1704	1.1		1701	0.5
	2346	4.3		2330	4.8
10 M	0524	1.0	**25** TU	0525	0.3
	1321	4.3		1200	4.7
	1742	1.2		1748	0.5
11 TU	0020	4.3	**26** W	0017	4.7
	0558	1.0		0612	0.3
	1405	4.3		1249	4.7
	1813	1.3		1835	0.5
12 W	0049	4.3	**27** TH	0105	4.6
	0625	1.1		0657	0.4
	1321	4.3		1342	4.6
	1840	1.3		1921	0.7
13 TH	0119	4.2	**28** F	0157	4.4
	0653	1.1		0744	0.6
	1348	4.3		1642	4.7
	1913	1.4		2010	0.9
14 F	0154	4.2	**29** SA	0255	4.3
	0729	1.2		0833	0.9
	1425	4.2		1720	4.5
	1953	1.4		2101	1.2
15 SA	0237	4.1	**30** SU	0403	4.1
	0812	1.2		0925	1.2
	1510	4.2		1750	4.3
	2040	1.5	☾	2157	1.5

JULY

	Time	m		Time	m
1 M	0511	3.9	**16** TU	0348	4.1
	1023	1.5		0924	1.3
	1758	4.1		1622	4.2
	2259	1.7	☽	2201	1.5
2 TU	0607	3.8	**17** W	0446	4.0
	1125	1.7		1029	1.5
	1842	4.0		1724	4.1
				2311	1.6
3 W	0004	1.8	**18** TH	0556	3.9
	0710	3.7		1143	1.6
	1229	1.8		1852	4.1
	1939	4.0			
4 TH	0109	1.7	**19** F	0027	1.6
	0941	3.8		0821	4.0
	1332	1.8		1300	1.6
	2040	4.0		2026	4.3
5 F	0207	1.6	**20** SA	0141	1.4
	1042	3.9		0903	4.2
	1428	1.6		1411	1.4
	2128	4.1		2106	4.4
6 SA	0257	1.4	**21** SU	0244	1.0
	1117	4.1		0938	4.4
	1518	1.4		1510	1.0
	2207	4.2		2148	4.6
7 SU	0343	1.2	**22** M	0338	0.7
	1054	4.2		1018	4.6
	1603	1.3		1602	0.7
	2247	4.3	O	2231	4.7
8 M	0426	1.0	**23** TU	0427	0.4
	1127	4.3		1101	4.7
	1645	1.2		1649	0.5
●	2325	4.3		2315	4.8
9 TU	0505	1.0	**24** W	0512	0.2
	1203	4.3		1146	4.7
	1723	1.2		1734	0.4
				2359	4.7
10 W	0000	4.3	**25** TH	0556	0.2
	0540	1.0		1232	4.7
	1234	4.4		1818	0.4
	1756	1.2			
11 TH	0029	4.3	**26** F	0045	4.6
	0610	1.0		0639	0.3
	1256	4.4		1319	4.6
	1824	1.2		1902	0.6
12 F	0056	4.3	**27** SA	0132	4.5
	0637	1.0		0722	0.5
	1321	4.4		1415	4.5
	1854	1.2		1945	0.8
13 SA	0129	4.3	**28** SU	0225	4.3
	0709	1.0		0805	0.8
	1357	4.4		1647	4.5
	1930	1.1		2030	1.1
14 SU	0209	4.3	**29** M	0333	4.1
	0748	1.0		0852	1.2
	1438	4.4		1702	4.3
	2012	1.2	☾	2120	1.5
15 M	0255	4.3	**30** TU	0450	4.0
	0832	1.1		0945	1.6
	1527	4.3		1718	4.1
	2101	1.3		2218	1.8
			31 W	0537	3.8
				1047	1.9
				1801	3.9
				2325	1.9

AUGUST

	Time	m		Time	m
1 TH	0632	3.7	**16** F	0540	3.9
	1155	2.0		1120	1.9
	1855	3.8		1922	4.0
2 F	0036	1.9	**17** SA	0015	1.7
	0742	3.7		0808	4.0
	1305	2.0		1257	1.8
	1958	3.8		2018	4.2
3 SA	0142	1.8	**18** SU	0138	1.5
	1006	3.9		0900	4.2
	1407	1.9		1408	1.5
	2059	4.0		2100	4.4
4 SU	0236	1.6	**19** M	0237	1.1
	1049	4.0		0937	4.4
	1458	1.6		1502	1.1
	2143	4.1		2137	4.5
5 M	0322	1.3	**20** TU	0327	0.7
	1026	4.2		1010	4.6
	1542	1.4		1549	0.8
	2222	4.3		2217	4.7
6 TU	0403	1.1	**21** W	0412	0.4
	1055	4.3		1048	4.7
	1623	1.2		1634	0.5
●	2300	4.4	O	2258	4.7
7 W	0442	0.9	**22** TH	0455	0.2
	1130	4.4		1129	4.7
	1700	1.1		1716	0.4
	2334	4.4		2340	4.7
8 TH	0517	0.8	**23** F	0537	0.2
	1202	4.5		1212	4.7
	1732	1.0		1758	0.4
9 F	0003	4.4	**24** SA	0022	4.6
	0548	0.8		0618	0.3
	1226	4.5		1255	4.6
	1802	1.0		1839	0.6
10 SA	0031	4.5	**25** SU	0106	4.5
	0617	0.8		0657	0.6
	1254	4.5		1343	4.5
	1832	0.9		1918	0.8
11 SU	0105	4.5	**26** M	0153	4.3
	0648	0.8		0737	0.9
	1329	4.5		1607	4.4
	1907	0.9		1958	1.1
12 M	0144	4.5	**27** TU	0253	4.1
	0724	0.8		0818	1.3
	1411	4.5		1624	4.2
	1946	1.0		2041	1.5
13 TU	0229	4.4	**28** W	0432	4.0
	0805	1.0		0906	1.7
	1458	4.4		1645	4.0
	2031	1.2	☾	2136	1.8
14 W	0320	4.3	**29** TH	0509	3.8
	0853	1.3		1008	2.0
	1553	4.3		1727	3.9
☽	2126	1.5		2245	2.1
15 TH	0421	4.0	**30** F	0559	3.7
	0954	1.6		1123	2.2
	1700	4.1		1820	3.7
	2240	1.7			
			31 SA	0004	2.1
				0701	3.6
				1240	2.2
				1922	3.7

HIGH WATERS - IMPORTANT NOTE. DOUBLE HIGH WATERS OCCUR AT SOUTHAMPTON. THE PREDICTIONS ARE FOR THE FIRST HIGH WATER. USERS ARE ADVISED TO CONSULT PART 1A OR THE UKHO 'EASYTIDE' WEBSITE (WWW.EASYTIDE.COM).

ENGLAND — SOUTHAMPTON

LAT 50°53'N LONG 1°24'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

SEPTEMBER

	Time	m		Time	m
1 SU	0115	2.0	**16** M	0128	1.5
	0938	3.8		0849	4.3
	1344	2.0		1357	1.5
	2026	3.9		2047	4.3
2 M	0209	1.7	**17** TU	0221	1.2
	1026	4.1		0930	4.5
	1434	1.7		1446	1.2
	2116	4.1		2123	4.5
3 TU	0255	1.4	**18** W	0308	0.8
	0956	4.2		0959	4.6
	1516	1.4		1531	0.8
	2156	4.3		2200	4.6
4 W	0336	1.1	**19** TH	0352	0.5
	1025	4.4		1033	4.7
	1555	1.2		1614	0.5
	2232	4.4	O	2240	4.6
5 TH	0414	0.9	**20** F	0433	0.4
	1059	4.5		1111	4.7
	1631	1.0		1655	0.4
●	2306	4.5		2320	4.6
6 F	0449	0.7	**21** SA	0514	0.3
	1129	4.6		1151	4.7
	1705	0.8		1735	0.5
	2335	4.6			
7 SA	0521	0.7	**22** SU	0000	4.5
	1157	4.6		0554	0.5
	1736	0.8		1231	4.6
				1813	0.6
8 SU	0006	4.6	**23** M	0041	4.4
	0553	0.7		0632	0.7
	1228	4.7		1310	4.5
	1809	0.7		1851	0.9
9 M	0041	4.7	**24** TU	0123	4.3
	0625	0.7		0708	1.1
	1304	4.7		1351	4.3
	1844	0.8		1926	1.2
10 TU	0121	4.6	**25** W	0210	4.2
	0702	0.8		0744	1.4
	1346	4.6		1551	4.2
	1923	0.9		2001	1.5
11 W	0206	4.5	**26** TH	0410	4.1
	0742	1.0		0823	1.8
	1433	4.5		1611	4.0
	2007	1.2		2045	1.9
12 TH	0259	4.3	**27** F	0442	3.9
	0830	1.4		0920	2.1
	1531	4.2		1652	3.8
☽	2100	1.5	☾	2157	2.1
13 F	0407	4.0	**28** SA	0528	3.8
	0932	1.8		1045	2.3
	1653	4.0		1746	3.7
	2226	1.9		2325	2.2
14 SA	0645	4.0	**29** SU	0625	3.7
	1124	2.0		1211	2.3
	1859	4.0		1846	3.7
15 SU	0019	1.8	**30** M	0039	2.1
	0750	4.1		0732	3.8
	1258	1.8		1313	2.1
	2002	4.1		1951	3.8

OCTOBER

	Time	m		Time	m
1 TU	0134	1.9	**16** W	0155	1.3
	0952	4.0		0935	4.5
	1402	1.8		1421	1.2
	2047	4.0		2108	4.4
2 W	0220	1.5	**17** TH	0242	1.0
	0921	4.2		0946	4.6
	1443	1.5		1506	0.9
	2128	4.3		2144	4.5
3 TH	0301	1.2	**18** F	0326	0.8
	0954	4.5		1017	4.6
	1522	1.2		1549	0.7
	2203	4.5	O	2223	4.5
4 F	0340	0.9	**19** SA	0408	0.6
	1026	4.6		1053	4.6
	1558	0.9		1631	0.6
	2236	4.6		2302	4.5
5 SA	0417	0.7	**20** SU	0449	0.6
	1057	4.7		1131	4.6
	1634	0.7		1711	0.6
●	2307	4.7		2342	4.5
6 SU	0452	0.6	**21** M	0529	0.7
	1128	4.8		1206	4.5
	1710	0.6		1749	0.8
	2342	4.8			
7 M	0528	0.6	**22** TU	0021	4.4
	1203	4.8		0607	1.0
	1747	0.6		1240	4.5
				1826	1.0
8 TU	0020	4.8	**23** W	0100	4.4
	0605	0.6		0642	1.2
	1242	4.8		1317	4.4
	1825	0.7		1857	1.3
9 W	0103	4.7	**24** TH	0141	4.3
	0644	0.8		0713	1.5
	1326	4.7		1357	4.2
	1905	0.9		1925	1.5
10 TH	0150	4.6	**25** F	0230	4.2
	0727	1.1		0744	1.8
	1416	4.5		1444	4.1
	1951	1.2		2000	1.7
11 F	0248	4.3	**26** SA	0416	4.0
	0817	1.5		0827	2.1
	1520	4.2		1555	3.9
☽	2049	1.6	☾	2052	2.0
12 SA	0411	4.1	**27** SU	0456	3.9
	0930	1.9		0940	2.3
	1655	4.1		1709	3.8
	2223	1.8		2220	2.2
13 SU	0627	4.1	**28** M	0550	3.9
	1118	2.0		1105	2.3
	1832	4.0		1812	3.7
	2357	1.8		2337	2.2
14 M	0735	4.2	**29** TU	0653	3.9
	1234	1.8		1218	2.2
	1945	4.1		1917	3.8
15 TU	0102	1.6	**30** W	0041	2.0
	0842	4.3		0756	4.0
	1332	1.6		1314	2.0
	2036	4.2		2016	4.0
			31 TH	0134	1.7
				0846	4.3
				1400	1.6
				2100	4.2

NOVEMBER

	Time	m		Time	m
1 F	0220	1.4	**16** SA	0259	1.1
	0922	4.5		1001	4.5
	1443	1.2		1524	0.9
	2134	4.4		2211	4.4
2 SA	0303	1.1	**17** SU	0343	1.0
	0954	4.6		1036	4.5
	1525	0.9		1608	0.8
	2206	4.6	O	2254	4.4
3 SU	0344	0.8	**18** M	0426	0.9
	1026	4.8		1114	4.5
	1605	0.7		1649	0.8
●	2241	4.8		2340	4.4
4 M	0425	0.6	**19** TU	0507	1.0
	1102	4.9		1149	4.5
	1646	0.5		1728	0.9
	2320	4.9			
5 TU	0506	0.6	**20** W	0140	4.4
	1141	4.9		0547	1.1
	1727	0.5		1222	4.4
				1804	1.1
6 W	0002	4.9	**21** TH	0217	4.4
	0548	0.6		0621	1.3
	1224	4.9		1256	4.4
	1810	0.6		1835	1.2
7 TH	0048	4.8	**22** F	0126	4.3
	0631	0.8		0650	1.5
	1310	4.7		1331	4.3
	1854	0.8		1901	1.4
8 F	0139	4.6	**23** SA	0202	4.3
	0718	1.1		0719	1.7
	1403	4.5		1409	4.2
	1944	1.1		1933	1.5
9 SA	0241	4.4	**24** SU	0243	4.2
	0813	1.4		0756	1.8
	1508	4.3		1453	4.0
	2043	1.4		2015	1.7
10 SU	0525	4.3	**25** M	0333	4.1
	0922	1.7		0846	2.0
	1629	4.1		1545	3.9
☽	2200	1.7	☾	2111	1.9
11 M	0615	4.3	**26** TU	0439	4.0
	1043	1.9		0953	2.1
	1754	4.0		1649	3.8
	2318	1.7		2226	2.0
12 TU	0718	4.3	**27** W	0619	4.0
	1156	1.8		1106	2.1
	1928	4.1		1845	3.8
				2337	2.0
13 W	0024	1.6	**28** TH	0721	4.0
	0827	4.3		1212	2.0
	1258	1.6		1948	3.9
	2106	4.1			
14 TH	0122	1.5	**29** F	0040	1.8
	0946	4.4		0814	4.2
	1352	1.4		1312	1.7
	2054	4.2		2035	4.1
15 F	0212	1.3	**30** SA	0137	1.5
	1058	4.5		0853	4.4
	1440	1.2		1405	1.3
	2130	4.3		2108	4.3

DECEMBER

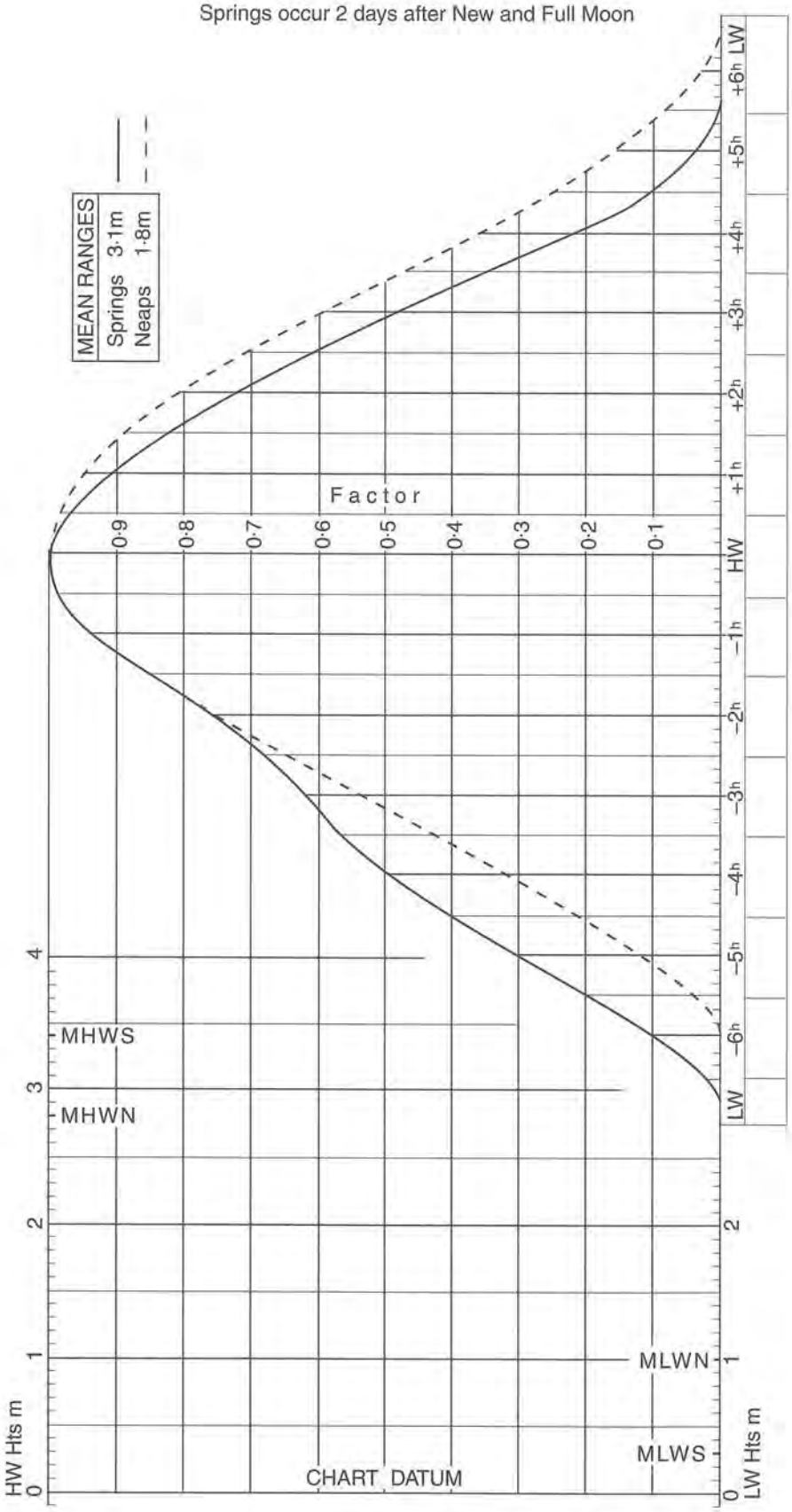
	Time	m		Time	m
1 SU	0228	1.2	**16** M	0321	1.3
	0925	4.6		1020	4.4
	1454	1.0		1547	1.0
	2142	4.5		2303	4.3
2 M	0316	0.9	**17** TU	0406	1.2
	1000	4.8		1057	4.4
	1541	0.7		1630	0.9
	2220	4.7	O		
3 TU	0403	0.7	**18** W	0022	4.4
	1040	4.9		0449	1.1
	1628	0.5		1133	4.4
●	2303	4.8		1711	0.9
4 W	0449	0.6	**19** TH	0103	4.4
	1123	4.9		0529	1.2
	1713	0.4		1208	4.4
	2349	4.9		1748	1.0
5 TH	0535	0.6	**20** F	0147	4.4
	1208	4.9		0604	1.3
	1759	0.4		1240	4.4
				1819	1.1
6 F	0036	4.8	**21** SA	0112	4.4
	0622	0.7		0632	1.4
	1256	4.8		1310	4.3
	1846	0.6		1843	1.2
7 SA	0128	4.7	**22** SU	0136	4.3
	0710	0.9		0658	1.4
	1348	4.6		1341	4.3
	1934	0.8		1912	1.3
8 SU	0226	4.5	**23** M	0208	4.3
	0801	1.2		0732	1.5
	1447	4.4		1419	4.2
	2028	1.1		1949	1.3
9 M	0343	4.4	**24** TU	0248	4.3
	0858	1.4		0813	1.6
	1557	4.2		1503	4.1
☽	2128	1.4		2033	1.5
10 TU	0559	4.4	**25** W	0335	4.2
	1004	1.7		0904	1.7
	1716	4.1		1554	4.0
	2235	1.6	☾	2128	1.6
11 W	0643	4.3	**26** TH	0429	4.1
	1114	1.8		1006	1.8
	1824	4.0		1652	3.9
	2343	1.7		2236	1.8
12 TH	0736	4.2	**27** F	0531	4.0
	1221	1.7		1118	1.9
	1931	4.0		1802	3.8
				2349	1.8
13 F	0046	1.7	**28** SA	0747	4.1
	0845	4.2		1228	1.7
	1321	1.6		2020	4.0
	2208	4.1			
14 SA	0143	1.6	**29** SU	0058	1.6
	1025	4.3		0831	4.3
	1414	1.4		1333	1.4
	2308	4.2		2057	4.2
15 SU	0234	1.4	**30** M	0200	1.4
	0945	4.3		0905	4.5
	1502	1.2		1432	1.1
	2355	4.3		2127	4.4
			31 TU	0256	1.1
				0943	4.7
				1525	0.8
				2207	4.6

HIGH WATERS - IMPORTANT NOTE. DOUBLE HIGH WATERS OCCUR AT SOUTHAMPTON. THE PREDICTIONS ARE FOR THE FIRST HIGH WATER. USERS ARE ADVISED TO CONSULT PART 1A OR THE UKHO 'EASYTIDE' WEBSITE (WWW.EASYTIDE.COM).

GREENOCK

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon



SCOTLAND — GREENOCK

LAT 55°57'N LONG 4°46'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

JANUARY

	Time	m		Time	m
1 TU	0237	3.3	**16** W	0322	3.4
	0755	0.7		0836	0.5
	1435	3.8		1534	3.8
	2007	0.5		2107	0.3
2 W	0314	3.3	**17** TH	0401	3.3
	0835	0.7		0920	0.6
	1513	3.7		1615	3.6
	2049	0.5		2155	0.4
3 TH	0353	3.3	**18** F	0440	3.3
	0920	0.7		1006	0.7
	1553	3.7		1657	3.4
	2136	0.6	☽	2248	0.6
4 F	0434	3.2	**19** SA	0520	3.2
	1008	0.8		1057	0.9
	1636	3.6		1742	3.2
	2228	0.6		2350	0.8
5 SA	0518	3.1	**20** SU	0606	3.0
	1103	0.9		1200	1.1
	1724	3.4		1833	3.0
☾	2326	0.7			
6 SU	0611	3.0	**21** M	0103	1.0
	1205	1.0		0659	2.9
	1822	3.3		1327	1.2
				1939	2.8
7 M	0030	0.8	**22** TU	0212	1.0
	0722	3.0		0810	2.9
	1316	1.0		1443	1.1
	1936	3.2		2117	2.8
8 TU	0140	0.8	**23** W	0310	0.9
	0851	3.0		0935	3.0
	1429	0.8		1539	1.0
	2102	3.2		2231	2.9
9 W	0250	0.7	**24** TH	0400	0.8
	1004	3.2		1038	3.2
	1534	0.6		1624	0.8
	2218	3.3		2320	3.1
10 TH	0352	0.6	**25** F	0443	0.7
	1102	3.4		1123	3.4
	1630	0.3		1703	0.7
	2321	3.4			
11 F	0446	0.5	**26** SA	0002	3.2
	1152	3.6		0520	0.6
	1720	0.1		1201	3.5
●				1737	0.6
12 SA	0016	3.5	**27** SU	0040	3.2
	0536	0.4		0555	0.6
	1240	3.8		1234	3.6
	1806	0.0	O	1808	0.5
13 SU	0108	3.5	**28** M	0114	3.2
	0623	0.3		0626	0.6
	1325	3.8		1306	3.6
	1852	0.0		1836	0.5
14 M	0156	3.5	**29** TU	0147	3.3
	0708	0.3		0657	0.5
	1409	3.9		1339	3.7
	1937	0.0		1907	0.4
15 TU	0241	3.5	**30** W	0219	3.3
	0752	0.4		0732	0.5
	1452	3.8		1416	3.7
	2021	0.1		1943	0.3
			31 TH	0253	3.3
				0811	0.4
				1454	3.7
				2024	0.3

FEBRUARY

	Time	m		Time	m
1 F	0328	3.3	**16** SA	0404	3.3
	0854	0.5		0925	0.5
	1533	3.7		1624	3.4
	2109	0.3		2159	0.6
2 SA	0405	3.3	**17** SU	0441	3.2
	0941	0.5		1010	0.7
	1614	3.6		1704	3.2
	2159	0.4	☽	2252	0.8
3 SU	0445	3.2	**18** M	0522	3.1
	1034	0.6		1102	0.9
	1658	3.5		1750	2.9
☾	2255	0.6		2358	1.0
4 M	0530	3.1	**19** TU	0610	2.9
	1135	0.8		1215	1.1
	1750	3.2		1846	2.7
	2359	0.8			
5 TU	0630	2.9	**20** W	0127	1.1
	1248	0.9		0710	2.8
	1857	3.0		1401	1.1
				2012	2.6
6 W	0115	0.9	**21** TH	0240	1.1
	0816	2.9		0840	2.8
	1412	0.8		1509	1.0
	2045	3.0		2206	2.7
7 TH	0237	0.9	**22** F	0334	0.9
	0950	3.1		1006	3.0
	1524	0.6		1557	0.8
	2216	3.1		2258	2.9
8 F	0345	0.7	**23** SA	0418	0.7
	1051	3.3		1057	3.2
	1621	0.3		1637	0.6
	2318	3.2		2339	3.1
9 SA	0439	0.5	**24** SU	0457	0.6
	1141	3.5		1136	3.3
	1710	0.0		1711	0.5
10 SU	0010	3.4	**25** M	0017	3.2
	0526	0.3		0530	0.5
	1228	3.7		1210	3.4
●	1753	-0.1	O	1741	0.4
11 M	0057	3.4	**26** TU	0053	3.2
	0609	0.3		0600	0.4
	1312	3.8		1243	3.5
	1834	-0.1		1810	0.3
12 TU	0140	3.4	**27** W	0125	3.2
	0650	0.2		0632	0.3
	1354	3.8		1318	3.6
	1914	0.0		1842	0.2
13 W	0219	3.4	**28** TH	0156	3.3
	0728	0.3		0707	0.3
	1433	3.7		1356	3.7
	1953	0.1		1919	0.1
14 TH	0254	3.4			
	0806	0.3			
	1511	3.7			
	2033	0.2			
15 F	0328	3.4			
	0845	0.4			
	1547	3.6			
	2114	0.4			

MARCH

	Time	m		Time	m
1 F	0229	3.4	**16** SA	0255	3.4
	0747	0.2		0811	0.3
	1436	3.7		1520	3.4
	2001	0.1		2038	0.4
2 SA	0304	3.4	**17** SU	0330	3.4
	0831	0.2		0850	0.4
	1515	3.7		1556	3.3
	2046	0.2		2120	0.6
3 SU	0341	3.4	**18** M	0406	3.3
	0919	0.3		0931	0.5
	1556	3.6		1634	3.1
	2136	0.4		2207	0.8
4 M	0420	3.3	**19** TU	0445	3.2
	1012	0.4		1020	0.8
	1640	3.4		1718	2.8
☾	2232	0.6	☽	2305	1.0
5 TU	0504	3.1	**20** W	0530	3.0
	1115	0.6		1123	1.0
	1730	3.1		1812	2.6
	2338	0.8			
6 W	0600	2.9	**21** TH	0024	1.2
	1234	0.7		0626	2.8
	1835	2.9		1256	1.1
				1926	2.5
7 TH	0102	1.0	**22** F	0155	1.1
	0753	2.8		0740	2.7
	1403	0.7		1424	0.9
	2049	2.8		2122	2.6
8 F	0230	0.9	**23** SA	0258	1.0
	0936	3.0		0916	2.9
	1514	0.4		1519	0.7
	2214	3.0		2223	2.8
9 SA	0337	0.7	**24** SU	0345	0.8
	1036	3.3		1017	3.0
	1608	0.2		1601	0.5
	2309	3.2		2308	3.0
10 SU	0428	0.5	**25** M	0424	0.6
	1125	3.5		1100	3.2
	1654	0.0		1637	0.4
	2356	3.3		2347	3.1
11 M	0512	0.3	**26** TU	0459	0.4
	1210	3.6		1138	3.3
	1736	-0.1		1708	0.2
●					
12 TU	0038	3.3	**27** W	0023	3.2
	0552	0.2		0531	0.3
	1253	3.6		1216	3.4
	1813	-0.1	O	1740	0.1
13 W	0117	3.3	**28** TH	0058	3.3
	0628	0.2		0606	0.2
	1333	3.6		1255	3.5
	1849	0.0		1817	0.1
14 TH	0150	3.4	**29** F	0131	3.4
	0702	0.2		0644	0.1
	1410	3.6		1336	3.6
	1924	0.1		1857	0.0
15 F	0223	3.4	**30** SA	0206	3.4
	0736	0.2		0727	0.0
	1445	3.5		1418	3.6
	2000	0.2		1942	0.1
			31 SU	0242	3.5
				0812	0.0
				1500	3.6
				2030	0.2

APRIL

	Time	m		Time	m
1 M	0321	3.5	**16** TU	0335	3.4
	0903	0.1		0902	0.5
	1543	3.5		1609	3.0
	2121	0.4		2136	0.7
2 TU	0402	3.4	**17** W	0412	3.3
	0959	0.3		0949	0.6
	1629	3.3		1653	2.9
	2220	0.6		2228	0.9
3 W	0448	3.2	**18** TH	0454	3.1
	1107	0.4		1046	0.8
	1722	3.0		1745	2.7
☾	2329	0.8	☽	2331	1.1
4 TH	0549	3.0	**19** F	0547	2.9
	1228	0.5		1159	0.9
	1836	2.8		1851	2.6
5 F	0053	1.0	**20** SA	0048	1.1
	0739	2.8		0652	2.8
	1348	0.5		1321	0.9
	2045	2.8		2019	2.6
6 SA	0214	0.9	**21** SU	0202	1.0
	0914	3.0		0810	2.8
	1454	0.3		1425	0.7
	2157	2.9		2136	2.8
7 SU	0319	0.7	**22** M	0259	0.8
	1013	3.2		0922	3.0
	1547	0.1		1514	0.5
	2249	3.1		2227	3.0
8 M	0410	0.5	**23** TU	0345	0.6
	1102	3.4		1015	3.1
	1633	0.0		1555	0.3
	2333	3.2		2310	3.1
9 TU	0454	0.3	**24** W	0425	0.4
	1148	3.5		1101	3.3
	1714	0.0		1633	0.2
				2349	3.2
10 W	0012	3.3	**25** TH	0503	0.2
	0532	0.2		1146	3.4
	1230	3.5		1713	0.1
●	1750	0.1	O		
11 TH	0048	3.3	**26** F	0027	3.3
	0606	0.2		0543	0.1
	1310	3.4		1232	3.5
	1824	0.2		1754	0.0
12 F	0120	3.4	**27** SA	0106	3.4
	0637	0.2		0625	0.0
	1346	3.4		1318	3.5
	1857	0.2		1839	0.0
13 SA	0152	3.4	**28** SU	0145	3.5
	0708	0.2		0710	-0.1
	1420	3.3		1404	3.6
	1932	0.3		1927	0.1
14 SU	0225	3.5	**29** M	0225	3.6
	0743	0.3		0759	-0.1
	1454	3.3		1450	3.5
	2010	0.4		2018	0.2
15 M	0259	3.5	**30** TU	0307	3.6
	0820	0.3		0852	0.0
	1530	3.2		1537	3.4
	2051	0.6		2112	0.4

SCOTLAND — GREENOCK

LAT 55°57'N LONG 4°46'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

MAY

	Time	m		Time	m
1 W	0351	3.5	**16** TH	0343	3.4
	0951	0.2		0923	0.5
	1627	3.2		1630	2.9
	2211	0.6		2159	0.8
2 TH	0441	3.3	**17** F	0423	3.2
	1059	0.3		1015	0.6
	1725	3.0		1719	2.8
☾	2318	0.8		2253	0.9
3 F	0545	3.1	**18** SA	0511	3.1
	1213	0.4		1115	0.7
	1842	2.8		1815	2.7
			☽	2354	1.0
4 SA	0032	0.9	**19** SU	0609	3.0
	0716	3.0		1221	0.7
	1324	0.3		1921	2.7
	2015	2.8			
5 SU	0146	0.8	**20** M	0059	1.0
	0841	3.0		0717	2.9
	1426	0.3		1326	0.6
	2125	2.9		2033	2.8
6 M	0251	0.7	**21** TU	0204	0.9
	0944	3.2		0828	3.0
	1519	0.2		1423	0.5
	2218	3.1		2138	2.9
7 TU	0345	0.5	**22** W	0301	0.6
	1036	3.3		0932	3.1
	1606	0.2		1514	0.3
	2303	3.2		2230	3.1
8 W	0431	0.4	**23** TH	0351	0.4
	1122	3.3		1027	3.3
	1649	0.2		1602	0.2
	2343	3.2		2316	3.2
9 TH	0511	0.3	**24** F	0438	0.2
	1205	3.3		1119	3.4
	1726	0.2		1648	0.1
10 F	0018	3.3	**25** SA	0000	3.4
	0545	0.3		0523	0.0
	1246	3.3		1211	3.4
●	1801	0.3	O	1735	0.1
11 SA	0052	3.4	**26** SU	0045	3.5
	0616	0.3		0609	-0.1
	1322	3.2		1302	3.5
	1834	0.4		1824	0.1
12 SU	0124	3.5	**27** M	0128	3.6
	0647	0.3		0657	-0.1
	1356	3.2		1352	3.5
	1910	0.4		1915	0.2
13 M	0157	3.5	**28** TU	0212	3.7
	0721	0.3		0747	-0.1
	1430	3.2		1443	3.4
	1947	0.5		2007	0.2
14 TU	0232	3.5	**29** W	0257	3.6
	0757	0.4		0841	-0.1
	1507	3.1		1533	3.3
	2028	0.6		2101	0.3
15 W	0306	3.5	**30** TH	0343	3.6
	0838	0.4		0938	0.0
	1546	3.0		1625	3.2
	2112	0.7		2157	0.5
			31 F	0434	3.4
				1041	0.2
				1721	3.1
			☾	2257	0.6

JUNE

	Time	m		Time	m
1 SA	0532	3.2	**16** SU	0440	3.3
	1147	0.3		1038	0.5
	1822	3.0		1737	2.9
			☽	2313	0.8
2 SU	0001	0.8	**17** M	0531	3.1
	0643	3.1		1136	0.6
	1253	0.3		1830	2.9
	1928	2.9			
3 M	0110	0.8	**18** TU	0012	0.8
	0759	3.0		0631	3.1
	1353	0.4		1238	0.6
	2036	2.9		1933	2.8
4 TU	0217	0.8	**19** W	0116	0.8
	0909	3.1		0742	3.0
	1449	0.4		1340	0.5
	2137	3.0		2045	2.9
5 W	0316	0.7	**20** TH	0222	0.7
	1007	3.1		0854	3.1
	1539	0.4		1440	0.4
	2228	3.1		2152	3.0
6 TH	0406	0.6	**21** F	0323	0.5
	1057	3.2		1000	3.2
	1624	0.4		1536	0.3
	2312	3.2		2249	3.2
7 F	0450	0.5	**22** SA	0417	0.2
	1143	3.2		1059	3.3
	1704	0.4		1629	0.2
	2351	3.3		2340	3.4
8 SA	0527	0.4	**23** SU	0508	0.0
	1224	3.1		1155	3.4
	1742	0.4		1720	0.2
●			O		
9 SU	0027	3.4	**24** M	0028	3.5
	0600	0.4		0556	-0.1
	1301	3.1		1250	3.4
	1817	0.5		1811	0.2
10 M	0100	3.5	**25** TU	0115	3.6
	0632	0.4		0644	-0.2
	1335	3.1		1343	3.4
	1852	0.5		1901	0.2
11 TU	0133	3.5	**26** W	0201	3.7
	0704	0.4		0733	-0.2
	1410	3.1		1435	3.4
	1929	0.5		1952	0.2
12 W	0207	3.6	**27** TH	0246	3.7
	0738	0.4		0824	-0.1
	1446	3.1		1524	3.3
	2007	0.6		2043	0.3
13 TH	0241	3.5	**28** F	0332	3.7
	0816	0.4		0916	0.0
	1524	3.1		1612	3.2
	2048	0.6		2134	0.4
14 F	0318	3.5	**29** SA	0419	3.5
	0858	0.4		1012	0.1
	1605	3.0		1659	3.2
	2132	0.7		2227	0.5
15 SA	0357	3.4	**30** SU	0508	3.4
	0945	0.5		1112	0.3
	1649	3.0		1746	3.1
	2220	0.7	☾	2323	0.7

JULY

	Time	m		Time	m
1 M	0602	3.1	**16** TU	0458	3.3
	1216	0.4		1058	0.5
	1835	3.0		1746	3.0
			☽	2335	0.7
2 TU	0027	0.8	**17** W	0551	3.2
	0706	3.0		1159	0.6
	1319	0.5		1843	2.9
	1932	2.9			
3 W	0139	0.9	**18** TH	0039	0.8
	0821	2.9		0658	3.0
	1418	0.6		1306	0.6
	2040	2.9		1958	2.9
4 TH	0245	0.8	**19** F	0150	0.7
	0936	2.9		0821	3.0
	1512	0.6		1413	0.6
	2148	3.0		2122	3.0
5 F	0342	0.7	**20** SA	0301	0.6
	1035	3.0		0942	3.1
	1601	0.5		1518	0.5
	2244	3.1		2230	3.2
6 SA	0429	0.6	**21** SU	0403	0.3
	1124	3.0		1049	3.2
	1645	0.5		1616	0.3
	2329	3.3		2325	3.4
7 SU	0510	0.5	**22** M	0456	0.0
	1207	3.1		1147	3.3
	1725	0.5	O	1709	0.2
8 M	0007	3.4	**23** TU	0015	3.6
	0545	0.5		0544	-0.1
	1245	3.1		1241	3.3
●	1801	0.5		1758	0.2
9 TU	0041	3.5	**24** W	0103	3.7
	0617	0.4		0630	-0.2
	1319	3.1		1332	3.3
	1835	0.5		1845	0.2
10 W	0112	3.5	**25** TH	0148	3.7
	0648	0.4		0715	-0.2
	1352	3.1		1420	3.3
	1908	0.5		1932	0.2
11 TH	0144	3.6	**26** F	0232	3.8
	0718	0.4		0801	-0.1
	1425	3.1		1504	3.3
	1943	0.5		2018	0.2
12 F	0219	3.6	**27** SA	0314	3.7
	0752	0.4		0847	0.0
	1500	3.1		1545	3.3
	2021	0.5		2103	0.3
13 SA	0255	3.6	**28** SU	0356	3.6
	0830	0.3		0935	0.2
	1537	3.1		1624	3.2
	2103	0.5		2150	0.5
14 SU	0333	3.5	**29** M	0437	3.4
	0914	0.4		1028	0.4
	1616	3.1		1704	3.1
	2148	0.6	☾	2240	0.6
15 M	0414	3.4	**30** TU	0521	3.2
	1003	0.4		1129	0.6
	1659	3.1		1747	3.0
	2238	0.6		2337	0.8
			31 W	0611	2.9
				1239	0.7
				1835	2.9

AUGUST

	Time	m		Time	m
1 TH	0052	1.0	**16** F	0011	0.8
	0714	2.7		0622	3.0
	1347	0.8		1240	0.8
	1934	2.9		1919	2.9
2 F	0214	1.0	**17** SA	0130	0.8
	0856	2.7		0755	2.9
	1446	0.8		1358	0.8
	2058	2.9		2102	3.0
3 SA	0318	0.9	**18** SU	0249	0.6
	1016	2.8		0937	3.0
	1539	0.7		1509	0.6
	2215	3.1		2217	3.2
4 SU	0408	0.7	**19** M	0353	0.3
	1107	2.9		1046	3.2
	1624	0.6		1608	0.5
	2306	3.2		2312	3.4
5 M	0450	0.5	**20** TU	0444	0.0
	1148	3.0		1140	3.3
	1705	0.5		1658	0.3
	2346	3.4			
6 TU	0526	0.5	**21** W	0001	3.6
	1225	3.1		0529	-0.1
	1741	0.5		1229	3.3
●			O	1743	0.2
7 W	0020	3.4	**22** TH	0047	3.7
	0557	0.4		0612	-0.2
	1300	3.1		1315	3.4
	1813	0.5		1826	0.2
8 TH	0050	3.5	**23** F	0131	3.8
	0626	0.4		0653	-0.2
	1331	3.1		1357	3.3
	1843	0.5		1908	0.2
9 F	0122	3.6	**24** SA	0212	3.7
	0653	0.4		0734	0.0
	1401	3.1		1435	3.3
	1915	0.5		1948	0.3
10 SA	0156	3.6	**25** SU	0251	3.7
	0725	0.3		0814	0.1
	1433	3.2		1511	3.3
	1952	0.4		2029	0.3
11 SU	0233	3.6	**26** M	0329	3.6
	0802	0.3		0856	0.3
	1508	3.2		1546	3.3
	2033	0.4		2110	0.5
12 M	0311	3.6	**27** TU	0406	3.4
	0845	0.3		0942	0.5
	1545	3.2		1624	3.3
	2118	0.5		2155	0.6
13 TU	0350	3.6	**28** W	0446	3.2
	0932	0.4		1035	0.8
	1624	3.2		1706	3.2
	2208	0.6	☾	2247	0.8
14 W	0432	3.4	**29** TH	0530	2.9
	1026	0.5		1145	1.0
	1708	3.1		1752	3.0
☽	2305	0.7		2357	1.1
15 TH	0520	3.2	**30** F	0626	2.7
	1128	0.7		1311	1.1
	1802	3.0		1848	2.9
			31 SA	0137	1.1
				0751	2.6
				1419	1.0
				2003	2.9

SCOTLAND — GREENOCK

LAT 55°57'N LONG 4°46'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

SEPTEMBER

	Time	m		Time	m
1 SU	0249	1.0	**16** M	0240	0.6
	0953	2.7		0938	3.0
	1514	0.9		1502	0.8
	2139	3.0		2202	3.3
2 M	0341	0.8	**17** TU	0340	0.3
	1043	2.9		1038	3.2
	1600	0.7		1558	0.6
	2237	3.2		2255	3.5
3 TU	0423	0.6	**18** W	0429	0.1
	1123	3.1		1127	3.3
	1640	0.6		1645	0.4
	2318	3.4		2343	3.7
4 W	0459	0.5	**19** TH	0512	0.0
	1159	3.2		1210	3.4
	1715	0.5		1727	0.3
	2352	3.4	○		
5 TH ●	0531	0.4	**20** F	0027	3.7
	1233	3.2		0552	-0.1
	1746	0.5		1251	3.4
				1806	0.3
6 F	0024	3.5	**21** SA	0110	3.7
	0558	0.4		0630	0.0
	1305	3.2		1328	3.4
	1815	0.4		1843	0.3
7 SA	0057	3.6	**22** SU	0149	3.7
	0626	0.3		0706	0.1
	1334	3.3		1402	3.4
	1847	0.4		1919	0.3
8 SU	0134	3.6	**23** M	0226	3.6
	0658	0.3		0743	0.3
	1405	3.3		1436	3.5
	1925	0.4		1955	0.4
9 M	0212	3.7	**24** TU	0301	3.5
	0737	0.2		0821	0.4
	1440	3.4		1511	3.5
	2007	0.4		2034	0.5
10 TU	0251	3.7	**25** W	0338	3.4
	0820	0.3		0903	0.6
	1517	3.4		1549	3.4
	2053	0.4		2117	0.7
11 W	0331	3.6	**26** TH	0416	3.2
	0908	0.4		0951	0.9
	1557	3.4		1630	3.3
	2145	0.5		2206	0.9
12 TH	0413	3.5	**27** F	0500	3.0
	1002	0.6		1051	1.1
	1641	3.2		1715	3.1
☽	2244	0.7	☾	2310	1.1
13 F	0500	3.2	**28** SA	0554	2.7
	1106	0.8		1217	1.3
	1734	3.1		1810	3.0
	2355	0.8			
14 SA	0601	3.0	**29** SU	0044	1.2
	1224	1.0		0708	2.6
	1855	2.9		1342	1.2
				1918	2.9
15 SU	0121	0.8	**30** M	0210	1.1
	0748	2.8		0907	2.7
	1351	1.0		1442	1.1
	2050	3.0		2046	3.0

OCTOBER

	Time	m		Time	m
1 TU	0305	0.9	**16** W	0320	0.4
	1007	3.0		1020	3.3
	1529	0.9		1541	0.7
	2154	3.2		2233	3.5
2 W	0349	0.7	**17** TH	0409	0.2
	1050	3.1		1106	3.4
	1609	0.7		1628	0.5
	2240	3.3		2321	3.7
3 TH	0426	0.5	**18** F	0452	0.1
	1128	3.3		1147	3.5
	1644	0.6		1709	0.4
	2318	3.5	○		
4 F	0458	0.4	**19** SA	0005	3.7
	1203	3.3		0531	0.1
	1716	0.5		1224	3.5
	2354	3.5		1746	0.4
5 SA ●	0528	0.3	**20** SU	0047	3.7
	1235	3.4		0607	0.2
	1748	0.4		1258	3.5
				1820	0.4
6 SU	0031	3.6	**21** M	0125	3.6
	0559	0.3		0641	0.3
	1306	3.4		1331	3.6
	1823	0.3		1853	0.4
7 M	0112	3.7	**22** TU	0201	3.5
	0635	0.2		0716	0.5
	1340	3.5		1406	3.6
	1903	0.3		1928	0.5
8 TU	0153	3.7	**23** W	0236	3.5
	0717	0.3		0753	0.6
	1417	3.6		1441	3.6
	1947	0.3		2006	0.6
9 W	0235	3.7	**24** TH	0313	3.4
	0802	0.4		0833	0.7
	1456	3.6		1519	3.6
	2035	0.4		2047	0.7
10 TH	0317	3.6	**25** F	0352	3.2
	0851	0.5		0918	0.9
	1537	3.5		1558	3.5
	2129	0.5		2134	0.9
11 F	0401	3.5	**26** SA	0436	3.0
	0947	0.7		1011	1.1
	1623	3.4		1642	3.3
☽	2232	0.7	☾	2231	1.0
12 SA	0451	3.2	**27** SU	0527	2.9
	1053	1.0		1118	1.3
	1719	3.2		1733	3.2
	2348	0.8		2345	1.2
13 SU	0556	3.0	**28** M	0633	2.8
	1215	1.1		1239	1.4
	1845	3.1		1835	3.1
14 M	0112	0.7	**29** TU	0109	1.1
	0753	2.9		0801	2.8
	1339	1.1		1352	1.3
	2030	3.1		1947	3.1
15 TU	0223	0.6	**30** W	0216	1.0
	0924	3.1		0919	3.0
	1447	0.9		1447	1.1
	2140	3.4		2058	3.2
			31 TH	0305	0.8
				1010	3.2
				1532	0.9
				2154	3.3

NOVEMBER

	Time	m		Time	m
1 F	0346	0.6	**16** SA	0430	0.3
	1052	3.3		1121	3.5
	1610	0.7		1650	0.5
	2240	3.5		2343	3.6
2 SA	0423	0.5	**17** SU	0510	0.4
	1130	3.4		1158	3.6
	1647	0.5		1728	0.5
	2324	3.6	○		
3 SU ●	0458	0.4	**18** M	0026	3.5
	1206	3.5		0547	0.4
	1724	0.4		1233	3.6
				1802	0.5
4 M	0008	3.6	**19** TU	0105	3.5
	0535	0.3		0622	0.5
	1242	3.6		1307	3.7
	1803	0.3		1834	0.5
5 TU	0053	3.7	**20** W	0140	3.4
	0616	0.3		0656	0.6
	1320	3.7		1341	3.7
	1846	0.3		1908	0.6
6 W	0138	3.7	**21** TH	0215	3.4
	0701	0.3		0732	0.7
	1400	3.7		1416	3.7
	1932	0.3		1944	0.6
7 TH	0223	3.7	**22** F	0252	3.3
	0749	0.4		0811	0.8
	1442	3.7		1453	3.7
	2023	0.3		2024	0.7
8 F	0308	3.6	**23** SA	0331	3.3
	0841	0.6		0853	0.9
	1526	3.7		1531	3.6
	2119	0.4		2108	0.8
9 SA	0356	3.5	**24** SU	0413	3.1
	0937	0.8		0939	1.0
	1614	3.6		1612	3.5
	2222	0.6		2156	0.9
10 SU	0449	3.3	**25** M	0500	3.0
	1042	1.0		1032	1.2
	1712	3.4		1658	3.3
☽	2336	0.6	☾	2253	1.0
11 M	0557	3.1	**26** TU	0555	2.9
	1156	1.1		1133	1.3
	1830	3.2		1752	3.2
12 TU	0050	0.6	**27** W	0000	1.1
	0731	3.0		0701	2.9
	1314	1.1		1243	1.3
	1958	3.2		1854	3.1
13 W	0157	0.6	**28** TH	0109	1.0
	0853	3.1		0816	2.9
	1422	1.0		1349	1.2
	2110	3.4		2002	3.2
14 TH	0255	0.5	**29** F	0210	0.9
	0951	3.2		0922	3.1
	1519	0.8		1446	1.0
	2208	3.5		2107	3.3
15 F	0345	0.4	**30** SA	0302	0.7
	1039	3.4		1014	3.3
	1608	0.6		1535	0.8
	2258	3.6		2205	3.4

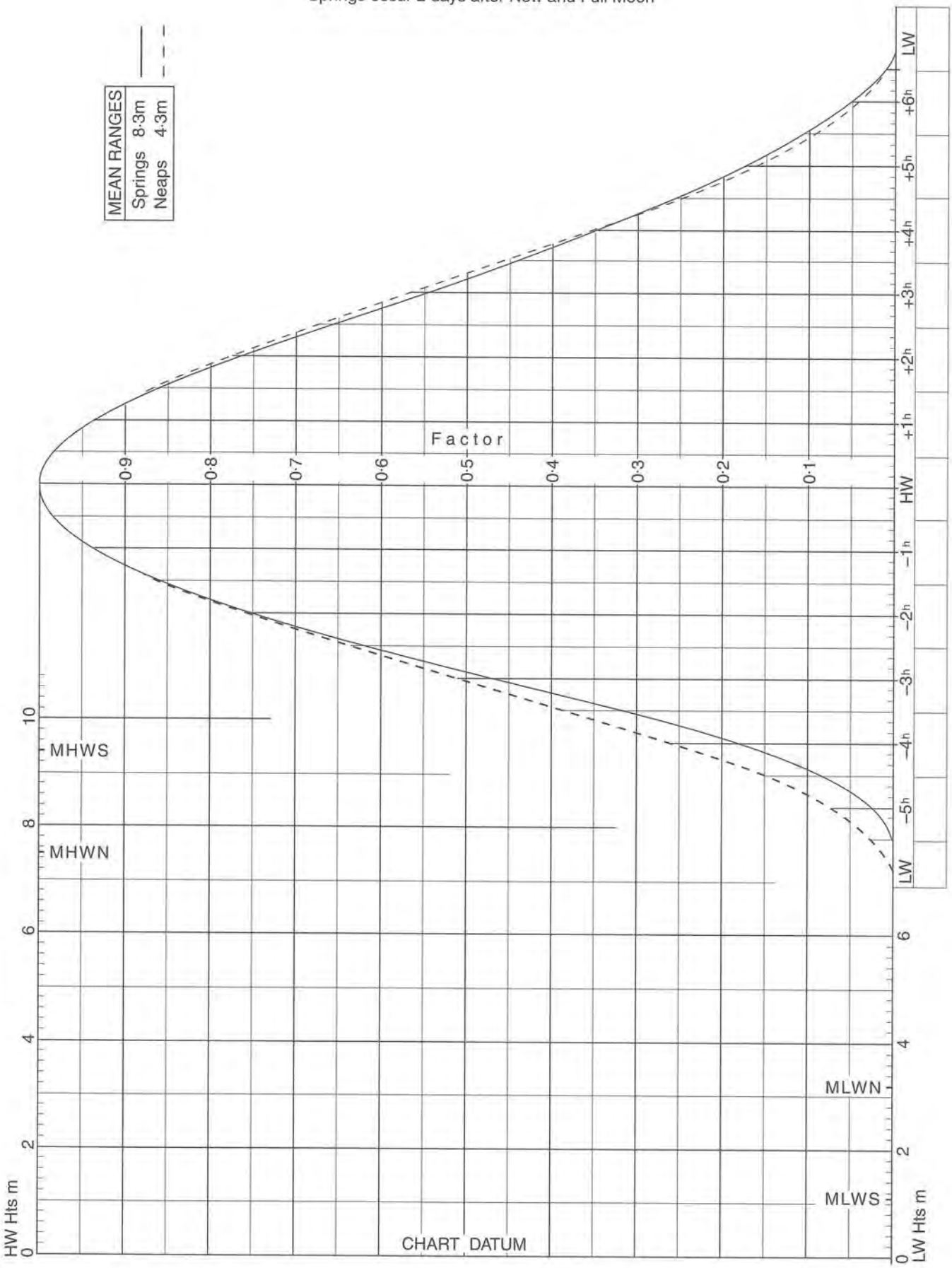
DECEMBER

	Time	m		Time	m
1 SU	0348	0.6	**16** M	0452	0.5
	1059	3.4		1137	3.5
	1620	0.6		1713	0.6
	2257	3.5			
2 M	0432	0.4	**17** TU	0010	3.4
	1140	3.5		0531	0.6
	1703	0.4		1214	3.6
	2347	3.6	○	1748	0.6
3 TU ●	0516	0.4	**18** W	0050	3.4
	1222	3.7		0607	0.6
	1747	0.3		1249	3.7
				1821	0.6
4 W	0037	3.6	**19** TH	0125	3.3
	0601	0.3		0642	0.6
	1305	3.8		1322	3.7
	1833	0.2		1853	0.6
5 TH	0127	3.7	**20** F	0159	3.3
	0649	0.4		0716	0.7
	1348	3.8		1356	3.8
	1921	0.2		1927	0.6
6 F	0215	3.6	**21** SA	0234	3.3
	0738	0.4		0751	0.7
	1432	3.9		1431	3.7
	2012	0.2		2003	0.6
7 SA	0304	3.6	**22** SU	0311	3.3
	0830	0.5		0829	0.8
	1518	3.8		1507	3.7
	2106	0.3		2041	0.7
8 SU	0353	3.5	**23** M	0350	3.2
	0924	0.7		0910	0.9
	1607	3.7		1546	3.6
	2205	0.4		2124	0.7
9 M	0445	3.3	**24** TU	0431	3.2
	1022	0.8		0955	1.0
	1701	3.6		1627	3.5
☽	2311	0.5		2211	0.8
10 TU	0543	3.2	**25** W	0515	3.1
	1128	1.0		1045	1.1
	1805	3.4		1714	3.4
			☾	2305	0.9
11 W	0020	0.6	**26** TH	0606	3.0
	0649	3.1		1143	1.2
	1240	1.0		1807	3.2
	1918	3.3			
12 TH	0127	0.6	**27** F	0006	0.9
	0804	3.1		0707	2.9
	1351	1.0		1249	1.2
	2034	3.2		1910	3.2
13 F	0227	0.6	**28** SA	0112	0.9
	0913	3.1		0822	3.0
	1453	0.9		1358	1.1
	2140	3.3		2023	3.2
14 SA	0320	0.6	**29** SU	0217	0.8
	1009	3.3		0933	3.1
	1547	0.8		1501	0.9
	2236	3.4		2134	3.3
15 SU	0408	0.5	**30** M	0316	0.7
	1056	3.4		1031	3.3
	1633	0.7		1556	0.6
	2326	3.4		2236	3.4
			31 TU	0410	0.5
				1120	3.5
				1646	0.3
				2333	3.5

LIVERPOOL (GLADSTONE DOCK)

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon



ENGLAND — LIVERPOOL (GLADSTONE DOCK)

LAT 53°27'N LONG 3°01'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

JANUARY

	Time	m		Time	m
1 TU	0103	8.8	**16** W	0154	9.1
	0740	1.9		0843	1.5
	1316	9.0		1411	9.4
	2012	1.8		2111	1.4
2 W	0139	8.7	**17** TH	0235	8.7
	0818	2.0		0922	1.9
	1351	8.8		1453	8.9
	2049	2.0		2149	2.0
3 TH	0218	8.5	**18** F	0316	8.3
	0856	2.2		1002	2.5
	1431	8.7		1538	8.4
	2128	2.2	☽	2230	2.5
4 F	0301	8.3	**19** SA	0404	7.8
	0938	2.5		1049	3.0
	1516	8.5		1631	7.9
	2213	2.4		2320	3.0
5 SA	0351	8.1	**20** SU	0503	7.4
	1029	2.7		1150	3.4
	1612	8.2		1736	7.5
☾	2310	2.6			
6 SU	0454	7.9	**21** M	0024	3.4
	1132	2.9		0616	7.2
	1722	8.1		1307	3.5
				1851	7.3
7 M	0022	2.7	**22** TU	0139	3.4
	0608	7.9		0735	7.3
	1251	2.9		1421	3.3
	1840	8.1		2005	7.4
8 TU	0143	2.5	**23** W	0244	3.2
	0723	8.1		0839	7.7
	1412	2.6		1522	2.9
	1956	8.3		2104	7.8
9 W	0255	2.2	**24** TH	0337	2.8
	0831	8.6		0928	8.1
	1524	2.1		1611	2.5
	2102	8.7		2150	8.1
10 TH	0358	1.8	**25** F	0421	2.4
	0930	9.1		1009	8.5
	1628	1.5		1654	2.1
	2201	9.1		2229	8.5
11 F	0455	1.3	**26** SA	0501	2.1
	1024	9.5		1044	8.8
	1725	1.0		1733	1.8
●	2254	9.4		2304	8.7
12 SA	0547	1.0	**27** SU	0538	1.8
	1113	9.8		1118	9.0
	1818	0.7		1809	1.5
	2343	9.6	O	2337	8.9
13 SU	0636	0.9	**28** M	0614	1.6
	1200	10.0		1151	9.2
	1906	0.5		1845	1.4
14 M	0029	9.6	**29** TU	0010	9.1
	0720	0.9		0650	1.4
	1246	9.9		1224	9.3
	1950	0.6		1921	1.3
15 TU	0113	9.4	**30** W	0044	9.1
	0802	1.1		0726	1.4
	1329	9.7		1257	9.3
	2031	0.9		1956	1.3
			31 TH	0119	9.1
				0802	1.5
				1332	9.2
				2030	1.5

FEBRUARY

	Time	m		Time	m
1 F	0155	8.9	**16** SA	0235	8.4
	0837	1.7		0921	2.2
	1409	9.1		1456	8.4
	2105	1.8		2138	2.4
2 SA	0235	8.7	**17** SU	0315	8.0
	0915	2.0		0957	2.8
	1451	8.8		1541	7.9
	2144	2.1	☽	2215	3.0
3 SU	0322	8.4	**18** M	0406	7.5
	1000	2.4		1047	3.3
	1543	8.4		1640	7.3
☾	2235	2.5		2310	3.5
4 M	0421	8.0	**19** TU	0516	7.0
	1100	2.7		1203	3.6
	1651	8.0		1759	7.0
	2345	2.8			
5 TU	0538	7.8	**20** W	0035	3.7
	1221	2.9		0643	7.0
	1818	7.8		1336	3.5
				1926	7.0
6 W	0115	2.8	**21** TH	0202	3.5
	0702	7.9		0802	7.3
	1353	2.7		1448	3.1
	1944	8.0		2036	7.4
7 TH	0238	2.5	**22** F	0306	3.1
	0818	8.3		0859	7.8
	1513	2.2		1543	2.6
	2056	8.4		2126	7.9
8 F	0346	2.0	**23** SA	0356	2.5
	0921	8.8		0942	8.3
	1620	1.5		1629	2.1
	2156	8.9		2205	8.4
9 SA	0445	1.5	**24** SU	0438	2.1
	1014	9.4		1019	8.7
	1716	1.0		1709	1.6
	2246	9.3		2240	8.7
10 SU	0536	1.0	**25** M	0518	1.7
	1102	9.7		1053	9.0
	1805	0.6		1748	1.3
●	2330	9.5	O	2313	9.0
11 M	0621	0.8	**26** TU	0556	1.3
	1145	9.9		1127	9.3
	1849	0.5		1825	1.0
				2346	9.3
12 TU	0011	9.6	**27** W	0633	1.1
	0702	0.7		1200	9.5
	1226	9.9		1901	0.9
	1928	0.6			
13 W	0050	9.4	**28** TH	0020	9.4
	0740	0.9		0709	1.0
	1304	9.7		1235	9.5
	2004	0.9		1936	0.9
14 TH	0125	9.2			
	0815	1.2			
	1341	9.4			
	2037	1.3			
15 F	0200	8.9			
	0848	1.7			
	1417	9.0			
	2107	1.9			

MARCH

	Time	m		Time	m
1 F	0056	9.4	**16** SA	0127	8.9
	0745	1.1		0816	1.6
	1311	9.5		1345	8.9
	2010	1.1		2028	1.8
2 SA	0134	9.2	**17** SU	0200	8.6
	0820	1.3		0846	2.1
	1350	9.3		1421	8.4
	2044	1.5		2056	2.3
3 SU	0215	8.9	**18** M	0236	8.1
	0858	1.6		0918	2.6
	1434	8.9		1502	7.9
	2123	1.9		2129	2.8
4 M	0302	8.5	**19** TU	0320	7.6
	0943	2.1		1000	3.1
	1526	8.4		1554	7.3
☾	2213	2.4	☽	2216	3.4
5 TU	0401	8.1	**20** W	0421	7.1
	1043	2.5		1104	3.5
	1637	7.9		1706	6.9
	2323	2.9		2329	3.7
6 W	0521	7.7	**21** TH	0546	6.9
	1207	2.8		1239	3.5
	1808	7.6		1836	6.8
7 TH	0058	2.9	**22** F	0105	3.7
	0648	7.8		0712	7.1
	1344	2.6		1403	3.2
	1936	7.8		1954	7.2
8 F	0225	2.6	**23** SA	0223	3.2
	0806	8.2		0817	7.6
	1504	2.1		1504	2.6
	2049	8.3		2049	7.7
9 SA	0334	2.0	**24** SU	0320	2.6
	0909	8.7		0905	8.1
	1608	1.5		1554	2.1
	2145	8.8		2131	8.3
10 SU	0431	1.5	**25** M	0407	2.1
	1000	9.2		0945	8.6
	1701	1.0		1638	1.6
	2230	9.1		2207	8.7
11 M	0519	1.1	**26** TU	0450	1.6
	1044	9.5		1021	9.0
	1746	0.7		1719	1.2
●	2311	9.4		2243	9.1
12 TU	0601	0.9	**27** W	0531	1.2
	1124	9.7		1057	9.3
	1825	0.6		1759	0.9
	2348	9.4	O	2318	9.4
13 W	0639	0.8	**28** TH	0611	0.9
	1202	9.7		1134	9.6
	1900	0.7		1837	0.7
				2355	9.6
14 TH	0022	9.4	**29** F	0650	0.8
	0713	0.9		1212	9.7
	1238	9.5		1915	0.7
	1932	1.0			
15 F	0055	9.2	**30** SA	0034	9.6
	0746	1.2		0728	0.8
	1311	9.3		1253	9.6
	2001	1.4		1951	0.9
			31 SU	0115	9.4
				0806	1.0
				1336	9.3
				2028	1.3

APRIL

	Time	m		Time	m
1 M	0159	9.1	**16** TU	0206	8.3
	0847	1.4		0850	2.4
	1424	8.9		1432	7.9
	2110	1.8		2059	2.7
2 TU	0250	8.7	**17** W	0246	7.8
	0936	1.8		0931	2.8
	1520	8.3		1518	7.5
	2202	2.4		2143	3.1
3 W	0352	8.2	**18** TH	0338	7.4
	1039	2.3		1025	3.1
	1633	7.8		1619	7.1
☾	2314	2.8	☽	2243	3.5
4 TH	0511	7.9	**19** F	0450	7.1
	1203	2.5		1141	3.3
	1759	7.6		1737	6.9
5 F	0045	2.9	**20** SA	0004	3.6
	0632	7.9		0612	7.1
	1331	2.4		1306	3.1
	1923	7.8		1855	7.2
6 SA	0207	2.6	**21** SU	0127	3.3
	0747	8.2		0722	7.5
	1446	2.0		1415	2.7
	2032	8.2		1958	7.6
7 SU	0315	2.1	**22** M	0233	2.7
	0848	8.6		0817	8.0
	1548	1.5		1511	2.1
	2125	8.6		2047	8.2
8 M	0410	1.6	**23** TU	0328	2.2
	0938	9.0		0903	8.5
	1638	1.2		1601	1.6
	2209	8.9		2130	8.7
9 TU	0456	1.3	**24** W	0417	1.7
	1021	9.2		0946	8.9
	1720	1.1		1647	1.2
	2247	9.1		2210	9.1
10 W	0536	1.1	**25** TH	0503	1.2
	1100	9.3		1027	9.3
	1757	1.0		1731	0.9
●	2322	9.2	O	2251	9.5
11 TH	0612	1.1	**26** F	0548	0.9
	1136	9.3		1109	9.6
	1830	1.1		1813	0.7
	2355	9.2		2332	9.7
12 F	0646	1.1	**27** SA	0631	0.7
	1211	9.2		1153	9.7
	1900	1.2		1855	0.7
13 SA	0027	9.1	**28** SU	0015	9.7
	0717	1.3		0714	0.7
	1245	9.0		1239	9.6
	1928	1.5		1935	0.9
14 SU	0058	8.9	**29** M	0101	9.6
	0748	1.6		0757	0.8
	1318	8.7		1327	9.3
	1955	1.8		2017	1.2
15 M	0131	8.6	**30** TU	0149	9.3
	0818	2.0		0843	1.2
	1353	8.4		1418	8.9
	2024	2.2		2103	1.7

ENGLAND — LIVERPOOL (GLADSTONE DOCK)

LAT 53°27'N LONG 3°01'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

MAY

	Time	m		Time	m
1 W	0243	8.9	**16** TH	0221	8.1
	0935	1.6		0910	2.4
	1517	8.4		1451	7.8
	2158	2.2		2120	2.8
2 TH	0345	8.5	**17** F	0306	7.8
	1038	2.0		0958	2.7
	1625	8.0		1542	7.5
☾	2306	2.6		2212	3.1
3 F	0456	8.2	**18** SA	0403	7.5
	1152	2.2		1057	2.9
	1741	7.8		1644	7.3
			☽	2316	3.2
4 SA	0024	2.7	**19** SU	0512	7.4
	0608	8.1		1208	2.9
	1308	2.2		1754	7.4
	1856	7.8			
5 SU	0139	2.5	**20** M	0029	3.1
	0719	8.2		0622	7.6
	1417	2.0		1320	2.6
	2004	8.1		1901	7.7
6 M	0246	2.2	**21** TU	0141	2.8
	0820	8.4		0725	8.0
	1517	1.8		1424	2.2
	2058	8.4		2000	8.1
7 TU	0342	1.9	**22** W	0245	2.3
	0912	8.7		0821	8.4
	1608	1.6		1522	1.8
	2142	8.6		2052	8.6
8 W	0429	1.7	**23** TH	0342	1.8
	0956	8.8		0912	8.8
	1650	1.5		1615	1.4
	2221	8.8		2140	9.1
9 TH	0509	1.5	**24** F	0435	1.4
	1035	8.9		1001	9.2
	1726	1.5		1704	1.0
	2256	8.9		2226	9.4
10 F	0546	1.4	**25** SA	0526	1.0
	1112	8.9		1049	9.5
	1758	1.5		1752	0.8
●	2330	9.0	O	2313	9.7
11 SA	0620	1.4	**26** SU	0615	0.7
	1147	8.9		1138	9.6
	1829	1.5		1838	0.8
12 SU	0002	8.9	**27** M	0000	9.8
	0652	1.5		0703	0.6
	1222	8.8		1228	9.5
	1859	1.7		1923	0.9
13 M	0035	8.8	**28** TU	0049	9.7
	0724	1.7		0751	0.7
	1256	8.6		1319	9.3
	1929	1.9		2010	1.1
14 TU	0108	8.6	**29** W	0140	9.5
	0756	1.9		0840	0.9
	1331	8.4		1412	9.0
	2001	2.1		2058	1.5
15 W	0143	8.4	**30** TH	0233	9.2
	0831	2.1		0932	1.2
	1409	8.1		1507	8.6
	2038	2.4		2150	1.9
			31 F	0330	8.8
				1028	1.6
				1606	8.2
			☾	2248	2.3

JUNE

	Time	m		Time	m
1 SA	0432	8.5	**16** SU	0326	8.0
	1129	2.0		1021	2.5
	1711	7.9		1601	7.7
	2353	2.5	☽	2237	2.8
2 SU	0536	8.2	**17** M	0422	7.9
	1233	2.2		1118	2.6
	1819	7.8		1702	7.7
				2339	2.9
3 M	0102	2.6	**18** TU	0528	7.8
	0643	8.1		1226	2.6
	1339	2.3		1810	7.8
	1926	7.9			
4 TU	0208	2.5	**19** W	0051	2.8
	0746	8.1		0637	8.0
	1440	2.2		1339	2.4
	2025	8.1		1917	8.1
5 W	0308	2.4	**20** TH	0204	2.5
	0842	8.2		0744	8.3
	1533	2.2		1446	2.0
	2114	8.3		2019	8.5
6 TH	0359	2.1	**21** F	0311	2.0
	0931	8.4		0845	8.7
	1617	2.0		1546	1.6
	2156	8.5		2115	8.9
7 F	0443	2.0	**22** SA	0412	1.5
	1013	8.5		0942	9.0
	1656	1.9		1642	1.3
	2233	8.7		2208	9.3
8 SA	0522	1.8	**23** SU	0509	1.1
	1051	8.6		1036	9.3
	1731	1.9		1734	1.0
●	2308	8.8	O	2258	9.7
9 SU	0558	1.7	**24** M	0603	0.7
	1127	8.7		1128	9.5
	1803	1.8		1825	0.8
	2342	8.8		2348	9.8
10 M	0632	1.7	**25** TU	0654	0.5
	1202	8.7		1219	9.6
	1836	1.8		1913	0.8
11 TU	0015	8.8	**26** W	0038	9.8
	0705	1.7		0743	0.5
	1237	8.6		1309	9.4
	1908	1.8		2000	0.9
12 W	0050	8.7	**27** TH	0127	9.7
	0739	1.8		0831	0.6
	1312	8.5		1358	9.2
	1943	2.0		2046	1.2
13 TH	0124	8.6	**28** F	0217	9.4
	0814	1.9		0917	1.0
	1348	8.3		1446	8.8
	2020	2.2		2132	1.6
14 F	0200	8.4	**29** SA	0306	9.1
	0853	2.1		1005	1.4
	1427	8.1		1537	8.4
	2101	2.4		2221	2.1
15 SA	0240	8.2	**30** SU	0359	8.6
	0934	2.3		1055	1.9
	1510	7.9		1631	8.0
	2145	2.6	☾	2316	2.5

JULY

	Time	m		Time	m
1 M	0456	8.2	**16** TU	0343	8.2
	1151	2.4		1038	2.4
	1733	7.7		1621	7.9
			☽	2300	2.7
2 TU	0018	2.8	**17** W	0444	8.0
	0600	7.9		1141	2.6
	1254	2.7		1729	7.9
	1841	7.6			
3 W	0127	2.9	**18** TH	0010	2.8
	0708	7.7		0559	7.9
	1358	2.8		1259	2.6
	1948	7.7		1844	8.0
4 TH	0233	2.8	**19** F	0131	2.6
	0812	7.8		0717	8.1
	1457	2.7		1417	2.3
	2046	7.9		1956	8.3
5 F	0331	2.6	**20** SA	0248	2.2
	0907	8.0		0829	8.4
	1547	2.5		1524	1.9
	2133	8.2		2059	8.8
6 SA	0420	2.3	**21** SU	0355	1.6
	0954	8.2		0931	8.9
	1630	2.3		1625	1.5
	2213	8.5		2155	9.3
7 SU	0502	2.1	**22** M	0457	1.1
	1034	8.4		1027	9.2
	1708	2.1		1721	1.1
	2250	8.7	O	2247	9.7
8 M	0540	1.9	**23** TU	0552	0.7
	1110	8.6		1118	9.5
	1743	1.9		1812	0.8
●	2324	8.8		2336	9.9
9 TU	0615	1.7	**24** W	0643	0.4
	1144	8.7		1206	9.6
	1817	1.8		1900	0.7
	2357	8.9			
10 W	0649	1.6	**25** TH	0023	10.0
	1218	8.7		0729	0.3
	1852	1.7		1252	9.5
				1944	0.8
11 TH	0031	8.9	**26** F	0108	9.9
	0723	1.6		0812	0.5
	1252	8.7		1336	9.3
	1927	1.7		2026	1.0
12 F	0104	8.9	**27** SA	0152	9.6
	0758	1.6		0853	0.9
	1326	8.6		1418	9.0
	2004	1.8		2107	1.5
13 SA	0138	8.8	**28** SU	0235	9.2
	0834	1.7		0933	1.5
	1402	8.5		1500	8.5
	2041	2.0		2148	2.0
14 SU	0213	8.6	**29** M	0320	8.6
	0910	2.0		1014	2.1
	1441	8.3		1546	8.1
	2120	2.3	☾	2234	2.5
15 M	0254	8.4	**30** TU	0411	8.1
	0950	2.2		1101	2.6
	1526	8.1		1642	7.6
	2204	2.5		2330	3.0
			31 W	0512	7.6
				1200	3.1
				1750	7.3

AUGUST

	Time	m		Time	m
1 TH	0042	3.3	**16** F	0536	7.8
	0625	7.3		1231	2.8
	1312	3.3		1823	7.9
	1907	7.3			
2 F	0158	3.2	**17** SA	0112	2.7
	0741	7.4		0704	7.8
	1422	3.1		1358	2.6
	2017	7.6		1941	8.2
3 SA	0303	2.9	**18** SU	0235	2.3
	0845	7.7		0821	8.3
	1520	2.8		1510	2.1
	2110	8.0		2048	8.7
4 SU	0357	2.5	**19** M	0345	1.7
	0935	8.0		0924	8.8
	1607	2.5		1612	1.6
	2153	8.4		2144	9.3
5 M	0441	2.1	**20** TU	0446	1.1
	1015	8.4		1017	9.2
	1647	2.2		1708	1.1
	2230	8.7		2234	9.7
6 TU	0520	1.8	**21** W	0539	0.6
	1050	8.6		1104	9.5
	1723	1.9		1757	0.8
●	2304	8.9	O	2320	10.0
7 W	0555	1.6	**22** TH	0626	0.4
	1123	8.8		1148	9.6
	1758	1.7		1841	0.7
	2336	9.1			
8 TH	0630	1.4	**23** F	0003	10.0
	1155	8.9		0707	0.4
	1834	1.5		1229	9.6
				1921	0.7
9 F	0008	9.2	**24** SA	0044	9.9
	0704	1.3		0746	0.6
	1228	9.0		1308	9.4
	1909	1.5		2000	1.0
10 SA	0041	9.2	**25** SU	0123	9.6
	0738	1.3		0823	1.1
	1302	9.0		1345	9.0
	1945	1.5		2037	1.5
11 SU	0114	9.1	**26** M	0202	9.1
	0812	1.5		0857	1.6
	1336	8.9		1422	8.6
	2020	1.7		2113	2.0
12 M	0148	8.9	**27** TU	0241	8.6
	0846	1.7		0930	2.2
	1414	8.7		1502	8.1
	2057	2.0		2151	2.6
13 TU	0227	8.7	**28** W	0327	8.0
	0923	2.0		1007	2.8
	1457	8.4		1552	7.6
	2138	2.3	☾	2240	3.2
14 W	0314	8.4	**29** TH	0424	7.4
	1007	2.4		1059	3.4
	1550	8.1		1658	7.2
☽	2231	2.6		2352	3.5
15 TH	0414	8.0	**30** F	0540	7.0
	1108	2.7		1217	3.6
	1700	7.8		1823	7.1
	2343	2.8			
			31 SA	0119	3.5
				0706	7.1
				1343	3.5
				1942	7.4

ENGLAND — LIVERPOOL (GLADSTONE DOCK)

LAT 53°27'N LONG 3°01'W

TIME ZONE **UT(GMT)** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

SEPTEMBER

	Time	m		Time	m
1 SU	0232	3.1	**16** M	0225	2.2
	0818	7.4		0814	8.2
	1449	3.1		1458	2.2
	2041	7.9		2036	8.8
2 M	0328	2.6	**17** TU	0334	1.6
	0910	7.9		0914	8.8
	1539	2.7		1559	1.7
	2126	8.3		2130	9.3
3 TU	0413	2.2	**18** W	0431	1.1
	0950	8.3		1003	9.2
	1621	2.2		1651	1.2
	2204	8.7		2217	9.7
4 W	0453	1.8	**19** TH	0520	0.8
	1025	8.7		1046	9.5
	1700	1.9		1737	0.9
	2238	9.0		2300	9.9
5 TH	0530	1.5	**20** F	0603	0.6
	1057	9.0		1126	9.6
	1736	1.6		1818	0.8
●	2310	9.2		2339	9.9
6 F	0605	1.2	**21** SA	0641	0.7
	1129	9.2		1203	9.5
	1813	1.3		1856	0.9
	2342	9.4			
7 SA	0641	1.1	**22** SU	0017	9.7
	1202	9.3		0716	0.9
	1850	1.2		1238	9.3
				1932	1.2
8 SU	0015	9.4	**23** M	0054	9.4
	0716	1.1		0749	1.3
	1236	9.3		1312	9.1
	1925	1.3		2006	1.6
9 M	0050	9.3	**24** TU	0130	9.0
	0750	1.3		0819	1.8
	1312	9.2		1346	8.7
	2001	1.5		2039	2.1
10 TU	0126	9.2	**25** W	0206	8.5
	0824	1.6		0848	2.4
	1351	8.9		1423	8.3
	2037	1.8		2113	2.6
11 W	0207	8.9	**26** TH	0248	8.0
	0901	1.9		0920	2.9
	1435	8.6		1508	7.8
	2120	2.2		2155	3.2
12 TH	0256	8.4	**27** F	0340	7.4
	0946	2.4		1005	3.4
	1530	8.2		1609	7.3
☽	2214	2.6	☾	2258	3.6
13 F	0400	8.0	**28** SA	0451	7.0
	1048	2.8		1115	3.8
	1644	7.9		1732	7.1
	2330	2.8			
14 SA	0527	7.6	**29** SU	0029	3.6
	1215	3.0		0619	6.9
	1811	7.8		1250	3.8
				1856	7.2
15 SU	0103	2.7	**30** M	0150	3.3
	0657	7.8		0739	7.3
	1345	2.7		1407	3.4
	1930	8.2		2002	7.7

OCTOBER

	Time	m		Time	m
1 TU	0249	2.8	**16** W	0315	1.7
	0835	7.8		0857	8.7
	1503	2.9		1539	1.8
	2051	8.2		2111	9.2
2 W	0337	2.2	**17** TH	0410	1.3
	0917	8.3		0944	9.1
	1548	2.3		1630	1.5
	2130	8.7		2157	9.4
3 TH	0419	1.8	**18** F	0456	1.1
	0952	8.7		1025	9.3
	1630	1.9		1714	1.3
	2205	9.0		2238	9.6
4 F	0459	1.4	**19** SA	0536	1.1
	1026	9.1		1102	9.4
	1710	1.5		1754	1.2
	2239	9.3		2316	9.6
5 SA	0538	1.2	**20** SU	0612	1.1
	1100	9.3		1137	9.4
	1749	1.3		1830	1.2
●	2314	9.5		2353	9.4
6 SU	0615	1.0	**21** M	0646	1.3
	1135	9.5		1211	9.3
	1828	1.1		1905	1.4
	2350	9.6			
7 M	0653	1.0	**22** TU	0028	9.2
	1212	9.5		0716	1.6
	1907	1.1		1244	9.1
				1938	1.8
8 TU	0028	9.5	**23** W	0103	8.9
	0729	1.2		0745	2.0
	1251	9.4		1317	8.8
	1945	1.3		2010	2.1
9 W	0110	9.3	**24** TH	0138	8.5
	0806	1.5		0814	2.4
	1333	9.2		1352	8.4
	2025	1.6		2042	2.6
10 TH	0155	9.0	**25** F	0218	8.1
	0846	1.9		0846	2.8
	1421	8.8		1433	8.0
	2111	2.0		2121	3.0
11 F	0249	8.5	**26** SA	0304	7.6
	0934	2.4		0928	3.3
	1520	8.4		1525	7.6
☽	2209	2.4	☾	2214	3.3
12 SA	0356	8.0	**27** SU	0404	7.2
	1039	2.9		1026	3.7
	1635	8.0		1635	7.3
	2327	2.7		2328	3.5
13 SU	0520	7.7	**28** M	0521	7.0
	1205	3.0		1145	3.8
	1757	8.0		1757	7.2
14 M	0053	2.5	**29** TU	0051	3.4
	0645	7.8		0640	7.2
	1330	2.8		1309	3.6
	1913	8.3		1908	7.5
15 TU	0210	2.1	**30** W	0159	2.9
	0759	8.2		0745	7.6
	1440	2.3		1415	3.1
	2018	8.8		2004	8.0
			31 TH	0253	2.4
				0833	8.1
				1508	2.5
				2049	8.5

NOVEMBER

	Time	m		Time	m
1 F	0341	1.9	**16** SA	0429	1.6
	0915	8.6		1003	9.0
	1556	2.0		1651	1.7
	2130	8.9		2217	9.2
2 SA	0426	1.5	**17** SU	0509	1.6
	0953	9.1		1040	9.1
	1641	1.6		1731	1.6
	2209	9.3	O	2256	9.2
3 SU	0509	1.2	**18** M	0544	1.6
	1031	9.4		1115	9.2
	1725	1.3		1807	1.6
●	2248	9.5		2332	9.1
4 M	0551	1.0	**19** TU	0617	1.7
	1111	9.7		1149	9.2
	1808	1.1		1842	1.7
	2330	9.6			
5 TU	0632	1.0	**20** W	0007	9.0
	1152	9.7		0648	1.8
	1851	1.0		1222	9.1
				1915	1.9
6 W	0013	9.6	**21** TH	0042	8.8
	0712	1.1		0717	2.0
	1236	9.7		1255	8.9
	1934	1.1		1946	2.1
7 TH	0059	9.4	**22** F	0117	8.6
	0754	1.4		0748	2.3
	1322	9.4		1329	8.6
	2019	1.4		2019	2.4
8 F	0149	9.1	**23** SA	0154	8.3
	0838	1.8		0822	2.6
	1413	9.1		1407	8.3
	2109	1.8		2057	2.7
9 SA	0245	8.6	**24** SU	0235	7.9
	0929	2.3		0902	3.0
	1513	8.7		1450	8.0
	2208	2.1		2141	2.9
10 SU	0350	8.2	**25** M	0323	7.6
	1032	2.7		0951	3.3
	1621	8.4		1543	7.7
☽	2318	2.4	☾	2237	3.2
11 M	0504	7.9	**26** TU	0422	7.3
	1148	2.9		1052	3.5
	1735	8.3		1650	7.5
				2346	3.2
12 TU	0033	2.4	**27** W	0532	7.3
	0621	7.9		1204	3.5
	1304	2.7		1802	7.5
	1846	8.4			
13 W	0145	2.2	**28** TH	0059	3.1
	0733	8.2		0641	7.5
	1414	2.5		1319	3.2
	1952	8.6		1907	7.8
14 TH	0248	2.0	**29** F	0204	2.7
	0832	8.5		0742	8.0
	1514	2.1		1424	2.8
	2048	8.8		2003	8.2
15 F	0343	1.8	**30** SA	0301	2.2
	0921	8.8		0834	8.5
	1606	1.9		1521	2.3
	2135	9.0		2054	8.7

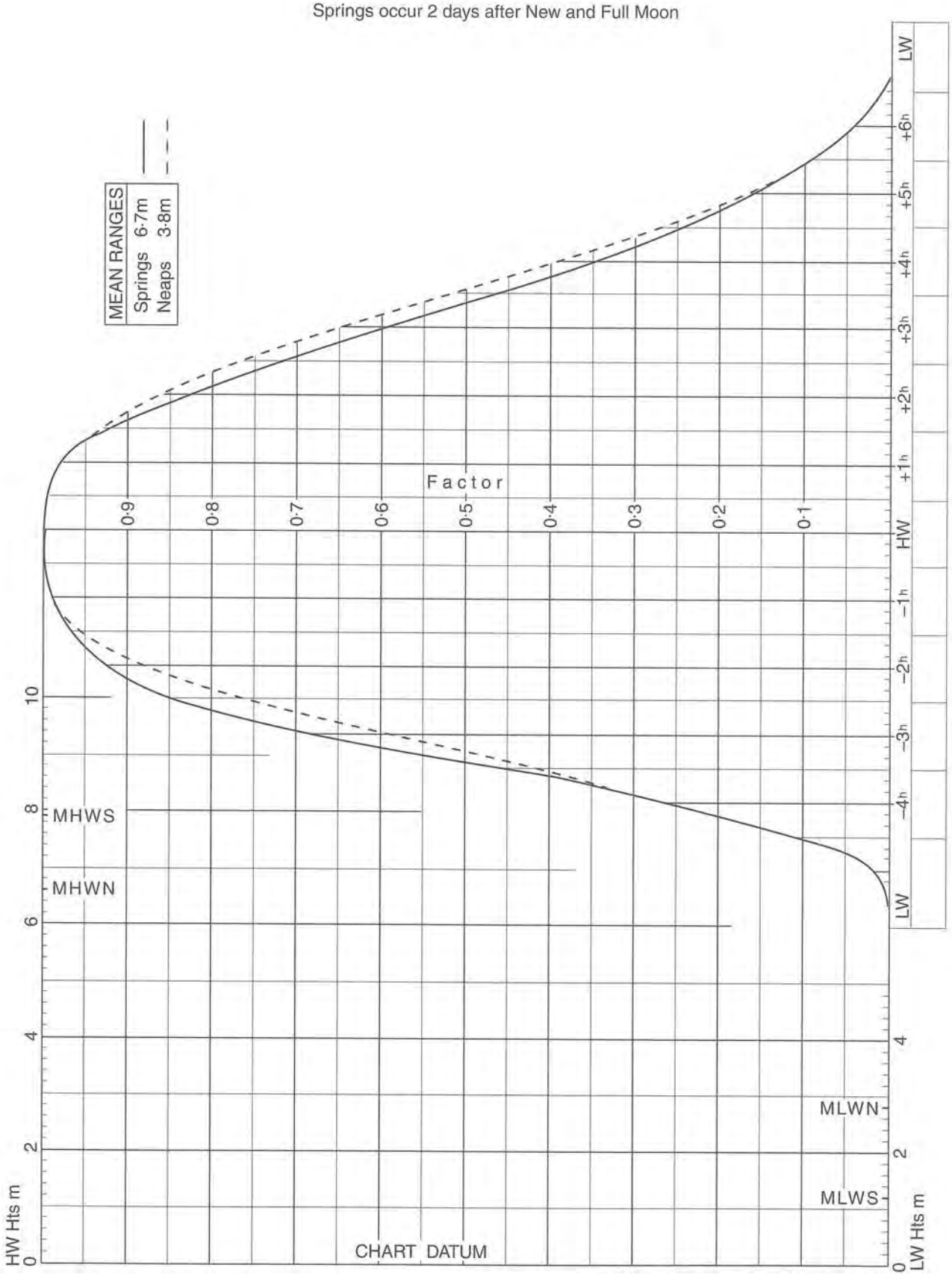
DECEMBER

	Time	m		Time	m
1 SU	0353	1.8	**16** M	0445	2.0
	0922	9.0		1022	8.8
	1613	1.8		1712	1.9
	2142	9.1		2240	8.8
2 M	0442	1.4	**17** TU	0521	1.9
	1007	9.4		1058	9.0
	1703	1.4		1750	1.8
	2228	9.4	O	2316	8.9
3 TU	0529	1.1	**18** W	0555	1.9
	1051	9.7		1132	9.1
	1752	1.1		1824	1.8
●	2315	9.6		2351	8.9
4 W	0615	1.0	**19** TH	0626	1.9
	1137	9.9		1205	9.1
	1840	0.9		1857	1.8
5 TH	0002	9.7	**20** F	0025	8.8
	0700	1.0		0657	2.0
	1224	9.9		1238	9.0
	1927	0.9		1928	1.9
6 F	0052	9.6	**21** SA	0059	8.7
	0745	1.2		0729	2.1
	1313	9.7		1311	8.9
	2015	1.0		2001	2.0
7 SA	0143	9.3	**22** SU	0133	8.5
	0832	1.5		0804	2.2
	1405	9.5		1345	8.7
	2105	1.3		2037	2.2
8 SU	0236	8.9	**23** M	0209	8.3
	0922	1.9		0842	2.5
	1500	9.1		1421	8.4
	2159	1.7		2115	2.5
9 M	0334	8.5	**24** TU	0249	8.0
	1017	2.3		0923	2.8
	1559	8.8		1502	8.1
☽	2258	2.0		2158	2.7
10 TU	0437	8.1	**25** W	0335	7.8
	1120	2.6		1011	3.1
	1704	8.4		1552	7.9
			☾	2251	2.9
11 W	0002	2.3	**26** TH	0431	7.6
	0545	7.9		1109	3.2
	1229	2.8		1655	7.7
	1811	8.3		2356	3.0
12 TH	0110	2.4	**27** F	0539	7.6
	0656	7.9		1220	3.2
	1339	2.7		1807	7.8
	1919	8.2			
13 F	0215	2.4	**28** SA	0112	2.9
	0802	8.1		0650	7.8
	1444	2.6		1338	3.0
	2021	8.4		1918	8.0
14 SA	0313	2.3	**29** SU	0222	2.5
	0856	8.4		0756	8.2
	1541	2.3		1447	2.5
	2114	8.5		2023	8.4
15 SU	0403	2.2	**30** M	0323	2.0
	0942	8.6		0854	8.7
	1630	2.1		1549	2.0
	2159	8.7		2120	8.9
			31 TU	0419	1.6
				0947	9.2
				1645	1.5
				2214	9.3

LE HAVRE

MEAN SPRING AND NEAP CURVES

Springs occur 2 days after New and Full Moon



FRANCE — LE HAVRE

LAT 49°29'N LONG 0°07'E

TIME ZONE -0100 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

JANUARY

	Time	m		Time	m
1 TU	0047	7.6	**16** W	0137	7.9
	0744	1.9		0846	1.5
	1256	7.7		1350	7.8
	2006	1.7		2104	1.4
2 W	0125	7.5	**17** TH	0217	7.6
	0820	2.0		0921	1.9
	1335	7.5		1431	7.5
	2041	1.9		2136	1.9
3 TH	0204	7.4	**18** F	0258	7.3
	0857	2.2		0955	2.3
	1416	7.4		1514	7.1
	2117	2.1		2210	2.4
4 F	0246	7.2	**19** SA	0342	6.9
	0936	2.4		1034	2.8
	1500	7.1		1605	6.7
	2158	2.3	☽	2251	2.9
5 SA	0334	7.1	**20** SU	0439	6.6
	1022	2.6		1123	3.1
	1552	7.0		1713	6.4
☾	2247	2.5		2348	3.3
6 SU	0433	6.9	**21** M	0549	6.5
	1119	2.7		1231	3.3
	1658	6.9		1832	6.3
	2350	2.7			
7 M	0547	6.9	**22** TU	0106	3.4
	1234	2.7		0708	6.5
	1821	6.9		1359	3.2
				1957	6.4
8 TU	0116	2.6	**23** W	0231	3.1
	0706	7.1		0820	6.7
	1403	2.4		1510	2.8
	1942	7.1		2055	6.8
9 W	0238	2.3	**24** TH	0333	2.7
	0815	7.5		0909	7.0
	1514	1.9		1604	2.4
	2048	7.5		2137	7.1
10 TH	0344	1.8	**25** F	0424	2.4
	0913	7.8		0947	7.3
	1618	1.5		1650	2.0
	2145	7.8		2213	7.4
11 F	0446	1.5	**26** SA	0507	2.0
	1005	8.0		1022	7.5
	1720	1.1		1731	1.7
●	2236	8.0		2247	7.6
12 SA	0546	1.2	**27** SU	0546	1.8
	1054	8.2		1056	7.7
	1817	0.9		1809	1.5
	2324	8.1	○	2321	7.7
13 SU	0640	1.1	**28** M	0622	1.6
	1141	8.3		1130	7.8
	1907	0.7		1844	1.4
				2355	7.8
14 M	0010	8.2	**29** TU	0657	1.5
	0727	1.0		1205	7.9
	1226	8.3		1918	1.3
	1950	0.8			
15 TU	0054	8.1	**30** W	0031	7.8
	0809	1.2		0732	1.5
	1309	8.1		1241	7.9
	2029	1.0		1953	1.3
			31 TH	0107	7.8
				0807	1.5
				1319	7.8
				2027	1.4

FEBRUARY

	Time	m		Time	m
1 F	0145	7.7	**16** SA	0217	7.4
	0842	1.7		0916	2.1
	1358	7.6		1433	7.2
	2101	1.7		2127	2.3
2 SA	0223	7.5	**17** SU	0251	7.0
	0918	1.9		0946	2.6
	1439	7.4		1513	6.7
	2137	2.0	☽	2159	2.9
3 SU	0306	7.2	**18** M	0334	6.6
	0958	2.2		1026	3.1
	1526	7.1		1611	6.3
☾	2220	2.4		2250	3.3
4 M	0358	7.0	**19** TU	0445	6.3
	1049	2.6		1127	3.4
	1629	6.8		1740	6.1
	2318	2.7			
5 TU	0513	6.8	**20** W	0004	3.6
	1201	2.8		0615	6.2
	1800	6.7		1255	3.5
				1914	6.2
6 W	0047	2.8	**21** TH	0144	3.5
	0646	6.9		0740	6.3
	1340	2.6		1433	3.1
	1931	6.9		2025	6.5
7 TH	0220	2.5	**22** F	0303	3.0
	0802	7.2		0840	6.7
	1458	2.1		1535	2.6
	2040	7.3		2111	6.9
8 F	0332	2.1	**23** SA	0357	2.5
	0903	7.6		0922	7.1
	1609	1.6		1624	2.1
	2136	7.6		2148	7.3
9 SA	0440	1.6	**24** SU	0444	2.0
	0954	7.9		0958	7.4
	1715	1.2		1708	1.7
	2224	7.9		2223	7.6
10 SU	0541	1.2	**25** M	0525	1.7
	1041	8.1		1034	7.7
	1809	0.9		1747	1.4
●	2309	8.0	○	2258	7.8
11 M	0630	1.0	**26** TU	0602	1.4
	1124	8.2		1109	7.9
	1853	0.7		1824	1.2
	2351	8.1		2333	7.9
12 TU	0711	0.9	**27** W	0638	1.2
	1206	8.2		1145	8.0
	1931	0.8		1859	1.0
13 W	0031	8.1	**28** TH	0009	8.0
	0747	1.0		0714	1.1
	1245	8.1		1222	8.0
	2004	1.0		1934	1.0
14 TH	0109	7.9			
	0819	1.3			
	1322	7.9			
	2033	1.3			
15 F	0144	7.7			
	0849	1.7			
	1358	7.5			
	2100	1.8			

MARCH

	Time	m		Time	m
1 F	0046	8.0	**16** SA	0110	7.7
	0749	1.1		0816	1.6
	1301	8.0		1327	7.5
	2009	1.1		2027	1.8
2 SA	0124	7.9	**17** SU	0141	7.4
	0824	1.3		0842	2.0
	1341	7.8		1359	7.2
	2043	1.4		2051	2.3
3 SU	0203	7.7	**18** M	0210	7.1
	0859	1.6		0907	2.4
	1423	7.5		1431	6.8
	2118	1.8		2119	2.8
4 M	0243	7.4	**19** TU	0245	6.7
	0938	2.0		0941	2.9
	1510	7.1		1515	6.4
☾	2200	2.3	☽	2202	3.3
5 TU	0334	7.0	**20** W	0337	6.3
	1028	2.4		1035	3.3
	1614	6.8		1638	6.1
	2258	2.8		2312	3.6
6 W	0453	6.7	**21** TH	0512	6.0
	1142	2.8		1155	3.5
	1752	6.6		1821	6.1
7 TH	0032	3.0	**22** F	0043	3.6
	0633	6.8		0647	6.2
	1325	2.7		1334	3.3
	1922	6.8		1939	6.4
8 F	0207	2.7	**23** SA	0215	3.2
	0750	7.0		0756	6.5
	1447	2.2		1451	2.8
	2030	7.2		2033	6.8
9 SA	0325	2.1	**24** SU	0317	2.6
	0850	7.4		0846	7.0
	1603	1.7		1545	2.2
	2123	7.5		2114	7.2
10 SU	0434	1.6	**25** M	0407	2.1
	0939	7.7		0927	7.3
	1705	1.3		1633	1.8
	2208	7.8		2152	7.6
11 M	0528	1.3	**26** TU	0452	1.7
	1023	7.9		1005	7.7
	1752	1.0		1716	1.4
●	2249	7.9		2229	7.8
12 TU	0611	1.1	**27** W	0534	1.4
	1104	8.0		1043	7.9
	1831	0.9		1756	1.1
	2328	8.0	○	2307	8.0
13 W	0647	1.0	**28** TH	0614	1.1
	1142	8.0		1122	8.0
	1904	0.9		1835	1.0
				2345	8.1
14 TH	0004	8.0	**29** F	0653	0.9
	0719	1.1		1202	8.1
	1219	8.0		1913	0.9
	1934	1.1			
15 F	0038	7.9	**30** SA	0024	8.1
	0749	1.3		0731	0.9
	1253	7.8		1243	8.1
	2001	1.4		1950	1.0
			31 SU	0104	8.0
				0808	1.1
				1326	7.9
				2026	1.4

APRIL

	Time	m		Time	m
1 M	0145	7.8	**16** TU	0140	7.2
	0845	1.4		0840	2.3
	1410	7.6		1404	6.9
	2104	1.8		2052	2.7
2 TU	0230	7.5	**17** W	0214	6.9
	0925	1.9		0910	2.7
	1501	7.2		1445	6.6
	2147	2.3		2130	3.1
3 W	0324	7.1	**18** TH	0300	6.5
	1016	2.3		0956	3.1
	1608	6.8		1543	6.3
☾	2250	2.8	☽	2230	3.4
4 TH	0442	6.8	**19** F	0406	6.2
	1136	2.7		1106	3.3
	1744	6.7		1719	6.2
				2350	3.5
5 F	0026	2.9	**20** SA	0541	6.2
	0616	6.7		1230	3.2
	1311	2.6		1841	6.4
	1906	6.8			
6 SA	0153	2.6	**21** SU	0113	3.2
	0730	7.0		0659	6.5
	1431	2.2		1350	2.9
	2011	7.1		1943	6.8
7 SU	0309	2.2	**22** M	0223	2.7
	0830	7.2		0759	6.8
	1544	1.8		1454	2.4
	2103	7.4		2033	7.2
8 M	0414	1.8	**23** TU	0320	2.2
	0919	7.5		0848	7.2
	1641	1.5		1548	1.9
	2146	7.6		2116	7.5
9 TU	0504	1.5	**24** W	0412	1.7
	1001	7.7		0932	7.6
	1725	1.3		1638	1.5
	2225	7.7		2158	7.8
10 W	0544	1.3	**25** TH	0501	1.4
	1041	7.8		1015	7.8
	1801	1.2		1725	1.2
●	2302	7.8	○	2239	8.0
11 TH	0617	1.3	**26** F	0547	1.1
	1118	7.8		1058	8.0
	1832	1.3		1809	1.0
	2336	7.8		2320	8.1
12 F	0649	1.3	**27** SA	0631	0.9
	1153	7.8		1142	8.1
	1902	1.4		1852	1.0
13 SA	0008	7.7	**28** SU	0003	8.2
	0719	1.4		0713	0.8
	1227	7.6		1227	8.1
	1931	1.6		1934	1.1
14 SU	0040	7.6	**29** M	0047	8.1
	0747	1.6		0755	1.0
	1300	7.4		1313	7.9
	1958	1.9		2015	1.4
15 M	0110	7.4	**30** TU	0132	7.9
	0813	1.9		0836	1.3
	1332	7.2		1401	7.7
	2023	2.3		2057	1.8

FRANCE — LE HAVRE

LAT 49°29'N LONG 0°07'E

TIME ZONE -0100 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

MAY

	Time	m		Time	m
1	0220	7.6	**16**	0153	7.1
W	0921	1.7	TH	0852	2.4
	1454	7.3		1424	6.8
	2146	2.2		2111	2.8
2	0315	7.2	**17**	0236	6.8
TH	1017	2.1	F	0932	2.7
	1601	7.0		1514	6.6
☾	2253	2.6		2159	3.0
3	0428	6.9	**18**	0330	6.6
F	1131	2.4	SA	1026	2.9
	1723	6.8		1619	6.5
			☽	2303	3.2
4	0011	2.7	**19**	0437	6.5
SA	0548	6.8	SU	1135	3.0
	1247	2.5		1735	6.6
	1837	6.9			
5	0125	2.6	**20**	0014	3.0
SU	0700	6.9	M	0554	6.5
	1357	2.3		1248	2.8
	1942	7.1		1845	6.8
6	0234	2.3	**21**	0126	2.7
M	0802	7.1	TU	0703	6.8
	1505	2.1		1359	2.5
	2035	7.3		1944	7.1
7	0338	2.0	**22**	0233	2.3
TU	0854	7.3	W	0804	7.1
	1604	1.9		1503	2.0
	2120	7.4		2037	7.4
8	0429	1.8	**23**	0333	1.9
W	0938	7.4	TH	0858	7.4
	1649	1.8		1600	1.7
	2200	7.6		2126	7.7
9	0510	1.7	**24**	0428	1.5
TH	1018	7.5	F	0949	7.7
	1726	1.7		1654	1.4
	2236	7.6		2213	7.9
10	0546	1.6	**25**	0521	1.1
F	1055	7.6	SA	1038	7.9
	1800	1.6		1746	1.2
●	2309	7.6	O	2259	8.0
11	0619	1.5	**26**	0612	0.9
SA	1129	7.6	SU	1126	8.1
	1833	1.7		1835	1.1
	2341	7.6		2346	8.2
12	0652	1.6	**27**	0700	0.8
SU	1204	7.5	M	1214	8.1
	1905	1.8		1923	1.1
13	0013	7.5	**28**	0033	8.1
M	0722	1.7	TU	0748	0.9
	1238	7.4		1302	8.0
	1934	2.0		2010	1.3
14	0045	7.4	**29**	0121	8.0
TU	0751	1.9	W	0835	1.1
	1311	7.2		1352	7.8
	2003	2.2		2058	1.6
15	0118	7.3	**30**	0210	7.7
W	0820	2.1	TH	0924	1.5
	1345	7.0		1445	7.5
	2034	2.5		2149	2.0
			31	0303	7.4
			F	1015	1.9
				1543	7.2
			☾	2244	2.3

JUNE

	Time	m		Time	m
1	0403	7.1	**16**	0302	6.9
SA	1111	2.2	SU	0958	2.5
	1649	7.0		1539	6.8
	2343	2.5	☽	2226	2.7
2	0511	6.9	**17**	0355	6.8
SU	1211	2.4	M	1050	2.6
	1756	6.9		1638	6.8
				2324	2.8
3	0045	2.6	**18**	0458	6.7
M	0619	6.8	TU	1153	2.7
	1313	2.5		1746	6.8
	1902	6.9			
4	0149	2.5	**19**	0032	2.7
TU	0726	6.9	W	0610	6.8
	1416	2.5		1307	2.5
	2002	7.1		1856	7.0
5	0251	2.4	**20**	0149	2.4
W	0826	7.0	TH	0722	7.0
	1516	2.3		1424	2.2
	2052	7.2		2001	7.3
6	0347	2.2	**21**	0259	2.0
TH	0915	7.1	F	0829	7.3
	1608	2.2		1530	1.9
	2135	7.4		2059	7.6
7	0434	2.0	**22**	0401	1.6
F	0958	7.3	SA	0928	7.6
	1652	2.0		1629	1.5
	2212	7.5		2152	7.9
8	0516	1.8	**23**	0459	1.2
SA	1035	7.4	SU	1021	7.9
	1732	1.9		1726	1.3
●	2246	7.5	O	2242	8.1
9	0554	1.7	**24**	0557	1.0
SU	1110	7.4	M	1112	8.0
	1809	1.9		1823	1.1
	2319	7.5		2331	8.2
10	0629	1.7	**25**	0652	0.8
M	1145	7.4	TU	1201	8.1
	1843	1.9		1916	1.1
	2352	7.5			
11	0703	1.7	**26**	0019	8.2
TU	1219	7.4	W	0743	0.8
	1915	2.0		1250	8.1
				2005	1.1
12	0025	7.5	**27**	0107	8.1
W	0734	1.8	TH	0830	0.9
	1253	7.3		1338	7.9
	1947	2.1		2051	1.4
13	0059	7.4	**28**	0154	7.9
TH	0806	1.9	F	0914	1.2
	1328	7.3		1426	7.7
	2021	2.2		2135	1.7
14	0136	7.3	**29**	0241	7.6
F	0839	2.1	SA	0956	1.7
	1406	7.1		1514	7.4
	2056	2.4		2218	2.1
15	0216	7.1	**30**	0331	7.2
SA	0916	2.3	SU	1038	2.1
	1449	7.0		1606	7.1
	2137	2.6	☾	2305	2.4

JULY

	Time	m		Time	m
1	0427	6.9	**16**	0323	7.0
M	1126	2.5	TU	1017	2.4
	1706	6.8		1557	7.0
	2359	2.7	☽	2246	2.6
2	0532	6.7	**17**	0419	6.9
TU	1223	2.8	W	1111	2.6
	1812	6.7		1700	6.9
				2349	2.7
3	0101	2.8	**18**	0530	6.8
W	0644	6.6	TH	1222	2.7
	1329	2.9		1817	6.9
	1922	6.8			
4	0208	2.8	**19**	0113	2.6
TH	0757	6.7	F	0654	6.9
	1435	2.8		1354	2.5
	2024	6.9		1935	7.2
5	0310	2.5	**20**	0235	2.2
F	0855	6.9	SA	0811	7.2
	1534	2.6		1508	2.1
	2113	7.1		2041	7.5
6	0404	2.3	**21**	0340	1.7
SA	0941	7.1	SU	0914	7.5
	1624	2.3		1611	1.7
	2153	7.3		2137	7.9
7	0451	2.0	**22**	0443	1.3
SU	1018	7.3	M	1009	7.8
	1709	2.1		1714	1.4
	2227	7.4	O	2228	8.1
8	0533	1.9	**23**	0547	1.0
M	1053	7.4	TU	1059	8.0
	1749	2.0		1814	1.1
●	2300	7.5		2317	8.2
9	0611	1.7	**24**	0644	0.8
TU	1126	7.4	W	1146	8.1
	1825	1.9		1906	1.0
	2334	7.6			
10	0646	1.7	**25**	0003	8.3
W	1200	7.5	TH	0731	0.7
	1859	1.8		1232	8.1
				1952	1.0
11	0007	7.7	**26**	0048	8.2
TH	0719	1.6	F	0814	0.8
	1234	7.5		1316	8.0
	1932	1.8		2032	1.2
12	0041	7.6	**27**	0131	8.0
F	0752	1.7	SA	0851	1.1
	1309	7.5		1359	7.8
	2006	1.9		2109	1.5
13	0118	7.5	**28**	0213	7.7
SA	0825	1.8	SU	0925	1.6
	1346	7.4		1439	7.5
	2040	2.0		2144	2.0
14	0156	7.4	**29**	0255	7.3
SU	0859	1.9	M	0958	2.1
	1424	7.3		1521	7.1
	2116	2.2	☾	2221	2.5
15	0237	7.2	**30**	0342	6.9
M	0935	2.2	TU	1036	2.7
	1508	7.1		1612	6.8
	2157	2.4		2307	2.9
			31	0443	6.5
			W	1128	3.1
				1718	6.5

AUGUST

	Time	m		Time	m
1	0009	3.2	**16**	0508	6.7
TH	0559	6.3	F	1152	2.9
	1240	3.3		1754	6.8
	1836	6.5			
2	0126	3.2	**17**	0049	2.7
F	0725	6.4	SA	0642	6.8
	1359	3.2		1336	2.7
	1954	6.6		1921	7.1
3	0239	2.9	**18**	0218	2.3
SA	0835	6.7	SU	0802	7.2
	1506	2.9		1453	2.3
	2051	6.9		2029	7.5
4	0338	2.5	**19**	0326	1.8
SU	0921	7.0	M	0904	7.5
	1601	2.5		1559	1.8
	2132	7.2		2125	7.8
5	0428	2.1	**20**	0433	1.4
M	0958	7.2	TU	0956	7.8
	1649	2.2		1705	1.4
	2206	7.4		2213	8.1
6	0513	1.9	**21**	0537	1.0
TU	1031	7.4	W	1043	8.0
	1730	2.0		1803	1.1
●	2240	7.6	O	2259	8.2
7	0552	1.7	**22**	0629	0.8
W	1105	7.6	TH	1127	8.1
	1807	1.8		1849	1.0
	2313	7.7		2343	8.3
8	0627	1.5	**23**	0711	0.8
TH	1138	7.6	F	1209	8.1
	1840	1.7		1929	1.0
	2347	7.8			
9	0700	1.4	**24**	0024	8.2
F	1212	7.7	SA	0748	0.9
	1914	1.6		1249	8.0
				2005	1.2
10	0021	7.8	**25**	0104	8.0
SA	0733	1.4	SU	0820	1.3
	1247	7.7		1327	7.8
	1947	1.6		2037	1.5
11	0058	7.7	**26**	0142	7.7
SU	0806	1.5	M	0849	1.7
	1324	7.7		1403	7.5
	2021	1.7		2106	2.0
12	0136	7.6	**27**	0219	7.3
M	0839	1.7	TU	0916	2.2
	1400	7.5		1438	7.2
	2056	1.9		2136	2.5
13	0215	7.4	**28**	0259	6.9
TU	0913	2.0	W	0946	2.8
	1441	7.3		1520	6.8
	2133	2.2	☾	2214	3.0
14	0258	7.1	**29**	0353	6.5
W	0952	2.3	TH	1033	3.3
	1527	7.1		1622	6.4
☽	2218	2.5		2313	3.4
15	0353	6.9	**30**	0514	6.2
TH	1041	2.6	F	1146	3.6
	1628	6.9		1749	6.3
	2318	2.7			
			31	0037	3.5
			SA	0644	6.2
				1319	3.5
				1914	6.4

FRANCE — LE HAVRE

LAT 49°29'N LONG 0°07'E

TIME ZONE -0100 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

SEPTEMBER

	Time	m		Time	m
1 SU	0206	3.2	16 M	0207	2.4
	0803	6.5		0752	7.2
	1438	3.1		1443	2.3
	2020	6.7		2016	7.5
2 M	0310	2.7	17 TU	0316	1.8
	0853	6.9		0850	7.6
	1535	2.6		1550	1.8
	2104	7.1		2109	7.8
3 TU	0401	2.2	18 W	0423	1.4
	0930	7.3		0939	7.9
	1623	2.2		1652	1.4
	2140	7.4		2156	8.0
4 W	0446	1.9	19 TH	0520	1.1
	1004	7.5		1023	8.0
	1705	1.9		1743	1.2
	2215	7.7		2239	8.2
5 TH	0526	1.6	20 F	0606	1.0
	1038	7.7		1104	8.1
	1742	1.7		1825	1.1
●	2249	7.8		2320	8.2
6 F	0602	1.4	21 SA	0644	1.0
	1112	7.8		1143	8.1
	1817	1.5		1901	1.1
	2324	7.9		2359	8.1
7 SA	0636	1.3	22 SU	0716	1.2
	1147	7.9		1220	8.0
	1851	1.4		1934	1.3
	2359	8.0			
8 SU	0710	1.3	23 M	0036	7.9
	1223	7.9		0747	1.5
	1926	1.4		1254	7.8
				2003	1.6
9 M	0037	7.9	24 TU	0111	7.7
	0744	1.3		0814	1.9
	1300	7.9		1327	7.6
	2001	1.5		2031	2.0
10 TU	0116	7.8	25 W	0146	7.3
	0819	1.6		0839	2.3
	1338	7.7		1400	7.3
	2036	1.7		2057	2.5
11 W	0157	7.6	26 TH	0223	7.0
	0853	1.9		0906	2.8
	1418	7.5		1436	6.9
	2113	2.0		2130	2.9
12 TH	0242	7.3	27 F	0307	6.5
	0931	2.3		0947	3.3
	1506	7.2		1526	6.5
☽	2157	2.4	☾	2221	3.4
13 F	0338	7.0	28 SA	0423	6.2
	1021	2.7		1055	3.7
	1610	6.9		1655	6.2
	2258	2.8		2341	3.6
14 SA	0458	6.7	29 SU	0558	6.2
	1137	3.0		1226	3.7
	1743	6.8		1825	6.2
15 SU	0038	2.8	30 M	0116	3.4
	0637	6.8		0714	6.4
	1327	2.8		1356	3.3
	1910	7.1		1935	6.6

OCTOBER

	Time	m		Time	m
1 TU	0231	2.9	16 W	0300	1.9
	0812	6.8		0831	7.6
	1458	2.8		1533	1.9
	2027	7.0		2050	7.7
2 W	0324	2.4	17 TH	0403	1.6
	0854	7.3		0918	7.8
	1547	2.3		1631	1.6
	2108	7.4		2136	7.9
3 TH	0411	1.9	18 F	0455	1.4
	0932	7.6		1000	7.9
	1631	1.9		1718	1.4
	2145	7.7		2218	8.0
4 F	0452	1.6	19 SA	0537	1.3
	1008	7.8		1040	8.0
	1711	1.6		1757	1.3
	2222	7.9	○	2257	8.0
5 SA	0531	1.4	20 SU	0612	1.3
	1044	8.0		1116	8.0
	1749	1.4		1831	1.3
●	2259	8.0		2334	8.0
6 SU	0609	1.3	21 M	0644	1.5
	1121	8.0		1151	7.9
	1827	1.2		1903	1.5
	2337	8.1			
7 M	0646	1.2	22 TU	0010	7.8
	1158	8.1		0715	1.7
	1905	1.2		1224	7.8
				1934	1.7
8 TU	0017	8.1	23 W	0045	7.6
	0724	1.3		0744	2.0
	1238	8.0		1256	7.6
	1942	1.3		2002	2.0
9 W	0059	7.9	24 TH	0119	7.4
	0800	1.5		0811	2.3
	1319	7.9		1329	7.3
	2020	1.5		2030	2.4
10 TH	0143	7.7	25 F	0154	7.1
	0837	1.9		0840	2.8
	1402	7.6		1402	7.0
	2058	1.9		2100	2.8
11 F	0232	7.4	26 SA	0232	6.7
	0918	2.3		0916	3.2
	1453	7.3		1445	6.7
	2144	2.3		2143	3.2
12 SA	0331	7.1	27 SU	0329	6.4
	1010	2.8		1012	3.5
	1601	7.0		1548	6.4
☽	2248	2.7	☾	2249	3.4
13 SU	0454	6.8	28 M	0501	6.3
	1135	3.0		1128	3.6
	1731	6.9		1725	6.3
14 M	0030	2.7	29 TU	0009	3.4
	0624	6.9		0619	6.5
	1316	2.8		1251	3.4
	1853	7.1		1840	6.5
15 TU	0152	2.4	30 W	0130	3.1
	0734	7.2		0721	6.8
	1429	2.3		1405	3.0
	1957	7.4		1940	6.9
			31 TH	0235	2.6
				0812	7.2
				1502	2.5
				2029	7.3

NOVEMBER

	Time	m		Time	m
1 F	0328	2.1	16 SA	0424	1.8
	0855	7.5		0938	7.8
	1552	2.0		1649	1.7
	2112	7.6		2158	7.7
2 SA	0415	1.8	17 SU	0505	1.7
	0936	7.8		1017	7.8
	1638	1.6		1728	1.6
	2154	7.9	○	2238	7.8
3 SU	0459	1.5	18 M	0542	1.7
	1016	8.0		1053	7.9
	1722	1.4		1803	1.6
●	2235	8.0		2314	7.8
4 M	0542	1.3	19 TU	0617	1.7
	1056	8.1		1126	7.8
	1805	1.2		1837	1.6
	2317	8.1		2349	7.7
5 TU	0625	1.2	20 W	0650	1.8
	1137	8.2		1159	7.8
	1847	1.1		1910	1.7
6 W	0001	8.2	21 TH	0024	7.6
	0707	1.3		0722	2.0
	1220	8.2		1232	7.6
	1929	1.1		1941	1.9
7 TH	0046	8.1	22 F	0058	7.4
	0748	1.5		0752	2.2
	1305	8.0		1305	7.5
	2010	1.4		2011	2.2
8 F	0134	7.8	23 SA	0132	7.2
	0829	1.8		0823	2.5
	1353	7.8		1338	7.2
	2052	1.7		2042	2.5
9 SA	0224	7.5	24 SU	0208	7.0
	0914	2.2		0857	2.9
	1445	7.5		1418	7.0
	2141	2.1		2119	2.8
10 SU	0324	7.2	25 M	0253	6.8
	1011	2.6		0941	3.1
	1550	7.2		1507	6.7
☽	2248	2.5	☾	2207	3.0
11 M	0440	7.0	26 TU	0354	6.6
	1132	2.8		1038	3.3
	1710	7.0		1612	6.5
				2310	3.2
12 TU	0012	2.6	27 W	0512	6.6
	0559	7.0		1145	3.3
	1252	2.7		1733	6.5
	1825	7.0			
13 W	0126	2.4	28 TH	0019	3.1
	0707	7.2		0623	6.8
	1402	2.4		1257	3.1
	1931	7.2		1844	6.7
14 TH	0232	2.2	29 F	0132	2.8
	0806	7.4		0723	7.1
	1506	2.1		1409	2.7
	2027	7.4		1944	7.1
15 F	0333	1.9	30 SA	0240	2.4
	0855	7.6		0816	7.4
	1602	1.9		1511	2.2
	2115	7.6		2038	7.4

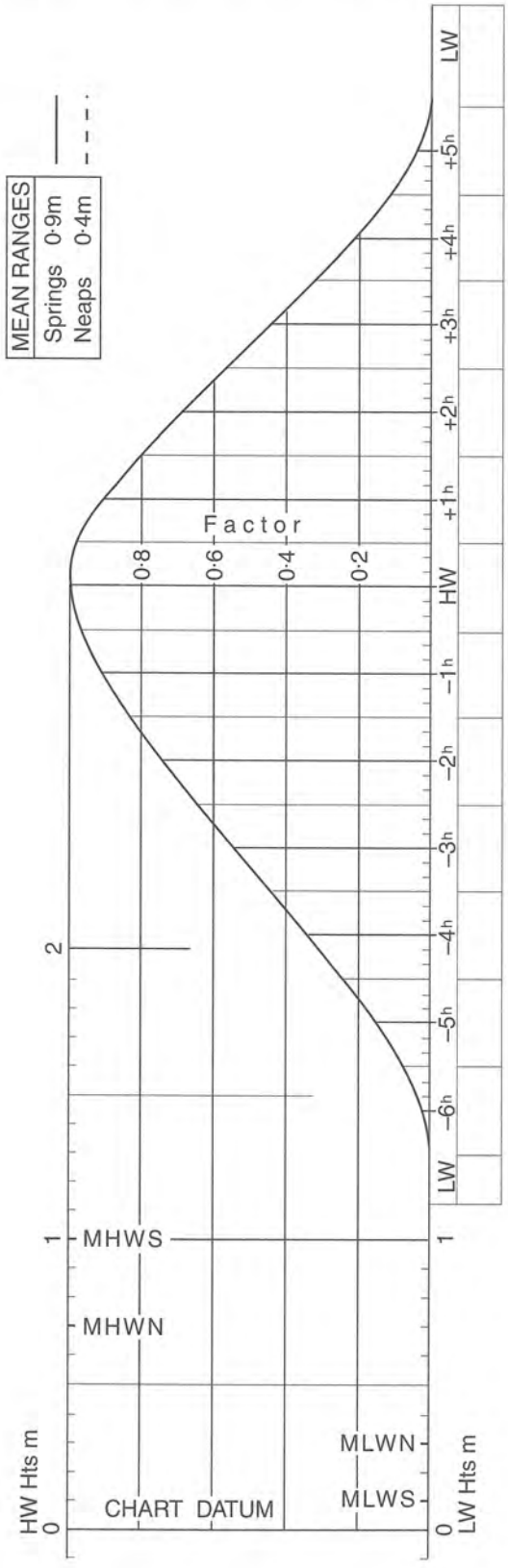
DECEMBER

	Time	m		Time	m
1 SU	0338	2.0	16 M	0437	2.0
	0904	7.7		0959	7.6
	1606	1.7		1703	1.8
	2128	7.7		2223	7.6
2 M	0430	1.6	17 TU	0518	1.9
	0950	8.0		1035	7.7
	1657	1.4		1742	1.7
	2215	8.0	○	2259	7.6
3 TU	0520	1.3	18 W	0555	1.8
	1035	8.1		1108	7.7
	1746	1.1		1818	1.6
●	2302	8.1		2333	7.7
4 W	0608	1.2	19 TH	0631	1.8
	1121	8.2		1141	7.7
	1834	1.0		1853	1.6
	2349	8.2			
5 TH	0656	1.2	20 F	0007	7.6
	1208	8.2		0705	1.9
	1922	1.0		1214	7.7
				1926	1.7
6 F	0037	8.2	21 SA	0040	7.5
	0743	1.3		0737	2.0
	1255	8.2		1246	7.6
	2009	1.1		1958	1.9
7 SA	0125	8.0	22 SU	0114	7.4
	0830	1.5		0809	2.2
	1344	8.0		1320	7.5
	2055	1.4		2029	2.1
8 SU	0216	7.7	23 M	0149	7.3
	0918	1.9		0842	2.4
	1434	7.7		1356	7.3
	2144	1.8		2102	2.3
9 M	0310	7.4	24 TU	0227	7.1
	1011	2.2		0918	2.6
	1531	7.4		1438	7.0
☽	2238	2.1		2139	2.6
10 TU	0413	7.2	25 W	0312	6.9
	1110	2.5		1001	2.9
	1637	7.1		1527	6.8
	2339	2.4	☾	2225	2.8
11 W	0522	7.0	26 TH	0408	6.8
	1215	2.7		1055	3.0
	1749	7.0		1629	6.7
				2322	2.9
12 TH	0046	2.6	27 F	0518	6.8
	0631	7.0		1158	3.0
	1323	2.7		1743	6.7
	1859	7.0			
13 F	0153	2.5	28 SA	0030	2.9
	0735	7.1		0630	6.9
	1430	2.5		1313	2.8
	2003	7.1		1859	6.8
14 SA	0256	2.4	29 SU	0152	2.6
	0831	7.3		0737	7.2
	1530	2.2		1434	2.4
	2057	7.3		2008	7.2
15 SU	0352	2.2	30 M	0306	2.2
	0918	7.5		0837	7.5
	1621	2.0		1539	1.9
	2143	7.4		2107	7.5
			31 TU	0406	1.7
				0930	7.9
				1636	1.4
				2200	7.9

GIBRALTAR

MEAN SPRING AND NEAP CURVES

Springs occur 1 day after New and Full Moon



GIBRALTAR

LAT 36°08'N LONG 5°21'W

TIME ZONE -0100 | TIMES AND HEIGHTS OF HIGH AND LOW WATERS | YEAR 2013

JANUARY

	Time	m		Time	m
1 TU	0516	0.9	16 W	0616	0.9
	1056	0.2		1150	0.1
	1733	0.9		1843	0.9
	2309	0.1			
2 W	0555	0.9	17 TH	0009	0.1
	1135	0.2		0701	0.9
	1813	0.8		1236	0.2
	2346	0.2		1930	0.8
3 TH	0638	0.9	18 F	0054	0.2
	1220	0.2		0750	0.8
	1900	0.8		1326	0.2
				2021	0.7
4 F	0030	0.2	19 SA	0147	0.2
	0728	0.8		0842	0.7
	1318	0.2		1427	0.3
	1953	0.8	☽	2118	0.7
5 SA	0128	0.2	20 SU	0257	0.3
	0827	0.8		0943	0.7
	1428	0.2		1548	0.3
☾	2057	0.7		2231	0.6
6 SU	0245	0.3	21 M	0427	0.3
	0936	0.8		1055	0.7
	1549	0.2		1718	0.3
	2212	0.7		2353	0.7
7 M	0415	0.3	22 TU	0542	0.3
	1053	0.8		1204	0.7
	1710	0.2		1818	0.3
	2333	0.7			
8 TU	0533	0.2	23 W	0055	0.7
	1203	0.8		0633	0.3
	1815	0.1		1258	0.7
				1901	0.2
9 W	0040	0.8	24 TH	0140	0.7
	0632	0.1		0713	0.2
	1303	0.9		1341	0.8
	1908	0.1		1938	0.2
10 TH	0137	0.9	25 F	0216	0.8
	0723	0.1		0750	0.2
	1357	0.9		1420	0.8
	1957	0.0		2013	0.1
11 F	0228	0.9	26 SA	0250	0.8
	0811	0.0		0824	0.1
	1449	1.0		1456	0.9
●	2044	0.0		2046	0.1
12 SA	0317	1.0	27 SU	0321	0.9
	0857	0.0		0858	0.1
	1538	1.0		1532	0.9
	2128	0.0	O	2117	0.1
13 SU	0403	1.0	28 M	0353	0.9
	0943	0.0		0931	0.1
	1626	1.0		1607	0.9
	2210	0.0		2148	0.1
14 M	0448	1.0	29 TU	0426	0.9
	1026	0.0		1005	0.1
	1711	1.0		1642	0.9
	2250	0.0		2220	0.1
15 TU	0531	1.0	30 W	0500	0.9
	1108	0.0		1040	0.1
	1757	0.9		1718	0.9
	2329	0.0		2253	0.1
			31 TH	0537	0.9
				1117	0.1
				1757	0.9
				2328	0.1

FEBRUARY

	Time	m		Time	m
1 F	0617	0.9	16 SA	0015	0.1
	1158	0.1		0709	0.8
	1841	0.8		1240	0.2
				1941	0.7
2 SA	0008	0.1	17 SU	0058	0.2
	0704	0.8		0755	0.7
	1248	0.2		1329	0.2
	1931	0.8	☽	2031	0.6
3 SU	0058	0.2	18 M	0155	0.3
	0800	0.8		0850	0.6
	1354	0.2		1443	0.3
☾	2032	0.7		2133	0.6
4 M	0208	0.2	19 TU	0329	0.3
	0908	0.7		1000	0.6
	1522	0.2		1637	0.3
	2147	0.7		2301	0.6
5 TU	0349	0.3	20 W	0513	0.3
	1030	0.7		1126	0.6
	1701	0.2		1754	0.3
	2316	0.7			
6 W	0527	0.2	21 TH	0022	0.6
	1152	0.8		0612	0.3
	1813	0.1		1232	0.7
				1840	0.2
7 TH	0032	0.8	22 F	0112	0.7
	0631	0.1		0653	0.2
	1258	0.8		1319	0.7
	1907	0.1		1917	0.2
8 F	0130	0.8	23 SA	0150	0.8
	0722	0.1		0729	0.2
	1352	0.9		1358	0.8
	1953	0.0		1950	0.1
9 SA	0220	0.9	24 SU	0223	0.8
	0807	0.0		0803	0.1
	1441	0.9		1435	0.9
	2036	0.0		2022	0.1
10 SU	0306	0.9	25 M	0257	0.9
	0851	0.0		0837	0.1
	1527	1.0		1511	0.9
●	2117	-0.1	O	2054	0.0
11 M	0349	1.0	26 TU	0331	0.9
	0931	0.0		0911	0.0
	1611	1.0		1547	0.9
	2154	-0.1		2127	0.0
12 TU	0430	1.0	27 W	0405	1.0
	1010	0.0		0946	0.0
	1653	0.9		1624	1.0
	2230	0.0		2200	0.0
13 W	0509	0.9	28 TH	0441	1.0
	1047	0.0		1022	0.0
	1734	0.9		1702	1.0
	2304	0.0		2234	0.0
14 TH	0548	0.9			
	1123	0.0			
	1814	0.8			
	2338	0.1			
15 F	0628	0.8			
	1159	0.1			
	1856	0.8			

MARCH

	Time	m		Time	m
1 F	0519	1.0	16 SA	0554	0.8
	1100	0.0		1127	0.1
	1742	0.9		1824	0.8
	2311	0.1		2343	0.1
2 SA	0600	0.9	17 SU	0632	0.8
	1140	0.1		1202	0.2
	1826	0.9		1905	0.7
	2351	0.1			
3 SU	0646	0.9	18 M	0020	0.2
	1228	0.1		0714	0.7
	1917	0.8		1243	0.2
				1952	0.7
4 M	0040	0.2	19 TU	0110	0.3
	0742	0.8		0806	0.6
	1332	0.2		1345	0.3
☾	2017	0.7	☽	2048	0.6
5 TU	0150	0.2	20 W	0231	0.3
	0850	0.7		0910	0.6
	1506	0.2		1536	0.3
	2131	0.7		2200	0.6
6 W	0339	0.3	21 TH	0425	0.3
	1017	0.7		1033	0.6
	1653	0.2		1711	0.3
	2303	0.7		2327	0.6
7 TH	0524	0.2	22 F	0538	0.3
	1146	0.7		1152	0.7
	1805	0.2		1804	0.2
8 F	0022	0.7	23 SA	0028	0.7
	0627	0.1		0623	0.2
	1252	0.8		1245	0.7
	1856	0.1		1842	0.2
9 SA	0119	0.8	24 SU	0111	0.8
	0715	0.1		0700	0.2
	1343	0.9		1327	0.8
	1940	0.0		1917	0.1
10 SU	0206	0.9	25 M	0148	0.8
	0757	0.0		0735	0.1
	1428	0.9		1406	0.9
	2019	0.0		1950	0.1
11 M	0249	0.9	26 TU	0225	0.9
	0836	0.0		0810	0.1
	1511	0.9		1445	0.9
●	2056	0.0		2024	0.1
12 TU	0329	0.9	27 W	0303	1.0
	0913	0.0		0847	0.0
	1552	0.9		1524	1.0
	2131	0.0	O	2100	0.0
13 W	0407	0.9	28 TH	0341	1.0
	0949	0.0		0925	0.0
	1631	0.9		1604	1.0
	2205	0.0		2137	0.0
14 TH	0443	0.9	29 F	0421	1.0
	1022	0.0		1003	0.0
	1708	0.9		1645	1.0
	2237	0.0		2215	0.0
15 F	0519	0.9	30 SA	0501	1.0
	1055	0.0		1043	0.0
	1746	0.8		1727	1.0
	2309	0.1		2255	0.1
			31 SU	0545	0.9
				1125	0.1
				1814	0.9
				2339	0.1

APRIL

	Time	m		Time	m
1 M	0634	0.9	16 TU	0641	0.7
	1214	0.1		1212	0.2
	1907	0.8		1919	0.7
2 TU	0031	0.2	17 W	0039	0.3
	0731	0.8		0730	0.7
	1320	0.2		1305	0.3
	2008	0.8		2011	0.7
3 W	0144	0.3	18 TH	0146	0.3
	0840	0.7		0829	0.6
	1453	0.3		1431	0.3
☾	2120	0.7	☽	2112	0.7
4 TH	0329	0.3	19 F	0320	0.3
	1006	0.7		0939	0.6
	1632	0.2		1606	0.3
	2246	0.7		2223	0.7
5 F	0509	0.2	20 SA	0443	0.3
	1132	0.7		1057	0.7
	1743	0.2		1711	0.3
				2331	0.7
6 SA	0002	0.8	21 SU	0539	0.2
	0612	0.2		1200	0.7
	1236	0.8		1757	0.2
	1833	0.1			
7 SU	0057	0.8	22 M	0023	0.8
	0658	0.1		0622	0.2
	1326	0.8		1249	0.8
	1915	0.1		1836	0.2
8 M	0143	0.9	23 TU	0108	0.9
	0737	0.1		0702	0.1
	1409	0.9		1333	0.9
	1953	0.1		1913	0.1
9 TU	0224	0.9	24 W	0150	0.9
	0814	0.0		0741	0.1
	1450	0.9		1415	0.9
	2029	0.0		1952	0.1
10 W	0302	0.9	25 TH	0233	1.0
	0850	0.0		0821	0.0
	1529	0.9		1459	1.0
●	2104	0.0	O	2032	0.1
11 TH	0339	0.9	26 F	0316	1.0
	0924	0.0		0903	0.0
	1606	0.9		1543	1.0
	2138	0.0		2114	0.1
12 F	0415	0.9	27 SA	0400	1.0
	0957	0.0		0945	0.0
	1643	0.9		1627	1.0
	2211	0.1		2157	0.1
13 SA	0450	0.9	28 SU	0445	1.0
	1029	0.1		1029	0.0
	1719	0.8		1713	1.0
	2243	0.1		2242	0.1
14 SU	0524	0.8	29 M	0532	1.0
	1101	0.1		1114	0.1
	1755	0.8		1803	0.9
	2317	0.2		2329	0.1
15 M	0600	0.8	30 TU	0624	0.9
	1134	0.2		1205	0.1
	1835	0.7		1857	0.9
	2354	0.2			

GIBRALTAR

LAT 36°08'N LONG 5°21'W

TIME ZONE -0100 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

MAY

	Time	m		Time	m
1 W	0025	0.2	16 TH	0013	0.3
	0722	0.8		0657	0.7
	1309	0.2		1233	0.3
	1957	0.8		1935	0.7
2 TH	0135	0.3	17 F	0107	0.3
	0829	0.8		0750	0.7
	1430	0.2		1333	0.3
☾	2105	0.8		2028	0.7
3 F	0303	0.3	18 SA	0216	0.3
	0945	0.7		0849	0.7
	1553	0.3		1449	0.3
	2218	0.8	☽	2127	0.7
4 SA	0434	0.3	19 SU	0332	0.3
	1104	0.8		0957	0.7
	1705	0.2		1602	0.3
	2329	0.8		2232	0.7
5 SU	0543	0.2	20 M	0442	0.3
	1209	0.8		1108	0.7
	1800	0.2		1703	0.3
				2334	0.8
6 M	0026	0.8	21 TU	0539	0.2
	0632	0.2		1207	0.8
	1301	0.8		1754	0.2
	1844	0.2			
7 TU	0113	0.9	22 W	0027	0.9
	0713	0.1		0628	0.1
	1345	0.9		1259	0.8
	1923	0.1		1839	0.2
8 W	0155	0.9	23 TH	0117	0.9
	0750	0.1		0713	0.1
	1426	0.9		1347	0.9
	2000	0.1		1923	0.1
9 TH	0234	0.9	24 F	0205	1.0
	0826	0.1		0758	0.0
	1505	0.9		1435	1.0
	2036	0.1		2009	0.1
10 F	0312	0.9	25 SA	0253	1.0
	0901	0.1		0844	0.0
	1543	0.9		1523	1.0
●	2112	0.1	O	2055	0.1
11 SA	0348	0.9	26 SU	0342	1.0
	0935	0.1		0931	0.0
	1619	0.9		1611	1.0
	2147	0.1		2143	0.1
12 SU	0424	0.9	27 M	0431	1.0
	1008	0.1		1017	0.0
	1654	0.8		1700	1.0
	2221	0.2		2231	0.1
13 M	0459	0.8	28 TU	0520	1.0
	1040	0.1		1104	0.1
	1730	0.8		1750	1.0
	2256	0.2		2321	0.1
14 TU	0534	0.8	29 W	0613	0.9
	1113	0.2		1154	0.1
	1807	0.8		1843	0.9
	2332	0.2			
15 W	0613	0.8	30 TH	0014	0.2
	1148	0.2		0709	0.9
	1848	0.8		1250	0.2
				1940	0.9
			31 F	0116	0.2
				0810	0.8
				1355	0.2
			☾	2040	0.9

JUNE

	Time	m		Time	m
1 SA	0227	0.3	16 SU	0126	0.3
	0916	0.8		0806	0.7
	1505	0.3		1345	0.3
	2144	0.8	☽	2038	0.8
2 SU	0343	0.3	17 M	0231	0.3
	1026	0.8		0907	0.7
	1616	0.3		1454	0.3
	2249	0.8		2139	0.8
3 M	0501	0.3	18 TU	0343	0.3
	1134	0.8		1017	0.7
	1720	0.3		1607	0.3
	2350	0.8		2247	0.8
4 TU	0602	0.2	19 W	0456	0.2
	1232	0.8		1128	0.8
	1812	0.2		1715	0.2
				2351	0.8
5 W	0042	0.8	20 TH	0600	0.2
	0648	0.2		1230	0.8
	1320	0.8		1813	0.2
	1855	0.2			
6 TH	0127	0.8	21 F	0049	0.9
	0728	0.2		0653	0.1
	1404	0.8		1324	0.9
	1935	0.2		1904	0.1
7 F	0208	0.9	22 SA	0143	0.9
	0805	0.1		0742	0.0
	1444	0.9		1416	0.9
	2013	0.2		1953	0.1
8 SA	0247	0.9	23 SU	0235	1.0
	0841	0.1		0831	0.0
	1522	0.9		1507	1.0
●	2050	0.2	O	2043	0.1
9 SU	0325	0.9	24 M	0327	1.0
	0916	0.1		0919	0.0
	1558	0.9		1557	1.0
	2126	0.2		2132	0.1
10 M	0401	0.9	25 TU	0417	1.0
	0949	0.1		1005	0.0
	1632	0.9		1645	1.0
	2201	0.2		2220	0.1
11 TU	0436	0.9	26 W	0507	1.0
	1021	0.1		1050	0.0
	1705	0.9		1734	1.0
	2236	0.2		2308	0.1
12 W	0511	0.8	27 TH	0557	1.0
	1052	0.2		1135	0.1
	1739	0.8		1823	1.0
	2310	0.2		2356	0.1
13 TH	0547	0.8	28 F	0649	0.9
	1125	0.2		1223	0.1
	1815	0.8		1915	0.9
	2348	0.2			
14 F	0626	0.8	29 SA	0048	0.2
	1202	0.2		0744	0.9
	1857	0.8		1315	0.2
				2008	0.9
15 SA	0032	0.3	30 SU	0145	0.2
	0712	0.8		0842	0.8
	1247	0.3		1414	0.3
	1945	0.8	☾	2104	0.8

JULY

	Time	m		Time	m
1 M	0250	0.3	16 TU	0146	0.2
	0945	0.8		0829	0.8
	1520	0.3		1403	0.3
	2205	0.8	☽	2057	0.8
2 TU	0407	0.3	17 W	0258	0.3
	1054	0.7		0938	0.7
	1635	0.3		1522	0.3
	2309	0.8		2207	0.8
3 W	0528	0.3	18 TH	0424	0.2
	1202	0.7		1057	0.8
	1741	0.3		1648	0.3
				2323	0.8
4 TH	0010	0.8	19 F	0542	0.2
	0624	0.3		1209	0.8
	1258	0.8		1758	0.2
	1832	0.3			
5 F	0101	0.8	20 SA	0029	0.9
	0708	0.2		0641	0.1
	1344	0.8		1309	0.9
	1914	0.2		1854	0.1
6 SA	0146	0.8	21 SU	0128	0.9
	0745	0.2		0732	0.1
	1425	0.8		1403	1.0
	1953	0.2		1945	0.1
7 SU	0226	0.8	22 M	0222	1.0
	0821	0.2		0820	0.0
	1502	0.9		1453	1.0
	2030	0.2	O	2033	0.0
8 M	0303	0.9	23 TU	0313	1.0
	0855	0.1		0905	0.0
	1535	0.9		1541	1.0
●	2106	0.2		2121	0.0
9 TU	0339	0.9	24 W	0402	1.0
	0927	0.1		0949	0.0
	1607	0.9		1627	1.1
	2140	0.2		2206	0.0
10 W	0413	0.9	25 TH	0449	1.0
	0958	0.1		1030	0.0
	1638	0.9		1712	1.1
	2214	0.2		2249	0.0
11 TH	0446	0.9	26 F	0535	1.0
	1028	0.1		1110	0.1
	1710	0.9		1757	1.0
	2247	0.2		2331	0.1
12 F	0521	0.9	27 SA	0623	0.9
	1059	0.2		1150	0.1
	1744	0.9		1843	1.0
	2322	0.2			
13 SA	0558	0.9	28 SU	0014	0.2
	1133	0.2		0712	0.9
	1822	0.9		1234	0.2
				1930	0.9
14 SU	0001	0.2	29 M	0101	0.2
	0640	0.8		0804	0.8
	1212	0.2		1323	0.3
	1906	0.9	☾	2021	0.8
15 M	0048	0.2	30 TU	0156	0.3
	0730	0.8		0901	0.7
	1300	0.2		1424	0.3
	1957	0.8		2116	0.8
			31 W	0307	0.3
				1009	0.7
				1545	0.4
				2222	0.7

AUGUST

	Time	m		Time	m
1 TH	0445	0.3	16 F	0407	0.3
	1128	0.7		1035	0.8
	1710	0.4		1636	0.3
	2335	0.7		2304	0.8
2 F	0559	0.3	17 SA	0534	0.2
	1234	0.8		1155	0.8
	1810	0.3		1752	0.2
3 SA	0036	0.8	18 SU	0019	0.9
	0645	0.3		0633	0.1
	1323	0.8		1258	0.9
	1853	0.3		1847	0.2
4 SU	0123	0.8	19 M	0118	0.9
	0722	0.2		0721	0.1
	1402	0.9		1350	1.0
	1931	0.2		1935	0.1
5 M	0203	0.9	20 TU	0210	1.0
	0756	0.2		0805	0.0
	1436	0.9		1437	1.0
	2007	0.2		2020	0.0
6 TU	0239	0.9	21 W	0258	1.0
	0828	0.2		0846	0.0
	1508	0.9		1522	1.1
●	2041	0.2	O	2104	0.0
7 W	0314	0.9	22 TH	0343	1.0
	0900	0.1		0926	0.0
	1539	1.0		1605	1.1
	2115	0.1		2145	0.0
8 TH	0348	1.0	23 F	0427	1.0
	0930	0.1		1004	0.0
	1610	1.0		1646	1.1
	2149	0.1		2224	0.0
9 F	0421	1.0	24 SA	0509	1.0
	1001	0.1		1040	0.1
	1642	1.0		1726	1.0
	2222	0.1		2301	0.1
10 SA	0456	1.0	25 SU	0552	1.0
	1032	0.1		1116	0.1
	1716	1.0		1807	1.0
	2257	0.1		2338	0.2
11 SU	0533	0.9	26 M	0635	0.9
	1106	0.2		1153	0.2
	1753	1.0		1849	0.9
	2334	0.2			
12 M	0614	0.9	27 TU	0017	0.2
	1143	0.2		0722	0.8
	1835	0.9		1236	0.3
				1934	0.8
13 TU	0017	0.2	28 W	0103	0.3
	0703	0.9		0816	0.8
	1228	0.2		1331	0.4
	1925	0.9	☾	2025	0.8
14 W	0112	0.2	29 TH	0207	0.4
	0801	0.8		0919	0.7
	1329	0.3		1453	0.4
☽	2025	0.8		2129	0.7
15 TH	0227	0.3	30 F	0351	0.4
	0911	0.8		1042	0.7
	1455	0.3		1633	0.4
	2139	0.8		2251	0.7
			31 SA	0525	0.4
				1200	0.8
				1742	0.4

GIBRALTAR

LAT 36°08'N LONG 5°21'W

TIME ZONE **-0100** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

SEPTEMBER

	Time	m		Time	m
1	0006	0.8	**16**	0011	0.9
	0615	0.3		0619	0.2
SU	1252	0.8	M	1244	0.9
	1827	0.3		1836	0.2
2	0056	0.8	**17**	0108	0.9
	0653	0.3		0704	0.1
M	1330	0.9	TU	1333	1.0
	1905	0.3		1921	0.1
3	0135	0.9	**18**	0155	1.0
	0726	0.2		0744	0.1
TU	1403	0.9	W	1416	1.1
	1939	0.2		2002	0.1
4	0211	0.9	**19**	0239	1.0
	0757	0.2		0823	0.1
W	1435	1.0	TH	1458	1.1
	2013	0.2	O	2041	0.1
5	0246	1.0	**20**	0321	1.1
	0828	0.1		0859	0.1
TH	1508	1.0	F	1538	1.1
●	2047	0.1		2119	0.1
6	0321	1.0	**21**	0401	1.0
	0900	0.1		0935	0.1
F	1541	1.1	SA	1616	1.1
	2122	0.1		2155	0.1
7	0356	1.0	**22**	0440	1.0
	0933	0.1		1009	0.1
SA	1615	1.1	SU	1654	1.0
	2157	0.1		2230	0.1
8	0433	1.0	**23**	0518	1.0
	1006	0.1		1044	0.2
SU	1651	1.1	M	1730	1.0
	2233	0.1		2304	0.2
9	0511	1.0	**24**	0557	0.9
	1042	0.2		1119	0.2
M	1729	1.0	TU	1808	0.9
	2310	0.2		2338	0.2
10	0553	1.0	**25**	0640	0.8
	1120	0.2		1157	0.3
TU	1812	1.0	W	1849	0.8
	2353	0.2			
11	0642	0.9	**26**	0018	0.3
	1206	0.3		0729	0.8
W	1902	0.9	TH	1247	0.4
				1938	0.8
12	0046	0.3	**27**	0114	0.4
	0740	0.9		0829	0.7
TH	1308	0.3	F	1405	0.4
☽	2004	0.9	☾	2039	0.7
13	0207	0.3	**28**	0253	0.4
	0852	0.8		0943	0.7
F	1443	0.4	SA	1548	0.4
	2121	0.8		2157	0.7
14	0358	0.3	**29**	0439	0.4
	1018	0.8		1107	0.8
SA	1630	0.4	SU	1704	0.4
	2254	0.8		2323	0.8
15	0523	0.3	**30**	0538	0.4
	1142	0.9		1208	0.8
SU	1744	0.3	M	1754	0.3

OCTOBER

	Time	m		Time	m
1	0021	0.8	**16**	0052	0.9
	0618	0.3		0642	0.2
TU	1250	0.9	W	1311	1.0
	1833	0.3		1900	0.2
2	0103	0.9	**17**	0137	1.0
	0652	0.2		0721	0.1
W	1325	1.0	TH	1353	1.0
	1908	0.2		1940	0.1
3	0140	1.0	**18**	0218	1.0
	0724	0.2		0757	0.1
TH	1400	1.0	F	1432	1.1
	1943	0.2		2017	0.1
4	0216	1.0	**19**	0257	1.0
	0757	0.2		0833	0.1
F	1436	1.1	SA	1511	1.1
	2018	0.1	O	2053	0.1
5	0253	1.1	**20**	0335	1.0
	0830	0.1		0908	0.1
SA	1513	1.1	SU	1548	1.0
●	2055	0.1		2128	0.1
6	0332	1.1	**21**	0412	1.0
	0905	0.1		0942	0.2
SU	1551	1.1	M	1624	1.0
	2132	0.1		2202	0.1
7	0411	1.1	**22**	0448	1.0
	0943	0.2		1017	0.2
M	1630	1.1	TU	1659	1.0
	2210	0.1		2235	0.2
8	0452	1.1	**23**	0524	0.9
	1021	0.2		1052	0.2
TU	1711	1.1	W	1735	0.9
	2250	0.2		2308	0.2
9	0536	1.0	**24**	0602	0.9
	1103	0.2		1129	0.3
W	1756	1.0	TH	1814	0.8
	2335	0.2		2345	0.3
10	0626	1.0	**25**	0647	0.8
	1152	0.3		1215	0.4
TH	1848	0.9	F	1901	0.8
11	0030	0.3	**26**	0033	0.4
	0725	0.9		0742	0.8
F	1258	0.4	SA	1322	0.4
	1951	0.9		1958	0.7
12	0153	0.4	**27**	0153	0.4
	0836	0.9		0847	0.8
SA	1434	0.4	SU	1454	0.4
☽	2109	0.8	☾	2105	0.7
13	0340	0.4	**28**	0338	0.4
	1000	0.8		1000	0.8
SU	1615	0.4	M	1614	0.4
	2241	0.8		2223	0.7
14	0502	0.3	**29**	0450	0.4
	1122	0.9		1110	0.8
M	1726	0.3	TU	1712	0.3
	2357	0.9		2334	0.8
15	0558	0.2	**30**	0539	0.3
	1223	0.9		1203	0.9
TU	1818	0.2	W	1757	0.3
			31	0025	0.9
				0617	0.3
			TH	1246	0.9
				1836	0.2

NOVEMBER

	Time	m		Time	m
1	0107	0.9	**16**	0158	1.0
	0652	0.2		0735	0.2
F	1326	1.0	SA	1408	1.0
	1913	0.2		1956	0.1
2	0147	1.0	**17**	0237	1.0
	0727	0.2		0811	0.2
SA	1406	1.1	SU	1447	1.0
	1951	0.1	O	2032	0.1
3	0228	1.1	**18**	0314	1.0
	0803	0.2		0847	0.2
SU	1447	1.1	M	1524	1.0
●	2031	0.1		2108	0.1
4	0310	1.1	**19**	0350	1.0
	0842	0.1		0922	0.2
M	1530	1.1	TU	1601	1.0
	2111	0.1		2142	0.1
5	0352	1.1	**20**	0425	0.9
	0924	0.1		0957	0.2
TU	1613	1.1	W	1636	0.9
	2153	0.1		2215	0.2
6	0436	1.1	**21**	0500	0.9
	1007	0.2		1033	0.2
W	1658	1.1	TH	1712	0.9
	2237	0.1		2249	0.2
7	0523	1.0	**22**	0535	0.9
	1053	0.2		1109	0.3
TH	1746	1.0	F	1749	0.8
	2324	0.2		2323	0.3
8	0614	1.0	**23**	0615	0.8
	1145	0.3		1150	0.3
F	1839	0.9	SA	1831	0.8
9	0019	0.3	**24**	0004	0.3
	0712	0.9		0701	0.8
SA	1251	0.3	SU	1243	0.4
	1942	0.9		1920	0.8
10	0135	0.3	**25**	0058	0.4
	0819	0.9		0757	0.8
SU	1417	0.4	M	1354	0.4
☽	2054	0.8	☾	2017	0.7
11	0306	0.3	**26**	0218	0.4
	0935	0.9		0858	0.8
M	1545	0.3	TU	1511	0.4
	2217	0.8		2122	0.7
12	0427	0.3	**27**	0342	0.4
	1052	0.9		1005	0.8
TU	1659	0.3	W	1620	0.3
	2333	0.9		2234	0.8
13	0529	0.3	**28**	0448	0.3
	1155	0.9		1111	0.8
W	1755	0.2	TH	1717	0.3
				2341	0.8
14	0031	0.9	**29**	0538	0.3
	0617	0.2		1206	0.9
TH	1245	1.0	F	1804	0.2
	1839	0.2			
15	0117	0.9	**30**	0034	0.9
	0657	0.2		0621	0.2
F	1328	1.0	SA	1254	0.9
	1919	0.2		1847	0.1

DECEMBER

	Time	m		Time	m
1	0121	0.9	**16**	0224	0.9
	0702	0.2		0756	0.2
SU	1340	1.0	M	1430	0.9
	1930	0.1		2019	0.1
2	0207	1.0	**17**	0301	0.9
	0743	0.1		0832	0.2
M	1426	1.0	TU	1508	0.9
	2013	0.1	O	2055	0.1
3	0253	1.0	**18**	0337	0.9
	0826	0.1		0908	0.2
TU	1513	1.1	W	1545	0.9
●	2058	0.0		2129	0.1
4	0339	1.1	**19**	0410	0.9
	0912	0.1		0943	0.2
W	1601	1.1	TH	1620	0.9
	2143	0.1		2202	0.1
5	0425	1.1	**20**	0442	0.9
	0958	0.1		1018	0.2
TH	1648	1.0	F	1655	0.9
	2229	0.1		2234	0.2
6	0513	1.0	**21**	0515	0.9
	1047	0.1		1052	0.2
F	1738	1.0	SA	1729	0.8
	2316	0.1		2306	0.2
7	0603	1.0	**22**	0549	0.8
	1139	0.2		1128	0.2
SA	1830	0.9	SU	1806	0.8
				2339	0.2
8	0009	0.2	**23**	0628	0.8
	0658	1.0		1209	0.3
SU	1239	0.2	M	1847	0.8
	1928	0.9			
9	0111	0.2	**24**	0018	0.3
	0758	0.9		0714	0.8
M	1349	0.3	TU	1300	0.3
☽	2032	0.8		1935	0.7
10	0224	0.3	**25**	0109	0.3
	0904	0.9		0808	0.8
TU	1505	0.3	W	1405	0.3
	2143	0.8	☾	2032	0.7
11	0341	0.3	**26**	0218	0.3
	1015	0.8		0909	0.8
W	1622	0.3	TH	1519	0.3
	2259	0.8		2138	0.7
12	0453	0.3	**27**	0341	0.3
	1123	0.9		1018	0.8
TH	1729	0.3	F	1633	0.2
				2254	0.7
13	0006	0.8	**28**	0457	0.3
	0551	0.3		1127	0.8
F	1220	0.9	SA	1737	0.2
	1821	0.2			
14	0059	0.8	**29**	0003	0.8
	0638	0.2		0555	0.2
SA	1308	0.9	SU	1227	0.9
	1904	0.2		1829	0.1
15	0143	0.9	**30**	0100	0.8
	0718	0.2		0645	0.1
SU	1350	0.9	M	1321	0.9
	1942	0.2		1917	0.1
			31	0151	0.9
				0731	0.1
			TU	1411	1.0
				2004	0.0

TIDE TABLES 2013

PART II

TIME & HEIGHT DIFFERENCES

FOR PREDICTING THE TIDE AT

SECONDARY PORTS

ENGLAND, SOUTH COAST

No.	PLACE	Lat N	Long W	TIME DIFFERENCES High Water	TIME DIFFERENCES Low Water			HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
				Zone UT(GMT)									
33	**PORTLAND** (see page 18)			**0100 and 1300**	**0700 and 1900**	**0100 and 1300**	**0700 and 1900**	**2.1**	**1.4**	**0.8**	**0.1**	1.04	★
34	Lulworth Cove	50 37	2 15	+0005	+0015	-0005	+0000	+0.1	+0.1	+0.2	+0.1	1.2	★x
34a	Mupe Bay	50 37	2 13	+0005	+0015	-0005	+0000	+0.1	+0.1	+0.2	+0.1	1.20	
36a	**POOLE HARBOUR** (see page 22)			——	——	**0500 and 1700**	**1100 and 2300**	**2.2**	**1.7**	**1.2**	**0.6**		
35	Swanage	50 37	1 57	——	——	-0045	-0050	-0.1	+0.1	+0.2	+0.2	1.63	★
	Poole Harbour												
36	Entrance	50 41	1 57	——	——	-0025	-0010	0.0	0.0	0.0	0.0	1.59	★
36a	POOLE HARBOUR	50 43	1 59	STANDARD PORT				See Table V				1.59	★
36b	Pottery Pier	50 42	1 59	——	——	+0010	+0010	-0.2	0.0	+0.1	+0.2	1.50	★
36c	Wareham (River Frome)	50 41	2 06	——	——	+0130	+0045	0.0	0.0	0.0	+0.3	⊙	★§
36d	Cleavel Point	50 40	2 00	——	——	-0005	-0005	-0.1	-0.2	0.0	-0.1	⊙	★
65	**PORTSMOUTH** (see page 34)			**0000 and 1200**	**0600 and 1800**	**0500 and 1700**	**1100 and 2300**	**4.7**	**3.8**	**1.9**	**0.8**		
37	Bournemouth	50 43	1 52	-0240	+0055	-0050	-0030	-2.6	-2.0	-0.6	-0.2	1.60	★j
38	Christchurch (Entrance)	50 43	1 45	-0230	+0030	-0035	-0035	-2.9	-2.4	-1.2	-0.2	1.17	★j
38a	Christchurch (Quay)	50 44	1 46	-0210	+0100	+0105	+0055	-2.9	-2.4	-1.0	0.0	1.24	★j
38b	Christchurch (Tuckton)	50 44	1 47	-0205	+0110	+0110	+0105	-3.0	-2.5	-1.0	+0.1	1.14	★§
39	Hurst Point	50 42	1 33	-0115	-0005	-0030	-0025	-2.0	-1.5	-0.5	-0.1	1.97	★j
40	Lymington	50 46	1 32	-0110	+0005	-0020	-0020	-1.6	-1.2	-0.4	-0.1	2.09	★j
42	Bucklers Hard	50 48	1 25	-0040	-0010	+0010	-0010	-1.0	-0.8	-0.2	-0.3	2.40	★j
43	Stansore Point	50 47	1 20	-0030	-0010	-0005	-0015	-0.7	-0.5	-0.3	-0.3	2.50	★j
	Isle of Wight												
45	Yarmouth	50 42	1 30	-0105	+0005	-0025	-0030	-1.7	-1.2	-0.3	0.0	2.17	★j
46	Totland Bay	50 41	1 33	-0130	-0045	-0035	-0045	-2.2	-1.7	-0.4	-0.1	1.83	★j
48	Freshwater Bay	50 40	1 31	-0210	+0025	-0040	-0020	-2.1	-1.5	-0.4	0.0	1.62	★j
51	Ventnor	50 36	1 12	-0025	-0030	-0025	-0030	-0.8	-0.6	-0.2	+0.2	2.33	★j
53	Sandown	50 39	1 09	+0000	+0005	+0010	+0025	-0.6	-0.5	-0.2	0.0	2.41	★j
53a	Foreland (Lifeboat Slip)	50 41	1 04	-0005	+0000	+0005	+0010	+0.1	+0.1	0.0	+0.1	2.88	★j
53b	Bembridge Approaches	50 42	1 06	-0010	-0005	+0000	+0005	+0.1	+0.1	0.0	+0.1	2.9	x
54	Bembridge Harbour	50 42	1 07	+0020	+0000	+0100	+0020	-1.5	-1.4	-1.3	-1.0	1.63	★j
58	Ryde	50 44	1 10	-0010	-0010	-0005	-0005	-0.1	0.0	0.0	0.0	2.86	★j
	Medina River												
60	COWES	50 46	1 18	STANDARD PORT				See Table V				2.67	
60a	Folly Inn	50 44	1 17	-0015	+0015	+0000	-0020	-0.6	-0.4	-0.1	+0.2	⊙	★j
60b	Newport	50 42	1 17	⊙	⊙	⊙	⊙	-0.6	-0.4	+0.1	+0.8	⊙	★j
62	**SOUTHAMPTON** (see page 30)			**0400 and 1600**	**1100 and 2300**	**0000 and 1200**	**0600 and 1800**	**4.5**	**3.7**	**1.8**	**0.5**		
61	Calshot Castle	50 49	1 18	+0000	+0025	+0000	+0000	0.0	0.0	+0.2	+0.3	2.87	★j
62	SOUTHAMPTON	50 53	1 24	STANDARD PORT				See Table V				2.91	★
63	Redbridge	50 55	1 28	-0020	+0005	+0000	-0005	-0.1	-0.1	-0.1	-0.1	2.82	★
	River Hamble												
63a	Warsash	50 51	1 18	+0020	+0010	+0010	+0000	0.0	+0.1	+0.1	+0.3	2.95	★
63b	Bursledon	50 53	1 18	+0020	+0020	+0010	+0010	+0.1	+0.1	+0.2	+0.2	3.05	★
65	**PORTSMOUTH** (see page 34)			**0500 and 1700**	**1000 and 2200**	**0000 and 1200**	**0600 and 1800**	**4.7**	**3.8**	**1.9**	**0.8**		
64	Lee-on-The-Solent	50 48	1 12	-0005	+0005	-0015	-0010	-0.2	-0.1	+0.1	+0.2	⊙	★j
65	PORTSMOUTH	50 48	1 07	STANDARD PORT				See Table V				2.87	★
	Langstone Harbour												
66	Entrance	50 48	1 01	+0000	-0015	+0000	-0010	+0.1	+0.1	0.0	0.0	2.93	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
1 - 60b						Negligible							
61 - 63b	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0
64 - 66						Negligible							

SCOTLAND, WEST COAST

No.	PLACE	Lat N	Long W	TIME DIFFERENCES High Water		Low Water		HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
				Zone UT(GMT)									
334	**ULLAPOOL** (see page 130)			**0000 and 1200**	**0600 and 1800**	**0300 and 1500**	**0900 and 2100**	**5.2**	**3.9**	**2.1**	**0.7**		
	Summer Isles												
333	Tanera Mor	58 01	5 24	-0005	-0005	-0010	-0010	-0.1	+0.1	0.0	+0.1	⊙	
	Loch Broom												
334	ULLAPOOL	57 54	5 09	STANDARD PORT				See Table V				3.10	
	Loch Ewe												
336	Mellon Charles	57 51	5 38	-0005	-0010	-0005	-0005	-0.1	-0.1	-0.1	+0.1	2.95	
336a	Nato Jetty	57 50	5 35	-0005	-0005	-0005	-0010	0.0	+0.1	+0.1	+0.2	3.10	
	Loch Gairloch												
337	Gairloch	57 43	5 41	-0020	-0020	-0010	-0010	0.0	+0.1	-0.3	-0.1	⊙	
	Loch Torridon												
338	Shieldaig	57 31	5 39	-0020	-0020	-0015	-0015	+0.4	+0.3	+0.1	0.0	⊙	
	Inner Sound												
338a	Applecross	57 26	5 49	-0010	-0015	-0010	-0010	0.0	0.0	0.0	+0.1	3.03	
	Loch Carron												
339	Plockton	57 21	5 39	+0005	-0025	-0005	-0010	+0.5	+0.5	+0.5	+0.2	3.53	
	Rona												
340	Loch a' Bhraige	57 35	5 58	-0020	+0000	-0010	+0000	-0.1	-0.1	-0.1	-0.2	2.79	
	Skye												
341	Broadford Bay	57 15	5 54	-0015	-0015	-0010	-0015	+0.2	+0.1	+0.1	0.0	3.15	
342	Portree	57 24	6 11	-0025	-0025	-0025	-0025	+0.1	-0.2	-0.2	0.0	⊙	
343	Loch Snizort (Uig Bay)	57 35	6 22	-0045	-0020	-0005	-0025	+0.1	-0.4	-0.2	0.0	3.03	
344	Loch Dunvegan	57 27	6 38	-0105	-0030	-0020	-0040	0.0	-0.1	0.0	0.0	⊙	
345	Loch Harport	57 20	6 25	-0115	-0035	-0020	-0100	-0.1	-0.1	0.0	+0.1	⊙	
	Soay												
346	Camus Nan Gall	57 09	6 13	-0055	-0025	-0025	-0045	-0.4	-0.2	⊙	⊙	⊙	
	Loch Alsh												
349	Kyle of Lochalsh	57 17	5 43	-0040	-0020	-0005	-0025	+0.1	0.0	0.0	-0.1	3.10	c
349a	Dornie Bridge	57 17	5 31	-0040	-0010	-0005	-0020	+0.1	-0.1	0.0	0.0	2.98	c
	Kyle Rhea												
351	Glenelg Bay	57 13	5 38	-0105	-0035	-0035	-0055	-0.4	-0.4	-0.9	-0.1	⊙	
352	Loch Hourn	57 06	5 34	-0125	-0050	-0040	-0110	-0.2	-0.1	-0.1	+0.1	2.93	
372	**OBAN** (see page 134)			**0000 and 1200**	**0600 and 1800**	**0100 and 1300**	**0700 and 1900**	**4.0**	**2.9**	**1.8**	**0.7**		
	Loch Nevis												
353	Inverie Bay	57 02	5 41	+0030	+0020	+0035	+0020	+1.0	+0.9	+0.2	0.0	⊙	
353a	Mallaig	57 00	5 50	+0017	+0017	+0030	+0024	+1.0	+0.7	+0.3	+0.1	2.98	
	Rum												
353b	Loch Scresort	57 01	6 16	+0018	+0018	+0026	+0020	+0.6	+0.6	+0.1	0.0	2.71	
	Eigg												
354	Bay of Laig	56 55	6 10	+0015	+0030	+0040	+0005	+0.7	+0.6	-0.2	-0.2	⊙	
354a	Galmisdale Pier	56 53	6 08	+0016	+0016	+0026	+0022	+0.7	+0.8	+0.2	+0.2	2.86	
355	Loch Moidart	56 47	5 53	+0015	+0015	+0040	+0020	+0.8	+0.6	-0.2	-0.2	⊙	
	Coll												
356	Loch Eatharna	56 37	6 31	+0025	+0010	+0015	+0025	+0.4	+0.3	⊙	⊙	⊙	
	Tiree												
357	Gott Bay	56 31	6 48	+0000	+0010	+0005	+0010	0.0	+0.1	0.0	0.0	2.46	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
267 - 297	+0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	+0.1	+0.1	+0.1
297a	+0.1	+0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	+0.1
298	+0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	+0.1	+0.1	+0.1
299 - 372	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1

No.	PLACE	Lat N	Long W	TIME DIFFERENCES High Water		Low Water		HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
				Zone UT(GMT)									
372	**OBAN** (see page 134)			**0100 and 1300**	**0700 and 1900**	**0100 and 1300**	**0800 and 2000**	**4.0**	**2.9**	**1.8**	**0.7**		
	Mull												
359	Carsaig Bay	56 19	5 58	-0015	-0005	-0030	+0020	+0.1	+0.2	0.0	-0.1	⊙	
360	Iona	56 20	6 23	-0010	-0005	-0020	+0015	0.0	+0.1	-0.3	-0.2	2.36	
361	Bunessan	56 19	6 14	-0015	-0015	-0010	-0015	+0.3	+0.1	0.0	-0.1	⊙	
362	Ulva Sound	56 29	6 08	-0010	-0015	+0000	-0005	+0.4	+0.3	0.0	-0.1	⊙	
	Loch Sunart												
363	Salen	56 43	5 47	-0015	+0015	+0010	+0005	+0.6	+0.5	-0.1	-0.1	2.53	c
	Sound of Mull												
364	Tobermory	56 37	6 04	+0025	+0010	+0015	+0025	+0.5	+0.6	+0.1	+0.2	2.73	
364a	Salen	56 31	5 57	+0045	+0015	+0020	+0030	+0.2	+0.2	-0.1	0.0	2.43	
365	Loch Aline	56 32	5 46	+0012	+0012	⊙	⊙	+0.5	+0.3	⊙	⊙	⊙	
365a	Craignure	56 28	5 42	+0030	+0005	+0010	+0015	0.0	+0.1	-0.1	-0.1	2.38	
	Loch Linnhe												
367	Corran	56 43	5 14	+0007	+0007	+0004	+0004	+0.4	+0.4	-0.1	0.0	⊙	
368	Corpach	56 51	5 07	+0000	+0020	+0040	+0000	0.0	0.0	-0.2	-0.2	2.26	
368a	Loch Eil Head	56 51	5 20	+0025	+0045	+0105	+0025	⊙	⊙	⊙	⊙	⊙	
369	Loch Leven Head	56 43	5 00	+0045	+0045	+0045	+0045	⊙	⊙	⊙	⊙	⊙	
	Loch Linnhe												
370	Port Appin	56 33	5 25	-0005	-0005	-0030	+0000	+0.2	+0.2	+0.1	+0.1	2.35	
	Loch Creran												
370a	Barcaldine Pier	56 32	5 19	+0010	+0020	+0040	+0015	+0.1	+0.1	0.0	+0.1	⊙	
370b	Loch Creran Head	56 33	5 16	+0015	+0025	+0120	+0020	-0.3	-0.3	-0.4	-0.3	⊙	
	Loch Etive												
371	Dunstaffnage Bay	56 27	5 26	+0005	+0000	+0000	+0005	+0.1	+0.1	+0.1	+0.1	⊙	
371a	Connel	56 27	5 24	+0020	+0005	+0010	+0015	-0.3	-0.2	-0.1	+0.1	⊙	
371b	Bonawe	56 27	5 13	+0150	+0205	+0240	+0210	-2.0	-1.7	-1.3	-0.5	1.2	x
372	OBAN	56 25	5 29	STANDARD PORT				See Table V				2.39	
373	Seil Sound	56 18	5 35	-0035	-0015	-0040	-0015	-1.3	-0.9	-0.7	-0.3	1.37	
	Colonsay												
374	Scalasaig	56 04	6 11	-0020	-0005	-0015	+0005	-0.3	-0.2	-0.3	0.0	2.15	
	Jura												
375	Glengarrisdale Bay	56 07	5 47	-0020	+0000	-0010	+0000	-0.4	-0.2	0.0	-0.2	2.15	
	Islay												
377	Rubh' a' Mhail	55 56	6 07	-0020	+0000	+0005	-0015	-0.3	-0.1	-0.3	-0.1	2.11	
378	Ardnave Point	55 52	6 20	-0035	+0010	+0000	-0025	-0.4	-0.2	-0.3	-0.1	2.02	
379	Orsay	55 41	6 31	-0110	-0110	-0040	-0040	-1.4	-0.6	-0.5	-0.2	1.37	c
380	Bruichladdich	55 46	6 22	-0105	-0035	-0110	-0110	-1.8	-1.3	-0.5	+0.3	1.52	c
381	Port Ellen	55 38	6 11	-0530	-0050	-0045	-0530	-3.1	-2.1	-1.3	-0.4	0.46	★
382	Port Askaig	55 50	6 06	-0030	-0035	-0015	-0025	-1.8	-1.3	-0.7	-0.2	1.33	★
	Sound of Jura												
383	Craighouse	55 50	5 57	-0230	-0250	-0150	-0230	-3.0	-2.4	-1.3	-0.6	0.54	★
383a	Loch Melfort	56 15	5 29	-0055	-0025	-0040	-0035	-1.2	-0.8	-0.5	-0.1	1.7	x
384	Loch Beag	56 09	5 36	-0110	-0045	-0035	-0045	-1.6	-1.2	-0.8	-0.4	1.20	
387	Carsaig Bay	56 02	5 38	-0105	-0040	-0050	-0050	-2.1	-1.6	-1.0	-0.4	0.91	★
389	Sound of Gigha	55 41	5 44	-0450	-0210	-0130	-0410	-2.5	-1.6	-1.0	-0.1	0.93	★
390	Machrihanish	55 25	5 45	-0520	-0350	-0340	-0540	⊙	⊙	⊙	⊙	1.01	★
404	**GREENOCK** (see page 138)			**0000 and 1200**	**0600 and 1800**	**0000 and 1200**	**0600 and 1800**	**3.4**	**2.8**	**1.0**	**0.3**		
	Firth of Clyde												
391	Southend (Kintyre)	55 19	5 38	-0030	-0010	+0005	+0035	-1.3	-1.2	-0.5	-0.2	1.28	
393	Campbeltown	55 25	5 36	-0025	-0005	-0015	+0005	-0.5	-0.3	+0.1	+0.2	1.82	
393a	Carradale	55 36	5 28	-0015	-0005	-0005	+0005	-0.3	-0.2	+0.1	+0.1	1.85	
393b	Loch Ranza	55 43	5 18	-0015	-0005	-0010	-0005	-0.4	-0.3	-0.1	0.0	1.76	
	Loch Fyne												
394	East Loch Tarbert	55 52	5 24	-0005	-0005	+0000	-0005	+0.2	+0.1	0.0	0.0	2.03	
395	Inveraray	56 14	5 04	+0011	+0011	+0034	+0034	-0.1	+0.1	-0.5	-0.2	⊙	

⊙ No data.
‡ The tide does not normally fall below Chart Datum.
★ See notes on page 342.

c For intermediate heights, use harmonic constants (see Part III).
x ML inferred.

No.	PLACE	Lat N	Long W	TIME DIFFERENCES High Water		Low Water		HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
				Zone UT(GMT)									
451	**LIVERPOOL (GLADSTONE DOCK)**	(see page 150)		**0000 and 1200**	**0600 and 1800**	**0200 and 1400**	**0800 and 2000**	**9.4**	**7.5**	**3.2**	**1.1**		
	England												
	Solway Firth												
432	Silloth	54 52	3 24	+0035	+0045	+0040	+0050	-0.2	-0.4	-0.9	-0.3	⊙	
433	Maryport	54 43	3 30	+0021	+0036	+0017	+0002	-0.8	-0.9	-0.7	-0.2	⊙	
434	Workington	54 39	3 34	+0029	+0027	+0014	+0004	-1.1	-1.1	-0.5	-0.1	4.54	
435	Whitehaven	54 33	3 36	+0010	+0020	+0005	+0000	-1.4	-1.2	-0.8	-0.1	4.53	
436	Tarn Point	54 17	3 25	+0010	+0010	+0005	-0005	-1.1	-1.1	-0.7	-0.2	⊙	
437	Duddon Bar	54 09	3 20	+0007	+0007	+0005	-0001	-0.9	-0.9	-0.6	-0.2	⊙	
439	**BARROW (RAMSDEN DOCK)**	(see page 146)		**0000 and 1200**	**0600 and 1800**	**0100 and 1300**	**0700 and 1900**	**9.3**	**7.1**	**3.0**	**1.1**	5.04	
	Morecambe Bay												
439a	Roa Island	54 04	3 10	-0007	-0005	-0005	-0003	-0.1	0.0	-0.1	0.0	4.97	
439b	Haws Point	54 03	3 10	-0007	-0004	-0002	-0005	+0.1	0.0	0.0	0.0	4.89	
439c	Halfway Shoal	54 01	3 12	-0014	-0012	-0012	-0010	-0.3	-0.2	-0.1	0.0	4.91	
451	**LIVERPOOL (GLADSTONE DOCK)**	(see page 150)		**0000 and 1200**	**0600 and 1800**	**0200 and 1400**	**0700 and 1900**	**9.4**	**7.5**	**3.2**	**1.1**		
440	Ulverston	54 11	3 04	+0025	+0045	⊙	⊙	-0.1	-0.2	⊙	⊙	⊙	
440a	Arnside	54 12	2 51	+0105	+0140	⊙	⊙	+0.4	+0.1	⊙	⊙	⊙	
440b	Morecambe	54 04	2 53	+0010	+0015	+0025	+0010	+0.1	-0.1	-0.3	0.0	⊙	
441	Heysham	54 02	2 55	+0014	+0012	+0002	-0003	+0.2	-0.1	-0.1	+0.1	5.18	
	River Lune												
442	Glasson Dock	54 00	2 51	+0025	+0035	+0215	+0235	-2.8	-3.1	⊙	⊙	⊙	★
442a	Lancaster	54 03	2 49	+0115	+0035	§	§	-5.1	-5.0	§	§	⊙	
	River Wyre												
443	Wyre Lighthouse	53 57	3 02	-0005	-0005	+0000	-0005	-0.2	-0.2	⊙	⊙	⊙	
444	Fleetwood	53 56	3 00	-0004	-0004	-0006	-0006	0.0	-0.2	-0.1	+0.1	5.18	
445	Blackpool	53 49	3 04	-0010	+0000	-0010	-0020	-0.5	-0.5	-0.4	-0.1	⊙	
	River Ribble												
446	Preston	53 45	2 45	+0015	+0015	+0330	+0305	-4.1	-4.2	-3.1	-1.0	⊙	★
	Liverpool Bay												
447	Southport	53 39	3 01	-0015	-0005	⊙	⊙	-0.4	-0.4	⊙	⊙	⊙	
448	Formby	53 32	3 07	-0010	-0005	-0025	-0025	-0.4	-0.2	-0.3	-0.1	5.15	
	River Mersey												
451	LIVERPOOL (GLADSTONE DOCK)	53 27	3 01	STANDARD PORT					See Table V			5.25	
452	Liverpool (Alfred Dock)	53 24	3 01	+0007	+0007	+0000	+0000	-0.1	-0.1	-0.3	-0.2	5.14	
453	Eastham	53 19	2 57	+0014	+0014	+0006	+0006	+0.2	0.0	-0.4	-0.5	5.17	
455	Hale Head	53 19	2 48	+0035	+0030	⊙	⊙	-2.5	-2.6	⊙	⊙	⊙	
456	Widnes	53 21	2 44	+0045	+0050	+0355	+0340	-4.3	-4.5	-2.8	-0.6	⊙	
456a	Fiddler's Ferry	53 22	2 40	+0105	+0120	+0535	+0445	-6.0	-6.4	-2.7	-0.6	⊙	
	River Dee												
461	Hilbre Island	53 23	3 14	-0011	-0008	-0013	-0018	-0.4	-0.3	-0.1	+0.2	5.15	
462	Chester	53 12	2 54	+0110	+0110	+0455	+0455	-5.4	-5.5	§	§	⊙	★
	Wales												
463	Connah's Quay	53 13	3 03	+0005	+0020	+0350	+0335	-4.7	-4.5	§	§	⊙	★
464	Mostyn Docks	53 19	3 16	-0015	-0010	-0025	-0025	-0.9	-0.8	⊙	⊙	⊙	
	Isle of Man												
466	Peel	54 14	4 42	+0010	+0010	-0020	-0030	-4.2	-3.2	-1.7	-0.7	2.92	
467	Ramsey	54 19	4 21	+0010	+0020	-0010	-0020	-2.0	-1.6	-0.9	-0.2	4.16	
468	Douglas	54 09	4 28	+0010	+0020	-0020	-0030	-2.5	-2.1	-0.8	-0.3	3.79	
468a	Port St. Mary	54 04	4 44	+0010	+0020	-0015	-0035	-3.5	-2.7	-1.6	-0.6	3.25	
469	Calf Sound	54 04	4 48	+0010	+0010	-0020	-0030	-3.3	-2.7	-1.2	-0.5	⊙	
469a	Port Erin	54 05	4 46	+0018	+0010	-0013	-0028	-4.1	-3.3	-1.6	-0.6	2.89	

⊙ No data.
§ Dries out except for river water.
★ See notes on page 342.

c For intermediate heights, use harmonic constants (see Part III).
x ML inferred.

NETHERLANDS AND BELGIUM

No.	PLACE	Lat N	Long E	TIME DIFFERENCES High Water		Low Water		HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
				Zone -0100									
1534	**VLISSINGEN (FLUSHING)**	(see page 214)		**0300 and 1500**	**0900 and 2100**	**0400 and 1600**	**1000 and 2200**	**4.9**	**4.1**	**1.0**	**0.5**		
	Netherlands												
1500	Petten (South)	52 46	4 39	+0210	+0215	+0345	+0500	-2.8	-2.3	-0.5	-0.2	1.20	
1501	IJmuiden	N 52 28	4 33	+0145	+0140	+0305	+0325	-2.8	-2.4	-0.7	-0.3	1.07	c
1503	Scheveningen	N 52 06	4 16	+0105	+0100	+0220	+0245	-2.7	-2.3	-0.7	-0.2	1.05	★c
1504	Europlatform	N 52 00	3 17	+0005	-0005	-0030	-0055	-2.7	-2.3	-0.5	-0.1	1.14	
	Nieuwe Waterweg												
1505	HOEK VAN HOLLAND	51 59	4 07	STANDARD PORT				See Table V				1.01	★
1506	Maassluis	51 55	4 15	+0155	+0115	+0100	+0310	-2.8	-2.3	-0.7	-0.2	0.96	★
	Nieuwe Maas												
1507	Vlaardingen	51 54	4 21	+0150	+0120	+0130	+0330	-2.8	-2.3	-0.7	-0.2	0.93	★
1508	ROTTERDAM	51 55	4 30	STANDARD PORT				See Table V				0.91	★
	IJssel												
1508a	Krimpen aan de IJssel	51 55	4 35	+0230	+0155	+0235	+0415	-3.0	-2.5	-0.7	-0.2	0.83	★
	Lek												
1509	Krimpen aan de Lek	51 53	4 38	+0225	+0200	+0325	+0445	-3.2	-2.7	-0.8	-0.3	0.73	★
1511	Schoonhoven	51 57	4 51	+0415	+0315	+0435	+0545	-3.2	-2.6	-0.6	-0.1	0.91	★
	Oude Maas												
1512	Spijkenisse	51 52	4 20	+0145	+0120	+0145	+0310	-3.0	-2.5	-0.8	-0.2	0.84	★
1512a	Goidschalxoord	51 50	4 27	+0200	+0140	+0240	+0410	-3.4	-2.9	-0.8	-0.2	0.65	★
	Merwede												
1517	Dordrecht	51 49	4 40	+0220	+0210	+0420	+0510	-3.8	-3.2	-0.8	-0.3	0.55	★
1520	Werkendam	51 49	4 53	+0425	+0410	+0550	+0650	-4.1	-3.4	-0.6	-0.1	0.56	★
1520a	Moerdijk	51 42	4 37	+0525	+0450	+0520	+0605	-4.4	-3.6	-0.8	-0.2	0.36	★
1520b	Rak (North)	51 42	4 25	+0535	+0505	+0550	+0655	-4.3	-3.6	-0.7	-0.2	0.36	
1521	Haringvlietsluizen	51 50	4 03	+0015	+0015	+0015	-0020	-1.9	-1.9	-0.6	-0.2	1.20	★c
1522	Brouwershavensche Gat	51 45	3 49	+0000	+0010	+0000	-0030	-1.8	-1.5	-0.4	-0.1	1.55	c
	Oosterschelde												
1528	Roompot Buiten	51 37	3 40	-0015	+0005	+0005	-0020	-1.2	-1.1	-0.3	-0.1	1.80	
1529	Stavenisse	51 36	4 01	+0150	+0120	+0055	+0115	-1.3	-1.0	-0.5	-0.1	1.84	
1530a	Bergse Diepsluis (West)	51 30	4 12	+0145	+0125	+0105	+0115	-0.7	-0.5	-0.3	-0.1	2.11	
	Zijpe												
1530c	Krammersluizen (West)	51 39	4 09	+0215	+0125	+0100	+0110	-1.2	-0.9	-0.4	-0.2	1.90	
	Walcheren												
1533a	Westkapelle	51 32	3 26	-0025	-0015	-0010	-0025	-0.6	-0.6	-0.1	-0.1	2.19	
	Westerschelde												
1534	VLISSINGEN (FLUSHING)	51 27	3 36	STANDARD PORT				See Table V				2.56	
1536	Terneuzen	N 51 20	3 50	+0020	+0020	+0020	+0030	+0.4	+0.3	+0.1	0.0	2.78	c
1537	Hansweert	N 51 27	4 00	+0100	+0050	+0040	+0100	+0.7	+0.6	+0.1	0.0	2.94	c
1538	Bath	N 51 24	4 13	+0125	+0115	+0115	+0140	+1.2	+1.0	+0.2	+0.1	3.12	c
1539	**ANTWERP (PROSPERPOLDER)**	(see page 218)		**0000 and 1200**	**0500 and 1700**	**0000 and 1200**	**0600 and 1800**	**6.2**	**5.1**	**1.1**	**0.5**	3.17	
	Belgium												
1539a	Boudewijnsluis	51 17	4 20	+0013	+0005	+0025	+0020	-0.1	+0.1	0.0	+0.1	3.12	c
1539b	Royersluis	51 14	4 24	+0030	+0015	+0045	+0041	+0.1	+0.3	0.0	+0.1	3.14	c
1539c	Boom	51 05	4 22	+0125	+0110	+0155	+0150	-0.3	0.0	-0.4	-0.1	3.14	
1539d	Gentbrugge	51 03	3 44	+0430	+0415	+0630	+0600	-4.0	-3.3	-1.1	-0.3	1.3	x
1562	**ZEEBRUGGE**	(see page 222)		**0300 and 1500**	**0900 and 2100**	**0300 and 1500**	**0900 and 2100**	**4.8**	**3.9**	**1.1**	**0.5**		
1540	Cadzand (Wielingen Sluis)	51 23	3 23	+0005	-0010	+0000	+0010	+0.1	+0.1	0.0	0.0	2.50	
1562	ZEEBRUGGE	51 21	3 12	STANDARD PORT				See Table V				2.52	
1564	Oostende	B 51 14	2 56	-0019	-0019	-0008	-0008	+0.4	+0.3	+0.2	+0.1	2.79	
1565	Nieuwpoort	B 51 09	2 43	-0031	-0031	-0010	-0010	+0.7	+0.6	+0.3	+0.1	2.96	

⊙ No data.
★ See notes on page 342.
c For intermediate heights, use harmonic constants (see Part III).
x ML inferred.

B Tides predicted in Belgian Tide Tables.
F Tides predicted in French Tide Tables.
N Tides predicted in Netherlands Tide Tables.

FRANCE; CHANNEL ISLANDS

No.	PLACE	Lat N	Long W	TIME DIFFERENCES High Water	TIME DIFFERENCES Low Water	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
				Zone -0100							
1600	**CHERBOURG** (see page 246)			**0300 and 1500**	**1000 and 2200**	**0400 and 1600**	**1000 and 2200**	**6.4**	**5.0**	**2.5**	**1.1**	
1596	Rade de la Capelle	49 25	1 05	+0115	+0050	+0130	+0115	+0.8	+0.9	+0.1	+0.1	4.40
1597	Iles Saint Marcouf	49 30	1 08	+0120	+0050	+0125	+0110	+0.6	+0.7	+0.1	+0.1	4.28
1598	St. Vaast-la-Hougue	49 34	1 16	+0120	+0050	+0120	+0115	+0.3	+0.5	0.0	-0.1	4.12
1599	Barfleur	49 40	1 15	+0110	+0055	+0050	+0050	+0.1	+0.3	0.0	0.0	3.94
1600	CHERBOURG	49 39	1 38		STANDARD PORT				See Table V			3.81
1601	Omonville	49 42	1 50	-0010	-0010	-0015	-0015	-0.1	-0.1	0.0	0.0	3.77
1602	Goury	49 43	1 57	-0100	-0040	-0105	-0120	+1.7	+1.6	+1.0	+0.3	5.06
1605	**ST. HELIER** (see page 254)			**0300 and 1500**	**0900 and 2100**	**0200 and 1400**	**0900 and 2100**	**11.0**	**8.1**	**4.0**	**1.4**	
	Channel Islands				**Zone UT(GMT)**							
	Alderney											
1603	Braye	49 43	2 12	+0050	+0040	+0025	+0105	-4.8	-3.4	-1.5	-0.5	3.50
	Sark											
1603a	Maseline Pier	49 26	2 21	+0005	+0015	+0005	+0010	-2.1	-1.5	-0.6	-0.3	4.87
	Guernsey											
1604	ST. PETER PORT	49 27	2 32		STANDARD PORT				See Table V			5.27
	Jersey											
1605	ST. HELIER	49 11	2 07		STANDARD PORT				See Table V			6.03
1606	St. Catherine Bay	49 13	2 01	+0000	+0010	+0010	+0010	0.0	-0.1	0.0	+0.1	6.0 x
1606a	Bouley Bay	49 15	2 05	+0002	+0002	+0004	+0004	-0.3	-0.3	-0.1	-0.1	5.76
1607	Les Ecrehou	49 17	1 56	+0005	+0009	+0011	+0009	-0.2	+0.1	-0.2	0.0	6.00
1608	Les Minquiers	48 57	2 08	-0014	-0018	-0001	-0008	+0.5	+0.6	+0.1	+0.1	6.40
1614	**ST. MALO** (see page 258)			**0100 and 1300**	**0800 and 2000**	**0300 and 1500**	**0800 and 2000**	**12.2**	**9.3**	**4.2**	**1.5**	
	France				**Zone -0100**							
1608a	Les Ardentes	48 58	1 52	+0010	+0010	+0020	+0010	0.0	-0.1	0.0	-0.1	6.73
1609	Iles Chausey	48 52	1 49	+0005	+0005	+0015	+0015	+0.8	+0.7	+0.6	+0.4	7.37
1610	Dielette	49 33	1 52	+0045	+0035	+0020	+0035	-2.5	-1.9	-0.7	-0.3	5.44
1611	Carteret	49 22	1 47	+0030	+0020	+0015	+0030	-1.6	-1.2	-0.5	-0.2	5.86
1611a	Portbail	49 18	1 45	+0030	+0025	+0025	+0030	-0.8	-0.6	-0.2	-0.1	6.32
1611b	St. Germain sur Ay	49 14	1 36	+0025	+0025	+0035	+0035	-0.7	-0.5	0.0	+0.1	6.48
1611c	Le Senequet	49 05	1 40	+0015	+0015	+0025	+0025	-0.3	-0.3	+0.1	+0.1	6.62
1611d	Regneville sur Mer	49 01	1 33	+0010	+0010	+0030	+0020	+0.5	+0.4	+0.2	0.0	7.05
1612	Granville	48 50	1 36	+0005	+0005	+0020	+0010	+0.7	+0.5	+0.3	+0.1	7.15
1613	Cancale	48 40	1 51	+0000	+0000	+0010	+0010	+0.8	+0.6	+0.3	+0.1	7.20
1614	ST. MALO	48 38	2 02		STANDARD PORT				See Table V			6.78
1614a	Ile des Hebihens	48 37	2 11	+0000	+0000	-0005	-0005	-0.2	-0.2	-0.1	-0.1	6.65
1614b	St. Cast	48 38	2 15	+0000	+0000	-0005	-0005	-0.2	-0.2	-0.1	-0.1	6.64
1615	Erquy	48 38	2 28	-0010	-0005	-0025	-0015	-0.6	-0.5	0.0	0.0	6.51
1616	Dahouet	48 35	2 34	-0010	-0010	-0025	-0020	-0.9	-0.7	-0.2	-0.2	6.32
1617	Le Legue (Buoy)	48 34	2 41	-0010	-0005	-0020	-0015	-0.8	-0.5	-0.2	-0.1	6.46
1618	Binic	48 36	2 49	-0010	-0010	-0030	-0015	-0.8	-0.7	-0.2	-0.2	6.35
1619	Portrieux	48 38	2 49	-0010	-0005	-0025	-0020	-0.9	-0.7	-0.2	-0.1	6.35
1620	Paimpol F	48 47	3 02	-0010	-0005	-0035	-0025	-1.4	-1.0	-0.4	-0.2	6.09
1621	Ile de Brehat	48 50	3 00	-0015	-0005	-0040	-0030	-1.6	-1.2	-0.5	0.0	5.95
1621a	Les Roches Douvres	49 06	2 49	-0005	+0005	-0020	-0040	-2.4	-1.7	-0.7	-0.2	5.52
1622	Les Heaux de Brehat	48 55	3 05	-0020	-0020	-0055	-0045	-2.4	-1.7	-0.7	-0.3	5.61
1623	Lezardrieux	48 47	3 06	-0020	-0015	-0055	-0045	-1.7	-1.3	-0.5	-0.2	5.90
1624	Port Beni	48 51	3 10	-0025	-0025	-0105	-0050	-2.4	-1.7	-0.6	-0.2	5.70
1625	Treguier	48 47	3 13	-0020	-0020	-0100	-0045	-2.3	-1.6	-0.6	-0.2	5.72
1625a	Perros-Guirec	48 49	3 28	-0040	-0045	-0120	-0105	-2.9	-2.0	-0.8	-0.3	5.45
1626	Ploumanac'h	48 50	3 29	-0035	-0040	-0120	-0100	-2.9	-2.0	-0.7	-0.2	5.50
1638	**BREST** (see page 262)			**0000 and 1200**	**0600 and 1800**	**0000 and 1200**	**0600 and 1800**	**7.0**	**5.5**	**2.7**	**1.1**	
1628	Trebeurden	48 46	3 35	+0100	+0110	+0120	+0100	+2.2	+1.8	+0.8	+0.3	5.48

x ML inferred.

F Tides predicted in French Tide Tables.

GIBRALTAR; WESTERN AND CENTRAL MEDITERRANEAN

No.	PLACE	Lat N	Long W	TIME DIFFERENCES High Water	TIME DIFFERENCES Low Water			HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
				Zone -0100									
1770	**GIBRALTAR** (see page 106)			**0000 and 1200**	**0700 and 1900**	**0100 and 1300**	**0600 and 1800**	**1.0**	**0.7**	**0.3**	**0.1**	0.52	
	Gibraltar												
1770a	Sandy Bay	36 08	5 20	-0011	-0011	-0016	-0016	-0.2	-0.1	0.0	0.0	0.45	
	Spain												
1773	Malaga	36 43	4 25	+0005	+0005	-0005	-0005	-0.3	-0.1	0.0	+0.1	0.45	
1773a	Almeria	36 50	2 29	+0010	+0010	-0010	-0010	-0.5	-0.3	0.0	+0.2	0.4	x
1774	Alicante	38 20	0 29	⊙	⊙	⊙	⊙	Tide hardly appreciable				0.4	x
1775	Valencia	39 27	0 19	⊙	⊙	⊙	⊙	Tide hardly appreciable				0.38	
		N	**E**										
1776	Barcelona	41 21	2 10	⊙	⊙	⊙	⊙	Tide hardly appreciable				0.45	
	Islas Baleares												
1780	Palma de Mallorca	39 33	2 38	⊙	⊙	⊙	⊙	Tide hardly appreciable				0.3	x
	France												
1782	Port Vendres	42 31	3 06	-0425	-0425	-0400	-0400	-0.6	-0.4	0.0	+0.1	0.3	x
1783	Sete	43 24	3 42	-0725	-0725	-0625	-0625	-0.5	-0.3	+0.1	+0.2	0.41	
1785	Marseille	43 18	5 22	-0650	-0650	-0630	-0630	-0.6	-0.3	0.0	+0.1	0.30	
1786	Toulon F	43 07	5 56	-0700	-0700	-0610	-0610	-0.5	-0.3	0.0	+0.2	0.38	
1789	Nice	43 42	7 17	-0555	-0555	-0530	-0530	-0.5	-0.3	+0.1	+0.2	0.42	
	Monaco												
1790	Monte Carlo	43 44	7 25	-0525	-0525	-0500	-0500	-0.5	-0.3	+0.1	+0.3	0.43	
	Corsica												
1794	Ajaccio	41 56	8 45	-0545	-0545	-0520	-0520	-0.5	-0.3	0.0	+0.2	0.4	x
	Sardinia												
1800	La Maddalena	41 13	9 24	+0550	+0550	⊙	⊙	-0.6	-0.5	-0.2	-0.1	0.18	
1801	Cagliari I	39 12	9 06	+0615	+0615	+0635	+0635	-0.7	-0.5	-0.2	0.0	0.16	
1802	Carloforte	39 09	8 18	+0605	+0605	+0625	+0625	-0.8	-0.6	-0.2	-0.1	0.10	
	Morocco	**N**	**W**	**Zone UT(GMT)**									
1809	Tanger S	35 47	5 48	-0030	-0030	-0020	-0020	+1.0	+0.8	+0.3	+0.1	1.03	
1809a	Hejar Lesfar	35 50	5 41	-0035	-0035	-0005	-0005	+0.8	+0.6	+0.4	+0.2	1.0	x
1809b	Ras Ciress	35 55	5 29	-0110	-0110	-0110	-0110	+0.2	+0.2	+0.2	+0.1	0.7	x
1810	Ceuta S	35 54	5 19	-0045	-0045	-0050	-0050	0.0	+0.1	+0.1	+0.1	0.61	
1811	Ensenada de Tetouan	35 37	5 17	-0045	-0045	⊙	⊙	-0.1	0.0	+0.1	+0.1	⊙	
1815	Baie d'al Hoceima	35 15	3 55	-0035	-0035	-0050	-0050	-0.4	-0.2	-0.1	0.0	0.34	
1817	Melilla	35 17	2 56	-0040	-0040	⊙	⊙	-0.4	-0.2	0.0	+0.1	⊙	
1818	Islas Chafarinas	35 11	2 26	+0030	+0030	+0055	+0055	-0.6	-0.4	-0.1	0.0	0.23	
	Algeria			**Zone -0100**									
1820	Arzew	35 52	0 18	+0105	+0105	+0105	+0105	-0.4	-0.2	+0.2	+0.3	⊙	
		N	**E**										
1822	Alger (Algiers)	36 47	3 04	⊙	⊙	⊙	⊙	Tide hardly appreciable				⊙	
1770	**GIBRALTAR** (see page 106)			**0300 and 1500**	**0900 and 2100**	**0400 and 1600**	**0800 and 2000**	**1.0**	**0.7**	**0.3**	**0.1**		
	Tunisia												
1827	Bizerte	37 16	9 53	-0315	-0425	-0345	-0305	-0.6	-0.4	-0.1	+0.1	⊙	
1828	La Goulette	36 49	10 19	-0545	-0545	-0525	-0525	-0.6	-0.3	-0.1	+0.1	0.3	x
1829	Monastir	35 46	10 50	-0235	-0235	-0225	-0225	-0.5	-0.3	+0.1	+0.2	0.41	
1829a	Mahdia	35 30	11 05	-0130	-0130	-0055	-0055	-0.5	-0.4	0.0	0.0	⊙	
1830	Ras Kaboudia	35 13	11 09	-0110	-0110	-0040	-0040	-0.6	-0.5	-0.1	0.0	0.22	
1830a	Canal des Kerkennah (North Entrance)	34 59	11 07	+0125	+0125	+0105	+0105	-0.2	-0.3	+0.1	+0.1	⊙	
1831	Kerkennah Banks (East Point)	34 52	11 39	-0110	-0110	-0105	-0105	-0.2	-0.3	+0.1	+0.1	⊙	
1832	Bordj el Hassar	34 43	11 09	+0215	+0215	+0315	+0315	+0.2	+0.1	+0.3	+0.1	⊙	
1832a	El Abassia	34 43	11 15	+0030	+0030	+0210	+0210	+0.1	-0.1	+0.2	+0.1	0.63	
1833	Kerkennah Banks (South Point)	34 32	10 58	+0030	+0030	-0020	-0020	+0.4	+0.2	+0.4	+0.2	⊙	

⊙ No data.
★ See notes on page 296.
x ML inferred.

F Tides predicted in French Tide Tables.
I Tides predicted in Italian Tide Tables.
S Tides predicted in Spanish Tide Tables.

CENTRAL MEDITERRANEAN

No.	PLACE		Lat N	Long E	TIME DIFFERENCES High Water	TIME DIFFERENCES Low Water			HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
					Zone -0100									
1770	**GIBRALTAR**	(see page 106)			**0300 and 1500**	**0900 and 2100**	**0400 and 1600**	**0800 and 2000**	**1.0**	**0.7**	**0.3**	**0.1**		
1834	Sfax	F	34	44 10 46	+0045	+0045	+0105	+0105	+0.7	+0.4	+0.5	+0.2	0.99	
1770	**GIBRALTAR**	(see page 106)			—	—	—	—	**1.0**	**0.7**	**0.3**	**0.1**		
1835	La Skhirra		34	17 10 05	+0050	+0050	+0200	+0200	+1.1	+0.7	+0.7	+0.4	1.25	
1836	Gabes		33	53 10 07	+0050	+0050	+0150	+0150	+1.1	+0.6	+0.7	+0.2	1.19	
1837	Bou Grara		33	32 10 41	+0415	+0415	+0535	+0535	-0.2	-0.2	+0.2	+0.2	0.36	
1838	Houmt Adjim		33	43 10 44	+0125	+0125	+0220	+0220	+0.2	-0.1	+0.1	0.0	0.64	
1839	Adjim Bar		33	44 10 40	+0115	+0115	+0235	+0235	+1.1	+0.7	+0.7	+0.4	⊙	
1840	Houmt Souk		33	53 10 52	+0110	+0110	+0210	+0210	+0.7	+0.4	+0.6	+0.5	1.14	
1841	Ras Taguerness		33	49 11 03	+0100	+0100	+0110	+0110	+0.4	+0.3	+0.5	+0.4	0.99	
1842	Zarzis		33	30 11 07	+0055	+0055	+0110	+0110	0.0	-0.1	+0.2	+0.1	0.63	
1843	Ras el Ketef		33	11 11 30	-0040	-0040	+0030	+0030	0.0	-0.1	+0.3	+0.2	0.52	
	Italy													
	Gulf of Genoa													
1850	Imperia	I	43	53 8 01	+0615	+0615	+0635	+0635	-0.7	-0.5	-0.2	-0.1	0.15	
1851	Genova (Genoa)	I	44	24 8 54	+0545	+0545	+0605	+0605	-0.7	-0.5	-0.2	-0.1	0.15	
1851a	La Spezia	I	44	04 9 51	+0530	+0530	+0550	+0550	-0.7	-0.4	-0.2	0.0	0.20	
1852	Livorno (Leghorn)	I	43	33 10 18	+0605	+0605	+0625	+0625	-0.7	-0.5	-0.2	0.0	0.17	
1853	Civitavecchia	I	42	06 11 47	+0620	+0620	+0640	+0640	-0.6	-0.4	-0.2	0.0	0.20	
1854	Gaeta		41	12 13 36	+0615	+0615	+0640	+0640	-0.6	-0.5	-0.2	0.0	0.15	
1855	Napoli (Naples)	I	40	50 14 16	+0615	+0615	+0640	+0640	-0.6	-0.4	-0.2	0.0	0.20	
1856	Ischia		40	44 13 56	+0615	+0615	+0640	+0640	-0.6	-0.5	-0.2	-0.1	0.16	
1857	Tropea		38	41 15 54	+0630	+0630	+0655	+0655	-0.5	-0.4	-0.2	-0.1	0.20	
	Strait of Messina													
1860	Villa San Giovanni		38	13 15 38	+0135	+0135	+0135	+0135	-0.8	-0.6	-0.2	-0.1	0.12	
1861	Reggio Calabria		38	06 15 39	+0025	+0025	+0050	+0050	-0.7	-0.6	-0.2	-0.1	0.12	
1862	Taormina		37	49 15 17	+0010	+0010	+0035	+0035	-0.7	-0.6	-0.3	-0.1	0.12	
1863	Messina	I	38	12 15 34	-0150	-0150	-0130	-0130	-0.8	-0.6	-0.2	-0.1	0.12	
1864	Capo Peloro		38	16 15 39	+0620	+0620	+0650	+0650	-0.7	-0.5	-0.2	0.0	0.20	
	Lipari Islands													
1865	Lipari		38	28 14 56	+0605	+0605	+0630	+0630	-0.6	-0.4	-0.2	-0.1	0.20	
	Sicily													
1866	Milazzo		38	13 15 15	+0610	+0610	+0635	+0635	-0.6	-0.4	-0.2	-0.1	0.20	
1867	Palermo	I	38	08 13 20	+0605	+0605	+0625	+0625	-0.6	-0.4	-0.2	0.0	0.21	
1868	Marsala		37	47 12 26	+0615	+0615	+0640	+0640	-0.7	-0.5	-0.2	-0.1	0.15	★
1869	Mazara del Vallo		37	39 12 36	+0235	+0235	+0250	+0250	-0.7	-0.6	-0.2	0.0	0.15	★
1870	Porto Empedocle	I	37	17 13 32	+0040	+0040	+0105	+0105	-0.7	-0.6	-0.2	0.0	0.15	★
1871	Catania		37	29 15 06	+0025	+0025	+0050	+0050	-0.7	-0.6	-0.2	-0.1	0.12	★
	Malta													
1880	Valletta		35	53 14 31	-0005	-0005	+0020	+0020	-0.2	0.0	+0.3	+0.3	0.63	★
	Italy													
	Golfo di Taranto													
1885	Taranto	I	40	28 17 13	+0030	+0030	+0055	+0055	-0.8	-0.6	-0.2	-0.1	0.12	
1885a	Otranto		40	09 18 30	+0035	+0035	+0055	+0055	-0.7	-0.5	-0.1	0.0	0.2	x

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
1770 - 1770a	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0
1773 - 1776	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1
1780 - 1871						Negligible							
1880	0.0	-0.2	-0.2	-0.2	-0.1	0.0	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0
1885 - 1885a						Negligible							

NOTES

No.	
21-33	Between Start Point and Portland the tidal curve gradually becomes more and more distorted, especially on the rising tide; the rise is relatively fast for the first hour after low water and there is then a noticeable slackening in the rate of rise for the next 1½ hours, after which the rapid rate of rise is resumed. There is often a "stand" at high water, which, while not very noticeable at Start Point, lasts for about an hour at Torquay and for 1½ hours at Lyme Regis.
34	Double low waters occur between Portland and Lulworth Cove. Data for Lulworth refer to the first low water.
35-70	Owing to the complicated variations in the tide between Portland and Portsmouth, the time and height differences for these places will only give approximate predictions. A more accurate representation of the tidal curves at these places can be obtained from the diagrams on pages xxvii to xxix.
35-38	From Swanage to Christchurch double high waters occur except at neaps. High water differences refer to the higher high water when there are two and are approximate.
36-36d	In Poole Harbour the tide is above mean level from about 2 hours after low water to 2 hours before the next low water. Strong and continuous winds from east through south to south-west may raise sea levels by as much as 0.2 m while winds from west through north to north-east may lower levels by 0.1 m. Barometric pressure effects are also appreciable - see page xii.
36a	At Poole (RoRo Terminal) the height of the second high water is always about 1.8 m. Only the height of the first high water varies from springs to neaps.
38	Tidal levels at Christchurch (Entrance) are for a position inside the bar; outside the bar the tide falls about 0.6 m lower at springs. The tide is above mean level from about 3 hours after low water to 2½ hours before the next low water.
39-48	In the approaches to and within the Western Solent double high waters occur at or near springs; on other occasions there is a stand which lasts about 2 hours. The time differences refer to the first high water when there are two and are approximate.
62	With a north-east gale and a high barometer, tidal heights at Southampton may be as much as 0.6 m less than predictions.
61-63a	For intermediate heights use the Standard Curve for Southampton on page 30.
65	Strong winds between north-east and south-east coupled with high barometric pressures may reduce predicted levels by up to 1 m and delay times of high and low waters by up to 1 hour. Strong winds from the West coupled with low barometric pressures may increase predicted levels and advance predicted times by a similar amount.
74	Tidal heights inside Littlehampton Harbour are affected by the water coming down the River Arun; the tide seldom falls lower than 0.7 m above datum.
110-116	River water has a marked effect on tidal levels in the river Thames, especially in the upper reaches. The levels given are for a mean flow of 18 cumecs at Teddington Weir. Flows of 650 cumecs have been recorded and, for the latter figure, levels at London Bridge will be approximately 0.3 m higher than predictions. The effect decreases down the river and is not noticeable at Southend. Similarly, abnormally low flows can be expected to reduce tidal levels. When the Thames Flood Barrier is closed, levels upstream of the Barrier will be markedly different from predictions.

NOTES

No.	
115a, 116	Water levels between Kew Bridge and Richmond Lock will, under low flow conditions, remain at or less than chart datum from up to 3 hours before to 1 hour after the time of predicted low water at Richmond Lock. Low water levels of 0.5 m below chart datum are not uncommon.
116	Above Richmond Lock, as far as Teddington Weir, low water level is maintained at 1.72 m above Ordnance Datum (Newlyn) by the weir at Richmond.
116a-121	Predictions for other places in the Thames Estuary should be obtained from the co-tidal charts contained in "Thames Estuary-Tidal Stream Atlas and Co-tidal Charts" (NP 249). For details see page 368.
142-144	Between Winterton-on-Sea and Great Yarmouth the rise of the tide occurs mainly during the 3½ hours following low water. At Winterton-on-Sea the level is usually within 0.3 m of the predicted high water height from 4 hours before high water at Lowestoft until 1 hour before high water at Lowestoft. At Caister-on-Sea, where double high waters sometimes occur, and at Great Yarmouth the level is usually within 0.3 m of the predicted high water height from 3 hours before high water at Lowestoft until high water at Lowestoft.
157a	Low water time differences at Wells are for the end of a low water stand which lasts about 4 hours at springs and about 5 hours at neaps.
177	At Burton Stather, normal river level is about 0.1 m below chart datum.
178	At Keadby, normal river level is between 0.1 m and 0.2 m below chart datum. The tide is normally at or just below chart datum for ½ to 1½ hours; low water time differences are for the beginning of the rise.
179, 180	At Blacktoft and Goole the amount of fresh water coming down the rivers has little effect on the heights of high water. The levels for low water are given for a low rate of river flow. High rates of river flow can increase the level of low water by as much as 0.3 m at Blacktoft and 0.6 m at Goole.
208	The causeway can be used by motor vehicles from 3½ hours after to 2 hours before high water. Adverse weather conditions may shorten the period during which it is usable.
236b	At Perth the low water time differences give the beginning of the rise, following a low water stand of about 4 hours.
381-390	In the Sound of Jura, south of Loch Crinan, the rise of tide occurs mainly during the 3½ hours following low water, and the fall during the 3½ hours following high water. At other times the changes in level are usually small and irregular. In the vicinity of the amphidromic point, predictions using the data in Part II may produce significant differences compared to those using harmonic constants, especially at neaps when the diurnal inequality becomes pronounced. At Port Ellen weather conditions have a marked effect on sea level, southerly and easterly gales raising the level up to 1 m; at neaps the tide is sometimes diurnal, while the range is negligible. At Machrihanish the difference between springs and neaps is not more than 0.2 m.
426-431	The time differences given for low water are for the beginning of the rise which is very sudden at springs.
442	Low water time differences at Glasson Dock give the end of a low water stand which lasts up to 2 hours at springs.
446	Low water time differences at Preston give the end of a low water stand which lasts about 3½ hours.

NOTES

No.	
462	Levels are given for a mean flow of 10 cumecs at Chester Weir. Flows of 180 cumecs have been recorded and, for this figure, levels at Chester will be 0.7 m at springs and 1.9 m at neaps higher than predictions. The effect decreases down the river and is not noticeable at Connah's Quay. A bore occurs in the River Dee at Chester.
463	Low water time differences at Connah's Quay give the end of a low water stand which lasts for 3½ to 4 hours at springs and for 4½ to 5½ hours at neaps. In the dock, impounded low water level is 0.7 m above chart datum.
515	The height of low water at Newport does not normally fall below MLWS; tidal heights are calculated for an average minimum flow; maximum river flow may raise the height of low water by as much as 0.3 m.
516	The effect of the tide in the river Wye is felt as far as St. Briavel, where the height of MHWS is about 8 m above Ordnance Datum (Newlyn), when the river flow at Redbrook is 21 cumecs. At St. Briavel the tidal range at springs may be as much as 1.8 m, but changes in level due to river water may be greater than this.
519-522b	Above Inward Rocks the height of low water is greatly affected by the amount of fresh water coming down the river Severn and its tributaries. The tidal levels given are for a low rate of river flow (about 35 cumecs at Wellhouse Rock). Flood water can increase the height of low water by as much as 0.6 m to 1 m but the height of high water is scarcely affected by river flow except, perhaps, for freak conditions which occur less than once a year.
522c-522e	Time and height differences refer to springs only. At neaps, the river in this area is non-tidal. The Bore on the River Severn can usually be seen when the range of the tide at Avonmouth is 13.5 m or more . It usually arrives at Minsterworth about 45 minutes and at Stonebench about 60 minutes after the time of High Water at Avonmouth. For further information, see West Coasts of England and Wales Pilot (NP 37).
529	At Bridgwater, the tide falls to normal river level, which is about 1.8 m above Ordnance Datum (Newlyn). Low water time differences give the end of the low water stand, which lasts for 1½ to 2½ hours at springs and 7½ to 8½ hours at neaps. The onset of the rising tide is often accompanied by a bore.
536-540	Rivers Taw and Torridge: At Fremington there is a low water stand of 2 to 2½ hours at springs; the 0100/1300 low water time difference gives the beginning of the stand. At neaps there is no stand. At Barnstaple there is a low water stand lasting until 1 hour 45 minutes before high water. The low water time differences give the beginning of the stand. At Bideford there is a low water stand lasting for 2 to 3 hours at springs. The low water time difference gives the beginning of the stand. Meteorological conditions have a considerable effect on the heights of high and low water. Levels given for MLWS are those below which the tide will not fall.
545a	The low water time differences give the beginning of the rise which follows a low water stand of about 5 hours.
718	Strong winds between south and west increase the height and delay the times of high water. Strong winds between north and east have the opposite effect.
1503, 1505-1509 1512, 1521	Double low waters occur on the coast of the Netherlands between Scheveningen and Haringvlietsluizen and in the entrances to the River Rhine as far upstream as Krimpen and Spijkenisse. They are more pronounced at springs; on occasions when they do not occur, there is still a considerable distortion of the tidal curve which takes the form of a low water stand. The slight rise after the first low water is known as the agger. Predictions for the Standard Ports of Hoek van Holland and Rotterdam are for the *lower* low water. The *first* low water occurs about 5½ hours after high water and the *second* low water about 4 hours before the following high water. Time differences for low water refer to the *first* low water for Nos. 1505 & 1521 and to the *second* low water for Nos. 1503, 1506-1509 and 1512.

NOTES

No.

1506-1520a On the tidal rivers water levels are considerably affected by river water; at Lobith there is no tidal effect but the river level varies by as much as 6 m; the effect of river water gradually decreases down the river but is of importance as far as Dordrecht. The differences given are for a river level of 9.8 m above NAP at Lobith *two days earlier*. Predictions for Dordrecht should be corrected according to the following table:

	m	m	m	m
River level at Lobith *two days earlier*	7.7	9.8	12.7	13.9
Correction to high water time (minutes)	-10	0	+20	+35
Correction to low water time (minutes)	-10	0	+20	+30
Correction to high water height (metres)	-0.2	0.0	+0.1	+0.2
Correction to low water height (metres)	-0.2	0.0	0.0	0.0

1582a-1588 In La Seine, there is a high water stand, within 0.2 m of the maximum, which lasts for about 2 hours 50 minutes as far up as Vatteville, decreasing to about 1 hour 50 minutes at Duclair. The high water time differences refer to the beginning of the stand.

1590-1592 A double high water exists at Trouville, Dives and Ouistreham. The high water time differences referred to the published time of high water at Le Havre give the times of the first high water.

GEOGRAPHICAL INDEX

TIDE TABLES 2013

INSTRUCTIONS FOR THE USE OF TABLES

TO FIND THE TIMES AND HEIGHTS OF HIGH AND LOW WATER

Standard Ports

The times and heights of high and low water are tabulated for every day of the year. The zone time used for the predicted times is usually the standard time for the area and is given at the top of each page. Care should be taken to ensure that this is the actual time zone in use on that date, the predicted time being corrected if necessary. Special care is needed for those ports whose time is changed during the year.

The heights are shown in metres referred to the chart datum of the port concerned.

Secondary Ports

The times of high and low water are obtained by applying the time differences tabulated in Part II to the daily prediction for the most suitable (not necessarily the closest) Standard Port. The Standard Port to be used is that which appears in **bold type** at the head of the subsection in Part II. Other Standard Ports may occur within a subsection in their correct geographical sequence but full data for these are not shown. The times obtained by applying these corrections are in the time zone shown next above the Secondary Port irrespective of the zone time used for the Standard Port predictions.

The heights of high and low water are obtained by applying the height differences tabulated in Part II to the daily predictions for the same Standard Port as is used for the times. For places where the tide is mainly semi-diurnal in character these differences are tabulated for the Mean Spring and Mean Neap levels at the Standard Port. Where the diurnal inequality is large, the tabulations are made for Mean Higher and Mean Lower, High and Low Water. In either case, unless there is a statement to the contrary in Part II it may be assumed that the variation is linear and differences for heights other than those tabulated may be obtained by interpolation or extrapolation. It MUST be noted that the predictions for Standard Ports include the seasonal changes for the Standard Port which may be different from those for the Secondary Port. The seasonal changes tabulated in Part II (and Part III) are shown for the first day of each month (i.e. Jan 1 is the first of January, and so on). They should be suitably interpolated for the day of prediction. The first step is therefore to SUBTRACT algebraically the seasonal change for the Standard Port from the predicted height obtained from Part I. The next step is to apply the height difference corresponding to this corrected height at the Standard Port, interpolating or extrapolating as necessary. The final step is to ADD algebraically the seasonal change for the Secondary Port. In both cases great care must be taken to ensure that the signs of the seasonal changes are correctly applied. Where no seasonal changes are given they are less than 0.1m and can be ignored. Allowance has been made in the preparation of the tables for any difference in the level of chart datum between the Standard and Secondary Port and the resulting heights are referred to chart datum at the Secondary Port concerned.

For certain ports the time differences are replaced by "*p*" indicating that no suitable Standard Port is available and predictions can only be made by using the Simplified Harmonic Method of Tidal Prediction. Height differences are included for these ports to enable tidal levels to be obtained but they should not be used for obtaining daily predictions.

TO FIND THE HEIGHT OF TIDE AT TIMES BETWEEN HIGH AND LOW WATER

The Standard Curves on page xxii show the factor of the range attained at a given time interval relative to that of HW for durations between 5 and 7 hours. They are based on the assumption that the tide approximates to a cosine curve.

These curves will give acceptable results, using interpolation between adjacent curves for the actual duration where necessary, provided that *both* the following criteria are satisfied:

(a) The duration of rise or fall must lie within the scope of the graphs i.e. between 5 and 7 hours.

(b) There must be no shallow water correction (f_4, F_4, f_6 and F_6) shown in Part III.

If either of these criteria is not met, intermediate heights must be predicted by the use of the Simplified Harmonic Method of Tidal Prediction.

Owing to the relatively small number of constituents used, the Simplified Harmonic Method of Tidal Prediction may produce predictions, for a Standard Port, which differ from those obtained in Part I. Times and heights from Part I should also be plotted on a graph of the results of calculations by the Simplified Harmonic Method of Tidal Prediction and this curve then adjusted to pass through the Part I predictions.

See page xxiii for instructions on the use of calculators and the Simplified Harmonic Method of Tidal Predictions and forms A and B at the back of the book.

MEAN LEVELS

The values of MLWS, MLWN, MSL, MHWN and MHWS are shown for Standard Ports in Table V and Part II where the tide is mainly semi-diurnal. Where there is large diurnal inequality the values of MLLW, MHLW, MSL, MLHW and MHHW are shown. The equivalent values for Secondary Ports may be found by the direct application of the appropriate height differences tabulated in Part II.

HIGHEST AND LOWEST LEVELS

The values of HAT and LAT for Standard Ports are shown in Table V Part 1. The values of HAT for Secondary Ports are shown in Table V Part 2. The values of LAT at Secondary Ports may be *inferred* by linear extrapolation beyond the given height differences tabulated in Part II for a tide that reaches the appropriate level at the Standard Port using the graphical solution for the examples on the following pages.

OFFSHORE AREAS AND PLACES BETWEEN SECONDARY PORTS

Tidal predictions for offshore areas and stretches of coastline between Secondary Ports should be obtained by the use of Co-Tidal Charts. For details of Co-Tidal Charts available see page 359 and the Catalogue of Admiralty Charts. Full instructions for their use are contained on the body of the charts.

DETAILED INSTRUCTIONS AND EXAMPLES

The Tidal Prediction Form is a convenient form for the majority of time and height calculations. The examples have been carried out on these forms and the instructions refer to the boxes. Copies of the form are found in the back of Admiralty Tide Tables.

THE SIMPLIFIED HARMONIC METHOD OF TIDAL PREDICTION

This method of prediction uses the Harmonic Constants published in Part III of these Tables and the Tidal Angles and Factors from Table VII. The application of Table VII to the four main constituents revises them for the date concerned and modifies them to allow for the effects of a number of related constituents. When the Shallow Water Corrections, Seasonal Corrections and Table VI are also used the prediction obtained is equivalent to one using 36 harmonic constituents. Of course, for many ports not all the above corrections are needed and for them only the necessary data are published. Instructions for use with programmable computers or calculators, with a worked example, are included on pages xxiii to xxv.

This method may also be used in the prediction of tidal streams, and harmonic constants are included in Part IIIa for this purpose. The constants are used in exactly the same way as for tidal predictions with the values of "H" given in knots instead of metres. For those positions where appropriate the tidal stream is assumed to run in two opposing directions, and the results obtained from the Simplified Harmonic Method give hourly rates in the positive or negative direction. The compass courses given for each direction in Part IIIa give the directions *towards which* the stream is predicted to run. For those positions where the stream is rotary, constants are given for both the north and east components. When hourly values of the stream for each component have been found, it is necessary to combine them to obtain the rates and directions towards which the stream is running at each time.

Example I: To find the times and heights of high and low waters at "Secondary Port" (semi-diurnal tides) on 16th January, using the following extracts.

Extract from ATT Part II.

PLACE	Lat	Long	TIME DIFFERENCES MHW	MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS
STANDARD PORT	(see extract)				**2.5**	**1.8**	**1.2**	**0.4**
	S	**W**						
Secondary Port	2 45	8 15	-0015	-0025	-1.2	-0.8	-0.4	+0.1

SEASONAL CHANGES IN MEAN LEVEL

No	Jan 1	Feb 1	Mar 1	Apr 1	May 1	June 1	July 1	Aug 1	Sep 1	Oct 1
STANDARD PORT	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
Secondary Port	0.0	+0.2	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.2	-0.1

Notes: (i) The data used in this example do not refer to the year of these tables.

(ii) Computation of HW height differences is done by interpolation or extrapolation, using the two values tabulated for HW and the height of HW at the Standard Port. Similarly, LW height differences are computed from the data given for LW. In most cases, this can be carried out by eye. However, the use of a pocket calculator may be preferred. Alternatively, it may be carried out graphically, as shown below.

Plot A (MHWS 2.5, difference -1.2) and B (MHWN 1.8, difference -0.8).

Draw a line through A and B. Read off the height differences for Secondary Port corresponding to the corrected heights at Standard Port of 1.8 and 2.2 - i.e. -0.8 and -1.0.

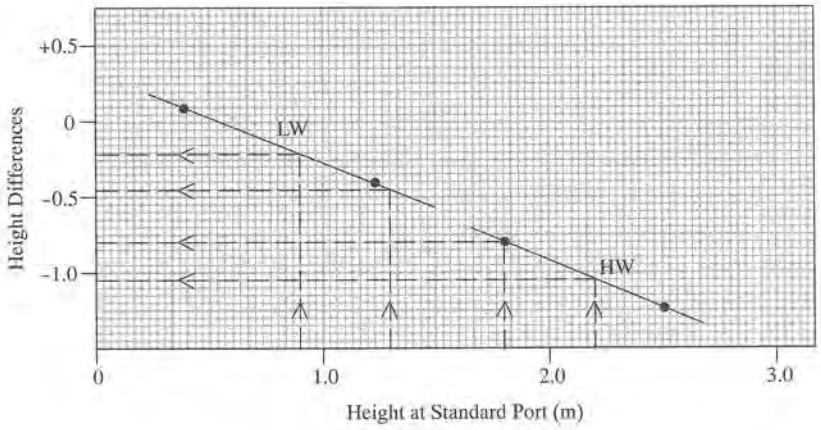
Similarly, plot the LW height differences to get Secondary Port differences corresponding to the corrected heights at Standard Port of 0.9 and 1.3 - i.e. -0.2 and -0.5.

Extract from ATT Part I.

STANDARD PORT

JANUARY

	Time	m
16	0324	0.8
	1014	1.7
F	1514	1.2
	2127	2.1



TIDAL PREDICTION FORM

STANDARD PORT **Standard** TIME/HEIGHT REQUIRED **H & LW**

SECONDARY PORT **Secondary** DATE **16 Jan** TIME ZONE **-0700**

	TIME		HEIGHT		
STANDARD PORT	HW	LW	HW	LW	RANGE
	1 **1014** **2127**	2 **0324** **1514**	3 **1.7** **2.1**	4 **0.8** **1.2**	5 —
Seasonal change	Standard Port		6 **+0.1**	6 **+0.1**	
DIFFERENCES	7 **-0015**	8 **-0025**	9 **-0.8** **-1.0**	10 **-0.2** **-0.5**	
Seasonal change	Secondary Port		11 **0.0**	11 **0.0**	
SECONDARY PORT	12 **0959** **2112**	13 **0259** **1449**	14 **1.0** **1.2**	15 **0.7** **0.8**	
Duration	16 —				

Example II: To find the times and heights of high and low waters at "Secondary Haven" (tides with large diurnal inequality) on 16th January, using the following extracts.

Extract from ATT Part II.

PLACE	Lat	Long	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW
STANDARD PORT	(see extract)				**2.5**	**2.2**	**1.9**	**0.4**
	S	**E**						
Secondary Haven	37 05	149 55	-0015	-0025	-1.2	-1.1	-0.9	-0.1

SEASONAL CHANGES IN MEAN LEVEL

No	Jan 1	Feb 1	Mar 1	Apr 1	May 1	June 1	July 1	Aug 1	Sep 1	Oct 1
STANDARD PORT	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
Secondary Haven	0.0	+0.1	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.2	-0.1

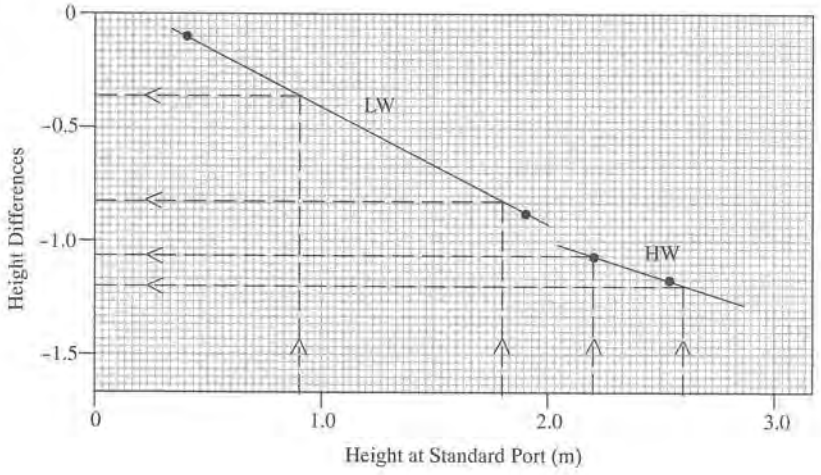
Notes: (i) The data used in this example do not refer to the year of these tables.
(ii) Computation of HW height differences is done by interpolation or extrapolation, using the two values tabulated for HW and the height of HW at the Standard Port. Similarly, LW height differences are computed from the data given for LW.
(iii) For instructions on graphical interpolation of differences, see Example I on page xvii.

Extract from ATT Part I.

STANDARD PORT

JANUARY

	Time	m
16	0254	0.8
	1144	2.5
F	1618	1.7
	2025	2.1



TIDAL PREDICTION FORM

STANDARD PORT **Standard** TIME/HEIGHT REQUIRED **H & LW**
SECONDARY PORT **Secondary** DATE **16 Jan** TIME ZONE **-0700**

	TIME		HEIGHT		
STANDARD PORT	HW	LW	HW	LW	RANGE
	1 **1144** **2025**	2 **0254** **1618**	3 **2.5** **2.1**	4 **0.8** **1.7**	5 —
Seasonal change	Standard Port		6 **+0.1**	6 **+0.1**	
DIFFERENCES	7 **-0015**	8 **-0025**	9 **-1.2** **-1.1**	10 **-0.4** **-0.9**	
Seasonal change	Secondary Port		11 **0.0**	11 **0.0**	
SECONDARY PORT	12 **1129** **2010**	13 **0229** **1553**	14 **1.4** **1.1**	15 **0.5** **0.9**	
Duration	16 —				

Example III: To find the times and heights of high and low waters at "Secondary Harbour" (diurnal tides) on 10th February, using the following extracts.

Extract from ATT Part II.

PLACE	Lat	Long	TIME DIFFERENCES HHW	TIME DIFFERENCES LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW
STANDARD HARBOUR	(see extract)				**1.6**	Δ	Δ	**0.4**
	S	**E**						
Secondary Harbour	33 50	121 55	+0106	+0146	+0.5	Δ	Δ	+0.1

SEASONAL CHANGES IN MEAN LEVEL

No	Jan 1	Feb 1	Mar 1	Apr 1	May 1	June 1	July 1	Aug 1	Sep 1	Oct 1
STANDARD HARBOUR	0.0	0.0	-0.1	0.0	0.0	+0.1	+0.1	-0.1	-0.2	-0.2
Secondary Harbour	0.0	+0.1	+0.1	+0.1	+0.1	+0.1	0.0	0.0	0.0	0.0

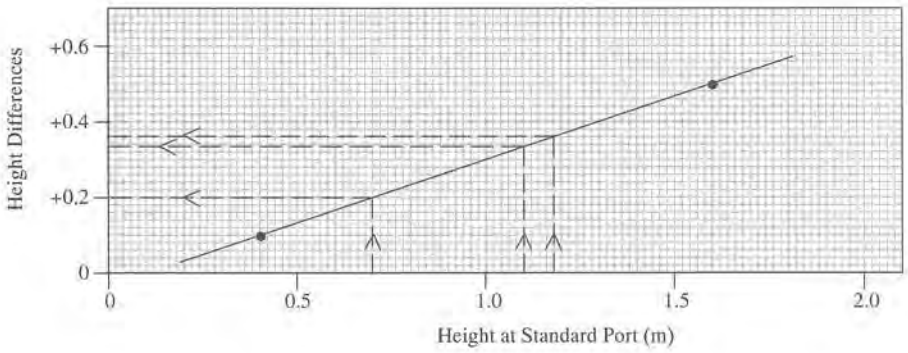
Notes: (i) The data used in this example do not refer to the year of these tables.
(ii) Where only one HW and one LW height differences is tabulated in Part II, both HW and LW differences must be obtained by interpolation or extrapolation, using these values and the heights at the Standard Port.
(iii) For instructions on graphical interpolation of differences, see Example I on page xvii.

Extract from ATT Part I.

STANDARD HARBOUR

FEBRUARY

	Time	m
10	0438	1.2
	0631	1.1
TU	1057	1.2
	1928	0.7



TIDAL PREDICTION FORM

STANDARD PORT **Standard** TIME/HEIGHT REQUIRED **H & LW**
SECONDARY PORT **Secondary** DATE **10 Feb** TIME ZONE **-0600**

	TIME HW	TIME LW	HEIGHT HW	HEIGHT LW	RANGE
STANDARD PORT	1 **0438** **1057**	2 **0631** **1928**	3 **1.2** **1.2**	4 **1.1** **0.7**	5 —
Seasonal change	Standard Port		6 **0.0**	6 **0.0**	
DIFFERENCES	7 **+0106**	8 **+0146**	9 **+0.4** **+0.4**	10 **+0.3** **+0.2**	
Seasonal change	Secondary Port		11 **+0.1**	11 **+0.1**	
SECONDARY PORT	12 **0544** **1203**	13 **0817** **2114**	14 **1.7** **1.7**	15 **1.5** **1.0**	
Duration	16 —				

Example IV: To find the height of the tide at 1200 on 8th November at "Standard Port".

Extract from ATT Part I

STANDARD PORT Standard TIME/~~HEIGHT~~ REQUIRED 1200
SECONDARY PORT — DATE 8 Nov TIME ZONE -0700

NOVEMBER

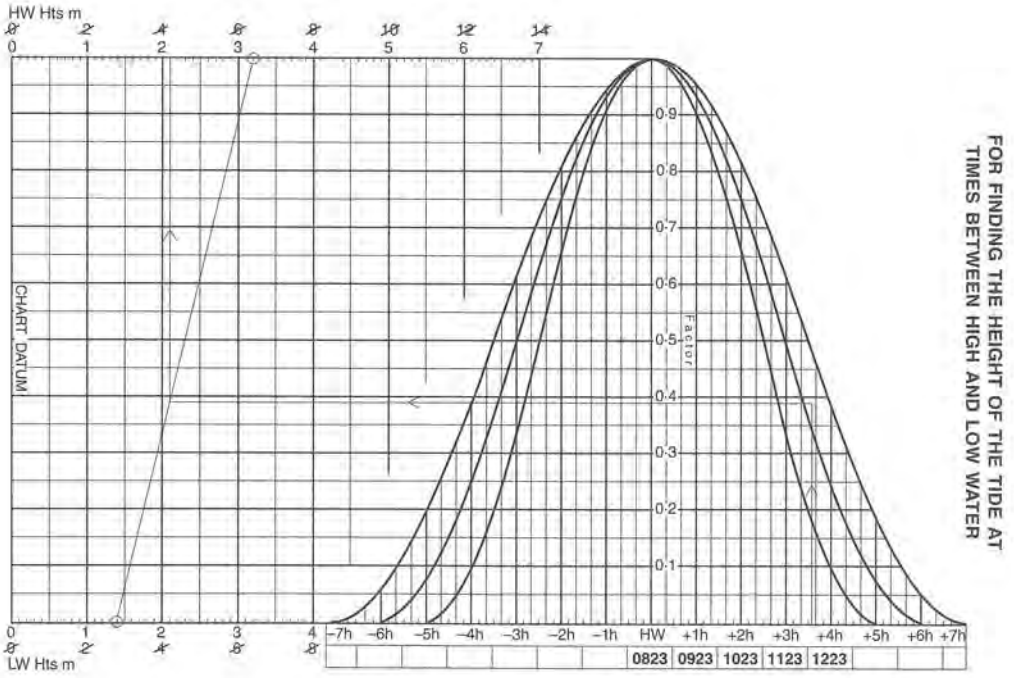
Time	m
8 0132	1.5
0823	3.2
F 1440	1.4
2115	3.0

	TIME		HEIGHT		
STANDARD PORT	HW	LW	HW	LW	RANGE
	1 **0823**	2 **1440**	3 **3.2**	4 **1.4**	5 **1.8**
Seasonal change	Standard Port		6 —	6 —	
DIFFERENCES	7 —	8 —	9 —	10 —	
Seasonal change	Secondary Port		11 —	11 —	
SECONDARY PORT	12 —	13 —	14 —	15 —	
Duration	16 **0617**				

Notes: (i) This method is only suitable when the duration of rise or fall is between 5 and 7 hours and when there is no Shallow Water Correction (see page xvi).
(ii) For Secondary Ports, first obtain the times and heights of high and low waters as in examples I and II and then proceed as below.
(iii) The data used in this example do not refer to the year of these tables.

I On diagram on page xvii, plot heights of HW and LW occurring either side of required time and join by sloping line.
II Enter HW time and sufficient others to embrace required time.
III From required time, proceed vertically to curve for duration, interpolating as necessary between curves on diagram.
IV Proceed horizontally to sloping line, thence vertically to height scale. Read off height.

Extract from ATT Part I.



Height 2.1m

Example V: To find the time at which the midday tide falls to 2.1m on 8th November at "Standard Port".

Extract from ATT Part I.

STANDARD PORT Standard TIME/HEIGHT REQUIRED 2.1 (Midday - falling)
SECONDARY PORT — DATE 8 Nov TIME ZONE -0700

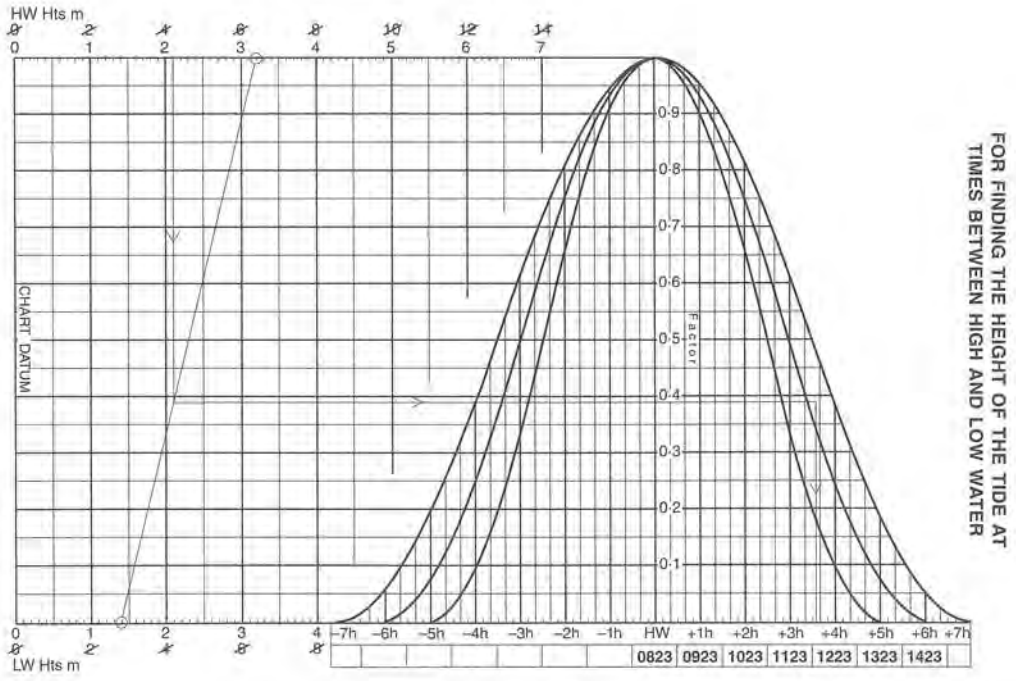
NOVEMBER

Time	m
8 0132	1.5
0823	3.2
F 1440	1.4
2115	3.0

	TIME		HEIGHT		
STANDARD PORT	HW	LW	HW	LW	RANGE
	1 **0823**	2 **1440**	3 **3.2**	4 **1.4**	5 **1.8**
Seasonal change	Standard Port		6 —	6 —	
DIFFERENCES	7 —	8 —	9 —	10 —	
Seasonal change	Secondary Port		11 —	11 —	
SECONDARY PORT	12 —	13 —	14 —	15 —	
Duration	16 **0617**				

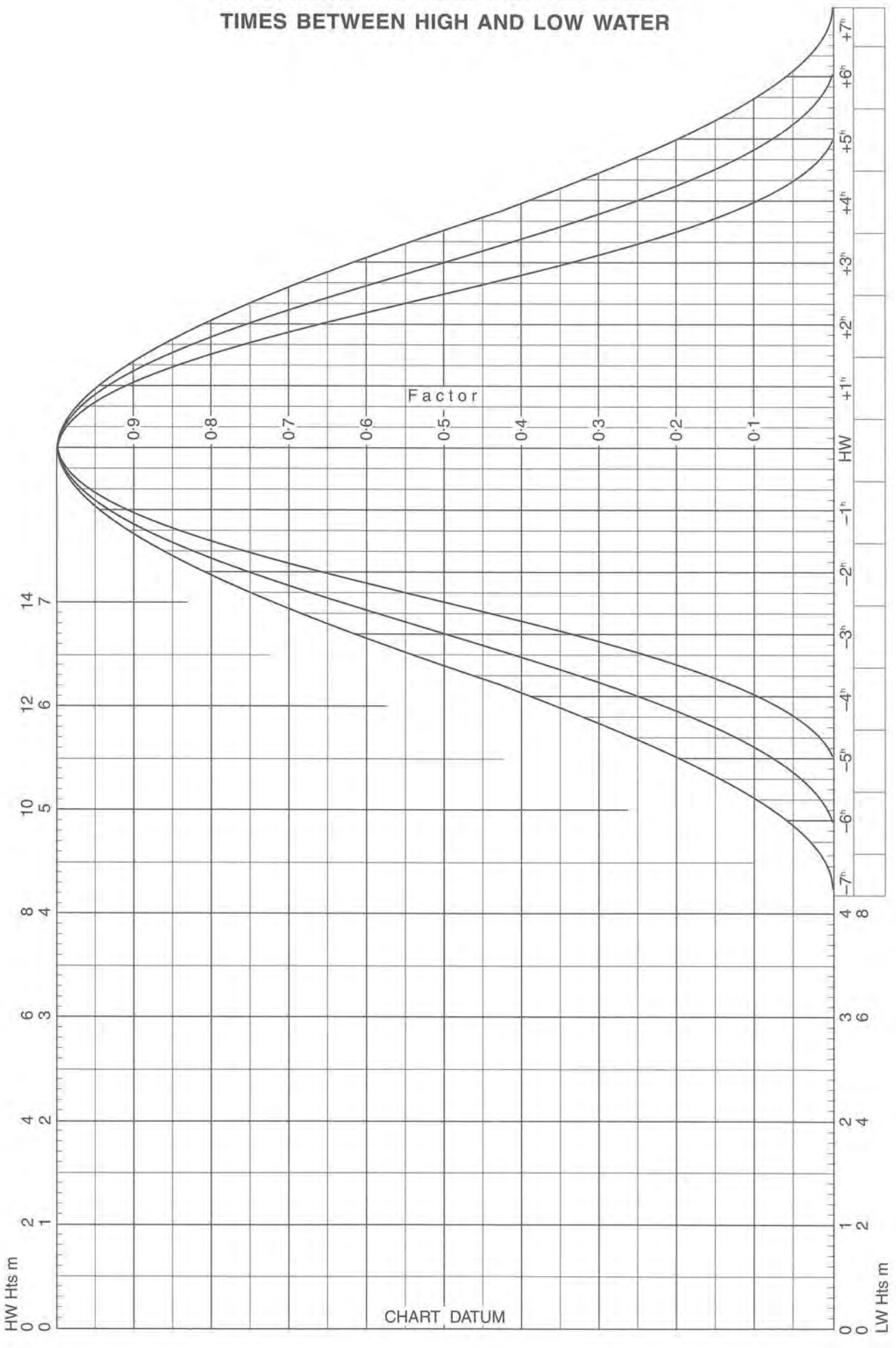
Notes: (i) This method is only suitable when the duration of rise or fall is between 5 and 7 hours and when there is no Shallow Water Correction (see page xi).
(ii) For Secondary Ports, first obtain the times and heights of high and low waters as in examples I and II and then proceed as below.
(iii) The data used in this example do not refer to the year of these tables.

I On diagram on page xvii, plot heights of HW and LW occurring either side of required event and join by sloping line.
II Enter HW time and those for half-tidal cycle covering required event.
III From required height, proceed vertically to sloping line, thence horizontal to curve for duration, interpolating as necessary between curves on diagram.
IV Proceed vertically to time scale. Read off time.



Time 1200

FOR FINDING THE HEIGHT OF THE TIDE AT TIMES BETWEEN HIGH AND LOW WATER



A

Port	**Example**
ATT No.	-
Date	**10 September 2005**
Time Zone	**+0400**

	Mean Level	
1.	Zo (Part III) or (Tab VI)	**0.67**
2.	Seasonal Corr. (Part III)	**0.0**
3.	Sum = ML	**0.67**

		M_2	S_2	K_1	O_1
4.	A1 (Tab VII)	**140**	**005**	**117**	**038**
5.	A2 (Tab VII)	**164**	**004**	**115**	**064**
6.	A1 - A2	**-024**	**001**	**002**	**-026**
*7.	360.n	**720**	**720**	**360**	**360**
8.	(A1 - A2) + 360.n = p	**696**	**721**	**362**	**334**
9.	p/24	**29.00**	**30.04**	**15.08**	**13.92**
10.	A1 (Line 4)	**140**	**005**	**117**	**038**
11	g (Part III)	**243**	**267**	**127**	**137**
12.	A1 + g	**023**	**272**	**244**	**175**
13.	F2 (Tab VII)	**0.96**	**1.31**	**0.89**	**1.25**
14.	F1 (Tab VII)	**0.93**	**1.30**	**0.88**	**1.20**
15.	F2 - F1 = P	**+0.03**	**+0.01**	**+0.01**	**+0.05**
16.	P/24	**+0.0013**	**+0.0004**	**+0.0004**	**+0.0021**

*n = 0 or smallest integer necessary to make Line 8 > 600° in M_2 and S_2 columns and > 300° in K_1 and O_1 columns.

† R Sin r = sum of H.Ft Sin θ for M_2 and S_2

R Cos r = sum of H.Ft Cos θ for M_2 and S_2

‡ H.Ft Cos θ (K_1)

§ H.Ft Cos θ (O_1)

B

17.	Time = T	0800			
	H.C.	M_2	S_2	K_1	O_1
18.	p/24 (Line 9)	**29.00**	**30.04**	**15.08**	**13.92**
19.	p/24 x T	**232**	**240**	**121**	**111**
20.	(A1 + g) (Line 12)	**023**	**272**	**244**	**175**
21.	(A1 + g) - p.T/24 = θ	**151**	**032**	**123**	**064**
22.	Sin θ	**0.485**	**0.530**		
23.	Cos θ	**-0.875**	**+0.848**	**-0.545**	**+0.438**
24.	P/24 (Line 16)	**+0.0013**	**+0.0004**	**+0.0004**	**+0.0021**
25.	P/24 x T	**+0.0104**	**+0.0032**	**+0.0032**	**+0.0168**
26.	F1 (Line 14)	**0.93**	**1.30**	**0.88**	**1.20**
27.	F1 + P.T/24 = Ft	**0.94**	**1.30**	**0.88**	**1.22**
28.	H (Part III)	**0.35**	**0.08**	**0.07**	**0.05**
29.	H x Ft	**0.329**	**0.104**	**0.062**	**0.061**
30.	(H x Ft) Sin θ	**+0.160**	**+0.055**	‡	**-0.034**
31.	(H x Ft) Cos θ	**-0.288**	**+0.088**	§	**+0.027**
†32.	R Sin r : R Cos r	**+0.215**	**-0.200**	→	**-0.200**
33.	r : R	**133**	**0.294**	ML (line 3)	**0.67**
34.	2r : R^2	**266**	**0.086**		
35.	f_4 (Part III) : F_4 (Part III)	**238**	**0.013**		
36.	$2r + f_4 = d_4$: $R^2.F_4 = D_4$	**144**	**0.001**	$D_4 \cos d_4$	**-0.001**
37.	3r : R^3	**039**	**0.025**		
38.	f_6 (Part III) : F_6 (Part III)	**133**	**0.022**		
39.	$3r + f_6 = d_6$: $R^3.F_6 = D_6$	**172**	**0.001**	$D_6 \cos d_6$	**-0.001**
40.		Sum lines 30 - 39 = Height			**0.46**

This variation of the Simplified Harmonic Method of Tidal Prediction has been designed primarily for use with a pocket calculator. When performed in this manner there will be no saving in time required to predict a full 24 hours but there will be a slight gain in accuracy (see also note 4). However this method is probably quicker when only a short period of prediction is required, and prediction at fractions of an hour are easier. The box diagram has also been found useful to assist in programming a pocket calculator and to assist in this some additional notes have been added.

DETAILED INSTRUCTION FOR MANUAL COMPLETION OF FORM

The example shows the number of decimal places required.

Section A. To be completed once for each day on which predictions are required.

1. Complete heading section (Port, No., Date and Time Zone).
2. From ATT Part III enter:
   - Z_o (or from Tab VI) ..... Line 1
   - Seasonal Change ..... Line 2
   - Values of g ..... Line 11
3. From ATT, Tab VII enter:
   - Values of A on required day (A1) ..... Lines 4 and 10
   - Values of A on succeeding day (A2) ..... Line 5
   - Values of F on required day (F1) ..... Line 14
   - Values of F on succeeding day (F2) ..... Line 13
4. Sum Lines 1 and 2 to obtain days value of Mean Level in Line 3.

For each column in turn:

5. Obtain Line 6 by subtracting A2 from A1 .
6. Enter 360.n in Line 7. (See note under section A and Note 5).
7. Add Lines 6 and 7 to obtain daily rate of change of A (p) in Line 8.
8. Insert p/24 in Line 9.
9. Add Lines 10 and 11 to obtain (A1 +g) in Line 12.
10. Subtract Line 14 from Line 13 to obtain daily rate of change of F (P) in Line 15.
11. Insert P/24 in Line 16.

Section B. To be completed for each time for which a prediction is required.

12. Enter Time (T) in Line 17. If your calculator has not got conversion between Hrs/Mins/Sec and Dec. Hrs it is probably best to work in decimals e.g. 1812=18.2.
13. From ATT Part III enter:

Values of H		Line 28.
f_4	If no data are given, enter zero	Line 35 Col 1
F_4		Line 35 Col 2
f_6		Line 38 Col 1
F_6		Line 38 Col 2

14. From Section A enter:

p/24 (Line 9)	Line 18
(A1+g) (Line 12)	Line 20
P/24 (Line 16)	Line 24
F1 (Line 14 or direct from ATT Tab VII)	Line 26
ML (Line 3)	Line 33 Col 4

15. Multiply p/24 by T in Line 19.
16. *Subtract* (see note 4) Line 19 from Line 20 to obtain θ in Line 21.
17. Enter Sin θ in M_2 and S_2 columns only of Line 22.
18. Enter Cos θ in all columns of Line 23.
19. Multiply P/24 by T in Line 25 and add to Line 26 to obtain interpolated value of F (=Ft) in Line 27.
20. Multiply H (Line 28) by Ft (Line 27). Enter result in Line 29.
21. Multiply Line 29 by Line 22 to obtain H.Ft.sin θ in M_2 and S_2 columns only.
22. Multiply Line 29 by Line 23 to obtain H.Ft.cos θ. Insert results for M_2, S_2 and O_1 in appropriate columns of Line 31. Insert result for K_1 in Line 30 (Col 4).

N.B.From here on the columns no longer refer to H.C.s and are referred to by their numbers.

23. Sum columns 1 and 2 of Line 30 and enter in Line 32, Col 1 (=R.sin r).
24. Sum columns 1 and 2 of Line 31 and enter in Line 32, Col 2 (=R.cos r), and Col 4.
25. From R.sin r and R.cos r obtain values of r (Line 33, Col 1) and R (Line 33 Col 2).
26. Obtain 2r in Line 34, Col 1 and 3r in Line 37, Col 1.
27. Obtain R^2 in Line 34 Col 2 and R^3 in Line 37 Col 2.
28. Add Lines 34 and 35 (Col 1) to obtain d_4 in Line 36.
29. Add Lines 37 and 38 (Col 1) to obtain d_6 in Line 39.
30. Multiply Lines 34 and 35 (Col 2) to obtain D_4 in Line 36.
31. Multiply Lines 37 and 38 (Col 2) to obtain D_6 in Line 39.
32. Obtain D_4.cos d_4 and insert in Line 36, Col 4.
33. Obtain D_6.cos d_6 and insert in Line 39, Col 4.
34. Finally sum Col 4, Lines 30, 31, 32, 33, 36 and 39; enter the result in Line 40.

Notes.

1. It is strongly recommended that calculations should bracket the required time and the results be plotted on any suitable squared paper. A single prediction is seldom of value as it gives no indication of the rate of rise or fall (in complicated ports it will not even be possible to ascertain whether it is rising or falling).

2. Although the box diagrams allow for entry of every step the capabilities of the calculator and the skill of the operator may enable many boxes to be left blank or placed in Memory. POLAR/RECTANGULAR conversion is particularly valuable and with this facility one can go from Line 17 to 31 without any intermediate writing down and with no ambiguity of quadrant.

3. In many cases interpolation between F1 and F2 can be carried out with sufficient accuracy by eye thus enabling Lines 13, 14, 15, 16, 24 and 25 to be omitted.

4. In order to simplify the calculation (or if being programmed to save steps and/or stores) the following approximations may be made. These are given in the order of their effect on the accuracy that with the least effect being given first:

(a) Omit lines 4 to 9. Insert the following rates in Line 18:

M_2	29.0 deg/hr
S_2	30.0 deg/hr
K_1	15.0 deg/hr
O_1	13.9 deg/hr

(b) As (a) but using the following rates:

M_2, S_2 } -29.32 deg/hr.

K_1, O_1 } -Half this figure i.e. 14.66 deg/hr.

(c) Omit interpolation of F. Hence omit Lines 13, 14, 15, 16, 24, 25 and 26 and insert Ft=F (direct from ATT Tab VII) in Line 27.

5. *Interpolation Between Tabulated Values of A and F.*

The hourly rates of change of A for each constituent can be calculated from consecutive tabulated values, care being taken to apply sufficient multiples of 360° to the tabulated values to ensure that these rates approximate to the astronomical values for each constituent - i.e. 30 deg/hr for M_2 and S_2 and 15 deg/hr for K_1 and O_1. This can be done as follows:

Daily Rate (p)=(A1+360.n) - A2

where n=o or the smallest integer which makes p>600 in the case of M_2 and S_2 and p>300 in the case of K_1 and O_1. Then for each of the four constituents:

At=A1 - (T×p)/24

(The values of A in Table VII are published in a form designed to simplify the arithmetic of the original graphical version of the Simplified Harmonic Method of Tidal Prediction (the tabulated value is 360° minus the astronomical value). The second term in the above expression is, therefore, SUBTRACTED.)

The interpolation for F for any given time is simpler:

Ft=F1 +(T×P)/24 where P=F2-F1

6. *Vectorial Addition of SD components*

The SD tide (R, r) at any time consists of the sum of the M_2 and S_2 tides. Thus:

R.sin r=H.Ft.sin(At+g) for M_2+H.Ft.sin(At+g) for S_2
R.cos r=H.Ft.cos(At+g) for M_2+H.Ft.cos(At+g) for S_2

and from this R and r may be obtained. If using a programmed calculator POLAR/RECTANGULAR conversion *must* be used to avoid ambiguity of sign or quadrant, but if the calculation is being done manually ordinary trig (and inverse trig) functions may be used provided great care is taken to resolve this ambiguity.

Shallow Water Corrections

The quarterdiurnal tide has phase ..... $d_4 = 2r + f_4$
and amplitude ..... $D_4 = R^2 \times F_4$
and the height correction due to the
quarterdiurnal effect ..... $h_4 = D_4 . \cos d_4$
The sixthdiurnal tide has phase ..... $d_6 = 3r + f_6$
and amplitude ..... $D_6 = R^3 \times F_6$
and hence height ..... $h_6 = D_6 . \cos d_6$

h4 and h6 must be summed algebraically to the combined SD and D tide to give a corrected height for the required time.

ADDITIONAL NOTES MORE APPLICABLE TO PROGRAMMABLE CALCULATORS

7. Although the boxes show a possible route through the problem this may not be the best route for every calculator.

8. If storage is limited, parameters can often be combined and placed each side of the decimal place after application of suitable multipliers e.g. g and H can be stored together: thus a g of 312 and H of 2.45 might be stored as 312.245. Strangely in some cases this not only reduces the number of stores required but also the program steps.

9. Given sufficient facilities on the calculator the following are recommended:
   (a) Automatic stepping of TIME at both fixed and variable intervals.
   (b) Ability to change Start Time of a series of predictions.
   (c) Prediction of successive days without re-entry of Harmonic Constants for each day.
   (d) Prediction for second port on same day without re-entry of astronomical data (A and F)
   (e) Recording of Harmonic Constants for any port. Steps should be allocated for amendment of carded data to allow for any changes.

Although possible to program for the derivation of a time of HW or of LW this has been found to be of little value. In a large number of ports where this method is of greatest use the curve may be so flat at these points that the actual time derived is meaningless: at ports where a double HW or LW or intermediate stand occurs there may well be ambiguity as to the point on the curve obtained. In most cases it is preferable to plot a short portion of the curve from the results of successive calculations.

10. It is sometimes more convenient to work in centimetres rather than metres provided there are no Shallow Water Corrections.

TIDE TABLES 2013

PART I

TIDAL PREDICTIONS

FOR

STANDARD PORTS

CANADA — HALIFAX

LAT 44°40'N LONG 63°35'W

TIME ZONE **+0400** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

JANUARY

	Time	m		Time	m
1 TU	0422	0.6	**16** W	0554	0.4
	1013	1.8		1111	1.8
	1644	0.3		1804	0.3
	2250	1.7		2341	1.8
2 W	0511	0.6	**17** TH	0649	0.4
	1052	1.7		1158	1.6
	1726	0.4		1855	0.4
	2327	1.7			
3 TH	0604	0.6	**18** F	0026	1.8
	1134	1.7		0743	0.5
	1813	0.4		1248	1.5
			☽	1947	0.5
4 F	0007	1.7	**19** SA	0115	1.7
	0700	0.5		0836	0.5
	1221	1.6		1343	1.4
☾	1905	0.5		2041	0.6
5 SA	0053	1.7	**20** SU	0209	1.6
	0758	0.5		0928	0.5
	1316	1.6		1448	1.4
	2001	0.5		2136	0.6
6 SU	0145	1.7	**21** M	0310	1.6
	0857	0.4		1019	0.5
	1420	1.5		1601	1.4
	2100	0.5		2231	0.7
7 M	0246	1.8	**22** TU	0413	1.6
	0957	0.3		1108	0.5
	1534	1.5		1706	1.4
	2203	0.5		2323	0.7
8 TU	0353	1.8	**23** W	0508	1.6
	1059	0.2		1154	0.4
	1646	1.6		1759	1.5
	2307	0.4			
9 W	0459	1.9	**24** TH	0008	0.6
	1159	0.1		0556	1.6
	1752	1.7		1237	0.4
				1843	1.6
10 TH	0011	0.4	**25** F	0048	0.6
	0601	2.0		0639	1.7
	1257	0.0		1316	0.3
	1851	1.8		1923	1.6
11 F	0112	0.3	**26** SA	0124	0.6
	0659	2.0		0719	1.8
	1352	0.0		1353	0.3
●	1946	1.9		1959	1.7
12 SA	0211	0.3	**27** SU	0159	0.5
	0754	2.0		0757	1.8
	1444	0.0		1428	0.2
	2038	1.9	O	2035	1.7
13 SU	0308	0.3	**28** M	0237	0.5
	0847	2.0		0835	1.8
	1534	0.0		1504	0.2
	2127	1.9		2110	1.7
14 M	0404	0.3	**29** TU	0317	0.4
	0937	1.9		0913	1.8
	1624	0.1		1540	0.2
	2214	1.9		2146	1.8
15 TU	0459	0.4	**30** W	0400	0.4
	1025	1.9		0952	1.8
	1714	0.2		1618	0.2
	2258	1.9		2221	1.8
			31 TH	0447	0.4
				1031	1.7
				1659	0.3
				2259	1.8

FEBRUARY

	Time	m		Time	m
1 F	0539	0.4	**16** SA	0658	0.5
	1114	1.7		1213	1.5
	1748	0.4		1901	0.6
	2339	1.8			
2 SA	0636	0.4	**17** SU	0033	1.7
	1201	1.6		0749	0.5
	1843	0.4		1303	1.5
			☽	1956	0.7
3 SU	0025	1.8	**18** M	0124	1.6
	0736	0.4		0840	0.6
	1253	1.6		1402	1.4
☾	1945	0.5		2052	0.7
4 M	0117	1.7	**19** TU	0223	1.5
	0838	0.4		0931	0.6
	1355	1.5		1515	1.4
	2049	0.5		2148	0.7
5 TU	0220	1.7	**20** W	0331	1.5
	0941	0.3		1022	0.5
	1511	1.5		1630	1.4
	2154	0.5		2241	0.7
6 W	0332	1.8	**21** TH	0435	1.5
	1043	0.3		1111	0.5
	1631	1.6		1727	1.5
	2259	0.5		2328	0.7
7 TH	0445	1.8	**22** F	0527	1.6
	1144	0.2		1157	0.4
	1740	1.7		1812	1.6
8 F	0003	0.4	**23** SA	0011	0.6
	0551	1.9		0611	1.7
	1242	0.1		1239	0.3
	1838	1.8		1851	1.6
9 SA	0102	0.3	**24** SU	0052	0.5
	0648	1.9		0652	1.8
	1335	0.1		1319	0.3
	1930	1.9		1927	1.7
10 SU	0158	0.3	**25** M	0132	0.4
	0741	2.0		0732	1.8
	1425	0.0		1357	0.2
●	2018	1.9	O	2002	1.7
11 M	0250	0.3	**26** TU	0213	0.3
	0830	2.0		0811	1.8
	1512	0.1		1434	0.2
	2103	2.0		2038	1.8
12 TU	0340	0.3	**27** W	0255	0.3
	0916	1.9		0850	1.8
	1557	0.1		1512	0.2
	2145	1.9		2115	1.8
13 W	0429	0.3	**28** TH	0340	0.2
	1001	1.8		0931	1.8
	1641	0.3		1552	0.2
	2226	1.9		2153	1.8
14 TH	0518	0.4			
	1045	1.8			
	1725	0.4			
	2307	1.8			
15 F	0607	0.4			
	1128	1.6			
	1811	0.5			
	2349	1.8			

MARCH

	Time	m		Time	m
1 F	0427	0.2	**16** SA	0522	0.4
	1013	1.7		1100	1.6
	1637	0.3		1725	0.6
	2233	1.8		2313	1.7
2 SA	0520	0.3	**17** SU	0607	0.5
	1057	1.7		1142	1.6
	1730	0.4		1814	0.7
	2316	1.8		2355	1.7
3 SU	0619	0.3	**18** M	0655	0.6
	1145	1.6		1227	1.5
	1833	0.4		1910	0.7
4 M	0004	1.8	**19** TU	0041	1.6
	0721	0.3		0745	0.6
	1238	1.6		1320	1.5
☾	1939	0.5	☽	2008	0.8
5 TU	0058	1.7	**20** W	0135	1.5
	0825	0.3		0837	0.6
	1340	1.5		1427	1.4
	2045	0.5		2104	0.8
6 W	0202	1.7	**21** TH	0241	1.5
	0928	0.3		0929	0.6
	1458	1.5		1544	1.5
	2150	0.5		2157	0.8
7 TH	0320	1.7	**22** F	0351	1.5
	1029	0.3		1020	0.5
	1623	1.6		1646	1.5
	2254	0.5		2248	0.7
8 F	0438	1.7	**23** SA	0450	1.6
	1129	0.2		1110	0.5
	1729	1.7		1733	1.6
	2355	0.4		2335	0.6
9 SA	0542	1.8	**24** SU	0538	1.6
	1225	0.2		1156	0.4
	1822	1.8		1812	1.7
10 SU	0051	0.3	**25** M	0020	0.5
	0636	1.9		0622	1.7
	1317	0.2		1239	0.3
	1909	1.9		1849	1.8
11 M	0143	0.3	**26** TU	0105	0.3
	0725	1.9		0704	1.8
	1404	0.2		1321	0.2
●	1952	1.9		1926	1.8
12 TU	0231	0.2	**27** W	0150	0.2
	0811	1.9		0745	1.8
	1448	0.2		1402	0.2
	2034	1.9	O	2004	1.9
13 W	0315	0.2	**28** TH	0235	0.1
	0854	1.9		0828	1.8
	1529	0.3		1445	0.2
	2114	1.9		2044	1.9
14 TH	0358	0.3	**29** F	0321	0.1
	0937	1.8		0912	1.8
	1607	0.4		1530	0.2
	2153	1.9		2127	1.9
15 F	0440	0.3	**30** SA	0411	0.1
	1019	1.7		0957	1.8
	1645	0.5		1622	0.3
	2232	1.8		2211	1.9
			31 SU	0507	0.1
				1044	1.7
				1722	0.4
				2258	1.8

APRIL

	Time	m		Time	m
1 M	0607	0.2	**16** TU	0604	0.6
	1134	1.7		1157	1.6
	1829	0.5		1827	0.8
	2348	1.8			
2 TU	0709	0.2	**17** W	0003	1.6
	1229	1.6		0653	0.6
	1937	0.5		1244	1.5
				1926	0.8
3 W	0044	1.7	**18** TH	0051	1.5
	0812	0.3		0744	0.6
	1333	1.5		1341	1.5
☾	2042	0.5	☽	2023	0.8
4 TH	0151	1.6	**19** F	0148	1.5
	0913	0.3		0837	0.6
	1451	1.5		1449	1.5
	2145	0.5		2117	0.8
5 F	0311	1.6	**20** SA	0256	1.5
	1013	0.3		0929	0.6
	1611	1.6		1553	1.6
	2246	0.4		2209	0.7
6 SA	0428	1.7	**21** SU	0403	1.5
	1111	0.3		1020	0.5
	1711	1.7		1644	1.6
	2344	0.4		2259	0.5
7 SU	0530	1.7	**22** M	0459	1.6
	1206	0.3		1110	0.4
	1759	1.8		1727	1.7
				2349	0.4
8 M	0037	0.3	**23** TU	0549	1.6
	0621	1.8		1158	0.3
	1256	0.3		1807	1.8
	1843	1.8			
9 TU	0125	0.2	**24** W	0038	0.2
	0707	1.8		0635	1.7
	1342	0.3		1245	0.3
	1924	1.9		1849	1.9
10 W	0209	0.2	**25** TH	0126	0.1
	0751	1.8		0721	1.7
	1424	0.3		1333	0.2
●	2004	1.9	O	1932	2.0
11 TH	0250	0.2	**26** F	0215	0.0
	0833	1.8		0807	1.8
	1502	0.4		1422	0.2
	2043	1.8		2017	2.0
12 F	0328	0.2	**27** SA	0305	0.0
	0915	1.7		0855	1.8
	1537	0.5		1514	0.2
	2121	1.8		2105	2.0
13 SA	0404	0.3	**28** SU	0357	0.0
	0955	1.7		0944	1.8
	1610	0.6		1612	0.3
	2200	1.8		2154	1.9
14 SU	0440	0.4	**29** M	0454	0.0
	1035	1.7		1035	1.8
	1646	0.7		1716	0.4
	2239	1.7		2244	1.9
15 M	0520	0.5	**30** TU	0553	0.1
	1115	1.6		1127	1.7
	1732	0.7		1824	0.5
	2320	1.7		2337	1.8

CANADA — HALIFAX

LAT 44°40'N LONG 63°35'W

TIME ZONE +0400 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

MAY

	Time	m		Time	m
1 W	0655	0.2	**16** TH	0609	0.6
	1223	1.7		1212	1.6
	1930	0.5		1847	0.8
2 TH	0034	1.7	**17** F	0013	1.6
	0755	0.3		0659	0.6
	1325	1.6		1259	1.6
☾	2034	0.5		1943	0.8
3 F	0140	1.6	**18** SA	0103	1.5
	0855	0.3		0750	0.6
	1435	1.6		1354	1.6
	2135	0.5	☽	2038	0.7
4 SA	0256	1.6	**19** SU	0203	1.5
	0953	0.3		0842	0.5
	1546	1.7		1452	1.6
	2233	0.4		2132	0.6
5 SU	0411	1.6	**20** M	0311	1.5
	1049	0.4		0934	0.5
	1644	1.7		1548	1.7
	2328	0.3		2225	0.5
6 M	0512	1.6	**21** TU	0417	1.5
	1143	0.4		1027	0.5
	1732	1.8		1639	1.8
				2318	0.3
7 TU	0019	0.3	**22** W	0515	1.6
	0602	1.7		1121	0.4
	1234	0.4		1727	1.9
	1815	1.8			
8 W	0105	0.2	**23** TH	0011	0.2
	0648	1.7		0607	1.6
	1320	0.4		1215	0.3
	1856	1.8		1815	1.9
9 TH	0147	0.2	**24** F	0104	0.0
	0732	1.7		0658	1.7
	1402	0.4		1309	0.3
●	1935	1.8		1905	2.0
10 F	0225	0.2	**25** SA	0156	0.0
	0814	1.7		0749	1.8
	1439	0.5		1405	0.3
	2014	1.8	○	1956	2.0
11 SA	0300	0.2	**26** SU	0249	-0.1
	0855	1.7		0840	1.8
	1511	0.6		1502	0.3
	2053	1.8		2048	2.0
12 SU	0334	0.3	**27** M	0343	-0.1
	0934	1.7		0933	1.8
	1543	0.6		1603	0.3
	2132	1.8		2140	2.0
13 M	0407	0.4	**28** TU	0439	0.0
	1012	1.7		1025	1.8
	1617	0.7		1707	0.4
	2211	1.7		2233	1.9
14 TU	0443	0.4	**29** W	0536	0.1
	1051	1.7		1117	1.8
	1659	0.8		1813	0.4
	2250	1.7		2326	1.8
15 W	0523	0.5	**30** TH	0635	0.2
	1130	1.6		1210	1.8
	1751	0.8		1916	0.4
	2330	1.6			
			31 F	0022	1.7
				0733	0.2
				1306	1.7
			☾	2017	0.4

JUNE

	Time	m		Time	m
1 SA	0122	1.6	**16** SU	0028	1.6
	0831	0.3		0710	0.5
	1406	1.7		1307	1.7
	2116	0.4	☽	2001	0.6
2 SU	0230	1.5	**17** M	0121	1.5
	0927	0.4		0802	0.5
	1509	1.7		1357	1.7
	2212	0.4		2056	0.5
3 M	0342	1.5	**18** TU	0224	1.5
	1023	0.4		0856	0.5
	1609	1.7		1454	1.7
	2305	0.3		2153	0.4
4 TU	0446	1.5	**19** W	0333	1.5
	1118	0.5		0953	0.5
	1700	1.7		1554	1.8
	2356	0.3		2250	0.3
5 W	0541	1.6	**20** TH	0441	1.6
	1210	0.5		1052	0.5
	1747	1.7		1652	1.9
				2347	0.2
6 TH	0042	0.3	**21** F	0541	1.6
	0629	1.6		1152	0.4
	1258	0.5		1749	2.0
	1830	1.7			
7 F	0124	0.2	**22** SA	0044	0.0
	0713	1.6		0638	1.7
	1339	0.5		1252	0.3
	1911	1.7		1845	2.0
8 SA	0201	0.2	**23** SU	0139	0.0
	0756	1.7		0733	1.8
	1415	0.6		1352	0.3
●	1951	1.7	○	1940	2.1
9 SU	0236	0.3	**24** M	0233	-0.1
	0836	1.7		0827	1.9
	1447	0.6		1451	0.3
	2030	1.8		2034	2.0
10 M	0309	0.3	**25** TU	0326	-0.1
	0914	1.7		0920	1.9
	1518	0.6		1551	0.3
	2109	1.8		2128	2.0
11 TU	0341	0.3	**26** W	0420	0.0
	0950	1.7		1011	1.9
	1551	0.7		1652	0.3
	2147	1.7		2220	1.9
12 W	0415	0.4	**27** TH	0515	0.1
	1027	1.7		1100	1.9
	1631	0.7		1754	0.4
	2225	1.7		2311	1.8
13 TH	0452	0.4	**28** F	0610	0.2
	1103	1.7		1149	1.9
	1718	0.7		1854	0.4
	2302	1.7			
14 F	0534	0.5	**29** SA	0002	1.7
	1141	1.7		0706	0.3
	1811	0.7		1238	1.8
	2342	1.6		1952	0.4
15 SA	0620	0.5	**30** SU	0056	1.6
	1222	1.7		0802	0.4
	1906	0.7		1330	1.7
			☾	2049	0.4

JULY

	Time	m		Time	m
1 M	0156	1.5	**16** TU	0049	1.6
	0858	0.4		0730	0.5
	1427	1.7		1316	1.7
	2144	0.4		2026	0.5
2 TU	0304	1.4	**17** W	0147	1.5
	0954	0.5		0828	0.5
	1528	1.6		1413	1.7
	2237	0.4		2126	0.4
3 W	0414	1.4	**18** TH	0256	1.5
	1050	0.5		0930	0.5
	1627	1.6		1518	1.8
	2328	0.4		2226	0.3
4 TH	0515	1.5	**19** F	0411	1.5
	1143	0.6		1033	0.5
	1720	1.6		1625	1.8
				2327	0.2
5 F	0015	0.3	**20** SA	0520	1.6
	0608	1.5		1137	0.4
	1231	0.6		1730	1.9
	1807	1.7			
6 SA	0058	0.3	**21** SU	0026	0.1
	0653	1.6		0621	1.7
	1313	0.6		1240	0.3
	1850	1.7		1830	2.0
7 SU	0136	0.3	**22** M	0122	0.0
	0735	1.6		0718	1.8
	1348	0.6		1340	0.3
	1930	1.7	○	1927	2.0
8 M	0211	0.3	**23** TU	0216	0.0
	0814	1.7		0811	1.9
	1420	0.6		1438	0.2
●	2010	1.8		2021	2.0
9 TU	0244	0.3	**24** W	0307	0.0
	0850	1.7		0902	2.0
	1451	0.6		1535	0.2
	2047	1.8		2113	2.0
10 W	0316	0.3	**25** TH	0358	0.0
	0925	1.7		0950	2.0
	1526	0.6		1631	0.3
	2124	1.8		2202	1.9
11 TH	0349	0.3	**26** F	0449	0.1
	0959	1.7		1036	2.0
	1604	0.6		1728	0.3
	2201	1.8		2250	1.8
12 F	0424	0.4	**27** SA	0541	0.2
	1034	1.7		1120	1.9
	1648	0.6		1824	0.3
	2237	1.7		2337	1.7
13 SA	0503	0.4	**28** SU	0634	0.3
	1110	1.7		1205	1.8
	1738	0.6		1920	0.4
	2316	1.7			
14 SU	0546	0.4	**29** M	0026	1.6
	1147	1.7		0729	0.4
	1831	0.6		1252	1.7
	2359	1.6	☾	2014	0.4
15 M	0636	0.5	**30** TU	0119	1.5
	1229	1.7		0824	0.5
	1928	0.5		1345	1.6
☽				2109	0.5
			31 W	0221	1.4
				0920	0.6
				1445	1.6
				2202	0.5

AUGUST

	Time	m		Time	m
1 TH	0334	1.4	**16** F	0229	1.5
	1017	0.6		0918	0.5
	1552	1.6		1452	1.7
	2253	0.5		2208	0.3
2 F	0446	1.4	**17** SA	0349	1.5
	1111	0.6		1023	0.5
	1652	1.6		1607	1.8
	2342	0.4		2310	0.2
3 SA	0543	1.5	**18** SU	0505	1.6
	1159	0.6		1128	0.4
	1744	1.6		1718	1.9
4 SU	0027	0.4	**19** M	0009	0.1
	0629	1.6		0607	1.8
	1241	0.6		1230	0.3
	1828	1.7		1819	1.9
5 M	0106	0.3	**20** TU	0105	0.1
	0710	1.6		0701	1.9
	1317	0.6		1328	0.3
	1908	1.7	○	1914	2.0
6 TU	0142	0.3	**21** W	0157	0.0
	0747	1.7		0751	2.0
	1350	0.5		1423	0.2
●	1947	1.8		2005	2.0
7 W	0216	0.3	**22** TH	0246	0.0
	0822	1.7		0838	2.0
	1424	0.5		1516	0.2
	2024	1.8		2054	2.0
8 TH	0248	0.3	**23** F	0334	0.1
	0856	1.7		0923	2.0
	1501	0.5		1607	0.2
	2100	1.8		2141	1.9
9 F	0322	0.3	**24** SA	0421	0.2
	0929	1.8		1006	1.9
	1540	0.4		1657	0.3
	2137	1.8		2226	1.8
10 SA	0357	0.3	**25** SU	0508	0.3
	1004	1.8		1048	1.9
	1623	0.4		1748	0.3
	2214	1.7		2311	1.7
11 SU	0435	0.3	**26** M	0558	0.4
	1039	1.8		1131	1.8
	1710	0.4		1840	0.4
	2253	1.7		2356	1.6
12 M	0519	0.4	**27** TU	0651	0.5
	1117	1.8		1215	1.7
	1804	0.4		1933	0.5
	2336	1.6			
13 TU	0610	0.5	**28** W	0044	1.5
	1158	1.7		0746	0.6
	1902	0.4		1304	1.6
			☾	2026	0.5
14 W	0024	1.6	**29** TH	0141	1.4
	0709	0.5		0843	0.7
	1247	1.7		1402	1.5
☽	2003	0.4		2118	0.6
15 TH	0121	1.5	**30** F	0251	1.4
	0813	0.5		0940	0.7
	1344	1.7		1511	1.5
	2106	0.4		2210	0.6
			31 SA	0409	1.4
				1033	0.7
				1620	1.5
				2259	0.5

Tilbage til Menuen

CANADA — HALIFAX

LAT 44°40'N LONG 63°35'W

TIME ZONE +0400 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

SEPTEMBER

	Time	m		Time	m
1 SU	0511	1.5	16 M	0453	1.7
	1122	0.7		1121	0.4
	1715	1.6		1708	1.8
	2346	0.5		2352	0.2
2 M	0558	1.6	17 TU	0551	1.8
	1204	0.6		1220	0.3
	1800	1.7		1807	1.9
3 TU	0028	0.4	18 W	0046	0.2
	0638	1.6		0641	1.9
	1243	0.5		1315	0.2
	1841	1.7		1859	1.9
4 W	0106	0.3	19 TH	0137	0.1
	0714	1.7		0727	1.9
	1320	0.5		1406	0.2
	1920	1.8		1948	1.9
5 TH	0142	0.3	20 F	0224	0.1
	0748	1.7		0811	2.0
	1358	0.4		1454	0.2
●	1958	1.8		2034	1.9
6 F	0217	0.2	21 SA	0309	0.2
	0822	1.8		0854	1.9
	1437	0.3		1540	0.2
	2035	1.8		2119	1.8
7 SA	0252	0.2	22 SU	0352	0.3
	0856	1.8		0935	1.9
	1518	0.3		1625	0.2
	2114	1.8		2202	1.8
8 SU	0330	0.2	23 M	0435	0.4
	0933	1.8		1016	1.8
	1602	0.3		1710	0.3
	2153	1.7		2245	1.7
9 M	0411	0.3	24 TU	0520	0.5
	1010	1.8		1057	1.8
	1650	0.3		1756	0.4
	2235	1.7		2328	1.6
10 TU	0459	0.4	25 W	0610	0.6
	1051	1.8		1140	1.7
	1745	0.3		1845	0.5
	2319	1.7			
11 W	0556	0.5	26 TH	0013	1.6
	1135	1.8		0705	0.7
	1846	0.3		1227	1.6
			☾	1935	0.6
12 TH	0008	1.6	27 F	0105	1.5
	0702	0.5		0802	0.8
	1226	1.7		1320	1.5
☽	1949	0.3		2026	0.6
13 F	0105	1.5	28 SA	0208	1.5
	0808	0.6		0858	0.8
	1325	1.7		1424	1.5
	2051	0.3		2116	0.6
14 SA	0214	1.5	29 SU	0323	1.5
	0914	0.5		0951	0.8
	1436	1.7		1535	1.5
	2153	0.3		2206	0.6
15 SU	0338	1.6	30 M	0429	1.5
	1018	0.5		1040	0.7
	1556	1.7		1637	1.5
	2254	0.3		2255	0.5

OCTOBER

	Time	m		Time	m
1 TU	0518	1.6	16 W	0530	1.8
	1125	0.6		1208	0.3
	1726	1.6		1754	1.7
	2340	0.4			
2 W	0558	1.7	17 TH	0027	0.3
	1208	0.5		0617	1.9
	1810	1.7		1300	0.2
				1843	1.8
3 TH	0023	0.4	18 F	0117	0.3
	0634	1.7		0701	1.9
	1250	0.4		1348	0.2
	1851	1.7		1930	1.8
4 F	0104	0.3	19 SA	0203	0.3
	0709	1.8		0743	1.9
	1332	0.3		1432	0.2
●	1931	1.7		2015	1.8
5 SA	0143	0.3	20 SU	0246	0.3
	0746	1.8		0824	1.9
	1415	0.2		1514	0.2
	2011	1.7		2058	1.8
6 SU	0224	0.2	21 M	0327	0.4
	0824	1.9		0905	1.8
	1459	0.1		1553	0.2
	2053	1.7		2140	1.7
7 M	0306	0.3	22 TU	0405	0.5
	0904	1.9		0945	1.8
	1545	0.1		1632	0.3
	2135	1.7		2222	1.7
8 TU	0353	0.3	23 W	0445	0.6
	0946	1.9		1026	1.7
	1636	0.1		1712	0.4
	2220	1.7		2303	1.7
9 W	0448	0.4	24 TH	0530	0.7
	1031	1.8		1108	1.7
	1733	0.2		1755	0.5
	2308	1.7		2346	1.6
10 TH	0552	0.5	25 F	0623	0.8
	1119	1.8		1152	1.6
	1834	0.2		1841	0.6
	2359	1.6			
11 F	0700	0.5	26 SA	0032	1.6
	1212	1.7		0718	0.8
	1936	0.3		1240	1.5
☽			☾	1930	0.6
12 SA	0057	1.6	27 SU	0126	1.6
	0806	0.5		0813	0.8
	1313	1.7		1335	1.5
	2037	0.3		2020	0.6
13 SU	0207	1.6	28 M	0229	1.6
	0910	0.5		0906	0.8
	1426	1.6		1441	1.5
	2137	0.3		2111	0.6
14 M	0326	1.6	29 TU	0334	1.6
	1012	0.5		0956	0.7
	1546	1.7		1548	1.5
	2236	0.3		2201	0.5
15 TU	0435	1.7	30 W	0427	1.6
	1112	0.4		1045	0.6
	1657	1.7		1645	1.5
	2333	0.3		2250	0.5
			31 TH	0511	1.7
				1133	0.4
				1734	1.6
				2339	0.4

NOVEMBER

	Time	m		Time	m
1 F	0551	1.8	16 SA	0058	0.4
	1220	0.3		0634	1.8
	1820	1.6		1328	0.2
				1912	1.7
2 SA	0026	0.4	17 SU	0144	0.4
	0630	1.8		0716	1.8
	1306	0.2		1410	0.2
	1904	1.7		1956	1.7
3 SU	0112	0.3	18 M	0226	0.5
	0711	1.9		0758	1.8
	1353	0.1		1449	0.2
●	1948	1.7		2039	1.7
4 M	0159	0.3	19 TU	0304	0.5
	0755	1.9		0839	1.8
	1440	0.0		1526	0.3
	2034	1.7		2121	1.7
5 TU	0248	0.3	20 W	0339	0.6
	0840	1.9		0919	1.8
	1530	0.0		1600	0.3
	2121	1.8		2201	1.7
6 W	0341	0.3	21 TH	0414	0.7
	0928	1.9		1000	1.7
	1623	0.0		1635	0.4
	2209	1.8		2240	1.7
7 TH	0442	0.4	22 F	0454	0.7
	1017	1.9		1040	1.7
	1720	0.1		1713	0.5
	2300	1.8		2319	1.7
8 F	0548	0.4	23 SA	0541	0.8
	1108	1.8		1121	1.6
	1820	0.2		1754	0.6
	2353	1.7			
9 SA	0655	0.5	24 SU	0001	1.7
	1203	1.8		0634	0.8
	1921	0.2		1204	1.6
				1840	0.6
10 SU	0050	1.7	25 M	0046	1.6
	0759	0.5		0728	0.8
	1304	1.7		1250	1.5
☽	2020	0.3	☾	1929	0.6
11 M	0155	1.7	26 TU	0136	1.6
	0901	0.5		0821	0.7
	1414	1.6		1346	1.5
	2119	0.3		2020	0.6
12 TU	0304	1.7	27 W	0232	1.6
	1001	0.4		0914	0.6
	1531	1.6		1450	1.5
	2217	0.3		2112	0.6
13 W	0409	1.7	28 TH	0327	1.7
	1058	0.3		1006	0.5
	1640	1.6		1557	1.5
	2313	0.4		2205	0.5
14 TH	0503	1.8	29 F	0419	1.7
	1152	0.3		1058	0.4
	1737	1.6		1656	1.5
				2258	0.5
15 F	0007	0.4	30 SA	0507	1.8
	0550	1.8		1149	0.2
	1242	0.2		1748	1.6
	1826	1.7		2351	0.4

DECEMBER

	Time	m		Time	m
1 SU	0554	1.9	16 M	0124	0.5
	1241	0.1		0654	1.7
	1837	1.7		1348	0.2
				1939	1.7
2 M	0045	0.4	17 TU	0205	0.5
	0642	1.9		0737	1.8
	1332	0.0		1426	0.2
●	1927	1.7		2021	1.7
3 TU	0138	0.3	18 W	0241	0.6
	0731	2.0		0818	1.8
	1423	0.0		1501	0.3
	2017	1.8		2101	1.7
4 W	0233	0.3	19 TH	0313	0.6
	0822	2.0		0858	1.8
	1515	-0.1		1533	0.3
	2108	1.8		2138	1.7
5 TH	0331	0.3	20 F	0345	0.7
	0914	2.0		0937	1.8
	1609	0.0		1605	0.4
	2159	1.9		2215	1.7
6 F	0433	0.3	21 SA	0420	0.7
	1006	1.9		1015	1.7
	1705	0.0		1638	0.4
	2250	1.9		2251	1.7
7 SA	0538	0.4	22 SU	0503	0.7
	1059	1.9		1053	1.7
	1803	0.1		1716	0.5
	2342	1.8		2328	1.7
8 SU	0642	0.4	23 M	0551	0.7
	1153	1.8		1131	1.6
	1901	0.2		1758	0.5
9 M	0035	1.8	24 TU	0007	1.7
	0745	0.4		0644	0.7
	1250	1.7		1213	1.6
☽	1959	0.3		1846	0.5
10 TU	0132	1.7	25 W	0049	1.7
	0844	0.4		0738	0.7
	1354	1.6		1301	1.5
	2057	0.3	☾	1937	0.6
11 W	0233	1.7	26 TH	0136	1.7
	0942	0.4		0833	0.6
	1505	1.5		1358	1.5
	2155	0.4		2031	0.6
12 TH	0336	1.7	27 F	0229	1.7
	1038	0.3		0928	0.5
	1615	1.5		1505	1.5
	2252	0.4		2127	0.6
13 F	0433	1.7	28 SA	0327	1.7
	1131	0.3		1024	0.4
	1716	1.5		1614	1.5
	2347	0.5		2225	0.5
14 SA	0524	1.7	29 SU	0426	1.8
	1221	0.3		1121	0.2
	1808	1.6		1716	1.6
				2324	0.5
15 SU	0038	0.5	30 M	0523	1.9
	0611	1.7		1217	0.1
	1307	0.2		1813	1.7
	1855	1.6			
			31 TU	0024	0.4
				0619	2.0
				1312	0.0
				1907	1.7

JAPAN HONSHU SOUTH COAST — YOKOHAMA (SHIN-YAMASHITA)

LAT 35°26'N LONG 139°40'E

TIME ZONE -0900 | TIMES AND HEIGHTS OF HIGH AND LOW WATERS | YEAR 2013

JANUARY

	Time	m		Time	m
1	0053	0.2	**16**	0126	0.3
	0726	1.8		0757	1.7
TU	1307	0.9	W	1355	0.7
	1837	1.7		1930	1.6
2	0125	0.3	**17**	0155	0.5
	0757	1.7		0824	1.7
W	1343	0.8	TH	1438	0.7
	1918	1.6		2015	1.4
3	0158	0.4	**18**	0222	0.6
	0831	1.7		0852	1.6
TH	1425	0.8	F	1529	0.7
	2007	1.5		2109	1.3
4	0235	0.5	**19**	0248	0.8
	0907	1.7		0924	1.6
F	1520	0.8	SA	1640	0.7
	2112	1.4	☽	2227	1.2
5	0319	0.7	**20**	0317	1.0
	0948	1.6		1006	1.5
SA	1635	0.8	SU	1810	0.7
☾	2244	1.3			
6	0420	0.9	**21**	0128	1.1
	1038	1.6		0432	1.1
SU	1807	0.6	M	1109	1.5
				1928	0.6
7	0052	1.3	**22**	0332	1.3
	0551	1.0		0711	1.2
M	1139	1.6	TU	1244	1.4
	1926	0.5		2026	0.5
8	0244	1.4	**23**	0402	1.4
	0726	1.1		0835	1.1
TU	1254	1.6	W	1406	1.5
	2029	0.3		2112	0.3
9	0349	1.6	**24**	0427	1.5
	0842	1.1		0928	1.1
W	1406	1.7	TH	1459	1.6
	2124	0.1		2152	0.2
10	0436	1.7	**25**	0451	1.6
	0942	1.0		1008	1.0
TH	1507	1.8	F	1539	1.7
	2213	0.0		2228	0.1
11	0516	1.8	**26**	0515	1.6
	1032	1.0		1042	0.9
F	1558	1.9	SA	1615	1.7
	2259	-0.1		2302	0.1
12	0553	1.8	**27**	0539	1.7
	1117	0.9		1114	0.8
SA	1644	1.9	SU	1649	1.8
●	2341	-0.1	O	2334	0.1
13	0628	1.8	**28**	0603	1.7
	1158	0.8		1145	0.7
SU	1727	1.9	M	1723	1.8
14	0019	0.0	**29**	0006	0.1
	0700	1.8		0629	1.8
M	1237	0.7	TU	1217	0.7
	1808	1.8		1759	1.8
15	0055	0.1	**30**	0037	0.2
	0729	1.8		0655	1.8
TU	1316	0.7	W	1250	0.6
	1848	1.7		1836	1.7
			31	0107	0.3
				0723	1.8
			TH	1324	0.6
				1916	1.7

FEBRUARY

	Time	m		Time	m
1	0139	0.4	**16**	0149	0.7
	0751	1.7		0758	1.6
F	1402	0.6	SA	1442	0.5
	2003	1.5		2041	1.3
2	0211	0.6	**17**	0210	0.8
	0822	1.7		0825	1.6
SA	1448	0.6	SU	1535	0.6
	2101	1.4		2142	1.2
3	0247	0.7	**18**	0229	1.0
	0857	1.6		0858	1.5
SU	1549	0.6	M	1656	0.6
☾	2223	1.3	☽	2333	1.1
4	0333	0.9	**19**	0233	1.1
	0941	1.6		0948	1.4
M	1722	0.5	TU	1836	0.6
5	0047	1.2	**20**	0338	1.2
	0503	1.1		0633	1.2
TU	1044	1.5	W	1135	1.3
	1902	0.4		1952	0.5
6	0257	1.4	**21**	0346	1.3
	0713	1.2		0826	1.1
W	1223	1.5	TH	1343	1.4
	2018	0.3		2046	0.4
7	0350	1.5	**22**	0404	1.4
	0840	1.1		0917	1.0
TH	1402	1.6	F	1446	1.5
	2117	0.2		2129	0.3
8	0427	1.6	**23**	0424	1.5
	0938	1.0		0953	0.9
F	1509	1.7	SA	1529	1.6
	2206	0.1		2206	0.2
9	0500	1.7	**24**	0445	1.6
	1024	0.8		1025	0.8
SA	1559	1.8	SU	1607	1.7
	2249	0.0		2241	0.2
10	0529	1.8	**25**	0507	1.7
	1104	0.7		1056	0.6
SU	1643	1.9	M	1642	1.8
●	2327	0.0		2314	0.1
11	0557	1.8	**26**	0530	1.7
	1141	0.6		1126	0.5
M	1723	1.9	TU	1718	1.8
			O	2346	0.2
12	0001	0.1	**27**	0554	1.8
	0624	1.8		1158	0.4
TU	1217	0.5	W	1755	1.8
	1802	1.8			
13	0032	0.2	**28**	0018	0.2
	0648	1.8		0620	1.8
W	1251	0.5	TH	1230	0.3
	1839	1.7		1834	1.8
14	0100	0.4			
	0711	1.7			
TH	1325	0.4			
	1916	1.6			
15	0126	0.5			
	0734	1.7			
F	1401	0.5			
	1956	1.5			

MARCH

	Time	m		Time	m
1	0049	0.4	**16**	0100	0.6
	0646	1.8		0650	1.7
F	1304	0.3	SA	1330	0.3
	1916	1.7		1942	1.5
2	0120	0.5	**17**	0124	0.8
	0713	1.7		0713	1.6
SA	1341	0.3	SU	1405	0.4
	2003	1.6		2025	1.4
3	0152	0.7	**18**	0147	0.9
	0742	1.7		0739	1.6
SU	1424	0.3	M	1448	0.5
	2100	1.4		2117	1.3
4	0226	0.9	**19**	0211	1.0
	0815	1.6		0809	1.5
M	1521	0.4	TU	1548	0.6
	2223	1.3		2235	1.2
5	0310	1.0	**20**	0240	1.1
	0857	1.5		0850	1.3
TU	1649	0.5	W	1723	0.6
☾			☽		
6	0056	1.2	**21**	0145	1.2
	0454	1.2		0557	1.2
W	1007	1.4	TH	1025	1.2
	1842	0.5		1858	0.6
7	0245	1.4	**22**	0252	1.3
	0723	1.1		0810	1.1
TH	1223	1.4	F	1310	1.3
	2005	0.4		2004	0.5
8	0329	1.5	**23**	0316	1.4
	0840	1.0		0856	0.9
F	1410	1.5	SA	1426	1.4
	2104	0.3		2053	0.4
9	0400	1.6	**24**	0338	1.5
	0929	0.8		0929	0.8
SA	1512	1.6	SU	1514	1.5
	2150	0.2		2135	0.4
10	0428	1.7	**25**	0401	1.6
	1009	0.6		1000	0.6
SU	1559	1.7	M	1554	1.6
	2230	0.2		2212	0.3
11	0455	1.7	**26**	0424	1.7
	1046	0.5		1031	0.5
M	1640	1.8	TU	1633	1.8
	2306	0.2		2248	0.3
12	0520	1.8	**27**	0449	1.7
	1120	0.4		1102	0.3
TU	1718	1.8	W	1712	1.8
●	2338	0.3	O	2323	0.4
13	0543	1.8	**28**	0515	1.8
	1153	0.3		1136	0.2
W	1754	1.8	TH	1752	1.8
				2357	0.4
14	0008	0.4	**29**	0542	1.8
	0605	1.8		1210	0.1
TH	1225	0.3	F	1834	1.8
	1829	1.7			
15	0035	0.5	**30**	0031	0.6
	0628	1.7		0609	1.8
F	1257	0.3	SA	1246	0.1
	1905	1.6		1919	1.7
			31	0105	0.7
				0639	1.8
			SU	1325	0.1
				2009	1.6

APRIL

	Time	m		Time	m
1	0140	0.8	**16**	0134	0.9
	0710	1.7		0706	1.6
M	1410	0.2	TU	1415	0.4
	2109	1.5		2100	1.4
2	0220	1.0	**17**	0207	1.0
	0746	1.6		0737	1.5
TU	1505	0.4	W	1502	0.5
	2232	1.4		2200	1.3
3	0318	1.1	**18**	0254	1.1
	0834	1.5		0820	1.3
W	1627	0.5	TH	1610	0.6
☾			☽	2321	1.3
4	0028	1.3	**19**	0504	1.1
	0518	1.1		0945	1.2
TH	1002	1.3	F	1742	0.7
	1812	0.5			
5	0156	1.4	**20**	0055	1.3
	0721	1.0		0723	1.0
F	1233	1.3	SA	1217	1.2
	1937	0.5		1903	0.6
6	0244	1.5	**21**	0155	1.4
	0825	0.8		0816	0.9
SA	1411	1.4	SU	1354	1.3
	2037	0.5		2003	0.6
7	0318	1.6	**22**	0233	1.5
	0910	0.7		0852	0.7
SU	1510	1.5	M	1452	1.5
	2123	0.5		2053	0.6
8	0346	1.6	**23**	0305	1.6
	0947	0.5		0926	0.5
M	1555	1.6	TU	1539	1.6
	2203	0.5		2137	0.6
9	0413	1.7	**24**	0334	1.7
	1023	0.3		1001	0.3
TU	1635	1.7	W	1622	1.8
	2239	0.5		2218	0.6
10	0438	1.7	**25**	0404	1.8
	1056	0.2		1036	0.1
W	1711	1.8	TH	1705	1.8
●	2312	0.6		2257	0.6
11	0502	1.8	**26**	0435	1.8
	1129	0.2		1113	0.0
TH	1747	1.7	F	1749	1.9
	2343	0.6	O	2336	0.7
12	0525	1.8	**27**	0507	1.9
	1200	0.1		1152	0.0
F	1821	1.7	SA	1835	1.8
13	0012	0.7	**28**	0015	0.8
	0549	1.7		0539	1.8
SA	1232	0.2	SU	1232	0.0
	1856	1.7		1923	1.8
14	0039	0.8	**29**	0054	0.9
	0613	1.7		0614	1.8
SU	1304	0.2	M	1315	0.0
	1933	1.6		2015	1.7
15	0107	0.9	**30**	0135	1.0
	0639	1.6		0652	1.7
M	1338	0.3	TU	1401	0.2
	2013	1.5		2113	1.6

JAPAN HONSHU SOUTH COAST — YOKOHAMA (SHIN-YAMASHITA)

LAT 35°26'N LONG 139°40'E

TIME ZONE -0900 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

MAY

	Time	m		Time	m
1 W	0224	1.0	**16** TH	0203	1.0
	0736	1.6		0723	1.5
	1455	0.3		1432	0.5
	2219	1.5		2126	1.5
2 TH ☾	0331	1.1	**17** F	0253	1.1
	0835	1.4		0811	1.4
	1602	0.5		1521	0.6
	2333	1.5		2219	1.5
3 F	0512	1.1	**18** SA ☽	0414	1.1
	1011	1.3		0927	1.3
	1727	0.6		1628	0.7
				2318	1.5
4 SA	0043	1.5	**19** SU	0604	1.0
	0650	0.9		1121	1.3
	1221	1.3		1748	0.8
	1849	0.7			
5 SU	0138	1.5	**20** M	0019	1.5
	0754	0.7		0717	0.8
	1359	1.4		1309	1.3
	1954	0.7		1902	0.8
6 M	0221	1.6	**21** TU	0113	1.6
	0841	0.6		0806	0.6
	1502	1.5		1426	1.5
	2046	0.8		2005	0.8
7 TU	0256	1.6	**22** W	0200	1.6
	0920	0.4		0849	0.4
	1549	1.6		1523	1.6
	2131	0.8		2059	0.8
8 W	0327	1.7	**23** TH	0242	1.7
	0957	0.3		0930	0.2
	1629	1.7		1614	1.7
	2211	0.8		2148	0.8
9 TH	0356	1.7	**24** F	0322	1.8
	1032	0.2		1012	0.1
	1706	1.7		1701	1.8
	2247	0.8		2234	0.9
10 F ●	0424	1.7	**25** SA ○	0401	1.8
	1105	0.1		1055	0.0
	1741	1.7		1748	1.9
	2321	0.9		2319	0.9
11 SA	0452	1.8	**26** SU	0440	1.9
	1138	0.1		1139	-0.1
	1814	1.7		1835	1.9
	2352	0.9			
12 SU	0519	1.7	**27** M	0003	0.9
	1211	0.1		0521	1.9
	1848	1.7		1223	-0.1
				1922	1.8
13 M	0023	0.9	**28** TU	0047	1.0
	0547	1.7		0603	1.8
	1244	0.2		1307	0.0
	1923	1.7		2010	1.8
14 TU	0054	1.0	**29** W	0132	1.0
	0616	1.7		0648	1.7
	1317	0.3		1353	0.2
	1959	1.6		2057	1.7
15 W	0126	1.0	**30** TH	0222	1.0
	0647	1.6		0738	1.6
	1352	0.4		1439	0.4
	2040	1.6		2144	1.6
			31 F	0322	1.0
				0840	1.5
				1530	0.6
				2232	1.6

JUNE

	Time	m		Time	m
1 SA ☾	0438	0.9	**16** SU	0332	0.9
	1001	1.4		0912	1.4
	1630	0.7		1536	0.7
	2322	1.6		2213	1.6
2 SU	0601	0.8	**17** M ☽	0448	0.9
	1147	1.3		1039	1.3
	1743	0.9		1639	0.8
				2302	1.6
3 M	0016	1.6	**18** TU	0610	0.8
	0712	0.7		1223	1.4
	1337	1.3		1758	0.9
	1857	1.0		2357	1.6
4 TU	0109	1.6	**19** W	0718	0.6
	0806	0.6		1401	1.5
	1453	1.4		1916	1.0
	2002	1.0			
5 W	0159	1.6	**20** TH	0056	1.7
	0851	0.4		0814	0.4
	1545	1.5		1514	1.6
	2057	1.0		2024	1.0
6 TH	0242	1.7	**21** F	0154	1.7
	0931	0.3		0905	0.2
	1626	1.6		1610	1.7
	2144	1.0		2124	1.1
7 F	0320	1.7	**22** SA	0249	1.8
	1009	0.2		0954	0.1
	1701	1.7		1659	1.8
	2225	1.0		2218	1.0
8 SA	0355	1.7	**23** SU	0339	1.9
	1045	0.2		1043	0.0
	1734	1.7		1745	1.9
	2302	1.0	○	2307	1.0
9 SU	0428	1.8	**24** M	0427	1.9
	1120	0.2		1130	0.0
	1805	1.7		1828	1.9
●	2337	1.0		2353	1.0
10 M	0500	1.8	**25** TU	0514	1.9
	1154	0.2		1215	0.0
	1836	1.7		1908	1.9
11 TU	0009	1.0	**26** W	0037	0.9
	0532	1.8		0600	1.9
	1227	0.2		1257	0.1
	1907	1.7		1947	1.8
12 W	0041	1.0	**27** TH	0121	0.9
	0604	1.7		0647	1.8
	1300	0.3		1338	0.3
	1939	1.7		2023	1.8
13 TH	0115	1.0	**28** F	0207	0.9
	0639	1.7		0736	1.7
	1333	0.3		1416	0.4
	2013	1.7		2057	1.7
14 F	0152	1.0	**29** SA	0256	0.8
	0718	1.6		0831	1.5
	1408	0.4		1454	0.6
	2050	1.7		2131	1.7
15 SA	0236	1.0	**30** SU ☾	0354	0.8
	0807	1.5		0936	1.4
	1448	0.6		1534	0.8
	2129	1.6		2208	1.7

JULY

	Time	m		Time	m
1 M	0505	0.8	**16** TU ☽	0355	0.8
	1101	1.3		1009	1.4
	1626	1.0		1547	0.9
	2252	1.6		2202	1.7
2 TU	0622	0.7	**17** W	0512	0.7
	1302	1.3		1149	1.4
	1746	1.1		1701	1.1
	2348	1.6		2254	1.7
3 W	0728	0.6	**18** TH	0636	0.6
	1450	1.4		1350	1.4
	1916	1.2		1837	1.2
4 TH	0057	1.6	**19** F	0002	1.7
	0822	0.5		0748	0.4
	1544	1.5		1515	1.6
	2029	1.2		2003	1.2
5 F	0203	1.6	**20** SA	0121	1.7
	0908	0.4		0849	0.3
	1622	1.6		1609	1.7
	2124	1.1		2112	1.2
6 SA	0255	1.7	**21** SU	0233	1.8
	0950	0.3		0944	0.1
	1653	1.7		1653	1.8
	2209	1.1		2208	1.1
7 SU	0337	1.7	**22** M	0333	1.9
	1028	0.3		1034	0.1
	1722	1.7		1731	1.9
	2247	1.0		2256	1.0
8 M	0414	1.8	**23** TU	0424	1.9
	1104	0.2		1120	0.0
	1749	1.8		1807	1.9
●	2322	1.0	○	2340	0.9
9 TU	0449	1.8	**24** W	0512	2.0
	1139	0.2		1202	0.1
	1816	1.8		1840	1.9
	2354	1.0			
10 W	0523	1.8	**25** TH	0021	0.8
	1211	0.2		0557	1.9
	1843	1.8		1240	0.2
				1911	1.9
11 TH	0026	0.9	**26** F	0101	0.7
	0557	1.8		0641	1.9
	1243	0.3		1315	0.4
	1911	1.8		1940	1.9
12 F	0059	0.9	**27** SA	0141	0.7
	0633	1.7		0726	1.7
	1314	0.4		1347	0.6
	1940	1.8		2007	1.8
13 SA	0134	0.8	**28** SU	0223	0.7
	0713	1.7		0813	1.6
	1346	0.5		1416	0.7
	2011	1.8		2034	1.8
14 SU	0212	0.8	**29** M	0310	0.7
	0759	1.6		0907	1.5
	1420	0.6		1445	0.9
	2043	1.8		2104	1.7
15 M	0257	0.8	**30** TU ☾	0410	0.7
	0856	1.5		1017	1.3
	1458	0.8		1518	1.1
	2120	1.7		2141	1.6
			31 W	0527	0.7
				1213	1.3
				1619	1.2
				2232	1.6

AUGUST

	Time	m		Time	m
1 TH	0647	0.7	**16** F	0606	0.6
	1452	1.4		1359	1.5
	1836	1.3		1820	1.3
	2356	1.5		2326	1.6
2 F	0754	0.6	**17** SA	0733	0.5
	1540	1.5		1515	1.6
	2013	1.3		2001	1.2
3 SA	0135	1.5	**18** SU	0114	1.6
	0846	0.5		0840	0.4
	1610	1.6		1558	1.7
	2113	1.2		2108	1.1
4 SU	0241	1.6	**19** M	0236	1.7
	0931	0.4		0935	0.3
	1635	1.7		1634	1.8
	2156	1.1		2159	1.0
5 M	0327	1.7	**20** TU	0335	1.9
	1010	0.3		1023	0.2
	1700	1.7		1705	1.9
	2232	1.0		2242	0.8
6 TU	0405	1.8	**21** W	0424	2.0
	1046	0.3		1105	0.2
	1723	1.8		1735	1.9
	2304	0.9	○	2322	0.7
7 W	0441	1.8	**22** TH	0508	2.0
	1120	0.3		1143	0.3
	1747	1.8		1803	1.9
●	2336	0.8			
8 TH	0515	1.9	**23** F	0000	0.6
	1152	0.3		0550	2.0
	1812	1.9		1217	0.4
				1829	1.9
9 F	0007	0.8	**24** SA	0036	0.5
	0550	1.9		0631	1.9
	1222	0.4		1248	0.5
	1837	1.9		1854	1.9
10 SA	0038	0.7	**25** SU	0112	0.5
	0627	1.8		0711	1.8
	1253	0.4		1316	0.7
	1903	1.9		1918	1.9
11 SU	0111	0.7	**26** M	0149	0.5
	0706	1.8		0754	1.7
	1323	0.6		1343	0.9
	1930	1.9		1942	1.8
12 M	0146	0.6	**27** TU	0230	0.6
	0751	1.7		0842	1.5
	1355	0.7		1408	1.0
	1959	1.8		2009	1.7
13 TU	0226	0.6	**28** W ☾	0319	0.7
	0844	1.6		0942	1.4
	1429	0.9		1434	1.1
	2032	1.8		2042	1.6
14 W ☽	0317	0.6	**29** TH	0428	0.7
	0953	1.5		1118	1.3
	1510	1.0		1511	1.3
	2111	1.7		2128	1.5
15 TH	0430	0.6	**30** F	0559	0.7
	1137	1.4		1433	1.4
	1618	1.2		1809	1.3
	2204	1.7		2300	1.5
			31 SA	0720	0.7
				1516	1.5
				2007	1.3

JAPAN HONSHU SOUTH COAST — YOKOHAMA (SHIN-YAMASHITA)

LAT 35°26'N LONG 139°40'E

TIME ZONE -0900 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

SEPTEMBER

	Time	m		Time	m
1 SU	0116	1.5	16 M	0126	1.6
	0820	0.6		0827	0.5
	1541	1.6		1530	1.7
	2102	1.1		2101	1.0
2 M	0229	1.6	17 TU	0242	1.7
	0907	0.5		0920	0.4
	1604	1.7		1601	1.8
	2139	1.0		2144	0.8
3 TU	0316	1.7	18 W	0335	1.8
	0946	0.5		1004	0.4
	1625	1.7		1630	1.9
	2212	0.9		2223	0.6
4 W	0355	1.8	19 TH	0421	1.9
	1022	0.4		1043	0.4
	1647	1.8		1656	1.9
	2242	0.8		2300	0.5
5 TH	0431	1.9	20 F	0502	2.0
	1056	0.4		1118	0.5
	1710	1.9		1722	1.9
●	2312	0.7		2335	0.4
6 F	0506	1.9	21 SA	0542	1.9
	1128	0.4		1151	0.6
	1734	1.9		1746	1.9
	2343	0.6			
7 SA	0542	1.9	22 SU	0010	0.4
	1159	0.5		0620	1.9
	1758	1.9		1221	0.7
				1809	1.9
8 SU	0014	0.5	23 M	0044	0.4
	0620	1.9		0658	1.8
	1230	0.6		1249	0.9
	1824	1.9		1833	1.9
9 M	0047	0.4	24 TU	0118	0.4
	0701	1.8		0738	1.7
	1302	0.7		1315	1.0
	1850	1.9		1857	1.8
10 TU	0122	0.4	25 W	0154	0.5
	0746	1.7		0821	1.6
	1333	0.8		1342	1.1
	1919	1.9		1924	1.7
11 W	0202	0.5	26 TH	0236	0.6
	0839	1.6		0914	1.5
	1407	1.0		1411	1.2
	1951	1.8		1954	1.6
12 TH	0252	0.5	27 F	0332	0.7
	0951	1.5		1029	1.4
	1450	1.2		1454	1.3
	2031	1.7	☾	2036	1.5
13 F	0403	0.6	28 SA	0456	0.8
	1143	1.4		1239	1.4
	1608	1.3		1745	1.3
☽	2130	1.6		2206	1.4
14 SA	0546	0.6	29 SU	0628	0.8
	1353	1.5		1415	1.5
	1832	1.3		1952	1.2
	2320	1.5			
15 SU	0720	0.6	30 M	0047	1.4
	1453	1.6		0738	0.7
	2005	1.2		1450	1.6
				2040	1.1

OCTOBER

	Time	m		Time	m
1 TU	0211	1.5	16 W	0242	1.7
	0830	0.7		0854	0.7
	1516	1.6		1519	1.8
	2114	0.9		2124	0.6
2 W	0301	1.6	17 TH	0334	1.8
	0913	0.6		0938	0.7
	1539	1.7		1548	1.8
	2145	0.8		2201	0.5
3 TH	0341	1.7	18 F	0417	1.9
	0951	0.6		1017	0.7
	1603	1.8		1615	1.9
	2215	0.6		2237	0.3
4 F	0419	1.8	19 SA	0457	1.9
	1027	0.6		1053	0.8
	1627	1.9		1641	1.9
	2245	0.5		2311	0.3
5 SA	0457	1.9	20 SU	0535	1.9
	1101	0.6		1126	0.8
	1652	1.9		1707	1.9
●	2317	0.4		2345	0.2
6 SU	0535	2.0	21 M	0611	1.9
	1135	0.7		1157	0.9
	1719	2.0		1732	1.9
	2350	0.3			
7 M	0615	1.9	22 TU	0018	0.2
	1209	0.8		0648	1.8
	1746	2.0		1227	1.0
				1757	1.9
8 TU	0026	0.2	23 W	0051	0.3
	0659	1.9		0725	1.7
	1243	0.9		1256	1.0
	1815	1.9		1823	1.8
9 W	0103	0.3	24 TH	0126	0.4
	0747	1.8		0804	1.7
	1318	1.0		1326	1.1
	1846	1.9		1851	1.7
10 TH	0145	0.3	25 F	0203	0.5
	0843	1.7		0850	1.6
	1358	1.1		1400	1.2
	1922	1.8		1923	1.6
11 F	0236	0.4	26 SA	0247	0.6
	0955	1.6		0945	1.5
	1450	1.2		1450	1.2
	2007	1.7		2004	1.5
12 SA	0344	0.6	27 SU	0347	0.7
	1132	1.5		1057	1.5
	1625	1.3		1645	1.3
☽	2120	1.5	☾	2122	1.4
13 SU	0520	0.7	28 M	0511	0.8
	1308	1.5		1221	1.5
	1836	1.2		1907	1.2
	2333	1.5		2350	1.3
14 M	0653	0.7	29 TU	0635	0.8
	1407	1.6		1326	1.5
	1953	1.0		2003	1.0
15 TU	0132	1.5	30 W	0138	1.4
	0801	0.7		0739	0.8
	1447	1.7		1408	1.6
	2043	0.8		2039	0.8
			31 TH	0240	1.5
				0830	0.8
				1441	1.7
				2112	0.6

NOVEMBER

	Time	m		Time	m
1 F	0326	1.7	16 SA	0417	1.7
	0914	0.8		0951	0.9
	1512	1.8		1537	1.8
	2144	0.5		2215	0.2
2 SA	0408	1.8	17 SU	0455	1.8
	0955	0.8		1029	1.0
	1542	1.9		1607	1.9
	2218	0.3		2251	0.2
3 SU	0449	1.9	18 M	0531	1.8
	1035	0.8		1105	1.0
	1612	1.9		1636	1.9
●	2254	0.2	O	2325	0.2
4 M	0531	1.9	19 TU	0605	1.8
	1113	0.9		1138	1.0
	1644	2.0		1704	1.9
	2331	0.1		2358	0.2
5 TU	0614	1.9	20 W	0638	1.8
	1151	0.9		1210	1.0
	1716	2.0		1733	1.8
6 W	0010	0.1	21 TH	0031	0.2
	0700	1.9		0711	1.8
	1230	1.0		1241	1.0
	1751	1.9		1802	1.8
7 TH	0051	0.1	22 F	0104	0.3
	0749	1.8		0746	1.7
	1311	1.1		1313	1.1
	1828	1.9		1833	1.7
8 F	0135	0.2	23 SA	0138	0.4
	0843	1.7		0823	1.7
	1357	1.1		1349	1.1
	1910	1.8		1907	1.6
9 SA	0225	0.4	24 SU	0214	0.5
	0943	1.6		0905	1.6
	1456	1.2		1435	1.1
	2003	1.6		1949	1.5
10 SU	0324	0.5	25 M	0256	0.6
	1050	1.6		0952	1.6
	1623	1.2		1545	1.1
☽	2124	1.5		2053	1.4
11 M	0439	0.7	26 TU	0351	0.8
	1200	1.6		1047	1.6
	1809	1.1		1737	1.1
	2326	1.4	☾	2240	1.3
12 TU	0605	0.8	27 W	0508	0.9
	1301	1.6		1146	1.6
	1925	0.9		1903	0.9
13 W	0124	1.4	28 TH	0044	1.3
	0720	0.9		0630	0.9
	1350	1.7		1243	1.6
	2017	0.7		1954	0.7
14 TH	0240	1.5	29 F	0212	1.4
	0819	0.9		0738	0.9
	1430	1.7		1334	1.7
	2100	0.5		2035	0.5
15 F	0334	1.6	30 SA	0312	1.6
	0908	0.9		0835	0.9
	1505	1.8		1419	1.7
	2139	0.4		2115	0.3

DECEMBER

	Time	m		Time	m
1 SU	0400	1.7	16 M	0455	1.7
	0925	1.0		1012	1.0
	1500	1.8		1544	1.8
	2155	0.2		2235	0.2
2 M	0445	1.8	17 TU	0527	1.7
	1011	1.0		1050	1.0
	1539	1.9		1618	1.8
	2236	0.0	O	2310	0.1
3 TU	0529	1.9	18 W	0556	1.8
	1056	1.0		1124	1.0
	1619	2.0		1650	1.8
●	2318	-0.1		2343	0.1
4 W	0614	1.9	19 TH	0625	1.8
	1139	1.0		1156	1.0
	1659	2.0		1721	1.8
5 TH	0001	-0.1	20 F	0015	0.1
	0658	1.9		0654	1.8
	1222	1.0		1227	1.0
	1740	1.9		1752	1.8
6 F	0044	0.0	21 SA	0046	0.2
	0742	1.8		0723	1.7
	1305	1.0		1259	0.9
	1823	1.9		1824	1.7
7 SA	0127	0.1	22 SU	0117	0.3
	0827	1.8		0753	1.7
	1353	1.0		1333	0.9
	1910	1.7		1859	1.6
8 SU	0211	0.3	23 M	0148	0.4
	0911	1.7		0826	1.7
	1446	1.0		1412	0.9
	2005	1.6		1940	1.5
9 M	0257	0.5	24 TU	0221	0.5
	0956	1.6		0901	1.7
	1554	1.0		1500	0.9
	2116	1.4		2033	1.4
10 TU	0348	0.7	25 W	0259	0.7
	1045	1.6		0941	1.6
	1720	0.9		1608	0.9
☽	2255	1.3	☾	2149	1.3
11 W	0455	0.9	26 TH	0349	0.8
	1139	1.6		1027	1.6
	1844	0.8		1740	0.8
				2338	1.2
12 TH	0103	1.3	27 F	0506	1.0
	0618	1.0		1121	1.6
	1237	1.6		1900	0.7
	1947	0.6			
13 F	0242	1.4	28 SA	0142	1.3
	0735	1.1		0639	1.0
	1335	1.6		1224	1.6
	2037	0.5		1959	0.5
14 SA	0339	1.5	29 SU	0304	1.5
	0838	1.1		0758	1.1
	1424	1.7		1329	1.7
	2119	0.3		2050	0.3
15 SU	0421	1.6	30 M	0359	1.6
	0929	1.1		0901	1.1
	1507	1.7		1427	1.7
	2158	0.2		2138	0.1
			31 TU	0443	1.7
				0956	1.0
				1522	1.8
				2225	0.0

UNITED STATES — SAN FRANCISCO (GOLDEN GATE)

LAT 37°48'N LONG 122°28'W

TIME ZONE +0800 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

JANUARY

	Time	m		Time	m
1 TU	0230	1.6	16 W	0302	1.8
	0735	0.8		0854	0.5
	1323	1.6		1450	1.5
	1950	0.1		2047	0.2
2 W	0306	1.6	17 TH	0345	1.8
	0830	0.8		1001	0.5
	1413	1.5		1559	1.3
	2030	0.2		2135	0.4
3 TH	0344	1.6	18 F	0430	1.7
	0932	0.7		1112	0.4
	1515	1.3		1723	1.2
	2114	0.3	☽	2230	0.6
4 F	0426	1.7	19 SA	0517	1.7
	1041	0.5		1221	0.3
	1633	1.2		1857	1.2
☾	2206	0.5		2332	0.8
5 SA	0512	1.8	20 SU	0607	1.7
	1149	0.4		1322	0.2
	1807	1.2		2019	1.2
	2306	0.6			
6 SU	0602	1.9	21 M	0036	0.9
	1253	0.2		0656	1.8
	1940	1.2		1415	0.2
				2120	1.3
7 M	0012	0.7	22 TU	0136	0.9
	0655	2.0		0745	1.8
	1352	0.0		1459	0.1
	2056	1.3		2207	1.3
8 TU	0118	0.8	23 W	0228	0.9
	0749	2.0		0830	1.8
	1445	-0.2		1537	0.0
	2155	1.4		2245	1.4
9 W	0219	0.8	24 TH	0313	0.9
	0842	2.1		0912	1.8
	1535	-0.3		1611	0.0
	2246	1.5		2317	1.5
10 TH	0317	0.8	25 F	0354	0.8
	0935	2.2		0952	1.9
	1622	-0.4		1642	-0.1
	2332	1.6		2347	1.5
11 F	0412	0.7	26 SA	0432	0.8
	1026	2.2		1030	1.9
	1707	-0.4		1712	-0.1
●			O		
12 SA	0016	1.6	27 SU	0015	1.5
	0506	0.7		0508	0.8
	1117	2.1		1109	1.8
	1752	-0.4		1742	-0.1
13 SU	0058	1.7	28 M	0044	1.6
	0559	0.6		0546	0.7
	1207	2.0		1148	1.8
	1835	-0.3		1812	0.0
14 M	0139	1.7	29 TU	0113	1.6
	0654	0.6		0626	0.6
	1258	1.9		1229	1.7
	1918	-0.1		1845	0.0
15 TU	0221	1.8	30 W	0144	1.7
	0752	0.6		0711	0.6
	1352	1.7		1314	1.6
	2001	0.1		1920	0.2
			31 TH	0218	1.7
				0801	0.5
				1406	1.5
				1958	0.3

FEBRUARY

	Time	m		Time	m
1 F	0256	1.7	16 SA	0328	1.7
	0859	0.4		1015	0.4
	1509	1.3		1655	1.2
	2042	0.5		2148	0.8
2 SA	0339	1.8	17 SU	0415	1.6
	1005	0.3		1124	0.3
	1629	1.2		1830	1.2
	2134	0.6	☽	2255	0.9
3 SU	0430	1.8	18 M	0510	1.6
	1117	0.2		1232	0.3
	1806	1.2		1953	1.2
☾	2240	0.8			
4 M	0528	1.9	19 TU	0008	0.9
	1228	0.1		0609	1.6
	1939	1.2		1332	0.2
	2357	0.8		2051	1.3
5 TU	0630	1.9	20 W	0114	0.9
	1332	0.0		0708	1.6
	2048	1.3		1421	0.2
				2133	1.3
6 W	0110	0.8	21 TH	0208	0.9
	0733	2.0		0801	1.7
	1429	-0.2		1502	0.1
	2142	1.5		2206	1.4
7 TH	0216	0.8	22 F	0254	0.8
	0833	2.0		0850	1.7
	1520	-0.2		1537	0.1
	2227	1.6		2236	1.5
8 F	0314	0.7	23 SA	0335	0.7
	0928	2.1		0934	1.8
	1606	-0.3		1609	0.0
	2308	1.6		2303	1.5
9 SA	0407	0.6	24 SU	0412	0.6
	1021	2.0		1016	1.8
	1649	-0.2		1640	0.0
●	2346	1.7		2330	1.6
10 SU	0457	0.5	25 M	0448	0.5
	1111	2.0		1058	1.8
	1729	-0.2		1711	0.1
			O	2357	1.6
11 M	0023	1.8	26 TU	0526	0.4
	0546	0.4		1140	1.7
	1159	1.9		1742	0.1
	1809	-0.1			
12 TU	0059	1.8	27 W	0026	1.7
	0634	0.4		0606	0.3
	1248	1.8		1225	1.6
	1848	0.1		1816	0.2
13 W	0134	1.8	28 TH	0058	1.8
	0724	0.4		0650	0.2
	1338	1.6		1314	1.6
	1927	0.2		1852	0.3
14 TH	0210	1.8			
	0816	0.4			
	1433	1.4			
	2008	0.4			
15 F	0247	1.7			
	0912	0.4			
	1536	1.3			
	2054	0.6			

MARCH

	Time	m		Time	m
1 F	0133	1.8	16 SA	0152	1.7
	0739	0.2		0827	0.2
	1410	1.4		1520	1.3
	1933	0.5		2019	0.7
2 SA	0214	1.8	17 SU	0232	1.6
	0834	0.1		0920	0.2
	1515	1.3		1630	1.2
	2020	0.6		2114	0.8
3 SU	0301	1.8	18 M	0318	1.6
	0938	0.1		1021	0.2
	1636	1.2		1752	1.2
	2119	0.7		2224	0.9
4 M	0357	1.8	19 TU	0414	1.5
	1049	0.1		1128	0.3
	1806	1.2		1908	1.2
☾	2235	0.8	☽	2342	0.9
5 TU	0503	1.8	20 W	0518	1.5
	1202	0.0		1232	0.2
	1926	1.3		2002	1.3
	2359	0.9			
6 W	0614	1.8	21 TH	0050	0.9
	1309	0.0		0626	1.5
	2027	1.4		1327	0.2
				2042	1.3
7 TH	0114	0.8	22 F	0145	0.8
	0723	1.8		0728	1.5
	1408	-0.1		1412	0.2
	2116	1.5		2115	1.4
8 F	0218	0.6	23 SA	0231	0.6
	0827	1.9		0824	1.6
	1458	-0.1		1451	0.2
	2158	1.6		2143	1.5
9 SA	0313	0.5	24 SU	0311	0.5
	0925	1.9		0915	1.6
	1543	-0.1		1527	0.2
	2235	1.7		2211	1.6
10 SU	0402	0.4	25 M	0349	0.4
	1018	1.9		1002	1.6
	1624	0.0		1601	0.2
	2310	1.8		2240	1.7
11 M	0447	0.3	26 TU	0426	0.2
	1107	1.8		1049	1.6
	1702	0.1		1635	0.2
●	2343	1.8		2309	1.7
12 TU	0531	0.2	27 W	0505	0.1
	1155	1.7		1137	1.6
	1740	0.2		1710	0.3
			O	2342	1.8
13 W	0015	1.8	28 TH	0547	0.0
	0613	0.2		1226	1.6
	1242	1.6		1748	0.4
	1817	0.3			
14 TH	0046	1.8	29 F	0017	1.9
	0655	0.1		0632	-0.1
	1330	1.5		1319	1.5
	1854	0.5		1829	0.5
15 F	0118	1.7	30 SA	0056	1.9
	0739	0.2		0721	-0.2
	1422	1.4		1417	1.4
	1934	0.6		1915	0.6
			31 SU	0141	1.9
				0815	-0.2
				1523	1.3
				2010	0.7

APRIL

	Time	m		Time	m
1 M	0233	1.8	16 TU	0230	1.5
	0917	-0.1		0927	0.1
	1637	1.3		1708	1.2
	2118	0.8		2155	0.9
2 TU	0334	1.7	17 W	0325	1.4
	1024	-0.1		1025	0.2
	1752	1.3		1808	1.2
☾	2242	0.8		2311	0.9
3 W	0444	1.6	18 TH	0428	1.3
	1134	0.0		1125	0.2
	1900	1.4		1859	1.3
			☽		
4 TH	0006	0.7	19 F	0019	0.8
	0601	1.6		0539	1.3
	1240	0.0		1221	0.2
	1955	1.5		1939	1.4
5 F	0117	0.6	20 SA	0115	0.7
	0715	1.6		0650	1.3
	1338	0.0		1311	0.2
	2041	1.6		2014	1.5
6 SA	0217	0.5	21 SU	0202	0.5
	0823	1.6		0756	1.3
	1428	0.1		1356	0.2
	2121	1.7		2046	1.6
7 SU	0308	0.3	22 M	0244	0.3
	0923	1.6		0855	1.4
	1513	0.1		1437	0.3
	2158	1.7		2117	1.7
8 M	0354	0.2	23 TU	0324	0.1
	1017	1.6		0950	1.4
	1554	0.2		1518	0.3
	2231	1.8		2150	1.8
9 TU	0436	0.0	24 W	0405	-0.1
	1107	1.6		1043	1.5
	1632	0.3		1558	0.4
	2302	1.8		2225	1.9
10 W	0515	0.0	25 TH	0446	-0.2
	1155	1.5		1135	1.5
	1710	0.4		1639	0.5
●	2331	1.8	O	2303	1.9
11 TH	0552	-0.1	26 F	0530	-0.4
	1241	1.5		1228	1.5
	1747	0.5		1723	0.5
				2343	2.0
12 F	0001	1.7	27 SA	0617	-0.4
	0630	-0.1		1322	1.5
	1327	1.4		1810	0.6
	1825	0.6			
13 SA	0032	1.7	28 SU	0028	1.9
	0708	-0.1		0706	-0.4
	1415	1.3		1420	1.4
	1905	0.7		1903	0.7
14 SU	0106	1.6	29 M	0117	1.9
	0750	0.0		0800	-0.4
	1507	1.3		1520	1.4
	1950	0.8		2006	0.8
15 M	0145	1.6	30 TU	0213	1.8
	0835	0.0		0857	-0.3
	1605	1.2		1623	1.4
	2045	0.9		2120	0.8

UNITED STATES — SAN FRANCISCO (GOLDEN GATE)

LAT 37°48'N LONG 122°28'W

TIME ZONE +0800 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

MAY

	Time	m		Time	m
1 W	0316	1.6	**16** TH	0244	1.4
	0959	-0.2		0932	0.1
	1726	1.5		1709	1.3
	2243	0.7		2232	0.8
2 TH	0428	1.5	**17** F	0344	1.3
	1102	-0.1		1023	0.2
	1824	1.6		1752	1.4
☾			☽	2339	0.7
3 F	0003	0.6	**18** SA	0454	1.2
	0547	1.4		1115	0.2
	1204	0.0		1833	1.5
	1915	1.6			
4 SA	0112	0.4	**19** SU	0038	0.6
	0706	1.4		0611	1.2
	1301	0.2		1208	0.3
	2001	1.7		1912	1.6
5 SU	0210	0.3	**20** M	0129	0.4
	0818	1.4		0728	1.2
	1352	0.2		1259	0.4
	2041	1.7		1949	1.7
6 M	0300	0.1	**21** TU	0215	0.2
	0922	1.4		0839	1.2
	1439	0.4		1348	0.5
	2118	1.8		2027	1.8
7 TU	0343	0.0	**22** W	0300	-0.1
	1018	1.4		0942	1.3
	1522	0.5		1436	0.5
	2151	1.8		2107	1.9
8 W	0423	-0.1	**23** TH	0344	-0.3
	1109	1.4		1040	1.4
	1603	0.5		1524	0.6
	2222	1.8		2149	2.0
9 TH	0459	-0.2	**24** F	0429	-0.4
	1156	1.4		1134	1.4
	1642	0.6		1612	0.6
●	2253	1.8	O	2232	2.0
10 F	0534	-0.2	**25** SA	0515	-0.5
	1240	1.4		1226	1.5
	1720	0.7		1703	0.7
	2323	1.7		2319	2.0
11 SA	0608	-0.2	**26** SU	0603	-0.6
	1323	1.3		1318	1.5
	1800	0.8		1756	0.7
	2356	1.7			
12 SU	0644	-0.2	**27** M	0008	2.0
	1406	1.3		0652	-0.5
	1841	0.8		1410	1.5
				1854	0.7
13 M	0031	1.6	**28** TU	0101	1.9
	0721	-0.2		0743	-0.5
	1450	1.3		1503	1.6
	1926	0.9		1959	0.7
14 TU	0110	1.6	**29** W	0158	1.8
	0801	-0.1		0836	-0.3
	1535	1.3		1557	1.6
	2019	0.9		2113	0.7
15 W	0154	1.5	**30** TH	0301	1.6
	0845	0.0		0931	-0.2
	1622	1.3		1650	1.6
	2122	0.9		2231	0.6
			31 F	0412	1.4
				1028	0.0
				1742	1.7
			☾	2347	0.5

JUNE

	Time	m		Time	m
1 SA	0531	1.3	**16** SU	0418	1.2
	1125	0.2		1020	0.3
	1832	1.7		1733	1.6
			☽	2356	0.5
2 SU	0056	0.3	**17** M	0540	1.1
	0654	1.2		1113	0.4
	1221	0.3		1816	1.7
	1917	1.8			
3 M	0154	0.2	**18** TU	0054	0.3
	0813	1.2		0708	1.1
	1314	0.5		1209	0.5
	2000	1.8		1900	1.8
4 TU	0245	0.0	**19** W	0147	0.1
	0920	1.2		0829	1.2
	1405	0.6		1307	0.6
	2038	1.8		1946	1.9
5 W	0329	-0.1	**20** TH	0237	-0.2
	1018	1.3		0937	1.2
	1452	0.7		1403	0.7
	2114	1.8		2034	2.0
6 TH	0408	-0.2	**21** F	0326	-0.3
	1108	1.3		1034	1.3
	1537	0.7		1459	0.7
	2148	1.8		2123	2.1
7 F	0443	-0.2	**22** SA	0413	-0.5
	1152	1.3		1126	1.4
	1618	0.8		1553	0.7
	2222	1.8		2213	2.1
8 SA	0516	-0.2	**23** SU	0501	-0.5
	1233	1.4		1214	1.5
	1658	0.8		1648	0.7
●	2256	1.8	O	2303	2.1
9 SU	0549	-0.2	**24** M	0548	-0.5
	1310	1.4		1301	1.6
	1738	0.8		1744	0.7
	2330	1.7		2355	2.0
10 M	0622	-0.2	**25** TU	0635	-0.5
	1347	1.4		1347	1.6
	1819	0.9		1843	0.7
11 TU	0007	1.7	**26** W	0049	2.0
	0656	-0.2		0722	-0.4
	1422	1.4		1433	1.7
	1902	0.9		1946	0.6
12 W	0045	1.6	**27** TH	0145	1.8
	0731	-0.1		0810	-0.2
	1458	1.4		1520	1.7
	1950	0.9		2054	0.6
13 TH	0127	1.5	**28** F	0246	1.6
	0809	0.0		0900	0.0
	1535	1.4		1608	1.7
	2045	0.8		2206	0.5
14 F	0214	1.4	**29** SA	0354	1.4
	0849	0.1		0951	0.2
	1613	1.5		1656	1.8
	2147	0.8	☾	2319	0.4
15 SA	0310	1.3	**30** SU	0513	1.2
	0932	0.2		1045	0.4
	1653	1.5		1744	1.8
	2253	0.6			

JULY

	Time	m		Time	m
1 M	0029	0.3	**16** TU	0524	1.1
	0641	1.2		1031	0.6
	1143	0.5		1730	1.8
	1832	1.8			
2 TU	0130	0.2	**17** W	0020	0.2
	0805	1.2		0659	1.1
	1241	0.7		1134	0.7
	1918	1.8		1822	1.9
3 W	0224	0.1	**18** TH	0120	0.0
	0914	1.2		0823	1.2
	1337	0.8		1241	0.8
	2002	1.8		1917	2.0
4 TH	0309	0.0	**19** F	0216	-0.1
	1010	1.3		0927	1.3
	1429	0.8		1345	0.8
	2043	1.8		2013	2.1
5 F	0349	-0.1	**20** SA	0308	-0.3
	1056	1.3		1020	1.4
	1516	0.8		1446	0.8
	2122	1.8		2107	2.1
6 SA	0424	-0.1	**21** SU	0357	-0.4
	1135	1.4		1107	1.5
	1559	0.9		1543	0.7
	2159	1.8		2201	2.2
7 SU	0457	-0.2	**22** M	0444	-0.4
	1210	1.4		1150	1.6
	1639	0.9		1638	0.6
●	2236	1.8	O	2253	2.1
8 M	0528	-0.2	**23** TU	0529	-0.4
	1242	1.4		1232	1.7
	1718	0.8		1732	0.6
	2312	1.8		2346	2.0
9 TU	0559	-0.1	**24** W	0613	-0.3
	1313	1.5		1313	1.7
	1756	0.8		1828	0.5
	2349	1.7			
10 W	0630	-0.1	**25** TH	0038	1.9
	1343	1.5		0657	-0.2
	1837	0.8		1355	1.8
				1925	0.5
11 TH	0028	1.7	**26** F	0133	1.7
	0701	0.0		0741	0.0
	1413	1.5		1437	1.8
	1920	0.8		2026	0.5
12 F	0109	1.6	**27** SA	0231	1.6
	0735	0.0		0826	0.2
	1446	1.6		1520	1.8
	2010	0.7		2131	0.4
13 SA	0155	1.5	**28** SU	0338	1.4
	0811	0.2		0915	0.4
	1521	1.6		1605	1.8
	2106	0.6		2240	0.4
14 SU	0250	1.3	**29** M	0456	1.2
	0851	0.3		1009	0.6
	1559	1.7		1653	1.8
	2208	0.5	☾	2350	0.3
15 M	0358	1.2	**30** TU	0626	1.2
	0937	0.4		1110	0.7
	1642	1.7		1744	1.8
☽	2315	0.4			
			31 W	0056	0.2
				0750	1.2
				1215	0.8
				1837	1.8

AUGUST

	Time	m		Time	m
1 TH	0153	0.2	**16** F	0056	0.0
	0857	1.3		0811	1.3
	1316	0.9		1234	0.9
	1928	1.8		1859	2.0
2 F	0241	0.1	**17** SA	0156	-0.1
	0947	1.3		0909	1.4
	1411	0.9		1342	0.8
	2016	1.8		2001	2.0
3 SA	0322	0.0	**18** SU	0249	-0.2
	1028	1.4		0956	1.5
	1459	0.9		1442	0.7
	2100	1.8		2100	2.1
4 SU	0358	0.0	**19** M	0337	-0.2
	1102	1.4		1038	1.6
	1541	0.8		1537	0.6
	2140	1.8		2155	2.1
5 M	0430	0.0	**20** TU	0422	-0.2
	1132	1.5		1117	1.7
	1620	0.8		1629	0.5
	2219	1.8	O	2248	2.0
6 TU	0500	0.0	**21** W	0504	-0.2
	1200	1.5		1155	1.8
	1657	0.7		1719	0.4
●	2258	1.8		2339	2.0
7 W	0530	0.0	**22** TH	0546	0.0
	1227	1.6		1233	1.8
	1733	0.7		1809	0.3
	2336	1.8			
8 TH	0559	0.1	**23** F	0031	1.8
	1255	1.6		0627	0.1
	1811	0.6		1310	1.8
				1900	0.3
9 F	0016	1.7	**24** SA	0124	1.7
	0629	0.1		0709	0.3
	1324	1.6		1348	1.8
	1852	0.6		1953	0.3
10 SA	0059	1.6	**25** SU	0220	1.5
	0702	0.2		0753	0.5
	1356	1.7		1428	1.8
	1939	0.5		2050	0.3
11 SU	0147	1.5	**26** M	0324	1.4
	0738	0.3		0841	0.6
	1431	1.7		1511	1.7
	2031	0.4		2152	0.3
12 M	0245	1.4	**27** TU	0439	1.3
	0818	0.5		0937	0.8
	1512	1.8		1559	1.7
	2132	0.4		2300	0.3
13 TU	0356	1.2	**28** W	0605	1.2
	0906	0.6		1044	0.9
	1559	1.8		1654	1.7
	2239	0.3	☾		
14 W	0524	1.2	**29** TH	0008	0.3
	1007	0.8		0725	1.3
	1654	1.8		1155	0.9
☽	2349	0.2		1754	1.6
15 TH	0656	1.2	**30** F	0110	0.2
	1120	0.8		0825	1.3
	1756	1.9		1300	0.9
				1853	1.7
			31 SA	0201	0.2
				0910	1.4
				1355	0.9
				1948	1.7

Tilbage til Menuen

UNITED STATES — SAN FRANCISCO (GOLDEN GATE)

LAT 37°48'N LONG 122°28'W

TIME ZONE +0800 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

SEPTEMBER

	Time	m		Time	m
1 SU	0244	0.2	16 M	0224	0.0
	0946	1.4		0924	1.6
	1441	0.8		1442	0.5
	2037	1.7		2056	1.9
2 M	0321	0.2	17 TU	0312	0.0
	1016	1.5		1003	1.7
	1521	0.7		1533	0.4
	2122	1.8		2152	1.9
3 TU	0354	0.1	18 W	0355	0.0
	1043	1.6		1040	1.8
	1558	0.6		1620	0.2
	2204	1.8		2245	1.9
4 W	0424	0.2	19 TH	0436	0.1
	1110	1.6		1115	1.9
	1634	0.5		1706	0.2
	2245	1.7	○	2336	1.8
5 TH	0454	0.2	20 F	0516	0.2
	1136	1.6		1149	1.9
	1709	0.4		1750	0.1
●	2326	1.7			
6 F	0524	0.2	21 SA	0027	1.7
	1204	1.7		0556	0.4
	1747	0.3		1223	1.9
				1835	0.1
7 SA	0009	1.6	22 SU	0118	1.6
	0556	0.3		0637	0.5
	1234	1.7		1258	1.8
	1828	0.3		1920	0.1
8 SU	0056	1.6	23 M	0212	1.5
	0631	0.4		0720	0.7
	1308	1.8		1335	1.8
	1913	0.2		2009	0.2
9 M	0149	1.5	24 TU	0312	1.4
	0709	0.5		0809	0.8
	1347	1.8		1417	1.7
	2005	0.2		2103	0.2
10 TU	0250	1.4	25 W	0421	1.3
	0754	0.7		0908	0.9
	1432	1.8		1505	1.6
	2104	0.2		2204	0.2
11 W	0403	1.3	26 TH	0536	1.3
	0850	0.8		1020	0.9
	1525	1.8		1602	1.6
	2211	0.1	☾	2310	0.3
12 TH	0527	1.3	27 F	0645	1.3
	1001	0.9		1135	0.9
	1628	1.8		1707	1.5
☽	2323	0.1			
13 F	0646	1.3	28 SA	0013	0.3
	1124	0.9		0739	1.4
	1738	1.8		1241	0.9
				1813	1.5
14 SA	0031	0.0	29 SU	0108	0.3
	0750	1.4		0819	1.4
	1240	0.8		1334	0.8
	1849	1.8		1916	1.5
15 SU	0132	0.0	30 M	0154	0.3
	0840	1.5		0852	1.5
	1345	0.7		1419	0.6
	1955	1.9		2011	1.6

OCTOBER

	Time	m		Time	m
1 TU	0233	0.2	16 W	0242	0.2
	0922	1.6		0926	1.8
	1458	0.5		1527	0.2
	2101	1.6		2153	1.6
2 W	0308	0.3	17 TH	0326	0.3
	0949	1.6		1001	1.9
	1535	0.4		1611	0.0
	2148	1.6		2246	1.6
3 TH	0342	0.3	18 F	0407	0.4
	1017	1.7		1035	1.9
	1610	0.3		1652	-0.1
	2234	1.6	○	2337	1.6
4 F	0415	0.4	19 SA	0447	0.5
	1045	1.8		1108	1.9
	1647	0.1		1732	-0.1
●	2320	1.6			
5 SA	0448	0.4	20 SU	0026	1.6
	1116	1.8		0527	0.6
	1725	0.0		1140	1.9
				1811	-0.1
6 SU	0008	1.6	21 M	0115	1.5
	0524	0.5		0608	0.7
	1150	1.9		1213	1.8
	1807	-0.1		1852	-0.1
7 M	0058	1.5	22 TU	0205	1.4
	0603	0.6		0651	0.8
	1228	1.9		1249	1.7
	1854	-0.1		1934	0.0
8 TU	0154	1.5	23 W	0258	1.4
	0647	0.7		0740	0.9
	1311	1.9		1330	1.6
	1945	-0.1		2020	0.1
9 W	0256	1.4	24 TH	0355	1.3
	0740	0.8		0839	0.9
	1401	1.8		1416	1.6
	2043	-0.1		2112	0.2
10 TH	0405	1.4	25 F	0455	1.3
	0845	0.9		0950	0.9
	1500	1.8		1511	1.5
	2147	0.0		2209	0.2
11 F	0517	1.4	26 SA	0552	1.4
	1007	0.9		1106	0.9
	1609	1.7		1616	1.4
☽	2256	0.0	☾	2308	0.3
12 SA	0623	1.5	27 SU	0639	1.4
	1131	0.8		1212	0.8
	1725	1.6		1726	1.3
13 SU	0002	0.1	28 M	0004	0.3
	0719	1.6		0719	1.5
	1245	0.7		1306	0.7
	1841	1.6		1837	1.3
14 M	0102	0.1	29 TU	0053	0.3
	0806	1.7		0753	1.6
	1346	0.5		1352	0.5
	1952	1.6		1943	1.4
15 TU	0155	0.1	30 W	0137	0.4
	0848	1.8		0824	1.6
	1439	0.3		1432	0.4
	2055	1.6		2041	1.4
			31 TH	0218	0.4
				0855	1.7
				1510	0.2
				2135	1.4

NOVEMBER

	Time	m		Time	m
1 F	0257	0.5	16 SA	0340	0.6
	0927	1.8		1000	1.9
	1547	0.0		1639	-0.2
	2227	1.5		2339	1.5
2 SA	0335	0.5	17 SU	0422	0.7
	1000	1.9		1033	1.9
	1626	-0.1		1716	-0.2
	2317	1.5	○		
3 SU	0415	0.6	18 M	0025	1.5
	1036	2.0		0503	0.8
	1707	-0.2		1106	1.9
●				1752	-0.2
4 M	0007	1.5	19 TU	0109	1.5
	0457	0.7		0544	0.8
	1115	2.0		1139	1.8
	1751	-0.3		1828	-0.2
5 TU	0059	1.5	20 W	0153	1.4
	0542	0.7		0627	0.9
	1159	2.0		1215	1.7
	1838	-0.3		1905	-0.1
6 W	0154	1.5	21 TH	0236	1.4
	0633	0.8		0713	0.9
	1247	2.0		1254	1.6
	1929	-0.3		1945	0.0
7 TH	0251	1.5	22 F	0321	1.4
	0732	0.8		0807	0.9
	1341	1.9		1338	1.6
	2024	-0.2		2028	0.1
8 F	0351	1.5	23 SA	0406	1.4
	0844	0.9		0910	0.9
	1443	1.7		1428	1.4
	2124	-0.1		2114	0.2
9 SA	0452	1.6	24 SU	0450	1.4
	1006	0.8		1020	0.9
	1553	1.6		1527	1.3
☽	2226	0.0		2203	0.2
10 SU	0549	1.6	25 M	0533	1.5
	1128	0.7		1128	0.8
	1712	1.5		1637	1.2
	2328	0.1	☾	2255	0.3
11 M	0641	1.7	26 TU	0613	1.6
	1240	0.5		1227	0.6
	1833	1.4		1755	1.2
				2348	0.4
12 TU	0027	0.2	27 W	0651	1.6
	0728	1.8		1317	0.5
	1341	0.3		1913	1.2
	1949	1.4			
13 W	0121	0.3	28 TH	0039	0.5
	0810	1.9		0728	1.7
	1433	0.2		1402	0.2
	2056	1.4		2024	1.2
14 TH	0211	0.4	29 F	0128	0.6
	0849	1.9		0805	1.8
	1519	0.0		1444	0.1
	2156	1.5		2126	1.3
15 F	0257	0.5	30 SA	0215	0.6
	0926	1.9		0844	1.9
	1601	-0.1		1525	-0.2
	2250	1.5		2221	1.4

DECEMBER

	Time	m		Time	m
1 SU	0301	0.7	16 M	0404	0.8
	0924	2.0		1008	1.9
	1608	-0.3		1701	-0.2
	2313	1.5			
2 M	0348	0.7	17 TU	0016	1.5
	1007	2.1		0445	0.9
	1651	-0.4		1042	1.9
●			○	1734	-0.2
3 TU	0002	1.5	18 W	0054	1.5
	0436	0.8		0525	0.9
	1052	2.1		1117	1.8
	1737	-0.5		1807	-0.2
4 W	0052	1.6	19 TH	0129	1.5
	0527	0.8		0606	0.9
	1140	2.1		1153	1.8
	1824	-0.5		1840	-0.1
5 TH	0141	1.6	20 F	0203	1.5
	0622	0.8		0648	0.9
	1231	2.0		1230	1.7
	1913	-0.4		1914	0.0
6 F	0232	1.6	21 SA	0237	1.5
	0724	0.8		0734	0.9
	1327	1.9		1311	1.6
	2004	-0.3		1950	0.0
7 SA	0323	1.6	22 SU	0312	1.5
	0834	0.8		0827	0.9
	1429	1.7		1356	1.5
	2057	-0.1		2027	0.2
8 SU	0415	1.7	23 M	0349	1.5
	0952	0.7		0926	0.8
	1538	1.5		1449	1.3
	2153	0.1		2108	0.3
9 M	0508	1.7	24 TU	0428	1.6
	1111	0.5		1032	0.7
	1657	1.4		1555	1.2
☽	2251	0.2		2154	0.4
10 TU	0558	1.8	25 W	0508	1.6
	1224	0.4		1136	0.6
	1823	1.3		1716	1.1
	2350	0.4	☾	2246	0.5
11 W	0647	1.9	26 TH	0551	1.7
	1327	0.2		1235	0.4
	1946	1.3		1848	1.1
				2343	0.6
12 TH	0048	0.5	27 F	0636	1.8
	0733	1.9		1329	0.2
	1422	0.1		2012	1.2
	2058	1.3			
13 F	0143	0.6	28 SA	0043	0.7
	0815	1.9		0723	1.9
	1508	-0.1		1418	0.0
	2158	1.4		2119	1.3
14 SA	0233	0.7	29 SU	0141	0.8
	0855	1.9		0810	2.0
	1550	-0.1		1505	-0.2
	2250	1.4		2214	1.4
15 SU	0320	0.8	30 M	0237	0.8
	0932	1.9		0859	2.1
	1627	-0.2		1551	-0.3
	2335	1.5		2303	1.5
			31 TU	0330	0.8
				0948	2.2
				1636	-0.5
				2348	1.6

PANAMA — BALBOA

LAT 8°57'N LONG 79°34'W

TIME ZONE +0500 | TIMES AND HEIGHTS OF HIGH AND LOW WATERS | YEAR 2013

JANUARY

	Time	m		Time	m
1	0005	0.5	16	0045	-0.2
	0607	4.5		0703	4.9
TU	1219	0.2	W	1305	-0.2
	1833	4.6		1928	5.0
2	0043	0.5	17	0132	0.1
	0644	4.4		0748	4.6
W	1257	0.3	TH	1352	0.2
	1908	4.6		2012	4.7
3	0125	0.6	18	0222	0.4
	0723	4.4		0834	4.2
TH	1338	0.5	F	1441	0.5
	1946	4.5	☽	2058	4.4
4	0211	0.7	19	0314	0.7
	0806	4.2		0925	3.9
F	1425	0.6	SA	1534	0.9
☾	2030	4.4		2149	4.1
5	0303	0.8	20	0410	0.9
	0856	4.1		1025	3.6
SA	1518	0.8	SU	1630	1.2
	2123	4.3		2249	3.8
6	0401	0.8	21	0508	1.1
	0959	4.0		1135	3.5
SU	1619	0.9	M	1731	1.3
	2228	4.3		2354	3.7
7	0505	0.8	22	0610	1.1
	1113	4.0		1242	3.5
M	1725	0.9	TU	1835	1.3
	2341	4.3			
8	0612	0.6	23	0054	3.8
	1225	4.1		0712	1.0
TU	1835	0.8	W	1338	3.7
				1937	1.2
9	0049	4.5	24	0146	3.9
	0720	0.4		0807	0.8
W	1330	4.4	TH	1425	3.8
	1943	0.5		2029	1.0
10	0150	4.8	25	0231	4.1
	0821	0.0		0853	0.5
TH	1429	4.7	F	1507	4.1
	2044	0.2		2114	0.7
11	0248	5.0	26	0313	4.2
	0915	-0.3		0933	0.3
F	1524	5.0	SA	1545	4.3
●	2137	-0.1	O	2154	0.5
12	0343	5.2	27	0353	4.4
	1004	-0.6		1011	0.1
SA	1618	5.2	SU	1623	4.4
	2226	-0.3		2231	0.3
13	0436	5.2	28	0432	4.5
	1050	-0.7		1046	-0.1
SU	1709	5.3	M	1659	4.6
	2313	-0.4		2307	0.1
14	0528	5.2	29	0510	4.6
	1135	-0.6		1121	-0.1
M	1758	5.3	TU	1734	4.7
	2358	-0.4		2343	0.1
15	0616	5.1	30	0547	4.6
	1220	-0.5		1157	-0.1
TU	1844	5.2	W	1809	4.8
			31	0021	0.1
				0624	4.6
			TH	1234	0.0
				1845	4.8

FEBRUARY

	Time	m		Time	m
1	0101	0.1	16	0145	0.2
	0703	4.5		0758	4.2
F	1314	0.1	SA	1403	0.5
	1923	4.7		2016	4.3
2	0145	0.2	17	0232	0.5
	0745	4.4		0840	3.9
SA	1400	0.3	SU	1451	0.8
	2006	4.5	☽	2059	4.0
3	0235	0.4	18	0323	0.8
	0833	4.2		0930	3.5
SU	1452	0.5	M	1544	1.1
☾	2056	4.4		2151	3.7
4	0333	0.5	19	0420	1.0
	0933	4.0		1036	3.4
M	1553	0.7	TU	1645	1.3
	2200	4.2		2259	3.5
5	0438	0.6	20	0522	1.2
	1047	3.9		1154	3.3
TU	1702	0.8	W	1753	1.4
	2317	4.1			
6	0549	0.6	21	0012	3.5
	1207	4.0		0629	1.1
W	1816	0.8	TH	1300	3.4
				1900	1.3
7	0033	4.2	22	0112	3.6
	0700	0.4		0730	0.9
TH	1317	4.2	F	1352	3.7
	1928	0.5		1959	1.0
8	0140	4.4	23	0202	3.8
	0805	0.1		0822	0.6
F	1417	4.5	SA	1435	3.9
	2031	0.2		2047	0.7
9	0238	4.7	24	0246	4.1
	0901	-0.2		0905	0.3
SA	1512	4.8	SU	1514	4.2
	2124	-0.1		2128	0.4
10	0333	4.9	25	0326	4.3
	0949	-0.5		0944	0.1
SU	1603	5.0	M	1551	4.5
●	2212	-0.4	O	2206	0.1
11	0423	5.0	26	0406	4.5
	1034	-0.6		1021	-0.2
M	1651	5.2	TU	1628	4.7
	2255	-0.5		2243	-0.2
12	0511	5.1	27	0445	4.7
	1116	-0.6		1057	-0.3
TU	1736	5.2	W	1705	4.8
	2338	-0.5		2320	-0.3
13	0555	5.0	28	0524	4.8
	1157	-0.5		1134	-0.3
W	1818	5.1	TH	1743	4.9
				2358	-0.3
14	0019	-0.3			
	0638	4.8			
TH	1237	-0.2			
	1858	4.9			
15	0101	-0.1			
	0718	4.5			
F	1319	0.1			
	1937	4.6			

MARCH

	Time	m		Time	m
1	0604	4.8	16	0031	-0.1
	1212	-0.2		0648	4.4
F	1822	4.9	SA	1248	0.2
				1902	4.5
2	0038	-0.2	17	0111	0.2
	0645	4.7		0725	4.2
SA	1254	-0.1	SU	1329	0.5
	1903	4.8		1938	4.3
3	0123	-0.1	18	0153	0.5
	0729	4.5		0803	3.9
SU	1340	0.2	M	1413	0.8
	1947	4.6		2017	4.0
4	0214	0.1	19	0241	0.8
	0818	4.3		0847	3.7
M	1434	0.4	TU	1505	1.1
☾	2039	4.4	☽	2103	3.7
5	0312	0.4	20	0335	1.0
	0918	4.1		0943	3.4
TU	1537	0.6	W	1604	1.3
	2144	4.1		2205	3.5
6	0419	0.5	21	0436	1.2
	1032	3.9		1057	3.4
W	1647	0.8	TH	1711	1.4
	2304	4.0		2322	3.4
7	0530	0.6	22	0541	1.2
	1154	3.9		1211	3.4
TH	1802	0.8	F	1819	1.3
8	0024	4.1	23	0031	3.5
	0643	0.5		0645	1.0
F	1305	4.1	SA	1309	3.7
	1914	0.6		1920	1.1
9	0131	4.3	24	0126	3.8
	0748	0.2		0742	0.8
SA	1404	4.4	SU	1354	4.0
	2017	0.2		2013	0.7
10	0228	4.5	25	0212	4.1
	0844	0.0		0830	0.5
SU	1456	4.7	M	1435	4.3
	2109	-0.1		2057	0.3
11	0319	4.7	26	0254	4.3
	0931	-0.3		0913	0.2
M	1544	4.9	TU	1515	4.6
●	2154	-0.3		2138	0.0
12	0406	4.8	27	0336	4.6
	1014	-0.4		0953	-0.1
TU	1628	5.0	W	1554	4.8
	2235	-0.5	O	2217	-0.3
13	0450	4.9	28	0418	4.8
	1053	-0.4		1032	-0.3
W	1710	5.0	TH	1635	5.0
	2314	-0.5		2256	-0.5
14	0532	4.8	29	0500	4.9
	1131	-0.3		1111	-0.4
TH	1749	5.0	F	1717	5.1
	2353	-0.3		2336	-0.5
15	0611	4.7	30	0544	5.0
	1209	-0.1		1152	-0.3
F	1826	4.8	SA	1801	5.1
			31	0019	-0.5
				0630	4.9
			SU	1236	-0.2
				1846	5.0

APRIL

	Time	m		Time	m
1	0105	-0.3	16	0121	0.5
	0717	4.7		0735	4.1
M	1326	0.1	TU	1343	0.9
	1935	4.8		1944	4.1
2	0158	0.0	17	0206	0.8
	0809	4.5		0815	3.9
TU	1422	0.4	W	1432	1.2
☾	2029	4.4		2027	3.8
3	0257	0.3	18	0256	1.0
	0909	4.3		0903	3.7
W	1526	0.6	TH	1529	1.3
	2135	4.2	☽	2120	3.6
4	0403	0.5	19	0353	1.2
	1022	4.1		1004	3.6
TH	1636	0.8	F	1630	1.4
	2254	4.0		2229	3.5
5	0513	0.6	20	0453	1.2
	1140	4.1		1114	3.7
F	1748	0.8	SA	1734	1.3
				2342	3.6
6	0012	4.1	21	0555	1.1
	0622	0.6		1217	3.8
SA	1249	4.3	SU	1835	1.1
	1857	0.6			
7	0118	4.2	22	0042	3.8
	0727	0.5		0654	0.9
SU	1346	4.5	M	1308	4.1
	1958	0.4		1932	0.8
8	0213	4.4	23	0133	4.1
	0822	0.2		0749	0.7
M	1435	4.7	TU	1353	4.4
	2049	0.1		2021	0.4
9	0301	4.6	24	0219	4.4
	0909	0.1		0838	0.4
TU	1520	4.8	W	1437	4.8
	2133	-0.1		2107	0.0
10	0346	4.7	25	0305	4.7
	0951	0.0		0923	0.1
W	1601	4.9	TH	1521	5.0
●	2213	-0.2	O	2150	-0.3
11	0427	4.7	26	0351	4.9
	1029	-0.1		1006	-0.2
TH	1641	4.9	F	1607	5.2
	2250	-0.2		2233	-0.5
12	0507	4.7	27	0438	5.1
	1106	0.0		1050	-0.3
F	1719	4.8	SA	1654	5.3
	2327	-0.2		2316	-0.6
13	0545	4.6	28	0527	5.2
	1143	0.2		1134	-0.3
SA	1755	4.7	SU	1743	5.3
14	0003	0.0	29	0001	-0.5
	0621	4.4		0617	5.1
SU	1220	0.4	M	1222	-0.1
	1831	4.5		1833	5.2
15	0041	0.2	30	0050	-0.3
	0658	4.3		0708	5.0
M	1300	0.6	TU	1313	0.1
	1907	4.3		1926	4.9

PANAMA — BALBOA

LAT 8°57'N LONG 79°34'W

TIME ZONE +0500 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

MAY

	Time	m		Time	m
1	0144	-0.1	**16**	0136	0.7
W	0802	4.8	TH	0749	4.1
	1411	0.4		1404	1.1
	2022	4.6		1959	4.0
2	0242	0.2	**17**	0222	0.9
TH	0901	4.6	F	0831	4.0
☾	1514	0.6	☽	1455	1.2
	2126	4.3		2045	3.9
3	0346	0.5	**18**	0313	1.1
F	1007	4.4	SA	0920	4.0
	1621	0.8		1551	1.3
	2239	4.1		2142	3.7
4	0451	0.7	**19**	0408	1.2
SA	1119	4.3	SU	1019	4.0
	1729	0.8		1650	1.2
	2353	4.1		2249	3.7
5	0557	0.7	**20**	0506	1.2
SU	1225	4.4	M	1122	4.1
	1834	0.7		1749	1.1
				2355	3.9
6	0058	4.2	**21**	0606	1.0
M	0659	0.7	TU	1221	4.3
	1321	4.5		1848	0.9
	1934	0.6			
7	0152	4.3	**22**	0053	4.1
TU	0755	0.6	W	0706	0.9
	1409	4.6		1313	4.6
	2025	0.4		1945	0.5
8	0239	4.4	**23**	0145	4.4
W	0843	0.5	TH	0802	0.6
	1453	4.7		1403	4.9
	2110	0.2		2037	0.2
9	0323	4.5	**24**	0236	4.8
TH	0926	0.4	F	0854	0.3
●	1533	4.8	O	1452	5.1
	2149	0.1		2125	-0.2
10	0403	4.5	**25**	0327	5.0
F	1005	0.4	SA	0943	0.0
	1612	4.8		1543	5.3
	2226	0.1		2212	-0.5
11	0443	4.5	**26**	0419	5.2
SA	1043	0.4	SU	1031	-0.2
	1650	4.7		1635	5.4
	2302	0.1		2259	-0.6
12	0521	4.5	**27**	0512	5.3
SU	1119	0.5	M	1119	-0.2
	1727	4.6		1729	5.4
	2338	0.2		2346	-0.5
13	0558	4.5	**28**	0604	5.3
M	1157	0.6	TU	1208	-0.1
	1804	4.5		1822	5.3
14	0015	0.3	**29**	0035	-0.4
TU	0635	4.4	W	0657	5.2
	1236	0.8		1300	0.1
	1841	4.4		1915	5.1
15	0054	0.5	**30**	0128	-0.1
W	0711	4.3	TH	0750	5.1
	1317	0.9		1356	0.3
	1919	4.2		2010	4.8
			31	0224	0.2
			F	0845	4.9
				1457	0.5
			☾	2109	4.5

JUNE

	Time	m		Time	m
1	0323	0.5	**16**	0237	0.9
SA	0945	4.7	SU	0843	4.3
	1559	0.7		1514	1.1
	2215	4.3	☽	2104	4.0
2	0424	0.7	**17**	0328	1.0
SU	1049	4.5	M	0933	4.2
	1702	0.8		1609	1.1
	2325	4.1		2203	3.9
3	0525	0.9	**18**	0423	1.1
M	1153	4.4	TU	1033	4.3
	1804	0.9		1707	1.0
				2310	4.0
4	0030	4.1	**19**	0523	1.1
TU	0626	1.0	W	1137	4.4
	1251	4.4		1809	0.9
	1903	0.8			
5	0126	4.1	**20**	0016	4.1
W	0724	1.0	TH	0627	0.9
	1340	4.5		1238	4.6
	1957	0.7		1911	0.6
6	0215	4.2	**21**	0116	4.4
TH	0816	0.9	F	0731	0.7
	1425	4.5		1335	4.8
	2044	0.5		2010	0.2
7	0259	4.3	**22**	0212	4.7
F	0901	0.8	SA	0830	0.4
	1506	4.6		1430	5.1
	2126	0.4		2104	-0.1
8	0340	4.4	**23**	0307	5.0
SA	0942	0.7	SU	0924	0.1
	1545	4.6		1525	5.3
●	2204	0.3	O	2154	-0.4
9	0420	4.4	**24**	0402	5.2
SU	1021	0.6	M	1015	-0.1
	1625	4.6		1620	5.4
	2241	0.2		2242	-0.5
10	0459	4.5	**25**	0457	5.4
M	1058	0.6	TU	1104	-0.2
	1703	4.6		1715	5.4
	2317	0.3		2330	-0.6
11	0536	4.5	**26**	0550	5.5
TU	1136	0.7	W	1153	-0.2
	1741	4.6		1809	5.4
	2353	0.3			
12	0613	4.5	**27**	0018	-0.4
W	1214	0.7	TH	0642	5.4
	1819	4.5		1243	-0.1
				1901	5.2
13	0030	0.5	**28**	0108	-0.2
TH	0648	4.5	F	0732	5.3
	1254	0.9		1336	0.2
	1856	4.4		1952	4.9
14	0109	0.6	**29**	0200	0.1
F	0724	4.4	SA	0822	5.0
	1336	1.0		1432	0.4
	1934	4.2	☾	2045	4.6
15	0151	0.8	**30**	0255	0.5
SA	0801	4.3	SU	0915	4.8
	1423	1.1		1529	0.7
	2015	4.1		2143	4.3

JULY

	Time	m		Time	m
1	0352	0.8	**16**	0253	0.9
M	1013	4.5	TU	0856	4.4
	1628	0.9		1532	0.9
	2248	4.1		2126	4.1
2	0450	1.0	**17**	0348	1.0
TU	1115	4.3	W	0954	4.4
	1728	1.0		1632	0.9
	2355	3.9		2233	4.0
3	0549	1.2	**18**	0450	1.0
W	1216	4.2	TH	1102	4.4
	1828	1.0		1737	0.9
				2346	4.1
4	0056	3.9	**19**	0558	1.0
TH	0649	1.2	F	1212	4.5
	1310	4.3		1844	0.7
	1926	1.0			
5	0149	4.0	**20**	0054	4.4
F	0746	1.2	SA	0707	0.8
	1357	4.3		1316	4.7
	2017	0.8		1948	0.4
6	0235	4.1	**21**	0155	4.6
SA	0837	1.1	SU	0812	0.5
	1441	4.4		1415	5.0
	2102	0.6		2046	0.0
7	0317	4.3	**22**	0252	4.9
SU	0921	0.9	M	0909	0.2
	1522	4.5	O	1512	5.2
	2142	0.5		2138	-0.3
8	0357	4.4	**23**	0347	5.2
M	1000	0.8	TU	1000	-0.1
	1602	4.5		1607	5.4
●	2219	0.3		2226	-0.5
9	0435	4.5	**24**	0441	5.4
TU	1038	0.6	W	1048	-0.3
	1641	4.6		1700	5.4
	2255	0.3		2312	-0.6
10	0512	4.6	**25**	0532	5.5
W	1115	0.6	TH	1135	-0.3
	1719	4.6		1752	5.4
	2330	0.2		2358	-0.5
11	0548	4.6	**26**	0620	5.5
TH	1151	0.6	F	1222	-0.2
	1756	4.6		1840	5.2
12	0006	0.3	**27**	0044	-0.2
F	0622	4.7	SA	0707	5.3
	1229	0.6		1310	0.0
	1832	4.5		1928	5.0
13	0043	0.4	**28**	0132	0.1
SA	0656	4.6	SU	0753	5.1
	1308	0.7		1401	0.3
	1908	4.4		2015	4.6
14	0122	0.6	**29**	0222	0.5
SU	0731	4.6	M	0840	4.8
	1351	0.8		1454	0.6
	1947	4.3	☾	2106	4.3
15	0204	0.7	**30**	0315	0.8
M	0810	4.5	TU	0932	4.4
	1439	0.9		1549	0.9
☽	2032	4.2		2204	4.0
			31	0411	1.1
			W	1030	4.1
				1648	1.1
				2313	3.7

AUGUST

	Time	m		Time	m
1	0511	1.3	**16**	0427	1.0
TH	1136	4.0	F	1038	4.3
	1749	1.2		1713	0.9
				2326	4.1
2	0022	3.7	**17**	0539	1.0
F	0614	1.4	SA	1156	4.4
	1237	4.0		1824	0.7
	1851	1.2			
3	0120	3.8	**18**	0040	4.3
SA	0716	1.4	SU	0651	0.8
	1331	4.1		1305	4.6
	1948	1.0		1931	0.5
4	0209	4.0	**19**	0143	4.6
SU	0811	1.2	M	0757	0.5
	1417	4.2		1406	4.8
	2036	0.8		2030	0.1
5	0251	4.2	**20**	0239	4.9
M	0857	1.0	TU	0854	0.2
	1459	4.4	O	1501	5.1
	2118	0.6		2122	-0.2
6	0330	4.4	**21**	0331	5.2
TU	0938	0.7	W	0945	-0.2
	1538	4.5		1553	5.3
●	2155	0.4		2208	-0.4
7	0407	4.5	**22**	0421	5.4
W	1015	0.5	TH	1031	-0.3
	1617	4.6		1643	5.4
	2231	0.2		2252	-0.5
8	0443	4.7	**23**	0509	5.5
TH	1051	0.4	F	1114	-0.4
	1654	4.7		1731	5.3
	2306	0.2		2335	-0.4
9	0518	4.8	**24**	0554	5.4
F	1127	0.3	SA	1158	-0.3
	1730	4.7		1816	5.2
	2341	0.2			
10	0552	4.8	**25**	0017	-0.2
SA	1203	0.3	SU	0638	5.2
	1807	4.7		1241	0.0
				1900	4.9
11	0016	0.2	**26**	0101	0.2
SU	0626	4.8	M	0720	5.0
	1241	0.4		1327	0.3
	1843	4.7		1943	4.6
12	0054	0.4	**27**	0147	0.5
M	0702	4.8	TU	0803	4.7
	1322	0.5		1415	0.6
	1923	4.5		2028	4.2
13	0136	0.5	**28**	0236	0.9
TU	0742	4.7	W	0848	4.3
	1409	0.6		1507	1.0
	2007	4.4	☾	2120	3.9
14	0225	0.8	**29**	0331	1.2
W	0828	4.5	TH	0942	4.0
	1503	0.8		1605	1.2
☽	2100	4.2		2224	3.7
15	0322	0.9	**30**	0432	1.5
TH	0925	4.4	F	1049	3.8
	1605	0.9		1707	1.3
	2208	4.1		2340	3.6
			31	0538	1.6
			SA	1201	3.8
				1812	1.3

PANAMA — BALBOA

LAT 8°57'N LONG 79°34'W

TIME ZONE +0500 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

SEPTEMBER

	Time	m		Time	m
1 SU	0046	3.7	16 M	0029	4.4
	0643	1.5		0638	0.9
	1301	3.9		1257	4.5
	1913	1.2		1914	0.6
2 M	0138	3.9	17 TU	0131	4.7
	0741	1.2		0744	0.5
	1350	4.1		1356	4.8
	2005	0.9		2013	0.3
3 TU	0220	4.2	18 W	0224	5.0
	0830	1.0		0839	0.2
	1432	4.3		1449	5.0
	2049	0.7		2104	0.0
4 W	0258	4.4	19 TH	0313	5.2
	0911	0.7		0927	-0.1
	1511	4.5		1537	5.2
	2128	0.4		2149	-0.2
5 TH	0334	4.6	20 F	0359	5.4
	0949	0.4		1011	-0.3
	1548	4.7		1624	5.2
●	2204	0.2		2231	-0.2
6 F	0409	4.8	21 SA	0443	5.4
	1025	0.2		1052	-0.3
	1626	4.8		1708	5.2
	2239	0.1		2311	-0.2
7 SA	0444	5.0	22 SU	0526	5.3
	1101	0.1		1132	-0.2
	1703	4.9		1750	5.1
	2315	0.1		2351	0.0
8 SU	0521	5.0	23 M	0607	5.2
	1137	0.0		1212	0.0
	1741	4.9		1831	4.8
	2351	0.1			
9 M	0558	5.0	24 TU	0031	0.3
	1215	0.1		0647	4.9
	1821	4.8		1253	0.3
				1911	4.6
10 TU	0030	0.2	25 W	0113	0.7
	0637	5.0		0726	4.6
	1257	0.2		1337	0.7
	1903	4.7		1953	4.3
11 W	0114	0.5	26 TH	0200	1.0
	0720	4.8		0808	4.3
	1345	0.5		1426	1.0
	1949	4.5	☾	2039	4.0
12 TH	0204	0.7	27 F	0253	1.3
	0808	4.6		0856	4.0
	1441	0.7		1522	1.2
☽	2044	4.3		2136	3.7
13 F	0304	0.9	28 SA	0353	1.6
	0908	4.4		0959	3.7
	1545	0.8		1623	1.4
	2153	4.2		2249	3.7
14 SA	0413	1.0	29 SU	0459	1.6
	1024	4.2		1115	3.7
	1655	0.9		1727	1.4
	2314	4.2			
15 SU	0526	1.0	30 M	0001	3.7
	1146	4.3		0604	1.5
	1806	0.8		1223	3.8
				1829	1.3

OCTOBER

	Time	m		Time	m
1 TU	0057	3.9	16 W	0114	4.7
	0704	1.3		0726	0.6
	1315	4.0		1343	4.7
	1925	1.1		1952	0.5
2 W	0141	4.2	17 TH	0206	5.0
	0756	1.0		0821	0.3
	1359	4.3		1434	4.9
	2013	0.9		2043	0.3
3 TH	0220	4.5	18 F	0252	5.1
	0840	0.7		0908	0.1
	1439	4.5		1520	5.0
	2055	0.6	○	2128	0.2
4 F	0257	4.8	19 SA	0336	5.2
	0920	0.4		0951	-0.1
	1517	4.8		1603	5.1
●	2134	0.3		2209	0.1
5 SA	0334	5.0	20 SU	0418	5.2
	0958	0.1		1030	-0.1
	1556	4.9		1645	5.0
	2212	0.1		2248	0.1
6 SU	0412	5.1	21 M	0458	5.2
	1035	-0.1		1108	-0.1
	1637	5.1		1726	4.9
	2250	0.0		2326	0.3
7 M	0451	5.2	22 TU	0537	5.0
	1113	-0.2		1146	0.1
	1718	5.1		1805	4.8
	2329	0.1			
8 TU	0533	5.2	23 W	0004	0.5
	1154	-0.1		0616	4.8
	1802	5.1		1224	0.4
				1844	4.6
9 W	0011	0.2	24 TH	0044	0.8
	0617	5.1		0654	4.5
	1237	0.0		1305	0.6
	1848	4.9		1923	4.4
10 TH	0057	0.4	25 F	0128	1.1
	0704	5.0		0733	4.3
	1327	0.3		1350	0.9
	1938	4.8		2004	4.1
11 F	0150	0.6	26 SA	0218	1.3
	0757	4.7		0817	4.0
	1424	0.5	☾	1441	1.2
☽	2035	4.5		2053	3.9
12 SA	0253	0.9	27 SU	0315	1.5
	0859	4.4		0911	3.8
	1529	0.8		1538	1.4
	2143	4.4		2152	3.8
13 SU	0402	1.0	28 M	0417	1.6
	1015	4.3		1019	3.7
	1638	0.9		1638	1.5
	2301	4.4		2302	3.8
14 M	0514	1.0	29 TU	0519	1.5
	1136	4.3		1131	3.7
	1748	0.9		1739	1.4
15 TU	0013	4.5	30 W	0004	4.0
	0623	0.8		0619	1.3
	1246	4.4		1231	3.9
	1854	0.7		1837	1.2
			31 TH	0054	4.2
				0714	1.1
				1320	4.2
				1931	1.0

NOVEMBER

	Time	m		Time	m
1 F	0138	4.5	16 SA	0230	4.9
	0803	0.7		0848	0.3
	1404	4.5		1502	4.7
	2019	0.7		2106	0.5
2 SA	0219	4.8	17 SU	0313	5.0
	0848	0.4		0930	0.2
	1446	4.8		1544	4.8
	2103	0.5	○	2148	0.4
3 SU	0300	5.0	18 M	0354	5.0
	0930	0.1		1009	0.1
	1529	5.0		1625	4.8
●	2146	0.2		2227	0.4
4 M	0342	5.2	19 TU	0433	4.9
	1011	-0.2		1046	0.1
	1613	5.2		1705	4.8
	2227	0.1		2304	0.5
5 TU	0427	5.3	20 W	0512	4.8
	1053	-0.3		1123	0.2
	1659	5.2		1743	4.7
	2310	0.0		2342	0.6
6 W	0514	5.4	21 TH	0550	4.7
	1136	-0.3		1200	0.3
	1748	5.2		1821	4.6
	2355	0.1			
7 TH	0603	5.3	22 F	0020	0.8
	1222	-0.2		0628	4.5
	1837	5.2		1238	0.5
				1858	4.4
8 F	0044	0.2	23 SA	0102	0.9
	0654	5.1		0706	4.3
	1312	0.1		1319	0.8
	1930	5.0		1935	4.3
9 SA	0139	0.5	24 SU	0147	1.2
	0749	4.8		0746	4.1
	1409	0.4		1404	1.0
	2026	4.8		2016	4.2
10 SU	0240	0.7	25 M	0238	1.3
	0850	4.6		0830	3.9
	1511	0.6	☾	1454	1.2
☽	2130	4.6		2102	4.1
11 M	0347	0.8	26 TU	0333	1.4
	1000	4.4		0924	3.8
	1617	0.8		1548	1.3
	2240	4.5		2158	4.0
12 TU	0455	0.9	27 W	0430	1.4
	1117	4.3		1029	3.7
	1724	0.9		1646	1.3
	2351	4.6		2301	4.0
13 W	0602	0.8	28 TH	0529	1.3
	1227	4.4		1136	3.8
	1828	0.9		1745	1.3
14 TH	0052	4.7	29 F	0001	4.2
	0704	0.7		0628	1.1
	1326	4.5		1235	4.1
	1928	0.8		1844	1.1
15 F	0144	4.8	30 SA	0054	4.4
	0800	0.5		0724	0.8
	1416	4.6		1327	4.3
	2020	0.6		1941	0.9

DECEMBER

	Time	m		Time	m
1 SU	0143	4.7	16 M	0252	4.6
	0816	0.4		0910	0.4
	1416	4.6		1527	4.4
	2033	0.5		2129	0.7
2 M	0230	5.0	17 TU	0333	4.6
	0904	0.1		0950	0.2
	1504	4.9		1607	4.5
●	2122	0.2	○	2208	0.6
3 TU	0318	5.2	18 W	0413	4.6
	0950	-0.2		1027	0.2
	1553	5.1		1646	4.6
	2208	0.0		2246	0.5
4 W	0408	5.3	19 TH	0451	4.6
	1035	-0.4		1103	0.2
	1644	5.3		1723	4.6
	2255	-0.1		2322	0.5
5 TH	0500	5.4	20 F	0529	4.6
	1120	-0.5		1138	0.2
	1735	5.4		1759	4.6
	2342	-0.1			
6 F	0552	5.3	21 SA	0000	0.6
	1208	-0.4		0606	4.5
	1827	5.3		1215	0.3
				1834	4.5
7 SA	0032	0.0	22 SU	0038	0.7
	0645	5.2		0642	4.4
	1258	-0.2		1252	0.5
	1918	5.2		1908	4.4
8 SU	0125	0.2	23 M	0118	0.8
	0738	5.0		0718	4.2
	1351	0.1		1332	0.7
	2012	5.0		1943	4.3
9 M	0223	0.4	24 TU	0202	0.9
	0835	4.7		0756	4.1
	1450	0.4		1415	0.9
☽	2109	4.8		2021	4.2
10 TU	0325	0.6	25 W	0250	1.1
	0938	4.4		0840	3.9
	1551	0.6		1502	1.0
	2212	4.6	☾	2105	4.1
11 W	0429	0.7	26 TH	0343	1.1
	1048	4.2		0933	3.8
	1654	0.9		1556	1.1
	2320	4.5		2201	4.1
12 TH	0533	0.8	27 F	0440	1.1
	1200	4.1		1039	3.7
	1757	0.9		1655	1.2
				2306	4.1
13 F	0023	4.4	28 SA	0541	1.0
	0636	0.8		1149	3.9
	1303	4.2		1759	1.1
	1859	1.0			
14 SA	0119	4.5	29 SU	0011	4.3
	0735	0.7		0645	0.8
	1356	4.3		1253	4.1
	1956	0.9		1905	0.9
15 SU	0208	4.5	30 M	0111	4.5
	0826	0.5		0746	0.4
	1444	4.4		1350	4.4
	2045	0.8		2006	0.6
			31 TU	0206	4.8
				0841	0.1
				1444	4.7
				2102	0.2

CHILE — VALPARAISO

LAT 33°02'S LONG 71°38'W

TIME ZONE +0400 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

JANUARY

	Time	m		Time	m
1 TU	0023 1.6 0706 0.4 1258 1.2 1836 0.5		**16** W	0110 1.6 0744 0.3 1350 1.3 1947 0.4	
2 W	0100 1.5 0744 0.4 1342 1.2 1922 0.5		**17** TH	0154 1.5 0828 0.4 1443 1.3 2043 0.6	
3 TH	0141 1.4 0825 0.4 1433 1.2 2014 0.6		**18** F	0241 1.3 0914 0.5 1543 1.3 ☾ 2153 0.7	
4 F	0226 1.3 0910 0.4 1532 1.2 ☽ 2120 0.6		**19** SA	0336 1.2 1006 0.5 1651 1.3 2321 0.7	
5 SA	0320 1.2 1000 0.5 1636 1.3 2243 0.7		**20** SU	0449 1.1 1105 0.6 1801 1.3	
6 SU	0427 1.2 1056 0.5 1741 1.4		**21** M	0050 0.7 0615 1.0 1208 0.6 1905 1.4	
7 M	0011 0.6 0545 1.1 1155 0.5 1843 1.5		**22** TU	0158 0.6 0728 1.0 1306 0.6 1957 1.4	
8 TU	0125 0.5 0700 1.1 1254 0.4 1940 1.6		**23** W	0247 0.5 0823 1.1 1355 0.6 2040 1.5	
9 W	0225 0.4 0806 1.1 1351 0.4 2033 1.7		**24** TH	0326 0.5 0904 1.1 1438 0.5 2117 1.6	
10 TH	0318 0.3 0903 1.2 1446 0.3 2124 1.9		**25** F	0359 0.4 0940 1.1 1516 0.5 2151 1.6	
11 F	0406 0.2 0954 1.3 1538 0.3 ● 2212 1.9		**26** SA	0429 0.4 1013 1.2 1552 0.4 2223 1.7	
12 SA	0451 0.1 1042 1.3 1629 0.2 2258 1.9		**27** SU	0459 0.3 1045 1.2 1628 0.4 O 2255 1.7	
13 SU	0536 0.1 1129 1.4 1718 0.2 2343 1.9		**28** M	0529 0.3 1118 1.3 1704 0.4 2328 1.7	
14 M	0619 0.1 1215 1.4 1807 0.3		**29** TU	0600 0.3 1153 1.3 1742 0.4	
15 TU	0027 1.8 0702 0.2 1301 1.4 1856 0.3		**30** W	0002 1.6 0633 0.3 1231 1.3 1823 0.4	
			31 TH	0038 1.5 0707 0.3 1312 1.3 1907 0.5	

FEBRUARY

	Time	m		Time	m
1 F	0116 1.4 0744 0.4 1358 1.3 1958 0.5		**16** SA	0159 1.3 0817 0.5 1446 1.3 2113 0.7	
2 SA	0159 1.3 0826 0.4 1452 1.3 2102 0.6		**17** SU	0249 1.1 0903 0.6 1549 1.3 ☾ 2240 0.7	
3 SU	0251 1.2 0915 0.5 1557 1.4 ☽ 2226 0.6		**18** M	0402 1.0 1003 0.7 1706 1.3	
4 M	0402 1.1 1016 0.5 1709 1.4 2359 0.6		**19** TU	0017 0.7 0544 1.0 1120 0.7 1823 1.3	
5 TU	0531 1.0 1127 0.5 1821 1.5		**20** W	0131 0.6 0708 1.0 1234 0.7 1924 1.4	
6 W	0117 0.5 0656 1.1 1239 0.5 1926 1.6		**21** TH	0220 0.6 0802 1.1 1332 0.6 2012 1.5	
7 TH	0217 0.4 0803 1.1 1343 0.4 2022 1.7		**22** F	0256 0.5 0842 1.1 1418 0.6 2050 1.5	
8 F	0306 0.3 0856 1.2 1440 0.3 2112 1.8		**23** SA	0327 0.4 0915 1.2 1458 0.5 2125 1.6	
9 SA	0350 0.2 0943 1.3 1530 0.2 2158 1.9		**24** SU	0356 0.4 0947 1.3 1535 0.4 2158 1.6	
10 SU	0431 0.1 1026 1.4 1618 0.2 ● 2241 1.9		**25** M	0425 0.3 1019 1.3 1611 0.3 O 2230 1.6	
11 M	0510 0.1 1107 1.4 1704 0.2 2322 1.8		**26** TU	0454 0.3 1052 1.4 1649 0.3 2304 1.6	
12 TU	0548 0.1 1148 1.5 1748 0.2		**27** W	0524 0.3 1126 1.5 1728 0.3 2339 1.6	
13 W	0001 1.7 0625 0.2 1229 1.4 1833 0.3		**28** TH	0557 0.3 1203 1.5 1810 0.3	
14 TH	0039 1.6 0701 0.3 1310 1.4 1919 0.4				
15 F	0118 1.4 0738 0.4 1355 1.4 2009 0.5				

MARCH

	Time	m		Time	m
1 F	0016 1.5 0631 0.3 1244 1.5 1856 0.4		**16** SA	0047 1.3 0650 0.4 1312 1.4 1942 0.5	
2 SA	0056 1.4 0708 0.4 1329 1.5 1949 0.4		**17** SU	0126 1.2 0724 0.5 1355 1.4 2039 0.6	
3 SU	0141 1.3 0751 0.4 1423 1.5 2055 0.5		**18** M	0214 1.1 0804 0.6 1448 1.3 2155 0.7	
4 M	0238 1.1 0844 0.5 1529 1.4 ☽ 2219 0.6		**19** TU	0325 1.0 0900 0.7 1559 1.3 ☾ 2328 0.7	
5 TU	0359 1.0 0953 0.6 1646 1.4 2350 0.5		**20** W	0511 0.9 1023 0.7 1722 1.3	
6 W	0536 1.0 1115 0.6 1804 1.5		**21** TH	0046 0.6 0638 1.0 1153 0.7 1836 1.3	
7 TH	0104 0.5 0657 1.1 1234 0.5 1912 1.5		**22** F	0137 0.6 0732 1.1 1302 0.7 1930 1.4	
8 F	0201 0.4 0757 1.2 1339 0.4 2009 1.6		**23** SA	0214 0.5 0810 1.2 1353 0.6 2014 1.4	
9 SA	0246 0.3 0844 1.3 1434 0.3 2056 1.7		**24** SU	0245 0.4 0844 1.3 1435 0.5 2051 1.5	
10 SU	0326 0.2 0926 1.4 1521 0.3 2139 1.7		**25** M	0315 0.4 0916 1.4 1514 0.4 2127 1.6	
11 M	0403 0.2 1005 1.5 1606 0.2 ● 2219 1.7		**26** TU	0344 0.3 0949 1.5 1553 0.3 2202 1.6	
12 TU	0438 0.2 1043 1.5 1649 0.2 2257 1.6		**27** W	0415 0.3 1023 1.6 1632 0.3 O 2238 1.6	
13 W	0512 0.2 1120 1.5 1731 0.3 2334 1.5		**28** TH	0447 0.2 1059 1.6 1714 0.2 2316 1.5	
14 TH	0546 0.3 1156 1.5 1813 0.3		**29** F	0521 0.3 1138 1.7 1759 0.3 2356 1.4	
15 F	0010 1.4 0618 0.3 1233 1.5 1855 0.4		**30** SA	0558 0.3 1220 1.7 1848 0.3	
			31 SU	0041 1.3 0639 0.4 1308 1.6 1945 0.4	

APRIL

	Time	m		Time	m
1 M	0133 1.2 0728 0.4 1403 1.6 2052 0.4		**16** TU	0150 1.0 0721 0.6 1402 1.3 2113 0.6	
2 TU	0239 1.1 0828 0.5 1510 1.5 2210 0.5		**17** W	0256 1.0 0811 0.7 1459 1.3 2229 0.6	
3 W	0405 1.0 0944 0.6 1627 1.5 ☽ 2331 0.5		**18** TH	0427 1.0 0926 0.8 1613 1.2 ☾ 2342 0.6	
4 TH	0536 1.1 1109 0.6 1744 1.5		**19** F	0551 1.0 1059 0.8 1730 1.3	
5 F	0039 0.4 0647 1.2 1228 0.5 1852 1.5		**20** SA	0038 0.5 0648 1.1 1221 0.7 1836 1.3	
6 SA	0133 0.3 0741 1.3 1332 0.5 1948 1.5		**21** SU	0121 0.5 0730 1.2 1321 0.6 1928 1.3	
7 SU	0217 0.3 0826 1.4 1425 0.4 2036 1.5		**22** M	0156 0.4 0807 1.3 1409 0.5 2012 1.4	
8 M	0256 0.2 0906 1.5 1512 0.3 2118 1.5		**23** TU	0229 0.4 0842 1.5 1452 0.4 2053 1.4	
9 TU	0331 0.2 0943 1.5 1555 0.3 2157 1.5		**24** W	0302 0.3 0918 1.6 1534 0.3 2132 1.5	
10 W	0404 0.2 1018 1.6 1636 0.3 ● 2234 1.5		**25** TH	0336 0.3 0955 1.7 1617 0.3 O 2213 1.4	
11 TH	0437 0.3 1053 1.6 1717 0.3 2310 1.4		**26** F	0412 0.3 1035 1.8 1702 0.2 2256 1.4	
12 F	0508 0.3 1128 1.6 1757 0.3 2346 1.3		**27** SA	0451 0.3 1117 1.8 1750 0.2 2342 1.3	
13 SA	0539 0.4 1202 1.6 1838 0.4		**28** SU	0533 0.3 1203 1.8 1842 0.2	
14 SU	0023 1.2 0610 0.5 1238 1.5 1921 0.5		**29** M	0032 1.3 0621 0.3 1253 1.8 1939 0.3	
15 M	0103 1.1 0643 0.5 1316 1.4 2011 0.5		**30** TU	0130 1.2 0715 0.4 1349 1.7 2042 0.3	

CHILE — VALPARAISO

LAT 33°02'S LONG 71°38'W

TIME ZONE +0400 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

MAY

	Time	m		Time	m		Time	m		Time	m
1 W	0239	1.1	**16** TH	0225	1.0	**1** SA	0444	1.2	**16** SU	0350	1.1
	0819	0.5		0741	0.7		1032	0.6		0919	0.7
	1453	1.6		1418	1.3		1641	1.4		1530	1.3
	2151	0.4		2132	0.5		2322	0.4	☾	2225	0.5
2 TH	0358	1.1	**17** F	0335	1.0	**2** SU	0551	1.3	**17** M	0455	1.2
	0934	0.6		0843	0.7		1152	0.6		1042	0.7
	1604	1.5		1516	1.3		1749	1.3		1636	1.2
☽	2301	0.4		2233	0.5					2318	0.5
3 F	0517	1.2	**18** SA	0450	1.0	**3** M	0017	0.4	**18** TU	0554	1.3
	1056	0.6		1004	0.7		0649	1.4		1205	0.7
	1717	1.4	☾	2331	0.5		1304	0.6		1747	1.2
							1853	1.2			
4 SA	0004	0.4	**19** SU	0554	1.1	**4** TU	0106	0.4	**19** W	0010	0.5
	0624	1.2		1131	0.7		0740	1.4		0648	1.4
	1214	0.6		1734	1.2		1405	0.5		1315	0.6
	1824	1.4					1949	1.2		1854	1.2
5 SU	0058	0.4	**20** M	0020	0.5	**5** W	0149	0.4	**20** TH	0059	0.4
	0718	1.3		0644	1.2		0824	1.5		0738	1.5
	1320	0.5		1243	0.7		1455	0.5		1413	0.5
	1923	1.4		1837	1.2		2038	1.2		1953	1.2
6 M	0143	0.3	**21** TU	0103	0.4	**6** TH	0229	0.4	**21** F	0148	0.4
	0804	1.4		0727	1.4		0903	1.6		0826	1.7
	1415	0.4		1341	0.6		1539	0.4		1505	0.4
	2012	1.4		1931	1.3		2121	1.2		2048	1.2
7 TU	0222	0.3	**22** W	0143	0.4	**7** F	0306	0.4	**22** SA	0236	0.3
	0844	1.5		0808	1.5		0940	1.6		0913	1.8
	1503	0.4		1430	0.4		1619	0.4		1553	0.2
	2056	1.4		2020	1.3		2201	1.2		2140	1.3
8 W	0258	0.3	**23** TH	0222	0.3	**8** SA	0341	0.4	**23** SU	0325	0.3
	0921	1.6		0849	1.7		1015	1.6		1001	1.9
	1546	0.3		1517	0.3		1656	0.3		1641	0.2
	2137	1.3		2107	1.3	●	2238	1.2	O	2230	1.3
9 TH	0332	0.3	**24** F	0302	0.3	**9** SU	0415	0.4	**24** M	0415	0.2
	0957	1.6		0931	1.8		1049	1.6		1048	1.9
	1627	0.3		1604	0.2		1732	0.3		1729	0.1
●	2215	1.3		2154	1.3		2313	1.1		2320	1.3
10 F	0405	0.4	**25** SA	0344	0.3	**10** M	0448	0.4	**25** TU	0506	0.2
	1031	1.6		1015	1.9		1122	1.6		1136	1.9
	1706	0.3		1652	0.2		1807	0.3		1817	0.1
	2252	1.2	O	2242	1.3		2349	1.1			
11 SA	0437	0.4	**26** SU	0429	0.3	**11** TU	0522	0.5	**26** W	0011	1.3
	1105	1.6		1101	1.9		1155	1.6		0559	0.2
	1745	0.3		1741	0.1		1842	0.4		1225	1.9
	2328	1.2		2332	1.3					1906	0.1
12 SU	0509	0.4	**27** M	0517	0.3	**12** W	0026	1.1	**27** TH	0103	1.3
	1139	1.6		1149	1.9		0557	0.5		0652	0.3
	1823	0.4		1833	0.2		1229	1.5		1314	1.8
							1919	0.4		1955	0.2
13 M	0005	1.1	**28** TU	0024	1.3	**13** TH	0106	1.1	**28** F	0158	1.3
	0541	0.5		0609	0.3		0636	0.5		0749	0.4
	1213	1.5		1240	1.8		1306	1.5		1405	1.6
	1903	0.4		1927	0.2		1959	0.4		2046	0.3
14 TU	0045	1.1	**29** W	0121	1.2	**14** F	0152	1.1	**29** SA	0258	1.3
	0615	0.5		0706	0.4		0720	0.6		0850	0.5
	1250	1.5		1334	1.7		1347	1.4		1459	1.4
	1946	0.5		2023	0.2		2043	0.5		2138	0.4
15 W	0130	1.0	**30** TH	0224	1.2	**15** SA	0247	1.1	**30** SU	0403	1.3
	0654	0.6		0808	0.5		0812	0.7		1001	0.6
	1330	1.4		1432	1.6		1434	1.3		1559	1.3
	2035	0.5		2122	0.3		2132	0.5	☽	2234	0.4
			31 F	0333	1.2						
				0916	0.5						
				1534	1.5						
			☽	2222	0.4						

JULY

	Time	m		Time	m
1 M	0511	1.3	**16** TU	0401	1.2
	1124	0.7		1005	0.7
	1708	1.2		1551	1.2
	2331	0.5		2222	0.5
2 TU	0616	1.4	**17** W	0508	1.3
	1246	0.6		1135	0.7
	1821	1.1		1708	1.1
				2323	0.5
3 W	0027	0.5	**18** TH	0613	1.4
	0714	1.4		1256	0.6
	1354	0.6		1828	1.1
	1929	1.1			
4 TH	0119	0.5	**19** F	0025	0.5
	0804	1.5		0713	1.5
	1447	0.5		1400	0.5
	2024	1.1		1938	1.1
5 F	0205	0.5	**20** SA	0125	0.4
	0847	1.6		0808	1.7
	1530	0.5		1454	0.3
	2109	1.1		2037	1.2
6 SA	0246	0.5	**21** SU	0221	0.4
	0925	1.6		0859	1.8
	1607	0.4		1541	0.2
	2147	1.1		2129	1.3
7 SU	0324	0.5	**22** M	0314	0.3
	1000	1.6		0948	1.9
	1641	0.4		1627	0.1
	2222	1.2	O	2218	1.3
8 M	0359	0.4	**23** TU	0405	0.2
	1033	1.7		1035	1.9
	1714	0.3		1711	0.1
●	2256	1.2		2304	1.4
9 TU	0433	0.4	**24** W	0455	0.2
	1105	1.6		1120	1.9
	1745	0.3		1754	0.1
	2329	1.2		2351	1.4
10 W	0508	0.4	**25** TH	0545	0.2
	1136	1.6		1205	1.8
	1816	0.3		1837	0.1
11 TH	0003	1.2	**26** F	0037	1.4
	0543	0.4		0634	0.3
	1209	1.6		1249	1.7
	1848	0.4		1920	0.2
12 F	0039	1.2	**27** SA	0125	1.4
	0620	0.5		0725	0.4
	1243	1.5		1334	1.6
	1923	0.4		2004	0.3
13 SA	0120	1.2	**28** SU	0217	1.4
	0702	0.5		0821	0.5
	1320	1.4		1421	1.4
	2000	0.4		2050	0.4
14 SU	0206	1.2	**29** M	0315	1.3
	0749	0.6		0928	0.6
	1401	1.3		1515	1.2
	2041	0.5	☽	2141	0.5
15 M	0259	1.2	**30** TU	0422	1.3
	0848	0.6		1051	0.7
	1449	1.2		1624	1.1
☾	2128	0.5		2240	0.6
			31 W	0534	1.3
				1222	0.7
				1751	1.0
				2347	0.6

AUGUST

	Time	m		Time	m
1 TH	0644	1.4	**16** F	0544	1.4
	1338	0.6		1243	0.6
	1911	1.0		1821	1.0
2 F	0051	0.6	**17** SA	0004	0.5
	0742	1.4		0654	1.5
	1432	0.5		1348	0.4
	2010	1.1		1933	1.1
3 SA	0145	0.6	**18** SU	0113	0.5
	0828	1.5		0753	1.6
	1512	0.5		1439	0.3
	2053	1.1		2029	1.2
4 SU	0229	0.5	**19** M	0213	0.4
	0907	1.6		0846	1.7
	1546	0.4		1523	0.2
	2129	1.2		2117	1.3
5 M	0308	0.5	**20** TU	0306	0.3
	0941	1.6		0933	1.8
	1617	0.4		1605	0.1
	2202	1.2	O	2202	1.4
6 TU	0344	0.4	**21** W	0355	0.2
	1013	1.6		1017	1.9
	1646	0.3		1645	0.1
●	2233	1.2		2244	1.5
7 W	0418	0.4	**22** TH	0442	0.2
	1044	1.6		1100	1.8
	1714	0.3		1725	0.1
	2304	1.3		2326	1.5
8 TH	0453	0.4	**23** F	0529	0.2
	1114	1.6		1141	1.7
	1743	0.3		1803	0.2
	2337	1.3			
9 F	0528	0.4	**24** SA	0008	1.5
	1146	1.6		0615	0.2
	1814	0.3		1222	1.6
				1841	0.2
10 SA	0012	1.3	**25** SU	0051	1.5
	0606	0.4		0703	0.4
	1220	1.5		1303	1.5
	1845	0.3		1920	0.3
11 SU	0049	1.3	**26** M	0136	1.4
	0647	0.4		0754	0.5
	1255	1.4		1346	1.3
	1919	0.4		2000	0.5
12 M	0131	1.3	**27** TU	0226	1.4
	0733	0.5		0855	0.6
	1335	1.3		1436	1.1
	1957	0.4		2046	0.6
13 TU	0220	1.3	**28** W	0326	1.3
	0830	0.6		1014	0.7
	1421	1.2		1545	1.0
	2041	0.5	☽	2145	0.6
14 W	0319	1.3	**29** TH	0441	1.3
	0945	0.6		1148	0.7
	1524	1.1		1723	1.0
☾	2138	0.5		2301	0.7
15 TH	0430	1.4	**30** F	0600	1.3
	1117	0.6		1308	0.6
	1650	1.0		1852	1.0
	2249	0.6			
			31 SA	0019	0.7
				0707	1.4
				1402	0.6
				1950	1.1

CHILE — VALPARAISO

LAT 33°02'S LONG 71°38'W

TIME ZONE +0400 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

SEPTEMBER

	Time	m		Time	m
1 SU	0122	0.6	16 M	0108	0.5
	0758	1.4		0737	1.6
	1441	0.5		1416	0.3
	2030	1.1		2017	1.3
2 M	0209	0.6	17 TU	0207	0.4
	0838	1.5		0828	1.7
	1513	0.4		1459	0.2
	2104	1.2		2101	1.4
3 TU	0249	0.5	18 W	0258	0.3
	0913	1.5		0914	1.7
	1542	0.4		1538	0.2
	2135	1.3		2142	1.5
4 W	0325	0.4	19 TH	0345	0.2
	0945	1.6		0957	1.7
	1610	0.3		1615	0.1
	2205	1.4		2222	1.6
5 TH	0400	0.4	20 F	0430	0.2
	1017	1.6		1038	1.7
	1638	0.3		1651	0.2
●	2237	1.4		2301	1.6
6 F	0436	0.3	21 SA	0514	0.2
	1049	1.6		1117	1.6
	1706	0.3		1727	0.2
	2309	1.5		2340	1.6
7 SA	0513	0.3	22 SU	0558	0.3
	1122	1.6		1156	1.5
	1737	0.3		1802	0.3
	2344	1.5			
8 SU	0552	0.3	23 M	0018	1.6
	1157	1.5		0643	0.3
	1809	0.3		1235	1.3
				1837	0.4
9 M	0022	1.5	24 TU	0058	1.5
	0635	0.4		0731	0.4
	1234	1.4		1317	1.2
	1843	0.4		1913	0.5
10 TU	0103	1.5	25 W	0141	1.4
	0723	0.4		0826	0.5
	1316	1.3		1405	1.1
	1922	0.4		1954	0.6
11 W	0151	1.5	26 TH	0232	1.3
	0822	0.5		0936	0.6
	1408	1.1		1513	1.0
	2009	0.5	☽	2049	0.7
12 TH	0250	1.4	27 F	0338	1.3
	0937	0.6		1101	0.6
	1518	1.0		1651	1.0
☾	2112	0.6		2207	0.7
13 F	0403	1.4	28 SA	0458	1.3
	1105	0.6		1220	0.6
	1652	1.0		1820	1.0
	2232	0.6		2337	0.7
14 SA	0522	1.4	29 SU	0615	1.3
	1226	0.5		1317	0.6
	1820	1.1		1917	1.1
	2356	0.6			
15 SU	0635	1.5	30 M	0049	0.7
	1327	0.4		0714	1.3
	1926	1.2		1357	0.5
				1958	1.2

OCTOBER

	Time	m		Time	m
1 TU	0142	0.6	16 W	0158	0.4
	0759	1.4		0807	1.5
	1430	0.4		1429	0.2
	2031	1.3		2042	1.5
2 W	0225	0.5	17 TH	0249	0.3
	0838	1.4		0853	1.5
	1500	0.4		1507	0.2
	2103	1.4		2122	1.6
3 TH	0304	0.4	18 F	0335	0.3
	0913	1.5		0936	1.5
	1528	0.3		1543	0.2
	2135	1.5		2200	1.6
4 F	0341	0.4	19 SA	0419	0.2
	0947	1.5		1016	1.5
	1558	0.3		1618	0.2
●	2207	1.6		2237	1.7
5 SA	0419	0.3	20 SU	0502	0.2
	1022	1.5		1055	1.4
	1628	0.3		1652	0.3
	2242	1.6		2314	1.7
6 SU	0458	0.3	21 M	0544	0.3
	1058	1.5		1134	1.3
	1701	0.3		1726	0.4
	2318	1.7		2350	1.6
7 M	0540	0.3	22 TU	0627	0.3
	1137	1.4		1213	1.2
	1736	0.3		1800	0.4
	2358	1.7			
8 TU	0626	0.3	23 W	0027	1.6
	1219	1.3		0712	0.4
	1814	0.4		1255	1.1
				1835	0.5
9 W	0042	1.7	24 TH	0106	1.5
	0718	0.3		0800	0.5
	1307	1.2		1342	1.0
	1859	0.4		1915	0.6
10 TH	0132	1.6	25 F	0150	1.4
	0818	0.4		0857	0.5
	1406	1.1		1443	1.0
	1953	0.5		2003	0.7
11 F	0232	1.5	26 SA	0243	1.3
	0929	0.4		1005	0.6
	1523	1.1		1605	1.0
☾	2102	0.6	☽	2110	0.7
12 SA	0343	1.5	27 SU	0349	1.3
	1047	0.5		1115	0.6
	1652	1.1		1728	1.0
	2225	0.6		2238	0.8
13 SU	0500	1.4	28 M	0504	1.2
	1159	0.4		1215	0.6
	1810	1.1		1830	1.1
	2348	0.6			
14 M	0613	1.5	29 TU	0003	0.7
	1258	0.4		0614	1.3
	1910	1.2		1301	0.5
				1915	1.2
15 TU	0100	0.5	30 W	0107	0.7
	0715	1.5		0710	1.3
	1347	0.3		1339	0.5
	1959	1.4		1953	1.3
			31 TH	0157	0.6
				0756	1.3
				1412	0.4
				2028	1.4

NOVEMBER

	Time	m		Time	m
1 F	0240	0.5	16 SA	0328	0.3
	0837	1.4		0918	1.3
	1445	0.4		1514	0.3
	2103	1.6		2141	1.7
2 SA	0321	0.4	17 SU	0412	0.3
	0916	1.4		0959	1.3
	1518	0.3		1549	0.3
	2139	1.7	O	2218	1.7
3 SU	0402	0.3	18 M	0453	0.3
	0956	1.4		1039	1.2
	1553	0.3		1624	0.4
●	2217	1.7		2254	1.7
4 M	0445	0.2	19 TU	0533	0.3
	1037	1.4		1117	1.2
	1630	0.3		1659	0.4
	2257	1.8		2329	1.6
5 TU	0530	0.2	20 W	0613	0.3
	1121	1.3		1156	1.2
	1711	0.3		1733	0.5
	2340	1.8			
6 W	0619	0.2	21 TH	0004	1.6
	1209	1.3		0653	0.4
	1756	0.3		1235	1.1
				1809	0.5
7 TH	0027	1.8	22 F	0040	1.5
	0712	0.3		0734	0.4
	1302	1.2		1319	1.1
	1847	0.4		1847	0.6
8 F	0119	1.7	23 SA	0119	1.4
	0810	0.3		0819	0.5
	1404	1.2		1409	1.0
	1946	0.5		1930	0.6
9 SA	0218	1.6	24 SU	0202	1.4
	0913	0.3		0910	0.5
	1516	1.1		1512	1.0
	2055	0.5		2025	0.7
10 SU	0323	1.5	25 M	0253	1.3
	1020	0.4		1007	0.5
	1634	1.2		1623	1.0
☾	2213	0.6	☽	2137	0.7
11 M	0434	1.4	26 TU	0356	1.2
	1125	0.4		1104	0.5
	1746	1.2		1730	1.1
	2334	0.6		2304	0.7
12 TU	0545	1.4	27 W	0506	1.2
	1223	0.4		1157	0.5
	1846	1.3		1824	1.2
13 W	0047	0.5	28 TH	0023	0.7
	0649	1.4		0613	1.2
	1313	0.3		1242	0.5
	1937	1.4		1910	1.3
14 TH	0149	0.5	29 F	0125	0.6
	0744	1.4		0711	1.2
	1357	0.3		1323	0.4
	2022	1.5		1952	1.5
15 F	0241	0.4	30 SA	0216	0.5
	0833	1.3		0801	1.2
	1437	0.3		1403	0.4
	2103	1.6		2033	1.6

DECEMBER

	Time	m		Time	m
1 SU	0302	0.4	16 M	0405	0.4
	0849	1.3		0947	1.2
	1443	0.4		1528	0.4
	2114	1.7		2203	1.7
2 M	0347	0.3	17 TU	0444	0.3
	0935	1.3		1026	1.2
	1524	0.3		1605	0.4
●	2156	1.8	O	2238	1.7
3 TU	0433	0.2	18 W	0520	0.3
	1021	1.3		1103	1.2
	1607	0.3		1640	0.4
	2240	1.9		2312	1.6
4 W	0520	0.2	19 TH	0556	0.3
	1109	1.3		1138	1.1
	1654	0.3		1715	0.4
	2326	1.9		2345	1.6
5 TH	0608	0.2	20 F	0630	0.3
	1159	1.3		1214	1.1
	1744	0.3		1749	0.5
6 F	0015	1.9	21 SA	0018	1.6
	0659	0.2		0705	0.4
	1253	1.3		1252	1.1
	1838	0.3		1825	0.5
7 SA	0106	1.8	22 SU	0053	1.5
	0752	0.2		0742	0.4
	1351	1.2		1334	1.1
	1936	0.4		1905	0.6
8 SU	0201	1.7	23 M	0130	1.4
	0848	0.3		0822	0.5
	1455	1.2		1423	1.1
	2041	0.5		1952	0.6
9 M	0259	1.5	24 TU	0212	1.3
	0946	0.3		0907	0.5
	1604	1.2		1521	1.1
☾	2153	0.6		2051	0.7
10 TU	0403	1.4	25 W	0303	1.3
	1046	0.4		0956	0.5
	1714	1.3		1625	1.2
	2313	0.6	☽	2208	0.7
11 W	0511	1.3	26 TH	0405	1.2
	1144	0.4		1050	0.5
	1818	1.4		1728	1.2
				2337	0.7
12 TH	0031	0.6	27 F	0517	1.1
	0620	1.2		1144	0.5
	1237	0.4		1826	1.3
	1914	1.4			
13 F	0139	0.5	28 SA	0054	0.6
	0723	1.2		0628	1.1
	1326	0.4		1236	0.5
	2003	1.5		1918	1.5
14 SA	0235	0.5	29 SU	0155	0.5
	0817	1.2		0731	1.1
	1410	0.4		1326	0.4
	2047	1.6		2006	1.6
15 SU	0323	0.4	30 M	0246	0.4
	0905	1.2		0827	1.2
	1450	0.4		1415	0.4
	2126	1.6		2053	1.7
			31 TU	0334	0.3
				0919	1.2
				1503	0.3
				2139	1.8

TIDE TABLES 2013

PART Ia

TIDAL STREAM PREDICTIONS

TIDAL STREAM TABLES

The tables give the following information:-

Maximum rates and the times at which these occur, together with the times of slack water i.e. when the direction of the stream turns.

The diagrams A, B and C opposite show the various types of stream which can occur ranging from predominantly semi-diurnal to predominantly diurnal through a mixture of both.

A. dominant semi-diurnal i.e. there are 2 maxima in each of the opposing directions and 4 times of turn (slack waters).

B. mixture of semi-diurnal and diurnal:-

(1) here there are still 2 maxima in each direction except that in one case the maximum is a zero rate.

(2) with increased diurnal effect 3 maxima occur without change of direction of the stream.

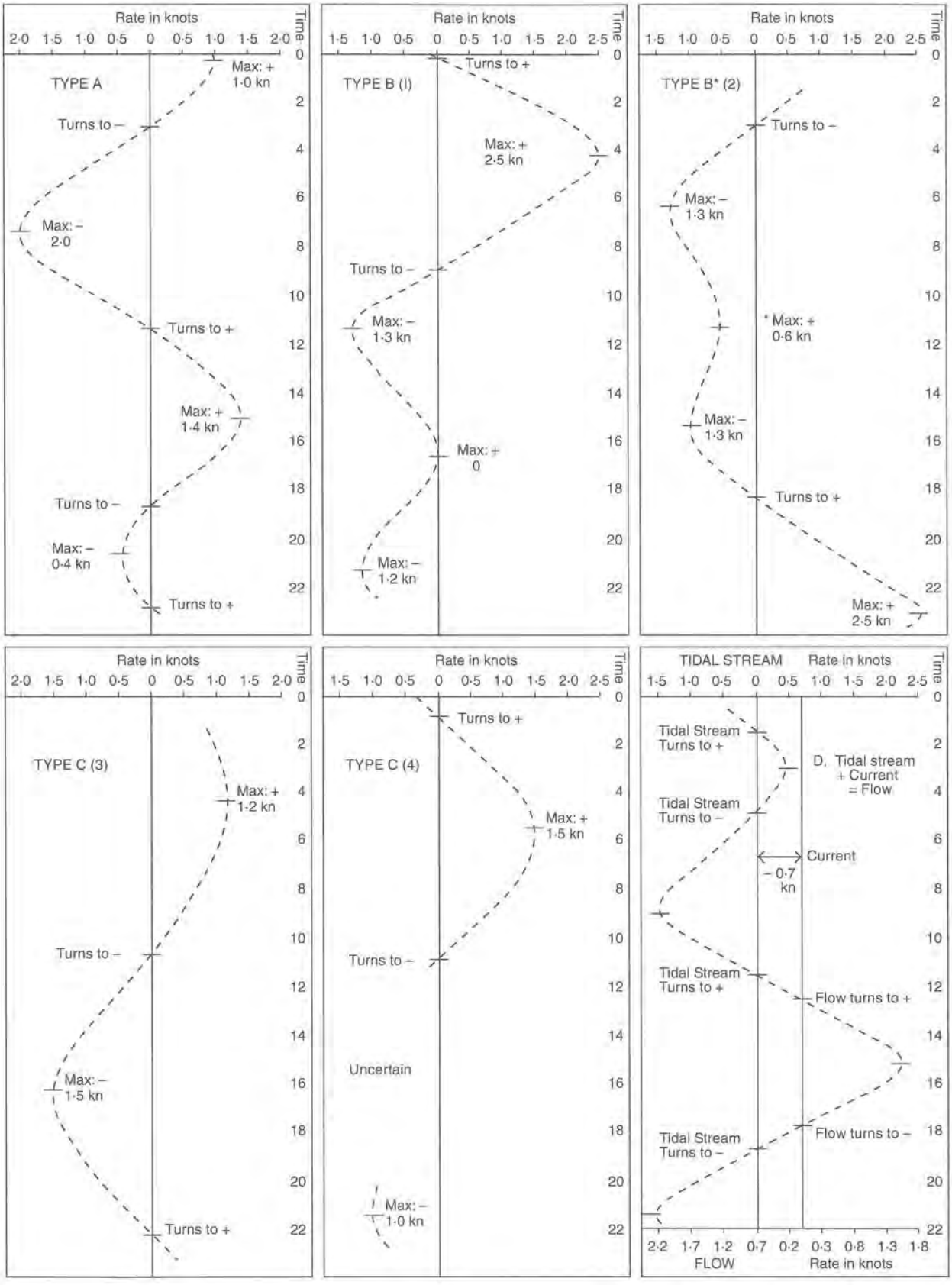
C. dominant diurnal:-

(1) one maximum in each direction and 2 times of turn (slack water).

(2) one stream may be so weak that its magnitude and direction are regarded as uncertain.

Unless otherwise stated at the foot of the page, the stream predictions do not include any steady current which may occur. This may be taken into account as shown in diagram D.

TYPICAL TIDAL STREAM CURVES Drawn from predicted times, maximum and zero rates



UNITED STATES– SAN FRANCISCO BAY ENTRANCE (GOLDEN GATE)

LAT 37°49'N LONG 122°30'W

TIDAL STREAM PREDICTIONS (RATES IN KNOTS)

TIME ZONE **+0800** POSITIVE (+) DIRECTION 065 NEGATIVE (-) DIRECTION 245 YEAR **2013**

JANUARY

	SLACK Time	MAXIMUM Time	Rate		SLACK Time	MAXIMUM Time	Rate
1 TU	0414	0046	3.3	**16** W	0446	0131	3.5
	0956	0637	-2.6		1113	0724	-3.3
	1524	1243	2.1		1651	1354	2.5
	2219	1845	-3.9		2320	1935	-3.3
2 W	0452	0126	3.2	**17** TH	0532	0220	3.1
	1053	0724	-2.8		1218	0816	-3.2
	1619	1335	2.0		1757	1500	2.3
	2258	1933	-3.5			2029	-2.6
3 TH	0532	0210	3.1	**18** F ☽	0011	0311	2.7
	1155	0814	-3.1		0620	0911	-3.2
	1725	1434	2.0		1324	1615	2.2
	2343	2026	-3.1		1907	2127	-2.0
4 F ☾	0615	0258	2.9	**19** SA	0108	0407	2.4
	1301	0907	-3.4		0709	1009	-3.3
	1840	1538	2.1		1427	1729	2.3
		2123	-2.7		2018	2230	-1.7
5 SA	0035	0350	2.8	**20** SU	0206	0505	2.2
	0701	1003	-3.8		0759	1109	-3.4
	1405	1647	2.4		1525	1834	2.5
	1958	2224	-2.4		2124	2338	-1.5
6 SU	0134	0446	2.8	**21** M	0304	0601	2.2
	0750	1100	-4.2		0849	1205	-3.6
	1506	1756	2.8		1617	1928	2.8
	2112	2326	-2.3		2222		
7 M	0237	0543	2.8	**22** TU		0042	-1.5
	0842	1157	-4.7		0356	0651	2.2
	1603	1901	3.4		0937	1255	-3.9
	2219				1703	2014	3.0
					2312		
8 TU	0338	0029	-2.3	**23** W	0443	0132	-1.6
	0935	0640	3.0		1022	0736	2.4
	1658	1254	-5.2		1745	1339	-4.1
	2318	1959	3.9		2356	2054	3.2
9 W	0437	0129	-2.4	**24** TH		0211	-1.8
	1028	0735	3.2		0526	0816	2.5
	1749	1348	-5.6		1105	1418	-4.4
		2053	4.3		1824	2129	3.4
10 TH	0012	0225	-2.6	**25** F	0035	0248	-2.1
	0533	0829	3.4		0606	0855	2.6
	1121	1441	-5.8		1146	1457	-4.5
	1839	2142	4.5		1900	2200	3.5
11 F ●	0102	0318	-2.8	**26** SA ○	0112	0325	-2.3
	0627	0921	3.5		0644	0933	2.7
	1214	1531	-5.9		1225	1535	-4.6
	1927	2230	4.6		1933	2230	3.5
12 SA	0148	0408	-3.0	**27** SU	0146	0403	-2.6
	0721	1013	3.5		0721	1011	2.8
	1306	1620	-5.7		1303	1613	-4.6
	2014	2315	4.5		2005	2301	3.5
13 SU	0233	0457	-3.2	**28** M	0220	0442	-2.9
	0815	1105	3.4		0800	1051	2.8
	1359	1708	-5.3		1343	1653	-4.5
	2100				2037	2334	3.5
14 M	0318	0000	4.3	**29** TU	0253	0523	-3.1
	0912	0545	-3.3		0842	1134	2.7
	1454	1159	3.2		1426	1735	-4.2
	2145	1756	-4.7		2109		
15 TU	0402	0045	3.9	**30** W	0327	0010	3.4
	1011	0634	-3.3		0928	0606	-3.3
	1550	1254	2.9		1513	1220	2.6
	2231	1845	-4.0		2143	1819	-3.8
				31 TH	0403	0049	3.2
					1021	0651	-3.5
					1609	1311	2.5
					2222	1907	-3.4

FEBRUARY

	SLACK Time	MAXIMUM Time	Rate		SLACK Time	MAXIMUM Time	Rate
1 F	0442	0133	3.0	**16** SA	0526	0221	2.2
	1122	0741	-3.6		1240	0822	-3.3
	1715	1410	2.4		1838	1530	2.1
	2308	2000	-2.9			2047	-1.7
2 SA	0528	0222	2.8	**17** SU ☽	0027	0317	1.9
	1230	0835	-3.8		0618	0919	-3.1
	1831	1515	2.4		1346	1650	2.1
		2058	-2.4		1948	2150	-1.4
3 SU ☾	0004	0318	2.6	**18** M	0132	0420	1.7
	0620	0933	-4.0		0715	1021	-3.1
	1340	1628	2.6		1449	1801	2.3
	1949	2202	-2.1		2054	2259	-1.3
4 M	0111	0419	2.5	**19** TU	0236	0525	1.8
	0718	1035	-4.2		0813	1124	-3.3
	1447	1744	2.9		1544	1858	2.6
	2102	2309	-2.0		2152		
5 TU	0224	0524	2.6	**20** W		0008	-1.4
	0820	1138	-4.6		0333	0624	2.0
	1548	1851	3.4		0908	1221	-3.6
	2206				1632	1944	2.9
					2240		
6 W	0331	0016	-2.1	**21** TH	0422	0102	-1.7
	0921	0627	2.8		0958	0713	2.3
	1643	1239	-4.9		1715	1310	-3.9
	2302	1949	3.8		2321	2022	3.1
7 TH	0432	0118	-2.4	**22** F	0505	0143	-2.1
	1019	0727	3.1		1045	0756	2.6
	1734	1335	-5.3		1752	1352	-4.1
	2351	2039	4.2		2358	2055	3.3
8 F	0527	0213	-2.8	**23** SA	0545	0221	-2.5
	1114	0821	3.4		1128	0835	2.8
	1822	1428	-5.4		1827	1432	-4.4
		2125	4.4			2124	3.5
9 SA ●	0035	0302	-3.2	**24** SU	0032	0257	-2.9
	0619	0913	3.7		0623	0913	3.1
	1207	1516	-5.4		1210	1510	-4.5
	1907	2207	4.4		1900	2153	3.6
10 SU	0117	0348	-3.5	**25** M ○	0104	0335	-3.3
	0709	1002	3.7		0700	0952	3.2
	1259	1602	-5.2		1251	1549	-4.5
	1949	2247	4.3		1931	2224	3.6
11 M	0157	0432	-3.7	**26** TU	0136	0413	-3.7
	0759	1050	3.7		0739	1032	3.3
	1349	1646	-4.8		1333	1629	-4.3
	2031	2327	4.0		2003	2258	3.6
12 TU	0237	0515	-3.8	**27** W	0207	0453	-3.9
	0849	1138	3.4		0819	1114	3.3
	1440	1730	-4.2		1419	1711	-4.0
	2112				2035	2334	3.4
13 W	0316	0006	3.6	**28** TH	0240	0536	-4.1
	0941	0558	-3.8		0904	1201	3.3
	1532	1228	3.1		1509	1756	-3.6
	2154	1815	-3.6		2111		
14 TH	0356	0048	3.2				
	1036	0643	-3.6				
	1629	1321	2.7				
	2238	1902	-2.9				
15 F	0439	0132	2.7				
	1135	0731	-3.4				
	1730	1420	2.4				
	2328	1952	-2.3				

MARCH

	SLACK Time	MAXIMUM Time	Rate		SLACK Time	MAXIMUM Time	Rate
1 F	0316	0015	3.2	**16** SA	0344	0047	2.4
	0956	0621	-4.2		1051	0649	-3.7
	1606	1252	3.1		1704	1341	2.6
	2152	1845	-3.1		2244	1917	-2.0
2 SA	0357	0100	2.9	**17** SU	0428	0133	1.9
	1056	0711	-4.2		1151	0738	-3.4
	1712	1350	2.9		1807	1443	2.2
	2242	1939	-2.6		2343	2010	-1.6
3 SU	0446	0152	2.5	**18** M	0521	0228	1.6
	1204	0806	-4.1		1257	0833	-3.1
	1825	1458	2.8		1914	1557	2.1
	2346	2039	-2.1			2111	-1.3
4 M ☾	0546	0252	2.3	**19** TU ☽	0056	0332	1.4
	1317	0907	-4.1		0624	0934	-3.0
	1941	1614	2.8		1403	1715	2.2
		2146	-1.9		2018	2217	-1.3
5 TU	0106	0401	2.2	**20** W	0207	0444	1.5
	0655	1013	-4.1		0731	1038	-3.0
	1427	1733	3.0		1501	1816	2.4
	2050	2258	-1.9		2113	2326	-1.5
6 W	0225	0514	2.3	**21** TH	0308	0551	1.7
	0806	1121	-4.3		0834	1139	-3.2
	1530	1840	3.4		1551	1902	2.7
	2149				2159		
7 TH	0332	0010	-2.2	**22** F	0359	0024	-1.9
	0913	0624	2.7		0931	0646	2.1
	1626	1227	-4.5		1635	1233	-3.5
	2239	1934	3.8		2239	1940	3.0
8 F	0431	0112	-2.7	**23** SA	0443	0109	-2.4
	1014	0725	3.1		1022	0732	2.5
	1715	1325	-4.7		1713	1320	-3.8
	2323	2021	4.0		2315	2012	3.3
9 SA	0523	0202	-3.2	**24** SU	0524	0149	-3.0
	1110	0818	3.5		1109	0813	3.0
	1800	1416	-4.8		1749	1402	-4.0
		2102	4.2		2348	2043	3.5
10 SU	0004	0246	-3.7	**25** M	0602	0227	-3.6
	0611	0907	3.8		1155	0853	3.4
	1203	1501	-4.7		1822	1444	-4.1
	1842	2140	4.1			2115	3.6
11 M ●	0042	0326	-4.0	**26** TU	0020	0305	-4.1
	0657	0952	3.9		0640	0933	3.7
	1252	1543	-4.5		1240	1525	-4.1
	1922	2216	4.0		1856	2148	3.6
12 TU	0119	0405	-4.2	**27** W ○	0051	0345	-4.5
	0741	1036	3.9		0719	1014	3.9
	1340	1624	-4.1		1326	1607	-4.0
	2001	2252	3.7		1930	2224	3.6
13 W	0154	0444	-4.3	**28** TH	0124	0426	-4.8
	0826	1119	3.7		0800	1058	3.9
	1427	1705	-3.6		1414	1651	-3.7
	2038	2328	3.3		2006	2303	3.4
14 TH	0230	0523	-4.2	**29** F	0158	0509	-5.0
	0911	1203	3.3		0846	1145	3.9
	1516	1746	-3.1		1506	1737	-3.3
	2116				2045	2346	3.1
15 F	0306	0006	2.8	**30** SA	0237	0555	-4.9
	0958	0605	-4.0		0937	1237	3.7
	1607	1249	3.0		1604	1827	-2.8
	2157	1830	-2.6		2131		
				31 SU	0321	0033	2.8
					1036	0646	-4.7
					1707	1336	3.4
					2227	1922	-2.4

UNITED STATES– SAN FRANCISCO BAY ENTRANCE (GOLDEN GATE)

LAT 37°49'N LONG 122°30'W

TIDAL STREAM PREDICTIONS (RATES IN KNOTS)

TIME ZONE +0800 POSITIVE (+) DIRECTION 065 NEGATIVE (-) DIRECTION 245 YEAR 2013

APRIL

	SLACK Time	MAXIMUM Time	Rate		SLACK Time	MAXIMUM Time	Rate
1 M	0415 1143 1816 2341	0128 0742 1443 2024	2.4 -4.4 3.1 -2.0	**16** TU	0425 1204 1835	0145 0753 1502 2034	1.5 -3.3 2.3 -1.5
2 TU ☾	0522 1254 1925	0233 0844 1559 2133	2.1 -4.1 3.1 -1.9	**17** W	0013 0528 1306 1933	0246 0849 1609 2136	1.3 -3.1 2.2 -1.5
3 W	0107 0638 1403 2028	0349 0953 1715 2250	2.0 -3.9 3.2 -2.1	**18** TH ☽	0131 0641 1405 2026	0356 0950 1712 2239	1.3 -2.9 2.3 -1.7
4 TH	0225 0756 1506 2123	0509 1104 1819	2.2 -3.8 3.4	**19** F	0238 0753 1458 2112	0507 1051 1803 2338	1.5 -2.9 2.6 -2.2
5 F	0331 0906 1602 2210	0005 0623 1213 1912	-2.5 2.6 -3.9 3.6	**20** SA	0332 0858 1544 2152	0610 1149 1845	1.9 -3.1 2.8
6 SA	0427 1010 1651 2252	0103 0724 1313 1956	-3.1 3.1 -3.9 3.8	**21** SU	0418 0956 1627 2228	0029 0703 1242 1923	-2.8 2.5 -3.3 3.1
7 SU	0516 1106 1735 2330	0149 0816 1403 2036	-3.7 3.6 -3.9 3.8	**22** M	0500 1050 1706 2303	0113 0749 1330 2000	-3.5 3.0 -3.4 3.3
8 M	0602 1158 1816	0228 0902 1446 2112	-4.1 3.8 -3.8 3.7	**23** TU	0540 1140 1744 2337	0155 0833 1416 2037	-4.2 3.5 -3.6 3.5
9 TU	0007 0644 1246 1855	0304 0944 1525 2146	-4.4 4.0 -3.6 3.5	**24** W	0620 1229 1822	0237 0916 1501 2115	-4.8 4.0 -3.6 3.6
10 W ●	0042 0725 1331 1932	0339 1023 1603 2219	-4.6 3.9 -3.3 3.3	**25** TH ○	0011 0701 1319 1901	0319 1000 1547 2155	-5.2 4.3 -3.5 3.5
11 TH	0115 0805 1416 2007	0415 1102 1641 2254	-4.6 3.8 -3.0 2.9	**26** F	0048 0745 1409 1941	0402 1045 1633 2238	-5.5 4.4 -3.3 3.4
12 F	0148 0845 1501 2043	0453 1141 1720 2330	-4.5 3.5 -2.7 2.6	**27** SA	0127 0832 1502 2026	0447 1134 1721 2323	-5.6 4.4 -3.1 3.1
13 SA	0221 0928 1549 2120	0532 1223 1802	-4.3 3.2 -2.3	**28** SU	0210 0923 1558 2117	0535 1226 1812	-5.5 4.2 -2.7
14 SU	0256 1014 1640 2202	0009 0615 1309 1848	2.2 -4.0 2.8 -1.9	**29** M	0259 1020 1657 2220	0014 0626 1323 1908	2.8 -5.2 3.8 -2.4
15 M	0336 1106 1736 2258	0053 0701 1401 1938	1.8 -3.7 2.5 -1.6	**30** TU	0356 1122 1758 2337	0111 0722 1426 2009	2.4 -4.7 3.5 -2.2

MAY

	SLACK Time	MAXIMUM Time	Rate		SLACK Time	MAXIMUM Time	Rate
1 W	0505 1227 1859	0218 0823 1535 2117	2.1 -4.2 3.3 -2.2	**16** TH	0439 1205 1843	0206 0810 1508 2056	1.4 -3.3 2.5 -1.9
2 TH ☾	0100 0623 1333 1957	0335 0929 1645 2233	2.0 -3.7 3.3 -2.5	**17** F ☽	0045 0548 1258 1931	0310 0905 1603 2154	1.3 -3.0 2.5 -2.2
3 F	0216 0743 1435 2048	0500 1040 1748 2347	2.2 -3.3 3.3 -2.9	**18** SA	0156 0706 1352 2017	0419 1004 1657 2251	1.4 -2.8 2.6 -2.6
4 SA	0321 0856 1531 2135	0616 1153 1841	2.6 -3.2 3.4	**19** SU	0256 0821 1445 2059	0527 1104 1747 2346	1.8 -2.7 2.7 -3.2
5 SU	0417 1002 1622 2217	0045 0718 1257 1927	-3.5 3.1 -3.1 3.4	**20** M	0347 0929 1535 2140	0629 1202 1834	2.3 -2.7 2.9
6 M	0506 1100 1708 2257	0130 0810 1349 2008	-4.0 3.5 -3.0 3.4	**21** TU	0433 1030 1622 2219	0036 0723 1257 1919	-3.9 3.0 -2.8 3.1
7 TU	0550 1152 1750 2334	0207 0855 1432 2045	-4.3 3.7 -2.9 3.3	**22** W	0518 1126 1707 2258	0123 0813 1350 2003	-4.6 3.6 -3.0 3.3
8 W	0631 1239 1829	0242 0936 1509 2119	-4.6 3.9 -2.8 3.1	**23** TH	0602 1220 1752 2339	0210 0900 1440 2047	-5.2 4.1 -3.1 3.4
9 TH ●	0009 0710 1323 1906	0316 1013 1545 2152	-4.7 3.9 -2.7 2.9	**24** F ○	0646 1311 1837	0256 0947 1529 2132	-5.7 4.5 -3.1 3.5
10 F	0043 0748 1406 1941	0351 1049 1621 2226	-4.8 3.8 -2.5 2.7	**25** SA	0021 0733 1402 1923	0342 1035 1618 2218	-6.0 4.7 -3.1 3.4
11 SA	0116 0826 1448 2016	0428 1125 1659 2302	-4.7 3.6 -2.3 2.4	**26** SU	0106 0821 1452 2013	0430 1123 1707 2307	-6.1 4.7 -3.0 3.3
12 SU	0149 0904 1531 2051	0506 1202 1739 2340	-4.5 3.3 -2.2 2.2	**27** M	0154 0911 1544 2108	0518 1214 1758	-5.9 4.5 -2.8
13 M	0223 0945 1616 2131	0547 1243 1822	-4.3 3.1 -2.0	**28** TU	0247 1003 1637 2212	0000 0609 1307 1852	3.0 -5.4 4.2 -2.7
14 TU	0301 1028 1703 2222	0023 0631 1327 1909	1.9 -4.0 2.8 -1.8	**29** W	0345 1058 1730 2324	0057 0703 1403 1950	2.7 -4.8 3.9 -2.7
15 W	0345 1114 1753 2329	0111 0718 1416 2000	1.6 -3.6 2.6 -1.8	**30** TH	0452 1156 1824	0202 0800 1502 2052	2.4 -4.1 3.5 -2.7
				31 F ☾	0041 0606 1256 1917	0317 0901 1605 2200	2.2 -3.4 3.2 -2.9

JUNE

	SLACK Time	MAXIMUM Time	Rate		SLACK Time	MAXIMUM Time	Rate
1 SA	0155 0724 1356 2008	0441 1008 1706 2311	2.2 -2.9 3.1 -3.2	**16** SU ☽	0107 0624 1244 1919	0335 0922 1559 2207	1.6 -2.7 2.6 -3.0
2 SU	0302 0840 1455 2056	0559 1121 1804	2.5 -2.5 3.0	**17** M	0213 0746 1340 2005	0444 1022 1653 2304	1.8 -2.4 2.6 -3.5
3 M	0400 0949 1549 2142	0014 0704 1234 1855	-3.6 2.9 -2.3 2.9	**18** TU	0312 0903 1441 2052	0554 1124 1748	2.3 -2.3 2.7
4 TU	0451 1050 1640 2224	0105 0758 1335 1940	-4.0 3.2 -2.2 2.8	**19** W	0406 1012 1540 2139	0000 0658 1226 1842	-4.1 2.9 -2.3 2.8
5 W	0536 1143 1725 2304	0146 0846 1421 2020	-4.3 3.5 -2.2 2.8	**20** TH	0457 1113 1636 2227	0054 0755 1325 1934	-4.7 3.5 -2.4 3.1
6 TH	0617 1230 1807 2342	0222 0927 1457 2056	-4.5 3.7 -2.2 2.7	**21** F	0545 1208 1728 2315	0146 0847 1421 2025	-5.3 4.1 -2.6 3.3
7 F	0656 1313 1845	0257 1004 1530 2131	-4.6 3.7 -2.2 2.7	**22** SA	0633 1259 1819	0236 0936 1513 2114	-5.8 4.5 -2.8 3.5
8 SA ●	0018 0733 1353 1921	0332 1039 1604 2205	-4.7 3.7 -2.2 2.6	**23** SU ○	0004 0721 1348 1910	0326 1024 1603 2204	-6.1 4.8 -3.0 3.6
9 SU	0053 0810 1432 1955	0408 1111 1640 2241	-4.7 3.6 -2.2 2.5	**24** M	0055 0808 1435 2003	0415 1111 1652 2255	-6.2 4.8 -3.1 3.5
10 M	0128 0845 1510 2031	0445 1144 1718 2319	-4.7 3.5 -2.2 2.3	**25** TU	0146 0855 1521 2058	0504 1157 1742 2348	-5.9 4.7 -3.2 3.4
11 TU	0203 0920 1549 2110	0525 1219 1758 2359	-4.5 3.3 -2.2 2.2	**26** W	0239 0943 1607 2158	0553 1245 1832	-5.5 4.4 -3.2
12 W	0239 0955 1628 2156	0605 1256 1842	-4.3 3.2 -2.3	**27** TH	0336 1032 1654 2303	0043 0643 1334 1925	3.1 -4.8 4.0 -3.2
13 TH	0320 1031 1708 2251	0044 0649 1336 1928	1.9 -3.9 3.0 -2.3	**28** F	0438 1122 1742	0144 0735 1425 2020	2.7 -4.0 3.6 -3.2
14 F	0409 1110 1750 2357	0134 0736 1420 2018	1.7 -3.5 2.8 -2.5	**29** SA ☾	0013 0547 1216 1832	0252 0831 1519 2119	2.4 -3.2 3.1 -3.2
15 SA	0510 1153 1834	0231 0827 1508 2112	1.6 -3.1 2.7 -2.7	**30** SU	0125 0701 1314 1923	0410 0931 1618 2223	2.2 -2.5 2.7 -3.3

UNITED STATES– SAN FRANCISCO BAY ENTRANCE (GOLDEN GATE)

LAT 37°49'N LONG 122°30'W

TIDAL STREAM PREDICTIONS (RATES IN KNOTS)

TIME ZONE +0800 — POSITIVE (+) DIRECTION 065 NEGATIVE (-) DIRECTION 245 — YEAR 2013

JULY

	SLACK Time	MAXIMUM Time	Rate		SLACK Time	MAXIMUM Time	Rate
1 M	0233 0818 1415 2014	0532 1039 1720 2329	2.3 -1.9 2.5 -3.5	**16** TU	0129 0720 1248 1914	0408 0949 1610 2227	2.1 -2.2 2.5 -3.8
2 TU	0335 0930 1516 2105	0643 1158 1819	2.6 -1.7 2.4	**17** W	0237 0841 1356 2009	0522 1053 1710 2327	2.4 -2.0 2.5 -4.2
3 W	0430 1034 1612 2152	0031 0741 1319 1912	-3.7 2.9 -1.6 2.4	**18** TH	0339 0954 1508 2107	0635 1159 1812	2.9 -1.9 2.6
4 TH	0518 1128 1702 2238	0121 0830 1413 1957	-4.0 3.2 -1.7 2.4	**19** F	0436 1057 1614 2205	0027 0738 1304 1912	-4.7 3.4 -2.1 2.9
5 F	0600 1214 1746 2320	0202 0913 1447 2037	-4.2 3.4 -1.8 2.5	**20** SA	0529 1151 1713 2300	0125 0833 1404 2009	-5.2 4.0 -2.4 3.2
6 SA	0640 1255 1826 2359	0239 0951 1516 2113	-4.4 3.6 -2.0 2.6	**21** SU	0618 1240 1808 2354	0220 0923 1458 2102	-5.6 4.4 -2.8 3.5
7 SU ●	0716 1333 1902	0314 1023 1547 2148	-4.6 3.6 -2.1 2.6	**22** M O	0706 1325 1900	0311 1009 1548 2154	-5.9 4.7 -3.2 3.7
8 M	0037 0751 1408 1938	0349 1053 1620 2224	-4.7 3.6 -2.3 2.6	**23** TU	0047 0751 1408 1952	0400 1052 1635 2244	-5.9 4.7 -3.5 3.8
9 TU	0113 0823 1442 2014	0426 1121 1656 2301	-4.7 3.6 -2.5 2.6	**24** W	0140 0835 1450 2045	0448 1135 1721 2335	-5.6 4.6 -3.7 3.7
10 W	0149 0854 1515 2051	0503 1152 1734 2340	-4.6 3.5 -2.7 2.5	**25** TH	0233 0919 1532 2140	0534 1218 1808	-5.1 4.3 -3.8
11 TH	0226 0924 1549 2133	0542 1224 1815	-4.4 3.4 -2.8	**26** F	0327 1003 1614 2238	0027 0621 1301 1855	3.4 -4.5 3.9 -3.8
12 F	0307 0955 1623 2221	0022 0623 1300 1858	2.4 -4.0 3.3 -3.0	**27** SA	0424 1048 1658 2340	0123 0709 1346 1944	3.1 -3.7 3.4 -3.7
13 SA	0353 1027 1659 2316	0108 0707 1340 1944	2.2 -3.6 3.1 -3.1	**28** SU	0527 1137 1745	0223 0800 1435 2037	2.7 -2.9 2.9 -3.5
14 SU	0449 1105 1738	0200 0755 1424 2034	2.1 -3.1 2.9 -3.3	**29** M ☾	0047 0636 1233 1836	0333 0855 1530 2134	2.3 -2.2 2.4 -3.3
15 M ☽	0020 0559 1151 1823	0300 0849 1514 2129	2.0 -2.6 2.6 -3.5	**30** TU	0155 0750 1336 1930	0455 0958 1632 2237	2.2 -1.6 2.1 -3.3
				31 W	0301 0902 1442 2026	0612 1111 1739 2344	2.4 -1.3 1.9 -3.4

AUGUST

	SLACK Time	MAXIMUM Time	Rate		SLACK Time	MAXIMUM Time	Rate
1 TH	0400 1008 1544 2121	0715 1248 1841	2.6 -1.3 2.0	**16** F	0314 0935 1454 2046	0614 1139 1752	2.9 -1.9 2.4
2 F	0452 1102 1638 2212	0047 0806 1353 1933	-3.6 2.9 -1.5 2.2	**17** SA	0415 1035 1604 2151	0005 0720 1247 1858	-4.5 3.4 -2.1 2.8
3 SA	0537 1147 1724 2258	0136 0850 1426 2017	-3.8 3.2 -1.7 2.4	**18** SU	0510 1127 1704 2251	0107 0815 1348 1958	-4.9 3.9 -2.6 3.2
4 SU	0616 1226 1805 2341	0216 0927 1453 2055	-4.1 3.4 -2.0 2.6	**19** M	0559 1212 1759 2348	0204 0903 1441 2053	-5.2 4.2 -3.1 3.6
5 M	0652 1301 1843	0253 0958 1523 2131	-4.3 3.5 -2.3 2.8	**20** TU O	0646 1255 1850	0256 0946 1528 2144	-5.3 4.4 -3.6 3.9
6 TU ●	0021 0725 1334 1919	0328 1025 1555 2207	-4.5 3.6 -2.7 2.9	**21** W	0041 0729 1335 1939	0344 1027 1613 2234	-5.2 4.4 -4.0 4.0
7 W	0100 0756 1406 1955	0404 1052 1630 2243	-4.5 3.6 -3.0 2.9	**22** TH	0134 0811 1414 2029	0430 1107 1656 2322	-5.0 4.3 -4.2 3.9
8 TH	0138 0825 1436 2032	0441 1120 1707 2321	-4.4 3.6 -3.3 2.9	**23** F	0225 0852 1453 2119	0514 1146 1739	-4.5 4.0 -4.3
9 F	0217 0854 1506 2111	0519 1152 1746	-4.2 3.5 -3.5	**24** SA	0317 0934 1532 2210	0010 0559 1227 1823	3.7 -3.9 3.5 -4.2
10 SA	0259 0923 1537 2155	0002 0600 1227 1828	2.9 -3.9 3.3 -3.7	**25** SU	0410 1016 1613 2306	0101 0644 1309 1908	3.3 -3.3 3.0 -4.0
11 SU	0347 0955 1611 2246	0047 0643 1305 1913	2.8 -3.5 3.1 -3.8	**26** M	0508 1103 1658	0155 0731 1355 1957	2.9 -2.6 2.5 -3.7
12 M	0442 1033 1650 2346	0138 0731 1349 2002	2.6 -3.0 2.8 -3.9	**27** TU	0006 0611 1157 1748	0256 0823 1447 2051	2.5 -2.0 2.1 -3.4
13 TU	0549 1118 1737	0236 0824 1439 2056	2.5 -2.5 2.5 -3.9	**28** W ☾	0112 0719 1301 1844	0410 0921 1547 2150	2.3 -1.5 1.8 -3.2
14 W ☽	0054 0706 1218 1834	0343 0924 1538 2156	2.4 -2.1 2.3 -4.0	**29** TH	0219 0827 1411 1946	0530 1028 1656 2254	2.2 -1.3 1.7 -3.1
15 TH	0206 0824 1334 1939	0458 1030 1643 2300	2.6 -1.8 2.3 -4.2	**30** F	0321 0930 1516 2047	0637 1145 1805	2.4 -1.3 1.8
				31 SA	0415 1023 1611 2143	0000 0730 1258 1903	-3.2 2.7 -1.5 2.0

SEPTEMBER

	SLACK Time	MAXIMUM Time	Rate		SLACK Time	MAXIMUM Time	Rate
1 SU	0501 1107 1659 2234	0057 0813 1341 1951	-3.5 2.9 -1.9 2.3	**16** M	0445 1055 1657 2244	0049 0750 1330 1951	-4.4 3.7 -3.0 3.3
2 M	0542 1145 1741 2320	0143 0849 1416 2032	-3.7 3.1 -2.3 2.6	**17** TU	0535 1138 1749 2342	0147 0836 1421 2046	-4.5 3.9 -3.6 3.7
3 TU	0618 1219 1820	0223 0919 1450 2110	-3.9 3.3 -2.8 2.9	**18** W	0620 1219 1838	0239 0918 1506 2135	-4.5 4.0 -4.1 4.0
4 W	0004 0651 1251 1857	0301 0946 1524 2147	-4.1 3.4 -3.2 3.1	**19** TH O	0035 0703 1257 1925	0326 0958 1548 2222	-4.3 4.0 -4.4 4.1
5 TH ●	0046 0723 1322 1933	0338 1014 1601 2224	-4.1 3.5 -3.6 3.3	**20** F	0127 0744 1335 2011	0410 1036 1629 2308	-4.1 3.8 -4.6 4.0
6 F	0127 0753 1352 2011	0417 1045 1638 2303	-4.1 3.5 -4.0 3.4	**21** SA	0217 0824 1412 2057	0453 1114 1709 2353	-3.7 3.5 -4.6 3.8
7 SA	0210 0823 1422 2050	0457 1119 1718 2345	-3.9 3.4 -4.2 3.4	**22** SU	0306 0905 1450 2144	0535 1153 1751	-3.2 3.1 -4.4
8 SU	0255 0855 1454 2134	0539 1155 1800	-3.6 3.2 -4.4	**23** M	0357 0947 1529 2234	0039 0619 1234 1835	3.4 -2.8 2.6 -4.1
9 M	0345 0930 1530 2224	0031 0624 1236 1846	3.3 -3.2 3.0 -4.4	**24** TU	0450 1033 1612 2328	0128 0705 1319 1921	3.1 -2.3 2.2 -3.8
10 TU	0442 1012 1613 2323	0122 0713 1322 1936	3.2 -2.8 2.7 -4.3	**25** W	0547 1126 1701	0223 0755 1409 2012	2.7 -1.9 1.8 -3.5
11 W	0547 1104 1705	0220 0807 1415 2032	3.0 -2.4 2.4 -4.2	**26** TH ☾	0028 0648 1230 1759	0327 0850 1508 2108	2.4 -1.6 1.6 -3.2
12 TH ☽	0030 0657 1212 1808	0326 0908 1518 2133	2.8 -2.0 2.2 -4.1	**27** F	0131 0749 1340 1903	0437 0951 1614 2209	2.3 -1.4 1.5 -3.0
13 F	0141 0807 1334 1920	0440 1014 1628 2238	2.9 -1.9 2.2 -4.1	**28** SA	0231 0846 1445 2009	0544 1056 1724 2310	2.4 -1.5 1.6 -3.0
14 SA	0249 0911 1452 2033	0553 1124 1741 2345	3.1 -2.1 2.4 -4.2	**29** SU	0326 0935 1541 2110	0637 1158 1826	2.5 -1.8 1.9
15 SU	0350 1007 1559 2142	0657 1231 1850	3.4 -2.5 2.8	**30** M	0413 1018 1630 2205	0008 0720 1249 1918	-3.1 2.7 -2.3 2.3

UNITED STATES– SAN FRANCISCO BAY ENTRANCE (GOLDEN GATE)

LAT 37°49'N LONG 122°30'W

TIDAL STREAM PREDICTIONS (RATES IN KNOTS)

TIME ZONE **+0800** POSITIVE (+) DIRECTION 065 NEGATIVE (-) DIRECTION 245 YEAR **2013**

OCTOBER

	SLACK	MAXIMUM			SLACK	MAXIMUM	
	Time	Time	Rate		Time	Time	Rate
1 TU		0059	-3.3	**16** W		0128	-3.7
	0456	0756	2.9		0505	0805	3.6
	1056	1332	-2.8		1101	1358	-4.1
	1713	2003	2.7		1738	2038	3.7
	2256				2335		
2 W		0145	-3.4	**17** TH		0220	-3.6
	0534	0829	3.1		0551	0847	3.6
	1130	1411	-3.3		1141	1441	-4.4
	1753	2044	3.0		1825	2126	3.9
	2344						
3 TH		0228	-3.6	**18** F	0029	0306	-3.4
	0609	0901	3.2		0634	0926	3.4
	1203	1450	-3.8		1220	1521	-4.7
	1832	2124	3.3		1910	2211	4.0
4 F ●	0030	0310	-3.6	**19** SA	0119	0349	-3.2
	0643	0934	3.3		0716	1004	3.2
	1235	1529	-4.3		1257	1601	-4.7
	1910	2204	3.6		1953	2254	3.9
5 SA	0116	0351	-3.6	**20** SU	0207	0431	-2.9
	0717	1009	3.3		0756	1042	2.9
	1307	1609	-4.6		1334	1641	-4.7
	1949	2246	3.8		2036	2336	3.7
6 SU	0203	0435	-3.4	**21** M	0255	0512	-2.6
	0752	1046	3.2		0837	1121	2.6
	1340	1651	-4.9		1411	1721	-4.5
	2032	2330	3.8		2119		
7 M	0252	0520	-3.2	**22** TU		0019	3.5
	0830	1127	3.0		0342	0555	-2.3
	1417	1735	-4.9		0919	1202	2.3
	2118				1450	1804	-4.2
					2205		
8 TU		0018	3.8	**23** W		0104	3.2
	0344	0607	-2.9		0432	0640	-2.1
	0912	1212	2.8		1005	1246	2.0
	1458	1823	-4.9		1531	1849	-3.9
	2210				2254		
9 W		0111	3.6	**24** TH		0153	2.9
	0441	0659	-2.6		0523	0728	-1.8
	1002	1302	2.5		1058	1336	1.7
	1547	1915	-4.7		1619	1938	-3.6
	2308				2346		
10 TH		0209	3.4	**25** F		0247	2.6
	0542	0755	-2.3		0616	0820	-1.7
	1104	1400	2.3		1201	1432	1.5
	1645	2012	-4.4		1715	2031	-3.3
11 F ☽	0011	0313	3.3	**26** SA ☾	0041	0343	2.5
	0645	0856	-2.2		0708	0916	-1.7
	1219	1506	2.1		1308	1534	1.4
	1754	2113	-4.2		1820	2127	-3.1
12 SA	0117	0422	3.2	**27** SU	0136	0440	2.5
	0747	1002	-2.2		0758	1014	-1.9
	1338	1619	2.2		1412	1640	1.5
	1910	2219	-3.9		1927	2224	-2.9
13 SU	0222	0529	3.3	**28** M	0228	0531	2.6
	0843	1110	-2.5		0843	1110	-2.3
	1450	1735	2.4		1509	1744	1.8
	2025	2326	-3.8		2033	2321	-2.9
14 M	0321	0628	3.4	**29** TU	0316	0616	2.7
	0933	1215	-3.0		0925	1202	-2.7
	1552	1844	2.9		1558	1840	2.2
	2134				2134		
15 TU		0030	-3.7	**30** W		0014	-2.9
	0415	0719	3.6		0400	0657	2.8
	1019	1310	-3.6		1003	1248	-3.3
	1648	1945	3.3		1643	1930	2.7
	2238				2230		
				31 TH		0105	-3.0
					0442	0736	3.0
					1039	1332	-3.9
					1725	2016	3.1
					2323		

NOVEMBER

	SLACK	MAXIMUM			SLACK	MAXIMUM	
	Time	Time	Rate		Time	Time	Rate
1 F		0153	-3.0	**16** SA	0020	0248	-2.6
	0522	0815	3.1		0606	0856	3.0
	1114	1415	-4.4		1146	1457	-4.7
	1806	2100	3.5		1854	2200	3.8
2 SA	0014	0240	-3.1	**17** SU ○	0109	0330	-2.4
	0601	0854	3.1		0648	0935	2.8
	1150	1458	-4.9		1224	1536	-4.7
	1847	2144	3.9		1936	2241	3.8
3 SU ●	0104	0327	-3.1	**18** M	0155	0410	-2.3
	0641	0935	3.1		0730	1013	2.6
	1226	1542	-5.2		1301	1615	-4.7
	1930	2229	4.1		2017	2320	3.6
4 M	0154	0413	-3.0	**19** TU	0240	0450	-2.2
	0722	1017	3.1		0810	1052	2.4
	1306	1627	-5.4		1339	1655	-4.5
	2015	2317	4.2		2057		
5 TU	0245	0502	-2.8	**20** W		0000	3.4
	0807	1103	3.0		0324	0531	-2.1
	1348	1714	-5.4		0852	1133	2.2
	2104				1417	1737	-4.3
					2139		
6 W		0007	4.1	**21** TH		0040	3.2
	0339	0552	-2.7		0409	0614	-2.0
	0857	1153	2.8		0937	1217	1.9
	1436	1804	-5.3		1458	1820	-4.1
	2156				2221		
7 TH	0433	0100	4.0	**22** F	0454	0123	3.0
	0956	0646	-2.5		1028	0700	-1.9
	1531	1247	2.6		1544	1304	1.7
	2252	1857	-5.0		2305	1907	-3.8
8 F	0529	0157	3.8	**23** SA	0539	0207	2.9
	1104	0743	-2.5		1127	0749	-2.0
	1634	1348	2.4		1636	1357	1.6
	2351	1954	-4.5		2351	1956	-3.4
9 SA ☽	0625	0257	3.6	**24** SU	0625	0254	2.7
	1219	0844	-2.5		1231	0841	-2.1
	1745	1457	2.2		1738	1456	1.5
		2055	-4.1			2047	-3.1
10 SU	0052	0359	3.5	**25** M ☾	0038	0342	2.7
	0719	0948	-2.7		0709	0934	-2.3
	1333	1612	2.3		1334	1558	1.6
	1901	2159	-3.6		1846	2142	-2.9
11 M	0152	0459	3.4	**26** TU	0126	0431	2.7
	0810	1053	-3.1		0751	1027	-2.7
	1441	1728	2.5		1432	1701	1.8
	2016	2304	-3.3		1956	2237	-2.7
12 TU	0249	0556	3.4	**27** W	0214	0518	2.7
	0858	1154	-3.5		0832	1119	-3.2
	1541	1837	2.9		1524	1802	2.2
	2126				2103	2333	-2.6
13 W		0009	-3.0	**28** TH	0302	0604	2.8
	0343	0647	3.3		0912	1209	-3.7
	0943	1248	-4.0		1611	1857	2.7
	1636	1937	3.3		2205		
	2230						
14 TH	0434	0109	-2.8	**29** F		0028	-2.6
	1026	0733	3.2		0350	0650	2.9
	1725	1335	-4.3		0951	1257	-4.3
	2328	2029	3.6		1656	1949	3.2
					2303		
15 F	0521	0201	-2.7	**30** SA	0436	0121	-2.6
	1107	0816	3.1		1031	0735	3.0
	1811	1417	-4.6		1741	1344	-4.8
		2117	3.8		2357	2038	3.6

DECEMBER

	SLACK	MAXIMUM			SLACK	MAXIMUM	
	Time	Time	Rate		Time	Time	Rate
1 SU		0213	-2.6	**16** M	0055	0312	-2.0
	0522	0820	3.1		0625	0912	2.6
	1112	1431	-5.3		1159	1514	-4.6
	1826	2125	4.0		1918	2226	3.6
2 M ●	0050	0303	-2.7	**17** TU ○	0138	0349	-2.0
	0609	0906	3.1		0705	0950	2.5
	1155	1518	-5.6		1237	1552	-4.6
	1912	2214	4.3		1957	2302	3.6
3 TU	0141	0353	-2.7	**18** W	0219	0427	-2.0
	0657	0954	3.2		0745	1028	2.4
	1241	1606	-5.8		1315	1631	-4.5
	2000	2302	4.4		2035	2337	3.4
4 W	0232	0444	-2.7	**19** TH	0259	0506	-2.1
	0748	1044	3.1		0825	1108	2.2
	1330	1656	-5.7		1353	1711	-4.4
	2049	2352	4.4		2112		
5 TH	0323	0536	-2.7	**20** F		0011	3.3
	0844	1137	3.0		0338	0546	-2.1
	1423	1747	-5.5		0907	1150	2.1
	2140				1433	1752	-4.2
					2148		
6 F	0414	0044	4.3	**21** SA		0048	3.2
	0947	0629	-2.8		0417	0630	-2.2
	1521	1234	2.8		0955	1235	1.9
	2233	1840	-5.0		1516	1836	-3.8
					2224		
7 SA	0504	0137	4.1	**22** SU		0127	3.0
	1055	0725	-2.8		0456	0715	-2.3
	1626	1336	2.6		1049	1324	1.8
	2327	1935	-4.5		1605	1922	-3.5
					2302		
8 SU	0555	0233	3.8	**23** M		0208	2.9
	1207	0824	-3.0		0536	0803	-2.5
	1736	1444	2.5		1148	1419	1.7
		2034	-3.8		1703	2011	-3.1
					2342		
9 M ☽	0023	0329	3.5	**24** TU		0252	2.8
	0645	0925	-3.2		0616	0854	-2.8
	1318	1600	2.4		1250	1518	1.7
	1851	2135	-3.2		1810	2103	-2.7
10 TU	0120	0426	3.3	**25** W ☾	0026	0339	2.7
	0734	1028	-3.5		0658	0946	-3.1
	1425	1716	2.6		1351	1622	1.9
	2005	2240	-2.7		1923	2159	-2.4
11 W	0217	0522	3.1	**26** TH	0116	0429	2.6
	0823	1129	-3.8		0741	1039	-3.5
	1526	1826	2.9		1448	1726	2.2
	2115	2347	-2.4		2035	2257	-2.3
12 TH	0313	0616	3.0	**27** F	0210	0520	2.7
	0909	1224	-4.1		0825	1133	-4.0
	1620	1926	3.2		1540	1828	2.7
	2220				2142	2356	-2.2
13 F		0051	-2.2	**28** SA	0306	0612	2.7
	0406	0705	2.9		0911	1226	-4.5
	0954	1313	-4.3		1631	1925	3.2
	1710	2019	3.4		2244		
	2317						
14 SA	0455	0147	-2.1	**29** SU	0401	0054	-2.3
	1038	0751	2.8		0958	0704	2.9
	1756	1356	-4.5		1719	1317	-5.1
		2105	3.6		2340	2018	3.7
15 SU	0009	0233	-2.0	**30** M		0150	-2.4
	0542	0833	2.7		0454	0755	3.1
	1119	1436	-4.6		1046	1408	-5.5
	1838	2148	3.7		1807	2108	4.1
				31 TU	0032	0243	-2.6
					0547	0845	3.3
					1136	1458	-5.8
					1855	2157	4.4

TIDE TABLES 2013

PART II

TIME & HEIGHT DIFFERENCES

FOR PREDICTING THE TIDE AT

SECONDARY PORTS

For use of Part II see pages x–xvi

CANADA — HALIFAX

LAT 44°40'N LONG 63°35'W

TIME ZONE +0400 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

JANUARY

	Time	m		Time	m
1 TU	0422	0.6	**16** W	0554	0.4
	1013	1.8		1111	1.8
	1644	0.3		1804	0.3
	2250	1.7		2341	1.8
2 W	0511	0.6	**17** TH	0649	0.4
	1052	1.7		1158	1.6
	1726	0.4		1855	0.4
	2327	1.7			
3 TH	0604	0.6	**18** F ☽	0026	1.8
	1134	1.7		0743	0.5
	1813	0.4		1248	1.5
				1947	0.5
4 F ☾	0007	1.7	**19** SA	0115	1.7
	0700	0.5		0836	0.5
	1221	1.6		1343	1.4
	1905	0.5		2041	0.6
5 SA	0053	1.7	**20** SU	0209	1.6
	0758	0.5		0928	0.5
	1316	1.6		1448	1.4
	2001	0.5		2136	0.6
6 SU	0145	1.7	**21** M	0310	1.6
	0857	0.4		1019	0.5
	1420	1.5		1601	1.4
	2100	0.5		2231	0.7
7 M	0246	1.8	**22** TU	0413	1.6
	0957	0.3		1108	0.5
	1534	1.5		1706	1.4
	2203	0.5		2323	0.7
8 TU	0353	1.8	**23** W	0508	1.6
	1059	0.2		1154	0.4
	1646	1.6		1759	1.5
	2307	0.4			
9 W	0459	1.9	**24** TH	0008	0.6
	1159	0.1		0556	1.6
	1752	1.7		1237	0.4
				1843	1.6
10 TH	0011	0.4	**25** F	0048	0.6
	0601	2.0		0639	1.7
	1257	0.0		1316	0.3
	1851	1.8		1923	1.6
11 F ●	0112	0.3	**26** SA	0124	0.6
	0659	2.0		0719	1.8
	1352	0.0		1353	0.3
	1946	1.9		1959	1.7
12 SA	0211	0.3	**27** SU	0159	0.5
	0754	2.0		0757	1.8
	1444	0.0		1428	0.2
	2038	1.9		2035	1.7
13 SU	0308	0.3	**28** M	0237	0.5
	0847	2.0		0835	1.8
	1534	0.0		1504	0.2
	2127	1.9		2110	1.7
14 M	0404	0.3	**29** TU	0317	0.4
	0937	1.9		0913	1.8
	1624	0.1		1540	0.2
	2214	1.9		2146	1.8
15 TU	0459	0.4	**30** W	0400	0.4
	1025	1.9		0952	1.8
	1714	0.2		1618	0.2
	2258	1.9		2221	1.8
			31 TH	0447	0.4
				1031	1.7
				1659	0.3
				2259	1.8

FEBRUARY

	Time	m		Time	m
1 F	0539	0.4	**16** SA	0658	0.5
	1114	1.7		1213	1.5
	1748	0.4		1901	0.6
	2339	1.8			
2 SA	0636	0.4	**17** SU ☽	0033	1.7
	1201	1.6		0749	0.5
	1843	0.4		1303	1.5
				1956	0.7
3 SU ☾	0025	1.8	**18** M	0124	1.6
	0736	0.4		0840	0.6
	1253	1.6		1402	1.4
	1945	0.5		2052	0.7
4 M	0117	1.7	**19** TU	0223	1.5
	0838	0.4		0931	0.6
	1355	1.5		1515	1.4
	2049	0.5		2148	0.7
5 TU	0220	1.7	**20** W	0331	1.5
	0941	0.3		1022	0.5
	1511	1.5		1630	1.4
	2154	0.5		2241	0.7
6 W	0332	1.8	**21** TH	0435	1.5
	1043	0.3		1111	0.5
	1631	1.6		1727	1.5
	2259	0.5		2328	0.7
7 TH	0445	1.8	**22** F	0527	1.6
	1144	0.2		1157	0.4
	1740	1.7		1812	1.6
8 F	0003	0.4	**23** SA	0011	0.6
	0551	1.9		0611	1.7
	1242	0.1		1239	0.3
	1838	1.8		1851	1.6
9 SA	0102	0.3	**24** SU	0052	0.5
	0648	1.9		0652	1.8
	1335	0.1		1319	0.3
	1930	1.9		1927	1.7
10 SU	0158	0.3	**25** M	0132	0.4
	0741	2.0		0732	1.8
	1425	0.0		1357	0.2
●	2018	1.9	O	2002	1.7
11 M	0250	0.3	**26** TU	0213	0.3
	0830	2.0		0811	1.8
	1512	0.1		1434	0.2
	2103	2.0		2038	1.8
12 TU	0340	0.3	**27** W	0255	0.3
	0916	1.9		0850	1.8
	1557	0.1		1512	0.2
	2145	1.9		2115	1.8
13 W	0429	0.3	**28** TH	0340	0.2
	1001	1.8		0931	1.8
	1641	0.3		1552	0.2
	2226	1.9		2153	1.8
14 TH	0518	0.4			
	1045	1.8			
	1725	0.4			
	2307	1.8			
15 F	0607	0.4			
	1128	1.6			
	1811	0.5			
	2349	1.8			

MARCH

	Time	m		Time	m
1 F	0427	0.2	**16** SA	0522	0.4
	1013	1.7		1100	1.6
	1637	0.3		1725	0.6
	2233	1.8		2313	1.7
2 SA	0520	0.3	**17** SU	0607	0.5
	1057	1.7		1142	1.6
	1730	0.4		1814	0.7
	2316	1.8		2355	1.7
3 SU	0619	0.3	**18** M	0655	0.6
	1145	1.6		1227	1.5
	1833	0.4		1910	0.7
4 M ☾	0004	1.8	**19** TU ☽	0041	1.6
	0721	0.3		0745	0.6
	1238	1.6		1320	1.5
	1939	0.5		2008	0.8
5 TU	0058	1.7	**20** W	0135	1.5
	0825	0.3		0837	0.6
	1340	1.5		1427	1.4
	2045	0.5		2104	0.8
6 W	0202	1.7	**21** TH	0241	1.5
	0928	0.3		0929	0.6
	1458	1.5		1544	1.5
	2150	0.5		2157	0.8
7 TH	0320	1.7	**22** F	0351	1.5
	1029	0.3		1020	0.5
	1623	1.6		1646	1.5
	2254	0.5		2248	0.7
8 F	0438	1.7	**23** SA	0450	1.6
	1129	0.2		1110	0.5
	1729	1.7		1733	1.6
	2355	0.4		2335	0.6
9 SA	0542	1.8	**24** SU	0538	1.6
	1225	0.2		1156	0.4
	1822	1.8		1812	1.7
10 SU	0051	0.3	**25** M	0020	0.5
	0636	1.9		0622	1.7
	1317	0.2		1239	0.3
	1909	1.9		1849	1.8
11 M	0143	0.3	**26** TU	0105	0.3
	0725	1.9		0704	1.8
	1404	0.2		1321	0.2
●	1952	1.9		1926	1.8
12 TU	0231	0.2	**27** W	0150	0.2
	0811	1.9		0745	1.8
	1448	0.2		1402	0.2
	2034	1.9	O	2004	1.9
13 W	0315	0.2	**28** TH	0235	0.1
	0854	1.9		0828	1.8
	1529	0.3		1445	0.2
	2114	1.9		2044	1.9
14 TH	0358	0.3	**29** F	0321	0.1
	0937	1.8		0912	1.8
	1607	0.4		1530	0.2
	2153	1.9		2127	1.9
15 F	0440	0.3	**30** SA	0411	0.1
	1019	1.7		0957	1.8
	1645	0.5		1622	0.3
	2232	1.8		2211	1.9
			31 SU	0507	0.1
				1044	1.7
				1722	0.4
				2258	1.8

APRIL

	Time	m		Time	m
1 M	0607	0.2	**16** TU	0604	0.6
	1134	1.7		1157	1.6
	1829	0.5		1827	0.8
	2348	1.8			
2 TU	0709	0.2	**17** W	0003	1.6
	1229	1.6		0653	0.6
	1937	0.5		1244	1.5
				1926	0.8
3 W ☾	0044	1.7	**18** TH ☽	0051	1.5
	0812	0.3		0744	0.6
	1333	1.5		1341	1.5
	2042	0.5		2023	0.8
4 TH	0151	1.6	**19** F	0148	1.5
	0913	0.3		0837	0.6
	1451	1.5		1449	1.5
	2145	0.5		2117	0.8
5 F	0311	1.6	**20** SA	0256	1.5
	1013	0.3		0929	0.6
	1611	1.6		1553	1.6
	2246	0.4		2209	0.7
6 SA	0428	1.7	**21** SU	0403	1.5
	1111	0.3		1020	0.5
	1711	1.7		1644	1.6
	2344	0.4		2259	0.5
7 SU	0530	1.7	**22** M	0459	1.6
	1206	0.3		1110	0.4
	1759	1.8		1727	1.7
				2349	0.4
8 M	0037	0.3	**23** TU	0549	1.6
	0621	1.8		1158	0.3
	1256	0.3		1807	1.8
	1843	1.8			
9 TU	0125	0.2	**24** W	0038	0.2
	0707	1.8		0635	1.7
	1342	0.3		1245	0.3
	1924	1.9		1849	1.9
10 W	0209	0.2	**25** TH	0126	0.1
	0751	1.8		0721	1.7
	1424	0.3		1333	0.2
●	2004	1.9	O	1932	2.0
11 TH	0250	0.2	**26** F	0215	0.0
	0833	1.8		0807	1.8
	1502	0.4		1422	0.2
	2043	1.8		2017	2.0
12 F	0328	0.2	**27** SA	0305	0.0
	0915	1.7		0855	1.8
	1537	0.5		1514	0.2
	2121	1.8		2105	2.0
13 SA	0404	0.3	**28** SU	0357	0.0
	0955	1.7		0944	1.8
	1610	0.6		1612	0.3
	2200	1.8		2154	1.9
14 SU	0440	0.4	**29** M	0454	0.0
	1035	1.7		1035	1.8
	1646	0.7		1716	0.4
	2239	1.7		2244	1.9
15 M	0520	0.5	**30** TU	0553	0.1
	1115	1.6		1127	1.7
	1732	0.7		1824	0.5
	2320	1.7		2337	1.8

CANADA — HALIFAX

LAT 44°40'N LONG 63°35'W

TIME ZONE +0400 — TIMES AND HEIGHTS OF HIGH AND LOW WATERS — YEAR 2013

MAY

	Time	m		Time	m		Time	m		Time	m
1 W	0655	0.2	**16** TH	0609	0.6	**1** SA	0122	1.6	**16** SU	0028	1.6
	1223	1.7		1212	1.6		0831	0.3		0710	0.5
	1930	0.5		1847	0.8		1406	1.7		1307	1.7
							2116	0.4	☽	2001	0.6
2 TH	0034	1.7	**17** F	0013	1.6	**2** SU	0230	1.5	**17** M	0121	1.5
	0755	0.3		0659	0.6		0927	0.4		0802	0.5
	1325	1.6		1259	1.6		1509	1.7		1357	1.7
☾	2034	0.5		1943	0.8		2212	0.4		2056	0.5
3 F	0140	1.6	**18** SA	0103	1.5	**3** M	0342	1.5	**18** TU	0224	1.5
	0855	0.3		0750	0.6		1023	0.4		0856	0.5
	1435	1.6		1354	1.6		1609	1.7		1454	1.7
	2135	0.5	☽	2038	0.7		2305	0.3		2153	0.4
4 SA	0256	1.6	**19** SU	0203	1.5	**4** TU	0446	1.5	**19** W	0333	1.5
	0953	0.3		0842	0.5		1118	0.5		0953	0.5
	1546	1.7		1452	1.6		1700	1.7		1554	1.8
	2233	0.4		2132	0.6		2356	0.3		2250	0.3
5 SU	0411	1.6	**20** M	0311	1.5	**5** W	0541	1.6	**20** TH	0441	1.6
	1049	0.4		0934	0.5		1210	0.5		1052	0.5
	1644	1.7		1548	1.7		1747	1.7		1652	1.9
	2328	0.3		2225	0.5					2347	0.2
6 M	0512	1.6	**21** TU	0417	1.5	**6** TH	0042	0.3	**21** F	0541	1.6
	1143	0.4		1027	0.5		0629	1.6		1152	0.4
	1732	1.8		1639	1.8		1258	0.5		1749	2.0
				2318	0.3		1830	1.7			
7 TU	0019	0.3	**22** W	0515	1.6	**7** F	0124	0.2	**22** SA	0044	0.0
	0602	1.7		1121	0.4		0713	1.6		0638	1.7
	1234	0.4		1727	1.9		1339	0.5		1252	0.3
	1815	1.8					1911	1.7		1845	2.0
8 W	0105	0.2	**23** TH	0011	0.2	**8** SA	0201	0.2	**23** SU	0139	0.0
	0648	1.7		0607	1.6		0756	1.7		0733	1.8
	1320	0.4		1215	0.3		1415	0.6		1352	0.3
	1856	1.8		1815	1.9	●	1951	1.7	O	1940	2.1
9 TH	0147	0.2	**24** F	0104	0.0	**9** SU	0236	0.3	**24** M	0233	-0.1
	0732	1.7		0658	1.7		0836	1.7		0827	1.9
	1402	0.4		1309	0.3		1447	0.6		1451	0.3
●	1935	1.8		1905	2.0		2030	1.8		2034	2.0
10 F	0225	0.2	**25** SA	0156	0.0	**10** M	0309	0.3	**25** TU	0326	-0.1
	0814	1.7		0749	1.8		0914	1.7		0920	1.9
	1439	0.5		1405	0.3		1518	0.6		1551	0.3
	2014	1.8	O	1956	2.0		2109	1.8		2128	2.0
11 SA	0300	0.2	**26** SU	0249	-0.1	**11** TU	0341	0.3	**26** W	0420	0.0
	0855	1.7		0840	1.8		0950	1.7		1011	1.9
	1511	0.6		1502	0.3		1551	0.7		1652	0.3
	2053	1.8		2048	2.0		2147	1.7		2220	1.9
12 SU	0334	0.3	**27** M	0343	-0.1	**12** W	0415	0.4	**27** TH	0515	0.1
	0934	1.7		0933	1.8		1027	1.7		1100	1.9
	1543	0.6		1603	0.3		1631	0.7		1754	0.4
	2132	1.8		2140	2.0		2225	1.7		2311	1.8
13 M	0407	0.4	**28** TU	0439	0.0	**13** TH	0452	0.4	**28** F	0610	0.2
	1012	1.7		1025	1.8		1103	1.7		1149	1.9
	1617	0.7		1707	0.4		1718	0.7		1854	0.4
	2211	1.7		2233	1.9		2302	1.7			
14 TU	0443	0.4	**29** W	0536	0.1	**14** F	0534	0.5	**29** SA	0002	1.7
	1051	1.7		1117	1.8		1141	1.7		0706	0.3
	1659	0.8		1813	0.4		1811	0.7		1238	1.8
	2250	1.7		2326	1.8		2342	1.6		1952	0.4
15 W	0523	0.5	**30** TH	0635	0.2	**15** SA	0620	0.5	**30** SU	0056	1.6
	1130	1.6		1210	1.8		1222	1.7		0802	0.4
	1751	0.8		1916	0.4		1906	0.7		1330	1.7
	2330	1.6							☾	2049	0.4
			31 F	0022	1.7						
				0733	0.2						
				1306	1.7						
			☾	2017	0.4						

JUNE

	Time	m		Time	m
1 SA	0122	1.6	**16** SU	0028	1.6
	0831	0.3		0710	0.5
	1406	1.7		1307	1.7
	2116	0.4	☽	2001	0.6
2 SU	0230	1.5	**17** M	0121	1.5
	0927	0.4		0802	0.5
	1509	1.7		1357	1.7
	2212	0.4		2056	0.5
3 M	0342	1.5	**18** TU	0224	1.5
	1023	0.4		0856	0.5
	1609	1.7		1454	1.7
	2305	0.3		2153	0.4
4 TU	0446	1.5	**19** W	0333	1.5
	1118	0.5		0953	0.5
	1700	1.7		1554	1.8
	2356	0.3		2250	0.3
5 W	0541	1.6	**20** TH	0441	1.6
	1210	0.5		1052	0.5
	1747	1.7		1652	1.9
				2347	0.2
6 TH	0042	0.3	**21** F	0541	1.6
	0629	1.6		1152	0.4
	1258	0.5		1749	2.0
	1830	1.7			
7 F	0124	0.2	**22** SA	0044	0.0
	0713	1.6		0638	1.7
	1339	0.5		1252	0.3
	1911	1.7		1845	2.0
8 SA	0201	0.2	**23** SU	0139	0.0
	0756	1.7		0733	1.8
	1415	0.6		1352	0.3
●	1951	1.7	O	1940	2.1
9 SU	0236	0.3	**24** M	0233	-0.1
	0836	1.7		0827	1.9
	1447	0.6		1451	0.3
	2030	1.8		2034	2.0
10 M	0309	0.3	**25** TU	0326	-0.1
	0914	1.7		0920	1.9
	1518	0.6		1551	0.3
	2109	1.8		2128	2.0
11 TU	0341	0.3	**26** W	0420	0.0
	0950	1.7		1011	1.9
	1551	0.7		1652	0.3
	2147	1.7		2220	1.9
12 W	0415	0.4	**27** TH	0515	0.1
	1027	1.7		1100	1.9
	1631	0.7		1754	0.4
	2225	1.7		2311	1.8
13 TH	0452	0.4	**28** F	0610	0.2
	1103	1.7		1149	1.9
	1718	0.7		1854	0.4
	2302	1.7			
14 F	0534	0.5	**29** SA	0002	1.7
	1141	1.7		0706	0.3
	1811	0.7		1238	1.8
	2342	1.6		1952	0.4
15 SA	0620	0.5	**30** SU	0056	1.6
	1222	1.7		0802	0.4
	1906	0.7		1330	1.7
			☾	2049	0.4

JULY

	Time	m		Time	m
1 M	0156	1.5	**16** TU	0049	1.6
	0858	0.4		0730	0.5
	1427	1.7		1316	1.7
	2144	0.4		2026	0.5
2 TU	0304	1.4	**17** W	0147	1.5
	0954	0.5		0828	0.5
	1528	1.6		1413	1.7
	2237	0.4		2126	0.4
3 W	0414	1.4	**18** TH	0256	1.5
	1050	0.5		0930	0.5
	1627	1.6		1518	1.8
	2328	0.4		2226	0.3
4 TH	0515	1.5	**19** F	0411	1.5
	1143	0.6		1033	0.5
	1720	1.6		1625	1.8
				2327	0.2
5 F	0015	0.3	**20** SA	0520	1.6
	0608	1.5		1137	0.4
	1231	0.6		1730	1.9
	1807	1.7			
6 SA	0058	0.3	**21** SU	0026	0.1
	0653	1.6		0621	1.7
	1313	0.6		1240	0.3
	1850	1.7		1830	2.0
7 SU	0136	0.3	**22** M	0122	0.0
	0735	1.6		0718	1.8
	1348	0.6		1340	0.3
	1930	1.7	O	1927	2.0
8 M	0211	0.3	**23** TU	0216	0.0
	0814	1.7		0811	1.9
	1420	0.6		1438	0.2
●	2010	1.8		2021	2.0
9 TU	0244	0.3	**24** W	0307	0.0
	0850	1.7		0902	2.0
	1451	0.6		1535	0.2
	2047	1.8		2113	2.0
10 W	0316	0.3	**25** TH	0358	0.0
	0925	1.7		0950	2.0
	1526	0.6		1631	0.3
	2124	1.8		2202	1.9
11 TH	0349	0.3	**26** F	0449	0.1
	0959	1.7		1036	2.0
	1604	0.6		1728	0.3
	2201	1.8		2250	1.8
12 F	0424	0.4	**27** SA	0541	0.2
	1034	1.7		1120	1.9
	1648	0.6		1824	0.3
	2237	1.7		2337	1.7
13 SA	0503	0.4	**28** SU	0634	0.3
	1110	1.7		1205	1.8
	1738	0.6		1920	0.4
	2316	1.7			
14 SU	0546	0.4	**29** M	0026	1.6
	1147	1.7		0729	0.4
	1831	0.6		1252	1.7
	2359	1.6	☾	2014	0.4
15 M	0636	0.5	**30** TU	0119	1.5
	1229	1.7		0824	0.5
	1928	0.5		1345	1.6
☽				2109	0.5
			31 W	0221	1.4
				0920	0.6
				1445	1.6
				2202	0.5

AUGUST

	Time	m		Time	m
1 TH	0334	1.4	**16** F	0229	1.5
	1017	0.6		0918	0.5
	1552	1.6		1452	1.7
	2253	0.5		2208	0.3
2 F	0446	1.4	**17** SA	0349	1.5
	1111	0.6		1023	0.5
	1652	1.6		1607	1.8
	2342	0.4		2310	0.2
3 SA	0543	1.5	**18** SU	0505	1.6
	1159	0.6		1128	0.4
	1744	1.6		1718	1.9
4 SU	0027	0.4	**19** M	0009	0.1
	0629	1.6		0607	1.8
	1241	0.6		1230	0.3
	1828	1.7		1819	1.9
5 M	0106	0.3	**20** TU	0105	0.1
	0710	1.6		0701	1.9
	1317	0.6		1328	0.3
	1908	1.7	O	1914	2.0
6 TU	0142	0.3	**21** W	0157	0.0
	0747	1.7		0751	2.0
	1350	0.5		1423	0.2
●	1947	1.8		2005	2.0
7 W	0216	0.3	**22** TH	0246	0.0
	0822	1.7		0838	2.0
	1424	0.5		1516	0.2
	2024	1.8		2054	2.0
8 TH	0248	0.3	**23** F	0334	0.1
	0856	1.7		0923	2.0
	1501	0.5		1607	0.2
	2100	1.8		2141	1.9
9 F	0322	0.3	**24** SA	0421	0.2
	0929	1.8		1006	1.9
	1540	0.4		1657	0.3
	2137	1.8		2226	1.8
10 SA	0357	0.3	**25** SU	0508	0.3
	1004	1.8		1048	1.9
	1623	0.4		1748	0.3
	2214	1.7		2311	1.7
11 SU	0435	0.3	**26** M	0558	0.4
	1039	1.8		1131	1.8
	1710	0.4		1840	0.4
	2253	1.7		2356	1.6
12 M	0519	0.4	**27** TU	0651	0.5
	1117	1.8		1215	1.7
	1804	0.4		1933	0.5
	2336	1.6			
13 TU	0610	0.5	**28** W	0044	1.5
	1158	1.7		0746	0.6
	1902	0.4		1304	1.6
			☾	2026	0.5
14 W	0024	1.6	**29** TH	0141	1.4
	0709	0.5		0843	0.7
	1247	1.7		1402	1.5
☽	2003	0.4		2118	0.6
15 TH	0121	1.5	**30** F	0251	1.4
	0813	0.5		0940	0.7
	1344	1.7		1511	1.5
	2106	0.4		2210	0.6
			31 SA	0409	1.4
				1033	0.7
				1620	1.5
				2259	0.5

CANADA — HALIFAX

LAT 44°40'N LONG 63°35'W

TIME ZONE **+0400** TIMES AND HEIGHTS OF HIGH AND LOW WATERS YEAR **2013**

SEPTEMBER

	Time	m		Time	m
1 SU	0511	1.5	**16** M	0453	1.7
	1122	0.7		1121	0.4
	1715	1.6		1708	1.8
	2346	0.5		2352	0.2
2 M	0558	1.6	**17** TU	0551	1.8
	1204	0.6		1220	0.3
	1800	1.7		1807	1.9
3 TU	0028	0.4	**18** W	0046	0.2
	0638	1.6		0641	1.9
	1243	0.5		1315	0.2
	1841	1.7		1859	1.9
4 W	0106	0.3	**19** TH	0137	0.1
	0714	1.7		0727	1.9
	1320	0.5		1406	0.2
	1920	1.8	O	1948	1.9
5 TH	0142	0.3	**20** F	0224	0.1
	0748	1.7		0811	2.0
	1358	0.4		1454	0.2
●	1958	1.8		2034	1.9
6 F	0217	0.2	**21** SA	0309	0.2
	0822	1.8		0854	1.9
	1437	0.3		1540	0.2
	2035	1.8		2119	1.8
7 SA	0252	0.2	**22** SU	0352	0.3
	0856	1.8		0935	1.9
	1518	0.3		1625	0.2
	2114	1.8		2202	1.8
8 SU	0330	0.2	**23** M	0435	0.4
	0933	1.8		1016	1.8
	1602	0.3		1710	0.3
	2153	1.7		2245	1.7
9 M	0411	0.3	**24** TU	0520	0.5
	1010	1.8		1057	1.8
	1650	0.3		1756	0.4
	2235	1.7		2328	1.6
10 TU	0459	0.4	**25** W	0610	0.6
	1051	1.8		1140	1.7
	1745	0.3		1845	0.5
	2319	1.7			
11 W	0556	0.5	**26** TH	0013	1.6
	1135	1.8		0705	0.7
	1846	0.3		1227	1.6
			☾	1935	0.6
12 TH	0008	1.6	**27** F	0105	1.5
	0702	0.5		0802	0.8
	1226	1.7		1320	1.5
☽	1949	0.3		2026	0.6
13 F	0105	1.5	**28** SA	0208	1.5
	0808	0.6		0858	0.8
	1325	1.7		1424	1.5
	2051	0.3		2116	0.6
14 SA	0214	1.5	**29** SU	0323	1.5
	0914	0.5		0951	0.8
	1436	1.7		1535	1.5
	2153	0.3		2206	0.6
15 SU	0338	1.6	**30** M	0429	1.5
	1018	0.5		1040	0.7
	1556	1.7		1637	1.5
	2254	0.3		2255	0.5

OCTOBER

	Time	m		Time	m
1 TU	0518	1.6	**16** W	0530	1.8
	1125	0.6		1208	0.3
	1726	1.6		1754	1.7
	2340	0.4			
2 W	0558	1.7	**17** TH	0027	0.3
	1208	0.5		0617	1.9
	1810	1.7		1300	0.2
				1843	1.8
3 TH	0023	0.4	**18** F	0117	0.3
	0634	1.7		0701	1.9
	1250	0.4		1348	0.2
	1851	1.7	O	1930	1.8
4 F	0104	0.3	**19** SA	0203	0.3
	0709	1.8		0743	1.9
	1332	0.3		1432	0.2
●	1931	1.7		2015	1.8
5 SA	0143	0.3	**20** SU	0246	0.3
	0746	1.8		0824	1.9
	1415	0.2		1514	0.2
	2011	1.7		2058	1.8
6 SU	0224	0.2	**21** M	0327	0.4
	0824	1.9		0905	1.8
	1459	0.1		1553	0.2
	2053	1.7		2140	1.7
7 M	0306	0.3	**22** TU	0405	0.5
	0904	1.9		0945	1.8
	1545	0.1		1632	0.3
	2135	1.7		2222	1.7
8 TU	0353	0.3	**23** W	0445	0.6
	0946	1.9		1026	1.7
	1636	0.1		1712	0.4
	2220	1.7		2303	1.7
9 W	0448	0.4	**24** TH	0530	0.7
	1031	1.8		1108	1.7
	1733	0.2		1755	0.5
	2308	1.7		2346	1.6
10 TH	0552	0.5	**25** F	0623	0.8
	1119	1.8		1152	1.6
	1834	0.2		1841	0.6
	2359	1.6			
11 F	0700	0.5	**26** SA	0032	1.6
	1212	1.7		0718	0.8
	1936	0.3		1240	1.5
☽			☾	1930	0.6
12 SA	0057	1.6	**27** SU	0126	1.6
	0806	0.5		0813	0.8
	1313	1.7		1335	1.5
	2037	0.3		2020	0.6
13 SU	0207	1.6	**28** M	0229	1.6
	0910	0.5		0906	0.8
	1426	1.6		1441	1.5
	2137	0.3		2111	0.6
14 M	0326	1.6	**29** TU	0334	1.6
	1012	0.5		0956	0.7
	1546	1.7		1548	1.5
	2236	0.3		2201	0.5
15 TU	0435	1.7	**30** W	0427	1.6
	1112	0.4		1045	0.6
	1657	1.7		1645	1.5
	2333	0.3		2250	0.5
			31 TH	0511	1.7
				1133	0.4
				1734	1.6
				2339	0.4

NOVEMBER

	Time	m		Time	m
1 F	0551	1.8	**16** SA	0058	0.4
	1220	0.3		0634	1.8
	1820	1.6		1328	0.2
				1912	1.7
2 SA	0026	0.4	**17** SU	0144	0.4
	0630	1.8		0716	1.8
	1306	0.2		1410	0.2
	1904	1.7	O	1956	1.7
3 SU	0112	0.3	**18** M	0226	0.5
	0711	1.9		0758	1.8
	1353	0.1		1449	0.2
●	1948	1.7		2039	1.7
4 M	0159	0.3	**19** TU	0304	0.5
	0755	1.9		0839	1.8
	1440	0.0		1526	0.3
	2034	1.7		2121	1.7
5 TU	0248	0.3	**20** W	0339	0.6
	0840	1.9		0919	1.8
	1530	0.0		1600	0.3
	2121	1.8		2201	1.7
6 W	0341	0.3	**21** TH	0414	0.7
	0928	1.9		1000	1.7
	1623	0.0		1635	0.4
	2209	1.8		2240	1.7
7 TH	0442	0.4	**22** F	0454	0.7
	1017	1.9		1040	1.7
	1720	0.1		1713	0.5
	2300	1.8		2319	1.7
8 F	0548	0.4	**23** SA	0541	0.8
	1108	1.8		1121	1.6
	1820	0.2		1754	0.6
	2353	1.7			
9 SA	0655	0.5	**24** SU	0001	1.7
	1203	1.8		0634	0.8
	1921	0.2		1204	1.6
				1840	0.6
10 SU	0050	1.7	**25** M	0046	1.6
	0759	0.5		0728	0.8
	1304	1.7		1250	1.5
☽	2020	0.3	☾	1929	0.6
11 M	0155	1.7	**26** TU	0136	1.6
	0901	0.5		0821	0.7
	1414	1.6		1346	1.5
	2119	0.3		2020	0.6
12 TU	0304	1.7	**27** W	0232	1.6
	1001	0.4		0914	0.6
	1531	1.6		1450	1.5
	2217	0.3		2112	0.6
13 W	0409	1.7	**28** TH	0327	1.7
	1058	0.3		1006	0.5
	1640	1.6		1557	1.5
	2313	0.4		2205	0.5
14 TH	0503	1.8	**29** F	0419	1.7
	1152	0.3		1058	0.4
	1737	1.6		1656	1.5
				2258	0.5
15 F	0007	0.4	**30** SA	0507	1.8
	0550	1.8		1149	0.2
	1242	0.2		1748	1.6
	1826	1.7		2351	0.4

DECEMBER

	Time	m		Time	m
1 SU	0554	1.9	**16** M	0124	0.5
	1241	0.1		0654	1.7
	1837	1.7		1348	0.2
				1939	1.7
2 M	0045	0.4	**17** TU	0205	0.5
	0642	1.9		0737	1.8
	1332	0.0		1426	0.2
●	1927	1.7	O	2021	1.7
3 TU	0138	0.3	**18** W	0241	0.6
	0731	2.0		0818	1.8
	1423	0.0		1501	0.3
	2017	1.8		2101	1.7
4 W	0233	0.3	**19** TH	0313	0.6
	0822	2.0		0858	1.8
	1515	-0.1		1533	0.3
	2108	1.8		2138	1.7
5 TH	0331	0.3	**20** F	0345	0.7
	0914	2.0		0937	1.8
	1609	0.0		1605	0.4
	2159	1.9		2215	1.7
6 F	0433	0.3	**21** SA	0420	0.7
	1006	1.9		1015	1.7
	1705	0.0		1638	0.4
	2250	1.9		2251	1.7
7 SA	0538	0.4	**22** SU	0503	0.7
	1059	1.9		1053	1.7
	1803	0.1		1716	0.5
	2342	1.8		2328	1.7
8 SU	0642	0.4	**23** M	0551	0.7
	1153	1.8		1131	1.6
	1901	0.2		1758	0.5
9 M	0035	1.8	**24** TU	0007	1.7
	0745	0.4		0644	0.7
	1250	1.7		1213	1.6
☽	1959	0.3		1846	0.5
10 TU	0132	1.7	**25** W	0049	1.7
	0844	0.4		0738	0.7
	1354	1.6		1301	1.5
	2057	0.3	☾	1937	0.6
11 W	0233	1.7	**26** TH	0136	1.7
	0942	0.4		0833	0.6
	1505	1.5		1358	1.5
	2155	0.4		2031	0.6
12 TH	0336	1.7	**27** F	0229	1.7
	1038	0.3		0928	0.5
	1615	1.5		1505	1.5
	2252	0.4		2127	0.6
13 F	0433	1.7	**28** SA	0327	1.7
	1131	0.3		1024	0.4
	1716	1.5		1614	1.5
	2347	0.5		2225	0.5
14 SA	0524	1.7	**29** SU	0426	1.8
	1221	0.3		1121	0.2
	1808	1.6		1716	1.6
				2324	0.5
15 SU	0038	0.5	**30** M	0523	1.9
	0611	1.7		1217	0.1
	1307	0.2		1813	1.7
	1855	1.6			
			31 TU	0024	0.4
				0619	2.0
				1312	0.0
				1907	1.7

CANADA; BAY OF FUNDY, NOVA SCOTIA

No.	PLACE	Lat. N	Long. W	TIME DIFFERENCES MHW	TIME DIFFERENCES MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
				Zone +0400							
2864	**SAINT JOHN, N.B.** (see page 182)					**7.9**	**6.9**	**1.8**	**0.8**		
2860	Back Bay	45 03	66 52	-0003	-0007	-1.1	-1.0	0.0	+0.1	3.85	d
2862	Lepreau Bay	45 07	66 29	-0001	+0003	-0.7	-0.5	-0.3	0.0	4.0	dx
2863	Dipper Harbour West	45 06	66 26	-0002	+0002	-0.9	-0.7	-0.2	0.0	3.96	
2864	SAINT JOHN, N.B.	45 16	66 04	STANDARD PORT			See Table V			4.42	
2866	St. Martins	45 21	65 32	+0011	+0007	+1.6	+1.5	+0.4	+0.2	5.28	
	CHIGNECTO BAY										
2869	Herring Cove	45 34	64 58	+0013	+0016	+2.5	+2.4	+0.5	+0.2	5.81	d
2871	Grindstone Island	45 43	64 37	+0016	+0025	+4.0	+3.6	+0.7	+0.2	6.56	d
	River Petitcodiac										
2872	Hopewell Cape	45 51	64 35	+0010	+0029	+4.8	+4.2	+1.0	+0.3	6.94	★
2874	Moncton	46 05	64 46	+0045	⊙	⊙	⊙	⊙	⊙	⊙	★
2875	Salisbury	45 59	65 05	+0130	⊙	⊙	⊙	⊙	⊙	⊙	★
	Cumberland Basin										
2877	Amherst Harbour	45 50	64 17	+0035	+0045	+5.7	+5.0	+0.8	+0.4	7.4	dx
2878	Joggins	45 41	64 28	+0014	+0026	+4.3	+3.9	+0.6	+0.2	6.61	
2880	Cape Capstan	45 28	64 51	+0011	+0013	+2.6	+2.3	+0.5	+0.2	5.75	d
	MINAS BASIN AND CHANNEL										
2881	Ile Haute	45 15	65 00	+0005	+0003	+2.7	+2.7	+0.6	+0.5	6.04	
2883	West Advocate	45 21	64 49	+0000	+0000	+2.6	+2.3	+0.5	+0.2	5.76	d
2883a	Cape D'or	45 17	64 46	+0010	+0012	+3.4	+3.1	+0.8	+0.5	6.27	
2884	Port Greville	45 24	64 33	+0029	+0031	+3.6	+3.3	+0.7	+0.3	6.35	
2884a	Diligent River	45 24	64 27	+0037	+0031	+4.4	+4.0	+0.8	+0.3	6.75	
2885	Parrsboro	45 22	64 20	+0050	+0043	+4.6	+4.1	+0.6	+0.1	6.70	
2886	Five Islands	45 23	64 07	+0057	+0057	+5.7	+5.1	+0.9	+0.3	7.38	
2888	Truro	45 22	63 20	+0135	⊙	+0.2	-0.5	⊙	⊙	⊙	
2891	Burntcoat Head	45 18	63 48	+0105	+0110	+6.1	+5.4	+0.9	+0.3	7.53	
	Avon River										
2893	Hantsport	45 04	64 10	+0103	+0114	+6.1	+5.4	+0.8	+0.1	7.49	
2894	Windsor	45 00	64 08	+0103	⊙	⊙	⊙	⊙	⊙	⊙	
2897	Scots Bay	45 19	64 26	+0016	+0014	+3.7	+3.4	+0.5	+0.1	6.36	
	BAY OF FUNDY										
2899	Margaretsville	45 03	65 04	-0009	-0009	+1.8	+2.0	+0.2	+0.3	5.41	
2900	Parkers Cove	44 48	65 32	-0016	-0016	+0.9	+0.8	+0.1	0.0	4.85	
	Annapolis Basin										
2901	Digby	44 38	65 45	-0018	-0020	+0.3	+0.3	+0.1	0.0	4.54	
2902	Annapolis Royal	44 45	65 30	+0006	+0010	+0.8	+0.9	0.0	+0.1	4.8	dx
	St.Mary Bay										
2904	Tiverton	44 23	66 13	-0044	-0045	-2.4	-2.1	-0.5	-0.1	3.06	
2905	Westport	44 16	66 21	-0035	-0035	-2.4	-2.0	-0.7	-0.3	3.02	
2906	Meteghan	44 12	66 10	-0051	-0054	-2.5	-2.2	-0.5	-0.1	3.01	
2907	Weymouth	44 25	66 00	-0023	-0017	-2.1	-1.6	-0.4	-0.2	3.2	dx
2910	Yarmouth **C**	43 50	66 07	-0108	-0111	-3.5	-3.0	-0.7	-0.3	2.47	
2912	Woods Harbour	43 32	65 44	-0206	-0238	-4.7	-4.1	-0.9	-0.2	1.85	
2913	Flat Island	43 30	66 00	-0132	-0146	-4.3	-3.7	-0.8	-0.2	2.05	
2913a	Seal Island	43 24	66 00	-0129	-0137	-4.6	-4.0	-0.9	-0.3	1.90	
2935	**HALIFAX** (see page 185)					**1.8**	**1.5**	**0.5**	**0.3**		
	ATLANTIC OCEAN										
2914	Clark's Harbour	43 27	65 38	+0133	+0056	+1.1	+1.0	+0.2	0.0	1.58	
2915	Barrington Passage	43 32	65 37	+0047	+0029	+0.4	+0.5	+0.1	+0.1	1.33	
2917	Shelburne	43 45	65 19	+0029	+0012	+0.4	+0.4	+0.3	+0.2	1.39	
2919	Lockeport	43 42	65 07	+0025	+0005	+0.4	+0.4	+0.3	+0.2	1.37	
2922	Port Mouton	43 56	64 51	+0020	+0005	+0.1	+0.1	+0.2	+0.1	1.15	
2923	Liverpool	44 03	64 43	+0012	+0001	+0.1	+0.1	+0.1	0.0	1.10	
	Lahave River										
2926	Krout Point	44 17	64 21	+0020	+0015	+0.2	+0.2	+0.1	0.0	1.2	dx
2927	Bridgewater	44 23	64 31	+0025	+0020	+0.3	+0.3	+0.2	+0.3	1.30	
2928	Lunenburg	44 22	64 19	-0005	-0002	+0.3	+0.3	+0.3	+0.2	1.29	

⊙ No data.
★ See notes on page 296.
C Tides predicted in Canadian Tide Tables.
d Differences approximate.
t Time differences approximate.
x ML inferred.

CANADA; NOVA SCOTIA, CAPE BRETON ISLAND, GULF OF ST. LAWRENCE

No.	PLACE		Lat. N	Long. W	TIME DIFFERENCES MHW	TIME DIFFERENCES MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
					Zone +0400							
2935	**HALIFAX**	(see page 185)					**1.8**	**1.5**	**0.5**	**0.3**		
	Mahone Bay											
2929	Mahone Harbour		44 27	64 22	-0001	-0001	+0.3	+0.3	+0.3	+0.2	1.3	dx
2930	Chester		44 33	64 15	-0003	-0004	+0.2	+0.2	0.0	-0.1	1.16	d
2932	Indian Harbour		44 31	63 57	+0002	+0003	+0.4	+0.4	+0.4	+0.3	1.37	
2935	HALIFAX		44 40	63 35	STANDARD PORT			See Table V			1.02	
2939	Jeddore Harbour		44 46	63 03	-0001	+0019	+0.3	+0.2	+0.2	+0.1	1.22	d
2940	Murphy Cove		44 47	62 46	-0020	-0013	+0.1	+0.2	+0.2	+0.2	1.18	
2942	Sheet Harbour		44 55	62 32	-0009	-0003	+0.1	+0.2	+0.2	+0.1	1.16	
2946	Sonora		45 03	61 55	-0012	+0002	+0.1	+0.1	+0.1	+0.1	1.10	
2948	Isaac's Harbour		45 11	61 40	-0020	-0009	+0.2	+0.1	+0.3	+0.1	1.21	
3159	**ARGENTIA**	(see page 203)					**2.3**	**1.9**	**0.9**	**0.5**		
2950	Larry's River		45 13	61 23	-0037	+0014	-0.4	-0.3	-0.2	-0.1	1.13	
2952	Sable Island		43 56	59 54	-0008	+0030	-0.7	-0.5	-0.3	-0.1	1.01	
2954	Canso Harbour		45 20	61 00	-0020	+0010	-0.5	-0.4	-0.3	-0.2	1.07	
2956	Guysborough		45 23	61 30	-0020	+0050	-0.9	-0.8	-0.5	-0.4	0.8	dx
	CAPE BRETON ISLAND											
	Strait of Canso											
2958	Port Hastings		45 39	61 24	-0032	+0014	-0.6	-0.5	-0.4	-0.3	0.92	
2958a	Port Hawkesbury		45 37	61 22	-0022	+0022	-0.3	-0.1	-0.1	+0.1	1.30	
2959	Point Tupper	C	45 36	61 22	-0033	+0014	-0.6	-0.6	-0.5	-0.3	0.89	
2959a	Sand Point		45 31	61 16	-0035	+0012	-0.7	-0.5	-0.5	-0.3	0.90	
2960	Arichat		45 31	61 02	-0037	+0002	-0.7	-0.6	-0.5	-0.3	0.86	
2961	Cannes		45 38	60 58	-0032	+0034	-0.9	-0.7	-0.6	-0.4	0.73	
2964	Gabarus		45 50	60 09	+0000	+0000	-0.8	-0.7	-0.4	-0.3	0.9	dx
2965	Louisburg		45 55	59 58	-0030	+0005	-0.7	-0.6	-0.4	-0.2	0.91	t
2935	**HALIFAX**	(see page 185)					**1.8**	**1.5**	**0.5**	**0.3**		
2968	Glace Bay		46 12	59 57	-1220	-1245	-0.6	-0.6	-0.1	-0.1	0.7	dx
2969	North Sydney	C	46 13	60 15	-1211	-1233	-0.6	-0.6	-0.1	-0.1	0.70	
2972	St Anns Harbour		46 16	60 36	-1205	-1215	-0.5	-0.4	0.0	0.0	0.8	dx
							MHHW	MLHW	MHLW	MLLW		
2321	**PORT OF SPAIN**	(see page 146)			HHW	LLW	**1.1**	**1.0**	**0.5**	**0.3**		
2974	Ingonish Island		46 41	60 20	+0432	+0429	+0.1	+0.1	+0.1	0.0	0.82	d
2976	Dingwall		46 54	60 28	★	★	0.0	0.0	+0.1	+0.1	0.79	
	Cabot Strait											
2977	St. Paul Island		47 12	60 09	+0440	+0435	0.0	0.0	0.0	0.0	0.72	t
2997	**PICTOU**	(see page 188)					**1.7**	**1.5**	**1.0**	**0.5**		
	GULF OF ST. LAWRENCE											
	Magdalen Islands											
2980	Grande Entree		47 33	61 33	-0052	-0045	-0.8	-0.7	-0.4	-0.2	0.67	
2983	Cap-aux-Meules		47 23	61 52	-0100	-0057	-0.7	-0.6	-0.3	-0.1	0.73	
2984	Havre Aubert		47 14	61 50	-0057	-0051	-0.8	-0.6	-0.4	-0.2	0.69	
	Cape Breton Islands											
2986	La Pointe		46 36	61 03	-0125	-0057	-0.7	-0.7	-0.3	-0.1	0.72	
2988	Broad Cove Marsh		46 18	61 16	-0116	-0047	-0.5	-0.6	-0.2	-0.1	0.81	
2990	Port Hood		46 01	61 32	-0052	-0029	-0.7	-0.7	-0.5	-0.3	0.65	
	Strait of Canso											
2992	Aulds Cove		45 39	61 26	-0032	-0011	-0.6	-0.6	-0.4	-0.2	0.74	
	St. George's Bay											
2993	Cape Jack		45 42	61 34	-0112	-0102	-0.4	-0.4	-0.3	-0.1	0.85	
2994	Antigonish		45 40	61 55	-0031	-0016	-0.5	-0.5	-0.2	-0.1	0.85	
2995	Ballantynes Cove		45 52	61 55	-0051	-0033	-0.3	-0.3	-0.2	0.0	0.94	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
2321	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0
2860 - 2997						Negligible							
3159	0.0	+0.1	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES MHW	MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
					Zone -0900							
7280	**CHANGJIANG APPROACHES (LUHUADAO)**	(see page 126)					**4.3**	**3.3**	**2.0**	**0.9**		
7553	Yeosu	K	34 45	127 46	-0055	-0052	-1.0	-1.0	-0.7	-0.6	1.81	
7553a	Kwangyang	K	34 54	127 45	-0051	-0051	-0.8	-0.8	-0.7	-0.6	1.91	
7555	Yokjido		34 38	128 16	-0111	-0059	-1.6	-1.4	-1.0	-0.7	1.43	
7557	Samchonpo	K	34 55	128 04	-0111	-0059	-1.3	-1.1	-0.9	-0.6	1.65	
7559	Ch'ungmu	K	34 49	128 26	-0109	-0105	-1.7	-1.5	-1.0	-0.7	1.41	
7560	Chisep'o	K	34 48	128 42	-0138	-0126	-2.5	-2.0	-1.4	-0.8	0.96	
7562	Unp'ungo		35 06	128 29	-0132	-0120	-2.2	-1.8	-1.2	-0.8	1.12	
7563	Masan	K	35 12	128 35	-0130	-0118	-2.4	-2.0	-1.4	-0.8	0.98	
7564	Jinhae	K	35 09	128 39	-0117	-0127	-2.4	-2.0	-1.3	-0.8	1.00	
7565	Gadeog Do	K	35 01	128 49	-0123	-0128	-2.5	-2.0	-1.4	-0.8	0.95	
7566	Busan	CJK	35 06	129 02	-0150	-0137	-3.1	-2.4	-1.6	-0.8	0.65	
7799	**MOJI**	(see page 144)					**2.3**	**1.7**	**0.9**	**0.3**		
	Korea East Coast											
7568	Ulsan Hang	K	35 30	129 23	+1059	+1036	-1.8	-1.3	-0.7	-0.2	0.30	

No.	PLACE		Lat. N	Long. E	HHW	LLW	MHHW	MLHW	MHLW	MLLW		
7994	**KAMAISHI**	(see page 150)					**1.3**	**1.1**	**0.8**	**0.3**		
7569	Kamp'o		35 48	129 30	p	p	-1.1	-0.9	-0.7	-0.2	0.14	
7570	P'ohang	K	36 01	129 24	p	p	-1.1	-1.0	-0.7	-0.3	0.12	
7571	Kanggu		36 21	129 24	p	p	-1.1	-0.9	-0.6	-0.3	0.13	
7572	Ch'uksan		36 31	129 26	+1210	+1235	-1.1	-0.9	-0.7	-0.3	0.13	t
7574	Chukpyon		37 03	129 26	+1210	+1220	-1.1	-0.9	-0.7	-0.3	0.13	t
7576	Muk'o	K	37 33	129 07	+1225	+1220	-1.0	-0.9	-0.6	-0.2	0.19	t
7577	Ullung Do	K	37 30	130 55	+1240	+1245	-1.1	-0.9	-0.6	-0.3	0.16	t
7580	Chumunjin Hang		37 53	128 50	+1210	+1245	-1.0	-0.9	-0.6	-0.2	0.20	t
7581	Sokch'o Hang	K	38 12	128 36	+1155	+1200	-1.0	-0.9	-0.6	-0.2	0.20	t
7583	Changjon Hang		38 45	128 12	+1206	+1237	-1.0	-0.8	-0.6	-0.2	0.20	
7585	Wonsan	K	39 09	127 27	+1210	+1205	-1.0	-0.8	-0.6	-0.2	0.22	t
7587	Sohojin Hang		39 49	127 38	+1210	+1235	-1.0	-0.8	-0.6	-0.2	0.21	t
7589	Sinp'o		40 00	128 12	+1210	+1243	-1.0	-0.8	-0.6	-0.2	0.22	
7591	Ch'aho		40 12	128 38	+1200	+1240	-1.0	-0.9	-0.6	-0.2	0.21	t
7594	Songjin		40 40	129 13	+1209	+1245	-1.0	-0.8	-0.6	-0.2	0.23	
7597	Taeryanghwa-man (Dairyoka Wan)		41 10	129 44	+1213	+1244	-1.0	-0.8	-0.6	-0.2	0.20	
7600	Sajin-man (Sashin Wan)		41 59	130 00	+1214	+1244	-1.0	-0.8	-0.6	-0.2	0.20	
7603	Unggi-hang (Yuki Ko)		42 20	130 25	+1217	+1247	-1.0	-0.8	-0.6	-0.2	0.20	

No.	PLACE		Lat. N	Long. E	MHW	MLW	MHWS	MHWN	MLWN	MLWS		
7799	**MOJI**	(see page 144)					**2.3**	**1.7**	**0.9**	**0.3**		
	Japan											
	Tsu Shima											
7606	Sasuna Ko		34 38	129 24	-0009	-0013	-0.8	-0.7	-0.3	-0.2	0.80	
7608	Tsuna		34 25	129 16	-0005	-0009	-0.3	-0.3	-0.1	-0.1	1.07	
7610	Tsutsu		34 07	129 11	-0005	-0016	-0.2	-0.2	-0.1	-0.1	1.17	
7611	Izuhara	CJ	34 12	129 18	-0010	-0021	-0.6	-0.5	-0.2	-0.1	0.93	
7613	Takeshiki Ko		34 18	129 18	+0005	+0000	-0.1	-0.2	-0.1	-0.1	1.18	t
7615	Oshika		34 31	129 27	-0024	-0027	-1.0	-0.8	-0.5	-0.2	0.67	
	Iki Shima											
7618	Gonoura		33 45	129 41	+0010	+0007	-0.1	-0.1	0.0	0.0	1.27	
7619	Katsumoto		33 51	129 42	+0017	+0013	-0.3	-0.3	-0.1	0.0	1.13	
7621	Ashibe		33 49	129 46	+0019	+0016	-0.6	-0.5	-0.2	-0.1	0.97	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
7280	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1
7469 - 7533	-0.2	-0.2	-0.1	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.2
7534 - 7566	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	-0.1	-0.1
7568 - 7603	0.0	-0.1	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	0.0
7606 - 7621	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
7799	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
7994	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0

JAPAN

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES MHW	MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
					Zone -0900							
7799	**MOJI**		(see page 144)				**2.3**	**1.7**	**0.9**	**0.3**		
	Goto Retto											
7622	Konoura		33 16	129 05	-0011	-0015	+0.3	+0.2	+0.2	+0.1	1.50	
7625	Arikawa		32 59	129 07	-0028	-0031	+0.1	+0.1	+0.1	+0.1	1.42	
7626	Tai-No-Ura		32 57	129 06	-0103	-0103	+0.5	+0.3	+0.3	+0.1	1.59	
7628	Wakamatsu (Goto Retto)		32 53	129 01	-0016	-0019	+0.5	+0.4	+0.3	+0.1	1.62	
7631	Fukue (Goto Retto)		32 42	128 51	-0054	-0057	+0.4	+0.3	+0.3	+0.2	1.59	
7632	Tomie		32 37	128 46	-0059	-0102	+0.4	+0.3	+0.3	+0.2	1.61	
7633	Tamanoura		32 37	128 37	-0033	-0033	+0.5	+0.3	+0.2	+0.1	1.56	
7636	Me Shima		32 00	128 21	-0112	-0115	0.0	0.0	+0.1	+0.1	1.38	
	Japan Kyushu West Coast											
7641	Konominato		33 51	130 29	+0042	+0039	-0.7	-0.5	-0.2	0.0	0.95	
7642	Saito Saki		33 39	130 22	+0036	+0030	-0.3	-0.3	-0.1	-0.1	1.10	
7643	Hakata Wharf	**C**	33 36	130 24	+0036	+0030	-0.4	-0.3	-0.1	0.0	1.10	
7644	Hakata (Higashihama Wharf)	**J**	33 37	130 24	+0041	+0035	-0.4	-0.3	-0.1	0.0	1.10	
7646	Karatsu	**J**	33 28	129 58	+0025	+0022	-0.3	-0.2	0.0	0.0	1.18	
7647	Yobuko		33 33	129 53	+0007	+0004	-0.2	-0.2	0.0	0.0	1.18	★
7648	Kariya		33 28	129 51	+0020	+0017	-0.1	-0.1	0.0	0.0	1.27	
	Imari Wan											
7649	Hase		33 19	129 49	+0018	+0014	+0.1	+0.1	+0.1	+0.1	1.40	
7650	Matsuura		33 21	129 41	+0015	+0012	+0.1	+0.1	+0.1	+0.1	1.40	
	Hirado Seto											
7652	Kuroko Shima		33 22	129 34	-0016	-0019	+0.4	+0.3	+0.2	+0.1	1.55	
	Hirado Shima											
7652a	Usuka Wan		33 23	129 32	+0002	+0002	+0.2	+0.1	+0.1	0.0	1.44	
7653	Shijiki Wan		33 12	129 23	-0018	-0021	+0.4	+0.3	+0.2	+0.1	1.57	
7656	Sasebo	**CJU**	33 09	129 43	-0043	-0043	+0.5	+0.4	+0.3	+0.2	1.65	★
	Omura Wan											
7658	Inourago		33 03	129 45	-0020	-0023	-0.3	-0.3	-0.1	0.0	1.14	
7659	Ogushi		33 04	129 49	+0215	+0210	-1.5	-1.1	-0.5	-0.1	0.50	t
7660	Omura		32 54	129 57	+0220	+0215	-1.5	-1.1	-0.6	-0.1	0.50	t
7661	Hizen Oshima		33 02	129 37	-0053	-0053	+0.6	+0.4	+0.3	+0.1	1.68	
7662	Matsushima		32 56	129 38	-0051	-0055	+0.6	+0.5	+0.3	+0.2	1.73	
7665	Koe		32 45	129 49	-0101	-0105	+0.6	+0.4	+0.2	+0.1	1.64	
7666	Nagasaki	**J**	32 44	129 52	-0101	-0105	+0.5	+0.4	+0.3	+0.2	1.64	★
7667	Fukahori		32 41	129 49	-0101	-0101	+0.6	+0.4	+0.3	+0.2	1.67	
7669	Kabashima Suido		32 33	129 47	-0103	-0107	+0.6	+0.5	+0.3	+0.1	1.66	
	Shimabara Kaiwan											
7672	Kuchinotsu		32 36	130 12	-0015	-0026	+1.1	+0.8	+0.5	+0.2	1.94	
7673	Shimabara		32 46	130 22	-0005	-0009	+2.0	+1.5	+0.7	+0.2	2.37	
7674	Oura		32 59	130 13	-0002	-0005	+2.6	+1.8	+0.9	+0.3	2.68	
7675	Suminoe		33 12	130 12	+0026	+0048	+2.9	+2.0	+1.0	+0.2	2.80	
7676	Miike Ko	**J**	33 01	130 25	-0002	-0006	+2.5	+1.8	+0.9	+0.2	2.65	
7678	Misumi Ko	**J**	32 37	130 27	-0015	-0018	+1.6	+1.2	+0.6	+0.2	2.21	
7679	Yanagino Seto		32 32	130 25	-0016	-0020	+1.6	+1.2	+0.6	+0.2	2.19	
7681	Tomioka		32 32	130 02	-0101	-0105	+1.0	+0.7	+0.4	+0.2	1.86	
7682	Sakitsu Wan		32 19	130 01	-0113	-0117	+0.6	+0.4	+0.3	+0.1	1.67	
	Yatsushiro Kaiwan											
7684	Ushibuka Ko		32 12	130 01	-0109	-0113	+0.5	+0.4	+0.3	+0.2	1.67	
7687	Yatsushiro Ko		32 31	130 34	-0016	-0020	+1.4	+1.1	+0.6	+0.3	2.15	
7688	Minamata Ko		32 11	130 22	-0022	-0014	+1.1	+0.8	+0.5	+0.2	1.95	
7690	Akune		32 01	130 11	-0122	-0120	+0.4	+0.3	+0.3	+0.2	1.60	
7691	Sendai		31 51	130 13	-0125	-0128	+0.4	+0.4	+0.2	+0.2	1.60	
7692	Kushikino		31 43	130 16	-0129	-0133	+0.4	+0.3	+0.3	+0.2	1.60	
7716	**NAHA KO**		(see page 141)				**2.0**	**1.5**	**0.8**	**0.4**		
7695	Makurazaki		31 16	130 18	+0004	+0002	+0.5	+0.4	+0.3	+0.1	1.50	
	Kagoshima Kaiwan											
7696	Yamagawa		31 12	130 38	+0004	+0002	+0.6	+0.5	+0.3	+0.1	1.54	
7696a	Kiire		31 23	130 33	+0004	+0002	+0.6	+0.5	+0.3	+0.1	1.55	

★ See notes on page 298.
t Time differences approximate.
C Tides predicted in Chinese Tide Tables.
J Tides predicted in Japanese Tide Tables.
U Tides predicted in United States Tide Tables.

JAPAN

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES MHW	MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
					Zone -0900							
7716	**NAHA KO**	(see page 141)					**2.0**	**1.5**	**0.8**	**0.4**		
7697	Kagoshima	CJ	31 35	130 34	+0004	+0002	+0.7	+0.5	+0.3	0.0	1.55	
7698	Kanoya		31 24	130 46	-0001	-0003	+0.7	+0.6	+0.3	+0.1	1.59	
	Shima Retto											
7700	Urauchi Wan		31 51	129 51	+0041	+0039	+0.7	+0.5	+0.4	+0.1	1.60	
	Japan Nansei Shoto											
7704	Kobi Sho		25 56	123 41	+0046	+0043	-0.3	-0.2	0.0	0.0	1.06	
	Sakishima Gunto											
7706	Yonakuni Shima		24 27	122 56	+0016	+0013	-0.4	-0.2	-0.1	0.0	1.00	
7707	Funauke		24 20	123 44	+0021	+0018	-0.3	-0.2	0.0	0.0	1.02	
7708	Hateruma		24 04	123 46	+0005	+0005	-0.4	-0.2	-0.1	0.0	1.00	
7709	Ishigaki		24 20	124 10	+0011	+0008	-0.3	-0.2	0.0	0.0	1.07	
7712	Hirara		24 48	125 17	+0015	+0012	-0.3	-0.2	0.0	-0.1	1.03	
7712a	Minami-Daito Shima	C	25 52	131 14	-0033	-0036	-0.3	-0.2	-0.1	-0.2	0.98	
	Okinawa Gunto											
7713	Kanegusuku		26 21	126 45	-0004	-0007	0.0	0.0	0.0	-0.1	1.17	
7714	Kerama Kaikyo (Zamami)		26 14	127 18	-0004	-0007	0.0	0.0	0.0	-0.1	1.16	
7716	NAHA KO		26 13	127 40	STANDARD PORT			See Table V			1.18	
7716a	Itoman		26 08	127 40	-0015	-0015	0.0	0.0	0.0	0.0	1.18	
7717	Tsuhako		26 11	127 48	-0027	-0029	0.0	0.0	+0.1	0.0	1.20	
7718	Ishikawa		26 26	127 50	-0033	-0036	0.0	0.0	+0.1	0.0	1.17	
7719	Suku		26 33	128 02	-0035	-0038	0.0	0.0	+0.1	0.0	1.18	
7721	Unten Ko		26 41	128 00	-0004	-0007	-0.1	-0.1	0.0	-0.1	1.10	
7722	Toguchi		26 40	127 54	+0005	+0005	-0.1	0.0	0.0	0.0	1.15	
7726	Gakiya		27 02	127 58	-0006	-0008	-0.2	-0.1	0.0	-0.1	1.08	
7727	Wadomari		27 23	128 40	-0029	-0031	-0.2	-0.1	0.0	0.0	1.11	
	Amami Gunto											
7728	Sanmura Wan		27 52	128 58	-0029	-0031	-0.1	-0.1	0.0	0.0	1.11	
7730	Koniya		28 09	129 19	-0008	-0011	-0.1	0.0	0.0	0.0	1.15	
7731	Sumiyo Wan		28 14	129 25	-0033	-0031	0.0	0.0	0.0	0.0	1.18	
7732	Kasari Wan		28 27	129 39	-0002	-0004	0.0	+0.1	0.0	0.0	1.20	
7733	Naze	CJ	28 23	129 30	-0007	-0009	0.0	0.0	0.0	-0.1	1.15	
7734	Uken		28 17	129 14	-0002	-0004	0.0	0.0	0.0	0.0	1.18	
	Tokara Gunto											
7737	Takara Shima		29 09	129 12	+0012	+0010	0.0	0.0	+0.1	0.0	1.18	
7740	Nakano Shima	C	29 51	129 51	-0013	-0014	+0.1	+0.1	+0.1	0.0	1.25	
	Osumi Gunto											
7741	Kuchinoerabu Shima		30 28	130 11	-0006	-0009	+0.2	+0.2	+0.2	0.0	1.32	
7742	Isso		30 28	130 30	-0008	-0011	+0.2	+0.2	+0.1	0.0	1.31	
7744	Kumano		30 28	130 58	-0049	-0052	0.0	0.0	+0.1	0.0	1.20	
7745	Nishinoomote	C	30 44	131 00	-0020	-0020	0.0	0.0	+0.1	0.0	1.20	
7746	Io Shima (Nansei Shoto)		30 47	130 17	-0002	-0004	+0.3	+0.2	+0.2	0.0	1.35	
	Japan Kyushu East Coast											
7750	Odomari	C	31 01	130 41	-0021	-0024	+0.4	+0.3	+0.2	0.0	1.42	
7752	Shibushi		31 29	131 07	-0057	-0100	0.0	0.0	0.0	0.0	1.16	
7753	Aburatsu	J	31 35	131 25	-0103	-0106	-0.1	0.0	+0.1	0.0	1.16	
7754	Uchiumi		31 45	131 28	-0104	-0107	-0.1	0.0	+0.1	0.0	1.16	★
7755	Oryuzako		31 47	131 28	-0103	-0106	0.0	0.0	+0.1	0.0	1.20	
7756	Miyazaki		31 54	131 27	-0054	-0056	-0.1	-0.1	0.0	0.0	1.13	
7757	Hososhima	J	32 25	131 40	-0059	-0101	-0.2	-0.1	0.0	-0.1	1.06	★
7758	Totoro		32 30	131 41	-0059	-0101	0.0	0.0	+0.1	0.0	1.17	
7759	Kamae		32 47	131 55	-0059	-0101	-0.1	-0.1	0.0	0.0	1.12	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
7622 - 7692	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
7695 - 7759	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	-0.1	-0.1
7799	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES MHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m
					Zone -0900						
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)					**1.6**	**1.6**	**1.0**	**0.4**	
	Bungo Suido										
7760	Nagashima		32 58	131 55	+0210	+0205	-0.1	-0.1	-0.1	0.0	1.05
7761	Saiki Ko		32 59	131 54	+0214	+0212	-0.1	-0.1	-0.1	0.0	1.05
7762	Tsukumi		33 05	131 52	+0240	+0235	+0.2	+0.1	0.0	0.0	1.19
	Japan Shikoku West And South Coasts										
7765	Yawatahama		33 27	132 24	+0223	+0219	+0.4	+0.3	0.0	0.0	1.30
7767	Uwajima	J	33 14	132 33	+0215	+0210	+0.3	+0.3	0.0	+0.1	1.30
7768	Noto		33 10	132 16	+0215	+0210	+0.2	+0.1	-0.1	0.0	1.21
7769	Kashiwazaki		33 01	132 29	+0129	+0127	+0.2	+0.2	-0.1	0.0	1.19
7770	Sukumowan		32 55	132 42	+0108	+0108	+0.1	+0.1	-0.1	0.0	1.17
7773	Tosa-Shimizu		32 47	132 58	+0107	+0107	+0.1	0.0	-0.1	0.0	1.12
7776	Susaki		33 23	133 18	+0059	+0059	+0.1	0.0	-0.1	0.0	1.12
7778	Kochi Ko (Urado)	J	33 30	133 34	+0103	+0103	0.0	0.0	-0.2	-0.1	1.08
7780	Murotozaki		33 16	134 10	+0101	+0101	0.0	0.0	-0.1	0.0	1.10
7782	Kannoura Ko		33 33	134 18	+0051	+0051	0.0	0.0	-0.2	0.0	1.09
7783	Hiwasa		33 43	134 33	+0053	+0053	0.0	0.0	-0.1	0.0	1.08
	Japan Kyushu North Coast										
	SETO NAIKAI (INLAND SEA)										
7786	Saganoseki		33 15	131 52	+0320	+0314	+0.3	+0.1	0.0	0.0	1.23
7788	Oita (Tsurusaki)	J	33 16	131 41	+0322	+0316	+0.4	+0.2	0.0	0.0	1.30
7788a	Nishi-Oita		1 00	131 35	+0322	+0316	+0.4	+0.2	0.0	0.0	1.30
7788b	Kamegawa		33 20	131 30	+0317	+0311	+0.4	+0.3	0.0	0.0	1.30
7789	Hiji		33 22	131 32	+0317	+0311	+0.4	+0.2	0.0	0.0	1.30
7790	Kunisaki		33 34	131 44	+0347	+0341	+0.8	+0.6	+0.2	+0.2	1.60

No.	PLACE		Lat. N	Long. E	MHW	MLW	MHWS **2.3**	MHWN **1.7**	MLWN **0.9**	MLWS **0.3**	
7799	**MOJI**	(see page 144)									
7792	Hime Shima		33 44	131 39	-0011	-0015	+0.8	+0.6	+0.4	+0.2	1.80
7794	Takada		33 35	131 26	-0008	-0012	+1.0	+0.7	+0.5	+0.2	1.90
7796	Unoshima		33 38	131 08	-0018	-0021	+1.4	+1.0	+0.6	+0.3	2.10
7797	Kanda	J	33 47	130 59	-0005	-0004	+1.3	+1.0	+0.6	+0.3	2.10
7797a	Shinmoji		33 52	130 59	-0005	-0004	+1.3	+1.0	+0.6	+0.3	2.10
7798	Aohama		33 57	131 01	-0009	-0009	+1.3	+1.0	+0.6	+0.3	2.10
7798a	Tanoura		33 57	130 59	-0003	-0007	+1.2	+0.9	+0.5	+0.2	2.00
7799	MOJI	J	33 57	130 58	STANDARD PORT			See Table V			1.30
7799a	Nishikaigan		33 57	130 58	+0005	+0005	0.0	0.0	0.0	0.0	1.30
7800	Sunatsu		33 53	130 54	+0026	+0023	-0.8	-0.6	-0.2	0.0	0.90
7800a	Hiagari	J	33 55	130 53	+0031	+0028	-0.9	-0.7	-0.3	-0.1	0.80
7800b	Seitetsu - Tobata Hakuchi		33 55	130 51	+0041	+0038	-0.9	-0.7	-0.3	-0.1	0.80
7800c	Wakamatsu		33 55	130 49	+0045	+0041	-0.9	-0.7	-0.3	0.0	0.80
7800d	Tobata		33 54	130 49	+0046	+0047	-1.0	-0.7	-0.3	0.0	0.80
7801	Yahata	J	33 52	130 48	+0051	+0052	-0.9	-0.7	-0.3	-0.1	0.80
7801a	Oki (Kukinami)		33 52	130 45	+0056	+0057	-0.9	-0.7	-0.3	-0.1	0.80
7801b	Waita		33 56	130 44	+0046	+0047	-1.0	-0.7	-0.3	0.0	0.80
7801c	Iwaya		33 56	130 41	+0046	+0047	-0.9	-0.7	-0.3	0.0	0.82
7801d	Kashiwabara		33 55	130 40	+0046	+0047	-0.9	-0.6	-0.2	0.0	0.87
7801e	Shirashima		34 01	130 44	+0051	+0052	-1.1	-0.8	-0.3	-0.1	0.73
	Japan Honshu South Coast										
7802	Izaki		33 57	130 55	+0106	+0103	-1.0	-0.7	-0.3	0.0	0.80
7803	Haedomari		33 57	130 53	+0053	+0049	-1.0	-0.7	-0.3	0.0	0.80
7803a	Tanokubi		33 55	130 55	+0021	+0018	-0.6	-0.5	-0.1	0.0	1.00
7803b	Deshimatsu		33 55	130 56	+0015	+0015	-0.3	-0.2	0.0	+0.1	1.20
7804	Shimonoseki (No. 1 Jetty)	C	33 57	130 56	+0015	+0015	0.0	-0.1	0.0	0.0	1.30
7804a	Dannoura		33 57	130 57	+0002	+0002	+0.1	+0.1	+0.1	+0.1	1.40
7805	Chofu		34 01	131 00	-0003	-0007	+1.4	+1.0	+0.6	+0.2	2.10
7806	Onoda		33 58	131 10	-0013	-0017	+1.3	+1.0	+0.6	+0.3	2.10
7806a	Ube	J	33 56	131 15	-0013	-0017	+1.3	+1.0	+0.6	+0.3	2.10
7807	Mitajiri		34 02	131 35	-0026	-0025	+0.8	+0.6	+0.4	+0.2	1.80
7808	Tokuyama	J	34 02	131 48	-0026	-0025	+0.8	+0.6	+0.4	+0.2	1.80
7809	Kudamatsu		34 00	131 52	-0026	-0025	+0.8	+0.6	+0.4	+0.2	1.80
7810	Hirao		33 55	132 03	-0031	-0030	+0.6	+0.5	+0.3	+0.2	1.70
7811	Murotsu		33 50	132 07	-0022	-0025	+0.6	+0.4	+0.4	+0.2	1.70

d Differences approximate.
t Time differences approximate.
C Tides predicted in Chinese Tide Tables.
J Tides predicted in Japanese Tide Tables.
U Tides predicted in United States Tide Tables.

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JAPAN

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES MHW	TIME DIFFERENCES MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
					Zone -0900							
7799	**MOJI**	(see page 144)					**2.3**	**1.7**	**0.9**	**0.3**		
7812	Obatake		33 57	132 10	-0016	-0015	+0.8	+0.6	+0.4	+0.2	1.80	
7813	Higashi-Agenosho		33 54	132 16	-0016	-0015	+0.7	+0.6	+0.4	+0.3	1.80	
7814	Oki-Kamuro Shima		33 51	132 22	-0006	-0005	+0.7	+0.7	+0.3	+0.3	1.80	
7815	Nasake Shima		33 57	132 28	+0006	+0003	+1.0	+0.8	+0.4	+0.3	1.90	
7816	Uwama		33 58	132 35	+0021	+0018	+0.8	+0.7	+0.5	+0.4	1.90	
7817	Iwakuni Ko		34 11	132 14	+0024	+0020	+1.1	+0.9	+0.5	+0.3	2.00	
7819	Hiroshima	J	34 21	132 28	+0031	+0030	+1.1	+0.9	+0.5	+0.3	2.00	
7820	Kure	JU	34 14	132 33	+0033	+0032	+1.2	+0.9	+0.5	+0.2	2.00	
7821	Ondo-No-Seto		34 11	132 32	+0033	+0032	+1.1	+0.9	+0.5	+0.3	2.00	
7822	Karoto Ko Seto		34 04	132 33	+0024	+0020	+1.0	+0.8	+0.6	+0.4	2.00	
7822a	Hiro Wan		34 13	132 37	+0018	+0017	+1.1	+0.9	+0.5	+0.3	2.00	
7823	Koyo		34 14	132 43	+0053	+0052	+1.0	+0.8	+0.6	+0.4	2.00	
7824	Mitarai		34 11	132 50	+0047	+0043	+1.1	+0.9	+0.5	+0.3	2.00	
7825	Takehara		34 20	132 58	+0115	+0113	+1.2	+0.9	+0.5	+0.2	2.00	
7826	Setoda		34 18	133 05	+0130	+0128	+1.2	+1.0	+0.5	+0.2	2.00	
7827	Itozaki		34 24	133 05	+0144	+0141	+1.1	+1.0	+0.4	+0.3	2.00	
7827a	Habu		34 17	133 11	+0200	+0158	+1.2	+1.0	+0.4	+0.2	2.00	
7828	Tachibana		34 21	133 12	+0159	+0156	+1.1	+1.0	+0.4	+0.3	2.00	
7828a	Onomichi	J	34 24	133 12	+0155	+0153	+1.2	+1.0	+0.4	+0.3	2.00	
7828b	Tomo		34 23	133 23	+0204	+0201	+1.3	+1.1	+0.5	+0.3	2.10	
7829	Fukuyama		34 29	133 25	+0210	+0208	+1.4	+1.1	+0.5	+0.2	2.10	
7829a	Sanagi Shima		34 20	133 38	+0205	+0202	+1.2	+1.0	+0.4	+0.2	2.00	
7829b	Aoki		34 22	133 41	+0210	+0208	+1.2	+1.0	+0.4	+0.2	2.00	
							MHHW	MLHW	MHLW	MLLW		
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)					**1.6**	**1.6**	**1.0**	**0.4**		
7829c	Tamashima		34 31	133 40	+0610	+0615	+1.6	+1.3	+0.2	+0.2	2.00	
7829d	Mizushima	J	34 32	133 44	+0605	+0610	+1.5	+1.2	+0.2	+0.2	1.90	
7830	Shimotsui		34 26	133 48	+0610	+0615	+1.2	+0.9	+0.2	+0.2	1.80	
7831	Yo Shima		34 24	133 49	+0605	+0610	+1.3	+0.9	+0.2	+0.2	1.80	
7831a	Nabe Shima		34 23	133 49	+0615	+0620	+1.3	+0.9	+0.2	+0.2	1.80	
7832	Miyanoura		34 27	133 58	+0600	+0605	+0.8	+0.5	+0.1	+0.1	1.50	
7833	Uno	J	34 29	133 57	+0555	+0600	+0.7	+0.3	0.0	0.0	1.40	
7835	Ushimado Ko		34 37	134 10	+0545	+0555	+0.3	-0.1	0.0	0.0	1.20	
7835a	Nyube		34 29	134 11	+0540	+0545	+0.3	-0.1	0.0	0.0	1.20	
7835b	Jizo Saki		34 26	134 14	+0540	+0545	+0.3	0.0	0.0	0.0	1.20	
7836	Sakate Wan	U	34 26	134 20	+0555	+0605	0.0	-0.4	-0.1	-0.1	1.00	
7837	Aioi Ko		34 48	134 29	+0550	+0600	0.0	-0.4	-0.1	0.0	1.00	
7838	Ie Shima		34 41	134 32	+0540	+0555	-0.2	-0.5	-0.2	-0.1	0.90	d
7841	Himeji (Shikama)	J	34 47	134 40	+0530	+0545	-0.2	-0.5	-0.2	-0.1	0.90	d
7841a	Hirohata		34 47	134 37	+0535	+0550	-0.2	-0.5	-0.2	-0.1	0.90	
7842	Takasago		34 44	134 48	+0515	+0530	-0.2	-0.6	-0.1	0.0	0.90	t
7843	Futami (Honshu S Coast)		34 42	134 53	+0425	+0440	-0.4	-0.7	-0.1	-0.1	0.80	
7844	Akashi		34 39	135 00	+0255	+0310	-0.6	-0.7	-0.2	-0.1	0.70	t
7994	**KAMAISHI**	(see page 150)			HHW	LLW	**1.3**	**1.1**	**0.8**	**0.3**		
7845	Kobe	JU	34 41	135 11	+0340	+0336	0.0	+0.2	+0.2	+0.1	0.95	
7846	Amagasaki		34 42	135 24	+0342	+0337	0.0	+0.2	+0.1	+0.1	0.95	
7847	Osaka	J	34 40	135 26	+0342	+0337	0.0	+0.2	+0.1	+0.1	0.95	
7847a	Sakai (Senboku Ku)		34 35	135 28	+0341	+0335	0.0	+0.2	+0.1	+0.1	0.95	
7848	Izumi-Otsu		34 31	135 24	+0337	+0332	0.0	+0.2	+0.1	+0.1	0.95	
7848a	Kishiwada		34 28	135 22	+0337	+0332	0.0	+0.2	+0.1	0.0	0.95	
7849	Fuke		34 19	135 08	+0327	+0322	0.0	+0.2	+0.1	0.0	0.95	
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)			MHW	LLW	**1.6**	**1.6**	**1.0**	**0.4**		
7850	Oki-No-Shima		34 17	135 01	+0132	+0134	-0.1	-0.2	-0.1	0.0	1.03	
7851	Wakayama	J	34 13	135 09	+0120	+0118	0.0	0.0	-0.1	0.0	1.11	
7852	Shimotsu		34 07	135 08	+0118	+0116	0.0	0.0	-0.1	0.0	1.10	
7854	Yura		33 57	135 07	+0102	+0103	0.0	0.0	-0.1	0.0	1.13	
7855	Hii Wan		33 55	135 05	+0110	+0108	-0.1	-0.1	-0.2	0.0	1.06	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
7760 - 7783	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	-0.1	-0.1
7786 - 7826	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
7827 - 7855	-0.1	-0.2	-0.1	-0.1	0.0	+0.1	+0.1	+0.2	+0.1	+0.1	0.0	-0.1	-0.1
		-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	-0.1
		-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0

JAPAN

No.	PLACE	Lat. N	Long. E	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
				Zone -0900							
7994	**KAMAISHI**	(see page 150)				**1.3**	**1.1**	**0.8**	**0.3**		
	Awaji Shima										
7856	Yura Ko	34 17	134 57	+0307	+0300	0.0	+0.2	+0.1	+0.1	0.95	
7857	Sumoto Ko	34 20	134 54	+0306	+0303	0.0	+0.1	+0.1	+0.1	0.95	
7858	Kariya (Awaji Shima)	34 31	135 00	+0315	+0311	-0.1	+0.1	+0.1	0.0	0.90	
7859	Iwaya (Awaji Shima)	34 35	135 01	+0405	+0401	-0.3	-0.2	+0.1	-0.1	0.70	
7859a	Ezaki	34 36	134 59	+0430	+0426	-0.4	-0.2	+0.1	0.0	0.70	
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)		MHW	LLW	**1.6**	**1.6**	**1.0**	**0.4**		
7860	Murotsu (Awaji Shima)	34 31	134 52	+0605	+0540	-0.4	-0.7	-0.2	-0.1	0.80	d
7861	Ei Ko	34 28	134 50	+0605	+0540	-0.3	-0.7	-0.3	-0.1	0.80	d
7862	Anaga Ura	34 16	134 40	+0620	+0555	-0.1	-0.6	-0.2	-0.1	0.90	d
7863	Fukura	34 15	134 43	+0128	+0126	-0.1	-0.1	-0.1	0.0	1.06	
	Japan Shikoku North Coast										
7865	Uchinoura	33 22	132 03	+0235	+0230	+0.3	+0.3	-0.1	0.0	1.30	
						MHWS	MHWN	MLWN	MLWS		
7799	**MOJI**	(see page 144)		MHW	MLW	**2.3**	**1.7**	**0.9**	**0.3**		
7866	Mitsukue Ko	33 27	132 14	-0036	-0040	+0.6	+0.5	+0.3	+0.2	1.70	
7868	Ao Shima	33 44	132 29	-0020	-0023	+0.8	+0.6	+0.4	+0.2	1.80	
7871	Matsuyama ..... J	33 52	132 43	+0006	+0003	+1.0	+0.8	+0.4	+0.2	1.90	
7871a	Gogo Shima	33 55	132 41	+0016	+0018	+0.9	+0.8	+0.4	+0.3	1.90	
7871b	Oura	33 59	132 38	+0021	+0018	+1.0	+0.8	+0.4	+0.3	1.90	
7872	Kikuma	34 02	132 50	+0018	+0017	+1.1	+1.0	+0.5	+0.3	2.00	
7873	Hashihama	34 06	132 58	+0108	+0107	+1.2	+1.0	+0.4	+0.2	2.00	
7873a	Kuru Shima	34 07	132 58	+0053	+0052	+1.2	+1.0	+0.4	+0.2	2.00	
7874	O Shima	34 07	132 59	+0123	+0046	+1.2	+1.0	+0.4	+0.2	2.00	
7875	Imabari	34 04	133 00	+0139	+0136	+1.1	+0.9	+0.5	+0.3	2.00	
7878	Niihama ..... J	33 58	133 16	+0150	+0147	+1.2	+1.0	+0.4	+0.2	2.00	
7881	Kan-Onji	34 07	133 38	+0200	+0157	+1.4	+1.1	+0.5	+0.2	2.10	
7882	Awashima	34 16	133 38	+0218	+0222	+1.2	+1.0	+0.4	+0.2	2.00	
						MHHW	MLHW	MHLW	MLLW		
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)		HHW	MLW	**1.6**	**1.6**	**1.0**	**0.4**		
7883	Marugame	34 18	133 48	+0610	+0615	+1.4	+1.1	+0.1	+0.1	1.80	
7884	Sakaide	34 20	133 51	+0605	+0610	+1.3	+0.9	+0.2	+0.2	1.80	
7885	Takamatsu ..... J	34 21	134 03	-0455	-0550	+0.7	+0.3	0.0	0.0	1.40	
7886	Ogi Shima	34 25	134 03	-0445	-0545	+0.5	+0.4	0.0	0.0	1.40	
7889	Hiketa Ko	34 14	134 24	-0435	-0540	0.0	-0.4	-0.1	0.0	1.00	
8287	**ZALIV TUKHARKA**	(see page 153)		MHW	LLW	**1.7**	**1.5**	**1.2**	**0.3**		
7890	Kitadomari	34 14	134 35	+0445	+0435	-0.5	-0.5	-0.2	+0.2	0.90	t
7890a	Donoura	34 13	134 35	+0245	+0235	-0.5	-0.3	-0.3	0.0	0.90	t
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)		MHW	MLW	**1.6**	**1.6**	**1.0**	**0.4**		
7891	Kameura	34 14	134 38	+0618	+0633	-0.1	-0.5	-0.3	-0.2	0.90	
7891a	Mago Saki	34 14	134 39	+0603	+0618	-0.3	-0.5	-0.1	-0.1	0.90	
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)		MHW	LLW	**1.6**	**1.6**	**1.0**	**0.4**		
7892	Tosadomari	34 11	134 38	+0202	+0209	-0.3	-0.4	-0.2	-0.1	0.90	
7894	Komatsushima ..... J	34 01	134 35	+0110	+0110	-0.1	-0.2	-0.2	-0.1	1.01	
7895	Tachibana (Shikoku)	33 52	134 39	+0055	+0055	0.0	-0.1	-0.1	0.0	1.10	
	Japan Honshu South Coast										
7898	Tanabe ..... J	33 43	135 23	+0047	+0048	0.0	0.0	-0.1	0.0	1.10	
7899	Susami	33 33	135 29	+0053	+0052	+0.1	0.0	-0.1	0.0	1.14	
7901	Kushimoto ..... J	33 29	135 46	+0053	+0052	-0.1	-0.1	-0.2	0.0	1.05	
7902	Uragami	33 33	135 54	+0047	+0048	-0.1	-0.1	-0.2	0.0	1.05	
7903	Katsuura (Honshu S Coast)	33 38	135 57	+0045	+0045	0.0	0.0	-0.1	-0.1	1.09	

★ See notes on page 298.
d Differences approximate.
t Time differences approximate.

C Tides predicted in Chinese Tide Tables.
J Tides predicted in Japanese Tide Tables.

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES MHW	TIME DIFFERENCES LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
					Zone -0900							
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)					**1.6**	**1.6**	**1.0**	**0.4**		
7904	Nigishima		33 56	136 11	+0047	+0048	-0.2	-0.3	-0.3	-0.1	0.92	
7905	Owase	J	34 05	136 12	+0042	+0043	-0.1	-0.1	-0.1	0.0	1.04	
7907	Nagashima (Honshu)		34 12	136 20	+0043	+0043	0.0	-0.1	-0.1	0.0	1.08	
7909	Gokasho		34 18	136 41	+0031	+0032	-0.1	-0.1	-0.2	-0.1	1.03	
7910	Hamajima		34 18	136 46	+0042	+0043	-0.1	-0.1	-0.1	0.0	1.05	
7911	Matoya Ko		34 22	136 52	+0040	+0041	0.0	-0.1	-0.1	0.0	1.10	
	Ise Wan											
7912	Toba		34 29	136 51	+0058	+0058	+0.2	+0.2	-0.1	0.0	1.20	
7912a	Kami Shima		34 33	136 59	+0051	+0051	+0.1	+0.1	-0.1	0.0	1.20	
7913	Matsusaka		34 36	136 34	+0102	+0101	+0.3	+0.3	0.0	0.0	1.30	
7914	Tsu Ko		34 43	136 32	+0059	+0058	+0.3	+0.3	-0.1	0.0	1.30	
7915	Yokkaichi	J	34 57	136 38	+0057	+0056	+0.3	+0.3	-0.1	0.0	1.30	
7916	Nagoya	J	35 05	136 53	+0057	+0056	+0.5	+0.5	0.0	+0.1	1.40	
7917	Onizaki		34 54	136 50	+0056	+0056	+0.3	+0.3	0.0	0.0	1.30	
7917a	Tokoname		34 52	136 50	+0056	+0056	+0.4	+0.3	-0.1	0.0	1.30	
7918	Morozaki		34 42	136 59	+0051	+0051	+0.3	+0.3	0.0	+0.1	1.30	
7918a	Shino Shima		34 41	137 00	+0056	+0056	+0.3	+0.3	0.0	+0.1	1.30	
7919	Irago		34 35	137 01	+0051	+0051	+0.2	+0.2	-0.1	0.0	1.20	
	Mikawa Wan											
7920	Saku Shima		34 44	137 03	+0051	+0051	+0.3	+0.3	0.0	+0.1	1.30	
7921	Kinuura (Juichigochi)	J	34 53	136 57	+0056	+0056	+0.3	+0.3	0.0	0.0	1.30	
7922	Katahara		34 47	137 11	+0051	+0051	+0.4	+0.4	0.0	+0.1	1.35	
7922a	Gamagori		34 49	137 13	+0046	+0046	+0.4	+0.4	0.0	0.0	1.35	
7923	Toyohashi		34 44	137 19	+0101	+0101	+0.4	+0.4	0.0	+0.1	1.35	
7924	Fukue		34 38	137 06	+0051	+0051	+0.3	+0.3	0.0	0.0	1.30	
7925	Akabane		34 36	137 12	+0036	+0036	-0.1	-0.1	-0.1	0.0	1.05	
7925a	Maisaka		34 41	137 37	+0056	+0056	-0.6	-0.6	-0.4	-0.2	0.70	
7926	Omaezaki		34 37	138 13	+0028	+0028	-0.2	-0.2	-0.1	-0.1	1.00	
7927	Yaizu		34 52	138 20	+0035	+0035	-0.2	-0.2	-0.2	-0.1	0.95	
7928	Shimizu	J	35 01	138 31	+0025	+0023	-0.2	-0.2	-0.2	-0.1	0.95	
7929	Mito		35 01	138 54	+0025	+0023	-0.2	-0.2	-0.2	0.0	1.00	
7930	Minami Izu	CJ	34 38	138 53	+0011	+0015	-0.2	-0.2	-0.1	-0.1	1.00	
7931	Shimoda		34 41	138 58	+0008	+0008	-0.2	-0.2	-0.1	0.0	1.01	★
7933	Ajiro		35 03	139 05	-0017	-0015	-0.3	-0.3	-0.2	-0.1	0.92	
7935	E-No-Shima		35 18	139 29	-0023	-0018	-0.3	-0.3	-0.2	-0.1	0.92	
7935a	Otawa Wan		35 13	139 37	-0028	-0023	-0.3	-0.3	-0.2	-0.1	0.93	
7936	Aburatsubo		35 10	139 37	-0006	-0004	-0.3	-0.3	-0.2	-0.1	0.93	★
7936a	Kaneda Wan		35 12	139 41	-0038	-0033	-0.2	-0.2	-0.1	0.0	1.00	
7936b	Kurihama		35 14	139 43	-0023	-0018	-0.2	-0.2	-0.1	0.0	1.00	
	Tokyo Kaiwan											
7937	Uraga Ko		35 14	139 43	-0007	-0006	-0.2	-0.2	-0.1	-0.1	1.00	
7937a	Hashirimizu		35 16	139 44	-0018	-0013	0.0	-0.1	0.0	0.0	1.10	
7938	Yokosuka	J	35 17	139 39	-0004	-0004	0.0	-0.1	0.0	0.0	1.10	
7939	Negishi		35 25	139 38	-0018	-0018	0.0	0.0	-0.1	0.0	1.10	
7940	YOKOHAMA (SHIN-YAMASHITA)		35 26	139 40	STANDARD PORT			See Table V			1.15	★
7941	Shinko		35 27	139 39	+0000	+0000	0.0	0.0	0.0	0.0	1.15	
7941a	Suehiro		35 29	139 42	+0005	+0005	+0.1	0.0	0.0	0.0	1.15	
7942	Tokyo (Shibaura)	J	35 38	139 45	-0005	-0005	+0.1	+0.1	0.0	0.0	1.20	
7942a	Harumi		35 39	139 46	-0005	-0005	+0.1	+0.1	0.0	0.0	1.20	
7943	Ichikawa		35 41	139 57	+0010	+0012	+0.2	+0.1	0.0	0.0	1.20	
7943a	Funabashi		35 41	139 59	-0005	-0003	+0.1	+0.1	0.0	0.0	1.20	
7944	Chiba Light	CJ	35 34	140 03	-0010	-0008	+0.1	+0.1	0.0	0.0	1.20	
7945	Ichihara		35 32	140 07	-0010	-0008	+0.2	+0.2	0.0	-0.1	1.20	
7945a	Anesaki		35 29	140 02	+0000	+0002	+0.2	+0.1	0.0	-0.1	1.20	
7946	Kimitsu		35 21	139 52	-0005	-0005	0.0	0.0	0.0	0.0	1.15	
7946a	Daiichi Kaiho		35 19	139 46	-0010	-0010	0.0	-0.1	-0.1	0.0	1.10	
7946b	Iwaifukuro		35 06	139 50	-0010	-0010	-0.2	-0.3	-0.1	0.0	1.00	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
7799	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
7856 - 7865	-0.1	-0.2	-0.1	-0.1	0.0	+0.1	+0.1	+0.2	+0.1	+0.1	0.0	-0.1	-0.1
7866 - 7873a	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
7874 - 7891a	-0.1	-0.2	-0.1	-0.1	0.0	+0.1	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
7892 - 7946b	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	-0.1
7994	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0

Negligible

JAPAN

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES MHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
					Zone -0900							
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)					**1.6**	**1.6**	**1.0**	**0.4**		
7947	Funakata		35 01	139 51	-0015	-0015	-0.2	-0.2	-0.1	0.0	1.00	
7947a	Tateyama		34 59	139 51	-0018	-0015	-0.2	-0.2	-0.1	0.0	1.00	
7948	Mera		34 55	139 49	-0028	-0026	-0.3	-0.4	-0.2	-0.1	0.90	
	Japan Nanpo Shoto											
7949	Minami-Tori Shima		24 18	153 58	p	p	-0.9	-1.1	-0.5	0.0	0.52	
	Kazan Retto											
7950	Io Shima		24 45	141 18	+0133	+0133	-0.7	-0.7	-0.4	-0.1	0.65	
	Ogasawara Gunto											
7952	Haha Shima		26 38	142 10	+0103	+0102	-0.6	-0.6	-0.4	-0.2	0.70	
7953	Chichi Shima	**CJ**	27 06	142 11	+0054	+0054	-0.6	-0.6	-0.4	-0.2	0.68	★
	Izu Shoto											
7957	Tori Shima		30 29	140 19	+0040	+0044	-0.5	-0.6	-0.3	-0.1	0.77	
7961	Hachijo Jima	**J**	33 08	139 48	+0007	+0007	-0.4	-0.5	-0.3	-0.1	0.81	
7964	Miyake Shima	**C**	34 04	139 29	+0002	+0004	-0.3	-0.4	-0.2	-0.1	0.91	
7965	Kozu Sima	**C**	34 13	139 08	+0021	+0022	-0.2	-0.3	-0.2	0.0	0.97	
7966	Shikine Jima		34 19	139 13	+0009	+0009	-0.2	-0.2	-0.1	-0.1	0.97	
	O Shima											
7968	O Shima (Okada)		34 47	139 23	-0015	-0015	-0.3	-0.4	-0.2	-0.1	0.90	
7969	O Shima (Habu)		34 41	139 26	-0021	-0019	-0.2	-0.2	-0.1	-0.1	0.97	
7994	**KAMAISHI**	(see page 150)			HHW	LLW	**1.3**	**1.1**	**0.8**	**0.3**		
	Japan Honshu East Coast											
7970	Shirahama		34 55	139 56	+0114	+0103	0.0	+0.1	0.0	0.0	0.89	
7971	Kamogawa		35 06	140 06	+0108	+0106	0.0	+0.2	0.0	0.0	0.93	
7972	Katsuura		35 09	140 19	+0116	+0104	0.0	+0.1	0.0	0.0	0.90	
7974	Naarai		35 42	140 51	+0033	+0031	0.0	0.0	0.0	0.0	0.87	
7975	Choshi-Gyoko		35 45	140 52	+0042	+0038	0.0	+0.1	+0.1	0.0	0.90	
7976	Kashima	**J**	35 56	140 42	+0033	+0031	0.0	+0.1	0.0	0.0	0.89	
7977	Nakaminato		36 20	140 35	+0033	+0031	-0.2	0.0	0.0	0.0	0.87	
7978	Hitachi		36 30	140 38	+0026	+0020	-0.1	0.0	0.0	0.0	0.86	
7979	Otsu		36 50	140 48	+0039	+0035	0.0	+0.1	0.0	0.0	0.90	
7980	Onahama	**J**	36 56	140 54	+0034	+0030	-0.1	0.0	0.0	0.0	0.84	
7981	Yotsukura		37 06	141 00	+0039	+0035	+0.2	+0.2	+0.1	0.0	0.98	
7982	Soma		37 50	140 58	+0020	+0017	0.0	+0.1	0.0	0.0	0.88	
7983	Sendai (Honshu)		38 16	141 01	+0015	+0010	+0.1	+0.1	+0.1	0.0	0.93	
7984	Sendai-Shiogama (Minatobashi)	**J**	38 19	141 02	+0017	+0012	+0.1	+0.1	0.0	0.0	0.92	
7984a	Hanabuchihama		38 18	141 05	+0012	+0007	+0.1	+0.2	+0.1	+0.1	0.96	
7985	Ishihama		38 19	141 07	+0020	+0016	+0.1	+0.1	0.0	0.0	0.92	
7985a	Nobiru Wan		38 21	141 09	+0017	+0012	0.0	+0.1	0.0	0.0	0.90	
7986	Ishinomaki		38 25	141 16	+0017	+0012	0.0	+0.1	0.0	0.0	0.90	
7986a	Oginahama		38 23	141 27	+0002	-0003	+0.1	+0.1	+0.1	0.0	0.94	
7987	Ayukawa		38 18	141 30	+0008	+0005	0.0	+0.1	0.0	0.0	0.88	
7988	Onagawa		38 26	141 27	+0000	+0000	0.0	+0.1	0.0	0.0	0.89	
7989	Shizugawa		38 40	141 27	+0000	+0000	0.0	+0.1	0.0	0.0	0.90	
7991	Kesennuma		38 53	141 37	+0002	-0003	-0.1	0.0	0.0	0.0	0.85	
7992	Ofunato		39 01	141 45	-0001	-0003	0.0	0.0	0.0	0.0	0.88	
7994	KAMAISHI		39 16	141 53	STANDARD PORT			See Table V			0.86	
7996	Yamada		39 28	141 58	-0008	-0007	0.0	0.0	0.0	0.0	0.86	
7997	Miyako		39 39	141 59	-0009	-0008	-0.1	0.0	0.0	0.0	0.83	★
8000	Kuji		40 12	141 48	-0010	-0014	0.0	+0.1	0.0	0.0	0.89	
8002	Hachinohe	**J**	40 32	141 32	-0015	-0019	-0.1	0.0	0.0	0.0	0.85	
8004	Mutsu-Ogawara		40 55	141 23	-0015	-0019	-0.1	0.0	0.0	0.0	0.85	
8005	Tomari		41 06	141 23	-0008	-0012	0.0	0.0	0.0	0.0	0.88	
8006	Shiranuka		41 08	141 23	-0015	-0019	0.0	+0.1	+0.1	0.0	0.90	
8007	Shiriya		41 24	141 26	-0018	-0021	-0.2	0.0	-0.1	0.0	0.79	
	Tsugaru Kaikyo											
8008	Shiriyamisaki		41 25	141 26	-0015	-0019	-0.1	0.0	0.0	0.0	0.83	
8009	Ohata		41 25	141 10	-0008	-0021	-0.3	-0.2	-0.2	-0.1	0.69	
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)			MHW	LLW	**1.6**	**1.6**	**1.0**	**0.4**		
8011	Oma		41 32	140 54	-0146	-0145	-0.9	-0.9	-0.6	-0.2	0.46	

★ See notes on page 298.
p For predictions use harmonic constants (see Part III).
C Tides predicted in Chinese Tide Tables.
J Tides predicted in Japanese Tide Tables.

JAPAN

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES MHW	MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
					Zone -0900							
7799	**MOJI**	(see page 144)					**2.3**	**1.7**	**0.9**	**0.3**		
8014	Ominato	CJ	41 15	141 09	-0606	-0604	-1.6	-1.2	-0.6	-0.2	0.41	*
8016	Asamushi		40 54	140 52	-0608	-0612	-1.7	-1.2	-0.6	-0.2	0.37	
8017	Aomori	J	40 50	140 46	-0608	-0612	-1.7	-1.2	-0.6	-0.2	0.37	
8019	Minmaya		41 12	140 26	-0603	-0607	-1.8	-1.4	-0.7	-0.2	0.28	
							MHHW	MLHW	MHLW	MLLW		
7056	**NAOZHOU DAO**	(see page 117)			HHW	LLW	**3.0**	**2.1**	**1.3**	**0.7**		
8020	Tappi Saki	C	41 16	140 20	-0716	-0724	-2.5	-1.7	-1.0	-0.6	0.33	
7994	**KAMAISHI**	(see page 150)					**1.3**	**1.1**	**0.8**	**0.3**		
	Japan Honshu West Coast											
8021	Kodomari		41 08	140 18	+1150	+1135	-1.0	-0.8	-0.6	-0.2	0.20	
8023	Ajigasawa		40 47	140 12	+1113	+1131	-1.0	-0.9	-0.6	-0.2	0.20	
8024	Fukaura		40 39	139 56	+1118	+1136	-1.0	-0.9	-0.6	-0.2	0.20	
8025	Iwasaki		40 35	139 54	+1128	+1152	-1.0	-0.9	-0.6	-0.2	0.17	
8026	Noshiro		40 13	140 00	+1113	+1131	-1.0	-0.9	-0.6	-0.2	0.20	
8027	Toga		39 57	139 42	+1129	+1153	-1.0	-0.9	-0.6	-0.2	0.18	
8028	Funagawa		39 55	139 51	+1108	+1126	-1.0	-0.9	-0.6	-0.2	0.18	
8029	Akita	J	39 45	140 04	+1113	+1131	-1.0	-0.9	-0.6	-0.2	0.19	
8031	Konoura (Honshu)		39 15	139 55	+1113	+1131	-1.0	-0.9	-0.6	-0.2	0.20	
8032	Sakata		38 55	139 49	+1126	+1139	-1.0	-0.8	-0.6	-0.2	0.21	
8033	Kamo Ko		38 46	139 44	+1117	+1136	-1.0	-0.8	-0.6	-0.2	0.22	
8033a	Nezugaseki		38 34	139 33	+1121	+1134	-1.0	-0.9	-0.6	-0.2	0.20	
8034	Awa Shima	C	38 28	139 15	+1114	+1135	-1.0	-0.9	-0.6	-0.2	0.20	
	Sado											
8035	Ryotsu		38 04	138 26	+1122	+1154	-1.0	-0.9	-0.6	-0.2	0.18	
8036	Futami (Honshu W Coast)		37 59	138 16	+1116	+1129	-1.0	-0.9	-0.6	-0.2	0.20	
8036a	Ogi		37 49	138 17	+1116	+1129	-1.0	-0.9	-0.6	-0.2	0.19	
8037	Niigata (Nishi Ku)	J	37 56	139 04	+1116	+1129	-1.0	-0.9	-0.6	-0.3	0.17	
8038	Teradomari		37 39	138 46	+1116	+1129	-1.0	-0.9	-0.6	-0.2	0.20	
8038a	Izumozaki		37 33	138 40	+1116	+1129	-1.0	-0.8	-0.6	-0.2	0.22	
8039	Kashiwazaki (Honshu)		37 21	138 31	+1111	+1124	-1.0	-0.8	-0.6	-0.2	0.21	
8040	Naoetsu		37 11	138 15	+1108	+0021	-1.0	-0.9	-0.6	-0.2	0.19	
8041	Nou		37 06	138 00	+1103	+1121	-0.9	-0.8	-0.6	-0.2	0.24	
8042	Miyazaki (Honshu)		36 58	137 35	+1113	+1131	-1.0	-0.8	-0.6	-0.2	0.22	
8043	Toyama	J	36 46	137 14	+1108	+1126	-1.0	-0.8	-0.6	-0.2	0.22	
8043a	Fushiki		36 48	137 04	+1113	+1131	-1.0	-0.8	-0.6	-0.2	0.20	
8043b	Ao		36 53	136 59	+1108	+1126	-1.0	-0.8	-0.6	-0.2	0.21	
	Nanao Wan											
8044	Nanao		37 03	136 58	+1108	+1126	-1.0	-0.9	-0.6	-0.2	0.20	
8044a	Sora		37 11	137 01	+1133	+1151	-1.0	-0.8	-0.6	-0.2	0.21	
8045	Matsunami		37 21	137 15	+1103	+1121	-1.0	-0.9	-0.6	-0.2	0.20	
8046	Wajima		37 24	136 54	+1110	+1122	-1.0	-0.9	-0.6	-0.2	0.20	
8047	Taki		36 56	136 46	+1100	+1115	-1.0	-0.9	-0.6	-0.2	0.20	
8048	Kanazawa		36 37	136 36	+1105	+1120	-1.0	-0.9	-0.6	-0.2	0.20	
8049	Fukui		36 12	136 08	+1105	+1120	-1.0	-0.9	-0.6	-0.3	0.18	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
7056	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	+0.1	+0.2	+0.2	0.0
7799	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
7940 - 7948	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	-0.1
7949 - 7953	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.2	+0.1	0.0	0.0	0.0	-0.1
7957 - 8011	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0
8014 - 8019	0.0	-0.1	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0	0.0
8020 - 8049	0.0	-0.1	-0.2	-0.2	-0.1	0.0	+0.1	+0.1	+0.1	+0.1	+0.1	0.0	0.0

JAPAN

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
					Zone -0900							
7994	**KAMAISHI**	(see page 150)					**1.3**	**1.1**	**0.8**	**0.3**		
8050	Tsuruga		35 40	136 04	+1055	+1110	-1.0	-0.8	-0.6	-0.2	0.18	
8051	Obama		35 30	135 44	+1055	+1110	-1.0	-0.8	-0.6	-0.2	0.18	
8051a	Uchiura Wan		35 32	135 30	+1055	+1110	-1.0	-0.8	-0.6	-0.2	0.18	
8052	Maizuru	**CJ**	35 27	135 19	+1100	+1115	-1.0	-0.8	-0.6	-0.2	0.19	
8053	Tai		35 35	135 14	+1055	+1110	-1.0	-0.8	-0.6	-0.2	0.19	
8053a	Ine		35 40	135 17	+1100	+1115	-1.0	-0.8	-0.6	-0.2	0.20	
8054	Tsuiyama		35 39	134 50	+1100	+1115	-1.0	-0.8	-0.6	-0.2	0.17	
8055	Shibayama		35 39	134 40	+1103	+1110	-1.0	-0.9	-0.6	-0.2	0.17	
8055a	Kasumi		35 39	134 38	+1105	+1120	-1.0	-0.9	-0.6	-0.2	0.18	
8056	Inaba-Ajiro		35 35	134 18	+1105	+1120	-1.0	-0.8	-0.6	-0.2	0.20	
8057	Akasaki		35 31	133 40	+1050	+1103	-1.0	-0.8	-0.6	-0.2	0.19	
8058	Sakai	**J**	35 33	133 15	+1103	+1102	-1.0	-0.8	-0.6	-0.2	0.17	
8058a	Shichirui		35 34	133 14	+1030	+1045	-1.0	-0.8	-0.6	-0.3	0.16	
	Dogo											
8059	Saigo		36 12	133 20	+1053	+1113	-1.0	-0.8	-0.6	-0.2	0.17	
	Dozen											
8060	Urago		36 05	133 01	+1055	+1110	-1.0	-0.8	-0.6	-0.2	0.18	
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)					**1.6**	**1.6**	**1.0**	**0.4**		
8061	Etomo		35 31	132 59	+0845	+0923	-1.3	-1.3	-0.8	-0.3	0.17	
8063	Kawashimo		35 27	132 45	+0810	+0848	-1.3	-1.3	-0.8	-0.3	0.17	
8064	Sagi Ura		35 26	132 41	+0835	+0857	-1.3	-1.3	-0.8	-0.3	0.19	
7110	**HONG KONG (QUARRY BAY)**	(see page 120)					**2.2**	**1.6**	**1.1**	**0.6**		
8064a	Taisha		35 24	132 40	+0359	+0402	-1.8	-1.3	-1.0	-0.5	0.22	
8065	Yunotsu		35 06	132 21	+0339	+0342	-1.8	-1.4	-0.9	-0.4	0.25	
8065a	Gotsu		35 01	132 14	+0329	+0332	-1.8	-1.4	-0.9	-0.5	0.24	
8066	Hamada	**J**	34 54	132 04	+0304	+0307	-1.7	-1.3	-0.9	-0.4	0.29	
8067	Esaki		34 38	131 39	+0227	+0216	-1.6	-1.2	-0.8	-0.4	0.36	
7056	**NAOZHOU DAO**	(see page 117)					**3.0**	**2.1**	**1.3**	**0.7**		
8069	Hagi		34 26	131 25	+0008	+0017	-2.2	-1.6	-0.9	-0.4	0.48	
8070	Senzaki		34 23	131 12	-0003	-0008	-2.2	-1.5	-0.9	-0.4	0.52	
8072	Yuya		34 24	130 57	-0031	-0040	-2.0	-1.4	-0.9	-0.4	0.59	
							MHWS	MHWN	MLWN	MLWS		
7799	**MOJI**	(see page 144)			MHW	MLW	**2.3**	**1.7**	**0.9**	**0.3**		
8073	Kottoi		34 19	130 54	+0105	+0102	-1.1	-0.8	-0.3	0.0	0.73	
8076	Yoshimo		34 05	130 52	+0047	+0043	-1.1	-0.8	-0.3	-0.1	0.71	
							MHHW	MLHW	MHLW	MLLW		
7056	**NAOZHOU DAO**	(see page 117)			HHW	LLW	**3.0**	**2.1**	**1.3**	**0.7**		
	Japan Hokkaido East Coast											
	Tsugaru Kaikyo											
8078	Yoshioka	**C**	41 27	140 14	-0659	-0647	-2.3	-1.6	-0.9	-0.5	0.45	
8080	Wakimoto		41 34	140 25	-0727	-0716	-2.1	-1.5	-0.8	-0.5	0.55	
7994	**KAMAISHI**	(see page 150)					**1.3**	**1.1**	**0.8**	**0.3**		
8083	Hakodate	**J**	41 47	140 43	+0022	+0010	-0.4	-0.4	-0.3	-0.1	0.57	★
8085	Shiokubi Misaki		41 43	140 58	+0014	+0020	0.0	0.0	0.0	0.0	0.88	
8088	Usujiri		41 56	140 57	-0015	-0022	-0.1	0.0	0.0	0.0	0.82	
	Iburi Wan											
8090	Mori Ko		42 07	140 36	-0014	-0024	+0.1	+0.1	0.0	0.0	0.92	
8093	Usu Wan		42 31	140 46	-0008	-0018	+0.1	+0.1	0.0	0.0	0.92	
8094	Muroran	**CJ**	42 21	140 57	-0006	-0011	+0.1	+0.1	+0.1	+0.1	0.95	
8095	Tomakomai	**J**	42 38	141 37	-0002	-0006	0.0	0.0	0.0	0.0	0.88	
8096	Higashi-Shizunai		42 17	142 28	-0010	-0009	+0.1	+0.2	+0.1	0.0	0.97	
8097	Urakawa	**J**	42 10	142 46	-0005	-0004	0.0	+0.1	+0.1	+0.1	0.93	
8098	Erimo Misaki		41 56	143 14	-0020	-0019	0.0	+0.1	+0.1	0.0	0.91	
8102	Rubeshibetsu		42 12	143 20	-0025	-0022	0.0	0.0	0.0	0.0	0.85	

△ Tide usually diurnal.
★ See notes on page 298.
d Differences approximate.
t Time differences approximate.
C Tides predicted in Chinese Tide Tables.
J Tides predicted in Japanese Tide Tables.

JAPAN

No.	PLACE		Lat. N	Long. E	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
					Zone -0900							
7994	**KAMAISHI**	(see page 150)					**1.3**	**1.1**	**0.8**	**0.3**		
8103	Tokachi		42 17	143 20	-0033	-0028	-0.1	0.0	0.0	0.0	0.85	
8105	Kushiro	J	42 58	144 22	-0028	-0023	0.0	0.0	+0.1	0.0	0.87	
8106	Akkeshi		43 03	144 51	-0027	-0029	-0.1	0.0	0.0	0.0	0.86	
8107	Kiritappu		43 05	145 08	-0027	-0026	-0.1	-0.1	0.0	0.0	0.81	
8108	Ochiishi		43 11	145 31	-0033	-0028	-0.1	-0.1	0.0	0.0	0.82	
8109	Hanasaki		43 17	145 34	-0028	-0022	0.0	0.0	0.0	0.0	0.86	
8111	Nemuro Ko		43 20	145 35	-0025	-0027	0.0	0.0	0.0	0.0	0.87	
7110	**HONG KONG (QUARRY BAY)**	(see page 120)					**2.2**	**1.6**	**1.1**	**0.6**		
	Japan Hokkaido North-east Coast											
8115	Koiseboi		44 03	144 57	-0649	-0635	-1.2	-1.0	-0.5	-0.3	0.64	
8117	Abashiri Ko		44 01	144 17	-0655	-0627	-1.1	-0.9	-0.5	-0.3	0.68	
8119	Monbetsu	J	44 21	143 22	-0710	-0645	-1.1	-0.8	-0.4	-0.3	0.71	
8121	Omu Ko		44 35	142 58	-0710	-0649	-1.2	-0.9	-0.4	-0.3	0.65	
8123	Esashi (Hokkaido Ne Coast)		44 56	142 36	-0707	-0654	-1.3	-0.9	-0.5	-0.4	0.57	
7940	**YOKOHAMA (SHIN-YAMASHITA)**	(see page 147)			MHW	LLW	**1.6**	**1.6**	**1.0**	**0.4**		
8125	Soya Misaki		45 31	141 57	-0200	-0210	-1.3	-1.4	-0.8	-0.3	0.19	
7377	**QINHUANGDAO**	(see page 135)					**1.2**	△	△	**0.5**		
	Japan Hokkaido West Coast											
8126	Wakkanai	J	45 24	141 41	-0641	-0659	-0.9	△	△	-0.4	0.18	
	Rishiri To											
8128	Oshidomari Wan		45 14	141 14	-0640	-0705	-1.0	△	△	-0.4	0.17	d
7994	**KAMAISHI**	(see page 150)			HHW	LLW	**1.3**	**1.1**	**0.8**	**0.3**		
8132	Tomamae		44 19	141 39	+1205	+1225	-1.0	-0.8	-0.6	-0.2	0.19	t
8133	Rumoi	J	43 57	141 38	+1210	+1228	-1.1	-0.9	-0.6	-0.3	0.16	
8136	Otaru	J	43 11	141 02	+1140	+1220	-1.1	-0.9	-0.6	-0.3	0.16	★t
8138	Kamui Misaki		43 20	140 21	+1145	+1205	-1.1	-0.9	-0.6	-0.2	0.17	t
8139	Iwanai		42 59	140 30	+1140	+1220	-1.1	-0.9	-0.6	-0.2	0.18	t
8140	Suttsu		42 48	140 14	+1135	+1215	-1.1	-0.9	-0.6	-0.2	0.17	t
8141	Setana		42 27	139 51	+1135	+1215	-1.0	-0.8	-0.6	-0.2	0.20	t
	Okushiri To											
8143	Aonae		42 03	139 27	+1145	+1155	-1.0	-0.8	-0.6	-0.2	0.19	t
8144	Esashi (Hokkaido W Coast)		41 52	140 08	+1105	+1145	-0.9	-0.8	-0.6	-0.2	0.24	t
8145	Matsumae		41 25	140 05	+1200	+1240	-0.9	-0.9	-0.6	-0.2	0.23	t

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
7056	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	+0.1	+0.2	+0.2	0.0
7110	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	+0.1	0.0
7377	-0.2	-0.2	-0.2	-0.1	0.0	+0.1	+0.2	+0.3	+0.2	+0.1	-0.1	-0.2	-0.2
7799	-0.1	-0.2	-0.2	-0.1	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1	-0.1
7940	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	-0.1
7994	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0
8050 - 8076	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	+0.1	+0.2	+0.2	+0.1	0.0	0.0	-0.1
8078 - 8085	0.0	-0.1	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	0.0
8088 - 8125	0.0	0.0	-0.1	-0.1	-0.1	0.0	+0.1	+0.1	0.0	0.0	0.0	0.0	0.0
8126 - 8145	0.0	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0	0.0

No.	PLACE		Lat. N	Long. W	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
					Zone +0800							
9133	**VANCOUVER**		(see page 165)				**4.4**	**3.9**	**2.9**	**1.1**		
	San Juan Island											
9159	Friday Harbour		48 33	123 00	-0030	-0053	-2.2	-1.9	-1.3	-1.1	1.43	
9065	**VICTORIA**		(see page 162)				**2.6**	**2.3**	**2.0**	**0.8**		
9160	Kanaka Bay		48 29	123 05	+0045	+0040	-0.6	-0.4	-0.6	-0.8	1.38	d
9133	**VANCOUVER**		(see page 165)				**4.4**	**3.9**	**2.9**	**1.1**		
	Whidbey Island											
9163	Yokeko Point		48 25	122 37	-0043	-0040	-1.3	-1.1	-1.2	-1.1	1.86	
9169	Point Partridge		48 14	122 46	-0125	-0140	-2.3	-1.8	-1.4	-1.1	1.43	
	PUGET SOUND											
9172	Everett		47 59	122 13	-0059	-0051	-1.2	-0.9	-1.1	-1.1	1.99	
9174	Seattle	U	47 36	122 20	-0059	-0050	-1.1	-0.8	-1.1	-1.1	2.03	
9176	Tacoma		47 16	122 25	-0100	-0048	-1.0	-0.7	-1.1	-1.1	2.10	
9178	Steilacoom		47 10	122 36	-0020	-0005	-0.5	-0.2	-1.0	-1.1	2.37	d
9180	Olympia		47 03	122 54	-0015	+0005	-0.2	+0.1	-1.0	-1.1	2.53	d
9183	Vaughn		47 20	122 46	-0010	+0005	-0.3	0.0	-1.0	-1.1	2.47	d
9186	Bremerton		47 34	122 37	-0050	-0037	-1.0	-0.7	-1.1	-1.1	2.09	
9187	Tracyton		47 37	122 40	-0031	+0003	-0.9	-0.7	-1.2	-1.1	2.10	
9191	Point No Point		47 55	122 32	-0100	-0100	-1.3	-1.1	-1.2	-1.1	1.89	
	Hood Canal											
9193	Bangor		47 45	122 44	-0111	-0104	-1.2	-0.9	-1.1	-1.1	2.00	
9194	Seabeck		47 38	122 50	-0055	-0050	-1.1	-0.8	-1.0	-1.1	2.07	
9196	Union		47 21	123 06	-0058	-0040	-1.0	-0.7	-1.0	-1.1	2.11	
	Admiralty Inlet											
9197	Port Ludlow		47 55	122 41	-0113	-0104	-1.6	-1.2	-1.2	-1.1	1.80	
9199	Port Townsend	U	48 07	122 45	-0120	-0129	-2.0	-1.6	-1.2	-1.1	1.58	
9201	Discovery Bay		48 04	122 55	-0207	-0145	-2.1	-1.7	-1.3	-1.1	1.46	
9203	Dungeness Bay		48 10	123 07	-0215	-0205	-2.2	-1.8	-1.4	-1.1	1.43	d
9065	**VICTORIA**		(see page 162)				**2.6**	**2.3**	**2.0**	**0.8**		
	Juan de Fuca Strait											
9204	Port Angeles		48 07	123 26	+0000	-0025	-0.6	-0.5	-0.6	-0.8	1.29	
9206	Crescent Bay		48 10	123 44	-0105	-0115	-0.7	-0.5	-0.7	-0.8	1.25	
9050	**TOFINO**		(see page 159)				**3.4**	**3.0**	**1.4**	**0.7**		
9208	Clallam Bay		48 16	124 18	+0043	+0027	-1.3	-1.2	-0.7	-0.7	1.28	
9210	Neah Bay	U	48 22	124 37	-0002	+0014	-1.0	-1.1	-0.4	-0.7	1.33	
9211	Cape Flattery		48 23	124 44	+0000	+0000	-1.1	-1.0	-0.4	-0.7	1.33	
9214	Union Seamount		49 35	132 47	+0019	+0024	-0.9	-0.9	-0.5	-0.7	1.4	x
9215	Destruction Island		47 40	124 29	-0015	-0018	-0.8	-0.8	-0.5	-0.7	1.43	
9218	Point Grenville		47 18	124 16	-0015	-0019	-1.0	-0.9	-0.6	-0.7	1.34	
	Grays Harbor											
9220	Point Chehalis		46 55	124 07	+0011	-0004	-0.7	-0.7	-0.5	-0.7	1.50	
9222	Aberdeen	U	46 58	123 51	+0028	+0028	-0.4	-0.4	-0.5	-0.7	1.65	
	Willapa Bay											
9223	Toke Point	U	46 42	123 58	+0022	+0025	-0.7	-0.7	-0.5	-0.7	1.46	
9223a	South Bend		46 40	123 48	+0037	+0045	-0.4	-0.5	-0.5	-0.7	1.59	
9224	Raymond		46 41	123 45	+0049	+0042	-0.4	-0.5	-0.5	-0.7	1.62	
9224a	Nahcotta		46 30	124 02	+0051	+0053	-0.4	-0.4	-0.5	-0.7	1.62	
9225	Cobb Seamount		46 46	130 49	+0000	+0006	-1.2	-1.2	-0.6	-0.7	1.2	x
	Columbia River											
9226	Entrance (Jetty "A")		46 16	124 02	+0002	-0021	-0.9	-0.9	-0.4	-0.7	1.40	
9227	Youngs Bay		46 10	123 50	+0030	+0032	-0.9	-0.8	-0.6	-0.7	1.37	
9228	Astoria (Tongue Point)	U	46 12	123 46	+0043	+0046	-0.9	-0.8	-0.6	-0.7	1.39	★
9229	Harrington Point		46 16	123 39	+0104	+0138	-1.1	-1.1	-0.7	-0.7	1.19	★
9229a	Shamokawa		46 16	123 27	+0139	+0231	-1.2	-1.2	-0.8	-0.7	1.15	★
9229b	Wauna		46 10	123 24	+0200	+0305	-1.4	-1.3	-0.9	-0.7	1.05	★
9230	Eagle Cliff		46 10	123 14	+0226	+0347	-1.7	⊙	⊙	-0.7	⊙	★
9230a	Longview		46 06	122 57	+0310	+0500	-2.1	-2.0	-1.1	-0.7	0.63	★

⊙ No data.
★ See notes on page 298.
d Differences approximate.
x ML inferred.
U Tides predicted in United States Tide Tables.

UNITED STATES

No.	PLACE		Lat. N	Long. W	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
					Zone +0800							
9050	**TOFINO**	(see page 159)					**3.4**	**3.0**	**1.4**	**0.7**		
9231	Saint Helens		45 52	122 48	+0414	+0630	-2.5	-2.4	-1.2	-0.7	0.46	★
9232	Vancouver		45 37	122 40	+0628	+0824	-2.6	-2.4	-1.2	-0.7	0.41	★
9233	Portland		45 31	122 40	+0548	+0823	-2.6	-2.4	-1.2	-0.7	0.45	★
	Tillamook Bay											
9236	Garibaldi		45 33	123 55	+0012	+0014	-0.9	-0.9	-0.5	-0.7	1.37	
9238	Nestucca Bay Entrance		45 10	123 58	-0012	+0015	-1.1	-1.1	-0.7	-0.7	1.22	
9239	Depoe Bay		44 49	124 04	-0040	-0030	-0.9	-0.9	-0.5	-0.7	1.36	
	Yaquina River											
9241	Newport		44 38	124 03	-0023	-0016	-1.0	-1.0	-0.6	-0.7	1.31	
9241a	South Beach		44 37	124 03	-0027	-0020	-0.9	-0.9	-0.5	-0.7	1.37	
9242	Yaquina		44 36	124 01	-0021	-0015	-1.0	-1.0	-0.5	-0.7	1.34	
9243	Waldport		44 26	124 04	-0005	+0003	-1.2	-1.1	-0.6	-0.7	1.25	
	Siuslaw River											
9245	Entrance		44 01	124 08	-0033	-0027	-1.2	-1.1	-0.6	-0.7	1.22	
9246	Florence		43 58	124 06	+0014	+0021	-1.5	-1.4	-0.7	-0.7	1.07	
	Umpqua River											
9249	Entrance		43 41	124 12	-0033	-0028	-1.3	-1.3	-0.6	-0.7	1.13	
9250	Gardiner		43 44	124 07	+0027	+0033	-1.4	-1.4	-0.7	-0.7	1.07	
	Coos Bay											
9252	Charleston (Coos Bay)	U	43 21	124 19	-0038	-0031	-1.1	-1.1	-0.6	-0.7	1.25	
9253	Port of Coos Bay		43 23	124 13	+0050	+0055	-1.3	-1.2	-0.7	-0.7	1.19	
9254	Bandon		43 07	124 25	-0041	-0033	-1.3	-1.3	-0.7	-0.7	1.15	
9256	Port Orford		42 44	124 30	-0058	-0047	-1.2	-1.2	-0.6	-0.7	1.21	
9305	**SAN FRANCISCO (GOLDEN GATE)**	(see page 168)					**1.7**	**1.4**	**0.7**	**0.0**		
9259	Wedderburn		42 26	124 25	+0017	+0018	+0.2	+0.2	0.0	0.0	1.10	
9262	Chetco Cove		42 03	124 17	+0010	+0004	+0.3	+0.3	+0.1	0.0	1.13	
9264	Crescent City	U	41 45	124 11	+0008	+0002	+0.3	+0.3	+0.1	0.0	1.14	
9268	Trinidad Harbour		41 03	124 09	+0006	-0001	+0.3	+0.2	+0.1	0.0	1.11	
	Humboldt Bay											
9270	North Spit	U	40 46	124 13	+0024	+0020	+0.4	+0.3	+0.1	0.0	1.13	
9271	Eureka		40 48	124 10	+0050	+0033	+0.5	+0.4	+0.1	0.0	1.20	
9281	Shelter Cove		40 02	124 04	-0023	-0022	+0.1	0.0	0.0	0.0	1.01	
9284	Fort Bragg Landing		39 27	123 49	-0014	-0025	0.0	0.0	0.0	0.0	0.94	
9287	Point Arena		38 57	123 44	-0026	-0026	0.0	0.0	0.0	0.0	0.94	
9288	Arena Cove	U	38 55	123 43	-0029	-0027	0.0	0.0	0.0	0.0	0.97	
9290	Fort Ross Cove		38 31	123 15	-0050	-0030	0.0	-0.1	0.0	0.0	0.91	
9293	Point Reyes		38 00	122 58	-0051	-0031	0.0	0.0	0.0	0.0	0.96	
9295	South East Farallon Island		37 42	123 00	-0040	-0020	-0.1	-0.1	0.0	0.0	0.91	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
9050	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0
9065	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
9133 - 9159	+0.1	+0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	+0.1
9160 - 9169	0.0	+0.1	+0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
9172 - 9197	+0.1	+0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	+0.1
9199 - 9206	0.0	+0.1	+0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
9208 - 9220	+0.1	+0.1	+0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	+0.1	+0.1
9222	+0.2	+0.2	+0.1	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	+0.1	+0.2	+0.2
9223 - 9256	+0.1	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1
9259 - 9293	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1
9295 - 9305						Negligible							

No.	PLACE	Lat. N	Long. W	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
				Zone +0800							
9305	**SAN FRANCISCO (GOLDEN GATE)**	(see page 168)				**1.7**	**1.4**	**0.7**	**0.0**		
	SAN FRANCISCO BAY										
9295a	Sausalito	37 51	122 29	+0010	+0014	0.0	0.0	0.0	0.0	0.95	
9295b	Richmond	37 56	122 24	+0024	+0038	+0.1	+0.1	0.0	0.0	0.99	
9295c	Richmond, Inner Harbour	37 55	122 22	+0016	+0030	0.0	0.0	0.0	0.0	0.99	
9296	Point San Quentin	37 57	122 28	+0039	+0050	0.0	0.0	0.0	0.0	0.95	
	Carquinez Strait										
9297	Mare Island	38 04	122 15	+0132	+0158	0.0	0.0	-0.1	0.0	0.95	
9298	Benicia	38 03	122 08	+0219	+0213	-0.1	-0.1	-0.1	0.0	0.89	
9298a	Port Chicago ..... **U**	38 03	122 02	+0242	+0238	-0.2	-0.2	-0.2	0.0	0.78	
	Sacramento River										
9299	Collinsville	38 04	121 51	+0353	+0358	-0.5	-0.5	-0.3	0.0	0.62	
9300	Three Mile Slough (Sacramento River)	38 06	121 42	+0431	+0436	-0.5	-0.4	-0.3	0.0	0.63	
	San Joaquin River										
9303	Three Mile Slough (San Joaquin River)	38 05	121 41	+0510	+0530	-0.7	-0.7	-0.3	0.0	0.55	t
9304	Stockton	37 58	121 17	+0650	+0710	-0.7	-0.5	-0.4	0.0	0.62	t
9305	SAN FRANCISCO (GOLDEN GATE)	37 48	122 28	STANDARD PORT			See Table V			0.97	
9306	Oakland (Grove Street)	37 48	122 17	+0033	+0042	+0.1	+0.1	0.0	0.0	1.01	
9306a	North Point, Pier 41	37 49	122 25	+0013	+0011	+0.1	+0.1	0.0	0.0	1.01	
9306b	Rincon Point, Pier 22½	37 47	122 23	+0023	+0025	+0.2	+0.2	0.0	0.0	1.04	
9306c	Hunters Point	37 44	122 21	+0025	+0039	+0.3	+0.3	+0.1	0.0	1.12	
9306d	Oyster Point Marina	37 40	122 23	+0041	+0100	+0.4	+0.4	0.0	0.0	1.15	
9307	Coyote Point Marina	37 36	122 19	+0042	+0108	+0.5	+0.4	+0.1	0.0	1.20	
9307a	San Mateo Bridge	37 35	122 15	+0044	+0111	+0.6	+0.5	+0.1	0.0	1.25	
9307b	Redwood Creek Marker 8	37 32	122 12	+0053	+0128	+0.7	+0.6	+0.1	0.0	1.31	
9307c	Redwood City	37 30	122 13	+0048	+0115	+0.7	+0.7	+0.1	0.0	1.34	
9308	Dumbarton Bridge	37 30	122 07	+0050	+0115	+0.8	+0.8	+0.1	0.0	1.39	
9309	Alameda	37 46	122 18	+0029	+0039	+0.2	+0.2	0.0	0.0	1.08	
	PACIFIC COAST										
9312	Halfmoon Bay	37 30	122 29	-0106	-0050	-0.1	-0.1	0.0	0.0	0.91	
9315	Ano Nuevo Island	37 06	122 20	-0124	-0104	-0.2	-0.2	0.0	0.0	0.82	
	Monterey Bay										
9318	Santa Cruz	36 58	122 01	-0107	-0103	-0.1	-0.2	0.0	0.0	0.85	
9318a	Elkhorn Yacht Club	36 49	121 47	-0101	-0050	-0.1	-0.2	-0.1	0.0	0.86	
9318b	Elkhorn Pacific Mariculture Dock	36 49	121 46	-0046	-0045	-0.1	-0.2	0.0	0.0	0.88	
9318c	Elkhorn Slough	36 49	121 45	-0040	-0047	-0.1	-0.2	0.0	0.0	0.87	
9319	Kirby Park	36 50	121 45	-0035	-0044	-0.1	-0.2	-0.1	0.0	0.88	
9319a	Elkhorn Slough Railroad Bridge	36 51	121 45	-0028	-0044	0.0	-0.2	-0.1	0.0	0.90	
9319b	Moss Landing	36 48	121 47	-0102	-0053	-0.2	-0.2	0.0	0.0	0.85	
9320	Monterey ..... **U**	36 36	121 53	-0101	-0052	-0.1	-0.2	0.0	0.0	0.87	
9321	Carmel Bay	36 31	121 56	-0057	-0048	-0.2	-0.3	0.0	0.0	0.85	
9326	San Simeon	35 38	121 11	-0117	-0110	-0.1	-0.2	0.0	0.0	0.85	
9331	Port San Luis ..... **U**	35 10	120 45	-0125	-0117	-0.1	-0.2	0.0	0.0	0.86	
9335	Point Arguello	34 35	120 39	-0128	-0125	-0.2	-0.3	-0.1	0.0	0.82	
9336	Oil Platform Harvest	34 28	120 40	-0135	-0126	-0.1	-0.3	-0.1	0.0	0.85	
9365	**SAN DIEGO**	(see page 171)				**1.7**	**1.2**	**0.6**	**0.0**		
9338	Santa Barbara	34 25	119 41	+0016	+0019	-0.1	-0.1	0.0	0.0	0.85	
9342	Port Hueneme	34 09	119 12	+0003	+0011	-0.1	-0.1	0.0	0.0	0.85	
	San Miguel Island										
9345	Cuyler Harbour	34 03	120 21	+0026	+0032	-0.2	-0.1	0.0	0.0	0.82	
	Santa Rosa Island										
9346	Bechers Bay	34 01	120 03	+0020	+0025	-0.2	-0.1	0.0	0.0	0.82	
	Santa Cruz Island										
9347	Prisoners Harbour	34 01	119 41	+0018	+0024	-0.2	-0.1	0.0	0.0	0.79	
9349	Santa Monica	34 00	118 30	-0006	-0001	-0.1	0.0	0.0	0.0	0.86	
9351	Los Angeles Harbour ..... **U**	33 43	118 16	-0007	-0002	-0.1	0.0	0.0	0.0	0.87	
9351a	Long Beach	33 45	118 14	-0009	-0005	-0.1	0.0	0.0	0.0	0.88	
9352	San Nicholas Island	33 16	119 30	+0003	+0019	-0.3	-0.2	-0.1	0.0	0.76	
9353	Santa Barbara Island	33 29	119 02	-0009	+0002	-0.2	-0.1	0.0	0.0	0.79	

⊙ No data.
△ Tide usually diurnal.
d Differences approximate.
p For predictions use harmonic constants (see Part III).
t Time differences approximate.
x ML inferred.
M Tides predicted in Mexican Tide Tables.
U Tides predicted in United States Tide Tables.

COSTA RICA TO ECUADOR

No.	PLACE		Lat. N	Long. W	TIME DIFFERENCES MHW	MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
					Zone +0600							
9448	**LA UNION**	(see page 174)					**2.9**	**2.4**	**0.5**	**0.0**		
	Isla del Coco											
9470	Chatham Bay		5 33	87 03	-0035	-0035	-0.4	-0.4	+0.3	+0.2	1.4	x
9487	**BALBOA**	(see page 177)					**4.9**	**3.9**	**1.1**	**0.1**		
	Panama				Zone +0500							
9471	Puerto Armuelles		8 16	82 51	-0010	-0010	-1.9	-1.6	-0.3	0.0	1.46	
9474	Isla Parida		8 08	82 19	-0005	-0005	-1.6	-1.4	-0.2	0.0	1.7	x
9477	Bahia Honda		7 46	81 31	-0005	-0005	-1.6	-1.4	-0.2	-0.1	1.7	x
9478	Isla Coiba		7 24	81 39	-0005	-0005	-1.4	-1.2	-0.2	0.0	1.8	x
9480	Isla Cebaco		7 31	81 13	-0005	-0005	-1.6	-1.4	-0.2	-0.1	1.7	x
9484	Punta Mala		7 28	80 00	-0005	-0005	-1.6	-1.5	-0.2	0.0	1.7	x
9487	BALBOA		8 57	79 34	STANDARD PORT			See Table V			2.57	
9488	Rio Chepo		8 59	79 07	+0000	+0000	-0.1	0.0	+0.1	+0.1	2.5	x
9492	Punta Garachine		8 05	78 25	-0005	-0005	-0.7	-0.6	0.0	+0.1	2.2	x
	Isla del Rey											
9493	Bahia San Telmo		8 18	78 54	-0005	-0005	-0.7	-0.6	0.0	+0.1	2.2	x
9496	Bahia Pina		7 34	78 11	-0005	-0005	-0.8	-0.7	0.0	+0.1	2.1	x
	Colombia											
9498	Bahia Octavia		6 52	77 40	+0005	-0005	-0.9	-0.8	-0.2	-0.1	2.0	x
9501	Puerto Utria		6 00	77 21	+0015	+0000	-1.0	-0.9	-0.2	-0.1	2.0	x
9503	Puerto Cuevita		5 28	77 31	+0020	+0000	-1.0	-0.9	-0.2	-0.1	2.0	x
9505	Punta Charambira		4 17	77 30	+0020	+0000	-1.1	-0.9	-0.2	-0.1	1.9	x
9507	Buenaventura	EU	3 54	77 05	+0023	+0003	-0.9	-1.0	-0.3	-0.2	1.98	
9510	Rio Sanguianga		2 40	78 19	+0020	+0006	-1.0	-0.9	-0.1	0.0	2.0	x
9511	Puerto Tumaco		1 50	78 44	+0002	+0000	-1.8	-1.4	-0.4	0.0	1.61	
9448	**LA UNION**	(see page 174)					**2.9**	**2.4**	**0.5**	**0.0**		
	Ecuador				Zone +0600							
	Archipelago de Colon (Islas Galapagos)											
9517	Bahia Darwin		0 19	89 57	-0020	-0008	-0.9	-0.9	-0.1	0.0	0.9	dx
			S	W								
9519	Caleta Iguana		0 58	91 27	-0020	⊙	-1.1	⊙	⊙	⊙	⊙	d
9519a	Puerto Villamil	E	0 57	90 58	-0020	⊙	-1.4	-1.1	-0.3	0.0	0.7	dx
9520	Santa Cruz	E	0 45	90 18	-0020	-0004	-1.2	-1.1	-0.1	0.0	0.86	
9521	Caleta Aeolian	E	0 26	90 17	-0020	-0004	-1.1	-1.0	-0.1	0.0	0.91	
9522	Bahia de Correo		1 15	90 27	-0015	-0007	-1.4	-1.2	-0.2	0.0	0.8	dx
9524	San Cristobal	E	0 54	89 37	-0017	-0001	-0.9	-0.8	+0.1	+0.2	1.13	
9487	**BALBOA**	(see page 177)					**4.9**	**3.9**	**1.1**	**0.1**		
			N	W	Zone +0500							
9525	San Lorenzo	E	1 18	78 51	+0029	+0023	-1.2	-0.9	0.0	+0.3	2.02	
9527	Esmeraldas	E	1 00	79 39	-0008	-0010	-1.7	-1.3	-0.2	+0.2	1.76	
9528	Bahia Atacames		0 53	79 52	+0025	+0025	-1.0	-0.9	-0.1	0.0	2.0	x
9530	Muisne	E	0 37	80 01	+0017	+0017	-1.9	-1.6	-0.2	+0.2	1.63	

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
6323	+0.1	+0.1	+0.2	+0.2	0.0	-0.1	-0.2	-0.2	-0.1	-0.1	0.0	0.0	+0.1
9365						Negligible							
9410 - 9415	-0.2	-0.2	-0.2	-0.1	0.0	0.0	+0.2	+0.2	+0.2	+0.1	0.0	-0.1	-0.2
9417 - 9435	-0.1	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.1	+0.1	0.0	0.0	-0.1
9436 - 9480	0.0	0.0	-0.1	-0.1	0.0	0.0	+0.1	+0.1	0.0	0.0	0.0	0.0	0.0
9484 - 9496	0.0	-0.1	-0.2	-0.1	0.0	0.0	+0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0
9498 - 9511	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	0.0	0.0
9517 - 9530						Negligible							

ECUADOR TO CHILE

No.	PLACE		Lat. S	Long. W	TIME DIFFERENCES MHW	MLW	HEIGHT DIFFERENCES (IN METRES) MHWS	MHWN	MLWN	MLWS	ML Z_0 m	
					Zone +0500							
9487	**BALBOA** (see page 177)						**4.9**	**3.9**	**1.1**	**0.1**		
9533	Cabo Pasado		0 22	80 30	+0005	+0005	-1.8	-1.4	-0.5	-0.1	1.6	x
9534	Bahia de Caraquez	E	0 35	80 26	+0011	+0009	-2.2	-1.7	-0.3	+0.2	1.51	
9535	Manta	E	0 57	80 43	-0002	-0003	-2.3	-1.8	-0.3	+0.2	1.46	
9538	Puerto Lopez	E	1 34	80 50	+0004	+0003	-2.0	-1.6	-0.2	+0.2	1.62	
9539	La Libertad	E	2 12	80 55	+0005	+0005	-2.8	-2.3	-0.6	0.0	1.07	
	Golfo de Guayaquil											
9540	Posorja	E	2 43	80 14	+0130	+0127	-2.4	-1.8	-0.5	+0.1	1.34	
9540a	Puerto Maritimo de Guayaquil	E	2 17	79 55	+0301	+0252	-0.9	-0.6	+0.1	+0.3	2.30	
9541	Isla Santa Clara		3 10	80 26	+0000	⊙	-3.0	-2.5	-0.8	-0.3	0.9	dx
9543	Puna	E	2 44	79 55	+0156	+0155	-1.3	-0.9	-0.1	+0.3	2.0	x
9544	Guayaquil	EU	2 12	79 52	+0336	+0427	-1.2	-0.9	-0.3	0.0	1.92	
9545	Puerto Bolivar	E	3 15	80 00	+0154	+0139	-1.6	-1.1	-0.5	-0.1	1.61	
	Peru											
9547	Caleta Zorritos	P	3 39	80 40	+0104	+0054	-3.2	-2.5	-0.6	+0.1	0.97	
7280	**CHANGJIANG APPROACHES (LUHUADAO)** (see page 126)						**4.3**	**3.3**	**2.0**	**0.9**		
9548	Lobitos	P	4 27	81 17	+0616	+0628	-2.7	-2.1	-1.5	-0.8	0.86	★
9549	Bahia de Talara	EPU	4 35	81 17	+0615	+0635	-2.8	-2.1	-1.6	-0.9	0.79	★t
9551	Puerto de Paita	P	5 05	81 07	+0624	+0636	-2.9	-2.2	-1.6	-0.8	0.77	★
9553	Puerto Bayovar	P	5 48	81 02	+0634	+0647	-3.0	-2.3	-1.6	-0.8	0.73	★
9555	Lobos de Afuera		6 56	80 43	+0646	+0635	-3.1	-2.3	-1.5	-0.8	0.69	★
							MHHW	MLHW	MHLW	MLLW		
9644	**VALPARAISO** (see page 180)				HHW	LLW	**1.5**	**1.2**	**0.5**	**0.4**		
9557	Puerto Eten	P	6 57	79 52	-0603	-0620	-0.4	-0.4	-0.2	-0.2	0.62	★
9560	Puerto Malabrigo	P	7 42	79 27	-0548	-0605	-0.5	-0.4	-0.2	-0.2	0.56	★
9562	Salaverry	P	8 13	78 59	-0534	-0637	-0.5	-0.4	-0.2	-0.2	0.58	★
9563	Chimbote	P	9 05	78 37	-0521	-0540	-0.4	-0.4	0.0	-0.1	0.68	★
9564	Bahia Ferrol		9 08	78 36	-0506	-0526	-0.4	-0.3	-0.1	-0.2	0.67	★
9566	Bahia Huarmey	P	10 05	78 09	-0508	-0527	-0.7	-0.6	-0.2	-0.3	0.48	★
9568	Bahia Barmejo		10 33	77 53	-0500	⊙	-0.4	⊙	⊙	⊙	0.7	★dx
9570	Puerto Huacho	P	11 08	77 37	-0443	-0553	-0.7	-0.7	-0.3	-0.3	0.42	★
9573	Callao	EPU	12 04	77 10	-0413	-0430	-0.6	-0.5	-0.1	-0.2	0.52	★
9575	Pucusana		12 30	76 50	-0410	⊙	-0.7	⊙	⊙	⊙	0.5	★dx
9577	Cerro Azul		13 01	76 29	-0400	⊙	-0.7	⊙	⊙	⊙	0.5	★dx
9579	Pisco	P	13 43	76 14	-0342	-0400	-0.8	-0.7	-0.3	-0.3	0.40	★
9580	Bahia Independencia		14 18	76 08	-0445	⊙	-0.7	⊙	⊙	⊙	0.5	★dx
9583	San Juan	P	15 21	75 09	-0249	-0240	-0.7	-0.8	-0.4	-0.3	0.37	
9584	Punta Lomas		15 33	74 52	-0300	⊙	-0.7	⊙	⊙	⊙	0.5	dx
9586	Rada Atico		16 13	73 43	-0210	⊙	-0.7	⊙	⊙	⊙	0.5	dx
9588	Caleta Quilca		16 42	72 27	-0205	⊙	-0.6	⊙	⊙	⊙	0.5	dx
9589	Matarani	EPU	17 00	72 07	-0214	-0219	-0.6	-0.6	-0.4	-0.3	0.43	
9591	Puerto Ilo	P	17 38	71 21	-0215	-0216	-0.6	-0.6	-0.4	-0.3	0.44	
	Chile				Zone +0400							
9594	Arica	C	18 28	70 19	-0103	-0102	-0.2	-0.2	0.0	0.0	0.80	
9597	Caleta Junin		19 39	70 11	-0110	-0110	-0.3	-0.3	-0.3	-0.3	0.6	dx
9599	Iquique	C	20 12	70 10	-0100	-0102	-0.2	-0.2	0.0	0.0	0.80	
9601	Caleta Lobos		21 01	70 10	-0115	-0115	-0.1	-0.1	-0.1	0.0	0.8	x
9604	Tocopilla		22 06	70 14	-0053	-0053	-0.4	-0.4	-0.2	-0.1	0.7	x
9606	Rada de Cobija		22 34	70 18	-0055	-0055	-0.3	-0.3	-0.3	-0.2	0.7	x
9608	Mejillones del Sur		23 06	70 28	-0057	-0057	-0.2	-0.2	-0.1	0.0	0.8	x
9610	Antofagasta	ACU	23 39	70 25	-0050	-0050	-0.2	-0.2	-0.1	0.0	0.80	
9612	Caleta Blanco Encalada		24 22	70 32	-0015	-0015	-0.5	-0.5	-0.4	-0.3	0.5	x
9614	Rada Paposo		25 02	70 28	-0010	-0010	-0.1	-0.1	-0.3	-0.2	0.7	x
9615	Puerto Taltal		25 25	70 29	-0020	-0020	-0.1	-0.1	-0.3	-0.2	0.7	x
9619	Isla San Felix		26 16	80 07	-0033	-0042	-0.4	-0.4	-0.3	-0.2	0.6	x
9620	Chanaral de las Animas		26 21	70 38	-0030	-0030	0.0	+0.1	+0.1	+0.2	1.01	
9622	Puerto Caldera	C	27 04	70 50	-0036	-0035	-0.1	-0.1	0.0	0.0	0.84	
9624	Caleta Barranquillas		27 31	70 54	-0050	-0050	-0.2	-0.2	-0.1	0.0	0.8	x
9626	Carrizal Bajo		28 05	71 10	-0051	-0058	-0.5	-0.4	-0.3	-0.2	0.60	

⊙ No data.
★ See notes on page 298.
d Differences approximate.
p For predictions use harmonic constants (see Part III).
t Time differences approximate.
x ML inferred.

A Tides predicted in Argentine Tide Tables.
C Tides predicted in Chilean Tide Tables.
E Tides predicted in Ecuador Tide Tables.
P Tides predicted in Peruvian Tide Tables.
U Tides predicted in United States Tide Tables.

CHILE

No.	PLACE		Lat. S	Long. W	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
					Zone +0400							
9644	**VALPARAISO** (see page 180)						**1.5**	**1.2**	**0.5**	**0.4**		
9627	Puerto Huasco		28 28	71 14	-0022	-0024	-0.3	-0.3	-0.2	-0.2	0.70	
9632	Caleta Totoralillo		29 28	71 20	-0050	-0050	0.0	0.0	-0.3	-0.3	0.8	x
9634	Coquimbo	C	29 56	71 21	-0017	-0016	0.0	0.0	0.0	0.0	0.90	
9635	Bahia Tongoy		30 15	71 31	-0027	-0027	0.0	0.0	-0.3	-0.3	0.8	x
9638	Caleta Oscuro		31 25	71 37	-0025	-0025	-0.1	-0.1	-0.3	-0.3	0.8	x
9640	Rada Tablas		31 51	71 33	+0009	-0003	+0.4	+0.4	-0.1	-0.3	1.0	x
9642	Puerto Papudo		32 31	71 27	p	p	-0.3	-0.3	+0.1	+0.1	0.8	x
9644	VALPARAISO		33 02	71 38	STANDARD PORT			See Table V			0.91	
9646	Puerto San Antonio	C	33 35	71 38	+0005	+0009	0.0	0.0	0.0	0.0	0.81	
9648	Isla Robinson Crusoe		33 37	78 50	+0015	+0026	-0.3	-0.3	0.0	0.0	0.76	
9650	Rada Topocalma		34 08	72 01	+0005	+0005	+0.1	+0.1	-0.1	-0.1	0.9	x
9652	Rada de Llico		34 45	72 06	+0015	+0015	0.0	0.0	-0.3	-0.3	0.9	x
9654	Puerto Constitucion		35 20	72 25	+0025	+0025	0.0	0.0	-0.3	-0.3	0.9	x
9656	Rada Curanipe		35 51	72 38	+0050	+0050	-0.3	-0.3	-0.3	-0.3	0.6	x
9657	Rada Buchupureo		36 05	72 49	+0030	+0030	+0.2	+0.2	0.0	0.0	1.0	x
	Bahia Concepcion											
9660	Talcahuano	ACE	36 41	73 06	+0025	+0025	+0.1	+0.1	+0.1	+0.1	1.00	
	Golfo de Arauco											
9662	Coronel		37 02	73 10	+0008	+0008	+0.1	+0.1	-0.3	-0.3	0.80	
9665	Puerto Lebu		37 36	73 40	+0035	+0035	-0.1	-0.1	0.0	0.0	0.85	
	Isla Mocha											
9667	Caleta la Hacienda		38 20	73 55	+0025	+0025	0.0	0.0	-0.3	-0.3	0.8	x
9668	Rio Imperial		38 45	73 25	+0030	+0030	0.0	0.0	-0.3	-0.3	0.7	x
9670	Caleta Queule		39 23	73 13	+0045	+0045	0.0	-0.1	-0.3	-0.3	0.7	x
	Rio Valdivia											
9671	Puerto Corral	C	39 53	73 26	+0055	+0055	+0.1	0.0	+0.1	+0.1	0.99	
9672	Valdivia		39 48	73 15	+0236	+0236	-0.3	-0.3	+0.1	+0.1	0.6	x
9675	Caleta Mansa		40 34	73 43	+0110	+0110	+0.1	0.0	-0.1	-0.2	0.94	
9678	Maullin		41 37	73 36	+0217	+0217	+0.8	+0.8	-0.2	-0.2	1.2	x

No.	PLACE		Lat. S	Long. W	MHW	MLW	MHWS	MHWN	MLWN	MLWS		
9700	**PUERTO MONTT** (see page 183)						**6.5**	**4.7**	**2.4**	**0.7**		
	Chiloe											
9680	Bahia de Ancud		41 52	73 51	-0110	-0110	-4.4	-3.1	-1.4	-0.2	1.31	t
9682	Caleta Quintil		42 31	74 13	-0120	⊙	-4.7	⊙	⊙	⊙	1.1	x
9686	Puerto San Pedro		43 20	73 43	-0025	-0025	-3.8	⊙	⊙	⊙	1.4	x
9688	Puerto Queilen		42 53	73 29	-0021	-0021	-1.1	-1.1	-1.1	-1.1	3.2	x
9690	Dalcahue		42 23	73 40	+0027	⊙	-0.9	⊙	⊙	⊙	2.7	x
9693	Quemchi		42 09	73 29	+0015	+0015	+0.3	+0.3	-0.5	-0.5	3.0	x
9694	Bahia Linao		41 58	73 33	+0020	⊙	-1.3	⊙	⊙	⊙	2.6	x
9695	Carelmapu		41 45	73 43	-0012	-0012	-3.3	-2.1	-1.2	-0.1	1.91	
9697	Puerto Chacao	C	41 50	73 31	-0010	+0000	-1.4	-0.6	-0.5	+0.2	3.00	
9700	PUERTO MONTT		41 29	72 58	STANDARD PORT			See Table V			3.60	
9706	Puerto Yelcho		43 01	72 46	+0019	⊙	-3.1	⊙	⊙	⊙	2.0	dx
9708	Bahia Tictoc		43 36	72 58	-0013	⊙	-3.7	⊙	⊙	⊙	1.5	dx
	Isla Guafo											
9709	Punta Caleta		43 37	74 36	-0110	⊙	-4.4	⊙	⊙	⊙	1.2	dx

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
7280	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.0	+0.1	+0.2	+0.2	+0.1	0.0	-0.1
9487	0.0	-0.1	-0.2	-0.1	0.0	0.0	+0.1	0.0	0.0	+0.1	+0.1	+0.1	0.0
9533 - 9646						Negligible							
9648	0.0	0.0	0.0	+0.1	+0.1	+0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0
9650 - 9709						Negligible							

No.	PLACE	Lat. S	Long. W	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
				Zone +0400							
9977	**ORANGE BAY (CAPE HORN)**	(see page 186)				**2.2**	**1.7**	**0.9**	**0.5**		
	Archipelago de los Chonos										
	Isla Guaiteca										
9710	Puerto Low	43 49	74 01	-0255	-0255	+0.2	+0.2	-0.5	-0.5	1.1	x
9713	Isla Guamblin	44 49	75 02	-0345	-0345	+0.1	+0.1	-0.5	-0.5	1.2	x
9715	Rada Vallenar	45 19	74 33	-0250	-0250	-0.3	-0.3	-0.5	-0.5	0.9	x
	Canal Darwin										
9716	Puerto Italiano	45 22	74 06	-0300	-0300	0.0	0.0	0.0	0.0	1.3	x
	Canal Utarupa										
9717	Puerto Condell	45 37	74 12	-0250	⊙	+0.8	⊙	⊙	⊙	2.0	x
9720	Puerto Americano	45 02	73 42	-0145	-0145	+0.2	+0.2	+0.5	-0.5	1.1	x
9722	Puerto Nassau	44 33	73 40	-0120	-0120	+0.5	⊙	⊙	⊙	1.4	x
9724	Puerto Ballena	44 08	73 29	-0246	-0229	+0.2	+0.1	-0.1	-0.3	1.3	x
	Estero Aysen										
9729	Puerto Perez	45 15	73 16	-0220	-0220	+0.1	⊙	⊙	⊙	1.5	x
9730	Puerto Chacabuco C	45 28	72 50	-0300	-0300	+0.5	+0.5	-0.1	-0.1	1.55	
	Estuario Elefantes										
9733	Paso Quesahuen	46 24	73 43	-0200	-0200	+0.4	+0.4	-0.5	-0.1	1.3	x
	Isla Rojas										
9734	Puerto San Miguel	45 45	73 43	-0200	-0200	+0.8	⊙	⊙	⊙	1.9	x
	Chile										
	Canal Pulluche										
9736	Estero Balladares	45 45	74 21	-0250	⊙	-0.3	⊙	⊙	⊙	1.2	dx
9738	Puerto Refugio	45 52	74 48	-0220	-0220	-0.6	-0.6	-0.6	-0.6	0.8	dx
	Bahia San Andres										
9742	Caleta Pascuas	46 36	75 32	-0215	-0215	-0.6	-0.6	-0.6	-0.6	0.7	x
						MHWS	MHWN	MLWN	MLWS		
5925	**TOWNSVILLE**	(see page 27)		MHW	MLW	**3.1**	**2.3**	**1.6**	**0.8**		
	GOLFO DE PENAS										
	Golfo Tres Montes										
9745	Puerto Slight	46 48	75 33	+0342	+0324	-1.7	-1.3	-0.9	-0.5	0.84	d
	Golfo Esteban										
9748	Bahia San Quintin	46 49	74 37	+0350	⊙	-0.9	⊙	⊙	⊙	1.4	dx
9749	Bahia Kelly	46 58	74 02	+0335	+0307	-0.8	-0.4	-0.3	0.0	1.56	
						MHHW	MLHW	MHLW	MLLW		
9977	**ORANGE BAY (CAPE HORN)**	(see page 186)		HHW	LLW	**2.2**	**1.7**	**0.9**	**0.5**		
	Paso del Sud-oeste										
9752	Caleta Chica	47 47	74 54	-0430	⊙	-1.0	⊙	⊙	⊙	0.8	dx
	CANAL BAKER										
9753	Puerto Francisco	47 47	74 36	-0250	⊙	-1.4	⊙	⊙	⊙	0.5	dx
9755	Rio Huemules	47 41	73 42	-0340	⊙	+0.1	⊙	⊙	⊙	1.5	dx
9757	Caleta Laguera	48 01	73 28	-0335	⊙	+0.1	⊙	⊙	⊙	1.5	dx
9759	Puerto Brown	48 02	74 02	-0335	⊙	-0.8	⊙	⊙	⊙	0.9	dx
	Isla Orlebar										
9761	Caleta Hale	47 57	74 38	-0250	⊙	-0.4	⊙	⊙	⊙	0.9	dx
	Isla Wellington										
9772	Angostura Inglesa C	48 59	74 24	-0314	-0255	-0.4	-0.3	-0.2	+0.1	1.16	
9773	Puerto Riofrio	49 13	74 25	-0250	⊙	-0.4	⊙	⊙	⊙	1.2	dx
9777	Estuario Gage	49 53	74 26	-0245	⊙	-1.0	⊙	⊙	⊙	0.8	dx
	Isla Madre de Dios										
9789	Puerto Henry	50 02	75 20	-0305	-0305	-0.5	-0.5	-0.6	-0.6	0.8	x
9790	Puerto Caracciolo	50 28	75 12	-0245	⊙	-0.6	⊙	⊙	⊙	1.0	dx
	Isla Duque de York										
9792	Puerto Morales	50 40	75 23	-0220	⊙	-0.1	⊙	⊙	⊙	1.3	dx

⊙ No data.
d Differences approximate.
t Time differences approximate.
x ML inferred.
C Tides predicted in Chilean Tide Tables.

Tilbage til Menuen

CHILE

No.	PLACE	Lat. S	Long. W	TIME DIFFERENCES HHW	TIME DIFFERENCES LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
				Zone +0400							
9977	**ORANGE BAY (CAPE HORN)**	(see page 186)				**2.2**	**1.7**	**0.9**	**0.5**		
9795	Bahia Portland	50 15	74 45	-0305	⊙	-1.0	⊙	⊙	⊙	0.8	dx
	Isla Chatham										
9799	Bahia Wide	50 39	74 36	-0250	⊙	-1.0	⊙	⊙	⊙	0.8	dx
	Isla Hanover										
9801	Angostura Guia	50 45	74 28	-0245	⊙	+0.2	⊙	⊙	⊙	1.4	dx
9806	Puerto Bueno	51 00	74 13	-0240	⊙	+0.2	⊙	⊙	⊙	1.6	dx
9807	Puerto Mayne	51 19	74 05	-0205	⊙	-0.4	⊙	⊙	⊙	1.2	dx
	Golfo Almirante Montt										
9811	Angostura Kirke	52 05	73 00	+0022	+0022	-1.6	⊙	⊙	⊙	0.4	dx
9814	Puerto Natales ..... **C**	51 44	72 31	+0140	+0125	-1.6	-1.3	-0.6	-0.2	0.40	
9815	Caleta Columbine	51 53	73 43	-0240	-0240	+0.1	+0.1	-0.3	-0.3	1.2	x
	Archipielago Reina Adelaida										
9821	Bahia Sholl	52 45	73 53	-0250	⊙	-0.4	⊙	⊙	⊙	1.2	dx
9823	Islote Pollo	52 23	73 41	-0155	-0130	-0.5	-0.5	-0.4	0.0	0.96	t
9824	Bahia Fortuna	52 16	73 41	-0210	-0150	-0.2	-0.2	0.0	0.0	1.2	x
9825	Puerto Camilo Henriquez	52 18	73 55	-0210	⊙	-0.3	⊙	⊙	⊙	1.2	dx
9826	Puerto Portales	52 06	74 10	-0210	⊙	0.0	⊙	⊙	⊙	1.4	dx
9828	Puerto Overend	52 09	74 46	-0215	⊙	-1.7	⊙	⊙	⊙	0.3	dx
	MAGELLAN STRAIT										
9829	Islas Evangelistas	52 24	75 06	-0210	-0210	-0.5	-0.5	-0.5	-0.5	0.8	x
9830	Puerto Cuarenta Dias	52 21	74 46	-0215	⊙	-1.0	⊙	⊙	⊙	0.8	dx
9833	Cabo Pilar	52 43	74 41	-0235	-0235	-0.8	-0.8	-0.6	-0.6	0.6	x
9836	Bahia Wodsworth	52 59	74 03	-0122	⊙	-0.1	⊙	⊙	⊙	1.4	dx
9839	Canal Cripples	53 02	73 27	-0210	⊙	-1.0	⊙	⊙	⊙	0.8	dx
	Golfo Xaultegua										
9841	Puerto Bobillier	53 12	72 55	-0215	⊙	+0.3	⊙	⊙	⊙	1.6	dx
9843	Puerto Gomez	52 58	72 57	-0135	⊙	-0.4	⊙	⊙	⊙	1.2	dx
	Seno Skyring										
9846	Puerto Williams	52 32	72 05	+0420	⊙	-1.0	⊙	⊙	⊙	0.8	dx
9848	Puerto Angosto	53 13	73 22	-0230	⊙	-1.0	⊙	⊙	⊙	0.6	dx
9851	Caleta Notch	53 24	72 49	-0215	⊙	-0.7	⊙	⊙	⊙	1.0	dx
	Seno Otway										
9853	Caleta Real	53 26	72 26	-0005	⊙	-0.8	⊙	⊙	⊙	0.9	dx
9854	Caleta Ocasion	53 16	72 14	+0025	⊙	+0.3	⊙	⊙	⊙	1.6	dx
9858	Puerto Curtze	52 49	71 24	+0045	⊙	+0.3	⊙	⊙	⊙	1.6	dx

SEASONAL CHANGES IN MEAN LEVEL

No	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sep. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1
5925	0.0	+0.1	+0.1	+0.1	+0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0
9710 - 9977						Negligible							

CHILE

No.	PLACE	Lat. S	Long. W	TIME DIFFERENCES HHW	LLW	HEIGHT DIFFERENCES (IN METRES) MHHW	MLHW	MHLW	MLLW	ML Z_0 m	
				Zone +0400							
9977	**ORANGE BAY (CAPE HORN)**	(see page 186)				**2.2**	**1.7**	**0.9**	**0.5**		
	Isla Carlos 111										
9859	Bahia Tilly	53 34	72 23	-0145	⊙	-0.4	⊙	⊙	⊙	1.2	dx
9861	Caleta Gallant	53 42	72 00	-0300	-0300	+0.1	+0.1	0.0	0.0	1.5	x
9863	Bahia Snug	53 51	71 26	-0250	-0250	+0.1	+0.1	0.0	0.0	1.5	x
9865	Bahia Morris (Puerto Sholl)	54 15	71 01	-0240	⊙	+0.8	⊙	⊙	⊙	2.0	dx
9867	Puerto San Antonio	53 54	70 53	-0320	⊙	-0.2	⊙	⊙	⊙	1.4	dx
9869	Puerto San Juan de la Posesion	53 38	70 55	-0320	⊙	-0.4	⊙	⊙	⊙	1.2	dx
	Seno Brenton										
9872	Puerto Choisel	54 07	70 35	-0450	-0450	-0.4	-0.4	⊙	⊙	1.1	x
9873	Puerto Yartou	53 54	70 10	-0105	⊙	-0.7	⊙	⊙	⊙	0.9	dx
	Bahia Inutil										
9875	Surgidero Valentin	53 38	70 28	-0400	⊙	-0.9	⊙	⊙	⊙	0.9	dx
9877	Puerto Nuevo	53 22	69 23	-0345	⊙	0.0	⊙	⊙	⊙	1.4	dx
6073	**PORT PHILLIP HEADS (POINT LONSDALE)** .	(see page 42)				**1.5**	**1.3**	**0.6**	**0.4**		
9879	Caleta Clarencia	52 54	70 07	+0023	+0010	+0.8	+0.5	+0.6	+0.1	1.4	x
9879a	Caleta Percy ..... **C**	52 53	70 15	+0020	+0010	+0.7	+0.4	+0.5	+0.1	1.33	★t
9881	Punta Arenas ..... **CAU**	53 10	70 54	+0105	+0040	+0.5	+0.1	+0.5	+0.1	1.22	t
9882	Bahia Catalina	53 07	70 53	+0133	+0110	+0.5	+0.1	+0.5	+0.1	1.2	x
9887	Cabo San Simon	52 45	70 18	-0115	⊙	+4.4	⊙	⊙	⊙	3.9	dx
						MHWS	MHWN	MLWN	MLWS		
7486	**INCHEON**	(see page 138)		MHW	MLW	**8.5**	**6.4**	**2.9**	**0.4**		
9889	Bahia Felipe	52 47	69 57	+0445	⊙	-3.3	⊙	⊙	⊙	2.9	dx
9891	Bahia Santiago	52 31	69 52	+0445	⊙	-2.4	⊙	⊙	⊙	3.2	dx
9893	Primera Angostura	52 34	69 42	+0446	+0450	-1.4	-1.3	-0.7	-0.1	3.7	ax
9893a	Punta Delgada ..... **C**	52 28	69 32	+0409	+0445	-0.1	+0.7	0.0	+1.2	5.00	
9893b	Punta Guillermos	52 30	69 32	+0412	+0450	-1.2	-0.4	-1.3	-0.2	3.8	x
9448	**LA UNION**	(see page 174)				**2.9**	**2.4**	**0.5**	**0.0**		
9895	Cabo Posesion	52 17	68 58	-0635	-0611	+6.5	+5.2	+2.0	+0.8	5.0	x
9897	Punta Dungeness	52 24	68 26	-0625	-0619	+6.4	+5.3	+1.9	+0.6	5.0	x
9899	Punta Catalina	52 33	68 45	-0626	-0605	+6.6	+5.3	+1.9	+0.3	5.1	★x
						MHHW	MLHW	MHLW	MLLW		
9977	**ORANGE BAY (CAPE HORN)**	(see page 186)		HHW	LLW	**2.2**	**1.7**	**0.9**	**0.5**		
	PACIFIC COAST										
9901	Bahia Dislocacion	52 54	74 34	-0125	⊙	-1.0	⊙	⊙	⊙	0.8	dx
	Isla Recalada										
9904	Bahia Latitud	53 19	74 15	-0105	⊙	-1.0	⊙	⊙	⊙	0.8	dx
	Isla Carlos										
9911	Cabo Gloucester	54 06	73 30	-0140	⊙	-0.7	⊙	⊙	⊙	1.0	dx
9915	Rada Noir	54 29	73 00	-0053	-0053	-0.6	-0.6	-0.5	-0.5	0.5	x
	Canal Barbara										
9917	Puerto Hewett	54 16	72 21	-0245	⊙	-0.2	⊙	⊙	⊙	1.3	dx
9919	Bahia Bedford	54 00	72 21	-0245	⊙	+0.2	⊙	⊙	⊙	1.6	dx
	Canal Cockburn										
9921	Bahia Furia	54 27	72 17	-0045	⊙	-1.0	⊙	⊙	⊙	0.8	dx
9925	Puerto Soffia	54 17	71 24	-0145	⊙	-0.8	⊙	⊙	⊙	0.9	dx
	Isla London										
9928	Puerto Townshend	54 43	71 55	-0045	⊙	-0.7	⊙	⊙	⊙	1.0	dx
	Bahia Desolada										
9931	Puerto Langlois	54 38	71 26	-0030	⊙	-1.2	⊙	⊙	⊙	0.7	dx
	Canal Ballenero										
9935	Puerto Fanny	54 52	70 58	-0130	⊙	-0.8	⊙	⊙	⊙	0.9	dx

⊙ No data.
★ See notes on page 298.
a Data approximate.
d Differences approximate.
t Time differences approximate.
x ML inferred.
A Tides predicted in Argentine Tide Tables.
C Tides predicted in Chilean Tide Tables.
U Tides predicted in United States Tide Tables.

No.	
2018a	Tidal data for the ice shelf off the foot of Shackleton Glacier were obtained by gravimeter observations.
5546	There is a bore in the Bamu River at springs.
5607	At Wewak, MLHW = 1.2 metres and MHLW = 0.8 metres.
5635	At Anewa Bay, MLHW = 1.0 metres and MHLW = 0.9 metres.
5635a	At Kieta, MLHW = 0.9 metres and MHLW = 0.8 metres.
5636	At Choiseul Bay, MLHW = 0.9 metres and MHLW = 0.7 metres.
5639	At Sikopo Island, MLHW = 0.7 metres and MHLW = 0.6 metres.
5636-5710	Water levels may be much affected by the 'El Nino' event, see Pacific Islands Pilot, Vol. I (NP 60).
6000 6094, 6097	Seasonal changes of mean level are not known, but they are probably greater than those given for the coastal ports.
6183	In Port Augusta, wind effect is considerable. When the wind shifts from west to southward and blows strongly, mean level may be raised by 1.0 to 1.2 metres. With a strong north wind mean level may be lowered by 0.3 to 0.5 metres.
6210	At Mary Ann Haven, MLHW = 0.8 metres and MHLW = 0.6 metres.
6223	At Fremantle, the water level is erratic, being almost entirely governed by the weather. Before and after westerly gales, a high level of about 1.2 metres is maintained for possibly 6 days. In the summer months, especially during easterly weather, a very low level is experienced for the same period.
6278	Approximate predictions for Derby by variable time differences on Port Hedland: HWS +0310, HWN +0155; LWS +0420, LWN +0215.
6744	Water levels may be much affected by the 'El Nino' event, see Pacific Islands Pilot, Vol. II (NP 61).
6278 7213, 7258	Seasonal changes of mean level are not known, but they are probably greater than those given for the coastal ports.
6776, 6776a	The time zone kept on Kwajalein Atoll is +1200, see Admiralty List of Radio Signals, Vol. 2. (NP 282). Predictions obtained from these tables and from US Tide Tables therefore refer to the previous date on the atoll.
7277	A bore occurs in the Qiantang Jiang. It originates near Chi San (12 miles from Haining) at about Low Water (approximately HW at Luhuadao) and may attain a height of about 3 metres at springs and not more than 0.6 metres at neaps. For further information, see China Sea Pilot, Vol. III (NP 32).

No.

7294-7298 For further information on river levels in Changjiang, see China Sea Pilot, Vol. III (NP 32).

7440-7443 Seasonal changes of mean level are not known, but they are probably greater than those given for the coastal ports.

7458 A barrage now closes Taedong Kang at P'i Do and all ports up-river are non-tidal. Data for P'i Do are suspect.

7545 Wind influence is considerable at Komun Do. During southerly winds, rises are 0.6 to 1.0 metre higher than during northerly winds.

7647 A marked rise and fall of sea level occurs at Yobuko Ko, with period of about 12 minutes and range up to 0.3 metres.

7656 A marked rise and fall of sea level occurs at Sasebo, with periods of 64 and 83 minutes and range up to 0.2 metres.

7666 A marked rise and fall of sea level occurs at Nagasaki (the ''Abiki''), with periods of 32 and 36 minutes and range up to 0.6 metres; it is most pronounced during depressions when the isobars assume a very tortuous shape.

7754 A rise and fall of sea level occurs at Uchiumi, with period of 10 to 12 minutes and range up to 0.4 metres.

7757 A regular rise and fall of sea level occurs at Hososhima, with period of about 19 minutes and range up to 0.3 metres in calm weather and 0.6 metres during storms.

7931 A regular rise and fall of sea level occurs at Shimoda Ko (the ''Yota''), with period of about 16 minutes, and conspicuous during the approach of a depression when range may be over 0.2 metres.

7936 A regular rise and fall of sea level occurs at Aburatsubo, with period of about 15 minutes and range up to 0.3 metres during strong winds.

7940 During strong southerly winds, sea level at Yokohama may be raised 0.3 metres higher than normal.

7953 A regular rise and fall of sea level occurs at Chici Shima, with period of 16, 17 or 20 minutes and range 0.3 metres.

7997 A marked rise and fall of sea level occurs at Miyako, with period of about 22 minutes and range over 0.3 metres.

8014 A marked rise and fall of sea level occurs at Ominato, with period of about 40 minutes and range up to 0.3 metres.

8083 A marked rise and fall of sea level occurs at Hakodate, with period of 46 to 58 minutes and range up to 0.5 metres.

8136 A rather marked rise and fall of sea level occurs at Otaru, with period of about 15 minutes.

No.

8441-8510 As a rule, the only marked tide is the lower low water, the heights of the two high waters and the higher low water not differing greatly.

9005, 9123 Tidal predictions for these locations should be obtained from the Canadian Hydrographic Service (www.charts.gc.ca) or Admiralty Digital Publication (ADP) TotalTide.

9138-9141 Data in the Fraser River are applicable to non-freshet months. During the freshets, the arrival of the tide at places up the river is retarded by about 20 minutes at Port Coquitlam and by about 45 minutes at Port Haney. Also during freshets, at Sumas there is no tide and at New Westminster the mean tide level is raised by about 1.0 metre.

9228-9233 The Columbia River is subject to freshets, occurring annually in May to July, during which river level may be as much as 6.0 metres above normal at Portland; this effect decreases down-river to zero at Astoria. At Portland, mean river level varies from about 1.0 metre in October to 5.0 metres in June above the low water level datum.

9410 There is a bore in the Colorado River above Phillips Point; with spring tides, it is reported to be 1.0 to 2.0 metres in height.

9548-9580 On the coast of Peru, water levels may be much affected by the 'El Nino' event, see South America Pilot, Vol. III (NP 7).

9879a At Caleta Percy there are frequently double high waters.

9899 For data for E entrance to Magellan Strait see Admiralty Tide Tables Vol. 2, Europe (excluding United Kingdom and Ireland), Mediterranean Sea and Atlantic Ocean, No. 2099a.

GEOGRAPHICAL INDEX

L

N

O

Tilbage til Menuen

T

U

V

W

X

Y

Z

TIDE TABLES 2013

A Højvande ved Dover 2013. UT-tidspunkter

Dato	Januar		Februar		Marts		April		Maj		Juni		Dato
	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	
	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	
1	00 50	13 02	01 39	13 54	00 42	12 57	01 45	14 09	02 33	15 03	04 29	16 50	1
2	01 22	13 35	02 20	14 38	01 19	13 36	02 37	15 07	03 38	16 09	05 41	17 59	2
3	01 59	14 15	03 07	15 31	02 00	14 20	03 42	16 21	04 55	17 23	06 59	19 14	3
4	02 43	15 03	04 05	16 40	02 47	15 13	05 09	17 51	06 24	18 45	08 04	20 19	4
5	03 34	16 00	05 27	18 26	03 47	16 25	06 50	19 19	07 43	19 58	08 56	21 12	5
6	04 38	17 16	07 08	19 52	05 14	18 11	08 10	20 29	08 43	20 54	09 41	21 58	6
7	05 59	18 49	08 26	20 58	07 01	19 40	09 11	21 23	09 30	21 41	10 21	22 40	7
8	07 21	20 02	09 30	21 55	08 23	20 49	09 57	22 07	10 09	22 23	10 58	23 17	8
9	08 29	21 03	10 24	22 42	09 26	21 43	10 36	22 47	10 45	23 01	11 35	23 52	9
10	09 29	21 58	11 10	23 25	10 16	22 29	11 10	23 24	11 20	23 38	-- --	12 09	10
11	10 23	22 48	11 50	-- --	10 57	23 09	11 44	-- --	11 55	-- --	00 24	12 42	11
12	11 13	23 34	00 05	12 28	11 33	23 46	00 00	12 18	00 13	12 30	00 54	13 11	12
13	11 59	-- --	00 44	13 04	-- --	12 07	00 35	12 52	00 45	13 03	01 20	13 39	13
14	00 18	12 42	01 22	13 42	00 23	12 41	01 07	13 24	01 13	13 32	01 49	14 12	14
15	01 01	13 25	01 59	14 20	00 59	13 16	01 35	13 54	01 38	14 00	02 26	14 54	15
16	01 44	14 08	02 36	15 00	01 32	13 50	02 00	14 23	02 10	14 36	03 13	15 46	16
17	02 27	14 52	03 16	15 47	02 03	14 23	02 33	15 05	02 54	15 28	04 13	16 51	17
18	03 11	15 40	04 06	16 48	02 34	15 00	03 30	16 24	04 01	16 40	05 30	18 04	18
19	03 59	16 34	05 14	18 01	03 13	15 57	05 08	17 43	05 28	17 55	06 47	19 12	19
20	04 55	17 38	06 31	19 16	04 27	17 16	06 22	18 50	06 37	18 58	07 50	20 12	20
21	06 02	18 50	07 46	20 24	05 51	18 31	07 24	19 47	07 34	19 53	08 46	21 08	21
22	07 17	20 01	08 48	21 15	07 04	19 39	08 16	20 35	08 23	20 42	09 38	22 01	22
23	08 27	21 01	09 32	21 53	08 07	20 33	09 00	21 17	09 09	21 29	10 30	22 53	23
24	09 21	21 47	10 08	22 27	08 55	21 16	09 40	21 58	09 54	22 15	11 19	23 44	24
25	10 01	22 23	10 42	23 01	09 35	21 54	10 19	22 39	10 40	23 02	-- --	12 08	25
26	10 36	22 56	11 16	23 34	10 12	22 30	10 59	23 20	11 27	23 50	00 33	12 56	26
27	11 08	23 27	11 49	-- --	10 48	23 06	11 41	-- --	-- --	12 15	01 23	13 45	27
28	11 41	23 59	00 07	12 22	11 24	23 43	00 02	12 25	00 39	13 05	02 13	14 33	28
29	-- --	12 12			-- --	12 00	00 48	13 12	01 31	13 57	03 04	15 24	29
30	00 30	12 43			00 21	12 39	01 37	14 04	02 27	14 52	03 57	16 16	30
31	01 03	13 17			01 01	13 21			03 26	15 49			31

Dato	Juli		August		September		Oktober		November		December		Dato
	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	
	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	
1	04 55	17 15	06 22	18 50	08 10	20 42	08 21	20 44	09 00	21 22	09 07	21 32	1
2	06 00	18 22	07 38	20 09	09 05	21 27	09 03	21 22	09 38	21 59	09 51	22 16	2
3	07 13	19 36	08 46	21 14	09 44	22 00	09 39	21 57	10 17	22 37	10 36	23 00	3
4	08 19	20 42	09 36	21 58	10 16	22 31	10 13	22 31	10 56	23 16	11 22	23 46	4
5	09 14	21 36	10 15	22 32	10 48	23 03	10 47	23 04	11 36	23 57	-- --	12 09	5
6	09 59	22 20	10 49	23 03	11 20	23 34	11 22	23 38	-- --	12 19	00 34	12 59	6
7	10 38	22 56	11 20	23 33	11 51	-- --	11 58	-- --	00 42	13 06	01 25	13 52	7
8	11 13	23 29	11 51	-- --	00 04	12 24	00 14	12 36	01 32	13 59	02 19	14 50	8
9	11 47	-- --	00 03	12 21	00 37	12 58	00 54	13 17	02 28	15 02	03 16	15 54	9
10	00 01	12 19	00 32	12 50	01 12	13 35	01 39	14 05	03 35	16 20	04 18	17 05	10
11	00 31	12 47	01 01	13 22	01 53	14 19	02 33	15 06	04 50	17 47	05 26	18 22	11
12	00 58	13 16	01 35	13 59	02 43	15 14	03 44	16 33	06 10	19 06	06 41	19 33	12
13	01 26	13 47	02 15	14 42	03 48	16 34	05 17	18 12	07 24	20 11	07 50	20 32	13
14	02 00	14 25	03 03	15 35	05 33	18 24	06 44	19 33	08 25	21 04	08 48	21 21	14
15	02 41	15 11	04 04	16 46	07 05	19 46	07 55	20 38	09 15	21 47	09 37	22 04	15
16	03 32	16 06	05 40	18 27	08 15	20 53	08 52	21 29	09 59	22 24	10 20	22 42	16
17	04 36	17 17	07 18	19 51	09 13	21 47	09 40	22 11	10 39	23 00	10 59	23 18	17
18	06 04	18 41	08 27	20 59	10 01	22 32	10 22	22 48	11 17	23 36	11 35	23 54	18
19	07 29	19 56	09 25	21 56	10 44	23 10	11 01	23 22	11 54	-- --	-- --	12 09	19
20	08 34	21 00	10 16	22 46	11 23	23 46	11 39	23 57	00 12	12 29	00 28	12 41	20
21	09 32	21 58	11 01	23 29	-- --	12 02	-- --	12 15	00 48	13 02	00 59	13 09	21
22	10 24	22 51	11 43	-- --	00 22	12 40	00 33	12 51	01 21	13 32	01 25	13 35	22
23	11 13	23 39	00 08	12 24	00 58	13 17	01 09	13 25	01 51	14 02	01 53	14 06	23
24	11 58	-- --	00 47	13 04	01 35	13 53	01 45	13 59	02 23	14 41	02 28	14 45	24
25	00 24	12 43	01 25	13 44	02 14	14 32	02 21	14 38	03 08	15 42	03 13	15 36	25
26	01 08	13 27	02 05	14 24	02 58	15 19	03 08	15 39	04 16	17 08	04 11	16 47	26
27	01 52	14 10	02 48	15 07	03 54	16 22	04 16	16 54	05 33	18 18	05 28	18 19	27
28	02 36	14 55	03 36	15 57	05 02	17 34	05 27	18 05	06 38	19 15	06 45	19 26	28
29	03 23	15 42	04 33	16 58	06 13	18 47	06 33	19 08	07 33	20 05	07 49	20 23	29
30	04 14	16 35	05 41	18 10	07 24	19 55	07 32	20 00	08 22	20 49	08 44	21 14	30
31	05 13	17 37	06 56	19 29			08 19	20 43			09 36	22 04	31

Tilbage til Menuen

Højvande ved London Bridge 2013. UT-tidspunkter

Dato	Januar		Februar		Marts		April		Maj		Juni		Dato
	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	
	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	
1	03 51	16 11	04 44	17 06	03 50	16 09	04 49	17 10	05 31	17 53	07 20	19 43	1
2	04 26	16 48	05 21	17 46	04 25	16 46	05 35	17 57	06 28	18 53	08 22	20 48	2
3	05 01	17 27	06 02	18 31	05 03	17 25	06 29	18 56	07 36	20 05	09 25	21 53	3
4	05 40	18 10	06 52	19 27	05 46	18 10	07 40	20 14	08 48	21 19	10 32	22 57	4
5	06 24	18 58	07 57	20 45	06 36	19 06	09 04	21 40	09 59	22 31	11 35	23 55	5
6	07 17	20 01	09 26	22 09	07 42	20 23	10 24	23 00	11 10	23 35	-- --	12 27	6
7	08 27	21 19	10 49	23 29	09 13	21 53	11 38	-- --	-- --	12 08	00 43	13 10	7
8	09 53	22 33	-- --	12 03	10 38	23 19	00 05	12 35	00 27	12 56	01 25	13 48	8
9	11 06	23 42	00 37	13 05	11 55	-- --	00 56	13 21	01 11	13 36	02 03	14 22	9
10	-- --	12 12	01 32	13 57	00 26	12 54	01 37	14 01	01 48	14 10	02 39	14 55	10
11	00 46	13 12	02 19	14 42	01 18	13 42	02 13	14 35	02 23	14 41	03 13	15 27	11
12	01 42	14 06	03 01	15 24	02 01	14 24	02 47	15 07	02 57	15 12	03 47	16 00	12
13	02 32	14 56	03 40	16 04	02 39	15 01	03 21	15 37	03 31	15 44	04 21	16 34	13
14	03 18	15 42	04 17	16 40	03 14	15 36	03 54	16 08	04 05	16 17	04 57	17 10	14
15	04 01	16 27	04 52	17 14	03 48	16 08	04 28	16 39	04 39	16 50	05 35	17 49	15
16	04 43	17 09	05 27	17 47	04 22	16 39	05 01	17 12	05 15	17 27	06 17	18 33	16
17	05 22	17 50	06 02	18 22	04 55	17 09	05 37	17 48	05 55	18 10	07 07	19 27	17
18	06 01	18 30	06 42	19 05	05 29	17 42	06 18	18 34	06 42	19 01	08 11	20 39	18
19	06 43	19 14	07 36	20 07	06 05	18 20	07 11	19 36	07 42	20 10	09 27	21 58	19
20	07 34	20 07	08 55	21 28	06 49	19 11	08 28	21 08	09 00	21 33	10 35	23 04	20
21	08 38	21 10	10 16	22 52	07 53	20 30	09 52	22 26	10 10	22 40	11 37	-- --	21
22	09 48	22 21	11 28	23 58	09 27	22 04	10 56	23 25	11 10	23 38	00 05	12 36	22
23	10 59	23 34	-- --	12 23	10 43	23 16	11 50	-- --	-- --	12 06	01 01	13 31	23
24	-- --	12 02	00 47	13 08	11 43	-- --	00 16	12 39	00 31	12 59	01 55	14 23	24
25	00 30	12 52	01 29	13 46	00 10	12 32	01 02	13 25	01 21	13 48	02 46	15 12	25
26	01 16	13 34	02 06	14 22	00 55	13 14	01 46	14 09	02 10	14 36	03 36	16 00	26
27	01 55	14 12	02 41	14 57	01 35	13 53	02 29	14 52	02 58	15 23	04 25	16 46	27
28	02 31	14 46	03 15	15 33	02 13	14 33	03 12	15 35	03 46	16 10	05 14	17 32	28
29	03 04	15 19			02 51	15 11	03 56	16 18	04 35	16 58	06 02	18 20	29
30	03 36	15 54			03 29	15 50	04 41	17 03	05 26	17 48	06 53	19 12	30
31	04 09	16 29			04 08	16 29			06 21	18 42			31

Dato	Juli		August		September		Oktober		November		December		Dato
	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	Fm.	Em.	
	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	t m	
1	07 47	20 09	08 52	21 27	10 34	23 11	10 59	23 28	11 56	-- --	-- --	12 06	1
2	08 44	21 09	10 01	22 39	11 42	-- --	11 54	-- --	00 18	12 42	00 33	12 57	2
3	09 45	22 13	11 17	23 46	00 09	12 33	00 17	12 39	01 03	13 24	01 23	13 45	3
4	10 52	23 18	-- --	12 16	00 55	13 16	00 58	13 18	01 46	14 06	02 11	14 33	4
5	11 54	-- --	00 39	13 04	01 34	13 53	01 36	13 55	02 28	14 48	02 58	15 20	5
6	00 15	12 45	01 24	13 44	02 09	14 26	02 13	14 31	03 10	15 31	03 44	16 08	6
7	01 03	13 28	02 02	14 21	02 42	14 59	02 50	15 08	03 52	16 15	04 30	16 57	7
8	01 45	14 06	02 37	14 53	03 15	15 32	03 28	15 46	04 35	17 01	05 17	17 49	8
9	02 23	14 41	03 09	15 24	03 50	16 06	04 05	16 25	05 21	17 54	06 08	18 46	9
10	02 58	15 13	03 40	15 56	04 25	16 42	04 44	17 08	06 15	18 58	07 07	19 48	10
11	03 30	15 45	04 14	16 29	05 02	17 22	05 27	17 58	07 23	20 11	08 13	20 52	11
12	04 02	16 17	04 49	17 04	05 43	18 09	06 20	19 00	08 41	21 23	09 19	21 58	12
13	04 37	16 51	05 26	17 42	06 34	19 08	07 31	20 24	09 54	22 33	10 26	23 05	13
14	05 13	17 27	06 07	18 28	07 42	20 32	09 00	21 45	11 02	23 38	11 29	-- --	14
15	05 52	18 07	06 57	19 25	09 14	22 00	10 21	23 00	-- --	12 00	00 04	12 23	15
16	06 35	18 54	08 06	20 47	10 39	23 18	11 31	-- --	00 31	12 49	00 53	13 09	16
17	07 30	19 55	09 34	22 14	11 52	-- --	00 04	12 28	01 16	13 29	01 34	13 48	17
18	08 44	21 18	10 54	23 30	00 23	12 49	00 56	13 13	01 54	14 06	02 10	14 25	18
19	10 02	22 36	-- --	12 06	01 16	13 36	01 39	13 52	02 27	14 41	02 43	15 00	19
20	11 13	23 44	00 36	13 05	02 01	14 17	02 16	14 28	02 59	15 16	03 14	15 33	20
21	-- --	12 19	01 32	13 55	02 41	14 55	02 51	15 04	03 30	15 51	03 45	16 05	21
22	00 46	13 18	02 20	14 39	03 18	15 31	03 23	15 39	04 02	16 25	04 17	16 39	22
23	01 43	14 10	03 04	15 21	03 53	16 07	03 55	16 14	04 35	17 00	04 50	17 14	23
24	02 35	14 58	03 45	16 00	04 27	16 43	04 27	16 49	05 08	17 37	05 26	17 53	24
25	03 23	15 43	04 25	16 38	04 59	17 18	04 58	17 24	05 47	18 20	06 06	18 37	25
26	04 08	16 26	05 02	17 15	05 31	17 55	05 32	18 03	06 33	19 12	06 52	19 29	26
27	04 52	17 08	05 37	17 53	06 07	18 39	06 14	18 52	07 30	20 22	07 51	20 41	27
28	05 36	17 50	06 13	18 34	06 55	19 40	07 09	20 02	08 53	21 40	09 14	21 59	28
29	06 18	18 33	06 56	19 27	08 10	21 10	08 37	21 30	10 12	22 43	10 32	23 06	29
30	07 03	19 22	07 54	20 39	09 46	22 26	10 05	22 36	11 13	23 40	11 36	-- --	30
31	07 53	20 20	09 11	21 58			11 06	23 30			00 07	12 34	31

Tilbage til Menuen

FOR AIR NAVIGATION VOL.1

Selected Stars Epoch 2015

Nord	LAT 58°N	44-45
Syd	LAT 57°N	46-47
Table 5	LAT 56°N	48-49
	LAT 55°N	50-51
	LAT 54°N	52-53
	LAT 53°N	54-55
	LAT 52°N	56-57
	LAT 51°N	58-59
	LAT 50°N	60-61
	LAT 49°N	62-63
	LAT 48°N	64-65
	LAT 47°N	66-67
	LAT 46°N	68-69

LAT 58°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		ALTAIR		◆ VEGA	
0	30 09	008	42 39	068	24 57	099	48 39	133	61 08	176	22 06	250	36 46	286
1	30 13	008	43 09	069	25 28	100	49 02	134	61 10	178	21 36	251	36 16	287
2	30 18	009	43 38	070	26 00	101	49 24	135	61 10	179	21 05	252	35 45	288
3	30 23	009	44 08	070	26 31	101	49 46	136	61 10	181	20 35	253	35 15	288
4	30 28	010	44 38	071	27 02	102	50 08	138	61 09	183	20 05	254	34 45	289
5	30 34	010	45 08	072	27 33	103	50 29	139	61 07	185	19 34	255	34 15	290
6	30 40	011	45 39	072	28 04	104	50 50	140	61 03	187	19 03	256	33 45	291
7	30 46	011	46 09	073	28 35	105	51 10	142	60 59	188	18 32	257	33 15	291
8	30 52	012	46 39	074	29 05	106	51 29	143	60 54	190	18 01	258	32 46	292
9	30 59	012	47 10	074	29 36	107	51 48	145	60 48	192	17 30	259	32 16	293
10	31 06	013	47 41	075	30 06	108	52 06	146	60 41	194	16 59	259	31 47	294
11	31 13	013	48 11	076	30 36	109	52 23	147	60 33	196	16 28	260	31 18	294
12	31 21	014	48 42	076	31 06	110	52 40	149	60 24	197	15 56	261	30 49	295
13	31 28	015	49 13	077	31 36	111	52 56	150	60 14	199	15 25	262	30 21	296
14	31 36	015	49 44	078	32 06	112	53 12	152	60 03	201	14 53	263	29 52	296
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		DENEB		◆ VEGA	
15	31 45	016	50 15	079	32 35	113	53 26	153	59 51	202	49 46	281	29 24	297
16	31 54	016	50 46	079	33 04	114	53 40	155	59 39	204	49 15	281	28 55	298
17	32 03	017	51 18	080	33 34	115	53 53	156	59 25	206	48 44	282	28 27	299
18	32 12	017	51 49	081	34 02	116	54 06	158	59 11	207	48 13	283	27 59	299
19	32 21	018	52 20	081	34 31	117	54 17	159	58 56	209	47 42	284	27 32	300
20	32 31	018	52 52	082	34 59	118	54 28	161	58 40	211	47 11	284	27 04	301
21	32 41	019	53 23	083	35 27	119	54 38	162	58 23	212	46 40	285	26 37	301
22	32 52	019	53 55	084	35 55	120	54 47	164	58 06	214	46 10	286	26 10	302
23	33 02	020	54 27	084	36 22	121	54 56	166	57 48	215	45 39	286	25 43	303
24	33 13	020	54 58	085	36 50	122	55 03	167	57 29	217	45 09	287	25 17	303
25	33 24	021	55 30	086	37 16	123	55 10	169	57 10	218	44 38	288	24 50	304
26	33 36	021	56 02	087	37 43	124	55 16	170	56 50	220	44 08	289	24 24	305
27	33 48	022	56 34	088	38 09	125	55 21	172	56 29	221	43 38	289	23 58	306
28	34 00	022	57 05	089	38 35	126	55 25	174	56 08	223	43 08	290	23 32	306
29	34 12	023	57 37	089	39 00	127	55 28	175	55 46	224	42 38	291	23 07	307
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		DENEB		◆ VEGA	
30	34 25	023	58 09	090	39 26	128	55 30	177	55 23	226	42 08	291	22 42	308
31	34 37	024	58 41	091	39 50	129	55 32	178	55 00	227	41 39	292	22 17	308
32	34 50	025	59 12	092	40 15	131	55 32	180	54 37	228	41 09	293	21 52	309
33	35 04	025	59 44	093	40 39	132	55 32	182	54 13	230	40 40	293	21 27	310
34	35 17	026	60 16	094	41 02	133	55 30	183	53 48	231	40 11	294	21 03	311
35	35 31	026	60 48	095	41 25	134	55 28	185	53 23	232	39 42	295	20 39	311
36	35 45	027	61 19	096	41 48	135	55 25	186	52 58	234	39 13	295	20 15	312
37	36 00	027	61 51	096	42 10	136	55 21	188	52 32	235	38 44	296	19 52	313
38	36 14	028	62 23	097	42 32	138	55 16	190	52 06	236	38 16	297	19 29	313
39	36 29	028	62 54	098	42 53	139	55 10	191	51 39	237	37 48	297	19 06	314
40	36 44	029	63 25	099	43 13	140	55 03	193	51 13	238	37 19	298	18 43	315
41	36 59	029	63 57	100	43 34	141	54 56	194	50 45	240	36 51	299	18 21	316
42	37 15	030	64 28	102	43 53	143	54 48	196	50 18	241	36 24	299	17 59	316
43	37 31	030	64 59	103	44 12	144	54 38	198	49 50	242	35 56	300	17 37	317
44	37 47	031	65 30	104	44 31	145	54 28	199	49 22	243	35 28	301	17 15	318
	◆ Dubhe		POLLUX		BETELGEUSE		◆ ALDEBARAN		Hamal		Alpheratz		◆ DENEB	
45	38 03	031	33 06	089	29 10	128	44 49	146	54 18	201	48 53	244	35 01	301
46	38 20	032	33 37	090	29 35	129	45 06	148	54 06	202	48 24	245	34 34	302
47	38 36	032	34 09	091	30 00	130	45 23	149	53 54	204	47 55	246	34 07	302
48	38 53	033	34 41	092	30 24	131	45 39	150	53 40	205	47 26	248	33 40	303
49	39 10	033	35 13	093	30 48	132	45 54	152	53 26	207	46 57	249	33 14	304
50	39 28	033	35 45	093	31 11	133	46 09	153	53 12	208	46 27	250	32 47	304
51	39 46	034	36 16	094	31 34	134	46 23	154	52 56	210	45 57	251	32 21	305
52	40 03	034	36 48	095	31 56	135	46 37	156	52 40	211	45 27	252	31 55	306
53	40 22	035	37 20	096	32 19	136	46 49	157	52 23	213	44 57	253	31 30	306
54	40 40	035	37 51	097	32 40	137	47 01	158	52 06	214	44 26	254	31 04	307
55	40 58	036	38 23	098	33 02	139	47 13	160	51 48	215	43 56	255	30 39	308
56	41 17	036	38 54	099	33 22	140	47 23	161	51 29	217	43 25	256	30 14	308
57	41 36	037	39 26	100	33 43	141	47 33	163	51 10	218	42 54	257	29 49	309
58	41 55	037	39 57	101	34 03	142	47 43	164	50 50	220	42 23	258	29 25	310
59	42 15	038	40 28	102	34 22	143	47 51	165	50 29	221	41 52	259	29 00	310
	◆ Dubhe		POLLUX		BETELGEUSE		◆ ALDEBARAN		Hamal		Alpheratz		◆ DENEB	
60	42 34	038	40 59	103	34 41	144	47 59	167	50 08	222	41 21	259	28 36	311
61	42 54	039	41 30	104	34 59	145	48 05	168	49 47	223	40 49	260	28 12	312
62	43 14	039	42 01	104	35 17	147	48 12	170	49 25	225	40 18	261	27 49	312
63	43 34	040	42 32	105	35 34	148	48 17	171	49 02	226	39 46	262	27 25	313
64	43 54	040	43 02	106	35 51	149	48 21	172	48 39	227	39 15	263	27 02	314
65	44 15	041	43 33	107	36 07	150	48 25	174	48 15	229	38 43	264	26 39	314
66	44 36	041	44 03	108	36 23	151	48 28	175	47 51	230	38 12	265	26 17	315
67	44 57	041	44 33	109	36 38	152	48 30	177	47 27	231	37 40	266	25 54	316
68	45 18	042	45 03	110	36 52	154	48 32	178	47 02	232	37 08	267	25 32	316
69	45 39	042	45 33	111	37 06	155	48 32	180	46 36	233	36 36	268	25 10	317
70	46 01	043	46 02	113	37 19	156	48 32	181	46 11	235	36 05	268	24 49	318
71	46 22	043	46 31	114	37 32	157	48 31	183	45 45	236	35 33	269	24 27	318
72	46 44	044	47 00	115	37 44	159	48 29	184	45 18	237	35 01	270	24 06	319
73	47 06	044	47 29	116	37 55	160	48 26	186	44 51	238	34 29	271	23 46	320
74	47 29	045	47 58	117	38 06	161	48 23	187	44 24	239	33 58	272	23 25	320
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		ALDEBARAN		◆ Alpheratz		DENEB	
75	47 51	045	16 47	094	28 44	133	12 08	154	48 19	188	33 26	273	23 05	321
76	48 14	045	17 19	095	29 07	134	12 21	155	48 14	190	32 54	273	22 45	322
77	48 36	046	17 51	096	29 30	135	12 35	156	48 08	191	32 22	274	22 26	322
78	48 59	046	18 22	097	29 52	136	12 47	157	48 01	193	31 51	275	22 06	323
79	49 22	047	18 54	098	30 14	137	12 59	158	47 54	194	31 19	276	21 47	324
80	49 45	047	19 25	099	30 35	138	13 11	159	47 46	196	30 47	277	21 29	324
81	50 09	048	19 57	100	30 56	139	13 22	160	47 37	197	30 16	278	21 10	325
82	50 32	048	20 28	100	31 17	141	13 33	161	47 27	198	29 44	278	20 52	326
83	50 56	048	20 59	101	31 36	142	13 43	162	47 17	200	29 13	279	20 34	326
84	51 20	049	21 30	102	31 56	143	13 53	163	47 06	201	28 42	280	20 17	327
85	51 44	049	22 01	103	32 15	144	14 02	164	46 54	202	28 10	281	20 00	328
86	52 08	050	22 32	104	32 33	145	14 11	165	46 42	204	27 39	282	19 43	328
87	52 32	050	23 03	105	32 51	146	14 19	166	46 28	205	27 08	282	19 27	329
88	52 57	050	23 34	106	33 09	147	14 26	167	46 15	207	26 37	283	19 10	330
89	53 21	051	24 04	107	33 26	148	14 33	168	46 00	208	26 06	284	18 55	331

LAT 58°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Dubhe		◆ REGULUS		PROCYON		SIRIUS		◆ ALDEBARAN		Mirfak		◆ DENEB	
90	53 46	051	24 34	108	33 42	150	14 40	169	45 45	209	66 15	267	18 39	331
91	54 11	052	25 05	109	33 58	151	14 46	170	45 29	211	65 43	268	18 24	332
92	54 36	052	25 35	110	34 13	152	14 51	171	45 13	212	65 12	269	18 09	333
93	55 01	052	26 05	110	34 28	153	14 56	172	44 56	213	64 40	270	17 55	333
94	55 26	053	26 34	111	34 42	154	15 00	173	44 38	214	64 08	270	17 41	334
95	55 52	053	27 04	112	34 55	155	15 04	174	44 20	216	63 36	271	17 27	335
96	56 17	054	27 33	113	35 08	157	15 08	175	44 01	217	63 04	272	17 13	335
97	56 43	054	28 02	114	35 21	158	15 10	176	43 41	218	62 33	273	17 00	336
98	57 09	054	28 31	115	35 32	159	15 12	177	43 21	219	62 01	274	16 48	337
99	57 34	055	29 00	116	35 44	160	15 14	178	43 01	221	61 29	275	16 35	337
100	58 00	055	29 28	117	35 54	161	15 15	179	42 40	222	60 57	275	16 23	338
101	58 27	055	29 56	118	36 04	163	15 16	180	42 19	223	60 26	276	16 12	339
102	58 53	056	30 24	119	36 13	164	15 16	181	41 57	224	59 54	277	16 00	340
103	59 19	056	30 52	120	36 21	165	15 15	182	41 34	225	59 23	278	15 49	340
104	59 46	056	31 19	121	36 29	166	15 14	183	41 11	227	58 51	278	15 39	341
	Alioth		◆ REGULUS		PROCYON		BETELGEUSE		◆ ALDEBARAN		Mirfak		◆ DENEB	
105	45 09	053	31 46	122	36 37	168	37 55	200	40 48	228	58 20	279	15 29	342
106	45 34	053	32 13	123	36 43	169	37 44	202	40 24	229	57 48	280	15 19	342
107	46 00	054	32 39	124	36 49	170	37 32	203	40 00	230	57 17	280	15 10	343
108	46 26	054	33 05	125	36 54	171	37 19	204	39 35	231	56 46	281	15 00	344
109	46 51	055	33 31	126	36 59	172	37 06	205	39 10	232	56 15	282	14 52	345
110	47 18	055	33 57	127	37 02	174	36 52	206	38 45	233	55 44	282	14 44	345
111	47 44	056	34 22	129	37 06	175	36 37	208	38 19	235	55 13	283	14 36	346
112	48 10	056	34 46	130	37 08	176	36 22	209	37 53	236	54 42	284	14 28	347
113	48 37	057	35 11	131	37 10	177	36 07	210	37 27	237	54 11	284	14 21	347
114	49 03	057	35 34	132	37 11	179	35 51	211	37 00	238	53 40	285	14 14	348
115	49 30	058	35 58	133	37 11	180	35 34	212	36 33	239	53 09	286	14 08	349
116	49 57	058	36 21	134	37 11	181	35 17	213	36 06	240	52 39	286	14 02	350
117	50 24	059	36 44	135	37 10	182	34 59	215	35 38	241	52 08	287	13 56	350
118	50 52	059	37 06	136	37 08	184	34 41	216	35 10	242	51 38	288	13 51	351
119	51 19	060	37 28	137	37 06	185	34 22	217	34 42	243	51 08	288	13 46	352
	◆ Kochab		ARCTURUS		◆ REGULUS		PROCYON		BETELGEUSE		◆ CAPELLA		DENEB	
120	51 36	025	14 00	076	37 49	139	37 03	186	34 02	218	62 51	262	13 42	352
121	51 50	026	14 31	077	38 10	140	36 59	187	33 43	219	62 19	263	13 38	353
122	52 04	026	15 02	078	38 30	141	36 54	189	33 22	220	61 48	264	13 34	354
123	52 18	026	15 33	079	38 50	142	36 49	190	33 01	221	61 16	265	13 31	355
124	52 32	026	16 04	080	39 09	143	36 43	191	32 40	223	60 45	265	13 28	355
125	52 46	027	16 35	080	39 28	144	36 37	192	32 18	224	60 13	266	13 26	356
126	53 00	027	17 07	081	39 46	146	36 30	194	31 56	225	59 41	267	13 24	357
127	53 15	027	17 38	082	40 04	147	36 22	195	31 34	226	59 09	268	13 23	357
128	53 29	027	18 10	083	40 21	148	36 13	196	31 11	227	58 38	269	13 21	358
129	53 44	028	18 41	084	40 37	149	36 04	197	30 47	228	58 06	270	13 21	359
130	53 59	028	19 13	084	40 53	151	35 54	199	30 24	229	57 34	271	13 20	000
131	54 14	028	19 45	085	41 08	152	35 44	200	29 59	230	57 02	272	13 20	000
132	54 29	028	20 16	086	41 23	153	35 33	201	29 35	231	56 30	272	13 21	001
133	54 44	028	20 48	087	41 37	154	35 21	202	29 10	232	55 59	273	13 21	002
134	54 59	029	21 20	088	41 51	156	35 09	203	28 45	233	55 27	274	13 23	003
	DENEB		◆ VEGA		ARCTURUS		◆ REGULUS		PROCYON		BETELGEUSE		◆ CAPELLA	
135	13 24	003	11 17	028	21 52	089	42 03	157	34 56	205	28 19	234	54 55	275
136	13 26	004	11 32	028	22 23	090	42 16	158	34 43	206	27 53	235	54 24	276
137	13 29	005	11 47	029	22 55	090	42 27	160	34 28	207	27 27	236	53 52	276
138	13 31	005	12 03	030	23 27	091	42 38	161	34 14	208	27 00	237	53 20	277
139	13 35	006	12 19	031	23 59	092	42 48	162	33 59	209	26 33	238	52 49	278
140	13 38	007	12 35	031	24 31	093	42 57	163	33 43	210	26 06	239	52 17	279
141	13 42	008	12 52	032	25 02	094	43 06	165	33 26	212	25 39	240	51 46	279
142	13 47	008	13 09	033	25 34	095	43 14	166	33 10	213	25 11	241	51 15	280
143	13 51	009	13 27	034	26 06	096	43 21	167	32 52	214	24 43	242	50 43	281
144	13 57	010	13 44	034	26 37	096	43 28	169	32 34	215	24 15	243	50 12	282
145	14 02	010	14 02	035	27 09	097	43 34	170	32 16	216	23 47	244	49 41	282
146	14 08	011	14 21	036	27 40	098	43 39	171	31 57	217	23 18	245	49 10	283
147	14 14	012	14 40	037	28 12	099	43 43	173	31 37	218	22 49	246	48 39	284
148	14 21	013	14 59	037	28 43	100	43 47	174	31 17	219	22 20	247	48 08	284
149	14 28	013	15 18	038	29 15	101	43 50	176	30 57	220	21 51	248	47 37	285
	DENEB		◆ VEGA		ARCTURUS		Denebola		◆ REGULUS		POLLUX		◆ CAPELLA	
150	14 36	014	15 38	039	29 46	102	41 52	143	43 52	177	52 02	232	47 07	286
151	14 44	015	15 58	039	30 17	103	42 11	144	43 53	178	51 37	234	46 36	286
152	14 52	015	16 18	040	30 48	104	42 29	146	43 54	180	51 11	235	46 06	287
153	15 01	016	16 39	041	31 19	105	42 47	147	43 53	181	50 45	236	45 36	288
154	15 10	017	17 00	042	31 49	105	43 04	148	43 53	182	50 19	237	45 05	289
155	15 19	018	17 21	042	32 20	106	43 20	149	43 51	184	49 52	238	44 35	289
156	15 29	018	17 43	043	32 50	107	43 36	151	43 48	185	49 24	240	44 05	290
157	15 39	019	18 05	044	33 21	108	43 52	152	43 45	186	48 57	241	43 35	291
158	15 50	020	18 27	045	33 51	109	44 06	153	43 41	188	48 29	242	43 06	291
159	16 01	020	18 49	045	34 21	110	44 20	155	43 37	189	48 01	243	42 36	292
160	16 12	021	19 12	046	34 50	111	44 33	156	43 31	190	47 32	244	42 07	293
161	16 24	022	19 35	047	35 20	112	44 46	157	43 25	192	47 04	245	41 37	293
162	16 36	023	19 58	047	35 49	113	44 58	159	43 18	193	46 35	246	41 08	294
163	16 48	023	20 22	048	36 18	114	45 09	160	43 11	194	46 05	247	40 39	295
164	17 01	024	20 46	049	36 47	115	45 20	161	43 03	196	45 36	248	40 10	295
165	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
166	17 14	025	21 10	050	37 16	116	14 38	143	42 54	197	45 06	249	39 42	296
167	17 27	025	21 34	050	37 44	117	14 57	144	42 44	198	44 36	250	39 13	297
168	17 41	026	21 59	051	38 12	118	15 15	145	42 33	200	44 06	251	38 45	297
169	17 55	027	22 23	052	38 40	119	15 33	146	42 22	201	43 36	252	38 17	298
170	18 10	027	22 49	052	39 08	120	15 51	147	42 11	202	43 06	253	37 49	298
171	18 24	028	23 14	053	39 35	121	16 08	148	41 58	204	42 35	254	37 21	299
172	18 40	029	23 39	054	40 02	123	16 25	149	41 45	205	42 05	255	36 53	300
173	18 55	030	24 05	055	40 29	124	16 41	150	41 31	206	41 34	256	36 26	300
174	19 11	030	24 31	055	40 55	125	16 57	151	41 17	207	41 03	257	35 58	301
175	19 27	031	24 58	056	41 21	126	17 12	152	41 02	209	40 32	258	35 31	302
176	19 44	032	25 24	057	41 47	127	17 27	153	40 47	210	40 00	259	35 04	302
177	20 00	032	25 51	057	42 12	128	17 41	154	40 30	211	39 29	260	34 37	303
178	20 17	033	26 18	058	42 37	129	17 55	155	40 14	212	38 58	261	34 11	304
179	20 35	034	26 45	059	43 01	130	18 09	156	39 56	214	38 26	262	33 44	304
180	20 53	034	27 12	060	43 25	132	18 21	157	39 39	215	37 55	263	33 18	305

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LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
180	21 11	035	27 39	060	43 49	133	18 34	158	39 20	216	37 23	264	32 52	306
181	21 29	036	28 07	061	44 12	134	18 45	159	39 01	217	36 52	265	32 27	306
182	21 48	036	28 35	062	44 34	135	18 57	160	38 42	218	36 20	266	32 01	307
183	22 07	037	29 03	062	44 56	136	19 07	161	38 22	220	35 48	266	31 36	308
184	22 26	038	29 31	063	45 18	138	19 18	162	38 01	221	35 16	267	31 11	308
185	22 46	038	30 00	064	45 39	139	19 27	163	37 40	222	34 45	268	30 46	309
186	23 06	039	30 28	065	46 00	140	19 36	164	37 19	223	34 13	269	30 21	310
187	23 26	040	30 57	065	46 20	141	19 45	165	36 57	224	33 41	270	29 57	310
188	23 46	040	31 26	066	46 40	143	19 53	166	36 34	225	33 09	271	29 33	311
189	24 07	041	31 55	067	46 59	144	20 00	167	36 12	226	32 38	272	29 09	311
190	24 28	042	32 25	067	47 17	145	20 07	168	35 48	228	32 06	272	28 45	312
191	24 49	042	32 54	068	47 35	147	20 14	169	35 25	229	31 34	273	28 21	313
192	25 11	043	33 24	069	47 52	148	20 19	170	35 01	230	31 02	274	27 58	313
193	25 33	044	33 53	070	48 08	149	20 25	171	34 36	231	30 31	275	27 35	314
194	25 55	044	34 23	070	48 24	151	20 29	172	34 11	232	29 59	276	27 13	315
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	26 17	045	34 53	071	21 44	101	48 39	152	33 46	233	29 27	277	26 50	315
196	26 40	046	35 23	072	22 16	102	48 54	153	33 20	234	28 56	277	26 28	316
197	27 03	046	35 54	072	22 47	103	49 08	155	32 55	235	28 24	278	26 06	317
198	27 26	047	36 24	073	23 18	104	49 21	156	32 28	236	27 53	279	25 44	317
199	27 49	048	36 54	074	23 48	105	49 33	158	32 02	237	27 21	280	25 23	318
200	28 13	048	37 25	075	24 19	106	49 45	159	31 35	238	26 50	281	25 02	319
201	28 37	049	37 56	075	24 49	107	49 56	161	31 08	239	26 19	281	24 41	319
202	29 01	050	38 27	076	25 20	108	50 06	162	30 40	240	25 48	282	24 20	320
203	29 25	050	38 57	077	25 50	109	50 16	163	30 13	241	25 17	283	24 00	321
204	29 50	051	39 29	078	26 20	110	50 24	165	29 45	242	24 46	284	23 40	321
205	30 15	052	40 00	078	26 50	110	50 32	166	29 16	243	24 15	285	23 20	322
206	30 40	052	40 31	079	27 20	111	50 39	168	28 48	244	23 44	285	23 01	323
207	31 05	053	41 02	080	27 49	112	50 45	169	28 19	245	23 14	286	22 42	323
208	31 30	054	41 33	081	28 18	113	50 51	171	27 50	246	22 43	287	22 23	324
209	31 56	054	42 05	081	28 48	114	50 56	172	27 21	247	22 13	288	22 04	325
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
210	32 22	055	42 36	082	29 16	115	50 59	174	26 52	248	21 43	288	21 46	325
211	32 48	056	43 08	083	29 45	116	51 02	175	26 22	249	21 12	289	21 28	326
212	33 15	056	43 39	084	30 13	117	51 04	177	25 52	250	20 42	290	21 11	327
213	33 41	057	44 11	085	30 42	118	51 06	178	25 22	251	20 13	291	20 53	327
214	34 08	058	44 43	085	31 09	119	51 06	180	24 52	252	19 43	292	20 36	328
215	34 35	058	45 14	086	31 37	120	51 06	181	24 22	253	19 14	292	20 20	329
216	35 02	059	45 46	087	32 04	121	51 05	183	23 51	254	18 44	293	20 03	329
217	35 29	060	46 18	088	32 31	122	51 03	184	23 21	255	18 15	294	19 47	330
218	35 57	060	46 50	089	32 58	123	51 00	186	22 50	255	17 46	295	19 32	331
219	36 24	061	47 22	090	33 25	124	50 56	187	22 19	256	17 17	295	19 16	331
220	36 52	061	47 53	090	33 51	125	50 52	189	21 48	257	16 49	296	19 01	332
221	37 20	062	48 25	091	34 16	126	50 46	190	21 17	258	16 20	297	18 47	333
222	37 48	063	48 57	092	34 42	128	50 40	192	20 46	259	15 52	298	18 32	334
223	38 17	063	49 29	093	35 07	129	50 33	193	20 15	260	15 24	299	18 18	334
224	38 45	064	50 00	094	35 31	130	50 26	195	19 44	261	14 56	299	18 05	335
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		Dubhe		◆ CAPELLA	
225	39 14	065	50 32	095	35 56	131	50 17	196	33 57	239	61 14	302	17 52	336
226	39 43	065	51 04	096	36 20	132	50 08	198	33 30	240	60 47	303	17 39	336
227	40 12	066	51 35	097	36 43	133	49 58	199	33 02	241	60 21	303	17 26	337
228	40 41	067	52 07	098	37 06	134	49 47	201	32 34	242	59 54	303	17 14	338
229	41 10	067	52 38	098	37 29	135	49 35	202	32 05	243	59 28	304	17 02	338
230	41 40	068	53 10	099	37 51	136	49 23	203	31 37	244	59 01	304	16 50	339
231	42 09	069	53 41	100	38 13	138	49 10	205	31 08	245	58 35	305	16 39	340
232	42 39	069	54 12	101	38 34	139	48 56	206	30 39	246	58 09	305	16 28	340
233	43 09	070	54 43	102	38 55	140	48 42	208	30 10	247	57 43	305	16 18	341
234	43 39	071	55 14	103	39 15	141	48 27	209	29 40	248	57 17	306	16 08	342
235	44 09	072	55 45	104	39 34	142	48 11	210	29 11	249	56 51	306	15 58	343
236	44 39	072	56 16	106	39 54	143	47 55	212	28 41	250	56 25	306	15 49	343
237	45 09	073	56 47	107	40 12	145	47 38	213	28 11	251	56 00	307	15 40	344
238	45 40	074	57 17	108	40 30	146	47 20	214	27 41	252	55 34	307	15 31	345
239	46 10	074	57 47	109	40 48	147	47 02	216	27 10	253	55 09	307	15 23	345
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		Dubhe		◆ CAPELLA	
240	46 41	075	58 17	110	41 05	148	46 43	217	26 40	254	54 44	308	15 15	346
241	47 12	076	58 47	111	41 21	150	46 23	218	26 09	255	54 19	308	15 08	347
242	47 43	076	59 16	112	41 37	151	46 03	220	25 38	256	53 54	309	15 01	348
243	48 14	077	59 46	113	41 52	152	45 43	221	25 07	257	53 29	309	14 54	348
244	48 45	078	60 15	115	42 07	153	45 22	222	24 36	258	53 05	309	14 48	349
245	49 16	079	60 44	116	42 21	155	45 00	223	24 05	259	52 40	310	14 42	350
246	49 47	079	61 12	117	42 34	156	44 38	225	23 34	259	52 16	310	14 37	350
247	50 18	080	61 40	118	42 47	157	44 16	226	23 03	260	51 52	311	14 31	351
248	50 50	081	62 08	120	42 59	159	43 53	227	22 31	261	51 28	311	14 27	352
249	51 21	082	62 35	121	43 10	160	43 29	228	22 00	262	51 04	311	14 22	353
250	51 53	082	63 02	123	43 21	161	43 05	229	21 28	263	50 40	312	14 18	353
251	52 24	083	63 29	124	43 31	163	42 41	231	20 57	264	50 16	312	14 15	354
252	52 56	084	63 55	125	43 40	164	42 16	232	20 25	265	49 53	313	14 12	355
253	53 27	085	64 21	127	43 48	165	41 51	233	19 54	266	49 30	313	14 09	355
254	53 59	085	64 46	128	43 56	167	41 25	234	19 22	266	49 07	314	14 07	356
	Schedar		DENEB		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Dubhe		◆ CAPELLA	
255	35 41	038	54 31	086	31 00	128	44 03	168	41 00	235	48 44	314	14 05	357
256	36 01	038	55 02	087	31 24	129	44 09	169	40 33	236	48 21	314	14 03	358
257	36 21	039	55 34	088	31 49	130	44 15	171	40 07	237	47 58	315	14 02	358
258	36 41	039	56 06	089	32 13	132	44 20	172	39 40	238	47 36	315	14 01	359
259	37 01	040	56 38	089	32 36	133	44 24	173	39 13	239	47 13	316	14 01	000
260	37 21	040	57 09	090	33 00	134	44 27	175	38 45	240	46 51	316	14 01	000
261	37 42	041	57 41	091	33 22	135	44 30	176	38 17	242	46 29	317	14 01	001
262	38 03	042	58 13	092	33 45	136	44 32	177	37 49	243	46 08	317	14 02	002
263	38 24	042	58 45	093	34 07	137	44 33	179	37 21	244	45 46	318	14 03	003
264	38 46	043	59 17	094	34 28	138	44 33	180	36 52	245	45 25	318	14 05	003
265	39 07	043	59 48	095	34 49	139	44 33	181	36 23	246	45 04	318	14 07	004
266	39 29	044	60 20	096	35 10	140	44 31	183	35 54	247	44 43	319	14 09	005
267	39 51	044	60 52	097	35 30	141	44 29	184	35 25	248	44 22	319	14 12	005
268	40 14	045	61 23	098	35 49	143	44 27	186	34 55	249	44 01	320	14 15	006
269	40 36	045	61 55	099	36 08	144	44 23	187	34 26	250	43 41	320	14 19	007

LAT 58°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Dubhe	
270	14 23	008	23 16	072	36 27	145	44 19	188	33 56	251	53 05	284	43 20	321
271	14 27	008	23 46	073	36 45	146	44 14	190	33 26	252	52 35	285	43 00	321
272	14 32	009	24 16	073	37 02	147	44 08	191	32 56	253	52 04	286	42 40	322
273	14 37	010	24 47	074	37 19	148	44 02	192	32 25	253	51 34	286	42 21	322
274	14 43	010	25 17	075	37 36	150	43 55	194	31 55	254	51 03	287	42 01	323
275	14 49	011	25 48	076	37 51	151	43 47	195	31 24	255	50 33	288	41 42	323
276	14 55	012	26 19	076	38 07	152	43 38	196	30 53	256	50 03	288	41 23	323
277	15 02	013	26 50	077	38 21	153	43 29	198	30 22	257	49 32	289	41 04	324
278	15 09	013	27 21	078	38 35	155	43 19	199	29 51	258	49 02	290	40 46	324
279	15 16	014	27 52	079	38 48	156	43 08	200	29 20	259	48 33	290	40 27	325
280	15 24	015	28 23	080	39 01	157	42 57	202	28 49	260	48 03	291	40 09	325
281	15 32	015	28 55	080	39 13	158	42 44	203	28 17	261	47 33	292	39 51	326
282	15 41	016	29 26	081	39 25	160	42 32	204	27 46	262	47 04	292	39 34	326
283	15 50	017	29 57	082	39 35	161	42 18	206	27 14	263	46 34	293	39 16	327
284	15 59	017	30 29	083	39 46	162	42 04	207	26 43	263	46 05	293	38 59	327
	◆ CAPELLA		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Dubhe	
285	16 09	018	31 01	084	39 55	163	41 50	208	26 11	264	45 36	294	38 42	328
286	16 19	019	31 32	084	40 04	165	41 34	209	25 40	265	45 07	295	38 25	328
287	16 29	020	32 04	085	40 12	166	41 18	211	25 08	266	44 38	295	38 08	329
288	16 40	020	32 36	086	40 19	167	41 02	212	24 36	267	44 10	296	37 52	329
289	16 51	021	33 07	087	40 26	168	40 45	213	24 04	268	43 41	297	37 36	330
290	17 03	022	33 39	088	40 32	170	40 27	214	23 33	269	43 13	297	37 20	330
291	17 15	022	34 11	089	40 37	171	40 09	216	23 01	270	42 45	298	37 04	331
292	17 27	023	34 43	089	40 42	172	39 50	217	22 29	270	42 17	298	36 49	331
293	17 40	024	35 14	090	40 46	174	39 31	218	21 57	271	41 49	299	36 34	332
294	17 53	024	35 46	091	40 49	175	39 11	219	21 25	272	41 21	300	36 19	332
295	18 06	025	36 18	092	40 52	176	38 51	220	20 54	273	40 53	300	36 04	333
296	18 20	026	36 50	093	40 53	178	38 30	222	20 22	274	40 26	301	35 50	333
297	18 34	027	37 21	094	40 54	179	38 09	223	19 50	275	39 59	302	35 36	334
298	18 48	027	37 53	095	40 55	180	37 47	224	19 19	275	39 32	302	35 22	334
299	19 03	028	38 25	095	40 54	181	37 25	225	18 47	276	39 05	303	35 08	335
	CAPELLA		◆ Alpheratz		Enif		ALTAIR		◆ VEGA		Alphecca		◆ Dubhe	
300	19 18	029	38 56	096	37 56	147	40 53	183	66 37	224	34 53	265	34 55	335
301	19 33	029	39 28	097	38 13	148	40 51	184	66 15	226	34 21	266	34 41	336
302	19 49	030	40 00	098	38 30	149	40 48	185	65 52	227	33 50	267	34 29	336
303	20 05	031	40 31	099	38 46	150	40 45	187	65 28	229	33 18	268	34 16	337
304	20 21	031	41 02	100	39 01	151	40 41	188	65 04	230	32 46	269	34 04	337
305	20 38	032	41 34	101	39 16	153	40 36	189	64 39	232	32 14	270	33 52	338
306	20 55	033	42 05	102	39 31	154	40 31	191	64 14	233	31 42	270	33 40	338
307	21 12	033	42 36	103	39 44	155	40 25	192	63 48	235	31 11	271	33 28	339
308	21 30	034	43 07	104	39 57	156	40 18	193	63 22	236	30 39	272	33 17	339
309	21 48	035	43 38	105	40 10	158	40 10	194	62 55	238	30 07	273	33 06	340
310	22 06	035	44 08	106	40 22	159	40 02	196	62 28	239	29 35	274	32 55	341
311	22 25	036	44 39	107	40 33	160	39 53	197	62 00	241	29 04	275	32 45	341
312	22 44	037	45 09	108	40 43	161	39 43	198	61 32	242	28 32	275	32 34	342
313	23 03	037	45 39	109	40 53	163	39 33	200	61 04	243	28 00	276	32 25	342
314	23 22	038	46 09	110	41 02	164	39 22	201	60 36	244	27 29	277	32 15	343
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
315	23 42	039	26 36	088	46 39	111	41 11	165	39 10	202	60 07	246	33 12	325
316	24 02	039	27 08	088	47 09	112	41 18	167	38 58	203	59 38	247	32 54	326
317	24 22	040	27 40	089	47 38	113	41 26	168	38 45	205	59 08	248	32 36	326
318	24 43	041	28 12	090	48 07	114	41 32	169	38 32	206	58 39	249	32 18	327
319	25 04	041	28 43	091	48 36	115	41 38	170	38 18	207	58 09	250	32 01	327
320	25 25	042	29 15	092	49 05	116	41 42	172	38 03	208	57 39	252	31 44	328
321	25 46	043	29 47	093	49 33	117	41 47	173	37 48	209	57 09	253	31 27	328
322	26 08	043	30 19	094	50 01	118	41 50	174	37 32	211	56 38	254	31 11	329
323	26 30	044	30 51	094	50 29	120	41 53	176	37 15	212	56 08	255	30 54	330
324	26 52	045	31 22	095	50 57	121	41 55	177	36 58	213	55 37	256	30 39	330
325	27 15	045	31 54	096	51 24	122	41 56	178	36 41	214	55 06	257	30 23	331
326	27 38	046	32 25	097	51 51	123	41 57	180	36 22	215	54 35	258	30 08	331
327	28 01	047	32 57	098	52 17	124	41 56	181	36 04	216	54 04	259	29 52	332
328	28 24	047	33 28	099	52 43	126	41 56	182	35 45	218	53 32	260	29 38	333
329	28 47	048	34 00	100	53 09	127	41 54	184	35 25	219	53 01	261	29 23	333
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
330	29 11	049	34 31	101	53 34	128	41 51	185	35 05	220	52 30	262	29 09	334
331	29 35	049	35 02	102	53 59	130	41 48	186	34 44	221	51 58	263	28 55	334
332	29 59	050	35 33	103	54 23	131	41 44	188	34 23	222	51 27	264	28 41	335
333	30 24	051	36 04	104	54 47	132	41 40	189	34 01	223	50 55	265	28 28	335
334	30 48	051	36 35	104	55 10	134	41 35	190	33 39	224	50 23	265	28 15	336
335	31 13	052	37 06	105	55 33	135	41 29	192	33 17	225	49 52	266	28 02	337
336	31 38	053	37 36	106	55 55	136	41 22	193	32 54	227	49 20	267	27 49	337
337	32 04	053	38 07	107	56 17	138	41 14	194	32 31	228	48 48	268	27 37	338
338	32 29	054	38 37	108	56 38	139	41 06	195	32 07	229	48 16	269	27 25	338
339	32 55	054	39 07	109	56 58	141	40 57	197	31 43	230	47 45	270	27 14	339
340	33 21	055	39 37	110	57 18	142	40 48	198	31 19	231	47 13	271	27 03	340
341	33 47	056	40 07	111	57 37	144	40 38	199	30 54	232	46 41	272	26 52	340
342	34 13	056	40 36	112	57 56	145	40 27	201	30 28	233	46 09	272	26 41	341
343	34 40	057	41 06	113	58 13	147	40 15	202	30 03	234	45 37	273	26 31	341
344	35 07	058	41 35	114	58 30	148	40 03	203	29 37	235	45 06	274	26 21	342
	CAPELLA		ALDEBARAN		◆ Hamal		Alpheratz		◆ ALTAIR		VEGA		◆ Alioth	
345	35 34	058	17 01	086	42 04	115	58 47	150	29 11	236	44 34	275	26 11	343
346	36 01	059	17 33	087	42 32	116	59 02	152	28 44	237	44 02	276	26 02	343
347	36 28	060	18 05	088	43 01	118	59 17	153	28 17	238	43 31	276	25 53	344
348	36 56	060	18 37	088	43 29	119	59 31	155	27 50	239	42 59	277	25 44	344
349	37 24	061	19 09	089	43 56	120	59 44	157	27 23	240	42 28	278	25 35	345
350	37 51	062	19 40	090	44 24	121	59 56	158	26 55	241	41 56	279	25 27	346
351	38 19	062	20 12	091	44 51	122	60 08	160	26 27	242	41 25	280	25 20	346
352	38 48	063	20 44	092	45 18	123	60 18	162	25 59	243	40 53	280	25 12	347
353	39 16	064	21 16	093	45 44	124	60 28	163	25 31	244	40 22	281	25 05	347
354	39 45	064	21 47	094	46 10	125	60 36	165	25 02	245	39 51	282	24 58	348
355	40 13	065	22 19	094	46 36	127	60 44	167	24 33	246	39 20	283	24 52	349
356	40 42	066	22 51	095	47 01	128	60 51	169	24 04	247	38 49	283	24 46	349
357	41 11	066	23 22	096	47 26	129	60 56	170	23 35	248	38 18	284	24 40	350
358	41 40	067	23 54	097	47 51	130	61 01	172	23 05	249	37 47	285	24 34	350
359	42 10	068	24 26	098	48 15	131	61 05	174	22 36	250	37 17	286	24 29	351

Tilbage til Menuen

LAT 57°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Dubhe		◆CAPELLA		ALDEBARAN		Hamal		◆Alpheratz		ALTAIR		◆VEGA	
0	29 10	007	42 16	067	25 06	098	49 19	132	62 08	176	22 26	251	36 29	287
1	29 14	008	42 47	068	25 38	099	49 43	133	62 10	178	21 55	252	35 58	288
2	29 19	009	43 17	069	26 10	100	50 07	134	62 10	179	21 23	253	35 27	288
3	29 24	009	43 47	069	26 43	101	50 30	136	62 10	181	20 52	254	34 56	289
4	29 29	010	44 18	070	27 15	102	50 52	137	62 09	183	20 21	254	34 25	290
5	29 35	010	44 49	071	27 47	103	51 14	138	62 06	185	19 49	255	33 54	291
6	29 41	011	45 20	071	28 18	104	51 36	140	62 03	187	19 18	256	33 24	291
7	29 47	011	45 51	072	28 50	105	51 57	141	61 59	189	18 46	257	32 53	292
8	29 53	012	46 22	073	29 22	105	52 17	142	61 53	191	18 14	258	32 23	293
9	30 00	012	46 53	073	29 53	106	52 36	144	61 47	192	17 42	259	31 53	293
10	30 07	013	47 24	074	30 24	107	52 55	145	61 39	194	17 10	260	31 23	294
11	30 15	013	47 56	075	30 55	108	53 14	147	61 30	196	16 37	261	30 53	295
12	30 22	014	48 27	075	31 26	109	53 31	148	61 21	198	16 05	261	30 24	296
13	30 30	014	48 59	076	31 57	110	53 48	150	61 10	200	15 33	262	29 54	296
14	30 39	015	49 31	077	32 28	111	54 04	151	60 59	201	15 00	263	29 25	297
	Dubhe		◆CAPELLA		ALDEBARAN		Hamal		◆Alpheratz		DENEB		◆VEGA	
15	30 47	015	50 03	077	32 58	112	54 20	153	60 47	203	49 34	282	28 56	298
16	30 56	016	50 35	078	33 28	113	54 34	154	60 33	205	49 02	283	28 27	298
17	31 05	017	51 07	079	33 58	114	54 48	156	60 19	207	48 31	283	27 58	299
18	31 15	017	51 39	079	34 28	115	55 01	157	60 04	208	47 59	284	27 30	300
19	31 24	018	52 11	080	34 57	116	55 13	159	59 48	210	47 27	285	27 02	300
20	31 34	018	52 43	081	35 27	117	55 25	160	59 31	212	46 56	285	26 34	301
21	31 44	019	53 15	082	35 56	118	55 35	162	59 14	213	46 24	286	26 06	302
22	31 55	019	53 48	082	36 24	119	55 45	164	58 56	215	45 53	287	25 38	302
23	32 06	020	54 20	083	36 53	120	55 54	165	58 37	216	45 22	287	25 11	303
24	32 17	020	54 53	084	37 21	121	56 02	167	58 17	218	44 50	288	24 43	304
25	32 28	021	55 25	085	37 49	122	56 09	168	57 56	219	44 19	289	24 16	305
26	32 40	021	55 58	085	38 16	123	56 15	170	57 35	221	43 49	289	23 50	305
27	32 52	022	56 30	086	38 43	124	56 20	172	57 14	222	43 18	290	23 23	306
28	33 04	022	57 03	087	39 10	125	56 24	173	56 51	224	42 47	291	22 57	307
29	33 17	023	57 36	088	39 37	127	56 28	175	56 28	225	42 17	291	22 31	307
	Dubhe		◆CAPELLA		ALDEBARAN		Hamal		◆Alpheratz		DENEB		◆VEGA	
30	33 29	023	58 08	089	40 03	128	56 30	177	56 05	227	41 46	292	22 05	308
31	33 42	024	58 41	089	40 28	129	56 31	178	55 41	228	41 16	293	21 39	309
32	33 56	024	59 14	090	40 53	130	56 32	180	55 16	229	40 46	293	21 14	309
33	34 09	025	59 46	091	41 18	131	56 31	182	54 51	231	40 16	294	20 49	310
34	34 23	025	60 19	092	41 43	132	56 30	183	54 26	232	39 46	295	20 24	311
35	34 37	026	60 52	093	42 07	133	56 28	185	54 00	233	39 17	295	19 59	312
36	34 51	026	61 24	094	42 30	135	56 24	187	53 33	235	38 47	296	19 35	312
37	35 06	027	61 57	095	42 53	136	56 20	188	53 06	236	38 18	297	19 11	313
38	35 21	027	62 29	096	43 16	137	56 15	190	52 39	237	37 49	297	18 47	314
39	35 36	028	63 02	097	43 38	138	56 09	192	52 11	238	37 20	298	18 24	314
40	35 51	028	63 34	097	43 59	139	56 02	193	51 43	240	36 51	299	18 01	315
41	36 07	029	64 07	098	44 20	141	55 54	195	51 15	241	36 22	299	17 38	316
42	36 23	029	64 39	099	44 41	142	55 45	196	50 46	242	35 54	300	17 15	317
43	36 39	030	65 11	101	45 01	143	55 36	198	50 17	243	35 26	300	16 53	317
44	36 55	030	65 43	102	45 20	145	55 25	200	49 48	244	34 58	301	16 31	318
	◆Dubhe		POLLUX		BETELGEUSE		◆ALDEBARAN		Hamal		Alpheratz		◆DENEB	
45	37 12	031	33 04	089	29 47	127	45 38	146	55 14	201	49 19	245	34 30	302
46	37 28	031	33 37	089	30 13	129	45 57	147	55 01	203	48 49	246	34 02	302
47	37 45	032	34 10	090	30 38	130	46 14	148	54 48	204	48 19	247	33 35	303
48	38 03	032	34 42	091	31 03	131	46 31	150	54 34	206	47 48	249	33 07	304
49	38 20	033	35 15	092	31 28	132	46 47	151	54 20	207	47 18	250	32 40	304
50	38 38	033	35 48	093	31 52	133	47 02	152	54 04	209	46 47	251	32 13	305
51	38 56	034	36 20	094	32 16	134	47 17	154	53 48	210	46 16	252	31 47	306
52	39 14	034	36 53	094	32 39	135	47 31	155	53 31	212	45 45	253	31 20	306
53	39 32	034	37 26	095	33 02	136	47 44	157	53 14	213	45 14	254	30 54	307
54	39 51	035	37 58	096	33 24	137	47 57	158	52 56	215	44 42	255	30 28	308
55	40 10	035	38 31	097	33 46	138	48 09	159	52 37	216	44 11	256	30 02	308
56	40 29	036	39 03	098	34 08	139	48 20	161	52 17	218	43 39	257	29 37	309
57	40 48	036	39 35	099	34 29	140	48 31	162	51 57	219	43 07	258	29 11	309
58	41 07	037	40 08	100	34 50	142	48 40	164	51 36	220	42 35	258	28 46	310
59	41 27	037	40 40	101	35 10	143	48 49	165	51 15	222	42 03	259	28 21	311
	◆Dubhe		POLLUX		BETELGEUSE		◆ALDEBARAN		Hamal		Alpheratz		◆DENEB	
60	41 47	038	41 12	102	35 29	144	48 57	167	50 53	223	41 31	260	27 57	311
61	42 07	038	41 44	103	35 48	145	49 04	168	50 30	224	40 59	261	27 32	312
62	42 27	039	42 15	104	36 07	146	49 11	169	50 07	226	40 27	262	27 08	313
63	42 48	039	42 47	105	36 25	147	49 16	171	49 43	227	39 54	263	26 44	313
64	43 08	039	43 19	106	36 42	148	49 21	172	49 19	228	39 22	264	26 21	314
65	43 29	040	43 50	106	36 59	150	49 25	174	48 55	229	38 49	265	25 57	315
66	43 50	040	44 21	107	37 15	151	49 28	175	48 29	231	38 17	266	25 34	315
67	44 12	041	44 52	108	37 31	152	49 30	177	48 04	232	37 44	267	25 11	316
68	44 33	041	45 23	110	37 46	153	49 32	178	47 38	233	37 11	267	24 49	317
69	44 55	042	45 54	111	38 00	155	49 32	180	47 12	234	36 39	268	24 26	317
70	45 16	042	46 25	112	38 14	156	49 32	181	46 45	235	36 06	269	24 04	318
71	45 38	043	46 55	113	38 27	157	49 31	183	46 18	237	35 33	270	23 43	319
72	46 01	043	47 25	114	38 39	158	49 29	184	45 50	238	35 01	271	23 21	319
73	46 23	043	47 55	115	38 51	159	49 26	186	45 23	239	34 28	272	23 00	320
74	46 46	044	48 24	116	39 02	161	49 23	187	44 55	240	33 55	272	22 39	321
	◆Dubhe		REGULUS		PROCYON		◆SIRIUS		ALDEBARAN		◆Alpheratz		DENEB	
75	47 08	044	16 52	094	29 25	133	13 02	154	49 18	189	33 23	273	22 18	321
76	47 31	045	17 24	095	29 49	134	13 16	155	49 13	190	32 50	274	21 58	322
77	47 54	045	17 57	096	30 12	135	13 29	156	49 07	191	32 17	275	21 38	323
78	48 17	045	18 29	097	30 35	136	13 42	157	49 00	193	31 45	276	21 18	323
79	48 41	046	19 02	098	30 58	137	13 55	158	48 52	194	31 12	277	20 59	324
80	49 04	046	19 34	098	31 20	138	14 07	159	48 44	196	30 40	277	20 40	325
81	49 28	047	20 06	099	31 42	139	14 19	160	48 34	197	30 08	278	20 21	325
82	49 52	047	20 39	100	32 03	140	14 30	161	48 24	199	29 35	279	20 03	326
83	50 16	047	21 11	101	32 23	141	14 40	162	48 13	200	29 03	280	19 44	327
84	50 40	048	21 43	102	32 44	142	14 50	163	48 02	201	28 31	280	19 27	327
85	51 04	048	22 15	103	33 03	144	15 00	164	47 50	203	27 59	281	19 09	328
86	51 29	049	22 47	104	33 22	145	15 08	165	47 36	204	27 27	282	18 52	329
87	51 53	049	23 18	105	33 41	146	15 17	166	47 23	206	26 55	283	18 35	329
88	52 18	049	23 50	105	33 59	147	15 25	167	47 08	207	26 23	284	18 19	330
89	52 43	050	24 21	106	34 17	148	15 32	168	46 53	208	25 51	284	18 02	331

LAT 57°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Dubhe		◆REGULUS		PROCYON		SIRIUS		◆ALDEBARAN		Mirfak		◆DENEB	
90	53 08	050	24 53	107	34 34	149	15 39	169	46 37	210	66 17	269	17 47	331
91	53 33	051	25 24	108	34 50	150	15 45	170	46 21	211	65 44	270	17 31	332
92	53 59	051	25 55	109	35 06	152	15 50	171	46 03	212	65 12	271	17 16	333
93	54 24	051	26 25	110	35 21	153	15 55	172	45 46	214	64 39	272	17 01	333
94	54 50	052	26 56	111	35 36	154	16 00	173	45 27	215	64 06	273	16 47	334
95	55 15	052	27 26	112	35 50	155	16 04	174	45 08	216	63 34	273	16 33	335
96	55 41	052	27 57	113	36 03	156	16 07	175	44 49	218	63 01	274	16 19	335
97	56 07	053	28 27	114	36 16	158	16 10	176	44 28	219	62 29	275	16 05	336
98	56 33	053	28 56	115	36 28	159	16 12	177	44 08	220	61 56	276	15 52	337
99	56 59	053	29 26	116	36 40	160	16 14	178	43 46	221	61 23	276	15 40	338
100	57 25	054	29 55	117	36 51	161	16 15	179	43 24	223	60 51	277	15 28	338
101	57 52	054	30 24	118	37 01	162	16 16	180	43 02	224	60 19	278	15 16	339
102	58 18	054	30 53	119	37 11	164	16 16	181	42 39	225	59 46	278	15 04	340
103	58 45	055	31 22	120	37 19	165	16 15	182	42 16	226	59 14	279	14 53	340
104	59 12	055	31 50	121	37 28	166	16 14	183	41 52	227	58 42	280	14 42	341
	Alioth		◆REGULUS		PROCYON		BETELGEUSE		◆ALDEBARAN		Mirfak		◆DENEB	
105	44 32	052	32 18	122	37 35	167	38 51	201	41 28	228	58 10	281	14 32	342
106	44 58	052	32 46	123	37 42	169	38 39	202	41 03	230	57 37	281	14 22	342
107	45 24	053	33 13	124	37 48	170	38 27	203	40 38	231	57 05	282	14 12	343
108	45 50	053	33 40	125	37 53	171	38 14	204	40 13	232	56 34	283	14 03	344
109	46 17	054	34 06	126	37 58	172	38 00	205	39 47	233	56 02	283	13 54	345
110	46 43	054	34 33	127	38 02	174	37 46	207	39 20	234	55 30	284	13 46	345
111	47 10	055	34 59	128	38 05	175	37 31	208	38 54	235	54 58	285	13 37	346
112	47 36	055	35 24	129	38 08	176	37 15	209	38 27	236	54 27	285	13 30	347
113	48 03	056	35 49	130	38 10	177	36 59	210	37 59	237	53 55	286	13 22	347
114	48 31	056	36 14	131	38 11	179	36 42	212	37 32	238	53 24	286	13 16	348
115	48 58	057	36 39	132	38 11	180	36 25	213	37 04	239	52 52	287	13 09	349
116	49 25	057	37 03	133	38 11	181	36 07	214	36 36	241	52 21	288	13 03	350
117	49 53	058	37 26	135	38 10	183	35 48	215	36 07	242	51 50	288	12 57	350
118	50 21	058	37 49	136	38 08	184	35 29	216	35 38	243	51 19	289	12 52	351
119	50 49	059	38 12	137	38 05	185	35 10	217	35 09	244	50 48	290	12 47	352
	◆Kochab		ARCTURUS		◆REGULUS		PROCYON		BETELGEUSE		◆CAPELLA		DENEB	
120	50 42	025	13 45	076	38 34	138	38 02	186	34 50	218	62 59	264	12 43	352
121	50 56	025	14 17	077	38 55	139	37 58	188	34 29	220	62 26	265	12 39	353
122	51 10	025	14 49	078	39 16	140	37 54	189	34 08	221	61 54	265	12 35	354
123	51 24	026	15 21	078	39 37	142	37 48	190	33 46	222	61 21	266	12 32	355
124	51 38	026	15 53	079	39 57	143	37 42	191	33 24	223	60 48	267	12 29	355
125	51 52	026	16 25	080	40 17	144	37 35	193	33 02	224	60 16	268	12 26	356
126	52 07	026	16 58	081	40 35	145	37 28	194	32 39	225	59 43	269	12 24	357
127	52 21	027	17 30	082	40 54	146	37 20	195	32 15	226	59 10	270	12 23	357
128	52 36	027	18 02	082	41 12	148	37 11	196	31 52	227	58 38	271	12 21	358
129	52 51	027	18 35	083	41 29	149	37 01	198	31 27	228	58 05	272	12 21	359
130	53 06	027	19 07	084	41 45	150	36 51	199	31 03	229	57 32	272	12 20	000
131	53 21	027	19 40	085	42 01	151	36 40	200	30 38	230	57 00	273	12 20	000
132	53 36	027	20 12	086	42 17	153	36 29	201	30 12	232	56 27	274	12 21	001
133	53 51	028	20 45	087	42 31	154	36 17	202	29 47	233	55 54	275	12 21	002
134	54 06	028	21 17	087	42 45	155	36 04	204	29 21	234	55 22	275	12 23	003
	DENEB		◆VEGA		ARCTURUS		◆REGULUS		PROCYON		BETELGEUSE		◆CAPELLA	
135	12 24	003	10 24	027	21 50	088	42 59	157	35 51	205	28 54	235	54 49	276
136	12 26	004	10 39	028	22 23	089	43 11	158	35 37	206	28 27	236	54 17	277
137	12 29	005	10 55	029	22 55	090	43 23	159	35 22	207	28 00	237	53 45	278
138	12 32	005	11 11	030	23 28	091	43 34	161	35 07	208	27 33	238	53 12	278
139	12 35	006	11 27	030	24 01	092	43 45	162	34 51	210	27 05	239	52 40	279
140	12 39	007	11 44	031	24 33	092	43 55	163	34 34	211	26 37	240	52 08	280
141	12 43	008	12 01	032	25 06	093	44 04	165	34 17	212	26 09	241	51 36	281
142	12 47	008	12 19	033	25 39	094	44 12	166	34 00	213	25 40	241	51 03	281
143	12 52	009	12 37	033	26 11	095	44 20	167	33 42	214	25 11	242	50 31	282
144	12 57	010	12 55	034	26 44	096	44 27	169	33 23	215	24 42	243	50 00	283
145	13 03	010	13 13	035	27 16	097	44 33	170	33 04	216	24 13	244	49 28	283
146	13 09	011	13 32	036	27 49	098	44 38	171	32 44	218	23 43	245	48 56	284
147	13 16	012	13 51	036	28 21	099	44 43	173	32 24	219	23 13	246	48 24	285
148	13 23	013	14 11	037	28 53	099	44 46	174	32 04	220	22 43	247	47 53	285
149	13 30	013	14 31	038	29 26	100	44 49	175	31 42	221	22 13	248	47 21	286
	DENEB		◆VEGA		ARCTURUS		Denebola		◆REGULUS		POLLUX		◆CAPELLA	
150	13 38	014	14 51	039	29 58	101	42 40	143	44 52	177	52 39	233	46 50	287
151	13 46	015	15 12	039	30 30	102	43 00	144	44 53	178	52 12	235	46 19	287
152	13 54	015	15 32	040	31 02	103	43 19	145	44 54	180	51 46	236	45 48	288
153	14 03	016	15 54	041	31 33	104	43 37	146	44 53	181	51 18	237	45 17	289
154	14 12	017	16 15	041	32 05	105	43 55	148	44 52	182	50 51	238	44 46	289
155	14 22	018	16 37	042	32 36	106	44 12	149	44 51	184	50 23	239	44 15	290
156	14 32	018	16 59	043	33 08	107	44 28	150	44 48	185	49 54	241	43 44	291
157	14 42	019	17 21	044	33 39	108	44 44	152	44 45	186	49 26	242	43 14	291
158	14 53	020	17 44	044	34 10	109	45 00	153	44 41	188	48 57	243	42 44	292
159	15 04	020	18 07	045	34 41	110	45 14	154	44 36	189	48 28	244	42 13	293
160	15 16	021	18 30	046	35 12	111	45 28	156	44 30	191	47 58	245	41 43	293
161	15 28	022	18 54	046	35 42	112	45 41	157	44 24	192	47 28	246	41 13	294
162	15 40	022	19 18	047	36 13	112	45 54	158	44 17	193	46 58	247	40 44	295
163	15 53	023	19 42	048	36 43	113	46 05	160	44 09	195	46 28	248	40 14	295
164	16 06	024	20 06	049	37 12	114	46 16	161	44 00	196	45 58	249	39 45	296
	◆DENEB		VEGA		ARCTURUS		◆SPICA		REGULUS		◆POLLUX		CAPELLA	
165	16 19	025	20 31	049	37 42	116	15 25	143	43 51	197	45 27	250	39 15	297
166	16 33	025	20 56	050	38 11	117	15 45	144	43 41	199	44 56	251	38 46	297
167	16 47	026	21 21	051	38 41	118	16 04	145	43 30	200	44 25	252	38 17	298
168	17 02	027	21 46	051	39 09	119	16 23	146	43 18	201	43 54	253	37 48	299
169	17 16	027	22 12	052	39 38	120	16 41	147	43 06	203	43 22	254	37 20	299
170	17 31	028	22 38	053	40 06	121	16 59	148	42 53	204	42 51	255	36 51	300
171	17 47	029	23 04	054	40 34	122	17 16	149	42 40	205	42 19	256	36 23	300
172	18 03	029	23 30	054	41 02	123	17 33	150	42 25	207	41 47	257	35 55	301
173	18 19	030	23 57	055	41 29	124	17 49	151	42 10	208	41 15	258	35 27	302
174	18 36	031	24 24	056	41 56	125	18 05	152	41 55	209	40 43	259	34 59	302
175	18 52	031	24 51	056	42 22	126	18 20	153	41 39	210	40 11	260	34 32	303
176	19 10	032	25 18	057	42 49	127	18 35	154	41 22	212	39 39	261	34 04	304
177	19 27	033	25 46	058	43 14	129	18 49	155	41 04	213	39 07	262	33 37	304
178	19 45	033	26 13	058	43 40	130	19 03	156	40 46	214	38 34	263	33 10	305
179	20 03	034	26 41	059	44 05	131	19 16	157	40 28	215	38 02	264	32 44	305

Tilbage til Menuen

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LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
180	20 22	035	27 09	060	44 29	132	19 29	158	40 08	217	37 29	265	32 17	306
181	20 40	035	27 38	060	44 53	133	19 41	159	39 49	218	36 57	265	31 51	307
182	20 59	036	28 06	061	45 17	134	19 53	160	39 29	219	36 24	266	31 25	307
183	21 19	037	28 35	062	45 40	136	20 04	161	39 08	220	35 52	267	30 59	308
184	21 39	037	29 04	063	46 02	137	20 15	162	38 46	221	35 19	268	30 33	309
185	21 59	038	29 33	063	46 24	138	20 25	163	38 25	222	34 46	269	30 08	309
186	22 19	039	30 02	064	46 46	140	20 34	164	38 02	224	34 14	270	29 43	310
187	22 40	039	30 32	065	47 07	141	20 43	165	37 40	225	33 41	271	29 18	311
188	23 00	040	31 01	065	47 27	142	20 51	166	37 16	226	33 08	271	28 53	311
189	23 22	041	31 31	066	47 47	143	20 59	167	36 53	227	32 36	272	28 29	312
190	23 43	041	32 01	067	48 06	145	21 06	168	36 29	228	32 03	273	28 05	313
191	24 05	042	32 31	068	48 25	146	21 13	169	36 04	229	31 30	274	27 41	313
192	24 27	043	33 02	068	48 43	147	21 19	170	35 39	230	30 58	275	27 17	314
193	24 49	043	33 32	069	49 00	149	21 24	171	35 14	231	30 25	275	26 53	314
194	25 12	044	34 03	070	49 16	150	21 29	172	34 48	232	29 53	276	26 30	315
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	25 35	045	34 33	070	21 56	101	49 32	152	34 22	234	29 20	277	26 07	316
196	25 58	045	35 04	071	22 28	102	49 48	153	33 55	235	28 48	278	25 45	316
197	26 21	046	35 35	072	23 00	103	50 02	154	33 29	236	28 15	279	25 22	317
198	26 45	047	36 06	072	23 32	104	50 16	156	33 02	237	27 43	279	25 00	318
199	27 09	047	36 37	073	24 04	105	50 29	157	32 34	238	27 11	280	24 38	318
200	27 33	048	37 09	074	24 35	105	50 41	159	32 06	239	26 39	281	24 17	319
201	27 57	049	37 40	075	25 07	106	50 52	160	31 38	240	26 07	282	23 55	320
202	28 22	049	38 12	075	25 38	107	51 03	162	31 10	241	25 35	283	23 34	320
203	28 47	050	38 43	076	26 09	108	51 13	163	30 41	242	25 03	283	23 14	321
204	29 12	051	39 15	077	26 40	109	51 22	165	30 12	243	24 31	284	22 53	322
205	29 37	051	39 47	078	27 11	110	51 30	166	29 43	244	24 00	285	22 33	322
206	30 03	052	40 19	078	27 41	111	51 38	168	29 14	245	23 28	286	22 13	323
207	30 29	052	40 51	079	28 12	112	51 44	169	28 44	246	22 57	286	21 54	324
208	30 55	053	41 23	080	28 42	113	51 50	171	28 14	247	22 26	287	21 34	324
209	31 21	054	41 55	081	29 12	114	51 55	172	27 44	248	21 54	288	21 15	325
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
210	31 47	054	42 28	081	29 42	115	51 59	174	27 14	248	21 23	289	20 57	326
211	32 14	055	43 00	082	30 11	116	52 02	175	26 43	249	20 53	290	20 38	326
212	32 41	056	43 32	083	30 41	117	52 04	177	26 13	250	20 22	290	20 20	327
213	33 08	056	44 05	084	31 10	118	52 06	178	25 42	251	19 51	291	20 03	328
214	33 35	057	44 37	084	31 39	119	52 06	180	25 11	252	19 21	292	19 45	328
215	34 03	058	45 10	085	32 07	120	52 06	181	24 40	253	18 51	293	19 28	329
216	34 31	058	45 43	086	32 35	121	52 05	183	24 08	254	18 21	293	19 12	330
217	34 58	059	46 15	087	33 03	122	52 03	184	23 37	255	17 51	294	18 55	330
218	35 27	060	46 48	088	33 31	123	52 00	186	23 05	256	17 21	295	18 39	331
219	35 55	060	47 20	088	33 58	124	51 56	188	22 33	257	16 51	296	18 24	332
220	36 23	061	47 53	089	34 25	125	51 51	189	22 01	258	16 22	296	18 08	332
221	36 52	061	48 26	090	34 52	126	51 45	191	21 30	258	15 53	297	17 53	333
222	37 21	062	48 59	091	35 18	127	51 39	192	20 57	259	15 24	298	17 39	334
223	37 50	063	49 31	092	35 44	128	51 32	194	20 25	260	14 55	299	17 24	334
224	38 19	063	50 04	093	36 10	129	51 24	195	19 53	261	14 27	300	17 10	335
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		Dubhe		◆ CAPELLA	
225	38 48	064	50 36	094	36 35	130	51 15	197	34 27	240	60 41	304	16 57	336
226	39 18	065	51 09	094	36 59	131	51 05	198	33 59	241	60 14	304	16 44	336
227	39 47	065	51 42	095	37 24	132	50 54	200	33 30	242	59 47	305	16 31	337
228	40 17	066	52 14	096	37 48	134	50 43	201	33 01	243	59 20	305	16 18	338
229	40 47	067	52 47	097	38 11	135	50 31	202	32 32	244	58 54	305	16 06	339
230	41 17	067	53 19	098	38 34	136	50 18	204	32 02	245	58 27	306	15 54	339
231	41 47	068	53 51	099	38 57	137	50 04	205	31 33	246	58 00	306	15 43	340
232	42 17	069	54 23	100	39 19	138	49 50	207	31 03	247	57 34	306	15 32	341
233	42 48	069	54 56	101	39 40	139	49 35	208	30 32	248	57 08	307	15 21	341
234	43 19	070	55 28	102	40 01	141	49 19	210	30 02	249	56 41	307	15 11	342
235	43 49	071	56 00	103	40 22	142	49 03	211	29 32	250	56 15	307	15 01	343
236	44 20	071	56 31	104	40 42	143	48 46	212	29 01	251	55 49	308	14 51	343
237	44 51	072	57 03	105	41 01	144	48 28	214	28 30	252	55 23	308	14 42	344
238	45 22	073	57 34	106	41 20	145	48 09	215	27 59	253	54 58	308	14 33	345
239	45 54	073	58 06	107	41 38	147	47 50	216	27 27	254	54 32	309	14 25	345
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		Dubhe		◆ CAPELLA	
240	46 25	074	58 37	108	41 56	148	47 31	218	26 56	255	54 07	309	14 17	346
241	46 56	075	59 08	109	42 13	149	47 10	219	26 24	255	53 41	309	14 09	347
242	47 28	075	59 38	111	42 29	150	46 49	220	25 53	256	53 16	310	14 02	348
243	48 00	076	60 09	112	42 45	152	46 28	222	25 21	257	52 51	310	13 55	348
244	48 31	077	60 39	113	43 00	153	46 06	223	24 49	258	52 26	310	13 49	349
245	49 03	077	61 09	114	43 15	154	45 44	224	24 17	259	52 01	311	13 43	350
246	49 35	078	61 39	116	43 29	156	45 21	225	23 45	260	51 37	311	13 37	350
247	50 07	079	62 08	117	43 42	157	44 57	227	23 13	261	51 12	312	13 32	351
248	50 39	080	62 37	118	43 54	158	44 33	228	22 40	262	50 48	312	13 27	352
249	51 12	080	63 06	119	44 06	160	44 09	229	22 08	263	50 24	312	13 23	353
250	51 44	081	63 34	121	44 17	161	43 44	230	21 36	263	50 00	313	13 19	353
251	52 16	082	64 02	122	44 28	162	43 19	231	21 03	264	49 36	313	13 15	354
252	52 48	082	64 29	124	44 37	164	42 53	232	20 31	265	49 12	314	13 12	355
253	53 21	083	64 56	125	44 46	165	42 27	234	19 58	266	48 48	314	13 09	355
254	53 53	084	65 22	127	44 54	166	42 00	235	19 25	267	48 25	314	13 07	356
	Schedar		DENEB		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Dubhe		◆ CAPELLA	
255	34 54	037	54 26	085	31 37	128	45 02	168	41 34	236	48 02	315	13 05	357
256	35 14	038	54 58	086	32 02	129	45 08	169	41 06	237	47 38	315	13 03	358
257	35 34	038	55 31	086	32 28	130	45 14	170	40 39	238	47 16	316	13 02	358
258	35 54	039	56 04	087	32 52	131	45 19	172	40 11	239	46 53	316	13 01	359
259	36 15	039	56 36	088	33 17	132	45 23	173	39 43	240	46 30	316	13 01	000
260	36 36	040	57 09	089	33 41	133	45 27	175	39 14	241	46 08	317	13 01	000
261	36 57	041	57 42	090	34 05	134	45 30	176	38 46	242	45 46	317	13 01	001
262	37 18	041	58 14	090	34 28	135	45 32	177	38 16	243	45 24	318	13 02	002
263	37 40	042	58 47	091	34 50	137	45 33	179	37 47	244	45 02	318	13 03	003
264	38 01	042	59 20	092	35 13	138	45 33	180	37 18	245	44 40	319	13 05	003
265	38 24	043	59 52	093	35 34	139	45 33	182	36 48	246	44 18	319	13 07	004
266	38 46	043	60 25	094	35 56	140	45 31	183	36 18	247	43 57	319	13 09	005
267	39 08	044	60 57	095	36 17	141	45 29	184	35 47	248	43 36	320	13 12	005
268	39 31	044	61 30	096	36 37	142	45 26	186	35 17	249	43 15	320	13 16	006
269	39 54	045	62 03	097	36 57	143	45 23	187	34 46	250	42 54	321	13 19	007

LAT 57°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Dubhe	
270	13 23	008	22 57	071	37 16	145	45 18	188	34 15	251	52 50	286	42 34	321
271	13 28	008	23 28	072	37 35	146	45 13	190	33 44	252	52 18	286	42 13	322
272	13 33	009	23 59	073	37 53	147	45 07	191	33 13	253	51 47	287	41 53	322
273	13 38	010	24 30	074	38 10	148	45 00	193	32 42	254	51 16	288	41 33	323
274	13 44	010	25 01	074	38 27	149	44 53	194	32 10	255	50 45	288	41 14	323
275	13 50	011	25 33	075	38 44	151	44 45	195	31 39	256	50 14	289	40 54	324
276	13 56	012	26 05	076	38 59	152	44 36	197	31 07	257	49 43	290	40 35	324
277	14 03	012	26 36	077	39 15	153	44 26	198	30 35	258	49 12	290	40 16	324
278	14 10	013	27 08	077	39 29	154	44 15	199	30 03	259	48 42	291	39 57	325
279	14 18	014	27 40	078	39 43	155	44 04	201	29 31	260	48 11	291	39 38	325
280	14 26	015	28 12	079	39 56	157	43 52	202	28 59	260	47 41	292	39 20	326
281	14 34	015	28 44	080	40 09	158	43 40	203	28 27	261	47 11	293	39 01	326
282	14 43	016	29 17	081	40 21	159	43 26	205	27 54	262	46 40	293	38 43	327
283	14 52	017	29 49	081	40 32	161	43 12	206	27 22	263	46 11	294	38 26	327
284	15 02	017	30 21	082	40 43	162	42 58	207	26 49	264	45 41	294	38 08	328
	◆ CAPELLA		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Dubhe	
285	15 12	018	30 54	083	40 53	163	42 42	209	26 17	265	45 11	295	37 51	328
286	15 22	019	31 26	084	41 02	164	42 26	210	25 44	266	44 41	296	37 34	329
287	15 33	019	31 59	085	41 10	166	42 10	211	25 12	267	44 12	296	37 17	329
288	15 44	020	32 31	085	41 18	167	41 53	212	24 39	267	43 43	297	37 00	330
289	15 55	021	33 04	086	41 25	168	41 35	214	24 06	268	43 14	297	36 44	330
290	16 07	022	33 36	087	41 31	170	41 17	215	23 34	269	42 45	298	36 28	331
291	16 19	022	34 09	088	41 37	171	40 58	216	23 01	270	42 16	299	36 12	331
292	16 32	023	34 42	089	41 41	172	40 38	217	22 28	271	41 48	299	35 56	332
293	16 45	024	35 14	090	41 46	174	40 18	218	21 56	272	41 19	300	35 41	332
294	16 58	024	35 47	090	41 49	175	39 57	220	21 23	272	40 51	300	35 26	333
295	17 12	025	36 20	091	41 51	176	39 36	221	20 50	273	40 23	301	35 11	333
296	17 26	026	36 52	092	41 53	178	39 15	222	20 18	274	39 55	302	34 56	334
297	17 40	026	37 25	093	41 54	179	38 53	223	19 45	275	39 27	302	34 42	334
298	17 55	027	37 58	094	41 55	180	38 30	224	19 13	276	39 00	303	34 28	335
299	18 10	028	38 30	095	41 54	181	38 07	225	18 40	277	38 32	303	34 14	335
	CAPELLA		◆ Alpheratz		Enif		ALTAIR		◆ VEGA		Alphecca		◆ Dubhe	
300	18 25	028	39 03	096	38 46	146	41 53	183	67 20	225	34 58	266	34 00	336
301	18 41	029	39 35	096	39 03	147	41 51	184	66 56	227	34 25	267	33 47	336
302	18 57	030	40 08	097	39 21	148	41 48	185	66 32	229	33 52	268	33 34	337
303	19 13	030	40 40	098	39 38	150	41 45	187	66 07	231	33 20	268	33 21	337
304	19 30	031	41 12	099	39 54	151	41 40	188	65 41	232	32 47	269	33 08	338
305	19 47	032	41 45	100	40 09	152	41 35	189	65 15	234	32 14	270	32 56	338
306	20 05	032	42 17	101	40 24	153	41 30	191	64 49	235	31 42	271	32 44	339
307	20 22	033	42 49	102	40 39	155	41 23	192	64 22	237	31 09	272	32 32	339
308	20 40	034	43 21	103	40 52	156	41 16	193	63 54	238	30 36	273	32 21	340
309	20 59	034	43 52	104	41 05	157	41 08	195	63 26	240	30 04	273	32 09	340
310	21 17	035	44 24	105	41 18	159	41 00	196	62 58	241	29 31	274	31 58	341
311	21 36	036	44 56	106	41 29	160	40 50	197	62 29	242	28 59	275	31 48	341
312	21 56	036	45 27	107	41 40	161	40 40	199	62 00	244	28 26	276	31 37	342
313	22 15	037	45 58	108	41 50	162	40 29	200	61 31	245	27 54	277	31 27	342
314	22 35	038	46 29	109	42 00	164	40 18	201	61 01	246	27 21	278	31 18	343
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
315	22 55	038	26 34	087	47 00	110	42 09	165	40 06	202	60 31	247	32 22	325
316	23 16	039	27 06	088	47 31	111	42 17	166	39 53	204	60 00	248	32 04	326
317	23 36	040	27 39	089	48 01	112	42 24	168	39 40	205	59 30	250	31 46	327
318	23 57	040	28 12	090	48 31	113	42 31	169	39 26	206	58 59	251	31 28	327
319	24 19	041	28 44	090	49 01	114	42 37	170	39 11	207	58 28	252	31 10	328
320	24 40	042	29 17	091	49 31	115	42 42	172	38 56	209	57 57	253	30 53	328
321	25 02	042	29 50	092	50 00	116	42 46	173	38 40	210	57 26	254	30 36	329
322	25 24	043	30 22	093	50 30	117	42 50	174	38 23	211	56 54	255	30 19	329
323	25 47	044	30 55	094	50 58	119	42 53	176	38 06	212	56 23	256	30 03	330
324	26 10	044	31 27	095	51 27	120	42 55	177	37 48	213	55 51	257	29 46	330
325	26 32	045	32 00	096	51 55	121	42 56	178	37 30	215	55 19	258	29 30	331
326	26 56	046	32 33	096	52 23	122	42 57	180	37 11	216	54 47	259	29 15	332
327	27 19	046	33 05	097	52 50	123	42 56	181	36 52	217	54 15	260	28 59	332
328	27 43	047	33 37	098	53 18	125	42 55	182	36 32	218	53 42	261	28 44	333
329	28 07	048	34 10	099	53 44	126	42 54	184	36 12	219	53 10	262	28 29	333
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
330	28 31	048	34 42	100	54 11	127	42 51	185	35 51	220	52 38	263	28 15	334
331	28 56	049	35 14	101	54 36	128	42 48	186	35 29	222	52 05	264	28 01	334
332	29 20	049	35 46	102	55 02	130	42 44	188	35 07	223	51 33	265	27 47	335
333	29 45	050	36 18	103	55 27	131	42 39	189	34 45	224	51 00	266	27 33	336
334	30 10	051	36 50	104	55 51	133	42 34	190	34 22	225	50 27	267	27 20	336
335	30 36	051	37 21	105	56 15	134	42 27	192	33 59	226	49 55	268	27 07	337
336	31 02	052	37 53	106	56 38	135	42 20	193	33 35	227	49 22	268	26 54	337
337	31 27	053	38 24	107	57 01	137	42 13	194	33 11	228	48 49	269	26 42	338
338	31 54	053	38 56	108	57 23	138	42 04	196	32 46	229	48 17	270	26 30	339
339	32 20	054	39 27	109	57 44	140	41 55	197	32 22	230	47 44	271	26 18	339
340	32 46	055	39 58	110	58 05	141	41 45	198	31 56	231	47 11	272	26 06	340
341	33 13	055	40 28	110	58 25	143	41 34	200	31 30	232	46 39	273	25 55	340
342	33 40	056	40 59	112	58 45	144	41 23	201	31 04	233	46 06	273	25 44	341
343	34 07	056	41 29	113	59 03	146	41 11	202	30 38	234	45 34	274	25 34	342
344	34 34	057	41 59	114	59 21	147	40 58	203	30 11	235	45 01	275	25 24	342
	CAPELLA		ALDEBARAN		◆ Hamal		Alpheratz		◆ ALTAIR		VEGA		◆ Alioth	
345	35 02	058	16 57	086	42 29	115	59 38	149	29 44	236	44 28	276	25 14	343
346	35 30	058	17 30	086	42 59	116	59 55	151	29 17	237	43 56	277	25 04	343
347	35 58	059	18 02	087	43 28	117	60 10	152	28 49	238	43 24	277	24 55	344
348	36 26	060	18 35	088	43 57	118	60 25	154	28 21	239	42 51	278	24 46	344
349	36 54	060	19 08	089	44 26	119	60 39	156	27 53	240	42 19	279	24 37	345
350	37 23	061	19 40	090	44 54	120	60 52	158	27 24	241	41 47	280	24 29	346
351	37 51	062	20 13	091	45 22	121	61 04	159	26 55	242	41 14	280	24 21	346
352	38 20	062	20 46	091	45 50	122	61 15	161	26 26	243	40 42	281	24 14	347
353	38 49	063	21 18	092	46 18	123	61 25	163	25 57	244	40 10	282	24 06	347
354	39 18	063	21 51	093	46 45	125	61 34	165	25 27	245	39 38	283	24 00	348
355	39 47	064	22 23	094	47 11	126	61 42	166	24 58	246	39 06	283	23 53	349
356	40 17	065	22 56	095	47 38	127	61 49	168	24 28	247	38 35	284	23 47	349
357	40 47	065	23 29	096	48 04	128	61 56	170	23 57	248	38 03	285	23 41	350
358	41 16	066	24 01	097	48 29	129	62 01	172	23 27	249	37 32	286	23 35	350
359	41 46	067	24 34	097	48 54	131	62 05	174	22 56	250	37 00	286	23 30	351

LAT 56°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		ALTAIR		◆ VEGA	
0	28 10	007	41 53	066	25 14	098	49 59	131	63 07	176	22 45	251	36 11	288
1	28 15	008	42 24	067	25 48	099	50 24	132	63 09	178	22 13	252	35 39	288
2	28 19	008	42 55	068	26 21	100	50 48	133	63 10	179	21 41	253	35 07	289
3	28 25	009	43 26	068	26 54	100	51 12	135	63 10	181	21 09	254	34 36	290
4	28 30	010	43 57	069	27 27	101	51 36	136	63 09	183	20 37	255	34 04	290
5	28 36	010	44 28	070	27 59	102	51 59	137	63 06	185	20 04	256	33 33	291
6	28 42	011	45 00	070	28 32	103	52 21	139	63 03	187	19 32	257	33 02	292
7	28 48	011	45 32	071	29 05	104	52 43	140	62 58	189	18 59	257	32 30	293
8	28 55	012	46 03	072	29 37	105	53 04	142	62 52	191	18 26	258	32 00	293
9	29 01	012	46 35	072	30 10	106	53 25	143	62 45	193	17 53	259	31 29	294
10	29 09	013	47 07	073	30 42	107	53 44	144	62 37	195	17 20	260	30 58	295
11	29 16	013	47 39	074	31 14	108	54 04	146	62 28	197	16 47	261	30 28	295
12	29 24	014	48 12	074	31 46	109	54 22	147	62 18	198	16 14	262	29 58	296
13	29 32	014	48 44	075	32 18	110	54 40	149	62 07	200	15 41	263	29 28	297
14	29 41	015	49 16	076	32 49	111	54 57	150	61 55	202	15 07	263	28 58	297
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		DENEB		◆ VEGA	
15	29 49	015	49 49	076	33 20	111	55 13	152	61 42	204	49 21	283	28 28	298
16	29 58	016	50 22	077	33 51	112	55 28	154	61 27	206	48 49	284	27 58	299
17	30 08	016	50 54	078	34 22	113	55 43	155	61 12	207	48 16	284	27 29	299
18	30 17	017	51 27	078	34 53	114	55 56	157	60 57	209	47 44	285	27 00	300
19	30 27	017	52 00	079	35 23	115	56 09	158	60 40	211	47 11	286	26 31	301
20	30 37	018	52 33	080	35 54	116	56 21	160	60 22	212	46 39	286	26 02	302
21	30 48	018	53 06	080	36 24	117	56 32	161	60 04	214	46 07	287	25 34	302
22	30 58	019	53 39	081	36 53	118	56 43	163	59 45	216	45 35	288	25 06	303
23	31 09	019	54 12	082	37 23	119	56 52	165	59 25	217	45 03	288	24 38	304
24	31 21	020	54 46	082	37 52	121	57 00	166	59 04	219	44 31	289	24 10	304
25	31 32	020	55 19	083	38 20	122	57 08	168	58 42	220	44 00	290	23 42	305
26	31 44	021	55 52	084	38 49	123	57 14	170	58 20	222	43 28	290	23 15	306
27	31 56	021	56 26	085	39 17	124	57 19	171	57 58	223	42 57	291	22 48	306
28	32 09	022	56 59	085	39 45	125	57 24	173	57 34	225	42 25	292	22 21	307
29	32 21	022	57 32	086	40 12	126	57 27	175	57 10	226	41 54	292	21 54	308
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		DENEB		◆ VEGA	
30	32 34	023	58 06	087	40 39	127	57 30	177	56 46	228	41 23	293	21 28	308
31	32 47	023	58 39	088	41 06	128	57 31	178	56 20	229	40 53	294	21 01	309
32	33 01	024	59 13	089	41 32	129	57 32	180	55 55	231	40 22	294	20 36	310
33	33 15	024	59 47	089	41 58	130	57 31	182	55 29	232	39 51	295	20 10	310
34	33 29	025	60 20	090	42 23	132	57 30	183	55 02	233	39 21	295	19 44	311
35	33 43	025	60 54	091	42 48	133	57 27	185	54 35	235	38 51	296	19 19	312
36	33 58	026	61 27	092	43 12	134	57 24	187	54 07	236	38 21	297	18 55	313
37	34 12	026	62 01	093	43 36	135	57 20	189	53 39	237	37 51	297	18 30	313
38	34 27	027	62 34	094	43 59	136	57 14	190	53 11	238	37 21	298	18 06	314
39	34 43	027	63 08	095	44 22	138	57 08	192	52 42	239	36 51	299	17 42	315
40	34 58	028	63 41	095	44 45	139	57 00	194	52 13	241	36 22	299	17 18	315
41	35 14	028	64 14	096	45 06	140	56 52	195	51 44	242	35 53	300	16 55	316
42	35 30	029	64 48	097	45 28	141	56 43	197	51 14	243	35 24	300	16 31	317
43	35 46	029	65 21	098	45 48	143	56 33	198	50 44	244	34 55	301	16 09	318
44	36 03	030	65 54	099	46 08	144	56 21	200	50 14	245	34 26	302	15 46	318
	◆ Dubhe		POLLUX		BETELGEUSE		◆ ALDEBARAN		Hamal		Alpheratz		◆ DENEB	
45	36 20	030	33 03	088	30 23	127	46 28	145	56 09	202	49 43	246	33 58	302
46	36 37	031	33 36	089	30 50	128	46 47	147	55 57	203	49 12	247	33 30	303
47	36 54	031	34 10	090	31 16	129	47 05	148	55 43	205	48 41	249	33 02	304
48	37 12	032	34 43	090	31 42	130	47 22	149	55 28	206	48 10	250	32 34	304
49	37 29	032	35 17	091	32 07	131	47 39	151	55 13	208	47 38	251	32 06	305
50	37 47	033	35 50	092	32 32	132	47 55	152	54 57	210	47 07	252	31 39	305
51	38 05	033	36 24	093	32 57	133	48 11	153	54 40	211	46 35	253	31 11	306
52	38 24	034	36 57	094	33 21	134	48 26	155	54 22	213	46 03	254	30 44	307
53	38 43	034	37 31	095	33 45	135	48 39	156	54 04	214	45 30	255	30 18	307
54	39 01	034	38 04	095	34 08	137	48 53	158	53 45	215	44 58	256	29 51	308
55	39 21	035	38 38	096	34 31	138	49 05	159	53 25	217	44 25	257	29 25	309
56	39 40	035	39 11	097	34 53	139	49 17	160	53 04	218	43 53	258	28 59	309
57	39 59	036	39 44	098	35 15	140	49 28	162	52 43	220	43 20	258	28 33	310
58	40 19	036	40 17	099	35 36	141	49 38	163	52 21	221	42 47	259	28 07	311
59	40 39	037	40 50	100	35 57	142	49 47	165	51 59	223	42 14	260	27 42	311
	◆ Dubhe		POLLUX		BETELGEUSE		◆ ALDEBARAN		Hamal		Alpheratz		◆ DENEB	
60	40 59	037	41 23	101	36 18	143	49 55	166	51 36	224	41 41	261	27 17	312
61	41 20	038	41 56	102	36 37	145	50 03	168	51 13	225	41 08	262	26 52	312
62	41 40	038	42 29	103	36 57	146	50 10	169	50 48	226	40 34	263	26 27	313
63	42 01	038	43 02	104	37 15	147	50 15	171	50 24	228	40 01	264	26 03	314
64	42 22	039	43 34	105	37 33	148	50 20	172	49 59	229	39 28	265	25 39	314
65	42 43	039	44 07	106	37 51	149	50 25	174	49 33	230	38 54	266	25 15	315
66	43 04	040	44 39	107	38 07	150	50 28	175	49 07	232	38 21	266	24 51	316
67	43 26	040	45 11	108	38 24	152	50 30	177	48 41	233	37 47	267	24 28	316
68	43 48	041	45 43	109	38 39	153	50 32	178	48 14	234	37 14	268	24 05	317
69	44 10	041	46 15	110	38 54	154	50 32	180	47 46	235	36 40	269	23 42	318
70	44 32	041	46 46	111	39 08	155	50 32	181	47 19	236	36 07	270	23 20	318
71	44 54	042	47 17	112	39 22	157	50 31	183	46 51	238	35 33	271	22 57	319
72	45 16	042	47 49	113	39 35	158	50 29	184	46 22	239	34 59	272	22 35	320
73	45 39	043	48 19	114	39 47	159	50 26	186	45 53	240	34 26	272	22 14	320
74	46 02	043	48 50	115	39 59	160	50 22	187	45 24	241	33 52	273	21 53	321
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		ALDEBARAN		◆ Alpheratz		DENEB	
75	46 25	043	16 56	094	30 06	132	13 56	154	50 17	189	33 19	274	21 31	321
76	46 48	044	17 29	095	30 30	133	14 10	155	50 12	190	32 45	275	21 11	322
77	47 11	044	18 03	095	30 54	134	14 24	156	50 06	192	32 12	276	20 50	323
78	47 35	045	18 36	096	31 18	135	14 38	157	49 58	193	31 39	276	20 30	323
79	47 59	045	19 09	097	31 42	137	14 51	158	49 50	195	31 05	277	20 10	324
80	48 23	045	19 43	098	32 04	138	15 03	159	49 41	196	30 32	278	19 51	325
81	48 47	046	20 16	099	32 27	139	15 15	160	49 32	198	29 59	279	19 32	325
82	49 11	046	20 49	100	32 49	140	15 26	161	49 21	199	29 26	279	19 13	326
83	49 35	047	21 22	101	33 10	141	15 37	162	49 10	200	28 53	280	18 54	327
84	49 59	047	21 55	101	33 31	142	15 47	163	48 58	202	28 20	281	18 36	327
85	50 24	047	22 28	102	33 51	143	15 57	164	48 45	203	27 47	282	18 18	328
86	50 49	048	23 01	103	34 11	144	16 06	165	48 31	205	27 14	283	18 01	329
87	51 14	048	23 33	104	34 31	145	16 15	166	48 17	206	26 41	283	17 43	329
88	51 39	048	24 06	105	34 49	147	16 23	167	48 02	208	26 09	284	17 27	330
89	52 04	049	24 38	106	35 08	148	16 30	168	47 46	209	25 36	285	17 10	331

LAT 56°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Dubhe		◆ REGULUS		PROCYON		SIRIUS		◆ ALDEBARAN		Mirfak		◆ DENEB	
90	52 29	049	25 10	107	35 25	149	16 37	169	47 29	210	66 17	272	16 54	332
91	52 55	050	25 42	108	35 42	150	16 44	170	47 12	212	65 43	272	16 38	332
92	53 20	050	26 14	109	35 59	151	16 50	171	46 54	213	65 10	273	16 23	333
93	53 46	050	26 46	110	36 15	152	16 55	172	46 35	214	64 36	274	16 07	334
94	54 12	051	27 17	110	36 30	154	16 59	173	46 16	216	64 03	275	15 53	334
95	54 38	051	27 49	111	36 44	155	17 04	174	45 56	217	63 29	275	15 38	335
96	55 04	051	28 20	112	36 58	156	17 07	175	45 36	218	62 56	276	15 24	336
97	55 30	052	28 51	113	37 12	157	17 10	176	45 15	219	62 22	277	15 11	336
98	55 56	052	29 21	114	37 24	158	17 12	177	44 53	221	61 49	277	14 57	337
99	56 23	052	29 52	115	37 36	160	17 14	178	44 31	222	61 16	278	14 44	338
100	56 49	052	30 22	116	37 48	161	17 15	179	44 08	223	60 43	279	14 32	338
101	57 16	053	30 52	117	37 58	162	17 16	180	43 45	224	60 10	280	14 20	339
102	57 43	053	31 22	118	38 08	163	17 16	181	43 22	226	59 37	280	14 08	340
103	58 10	053	31 51	119	38 17	165	17 15	182	42 57	227	59 04	281	13 56	340
104	58 37	054	32 20	120	38 26	166	17 14	183	42 33	228	58 31	281	13 45	341
	Alioth		◆ REGULUS		PROCYON		BETELGEUSE		◆ ALDEBARAN		Mirfak		◆ DENEB	
105	43 55	051	32 49	121	38 34	167	39 47	201	42 07	229	57 58	282	13 35	342
106	44 21	052	33 18	122	38 41	168	39 35	202	41 42	230	57 25	283	13 25	343
107	44 48	052	33 46	123	38 47	170	39 22	203	41 16	231	56 52	283	13 15	343
108	45 14	053	34 14	124	38 53	171	39 08	205	40 49	233	56 20	284	13 05	344
109	45 41	053	34 41	125	38 58	172	38 54	206	40 23	234	55 47	285	12 56	345
110	46 08	054	35 09	126	39 02	174	38 39	207	39 55	235	55 15	285	12 47	345
111	46 35	054	35 35	127	39 05	175	38 23	208	39 28	236	54 42	286	12 39	346
112	47 02	055	36 02	129	39 08	176	38 07	210	39 00	237	54 10	286	12 31	347
113	47 29	055	36 28	130	39 10	177	37 50	211	38 32	238	53 38	287	12 24	348
114	47 57	055	36 54	131	39 11	179	37 33	212	38 03	239	53 06	288	12 17	348
115	48 25	056	37 19	132	39 11	180	37 15	213	37 34	240	52 34	288	12 10	349
116	48 53	056	37 44	133	39 11	181	36 56	214	37 05	241	52 02	289	12 04	350
117	49 21	057	38 08	134	39 10	183	36 37	215	36 35	242	51 31	289	11 58	350
118	49 49	057	38 32	135	39 08	184	36 17	217	36 05	243	50 59	290	11 53	351
119	50 17	058	38 55	136	39 05	185	35 57	218	35 35	244	50 28	291	11 48	352
	◆ Kochab		ARCTURUS		◆ REGULUS		PROCYON		BETELGEUSE		◆ CAPELLA		DENEB	
120	49 47	024	13 31	076	39 18	138	39 02	186	35 36	219	63 04	266	11 43	352
121	50 01	025	14 03	077	39 41	139	38 58	188	35 15	220	62 31	266	11 39	353
122	50 15	025	14 36	077	40 02	140	38 53	189	34 53	221	61 57	267	11 35	354
123	50 30	025	15 09	078	40 24	141	38 47	190	34 31	222	61 24	268	11 32	355
124	50 44	025	15 42	079	40 45	142	38 41	191	34 08	223	60 50	269	11 29	355
125	50 58	026	16 15	080	41 05	143	38 34	193	33 45	225	60 17	270	11 26	356
126	51 13	026	16 48	081	41 25	145	38 26	194	33 21	226	59 43	271	11 24	357
127	51 28	026	17 21	081	41 44	146	38 18	195	32 57	227	59 10	272	11 23	358
128	51 42	026	17 54	082	42 02	147	38 08	197	32 32	228	58 36	272	11 21	358
129	51 57	026	18 27	083	42 20	148	37 59	198	32 07	229	58 03	273	11 21	359
130	52 12	027	19 01	084	42 37	150	37 48	199	31 42	230	57 29	274	11 20	000
131	52 27	027	19 34	085	42 54	151	37 37	200	31 16	231	56 56	275	11 20	000
132	52 42	027	20 08	085	43 10	152	37 25	201	30 50	232	56 22	275	11 21	001
133	52 57	027	20 41	086	43 25	154	37 12	203	30 23	233	55 49	276	11 21	002
134	53 13	027	21 15	087	43 40	155	36 59	204	29 56	234	55 15	277	11 23	003
	DENEB		◆ Kochab		ARCTURUS		◆ REGULUS		PROCYON		BETELGEUSE		◆ CAPELLA	
135	11 24	003	53 28	027	21 48	088	43 54	156	36 45	205	29 29	235	54 42	278
136	11 26	004	53 44	028	22 22	089	44 07	158	36 30	206	29 01	236	54 09	278
137	11 29	005	53 59	028	22 55	090	44 19	159	36 15	208	28 33	237	53 36	279
138	11 32	005	54 15	028	23 29	090	44 31	160	35 59	209	28 05	238	53 03	280
139	11 35	006	54 30	028	24 02	091	44 42	162	35 43	210	27 36	239	52 30	280
140	11 39	007	54 46	028	24 36	092	44 52	163	35 26	211	27 07	240	51 57	281
141	11 43	008	55 02	028	25 09	093	45 02	164	35 08	212	26 38	241	51 24	282
142	11 48	008	55 18	028	25 43	094	45 10	166	34 50	213	26 09	242	50 51	283
143	11 53	009	55 34	028	26 16	095	45 18	167	34 31	215	25 39	243	50 18	283
144	11 58	010	55 50	029	26 50	095	45 25	168	34 12	216	25 09	244	49 46	284
145	12 04	010	56 06	029	27 23	096	45 32	170	33 52	217	24 39	245	49 13	285
146	12 10	011	56 22	029	27 56	097	45 37	171	33 32	218	24 08	246	48 41	285
147	12 17	012	56 38	029	28 30	098	45 42	173	33 11	219	23 37	247	48 08	286
148	12 24	013	56 55	029	29 03	099	45 46	174	32 50	220	23 06	248	47 36	287
149	12 32	013	57 11	029	29 36	100	45 49	175	32 28	221	22 35	248	47 04	287
	DENEB		◆ VEGA		ARCTURUS		Denebola		◆ REGULUS		POLLUX		◆ CAPELLA	
150	12 39	014	14 04	038	30 09	101	43 28	142	45 51	177	53 14	234	46 32	288
151	12 48	015	14 25	039	30 42	102	43 48	143	45 53	178	52 47	236	46 00	288
152	12 56	015	14 46	040	31 15	102	44 08	145	45 54	180	52 19	237	45 28	289
153	13 05	016	15 08	041	31 47	103	44 27	146	45 53	181	51 50	238	44 57	290
154	13 15	017	15 30	041	32 20	104	44 45	147	45 52	182	51 22	239	44 25	290
155	13 25	017	15 52	042	32 52	105	45 03	148	45 51	184	50 53	240	43 54	291
156	13 35	018	16 15	043	33 25	106	45 20	150	45 48	185	50 23	242	43 23	292
157	13 46	019	16 38	043	33 57	107	45 37	151	45 44	187	49 54	243	42 52	292
158	13 57	020	17 01	044	34 29	108	45 53	152	45 40	188	49 24	244	42 21	293
159	14 08	020	17 24	045	35 01	109	46 08	154	45 35	189	48 53	245	41 50	294
160	14 20	021	17 48	046	35 32	110	46 23	155	45 29	191	48 23	246	41 19	294
161	14 32	022	18 12	046	36 04	111	46 36	156	45 23	192	47 52	247	40 49	295
162	14 45	022	18 37	047	36 35	112	46 49	158	45 15	194	47 21	248	40 18	295
163	14 58	023	19 01	048	37 06	113	47 02	159	45 07	195	46 50	249	39 48	296
164	15 11	024	19 26	048	37 37	114	47 13	161	44 58	196	46 18	250	39 18	297
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
165	15 25	024	19 51	049	38 08	115	16 13	143	44 48	198	45 47	251	38 48	297
166	15 39	025	20 17	050	38 38	116	16 33	144	44 37	199	45 15	252	38 18	298
167	15 53	026	20 43	050	39 08	117	16 53	145	44 26	200	44 43	253	37 49	299
168	16 08	026	21 09	051	39 38	118	17 12	145	44 14	202	44 10	254	37 19	299
169	16 23	027	21 35	052	40 07	119	17 31	146	44 01	203	43 38	255	36 50	300
170	16 38	028	22 01	052	40 36	120	17 49	147	43 48	204	43 06	256	36 21	300
171	16 54	029	22 28	053	41 05	121	18 07	148	43 34	206	42 33	257	35 52	301
172	17 10	029	22 55	054	41 34	122	18 25	149	43 19	207	42 00	258	35 24	302
173	17 27	030	23 22	055	42 02	123	18 41	150	43 03	208	41 27	259	34 55	302
174	17 44	031	23 50	055	42 30	124	18 58	151	42 47	210	40 54	260	34 27	303
175	18 01	031	24 17	056	42 58	126	19 13	152	42 30	211	40 21	261	33 59	304
176	18 19	032	24 45	057	43 25	127	19 29	153	42 13	212	39 48	262	33 31	304
177	18 37	033	25 13	057	43 51	128	19 44	154	41 55	213	39 15	263	33 03	305
178	18 55	033	25 42	058	44 18	129	19 58	155	41 36	215	38 41	264	32 36	305
179	19 13	034	26 10	059	44 44	130	20 11	156	41 16	216	38 08	264	32 09	306

Tilbage til Menuen

LAT 56°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
180	19 32	035	26 39	059	45 09	131	20 25	157	40 57	217	37 35	265	31 42	307
181	19 51	035	27 08	060	45 34	133	20 37	158	40 36	218	37 01	266	31 15	307
182	20 11	036	27 37	061	45 58	134	20 49	159	40 15	219	36 28	267	30 48	308
183	20 31	037	28 07	061	46 22	135	21 01	161	39 53	221	35 54	268	30 22	309
184	20 51	037	28 36	062	46 46	136	21 12	162	39 31	222	35 21	269	29 56	309
185	21 11	038	29 06	063	47 09	138	21 22	163	39 09	223	34 47	270	29 30	310
186	21 32	039	29 36	063	47 31	139	21 32	164	38 46	224	34 14	270	29 04	310
187	21 53	039	30 06	064	47 53	140	21 41	165	38 22	225	33 40	271	28 39	311
188	22 14	040	30 36	065	48 14	141	21 49	166	37 58	226	33 06	272	28 13	312
189	22 36	040	31 07	066	48 35	143	21 57	167	37 33	228	32 33	273	27 49	312
190	22 58	041	31 37	066	48 55	144	22 05	168	37 08	229	31 59	274	27 24	313
191	23 20	042	32 08	067	49 14	145	22 12	169	36 43	230	31 26	274	26 59	314
192	23 43	042	32 39	068	49 33	147	22 18	170	36 17	231	30 53	275	26 35	314
193	24 06	043	33 10	068	49 51	148	22 23	171	35 51	232	30 19	276	26 11	315
194	24 29	044	33 41	069	50 08	150	22 28	172	35 24	233	29 46	277	25 48	315
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	24 52	044	34 13	070	22 07	101	50 25	151	34 57	234	29 13	278	25 24	316
196	25 16	045	34 44	070	22 40	101	50 41	152	34 30	235	28 39	278	25 01	317
197	25 39	046	35 16	071	23 13	102	50 56	154	34 02	236	28 06	279	24 38	317
198	26 04	046	35 48	072	23 46	103	51 10	155	33 34	237	27 33	280	24 16	318
199	26 28	047	36 20	073	24 18	104	51 24	157	33 06	238	27 00	281	23 53	319
200	26 53	048	36 52	073	24 51	105	51 37	158	32 37	239	26 27	282	23 31	319
201	27 17	048	37 24	074	25 23	106	51 49	160	32 08	240	25 54	282	23 09	320
202	27 43	049	37 56	075	25 55	107	52 00	161	31 39	241	25 22	283	22 48	321
203	28 08	049	38 29	075	26 27	108	52 10	163	31 09	242	24 49	284	22 27	321
204	28 34	050	39 01	076	26 59	109	52 20	164	30 40	243	24 16	285	22 06	322
205	28 59	051	39 34	077	27 31	110	52 29	166	30 09	244	23 44	285	21 45	323
206	29 26	051	40 07	078	28 03	110	52 36	167	29 39	245	23 12	286	21 25	323
207	29 52	052	40 39	078	28 34	111	52 43	169	29 09	246	22 40	287	21 05	324
208	30 18	053	41 12	079	29 05	112	52 49	170	28 38	247	22 08	288	20 46	324
209	30 45	053	41 45	080	29 36	113	52 54	172	28 07	248	21 36	288	20 26	325
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
210	31 12	054	42 18	080	30 07	114	52 59	174	27 36	249	21 04	289	20 07	326
211	31 39	055	42 51	081	30 37	115	53 02	175	27 04	250	20 32	290	19 49	326
212	32 07	055	43 25	082	31 07	116	53 04	177	26 33	251	20 01	291	19 30	327
213	32 35	056	43 58	083	31 37	117	53 06	178	26 01	252	19 29	291	19 12	328
214	33 02	056	44 31	083	32 07	118	53 06	180	25 29	253	18 58	292	18 54	328
215	33 30	057	45 04	084	32 37	119	53 06	181	24 57	254	18 27	293	18 37	329
216	33 59	058	45 38	085	33 06	120	53 05	183	24 24	254	17 57	294	18 20	330
217	34 27	058	46 11	086	33 35	121	53 02	185	23 52	255	17 26	294	18 03	330
218	34 56	059	46 45	087	34 03	122	52 59	186	23 20	256	16 55	295	17 47	331
219	35 25	060	47 18	087	34 31	123	52 55	188	22 47	257	16 25	296	17 31	332
220	35 54	060	47 52	088	34 59	124	52 50	189	22 14	258	15 55	297	17 15	332
221	36 23	061	48 25	089	35 27	125	52 44	191	21 41	259	15 25	297	17 00	333
222	36 52	061	48 59	090	35 54	126	52 38	192	21 08	260	14 56	298	16 45	334
223	37 22	062	49 32	091	36 21	127	52 30	194	20 35	261	14 26	299	16 30	335
224	37 52	063	50 06	092	36 47	129	52 22	195	20 02	261	13 57	300	16 16	335
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		Dubhe		◆ CAPELLA	
225	38 21	063	50 40	092	37 13	130	52 12	197	34 57	241	60 07	305	16 02	336
226	38 52	064	51 13	093	37 39	131	52 02	198	34 28	242	59 40	306	15 49	337
227	39 22	065	51 47	094	38 04	132	51 51	200	33 58	243	59 13	306	15 35	337
228	39 52	065	52 20	095	38 29	133	51 39	201	33 28	244	58 45	306	15 23	338
229	40 23	066	52 53	096	38 53	134	51 26	203	32 58	245	58 18	307	15 10	339
230	40 53	067	53 27	097	39 17	135	51 13	204	32 27	246	57 52	307	14 58	339
231	41 24	067	54 00	098	39 40	136	50 59	206	31 57	247	57 25	307	14 46	340
232	41 55	068	54 33	099	40 03	138	50 44	207	31 26	248	56 58	307	14 35	341
233	42 26	068	55 06	100	40 26	139	50 28	209	30 55	249	56 31	308	14 24	341
234	42 58	069	55 39	101	40 47	140	50 11	210	30 23	249	56 05	308	14 14	342
235	43 29	070	56 12	102	41 09	141	49 54	212	29 52	250	55 39	308	14 04	343
236	44 01	070	56 45	103	41 29	142	49 36	213	29 20	251	55 12	309	13 54	343
237	44 32	071	57 18	104	41 50	144	49 18	214	28 48	252	54 46	309	13 44	344
238	45 04	072	57 50	105	42 09	145	48 58	216	28 16	253	54 20	309	13 36	345
239	45 36	072	58 23	106	42 28	146	48 38	217	27 44	254	53 54	310	13 27	346
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		Dubhe		◆ CAPELLA	
240	46 08	073	58 55	107	42 47	147	48 18	218	27 12	255	53 29	310	13 19	346
241	46 40	074	59 27	108	43 04	149	47 57	220	26 39	256	53 03	310	13 11	347
242	47 12	074	59 59	109	43 22	150	47 35	221	26 07	257	52 37	311	13 04	348
243	47 45	075	60 30	110	43 38	151	47 13	222	25 34	258	52 12	311	12 57	348
244	48 17	076	61 02	111	43 54	153	46 50	224	25 01	259	51 47	311	12 50	349
245	48 50	076	61 33	113	44 09	154	46 27	225	24 28	259	51 22	312	12 44	350
246	49 22	077	62 04	114	44 23	155	46 03	226	23 55	260	50 57	312	12 38	350
247	49 55	078	62 34	115	44 37	156	45 38	227	23 22	261	50 32	313	12 33	351
248	50 28	078	63 04	116	44 50	158	45 13	228	22 49	262	50 07	313	12 28	352
249	51 01	079	63 34	118	45 02	159	44 48	230	22 16	263	49 43	313	12 23	353
250	51 34	080	64 04	119	45 14	161	44 22	231	21 42	264	49 18	314	12 19	353
251	52 07	080	64 33	121	45 25	162	43 56	232	21 09	265	48 54	314	12 16	354
252	52 40	081	65 02	122	45 35	163	43 29	233	20 35	265	48 30	314	12 12	355
253	53 13	082	65 30	123	45 44	165	43 02	234	20 02	266	48 06	315	12 09	355
254	53 46	083	65 58	125	45 53	166	42 35	235	19 28	267	47 43	315	12 07	356
	Schedar		DENEB		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Dubhe		◆ CAPELLA	
255	34 06	037	54 20	083	32 13	127	46 00	167	42 07	237	47 19	316	12 05	357
256	34 26	037	54 53	084	32 40	128	46 07	169	41 39	238	46 56	316	12 03	358
257	34 47	038	55 26	085	33 06	129	46 13	170	41 10	239	46 32	316	12 02	358
258	35 07	038	56 00	086	33 32	131	46 19	172	40 42	240	46 09	317	12 01	359
259	35 28	039	56 33	086	33 57	132	46 23	173	40 12	241	45 46	317	12 01	000
260	35 50	040	57 07	087	34 22	133	46 27	174	39 43	242	45 24	318	12 01	000
261	36 11	040	57 40	088	34 46	134	46 29	176	39 13	243	45 01	318	12 01	001
262	36 33	041	58 14	089	35 10	135	46 31	177	38 43	244	44 39	318	12 02	002
263	36 55	041	58 47	090	35 34	136	46 33	179	38 13	245	44 17	319	12 03	003
264	37 17	042	59 21	090	35 57	137	46 33	180	37 42	246	43 55	319	12 05	003
265	37 39	042	59 54	091	36 19	138	46 33	182	37 12	247	43 33	320	12 07	004
266	38 02	043	60 28	092	36 41	139	46 31	183	36 41	248	43 11	320	12 10	005
267	38 25	043	61 02	093	37 03	141	46 29	184	36 09	249	42 50	321	12 13	005
268	38 48	044	61 35	094	37 24	142	46 26	186	35 38	250	42 29	321	12 16	006
269	39 11	044	62 08	095	37 45	143	46 22	187	35 06	251	42 08	321	12 20	007

LAT 56°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Dubhe	
270	12 24	007	22 37	071	38 05	144	46 18	189	34 34	252	52 33	287	41 47	322
271	12 28	008	23 09	072	38 24	145	46 12	190	34 02	253	52 01	288	41 26	322
272	12 33	009	23 41	072	38 43	146	46 06	191	33 30	254	51 29	288	41 06	323
273	12 39	010	24 13	073	39 01	148	45 59	193	32 58	255	50 57	289	40 45	323
274	12 45	010	24 45	074	39 19	149	45 51	194	32 26	256	50 26	289	40 25	324
275	12 51	011	25 17	075	39 36	150	45 42	196	31 53	257	49 54	290	40 06	324
276	12 57	012	25 50	075	39 52	151	45 33	197	31 20	257	49 22	291	39 46	324
277	13 04	012	26 22	076	40 08	153	45 23	198	30 48	258	48 51	291	39 27	325
278	13 12	013	26 55	077	40 23	154	45 12	200	30 15	259	48 20	292	39 08	325
279	13 20	014	27 28	078	40 38	155	45 00	201	29 42	260	47 49	292	38 49	326
280	13 28	015	28 01	079	40 51	156	44 48	202	29 09	261	47 18	293	38 30	326
281	13 36	015	28 33	079	41 04	158	44 35	204	28 35	262	46 47	294	38 11	327
282	13 45	016	29 06	080	41 17	159	44 21	205	28 02	263	46 16	294	37 53	327
283	13 55	017	29 40	081	41 29	160	44 06	206	27 29	264	45 46	295	37 35	328
284	14 05	017	30 13	082	41 40	162	43 51	208	26 55	264	45 15	295	37 17	328
	◆ CAPELLA		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Dubhe	
285	14 15	018	30 46	082	41 50	163	43 35	209	26 22	265	44 45	296	37 00	329
286	14 25	019	31 19	083	41 59	164	43 18	210	25 49	266	44 15	297	36 42	329
287	14 36	019	31 53	084	42 08	165	43 01	212	25 15	267	43 45	297	36 25	330
288	14 48	020	32 26	085	42 16	167	42 43	213	24 42	268	43 15	298	36 08	330
289	14 59	021	32 59	086	42 24	168	42 25	214	24 08	269	42 46	298	35 52	331
290	15 11	021	33 33	086	42 30	169	42 06	215	23 34	270	42 16	299	35 35	331
291	15 24	022	34 06	087	42 36	171	41 46	217	23 01	270	41 47	299	35 19	331
292	15 37	023	34 40	088	42 41	172	41 26	218	22 27	271	41 18	300	35 03	332
293	15 50	024	35 13	089	42 45	173	41 05	219	21 54	272	40 49	301	34 48	332
294	16 03	024	35 47	090	42 49	175	40 43	220	21 20	273	40 20	301	34 32	333
295	16 17	025	36 21	090	42 51	176	40 21	221	20 47	274	39 52	302	34 17	333
296	16 32	026	36 54	091	42 53	177	39 59	223	20 13	274	39 23	302	34 02	334
297	16 46	026	37 28	092	42 54	179	39 36	224	19 40	275	38 55	303	33 48	334
298	17 01	027	38 01	093	42 55	180	39 13	225	19 07	276	38 27	304	33 33	335
299	17 17	028	38 35	094	42 54	182	38 49	226	18 33	277	37 59	304	33 19	335
	CAPELLA		◆ Alpheratz		Enif		ALTAIR		◆ VEGA		Alphecca		◆ Dubhe	
300	17 32	028	39 08	095	39 35	146	42 53	183	68 01	227	35 02	267	33 05	336
301	17 48	029	39 41	096	39 54	147	42 51	184	67 36	229	34 28	267	32 52	336
302	18 05	030	40 15	096	40 12	148	42 48	186	67 10	231	33 55	268	32 38	337
303	18 22	030	40 48	097	40 29	149	42 44	187	66 44	232	33 21	269	32 25	337
304	18 39	031	41 21	098	40 46	151	42 40	188	66 17	234	32 47	270	32 13	338
305	18 56	032	41 55	099	41 02	152	42 35	190	65 50	235	32 14	271	32 00	338
306	19 14	032	42 28	100	41 18	153	42 29	191	65 22	237	31 40	272	31 48	339
307	19 32	033	43 01	101	41 33	154	42 22	192	64 54	238	31 07	272	31 36	339
308	19 50	034	43 34	102	41 47	156	42 14	194	64 25	240	30 33	273	31 24	340
309	20 09	034	44 06	103	42 01	157	42 06	195	63 56	241	30 00	274	31 13	340
310	20 28	035	44 39	104	42 13	158	41 57	196	63 26	243	29 26	275	31 02	341
311	20 48	036	45 11	105	42 25	159	41 47	198	62 56	244	28 53	276	30 51	341
312	21 07	036	45 44	106	42 37	161	41 37	199	62 26	245	28 20	276	30 40	342
313	21 27	037	46 16	107	42 48	162	41 26	200	61 55	247	27 46	277	30 30	342
314	21 47	038	46 48	108	42 57	163	41 14	201	61 24	248	27 13	278	30 20	343
315	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
	22 08	038	26 30	087	47 20	109	43 07	165	41 01	203	60 53	249	31 33	326
316	22 29	039	27 04	087	47 52	110	43 15	166	40 48	204	60 22	250	31 14	326
317	22 50	039	27 37	088	48 23	111	43 23	167	40 34	205	59 50	251	30 56	327
318	23 12	040	28 11	089	48 54	112	43 30	169	40 19	206	59 18	252	30 38	327
319	23 33	041	28 44	090	49 25	113	43 36	170	40 04	208	58 46	254	30 20	328
320	23 55	041	29 18	091	49 56	114	43 41	171	39 48	209	58 14	255	30 02	329
321	24 18	042	29 52	092	50 26	115	43 46	173	39 32	210	57 41	256	29 45	329
322	24 40	043	30 25	092	50 57	116	43 50	174	39 15	211	57 09	257	29 27	330
323	25 03	043	30 59	093	51 27	117	43 52	176	38 57	213	56 36	258	29 11	330
324	25 26	044	31 32	094	51 56	119	43 55	177	38 38	214	56 03	259	28 54	331
325	25 50	045	32 06	095	52 26	120	43 56	178	38 19	215	55 30	260	28 38	331
326	26 14	045	32 39	096	52 54	121	43 57	180	38 00	216	54 57	261	28 22	332
327	26 38	046	33 12	097	53 23	122	43 56	181	37 40	217	54 24	262	28 06	332
328	27 02	047	33 46	098	53 51	123	43 55	182	37 19	219	53 51	263	27 51	333
329	27 26	047	34 19	098	54 19	125	43 54	184	36 58	220	53 18	263	27 36	334
330	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
	27 51	048	34 52	099	54 46	126	43 51	185	36 36	221	52 44	264	27 21	334
331	28 16	048	35 25	100	55 13	127	43 48	187	36 14	222	52 11	265	27 07	335
332	28 41	049	35 58	101	55 40	129	43 43	188	35 51	223	51 37	266	26 52	335
333	29 07	050	36 31	102	56 06	130	43 38	189	35 28	224	51 04	267	26 38	336
334	29 32	050	37 04	103	56 31	131	43 33	191	35 04	225	50 30	268	26 25	336
335	29 58	051	37 36	104	56 56	133	43 26	192	34 40	226	49 57	269	26 12	337
336	30 24	052	38 09	105	57 20	134	43 19	193	34 16	228	49 23	270	25 59	338
337	30 51	052	38 41	106	57 44	136	43 11	195	33 51	229	48 50	270	25 46	338
338	31 17	053	39 13	107	58 07	137	43 02	196	33 25	230	48 16	271	25 34	339
339	31 44	053	39 45	108	58 30	139	42 52	197	33 00	231	47 43	272	25 22	339
340	32 11	054	40 17	109	58 51	140	42 42	199	32 33	232	47 09	273	25 10	340
341	32 39	055	40 49	110	59 13	142	42 31	200	32 07	233	46 36	274	24 59	340
342	33 06	055	41 20	111	59 33	143	42 19	201	31 40	234	46 02	274	24 48	341
343	33 34	056	41 52	112	59 53	145	42 07	203	31 13	235	45 29	275	24 37	342
344	34 02	057	42 23	113	60 12	147	41 53	204	30 45	236	44 55	276	24 27	342
345	CAPELLA		ALDEBARAN		◆ Hamal		Alpheratz		◆ ALTAIR		VEGA		◆ Alioth	
	34 30	057	16 52	085	42 54	114	60 30	148	30 17	237	44 22	277	24 16	343
346	34 58	058	17 26	086	43 24	115	60 47	150	29 49	238	43 49	277	24 07	343
347	35 27	058	17 59	087	43 54	116	61 03	152	29 20	239	43 15	278	23 57	344
348	35 55	059	18 33	088	44 25	117	61 19	153	28 51	240	42 42	279	23 48	345
349	36 24	060	19 06	089	44 54	118	61 33	155	28 22	241	42 09	280	23 39	345
350	36 53	060	19 40	089	45 24	119	61 47	157	27 53	242	41 36	280	23 31	346
351	37 22	061	20 13	090	45 53	120	62 00	159	27 23	243	41 03	281	23 23	346
352	37 52	062	20 47	091	46 22	121	62 12	160	26 53	244	40 30	282	23 15	347
353	38 21	062	21 20	092	46 50	122	62 22	162	26 23	245	39 57	283	23 08	348
354	38 51	063	21 54	093	47 18	124	62 32	164	25 52	246	39 25	283	23 01	348
355	39 21	063	22 27	094	47 46	125	62 41	166	25 22	247	38 52	284	22 54	349
356	39 51	064	23 01	094	48 13	126	62 48	168	24 51	248	38 20	285	22 48	349
357	40 21	065	23 34	095	48 40	127	62 55	170	24 20	249	37 47	286	22 42	350
358	40 52	065	24 08	096	49 07	128	63 00	172	23 48	249	37 15	286	22 36	351
359	41 22	066	24 41	097	49 33	130	63 04	174	23 17	250	36 43	287	22 31	351

Tilbage til Menuen

LAT 55°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		ALTAIR		◆ VEGA		Alioth	
0	41 29	066	25 22	097	50 37	130	64 07	175	23 04	252	35 52	288	21 26	352
1	42 00	066	25 56	098	51 04	131	64 09	177	22 31	253	35 20	289	21 22	352
2	42 32	067	26 30	099	51 29	133	64 10	179	21 58	253	34 47	290	21 17	353
3	43 03	068	27 04	100	51 54	134	64 10	181	21 25	254	34 15	290	21 13	354
4	43 35	068	27 38	101	52 19	135	64 09	183	20 52	255	33 43	291	21 10	354
5	44 07	069	28 12	102	52 43	137	64 06	185	20 19	256	33 11	292	21 06	355
6	44 39	069	28 46	103	53 06	138	64 02	187	19 45	257	32 39	292	21 03	355
7	45 12	070	29 19	103	53 29	139	63 57	189	19 12	258	32 07	293	21 01	356
8	45 44	071	29 52	104	53 51	141	63 51	191	18 38	259	31 36	294	20 59	357
9	46 17	071	30 26	105	54 12	142	63 44	193	18 04	260	31 04	295	20 57	357
10	46 49	072	30 59	106	54 33	144	63 35	195	17 30	260	30 33	295	20 55	358
11	47 22	072	31 32	107	54 53	145	63 25	197	16 56	261	30 02	296	20 54	358
12	47 55	073	32 05	108	55 12	147	63 15	199	16 22	262	29 31	297	20 53	359
13	48 28	074	32 37	109	55 31	148	63 03	201	15 48	263	29 00	297	20 53	000
14	49 01	074	33 10	110	55 49	150	62 50	203	15 14	264	28 30	298	20 53	000
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		DENEB		◆ VEGA	
15	28 51	015	49 34	075	33 42	111	56 06	151	62 36	205	49 07	284	28 00	299
16	29 00	016	50 07	076	34 14	112	56 22	153	62 21	206	48 34	285	27 29	299
17	29 10	016	50 41	076	34 46	113	56 37	154	62 06	208	48 01	285	26 59	300
18	29 20	017	51 14	077	35 18	114	56 51	156	61 49	210	47 28	286	26 30	301
19	29 30	017	51 48	078	35 49	115	57 05	158	61 31	212	46 55	287	26 00	301
20	29 40	018	52 21	078	36 20	116	57 18	159	61 13	213	46 22	287	25 31	302
21	29 51	018	52 55	079	36 51	117	57 29	161	60 53	215	45 49	288	25 02	303
22	30 02	019	53 29	080	37 21	118	57 40	163	60 33	217	45 16	289	24 33	303
23	30 13	019	54 03	080	37 52	119	57 50	164	60 12	218	44 44	289	24 04	304
24	30 24	020	54 37	081	38 22	120	57 58	166	59 50	220	44 11	290	23 36	305
25	30 36	020	55 11	082	38 51	121	58 06	168	59 28	222	43 39	291	23 08	305
26	30 48	021	55 45	082	39 21	122	58 13	170	59 05	223	43 07	291	22 40	306
27	31 00	021	56 19	083	39 50	123	58 19	171	58 41	225	42 35	292	22 12	307
28	31 13	022	56 53	084	40 19	124	58 24	173	58 16	226	42 03	292	21 44	307
29	31 26	022	57 28	085	40 47	125	58 27	175	57 51	228	41 31	293	21 17	308
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
30	31 39	023	24 31	076	23 29	112	14 54	130	58 30	176	57 25	229	41 00	294
31	31 52	023	25 04	076	24 01	113	15 21	130	58 31	178	56 59	230	40 28	294
32	32 06	024	25 37	077	24 33	114	15 47	131	58 32	180	56 32	232	39 57	295
33	32 20	024	26 11	078	25 04	115	16 12	132	58 31	182	56 05	233	39 26	296
34	32 34	025	26 45	079	25 35	116	16 38	133	58 30	184	55 37	234	38 55	296
35	32 49	025	27 19	079	26 06	117	17 02	134	58 27	185	55 09	236	38 24	297
36	33 04	026	27 52	080	26 37	118	17 27	135	58 24	187	54 41	237	37 53	297
37	33 19	026	28 26	081	27 07	119	17 51	136	58 19	189	54 12	238	37 23	298
38	33 34	027	29 00	082	27 37	120	18 15	137	58 13	190	53 42	239	36 53	299
39	33 49	027	29 34	083	28 07	121	18 38	138	58 06	192	53 12	241	36 22	299
40	34 05	028	30 09	083	28 36	122	19 01	139	57 59	194	52 42	242	35 53	300
41	34 21	028	30 43	084	29 06	123	19 23	140	57 50	196	52 12	243	35 23	300
42	34 37	029	31 17	085	29 35	124	19 45	141	57 40	197	51 41	244	34 53	301
43	34 54	029	31 51	086	30 03	125	20 06	142	57 29	199	51 10	245	34 24	302
44	35 11	029	32 26	086	30 31	126	20 27	143	57 18	201	50 38	246	33 55	302
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
45	35 28	030	33 00	087	30 59	127	20 48	144	57 05	202	50 07	247	33 26	303
46	35 45	030	33 34	088	31 27	128	21 08	145	56 52	204	49 35	249	32 57	304
47	36 03	031	34 09	089	31 54	129	21 27	146	56 37	206	49 03	250	32 28	304
48	36 20	031	34 43	090	32 20	130	21 46	147	56 22	207	48 30	251	32 00	305
49	36 38	032	35 18	090	32 47	131	22 05	148	56 06	209	47 58	252	31 32	305
50	36 57	032	35 52	091	33 12	132	22 23	149	55 49	210	47 25	253	31 04	306
51	37 15	033	36 26	092	33 38	133	22 41	150	55 31	212	46 52	254	30 36	307
52	37 34	033	37 01	093	34 03	134	22 57	151	55 13	213	46 19	255	30 08	307
53	37 53	034	37 35	094	34 28	135	23 14	152	54 53	215	45 46	256	29 41	308
54	38 12	034	38 10	095	34 52	136	23 30	153	54 33	216	45 12	257	29 14	308
55	38 31	034	38 44	096	35 15	137	23 45	154	54 13	218	44 39	258	28 47	309
56	38 51	035	39 18	096	35 38	138	24 00	155	53 51	219	44 05	258	28 21	310
57	39 11	035	39 52	097	36 01	139	24 14	156	53 29	221	43 31	259	27 54	310
58	39 31	036	40 26	098	36 23	141	24 28	157	53 06	222	42 57	260	27 28	311
59	39 51	036	41 00	099	36 45	142	24 41	158	52 43	223	42 24	261	27 02	312
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	40 11	037	41 34	100	10 07	140	24 53	159	52 19	225	41 49	262	26 37	312
61	40 32	037	42 08	101	10 29	141	25 05	160	51 55	226	41 15	263	26 11	313
62	40 53	037	42 42	102	10 51	142	25 16	162	51 29	227	40 41	264	25 46	313
63	41 14	038	43 15	103	11 12	143	25 27	163	51 04	229	40 07	265	25 21	314
64	41 35	038	43 49	104	11 33	144	25 37	164	50 38	230	39 33	266	24 57	315
65	41 56	039	44 22	105	11 53	144	25 46	165	50 11	231	38 58	266	24 32	315
66	42 18	039	44 56	106	12 13	145	25 55	166	49 44	232	38 24	267	24 08	316
67	42 40	040	45 29	107	12 32	146	26 03	167	49 17	234	37 50	268	23 44	317
68	43 02	040	46 02	108	12 51	147	26 10	168	48 49	235	37 15	269	23 21	317
69	43 24	040	46 34	109	13 09	148	26 17	169	48 20	236	36 41	270	22 58	318
70	43 47	041	47 07	110	13 27	149	26 23	170	47 52	237	36 06	271	22 35	319
71	44 09	041	47 39	111	13 45	150	26 29	171	47 22	238	35 32	271	22 12	319
72	44 32	042	48 11	112	14 02	151	26 33	172	46 53	240	34 57	272	21 50	320
73	44 55	042	48 43	113	14 18	152	26 38	174	46 23	241	34 23	273	21 28	320
74	45 18	042	49 15	114	14 34	153	26 41	175	45 53	242	33 49	274	21 06	321
	Dubhe		◆ REGULUS		PROCYON		SIRIUS		◆ RIGEL		Hamal		◆ DENEB	
75	45 41	043	17 00	093	30 46	132	14 49	154	26 44	176	45 22	243	20 44	322
76	46 05	043	17 34	094	31 11	133	15 04	155	26 46	177	44 52	244	20 23	322
77	46 28	044	18 08	095	31 36	134	15 19	156	26 48	178	44 21	245	20 02	323
78	46 52	044	18 43	096	32 01	135	15 33	157	26 49	179	43 49	246	19 42	324
79	47 16	044	19 17	097	32 25	136	15 46	158	26 49	180	43 18	247	19 22	324
80	47 40	045	19 51	098	32 49	137	15 59	159	26 48	181	42 46	248	19 02	325
81	48 04	045	20 25	099	33 12	138	16 11	160	26 47	182	42 14	249	18 42	326
82	48 29	045	20 59	099	33 34	139	16 23	161	26 46	184	41 42	250	18 23	326
83	48 53	046	21 33	100	33 57	140	16 34	162	26 43	185	41 09	251	18 04	327
84	49 18	046	22 07	101	34 18	142	16 45	163	26 40	186	40 36	252	17 45	328
85	49 43	046	22 40	102	34 39	143	16 55	164	26 36	187	40 04	253	17 27	328
86	50 08	047	23 14	103	35 00	144	17 04	165	26 32	188	39 31	254	17 09	329
87	50 33	047	23 48	104	35 20	145	17 13	166	26 27	189	38 57	255	16 52	330
88	50 59	048	24 21	105	35 39	146	17 21	167	26 21	190	38 24	256	16 34	330
89	51 24	048	24 54	105	35 58	147	17 29	167	26 15	191	37 51	257	16 18	331

LAT 55°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Dubhe		◆ REGULUS		PROCYON		SIRIUS		◆ RIGEL		Mirfak		◆ DENEB	
90	51 50	048	25 27	106	36 16	149	17 36	168	26 07	192	66 14	274	16 01	332
91	52 15	049	26 00	107	36 34	150	17 43	169	26 00	193	65 39	275	15 45	332
92	52 41	049	26 33	108	36 51	151	17 49	170	25 51	195	65 05	275	15 29	333
93	53 07	049	27 06	109	37 08	152	17 54	171	25 43	196	64 31	276	15 14	334
94	53 33	050	27 38	110	37 23	153	17 59	172	25 33	197	63 57	277	14 59	334
95	54 00	050	28 10	111	37 39	154	18 03	174	25 23	198	63 23	277	14 44	335
96	54 26	050	28 42	112	37 53	156	18 07	175	25 12	199	62 48	278	14 30	336
97	54 52	050	29 14	113	38 07	157	18 10	176	25 00	200	62 14	279	14 16	336
98	55 19	051	29 46	114	38 20	158	18 12	177	24 48	201	61 40	279	14 02	337
99	55 46	051	30 17	115	38 32	159	18 14	178	24 36	202	61 06	280	13 49	338
100	56 12	051	30 48	116	38 44	161	18 15	179	24 23	203	60 33	281	13 36	338
101	56 39	052	31 19	117	38 55	162	18 16	180	24 09	204	59 59	281	13 24	339
102	57 06	052	31 50	118	39 06	163	18 16	181	23 54	205	59 25	282	13 11	340
103	57 33	052	32 20	119	39 15	164	18 15	182	23 39	206	58 51	282	13 00	341
104	58 01	052	32 50	120	39 24	166	18 14	183	23 24	207	58 18	283	12 49	341
	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
105	58 28	053	21 52	096	33 20	121	18 12	184	23 08	208	42 46	230	57 44	284
106	58 55	053	22 26	097	33 49	122	18 09	185	22 51	209	42 20	231	57 11	284
107	59 23	053	23 00	098	34 19	123	18 06	186	22 34	210	41 53	232	56 38	285
108	59 50	053	23 34	098	34 47	124	18 03	187	22 16	211	41 26	233	56 04	285
109	60 18	054	24 08	099	35 16	125	17 59	188	21 58	212	40 58	234	55 31	286
110	60 46	054	24 42	100	35 44	126	17 54	189	21 39	213	40 30	235	54 58	287
111	61 14	054	25 16	101	36 12	127	17 48	190	21 20	214	40 01	237	54 25	287
112	61 42	054	25 49	102	36 39	128	17 42	191	21 01	215	39 32	238	53 53	288
113	62 09	054	26 23	103	37 06	129	17 36	192	20 40	216	39 03	239	53 20	288
114	62 38	055	26 57	104	37 32	130	17 28	193	20 20	217	38 33	240	52 47	289
115	63 06	055	27 30	105	37 59	131	17 21	194	19 58	218	38 04	241	52 15	290
116	63 34	055	28 03	105	38 24	132	17 12	195	19 37	219	37 33	242	51 42	290
117	64 02	055	28 36	106	38 49	133	17 03	196	19 15	220	37 03	243	51 10	291
118	64 30	055	29 09	107	39 14	135	16 54	197	18 52	221	36 32	244	50 38	291
119	64 58	055	29 42	108	39 38	136	16 44	198	18 29	222	36 01	245	50 06	292
	Kochab		◆ ARCTURUS		REGULUS		◆ SIRIUS		BETELGEUSE		CAPELLA		◆ Schedar	
120	48 53	024	13 16	076	40 02	137	16 33	199	36 23	219	63 08	268	35 18	321
121	49 07	024	13 49	076	40 25	138	16 22	200	36 01	221	62 34	268	34 56	321
122	49 21	024	14 23	077	40 48	139	16 10	200	35 38	222	61 59	269	34 35	322
123	49 35	025	14 56	078	41 10	141	15 58	201	35 15	223	61 25	270	34 14	322
124	49 50	025	15 30	079	41 32	142	15 45	202	34 51	224	60 50	271	33 53	323
125	50 04	025	16 04	079	41 53	143	15 31	203	34 27	225	60 16	272	33 32	323
126	50 19	025	16 38	080	42 13	144	15 17	204	34 03	226	59 41	272	33 11	324
127	50 33	025	17 12	081	42 33	145	15 03	205	33 38	227	59 07	273	32 51	324
128	50 48	026	17 46	082	42 52	147	14 48	206	33 12	228	58 33	274	32 31	325
129	51 03	026	18 20	083	43 11	148	14 33	207	32 46	229	57 58	275	32 11	325
130	51 18	026	18 54	083	43 29	149	14 17	208	32 20	230	57 24	275	31 52	326
131	51 33	026	19 28	084	43 46	151	14 00	209	31 53	231	56 50	276	31 32	326
132	51 49	026	20 03	085	44 03	152	13 43	210	31 26	232	56 16	277	31 13	327
133	52 04	026	20 37	086	44 19	153	13 26	211	30 59	233	55 42	278	30 55	327
134	52 19	027	21 11	087	44 34	154	13 08	212	30 31	234	55 08	278	30 36	328
	Kochab		◆ ARCTURUS		REGULUS		◆ POLLUX		BETELGEUSE		CAPELLA		◆ Schedar	
135	52 35	027	21 46	087	44 48	156	59 52	214	30 03	236	54 34	279	30 18	328
136	52 50	027	22 20	088	45 02	157	59 33	215	29 34	237	54 00	280	30 00	329
137	53 06	027	22 54	089	45 15	158	59 12	217	29 05	237	53 26	280	29 43	329
138	53 22	027	23 29	090	45 27	160	58 51	219	28 36	238	52 52	281	29 25	330
139	53 37	027	24 03	091	45 39	161	58 29	220	28 07	239	52 18	282	29 08	331
140	53 53	027	24 38	092	45 50	163	58 07	222	27 37	240	51 44	282	28 51	331
141	54 09	028	25 12	092	45 59	164	57 44	223	27 07	241	51 11	283	28 35	332
142	54 25	028	25 46	093	46 08	165	57 20	225	26 37	242	50 37	284	28 19	332
143	54 41	028	26 21	094	46 17	167	56 55	226	26 06	243	50 04	284	28 03	333
144	54 57	028	26 55	095	46 24	168	56 30	228	25 35	244	49 31	285	27 47	333
145	55 13	028	27 29	096	46 31	170	56 05	229	25 04	245	48 58	286	27 32	334
146	55 29	028	28 04	097	46 37	171	55 38	230	24 33	246	48 24	286	27 17	334
147	55 46	028	28 38	097	46 42	172	55 12	232	24 01	247	47 51	287	27 02	335
148	56 02	028	29 12	098	46 46	174	54 44	233	23 29	248	47 19	288	26 48	335
149	56 18	028	29 46	099	46 49	175	54 17	234	22 57	249	46 46	288	26 33	336
	◆ VEGA		ARCTURUS		SPICA		◆ REGULUS		POLLUX		◆ CAPELLA		Schedar	
150	13 17	038	30 20	100	10 59	129	46 51	177	53 49	236	46 13	289	26 20	337
151	13 38	039	30 54	101	11 26	129	46 53	178	53 20	237	45 41	289	26 06	337
152	14 00	040	31 27	102	11 52	130	46 54	180	52 51	238	45 08	290	25 53	338
153	14 22	040	32 01	103	12 18	131	46 53	181	52 22	239	44 36	291	25 40	338
154	14 45	041	32 34	104	12 44	132	46 52	182	51 52	240	44 04	291	25 27	339
155	15 08	042	33 08	105	13 09	133	46 50	184	51 22	242	43 32	292	25 15	339
156	15 31	042	33 41	105	13 34	134	46 48	185	50 51	243	43 00	293	25 03	340
157	15 54	043	34 14	106	13 59	135	46 44	187	50 21	244	42 28	293	24 52	341
158	16 18	044	34 47	107	14 23	136	46 40	188	49 50	245	41 57	294	24 40	341
159	16 42	045	35 20	108	14 47	137	46 34	190	49 18	246	41 25	294	24 29	342
160	17 06	045	35 52	109	15 10	138	46 28	191	48 47	247	40 54	295	24 19	342
161	17 31	046	36 25	110	15 33	139	46 21	192	48 15	248	40 23	296	24 08	343
162	17 56	047	36 57	111	15 56	140	46 13	194	47 43	249	39 52	296	23 58	343
163	18 21	047	37 29	112	16 18	140	46 05	195	47 11	250	39 21	297	23 49	344
164	18 46	048	38 01	113	16 40	141	45 55	197	46 38	251	38 51	297	23 39	345
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
165	14 30	024	19 12	049	38 32	114	17 01	142	45 45	198	46 05	252	38 20	298
166	14 44	025	19 38	049	39 04	115	17 22	143	45 34	199	45 32	253	37 50	299
167	14 59	026	20 04	050	39 35	116	17 42	144	45 22	201	44 59	254	37 20	299
168	15 14	026	20 31	051	40 05	117	18 02	145	45 10	202	44 26	255	36 50	300
169	15 30	027	20 58	051	40 36	118	18 21	146	44 57	203	43 53	256	36 20	300
170	15 45	028	21 25	052	41 06	119	18 40	147	44 42	205	43 19	257	35 50	301
171	16 02	028	21 52	053	41 36	120	18 58	148	44 28	206	42 46	258	35 21	302
172	16 18	029	22 20	054	42 06	121	19 16	149	44 12	207	42 12	259	34 52	302
173	16 35	030	22 47	054	42 35	123	19 33	150	43 56	209	41 38	260	34 23	303
174	16 52	030	23 15	055	43 04	124	19 50	151	43 39	210	41 04	261	33 54	303
175	17 10	031	23 44	056	43 32	125	20 07	152	43 22	211	40 30	262	33 25	304
176	17 28	032	24 12	056	44 00	126	20 22	153	43 03	213	39 56	263	32 57	305
177	17 46	032	24 41	057	44 28	127	20 38	154	42 45	214	39 22	263	32 29	305
178	18 05	033	25 10	058	44 55	128	20 52	155	42 25	215	38 48	264	32 01	306
179	18 23	034	25 39	058	45 22	129	21 06	156	42 05	216	38 14	265	31 33	307

LAT 55°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	DENEB		◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		POLLUX		◆ CAPELLA	
180	18 43	034	26 08	059	45 48	131	21 20	157	41 44	218	37 39	266	31 06	307
181	19 02	035	26 38	060	46 14	132	21 33	158	41 23	219	37 05	267	30 38	308
182	19 22	036	27 08	060	46 40	133	21 45	159	41 01	220	36 30	268	30 11	308
183	19 42	036	27 38	061	47 05	134	21 57	160	40 39	221	35 56	269	29 44	309
184	20 03	037	28 08	062	47 29	135	22 08	161	40 16	222	35 22	269	29 18	310
185	20 24	038	28 38	062	47 53	137	22 19	162	39 52	224	34 47	270	28 51	310
186	20 45	038	29 09	063	48 16	138	22 29	164	39 28	225	34 13	271	28 25	311
187	21 07	039	29 40	064	48 39	139	22 39	165	39 04	226	33 38	272	27 59	311
188	21 28	040	30 10	064	49 01	141	22 48	166	38 39	227	33 04	273	27 33	312
189	21 50	040	30 42	065	49 22	142	22 56	167	38 14	228	32 30	273	27 08	313
190	22 13	041	31 13	066	49 43	143	23 03	168	37 48	229	31 55	274	26 43	313
191	22 35	042	31 44	066	50 03	145	23 10	169	37 22	230	31 21	275	26 18	314
192	22 58	042	32 16	067	50 23	146	23 17	170	36 55	231	30 47	276	25 53	315
193	23 22	043	32 48	068	50 42	148	23 22	171	36 28	233	30 13	277	25 29	315
194	23 45	043	33 20	068	51 00	149	23 28	172	36 00	234	29 38	277	25 05	316
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	24 09	044	33 52	069	22 18	100	51 17	150	35 32	235	29 04	278	24 41	316
196	24 33	045	34 24	070	22 52	101	51 34	152	35 04	236	28 30	279	24 17	317
197	24 57	045	34 56	070	23 26	102	51 50	153	34 35	237	27 56	280	23 54	318
198	25 22	046	35 29	071	23 59	103	52 05	155	34 07	238	27 22	280	23 31	318
199	25 47	047	36 01	072	24 33	104	52 19	156	33 37	239	26 49	281	23 08	319
200	26 12	047	36 34	072	25 06	105	52 32	158	33 08	240	26 15	282	22 46	320
201	26 37	048	37 07	073	25 39	105	52 45	159	32 38	241	25 41	283	22 23	320
202	27 03	048	37 40	074	26 12	106	52 57	161	32 08	242	25 08	284	22 02	321
203	27 29	049	38 13	075	26 45	107	53 08	162	31 37	243	24 34	284	21 40	321
204	27 55	050	38 46	075	27 18	108	53 18	164	31 06	244	24 01	285	21 19	322
205	28 21	050	39 20	076	27 51	109	53 27	165	30 35	245	23 28	286	20 58	323
206	28 48	051	39 53	077	28 23	110	53 35	167	30 04	246	22 55	287	20 37	323
207	29 15	052	40 27	077	28 56	111	53 42	169	29 33	247	22 22	287	20 17	324
208	29 42	052	41 00	078	29 28	112	53 48	170	29 01	248	21 49	288	19 57	325
209	30 09	053	41 34	079	29 59	113	53 54	172	28 29	249	21 17	289	19 37	325
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
210	30 37	053	42 08	080	30 31	114	53 58	173	27 57	249	20 44	290	19 18	326
211	31 04	054	42 42	080	31 02	115	54 02	175	27 25	250	20 12	290	18 58	327
212	31 32	055	43 16	081	31 34	116	54 04	177	26 52	251	19 39	291	18 40	327
213	32 01	055	43 50	082	32 05	117	54 06	178	26 19	252	19 07	292	18 21	328
214	32 29	056	44 24	083	32 35	118	54 06	180	25 47	253	18 36	293	18 03	329
215	32 58	057	44 58	083	33 06	119	54 06	181	25 14	254	18 04	293	17 45	329
216	33 26	057	45 32	084	33 36	120	54 05	183	24 40	255	17 32	294	17 28	330
217	33 55	058	46 06	085	34 05	121	54 02	185	24 07	256	17 01	295	17 11	331
218	34 25	058	46 41	086	34 35	122	53 59	186	23 34	257	16 30	295	16 54	331
219	34 54	059	47 15	086	35 04	123	53 55	188	23 00	258	15 59	296	16 38	332
220	35 24	060	47 49	087	35 33	124	53 49	189	22 26	258	15 28	297	16 22	333
221	35 53	060	48 24	088	36 01	125	53 43	191	21 53	259	14 57	298	16 06	333
222	36 23	061	48 58	089	36 29	126	53 36	193	21 19	260	14 27	298	15 51	334
223	36 53	061	49 33	089	36 57	127	53 28	194	20 45	261	13 57	299	15 36	335
224	37 24	062	50 07	090	37 24	128	53 19	196	20 11	262	13 27	300	15 22	335
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		Dubhe		◆ CAPELLA	
225	37 54	063	50 41	091	37 51	129	53 09	197	19 37	263	59 32	307	15 07	336
226	38 25	063	51 16	092	38 18	130	52 59	199	19 03	264	59 04	307	14 53	337
227	38 56	064	51 50	093	38 44	131	52 47	200	18 28	264	58 37	307	14 40	337
228	39 27	064	52 25	094	39 10	132	52 35	202	17 54	265	58 09	308	14 27	338
229	39 58	065	52 59	095	39 35	134	52 21	203	17 20	266	57 42	308	14 14	339
230	40 29	066	53 33	095	39 59	135	52 07	205	16 45	267	57 15	308	14 02	339
231	41 01	066	54 07	096	40 24	136	51 52	206	16 11	268	56 48	308	13 50	340
232	41 32	067	54 42	097	40 47	137	51 37	208	15 37	269	56 21	309	13 39	341
233	42 04	068	55 16	098	41 11	138	51 20	209	15 02	269	55 54	309	13 27	341
234	42 36	068	55 50	099	41 33	139	51 03	211	14 28	270	55 27	309	13 17	342
235	43 08	069	56 24	100	41 55	141	50 45	212	13 53	271	55 01	309	13 06	343
236	43 40	069	56 57	101	42 17	142	50 26	214	13 19	272	54 34	310	12 56	344
237	44 12	070	57 31	102	42 38	143	50 07	215	12 45	273	54 08	310	12 47	344
238	44 45	071	58 05	103	42 58	144	49 47	216	12 10	273	53 42	310	12 38	345
239	45 17	071	58 38	104	43 18	146	49 26	218	11 36	274	53 16	311	12 29	346
	Schedar		◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		Denebola		◆ Dubhe	
240	28 40	029	45 50	072	59 11	105	43 37	147	49 05	219	27 27	256	52 50	311
241	28 57	029	46 23	073	59 45	106	43 55	148	48 43	220	26 54	256	52 24	311
242	29 14	030	46 56	073	60 18	107	44 13	149	48 20	222	26 20	257	51 58	312
243	29 31	030	47 29	074	60 50	109	44 30	151	47 57	223	25 47	258	51 32	312
244	29 48	031	48 02	075	61 23	110	44 47	152	47 33	224	25 13	259	51 07	312
245	30 06	031	48 35	075	61 55	111	45 03	153	47 09	226	24 39	260	50 41	313
246	30 24	032	49 08	076	62 27	112	45 18	155	46 44	227	24 05	261	50 16	313
247	30 42	032	49 42	077	62 59	113	45 32	156	46 19	228	23 31	262	49 51	313
248	31 01	033	50 15	077	63 30	115	45 46	157	45 53	229	22 57	262	49 26	314
249	31 19	033	50 49	078	64 01	116	45 58	159	45 27	230	22 23	263	49 01	314
250	31 38	034	51 22	079	64 32	117	46 10	160	45 00	232	21 49	264	48 37	314
251	31 58	034	51 56	079	65 03	119	46 22	162	44 33	233	21 14	265	48 12	315
252	32 17	035	52 30	080	65 33	120	46 32	163	44 05	234	20 40	266	47 48	315
253	32 37	035	53 04	081	66 02	122	46 42	164	43 37	235	20 06	267	47 24	316
254	32 57	036	53 38	081	66 31	123	46 51	166	43 09	236	19 31	268	47 00	316
	Schedar		DENEB		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		◆ CAPELLA	
255	33 18	037	54 12	082	32 50	127	46 59	167	42 40	237	60 36	279	11 05	357
256	33 38	037	54 46	083	33 17	128	47 06	169	42 11	238	60 02	280	11 03	358
257	33 59	038	55 20	083	33 44	129	47 12	170	41 41	239	59 28	280	11 02	358
258	34 20	038	55 54	084	34 10	130	47 18	171	41 11	241	58 54	281	11 01	359
259	34 42	039	56 29	085	34 37	131	47 23	173	40 41	242	58 20	282	11 01	000
260	35 03	039	57 03	086	35 02	132	47 26	174	40 11	243	57 47	282	11 01	000
261	35 25	040	57 37	086	35 28	133	47 29	176	39 40	244	57 13	283	11 01	001
262	35 47	040	58 12	087	35 52	134	47 31	177	39 09	245	56 40	283	11 02	002
263	36 09	041	58 46	088	36 17	136	47 33	179	38 38	246	56 06	284	11 03	003
264	36 32	041	59 20	089	36 41	137	47 33	180	38 06	247	55 33	285	11 05	003
265	36 54	042	59 55	090	37 04	138	47 32	182	37 35	248	55 00	285	11 07	004
266	37 17	042	60 29	090	37 27	139	47 31	183	37 03	249	54 26	286	11 10	005
267	37 41	043	61 04	091	37 49	140	47 29	184	36 30	250	53 53	286	11 13	005
268	38 04	043	61 38	092	38 11	141	47 26	186	35 58	251	53 20	287	11 16	006
269	38 28	044	62 12	093	38 32	142	47 22	187	35 26	252	52 48	288	11 20	007

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	11 24	007	22 17	071	38 53	144	47 17	189	34 53	253	52 15	288	63 25	333
271	11 29	008	22 50	071	39 13	145	47 11	190	34 20	253	51 42	289	63 10	333
272	11 34	009	23 23	072	39 33	146	47 05	192	33 47	254	51 10	289	62 54	333
273	11 40	010	23 55	073	39 52	147	46 57	193	33 14	255	50 37	290	62 38	333
274	11 46	010	24 28	074	40 10	148	46 49	194	32 40	256	50 05	291	62 23	333
275	11 52	011	25 01	074	40 28	150	46 40	196	32 07	257	49 33	291	62 07	332
276	11 59	012	25 34	075	40 45	151	46 30	197	31 33	258	49 01	292	61 51	332
277	12 06	012	26 08	076	41 01	152	46 20	199	30 59	259	48 29	292	61 35	332
278	12 13	013	26 41	077	41 17	153	46 08	200	30 26	260	47 57	293	61 18	332
279	12 21	014	27 15	077	41 32	155	45 56	201	29 52	261	47 25	293	61 02	332
280	12 30	014	27 48	078	41 46	156	45 43	203	29 18	262	46 54	294	60 46	332
281	12 39	015	28 22	079	42 00	157	45 29	204	28 44	262	46 23	295	60 30	332
282	12 48	016	28 56	080	42 13	159	45 15	206	28 09	263	45 51	295	60 13	332
283	12 57	017	29 30	080	42 25	160	45 00	207	27 35	264	45 20	296	59 57	332
284	13 07	017	30 04	081	42 36	161	44 44	208	27 01	265	44 49	296	59 41	332
	◆ CAPELLA		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
285	13 18	018	30 38	082	42 47	163	44 27	209	26 27	266	44 19	297	59 24	332
286	13 28	019	31 12	083	42 57	164	44 10	211	25 52	267	43 48	297	59 08	331
287	13 40	019	31 46	083	43 06	165	43 52	212	25 18	267	43 17	298	58 51	331
288	13 51	020	32 20	084	43 15	167	43 34	213	24 44	268	42 47	299	58 35	331
289	14 03	021	32 54	085	43 22	168	43 14	215	24 09	269	42 17	299	58 19	331
290	14 16	021	33 29	086	43 29	169	42 54	216	23 35	270	41 47	300	58 02	331
291	14 28	022	34 03	087	43 35	171	42 34	217	23 00	271	41 17	300	57 46	331
292	14 41	023	34 37	087	43 40	172	42 13	218	22 26	272	40 47	301	57 29	332
293	14 55	023	35 12	088	43 45	173	41 51	220	21 52	272	40 18	301	57 13	332
294	15 09	024	35 46	089	43 48	175	41 29	221	21 17	273	39 49	302	56 56	332
295	15 23	025	36 21	090	43 51	176	41 06	222	20 43	274	39 20	302	56 40	332
296	15 38	025	36 55	091	43 53	177	40 43	223	20 09	275	38 51	303	56 24	332
297	15 53	026	37 29	091	43 54	179	40 19	224	19 34	276	38 22	304	56 07	332
298	16 08	027	38 04	092	43 55	180	39 55	226	19 00	276	37 53	304	55 51	332
299	16 24	027	38 38	093	43 54	182	39 30	227	18 26	277	37 25	305	55 35	332
	CAPELLA		◆ Alpheratz		Enif		ALTAIR		◆ VEGA		Alphecca		◆ Alioth	
300	16 40	028	39 13	094	40 25	145	43 53	183	68 41	229	35 05	267	36 00	318
301	16 56	029	39 47	095	40 44	146	43 51	184	68 15	231	34 30	268	35 37	319
302	17 13	029	40 21	096	41 03	148	43 48	186	67 48	233	33 56	269	35 14	319
303	17 30	030	40 55	097	41 21	149	43 44	187	67 20	234	33 22	270	34 52	320
304	17 47	031	41 30	097	41 38	150	43 39	188	66 52	236	32 47	271	34 30	320
305	18 05	031	42 04	098	41 55	151	43 34	190	66 23	237	32 13	271	34 08	321
306	18 23	032	42 38	099	42 11	153	43 28	191	65 54	239	31 38	272	33 46	321
307	18 42	033	43 12	100	42 27	154	43 21	192	65 24	240	31 04	273	33 25	322
308	19 00	033	43 45	101	42 42	155	43 13	194	64 54	242	30 30	274	33 04	322
309	19 19	034	44 19	102	42 56	157	43 04	195	64 24	243	29 55	275	32 43	323
310	19 39	035	44 53	103	43 09	158	42 55	196	63 53	244	29 21	275	32 22	323
311	19 59	035	45 26	104	43 22	159	42 45	198	63 22	246	28 47	276	32 02	324
312	20 19	036	46 00	105	43 33	160	42 34	199	62 50	247	28 13	277	31 42	325
313	20 39	037	46 33	106	43 45	162	42 22	200	62 18	248	27 38	278	31 22	325
314	21 00	037	47 06	107	43 55	163	42 10	202	61 46	249	27 04	279	31 03	326
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
315	21 21	038	26 27	086	47 39	108	44 05	165	41 57	203	61 14	251	30 43	326
316	21 42	039	27 01	087	48 11	109	44 13	166	41 43	204	60 41	252	30 24	327
317	22 04	039	27 35	088	48 44	110	44 21	167	41 28	206	60 08	253	30 05	327
318	22 26	040	28 10	089	49 16	111	44 29	169	41 13	207	59 35	254	29 47	328
319	22 48	041	28 44	089	49 48	112	44 35	170	40 57	208	59 02	255	29 29	328
320	23 10	041	29 19	090	50 20	113	44 40	171	40 41	209	58 29	256	29 11	329
321	23 33	042	29 53	091	50 52	114	44 45	173	40 23	211	57 55	257	28 53	329
322	23 56	042	30 27	092	51 23	115	44 49	174	40 06	212	57 22	258	28 36	330
323	24 20	043	31 02	093	51 54	116	44 52	176	39 47	213	56 48	259	28 19	330
324	24 43	044	31 36	094	52 24	118	44 55	177	39 28	214	56 14	260	28 02	331
325	25 07	044	32 10	094	52 55	119	44 56	178	39 08	215	55 40	261	27 45	332
326	25 31	045	32 45	095	53 25	120	44 57	180	38 48	217	55 06	262	27 29	332
327	25 56	046	33 19	096	53 55	121	44 56	181	38 27	218	54 32	263	27 13	333
328	26 20	046	33 53	097	54 24	122	44 55	182	38 06	219	53 58	264	26 57	333
329	26 45	047	34 27	098	54 53	124	44 53	184	37 44	220	53 24	265	26 42	334
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
330	27 11	047	35 01	099	55 21	125	44 51	185	37 21	221	52 49	266	26 27	334
331	27 36	048	35 35	100	55 49	126	44 47	187	36 58	223	52 15	267	26 12	335
332	28 02	049	36 09	100	56 17	128	44 43	188	36 35	224	51 41	267	25 58	335
333	28 28	049	36 43	101	56 44	129	44 38	189	36 11	225	51 06	268	25 44	336
334	28 54	050	37 17	102	57 10	130	44 32	191	35 46	226	50 32	269	25 30	337
335	29 20	050	37 50	103	57 36	132	44 25	192	35 21	227	49 57	270	25 16	337
336	29 47	051	38 24	104	58 02	133	44 17	194	34 56	228	49 23	271	25 03	338
337	30 14	052	38 57	105	58 27	135	44 09	195	34 30	229	48 49	272	24 50	338
338	30 41	052	39 30	106	58 51	136	43 59	196	34 04	230	48 14	272	24 38	339
339	31 08	053	40 03	107	59 14	138	43 49	198	33 37	231	47 40	273	24 26	339
340	31 36	054	40 36	108	59 37	139	43 39	199	33 10	232	47 06	274	24 14	340
341	32 04	054	41 09	109	59 59	141	43 27	200	32 43	233	46 31	275	24 02	341
342	32 32	055	41 41	110	60 21	142	43 15	202	32 15	234	45 57	275	23 51	341
343	33 00	055	42 13	111	60 41	144	43 02	203	31 47	235	45 23	276	23 40	342
344	33 28	056	42 45	112	61 01	146	42 48	204	31 18	236	44 49	277	23 29	342
	◆ CAPELLA		ALDEBARAN		◆ Diphda		Enif		ALTAIR		◆ VEGA		Alioth	
345	33 57	057	16 47	085	13 47	154	42 34	205	30 50	237	44 14	278	23 19	343
346	34 26	057	17 21	086	14 02	155	42 19	207	30 20	238	43 40	278	23 09	344
347	34 55	058	17 56	087	14 16	156	42 03	208	29 51	239	43 06	279	23 00	344
348	35 24	058	18 30	087	14 30	157	41 46	209	29 21	240	42 32	280	22 50	345
349	35 53	059	19 05	088	14 43	158	41 29	211	28 51	241	41 58	281	22 41	345
350	36 23	060	19 39	089	14 55	159	41 11	212	28 21	242	41 25	281	22 33	346
351	36 53	060	20 13	090	15 07	160	40 53	213	27 50	243	40 51	282	22 25	346
352	37 23	061	20 48	091	15 18	161	40 34	214	27 19	244	40 17	283	22 17	347
353	37 53	061	21 22	091	15 29	162	40 14	216	26 48	245	39 44	284	22 09	348
354	38 23	062	21 57	092	15 39	163	39 54	217	26 17	246	39 10	284	22 02	348
355	38 54	063	22 31	093	15 49	164	39 33	218	25 45	247	38 37	285	21 55	349
356	39 24	063	23 05	094	15 58	165	39 11	219	25 13	248	38 04	286	21 49	349
357	39 55	064	23 40	095	16 07	166	38 49	220	24 41	249	37 31	286	21 43	350
358	40 26	064	24 14	096	16 15	167	38 27	221	24 09	250	36 58	287	21 37	351
359	40 57	065	24 48	097	16 22	168	38 04	223	23 37	251	36 25	288	21 31	351

Tilbage til Menuen

LAT 54°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		ALTAIR		◆ VEGA		Alioth	
0	41 03	065	25 30	097	51 16	129	65 07	175	23 23	252	35 33	289	20 27	352
1	41 35	065	26 05	098	51 43	130	65 09	177	22 49	253	35 00	290	20 22	352
2	42 08	066	26 40	099	52 09	132	65 10	179	22 15	254	34 27	290	20 18	353
3	42 40	067	27 14	099	52 35	133	65 10	181	21 41	255	33 54	291	20 14	354
4	43 12	067	27 49	100	53 01	134	65 09	184	21 07	256	33 21	292	20 10	354
5	43 45	068	28 24	101	53 26	136	65 06	186	20 33	256	32 48	292	20 07	355
6	44 18	068	28 58	102	53 50	137	65 02	188	19 59	257	32 16	293	20 04	355
7	44 51	069	29 33	103	54 14	138	64 56	190	19 24	258	31 43	294	20 01	356
8	45 24	070	30 07	104	54 37	140	64 50	192	18 50	259	31 11	294	19 59	357
9	45 57	070	30 41	105	54 59	141	64 42	194	18 15	260	30 39	295	19 57	357
10	46 30	071	31 15	106	55 21	143	64 33	196	17 40	261	30 07	296	19 55	358
11	47 03	071	31 49	107	55 42	144	64 23	198	17 05	262	29 36	296	19 54	358
12	47 37	072	32 23	107	56 02	146	64 11	200	16 31	262	29 04	297	19 53	359
13	48 10	073	32 56	108	56 22	147	63 59	202	15 56	263	28 33	298	19 53	000
14	48 44	073	33 30	109	56 40	149	63 45	204	15 21	264	28 02	298	19 53	000
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		DENEB		◆ VEGA	
15	27 53	015	49 18	074	34 03	110	56 58	151	63 31	206	48 52	285	27 31	299
16	28 03	016	49 52	075	34 36	111	57 15	152	63 15	207	48 18	286	27 00	300
17	28 12	016	50 26	075	35 09	112	57 31	154	62 58	209	47 44	287	26 29	300
18	28 22	017	51 00	076	35 41	113	57 46	155	62 40	211	47 10	287	25 59	301
19	28 32	017	51 34	076	36 14	114	58 00	157	62 22	213	46 37	288	25 29	302
20	28 43	018	52 09	077	36 46	115	58 14	159	62 02	215	46 03	288	24 59	302
21	28 54	018	52 43	078	37 18	116	58 26	160	61 42	216	45 30	289	24 29	303
22	29 05	019	53 18	078	37 49	117	58 37	162	61 21	218	44 57	290	24 00	304
23	29 16	019	53 52	079	38 20	118	58 47	164	60 59	220	44 23	290	23 31	304
24	29 28	020	54 27	080	38 51	119	58 57	166	60 36	221	43 50	291	23 02	305
25	29 40	020	55 02	080	39 22	120	59 05	167	60 12	223	43 18	291	22 33	306
26	29 52	021	55 36	081	39 52	121	59 12	169	59 48	224	42 45	292	22 04	306
27	30 04	021	56 11	082	40 22	122	59 18	171	59 23	226	42 12	293	21 36	307
28	30 17	022	56 46	082	40 52	123	59 23	173	58 57	227	41 40	293	21 08	308
29	30 30	022	57 21	083	41 21	124	59 27	175	58 31	229	41 07	294	20 40	308
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
30	30 44	022	24 15	075	23 52	112	15 32	129	59 30	176	58 04	230	40 35	294
31	30 57	023	24 50	076	24 24	113	16 00	130	59 31	178	57 37	232	40 03	295
32	31 11	023	25 24	077	24 57	113	16 26	131	59 32	180	57 09	233	39 31	296
33	31 25	024	25 58	077	25 29	114	16 53	132	59 31	182	56 41	234	39 00	296
34	31 40	024	26 33	078	26 01	115	17 19	133	59 30	184	56 12	236	38 28	297
35	31 54	025	27 07	079	26 33	116	17 44	134	59 27	185	55 43	237	37 57	297
36	32 09	025	27 42	080	27 04	117	18 09	135	59 23	187	55 13	238	37 25	298
37	32 25	026	28 17	080	27 36	118	18 34	136	59 18	189	54 43	239	36 54	299
38	32 40	026	28 51	081	28 07	119	18 58	137	59 12	191	54 12	241	36 24	299
39	32 56	027	29 26	082	28 37	120	19 22	138	59 05	193	53 41	242	35 53	300
40	33 12	027	30 01	083	29 08	121	19 46	139	58 57	194	53 10	243	35 22	300
41	33 28	028	30 36	083	29 38	122	20 09	140	58 48	196	52 38	244	34 52	301
42	33 45	028	31 11	084	30 07	123	20 31	141	58 37	198	52 07	245	34 22	302
43	34 01	029	31 46	085	30 37	124	20 54	142	58 26	200	51 34	246	33 52	302
44	34 18	029	32 22	086	31 06	125	21 15	143	58 14	201	51 02	247	33 22	303
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
45	34 36	030	32 57	087	31 35	126	21 36	144	58 00	203	50 29	249	32 53	303
46	34 53	030	33 32	087	32 03	127	21 57	145	57 46	205	49 56	250	32 23	304
47	35 11	030	34 07	088	32 31	128	22 17	146	57 31	206	49 23	251	31 54	305
48	35 29	031	34 43	089	32 58	129	22 37	147	57 15	208	48 50	252	31 25	305
49	35 47	031	35 18	090	33 26	130	22 56	148	56 58	209	48 16	253	30 57	306
50	36 06	032	35 53	091	33 52	131	23 14	149	56 40	211	47 42	254	30 28	306
51	36 24	032	36 28	091	34 19	132	23 32	150	56 22	213	47 08	255	30 00	307
52	36 43	033	37 04	092	34 44	133	23 50	151	56 02	214	46 34	256	29 32	308
53	37 03	033	37 39	093	35 10	135	24 07	152	55 42	216	46 00	257	29 04	308
54	37 22	034	38 14	094	35 35	136	24 23	153	55 21	217	45 26	258	28 37	309
55	37 42	034	38 49	095	35 59	137	24 39	154	55 00	219	44 51	258	28 09	309
56	38 01	034	39 24	096	36 23	138	24 54	155	54 37	220	44 17	259	27 42	310
57	38 21	035	39 59	096	36 46	139	25 09	156	54 14	222	43 42	260	27 15	311
58	38 42	035	40 34	097	37 09	140	25 23	157	53 51	223	43 07	261	26 49	311
59	39 02	036	41 09	098	37 32	141	25 36	158	53 26	224	42 32	262	26 22	312
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	39 23	036	41 44	099	10 53	140	25 49	159	53 01	226	41 57	263	25 56	313
61	39 44	037	42 19	100	11 16	141	26 01	160	52 36	227	41 22	264	25 30	313
62	40 05	037	42 54	101	11 38	142	26 13	161	52 10	228	40 47	265	25 05	314
63	40 26	037	43 28	102	12 00	142	26 24	162	51 43	230	40 12	266	24 39	314
64	40 48	038	44 03	103	12 21	143	26 34	164	51 16	231	39 37	266	24 14	315
65	41 09	038	44 37	104	12 42	144	26 44	165	50 48	232	39 02	267	23 50	316
66	41 31	039	45 11	105	13 02	145	26 53	166	50 20	233	38 26	268	23 25	316
67	41 53	039	45 45	106	13 22	146	27 01	167	49 52	235	37 51	269	23 01	317
68	42 16	039	46 19	107	13 41	147	27 09	168	49 23	236	37 16	270	22 37	318
69	42 38	040	46 53	108	14 00	148	27 16	169	48 53	237	36 41	271	22 13	318
70	43 01	040	47 26	109	14 19	149	27 22	170	48 24	238	36 05	271	21 50	319
71	43 24	041	48 00	110	14 37	150	27 28	171	47 53	239	35 30	272	21 27	319
72	43 47	041	48 33	111	14 54	151	27 33	172	47 23	240	34 55	273	21 04	320
73	44 10	041	49 06	112	15 11	152	27 37	174	46 52	242	34 20	274	20 41	321
74	44 33	042	49 38	113	15 27	153	27 41	175	46 21	243	33 44	274	20 19	321
	Dubhe		◆ REGULUS		PROCYON		SIRIUS		◆ RIGEL		Hamal		◆ DENEB	
75	44 57	042	17 03	093	31 26	131	15 43	154	27 44	176	45 49	244	19 57	322
76	45 21	042	17 38	094	31 52	132	15 59	155	27 46	177	45 18	245	19 36	323
77	45 45	043	18 14	095	32 18	133	16 13	156	27 48	178	44 45	246	19 14	323
78	46 09	043	18 49	096	32 43	135	16 28	157	27 49	179	44 13	247	18 53	324
79	46 33	044	19 24	096	33 08	136	16 42	158	27 49	180	43 41	248	18 33	325
80	46 57	044	19 59	097	33 32	137	16 55	159	27 48	181	43 08	249	18 13	325
81	47 22	044	20 34	098	33 56	138	17 07	160	27 47	182	42 35	250	17 53	326
82	47 46	045	21 09	099	34 20	139	17 19	160	27 45	184	42 02	251	17 33	326
83	48 11	045	21 43	100	34 43	140	17 31	161	27 43	185	41 28	252	17 14	327
84	48 36	045	22 18	101	35 05	141	17 42	162	27 40	186	40 54	253	16 55	328
85	49 01	046	22 53	102	35 27	142	17 52	163	27 36	187	40 21	254	16 36	328
86	49 27	046	23 27	102	35 48	143	18 02	164	27 31	188	39 47	255	16 18	329
87	49 52	046	24 02	103	36 09	145	18 11	165	27 26	189	39 13	256	16 00	330
88	50 18	047	24 36	104	36 29	146	18 20	166	27 20	190	38 38	257	15 42	330
89	50 43	047	25 10	105	36 49	147	18 28	167	27 13	191	38 04	258	15 25	331

LAT 54°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Dubhe		◆ REGULUS		PROCYON		SIRIUS		◆ RIGEL		Mirfak		◆ DENEB	
90	51 09	047	25 44	106	37 08	148	18 35	168	27 06	192	66 09	276	15 08	332
91	51 35	048	26 18	107	37 26	149	18 42	169	26 58	194	65 34	277	14 52	332
92	52 01	048	26 51	108	37 44	151	18 48	170	26 50	195	64 59	277	14 36	333
93	52 28	048	27 25	109	38 01	152	18 54	171	26 40	196	64 24	278	14 20	334
94	52 54	048	27 58	110	38 17	153	18 58	172	26 30	197	63 49	279	14 04	334
95	53 20	049	28 31	110	38 33	154	19 03	173	26 20	198	63 14	279	13 49	335
96	53 47	049	29 04	111	38 48	155	19 06	174	26 09	199	62 39	280	13 35	336
97	54 14	049	29 37	112	39 02	157	19 10	175	25 57	200	62 04	281	13 21	337
98	54 41	050	30 10	113	39 16	158	19 12	176	25 44	201	61 30	281	13 07	337
99	55 07	050	30 42	114	39 29	159	19 14	178	25 31	202	60 55	282	12 53	338
100	55 34	050	31 14	115	39 41	160	19 15	179	25 18	203	60 21	282	12 40	339
101	56 02	050	31 46	116	39 52	162	19 16	180	25 04	204	59 46	283	12 27	339
102	56 29	051	32 17	117	40 03	163	19 16	181	24 49	205	59 12	283	12 15	340
103	56 56	051	32 49	118	40 13	164	19 15	182	24 33	206	58 38	284	12 03	341
104	57 24	051	33 20	119	40 22	166	19 14	183	24 17	208	58 04	285	11 52	341
	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
105	57 51	051	21 58	096	33 50	120	19 12	184	24 01	209	43 25	231	57 29	285
106	58 19	052	22 33	096	34 21	121	19 09	185	23 43	210	42 57	232	56 55	286
107	58 46	052	23 08	097	34 51	122	19 06	186	23 26	211	42 30	233	56 22	286
108	59 14	052	23 43	098	35 20	123	19 02	187	23 08	212	42 01	234	55 48	287
109	59 42	052	24 17	099	35 50	124	18 58	188	22 49	213	41 33	235	55 14	287
110	60 10	052	24 52	100	36 19	125	18 53	189	22 29	214	41 03	236	54 40	288
111	60 38	053	25 27	101	36 47	126	18 47	190	22 10	215	40 34	237	54 07	289
112	61 06	053	26 02	101	37 16	127	18 41	191	21 49	216	40 04	238	53 34	289
113	61 34	053	26 36	102	37 43	128	18 34	192	21 28	217	39 34	239	53 00	290
114	62 02	053	27 11	103	38 11	130	18 27	193	21 07	218	39 03	240	52 27	290
115	62 30	053	27 45	104	38 38	131	18 19	194	20 45	219	38 33	241	51 54	291
116	62 59	053	28 19	105	39 04	132	18 10	195	20 23	220	38 01	243	51 21	291
117	63 27	053	28 53	106	39 31	133	18 01	196	20 00	221	37 30	244	50 48	292
118	63 55	054	29 27	107	39 56	134	17 51	197	19 37	222	36 58	245	50 16	292
119	64 24	054	30 00	108	40 21	135	17 41	198	19 14	223	36 26	246	49 43	293
	Kochab		◆ ARCTURUS		REGULUS		◆ SIRIUS		BETELGEUSE		CAPELLA		◆ Schedar	
120	47 58	024	13 01	075	40 46	136	17 30	199	37 09	220	63 09	269	34 31	321
121	48 12	024	13 35	076	41 10	138	17 18	200	36 46	221	62 34	270	34 09	322
122	48 26	024	14 09	077	41 33	139	17 06	201	36 23	222	61 59	271	33 48	322
123	48 41	024	14 44	078	41 56	140	16 53	202	35 59	223	61 24	272	33 26	323
124	48 55	024	15 18	078	42 19	141	16 40	203	35 34	224	60 48	273	33 05	323
125	49 10	025	15 53	079	42 41	142	16 26	204	35 10	225	60 13	273	32 44	324
126	49 24	025	16 28	080	43 02	144	16 12	204	34 44	227	59 38	274	32 23	324
127	49 39	025	17 02	081	43 22	145	15 57	205	34 18	228	59 03	275	32 02	325
128	49 54	025	17 37	082	43 42	146	15 42	206	33 52	229	58 28	276	31 42	325
129	50 09	025	18 12	082	44 02	147	15 26	207	33 25	230	57 53	276	31 22	326
130	50 24	025	18 47	083	44 20	149	15 09	208	32 58	231	57 18	277	31 02	326
131	50 39	026	19 22	084	44 38	150	14 52	209	32 31	232	56 43	278	30 42	327
132	50 55	026	19 57	085	44 56	151	14 35	210	32 03	233	56 08	278	30 23	327
133	51 10	026	20 32	085	45 12	153	14 17	211	31 34	234	55 33	279	30 04	328
134	51 25	026	21 08	086	45 28	154	13 58	212	31 06	235	54 58	280	29 45	328
	Kochab		◆ ARCTURUS		REGULUS		◆ POLLUX		BETELGEUSE		CAPELLA		◆ Schedar	
135	51 41	026	21 43	087	45 43	155	60 42	215	30 37	236	54 23	280	29 27	329
136	51 57	026	22 18	088	45 57	157	60 21	216	30 07	237	53 49	281	29 09	329
137	52 12	026	22 53	089	46 11	158	60 00	218	29 37	238	53 14	282	28 51	330
138	52 28	027	23 28	089	46 24	159	59 38	220	29 07	239	52 40	282	28 33	330
139	52 44	027	24 04	090	46 36	161	59 15	221	28 37	240	52 05	283	28 16	331
140	53 00	027	24 39	091	46 47	162	58 51	223	28 06	241	51 31	284	27 59	331
141	53 16	027	25 14	092	46 57	164	58 27	224	27 35	242	50 57	284	27 42	332
142	53 32	027	25 49	093	47 07	165	58 02	226	27 04	243	50 23	285	27 26	332
143	53 48	027	26 25	094	47 15	167	57 37	227	26 33	244	49 49	286	27 09	333
144	54 04	027	27 00	094	47 23	168	57 10	229	26 01	245	49 15	286	26 53	333
145	54 20	027	27 35	095	47 30	169	56 44	230	25 29	246	48 41	287	26 38	334
146	54 36	027	28 10	096	47 36	171	56 16	231	24 57	247	48 07	287	26 23	335
147	54 53	027	28 45	097	47 41	172	55 48	233	24 24	247	47 33	288	26 08	335
148	55 09	028	29 20	098	47 45	174	55 20	234	23 52	248	47 00	289	25 53	336
149	55 25	028	29 55	099	47 49	175	54 51	235	23 19	249	46 27	289	25 39	336
150	◆ VEGA		ARCTURUS		SPICA		◆ REGULUS		POLLUX		◆ CAPELLA		Schedar	
	12 30	038	30 30	099	11 37	128	47 51	177	54 22	237	45 53	290	25 24	337
151	12 52	039	31 05	100	12 04	129	47 53	178	53 52	238	45 20	290	25 11	337
152	13 14	040	31 39	101	12 31	130	47 54	180	53 22	239	44 47	291	24 57	338
153	13 37	040	32 14	102	12 58	131	47 53	181	52 52	240	44 14	292	24 44	338
154	14 00	041	32 48	103	13 24	132	47 52	182	52 21	242	43 42	292	24 31	339
155	14 23	042	33 23	104	13 50	133	47 50	184	51 50	243	43 09	293	24 19	340
156	14 46	042	33 57	105	14 16	134	47 47	185	51 18	244	42 37	293	24 07	340
157	15 10	043	34 31	106	14 41	135	47 44	187	50 47	245	42 04	294	23 55	341
158	15 35	044	35 05	107	15 06	136	47 39	188	50 15	246	41 32	295	23 43	341
159	15 59	044	35 38	108	15 31	137	47 33	190	49 42	247	41 00	295	23 32	342
160	16 24	045	36 12	108	15 55	137	47 27	191	49 10	248	40 28	296	23 21	342
161	16 49	046	36 45	109	16 18	138	47 20	193	48 37	249	39 57	296	23 11	343
162	17 14	046	37 18	110	16 41	139	47 12	194	48 04	250	39 25	297	23 01	344
163	17 40	047	37 51	111	17 04	140	47 03	195	47 30	251	38 54	298	22 51	344
164	18 06	048	38 24	112	17 26	141	46 53	197	46 57	252	38 23	298	22 41	345
165	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
	13 35	024	18 32	048	38 57	113	17 48	142	46 42	198	46 23	253	37 52	299
166	13 50	025	18 59	049	39 29	114	18 10	143	46 31	200	45 49	254	37 21	299
167	14 05	026	19 26	050	40 01	115	18 31	144	46 18	201	45 15	255	36 50	300
168	14 20	026	19 53	051	40 33	116	18 51	145	46 05	202	44 41	256	36 20	300
169	14 36	027	20 20	051	41 04	117	19 11	146	45 51	204	44 07	257	35 49	301
170	14 52	028	20 48	052	41 35	118	19 30	147	45 37	205	43 32	258	35 19	302
171	15 09	028	21 16	053	42 06	120	19 49	148	45 21	207	42 58	259	34 49	302
172	15 26	029	21 44	053	42 36	121	20 08	149	45 05	208	42 23	260	34 20	303
173	15 43	030	22 12	054	43 07	122	20 26	150	44 49	209	41 48	261	33 50	303
174	16 00	030	22 41	055	43 36	123	20 43	151	44 31	211	41 13	262	33 21	304
175	16 18	031	23 10	055	44 06	124	21 00	152	44 13	212	40 38	263	32 52	305
176	16 37	032	23 39	056	44 35	125	21 16	153	43 54	213	40 03	263	32 23	305
177	16 55	032	24 08	057	45 04	126	21 32	154	43 34	214	39 28	264	31 54	306
178	17 14	033	24 37	057	45 32	127	21 47	155	43 14	216	38 53	265	31 25	306
179	17 34	034	25 07	058	46 00	129	22 01	156	42 53	217	38 18	266	30 57	307

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	DENEB		◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		POLLUX		◆ CAPELLA	
180	17 53	034	25 37	059	46 27	130	22 15	157	42 32	218	37 43	267	30 29	308
181	18 13	035	26 07	059	46 54	131	22 29	158	42 10	219	37 08	268	30 01	308
182	18 33	035	26 38	060	47 20	132	22 42	159	41 47	221	36 32	268	29 34	309
183	18 54	036	27 08	061	47 46	133	22 54	160	41 24	222	35 57	269	29 06	309
184	19 15	037	27 39	061	48 11	135	23 05	161	41 00	223	35 22	270	28 39	310
185	19 36	037	28 10	062	48 36	136	23 16	162	40 36	224	34 47	271	28 12	311
186	19 58	038	28 41	062	49 00	137	23 27	163	40 11	225	34 11	272	27 46	311
187	20 20	039	29 13	063	49 24	139	23 36	164	39 46	226	33 36	273	27 19	312
188	20 42	039	29 44	064	49 47	140	23 46	166	39 20	228	33 01	273	26 53	312
189	21 04	040	30 16	064	50 09	141	23 54	167	38 53	229	32 26	274	26 27	313
190	21 27	041	30 48	065	50 31	143	24 02	168	38 27	230	31 51	275	26 02	314
191	21 50	041	31 20	066	50 52	144	24 09	169	38 00	231	31 15	276	25 36	314
192	22 14	042	31 52	066	51 13	145	24 16	170	37 32	232	30 40	276	25 11	315
193	22 37	043	32 25	067	51 32	147	24 22	171	37 04	233	30 05	277	24 46	315
194	23 01	043	32 57	068	51 51	148	24 27	172	36 36	234	29 30	278	24 22	316
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	23 26	044	33 30	068	22 28	100	52 09	150	36 07	235	28 56	279	23 57	317
196	23 50	044	34 03	069	23 03	101	52 27	151	35 38	236	28 21	279	23 33	317
197	24 15	045	34 36	070	23 38	101	52 43	153	35 08	237	27 46	280	23 09	318
198	24 40	046	35 09	070	24 12	102	52 59	154	34 38	238	27 11	281	22 46	319
199	25 05	046	35 42	071	24 47	103	53 14	156	34 08	239	26 37	282	22 23	319
200	25 31	047	36 16	072	25 21	104	53 28	157	33 38	240	26 02	282	22 00	320
201	25 57	047	36 49	072	25 55	105	53 41	159	33 07	241	25 28	283	21 37	320
202	26 23	048	37 23	073	26 29	106	53 53	160	32 36	242	24 54	284	21 15	321
203	26 49	049	37 57	074	27 03	107	54 05	162	32 04	243	24 19	285	20 53	322
204	27 16	049	38 31	075	27 37	108	54 15	164	31 33	244	23 45	285	20 31	322
205	27 43	050	39 05	075	28 10	109	54 25	165	31 01	245	23 11	286	20 10	323
206	28 10	051	39 39	076	28 44	109	54 33	167	30 29	246	22 38	287	19 49	324
207	28 37	051	40 13	077	29 17	110	54 41	168	29 56	247	22 04	288	19 28	324
208	29 05	052	40 48	077	29 50	111	54 48	170	29 24	248	21 30	288	19 08	325
209	29 33	052	41 22	078	30 22	112	54 53	172	28 51	249	20 57	289	18 48	326
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
210	30 01	053	41 57	079	30 55	113	54 58	173	28 18	250	20 24	290	18 28	326
211	30 29	054	42 31	079	31 27	114	55 01	175	27 44	251	19 51	291	18 08	327
212	30 58	054	43 06	080	31 59	115	55 04	177	27 11	252	19 18	291	17 49	327
213	31 26	055	43 41	081	32 31	116	55 06	178	26 37	253	18 45	292	17 30	328
214	31 55	055	44 15	082	33 03	117	55 06	180	26 04	254	18 12	293	17 12	329
215	32 24	056	44 50	082	33 34	118	55 06	182	25 30	254	17 40	294	16 54	329
216	32 54	057	45 25	083	34 05	119	55 04	183	24 56	255	17 08	294	16 36	330
217	33 23	057	46 00	084	34 36	120	55 02	185	24 22	256	16 36	295	16 19	331
218	33 53	058	46 35	084	35 06	121	54 59	186	23 47	257	16 04	296	16 02	331
219	34 23	058	47 11	085	35 36	122	54 54	188	23 13	258	15 32	296	15 45	332
220	34 53	059	47 46	086	36 06	123	54 49	190	22 38	259	15 01	297	15 29	333
221	35 23	060	48 21	087	36 35	124	54 42	191	22 04	260	14 29	298	15 13	333
222	35 54	060	48 56	088	37 04	125	54 35	193	21 29	261	13 58	299	14 57	334
223	36 24	061	49 31	088	37 33	126	54 26	195	20 54	261	13 28	299	14 42	335
224	36 55	061	50 07	089	38 01	127	54 17	196	20 19	262	12 57	300	14 27	335
	Schedar		◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		Denebola		◆ Dubhe	
225	24 11	020	37 26	062	50 42	090	38 29	128	54 07	198	35 55	242	58 55	308
226	24 23	021	37 58	063	51 17	091	38 56	130	53 55	199	35 24	243	58 28	308
227	24 35	021	38 29	063	51 52	092	39 23	131	53 43	201	34 52	244	58 00	309
228	24 48	022	39 00	064	52 28	092	39 50	132	53 30	202	34 20	245	57 32	309
229	25 02	022	39 32	064	53 03	093	40 16	133	53 16	204	33 48	246	57 05	309
230	25 15	023	40 04	065	53 38	094	40 41	134	53 02	206	33 16	247	56 38	309
231	25 29	023	40 36	066	54 13	095	41 06	135	52 46	207	32 43	248	56 10	310
232	25 43	024	41 08	066	54 48	096	41 31	136	52 30	209	32 11	249	55 43	310
233	25 58	024	41 41	067	55 23	097	41 55	138	52 12	210	31 38	250	55 16	310
234	26 12	025	42 13	067	55 58	098	42 19	139	51 54	211	31 04	251	54 49	310
235	26 27	026	42 46	068	56 33	099	42 41	140	51 36	213	30 31	252	54 22	311
236	26 43	026	43 18	069	57 08	100	43 04	141	51 16	214	29 58	252	53 56	311
237	26 58	027	43 51	069	57 43	101	43 26	143	50 56	216	29 24	253	53 29	311
238	27 14	027	44 24	070	58 18	102	43 47	144	50 35	217	28 50	254	53 02	311
239	27 31	028	44 58	070	58 52	103	44 07	145	50 13	218	28 16	255	52 36	312
	Schedar		◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		Denebola		◆ Dubhe	
240	27 47	028	45 31	071	59 26	104	44 27	146	49 51	220	27 42	256	52 10	312
241	28 04	029	46 04	072	60 01	105	44 46	148	49 28	221	27 08	257	51 44	312
242	28 21	029	46 38	072	60 35	106	45 05	149	49 05	222	26 33	258	51 18	313
243	28 39	030	47 11	073	61 08	107	45 23	150	48 40	224	25 59	259	50 52	313
244	28 56	030	47 45	073	61 42	108	45 40	152	48 16	225	25 24	259	50 26	313
245	29 14	031	48 19	074	62 16	109	45 56	153	47 51	226	24 49	260	50 00	314
246	29 33	031	48 53	075	62 49	110	46 12	154	47 25	228	24 14	261	49 35	314
247	29 51	032	49 27	075	63 22	111	46 27	156	46 58	229	23 40	262	49 10	314
248	30 10	033	50 01	076	63 54	113	46 41	157	46 32	230	23 05	263	48 44	315
249	30 29	033	50 35	077	64 27	114	46 54	158	46 04	231	22 30	264	48 19	315
250	30 49	034	51 10	077	64 59	115	47 07	160	45 37	232	21 54	265	47 54	315
251	31 08	034	51 44	078	65 31	117	47 19	161	45 09	234	21 19	265	47 30	316
252	31 28	035	52 19	079	66 02	118	47 30	163	44 40	235	20 44	266	47 05	316
253	31 48	035	52 53	079	66 33	120	47 40	164	44 11	236	20 09	267	46 41	316
254	32 09	036	53 28	080	67 03	121	47 49	166	43 42	237	19 34	268	46 16	317
	◆ Schedar		DENEB		ALTAIR		◆ Rasalhague		ARCTURUS		◆ Alkaid		Kochab	
255	32 29	036	54 03	081	33 25	126	47 57	167	43 12	238	60 26	281	66 05	339
256	32 50	037	54 38	081	33 54	127	48 05	168	42 42	239	59 51	281	65 52	338
257	33 11	037	55 13	082	34 21	128	48 11	170	42 11	240	59 16	282	65 39	338
258	33 33	038	55 48	083	34 49	130	48 17	171	41 40	241	58 42	283	65 26	338
259	33 54	038	56 23	083	35 16	131	48 22	173	41 09	242	58 08	283	65 12	337
260	34 16	039	56 58	084	35 42	132	48 26	174	40 38	243	57 33	284	64 59	337
261	34 39	039	57 33	085	36 09	133	48 29	176	40 06	244	56 59	284	64 45	337
262	35 01	040	58 08	086	36 34	134	48 31	177	39 34	245	56 25	285	64 30	336
263	35 23	040	58 43	086	36 59	135	48 33	179	39 02	246	55 51	285	64 16	336
264	35 46	041	59 18	087	37 24	136	48 33	180	38 30	247	55 17	286	64 02	336
265	36 09	041	59 53	088	37 48	137	48 32	182	37 57	248	54 43	287	63 47	335
266	36 33	042	60 29	089	38 12	138	48 31	183	37 24	249	54 09	287	63 32	335
267	36 56	042	61 04	089	38 35	140	48 29	185	36 51	250	53 36	288	63 17	335
268	37 20	043	61 39	090	38 58	141	48 25	186	36 18	251	53 02	288	63 02	335
269	37 44	043	62 15	091	39 20	142	48 21	187	35 44	252	52 29	289	62 47	334

LAT 54°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	18 52	025	21 57	070	39 41	143	48 16	189	35 10	253	51 55	289	62 32	334
271	19 07	026	22 30	071	40 02	144	48 10	190	34 37	254	51 22	290	62 16	334
272	19 23	026	23 04	072	40 22	146	48 03	192	34 03	255	50 49	291	62 01	334
273	19 38	027	23 37	072	40 42	147	47 56	193	33 28	256	50 16	291	61 45	334
274	19 55	028	24 11	073	41 01	148	47 47	195	32 54	257	49 43	292	61 29	333
275	20 11	028	24 45	074	41 19	149	47 38	196	32 20	258	49 11	292	61 13	333
276	20 28	029	25 19	075	41 37	150	47 28	198	31 45	259	48 38	293	60 57	333
277	20 45	030	25 53	075	41 54	152	47 17	199	31 11	260	48 06	293	60 41	333
278	21 03	030	26 27	076	42 10	153	47 05	200	30 36	260	47 33	294	60 25	333
279	21 21	031	27 01	077	42 26	154	46 52	202	30 01	261	47 01	294	60 09	333
280	21 39	031	27 36	078	42 41	156	46 38	203	29 26	262	46 29	295	59 53	333
281	21 57	032	28 10	078	42 55	157	46 24	205	28 51	263	45 57	296	59 37	333
282	22 16	033	28 45	079	43 09	158	46 09	206	28 16	264	45 25	296	59 20	332
283	22 35	033	29 19	080	43 21	160	45 53	207	27 41	265	44 54	297	59 04	332
284	22 55	034	29 54	080	43 33	161	45 37	209	27 06	265	44 22	297	58 48	332
	◆ CAPELLA		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
285	12 21	018	30 29	081	43 44	162	45 19	210	26 31	266	43 51	298	58 31	332
286	12 32	019	31 04	082	43 55	164	45 01	211	25 56	267	43 20	298	58 15	332
287	12 43	019	31 39	083	44 04	165	44 43	213	25 20	268	42 49	299	57 59	332
288	12 55	020	32 14	084	44 13	166	44 23	214	24 45	269	42 18	299	57 42	332
289	13 07	021	32 49	084	44 21	168	44 03	215	24 10	270	41 47	300	57 26	332
290	13 20	021	33 24	085	44 28	169	43 43	216	23 35	270	41 17	300	57 09	332
291	13 33	022	33 59	086	44 34	170	43 22	218	22 59	271	40 47	301	56 53	332
292	13 46	023	34 34	087	44 40	172	43 00	219	22 24	272	40 16	302	56 36	332
293	14 00	023	35 10	087	44 44	173	42 37	220	21 49	273	39 46	302	56 20	332
294	14 14	024	35 45	088	44 48	175	42 14	221	21 14	274	39 17	303	56 04	332
295	14 28	025	36 20	089	44 51	176	41 51	223	20 38	274	38 47	303	55 47	332
296	14 43	025	36 55	090	44 53	177	41 27	224	20 03	275	38 18	304	55 31	332
297	14 59	026	37 31	091	44 54	179	41 02	225	19 28	276	37 48	304	55 14	332
298	15 14	027	38 06	091	44 55	180	40 37	226	18 53	277	37 19	305	54 58	332
299	15 30	027	38 41	092	44 54	182	40 11	227	18 18	278	36 50	305	54 42	333
	CAPELLA		◆ Alpheratz		Enif		ALTAIR		◆ VEGA		Alphecca		◆ Alioth	
300	15 47	028	39 16	093	41 14	145	44 53	183	69 20	231	35 07	268	35 15	319
301	16 03	029	39 51	094	41 34	146	44 50	184	68 52	233	34 32	269	34 51	319
302	16 20	029	40 27	095	41 53	147	44 47	186	68 23	235	33 57	270	34 29	320
303	16 38	030	41 02	096	42 12	148	44 43	187	67 54	236	33 21	270	34 06	320
304	16 56	031	41 37	097	42 30	150	44 38	189	67 25	238	32 46	271	33 43	321
305	17 14	031	42 12	097	42 48	151	44 33	190	66 55	239	32 11	272	33 21	321
306	17 32	032	42 47	098	43 04	152	44 26	191	66 24	241	31 36	273	32 59	322
307	17 51	033	43 22	099	43 21	154	44 19	193	65 53	242	31 00	274	32 38	322
308	18 10	033	43 56	100	43 36	155	44 11	194	65 22	244	30 25	274	32 16	323
309	18 30	034	44 31	101	43 51	156	44 02	195	64 50	245	29 50	275	31 55	323
310	18 50	035	45 06	102	44 04	157	43 52	197	64 18	246	29 15	276	31 34	324
311	19 10	035	45 40	103	44 18	159	43 42	198	63 45	248	28 40	277	31 13	324
312	19 30	036	46 14	104	44 30	160	43 30	199	63 13	249	28 05	278	30 53	325
313	19 51	036	46 49	105	44 42	162	43 18	201	62 40	250	27 30	278	30 33	325
314	20 12	037	47 23	106	44 52	163	43 05	202	62 06	251	26 55	279	30 13	326
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
315	20 33	038	26 22	086	47 56	107	45 02	164	42 52	203	61 33	252	29 53	326
316	20 55	038	26 57	086	48 30	108	45 11	166	42 37	205	60 59	254	29 34	327
317	21 17	039	27 33	087	49 04	109	45 20	167	42 22	206	60 25	255	29 15	328
318	21 40	040	28 08	088	49 37	110	45 27	168	42 07	207	59 51	256	28 56	328
319	22 02	040	28 43	089	50 10	111	45 34	170	41 50	209	59 17	257	28 38	329
320	22 25	041	29 18	090	50 43	112	45 40	171	41 33	210	58 42	258	28 19	329
321	22 48	041	29 54	090	51 15	113	45 45	173	41 15	211	58 08	259	28 01	330
322	23 12	042	30 29	091	51 48	114	45 49	174	40 56	212	57 33	260	27 44	330
323	23 36	043	31 04	092	52 20	115	45 52	175	40 37	214	56 59	261	27 26	331
324	24 00	043	31 39	093	52 52	116	45 54	177	40 17	215	56 24	262	27 09	331
325	24 24	044	32 15	094	53 23	118	45 56	178	39 57	216	55 49	263	26 52	332
326	24 49	045	32 50	095	53 54	119	45 57	180	39 36	217	55 14	263	26 36	332
327	25 14	045	33 25	095	54 25	120	45 56	181	39 14	218	54 39	264	26 20	333
328	25 39	046	34 00	096	54 55	121	45 55	183	38 52	220	54 04	265	26 04	333
329	26 04	046	34 35	097	55 25	122	45 53	184	38 30	221	53 28	266	25 48	334
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
330	26 30	047	35 10	098	55 55	124	45 50	185	38 06	222	52 53	267	25 33	335
331	26 56	048	35 45	099	56 24	125	45 47	187	37 42	223	52 18	268	25 18	335
332	27 22	048	36 20	100	56 53	126	45 42	188	37 18	224	51 43	269	25 03	336
333	27 48	049	36 54	101	57 21	128	45 37	190	36 53	225	51 07	269	24 49	336
334	28 15	049	37 29	102	57 49	129	45 30	191	36 28	226	50 32	270	24 35	337
335	28 42	050	38 04	102	58 16	130	45 23	192	36 02	228	49 57	271	24 21	337
336	29 09	051	38 38	103	58 42	132	45 15	194	35 36	229	49 22	272	24 08	338
337	29 36	051	39 12	104	59 08	133	45 07	195	35 09	230	48 46	273	23 55	339
338	30 04	052	39 46	105	59 33	135	44 57	196	34 42	231	48 11	273	23 42	339
339	30 32	052	40 20	106	59 58	136	44 47	198	34 15	232	47 36	274	23 29	340
340	31 00	053	40 54	107	60 22	138	44 35	199	33 47	233	47 01	275	23 17	340
341	31 28	054	41 28	108	60 45	140	44 23	201	33 18	234	46 26	276	23 05	341
342	31 57	054	42 01	109	61 08	141	44 11	202	32 50	235	45 51	276	22 54	341
343	32 26	055	42 34	110	61 30	143	43 57	203	32 21	236	45 16	277	22 43	342
344	32 55	055	43 07	111	61 51	144	43 43	205	31 51	237	44 41	278	22 32	343
	◆ CAPELLA		ALDEBARAN		◆ Diphda		Enif		ALTAIR		◆ VEGA		Alioth	
345	33 24	056	16 42	085	14 42	154	43 28	206	31 22	238	44 06	279	22 22	343
346	33 53	057	17 17	085	14 57	155	43 12	207	30 52	239	43 31	279	22 12	344
347	34 23	057	17 52	086	15 11	156	42 56	208	30 21	240	42 56	280	22 02	344
348	34 52	058	18 27	087	15 25	157	42 38	210	29 51	241	42 22	281	21 52	345
349	35 22	058	19 02	088	15 38	158	42 20	211	29 20	242	41 47	282	21 43	345
350	35 52	059	19 38	089	15 51	159	42 02	212	28 48	243	41 12	282	21 35	346
351	36 23	060	20 13	089	16 03	160	41 43	214	28 17	244	40 38	283	21 26	347
352	36 53	060	20 48	090	16 15	161	41 23	215	27 45	245	40 04	284	21 18	347
353	37 24	061	21 23	091	16 26	162	41 03	216	27 13	246	39 29	284	21 11	348
354	37 55	061	21 59	092	16 37	163	40 41	217	26 41	247	38 55	285	21 03	348
355	38 26	062	22 34	093	16 47	164	40 20	218	26 08	248	38 21	286	20 56	349
356	38 57	063	23 09	094	16 56	165	39 58	220	25 36	248	37 47	286	20 50	350
357	39 28	063	23 44	094	17 05	166	39 35	221	25 03	249	37 14	287	20 44	350
358	40 00	064	24 20	095	17 13	167	39 12	222	24 30	250	36 40	288	20 38	351
359	40 32	064	24 55	096	17 21	168	38 48	223	23 56	251	36 06	288	20 32	351

Tilbage til Menuen

LAT 53°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		ALTAIR		◆ VEGA		Alioth	
0	40 38	064	25 37	096	51 53	128	66 07	175	23 41	252	35 13	290	19 28	352
1	41 10	065	26 12	097	52 21	129	66 09	177	23 07	253	34 39	290	19 23	353
2	41 43	065	26 48	098	52 49	131	66 10	179	22 32	254	34 05	291	19 18	353
3	42 16	066	27 24	099	53 16	132	66 10	182	21 57	255	33 32	292	19 14	354
4	42 49	066	28 00	100	53 43	133	66 08	184	21 22	256	32 58	292	19 10	354
5	43 22	067	28 35	101	54 09	135	66 05	186	20 47	257	32 25	293	19 07	355
6	43 55	068	29 11	101	54 34	136	66 01	188	20 12	258	31 52	294	19 04	355
7	44 29	068	29 46	102	54 59	138	65 55	190	19 36	258	31 19	294	19 01	356
8	45 02	069	30 21	103	55 23	139	65 48	192	19 01	259	30 46	295	18 59	357
9	45 36	069	30 56	104	55 46	140	65 40	194	18 25	260	30 13	296	18 57	357
10	46 10	070	31 31	105	56 09	142	65 31	196	17 50	261	29 41	296	18 55	358
11	46 44	070	32 06	106	56 31	143	65 20	198	17 14	262	29 09	297	18 54	358
12	47 18	071	32 41	107	56 52	145	65 08	200	16 38	263	28 37	298	18 53	359
13	47 52	072	33 15	108	57 12	147	64 54	202	16 03	263	28 05	298	18 53	000
14	48 26	072	33 49	109	57 31	148	64 40	204	15 27	264	27 33	299	18 53	000
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		DENEB		◆ VEGA	
15	26 55	015	49 01	073	34 23	110	57 50	150	64 25	206	48 36	286	27 01	299
16	27 05	015	49 35	073	34 57	111	58 08	151	64 08	208	48 01	287	26 30	300
17	27 15	016	50 10	074	35 31	111	58 25	153	63 50	210	47 27	288	25 59	301
18	27 25	016	50 45	075	36 05	112	58 41	155	63 32	212	46 52	288	25 28	301
19	27 35	017	51 20	075	36 38	113	58 55	156	63 12	214	46 18	289	24 57	302
20	27 46	017	51 55	076	37 11	114	59 09	158	62 51	216	45 44	289	24 27	303
21	27 57	018	52 30	076	37 44	115	59 22	160	62 30	217	45 10	290	23 56	303
22	28 08	018	53 05	077	38 16	116	59 34	162	62 08	219	44 36	291	23 26	304
23	28 19	019	53 40	078	38 48	117	59 45	163	61 44	221	44 02	291	22 57	305
24	28 31	019	54 15	078	39 20	118	59 55	165	61 21	222	43 29	292	22 27	305
25	28 43	020	54 51	079	39 52	119	60 03	167	60 56	224	42 55	292	21 58	306
26	28 56	020	55 26	080	40 23	121	60 11	169	60 30	225	42 22	293	21 29	307
27	29 08	021	56 02	080	40 54	122	60 17	171	60 04	227	41 49	293	21 00	307
28	29 21	021	56 37	081	41 25	123	60 23	173	59 38	229	41 16	294	20 31	308
29	29 35	022	57 13	082	41 55	124	60 27	174	59 10	230	40 43	295	20 03	309
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
30	29 48	022	24 00	075	24 14	111	16 10	129	60 30	176	58 42	231	40 10	295
31	30 02	023	24 35	075	24 47	112	16 38	130	60 31	178	58 14	233	39 37	296
32	30 16	023	25 10	076	25 21	113	17 06	131	60 32	180	57 45	234	39 05	296
33	30 30	024	25 45	077	25 54	114	17 33	132	60 31	182	57 15	236	38 33	297
34	30 45	024	26 20	078	26 27	115	17 59	133	60 30	184	56 45	237	38 01	298
35	31 00	025	26 55	078	26 59	116	18 26	134	60 27	186	56 15	238	37 29	298
36	31 15	025	27 31	079	27 32	117	18 52	135	60 23	187	55 44	239	36 57	299
37	31 31	026	28 06	080	28 04	118	19 17	136	60 17	189	55 13	241	36 25	299
38	31 46	026	28 42	081	28 36	119	19 42	137	60 11	191	54 41	242	35 54	300
39	32 02	026	29 18	081	29 07	120	20 07	138	60 03	193	54 09	243	35 23	300
40	32 18	027	29 53	082	29 38	121	20 31	139	59 55	195	53 37	244	34 52	301
41	32 35	027	30 29	083	30 09	122	20 55	139	59 45	197	53 04	245	34 21	302
42	32 52	028	31 05	084	30 40	123	21 18	140	59 34	198	52 31	246	33 50	302
43	33 09	028	31 41	084	31 10	124	21 41	141	59 22	200	51 58	248	33 20	303
44	33 26	029	32 17	085	31 40	125	22 03	142	59 10	202	51 24	249	32 50	303
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
45	33 43	029	32 53	086	32 10	126	22 25	143	58 56	204	50 51	250	32 19	304
46	34 01	030	33 29	087	32 39	127	22 46	144	58 41	205	50 17	251	31 50	305
47	34 19	030	34 05	088	33 08	128	23 07	145	58 25	207	49 42	252	31 20	305
48	34 37	031	34 41	088	33 36	129	23 27	146	58 08	209	49 08	253	30 51	306
49	34 56	031	35 17	089	34 04	130	23 46	147	57 50	210	48 33	254	30 21	306
50	35 15	031	35 53	090	34 32	131	24 06	148	57 32	212	47 59	255	29 52	307
51	35 34	032	36 29	091	34 59	132	24 24	150	57 12	213	47 24	256	29 24	308
52	35 53	032	37 06	091	35 25	133	24 42	151	56 52	215	46 49	257	28 55	308
53	36 12	033	37 42	092	35 52	134	25 00	152	56 31	217	46 13	258	28 27	309
54	36 32	033	38 18	093	36 17	135	25 17	153	56 09	218	45 38	259	27 59	309
55	36 52	034	38 54	094	36 43	136	25 33	154	55 46	220	45 03	259	27 31	310
56	37 12	034	39 30	095	37 07	137	25 49	155	55 23	221	44 27	260	27 03	310
57	37 32	034	40 06	096	37 32	139	26 04	156	54 59	222	43 52	261	26 36	311
58	37 53	035	40 42	096	37 55	140	26 18	157	54 34	224	43 16	262	26 09	312
59	38 13	035	41 17	097	38 18	141	26 32	158	54 09	225	42 40	263	25 42	312
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	38 34	036	41 53	098	11 39	140	26 45	159	53 43	227	42 04	264	25 15	313
61	38 55	036	42 29	099	12 02	141	26 58	160	53 16	228	41 28	265	24 49	313
62	39 17	036	43 05	100	12 25	141	27 10	161	52 49	229	40 52	266	24 23	314
63	39 38	037	43 40	101	12 47	142	27 21	162	52 22	231	40 16	266	23 57	315
64	40 00	037	44 15	102	13 09	143	27 32	163	51 53	232	39 40	267	23 32	315
65	40 22	038	44 51	103	13 30	144	27 42	165	51 25	233	39 04	268	23 07	316
66	40 44	038	45 26	104	13 51	145	27 51	166	50 56	234	38 28	269	22 42	317
67	41 07	038	46 01	105	14 12	146	28 00	167	50 26	236	37 52	270	22 17	317
68	41 29	039	46 36	106	14 32	147	28 08	168	49 56	237	37 16	270	21 52	318
69	41 52	039	47 10	107	14 51	148	28 15	169	49 26	238	36 40	271	21 28	318
70	42 15	040	47 45	108	15 10	149	28 21	170	48 55	239	36 04	272	21 05	319
71	42 38	040	48 19	109	15 28	150	28 27	171	48 24	240	35 27	273	20 41	320
72	43 01	040	48 53	110	15 46	151	28 32	172	47 52	241	34 51	274	20 18	320
73	43 25	041	49 27	111	16 04	152	28 37	173	47 20	243	34 15	274	19 55	321
74	43 48	041	50 01	112	16 21	153	28 41	175	46 48	244	33 39	275	19 32	322
	Dubhe		◆ REGULUS		PROCYON		SIRIUS		◆ RIGEL		Hamal		◆ DENEB	
75	44 12	041	17 06	093	32 05	131	16 37	154	28 44	176	46 15	245	19 10	322
76	44 36	042	17 42	094	32 32	132	16 53	155	28 46	177	45 43	246	18 48	323
77	45 00	042	18 18	094	32 59	133	17 08	155	28 48	178	45 10	247	18 26	323
78	45 25	043	18 54	095	33 25	134	17 23	156	28 49	179	44 36	248	18 05	324
79	45 49	043	19 30	096	33 51	135	17 37	157	28 49	180	44 03	249	17 44	325
80	46 14	043	20 06	097	34 16	136	17 51	158	28 48	181	43 29	250	17 23	325
81	46 39	044	20 42	098	34 41	137	18 04	159	28 47	182	42 55	251	17 03	326
82	47 03	044	21 18	099	35 05	138	18 16	160	28 45	184	42 21	252	16 43	327
83	47 29	044	21 53	099	35 28	140	18 28	161	28 43	185	41 46	253	16 23	327
84	47 54	045	22 29	100	35 52	141	18 39	162	28 39	186	41 12	254	16 04	328
85	48 19	045	23 04	101	36 14	142	18 50	163	28 35	187	40 37	255	15 45	329
86	48 45	045	23 40	102	36 36	143	19 00	164	28 31	188	40 02	256	15 26	329
87	49 10	045	24 15	103	36 58	144	19 09	165	28 25	189	39 27	257	15 08	330
88	49 36	046	24 50	104	37 19	145	19 18	166	28 19	190	38 52	257	14 50	331
89	50 02	046	25 25	105	37 39	147	19 26	167	28 12	191	38 16	258	14 33	331

LAT 53°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		◆ Hamal		Schedar	
90	50 28	046	26 00	105	37 58	148	19 34	168	28 05	193	37 41	259	46 35	308
91	50 54	047	26 35	106	38 17	149	19 41	169	27 56	194	37 06	260	46 06	308
92	51 21	047	27 09	107	38 36	150	19 47	170	27 48	195	36 30	261	45 38	309
93	51 47	047	27 44	108	38 53	151	19 53	171	27 38	196	35 54	262	45 10	309
94	52 14	048	28 18	109	39 10	153	19 58	172	27 28	197	35 18	263	44 42	310
95	52 40	048	28 52	110	39 27	154	20 02	173	27 17	198	34 43	264	44 15	310
96	53 07	048	29 26	111	39 42	155	20 06	174	27 05	199	34 07	264	43 47	311
97	53 34	048	30 00	112	39 57	156	20 09	175	26 53	200	33 31	265	43 20	311
98	54 01	049	30 33	113	40 11	158	20 12	176	26 40	201	32 55	266	42 53	311
99	54 28	049	31 06	114	40 25	159	20 14	177	26 27	202	32 19	267	42 26	312
100	54 56	049	31 39	115	40 37	160	20 15	179	26 13	203	31 43	268	41 59	312
101	55 23	049	32 12	116	40 49	161	20 16	180	25 58	205	31 06	269	41 32	313
102	55 50	050	32 44	116	41 00	163	20 16	181	25 43	206	30 30	269	41 06	313
103	56 18	050	33 17	117	41 11	164	20 15	182	25 27	207	29 54	270	40 39	314
104	56 45	050	33 48	118	41 20	165	20 14	183	25 10	208	29 18	271	40 13	314
105	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
	57 13	050	22 03	095	34 20	119	20 12	184	24 53	209	44 03	231	57 13	287
106	57 41	050	22 39	096	34 51	120	20 09	185	24 36	210	43 34	232	56 38	287
107	58 09	051	23 15	097	35 22	121	20 06	186	24 17	211	43 05	234	56 04	288
108	58 37	051	23 51	098	35 53	123	20 02	187	23 59	212	42 36	235	55 30	288
109	59 05	051	24 27	098	36 23	124	19 57	188	23 39	213	42 07	236	54 55	289
110	59 33	051	25 02	099	36 53	125	19 52	189	23 19	214	41 36	237	54 21	289
111	60 01	051	25 38	100	37 23	126	19 47	190	22 59	215	41 06	238	53 47	290
112	60 29	051	26 13	101	37 52	127	19 40	191	22 38	216	40 35	239	53 13	290
113	60 57	051	26 49	102	38 21	128	19 33	192	22 17	217	40 04	240	52 40	291
114	61 25	052	27 24	103	38 49	129	19 25	193	21 55	218	39 33	241	52 06	291
115	61 54	052	27 59	104	39 17	130	19 17	194	21 32	219	39 01	242	51 32	292
116	62 22	052	28 34	104	39 44	131	19 08	195	21 09	220	38 29	243	50 59	292
117	62 50	052	29 09	105	40 11	132	18 59	196	20 46	221	37 56	244	50 26	293
118	63 19	052	29 44	106	40 38	133	18 49	197	20 22	222	37 24	245	49 52	293
119	63 47	052	30 18	107	41 04	135	18 38	198	19 58	223	36 51	246	49 19	294
120	Kochab		◆ ARCTURUS		REGULUS		◆ SIRIUS		BETELGEUSE		CAPELLA		◆ Schedar	
	47 03	023	12 46	075	41 29	136	18 27	199	37 55	220	63 09	271	33 45	321
121	47 17	023	13 21	076	41 54	137	18 15	200	37 31	222	62 33	272	33 22	322
122	47 31	024	13 56	077	42 18	138	18 02	201	37 07	223	61 57	273	33 00	322
123	47 46	024	14 31	077	42 42	139	17 49	202	36 42	224	61 21	274	32 38	323
124	48 00	024	15 06	078	43 05	141	17 36	203	36 17	225	60 45	274	32 17	323
125	48 15	024	15 41	079	43 28	142	17 21	204	35 51	226	60 09	275	31 55	324
126	48 30	024	16 17	080	43 50	143	17 07	205	35 25	227	59 33	276	31 34	324
127	48 45	024	16 53	080	44 11	144	16 51	206	34 59	228	58 57	277	31 13	325
128	49 00	025	17 28	081	44 32	146	16 36	207	34 31	229	58 21	277	30 53	325
129	49 15	025	18 04	082	44 52	147	16 19	207	34 04	230	57 45	278	30 32	326
130	49 30	025	18 40	083	45 12	148	16 02	208	33 36	231	57 10	279	30 12	326
131	49 45	025	19 16	084	45 30	150	15 45	209	33 07	232	56 34	279	29 52	327
132	50 00	025	19 51	084	45 48	151	15 27	210	32 39	233	55 58	280	29 33	327
133	50 16	025	20 27	085	46 05	152	15 08	211	32 09	234	55 23	280	29 13	328
134	50 31	026	21 03	086	46 22	154	14 49	212	31 40	235	54 47	281	28 54	328
135	Kochab		◆ ARCTURUS		REGULUS		◆ POLLUX		BETELGEUSE		CAPELLA		◆ Schedar	
	50 47	026	21 39	087	46 37	155	61 31	216	31 10	236	54 12	282	28 36	329
136	51 03	026	22 16	087	46 52	156	61 09	218	30 40	237	53 37	282	28 17	329
137	51 18	026	22 52	088	47 06	158	60 47	219	30 09	238	53 01	283	27 59	330
138	51 34	026	23 28	089	47 20	159	60 24	221	29 38	239	52 26	284	27 41	331
139	51 50	026	24 04	090	47 32	161	60 00	222	29 07	240	51 51	284	27 23	331
140	52 06	026	24 40	091	47 44	162	59 35	224	28 35	241	51 16	285	27 06	332
141	52 22	026	25 16	091	47 55	163	59 10	225	28 04	242	50 41	285	26 49	332
142	52 38	026	25 52	092	48 04	165	58 44	227	27 31	243	50 07	286	26 32	333
143	52 54	027	26 28	093	48 13	166	58 17	228	26 59	244	49 32	287	26 16	333
144	53 10	027	27 04	094	48 22	168	57 50	230	26 26	245	48 57	287	26 00	334
145	53 27	027	27 40	095	48 29	169	57 22	231	25 53	246	48 23	288	25 44	334
146	53 43	027	28 16	096	48 35	171	56 53	233	25 20	247	47 49	288	25 28	335
147	53 59	027	28 52	096	48 41	172	56 24	234	24 47	248	47 14	289	25 13	335
148	54 16	027	29 28	097	48 45	174	55 55	235	24 13	249	46 40	290	24 58	336
149	54 32	027	30 04	098	48 49	175	55 25	237	23 40	250	46 06	290	24 44	336
150	◆ VEGA		ARCTURUS		SPICA		◆ REGULUS		POLLUX		◆ CAPELLA		Schedar	
	11 43	038	30 39	099	12 14	128	48 51	177	54 55	238	45 33	291	24 29	337
151	12 05	039	31 15	100	12 42	129	48 53	178	54 24	239	44 59	291	24 15	338
152	12 28	039	31 51	101	13 10	130	48 54	180	53 53	240	44 25	292	24 02	338
153	12 51	040	32 26	101	13 37	131	48 53	181	53 21	241	43 52	293	23 48	339
154	13 14	041	33 01	102	14 04	132	48 52	183	52 49	243	43 19	293	23 35	339
155	13 38	041	33 37	103	14 31	133	48 50	184	52 17	244	42 45	294	23 23	340
156	14 02	042	34 12	104	14 57	134	48 47	186	51 44	245	42 12	294	23 10	340
157	14 26	043	34 47	105	15 23	135	48 43	187	51 12	246	41 40	295	22 58	341
158	14 51	044	35 21	106	15 49	135	48 38	188	50 38	247	41 07	295	22 47	341
159	15 16	044	35 56	107	16 14	136	48 33	190	50 05	248	40 34	296	22 35	342
160	15 41	045	36 31	108	16 39	137	48 26	191	49 31	249	40 02	297	22 24	343
161	16 07	046	37 05	109	17 03	138	48 18	193	48 57	250	39 30	297	22 14	343
162	16 33	046	37 39	110	17 27	139	48 10	194	48 23	251	38 58	298	22 03	344
163	16 59	047	38 13	111	17 50	140	48 00	196	47 49	252	38 26	298	21 53	344
164	17 26	048	38 47	112	18 13	141	47 50	197	47 14	253	37 54	299	21 44	345
165	DENEB		◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		POLLUX		◆ CAPELLA	
	12 40	024	17 52	048	39 20	113	18 36	142	47 39	199	46 40	254	37 23	299
166	12 55	025	18 20	049	39 53	114	18 58	143	47 27	200	46 05	255	36 51	300
167	13 11	025	18 47	050	40 26	115	19 19	144	47 14	201	45 30	256	36 20	301
168	13 26	026	19 15	050	40 59	116	19 40	145	47 01	203	44 55	257	35 49	301
169	13 43	027	19 42	051	41 31	117	20 01	146	46 46	204	44 20	258	35 18	302
170	13 59	027	20 11	052	42 03	118	20 21	147	46 31	206	43 44	259	34 47	302
171	14 16	028	20 39	052	42 35	119	20 40	148	46 15	207	43 09	260	34 17	303
172	14 33	029	21 08	053	43 07	120	20 59	149	45 58	208	42 33	261	33 47	303
173	14 51	029	21 37	054	43 38	121	21 17	150	45 41	210	41 57	262	33 17	304
174	15 08	030	22 06	054	44 09	122	21 35	151	45 23	211	41 22	263	32 47	305
175	15 27	031	22 35	055	44 39	123	21 53	152	45 04	212	40 46	263	32 17	305
176	15 45	031	23 05	056	45 09	124	22 09	153	44 44	214	40 10	264	31 48	306
177	16 04	032	23 35	056	45 39	125	22 26	154	44 24	215	39 34	265	31 19	306
178	16 24	033	24 05	057	46 08	127	22 41	155	44 03	216	38 58	266	30 50	307
179	16 43	033	24 35	057	46 37	128	22 56	156	43 41	217	38 22	267	30 21	307

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LAT 53°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	DENEB		◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		POLLUX		◆ CAPELLA	
180	17 03	034	25 06	058	47 05	129	23 11	157	43 19	219	37 46	268	29 52	308
181	17 24	035	25 36	059	47 33	130	23 24	158	42 56	220	37 10	268	29 24	309
182	17 45	035	26 07	059	48 00	131	23 38	159	42 32	221	36 34	269	28 56	309
183	18 06	036	26 39	060	48 27	133	23 50	160	42 08	222	35 58	270	28 28	310
184	18 27	037	27 10	061	48 53	134	24 02	161	41 44	224	35 21	271	28 00	310
185	18 49	037	27 42	061	49 19	135	24 13	162	41 19	225	34 45	272	27 33	311
186	19 11	038	28 13	062	49 44	137	24 24	163	40 53	226	34 09	272	27 06	312
187	19 33	038	28 45	063	50 09	138	24 34	164	40 27	227	33 33	273	26 39	312
188	19 55	039	29 18	063	50 33	139	24 44	165	40 00	228	32 57	274	26 12	313
189	20 18	040	29 50	064	50 56	141	24 52	166	39 33	229	32 21	275	25 46	313
190	20 42	040	30 22	065	51 19	142	25 01	168	39 05	230	31 45	275	25 20	314
191	21 05	041	30 55	065	51 41	143	25 08	169	38 37	232	31 09	276	24 54	315
192	21 29	042	31 28	066	52 02	145	25 15	170	38 09	233	30 33	277	24 29	315
193	21 53	042	32 01	067	52 22	146	25 21	171	37 40	234	29 58	278	24 03	316
194	22 18	043	32 34	067	52 42	148	25 26	172	37 10	235	29 22	279	23 38	316
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	22 42	043	33 08	068	22 38	099	53 01	149	36 41	236	28 46	279	23 13	317
196	23 07	044	33 41	068	23 14	100	53 19	151	36 11	237	28 11	280	22 49	318
197	23 32	045	34 15	069	23 49	101	53 36	152	35 40	238	27 35	281	22 25	318
198	23 58	045	34 49	070	24 25	102	53 53	154	35 09	239	27 00	281	22 01	319
199	24 24	046	35 23	070	25 00	103	54 08	155	34 38	240	26 24	282	21 37	319
200	24 50	047	35 57	071	25 35	104	54 23	157	34 07	241	25 49	283	21 14	320
201	25 16	047	36 31	072	26 10	104	54 37	158	33 35	242	25 14	284	20 51	321
202	25 43	048	37 05	072	26 45	105	54 50	160	33 03	243	24 39	284	20 28	321
203	26 10	048	37 40	073	27 20	106	55 02	162	32 31	244	24 04	285	20 06	322
204	26 37	049	38 14	074	27 55	107	55 13	163	31 58	245	23 29	286	19 44	323
205	27 04	050	38 49	074	28 29	108	55 23	165	31 26	246	22 54	287	19 22	323
206	27 32	050	39 24	075	29 03	109	55 32	166	30 52	247	22 20	287	19 00	324
207	28 00	051	39 59	076	29 37	110	55 40	168	30 19	248	21 46	288	18 39	324
208	28 28	051	40 34	076	30 11	111	55 47	170	29 46	249	21 11	289	18 18	325
209	28 56	052	41 09	077	30 45	112	55 53	171	29 12	250	20 37	290	17 58	326
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
210	29 24	053	41 44	078	31 18	113	55 57	173	28 38	250	20 03	290	17 38	326
211	29 53	053	42 20	078	31 51	114	56 01	175	28 04	251	19 29	291	17 18	327
212	30 22	054	42 55	079	32 24	115	56 04	176	27 30	252	18 56	292	16 59	328
213	30 51	054	43 31	080	32 57	115	56 06	178	26 55	253	18 22	292	16 39	328
214	31 21	055	44 06	081	33 30	116	56 06	180	26 20	254	17 49	293	16 21	329
215	31 50	055	44 42	081	34 02	117	56 06	182	25 46	255	17 16	294	16 02	330
216	32 20	056	45 18	082	34 34	118	56 04	183	25 11	256	16 43	295	15 44	330
217	32 50	057	45 53	083	35 05	119	56 02	185	24 36	257	16 10	295	15 26	331
218	33 21	057	46 29	083	35 37	120	55 58	187	24 00	258	15 38	296	15 09	332
219	33 51	058	47 05	084	36 08	121	55 53	188	23 25	258	15 05	297	14 52	332
220	34 22	058	47 41	085	36 38	122	55 48	190	22 50	259	14 33	297	14 35	333
221	34 53	059	48 17	086	37 09	124	55 41	192	22 14	260	14 01	298	14 19	334
222	35 24	060	48 53	086	37 38	125	55 33	193	21 39	261	13 29	299	14 03	334
223	35 55	060	49 29	087	38 08	126	55 24	195	21 03	262	12 58	300	13 48	335
224	36 26	061	50 05	088	38 37	127	55 15	197	20 27	263	12 27	300	13 32	336
	Schedar		◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		Denebola		◆ Dubhe	
225	23 14	020	36 58	061	50 41	089	39 06	128	55 04	198	36 23	243	58 18	309
226	23 27	020	37 30	062	51 17	089	39 34	129	54 52	200	35 51	244	57 50	310
227	23 39	021	38 01	062	51 53	090	40 02	130	54 39	201	35 18	245	57 22	310
228	23 53	022	38 34	063	52 30	091	40 30	131	54 26	203	34 45	245	56 54	310
229	24 06	022	39 06	064	53 06	092	40 56	132	54 11	205	34 12	246	56 27	310
230	24 20	023	39 38	064	53 42	093	41 23	133	53 56	206	33 39	247	55 59	310
231	24 34	023	40 11	065	54 18	094	41 49	135	53 39	208	33 06	248	55 32	311
232	24 48	024	40 44	065	54 54	094	42 14	136	53 22	209	32 32	249	55 04	311
233	25 03	024	41 17	066	55 30	095	42 39	137	53 04	211	31 58	250	54 37	311
234	25 18	025	41 50	067	56 06	096	43 04	138	52 45	212	31 24	251	54 10	311
235	25 33	025	42 23	067	56 42	097	43 27	139	52 26	214	30 50	252	53 43	312
236	25 49	026	42 56	068	57 17	098	43 50	141	52 05	215	30 15	253	53 16	312
237	26 05	026	43 30	068	57 53	099	44 13	142	51 44	216	29 41	254	52 49	312
238	26 21	027	44 03	069	58 29	100	44 35	143	51 22	218	29 06	255	52 22	312
239	26 38	028	44 37	069	59 04	101	44 56	144	51 00	219	28 31	256	51 56	313
	◆ Schedar		DENEB		VEGA		◆ Rasalhague		ARCTURUS		◆ Denebola		Dubhe	
240	26 54	028	45 11	070	59 40	102	45 17	146	50 37	221	27 56	257	51 29	313
241	27 12	029	45 45	071	60 15	103	45 37	147	50 13	222	27 21	257	51 03	313
242	27 29	029	46 19	071	60 50	104	45 56	148	49 49	223	26 46	258	50 37	314
243	27 47	030	46 53	072	61 25	105	46 15	150	49 23	225	26 10	259	50 10	314
244	28 05	030	47 28	072	62 00	106	46 32	151	48 58	226	25 35	260	49 45	314
245	28 23	031	48 02	073	62 34	107	46 50	152	48 32	227	24 59	261	49 19	314
246	28 41	031	48 37	074	63 09	108	47 06	154	48 05	228	24 23	262	48 53	315
247	29 00	032	49 11	074	63 43	110	47 21	155	47 38	230	23 48	262	48 27	315
248	29 19	032	49 46	075	64 17	111	47 36	157	47 10	231	23 12	263	48 02	315
249	29 39	033	50 21	075	64 50	112	47 50	158	46 42	232	22 36	264	47 37	316
250	29 58	033	50 56	076	65 24	113	48 03	159	46 13	233	22 00	265	47 11	316
251	30 18	034	51 31	077	65 57	115	48 15	161	45 44	234	21 24	266	46 46	316
252	30 39	034	52 06	077	66 29	116	48 27	162	45 14	236	20 48	267	46 22	317
253	30 59	035	52 42	078	67 01	118	48 37	164	44 44	237	20 12	267	45 57	317
254	31 20	035	53 17	079	67 33	119	48 47	165	44 14	238	19 36	268	45 32	317
	◆ Schedar		DENEB		ALTAIR		◆ Rasalhague		ARCTURUS		◆ Alkaid		Kochab	
255	31 41	036	53 52	079	34 01	126	48 56	167	43 43	239	60 14	282	65 09	340
256	32 02	036	54 28	080	34 30	127	49 04	168	43 12	240	59 38	283	64 56	339
257	32 23	037	55 03	081	34 59	128	49 10	170	42 41	241	59 03	284	64 43	339
258	32 45	037	55 39	081	35 27	129	49 17	171	42 09	242	58 28	284	64 30	338
259	33 07	038	56 15	082	35 55	130	49 22	173	41 37	243	57 53	285	64 17	338
260	33 29	038	56 51	083	36 22	131	49 26	174	41 04	244	57 18	285	64 03	338
261	33 52	039	57 26	083	36 49	132	49 29	176	40 32	245	56 44	286	63 49	337
262	34 15	039	58 02	084	37 16	133	49 31	177	39 59	246	56 09	286	63 35	337
263	34 37	040	58 38	085	37 42	134	49 33	179	39 26	247	55 34	287	63 21	337
264	35 01	040	59 14	085	38 07	136	49 33	180	38 52	248	55 00	287	63 07	336
265	35 24	041	59 50	086	38 32	137	49 32	182	38 19	249	54 25	288	62 52	336
266	35 48	041	60 26	087	38 57	138	49 31	183	37 45	250	53 51	288	62 38	336
267	36 11	042	61 02	088	39 21	139	49 28	185	37 11	251	53 17	289	62 23	336
268	36 36	042	61 38	088	39 44	140	49 25	186	36 36	252	52 43	290	62 08	335
269	37 00	042	62 15	089	40 07	141	49 21	188	36 02	253	52 09	290	61 53	335

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	17 58	025	21 37	070	40 29	143	49 15	189	35 27	254	51 35	291	61 37	335
271	18 13	026	22 11	071	40 51	144	49 09	191	34 53	255	51 01	291	61 22	335
272	18 29	026	22 45	071	41 12	145	49 02	192	34 18	256	50 28	292	61 07	335
273	18 45	027	23 19	072	41 32	146	48 54	194	33 43	257	49 54	292	60 51	334
274	19 01	027	23 53	073	41 52	148	48 45	195	33 08	257	49 21	293	60 35	334
275	19 18	028	24 28	073	42 11	149	48 35	196	32 32	258	48 47	293	60 20	334
276	19 35	029	25 03	074	42 29	150	48 25	198	31 57	259	48 14	294	60 04	334
277	19 53	029	25 37	075	42 47	151	48 13	199	31 21	260	47 41	294	59 48	334
278	20 11	030	26 12	076	43 04	153	48 01	201	30 46	261	47 09	295	59 32	334
279	20 29	031	26 47	076	43 20	154	47 48	202	30 10	262	46 36	295	59 16	333
280	20 48	031	27 22	077	43 36	155	47 33	204	29 34	263	46 03	296	58 59	333
281	21 06	032	27 58	078	43 50	157	47 19	205	28 58	264	45 31	296	58 43	333
282	21 26	032	28 33	078	44 04	158	47 03	206	28 22	264	44 59	297	58 27	333
283	21 45	033	29 08	079	44 17	159	46 46	208	27 46	265	44 27	297	58 11	333
284	22 05	034	29 44	080	44 30	161	46 29	209	27 10	266	43 55	298	57 54	333
285	22 25	034	30 19	081	44 41	162	46 11	210	26 34	267	43 23	299	57 38	333
286	22 45	035	30 55	081	44 52	163	45 53	212	25 58	268	42 51	299	57 22	333
287	23 06	035	31 31	082	45 02	165	45 33	213	25 22	268	42 20	300	57 05	333
288	23 27	036	32 07	083	45 11	166	45 13	214	24 46	269	41 48	300	56 49	333
289	23 48	036	32 43	084	45 20	167	44 52	216	24 10	270	41 17	301	56 32	333
290	24 10	037	33 18	084	45 27	169	44 31	217	23 34	271	40 46	301	56 16	333
291	24 32	038	33 54	085	45 33	170	44 09	218	22 58	272	40 15	302	56 00	333
292	24 54	038	34 30	086	45 39	172	43 46	220	22 22	272	39 45	302	55 43	333
293	25 17	039	35 06	087	45 44	173	43 23	221	21 46	273	39 14	303	55 27	333
294	25 39	039	35 43	087	45 48	174	42 59	222	21 10	274	38 44	303	55 10	333
295	26 02	040	36 19	088	45 51	176	42 35	223	20 34	275	38 14	304	54 54	333
296	26 26	041	36 55	089	45 53	177	42 10	224	19 58	276	37 44	304	54 37	333
297	26 49	041	37 31	090	45 54	179	41 44	226	19 22	276	37 14	305	54 21	333
298	27 13	042	38 07	091	45 55	180	41 18	227	18 46	277	36 45	305	54 05	333
299	27 37	042	38 43	091	45 54	182	40 52	228	18 10	278	36 15	306	53 48	333
	CAPELLA		◆ Alpheratz		Enif		ALTAIR		◆ VEGA		Alphecca		◆ Alioth	
300	14 54	028	39 19	092	42 02	144	45 53	183	69 56	233	35 09	269	34 29	319
301	15 11	029	39 55	093	42 23	145	45 50	184	69 27	235	34 33	270	34 06	320
302	15 28	029	40 31	094	42 43	147	45 47	186	68 57	237	33 57	270	33 43	320
303	15 46	030	41 07	095	43 03	148	45 43	187	68 27	238	33 21	271	33 20	321
304	16 04	030	41 43	096	43 22	149	45 38	189	67 56	240	32 45	272	32 57	321
305	16 22	031	42 19	096	43 40	150	45 32	190	67 24	241	32 08	273	32 34	322
306	16 41	032	42 55	097	43 57	152	45 25	191	66 53	243	31 32	273	32 12	322
307	17 00	032	43 31	098	44 14	153	45 18	193	66 20	244	30 56	274	31 50	323
308	17 20	033	44 06	099	44 30	154	45 09	194	65 47	246	30 20	275	31 28	323
309	17 40	034	44 42	100	44 45	156	45 00	196	65 14	247	29 44	276	31 07	324
310	18 00	034	45 18	101	45 00	157	44 50	197	64 41	248	29 09	277	30 46	324
311	18 21	035	45 53	102	45 13	158	44 39	198	64 07	250	28 33	277	30 25	325
312	18 41	036	46 28	103	45 26	160	44 27	200	63 33	251	27 57	278	30 04	325
313	19 03	036	47 03	104	45 38	161	44 14	201	62 59	252	27 21	279	29 43	326
314	19 24	037	47 38	105	45 50	163	44 01	202	62 25	253	26 46	280	29 23	326
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
315	19 46	037	26 17	085	48 13	106	46 00	164	43 47	204	61 50	254	29 03	327
316	20 08	038	26 53	086	48 48	107	46 10	165	43 32	205	61 15	255	28 44	327
317	20 30	039	27 30	087	49 22	108	46 18	167	43 16	206	60 40	256	28 24	328
318	20 53	039	28 06	087	49 57	109	46 26	168	43 00	208	60 05	257	28 05	328
319	21 16	040	28 42	088	50 31	110	46 33	170	42 43	209	59 30	258	27 46	329
320	21 40	041	29 18	089	51 05	111	46 39	171	42 25	210	58 54	259	27 28	329
321	22 03	041	29 54	090	51 38	112	46 44	172	42 06	212	58 19	260	27 09	330
322	22 27	042	30 30	091	52 12	113	46 49	174	41 47	213	57 43	261	26 52	330
323	22 51	042	31 06	091	52 45	114	46 52	175	41 27	214	57 07	262	26 34	331
324	23 16	043	31 42	092	53 18	115	46 54	177	41 07	215	56 32	263	26 16	332
325	23 41	044	32 18	093	53 50	116	46 56	178	40 45	216	55 56	264	25 59	332
326	24 06	044	32 54	094	54 22	117	46 57	180	40 24	218	55 20	265	25 43	333
327	24 31	045	33 30	095	54 54	119	46 56	181	40 01	219	54 44	266	25 26	333
328	24 57	045	34 06	096	55 26	120	46 55	183	39 38	220	54 08	267	25 10	334
329	25 23	046	34 42	096	55 57	121	46 53	184	39 15	221	53 32	267	24 54	334
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
330	25 49	047	35 18	097	56 28	122	46 50	185	38 51	222	52 56	268	24 39	335
331	26 15	047	35 54	098	56 58	124	46 46	187	38 26	224	52 20	269	24 23	335
332	26 42	048	36 30	099	57 28	125	46 42	188	38 01	225	51 43	270	24 08	336
333	27 09	048	37 05	100	57 57	126	46 36	190	37 35	226	51 07	271	23 54	336
334	27 36	049	37 41	101	58 26	128	46 29	191	37 09	227	50 31	272	23 40	337
335	28 03	050	38 16	102	58 54	129	46 22	193	36 43	228	49 55	272	23 26	338
336	28 31	050	38 51	103	59 22	131	46 14	194	36 15	229	49 19	273	23 12	338
337	28 59	051	39 27	103	59 49	132	46 05	195	35 48	230	48 43	274	22 59	339
338	29 27	051	40 02	104	60 15	134	45 55	197	35 20	231	48 07	275	22 46	339
339	29 55	052	40 37	105	60 41	135	45 44	198	34 52	232	47 31	275	22 33	340
340	30 24	053	41 11	106	61 06	137	45 32	200	34 23	233	46 55	276	22 21	340
341	30 53	053	41 46	107	61 31	138	45 19	201	33 54	234	46 19	277	22 09	341
342	31 22	054	42 20	108	61 54	140	45 06	202	33 24	235	45 43	277	21 57	341
343	31 51	054	42 54	109	62 17	142	44 52	204	32 54	236	45 08	278	21 46	342
344	32 20	055	43 28	110	62 39	143	44 37	205	32 24	237	44 32	279	21 35	343
345	32 50	055	16 36	084	15 36	154	44 22	206	31 53	238	43 56	280	21 24	343
346	33 20	056	17 12	085	15 51	155	44 05	208	31 22	239	43 21	280	21 14	344
347	33 50	057	17 48	086	16 06	156	43 48	209	30 51	240	42 45	281	21 04	344
348	34 20	057	18 24	087	16 20	157	43 30	210	30 19	241	42 10	282	20 55	345
349	34 51	058	19 00	088	16 34	158	43 12	212	29 48	242	41 35	282	20 45	345
350	35 21	058	19 36	088	16 47	159	42 53	213	29 15	243	40 59	283	20 36	346
351	35 52	059	20 12	089	17 00	160	42 33	214	28 43	244	40 24	284	20 28	347
352	36 23	060	20 48	090	17 12	161	42 12	215	28 10	245	39 49	284	20 20	347
353	36 54	060	21 24	091	17 23	162	41 51	217	27 37	246	39 14	285	20 12	348
354	37 26	061	22 01	092	17 34	163	41 29	218	27 04	247	38 39	286	20 05	348
355	37 57	061	22 37	092	17 44	164	41 07	219	26 31	248	38 05	286	19 57	349
356	38 29	062	23 13	093	17 54	165	40 44	220	25 57	249	37 30	287	19 51	350
357	39 01	062	23 49	094	18 03	166	40 20	221	25 24	250	36 56	288	19 44	350
358	39 33	063	24 25	095	18 12	167	39 56	223	24 50	251	36 21	288	19 38	351
359	40 05	064	25 01	096	18 20	168	39 31	224	24 15	252	35 47	289	19 33	351

Tilbage til Menuen

LAT 52°N

LHA Y	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		ALTAIR		◆ VEGA		Alioth	
0	40 11	063	25 43	096	52 30	127	67 07	175	23 59	253	34 53	290	18 28	352
1	40 44	064	26 20	097	52 59	128	67 09	177	23 24	254	34 18	291	18 23	353
2	41 17	064	26 56	098	53 28	130	67 10	179	22 48	255	33 44	292	18 19	353
3	41 51	065	27 33	098	53 56	131	67 10	182	22 12	255	33 09	292	18 14	354
4	42 24	066	28 09	099	54 23	132	67 08	184	21 36	256	32 35	293	18 10	354
5	42 58	066	28 46	100	54 50	134	67 05	186	21 01	257	32 01	294	18 07	355
6	43 32	067	29 22	101	55 17	135	67 00	188	20 24	258	31 28	294	18 04	355
7	44 06	067	29 58	102	55 43	137	66 54	191	19 48	259	30 54	295	18 01	356
8	44 40	068	30 35	103	56 08	138	66 47	193	19 12	260	30 21	295	17 59	357
9	45 14	068	31 11	104	56 32	139	66 38	195	18 36	260	29 47	296	17 57	357
10	45 49	069	31 46	104	56 56	141	66 28	197	17 59	261	29 14	297	17 55	358
11	46 23	069	32 22	105	57 18	143	66 16	199	17 23	262	28 41	297	17 54	358
12	46 58	070	32 58	106	57 41	144	66 04	201	16 46	263	28 09	298	17 53	359
13	47 33	071	33 33	107	58 02	146	65 50	203	16 09	264	27 36	299	17 53	000
14	48 08	071	34 08	108	58 22	147	65 34	205	15 32	265	27 04	299	17 53	000
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		DENEB		◆ VEGA	
15	25 57	015	48 43	072	34 43	109	58 42	149	65 18	207	48 18	287	26 32	300
16	26 07	015	49 18	072	35 18	110	59 00	151	65 00	209	47 43	288	26 00	301
17	26 17	016	49 53	073	35 53	111	59 18	152	64 42	211	47 08	289	25 28	301
18	26 27	016	50 28	073	36 27	112	59 35	154	64 22	213	46 33	289	24 56	302
19	26 38	017	51 04	074	37 01	113	59 50	156	64 02	215	45 58	290	24 25	302
20	26 48	017	51 39	075	37 35	114	60 05	158	63 40	217	45 23	290	23 54	303
21	26 59	018	52 15	075	38 09	115	60 19	159	63 17	219	44 49	291	23 23	304
22	27 11	018	52 51	076	38 42	116	60 31	161	62 54	220	44 14	291	22 53	304
23	27 22	019	53 27	076	39 16	117	60 42	163	62 30	222	43 40	292	22 22	305
24	27 34	019	54 03	077	39 48	118	60 53	165	62 04	224	43 06	293	21 52	306
25	27 47	020	54 39	078	40 21	119	61 02	167	61 39	225	42 32	293	21 22	306
26	27 59	020	55 15	078	40 53	120	61 10	169	61 12	227	41 58	294	20 53	307
27	28 12	021	55 51	079	41 25	121	61 17	170	60 45	228	41 24	294	20 23	308
28	28 25	021	56 27	079	41 57	122	61 22	172	60 17	230	40 51	295	19 54	308
29	28 39	022	57 03	080	42 28	123	61 26	174	59 48	231	40 17	295	19 25	309
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
30	28 52	022	23 44	074	24 35	111	16 48	129	61 29	176	59 19	233	39 44	296
31	29 06	023	24 20	075	25 10	112	17 17	130	61 31	178	58 50	234	39 11	297
32	29 21	023	24 55	076	25 44	113	17 45	131	61 32	180	58 19	235	38 38	297
33	29 35	023	25 31	076	26 18	114	18 13	132	61 31	182	57 49	237	38 05	298
34	29 50	024	26 07	077	26 52	114	18 40	133	61 29	184	57 18	238	37 33	298
35	30 05	024	26 43	078	27 25	115	19 07	134	61 26	186	56 46	239	37 00	299
36	30 21	025	27 19	079	27 58	116	19 34	134	61 22	188	56 14	241	36 28	299
37	30 36	025	27 56	079	28 31	117	20 00	135	61 17	190	55 42	242	35 56	300
38	30 52	026	28 32	080	29 04	118	20 26	136	61 10	191	55 09	243	35 24	301
39	31 08	026	29 08	081	29 37	119	20 51	137	61 02	193	54 36	244	34 52	301
40	31 25	027	29 45	082	30 09	120	21 16	138	60 53	195	54 02	245	34 20	302
41	31 42	027	30 21	082	30 40	121	21 40	139	60 43	197	53 29	247	33 49	302
42	31 59	028	30 58	083	31 12	122	22 04	140	60 31	199	52 54	248	33 18	303
43	32 16	028	31 35	084	31 43	123	22 27	141	60 19	201	52 20	249	32 47	303
44	32 33	028	32 12	085	32 14	124	22 50	142	60 05	202	51 46	250	32 16	304
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
45	32 51	029	32 48	085	32 44	125	23 13	143	59 50	204	51 11	251	31 46	304
46	33 09	029	33 25	086	33 14	126	23 35	144	59 35	206	50 36	252	31 15	305
47	33 27	030	34 02	087	33 44	127	23 56	145	59 18	208	50 01	253	30 45	306
48	33 46	030	34 39	088	34 13	128	24 17	146	59 00	209	49 25	254	30 15	306
49	34 04	031	35 16	088	34 42	129	24 37	147	58 42	211	48 50	255	29 46	307
50	34 23	031	35 53	089	35 11	130	24 57	148	58 22	213	48 14	256	29 16	307
51	34 43	032	36 30	090	35 39	131	25 16	149	58 02	214	47 38	257	28 47	308
52	35 02	032	37 07	091	36 06	132	25 34	150	57 41	216	47 02	258	28 18	309
53	35 22	032	37 44	092	36 33	133	25 52	151	57 19	217	46 26	259	27 49	309
54	35 42	033	38 21	092	37 00	135	26 10	152	56 56	219	45 50	260	27 21	310
55	36 02	033	38 57	093	37 26	136	26 27	153	56 32	221	45 13	260	26 52	310
56	36 22	034	39 34	094	37 51	137	26 43	155	56 08	222	44 37	261	26 24	311
57	36 42	034	40 11	095	38 16	138	26 58	156	55 43	223	44 00	262	25 56	311
58	37 03	034	40 48	096	38 41	139	27 13	157	55 17	225	43 24	263	25 29	312
59	37 24	035	41 25	096	39 05	140	27 28	158	54 51	226	42 47	264	25 02	313
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	37 45	035	42 01	097	12 25	140	27 41	159	54 24	228	42 10	265	24 34	313
61	38 07	036	42 38	098	12 49	140	27 54	160	53 56	229	41 33	266	24 08	314
62	38 28	036	43 14	099	13 12	141	28 07	161	53 28	230	40 56	266	23 41	314
63	38 50	036	43 51	100	13 35	142	28 18	162	52 59	232	40 19	267	23 15	315
64	39 12	037	44 27	101	13 57	143	28 29	163	52 30	233	39 43	268	22 49	316
65	39 34	037	45 03	102	14 19	144	28 39	164	52 00	234	39 06	269	22 23	316
66	39 57	038	45 40	103	14 40	145	28 49	165	51 30	235	38 29	270	21 58	317
67	40 19	038	46 16	104	15 01	146	28 58	167	50 59	237	37 52	270	21 33	317
68	40 42	038	46 51	105	15 22	147	29 06	168	50 28	238	37 15	271	21 08	318
69	41 05	039	47 27	105	15 42	148	29 14	169	49 57	239	36 38	272	20 43	319
70	41 28	039	48 03	106	16 01	149	29 20	170	49 25	240	36 01	273	20 19	319
71	41 52	039	48 38	107	16 20	150	29 26	171	48 53	241	35 24	274	19 55	320
72	42 15	040	49 13	108	16 39	151	29 32	172	48 20	242	34 47	274	19 32	321
73	42 39	040	49 48	109	16 57	152	29 36	173	47 47	244	34 10	275	19 08	321
74	43 03	040	50 23	111	17 14	152	29 40	175	47 14	245	33 34	276	18 45	322
	Dubhe		◆ REGULUS		PROCYON		SIRIUS		◆ RIGEL		Hamal		◆ DENEB	
75	43 27	041	17 09	093	32 44	130	17 31	153	29 44	176	46 41	246	18 22	322
76	43 51	041	17 46	093	33 12	131	17 47	154	29 46	177	46 07	247	18 00	323
77	44 16	041	18 23	094	33 40	133	18 03	155	29 48	178	45 33	248	17 38	324
78	44 40	042	19 00	095	34 06	134	18 18	156	29 49	179	44 58	249	17 16	324
79	45 05	042	19 37	096	34 33	135	18 32	157	29 49	180	44 24	250	16 55	325
80	45 30	042	20 13	097	34 59	136	18 46	158	29 48	181	43 49	251	16 34	326
81	45 55	043	20 50	097	35 25	137	19 00	159	29 47	182	43 14	252	16 13	326
82	46 20	043	21 27	098	35 50	138	19 12	160	29 45	184	42 39	253	15 53	327
83	46 45	043	22 03	099	36 14	139	19 25	161	29 42	185	42 04	254	15 33	327
84	47 11	044	22 39	100	36 38	140	19 36	162	29 39	186	41 28	255	15 13	328
85	47 36	044	23 16	101	37 01	141	19 47	163	29 35	187	40 52	256	14 54	329
86	48 02	044	23 52	102	37 24	143	19 57	164	29 30	188	40 16	256	14 35	329
87	48 28	045	24 28	102	37 46	144	20 07	165	29 24	189	39 41	257	14 16	330
88	48 54	045	25 04	103	38 08	145	20 16	166	29 18	190	39 04	258	13 58	331
89	49 20	045	25 40	104	38 29	146	20 25	167	29 11	192	38 28	259	13 40	331

LHA Y	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		◆ Hamal		Schedar	
90	49 47	046	26 16	105	38 49	147	20 33	168	29 03	193	37 52	260	45 57	309
91	50 13	046	26 51	106	39 09	148	20 40	169	28 55	194	37 15	261	45 29	309
92	50 39	046	27 27	107	39 28	150	20 46	170	28 46	195	36 39	262	45 00	310
93	51 06	046	28 02	108	39 46	151	20 52	171	28 36	196	36 02	263	44 32	310
94	51 33	047	28 37	108	40 03	152	20 57	172	28 25	197	35 26	263	44 04	310
95	52 00	047	29 12	109	40 20	153	21 02	173	28 14	198	34 49	264	43 36	311
96	52 27	047	29 47	110	40 36	155	21 06	174	28 02	199	34 12	265	43 08	311
97	52 54	047	30 22	111	40 52	156	21 09	175	27 49	200	33 35	266	42 40	312
98	53 21	048	30 56	112	41 07	157	21 12	176	27 36	202	32 58	267	42 13	312
99	53 48	048	31 30	113	41 20	159	21 14	177	27 22	203	32 22	268	41 45	312
100	54 16	048	32 04	114	41 34	160	21 15	179	27 08	204	31 45	268	41 18	313
101	54 43	048	32 38	115	41 46	161	21 16	180	26 53	205	31 08	269	40 51	313
102	55 11	048	33 11	116	41 58	162	21 16	181	26 37	206	30 31	270	40 24	314
103	55 39	049	33 44	117	42 08	164	21 15	182	26 20	207	29 54	271	39 58	314
104	56 06	049	34 17	118	42 18	165	21 14	183	26 03	208	29 17	271	39 31	315
	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
105	56 34	049	22 08	095	34 49	119	21 12	184	25 46	209	44 40	232	56 55	288
106	57 02	049	22 45	096	35 21	120	21 09	185	25 28	210	44 11	233	56 20	289
107	57 30	049	23 22	096	35 53	121	21 06	186	25 09	211	43 41	234	55 45	289
108	57 58	049	23 58	097	36 25	122	21 02	187	24 49	212	43 11	235	55 10	290
109	58 26	050	24 35	098	36 56	123	20 57	188	24 30	213	42 40	237	54 35	290
110	58 54	050	25 12	099	37 27	124	20 52	189	24 09	214	42 09	238	54 01	291
111	59 23	050	25 48	100	37 57	125	20 46	190	23 48	215	41 38	239	53 26	291
112	59 51	050	26 24	100	38 27	126	20 39	191	23 26	216	41 06	240	52 52	292
113	60 19	050	27 01	101	38 57	127	20 32	192	23 04	217	40 34	241	52 18	292
114	60 48	050	27 37	102	39 26	128	20 24	193	22 42	218	40 01	242	51 43	293
115	61 16	050	28 13	103	39 55	129	20 15	194	22 19	219	39 29	243	51 09	293
116	61 44	050	28 49	104	40 23	130	20 06	195	21 55	220	38 55	244	50 35	294
117	62 13	050	29 25	105	40 51	132	19 57	196	21 31	221	38 22	245	50 02	294
118	62 41	050	30 00	106	41 19	133	19 46	197	21 07	222	37 49	246	49 28	295
119	63 10	050	30 36	107	41 45	134	19 35	198	20 42	223	37 15	247	48 54	295
	Kochab		◆ ARCTURUS		REGULUS		◆ SIRIUS		BETELGEUSE		CAPELLA		◆ Schedar	
120	46 07	023	12 30	075	42 12	135	19 23	199	38 41	221	63 06	273	32 58	322
121	46 22	023	13 06	076	42 38	136	19 11	200	38 16	222	62 30	274	32 35	322
122	46 36	023	13 42	076	43 03	138	18 58	201	37 51	223	61 53	275	32 12	323
123	46 51	023	14 18	077	43 27	139	18 45	202	37 26	224	61 16	276	31 50	323
124	47 05	023	14 54	078	43 52	140	18 31	203	36 59	225	60 39	276	31 28	324
125	47 20	024	15 30	079	44 15	141	18 16	204	36 33	227	60 03	277	31 07	324
126	47 35	024	16 06	079	44 38	142	18 01	205	36 06	228	59 26	278	30 45	325
127	47 50	024	16 42	080	45 00	144	17 45	206	35 38	229	58 49	278	30 24	325
128	48 05	024	17 19	081	45 21	145	17 29	207	35 10	230	58 13	279	30 03	326
129	48 20	024	17 55	082	45 42	146	17 12	208	34 42	231	57 36	279	29 42	326
130	48 35	024	18 32	082	46 02	148	16 55	209	34 13	232	57 00	280	29 22	327
131	48 51	025	19 09	083	46 22	149	16 37	210	33 44	233	56 24	281	29 02	327
132	49 06	025	19 45	084	46 40	150	16 19	210	33 14	234	55 47	281	28 42	328
133	49 22	025	20 22	085	46 58	152	16 00	211	32 44	235	55 11	282	28 22	328
134	49 37	025	20 59	085	47 15	153	15 40	212	32 14	236	54 35	283	28 03	329
	Kochab		◆ ARCTURUS		REGULUS		◆ POLLUX		BETELGEUSE		CAPELLA		◆ Schedar	
135	49 53	025	21 36	086	47 32	154	62 19	217	31 43	237	53 59	283	27 44	329
136	50 09	025	22 13	087	47 47	156	61 56	219	31 12	238	53 23	284	27 25	330
137	50 24	025	22 50	088	48 02	157	61 33	220	30 40	239	52 47	284	27 07	330
138	50 40	026	23 26	089	48 16	159	61 09	222	30 08	240	52 11	285	26 49	331
139	50 56	026	24 03	089	48 29	160	60 44	224	29 36	241	51 36	285	26 31	331
140	51 12	026	24 40	090	48 41	162	60 18	225	29 04	242	51 00	286	26 13	332
141	51 28	026	25 17	091	48 52	163	59 51	227	28 31	243	50 25	287	25 56	332
142	51 44	026	25 54	092	49 02	165	59 24	228	27 58	244	49 49	287	25 39	333
143	52 00	026	26 31	093	49 12	166	58 56	230	27 25	245	49 14	288	25 22	333
144	52 17	026	27 08	093	49 20	167	58 28	231	26 51	246	48 39	288	25 06	334
145	52 33	026	27 45	094	49 28	169	57 59	232	26 18	246	48 04	289	24 50	334
146	52 49	026	28 22	095	49 34	170	57 29	234	25 44	247	47 29	289	24 34	335
147	53 06	026	28 58	096	49 40	172	56 59	235	25 09	248	46 54	290	24 19	336
148	53 22	026	29 35	097	49 45	173	56 28	237	24 35	249	46 20	291	24 03	336
149	53 38	026	30 12	097	49 48	175	55 57	238	24 00	250	45 45	291	23 49	337
	◆ Kochab		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA		Schedar	
150	53 55	026	30 48	098	12 51	128	49 51	177	55 26	239	45 11	292	23 34	337
151	54 11	026	31 25	099	13 20	129	49 53	178	54 54	240	44 37	292	23 20	338
152	54 28	026	32 01	100	13 48	130	49 54	180	54 22	242	44 02	293	23 06	338
153	54 44	026	32 38	101	14 16	131	49 53	181	53 49	243	43 29	293	22 52	339
154	55 00	026	33 14	102	14 44	132	49 52	183	53 16	244	42 55	294	22 39	339
155	55 17	026	33 50	103	15 12	133	49 50	184	52 43	245	42 21	294	22 26	340
156	55 33	026	34 26	103	15 39	133	49 47	186	52 09	246	41 47	295	22 14	340
157	55 50	026	35 02	104	16 05	134	49 43	187	51 35	247	41 14	296	22 02	341
158	56 06	026	35 38	105	16 32	135	49 38	189	51 01	248	40 41	296	21 50	342
159	56 23	026	36 13	106	16 57	136	49 32	190	50 27	249	40 08	297	21 38	342
160	56 39	026	36 49	107	17 23	137	49 25	192	49 52	250	39 35	297	21 27	343
161	56 55	026	37 24	108	17 48	138	49 17	193	49 17	251	39 02	298	21 16	343
162	57 12	026	37 59	109	18 12	139	49 08	195	48 42	252	38 29	298	21 06	344
163	57 28	026	38 34	110	18 36	140	48 58	196	48 07	253	37 57	299	20 55	344
164	57 44	026	39 08	111	19 00	141	48 47	198	47 31	254	37 25	299	20 46	345
	DENEB		◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		POLLUX		◆ CAPELLA	
165	11 46	024	17 12	048	39 43	112	19 23	142	48 36	199	46 55	255	36 53	300
166	12 01	025	17 40	049	40 17	113	19 45	143	48 23	200	46 20	256	36 21	301
167	12 17	025	18 08	049	40 51	114	20 08	144	48 10	202	45 44	257	35 49	301
168	12 33	026	18 36	050	41 24	115	20 29	145	47 56	203	45 08	258	35 18	302
169	12 49	027	19 04	051	41 58	116	20 50	146	47 41	205	44 31	259	34 46	302
170	13 06	027	19 33	051	42 31	117	21 11	147	47 25	206	43 55	260	34 15	303
171	13 23	028	20 02	052	43 04	118	21 31	148	47 08	207	43 19	261	33 44	303
172	13 40	029	20 31	053	43 36	119	21 50	149	46 51	209	42 42	262	33 14	304
173	13 58	029	21 01	053	44 08	120	22 09	150	46 33	210	42 06	263	32 43	305
174	14 17	030	21 31	054	44 40	121	22 28	151	46 14	212	41 29	263	32 13	305
175	14 35	031	22 00	055	45 11	122	22 45	152	45 54	213	40 52	264	31 43	306
176	14 54	031	22 31	055	45 43	123	23 03	153	45 34	214	40 15	265	31 13	306
177	15 14	032	23 01	056	46 13	125	23 19	154	45 13	215	39 39	266	30 43	307
178	15 33	033	23 32	056	46 43	126	23 35	155	44 51	217	39 02	267	30 13	307
179	15 53	033	24 03	057	47 13	127	23 51	156	44 28	218	38 25	268	29 44	308

Tilbage til Menuen

LAT 52°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	DENEB		◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		POLLUX		◆ CAPELLA	
180	16 14	034	24 34	058	47 42	128	24 06	157	44 05	219	37 48	268	29 15	309
181	16 34	034	25 05	058	48 11	129	24 20	158	43 42	221	37 11	269	28 46	309
182	16 55	035	25 37	059	48 40	131	24 34	159	43 17	222	36 34	270	28 18	310
183	17 17	036	26 08	060	49 07	132	24 47	160	42 52	223	35 57	271	27 50	310
184	17 39	036	26 40	060	49 35	133	24 59	161	42 27	224	35 20	272	27 21	311
185	18 01	037	27 13	061	50 01	134	25 11	162	42 01	225	34 43	272	26 54	311
186	18 23	038	27 45	062	50 27	136	25 22	163	41 34	227	34 06	273	26 26	312
187	18 46	038	28 18	062	50 53	137	25 32	164	41 07	228	33 29	274	25 59	313
188	19 09	039	28 50	063	51 18	138	25 42	165	40 40	229	32 53	275	25 32	313
189	19 32	040	29 23	063	51 42	140	25 51	166	40 12	230	32 16	275	25 05	314
190	19 56	040	29 56	064	52 06	141	25 59	167	39 43	231	31 39	276	24 38	314
191	20 20	041	30 30	065	52 28	143	26 07	169	39 14	232	31 02	277	24 12	315
192	20 44	041	31 03	065	52 51	144	26 14	170	38 45	233	30 26	278	23 46	316
193	21 09	042	31 37	066	53 12	145	26 20	171	38 15	234	29 49	278	23 20	316
194	21 33	043	32 11	067	53 32	147	26 26	172	37 45	235	29 13	279	22 55	317
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	21 59	043	32 45	067	22 48	099	53 52	148	37 14	236	28 36	280	22 29	317
196	22 24	044	33 19	068	23 24	100	54 11	150	36 43	238	28 00	281	22 05	318
197	22 50	044	33 53	069	24 01	101	54 29	151	36 12	239	27 24	281	21 40	319
198	23 16	045	34 28	069	24 37	101	54 46	153	35 40	240	26 47	282	21 16	319
199	23 42	046	35 02	070	25 13	102	55 03	155	35 08	241	26 11	283	20 52	320
200	24 08	046	35 37	070	25 49	103	55 18	156	34 36	242	25 35	283	20 28	320
201	24 35	047	36 12	071	26 25	104	55 33	158	34 03	243	24 59	284	20 04	321
202	25 02	047	36 47	072	27 01	105	55 46	159	33 30	244	24 24	285	19 41	322
203	25 30	048	37 22	072	27 36	106	55 59	161	32 57	244	23 48	286	19 18	322
204	25 57	049	37 57	073	28 12	107	56 10	163	32 24	245	23 13	286	18 56	323
205	26 25	049	38 33	074	28 47	107	56 21	164	31 50	246	22 37	287	18 34	323
206	26 53	050	39 08	074	29 22	108	56 30	166	31 16	247	22 02	288	18 12	324
207	27 21	050	39 44	075	29 57	109	56 38	168	30 42	248	21 27	288	17 50	325
208	27 50	051	40 19	076	30 32	110	56 46	169	30 07	249	20 52	289	17 29	325
209	28 19	051	40 55	076	31 07	111	56 52	171	29 33	250	20 17	290	17 08	326
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
210	28 48	052	41 31	077	31 41	112	56 57	173	28 58	251	19 42	291	16 48	327
211	29 17	053	42 07	078	32 15	113	57 01	175	28 23	252	19 08	291	16 28	327
212	29 46	053	42 43	078	32 49	114	57 04	176	27 48	253	18 33	292	16 08	328
213	30 16	054	43 20	079	33 23	115	57 06	178	27 12	254	17 59	293	15 48	328
214	30 46	054	43 56	080	33 56	116	57 06	180	26 37	255	17 25	293	15 29	329
215	31 16	055	44 32	080	34 29	117	57 06	182	26 01	255	16 51	294	15 10	330
216	31 47	056	45 09	081	35 02	118	57 04	183	25 25	256	16 18	295	14 52	330
217	32 17	056	45 45	082	35 35	119	57 02	185	24 49	257	15 44	296	14 34	331
218	32 48	057	46 22	082	36 07	120	56 58	187	24 13	258	15 11	296	14 16	332
219	33 19	057	46 58	083	36 39	121	56 53	189	23 37	259	14 38	297	13 59	332
220	33 50	058	47 35	084	37 10	122	56 47	190	23 01	260	14 05	298	13 42	333
221	34 21	058	48 12	085	37 41	123	56 40	192	22 24	260	13 33	298	13 25	334
222	34 53	059	48 49	085	38 12	124	56 31	194	21 48	261	13 00	299	13 09	334
223	35 25	060	49 25	086	38 43	125	56 22	195	21 11	262	12 28	300	12 53	335
224	35 57	060	50 02	087	39 13	126	56 12	197	20 35	263	11 56	301	12 38	336
	Schedar		◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		Denebola		◆ Dubhe	
225	22 18	020	36 29	061	50 39	087	39 42	127	56 01	199	36 50	243	57 39	311
226	22 30	020	37 01	061	51 16	088	40 12	128	55 48	200	36 17	244	57 11	311
227	22 43	021	37 33	062	51 53	089	40 40	129	55 35	202	35 44	245	56 43	311
228	22 57	021	38 06	062	52 30	090	41 09	131	55 21	204	35 10	246	56 15	311
229	23 10	022	38 39	063	53 07	091	41 37	132	55 06	205	34 36	247	55 47	311
230	23 24	022	39 12	063	53 44	091	42 04	133	54 49	207	34 02	248	55 20	312
231	23 39	023	39 45	064	54 21	092	42 31	134	54 32	208	33 28	249	54 52	312
232	23 53	024	40 18	065	54 58	093	42 57	135	54 14	210	32 53	250	54 25	312
233	24 08	024	40 52	065	55 35	094	43 23	136	53 56	211	32 18	251	53 57	312
234	24 23	025	41 25	066	56 11	095	43 48	138	53 36	213	31 43	252	53 30	312
235	24 39	025	41 59	066	56 48	096	44 13	139	53 15	214	31 08	253	53 03	313
236	24 55	026	42 33	067	57 25	096	44 37	140	52 54	216	30 33	254	52 35	313
237	25 11	026	43 07	067	58 02	097	45 00	141	52 32	217	29 57	254	52 08	313
238	25 28	027	43 41	068	58 38	098	45 23	143	52 10	219	29 22	255	51 42	313
239	25 44	027	44 15	069	59 15	099	45 45	144	51 46	220	28 46	256	51 15	314
	◆ Schedar		DENEB		VEGA		◆ Rasalhague		ARCTURUS		◆ Denebola		Dubhe	
240	26 01	028	44 50	069	59 51	100	46 06	145	51 22	221	28 10	257	50 48	314
241	26 19	028	45 24	070	60 27	101	46 27	147	50 57	223	27 34	258	50 21	314
242	26 36	029	45 59	070	61 04	102	46 47	148	50 32	224	26 58	259	49 55	314
243	26 54	029	46 34	071	61 40	103	47 06	149	50 06	225	26 21	260	49 29	315
244	27 13	030	47 09	071	62 15	104	47 25	151	49 39	227	25 45	260	49 02	315
245	27 31	030	47 44	072	62 51	105	47 43	152	49 12	228	25 08	261	48 36	315
246	27 50	031	48 19	073	63 27	107	48 00	153	48 44	229	24 32	262	48 10	316
247	28 09	031	48 54	073	64 02	108	48 16	155	48 16	230	23 55	263	47 45	316
248	28 29	032	49 30	074	64 37	109	48 31	156	47 47	232	23 19	264	47 19	316
249	28 48	032	50 05	074	65 12	110	48 46	158	47 18	233	22 42	265	46 53	316
250	29 08	033	50 41	075	65 46	111	48 59	159	46 49	234	22 05	265	46 28	317
251	29 28	033	51 17	076	66 21	113	49 12	161	46 18	235	21 28	266	46 03	317
252	29 49	034	51 53	076	66 55	114	49 24	162	45 48	236	20 51	267	45 38	317
253	30 10	034	52 28	077	67 28	115	49 35	163	45 17	238	20 14	268	45 13	318
254	30 31	035	53 04	077	68 01	117	49 45	165	44 46	239	19 37	269	44 48	318
	◆ Schedar		DENEB		ALTAIR		◆ Rasalhague		ARCTURUS		◆ Alkaid		Kochab	
255	30 52	035	53 41	078	34 36	125	49 54	166	44 14	240	60 00	284	64 13	340
256	31 13	036	54 17	079	35 06	126	50 02	168	43 42	241	59 24	285	64 00	340
257	31 35	036	54 53	079	35 35	127	50 10	169	43 09	242	58 48	285	63 47	340
258	31 57	037	55 29	080	36 04	128	50 16	171	42 37	243	58 13	286	63 34	339
259	32 20	037	56 06	080	36 33	129	50 21	172	42 04	244	57 37	286	63 21	339
260	32 42	038	56 42	081	37 01	131	50 25	174	41 30	245	57 02	287	63 08	338
261	33 05	038	57 19	082	37 29	132	50 29	176	40 57	246	56 27	287	62 54	338
262	33 28	039	57 55	082	37 57	133	50 31	177	40 23	247	55 51	288	62 40	338
263	33 51	039	58 32	083	38 23	134	50 33	179	39 49	248	55 16	288	62 26	337
264	34 15	040	59 09	084	38 50	135	50 33	180	39 14	249	54 41	289	62 12	337
265	34 38	040	59 45	084	39 16	136	50 32	182	38 40	250	54 06	289	61 57	337
266	35 02	041	60 22	085	39 41	137	50 31	183	38 05	251	53 31	290	61 43	337
267	35 26	041	60 59	086	40 06	138	50 28	185	37 30	252	52 57	290	61 28	336
268	35 51	042	61 36	086	40 30	140	50 25	186	36 55	253	52 22	291	61 13	336
269	36 15	042	62 13	087	40 53	141	50 20	188	36 19	254	51 48	291	60 58	336

LAT 52°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	17 03	025	21 16	069	41 17	142	50 15	189	35 44	255	51 13	292	60 43	336
271	17 19	025	21 50	070	41 39	143	50 08	191	35 08	255	50 39	292	60 28	335
272	17 35	026	22 25	071	42 01	145	50 01	192	34 32	256	50 05	293	60 12	335
273	17 51	027	23 00	072	42 22	146	49 52	194	33 56	257	49 31	293	59 57	335
274	18 08	027	23 35	072	42 42	147	49 43	195	33 20	258	48 57	294	59 41	335
275	18 25	028	24 10	073	43 02	148	49 33	197	32 44	259	48 23	294	59 25	335
276	18 43	029	24 46	074	43 21	150	49 22	198	32 08	260	47 50	295	59 10	335
277	19 01	029	25 21	074	43 39	151	49 10	200	31 31	261	47 16	295	58 54	334
278	19 19	030	25 57	075	43 57	152	48 57	201	30 55	262	46 43	296	58 38	334
279	19 37	030	26 33	076	44 14	154	48 43	203	30 18	262	46 10	296	58 22	334
280	19 56	031	27 09	076	44 30	155	48 28	204	29 42	263	45 37	297	58 06	334
281	20 15	032	27 45	077	44 45	156	48 13	206	29 05	264	45 04	297	57 49	334
282	20 35	032	28 21	078	45 00	158	47 57	207	28 28	265	44 31	298	57 33	334
283	20 55	033	28 57	079	45 13	159	47 39	208	27 51	266	43 58	298	57 17	334
284	21 15	033	29 33	079	45 26	160	47 22	210	27 14	267	43 26	299	57 01	334
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
285	21 35	034	30 09	080	45 38	162	47 03	211	26 37	267	42 54	299	56 44	334
286	21 56	034	30 46	081	45 50	163	46 43	212	26 01	268	42 22	300	56 28	334
287	22 17	035	31 22	082	46 00	164	46 23	214	25 24	269	41 50	300	56 12	334
288	22 38	036	31 59	082	46 09	166	46 02	215	24 47	270	41 18	301	55 55	334
289	23 00	036	32 36	083	46 18	167	45 41	216	24 10	270	40 46	301	55 39	334
290	23 22	037	33 12	084	46 26	169	45 19	218	23 33	271	40 15	302	55 22	334
291	23 44	037	33 49	085	46 33	170	44 56	219	22 56	272	39 44	302	55 06	334
292	24 07	038	34 26	085	46 38	172	44 32	220	22 19	273	39 12	303	54 49	334
293	24 30	039	35 03	086	46 43	173	44 08	221	21 42	274	38 42	303	54 33	334
294	24 53	039	35 40	087	46 48	174	43 43	223	21 05	274	38 11	304	54 17	334
295	25 16	040	36 16	088	46 51	176	43 18	224	20 28	275	37 40	304	54 00	334
296	25 40	040	36 53	088	46 53	177	42 52	225	19 52	276	37 10	305	53 44	334
297	26 04	041	37 30	089	46 54	179	42 26	226	19 15	277	36 40	306	53 27	334
298	26 28	041	38 07	090	46 55	180	41 59	227	18 38	277	36 10	306	53 11	334
299	26 53	042	38 44	091	46 54	182	41 31	229	18 02	278	35 40	307	52 55	334
	◆ CAPELLA		Alpheratz		◆ Enif		ALTAIR		Rasalhague		◆ Alphecca		Alioth	
300	14 01	028	39 21	091	42 51	144	46 52	183	41 04	230	35 10	269	33 44	320
301	14 18	028	39 58	092	43 12	145	46 50	185	40 35	231	34 33	270	33 20	320
302	14 36	029	40 35	093	43 33	146	46 47	186	40 06	232	33 56	271	32 56	321
303	14 54	030	41 12	094	43 54	147	46 42	187	39 37	233	33 19	272	32 33	321
304	15 12	030	41 49	095	44 13	149	46 37	189	39 07	234	32 42	273	32 10	322
305	15 31	031	42 25	096	44 32	150	46 31	190	38 37	235	32 05	273	31 47	322
306	15 50	032	43 02	096	44 50	151	46 24	192	38 07	236	31 28	274	31 25	323
307	16 10	032	43 39	097	45 08	153	46 16	193	37 36	237	30 52	275	31 02	323
308	16 30	033	44 15	098	45 24	154	46 07	195	37 04	238	30 15	276	30 40	324
309	16 50	034	44 52	099	45 40	155	45 58	196	36 33	239	29 38	276	30 18	324
310	17 10	034	45 28	100	45 55	157	45 47	197	36 01	240	29 01	277	29 57	325
311	17 31	035	46 05	101	46 09	158	45 36	199	35 29	241	28 25	278	29 35	325
312	17 53	035	46 41	102	46 23	159	45 23	200	34 56	242	27 48	279	29 14	326
313	18 14	036	47 17	103	46 35	161	45 10	201	34 23	243	27 12	279	28 54	326
314	18 36	037	47 53	104	46 47	162	44 56	203	33 50	244	26 35	280	28 33	327
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
315	18 58	037	26 12	085	48 29	105	46 58	164	44 42	204	62 06	256	28 13	327
316	19 21	038	26 49	085	49 05	106	47 08	165	44 26	205	61 30	257	27 53	328
317	19 44	039	27 26	086	49 40	107	47 17	167	44 10	207	60 54	258	27 33	328
318	20 07	039	28 03	087	50 15	108	47 25	168	43 53	208	60 17	259	27 14	329
319	20 30	040	28 40	088	50 50	109	47 32	169	43 35	209	59 41	260	26 55	329
320	20 54	040	29 17	089	51 25	110	47 38	171	43 16	211	59 05	261	26 36	330
321	21 18	041	29 53	089	52 00	111	47 44	172	42 57	212	58 28	262	26 17	330
322	21 42	042	30 30	090	52 35	112	47 48	174	42 37	213	57 51	263	25 59	331
323	22 07	042	31 07	091	53 09	113	47 52	175	42 17	215	57 15	264	25 41	331
324	22 32	043	31 44	092	53 43	114	47 54	177	41 55	216	56 38	265	25 24	332
325	22 57	043	32 21	092	54 16	115	47 56	178	41 34	217	56 01	266	25 06	332
326	23 23	044	32 58	093	54 50	116	47 57	180	41 11	218	55 24	266	24 49	333
327	23 48	045	33 35	094	55 23	117	47 56	181	40 48	219	54 47	267	24 33	333
328	24 15	045	34 12	095	55 55	119	47 55	183	40 24	221	54 11	268	24 16	334
329	24 41	046	34 49	096	56 27	120	47 53	184	40 00	222	53 34	269	24 00	334
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
330	25 07	046	35 25	097	56 59	121	47 50	186	39 35	223	52 57	270	23 44	335
331	25 34	047	36 02	097	57 31	122	47 46	187	39 09	224	52 20	270	23 29	336
332	26 01	048	36 39	098	58 02	124	47 41	188	38 43	225	51 43	271	23 14	336
333	26 29	048	37 15	099	58 32	125	47 35	190	38 17	226	51 06	272	22 59	337
334	26 56	049	37 51	100	59 02	126	47 28	191	37 50	228	50 29	273	22 44	337
335	27 24	049	38 28	101	59 31	128	47 20	193	37 22	229	49 52	273	22 30	338
336	27 52	050	39 04	102	60 00	129	47 12	194	36 54	230	49 15	274	22 16	338
337	28 21	050	39 40	103	60 29	131	47 02	196	36 26	231	48 38	275	22 03	339
338	28 49	051	40 16	104	60 56	132	46 52	197	35 57	232	48 02	276	21 50	339
339	29 18	052	40 52	104	61 23	134	46 41	198	35 28	233	47 25	276	21 37	340
340	29 47	052	41 28	105	61 49	135	46 28	200	34 58	234	46 48	277	21 24	340
341	30 16	053	42 03	106	62 15	137	46 15	201	34 28	235	46 12	278	21 12	341
342	30 46	053	42 39	107	62 40	139	46 02	203	33 58	236	45 35	279	21 00	342
343	31 16	054	43 14	108	63 04	140	45 47	204	33 27	237	44 59	279	20 49	342
344	31 46	054	43 49	109	63 27	142	45 32	205	32 56	238	44 22	280	20 38	343
	◆ CAPELLA		ALDEBARAN		◆ Diphda		Enif		ALTAIR		◆ VEGA		Alioth	
345	32 16	055	16 30	084	16 30	154	45 15	207	32 24	239	43 46	281	20 27	343
346	32 46	056	17 07	085	16 45	155	44 58	208	31 52	240	43 10	281	20 16	344
347	33 17	056	17 44	086	17 01	156	44 41	209	31 20	241	42 33	282	20 06	344
348	33 47	057	18 20	086	17 15	157	44 22	211	30 48	242	41 57	283	19 57	345
349	34 18	057	18 57	087	17 30	158	44 03	212	30 15	243	41 21	283	19 47	346
350	34 49	058	19 34	088	17 43	159	43 43	213	29 42	244	40 45	284	19 38	346
351	35 21	058	20 11	089	17 56	160	43 22	215	29 09	245	40 10	285	19 30	347
352	35 52	059	20 48	090	18 09	161	43 01	216	28 35	246	39 34	285	19 21	347
353	36 24	059	21 25	090	18 20	162	42 39	217	28 01	247	38 58	286	19 13	348
354	36 56	060	22 02	091	18 32	163	42 16	218	27 27	248	38 23	287	19 06	348
355	37 28	061	22 39	092	18 42	164	41 53	220	26 53	248	37 47	287	18 59	349
356	38 00	061	23 16	093	18 52	165	41 29	221	26 19	249	37 12	288	18 52	350
357	38 33	062	23 53	093	19 01	166	41 05	222	25 44	250	36 37	288	18 45	350
358	39 05	062	24 29	094	19 10	167	40 40	223	25 09	251	36 02	289	18 39	351
359	39 38	063	25 06	095	19 18	168	40 14	224	24 34	252	35 27	290	18 33	351

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LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		ALTAIR		◆ VEGA		Alioth	
0	39 44	063	25 49	095	53 05	126	68 06	175	24 16	253	34 31	291	17 29	352
1	40 17	063	26 27	096	53 36	127	68 09	177	23 40	254	33 56	292	17 24	353
2	40 51	064	27 04	097	54 05	129	68 10	179	23 04	255	33 21	292	17 19	353
3	41 25	064	27 42	098	54 35	130	68 10	182	22 27	256	32 46	293	17 15	354
4	41 59	065	28 19	099	55 03	131	68 08	184	21 50	257	32 12	294	17 11	354
5	42 33	065	28 56	100	55 31	133	68 05	186	21 14	258	31 37	294	17 07	355
6	43 08	066	29 33	100	55 59	134	68 00	189	20 37	258	31 03	295	17 04	356
7	43 42	066	30 10	101	56 26	136	67 53	191	20 00	259	30 28	295	17 01	356
8	44 17	067	30 47	102	56 52	137	67 45	193	19 23	260	29 54	296	16 59	357
9	44 52	067	31 24	103	57 17	138	67 36	196	18 45	261	29 21	297	16 57	357
10	45 27	068	32 01	104	57 42	140	67 25	198	18 08	262	28 47	297	16 55	358
11	46 02	068	32 38	105	58 06	142	67 13	200	17 31	262	28 13	298	16 54	358
12	46 37	069	33 14	106	58 29	143	66 59	202	16 53	263	27 40	298	16 53	359
13	47 12	070	33 50	106	58 51	145	66 45	204	16 16	264	27 07	299	16 53	000
14	47 48	070	34 26	107	59 12	146	66 28	206	15 38	265	26 34	300	16 53	000
	Dubhe		◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		DENEB		◆ VEGA	
15	24 59	015	48 23	071	35 02	108	59 33	148	66 11	208	48 00	289	26 01	300
16	25 09	015	48 59	071	35 38	109	59 52	150	65 53	210	47 24	289	25 29	301
17	25 19	016	49 35	072	36 14	110	60 11	151	65 33	212	46 48	290	24 57	302
18	25 29	016	50 11	072	36 49	111	60 28	153	65 12	214	46 13	290	24 25	302
19	25 40	017	50 47	073	37 24	112	60 45	155	64 50	216	45 37	291	23 53	303
20	25 51	017	51 23	073	37 59	113	61 00	157	64 28	218	45 02	291	23 21	303
21	26 02	018	51 59	074	38 34	114	61 15	159	64 04	220	44 27	292	22 50	304
22	26 14	018	52 35	074	39 08	115	61 28	161	63 39	222	43 52	292	22 19	305
23	26 26	019	53 12	075	39 42	116	61 40	162	63 14	223	43 17	293	21 48	305
24	26 38	019	53 48	076	40 16	117	61 51	164	62 47	225	42 42	293	21 17	306
25	26 50	019	54 25	076	40 50	118	62 00	166	62 20	227	42 08	294	20 47	307
26	27 03	020	55 02	077	41 23	119	62 09	168	61 53	228	41 34	295	20 16	307
27	27 16	020	55 38	077	41 56	120	62 16	170	61 24	230	40 59	295	19 47	308
28	27 29	021	56 15	078	42 28	121	62 21	172	60 55	231	40 25	296	19 17	309
29	27 43	021	56 52	078	43 00	122	62 26	174	60 25	233	39 51	296	18 47	309
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
30	27 57	022	23 27	074	24 56	110	17 26	129	62 29	176	59 55	234	39 17	297
31	28 11	022	24 04	075	25 32	111	17 55	130	62 31	178	59 24	235	38 44	297
32	28 26	023	24 40	075	26 07	112	18 24	130	62 32	180	58 53	237	38 10	298
33	28 40	023	25 17	076	26 42	113	18 53	131	62 31	182	58 21	238	37 37	298
34	28 55	024	25 54	077	27 16	114	19 21	132	62 29	184	57 49	239	37 04	299
35	29 11	024	26 30	077	27 51	115	19 48	133	62 26	186	57 16	241	36 31	299
36	29 26	025	27 07	078	28 25	116	20 16	134	62 22	188	56 43	242	35 58	300
37	29 42	025	27 44	079	28 59	117	20 42	135	62 16	190	56 09	243	35 25	301
38	29 58	026	28 21	080	29 32	118	21 09	136	62 09	192	55 35	244	34 53	301
39	30 15	026	28 59	080	30 06	119	21 35	137	62 00	194	55 01	246	34 21	302
40	30 31	026	29 36	081	30 38	120	22 00	138	61 51	196	54 27	247	33 49	302
41	30 48	027	30 13	082	31 11	121	22 25	139	61 40	198	53 52	248	33 17	303
42	31 05	027	30 51	082	31 44	122	22 50	140	61 28	199	53 17	249	32 45	303
43	31 23	028	31 28	083	32 16	122	23 14	141	61 15	201	52 41	250	32 14	304
44	31 40	028	32 06	084	32 47	123	23 38	142	61 00	203	52 06	251	31 43	304
	Dubhe		◆ POLLUX		BETELGEUSE		RIGEL		◆ Hamal		Alpheratz		◆ DENEB	
45	31 58	029	32 43	085	33 19	124	24 01	143	60 45	205	51 30	252	31 12	305
46	32 17	029	33 21	085	33 49	126	24 23	144	60 29	207	50 54	253	30 41	306
47	32 35	029	33 58	086	34 20	127	24 45	145	60 11	208	50 18	254	30 10	306
48	32 54	030	34 36	087	34 50	128	25 06	146	59 53	210	49 41	255	29 40	307
49	33 13	030	35 14	088	35 20	129	25 27	147	59 33	212	49 05	256	29 10	307
50	33 32	031	35 52	088	35 49	130	25 48	148	59 13	214	48 28	257	28 40	308
51	33 51	031	36 29	089	36 18	131	26 07	149	58 51	215	47 51	258	28 10	308
52	34 11	032	37 07	090	36 46	132	26 26	150	58 29	217	47 14	259	27 40	309
53	34 31	032	37 45	091	37 14	133	26 45	151	58 06	218	46 37	260	27 11	310
54	34 51	032	38 23	092	37 42	134	27 03	152	57 42	220	46 00	261	26 42	310
55	35 11	033	39 00	092	38 09	135	27 20	153	57 17	222	45 23	261	26 13	311
56	35 32	033	39 38	093	38 35	136	27 37	154	56 52	223	44 45	262	25 45	311
57	35 53	034	40 16	094	39 01	137	27 53	155	56 26	224	44 08	263	25 17	312
58	36 14	034	40 53	095	39 26	139	28 08	156	55 59	226	43 30	264	24 49	312
59	36 35	034	41 31	096	39 51	140	28 23	158	55 32	227	42 53	265	24 21	313
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	36 56	035	42 08	096	13 10	139	28 37	159	55 04	229	42 15	266	23 53	314
61	37 18	035	42 46	097	13 35	140	28 51	160	54 35	230	41 37	266	23 26	314
62	37 40	036	43 23	098	13 59	141	29 03	161	54 06	231	41 00	267	22 59	315
63	38 02	036	44 01	099	14 22	142	29 15	162	53 36	233	40 22	268	22 32	315
64	38 24	036	44 38	100	14 45	143	29 27	163	53 06	234	39 44	269	22 06	316
65	38 46	037	45 15	101	15 08	144	29 37	164	52 35	235	39 06	270	21 40	317
66	39 09	037	45 52	102	15 30	145	29 47	165	52 04	236	38 29	270	21 14	317
67	39 32	037	46 29	103	15 51	146	29 56	166	51 32	238	37 51	271	20 48	318
68	39 55	038	47 06	103	16 12	147	30 05	168	51 00	239	37 13	272	20 23	318
69	40 18	038	47 43	104	16 33	148	30 13	169	50 27	240	36 35	273	19 58	319
70	40 42	038	48 19	105	16 53	149	30 20	170	49 54	241	35 58	273	19 34	320
71	41 05	039	48 55	106	17 12	149	30 26	171	49 21	242	35 20	274	19 09	320
72	41 29	039	49 31	107	17 31	150	30 31	172	48 48	243	34 42	275	18 45	321
73	41 53	040	50 07	108	17 49	151	30 36	173	48 14	245	34 05	276	18 21	321
74	42 17	040	50 43	109	18 07	152	30 40	174	47 39	246	33 27	276	17 58	322
	Dubhe		◆ REGULUS		PROCYON		SIRIUS		◆ RIGEL		Hamal		◆ DENEB	
75	42 41	040	17 12	092	33 23	130	18 24	153	30 43	176	47 05	247	17 35	323
76	43 06	041	17 49	093	33 52	131	18 41	154	30 46	177	46 30	248	17 12	323
77	43 30	041	18 27	094	34 20	132	18 57	155	30 48	178	45 55	249	16 50	324
78	43 55	041	19 05	095	34 48	133	19 13	156	30 49	179	45 20	250	16 28	324
79	44 20	042	19 42	095	35 15	134	19 28	157	30 49	180	44 44	251	16 06	325
80	44 45	042	20 20	096	35 42	135	19 42	158	30 48	181	44 08	252	15 44	326
81	45 10	042	20 57	097	36 08	136	19 56	159	30 47	183	43 32	253	15 23	326
82	45 36	042	21 35	098	36 34	137	20 09	160	30 45	184	42 56	254	15 02	327
83	46 01	043	22 12	099	36 59	139	20 21	161	30 42	185	42 20	255	14 42	328
84	46 27	043	22 50	099	37 24	140	20 33	162	30 39	186	41 44	255	14 22	328
85	46 53	043	23 27	100	37 48	141	20 45	163	30 34	187	41 07	256	14 02	329
86	47 19	044	24 04	101	38 11	142	20 55	164	30 29	188	40 30	257	13 43	330
87	47 45	044	24 41	102	38 34	143	21 05	165	30 24	189	39 53	258	13 24	330
88	48 11	044	25 18	103	38 57	144	21 15	166	30 17	191	39 16	259	13 05	331
89	48 38	044	25 54	104	39 18	146	21 23	167	30 10	192	38 39	260	12 47	331

LAT 51°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		◆ Hamal		Schedar	
90	49 04	045	26 31	104	39 39	147	21 31	168	30 02	193	38 02	261	45 19	310
91	49 31	045	27 08	105	40 00	148	21 39	169	29 53	194	37 25	262	44 50	310
92	49 58	045	27 44	106	40 19	149	21 45	170	29 44	195	36 47	262	44 22	310
93	50 24	045	28 20	107	40 38	151	21 51	171	29 33	196	36 10	263	43 53	311
94	50 51	046	28 56	108	40 56	152	21 57	172	29 22	197	35 32	264	43 24	311
95	51 18	046	29 32	109	41 14	153	22 02	173	29 11	198	34 55	265	42 56	312
96	51 46	046	30 08	110	41 31	154	22 06	174	28 59	200	34 17	266	42 28	312
97	52 13	046	30 43	111	41 47	156	22 09	175	28 46	201	33 39	267	42 00	312
98	52 40	047	31 18	112	42 02	157	22 12	176	28 32	202	33 02	267	41 32	313
99	53 08	047	31 53	112	42 16	158	22 14	177	28 18	203	32 24	268	41 05	313
100	53 35	047	32 28	113	42 30	160	22 15	178	28 03	204	31 46	269	40 37	314
101	54 03	047	33 03	114	42 43	161	22 16	180	27 47	205	31 08	270	40 10	314
102	54 31	047	33 37	115	42 55	162	22 16	181	27 31	206	30 31	270	39 43	314
103	54 59	048	34 11	116	43 06	163	22 15	182	27 14	207	29 53	271	39 16	315
104	55 26	048	34 45	117	43 16	165	22 14	183	26 56	208	29 15	272	38 49	315
	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
105	55 54	048	22 13	094	35 18	118	22 11	184	26 38	209	45 17	233	56 36	290
106	56 22	048	22 51	095	35 51	119	22 09	185	26 19	210	44 46	234	56 00	290
107	56 50	048	23 28	096	36 24	120	22 05	186	26 00	211	44 15	235	55 25	291
108	57 19	048	24 06	097	36 56	121	22 01	187	25 40	212	43 44	236	54 49	291
109	57 47	048	24 43	098	37 28	122	21 56	188	25 20	213	43 13	237	54 14	291
110	58 15	049	25 21	098	38 00	123	21 51	189	24 59	214	42 41	238	53 39	292
111	58 43	049	25 58	099	38 31	124	21 45	190	24 37	215	42 08	240	53 04	292
112	59 12	049	26 35	100	39 02	125	21 38	191	24 15	216	41 36	241	52 29	293
113	59 40	049	27 12	101	39 33	127	21 31	192	23 52	217	41 03	242	51 54	293
114	60 09	049	27 49	102	40 03	128	21 22	193	23 29	218	40 29	243	51 20	294
115	60 37	049	28 26	103	40 33	129	21 14	194	23 05	219	39 55	244	50 45	294
116	61 05	049	29 03	103	41 02	130	21 04	195	22 41	220	39 21	245	50 11	295
117	61 34	049	29 40	104	41 31	131	20 54	196	22 16	221	38 47	246	49 37	295
118	62 02	049	30 16	105	41 59	132	20 44	197	21 51	222	38 13	247	49 03	296
119	62 31	049	30 53	106	42 27	133	20 32	198	21 25	223	37 38	248	48 29	296
120	45 12	022	12 14	075	42 54	134	20 20	199	39 26	221	63 02	275	32 10	322
121	45 26	022	12 51	075	43 21	136	20 08	200	39 00	223	62 24	276	31 47	323
122	45 41	023	13 27	076	43 47	137	19 54	201	38 35	224	61 47	277	31 25	323
123	45 55	023	14 04	077	44 12	138	19 41	202	38 08	225	61 09	277	31 02	324
124	46 10	023	14 41	078	44 37	139	19 26	203	37 41	226	60 32	278	30 40	324
125	46 25	023	15 18	078	45 02	141	19 11	204	37 14	227	59 54	279	30 18	325
126	46 40	023	15 55	079	45 25	142	18 56	205	36 46	228	59 17	279	29 56	325
127	46 55	024	16 32	080	45 48	143	18 39	206	36 18	229	58 40	280	29 35	326
128	47 10	024	17 09	081	46 10	144	18 23	207	35 49	230	58 03	280	29 13	326
129	47 25	024	17 47	081	46 32	146	18 05	208	35 20	231	57 26	281	28 52	327
130	47 41	024	18 24	082	46 53	147	17 48	209	34 50	232	56 49	282	28 32	327
131	47 56	024	19 01	083	47 13	148	17 29	210	34 20	233	56 12	282	28 11	328
132	48 11	024	19 39	084	47 32	150	17 10	211	33 49	234	55 35	283	27 51	328
133	48 27	024	20 16	084	47 51	151	16 51	212	33 18	236	54 58	283	27 31	329
134	48 43	025	20 54	085	48 09	153	16 31	213	32 47	237	54 21	284	27 12	329
	Kochab		◆ ARCTURUS		REGULUS		◆ SIRIUS		BETELGEUSE		CAPELLA		◆ Schedar	
135	48 58	025	21 32	086	48 26	154	63 07	218	32 15	238	53 45	284	26 52	330
136	49 14	025	22 09	087	48 42	155	62 43	220	31 43	239	53 08	285	26 33	330
137	49 30	025	22 47	087	48 57	157	62 18	222	31 11	239	52 32	286	26 15	331
138	49 46	025	23 25	088	49 12	158	61 53	223	30 38	240	51 55	286	25 56	331
139	50 02	025	24 02	089	49 25	160	61 27	225	30 05	241	51 19	287	25 38	332
140	50 18	025	24 40	090	49 38	161	61 00	226	29 32	242	50 43	287	25 20	332
141	50 34	025	25 18	090	49 49	163	60 32	228	28 58	243	50 07	288	25 03	333
142	50 50	025	25 56	091	50 00	164	60 04	229	28 24	244	49 31	288	24 46	333
143	51 06	025	26 34	092	50 10	166	59 34	231	27 50	245	48 55	289	24 29	334
144	51 23	025	27 11	093	50 19	167	59 05	232	27 16	246	48 20	289	24 12	334
145	51 39	026	27 49	094	50 27	169	58 35	234	26 41	247	47 44	290	23 56	335
146	51 55	026	28 27	094	50 33	170	58 04	235	26 06	248	47 09	290	23 40	335
147	52 12	026	29 04	095	50 39	172	57 33	236	25 31	249	46 33	291	23 24	336
148	52 28	026	29 42	096	50 44	173	57 01	238	24 56	250	45 58	292	23 09	336
149	52 44	026	30 19	097	50 48	175	56 29	239	24 21	250	45 23	292	22 53	337
	◆ Kochab		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA		Schedar	
150	53 01	026	30 57	098	13 28	128	50 51	176	55 56	240	44 48	293	22 39	337
151	53 17	026	31 34	099	13 57	129	50 53	178	55 23	242	44 13	293	22 24	338
152	53 34	026	32 11	099	14 27	130	50 54	180	54 50	243	43 39	294	22 10	338
153	53 50	026	32 49	100	14 56	131	50 53	181	54 16	244	43 04	294	21 57	339
154	54 07	026	33 26	101	15 24	131	50 52	183	53 42	245	42 30	295	21 43	339
155	54 23	026	34 03	102	15 52	132	50 50	184	53 08	246	41 56	295	21 30	340
156	54 39	026	34 40	103	16 20	133	50 47	186	52 33	247	41 22	296	21 17	341
157	54 56	026	35 16	104	16 47	134	50 42	187	51 58	248	40 48	296	21 05	341
158	55 12	026	35 53	105	17 14	135	50 37	189	51 23	249	40 14	297	20 53	342
159	55 29	026	36 29	105	17 41	136	50 31	190	50 47	250	39 40	297	20 41	342
160	55 45	026	37 06	106	18 07	137	50 23	192	50 12	252	39 07	298	20 30	343
161	56 01	026	37 42	107	18 32	138	50 15	193	49 36	253	38 34	299	20 19	343
162	56 18	026	38 18	108	18 57	139	50 06	195	49 00	254	38 01	299	20 08	344
163	56 34	025	38 54	109	19 22	140	49 56	196	48 23	254	37 28	300	19 58	344
164	56 50	025	39 29	110	19 46	141	49 45	198	47 47	255	36 55	300	19 48	345
	DENEB		◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		POLLUX		◆ CAPELLA	
165	10 51	024	16 32	048	40 05	111	20 10	142	49 33	199	47 10	256	36 22	301
166	11 06	025	17 00	048	40 40	112	20 33	143	49 20	201	46 33	257	35 50	301
167	11 22	025	17 29	049	41 15	113	20 56	144	49 06	202	45 56	258	35 18	302
168	11 39	026	17 57	050	41 49	114	21 18	144	48 51	204	45 19	259	34 46	302
169	11 55	027	18 26	050	42 24	115	21 40	145	48 35	205	44 42	260	34 14	303
170	12 12	027	18 56	051	42 58	116	22 01	146	48 19	207	44 05	261	33 42	303
171	12 30	028	19 25	052	43 31	117	22 21	147	48 02	208	43 28	262	33 11	304
172	12 48	029	19 55	052	44 05	118	22 42	148	47 43	209	42 50	263	32 40	304
173	13 06	029	20 25	053	44 38	119	23 01	149	47 24	211	42 13	263	32 09	305
174	13 25	030	20 55	054	45 11	120	23 20	150	47 05	212	41 35	264	31 38	306
175	13 44	030	21 26	054	45 43	121	23 38	151	46 44	213	40 58	265	31 07	306
176	14 03	031	21 56	055	46 15	123	23 56	152	46 23	215	40 20	266	30 37	307
177	14 23	032	22 27	055	46 47	124	24 13	154	46 01	216	39 42	267	30 07	307
178	14 43	032	22 58	056	47 18	125	24 30	155	45 39	217	39 05	268	29 37	308
179	15 03	033	23 30	057	47 49	126	24 46	156	45 15	219	38 27	268	29 07	308

Tilbage til Menuen

LAT 51°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	DENEB		◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		POLLUX		◆ CAPELLA	
180	15 24	034	24 02	057	48 19	127	25 01	157	44 52	220	37 49	269	28 38	309
181	15 45	034	24 34	058	48 49	128	25 16	158	44 27	221	37 11	270	28 08	309
182	16 06	035	25 06	059	49 18	130	25 30	159	44 02	222	36 34	271	27 39	310
183	16 28	036	25 38	059	49 47	131	25 43	160	43 36	224	35 56	271	27 11	311
184	16 50	036	26 11	060	50 15	132	25 56	161	43 10	225	35 18	272	26 42	311
185	17 13	037	26 43	060	50 43	133	26 08	162	42 43	226	34 40	273	26 14	312
186	17 36	037	27 16	061	51 10	135	26 19	163	42 15	227	34 03	274	25 46	312
187	17 59	038	27 49	062	51 37	136	26 30	164	41 47	228	33 25	275	25 18	313
188	18 22	039	28 23	062	52 02	138	26 40	165	41 19	229	32 47	275	24 50	313
189	18 46	039	28 56	063	52 28	139	26 49	166	40 50	231	32 10	276	24 23	314
190	19 10	040	29 30	064	52 52	140	26 58	167	40 21	232	31 32	277	23 56	315
191	19 34	040	30 04	064	53 16	142	27 06	168	39 51	233	30 55	277	23 29	315
192	19 59	041	30 38	065	53 39	143	27 13	170	39 20	234	30 17	278	23 03	316
193	20 24	042	31 12	065	54 01	145	27 19	171	38 50	235	29 40	279	22 37	316
194	20 49	042	31 47	066	54 22	146	27 25	172	38 19	236	29 03	280	22 11	317
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	21 15	043	32 21	067	22 57	099	54 43	148	37 47	237	28 26	280	21 45	318
196	21 41	044	32 56	067	23 34	099	55 03	149	37 15	238	27 49	281	21 20	318
197	22 07	044	33 31	068	24 12	100	55 22	151	36 43	239	27 12	282	20 55	319
198	22 33	045	34 06	069	24 49	101	55 40	152	36 10	240	26 35	282	20 30	319
199	23 00	045	34 41	069	25 26	102	55 57	154	35 37	241	25 58	283	20 06	320
200	23 27	046	35 16	070	26 03	103	56 13	156	35 04	242	25 21	284	19 42	321
201	23 54	046	35 52	070	26 39	104	56 28	157	34 31	243	24 45	285	19 18	321
202	24 22	047	36 28	071	27 16	104	56 42	159	33 57	244	24 08	285	18 54	322
203	24 49	048	37 03	072	27 52	105	56 55	161	33 23	245	23 32	286	18 31	322
204	25 17	048	37 39	072	28 29	106	57 07	162	32 48	246	22 55	287	18 08	323
205	25 46	049	38 15	073	29 05	107	57 18	164	32 14	247	22 19	287	17 46	324
206	26 14	049	38 51	074	29 41	108	57 28	166	31 39	248	21 43	288	17 23	324
207	26 43	050	39 28	074	30 17	109	57 37	167	31 04	249	21 08	289	17 01	325
208	27 12	051	40 04	075	30 53	110	57 45	169	30 28	250	20 32	290	16 40	325
209	27 41	051	40 41	075	31 28	111	57 51	171	29 53	251	19 56	290	16 19	326
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
210	28 11	052	41 17	076	32 03	111	57 56	173	29 17	252	19 21	291	15 58	327
211	28 40	052	41 54	077	32 38	112	58 01	174	28 41	252	18 46	292	15 37	327
212	29 10	053	42 31	077	33 13	113	58 04	176	28 05	253	18 11	292	15 17	328
213	29 41	053	43 08	078	33 48	114	58 06	178	27 29	254	17 36	293	14 57	329
214	30 11	054	43 45	079	34 22	115	58 06	180	26 52	255	17 01	294	14 38	329
215	30 42	054	44 22	079	34 56	116	58 06	182	26 16	256	16 27	294	14 18	330
216	31 12	055	44 59	080	35 30	117	58 04	183	25 39	257	15 53	295	14 00	331
217	31 43	056	45 36	081	36 03	118	58 01	185	25 02	258	15 18	296	13 41	331
218	32 15	056	46 13	081	36 36	119	57 57	187	24 26	258	14 45	296	13 23	332
219	32 46	057	46 51	082	37 09	120	57 52	189	23 48	259	14 11	297	13 06	332
220	33 18	057	47 28	083	37 42	121	57 46	191	23 11	260	13 37	298	12 48	333
221	33 50	058	48 06	083	38 14	122	57 38	192	22 34	261	13 04	299	12 31	334
222	34 22	058	48 43	084	38 45	123	57 30	194	21 57	262	12 31	299	12 15	334
223	34 54	059	49 21	085	39 17	124	57 20	196	21 19	263	11 58	300	11 59	335
224	35 26	059	49 58	086	39 48	125	57 09	197	20 42	263	11 26	301	11 43	336
	Schedar		◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		Denebola		◆ Dubhe	
225	21 21	020	35 59	060	50 36	086	40 18	126	56 57	199	37 17	244	57 00	312
226	21 34	020	36 32	061	51 14	087	40 49	128	56 45	201	36 43	245	56 31	312
227	21 47	021	37 05	061	51 51	088	41 18	129	56 31	203	36 08	246	56 03	312
228	22 01	021	37 38	062	52 29	088	41 47	130	56 16	204	35 34	247	55 35	312
229	22 15	022	38 11	062	53 07	089	42 16	131	56 00	206	34 59	248	55 07	312
230	22 29	022	38 45	063	53 45	090	42 44	132	55 43	207	34 24	249	54 40	313
231	22 43	023	39 18	063	54 22	091	43 12	133	55 25	209	33 49	250	54 12	313
232	22 58	023	39 52	064	55 00	092	43 39	135	55 06	211	33 13	251	53 44	313
233	23 13	024	40 26	064	55 38	092	44 06	136	54 47	212	32 38	251	53 17	313
234	23 29	024	41 00	065	56 16	093	44 32	137	54 26	214	32 02	252	52 49	313
235	23 45	025	41 34	065	56 53	094	44 58	138	54 05	215	31 26	253	52 22	314
236	24 01	026	42 09	066	57 31	095	45 22	139	53 43	217	30 49	254	51 54	314
237	24 17	026	42 43	067	58 08	096	45 47	141	53 20	218	30 13	255	51 27	314
238	24 34	027	43 18	067	58 46	097	46 10	142	52 56	219	29 36	256	51 00	314
239	24 51	027	43 53	068	59 23	098	46 33	143	52 32	221	29 00	257	50 33	314
	◆ Schedar		DENEB		VEGA		◆ Rasalhague		ARCTURUS		◆ Denebola		Dubhe	
240	25 08	028	44 28	068	60 01	099	46 55	145	52 07	222	28 23	258	50 06	315
241	25 26	028	45 03	069	60 38	099	47 17	146	51 41	224	27 46	258	49 39	315
242	25 44	029	45 38	069	61 15	100	47 38	147	51 15	225	27 09	259	49 13	315
243	26 02	029	46 14	070	61 52	101	47 58	149	50 48	226	26 32	260	48 46	315
244	26 21	030	46 49	070	62 29	102	48 17	150	50 20	228	25 55	261	48 20	316
245	26 39	030	47 25	071	63 06	104	48 35	151	49 52	229	25 17	262	47 53	316
246	26 59	031	48 01	071	63 43	105	48 53	153	49 23	230	24 40	263	47 27	316
247	27 18	031	48 37	072	64 19	106	49 10	154	48 54	231	24 02	263	47 01	317
248	27 38	032	49 13	073	64 55	107	49 26	156	48 24	233	23 25	264	46 35	317
249	27 58	032	49 49	073	65 32	108	49 41	157	47 54	234	22 47	265	46 10	317
250	28 18	033	50 25	074	66 07	109	49 55	159	47 23	235	22 10	266	45 44	317
251	28 38	033	51 01	074	66 43	111	50 08	160	46 52	236	21 32	267	45 19	318
252	28 59	034	51 38	075	67 18	112	50 21	162	46 21	237	20 54	267	44 53	318
253	29 20	034	52 14	075	67 53	113	50 32	163	45 49	238	20 17	268	44 28	318
254	29 41	035	52 51	076	68 27	115	50 43	165	45 16	239	19 39	269	44 03	319
	◆ Schedar		DENEB		ALTAIR		◆ Rasalhague		ARCTURUS		◆ Alkaid		Kochab	
255	30 03	035	53 27	077	35 10	125	50 52	166	44 44	241	59 44	286	63 16	341
256	30 25	036	54 04	077	35 41	126	51 01	168	44 11	242	59 08	286	63 04	341
257	30 47	036	54 41	078	36 11	127	51 08	169	43 37	243	58 32	287	62 51	340
258	31 09	036	55 18	078	36 41	128	51 15	171	43 03	244	57 56	287	62 38	340
259	31 32	037	55 55	079	37 11	129	51 21	172	42 29	245	57 20	288	62 25	339
260	31 55	037	56 32	080	37 40	130	51 25	174	41 55	246	56 44	288	62 12	339
261	32 18	038	57 09	080	38 09	131	51 29	175	41 21	247	56 08	289	61 58	339
262	32 41	038	57 46	081	38 37	132	51 31	177	40 46	248	55 32	289	61 44	338
263	33 04	039	58 24	081	39 05	133	51 33	179	40 11	249	54 57	290	61 30	338
264	33 28	039	59 01	082	39 32	134	51 33	180	39 35	250	54 21	290	61 16	338
265	33 52	040	59 38	083	39 59	136	51 32	182	39 00	251	53 46	291	61 02	338
266	34 17	040	60 16	083	40 25	137	51 31	183	38 24	252	53 10	291	60 47	337
267	34 41	041	60 53	084	40 50	138	51 28	185	37 48	253	52 35	292	60 33	337
268	35 06	041	61 31	085	41 15	139	51 24	186	37 12	253	52 00	292	60 18	337
269	35 31	042	62 09	085	41 40	140	51 20	188	36 36	254	51 25	292	60 03	337

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	16 09	025	20 54	069	42 04	142	51 14	190	35 59	255	50 50	293	59 48	336
271	16 25	025	21 30	070	42 27	143	51 07	191	35 23	256	50 16	293	59 33	336
272	16 41	026	22 05	070	42 49	144	50 59	193	34 46	257	49 41	294	59 18	336
273	16 58	027	22 41	071	43 11	145	50 51	194	34 09	258	49 07	294	59 02	336
274	17 15	027	23 17	072	43 32	147	50 41	196	33 32	259	48 32	295	58 47	336
275	17 32	028	23 53	073	43 53	148	50 30	197	32 55	260	47 58	295	58 31	335
276	17 50	028	24 29	073	44 13	149	50 19	199	32 18	260	47 24	296	58 15	335
277	18 08	029	25 05	074	44 32	150	50 06	200	31 41	261	46 50	296	57 59	335
278	18 27	030	25 41	075	44 50	152	49 53	202	31 03	262	46 16	297	57 44	335
279	18 45	030	26 18	075	45 07	153	49 38	203	30 26	263	45 43	297	57 28	335
280	19 05	031	26 54	076	45 24	154	49 23	205	29 48	264	45 09	298	57 12	335
281	19 24	031	27 31	077	45 40	156	49 07	206	29 11	265	44 36	298	56 55	335
282	19 44	032	28 08	077	45 55	157	48 50	207	28 33	265	44 03	299	56 39	335
283	20 04	033	28 45	078	46 09	159	48 32	209	27 55	266	43 30	299	56 23	335
284	20 25	033	29 22	079	46 23	160	48 14	210	27 18	267	42 57	300	56 07	334
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
285	20 45	034	29 59	080	46 35	161	47 54	212	26 40	268	42 24	300	55 50	334
286	21 06	034	30 36	080	46 47	163	47 34	213	26 02	269	41 51	301	55 34	334
287	21 28	035	31 13	081	46 58	164	47 13	214	25 25	269	41 19	301	55 18	334
288	21 50	035	31 51	082	47 08	166	46 51	216	24 47	270	40 47	302	55 01	334
289	22 12	036	32 28	082	47 17	167	46 29	217	24 09	271	40 15	302	54 45	334
290	22 34	037	33 05	083	47 25	168	46 06	218	23 31	272	39 43	303	54 29	334
291	22 57	037	33 43	084	47 32	170	45 42	220	22 54	272	39 11	303	54 12	334
292	23 19	038	34 21	085	47 38	171	45 18	221	22 16	273	38 40	304	53 56	334
293	23 43	038	34 58	085	47 43	173	44 53	222	21 38	274	38 08	304	53 39	334
294	24 06	039	35 36	086	47 47	174	44 27	223	21 00	275	37 37	305	53 23	334
295	24 30	039	36 13	087	47 51	176	44 01	225	20 23	276	37 06	305	53 06	334
296	24 54	040	36 51	088	47 53	177	43 34	226	19 45	276	36 35	306	52 50	334
297	25 18	040	37 29	088	47 54	179	43 07	227	19 08	277	36 05	306	52 33	334
298	25 43	041	38 07	089	47 55	180	42 39	228	18 30	278	35 34	307	52 17	334
299	26 08	042	38 44	090	47 54	182	42 11	229	17 53	279	35 04	307	52 01	334
	◆ CAPELLA		Alpheratz		◆ Enif		ALTAIR		Rasalhague		◆ Alphecca		Alioth	
300	13 07	028	39 22	091	43 39	143	47 52	183	41 42	230	35 10	270	32 58	320
301	13 25	028	40 00	091	44 01	144	47 50	185	41 13	231	34 32	271	32 34	321
302	13 43	029	40 38	092	44 23	146	47 46	186	40 43	233	33 55	272	32 10	321
303	14 02	030	41 15	093	44 44	147	47 42	188	40 13	234	33 17	272	31 46	321
304	14 20	030	41 53	094	45 04	148	47 36	189	39 42	235	32 39	273	31 23	322
305	14 40	031	42 31	095	45 24	149	47 30	190	39 11	236	32 01	274	31 00	322
306	14 59	031	43 08	095	45 43	151	47 23	192	38 40	237	31 24	275	30 37	323
307	15 19	032	43 46	096	46 01	152	47 14	193	38 08	238	30 46	275	30 14	323
308	15 39	033	44 23	097	46 18	154	47 05	195	37 36	239	30 09	276	29 52	324
309	16 00	033	45 01	098	46 34	155	46 55	196	37 03	240	29 31	277	29 30	324
310	16 21	034	45 38	099	46 50	156	46 44	198	36 30	241	28 54	278	29 08	325
311	16 42	035	46 15	100	47 05	158	46 32	199	35 57	242	28 16	278	28 46	325
312	17 04	035	46 53	101	47 19	159	46 20	200	35 24	243	27 39	279	28 25	326
313	17 26	036	47 30	102	47 32	160	46 06	202	34 50	244	27 02	280	28 04	326
314	17 48	036	48 07	103	47 44	162	45 52	203	34 16	245	26 25	281	27 43	327
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
315	18 10	037	26 06	084	48 43	103	47 55	163	45 36	205	62 19	258	27 22	327
316	18 33	038	26 44	085	49 20	104	48 06	165	45 20	206	61 42	259	27 02	328
317	18 57	038	27 22	086	49 56	105	48 15	166	45 03	207	61 05	260	26 42	328
318	19 20	039	27 59	086	50 33	106	48 23	168	44 46	209	60 28	261	26 23	329
319	19 44	039	28 37	087	51 09	107	48 31	169	44 27	210	59 51	262	26 03	329
320	20 08	040	29 15	088	51 45	108	48 38	171	44 08	211	59 13	263	25 44	330
321	20 33	041	29 52	089	52 21	109	48 43	172	43 48	213	58 36	264	25 25	330
322	20 57	041	30 30	089	52 56	110	48 48	174	43 27	214	57 58	264	25 07	331
323	21 22	042	31 08	090	53 31	112	48 52	175	43 06	215	57 20	265	24 49	331
324	21 48	042	31 46	091	54 06	113	48 54	177	42 44	216	56 43	266	24 31	332
325	22 13	043	32 23	092	54 41	114	48 56	178	42 21	218	56 05	267	24 13	332
326	22 39	044	33 01	093	55 15	115	48 57	180	41 58	219	55 27	268	23 56	333
327	23 06	044	33 39	093	55 50	116	48 56	181	41 34	220	54 50	269	23 39	334
328	23 32	045	34 17	094	56 23	117	48 55	183	41 09	221	54 12	269	23 22	334
329	23 59	045	34 54	095	56 57	119	48 53	184	40 44	222	53 34	270	23 06	335
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Alioth	
330	24 26	046	35 32	096	57 30	120	48 50	186	40 19	224	52 56	271	22 50	335
331	24 53	047	36 09	097	58 02	121	48 45	187	39 52	225	52 19	272	22 34	336
332	25 21	047	36 47	098	58 34	122	48 40	189	39 25	226	51 41	272	22 19	336
333	25 49	048	37 24	098	59 06	124	48 34	190	38 58	227	51 03	273	22 04	337
334	26 17	048	38 01	099	59 37	125	48 27	192	38 30	228	50 26	274	21 49	337
335	26 45	049	38 39	100	60 08	127	48 19	193	38 02	229	49 48	275	21 35	338
336	27 13	049	39 16	101	60 38	128	48 10	195	37 33	230	49 10	275	21 21	338
337	27 42	050	39 53	102	61 07	129	48 00	196	37 04	231	48 33	276	21 07	339
338	28 11	051	40 30	103	61 36	131	47 49	197	36 34	232	47 55	277	20 53	340
339	28 41	051	41 06	104	62 04	133	47 37	199	36 04	233	47 18	277	20 40	340
340	29 10	052	41 43	105	62 32	134	47 25	200	35 33	235	46 40	278	20 28	341
341	29 40	052	42 20	105	62 58	136	47 11	202	35 02	236	46 03	279	20 15	341
342	30 10	053	42 56	106	63 24	137	46 57	203	34 31	237	45 26	280	20 03	342
343	30 40	053	43 32	107	63 50	139	46 42	204	33 59	238	44 48	280	19 52	342
344	31 10	054	44 08	108	64 14	141	46 26	206	33 27	239	44 11	281	19 40	343
	◆ CAPELLA		ALDEBARAN		◆ Diphda		Enif		ALTAIR		◆ VEGA		Alioth	
345	31 41	054	16 24	084	17 24	154	46 09	207	32 55	240	43 34	282	19 29	343
346	32 12	055	17 01	085	17 40	155	45 51	209	32 22	241	42 57	282	19 19	344
347	32 43	056	17 39	085	17 56	156	45 33	210	31 49	242	42 20	283	19 09	345
348	33 14	056	18 16	086	18 11	157	45 13	211	31 16	242	41 44	283	18 59	345
349	33 46	057	18 54	087	18 25	158	44 53	213	30 42	243	41 07	284	18 49	346
350	34 17	057	19 32	088	18 39	159	44 33	214	30 08	244	40 30	285	18 40	346
351	34 49	058	20 10	088	18 52	160	44 11	215	29 34	245	39 54	285	18 31	347
352	35 21	058	20 47	089	19 05	161	43 49	216	29 00	246	39 18	286	18 23	347
353	35 53	059	21 25	090	19 17	162	43 27	218	28 25	247	38 41	287	18 15	348
354	36 26	059	22 03	091	19 29	163	43 03	219	27 50	248	38 05	287	18 07	349
355	36 58	060	22 41	091	19 40	164	42 39	220	27 15	249	37 29	288	18 00	349
356	37 31	060	23 18	092	19 50	165	42 15	221	26 40	250	36 53	289	17 53	350
357	38 04	061	23 56	093	20 00	166	41 49	223	26 04	251	36 18	289	17 46	350
358	38 37	062	24 34	094	20 09	167	41 23	224	25 28	252	35 42	290	17 40	351
359	39 10	062	25 11	095	20 17	168	40 57	225	24 52	252	35 07	290	17 34	351

Tilbage til Menuen

LAT 50°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Alpheratz		ALTAIR		◆ VEGA		Kochab	
0	39 16	062	25 54	095	53 40	125	69 06	174	24 33	254	34 09	292	37 23	346
1	39 50	062	26 33	096	54 12	126	69 09	177	23 56	255	33 34	292	37 14	347
2	40 24	063	27 11	097	54 42	127	69 10	179	23 19	255	32 58	293	37 06	347
3	40 59	063	27 49	097	55 13	129	69 10	182	22 42	256	32 23	293	36 57	347
4	41 33	064	28 28	098	55 42	130	69 08	184	22 04	257	31 47	294	36 49	348
5	42 08	064	29 06	099	56 12	132	69 04	187	21 26	258	31 12	295	36 40	348
6	42 43	065	29 44	100	56 40	133	68 59	189	20 49	259	30 37	295	36 33	348
7	43 18	065	30 22	101	57 08	134	68 52	191	20 11	260	30 03	296	36 25	349
8	43 53	066	31 00	101	57 35	136	68 44	194	19 33	260	29 28	297	36 17	349
9	44 28	067	31 37	102	58 02	137	68 34	196	18 55	261	28 53	297	36 10	349
10	45 04	067	32 15	103	58 27	139	68 22	199	18 17	262	28 19	298	36 03	349
11	45 39	068	32 52	104	58 52	141	68 09	201	17 38	263	27 45	298	35 56	350
12	46 15	068	33 30	105	59 16	142	67 55	203	17 00	264	27 11	299	35 49	350
13	46 51	069	34 07	106	59 40	144	67 39	205	16 22	264	26 38	300	35 42	350
14	47 27	069	34 44	107	60 02	145	67 22	207	15 43	265	26 04	300	35 36	351
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Diphda		Alpheratz		◆ DENEB		Kochab	
15	48 03	070	35 21	108	60 23	147	22 00	184	67 04	210	47 40	290	35 30	351
16	48 39	070	35 58	109	60 44	149	21 57	185	66 44	212	47 04	290	35 24	351
17	49 15	071	36 34	109	61 03	151	21 54	186	66 23	214	46 28	291	35 18	352
18	49 52	071	37 10	110	61 22	152	21 49	187	66 01	216	45 52	291	35 13	352
19	50 28	072	37 46	111	61 39	154	21 44	188	65 38	217	45 16	292	35 08	352
20	51 05	072	38 22	112	61 55	156	21 38	189	65 14	219	44 40	292	35 02	353
21	51 42	073	38 58	113	62 10	158	21 32	190	64 49	221	44 04	293	34 58	353
22	52 19	073	39 33	114	62 24	160	21 25	191	64 24	223	43 29	293	34 53	353
23	52 56	074	40 08	115	62 37	162	21 17	192	63 57	225	42 53	294	34 49	354
24	53 33	074	40 43	116	62 48	164	21 09	193	63 29	226	42 18	294	34 44	354
25	54 10	075	41 17	117	62 58	166	20 59	194	63 01	228	41 43	295	34 40	354
26	54 47	075	41 51	118	63 07	168	20 50	195	62 32	230	41 08	295	34 36	355
27	55 25	076	42 25	119	63 15	170	20 39	196	62 02	231	40 33	296	34 33	355
28	56 02	076	42 59	120	63 21	172	20 28	197	61 32	233	39 59	296	34 30	355
29	56 40	077	43 32	121	63 26	174	20 16	198	61 01	234	39 24	297	34 26	355
	CAPELLA		◆ BETELGEUSE		RIGEL		Hamal		◆ Alpheratz		DENEB		◆ Kochab	
30	57 17	078	25 17	110	18 03	128	63 29	176	60 30	236	38 50	297	34 23	356
31	57 55	078	25 53	111	18 33	129	63 31	178	59 58	237	38 16	298	34 21	356
32	58 33	079	26 29	112	19 03	130	63 32	180	59 25	238	37 42	299	34 18	356
33	59 10	079	27 05	113	19 32	131	63 31	182	58 52	240	37 08	299	34 16	357
34	59 48	080	27 40	113	20 01	132	63 29	184	58 18	241	36 34	300	34 14	357
35	60 26	080	28 16	114	20 29	133	63 26	186	57 45	242	36 01	300	34 12	357
36	61 04	081	28 51	115	20 57	134	63 21	188	57 10	243	35 28	301	34 11	358
37	61 43	082	29 25	116	21 25	135	63 15	190	56 36	245	34 55	301	34 09	358
38	62 21	082	30 00	117	21 52	136	63 07	192	56 01	246	34 22	302	34 08	358
39	62 59	083	30 34	118	22 19	137	62 58	194	55 25	247	33 49	302	34 07	359
40	63 37	083	31 08	119	22 45	138	62 48	196	54 50	248	33 17	303	34 06	359
41	64 16	084	31 41	120	23 11	139	62 37	198	54 14	249	32 44	303	34 06	359
42	64 54	085	32 15	121	23 36	140	62 24	200	53 38	250	32 12	304	34 06	000
43	65 32	085	32 48	122	24 00	141	62 10	202	53 01	251	31 40	304	34 06	000
44	66 11	086	33 20	123	24 25	142	61 55	204	52 25	252	31 08	305	34 06	000
	◆ Dubhe		POLLUX		BETELGEUSE		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
45	31 06	028	32 37	084	33 52	124	24 48	143	61 39	206	51 48	253	30 37	305
46	31 24	029	33 16	085	34 24	125	25 11	144	61 22	208	51 11	254	30 06	306
47	31 43	029	33 54	085	34 56	126	25 34	145	61 04	209	50 34	255	29 35	307
48	32 02	030	34 32	086	35 27	127	25 56	146	60 44	211	49 56	256	29 04	307
49	32 21	030	35 11	087	35 57	128	26 18	147	60 24	213	49 19	257	28 33	308
50	32 40	030	35 49	088	36 27	129	26 38	148	60 02	215	48 41	258	28 03	308
51	33 00	031	36 28	088	36 57	130	26 59	149	59 40	216	48 03	259	27 32	309
52	33 20	031	37 07	089	37 26	131	27 18	150	59 17	218	47 25	260	27 02	309
53	33 40	032	37 45	090	37 55	132	27 37	151	58 53	219	46 47	261	26 33	310
54	34 00	032	38 24	091	38 23	133	27 56	152	58 28	221	46 09	262	26 03	310
55	34 21	032	39 02	092	38 51	135	28 14	153	58 02	223	45 31	262	25 34	311
56	34 42	033	39 41	092	39 18	136	28 31	154	57 36	224	44 53	263	25 05	312
57	35 03	033	40 19	093	39 45	137	28 47	155	57 08	226	44 14	264	24 36	312
58	35 24	034	40 58	094	40 11	138	29 03	156	56 41	227	43 36	265	24 08	313
59	35 45	034	41 36	095	40 36	139	29 18	157	56 12	228	42 58	266	23 40	313
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	36 07	034	42 15	096	13 56	139	29 33	158	55 43	230	42 19	267	23 12	314
61	36 29	035	42 53	096	14 21	140	29 47	160	55 13	231	41 41	267	22 44	314
62	36 51	035	43 31	097	14 45	141	30 00	161	54 43	233	41 02	268	22 17	315
63	37 13	035	44 10	098	15 09	142	30 12	162	54 12	234	40 23	269	21 50	316
64	37 36	036	44 48	099	15 33	143	30 24	163	53 40	235	39 45	270	21 23	316
65	37 58	036	45 26	100	15 56	144	30 35	164	53 09	236	39 06	270	20 56	317
66	38 21	037	46 04	101	16 19	145	30 45	165	52 36	238	38 28	271	20 30	317
67	38 44	037	46 42	102	16 41	146	30 55	166	52 04	239	37 49	272	20 04	318
68	39 07	037	47 19	102	17 02	146	31 03	167	51 30	240	37 11	273	19 38	319
69	39 31	038	47 57	103	17 23	147	31 11	169	50 57	241	36 32	273	19 13	319
70	39 54	038	48 34	104	17 44	148	31 19	170	50 23	242	35 54	274	18 48	320
71	40 18	038	49 12	105	18 04	149	31 25	171	49 49	243	35 15	275	18 23	320
72	40 42	039	49 49	106	18 23	150	31 31	172	49 14	244	34 37	276	17 59	321
73	41 06	039	50 26	107	18 42	151	31 36	173	48 39	246	33 59	276	17 34	322
74	41 31	039	51 02	108	19 00	152	31 40	174	48 04	247	33 20	277	17 11	322
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		◆ Hamal		DENEB	
75	41 55	040	17 14	092	34 01	129	19 18	153	31 43	176	47 28	248	16 47	323
76	42 20	040	17 52	093	34 31	130	19 35	154	31 46	177	46 52	249	16 24	323
77	42 45	040	18 31	093	35 00	132	19 52	155	31 48	178	46 16	250	16 01	324
78	43 10	041	19 09	094	35 28	133	20 08	156	31 49	179	45 40	251	15 39	325
79	43 35	041	19 48	095	35 57	134	20 23	157	31 49	180	45 03	252	15 17	325
80	44 00	041	20 26	096	36 24	135	20 38	158	31 48	181	44 27	253	14 55	326
81	44 26	041	21 05	097	36 51	136	20 52	159	31 47	183	43 50	254	14 33	326
82	44 51	042	21 43	097	37 18	137	21 05	160	31 45	184	43 13	254	14 12	327
83	45 17	042	22 21	098	37 44	138	21 18	161	31 42	185	42 36	255	13 51	328
84	45 43	042	22 59	099	38 09	139	21 30	162	31 38	186	41 58	256	13 31	328
85	46 09	043	23 37	100	38 34	140	21 42	163	31 34	187	41 21	257	13 11	329
86	46 35	043	24 15	101	38 59	142	21 53	164	31 29	188	40 43	258	12 51	330
87	47 02	043	24 53	101	39 22	143	22 03	165	31 23	190	40 05	259	12 32	330
88	47 28	043	25 31	102	39 45	144	22 13	166	31 16	191	39 27	260	12 13	331
89	47 55	044	26 08	103	40 08	145	22 22	167	31 08	192	38 49	261	11 54	332

LAT 50°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
90	48 21	044	26 46	104	40 29	146	22 30	168	31 00	193	52 34	214	65 25	285
91	48 48	044	27 23	105	40 50	148	22 38	169	30 51	194	52 12	216	64 48	285
92	49 15	044	28 00	106	41 11	149	22 45	170	30 41	195	51 49	217	64 10	286
93	49 42	045	28 37	107	41 30	150	22 51	171	30 31	196	51 26	218	63 33	286
94	50 09	045	29 14	107	41 49	151	22 56	172	30 20	197	51 01	220	62 56	286
95	50 36	045	29 51	108	42 07	153	23 01	173	30 08	199	50 36	221	62 19	287
96	51 04	045	30 28	109	42 25	154	23 05	174	29 55	200	50 11	222	61 43	287
97	51 31	045	31 04	110	42 41	155	23 09	175	29 42	201	49 44	224	61 06	288
98	51 59	046	31 40	111	42 57	157	23 12	176	29 28	202	49 17	225	60 29	288
99	52 26	046	32 16	112	43 12	158	23 14	177	29 13	203	48 50	226	59 52	289
100	52 54	046	32 52	113	43 26	159	23 15	178	28 58	204	48 22	228	59 16	289
101	53 22	046	33 27	114	43 39	161	23 16	180	28 41	205	47 53	229	58 39	289
102	53 50	046	34 02	115	43 52	162	23 16	181	28 25	206	47 23	230	58 03	290
103	54 18	047	34 37	116	44 03	163	23 15	182	28 07	207	46 54	231	57 27	290
104	54 46	047	35 12	117	44 14	165	23 13	183	27 49	208	46 23	232	56 51	291
	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
105	55 14	047	22 17	094	35 46	118	23 11	184	27 31	210	45 52	234	56 15	291
106	55 42	047	22 56	095	36 20	119	23 08	185	27 11	211	45 21	235	55 39	291
107	56 10	047	23 34	095	36 54	120	23 05	186	26 51	212	44 49	236	55 03	292
108	56 38	047	24 12	096	37 27	121	23 01	187	26 31	213	44 17	237	54 27	292
109	57 07	047	24 51	097	38 00	122	22 56	188	26 10	214	43 45	238	53 52	293
110	57 35	047	25 29	098	38 33	123	22 50	189	25 48	215	43 12	239	53 16	293
111	58 03	047	26 07	099	39 05	124	22 44	190	25 26	216	42 38	240	52 41	294
112	58 32	047	26 45	099	39 37	125	22 37	191	25 03	217	42 05	241	52 05	294
113	59 00	048	27 23	100	40 08	126	22 29	192	24 40	218	41 31	242	51 30	294
114	59 29	048	28 01	101	40 39	127	22 21	193	24 16	219	40 56	243	50 55	295
115	59 57	048	28 39	102	41 10	128	22 12	194	23 51	220	40 22	244	50 20	295
116	60 26	048	29 17	103	41 40	129	22 02	195	23 27	221	39 47	245	49 45	296
117	60 54	048	29 54	104	42 10	130	21 52	196	23 01	222	39 12	246	49 11	296
118	61 22	048	30 32	105	42 39	131	21 41	197	22 35	223	38 36	247	48 36	297
119	61 51	048	31 09	105	43 08	133	21 29	198	22 09	224	38 00	248	48 02	297
120	44 16	022	31 46	106	43 36	134	21 17	199	21 42	225	37 24	249	62 55	277
121	44 31	022	32 23	107	44 03	135	21 04	200	21 15	225	36 48	250	62 17	278
122	44 45	022	33 00	108	44 30	136	20 50	201	20 47	226	36 12	251	61 39	279
123	45 00	022	33 36	109	44 57	137	20 36	202	20 19	227	35 35	252	61 01	279
124	45 15	023	34 13	110	45 23	139	20 21	203	19 50	228	34 58	253	60 23	280
125	45 30	023	34 49	111	45 48	140	20 06	204	19 21	229	34 22	254	59 45	280
126	45 45	023	35 25	112	46 12	141	19 50	205	18 52	230	33 44	255	59 07	281
127	46 00	023	36 00	113	46 36	143	19 33	206	18 22	231	33 07	256	58 29	281
128	46 15	023	36 36	114	46 59	144	19 16	207	17 52	232	32 30	256	57 51	282
129	46 30	023	37 11	115	47 21	145	18 58	208	17 21	233	31 52	257	57 13	283
130	46 46	024	37 46	116	47 43	147	18 40	209	16 51	234	31 14	258	56 36	283
131	47 01	024	38 21	117	48 04	148	18 21	210	16 19	235	30 37	259	55 58	284
132	47 17	024	38 55	118	48 24	149	18 02	211	15 48	235	29 59	260	55 21	284
133	47 32	024	39 29	119	48 43	151	17 42	212	15 16	236	29 21	261	54 43	285
134	47 48	024	40 03	120	49 02	152	17 21	213	14 44	237	28 43	261	54 06	285
	◆ Kochab		ARCTURUS		Denebola		◆ REGULUS		SIRIUS		BETELGEUSE		◆ CAPELLA	
135	48 04	024	21 27	085	40 36	121	49 20	153	17 00	214	32 47	238	53 29	286
136	48 20	024	22 06	086	41 09	122	49 36	155	16 39	215	32 14	239	52 52	286
137	48 36	024	22 44	087	41 42	123	49 52	156	16 16	215	31 41	240	52 15	287
138	48 51	025	23 23	088	42 14	124	50 07	158	15 54	216	31 08	241	51 38	287
139	49 08	025	24 01	088	42 46	125	50 21	159	15 31	217	30 34	242	51 01	288
140	49 24	025	24 40	089	43 17	126	50 34	161	15 07	218	30 00	243	50 25	288
141	49 40	025	25 18	090	43 48	127	50 47	162	14 43	219	29 25	244	49 48	289
142	49 56	025	25 57	091	44 19	128	50 58	164	14 18	220	28 50	245	49 12	289
143	50 12	025	26 35	092	44 49	129	51 08	165	13 53	221	28 15	246	48 35	290
144	50 28	025	27 14	092	45 18	131	51 17	167	13 28	222	27 40	247	47 59	290
145	50 45	025	27 52	093	45 47	132	51 25	169	13 02	223	27 05	247	47 23	291
146	51 01	025	28 31	094	46 16	133	51 33	170	12 36	223	26 29	248	46 47	291
147	51 17	025	29 09	095	46 44	134	51 39	172	12 09	224	25 53	249	46 11	292
148	51 34	025	29 48	095	47 11	136	51 44	173	11 42	225	25 17	250	45 36	293
149	51 50	025	30 26	096	47 38	137	51 48	175	11 14	226	24 40	251	45 00	293
150	52 07	025	31 05	097	14 05	128	51 51	176	36 25	225	24 04	252	44 25	294
151	52 23	025	31 43	098	14 35	129	51 53	178	35 58	226	23 27	253	43 49	294
152	52 39	025	32 21	099	15 05	129	51 54	180	35 30	227	22 50	253	43 14	295
153	52 56	025	32 59	100	15 34	130	51 53	181	35 01	228	22 13	254	42 39	295
154	53 12	025	33 37	100	16 04	131	51 52	183	34 32	230	21 36	255	42 04	296
155	53 29	025	34 15	101	16 32	132	51 50	184	34 02	231	20 59	256	41 30	296
156	53 45	025	34 53	102	17 01	133	51 46	186	33 32	232	20 21	257	40 55	297
157	54 02	025	35 30	103	17 29	134	51 42	187	33 02	233	19 44	258	40 21	297
158	54 18	025	36 08	104	17 56	135	51 36	189	32 31	234	19 06	258	39 47	298
159	54 34	025	36 45	105	18 24	136	51 30	191	32 00	235	18 28	259	39 12	298
160	54 51	025	37 22	106	18 50	137	51 22	192	31 28	236	17 50	260	38 39	299
161	55 07	025	37 59	107	19 17	138	51 14	194	30 56	237	17 12	261	38 05	299
162	55 23	025	38 36	107	19 42	138	51 04	195	30 24	238	16 34	262	37 31	300
163	55 39	025	39 13	108	20 08	139	50 53	197	29 51	239	15 56	262	36 58	300
164	55 56	025	39 49	109	20 33	140	50 42	198	29 18	239	15 17	263	36 25	301
	◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		PROCYON		◆ POLLUX		CAPELLA	
165	15 52	048	40 26	110	20 57	141	50 29	200	28 45	240	47 24	257	35 52	301
166	16 20	048	41 02	111	21 21	142	50 16	201	28 11	241	46 46	258	35 19	302
167	16 49	049	41 38	112	21 44	143	50 01	203	27 37	242	46 08	259	34 46	302
168	17 18	049	42 13	113	22 07	144	49 46	204	27 03	243	45 30	260	34 14	303
169	17 48	050	42 49	114	22 29	145	49 29	206	26 28	244	44 52	261	33 41	303
170	18 18	051	43 24	115	22 51	146	49 12	207	25 53	245	44 14	262	33 09	304
171	18 48	051	43 58	116	23 12	147	48 54	209	25 18	246	43 36	263	32 37	304
172	19 18	052	44 33	117	23 33	148	48 36	210	24 43	247	42 58	264	32 06	305
173	19 48	053	45 07	118	23 53	149	48 16	211	24 07	248	42 19	264	31 34	306
174	20 19	053	45 41	119	24 12	150	47 55	213	23 31	249	41 41	265	31 03	306
175	20 50	054	46 14	121	24 31	151	47 34	214	22 55	249	41 02	266	30 32	307
176	21 22	055	46 47	122	24 49	152	47 12	215	22 19	250	40 24	267	30 01	307
177	21 53	055	47 20	123	25 07	153	46 50	217	21 43	251	39 45	268	29 30	308
178	22 25	056	47 52	124	25 24	154	46 26	218	21 06	252	39 07	268	29 00	308
179	22 57	056	48 24	125	25 40	155	46 02	219	20 30	253	38 28	269	28 30	309

Tilbage til Menuen

LAT 50°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
180	14 34	034	23 29	057	48 55	126	25 56	156	45 37	221	37 50	270	28 00	309
181	14 55	034	24 02	058	49 26	128	26 11	157	45 12	222	37 11	271	27 30	310
182	15 17	035	24 34	058	49 56	129	26 25	159	44 46	223	36 33	271	27 01	310
183	15 39	035	25 07	059	50 26	130	26 39	160	44 19	224	35 54	272	26 31	311
184	16 02	036	25 40	059	50 55	131	26 52	161	43 52	226	35 15	273	26 02	312
185	16 25	037	26 13	060	51 24	133	27 05	162	43 24	227	34 37	274	25 34	312
186	16 48	037	26 47	061	51 52	134	27 16	163	42 56	228	33 58	274	25 05	313
187	17 11	038	27 21	061	52 20	135	27 27	164	42 27	229	33 20	275	24 37	313
188	17 35	038	27 55	062	52 46	137	27 38	165	41 58	230	32 42	276	24 09	314
189	17 59	039	28 29	062	53 12	138	27 47	166	41 28	231	32 03	277	23 41	314
190	18 24	040	29 03	063	53 38	139	27 56	167	40 57	232	31 25	277	23 14	315
191	18 49	040	29 37	064	54 03	141	28 04	168	40 27	234	30 47	278	22 47	316
192	19 14	041	30 12	064	54 27	142	28 12	169	39 55	235	30 09	279	22 20	316
193	19 39	041	30 47	065	54 50	144	28 19	171	39 24	236	29 31	279	21 53	317
194	20 05	042	31 22	065	55 12	145	28 25	172	38 52	237	28 53	280	21 27	317
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	20 31	043	31 57	066	23 06	098	55 34	147	38 19	238	28 15	281	21 01	318
196	20 57	043	32 32	067	23 44	099	55 54	148	37 46	239	27 37	282	20 35	318
197	21 24	044	33 08	067	24 22	100	56 14	150	37 13	240	26 59	282	20 10	319
198	21 50	044	33 44	068	25 00	101	56 33	152	36 40	241	26 21	283	19 45	320
199	22 18	045	34 19	068	25 38	101	56 51	153	36 06	242	25 44	284	19 20	320
200	22 45	046	34 55	069	26 15	102	57 07	155	35 32	243	25 06	284	18 55	321
201	23 13	046	35 31	070	26 53	103	57 23	157	34 57	244	24 29	285	18 31	321
202	23 41	047	36 08	070	27 31	104	57 38	158	34 23	245	23 52	286	18 07	322
203	24 09	047	36 44	071	28 08	105	57 52	160	33 48	246	23 15	286	17 43	323
204	24 37	048	37 21	072	28 45	106	58 04	162	33 12	247	22 38	287	17 20	323
205	25 06	048	37 57	072	29 22	106	58 16	164	32 37	248	22 01	288	16 57	324
206	25 35	049	38 34	073	29 59	107	58 26	165	32 01	248	21 25	288	16 35	324
207	26 04	050	39 11	073	30 36	108	58 35	167	31 25	249	20 48	289	16 12	325
208	26 34	050	39 48	074	31 12	109	58 43	169	30 49	250	20 12	290	15 50	326
209	27 03	051	40 25	075	31 49	110	58 50	171	30 12	251	19 36	291	15 29	326
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
210	27 33	051	41 02	075	32 25	111	58 56	173	29 36	252	18 59	291	15 08	327
211	28 03	052	41 40	076	33 01	112	59 00	174	28 59	253	18 24	292	14 47	327
212	28 34	052	42 17	076	33 37	113	59 04	176	28 22	254	17 48	293	14 26	328
213	29 05	053	42 55	077	34 12	114	59 06	178	27 45	255	17 12	293	14 06	329
214	29 35	053	43 32	078	34 47	115	59 06	180	27 08	256	16 37	294	13 46	329
215	30 06	054	44 10	078	35 22	116	59 06	182	26 30	256	16 02	295	13 27	330
216	30 38	055	44 48	079	35 57	117	59 04	184	25 53	257	15 27	295	13 07	331
217	31 09	055	45 26	080	36 31	118	59 01	185	25 15	258	14 52	296	12 49	331
218	31 41	056	46 04	080	37 05	118	58 57	187	24 37	259	14 18	297	12 30	332
219	32 13	056	46 42	081	37 39	120	58 51	189	23 59	260	13 43	297	12 12	333
220	32 45	057	47 20	082	38 12	121	58 45	191	23 21	260	13 09	298	11 55	333
221	33 17	057	47 58	082	38 45	122	58 37	193	22 43	261	12 35	299	11 38	334
222	33 50	058	48 36	083	39 18	123	58 28	194	22 05	262	12 02	300	11 21	334
223	34 23	058	49 15	084	39 50	124	58 18	196	21 27	263	11 28	300	11 04	335
224	34 56	059	49 53	084	40 22	125	58 06	198	20 49	264	10 55	301	10 48	336
	DENEB		◆ VEGA		Rasalhague		ANTARES		◆ ARCTURUS		Denebola		◆ Dubhe	
225	35 29	059	50 31	085	40 54	126	10 57	160	57 54	200	37 43	245	56 19	313
226	36 02	060	51 10	086	41 25	127	11 10	160	57 40	201	37 08	246	55 51	313
227	36 35	060	51 48	086	41 55	128	11 23	161	57 26	203	36 33	246	55 23	313
228	37 09	061	52 27	087	42 26	129	11 35	162	57 10	205	35 57	247	54 55	313
229	37 43	062	53 05	088	42 55	130	11 46	163	56 54	206	35 22	248	54 27	313
230	38 17	062	53 44	089	43 24	131	11 57	164	56 36	208	34 46	249	53 59	314
231	38 51	063	54 22	089	43 53	133	12 08	165	56 17	210	34 09	250	53 31	314
232	39 25	063	55 01	090	44 21	134	12 18	166	55 58	211	33 33	251	53 03	314
233	40 00	064	55 40	091	44 49	135	12 27	167	55 37	213	32 56	252	52 35	314
234	40 34	064	56 18	092	45 16	136	12 35	168	55 16	214	32 20	253	52 08	314
235	41 09	065	56 57	093	45 42	137	12 43	168	54 54	216	31 43	254	51 40	314
236	41 44	065	57 35	093	46 08	139	12 51	169	54 31	217	31 06	255	51 12	315
237	42 19	066	58 14	094	46 33	140	12 58	170	54 07	219	30 28	256	50 45	315
238	42 54	066	58 52	095	46 57	141	13 04	171	53 42	220	29 51	256	50 18	315
239	43 30	067	59 31	096	47 21	143	13 09	172	53 17	222	29 13	257	49 51	315
	◆ DENEB		ALTAIR		Rasalhague		◆ ANTARES		ARCTURUS		Denebola		◆ Dubhe	
240	44 05	067	27 09	110	47 44	144	13 14	173	52 51	223	28 36	258	49 24	316
241	44 41	068	27 45	111	48 06	145	13 19	174	52 24	225	27 58	259	48 57	316
242	45 17	068	28 21	112	48 28	147	13 23	175	51 57	226	27 20	260	48 30	316
243	45 53	069	28 57	113	48 49	148	13 26	176	51 29	227	26 42	261	48 03	316
244	46 29	069	29 32	113	49 09	149	13 28	177	51 00	228	26 04	261	47 36	317
245	47 05	070	30 07	114	49 28	151	13 30	178	50 31	230	25 26	262	47 10	317
246	47 41	070	30 42	115	49 46	152	13 31	179	50 01	231	24 47	263	46 44	317
247	48 18	071	31 17	116	50 04	154	13 32	179	49 31	232	24 09	264	46 17	317
248	48 54	072	31 52	117	50 20	155	13 32	180	49 00	233	23 31	265	45 51	318
249	49 31	072	32 26	118	50 36	157	13 32	181	48 29	235	22 52	265	45 25	318
250	50 07	073	33 00	119	50 51	158	13 30	182	47 57	236	22 14	266	45 00	318
251	50 44	073	33 33	120	51 05	160	13 29	183	47 25	237	21 35	267	44 34	318
252	51 21	074	34 06	121	51 18	161	13 26	184	46 53	238	20 57	268	44 08	319
253	51 58	074	34 39	122	51 30	163	13 23	185	46 20	239	20 18	269	43 43	319
254	52 35	075	35 12	123	51 41	164	13 19	186	45 46	240	19 40	269	43 18	319
	◆ Schedar		DENEB		ALTAIR		◆ Rasalhague		ARCTURUS		◆ Alkaid		Kochab	
255	29 14	035	53 13	075	35 44	124	51 51	166	45 13	241	59 27	287	62 19	342
256	29 36	035	53 50	076	36 16	125	51 59	167	44 39	243	58 51	288	62 07	341
257	29 58	036	54 28	076	36 47	126	52 07	169	44 04	244	58 14	288	61 54	341
258	30 21	036	55 05	077	37 18	127	52 14	171	43 30	245	57 37	289	61 42	340
259	30 44	037	55 43	078	37 48	128	52 20	172	42 55	246	57 01	289	61 29	340
260	31 07	037	56 20	078	38 18	129	52 25	174	42 19	247	56 24	290	61 15	340
261	31 30	038	56 58	079	38 48	130	52 28	175	41 44	248	55 48	290	61 02	339
262	31 54	038	57 36	079	39 17	132	52 31	177	41 08	249	55 12	290	60 48	339
263	32 18	038	58 14	080	39 46	133	52 33	179	40 32	250	54 36	291	60 35	339
264	32 42	039	58 52	080	40 14	134	52 33	180	39 56	251	54 00	291	60 21	339
265	33 06	039	59 30	081	40 41	135	52 32	182	39 19	251	53 24	292	60 06	338
266	33 31	040	60 08	082	41 08	136	52 31	183	38 43	252	52 48	292	59 52	338
267	33 55	040	60 46	082	41 35	137	52 28	185	38 06	253	52 13	293	59 37	338
268	34 20	041	61 24	083	42 01	139	52 24	187	37 29	254	51 37	293	59 23	338
269	34 44	041	62 02	083	42 26	140	52 19	188	36 52	255	51 02	294	59 08	337

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	15 14	025	20 33	069	42 50	141	52 13	190	36 14	256	50 26	294	58 53	337
271	15 30	025	21 09	069	43 14	142	52 06	191	35 37	257	49 51	295	58 38	337
272	15 47	026	21 45	070	43 38	143	51 58	193	34 59	258	49 16	295	58 23	337
273	16 04	026	22 21	071	44 00	145	51 49	194	34 21	259	48 41	295	58 07	336
274	16 21	027	22 58	071	44 22	146	51 39	196	33 44	259	48 07	296	57 52	336
275	16 39	028	23 34	072	44 44	147	51 28	198	33 06	260	47 32	296	57 36	336
276	16 57	028	24 11	073	45 04	149	51 15	199	32 27	261	46 57	297	57 21	336
277	17 16	029	24 48	073	45 24	150	51 02	201	31 49	262	46 23	297	57 05	336
278	17 34	029	25 25	074	45 43	151	50 48	202	31 11	263	45 49	298	56 49	336
279	17 54	030	26 02	075	46 01	153	50 33	204	30 33	264	45 15	298	56 33	336
280	18 13	031	26 40	076	46 18	154	50 17	205	29 54	264	44 41	299	56 17	335
281	18 33	031	27 17	076	46 35	155	50 01	207	29 16	265	44 07	299	56 01	335
282	18 53	032	27 54	077	46 50	157	49 43	208	28 38	266	43 33	300	55 45	335
283	19 13	032	28 32	078	47 05	158	49 25	209	27 59	267	43 00	300	55 29	335
284	19 34	033	29 10	078	47 19	160	49 05	211	27 21	268	42 27	300	55 12	335
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
285	19 55	033	29 48	079	47 32	161	48 45	212	26 42	268	41 53	301	54 56	335
286	20 17	034	30 26	080	47 44	162	48 24	214	26 04	269	41 20	301	54 40	335
287	20 39	035	31 04	080	47 55	164	48 02	215	25 25	270	40 48	302	54 24	335
288	21 01	035	31 42	081	48 06	165	47 40	216	24 46	271	40 15	302	54 07	335
289	21 23	036	32 20	082	48 15	167	47 17	218	24 08	271	39 42	303	53 51	335
290	21 46	036	32 58	082	48 23	168	46 53	219	23 29	272	39 10	303	53 34	335
291	22 09	037	33 36	083	48 31	170	46 28	220	22 51	273	38 38	304	53 18	335
292	22 32	037	34 14	084	48 37	171	46 03	221	22 12	274	38 06	304	53 01	335
293	22 55	038	34 53	085	48 43	173	45 37	223	21 34	274	37 34	305	52 45	335
294	23 19	039	35 31	085	48 47	174	45 11	224	20 55	275	37 03	305	52 29	335
295	23 44	039	36 10	086	48 50	176	44 44	225	20 17	276	36 31	306	52 12	335
296	24 08	040	36 48	087	48 53	177	44 16	226	19 39	277	36 00	306	51 56	335
297	24 33	040	37 27	088	48 54	179	43 48	228	19 00	277	35 29	307	51 39	335
298	24 58	041	38 05	088	48 55	180	43 19	229	18 22	278	34 58	307	51 23	335
299	25 23	041	38 44	089	48 54	182	42 50	230	17 44	279	34 28	308	51 07	335
	CAPELLA		◆ Alpheratz		Enif		ALTAIR		◆ Rasalhague		Alphecca		◆ Kochab	
300	12 14	028	39 22	090	44 27	142	48 52	183	42 20	231	35 10	271	50 50	335
301	12 32	028	40 01	091	44 50	144	48 50	185	41 50	232	34 31	272	50 34	335
302	12 51	029	40 40	091	45 12	145	48 46	186	41 19	233	33 53	272	50 18	335
303	13 09	029	41 18	092	45 34	146	48 41	188	40 48	234	33 14	273	50 01	335
304	13 28	030	41 57	093	45 55	148	48 36	189	40 16	235	32 36	274	49 45	335
305	13 48	031	42 35	094	46 15	149	48 29	191	39 44	237	31 57	275	49 29	335
306	14 08	031	43 14	095	46 35	150	48 21	192	39 12	238	31 19	275	49 13	335
307	14 28	032	43 52	095	46 54	152	48 13	194	38 39	239	30 40	276	48 57	335
308	14 49	033	44 30	096	47 12	153	48 03	195	38 06	240	30 02	277	48 41	336
309	15 10	033	45 09	097	47 29	154	47 53	197	37 33	241	29 24	277	48 25	336
310	15 31	034	45 47	098	47 45	156	47 41	198	36 59	242	28 45	278	48 09	336
311	15 53	034	46 25	099	48 00	157	47 29	199	36 25	243	28 07	279	47 53	336
312	16 15	035	47 03	100	48 15	159	47 16	201	35 50	244	27 29	280	47 38	336
313	16 37	036	47 41	101	48 28	160	47 02	202	35 16	245	26 51	280	47 22	336
314	17 00	036	48 19	101	48 41	162	46 47	204	34 41	246	26 13	281	47 06	336
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Kochab	
315	17 22	037	26 00	084	48 57	102	48 53	163	46 31	205	62 31	260	46 51	336
316	17 46	037	26 38	084	49 34	103	49 03	165	46 14	206	61 53	261	46 36	337
317	18 09	038	27 17	085	50 12	104	49 13	166	45 56	208	61 15	262	46 20	337
318	18 33	039	27 55	086	50 49	105	49 22	167	45 38	209	60 37	263	46 05	337
319	18 58	039	28 34	087	51 26	106	49 30	169	45 19	210	59 58	263	45 50	337
320	19 22	040	29 12	087	52 03	107	49 37	171	44 59	212	59 20	264	45 35	337
321	19 47	040	29 51	088	52 40	108	49 43	172	44 38	213	58 42	265	45 20	337
322	20 12	041	30 29	089	53 16	109	49 47	174	44 17	214	58 03	266	45 05	337
323	20 38	042	31 08	090	53 53	110	49 51	175	43 55	216	57 25	267	44 50	338
324	21 03	042	31 46	090	54 29	111	49 54	177	43 32	217	56 46	268	44 36	338
325	21 30	043	32 25	091	55 05	112	49 56	178	43 09	218	56 07	268	44 21	338
326	21 56	043	33 04	092	55 40	114	49 57	180	42 45	219	55 29	269	44 07	338
327	22 23	044	33 42	093	56 15	115	49 56	181	42 20	221	54 50	270	43 53	338
328	22 49	045	34 21	094	56 50	116	49 55	183	41 54	222	54 12	271	43 38	339
329	23 17	045	34 59	094	57 25	117	49 53	184	41 28	223	53 33	272	43 24	339
	CAPELLA		◆ Hamal		Diphda		Enif		◆ ALTAIR		VEGA		◆ Kochab	
330	23 44	046	35 38	095	13 02	140	49 49	186	41 02	224	52 55	272	43 11	339
331	24 12	046	36 16	096	13 27	141	49 45	187	40 35	225	52 16	273	42 57	339
332	24 40	047	36 54	097	13 51	142	49 40	189	40 07	226	51 38	274	42 43	339
333	25 08	047	37 32	098	14 14	143	49 33	190	39 39	228	50 59	274	42 30	340
334	25 37	048	38 11	098	14 37	144	49 26	192	39 10	229	50 21	275	42 16	340
335	26 05	048	38 49	099	15 00	145	49 17	193	38 41	230	49 42	276	42 03	340
336	26 34	049	39 27	100	15 22	145	49 08	195	38 11	231	49 04	277	41 50	340
337	27 04	050	40 05	101	15 44	146	48 58	196	37 41	232	48 26	277	41 37	340
338	27 33	050	40 43	102	16 05	147	48 46	198	37 10	233	47 48	278	41 24	341
339	28 03	051	41 20	103	16 25	148	48 34	199	36 39	234	47 09	279	41 11	341
340	28 33	051	41 58	104	16 45	149	48 21	201	36 08	235	46 31	279	40 59	341
341	29 03	052	42 35	105	17 05	150	48 07	202	35 36	236	45 53	280	40 47	341
342	29 33	052	43 12	105	17 24	151	47 52	204	35 04	237	45 15	281	40 34	342
343	30 04	053	43 49	106	17 42	152	47 36	205	34 31	238	44 37	281	40 22	342
344	30 35	053	44 26	107	18 00	153	47 20	206	33 58	239	44 00	282	40 10	342
	◆ CAPELLA		ALDEBARAN		◆ Diphda		Enif		ALTAIR		◆ VEGA		Kochab	
345	31 06	054	16 17	083	18 17	154	47 02	208	33 25	240	43 22	282	39 59	342
346	31 37	055	16 55	084	18 34	155	46 44	209	32 51	241	42 44	283	39 47	343
347	32 09	055	17 34	085	18 50	156	46 25	210	32 18	242	42 07	284	39 36	343
348	32 40	056	18 12	086	19 06	157	46 05	212	31 43	243	41 29	284	39 24	343
349	33 12	056	18 51	086	19 21	158	45 44	213	31 09	244	40 52	285	39 13	343
350	33 44	057	19 29	087	19 35	159	45 22	214	30 34	245	40 15	286	39 03	344
351	34 17	057	20 08	088	19 49	160	45 00	216	29 59	246	39 38	286	38 52	344
352	34 49	058	20 46	089	20 02	161	44 37	217	29 24	247	39 01	287	38 41	344
353	35 22	058	21 25	090	20 14	162	44 14	218	28 48	248	38 24	287	38 31	345
354	35 55	059	22 03	090	20 26	163	43 50	220	28 12	249	37 47	288	38 21	345
355	36 28	059	22 42	091	20 37	164	43 25	221	27 36	249	37 10	289	38 11	345
356	37 01	060	23 20	092	20 48	165	42 59	222	27 00	250	36 34	289	38 01	345
357	37 35	060	23 59	093	20 58	166	42 33	223	26 24	251	35 58	290	37 51	346
358	38 08	061	24 38	093	21 07	167	42 07	224	25 47	252	35 21	290	37 42	346
359	38 42	061	25 16	094	21 16	168	41 39	226	25 10	253	34 45	291	37 32	346

Tilbage til Menuen

LAT 49°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Diphda		ALTAIR		◆ VEGA		Kochab	
0	38 47	061	25 59	094	54 14	124	22 22	169	24 50	254	33 47	292	36 25	347
1	39 22	062	26 39	095	54 46	125	22 30	170	24 12	255	33 11	293	36 16	347
2	39 56	062	27 18	096	55 18	126	22 37	171	23 34	256	32 34	293	36 07	347
3	40 31	063	27 57	097	55 50	128	22 43	172	22 56	257	31 58	294	35 58	348
4	41 06	063	28 36	098	56 21	129	22 48	173	22 17	258	31 23	295	35 50	348
5	41 42	064	29 15	098	56 51	130	22 53	174	21 39	258	30 47	295	35 42	348
6	42 17	064	29 54	099	57 21	132	22 57	175	21 00	259	30 11	296	35 34	348
7	42 52	065	30 33	100	57 50	133	23 00	176	20 21	260	29 36	296	35 26	349
8	43 28	065	31 11	101	58 18	135	23 02	177	19 43	261	29 01	297	35 18	349
9	44 04	066	31 50	102	58 46	136	23 04	178	19 04	262	28 26	298	35 11	349
10	44 40	066	32 28	103	59 12	138	23 05	179	18 25	262	27 51	298	35 04	350
11	45 16	067	33 07	103	59 38	139	23 06	180	17 46	263	27 17	299	34 57	350
12	45 52	067	33 45	104	60 04	141	23 05	181	17 07	264	26 42	299	34 50	350
13	46 28	068	34 23	105	60 28	143	23 04	182	16 27	265	26 08	300	34 43	351
14	47 05	068	35 01	106	60 51	144	23 03	183	15 48	265	25 34	301	34 37	351
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Diphda		Alpheratz		◆ DENEB		Kochab	
15	47 41	069	35 39	107	61 14	146	23 00	184	67 55	211	47 20	291	34 31	351
16	48 18	069	36 16	108	61 35	148	22 57	185	67 35	213	46 43	291	34 25	351
17	48 55	070	36 54	109	61 55	150	22 53	186	67 13	215	46 06	292	34 19	352
18	49 32	070	37 31	110	62 15	152	22 49	187	66 50	217	45 30	292	34 13	352
19	50 09	071	38 08	111	62 33	153	22 44	188	66 25	219	44 53	293	34 08	352
20	50 46	071	38 45	112	62 50	155	22 38	189	66 00	221	44 17	293	34 03	353
21	51 23	072	39 21	112	63 06	157	22 31	190	65 34	223	43 41	294	33 58	353
22	52 01	072	39 57	113	63 20	159	22 24	191	65 07	224	43 05	294	33 53	353
23	52 38	073	40 33	114	63 34	161	22 16	192	64 39	226	42 29	295	33 49	354
24	53 16	073	41 09	115	63 46	163	22 07	193	64 10	228	41 53	295	33 45	354
25	53 54	074	41 44	116	63 56	165	21 58	194	63 41	229	41 18	296	33 41	354
26	54 31	074	42 19	117	64 06	167	21 48	195	63 10	231	40 42	296	33 37	355
27	55 09	075	42 54	118	64 14	169	21 37	196	62 39	233	40 07	297	33 33	355
28	55 47	075	43 29	120	64 20	171	21 25	197	62 08	234	39 32	297	33 30	355
29	56 25	076	44 03	121	64 25	174	21 13	198	61 36	236	38 57	298	33 27	356
	CAPELLA		◆ BETELGEUSE		RIGEL		Hamal		◆ Alpheratz		DENEB		◆ Kochab	
30	57 03	076	25 37	109	18 40	128	64 29	176	61 03	237	38 22	298	33 24	356
31	57 42	077	26 14	110	19 11	129	64 31	178	60 30	238	37 47	299	33 21	356
32	58 20	077	26 51	111	19 41	130	64 32	180	59 56	240	37 13	299	33 18	357
33	58 58	078	27 28	112	20 11	131	64 31	182	59 22	241	36 39	300	33 16	357
34	59 37	078	28 04	113	20 41	132	64 29	184	58 47	242	36 05	300	33 14	357
35	60 15	079	28 40	114	21 10	133	64 25	186	58 12	244	35 31	301	33 12	357
36	60 54	079	29 16	115	21 39	134	64 20	188	57 37	245	34 57	301	33 11	358
37	61 33	080	29 52	116	22 07	135	64 14	191	57 01	246	34 23	302	33 09	358
38	62 12	080	30 27	117	22 35	136	64 06	193	56 25	247	33 50	302	33 08	358
39	62 50	081	31 02	118	23 02	136	63 57	195	55 48	248	33 17	303	33 07	359
40	63 29	081	31 37	119	23 29	137	63 46	197	55 12	249	32 44	303	33 06	359
41	64 08	082	32 11	119	23 56	138	63 34	199	54 35	250	32 11	304	33 06	359
42	64 47	082	32 45	120	24 21	139	63 21	201	53 57	251	31 38	304	33 06	000
43	65 26	083	33 19	121	24 47	140	63 06	203	53 20	252	31 06	305	33 06	000
44	66 05	084	33 52	122	25 12	141	62 50	205	52 42	253	30 34	305	33 06	000
	◆ Dubhe		POLLUX		BETELGEUSE		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
45	30 13	028	32 31	083	34 26	123	25 36	142	62 33	207	52 04	254	30 02	306
46	30 31	028	33 10	084	34 58	124	26 00	143	62 15	208	51 26	255	29 30	306
47	30 50	029	33 49	085	35 31	125	26 23	144	61 56	210	50 48	256	28 59	307
48	31 09	029	34 28	086	36 02	126	26 46	145	61 35	212	50 10	257	28 27	308
49	31 29	030	35 07	086	36 34	127	27 08	146	61 14	214	49 31	258	27 56	308
50	31 48	030	35 47	087	37 05	129	27 29	147	60 51	216	48 53	259	27 25	309
51	32 08	030	36 26	088	37 35	130	27 50	149	60 28	217	48 14	260	26 55	309
52	32 28	031	37 05	088	38 06	131	28 10	150	60 04	219	47 35	261	26 24	310
53	32 49	031	37 45	089	38 35	132	28 30	151	59 39	221	46 56	262	25 54	310
54	33 09	032	38 24	090	39 04	133	28 49	152	59 13	222	46 17	263	25 24	311
55	33 30	032	39 03	091	39 33	134	29 07	153	58 46	224	45 38	263	24 55	311
56	33 51	032	39 43	091	40 01	135	29 25	154	58 18	225	44 59	264	24 25	312
57	34 12	033	40 22	092	40 28	136	29 42	155	57 50	227	44 20	265	23 56	312
58	34 34	033	41 01	093	40 55	137	29 58	156	57 21	228	43 41	266	23 27	313
59	34 55	034	41 41	094	41 21	139	30 14	157	56 51	230	43 01	267	22 58	314
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	35 17	034	42 20	095	14 41	139	30 29	158	56 21	231	42 22	267	22 30	314
61	35 39	034	42 59	095	15 07	140	30 43	159	55 50	232	41 43	268	22 02	315
62	36 02	035	43 38	096	15 32	141	30 56	160	55 19	234	41 03	269	21 34	315
63	36 24	035	44 17	097	15 57	142	31 09	162	54 47	235	40 24	270	21 07	316
64	36 47	035	44 57	098	16 21	143	31 21	163	54 14	236	39 45	271	20 39	316
65	37 10	036	45 35	099	16 44	144	31 33	164	53 41	237	39 05	271	20 12	317
66	37 33	036	46 14	100	17 07	144	31 43	165	53 08	239	38 26	272	19 46	318
67	37 56	036	46 53	100	17 30	145	31 53	166	52 34	240	37 47	273	19 19	318
68	38 20	037	47 32	101	17 52	146	32 02	167	52 00	241	37 07	274	18 53	319
69	38 43	037	48 10	102	18 14	147	32 10	169	51 25	242	36 28	274	18 27	319
70	39 07	037	48 49	103	18 35	148	32 18	170	50 50	243	35 49	275	18 02	320
71	39 31	038	49 27	104	18 55	149	32 24	171	50 15	244	35 10	276	17 37	321
72	39 55	038	50 05	105	19 15	150	32 30	172	49 39	246	34 31	276	17 12	321
73	40 20	038	50 43	106	19 34	151	32 35	173	49 03	247	33 51	277	16 47	322
74	40 44	039	51 21	107	19 53	152	32 40	174	48 27	248	33 12	278	16 23	322
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		◆ Hamal		DENEB	
75	41 09	039	17 16	092	34 39	129	20 11	153	32 43	176	47 50	249	15 59	323
76	41 34	039	17 55	092	35 09	130	20 29	154	32 46	177	47 14	250	15 36	324
77	41 59	040	18 34	093	35 39	131	20 46	155	32 48	178	46 37	251	15 13	324
78	42 24	040	19 14	094	36 09	132	21 02	156	32 49	179	45 59	252	14 50	325
79	42 49	040	19 53	095	36 38	133	21 18	157	32 49	180	45 22	253	14 27	325
80	43 15	041	20 32	095	37 06	134	21 33	158	32 48	181	44 44	254	14 05	326
81	43 41	041	21 11	096	37 34	135	21 48	159	32 47	183	44 06	254	13 43	327
82	44 06	041	21 50	097	38 02	136	22 02	160	32 45	184	43 28	255	13 22	327
83	44 32	041	22 29	098	38 29	138	22 15	161	32 42	185	42 50	256	13 01	328
84	44 58	042	23 08	099	38 55	139	22 27	162	32 38	186	42 12	257	12 40	328
85	45 25	042	23 47	099	39 20	140	22 39	163	32 33	187	41 33	258	12 19	329
86	45 51	042	24 26	100	39 45	141	22 51	164	32 28	188	40 55	259	11 59	330
87	46 17	042	25 05	101	40 10	142	23 01	165	32 22	190	40 16	260	11 40	330
88	46 44	043	25 43	102	40 34	143	23 11	166	32 15	191	39 37	261	11 21	331
89	47 11	043	26 22	103	40 57	145	23 20	167	32 07	192	38 59	261	11 02	332

LAT 49°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
90	47 38	043	27 00	104	41 19	146	23 29	168	31 59	193	53 24	215	65 08	287
91	48 05	043	27 38	104	41 41	147	23 37	169	31 49	194	53 01	216	64 31	287
92	48 32	044	28 16	105	42 02	148	23 44	170	31 39	195	52 37	218	63 53	288
93	48 59	044	28 54	106	42 22	150	23 50	171	31 28	197	52 13	219	63 16	288
94	49 26	044	29 32	107	42 42	151	23 56	172	31 17	198	51 47	221	62 38	288
95	49 54	044	30 10	108	43 00	152	24 01	173	31 05	199	51 21	222	62 01	289
96	50 21	044	30 47	109	43 18	154	24 05	174	30 52	200	50 55	223	61 24	289
97	50 49	045	31 24	110	43 36	155	24 09	175	30 38	201	50 27	225	60 47	289
98	51 16	045	32 01	110	43 52	156	24 11	176	30 23	202	49 59	226	60 10	290
99	51 44	045	32 38	111	44 07	157	24 14	177	30 08	203	49 31	227	59 33	290
100	52 12	045	33 15	112	44 22	159	24 15	178	29 52	204	49 02	228	58 56	291
101	52 40	045	33 51	113	44 36	160	24 16	180	29 36	205	48 32	230	58 19	291
102	53 08	045	34 27	114	44 49	162	24 16	181	29 18	207	48 02	231	57 42	291
103	53 36	046	35 03	115	45 01	163	24 15	182	29 00	208	47 31	232	57 05	292
104	54 04	046	35 38	116	45 12	164	24 13	183	28 42	209	46 59	233	56 29	292
	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
105	54 32	046	22 21	093	36 14	117	24 11	184	28 23	210	46 28	235	55 52	292
106	55 00	046	23 00	094	36 48	118	24 08	185	28 03	211	45 55	236	55 16	293
107	55 29	046	23 40	095	37 23	119	24 05	186	27 42	212	45 23	237	54 40	293
108	55 57	046	24 19	096	37 57	120	24 00	187	27 21	213	44 49	238	54 04	294
109	56 25	046	24 58	097	38 31	121	23 55	188	27 00	214	44 16	239	53 28	294
110	56 54	046	25 37	097	39 05	122	23 49	189	26 37	215	43 42	240	52 52	294
111	57 22	046	26 16	098	39 38	123	23 43	190	26 14	216	43 08	241	52 16	295
112	57 51	046	26 55	099	40 11	124	23 36	191	25 51	217	42 33	242	51 40	295
113	58 19	046	27 34	100	40 43	125	23 28	192	25 27	218	41 58	243	51 05	296
114	58 48	046	28 12	101	41 15	126	23 19	193	25 03	219	41 23	244	50 29	296
115	59 16	046	28 51	101	41 47	127	23 10	194	24 37	220	40 47	245	49 54	296
116	59 45	046	29 30	102	42 18	128	23 00	195	24 12	221	40 11	246	49 19	297
117	60 13	046	30 08	103	42 48	130	22 50	196	23 46	222	39 35	247	48 44	297
118	60 41	046	30 46	104	43 18	131	22 38	197	23 19	223	38 59	248	48 09	298
119	61 10	046	31 24	105	43 48	132	22 26	198	22 52	224	38 22	249	47 34	298
	◆ Kochab		Denebola		◆ REGULUS		SIRIUS		RIGEL		◆ ALDEBARAN		CAPELLA	
120	43 21	022	32 02	106	44 17	133	22 14	199	22 25	225	37 45	250	62 46	279
121	43 35	022	32 40	107	44 46	134	22 00	200	21 57	226	37 08	251	62 08	280
122	43 50	022	33 18	107	45 13	136	21 46	201	21 28	227	36 31	252	61 29	280
123	44 05	022	33 55	108	45 41	137	21 32	202	20 59	228	35 53	253	60 50	281
124	44 19	022	34 33	109	46 07	138	21 17	203	20 30	229	35 16	254	60 12	281
125	44 34	022	35 10	110	46 33	139	21 01	204	20 00	229	34 38	255	59 33	282
126	44 49	023	35 47	111	46 59	141	20 44	205	19 30	230	34 00	255	58 55	282
127	45 05	023	36 23	112	47 23	142	20 27	206	19 00	231	33 22	256	58 16	283
128	45 20	023	37 00	113	47 47	143	20 10	207	18 29	232	32 43	257	57 38	284
129	45 35	023	37 36	114	48 11	145	19 51	208	17 58	233	32 05	258	57 00	284
130	45 51	023	38 12	115	48 33	146	19 33	209	17 26	234	31 26	259	56 21	285
131	46 06	023	38 47	116	48 55	147	19 13	210	16 54	235	30 48	260	55 43	285
132	46 22	023	39 22	117	49 16	149	18 53	211	16 22	236	30 09	260	55 05	286
133	46 37	024	39 57	118	49 36	150	18 33	212	15 49	237	29 30	261	54 28	286
134	46 53	024	40 32	119	49 55	152	18 12	213	15 16	237	28 51	262	53 50	287
	◆ Kochab		ARCTURUS		Denebola		◆ REGULUS		SIRIUS		BETELGEUSE		◆ CAPELLA	
135	47 09	024	21 22	085	41 06	120	50 13	153	17 50	214	33 19	239	53 12	287
136	47 25	024	22 01	086	41 40	121	50 31	154	17 28	215	32 45	240	52 35	288
137	47 41	024	22 41	087	42 14	122	50 47	156	17 05	216	32 11	241	51 57	288
138	47 57	024	23 20	087	42 47	123	51 03	157	16 42	217	31 36	242	51 20	289
139	48 13	024	23 59	088	43 20	124	51 17	159	16 18	217	31 02	242	50 42	289
140	48 29	024	24 39	089	43 52	125	51 31	160	15 54	218	30 27	243	50 05	290
141	48 45	024	25 18	090	44 24	126	51 44	162	15 30	219	29 51	244	49 28	290
142	49 01	024	25 57	090	44 56	128	51 55	164	15 04	220	29 16	245	48 51	290
143	49 18	024	26 37	091	45 27	129	52 06	165	14 39	221	28 40	246	48 14	291
144	49 34	024	27 16	092	45 57	130	52 16	167	14 13	222	28 04	247	47 38	291
145	49 50	025	27 55	093	46 27	131	52 24	168	13 46	223	27 27	248	47 01	292
146	50 07	025	28 35	093	46 57	132	52 32	170	13 19	224	26 51	249	46 25	292
147	50 23	025	29 14	094	47 25	134	52 38	171	12 52	225	26 14	250	45 48	293
148	50 39	025	29 53	095	47 54	135	52 43	173	12 24	225	25 37	251	45 12	293
149	50 56	025	30 32	096	48 21	136	52 48	175	11 56	226	25 00	251	44 36	294
150	51 12	025	31 12	097	14 41	127	52 51	176	37 08	226	24 22	252	44 00	294
151	51 29	025	31 51	097	15 12	128	52 53	178	36 39	227	23 45	253	43 25	295
152	51 45	025	32 30	098	15 43	129	52 54	180	36 10	228	23 07	254	42 49	295
153	52 02	025	33 09	099	16 13	130	52 53	181	35 41	229	22 29	255	42 13	296
154	52 18	025	33 47	100	16 43	131	52 52	183	35 11	230	21 51	256	41 38	296
155	52 34	025	34 26	101	17 13	132	52 50	184	34 40	231	21 13	256	41 03	297
156	52 51	025	35 05	101	17 42	133	52 46	186	34 09	232	20 35	257	40 28	297
157	53 07	025	35 43	102	18 10	134	52 41	188	33 38	233	19 56	258	39 53	298
158	53 24	025	36 22	103	18 39	135	52 36	189	33 07	234	19 18	259	39 18	298
159	53 40	024	37 00	104	19 06	135	52 29	191	32 34	235	18 39	260	38 44	299
160	53 56	024	37 38	105	19 34	136	52 21	192	32 02	236	18 00	260	38 09	299
161	54 12	024	38 16	106	20 01	137	52 12	194	31 29	237	17 21	261	37 35	300
162	54 29	024	38 54	107	20 27	138	52 02	196	30 56	238	16 42	262	37 01	300
163	54 45	024	39 32	108	20 53	139	51 51	197	30 22	239	16 03	263	36 27	301
164	55 01	024	40 09	109	21 19	140	51 39	199	29 48	240	15 24	264	35 54	301
165	15 11	047	40 46	109	21 44	141	51 25	200	29 14	241	47 36	259	35 20	302
166	15 40	048	41 23	110	22 08	142	51 11	202	28 39	242	46 58	259	34 47	302
167	16 10	049	42 00	111	22 32	143	50 56	203	28 05	243	46 19	260	34 14	303
168	16 39	049	42 36	112	22 55	144	50 40	205	27 29	244	45 40	261	33 41	303
169	17 09	050	43 13	113	23 18	145	50 23	206	26 54	245	45 01	262	33 08	304
170	17 40	051	43 49	114	23 41	146	50 06	208	26 18	245	44 22	263	32 35	304
171	18 10	051	44 24	115	24 02	147	49 47	209	25 42	246	43 43	264	32 03	305
172	18 41	052	45 00	116	24 24	148	49 27	211	25 06	247	43 04	264	31 31	306
173	19 12	052	45 35	117	24 44	149	49 07	212	24 30	248	42 25	265	30 59	306
174	19 43	053	46 10	119	25 04	150	48 46	213	23 53	249	41 45	266	30 27	307
175	20 15	054	46 44	120	25 23	151	48 24	215	23 16	250	41 06	267	29 56	307
176	20 47	054	47 18	121	25 42	152	48 01	216	22 39	251	40 27	268	29 24	308
177	21 19	055	47 52	122	26 00	153	47 37	217	22 02	252	39 47	268	28 53	308
178	21 51	055	48 25	123	26 18	154	47 13	219	21 25	252	39 08	269	28 23	309
179	22 23	056	48 58	124	26 35	155	46 48	220	20 47	253	38 29	270	27 52	309

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LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
180	13 44	033	22 56	057	49 30	125	26 51	156	46 23	221	37 49	271	27 22	310
181	14 06	034	23 29	057	50 02	127	27 06	157	45 56	223	37 10	271	26 51	310
182	14 28	035	24 02	058	50 33	128	27 21	158	45 29	224	36 31	272	26 22	311
183	14 50	035	24 36	058	51 04	129	27 35	159	45 02	225	35 51	273	25 52	311
184	15 13	036	25 09	059	51 34	130	27 49	161	44 34	226	35 12	274	25 22	312
185	15 36	036	25 43	060	52 04	132	28 02	162	44 05	227	34 33	274	24 53	312
186	16 00	037	26 17	060	52 33	133	28 14	163	43 36	229	33 53	275	24 24	313
187	16 24	038	26 52	061	53 02	134	28 25	164	43 06	230	33 14	276	23 56	314
188	16 48	038	27 26	061	53 30	136	28 36	165	42 36	231	32 35	277	23 27	314
189	17 13	039	28 01	062	53 57	137	28 46	166	42 05	232	31 56	277	22 59	315
190	17 38	039	28 36	063	54 23	139	28 55	167	41 34	233	31 17	278	22 31	315
191	18 03	040	29 11	063	54 49	140	29 03	168	41 02	234	30 38	279	22 04	316
192	18 28	041	29 46	064	55 14	141	29 11	169	40 30	235	29 59	279	21 37	316
193	18 54	041	30 21	064	55 38	143	29 18	170	39 57	236	29 20	280	21 10	317
194	19 20	042	30 57	065	56 01	145	29 24	172	39 24	237	28 42	281	20 43	318
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	19 46	042	31 33	066	23 14	098	56 24	146	38 51	238	28 03	281	20 16	318
196	20 13	043	32 08	066	23 53	098	56 45	148	38 17	239	27 25	282	19 50	319
197	20 40	044	32 44	067	24 32	099	57 06	149	37 43	240	26 46	283	19 24	319
198	21 07	044	33 21	067	25 11	100	57 25	151	37 09	241	26 08	283	18 59	320
199	21 35	045	33 57	068	25 49	101	57 44	153	36 34	242	25 30	284	18 34	320
200	22 03	045	34 34	068	26 28	102	58 02	154	35 59	243	24 51	285	18 09	321
201	22 31	046	35 10	069	27 06	103	58 18	156	35 24	244	24 13	285	17 44	322
202	22 59	046	35 47	070	27 45	103	58 34	158	34 48	245	23 36	286	17 20	322
203	23 28	047	36 24	070	28 23	104	58 48	159	34 12	246	22 58	287	16 56	323
204	23 57	048	37 01	071	29 01	105	59 01	161	33 36	247	22 20	288	16 32	323
205	24 26	048	37 38	071	29 39	106	59 13	163	32 59	248	21 43	288	16 09	324
206	24 55	049	38 16	072	30 17	107	59 24	165	32 23	249	21 05	289	15 46	325
207	25 25	049	38 53	073	30 54	108	59 34	167	31 46	250	20 28	290	15 23	325
208	25 55	050	39 31	073	31 32	108	59 42	169	31 09	251	19 51	290	15 01	326
209	26 25	050	40 09	074	32 09	109	59 50	170	30 32	252	19 14	291	14 39	326
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		REGULUS		◆ Dubhe	
210	26 56	051	40 47	074	32 46	110	59 55	172	46 24	229	29 54	253	62 44	314
211	27 26	051	41 25	075	33 23	111	60 00	174	45 54	230	29 16	253	62 16	314
212	27 57	052	42 03	076	33 59	112	60 03	176	45 24	231	28 39	254	61 47	314
213	28 28	052	42 41	076	34 36	113	60 06	178	44 53	233	28 01	255	61 19	314
214	28 59	053	43 19	077	35 12	114	60 06	180	44 21	234	27 23	256	60 51	314
215	29 31	054	43 57	077	35 48	115	60 06	182	43 49	235	26 44	257	60 22	314
216	30 03	054	44 36	078	36 23	116	60 04	184	43 17	236	26 06	258	59 54	314
217	30 35	055	45 14	079	36 59	117	60 01	186	42 44	237	25 27	258	59 25	314
218	31 07	055	45 53	079	37 34	118	59 56	187	42 11	238	24 49	259	58 57	314
219	31 39	056	46 32	080	38 08	119	59 51	189	41 37	239	24 10	260	58 28	314
220	32 12	056	47 11	081	38 43	120	59 44	191	41 03	240	23 31	261	58 00	314
221	32 45	057	47 49	081	39 16	121	59 35	193	40 29	241	22 52	262	57 31	314
222	33 18	057	48 28	082	39 50	122	59 26	195	39 54	242	22 13	262	57 03	314
223	33 51	058	49 07	083	40 23	123	59 15	197	39 19	243	21 34	263	56 35	314
224	34 24	058	49 46	083	40 56	124	59 03	198	38 44	244	20 55	264	56 06	314
	DENEB		◆ VEGA		Rasalhague		ANTARES		◆ ARCTURUS		Denebola		◆ Dubhe	
225	34 58	059	50 26	084	41 29	125	11 53	159	58 50	200	38 08	245	55 38	314
226	35 32	059	51 05	085	42 01	126	12 07	160	58 36	202	37 33	246	55 10	314
227	36 06	060	51 44	085	42 32	127	12 20	161	58 21	204	36 56	247	54 41	314
228	36 40	060	52 23	086	43 03	128	12 32	162	58 05	205	36 20	248	54 13	314
229	37 14	061	53 02	087	43 34	130	12 44	163	57 47	207	35 43	249	53 45	314
230	37 48	061	53 42	087	44 04	131	12 55	164	57 29	209	35 06	250	53 17	315
231	38 23	062	54 21	088	44 33	132	13 06	165	57 09	210	34 29	251	52 49	315
232	38 58	062	55 00	089	45 02	133	13 16	166	56 49	212	33 52	252	52 21	315
233	39 33	063	55 40	089	45 31	134	13 25	167	56 27	214	33 15	253	51 53	315
234	40 08	063	56 19	090	45 59	136	13 34	168	56 05	215	32 37	254	51 25	315
235	40 43	064	56 59	091	46 26	137	13 42	168	55 42	217	31 59	254	50 58	315
236	41 19	064	57 38	092	46 53	138	13 50	169	55 18	218	31 21	255	50 30	316
237	41 54	065	58 17	093	47 19	139	13 57	170	54 53	220	30 43	256	50 02	316
238	42 30	065	58 57	093	47 44	141	14 03	171	54 28	221	30 05	257	49 35	316
239	43 06	066	59 36	094	48 09	142	14 09	172	54 01	223	29 26	258	49 08	316
	◆ DENEB		ALTAIR		Rasalhague		◆ ANTARES		ARCTURUS		Denebola		◆ Dubhe	
240	43 42	066	27 29	109	48 32	143	14 14	173	53 34	224	28 48	259	48 40	316
241	44 18	067	28 06	110	48 56	145	14 18	174	53 07	225	28 09	259	48 13	317
242	44 54	067	28 43	111	49 18	146	14 22	175	52 38	227	27 30	260	47 46	317
243	45 31	068	29 19	112	49 40	147	14 25	176	52 09	228	26 51	261	47 19	317
244	46 07	068	29 56	113	50 00	149	14 28	177	51 40	229	26 13	262	46 53	317
245	46 44	069	30 32	114	50 20	150	14 30	178	51 09	231	25 34	263	46 26	318
246	47 21	069	31 08	115	50 39	152	14 31	179	50 39	232	24 54	263	45 59	318
247	47 57	070	31 43	116	50 58	153	14 32	179	50 07	233	24 15	264	45 33	318
248	48 34	070	32 19	117	51 15	155	14 32	180	49 36	234	23 36	265	45 07	318
249	49 12	071	32 54	118	51 31	156	14 32	181	49 03	236	22 57	266	44 41	319
250	49 49	071	33 29	119	51 47	158	14 30	182	48 31	237	22 18	267	44 15	319
251	50 26	072	34 03	120	52 01	159	14 28	183	47 58	238	21 38	267	43 49	319
252	51 04	072	34 37	120	52 14	161	14 26	184	47 24	239	20 59	268	43 23	319
253	51 41	073	35 11	121	52 27	162	14 23	185	46 50	240	20 20	269	42 58	320
254	52 19	073	35 44	122	52 38	164	14 19	186	46 16	241	19 40	270	42 32	320
	◆ Schedar		DENEB		ALTAIR		◆ Rasalhague		ARCTURUS		◆ Alkaid		Kochab	
255	28 24	034	52 57	074	36 17	123	52 49	166	45 41	242	59 09	289	61 22	342
256	28 47	035	53 35	075	36 50	125	52 58	167	45 06	243	58 31	289	61 10	342
257	29 09	035	54 13	075	37 22	126	53 06	169	44 31	244	57 54	290	60 58	341
258	29 32	036	54 51	076	37 54	127	53 13	170	43 55	245	57 17	290	60 45	341
259	29 55	036	55 29	076	38 25	128	53 19	172	43 19	246	56 40	291	60 32	341
260	30 19	037	56 07	077	38 56	129	53 24	174	42 43	247	56 04	291	60 19	340
261	30 42	037	56 46	077	39 27	130	53 28	175	42 06	248	55 27	291	60 06	340
262	31 06	038	57 24	078	39 57	131	53 31	177	41 30	249	54 50	292	59 52	340
263	31 30	038	58 02	078	40 26	132	53 33	179	40 53	250	54 14	292	59 38	339
264	31 55	038	58 41	079	40 55	133	53 33	180	40 15	251	53 37	293	59 25	339
265	32 19	039	59 20	079	41 23	134	53 32	182	39 38	252	53 01	293	59 10	339
266	32 44	039	59 58	080	41 51	136	53 31	183	39 00	253	52 25	293	58 56	339
267	33 09	040	60 37	080	42 19	137	53 28	185	38 23	254	51 49	294	58 42	338
268	33 35	040	61 16	081	42 45	138	53 24	187	37 45	255	51 13	294	58 27	338
269	34 00	041	61 55	082	43 11	139	53 18	188	37 07	256	50 37	295	58 12	338

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	14 20	025	20 11	068	43 37	140	53 12	190	36 28	257	50 02	295	57 58	338
271	14 36	025	20 48	069	44 02	142	53 05	192	35 50	258	49 26	296	57 43	337
272	14 53	026	21 24	070	44 26	143	52 56	193	35 12	258	48 50	296	57 27	337
273	15 10	026	22 01	070	44 49	144	52 47	195	34 33	259	48 15	296	57 12	337
274	15 28	027	22 38	071	45 12	145	52 36	196	33 54	260	47 40	297	56 57	337
275	15 46	028	23 16	072	45 34	147	52 25	198	33 15	261	47 05	297	56 41	337
276	16 04	028	23 53	072	45 55	148	52 12	199	32 36	262	46 30	298	56 26	337
277	16 23	029	24 31	073	46 15	149	51 58	201	31 57	263	45 55	298	56 10	336
278	16 42	029	25 09	074	46 35	151	51 44	203	31 18	263	45 21	299	55 54	336
279	17 02	030	25 46	074	46 54	152	51 28	204	30 39	264	44 46	299	55 38	336
280	17 21	030	26 24	075	47 12	153	51 12	206	30 00	265	44 12	299	55 22	336
281	17 41	031	27 02	076	47 29	155	50 54	207	29 21	266	43 38	300	55 06	336
282	18 02	032	27 41	076	47 45	156	50 36	209	28 42	267	43 04	300	54 50	336
283	18 23	032	28 19	077	48 01	158	50 17	210	28 02	267	42 30	301	54 34	336
284	18 44	033	28 57	078	48 15	159	49 57	211	27 23	268	41 56	301	54 18	336
285	19 05	033	29 36	078	48 29	161	49 36	213	26 44	269	41 22	302	54 02	336
286	19 27	034	30 14	079	48 41	162	49 14	214	26 04	270	40 49	302	53 45	336
287	19 49	034	30 53	080	48 53	164	48 51	216	25 25	270	40 16	303	53 29	335
288	20 11	035	31 32	080	49 04	165	48 28	217	24 45	271	39 43	303	53 13	335
289	20 34	036	32 11	081	49 13	166	48 04	218	24 06	272	39 10	304	52 56	335
290	20 57	036	32 50	082	49 22	168	47 39	220	23 27	273	38 37	304	52 40	335
291	21 21	037	33 29	083	49 30	170	47 14	221	22 47	273	38 04	304	52 24	335
292	21 44	037	34 08	083	49 36	171	46 48	222	22 08	274	37 32	305	52 07	335
293	22 08	038	34 47	084	49 42	173	46 21	223	21 29	275	37 00	305	51 51	335
294	22 32	038	35 26	085	49 47	174	45 54	225	20 50	276	36 28	306	51 34	335
295	22 57	039	36 05	085	49 50	176	45 26	226	20 11	276	35 56	306	51 18	335
296	23 22	039	36 45	086	49 53	177	44 57	227	19 31	277	35 24	307	51 01	335
297	23 47	040	37 24	087	49 54	179	44 28	228	18 52	278	34 53	307	50 45	335
298	24 12	040	38 03	088	49 55	180	43 58	229	18 13	278	34 22	308	50 28	335
299	24 38	041	38 42	088	49 54	182	43 28	231	17 35	279	33 51	308	50 12	335
300	11 21	027	39 22	089	45 14	142	49 52	183	42 58	232	35 08	272	49 56	335
301	11 39	028	40 01	090	45 38	143	49 49	185	42 26	233	34 29	272	49 39	336
302	11 58	029	40 41	091	46 01	144	49 46	186	41 55	234	33 50	273	49 23	336
303	12 17	029	41 20	091	46 24	146	49 41	188	41 23	235	33 10	274	49 07	336
304	12 37	030	41 59	092	46 46	147	49 35	189	40 50	236	32 31	274	48 51	336
305	12 56	031	42 39	093	47 07	148	49 28	191	40 17	237	31 52	275	48 34	336
306	13 17	031	43 18	094	47 27	150	49 20	192	39 44	238	31 13	276	48 18	336
307	13 37	032	43 57	094	47 46	151	49 11	194	39 10	239	30 34	277	48 02	336
308	13 58	032	44 36	095	48 05	153	49 01	195	38 36	240	29 55	277	47 46	336
309	14 19	033	45 16	096	48 23	154	48 50	197	38 02	241	29 16	278	47 30	336
310	14 41	034	45 55	097	48 39	155	48 38	198	37 27	242	28 37	279	47 14	336
311	15 03	034	46 34	098	48 55	157	48 26	200	36 52	243	27 58	279	46 58	336
312	15 25	035	47 13	099	49 10	158	48 12	201	36 17	244	27 19	280	46 43	336
313	15 48	035	47 52	099	49 25	160	47 57	203	35 41	245	26 40	281	46 27	337
314	16 11	036	48 30	100	49 38	161	47 42	204	35 05	246	26 02	282	46 11	337
315	16 34	037	25 53	083	49 09	101	49 50	163	47 25	205	62 41	262	45 56	337
316	16 58	037	26 32	084	49 48	102	50 01	164	47 08	207	62 02	263	45 40	337
317	17 22	038	27 11	085	50 26	103	50 11	166	46 49	208	61 23	263	45 25	337
318	17 46	038	27 51	085	51 04	104	50 21	167	46 30	210	60 43	264	45 10	337
319	18 11	039	28 30	086	51 42	105	50 29	169	46 11	211	60 04	265	44 55	337
320	18 36	040	29 09	087	52 20	106	50 36	170	45 50	212	59 25	266	44 39	338
321	19 01	040	29 49	088	52 58	107	50 42	172	45 29	214	58 46	267	44 24	338
322	19 27	041	30 28	088	53 36	108	50 47	173	45 06	215	58 06	268	44 10	338
323	19 53	041	31 07	089	54 13	109	50 51	175	44 44	216	57 27	268	43 55	338
324	20 19	042	31 47	090	54 50	110	50 54	177	44 20	217	56 48	269	43 40	338
325	20 45	043	32 26	091	55 27	111	50 56	178	43 56	219	56 08	270	43 26	338
326	21 12	043	33 05	091	56 03	112	50 57	180	43 31	220	55 29	271	43 11	339
327	21 39	044	33 45	092	56 40	113	50 56	181	43 05	221	54 50	271	42 57	339
328	22 07	044	34 24	093	57 16	115	50 55	183	42 39	222	54 10	272	42 43	339
329	22 34	045	35 03	094	57 51	116	50 53	184	42 12	224	53 31	273	42 28	339
330	23 02	045	35 43	094	13 48	140	50 49	186	41 45	225	52 52	274	42 14	339
331	23 30	046	36 22	095	14 13	141	50 44	187	41 17	226	52 12	274	42 01	340
332	23 59	046	37 01	096	14 38	142	50 39	189	40 48	227	51 33	275	41 47	340
333	24 27	047	37 40	097	15 02	143	50 32	191	40 19	228	50 54	276	41 33	340
334	24 56	048	38 19	098	15 26	143	50 24	192	39 49	229	50 15	276	41 20	340
335	25 25	048	38 58	098	15 49	144	50 16	194	39 19	230	49 36	277	41 07	340
336	25 55	049	39 37	099	16 11	145	50 06	195	38 49	232	48 57	278	40 53	341
337	26 25	049	40 16	100	16 34	146	49 55	197	38 18	233	48 18	278	40 40	341
338	26 54	050	40 54	101	16 55	147	49 43	198	37 46	234	47 39	279	40 27	341
339	27 25	050	41 33	102	17 16	148	49 31	200	37 14	235	47 00	280	40 15	341
340	27 55	051	42 11	103	17 37	149	49 17	201	36 42	236	46 21	280	40 02	341
341	28 26	051	42 50	104	17 57	150	49 02	203	36 09	237	45 42	281	39 50	342
342	28 57	052	43 28	105	18 16	151	48 47	204	35 36	238	45 04	281	39 37	342
343	29 28	052	44 06	106	18 35	152	48 31	205	35 03	239	44 25	282	39 25	342
344	29 59	053	44 44	106	18 54	153	48 13	207	34 29	240	43 47	283	39 13	342
345	◆ CAPELLA		ALDEBARAN		◆ Diphda		Enif		ALTAIR		◆ VEGA		Kochab	
	30 30	053	16 10	083	19 11	154	47 55	208	33 55	241	43 08	283	39 01	343
346	31 02	054	16 49	084	19 28	155	47 36	210	33 20	242	42 30	284	38 50	343
347	31 34	055	17 28	085	19 45	156	47 16	211	32 45	243	41 52	285	38 38	343
348	32 06	055	18 08	085	20 01	157	46 55	212	32 10	244	41 14	285	38 27	343
349	32 39	056	18 47	086	20 16	158	46 34	214	31 35	245	40 36	286	38 16	344
350	33 11	056	19 26	087	20 31	159	46 12	215	30 59	245	39 58	286	38 05	344
351	33 44	057	20 05	088	20 45	160	45 49	216	30 23	246	39 21	287	37 54	344
352	34 17	057	20 45	088	20 58	161	45 25	218	29 47	247	38 43	288	37 43	344
353	34 50	058	21 24	089	21 11	162	45 01	219	29 11	248	38 06	288	37 33	345
354	35 23	058	22 03	090	21 23	163	44 36	220	28 34	249	37 28	289	37 23	345
355	35 57	059	22 43	091	21 35	164	44 10	221	27 57	250	36 51	289	37 13	345
356	36 31	059	23 22	091	21 46	165	43 44	223	27 20	251	36 14	290	37 03	346
357	37 05	060	24 01	092	21 56	166	43 17	224	26 43	252	35 37	291	36 53	346
358	37 39	060	24 41	093	22 05	167	42 49	225	26 05	253	35 00	291	36 43	346
359	38 13	061	25 20	094	22 14	168	42 21	226	25 28	253	34 24	292	36 34	346

Tilbage til Menuen

LAT 48°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Diphda		ALTAIR		◆ VEGA		Kochab	
0	38 18	060	26 04	094	54 47	123	23 21	169	25 06	255	33 24	293	35 26	347
1	38 53	061	26 44	095	55 20	124	23 29	170	24 27	255	32 47	293	35 17	347
2	39 28	061	27 24	096	55 53	125	23 36	171	23 48	256	32 10	294	35 09	347
3	40 03	062	28 04	096	56 26	126	23 42	172	23 09	257	31 34	295	35 00	348
4	40 39	062	28 44	097	56 58	128	23 47	173	22 30	258	30 57	295	34 51	348
5	41 15	063	29 23	098	57 29	129	23 52	174	21 51	259	30 21	296	34 43	348
6	41 50	063	30 03	099	58 00	131	23 56	175	21 11	259	29 45	296	34 35	349
7	42 26	064	30 43	099	58 30	132	24 00	176	20 32	260	29 09	297	34 27	349
8	43 02	064	31 22	100	59 00	134	24 02	177	19 52	261	28 33	297	34 19	349
9	43 39	065	32 02	101	59 28	135	24 04	178	19 12	262	27 58	298	34 12	349
10	44 15	065	32 41	102	59 56	137	24 05	179	18 33	263	27 23	299	34 05	350
11	44 52	066	33 20	103	60 24	138	24 06	180	17 53	263	26 47	299	33 58	350
12	45 28	066	33 59	104	60 50	140	24 05	181	17 13	264	26 13	300	33 51	350
13	46 05	067	34 38	104	61 15	142	24 04	182	16 33	265	25 38	300	33 44	351
14	46 42	067	35 17	105	61 40	143	24 03	183	15 53	266	25 03	301	33 38	351
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Diphda		Alpheratz		◆ DENEB		Kochab	
15	47 19	068	35 56	106	62 03	145	24 00	184	68 47	212	46 58	292	33 31	351
16	47 56	068	36 34	107	62 26	147	23 57	185	68 25	214	46 21	292	33 25	352
17	48 33	068	37 13	108	62 47	149	23 53	186	68 02	216	45 44	293	33 20	352
18	49 11	069	37 51	109	63 07	151	23 48	187	67 37	218	45 06	293	33 14	352
19	49 48	069	38 29	110	63 26	153	23 43	188	67 12	220	44 30	294	33 09	352
20	50 26	070	39 06	111	63 44	154	23 37	189	66 45	222	43 53	294	33 03	353
21	51 04	070	39 44	112	64 01	156	23 30	190	66 18	224	43 16	294	32 58	353
22	51 42	071	40 21	113	64 16	158	23 22	191	65 49	226	42 40	295	32 54	353
23	52 20	071	40 58	114	64 30	161	23 14	192	65 20	228	42 03	295	32 49	354
24	52 58	072	41 34	115	64 43	163	23 05	193	64 50	229	41 27	296	32 45	354
25	53 36	072	42 11	116	64 54	165	22 56	194	64 19	231	40 51	296	32 41	354
26	54 14	073	42 47	117	65 04	167	22 45	195	63 47	233	40 15	297	32 37	355
27	54 53	073	43 22	118	65 13	169	22 34	196	63 15	234	39 40	297	32 33	355
28	55 31	074	43 58	119	65 20	171	22 23	197	62 42	236	39 04	298	32 30	355
29	56 10	074	44 33	120	65 25	173	22 10	198	62 09	237	38 29	298	32 27	356
	CAPELLA		◆ BETELGEUSE		RIGEL		Hamal		◆ Alpheratz		DENEB		◆ Kochab	
30	56 48	075	25 57	109	19 17	128	65 29	176	61 35	239	37 53	299	32 24	356
31	57 27	075	26 35	110	19 49	129	65 31	178	61 00	240	37 18	299	32 21	356
32	58 06	075	27 13	111	20 20	130	65 32	180	60 25	241	36 43	300	32 19	357
33	58 45	076	27 50	112	20 51	131	65 31	182	59 50	243	36 09	300	32 16	357
34	59 24	076	28 27	112	21 21	131	65 29	184	59 14	244	35 34	301	32 14	357
35	60 03	077	29 04	113	21 51	132	65 25	187	58 38	245	35 00	301	32 12	358
36	60 42	077	29 41	114	22 20	133	65 20	189	58 01	246	34 26	302	32 11	358
37	61 21	078	30 17	115	22 49	134	65 13	191	57 25	247	33 52	302	32 09	358
38	62 00	078	30 54	116	23 18	135	65 04	193	56 47	249	33 18	303	32 08	358
39	62 40	079	31 30	117	23 46	136	64 55	195	56 10	250	32 44	303	32 07	359
40	63 19	079	32 05	118	24 13	137	64 43	197	55 32	251	32 11	304	32 06	359
41	63 59	080	32 40	119	24 40	138	64 31	199	54 54	252	31 37	304	32 06	359
42	64 38	080	33 15	120	25 07	139	64 17	202	54 16	253	31 04	305	32 06	000
43	65 18	081	33 50	121	25 33	140	64 01	204	53 37	254	30 31	305	32 06	000
44	65 58	081	34 24	122	25 58	141	63 44	206	52 59	255	29 59	306	32 06	000
	◆ Dubhe		POLLUX		BETELGEUSE		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
45	29 20	028	32 23	083	34 58	123	26 23	142	63 27	207	52 20	256	29 26	306
46	29 39	028	33 03	083	35 32	124	26 48	143	63 07	209	51 41	257	28 54	307
47	29 58	029	33 43	084	36 05	125	27 12	144	62 47	211	51 02	258	28 22	307
48	30 17	029	34 23	085	36 38	126	27 35	145	62 26	213	50 23	259	27 51	308
49	30 37	029	35 03	086	37 10	127	27 58	146	62 03	215	49 43	259	27 19	309
50	30 56	030	35 43	086	37 42	128	28 20	147	61 40	217	49 04	260	26 48	309
51	31 16	030	36 23	087	38 13	129	28 41	148	61 15	218	48 24	261	26 17	310
52	31 37	031	37 03	088	38 44	130	29 02	149	60 50	220	47 44	262	25 46	310
53	31 57	031	37 43	088	39 15	131	29 22	150	60 24	222	47 04	263	25 15	311
54	32 18	031	38 24	089	39 45	132	29 42	151	59 57	223	46 25	264	24 45	311
55	32 39	032	39 04	090	40 14	133	30 00	153	59 29	225	45 45	264	24 15	312
56	33 00	032	39 44	091	40 43	135	30 19	154	59 00	226	45 05	265	23 45	312
57	33 22	032	40 24	091	41 11	136	30 36	155	58 31	228	44 25	266	23 15	313
58	33 43	033	41 04	092	41 39	137	30 53	156	58 01	229	43 45	267	22 46	313
59	34 05	033	41 44	093	42 06	138	31 09	157	57 30	231	43 04	268	22 17	314
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	34 27	034	42 24	094	15 26	139	31 24	158	56 58	232	42 24	268	21 48	314
61	34 50	034	43 04	094	15 53	140	31 39	159	56 26	234	41 44	269	21 20	315
62	35 12	034	43 44	095	16 18	141	31 53	160	55 54	235	41 04	270	20 51	316
63	35 35	035	44 24	096	16 44	142	32 06	161	55 21	236	40 24	271	20 23	316
64	35 58	035	45 04	097	17 08	142	32 19	163	54 47	237	39 44	271	19 56	317
65	36 21	035	45 44	098	17 32	143	32 30	164	54 13	239	39 04	272	19 28	317
66	36 44	036	46 24	099	17 56	144	32 41	165	53 39	240	38 24	273	19 01	318
67	37 08	036	47 03	099	18 19	145	32 51	166	53 04	241	37 43	274	18 35	318
68	37 31	036	47 43	100	18 42	146	33 00	167	52 28	242	37 03	274	18 08	319
69	37 55	037	48 22	101	19 04	147	33 09	168	51 53	243	36 23	275	17 42	320
70	38 19	037	49 02	102	19 26	148	33 17	170	51 17	244	35 43	276	17 16	320
71	38 43	037	49 41	103	19 47	149	33 23	171	50 40	246	35 03	276	16 50	321
72	39 08	038	50 20	104	20 07	150	33 30	172	50 04	247	34 24	277	16 25	321
73	39 32	038	50 59	105	20 27	151	33 35	173	49 27	248	33 44	278	16 00	322
74	39 57	038	51 38	106	20 46	152	33 39	174	48 49	249	33 04	278	15 36	323
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		◆ Hamal		Schedar	
75	40 22	039	17 17	091	35 16	128	21 05	153	33 43	175	48 12	250	51 05	308
76	40 47	039	17 57	092	35 48	129	21 23	154	33 46	177	47 34	251	50 34	308
77	41 12	039	18 38	093	36 19	130	21 40	155	33 48	178	46 56	252	50 02	308
78	41 38	039	19 18	094	36 49	131	21 57	156	33 49	179	46 18	253	49 30	308
79	42 03	040	19 58	094	37 19	133	22 13	157	33 49	180	45 39	254	48 59	309
80	42 29	040	20 38	095	37 48	134	22 29	158	33 48	181	45 01	255	48 28	309
81	42 55	040	21 18	096	38 17	135	22 44	159	33 47	183	44 22	255	47 57	309
82	43 21	040	21 58	097	38 45	136	22 58	160	33 45	184	43 43	256	47 26	309
83	43 47	041	22 37	097	39 13	137	23 12	161	33 42	185	43 04	257	46 55	310
84	44 13	041	23 17	098	39 40	138	23 24	162	33 38	186	42 25	258	46 24	310
85	44 40	041	23 57	099	40 06	139	23 37	163	33 33	187	41 45	259	45 53	310
86	45 06	041	24 37	100	40 32	141	23 48	164	33 27	189	41 06	260	45 23	311
87	45 33	042	25 16	101	40 57	142	23 59	165	33 21	190	40 26	261	44 52	311
88	46 00	042	25 55	101	41 22	143	24 09	166	33 14	191	39 47	261	44 22	311
89	46 27	042	26 35	102	41 46	144	24 19	167	33 06	192	39 07	262	43 52	312

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LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
90	46 54	042	27 14	103	42 09	145	24 27	168	32 57	193	54 13	216	64 50	289
91	47 21	043	27 53	104	42 31	147	24 35	169	32 48	194	53 49	217	64 12	289
92	47 48	043	28 32	105	42 53	148	24 43	170	32 37	196	53 24	219	63 34	290
93	48 15	043	29 11	106	43 14	149	24 49	171	32 26	197	52 59	220	62 56	290
94	48 43	043	29 49	106	43 34	150	24 55	172	32 14	198	52 33	221	62 19	290
95	49 10	043	30 28	107	43 53	152	25 00	173	32 01	199	52 06	223	61 41	290
96	49 38	044	31 06	108	44 12	153	25 05	174	31 48	200	51 38	224	61 03	291
97	50 06	044	31 44	109	44 30	154	25 08	175	31 34	201	51 10	225	60 26	291
98	50 33	044	32 22	110	44 47	156	25 11	176	31 19	202	50 41	227	59 48	291
99	51 01	044	33 00	111	45 03	157	25 14	177	31 03	203	50 11	228	59 11	292
100	51 29	044	33 37	112	45 18	158	25 15	178	30 47	205	49 41	229	58 34	292
101	51 57	044	34 14	113	45 32	160	25 16	180	30 30	206	49 10	231	57 57	292
102	52 25	044	34 51	113	45 46	161	25 16	181	30 12	207	48 39	232	57 20	293
103	52 54	045	35 28	114	45 58	163	25 15	182	29 54	208	48 07	233	56 43	293
104	53 22	045	36 04	115	46 10	164	25 13	183	29 34	209	47 35	234	56 06	293
	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
105	53 50	045	22 25	093	36 40	116	25 11	184	29 15	210	47 02	235	55 29	294
106	54 18	045	23 05	094	37 16	117	25 08	185	28 54	211	46 29	237	54 52	294
107	54 47	045	23 45	095	37 52	118	25 04	186	28 33	212	45 55	238	54 16	294
108	55 15	045	24 25	095	38 27	119	25 00	187	28 12	213	45 21	239	53 39	295
109	55 43	045	25 05	096	39 02	120	24 55	188	27 49	214	44 47	240	53 03	295
110	56 12	045	25 44	097	39 36	121	24 49	189	27 26	215	44 12	241	52 27	296
111	56 40	045	26 24	098	40 10	122	24 42	190	27 03	216	43 36	242	51 50	296
112	57 09	045	27 04	098	40 44	123	24 35	191	26 39	217	43 01	243	51 14	296
113	57 37	045	27 44	099	41 18	124	24 27	192	26 14	218	42 25	244	50 38	297
114	58 06	045	28 23	100	41 50	126	24 18	193	25 49	219	41 49	245	50 03	297
115	58 34	045	29 03	101	42 23	127	24 08	194	25 23	220	41 12	246	49 27	297
116	59 03	045	29 42	102	42 55	128	23 58	195	24 57	221	40 35	247	48 51	298
117	59 31	045	30 21	103	43 26	129	23 47	196	24 30	222	39 58	248	48 16	298
118	59 59	045	31 00	103	43 57	130	23 36	197	24 03	223	39 21	249	47 41	299
119	60 28	045	31 39	104	44 28	131	23 23	198	23 35	224	38 43	250	47 05	299
	◆ Kochab		Denebola		◆ REGULUS		SIRIUS		RIGEL		◆ ALDEBARAN		CAPELLA	
120	42 25	021	32 18	105	44 58	132	23 10	199	23 07	225	38 05	251	62 36	281
121	42 39	021	32 57	106	45 27	134	22 57	200	22 38	226	37 27	252	61 56	282
122	42 54	022	33 36	107	45 56	135	22 42	201	22 09	227	36 49	253	61 17	282
123	43 09	022	34 14	108	46 24	136	22 27	202	21 40	228	36 11	253	60 38	283
124	43 24	022	34 52	109	46 52	137	22 12	203	21 10	229	35 32	254	59 59	283
125	43 39	022	35 30	109	47 19	139	21 56	204	20 39	230	34 54	255	59 20	284
126	43 54	022	36 08	110	47 45	140	21 39	205	20 08	231	34 15	256	58 41	284
127	44 09	022	36 45	111	48 10	141	21 21	206	19 37	232	33 36	257	58 02	285
128	44 24	022	37 23	112	48 35	143	21 03	207	19 06	232	32 57	258	57 23	285
129	44 40	023	38 00	113	48 59	144	20 44	208	18 34	233	32 17	259	56 44	286
130	44 55	023	38 36	114	49 22	145	20 25	209	18 01	234	31 38	259	56 06	286
131	45 11	023	39 13	115	49 45	147	20 05	210	17 28	235	30 58	260	55 27	286
132	45 27	023	39 49	116	50 07	148	19 45	211	16 55	236	30 19	261	54 49	287
133	45 42	023	40 25	117	50 27	149	19 24	212	16 22	237	29 39	262	54 10	287
134	45 58	023	41 01	118	50 47	151	19 02	213	15 48	238	28 59	263	53 32	288
	◆ Kochab		ARCTURUS		Denebola		◆ REGULUS		SIRIUS		BETELGEUSE		◆ CAPELLA	
135	46 14	023	21 17	085	41 36	119	51 06	152	18 40	214	33 50	239	52 54	288
136	46 30	023	21 57	085	42 11	120	51 25	154	18 17	215	33 15	240	52 16	289
137	46 46	024	22 37	086	42 45	121	51 42	155	17 54	216	32 40	241	51 38	289
138	47 02	024	23 17	087	43 19	122	51 58	157	17 30	217	32 05	242	51 00	290
139	47 18	024	23 57	088	43 53	123	52 13	158	17 06	218	31 29	243	50 22	290
140	47 34	024	24 37	088	44 27	124	52 28	160	16 41	219	30 53	244	49 45	291
141	47 50	024	25 17	089	44 59	126	52 41	162	16 16	219	30 17	245	49 07	291
142	48 07	024	25 57	090	45 32	127	52 53	163	15 50	220	29 41	246	48 30	292
143	48 23	024	26 38	091	46 04	128	53 04	165	15 24	221	29 04	247	47 52	292
144	48 39	024	27 18	091	46 35	129	53 14	166	14 57	222	28 27	248	47 15	292
145	48 56	024	27 58	092	47 06	130	53 23	168	14 30	223	27 50	248	46 38	293
146	49 12	024	28 38	093	47 37	131	53 31	170	14 03	224	27 12	249	46 01	293
147	49 28	024	29 18	094	48 06	133	53 37	171	13 35	225	26 35	250	45 25	294
148	49 45	024	29 58	094	48 36	134	53 43	173	13 06	226	25 57	251	44 48	294
149	50 01	024	30 38	095	49 04	135	53 47	175	12 37	226	25 19	252	44 11	295
	◆ Kochab		ARCTURUS		◆ SPICA		REGULUS		PROCYON		◆ BETELGEUSE		CAPELLA	
150	50 18	024	31 18	096	15 18	127	53 51	176	37 49	226	24 41	253	43 35	295
151	50 34	024	31 58	097	15 49	128	53 53	178	37 20	227	24 02	253	42 59	296
152	50 50	024	32 38	097	16 21	129	53 54	180	36 50	228	23 24	254	42 23	296
153	51 07	024	33 18	098	16 52	130	53 53	181	36 20	230	22 45	255	41 47	297
154	51 23	024	33 57	099	17 22	131	53 52	183	35 49	231	22 06	256	41 11	297
155	51 40	024	34 37	100	17 53	132	53 49	184	35 18	232	21 27	257	40 35	298
156	51 56	024	35 16	101	18 22	133	53 46	186	34 46	233	20 48	258	40 00	298
157	52 13	024	35 56	102	18 52	133	53 41	188	34 14	234	20 09	258	39 25	299
158	52 29	024	36 35	102	19 21	134	53 35	189	33 41	235	19 29	259	38 49	299
159	52 45	024	37 14	103	19 49	135	53 28	191	33 08	236	18 50	260	38 14	300
160	53 01	024	37 53	104	20 17	136	53 19	193	32 35	237	18 10	261	37 40	300
161	53 18	024	38 32	105	20 45	137	53 10	194	32 01	238	17 30	261	37 05	301
162	53 34	024	39 11	106	21 12	138	52 59	196	31 27	239	16 51	262	36 30	301
163	53 50	024	39 49	107	21 39	139	52 48	197	30 53	240	16 11	263	35 56	302
164	54 06	024	40 28	108	22 05	140	52 35	199	30 18	240	15 31	264	35 22	302
	◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		PROCYON		◆ POLLUX		CAPELLA	
165	14 31	047	41 06	109	22 30	141	52 22	201	29 43	241	47 48	260	34 48	303
166	15 00	048	41 44	110	22 55	142	52 07	202	29 08	242	47 08	260	34 14	303
167	15 30	048	42 21	111	23 20	143	51 51	204	28 32	243	46 28	261	33 41	304
168	16 00	049	42 59	111	23 44	144	51 35	205	27 56	244	45 49	262	33 07	304
169	16 31	050	43 36	112	24 07	145	51 17	207	27 20	245	45 09	263	32 34	305
170	17 01	050	44 13	113	24 30	146	50 59	208	26 43	246	44 29	264	32 01	305
171	17 32	051	44 50	114	24 53	147	50 39	210	26 06	247	43 49	265	31 28	306
172	18 04	051	45 26	116	25 14	148	50 19	211	25 29	248	43 09	265	30 56	306
173	18 35	052	46 02	117	25 35	149	49 58	213	24 52	249	42 29	266	30 23	307
174	19 07	053	46 38	118	25 56	150	49 36	214	24 15	249	41 49	267	29 51	307
175	19 39	053	47 13	119	26 16	151	49 13	215	23 37	250	41 09	268	29 19	308
176	20 11	054	47 48	120	26 35	152	48 49	217	22 59	251	40 29	269	28 48	308
177	20 44	054	48 23	121	26 54	153	48 25	218	22 21	252	39 49	269	28 16	309
178	21 17	055	48 57	122	27 12	154	48 00	219	21 43	253	39 08	270	27 45	309
179	21 50	056	49 31	123	27 29	155	47 34	221	21 04	254	38 28	271	27 14	310

LAT 48°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
180	12 54	033	22 23	056	50 04	124	27 46	156	47 08	222	37 48	271	26 43	310
181	13 16	034	22 57	057	50 37	126	28 02	157	46 40	223	37 08	272	26 12	311
182	13 38	034	23 30	057	51 10	127	28 17	158	46 13	224	36 28	273	25 42	311
183	14 01	035	24 04	058	51 42	128	28 32	159	45 44	226	35 48	274	25 12	312
184	14 25	036	24 38	059	52 13	129	28 45	160	45 15	227	35 08	274	24 42	312
185	14 48	036	25 13	059	52 44	131	28 59	161	44 45	228	34 28	275	24 13	313
186	15 12	037	25 47	060	53 14	132	29 11	163	44 15	229	33 48	276	23 43	313
187	15 36	037	26 22	060	53 43	133	29 23	164	43 45	230	33 08	276	23 14	314
188	16 01	038	26 57	061	54 12	135	29 34	165	43 13	232	32 28	277	22 45	314
189	16 26	039	27 32	062	54 40	136	29 44	166	42 42	233	31 48	278	22 17	315
190	16 51	039	28 08	062	55 08	138	29 53	167	42 09	234	31 08	279	21 49	316
191	17 17	040	28 43	063	55 35	139	30 02	168	41 37	235	30 29	279	21 21	316
192	17 43	040	29 19	063	56 00	141	30 10	169	41 04	236	29 49	280	20 53	317
193	18 09	041	29 55	064	56 26	142	30 17	170	40 30	237	29 10	281	20 26	317
194	18 35	042	30 31	064	56 50	144	30 23	171	39 56	238	28 30	281	19 58	318
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	19 02	042	31 07	065	23 22	097	57 13	145	39 22	239	27 51	282	19 32	318
196	19 29	043	31 44	066	24 01	098	57 36	147	38 47	240	27 12	283	19 05	319
197	19 57	043	32 20	066	24 41	099	57 57	148	38 12	241	26 33	283	18 39	319
198	20 24	044	32 57	067	25 21	100	58 18	150	37 37	242	25 54	284	18 13	320
199	20 52	044	33 34	067	26 00	100	58 37	152	37 01	243	25 15	285	17 47	321
200	21 20	045	34 11	068	26 40	101	58 56	154	36 25	244	24 36	285	17 22	321
201	21 49	046	34 49	068	27 19	102	59 13	155	35 49	245	23 57	286	16 57	322
202	22 18	046	35 26	069	27 58	103	59 29	157	35 13	246	23 19	287	16 32	322
203	22 47	047	36 03	070	28 37	104	59 44	159	34 36	247	22 40	287	16 08	323
204	23 16	047	36 41	070	29 16	104	59 58	161	33 59	248	22 02	288	15 44	324
205	23 46	048	37 19	071	29 55	105	60 11	163	33 21	249	21 24	289	15 20	324
206	24 16	048	37 57	071	30 34	106	60 22	164	32 44	250	20 46	289	14 57	325
207	24 46	049	38 35	072	31 12	107	60 32	166	32 06	251	20 08	290	14 34	325
208	25 16	049	39 13	072	31 51	108	60 41	168	31 28	251	19 30	291	14 11	326
209	25 47	050	39 52	073	32 29	109	60 49	170	30 50	252	18 53	291	13 49	327
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		REGULUS		◆ Dubhe	
210	26 17	050	40 30	074	33 07	110	60 55	172	47 03	230	30 12	253	62 02	316
211	26 49	051	41 09	074	33 44	111	61 00	174	46 33	231	29 33	254	61 33	315
212	27 20	052	41 47	075	34 22	111	61 03	176	46 01	232	28 55	255	61 05	315
213	27 51	052	42 26	075	34 59	112	61 05	178	45 29	233	28 16	256	60 37	315
214	28 23	053	43 05	076	35 36	113	61 06	180	44 57	235	27 37	257	60 09	315
215	28 55	053	43 44	077	36 13	114	61 06	182	44 24	236	26 58	257	59 40	315
216	29 27	054	44 23	077	36 49	115	61 04	184	43 50	237	26 18	258	59 12	315
217	30 00	054	45 02	078	37 25	116	61 00	186	43 17	238	25 39	259	58 43	315
218	30 32	055	45 41	078	38 01	117	60 56	188	42 42	239	25 00	260	58 15	315
219	31 05	055	46 21	079	38 37	118	60 50	190	42 08	240	24 20	261	57 46	315
220	31 38	056	47 00	080	39 12	119	60 43	191	41 33	241	23 40	261	57 18	315
221	32 12	056	47 40	080	39 47	120	60 34	193	40 58	242	23 01	262	56 49	315
222	32 45	057	48 19	081	40 21	121	60 24	195	40 22	243	22 21	263	56 21	315
223	33 19	057	48 59	081	40 56	122	60 13	197	39 46	244	21 41	264	55 53	315
224	33 52	058	49 39	082	41 29	123	60 00	199	39 10	245	21 01	264	55 24	315
	DENEB		◆ VEGA		Rasalhague		ANTARES		◆ ARCTURUS		Denebola		◆ Dubhe	
225	34 26	058	50 19	083	42 03	124	12 49	159	59 47	201	38 33	246	54 56	315
226	35 01	059	50 58	083	42 36	125	13 03	160	59 32	203	37 56	247	54 27	315
227	35 35	059	51 38	084	43 08	127	13 16	161	59 16	204	37 19	248	53 59	315
228	36 10	060	52 18	085	43 40	128	13 29	162	58 59	206	36 42	249	53 31	315
229	36 44	060	52 58	085	44 12	129	13 41	163	58 40	208	36 04	250	53 03	315
230	37 19	061	53 38	086	44 43	130	13 53	164	58 21	210	35 27	251	52 34	316
231	37 54	061	54 18	087	45 13	131	14 04	165	58 01	211	34 49	252	52 06	316
232	38 30	062	54 58	087	45 43	132	14 14	166	57 39	213	34 11	252	51 38	316
233	39 05	062	55 38	088	46 13	134	14 23	167	57 17	215	33 32	253	51 10	316
234	39 41	063	56 19	089	46 41	135	14 33	167	56 54	216	32 54	254	50 42	316
235	40 16	063	56 59	089	47 10	136	14 41	168	56 30	218	32 15	255	50 15	316
236	40 52	064	57 39	090	47 37	137	14 49	169	56 05	219	31 36	256	49 47	316
237	41 28	064	58 19	091	48 04	139	14 56	170	55 39	221	30 57	257	49 19	317
238	42 04	065	58 59	092	48 30	140	15 02	171	55 12	222	30 18	258	48 52	317
239	42 41	065	59 39	093	48 56	141	15 08	172	54 45	224	29 39	258	48 24	317
	◆ DENEB		ALTAIR		Rasalhague		◆ ANTARES		ARCTURUS		Denebola		◆ Dubhe	
240	43 17	066	27 49	109	49 20	143	15 13	173	54 17	225	28 59	259	47 57	317
241	43 54	066	28 27	110	49 44	144	15 18	174	53 48	226	28 20	260	47 30	317
242	44 31	067	29 04	111	50 08	145	15 22	175	53 19	228	27 40	261	47 02	318
243	45 08	067	29 42	112	50 30	147	15 25	176	52 49	229	27 01	262	46 35	318
244	45 45	067	30 19	112	50 52	148	15 28	177	52 18	230	26 21	262	46 08	318
245	46 22	068	30 56	113	51 12	150	15 30	178	51 47	232	25 41	263	45 42	318
246	46 59	068	31 33	114	51 32	151	15 31	179	51 15	233	25 01	264	45 15	318
247	47 36	069	32 09	115	51 51	153	15 32	179	50 43	234	24 21	265	44 48	319
248	48 14	069	32 45	116	52 09	154	15 32	180	50 10	235	23 41	265	44 22	319
249	48 52	070	33 21	117	52 26	156	15 32	181	49 37	237	23 01	266	43 56	319
250	49 29	070	33 57	118	52 42	157	15 30	182	49 03	238	22 21	267	43 29	319
251	50 07	071	34 32	119	52 57	159	15 28	183	48 29	239	21 41	268	43 03	320
252	50 45	071	35 07	120	53 11	160	15 26	184	47 54	240	21 01	269	42 37	320
253	51 23	072	35 42	121	53 24	162	15 23	185	47 19	241	20 21	269	42 12	320
254	52 01	072	36 16	122	53 36	164	15 19	186	46 44	242	19 40	270	41 46	321
	◆ Schedar		DENEB		ALTAIR		◆ Rasalhague		ARCTURUS		◆ Alkaid		Kochab	
255	27 35	034	52 40	073	36 50	123	53 47	165	46 08	243	58 48	291	60 25	343
256	27 57	035	53 18	073	37 24	124	53 56	167	45 32	244	58 11	291	60 13	342
257	28 20	035	53 57	074	37 57	125	54 05	168	44 56	245	57 33	291	60 01	342
258	28 43	035	54 35	074	38 29	126	54 13	170	44 19	246	56 56	292	59 48	342
259	29 07	036	55 14	075	39 02	127	54 19	172	43 43	247	56 19	292	59 35	341
260	29 31	036	55 53	075	39 34	128	54 24	173	43 05	248	55 41	292	59 22	341
261	29 55	037	56 31	076	40 05	129	54 28	175	42 28	249	55 04	293	59 09	341
262	30 19	037	57 10	076	40 36	130	54 31	177	41 50	250	54 27	293	58 56	340
263	30 43	038	57 49	077	41 06	131	54 33	178	41 12	251	53 51	294	58 42	340
264	31 08	038	58 28	077	41 36	133	54 33	180	40 34	252	53 14	294	58 28	340
265	31 33	039	59 08	078	42 05	134	54 32	182	39 56	253	52 37	294	58 14	339
266	31 58	039	59 47	078	42 34	135	54 30	184	39 17	254	52 01	295	58 00	339
267	32 23	039	60 26	079	43 02	136	54 27	185	38 39	255	51 24	295	57 46	339
268	32 49	040	61 06	079	43 30	137	54 23	187	38 00	256	50 48	295	57 31	339
269	33 14	040	61 45	080	43 57	138	54 18	189	37 21	257	50 12	296	57 17	338

LAT 48°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	13 25	024	19 49	068	44 23	140	54 11	190	36 42	257	49 36	296	57 02	338
271	13 42	025	20 26	069	44 48	141	54 04	192	36 03	258	49 00	297	56 47	338
272	13 59	026	21 03	069	45 13	142	53 55	193	35 23	259	48 24	297	56 32	338
273	14 17	026	21 41	070	45 38	144	53 45	195	34 44	260	47 48	297	56 17	338
274	14 34	027	22 19	071	46 01	145	53 34	197	34 04	261	47 12	298	56 01	337
275	14 53	027	22 57	071	46 24	146	53 22	198	33 24	262	46 37	298	55 46	337
276	15 11	028	23 35	072	46 46	147	53 09	200	32 45	262	46 02	299	55 30	337
277	15 30	029	24 13	073	47 07	149	52 54	202	32 05	263	45 27	299	55 15	337
278	15 50	029	24 51	073	47 27	150	52 39	203	31 25	264	44 51	299	54 59	337
279	16 09	030	25 30	074	47 47	152	52 23	205	30 45	265	44 17	300	54 43	337
280	16 30	030	26 09	075	48 06	153	52 06	206	30 05	266	43 42	300	54 27	337
281	16 50	031	26 47	075	48 23	154	51 48	208	29 25	266	43 07	301	54 11	337
282	17 11	031	27 26	076	48 40	156	51 28	209	28 45	267	42 33	301	53 55	336
283	17 32	032	28 05	077	48 56	157	51 08	211	28 05	268	41 59	302	53 39	336
284	17 53	033	28 44	077	49 11	159	50 48	212	27 25	269	41 24	302	53 23	336
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
285	18 15	033	29 23	078	49 25	160	50 26	213	26 45	269	40 50	302	53 07	336
286	18 37	034	30 03	079	49 38	162	50 03	215	26 04	270	40 17	303	52 51	336
287	19 00	034	30 42	079	49 50	163	49 40	216	25 24	271	39 43	303	52 34	336
288	19 22	035	31 22	080	50 02	165	49 16	218	24 44	272	39 10	304	52 18	336
289	19 45	035	32 01	081	50 12	166	48 51	219	24 04	272	38 36	304	52 02	336
290	20 09	036	32 41	081	50 21	168	48 25	220	23 24	273	38 03	305	51 45	336
291	20 32	036	33 21	082	50 29	169	47 59	222	22 44	274	37 30	305	51 29	336
292	20 56	037	34 00	083	50 36	171	47 32	223	22 04	274	36 57	306	51 12	336
293	21 21	037	34 40	083	50 42	172	47 04	224	21 24	275	36 25	306	50 56	336
294	21 45	038	35 20	084	50 46	174	46 36	225	20 44	276	35 52	306	50 40	336
295	22 10	039	36 00	085	50 50	175	46 07	227	20 04	277	35 20	307	50 23	336
296	22 35	039	36 40	085	50 53	177	45 38	228	19 24	277	34 48	307	50 07	336
297	23 01	040	37 20	086	50 54	179	45 08	229	18 44	278	34 16	308	49 50	336
298	23 26	040	38 00	087	50 55	180	44 37	230	18 05	279	33 45	308	49 34	336
299	23 52	041	38 40	087	50 54	182	44 06	231	17 25	279	33 13	309	49 17	336
	Mirfak		◆ Alpheratz		Enif		ALTAIR		◆ Rasalhague		Alphecca		◆ Kochab	
300	24 19	041	39 20	088	46 01	141	50 52	183	43 34	233	35 06	272	49 01	336
301	24 45	042	40 00	089	46 26	142	50 49	185	43 02	234	34 26	273	48 45	336
302	25 12	042	40 41	090	46 50	144	50 45	186	42 30	235	33 46	274	48 28	336
303	25 39	043	41 21	090	47 13	145	50 40	188	41 57	236	33 06	274	48 12	336
304	26 06	043	42 01	091	47 36	146	50 34	190	41 23	237	32 26	275	47 56	336
305	26 34	044	42 41	092	47 58	148	50 27	191	40 49	238	31 46	276	47 40	336
306	27 02	044	43 21	093	48 19	149	50 19	193	40 15	239	31 06	277	47 23	336
307	27 30	045	44 01	093	48 39	151	50 09	194	39 41	240	30 26	277	47 07	336
308	27 58	045	44 41	094	48 58	152	49 59	196	39 06	241	29 47	278	46 51	336
309	28 27	046	45 21	095	49 16	153	49 48	197	38 30	242	29 07	279	46 35	337
310	28 56	046	46 01	096	49 34	155	49 35	199	37 55	243	28 27	279	46 19	337
311	29 25	047	46 41	097	49 50	156	49 22	200	37 19	244	27 48	280	46 03	337
312	29 54	047	47 21	097	50 06	158	49 08	202	36 42	245	27 08	281	45 48	337
313	30 24	048	48 01	098	50 21	159	48 52	203	36 06	246	26 29	281	45 32	337
314	30 54	048	48 40	099	50 34	161	48 36	205	35 29	247	25 49	282	45 16	337
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Kochab	
315	15 46	037	25 46	083	49 20	100	50 47	162	48 19	206	62 48	264	45 01	337
316	16 10	037	26 26	083	50 00	101	50 59	164	48 01	207	62 08	264	44 45	337
317	16 35	038	27 06	084	50 39	102	51 09	165	47 42	209	61 28	265	44 30	337
318	16 59	038	27 46	085	51 18	103	51 19	167	47 22	210	60 48	266	44 14	338
319	17 24	039	28 26	086	51 57	104	51 28	169	47 02	211	60 08	267	43 59	338
320	17 50	039	29 06	086	52 36	105	51 35	170	46 41	213	59 28	268	43 44	338
321	18 15	040	29 46	087	53 15	106	51 41	172	46 18	214	58 48	268	43 29	338
322	18 41	041	30 26	088	53 53	107	51 47	173	45 55	215	58 08	269	43 14	338
323	19 08	041	31 06	088	54 32	108	51 51	175	45 32	217	57 28	270	42 59	338
324	19 34	042	31 46	089	55 10	109	51 54	176	45 07	218	56 48	271	42 44	339
325	20 01	042	32 26	090	55 48	110	51 56	178	44 42	219	56 08	271	42 30	339
326	20 28	043	33 06	091	56 26	111	51 57	180	44 17	221	55 27	272	42 15	339
327	20 56	043	33 46	091	57 03	112	51 56	181	43 50	222	54 47	273	42 01	339
328	21 23	044	34 27	092	57 40	113	51 55	183	43 23	223	54 07	274	41 47	339
329	21 51	045	35 07	093	58 17	114	51 52	184	42 55	224	53 27	274	41 32	339
	CAPELLA		◆ Hamal		Diphda		Enif		◆ ALTAIR		VEGA		◆ Kochab	
330	22 20	045	35 47	094	14 34	140	51 49	186	42 27	225	52 47	275	41 18	340
331	22 48	046	36 27	094	15 00	141	51 44	188	41 58	227	52 07	276	41 04	340
332	23 17	046	37 07	095	15 25	142	51 38	189	41 29	228	51 27	276	40 51	340
333	23 46	047	37 47	096	15 49	142	51 31	191	40 59	229	50 47	277	40 37	340
334	24 16	047	38 27	097	16 14	143	51 23	192	40 28	230	50 08	278	40 23	340
335	24 45	048	39 07	098	16 37	144	51 14	194	39 57	231	49 28	278	40 10	341
336	25 15	048	39 46	099	17 01	145	51 04	195	39 26	232	48 48	279	39 57	341
337	25 45	049	40 26	099	17 23	146	50 53	197	38 54	233	48 08	279	39 44	341
338	26 16	049	41 05	100	17 46	147	50 40	198	38 22	234	47 29	280	39 31	341
339	26 46	050	41 45	101	18 07	148	50 27	200	37 49	235	46 49	281	39 18	341
340	27 17	050	42 24	102	18 28	149	50 13	201	37 16	236	46 10	281	39 05	342
341	27 48	051	43 04	103	18 49	150	49 58	203	36 42	237	45 31	282	38 53	342
342	28 19	051	43 43	104	19 09	151	49 42	204	36 08	238	44 51	282	38 40	342
343	28 51	052	44 22	105	19 28	152	49 25	206	35 34	239	44 12	283	38 28	342
344	29 23	053	45 00	105	19 47	153	49 07	207	34 59	240	43 33	284	38 16	343
345	◆ CAPELLA		ALDEBARAN		◆ Diphda		Enif		ALTAIR		◆ VEGA		Kochab	
	29 55	053	16 03	083	20 05	154	48 48	209	34 24	241	42 54	284	38 04	343
346	30 27	054	16 43	084	20 23	155	48 28	210	33 48	242	42 15	285	37 52	343
347	30 59	054	17 23	084	20 40	155	48 07	212	33 13	243	41 37	285	37 41	343
348	31 32	055	18 03	085	20 56	156	47 46	213	32 37	244	40 58	286	37 29	344
349	32 05	055	18 43	086	21 12	157	47 24	214	32 00	245	40 19	287	37 18	344
350	32 38	056	19 23	087	21 27	158	47 01	216	31 24	246	39 41	287	37 07	344
351	33 11	056	20 03	087	21 41	159	46 37	217	30 47	247	39 03	288	36 56	344
352	33 44	057	20 43	088	21 55	160	46 13	218	30 10	248	38 24	288	36 46	345
353	34 18	057	21 23	089	22 08	161	45 47	220	29 33	249	37 46	289	36 35	345
354	34 51	058	22 03	089	22 21	162	45 21	221	28 55	250	37 09	289	36 25	345
355	35 25	058	22 43	090	22 32	163	44 55	222	28 17	250	36 31	290	36 15	345
356	36 00	059	23 23	091	22 44	164	44 28	223	27 40	251	35 53	291	36 05	346
357	36 34	059	24 04	092	22 54	165	44 00	224	27 01	252	35 16	291	35 55	346
358	37 08	059	24 44	092	23 04	166	43 31	226	26 23	253	34 38	292	35 45	346
359	37 43	060	25 24	093	23 13	167	43 02	227	25 45	254	34 01	292	35 36	347

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LAT 47°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Diphda		ALTAIR		◆ VEGA		Kochab	
0	37 48	060	26 08	094	55 19	121	24 20	168	25 22	255	33 00	294	34 28	347
1	38 23	060	26 49	094	55 53	123	24 28	169	24 42	256	32 23	294	34 19	347
2	38 59	061	27 29	095	56 28	124	24 35	170	24 02	257	31 46	295	34 10	348
3	39 35	061	28 10	096	57 01	125	24 41	172	23 22	258	31 08	295	34 01	348
4	40 11	062	28 51	097	57 34	127	24 47	173	22 42	258	30 32	296	33 53	348
5	40 47	062	29 31	097	58 07	128	24 52	174	22 02	259	29 55	296	33 44	348
6	41 23	063	30 12	098	58 39	129	24 56	175	21 22	260	29 18	297	33 36	349
7	41 59	063	30 52	099	59 10	131	24 59	176	20 42	261	28 42	297	33 28	349
8	42 36	063	31 33	100	59 41	132	25 02	177	20 01	261	28 06	298	33 21	349
9	43 13	064	32 13	101	60 11	134	25 04	178	19 21	262	27 29	299	33 13	350
10	43 50	064	32 53	101	60 40	135	25 05	179	18 40	263	26 54	299	33 06	350
11	44 26	065	33 33	102	61 08	137	25 06	180	18 00	264	26 18	300	32 59	350
12	45 04	065	34 13	103	61 35	139	25 05	181	17 19	264	25 42	300	32 52	350
13	45 41	066	34 53	104	62 02	140	25 04	182	16 38	265	25 07	301	32 45	351
14	46 18	066	35 33	105	62 27	142	25 03	183	15 57	266	24 32	301	32 38	351
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Diphda		Alpheratz		◆ DENEB		Kochab	
15	46 56	067	36 12	106	62 52	144	25 00	184	69 37	213	46 35	293	32 32	351
16	47 33	067	36 52	106	63 16	146	24 57	185	69 14	216	45 58	293	32 26	352
17	48 11	067	37 31	107	63 38	148	24 53	186	68 49	218	45 20	293	32 20	352
18	48 49	068	38 10	108	63 59	150	24 48	187	68 24	220	44 43	294	32 15	352
19	49 27	068	38 48	109	64 19	152	24 42	188	67 57	222	44 05	294	32 09	353
20	50 05	069	39 27	110	64 38	154	24 36	189	67 29	224	43 28	295	32 04	353
21	50 43	069	40 05	111	64 56	156	24 29	190	67 00	226	42 51	295	31 59	353
22	51 21	070	40 43	112	65 12	158	24 21	191	66 30	228	42 14	296	31 54	353
23	52 00	070	41 21	113	65 27	160	24 13	192	66 00	229	41 37	296	31 50	354
24	52 38	070	41 59	114	65 40	162	24 04	193	65 28	231	41 01	297	31 45	354
25	53 17	071	42 36	115	65 52	164	23 54	194	64 56	233	40 24	297	31 41	354
26	53 56	071	43 13	116	66 03	166	23 43	196	64 23	234	39 48	298	31 37	355
27	54 34	072	43 50	117	66 12	169	23 32	197	63 50	236	39 12	298	31 34	355
28	55 13	072	44 26	118	66 19	171	23 20	198	63 15	237	38 36	299	31 30	355
29	55 52	073	45 02	119	66 25	173	23 07	199	62 41	239	38 00	299	31 27	356
	CAPELLA		◆ BETELGEUSE		RIGEL		Hamal		◆ Alpheratz		DENEB		◆ Kochab	
30	56 31	073	26 16	109	19 54	128	66 29	175	62 06	240	37 24	300	31 24	356
31	57 11	074	26 55	109	20 26	128	66 31	178	61 30	242	36 49	300	31 21	356
32	57 50	074	27 34	110	20 58	129	66 32	180	60 54	243	36 13	300	31 19	357
33	58 29	074	28 12	111	21 30	130	66 31	182	60 17	244	35 38	301	31 16	357
34	59 09	075	28 50	112	22 01	131	66 29	185	59 40	245	35 03	301	31 14	357
35	59 48	075	29 28	113	22 31	132	66 25	187	59 03	247	34 28	302	31 12	358
36	60 28	076	30 05	114	23 01	133	66 19	189	58 25	248	33 54	302	31 11	358
37	61 08	076	30 43	115	23 31	134	66 12	191	57 47	249	33 19	303	31 09	358
38	61 47	077	31 20	116	24 00	135	66 03	194	57 09	250	32 45	303	31 08	359
39	62 27	077	31 57	116	24 29	136	65 52	196	56 30	251	32 11	304	31 07	359
40	63 07	077	32 33	117	24 57	137	65 40	198	55 51	252	31 37	304	31 06	359
41	63 47	078	33 09	118	25 25	138	65 27	200	55 12	253	31 03	305	31 06	359
42	64 27	078	33 45	119	25 52	139	65 12	202	54 33	254	30 30	305	31 06	000
43	65 07	079	34 21	120	26 19	140	64 56	204	53 53	255	29 57	306	31 06	000
44	65 47	079	34 56	121	26 45	141	64 38	206	53 14	256	29 23	306	31 06	000
	◆ Dubhe		POLLUX		BETELGEUSE		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
45	28 27	028	32 15	082	35 31	122	27 11	142	64 20	208	52 34	257	28 51	307
46	28 46	028	32 56	083	36 05	123	27 36	143	63 59	210	51 54	258	28 18	307
47	29 05	028	33 37	083	36 39	124	28 00	144	63 38	212	51 14	259	27 46	308
48	29 24	029	34 17	084	37 13	125	28 24	145	63 16	214	50 34	260	27 13	308
49	29 44	029	34 58	085	37 46	126	28 47	146	62 52	216	49 54	261	26 41	309
50	30 04	029	35 39	086	38 19	127	29 10	147	62 28	218	49 13	261	26 10	309
51	30 25	030	36 20	086	38 51	128	29 32	148	62 02	220	48 33	262	25 38	310
52	30 45	030	37 01	087	39 23	129	29 53	149	61 36	221	47 52	263	25 07	310
53	31 06	031	37 41	088	39 54	131	30 14	150	61 08	223	47 11	264	24 36	311
54	31 27	031	38 22	088	40 25	132	30 34	151	60 40	224	46 31	265	24 05	312
55	31 48	031	39 03	089	40 55	133	30 54	152	60 11	226	45 50	266	23 35	312
56	32 09	032	39 44	090	41 25	134	31 12	153	59 41	228	45 09	266	23 04	313
57	32 31	032	40 25	091	41 54	135	31 30	154	59 10	229	44 28	267	22 34	313
58	32 53	032	41 06	091	42 23	136	31 48	156	58 39	231	43 47	268	22 05	314
59	33 15	033	41 47	092	42 51	137	32 04	157	58 07	232	43 06	269	21 35	314
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	33 37	033	42 28	093	16 12	139	32 20	158	57 35	233	42 26	269	21 06	315
61	34 00	034	43 09	094	16 38	140	32 35	159	57 02	235	41 45	270	20 37	315
62	34 22	034	43 49	094	17 05	140	32 49	160	56 28	236	41 04	271	20 08	316
63	34 45	034	44 30	095	17 30	141	33 03	161	55 54	237	40 23	272	19 40	316
64	35 08	035	45 11	096	17 56	142	33 16	162	55 19	239	39 42	272	19 12	317
65	35 32	035	45 52	097	18 21	143	33 28	164	54 44	240	39 01	273	18 44	318
66	35 55	035	46 32	098	18 45	144	33 39	165	54 08	241	38 20	274	18 17	318
67	36 19	036	47 13	098	19 09	145	33 49	166	53 32	242	37 39	274	17 50	319
68	36 43	036	47 53	099	19 32	146	33 59	167	52 56	243	36 59	275	17 23	319
69	37 07	036	48 34	100	19 54	147	34 08	168	52 19	244	36 18	276	16 56	320
70	37 31	037	49 14	101	20 16	148	34 16	169	51 42	246	35 37	276	16 30	320
71	37 56	037	49 54	102	20 38	149	34 23	171	51 05	247	34 56	277	16 04	321
72	38 20	037	50 34	103	20 59	150	34 29	172	50 27	248	34 16	278	15 38	322
73	38 45	037	51 14	104	21 19	151	34 34	173	49 49	249	33 35	278	15 13	322
74	39 10	038	51 53	105	21 39	152	34 39	174	49 11	250	32 55	279	14 48	323
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		◆ Hamal		Schedar	
75	39 35	038	17 19	091	35 53	128	21 58	153	34 43	175	48 32	251	50 28	309
76	40 00	038	17 59	092	36 26	129	22 17	154	34 45	177	47 53	252	49 56	309
77	40 26	039	18 40	092	36 57	130	22 35	155	34 47	178	47 14	253	49 25	309
78	40 51	039	19 21	093	37 28	131	22 52	156	34 49	179	46 35	254	48 53	309
79	41 17	039	20 02	094	37 59	132	23 08	157	34 49	180	45 56	255	48 21	310
80	41 43	039	20 43	095	38 29	133	23 24	158	34 48	181	45 16	255	47 50	310
81	42 09	040	21 24	095	38 59	134	23 40	159	34 47	183	44 37	256	47 18	310
82	42 35	040	22 04	096	39 28	135	23 54	160	34 45	184	43 57	257	46 47	310
83	43 01	040	22 45	097	39 56	136	24 08	161	34 41	185	43 17	258	46 16	311
84	43 28	040	23 26	098	40 24	138	24 21	162	34 37	186	42 37	259	45 45	311
85	43 54	041	24 06	099	40 51	139	24 34	163	34 32	187	41 56	260	45 14	311
86	44 21	041	24 46	099	41 18	140	24 46	164	34 27	189	41 16	261	44 43	311
87	44 48	041	25 27	100	41 44	141	24 57	165	34 20	190	40 36	261	44 13	312
88	45 15	041	26 07	101	42 09	142	25 07	166	34 13	191	39 55	262	43 42	312
89	45 42	041	26 47	102	42 34	144	25 17	167	34 05	192	39 15	263	43 12	312

LAT 47°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
90	46 09	042	27 27	103	42 58	145	25 26	168	33 55	193	55 01	216	64 29	291
91	46 36	042	28 07	103	43 21	146	25 34	169	33 46	195	54 36	218	63 51	291
92	47 04	042	28 47	104	43 44	147	25 42	170	33 35	196	54 11	219	63 13	291
93	47 31	042	29 26	105	44 05	149	25 49	171	33 23	197	53 44	221	62 35	292
94	47 59	042	30 06	106	44 26	150	25 55	172	33 11	198	53 17	222	61 57	292
95	48 26	043	30 45	107	44 46	151	26 00	173	32 58	199	52 49	224	61 19	292
96	48 54	043	31 24	107	45 05	153	26 04	174	32 44	200	52 21	225	60 41	292
97	49 22	043	32 03	108	45 24	154	26 08	175	32 30	201	51 52	226	60 04	293
98	49 50	043	32 42	109	45 41	155	26 11	176	32 14	203	51 22	228	59 26	293
99	50 18	043	33 20	110	45 58	157	26 13	177	31 58	204	50 51	229	58 48	293
100	50 46	043	33 59	111	46 14	158	26 15	178	31 41	205	50 20	230	58 11	294
101	51 14	043	34 37	112	46 28	159	26 16	180	31 24	206	49 48	232	57 33	294
102	51 42	044	35 15	113	46 42	161	26 16	181	31 05	207	49 16	233	56 56	294
103	52 10	044	35 52	114	46 55	162	26 15	182	30 47	208	48 43	234	56 18	294
104	52 39	044	36 30	115	47 07	164	26 13	183	30 27	209	48 10	235	55 41	295
	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
105	53 07	044	22 28	093	37 07	116	26 11	184	30 07	210	47 36	236	55 04	295
106	53 35	044	23 08	093	37 43	117	26 08	185	29 46	211	47 02	237	54 27	295
107	54 04	044	23 49	094	38 20	118	26 04	186	29 24	212	46 27	239	53 50	296
108	54 32	044	24 30	095	38 56	119	25 59	187	29 02	214	45 52	240	53 13	296
109	55 01	044	25 11	096	39 32	120	25 54	188	28 39	215	45 16	241	52 37	296
110	55 29	044	25 51	096	40 07	121	25 48	189	28 15	216	44 40	242	52 00	297
111	55 58	044	26 32	097	40 42	122	25 41	190	27 51	217	44 04	243	51 24	297
112	56 26	044	27 13	098	41 17	123	25 34	191	27 26	218	43 28	244	50 47	297
113	56 55	044	27 53	099	41 51	124	25 25	192	27 01	219	42 51	245	50 11	298
114	57 23	044	28 34	100	42 25	125	25 16	193	26 35	220	42 14	246	49 35	298
115	57 51	044	29 14	100	42 58	126	25 06	194	26 09	221	41 36	247	48 59	298
116	58 20	044	29 54	101	43 31	127	24 56	195	25 42	222	40 58	248	48 23	299
117	58 48	044	30 34	102	44 04	128	24 45	196	25 15	223	40 20	249	47 47	299
118	59 17	044	31 14	103	44 36	129	24 33	197	24 47	224	39 42	250	47 11	300
119	59 45	044	31 54	104	45 07	130	24 20	198	24 18	224	39 04	251	46 36	300
	◆ Kochab		Denebola		◆ REGULUS		SIRIUS		RIGEL		◆ ALDEBARAN		CAPELLA	
120	41 29	021	32 34	104	45 38	132	24 07	199	23 49	225	38 25	251	62 23	283
121	41 43	021	33 13	105	46 08	133	23 53	201	23 20	226	37 46	252	61 43	283
122	41 58	021	33 53	106	46 38	134	23 38	202	22 50	227	37 07	253	61 04	284
123	42 13	021	34 32	107	47 07	135	23 23	203	22 20	228	36 28	254	60 24	284
124	42 28	022	35 11	108	47 36	137	23 07	204	21 49	229	35 48	255	59 44	285
125	42 43	022	35 50	109	48 03	138	22 50	205	21 18	230	35 09	256	59 05	285
126	42 58	022	36 28	110	48 30	139	22 33	206	20 46	231	34 29	257	58 25	286
127	43 14	022	37 07	111	48 57	140	22 15	207	20 14	232	33 49	258	57 46	286
128	43 29	022	37 45	111	49 23	142	21 56	207	19 42	233	33 09	258	57 07	287
129	43 44	022	38 23	112	49 47	143	21 37	208	19 09	234	32 29	259	56 28	287
130	44 00	022	39 01	113	50 12	145	21 17	209	18 36	234	31 49	260	55 48	287
131	44 16	022	39 38	114	50 35	146	20 57	210	18 03	235	31 08	261	55 09	288
132	44 31	023	40 15	115	50 57	147	20 36	211	17 29	236	30 28	262	54 31	288
133	44 47	023	40 52	116	51 19	149	20 14	212	16 55	237	29 47	262	53 52	289
134	45 03	023	41 28	117	51 40	150	19 52	213	16 20	238	29 07	263	53 13	289
	◆ Kochab		ARCTURUS		Denebola		◆ REGULUS		SIRIUS		BETELGEUSE		◆ CAPELLA	
135	45 19	023	21 11	084	42 05	118	51 59	152	19 30	214	34 20	240	52 34	290
136	45 35	023	21 52	085	42 41	119	52 18	153	19 06	215	33 45	241	51 56	290
137	45 51	023	22 33	086	43 16	120	52 36	155	18 43	216	33 09	242	51 18	290
138	46 07	023	23 13	086	43 51	121	52 53	156	18 18	217	32 33	243	50 39	291
139	46 23	023	23 54	087	44 26	123	53 09	158	17 53	218	31 56	244	50 01	291
140	46 39	023	24 35	088	45 00	124	53 24	160	17 28	219	31 19	244	49 23	292
141	46 55	023	25 16	089	45 34	125	53 38	161	17 02	220	30 42	245	48 45	292
142	47 12	023	25 57	089	46 07	126	53 50	163	16 36	221	30 05	246	48 07	293
143	47 28	024	26 38	090	46 40	127	54 02	164	16 09	221	29 27	247	47 29	293
144	47 44	024	27 19	091	47 13	128	54 12	166	15 42	222	28 50	248	46 52	293
145	48 01	024	28 00	092	47 45	129	54 22	168	15 14	223	28 12	249	46 14	294
146	48 17	024	28 41	092	48 16	131	54 30	169	14 46	224	27 33	250	45 37	294
147	48 33	024	29 22	093	48 47	132	54 37	171	14 17	225	26 55	251	45 00	295
148	48 50	024	30 02	094	49 17	133	54 42	173	13 48	226	26 16	251	44 23	295
149	49 06	024	30 43	095	49 46	134	54 47	174	13 19	227	25 37	252	43 46	296
	◆ Kochab		ARCTURUS		◆ SPICA		REGULUS		PROCYON		◆ BETELGEUSE		CAPELLA	
150	49 23	024	31 24	095	15 54	127	54 50	176	38 30	227	24 58	253	43 09	296
151	49 39	024	32 05	096	16 26	128	54 53	178	38 00	228	24 19	254	42 32	297
152	49 56	024	32 45	097	16 58	129	54 54	180	37 30	229	23 40	255	41 56	297
153	50 12	024	33 26	098	17 30	130	54 53	181	36 59	230	23 00	256	41 19	298
154	50 28	024	34 06	098	18 01	130	54 52	183	36 27	231	22 20	256	40 43	298
155	50 45	024	34 47	099	18 32	131	54 49	185	35 55	232	21 40	257	40 07	298
156	51 01	024	35 27	100	19 03	132	54 45	186	35 22	233	21 01	258	39 31	299
157	51 18	024	36 07	101	19 33	133	54 40	188	34 49	234	20 20	259	38 56	299
158	51 34	023	36 48	102	20 02	134	54 34	190	34 16	235	19 40	259	38 20	300
159	51 50	023	37 28	103	20 32	135	54 26	191	33 42	236	19 00	260	37 45	300
160	52 06	023	38 07	103	21 00	136	54 18	193	33 08	237	18 20	261	37 09	301
161	52 23	023	38 47	104	21 29	137	54 08	195	32 33	238	17 39	262	36 34	301
162	52 39	023	39 27	105	21 56	138	53 57	196	31 58	239	16 59	263	35 59	302
163	52 55	023	40 06	106	22 24	139	53 45	198	31 23	240	16 18	263	35 25	302
164	53 11	023	40 45	107	22 50	140	53 32	200	30 47	241	15 37	264	34 50	303
	◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		PROCYON		◆ POLLUX		CAPELLA	
165	13 50	047	41 25	108	23 17	141	53 18	201	30 11	242	47 58	261	34 16	303
166	14 20	048	42 03	109	23 42	142	53 03	203	29 35	243	47 17	262	33 41	304
167	14 50	048	42 42	110	24 08	143	52 46	204	28 59	244	46 37	262	33 07	304
168	15 21	049	43 20	111	24 32	143	52 29	206	28 22	245	45 56	263	32 34	305
169	15 52	049	43 59	112	24 56	144	52 11	207	27 45	246	45 16	264	32 00	305
170	16 23	050	44 37	113	25 20	145	51 51	209	27 07	246	44 35	265	31 27	306
171	16 54	051	45 14	114	25 43	146	51 31	210	26 30	247	43 54	266	30 53	306
172	17 26	051	45 52	115	26 05	147	51 10	212	25 52	248	43 13	266	30 20	306
173	17 58	052	46 29	116	26 27	148	50 48	213	25 14	249	42 32	267	29 48	307
174	18 31	052	47 05	117	26 48	150	50 25	215	24 35	250	41 52	268	29 15	307
175	19 03	053	47 42	118	27 08	151	50 02	216	23 57	251	41 11	269	28 43	308
176	19 36	054	48 18	119	27 28	152	49 37	217	23 18	251	40 30	269	28 10	308
177	20 09	054	48 53	120	27 47	153	49 12	219	22 39	252	39 49	270	27 39	309
178	20 42	055	49 29	121	28 06	154	48 46	220	22 00	253	39 08	271	27 07	310
179	21 16	055	50 04	122	28 23	155	48 19	221	21 21	254	38 27	272	26 35	310

LAT 47°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
180	12 03	033	21 50	056	50 38	123	28 41	156	47 52	223	37 46	272	26 04	311
181	12 26	034	22 24	057	51 12	125	28 57	157	47 24	224	37 05	273	25 33	311
182	12 49	034	22 58	057	51 45	126	29 13	158	46 55	225	36 24	274	25 02	312
183	13 12	035	23 32	058	52 18	127	29 28	159	46 26	226	35 44	274	24 32	312
184	13 36	036	24 07	058	52 51	128	29 42	160	45 56	228	35 03	275	24 02	313
185	14 00	036	24 42	059	53 22	130	29 55	161	45 25	229	34 22	276	23 32	313
186	14 24	037	25 17	059	53 54	131	30 08	162	44 54	230	33 41	276	23 02	314
187	14 49	037	25 52	060	54 24	132	30 20	163	44 22	231	33 01	277	22 33	314
188	15 14	038	26 28	060	54 54	134	30 31	165	43 50	232	32 20	278	22 03	315
189	15 39	039	27 03	061	55 23	135	30 42	166	43 18	233	31 40	278	21 34	315
190	16 05	039	27 39	062	55 52	137	30 52	167	42 45	235	30 59	279	21 06	316
191	16 31	040	28 16	062	56 19	138	31 01	168	42 11	236	30 19	280	20 37	316
192	16 57	040	28 52	063	56 46	140	31 09	169	41 37	237	29 39	280	20 09	317
193	17 23	041	29 28	063	57 13	141	31 16	170	41 03	238	28 58	281	19 41	317
194	17 50	041	30 05	064	57 38	143	31 23	171	40 28	239	28 18	282	19 14	318
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	18 18	042	30 42	064	23 29	097	58 02	144	39 53	240	27 38	282	18 47	319
196	18 45	043	31 19	065	24 10	098	58 26	146	39 17	241	26 58	283	18 20	319
197	19 13	043	31 56	066	24 50	098	58 48	148	38 41	242	26 19	284	17 53	320
198	19 41	044	32 33	066	25 31	099	59 09	149	38 05	243	25 39	284	17 27	320
199	20 09	044	33 11	067	26 11	100	59 30	151	37 28	244	24 59	285	17 01	321
200	20 38	045	33 48	067	26 51	101	59 49	153	36 51	245	24 20	286	16 35	321
201	21 07	045	34 26	068	27 31	102	60 07	155	36 14	246	23 41	286	16 10	322
202	21 36	046	35 04	068	28 11	102	60 24	156	35 37	247	23 01	287	15 45	323
203	22 06	046	35 42	069	28 51	103	60 40	158	34 59	248	22 22	288	15 20	323
204	22 35	047	36 20	069	29 31	104	60 55	160	34 21	248	21 43	288	14 56	324
205	23 05	047	36 59	070	30 11	105	61 08	162	33 43	249	21 05	289	14 32	324
206	23 36	048	37 37	071	30 50	106	61 20	164	33 05	250	20 26	290	14 08	325
207	24 06	048	38 16	071	31 30	106	61 30	166	32 26	251	19 47	290	13 44	325
208	24 37	049	38 55	072	32 09	107	61 40	168	31 47	252	19 09	291	13 21	326
209	25 08	050	39 34	072	32 48	108	61 48	170	31 08	253	18 31	292	12 59	327
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		REGULUS		◆ Dubhe	
210	25 39	050	40 13	073	33 26	109	61 54	172	47 42	231	30 29	254	61 18	317
211	26 11	051	40 52	073	34 05	110	61 59	174	47 10	232	29 50	255	60 50	317
212	26 42	051	41 31	074	34 43	111	62 03	176	46 37	233	29 10	255	60 22	316
213	27 14	052	42 10	074	35 22	112	62 05	178	46 04	234	28 30	256	59 54	316
214	27 46	052	42 50	075	35 59	113	62 06	180	45 31	235	27 51	257	59 26	316
215	28 19	053	43 29	076	36 37	114	62 06	182	44 57	236	27 11	258	58 57	316
216	28 52	053	44 09	076	37 14	115	62 04	184	44 23	238	26 31	259	58 29	316
217	29 24	054	44 49	077	37 51	115	62 00	186	43 48	239	25 50	259	58 01	316
218	29 57	054	45 29	077	38 28	116	61 55	188	43 13	240	25 10	260	57 32	316
219	30 31	055	46 09	078	39 05	117	61 49	190	42 37	241	24 30	261	57 04	316
220	31 04	055	46 49	078	39 41	118	61 41	192	42 02	242	23 49	262	56 35	316
221	31 38	056	47 29	079	40 17	119	61 32	194	41 25	243	23 09	263	56 07	316
222	32 12	056	48 09	080	40 52	120	61 22	196	40 49	244	22 28	263	55 38	316
223	32 46	057	48 49	080	41 27	121	61 10	198	40 12	245	21 47	264	55 10	316
224	33 20	057	49 30	081	42 02	123	60 57	200	39 35	246	21 07	265	54 41	316
	DENEB		◆ VEGA		Rasalhague		ANTARES		◆ ARCTURUS		Denebola		◆ Dubhe	
225	33 55	058	50 10	081	42 36	124	13 45	159	60 43	201	38 57	247	54 13	316
226	34 29	058	50 51	082	43 10	125	14 00	160	60 27	203	38 20	248	53 45	316
227	35 04	059	51 31	083	43 44	126	14 13	161	60 10	205	37 42	249	53 16	316
228	35 39	059	52 12	083	44 17	127	14 26	162	59 52	207	37 03	250	52 48	316
229	36 14	060	52 53	084	44 49	128	14 39	163	59 33	209	36 25	250	52 20	316
230	36 50	060	53 33	085	45 21	129	14 50	164	59 13	210	35 46	251	51 51	316
231	37 25	060	54 14	085	45 52	130	15 01	165	58 52	212	35 07	252	51 23	317
232	38 01	061	54 55	086	46 23	132	15 12	166	58 30	214	34 28	253	50 55	317
233	38 37	061	55 36	087	46 54	133	15 22	166	58 06	215	33 49	254	50 27	317
234	39 13	062	56 17	087	47 23	134	15 31	167	57 42	217	33 10	255	49 59	317
235	39 49	062	56 57	088	47 52	135	15 40	168	57 17	219	32 30	256	49 31	317
236	40 25	063	57 38	089	48 21	137	15 48	169	56 51	220	31 50	256	49 03	317
237	41 02	063	58 19	089	48 49	138	15 55	170	56 24	222	31 11	257	48 35	317
238	41 38	064	59 00	090	49 16	139	16 02	171	55 57	223	30 31	258	48 08	318
239	42 15	064	59 41	091	49 42	141	16 08	172	55 28	225	29 50	259	47 40	318
	◆ DENEB		ALTAIR		Rasalhague		◆ ANTARES		ARCTURUS		Denebola		◆ Dubhe	
240	42 52	065	28 08	108	50 08	142	16 13	173	54 59	226	29 10	260	47 13	318
241	43 29	065	28 47	109	50 33	143	16 18	174	54 29	227	28 30	261	46 45	318
242	44 06	066	29 25	110	50 57	145	16 22	175	53 59	229	27 50	261	46 18	318
243	44 44	066	30 04	111	51 20	146	16 25	176	53 28	230	27 09	262	45 51	318
244	45 21	067	30 42	112	51 42	148	16 28	177	52 56	231	26 28	263	45 24	319
245	45 59	067	31 19	113	52 04	149	16 30	178	52 24	233	25 48	264	44 57	319
246	46 36	067	31 57	114	52 24	151	16 31	179	51 51	234	25 07	264	44 30	319
247	47 14	068	32 34	115	52 44	152	16 32	179	51 18	235	24 26	265	44 03	319
248	47 52	068	33 12	115	53 03	154	16 32	180	50 44	236	23 46	266	43 36	320
249	48 30	069	33 48	116	53 21	155	16 31	181	50 09	238	23 05	267	43 10	320
250	49 09	069	34 25	117	53 37	157	16 30	182	49 35	239	22 24	267	42 44	320
251	49 47	070	35 01	118	53 53	158	16 28	183	49 00	240	21 43	268	42 17	320
252	50 25	070	35 37	119	54 07	160	16 26	184	48 24	241	21 02	269	41 51	321
253	51 04	071	36 12	120	54 21	162	16 22	185	47 48	242	20 21	270	41 25	321
254	51 42	071	36 48	121	54 33	163	16 18	186	47 12	243	19 40	270	41 00	321
	◆ Schedar		DENEB		ALTAIR		◆ Rasalhague		ARCTURUS		◆ Alkaid		Kochab	
255	26 45	034	52 21	072	37 22	122	54 45	165	46 35	244	58 26	292	59 28	343
256	27 08	034	53 00	072	37 57	123	54 55	166	45 58	245	57 49	292	59 16	343
257	27 31	035	53 39	072	38 31	124	55 04	168	45 21	246	57 11	293	59 04	343
258	27 55	035	54 18	073	39 04	125	55 12	170	44 43	247	56 33	293	58 51	342
259	28 18	036	54 57	073	39 38	126	55 18	172	44 05	248	55 55	293	58 38	342
260	28 42	036	55 37	074	40 10	127	55 24	173	43 27	249	55 18	294	58 26	341
261	29 06	036	56 16	074	40 43	129	55 28	175	42 49	250	54 41	294	58 13	341
262	29 31	037	56 55	075	41 14	130	55 31	177	42 10	251	54 03	294	57 59	341
263	29 55	037	57 35	075	41 46	131	55 32	178	41 31	252	53 26	295	57 46	341
264	30 20	038	58 14	076	42 16	132	55 33	180	40 52	253	52 49	295	57 32	340
265	30 46	038	58 54	076	42 46	133	55 32	182	40 13	254	52 12	295	57 18	340
266	31 11	039	59 34	076	43 16	134	55 30	184	39 34	255	51 35	296	57 04	340
267	31 37	039	60 14	077	43 45	135	55 27	185	38 54	256	50 58	296	56 50	340
268	32 02	039	60 54	077	44 13	137	55 23	187	38 14	256	50 22	297	56 35	339
269	32 28	040	61 33	078	44 41	138	55 17	189	37 34	257	49 45	297	56 21	339

LAT 47°N

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	12 30	024	19 26	068	45 08	139	55 10	190	36 55	258	49 09	297	56 06	339
271	12 47	025	20 04	068	45 35	140	55 02	192	36 14	259	48 32	298	55 51	339
272	13 05	026	20 42	069	46 01	142	54 53	194	35 34	260	47 56	298	55 36	338
273	13 23	026	21 20	070	46 26	143	54 43	195	34 54	261	47 20	298	55 21	338
274	13 41	027	21 59	070	46 50	144	54 31	197	34 13	261	46 44	299	55 06	338
275	13 59	027	22 37	071	47 13	146	54 19	199	33 33	262	46 08	299	54 51	338
276	14 18	028	23 16	072	47 36	147	54 05	200	32 52	263	45 33	300	54 35	338
277	14 38	028	23 55	072	47 58	148	53 50	202	32 12	264	44 57	300	54 20	338
278	14 57	029	24 34	073	48 19	150	53 34	204	31 31	265	44 22	300	54 04	337
279	15 17	030	25 13	073	48 40	151	53 17	205	30 50	265	43 46	301	53 48	337
280	15 38	030	25 52	074	48 59	152	52 59	207	30 09	266	43 11	301	53 32	337
281	15 58	031	26 32	075	49 17	154	52 41	208	29 29	267	42 36	302	53 16	337
282	16 19	031	27 11	075	49 35	155	52 21	210	28 48	268	42 01	302	53 00	337
283	16 41	032	27 51	076	49 51	157	52 00	211	28 07	268	41 27	302	52 44	337
284	17 03	032	28 31	077	50 07	158	51 38	213	27 26	269	40 52	303	52 28	337
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
285	17 25	033	29 11	077	50 22	160	51 16	214	26 45	270	40 18	303	52 12	337
286	17 47	033	29 51	078	50 35	161	50 52	216	26 04	271	39 44	304	51 56	337
287	18 10	034	30 31	079	50 48	163	50 28	217	25 23	271	39 10	304	51 39	337
288	18 33	035	31 11	079	50 59	164	50 03	218	24 42	272	38 36	304	51 23	336
289	18 56	035	31 51	080	51 10	166	49 37	220	24 01	273	38 02	305	51 07	336
290	19 20	036	32 31	081	51 19	167	49 11	221	23 21	273	37 29	305	50 50	336
291	19 44	036	33 12	081	51 28	169	48 44	222	22 40	274	36 55	306	50 34	336
292	20 08	037	33 52	082	51 35	171	48 16	224	21 59	275	36 22	306	50 18	336
293	20 33	037	34 33	083	51 41	172	47 47	225	21 18	276	35 49	307	50 01	336
294	20 58	038	35 13	083	51 46	174	47 18	226	20 37	276	35 17	307	49 45	336
295	21 23	038	35 54	084	51 50	175	46 48	227	19 57	277	34 44	307	49 28	336
296	21 49	039	36 35	085	51 53	177	46 18	229	19 16	278	34 12	308	49 12	336
297	22 14	039	37 16	085	51 54	179	45 47	230	18 36	278	33 39	308	48 55	336
298	22 40	040	37 56	086	51 55	180	45 15	231	17 55	279	33 07	309	48 39	336
299	23 07	040	38 37	087	51 54	182	44 43	232	17 15	280	32 36	309	48 23	336
	Mirfak		◆ Alpheratz		Enif		ALTAIR		◆ Rasalhague		Alphecca		◆ Kochab	
300	23 33	041	39 18	087	46 48	141	51 52	183	44 11	233	35 04	273	48 06	336
301	24 00	041	39 59	088	47 13	142	51 49	185	43 37	234	34 23	274	47 50	336
302	24 27	042	40 40	089	47 38	143	51 45	187	43 04	236	33 42	274	47 33	336
303	24 55	042	41 21	090	48 02	144	51 40	188	42 30	237	33 01	275	47 17	337
304	25 23	043	42 02	090	48 26	146	51 33	190	41 56	238	32 21	276	47 01	337
305	25 51	043	42 43	091	48 48	147	51 26	191	41 21	239	31 40	276	46 45	337
306	26 19	044	43 23	092	49 10	149	51 17	193	40 46	240	30 59	277	46 28	337
307	26 47	044	44 04	092	49 31	150	51 07	194	40 10	241	30 19	278	46 12	337
308	27 16	045	44 45	093	49 51	151	50 57	196	39 34	242	29 38	278	45 56	337
309	27 45	045	45 26	094	50 10	153	50 45	198	38 58	243	28 58	279	45 40	337
310	28 14	046	46 07	095	50 28	154	50 32	199	38 22	244	28 17	280	45 24	337
311	28 44	046	46 48	096	50 45	156	50 18	201	37 45	245	27 37	280	45 08	337
312	29 13	047	47 28	096	51 02	157	50 03	202	37 08	246	26 57	281	44 52	337
313	29 43	047	48 09	097	51 17	159	49 47	204	36 30	247	26 17	282	44 37	337
314	30 13	048	48 49	098	51 31	160	49 31	205	35 52	248	25 37	282	44 21	337
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Kochab	
315	14 58	036	25 38	082	49 30	099	51 44	162	49 13	206	62 54	265	44 05	338
316	15 22	037	26 19	083	50 10	100	51 56	164	48 54	208	62 13	266	43 50	338
317	15 47	038	26 59	084	50 51	101	52 07	165	48 35	209	61 32	267	43 34	338
318	16 12	038	27 40	084	51 31	102	52 17	167	48 14	211	60 52	268	43 19	338
319	16 38	039	28 21	085	52 11	102	52 26	168	47 53	212	60 11	269	43 03	338
320	17 03	039	29 01	086	52 51	103	52 34	170	47 31	213	59 30	269	42 48	338
321	17 29	040	29 42	086	53 30	104	52 41	171	47 08	215	58 49	270	42 33	338
322	17 56	040	30 23	087	54 10	105	52 46	173	46 44	216	58 08	271	42 18	339
323	18 22	041	31 04	088	54 49	106	52 51	175	46 20	217	57 27	272	42 03	339
324	18 49	041	31 45	089	55 28	107	52 54	176	45 54	219	56 46	272	41 48	339
325	19 17	042	32 26	089	56 07	108	52 56	178	45 29	220	56 05	273	41 34	339
326	19 44	043	33 07	090	56 46	109	52 57	180	45 02	221	55 24	274	41 19	339
327	20 12	043	33 48	091	57 25	111	52 56	181	44 35	222	54 44	274	41 05	339
328	20 40	044	34 29	091	58 03	112	52 55	183	44 07	224	54 03	275	40 50	340
329	21 09	044	35 09	092	58 41	113	52 52	185	43 38	225	53 22	276	40 36	340
	CAPELLA		◆ Hamal		Diphda		Enif		◆ ALTAIR		VEGA		◆ Kochab	
330	21 37	045	35 50	093	15 20	140	52 48	186	43 09	226	52 41	276	40 22	340
331	22 06	045	36 31	094	15 46	140	52 43	188	42 39	227	52 01	277	40 08	340
332	22 35	046	37 12	095	16 12	141	52 37	189	42 09	228	51 20	277	39 54	340
333	23 05	046	37 53	095	16 37	142	52 30	191	41 38	230	50 40	278	39 40	340
334	23 35	047	38 33	096	17 02	143	52 22	193	41 07	231	49 59	279	39 27	341
335	24 05	047	39 14	097	17 26	144	52 12	194	40 35	232	49 19	279	39 13	341
336	24 35	048	39 55	098	17 50	145	52 02	196	40 02	233	48 38	280	39 00	341
337	25 06	048	40 35	098	18 13	146	51 50	197	39 30	234	47 58	281	38 47	341
338	25 36	049	41 16	099	18 36	147	51 37	199	38 56	235	47 18	281	38 34	342
339	26 07	050	41 56	100	18 58	148	51 24	200	38 23	236	46 38	282	38 21	342
340	26 39	050	42 36	101	19 20	149	51 09	202	37 48	237	45 58	282	38 08	342
341	27 10	051	43 16	102	19 41	150	50 53	203	37 14	238	45 18	283	37 56	342
342	27 42	051	43 56	103	20 01	151	50 36	205	36 39	239	44 38	283	37 43	342
343	28 14	052	44 36	104	20 21	151	50 18	206	36 04	240	43 58	284	37 31	343
344	28 46	052	45 16	105	20 40	152	50 00	208	35 28	241	43 18	285	37 19	343
	◆ CAPELLA		ALDEBARAN		◆ Diphda		Enif		ALTAIR		◆ VEGA		Kochab	
345	29 18	053	15 55	083	20 59	153	49 40	209	34 52	242	42 39	285	37 07	343
346	29 51	053	16 36	083	21 17	154	49 20	211	34 16	243	41 59	286	36 55	343
347	30 24	054	17 17	084	21 34	155	48 58	212	33 39	244	41 20	286	36 43	344
348	30 57	054	17 57	085	21 51	156	48 36	214	33 03	245	40 41	287	36 32	344
349	31 30	055	18 38	085	22 07	157	48 13	215	32 25	246	40 02	287	36 21	344
350	32 03	055	19 19	086	22 23	158	47 49	216	31 48	247	39 23	288	36 09	344
351	32 37	056	20 00	087	22 37	159	47 25	218	31 10	247	38 44	289	35 59	345
352	33 11	056	20 41	088	22 52	160	46 59	219	30 32	248	38 05	289	35 48	345
353	33 45	056	21 21	088	23 05	161	46 33	220	29 54	249	37 27	290	35 37	345
354	34 19	057	22 02	089	23 18	162	46 07	221	29 16	250	36 48	290	35 27	345
355	34 53	057	22 43	090	23 30	163	45 39	223	28 37	251	36 10	291	35 16	346
356	35 28	058	23 24	091	23 41	164	45 11	224	27 59	252	35 32	291	35 06	346
357	36 03	058	24 05	091	23 52	165	44 42	225	27 20	253	34 54	292	34 56	346
358	36 38	059	24 46	092	24 02	166	44 13	226	26 40	253	34 16	292	34 47	346
359	37 13	059	25 27	093	24 11	167	43 43	228	26 01	254	33 38	293	34 37	347

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LAT 46°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Diphda		ALTAIR		◆ VEGA		Kochab	
0	37 18	059	26 11	093	55 49	120	25 19	168	25 37	256	32 36	294	33 30	347
1	37 53	060	26 53	094	56 25	121	25 27	169	24 56	256	31 58	295	33 20	347
2	38 29	060	27 34	094	57 00	123	25 34	170	24 16	257	31 20	295	33 11	348
3	39 06	060	28 16	095	57 35	124	25 41	171	23 35	258	30 43	296	33 03	348
4	39 42	061	28 57	096	58 10	125	25 46	173	22 54	259	30 05	296	32 54	348
5	40 18	061	29 39	097	58 43	127	25 51	174	22 13	259	29 28	297	32 46	349
6	40 55	062	30 20	098	59 16	128	25 56	175	21 32	260	28 51	297	32 37	349
7	41 32	062	31 01	098	59 49	130	25 59	176	20 51	261	28 14	298	32 29	349
8	42 09	063	31 43	099	60 21	131	26 02	177	20 10	262	27 37	298	32 22	349
9	42 46	063	32 24	100	60 52	133	26 04	178	19 29	263	27 01	299	32 14	350
10	43 23	063	33 05	101	61 22	134	26 05	179	18 47	263	26 24	300	32 07	350
11	44 00	064	33 46	101	61 51	136	26 06	180	18 06	264	25 48	300	31 59	350
12	44 38	064	34 26	102	62 20	138	26 05	181	17 24	265	25 12	301	31 52	351
13	45 16	065	35 07	103	62 48	139	26 04	182	16 43	266	24 36	301	31 46	351
14	45 53	065	35 48	104	63 14	141	26 02	183	16 01	266	24 01	302	31 39	351
	◆ CAPELLA		ALDEBARAN		Hamal		◆ Diphda		Enif		◆ DENEB		Kochab	
15	46 31	066	36 28	105	63 40	143	26 00	184	35 07	245	46 12	294	31 33	351
16	47 09	066	37 08	106	64 05	145	25 56	185	34 29	246	45 34	294	31 27	352
17	47 47	066	37 48	107	64 28	147	25 52	186	33 51	247	44 56	294	31 21	352
18	48 26	067	38 28	107	64 51	149	25 47	187	33 12	248	44 18	295	31 15	352
19	49 04	067	39 08	108	65 12	151	25 42	188	32 34	249	43 40	295	31 10	353
20	49 43	068	39 47	109	65 32	153	25 35	189	31 55	249	43 02	296	31 04	353
21	50 21	068	40 26	110	65 50	155	25 28	190	31 16	250	42 25	296	30 59	353
22	51 00	068	41 05	111	66 07	157	25 20	191	30 36	251	41 48	297	30 55	354
23	51 39	069	41 44	112	66 23	159	25 11	193	29 57	252	41 10	297	30 50	354
24	52 18	069	42 23	113	66 37	161	25 02	194	29 17	253	40 33	297	30 46	354
25	52 57	070	43 01	114	66 50	163	24 52	195	28 37	254	39 56	298	30 41	354
26	53 36	070	43 39	115	67 01	166	24 41	196	27 57	254	39 20	298	30 38	355
27	54 15	070	44 17	116	67 10	168	24 29	197	27 17	255	38 43	299	30 34	355
28	54 54	071	44 54	117	67 18	170	24 17	198	26 36	256	38 07	299	30 30	355
29	55 34	071	45 31	118	67 24	173	24 04	199	25 56	257	37 30	300	30 27	356
	CAPELLA		◆ BETELGEUSE		RIGEL		Hamal		◆ Alpheratz		DENEB		◆ Kochab	
30	56 13	072	26 35	108	20 31	127	67 28	175	62 35	242	36 54	300	30 24	356
31	56 53	072	27 15	109	21 03	128	67 31	178	61 58	243	36 18	301	30 21	356
32	57 33	072	27 54	110	21 36	129	67 32	180	61 20	244	35 43	301	30 19	357
33	58 12	073	28 33	111	22 08	130	67 31	182	60 42	246	35 07	302	30 16	357
34	58 52	073	29 12	111	22 40	131	67 28	185	60 04	247	34 32	302	30 14	357
35	59 32	074	29 51	112	23 11	132	67 24	187	59 26	248	33 56	302	30 12	358
36	60 12	074	30 29	113	23 42	133	67 18	190	58 47	249	33 21	303	30 11	358
37	60 52	074	31 07	114	24 12	134	67 10	192	58 08	250	32 46	303	30 09	358
38	61 32	075	31 45	115	24 42	135	67 01	194	57 28	251	32 12	304	30 08	359
39	62 13	075	32 23	116	25 12	136	66 50	196	56 49	252	31 37	304	30 07	359
40	62 53	076	33 00	117	25 41	136	66 37	199	56 09	253	31 03	305	30 06	359
41	63 33	076	33 37	118	26 09	137	66 23	201	55 29	254	30 29	305	30 06	359
42	64 14	076	34 14	119	26 37	138	66 08	203	54 49	255	29 55	306	30 06	000
43	64 54	077	34 51	120	27 04	139	65 50	205	54 08	256	29 21	306	30 06	000
44	65 35	077	35 27	121	27 31	140	65 32	207	53 28	257	28 48	307	30 06	000
	◆ Dubhe		POLLUX		BETELGEUSE		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
45	27 33	027	32 07	082	36 02	122	27 58	141	65 12	209	52 47	258	28 14	307
46	27 53	028	32 48	082	36 38	123	28 23	142	64 51	211	52 06	259	27 41	308
47	28 12	028	33 30	083	37 12	124	28 48	143	64 29	213	51 25	260	27 09	308
48	28 32	028	34 11	083	37 47	125	29 13	144	64 05	215	50 44	261	26 36	309
49	28 52	029	34 52	084	38 21	126	29 37	146	63 40	217	50 03	262	26 04	309
50	29 12	029	35 34	085	38 55	127	30 00	147	63 15	219	49 21	263	25 31	310
51	29 32	030	36 15	086	39 28	128	30 23	148	62 48	221	48 40	263	25 00	310
52	29 53	030	36 57	086	40 01	129	30 45	149	62 20	222	47 59	264	24 28	311
53	30 14	030	37 39	087	40 33	130	31 06	150	61 52	224	47 17	265	23 56	311
54	30 35	031	38 20	088	41 05	131	31 27	151	61 22	226	46 36	266	23 25	312
55	30 57	031	39 02	088	41 36	132	31 47	152	60 52	227	45 54	267	22 54	312
56	31 18	031	39 43	089	42 06	133	32 06	153	60 21	229	45 12	267	22 24	313
57	31 40	032	40 25	090	42 36	134	32 24	154	59 49	230	44 31	268	21 53	313
58	32 02	032	41 07	090	43 06	136	32 42	155	59 17	232	43 49	269	21 23	314
59	32 24	032	41 49	091	43 35	137	32 59	156	58 44	233	43 07	270	20 53	314
	◆ Dubhe		POLLUX		SIRIUS		◆ RIGEL		Hamal		◆ Alpheratz		DENEB	
60	32 47	033	42 30	092	16 57	138	33 16	158	58 10	235	42 26	270	20 24	315
61	33 10	033	43 12	093	17 24	139	33 31	159	57 36	236	41 44	271	19 54	316
62	33 32	034	43 53	093	17 51	140	33 46	160	57 01	237	41 02	272	19 25	316
63	33 56	034	44 35	094	18 17	141	34 00	161	56 25	239	40 21	272	18 57	317
64	34 19	034	45 17	095	18 43	142	34 13	162	55 50	240	39 39	273	18 28	317
65	34 42	034	45 58	096	19 09	143	34 25	163	55 13	241	38 57	274	18 00	318
66	35 06	035	46 40	096	19 33	144	34 37	165	54 37	242	38 16	274	17 32	318
67	35 30	035	47 21	097	19 58	145	34 48	166	54 00	243	37 34	275	17 04	319
68	35 54	035	48 02	098	20 21	146	34 57	167	53 22	245	36 53	276	16 37	319
69	36 18	036	48 43	099	20 45	147	35 06	168	52 44	246	36 11	276	16 10	320
70	36 43	036	49 25	100	21 07	148	35 15	169	52 06	247	35 30	277	15 44	321
71	37 07	036	50 06	101	21 29	149	35 22	171	51 28	248	34 49	278	15 17	321
72	37 32	037	50 46	102	21 51	150	35 28	172	50 49	249	34 07	278	14 51	322
73	37 57	037	51 27	102	22 12	150	35 34	173	50 10	250	33 26	279	14 26	322
74	38 22	037	52 08	103	22 32	151	35 39	174	49 31	251	32 45	280	14 00	323
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		◆ Hamal		Schedar	
75	38 48	037	17 19	091	36 30	127	22 51	152	35 42	175	48 51	252	49 50	310
76	39 13	038	18 01	091	37 03	128	23 10	153	35 45	177	48 12	253	49 18	310
77	39 39	038	18 43	092	37 35	129	23 29	154	35 47	178	47 32	254	48 46	310
78	40 04	038	19 24	093	38 07	130	23 46	155	35 49	179	46 52	255	48 14	310
79	40 30	039	20 06	094	38 39	131	24 03	156	35 49	180	46 11	256	47 43	310
80	40 56	039	20 48	094	39 10	133	24 20	157	35 48	181	45 31	256	47 11	311
81	41 23	039	21 29	095	39 40	134	24 35	158	35 47	183	44 50	257	46 39	311
82	41 49	039	22 11	096	40 10	135	24 50	159	35 44	184	44 09	258	46 08	311
83	42 15	040	22 52	097	40 40	136	25 05	160	35 41	185	43 29	259	45 37	311
84	42 42	040	23 33	097	41 08	137	25 18	161	35 37	186	42 48	260	45 05	312
85	43 09	040	24 15	098	41 36	138	25 31	163	35 32	188	42 07	261	44 34	312
86	43 36	040	24 56	099	42 04	139	25 43	164	35 26	189	41 25	262	44 03	312
87	44 02	040	25 37	100	42 31	141	25 55	165	35 19	190	40 44	262	43 32	312
88	44 30	041	26 18	100	42 57	142	26 06	166	35 12	191	40 03	263	43 02	313
89	44 57	041	26 59	101	43 22	143	26 15	167	35 03	192	39 21	264	42 31	313

LAT 46°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Dubhe		REGULUS		PROCYON		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
90	45 24	041	27 40	102	43 47	144	26 25	168	34 54	194	55 49	217	64 07	293
91	45 51	041	28 21	103	44 11	146	26 33	169	34 44	195	55 23	219	63 29	293
92	46 19	041	29 01	104	44 34	147	26 41	170	34 33	196	54 57	220	62 50	293
93	46 47	042	29 42	104	44 56	148	26 48	171	34 21	197	54 30	222	62 12	293
94	47 14	042	30 22	105	45 18	149	26 54	172	34 08	198	54 01	223	61 34	294
95	47 42	042	31 02	106	45 39	151	26 59	173	33 55	199	53 32	225	60 56	294
96	48 10	042	31 42	107	45 59	152	27 04	174	33 40	201	53 03	226	60 18	294
97	48 38	042	32 22	108	46 18	154	27 08	175	33 25	202	52 33	227	59 40	294
98	49 06	042	33 01	109	46 36	155	27 11	176	33 10	203	52 02	229	59 02	295
99	49 34	042	33 41	109	46 53	156	27 13	177	32 53	204	51 30	230	58 24	295
100	50 02	043	34 20	110	47 09	158	27 15	178	32 36	205	50 58	231	57 46	295
101	50 30	043	34 59	111	47 25	159	27 16	180	32 18	206	50 25	232	57 08	295
102	50 58	043	35 38	112	47 39	161	27 16	181	31 59	207	49 52	234	56 31	296
103	51 27	043	36 16	113	47 52	162	27 15	182	31 39	208	49 18	235	55 53	296
104	51 55	043	36 54	114	48 05	163	27 13	183	31 19	210	48 44	236	55 16	296
	◆ Dubhe		Denebola		REGULUS		◆ SIRIUS		RIGEL		ALDEBARAN		◆ Mirfak	
105	52 23	043	22 30	092	37 32	115	27 11	184	30 58	211	48 09	237	54 38	296
106	52 52	043	23 12	093	38 10	116	27 08	185	30 37	212	47 33	238	54 01	297
107	53 20	043	23 53	094	38 47	117	27 04	186	30 14	213	46 58	239	53 24	297
108	53 49	043	24 35	094	39 24	118	26 59	187	29 52	214	46 22	241	52 46	297
109	54 17	043	25 16	095	40 01	119	26 53	188	29 28	215	45 45	242	52 09	298
110	54 46	043	25 58	096	40 37	120	26 47	189	29 04	216	45 08	243	51 33	298
111	55 14	043	26 39	097	41 13	121	26 40	190	28 39	217	44 31	244	50 56	298
112	55 43	043	27 21	097	41 49	122	26 32	191	28 14	218	43 54	245	50 19	298
113	56 11	043	28 02	098	42 24	123	26 24	192	27 48	219	43 16	246	49 42	299
114	56 40	043	28 43	099	42 59	124	26 15	193	27 21	220	42 38	247	49 06	299
115	57 08	043	29 24	100	43 33	125	26 05	194	26 54	221	41 59	248	48 30	299
116	57 36	043	30 05	101	44 07	126	25 54	196	26 27	222	41 21	249	47 53	300
117	58 05	043	30 46	101	44 40	127	25 42	197	25 59	223	40 42	250	47 17	300
118	58 33	043	31 27	102	45 13	128	25 30	198	25 30	224	40 03	250	46 41	300
119	59 01	043	32 08	103	45 46	130	25 17	199	25 01	225	39 23	251	46 05	301
	◆ Kochab		Denebola		◆ REGULUS		SIRIUS		RIGEL		◆ ALDEBARAN		CAPELLA	
120	40 33	021	32 48	104	46 17	131	25 03	200	24 31	226	38 44	252	62 09	285
121	40 47	021	33 29	105	46 49	132	24 49	201	24 01	227	38 04	253	61 28	285
122	41 02	021	34 09	105	47 19	133	24 34	202	23 31	228	37 24	254	60 48	286
123	41 17	021	34 49	106	47 49	135	24 18	203	23 00	229	36 44	255	60 08	286
124	41 32	021	35 29	107	48 19	136	24 02	204	22 28	229	36 03	256	59 28	286
125	41 47	021	36 09	108	48 48	137	23 45	205	21 56	230	35 23	257	58 48	287
126	42 03	022	36 48	109	49 16	138	23 27	206	21 24	231	34 42	257	58 08	287
127	42 18	022	37 27	110	49 43	140	23 09	207	20 51	232	34 02	258	57 29	288
128	42 33	022	38 07	111	50 09	141	22 50	208	20 18	233	33 21	259	56 49	288
129	42 49	022	38 45	112	50 35	142	22 30	209	19 45	234	32 40	260	56 09	288
130	43 04	022	39 24	113	51 00	144	22 10	210	19 11	235	31 59	261	55 30	289
131	43 20	022	40 02	114	51 24	145	21 49	211	18 37	236	31 18	261	54 50	289
132	43 36	022	40 40	115	51 48	147	21 27	212	18 02	236	30 36	262	54 11	290
133	43 52	022	41 18	115	52 10	148	21 05	212	17 27	237	29 55	263	53 32	290
134	44 07	022	41 56	116	52 32	150	20 42	213	16 52	238	29 14	264	52 53	290
	◆ Kochab		ARCTURUS		Denebola		◆ REGULUS		SIRIUS		BETELGEUSE		◆ CAPELLA	
135	44 23	023	21 05	084	42 33	117	52 52	151	20 19	214	34 50	240	52 14	291
136	44 39	023	21 46	085	43 10	119	53 12	153	19 55	215	34 14	241	51 35	291
137	44 55	023	22 28	085	43 46	120	53 30	154	19 31	216	33 37	242	50 56	292
138	45 12	023	23 10	086	44 22	121	53 48	156	19 06	217	33 00	243	50 17	292
139	45 28	023	23 51	087	44 58	122	54 04	157	18 41	218	32 23	244	49 39	292
140	45 44	023	24 33	087	45 33	123	54 20	159	18 15	219	31 45	245	49 00	293
141	46 00	023	25 14	088	46 08	124	54 34	161	17 48	220	31 07	246	48 22	293
142	46 17	023	25 56	089	46 42	125	54 47	162	17 21	221	30 29	247	47 44	294
143	46 33	023	26 38	090	47 16	126	55 00	164	16 54	222	29 51	248	47 05	294
144	46 49	023	27 19	090	47 49	127	55 10	166	16 26	222	29 12	249	46 27	294
145	47 06	023	28 01	091	48 22	129	55 20	167	15 58	223	28 33	249	45 50	295
146	47 22	023	28 43	092	48 55	130	55 29	169	15 29	224	27 54	250	45 12	295
147	47 38	023	29 24	092	49 26	131	55 36	171	15 00	225	27 15	251	44 34	296
148	47 55	023	30 06	093	49 58	132	55 42	173	14 30	226	26 35	252	43 57	296
149	48 11	023	30 48	094	50 28	134	55 47	174	14 00	227	25 55	253	43 19	297
	◆ Kochab		ARCTURUS		◆ SPICA		REGULUS		PROCYON		◆ BETELGEUSE		CAPELLA	
150	48 28	023	31 29	095	16 30	127	55 50	176	39 11	227	25 15	254	42 42	297
151	48 44	023	32 11	095	17 03	128	55 53	178	38 40	229	24 35	254	42 05	297
152	49 01	023	32 52	096	17 36	129	55 54	179	38 09	230	23 55	255	41 28	298
153	49 17	023	33 34	097	18 08	129	55 53	181	37 37	231	23 15	256	40 51	298
154	49 33	023	34 15	098	18 40	130	55 52	183	37 04	232	22 34	257	40 15	299
155	49 50	023	34 56	099	19 12	131	55 49	185	36 31	233	21 54	258	39 38	299
156	50 06	023	35 37	099	19 43	132	55 45	186	35 58	234	21 13	258	39 02	300
157	50 22	023	36 18	100	20 14	133	55 40	188	35 24	235	20 32	259	38 26	300
158	50 39	023	36 59	101	20 44	134	55 33	190	34 50	236	19 51	260	37 50	300
159	50 55	023	37 40	102	21 14	135	55 25	192	34 15	237	19 10	261	37 14	301
160	51 11	023	38 21	103	21 43	136	55 16	193	33 40	238	18 29	261	36 38	301
161	51 27	023	39 02	103	22 12	137	55 06	195	33 05	239	17 48	262	36 03	302
162	51 44	023	39 42	104	22 41	137	54 55	197	32 29	240	17 06	263	35 27	302
163	52 00	023	40 22	105	23 09	138	54 42	198	31 53	241	16 25	264	34 52	303
164	52 16	022	41 02	106	23 36	139	54 28	200	31 16	242	15 43	264	34 17	303
165	◆ VEGA		ARCTURUS		◆ SPICA		REGULUS		PROCYON		◆ POLLUX		CAPELLA	
	13 09	047	41 42	107	24 03	140	54 14	202	30 39	242	48 07	262	33 43	304
166	13 39	047	42 22	108	24 29	141	53 58	203	30 02	243	47 26	263	33 08	304
167	14 10	048	43 02	109	24 55	142	53 41	205	29 25	244	46 44	263	32 34	305
168	14 41	049	43 41	110	25 20	143	53 23	206	28 47	245	46 03	264	31 59	305
169	15 13	049	44 20	111	25 45	144	53 04	208	28 09	246	45 21	265	31 25	306
170	15 44	050	44 59	112	26 09	145	52 44	209	27 31	247	44 40	266	30 52	306
171	16 16	050	45 38	113	26 33	146	52 23	211	26 53	248	43 58	267	30 18	306
172	16 49	051	46 16	114	26 55	147	52 01	212	26 14	249	43 17	267	29 44	307
173	17 21	052	46 54	115	27 18	148	51 38	214	25 35	249	42 35	268	29 11	307
174	17 54	052	47 32	116	27 39	149	51 14	215	24 56	250	41 53	269	28 38	308
175	18 27	053	48 09	117	28 00	150	50 50	217	24 17	251	41 12	270	28 06	308
176	19 00	053	48 46	118	28 21	151	50 25	218	23 37	252	40 30	270	27 33	309
177	19 34	054	49 23	119	28 40	152	49 59	219	22 57	253	39 48	271	27 01	309
178	20 08	054	49 59	120	28 59	153	49 32	221	22 18	254	39 07	272	26 29	310
179	20 42	055	50 35	121	29 18	155	49 04	222	21 37	254	38 25	272	25 57	310

Tilbage til Menuen

LAT 46°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ DENEB		VEGA		ARCTURUS		◆ SPICA		REGULUS		◆ POLLUX		CAPELLA	
180	11 13	033	21 16	056	51 10	122	29 35	156	48 36	223	37 43	273	25 25	311
181	11 36	034	21 50	056	51 45	124	29 52	157	48 07	225	37 02	274	24 54	311
182	11 59	034	22 25	057	52 20	125	30 08	158	47 37	226	36 20	274	24 23	312
183	12 23	035	23 00	057	52 54	126	30 24	159	47 07	227	35 39	275	23 52	312
184	12 47	035	23 35	058	53 27	127	30 38	160	46 36	228	34 57	276	23 21	313
185	13 11	036	24 11	058	54 00	129	30 52	161	46 04	230	34 16	276	22 51	313
186	13 36	037	24 46	059	54 32	130	31 05	162	45 32	231	33 34	277	22 20	314
187	14 01	037	25 22	060	55 04	131	31 18	163	45 00	232	32 53	278	21 51	314
188	14 26	038	25 58	060	55 35	133	31 29	164	44 27	233	32 12	278	21 21	315
189	14 52	038	26 34	061	56 05	134	31 40	166	43 53	234	31 31	279	20 52	316
190	15 18	039	27 11	061	56 35	136	31 50	167	43 19	235	30 49	280	20 23	316
191	15 44	039	27 47	062	57 04	137	31 59	168	42 44	236	30 08	280	19 54	317
192	16 11	040	28 24	062	57 32	139	32 08	169	42 10	237	29 27	281	19 25	317
193	16 38	041	29 01	063	57 59	140	32 15	170	41 34	239	28 47	282	18 57	318
194	17 05	041	29 38	063	58 25	142	32 22	171	40 58	240	28 06	282	18 29	318
	◆ DENEB		VEGA		Rasalhague		◆ ARCTURUS		REGULUS		◆ POLLUX		CAPELLA	
195	17 33	042	30 16	064	23 36	096	58 51	143	40 22	241	27 25	283	18 02	319
196	18 01	042	30 53	064	24 17	097	59 15	145	39 46	242	26 45	284	17 34	319
197	18 29	043	31 31	065	24 59	098	59 38	147	39 09	243	26 04	284	17 07	320
198	18 57	043	32 09	066	25 40	099	60 01	148	38 32	244	25 24	285	16 41	320
199	19 26	044	32 47	066	26 21	099	60 22	150	37 54	245	24 44	285	16 14	321
200	19 55	044	33 25	067	27 02	100	60 42	152	37 17	245	24 03	286	15 48	322
201	20 25	045	34 03	067	27 43	101	61 01	154	36 39	246	23 23	287	15 22	322
202	20 54	046	34 42	068	28 24	102	61 19	156	36 00	247	22 44	287	14 57	323
203	21 24	046	35 20	068	29 05	103	61 36	158	35 22	248	22 04	288	14 32	323
204	21 54	047	35 59	069	29 45	103	61 51	159	34 43	249	21 24	289	14 07	324
205	22 25	047	36 38	069	30 26	104	62 05	161	34 04	250	20 45	289	13 43	324
206	22 55	048	37 17	070	31 06	105	62 17	163	33 24	251	20 06	290	13 19	325
207	23 26	048	37 56	070	31 46	106	62 29	165	32 45	252	19 27	291	12 55	326
208	23 57	049	38 35	071	32 26	107	62 38	167	32 05	253	18 48	291	12 32	326
209	24 29	049	39 15	071	33 06	108	62 47	169	31 25	253	18 09	292	12 09	327
	DENEB		◆ VEGA		Rasalhague		◆ ARCTURUS		Denebola		REGULUS		◆ Dubhe	
210	25 00	050	39 54	072	33 46	108	62 54	172	48 19	232	30 45	254	60 34	318
211	25 32	050	40 34	072	34 25	109	62 59	174	47 47	233	30 05	255	60 06	318
212	26 05	051	41 14	073	35 04	110	63 03	176	47 13	234	29 25	256	59 38	318
213	26 37	051	41 54	074	35 43	111	63 05	178	46 39	235	28 44	257	59 10	318
214	27 09	052	42 34	074	36 22	112	63 06	180	46 05	236	28 04	258	58 42	317
215	27 42	052	43 14	075	37 01	113	63 06	182	45 30	237	27 23	258	58 14	317
216	28 15	053	43 54	075	37 39	114	63 04	184	44 55	238	26 42	259	57 45	317
217	28 49	053	44 35	076	38 17	115	63 00	186	44 19	239	26 01	260	57 17	317
218	29 22	054	45 15	076	38 55	116	62 55	188	43 43	241	25 20	261	56 49	317
219	29 56	054	45 56	077	39 32	117	62 48	190	43 06	242	24 39	261	56 20	317
220	30 30	055	46 36	077	40 09	118	62 40	192	42 30	243	23 58	262	55 52	317
221	31 04	055	47 17	078	40 46	119	62 30	194	41 52	244	23 16	263	55 23	317
222	31 38	056	47 58	079	41 22	120	62 19	196	41 15	245	22 35	264	54 55	317
223	32 13	056	48 39	079	41 58	121	62 07	198	40 37	246	21 53	264	54 26	317
224	32 47	057	49 20	080	42 34	122	61 53	200	39 59	247	21 12	265	53 58	317
	DENEB		◆ VEGA		Rasalhague		ANTARES		◆ ARCTURUS		Denebola		◆ Dubhe	
225	33 22	057	50 01	080	43 09	123	14 42	159	61 38	202	39 21	247	53 29	317
226	33 57	058	50 42	081	43 44	124	14 56	160	61 22	204	38 42	248	53 01	317
227	34 33	058	51 23	081	44 18	125	15 10	161	61 04	206	38 03	249	52 33	317
228	35 08	058	52 04	082	44 52	126	15 23	162	60 46	208	37 24	250	52 04	317
229	35 44	059	52 46	083	45 26	127	15 36	163	60 26	210	36 45	251	51 36	317
230	36 19	059	53 27	083	45 59	128	15 48	164	60 05	211	36 05	252	51 08	317
231	36 55	060	54 08	084	46 31	130	15 59	165	59 42	213	35 25	253	50 39	317
232	37 31	060	54 50	084	47 03	131	16 10	166	59 19	215	34 45	254	50 11	317
233	38 08	061	55 31	085	47 34	132	16 20	166	58 55	216	34 05	255	49 43	318
234	38 44	061	56 13	086	48 05	133	16 30	167	58 30	218	33 25	255	49 15	318
235	39 21	062	56 54	086	48 35	135	16 38	168	58 04	220	32 45	256	48 47	318
236	39 57	062	57 36	087	49 04	136	16 47	169	57 37	221	32 04	257	48 19	318
237	40 34	063	58 18	088	49 33	137	16 54	170	57 09	223	31 23	258	47 51	318
238	41 11	063	58 59	088	50 01	138	17 01	171	56 40	224	30 43	259	47 23	318
239	41 49	063	59 41	089	50 28	140	17 07	172	56 11	226	30 02	259	46 55	318
	◆ DENEB		ALTAIR		Rasalhague		◆ ANTARES		ARCTURUS		Denebola		◆ Dubhe	
240	42 26	064	28 27	108	50 55	141	17 13	173	55 40	227	29 21	260	46 28	319
241	43 03	064	29 06	109	51 21	143	17 17	174	55 10	228	28 40	261	46 00	319
242	43 41	065	29 46	110	51 45	144	17 22	175	54 38	230	27 58	262	45 33	319
243	44 19	065	30 25	110	52 10	145	17 25	176	54 06	231	27 17	263	45 05	319
244	44 57	066	31 04	111	52 33	147	17 28	177	53 33	232	26 36	263	44 38	319
245	45 35	066	31 42	112	52 55	148	17 30	178	53 00	234	25 54	264	44 11	320
246	46 13	066	32 21	113	53 17	150	17 31	179	52 26	235	25 13	265	43 44	320
247	46 51	067	32 59	114	53 37	151	17 32	179	51 51	236	24 31	266	43 17	320
248	47 30	067	33 37	115	53 56	153	17 32	180	51 17	237	23 50	266	42 51	320
249	48 08	068	34 15	116	54 15	155	17 31	181	50 41	239	23 08	267	42 24	320
250	48 47	068	34 52	117	54 32	156	17 30	182	50 05	240	22 26	268	41 57	321
251	49 26	069	35 29	118	54 49	158	17 28	183	49 29	241	21 45	269	41 31	321
252	50 04	069	36 06	119	55 04	159	17 25	184	48 53	242	21 03	269	41 05	321
253	50 43	069	36 42	120	55 18	161	17 22	185	48 16	243	20 21	270	40 39	321
254	51 22	070	37 18	121	55 31	163	17 18	186	47 38	244	19 40	271	40 13	322
	◆ Schedar		DENEB		ALTAIR		◆ Rasalhague		ARCTURUS		◆ Alkaid		Kochab	
255	25 55	034	52 02	070	37 54	122	55 43	164	47 01	245	58 03	294	58 30	344
256	26 18	034	52 41	071	38 29	123	55 53	166	46 23	246	57 25	294	58 18	343
257	26 42	034	53 20	071	39 04	124	56 03	168	45 44	247	56 47	294	58 06	343
258	27 05	035	54 00	072	39 39	125	56 11	170	45 06	248	56 09	294	57 54	343
259	27 29	035	54 39	072	40 13	126	56 18	171	44 27	249	55 31	295	57 41	342
260	27 54	036	55 19	072	40 46	127	56 23	173	43 48	250	54 53	295	57 29	342
261	28 18	036	55 59	073	41 20	128	56 28	175	43 09	251	54 15	295	57 16	342
262	28 43	037	56 39	073	41 52	129	56 31	177	42 29	252	53 38	296	57 02	341
263	29 08	037	57 19	074	42 24	130	56 32	178	41 49	253	53 00	296	56 49	341
264	29 33	037	57 59	074	42 56	131	56 33	180	41 09	254	52 23	296	56 35	341
265	29 58	038	58 39	074	43 27	132	56 32	182	40 29	255	51 46	297	56 22	341
266	30 24	038	59 19	075	43 58	134	56 30	184	39 49	256	51 08	297	56 08	340
267	30 50	039	59 59	075	44 28	135	56 27	185	39 09	256	50 31	297	55 53	340
268	31 16	039	60 40	076	44 57	136	56 22	187	38 28	257	49 54	298	55 39	340
269	31 42	039	61 20	076	45 26	137	56 16	189	37 47	258	49 17	298	55 25	340

LAT 46°N

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
270	11 36	024	19 03	067	45 54	138	56 09	191	37 06	259	48 41	298	55 10	339
271	11 53	025	19 42	068	46 21	140	56 01	192	36 25	260	48 04	299	54 55	339
272	12 11	025	20 20	069	46 47	141	55 51	194	35 44	261	47 27	299	54 40	339
273	12 29	026	20 59	069	47 13	142	55 40	196	35 03	261	46 51	299	54 25	339
274	12 47	027	21 38	070	47 38	144	55 28	198	34 22	262	46 15	300	54 10	339
275	13 06	027	22 17	070	48 03	145	55 15	199	33 41	263	45 39	300	53 55	338
276	13 25	028	22 57	071	48 26	146	55 01	201	32 59	264	45 03	300	53 39	338
277	13 45	028	23 36	072	48 49	148	54 46	203	32 18	264	44 27	301	53 24	338
278	14 05	029	24 16	072	49 11	149	54 29	204	31 36	265	43 51	301	53 08	338
279	14 25	029	24 56	073	49 32	150	54 12	206	30 55	266	43 15	302	52 53	338
280	14 46	030	25 36	074	49 52	152	53 53	207	30 13	267	42 40	302	52 37	338
281	15 07	031	26 16	074	50 11	153	53 33	209	29 32	267	42 05	302	52 21	338
282	15 28	031	26 56	075	50 29	155	53 13	210	28 50	268	41 29	303	52 05	337
283	15 50	032	27 36	075	50 46	156	52 51	212	28 08	269	40 54	303	51 49	337
284	16 12	032	28 17	076	51 03	158	52 29	213	27 27	270	40 20	303	51 33	337
	◆ Mirfak		Alpheratz		◆ ALTAIR		Rasalhague		◆ ARCTURUS		Alkaid		Kochab	
285	16 34	033	28 57	077	51 18	159	52 05	215	26 45	270	39 45	304	51 17	337
286	16 57	033	29 38	077	51 32	161	51 41	216	26 03	271	39 10	304	51 01	337
287	17 20	034	30 18	078	51 45	162	51 16	218	25 22	272	38 36	305	50 44	337
288	17 43	034	30 59	079	51 57	164	50 50	219	24 40	272	38 02	305	50 28	337
289	18 07	035	31 40	079	52 08	166	50 23	220	23 58	273	37 28	305	50 12	337
290	18 31	035	32 21	080	52 18	167	49 56	222	23 17	274	36 54	306	49 55	337
291	18 55	036	33 02	081	52 27	169	49 28	223	22 35	275	36 20	306	49 39	337
292	19 20	037	33 43	081	52 34	170	48 59	224	21 54	275	35 47	307	49 23	337
293	19 45	037	34 25	082	52 40	172	48 29	226	21 12	276	35 13	307	49 06	337
294	20 10	038	35 06	083	52 46	174	47 59	227	20 31	277	34 40	308	48 50	337
295	20 36	038	35 47	083	52 50	175	47 28	228	19 49	277	34 07	308	48 33	337
296	21 02	039	36 29	084	52 52	177	46 57	229	19 08	278	33 35	308	48 17	337
297	21 28	039	37 10	085	52 54	179	46 25	231	18 27	279	33 02	309	48 00	337
298	21 54	040	37 52	085	52 55	180	45 53	232	17 46	279	32 30	309	47 44	337
299	22 21	040	38 33	086	52 54	182	45 20	233	17 05	280	31 57	310	47 28	337
	Mirfak		◆ Alpheratz		Enif		ALTAIR		◆ Rasalhague		Alphecca		◆ Kochab	
300	22 48	041	39 15	087	47 34	140	52 52	183	44 46	234	35 00	274	47 11	337
301	23 15	041	39 56	087	48 00	141	52 49	185	44 12	235	34 19	274	46 55	337
302	23 43	042	40 38	088	48 26	142	52 44	187	43 38	236	33 37	275	46 38	337
303	24 10	042	41 20	089	48 51	144	52 39	188	43 03	237	32 56	276	46 22	337
304	24 39	043	42 01	089	49 15	145	52 32	190	42 27	238	32 14	276	46 06	337
305	25 07	043	42 43	090	49 38	147	52 25	192	41 52	239	31 33	277	45 49	337
306	25 35	044	43 25	091	50 01	148	52 16	193	41 16	241	30 51	278	45 33	337
307	26 04	044	44 06	092	50 23	149	52 06	195	40 39	242	30 10	278	45 17	337
308	26 33	044	44 48	092	50 43	151	51 54	196	40 02	243	29 29	279	45 01	337
309	27 03	045	45 30	093	51 03	152	51 42	198	39 25	243	28 48	280	44 45	337
310	27 32	045	46 11	094	51 22	154	51 29	199	38 48	244	28 07	280	44 29	337
311	28 02	046	46 53	095	51 40	155	51 14	201	38 10	245	27 26	281	44 13	338
312	28 32	046	47 34	095	51 57	157	50 59	203	37 32	246	26 45	282	43 57	338
313	29 02	047	48 16	096	52 13	158	50 42	204	36 54	247	26 04	282	43 41	338
314	29 33	047	48 57	097	52 28	160	50 25	205	36 15	248	25 24	283	43 25	338
	CAPELLA		◆ Hamal		Alpheratz		Enif		◆ ALTAIR		VEGA		◆ Kochab	
315	14 10	036	25 30	082	49 39	098	52 41	162	50 07	207	62 58	267	43 10	338
316	14 34	037	26 11	082	50 20	099	52 54	163	49 47	208	62 16	268	42 54	338
317	15 00	037	26 52	083	51 01	099	53 05	165	49 27	210	61 34	269	42 39	338
318	15 25	038	27 34	084	51 42	100	53 16	166	49 06	211	60 53	270	42 23	338
319	15 51	038	28 15	084	52 23	101	53 25	168	48 44	213	60 11	270	42 08	338
320	16 17	039	28 57	085	53 04	102	53 33	170	48 21	214	59 29	271	41 52	339
321	16 43	040	29 38	086	53 45	103	53 40	171	47 57	215	58 48	272	41 37	339
322	17 10	040	30 20	087	54 25	104	53 46	173	47 32	217	58 06	272	41 22	339
323	17 37	041	31 01	087	55 05	105	53 50	175	47 07	218	57 25	273	41 07	339
324	18 04	041	31 43	088	55 46	106	53 54	176	46 41	219	56 43	274	40 52	339
325	18 32	042	32 25	089	56 26	107	53 56	178	46 14	221	56 01	274	40 38	339
326	19 00	042	33 06	089	57 05	108	53 57	180	45 47	222	55 20	275	40 23	340
327	19 28	043	33 48	090	57 45	109	53 56	181	45 19	223	54 38	276	40 08	340
328	19 57	043	34 30	091	58 24	110	53 55	183	44 50	224	53 57	276	39 54	340
329	20 26	044	35 11	092	59 03	111	53 52	185	44 20	226	53 15	277	39 40	340
	CAPELLA		◆ Hamal		Diphda		Enif		◆ ALTAIR		VEGA		◆ Kochab	
330	20 55	045	35 53	092	16 05	139	53 48	186	43 50	227	52 34	278	39 26	340
331	21 24	045	36 35	093	16 32	140	53 43	188	43 20	228	51 53	278	39 12	340
332	21 54	046	37 16	094	16 58	141	53 36	190	42 48	229	51 12	279	38 58	341
333	22 23	046	37 58	095	17 24	142	53 29	191	42 17	230	50 30	279	38 44	341
334	22 54	047	38 39	095	17 50	143	53 20	193	41 44	231	49 49	280	38 30	341
335	23 24	047	39 21	096	18 15	144	53 10	195	41 12	232	49 08	280	38 17	341
336	23 55	048	40 02	097	18 39	145	52 59	196	40 38	233	48 27	281	38 03	341
337	24 26	048	40 44	098	19 03	146	52 47	198	40 05	235	47 46	282	37 50	342
338	24 57	049	41 25	098	19 26	147	52 34	199	39 30	236	47 06	282	37 37	342
339	25 28	049	42 06	099	19 49	148	52 20	201	38 56	237	46 25	283	37 24	342
340	26 00	050	42 47	100	20 11	148	52 04	202	38 21	238	45 44	283	37 11	342
341	26 32	050	43 28	101	20 32	149	51 48	204	37 45	239	45 04	284	36 58	342
342	27 04	051	44 09	102	20 53	150	51 30	205	37 10	240	44 23	284	36 46	343
343	27 36	051	44 50	103	21 14	151	51 12	207	36 34	241	43 43	285	36 34	343
344	28 09	052	45 30	104	21 33	152	50 53	208	35 57	242	43 03	285	36 21	343
	◆ CAPELLA		ALDEBARAN		◆ Diphda		Enif		ALTAIR		◆ VEGA		Kochab	
345	28 42	052	15 47	082	21 52	153	50 32	210	35 20	243	42 23	286	36 09	343
346	29 15	053	16 29	083	22 11	154	50 11	211	34 43	243	41 43	287	35 57	344
347	29 48	053	17 10	084	22 29	155	49 49	213	34 06	244	41 03	287	35 46	344
348	30 21	054	17 52	084	22 46	156	49 26	214	33 28	245	40 23	288	35 34	344
349	30 55	054	18 33	085	23 02	157	49 02	216	32 50	246	39 43	288	35 23	344
350	31 29	055	19 15	086	23 18	158	48 38	217	32 12	247	39 04	289	35 12	345
351	32 03	055	19 56	087	23 33	159	48 12	218	31 33	248	38 25	289	35 01	345
352	32 37	055	20 38	087	23 48	160	47 46	220	30 54	249	37 45	290	34 50	345
353	33 11	056	21 19	088	24 02	161	47 19	221	30 15	250	37 06	290	34 39	345
354	33 46	056	22 01	089	24 15	162	46 51	222	29 36	251	36 27	291	34 29	346
355	34 21	057	22 43	089	24 27	163	46 23	223	28 57	251	35 48	291	34 18	346
356	34 56	057	23 25	090	24 39	164	45 54	225	28 17	252	35 10	292	34 08	346
357	35 31	058	24 06	091	24 50	165	45 25	226	27 37	253	34 31	292	33 58	346
358	36 06	058	24 48	092	25 00	166	44 54	227	26 57	254	33 52	293	33 48	347
359	36 42	059	25 30	092	25 10	167	44 23	228	26 17	255	33 14	294	33 39	347

Tilbage til Menuen

FOR AIR NAVIGATION VOL.1

Selected Stars Epoch 2015

Nord	LAT 58°S	276-277
Syd	LAT 57°S	274-275
Table 5	LAT 56°S	272-273
	LAT 55°S	270-271
	LAT 54°S	268-269
	LAT 53°S	266-267
	LAT 52°S	264-265
	LAT 51°S	262-263
	LAT 50°S	260-261
	LAT 49°S	258-259
	LAT 48°S	256-257
	LAT 47°S	254-255
	LAT 46°S	252-253

LAT 46°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Alpheratz		Hamal		◆ RIGEL		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	14 48	002	14 39	030	13 38	088	31 51	135	21 44	200	56 01	232	69 37	319
1	14 49	001	14 59	029	14 20	087	32 21	134	21 30	199	55 28	232	69 09	316
2	14 50	000	15 20	028	15 02	086	32 51	134	21 16	199	54 55	232	68 40	314
3	14 49	359	15 39	027	15 43	085	33 21	134	21 03	198	54 23	232	68 09	312
4	14 49	358	15 58	027	16 25	085	33 51	133	20 50	198	53 50	232	67 38	311
5	14 47	358	16 16	026	17 06	084	34 22	133	20 38	197	53 17	231	67 06	309
6	14 45	357	16 34	025	17 48	083	34 52	132	20 25	197	52 45	231	66 33	307
7	14 42	356	16 51	024	18 29	083	35 23	132	20 13	196	52 12	231	66 00	305
8	14 39	355	17 08	023	19 10	082	35 54	132	20 02	196	51 40	231	65 25	304
9	14 35	354	17 24	022	19 51	081	36 25	131	19 50	196	51 08	231	64 50	302
10	14 30	353	17 39	021	20 33	080	36 57	131	19 39	195	50 35	231	64 15	301
11	14 25	352	17 54	020	21 14	079	37 28	130	19 29	195	50 03	230	63 39	299
12	14 19	351	18 08	019	21 54	079	38 00	130	19 18	194	49 31	230	63 02	298
13	14 12	350	18 21	018	22 35	078	38 32	130	19 08	194	48 59	230	62 25	297
14	14 05	349	18 34	017	23 16	077	39 04	129	18 59	193	48 27	230	61 48	295
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
15	18 46	016	23 57	076	14 23	099	39 37	129	18 50	193	47 55	230	61 10	294
16	18 58	016	24 37	076	15 04	099	40 09	129	18 41	192	47 24	229	60 32	293
17	19 09	015	25 17	075	15 45	098	40 42	128	18 32	192	46 52	229	59 53	292
18	19 19	014	25 57	074	16 26	097	41 15	128	18 24	191	46 21	229	59 14	291
19	19 28	013	26 37	073	17 08	097	41 47	128	18 16	191	45 49	229	58 35	290
20	19 37	012	27 17	072	17 49	096	42 21	127	18 08	190	45 18	228	57 56	288
21	19 45	011	27 57	071	18 31	095	42 54	127	18 01	190	44 47	228	57 16	287
22	19 53	010	28 36	071	19 12	094	43 27	127	17 54	189	44 16	228	56 36	286
23	19 59	009	29 15	070	19 54	094	44 01	126	17 48	189	43 45	228	55 56	285
24	20 05	008	29 55	069	20 35	093	44 34	126	17 42	188	43 14	227	55 16	284
25	20 11	007	30 33	068	21 17	092	45 08	126	17 36	188	42 44	227	54 36	283
26	20 15	006	31 12	067	21 59	092	45 42	125	17 31	187	42 13	227	53 55	282
27	20 19	005	31 50	066	22 40	091	46 16	125	17 26	187	41 43	226	53 14	282
28	20 22	004	32 28	065	23 22	090	46 50	125	17 21	186	41 13	226	52 33	281
29	20 25	003	33 06	065	24 04	090	47 25	124	17 17	186	40 43	226	51 52	280
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
30	20 27	002	33 43	064	24 45	089	47 59	124	17 13	185	40 13	226	51 11	279
31	20 28	001	34 21	063	25 27	088	48 34	124	17 09	185	39 43	225	50 30	278
32	20 28	000	34 57	062	26 09	087	49 08	124	17 06	184	39 14	225	49 49	277
33	20 28	359	35 34	061	26 50	087	49 43	123	17 03	184	38 44	225	49 07	276
34	20 27	358	36 10	060	27 32	086	50 18	123	17 01	183	38 15	224	48 26	276
35	20 25	357	36 46	059	28 13	085	50 53	123	16 59	183	37 46	224	47 44	275
36	20 22	356	37 21	058	28 55	084	51 28	123	16 57	182	37 17	224	47 03	274
37	20 19	355	37 57	057	29 36	084	52 03	122	16 56	182	36 49	223	46 21	273
38	20 15	354	38 31	056	30 18	083	52 38	122	16 55	181	36 20	223	45 39	273
39	20 11	353	39 05	055	30 59	082	53 14	122	16 54	181	35 52	223	44 58	272
40	20 05	352	39 39	054	31 40	081	53 49	122	16 54	180	35 24	222	44 16	271
41	19 59	351	40 13	053	32 22	080	54 25	121	16 54	180	34 56	222	43 34	270
42	19 53	350	40 46	052	33 03	080	55 00	121	16 54	179	34 28	222	42 53	270
43	19 45	349	41 18	050	33 44	079	55 36	121	16 55	179	34 00	221	42 11	269
44	19 37	348	41 50	049	34 24	078	56 12	121	16 56	178	33 33	221	41 29	268
	RIGEL		SIRIUS		◆ CANOPUS		RIGIL KENT		◆ Peacock		FOMALHAUT		◆ Hamal	
45	42 21	048	35 05	077	56 48	121	16 58	178	33 06	220	40 48	267	19 28	347
46	42 52	047	35 46	076	57 24	120	17 00	177	32 39	220	40 06	267	19 19	346
47	43 22	046	36 26	076	58 00	120	17 02	177	32 12	220	39 25	266	19 09	345
48	43 52	045	37 06	075	58 36	120	17 05	176	31 46	219	38 43	265	18 58	345
49	44 21	043	37 47	074	59 12	120	17 08	176	31 20	219	38 01	265	18 47	344
50	44 49	042	38 26	073	59 48	120	17 12	175	30 53	219	37 20	264	18 34	343
51	45 17	041	39 06	072	60 24	120	17 15	175	30 28	218	36 39	263	18 22	342
52	45 44	040	39 46	071	61 00	120	17 20	174	30 02	218	35 57	263	18 08	341
53	46 10	038	40 25	070	61 37	120	17 24	173	29 37	217	35 16	262	17 54	340
54	46 36	037	41 04	069	62 13	119	17 29	173	29 11	217	34 35	261	17 39	339
55	47 01	036	41 43	068	62 49	119	17 34	172	28 47	217	33 53	261	17 24	338
56	47 25	035	42 22	067	63 26	119	17 40	172	28 22	216	33 12	260	17 08	337
57	47 48	033	43 00	066	64 02	119	17 46	171	27 57	216	32 31	260	16 52	336
58	48 10	032	43 38	066	64 38	119	17 52	171	27 33	215	31 50	259	16 34	335
59	48 32	030	44 16	065	65 15	119	17 59	170	27 09	215	31 09	258	16 17	334
	◆ ALDEBARAN		BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda	
60	26 55	010	30 39	034	44 53	063	37 24	117	18 06	170	65 41	230	40 58	288
61	27 01	009	31 02	033	45 31	062	38 01	117	18 13	170	65 09	230	40 18	287
62	27 07	008	31 24	032	46 07	061	38 38	116	18 21	169	64 37	230	39 38	286
63	27 13	007	31 46	031	46 44	060	39 16	116	18 29	169	64 05	230	38 58	286
64	27 17	006	32 07	030	47 20	059	39 53	115	18 38	168	63 33	231	38 18	285
65	27 21	005	32 27	029	47 55	058	40 31	115	18 47	168	63 01	231	37 37	284
66	27 24	003	32 47	027	48 31	057	41 09	114	18 56	167	62 29	231	36 57	283
67	27 26	002	33 05	026	49 05	056	41 47	114	19 05	167	61 56	231	36 16	282
68	27 27	001	33 24	025	49 39	055	42 25	113	19 15	166	61 24	231	35 35	281
69	27 28	000	33 41	024	50 13	053	43 04	113	19 25	166	60 51	231	34 55	281
70	27 27	359	33 57	023	50 46	052	43 42	112	19 36	165	60 19	231	34 13	280
71	27 26	358	34 13	022	51 19	051	44 21	112	19 47	165	59 46	231	33 32	279
72	27 25	357	34 28	021	51 51	050	44 59	111	19 58	164	59 14	231	32 51	278
73	27 22	356	34 43	019	52 23	048	45 38	111	20 10	164	58 41	231	32 10	277
74	27 19	355	34 56	018	52 53	047	46 17	111	20 21	163	58 09	231	31 28	277
	BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda		◆ ALDEBARAN	
75	35 09	017	53 24	046	46 56	110	20 34	163	57 36	231	30 47	276	27 14	354
76	35 21	016	53 53	044	47 36	110	20 46	162	57 04	231	30 06	275	27 10	353
77	35 32	015	54 22	043	48 15	109	20 59	162	56 31	231	29 24	274	27 04	352
78	35 42	013	54 50	041	48 54	109	21 12	161	55 59	231	28 42	274	26 57	351
79	35 51	012	55 17	040	49 34	108	21 26	161	55 26	231	28 01	273	26 50	349
80	35 59	011	55 43	038	50 13	108	21 40	160	54 54	231	27 19	272	26 42	348
81	36 07	010	56 09	037	50 53	107	21 54	160	54 21	231	26 38	271	26 33	347
82	36 14	009	56 33	035	51 33	107	22 08	159	53 49	231	25 56	271	26 24	346
83	36 19	007	56 57	034	52 13	106	22 23	159	53 17	231	25 14	270	26 14	345
84	36 24	006	57 20	032	52 53	106	22 38	159	52 45	230	24 32	269	26 03	344
85	36 28	005	57 41	030	53 33	105	22 53	158	52 13	230	23 51	269	25 51	343
86	36 31	004	58 02	029	54 13	105	23 09	158	51 41	230	23 09	268	25 38	342
87	36 34	002	58 21	027	54 54	104	23 25	157	51 09	230	22 28	267	25 25	341
88	36 35	001	58 40	025	55 34	104	23 41	157	50 37	230	21 46	266	25 11	340
89	36 35	000	58 57	024	56 15	104	23 58	156	50 05	230	21 04	266	24 57	339

LAT 46°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		Alphard		◆ Suhail		RIGIL KENT		◆ ACHERNAR		◆ RIGEL		BETELGEUSE	
90	34 11	031	32 05	067	56 55	103	24 15	156	49 33	229	50 59	342	36 35	359
91	34 32	029	32 43	066	57 36	103	24 32	156	49 02	229	50 46	341	36 34	358
92	34 52	028	33 21	065	58 17	102	24 49	155	48 30	229	50 31	339	36 31	356
93	35 12	027	33 59	064	58 57	102	25 07	155	47 59	229	50 16	338	36 28	355
94	35 30	026	34 36	063	59 38	101	25 25	154	47 27	229	50 00	336	36 24	354
95	35 48	025	35 13	062	60 19	101	25 43	154	46 56	228	49 42	335	36 19	353
96	36 05	024	35 50	061	61 00	100	26 02	153	46 25	228	49 24	333	36 14	351
97	36 22	022	36 26	060	61 41	100	26 20	153	45 54	228	49 05	332	36 07	350
98	36 37	021	37 02	059	62 22	099	26 40	153	45 23	228	48 45	330	35 59	349
99	36 52	020	37 38	058	63 04	099	26 59	152	44 52	227	48 24	329	35 51	348
100	37 06	019	38 13	057	63 45	098	27 18	152	44 21	227	48 02	328	35 42	347
101	37 19	018	38 48	056	64 26	098	27 38	151	43 51	227	47 39	326	35 31	345
102	37 31	016	39 23	055	65 07	097	27 58	151	43 21	227	47 16	325	35 20	344
103	37 42	015	39 57	054	65 49	096	28 19	151	42 50	226	46 51	324	35 09	343
104	37 53	014	40 31	053	66 30	096	28 39	150	42 20	226	46 26	322	34 56	342
	PROCYON		REGULUS		◆ Glenah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ BETELGEUSE	
105	38 03	013	38 14	049	20 02	095	29 00	150	41 50	226	46 00	321	34 43	341
106	38 11	011	38 45	048	20 43	094	29 21	149	41 20	226	45 34	320	34 28	339
107	38 19	010	39 16	047	21 25	094	29 43	149	40 51	225	45 07	319	34 13	338
108	38 26	009	39 46	047	22 06	093	30 04	149	40 21	225	44 39	317	33 57	337
109	38 32	008	40 16	046	22 48	092	30 26	148	39 52	225	44 10	316	33 41	336
110	38 37	006	20 46	045	23 30	091	30 48	148	39 22	224	43 41	315	33 23	335
111	38 41	005	21 15	044	24 11	091	31 10	148	38 53	224	43 11	314	33 05	334
112	38 45	004	21 44	043	24 53	090	31 33	147	38 25	224	42 41	313	32 46	333
113	38 47	003	22 12	042	25 35	089	31 56	147	37 56	223	42 10	311	32 27	331
114	38 48	001	22 40	041	26 16	089	32 19	146	37 27	223	41 38	310	32 07	330
115	38 49	000	23 07	040	26 58	088	32 42	146	36 59	223	41 06	309	31 46	329
116	38 48	359	23 33	039	27 40	087	33 05	146	36 31	222	40 33	308	31 24	328
117	38 47	357	23 59	038	28 21	086	33 29	145	36 03	222	40 00	307	31 02	327
118	38 45	356	24 25	037	29 03	086	33 52	145	35 35	222	39 27	306	30 39	326
119	38 42	355	24 50	036	29 44	085	34 16	145	35 07	221	38 53	305	30 15	325
120	25 14	035	13 57	092	34 40	144	34 40	221	38 18	304	29 51	324	38 37	354
121	25 38	034	14 38	091	35 05	144	34 12	221	37 44	303	29 26	323	38 32	352
122	26 01	033	15 20	090	35 29	144	33 45	220	37 08	302	29 01	322	38 26	351
123	26 24	032	16 02	090	35 54	143	33 19	220	36 33	301	28 34	321	38 19	350
124	26 46	031	16 43	089	36 19	143	32 52	220	35 57	300	28 08	320	38 12	349
125	27 07	030	17 25	088	36 44	143	32 25	219	35 20	299	27 41	319	38 03	347
126	27 28	029	18 07	088	37 09	143	31 59	219	34 44	298	27 13	318	37 53	346
127	27 48	028	18 48	087	37 35	142	31 33	218	34 07	297	26 45	317	37 43	345
128	28 07	027	19 30	086	38 01	142	31 07	218	33 30	296	26 16	316	37 32	344
129	28 26	026	20 11	085	38 26	142	30 42	218	32 52	295	25 47	315	37 19	342
130	28 44	025	20 53	085	38 52	141	30 16	217	32 14	294	25 17	314	37 06	341
131	29 01	024	21 34	084	39 18	141	29 51	217	31 36	293	24 47	313	36 53	340
132	29 18	023	22 16	083	39 45	141	29 26	216	30 58	292	24 16	312	36 38	339
133	29 34	022	22 57	082	40 11	141	29 02	216	30 19	292	23 45	311	36 22	338
134	29 49	021	23 38	082	40 38	140	28 37	216	29 40	291	23 13	310	36 06	336
	◆ REGULUS		SPICA		◆ RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		PROCYON	
135	30 03	020	24 20	081	41 04	140	28 13	215	64 07	241	49 36	305	35 49	335
136	30 17	019	25 01	080	41 31	140	27 49	215	63 31	241	49 02	304	35 31	334
137	30 30	017	25 42	079	41 58	139	27 26	214	62 54	241	48 27	303	35 12	333
138	30 42	016	26 23	078	42 25	139	27 02	214	62 18	241	47 52	302	34 53	332
139	30 53	015	27 03	078	42 53	139	26 39	214	61 42	241	47 16	301	34 33	331
140	31 04	014	27 44	077	43 20	139	26 16	213	61 05	240	46 40	300	34 12	329
141	31 13	013	28 24	076	43 48	139	25 54	213	60 29	240	46 04	299	33 50	328
142	31 22	012	29 05	075	44 15	138	25 31	212	59 53	240	45 27	297	33 28	327
143	31 30	011	29 45	074	44 43	138	25 09	212	59 17	240	44 50	296	33 05	326
144	31 38	010	30 25	074	45 11	138	24 47	211	58 41	240	44 12	295	32 42	325
145	31 44	008	31 05	073	45 39	138	24 26	211	58 05	240	43 35	294	32 18	324
146	31 50	007	31 45	072	46 07	138	24 05	210	57 29	240	42 56	293	31 53	323
147	31 55	006	32 24	071	46 35	137	23 44	210	56 53	239	42 18	292	31 27	322
148	31 59	005	33 04	070	47 03	137	23 23	210	56 17	239	41 39	291	31 01	321
149	32 02	004	33 43	069	47 32	137	23 02	209	55 41	239	41 01	291	30 35	320
150	32 04	003	34 22	068	48 00	137	22 42	209	55 06	239	40 21	290	30 07	319
151	32 06	001	35 00	068	48 29	137	22 23	208	54 30	239	39 42	289	29 40	318
152	32 06	000	35 39	067	48 57	137	22 03	208	53 54	238	39 02	288	29 11	317
153	32 06	359	36 17	066	49 26	136	21 44	207	53 19	238	38 23	287	28 42	316
154	32 05	358	36 55	065	49 55	136	21 25	207	52 44	238	37 43	286	28 13	315
155	32 03	357	37 32	064	50 24	136	21 06	206	52 08	238	37 03	285	27 43	314
156	32 01	356	38 09	063	50 53	136	20 48	206	51 33	237	36 22	284	27 13	313
157	31 57	355	38 46	062	51 22	136	20 30	205	50 58	237	35 42	284	26 42	312
158	31 53	353	39 23	061	51 51	136	20 12	205	50 23	237	35 01	283	26 11	311
159	31 48	352	39 59	060	52 20	136	19 55	204	49 48	237	34 20	282	25 39	310
160	31 42	351	40 35	059	52 49	136	19 38	204	49 13	236	33 40	281	25 07	309
161	31 35	350	41 10	058	53 18	136	19 21	203	48 39	236	32 59	280	24 34	308
162	31 27	349	41 45	057	53 47	136	19 05	203	48 04	236	32 18	279	24 01	307
163	31 19	348	42 20	056	54 16	136	18 49	202	47 30	236	31 36	279	23 28	306
164	31 09	347	42 54	055	54 45	136	18 33	202	46 55	235	30 55	278	22 54	305
	SPICA		◆ ANTARES		RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		◆ REGULUS	
165	43 28	053	23 38	104	55 14	136	18 18	201	46 21	235	30 14	277	30 59	345
166	44 01	052	24 18	104	55 44	136	18 03	201	45 47	235	29 32	276	30 48	344
167	44 34	051	24 59	103	56 13	136	17 48	200	45 13	234	28 51	276	30 37	343
168	45 06	050	25 40	102	56 42	136	17 34	200	44 39	234	28 10	275	30 24	342
169	45 38	049	26 20	102	57 11	136	17 20	199	44 06	234	27 28	274	30 11	341
170	46 09	048	27 01	101	57 40	136	17 07	199	43 32	233	26 46	273	29 57	340
171	46 40	046	27 42	100	58 09	136	16 53	198	42 59	233	26 05	273	29 42	339
172	47 09	045	28 23	100	58 38	136	16 40	198	42 25	233	25 23	272	29 27	338
173	47 39	044	29 04	099	59 07	136	16 28	197	41 52	232	24 41	271	29 11	337
174	48 07	043	29 45	098	59 36	136	16 16	197	41 19	232	24 00	270	28 54	336
175	48 35	041	30 27	098	60 05	136	16 04	196	40 46	232	23 18	270	28 36	335
176	49 02	040	31 08	097	60 34	136	15 53	196	40 14	231	22 36	269	28 18	333
177	49 29	039	31 49	096	61 03	137	15 41	195	39 41	231	21 55	268	27 59	332
178	49 55	037	32 31	096	61 31	137	15 31	195	39 09	231	21 13	268	27 40	331
179	50 20	036	33 12	095	62 00	137	15 21	194	38 37	230	20 31	267	27 19	330

Tilbage til Menuen

LAT 46°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	17 57	034	33 54	094	21 54	152	15 11	194	38 05	230	59 49	259	26 58	329
181	18 20	033	34 35	094	22 14	151	15 01	193	37 33	230	59 09	259	26 37	328
182	18 42	032	35 17	093	22 35	151	14 52	192	37 01	229	58 28	258	26 14	327
183	19 04	031	35 59	092	22 55	150	14 43	192	36 30	229	57 47	258	25 52	326
184	19 25	030	36 40	092	23 16	150	14 35	191	35 59	228	57 06	257	25 28	325
185	19 46	029	37 22	091	23 37	149	14 27	191	35 28	228	56 26	257	25 04	324
186	20 06	028	38 04	090	23 58	149	14 19	190	34 57	228	55 45	256	24 40	323
187	20 25	027	38 45	090	24 20	148	14 12	190	34 26	227	55 05	256	24 14	322
188	20 44	026	39 27	089	24 42	148	14 05	189	33 55	227	54 24	255	23 49	321
189	21 02	025	40 09	088	25 04	148	13 59	189	33 25	226	53 44	255	23 22	320
190	21 20	024	40 50	087	25 27	147	13 52	188	32 55	226	53 04	254	22 56	319
191	21 37	023	41 32	087	25 50	147	13 47	188	32 25	226	52 24	254	22 28	319
192	21 53	023	42 14	086	26 13	146	13 42	187	31 55	225	51 44	253	22 00	318
193	22 09	022	42 55	085	26 36	146	13 37	186	31 26	225	51 04	253	21 32	317
194	22 24	021	43 37	084	26 59	145	13 32	186	30 57	224	50 24	252	21 03	316
	ARCTURUS		◆ ANTARES		Peacock		◆ ACHERNAR		CANOPUS		Suhail		◆ REGULUS	
195	22 38	020	44 18	083	27 23	145	13 28	185	30 28	224	49 45	252	20 34	315
196	22 52	019	44 59	083	27 47	144	13 25	185	29 59	224	49 05	251	20 04	314
197	23 05	018	45 41	082	28 12	144	13 21	184	29 30	223	48 26	251	19 34	313
198	23 17	017	46 22	081	28 36	144	13 18	184	29 02	223	47 46	251	19 03	312
199	23 28	016	47 03	080	29 01	143	13 16	183	28 34	222	47 07	250	18 32	311
200	23 39	015	47 44	079	29 26	143	13 14	183	28 06	222	46 28	250	18 01	310
201	23 49	014	48 25	078	29 51	142	13 12	182	27 38	221	45 49	249	17 29	310
202	23 59	013	49 06	078	30 17	142	13 11	181	27 11	221	45 10	249	16 56	309
203	24 07	011	49 46	077	30 43	142	13 10	181	26 43	220	44 31	248	16 24	308
204	24 15	010	50 27	076	31 09	141	13 10	180	26 16	220	43 53	248	15 50	307
205	24 23	009	51 07	075	31 35	141	13 10	180	25 50	220	43 14	247	15 17	306
206	24 29	008	51 47	074	32 01	140	13 10	179	25 23	219	42 36	247	14 43	305
207	24 35	007	52 27	073	32 28	140	13 11	179	24 57	219	41 58	246	14 09	305
208	24 40	006	53 07	072	32 55	140	13 12	178	24 31	218	41 19	246	13 35	304
209	24 44	005	53 46	071	33 22	139	13 14	178	24 06	218	40 41	245	13 00	303
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	24 47	004	54 26	070	33 49	139	13 16	177	23 40	217	40 04	245	54 30	346
211	24 50	003	55 05	069	34 17	139	13 18	176	23 15	217	39 26	244	54 19	344
212	24 52	002	55 43	068	34 44	138	13 21	176	22 51	216	38 48	244	54 06	342
213	24 53	001	56 22	067	35 12	138	13 24	175	22 26	216	38 11	244	53 53	341
214	24 54	000	57 00	065	35 40	138	13 28	175	22 02	215	37 34	243	53 39	339
215	24 53	359	57 37	064	36 08	137	13 32	174	21 38	215	36 57	243	53 23	337
216	24 52	358	58 15	063	36 37	137	13 36	174	21 14	214	36 20	242	53 07	336
217	24 50	357	58 52	062	37 05	136	13 41	173	20 51	214	35 43	242	52 49	334
218	24 48	356	59 28	060	37 34	136	13 46	173	20 28	213	35 07	241	52 31	333
219	24 45	355	60 04	059	38 03	136	13 52	172	20 05	213	34 30	241	52 11	331
220	24 40	354	60 40	058	38 32	135	13 58	171	19 43	212	33 54	240	51 51	330
221	24 36	353	61 15	056	39 02	135	14 04	171	19 21	212	33 18	240	51 29	328
222	24 30	352	61 49	055	39 31	135	14 11	170	18 59	211	32 42	239	51 07	327
223	24 24	351	62 23	053	40 01	135	14 18	170	18 37	211	32 06	239	50 43	325
224	24 17	350	62 56	052	40 31	134	14 26	169	18 16	210	31 31	238	50 19	324
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		◆ SPICA		ARCTURUS	
225	63 29	050	39 42	088	41 00	134	14 34	169	17 55	210	49 54	323	24 09	349
226	64 00	049	40 24	087	41 31	134	14 42	168	17 35	209	49 29	321	24 00	348
227	64 31	047	41 05	087	42 01	133	14 51	168	17 15	209	49 02	320	23 51	347
228	65 01	045	41 47	086	42 31	133	15 00	167	16 55	208	48 35	319	23 41	346
229	65 30	043	42 29	085	43 02	133	15 09	167	16 36	208	48 07	317	23 30	345
230	65 59	042	43 10	084	43 32	132	15 19	166	16 16	207	47 39	316	23 19	344
231	66 26	040	43 52	084	44 03	132	15 29	165	15 58	206	47 09	315	23 07	343
232	66 52	038	44 33	083	44 34	132	15 40	165	15 39	206	46 39	314	22 54	342
233	67 17	036	45 14	082	45 05	132	15 51	164	15 21	205	46 09	312	22 41	341
234	67 40	034	45 55	081	45 36	131	16 02	164	15 03	205	45 38	311	22 26	340
235	68 03	031	46 37	080	46 08	131	16 14	163	14 46	204	45 06	310	22 12	339
236	68 24	029	47 18	079	46 39	131	16 26	163	14 29	204	44 34	309	21 56	338
237	68 44	027	47 59	079	47 11	131	16 39	162	14 13	203	44 01	308	21 40	337
238	69 02	025	48 39	078	47 42	130	16 52	162	13 56	203	43 28	306	21 23	336
239	69 18	022	49 20	077	48 14	130	17 05	161	13 40	202	42 54	305	21 06	335
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ARCTURUS	
240	27 37	027	14 41	060	11 40	121	17 18	161	56 06	220	42 20	304	20 47	334
241	27 55	025	15 17	059	12 16	120	17 32	160	55 39	220	41 45	303	20 29	333
242	28 13	024	15 53	058	12 52	119	17 46	160	55 12	220	41 10	302	20 09	332
243	28 30	023	16 28	057	13 28	119	18 01	159	54 45	220	40 35	301	19 49	331
244	28 46	022	17 03	057	14 05	118	18 16	159	54 18	220	39 59	300	19 29	330
245	29 01	021	17 37	056	14 42	118	18 31	158	53 51	221	39 23	299	19 08	329
246	29 16	020	18 12	055	15 19	117	18 47	158	53 24	220	38 46	298	18 46	328
247	29 30	019	18 46	054	15 56	116	19 03	157	52 56	220	38 09	297	18 24	327
248	29 43	018	19 19	053	16 34	116	19 19	157	52 29	220	37 32	296	18 01	326
249	29 56	017	19 52	052	17 11	115	19 36	156	52 02	220	36 54	295	17 38	325
250	30 07	016	20 25	051	17 49	114	19 53	156	51 35	220	36 16	294	17 14	325
251	30 18	015	20 58	051	18 27	114	20 10	155	51 08	220	35 38	293	16 49	324
252	30 28	014	21 30	050	19 05	113	20 28	155	50 41	220	35 00	292	16 24	323
253	30 38	012	22 01	049	19 44	112	20 46	154	50 15	220	34 21	292	15 59	322
254	30 46	011	22 32	048	20 22	112	21 04	154	49 48	220	33 42	291	15 33	321
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ANTARES	
255	30 54	010	23 03	047	21 01	111	21 22	153	49 21	220	33 03	290	69 35	341
256	31 01	009	23 33	046	21 40	111	21 41	153	48 54	220	32 24	289	69 21	338
257	31 07	008	24 03	045	22 19	110	22 00	152	48 27	220	31 44	288	69 05	336
258	31 12	007	24 32	044	22 58	109	22 20	152	48 01	220	31 05	287	68 47	333
259	31 17	006	25 01	043	23 38	109	22 40	151	47 34	220	30 25	286	68 27	331
260	31 21	004	25 29	042	24 17	108	23 00	151	47 08	219	29 45	286	68 06	329
261	31 23	003	25 57	041	24 57	108	23 20	151	46 41	219	29 05	285	67 44	327
262	31 25	002	26 24	040	25 37	107	23 41	150	46 15	219	28 24	284	67 21	325
263	31 27	001	26 51	039	26 17	106	24 02	150	45 49	219	27 44	283	66 56	323
264	31 27	000	27 17	038	26 57	106	24 23	149	45 23	219	27 03	282	66 30	321
265	31 26	359	27 42	037	27 37	105	24 44	149	44 57	219	26 22	282	66 03	319
266	31 25	358	28 07	036	28 17	104	25 06	148	44 31	218	25 41	281	65 35	317
267	31 23	356	28 32	035	28 58	104	25 28	148	44 05	218	25 00	280	65 06	315
268	31 20	355	28 55	034	29 38	103	25 51	147	43 39	218	24 19	279	64 36	313
269	31 16	354	29 19	033	30 19	103	26 13	147	43 13	218	23 38	278	64 05	312

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ SPICA		ANTARES		Rasalhague	
270	29 41	032	31 00	102	26 36	147	57 49	224	22 57	278	63 34	310	31 12	353
271	30 03	031	31 41	101	26 59	146	57 20	224	22 15	277	63 02	308	31 06	352
272	30 24	030	32 22	101	27 23	146	56 51	224	21 34	276	62 29	307	31 00	351
273	30 45	029	33 03	100	27 46	145	56 22	224	20 53	275	61 55	305	30 53	350
274	31 04	028	33 44	099	28 10	145	55 53	224	20 11	275	61 20	304	30 45	349
275	31 24	027	34 25	099	28 34	144	55 24	224	19 30	274	60 46	302	30 36	347
276	31 42	026	35 06	098	28 59	144	54 54	224	18 48	273	60 10	301	30 27	346
277	32 00	025	35 47	097	29 23	144	54 25	224	18 06	272	59 34	300	30 16	345
278	32 17	023	36 29	097	29 48	143	53 56	224	17 25	272	58 58	298	30 05	344
279	32 33	022	37 10	096	30 13	143	53 27	224	16 43	271	58 21	297	29 54	343
280	32 48	021	37 52	095	30 38	142	52 58	224	16 01	270	57 44	296	29 41	342
281	33 03	020	38 33	095	31 04	142	52 29	224	15 20	270	57 06	295	29 28	341
282	33 17	019	39 15	094	31 30	142	52 00	224	14 38	269	56 28	294	29 13	340
283	33 30	018	39 56	093	31 56	141	51 31	224	13 56	268	55 50	293	28 59	339
284	33 42	017	40 38	093	32 22	141	51 02	224	13 15	267	55 11	291	28 43	338
	ALTAIR		Enif		◆ FOMALHAUT		ACHERNAR		◆ RIGIL KENT		ANTARES		◆ Rasalhague	
285	33 53	015	22 59	045	41 19	092	32 48	140	50 33	224	54 32	290	28 27	336
286	34 04	014	23 28	044	42 01	091	33 15	140	50 04	224	53 53	289	28 10	335
287	34 14	013	23 56	043	42 43	091	33 42	140	49 35	224	53 13	288	27 52	334
288	34 23	012	24 25	042	43 25	090	34 09	139	49 07	223	52 34	287	27 34	333
289	34 31	011	24 52	041	44 06	089	34 36	139	48 38	223	51 54	286	27 15	332
290	34 38	009	25 19	040	44 48	088	35 03	139	48 09	223	51 14	285	26 55	331
291	34 45	008	25 46	039	45 30	088	35 31	138	47 41	223	50 33	284	26 34	330
292	34 50	007	26 12	038	46 11	087	35 59	138	47 12	223	49 53	283	26 13	329
293	34 55	006	26 37	037	46 53	086	36 27	138	46 44	223	49 12	283	25 52	328
294	34 59	005	27 02	036	47 34	085	36 55	137	46 16	223	48 32	282	25 29	327
295	35 02	003	27 26	035	48 16	085	37 23	137	45 48	222	47 51	281	25 07	326
296	35 04	002	27 50	034	48 57	084	37 52	137	45 20	222	47 10	280	24 43	325
297	35 05	001	28 13	033	49 39	083	38 21	136	44 52	222	46 29	279	24 19	324
298	35 05	000	28 36	032	50 20	082	38 49	136	44 24	222	45 48	278	23 54	323
299	35 05	359	28 57	031	51 01	081	39 19	136	43 56	222	45 06	277	23 29	322
	◆ Enif		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ ANTARES		Rasalhague		ALTAIR	
300	29 19	030	51 42	080	39 48	135	43 29	221	44 25	277	23 03	321	35 03	357
301	29 39	029	52 23	080	40 17	135	43 01	221	43 43	276	22 37	320	35 01	356
302	29 59	028	53 04	079	40 47	135	42 34	221	43 02	275	22 10	319	34 58	355
303	30 18	027	53 45	078	41 16	134	42 07	221	42 20	274	21 43	319	34 54	354
304	30 36	026	54 26	077	41 46	134	41 40	220	41 39	274	21 15	318	34 49	353
305	30 54	025	55 06	076	42 16	134	41 13	220	40 57	273	20 47	317	34 43	351
306	31 11	023	55 47	075	42 46	134	40 46	220	40 16	272	20 18	316	34 37	350
307	31 27	022	56 27	074	43 16	133	40 20	220	39 34	271	19 48	315	34 29	349
308	31 43	021	57 07	073	43 47	133	39 53	219	38 52	271	19 19	314	34 21	348
309	31 57	020	57 47	072	44 17	133	39 27	219	38 11	270	18 48	313	34 12	347
310	32 11	019	58 26	071	44 48	133	39 01	219	37 29	269	18 18	312	34 02	346
311	32 25	018	59 05	070	45 19	132	38 35	218	36 47	268	17 47	311	33 51	344
312	32 37	017	59 44	069	45 50	132	38 09	218	36 06	268	17 15	310	33 39	343
313	32 49	016	60 23	067	46 21	132	37 43	218	35 24	267	16 43	310	33 27	342
314	32 59	014	61 01	066	46 52	132	37 18	218	34 42	266	16 11	309	33 13	341
	◆ Enif		Diphda		◆ ACHERNAR		Miaplacidus		RIGIL KENT		◆ ANTARES		ALTAIR	
315	33 09	013	36 09	078	47 23	131	25 48	181	36 52	217	34 01	266	32 59	340
316	33 18	012	36 50	077	47 54	131	25 48	181	36 27	217	33 19	265	32 44	339
317	33 27	011	37 31	076	48 26	131	25 47	181	36 02	217	32 38	264	32 29	337
318	33 34	010	38 11	075	48 57	131	25 47	180	35 37	216	31 56	264	32 12	336
319	33 41	009	38 51	075	49 29	131	25 47	180	35 13	216	31 15	263	31 55	335
320	33 47	007	39 31	074	50 01	130	25 47	179	34 48	216	30 34	262	31 38	334
321	33 52	006	40 11	073	50 32	130	25 48	179	34 24	215	29 52	262	31 19	333
322	33 56	005	40 51	072	51 04	130	25 49	179	34 00	215	29 11	261	31 00	332
323	33 59	004	41 30	071	51 36	130	25 50	178	33 36	215	28 30	260	30 40	331
324	34 01	003	42 10	070	52 08	130	25 51	178	33 12	214	27 49	260	30 19	330
325	34 03	001	42 49	069	52 40	130	25 53	177	32 49	214	27 08	259	29 58	329
326	34 03	000	43 28	068	53 13	129	25 55	177	32 26	214	26 27	258	29 36	328
327	34 03	359	44 06	067	53 45	129	25 57	177	32 03	213	25 46	258	29 13	327
328	34 02	358	44 45	066	54 17	129	26 00	176	31 40	213	25 06	257	28 50	326
329	34 00	357	45 22	065	54 49	129	26 03	176	31 18	213	24 25	256	28 26	325
	◆ Diphda		ACHERNAR		◆ Miaplacidus		RIGIL KENT		ANTARES		◆ ALTAIR		Enif	
330	46 00	064	55 22	129	26 06	176	30 55	212	23 45	256	28 01	323	33 57	356
331	46 38	063	55 54	129	26 09	175	30 33	212	23 04	255	27 36	322	33 54	354
332	47 15	062	56 27	129	26 13	175	30 11	211	22 24	255	27 11	321	33 49	353
333	47 51	061	56 59	129	26 17	174	29 50	211	21 44	254	26 44	320	33 44	352
334	48 27	060	57 32	129	26 21	174	29 28	211	21 04	253	26 18	319	33 37	351
335	49 03	059	58 04	129	26 25	174	29 07	210	20 24	253	25 50	319	33 30	350
336	49 39	058	58 37	129	26 30	173	28 46	210	19 44	252	25 22	318	33 22	348
337	50 14	056	59 09	129	26 35	173	28 25	210	19 05	251	24 54	317	33 14	347
338	50 48	055	59 42	129	26 40	173	28 05	209	18 25	251	24 25	316	33 04	346
339	51 22	054	60 14	129	26 46	172	27 45	209	17 46	250	23 56	315	32 54	345
340	51 56	053	60 47	129	26 52	172	27 25	208	17 07	249	23 26	314	32 42	344
341	52 29	052	61 19	129	26 58	171	27 05	208	16 28	249	22 55	313	32 30	343
342	53 01	050	61 52	129	27 04	171	26 46	208	15 49	248	22 25	312	32 18	342
343	53 33	049	62 24	129	27 11	171	26 26	207	15 11	247	21 53	311	32 04	340
344	54 04	048	62 56	129	27 18	170	26 08	207	14 32	247	21 22	310	31 50	339
	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		Enif	
345	54 34	046	47 04	105	24 54	141	27 25	170	25 49	206	38 23	270	31 34	338
346	55 04	045	47 45	104	25 20	141	27 32	170	25 31	206	37 41	270	31 19	337
347	55 33	043	48 25	104	25 46	141	27 40	169	25 13	205	37 00	269	31 02	336
348	56 01	042	49 06	103	26 13	140	27 48	169	24 55	205	36 18	268	30 45	335
349	56 29	040	49 46	102	26 40	140	27 56	168	24 37	205	35 36	268	30 27	334
350	56 55	039	50 27	102	27 07	139	28 05	168	24 20	204	34 55	267	30 08	333
351	57 21	037	51 08	101	27 34	139	28 13	168	24 03	204	34 13	266	29 48	332
352	57 46	036	51 49	101	28 02	138	28 22	167	23 46	203	33 31	266	29 28	331
353	58 09	034	52 30	100	28 30	138	28 31	167	23 30	203	32 50	265	29 07	329
354	58 32	032	53 11	100	28 58	137	28 41	167	23 14	202	32 08	264	28 46	328
355	58 54	031	53 52	099	29 26	137	28 51	166	22 58	202	31 27	263	28 24	327
356	59 15	029	54 33	099	29 55	137	29 00	166	22 43	202	30 46	263	28 01	326
357	59 34	027	55 14	098	30 23	136	29 11	166	22 28	201	30 04	262	27 37	325
358	59 53	025	55 56	097	30 52	136	29 21	165	22 13	201	29 23	261	27 13	324
359	60 10	024	56 37	097	31 22	135	29 32	165	21 58	200	28 42	261	26 49	323

Tilbage til Menuen

LAT 47°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Alpheratz		Hamal		◆ RIGEL		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	13 48	002	13 47	030	13 36	087	32 33	134	22 40	200	56 37	233	68 51	320
1	13 49	001	14 07	029	14 17	087	33 03	134	22 27	199	56 05	233	68 25	318
2	13 50	000	14 27	028	14 57	086	33 32	134	22 13	199	55 32	233	67 57	316
3	13 49	359	14 46	027	15 38	085	34 02	133	22 00	198	54 59	233	67 28	314
4	13 49	358	15 04	026	16 19	084	34 32	133	21 47	198	54 27	233	66 58	312
5	13 47	358	15 22	026	17 00	084	35 02	132	21 35	198	53 54	232	66 28	311
6	13 45	357	15 40	025	17 40	083	35 32	132	21 23	197	53 22	232	65 56	309
7	13 42	356	15 57	024	18 21	082	36 03	131	21 11	197	52 49	232	65 24	307
8	13 39	355	16 13	023	19 01	081	36 34	131	20 59	196	52 17	232	64 51	306
9	13 35	354	16 28	022	19 42	081	37 05	131	20 48	196	51 45	232	64 18	304
10	13 31	353	16 43	021	20 22	080	37 36	130	20 37	195	51 13	232	63 43	303
11	13 25	352	16 58	020	21 02	079	38 07	130	20 27	195	50 41	231	63 09	301
12	13 19	351	17 11	019	21 43	078	38 39	129	20 17	194	50 09	231	62 33	300
13	13 13	350	17 25	018	22 23	078	39 10	129	20 07	194	49 37	231	61 58	298
14	13 06	350	17 37	017	23 02	077	39 42	129	19 57	193	49 06	231	61 21	297
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
15	17 49	016	23 42	076	14 32	099	40 14	128	19 48	193	48 34	230	60 45	296
16	18 00	015	24 22	075	15 13	098	40 46	128	19 39	192	48 02	230	60 08	295
17	18 11	014	25 01	074	15 53	098	41 19	128	19 31	192	47 31	230	59 30	293
18	18 20	014	25 41	074	16 34	097	41 51	127	19 23	191	47 00	230	58 53	292
19	18 30	013	26 20	073	17 15	096	42 24	127	19 15	191	46 29	229	58 15	291
20	18 38	012	26 59	072	17 55	096	42 57	127	19 07	190	45 58	229	57 36	290
21	18 46	011	27 38	071	18 36	095	43 30	126	19 00	190	45 27	229	56 58	289
22	18 53	010	28 16	070	19 17	094	44 03	126	18 54	189	44 56	229	56 19	288
23	19 00	009	28 55	069	19 58	093	44 36	126	18 47	189	44 25	228	55 40	287
24	19 06	008	29 33	068	20 38	093	45 09	125	18 41	188	43 55	228	55 00	286
25	19 11	007	30 11	068	21 19	092	45 43	125	18 36	188	43 24	228	54 21	285
26	19 16	006	30 48	067	22 00	091	46 16	124	18 30	187	42 54	227	53 41	284
27	19 19	005	31 26	066	22 41	091	46 50	124	18 25	187	42 24	227	53 01	283
28	19 22	004	32 03	065	23 22	090	47 24	124	18 21	186	41 54	227	52 21	282
29	19 25	003	32 40	064	24 03	089	47 58	124	18 16	186	41 24	227	51 41	281
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
30	19 27	002	33 16	063	24 44	088	48 32	123	18 13	185	40 55	226	51 01	280
31	19 28	001	33 53	062	25 25	088	49 07	123	18 09	185	40 25	226	50 21	279
32	19 28	000	34 29	061	26 06	087	49 41	123	18 06	184	39 56	226	49 40	278
33	19 28	359	35 04	060	26 47	086	50 16	122	18 03	184	39 27	225	49 00	278
34	19 27	358	35 40	059	27 27	085	50 50	122	18 01	183	38 58	225	48 19	277
35	19 25	357	36 15	058	28 08	085	51 25	122	17 59	183	38 29	225	47 39	276
36	19 23	356	36 49	057	28 49	084	52 00	121	17 57	182	38 01	224	46 58	275
37	19 19	355	37 23	056	29 29	083	52 35	121	17 56	182	37 32	224	46 17	274
38	19 16	354	37 57	055	30 10	082	53 10	121	17 55	181	37 04	223	45 36	274
39	19 11	353	38 31	054	30 51	081	53 45	121	17 54	181	36 36	223	44 55	273
40	19 06	352	39 03	053	31 31	081	54 20	120	17 54	180	36 08	223	44 15	272
41	19 00	351	39 36	052	32 11	080	54 56	120	17 54	180	35 40	222	43 34	271
42	18 54	350	40 08	051	32 52	079	55 31	120	17 54	179	35 13	222	42 53	271
43	18 46	349	40 39	050	33 32	078	56 06	120	17 55	179	34 45	222	42 12	270
44	18 38	348	41 10	049	34 12	077	56 42	119	17 56	178	34 18	221	41 31	269
	RIGEL		SIRIUS		◆ CANOPUS		RIGIL KENT		◆ Peacock		FOMALHAUT		◆ Hamal	
45	41 41	048	34 51	077	57 18	119	17 58	178	33 51	221	40 50	268	18 30	347
46	42 11	046	35 31	076	57 53	119	18 00	177	33 25	220	40 09	268	18 21	346
47	42 40	045	36 11	075	58 29	119	18 02	177	32 58	220	39 28	267	18 11	346
48	43 09	044	36 50	074	59 05	119	18 05	176	32 32	220	38 47	266	18 00	345
49	43 37	043	37 29	073	59 41	118	18 08	175	32 06	219	38 07	266	17 49	344
50	44 04	042	38 09	072	60 17	118	18 11	175	31 40	219	37 26	265	17 37	343
51	44 31	040	38 47	071	60 53	118	18 15	174	31 15	219	36 45	264	17 25	342
52	44 57	039	39 26	070	61 29	118	18 19	174	30 49	218	36 04	263	17 12	341
53	45 23	038	40 04	069	62 05	118	18 24	173	30 24	218	35 24	263	16 58	340
54	45 48	037	40 43	069	62 42	118	18 29	173	29 59	217	34 43	262	16 43	339
55	46 12	035	41 21	068	63 18	118	18 34	172	29 35	217	34 03	261	16 28	338
56	46 35	034	41 58	067	63 54	118	18 39	172	29 10	216	33 22	261	16 13	337
57	46 57	033	42 36	066	64 30	117	18 45	171	28 46	216	32 42	260	15 57	336
58	47 19	031	43 13	065	65 07	117	18 52	171	28 22	216	32 02	260	15 40	335
59	47 40	030	43 50	064	65 43	117	18 58	170	27 58	215	31 21	259	15 23	334
	◆ ALDEBARAN		BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda	
60	25 56	010	29 49	034	44 26	063	37 51	116	19 05	170	66 19	232	40 39	289
61	26 02	009	30 11	033	45 02	062	38 27	116	19 12	169	65 47	232	40 00	288
62	26 08	008	30 33	032	45 38	060	39 04	115	19 20	169	65 15	232	39 21	287
63	26 13	007	30 54	030	46 14	059	39 41	115	19 28	168	64 43	232	38 42	286
64	26 17	006	31 15	029	46 49	058	40 18	114	19 37	168	64 11	232	38 02	285
65	26 21	004	31 34	028	47 23	057	40 56	114	19 45	167	63 38	232	37 23	285
66	26 24	003	31 53	027	47 57	056	41 33	113	19 54	167	63 06	232	36 43	284
67	26 26	002	32 12	026	48 31	055	42 11	113	20 04	166	62 33	233	36 03	283
68	26 27	001	32 29	025	49 04	054	42 49	112	20 13	166	62 01	233	35 23	282
69	26 28	000	32 46	024	49 37	052	43 26	112	20 23	166	61 28	233	34 43	281
70	26 27	359	33 02	023	50 09	051	44 04	111	20 34	165	60 56	233	34 03	280
71	26 26	358	33 18	022	50 41	050	44 43	111	20 45	165	60 23	233	33 23	280
72	26 25	357	33 32	020	51 12	049	45 21	111	20 56	164	59 51	233	32 42	279
73	26 22	356	33 46	019	51 42	047	45 59	110	21 07	164	59 18	233	32 02	278
74	26 19	355	33 59	018	52 12	046	46 38	110	21 19	163	58 46	233	31 21	277
	BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda		◆ ALDEBARAN	
75	34 11	017	52 41	045	47 16	109	21 31	163	58 13	233	30 41	276	26 15	354
76	34 23	016	53 10	043	47 55	109	21 43	162	57 41	232	30 00	276	26 10	353
77	34 33	014	53 37	042	48 34	108	21 56	162	57 08	232	29 19	275	26 04	352
78	34 43	013	54 04	041	49 13	108	22 09	161	56 36	232	28 38	274	25 58	351
79	34 52	012	54 31	039	49 52	107	22 22	161	56 03	232	27 58	273	25 51	350
80	35 00	011	54 56	038	50 31	107	22 36	160	55 31	232	27 17	273	25 43	348
81	35 08	010	55 20	036	51 10	106	22 50	160	54 59	232	26 36	272	25 35	347
82	35 14	009	55 44	035	51 50	106	23 04	159	54 27	232	25 55	271	25 26	346
83	35 20	007	56 07	033	52 29	105	23 19	159	53 55	232	25 14	270	25 16	345
84	35 25	006	56 29	031	53 09	105	23 34	158	53 23	232	24 33	270	25 05	344
85	35 29	005	56 49	030	53 48	104	23 49	158	52 51	231	23 52	269	24 53	343
86	35 32	004	57 09	028	54 28	104	24 04	158	52 19	231	23 11	268	24 41	342
87	35 34	002	57 28	026	55 08	103	24 20	157	51 47	231	22 30	267	24 28	341
88	35 35	001	57 46	025	55 48	103	24 36	157	51 15	231	21 49	267	24 15	340
89	35 35	000	58 02	023	56 28	102	24 53	156	50 43	231	21 09	266	24 01	339

LAT 47°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		Alphard		◆ Suhail		RIGIL KENT		◆ ACHERNAR		◆ RIGEL		BETELGEUSE	
90	33 19	030	31 41	066	57 08	102	25 09	156	50 12	230	50 02	343	35 35	359
91	33 40	029	32 18	065	57 48	101	25 26	155	49 40	230	49 49	341	35 34	358
92	33 59	028	32 55	065	58 28	100	25 44	155	49 09	230	49 35	340	35 32	356
93	34 18	027	33 32	064	59 09	100	26 01	154	48 38	230	49 20	338	35 29	355
94	34 36	026	34 09	063	59 49	099	26 19	154	48 07	229	49 05	337	35 25	354
95	34 54	025	34 45	062	60 29	099	26 37	154	47 35	229	48 48	335	35 20	353
96	35 10	023	35 21	061	61 10	098	26 55	153	47 04	229	48 30	334	35 14	351
97	35 26	022	35 56	060	61 50	098	27 14	153	46 34	229	48 12	332	35 08	350
98	35 41	021	36 32	059	62 31	097	27 33	152	46 03	228	47 53	331	35 00	349
99	35 55	020	37 06	058	63 11	097	27 52	152	45 32	228	47 32	330	34 52	348
100	36 09	019	37 41	057	63 52	096	28 11	152	45 02	228	47 11	328	34 43	347
101	36 22	017	38 15	056	64 33	095	28 31	151	44 32	228	46 49	327	34 33	345
102	36 34	016	38 48	055	65 14	095	28 51	151	44 01	227	46 26	326	34 23	344
103	36 45	015	39 22	054	65 54	094	29 11	150	43 31	227	46 03	324	34 11	343
104	36 55	014	39 54	053	66 35	094	29 31	150	43 01	227	45 39	323	33 59	342
	PROCYON		REGULUS		◆ Glenah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ BETELGEUSE	
105	37 04	013	17 34	049	20 07	095	29 52	149	42 32	227	45 14	322	33 46	341
106	37 12	011	18 05	048	20 48	094	30 13	149	42 02	226	44 48	320	33 32	340
107	37 20	010	18 35	047	21 28	093	30 34	149	41 33	226	44 21	319	33 17	338
108	37 27	009	19 05	046	22 09	092	30 55	148	41 03	226	43 54	318	33 02	337
109	37 33	008	19 34	045	22 50	092	31 17	148	40 34	225	43 27	317	32 46	336
110	37 38	006	20 03	045	23 31	091	31 39	148	40 05	225	42 58	316	32 29	335
111	37 42	005	20 32	044	24 12	090	32 01	147	39 36	225	42 29	314	32 11	334
112	37 45	004	21 00	043	24 53	090	32 23	147	39 08	224	42 00	313	31 53	333
113	37 47	003	21 27	042	25 34	089	32 46	146	38 39	224	41 30	312	31 34	332
114	37 48	001	21 54	041	26 15	088	33 08	146	38 11	224	40 59	311	31 14	331
115	37 49	000	22 21	040	26 56	087	33 31	146	37 43	223	40 28	310	30 54	330
116	37 48	359	22 47	039	27 36	087	33 55	145	37 15	223	39 56	309	30 33	328
117	37 47	358	23 12	038	28 17	086	34 18	145	36 47	223	39 24	308	30 11	327
118	37 45	356	23 37	037	28 58	085	34 41	145	36 19	222	38 51	307	29 49	326
119	37 42	355	24 01	036	29 39	084	35 05	144	35 52	222	38 18	306	29 26	325
	REGULUS		◆ SPICA		RIGIL KENT		◆ ACHERNAR		RIGEL		BETELGEUSE		◆ PROCYON	
120	24 25	035	13 58	092	35 29	144	35 25	221	37 45	304	29 02	324	37 38	354
121	24 48	034	14 39	091	35 53	144	34 58	221	37 11	303	28 38	323	37 33	352
122	25 11	033	15 20	090	36 18	143	34 31	221	36 36	302	28 13	322	37 27	351
123	25 33	032	16 01	089	36 42	143	34 04	220	36 02	301	27 48	321	37 20	350
124	25 54	031	16 42	089	37 07	143	33 38	220	35 27	300	27 22	320	37 13	349
125	26 15	030	17 23	088	37 32	142	33 12	220	34 51	299	26 55	319	37 04	348
126	26 35	029	18 04	087	37 57	142	32 46	219	34 15	299	26 28	318	36 55	346
127	26 55	028	18 45	086	38 22	142	32 20	219	33 39	298	26 01	317	36 45	345
128	27 14	027	19 25	086	38 48	141	31 55	218	33 03	297	25 33	316	36 34	344
129	27 32	026	20 06	085	39 13	141	31 29	218	32 26	296	25 04	315	36 22	343
130	27 49	025	20 47	084	39 39	141	31 04	218	31 49	295	24 35	314	36 10	341
131	28 06	024	21 28	083	40 05	141	30 39	217	31 12	294	24 06	313	35 56	340
132	28 22	023	22 08	083	40 31	140	30 15	217	30 34	293	23 36	312	35 42	339
133	28 38	022	22 49	082	40 57	140	29 50	216	29 57	292	23 05	312	35 27	338
134	28 53	021	23 29	081	41 24	140	29 26	216	29 19	291	22 34	311	35 11	337
	◆ REGULUS		SPICA		◆ RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		PROCYON	
135	29 07	019	24 10	080	41 50	139	29 02	216	64 36	243	49 01	306	34 54	335
136	29 20	018	24 50	080	42 17	139	28 39	215	63 59	242	48 28	305	34 37	334
137	29 32	017	25 30	079	42 44	139	28 15	215	63 23	242	47 54	304	34 19	333
138	29 44	016	26 10	078	43 11	139	27 52	214	62 47	242	47 20	303	34 00	332
139	29 55	015	26 50	077	43 38	138	27 29	214	62 11	242	46 45	302	33 41	331
140	30 05	014	27 30	076	44 05	138	27 06	213	61 34	242	46 10	300	33 20	330
141	30 15	013	28 10	076	44 32	138	26 44	213	60 58	242	45 35	299	32 59	329
142	30 23	012	28 49	075	45 00	138	26 22	212	60 22	242	44 59	298	32 38	328
143	30 31	011	29 29	074	45 27	137	26 00	212	59 46	242	44 23	297	32 15	326
144	30 38	009	30 08	073	45 55	137	25 39	212	59 10	241	43 46	296	31 53	325
145	30 45	008	30 47	072	46 23	137	25 17	211	58 34	241	43 09	295	31 29	324
146	30 50	007	31 26	071	46 51	137	24 56	211	57 59	241	42 32	294	31 05	323
147	30 55	006	32 04	070	47 19	137	24 35	210	57 23	241	41 55	293	30 40	322
148	30 59	005	32 43	070	47 47	136	24 15	210	56 47	241	41 17	292	30 15	321
149	31 02	004	33 21	069	48 15	136	23 55	209	56 12	240	40 39	291	29 49	320
	◆ REGULUS		SPICA		◆ RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		PROCYON	
150	31 04	003	33 59	068	48 44	136	23 35	209	55 36	240	40 01	290	29 22	319
151	31 06	001	34 37	067	49 12	136	23 15	208	55 01	240	39 22	289	28 55	318
152	31 06	000	35 14	066	49 41	136	22 56	208	54 25	240	38 44	289	28 27	317
153	31 06	359	35 52	065	50 09	136	22 37	207	53 50	239	38 05	288	27 59	316
154	31 05	358	36 29	064	50 38	135	22 18	207	53 15	239	37 26	287	27 31	315
155	31 03	357	37 05	063	51 07	135	22 00	206	52 40	239	36 46	286	27 01	314
156	31 01	356	37 42	062	51 35	135	21 42	206	52 05	239	36 07	285	26 32	313
157	30 57	355	38 18	061	52 04	135	21 24	205	51 30	238	35 27	284	26 02	312
158	30 53	353	38 53	060	52 33	135	21 07	205	50 55	238	34 48	283	25 31	311
159	30 48	352	39 29	059	53 02	135	20 50	204	50 21	238	34 08	283	25 00	310
160	30 42	351	40 03	058	53 31	135	20 33	204	49 46	237	33 28	282	24 29	309
161	30 36	350	40 38	057	54 00	135	20 16	203	49 12	237	32 48	281	23 57	308
162	30 28	349	41 12	056	54 29	135	20 00	203	48 37	237	32 07	280	23 25	307
163	30 20	348	41 46	055	54 59	135	19 45	202	48 03	237	31 27	279	22 52	307
164	30 11	347	42 19	054	55 28	135	19 29	202	47 29	236	30 47	278	22 19	306
	SPICA		◆ ANTARES		RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		◆ REGULUS	
165	42 52	053	23 52	104	55 57	135	19 14	201	46 55	236	30 06	278	30 01	346
166	43 24	052	24 32	103	56 26	135	18 59	201	46 21	236	29 26	277	29 51	344
167	43 56	050	25 12	103	56 55	135	18 45	200	45 48	235	28 45	276	29 39	343
168	44 27	049	25 52	102	57 24	135	18 31	200	45 14	235	28 04	275	29 27	342
169	44 58	048	26 32	101	57 54	135	18 17	199	44 41	235	27 23	275	29 14	341
170	45 28	047	27 12	101	58 23	135	18 03	199	44 07	234	26 43	274	29 01	340
171	45 58	046	27 53	100	58 52	135	17 50	198	43 34	234	26 02	273	28 47	339
172	46 27	044	28 33	099	59 21	135	17 38	198	43 01	234	25 21	272	28 31	338
173	46 55	043	29 13	099	59 50	135	17 25	197	42 28	233	24 40	272	28 16	337
174	47 23	042	29 54	098	60 19	135	17 13	197	41 56	233	23 59	271	27 59	336
175	47 50	041	30 35	097	60 48	135	17 02	196	41 23	232	23 18	270	27 42	335
176	48 16	039	31 15	097	61 17	135	16 50	196	40 51	232	22 37	269	27 24	334
177	48 42	038	31 56	096	61 46	135	16 39	195	40 19	232	21 56	269	27 06	333
178	49 07	037	32 37	095	62 14	135	16 29	195	39 47	231	21 15	268	26 47	332
179	49 31	035	33 17	094	62 43	136	16 19	194	39 15	231	20 35	267	26 27	331

Tilbage til Menuen

LAT 47°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	17 07	034	33 58	094	22 47	151	16 09	194	38 43	231	60 00	261	26 07	330
181	17 30	033	34 39	093	23 07	151	15 59	193	38 12	230	59 20	260	25 46	329
182	17 51	032	35 20	092	23 27	151	15 50	192	37 40	230	58 39	260	25 24	328
183	18 13	031	36 01	092	23 47	150	15 42	192	37 09	229	57 59	259	25 02	327
184	18 33	030	36 42	091	24 08	150	15 34	191	36 38	229	57 19	259	24 39	326
185	18 54	029	37 23	090	24 29	149	15 26	191	36 07	229	56 39	258	24 15	325
186	19 13	028	38 04	089	24 50	149	15 18	190	35 37	228	55 59	258	23 51	324
187	19 32	027	38 44	089	25 11	148	15 11	190	35 06	228	55 19	257	23 27	323
188	19 50	026	39 25	088	25 33	148	15 04	189	34 36	227	54 39	257	23 02	322
189	20 08	025	40 06	087	25 55	147	14 58	189	34 06	227	53 59	256	22 36	321
190	20 25	024	40 47	086	26 17	147	14 52	188	33 36	227	53 20	256	22 10	320
191	20 42	023	41 28	086	26 40	146	14 46	188	33 07	226	52 40	255	21 43	319
192	20 58	022	42 09	085	27 02	146	14 41	187	32 37	226	52 01	255	21 16	318
193	21 13	021	42 49	084	27 25	145	14 36	186	32 08	225	51 21	254	20 48	317
194	21 28	020	43 30	083	27 49	145	14 32	186	31 39	225	50 42	254	20 20	316
	ARCTURUS		◆ ANTARES		Peacock		◆ ACHERNAR		CANOPUS		Suhail		◆ REGULUS	
195	21 42	019	44 11	082	28 12	145	14 28	185	31 11	224	50 03	253	19 51	315
196	21 55	018	44 51	082	28 36	144	14 24	185	30 42	224	49 24	253	19 22	314
197	22 07	017	45 32	081	29 00	144	14 21	184	30 14	224	48 45	252	18 53	313
198	22 19	016	46 12	080	29 25	143	14 18	184	29 46	223	48 06	252	18 23	312
199	22 31	015	46 52	079	29 49	143	14 16	183	29 18	223	47 27	251	17 52	312
200	22 41	014	47 32	078	30 14	142	14 14	183	28 50	222	46 48	251	17 22	311
201	22 51	013	48 12	077	30 39	142	14 12	182	28 23	222	46 10	250	16 50	310
202	23 00	012	48 52	076	31 04	142	14 11	181	27 56	221	45 31	250	16 19	309
203	23 09	011	49 32	076	31 30	141	14 10	181	27 29	221	44 53	249	15 47	308
204	23 16	010	50 11	075	31 55	141	14 10	180	27 02	220	44 15	249	15 14	307
205	23 23	009	50 51	074	32 21	140	14 10	180	26 36	220	43 37	248	14 41	306
206	23 30	008	51 30	073	32 47	140	14 10	179	26 10	219	42 59	248	14 08	306
207	23 35	007	52 09	072	33 14	140	14 11	179	25 44	219	42 21	247	13 35	305
208	23 40	006	52 48	071	33 40	139	14 12	178	25 18	218	41 44	247	13 01	304
209	23 44	005	53 26	070	34 07	139	14 14	178	24 53	218	41 06	246	12 27	303
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	23 48	004	54 04	069	34 34	139	14 16	177	24 28	217	40 29	246	53 31	346
211	23 50	003	54 42	067	35 01	138	14 18	176	24 03	217	39 51	245	53 21	344
212	23 52	002	55 20	066	35 29	138	14 21	176	23 39	217	39 14	245	53 09	343
213	23 53	001	55 57	065	35 56	137	14 24	175	23 15	216	38 37	244	52 57	341
214	23 54	000	56 34	064	36 24	137	14 27	175	22 51	216	38 01	244	52 43	339
215	23 53	359	57 11	063	36 52	137	14 31	174	22 27	215	37 24	243	52 28	338
216	23 52	358	57 47	062	37 20	136	14 36	174	22 04	215	36 48	243	52 12	336
217	23 51	357	58 23	060	37 49	136	14 40	173	21 41	214	36 11	242	51 55	335
218	23 48	356	58 58	059	38 17	136	14 46	173	21 18	214	35 35	242	51 37	333
219	23 45	355	59 33	058	38 46	135	14 51	172	20 56	213	34 59	241	51 18	332
220	23 41	354	60 07	056	39 15	135	14 57	171	20 33	212	34 23	241	50 59	330
221	23 36	353	60 41	055	39 44	135	15 03	171	20 12	212	33 48	240	50 38	329
222	23 31	352	61 14	053	40 13	134	15 10	170	19 50	211	33 12	240	50 16	327
223	23 25	351	61 47	052	40 43	134	15 17	170	19 29	211	32 37	239	49 54	326
224	23 18	350	62 19	050	41 12	134	15 25	169	19 08	210	32 02	239	49 31	325
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		◆ SPICA		ARCTURUS	
225	62 50	049	39 40	087	41 42	133	15 32	169	18 48	210	49 07	323	23 10	349
226	63 20	047	40 21	087	42 12	133	15 41	168	18 27	209	48 42	322	23 02	348
227	63 50	046	41 02	086	42 42	133	15 49	168	18 07	209	48 16	321	22 53	347
228	64 18	044	41 42	085	43 12	132	15 58	167	17 48	208	47 50	319	22 43	346
229	64 46	042	42 23	084	43 42	132	16 08	166	17 29	208	47 23	318	22 33	345
230	65 13	040	43 04	083	44 13	132	16 17	166	17 10	207	46 55	317	22 21	344
231	65 39	038	43 44	083	44 43	131	16 27	165	16 51	207	46 27	315	22 10	343
232	66 04	036	44 25	082	45 14	131	16 38	165	16 33	206	45 58	314	21 57	342
233	66 28	034	45 05	081	45 45	131	16 49	164	16 15	206	45 28	313	21 44	341
234	66 50	032	45 46	080	46 16	131	17 00	164	15 58	205	44 58	312	21 30	340
235	67 11	030	46 26	079	46 47	130	17 12	163	15 41	204	44 27	311	21 16	339
236	67 31	028	47 06	078	47 18	130	17 24	163	15 24	204	43 56	310	21 00	338
237	67 50	026	47 46	078	47 49	130	17 36	162	15 08	203	43 24	308	20 45	337
238	68 07	024	48 26	077	48 21	130	17 49	162	14 52	203	42 52	307	20 28	336
239	68 23	021	49 06	076	48 52	129	18 02	161	14 36	202	42 19	306	20 11	335
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ARCTURUS	
240	26 43	026	14 11	060	12 10	121	18 15	161	56 51	221	41 46	305	19 54	334
241	27 01	025	14 46	059	12 46	120	18 29	160	56 24	221	41 12	304	19 35	333
242	27 18	024	15 21	058	13 21	119	18 43	160	55 57	221	40 38	303	19 16	332
243	27 35	023	15 55	057	13 57	119	18 57	159	55 30	221	40 03	302	18 57	331
244	27 50	022	16 30	056	14 33	118	19 12	159	55 03	221	39 28	301	18 37	330
245	28 05	021	17 04	055	15 09	117	19 27	158	54 36	221	38 53	300	18 16	329
246	28 20	020	17 37	055	15 46	117	19 42	158	54 09	221	38 17	299	17 55	328
247	28 33	019	18 10	054	16 23	116	19 58	157	53 42	221	37 41	298	17 33	327
248	28 46	018	18 43	053	16 59	115	20 14	157	53 15	221	37 05	297	17 11	327
249	28 58	017	19 16	052	17 37	115	20 31	156	52 48	221	36 28	296	16 48	326
250	29 10	016	19 48	051	18 14	114	20 47	156	52 21	221	35 51	295	16 25	325
251	29 20	014	20 19	050	18 51	113	21 04	155	51 54	221	35 14	294	16 01	324
252	29 30	013	20 51	049	19 29	113	21 22	155	51 27	221	34 37	293	15 36	323
253	29 39	012	21 21	048	20 07	112	21 40	154	51 00	221	33 59	292	15 12	322
254	29 48	011	21 52	048	20 45	112	21 58	154	50 33	221	33 21	291	14 46	321
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ANTARES	
255	29 55	010	22 22	047	21 23	111	22 16	153	50 07	221	32 43	290	68 39	341
256	30 02	009	22 51	046	22 01	110	22 35	153	49 40	221	32 04	290	68 25	339
257	30 08	008	23 20	045	22 40	110	22 54	152	49 13	221	31 26	289	68 10	337
258	30 13	007	23 49	044	23 18	109	23 13	152	48 47	220	30 47	288	67 53	335
259	30 17	006	24 17	043	23 57	108	23 32	151	48 20	220	30 08	287	67 34	332
260	30 21	004	24 45	042	24 36	108	23 52	151	47 54	220	29 28	286	67 15	330
261	30 24	003	25 12	041	25 15	107	24 12	150	47 28	220	28 49	285	66 54	328
262	30 26	002	25 38	040	25 54	106	24 33	150	47 01	220	28 09	284	66 31	326
263	30 27	001	26 04	039	26 33	106	24 53	149	46 35	220	27 30	284	66 08	324
264	30 27	000	26 30	038	27 13	105	25 14	149	46 09	219	26 50	283	65 43	322
265	30 27	359	26 55	037	27 52	105	25 36	148	45 43	219	26 10	282	65 18	320
266	30 25	358	27 19	036	28 32	104	25 57	148	45 17	219	25 30	281	64 51	318
267	30 23	357	27 43	035	29 12	103	26 19	148	44 52	219	24 50	280	64 23	316
268	30 20	355	28 06	034	29 52	103	26 41	147	44 26	219	24 09	280	63 55	315
269	30 17	354	28 28	033	30 32	102	27 03	147	44 01	218	23 29	279	63 25	313

LAT 47°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ SPICA		ANTARES		Rasalhague	
270	28 50	032	31 12	101	27 26	146	58 32	225	22 49	278	62 55	311	30 12	353
271	29 11	031	31 52	101	27 49	146	58 03	225	22 08	277	62 24	310	30 07	352
272	29 32	030	32 32	100	28 12	145	57 34	225	21 27	277	61 52	308	30 01	351
273	29 52	029	33 13	099	28 35	145	57 04	225	20 47	276	61 19	307	29 54	350
274	30 11	028	33 53	099	28 59	145	56 35	225	20 06	275	60 46	305	29 46	349
275	30 30	026	34 33	098	29 23	144	56 06	225	19 25	274	60 13	304	29 38	348
276	30 48	025	35 14	097	29 47	144	55 37	225	18 44	274	59 39	303	29 28	346
277	31 05	024	35 55	097	30 11	143	55 08	225	18 04	273	59 04	301	29 18	345
278	31 21	023	36 35	096	30 36	143	54 39	225	17 23	272	58 29	300	29 08	344
279	31 37	022	37 16	095	31 01	142	54 10	225	16 42	271	57 53	299	28 56	343
280	31 52	021	37 57	095	31 26	142	53 40	225	16 01	271	57 17	297	28 44	342
281	32 06	020	38 38	094	31 51	142	53 11	225	15 20	270	56 40	296	28 31	341
282	32 20	019	39 18	093	32 17	141	52 42	225	14 39	269	56 03	295	28 17	340
283	32 33	018	39 59	093	32 42	141	52 14	225	13 58	268	55 26	294	28 03	339
284	32 44	016	40 40	092	33 08	140	51 45	225	13 17	268	54 48	293	27 48	338
	ALTAIR		Enif		◆ FOMALHAUT		ACHERNAR		◆ RIGIL KENT		ANTARES		◆ Rasalhague	
285	32 56	015	22 16	045	41 21	091	33 34	140	51 16	225	54 11	292	27 32	337
286	33 06	014	22 44	044	42 02	090	34 01	140	50 47	225	53 32	291	27 15	336
287	33 15	013	23 12	043	42 43	090	34 27	139	50 18	224	52 54	290	26 58	335
288	33 24	012	23 40	042	43 24	089	34 54	139	49 50	224	52 15	289	26 40	334
289	33 32	011	24 07	041	44 05	088	35 21	139	49 21	224	51 36	288	26 21	332
290	33 39	009	24 33	040	44 46	087	35 48	138	48 53	224	50 57	287	26 02	331
291	33 45	008	24 59	039	45 27	087	36 16	138	48 24	224	50 18	286	25 42	330
292	33 51	007	25 25	038	46 07	086	36 43	137	47 56	224	49 38	285	25 22	329
293	33 55	006	25 49	037	46 48	085	37 11	137	47 28	223	48 59	284	25 01	328
294	33 59	005	26 14	036	47 29	084	37 39	137	47 00	223	48 19	283	24 39	327
295	34 02	003	26 37	035	48 10	083	38 07	136	46 32	223	47 39	282	24 17	326
296	34 04	002	27 00	034	48 50	083	38 35	136	46 04	223	46 59	281	23 54	325
297	34 05	001	27 23	033	49 31	082	39 04	136	45 36	223	46 19	280	23 30	324
298	34 05	000	27 45	032	50 11	081	39 32	135	45 09	222	45 38	279	23 06	323
299	34 05	359	28 06	031	50 52	080	40 01	135	44 41	222	44 58	278	22 42	323
	◆ Enif		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ ANTARES		Rasalhague		ALTAIR	
300	28 27	030	51 32	079	40 30	135	44 14	222	44 17	278	22 16	322	34 04	357
301	28 46	029	52 12	078	40 59	134	43 46	222	43 37	277	21 51	321	34 01	356
302	29 06	028	52 52	077	41 29	134	43 19	221	42 56	276	21 24	320	33 58	355
303	29 24	026	53 32	076	41 58	134	42 52	221	42 15	275	20 58	319	33 54	354
304	29 42	025	54 11	075	42 28	134	42 25	221	41 35	274	20 31	318	33 50	353
305	29 59	024	54 51	075	42 57	133	41 59	221	40 54	274	20 03	317	33 44	352
306	30 16	023	55 30	073	43 27	133	41 32	220	40 13	273	19 35	316	33 37	350
307	30 32	022	56 09	072	43 57	133	41 06	220	39 32	272	19 06	315	33 30	349
308	30 47	021	56 48	071	44 28	132	40 39	220	38 51	271	18 37	314	33 22	348
309	31 01	020	57 27	070	44 58	132	40 13	220	38 10	271	18 07	313	33 13	347
310	31 15	019	58 05	069	45 28	132	39 47	219	37 29	270	17 37	312	33 03	346
311	31 27	018	58 44	068	45 59	132	39 21	219	36 48	269	17 07	312	32 53	345
312	31 39	017	59 21	067	46 30	131	38 56	219	36 08	268	16 36	311	32 42	343
313	31 51	015	59 59	066	47 00	131	38 30	218	35 27	268	16 05	310	32 30	342
314	32 01	014	60 36	065	47 31	131	38 05	218	34 46	267	15 33	309	32 17	341
	◆ Enif		Diphda		◆ ACHERNAR		Miaplacidus		RIGIL KENT		◆ ANTARES		ALTAIR	
315	32 11	013	35 56	077	48 02	131	26 48	181	37 40	218	34 05	266	32 03	340
316	32 20	012	36 36	076	48 33	130	26 48	181	37 15	217	33 24	266	31 49	339
317	32 28	011	37 16	076	49 05	130	26 47	181	36 50	217	32 43	265	31 33	338
318	32 35	010	37 55	075	49 36	130	26 47	180	36 25	217	32 03	264	31 17	337
319	32 41	008	38 35	074	50 08	130	26 47	180	36 01	216	31 22	264	31 01	335
320	32 47	007	39 14	073	50 39	129	26 47	179	35 37	216	30 41	263	30 43	334
321	32 52	006	39 53	072	51 11	129	26 48	179	35 13	216	30 01	262	30 25	333
322	32 56	005	40 32	071	51 42	129	26 49	179	34 49	215	29 20	262	30 07	332
323	32 59	004	41 11	070	52 14	129	26 50	178	34 25	215	28 40	261	29 47	331
324	33 01	003	41 49	069	52 46	129	26 51	178	34 02	215	27 59	260	29 27	330
325	33 03	001	42 27	068	53 18	129	26 53	177	33 39	214	27 19	260	29 06	329
326	33 03	000	43 05	067	53 50	128	26 55	177	33 16	214	26 39	259	28 45	328
327	33 03	359	43 43	066	54 22	128	26 57	177	32 53	214	25 59	258	28 23	327
328	33 02	358	44 20	065	54 55	128	27 00	176	32 30	213	25 19	258	28 00	326
329	33 00	357	44 57	064	55 27	128	27 02	176	32 08	213	24 39	257	27 37	325
	◆ Diphda		ACHERNAR		◆ Miaplacidus		RIGIL KENT		ANTARES		◆ ALTAIR		Enif	
330	45 34	063	55 59	128	27 06	175	31 46	213	23 59	256	27 13	324	32 57	356
331	46 10	062	56 31	128	27 09	175	31 24	212	23 19	256	26 49	323	32 54	354
332	46 46	061	57 04	128	27 12	175	31 02	212	22 40	255	26 24	322	32 49	353
333	47 22	060	57 36	128	27 16	174	30 41	211	22 00	254	25 58	321	32 44	352
334	47 57	059	58 09	127	27 21	174	30 20	211	21 21	254	25 32	320	32 38	351
335	48 32	058	58 41	127	27 25	174	29 59	211	20 42	253	25 05	319	32 31	350
336	49 06	057	59 14	127	27 30	173	29 38	210	20 03	252	24 38	318	32 24	349
337	49 40	055	59 46	127	27 35	173	29 17	210	19 24	252	24 10	317	32 15	347
338	50 14	054	60 19	127	27 40	172	28 57	209	18 45	251	23 42	316	32 06	346
339	50 47	053	60 51	127	27 45	172	28 37	209	18 06	250	23 13	315	31 56	345
340	51 19	052	61 24	127	27 51	172	28 17	209	17 28	250	22 44	314	31 45	344
341	51 51	051	61 56	127	27 57	171	27 58	208	16 50	249	22 15	313	31 33	343
342	52 22	049	62 29	127	28 03	171	27 39	208	16 12	248	21 44	312	31 21	342
343	52 53	048	63 01	128	28 10	171	27 20	207	15 34	248	21 14	311	31 07	341
344	53 23	047	63 34	128	28 17	170	27 01	207	14 56	247	20 43	310	30 53	339
	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		Enif	
345	53 52	045	47 19	104	25 40	141	28 24	170	26 43	207	38 22	271	30 39	338
346	54 21	044	47 59	103	26 06	141	28 31	169	26 25	206	37 41	270	30 23	337
347	54 49	042	48 39	102	26 32	140	28 39	169	26 07	206	37 00	270	30 07	336
348	55 16	041	49 19	102	26 59	140	28 47	169	25 49	205	36 19	269	29 50	335
349	55 43	039	49 59	101	27 25	139	28 55	168	25 32	205	35 38	268	29 33	334
350	56 08	038	50 39	101	27 52	139	29 03	168	25 15	204	34 57	268	29 14	333
351	56 33	036	51 19	100	28 19	138	29 12	168	24 58	204	34 17	267	28 55	332
352	56 57	035	51 59	100	28 46	138	29 21	167	24 41	204	33 36	266	28 36	331
353	57 20	033	52 40	099	29 14	137	29 30	167	24 25	203	32 55	265	28 16	330
354	57 41	032	53 20	098	29 42	137	29 39	167	24 09	203	32 14	265	27 55	329
355	58 02	030	54 01	098	30 10	137	29 49	166	23 54	202	31 33	264	27 33	328
356	58 22	028	54 41	097	30 38	136	29 59	166	23 39	202	30 53	263	27 11	327
357	58 41	026	55 22	097	31 06	136	30 09	166	23 24	201	30 12	263	26 48	326
358	58 59	025	56 03	096	31 35	135	30 19	165	23 09	201	29 32	262	26 25	325
359	59 15	023	56 43	095	32 04	135	30 30	165	22 55	200	28 51	261	26 01	324

Tilbage til Menuen

LAT 48°S

LHA Y	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Alpheratz		Hamal		◆ RIGEL		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	12 48	002	12 55	030	13 33	087	33 15	134	23 37	200	57 13	234	68 05	322
1	12 49	001	13 15	029	14 13	086	33 44	133	23 23	200	56 40	234	67 39	320
2	12 50	000	13 34	028	14 53	086	34 13	133	23 10	199	56 08	234	67 13	318
3	12 49	359	13 53	027	15 33	085	34 43	133	22 57	199	55 35	234	66 46	316
4	12 49	358	14 11	026	16 13	084	35 12	132	22 44	198	55 03	234	66 17	314
5	12 47	358	14 28	025	16 53	083	35 42	132	22 32	198	54 30	234	65 48	312
6	12 45	357	14 45	025	17 33	083	36 12	131	22 20	197	53 58	233	65 18	311
7	12 43	356	15 02	024	18 13	082	36 43	131	22 08	197	53 26	233	64 47	309
8	12 39	355	15 17	023	18 52	081	37 13	130	21 57	196	52 54	233	64 15	307
9	12 36	354	15 33	022	19 32	080	37 44	130	21 46	196	52 22	233	63 43	306
10	12 31	353	15 47	021	20 11	080	38 14	130	21 35	195	51 50	233	63 10	304
11	12 26	352	16 01	020	20 51	079	38 45	129	21 25	195	51 18	232	62 37	303
12	12 20	351	16 15	019	21 30	078	39 17	129	21 15	194	50 46	232	62 03	301
13	12 14	350	16 28	018	22 09	077	39 48	128	21 05	194	50 15	232	61 28	300
14	12 07	350	16 40	017	22 48	076	40 19	128	20 56	193	49 43	232	60 53	299
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
15	16 51	016	23 27	076	14 42	099	40 51	128	20 47	193	49 12	231	60 18	297
16	17 02	015	24 06	075	15 21	098	41 23	127	20 38	192	48 40	231	59 42	296
17	17 12	014	24 45	074	16 01	097	41 55	127	20 30	192	48 09	231	59 06	295
18	17 22	013	25 23	073	16 41	097	42 27	127	20 21	191	47 38	231	58 29	294
19	17 31	012	26 02	072	17 21	096	43 00	126	20 14	191	47 07	230	57 52	293
20	17 40	012	26 40	071	18 01	095	43 32	126	20 06	190	46 36	230	57 15	291
21	17 47	011	27 18	071	18 41	095	44 05	125	19 59	190	46 06	230	56 38	290
22	17 54	010	27 56	070	19 21	094	44 37	125	19 53	189	45 35	229	56 00	289
23	18 01	009	28 33	069	20 01	093	45 10	125	19 47	189	45 05	229	55 22	288
24	18 06	008	29 10	068	20 41	092	45 43	124	19 41	188	44 35	229	54 43	287
25	18 11	007	29 47	067	21 21	092	46 17	124	19 35	188	44 04	228	54 05	286
26	18 16	006	30 24	066	22 01	091	46 50	124	19 30	187	43 34	228	53 26	285
27	18 20	005	31 01	065	22 42	090	47 24	123	19 25	187	43 05	228	52 47	284
28	18 23	004	31 37	064	23 22	089	47 57	123	19 20	186	42 35	228	52 08	283
29	18 25	003	32 13	063	24 02	089	48 31	123	19 16	186	42 05	227	51 29	282
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
30	18 27	002	32 49	062	24 42	088	49 05	122	19 12	185	41 36	227	50 50	281
31	18 28	001	33 24	061	25 22	087	49 39	122	19 09	185	41 07	227	50 11	280
32	18 28	000	33 59	061	26 02	086	50 13	122	19 06	184	40 38	226	49 31	280
33	18 28	359	34 34	060	26 42	086	50 47	121	19 03	184	40 09	226	48 51	279
34	18 27	358	35 09	059	27 22	085	51 22	121	19 01	183	39 40	225	48 12	278
35	18 25	357	35 43	058	28 02	084	51 56	121	18 59	183	39 12	225	47 32	277
36	18 23	356	36 16	057	28 42	083	52 31	120	18 57	182	38 43	225	46 52	276
37	18 20	355	36 50	056	29 22	082	53 05	120	18 56	182	38 15	224	46 12	275
38	18 16	354	37 23	055	30 02	082	53 40	120	18 55	181	37 47	224	45 32	275
39	18 12	353	37 55	053	30 41	081	54 15	119	18 54	181	37 19	224	44 52	274
40	18 06	352	38 27	052	31 21	080	54 50	119	18 54	180	36 52	223	44 12	273
41	18 01	351	38 59	051	32 00	079	55 25	119	18 54	180	36 24	223	43 32	272
42	17 54	350	39 30	050	32 40	078	56 00	119	18 54	179	35 57	222	42 52	271
43	17 47	349	40 00	049	33 19	078	56 36	118	18 55	179	35 30	222	42 12	271
44	17 40	348	40 31	048	33 58	077	57 11	118	18 56	178	35 03	222	41 31	270
	RIGEL		SIRIUS		◆ CANOPUS		RIGIL KENT		◆ Peacock		FOMALHAUT		◆ Hamal	
45	41 00	047	34 37	076	57 46	118	18 58	178	34 37	221	40 51	269	17 31	348
46	41 29	046	35 16	075	58 22	118	19 00	177	34 10	221	40 11	268	17 22	347
47	41 58	045	35 55	074	58 58	117	19 02	176	33 44	221	39 31	268	17 13	346
48	42 25	043	36 33	073	59 33	117	19 05	176	33 18	220	38 51	267	17 02	345
49	42 53	042	37 12	072	60 09	117	19 08	175	32 52	220	38 11	266	16 51	344
50	43 19	041	37 50	071	60 45	117	19 11	175	32 27	219	37 31	266	16 40	343
51	43 45	040	38 28	071	61 21	117	19 15	174	32 02	219	36 51	265	16 28	342
52	44 11	039	39 06	070	61 57	116	19 19	174	31 36	218	36 11	264	16 15	341
53	44 35	037	39 43	069	62 33	116	19 23	173	31 12	218	35 31	264	16 01	340
54	44 59	036	40 20	068	63 09	116	19 28	173	30 47	218	34 51	263	15 47	339
55	45 23	035	40 57	067	63 45	116	19 33	172	30 23	217	34 11	262	15 33	338
56	45 45	033	41 34	066	64 21	116	19 39	172	29 58	217	33 31	261	15 18	337
57	46 07	032	42 11	065	64 57	116	19 45	171	29 34	216	32 52	261	15 02	336
58	46 28	031	42 47	064	65 33	115	19 51	171	29 11	216	32 12	260	14 45	335
59	46 48	029	43 23	063	66 10	115	19 57	170	28 47	215	31 33	259	14 28	335
	◆ ALDEBARAN		BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda	
60	24 56	010	28 59	033	43 58	062	38 17	116	20 04	170	66 56	233	40 19	290
61	25 03	009	29 21	032	44 33	061	38 53	115	20 11	169	66 24	234	39 41	289
62	25 08	008	29 42	031	45 08	060	39 30	115	20 19	169	65 51	234	39 03	288
63	25 13	007	30 02	030	45 43	059	40 06	114	20 27	168	65 19	234	38 24	287
64	25 18	006	30 22	029	46 17	057	40 43	114	20 35	168	64 47	234	37 46	286
65	25 21	004	30 41	028	46 50	056	41 20	113	20 44	167	64 14	234	37 07	285
66	25 24	003	31 00	027	47 23	055	41 57	113	20 53	167	63 42	234	36 28	284
67	25 26	002	31 18	026	47 56	054	42 34	112	21 02	166	63 09	234	35 49	284
68	25 27	001	31 35	025	48 28	053	43 11	112	21 12	166	62 37	234	35 10	283
69	25 28	000	31 51	024	49 00	052	43 49	111	21 22	165	62 04	234	34 31	282
70	25 27	359	32 07	022	49 31	050	44 26	111	21 32	165	61 31	234	33 52	281
71	25 26	358	32 22	021	50 02	049	45 04	110	21 42	164	60 59	234	33 12	280
72	25 25	357	32 36	020	50 32	048	45 41	110	21 53	164	60 26	234	32 33	279
73	25 22	356	32 49	019	51 01	046	46 19	109	22 05	163	59 54	234	31 53	279
74	25 19	355	33 02	018	51 30	045	46 57	109	22 16	163	59 21	234	31 13	278
	BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda		◆ ALDEBARAN	
75	33 14	017	51 58	044	47 35	108	22 28	162	58 49	234	30 34	277	25 15	354
76	33 25	015	52 26	042	48 14	107	22 40	162	58 17	234	29 54	276	25 11	353
77	33 35	014	52 53	041	48 52	107	22 53	162	57 44	234	29 14	275	25 05	352
78	33 45	013	53 19	040	49 31	106	23 06	161	57 12	234	28 34	275	24 59	351
79	33 54	012	53 44	038	50 09	106	23 19	161	56 40	233	27 54	274	24 52	350
80	34 02	011	54 08	037	50 48	105	23 32	160	56 08	233	27 14	273	24 45	349
81	34 09	010	54 32	035	51 26	105	23 46	160	55 35	233	26 34	272	24 36	348
82	34 15	008	54 54	034	52 05	104	24 00	159	55 03	233	25 53	272	24 27	347
83	34 20	007	55 16	032	52 44	104	24 15	159	54 31	233	25 13	271	24 17	345
84	34 25	006	55 37	031	53 23	103	24 30	158	53 59	233	24 33	270	24 07	344
85	34 29	005	55 57	029	54 02	103	24 45	158	53 28	232	23 53	269	23 56	343
86	34 32	004	56 16	027	54 42	102	25 00	157	52 56	232	23 13	269	23 44	342
87	34 34	002	56 34	026	55 21	102	25 15	157	52 24	232	22 33	268	23 32	341
88	34 35	001	56 51	024	56 00	101	25 31	156	51 53	232	21 53	267	23 18	340
89	34 35	000	57 07	022	56 40	101	25 48	156	51 21	232	21 13	266	23 05	339

LAT 48°S

LHA Y	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		Alphard		◆ Suhail		RIGIL KENT		◆ ACHERNAR		◆ RIGEL		BETELGEUSE	
90	32 27	030	31 17	066	57 19	100	26 04	156	50 50	231	49 04	343	34 35	359
91	32 47	029	31 53	065	57 59	099	26 21	155	50 18	231	48 52	341	34 34	358
92	33 06	028	32 29	064	58 38	099	26 38	155	49 47	231	48 39	340	34 32	356
93	33 25	027	33 05	063	59 18	098	26 55	154	49 16	231	48 25	339	34 29	355
94	33 42	025	33 41	062	59 58	098	27 13	154	48 45	230	48 10	337	34 25	354
95	33 59	024	34 16	061	60 38	097	27 31	153	48 14	230	47 53	336	34 20	353
96	34 15	023	34 51	060	61 17	097	27 49	153	47 44	230	47 36	334	34 15	352
97	34 31	022	35 26	059	61 57	096	28 07	153	47 13	230	47 19	333	34 09	350
98	34 45	021	36 00	058	62 37	095	28 26	152	46 42	229	47 00	332	34 01	349
99	34 59	020	36 34	057	63 17	095	28 45	152	46 12	229	46 40	330	33 54	348
100	35 12	018	37 08	056	63 57	094	29 04	151	45 42	229	46 20	329	33 45	347
101	35 24	017	37 41	055	64 37	093	29 23	151	45 12	228	45 59	327	33 35	346
102	35 36	016	38 14	054	65 18	093	29 43	150	44 42	228	45 37	326	33 25	344
103	35 47	015	38 46	053	65 58	092	30 03	150	44 12	228	45 14	325	33 14	343
104	35 56	014	39 18	052	66 38	091	30 23	150	43 42	228	44 51	324	33 02	342
	PROCYON		REGULUS		◆ Gienah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ BETELGEUSE	
105	36 05	012	16 55	049	20 11	094	30 44	149	43 13	227	44 26	322	32 49	341
106	36 14	011	17 25	048	20 51	094	31 04	149	42 43	227	44 01	321	32 36	340
107	36 21	010	17 54	047	21 31	093	31 25	148	42 14	227	43 36	320	32 22	339
108	36 27	009	18 24	046	22 12	092	31 46	148	41 45	226	43 10	319	32 07	338
109	36 33	007	18 52	045	22 52	091	32 08	148	41 16	226	42 43	317	31 51	336
110	36 38	006	19 20	044	23 32	091	32 29	147	40 47	226	42 15	316	31 35	335
111	36 42	005	19 48	043	24 12	090	32 51	147	40 19	225	41 47	315	31 17	334
112	36 45	004	20 16	042	24 52	089	33 13	146	39 50	225	41 18	314	31 00	333
113	36 47	003	20 42	041	25 32	088	33 36	146	39 22	225	40 49	313	30 41	332
114	36 48	001	21 09	041	26 12	088	33 58	146	38 54	224	40 19	312	30 22	331
115	36 49	000	21 35	040	26 53	087	34 21	145	38 26	224	39 49	310	30 02	330
116	36 48	359	22 00	039	27 33	086	34 44	145	37 59	223	39 18	309	29 42	329
117	36 47	358	22 25	038	28 13	085	35 07	145	37 31	223	38 47	308	29 21	328
118	36 45	356	22 49	037	28 53	085	35 30	144	37 04	223	38 15	307	28 59	327
119	36 42	355	23 13	036	29 33	084	35 54	144	36 37	222	37 43	306	28 36	326
	REGULUS		◆ SPICA		RIGIL KENT		◆ ACHERNAR		RIGEL		BETELGEUSE		◆ PROCYON	
120	23 36	035	14 00	091	36 18	144	36 10	222	37 11	305	28 13	325	36 38	354
121	23 59	034	14 40	091	36 42	143	35 43	222	36 37	304	27 50	324	36 33	353
122	24 21	033	15 20	090	37 06	143	35 16	221	36 04	303	27 26	323	36 28	351
123	24 42	032	16 00	089	37 30	143	34 50	221	35 30	302	27 01	322	36 21	350
124	25 03	031	16 40	088	37 54	142	34 24	220	34 56	301	26 36	320	36 14	349
125	25 23	030	17 21	088	38 19	142	33 58	220	34 21	300	26 10	319	36 06	348
126	25 43	029	18 01	087	38 44	142	33 32	220	33 47	299	25 44	319	35 57	346
127	26 02	028	18 41	086	39 09	141	33 07	219	33 11	298	25 17	318	35 47	345
128	26 20	027	19 21	085	39 34	141	32 41	219	32 36	297	24 49	317	35 36	344
129	26 38	026	20 01	085	40 00	141	32 16	218	32 00	296	24 22	316	35 25	343
130	26 55	025	20 41	084	40 25	140	31 52	218	31 24	295	23 53	315	35 13	342
131	27 11	024	21 21	083	40 51	140	31 27	218	30 47	294	23 24	314	35 00	340
132	27 27	022	22 00	082	41 17	140	31 03	217	30 11	294	22 55	313	34 46	339
133	27 42	021	22 40	081	41 43	139	30 38	217	29 34	293	22 25	312	34 31	338
134	27 56	020	23 20	081	42 09	139	30 15	216	28 57	292	21 55	311	34 16	337
	◆ REGULUS		SPICA		◆ RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		PROCYON	
135	28 10	019	23 59	080	42 36	139	29 51	216	65 02	244	48 25	307	34 00	336
136	28 23	018	24 39	079	43 02	139	29 28	215	64 26	244	47 53	306	33 43	335
137	28 35	017	25 18	078	43 29	138	29 04	215	63 50	244	47 20	305	33 25	333
138	28 46	016	25 58	077	43 56	138	28 41	215	63 14	244	46 47	304	33 07	332
139	28 57	015	26 37	077	44 22	138	28 19	214	62 38	244	46 13	302	32 48	331
140	29 07	014	27 16	076	44 49	137	27 56	214	62 02	244	45 39	301	32 28	330
141	29 16	013	27 54	075	45 17	137	27 34	213	61 26	243	45 05	300	32 08	329
142	29 25	012	28 33	074	45 44	137	27 12	213	60 50	243	44 30	299	31 47	328
143	29 32	010	29 12	073	46 11	137	26 51	212	60 14	243	43 55	298	31 25	327
144	29 39	009	29 50	072	46 39	137	26 30	212	59 38	243	43 19	297	31 03	326
145	29 45	008	30 28	072	47 07	136	26 09	211	59 03	243	42 43	296	30 40	325
146	29 51	007	31 06	071	47 34	136	25 48	211	58 27	242	42 07	295	30 17	324
147	29 55	006	31 44	070	48 02	136	25 27	210	57 51	242	41 31	294	29 52	323
148	29 59	005	32 22	069	48 30	136	25 07	210	57 16	242	40 54	293	29 28	321
149	30 02	004	32 59	068	48 58	135	24 47	210	56 41	242	40 17	292	29 02	320
	◆ REGULUS		SPICA		◆ RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		PROCYON	
150	30 04	003	33 36	067	49 27	135	24 27	209	56 05	241	39 40	291	28 37	319
151	30 06	001	34 13	066	49 55	135	24 08	209	55 30	241	39 02	290	28 10	318
152	30 06	000	34 50	065	50 23	135	23 49	208	54 55	241	38 24	289	27 43	317
153	30 06	359	35 26	064	50 52	135	23 30	208	54 20	241	37 46	288	27 16	316
154	30 05	358	36 02	063	51 20	135	23 12	207	53 45	240	37 08	288	26 48	315
155	30 03	357	36 38	062	51 49	134	22 54	207	53 10	240	36 30	287	26 20	314
156	30 01	356	37 13	061	52 18	134	22 36	206	52 36	240	35 51	286	25 51	313
157	29 58	355	37 48	060	52 47	134	22 18	206	52 01	239	35 12	285	25 21	313
158	29 54	354	38 23	059	53 15	134	22 01	205	51 27	239	34 34	284	24 51	312
159	29 49	352	38 57	058	53 44	134	21 44	205	50 52	239	33 54	283	24 21	311
160	29 43	351	39 31	057	54 13	134	21 28	204	50 18	238	33 15	282	23 51	310
161	29 36	350	40 05	056	54 42	134	21 11	204	49 44	238	32 36	282	23 19	309
162	29 29	349	40 38	055	55 11	134	20 56	203	49 10	238	31 57	281	22 48	308
163	29 21	348	41 11	054	55 40	134	20 40	203	48 36	237	31 17	280	22 16	307
164	29 13	347	41 43	053	56 09	133	20 25	202	48 02	237	30 38	279	21 44	306
	SPICA		◆ ANTARES		RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		◆ REGULUS	
165	42 15	052	24 07	103	56 39	133	20 10	202	47 28	237	29 58	278	29 03	346
166	42 47	051	24 46	103	57 08	133	19 55	201	46 55	236	29 18	277	28 53	345
167	43 18	050	25 25	102	57 37	133	19 41	201	46 21	236	28 38	277	28 42	344
168	43 48	049	26 04	101	58 06	133	19 27	200	45 48	236	27 58	276	28 30	342
169	44 18	047	26 44	101	58 35	133	19 13	200	45 15	235	27 18	275	28 18	341
170	44 47	046	27 23	100	59 04	133	19 00	199	44 42	235	26 38	274	28 04	340
171	45 16	045	28 03	099	59 34	133	18 47	198	44 09	235	25 58	274	27 50	339
172	45 44	044	28 42	099	60 03	133	18 35	198	43 37	234	25 18	273	27 36	338
173	46 11	043	29 22	098	60 32	134	18 22	197	43 04	234	24 38	272	27 21	337
174	46 38	041	30 02	097	61 01	134	18 11	197	42 32	234	23 58	271	27 05	336
175	47 04	040	30 42	097	61 30	134	17 59	196	42 00	233	23 18	271	26 48	335
176	47 30	039	31 22	096	61 59	134	17 48	196	41 28	233	22 38	270	26 31	334
177	47 54	037	32 02	095	62 28	134	17 37	195	40 56	232	21 58	269	26 13	333
178	48 18	036	32 42	095	62 57	134	17 27	195	40 24	232	21 17	268	25 54	332
179	48 42	035	33 22	094	63 26	134	17 17	194	39 52	232	20 37	268	25 35	331

LAT 48°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	16 17	033	34 02	093	23 40	151	17 07	194	39 21	231	60 09	262	25 15	330
181	16 39	033	34 42	092	23 59	151	16 58	193	38 50	231	59 29	262	24 54	329
182	17 00	032	35 22	092	24 19	150	16 49	193	38 19	230	58 49	261	24 33	328
183	17 21	031	36 02	091	24 39	150	16 40	192	37 48	230	58 10	261	24 12	327
184	17 41	030	36 42	090	24 59	149	16 32	191	37 17	230	57 30	260	23 49	326
185	18 01	029	37 22	089	25 20	149	16 25	191	36 47	229	56 50	260	23 26	325
186	18 20	028	38 03	089	25 41	148	16 17	190	36 17	229	56 11	259	23 03	324
187	18 39	027	38 43	088	26 02	148	16 10	190	35 47	228	55 32	258	22 39	323
188	18 57	026	39 23	087	26 23	147	16 03	189	35 17	228	54 52	258	22 15	322
189	19 14	025	40 03	086	26 45	147	15 57	189	34 47	227	54 13	257	21 49	321
190	19 31	024	40 43	086	27 07	147	15 51	188	34 18	227	53 34	257	21 24	320
191	19 47	023	41 23	085	27 29	146	15 46	188	33 48	227	52 55	256	20 58	319
192	20 02	022	42 03	084	27 52	146	15 41	187	33 19	226	52 16	256	20 31	318
193	20 17	021	42 43	083	28 15	145	15 36	186	32 50	226	51 37	255	20 04	317
194	20 31	020	43 23	082	28 38	145	15 32	186	32 22	225	50 58	255	19 37	316
	ARCTURUS		◆ ANTARES		Peacock		◆ ACHERNAR		CANOPUS		Suhail		◆ REGULUS	
195	20 45	019	44 02	082	29 01	144	15 28	185	31 53	225	50 20	254	19 09	315
196	20 58	018	44 42	081	29 25	144	15 24	185	31 25	224	49 41	254	18 40	314
197	21 10	017	45 22	080	29 49	143	15 21	184	30 57	224	49 03	253	18 11	314
198	21 22	016	46 01	079	30 13	143	15 18	184	30 29	223	48 24	253	17 42	313
199	21 33	015	46 40	078	30 37	143	15 16	183	30 02	223	47 46	252	17 12	312
200	21 43	014	47 20	077	31 01	142	15 14	183	29 35	223	47 08	252	16 42	311
201	21 53	013	47 59	076	31 26	142	15 12	182	29 08	222	46 30	251	16 12	310
202	22 02	012	48 38	075	31 51	141	15 11	181	28 41	222	45 52	251	15 41	309
203	22 10	011	49 16	074	32 16	141	15 10	181	28 14	221	45 14	250	15 10	308
204	22 17	010	49 55	073	32 42	140	15 10	180	27 48	221	44 36	250	14 38	307
205	22 24	009	50 33	072	33 07	140	15 10	180	27 22	220	43 59	249	14 06	307
206	22 30	008	51 11	071	33 33	140	15 10	179	26 56	220	43 21	249	13 33	306
207	22 36	007	51 49	070	33 59	139	15 11	179	26 31	219	42 44	248	13 01	305
208	22 40	006	52 27	069	34 26	139	15 12	178	26 05	219	42 07	248	12 28	304
209	22 44	005	53 05	068	34 52	138	15 14	178	25 40	218	41 30	247	11 54	303
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	22 48	004	53 42	067	35 19	138	15 15	177	25 16	218	40 53	246	52 33	346
211	22 50	003	54 19	066	35 46	138	15 18	176	24 51	217	40 16	246	52 23	345
212	22 52	002	54 55	065	36 13	137	15 21	176	24 27	217	39 40	245	52 12	343
213	22 53	001	55 31	064	36 40	137	15 24	175	24 03	216	39 03	245	52 00	341
214	22 54	000	56 07	063	37 08	137	15 27	175	23 40	216	38 27	244	51 46	340
215	22 53	359	56 43	061	37 36	136	15 31	174	23 16	215	37 51	244	51 32	338
216	22 52	358	57 18	060	38 04	136	15 35	174	22 53	215	37 15	243	51 17	337
217	22 51	357	57 52	059	38 32	135	15 40	173	22 30	214	36 39	243	51 01	335
218	22 48	356	58 26	058	39 00	135	15 45	172	22 08	214	36 03	242	50 43	334
219	22 45	355	59 00	056	39 28	135	15 51	172	21 46	213	35 28	242	50 25	332
220	22 41	354	59 33	055	39 57	134	15 56	171	21 24	213	34 53	241	50 06	331
221	22 37	353	60 06	053	40 26	134	16 03	171	21 02	212	34 17	241	49 46	330
222	22 31	352	60 38	052	40 55	134	16 09	170	20 41	212	33 42	240	49 26	328
223	22 25	351	61 09	051	41 24	133	16 16	170	20 20	211	33 08	240	49 04	327
224	22 19	350	61 40	049	41 53	133	16 23	169	20 00	211	32 33	239	48 41	325
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		◆ SPICA		ARCTURUS	
225	62 10	047	39 37	087	42 23	133	16 31	169	19 40	210	48 18	324	22 11	349
226	62 39	046	40 17	086	42 52	132	16 39	168	19 20	209	47 54	323	22 03	348
227	63 07	044	40 57	085	43 22	132	16 48	168	19 00	209	47 30	321	21 54	347
228	63 35	042	41 37	084	43 52	132	16 57	167	18 41	208	47 04	320	21 45	346
229	64 01	041	42 17	083	44 22	131	17 06	166	18 22	208	46 38	319	21 35	345
230	64 27	039	42 56	083	44 52	131	17 16	166	18 03	207	46 11	317	21 24	344
231	64 52	037	43 36	082	45 23	131	17 26	165	17 45	207	45 44	316	21 12	343
232	65 15	035	44 16	081	45 53	130	17 36	165	17 27	206	45 16	315	21 00	342
233	65 38	033	44 56	080	46 24	130	17 47	164	17 09	206	44 47	314	20 47	341
234	65 59	031	45 35	079	46 55	130	17 58	164	16 52	205	44 18	313	20 34	340
235	66 19	029	46 14	078	47 25	130	18 09	163	16 35	205	43 48	311	20 20	339
236	66 38	027	46 54	077	47 56	129	18 21	163	16 19	204	43 17	310	20 05	338
237	66 56	025	47 33	076	48 28	129	18 33	162	16 03	203	42 46	309	19 50	337
238	67 12	023	48 12	076	48 59	129	18 45	162	15 47	203	42 15	308	19 34	336
239	67 26	020	48 50	075	49 30	129	18 58	161	15 32	202	41 43	307	19 17	335
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ARCTURUS	
240	25 49	026	13 40	059	12 41	120	19 12	161	57 36	222	41 11	306	19 00	334
241	26 07	025	14 15	059	13 16	120	19 25	160	57 09	222	40 38	305	18 42	333
242	26 23	024	14 49	058	13 51	119	19 39	160	56 42	222	40 05	304	18 23	332
243	26 39	023	15 23	057	14 26	118	19 53	159	56 15	222	39 31	303	18 04	331
244	26 55	022	15 56	056	15 01	118	20 08	158	55 48	222	38 57	302	17 45	330
245	27 09	021	16 29	055	15 37	117	20 23	158	55 21	222	38 23	301	17 25	329
246	27 23	020	17 02	054	16 13	116	20 38	157	54 54	222	37 48	300	17 04	328
247	27 37	019	17 35	054	16 49	116	20 53	157	54 27	222	37 13	299	16 43	328
248	27 49	018	18 07	053	17 25	115	21 09	156	54 00	222	36 38	298	16 21	327
249	28 01	017	18 39	052	18 01	114	21 25	156	53 33	222	36 02	297	15 59	326
250	28 12	015	19 10	051	18 38	114	21 42	155	53 06	222	35 26	296	15 36	325
251	28 22	014	19 41	050	19 15	113	21 59	155	52 39	222	34 49	295	15 12	324
252	28 32	013	20 11	049	19 52	112	22 16	154	52 12	222	34 13	294	14 49	323
253	28 41	012	20 42	048	20 29	112	22 34	154	51 45	222	33 36	293	14 24	322
254	28 49	011	21 11	047	21 06	111	22 51	153	51 18	222	32 59	292	13 59	321
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ANTARES	
255	28 56	010	21 40	046	21 44	111	23 09	153	50 52	222	32 21	291	67 42	342
256	29 03	009	22 09	045	22 22	110	23 28	152	50 25	221	31 44	290	67 29	340
257	29 08	008	22 38	044	23 00	109	23 47	152	49 59	221	31 06	289	67 14	338
258	29 13	007	23 06	044	23 38	109	24 06	152	49 32	221	30 28	288	66 58	336
259	29 18	005	23 33	043	24 16	108	24 25	151	49 06	221	29 50	288	66 41	333
260	29 21	004	24 00	042	24 54	107	24 44	151	48 39	221	29 11	287	66 22	331
261	29 24	003	24 26	041	25 32	107	25 04	150	48 13	221	28 33	286	66 02	329
262	29 26	002	24 52	040	26 11	106	25 24	150	47 47	220	27 54	285	65 41	327
263	29 27	001	25 17	039	26 50	105	25 45	149	47 21	220	27 15	284	65 19	325
264	29 27	000	25 42	038	27 28	105	26 06	149	46 55	220	26 36	283	64 56	323
265	29 27	359	26 07	037	28 07	104	26 27	148	46 29	220	25 57	283	64 31	321
266	29 25	358	26 30	036	28 46	103	26 48	148	46 04	220	25 18	282	64 06	320
267	29 23	357	26 53	035	29 25	103	27 10	147	45 38	219	24 39	281	63 39	318
268	29 20	355	27 16	034	30 05	102	27 31	147	45 13	219	23 59	280	63 12	316
269	29 17	354	27 38	033	30 44	101	27 53	146	44 47	219	23 20	279	62 44	314

LAT 48°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ SPICA		ANTARES		Rasalhague	
270	27 59	032	31 23	101	28 16	146	59 14	227	22 40	279	62 14	313	29 12	353
271	28 20	030	32 03	100	28 38	146	58 44	227	22 00	278	61 45	311	29 07	352
272	28 40	029	32 42	099	29 01	145	58 15	227	21 20	277	61 14	310	29 01	351
273	28 59	028	33 22	099	29 24	145	57 46	227	20 40	276	60 43	308	28 55	350
274	29 18	027	34 02	098	29 48	144	57 17	227	20 00	275	60 11	307	28 47	349
275	29 36	026	34 41	097	30 11	144	56 48	227	19 21	275	59 39	305	28 39	348
276	29 53	025	35 21	097	30 35	143	56 19	227	18 40	274	59 06	304	28 30	347
277	30 10	024	36 01	096	30 59	143	55 50	226	18 00	273	58 32	303	28 20	345
278	30 26	023	36 41	095	31 24	142	55 20	226	17 20	272	57 58	301	28 10	344
279	30 41	022	37 21	095	31 48	142	54 51	226	16 40	272	57 23	300	27 59	343
280	30 56	021	38 01	094	32 13	142	54 22	226	16 00	271	56 48	299	27 47	342
281	31 10	020	38 41	093	32 38	141	53 53	226	15 20	270	56 13	298	27 34	341
282	31 23	018	39 21	092	33 03	141	53 25	226	14 40	269	55 37	296	27 21	340
283	31 35	017	40 02	092	33 29	140	52 56	226	14 00	269	55 01	295	27 07	339
284	31 47	016	40 42	091	33 54	140	52 27	226	13 19	268	54 25	294	26 52	338
	ALTAIR		Enif		◆ FOMALHAUT		ACHERNAR		◆ RIGIL KENT		ANTARES		◆ Rasalhague	
285	31 58	015	21 33	044	41 22	090	34 20	140	51 58	226	53 48	293	26 37	337
286	32 08	014	22 01	043	42 02	089	34 46	139	51 29	225	53 11	292	26 20	336
287	32 17	013	22 28	042	42 42	089	35 13	139	51 01	225	52 33	291	26 04	335
288	32 25	012	22 55	041	43 22	088	35 39	138	50 32	225	51 56	290	25 46	334
289	32 33	010	23 21	040	44 02	087	36 06	138	50 04	225	51 18	289	25 28	333
290	32 40	009	23 47	040	44 42	086	36 33	138	49 36	225	50 40	288	25 09	332
291	32 46	008	24 12	039	45 22	086	37 00	137	49 07	225	50 01	287	24 50	331
292	32 51	007	24 37	038	46 02	085	37 27	137	48 39	224	49 23	286	24 30	330
293	32 56	006	25 01	037	46 42	084	37 55	137	48 11	224	48 44	285	24 10	329
294	32 59	005	25 25	036	47 22	083	38 22	136	47 43	224	48 05	284	23 48	328
295	33 02	003	25 48	035	48 02	082	38 50	136	47 15	224	47 26	283	23 27	327
296	33 04	002	26 10	034	48 42	082	39 18	136	46 48	224	46 47	282	23 04	326
297	33 05	001	26 32	033	49 22	081	39 47	135	46 20	223	46 08	281	22 41	325
298	33 05	000	26 54	031	50 01	080	40 15	135	45 53	223	45 28	280	22 18	324
299	33 05	359	27 14	030	50 41	079	40 44	134	45 25	223	44 49	279	21 54	323
	◆ Enif		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ ANTARES		Rasalhague		ALTAIR	
300	27 34	029	51 20	078	41 12	134	44 58	223	44 09	279	21 29	322	33 04	357
301	27 54	028	51 59	077	41 41	134	44 31	222	43 29	278	21 04	321	33 01	356
302	28 12	027	52 38	076	42 10	133	44 04	222	42 49	277	20 39	320	32 58	355
303	28 31	026	53 17	075	42 39	133	43 37	222	42 09	276	20 13	319	32 55	354
304	28 48	025	53 56	074	43 09	133	43 11	222	41 29	275	19 46	318	32 50	353
305	29 05	024	54 34	073	43 38	133	42 44	221	40 49	275	19 19	317	32 45	352
306	29 21	023	55 13	072	44 08	132	42 18	221	40 09	274	18 51	316	32 38	350
307	29 36	022	55 51	071	44 38	132	41 51	221	39 29	273	18 23	315	32 31	349
308	29 51	021	56 29	070	45 08	132	41 25	220	38 49	272	17 55	314	32 23	348
309	30 05	020	57 06	069	45 38	131	40 59	220	38 09	271	17 26	314	32 15	347
310	30 18	019	57 43	068	46 08	131	40 33	220	37 29	271	16 57	313	32 05	346
311	30 30	017	58 20	067	46 38	131	40 08	220	36 49	270	16 27	312	31 55	345
312	30 42	016	58 57	065	47 09	130	39 42	219	36 09	269	15 57	311	31 44	344
313	30 53	015	59 33	064	47 39	130	39 17	219	35 29	268	15 26	310	31 32	342
314	31 03	014	60 09	063	48 10	130	38 52	219	34 48	268	14 55	309	31 20	341
	◆ Enif		Diphda		◆ ACHERNAR		Miaplacidus		RIGIL KENT		◆ ANTARES		ALTAIR	
315	31 12	013	35 43	077	48 41	130	27 48	181	38 27	218	34 08	267	31 07	340
316	31 21	012	36 22	076	49 12	129	27 47	181	38 02	218	33 28	266	30 53	339
317	31 29	011	37 01	075	49 43	129	27 47	181	37 38	218	32 48	266	30 38	338
318	31 36	010	37 39	074	50 14	129	27 47	180	37 13	217	32 08	265	30 22	337
319	31 42	008	38 18	073	50 45	129	27 47	180	36 49	217	31 28	264	30 06	336
320	31 48	007	38 56	072	51 17	128	27 47	179	36 25	217	30 48	264	29 49	335
321	31 52	006	39 34	071	51 48	128	27 48	179	36 01	216	30 08	263	29 32	334
322	31 56	005	40 12	070	52 20	128	27 49	179	35 38	216	29 29	262	29 14	332
323	31 59	004	40 50	069	52 52	128	27 50	178	35 14	215	28 49	261	28 55	331
324	32 01	003	41 27	068	53 23	128	27 51	178	34 51	215	28 09	261	28 35	330
325	32 03	001	42 04	067	53 55	127	27 53	177	34 28	215	27 30	260	28 15	329
326	32 03	000	42 41	066	54 27	127	27 55	177	34 05	214	26 50	259	27 54	328
327	32 03	359	43 18	065	54 59	127	27 57	177	33 43	214	26 11	259	27 33	327
328	32 02	358	43 54	064	55 31	127	28 00	176	33 20	214	25 31	258	27 10	326
329	32 00	357	44 30	063	56 03	127	28 02	176	32 58	213	24 52	257	26 48	325
	◆ Diphda		ACHERNAR		◆ Miaplacidus		RIGIL KENT		ANTARES		◆ ALTAIR		Enif	
330	45 06	062	56 35	127	28 05	175	32 36	213	24 13	257	26 25	324	31 58	356
331	45 42	061	57 08	127	28 09	175	32 15	213	23 34	256	26 01	323	31 54	354
332	46 17	060	57 40	126	28 12	175	31 53	212	22 55	255	25 36	322	31 50	353
333	46 51	059	58 12	126	28 16	174	31 32	212	22 16	255	25 11	321	31 45	352
334	47 26	058	58 45	126	28 20	174	31 11	211	21 38	254	24 46	320	31 39	351
335	47 59	057	59 17	126	28 25	174	30 50	211	20 59	253	24 20	319	31 32	350
336	48 33	056	59 50	126	28 29	173	30 30	211	20 21	253	23 53	318	31 25	349
337	49 06	055	60 22	126	28 34	173	30 09	210	19 43	252	23 26	317	31 16	348
338	49 38	053	60 55	126	28 39	172	29 49	210	19 05	251	22 59	316	31 07	346
339	50 10	052	61 27	126	28 45	172	29 30	209	18 27	251	22 31	315	30 58	345
340	50 42	051	62 00	126	28 51	172	29 10	209	17 49	250	22 02	314	30 47	344
341	51 12	050	62 32	126	28 56	171	28 51	208	17 11	249	21 33	313	30 36	343
342	51 43	048	63 05	126	29 03	171	28 32	208	16 34	249	21 04	313	30 24	342
343	52 12	047	63 37	126	29 09	170	28 13	208	15 56	248	20 34	312	30 11	341
344	52 41	046	64 10	126	29 16	170	27 55	207	15 19	247	20 04	311	29 57	340
	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		Enif	
345	53 10	044	47 32	103	26 27	141	29 23	170	27 36	207	38 20	272	29 43	339
346	53 37	043	48 12	102	26 52	140	29 30	169	27 18	206	37 40	271	29 28	338
347	54 04	041	48 51	101	27 18	140	29 38	169	27 01	206	37 00	270	29 12	336
348	54 31	040	49 30	101	27 44	139	29 46	169	26 43	205	36 20	270	28 56	335
349	54 56	039	50 10	100	28 10	139	29 54	168	26 26	205	35 40	269	28 39	334
350	55 21	037	50 49	100	28 37	138	30 02	168	26 09	205	35 00	268	28 21	333
351	55 44	035	51 29	099	29 04	138	30 10	168	25 53	204	34 20	268	28 02	332
352	56 07	034	52 09	098	29 31	138	30 19	167	25 36	204	33 39	267	27 43	331
353	56 29	032	52 48	098	29 58	137	30 28	167	25 20	203	32 59	266	27 24	330
354	56 50	031	53 28	097	30 25	137	30 38	166	25 05	203	32 19	265	27 03	329
355	57 10	029	54 08	096	30 53	136	30 47	166	24 49	202	31 39	265	26 42	328
356	57 29	027	54 48	096	31 21	136	30 57	166	24 34	202	30 59	264	26 21	327
357	57 47	026	55 28	095	31 49	135	31 07	165	24 19	201	30 19	263	25 58	326
358	58 04	024	56 08	094	32 18	135	31 17	165	24 05	201	29 40	263	25 36	325
359	58 20	022	56 48	094	32 46	134	31 28	165	23 51	200	29 00	262	25 12	324

LAT 49°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Alpheratz		Hamal		◆ RIGEL		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	11 48	002	12 03	030	13 30	087	33 56	133	24 33	200	57 47	236	67 17	323
1	11 49	001	12 22	029	14 09	086	34 25	133	24 20	200	57 15	236	66 53	321
2	11 50	000	12 41	028	14 48	085	34 54	133	24 07	199	56 42	235	66 28	319
3	11 49	359	12 59	027	15 28	085	35 23	132	23 54	199	56 10	235	66 02	318
4	11 49	358	13 17	026	16 07	084	35 52	132	23 41	198	55 38	235	65 35	316
5	11 47	358	13 34	025	16 46	083	36 22	131	23 29	198	55 05	235	65 07	314
6	11 45	357	13 51	024	17 25	082	36 52	131	23 17	197	54 33	235	64 38	312
7	11 43	356	14 07	024	18 04	082	37 22	130	23 06	197	54 01	234	64 09	311
8	11 40	355	14 22	023	18 43	081	37 52	130	22 55	196	53 29	234	63 38	309
9	11 36	354	14 37	022	19 22	080	38 22	129	22 44	196	52 58	234	63 07	307
10	11 31	353	14 51	021	20 00	079	38 52	129	22 33	195	52 26	234	62 36	306
11	11 26	352	15 05	020	20 39	078	39 23	129	22 23	195	51 54	233	62 04	304
12	11 21	351	15 18	019	21 17	078	39 54	128	22 13	194	51 23	233	61 31	303
13	11 15	350	15 30	018	21 56	077	40 25	128	22 03	194	50 51	233	60 58	302
14	11 08	350	15 42	017	22 34	076	40 56	127	21 54	193	50 20	233	60 24	300
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
15	15 54	016	23 12	075	14 51	099	41 28	127	21 45	193	49 49	232	59 50	299
16	16 04	015	23 50	074	15 30	098	41 59	127	21 36	192	49 18	232	59 15	298
17	16 14	014	24 28	073	16 09	097	42 31	126	21 28	192	48 47	232	58 40	296
18	16 24	013	25 06	073	16 48	096	43 03	126	21 20	191	48 16	231	58 04	295
19	16 33	012	25 43	072	17 27	096	43 35	125	21 13	191	47 45	231	57 29	294
20	16 41	011	26 20	071	18 06	095	44 07	125	21 05	190	47 15	231	56 52	293
21	16 48	011	26 58	070	18 45	094	44 39	125	20 59	190	46 44	230	56 16	292
22	16 55	010	27 34	069	19 25	093	45 12	124	20 52	189	46 14	230	55 39	291
23	17 01	009	28 11	068	20 04	093	45 44	124	20 46	189	45 44	230	55 02	289
24	17 07	008	28 48	067	20 43	092	46 17	123	20 40	188	45 14	230	54 25	288
25	17 12	007	29 24	066	21 23	091	46 50	123	20 34	188	44 44	229	53 48	287
26	17 16	006	30 00	066	22 02	090	47 23	123	20 29	187	44 14	229	53 10	286
27	17 20	005	30 35	065	22 41	090	47 56	122	20 24	187	43 45	229	52 32	285
28	17 23	004	31 11	064	23 21	089	48 29	122	20 20	186	43 15	228	51 54	284
29	17 25	003	31 46	063	24 00	088	49 03	122	20 16	186	42 46	228	51 16	283
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
30	17 27	002	32 21	062	24 39	087	49 36	121	20 12	185	42 17	227	50 38	283
31	17 28	001	32 55	061	25 19	087	50 10	121	20 09	185	41 48	227	49 59	282
32	17 28	000	33 30	060	25 58	086	50 44	121	20 06	184	41 19	227	49 20	281
33	17 28	359	34 04	059	26 37	085	51 18	120	20 03	184	40 51	226	48 42	280
34	17 27	358	34 37	058	27 16	084	51 52	120	20 00	183	40 22	226	48 03	279
35	17 25	357	35 10	057	27 56	084	52 26	120	19 58	183	39 54	226	47 24	278
36	17 23	356	35 43	056	28 35	083	53 00	119	19 57	182	39 26	225	46 45	277
37	17 20	355	36 16	055	29 14	082	53 35	119	19 56	182	38 58	225	46 06	276
38	17 16	354	36 48	054	29 53	081	54 09	119	19 55	181	38 30	225	45 27	276
39	17 12	353	37 19	053	30 31	080	54 44	118	19 54	181	38 03	224	44 48	275
40	17 07	352	37 50	052	31 10	079	55 19	118	19 54	180	37 35	224	44 08	274
41	17 01	351	38 21	051	31 49	079	55 54	118	19 54	180	37 08	223	43 29	273
42	16 55	350	38 51	050	32 27	078	56 29	117	19 54	179	36 41	223	42 50	272
43	16 48	349	39 21	049	33 06	077	57 04	117	19 55	179	36 14	223	42 10	272
44	16 41	349	39 50	047	33 44	076	57 39	117	19 56	178	35 48	222	41 31	271
	RIGEL		SIRIUS		◆ CANOPUS		RIGIL KENT		◆ Peacock		FOMALHAUT		◆ Hamal	
45	40 19	046	34 22	075	58 14	116	19 58	177	35 22	222	40 52	270	16 33	348
46	40 47	045	35 00	074	58 49	116	20 00	177	34 55	221	40 12	269	16 24	347
47	41 15	044	35 38	073	59 24	116	20 02	176	34 30	221	39 33	269	16 14	346
48	41 42	043	36 16	073	60 00	116	20 05	176	34 04	221	38 54	268	16 04	345
49	42 08	042	36 53	072	60 35	115	20 08	175	33 38	220	38 14	267	15 54	344
50	42 34	040	37 30	071	61 11	115	20 11	175	33 13	220	37 35	266	15 42	343
51	42 59	039	38 07	070	61 47	115	20 15	174	32 48	219	36 56	266	15 31	342
52	43 24	038	38 44	069	62 22	115	20 19	174	32 23	219	36 16	265	15 18	341
53	43 47	037	39 21	068	62 58	114	20 23	173	31 59	218	35 37	264	15 05	340
54	44 11	035	39 57	067	63 34	114	20 28	173	31 34	218	34 58	264	14 51	339
55	44 33	034	40 33	066	64 10	114	20 33	172	31 10	218	34 19	263	14 37	338
56	44 55	033	41 09	065	64 46	114	20 38	172	30 46	217	33 40	262	14 22	337
57	45 16	032	41 45	064	65 22	114	20 44	171	30 23	217	33 01	261	14 07	336
58	45 36	030	42 20	063	65 58	113	20 50	171	29 59	216	32 22	261	13 51	336
59	45 55	029	42 55	062	66 34	113	20 56	170	29 36	216	31 43	260	13 34	335
	◆ ALDEBARAN		BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda	
60	23 57	010	28 09	033	43 29	061	38 43	115	21 03	170	67 31	235	39 58	291
61	24 03	009	28 30	032	44 04	060	39 18	114	21 10	169	66 59	235	39 21	290
62	24 09	008	28 50	031	44 38	059	39 54	114	21 18	169	66 26	236	38 44	289
63	24 14	007	29 10	030	45 11	058	40 30	113	21 26	168	65 54	236	38 06	288
64	24 18	005	29 30	029	45 44	057	41 07	113	21 34	168	65 21	236	37 29	287
65	24 21	004	29 48	028	46 17	055	41 43	112	21 42	167	64 49	236	36 51	286
66	24 24	003	30 06	027	46 49	054	42 19	112	21 51	167	64 16	236	36 13	285
67	24 26	002	30 24	026	47 21	053	42 56	111	22 00	166	63 44	236	35 35	284
68	24 27	001	30 40	024	47 52	052	43 33	111	22 10	166	63 11	236	34 57	283
69	24 28	000	30 56	023	48 22	051	44 10	110	22 20	165	62 39	236	34 18	283
70	24 27	359	31 11	022	48 53	049	44 47	110	22 30	165	62 06	236	33 40	282
71	24 27	358	31 26	021	49 22	048	45 24	109	22 40	164	61 34	236	33 01	281
72	24 25	357	31 39	020	49 51	047	46 01	109	22 51	164	61 01	236	32 23	280
73	24 22	356	31 53	019	50 20	046	46 38	108	23 02	163	60 29	235	31 44	279
74	24 19	355	32 05	018	50 48	044	47 16	108	23 14	163	59 56	235	31 05	278
	BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda		◆ ALDEBARAN	
75	32 16	016	51 15	043	47 54	107	23 25	162	59 24	235	30 26	278	24 16	354
76	32 27	015	51 41	042	48 31	106	23 37	162	58 52	235	29 47	277	24 11	353
77	32 37	014	52 07	040	49 09	106	23 50	161	58 19	235	29 08	276	24 06	352
78	32 46	013	52 32	039	49 47	105	24 03	161	57 47	235	28 29	275	24 00	351
79	32 55	012	52 56	037	50 25	105	24 16	160	57 15	235	27 49	274	23 53	350
80	33 03	011	53 20	036	51 03	104	24 29	160	56 43	234	27 10	274	23 46	349
81	33 09	009	53 42	034	51 41	104	24 43	160	56 11	234	26 31	273	23 38	348
82	33 16	008	54 04	033	52 20	103	24 56	159	55 39	234	25 52	272	23 29	347
83	33 21	007	54 25	031	52 58	103	25 11	159	55 07	234	25 12	271	23 19	346
84	33 25	006	54 45	030	53 36	102	25 25	158	54 35	234	24 33	271	23 09	345
85	33 29	005	55 04	028	54 15	101	25 40	158	54 04	233	23 53	270	22 58	344
86	33 32	004	55 23	027	54 54	101	25 55	157	53 32	233	23 14	269	22 47	343
87	33 34	002	55 40	025	55 32	100	26 11	157	53 01	233	22 35	268	22 35	341
88	33 35	001	55 56	023	56 11	100	26 26	156	52 29	233	21 55	268	22 22	340
89	33 35	000	56 11	022	56 50	099	26 42	156	51 58	233	21 16	267	22 08	339

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LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		Alphard		◆ Suhail		RIGIL KENT		◆ ACHERNAR		◆ RIGEL		BETELGEUSE	
90	31 35	030	30 52	065	57 29	098	26 59	155	51 27	232	48 07	343	33 35	359
91	31 55	029	31 27	064	58 08	098	27 15	155	50 56	232	47 55	342	33 34	358
92	32 13	027	32 03	063	58 47	097	27 32	154	50 25	232	47 42	340	33 32	356
93	32 31	026	32 38	062	59 26	097	27 49	154	49 54	232	47 29	339	33 29	355
94	32 48	025	33 13	062	60 05	096	28 06	154	49 23	231	47 14	338	33 25	354
95	33 04	024	33 47	061	60 44	095	28 24	153	48 52	231	46 59	336	33 21	353
96	33 20	023	34 21	060	61 23	095	28 42	153	48 22	231	46 42	335	33 15	352
97	33 35	022	34 55	059	62 03	094	29 00	152	47 51	230	46 25	333	33 09	351
98	33 49	021	35 28	058	62 42	093	29 19	152	47 21	230	46 07	332	33 02	349
99	34 02	019	36 01	057	63 21	093	29 37	151	46 51	230	45 48	331	32 55	348
100	34 15	018	36 34	056	64 01	092	29 56	151	46 21	229	45 28	329	32 46	347
101	34 27	017	37 06	055	64 40	091	30 16	151	45 51	229	45 08	328	32 37	346
102	34 38	016	37 38	053	65 19	091	30 35	150	45 22	229	44 47	327	32 27	345
103	34 49	015	38 10	052	65 59	090	30 55	150	44 52	229	44 25	325	32 16	344
104	34 58	013	38 41	051	66 38	089	31 15	149	44 22	228	44 02	324	32 05	342
	PROCYON		REGULUS		◆ Gienah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ BETELGEUSE	
105	35 07	012	16 15	049	20 16	094	31 35	149	43 53	228	43 39	323	31 52	341
106	35 15	011	16 44	048	20 55	093	31 56	148	43 24	228	43 15	322	31 39	340
107	35 22	010	17 13	047	21 34	092	32 16	148	42 55	227	42 50	320	31 26	339
108	35 28	009	17 42	046	22 14	092	32 37	148	42 26	227	42 24	319	31 11	338
109	35 34	007	18 10	045	22 53	091	32 58	147	41 58	227	41 58	318	30 56	337
110	35 38	006	18 37	044	23 32	090	33 20	147	41 29	226	41 32	317	30 40	336
111	35 42	005	19 05	043	24 12	089	33 41	146	41 01	226	41 04	316	30 23	334
112	35 45	004	19 31	042	24 51	089	34 03	146	40 33	225	40 37	314	30 06	333
113	35 47	002	19 57	041	25 30	088	34 25	146	40 05	225	40 08	313	29 48	332
114	35 48	001	20 23	040	26 10	087	34 48	145	39 37	225	39 39	312	29 29	331
115	35 49	000	20 48	039	26 49	086	35 10	145	39 09	224	39 10	311	29 10	330
116	35 48	359	21 13	038	27 28	086	35 33	145	38 42	224	38 40	310	28 50	329
117	35 47	358	21 37	037	28 07	085	35 56	144	38 15	224	38 10	309	28 30	328
118	35 45	356	22 01	036	28 47	084	36 19	144	37 48	223	37 39	308	28 09	327
119	35 42	355	22 24	036	29 26	083	36 42	143	37 21	223	37 07	307	27 47	326
	REGULUS		◆ SPICA		RIGIL KENT		◆ ACHERNAR		RIGEL		BETELGEUSE		◆ PROCYON	
120	22 47	035	14 01	091	37 06	143	36 54	222	36 36	306	27 24	325	35 38	354
121	23 09	034	14 41	090	37 29	143	36 28	222	36 04	305	27 02	324	35 34	353
122	23 30	033	15 20	090	37 53	142	36 01	222	35 31	304	26 38	323	35 28	351
123	23 51	032	15 59	089	38 17	142	35 35	221	34 58	303	26 14	322	35 22	350
124	24 11	031	16 39	088	38 42	142	35 09	221	34 25	302	25 49	321	35 15	349
125	24 31	030	17 18	087	39 06	141	34 44	220	33 51	301	25 24	320	35 07	348
126	24 50	029	17 57	087	39 31	141	34 18	220	33 17	300	24 59	319	34 58	347
127	25 09	028	18 37	086	39 56	141	33 53	220	32 43	299	24 32	318	34 49	345
128	25 27	026	19 16	085	40 21	140	33 28	219	32 08	298	24 06	317	34 39	344
129	25 44	025	19 55	084	40 46	140	33 03	219	31 33	297	23 39	316	34 28	343
130	26 00	024	20 34	083	41 11	140	32 39	218	30 58	296	23 11	315	34 16	342
131	26 16	023	21 13	083	41 37	139	32 14	218	30 22	295	22 43	314	34 03	341
132	26 32	022	21 52	082	42 03	139	31 50	218	29 46	294	22 14	313	33 50	340
133	26 46	021	22 31	081	42 28	139	31 26	217	29 10	293	21 45	312	33 35	338
134	27 00	020	23 10	080	42 54	139	31 03	217	28 34	292	21 16	311	33 21	337
	◆ REGULUS		SPICA		◆ RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		PROCYON	
135	27 13	019	23 49	079	43 21	138	30 39	216	65 27	246	47 49	308	33 05	336
136	27 26	018	24 27	079	43 47	138	30 16	216	64 51	246	47 18	307	32 49	335
137	27 38	017	25 06	078	44 13	138	29 53	215	64 15	246	46 46	306	32 32	334
138	27 49	016	25 44	077	44 40	137	29 31	215	63 39	246	46 14	304	32 14	333
139	27 59	015	26 23	076	45 07	137	29 08	214	63 03	246	45 41	303	31 55	332
140	28 09	014	27 01	075	45 33	137	28 46	214	62 28	245	45 08	302	31 36	330
141	28 18	013	27 39	075	46 00	137	28 24	214	61 52	245	44 34	301	31 16	329
142	28 26	011	28 17	074	46 28	136	28 03	213	61 16	245	44 00	300	30 56	328
143	28 33	010	28 54	073	46 55	136	27 42	213	60 41	245	43 26	299	30 35	327
144	28 40	009	29 32	072	47 22	136	27 20	212	60 05	244	42 52	298	30 13	326
145	28 46	008	30 09	071	47 50	136	27 00	212	59 30	244	42 17	297	29 51	325
146	28 51	007	30 46	070	48 17	135	26 39	211	58 54	244	41 41	296	29 28	324
147	28 56	006	31 23	069	48 45	135	26 19	211	58 19	244	41 06	295	29 05	323
148	28 59	005	32 00	068	49 13	135	25 59	210	57 44	243	40 30	294	28 41	322
149	29 02	004	32 36	067	49 41	135	25 39	210	57 09	243	39 54	293	28 16	321
	◆ REGULUS		SPICA		◆ RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		PROCYON	
150	29 04	003	33 13	067	50 09	134	25 20	209	56 33	243	39 17	292	27 51	320
151	29 06	001	33 49	066	50 37	134	25 01	209	55 59	242	38 41	291	27 25	319
152	29 06	000	34 24	065	51 05	134	24 42	208	55 24	242	38 04	290	26 59	318
153	29 06	359	35 00	064	51 34	134	24 23	208	54 49	242	37 27	289	26 32	317
154	29 05	358	35 35	063	52 02	134	24 05	207	54 14	241	36 50	288	26 05	316
155	29 04	357	36 10	062	52 31	134	23 47	207	53 40	241	36 12	287	25 37	315
156	29 01	356	36 44	061	52 59	133	23 30	206	53 05	241	35 34	286	25 09	314
157	28 58	355	37 18	060	53 28	133	23 12	206	52 31	240	34 57	286	24 41	313
158	28 54	354	37 52	059	53 57	133	22 55	205	51 57	240	34 19	285	24 12	312
159	28 49	353	38 26	058	54 25	133	22 39	205	51 23	240	33 40	284	23 42	311
160	28 44	351	38 59	057	54 54	133	22 22	204	50 49	239	33 02	283	23 12	310
161	28 37	350	39 32	056	55 23	133	22 06	204	50 15	239	32 24	282	22 42	309
162	28 30	349	40 04	055	55 52	133	21 51	203	49 41	239	31 45	281	22 11	308
163	28 23	348	40 36	054	56 21	132	21 35	203	49 08	238	31 07	280	21 40	307
164	28 14	347	41 07	052	56 50	132	21 20	202	48 34	238	30 28	280	21 08	306
	SPICA		◆ ANTARES		RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		◆ REGULUS	
165	41 38	051	24 20	103	57 19	132	21 05	202	48 01	238	29 49	279	28 05	346
166	42 09	050	24 59	102	57 48	132	20 51	201	47 28	237	29 10	278	27 55	345
167	42 39	049	25 37	102	58 18	132	20 37	201	46 55	237	28 31	277	27 44	344
168	43 08	048	26 16	101	58 47	132	20 23	200	46 22	237	27 52	276	27 33	343
169	43 37	047	26 55	100	59 16	132	20 10	200	45 49	236	27 13	276	27 21	342
170	44 05	046	27 33	100	59 45	132	19 57	199	45 16	236	26 34	275	27 08	340
171	44 33	044	28 12	099	60 14	132	19 44	199	44 44	235	25 54	274	26 54	339
172	45 00	043	28 51	098	60 44	132	19 32	198	44 11	235	25 15	273	26 40	338
173	45 27	042	29 30	097	61 13	132	19 20	198	43 39	235	24 36	273	26 25	337
174	45 53	041	30 09	097	61 42	132	19 08	197	43 07	234	23 56	272	26 10	336
175	46 18	039	30 48	096	62 11	132	18 57	196	42 35	234	23 17	271	25 54	335
176	46 43	038	31 28	095	62 40	132	18 46	196	42 04	233	22 38	270	25 37	334
177	47 07	037	32 07	095	63 09	133	18 35	195	41 32	233	21 58	269	25 19	333
178	47 30	035	32 46	094	63 38	133	18 25	195	41 01	233	21 19	269	25 01	332
179	47 52	034	33 25	093	64 07	133	18 15	194	40 29	232	20 40	268	24 42	331

LAT 49°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	15 27	033	34 05	092	24 32	151	18 06	194	39 58	232	60 16	264	24 23	330
181	15 48	032	34 44	092	24 52	151	17 56	193	39 28	231	59 37	264	24 03	329
182	16 09	032	35 23	091	25 11	150	17 48	193	38 57	231	58 57	263	23 42	328
183	16 30	031	36 03	090	25 31	150	17 39	192	38 26	231	58 18	262	23 21	327
184	16 49	030	36 42	089	25 51	149	17 31	192	37 56	230	57 39	262	23 00	326
185	17 08	029	37 21	089	26 11	149	17 23	191	37 26	230	57 01	261	22 37	325
186	17 27	028	38 01	088	26 32	148	17 16	190	36 56	229	56 22	261	22 14	324
187	17 45	027	38 40	087	26 53	148	17 09	190	36 26	229	55 43	260	21 51	323
188	18 03	026	39 19	086	27 14	147	17 03	189	35 57	228	55 04	259	21 27	322
189	18 20	025	39 59	086	27 35	147	16 56	189	35 27	228	54 26	259	21 03	321
190	18 36	024	40 38	085	27 57	146	16 51	188	34 58	228	53 47	258	20 38	320
191	18 52	023	41 17	084	28 19	146	16 45	188	34 29	227	53 08	258	20 12	319
192	19 07	022	41 56	083	28 41	145	16 40	187	34 01	227	52 30	257	19 47	318
193	19 21	021	42 35	082	29 04	145	16 36	187	33 32	226	51 52	256	19 20	317
194	19 35	020	43 14	081	29 27	144	16 31	186	33 04	226	51 14	256	18 53	317
	ARCTURUS		◆ ANTARES		Peacock		◆ ACHERNAR		CANOPUS		Suhail		◆ REGULUS	
195	19 48	019	43 53	081	29 50	144	16 27	185	32 36	225	50 35	255	18 26	316
196	20 01	018	44 32	080	30 13	144	16 24	185	32 08	225	49 57	255	17 58	315
197	20 13	017	45 10	079	30 37	143	16 21	184	31 40	224	49 19	254	17 30	314
198	20 24	016	45 49	078	31 00	143	16 18	184	31 13	224	48 42	254	17 01	313
199	20 35	015	46 27	077	31 24	142	16 16	183	30 46	223	48 04	253	16 32	312
200	20 45	014	47 06	076	31 49	142	16 14	183	30 19	223	47 26	253	16 03	311
201	20 54	013	47 44	075	32 13	141	16 12	182	29 52	222	46 49	252	15 33	310
202	21 03	012	48 22	074	32 38	141	16 11	181	29 26	222	46 11	252	15 03	309
203	21 11	011	49 00	073	33 03	140	16 10	181	28 59	222	45 34	251	14 32	309
204	21 18	010	49 37	072	33 28	140	16 10	180	28 33	221	44 57	250	14 01	308
205	21 25	009	50 15	071	33 53	140	16 10	180	28 08	221	44 20	250	13 30	307
206	21 31	008	50 52	070	34 19	139	16 10	179	27 42	220	43 43	249	12 58	306
207	21 36	007	51 29	069	34 45	139	16 11	179	27 17	220	43 06	249	12 26	305
208	21 41	006	52 05	068	35 11	138	16 12	178	26 52	219	42 29	248	11 54	304
209	21 45	005	52 42	067	35 37	138	16 13	177	26 27	219	41 53	248	11 21	303
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	21 48	004	53 18	066	36 04	138	16 15	177	26 03	218	41 17	247	51 35	347
211	21 50	003	53 54	065	36 30	137	16 18	176	25 39	218	40 40	247	51 25	345
212	21 52	002	54 29	064	36 57	137	16 20	176	25 15	217	40 04	246	51 14	343
213	21 53	001	55 04	063	37 24	136	16 23	175	24 51	217	39 28	246	51 03	342
214	21 54	000	55 39	061	37 51	136	16 27	175	24 28	216	38 52	245	50 50	340
215	21 53	359	56 13	060	38 19	136	16 31	174	24 05	216	38 17	245	50 36	339
216	21 52	358	56 47	059	38 46	135	16 35	174	23 42	215	37 41	244	50 22	337
217	21 51	357	57 21	058	39 14	135	16 40	173	23 20	214	37 06	244	50 06	336
218	21 48	356	57 54	056	39 42	134	16 45	172	22 58	214	36 31	243	49 49	334
219	21 45	355	58 26	055	40 10	134	16 50	172	22 36	213	35 56	242	49 32	333
220	21 41	354	58 58	054	40 39	134	16 56	171	22 14	213	35 21	242	49 14	332
221	21 37	353	59 30	052	41 07	133	17 02	171	21 53	212	34 46	241	48 54	330
222	21 32	352	60 00	051	41 36	133	17 08	170	21 32	212	34 12	241	48 34	329
223	21 26	351	60 30	049	42 05	133	17 15	170	21 12	211	33 38	240	48 14	327
224	21 19	350	61 00	048	42 34	132	17 22	169	20 51	211	33 04	240	47 52	326
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		◆ SPICA		ARCTURUS	
225	61 29	046	39 33	086	43 03	132	17 30	169	20 31	210	47 30	325	21 12	349
226	61 56	044	40 12	085	43 32	132	17 38	168	20 12	210	47 06	323	21 04	348
227	62 24	043	40 51	084	44 02	131	17 46	167	19 52	209	46 42	322	20 56	347
228	62 50	041	41 30	083	44 32	131	17 55	167	19 33	209	46 18	321	20 47	346
229	63 15	039	42 09	082	45 01	131	18 04	166	19 15	208	45 53	319	20 37	345
230	63 40	038	42 48	082	45 31	130	18 14	166	18 56	207	45 27	318	20 26	344
231	64 03	036	43 27	081	46 02	130	18 24	165	18 38	207	45 00	317	20 15	343
232	64 26	034	44 06	080	46 32	130	18 34	165	18 21	206	44 33	316	20 03	342
233	64 47	032	44 45	079	47 02	129	18 44	164	18 04	206	44 05	314	19 51	341
234	65 07	030	45 23	078	47 33	129	18 55	164	17 47	205	43 37	313	19 37	340
235	65 26	028	46 02	077	48 03	129	19 06	163	17 30	205	43 08	312	19 24	339
236	65 44	026	46 40	076	48 34	128	19 18	163	17 14	204	42 38	311	19 09	338
237	66 01	024	47 18	075	49 05	128	19 30	162	16 58	204	42 08	310	18 54	337
238	66 16	022	47 56	074	49 36	128	19 42	161	16 42	203	41 38	309	18 39	336
239	66 30	020	48 34	074	50 07	128	19 55	161	16 27	202	41 07	308	18 22	335
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ARCTURUS	
240	24 56	026	13 10	059	13 11	120	20 08	160	58 20	223	40 35	306	18 06	334
241	25 12	025	13 44	058	13 45	119	20 21	160	57 53	223	40 04	305	17 48	333
242	25 29	024	14 17	058	14 20	119	20 35	159	57 26	223	39 31	304	17 30	332
243	25 44	023	14 50	057	14 54	118	20 49	159	56 59	223	38 59	303	17 12	331
244	25 59	022	15 23	056	15 29	117	21 03	158	56 32	223	38 26	302	16 53	330
245	26 13	021	15 55	055	16 04	117	21 18	158	56 05	223	37 52	301	16 33	330
246	26 27	020	16 27	054	16 39	116	21 33	157	55 38	223	37 18	300	16 13	329
247	26 40	019	16 59	053	17 15	115	21 49	157	55 11	223	36 44	299	15 52	328
248	26 52	017	17 30	052	17 50	115	22 04	156	54 44	223	36 09	298	15 31	327
249	27 03	016	18 01	052	18 26	114	22 20	156	54 17	223	35 35	297	15 09	326
250	27 14	015	18 32	051	19 02	113	22 37	155	53 50	223	34 59	296	14 47	325
251	27 24	014	19 02	050	19 38	113	22 53	155	53 23	223	34 24	295	14 24	324
252	27 33	013	19 32	049	20 15	112	23 10	154	52 56	223	33 48	294	14 01	323
253	27 42	012	20 01	048	20 51	111	23 27	154	52 30	223	33 12	293	13 37	322
254	27 50	011	20 30	047	21 28	111	23 45	153	52 03	223	32 36	293	13 12	321
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ANTARES	
255	27 57	010	20 59	046	22 05	110	24 03	153	51 36	222	32 00	292	66 44	343
256	28 03	009	21 27	045	22 42	109	24 21	152	51 10	222	31 23	291	66 32	341
257	28 09	008	21 55	044	23 19	109	24 39	152	50 43	222	30 46	290	66 19	339
258	28 14	007	22 22	043	23 56	108	24 58	151	50 17	222	30 09	289	66 03	336
259	28 18	005	22 49	042	24 34	107	25 17	151	49 51	222	29 31	288	65 47	334
260	28 21	004	23 15	041	25 11	107	25 37	150	49 25	222	28 54	287	65 29	332
261	28 24	003	23 41	040	25 49	106	25 56	150	48 59	221	28 16	286	65 11	330
262	28 26	002	24 06	039	26 27	105	26 16	149	48 33	221	27 38	285	64 51	328
263	28 27	001	24 31	038	27 05	105	26 36	149	48 07	221	27 00	285	64 29	326
264	28 27	000	24 55	037	27 43	104	26 57	148	47 41	221	26 22	284	64 07	325
265	28 27	359	25 18	036	28 21	103	27 18	148	47 15	221	25 44	283	63 44	323
266	28 25	358	25 41	035	29 00	103	27 39	147	46 50	220	25 06	282	63 19	321
267	28 23	357	26 04	034	29 38	102	28 00	147	46 24	220	24 27	281	62 54	319
268	28 21	355	26 26	033	30 17	101	28 22	147	45 59	220	23 48	281	62 28	317
269	28 17	354	26 47	032	30 55	101	28 43	146	45 34	220	23 10	280	62 01	316

LAT 49°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ SPICA		ANTARES		Rasalhague	
270	27 08	031	31 34	100	29 05	146	59 54	228	22 31	279	61 33	314	28 13	353
271	27 28	030	32 13	099	29 28	145	59 25	228	21 52	278	61 05	313	28 08	352
272	27 48	029	32 52	099	29 50	145	58 56	228	21 13	277	60 35	311	28 02	351
273	28 06	028	33 31	098	30 13	144	58 27	228	20 34	277	60 05	310	27 56	350
274	28 25	027	34 10	097	30 36	144	57 58	228	19 55	276	59 35	308	27 48	349
275	28 42	026	34 49	097	31 00	143	57 29	228	19 15	275	59 03	307	27 40	348
276	28 59	025	35 28	096	31 23	143	57 00	228	18 36	274	58 32	305	27 32	347
277	29 15	024	36 07	095	31 47	143	56 30	228	17 57	273	57 59	304	27 22	346
278	29 31	023	36 46	095	32 11	142	56 01	227	17 18	273	57 26	303	27 12	345
279	29 46	022	37 26	094	32 35	142	55 32	227	16 38	272	56 53	301	27 01	343
280	30 00	021	38 05	093	33 00	141	55 03	227	15 59	271	56 19	300	26 50	342
281	30 13	019	38 44	092	33 25	141	54 35	227	15 20	270	55 45	299	26 37	341
282	30 26	018	39 24	092	33 50	140	54 06	227	14 40	270	55 10	298	26 24	340
283	30 38	017	40 03	091	34 15	140	53 37	227	14 01	269	54 35	296	26 11	339
284	30 49	016	40 42	090	34 40	140	53 08	227	13 22	268	54 00	295	25 56	338
	ALTAIR		Enif		◆ FOMALHAUT		ACHERNAR		◆ RIGIL KENT		ANTARES		◆ Rasalhague	
285	31 00	015	20 50	044	41 22	089	35 06	139	52 40	227	53 24	294	25 41	337
286	31 09	014	21 17	043	42 01	089	35 32	139	52 11	226	52 48	293	25 26	336
287	31 18	013	21 44	042	42 40	088	35 58	138	51 43	226	52 11	292	25 09	335
288	31 27	011	22 10	041	43 20	087	36 24	138	51 14	226	51 35	291	24 52	334
289	31 34	010	22 36	040	43 59	086	36 50	138	50 46	226	50 58	290	24 35	333
290	31 41	009	23 01	039	44 38	085	37 17	137	50 18	226	50 21	289	24 17	332
291	31 47	008	23 25	038	45 17	085	37 44	137	49 50	225	49 43	288	23 58	331
292	31 52	007	23 49	037	45 57	084	38 11	136	49 22	225	49 06	287	23 38	330
293	31 56	006	24 13	036	46 36	083	38 38	136	48 54	225	48 28	286	23 18	329
294	31 59	005	24 36	035	47 15	082	39 06	136	48 26	225	47 50	285	22 58	328
295	32 02	003	24 59	034	47 54	081	39 33	135	47 59	225	47 12	284	22 36	327
296	32 04	002	25 20	033	48 32	080	40 01	135	47 31	224	46 34	283	22 15	326
297	32 05	001	25 42	032	49 11	080	40 29	135	47 04	224	45 55	282	21 52	325
298	32 05	000	26 02	031	49 50	079	40 57	134	46 36	224	45 17	281	21 29	324
299	32 05	359	26 23	030	50 28	078	41 25	134	46 09	224	44 38	280	21 06	323
	◆ Enif		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ ANTARES		Rasalhague		ALTAIR	
300	26 42	029	51 07	077	41 54	134	45 42	223	43 59	280	20 42	322	32 04	358
301	27 01	028	51 45	076	42 22	133	45 15	223	43 21	279	20 18	321	32 02	356
302	27 19	027	52 23	075	42 51	133	44 48	223	42 42	278	19 53	320	31 59	355
303	27 37	026	53 01	074	43 20	132	44 22	222	42 03	277	19 27	319	31 55	354
304	27 54	025	53 39	073	43 49	132	43 55	222	41 23	276	19 01	318	31 50	353
305	28 10	024	54 16	072	44 19	132	43 29	222	40 44	275	18 35	317	31 45	352
306	28 25	023	54 54	071	44 48	131	43 03	222	40 05	275	18 08	316	31 39	351
307	28 40	022	55 31	070	45 17	131	42 37	221	39 26	274	17 41	316	31 32	349
308	28 55	021	56 07	069	45 47	131	42 11	221	38 47	273	17 13	315	31 25	348
309	29 08	020	56 44	067	46 17	131	41 45	221	38 07	272	16 45	314	31 16	347
310	29 21	018	57 20	066	46 47	130	41 19	220	37 28	271	16 16	313	31 07	346
311	29 33	017	57 56	065	47 17	130	40 54	220	36 49	271	15 47	312	30 57	345
312	29 44	016	58 31	064	47 47	130	40 29	220	36 09	270	15 18	311	30 47	344
313	29 55	015	59 07	063	48 18	129	40 04	219	35 30	269	14 48	310	30 35	343
314	30 05	014	59 41	061	48 48	129	39 39	219	34 50	268	14 17	309	30 23	341
	◆ Enif		Diphda		◆ ACHERNAR		Miaplacidus		RIGIL KENT		◆ ANTARES		ALTAIR	
315	30 14	013	35 28	076	49 19	129	28 48	181	39 14	219	34 11	268	30 10	340
316	30 22	012	36 07	075	49 50	129	28 47	181	38 49	218	33 32	267	29 57	339
317	30 30	011	36 45	074	50 20	128	28 47	181	38 25	218	32 52	266	29 42	338
318	30 37	009	37 22	073	50 51	128	28 47	180	38 01	218	32 13	266	29 27	337
319	30 43	008	38 00	072	51 23	128	28 47	180	37 37	217	31 34	265	29 11	336
320	30 48	007	38 37	071	51 54	127	28 47	179	37 13	217	30 55	264	28 55	335
321	30 53	006	39 14	070	52 25	127	28 48	179	36 50	217	30 16	263	28 38	334
322	30 56	005	39 51	070	52 56	127	28 49	179	36 26	216	29 37	263	28 20	333
323	30 59	004	40 28	069	53 28	127	28 50	178	36 03	216	28 58	262	28 02	332
324	31 01	003	41 05	068	53 59	127	28 51	178	35 40	216	28 19	261	27 43	331
325	31 03	001	41 41	067	54 31	126	28 53	177	35 17	215	27 40	261	27 23	330
326	31 03	000	42 17	066	55 03	126	28 55	177	34 55	215	27 01	260	27 03	328
327	31 03	359	42 53	065	55 35	126	28 57	177	34 32	214	26 22	259	26 42	327
328	31 02	358	43 28	064	56 07	126	28 59	176	34 10	214	25 44	258	26 21	326
329	31 00	357	44 03	063	56 39	126	29 02	176	33 48	214	25 05	258	25 59	325
	◆ Diphda		ACHERNAR		◆ Miaplacidus		RIGIL KENT		ANTARES		◆ ALTAIR		Enif	
330	44 38	061	57 11	125	29 05	175	33 27	213	24 27	257	25 36	324	30 58	356
331	45 12	060	57 43	125	29 08	175	33 05	213	23 48	256	25 13	323	30 54	355
332	45 46	059	58 15	125	29 12	175	32 44	212	23 10	256	24 49	322	30 50	353
333	46 20	058	58 47	125	29 16	174	32 23	212	22 32	255	24 25	321	30 45	352
334	46 53	057	59 20	125	29 20	174	32 02	212	21 54	254	24 00	320	30 40	351
335	47 26	056	59 52	125	29 24	173	31 42	211	21 16	254	23 34	319	30 33	350
336	47 59	055	60 24	125	29 29	173	31 21	211	20 39	253	23 09	318	30 26	349
337	48 31	054	60 57	125	29 34	173	31 01	210	20 01	252	22 42	317	30 18	348
338	49 02	052	61 29	124	29 39	172	30 41	210	19 24	252	22 15	317	30 09	347
339	49 33	051	62 02	124	29 44	172	30 22	210	18 46	251	21 48	316	30 00	345
340	50 03	050	62 34	124	29 50	172	30 03	209	18 09	250	21 20	315	29 49	344
341	50 33	049	63 07	124	29 56	171	29 43	209	17 32	250	20 52	314	29 38	343
342	51 02	047	63 39	124	30 02	171	29 25	208	16 55	249	20 23	313	29 27	342
343	51 31	046	64 12	124	30 08	170	29 06	208	16 19	248	19 54	312	29 14	341
344	51 59	045	64 44	124	30 15	170	28 48	207	15 42	248	19 25	311	29 01	340
	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		Enif	
345	52 26	043	47 45	101	27 13	141	30 22	170	28 30	207	38 18	273	28 47	339
346	52 53	042	48 23	101	27 39	140	30 29	169	28 12	207	37 39	272	28 32	338
347	53 19	041	49 02	100	28 04	140	30 37	169	27 55	206	36 59	271	28 17	337
348	53 44	039	49 41	100	28 30	139	30 44	169	27 37	206	36 20	270	28 01	336
349	54 09	038	50 20	099	28 56	139	30 52	168	27 20	205	35 40	270	27 45	334
350	54 32	036	50 59	098	29 22	138	31 01	168	27 04	205	35 01	269	27 27	333
351	54 55	035	51 38	098	29 48	138	31 09	167	26 47	204	34 22	268	27 09	332
352	55 17	033	52 17	097	30 15	137	31 18	167	26 31	204	33 42	267	26 51	331
353	55 38	032	52 56	096	30 42	137	31 27	167	26 16	203	33 03	267	26 32	330
354	55 58	030	53 35	096	31 09	136	31 36	166	26 00	203	32 24	266	26 12	329
355	56 17	028	54 14	095	31 36	136	31 45	166	25 45	203	31 45	265	25 51	328
356	56 36	027	54 53	094	32 04	135	31 55	166	25 30	202	31 05	265	25 30	327
357	56 53	025	55 33	094	32 32	135	32 05	165	25 15	202	30 26	264	25 09	326
358	57 09	023	56 12	093	33 00	134	32 15	165	25 01	201	29 47	263	24 46	325
359	57 24	022	56 51	092	33 28	134	32 25	165	24 47	201	29 08	262	24 24	324

Tilbage til Menuen

LAT 50°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Alpheratz		Hamal		◆ RIGEL		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	10 48	002	11 11	030	13 27	087	34 38	133	25 29	200	58 20	237	66 29	325
1	10 49	001	11 30	029	14 05	086	35 06	132	25 16	200	57 48	237	66 06	323
2	10 50	000	11 48	028	14 44	085	35 34	132	25 03	199	57 16	237	65 42	321
3	10 49	359	12 06	027	15 22	084	36 03	132	24 51	199	56 44	236	65 17	319
4	10 49	358	12 23	026	16 00	084	36 32	131	24 38	198	56 12	236	64 51	317
5	10 47	358	12 40	025	16 39	083	37 01	131	24 26	198	55 40	236	64 25	315
6	10 45	357	12 56	024	17 17	082	37 31	130	24 15	197	55 08	236	63 57	314
7	10 43	356	13 12	023	17 55	081	38 00	130	24 03	197	54 36	235	63 29	312
8	10 40	355	13 27	023	18 33	080	38 30	129	23 52	196	54 04	235	63 00	310
9	10 36	354	13 41	022	19 11	080	39 00	129	23 41	196	53 33	235	62 30	309
10	10 32	353	13 55	021	19 49	079	39 30	128	23 31	195	53 01	235	62 00	307
11	10 27	352	14 08	020	20 27	078	40 00	128	23 21	195	52 30	234	61 29	306
12	10 21	351	14 21	019	21 04	077	40 31	128	23 11	194	51 58	234	60 58	304
13	10 15	351	14 33	018	21 42	076	41 01	127	23 02	194	51 27	234	60 26	303
14	10 09	350	14 45	017	22 19	076	41 32	127	22 52	193	50 56	234	59 53	302
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
15	14 56	016	22 57	075	15 00	098	42 03	126	22 44	193	50 25	233	59 20	300
16	15 06	015	23 34	074	15 38	098	42 35	126	22 35	192	49 54	233	58 46	299
17	15 16	014	24 11	073	16 16	097	43 06	125	22 27	192	49 24	233	58 13	298
18	15 25	013	24 47	072	16 54	096	43 37	125	22 19	191	48 53	232	57 38	297
19	15 34	012	25 24	071	17 33	095	44 09	125	22 12	191	48 23	232	57 04	295
20	15 42	011	26 01	070	18 11	095	44 41	124	22 05	190	47 52	232	56 29	294
21	15 49	010	26 37	070	18 50	094	45 13	124	21 58	190	47 22	231	55 53	293
22	15 56	010	27 13	069	19 28	093	45 45	123	21 51	189	46 52	231	55 18	292
23	16 02	009	27 49	068	20 07	092	46 17	123	21 45	189	46 22	231	54 42	291
24	16 07	008	28 24	067	20 45	092	46 50	123	21 39	188	45 52	230	54 06	290
25	16 12	007	29 00	066	21 24	091	47 22	122	21 34	188	45 23	230	53 29	289
26	16 16	006	29 35	065	22 02	090	47 55	122	21 29	187	44 53	230	52 52	288
27	16 20	005	30 10	064	22 41	089	48 28	121	21 24	187	44 24	229	52 16	287
28	16 23	004	30 44	063	23 19	089	49 01	121	21 20	186	43 55	229	51 39	286
29	16 25	003	31 18	062	23 58	088	49 34	121	21 16	186	43 26	229	51 01	285
	Hamal		◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
30	16 27	002	31 52	061	24 37	087	50 07	120	21 12	185	42 57	228	50 24	284
31	16 28	001	32 26	060	25 15	086	50 41	120	21 08	185	42 28	228	49 46	283
32	16 28	000	32 59	059	25 53	085	51 14	120	21 05	184	42 00	227	49 09	282
33	16 28	359	33 32	058	26 32	085	51 48	119	21 03	184	41 32	227	48 31	281
34	16 27	358	34 05	057	27 10	084	52 21	119	21 00	183	41 04	227	47 53	280
35	16 25	357	34 37	056	27 49	083	52 55	118	20 58	183	40 36	226	47 15	279
36	16 23	356	35 09	055	28 27	082	53 29	118	20 57	182	40 08	226	46 37	278
37	16 20	355	35 41	054	29 05	081	54 03	118	20 55	182	39 40	226	45 59	277
38	16 16	354	36 12	053	29 43	081	54 38	117	20 55	181	39 13	225	45 20	277
39	16 12	353	36 43	052	30 21	080	55 12	117	20 54	181	38 45	225	44 42	276
40	16 08	352	37 13	051	30 59	079	55 46	117	20 54	180	38 18	224	44 04	275
41	16 02	351	37 43	050	31 37	078	56 21	116	20 54	180	37 52	224	43 25	274
42	15 56	350	38 12	049	32 14	077	56 55	116	20 54	179	37 25	224	42 47	273
43	15 49	350	38 41	048	32 52	076	57 30	116	20 55	179	36 58	223	42 08	273
44	15 42	349	39 09	047	33 29	075	58 05	115	20 56	178	36 32	223	41 30	272
	RIGEL		SIRIUS		◆ CANOPUS		RIGIL KENT		◆ Peacock		FOMALHAUT		◆ Hamal	
45	39 37	046	34 07	075	58 40	115	20 58	177	36 06	222	40 51	271	15 34	348
46	40 04	045	34 44	074	59 15	115	21 00	177	35 40	222	40 13	270	15 25	347
47	40 31	043	35 21	073	59 50	114	21 02	176	35 15	221	39 34	269	15 16	346
48	40 57	042	35 57	072	60 25	114	21 05	176	34 49	221	38 55	269	15 07	345
49	41 23	041	36 34	071	61 00	114	21 07	175	34 24	221	38 17	268	14 56	344
50	41 48	040	37 10	070	61 36	113	21 11	175	33 59	220	37 38	267	14 45	343
51	42 12	039	37 46	069	62 11	113	21 14	174	33 34	220	37 00	266	14 34	342
52	42 36	037	38 22	068	62 47	113	21 18	174	33 10	219	36 21	266	14 21	341
53	42 59	036	38 58	067	63 22	113	21 23	173	32 46	219	35 43	265	14 09	340
54	43 22	035	39 33	066	63 58	112	21 27	173	32 22	218	35 04	264	13 55	339
55	43 43	034	40 09	065	64 34	112	21 32	172	31 58	218	34 26	264	13 41	338
56	44 04	032	40 43	064	65 09	112	21 38	172	31 34	217	33 48	263	13 27	337
57	44 24	031	41 18	063	65 45	112	21 43	171	31 11	217	33 10	262	13 12	337
58	44 44	030	41 52	062	66 21	111	21 49	171	30 48	217	32 31	261	12 56	336
59	45 03	028	42 26	061	66 57	111	21 56	170	30 25	216	31 53	261	12 40	335
	◆ ALDEBARAN		BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda	
60	22 58	010	27 18	033	43 00	060	39 08	114	22 02	170	68 04	237	39 36	291
61	23 04	009	27 39	032	43 33	059	39 43	114	22 09	169	67 32	237	39 00	290
62	23 10	008	27 59	031	44 06	058	40 18	113	22 17	169	66 59	237	38 24	290
63	23 14	006	28 18	030	44 38	057	40 54	113	22 24	168	66 27	238	37 48	289
64	23 18	005	28 37	029	45 11	056	41 30	112	22 32	168	65 54	238	37 11	288
65	23 22	004	28 55	027	45 42	055	42 05	111	22 41	167	65 22	238	36 34	287
66	23 24	003	29 13	026	46 13	053	42 41	111	22 50	167	64 49	237	35 57	286
67	23 26	002	29 29	025	46 44	052	43 17	110	22 59	166	64 17	237	35 20	285
68	23 27	001	29 45	024	47 14	051	43 54	110	23 08	166	63 44	237	34 43	284
69	23 28	000	30 01	023	47 44	050	44 30	109	23 18	165	63 12	237	34 05	283
70	23 27	359	30 16	022	48 13	049	45 06	109	23 28	165	62 39	237	33 27	282
71	23 27	358	30 30	021	48 42	047	45 43	108	23 38	164	62 07	237	32 50	282
72	23 25	357	30 43	020	49 10	046	46 20	108	23 49	164	61 34	237	32 12	281
73	23 23	356	30 56	019	49 37	045	46 57	107	24 00	163	61 02	237	31 34	280
74	23 20	355	31 08	017	50 04	043	47 33	106	24 11	163	60 30	237	30 56	279
	BETELGEUSE		SIRIUS		◆ Suhail		RIGIL KENT		◆ ACHERNAR		Diphda		◆ ALDEBARAN	
75	31 19	016	50 31	042	48 10	106	24 23	162	59 58	237	30 18	278	23 16	354
76	31 29	015	50 56	041	48 48	105	24 34	162	59 25	236	29 40	277	23 11	353
77	31 39	014	51 21	039	49 25	105	24 47	161	58 53	236	29 01	277	23 06	352
78	31 48	013	51 45	038	50 02	104	24 59	161	58 21	236	28 23	276	23 01	351
79	31 56	012	52 08	037	50 40	104	25 12	160	57 49	236	27 44	275	22 54	350
80	32 04	011	52 31	035	51 17	103	25 25	160	57 17	236	27 06	274	22 47	349
81	32 10	009	52 53	034	51 55	102	25 39	159	56 45	236	26 28	273	22 39	348
82	32 16	008	53 14	032	52 33	102	25 52	159	56 14	235	25 49	273	22 30	347
83	32 21	007	53 34	031	53 10	101	26 07	158	55 42	235	25 11	272	22 21	346
84	32 26	006	53 53	029	53 48	101	26 21	158	55 10	235	24 32	271	22 11	345
85	32 29	005	54 11	028	54 26	100	26 36	157	54 39	235	23 53	270	22 01	344
86	32 32	004	54 29	026	55 04	099	26 50	157	54 08	234	23 15	270	21 50	343
87	32 34	002	54 45	024	55 42	099	27 06	157	53 36	234	22 36	269	21 38	342
88	32 35	001	55 01	023	56 20	098	27 21	156	53 05	234	21 58	268	21 25	341
89	32 35	000	55 15	021	56 59	098	27 37	156	52 34	234	21 19	267	21 12	340

LAT 50°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		Alphard		◆ Suhail		RIGIL KENT		◆ ACHERNAR		◆ RIGEL		BETELGEUSE	
90	30 43	029	30 26	065	57 37	097	27 53	155	52 03	233	47 09	344	32 35	359
91	31 02	028	31 01	064	58 15	096	28 09	155	51 32	233	46 58	342	32 34	358
92	31 20	027	31 36	063	58 53	096	28 26	154	51 01	233	46 46	341	32 32	356
93	31 37	026	32 10	062	59 32	095	28 43	154	50 31	232	46 33	339	32 29	355
94	31 54	025	32 44	061	60 10	094	29 00	153	50 00	232	46 19	338	32 26	354
95	32 09	024	33 17	060	60 49	094	29 18	153	49 30	232	46 04	337	32 21	353
96	32 25	023	33 50	059	61 27	093	29 35	152	49 00	232	45 48	335	32 16	352
97	32 39	021	34 23	058	62 06	092	29 53	152	48 29	231	45 31	334	32 10	351
98	32 53	020	34 56	057	62 44	091	30 12	152	47 59	231	45 14	332	32 04	349
99	33 06	019	35 28	056	63 23	091	30 30	151	47 29	231	44 56	331	31 56	348
100	33 18	018	36 00	055	64 02	090	30 49	151	47 00	230	44 37	330	31 48	347
101	33 30	017	36 31	054	64 40	089	31 08	150	46 30	230	44 17	329	31 39	346
102	33 40	016	37 02	053	65 19	088	31 27	150	46 01	230	43 56	327	31 29	345
103	33 50	014	37 33	052	65 57	088	31 47	149	45 31	229	43 35	326	31 19	344
104	34 00	013	38 03	051	66 36	087	32 06	149	45 02	229	43 13	325	31 08	343
	PROCYON		REGULUS		◆ Gienah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ BETELGEUSE	
105	34 08	012	15 35	048	20 19	093	32 26	149	44 33	229	42 51	323	30 56	341
106	34 16	011	16 04	047	20 58	093	32 47	148	44 04	228	42 27	322	30 43	340
107	34 23	010	16 32	047	21 36	092	33 07	148	43 36	228	42 03	321	30 30	339
108	34 29	008	17 00	046	22 15	091	33 28	147	43 07	228	41 39	320	30 16	338
109	34 34	007	17 27	045	22 54	090	33 49	147	42 39	227	41 14	319	30 01	337
110	34 39	006	17 54	044	23 32	090	34 10	147	42 10	227	40 48	317	29 45	336
111	34 42	005	18 21	043	24 11	089	34 31	146	41 42	226	40 21	316	29 29	335
112	34 45	004	18 47	042	24 49	088	34 53	146	41 15	226	39 54	315	29 12	334
113	34 47	002	19 12	041	25 28	087	35 15	145	40 47	226	39 27	314	28 55	333
114	34 48	001	19 37	040	26 06	087	35 37	145	40 19	225	38 59	313	28 37	331
115	34 49	000	20 02	039	26 45	086	35 59	145	39 52	225	38 30	312	28 18	330
116	34 48	359	20 26	038	27 23	085	36 22	144	39 25	225	38 01	311	27 59	329
117	34 47	358	20 50	037	28 02	084	36 44	144	38 58	224	37 32	310	27 39	328
118	34 45	356	21 13	036	28 40	083	37 07	143	38 31	224	37 02	308	27 18	327
119	34 42	355	21 35	035	29 18	083	37 30	143	38 04	223	36 31	307	26 57	326
	REGULUS		◆ SPICA		RIGIL KENT		◆ ACHERNAR		RIGEL		BETELGEUSE		◆ PROCYON	
120	21 57	034	14 02	091	37 54	143	37 38	223	36 00	306	26 35	325	34 39	354
121	22 19	033	14 41	090	38 17	142	37 12	223	35 29	305	26 13	324	34 34	353
122	22 39	032	15 19	089	38 41	142	36 46	222	34 57	304	25 50	323	34 29	352
123	23 00	031	15 58	089	39 05	142	36 20	222	34 25	303	25 27	322	34 23	350
124	23 20	030	16 36	088	39 29	141	35 55	221	33 53	302	25 03	321	34 16	349
125	23 39	029	17 15	087	39 53	141	35 29	221	33 20	301	24 38	320	34 08	348
126	23 57	028	17 53	086	40 17	141	35 04	220	32 47	300	24 13	319	34 00	347
127	24 15	027	18 32	085	40 42	140	34 39	220	32 14	299	23 48	318	33 51	346
128	24 33	026	19 10	085	41 07	140	34 14	220	31 40	298	23 22	317	33 41	344
129	24 50	025	19 49	084	41 32	139	33 50	219	31 06	297	22 55	316	33 30	343
130	25 06	024	20 27	083	41 57	139	33 26	219	30 31	296	22 28	315	33 19	342
131	25 21	023	21 05	082	42 22	139	33 02	218	29 57	296	22 01	314	33 06	341
132	25 36	022	21 43	081	42 48	139	32 38	218	29 22	295	21 33	313	32 53	340
133	25 50	021	22 22	081	43 13	138	32 14	217	28 47	294	21 05	312	32 40	339
134	26 04	020	23 00	080	43 39	138	31 51	217	28 11	293	20 36	311	32 25	337
	◆ REGULUS		SPICA		◆ RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		PROCYON	
135	26 17	019	23 37	079	44 05	138	31 28	217	65 50	248	47 12	309	32 10	336
136	26 29	018	24 15	078	44 31	137	31 05	216	65 14	248	46 41	308	31 54	335
137	26 40	017	24 53	077	44 57	137	30 42	216	64 39	248	46 10	306	31 38	334
138	26 51	016	25 31	077	45 24	137	30 20	215	64 03	248	45 39	305	31 20	333
139	27 01	015	26 08	076	45 50	136	29 58	215	63 27	247	45 08	304	31 03	332
140	27 10	014	26 45	075	46 17	136	29 36	214	62 52	247	44 35	303	30 44	331
141	27 19	012	27 22	074	46 44	136	29 14	214	62 16	247	44 03	302	30 25	330
142	27 27	011	27 59	073	47 11	136	28 53	213	61 41	247	43 30	301	30 05	329
143	27 34	010	28 36	072	47 38	135	28 32	213	61 05	246	42 57	300	29 45	327
144	27 41	009	29 13	071	48 05	135	28 11	212	60 30	246	42 23	299	29 23	326
145	27 47	008	29 49	071	48 32	135	27 51	212	59 55	246	41 49	298	29 02	325
146	27 52	007	30 26	070	49 00	135	27 30	211	59 20	245	41 15	297	28 40	324
147	27 56	006	31 02	069	49 27	134	27 10	211	58 45	245	40 40	296	28 17	323
148	28 00	005	31 37	068	49 55	134	26 51	210	58 10	245	40 05	295	27 53	322
149	28 02	004	32 13	067	50 23	134	26 31	210	57 35	244	39 30	294	27 29	321
	◆ REGULUS		SPICA		◆ RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		PROCYON	
150	28 04	003	32 48	066	50 51	134	26 12	210	57 00	244	38 55	293	27 05	320
151	28 06	001	33 24	065	51 19	133	25 53	209	56 26	244	38 19	292	26 40	319
152	28 06	000	33 58	064	51 47	133	25 35	209	55 51	243	37 43	291	26 15	318
153	28 06	359	34 33	063	52 15	133	25 16	208	55 17	243	37 07	290	25 49	317
154	28 05	358	35 07	062	52 43	133	24 59	208	54 42	243	36 30	289	25 22	316
155	28 04	357	35 41	061	53 12	133	24 41	207	54 08	242	35 54	288	24 55	315
156	28 01	356	36 15	060	53 40	132	24 23	207	53 34	242	35 17	287	24 28	314
157	27 58	355	36 48	059	54 09	132	24 06	206	53 00	242	34 40	286	24 00	313
158	27 54	354	37 21	058	54 37	132	23 50	205	52 26	241	34 03	285	23 31	312
159	27 50	353	37 53	057	55 06	132	23 33	205	51 52	241	33 26	284	23 03	311
160	27 44	351	38 26	056	55 35	132	23 17	204	51 19	241	32 48	284	22 33	310
161	27 38	350	38 57	055	56 03	132	23 01	204	50 45	240	32 11	283	22 04	309
162	27 31	349	39 29	054	56 32	131	22 46	203	50 12	240	31 33	282	21 34	308
163	27 24	348	40 00	053	57 01	131	22 31	203	49 39	239	30 55	281	21 03	308
164	27 16	347	40 30	052	57 30	131	22 16	202	49 05	239	30 17	280	20 33	307
	SPICA		◆ ANTARES		RIGIL KENT		ACHERNAR		◆ CANOPUS		SIRIUS		◆ REGULUS	
165	41 00	051	24 34	103	57 59	131	22 01	202	48 32	239	29 39	279	27 07	346
166	41 30	049	25 11	102	58 28	131	21 47	201	48 00	238	29 01	279	26 57	345
167	41 59	048	25 49	101	58 57	131	21 33	201	47 27	238	28 23	278	26 47	344
168	42 28	047	26 27	100	59 27	131	21 20	200	46 54	237	27 45	277	26 35	343
169	42 56	046	27 05	100	59 56	131	21 06	200	46 22	237	27 07	276	26 24	342
170	43 23	045	27 43	099	60 25	131	20 53	199	45 50	237	26 28	275	26 11	341
171	43 50	044	28 21	098	60 54	131	20 41	199	45 17	236	25 50	275	25 58	340
172	44 16	042	28 59	098	61 23	131	20 29	198	44 45	236	25 11	274	25 44	339
173	44 42	041	29 38	097	61 52	131	20 17	198	44 14	235	24 33	273	25 30	337
174	45 07	040	30 16	096	62 22	131	20 05	197	43 42	235	23 54	272	25 15	336
175	45 31	039	30 54	095	62 51	131	19 54	197	43 10	235	23 16	271	24 59	335
176	45 55	037	31 33	095	63 20	131	19 43	196	42 39	234	22 37	271	24 43	334
177	46 18	036	32 11	094	63 49	131	19 33	195	42 08	234	21 59	270	24 26	333
178	46 41	035	32 50	093	64 18	131	19 23	195	41 37	233	21 20	269	24 08	332
179	47 02	033	33 28	092	64 47	131	19 13	194	41 06	233	20 42	268	23 50	331

Tilbage til Menuen

LAT 50°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	14 37	033	34 07	092	25 25	151	19 04	194	40 35	233	60 21	266	23 31	330
181	14 58	032	34 45	091	25 44	150	18 55	193	40 05	232	59 42	265	23 11	329
182	15 18	031	35 24	090	26 03	150	18 46	193	39 34	232	59 04	265	22 51	328
183	15 38	030	36 02	089	26 23	149	18 38	192	39 04	231	58 26	264	22 31	327
184	15 57	030	36 41	089	26 42	149	18 30	192	38 34	231	57 47	263	22 10	326
185	16 16	029	37 20	088	27 02	148	18 22	191	38 04	230	57 09	263	21 48	325
186	16 34	028	37 58	087	27 23	148	18 15	190	37 35	230	56 31	262	21 26	324
187	16 52	027	38 37	086	27 43	147	18 08	190	37 05	229	55 53	261	21 03	323
188	17 09	026	39 15	086	28 04	147	18 02	189	36 36	229	55 15	261	20 40	322
189	17 25	025	39 53	085	28 26	146	17 56	189	36 07	229	54 37	260	20 16	321
190	17 41	024	40 32	084	28 47	146	17 50	188	35 39	228	53 59	260	19 52	320
191	17 56	023	41 10	083	29 09	145	17 45	188	35 10	228	53 21	259	19 27	320
192	18 11	022	41 48	082	29 31	145	17 40	187	34 42	227	52 43	258	19 02	319
193	18 25	021	42 27	081	29 53	145	17 35	187	34 13	227	52 05	258	18 36	318
194	18 39	020	43 05	080	30 15	144	17 31	186	33 45	226	51 27	257	18 10	317
	ARCTURUS		◆ ANTARES		Peacock		◆ ACHERNAR		CANOPUS		Suhail		◆ REGULUS	
195	18 52	019	43 43	080	30 38	144	17 27	185	33 18	226	50 50	257	17 43	316
196	19 04	018	44 21	079	31 01	143	17 24	185	32 50	225	50 12	256	17 16	315
197	19 16	017	44 58	078	31 24	143	17 21	184	32 23	225	49 35	255	16 48	314
198	19 27	016	45 36	077	31 48	142	17 18	184	31 56	224	48 58	255	16 20	313
199	19 37	015	46 13	076	32 12	142	17 16	183	31 29	224	48 21	254	15 52	312
200	19 47	014	46 51	075	32 36	141	17 14	183	31 02	223	47 44	254	15 23	311
201	19 56	013	47 28	074	33 00	141	17 12	182	30 36	223	47 07	253	14 54	310
202	20 04	012	48 05	073	33 24	140	17 11	181	30 10	222	46 30	253	14 25	310
203	20 12	011	48 42	072	33 49	140	17 10	181	29 44	222	45 53	252	13 55	309
204	20 19	010	49 18	071	34 14	140	17 10	180	29 18	221	45 16	251	13 25	308
205	20 26	009	49 55	070	34 39	139	17 10	180	28 53	221	44 40	251	12 54	307
206	20 32	008	50 31	069	35 04	139	17 10	179	28 28	220	44 04	250	12 23	306
207	20 37	007	51 07	068	35 30	138	17 11	179	28 03	220	43 27	250	11 52	305
208	20 41	006	51 43	067	35 55	138	17 12	178	27 39	219	42 51	249	11 20	304
209	20 45	005	52 18	066	36 21	137	17 13	177	27 14	219	42 15	249	10 48	304
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	20 48	004	52 53	065	36 48	137	17 15	177	26 50	218	41 39	248	50 37	347
211	20 50	003	53 28	064	37 14	137	17 18	176	26 26	218	41 04	248	50 27	345
212	20 52	002	54 02	062	37 41	136	17 20	176	26 03	217	40 28	247	50 17	344
213	20 53	001	54 36	061	38 07	136	17 23	175	25 40	217	39 53	246	50 06	342
214	20 54	000	55 10	060	38 34	135	17 27	175	25 17	216	39 17	246	49 53	341
215	20 53	359	55 43	059	39 01	135	17 30	174	24 54	216	38 42	245	49 40	339
216	20 52	358	56 16	058	39 29	135	17 35	174	24 31	215	38 07	245	49 26	338
217	20 51	357	56 48	056	39 56	134	17 39	173	24 09	215	37 32	244	49 11	336
218	20 48	356	57 20	055	40 24	134	17 44	172	23 48	214	36 58	244	48 55	335
219	20 45	355	57 51	054	40 52	133	17 49	172	23 26	214	36 23	243	48 38	333
220	20 42	354	58 22	052	41 20	133	17 55	171	23 05	213	35 49	243	48 21	332
221	20 37	353	58 52	051	41 48	133	18 01	171	22 44	213	35 15	242	48 02	331
222	20 32	352	59 22	049	42 17	132	18 07	170	22 23	212	34 41	241	47 43	329
223	20 27	351	59 51	048	42 45	132	18 14	170	22 03	212	34 07	241	47 23	328
224	20 20	350	60 19	046	43 14	132	18 21	169	21 43	211	33 33	240	47 02	327
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		◆ SPICA		ARCTURUS	
225	60 46	045	39 28	085	43 43	131	18 29	168	21 23	210	46 40	325	20 13	349
226	61 13	043	40 06	084	44 12	131	18 37	168	21 04	210	46 18	324	20 06	348
227	61 39	042	40 44	083	44 41	131	18 45	167	20 45	209	45 55	323	19 57	347
228	62 04	040	41 23	082	45 11	130	18 54	167	20 26	209	45 31	321	19 48	346
229	62 29	038	42 01	082	45 40	130	19 03	166	20 08	208	45 07	320	19 39	345
230	62 52	036	42 39	081	46 10	129	19 12	166	19 50	208	44 42	319	19 28	344
231	63 14	035	43 17	080	46 40	129	19 22	165	19 32	207	44 16	318	19 18	343
232	63 36	033	43 55	079	47 10	129	19 32	165	19 15	207	43 50	316	19 06	342
233	63 56	031	44 33	078	47 40	128	19 42	164	18 58	206	43 23	315	18 54	341
234	64 15	029	45 10	077	48 10	128	19 53	164	18 41	205	42 55	314	18 41	340
235	64 33	027	45 48	076	48 40	128	20 04	163	18 24	205	42 27	313	18 28	339
236	64 50	025	46 25	075	49 11	128	20 15	162	18 08	204	41 59	312	18 14	338
237	65 06	023	47 03	074	49 42	127	20 27	162	17 53	204	41 30	310	17 59	337
238	65 20	021	47 40	073	50 12	127	20 39	161	17 37	203	41 00	309	17 44	336
239	65 33	019	48 16	072	50 43	127	20 52	161	17 23	203	40 30	308	17 28	335
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ARCTURUS	
240	24 02	026	12 39	059	13 41	120	21 05	160	59 03	225	40 00	307	17 12	334
241	24 18	025	13 12	058	14 15	119	21 18	160	58 36	225	39 29	306	16 55	333
242	24 34	024	13 45	057	14 48	119	21 31	159	58 09	225	38 57	305	16 37	333
243	24 49	023	14 17	056	15 22	118	21 45	159	57 42	225	38 25	304	16 19	332
244	25 03	022	14 49	056	15 57	117	21 59	158	57 15	224	37 53	303	16 00	331
245	25 17	020	15 21	055	16 31	117	22 14	158	56 48	224	37 21	302	15 41	330
246	25 30	019	15 52	054	17 06	116	22 29	157	56 21	224	36 48	301	15 21	329
247	25 43	018	16 23	053	17 40	115	22 44	157	55 54	224	36 14	300	15 01	328
248	25 55	017	16 54	052	18 15	114	22 59	156	55 27	224	35 41	299	14 40	327
249	26 06	016	17 24	051	18 51	114	23 15	156	55 00	224	35 07	298	14 19	326
250	26 16	015	17 54	050	19 26	113	23 31	155	54 33	224	34 33	297	13 57	325
251	26 26	014	18 23	049	20 01	112	23 47	155	54 07	224	33 58	296	13 35	324
252	26 35	013	18 52	049	20 37	112	24 04	154	53 40	224	33 23	295	13 12	323
253	26 43	012	19 21	048	21 13	111	24 21	154	53 13	224	32 48	294	12 49	323
254	26 51	011	19 49	047	21 49	110	24 38	153	52 47	223	32 13	293	12 25	322
	Rasalhague		◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		ACRUX		◆ SPICA		ANTARES	
255	26 58	010	20 17	046	22 25	110	24 56	153	52 20	223	31 37	292	65 47	344
256	27 04	009	20 45	045	23 02	109	25 14	152	51 54	223	31 01	291	65 35	342
257	27 09	008	21 12	044	23 38	108	25 32	152	51 28	223	30 25	290	65 22	339
258	27 14	006	21 38	043	24 15	108	25 51	151	51 01	223	29 49	289	65 08	337
259	27 18	005	22 04	042	24 52	107	26 10	151	50 35	223	29 13	289	64 53	335
260	27 21	004	22 30	041	25 29	106	26 29	150	50 09	222	28 36	288	64 36	333
261	27 24	003	22 55	040	26 06	106	26 48	150	49 43	222	27 59	287	64 18	331
262	27 26	002	23 19	039	26 43	105	27 08	149	49 17	222	27 22	286	63 59	329
263	27 27	001	23 43	038	27 20	104	27 28	149	48 52	222	26 45	285	63 39	328
264	27 27	000	24 07	037	27 58	104	27 48	148	48 26	222	26 08	284	63 18	326
265	27 27	359	24 30	036	28 35	103	28 08	148	48 01	221	25 30	283	62 56	324
266	27 25	358	24 52	035	29 13	102	28 29	147	47 35	221	24 53	283	62 32	322
267	27 23	357	25 14	034	29 51	102	28 50	147	47 10	221	24 15	282	62 08	320
268	27 21	356	25 36	033	30 28	101	29 11	146	46 45	221	23 37	281	61 43	319
269	27 17	354	25 56	032	31 06	100	29 33	146	46 20	220	22 59	280	61 17	317

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ SPICA		ANTARES		Rasalhague	
270	26 17	031	31 44	099	29 55	145	60 34	229	22 21	279	60 51	316	27 13	353
271	26 36	030	32 22	099	30 17	145	60 05	229	21 43	279	60 23	314	27 08	352
272	26 55	029	33 01	098	30 39	144	59 36	229	21 05	278	59 55	312	27 03	351
273	27 13	028	33 39	097	31 02	144	59 07	229	20 27	277	59 26	311	26 57	350
274	27 31	027	34 17	097	31 25	143	58 38	229	19 48	276	58 57	309	26 49	349
275	27 48	026	34 55	096	31 48	143	58 09	229	19 10	275	58 27	308	26 42	348
276	28 05	025	35 34	095	32 11	143	57 39	229	18 32	275	57 56	307	26 33	347
277	28 20	024	36 12	094	32 35	142	57 10	229	17 53	274	57 25	305	26 24	346
278	28 35	022	36 51	094	32 58	142	56 42	229	17 15	273	56 53	304	26 14	345
279	28 50	021	37 29	093	33 22	141	56 13	228	16 36	272	56 21	303	26 04	344
280	29 04	020	38 08	092	33 47	141	55 44	228	15 58	271	55 48	301	25 52	343
281	29 17	019	38 46	092	34 11	140	55 15	228	15 19	271	55 15	300	25 40	341
282	29 29	018	39 25	091	34 36	140	54 46	228	14 40	270	54 42	299	25 28	340
283	29 41	017	40 03	090	35 01	140	54 18	228	14 02	269	54 08	298	25 15	339
284	29 52	016	40 42	089	35 26	139	53 49	228	13 23	268	53 33	297	25 01	338
	ALTAIR		Enif		◆ FOMALHAUT		ACHERNAR		◆ RIGIL KENT		ANTARES		◆ Rasalhague	
285	30 02	015	20 07	044	41 20	088	35 51	139	53 21	228	52 59	295	24 46	337
286	30 11	014	20 33	043	41 59	088	36 17	138	52 52	227	52 24	294	24 31	336
287	30 20	012	20 59	042	42 38	087	36 42	138	52 24	227	51 48	293	24 15	335
288	30 28	011	21 25	041	43 16	086	37 08	137	51 56	227	51 13	292	23 58	334
289	30 35	010	21 50	040	43 54	085	37 35	137	51 28	227	50 37	291	23 41	333
290	30 41	009	22 14	039	44 33	084	38 01	137	51 00	227	50 01	290	23 24	332
291	30 47	008	22 38	038	45 11	084	38 27	136	50 32	226	49 24	289	23 05	331
292	30 52	007	23 02	037	45 50	083	38 54	136	50 04	226	48 48	288	22 46	330
293	30 56	006	23 25	036	46 28	082	39 21	135	49 36	226	48 11	287	22 27	329
294	31 00	004	23 47	035	47 06	081	39 48	135	49 09	226	47 34	286	22 07	328
295	31 02	003	24 09	034	47 44	080	40 16	135	48 41	225	46 57	285	21 46	327
296	31 04	002	24 30	033	48 22	079	40 43	134	48 14	225	46 20	284	21 25	326
297	31 05	001	24 51	032	49 00	078	41 11	134	47 46	225	45 42	283	21 03	325
298	31 05	000	25 11	031	49 37	077	41 39	134	47 19	225	45 05	282	20 41	324
299	31 05	359	25 31	030	50 15	077	42 07	133	46 52	224	44 27	281	20 18	323
	◆ Enif		FOMALHAUT		◆ ACHERNAR		RIGIL KENT		◆ ANTARES		Rasalhague		ALTAIR	
300	25 50	029	50 52	076	42 35	133	46 25	224	43 49	281	19 55	322	31 04	358
301	26 08	028	51 30	075	43 03	132	45 59	224	43 11	280	19 31	321	31 02	356
302	26 26	027	52 07	074	43 32	132	45 32	223	42 33	279	19 06	320	30 59	355
303	26 43	026	52 44	073	44 00	132	45 06	223	41 55	278	18 42	319	30 55	354
304	26 59	025	53 20	072	44 29	131	44 39	223	41 16	277	18 16	319	30 51	353
305	27 15	024	53 57	071	44 58	131	44 13	223	40 38	276	17 51	318	30 46	352
306	27 30	023	54 33	069	45 27	131	43 47	222	40 00	275	17 24	317	30 40	351
307	27 45	022	55 09	068	45 57	130	43 21	222	39 21	275	16 58	316	30 33	350
308	27 58	020	55 45	067	46 26	130	42 56	222	38 43	274	16 31	315	30 26	348
309	28 12	019	56 20	066	46 56	130	42 30	221	38 04	273	16 03	314	30 18	347
310	28 24	018	56 55	065	47 25	129	42 05	221	37 26	272	15 35	313	30 09	346
311	28 36	017	57 30	064	47 55	129	41 40	221	36 47	271	15 07	312	29 59	345
312	28 47	016	58 04	062	48 25	129	41 15	220	36 09	271	14 38	311	29 49	344
313	28 57	015	58 38	061	48 55	128	40 50	220	35 30	270	14 09	310	29 38	343
314	29 07	014	59 12	060	49 26	128	40 25	220	34 52	269	13 39	310	29 26	342
	◆ Enif		Diphda		◆ ACHERNAR		Miaplacidus		RIGIL KENT		◆ ANTARES		ALTAIR	
315	29 15	013	35 13	075	49 56	128	29 48	181	40 01	219	34 13	268	29 14	341
316	29 23	012	35 51	074	50 27	128	29 47	181	39 36	219	33 35	268	29 00	339
317	29 31	010	36 28	073	50 57	127	29 47	181	39 12	219	32 56	267	28 46	338
318	29 37	009	37 05	072	51 28	127	29 47	180	38 48	218	32 18	266	28 32	337
319	29 43	008	37 41	072	51 59	127	29 47	180	38 25	218	31 39	265	28 17	336
320	29 49	007	38 18	071	52 30	126	29 47	179	38 01	217	31 01	265	28 01	335
321	29 53	006	38 54	070	53 01	126	29 48	179	37 38	217	30 22	264	27 44	334
322	29 56	005	39 30	069	53 32	126	29 49	179	37 14	217	29 44	263	27 27	333
323	29 59	004	40 06	068	54 03	126	29 50	178	36 51	216	29 06	263	27 09	332
324	30 01	003	40 41	067	54 35	125	29 51	178	36 29	216	28 27	262	26 51	331
325	30 03	001	41 17	066	55 06	125	29 53	177	36 06	216	27 49	261	26 31	330
326	30 03	000	41 52	065	55 38	125	29 55	177	35 44	215	27 11	260	26 12	329
327	30 03	359	42 27	064	56 09	125	29 57	177	35 22	215	26 33	260	25 51	328
328	30 02	358	43 01	063	56 41	125	29 59	176	35 00	214	25 55	259	25 31	327
329	30 00	357	43 35	062	57 13	124	30 02	176	34 38	214	25 18	258	25 09	326
	◆ Diphda		ACHERNAR		◆ Miaplacidus		RIGIL KENT		ANTARES		◆ ALTAIR		Enif	
330	44 09	061	57 45	124	30 05	175	34 17	214	24 40	258	24 47	325	29 58	356
331	44 42	060	58 17	124	30 08	175	33 55	213	24 02	257	24 24	324	29 55	355
332	45 15	058	58 49	124	30 12	175	33 34	213	23 25	256	24 01	323	29 51	353
333	45 48	057	59 21	124	30 15	174	33 14	212	22 47	255	23 38	322	29 46	352
334	46 20	056	59 53	123	30 20	174	32 53	212	22 10	255	23 13	321	29 40	351
335	46 52	055	60 25	123	30 24	173	32 33	212	21 33	254	22 49	320	29 34	350
336	47 24	054	60 58	123	30 28	173	32 13	211	20 56	253	22 24	319	29 27	349
337	47 55	053	61 30	123	30 33	173	31 53	211	20 19	253	21 58	318	29 19	348
338	48 25	052	62 02	123	30 38	172	31 33	210	19 42	252	21 32	317	29 11	347
339	48 55	050	62 35	123	30 44	172	31 14	210	19 06	251	21 05	316	29 01	346
340	49 24	049	63 07	123	30 49	171	30 55	209	18 29	251	20 38	315	28 52	344
341	49 53	048	63 40	123	30 55	171	30 36	209	17 53	250	20 10	314	28 41	343
342	50 21	046	64 12	123	31 01	171	30 17	209	17 17	249	19 43	313	28 29	342
343	50 49	045	64 45	123	31 08	170	29 59	208	16 41	248	19 14	312	28 17	341
344	51 16	044	65 17	122	31 14	170	29 41	208	16 05	248	18 45	311	28 05	340
	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		Enif	
345	51 42	042	47 56	100	28 00	140	31 21	170	29 23	207	38 15	274	27 51	339
346	52 08	041	48 34	100	28 24	140	31 28	169	29 06	207	37 36	273	27 37	338
347	52 33	040	49 12	099	28 50	139	31 36	169	28 48	206	36 58	272	27 22	337
348	52 57	038	49 50	098	29 15	139	31 43	168	28 31	206	36 19	271	27 07	336
349	53 21	037	50 28	098	29 40	138	31 51	168	28 15	205	35 40	270	26 50	335
350	53 44	035	51 07	097	30 06	138	31 59	168	27 58	205	35 02	270	26 34	334
351	54 06	034	51 45	096	30 32	137	32 08	167	27 42	205	34 23	269	26 16	333
352	54 27	032	52 23	096	30 59	137	32 16	167	27 26	204	33 45	268	25 58	332
353	54 47	031	53 02	095	31 25	136	32 25	167	27 11	204	33 06	267	25 39	331
354	55 06	029	53 40	094	31 52	136	32 34	166	26 55	203	32 28	267	25 20	329
355	55 24	028	54 19	094	32 19	135	32 43	166	26 40	203	31 49	266	25 00	328
356	55 42	026	54 57	093	32 46	135	32 53	165	26 25	202	31 11	265	24 40	327
357	55 58	024	55 36	092	33 14	134	33 03	165	26 11	202	30 32	264	24 19	326
358	56 14	023	56 14	091	33 41	134	33 13	165	25 57	201	29 54	264	23 57	325
359	56 28	021	56 53	091	34 09	133	33 23	164	25 43	201	29 16	263	23 35	324

LAT 51°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Diphda		◆ RIGEL		CANOPUS		Miaplacidus		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	55 45	019	13 23	086	35 18	132	34 31	164	26 26	201	58 52	238	65 39	326
1	55 57	017	14 01	086	35 46	132	34 42	163	26 13	200	58 20	238	65 18	324
2	56 07	016	14 38	085	36 14	131	34 53	163	26 00	200	57 48	238	64 55	322
3	56 17	014	15 16	084	36 43	131	35 04	163	25 47	199	57 16	238	64 31	320
4	56 26	012	15 53	083	37 11	131	35 15	162	25 35	199	56 44	237	64 07	319
5	56 33	011	16 31	083	37 40	130	35 27	162	25 23	198	56 13	237	63 41	317
6	56 39	009	17 08	082	38 09	130	35 39	162	25 12	198	55 41	237	63 15	315
7	56 45	007	17 46	081	38 38	129	35 51	161	25 01	197	55 09	237	62 48	314
8	56 49	005	18 23	080	39 08	129	36 03	161	24 50	197	54 38	236	62 21	312
9	56 52	004	19 00	079	39 37	128	36 15	161	24 39	196	54 07	236	61 52	310
10	56 54	002	19 37	078	40 07	128	36 28	160	24 29	196	53 35	236	61 23	309
11	56 54	000	20 14	078	40 37	127	36 41	160	24 19	195	53 04	235	60 53	307
12	56 54	358	20 51	077	41 07	127	36 54	160	24 09	195	52 33	235	60 23	306
13	56 52	357	21 28	076	41 37	126	37 07	159	24 00	194	52 02	235	59 52	305
14	56 49	355	22 04	075	42 08	126	37 20	159	23 51	194	51 31	235	59 21	303
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
15	22 41	074	15 08	098	42 39	126	23 42	193	51 01	234	58 49	302	56 45	353
16	23 17	073	15 46	097	43 09	125	23 34	193	50 30	234	58 17	301	56 40	351
17	23 53	073	16 23	097	43 40	125	23 26	192	50 00	234	57 44	299	56 34	350
18	24 29	072	17 01	096	44 11	124	23 18	192	49 29	233	57 11	298	56 27	348
19	25 05	071	17 38	095	44 43	124	23 11	191	48 59	233	56 37	297	56 19	346
20	25 40	070	18 16	094	45 14	123	23 04	190	48 29	233	56 03	296	56 09	345
21	26 16	069	18 53	094	45 46	123	22 57	190	47 59	232	55 29	294	55 59	343
22	26 51	068	19 31	093	46 18	123	22 50	189	47 30	232	54 55	293	55 47	341
23	27 26	067	20 09	092	46 50	122	22 44	189	47 00	231	54 20	292	55 34	340
24	28 00	066	20 47	091	47 22	122	22 39	188	46 30	231	53 45	291	55 21	338
25	28 35	065	21 24	090	47 54	121	22 33	188	46 01	231	53 09	290	55 06	336
26	29 09	065	22 02	090	48 26	121	22 28	187	45 32	230	52 34	289	54 51	335
27	29 43	064	22 40	089	48 59	120	22 24	187	45 03	230	51 58	288	54 34	333
28	30 17	063	23 18	088	49 31	120	22 19	186	44 34	230	51 22	287	54 17	332
29	30 50	062	23 55	087	50 04	120	22 15	186	44 05	229	50 46	286	53 58	330
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
30	31 23	061	24 33	087	50 37	119	22 12	185	43 37	229	50 09	285	53 39	329
31	31 56	060	25 11	086	51 10	119	22 08	185	43 09	229	49 33	284	53 19	327
32	32 29	059	25 48	085	51 43	118	22 05	184	42 40	228	48 56	283	52 58	326
33	33 01	058	26 26	084	52 16	118	22 03	184	42 12	228	48 19	282	52 36	324
34	33 32	057	27 04	083	52 50	118	22 00	183	41 44	227	47 42	281	52 14	323
35	34 04	056	27 41	082	53 23	117	21 58	183	41 17	227	47 05	280	51 51	321
36	34 35	055	28 18	082	53 57	117	21 57	182	40 49	227	46 28	279	51 27	320
37	35 06	054	28 56	081	54 31	116	21 55	182	40 22	226	45 50	278	51 02	319
38	35 36	053	29 33	080	55 05	116	21 55	181	39 55	226	45 13	278	50 37	317
39	36 06	052	30 10	079	55 38	116	21 54	181	39 28	225	44 35	277	50 11	316
40	36 35	051	30 47	078	56 13	115	21 54	180	39 01	225	43 58	276	49 44	315
41	37 04	050	31 24	077	56 47	115	21 54	180	38 35	224	43 20	275	49 17	313
42	37 32	048	32 01	077	57 21	115	21 54	179	38 08	224	42 43	274	48 49	312
43	38 00	047	32 37	076	57 55	114	21 55	179	37 42	224	42 05	273	48 21	311
44	38 28	046	33 14	075	58 30	114	21 56	178	37 16	223	41 27	273	47 52	310
	RIGEL		◆ SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
45	38 55	045	33 50	074	59 04	113	21 58	177	36 50	223	40 50	272	47 23	308
46	39 21	044	34 27	073	59 39	113	22 00	177	36 25	222	40 12	271	46 53	307
47	39 47	043	35 03	072	60 14	113	22 02	176	36 00	222	39 34	270	46 23	306
48	40 13	042	35 38	071	60 49	112	22 04	176	35 34	221	38 56	269	45 52	305
49	40 37	040	36 14	070	61 24	112	22 07	175	35 10	221	38 19	269	45 21	304
50	41 02	039	36 49	069	61 59	112	22 10	175	34 45	221	37 41	268	44 49	303
51	41 25	038	37 25	068	62 34	111	22 14	174	34 20	220	37 03	267	44 17	301
52	41 48	037	38 00	067	63 09	111	22 18	174	33 56	220	36 25	266	43 45	300
53	42 10	036	38 34	066	63 44	111	22 22	173	33 32	219	35 48	266	43 12	299
54	42 32	034	39 09	065	64 20	110	22 27	173	33 08	219	35 10	265	42 39	298
55	42 53	033	39 43	064	64 55	110	22 32	172	32 45	218	34 33	264	42 05	297
56	43 13	032	40 17	063	65 31	110	22 37	172	32 22	218	33 55	263	41 32	296
57	43 33	030	40 51	062	66 06	109	22 43	171	31 59	217	33 18	263	40 58	295
58	43 52	029	41 24	061	66 42	109	22 48	171	31 36	217	32 40	262	40 23	294
59	44 10	028	41 57	060	67 18	109	22 55	170	31 13	216	32 03	261	39 49	293
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
60	44 27	027	42 30	059	39 32	114	23 01	170	30 51	216	31 25	261	39 14	292
61	44 43	025	43 02	058	40 07	113	23 08	169	30 29	216	30 48	260	38 39	291
62	44 59	024	43 34	057	40 42	112	23 16	169	30 07	215	30 11	259	38 04	290
63	45 14	023	44 05	056	41 17	112	23 23	168	29 45	215	29 34	258	37 28	289
64	45 28	021	44 36	055	41 52	111	23 31	168	29 24	214	28 57	258	36 52	288
65	45 41	020	45 07	054	42 27	111	23 39	167	29 03	214	28 20	257	36 16	287
66	45 54	018	45 37	053	43 02	110	23 48	167	28 42	213	27 44	256	35 40	287
67	46 05	017	46 07	051	43 38	109	23 57	166	28 22	213	27 07	256	35 04	286
68	46 16	016	46 36	050	44 14	109	24 06	166	28 02	212	26 30	255	34 28	285
69	46 25	014	47 05	049	44 49	108	24 16	165	27 42	212	25 54	254	33 51	284
70	46 34	013	47 33	048	45 25	108	24 26	165	27 22	211	25 18	254	33 14	283
71	46 42	011	48 01	047	46 01	107	24 36	164	27 03	211	24 42	253	32 37	282
72	46 49	010	48 28	045	46 37	107	24 46	164	26 44	210	24 06	252	32 00	281
73	46 55	008	48 55	044	47 14	106	24 57	163	26 25	210	23 30	251	31 23	280
74	47 00	007	49 20	043	47 50	105	25 08	163	26 06	209	22 54	251	30 46	280
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		ACHERNAR		◆ Diphda	
75	47 04	006	49 46	041	48 26	105	25 20	162	25 48	209	60 30	238	30 09	279
76	47 07	004	50 10	040	49 03	104	25 31	162	25 30	208	59 58	238	29 32	278
77	47 10	003	50 34	039	49 40	104	25 43	161	25 12	208	59 26	238	28 54	277
78	47 11	001	50 57	037	50 16	103	25 56	161	24 55	207	58 54	237	28 17	276
79	47 11	000	51 20	036	50 53	102	26 09	160	24 38	207	58 22	237	27 39	275
80	47 10	358	51 42	034	51 30	102	26 22	160	24 21	206	57 51	237	27 01	275
81	47 09	357	52 03	033	52 07	101	26 35	159	24 05	206	57 19	237	26 24	274
82	47 06	355	52 23	031	52 44	101	26 48	159	23 49	205	56 47	237	25 46	273
83	47 03	354	52 42	030	53 21	100	27 02	158	23 33	204	56 16	236	25 08	272
84	46 58	352	53 01	029	53 59	099	27 16	158	23 18	204	55 45	236	24 31	271
85	46 53	351	53 18	027	54 36	099	27 31	157	23 02	203	55 13	236	23 53	271
86	46 46	350	53 35	025	55 13	098	27 46	157	22 48	203	54 42	236	23 15	270
87	46 39	348	53 51	024	55 51	097	28 01	156	22 33	202	54 11	235	22 37	269
88	46 31	347	54 05	022	56 28	097	28 16	156	22 19	202	53 40	235	22 00	268
89	46 22	345	54 19	021	57 06	096	28 32	155	22 05	201	53 09	235	21 22	268

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LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		◆ Suhail		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL		BETELGEUSE	
90	29 51	029	57 43	095	28 47	155	21 52	201	52 38	234	46 12	344	31 35	359
91	30 09	028	58 21	095	29 04	154	21 38	200	52 08	234	46 01	342	31 34	358
92	30 26	027	58 58	094	29 20	154	21 26	200	51 37	234	45 49	341	31 32	357
93	30 43	026	59 36	093	29 37	154	21 13	199	51 07	233	45 36	340	31 29	355
94	30 59	025	60 14	093	29 54	153	21 01	199	50 37	233	45 23	338	31 26	354
95	31 14	024	60 52	092	30 11	153	20 49	198	50 06	233	45 09	337	31 22	353
96	31 29	022	61 29	091	30 28	152	20 38	197	49 36	232	44 53	336	31 17	352
97	31 43	021	62 07	090	30 46	152	20 26	197	49 07	232	44 37	334	31 11	351
98	31 56	020	62 45	089	31 04	151	20 16	196	48 37	232	44 21	333	31 05	350
99	32 09	019	63 23	089	31 23	151	20 05	196	48 07	231	44 03	332	30 57	348
100	32 21	018	64 00	088	31 41	150	19 55	195	47 38	231	43 45	330	30 49	347
101	32 32	017	64 38	087	32 00	150	19 45	195	47 08	231	43 26	329	30 41	346
102	32 43	015	65 16	086	32 19	150	19 36	194	46 39	230	43 06	328	30 31	345
103	32 52	014	65 53	085	32 38	149	19 27	194	46 10	230	42 45	326	30 21	344
104	33 01	013	66 31	084	32 58	149	19 18	193	45 41	230	42 24	325	30 10	343
	PROCYON		REGULUS		◆ Gienah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ SIRIUS	
105	33 09	012	14 55	048	20 23	093	33 17	148	45 13	229	42 02	324	55 37	354
106	33 17	011	15 23	047	21 01	092	33 37	148	44 44	229	41 40	323	55 33	352
107	33 24	010	15 51	046	21 38	092	33 58	147	44 16	229	41 17	322	55 27	351
108	33 29	008	16 18	045	22 16	091	34 18	147	43 47	228	40 53	320	55 20	349
109	33 35	007	16 45	044	22 54	090	34 39	147	43 19	228	40 28	319	55 13	347
110	33 39	006	17 11	044	23 32	089	35 00	146	42 51	228	40 03	318	55 04	346
111	33 42	005	17 37	043	24 09	088	35 21	146	42 23	227	39 38	317	54 54	344
112	33 45	004	18 02	042	24 47	088	35 42	145	41 56	227	39 12	316	54 43	342
113	33 47	002	18 27	041	25 25	087	36 04	145	41 28	226	38 45	315	54 31	341
114	33 48	001	18 51	040	26 02	086	36 26	145	41 01	226	38 18	313	54 18	339
115	33 49	000	19 15	039	26 40	085	36 48	144	40 34	226	37 50	312	54 04	338
116	33 48	359	19 39	038	27 18	085	37 10	144	40 07	225	37 22	311	53 49	336
117	33 47	358	20 02	037	27 55	084	37 32	143	39 41	225	36 53	310	53 33	334
118	33 45	356	20 24	036	28 33	083	37 55	143	39 14	224	36 24	309	53 16	333
119	33 43	355	20 46	035	29 10	082	38 18	143	38 48	224	35 55	308	52 59	331
	REGULUS		◆ SPICA		RIGIL KENT		Peacock		◆ ACHERNAR		RIGEL		◆ SIRIUS	
120	21 07	034	14 03	091	38 41	142	17 50	184	38 22	224	35 25	307	52 40	330
121	21 28	033	14 41	090	39 04	142	17 47	183	37 56	223	34 54	306	52 21	328
122	21 49	032	15 18	089	39 28	141	17 45	183	37 30	223	34 23	305	52 01	327
123	22 09	031	15 56	088	39 51	141	17 44	182	37 05	222	33 52	304	51 40	325
124	22 28	030	16 34	087	40 15	141	17 43	182	36 39	222	33 21	303	51 18	324
125	22 46	029	17 12	087	40 39	140	17 42	181	36 14	221	32 49	302	50 55	323
126	23 05	028	17 49	086	41 03	140	17 41	180	35 50	221	32 17	301	50 32	321
127	23 22	027	18 27	085	41 28	140	17 41	180	35 25	221	31 44	300	50 08	320
128	23 39	026	19 05	084	41 52	139	17 41	179	35 00	220	31 11	299	49 43	319
129	23 55	025	19 42	083	42 17	139	17 42	179	34 36	220	30 38	298	49 18	317
130	24 11	024	20 20	083	42 42	139	17 43	178	34 12	219	30 04	297	48 52	316
131	24 26	023	20 57	082	43 07	138	17 45	178	33 49	219	29 31	296	48 26	315
132	24 40	022	21 34	081	43 32	138	17 46	177	33 25	218	28 56	295	47 58	313
133	24 54	021	22 12	080	43 58	138	17 49	176	33 02	218	28 22	294	47 31	312
134	25 07	020	22 49	079	44 23	137	17 51	176	32 39	217	27 48	293	47 02	311
	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
135	25 20	019	23 26	079	44 49	137	17 54	175	32 16	217	66 11	251	46 34	310
136	25 32	018	24 03	078	45 15	137	17 58	175	31 53	216	65 36	250	46 04	308
137	25 43	017	24 40	077	45 41	136	18 01	174	31 31	216	65 00	250	45 34	307
138	25 53	016	25 16	076	46 07	136	18 05	174	31 09	216	64 25	250	45 04	306
139	26 03	015	25 53	075	46 33	136	18 10	173	30 47	215	63 49	249	44 33	305
140	26 12	013	26 29	074	47 00	135	18 15	172	30 25	215	63 14	249	44 02	304
141	26 21	012	27 06	074	47 27	135	18 20	172	30 04	214	62 39	249	43 31	303
142	26 28	011	27 42	073	47 53	135	18 25	171	29 43	214	62 04	248	42 59	302
143	26 35	010	28 18	072	48 20	134	18 31	171	29 22	213	61 29	248	42 27	301
144	26 42	009	28 53	071	48 47	134	18 38	170	29 02	213	60 54	248	41 54	300
145	26 47	008	29 29	070	49 14	134	18 44	170	28 42	212	60 19	247	41 21	298
146	26 52	007	30 04	069	49 42	134	18 51	169	28 22	212	59 44	247	40 47	297
147	26 56	006	30 40	068	50 09	133	18 59	168	28 02	211	59 09	247	40 14	296
148	27 00	005	31 15	067	50 36	133	19 07	168	27 42	211	58 35	246	39 40	295
149	27 02	004	31 49	066	51 04	133	19 15	167	27 23	210	58 00	246	39 06	294
	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
150	27 04	003	32 24	065	51 32	133	19 23	167	27 04	210	57 26	245	38 31	293
151	27 06	001	32 58	064	52 00	132	19 32	166	26 46	209	56 52	245	37 56	292
152	27 06	000	33 32	063	52 27	132	19 41	166	26 27	209	56 17	245	37 21	292
153	27 06	359	34 05	062	52 55	132	19 51	165	26 09	208	55 43	244	36 46	291
154	27 05	358	34 39	062	53 24	132	20 01	164	25 52	208	55 09	244	36 11	290
155	27 04	357	35 12	061	53 52	132	20 11	164	25 34	207	54 35	244	35 35	289
156	27 01	356	35 45	060	54 20	131	20 22	163	25 17	207	54 02	243	34 59	288
157	26 58	355	36 17	059	54 49	131	20 33	163	25 00	206	53 28	243	34 23	287
158	26 55	354	36 49	057	55 17	131	20 44	162	24 44	206	52 55	242	33 47	286
159	26 50	353	37 21	056	55 46	131	20 56	162	24 28	205	52 21	242	33 10	285
160	26 45	352	37 52	055	56 14	131	21 08	161	24 12	205	51 48	242	32 34	284
161	26 39	350	38 23	054	56 43	130	21 20	161	23 56	204	51 15	241	31 57	283
162	26 32	349	38 53	053	57 12	130	21 33	160	23 41	204	50 42	241	31 20	282
163	26 25	348	39 23	052	57 40	130	21 46	160	23 26	203	50 09	240	30 44	282
164	26 17	347	39 53	051	58 09	130	21 59	159	23 11	203	49 36	240	30 07	281
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		REGULUS	
165	40 22	050	24 47	102	22 13	158	22 57	202	49 03	240	29 29	280	26 08	346
166	40 51	049	25 23	101	22 27	158	22 43	202	48 31	239	28 52	279	25 59	345
167	41 19	048	26 01	101	22 42	157	22 29	201	47 58	239	28 15	278	25 49	344
168	41 47	047	26 38	100	22 56	157	22 16	200	47 26	238	27 37	277	25 38	343
169	42 14	045	27 15	099	23 11	156	22 03	200	46 54	238	27 00	277	25 27	342
170	42 40	044	27 52	099	23 27	156	21 50	199	46 22	238	26 22	276	25 15	341
171	43 06	043	28 30	098	23 42	155	21 38	199	45 50	237	25 45	275	25 02	340
172	43 32	042	29 07	097	23 58	155	21 26	198	45 19	237	25 07	274	24 48	339
173	43 57	041	29 45	096	24 15	154	21 14	198	44 47	236	24 30	273	24 34	338
174	44 21	039	30 22	096	24 31	154	21 03	197	44 16	236	23 52	273	24 20	337
175	44 44	038	31 00	095	24 48	153	20 52	197	43 45	235	23 14	272	24 04	336
176	45 07	037	31 37	094	25 05	153	20 41	196	43 14	235	22 36	271	23 49	335
177	45 30	035	32 15	093	25 23	152	20 31	196	42 43	235	21 59	270	23 32	334
178	45 51	034	32 53	093	25 41	152	20 21	195	42 12	234	21 21	270	23 15	332
179	46 12	033	33 30	092	25 59	151	20 11	194	41 42	234	20 43	269	22 57	331

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LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	46 32	031	34 08	091	26 17	151	20 02	194	41 11	233	60 24	268	22 39	330
181	46 51	030	34 46	090	26 36	150	19 53	193	40 41	233	59 47	267	22 20	329
182	47 10	029	35 24	089	26 55	150	19 45	193	40 11	232	59 09	266	22 00	328
183	47 28	027	36 01	089	27 14	149	19 36	192	39 42	232	58 31	266	21 40	327
184	47 45	026	36 39	088	27 34	149	19 29	192	39 12	231	57 54	265	21 20	326
185	48 01	025	37 17	087	27 53	148	19 21	191	38 43	231	57 16	264	20 59	326
186	48 16	023	37 55	086	28 14	148	19 14	191	38 13	230	56 38	263	20 37	325
187	48 31	022	38 32	086	28 34	147	19 07	190	37 44	230	56 01	263	20 15	324
188	48 44	020	39 10	085	28 55	147	19 01	189	37 15	230	55 23	262	19 52	323
189	48 57	019	39 47	084	29 15	146	18 55	189	36 47	229	54 46	262	19 29	322
190	49 09	017	40 25	083	29 37	146	18 49	188	36 18	229	54 09	261	19 05	321
191	49 19	016	41 02	082	29 58	145	18 44	188	35 50	228	53 32	260	18 41	320
192	49 29	014	41 40	081	30 20	145	18 39	187	35 22	228	52 54	260	18 17	319
193	49 38	013	42 17	080	30 42	144	18 35	187	34 54	227	52 17	259	17 51	318
194	49 46	011	42 54	080	31 04	144	18 31	186	34 27	227	51 40	258	17 26	317
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		Denebola	
195	17 55	019	43 31	079	31 26	143	18 27	185	33 59	226	51 03	258	22 44	342
196	18 07	018	44 08	078	31 49	143	18 23	185	33 32	226	50 26	257	22 32	341
197	18 18	017	44 45	077	32 12	142	18 20	184	33 05	225	49 50	257	22 19	340
198	18 29	016	45 22	076	32 35	142	18 18	184	32 39	225	49 13	256	22 06	338
199	18 39	015	45 58	075	32 59	141	18 15	183	32 12	224	48 36	255	21 51	337
200	18 49	014	46 35	074	33 22	141	18 14	183	31 46	224	48 00	255	21 37	336
201	18 57	013	47 11	073	33 46	141	18 12	182	31 20	223	47 24	254	21 21	335
202	19 06	012	47 47	072	34 10	140	18 11	181	30 54	223	46 47	254	21 05	334
203	19 13	011	48 23	071	34 35	140	18 10	181	30 29	222	46 11	253	20 49	333
204	19 20	010	48 59	070	34 59	139	18 10	180	30 03	222	45 35	252	20 32	332
205	19 26	009	49 34	069	35 24	139	18 10	180	29 38	221	44 59	252	20 14	331
206	19 32	008	50 09	068	35 49	138	18 10	179	29 14	221	44 23	251	19 56	331
207	19 37	007	50 44	067	36 14	138	18 11	179	28 49	220	43 48	251	19 37	330
208	19 41	006	51 19	066	36 40	137	18 12	178	28 25	220	43 12	250	19 17	329
209	19 45	005	51 53	065	37 05	137	18 13	177	28 01	219	42 37	250	18 57	328
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	19 48	004	52 27	064	37 31	137	18 15	177	27 37	219	42 01	249	49 38	347
211	19 51	003	53 00	062	37 57	136	18 17	176	27 14	218	41 26	248	49 29	346
212	19 52	002	53 34	061	38 24	136	18 20	176	26 50	218	40 51	248	49 19	344
213	19 53	001	54 07	060	38 50	135	18 23	175	26 27	217	40 16	247	49 08	343
214	19 54	000	54 39	059	39 17	135	18 26	175	26 05	217	39 41	247	48 57	341
215	19 53	359	55 11	058	39 44	134	18 30	174	25 42	216	39 07	246	48 44	340
216	19 52	358	55 43	056	40 11	134	18 34	173	25 20	216	38 32	246	48 30	338
217	19 51	357	56 14	055	40 38	134	18 39	173	24 59	215	37 58	245	48 16	337
218	19 49	356	56 45	054	41 05	133	18 43	172	24 37	214	37 24	244	48 01	335
219	19 46	355	57 15	052	41 33	133	18 49	172	24 16	214	36 50	244	47 45	334
220	19 42	354	57 45	051	42 01	132	18 54	171	23 55	213	36 16	243	47 28	333
221	19 38	353	58 14	050	42 29	132	19 00	171	23 34	213	35 43	243	47 10	331
222	19 33	352	58 42	048	42 57	132	19 07	170	23 14	212	35 09	242	46 51	330
223	19 27	351	59 10	047	43 25	131	19 13	170	22 54	212	34 36	242	46 32	328
224	19 21	350	59 37	045	43 54	131	19 20	169	22 34	211	34 03	241	46 12	327
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
225	60 03	044	39 22	084	44 22	131	19 28	168	22 15	211	33 30	240	45 51	326
226	60 29	042	39 59	083	44 51	130	19 35	168	21 56	210	32 57	240	45 29	325
227	60 54	040	40 37	082	45 20	130	19 44	167	21 37	210	32 25	239	45 07	323
228	61 18	039	41 14	082	45 49	129	19 52	167	21 19	209	31 52	239	44 44	322
229	61 41	037	41 52	081	46 18	129	20 01	166	21 01	208	31 20	238	44 21	321
230	62 03	035	42 29	080	46 48	129	20 10	166	20 43	208	30 48	238	43 56	319
231	62 24	033	43 06	079	47 17	128	20 20	165	20 25	207	30 16	237	43 32	318
232	62 45	032	43 43	078	47 47	128	20 29	165	20 08	207	29 45	236	43 06	317
233	63 04	030	44 20	077	48 17	128	20 40	164	19 51	206	29 14	236	42 40	316
234	63 22	028	44 57	076	48 47	127	20 50	163	19 35	206	28 42	235	42 13	315
235	63 40	026	45 33	075	49 17	127	21 01	163	19 19	205	28 12	235	41 46	313
236	63 56	024	46 10	074	49 47	127	21 13	162	19 03	204	27 41	234	41 19	312
237	64 10	022	46 46	073	50 18	126	21 24	162	18 48	204	27 10	233	40 50	311
238	64 24	020	47 22	072	50 48	126	21 36	161	18 33	203	26 40	233	40 22	310
239	64 36	018	47 58	071	51 19	126	21 48	161	18 18	203	26 10	232	39 53	309
	◆ ANTARES		Nunki		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA	
240	64 48	016	48 34	070	14 11	120	22 01	160	18 04	202	59 45	226	39 23	308
241	64 57	014	49 09	069	14 44	119	22 14	160	17 50	201	59 18	226	38 53	307
242	65 06	012	49 44	068	15 17	118	22 27	159	17 36	201	58 51	226	38 22	306
243	65 13	010	50 19	067	15 50	118	22 41	159	17 23	200	58 24	226	37 52	305
244	65 19	008	50 54	066	16 24	117	22 55	158	17 10	200	57 57	226	37 20	304
245	65 23	006	51 28	065	16 58	116	23 09	158	16 57	199	57 30	225	36 49	303
246	65 26	003	52 02	064	17 32	116	23 24	157	16 45	198	57 03	225	36 17	301
247	65 28	001	52 36	063	18 06	115	23 39	156	16 33	198	56 36	225	35 44	300
248	65 28	359	53 09	062	18 40	114	23 54	156	16 22	197	56 10	225	35 12	299
249	65 26	357	53 42	060	19 15	114	24 10	155	16 11	197	55 43	225	34 39	298
250	65 24	355	54 15	059	19 49	113	24 25	155	16 00	196	55 16	225	34 05	297
251	65 20	353	54 47	058	20 24	112	24 42	154	15 50	195	54 50	225	33 32	297
252	65 14	351	55 19	057	20 59	111	24 58	154	15 40	195	54 23	225	32 58	296
253	65 07	348	55 51	055	21 34	111	25 15	153	15 31	194	53 56	225	32 23	295
254	64 59	346	56 21	054	22 10	110	25 32	153	15 22	194	53 30	224	31 49	294
	ALTAIR		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA		◆ ANTARES	
255	19 35	046	22 45	109	25 49	152	15 13	193	53 04	224	31 14	293	64 49	344
256	20 02	045	23 21	109	26 07	152	15 04	192	52 37	224	30 39	292	64 38	342
257	20 28	044	23 57	108	26 25	151	14 57	192	52 11	224	30 04	291	64 26	340
258	20 54	043	24 33	107	26 43	151	14 49	191	51 45	224	29 29	290	64 13	338
259	21 19	042	25 09	107	27 02	150	14 42	191	51 19	223	28 53	289	63 58	336
260	21 44	041	25 45	106	27 21	150	14 35	190	50 53	223	28 17	288	63 42	334
261	22 09	040	26 22	105	27 40	149	14 29	189	50 27	223	27 42	287	63 25	332
262	22 33	039	26 58	105	27 59	149	14 23	189	50 02	223	27 05	286	63 07	330
263	22 56	038	27 35	104	28 19	148	14 17	188	49 36	223	26 29	286	62 48	329
264	23 19	037	28 12	103	28 39	148	14 12	188	49 11	222	25 53	285	62 28	327
265	23 41	036	28 48	102	28 59	147	14 07	187	48 45	222	25 16	284	62 07	325
266	24 03	035	29 25	102	29 19	147	14 03	186	48 20	222	24 39	283	61 45	323
267	24 25	034	30 02	101	29 40	146	13 59	186	47 55	222	24 03	282	61 22	322
268	24 45	033	30 39	100	30 01	146	13 56	185	47 30	221	23 26	281	60 58	320
269	25 05	032	31 17	100	30 23	145	13 53	184	47 05	221	22 48	281	60 33	318

LAT 51°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		RIGIL KENT		◆ SPICA		ANTARES	
270	25 25	031	31 54	099	30 44	145	13 50	184	61 13	231	22 11	280	60 08	317
271	25 44	030	32 31	098	31 06	145	13 48	183	60 44	230	21 34	279	59 41	315
272	26 03	029	33 09	097	31 28	144	13 46	183	60 15	230	20 57	278	59 14	314
273	26 20	028	33 46	097	31 50	144	13 44	182	59 46	230	20 19	277	58 47	312
274	26 38	027	34 24	096	32 13	143	13 43	181	59 16	230	19 42	276	58 18	311
275	26 54	026	35 01	095	32 36	143	13 42	181	58 47	230	19 04	276	57 49	309
276	27 10	024	35 39	095	32 59	142	13 42	180	58 19	230	18 27	275	57 20	308
277	27 25	023	36 16	094	33 22	142	13 42	179	57 50	230	17 49	274	56 50	307
278	27 40	022	36 54	093	33 45	141	13 43	179	57 21	230	17 11	273	56 19	305
279	27 54	021	37 32	092	34 09	141	13 44	178	56 52	230	16 34	273	55 48	304
280	28 07	020	38 10	091	34 33	140	13 45	178	56 23	229	15 56	272	55 17	303
281	28 20	019	38 47	091	34 57	140	13 47	177	55 55	229	15 18	271	54 45	301
282	28 32	018	39 25	090	35 22	140	13 49	176	55 26	229	14 40	270	54 12	300
283	28 43	017	40 03	089	35 46	139	13 52	176	54 58	229	14 03	269	53 39	299
284	28 54	016	40 41	088	36 11	139	13 55	175	54 29	229	13 25	269	53 06	298
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Rasalhague	
285	29 04	015	41 18	088	36 36	138	13 59	174	54 01	229	52 32	297	23 51	337
286	29 13	013	41 56	087	37 01	138	14 02	174	53 33	228	51 58	295	23 36	336
287	29 21	012	42 34	086	37 27	137	14 07	173	53 04	228	51 24	294	23 20	335
288	29 29	011	43 11	085	37 52	137	14 11	173	52 36	228	50 50	293	23 04	334
289	29 36	010	43 49	084	38 18	137	14 17	172	52 08	228	50 15	292	22 48	333
290	29 42	009	44 27	083	38 44	136	14 22	171	51 41	227	49 40	291	22 30	332
291	29 48	008	45 04	083	39 11	136	14 28	171	51 13	227	49 04	290	22 13	331
292	29 52	007	45 41	082	39 37	135	14 34	170	50 45	227	48 29	289	21 54	330
293	29 57	006	46 19	081	40 04	135	14 41	169	50 18	227	47 53	288	21 35	329
294	30 00	004	46 56	080	40 31	135	14 48	169	49 50	226	47 17	287	21 16	328
295	30 02	003	47 33	079	40 58	134	14 55	168	49 23	226	46 41	286	20 56	327
296	30 04	002	48 10	078	41 25	134	15 03	168	48 56	226	46 04	285	20 35	326
297	30 05	001	48 47	077	41 52	133	15 12	167	48 29	226	45 28	284	20 14	325
298	30 05	000	49 24	076	42 20	133	15 20	166	48 02	225	44 51	283	19 52	324
299	30 05	359	50 00	075	42 47	133	15 29	166	47 35	225	44 14	282	19 30	323
	FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki		◆ ALTAIR	
300	50 37	074	43 15	132	15 39	165	47 08	225	43 37	281	62 27	328	30 04	358
301	51 13	073	43 43	132	15 49	165	46 42	224	43 00	281	62 06	326	30 02	356
302	51 49	072	44 12	131	15 59	164	46 15	224	42 23	280	61 45	324	29 59	355
303	52 25	071	44 40	131	16 09	163	45 49	224	41 46	279	61 22	323	29 56	354
304	53 01	070	45 09	131	16 20	163	45 23	224	41 09	278	60 59	321	29 51	353
305	53 36	069	45 37	130	16 32	162	44 57	223	40 31	277	60 35	319	29 46	352
306	54 11	068	46 06	130	16 43	162	44 31	223	39 54	276	60 10	318	29 41	351
307	54 46	067	46 35	130	16 56	161	44 06	223	39 16	275	59 44	316	29 34	350
308	55 21	066	47 04	129	17 08	160	43 40	222	38 39	275	59 17	315	29 27	348
309	55 55	065	47 34	129	17 21	160	43 15	222	38 01	274	58 50	313	29 19	347
310	56 29	064	48 03	129	17 34	159	42 50	222	37 23	273	58 22	312	29 11	346
311	57 03	062	48 33	128	17 48	159	42 25	221	36 45	272	57 54	310	29 01	345
312	57 36	061	49 03	128	18 02	158	42 00	221	36 08	271	57 24	309	28 51	344
313	58 09	060	49 32	128	18 16	157	41 36	221	35 30	271	56 55	307	28 41	343
314	58 41	058	50 02	127	18 31	157	41 11	220	34 52	270	56 24	306	28 29	342
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
315	59 13	057	50 33	127	18 46	156	40 47	220	34 14	269	55 54	305	28 17	341
316	59 45	056	51 03	127	19 01	156	40 23	219	33 37	268	55 22	303	28 04	340
317	60 16	054	51 33	126	19 17	155	39 59	219	32 59	268	54 50	302	27 51	339
318	60 46	053	52 04	126	19 33	155	39 35	219	32 21	267	54 18	301	27 37	337
319	61 16	051	52 34	126	19 49	154	39 12	218	31 44	266	53 46	300	27 22	336
320	61 45	050	53 05	125	20 06	153	38 48	218	31 06	265	53 13	298	27 06	335
321	62 14	048	53 36	125	20 23	153	38 25	218	30 28	265	52 39	297	26 50	334
322	62 42	047	54 07	125	20 40	152	38 02	217	29 51	264	52 06	296	26 33	333
323	63 09	045	54 38	125	20 58	152	37 40	217	29 13	263	51 32	295	26 16	332
324	63 35	044	55 09	124	21 16	151	37 17	216	28 36	262	50 57	294	25 58	331
325	64 01	042	55 40	124	21 34	151	36 55	216	27 58	262	50 23	293	25 40	330
326	64 26	040	56 12	124	21 53	150	36 33	216	27 21	261	49 48	292	25 20	329
327	64 49	038	56 43	123	22 12	149	36 11	215	26 44	260	49 12	291	25 01	328
328	65 12	036	57 15	123	22 32	149	35 49	215	26 07	259	48 37	290	24 40	327
329	65 34	034	57 46	123	22 51	148	35 28	214	25 30	259	48 01	289	24 19	326
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
330	65 55	033	58 18	123	23 11	148	35 07	214	24 53	258	47 25	288	23 58	325
331	66 15	031	58 50	123	23 31	147	34 45	214	24 16	257	46 49	287	23 36	324
332	66 33	029	59 22	122	23 52	147	34 25	213	23 39	257	46 13	286	23 14	323
333	66 51	026	59 54	122	24 13	146	34 04	213	23 02	256	45 37	285	22 50	322
334	67 07	024	60 26	122	24 34	146	33 44	212	22 26	255	45 00	284	22 27	321
335	67 22	022	60 58	122	24 56	145	33 24	212	21 49	254	44 23	283	22 03	320
336	67 36	020	61 30	122	25 17	145	33 04	211	21 13	254	43 47	282	21 38	319
337	67 48	018	62 02	121	25 39	144	32 44	211	20 37	253	43 10	281	21 13	318
338	67 59	016	62 34	121	26 02	143	32 25	211	20 01	252	42 32	280	20 48	317
339	68 08	013	63 07	121	26 24	143	32 06	210	19 25	252	41 55	279	20 22	316
340	68 16	011	63 39	121	26 47	142	31 47	210	18 49	251	41 18	279	19 56	315
341	68 22	009	64 11	121	27 10	142	31 28	209	18 13	250	40 41	278	19 29	314
342	68 27	006	64 44	121	27 34	141	31 10	209	17 38	249	40 03	277	19 01	313
343	68 30	004	65 16	121	27 57	141	30 52	208	17 03	249	39 26	276	18 34	312
344	68 32	001	65 49	121	28 21	140	30 34	208	16 28	248	38 48	275	18 06	311
	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		FOMALHAUT	
345	50 58	042	48 06	099	28 46	140	32 20	169	30 16	208	38 10	274	68 32	359
346	51 23	040	48 44	099	29 10	139	32 27	169	29 59	207	37 33	274	68 31	357
347	51 47	039	49 21	098	29 35	139	32 34	169	29 42	207	36 55	273	68 28	354
348	52 10	037	49 58	097	30 00	138	32 42	168	29 25	206	36 17	272	68 24	352
349	52 33	036	50 36	097	30 25	138	32 50	168	29 09	206	35 40	271	68 18	350
350	52 54	035	51 13	096	30 51	137	32 58	168	28 53	205	35 02	270	68 10	347
351	53 16	033	51 51	095	31 16	137	33 06	167	28 37	205	34 24	270	68 01	345
352	53 36	032	52 29	094	31 42	136	33 15	167	28 21	204	33 46	269	67 51	343
353	53 55	030	53 06	094	32 08	136	33 23	166	28 05	204	33 09	268	67 39	341
354	54 14	029	53 44	093	32 35	135	33 32	166	27 50	203	32 31	267	67 25	338
355	54 31	027	54 22	092	33 02	135	33 42	166	27 36	203	31 53	267	67 11	336
356	54 48	025	54 59	092	33 28	134	33 51	165	27 21	202	31 15	266	66 55	334
357	55 04	024	55 37	091	33 56	134	34 01	165	27 07	202	30 38	265	66 38	332
358	55 18	022	56 15	090	34 23	133	34 11	165	26 53	201	30 00	264	66 19	330
359	55 32	021	56 53	089	34 50	133	34 21	164	26 39	201	29 23	264	66 00	328

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LAT 52°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Diphda		◆ RIGEL		CANOPUS		Miaplacidus		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	54 48	019	13 19	086	35 58	132	35 29	164	27 22	201	59 23	240	64 49	327
1	54 59	017	13 56	085	36 26	131	35 40	163	27 09	200	58 51	240	64 29	325
2	55 10	015	14 33	085	36 54	131	35 50	163	26 56	200	58 20	239	64 07	323
3	55 19	014	15 10	084	37 22	130	36 01	163	26 44	199	57 48	239	63 45	322
4	55 27	012	15 46	083	37 50	130	36 12	162	26 32	199	57 16	239	63 21	320
5	55 34	010	16 23	082	38 19	129	36 24	162	26 20	198	56 45	238	62 57	318
6	55 40	009	17 00	081	38 47	129	36 36	161	26 09	198	56 13	238	62 32	317
7	55 45	007	17 36	081	39 16	129	36 47	161	25 58	197	55 42	238	62 06	315
8	55 49	005	18 12	080	39 45	128	36 59	161	25 47	197	55 11	238	61 40	313
9	55 52	004	18 49	079	40 14	128	37 12	160	25 37	196	54 40	237	61 13	312
10	55 54	002	19 25	078	40 44	127	37 24	160	25 27	196	54 09	237	60 45	310
11	55 54	000	20 01	077	41 13	127	37 37	160	25 17	195	53 38	237	60 16	309
12	55 54	358	20 37	076	41 43	126	37 50	159	25 07	195	53 07	236	59 47	307
13	55 52	357	21 13	076	42 13	126	38 03	159	24 58	194	52 36	236	59 18	306
14	55 50	355	21 49	075	42 43	125	38 16	159	24 49	194	52 06	236	58 47	305
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
15	22 24	074	15 16	098	43 13	125	24 40	193	51 35	235	58 17	303	55 46	353
16	23 00	073	15 53	097	43 44	124	24 32	193	51 05	235	57 46	302	55 41	352
17	23 35	072	16 30	096	44 14	124	24 24	192	50 35	235	57 14	301	55 35	350
18	24 10	071	17 06	095	44 45	123	24 17	192	50 05	234	56 42	299	55 28	348
19	24 45	070	17 43	095	45 16	123	24 09	191	49 35	234	56 10	298	55 20	347
20	25 19	070	18 20	094	45 47	123	24 03	191	49 05	233	55 37	297	55 11	345
21	25 54	069	18 57	093	46 18	122	23 56	190	48 36	233	55 04	296	55 01	343
22	26 28	068	19 34	092	46 49	122	23 50	190	48 06	233	54 30	295	54 50	342
23	27 02	067	20 11	092	47 21	121	23 44	189	47 37	232	53 56	293	54 38	340
24	27 36	066	20 48	091	47 53	121	23 38	188	47 08	232	53 22	292	54 25	339
25	28 10	065	21 25	090	48 24	120	23 33	188	46 39	232	52 48	291	54 11	337
26	28 43	064	22 02	089	48 56	120	23 28	187	46 10	231	52 14	290	53 56	335
27	29 16	063	22 39	088	49 29	119	23 23	187	45 41	231	51 39	289	53 40	334
28	29 49	062	23 15	088	50 01	119	23 19	186	45 13	230	51 04	288	53 24	332
29	30 22	061	23 52	087	50 33	119	23 15	186	44 44	230	50 29	287	53 06	331
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
30	30 54	060	24 29	086	51 06	118	23 11	185	44 16	230	49 53	286	52 48	329
31	31 26	059	25 06	085	51 38	118	23 08	185	43 48	229	49 18	285	52 28	328
32	31 57	058	25 43	084	52 11	117	23 05	184	43 20	229	48 42	284	52 08	326
33	32 28	057	26 20	084	52 44	117	23 02	184	42 52	228	48 06	283	51 48	325
34	32 59	056	26 56	083	53 17	116	23 00	183	42 25	228	47 30	282	51 26	324
35	33 30	055	27 33	082	53 50	116	22 58	183	41 57	228	46 54	281	51 04	322
36	34 00	054	28 09	081	54 23	116	22 57	182	41 30	227	46 17	280	50 41	321
37	34 30	053	28 46	080	54 57	115	22 55	182	41 03	227	45 41	279	50 17	319
38	34 59	052	29 22	079	55 30	115	22 55	181	40 36	226	45 05	279	49 53	318
39	35 28	051	29 58	079	56 04	114	22 54	181	40 10	226	44 28	278	49 28	317
40	35 57	050	30 35	078	56 38	114	22 54	180	39 43	225	43 51	277	49 02	315
41	36 25	049	31 11	077	57 11	114	22 54	180	39 17	225	43 15	276	48 36	314
42	36 52	048	31 47	076	57 45	113	22 54	179	38 51	225	42 38	275	48 09	313
43	37 20	047	32 22	075	58 19	113	22 55	178	38 25	224	42 01	274	47 42	312
44	37 46	046	32 58	074	58 53	112	22 56	178	38 00	224	41 24	273	47 14	310
	RIGEL		◆ SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
45	38 12	045	33 33	073	59 28	112	22 58	177	37 34	223	40 47	273	46 45	309
46	38 38	043	34 09	072	60 02	112	23 00	177	37 09	223	40 10	272	46 16	308
47	39 03	042	34 44	071	60 36	111	23 02	176	36 44	222	39 33	271	45 47	307
48	39 28	041	35 19	071	61 11	111	23 04	176	36 19	222	38 57	270	45 17	306
49	39 52	040	35 53	070	61 45	110	23 07	175	35 55	221	38 20	269	44 47	305
50	40 15	039	36 28	069	62 20	110	23 10	175	35 30	221	37 43	269	44 16	303
51	40 38	037	37 02	068	62 55	110	23 14	174	35 06	221	37 06	268	43 45	302
52	41 00	036	37 36	067	63 30	109	23 18	174	34 42	220	36 29	267	43 14	301
53	41 22	035	38 10	066	64 05	109	23 22	173	34 19	220	35 52	266	42 42	300
54	41 42	034	38 44	065	64 40	108	23 26	173	33 55	219	35 15	266	42 10	299
55	42 03	033	39 17	064	65 15	108	23 31	172	33 32	219	34 38	265	41 38	298
56	42 22	031	39 50	063	65 50	108	23 36	172	33 09	218	34 01	264	41 05	297
57	42 41	030	40 23	062	66 25	107	23 42	171	32 46	218	33 25	263	40 32	296
58	42 59	029	40 55	061	67 00	107	23 48	171	32 24	217	32 48	263	39 58	295
59	43 17	027	41 27	060	67 36	107	23 54	170	32 01	217	32 12	262	39 25	294
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
60	43 33	026	41 59	059	39 56	113	24 00	170	31 39	216	31 35	261	38 51	293
61	43 49	025	42 30	057	40 30	112	24 07	169	31 18	216	30 58	260	38 17	292
62	44 04	023	43 01	056	41 04	112	24 14	169	30 56	215	30 22	260	37 42	291
63	44 18	022	43 31	055	41 38	111	24 22	168	30 35	215	29 46	259	37 08	290
64	44 32	021	44 02	054	42 13	110	24 30	168	30 14	214	29 10	258	36 33	289
65	44 45	019	44 31	053	42 48	110	24 38	167	29 53	214	28 33	258	35 58	288
66	44 57	018	45 00	052	43 22	109	24 46	166	29 33	213	27 57	257	35 23	287
67	45 08	017	45 29	051	43 57	109	24 55	166	29 12	213	27 22	256	34 47	286
68	45 18	015	45 58	049	44 32	108	25 04	165	28 52	212	26 46	255	34 12	285
69	45 27	014	46 25	048	45 08	107	25 14	165	28 33	212	26 10	255	33 36	285
70	45 36	013	46 53	047	45 43	107	25 23	164	28 13	211	25 34	254	33 00	284
71	45 43	011	47 19	046	46 18	106	25 33	164	27 54	211	24 59	253	32 24	283
72	45 50	010	47 46	044	46 54	106	25 44	163	27 35	210	24 24	253	31 48	282
73	45 56	008	48 11	043	47 30	105	25 54	163	27 17	210	23 48	252	31 12	281
74	46 00	007	48 36	042	48 05	104	26 05	162	26 59	209	23 13	251	30 36	280
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		ACHERNAR		◆ Diphda	
75	46 04	005	49 00	041	48 41	104	26 17	162	26 41	209	61 01	240	29 59	279
76	46 07	004	49 24	039	49 17	103	26 28	161	26 23	208	60 29	239	29 23	278
77	46 10	003	49 47	038	49 53	102	26 40	161	26 06	208	59 57	239	28 46	278
78	46 11	001	50 09	037	50 29	102	26 52	160	25 49	207	59 26	239	28 10	277
79	46 11	000	50 31	035	51 05	101	27 05	160	25 32	207	58 54	239	27 33	276
80	46 10	358	50 52	034	51 42	101	27 18	159	25 15	206	58 23	238	26 56	275
81	46 09	357	51 12	032	52 18	100	27 31	159	24 59	206	57 51	238	26 19	274
82	46 06	355	51 31	031	52 54	099	27 44	158	24 43	205	57 20	238	25 43	274
83	46 03	354	51 50	029	53 31	099	27 58	158	24 28	205	56 49	238	25 06	273
84	45 59	353	52 08	028	54 08	098	28 12	158	24 12	204	56 17	237	24 29	272
85	45 54	351	52 24	026	54 44	097	28 26	157	23 58	204	55 46	237	23 52	271
86	45 47	350	52 40	025	55 21	097	28 41	157	23 43	203	55 16	237	23 15	270
87	45 40	348	52 56	023	55 58	096	28 56	156	23 29	202	54 45	236	22 38	270
88	45 33	347	53 10	022	56 34	095	29 11	156	23 15	202	54 14	236	22 01	269
89	45 24	346	53 23	020	57 11	094	29 26	155	23 01	201	53 43	236	21 24	268

LAT 52°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		◆ Suhail		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL		BETELGEUSE	
90	28 58	029	57 48	094	29 42	155	22 48	201	53 13	235	45 14	344	30 35	359
91	29 16	028	58 25	093	29 58	154	22 35	200	52 43	235	45 04	343	30 34	358
92	29 33	027	59 02	092	30 14	154	22 22	200	52 12	235	44 52	341	30 32	357
93	29 49	025	59 39	092	30 30	153	22 10	199	51 42	234	44 40	340	30 30	355
94	30 04	024	60 16	091	30 47	153	21 58	199	51 12	234	44 27	339	30 26	354
95	30 19	023	60 53	090	31 04	152	21 46	198	50 42	234	44 13	337	30 22	353
96	30 34	022	61 29	089	31 21	152	21 35	198	50 13	233	43 59	336	30 17	352
97	30 47	021	62 06	088	31 39	151	21 24	197	49 43	233	43 43	335	30 12	351
98	31 00	020	62 43	088	31 57	151	21 13	196	49 14	233	43 27	333	30 06	350
99	31 12	019	63 20	087	32 15	151	21 03	196	48 44	232	43 10	332	29 59	349
100	31 24	018	63 57	086	32 33	150	20 53	195	48 15	232	42 52	331	29 51	347
101	31 35	016	64 34	085	32 52	150	20 43	195	47 46	232	42 34	330	29 42	346
102	31 45	015	65 11	084	33 10	149	20 34	194	47 17	231	42 15	328	29 33	345
103	31 54	014	65 47	083	33 30	149	20 25	194	46 48	231	41 55	327	29 23	344
104	32 03	013	66 24	082	33 49	148	20 17	193	46 20	231	41 35	326	29 13	343
	PROCYON		REGULUS		◆ Glenah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ SIRIUS	
105	32 11	012	14 15	048	20 26	093	34 08	148	45 51	230	41 14	324	54 38	354
106	32 18	011	14 42	047	21 03	092	34 28	147	45 23	230	40 52	323	54 33	352
107	32 24	009	15 09	046	21 40	091	34 48	147	44 55	229	40 29	322	54 28	351
108	32 30	008	15 36	045	22 17	090	35 08	147	44 27	229	40 06	321	54 21	349
109	32 35	007	16 02	044	22 54	090	35 29	146	43 59	229	39 43	320	54 14	348
110	32 39	006	16 27	043	23 31	089	35 50	146	43 32	228	39 19	319	54 06	346
111	32 43	005	16 52	042	24 08	088	36 10	145	43 04	228	38 54	317	53 56	344
112	32 45	004	17 17	042	24 44	087	36 32	145	42 37	227	38 29	316	53 46	343
113	32 47	002	17 41	041	25 21	086	36 53	144	42 10	227	38 03	315	53 34	341
114	32 48	001	18 05	040	25 58	086	37 14	144	41 43	227	37 36	314	53 22	340
115	32 49	000	18 28	039	26 35	085	37 36	144	41 16	226	37 10	313	53 08	338
116	32 49	359	18 51	038	27 12	084	37 58	143	40 49	226	36 42	312	52 54	336
117	32 47	358	19 14	037	27 48	083	38 20	143	40 23	225	36 14	311	52 39	335
118	32 45	356	19 36	036	28 25	082	38 43	142	39 57	225	35 46	310	52 23	333
119	32 43	355	19 57	035	29 02	081	39 05	142	39 31	224	35 18	309	52 06	332
120	REGULUS		◆ SPICA		RIGIL KENT		Peacock		◆ ACHERNAR		RIGEL		◆ SIRIUS	
121	20 18	034	14 03	090	39 28	142	18 50	184	39 05	224	34 48	307	51 48	330
122	20 38	033	14 40	090	39 51	141	18 47	183	38 40	224	34 19	306	51 30	329
123	20 58	032	15 17	089	40 15	141	18 45	183	38 14	223	33 49	305	51 10	328
124	21 17	031	15 54	088	40 38	141	18 44	182	37 49	223	33 19	304	50 50	326
	21 36	030	16 31	087	41 01	140	18 43	182	37 24	222	32 48	303	50 29	325
125	21 54	029	17 08	086	41 25	140	18 42	181	36 59	222	32 17	302	50 07	323
126	22 12	028	17 45	086	41 49	139	18 41	180	36 35	221	31 46	301	49 45	322
127	22 29	027	18 22	085	42 13	139	18 41	180	36 10	221	31 14	300	49 22	321
128	22 45	026	18 58	084	42 38	139	18 41	179	35 46	221	30 42	299	48 58	319
129	23 01	025	19 35	083	43 02	138	18 42	179	35 22	220	30 09	298	48 34	318
130	23 16	024	20 12	082	43 27	138	18 43	178	34 59	220	29 37	297	48 09	317
131	23 31	023	20 48	082	43 52	138	18 45	178	34 35	219	29 04	297	47 43	315
132	23 45	022	21 25	081	44 17	137	18 46	177	34 12	219	28 31	296	47 17	314
133	23 58	021	22 01	080	44 42	137	18 49	176	33 49	218	27 57	295	46 50	313
134	24 11	020	22 38	079	45 07	137	18 51	176	33 26	218	27 24	294	46 23	312
	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
135	24 23	019	23 14	078	45 33	136	18 54	175	33 04	217	66 30	253	45 55	310
136	24 34	018	23 50	077	45 58	136	18 57	175	32 41	217	65 55	252	45 27	309
137	24 45	017	24 26	076	46 24	136	19 01	174	32 19	216	65 20	252	44 58	308
138	24 55	015	25 02	076	46 50	135	19 05	173	31 58	216	64 45	252	44 28	307
139	25 05	014	25 37	075	47 16	135	19 09	173	31 36	215	64 10	251	43 59	306
140	25 14	013	26 13	074	47 42	135	19 14	172	31 15	215	63 35	251	43 29	305
141	25 22	012	26 48	073	48 09	134	19 19	172	30 54	214	63 00	250	42 58	304
142	25 29	011	27 24	072	48 35	134	19 25	171	30 33	214	62 25	250	42 27	302
143	25 36	010	27 59	071	49 02	134	19 31	171	30 12	213	61 50	250	41 56	301
144	25 42	009	28 34	070	49 29	133	19 37	170	29 52	213	61 16	249	41 24	300
145	25 48	008	29 08	069	49 56	133	19 43	169	29 32	213	60 41	249	40 52	299
146	25 53	007	29 43	069	50 23	133	19 50	169	29 12	212	60 07	249	40 19	298
147	25 57	006	30 17	068	50 50	133	19 58	168	28 53	212	59 33	248	39 47	297
148	26 00	005	30 51	067	51 17	132	20 05	168	28 34	211	58 58	248	39 14	296
149	26 03	004	31 25	066	51 44	132	20 13	167	28 15	211	58 24	247	38 40	295
150	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
151	26 05	002	31 58	065	52 12	132	20 22	167	27 56	210	57 50	247	38 07	294
152	26 06	001	32 32	064	52 40	131	20 30	166	27 38	210	57 16	247	37 33	293
153	26 06	000	33 05	063	53 07	131	20 39	165	27 20	209	56 42	246	36 59	292
154	26 06	359	33 37	062	53 35	131	20 49	165	27 02	208	56 09	246	36 25	291
155	26 05	358	34 10	061	54 03	131	20 59	164	26 45	208	55 35	245	35 50	290
156	26 04	357	34 42	060	54 31	130	21 09	164	26 28	207	55 02	245	35 15	289
157	26 02	356	35 14	059	54 59	130	21 19	163	26 11	207	54 28	244	34 40	288
158	25 59	355	35 45	058	55 28	130	21 30	163	25 54	206	53 55	244	34 05	288
159	25 55	354	36 16	057	55 56	130	21 41	162	25 38	206	53 22	244	33 30	287
	25 51	353	36 47	056	56 24	130	21 53	162	25 22	205	52 49	243	32 55	286
160	25 46	352	37 18	055	56 53	129	22 05	161	25 06	205	52 16	243	32 19	285
161	25 40	351	37 47	054	57 21	129	22 17	160	24 51	204	51 43	242	31 43	284
162	25 33	349	38 17	053	57 50	129	22 29	160	24 36	204	51 10	242	31 07	283
163	25 26	348	38 46	052	58 19	129	22 42	159	24 21	203	50 38	242	30 31	282
164	25 19	347	39 15	050	58 47	129	22 55	159	24 07	203	50 05	241	29 55	281
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		REGULUS	
165	39 43	049	24 59	102	23 09	158	23 52	202	49 33	241	29 19	280	25 10	346
166	40 11	048	25 35	101	23 23	158	23 39	202	49 01	240	28 42	280	25 01	345
167	40 38	047	26 11	100	23 37	157	23 25	201	48 29	240	28 06	279	24 51	344
168	41 05	046	26 48	099	23 51	157	23 12	201	47 57	239	27 29	278	24 41	343
169	41 31	045	27 24	099	24 06	156	22 59	200	47 25	239	26 53	277	24 30	342
170	41 57	044	28 01	098	24 21	156	22 47	199	46 54	238	26 16	276	24 18	341
171	42 22	042	28 37	097	24 37	155	22 35	199	46 23	238	25 39	275	24 06	340
172	42 47	041	29 14	096	24 53	155	22 23	198	45 51	238	25 03	275	23 53	339
173	43 11	040	29 51	096	25 09	154	22 11	198	45 20	237	24 26	274	23 39	338
174	43 34	039	30 28	095	25 25	153	22 00	197	44 49	237	23 49	273	23 25	337
175	43 57	037	31 04	094	25 42	153	21 49	197	44 18	236	23 12	272	23 10	336
176	44 19	036	31 41	093	25 59	152	21 39	196	43 48	236	22 35	271	22 54	335
177	44 41	035	32 18	093	26 16	152	21 29	196	43 17	235	21 58	271	22 38	334
178	45 01	034	32 55	092	26 33	151	21 19	195	42 47	235	21 21	270	22 22	333
179	45 21	032	33 32	091	26 51	151	21 09	195	42 17	234	20 44	269	22 04	332

LAT 52°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	45 41	031	34 09	090	27 09	150	21 00	194	41 47	234	60 26	269	21 46	331
181	45 59	030	34 46	090	27 28	150	20 52	193	41 17	233	59 49	269	21 28	330
182	46 17	028	35 23	089	27 46	149	20 43	193	40 48	233	59 12	268	21 09	329
183	46 34	027	36 00	088	28 05	149	20 35	192	40 18	233	58 35	267	20 50	328
184	46 51	026	36 37	087	28 25	148	20 27	192	39 49	232	57 58	266	20 30	327
185	47 06	024	37 14	086	28 44	148	20 20	191	39 20	232	57 21	266	20 09	326
186	47 21	023	37 50	086	29 04	147	20 13	191	38 51	231	56 44	265	19 48	325
187	47 35	021	38 27	085	29 24	147	20 06	190	38 23	231	56 08	264	19 27	324
188	47 48	020	39 04	084	29 45	146	20 00	189	37 54	230	55 31	264	19 04	323
189	48 00	018	39 41	083	30 05	146	19 54	189	37 26	230	54 54	263	18 42	322
190	48 11	017	40 17	082	30 26	145	19 49	188	36 58	229	54 18	262	18 19	321
191	48 22	016	40 54	081	30 47	145	19 44	188	36 30	229	53 41	262	17 55	320
192	48 31	014	41 30	080	31 09	144	19 39	187	36 02	228	53 04	261	17 31	319
193	48 40	013	42 07	080	31 30	144	19 34	187	35 35	228	52 28	260	17 07	318
194	48 47	011	42 43	079	31 52	143	19 30	186	35 08	227	51 52	260	16 42	317
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		Denebola	
195	16 58	019	43 19	078	32 14	143	19 27	185	34 41	227	51 15	259	21 47	342
196	17 10	018	43 55	077	32 37	142	19 23	185	34 14	226	50 39	258	21 36	341
197	17 21	017	44 31	076	32 59	142	19 20	184	33 47	226	50 03	258	21 23	340
198	17 31	016	45 07	075	33 22	141	19 18	184	33 21	225	49 27	257	21 10	339
199	17 41	015	45 42	074	33 45	141	19 15	183	32 55	225	48 51	256	20 56	338
200	17 50	014	46 18	073	34 09	141	19 14	183	32 29	224	48 15	256	20 42	337
201	17 59	013	46 53	072	34 32	140	19 12	182	32 03	224	47 39	255	20 27	336
202	18 07	012	47 28	071	34 56	140	19 11	181	31 38	223	47 04	255	20 11	335
203	18 14	011	48 03	070	35 20	139	19 10	181	31 13	223	46 28	254	19 55	334
204	18 21	010	48 38	069	35 45	139	19 10	180	30 48	222	45 53	253	19 38	333
205	18 27	009	49 12	068	36 09	138	19 10	180	30 23	222	45 17	253	19 21	332
206	18 33	008	49 46	067	36 34	138	19 10	179	29 59	221	44 42	252	19 03	331
207	18 38	007	50 20	066	36 59	137	19 11	179	29 35	221	44 07	252	18 45	330
208	18 42	006	50 53	065	37 24	137	19 12	178	29 11	220	43 32	251	18 26	329
209	18 45	005	51 27	064	37 49	136	19 13	177	28 47	220	42 57	250	18 07	328
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	18 48	004	52 00	062	38 15	136	19 15	177	28 24	219	42 22	250	48 40	347
211	18 51	003	52 32	061	38 40	136	19 17	176	28 01	218	41 48	249	48 31	346
212	18 52	002	53 04	060	39 06	135	19 20	176	27 38	218	41 13	249	48 22	344
213	18 53	001	53 36	059	39 33	135	19 23	175	27 15	217	40 39	248	48 11	343
214	18 54	000	54 08	058	39 59	134	19 26	175	26 53	217	40 05	247	48 00	341
215	18 53	359	54 39	056	40 25	134	19 30	174	26 31	216	39 31	247	47 48	340
216	18 53	358	55 09	055	40 52	133	19 34	173	26 09	216	38 57	246	47 35	339
217	18 51	357	55 39	054	41 19	133	19 38	173	25 48	215	38 23	246	47 21	337
218	18 49	356	56 09	052	41 46	133	19 43	172	25 26	215	37 50	245	47 06	336
219	18 46	355	56 38	051	42 14	132	19 48	172	25 06	214	37 16	244	46 51	334
220	18 42	354	57 06	050	42 41	132	19 54	171	24 45	214	36 43	244	46 34	333
221	18 38	353	57 34	048	43 09	131	19 59	171	24 25	213	36 10	243	46 17	332
222	18 34	352	58 02	047	43 36	131	20 06	170	24 05	213	35 37	243	45 59	330
223	18 28	351	58 28	045	44 04	131	20 12	169	23 45	212	35 04	242	45 41	329
224	18 22	350	58 54	044	44 33	130	20 19	169	23 26	211	34 32	242	45 21	328
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
225	59 19	042	39 15	083	45 01	130	20 26	168	23 07	211	33 59	241	45 01	326
226	59 44	041	39 52	082	45 29	129	20 34	168	22 48	210	33 27	240	44 40	325
227	60 08	039	40 29	082	45 58	129	20 42	167	22 29	210	32 55	240	44 19	324
228	60 31	038	41 05	081	46 27	129	20 50	167	22 11	209	32 23	239	43 57	323
229	60 53	036	41 41	080	46 56	128	20 59	166	21 53	209	31 52	239	43 34	321
230	61 14	034	42 18	079	47 25	128	21 08	166	21 36	208	31 20	238	43 11	320
231	61 34	032	42 54	078	47 54	127	21 18	165	21 19	207	30 49	237	42 47	319
232	61 53	031	43 30	077	48 24	127	21 27	164	21 02	207	30 18	237	42 22	318
233	62 12	029	44 06	076	48 53	127	21 37	164	20 45	206	29 47	236	41 57	316
234	62 29	027	44 42	075	49 23	126	21 48	163	20 29	206	29 16	236	41 31	315
235	62 45	025	45 17	074	49 53	126	21 59	163	20 13	205	28 46	235	41 05	314
236	63 01	023	45 53	073	50 23	126	22 10	162	19 58	205	28 16	234	40 38	313
237	63 15	021	46 28	072	50 53	125	22 21	162	19 43	204	27 46	234	40 11	312
238	63 28	019	47 03	071	51 23	125	22 33	161	19 28	203	27 16	233	39 43	311
239	63 39	018	47 38	070	51 53	125	22 45	161	19 13	203	26 47	233	39 15	310
	◆ ANTARES		Nunki		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA	
240	63 50	016	48 13	069	14 41	120	22 57	160	18 59	202	60 27	227	38 46	308
241	63 59	014	48 47	068	15 13	119	23 10	159	18 45	202	60 00	227	38 17	307
242	64 07	012	49 21	067	15 45	118	23 23	159	18 32	201	59 33	227	37 47	306
243	64 14	009	49 55	066	16 18	117	23 37	158	18 19	200	59 06	227	37 17	305
244	64 19	007	50 29	065	16 51	117	23 51	158	18 06	200	58 39	227	36 47	304
245	64 23	005	51 02	064	17 24	116	24 05	157	17 54	199	58 12	227	36 16	303
246	64 26	003	51 35	063	17 57	115	24 19	157	17 42	199	57 45	227	35 45	302
247	64 28	001	52 08	062	18 31	115	24 34	156	17 30	198	57 18	226	35 14	301
248	64 28	359	52 40	060	19 04	114	24 49	156	17 19	197	56 52	226	34 42	300
249	64 27	357	53 12	059	19 38	113	25 04	155	17 08	197	56 25	226	34 10	299
250	64 24	355	53 44	058	20 12	112	25 20	155	16 58	196	55 58	226	33 37	298
251	64 20	353	54 15	057	20 47	112	25 36	154	16 48	196	55 32	226	33 04	297
252	64 15	351	54 46	056	21 21	111	25 52	154	16 38	195	55 05	226	32 31	296
253	64 08	349	55 16	054	21 56	110	26 08	153	16 29	194	54 39	225	31 58	295
254	64 01	347	55 46	053	22 30	110	26 25	153	16 20	194	54 13	225	31 25	294
	ALTAIR		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA		◆ ANTARES	
255	18 53	045	23 05	109	26 42	152	16 11	193	53 46	225	30 51	293	63 51	345
256	19 19	044	23 40	108	27 00	152	16 03	192	53 20	225	30 17	292	63 41	343
257	19 45	043	24 15	108	27 18	151	15 55	192	52 54	225	29 42	291	63 30	341
258	20 10	042	24 51	107	27 36	151	15 48	191	52 28	224	29 08	291	63 17	339
259	20 35	041	25 26	106	27 54	150	15 41	191	52 02	224	28 33	290	63 03	337
260	20 59	041	26 02	105	28 12	150	15 34	190	51 37	224	27 58	289	62 48	335
261	21 23	040	26 37	105	28 31	149	15 28	189	51 11	224	27 23	288	62 32	333
262	21 46	039	27 13	104	28 50	149	15 22	189	50 46	224	26 48	287	62 15	331
263	22 09	038	27 49	103	29 10	148	15 17	188	50 20	223	26 13	286	61 57	330
264	22 31	037	28 25	103	29 30	148	15 12	188	49 55	223	25 37	285	61 37	328
265	22 53	036	29 01	102	29 49	147	15 07	187	49 30	223	25 01	284	61 17	326
266	23 14	035	29 37	101	30 10	147	15 03	186	49 05	223	24 26	284	60 56	324
267	23 35	034	30 13	100	30 30	146	14 59	186	48 40	222	23 50	283	60 34	323
268	23 55	033	30 50	100	30 51	146	14 55	185	48 15	222	23 13	282	60 11	321
269	24 14	032	31 26	099	31 12	145	14 52	184	47 50	222	22 37	281	59 48	319

LAT 52°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		RIGIL KENT		◆ SPICA		ANTARES	
270	24 33	031	32 03	098	31 33	145	14 50	184	61 50	232	22 01	280	59 23	318
271	24 52	029	32 39	098	31 55	144	14 47	183	61 21	232	21 25	279	58 58	316
272	25 10	028	33 16	097	32 16	144	14 46	183	60 52	232	20 48	278	58 32	315
273	25 27	027	33 53	096	32 38	143	14 44	182	60 23	232	20 11	278	58 06	313
274	25 44	026	34 30	095	33 01	143	14 43	181	59 54	232	19 35	277	57 39	312
275	26 00	025	35 06	095	33 23	142	14 42	181	59 25	231	18 58	276	57 11	310
276	26 15	024	35 43	094	33 46	142	14 42	180	58 57	231	18 21	275	56 43	309
277	26 30	023	36 20	093	34 09	141	14 42	179	58 28	231	17 45	274	56 14	308
278	26 44	022	36 57	092	34 32	141	14 43	179	57 59	231	17 08	274	55 44	306
279	26 58	021	37 34	091	34 55	140	14 44	178	57 30	231	16 31	273	55 14	305
280	27 11	020	38 11	091	35 19	140	14 45	178	57 02	231	15 54	272	54 44	304
281	27 23	019	38 48	090	35 43	140	14 47	177	56 33	230	15 17	271	54 13	303
282	27 35	018	39 25	089	36 07	139	14 49	176	56 05	230	14 40	270	53 41	301
283	27 46	017	40 02	088	36 31	139	14 52	176	55 37	230	14 03	270	53 10	300
284	27 56	016	40 38	088	36 56	138	14 55	175	55 08	230	13 26	269	52 38	299
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Rasalhague	
285	28 06	014	41 15	087	37 21	138	14 58	174	54 40	230	52 05	298	22 55	338
286	28 14	013	41 52	086	37 46	137	15 02	174	54 12	229	51 32	297	22 41	337
287	28 23	012	42 29	085	38 11	137	15 06	173	53 44	229	50 59	295	22 26	336
288	28 30	011	43 06	084	38 36	136	15 11	173	53 16	229	50 25	294	22 10	335
289	28 37	010	43 43	083	39 02	136	15 16	172	52 48	229	49 52	293	21 54	334
290	28 43	009	44 19	083	39 27	136	15 21	171	52 21	228	49 18	292	21 37	332
291	28 48	008	44 56	082	39 53	135	15 27	171	51 53	228	48 43	291	21 20	331
292	28 53	007	45 32	081	40 20	135	15 33	170	51 26	228	48 09	290	21 02	330
293	28 57	006	46 09	080	40 46	134	15 40	169	50 58	228	47 34	289	20 44	330
294	29 00	004	46 45	079	41 12	134	15 47	169	50 31	227	46 59	288	20 25	329
295	29 02	003	47 21	078	41 39	133	15 54	168	50 04	227	46 24	287	20 05	328
296	29 04	002	47 57	077	42 06	133	16 02	168	49 37	227	45 48	286	19 45	327
297	29 05	001	48 33	076	42 33	133	16 10	167	49 10	226	45 13	285	19 24	326
298	29 05	000	49 09	075	43 00	132	16 19	166	48 44	226	44 37	284	19 03	325
299	29 05	359	49 45	074	43 28	132	16 27	166	48 17	226	44 01	283	18 42	324
	FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki		◆ ALTAIR	
300	50 20	073	43 55	131	16 37	165	47 51	226	43 25	282	61 36	329	29 04	358
301	50 55	072	44 23	131	16 46	165	47 24	225	42 49	281	61 16	327	29 02	356
302	51 30	071	44 51	131	16 56	164	46 58	225	42 13	281	60 56	325	28 59	355
303	52 05	070	45 19	130	17 07	163	46 32	225	41 36	280	60 34	324	28 56	354
304	52 40	069	45 47	130	17 18	163	46 06	224	41 00	279	60 12	322	28 52	353
305	53 14	068	46 16	130	17 29	162	45 41	224	40 23	278	59 49	320	28 47	352
306	53 48	067	46 44	129	17 40	162	45 15	224	39 47	277	59 25	319	28 42	351
307	54 22	066	47 13	129	17 52	161	44 50	223	39 10	276	59 00	317	28 35	350
308	54 56	065	47 42	128	18 05	160	44 25	223	38 33	275	58 35	316	28 28	349
309	55 29	063	48 11	128	18 17	160	44 00	223	37 56	275	58 09	314	28 21	347
310	56 02	062	48 40	128	18 30	159	43 35	222	37 20	274	57 42	313	28 12	346
311	56 34	061	49 10	127	18 44	159	43 10	222	36 43	273	57 14	311	28 03	345
312	57 06	060	49 39	127	18 57	158	42 45	221	36 06	272	56 46	310	27 54	344
313	57 38	058	50 09	127	19 11	157	42 21	221	35 29	271	56 18	309	27 43	343
314	58 09	057	50 38	126	19 26	157	41 57	221	34 52	271	55 49	307	27 32	342
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
315	58 40	056	51 08	126	19 40	156	41 33	220	34 15	270	55 19	306	27 20	341
316	59 10	054	51 38	126	19 56	156	41 09	220	33 38	269	54 49	305	27 08	340
317	59 40	053	52 08	125	20 11	155	40 45	220	33 01	268	54 18	303	26 55	339
318	60 09	052	52 38	125	20 27	154	40 22	219	32 24	267	53 47	302	26 41	338
319	60 38	050	53 09	125	20 43	154	39 59	219	31 47	267	53 15	301	26 27	337
320	61 06	049	53 39	124	20 59	153	39 36	218	31 11	266	52 44	300	26 12	336
321	61 33	047	54 10	124	21 16	153	39 13	218	30 34	265	52 11	298	25 56	334
322	62 00	045	54 41	124	21 33	152	38 50	218	29 57	264	51 39	297	25 40	333
323	62 26	044	55 11	123	21 51	152	38 28	217	29 20	264	51 06	296	25 23	332
324	62 51	042	55 42	123	22 09	151	38 05	217	28 43	263	50 32	295	25 06	331
325	63 16	040	56 13	123	22 27	150	37 43	216	28 07	262	49 59	294	24 48	330
326	63 39	039	56 44	122	22 45	150	37 21	216	27 30	261	49 25	293	24 29	329
327	64 02	037	57 16	122	23 04	149	37 00	216	26 54	261	48 51	292	24 10	328
328	64 24	035	57 47	122	23 23	149	36 38	215	26 17	260	48 16	291	23 50	327
329	64 44	033	58 18	122	23 42	148	36 17	215	25 41	259	47 42	290	23 30	326
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
330	65 04	031	58 50	121	24 02	148	35 56	214	25 05	258	47 07	289	23 09	325
331	65 23	029	59 21	121	24 22	147	35 35	214	24 29	258	46 32	288	22 47	324
332	65 41	027	59 53	121	24 42	146	35 15	214	23 53	257	45 56	287	22 26	323
333	65 57	025	60 25	121	25 03	146	34 55	213	23 17	256	45 21	286	22 03	322
334	66 12	023	60 57	120	25 23	145	34 34	213	22 41	256	44 45	285	21 40	321
335	66 26	021	61 29	120	25 45	145	34 15	212	22 05	255	44 09	284	21 17	320
336	66 39	019	62 00	120	26 06	144	33 55	212	21 30	254	43 34	283	20 53	319
337	66 51	017	62 33	120	26 28	144	33 36	211	20 54	253	42 57	282	20 29	318
338	67 01	015	63 05	120	26 50	143	33 17	211	20 19	253	42 21	281	20 04	317
339	67 10	013	63 37	119	27 12	143	32 58	211	19 44	252	41 45	280	19 39	316
340	67 17	010	64 09	119	27 35	142	32 39	210	19 09	251	41 09	279	19 13	315
341	67 23	008	64 41	119	27 57	142	32 21	210	18 34	251	40 32	279	18 47	314
342	67 28	006	65 14	119	28 20	141	32 02	209	17 59	250	39 56	278	18 20	314
343	67 31	004	65 46	119	28 44	141	31 45	209	17 24	249	39 19	277	17 53	313
344	67 32	001	66 18	119	29 07	140	31 27	208	16 50	248	38 42	276	17 26	312
	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		FOMALHAUT	
345	50 13	041	48 15	098	29 31	139	33 19	169	31 10	208	38 05	275	67 32	359
346	50 37	039	48 52	097	29 55	139	33 26	169	30 53	207	37 29	274	67 31	357
347	51 00	038	49 29	097	30 20	138	33 33	169	30 36	207	36 52	273	67 28	355
348	51 22	037	50 05	096	30 44	138	33 41	168	30 19	206	36 15	273	67 24	352
349	51 44	035	50 42	095	31 09	137	33 48	168	30 03	206	35 38	272	67 19	350
350	52 05	034	51 19	095	31 34	137	33 56	167	29 47	205	35 01	271	67 11	348
351	52 25	032	51 56	094	32 00	136	34 05	167	29 31	205	34 24	270	67 03	346
352	52 44	031	52 33	093	32 25	136	34 13	167	29 16	205	33 47	269	66 53	343
353	53 03	029	53 10	092	32 51	135	34 22	166	29 00	204	33 10	269	66 42	341
354	53 21	028	53 46	092	33 17	135	34 31	166	28 45	204	32 33	268	66 29	339
355	53 38	026	54 23	091	33 44	134	34 40	165	28 31	203	31 56	267	66 16	337
356	53 54	025	55 00	090	34 10	134	34 49	165	28 16	203	31 20	266	66 01	335
357	54 09	023	55 37	089	34 37	133	34 59	165	28 02	202	30 43	266	65 45	333
358	54 23	022	56 14	088	35 04	133	35 09	164	27 49	202	30 06	265	65 27	331
359	54 36	020	56 51	088	35 31	132	35 19	164	27 35	201	29 29	264	65 09	329

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LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Diphda		◆ RIGEL		CANOPUS		Miaplacidus		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	53 51	018	13 15	086	36 38	131	36 27	163	28 18	201	59 53	241	63 59	328
1	54 02	016	13 51	085	37 06	131	36 37	163	28 05	200	59 21	241	63 39	326
2	54 12	015	14 27	084	37 33	130	36 48	163	27 53	200	58 50	241	63 19	325
3	54 20	013	15 03	084	38 01	130	36 58	162	27 41	199	58 18	240	62 57	323
4	54 28	012	15 39	083	38 28	129	37 10	162	27 29	199	57 47	240	62 35	321
5	54 35	010	16 15	082	38 56	129	37 21	162	27 17	198	57 15	240	62 12	319
6	54 41	008	16 50	081	39 25	128	37 32	161	27 06	198	56 44	239	61 48	318
7	54 46	007	17 26	080	39 53	128	37 44	161	26 55	197	56 13	239	61 24	316
8	54 49	005	18 02	079	40 22	127	37 56	160	26 45	197	55 42	239	60 58	315
9	54 52	003	18 37	079	40 50	127	38 08	160	26 34	196	55 12	238	60 32	313
10	54 54	002	19 12	078	41 19	126	38 21	160	26 24	196	54 41	238	60 05	312
11	54 54	000	19 48	077	41 49	126	38 33	159	26 15	195	54 10	238	59 38	310
12	54 54	358	20 23	076	42 18	125	38 46	159	26 05	195	53 40	237	59 10	309
13	54 52	357	20 58	075	42 47	125	38 59	159	25 56	194	53 09	237	58 42	307
14	54 50	355	21 33	074	43 17	124	39 12	158	25 47	194	52 39	237	58 13	306
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
15	22 07	073	15 24	098	43 47	124	25 39	193	52 09	236	57 43	305	54 46	354
16	22 42	073	16 00	097	44 17	124	25 31	193	51 39	236	57 13	303	54 42	352
17	23 16	072	16 36	096	44 47	123	25 23	192	51 09	236	56 43	302	54 36	350
18	23 50	071	17 12	095	45 18	123	25 15	192	50 40	235	56 12	301	54 29	349
19	24 24	070	17 48	094	45 48	122	25 08	191	50 10	235	55 41	299	54 22	347
20	24 58	069	18 24	094	46 19	122	25 01	191	49 41	234	55 09	298	54 13	345
21	25 32	068	19 00	093	46 50	121	24 55	190	49 11	234	54 37	297	54 04	344
22	26 05	067	19 36	092	47 20	121	24 49	190	48 42	234	54 05	296	53 53	342
23	26 38	066	20 12	091	47 52	120	24 43	189	48 13	233	53 32	295	53 42	341
24	27 11	065	20 48	090	48 23	120	24 37	189	47 44	233	52 59	294	53 29	339
25	27 44	065	21 24	090	48 54	119	24 32	188	47 16	232	52 26	292	53 16	338
26	28 17	064	22 01	089	49 26	119	24 27	188	46 47	232	51 52	291	53 02	336
27	28 49	063	22 37	088	49 58	118	24 23	187	46 19	232	51 19	290	52 46	334
28	29 21	062	23 13	087	50 29	118	24 18	186	45 51	231	50 45	289	52 30	333
29	29 52	061	23 49	086	51 01	117	24 15	186	45 22	231	50 10	288	52 14	331
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
30	30 24	060	24 25	086	51 33	117	24 11	185	44 55	230	49 36	287	51 56	330
31	30 55	059	25 01	085	52 06	117	24 08	185	44 27	230	49 01	286	51 37	329
32	31 25	058	25 37	084	52 38	116	24 05	184	43 59	230	48 27	285	51 18	327
33	31 56	057	26 13	083	53 11	116	24 02	184	43 32	229	47 52	284	50 58	326
34	32 26	056	26 48	082	53 43	115	24 00	183	43 05	229	47 17	283	50 37	324
35	32 55	055	27 24	081	54 16	115	23 58	183	42 38	228	46 41	282	50 16	323
36	33 25	054	28 00	081	54 49	114	23 57	182	42 11	228	46 06	281	49 54	322
37	33 54	053	28 35	080	55 22	114	23 55	182	41 44	227	45 31	280	49 31	320
38	34 22	052	29 11	079	55 55	113	23 55	181	41 18	227	44 55	280	49 08	319
39	34 50	051	29 46	078	56 28	113	23 54	181	40 51	227	44 19	279	48 44	318
40	35 18	049	30 22	077	57 01	113	23 54	180	40 25	226	43 44	278	48 19	316
41	35 45	048	30 57	076	57 35	112	23 54	180	39 59	226	43 08	277	47 54	315
42	36 12	047	31 32	075	58 08	112	23 54	179	39 34	225	42 32	276	47 28	314
43	36 38	046	32 07	074	58 42	111	23 55	178	39 08	225	41 56	275	47 01	312
44	37 04	045	32 41	074	59 15	111	23 56	178	38 43	224	41 20	274	46 34	311
	RIGEL		◆ SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
45	37 29	044	33 16	073	59 49	110	23 58	177	38 18	224	40 44	274	46 07	310
46	37 54	043	33 50	072	60 23	110	23 59	177	37 53	223	40 08	273	45 39	309
47	38 18	042	34 24	071	60 57	109	24 02	176	37 28	223	39 32	272	45 11	308
48	38 42	041	34 58	070	61 31	109	24 04	176	37 04	222	38 56	271	44 42	306
49	39 05	039	35 32	069	62 05	109	24 07	175	36 39	222	38 20	270	44 13	305
50	39 28	038	36 06	068	62 40	108	24 10	175	36 15	222	37 44	269	43 43	304
51	39 50	037	36 39	067	63 14	108	24 13	174	35 52	221	37 07	269	43 13	303
52	40 11	036	37 12	066	63 49	107	24 17	174	35 28	221	36 31	268	42 43	302
53	40 32	035	37 45	065	64 23	107	24 21	173	35 05	220	35 55	267	42 12	301
54	40 52	033	38 18	064	64 58	106	24 26	173	34 41	220	35 19	266	41 41	300
55	41 12	032	38 50	063	65 32	106	24 31	172	34 18	219	34 43	266	41 09	299
56	41 31	031	39 22	062	66 07	106	24 36	172	33 56	219	34 07	265	40 37	298
57	41 49	030	39 54	061	66 42	105	24 41	171	33 33	218	33 31	264	40 05	297
58	42 06	028	40 25	060	67 17	105	24 47	171	33 11	218	32 55	263	39 33	296
59	42 23	027	40 56	059	67 52	104	24 53	170	32 49	217	32 20	263	39 00	295
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
60	42 39	026	41 27	058	40 18	112	24 59	170	32 28	217	31 44	262	38 27	294
61	42 54	024	41 57	057	40 52	111	25 06	169	32 06	216	31 08	261	37 54	293
62	43 09	023	42 27	056	41 26	111	25 13	168	31 45	216	30 33	260	37 21	292
63	43 23	022	42 57	054	41 59	110	25 21	168	31 24	215	29 57	260	36 47	291
64	43 36	020	43 26	053	42 33	110	25 28	167	31 03	215	29 21	259	36 13	290
65	43 48	019	43 55	052	43 08	109	25 36	167	30 43	214	28 46	258	35 39	289
66	43 59	018	44 23	051	43 42	108	25 45	166	30 23	214	28 11	257	35 05	288
67	44 10	016	44 51	050	44 16	108	25 53	166	30 03	213	27 36	257	34 30	287
68	44 20	015	45 18	049	44 51	107	26 02	165	29 43	213	27 01	256	33 56	286
69	44 29	014	45 46	047	45 25	106	26 12	165	29 24	212	26 26	255	33 21	285
70	44 37	012	46 11	046	46 00	106	26 21	164	29 05	212	25 51	254	32 46	284
71	44 44	011	46 37	045	46 35	105	26 31	164	28 46	211	25 16	254	32 11	283
72	44 51	010	47 02	044	47 10	105	26 41	163	28 27	211	24 41	253	31 36	283
73	44 56	008	47 27	042	47 45	104	26 52	163	28 09	210	24 07	252	31 00	282
74	45 01	007	47 51	041	48 20	103	27 03	162	27 51	210	23 33	252	30 25	281
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		ACHERNAR		◆ Diphda	
75	45 05	005	48 15	040	48 55	103	27 14	162	27 33	209	61 31	241	29 49	280
76	45 08	004	48 37	039	49 30	102	27 25	161	27 16	209	60 59	241	29 14	279
77	45 10	003	49 00	037	50 05	101	27 37	161	26 59	208	60 27	241	28 38	278
78	45 11	001	49 21	036	50 41	101	27 49	160	26 42	208	59 56	240	28 02	277
79	45 11	000	49 42	034	51 16	100	28 01	160	26 25	207	59 25	240	27 26	277
80	45 10	358	50 02	033	51 52	099	28 14	159	26 09	206	58 53	240	26 51	276
81	45 09	357	50 21	032	52 28	099	28 27	159	25 53	206	58 22	239	26 15	275
82	45 07	356	50 40	030	53 03	098	28 40	158	25 37	205	57 51	239	25 39	274
83	45 03	354	50 57	029	53 39	097	28 54	158	25 22	205	57 20	239	25 03	273
84	44 59	353	51 14	027	54 15	097	29 07	157	25 07	204	56 49	239	24 27	272
85	44 54	351	51 31	026	54 51	096	29 21	157	24 52	204	56 19	238	23 50	272
86	44 48	350	51 46	024	55 27	095	29 36	156	24 38	203	55 48	238	23 14	271
87	44 42	349	52 00	023	56 03	094	29 50	156	24 24	203	55 17	238	22 38	270
88	44 34	347	52 14	021	56 39	094	30 05	155	24 10	202	54 47	237	22 02	269
89	44 26	346	52 27	020	57 15	093	30 20	155	23 57	202	54 17	237	21 26	268

LAT 53°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		◆ Suhail		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL		BETELGEUSE	
90	28 06	029	57 51	092	30 36	154	23 44	201	53 46	237	44 16	344	29 35	359
91	28 23	027	58 27	091	30 52	154	23 31	200	53 16	236	44 06	343	29 34	358
92	28 39	026	59 03	091	31 08	153	23 18	200	52 46	236	43 55	342	29 32	357
93	28 55	025	59 39	090	31 24	153	23 06	199	52 17	236	43 44	340	29 30	355
94	29 10	024	60 15	089	31 40	153	22 55	199	51 47	235	43 31	339	29 26	354
95	29 24	023	60 52	088	31 57	152	22 43	198	51 17	235	43 18	338	29 23	353
96	29 38	022	61 28	087	32 14	152	22 32	198	50 48	234	43 04	336	29 18	352
97	29 51	021	62 04	086	32 32	151	22 21	197	50 19	234	42 49	335	29 13	351
98	30 04	020	62 40	086	32 49	151	22 11	197	49 49	234	42 33	334	29 06	350
99	30 15	019	63 16	085	33 07	150	22 01	196	49 20	233	42 17	333	29 00	349
100	30 27	017	63 52	084	33 25	150	21 51	195	48 52	233	42 00	331	28 52	348
101	30 37	016	64 27	083	33 43	149	21 41	195	48 23	233	41 42	330	28 44	346
102	30 47	015	65 03	082	34 02	149	21 32	194	47 54	232	41 24	329	28 35	345
103	30 56	014	65 39	081	34 21	148	21 24	194	47 26	232	41 05	327	28 26	344
104	31 04	013	66 15	080	34 40	148	21 15	193	46 58	231	40 45	326	28 16	343
	PROCYON		REGULUS		◆ Gienah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ SIRIUS	
105	31 12	012	13 35	048	20 29	092	34 59	147	46 29	231	40 25	325	53 38	354
106	31 19	011	14 01	047	21 05	092	35 19	147	46 01	231	40 04	324	53 34	353
107	31 25	009	14 28	046	21 41	091	35 38	147	45 34	230	39 42	323	53 29	351
108	31 31	008	14 53	045	22 17	090	35 58	146	45 06	230	39 20	321	53 23	349
109	31 36	007	15 19	044	22 53	089	36 19	146	44 39	229	38 57	320	53 15	348
110	31 40	006	15 44	043	23 29	088	36 39	145	44 11	229	38 34	319	53 07	346
111	31 43	005	16 08	042	24 05	088	37 00	145	43 44	229	38 10	318	52 58	345
112	31 46	004	16 32	041	24 41	087	37 21	144	43 17	228	37 45	317	52 48	343
113	31 47	002	16 56	040	25 17	086	37 42	144	42 50	228	37 20	316	52 37	342
114	31 48	001	17 19	039	25 53	085	38 03	144	42 24	227	36 55	314	52 25	340
115	31 49	000	17 42	038	26 29	084	38 24	143	41 57	227	36 29	313	52 13	339
116	31 49	359	18 04	038	27 05	083	38 46	143	41 31	226	36 02	312	51 59	337
117	31 47	358	18 26	037	27 41	083	39 08	142	41 05	226	35 35	311	51 45	336
118	31 46	357	18 47	036	28 17	082	39 30	142	40 39	226	35 08	310	51 29	334
119	31 43	355	19 08	035	28 53	081	39 53	142	40 13	225	34 40	309	51 13	333
	REGULUS		◆ SPICA		RIGIL KENT		Peacock		◆ ACHERNAR		RIGEL		◆ SIRIUS	
120	19 28	034	14 04	090	40 15	141	19 49	184	39 48	225	34 12	308	50 56	331
121	19 48	033	14 40	089	40 38	141	19 47	183	39 23	224	33 43	307	50 38	330
122	20 07	032	15 16	088	41 01	140	19 45	183	38 58	224	33 14	306	50 19	328
123	20 26	031	15 52	088	41 24	140	19 44	182	38 33	223	32 45	305	50 00	327
124	20 44	030	16 28	087	41 47	140	19 42	182	38 08	223	32 15	304	49 40	325
125	21 01	029	17 04	086	42 11	139	19 42	181	37 44	222	31 45	303	49 19	324
126	21 18	028	17 40	085	42 35	139	19 41	180	37 19	222	31 14	302	48 57	323
127	21 35	027	18 16	084	42 58	138	19 41	180	36 55	221	30 43	301	48 35	321
128	21 51	026	18 52	084	43 23	138	19 41	179	36 32	221	30 12	300	48 12	320
129	22 06	025	19 28	083	43 47	138	19 42	179	36 08	221	29 41	299	47 49	319
130	22 21	024	20 04	082	44 11	137	19 43	178	35 45	220	29 09	298	47 25	317
131	22 35	023	20 39	081	44 36	137	19 45	177	35 22	220	28 37	297	47 00	316
132	22 49	022	21 15	080	45 00	137	19 46	177	34 59	219	28 05	296	46 35	315
133	23 02	021	21 50	079	45 25	136	19 48	176	34 36	219	27 32	295	46 09	314
134	23 14	020	22 26	079	45 50	136	19 51	176	34 13	218	26 59	294	45 43	312
	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
135	23 26	018	23 01	078	46 16	135	19 54	175	33 51	218	66 47	255	45 16	311
136	23 37	017	23 36	077	46 41	135	19 57	175	33 29	217	66 12	255	44 48	310
137	23 48	016	24 12	076	47 07	135	20 01	174	33 08	217	65 37	254	44 20	309
138	23 58	015	24 47	075	47 32	134	20 05	173	32 46	216	65 03	254	43 52	308
139	24 07	014	25 21	074	47 58	134	20 09	173	32 25	216	64 28	253	43 23	307
140	24 15	013	25 56	073	48 24	134	20 14	172	32 04	215	63 53	253	42 54	305
141	24 23	012	26 31	073	48 50	133	20 19	172	31 43	215	63 19	252	42 24	304
142	24 31	011	27 05	072	49 17	133	20 24	171	31 23	214	62 45	252	41 54	303
143	24 37	010	27 39	071	49 43	133	20 30	171	31 02	214	62 10	251	41 24	302
144	24 43	009	28 13	070	50 10	133	20 36	170	30 42	213	61 36	251	40 53	301
145	24 48	008	28 47	069	50 36	132	20 42	169	30 23	213	61 02	251	40 22	300
146	24 53	007	29 21	068	51 03	132	20 49	169	30 03	212	60 28	250	39 51	299
147	24 57	006	29 54	067	51 30	132	20 56	168	29 44	212	59 54	250	39 19	298
148	25 00	005	30 27	066	51 57	131	21 04	168	29 25	211	59 20	249	38 47	297
149	25 03	004	31 00	065	52 24	131	21 12	167	29 07	211	58 47	249	38 15	296
	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
150	25 05	002	31 33	064	52 52	131	21 20	167	28 48	210	58 13	248	37 42	295
151	25 06	001	32 05	063	53 19	130	21 29	166	28 30	210	57 39	248	37 09	294
152	25 06	000	32 37	062	53 46	130	21 38	165	28 12	209	57 06	248	36 36	293
153	25 06	359	33 09	061	54 14	130	21 47	165	27 55	209	56 33	247	36 03	292
154	25 05	358	33 40	060	54 42	130	21 56	164	27 38	208	55 59	247	35 29	291
155	25 04	357	34 12	059	55 10	129	22 06	164	27 21	208	55 26	246	34 55	290
156	25 02	356	34 43	058	55 38	129	22 17	163	27 04	207	54 53	246	34 21	289
157	24 59	355	35 13	057	56 06	129	22 27	163	26 48	207	54 21	245	33 47	288
158	24 55	354	35 43	056	56 34	129	22 38	162	26 32	206	53 48	245	33 13	287
159	24 51	353	36 13	055	57 02	128	22 50	161	26 16	206	53 15	244	32 38	286
160	24 46	352	36 43	054	57 30	128	23 01	161	26 01	205	52 43	244	32 03	285
161	24 41	351	37 12	053	57 59	128	23 13	160	25 45	205	52 10	243	31 28	285
162	24 34	350	37 40	052	58 27	128	23 26	160	25 31	204	51 38	243	30 53	284
163	24 28	348	38 09	051	58 56	128	23 38	159	25 16	203	51 06	243	30 18	283
164	24 20	347	38 36	050	59 24	127	23 51	159	25 02	203	50 34	242	29 43	282
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		REGULUS	
165	39 04	049	25 11	101	24 05	158	24 48	202	50 02	242	29 08	281	24 12	346
166	39 31	048	25 46	100	24 18	158	24 34	202	49 30	241	28 32	280	24 03	345
167	39 57	046	26 22	100	24 32	157	24 21	201	48 59	241	27 56	279	23 53	344
168	40 23	045	26 57	099	24 46	156	24 08	201	48 27	240	27 21	278	23 43	343
169	40 48	044	27 33	098	25 01	156	23 56	200	47 56	240	26 45	278	23 33	342
170	41 13	043	28 09	097	25 16	155	23 43	200	47 25	239	26 09	277	23 21	341
171	41 38	042	28 45	097	25 31	155	23 31	199	46 54	239	25 33	276	23 09	340
172	42 01	041	29 21	096	25 47	154	23 20	199	46 23	238	24 57	275	22 57	339
173	42 25	039	29 57	095	26 02	154	23 08	198	45 52	238	24 21	274	22 43	338
174	42 47	038	30 33	094	26 19	153	22 57	197	45 22	237	23 45	274	22 29	337
175	43 09	037	31 09	094	26 35	153	22 47	197	44 51	237	23 09	273	22 15	336
176	43 30	036	31 45	093	26 52	152	22 36	196	44 21	237	22 33	272	22 00	335
177	43 51	034	32 21	092	27 09	152	22 26	196	43 51	236	21 57	271	21 44	334
178	44 11	033	32 57	091	27 26	151	22 17	195	43 21	236	21 21	270	21 28	333
179	44 31	032	33 33	090	27 44	151	22 07	195	42 52	235	20 45	269	21 11	332

Tilbage til Menuen

LAT 53°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	44 49	030	34 09	090	28 01	150	21 59	194	42 22	235	60 25	271	20 54	331
181	45 07	029	34 45	089	28 20	150	21 50	194	41 53	234	59 49	270	20 36	330
182	45 24	028	35 21	088	28 38	149	21 42	193	41 24	234	59 13	270	20 18	329
183	45 41	026	35 57	087	28 57	149	21 34	192	40 55	233	58 37	269	19 59	328
184	45 56	025	36 33	086	29 16	148	21 26	192	40 26	233	58 01	268	19 39	327
185	46 11	024	37 09	086	29 35	147	21 19	191	39 57	232	57 25	267	19 20	326
186	46 26	022	37 45	085	29 54	147	21 12	191	39 29	232	56 49	267	18 59	325
187	46 39	021	38 21	084	30 14	146	21 06	190	39 00	231	56 13	266	18 38	324
188	46 51	020	38 57	083	30 34	146	20 59	190	38 32	231	55 37	265	18 17	323
189	47 03	018	39 33	082	30 55	145	20 54	189	38 05	230	55 01	264	17 55	322
190	47 14	017	40 09	081	31 15	145	20 48	188	37 37	230	54 25	264	17 32	321
191	47 24	015	40 44	080	31 36	144	20 43	188	37 09	229	53 49	263	17 09	320
192	47 33	014	41 20	080	31 57	144	20 38	187	36 42	229	53 13	262	16 46	319
193	47 41	012	41 55	079	32 19	143	20 34	187	36 15	228	52 38	262	16 22	318
194	47 48	011	42 31	078	32 40	143	20 30	186	35 48	228	52 02	261	15 58	317
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		Denebola	
195	16 01	019	43 06	077	33 02	143	20 26	186	35 22	227	51 26	260	20 50	342
196	16 13	018	43 41	076	33 24	142	20 23	185	34 55	227	50 51	260	20 39	341
197	16 23	017	44 16	075	33 47	142	20 20	184	34 29	226	50 15	259	20 27	340
198	16 34	016	44 51	074	34 09	141	20 18	184	34 03	226	49 40	258	20 14	339
199	16 43	015	45 25	073	34 32	141	20 15	183	33 37	225	49 04	258	20 01	338
200	16 52	014	46 00	072	34 55	140	20 13	183	33 12	225	48 29	257	19 47	337
201	17 00	013	46 34	071	35 18	140	20 12	182	32 47	224	47 54	256	19 32	336
202	17 08	012	47 08	070	35 42	139	20 11	181	32 22	224	47 19	256	19 17	335
203	17 15	011	47 42	069	36 05	139	20 10	181	31 57	223	46 44	255	19 01	334
204	17 22	010	48 16	068	36 29	138	20 10	180	31 32	223	46 09	254	18 45	333
205	17 28	009	48 49	067	36 54	138	20 10	180	31 08	222	45 35	254	18 28	332
206	17 33	008	49 22	066	37 18	137	20 10	179	30 44	222	45 00	253	18 11	331
207	17 38	007	49 55	065	37 43	137	20 11	179	30 20	221	44 26	252	17 53	330
208	17 42	006	50 27	064	38 07	136	20 12	178	29 57	220	43 51	252	17 35	329
209	17 46	005	50 59	062	38 32	136	20 13	177	29 33	220	43 17	251	17 16	328
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	17 48	004	51 31	061	38 58	135	20 15	177	29 10	219	42 43	251	47 41	348
211	17 51	003	52 03	060	39 23	135	20 17	176	28 48	219	42 09	250	47 33	346
212	17 52	002	52 34	059	39 49	135	20 20	176	28 25	218	41 35	249	47 24	345
213	17 53	001	53 05	058	40 15	134	20 23	175	28 03	218	41 01	249	47 14	343
214	17 54	000	53 35	057	40 41	134	20 26	175	27 41	217	40 28	248	47 03	342
215	17 53	359	54 05	055	41 07	133	20 29	174	27 19	217	39 54	248	46 51	340
216	17 53	358	54 34	054	41 33	133	20 33	173	26 58	216	39 21	247	46 39	339
217	17 51	357	55 03	053	42 00	132	20 38	173	26 37	216	38 48	246	46 25	338
218	17 49	356	55 32	051	42 27	132	20 42	172	26 16	215	38 15	246	46 11	336
219	17 46	355	56 00	050	42 54	131	20 47	172	25 55	214	37 42	245	45 56	335
220	17 43	354	56 27	049	43 21	131	20 53	171	25 35	214	37 09	245	45 41	334
221	17 39	353	56 54	047	43 48	131	20 59	171	25 15	213	36 37	244	45 24	332
222	17 34	352	57 20	046	44 15	130	21 05	170	24 55	213	36 04	243	45 07	331
223	17 29	351	57 46	044	44 43	130	21 11	169	24 36	212	35 32	243	44 49	330
224	17 23	350	58 10	043	45 11	129	21 18	169	24 17	212	35 00	242	44 30	328
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
225	58 35	041	39 08	082	45 39	129	21 25	168	23 58	211	34 28	242	44 11	327
226	58 58	040	39 44	082	46 07	129	21 33	168	23 39	210	33 56	241	43 51	326
227	59 21	038	40 19	081	46 35	128	21 41	167	23 21	210	33 25	240	43 30	324
228	59 43	037	40 55	080	47 04	128	21 49	167	23 03	209	32 54	240	43 09	323
229	60 04	035	41 30	079	47 33	127	21 57	166	22 46	209	32 23	239	42 47	322
230	60 24	033	42 06	078	48 01	127	22 06	165	22 29	208	31 52	239	42 24	321
231	60 43	031	42 41	077	48 30	127	22 15	165	22 12	208	31 21	238	42 01	319
232	61 02	030	43 16	076	48 59	126	22 25	164	21 55	207	30 51	237	41 37	318
233	61 19	028	43 51	075	49 29	126	22 35	164	21 39	206	30 20	237	41 13	317
234	61 36	026	44 26	074	49 58	125	22 45	163	21 23	206	29 50	236	40 48	316
235	61 51	024	45 01	073	50 27	125	22 56	163	21 08	205	29 20	236	40 23	315
236	62 05	023	45 35	072	50 57	125	23 07	162	20 52	205	28 51	235	39 57	314
237	62 19	021	46 09	071	51 27	124	23 18	162	20 37	204	28 21	234	39 30	312
238	62 31	019	46 44	070	51 57	124	23 30	161	20 23	203	27 52	234	39 04	311
239	62 42	017	47 17	069	52 27	124	23 42	160	20 09	203	27 23	233	38 36	310
	◆ ANTARES		Nunki		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA	
240	62 52	015	47 51	068	15 10	119	23 54	160	19 55	202	61 07	228	38 08	309
241	63 01	013	48 25	067	15 42	119	24 06	159	19 41	202	60 40	228	37 40	308
242	63 08	011	48 58	066	16 13	118	24 19	159	19 28	201	60 13	228	37 11	307
243	63 15	009	49 31	065	16 45	117	24 33	158	19 15	201	59 46	228	36 42	306
244	63 20	007	50 03	064	17 18	116	24 46	158	19 03	200	59 19	228	36 13	305
245	63 24	005	50 36	063	17 50	116	25 00	157	18 51	199	58 53	228	35 43	304
246	63 26	003	51 07	062	18 23	115	25 14	157	18 39	199	58 26	228	35 13	303
247	63 28	001	51 39	061	18 56	114	25 29	156	18 27	198	57 59	228	34 42	302
248	63 28	359	52 10	059	19 29	114	25 43	156	18 16	197	57 33	227	34 11	301
249	63 27	357	52 41	058	20 02	113	25 58	155	18 06	197	57 06	227	33 40	300
250	63 24	355	53 12	057	20 35	112	26 14	154	17 56	196	56 40	227	33 09	299
251	63 20	353	53 42	056	21 09	111	26 30	154	17 46	196	56 13	227	32 37	298
252	63 16	351	54 11	054	21 42	111	26 46	153	17 36	195	55 47	227	32 05	297
253	63 09	349	54 40	053	22 16	110	27 02	153	17 27	194	55 21	227	31 32	296
254	63 02	347	55 09	052	22 50	109	27 18	152	17 18	194	54 54	226	31 00	295
	ALTAIR		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA		◆ ANTARES	
255	18 11	045	23 24	109	27 35	152	17 10	193	54 28	226	30 27	294	62 53	345
256	18 36	044	23 59	108	27 53	151	17 02	193	54 02	226	29 54	293	62 44	343
257	19 01	043	24 33	107	28 10	151	16 54	192	53 37	226	29 20	292	62 33	341
258	19 26	042	25 08	106	28 28	150	16 47	191	53 11	225	28 47	291	62 21	340
259	19 50	041	25 42	106	28 46	150	16 40	191	52 45	225	28 13	290	62 08	338
260	20 13	040	26 17	105	29 04	149	16 33	190	52 20	225	27 39	289	61 53	336
261	20 36	039	26 52	104	29 23	149	16 27	189	51 54	225	27 05	288	61 38	334
262	20 59	038	27 27	104	29 42	148	16 21	189	51 29	224	26 30	287	61 22	332
263	21 21	037	28 02	103	30 01	148	16 16	188	51 04	224	25 56	287	61 05	331
264	21 43	036	28 38	102	30 20	147	16 11	188	50 38	224	25 21	286	60 46	329
265	22 04	035	29 13	101	30 40	147	16 07	187	50 13	224	24 46	285	60 27	327
266	22 24	034	29 48	101	31 00	146	16 02	186	49 49	223	24 11	284	60 07	325
267	22 45	033	30 24	100	31 20	146	15 59	186	49 24	223	23 36	283	59 46	324
268	23 04	032	31 00	099	31 40	145	15 55	185	48 59	223	23 01	282	59 24	322
269	23 23	031	31 35	098	32 01	145	15 52	184	48 35	222	22 26	281	59 02	321

LAT 53°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		RIGIL KENT		◆ SPICA		ANTARES	
270	23 42	030	32 11	098	32 22	144	15 50	184	62 27	233	21 50	281	58 39	319
271	24 00	029	32 47	097	32 43	144	15 47	183	61 58	233	21 15	280	58 15	317
272	24 17	028	33 23	096	33 05	143	15 46	183	61 29	233	20 39	279	57 50	316
273	24 34	027	33 59	095	33 26	143	15 44	182	61 00	233	20 03	278	57 24	314
274	24 50	026	34 35	095	33 48	142	15 43	181	60 31	233	19 27	277	56 58	313
275	25 06	025	35 11	094	34 10	142	15 42	181	60 02	233	18 52	276	56 32	312
276	25 21	024	35 47	093	34 33	141	15 42	180	59 34	233	18 16	276	56 04	310
277	25 35	023	36 23	092	34 56	141	15 42	179	59 05	232	17 40	275	55 36	309
278	25 49	022	36 59	092	35 18	140	15 43	179	58 36	232	17 04	274	55 08	308
279	26 02	021	37 35	091	35 42	140	15 44	178	58 08	232	16 28	273	54 39	306
280	26 15	020	38 11	090	36 05	140	15 45	178	57 39	232	15 52	272	54 10	305
281	26 26	019	38 47	089	36 28	139	15 47	177	57 11	232	15 16	272	53 40	304
282	26 38	018	39 23	088	36 52	139	15 49	176	56 43	231	14 39	271	53 10	302
283	26 48	017	39 59	087	37 16	138	15 52	176	56 15	231	14 03	270	52 39	301
284	26 58	015	40 35	087	37 40	138	15 55	175	55 47	231	13 27	269	52 08	300
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Rasalhague	
285	27 07	014	41 11	086	38 05	137	15 58	174	55 19	231	51 37	299	22 00	338
286	27 16	013	41 47	085	38 29	137	16 02	174	54 51	230	51 05	298	21 46	337
287	27 24	012	42 23	084	38 54	136	16 06	173	54 23	230	50 33	297	21 31	336
288	27 31	011	42 59	083	39 19	136	16 10	173	53 55	230	50 00	295	21 16	335
289	27 38	010	43 35	082	39 45	135	16 15	172	53 28	230	49 27	294	21 00	334
290	27 44	009	44 11	082	40 10	135	16 21	171	53 00	229	48 54	293	20 44	333
291	27 49	008	44 47	081	40 36	135	16 26	171	52 33	229	48 21	292	20 27	332
292	27 53	007	45 22	080	41 02	134	16 32	170	52 06	229	47 48	291	20 10	331
293	27 57	005	45 58	079	41 28	134	16 39	169	51 39	228	47 14	290	19 52	330
294	28 00	004	46 33	078	41 54	133	16 46	169	51 12	228	46 40	289	19 33	329
295	28 03	003	47 08	077	42 20	133	16 53	168	50 45	228	46 05	288	19 14	328
296	28 04	002	47 43	076	42 47	132	17 00	168	50 18	228	45 31	287	18 55	327
297	28 05	001	48 18	075	43 13	132	17 08	167	49 51	227	44 56	286	18 35	326
298	28 05	000	48 53	074	43 40	132	17 17	166	49 25	227	44 22	285	18 14	325
299	28 05	359	49 28	073	44 08	131	17 26	166	48 59	227	43 47	284	17 53	324
	FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki		◆ ALTAIR	
300	50 02	072	44 35	131	17 35	165	48 32	226	43 12	283	60 44	330	28 04	358
301	50 36	071	45 02	130	17 44	164	48 06	226	42 37	282	60 26	328	28 02	357
302	51 10	070	45 30	130	17 54	164	47 41	226	42 01	281	60 06	326	27 59	355
303	51 44	069	45 58	129	18 04	163	47 15	225	41 26	281	59 46	325	27 56	354
304	52 18	068	46 26	129	18 15	163	46 49	225	40 50	280	59 24	323	27 52	353
305	52 51	067	46 54	129	18 26	162	46 24	225	40 15	279	59 02	321	27 48	352
306	53 24	066	47 22	128	18 37	161	45 58	224	39 39	278	58 39	320	27 42	351
307	53 57	064	47 50	128	18 49	161	45 33	224	39 03	277	58 16	318	27 36	350
308	54 29	063	48 19	128	19 01	160	45 08	224	38 27	276	57 51	317	27 30	349
309	55 01	062	48 48	127	19 13	160	44 44	223	37 51	275	57 26	315	27 22	348
310	55 33	061	49 17	127	19 26	159	44 19	223	37 15	275	57 01	314	27 14	347
311	56 05	060	49 46	126	19 39	158	43 54	222	36 39	274	56 34	312	27 05	345
312	56 36	058	50 15	126	19 53	158	43 30	222	36 03	273	56 07	311	26 56	344
313	57 06	057	50 44	126	20 07	157	43 06	222	35 27	272	55 40	310	26 46	343
314	57 36	056	51 13	125	20 21	157	42 42	221	34 51	271	55 12	308	26 35	342
315	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
	58 06	054	51 43	125	20 35	156	42 18	221	34 15	270	54 43	307	26 24	341
316	58 35	053	52 13	125	20 50	155	41 55	221	33 39	270	54 14	306	26 12	340
317	59 04	052	52 42	124	21 05	155	41 31	220	33 03	269	53 45	304	25 59	339
318	59 32	050	53 12	124	21 21	154	41 08	220	32 27	268	53 15	303	25 46	338
319	59 59	049	53 42	123	21 37	154	40 45	219	31 51	267	52 44	302	25 32	337
320	60 26	047	54 13	123	21 53	153	40 22	219	31 14	266	52 13	301	25 17	336
321	60 52	046	54 43	123	22 09	152	40 00	219	30 38	266	51 42	300	25 02	335
322	61 18	044	55 13	122	22 26	152	39 37	218	30 02	265	51 11	298	24 46	334
323	61 42	043	55 44	122	22 43	151	39 15	218	29 27	264	50 39	297	24 30	333
324	62 06	041	56 14	122	23 01	151	38 53	217	28 51	263	50 06	296	24 13	332
325	62 30	039	56 45	121	23 19	150	38 31	217	28 15	263	49 34	295	23 55	330
326	62 52	038	57 16	121	23 37	150	38 10	217	27 39	262	49 01	294	23 37	329
327	63 14	036	57 47	121	23 55	149	37 48	216	27 03	261	48 28	293	23 19	328
328	63 34	034	58 18	121	24 14	148	37 27	216	26 28	260	47 54	292	22 59	327
329	63 54	032	58 49	120	24 33	148	37 06	215	25 52	260	47 21	291	22 40	326
330	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
	64 13	030	59 20	120	24 52	147	36 46	215	25 17	259	46 47	290	22 20	325
331	64 30	028	59 52	120	25 12	147	36 25	214	24 41	258	46 13	289	21 59	324
332	64 47	026	60 23	119	25 32	146	36 05	214	24 06	257	45 39	288	21 37	323
333	65 03	025	60 55	119	25 52	146	35 45	214	23 31	257	45 04	287	21 16	322
334	65 17	023	61 26	119	26 13	145	35 25	213	22 56	256	44 29	286	20 53	321
335	65 30	021	61 58	119	26 34	145	35 05	213	22 21	255	43 55	285	20 31	320
336	65 42	018	62 30	118	26 55	144	34 46	212	21 46	254	43 20	284	20 07	319
337	65 53	016	63 02	118	27 16	143	34 27	212	21 11	254	42 44	283	19 44	319
338	66 03	014	63 33	118	27 38	143	34 08	211	20 36	253	42 09	282	19 20	318
339	66 11	012	64 05	118	28 00	142	33 49	211	20 02	252	41 34	281	18 55	317
340	66 18	010	64 37	117	28 22	142	33 31	210	19 28	252	40 58	280	18 30	316
341	66 24	008	65 10	117	28 44	141	33 13	210	18 54	251	40 23	279	18 05	315
342	66 28	006	65 42	117	29 07	141	32 55	209	18 19	250	39 47	278	17 39	314
343	66 31	004	66 14	117	29 30	140	32 37	209	17 46	249	39 11	278	17 12	313
344	66 32	001	66 46	117	29 53	140	32 20	209	17 12	249	38 36	277	16 46	312
345	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		FOMALHAUT	
	49 27	040	48 23	097	30 17	139	34 18	169	32 03	208	38 00	276	66 32	359
346	49 50	039	48 59	096	30 41	139	34 25	169	31 46	208	37 24	275	66 31	357
347	50 12	037	49 35	096	31 05	138	34 32	168	31 29	207	36 48	274	66 29	355
348	50 34	036	50 11	095	31 29	138	34 39	168	31 13	207	36 12	273	66 25	353
349	50 55	035	50 47	094	31 53	137	34 47	168	30 57	206	35 36	273	66 19	350
350	51 15	033	51 23	093	32 18	136	34 55	167	30 41	206	35 00	272	66 13	348
351	51 34	032	51 59	093	32 43	136	35 03	167	30 25	205	34 23	271	66 05	346
352	51 53	030	52 35	092	33 08	135	35 11	166	30 10	205	33 47	270	65 56	344
353	52 11	029	53 11	091	33 34	135	35 20	166	29 55	204	33 11	269	65 45	342
354	52 28	027	53 47	090	33 59	134	35 29	166	29 40	204	32 35	269	65 33	340
355	52 44	026	54 24	089	34 25	134	35 38	165	29 26	203	31 59	268	65 20	338
356	52 59	024	55 00	089	34 52	133	35 47	165	29 12	203	31 23	267	65 06	336
357	53 13	023	55 36	088	35 18	133	35 57	165	28 58	202	30 47	266	64 51	334
358	53 27	021	56 12	087	35 44	132	36 06	164	28 44	202	30 11	265	64 34	332
359	53 40	020	56 48	086	36 11	132	36 16	164	28 31	201	29 35	265	64 17	330

LAT 54°S

LAT 54°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Diphda		◆ RIGEL		CANOPUS		Miaplacidus		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	52 54	018	13 11	086	37 18	131	37 24	163	29 14	201	60 21	243	63 07	329
1	53 04	016	13 46	085	37 45	130	37 34	163	29 01	201	59 49	243	62 49	328
2	53 14	015	14 21	084	38 12	130	37 45	162	28 49	200	59 18	242	62 29	326
3	53 22	013	14 56	083	38 39	129	37 56	162	28 37	200	58 47	242	62 09	324
4	53 29	011	15 31	082	39 06	129	38 07	162	28 26	199	58 16	241	61 48	322
5	53 36	010	16 06	082	39 34	128	38 18	161	28 14	199	57 45	241	61 26	321
6	53 41	008	16 41	081	40 02	128	38 29	161	28 03	198	57 14	241	61 03	319
7	53 46	007	17 16	080	40 30	127	38 41	161	27 52	198	56 44	240	60 40	317
8	53 50	005	17 50	079	40 58	127	38 53	160	27 42	197	56 13	240	60 16	316
9	53 52	003	18 25	078	41 26	126	39 05	160	27 32	196	55 42	240	59 51	314
10	53 54	002	19 00	077	41 55	126	39 17	159	27 22	196	55 12	239	59 25	313
11	53 54	000	19 34	077	42 23	125	39 29	159	27 12	195	54 42	239	58 59	311
12	53 54	359	20 08	076	42 52	125	39 42	159	27 03	195	54 12	239	58 32	310
13	53 52	357	20 42	075	43 21	124	39 55	158	26 54	194	53 42	238	58 05	309
14	53 50	355	21 16	074	43 51	124	40 08	158	26 46	194	53 12	238	57 37	307
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
15	21 50	073	15 32	097	44 20	123	26 37	193	52 42	237	57 09	306	53 47	354
16	22 24	072	16 07	096	44 50	123	26 29	193	52 12	237	56 40	304	53 42	352
17	22 57	071	16 42	096	45 20	122	26 22	192	51 43	237	56 11	303	53 37	350
18	23 31	070	17 17	095	45 49	122	26 14	192	51 13	236	55 41	302	53 31	349
19	24 04	070	17 52	094	46 20	121	26 07	191	50 44	236	55 11	301	53 23	347
20	24 37	069	18 28	093	46 50	121	26 00	191	50 15	235	54 40	299	53 15	346
21	25 09	068	19 03	092	47 20	120	25 54	190	49 46	235	54 09	298	53 06	344
22	25 42	067	19 38	092	47 51	120	25 48	190	49 17	235	53 38	297	52 56	343
23	26 14	066	20 13	091	48 21	119	25 42	189	48 49	234	53 06	296	52 45	341
24	26 46	065	20 49	090	48 52	119	25 37	189	48 20	234	52 35	295	52 33	340
25	27 18	064	21 24	089	49 23	118	25 32	188	47 52	233	52 02	294	52 20	338
26	27 50	063	21 59	088	49 54	118	25 27	188	47 24	233	51 30	293	52 07	336
27	28 21	062	22 34	088	50 26	117	25 22	187	46 56	232	50 57	291	51 52	335
28	28 52	061	23 10	087	50 57	117	25 18	187	46 28	232	50 24	290	51 37	334
29	29 23	060	23 45	086	51 29	116	25 14	186	46 00	232	49 51	289	51 21	332
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
30	29 53	059	24 20	085	52 00	116	25 11	185	45 33	231	49 18	288	51 04	331
31	30 23	058	24 55	084	52 32	115	25 08	185	45 05	231	48 44	287	50 46	329
32	30 53	057	25 30	083	53 04	115	25 05	184	44 38	230	48 10	286	50 28	328
33	31 23	056	26 05	083	53 36	114	25 02	184	44 11	230	47 36	285	50 08	326
34	31 52	055	26 40	082	54 08	114	25 00	183	43 44	229	47 02	284	49 49	325
35	32 21	054	27 15	081	54 40	113	24 58	183	43 17	229	46 28	283	49 28	324
36	32 49	053	27 50	080	55 13	113	24 57	182	42 51	229	45 54	282	49 07	322
37	33 17	052	28 24	079	55 45	113	24 55	182	42 25	228	45 19	281	48 45	321
38	33 45	051	28 59	078	56 18	112	24 55	181	41 58	228	44 45	281	48 22	320
39	34 12	050	29 34	077	56 51	112	24 54	181	41 32	227	44 10	280	47 59	318
40	34 39	049	30 08	077	57 24	111	24 54	180	41 07	227	43 35	279	47 35	317
41	35 05	048	30 42	076	57 56	111	24 54	180	40 41	226	43 00	278	47 11	316
42	35 31	047	31 16	075	58 30	110	24 54	179	40 16	226	42 25	277	46 46	314
43	35 57	046	31 50	074	59 03	110	24 55	178	39 51	225	41 50	276	46 21	313
44	36 22	045	32 24	073	59 36	109	24 56	178	39 26	225	41 15	275	45 55	312
	RIGEL		◆ SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
45	36 46	043	32 58	072	60 09	109	24 58	177	39 01	224	40 40	274	45 28	311
46	37 10	042	33 31	071	60 43	108	24 59	177	38 36	224	40 05	274	45 01	310
47	37 34	041	34 04	070	61 16	108	25 01	176	38 12	223	39 30	273	44 34	308
48	37 56	040	34 37	069	61 50	107	25 04	176	37 48	223	38 54	272	44 06	307
49	38 19	039	35 10	068	62 24	107	25 07	175	37 24	222	38 19	271	43 38	306
50	38 41	038	35 43	067	62 58	106	25 10	175	37 00	222	37 44	270	43 09	305
51	39 02	036	36 15	066	63 31	106	25 13	174	36 37	222	37 08	269	42 40	304
52	39 23	035	36 48	065	64 05	105	25 17	174	36 13	221	36 33	269	42 10	303
53	39 43	034	37 19	064	64 39	105	25 21	173	35 50	221	35 58	268	41 41	302
54	40 02	033	37 51	063	65 14	104	25 25	173	35 27	220	35 23	267	41 10	301
55	40 21	032	38 22	062	65 48	104	25 30	172	35 05	220	34 48	266	40 40	300
56	40 39	030	38 54	061	66 22	103	25 35	172	34 43	219	34 12	265	40 09	298
57	40 57	029	39 24	060	66 56	103	25 40	171	34 20	219	33 37	265	39 38	297
58	41 13	028	39 55	059	67 31	102	25 46	170	33 59	218	33 02	264	39 06	296
59	41 30	027	40 25	058	68 05	102	25 52	170	33 37	218	32 27	263	38 35	295
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
60	41 45	025	40 55	057	40 40	111	25 58	169	33 15	217	31 52	262	38 03	294
61	42 00	024	41 24	056	41 13	111	26 05	169	32 54	217	31 17	262	37 31	293
62	42 14	023	41 53	055	41 46	110	26 12	168	32 33	216	30 42	261	36 58	292
63	42 27	021	42 22	054	42 20	109	26 19	168	32 13	216	30 08	260	36 25	291
64	42 40	020	42 50	053	42 53	109	26 27	167	31 52	215	29 33	259	35 52	290
65	42 51	019	43 18	051	43 27	108	26 35	167	31 32	215	28 58	259	35 19	290
66	43 02	017	43 45	050	44 00	107	26 43	166	31 12	214	28 24	258	34 46	289
67	43 13	016	44 12	049	44 34	107	26 51	166	30 53	214	27 49	257	34 12	288
68	43 22	015	44 38	048	45 08	106	27 00	165	30 33	213	27 15	256	33 39	287
69	43 31	013	45 04	047	45 42	105	27 09	165	30 14	213	26 41	256	33 05	286
70	43 38	012	45 30	045	46 16	105	27 19	164	29 55	212	26 07	255	32 31	285
71	43 45	011	45 54	044	46 50	104	27 29	164	29 37	211	25 33	254	31 57	284
72	43 51	009	46 19	043	47 24	103	27 39	163	29 19	211	24 59	253	31 22	283
73	43 57	008	46 43	042	47 58	103	27 49	163	29 01	210	24 25	253	30 48	282
74	44 01	007	47 06	040	48 33	102	28 00	162	28 43	210	23 51	252	30 13	281
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		ACHERNAR		◆ Diphda	
75	44 05	005	47 28	039	49 07	101	28 11	162	28 26	209	61 59	243	29 39	280
76	44 08	004	47 50	038	49 42	101	28 22	161	28 08	209	61 27	243	29 04	280
77	44 10	003	48 12	036	50 17	100	28 34	161	27 52	208	60 56	242	28 29	279
78	44 11	001	48 32	035	50 51	099	28 45	160	27 35	208	60 25	242	27 54	278
79	44 11	000	48 52	034	51 26	099	28 58	160	27 19	207	59 54	242	27 19	277
80	44 11	358	49 11	032	52 01	098	29 10	159	27 03	207	59 23	241	26 44	276
81	44 09	357	49 30	031	52 36	097	29 23	159	26 47	206	58 52	241	26 09	275
82	44 07	356	49 48	030	53 11	097	29 36	158	26 32	206	58 21	241	25 34	275
83	44 04	354	50 05	028	53 46	096	29 49	158	26 17	205	57 51	240	24 59	274
84	44 00	353	50 21	027	54 21	095	30 03	157	26 02	204	57 20	240	24 24	273
85	43 55	351	50 36	025	54 56	094	30 16	157	25 47	204	56 50	240	23 49	272
86	43 49	350	50 51	024	55 32	094	30 31	156	25 33	203	56 19	239	23 13	271
87	43 43	349	51 05	022	56 07	093	30 45	156	25 19	203	55 49	239	22 38	270
88	43 36	347	51 18	021	56 42	092	31 00	155	25 06	202	55 19	238	22 03	270
89	43 27	346	51 30	019	57 17	091	31 15	155	24 53	202	54 49	238	21 27	269

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		◆ Suhail		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL		BETELGEUSE	
90	27 13	028	57 52	091	31 30	154	24 40	201	54 19	238	43 19	345	28 35	359
91	27 29	027	58 28	090	31 45	154	24 27	201	53 49	237	43 09	343	28 34	358
92	27 45	026	59 03	089	32 01	153	24 15	200	53 20	237	42 58	342	28 32	357
93	28 00	025	59 38	088	32 17	153	24 03	199	52 50	237	42 47	341	28 30	355
94	28 15	024	60 14	087	32 34	152	23 51	199	52 21	236	42 35	339	28 27	354
95	28 29	023	60 49	086	32 50	152	23 40	198	51 52	236	42 22	338	28 23	353
96	28 42	022	61 24	086	33 07	151	23 29	198	51 22	235	42 09	337	28 18	352
97	28 55	021	61 59	085	33 24	151	23 18	197	50 53	235	41 54	335	28 13	351
98	29 07	019	62 34	084	33 41	150	23 08	197	50 25	235	41 39	334	28 07	350
99	29 19	018	63 09	083	33 59	150	22 58	196	49 56	234	41 24	333	28 01	349
100	29 29	017	63 44	082	34 17	149	22 49	196	49 27	234	41 07	332	27 54	348
101	29 39	016	64 19	081	34 35	149	22 39	195	48 59	233	40 50	330	27 46	347
102	29 49	015	64 54	080	34 53	148	22 30	194	48 31	233	40 32	329	27 37	345
103	29 58	014	65 28	079	35 12	148	22 22	194	48 03	233	40 14	328	27 28	344
104	30 06	013	66 03	078	35 31	148	22 14	193	47 35	232	39 55	327	27 18	343
	PROCYON		REGULUS		◆ Gienah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ SIRIUS	
105	30 13	012	12 54	048	20 31	092	35 50	147	47 07	232	39 35	325	52 38	354
106	30 20	010	13 20	047	21 06	091	36 09	147	46 39	231	39 15	324	52 34	353
107	30 26	009	13 46	046	21 41	090	36 28	146	46 12	231	38 54	323	52 29	351
108	30 31	008	14 11	045	22 17	090	36 48	146	45 44	231	38 33	322	52 23	350
109	30 36	007	14 35	044	22 52	089	37 08	145	45 17	230	38 11	321	52 17	348
110	30 40	006	15 00	043	23 27	088	37 28	145	44 50	230	37 48	320	52 09	347
111	30 43	005	15 24	042	24 02	087	37 49	144	44 24	229	37 25	318	52 00	345
112	30 46	004	15 47	041	24 38	086	38 09	144	43 57	229	37 01	317	51 51	344
113	30 47	002	16 10	040	25 13	085	38 30	144	43 30	228	36 37	316	51 40	342
114	30 48	001	16 32	039	25 48	085	38 51	143	43 04	228	36 12	315	51 29	340
115	30 49	000	16 55	038	26 23	084	39 12	143	42 38	227	35 47	314	51 17	339
116	30 49	359	17 16	037	26 58	083	39 34	142	42 12	227	35 22	313	51 04	337
117	30 47	358	17 37	036	27 33	082	39 55	142	41 46	227	34 55	312	50 50	336
118	30 46	357	17 58	035	28 08	081	40 17	141	41 21	226	34 29	311	50 35	335
119	30 43	355	18 18	034	28 43	080	40 39	141	40 56	226	34 02	310	50 20	333
	REGULUS		◆ SPICA		RIGIL KENT		Peacock		◆ ACHERNAR		RIGEL		◆ SIRIUS	
120	18 38	033	14 04	090	41 02	141	20 49	184	40 30	225	33 35	309	50 03	332
121	18 57	033	14 39	089	41 24	140	20 47	183	40 06	225	33 07	307	49 46	330
122	19 16	032	15 14	088	41 47	140	20 45	183	39 41	224	32 39	306	49 28	329
123	19 34	031	15 49	087	42 10	139	20 44	182	39 16	224	32 10	305	49 10	327
124	19 52	030	16 25	087	42 33	139	20 42	182	38 52	223	31 41	304	48 50	326
125	20 09	029	17 00	086	42 56	139	20 42	181	38 28	223	31 12	303	48 30	325
126	20 25	028	17 35	085	43 19	138	20 41	180	38 04	222	30 42	302	48 10	323
127	20 41	027	18 10	084	43 43	138	20 41	180	37 40	222	30 12	301	47 48	322
128	20 57	026	18 45	083	44 07	137	20 41	179	37 17	222	29 42	300	47 26	321
129	21 12	025	19 20	082	44 31	137	20 42	179	36 53	221	29 11	299	47 04	319
130	21 26	024	19 55	082	44 55	137	20 43	178	36 30	221	28 41	298	46 40	318
131	21 40	022	20 30	081	45 19	136	20 44	177	36 08	220	28 09	298	46 17	317
132	21 53	021	21 05	080	45 44	136	20 46	177	35 45	220	27 38	297	45 52	316
133	22 06	020	21 39	079	46 08	135	20 48	176	35 23	219	27 06	296	45 27	314
134	22 18	019	22 14	078	46 33	135	20 51	176	35 00	219	26 34	295	45 02	313
135	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
136	22 29	018	22 48	077	46 58	135	20 54	175	34 39	218	67 01	257	44 36	312
137	22 40	017	23 23	076	47 23	134	20 57	175	34 17	218	66 27	257	44 09	311
138	22 50	016	23 57	076	47 49	134	21 00	174	33 55	217	65 53	256	43 42	310
139	23 00	015	24 31	075	48 14	134	21 04	173	33 34	217	65 18	256	43 15	308
140	23 09	014	25 05	074	48 40	133	21 08	173	33 13	216	64 44	255	42 47	307
141	23 17	013	25 39	073	49 05	133	21 13	172	32 53	216	64 10	255	42 19	306
142	23 25	012	26 12	072	49 31	133	21 18	172	32 32	215	63 36	254	41 50	305
143	23 32	011	26 46	071	49 57	132	21 23	171	32 12	215	63 02	254	41 21	304
144	23 38	010	27 19	070	50 23	132	21 29	170	31 52	214	62 29	253	40 52	303
145	23 44	009	27 52	069	50 50	132	21 35	170	31 32	214	61 55	253	40 22	302
146	23 49	008	28 25	068	51 16	131	21 41	169	31 13	213	61 21	252	39 52	301
147	23 53	007	28 58	067	51 43	131	21 48	169	30 54	213	60 48	252	39 21	300
148	23 57	006	29 30	067	52 09	131	21 55	168	30 35	212	60 14	251	38 51	299
149	24 00	005	30 03	066	52 36	130	22 02	168	30 16	212	59 41	251	38 19	298
150	24 03	004	30 35	065	53 03	130	22 10	167	29 58	211	59 07	250	37 48	297
	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
151	24 05	002	31 06	064	53 30	130	22 18	166	29 40	211	58 34	250	37 16	296
152	24 06	001	31 38	063	53 57	129	22 27	166	29 22	210	58 01	249	36 44	295
153	24 06	000	32 09	062	54 25	129	22 36	165	29 05	210	57 28	249	36 12	294
154	24 06	359	32 40	061	54 52	129	22 45	165	28 47	209	56 55	248	35 40	293
155	24 05	358	33 10	060	55 20	129	22 54	164	28 30	208	56 23	248	35 07	292
156	24 04	357	33 41	059	55 47	128	23 04	164	28 14	208	55 50	248	34 34	291
157	24 02	356	34 11	058	56 15	128	23 14	163	27 57	207	55 17	247	34 01	290
158	23 59	355	34 40	057	56 43	128	23 25	162	27 41	207	54 45	247	33 28	289
159	23 56	354	35 10	056	57 11	127	23 35	162	27 26	206	54 13	246	32 54	288
160	23 52	353	35 39	055	57 39	127	23 47	161	27 10	206	53 41	246	32 21	287
161	23 47	352	36 07	054	58 07	127	23 58	161	26 55	205	53 08	245	31 47	286
162	23 41	351	36 35	052	58 35	127	24 10	160	26 40	205	52 37	245	31 13	285
163	23 35	350	37 03	051	59 04	127	24 22	160	26 25	204	52 05	244	30 39	284
164	23 29	349	37 31	050	59 32	126	24 34	159	26 11	204	51 33	244	30 05	283
165	23 21	348	37 57	049	60 00	126	24 47	158	25 57	203	51 01	243	29 30	282
166	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		REGULUS	
167	38 24	048	25 22	101	25 00	158	25 43	203	50 30	243	28 56	282	23 14	346
168	38 50	047	25 57	100	25 14	157	25 30	202	49 59	242	28 21	281	23 05	345
169	39 16	046	26 32	099	25 27	157	25 17	201	49 28	242	27 46	280	22 56	344
170	39 41	045	27 07	098	25 41	156	25 04	201	48 57	241	27 12	279	22 46	343
171	40 05	044	27 41	098	25 56	156	24 52	200	48 26	241	26 37	278	22 35	342
172	40 29	042	28 16	097	26 10	155	24 40	200	47 55	240	26 02	277	22 24	341
173	40 53	041	28 51	096	26 25	155	24 28	199	47 25	240	25 27	276	22 13	340
174	41 16	040	29 27	095	26 41	154	24 16	199	46 54	239	24 52	276	22 01	339
175	41 38	039	30 02	095	26 56	154	24 05	198	46 24	239	24 17	275	21 48	338
176	42 00	038	30 37	094	27 12	153	23 55	198	45 54	238	23 41	274	21 34	337
177	42 21	036	31 12	093	27 28	152	23 44	197	45 24	238	23 06	273	21 20	336
178	42 41	035	31 47	092	27 45	152	23 34	196	44 54	237	22 31	272	21 06	335
179	43 01	034	32 23	091	28 01	151	23 24	196	44 24	237	21 56	271	20 50	334
180	43 21	033	32 58	091	28 18	151	23 15	195	43 55	236	21 21	271	20 35	333
181	43 39	031	33 33	090	28 36	150	23 05	195	43 26	236	20 45	270	20 19	332

LAT 54°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	43 57	030	34 08	089	28 53	150	22 57	194	42 57	235	60 23	273	20 02	331
181	44 15	029	34 44	088	29 11	149	22 48	194	42 28	235	59 48	272	19 44	330
182	44 31	027	35 19	087	29 29	149	22 40	193	41 59	234	59 13	271	19 26	329
183	44 47	026	35 54	087	29 48	148	22 32	192	41 30	234	58 37	270	19 08	328
184	45 02	025	36 29	086	30 06	148	22 25	192	41 02	233	58 02	270	18 49	327
185	45 16	023	37 04	085	30 25	147	22 18	191	40 34	233	57 27	269	18 30	326
186	45 30	022	37 39	084	30 45	147	22 11	191	40 06	232	56 52	268	18 10	325
187	45 43	021	38 14	083	31 04	146	22 05	190	39 38	232	56 16	267	17 49	324
188	45 55	019	38 49	082	31 24	146	21 59	190	39 10	231	55 41	267	17 29	323
189	46 06	018	39 24	081	31 44	145	21 53	189	38 43	231	55 06	266	17 07	322
190	46 16	016	39 59	081	32 04	145	21 48	188	38 15	230	54 31	265	16 45	321
191	46 26	015	40 34	080	32 25	144	21 43	188	37 48	230	53 56	264	16 23	320
192	46 35	014	41 09	079	32 46	144	21 38	187	37 22	229	53 21	264	16 00	319
193	46 42	012	41 43	078	33 07	143	21 34	187	36 55	229	52 46	263	15 37	318
194	46 50	011	42 18	077	33 28	143	21 30	186	36 28	228	52 11	262	15 14	318
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		Denebola	
195	15 05	019	42 52	076	33 50	142	21 26	186	36 02	228	51 36	261	19 53	342
196	15 16	018	43 26	075	34 11	142	21 23	185	35 36	227	51 01	261	19 42	341
197	15 26	017	44 00	074	34 33	141	21 20	184	35 10	227	50 26	260	19 30	340
198	15 36	016	44 34	073	34 56	141	21 17	184	34 45	226	49 51	259	19 18	339
199	15 45	015	45 07	072	35 18	140	21 15	183	34 20	226	49 17	259	19 05	338
200	15 54	014	45 41	071	35 41	140	21 13	183	33 54	225	48 42	258	18 51	337
201	16 02	013	46 14	070	36 04	139	21 12	182	33 30	225	48 08	257	18 37	336
202	16 10	012	46 47	069	36 27	139	21 11	181	33 05	224	47 33	257	18 23	335
203	16 17	011	47 20	068	36 50	138	21 10	181	32 41	224	46 59	256	18 07	334
204	16 23	010	47 53	067	37 14	138	21 10	180	32 16	223	46 25	255	17 52	333
205	16 29	009	48 25	066	37 38	137	21 10	180	31 52	222	45 51	255	17 35	332
206	16 34	008	48 57	065	38 02	137	21 10	179	31 29	222	45 17	254	17 19	331
207	16 38	007	49 29	064	38 26	136	21 11	179	31 05	221	44 43	253	17 01	330
208	16 42	006	50 00	063	38 51	136	21 12	178	30 42	221	44 09	253	16 43	329
209	16 46	005	50 31	061	39 15	135	21 13	177	30 19	220	43 36	252	16 25	328
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	16 49	004	51 02	060	39 40	135	21 15	177	29 57	220	43 02	252	46 42	348
211	16 51	003	51 33	059	40 05	134	21 17	176	29 34	219	42 29	251	46 35	346
212	16 52	002	52 03	058	40 31	134	21 20	176	29 12	219	41 56	250	46 26	345
213	16 53	001	52 32	057	40 56	133	21 22	175	28 50	218	41 22	250	46 16	344
214	16 54	000	53 01	055	41 22	133	21 26	175	28 28	218	40 49	249	46 06	342
215	16 53	359	53 30	054	41 48	133	21 29	174	28 07	217	40 17	248	45 55	341
216	16 53	358	53 59	053	42 14	132	21 33	173	27 46	216	39 44	248	45 43	339
217	16 51	357	54 27	052	42 40	132	21 37	173	27 25	216	39 11	247	45 30	338
218	16 49	356	54 54	050	43 06	131	21 42	172	27 05	215	38 39	247	45 16	337
219	16 46	355	55 21	049	43 33	131	21 47	172	26 45	215	38 07	246	45 02	335
220	16 43	354	55 47	047	44 00	130	21 52	171	26 25	214	37 35	245	44 47	334
221	16 39	353	56 13	046	44 27	130	21 58	170	26 05	214	37 03	245	44 31	333
222	16 35	352	56 38	045	44 54	129	22 04	170	25 46	213	36 31	244	44 14	331
223	16 30	351	57 02	043	45 21	129	22 10	169	25 27	212	35 59	243	43 57	330
224	16 24	350	57 26	042	45 49	129	22 17	169	25 08	212	35 28	243	43 39	329
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
225	57 49	040	39 00	082	46 16	128	22 24	168	24 49	211	34 56	242	43 21	327
226	58 12	039	39 34	081	46 44	128	22 31	168	24 31	211	34 25	242	43 01	326
227	58 33	037	40 09	080	47 12	127	22 39	167	24 13	210	33 54	241	42 41	325
228	58 54	036	40 44	079	47 40	127	22 47	166	23 56	210	33 24	240	42 21	324
229	59 14	034	41 18	078	48 09	126	22 56	166	23 38	209	32 53	240	42 00	322
230	59 33	032	41 53	077	48 37	126	23 04	165	23 22	208	32 23	239	41 38	321
231	59 52	031	42 27	076	49 06	126	23 13	165	23 05	208	31 53	238	41 15	320
232	60 09	029	43 01	075	49 34	125	23 23	164	22 49	207	31 23	238	40 52	319
233	60 26	027	43 35	074	50 03	125	23 33	164	22 33	207	30 53	237	40 29	318
234	60 42	025	44 09	073	50 32	124	23 43	163	22 17	206	30 23	237	40 05	316
235	60 56	024	44 43	072	51 01	124	23 53	163	22 02	205	29 54	236	39 40	315
236	61 10	022	45 16	071	51 31	124	24 04	162	21 47	205	29 25	235	39 15	314
237	61 22	020	45 50	070	52 00	123	24 15	161	21 32	204	28 56	235	38 50	313
238	61 34	018	46 23	069	52 30	123	24 26	161	21 18	204	28 27	234	38 24	312
239	61 45	016	46 56	068	52 59	122	24 38	160	21 04	203	27 59	234	37 57	311
	◆ ANTARES		Nunki		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA	
240	61 54	015	47 28	067	15 39	119	24 50	160	20 50	202	61 46	230	37 30	310
241	62 02	013	48 01	066	16 10	118	25 03	159	20 37	202	61 19	230	37 03	309
242	62 09	011	48 33	065	16 41	118	25 15	159	20 24	201	60 53	230	36 35	307
243	62 15	009	49 05	064	17 13	117	25 28	158	20 11	201	60 26	229	36 07	306
244	62 20	007	49 36	063	17 44	116	25 42	158	19 59	200	59 59	229	35 38	305
245	62 24	005	50 08	062	18 16	115	25 55	157	19 47	199	59 32	229	35 10	304
246	62 26	003	50 39	061	18 48	115	26 09	156	19 36	199	59 06	229	34 40	303
247	62 28	001	51 09	059	19 20	114	26 23	156	19 25	198	58 39	229	34 11	302
248	62 28	359	51 39	058	19 52	113	26 38	155	19 14	198	58 13	229	33 41	301
249	62 27	357	52 09	057	20 25	113	26 53	155	19 03	197	57 46	228	33 10	300
250	62 24	355	52 38	056	20 58	112	27 08	154	18 53	196	57 20	228	32 40	299
251	62 21	353	53 07	055	21 30	111	27 23	154	18 43	196	56 54	228	32 09	298
252	62 16	351	53 36	053	22 03	110	27 39	153	18 34	195	56 28	228	31 38	297
253	62 10	350	54 04	052	22 37	110	27 55	153	18 25	194	56 01	228	31 06	296
254	62 03	348	54 32	051	23 10	109	28 12	152	18 16	194	55 35	227	30 34	295
	ALTAIR		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA		◆ ANTARES	
255	17 28	045	23 43	108	28 28	152	18 08	193	55 10	227	30 02	294	61 55	346
256	17 53	044	24 17	107	28 45	151	18 00	193	54 44	227	29 30	293	61 46	344
257	18 17	043	24 51	107	29 02	151	17 53	192	54 18	227	28 58	293	61 36	342
258	18 41	042	25 24	106	29 20	150	17 45	191	53 53	226	28 25	292	61 24	340
259	19 04	041	25 58	105	29 38	150	17 39	191	53 27	226	27 52	291	61 12	338
260	19 27	040	26 33	104	29 56	149	17 32	190	53 02	226	27 19	290	60 59	337
261	19 50	039	27 07	104	30 14	148	17 26	190	52 36	226	26 46	289	60 44	335
262	20 12	038	27 41	103	30 32	148	17 21	189	52 11	225	26 12	288	60 29	333
263	20 33	037	28 15	102	30 51	147	17 15	188	51 46	225	25 38	287	60 12	331
264	20 54	036	28 50	102	31 10	147	17 11	188	51 21	225	25 05	286	59 55	330
265	21 15	035	29 25	101	31 30	146	17 06	187	50 57	224	24 31	285	59 37	328
266	21 35	034	29 59	100	31 49	146	17 02	186	50 32	224	23 57	284	59 17	326
267	21 54	033	30 34	099	32 09	145	16 58	186	50 07	224	23 22	284	58 57	325
268	22 13	032	31 09	099	32 29	145	16 55	185	49 43	224	22 48	283	58 37	323
269	22 32	031	31 44	098	32 50	144	16 52	184	49 19	223	22 14	282	58 15	322

LAT 54°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		RIGIL KENT		◆ SPICA		ANTARES	
270	22 50	030	32 19	097	33 11	144	16 49	184	63 02	235	21 39	281	57 53	320
271	23 07	029	32 54	096	33 31	143	16 47	183	62 33	235	21 04	280	57 30	319
272	23 24	028	33 29	095	33 53	143	16 45	183	62 04	235	20 30	279	57 06	317
273	23 40	027	34 04	095	34 14	142	16 44	182	61 35	235	19 55	278	56 42	316
274	23 56	026	34 39	094	34 36	142	16 43	181	61 07	234	19 20	278	56 17	314
275	24 11	025	35 14	093	34 57	141	16 42	181	60 38	234	18 45	277	55 51	313
276	24 26	024	35 50	092	35 20	141	16 42	180	60 09	234	18 10	276	55 25	311
277	24 40	023	36 25	092	35 42	140	16 42	179	59 41	234	17 35	275	54 58	310
278	24 53	022	37 00	091	36 05	140	16 43	179	59 13	234	16 59	274	54 31	309
279	25 06	021	37 35	090	36 27	139	16 44	178	58 44	233	16 24	273	54 03	307
280	25 18	020	38 11	089	36 50	139	16 45	178	58 16	233	15 49	273	53 35	306
281	25 30	019	38 46	088	37 14	139	16 47	177	57 48	233	15 14	272	53 06	305
282	25 40	017	39 21	087	37 37	138	16 49	176	57 20	233	14 39	271	52 37	304
283	25 51	016	39 56	087	38 01	138	16 52	176	56 52	232	14 03	270	52 07	302
284	26 00	015	40 32	086	38 25	137	16 54	175	56 24	232	13 28	269	51 37	301
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Rasalhague	
285	26 09	014	41 07	085	38 49	137	16 58	174	55 56	232	51 07	300	21 04	338
286	26 18	013	41 42	084	39 13	136	17 01	174	55 28	232	50 36	299	20 51	337
287	26 25	012	42 17	083	39 37	136	17 05	173	55 01	231	50 05	298	20 36	336
288	26 32	011	42 52	082	40 02	135	17 10	172	54 33	231	49 34	297	20 22	335
289	26 39	010	43 27	081	40 27	135	17 15	172	54 06	231	49 02	295	20 07	334
290	26 44	009	44 02	081	40 52	134	17 20	171	53 39	230	48 30	294	19 51	333
291	26 49	008	44 36	080	41 18	134	17 25	171	53 12	230	47 58	293	19 34	332
292	26 54	007	45 11	079	41 43	133	17 31	170	52 45	230	47 25	292	19 17	331
293	26 57	005	45 45	078	42 09	133	17 38	169	52 18	229	46 53	291	19 00	330
294	27 00	004	46 20	077	42 35	133	17 45	169	51 51	229	46 20	290	18 42	329
295	27 03	003	46 54	076	43 01	132	17 52	168	51 25	229	45 46	289	18 24	328
296	27 04	002	47 28	075	43 27	132	17 59	167	50 58	228	45 13	288	18 05	327
297	27 05	001	48 02	074	43 53	131	18 07	167	50 32	228	44 39	287	17 45	326
298	27 05	000	48 36	073	44 20	131	18 15	166	50 06	228	44 06	286	17 25	325
299	27 05	359	49 10	072	44 47	130	18 24	166	49 39	227	43 32	285	17 05	324
	FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki		◆ ALTAIR	
300	49 43	071	45 14	130	18 33	165	49 14	227	42 57	284	59 52	331	27 04	358
301	50 16	070	45 41	130	18 42	164	48 48	227	42 23	283	59 35	329	27 02	357
302	50 49	069	46 08	129	18 52	164	48 22	226	41 49	282	59 16	327	27 00	355
303	51 22	068	46 36	129	19 02	163	47 57	226	41 14	281	58 56	326	26 57	354
304	51 55	067	47 03	128	19 12	163	47 31	226	40 40	281	58 36	324	26 53	353
305	52 27	066	47 31	128	19 23	162	47 06	225	40 05	280	58 15	322	26 48	352
306	52 59	064	47 59	127	19 34	161	46 41	225	39 30	279	57 53	321	26 43	351
307	53 31	063	48 27	127	19 46	161	46 16	225	38 55	278	57 31	319	26 37	350
308	54 02	062	48 55	127	19 57	160	45 52	224	38 20	277	57 07	318	26 31	349
309	54 33	061	49 23	126	20 10	159	45 27	224	37 45	276	56 43	316	26 23	348
310	55 03	060	49 52	126	20 22	159	45 03	224	37 10	275	56 19	315	26 16	347
311	55 34	058	50 21	125	20 35	158	44 38	223	36 35	274	55 53	314	26 07	346
312	56 04	057	50 50	125	20 48	158	44 14	223	36 00	274	55 28	312	25 58	344
313	56 33	056	51 18	125	21 02	157	43 51	222	35 25	273	55 01	311	25 48	343
314	57 02	055	51 48	124	21 16	156	43 27	222	34 49	272	54 34	309	25 38	342
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
315	57 30	053	52 17	124	21 30	156	43 03	222	34 14	271	54 07	308	25 27	341
316	57 58	052	52 46	123	21 45	155	42 40	221	33 39	270	53 39	307	25 15	340
317	58 26	050	53 16	123	22 00	155	42 17	221	33 04	269	53 10	306	25 03	339
318	58 53	049	53 45	123	22 15	154	41 54	220	32 28	269	52 41	304	24 50	338
319	59 19	047	54 15	122	22 30	153	41 31	220	31 53	268	52 12	303	24 36	337
320	59 45	046	54 45	122	22 46	153	41 09	220	31 18	267	51 42	302	24 22	336
321	60 10	044	55 15	122	23 03	152	40 47	219	30 43	266	51 12	301	24 08	335
322	60 34	043	55 45	121	23 19	152	40 24	219	30 07	266	50 42	299	23 52	334
323	60 58	041	56 15	121	23 36	151	40 02	218	29 32	265	50 11	298	23 36	333
324	61 21	040	56 45	121	23 53	151	39 41	218	28 57	264	49 39	297	23 20	332
325	61 43	038	57 16	120	24 11	150	39 19	217	28 22	263	49 08	296	23 03	331
326	62 04	036	57 46	120	24 29	149	38 58	217	27 47	262	48 36	295	22 46	330
327	62 25	035	58 17	119	24 47	149	38 37	217	27 12	262	48 04	294	22 27	329
328	62 44	033	58 48	119	25 05	148	38 16	216	26 37	261	47 32	293	22 09	328
329	63 03	031	59 19	119	25 24	148	37 55	216	26 03	260	46 59	292	21 50	327
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
330	63 21	029	59 50	118	25 43	147	37 35	215	25 28	259	46 26	291	21 30	326
331	63 37	027	60 21	118	26 02	147	37 14	215	24 53	259	45 53	290	21 10	325
332	63 53	026	60 52	118	26 22	146	36 54	214	24 19	258	45 20	289	20 49	324
333	64 08	024	61 23	118	26 42	145	36 35	214	23 44	257	44 46	288	20 28	323
334	64 21	022	61 54	117	27 02	145	36 15	213	23 10	256	44 13	287	20 06	322
335	64 34	020	62 26	117	27 22	144	35 56	213	22 36	256	43 39	286	19 44	321
336	64 45	018	62 57	117	27 43	144	35 37	213	22 02	255	43 05	285	19 22	320
337	64 55	016	63 29	116	28 04	143	35 18	212	21 28	254	42 31	284	18 59	319
338	65 04	014	64 01	116	28 25	143	34 59	212	20 54	253	41 56	283	18 35	318
339	65 12	012	64 32	116	28 47	142	34 41	211	20 20	253	41 22	282	18 11	317
340	65 19	010	65 04	115	29 09	141	34 22	211	19 47	252	40 47	281	17 47	316
341	65 24	008	65 36	115	29 31	141	34 05	210	19 13	251	40 13	280	17 22	315
342	65 28	005	66 08	115	29 53	140	33 47	210	18 40	250	39 38	279	16 57	314
343	65 31	003	66 40	115	30 16	140	33 30	209	18 07	250	39 03	278	16 32	313
344	65 32	001	67 12	114	30 39	139	33 12	209	17 34	249	38 28	278	16 06	312
	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		FOMALHAUT	
345	48 41	039	48 30	096	31 02	139	35 17	169	32 55	208	37 53	277	65 32	359
346	49 03	038	49 05	095	31 25	138	35 24	169	32 39	208	37 18	276	65 31	357
347	49 24	037	49 40	094	31 49	138	35 31	168	32 22	207	36 43	275	65 29	355
348	49 45	035	50 16	094	32 13	137	35 38	168	32 06	207	36 08	274	65 25	353
349	50 05	034	50 51	093	32 37	137	35 46	167	31 50	206	35 33	273	65 20	351
350	50 24	032	51 26	092	33 01	136	35 53	167	31 35	206	34 57	272	65 14	349
351	50 43	031	52 01	091	33 26	135	36 01	167	31 20	206	34 22	272	65 06	347
352	51 01	030	52 36	091	33 51	135	36 10	166	31 04	205	33 47	271	64 58	345
353	51 18	028	53 12	090	34 16	134	36 18	166	30 50	205	33 12	270	64 48	343
354	51 34	027	53 47	089	34 41	134	36 27	165	30 35	204	32 36	269	64 37	341
355	51 50	025	54 22	088	35 07	133	36 36	165	30 21	204	32 01	268	64 25	339
356	52 04	024	54 58	087	35 33	133	36 45	165	30 07	203	31 26	268	64 11	337
357	52 18	022	55 33	086	35 59	132	36 54	164	29 53	203	30 51	267	63 57	335
358	52 31	021	56 08	086	36 25	132	37 04	164	29 40	202	30 15	266	63 41	333
359	52 43	019	56 43	085	36 51	131	37 14	164	29 27	202	29 40	265	63 25	331

Tilbage til Menuen

LAT 55°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Diphda		◆ RIGEL		CANOPUS		Miaplacidus		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	51 57	017	13 06	086	37 57	130	38 21	163	30 10	201	60 47	244	62 15	330
1	52 07	016	13 41	085	38 23	130	38 32	163	29 58	201	60 16	244	61 58	329
2	52 16	014	14 15	084	38 50	129	38 42	162	29 46	200	59 45	244	61 39	327
3	52 24	013	14 49	083	39 16	129	38 53	162	29 34	200	59 15	243	61 20	325
4	52 31	011	15 23	082	39 43	128	39 03	161	29 22	199	58 44	243	61 00	323
5	52 37	010	15 57	081	40 11	128	39 15	161	29 11	199	58 13	243	60 39	322
6	52 42	008	16 31	081	40 38	127	39 26	161	29 00	198	57 43	242	60 18	320
7	52 46	006	17 05	080	41 06	126	39 37	160	28 50	198	57 13	242	59 55	319
8	52 50	005	17 39	079	41 33	126	39 49	160	28 39	197	56 42	241	59 32	317
9	52 52	003	18 13	078	42 01	125	40 01	160	28 29	197	56 12	241	59 08	316
10	52 54	002	18 46	077	42 29	125	40 13	159	28 20	196	55 42	241	58 44	314
11	52 54	000	19 20	076	42 58	124	40 25	159	28 10	196	55 12	240	58 19	313
12	52 54	359	19 53	075	43 26	124	40 38	158	28 01	195	54 42	240	57 53	311
13	52 53	357	20 26	074	43 55	123	40 51	158	27 52	195	54 13	239	57 27	310
14	52 50	355	20 59	074	44 24	123	41 04	158	27 44	194	53 43	239	57 00	308
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
15	21 32	073	15 39	097	44 53	122	27 36	193	53 14	238	56 33	307	52 47	354
16	22 05	072	16 14	096	45 22	122	27 28	193	52 45	238	56 05	306	52 43	352
17	22 38	071	16 48	095	45 51	121	27 20	192	52 15	238	55 37	304	52 38	351
18	23 10	070	17 22	095	46 21	121	27 13	192	51 46	237	55 09	303	52 32	349
19	23 42	069	17 57	094	46 50	120	27 06	191	51 18	237	54 40	302	52 25	348
20	24 15	068	18 31	093	47 20	120	26 59	191	50 49	236	54 10	301	52 17	346
21	24 46	067	19 05	092	47 50	119	26 53	190	50 20	236	53 40	299	52 08	345
22	25 18	066	19 40	091	48 20	119	26 47	190	49 52	236	53 10	298	51 59	343
23	25 49	065	20 14	090	48 50	118	26 41	189	49 24	235	52 40	297	51 48	341
24	26 21	065	20 48	090	49 21	118	26 36	189	48 55	235	52 09	296	51 37	340
25	26 52	064	21 23	089	49 51	117	26 31	188	48 27	234	51 38	295	51 25	338
26	27 22	063	21 57	088	50 22	117	26 26	188	48 00	234	51 06	294	51 11	337
27	27 53	062	22 32	087	50 53	116	26 22	187	47 32	233	50 35	293	50 58	336
28	28 23	061	23 06	086	51 24	116	26 18	187	47 04	233	50 03	291	50 43	334
29	28 53	060	23 40	086	51 55	115	26 14	186	46 37	232	49 31	290	50 28	333
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
30	29 22	059	24 15	085	52 26	115	26 10	185	46 10	232	48 58	289	50 11	331
31	29 52	058	24 49	084	52 57	114	26 07	185	45 43	232	48 26	288	49 54	330
32	30 21	057	25 23	083	53 29	114	26 05	184	45 16	231	47 53	287	49 37	328
33	30 49	056	25 57	082	54 00	113	26 02	184	44 49	231	47 20	286	49 18	327
34	31 17	055	26 31	081	54 32	113	26 00	183	44 23	230	46 47	285	48 59	326
35	31 45	054	27 05	080	55 04	112	25 58	183	43 56	230	46 14	284	48 39	324
36	32 13	053	27 39	080	55 36	112	25 57	182	43 30	229	45 40	283	48 19	323
37	32 40	052	28 13	079	56 08	111	25 55	182	43 04	229	45 07	282	47 58	322
38	33 07	051	28 47	078	56 40	111	25 55	181	42 39	228	44 33	282	47 36	320
39	33 33	050	29 20	077	57 12	110	25 54	181	42 13	228	43 59	281	47 14	319
40	33 59	048	29 54	076	57 44	110	25 54	180	41 48	227	43 25	280	46 51	318
41	34 25	047	30 27	075	58 17	109	25 54	180	41 22	227	42 51	279	46 28	316
42	34 50	046	31 00	074	58 49	109	25 54	179	40 57	226	42 17	278	46 04	315
43	35 14	045	31 33	073	59 22	108	25 55	178	40 33	226	41 43	277	45 39	314
44	35 39	044	32 06	072	59 55	108	25 56	178	40 08	225	41 09	276	45 14	313
	RIGEL		◆ SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
45	36 02	043	32 39	071	60 28	107	25 58	177	39 43	225	40 35	275	44 49	312
46	36 25	042	33 11	070	61 01	107	25 59	177	39 19	224	40 01	274	44 23	310
47	36 48	041	33 44	070	61 34	106	26 01	176	38 55	224	39 26	274	43 56	309
48	37 10	040	34 16	069	62 07	105	26 04	176	38 31	224	38 52	273	43 29	308
49	37 32	038	34 48	068	62 40	105	26 06	175	38 08	223	38 17	272	43 02	307
50	37 53	037	35 19	067	63 13	104	26 09	175	37 45	223	37 43	271	42 34	306
51	38 14	036	35 51	066	63 47	104	26 13	174	37 21	222	37 09	270	42 06	305
52	38 34	035	36 22	065	64 20	103	26 16	174	36 58	222	36 34	269	41 38	304
53	38 53	034	36 53	064	64 54	103	26 20	173	36 36	221	36 00	269	41 09	302
54	39 12	032	37 24	063	65 27	102	26 25	173	36 13	221	35 25	268	40 40	301
55	39 30	031	37 54	062	66 01	102	26 29	172	35 51	220	34 51	267	40 10	300
56	39 47	030	38 24	061	66 35	101	26 34	171	35 29	220	34 17	266	39 40	299
57	40 04	029	38 54	060	67 09	101	26 40	171	35 07	219	33 42	265	39 10	298
58	40 20	027	39 24	058	67 42	100	26 45	170	34 46	219	33 08	265	38 39	297
59	40 36	026	39 53	057	68 16	099	26 51	170	34 24	218	32 34	264	38 09	296
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
60	40 51	025	40 22	056	41 02	110	26 57	169	34 03	218	32 00	263	37 38	295
61	41 05	024	40 50	055	41 34	110	27 04	169	33 42	217	31 26	262	37 06	294
62	41 18	022	41 18	054	42 06	109	27 11	168	33 22	216	30 51	261	36 35	293
63	41 31	021	41 46	053	42 39	108	27 18	168	33 01	216	30 17	261	36 03	292
64	41 43	020	42 13	052	43 12	108	27 25	167	32 41	215	29 44	260	35 31	291
65	41 54	019	42 40	051	43 45	107	27 33	167	32 22	215	29 10	259	34 59	290
66	42 05	017	43 06	050	44 18	106	27 41	166	32 02	214	28 36	258	34 26	289
67	42 15	016	43 32	048	44 51	106	27 50	166	31 43	214	28 02	258	33 54	288
68	42 24	015	43 58	047	45 24	105	27 58	165	31 24	213	27 29	257	33 21	287
69	42 32	013	44 23	046	45 57	104	28 07	165	31 05	213	26 55	256	32 48	286
70	42 40	012	44 47	045	46 30	104	28 17	164	30 46	212	26 22	255	32 15	286
71	42 46	011	45 11	044	47 04	103	28 26	164	30 28	212	25 49	255	31 42	285
72	42 52	009	45 35	042	47 38	102	28 36	163	30 10	211	25 16	254	31 08	284
73	42 57	008	45 58	041	48 11	102	28 46	162	29 52	211	24 42	253	30 35	283
74	43 02	007	46 20	040	48 45	101	28 57	162	29 35	210	24 10	252	30 01	282
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		ACHERNAR		◆ Diphda	
75	43 05	005	46 42	038	49 19	100	29 08	161	29 18	210	62 25	245	29 28	281
76	43 08	004	47 03	037	49 53	100	29 19	161	29 01	209	61 54	244	28 54	280
77	43 10	002	47 23	036	50 27	099	29 30	160	28 44	209	61 23	244	28 20	279
78	43 11	001	47 43	035	51 01	098	29 42	160	28 28	208	60 52	243	27 46	278
79	43 11	000	48 02	033	51 35	097	29 54	159	28 12	207	60 22	243	27 12	278
80	43 11	358	48 21	032	52 09	097	30 06	159	27 56	207	59 51	243	26 38	277
81	43 09	357	48 38	030	52 43	096	30 19	158	27 41	206	59 21	242	26 03	276
82	43 07	356	48 55	029	53 17	095	30 31	158	27 26	206	58 50	242	25 29	275
83	43 04	354	49 12	028	53 52	095	30 44	157	27 11	205	58 20	242	24 55	274
84	43 00	353	49 27	026	54 26	094	30 58	157	26 56	205	57 50	241	24 21	273
85	42 56	352	49 42	025	55 00	093	31 12	156	26 42	204	57 19	241	23 46	272
86	42 50	350	49 56	023	55 35	092	31 25	156	26 28	204	56 49	240	23 12	272
87	42 44	349	50 09	022	56 09	091	31 40	155	26 15	203	56 20	240	22 37	271
88	42 37	348	50 22	020	56 43	091	31 54	155	26 01	202	55 50	240	22 03	270
89	42 29	346	50 33	019	57 18	090	32 09	154	25 48	202	55 20	239	21 29	269

LAT 55°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	PROCYON		◆ Suhail		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL		BETELGEUSE	
90	26 20	028	57 52	089	32 24	154	25 36	201	54 51	239	42 21	345	27 35	359
91	26 36	027	58 27	088	32 39	153	25 23	201	54 21	239	42 11	344	27 34	358
92	26 51	026	59 01	087	32 55	153	25 11	200	53 52	238	42 01	342	27 32	357
93	27 06	025	59 35	086	33 11	152	24 59	200	53 23	238	41 50	341	27 30	356
94	27 20	024	60 10	086	33 27	152	24 48	199	52 54	237	41 39	340	27 27	354
95	27 34	023	60 44	085	33 43	151	24 37	199	52 25	237	41 27	338	27 23	353
96	27 47	022	61 18	084	34 00	151	24 26	198	51 56	236	41 13	337	27 19	352
97	27 59	020	61 52	083	34 16	150	24 16	197	51 27	236	41 00	336	27 14	351
98	28 11	019	62 27	082	34 33	150	24 06	197	50 59	236	40 45	335	27 08	350
99	28 22	018	63 01	081	34 51	150	23 56	196	50 31	235	40 30	333	27 02	349
100	28 32	017	63 34	080	35 08	149	23 46	196	50 02	235	40 14	332	26 55	348
101	28 42	016	64 08	079	35 26	149	23 37	195	49 34	234	39 58	331	26 47	347
102	28 51	015	64 42	078	35 44	148	23 29	194	49 06	234	39 41	330	26 39	346
103	28 59	014	65 16	077	36 03	148	23 20	194	48 39	234	39 23	328	26 30	344
104	29 07	013	65 49	075	36 21	147	23 12	193	48 11	233	39 05	327	26 21	343
	PROCYON		REGULUS		◆ Gienah		RIGIL KENT		◆ ACHERNAR		RIGEL		◆ SIRIUS	
105	29 14	011	12 14	047	20 33	092	36 40	147	47 44	233	38 46	326	51 38	355
106	29 21	010	12 39	046	21 07	091	36 59	146	47 16	232	38 26	325	51 35	353
107	29 27	009	13 04	046	21 42	090	37 18	146	46 49	232	38 06	324	51 30	351
108	29 32	008	13 28	045	22 16	089	37 38	145	46 22	231	37 45	322	51 24	350
109	29 36	007	13 52	044	22 50	088	37 57	145	45 55	231	37 24	321	51 18	348
110	29 40	006	14 16	043	23 25	088	38 17	144	45 29	230	37 02	320	51 11	347
111	29 43	005	14 39	042	23 59	087	38 37	144	45 02	230	36 40	319	51 02	345
112	29 46	003	15 02	041	24 34	086	38 58	144	44 36	230	36 17	318	50 53	344
113	29 47	002	15 24	040	25 08	085	39 18	143	44 10	229	35 54	317	50 43	342
114	29 49	001	15 46	039	25 42	084	39 39	143	43 44	229	35 30	316	50 32	341
115	29 49	000	16 07	038	26 16	083	40 00	142	43 18	228	35 05	314	50 21	339
116	29 49	359	16 28	037	26 50	082	40 21	142	42 53	228	34 41	313	50 08	338
117	29 48	358	16 49	036	27 25	082	40 43	141	42 27	227	34 15	312	49 55	337
118	29 46	357	17 09	035	27 59	081	41 04	141	42 02	227	33 50	311	49 41	335
119	29 43	355	17 29	034	28 33	080	41 26	140	41 37	226	33 23	310	49 26	334
120	17 48	033	14 03	090	41 48	140	21 49	184	41 13	226	32 57	309	49 10	332
121	18 06	032	14 38	089	42 10	140	21 47	183	40 48	225	32 30	308	48 54	331
122	18 25	031	15 12	088	42 33	139	21 45	183	40 24	225	32 03	307	48 37	329
123	18 42	030	15 46	087	42 55	139	21 44	182	39 59	224	31 35	306	48 19	328
124	18 59	029	16 21	086	43 18	138	21 42	182	39 35	224	31 07	305	48 00	327
125	19 16	028	16 55	085	43 41	138	21 42	181	39 12	223	30 39	304	47 41	325
126	19 32	027	17 29	085	44 04	138	21 41	180	38 48	223	30 10	303	47 21	324
127	19 48	026	18 04	084	44 27	137	21 41	180	38 25	223	29 41	302	47 01	323
128	20 03	025	18 38	083	44 51	137	21 41	179	38 01	222	29 11	301	46 39	321
129	20 17	024	19 12	082	45 14	136	21 42	179	37 39	222	28 42	300	46 18	320
130	20 31	023	19 46	081	45 38	136	21 43	178	37 16	221	28 12	299	45 55	319
131	20 44	022	20 20	080	46 02	136	21 44	177	36 53	221	27 41	298	45 32	318
132	20 57	021	20 54	080	46 27	135	21 46	177	36 31	220	27 11	297	45 09	316
133	21 09	020	21 28	079	46 51	135	21 48	176	36 09	220	26 40	296	44 45	315
134	21 21	019	22 01	078	47 15	134	21 51	176	35 47	219	26 09	295	44 20	314
	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
135	21 32	018	22 35	077	47 40	134	21 53	175	35 26	219	67 13	260	43 55	313
136	21 43	017	23 08	076	48 05	134	21 56	175	35 04	218	66 40	259	43 30	312
137	21 52	016	23 42	075	48 30	133	22 00	174	34 43	218	66 06	258	43 04	310
138	22 02	015	24 15	074	48 55	133	22 04	173	34 22	217	65 32	258	42 37	309
139	22 10	014	24 48	073	49 20	132	22 08	173	34 02	217	64 59	257	42 11	308
140	22 18	013	25 21	073	49 46	132	22 12	172	33 41	216	64 25	257	41 43	307
141	22 26	012	25 54	072	50 12	132	22 17	172	33 21	216	63 52	256	41 15	306
142	22 33	011	26 26	071	50 37	131	22 23	171	33 01	215	63 18	256	40 47	305
143	22 39	010	26 59	070	51 03	131	22 28	170	32 42	215	62 45	255	40 19	304
144	22 44	009	27 31	069	51 29	131	22 34	170	32 22	214	62 12	255	39 50	303
145	22 49	008	28 03	068	51 55	130	22 40	169	32 03	213	61 38	254	39 21	301
146	22 54	007	28 35	067	52 22	130	22 47	169	31 44	213	61 05	254	38 51	300
147	22 57	006	29 06	066	52 48	130	22 54	168	31 26	212	60 32	253	38 21	299
148	23 01	005	29 37	065	53 15	129	23 01	167	31 07	212	60 00	253	37 51	298
149	23 03	004	30 09	064	53 41	129	23 09	167	30 49	211	59 27	252	37 21	297
	◆ REGULUS		SPICA		◆ RIGIL KENT		Peacock		ACHERNAR		◆ CANOPUS		SIRIUS	
150	23 05	002	30 39	063	54 08	129	23 17	166	30 32	211	58 54	251	36 50	296
151	23 06	001	31 10	062	54 35	128	23 25	166	30 14	210	58 22	251	36 19	295
152	23 06	000	31 40	061	55 02	128	23 34	165	29 57	210	57 49	250	35 48	294
153	23 06	359	32 10	060	55 29	128	23 43	165	29 40	209	57 17	250	35 16	293
154	23 05	358	32 40	059	55 57	127	23 52	164	29 23	209	56 44	249	34 45	292
155	23 04	357	33 09	058	56 24	127	24 02	163	29 07	208	56 12	249	34 13	291
156	23 02	356	33 39	057	56 52	127	24 12	163	28 51	208	55 40	248	33 41	290
157	22 59	355	34 07	056	57 19	127	24 22	162	28 35	207	55 08	248	33 08	289
158	22 56	354	34 36	055	57 47	126	24 32	162	28 19	207	54 36	247	32 36	288
159	22 52	353	35 04	054	58 15	126	24 43	161	28 04	206	54 05	247	32 03	288
160	22 47	352	35 31	053	58 43	126	24 55	161	27 49	205	53 33	246	31 30	287
161	22 42	351	35 59	052	59 11	125	25 06	160	27 34	205	53 02	246	30 57	286
162	22 36	350	36 26	051	59 39	125	25 18	159	27 20	204	52 30	245	30 24	285
163	22 30	349	36 52	050	60 07	125	25 30	159	27 06	204	51 59	245	29 50	284
164	22 23	348	37 18	049	60 35	125	25 43	158	26 52	203	51 28	244	29 17	283
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		REGULUS	
165	37 44	048	25 33	100	25 56	158	26 39	203	50 57	244	28 43	282	22 15	347
166	38 09	046	26 07	100	26 09	157	26 26	202	50 26	243	28 10	281	22 07	346
167	38 34	045	26 41	099	26 23	157	26 13	202	49 56	243	27 36	280	21 58	344
168	38 58	044	27 15	098	26 36	156	26 00	201	49 25	242	27 02	280	21 48	343
169	39 21	043	27 49	097	26 50	156	25 48	201	48 55	242	26 28	279	21 38	342
170	39 45	042	28 23	096	27 05	155	25 36	200	48 24	241	25 54	278	21 28	341
171	40 07	041	28 58	096	27 20	154	25 25	199	47 54	241	25 20	277	21 16	340
172	40 29	039	29 32	095	27 35	154	25 13	199	47 24	240	24 46	276	21 04	339
173	40 51	038	30 06	094	27 50	153	25 02	198	46 54	240	24 11	275	20 52	338
174	41 12	037	30 41	093	28 05	153	24 52	198	46 25	239	23 37	274	20 39	337
175	41 32	036	31 15	092	28 21	152	24 41	197	45 55	239	23 03	274	20 25	336
176	41 52	035	31 49	092	28 38	152	24 31	197	45 26	238	22 28	273	20 11	335
177	42 11	033	32 24	091	28 54	151	24 22	196	44 57	238	21 54	272	19 56	334
178	42 30	032	32 58	090	29 11	151	24 12	195	44 28	237	21 20	271	19 41	333
179	42 48	031	33 33	089	29 28	150	24 04	195	43 59	237	20 45	270	19 25	332

Tilbage til Menuen

LAT 55°S

LAT 55°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		REGULUS	
180	43 05	029	34 07	088	29 45	150	23 55	194	43 30	236	60 19	275	19 09	331
181	43 22	028	34 41	088	30 03	149	23 47	194	43 02	236	59 45	274	18 52	330
182	43 38	027	35 16	087	30 21	148	23 39	193	42 33	235	59 10	273	18 35	329
183	43 53	026	35 50	086	30 39	148	23 31	193	42 05	235	58 36	272	18 17	328
184	44 07	024	36 24	085	30 57	147	23 24	192	41 37	234	58 02	271	17 59	327
185	44 21	023	36 59	084	31 16	147	23 17	191	41 10	234	57 27	270	17 40	326
186	44 34	022	37 33	083	31 35	146	23 10	191	40 42	233	56 53	270	17 21	325
187	44 46	020	38 07	082	31 54	146	23 04	190	40 15	233	56 18	269	17 01	324
188	44 58	019	38 41	081	32 13	145	22 58	190	39 47	232	55 44	268	16 40	323
189	45 09	018	39 15	081	32 33	145	22 52	189	39 20	231	55 10	267	16 20	322
190	45 19	016	39 49	080	32 53	144	22 47	189	38 53	231	54 35	266	15 59	321
191	45 28	015	40 23	079	33 13	144	22 42	188	38 27	230	54 01	266	15 37	321
192	45 36	013	40 56	078	33 34	143	22 37	187	38 00	230	53 27	265	15 15	320
193	45 44	012	41 30	077	33 55	143	22 33	187	37 34	229	52 52	264	14 52	319
194	45 51	011	42 03	076	34 16	142	22 29	186	37 08	229	52 18	263	14 29	318
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		Denebola	
195	14 08	019	42 37	075	34 37	142	22 26	186	36 42	228	51 44	263	18 56	342
196	14 18	018	43 10	074	34 58	141	22 23	185	36 17	228	51 10	262	18 45	341
197	14 28	017	43 43	073	35 20	141	22 20	184	35 51	227	50 36	261	18 34	340
198	14 38	016	44 16	072	35 42	140	22 17	184	35 26	227	50 02	261	18 22	339
199	14 47	015	44 48	071	36 04	140	22 15	183	35 01	226	49 28	260	18 09	338
200	14 56	014	45 21	070	36 26	139	22 13	183	34 37	226	48 54	259	17 56	337
201	15 03	013	45 53	069	36 49	139	22 12	182	34 12	225	48 20	258	17 42	336
202	15 11	012	46 25	068	37 12	138	22 11	182	33 48	225	47 47	258	17 28	335
203	15 18	011	46 57	067	37 35	138	22 10	181	33 24	224	47 13	257	17 13	334
204	15 24	010	47 29	066	37 58	137	22 10	180	33 00	223	46 40	256	16 58	333
205	15 29	009	48 00	065	38 22	137	22 10	180	32 37	223	46 06	256	16 42	332
206	15 34	008	48 31	064	38 45	136	22 10	179	32 13	222	45 33	255	16 26	331
207	15 39	007	49 02	063	39 09	136	22 11	179	31 50	222	45 00	254	16 09	330
208	15 43	006	49 32	062	39 33	135	22 12	178	31 27	221	44 27	254	15 52	329
209	15 46	005	50 02	060	39 58	135	22 13	177	31 05	221	43 54	253	15 34	328
	◆ ARCTURUS		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ Suhail		SPICA	
210	15 49	004	50 32	059	40 22	134	22 15	177	30 43	220	43 21	252	45 44	348
211	15 51	003	51 01	058	40 47	134	22 17	176	30 21	220	42 48	252	45 36	347
212	15 52	002	51 30	057	41 12	133	22 19	176	29 59	219	42 15	251	45 28	345
213	15 53	001	51 59	056	41 37	133	22 22	175	29 37	218	41 43	250	45 19	344
214	15 54	000	52 27	054	42 02	132	22 25	174	29 16	218	41 11	250	45 09	342
215	15 53	359	52 55	053	42 28	132	22 29	174	28 55	217	40 38	249	44 58	341
216	15 53	358	53 22	052	42 54	131	22 33	173	28 34	217	40 06	249	44 46	340
217	15 51	357	53 49	050	43 20	131	22 37	173	28 14	216	39 34	248	44 34	338
218	15 49	356	54 15	049	43 46	131	22 41	172	27 54	216	39 02	247	44 21	337
219	15 47	355	54 41	048	44 12	130	22 46	172	27 34	215	38 31	247	44 07	336
220	15 43	354	55 06	046	44 38	130	22 51	171	27 14	214	37 59	246	43 53	334
221	15 40	353	55 31	045	45 05	129	22 57	170	26 55	214	37 28	245	43 38	333
222	15 35	352	55 55	044	45 32	129	23 03	170	26 36	213	36 57	245	43 22	332
223	15 30	351	56 18	042	45 59	128	23 09	169	26 17	213	36 26	244	43 05	331
224	15 25	350	56 41	041	46 26	128	23 16	169	25 59	212	35 55	243	42 48	329
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
225	57 03	039	38 50	081	46 53	127	23 23	168	25 41	212	35 24	243	42 30	328
226	57 24	038	39 24	080	47 21	127	23 30	168	25 23	211	34 54	242	42 11	327
227	57 45	036	39 58	079	47 48	126	23 37	167	25 05	210	34 23	242	41 52	325
228	58 05	035	40 32	078	48 16	126	23 45	166	24 48	210	33 53	241	41 32	324
229	58 24	033	41 06	077	48 44	126	23 54	166	24 31	209	33 23	240	41 12	323
230	58 42	031	41 39	076	49 12	125	24 02	165	24 14	209	32 53	240	40 51	322
231	59 00	030	42 12	075	49 40	125	24 11	165	23 58	208	32 24	239	40 29	321
232	59 17	028	42 46	074	50 09	124	24 21	164	23 42	207	31 54	238	40 07	319
233	59 32	026	43 19	073	50 37	124	24 30	164	23 26	207	31 25	238	39 44	318
234	59 47	025	43 52	072	51 06	123	24 40	163	23 11	206	30 56	237	39 21	317
235	60 01	023	44 24	071	51 35	123	24 50	162	22 56	206	30 27	236	38 58	316
236	60 14	021	44 57	070	52 03	123	25 01	162	22 41	205	29 59	236	38 33	315
237	60 26	019	45 29	069	52 33	122	25 12	161	22 27	204	29 30	235	38 09	314
238	60 37	018	46 01	068	53 02	122	25 23	161	22 13	204	29 02	235	37 43	312
239	60 47	016	46 33	067	53 31	121	25 35	160	21 59	203	28 34	234	37 18	311
	◆ ANTARES		Nunki		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA	
240	60 56	014	47 05	066	16 08	119	25 46	160	21 46	203	62 25	231	36 52	310
241	61 04	012	47 36	065	16 39	118	25 59	159	21 33	202	61 58	231	36 25	309
242	61 10	010	48 07	064	17 09	117	26 11	158	21 20	201	61 31	231	35 58	308
243	61 16	009	48 38	063	17 40	117	26 24	158	21 08	201	61 04	231	35 31	307
244	61 21	007	49 09	062	18 11	116	26 37	157	20 55	200	60 38	231	35 03	306
245	61 24	005	49 39	061	18 42	115	26 50	157	20 44	200	60 11	230	34 35	305
246	61 26	003	50 09	060	19 13	114	27 04	156	20 32	199	59 45	230	34 07	304
247	61 28	001	50 38	058	19 44	114	27 18	156	20 22	198	59 18	230	33 38	303
248	61 28	359	51 07	057	20 16	113	27 32	155	20 11	198	58 52	230	33 09	302
249	61 27	357	51 36	056	20 48	112	27 47	155	20 01	197	58 26	230	32 40	301
250	61 25	355	52 04	055	21 20	111	28 02	154	19 51	196	58 00	229	32 10	300
251	61 21	354	52 32	054	21 52	111	28 17	154	19 41	196	57 33	229	31 40	299
252	61 17	352	53 00	052	22 24	110	28 33	153	19 32	195	57 07	229	31 10	298
253	61 11	350	53 27	051	22 57	109	28 48	152	19 23	195	56 42	229	30 39	297
254	61 05	348	53 53	050	23 29	108	29 05	152	19 15	194	56 16	228	30 08	296
	ALTAIR		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA		◆ ANTARES	
255	16 46	045	24 02	108	29 21	151	19 06	193	55 50	228	29 37	295	60 57	346
256	17 10	044	24 35	107	29 38	151	18 59	193	55 24	228	29 06	294	60 48	344
257	17 33	043	25 08	106	29 54	150	18 51	192	54 59	228	28 34	293	60 39	343
258	17 56	042	25 41	105	30 12	150	18 44	191	54 33	227	28 03	292	60 28	341
259	18 19	041	26 14	105	30 29	149	18 38	191	54 08	227	27 31	291	60 16	339
260	18 41	040	26 47	104	30 47	149	18 31	190	53 43	227	26 58	290	60 03	337
261	19 03	039	27 21	103	31 05	148	18 25	190	53 18	227	26 26	289	59 50	336
262	19 24	038	27 54	102	31 23	148	18 20	189	52 53	226	25 53	288	59 35	334
263	19 45	037	28 28	102	31 42	147	18 15	188	52 28	226	25 21	287	59 19	332
264	20 06	036	29 02	101	32 01	147	18 10	188	52 04	226	24 48	287	59 03	331
265	20 26	035	29 35	100	32 20	146	18 06	187	51 39	225	24 15	286	58 45	329
266	20 45	034	30 09	099	32 39	146	18 02	186	51 15	225	23 42	285	58 27	327
267	21 04	033	30 43	099	32 59	145	17 58	186	50 50	225	23 08	284	58 08	326
268	21 23	032	31 17	098	33 18	145	17 55	185	50 26	224	22 35	283	57 48	324
269	21 40	031	31 52	097	33 38	144	17 52	184	50 02	224	22 01	282	57 28	323

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		RIGIL KENT		◆ SPICA		ANTARES	
270	21 58	030	32 26	096	33 59	144	17 49	184	63 35	237	21 27	281	57 07	321
271	22 15	029	33 00	096	34 19	143	17 47	183	63 07	237	20 54	280	56 45	320
272	22 31	028	33 34	095	34 40	142	17 45	183	62 38	236	20 20	280	56 22	318
273	22 47	027	34 09	094	35 01	142	17 44	182	62 09	236	19 46	279	55 59	317
274	23 02	026	34 43	093	35 23	141	17 43	181	61 41	236	19 12	278	55 35	315
275	23 17	025	35 17	092	35 44	141	17 42	181	61 12	236	18 38	277	55 10	314
276	23 31	024	35 52	092	36 06	140	17 42	180	60 44	235	18 03	276	54 45	312
277	23 44	023	36 26	091	36 28	140	17 42	179	60 16	235	17 29	275	54 19	311
278	23 57	022	37 00	090	36 50	140	17 43	179	59 48	235	16 55	275	53 53	310
279	24 10	021	37 35	089	37 13	139	17 44	178	59 19	235	16 21	274	53 26	308
280	24 21	019	38 09	088	37 35	139	17 45	178	58 51	234	15 46	273	52 59	307
281	24 33	018	38 44	088	37 58	138	17 47	177	58 24	234	15 12	272	52 32	306
282	24 43	017	39 18	087	38 21	138	17 49	176	57 56	234	14 37	271	52 03	305
283	24 53	016	39 52	086	38 45	137	17 51	176	57 28	234	14 03	270	51 35	303
284	25 02	015	40 27	085	39 08	137	17 54	175	57 00	233	13 29	270	51 06	302
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Rasalhague	
285	25 11	014	41 01	084	39 32	136	17 57	174	56 33	233	50 37	301	20 09	338
286	25 19	013	41 35	083	39 56	136	18 01	174	56 05	233	50 07	300	19 55	337
287	25 27	012	42 09	082	40 20	135	18 05	173	55 38	232	49 37	299	19 42	336
288	25 33	011	42 43	081	40 45	135	18 09	172	55 11	232	49 07	298	19 27	335
289	25 40	010	43 17	081	41 09	134	18 14	172	54 44	232	48 36	296	19 13	334
290	25 45	009	43 51	080	41 34	134	18 19	171	54 17	231	48 05	295	18 57	333
291	25 50	008	44 25	079	41 59	133	18 25	171	53 50	231	47 34	294	18 41	332
292	25 54	006	44 59	078	42 24	133	18 31	170	53 23	231	47 02	293	18 25	331
293	25 58	005	45 32	077	42 49	132	18 37	169	52 57	230	46 30	292	18 08	330
294	26 01	004	46 06	076	43 15	132	18 43	169	52 30	230	45 58	291	17 51	329
295	26 03	003	46 39	075	43 41	131	18 50	168	52 04	230	45 26	290	17 33	328
296	26 04	002	47 12	074	44 07	131	18 58	167	51 38	229	44 54	289	17 14	327
297	26 05	001	47 45	073	44 33	131	19 05	167	51 11	229	44 21	288	16 55	326
298	26 05	000	48 18	072	44 59	130	19 13	166	50 45	229	43 48	287	16 36	325
299	26 05	359	48 51	071	45 25	130	19 22	166	50 20	228	43 15	286	16 16	324
	FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki		◆ ALTAIR	
300	49 23	070	45 52	129	19 31	165	49 54	228	42 42	285	59 00	331	26 04	358
301	49 55	069	46 19	129	19 40	164	49 29	228	42 09	284	58 43	330	26 02	357
302	50 27	068	46 46	128	19 49	164	49 03	227	41 36	283	58 25	328	26 00	355
303	50 59	067	47 13	128	19 59	163	48 38	227	41 02	282	58 07	327	25 57	354
304	51 30	065	47 40	127	20 09	162	48 13	227	40 28	281	57 47	325	25 53	353
305	52 02	064	48 07	127	20 20	162	47 48	226	39 54	280	57 27	323	25 49	352
306	52 32	063	48 35	127	20 31	161	47 23	226	39 21	280	57 06	322	25 44	351
307	53 03	062	49 03	126	20 42	161	46 59	225	38 47	279	56 45	320	25 38	350
308	53 33	061	49 31	126	20 54	160	46 34	225	38 13	278	56 22	319	25 32	349
309	54 03	060	49 59	125	21 06	159	46 10	225	37 38	277	55 59	317	25 25	348
310	54 33	058	50 27	125	21 18	159	45 46	224	37 04	276	55 36	316	25 17	347
311	55 02	057	50 55	124	21 31	158	45 22	224	36 30	275	55 12	315	25 09	346
312	55 30	056	51 24	124	21 44	157	44 58	223	35 56	274	54 47	313	25 00	345
313	55 59	055	51 52	124	21 57	157	44 35	223	35 21	273	54 22	312	24 51	344
314	56 27	053	52 21	123	22 11	156	44 11	223	34 47	273	53 56	311	24 41	342
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
315	56 54	052	52 50	123	22 25	156	43 48	222	34 13	272	53 29	309	24 30	341
316	57 21	051	53 19	122	22 39	155	43 25	222	33 38	271	53 02	308	24 19	340
317	57 47	049	53 48	122	22 54	154	43 02	221	33 04	270	52 35	307	24 07	339
318	58 13	048	54 17	122	23 09	154	42 40	221	32 29	269	52 07	305	23 54	338
319	58 38	046	54 47	121	23 24	153	42 17	221	31 55	269	51 39	304	23 41	337
320	59 03	045	55 16	121	23 40	153	41 55	220	31 21	268	51 10	303	23 28	336
321	59 26	043	55 46	120	23 56	152	41 33	220	30 46	267	50 41	302	23 13	335
322	59 50	042	56 15	120	24 12	151	41 11	219	30 12	266	50 12	301	22 58	334
323	60 12	040	56 45	120	24 29	151	40 49	219	29 38	265	49 42	299	22 43	333
324	60 34	039	57 15	119	24 45	150	40 28	218	29 03	265	49 12	298	22 27	332
325	60 55	037	57 45	119	25 03	150	40 07	218	28 29	264	48 41	297	22 11	331
326	61 15	035	58 16	118	25 20	149	39 46	217	27 55	263	48 10	296	21 54	330
327	61 35	034	58 46	118	25 38	149	39 25	217	27 21	262	47 39	295	21 36	329
328	61 54	032	59 16	118	25 56	148	39 04	217	26 47	261	47 08	294	21 18	328
329	62 11	030	59 47	117	26 14	147	38 44	216	26 13	261	46 36	293	21 00	327
330	62 28	028	60 18	117	26 33	147	38 23	216	25 39	260	46 04	292	20 40	326
331	62 44	027	60 48	117	26 52	146	38 04	215	25 05	259	45 32	291	20 21	325
332	62 59	025	61 19	116	27 11	146	37 44	215	24 31	258	45 00	290	20 01	324
333	63 13	023	61 50	116	27 31	145	37 24	214	23 57	258	44 27	289	19 40	323
334	63 26	021	62 21	115	27 51	144	37 05	214	23 24	257	43 55	288	19 19	322
335	63 37	019	62 52	115	28 11	144	36 46	213	22 50	256	43 22	287	18 58	321
336	63 48	017	63 23	115	28 31	143	36 27	213	22 17	255	42 49	286	18 36	320
337	63 58	015	63 55	114	28 52	143	36 08	213	21 44	255	42 16	285	18 14	319
338	64 06	013	64 26	114	29 13	142	35 50	212	21 11	254	41 42	284	17 51	318
339	64 13	011	64 57	114	29 34	142	35 32	212	20 38	253	41 09	283	17 28	317
340	64 20	009	65 29	113	29 56	141	35 14	211	20 05	252	40 35	282	17 04	316
341	64 25	007	66 01	113	30 17	141	34 56	211	19 32	251	40 02	281	16 40	315
342	64 28	005	66 32	113	30 39	140	34 39	210	19 00	251	39 28	280	16 15	314
343	64 31	003	67 04	113	31 02	139	34 22	210	18 27	250	38 54	279	15 51	313
344	64 32	001	67 36	112	31 24	139	34 05	209	17 55	249	38 20	278	15 25	312
345	◆ Diphda		Acamar		◆ CANOPUS		Miaplacidus		RIGIL KENT		◆ Nunki		FOMALHAUT	
	47 54	039	48 36	095	31 47	138	36 16	169	33 48	209	37 46	277	64 32	359
346	48 15	037	49 10	094	32 10	138	36 23	169	33 32	208	37 12	277	64 31	357
347	48 36	036	49 44	093	32 33	137	36 29	168	33 16	208	36 37	276	64 29	355
348	48 56	035	50 19	092	32 57	137	36 37	168	33 00	207	36 03	275	64 26	353
349	49 15	033	50 53	092	33 20	136	36 44	167	32 44	207	35 29	274	64 21	351
350	49 34	032	51 28	091	33 44	136	36 52	167	32 29	206	34 54	273	64 15	349
351	49 51	030	52 02	090	34 09	135	37 00	166	32 14	206	34 20	272	64 08	347
352	50 08	029	52 36	089	34 33	134	37 08	166	31 59	205	33 46	272	64 00	345
353	50 25	028	53 11	088	34 58	134	37 16	166	31 44	205	33 11	271	63 50	343
354	50 40	026	53 45	088	35 23	133	37 25	165	31 30	204	32 37	270	63 40	341
355	50 55	025	54 20	087	35 48	133	37 34	165	31 16	204	32 02	269	63 28	339
356	51 09	023	54 54	086	36 13	132	37 43	165	31 02	203	31 28	268	63 16	338
357	51 22	022	55 28	085	36 39	132	37 52	164	30 49	203	30 54	267	63 02	336
358	51 35	020	56 02	084	37 04	131	38 02	164	30 35	202	30 19	267	62 48	334
359	51 46	019	56 37	083	37 30	131	38 11	163	30 23	202	29 45	266	62 32	332

LAT 56°S

LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Diphda		◆ RIGEL		CANOPUS		Miaplacidus		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	51 00	017	13 02	085	38 35	130	39 19	163	31 06	201	61 12	246	61 23	331
1	51 09	015	13 35	084	39 01	129	39 29	162	30 54	201	60 42	246	61 06	329
2	51 17	014	14 08	084	39 27	128	39 39	162	30 42	200	60 11	245	60 49	328
3	51 25	012	14 42	083	39 54	128	39 50	162	30 30	200	59 41	245	60 31	326
4	51 32	011	15 15	082	40 20	127	40 00	161	30 19	199	59 11	244	60 12	324
5	51 38	009	15 48	081	40 47	127	40 11	161	30 08	199	58 40	244	59 52	323
6	51 43	008	16 21	080	41 14	126	40 22	160	29 57	198	58 10	244	59 31	321
7	51 47	006	16 54	079	41 41	126	40 34	160	29 47	198	57 40	243	59 10	320
8	51 50	005	17 27	079	42 08	125	40 45	160	29 37	197	57 10	243	58 48	318
9	51 52	003	18 00	078	42 36	125	40 57	159	29 27	197	56 41	242	58 25	317
10	51 54	002	18 33	077	43 03	124	41 09	159	29 17	196	56 11	242	58 02	315
11	51 54	000	19 05	076	43 31	124	41 21	159	29 08	196	55 42	241	57 38	314
12	51 54	359	19 38	075	43 59	123	41 34	158	28 59	195	55 12	241	57 13	312
13	51 53	357	20 10	074	44 27	123	41 46	158	28 50	195	54 43	241	56 48	311
14	51 50	356	20 42	073	44 56	122	41 59	157	28 42	194	54 14	240	56 23	310
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
15	21 14	072	15 47	097	45 24	122	28 34	194	53 45	240	55 56	308	51 47	354
16	21 46	071	16 20	096	45 53	121	28 26	193	53 16	239	55 30	307	51 43	352
17	22 18	071	16 53	095	46 22	120	28 19	193	52 47	239	55 03	306	51 39	351
18	22 50	070	17 27	094	46 51	120	28 12	192	52 18	238	54 35	304	51 33	349
19	23 21	069	18 00	093	47 20	119	28 05	191	51 50	238	54 07	303	51 26	348
20	23 52	068	18 34	093	47 49	119	27 58	191	51 22	237	53 39	302	51 19	346
21	24 23	067	19 07	092	48 19	118	27 52	190	50 53	237	53 10	301	51 10	345
22	24 54	066	19 41	091	48 48	118	27 46	190	50 25	236	52 41	299	51 01	343
23	25 24	065	20 14	090	49 18	117	27 41	189	49 57	236	52 12	298	50 51	342
24	25 55	064	20 48	089	49 48	117	27 35	189	49 30	236	51 42	297	50 40	340
25	26 25	063	21 21	088	50 18	116	27 30	188	49 02	235	51 12	296	50 29	339
26	26 54	062	21 55	088	50 48	116	27 26	188	48 35	235	50 42	295	50 16	337
27	27 24	061	22 29	087	51 19	115	27 21	187	48 07	234	50 11	294	50 03	336
28	27 53	060	23 02	086	51 49	115	27 17	187	47 40	234	49 40	293	49 49	335
29	28 22	059	23 35	085	52 20	114	27 14	186	47 13	233	49 09	292	49 34	333
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
30	28 51	058	24 09	084	52 50	114	27 10	186	46 46	233	48 38	290	49 19	332
31	29 19	057	24 42	083	53 21	113	27 07	185	46 20	232	48 06	289	49 02	330
32	29 47	056	25 16	083	53 52	112	27 04	184	45 53	232	47 35	288	48 45	329
33	30 15	055	25 49	082	54 23	112	27 02	184	45 27	231	47 03	287	48 28	328
34	30 43	054	26 22	081	54 54	111	27 00	183	45 01	231	46 31	286	48 10	326
35	31 10	053	26 55	080	55 26	111	26 58	183	44 35	230	45 58	285	47 51	325
36	31 36	052	27 28	079	55 57	110	26 57	182	44 09	230	45 26	284	47 31	324
37	32 03	051	28 01	078	56 29	110	26 55	182	43 44	229	44 53	283	47 11	322
38	32 29	050	28 34	077	57 00	109	26 54	181	43 18	229	44 21	282	46 50	321
39	32 54	049	29 06	076	57 32	109	26 54	181	42 53	229	43 48	282	46 28	320
40	33 19	048	29 39	075	58 04	108	26 54	180	42 28	228	43 15	281	46 06	318
41	33 44	047	30 11	075	58 36	108	26 54	180	42 03	228	42 42	280	45 44	317
42	34 08	046	30 44	074	59 08	107	26 54	179	41 38	227	42 09	279	45 21	316
43	34 32	045	31 16	073	59 40	106	26 55	178	41 14	227	41 36	278	44 57	315
44	34 55	044	31 48	072	60 12	106	26 56	178	40 50	226	41 02	277	44 33	313
	RIGEL		◆ SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
45	35 18	042	32 19	071	60 44	105	26 57	177	40 26	226	40 29	276	44 09	312
46	35 41	041	32 51	070	61 17	105	26 59	177	40 02	225	39 56	275	43 44	311
47	36 02	040	33 22	069	61 49	104	27 01	176	39 38	225	39 22	274	43 18	310
48	36 24	039	33 54	068	62 22	104	27 04	176	39 15	224	38 49	273	42 52	309
49	36 45	038	34 25	067	62 55	103	27 06	175	38 52	224	38 15	273	42 26	308
50	37 05	037	34 55	066	63 27	102	27 09	175	38 29	223	37 42	272	41 59	306
51	37 25	036	35 26	065	64 00	102	27 12	174	38 06	223	37 08	271	41 32	305
52	37 44	034	35 56	064	64 33	101	27 16	174	37 43	222	36 35	270	41 04	304
53	38 03	033	36 26	063	65 06	101	27 20	173	37 21	222	36 01	269	40 36	303
54	38 21	032	36 56	062	65 39	100	27 24	172	36 59	221	35 27	268	40 08	302
55	38 38	031	37 25	061	66 12	099	27 29	172	36 37	221	34 54	268	39 39	301
56	38 55	030	37 55	060	66 45	099	27 34	171	36 15	220	34 20	267	39 11	300
57	39 11	028	38 23	059	67 18	098	27 39	171	35 54	219	33 47	266	38 41	299
58	39 27	027	38 52	058	67 52	098	27 44	170	35 32	219	33 13	265	38 12	298
59	39 42	026	39 20	057	68 25	097	27 50	170	35 11	218	32 40	264	37 42	297
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
60	39 56	025	39 48	056	41 22	110	27 56	169	34 51	218	32 07	264	37 12	296
61	40 10	023	40 16	055	41 54	109	28 03	169	34 30	217	31 33	263	36 42	295
62	40 23	022	40 43	053	42 26	108	28 09	168	34 10	217	31 00	262	36 11	294
63	40 35	021	41 09	052	42 58	108	28 16	168	33 50	216	30 27	261	35 40	293
64	40 47	020	41 36	051	43 30	107	28 24	167	33 30	216	29 54	261	35 09	292
65	40 58	018	42 02	050	44 02	106	28 31	167	33 11	215	29 21	260	34 38	291
66	41 08	017	42 27	049	44 34	106	28 39	166	32 51	215	28 48	259	34 06	290
67	41 17	016	42 52	048	45 06	105	28 48	165	32 32	214	28 15	258	33 35	289
68	41 26	014	43 17	046	45 39	104	28 56	165	32 14	214	27 42	257	33 03	288
69	41 34	013	43 41	045	46 12	103	29 05	164	31 55	213	27 09	257	32 31	287
70	41 41	012	44 04	044	46 44	103	29 14	164	31 37	213	26 37	256	31 59	286
71	41 47	010	44 27	043	47 17	102	29 24	163	31 19	212	26 04	255	31 26	285
72	41 53	009	44 50	042	47 50	101	29 33	163	31 01	212	25 32	254	30 54	284
73	41 58	008	45 12	040	48 23	101	29 44	162	30 44	211	25 00	254	30 21	283
74	42 02	006	45 33	039	48 56	100	29 54	162	30 27	210	24 27	253	29 49	282
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		ACHERNAR		◆ Diphda	
75	42 05	005	45 54	038	49 29	099	30 04	161	30 10	210	62 50	246	29 16	282
76	42 08	004	46 15	037	50 02	098	30 15	161	29 53	209	62 20	246	28 43	281
77	42 10	002	46 34	035	50 35	098	30 27	160	29 37	209	61 49	246	28 10	280
78	42 11	001	46 53	034	51 09	097	30 38	160	29 21	208	61 19	245	27 37	279
79	42 11	000	47 12	033	51 42	096	30 50	159	29 05	208	60 48	245	27 04	278
80	42 11	358	47 29	031	52 15	095	31 02	159	28 50	207	60 18	244	26 30	277
81	42 09	357	47 46	030	52 49	095	31 14	158	28 35	207	59 48	244	25 57	276
82	42 07	356	48 03	028	53 22	094	31 27	158	28 20	206	59 18	244	25 24	275
83	42 04	354	48 18	027	53 56	093	31 40	157	28 05	205	58 48	243	24 50	275
84	42 01	353	48 33	026	54 29	092	31 53	157	27 51	205	58 18	243	24 17	274
85	41 56	352	48 48	024	55 03	092	32 06	156	27 37	204	57 48	242	23 43	273
86	41 51	350	49 01	023	55 36	091	32 20	156	27 23	204	57 18	242	23 10	272
87	41 45	349	49 14	021	56 10	090	32 34	155	27 10	203	56 49	241	22 36	271
88	41 38	348	49 26	020	56 43	089	32 48	155	26 57	203	56 19	241	22 03	270
89	41 31	346	49 37	019	57 17	088	33 03	154	26 44	202	55 50	241	21 29	270

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LHA ♈	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	SIRIUS		Alphard		◆ Suhail		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL	
90	49 47	017	27 44	062	57 50	087	33 18	154	26 31	202	55 21	240	41 23	345
91	49 56	016	28 14	061	58 24	087	33 33	153	26 19	201	54 52	240	41 14	344
92	50 05	014	28 43	060	58 57	086	33 48	153	26 07	200	54 23	239	41 04	343
93	50 13	013	29 12	059	59 31	085	34 04	152	25 56	200	53 54	239	40 54	341
94	50 20	011	29 40	058	60 04	084	34 19	152	25 45	199	53 26	238	40 42	340
95	50 26	010	30 08	057	60 37	083	34 36	151	25 34	199	52 57	238	40 31	339
96	50 31	008	30 36	056	61 11	082	34 52	151	25 23	198	52 29	238	40 18	337
97	50 35	007	31 04	055	61 44	081	35 08	150	25 13	198	52 00	237	40 05	336
98	50 39	005	31 31	054	62 17	080	35 25	150	25 03	197	51 32	237	39 51	335
99	50 42	004	31 58	053	62 50	079	35 42	149	24 53	196	51 04	236	39 37	334
100	50 43	002	32 25	052	63 23	078	36 00	149	24 44	196	50 37	236	39 21	332
101	50 44	001	32 51	051	63 56	077	36 17	148	24 35	195	50 09	235	39 05	331
102	50 44	359	33 16	050	64 28	076	36 35	148	24 27	195	49 41	235	38 49	330
103	50 43	358	33 42	049	65 01	074	36 53	147	24 18	194	49 14	234	38 32	329
104	50 41	356	34 07	047	65 33	073	37 11	147	24 10	193	48 47	234	38 14	328
	Alphard		◆ Gienah		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL		SIRIUS	
105	34 31	046	20 34	091	37 30	146	24 03	193	48 20	234	37 56	326	50 39	355
106	34 55	045	21 08	090	37 49	146	23 55	192	47 53	233	37 37	325	50 35	353
107	35 19	044	21 41	090	38 08	145	23 48	192	47 26	233	37 18	324	50 31	352
108	35 42	043	22 15	089	38 27	145	23 42	191	46 59	232	36 58	323	50 25	350
109	36 05	042	22 49	088	38 46	144	23 36	191	46 33	232	36 37	322	50 19	349
110	36 27	041	23 22	087	39 06	144	23 30	190	46 07	231	36 16	321	50 12	347
111	36 48	040	23 56	086	39 26	144	23 24	189	45 41	231	35 54	319	50 04	346
112	37 10	038	24 29	085	39 46	143	23 19	189	45 15	230	35 32	318	49 56	344
113	37 30	037	25 02	085	40 06	143	23 14	188	44 49	230	35 10	317	49 46	343
114	37 50	036	25 36	084	40 26	142	23 09	188	44 23	229	34 47	316	49 36	341
115	38 10	035	26 09	083	40 47	142	23 05	187	43 58	229	34 23	315	49 24	340
116	38 29	034	26 42	082	41 08	141	23 01	186	43 33	228	33 59	314	49 12	338
117	38 47	033	27 16	081	41 29	141	22 58	186	43 08	228	33 35	313	49 00	337
118	39 05	031	27 49	080	41 50	140	22 54	185	42 43	227	33 10	312	48 46	336
119	39 22	030	28 22	079	42 12	140	22 51	185	42 19	227	32 45	311	48 32	334
	REGULUS		◆ SPICA		RIGIL KENT		Peacock		◆ ACHERNAR		RIGEL		◆ SIRIUS	
120	16 58	033	14 03	089	42 34	139	22 49	184	41 54	226	32 19	310	48 17	333
121	17 16	032	14 36	089	42 56	139	22 47	183	41 30	226	31 53	308	48 01	331
122	17 33	031	15 10	088	43 18	139	22 45	183	41 06	226	31 26	307	47 45	330
123	17 50	030	15 43	087	43 40	138	22 44	182	40 42	225	31 00	306	47 28	329
124	18 07	029	16 17	086	44 02	138	22 42	182	40 18	225	30 32	305	47 10	327
125	18 23	028	16 50	085	44 25	137	22 42	181	39 55	224	30 05	304	46 51	326
126	18 39	027	17 24	084	44 48	137	22 41	180	39 32	224	29 37	303	46 32	325
127	18 54	026	17 57	083	45 11	136	22 41	180	39 09	223	29 09	302	46 13	323
128	19 08	025	18 30	083	45 34	136	22 41	179	38 46	223	28 40	301	45 52	322
129	19 22	024	19 04	082	45 58	136	22 42	179	38 23	222	28 12	300	45 31	321
130	19 36	023	19 37	081	46 21	135	22 43	178	38 01	222	27 42	299	45 10	320
131	19 49	022	20 10	080	46 45	135	22 44	177	37 39	221	27 13	298	44 48	318
132	20 01	021	20 43	079	47 09	134	22 46	177	37 17	221	26 43	297	44 25	317
133	20 13	020	21 16	078	47 33	134	22 48	176	36 55	220	26 14	297	44 02	316
134	20 24	019	21 49	077	47 57	134	22 50	176	36 34	220	25 43	296	43 39	315
	REGULUS		◆ SPICA		RIGIL KENT		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS	
135	20 35	018	22 21	077	48 22	133	22 53	175	36 12	219	67 23	262	43 14	313
136	20 45	017	22 54	076	48 46	133	22 56	174	35 51	219	66 50	261	42 50	312
137	20 55	016	23 26	075	49 11	132	23 00	174	35 31	218	66 17	261	42 25	311
138	21 04	015	23 59	074	49 36	132	23 03	173	35 10	217	65 44	260	41 59	310
139	21 12	014	24 31	073	50 01	132	23 07	173	34 50	217	65 11	259	41 33	309
140	21 20	013	25 03	072	50 26	131	23 12	172	34 30	216	64 38	259	41 07	308
141	21 27	012	25 35	071	50 51	131	23 17	172	34 10	216	64 05	258	40 40	306
142	21 34	011	26 06	070	51 17	130	23 22	171	33 50	215	63 32	258	40 13	305
143	21 40	010	26 38	069	51 42	130	23 27	170	33 31	215	62 59	257	39 45	304
144	21 45	009	27 09	068	52 08	130	23 33	170	33 12	214	62 27	256	39 17	303
145	21 50	008	27 40	067	52 34	129	23 39	169	32 53	214	61 54	256	38 49	302
146	21 54	007	28 11	066	53 00	129	23 46	169	32 35	213	61 21	255	38 21	301
147	21 58	006	28 42	066	53 26	129	23 52	168	32 16	213	60 49	255	37 52	300
148	22 01	005	29 12	065	53 52	128	24 00	167	31 58	212	60 17	254	37 23	299
149	22 03	003	29 42	064	54 19	128	24 07	167	31 40	212	59 45	254	36 53	298
	REGULUS		◆ SPICA		RIGIL KENT		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS	
150	22 05	002	30 12	063	54 45	128	24 15	166	31 23	211	59 12	253	36 23	297
151	22 06	001	30 42	062	55 12	127	24 23	166	31 06	211	58 40	253	35 53	296
152	22 06	000	31 11	061	55 39	127	24 32	165	30 49	210	58 08	252	35 23	295
153	22 06	359	31 40	060	56 06	127	24 40	164	30 32	210	57 37	251	34 52	294
154	22 05	358	32 09	059	56 33	126	24 50	164	30 16	209	57 05	251	34 22	293
155	22 04	357	32 38	058	57 00	126	24 59	163	30 00	208	56 33	250	33 51	292
156	22 02	356	33 06	057	57 27	126	25 09	163	29 44	208	56 02	250	33 19	291
157	22 00	355	33 34	056	57 54	125	25 19	162	29 28	207	55 30	249	32 48	290
158	21 56	354	34 01	055	58 22	125	25 29	162	29 13	207	54 59	249	32 16	289
159	21 53	353	34 28	053	58 49	125	25 40	161	28 58	206	54 28	248	31 45	288
160	21 48	352	34 55	052	59 17	124	25 51	160	28 43	206	53 57	248	31 13	287
161	21 43	351	35 21	051	59 45	124	26 03	160	28 29	205	53 26	247	30 40	286
162	21 37	350	35 47	050	60 13	124	26 14	159	28 15	205	52 55	247	30 08	285
163	21 31	349	36 13	049	60 41	123	26 26	159	28 01	204	52 24	246	29 36	284
164	21 24	348	36 38	048	61 09	123	26 39	158	27 47	203	51 53	245	29 03	284
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		REGULUS	
165	37 03	047	25 44	100	26 51	158	27 34	203	51 23	245	28 31	283	21 17	347
166	37 27	046	26 17	099	27 04	157	27 21	202	50 53	244	27 58	282	21 09	346
167	37 51	045	26 50	098	27 18	156	27 09	202	50 22	244	27 25	281	21 00	345
168	38 14	044	27 23	097	27 31	156	26 56	201	49 52	243	26 52	280	20 51	344
169	38 37	042	27 56	097	27 45	155	26 44	201	49 22	243	26 19	279	20 41	343
170	39 00	041	28 30	096	27 59	155	26 33	200	48 53	242	25 46	278	20 31	341
171	39 22	040	29 03	095	28 14	154	26 21	200	48 23	242	25 12	277	20 20	340
172	39 43	039	29 37	094	28 28	154	26 10	199	47 54	241	24 39	277	20 08	339
173	40 04	038	30 10	093	28 43	153	25 59	198	47 24	241	24 06	276	19 56	338
174	40 24	036	30 44	093	28 59	153	25 49	198	46 55	240	23 32	275	19 44	337
175	40 44	035	31 17	092	29 14	152	25 39	197	46 26	240	22 59	274	19 30	336
176	41 03	034	31 51	091	29 30	151	25 29	197	45 57	239	22 25	273	19 17	335
177	41 21	033	32 24	090	29 46	151	25 19	196	45 28	239	21 52	272	19 02	334
178	41 39	032	32 58	089	30 03	150	25 10	196	45 00	238	21 18	271	18 48	333
179	41 56	030	33 31	089	30 20	150	25 01	195	44 32	238	20 45	271	18 32	332

LAT 56°S

LAT 56°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		Alphard	
180	42 13	029	34 05	088	30 37	149	24 53	194	44 03	237	20 11	270	34 11	313
181	42 29	028	34 38	087	30 54	149	24 45	194	43 35	236	19 38	269	33 46	312
182	42 44	026	35 12	086	31 12	148	24 37	193	43 07	236	19 04	268	33 21	311
183	42 59	025	35 45	085	31 29	148	24 29	193	42 40	235	18 31	267	32 55	310
184	43 13	024	36 19	084	31 48	147	24 22	192	42 12	235	17 57	267	32 29	308
185	43 26	023	36 52	083	32 06	147	24 15	191	41 45	234	17 24	266	32 02	307
186	43 38	021	37 25	082	32 25	146	24 09	191	41 18	234	16 50	265	31 36	306
187	43 50	020	37 59	082	32 43	145	24 03	190	40 51	233	16 17	264	31 08	305
188	44 01	019	38 32	081	33 03	145	23 57	190	40 24	233	15 43	263	30 41	304
189	44 11	017	39 05	080	33 22	144	23 51	189	39 57	232	15 10	262	30 13	303
190	44 21	016	39 38	079	33 42	144	23 46	189	39 31	232	14 37	262	29 45	302
191	44 30	015	40 11	078	34 02	143	23 41	188	39 05	231	14 04	261	29 16	301
192	44 38	013	40 43	077	34 22	143	23 37	187	38 39	231	13 31	260	28 48	300
193	44 45	012	41 16	076	34 42	142	23 33	187	38 13	230	12 58	259	28 18	299
194	44 52	010	41 48	075	35 03	142	23 29	186	37 47	229	12 25	258	27 49	298
	SPICA		◆ ANTARES		Peacock		◆ ACHERNAR		CANOPUS		Suhail		◆ Alphard	
195	44 57	009	42 21	074	35 24	141	23 25	186	37 22	229	51 51	264	27 19	297
196	45 02	008	42 53	073	35 45	141	23 22	185	36 57	228	51 18	263	26 49	296
197	45 06	006	43 25	072	36 06	140	23 20	184	36 32	228	50 44	262	26 19	296
198	45 09	005	43 57	071	36 28	140	23 17	184	36 07	227	50 11	262	25 49	295
199	45 12	003	44 29	070	36 50	139	23 15	183	35 43	227	49 38	261	25 18	294
200	45 13	002	45 00	069	37 12	139	23 13	183	35 18	226	49 05	260	24 47	293
201	45 14	001	45 31	068	37 34	138	23 12	182	34 54	226	48 32	260	24 16	292
202	45 14	359	46 02	067	37 56	138	23 11	182	34 31	225	47 59	259	23 45	291
203	45 13	358	46 33	066	38 19	137	23 10	181	34 07	224	47 26	258	23 14	290
204	45 12	357	47 04	065	38 42	137	23 10	180	33 44	224	46 53	257	22 42	289
205	45 09	355	47 34	064	39 05	136	23 10	180	33 20	223	46 21	257	22 10	288
206	45 06	354	48 04	063	39 29	136	23 10	179	32 57	223	45 48	256	21 38	287
207	45 02	352	48 34	062	39 52	135	23 11	179	32 35	222	45 15	255	21 06	286
208	44 57	351	49 03	060	40 16	135	23 12	178	32 12	222	44 43	255	20 34	285
209	44 51	350	49 32	059	40 40	134	23 13	177	31 50	221	44 11	254	20 02	285
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
210	50 01	058	30 19	093	41 04	134	23 15	177	31 28	220	43 38	253	44 45	348
211	50 29	057	30 53	092	41 28	133	23 17	176	31 07	220	43 06	253	44 38	347
212	50 57	056	31 26	091	41 53	133	23 19	176	30 45	219	42 34	252	44 30	345
213	51 24	055	32 00	090	42 18	132	23 22	175	30 24	219	42 03	251	44 21	344
214	51 52	053	32 33	090	42 43	132	23 25	174	30 03	218	41 31	251	44 11	343
215	52 18	052	33 07	089	43 08	131	23 28	174	29 43	218	40 59	250	44 01	341
216	52 44	051	33 40	088	43 33	131	23 32	173	29 22	217	40 28	249	43 50	340
217	53 10	049	34 14	087	43 59	130	23 36	173	29 02	216	39 56	249	43 38	339
218	53 35	048	34 47	086	44 24	130	23 41	172	28 42	216	39 25	248	43 26	337
219	54 00	047	35 21	085	44 50	129	23 46	172	28 23	215	38 54	247	43 13	336
220	54 24	045	35 54	084	45 16	129	23 51	171	28 04	215	38 23	247	42 59	335
221	54 48	044	36 28	084	45 43	128	23 56	170	27 45	214	37 53	246	42 44	334
222	55 11	043	37 01	083	46 09	128	24 02	170	27 26	214	37 22	245	42 29	332
223	55 33	041	37 34	082	46 35	127	24 08	169	27 08	213	36 52	245	42 13	331
224	55 55	040	38 07	081	47 02	127	24 15	169	26 49	212	36 21	244	41 56	330
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
225	56 16	038	38 40	080	47 29	126	24 21	168	26 32	212	35 51	243	41 39	328
226	56 37	037	39 13	079	47 56	126	24 28	167	26 14	211	35 21	243	41 21	327
227	56 56	035	39 46	078	48 23	126	24 36	167	25 57	211	34 52	242	41 03	326
228	57 15	034	40 19	077	48 51	125	24 44	166	25 40	210	34 22	241	40 43	325
229	57 34	032	40 52	076	49 18	125	24 52	166	25 23	209	33 53	241	40 24	324
230	57 51	031	41 24	075	49 46	124	25 00	165	25 07	209	33 23	240	40 04	322
231	58 08	029	41 57	074	50 14	124	25 09	165	24 51	208	32 54	240	39 43	321
232	58 23	027	42 29	073	50 42	123	25 18	164	24 35	208	32 26	239	39 21	320
233	58 38	026	43 01	073	51 10	123	25 28	163	24 20	207	31 57	238	39 00	319
234	58 53	024	43 33	072	51 38	122	25 37	163	24 05	206	31 29	238	38 37	318
235	59 06	022	44 05	071	52 07	122	25 47	162	23 50	206	31 00	237	38 14	316
236	59 18	021	44 36	069	52 35	121	25 58	162	23 36	205	30 32	236	37 51	315
237	59 29	019	45 08	068	53 04	121	26 09	161	23 21	205	30 04	236	37 27	314
238	59 40	017	45 39	067	53 33	121	26 20	161	23 08	204	29 37	235	37 03	313
239	59 49	015	46 10	066	54 02	120	26 31	160	22 54	203	29 09	234	36 38	312
	◆ ANTARES		Nunki		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA	
240	59 58	014	46 40	065	16 37	119	26 43	159	22 41	203	63 02	233	36 13	311
241	60 05	012	47 11	064	17 07	118	26 55	159	22 28	202	62 35	233	35 47	310
242	60 11	010	47 41	063	17 36	117	27 07	158	22 16	202	62 08	232	35 21	309
243	60 17	008	48 10	062	18 06	116	27 19	158	22 04	201	61 42	232	34 55	308
244	60 21	006	48 40	061	18 37	116	27 32	157	21 52	200	61 15	232	34 28	307
245	60 24	005	49 09	060	19 07	115	27 45	157	21 40	200	60 49	232	34 01	305
246	60 27	003	49 38	059	19 38	114	27 59	156	21 29	199	60 23	232	33 33	304
247	60 28	001	50 06	057	20 08	113	28 13	155	21 18	198	59 56	231	33 06	303
248	60 28	359	50 34	056	20 39	113	28 27	155	21 08	198	59 30	231	32 37	302
249	60 27	357	51 02	055	21 10	112	28 41	154	20 58	197	59 04	231	32 09	301
250	60 25	356	51 29	054	21 41	111	28 56	154	20 48	197	58 38	231	31 40	300
251	60 22	354	51 56	052	22 13	110	29 11	153	20 39	196	58 12	230	31 11	299
252	60 18	352	52 22	051	22 44	110	29 26	153	20 30	195	57 46	230	30 42	298
253	60 12	350	52 48	050	23 16	109	29 42	152	20 21	195	57 21	230	30 12	297
254	60 06	348	53 14	049	23 48	108	29 57	152	20 13	194	56 55	230	29 42	296
	ALTAIR		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA		◆ ANTARES	
255	16 03	044	24 20	107	30 13	151	20 05	193	56 30	229	29 12	295	59 59	347
256	16 26	043	24 52	107	30 30	151	19 57	193	56 04	229	28 41	294	59 51	345
257	16 49	042	25 24	106	30 47	150	19 50	192	55 39	229	28 11	294	59 41	343
258	17 11	042	25 57	105	31 03	149	19 43	192	55 14	228	27 40	293	59 31	341
259	17 34	041	26 29	104	31 21	149	19 37	191	54 49	228	27 09	292	59 20	340
260	17 55	040	27 02	104	31 38	148	19 30	190	54 24	228	26 37	291	59 08	338
261	18 16	039	27 34	103	31 56	148	19 25	190	53 59	228	26 06	290	58 55	336
262	18 37	038	28 07	102	32 14	147	19 19	189	53 34	227	25 34	289	58 41	335
263	18 57	037	28 40	101	32 32	147	19 14	188	53 10	227	25 02	288	58 26	333
264	19 17	036	29 13	100	32 51	146	19 09	188	52 45	227	24 30	287	58 10	331
265	19 36	035	29 46	100	33 09	146	19 05	187	52 21	226	23 58	286	57 54	330
266	19 55	034	30 19	099	33 28	145	19 01	186	51 57	226	23 26	285	57 37	328
267	20 14	033	30 52	098	33 48	145	18 58	186	51 33	226	22 54	284	57 18	327
268	20 32	032	31 25	097	34 07	144	18 54	185	51 09	225	22 21	283	57 00	325
269	20 49	031	31 59	097	34 27	144	18 52	185	50 45	225	21 48	283	56 40	323

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		RIGIL KENT		◆ SPICA		ANTARES	
270	21 06	030	32 32	096	34 47	143	18 49	184	64 08	238	21 15	282	56 20	322
271	21 22	029	33 05	095	35 07	143	18 47	183	63 39	238	20 43	281	55 59	321
272	21 38	028	33 39	094	35 28	142	18 45	183	63 11	238	20 10	280	55 37	319
273	21 53	027	34 12	093	35 49	142	18 44	182	62 42	238	19 36	279	55 15	318
274	22 08	026	34 46	093	36 10	141	18 43	181	62 14	237	19 03	278	54 52	316
275	22 22	025	35 19	092	36 31	141	18 42	181	61 46	237	18 30	277	54 28	315
276	22 36	024	35 53	091	36 52	140	18 42	180	61 18	237	17 57	277	54 04	313
277	22 49	022	36 27	090	37 14	140	18 42	179	60 49	237	17 23	276	53 40	312
278	23 02	021	37 00	089	37 36	139	18 43	179	60 21	236	16 50	275	53 14	311
279	23 13	020	37 34	088	37 58	139	18 44	178	59 54	236	16 17	274	52 49	309
280	23 25	019	38 07	088	38 20	138	18 45	177	59 26	236	15 43	273	52 23	308
281	23 36	018	38 41	087	38 43	138	18 47	177	58 58	235	15 10	272	51 56	307
282	23 46	017	39 14	086	39 06	137	18 49	176	58 31	235	14 36	271	51 29	306
283	23 55	016	39 48	085	39 29	137	18 51	176	58 03	235	14 02	271	51 01	304
284	24 04	015	40 21	084	39 52	136	18 54	175	57 36	235	13 29	270	50 34	303
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki	
285	24 13	014	40 54	083	40 15	136	18 57	174	57 08	234	50 05	302	60 16	358
286	24 21	013	41 28	082	40 39	135	19 01	174	56 41	234	49 37	301	60 15	356
287	24 28	012	42 01	081	41 03	135	19 05	173	56 14	234	49 08	300	60 12	355
288	24 34	011	42 34	081	41 27	134	19 09	172	55 47	233	48 38	299	60 08	353
289	24 40	010	43 07	080	41 51	134	19 13	172	55 20	233	48 09	297	60 04	351
290	24 46	009	43 40	079	42 15	133	19 18	171	54 54	233	47 39	296	59 58	349
291	24 50	007	44 13	078	42 40	133	19 24	170	54 27	232	47 09	295	59 51	348
292	24 54	006	44 46	077	43 05	132	19 30	170	54 01	232	46 38	294	59 43	346
293	24 58	005	45 18	076	43 30	132	19 36	169	53 34	232	46 07	293	59 35	344
294	25 01	004	45 51	075	43 55	131	19 42	169	53 08	231	45 36	292	59 25	342
295	25 03	003	46 23	074	44 20	131	19 49	168	52 42	231	45 05	291	59 14	341
296	25 04	002	46 55	073	44 46	130	19 56	167	52 16	230	44 34	290	59 03	339
297	25 05	001	47 27	072	45 11	130	20 04	167	51 50	230	44 02	289	58 50	337
298	25 05	000	47 59	071	45 37	129	20 12	166	51 25	230	43 30	288	58 37	335
299	25 05	359	48 30	070	46 03	129	20 20	165	50 59	229	42 58	287	58 22	334
	FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki		◆ ALTAIR	
300	49 02	069	46 29	128	20 29	165	50 34	229	42 26	286	58 07	332	25 04	358
301	49 33	068	46 56	128	20 38	164	50 09	229	41 54	285	57 51	331	25 02	357
302	50 04	067	47 22	127	20 47	164	49 44	228	41 21	284	57 34	329	25 00	356
303	50 35	065	47 49	127	20 57	163	49 19	228	40 49	283	57 16	327	24 57	354
304	51 05	064	48 16	127	21 07	162	48 54	227	40 16	282	56 58	326	24 54	353
305	51 35	063	48 43	126	21 17	162	48 29	227	39 43	281	56 39	324	24 49	352
306	52 05	062	49 10	126	21 28	161	48 05	227	39 10	280	56 19	323	24 44	351
307	52 34	061	49 38	125	21 39	160	47 41	226	38 37	279	55 58	321	24 39	350
308	53 03	060	50 05	125	21 50	160	47 16	226	38 04	279	55 37	320	24 33	349
309	53 32	058	50 33	124	22 02	159	46 52	225	37 31	278	55 15	318	24 26	348
310	54 01	057	51 01	124	22 14	159	46 29	225	36 58	277	54 52	317	24 19	347
311	54 29	056	51 28	123	22 26	158	46 05	225	36 24	276	54 29	316	24 11	346
312	54 56	055	51 57	123	22 39	157	45 42	224	35 51	275	54 05	314	24 02	345
313	55 23	053	52 25	122	22 52	157	45 18	224	35 17	274	53 41	313	23 53	344
314	55 50	052	52 53	122	23 06	156	44 55	223	34 44	273	53 16	312	23 43	343
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
315	56 16	051	53 22	122	23 19	156	44 32	223	34 10	272	52 51	310	23 33	342
316	56 42	049	53 50	121	23 34	155	44 10	222	33 37	272	52 25	309	23 22	340
317	57 07	048	54 19	121	23 48	154	43 47	222	33 03	271	51 59	308	23 11	339
318	57 32	047	54 48	120	24 03	154	43 25	222	32 30	270	51 32	306	22 59	338
319	57 56	045	55 17	120	24 18	153	43 03	221	31 56	269	51 05	305	22 46	337
320	58 20	044	55 46	119	24 33	152	42 41	221	31 23	268	50 37	304	22 33	336
321	58 42	042	56 15	119	24 49	152	42 19	220	30 49	268	50 09	303	22 19	335
322	59 05	041	56 45	119	25 05	151	41 57	220	30 16	267	49 41	302	22 05	334
323	59 26	039	57 14	118	25 21	151	41 36	219	29 42	266	49 12	300	21 50	333
324	59 47	037	57 44	118	25 38	150	41 15	219	29 09	265	48 43	299	21 34	332
325	60 07	036	58 14	117	25 54	149	40 54	218	28 35	264	48 13	298	21 18	331
326	60 26	034	58 44	117	26 12	149	40 33	218	28 02	263	47 44	297	21 02	330
327	60 45	033	59 14	117	26 29	148	40 12	218	27 29	263	47 13	296	20 45	329
328	61 02	031	59 44	116	26 47	148	39 52	217	26 55	262	46 43	295	20 27	328
329	61 19	029	60 14	116	27 05	147	39 32	217	26 22	261	46 13	294	20 09	327
330	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
	61 35	027	60 44	115	27 23	147	39 12	216	25 49	260	45 42	293	19 51	326
331	61 50	026	61 14	115	27 42	146	38 52	216	25 16	260	45 11	292	19 32	325
332	62 04	024	61 45	115	28 01	145	38 33	215	24 43	259	44 39	291	19 12	324
333	62 17	022	62 15	114	28 20	145	38 14	215	24 10	258	44 08	290	18 52	323
334	62 29	020	62 46	114	28 40	144	37 55	214	23 37	257	43 36	289	18 32	322
335	62 41	018	63 17	113	28 59	144	37 36	214	23 05	256	43 04	288	18 11	321
336	62 51	017	63 48	113	29 19	143	37 17	213	22 32	256	42 32	287	17 50	320
337	63 00	015	64 19	113	29 40	142	36 59	213	22 00	255	42 00	286	17 28	319
338	63 08	013	64 50	112	30 00	142	36 41	212	21 27	254	41 28	285	17 06	318
339	63 15	011	65 21	112	30 21	141	36 23	212	20 55	253	40 55	284	16 44	317
340	63 20	009	65 52	111	30 42	141	36 05	211	20 23	253	40 22	283	16 21	316
341	63 25	007	66 23	111	31 04	140	35 48	211	19 51	252	39 50	282	15 57	315
342	63 29	005	66 55	111	31 25	140	35 31	211	19 19	251	39 17	281	15 33	314
343	63 31	003	67 26	110	31 47	139	35 14	210	18 48	250	38 44	280	15 09	314
344	63 32	001	67 57	110	32 09	138	34 57	210	18 16	250	38 11	279	14 45	313
	◆ Diphda		Acamar		CANOPUS		◆ Miaplacidus		RIGIL KENT		◆ Nunki		FOMALHAUT	
345	47 07	038	48 40	094	32 32	138	37 15	169	34 41	209	37 37	278	63 32	359
346	47 28	037	49 14	093	32 54	137	37 21	168	34 25	209	37 04	277	63 31	357
347	47 47	035	49 47	092	33 17	137	37 28	168	34 09	208	36 31	276	63 29	355
348	48 06	034	50 21	091	33 40	136	37 35	168	33 53	208	35 58	276	63 26	353
349	48 25	033	50 54	090	34 04	136	37 43	167	33 38	207	35 24	275	63 22	351
350	48 42	031	51 28	090	34 27	135	37 50	167	33 22	207	34 51	274	63 16	350
351	49 00	030	52 01	089	34 51	135	37 58	166	33 08	206	34 17	273	63 09	348
352	49 16	028	52 35	088	35 15	134	38 06	166	32 53	206	33 44	272	63 02	346
353	49 32	027	53 08	087	35 39	133	38 14	166	32 39	205	33 10	271	62 53	344
354	49 46	026	53 42	086	36 04	133	38 23	165	32 25	205	32 37	270	62 43	342
355	50 01	024	54 15	085	36 28	132	38 32	165	32 11	204	32 03	270	62 32	340
356	50 14	023	54 49	084	36 53	132	38 41	164	31 57	204	31 29	269	62 20	338
357	50 27	021	55 22	083	37 18	131	38 50	164	31 44	203	30 56	268	62 07	336
358	50 38	020	55 55	083	37 44	131	38 59	164	31 31	203	30 22	267	61 53	335
359	50 49	018	56 29	082	38 09	130	39 09	163	31 18	202	29 49	266	61 39	333

LAT 57°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Diphda		◆ RIGEL		CANOPUS		Miaplacidus		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	50 02	017	12 57	085	39 13	129	40 16	162	32 02	202	61 36	248	60 30	332
1	50 11	015	13 29	084	39 39	128	40 26	162	31 50	201	61 06	247	60 14	330
2	50 19	014	14 02	083	40 04	128	40 36	162	31 38	201	60 36	247	59 58	329
3	50 26	012	14 34	083	40 30	127	40 46	161	31 27	200	60 06	246	59 41	327
4	50 33	011	15 06	082	40 56	127	40 57	161	31 15	200	59 36	246	59 22	325
5	50 38	009	15 39	081	41 23	126	41 08	161	31 05	199	59 06	245	59 03	324
6	50 43	008	16 11	080	41 49	126	41 19	160	30 54	199	58 36	245	58 44	322
7	50 47	006	16 43	079	42 16	125	41 30	160	30 44	198	58 07	245	58 24	321
8	50 50	005	17 15	078	42 43	124	41 42	159	30 34	197	57 37	244	58 03	319
9	50 52	003	17 47	077	43 10	124	41 53	159	30 24	197	57 08	244	57 41	318
10	50 54	002	18 19	076	43 37	123	42 05	159	30 15	196	56 39	243	57 19	316
11	50 54	000	18 51	076	44 04	123	42 17	158	30 06	196	56 10	243	56 56	315
12	50 54	359	19 22	075	44 32	122	42 29	158	29 57	195	55 41	242	56 32	313
13	50 53	357	19 54	074	44 59	122	42 42	157	29 48	195	55 12	242	56 08	312
14	50 51	356	20 25	073	45 27	121	42 54	157	29 40	194	54 43	241	55 44	311
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
15	20 56	072	15 53	096	45 55	121	29 32	194	54 14	241	55 19	309	50 48	354
16	21 27	071	16 26	096	46 24	120	29 25	193	53 46	240	54 53	308	50 44	353
17	21 58	070	16 58	095	46 52	120	29 17	193	53 18	240	54 27	307	50 39	351
18	22 29	069	17 31	094	47 20	119	29 10	192	52 49	239	54 01	305	50 34	350
19	22 59	068	18 04	093	47 49	118	29 04	192	52 21	239	53 34	304	50 27	348
20	23 29	067	18 36	092	48 18	118	28 57	191	51 53	238	53 07	303	50 20	347
21	23 59	066	19 09	091	48 47	117	28 51	191	51 26	238	52 39	302	50 12	345
22	24 29	066	19 42	091	49 16	117	28 45	190	50 58	238	52 11	301	50 04	344
23	24 59	065	20 14	090	49 45	116	28 40	189	50 31	237	51 43	299	49 54	342
24	25 28	064	20 47	089	50 15	116	28 35	189	50 03	237	51 14	298	49 44	341
25	25 57	063	21 20	088	50 44	115	28 30	188	49 36	236	50 45	297	49 33	339
26	26 26	062	21 52	087	51 14	115	28 25	188	49 09	236	50 16	296	49 21	338
27	26 55	061	22 25	086	51 44	114	28 21	187	48 42	235	49 47	295	49 08	336
28	27 23	060	22 58	086	52 14	113	28 17	187	48 15	235	49 17	294	48 55	335
29	27 51	059	23 30	085	52 44	113	28 13	186	47 49	234	48 47	293	48 40	334
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
30	28 19	058	24 03	084	53 14	112	28 10	186	47 22	234	48 16	292	48 26	332
31	28 47	057	24 35	083	53 44	112	28 07	185	46 56	233	47 46	290	48 10	331
32	29 14	056	25 07	082	54 14	111	28 04	184	46 30	233	47 15	289	47 54	330
33	29 41	055	25 40	081	54 45	111	28 02	184	46 04	232	46 44	288	47 37	328
34	30 07	054	26 12	080	55 16	110	28 00	183	45 38	232	46 13	287	47 19	327
35	30 33	053	26 44	079	55 46	109	27 58	183	45 13	231	45 42	286	47 01	326
36	30 59	052	27 16	079	56 17	109	27 56	182	44 48	231	45 10	285	46 42	324
37	31 25	051	27 48	078	56 48	108	27 55	182	44 22	230	44 39	284	46 23	323
38	31 50	050	28 20	077	57 19	108	27 54	181	43 57	230	44 07	283	46 03	322
39	32 14	049	28 52	076	57 50	107	27 54	181	43 32	229	43 35	282	45 43	320
40	32 39	047	29 24	075	58 22	107	27 54	180	43 08	229	43 03	282	45 21	319
41	33 03	046	29 55	074	58 53	106	27 54	180	42 43	228	42 31	281	45 00	318
42	33 26	045	30 26	073	59 25	105	27 54	179	42 19	228	41 59	280	44 38	317
43	33 49	044	30 58	072	59 56	105	27 55	178	41 55	227	41 27	279	44 15	315
44	34 12	043	31 29	071	60 26	104	27 56	178	41 31	227	40 55	278	43 52	314
	RIGEL		◆ SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
45	34 34	042	31 59	070	60 59	104	27 57	177	41 07	226	40 22	277	43 28	313
46	34 55	041	32 30	069	61 31	103	27 59	177	40 44	226	39 50	276	43 04	312
47	35 16	040	33 00	068	62 03	102	28 01	176	40 21	225	39 17	275	42 39	311
48	35 37	039	33 31	067	62 35	102	28 03	176	39 58	225	38 45	274	42 14	309
49	35 57	037	34 01	066	63 07	101	28 06	175	39 35	224	38 12	273	41 49	308
50	36 17	036	34 31	065	63 39	100	28 09	175	39 12	224	37 39	273	41 23	307
51	36 36	035	35 00	064	64 11	100	28 12	174	38 50	223	37 07	272	40 57	306
52	36 54	034	35 30	063	64 44	099	28 16	173	38 28	223	36 34	271	40 30	305
53	37 12	033	35 59	062	65 16	099	28 20	173	38 06	222	36 01	270	40 03	304
54	37 30	032	36 27	061	65 48	098	28 24	172	37 44	222	35 29	269	39 36	303
55	37 47	030	36 56	060	66 21	097	28 28	172	37 22	221	34 56	268	39 08	302
56	38 03	029	37 24	059	66 53	096	28 33	171	37 01	220	34 23	268	38 40	301
57	38 18	028	37 52	058	67 26	096	28 38	171	36 40	220	33 51	267	38 12	300
58	38 34	027	38 20	057	67 58	095	28 43	170	36 19	219	33 18	266	37 43	299
59	38 48	026	38 47	056	68 31	094	28 49	170	35 58	219	32 45	265	37 15	297
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
60	39 02	024	39 14	055	41 42	109	28 55	169	35 38	218	32 13	264	36 45	296
61	39 15	023	39 40	054	42 13	108	29 02	169	35 18	218	31 40	263	36 16	295
62	39 27	022	40 07	053	42 44	107	29 08	168	34 58	217	31 08	263	35 46	294
63	39 39	021	40 32	052	43 15	107	29 15	168	34 38	217	30 36	262	35 17	293
64	39 50	019	40 58	050	43 47	106	29 22	167	34 19	216	30 03	261	34 46	292
65	40 01	018	41 23	049	44 18	105	29 30	166	33 59	216	29 31	260	34 16	291
66	40 10	017	41 47	048	44 50	105	29 38	166	33 41	215	28 59	260	33 46	291
67	40 19	015	42 11	047	45 21	104	29 46	165	33 22	215	28 27	259	33 15	290
68	40 28	014	42 35	046	45 53	103	29 54	165	33 03	214	27 55	258	32 44	289
69	40 35	013	42 58	045	46 25	102	30 03	164	32 45	214	27 23	257	32 13	288
70	40 42	012	43 21	043	46 57	102	30 12	164	32 27	213	26 51	256	31 42	287
71	40 48	010	43 43	042	47 29	101	30 21	163	32 10	212	26 19	256	31 10	286
72	40 54	009	44 05	041	48 01	100	30 31	163	31 52	212	25 48	255	30 39	285
73	40 58	008	44 26	040	48 33	100	30 41	162	31 35	211	25 16	254	30 07	284
74	41 02	006	44 47	038	49 06	099	30 51	162	31 18	211	24 45	253	29 35	283
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		ACHERNAR		◆ Diphda	
75	41 06	005	45 07	037	49 38	098	31 01	161	31 02	210	63 13	248	29 04	282
76	41 08	004	45 26	036	50 10	097	31 12	161	30 45	210	62 43	248	28 32	281
77	41 10	002	45 45	035	50 43	097	31 23	160	30 29	209	62 13	247	27 59	280
78	41 11	001	46 03	033	51 15	096	31 34	159	30 14	209	61 43	247	27 27	279
79	41 11	000	46 21	032	51 48	095	31 46	159	29 58	208	61 13	246	26 55	279
80	41 11	358	46 38	031	52 20	094	31 58	158	29 43	207	60 43	246	26 23	278
81	41 09	357	46 54	029	52 53	093	32 10	158	29 28	207	60 13	245	25 50	277
82	41 07	356	47 10	028	53 26	093	32 22	157	29 14	206	59 44	245	25 18	276
83	41 05	355	47 25	027	53 58	092	32 35	157	28 59	206	59 14	245	24 45	275
84	41 01	353	47 39	025	54 31	091	32 48	156	28 45	205	58 45	244	24 13	274
85	40 57	352	47 53	024	55 04	090	33 01	156	28 31	205	58 15	244	23 40	273
86	40 52	351	48 06	022	55 36	089	33 15	155	28 18	204	57 46	243	23 07	273
87	40 46	349	48 18	021	56 09	088	33 28	155	28 05	203	57 17	243	22 35	272
88	40 40	348	48 29	020	56 42	088	33 43	154	27 52	203	56 48	242	22 02	271
89	40 33	347	48 40	018	57 14	087	33 57	154	27 39	202	56 19	242	21 29	270

LAT 57°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	SIRIUS		Alphard		◆ Suhail		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL	
90	48 50	017	27 16	061	57 47	086	34 11	153	27 27	202	55 50	241	40 25	345
91	48 59	015	27 44	060	58 19	085	34 26	153	27 15	201	55 22	241	40 16	344
92	49 07	014	28 12	059	58 52	084	34 41	152	27 04	201	54 53	241	40 07	343
93	49 14	012	28 40	058	59 24	083	34 57	152	26 52	200	54 25	240	39 57	342
94	49 21	011	29 08	057	59 57	082	35 12	151	26 41	199	53 56	240	39 46	340
95	49 27	010	29 35	056	60 29	081	35 28	151	26 31	199	53 28	239	39 35	339
96	49 32	008	30 02	055	61 01	080	35 44	150	26 20	198	53 00	239	39 23	338
97	49 36	007	30 29	054	61 33	079	36 00	150	26 10	198	52 32	238	39 10	337
98	49 39	005	30 56	053	62 05	078	36 17	149	26 00	197	52 05	238	38 57	335
99	49 42	004	31 22	052	62 37	077	36 34	149	25 51	196	51 37	237	38 43	334
100	49 43	002	31 47	051	63 09	076	36 51	148	25 42	196	51 10	237	38 28	333
101	49 44	001	32 12	050	63 41	075	37 08	148	25 33	195	50 43	236	38 13	332
102	49 44	359	32 37	049	64 12	074	37 26	147	25 25	195	50 15	236	37 57	330
103	49 43	358	33 02	048	64 43	072	37 43	147	25 16	194	49 48	235	37 40	329
104	49 42	356	33 26	047	65 15	071	38 01	146	25 09	194	49 22	235	37 23	328
	Alphard		◆ Gienah		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL		SIRIUS	
105	33 50	046	20 35	091	38 20	146	25 01	193	48 55	234	37 06	327	49 39	355
106	34 13	045	21 08	090	38 38	145	24 54	192	48 28	234	36 48	326	49 36	353
107	34 36	044	21 41	089	38 57	145	24 47	192	48 02	234	36 29	324	49 31	352
108	34 58	043	22 13	088	39 16	144	24 41	191	47 36	233	36 10	323	49 26	350
109	35 20	041	22 46	088	39 35	144	24 35	191	47 10	233	35 50	322	49 20	349
110	35 41	040	23 19	087	39 54	143	24 29	190	46 44	232	35 30	321	49 14	347
111	36 02	039	23 51	086	40 14	143	24 23	189	46 18	232	35 09	320	49 06	346
112	36 22	038	24 24	085	40 33	143	24 18	189	45 53	231	34 47	319	48 58	345
113	36 42	037	24 56	084	40 53	142	24 13	188	45 27	231	34 26	318	48 49	343
114	37 02	036	25 29	083	41 14	142	24 09	188	45 02	230	34 03	316	48 39	342
115	37 20	034	26 01	082	41 34	141	24 05	187	44 37	230	33 41	315	48 28	340
116	37 39	033	26 34	081	41 55	141	24 01	186	44 12	229	33 17	314	48 17	339
117	37 56	032	27 06	081	42 15	140	23 57	186	43 48	229	32 54	313	48 04	337
118	38 13	031	27 38	080	42 36	140	23 54	185	43 23	228	32 30	312	47 52	336
119	38 30	030	28 10	079	42 58	139	23 51	185	42 59	228	32 05	311	47 38	335
	REGULUS		◆ SPICA		RIGIL KENT		Peacock		◆ ACHERNAR		RIGEL		◆ SIRIUS	
120	16 07	033	14 02	089	43 19	139	23 49	184	42 35	227	31 41	310	47 24	333
121	16 25	032	14 35	088	43 41	138	23 47	183	42 11	227	31 15	309	47 08	332
122	16 42	031	15 07	087	44 03	138	23 45	183	41 48	226	30 50	308	46 53	331
123	16 59	030	15 40	087	44 24	138	23 43	182	41 24	226	30 24	307	46 36	329
124	17 15	029	16 12	086	44 47	137	23 42	182	41 01	225	29 57	306	46 19	328
125	17 30	028	16 45	085	45 09	137	23 42	181	40 38	225	29 31	305	46 02	327
126	17 45	027	17 18	084	45 32	136	23 41	180	40 15	224	29 04	304	45 43	325
127	18 00	026	17 50	083	45 54	136	23 41	180	39 52	224	28 37	303	45 24	324
128	18 14	025	18 22	082	46 17	135	23 41	179	39 30	223	28 09	302	45 05	323
129	18 28	024	18 55	081	46 40	135	23 42	179	39 08	223	27 41	301	44 45	321
130	18 41	023	19 27	081	47 03	134	23 43	178	38 46	222	27 13	300	44 24	320
131	18 53	022	19 59	080	47 27	134	23 44	177	38 24	222	26 44	299	44 03	319
132	19 05	021	20 31	079	47 50	134	23 46	177	38 02	221	26 16	298	43 41	318
133	19 17	020	21 03	078	48 14	133	23 48	176	37 41	221	25 47	297	43 19	316
134	19 28	019	21 35	077	48 38	133	23 50	176	37 20	220	25 17	296	42 56	315
	REGULUS		◆ SPICA		RIGIL KENT		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS	
135	19 38	018	22 07	076	49 02	132	23 53	175	36 59	220	67 30	264	42 33	314
136	19 48	017	22 39	075	49 26	132	23 56	174	36 38	219	66 58	264	42 09	313
137	19 57	016	23 10	074	49 51	132	23 59	174	36 18	218	66 25	263	41 45	312
138	20 06	015	23 42	073	50 15	131	24 03	173	35 58	218	65 53	262	41 20	311
139	20 14	014	24 13	073	50 40	131	24 07	173	35 38	217	65 21	262	40 55	309
140	20 21	013	24 44	072	51 05	130	24 11	172	35 18	217	64 48	261	40 30	308
141	20 28	012	25 15	071	51 30	130	24 16	171	34 58	216	64 16	260	40 04	307
142	20 35	011	25 46	070	51 55	129	24 21	171	34 39	216	63 44	260	39 38	306
143	20 41	010	26 16	069	52 20	129	24 26	170	34 20	215	63 12	259	39 11	305
144	20 46	009	26 47	068	52 46	129	24 32	170	34 01	215	62 40	258	38 44	304
145	20 51	008	27 17	067	53 11	128	24 38	169	33 43	214	62 08	258	38 17	303
146	20 55	007	27 47	066	53 37	128	24 44	168	33 25	214	61 36	257	37 49	302
147	20 58	006	28 16	065	54 03	128	24 51	168	33 07	213	61 04	256	37 21	301
148	21 01	004	28 46	064	54 29	127	24 58	167	32 49	213	60 32	256	36 53	300
149	21 03	003	29 15	063	54 55	127	25 06	167	32 31	212	60 01	255	36 25	299
	REGULUS		◆ SPICA		RIGIL KENT		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS	
150	21 05	002	29 44	062	55 21	126	25 13	166	32 14	211	59 29	255	35 56	298
151	21 06	001	30 13	061	55 48	126	25 21	166	31 57	211	58 58	254	35 27	297
152	21 06	000	30 42	060	56 14	126	25 30	165	31 41	210	58 26	254	34 57	296
153	21 06	359	31 10	059	56 41	125	25 38	164	31 24	210	57 55	253	34 28	295
154	21 06	358	31 38	058	57 07	125	25 47	164	31 08	209	57 24	252	33 58	294
155	21 04	357	32 05	057	57 34	125	25 57	163	30 52	209	56 53	252	33 28	293
156	21 02	356	32 32	056	58 01	124	26 06	163	30 37	208	56 22	251	32 58	292
157	21 00	355	32 59	055	58 28	124	26 16	162	30 21	208	55 51	251	32 27	291
158	20 57	354	33 26	054	58 56	124	26 26	161	30 06	207	55 20	250	31 56	290
159	20 53	353	33 52	053	59 23	123	26 37	161	29 52	207	54 49	249	31 26	289
160	20 49	352	34 18	052	59 50	123	26 48	160	29 37	206	54 19	249	30 55	288
161	20 44	351	34 44	051	60 18	123	26 59	160	29 23	205	53 48	248	30 23	287
162	20 38	350	35 09	050	60 45	122	27 10	159	29 09	205	53 18	248	29 52	286
163	20 32	349	35 34	049	61 13	122	27 22	159	28 56	204	52 48	247	29 21	285
164	20 26	348	35 58	048	61 41	122	27 34	158	28 42	204	52 18	247	28 49	284
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		REGULUS	
165	36 22	046	25 54	099	27 47	157	28 29	203	51 48	246	28 17	283	20 18	347
166	36 45	045	26 26	099	28 00	157	28 17	203	51 18	246	27 45	282	20 11	346
167	37 08	044	26 58	098	28 13	156	28 04	202	50 48	245	27 13	281	20 02	345
168	37 31	043	27 31	097	28 26	156	27 52	201	50 19	244	26 41	280	19 53	344
169	37 53	042	28 03	096	28 39	155	27 40	201	49 49	244	26 09	280	19 44	343
170	38 14	041	28 36	095	28 53	155	27 29	200	49 20	243	25 37	279	19 34	342
171	38 35	040	29 08	094	29 08	154	27 18	200	48 51	243	25 04	278	19 23	341
172	38 56	038	29 41	094	29 22	153	27 07	199	48 22	242	24 32	277	19 12	340
173	39 16	037	30 13	093	29 37	153	26 56	199	47 53	242	24 00	276	19 00	339
174	39 36	036	30 46	092	29 52	152	26 46	198	47 24	241	23 27	275	18 48	338
175	39 54	035	31 19	091	30 07	152	26 36	197	46 56	241	22 54	274	18 35	337
176	40 13	034	31 51	090	30 23	151	26 26	197	46 28	240	22 22	274	18 22	336
177	40 31	032	32 24	090	30 39	151	26 17	196	45 59	239	21 49	273	18 08	335
178	40 48	031	32 57	089	30 55	150	26 08	196	45 31	239	21 17	272	17 54	334
179	41 04	030	33 29	088	31 11	149	25 59	195	45 03	238	20 44	271	17 39	333

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LAT 57°S

LHA Y	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		Alphard	
180	41 20	029	34 02	087	31 28	149	25 51	195	44 36	238	20 11	270	33 30	313
181	41 36	027	34 35	086	31 45	148	25 43	194	44 08	237	19 39	269	33 06	312
182	41 50	026	35 07	085	32 02	148	25 35	193	43 41	237	19 06	268	32 41	311
183	42 04	025	35 40	084	32 20	147	25 28	193	43 13	236	18 33	268	32 17	310
184	42 18	023	36 12	084	32 38	147	25 21	192	42 46	236	18 01	267	31 51	309
185	42 30	022	36 45	083	32 56	146	25 14	192	42 20	235	17 28	266	31 26	308
186	42 42	021	37 17	082	33 14	146	25 08	191	41 53	234	16 55	265	31 00	307
187	42 54	020	37 49	081	33 33	145	25 02	190	41 26	234	16 23	264	30 33	306
188	43 04	018	38 22	080	33 52	145	24 56	190	41 00	233	15 50	264	30 07	305
189	43 14	017	38 54	079	34 11	144	24 51	189	40 34	233	15 18	263	29 40	304
190	43 23	016	39 26	078	34 30	143	24 46	189	40 08	232	14 46	262	29 13	303
191	43 32	014	39 58	077	34 50	143	24 41	188	39 42	232	14 13	261	28 45	302
192	43 39	013	40 29	076	35 09	142	24 36	187	39 17	231	13 41	260	28 17	301
193	43 46	012	41 01	075	35 30	142	24 32	187	38 51	231	13 09	259	27 49	300
194	43 53	010	41 33	074	35 50	141	24 29	186	38 26	230	12 37	259	27 20	299
	SPICA		◆ ANTARES		Peacock		◆ ACHERNAR		CANOPUS		Suhail		◆ Alphard	
195	43 58	009	42 04	073	36 10	141	24 25	186	38 01	229	51 57	265	26 52	298
196	44 03	008	42 35	072	36 31	140	24 22	185	37 37	229	51 24	264	26 23	297
197	44 06	006	43 06	071	36 52	140	24 19	184	37 12	228	50 52	264	25 53	296
198	44 10	005	43 37	070	37 13	139	24 17	184	36 48	228	50 19	263	25 24	295
199	44 12	003	44 08	069	37 35	139	24 15	183	36 24	227	49 47	262	24 54	294
200	44 13	002	44 38	068	37 57	138	24 13	183	36 00	227	49 14	261	24 24	293
201	44 14	001	45 09	067	38 18	138	24 12	182	35 36	226	48 42	261	23 54	292
202	44 14	359	45 39	066	38 41	137	24 11	182	35 13	225	48 10	260	23 24	291
203	44 13	358	46 08	065	39 03	137	24 10	181	34 50	225	47 38	259	22 53	290
204	44 12	357	46 38	064	39 25	136	24 10	180	34 27	224	47 06	258	22 22	289
205	44 10	355	47 07	063	39 48	136	24 10	180	34 04	224	46 34	258	21 51	289
206	44 06	354	47 36	062	40 11	135	24 10	179	33 41	223	46 02	257	21 20	288
207	44 03	352	48 05	061	40 34	135	24 11	179	33 19	223	45 30	256	20 49	287
208	43 58	351	48 33	060	40 58	134	24 12	178	32 57	222	44 58	256	20 18	286
209	43 52	350	49 01	058	41 21	134	24 13	177	32 35	221	44 27	255	19 46	285
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
210	49 29	057	30 22	092	41 45	133	24 15	177	32 14	221	43 55	254	43 46	348
211	49 56	056	30 55	091	42 09	133	24 17	176	31 53	220	43 24	254	43 39	347
212	50 23	055	31 27	091	42 33	132	24 19	176	31 32	220	42 53	253	43 32	346
213	50 49	054	32 00	090	42 58	132	24 22	175	31 11	219	42 21	252	43 23	344
214	51 15	052	32 33	089	43 22	131	24 25	174	30 50	219	41 50	251	43 14	343
215	51 41	051	33 05	088	43 47	130	24 28	174	30 30	218	41 19	251	43 04	342
216	52 06	050	33 38	087	44 12	130	24 32	173	30 10	217	40 49	250	42 54	340
217	52 31	048	34 10	086	44 37	130	24 36	173	29 50	217	40 18	249	42 42	339
218	52 55	047	34 43	086	45 02	129	24 40	172	29 31	216	39 47	249	42 30	338
219	53 19	046	35 16	085	45 28	129	24 45	171	29 12	216	39 17	248	42 18	336
220	53 42	044	35 48	084	45 54	128	24 50	171	28 53	215	38 47	247	42 04	335
221	54 04	043	36 21	083	46 19	128	24 55	170	28 34	214	38 17	247	41 50	334
222	54 26	042	36 53	082	46 45	127	25 01	170	28 16	214	37 47	246	41 35	333
223	54 48	040	37 25	081	47 12	127	25 07	169	27 58	213	37 17	245	41 20	331
224	55 09	039	37 58	080	47 38	126	25 13	168	27 40	213	36 47	245	41 04	330
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
225	55 29	037	38 30	079	48 04	126	25 20	168	27 23	212	36 18	244	40 48	329
226	55 48	036	39 02	078	48 31	125	25 27	167	27 05	211	35 49	243	40 30	328
227	56 07	034	39 34	077	48 58	125	25 34	167	26 48	211	35 19	243	40 13	326
228	56 25	033	40 06	076	49 25	124	25 42	166	26 32	210	34 50	242	39 54	325
229	56 43	031	40 37	076	49 52	124	25 50	166	26 15	210	34 22	241	39 35	324
230	56 59	030	41 09	075	50 19	123	25 58	165	25 59	209	33 53	241	39 16	323
231	57 15	028	41 40	074	50 47	123	26 07	164	25 44	208	33 25	240	38 56	322
232	57 30	027	42 12	073	51 14	122	26 16	164	25 28	208	32 56	239	38 35	320
233	57 44	025	42 43	072	51 42	122	26 25	163	25 13	207	32 28	239	38 14	319
234	57 58	023	43 14	071	52 10	121	26 35	163	24 58	207	32 00	238	37 53	318
235	58 10	022	43 44	070	52 38	121	26 45	162	24 44	206	31 33	237	37 31	317
236	58 22	020	44 15	069	53 06	120	26 55	162	24 30	205	31 05	237	37 08	316
237	58 32	018	44 45	068	53 34	120	27 05	161	24 16	205	30 38	236	36 45	315
238	58 42	017	45 15	066	54 03	119	27 16	160	24 02	204	30 11	236	36 22	314
239	58 51	015	45 45	065	54 31	119	27 27	160	23 49	204	29 44	235	35 58	312
	◆ ANTARES		Nunki		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA	
240	58 59	013	46 15	064	17 06	118	27 39	159	23 36	203	63 37	234	35 33	311
241	59 06	012	46 44	063	17 34	118	27 50	159	23 24	202	63 11	234	35 09	310
242	59 12	010	47 13	062	18 04	117	28 03	158	23 12	202	62 44	234	34 44	309
243	59 17	008	47 42	061	18 33	116	28 15	158	23 00	201	62 18	234	34 18	308
244	59 21	006	48 10	060	19 02	115	28 28	157	22 48	200	61 52	233	33 52	307
245	59 24	005	48 38	059	19 32	114	28 40	156	22 37	200	61 25	233	33 26	306
246	59 27	003	49 06	058	20 02	114	28 54	156	22 26	199	60 59	233	32 59	305
247	59 28	001	49 33	056	20 32	113	29 07	155	22 15	199	60 33	233	32 32	304
248	59 28	359	50 00	055	21 02	112	29 21	155	22 05	198	60 07	232	32 05	303
249	59 27	358	50 27	054	21 32	111	29 35	154	21 55	197	59 41	232	31 37	302
250	59 25	356	50 53	053	22 03	111	29 50	154	21 46	197	59 16	232	31 09	301
251	59 22	354	51 19	051	22 33	110	30 04	153	21 37	196	58 50	232	30 41	300
252	59 18	352	51 44	050	23 04	109	30 19	152	21 28	195	58 24	231	30 13	299
253	59 13	350	52 09	049	23 35	108	30 35	152	21 19	195	57 59	231	29 44	298
254	59 07	349	52 34	048	24 06	108	30 50	151	21 11	194	57 33	231	29 15	297
	ALTAIR		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA		◆ ANTARES	
255	15 20	044	24 37	107	31 06	151	21 03	193	57 08	230	28 46	296	59 00	347
256	15 43	043	25 09	106	31 22	150	20 56	193	56 43	230	28 16	295	58 53	345
257	16 05	042	25 40	105	31 38	150	20 49	192	56 18	230	27 47	294	58 44	344
258	16 26	041	26 12	105	31 55	149	20 42	192	55 53	230	27 17	293	58 34	342
259	16 48	040	26 44	104	32 12	149	20 36	191	55 28	229	26 46	292	58 24	340
260	17 09	039	27 15	103	32 29	148	20 29	190	55 04	229	26 16	291	58 12	339
261	17 29	038	27 47	102	32 47	147	20 24	190	54 39	229	25 45	290	58 00	337
262	17 49	037	28 19	101	33 04	147	20 18	189	54 15	228	25 15	289	57 46	335
263	18 09	036	28 51	101	33 22	146	20 14	188	53 50	228	24 44	288	57 32	334
264	18 28	035	29 23	100	33 40	146	20 09	188	53 26	228	24 13	287	57 17	332
265	18 47	035	29 56	099	33 59	145	20 05	187	53 02	227	23 41	287	57 02	331
266	19 05	034	30 28	098	34 18	145	20 01	186	52 38	227	23 10	286	56 45	329
267	19 23	033	31 00	098	34 36	144	19 57	186	52 14	227	22 38	285	56 28	327
268	19 40	032	31 33	097	34 56	144	19 54	185	51 51	226	22 07	284	56 10	326
269	19 57	031	32 05	096	35 15	143	19 51	185	51 27	226	21 35	283	55 51	324

LHA Y	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		RIGIL KENT		◆ SPICA		ANTARES	
270	20 14	029	32 38	095	35 35	143	19 49	184	64 38	240	21 03	282	55 32	323
271	20 29	028	33 10	094	35 55	142	19 47	183	64 10	240	20 31	281	55 12	321
272	20 45	027	33 43	093	36 15	142	19 45	183	63 42	240	19 59	280	54 51	320
273	21 00	026	34 16	093	36 35	141	19 44	182	63 14	239	19 27	279	54 30	319
274	21 14	025	34 48	092	36 56	141	19 43	181	62 45	239	18 55	279	54 08	317
275	21 28	024	35 21	091	37 17	140	19 42	181	62 17	239	18 22	278	53 46	316
276	21 41	023	35 54	090	37 38	140	19 42	180	61 50	238	17 50	277	53 23	314
277	21 54	022	36 26	089	37 59	139	19 42	179	61 22	238	17 17	276	52 59	313
278	22 06	021	36 59	088	38 21	138	19 43	179	60 54	238	16 45	275	52 35	312
279	22 17	020	37 32	088	38 43	138	19 44	178	60 26	238	16 12	274	52 10	310
280	22 28	019	38 04	087	39 05	137	19 45	177	59 59	237	15 40	273	51 45	309
281	22 39	018	38 37	086	39 27	137	19 47	177	59 31	237	15 07	273	51 20	308
282	22 49	017	39 09	085	39 49	136	19 49	176	59 04	237	14 34	272	50 54	307
283	22 58	016	39 42	084	40 12	136	19 51	176	58 37	236	14 02	271	50 27	305
284	23 07	015	40 14	083	40 35	135	19 54	175	58 10	236	13 29	270	50 00	304
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki	
285	23 15	014	40 47	082	40 58	135	19 57	174	57 43	236	49 33	303	59 16	358
286	23 22	013	41 19	081	41 21	134	20 00	174	57 16	235	49 05	302	59 15	357
287	23 29	012	41 51	081	41 44	134	20 04	173	56 49	235	48 38	301	59 12	355
288	23 35	011	42 24	080	42 08	133	20 08	172	56 23	234	48 09	300	59 09	353
289	23 41	010	42 56	079	42 32	133	20 13	172	55 56	234	47 41	298	59 04	351
290	23 46	009	43 28	078	42 56	132	20 18	171	55 30	234	47 12	297	58 59	350
291	23 51	007	44 00	077	43 20	132	20 23	170	55 03	233	46 43	296	58 53	348
292	23 55	006	44 31	076	43 45	131	20 29	170	54 37	233	46 13	295	58 45	346
293	23 58	005	45 03	075	44 09	131	20 35	169	54 11	233	45 43	294	58 37	344
294	24 01	004	45 34	074	44 34	130	20 41	168	53 45	232	45 13	293	58 28	343
295	24 03	003	46 06	073	44 59	130	20 48	168	53 20	232	44 43	292	58 18	341
296	24 04	002	46 37	072	45 24	129	20 55	167	52 54	231	44 13	291	58 07	339
297	24 05	001	47 08	071	45 49	129	21 02	167	52 28	231	43 42	290	57 55	338
298	24 05	000	47 39	070	46 15	128	21 10	166	52 03	231	43 11	289	57 42	336
299	24 05	359	48 09	069	46 41	128	21 18	165	51 38	230	42 40	288	57 28	335
	FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki		◆ ALTAIR	
300	48 40	068	47 06	128	21 26	165	51 13	230	42 09	287	57 14	333	24 04	358
301	49 10	067	47 32	127	21 35	164	50 48	229	41 38	286	56 58	331	24 02	357
302	49 40	066	47 59	127	21 44	163	50 23	229	41 06	285	56 42	330	24 00	356
303	50 09	064	48 25	126	21 54	163	49 59	229	40 35	284	56 26	328	23 57	354
304	50 38	063	48 51	126	22 04	162	49 34	228	40 03	283	56 08	327	23 54	353
305	51 07	062	49 18	125	22 14	162	49 10	228	39 31	282	55 50	325	23 50	352
306	51 36	061	49 45	125	22 24	161	48 46	227	38 59	281	55 31	324	23 45	351
307	52 05	060	50 12	124	22 35	160	48 22	227	38 27	280	55 11	322	23 40	350
308	52 33	059	50 39	124	22 46	160	47 58	227	37 55	279	54 51	321	23 34	349
309	53 00	057	51 06	123	22 58	159	47 34	226	37 22	278	54 30	319	23 28	348
310	53 28	056	51 33	123	23 10	158	47 11	226	36 50	278	54 08	318	23 20	347
311	53 55	055	52 01	122	23 22	158	46 48	225	36 18	277	53 46	317	23 13	346
312	54 21	054	52 29	122	23 35	157	46 24	225	35 45	276	53 23	315	23 04	345
313	54 47	052	52 57	121	23 47	157	46 02	224	35 13	275	53 00	314	22 56	344
314	55 13	051	53 25	121	24 01	156	45 39	224	34 40	274	52 36	313	22 46	343
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
315	55 38	050	53 53	120	24 14	155	45 16	224	34 07	273	52 12	311	22 36	342
316	56 03	048	54 21	120	24 28	155	44 54	223	33 35	272	51 47	310	22 26	341
317	56 27	047	54 49	120	24 42	154	44 32	223	33 02	271	51 22	309	22 14	340
318	56 50	045	55 18	119	24 56	153	44 09	222	32 29	271	50 56	307	22 03	338
319	57 13	044	55 46	119	25 11	153	43 48	222	31 57	270	50 30	306	21 50	337
320	57 36	043	56 15	118	25 26	152	43 26	221	31 24	269	50 03	305	21 38	336
321	57 57	041	56 44	118	25 42	152	43 04	221	30 51	268	49 36	304	21 24	335
322	58 19	040	57 13	117	25 57	151	42 43	220	30 19	267	49 09	303	21 10	334
323	58 39	038	57 42	117	26 13	150	42 22	220	29 46	266	48 41	301	20 56	333
324	58 59	036	58 11	116	26 29	150	42 01	219	29 14	266	48 13	300	20 41	332
325	59 18	035	58 41	116	26 46	149	41 41	219	28 41	265	47 45	299	20 26	331
326	59 36	033	59 10	115	27 03	149	41 20	219	28 08	264	47 16	298	20 10	330
327	59 54	032	59 40	115	27 20	148	41 00	218	27 36	263	46 47	297	19 53	329
328	60 11	030	60 09	115	27 37	147	40 40	218	27 04	262	46 18	296	19 36	328
329	60 27	028	60 39	114	27 55	147	40 20	217	26 31	262	45 48	295	19 19	327
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
330	60 42	027	61 09	114	28 13	146	40 00	217	25 59	261	45 18	294	19 01	326
331	60 56	025	61 39	113	28 32	146	39 41	216	25 27	260	44 48	293	18 43	325
332	61 09	023	62 09	113	28 50	145	39 22	216	24 55	259	44 18	292	18 24	324
333	61 22	021	62 39	112	29 09	144	39 03	215	24 22	258	43 47	290	18 04	323
334	61 33	020	63 09	112	29 28	144	38 44	215	23 50	258	43 17	289	17 45	322
335	61 44	018	63 40	112	29 48	143	38 25	214	23 19	257	42 46	288	17 24	321
336	61 53	016	64 10	111	30 07	143	38 07	214	22 47	256	42 15	287	17 04	320
337	62 02	014	64 41	111	30 27	142	37 49	213	22 15	255	41 43	286	16 43	319
338	62 09	012	65 11	110	30 47	142	37 31	213	21 44	255	41 12	286	16 21	318
339	62 16	011	65 42	110	31 08	141	37 14	212	21 12	254	40 40	285	15 59	317
340	62 21	009	66 13	109	31 29	140	36 56	212	20 41	253	40 09	284	15 37	317
341	62 26	007	66 44	109	31 50	140	36 39	211	20 10	252	39 37	283	15 14	316
342	62 29	005	67 15	108	32 11	139	36 22	211	19 39	251	39 05	282	14 51	315
343	62 31	003	67 46	108	32 32	139	36 06	210	19 08	251	38 33	281	14 28	314
344	62 32	001	68 17	108	32 54	138	35 49	210	18 37	250	38 01	280	14 04	313
	◆ Diphda		Acamar		CANOPUS		◆ Miaplacidus		RIGIL KENT		◆ Nunki		FOMALHAUT	
345	46 20	037	48 43	093	33 16	137	38 13	169	35 33	209	37 28	279	62 32	359
346	46 39	036	49 16	092	33 38	137	38 20	168	35 17	209	36 56	278	62 32	357
347	46 58	035	49 49	091	34 01	136	38 27	168	35 02	208	36 24	277	62 29	356
348	47 16	033	50 21	090	34 23	136	38 34	167	34 46	208	35 51	276	62 26	354
349	47 34	032	50 54	089	34 46	135	38 41	167	34 31	207	35 19	275	62 22	352
350	47 51	031	51 27	088	35 09	135	38 49	167	34 16	207	34 46	275	62 17	350
351	48 07	029	51 59	087	35 33	134	38 56	166	34 01	206	34 14	274	62 11	348
352	48 23	028	52 32	087	35 56	133	39 04	166	33 47	206	33 41	273	62 04	346
353	48 38	027	53 05	086	36 20	133	39 12	165	33 33	205	33 08	272	61 55	344
354	48 52	025	53 37	085	36 44	132	39 21	165	33 19	205	32 36	271	61 46	343
355	49 06	024	54 10	084	37 09	132	39 30	164	33 05	204	32 03	270	61 36	341
356	49 19	022	54 42	083	37 33	131	39 38	164	32 52	204	31 30	269	61 24	339
357	49 31	021	55 15	082	37 58	131	39 47	164	32 39	203	30 58	269	61 12	337
358	49 42	019	55 47	081	38 23	130	39 57	163	32 26	203	30 25	268	60 59	335
359	49 52	018	56 19	080	38 48	130	40 06	163	32 14	202	29 52	267	60 45	334

Tilbage til Menuen

LAT 58°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	Diphda		◆ RIGEL		CANOPUS		Miaplacidus		◆ RIGIL KENT		Peacock		◆ FOMALHAUT	
0	49 04	016	12 51	085	39 51	128	41 13	162	32 57	202	61 58	250	59 37	333
1	49 13	015	13 23	084	40 16	128	41 23	162	32 46	201	61 28	249	59 22	331
2	49 21	013	13 55	083	40 41	127	41 33	161	32 34	201	60 58	249	59 06	330
3	49 28	012	14 26	082	41 06	127	41 43	161	32 23	200	60 29	248	58 50	328
4	49 34	010	14 58	081	41 32	126	41 54	161	32 12	200	59 59	248	58 33	326
5	49 39	009	15 29	081	41 58	125	42 04	160	32 01	199	59 30	247	58 15	325
6	49 44	007	16 00	080	42 24	125	42 15	160	31 51	199	59 01	247	57 56	323
7	49 47	006	16 32	079	42 50	124	42 26	159	31 41	198	58 32	246	57 37	322
8	49 50	005	17 03	078	43 16	124	42 38	159	31 31	198	58 03	246	57 17	320
9	49 52	003	17 34	077	43 43	123	42 49	159	31 22	197	57 34	245	56 56	319
10	49 54	002	18 05	076	44 09	123	43 01	158	31 12	197	57 05	245	56 35	317
11	49 54	000	18 35	075	44 36	122	43 13	158	31 03	196	56 37	244	56 13	316
12	49 54	359	19 06	074	45 03	121	43 25	157	30 55	196	56 08	244	55 51	315
13	49 53	357	19 37	073	45 31	121	43 37	157	30 46	195	55 40	243	55 28	313
14	49 51	356	20 07	073	45 58	120	43 50	157	30 38	194	55 11	243	55 04	312
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
15	20 37	072	16 00	096	46 26	120	30 31	194	54 43	242	54 40	310	49 48	354
16	21 07	071	16 32	095	46 53	119	30 23	193	54 15	242	54 16	309	49 44	353
17	21 37	070	17 03	094	47 21	119	30 16	193	53 47	241	53 51	308	49 40	351
18	22 07	069	17 35	094	47 49	118	30 09	192	53 19	241	53 26	307	49 35	350
19	22 37	068	18 07	093	48 17	117	30 02	192	52 52	240	53 00	305	49 29	348
20	23 06	067	18 39	092	48 45	117	29 56	191	52 24	240	52 34	304	49 22	347
21	23 35	066	19 10	091	49 14	116	29 50	191	51 57	239	52 07	303	49 14	345
22	24 04	065	19 42	090	49 42	116	29 44	190	51 30	239	51 40	302	49 06	344
23	24 33	064	20 14	089	50 11	115	29 39	190	51 03	238	51 13	300	48 57	343
24	25 01	063	20 46	089	50 40	115	29 34	189	50 36	238	50 46	299	48 47	341
25	25 30	062	21 17	088	51 09	114	29 29	188	50 09	237	50 18	298	48 36	340
26	25 58	061	21 49	087	51 38	113	29 25	188	49 42	237	49 49	297	48 25	338
27	26 25	060	22 21	086	52 07	113	29 20	187	49 16	236	49 21	296	48 13	337
28	26 53	059	22 53	085	52 37	112	29 16	187	48 50	236	48 52	295	48 00	336
29	27 20	058	23 24	084	53 06	112	29 13	186	48 24	235	48 23	294	47 47	334
	◆ RIGEL		SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		◆ FOMALHAUT		Diphda	
30	27 47	057	23 56	083	53 36	111	29 10	186	47 58	235	47 54	293	47 32	333
31	28 14	056	24 27	082	54 06	110	29 07	185	47 32	234	47 24	291	47 18	331
32	28 40	055	24 59	082	54 35	110	29 04	185	47 06	234	46 55	290	47 02	330
33	29 06	054	25 30	081	55 05	109	29 02	184	46 41	233	46 25	289	46 46	329
34	29 32	053	26 02	080	55 35	109	29 00	183	46 15	233	45 55	288	46 29	327
35	29 57	052	26 33	079	56 06	108	28 58	183	45 50	232	45 25	287	46 12	326
36	30 22	051	27 04	078	56 36	107	28 56	182	45 25	231	44 54	286	45 54	325
37	30 47	050	27 35	077	57 06	107	28 55	182	45 00	231	44 24	285	45 35	324
38	31 11	049	28 06	076	57 37	106	28 54	181	44 36	230	43 53	284	45 16	322
39	31 35	048	28 37	075	58 07	106	28 54	181	44 11	230	43 22	283	44 56	321
40	31 58	047	29 08	074	58 38	105	28 54	180	43 47	229	42 51	282	44 36	320
41	32 21	046	29 38	073	59 09	104	28 54	180	43 23	229	42 20	281	44 15	319
42	32 44	045	30 09	072	59 40	104	28 54	179	42 59	228	41 49	281	43 54	317
43	33 06	044	30 39	072	60 11	103	28 55	178	42 36	228	41 17	280	43 32	316
44	33 28	043	31 09	071	60 42	102	28 56	178	42 12	227	40 46	279	43 10	315
	RIGEL		◆ SIRIUS		CANOPUS		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
45	33 49	042	31 39	070	61 13	102	28 57	177	41 49	227	40 14	278	42 47	314
46	34 10	040	32 08	069	61 44	101	28 59	177	41 26	226	39 43	277	42 24	312
47	34 30	039	32 38	068	62 15	101	29 01	176	41 03	226	39 11	276	42 00	311
48	34 50	038	33 07	067	62 46	100	29 03	176	40 40	225	38 40	275	41 36	310
49	35 09	037	33 36	066	63 18	099	29 06	175	40 18	225	38 08	274	41 11	309
50	35 28	036	34 05	065	63 49	098	29 09	175	39 55	224	37 36	273	40 46	308
51	35 47	035	34 34	064	64 21	098	29 12	174	39 33	224	37 04	272	40 21	307
52	36 05	034	35 02	063	64 52	097	29 15	173	39 12	223	36 33	272	39 55	306
53	36 22	032	35 30	062	65 24	096	29 19	173	38 50	223	36 01	271	39 29	305
54	36 39	031	35 58	061	65 55	096	29 23	172	38 28	222	35 29	270	39 03	303
55	36 55	030	36 26	060	66 27	095	29 28	172	38 07	222	34 57	269	38 36	302
56	37 10	029	36 53	059	66 59	094	29 32	171	37 46	221	34 26	268	38 09	301
57	37 25	028	37 20	058	67 30	093	29 37	171	37 26	220	33 54	267	37 42	300
58	37 40	026	37 47	056	68 02	093	29 43	170	37 05	220	33 22	267	37 14	299
59	37 54	025	38 13	055	68 34	092	29 48	170	36 45	219	32 50	266	36 47	298
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		FOMALHAUT		◆ Diphda	
60	38 07	024	38 39	054	42 01	108	29 54	169	36 25	219	32 19	265	36 18	297
61	38 19	023	39 05	053	42 31	107	30 00	168	36 05	218	31 47	264	35 50	296
62	38 31	021	39 30	052	43 01	106	30 07	168	35 45	218	31 15	263	35 21	295
63	38 43	020	39 55	051	43 32	106	30 14	167	35 26	217	30 44	262	34 52	294
64	38 53	019	40 19	050	44 03	105	30 21	167	35 07	217	30 12	262	34 23	293
65	39 03	018	40 43	049	44 33	104	30 28	166	34 48	216	29 41	261	33 54	292
66	39 13	016	41 07	048	45 04	104	30 36	166	34 29	216	29 10	260	33 24	291
67	39 21	015	41 30	046	45 35	103	30 44	165	34 11	215	28 38	259	32 55	290
68	39 29	014	41 53	045	46 06	102	30 52	165	33 53	214	28 07	258	32 25	289
69	39 37	013	42 15	044	46 37	101	31 01	164	33 35	214	27 36	258	31 55	288
70	39 43	011	42 37	043	47 09	101	31 09	164	33 18	213	27 05	257	31 24	287
71	39 49	010	42 59	042	47 40	100	31 19	163	33 00	213	26 34	256	30 54	286
72	39 54	009	43 19	040	48 11	099	31 28	162	32 43	212	26 03	255	30 23	285
73	39 59	008	43 40	039	48 43	098	31 38	162	32 26	212	25 33	255	29 53	284
74	40 03	006	44 00	038	49 14	098	31 48	161	32 10	211	25 02	254	29 22	284
	RIGEL		◆ SIRIUS		Suhail		◆ RIGIL KENT		Peacock		ACHERNAR		◆ Diphda	
75	40 06	005	44 19	037	49 46	097	31 58	161	31 54	211	63 35	250	28 51	283
76	40 08	004	44 37	035	50 17	096	32 09	160	31 38	210	63 05	249	28 20	282
77	40 10	002	44 56	034	50 49	095	32 19	160	31 22	209	62 35	249	27 48	281
78	40 11	001	45 13	033	51 21	095	32 30	159	31 06	209	62 06	249	27 17	280
79	40 11	000	45 30	031	51 52	094	32 42	159	30 51	208	61 36	248	26 46	279
80	40 11	358	45 46	030	52 24	093	32 54	158	30 36	208	61 07	248	26 14	278
81	40 09	357	46 02	029	52 56	092	33 05	158	30 22	207	60 37	247	25 43	277
82	40 07	356	46 17	027	53 28	091	33 18	157	30 07	207	60 08	247	25 11	276
83	40 05	355	46 31	026	53 59	090	33 30	157	29 53	206	59 39	246	24 40	276
84	40 01	353	46 45	025	54 31	090	33 43	156	29 39	205	59 10	246	24 08	275
85	39 57	352	46 58	023	55 03	089	33 56	156	29 26	205	58 41	245	23 36	274
86	39 53	351	47 10	022	55 35	088	34 09	155	29 13	204	58 12	245	23 05	273
87	39 47	349	47 22	021	56 06	087	34 23	155	29 00	204	57 44	244	22 33	272
88	39 41	348	47 33	019	56 38	086	34 37	154	28 47	203	57 15	244	22 01	271
89	39 34	347	47 43	018	57 10	085	34 51	153	28 35	202	56 47	243	21 29	270

LAT 58°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	SIRIUS		Alphard		◆ Suhail		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL	
90	47 52	016	26 47	061	57 42	084	35 05	153	28 23	202	56 18	243	39 27	346
91	48 01	015	27 14	060	58 13	083	35 19	152	28 11	201	55 50	242	39 18	344
92	48 09	014	27 42	059	58 45	082	35 34	152	28 00	201	55 22	242	39 09	343
93	48 16	012	28 09	058	59 16	081	35 49	151	27 49	200	54 54	241	39 00	342
94	48 22	011	28 35	057	59 48	080	36 05	151	27 38	200	54 26	241	38 50	341
95	48 28	009	29 02	056	60 19	079	36 20	150	27 27	199	53 59	240	38 39	339
96	48 32	008	29 28	055	60 50	078	36 36	150	27 17	198	53 31	240	38 27	338
97	48 36	006	29 54	054	61 21	077	36 52	149	27 07	198	53 04	239	38 15	337
98	48 39	005	30 19	053	61 52	076	37 08	149	26 58	197	52 36	239	38 02	336
99	48 42	004	30 45	052	62 23	075	37 25	148	26 49	197	52 09	238	37 49	334
100	48 43	002	31 09	051	62 54	074	37 42	148	26 40	196	51 42	238	37 35	333
101	48 44	001	31 34	050	63 24	073	37 59	147	26 31	195	51 15	237	37 20	332
102	48 44	359	31 58	049	63 54	072	38 16	147	26 23	195	50 49	237	37 05	331
103	48 43	358	32 22	048	64 24	070	38 34	146	26 15	194	50 22	236	36 49	330
104	48 42	356	32 45	046	64 54	069	38 51	146	26 07	194	49 56	236	36 32	328
	Alphard		◆ Gienah		RIGIL KENT		◆ Peacock		ACHERNAR		◆ RIGEL		SIRIUS	
105	33 08	045	20 36	091	39 09	145	26 00	193	49 29	235	36 16	327	48 39	355
106	33 30	044	21 08	090	39 27	145	25 53	192	49 03	235	35 58	326	48 36	353
107	33 52	043	21 40	089	39 46	144	25 46	192	48 37	234	35 40	325	48 32	352
108	34 14	042	22 12	088	40 04	144	25 40	191	48 12	234	35 21	324	48 27	351
109	34 35	041	22 43	087	40 23	143	25 33	191	47 46	233	35 02	323	48 21	349
110	34 55	040	23 15	086	40 42	143	25 28	190	47 21	233	34 43	321	48 15	348
111	35 15	039	23 47	085	41 01	142	25 22	189	46 55	232	34 23	320	48 08	346
112	35 35	038	24 18	084	41 21	142	25 17	189	46 30	232	34 02	319	48 00	345
113	35 54	036	24 50	084	41 41	142	25 13	188	46 05	231	33 41	318	47 51	343
114	36 13	035	25 22	083	42 01	141	25 08	188	45 40	231	33 20	317	47 42	342
115	36 31	034	25 53	082	42 21	141	25 04	187	45 16	230	32 58	316	47 32	341
116	36 48	033	26 25	081	42 41	140	25 00	186	44 51	230	32 35	315	47 21	339
117	37 05	032	26 56	080	43 01	140	24 57	186	44 27	229	32 13	314	47 09	338
118	37 22	030	27 27	079	43 22	139	24 54	185	44 03	229	31 49	313	46 57	336
119	37 37	029	27 58	078	43 43	139	24 51	185	43 39	228	31 26	312	46 44	335
	REGULUS		◆ SPICA		RIGIL KENT		Peacock		◆ ACHERNAR		RIGEL		◆ SIRIUS	
120	15 17	033	14 01	089	44 04	138	24 49	184	43 16	228	31 02	310	46 30	334
121	15 34	032	14 33	088	44 25	138	24 47	183	42 52	227	30 37	309	46 15	332
122	15 50	031	15 04	087	44 47	137	24 45	183	42 29	227	30 13	308	46 00	331
123	16 07	030	15 36	086	45 08	137	24 43	182	42 06	226	29 48	307	45 45	330
124	16 22	029	16 08	085	45 30	136	24 42	182	41 43	226	29 22	306	45 28	328
125	16 37	028	16 39	085	45 52	136	24 42	181	41 20	225	28 56	305	45 11	327
126	16 52	027	17 11	084	46 15	135	24 41	180	40 58	225	28 30	304	44 54	326
127	17 06	026	17 43	083	46 37	135	24 41	180	40 35	224	28 04	303	44 36	325
128	17 20	025	18 14	082	47 00	135	24 41	179	40 13	224	27 37	302	44 17	323
129	17 33	024	18 46	081	47 22	134	24 42	179	39 52	223	27 10	301	43 58	322
130	17 46	023	19 17	080	47 45	134	24 43	178	39 30	223	26 43	300	43 38	321
131	17 58	022	19 48	079	48 08	133	24 44	177	39 08	222	26 15	299	43 17	320
132	18 09	021	20 19	078	48 32	133	24 46	177	38 47	222	25 47	298	42 57	318
133	18 20	020	20 51	078	48 55	132	24 48	176	38 26	221	25 19	297	42 35	317
134	18 31	019	21 22	077	49 19	132	24 50	176	38 06	221	24 51	296	42 13	316
135	18 41	018	21 52	076	49 42	131	24 53	175	37 45	220	67 35	267	41 51	315
136	18 50	017	22 23	075	50 06	131	24 56	174	37 25	219	67 03	266	41 28	314
137	18 59	016	22 54	074	50 30	131	24 59	174	37 05	219	66 31	265	41 05	312
138	19 08	015	23 24	073	50 54	130	25 02	173	36 45	218	66 00	264	40 41	311
139	19 16	014	23 55	072	51 19	130	25 06	173	36 25	218	65 28	264	40 17	310
140	19 23	013	24 25	071	51 43	129	25 11	172	36 06	217	64 57	263	39 53	309
141	19 30	012	24 55	070	52 08	129	25 15	171	35 47	217	64 25	262	39 28	308
142	19 36	011	25 25	069	52 33	128	25 20	171	35 28	216	63 54	262	39 02	307
143	19 42	010	25 54	068	52 58	128	25 26	170	35 09	216	63 22	261	38 37	306
144	19 47	009	26 24	067	53 23	128	25 31	170	34 51	215	62 51	260	38 11	305
145	19 51	008	26 53	066	53 48	127	25 37	169	34 32	215	62 19	260	37 44	303
146	19 55	007	27 22	066	54 14	127	25 43	168	34 14	214	61 48	259	37 18	302
147	19 58	006	27 51	065	54 39	126	25 50	168	33 57	213	61 17	258	36 51	301
148	20 01	004	28 20	064	55 05	126	25 57	167	33 39	213	60 46	258	36 23	300
149	20 03	003	28 48	063	55 31	126	26 04	167	33 22	212	60 15	257	35 56	299
	REGULUS		◆ SPICA		RIGIL KENT		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS	
150	20 05	002	29 16	062	55 56	125	26 11	166	33 05	212	59 44	256	35 28	298
151	20 06	001	29 44	061	56 22	125	26 19	165	32 49	211	59 13	256	35 00	297
152	20 06	000	30 11	060	56 49	124	26 27	165	32 32	211	58 42	255	34 31	296
153	20 06	359	30 39	059	57 15	124	26 36	164	32 16	210	58 12	254	34 03	295
154	20 06	358	31 06	058	57 41	124	26 45	164	32 00	210	57 41	254	33 34	294
155	20 04	357	31 32	057	58 08	123	26 54	163	31 45	209	57 11	253	33 05	293
156	20 02	356	31 59	056	58 34	123	27 03	162	31 29	208	56 40	253	32 35	292
157	20 00	355	32 25	055	59 01	123	27 13	162	31 14	208	56 10	252	32 06	291
158	19 57	354	32 51	053	59 28	122	27 23	161	31 00	207	55 40	251	31 36	290
159	19 53	353	33 16	052	59 55	122	27 34	161	30 45	207	55 10	251	31 06	289
160	19 49	352	33 41	051	60 22	121	27 44	160	30 31	206	54 40	250	30 36	288
161	19 45	351	34 06	050	60 49	121	27 55	159	30 17	206	54 10	250	30 06	287
162	19 39	350	34 30	049	61 17	121	28 06	159	30 04	205	53 40	249	29 35	286
163	19 33	349	34 54	048	61 44	120	28 18	158	29 50	205	53 10	248	29 05	286
164	19 27	348	35 17	047	62 11	120	28 30	158	29 37	204	52 41	248	28 34	285
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		REGULUS	
165	35 40	046	26 03	099	28 42	157	29 24	203	52 12	247	28 03	284	19 20	347
166	36 03	045	26 34	098	28 55	157	29 12	203	51 42	247	27 32	283	19 12	346
167	36 25	044	27 06	097	29 07	156	29 00	202	51 13	246	27 01	282	19 04	345
168	36 47	043	27 38	096	29 20	155	28 48	202	50 44	246	26 30	281	18 56	344
169	37 08	041	28 09	096	29 34	155	28 36	201	50 15	245	25 59	280	18 47	343
170	37 29	040	28 41	095	29 48	154	28 25	200	49 47	244	25 27	279	18 37	342
171	37 49	039	29 13	094	30 01	154	28 14	200	49 18	244	24 56	278	18 27	341
172	38 09	038	29 44	093	30 16	153	28 03	199	48 50	243	24 24	277	18 16	340
173	38 28	037	30 16	092	30 30	153	27 53	199	48 21	243	23 53	277	18 05	339
174	38 47	036	30 48	091	30 45	152	27 43	198	47 53	242	23 21	276	17 53	338
175	39 05	034	31 20	091	31 00	151	27 33	198	47 25	241	22 50	275	17 40	337
176	39 23	033	31 51	090	31 15	151	27 24	197	46 57	241	22 18	274	17 27	336
177	39 40	032	32 23	089	31 31	150	27 15	196	46 29	240	21 46	273	17 14	335
178	39 56	031	32 55	088	31 47	150	27 06	196	46 02	240	21 14	272	17 00	334
179	40 12	029	33 27	087	32 03	149	26 57	195	45 34	239	20 43	271	16 46	333

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LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ SPICA		ANTARES		◆ Peacock		ACHERNAR		CANOPUS		◆ SIRIUS		Alphard	
180	40 27	028	33 59	086	32 20	149	26 49	195	45 07	239	20 11	271	32 49	314
181	40 42	027	34 30	085	32 36	148	26 41	194	44 40	238	19 39	270	32 25	313
182	40 56	026	35 02	085	32 53	147	26 34	193	44 13	237	19 07	269	32 02	312
183	41 10	024	35 34	084	33 10	147	26 26	193	43 47	237	18 35	268	31 38	311
184	41 23	023	36 05	083	33 28	146	26 20	192	43 20	236	18 04	267	31 13	309
185	41 35	022	36 37	082	33 46	146	26 13	192	42 54	236	17 32	266	30 49	308
186	41 46	021	37 08	081	34 04	145	26 07	191	42 27	235	17 00	265	30 24	307
187	41 57	019	37 39	080	34 22	145	26 01	190	42 01	235	16 29	265	29 58	306
188	42 07	018	38 11	079	34 40	144	25 55	190	41 36	234	15 57	264	29 32	305
189	42 17	017	38 42	078	34 59	144	25 50	189	41 10	233	15 25	263	29 06	304
190	42 25	015	39 13	077	35 18	143	25 45	189	40 44	233	14 54	262	28 40	303
191	42 34	014	39 44	076	35 37	142	25 40	188	40 19	232	14 22	261	28 13	302
192	42 41	013	40 15	075	35 57	142	25 36	188	39 54	232	13 51	260	27 46	301
193	42 48	011	40 45	074	36 17	141	25 32	187	39 29	231	13 20	260	27 19	300
194	42 53	010	41 16	073	36 37	141	25 28	186	39 05	231	12 48	259	26 51	299
	SPICA		◆ ANTARES		Peacock		◆ ACHERNAR		CANOPUS		Suhail		◆ Alphard	
195	42 59	009	41 46	072	36 57	140	25 25	186	38 40	230	52 01	267	26 23	298
196	43 03	007	42 17	071	37 17	140	25 22	185	38 16	229	51 29	266	25 55	297
197	43 07	006	42 47	070	37 38	139	25 19	185	37 52	229	50 58	265	25 27	296
198	43 10	005	43 16	069	37 59	139	25 17	184	37 28	228	50 26	264	24 58	295
199	43 12	003	43 46	068	38 20	138	25 15	183	37 04	228	49 54	263	24 29	294
200	43 14	002	44 16	067	38 41	138	25 13	183	36 41	227	49 23	263	24 00	294
201	43 14	001	44 45	066	39 03	137	25 12	182	36 18	227	48 51	262	23 31	293
202	43 14	359	45 14	065	39 24	137	25 11	182	35 55	226	48 20	261	23 02	292
203	43 14	358	45 43	064	39 46	136	25 10	181	35 32	225	47 48	260	22 32	291
204	43 12	357	46 11	063	40 08	136	25 10	180	35 09	225	47 17	260	22 02	290
205	43 10	355	46 39	062	40 31	135	25 10	180	34 47	224	46 46	259	21 32	289
206	43 07	354	47 07	061	40 53	134	25 10	179	34 25	224	46 15	258	21 02	288
207	43 03	353	47 35	060	41 16	134	25 11	179	34 03	223	45 44	257	20 32	287
208	42 59	351	48 02	059	41 39	133	25 12	178	33 42	222	45 13	257	20 01	286
209	42 53	350	48 29	057	42 02	133	25 13	177	33 20	222	44 42	256	19 31	285
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
210	48 56	056	30 24	092	42 26	132	25 15	177	32 59	221	44 11	255	42 47	349
211	49 22	055	30 56	091	42 49	132	25 17	176	32 38	221	43 40	254	42 41	347
212	49 48	054	31 28	090	43 13	131	25 19	176	32 18	220	43 10	254	42 33	346
213	50 13	053	31 59	089	43 37	131	25 21	175	31 57	220	42 39	253	42 25	345
214	50 38	051	32 31	088	44 01	130	25 24	174	31 37	219	42 09	252	42 17	343
215	51 03	050	33 03	087	44 26	130	25 28	174	31 17	218	41 39	252	42 07	342
216	51 27	049	33 35	087	44 50	129	25 31	173	30 58	218	41 09	251	41 57	341
217	51 51	047	34 06	086	45 15	129	25 35	173	30 38	217	40 39	250	41 46	339
218	52 14	046	34 38	085	45 40	128	25 40	172	30 19	217	40 09	250	41 35	338
219	52 36	045	35 10	084	46 05	128	25 44	171	30 00	216	39 39	249	41 22	337
220	52 59	044	35 41	083	46 30	127	25 49	171	29 42	215	39 09	248	41 10	336
221	53 20	042	36 13	082	46 56	127	25 54	170	29 24	215	38 40	247	40 56	334
222	53 41	041	36 44	081	47 21	126	26 00	170	29 06	214	38 11	247	40 42	333
223	54 02	039	37 16	080	47 47	126	26 06	169	28 48	214	37 42	246	40 27	332
224	54 22	038	37 47	079	48 13	125	26 12	168	28 30	213	37 13	245	40 12	331
	ANTARES		◆ Nunki		Peacock		ACHERNAR		◆ CANOPUS		Suhail		◆ SPICA	
225	54 41	036	38 18	078	48 39	125	26 19	168	28 13	212	36 44	245	39 56	329
226	54 59	035	38 49	078	49 05	124	26 26	167	27 56	212	36 15	244	39 40	328
227	55 17	034	39 20	077	49 32	124	26 33	167	27 40	211	35 47	243	39 23	327
228	55 35	032	39 51	076	49 58	123	26 40	166	27 24	211	35 18	243	39 05	326
229	55 51	031	40 22	075	50 25	123	26 48	165	27 08	210	34 50	242	38 47	324
230	56 07	029	40 52	074	50 52	122	26 56	165	26 52	209	34 22	241	38 28	323
231	56 22	027	41 23	073	51 19	122	27 05	164	26 36	209	33 54	241	38 09	322
232	56 36	026	41 53	072	51 46	121	27 13	164	26 21	208	33 27	240	37 49	321
233	56 50	024	42 23	071	52 13	121	27 23	163	26 07	207	32 59	239	37 29	320
234	57 02	023	42 53	070	52 40	120	27 32	163	25 52	207	32 32	239	37 08	319
235	57 14	021	43 23	069	53 08	120	27 42	162	25 38	206	32 05	238	36 47	317
236	57 25	019	43 52	068	53 36	119	27 52	161	25 24	206	31 38	237	36 25	316
237	57 35	018	44 22	067	54 04	119	28 02	161	25 10	205	31 11	237	36 03	315
238	57 45	016	44 51	066	54 32	118	28 13	160	24 57	204	30 45	236	35 40	314
239	57 53	015	45 20	065	55 00	118	28 24	160	24 44	204	30 19	235	35 17	313
	◆ ANTARES		Nunki		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA	
240	58 01	013	45 48	063	17 34	118	28 35	159	24 32	203	64 11	236	34 54	312
241	58 07	011	46 17	062	18 02	117	28 46	158	24 19	202	63 45	236	34 30	311
242	58 13	010	46 45	061	18 30	116	28 58	158	24 07	202	63 19	236	34 05	310
243	58 18	008	47 12	060	18 59	116	29 10	157	23 56	201	62 53	235	33 41	309
244	58 22	006	47 40	059	19 28	115	29 23	157	23 44	201	62 27	235	33 16	308
245	58 25	004	48 07	058	19 57	114	29 35	156	23 33	200	62 01	235	32 50	307
246	58 27	003	48 33	057	20 26	113	29 48	156	23 23	199	61 35	234	32 25	305
247	58 28	001	49 00	055	20 55	113	30 02	155	23 12	199	61 09	234	31 59	304
248	58 28	359	49 26	054	21 24	112	30 15	154	23 02	198	60 43	234	31 32	303
249	58 27	358	49 51	053	21 54	111	30 29	154	22 53	197	60 18	234	31 05	302
250	58 25	356	50 17	052	22 24	110	30 43	153	22 43	197	59 52	233	30 38	301
251	58 22	354	50 41	051	22 54	110	30 58	153	22 34	196	59 27	233	30 11	300
252	58 19	352	51 06	049	23 24	109	31 12	152	22 25	196	59 01	233	29 44	299
253	58 14	351	51 30	048	23 54	108	31 27	152	22 17	195	58 36	232	29 16	298
254	58 08	349	51 53	047	24 24	107	31 43	151	22 09	194	58 11	232	28 48	297
	ALTAIR		◆ FOMALHAUT		ACHERNAR		CANOPUS		◆ ACRUX		SPICA		◆ ANTARES	
255	14 37	044	24 55	106	31 58	150	22 02	194	57 46	232	28 19	296	58 02	347
256	14 59	043	25 25	106	32 14	150	21 54	193	57 21	231	27 51	295	57 55	346
257	15 20	042	25 56	105	32 30	149	21 47	192	56 56	231	27 22	294	57 46	344
258	15 41	041	26 27	104	32 46	149	21 41	192	56 31	231	26 53	294	57 37	342
259	16 02	040	26 58	103	33 03	148	21 34	191	56 07	230	26 24	293	57 27	341
260	16 22	039	27 29	103	33 20	148	21 28	190	55 43	230	25 54	292	57 16	339
261	16 42	038	28 00	102	33 37	147	21 23	190	55 18	230	25 24	291	57 04	338
262	17 02	037	28 31	101	33 54	147	21 18	189	54 54	229	24 55	290	56 52	336
263	17 21	036	29 02	100	34 12	146	21 13	188	54 30	229	24 25	289	56 38	334
264	17 39	035	29 33	099	34 30	145	21 08	188	54 06	229	23 54	288	56 24	333
265	17 58	034	30 05	099	34 48	145	21 04	187	53 42	228	23 24	287	56 09	331
266	18 15	033	30 36	098	35 06	144	21 00	187	53 19	228	22 54	286	55 54	330
267	18 32	032	31 08	097	35 25	144	20 57	186	52 55	227	22 23	285	55 37	328
268	18 49	031	31 39	096	35 44	143	20 54	185	52 32	227	21 52	284	55 20	327
269	19 06	030	32 11	095	36 03	143	20 51	185	52 09	227	21 21	283	55 02	325

LAT 58°S

LHA Υ	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn	Hc	Zn
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		RIGIL KENT		◆ SPICA		ANTARES	
270	19 21	029	32 43	094	36 22	142	20 49	184	65 07	242	20 50	282	54 44	324
271	19 37	028	33 14	094	36 42	142	20 47	183	64 39	242	20 19	282	54 25	322
272	19 51	027	33 46	093	37 02	141	20 45	183	64 11	241	19 48	281	54 05	321
273	20 06	026	34 18	092	37 22	141	20 44	182	63 43	241	19 17	280	53 45	319
274	20 20	025	34 50	091	37 42	140	20 43	181	63 16	241	18 45	279	53 24	318
275	20 33	024	35 22	090	38 03	140	20 42	181	62 48	240	18 14	278	53 02	317
276	20 46	023	35 53	089	38 23	139	20 42	180	62 20	240	17 42	277	52 40	315
277	20 58	022	36 25	089	38 44	138	20 42	179	61 53	240	17 11	276	52 18	314
278	21 10	021	36 57	088	39 06	138	20 43	179	61 25	239	16 39	275	51 54	313
279	21 21	020	37 29	087	39 27	137	20 44	178	60 58	239	16 08	275	51 31	311
280	21 32	019	38 00	086	39 49	137	20 45	177	60 31	239	15 36	274	51 07	310
281	21 42	018	38 32	085	40 10	136	20 47	177	60 04	238	15 04	273	50 42	309
282	21 51	017	39 04	084	40 32	136	20 49	176	59 37	238	14 32	272	50 17	308
283	22 00	016	39 35	083	40 55	135	20 51	176	59 10	238	14 01	271	49 52	306
284	22 09	015	40 07	082	41 17	135	20 54	175	58 43	237	13 29	270	49 26	305
	◆ ALTAIR		FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki	
285	22 16	014	40 38	082	41 40	134	20 57	174	58 16	237	49 00	304	58 16	358
286	22 24	013	41 10	081	42 03	134	21 00	174	57 50	236	48 33	303	58 15	357
287	22 30	012	41 41	080	42 26	133	21 04	173	57 23	236	48 06	302	58 12	355
288	22 37	011	42 12	079	42 49	133	21 08	172	56 57	236	47 39	300	58 09	353
289	22 42	010	42 44	078	43 12	132	21 12	172	56 31	235	47 12	299	58 05	352
290	22 47	008	43 15	077	43 36	132	21 17	171	56 05	235	46 44	298	58 00	350
291	22 51	007	43 45	076	44 00	131	21 22	170	55 39	235	46 16	297	57 54	348
292	22 55	006	44 16	075	44 24	131	21 28	170	55 13	234	45 47	296	57 47	347
293	22 58	005	44 47	074	44 48	130	21 34	169	54 47	234	45 19	295	57 39	345
294	23 01	004	45 17	073	45 13	130	21 40	168	54 22	233	44 50	294	57 30	343
295	23 03	003	45 48	072	45 37	129	21 46	168	53 56	233	44 20	293	57 21	342
296	23 04	002	46 18	071	46 02	129	21 53	167	53 31	232	43 51	292	57 10	340
297	23 05	001	46 48	070	46 27	128	22 00	166	53 06	232	43 21	291	56 59	338
298	23 05	000	47 17	069	46 52	128	22 08	166	52 41	232	42 52	290	56 47	337
299	23 05	359	47 47	068	47 17	127	22 16	165	52 16	231	42 22	289	56 34	335
	FOMALHAUT		◆ ACHERNAR		CANOPUS		◆ RIGIL KENT		ANTARES		Nunki		◆ ALTAIR	
300	48 16	067	47 43	127	22 24	165	51 51	231	41 51	288	56 20	334	23 04	358
301	48 45	066	48 08	126	22 33	164	51 27	230	41 21	287	56 06	332	23 03	357
302	49 14	064	48 34	126	22 42	163	51 02	230	40 50	286	55 50	331	23 00	356
303	49 43	063	49 00	125	22 51	163	50 38	230	40 20	285	55 34	329	22 58	355
304	50 11	062	49 26	125	23 01	162	50 14	229	39 49	284	55 18	327	22 54	353
305	50 39	061	49 52	124	23 11	161	49 50	229	39 18	283	55 00	326	22 50	352
306	51 07	060	50 18	124	23 21	161	49 26	228	38 47	282	54 42	325	22 46	351
307	51 34	059	50 45	123	23 32	160	49 02	228	38 16	281	54 23	323	22 41	350
308	52 01	057	51 12	123	23 43	160	48 39	227	37 45	280	54 04	322	22 35	349
309	52 28	056	51 39	122	23 54	159	48 16	227	37 13	279	53 44	320	22 29	348
310	52 54	055	52 06	122	24 06	158	47 53	226	36 42	278	53 23	319	22 22	347
311	53 20	054	52 33	121	24 18	158	47 30	226	36 10	277	53 02	317	22 15	346
312	53 45	052	53 00	121	24 30	157	47 07	226	35 39	276	52 40	316	22 07	345
313	54 10	051	53 27	120	24 42	156	46 44	225	35 07	276	52 18	315	21 58	344
314	54 35	050	53 55	120	24 55	156	46 22	225	34 35	275	51 55	313	21 49	343
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
315	54 59	049	54 23	119	25 08	155	45 59	224	34 04	274	51 32	312	21 39	342
316	55 22	047	54 50	119	25 22	155	45 37	224	33 32	273	51 08	311	21 29	341
317	55 45	046	55 18	118	25 36	154	45 15	223	33 00	272	50 44	310	21 18	340
318	56 08	044	55 46	118	25 50	153	44 54	223	32 28	271	50 19	308	21 07	339
319	56 30	043	56 14	117	26 04	153	44 32	222	31 57	270	49 54	307	20 55	338
320	56 51	042	56 43	117	26 19	152	44 11	222	31 25	270	49 28	306	20 43	337
321	57 12	040	57 11	116	26 34	151	43 50	221	30 53	269	49 02	305	20 30	336
322	57 32	039	57 40	116	26 50	151	43 29	221	30 21	268	48 36	304	20 16	335
323	57 52	037	58 08	115	27 05	150	43 08	221	29 50	267	48 09	302	20 02	333
324	58 10	036	58 37	115	27 21	150	42 47	220	29 18	266	47 42	301	19 48	332
325	58 28	034	59 06	114	27 37	149	42 27	220	28 46	265	47 15	300	19 33	331
326	58 46	032	59 35	114	27 54	148	42 07	219	28 14	265	46 47	299	19 18	330
327	59 03	031	60 04	113	28 11	148	41 47	219	27 43	264	46 19	298	19 02	329
328	59 18	029	60 33	113	28 28	147	41 27	218	27 11	263	45 51	297	18 45	328
329	59 34	028	61 03	112	28 45	147	41 08	218	26 40	262	45 22	296	18 28	327
	◆ FOMALHAUT		ACHERNAR		◆ CANOPUS		RIGIL KENT		◆ ANTARES		Nunki		ALTAIR	
330	59 48	026	61 32	112	29 03	146	40 48	217	26 08	261	44 54	295	18 11	326
331	60 01	024	62 02	112	29 21	145	40 29	217	25 37	260	44 25	293	17 53	325
332	60 14	023	62 31	111	29 39	145	40 10	216	25 06	260	43 55	292	17 35	324
333	60 26	021	63 01	111	29 58	144	39 52	216	24 34	259	43 26	291	17 16	323
334	60 36	019	63 31	110	30 16	144	39 33	215	24 03	258	42 56	290	16 57	322
335	60 46	017	64 01	110	30 36	143	39 15	215	23 32	257	42 26	289	16 38	322
336	60 55	016	64 31	109	30 55	142	38 57	214	23 01	256	41 56	288	16 18	321
337	61 03	014	65 01	109	31 14	142	38 39	214	22 30	256	41 26	287	15 57	320
338	61 11	012	65 31	108	31 34	141	38 22	213	21 59	255	40 55	286	15 36	319
339	61 17	010	66 01	108	31 54	141	38 04	213	21 29	254	40 25	285	15 15	318
340	61 22	008	66 32	107	32 15	140	37 47	212	20 58	253	39 54	284	14 53	317
341	61 26	007	67 02	107	32 35	139	37 30	212	20 28	253	39 23	283	14 31	316
342	61 29	005	67 33	106	32 56	139	37 14	211	19 58	252	38 52	283	14 09	315
343	61 31	003	68 03	106	33 17	138	36 57	211	19 28	251	38 21	282	13 46	314
344	61 32	001	68 34	105	33 38	138	36 41	210	18 58	250	37 50	281	13 23	313
	◆ Diphda		Acamar		CANOPUS		◆ Miaplacidus		RIGIL KENT		◆ Nunki		FOMALHAUT	
345	45 32	037	48 45	091	34 00	137	39 12	168	36 25	210	37 19	280	61 32	359
346	45 50	035	49 17	091	34 22	136	39 19	168	36 10	209	36 47	279	61 32	357
347	46 09	034	49 49	090	34 44	136	39 25	168	35 54	209	36 16	278	61 30	356
348	46 26	033	50 21	089	35 06	135	39 32	167	35 39	208	35 44	277	61 27	354
349	46 43	031	50 53	088	35 29	135	39 40	167	35 24	208	35 13	276	61 23	352
350	46 59	030	51 24	087	35 51	134	39 47	166	35 10	207	34 41	275	61 18	350
351	47 15	029	51 56	086	36 14	133	39 55	166	34 55	207	34 09	274	61 12	348
352	47 30	027	52 28	085	36 37	133	40 02	166	34 41	206	33 38	274	61 05	347
353	47 44	026	52 59	084	37 01	132	40 10	165	34 27	206	33 06	273	60 57	345
354	47 58	025	53 31	083	37 24	132	40 19	165	34 13	205	32 34	272	60 49	343
355	48 11	023	54 03	083	37 48	131	40 27	164	34 00	205	32 02	271	60 39	341
356	48 23	022	54 34	082	38 12	131	40 36	164	33 47	204	31 31	270	60 28	340
357	48 34	020	55 06	081	38 37	130	40 45	163	33 34	204	30 59	269	60 17	338
358	48 45	019	55 37	080	39 01	129	40 54	163	33 22	203	30 27	268	60 04	336
359	48 55	018	56 08	079	39 26	129	41 04	163	33 09	202	29 55	268	59 51	335

Tilbage til Menuen

FOR AIR NAVIGATION VOL.1

Selected Stars Epoch 2015

Nord

Syd

Table 5	Table 5 - Correction for precession and nutation	
	2011 - 2013	326

LHA ♈	North latitudes						0°	South latitudes						LHA ♈
	N 80°	N 70°	N 60°	N 50°	N 40°	N 20°		S 20°	S 40°	S 50°	S 60°	S 70°	S 80°	
2011														
°	′ °	′ °	′ °	′ °	′ °	′ °	′ °	′ °	′ °	′ °	′ °	′ °	′ °	°
0	1·1 200	1·3 217	1·6 228	1·9 236	2·1 240	2·5 245	2·6 247	2·5 245	2·1 241	1·9 236	1·6 230	1·4 219	1·1 203	0
30	1·3 225	1·6 235	1·9 241	2·1 245	2·4 247	2·6 249	2·6 249	2·3 246	1·8 239	1·5 232	1·2 220	1·0 201	0·9 175	30
60	1·4 247	1·8 252	2·1 255	2·3 256	2·5 257	2·6 258	2·5 257	2·0 254	1·4 247	1·0 238	0·7 218	0·5 178	0·7 140	60
90	1·5 269	1·8 269	2·1 269	2·4 269	2·5 269	2·6 269	2·4 269	1·9 269	1·2 269	0·8 268	0·3 265	0·2 100	0·6 093	90
120	1·4 291	1·8 286	2·1 284	2·3 282	2·5 282	2·6 281	2·5 282	2·0 284	1·4 292	1·0 301	0·6 321	0·5 005	0·7 044	120
150	1·3 313	1·6 304	1·9 298	2·2 294	2·4 292	2·6 290	2·6 290	2·3 293	1·7 301	1·4 308	1·2 321	0·9 341	0·9 008	150
180	1·1 337	1·4 321	1·6 310	1·9 304	2·1 299	2·5 295	2·6 293	2·5 295	2·1 300	1·9 304	1·6 312	1·3 323	1·1 340	180
210	0·9 005	1·0 339	1·2 320	1·5 308	1·8 301	2·3 294	2·6 291	2·6 291	2·4 293	2·1 295	1·9 299	1·6 305	1·3 315	210
240	0·7 040	0·5 002	0·7 322	1·0 302	1·4 293	2·0 286	2·5 283	2·6 282	2·5 283	2·3 284	2·1 285	1·8 288	1·4 293	240
270	0·6 087	0·2 080	0·3 275	0·8 272	1·2 271	1·9 271	2·4 271	2·6 271	2·5 271	2·4 271	2·1 271	1·8 271	1·5 271	270
300	0·7 136	0·5 175	0·6 219	1·0 239	1·4 248	2·0 256	2·5 258	2·6 259	2·5 258	2·3 258	2·1 256	1·8 254	1·4 249	300
330	0·9 172	0·9 199	1·2 219	1·4 232	1·7 239	2·3 247	2·6 250	2·6 250	2·4 248	2·2 246	1·9 242	1·6 236	1·3 227	330
360	1·1 200	1·3 217	1·6 228	1·9 236	2·1 240	2·5 245	2·6 247	2·5 245	2·1 241	1·9 236	1·6 230	1·4 219	1·1 203	360
2012														
0	0·8 196	0·9 214	1·1 227	1·3 234	1·4 239	1·7 245	1·8 247	1·8 246	1·5 241	1·4 237	1·2 231	1·0 222	0·8 207	0
30	0·9 221	1·1 232	1·3 239	1·5 243	1·6 246	1·8 248	1·8 248	1·6 246	1·3 238	1·1 232	0·9 221	0·7 204	0·7 180	30
60	1·0 244	1·2 249	1·4 252	1·6 254	1·7 255	1·8 256	1·7 256	1·4 253	1·0 244	0·8 235	0·5 217	0·4 182	0·5 146	60
90	1·0 266	1·3 266	1·5 267	1·6 267	1·8 267	1·8 268	1·7 267	1·3 267	0·8 264	0·5 261	0·2 249	0·1 125	0·4 100	90
120	1·0 287	1·2 284	1·5 282	1·6 281	1·7 280	1·8 279	1·7 280	1·4 282	0·9 289	0·6 298	0·4 319	0·3 011	0·5 051	120
150	0·9 310	1·1 301	1·4 296	1·5 293	1·7 291	1·8 289	1·8 289	1·5 293	1·2 300	1·0 308	0·8 322	0·6 344	0·6 013	150
180	0·8 333	1·0 318	1·2 309	1·4 303	1·5 299	1·8 294	1·8 293	1·7 295	1·4 301	1·3 306	1·1 313	0·9 326	0·8 344	180
210	0·7 000	0·7 336	0·9 319	1·1 308	1·3 302	1·6 294	1·8 292	1·8 292	1·6 294	1·5 297	1·3 301	1·1 308	0·9 319	210
240	0·5 034	0·4 358	0·5 323	0·8 305	1·0 296	1·4 287	1·7 284	1·8 284	1·7 285	1·6 286	1·4 288	1·2 291	1·0 296	240
270	0·4 080	0·1 055	0·2 291	0·5 279	0·8 276	1·3 273	1·7 273	1·8 272	1·8 273	1·6 273	1·5 273	1·3 274	1·0 274	270
300	0·5 129	0·3 169	0·4 221	0·6 242	0·9 251	1·4 258	1·7 260	1·8 261	1·7 260	1·6 259	1·5 258	1·2 256	1·0 253	300
330	0·6 167	0·6 196	0·8 218	1·0 232	1·2 240	1·5 247	1·8 251	1·8 251	1·7 249	1·5 247	1·4 244	1·1 239	0·9 230	330
360	0·8 196	0·9 214	1·1 227	1·3 234	1·4 239	1·7 245	1·8 247	1·8 246	1·5 241	1·4 237	1·2 231	1·0 222	0·8 207	360
2013														
0	0·4 187	0·5 207	0·6 222	0·7 232	0·8 238	1·0 244	1·0 247	1·0 246	0·9 243	0·8 239	0·7 234	0·6 227	0·5 214	0
30	0·5 213	0·6 225	0·7 234	0·8 239	0·9 242	1·0 246	1·1 246	1·0 244	0·8 238	0·7 232	0·6 223	0·5 209	0·4 188	30
60	0·6 236	0·7 243	0·8 247	0·9 250	1·0 251	1·1 253	1·0 252	0·9 249	0·6 240	0·5 231	0·4 215	0·3 188	0·3 157	60
90	0·6 258	0·7 261	0·9 262	0·9 263	1·0 263	1·1 263	1·0 263	0·8 261	0·5 256	0·3 248	0·2 225	0·1 152	0·3 116	90
120	0·6 280	0·7 278	0·9 277	0·9 276	1·0 276	1·1 276	1·0 276	0·8 278	0·5 283	0·3 290	0·2 312	0·1 032	0·3 067	120
150	0·6 302	0·7 296	0·8 292	0·9 289	1·0 288	1·1 287	1·0 287	0·9 291	0·6 299	0·5 309	0·4 325	0·3 353	0·3 025	150
180	0·5 326	0·6 313	0·7 306	0·8 301	0·9 297	1·0 294	1·0 293	1·0 296	0·8 302	0·7 308	0·6 318	0·5 333	0·4 353	180
210	0·4 352	0·5 331	0·6 317	0·7 308	0·8 302	1·0 296	1·1 294	1·0 294	0·9 298	0·8 301	0·7 306	0·6 315	0·5 327	210
240	0·3 023	0·3 352	0·4 325	0·5 309	0·6 300	0·9 291	1·0 288	1·1 287	1·0 289	0·9 290	0·8 293	0·7 297	0·6 304	240
270	0·3 064	0·1 028	0·2 315	0·3 292	0·5 284	0·8 279	1·0 277	1·1 277	1·0 277	0·9 277	0·9 278	0·7 279	0·6 282	270
300	0·3 113	0·1 148	0·2 228	0·3 250	0·5 257	0·8 262	1·0 264	1·1 264	1·0 264	0·9 264	0·9 263	0·7 262	0·6 260	300
330	0·3 155	0·3 187	0·4 215	0·5 231	0·6 241	0·9 249	1·0 253	1·1 253	1·0 252	0·9 251	0·8 248	0·7 244	0·6 238	330
360	0·4 187	0·5 207	0·6 222	0·7 232	0·8 238	1·0 244	1·0 247	1·0 246	0·9 243	0·8 239	0·7 234	0·6 227	0·5 214	360

The above table gives the correction to be applied to a position line or a fix for the effects of precession and nutation from the mean equinox of 2015·0. Each entry consists of the distance (in bold type) in nautical miles, and the direction (true bearing) in which the position line or fix is to be moved. The table is entered firstly by the year, then by choosing the column nearest the latitude and finally the entry nearest the LHA ♈ of observation; no interpolation is necessary, though in extreme cases near the beginning or end of a year (but not the end of 2014 or the beginning of 2015 when the corrections are zero) values midway towards those of the previous or following years may be taken.

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Latitudes 39° - 89°

Table	Tabel 5 - Correction to Tabulated Altitude for Minutes of Declination	3
Lat 42° - 51°		
Lat 52° - 55°		
Lat 56° - 70°		

Tilbage til Menuen

TABLE 5.—Correction to Tabulated Altitude for Minutes of Declination

d / ′	1 2 3	4 5 6	7 8 9	10 11 12	13 14 15	16 17 18	19 20 21	22 23 24	25 26 27	28 29 30	31 32 33	34 35 36	37 38 39	40 41 42	43 44 45	46 47 48	49 50 51	52 53 54	55 56 57	58 59 60	d / ′
0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0
1	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1
2	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 2	2 2 2	2 2 2	2 2 2	2 2 2	2 2 2	2
3	0 0 0	0 0 0	0 0 0	0 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 2	2 2 2	2 2 2	2 2 2	2 2 2	2 2 3	2 2 2	2 2 2	2 2 3	3 3 3	3 3 3	3 3 3	3
4	0 0 0	0 0 0	0 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 2 2	2 2 2	2 2 2	2 2 2	2 2 2	2 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 4 4	4 4 4	4 4 4	4
5	0 0 0	0 0 0	1 1 1	1 1 1	1 1 1	1 1 2	2 2 2	2 2 2	2 2 2	2 2 2	3 3 3	3 3 3	3 3 3	3 3 4	4 4 4	4 4 4	4 4 4	4 4 4	5 5 5	5 5 5	5
6	0 0 0	0 0 1	1 1 1	1 1 1	1 1 2	2 2 2	2 2 2	2 2 3	3 3 3	3 3 3	3 3 3	3 4 4	4 4 4	4 4 4	4 4 4	5 5 5	5 5 5	5 5 5	6 6 6	6 6 6	6
7	0 0 0	0 1 1	1 1 1	1 1 1	2 2 2	2 2 2	2 2 2	3 3 3	3 3 3	3 3 4	4 4 4	4 4 4	4 4 5	5 5 5	5 5 6	6 6 6	6 6 6	6 6 6	6 7 7	7 7 7	7
8	0 0 0	1 1 1	1 1 1	1 1 2	2 2 2	2 2 2	3 3 3	3 3 3	3 3 4	4 4 4	4 4 4	5 5 5	5 5 5	5 5 6	6 6 6	6 6 6	7 7 7	7 7 7	7 7 8	8 8 8	8
9	0 0 0	1 1 1	1 1 1	2 2 2	2 2 2	2 3 3	3 3 3	3 3 4	4 4 4	4 4 4	5 5 5	5 5 5	6 6 6	6 6 6	6 7 7	7 7 7	7 8 8	8 8 8	8 8 9	9 9 9	9
10	0 0 0	1 1 1	1 1 2	2 2 2	2 2 2	3 3 3	3 3 4	4 4 4	4 4 4	5 5 5	5 5 6	6 6 6	6 6 6	7 7 7	7 7 8	8 8 8	8 8 8	9 9 9	9 9 10	10 10 10	10
11	0 0 1	1 1 1	1 1 2	2 2 2	2 3 3	3 3 3	4 4 4	4 4 4	5 5 5	5 5 6	6 6 6	6 6 7	7 7 7	7 8 8	8 8 9	8 9 9	9 9 9	10 10 10	10 10 10	11 11 11	11
12	0 0 1	1 1 1	1 2 2	2 2 2	3 3 3	3 3 4	4 4 4	4 5 5	5 5 5	6 6 6	6 6 7	7 7 7	7 8 8	8 8 8	9 9 9	9 9 10	10 10 10	10 11 11	11 11 11	12 12 12	12
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FOR AIR NAVIGATION VOL.3

Latitudes 39° - 89°

Table

Lat 42° - 51°	Lat 42°	56 - 63
	Lat 46°	56 - 63
Lat 52° - 55°	Lat 47°	56 - 63
	Lat 48°	56 - 63
Lat 56° - 70°	Lat 49°	64 - 71
	Lat 50°	72 - 79
	Lat 51°	80 - 87

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 42°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	360
1	47 59	60	179	48 59	60	178	49 59	60	178	50 59	60	178	51 59	60	178	52 59	60	178	53 59	60	178	54 59	60	178	55 59	60	178	56 59	60	178	57 59	60	178	58 59	60	178	59 59	60	178	60 59	60	178	61 59	60	178	359
2	47 58	60	177	48 58	60	177	49 58	60	177	50 58	59	177	51 57	60	177	52 57	60	177	53 57	60	177	54 57	60	177	55 57	60	176	56 57	60	176	57 57	60	176	58 57	60	176	59 57	60	176	60 57	60	176	61 57	60	176	358
3	47 55	60	176	48 55	60	175	49 55	59	175	50 54	60	175	51 54	60	175	52 54	60	175	53 54	60	175	54 54	60	175	55 54	60	175	56 54	60	175	57 54	59	174	58 53	60	174	59 53	60	174	60 53	60	174	61 53	60	174	357
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6	47 39	60	171	48 39	59	171	49 38	60	171	50 38	59	171	51 37	60	170	52 37	59	170	53 36	60	170	54 36	59	170	55 35	60	169	56 35	59	169	57 34	59	169	58 33	60	169	59 33	59	168	60 32	59	168	61 31	59	168	354
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31	39 34	52	138	40 26	52	137	41 18	51	137	42 09	52	136	43 01	51	135	43 52	50	135	44 42	51	134	45 33	50	133	46 23	50	132	47 13	49	132	48 02	49	131	48 51	49	130	49 40	48	129	50 28	47	128	51 15	48	127	329
32	39 04	52	137	39 56	51	136	40 47	51	136	41 38	51	135	42 29	51	134	43 20	50	133	44 10	50	133	45 00	49	132	45 49	50	131	46 39	49	130	47 28	48	129	48 16	49	129	49 05	47	128	49 52	48	127	50 40	46	126	328
33	38 33	51	136	39 24	51	135	40 15	51	135	41 06	51	134	41 57	50	133	42 47	50	132	43 37	49	132	44 26	50	131	45 16	49	130	46 05	48	129	46 53	48	128	47 41	48	127	48 29	47	127	49 16	47	126	50 03	46	125	327
34	38 02	51	135	38 53	50	134	39 43	51	133	40 34	50	133	41 24	50	132	42 14	49	131	43 03	49	130	43 52	49	130	44 41	49	129	45 30	48	128	46 18	48	127	47 06	47	126	47 53	47	125	48 40	46	124	49 26	46	123	326
35	37 30	+50	134	38 20	+51	133	39 11	+50	132	40 01	+49	132	40 50	+50	131	41 40	+49	130	42 29	+49	129	43 18	+48	129	44 06	+48	128	44 54	+48	127	45 42	+47	126	46 29	+47	125	47 16	+47	124	48 03	+46	123	48 49	+45	122	325
36	36 57	51	133	37 48	49	132	38 37	50	131	39 27	49	131	40 16	49	130	41 05	49	129	41 54	49	128	42 43	48	127	43 31	47	127	44 18	48	126	45 06	47	125	45 53	46	124	46 39	46	123	47 25	46	122	48 11	45	121	324
37	36 24	50	132	37 14	50	131	38 04	49	130	38 53	49	129	39 42	49	129	40 31	48	128	41 19	48	127	42 07	48	126	42 55	47	126	43 42	47	125	44 29	46	124	45 15	47	123	46 02	45	122	46 47	45	121	47 32	45	120	323
38	35 51	49	131	36 40	49	130	37 29	49	129	38 18	49	128	39 07	48	128	39 55	48	127	40 43	48	126	41 31	47	125	42 18	47	124	43 05	47	124	43 52	46	123	44 38	46	122	45 24	45	121	46 09	45	120	46 54	44	119	322
39	35 17	49	130	36 06	48	129	36 54	49	128	37 43	48	127	38 31	48	127	39 19	48	126	40 07	47	125	40 54	47	124	41 41	47	123	42 28	46	123	43 14	46	122	44 00	45	121	44 45	45	120	45 30	44	119	46 14	44	118	321
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41	34 07	48	128	34 55	48	127	35 43	48	126	36 31	48	125	37 19	47	125	38 06	47	124	38 53	47	123	39 40	46	122	40 26	46	121	41 12	45	121	41 57	45	120	42 42	45	119	43 27	44	118	44 11	44	117	44 55	43	116	319
42	33 31	48	127	34 19	48	126	35 07	48	125	35 55	47	124	36 42	47	124	37 29	46	123	38 15	47	122	39 02	46	121	39 48	45	120	40 33	45	120	41 18	45	119	42 03	44	118	42 47	44	117	43 31	44	116	44 15	43	115	318
43	32 55	48	126	33 43	47	125	34 30	48	124	35 18	47	123	36 05	46	123	36 51	46	122	37 37	46	121	38 23	46	120	39 09	45	119	39 54	45	119	40 39	44	118	41 23	44	117	42 07	44	116	42 51	43	115	43 34	43	114	317
44	32 19	47	125	33 06	47	124	33 53	47	123	34 40	47	122	35 27	46	122	36 13	46	121	36 59	46	120	37 45	45	119	38 30	45	118	39 15	44	118	39 59	44	117	40 43	44	116	41 27	43	115	42 10	43	114	42 53	43	113	316
45	31 42	+47	124	32 29	+47	123	33 16	+46	122	34 02	+47	122	34 49	+46	121	35 35	+45	120	36 20	+46	119	37 06	+45	118	37 51	+44	118	38 35	+44	117	39 19	+44	116	40 03	+44	115	40 47	+43	114	41 30	+42	113	42 12	+42	112	315
46	31 05	47	123	31 52	46	122	32 38	46	121	33 24	46	121	34 10	46	120	34 56	45	119	35 41	45	118	36 26	45	117	37 11	44	117	37 55	44	116	38 39	44	115	39 23	43	114	40 06	42	113	40 48	43	112	41 31	41	111	314
47	30 27	47	122	31 14	46	121	32 00	46	120	32 46	45	120	33 31	46	119	34 17	45	118	35 02	44	117	35 46	45	117	36 31	44	116	37 15	43	115	37 58	44	114	38 42	43	113	39 25	42	112	40 07	42	111	40 49	42	110	313
48	29 49	46	121	30 35	46	120	31 21	46	120	32 07	45	119	32 52	45	118	33 37	45	117	34 22	44	116	35 06	44	116	35 50	44	115	36 34	44	114	37 18	43	113	38 01	42	112	38 43	42	111	39 25	42	110	40 07	41	109	312
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51	27 53	45	118	28 38	45	118	29 23	45	117	30 08	45	116	30 53	44	115	31 37	44	115	32 21	44	114	33 05	43	113	33 48	43	112	34 31	42	111	35 13	43	110	35 56	42	110	36 38	41	109	37 19	41	108	38 00	41	107	309
52	27 14	45	118	27 59	44	117	28 43	45	116	29 28	44	115	30 12	44	115	30 56	44	114	31 40	43	113	32 23	43	112	33 06	43	111	33 49	43	110	34 32	42	110	35 14	41	109	35 55	41	108	36 36	41	107	37 17	41	106	308
53	26 34	45	117	27 19	44	116	28 03	45	115	28 48	44	114	29 32	43	114	30 15	44	113	30 59	43	112	31 42	43	111	32 25	42	110	33 07	42	110	33 49	42	109	34 31	42	108	35 13	41	107	35 54	40	106	36 34	41	105	307
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55	25 14	+44	115	25 58	+44	114	26 42	+44	114	27 26	+43	113	28 09	+44	112	28 53	+43	111	29 36	+42	110	30 18	+43	110	31 01	+42	109	31 43	+42	108	32 25	+41	107	33 06	+41	106	33 47	+41	105	34 28	+40	105	35 08	+40	104	305
56	24 33	44	114	25 17	44	114	26 01	44	113	26 45	43	112	27 28	43	111	28 11	43	110	28 54	42	110	29 36	42	109	30 18	42	108	31 00	42	107	31 42	41	106	32 23	41	105	33 04	40	105	33 44	41	104	34 25	39	103	304
57	23 53	43	113	24 36	44	113	25 20	43	112	26 03	43	111	26 46	43	110	27 29	43	110	28 12	42	109	28 54	42	108	29 36	42	107	30 18	41	106	30 59	41	106	31 40	41	105	32 21	40	104	33 01	40	103	33 41	40	102	303
58	23 11	44	113	23 55	43	112	24 38	44	111	25 22	42	110	26 04	43	110	26 47	42	109	27 29	42	108	28 11	42	107	28 53	42	106	29 35	41	106	30 16	41	105	30 57	40	104	31 37	41	103	32 18	39	102	32 57	40	101	302
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61	21 07	43	110	21 50	43	110	22 33	42	109	23 15	43	108	23 58	42	107	24 40	41	107	25 21	42	106	26 03	41	105	26 44	41	104	27 25	41	103	28 06	40	102	28 46	40	102	29 26	40	101	30 06	40	100	30 46	39	99	299
62	20 25	43	110	21 08	42	109	21 50	43	108	22 33	42	107	23 15	42	107	23 57	41	106	24 38	42	105	25 20	41	104	26 01	41	103	26 42	40	103	27 22	41	102	28 03	40	101	28 43	39	100	29 22	40	99	30 02	39	98	298
63	19 43	43	109	20 26	42	108	21 08	42	107	21 50	42	107	22 32	42	106	23 14	41	105	23 55	41	104	24 36	41	103	25 17	41	103	25 58	41	102	26 39	40	101	27 19	40	100	27 59	39	99	28 38	39	98	29 17	39	98	297
64	19 01	42	108	19 43	42	107	20 25	42	107	21 07	42	106	21 49	42	105	22 31	41	104	23 12	41	103	23 53	41	103	24 34	41	102	25 15	40	101	25 55	40	100	26 35	40	99	27 15	39	99	27 54	39	98	28 33	39	97	296
65	18 18	+42	107	19 00	+42	107	19 42	+42	106	20 24	+42	105	21 06	+41	104	21 47	+42	104	22 29	+40	103	23 09	+41	102	23 50	+41	101	24 31	+40	100	25 11	+40	100	25 51	+39	99	26 30	+40	98	27 10	+39	97	27 49	+39	96	295
66	17 36	42	107	18 18	42	106	19 00	41	105	19 41	42	104	20 23	41	104	21 04	41	103	21 45	41	102	22 26	40	101	23 06	41	100	23 47	40	100	24 27	40	99	25 07	39	98	25 46	40	97	26 26	39	96	27 05	39	95	294
67	16 53	42	106	17 35	41	105	18 16	42	104	18 58	41	104	19 39	41	103	20 20	41	102	21 01	41	101	21 42	41	100	22 23	40	100	23 03	40	99	23 43	40	98	24 23	39	97	25 02	39	96	25 41	39	96	26 20	39	95	293
68	16 10	42	105	16 52	41	104	17 33	41	104	18 14	42	103	18 56	41	102	19 37	41	101	20 18	40	100	20 58	41	100	21 39	40	99	22 19	39	98	22 59	39	97	23 38	40	97	24 18	39	96	24 57	38	95	25 36	38	94	292
69	15 27	41	104	16 08	42	104	16 50	41	103	17 31	41	102	18 12	41	101	18 53	41	101	19 34	40	100	20 14	40	99	20 54	40	98	21 34	40	97	22 14	40	97	22 54

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
70	14 43	+42	104	15 25	+41	103	16 06	+41	102	16 47	+41	101	17 28	+41	101	18 09	+41	100	18 50	+40	99	19 30	+40	98	20 10	+40	98	20 50	+40	97	21 30	+40	96	22 10	+39	95	22 49	+39	94	23 28	+39	93	24 07	+38	93	290
71	14 00	41	103	14 41	42	102	15 23	41	101	16 04	40	101	16 44	41	100	17 25	41	99	18 06	40	98	18 46	40	98	19 26	40	97	20 06	40	96	20 46	39	95	21 25	39	94	22 04	39	94	22 43	39	93	23 22	39	92	289
72	13 17	41	102	13 58	41	102	14 39	41	101	15 20	40	100	16 00	41	99	16 41	40	98	17 21	41	98	18 02	40	97	18 42	40	96	19 22	39	95	20 01	40	95	20 41	39	94	21 20	39	93	21 59	39	92	22 38	38	91	288
73	12 33	41	102	13 14	41	101	13 55	41	100	14 36	40	99	15 16	41	99	15 57	40	98	16 37	40	97	17 17	40	96	17 57	40	95	18 37	40	95	19 17	39	94	19 56	39	93	20 35	39	92	21 14	39	91	21 53	38	91	287
74	11 49	41	101	12 30	41	100	13 11	41	99	13 52	40	99	14 32	41	98	15 13	40	97	15 53	40	96	16 33	40	96	17 13	40	95	17 53	39	94	18 32	40	93	19 12	39	92	19 51	39	92	20 30	38	91	21 08	39	90	286
75	11 05	+41	100	11 46	+41	99	12 27	+41	99	13 08	+40	98	13 48	+40	97	14 28	+41	96	15 09	+40	96	15 49	+39	95	16 28	+40	94	17 08	+40	93	17 48	+39	92	18 27	+39	92	19 06	+39	91	19 45	+39	90	20 24	+38	89	285
76	10 21	41	99	11 02	41	99	11 43	40	98	12 23	41	97	13 04	40	96	13 44	40	96	14 24	40	95	15 04	40	94	15 44	40	93	16 24	39	93	17 03	39	92	17 42	40	91	18 22	38	90	19 00	39	89	19 39	39	89	284
77	09 37	41	99	10 18	41	98	10 59	40	97	11 39	40	97	12 19	41	96	13 00	40	95	13 40	40	94	14 20	39	93	14 59	40	93	15 39	40	92	16 19	39	91	16 58	39	90	17 37	39	90	18 16	39	89	18 55	38	88	283
78	08 53	41	98	09 34	40	97	10 14	41	97	10 55	40	96	11 35	40	95	12 15	40	94	12 55	40	94	13 35	40	93	14 15	40	92	14 55	39	91	15 34	39	90	16 13	39	90	16 52	39	89	17 31	39	88	18 10	39	87	282
79	08 09	41	97	08 50	40	97	09 30	40	96	10 10	41	95	10 51	40	94	11 31	40	94	12 11	40	93	12 51	39	92	13 30	40	91	14 10	39	91	14 49	40	90	15 29	39	89	16 08	39	88	16 47	39	87	17 26	38	87	281
80	07 25	+40	97	08 05	+41	96	08 46	+40	95	09 26	+40	94	10 06	+40	94	10 46	+40	93	11 26	+40	92	12 06	+40	91	12 46	+39	91	13 25	+40	90	14 05	+39	89	14 44	+39	88	15 23	+39	88	16 02	+39	87	16 41	+39	86	280
81	06 41	40	96	07 21	40	95	08 01	40	95	08 41	41	94	09 22	40	93	10 02	40	92	10 42	39	92	11 21	40	91	12 01	40	90	12 41	39	89	13 20	40	88	14 00	39	88	14 39	39	87	15 18	39	86	15 57	38	85	279
82	05 56	41	95	06 37	40	95	07 17	40	94	07 57	40	93	08 37	40	92	09 17	40	92	09 57	40	91	10 37	40	90	11 17	39	89	11 56	40	89	12 36	39	88	13 15	39	87	13 54	39	86	14 33	39	85	15 12	39	85	278
83	05 12	40	95	05 52	40	94	06 32	40	93	07 12	41	92	07 53	40	92	08 33	39	91	09 12	40	90	09 52	40	89	10 32	40	89	11 12	39	88	11 51	39	87	12 30	40	86	13 10	39	86	13 49	39	85	14 28	39	84	277
84	04 27	41	94	05 08	40	93	05 48	40	93	06 28	40	92	07 08	40	91	07 48	40	90	08 28	40	90	09 08	39	89	09 47	40	88	10 27	40	87	11 07	39	86	11 46	39	86	12 25	39	85	13 04	39	84	13 43	39	83	276
85	03 43	+40	93	04 23	+40	93	05 03	+40	92	05 43	+40	91	06 23	+40	90	07 03	+40	90	07 43	+40	89	08 23	+40	88	09 03	+40	87	09 43	+39	87	10 22	+40	86	11 02	+39	85	11 41	+39	84	12 20	+39	84	12 59	+39	83	275
86	02 58	40	93	03 38	41	92	04 19	40	91	04 59	40	90	05 39	40	90	06 19	40	89	06 59	40	88	07 39	39	87	08 18	40	87	08 58	40	86	09 38	39	85	10 17	40	84	10 57	39	84	11 36	39	83	12 15	39	82	274
87	02 14	40	92	02 54	40	91	03 34	40	91	04 14	40	90	04 54	40	89	05 34	40	88	06 14	40	88	06 54	40	87	07 34	40	86	08 14	39	85	08 53	40	85	09 33	39	84	10 12	40	83	10 52	39	82	11 31	39	81	273
88	01 29	40	91	02 09	40	91	02 49	41	90	03 30	40	89	04 10	40	88	04 50	40	88	05 30	40	87	06 10	39	86	06 49	40	85	07 29	40	85	08 09	40	84	08 49	39	83	09 28	39	82	10 07	40	82	10 47	39	81	272
89	00 45	40	91	01 25	40	90	02 05	40	89	02 45	40	88	03 25	40	88	04 05	40	87	04 45	40	86	05 25	40	85	06 05	40	85	06 45	40	84	07 25	39	83	08 04	40	82	08 44	39	82	09 23	40	81	10 03	39	80	271
90	00 00	+40	90	00 40	+40	89	01 20	+40	89	02 00	+41	88	02 41	+40	87	03 21	+40	86	04 01	+40	86	04 41	+40	85	05 21	+40	84	06 01	+39	83	06 40	+40	83	07 20	+40	82	08 00	+39	81	08 39	+40	80	09 19	+39	80	270
91	−0 45	41	89	−0 04	40	89	00 36	40	88	01 16	40	87	01 56	40	86	02 36	40	86	03 16	40	85	03 56	40	84	04 36	40	83	05 16	40	82	05 56	40	82	06 36	40	81	07 16	40	80	07 56	39	80	08 35	40	79	269
92	−1 29	40	89	−0 49	40	88	−0 09	40	87	00 31	41	86	01 12	40	86	01 52	40	85	02 32	40	84	03 12	40	83	03 52	40	83	04 32	40	82	05 12	40	81	05 52	40	80	06 32	40	80	07 12	39	79	07 51	40	78	268
93	−2 14	40	88	−1 34	41	87	−0 53	40	87	−0 13	40	86	00 27	40	85	01 07	40	84	01 47	41	84	02 28	40	83	03 08	40	82	03 48	40	81	04 28	40	81	05 08	40	80	05 48	40	79	06 28	40	78	07 08	40	78	267
94	−2 58	40	87	−2 18	40	87	−1 38	40	86	−0 58	41	85	−0 17	40	84	00 23	40	84	01 03	40	83	01 43	41	82	02 24	40	81	03 04	40	81	03 44	40	80	04 24	40	79	05 04	40	78	05 44	40	78	06 24	40	77	266
95	−3 43	+40	87	−3 03	+41	86	−2 22	+40	85	−1 42	+40	84	−1 02	+41	84	−0 21	+40	83	00 19	+40	82	00 59	+41	81	01 40	+40	81	02 20	+40	80	03 00	+40	79	03 40	+41	78	04 21	+40	78	05 01	+40	77	05 41	+40	76	265
96	−4 27	40	86	−3 47	40	85	−3 07	41	84	−2 26	40	84	−1 46	40	83	−1 06	41	82	−0 25	40	82	00 15	41	81	00 56	40	80	01 36	40	79	02 16	41	79	02 57	40	78	03 37	40	77	04 17	41	76	04 58	40	76	264
97	−5 12	41	85	−4 31	40	85	−3 51	40	84	−3 11	41	83	−2 30	40	82	−1 50	41	82	−1 09	40	81	−0 29	41	80	00 52	41	79	01 33	40	78	02 13	41	77	02 54	40	76	03 34	41	76	04 15	40	75	04 55	40	75	263
98	−5 56	+40	85	−5 16	41	84	−4 35	40	83	−3 55	41	82	−3 14	40	82	−2 34	41	81	−1 53	40	80	−1 13	41	79	−0 32	41	79	00 09	40	78	00 49	41	77	01 30	41	77	02 11	40	76	02 51	41	75	03 32	40	74	262
			99	−6 00	+40	83	−5 20	41	82	−4 39	41	82	−3 58	40	81	−3 18	41	80	−2 37	41	80	−1 56	40	79	−1 16	41	78	−0 35	41	77	00 06	41	77	00 47	40	76	01 27	41	75	02 08	41	74	02 49	40	74	261
						100	−6 04	+41	82	−5 23	+41	81	−4 42	+40	80	−4 02	+41	80	−3 21	+41	79	−2 40	+41	78	−1 59	+41	77	−1 18	+41	77	−0 37	+40	76	00 03	+41	75	00 44	+41	74	01 25	+41	74	02 06	+41	73	260
									101	−6 07	+41	80	−5 26	41	80	−4 45	40	79	−4 05	41	78	−3 24	41	77	−2 43	41	77	−2 02	41	76	−1 21	41	75	−0 40	41	75	00 01	41	74	00 42	42	73	01 24	41	72	259
												102	−6 10	+41	79	−5 29	41	78	−4 48	41	77	−4 07	41	77	−3 26	41	76	−2 45	41	75	−2 04	42	75	−1 22	41	74	−0 41	41	73	00 00	41	72	00 41	41	72	258
															103	−6 13	+41	78	−5 32	42	77	−4 50	41	76	−4 09	41	75	−3 28	41	75	−2 47	42	74	−2 05	41	73	−1 24	41	72	−0 43	42	72	−0 01	41	71	257
																		104	−6 15	+41	76	−5 34	42	75	−4 52	41	75	−4 11	42	74	−3 29	41	73	−2 48	42	72	−2 06	41	72	−1 25	42	71	−0 43	41	70	256
																					105	−6 17	+42	75	−5 35	+41	74	−4 54	+42	73	−4 12	+42	73	−3 30	+41	72	−2 49	+42	71	−2 07	+42	70	−1 25	+42	70	255
																								106	−6 18	+42	73	−5 36	42	73	−4 54	41	72	−4 13	42	71	−3 31	42	70	−2 49	42	70	−2 07	42	69	254
																											107	−6 19	+42	72	−5 37	42	71	−4 55	42	70	−4 13	43	70	−3 30	42	69	−2 48	42	68	253
																														108	−6 19	+42	70	−5 37	43	70	−4 54	42	69	−4 12	42	68	−3 30	43	68	252
																																	109	−6 18	+42	69	−5 36	43	68	−4 53	42	68	−4 11	43	67	251
																																					110	−6 17	+43	68	−5 34	+42	67	−4 52	+43	66	250
																																							111	−6 15	+43	66	−5 32	43	66	249
																																								112	−6 13	+43	65	248

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 42°

LAT 42°

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) CONTRARY NAME TO LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	15 27	42	104	14 45	42	105	14 03	42	106	13 21	42	107	12 39	42	107	11 57	43	108	11 14	42	109	10 32	43	110	09 49	42	110	09 07	43	111	08 24	43	112	07 41	43	112	06 58	43	113	06 15	43	114	05 32	43	114	291
68	16 10	42	105	15 28	42	106	14 46	42	107	14 04	43	107	13 21	42	108	12 39	42	109	11 57	43	110	11 14	43	110	10 31	43	111	09 48	43	112	09 05	43	112	08 22	43	113	07 39	43	114	06 56	43	114	06 13	43	115	292
67	16 53	42	106	16 11	42	107	15 29	43	107	14 46	42	108	14 04	43	109	13 21	43	110	12 38	42	110	11 56	43	111	11 13	43	112	10 30	44	112	09 46	43	113	09 03	43	114	08 20	43	114	07 37	44	115	06 53	43	116	293
66	17 36	43	107	16 53	42	107	16 11	42	108	15 29	43	109	14 46	43	110	14 03	43	110	13 20	43	111	12 37	43	112	11 54	43	112	11 11	44	113	10 27	43	114	09 44	44	115	09 00	43	115	08 17	44	116	07 33	44	117	294
65	18 18	-42	107	17 36	-43	108	16 53	-42	109	16 11	-43	110	15 28	-43	110	14 45	-43	111	14 02	-44	112	13 18	-43	112	12 35	-43	113	11 52	-44	114	11 08	-44	115	10 24	-43	115	09 41	-44	116	08 57	-44	117	08 13	-44	117	295
64	19 01	43	108	18 18	43	109	17 35	42	110	16 53	43	110	16 10	44	111	15 26	43	112	14 43	43	112	14 00	44	113	13 16	44	114	12 32	44	115	11 48	43	115	11 05	44	116	10 21	45	117	09 36	44	117	08 52	44	118	296
63	19 43	43	109	19 00	43	110	18 17	43	110	17 34	43	111	16 51	43	112	16 08	44	112	15 24	44	113	14 40	43	114	13 57	44	115	13 13	44	116	12 29	44	116	11 45	45	117	11 00	44	117	10 16	44	118	09 32	45	119	297
62	20 25	43	110	19 42	43	110	18 59	43	111	18 16	44	112	17 32	43	113	16 49	44	113	16 05	44	114	15 21	44	115	14 37	44	115	13 53	44	116	13 09	45	117	12 24	44	117	11 40	45	118	10 55	45	119	10 10	44	119	298
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12	46 38	59	162	45 39	58	163	44 41	59	163	43 42	59	163	42 43	58	164	41 45	59	164	40 46	59	164	39 47	59	164	38 48	58	165	37 50	59	165	36 51	59	165	35 52	59	165	34 53	59	166	33 54	59	166	32 55	59	166	348
11	46 51	59	164	45 52	59	164	44 53	59	164	43 54	59	165	42 55	58	165	41 57	59	165	40 58	59	165	39 59	59	166	39 00	59	166	38 01	59	166	37 02	59	167	36 03	59	167	35 04	60	167	34 04	59	167	33 05	59	167	349
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7	47 32	60	170	46 32	59	170	45 33	60	170	44 33	59	170	43 34	60	170	42 34	59	171	41 35	60	171	40 35	60	171	39 35	59	171	38 36	60	171	37 36	59	171	36 37	60	171	35 37	60	172	34 37	59	172	33 38	60	172	353
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5	47 46	-60	173	46 46	-60	173	45 46	-60	173	44 46	-59	173	43 47	-60	173	42 47	-60	173	41 47	-60	173	40 47	-60	173	39 47	-59	174	38 48	-60	174	37 48	-60	174	36 48	-60	174	35 48	-60	174	34 48	-59	174	33 49	-60	174	355
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3	47 55	60	176	46 55	60	176	45 55	60	176	44 55	60	176	43 55	60	176	42 55	60	176	41 55	60	176	40 55	60	176	39 55	59	176	38 56	60	176	37 56	60	176	36 56	60	176	35 56	60	176	34 56	60	176	33 56	60	176	357
2	47 58	60	177	46 58	60	177	45 58	60	177	44 58	60	177	43 58	60	177	42 58	60	177	41 58	60	177	40 58	60	177	39 58	60	177	38 58	60	177	37 58	60	178	36 58	60	178	35 58	60	178	34 58	60	178	33 58	60	178	358
1	47 59	60	179	46 59	60	179	45 59	60	179	44 59	60	179	43 59	60	179	42 59	60	179	41 59	60	179	40 59	60	179	39 59	59	179	39 00	60	179	38 00	60	179	37 00	60	179	36 00	60	179	35 00	60	179	34 00	60	179	359
0	48 00	-60	180	47 00	-60	180	46 00	-60	180	45 00	-60	180	44 00	-60	180	43 00	-60	180	42 00	-60	180	41 00	-60	180	40 00	-60	180	39 00	-60	180	38 00	-60	180	37 00	-60	180

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
0	63 00	+60	180	64 00	+60	180	65 00	+60	180	66 00	+60	180	67 00	+60	180	68 00	+60	180	69 00	+60	180	70 00	+60	180	71 00	+60	180	72 00	+60	180	73 00	+60	180	74 00	+60	180	75 00	+60	180	76 00	+60	180	77 00	+60	180	360
1	62 59	60	178	63 59	60	178	64 59	60	178	65 59	60	178	66 59	60	178	67 59	60	177	68 59	60	177	69 59	60	177	70 59	60	177	71 59	60	177	72 59	60	177	73 59	60	177	74 59	60	177	75 59	59	176	76 58	60	176	359
2	62 57	60	176	63 57	59	176	64 56	60	175	65 56	60	175	66 56	60	175	67 56	60	175	68 56	60	175	69 56	60	175	70 56	59	174	71 55	60	174	72 55	60	174	73 55	60	173	74 55	59	173	75 54	60	173	76 54	60	172	358
3	62 53	59	174	63 52	60	173	64 52	60	173	65 52	60	173	66 52	59	173	67 51	60	173	68 51	60	172	69 51	59	172	70 50	60	172	71 50	59	171	72 49	60	171	73 49	59	170	74 48	59	170	75 47	60	169	76 47	59	168	357
4	62 47	59	172	63 46	60	171	64 46	60	171	65 46	59	171	66 45	59	170	67 44	60	170	68 44	59	170	69 43	60	169	70 43	59	169	71 42	59	168	72 41	59	168	73 40	59	167	74 39	59	166	75 38	58	166	76 36	59	165	356
5	62 39	+60	169	63 39	+59	169	64 38	+59	169	65 37	+60	168	66 37	+59	168	67 36	+59	168	68 35	+59	167	69 34	+59	167	70 33	+59	166	71 32	+58	165	72 30	+59	165	73 29	+58	164	74 27	+58	163	75 25	+58	162	76 23	+58	161	355
6	62 30	60	167	63 30	59	167	64 29	59	167	65 28	59	166	66 27	58	166	67 25	59	165	68 24	59	165	69 23	58	164	70 21	58	163	71 19	58	163	72 17	58	162	73 15	58	161	74 13	57	160	75 10	57	159	76 07	57	158	354
7	62 20	59	165	63 19	58	165	64 17	59	164	65 16	59	164	66 15	58	163	67 13	58	163	68 11	58	162	69 09	58	161	70 07	58	161	71 05	58	160	72 03	57	159	73 00	57	158	73 57	56	157	74 53	56	156	75 49	56	154	353
8	62 08	58	163	63 06	59	163	64 05	58	162	65 03	58	162	66 01	58	161	66 59	58	160	67 57	57	160	68 54	58	159	69 52	57	158	70 49	57	157	71 46	56	156	72 42	56	155	73 38	56	154	74 34	55	153	75 29	54	151	352
9	61 54	58	161	62 52	58	161	63 50	58	160	64 48	58	160	65 46	57	159	66 43	57	158	67 40	57	157	68 37	57	157	69 34	57	156	70 31	56	155	71 27	55	154	72 22	55	152	73 17	55	151	74 12	54	150	75 06	53	148	351
10	61 39	+58	159	62 37	+57	159	63 34	+58	158	64 32	+57	157	65 29	+57	157	66 26	+56	156	67 22	+57	155	68 19	+56	154	69 15	+56	153	70 11	+55	152	71 06	+55	151	72 01	+54	150	72 55	+53	148	73 48	+53	147	74 41	+52	145	350
11	61 23	57	157	62 20	57	157	63 17	57	156	64 14	57	155	65 11	56	155	66 07	56	154	67 03	56	153	67 59	55	152	68 54	55	151	69 49	54	150	70 43	54	148	71 37	53	147	72 30	53	146	73 23	52	144	74 15	50	142	349
12	61 05	57	155	62 02	56	155	62 58	57	154	63 55	56	153	64 51	55	152	65 46	56	152	66 42	55	151	67 37	54	150	68 31	55	148	69 26	53	147	70 19	53	146	71 12	52	145	72 04	52	143	72 56	50	141	73 46	50	139	348
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14	60 25	56	152	61 21	56	151	62 17	55	150	63 12	55	149	64 07	54	148	65 01	54	147	65 55	54	146	66 49	53	145	67 42	52	144	68 34	52	143	69 26	51	141	70 17	51	140	71 08	49	138	71 57	49	136	72 46	47	134	346
15	60 04	+55	150	60 59	+55	149	61 54	+54	148	62 48	+55	147	63 43	+53	146	64 36	+54	145	65 30	+53	144	66 23	+52	143	67 15	+52	142	68 07	+51	141	68 58	+50	139	69 48	+49	138	70 37	+49	136	71 26	+47	134	72 13	+46	132	345
16	59 41	54	148	60 35	55	147	61 30	54	146	62 24	53	146	63 17	54	145	64 11	52	144	65 03	52	142	65 55	52	141	66 47	51	140	67 38	50	139	68 28	49	137	69 17	49	136	70 06	47	134	70 53	46	132	71 39	45	130	344
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18	58 51	54	145	59 45	53	144	60 38	53	143	61 31	52	142	62 23	52	141	63 15	52	140	64 07	50	139	64 57	50	137	65 47	50	136	66 37	48	135	67 25	48	133	68 13	46	132	68 59	46	130	69 45	44	128	70 29	43	126	342
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20	57 58	+52	141	58 50	+52	141	59 42	+52	140	60 34	+51	139	61 25	+51	137	62 16	+50	136	63 06	+49	135	63 55	+48	134	64 43	+48	132	65 31	+47	131	66 18	+46	130	67 04	+45	128	67 49	+44	126	68 33	+42	124	69 15	+41	122	340
21	57 30	52	140	58 22	51	139	59 13	51	138	60 04	50	137	60 54	50	136	61 44	50	135	62 34	48	133	63 22	48	132	64 10	47	131	64 57	46	129	65 43	46	128	66 29	44	126	67 13	43	124	67 56	41	123	68 37	41	121	339
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23	56 30	51	137	57 21	50	136	58 11	50	135	59 01	50	134	59 51	48	133	60 39	48	131	61 27	47	130	62 14	47	129	63 01	46	128	63 47	44	126	64 31	44	125	65 15	43	123	65 58	41	121	66 39	40	119	67 19	39	118	337
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35	49 34	+45	121	50 19	+44	120	51 03	+44	119	51 47	+43	118	52 30	+43	117	53 13	+42	116	53 55	+41	115	54 36	+40	113	55 16	+39	112	55 55	+39	111	56 34	+37	109	57 11	+37	108	57 48	+35	106	58 23	+35	105	58 58	+33	103	325
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40	46 19	+43	116	47 02	+42	115	47 44	+42	114	48 26	+41	113	49 07	+41	112	49 48	+40	111	50 28	+39	109	51 07	+39	108	51 46	+38	107	52 24	+37	106	53 01	+36	104	53 37	+35	103	54 12	+34	102	54 46	+33	100	55 19	+32	99	320
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44	43 36	41	112	44 17	42	111	44 59	40	110	45 39	41	109	46 20	39	108	46 59	39	107	47 38	38	106	48 16	38	105	48 54	37	103	49 31	36	102	50 07	35	101	50 42	34	100	51 16	34	98	51 50	32	97	52 22	32	96	316
45	42 54	+42	111	43 36	+41	110	44 17	+40	109	44 57	+40	108	45 37	+39	107	46 16	+39	106	46 55	+38	105	47 33	+37	104	48 10	+37	103	48 47	+36	101	49 23	+35	100	49 58	+34	99	50 32	+33	98	51 05	+33	96	51 38	+31	95	315
46	42 12	42	110	42 54	41	109	43 35	40	108	44 15	39	107	44 54	39	106	45 33	39	105	46 12	38	104	46 50	37	103	47 27	36	102	48 03	36	101	48 39	35	99	49 14	34	98	49 48	33	97	50 21	32	96	50 53	32	94	314
47	41 31	41	109	42 12	40	108	42 52	40	107	43 32	39	106	44 11	39	105	44 50	39	104	45 29	37	103	46 06	37	102	46 43	36	101	47 19	36	100	47 55	34	99	48 29	34	97	49 03	34	96	49 37	32	95	50 09	31	93	313
48	40 48	41	108	41 29	40	108	42 09	40	107	42 49	39	106	43 28	39	104	44 07	38	103	44 45	37	102	45 22	37	101	45 59	36	100	46 35	36	99	47 11	34	98	47 45	34	97	48 19	33	95	48 52	32	94	49 24	32	93	312
49	40 06	41	108	40 47	40	107	41 27	39	106	42 06	39	105	42 45	39	104	43 24	37	103	44 01	38	102	44 39	36	100	45 15	36	99	45 51	35	98	46 26	36	97	47 01	34	96	47 35	33	95	48 08	32	93	48 40	31	92	311
50	39 23	+41	107	40 04	+40	106	40 44	+39	105	41 23	+39	104	42 02	+38	103	42 40	+38	102	43 18	+37	101	43 55	+36	100	44 31	+36	99	45 07	+35	97	45 42	+35	96	46 17	+33	95	46 50	+33	94	47 23	+32	93	47 55	+31	91	310
51	38 41	40	106	39 21	39	105	40 00	40	104	40 40	38	103	41 18	38	102	41 56	38	101	42 34	37	100	43 11	36	99	43 47	36	98	44 23	35	97	44 58	34	95	45 32	34	94	46 06	32	93	46 38	33	92	47 11	31	91	309
52	37 58	40	105	38 38	39	104	39 17	39	103	39 56	39	102	40 35	37	101	41 12	38	100	41 50	37	99	42 27	36	98	43 03	35	97	43 38	35	96	44 13	35	95	44 48	33	94	45 21	33	92	45 54	32	91	46 26	31	90	308
53	37 15	39	104	37 54	40	103	38 34	38	102	39 12	39	101	39 51	38	100	40 29	37	99	41 06	36	98	41 42	37	97	42 19	35	96	42 54	35	95	43 29	34	94	44 03	34	93	44 37	32	92	45 09	32	91	45 41	32	89	307
54	36 31	40	103	37 11	39	103	37 50	39	102	38 29	38	101	39 07	37	100	39 44	38	99	40 22	36	98	40 58	36	97	41 34	36	95	42 10	34	94	42 44	35	93	43 19	33	92	43 52	33	91	44 25	32	90	44 57	31	89	306
55	35 48	+39	103	36 27	+39	102	37 06	+39	101	37 45	+38	100	38 23	+37	99	39 00	+37	98	39 37	+37	97	40 14	+36	96	40 50	+35	95	41 25	+35	94	42 00	+34	93	42 34	+33	91	43 07	+33	90	43 40	+32	89	44 12	+32	88	305
56	35 04	40	102	35 44	38	101	36 22	39	100	37 01	38	99	37 39	37	98	38 16	37	97	38 53	36	96	39 29	36	95	40 05	36	94	40 41	34	93	41 15	34	92	41 49	34	91	42 23	33	90	42 56	32	89	43 28	31	87	304
57	34 21	39	101	35 00	38	100	35 38	39	99	36 17	38	98	36 55	37	97	37 32	37	96	38 09	36	95	38 45	36	94	39 21	35	93	39 56	35	92	40 31	34	91	41 05	33	90	41 38	33	89	42 11	32	88	42 43	32	87	303
58	33 37	39	100	34 16	38	99	34 54	39	99	35 33	37	98	36 10	38	97	36 48	36	96	37 24	37	95	38 01	35	94	38 36	36	93	39 12	34	92	39 46	34	91	40 20	34	89	40 54	32	88	41 26	33	87	41 59	31	86	302
59	32 53	39	100	33 32	38	99	34 10	38	98	34 48	38	97	35 26	37	96	36 03	37	95	36 40	36	94	37 16	36	93	37 52	35	92	38 27	35	91	39 02	34	90	39 36	33	89	40 09	33	88	40 42	32	87	41 14	32	86	301
60	32 09	+39	99	32 48	+38	98	33 26	+38	97	34 04	+38	96	34 42	+37	95	35 19	+36	94	35 55	+37	93	36 32	+35	92	37 07	+35	91	37 42	+35	90	38 17	+34	89	38 51	+34	88	39 25	+32	87	39 57	+33	86	40 30	+31	85	300
61	31 25	38	98	32 03	39	97	32 42	38	96	33 20	37	95	33 57	37	94	34 34	37	94	35 11	36	93	35 47	36	92	36 23	35	91	36 58	34	89	37 32	34	89	38 06	34	88	38 40	33	86	39 13	32	85	39 45	32	84	299
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63	29 56	39	97	30 35	38	96	31 13	38	95	31 51	37	94	32 28	37	93	33 05	37	92	33 42	36	91	34 18	35	90	34 53	36	89	35 29	34	88	36 03	34	87	36 37	34	86	37 11	33	85	37 44	33	84	38 17	32	83	297
64	29 12	38	96	29 50	39	95	30 29	37	94	31 06	38	93	31 44	37	92	32 21	36	91	32 57	36	91	33 33	36	90	34 09	35	89	34 44	35	88	35 19	34	87	35 53	34	86	36 27	33	85	37 00	32	84	37 32	33	82	296
65	28 28	+38	95	29 06	+38	94	29 44	+38	94	30 22	+37	93	30 59	+37	92	31 36	+37	91	32 13	+36	90	32 49	+35	89	33 24	+36	88	34 00	+34	87	34 34	+35	86	35 09	+33	85	35 42	+34	84	36 16	+32	83	36 48	+32	82	295
66	27 43	39	95	28 22	38	94	29 00	37	93	29 37	37	92	30 14	37	91	30 51	37	90	31 28	36	89	32 04	36	88	32 40	35	87	33 15	35	86	33 50	34	85	34 24	34	84	34 58	33	83	35 31	33	82	36 04	32	81	294
67	26 59	38	94	27 37	38	93	28 15	38	92	28 53	37	91	29 30	37	90	30 07	36	89	30 43	36	89	31 19	36	88	31 55	36	87	32 31	34	86	33 05	35	85	33 40	34	84	34 14	33	83	34 47	33	82	35 20	33	81	293
68	26 14	38	93	26 52	38	92	27 30	38	91	28 08	37	91	28 45	37	90	29 22	37	89	29 59	36	88	30 35	36	87	31 11	35	86	31 46	35	85	32 21	34	84	32 55	35	83	33 30	33	82	34 03	33	81	34 36	33	80	292
69	25 30	38	92	26 08	38	92	26 46	37	91	27 23	38	90	28 01	37	89	28 38	36	88	29 14	36	87	29 50	36	86	30 26	36	85	31 02	35	84	31 37	34	83	32 11	34	83	32 45	34	82	33 19	33	81	33 52	33	80	291
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME A

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 42°

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	24 45	+38	92	25 23	+38	91	26 01	+38	90	26 39	+37	89	27 16	+37	88	27 53	+37	87	28 30	+36	87	29 06	+36	86	29 42	+35	85	30 17	+35	84	30 52	+35	83	31 27	+34	82	32 01	+34	81	32 35	+33	80	33 08	+33	79	290
71	24 01	38	91	24 39	38	90	25 17	37	89	25 54	38	89	26 32	37	88	27 09	36	87	27 45	37	86	28 22	35	85	28 57	36	84	29 33	35	83	30 08	35	82	30 43	34	81	31 17	34	80	31 51	34	79	32 25	33	78	289
72	23 16	38	90	23 54	38	90	24 32	38	89	25 10	37	88	25 47	37	87	26 24	37	86	27 01	36	85	27 37	36	84	28 13	36	83	28 49	35	83	29 24	35	82	29 59	34	81	30 33	34	80	31 07	34	79	31 41	33	78	288
73	22 31	39	90	23 10	38	89	23 48	37	88	24 25	38	87	25 03	37	86	25 40	36	86	26 16	37	85	26 53	36	84	27 29	36	83	28 05	35	82	28 40	35	81	29 15	35	80	29 50	34	79	30 24	34	78	30 58	33	77	287
74	21 47	38	89	22 25	38	88	23 03	38	87	23 41	37	87	24 18	37	86	24 55	37	85	25 32	36	84	26 08	37	83	26 45	35	82	27 20	36	81	27 56	35	80	28 31	35	80	29 06	34	79	29 40	34	78	30 14	34	77	286
75	21 02	+38	88	21 40	+38	88	22 18	+38	87	22 56	+38	86	23 34	+37	85	24 11	+37	84	24 48	+36	83	25 24	+36	83	26 00	+36	82	26 36	+36	81	27 12	+35	80	27 47	+35	79	28 22	+35	78	28 57	+34	77	29 31	+34	76	285
76	20 18	38	88	20 56	38	87	21 34	38	86	22 12	37	85	22 49	37	84	23 26	37	84	24 03	37	83	24 40	36	82	25 16	36	81	25 52	36	80	26 28	36	79	27 04	35	78	27 39	34	77	28 13	35	76	28 48	33	76	284
77	19 33	38	87	20 11	38	86	20 49	38	86	21 27	38	85	22 05	37	84	22 42	37	83	23 19	37	82	23 56	36	81	24 32	37	80	25 09	35	80	25 44	36	79	26 20	35	78	26 55	35	77	27 30	34	76	28 04	35	75	283
78	18 49	38	86	19 27	38	86	20 05	38	85	20 43	38	84	21 21	37	83	21 58	37	82	22 35	37	82	23 12	36	81	23 48	37	80	24 25	36	79	25 01	35	78	25 36	36	77	26 12	35	76	26 47	34	75	27 21	35	74	282
79	18 04	38	86	18 42	39	85	19 21	38	84	19 59	37	83	20 36	38	83	21 14	37	82	21 51	37	81	22 28	37	80	23 05	36	79	23 41	36	78	24 17	36	77	24 53	36	77	25 29	35	76	26 04	35	75	26 39	34	74	281
80	17 20	+38	85	17 58	+38	84	18 36	+38	84	19 14	+38	83	19 52	+38	82	20 30	+37	81	21 07	+37	80	21 44	+37	79	22 21	+36	79	22 57	+37	78	23 34	+36	77	24 10	+35	76	24 45	+36	75	25 21	+35	74	25 56	+34	73	280
81	16 35	39	85	17 14	38	84	17 52	38	83	18 30	38	82	19 08	38	81	19 46	37	80	20 23	37	80	21 00	37	79	21 37	37	78	22 14	36	77	22 50	37	76	23 27	35	75	24 02	36	74	24 38	35	74	25 13	35	73	279
82	15 51	38	84	16 29	39	83	17 08	38	82	17 46	38	81	18 24	38	81	19 02	37	80	19 39	38	79	20 17	37	78	20 54	37	77	21 31	36	76	22 07	36	76	22 43	36	75	23 19	36	74	23 55	36	73	24 31	35	72	278
83	15 07	38	83	15 45	39	82	16 24	38	82	17 02	38	81	17 40	38	80	18 18	38	79	18 56	37	78	19 33	37	78	20 10	37	77	20 47	37	76	21 24	36	75	22 00	37	74	22 36	36	73	23 13	35	72	23 48	36	72	277
84	14 22	39	83	15 01	39	82	15 40	38	81	16 18	38	80	16 56	38	79	17 34	38	79	18 12	38	78	18 50	37	77	19 27	37	76	20 04	37	75	20 41	37	74	21 18	36	74	21 54	36	73	22 30	36	72	23 06	36	71	276
85	13 38	+39	82	14 17	+39	81	14 56	+38	80	15 34	+38	80	16 12	+38	79	16 50	+38	78	17 28	+38	77	18 06	+38	76	18 44	+37	76	19 21	+37	75	19 58	+37	74	20 35	+36	73	21 11	+37	72	21 48	+36	71	22 24	+36	70	275
86	12 54	39	81	13 33	39	81	14 12	38	80	14 50	39	79	15 29	38	78	16 07	38	77	16 45	38	77	17 23	38	76	18 01	37	75	18 38	37	74	19 15	37	73	19 52	37	72	20 29	37	72	21 06	36	71	21 42	36	70	274
87	12 10	39	81	12 49	39	80	13 28	39	79	14 07	38	78	14 45	38	78	15 23	39	77	16 02	38	76	16 40	38	75	17 18	37	74	17 55	38	73	18 33	37	73	19 10	37	72	19 47	37	71	20 24	36	70	21 00	36	69	273
88	11 26	39	80	12 05	39	79	12 44	39	78	13 23	39	78	14 02	38	77	14 40	38	76	15 18	39	75	15 57	38	75	16 35	38	74	17 13	37	73	17 50	38	72	18 28	37	71	19 05	37	70	19 42	37	70	20 19	36	69	272
89	10 42	39	79	11 21	39	79	12 00	39	78	12 39	39	77	13 18	39	76	13 57	38	75	14 35	39	75	15 14	38	74	15 52	38	73	16 30	38	72	17 08	37	71	17 45	38	71	18 23	37	70	19 00	37	69	19 37	37	68	271
90	09 58	+40	79	10 38	+39	78	11 17	+39	77	11 56	+39	76	12 35	+39	76	13 14	+38	75	13 52	+39	74	14 31	+38	73	15 09	+39	72	15 48	+38	72	16 26	+37	71	17 03	+38	70	17 41	+38	69	18 19	+37	68	18 56	+37	68	270
91	09 15	39	78	09 54	39	77	10 33	40	77	11 13	39	76	11 52	39	75	12 31	39	74	13 10	38	73	13 48	39	73	14 27	38	72	15 05	39	71	15 44	38	70	16 22	37	69	16 59	38	69	17 37	38	68	18 15	37	67	269
92	08 31	40	77	09 11	39	77	09 50	40	76	10 30	39	75	11 09	39	74	11 48	39	74	12 27	39	73	13 06	39	72	13 45	38	71	14 23	39	70	15 02	38	70	15 40	38	69	16 18	38	68	16 56	38	67	17 34	37	66	268
93	07 48	39	77	08 27	40	76	09 07	40	75	09 47	39	75	10 26	39	74	11 05	39	73	11 44	40	72	12 24	38	71	13 02	39	71	13 41	39	70	14 20	38	69	14 58	39	68	15 37	38	67	16 15	38	67	16 53	38	66	267
94	07 04	40	76	07 44	40	75	08 24	40	75	09 04	39	74	09 43	40	73	10 23	39	72	11 02	39	72	11 41	39	71	12 20	39	70	12 59	39	69	13 38	39	68	14 17	39	68	14 56	38	67	15 34	38	66	16 12	38	65	266
95	06 21	+40	76	07 01	+40	75	07 41	+40	74	08 21	+40	73	09 01	+39	72	09 40	+40	72	10 20	+39	71	10 59	+40	70	11 39	+39	69	12 18	+39	69	12 57	+39	68	13 36	+39	67	14 15	+38	66	14 53	+39	66	15 32	+38	65	265
96	05 38	40	75	06 18	40	74	06 58	40	73	07 38	40	73	08 18	40	72	08 58	40	71	09 38	39	70	10 17	40	70	10 57	39	69	11 36	40	68	12 16	39	67	12 55	39	67	13 34	39	66	14 13	39	65	14 52	38	64	264
97	04 55	40	74	05 35	41	73	06 16	40	72	06 56	40	72	07 36	40	71	08 16	40	70	08 56	40	70	09 36	39	69	10 15	40	68	10 55	40	67	11 35	39	67	12 14	39	66	12 53	40	65	13 33	39	64	14 12	38	64	263
98	04 12	41	74	04 53	40	73	05 33	40	72	06 13	41	71	06 54	40	71	07 34	40	70	08 14	40	69	08 54	40	68	09 34	40	68	10 14	40	67	10 54	40	66	11 34	39	65	12 13	39	65	12 52	40	64	13 32	39	63	262
99	03 29	41	73	04 10	41	72	04 51	40	71	05 31	41	71	06 12	40	70	06 52	41	69	07 33	40	68	08 13	40	68	08 53	40	67	09 33	40	66	10 13	40	65	10 53	40	65	11 33	40	64	12 13	39	63	12 52	40	62	261
100	02 47	+41	72	03 28	+41	72	04 09	+40	71	04 49	+41	70	05 30	+41	69	06 11	+40	69	06 51	+41	68	07 32	+40	67	08 12	+40	66	08 52	+41	66	09 33	+40	65	10 13	+40	64	10 53	+40	63	11 33	+40	63	12 13	+39	62	260
101	02 05	41	72	02 46	40	71	03 26	41	70	04 07	41	69	04 48	41	69	05 29	41	68	06 10	41	67	06 51	40	66	07 31	41	66	08 12	40	65	08 52	41	64	09 33	40	63	10 13	40	63	10 53	41	62	11 34	40	61	259
102	01 22	41	71	02 03	42	70	02 45	41	69	03 26	41	69	04 07	41	68	04 48	41	67	05 29	41	67	06 10	41	66	06 51	41	65	07 32	40	64	08 12	41	64	08 53	41	63	09 34	40	62	10 14	41	61	10 55	40	61	258
103	00 40	42	70	01 22	41	70	02 03	41	69	02 44	42	68	03 26	41	67	04 07	41	67	04 48	41	66	05 29	42	65	06 11	41	64	06 52	41	64	07 33	41	63	08 14	40	62	08 54	41	61	09 35	41	61	10 16	40	60	257
104	−0 02	42	70	00 40	42	69	01 22	41	68	02 03	42	67	02 45	41	67	03 26	42	66	04 08	41	65	04 49	41	65	05 30	42	64	06 12	41	63	06 53	41	62	07 34	41	62	08 15	41	61	08 56	41	60	09 37	41	59	256
105	−0 43	+41	69	−0 02	+42	68	00 40	+42	67	01 22	+42	67	02 04	+41	66	02 45	+42	65	03 27	+42	65	04 09	+41	64	04 50	+42	63	05 32	+42	62	06 14	+41	62	06 55	+42	61	07 37	+41	60	08 18	+41	60	08 59	+41	59	255
106	−1 25	42	68	−0 43	42	68	−0 01	42	67	00 41	42	66	01 23	42	65	02 05	42	65	02 47	42	64	03 29	42	63	04 11	42	63	04 53	41	62	05 34	42	61	06 16	42	60	06 58	42	60	07 40	41	59	08 21	42	58	254
107	−2 06	42	68	−1 24	42	67	−0 42	42	66	00 00	43	65	00 43	42	65	01 25	42	64	02 07	42	63	02 49	42	63	03 31	42	62	04 13	43	61	04 56	42	60	05 38	42	60	06 20	41	59	07 01	42	58	07 43	42	58	253
108	−2 47	42	67	−2 05	43	66	−1 22	42	65	−0 40	42	65	00 02	43	64	00 45	42	63	01 27	43	63	02 10	42	62	02 52	43	61	03 35	42	61	04 17	42	60	04 59	42	59	05 41	43	58	06 24	42	58	07 06	42	57	252
109	−3 28	42	66	−2 46	43	65	−2 03	43	65	−1 20	42	64	−0 38	43	63	00 05	43	63	00 48	43	62	01 31	42	61	02 13	43	61	02 56	42	60	03 38	43	59	04 21	43	58	05 04	42	58	05 46	43	57	06 29	42	56	251
110	−4 09	+43	66	−3 26	+43	65	−2 43	+43	64	−2 00	+43	63	−1 17	+43	63	−0 34	+43	62	00 09	+43	61	00 52	+42	61	01 34	+43	60	02 17	+43	59	03 00	+43	59	03 43	+43	58	04 26	+43	57	05 09	+43	56	05 52	+42	56	250
111	−4 49	43	65	−4 06	43	64	−3 23	43	63	−2 40	43	63	−1 57	43	62	−1 14	44	61	−0 30	43	61	00 13	43	60	00 56	43	59	01 39	43	59	02 22	44	58	03 06	43	57	03 49	43	56	04 32	43	56	05 15	43	55	249
112	−5 30	44	64	−4 46	43	63	−4 03	44	63	−3 19	43	62	−2 36	43	61	−1 53	44	61	−1 09	43	60	−0 26	44	59	00 18	43	59	01 01	44	58	01 45	43	57	02 28	44	57	03 12	43	56	03 55	43	55	04 38	44	54	248
113	−6 10	+44	63	−5 26	44	63	−4 42	43	62	−3 59	44	61	−3 15	44	61	−2 31	43	60	−1 48	44	59	−1 04	44	59	−0 20	44	58	00 24	43	57	01 07	44	57	01 51	44	56	02 35	44	55	03 19	43	55	04 02	44	54	247
			114	−6 05	+43	62	−5 22	44	61	−4 38	44	61	−3 54	44	60	−3 10	44	59	−2 26	44	59	−1 42	44	58	−0 58	44	57	−0 14	44	57	00 30	44	56	01 14	44	55	01 58	45	55	02 43	44	54	03 27	43	53	246
						115	−6 01	+45	61	−5 16	+44	60	−4 32	+44	59	−3 48	+44	59	−3 04	+45	58	−2 19	+44	57	−1 35	+44	57	−0 51	+45	56	−0 06	+44	55	00 38	+44	55	01 22	+45	54	02 07	+44	53	02 51	+44	53	245
									116	−5 55	+45	59	−5 10	44	59	−4 26	45	58	−3 41	44	57	−2 57	45	57	−2 12	45	56	−1 27	44	55	−0 43	45	55	00 02	44	54	00 46	45	53	01 31	45	53	02 16	44	52	244
												117	−5 48	+44	58	−5 04	45	57	−4 19	45	57	−3 34	45	56	−2 49	45	55	−2 04	45	54	−1 19	45	54	−0 34	45	53	00 11	45	53	00 56	45	52	01 41	45	51	243
															118	−5 41	45	56	−4 56	45	56	−4 11	46	55	−3 25	45	55	−2 40	45	54	−1 55	45	53	−1 10	46	53	−0 24	45	52	00 21	45	51	01 06	45	51	242
															119	−6 18	+46	56	−5 32	45	55	−4 47	45	54	−4 02	46	54	−3 16	46	53	−2 30	45	53	−1 45	46	52	−0 59	45	51	−0 14	46	51	00 32	46	50	241
																		120	−6 09	+46	54	−5 23	+46	54	−4 37	+46	53	−3 51	+45	52	−3 06	+46	52	−2 20	+46	51	−1 34	+46	51	−0 48	+46	50	−0 02	+46	49	240
																					121	−5 59	+46	53	−5 13	46	52	−4 27	46	52	−3 41	47	51	−2 54	46	50	−2 08	46	50	−1 22	46	49	−0 36	47	49	239
																								122	−5 48	+46	52	−5 02	47	51	−4 15	46	50	−3 29	47	50	−2 42	47	49	−1 55	46	49	−1 09	47	48	238
																											123	−5 36	47	50	−4 49	47	50	−4 02	46	49	−3 16	47	48	−2 29	47	48	−1 42	47	47	237
																											124	−6 10	+47	50	−5 23	47	49	−4 36	47	48	−3 49	47	48	−3 02	48	47	−2 14	47	47	236
																																	125	−5 57	+48	48	−5 09	+47	48	−4 22	+48	47	−3 34	+48	46	235
																																			126	−5 42	48	47	−4 54	48	46	−4 06	48	46	−3 18	48	45	234
																																			127	−6 14	+48	46	−5 26	48	46	−4 38	48	45	−3 50	49	44	233
																																						128	−5 58	+49	45	−5 09	48	44	−4 21	49	44	232
																																								129	−5 40	49	44	−4 51	49	43	231
																																								130	−6 11	+49	43	−5 22	+50	42	230
																																										131	−5 51	+49	42	229
85	−6 21	−40	104	275																																											
84	−5 38	40	105	−6 18	−40	106	276																																							
83	−4 55	40	106	−5 35	41	107	−6 16	−40	107	277																																				
82	−4 12	41	106	−4 53	40	107	−5 33	40	108	−6 13	−41	109	278																																	
81	−3 29	41	107	−4 10	41	108	−4 51	40	109	−5 31	41	109	−6 12	−40	110	279																													
80	−2 47	−41	108	−3 28	−41	108	−4 09	−40	109	−4 49	−41	110	−5 30	−41	111	−6 11	−40	111	280																									
79	−2 05	41	108	−2 46	40	109	−3 26	41	110	−4 07	41	111	−4 48	41	111	−5 29	41	112	−6 10	−41	113	281																					
78	−1 22	41	109	−2 03	42	110	−2 45	41	111	−3 26	41	111	−4 07	41	112	−4 48	41	113	−5 29	41	113	−6 10	−41	114	282																	
77	−0 40	42	110	−1 22	41	110	−2 03	41	111	−2 44	42	112	−3 26	41	113	−4 07	41	113	−4 48	41	114	−5 29	42	115	−6 11	−41	116	283															
76	00 02	42	110	−0 40	42	111	−1 22	41	112	−2 03	42	113	−2 45	41	113	−3 26	42	114	−4 08	41	115	−4 49	41	115	−5 30	42	116	−6 12	−41	117	284												
75	00 43	−41	111	00 02	−42	112	−0 40	−42	113	−1 22	−42	113	−2 04	−41	114	−2 45	−42	115	−3 27	−42	115	−4 09	−41	116	−4 50	−42	117	−5 32	−42	118	−6 14	−41	118	285								
74	01 25	42	112	00 43	42	112	00 01	42	113	−0 41	42	114	−1 23	42	115	−2 05	42	115	−2 47	42	116	−3 29	42	117	−4 11	42	117	−4 53	41	118	−5 34	42	119	−6 16	−42	120	286					
73	02 06	42	112	01 24	42	113	00 42	42	114	00 00	43	115	−0 43	42	115	−1 25	42	116	−2 07	42	117	−2 49	42	117	−3 31	42	118	−4 13	43	119	−4 56	42	120	−5 38	42	120	−6 20	−41	121	287			
72	02 47	42	113	02 05	43	114	01 22	42	115	00 40	42	115	−0 02	43	116	−0 45	42	117	−1 27	43	117	−2 10	42	118	−2 52	43	119	−3 35	42	119	−4 17	42	120	−4 59	42	121	−5 41	43	122	288		
71	03 28	42	114	02 46	43	115	02 03	43	115	01 20	42	116	00 38	43	117	−0 05	43	117	−0 48	43	118	−1 31	42	119	−2 13	43	119	−2 56	42	120	−3 38	43	121	−4 21	43	122	−5 04	42	122	−5 46	−43	123	289	
70	04 09	−43	114	03 26	−43	115	02 43	−43	116	02 00	−43	117	01 17	−43	117	00 34	−43	118	−0 09	−43	119	−0 52	−42	119	−1 34	−43	120	−2 17	−43	121	−3 00	−43	121	−3 43	−43	122	−4 26	−43	123	−5 09	−43	124	−5 52	−42	124	290
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) CONTRARY NAME TO LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
69	04 49	43	115	04 06	43	116	03 23	43	117	02 40	43	117	01 57	43	118	01 14	44	119	00 30	43	119	−0 13	43	120	−0 56	43	121	−1 39	43	121	−2 22	44	122	−3 06	43	123	−3 49	45	124	−4 32	43	124	−5 15	43	125	291
68	05 30	44	116	04 46	43	117	04 03	44	117	03 19	43	118	02 36	43	119	01 53	44	119	01 09	43	120	00 26	44	121	−0 18	43	121	−1 01	44	122	−1 45	43	123	−2 28	44	123	−3 12	43	124	−3 55	43	125	−4 38	44	126	292
67	06 10	44	117	05 26	44	117	04 42	43	118	03 59	44	119	03 15	44	119	02 31	43	120	01 48	44	121	01 04	44	121	00 20	44	122	−0 24	43	123	−1 07	44	123	−1 51	44	124	−2 35	44	125	−3 19	43	125	−4 02	44	126	293
66	06 49	44	117	06 05	43	118	05 22	44	119	04 38	44	119	03 54	44	120	03 10	44	121	02 26	44	121	01 42	44	122	00 58	44	123	00 14	44	123	−0 30	44	124	−1 14	44	125	−1 58	45	125	−2 43	44	126	−3 27	43	127	294
65	07 29	−44	118	06 45	−44	119	06 01	−45	119	05 16	−44	120	04 32	−44	121	03 48	−44	121	03 04	−45	122	02 19	−44	123	01 35	−44	123	00 51	−45	124	00 06	−44	125	−0 38	−44	125	−1 22	−45	126	−2 07	−44	127	−2 51	−44	127	295
64	08 08	44	119	07 24	45	119	06 39	44	120	05 55	45	121	05 10	44	121	04 26	45	122	03 41	44	123	02 57	45	123	02 12	45	124	01 27	44	125	00 43	45	125	−0 02	44	126	−0 46	45	127	−1 31	45	127	−2 16	44	128	296
63	08 47	45	119	08 02	44	120	07 18	45	121	06 33	45	121	05 48	44	122	05 04	45	123	04 19	45	123	03 34	45	124	02 49	45	125	02 04	45	125	01 19	45	126	00 34	45	127	−0 11	45	127	−0 56	45	128	−1 41	45	129	297
62	09 26	45	120	08 41	45	121	07 56	45	122	07 11	45	122	06 26	45	123	05 41	45	124	04 56	45	124	04 11	46	125	03 25	45	125	02 40	45	126	01 55	45	127	01 10	46	127	00 24	45	128	−0 21	45	129	−1 06	45	129	298
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58	11 58	46	123	11 12	46	124	10 26	47	124	09 39	46	125	08 53	46	126	08 07	46	126	07 21	47	127	06 34	46	128	05 48	46	128	05 02	47	129	04 15	46	130	03 29	47	130	02 42	47	131	01 55	46	131	01 09	47	132	302
57	12 35	47	124	11 48	46	125	11 02	46	125	10 16	47	126	09 29	46	126	08 43	47	127	07 56	46	128	07 10	47	128	06 23	47	129	05 36	47	130	04 49	47	130	04 02	46	131	03 16	47	132	02 29	47	132	01 42	47	133	303
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53	15 00	47	127	14 13	48	128	13 25	47	128	12 38	48	129	11 50	48	130	11 02	48	130	10 14	48	131	09 26	48	131	08 38	48	132	07 50	48	133	07 02	48	133	06 14	48	134	05 26	48	134	04 38	48	135	03 50	49	136	307
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48	17 53	49	131	17 04	49	132	16 15	49	132	15 26	49	133	14 37	49	133	13 48	50	134	12 58	49	135	12 09	50	135	11 19	49	136	10 30	50	136	09 40	50	137	08 50	50	137	08 00	49	138	07 11	50	139	06 21	50	139	312
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43	20 36	51	135	19 45	50	136	18 55	51	136	18 04	51	137	17 13	51	138	16 22	51	138	15 31	51	139	14 40	51	139	13 49	51	140	12 58	51	140	12 07	52	141	11 15	51	141	10 24	52	142	09 32	51	142	08 41	52	143	317
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33	25 24	54	144	24 30	54	145	23 36	54	145	22 42	54	146	21 48	54	146	20 54	54	147	20 00	54	147	19 06	54	148	18 12	55	148	17 17	54	149	16 23	54	149	15 29	55	149	14 34	54	150	13 40	55	150	12 45	55	151	327
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22	29 30	57	155	28 33	57	156	27 36	57	156	26 39	57	157	25 42	57	157	24 45	57	157	23 48	57	158	22 51	58	158	21 53	57	158	20 56	57	159	19 59	58	159	19 01	57	159	18 04	57	159	17 07	58	160	16 09	57	160	338
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20	30 05	−57	158	29 08	−57	158	28 11	−58	158	27 13	−57	159	26 16	−58	159	25 18	−58	159	24 20	−57	159	23 23	−58	160	22 25	−58	160	21 27	−57	160	20 30	−58	161	19 32	−58	161	18 34	−58	161	17 36	−58	162	16 38	−57	162	340
19	30 22	58	159	29 24	57	159	28 27	58	159	27 29	58	160	26 31	58	160	25 33	57	160	24 36	58	160	23 38	58	161	22 40	58	161	21 42	58	161	20 44	58	162	19 46	58	162	18 48	58	162	17 50	58	162	16 52	58	163	341
18	30 38	58	160	29 40	58	160	28 42	58	160	27 44	59	161	26 46	58	161	25 48	58	161	24 50	58	161	23 52	58	162	22 54	58	162	21 56	58	162	20 58	58	163	20 00	59	163	19 01	58	163	18 03	58	163	17 05	58	164	342
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LHA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) C

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	360
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48	27 42	49	123	28 31	48	122	29 19	48	122	30 07	48	121	30 55	48	120	31 43	48	120	32 31	47	119	33 18	47	118	34 05	47	117	34 52	46	117	35 38	46	116	36 24	46	115	37 10	46	114	37 56	45	113	38 41	45	113	312
49	27 07	48	122	27 55	48	121	28 43	48	121	29 31	48	120	30 19	48	119	31 07	47	119	31 54	47	118	32 41	47	117	33 28	46	116	34 14	47	116	35 01	46	115	35 47	45	114	36 32	45	113	37 17	45	112	38 02	45	112	311
50	26 31	+48	121	27 19	+48	120	28 07	+48	120	28 55	+48	119	29 43	+47	118	30 30	+47	118	31 17	+47	117	32 04	+46	116	32 50	+47	115	33 37	+46	115	34 23	+45	114	35 08	+46	113	35 54	+45	112	36 39	+45	112	37 24	+44	111	310
51	25 55	48	120	26 43	48	120	27 31	47	119	28 18	48	118	29 06	47	117	29 53	47	117	30 40	46	116	31 26	47	115	32 13	46	115	32 59	45	114	33 44	46	113	34 30	45	112	35 15	45	111	36 00	44	111	36 44	45	110	309
52	25 19	48	119	26 07	47	119	26 54	48	118	27 42	47	117	28 29	46	117	29 15	47	116	30 02	46	115	30 48	47	114	31 35	45	114	32 20	46	113	33 06	45	112	33 51	45	111	34 36	45	111	35 21	44	110	36 05	44	109	308
53	24 43	47	118	25 30	47	118	26 17	47	117	27 04	47	116	27 51	47	116	28 38	46	115	29 24	46	114	30 10	46	114	30 56	46	113	31 42	45	112	32 27	45	111	33 12	45	110	33 57	44	110	34 41	45	109	35 26	43	108	307
54	24 06	47	118	24 53	47	117	25 40	47	116	26 27	47	116	27 14	46	115	28 00	46	114	28 46	46	113	29 32	46	113	30 18	45	112	31 03	45	111	31 48	45	110	32 33	45	110	33 18	44	109	34 02	44	108	34 46	43	107	306
55	23 29	+47	117	24 16	+47	116	25 03	+46	115	25 49	+47	115	26 36	+46	114	27 22	+46	113	28 08	+45	113	28 53	+46	112	29 39	+45	111	30 24	+45	110	31 09	+45	110	31 54	+44	109	32 38	+44	108	33 22	+44	107	34 06	+43	106	305
56	22 51	47	116	23 38	47	115	24 25	46	115	25 11	46	114	25 57	46	113	26 43	46	112	27 29	46	112	28 15	45	111	29 00	45	110	29 45	45	109	30 30	44	109	31 14	44	108	31 58	44	107	32 42	44	106	33 26	43	105	304
57	22 14	46	115	23 00	47	114	23 47	46	114	24 33	46	113	25 19	46	112	26 05	45	112	26 50	46	111	27 36	45	110	28 21	45	109	29 06	44	109	29 50	44	108	30 34	44	107	31 18	44	106	32 02	44	105	32 46	43	105	303
58	21 36	46	114	22 22	46	114	23 08	46	113	23 54	46	112	24 40	46	111	25 26	45	111	26 11	45	110	26 56	45	109	27 41	45	108	28 26	44	108	29 10	44	107	29 54	44	106	30 38	44	105	31 22	43	105	32 05	43	104	302
59	20 58	46	113	21 44	46	113	22 30	46	112	23 16	45	111	24 01	46	111	24 47	45	110	25 32	45	109	26 17	45	108	27 02	44	108	27 46	44	107	28 30	44	106	29 14	44	105	29 58	44	105	30 42	43	104	31 25	42	103	301
60	20 19	+46	113	21 05	+46	112	21 51	+46	111	22 37	+45	110	23 22	+45	110	24 07	+45	109	24 52	+45	108	25 37	+45	108	26 22	+44	107	27 06	+44	106	27 50	+44	105	28 34	+44	105	29 18	+43	104	30 01	+43	103	30 44	+43	102	300
61	19 41	46	112	20 27	45	111	21 12	46	110	21 58	45	110	22 43	45	109	23 28	45	108	24 13	44	107	24 57	45	107	25 42	44	106	26 26	44	105	27 10	44	105	27 54	43	104	28 37	43	103	29 20	43	102	30 03	43	101	299
62	19 02	46	111	19 48	45	110	20 33	45	110	21 18	45	109	22 03	45	108	22 48	45	107	23 33	44	107	24 17	45	106	25 02	44	105	25 46	44	104	26 30	43	104	27 13	43	103	27 56	43	102	28 39	43	101	29 22	43	101	298
63	18 23	45	110	19 08	46	109	19 54	45	109	20 39	45	108	21 24	44	107	22 08	45	107	22 53	44	106	23 37	44	105	24 21	44	104	25 05	44	104	25 49	43	103	26 32	44	102	27 16	43	101	27 59	42	101	28 41	43	100	297
64	17 44	45	109	18 29	45	109	19 14	45	108	19 59	45	107	20 44	44	107	21 28	45	106	22 13	44	105	22 57	44	104	23 41	44	104	24 25	43	103	25 08	44	102	25 52	43	101	26 35	43	101	27 18	42	100	28 00	42	99	296
65	17 04	+45	109	17 49	+45	108	18 34	+45	107	19 19	+45	106	20 04	+44	106	20 48	+44	105	21 32	+45	104	22 17	+43	104	23 00	+44	103	23 44	+43	102	24 27	+44	101	25 11	+43	101	25 54	+42	100	26 36	+43	99	27 19	+42	98	295
66	16 25	45	108	17 10	44	107	17 54	45	106	18 39	45	106	19 24	44	105	20 08	44	104	20 52	44	104	21 36	44	103	22 20	43	102	23 03	44	101	23 47	43	101	24 30	43	100	25 13	42	99	25 55	43	98	26 38	42	97	294
67	15 45	45	107	16 30	44	106	17 14	45	106	17 59	44	105	18 43	44	104	19 27	44	103	20 11	44	103	20 55	44	102	21 39	43	101	22 22	44	101	23 06	43	100	23 49	42	99	24 31	43	98	25 14	42	97	25 56	42	97	293
68	15 05	45	106	15 50	44	106	16 34	45	105	17 19	44	104	18 03	44	103	18 47	44	103	19 31	43	102	20 14	44	101	20 58	43	100	22 24	43	99	23 07	43	98	23 50	43	97	24 33	42	97	25 15	42	96	292
69	14 25	44	105	15 09	45	105	15 54	44	104	16 38	44	103	17 22	44	103	18 06	44	102	18 50	43	101	19 33	44	100	20 17	43	100	21 00	43	99	21 43	43	98	22 26	43	97	23 09	42	97

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	13 45	+44	105	14 29	+44	104	15 13	+44	103	15 57	+44	103	16 41	+44	102	17 25	+44	101	18 09	+43	100	18 52	+44	100	19 36	+43	99	20 19	+43	98	21 02	+43	97	21 45	+42	97	22 27	+43	96	23 10	+42	95	23 52	+42	94	290
71	13 04	45	104	13 49	44	103	14 33	44	103	15 17	44	102	16 01	43	101	16 44	44	100	17 28	43	100	18 11	44	99	18 55	43	98	19 38	43	97	20 21	42	97	21 03	43	96	21 46	42	95	22 28	42	94	23 10	42	94	289
72	12 24	44	103	13 08	44	102	13 52	44	102	14 36	44	101	15 20	43	100	16 03	44	100	16 47	43	99	17 30	43	98	18 13	43	97	18 56	43	97	19 39	43	96	20 22	42	95	21 04	43	94	21 47	42	94	22 29	41	93	288
73	11 43	44	102	12 27	44	102	13 11	44	101	13 55	44	100	14 39	43	100	15 22	44	99	16 06	43	98	16 49	43	97	17 32	43	97	18 15	43	96	18 58	42	95	19 40	43	95	20 23	42	94	21 05	42	93	21 47	42	92	287
74	11 02	44	102	11 46	44	101	12 30	44	100	13 14	43	100	13 57	44	99	14 41	43	98	15 24	43	97	16 07	43	97	16 50	43	96	17 33	43	95	18 16	43	95	18 59	42	94	19 41	42	93	20 23	42	92	21 05	42	91	286
75	10 21	+44	101	11 05	+44	100	11 49	+44	100	12 33	+43	99	13 16	+44	98	14 00	+43	97	14 43	+43	97	15 26	+43	96	16 09	+43	95	16 52	+43	95	17 35	+42	94	18 17	+42	93	18 59	+43	92	19 42	+42	92	20 24	+41	91	285
76	09 40	44	100	10 24	44	99	11 08	43	99	11 51	44	98	12 35	43	97	13 18	43	97	14 01	44	96	14 45	42	95	15 27	43	95	16 10	43	94	16 53	42	93	17 35	43	92	18 18	42	92	19 00	42	91	19 42	42	90	284
77	08 59	44	99	09 43	44	99	10 27	43	98	11 10	44	97	11 54	43	97	12 37	43	96	13 20	43	95	14 03	43	94	14 46	43	94	15 29	42	93	16 11	43	92	16 54	42	92	17 36	42	91	18 18	42	90	19 00	42	89	283
78	08 18	44	99	09 02	43	98	09 45	44	97	10 29	43	97	11 12	43	96	11 55	43	95	12 38	43	94	13 21	43	94	14 04	43	93	14 47	43	92	15 30	42	92	16 12	42	91	16 54	43	90	17 37	42	89	18 19	41	89	282
79	07 37	44	98	08 21	43	97	09 04	43	97	09 47	44	96	10 31	43	95	11 14	43	94	11 57	43	94	12 40	43	93	13 23	42	92	14 05	43	92	14 48	42	91	15 30	43	90	16 13	42	89	16 55	42	89	17 37	42	88	281
80	06 56	+43	97	07 39	+44	97	08 23	+43	96	09 06	+43	95	09 49	+43	94	10 32	+43	94	11 15	+43	93	11 58	+43	92	12 41	+43	92	13 24	+42	91	14 06	+43	90	14 49	+42	89	15 31	+42	89	16 13	+42	88	16 55	+42	87	280
81	06 14	44	96	06 58	43	96	07 41	43	95	08 24	43	94	09 07	44	94	09 51	43	93	10 34	43	92	11 17	42	92	11 59	43	91	12 42	43	90	13 25	42	89	14 07	42	89	14 49	43	88	15 32	42	87	16 14	42	86	279
82	05 33	43	96	06 16	43	95	06 59	44	94	07 43	43	94	08 26	43	93	09 09	43	92	09 52	43	92	10 35	43	91	11 18	42	90	12 00	43	89	12 43	42	89	13 25	43	88	14 08	42	87	14 50	42	87	15 32	42	86	278
83	04 51	44	95	05 35	43	94	06 18	43	94	07 01	43	93	07 44	43	92	08 27	43	92	09 10	43	91	09 53	43	90	10 36	43	89	11 19	42	89	12 01	43	88	12 44	42	87	13 26	42	87	14 08	43	86	14 51	42	85	277
84	04 10	43	94	04 53	43	94	05 36	43	93	06 19	44	92	07 03	43	92	07 46	43	91	08 29	42	90	09 11	43	89	09 54	43	89	10 37	43	88	11 20	42	87	12 02	43	87	12 45	42	86	13 27	42	85	14 09	42	84	276
85	03 28	+43	94	04 11	+44	93	04 55	+43	92	05 38	+43	92	06 21	+43	91	07 04	+43	90	07 47	+43	89	08 30	+43	89	09 13	+42	88	09 55	+43	87	10 38	+43	87	11 21	+42	86	12 03	+42	85	12 45	+43	84	13 28	+42	84	275
86	02 47	43	93	03 30	43	92	04 13	43	91	04 56	43	91	05 39	43	90	06 22	43	89	07 05	43	89	07 48	43	88	08 31	43	87	09 14	42	87	09 56	43	86	10 39	43	85	11 22	42	84	12 04	42	84	12 46	42	83	274
87	02 05	43	92	02 48	43	91	03 31	43	91	04 14	44	90	04 58	43	89	05 41	43	89	06 24	43	88	07 07	42	87	07 49	43	87	08 32	43	86	09 15	43	85	09 58	42	84	10 40	43	84	11 23	42	83	12 05	42	82	273
88	01 23	44	91	02 07	43	91	02 50	43	90	03 33	43	89	04 16	43	89	04 59	43	88	05 42	43	87	06 25	43	87	07 08	43	86	07 51	42	85	08 33	43	84	09 16	43	84	09 59	42	83	10 41	43	82	11 24	42	82	272
89	00 42	43	91	01 25	43	90	02 08	43	89	02 51	43	89	03 34	43	88	04 17	43	87	05 00	43	87	05 43	43	86	06 26	43	85	07 09	43	84	07 52	43	84	08 35	42	83	09 17	43	82	10 00	42	82	10 42	43	81	271
90	00 00	+43	90	00 43	+43	89	01 26	+43	89	02 09	+44	88	02 53	+43	87	03 36	+43	87	04 19	+43	86	05 02	+43	85	05 45	+43	84	06 28	+43	84	07 11	+42	83	07 53	+43	82	08 36	+43	82	09 19	+42	81	10 01	+43	80	270
91	−0 42	43	89	00 01	44	89	00 45	43	88	01 28	43	87	02 11	43	87	02 54	43	86	03 37	43	85	04 20	43	84	05 03	43	84	05 46	43	83	06 29	43	82	07 12	43	82	07 55	43	81	08 38	42	80	09 20	43	79	269
92	−1 23	43	89	−0 40	43	88	00 03	43	87	00 46	43	86	01 29	44	86	02 13	43	85	02 56	43	84	03 39	43	84	04 22	43	83	05 05	43	82	05 48	43	82	06 31	43	81	07 14	43	80	07 57	42	79	08 39	43	79	268
93	−2 05	43	88	−1 22	43	87	−0 39	44	86	00 05	43	86	00 48	43	85	01 31	43	84	02 14	43	84	02 57	44	83	03 41	43	82	04 24	43	82	05 07	43	81	05 50	43	80	06 33	43	79	07 16	43	79	07 59	42	78	267
94	−2 47	44	87	−2 03	43	86	−1 20	43	86	−0 37	43	85	00 06	44	84	00 50	43	84	01 33	43	83	02 16	43	82	02 59	43	82	03 42	44	81	04 26	43	80	05 09	43	79	05 52	43	79	06 35	43	78	07 18	43	77	266
95	−3 28	+43	86	−2 45	+43	86	−2 02	+44	85	−1 18	+43	84	−0 35	+43	84	00 08	+43	83	00 51	+44	82	01 35	+43	82	02 18	+43	81	03 01	+44	80	03 45	+43	79	04 28	+43	79	05 11	+43	78	05 54	+43	77	06 37	+43	77	265
96	−4 10	43	86	−3 27	44	85	−2 43	43	84	−2 00	43	84	−1 17	44	83	−0 33	43	82	00 10	44	82	00 54	43	81	01 37	43	80	02 20	44	79	03 04	43	79	03 47	43	78	04 30	43	77	05 13	44	77	05 57	43	76	264
97	−4 51	43	85	−4 08	43	84	−3 25	44	84	−2 41	43	83	−1 58	44	82	−1 14	43	81	−0 31	44	81	00 13	43	80	00 56	43	79	01 39	44	79	02 23	43	78	03 06	44	77	03 50	43	77	04 33	43	76	05 16	44	75	263
98	−5 33	44	84	−4 49	43	84	−4 06	43	83	−3 23	44	82	−2 39	43	81	−1 56	44	81	−1 12	43	80	−0 29	44	79	00 15	44	79	00 59	43	78	01 42	44	77	02 26	43	77	03 09	44	76	03 53	43	75	04 36	43	75	262
99	−6 14	+43	84	−5 31	44	83	−4 47	43	82	−4 04	44	81	−3 20	43	81	−2 37	44	80	−1 53	44	79	−1 09	43	79	−0 26	44	78	00 18	44	77	01 02	43	77	01 45	44	76	02 29	43	75	03 12	44	75	03 56	43	74	261
			100	−6 12	+43	82	−5 29	+44	81	−4 45	+44	81	−4 01	+43	80	−3 18	+44	79	−2 34	+44	79	−1 50	+44	78	−1 06	+43	77	−0 23	+44	77	00 21	+44	76	01 05	+44	75	01 49	+43	75	02 32	+44	74	03 16	+44	73	260
						101	−6 10	+44	81	−5 26	44	80	−4 42	43	79	−3 59	44	79	−3 15	44	78	−2 31	44	77	−1 47	44	77	−1 03	44	76	−0 19	44	75	00 25	43	74	01 08	44	74	01 52	44	73	02 36	44	72	259
									102	−6 07	+44	79	−5 23	44	79	−4 39	44	78	−3 55	43	77	−3 12	44	76	−2 28	44	76	−1 44	44	75	−1 00	44	74	−0 16	44	74	00 28	45	73	01 13	44	72	01 57	44	72	258
												103	−6 04	+44	78	−5 20	44	77	−4 36	44	76	−3 52	44	76	−3 08	44	75	−2 24	44	74	−1 40	45	74	−0 55	44	73	−0 11	44	72	00 33	44	72	01 17	44	71	257
															104	−6 01	+44	76	−5 17	45	76	−4 32	44	75	−3 48	44	74	−3 04	44	74	−2 20	45	73	−1 35	44	72	−0 51	44	72	−0 07	45	71	00 38	44	70	256
																		105	−5 57	+44	75	−5 13	+45	74	−4 28	+44	74	−3 44	+45	73	−2 59	+44	72	−2 15	+45	72	−1 30	+44	71	−0 46	+45	70	−0 01	+44	70	255
																					106	−5 53	+45	74	−5 08	44	73	−4 24	45	72	−3 39	45	72	−2 54	44	71	−2 10	45	70	−1 25	45	70	−0 40	44	69	254
																								107	−5 48	+45	72	−5 03	45	71	−4 18	44	71	−3 34	45	70	−2 49	45	69	−2 04	45	69	−1 19	45	68	253
																											108	−5 43	45	71	−4 58	45	70	−4 13	45	69	−3 28	45	69	−2 43	45	68	−1 58	45	67	252
																											109	−6 22	+45	70	−5 37	45	69	−4 52	45	69	−4 07	46	68	−3 21	45	67	−2 36	45	67	251
																																	110	−6 16	+46	69	−5 30	+45	68	−4 45	+45	67	−4 00	+46	67	−3 14	+45	66	250
																																			111	−6 09	+46	67	−5 23	45	67	−4 38	46	66	−3 52	45	65	249
																																					112	−6 02	+46	66	−5 16	46	65	−4 30	46	64	248
																																							113	−5 54	+46	64	−5 08	46	64	247
																																								114	−5 45	46	63	246
																																								115	−6 22	+47	62	245
98	−5 33	−43	84	−6 16	−43	85	262																																						
97	−4 51	44	85	−5 35	43	86	−6 18	−43	86	263																																				
96	−4 10	43	86	−4 53	43	86	−5 36	43	87	−6 19	−44	88	264																																
95	−3 28	−43	86	−4 11	−44	87	−4 55	−43	88	−5 38	−43	88	−6 21	−43	89	265																												
94	−2 47	43	87	−3 30	43	88	−4 13	43	89	−4 56	43	89	−5 39	43	90	−6 22	−43	91	266																										
93	−2 05	43	88	−2 48	43	89	−3 31	43	89	−4 14	44	90	−4 58	43	91	−5 41	43	91	−6 24	−43	92	267																						
92	−1 23	44	89	−2 07	43	89	−2 50	43	90	−3 33	43	91	−4 16	43	91	−4 59	43	92	−5 42	43	93	268																						
91	−0 42	43	89	−1 25	43	90	−2 08	43	91	−2 51	43	91	−3 34	43	92	−4 17	43	93	−5 00	43	93	−5 43	−43	94	269																		
90	00 00	−43	90	−0 43	−43	91	−1 26	−43	91	−2 09	−44	92	−2 53	−43	93	−3 36	−43	93	−4 19	−43	94	−5 02	−43	95	−5 45	−43	96	270																
89	00 42	43	91	−0 01	44	91	−0 45	43	92	−1 28	43	93	−2 11	43	93	−2 54	43	94	−3 37	43	95	−4 20	43	96	−5 03	43	96	−5 46	−43	97	271														
88	01 23	43	91	00 40	43	92	−0 03	43	93	−0 46	43	94	−1 29	44	94	−2 13	43	95	−2 56	43	96	−3 39	43	96	−4 22	43	97	−5 05	43	98	−5 48	−43	98	272										
87	02 05	43	92	01 22	43	93	00 39	44	94	−0 05	43	94	−0 48	43	95	−1 31	43	96	−2 14	43	96	−2 57	44	97	−3 41	43	98	−4 24	43	98	−5 07	43	99	−5 50	−43	100	273								
86	02 47	44	93	02 03	43	94	01 20	43	94	00 37	43	95	−0 06	44	96	−0 50	43	96	−1 33	43	97	−2 16	43	98	−2 59	43	98	−3 42	44	99	−4 26	43	100	−5 09	43	101	−5 52	−43	101	274				
85	03 28	−43	94	02 45	−43	94	02 02	−44	95	01 18	−43	96	00 35	−43	96	−0 08	−43	97	−0 51	−44	98	−1 35	−43	98	−2 18	−43	99	−3 01	−44	100	−3 45	−43	101	−4 28	−43	101	−5 11	−43	102	−5 54	−43	103	275		
84	04 10	43	94	03 27	44	95	02 43	43	96	02 00	43	96	01 17	44	97	00 33	43	98	−0 10	44	98	−0 54	43	99	−1 37	43	100	−2 20	44	101	−3 04	43	101	−3 47	43	102	−4 30	43	103	−5 13	44	103	−5 57	−43	104	276
83	04 51	43	95	04 08	43	96	03 25	44	96	02 41	43	97	01 58	44	98	01 14	43	99	00 31	44	99	−0 13	43	100	−0 56	43	101	−1 39	44	101	−2 23	43	102	−3 06	44	103	−3 50	43	103	−4 33	43	104	−5 16	44	105	277
82	05 33	44	96	04 49	43	96	04 06	43	97	03 23	44	98	02 39	43	99	01 56	44	99	01 12	43	100	00 29	44	101	−0 15	44	101	−0 59	43	102	−1 42	44	103	−2 26	43	103	−3 09	44	104	−3 53	43	105	−4 36	43	105	278
81	06 14	45	96	05 31	44	97	04 47	43	98	04 04	44	99	03 20	43	99	02 37	44	100	01 53	44	101	01 09	43	101	00 26	44	102	−0 18	44	103	−1 02	43	103	−1 45	44	104	−2 29	43	105	−3 12	44	105	−3 56	43	106	279
80	06 56	−44	97	06 12	−43	98	05 29	−44	99	04 45	−44	99	04 01	−43	100	03 18	−44	101	02 34	−44	101	01 50	−44	102	01 06	−43	103	00 23	−44	103	−0 21	−44	104	−1 05	−44	105	−1 49	−43	105	−2 32	−44	106	−3 16	−44	107	280
79	07 37	44	98	06 53	43	99	06 10	44	99	05 26	44	100	04 42	43	101	03 59	44	101	03 15	44	102	02 31	44	103	01 47	44	103	01 03	44	104	00 19	44	105	−0 25	45	106	−1 08	44	106	−1 52	44	107	−2 36	44	108	281
78	08 18	43	99	07 35	44	99	06 51	44	100	06 07	44	101	05 23	44	101	04 39	44	102	03 55	43	103	03 12	44	104	02 28	44	104	01 44	44	105	01 00	44	106	00 16	44	106	−0 28	45	107	−1 13	44	108	−1 57	44	108	282
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74	11 02	44	102	10 18	44	102	09 34	44	103	08 50	44	104	08 06	45	104	07 21	44	105	06 37	44	106	05 53	45	106	05 08	44	107	04 24	45	108	03 39	45	108	02 54	44	109	02 10	45	110	01 25	45	110	00 40	44	111	286
73	11 43	44	102	10 59	44	103	10 15	45	104	09 30	44	104	08 46	44	105	08 02	45	106	07 17	45	107	06 32	44	107	05 48	45	108	05 03	45	109	04 18	44	109	03 34	45	110	02 49	45	111	02 04	45	111	01 19	45	112	287
72	12 24	45	103	11 39	44	104	10 55	44	105	10 11	45	105	09 26	44	106	08 42	45	107	07 57	45	107	07 12	45	108	06 27	44	109	05 43	45	109	04 58	45	110	04 13	45	111	03 28	45	111	02 43	45	112	01 58	45	113	288
71	13 04	44	104	12 20	45	105	11 35	44	105	10 51	45	106	10 06	45	107	09 21	44	107	08 37	45	108	07 52	45	109	07 07	45	109	06 22	45	110	05 37	45	111	04 52	45	111	04 07	46	112	03 21	45	113	03 36	45	113	289
70	13 45	−45	105	13 00	−44	105	12 16	−45	106	11 31	−45	107	10 46	−45	107	10 01	−45	108	09 16	−45	109	08 31	−45	109	07 46	−45	110	07 01	−45	111	06 16	−46	111	05 30	−45	112	04 45	−45	113	04 00	−46	113	03 14	−45	114	290
HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 46°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	14 25	45	105	13 40	44	106	12 56	45	107	12 11	45	107	11 26	45	108	10 41	45	109	09 56	46	110	09 10	45	110	08 25	45	111	07 40	46	112	06 54	45	112	06 09	46	113	05 23	45	113	04 38	46	114	03 52	45	115	291
68	15 05	45	106	14 20	45	107	13 35	45	108	12 50	45	108	12 05	45	109	11 20	45	110	10 35	46	110	09 49	45	111	09 04	46	112	08 18	45	112	07 33	46	113	06 47	45	114	06 02	46	114	05 16	46	115	04 30	46	116	292
67	15 45	45	107	15 00	45	108	14 15	45	108	13 30	45	109	12 45	46	110	11 59	45	110	11 14	46	111	10 28	45	112	09 43	46	112	08 57	46	113	08 11	46	114	07 25	46	114	06 39	45	115	05 54	46	116	05 08	46	116	293
66	16 25	45	108	15 40	46	108	14 54	45	109	14 09	45	110	13 24	46	110	12 38	45	111	11 53	46	112	11 07	46	112	10 21	46	113	09 35	46	114	08 49	46	114	08 03	46	115	07 17	46	116	06 31	46	116	05 45	46	117	294
65	17 04	−45	109	16 19	−45	109	15 34	−46	110	14 48	−45	111	14 03	−46	111	13 17	−46	112	12 31	−46	113	11 45	−46	113	10 59	−46	114	10 13	−46	115	09 27	−46	115	08 41	−46	116	07 55	−47	116	07 08	−46	117	06 22	−47	118	295
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63	18 23	46	110	17 37	46	111	16 52	46	111	16 06	46	112	15 20	46	113	14 34	46	113	13 48	47	114	13 01	46	115	12 15	46	115	11 29	47	116	10 42	47	117	09 55	46	117	09 09	47	118	08 22	47	119	07 35	47	119	297
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53	24 43	48	118	23 55	48	119	23 07	48	120	22 19	48	120	21 31	48	121	20 43	48	122	19 55	49	122	19 06	48	123	18 18	49	124	17 29	49	124	16 40	49	125	15 51	49	125	15 02	49	126	14 13	49	127	13 24	50	127	307
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N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) SAME NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	64 00	+60	180	65 00	+60	180	66 00	+60	180	67 00	+60	180	68 00	+60	180	69 00	+60	180	70 00	+60	180	71 00	+60	180	72 00	+60	180	73 00	+60	180	360
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55	34 49	+43	105	35 32	+43	105	36 15	+42	104	36 57	+42	103	37 39	+42	102	38 21	+41	101	39 02	+41	100	39 43	+40	99	40 23	+39	98	41 02	+39	97	41 41	+39	96	42 20	+38	95	42 58	+37	94	43 35	+37	93	44 12	+36	92	305
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57	33 29	42	104	34 11	43	103	34 54	42	102	35 36	42	101	36 18	41	100	36 59	41	99	37 40	40	98	38 20	40	98	39 00	40	97	39 40	38	96	40 18	39	95	40 57	38	94	41 35	37	93	42 12	37	92	42 49	36	90	303
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59	32 07	43	102	32 50	42	101	33 32	42	100	34 14	41	100	34 55	41	99	35 36	41	98	36 17	40	97	36 57	40	96	37 37	39	95	38 16	39	94	38 55	39	93	39 34	38	92	40 12	37	91	40 49	37	90	41 26	36	89	301
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62	30 05	42	100	30 47	42	99	31 29	41	98	32 10	41	97	32 51	41	96	33 32	41	95	34 13	40	94	34 53	39	94	35 32	40	93	36 12	38	92	36 50	39	91	37 29	38	90	38 07	37	89	38 44	37	88	39 21	36	87	298
63	29 24	42	99	30 06	41	98	30 47	42	97	31 29	41	96	32 10	41	96	32 51	40	95	33 32	41	94	34 11	40	93	34 51	39	92	35 30	39	91	36 09	38	90	36 47	38	89	37 25	37	88	38 02	37	87	38 39	36	86	297
64	28 42	42	98	29 24	42	97	30 06	41	97	30 47	41	96	31 28	41	95	32 09	41	94	32 50	39	93	33 29	40	92	34 09	39	91	34 48	39	90	35 27	38	89	36 05	38	89	36 43	38	88	37 21	36	87	37 57	37	86	296
65	28 01	+42	97	28 43	+42	97	29 25	+41	96	30 06	+41	95	30 47	+41	94	31 28	+40	93	32 08	+40	92	32 48	+39	91	33 27	+40	91	34 07	+38	90	34 45	+39	89	35 24	+38	88	36 02	+37	87	36 39	+37	86	37 16	+36	85	295
66	27 20	42	97	28 02	41	96	28 43	41	95	29 24	41	94	30 05	41	93	30 46	40	92	31 26	40	92	32 06	40	91	32 46	39	90	33 25	39	89	34 04	38	88	34 42	38	87	35 20	37	86	35 57	37	85	36 34	37	84	294
67	26 38	42	96	27 20	42	95	28 02	41	94	28 43	41	93	29 24	40	93	30 04	41	92	30 45	39	91	31 24	40	90	32 04	39	89	32 43	39	88	33 22	38	87	34 00	38	86	34 38	38	85	35 16	37	85	35 53	37	84	293
68	25 57	42	95	26 39	41	94	27 20	42	94	28 01	41	93	28 42	41	92	29 23	40	91	30 03	40	90	30 43	39	89	31 22	40	88	32 02	38	88	32 40	39	87	33 19	38	86	33 57	37	85	34 34	38	84	35 12	36	83	292
69	25 15	42	94	25 57	41	94	26 38	42	93	27 20	40	92	28 00	41	91	28 41	40	90	29 21	40	89	30 01	40	89	30 41	39	88	31 20	39	87	31 59	38	86	32 37	38	85	33 15	38	84	33 53	37	83	34 30

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 46°

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
70	24 34	+41	94	25 15	+42	93	25 57	+43	92	26 38	+41	91	27 19	+40	90	27 59	+41	90	28 40	+39	89	29 19	+40	88	29 59	+39	87	30 38	+39	86	31 17	+39	85	31 56	+38	84	32 34	+38	83	33 12	+37	83	33 49	+37	82	70
71	23 52	42	93	24 34	41	92	25 15	41	91	25 56	41	91	26 37	41	90	27 18	40	89	27 58	40	88	28 38	39	87	29 17	40	86	29 57	39	85	30 36	38	85	31 14	39	84	31 53	37	83	32 30	38	82	33 08	37	81	71
72	23 10	42	92	23 52	41	91	24 33	42	91	25 15	40	90	25 56	43	89	26 36	40	88	27 16	40	87	27 56	40	86	28 36	39	86	29 15	39	85	29 54	39	84	30 33	38	83	31 11	38	82	31 49	38	81	32 27	37	80	72
73	22 29	41	91	23 10	42	91	23 52	41	90	24 33	41	89	25 14	40	88	25 54	41	87	26 35	40	87	27 15	39	86	27 54	40	85	28 34	39	84	29 13	39	83	29 52	38	82	30 30	38	81	31 08	38	81	31 46	37	80	73
74	21 47	42	91	22 29	41	90	23 10	41	89	23 51	41	88	24 32	41	88	25 13	40	87	25 53	40	86	26 33	40	85	27 13	39	84	27 52	39	83	28 31	39	83	29 10	39	82	29 49	38	81	30 27	38	80	31 05	37	79	74
75	21 05	+42	90	21 47	+41	89	22 28	+42	88	23 10	+40	88	23 50	+41	87	24 31	+40	86	25 11	+41	85	25 52	+39	84	26 31	+40	84	27 11	+39	83	27 50	+39	82	28 29	+39	81	29 08	+38	80	29 46	+38	79	30 24	+37	78	75
76	20 24	41	89	21 05	42	89	21 47	41	88	22 28	41	87	23 09	41	86	23 50	40	85	24 30	40	85	25 10	40	84	25 50	40	83	26 30	39	82	27 09	39	81	27 48	39	80	28 27	38	79	29 05	38	78	29 43	38	78	76
77	19 42	42	89	20 24	41	88	21 05	41	87	21 46	41	86	22 27	41	85	23 08	40	85	23 48	41	84	24 29	40	83	25 09	39	82	25 48	40	81	26 28	39	81	27 07	39	80	27 46	38	79	28 24	38	78	29 02	38	77	77
78	19 00	42	88	19 42	41	87	20 23	42	86	21 05	41	86	21 46	41	85	22 27	40	84	23 07	40	83	23 47	40	82	24 27	40	82	25 07	40	81	25 47	39	80	26 26	39	79	27 05	39	78	27 44	38	77	28 22	38	76	78
79	18 19	41	87	19 00	42	86	19 42	41	86	20 23	41	85	21 04	41	84	21 45	41	83	22 26	40	82	23 06	40	82	23 46	40	81	24 26	40	80	25 06	39	79	25 45	39	78	26 24	39	78	27 03	38	77	27 41	38	76	79
80	17 37	+42	86	18 19	+41	86	19 00	+42	85	19 42	+41	84	20 23	+41	83	21 04	+40	83	21 44	+41	82	22 25	+40	81	23 05	+40	80	23 45	+40	79	24 25	+39	79	25 04	+39	78	25 43	+39	77	26 22	+39	76	27 01	+38	75	80
81	16 56	41	86	17 37	42	85	18 19	41	84	19 00	41	83	19 41	41	83	20 22	41	82	21 03	41	81	21 44	40	80	22 24	40	80	23 04	40	79	23 44	40	78	24 24	39	77	25 03	39	76	25 42	39	75	26 21	38	75	81
82	16 14	42	85	16 56	41	84	17 37	42	84	18 19	41	83	19 00	41	82	19 41	41	81	20 22	41	80	21 03	40	80	21 43	40	79	22 23	40	78	23 03	40	77	23 43	40	76	24 23	39	76	25 02	39	75	25 41	38	74	82
83	15 33	41	84	16 14	42	84	16 56	42	83	17 38	41	82	18 19	41	81	19 00	41	81	19 41	41	80	20 22	40	79	21 02	41	78	21 43	40	77	22 23	40	77	23 03	39	76	23 42	40	75	24 22	39	74	25 01	38	73	83
84	14 51	42	84	15 33	42	83	16 15	41	82	16 56	42	81	17 38	41	81	18 19	41	80	19 00	41	79	19 41	41	78	20 22	40	78	21 02	40	77	21 42	40	76	22 22	40	75	23 02	40	74	23 42	39	74	24 21	39	73	84
85	14 10	+42	83	14 52	+41	82	15 33	+42	81	16 15	+42	81	16 57	+41	80	17 38	+41	79	18 19	+41	78	19 00	+41	78	19 41	+41	77	20 22	+40	76	21 02	+40	75	21 42	+40	75	22 22	+40	74	23 02	+39	73	23 41	+39	72	85
86	13 28	42	82	14 10	42	82	14 52	42	81	15 34	42	80	16 16	41	79	16 57	41	79	17 38	41	78	18 19	41	77	19 00	41	76	19 41	41	75	20 22	40	75	21 02	40	74	21 42	40	73	22 22	39	72	23 01	40	71	86
87	12 47	42	82	13 29	42	81	14 11	42	80	14 53	42	79	15 35	41	79	16 16	42	78	16 58	41	77	17 39	41	76	18 20	41	76	19 01	40	75	19 41	41	74	20 22	40	73	21 02	40	72	21 42	40	72	22 22	40	71	87
88	12 06	42	81	12 48	42	80	13 30	42	79	14 12	42	79	14 54	42	78	15 36	41	77	16 17	41	76	16 58	42	76	17 40	41	75	18 21	40	74	19 01	41	73	19 42	41	73	20 23	40	72	21 03	40	71	21 43	39	70	88
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91	10 03	42	79	10 45	43	78	11 28	42	77	12 10	42	77	12 52	42	76	13 34	42	75	14 16	42	74	14 58	42	74	15 40	41	73	16 21	41	72	17 02	41	71	17 43	41	71	18 24	41	70	19 05	41	69	19 46	40	68	91
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95	07 20	+43	76	08 03	+43	75	08 46	+43	75	09 29	+43	74	10 12	+42	73	10 54	+43	72	11 37	+42	72	12 19	+42	71	13 01	+43	70	13 44	+42	70	14 26	+41	69	15 07	+42	68	15 49	+42	67	16 31	+41	67	17 12	+42	66	95
96	06 40	43	75	07 23	43	75	08 06	43	74	08 49	43	73	09 32	42	72	10 14	43	72	10 57	43	71	11 40	42	70	12 22	43	70	13 05	42	69	13 47	42	68	14 29	42	67	15 11	42	67	15 53	41	66	16 34	42	65	96
97	06 00	43	75	06 43	43	74	07 26	43	73	08 09	43	72	08 52	43	72	09 35	43	71	10 18	43	70	11 01	42	70	11 43	43	69	12 26	42	68	13 08	43	67	13 51	42	67	14 33	42	66	15 15	42	65	15 57	41	65	97
98	05 19	44	74	06 03	43	73	06 46	43	72	07 29	44	72	08 13	43	71	08 56	43	70	09 39	43	70	10 22	42	69	11 04	43	68	11 47	43	68	12 30	42	67	13 12	43	66	13 55	42	65	14 37	42	65	15 19	42	64	98
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100	04 00	+43	72	04 43	+44	72	05 27	+44	71	06 11	+43	70	06 54	+43	70	07 37	+44	69	08 21	+43	68	09 04	+43	68	09 47	+44	67	10 31	+43	66	11 14	+43	65	11 57	+42	65	12 39	+43	64	13 22	+43	63	14 05	+42	63	100
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105	00 43	+45	69	01 28	+44	68	02 12	+44	68	02 56	+45	67	03 41	+44	66	04 25	+45	66	05 10	+44	65	05 54	+44	64	06 38	+44	64	07 22	+45	63	08 07	+44	62	08 51	+44	61	09 35	+44	61	10 19	+43	60	11 02	+44	59	105
106	00 04	45	68	00 49	45	68	01 34	44	67	02 18	45	66	03 03	44	66	03 47	45	65	04 32	45	64	05 17	44	64	06 01	44	63	06 45	45	62	07 30	44	61	08 14	44	61	08 58	45	60	09 43	44	59	10 27	44	59	106
107	−0 34	44	67	00 10	45	67	00 55	45	66	01 40	45	65	02 25	45	65	03 10	45	64	03 55	44	63	04 39	45	63	05 24	45	62	06 09	44	61	06 53	45	61	07 38	44	60	08 22	45	59	09 07	44	59	09 51	44	58	107
108	−1 13	45	67	−0 28	45	66	00 17	45	65	01 02	45	65	01 47	45	64	02 32	45	63	03 17	45	63	04 02	45	62	04 47	45	61	05 32	45	61	06 17	45	60	07 02	45	59	07 47	44	59	08 31	45	58	09 16	44	57	108
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110	−2 29	+45	65	−1 44	+46	65	−0 58	+45	64	−0 13	+46	63	00 33	+45	63	01 18	+46	62	02 04	+45	61	02 49	+46	61	03 35	+45	60	04 20	+45	59	05 05	+46	59	05 51	+45	58	06 36	+45	57	07 21	+45	57	08 06	+45	56	110
111	−3 07	46	65	−2 21	46	64	−1 35	45	63	−0 50	46	63	−0 04	46	62	00 42	45	61	01 27	46	61	02 13	46	60	02 59	45	59	03 44	46	59	04 30	45	58	05 15	46	57	06 01	45	57	06 46	46	56	07 32	45	55	111
112	−3 44	46	64	−2 58	45	63	−2 13	46	63	−1 27	46	62	−0 41	46	61	00 05	46	61	00 51	46	60	01 37	46	59	02 23	46	59	03 09	46	58	03 55	45	57	04 40	46	57	05 26	46	56	06 12	45	55	06 57	46	55	112
113	−4 22	47	63	−3 35	46	62	−2 49	46	62	−2 03	46	61	−1 17	46	61	−0 31	46	60	00 15	46	59	01 01	46	59	01 47	46	58	02 33	47	57	03 20	46	57	04 06	46	56	04 52	46	55	05 38	46	54	06 24	45	54	113
114	−4 59	47	62	−4 12	46	62	−3 26	46	61	−2 40	47	60	−1 53	46	60	−1 07	46	59	−0 21	47	59	00 26	46	58	01 12	47	57	01 59	46	57	02 45	46	56	03 31	46	55	04 17	47	55	05 04	46	53	05 50	46	53	114
115	−5 35	+46	62	−4 49	+47	61	−4 02	+46	60	−3 16	+47	60	−2 29	+46	59	−1 43	+47	58	−0 56	+47	58	−0 09	+46	57	00 37	+47	57	01 24	+46	56	02 10	+47	55	02 57	+47	55	03 44	+46	54	04 30	+47	53	05 17	+46	53	115
116	−6 12	+47	61	−5 25	47	60	−4 38	46	60	−3 52	47	59	−3 05	47	58	−2 18	47	58	−1 31	47	57	−0 44	47	56	00 03	46	56	00 49	47	55	01 36	47	55	02 23	47	54	03 10	47	53	03 57	47	53	04 44	46	52	116
		117		−6 01	+47	59	−5 14	47	59	−4 27	47	58	−3 40	47	58	−2 53	47	57	−2 06	47	56	−1 19	47	56	−0 32	47	55	00 15	48	54	01 03	47	54	01 50	47	53	02 37	47	53	03 24	47	52	04 11	47	51	117
			118			118	−5 50	+48	58	−5 02	47	57	−4 15	47	57	−3 28	47	56	−2 41	48	56	−1 53	47	55	−1 06	48	54	−0 18	47	54	00 29	47	53	01 16	48	53	02 04	47	52	02 51	47	51	03 38	48	51	118
									119	−5 37	47	57	−4 50	48	56	−4 02	47	55	−3 15	48	55	−2 27	48	54	−1 39	47	54	−0 52	48	53	−0 04	47	52	00 43	48	52	01 31	48	51	02 19	47	51	03 06	48	50	119
									120	−6 12	+48	56	−5 24	+47	55	−4 37	+48	55	−3 49	+48	54	−3 01	+48	54	−2 13	+48	53	−1 25	+48	52	−0 37	+48	52	00 11	+48	51	00 59	+48	51	01 47	+48	50	02 35	+48	49	120
												121	−5 58	+48	55	−5 10	48	54	−4 22	48	53	−3 34	48	53	−2 46	48	52	−1 58	48	52	−1 10	49	51	−0 21	48	50	00 27	48	50	01 15	48	49	02 03	48	49	121
															122	−5 44	48	53	−4 56	49	53	−4 07	48	52	−3 19	49	51	−1 42	49	50	−0 53	48	50	−0 05	49	49	00 44	48	48	01 32	49	48	122
															123	−6 17	+48	52	−5 29	49	52	−4 40	49	51	−3 51	49	51	−3 02	48	50	−2 14	49	50	−1 25	49	49	−0 36	49	48	00 13	48	48	01 01	49	47	123
																			−6 01	+49	51	−5 12	49	51	−4 23	49	50	−3 34	49	49	−2 45	49	49	−1 56	49	48	−1 07	49	48	−0 18	49	47	00 31	49	46	124
																																													125
																																													126
																																													127
																																													128
																																													129
83	−6 00	−43	105	277																																										
82	−5 19	44	106	−6 03	−43	107	278																																						
81	−4 39	44	107	−5 23	43	108	−6 06	−44	108	279																																				
80	−4 00	−43	108	−4 43	−44	108	−5 27	−44	109	−6 11	−43	110	280																																	
79	−3 20	44	108	−4 04	44	109	−4 48	43	110	−5 31	44	110	−6 15	−44	111	281																													
78	−2 41	43	109	−3 24	44	110	−4 08	44	110	−4 52	44	111	−5 36	44	112	−6 20	−44	112	282																										
77	−2 01	44	110	−2 45	44	110	−3 29	44	111	−4 13	45	112	−4 58	44	112	−5 42	44	113	283																										
76	−1 22	44	110	−2 06	45	111	−2 51	44	112	−3 35	44	112	−4 19	44	113	−5 03	44	114	−5 47	−45	114	284																						
75	−0 43	−45	111	−1 28	−44	112	−2 12	−44	112	−2 56	−45	113	−3 41	−44	114	−4 25	−45	114	−5 10	−44	115	−5 54	−44	116	285																		
74	−0 04	45	112	−0 49	45	112	−1 34	44	113	−2 18	45	114	−3 03	44	114	−3 47	45	115	−4 32	45	116	−5 17	44	116	−6 01	−44	117	286																
73	00 34	44	113	−0 10	45	113	−0 55	45	114	−1 40	45	115	−2 25	45	115	−3 10	45	116	−3 55	44	117	−4 39	45	117	−5 24	45	118	−6 09	−44	119	287													
72	01 13	45	113	00 28	45	114	−0 17	45	115	−1 02	45	115	−1 47	45	116	−2 32	45	117	−3 17	45	117	−4 02	45	118	−4 47	45	119	−5 32	45	119	−6 17	−45	120	288								
71	01 51	45	114	01 06	46	115	00 20	45	115	−0 25	45	116	−1 10	45	117	−1 55	45	117	−2 40	46	118	−3 26	45	119	−4 11	45	119	−4 56	45	120	−5 41	45	121	289							
70	02 29	−45	115	01 44	−46	115	00 58	−45	116	00 13	−46	117	−0 33	−45	117	−1 18	−46	118	−2 04	−45	119	−2 49	−46	119	−3 35	−45	120	−4 20	−45	121	−5 05	−46	121	−5 51	−45	122	290					
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	03 07	46	115	02 21	46	116	01 35	45	117	00 50	46	117	00 04	46	118	−0 42	45	119	−1 27	46	119	−2 13	46	120	−2 59	45	121	−3 44	46	121	−4 30	45	122	−5 15	46	123	−6 01	−45	123	291							
68	03 44	46	116	02 58	45	117	02 13	46	117	01 27	46	118	00 41	46	119	−0 05	46	119	−0 51	46	120	−1 37	46	121	−2 23	46	121	−3 09	46	122	−3 55	45	123	−4 40	46	123	−5 26	46	124	−6 12	−45	125	292			
67	04 22	47	117	03 35	46	118	02 49	46	118	02 03	46	119	01 17	46	119	00 31	46	120	−0 15	46	121	−1 01	46	121	−1 47	46	122	−2 33	47	123	−3 20	46	123	−4 06	46	124	−4 52	46	125	−5 38	46	125	293			
66	04 59	47	118	04 12	46	118	03 26	46	119	02 40	47	120	01 53	46	120	01 07	46	121	00 21	47	121	−0 26	46	122	−1 12	47	123	−1 59	46	123	−2 45	46	124	−3 31	46	125	−4 17	47	125	−5 04	46	126	−5 50	−46	127	294
65	05 35	−46	118	04 49	−47	119	04 02	−46	120	03 16	−47	120	02 29	−46	121	01 43	−47	122	00 56	−47	122	00 09	−46	123	−0 37	−47	123	−1 24	−46	124	−2 10	−47	125	−2 57	−47	125	−3 44	−46	126	−4 30	−47	127	−5 17	−46	127	295
64	06 12	47	119	05 25	47	120	04 38	46	120	03 52	47	121	03 05	47	122	02 18	47	122	01 31	47	123	00 44	47	124	−0 03	46	124	−0 49	47	125	−1 36	47	125	−2 23	47	126	−3 10	47	127	−3 57	47	127	−4 44	46	128	296
63	06 48	47	120	06 01	47	121	05 14	47	121	04 27	47	122	03 40	47	122	02 53	47	123	02 06	47	124	01 19	47	124	00 32	47	125	−0 15	48	126	−1 03	47	126	−1 50	47	127	−2 37	47	127	−3 24	47	128	−4 11	47	129	297
62	07 24	47	121	06 37	47	121	05 50	48	122	05 02	47	123	04 15	47	123	03 28	47	124	02 41	48	124	01 53	47	125	01 06	48	126	00 18	47	126	−0 29	47	127	−1 16	48	127	−2 04	47	128	−2 51	47	129	−3 38	48	129	298
61	08 00	48	121	07 12	47	122	06 25	48	123	05 37	47	123	04 50	48	124	04 02	47	125	03 15	48	125	02 27	48	126	01 39	47	126	00 52	48	127	00 04	47	128	−0 43	48	128	−1 31	48	129	−2 19	47	129	−3 06	48	130	299
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59	09 10	48	123	08 22	47	124	07 35	48	124	06 47	49	125	05 58	48	125	05 10	48	126	04 22	48	127	03 34	48	127	02 46	48	128	01 58	48	128	01 10	49	129	00 21	48	130	−0 27	48	130	−1 15	48	131	−2 03	48	131	301
58	09 45	48	124	08 57	48	124	08 09	48	125	07 21	49	126	06 32	48	126	05 44	48	127	04 56	49	127	04 07	48	128	03 19	49	129	02 30	48	129	01 42	49	130	00 53	48	130	00 05	49	131	−0 44	48	132	−1 32	49	132	302
57	10 20	49	125	09 31	48	125	08 43	49	126	07 54	48	126	07 06	49	127	06 17	48	128	05 29	49	128	04 40	49	129	03 51	49	129	03 02	48	130	02 14	49	130	01 25	49	131	00 36	49	132	−0 13	48	132	−1 01	49	133	303
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54	12 01	49	127	11 12	49	128	10 23	50	128	09 33	49	129	08 44	49	129	07 55	50	130	07 05	49	130	06 16	50	131	05 26	49	132	04 37	50	132	03 47	49	133	02 58	50	133	02 08	50	134	01 18	49	134	00 29	50	135	306
53	12 34	49	128	11 45	50	128	10 55	49	129	10 06	50	130	09 16	49	130	08 27	50	131	07 37	50	131	06 47	50	132	05 57	49	132	05 08	50	133	04 18	50	133	03 28	50	134	02 38	50	135	01 48	50	135	00 58	50	136	307
52	13 07	50	129	12 17	49	129	11 28	50	130	10 38	50	130	09 48	50	131	08 58	50	131	08 08	50	132	07 18	50	133	06 28	50	133	05 38	50	134	04 48	50	134	03 58	51	135	03 07	50	135	02 17	50	136	01 27	50	136	308
51	13 39	50	129	12 49	50	130	11 59	50	131	11 09	50	131	10 19	50	132	09 29	50	132	08 39	50	133	07 49	51	133	06 58	50	134	06 08	51	134	05 17	50	135	04 27	50	136	03 37	51	136	02 46	50	137	01 56	51	137	309
50	14 11	−50	130	13 21	−50	131	12 31	−50	131	11 41	−51	132	10 50	−50	132	10 00	−51	133	09 09	−50	134	08 19	−51	134	07 28	−51	135	06 37	−50	135	05 47	−51	136	04 56	−51	136	04 05	−51	137	03 14	−50	137	02 24	−51	138	310
49	14 43	50	131	13 53	51	132	13 02	51	132	12 11	50	133	11 21	51	133	10 30	51	134	09 39	51	134	08 48	51	135	07 57	50	135	07 07	51	136	06 16	51	137	05 25	51	137	04 34	51	138	03 43	52	138	02 51	51	139	311
48	15 14	51	132	14 23	50	132	13 33	51	133	12 42	51	134	11 51	51	134	11 00	51	135	10 09	51	135	09 18	52	136	08 26	51	136	07 35	51	137	06 44	51	137	05 53	52	138	05 01	51	138	04 10	51	139	03 19	52	139	312
47	15 45	51	133	14 54	51	133	14 03	51	134	13 12	51	134	12 21	52	135	11 29	51	135	10 38	51	136	09 47	52	137	08 55	51	137	08 04	52	138	07 12	51	138	06 21	52	139	05 29	52	139	04 37	51	140	03 46	52	140	313
46	16 15	51	134	15 24	51	134	14 33	52	135	13 41	51	135	12 50	52	136	11 58	51	136	11 07	52	137	10 15	52	137	09 23	51	138	08 32	52	138	07 40	52	139	06 48	52	139	05 56	52	140	05 04	52	140	04 12	52	141	314
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42	18 12	52	137	17 20	52	138	16 28	53	138	15 35	52	139	14 43	53	139	13 50	53	140	12 57	53	140	12 04	52	141	11 12	53	141	10 19	53	142	09 26	53	142	08 33	53	143	07 40	53	143	06 47	53	143	05 54	53	144	318
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33	22 07	55	145	21 12	54	146	20 18	55	146	19 23	55	147	18 28	55	147	17 33	56	148	16 37	55	148	15 42	55	148	14 47	55	149	13 52	55	149	12 57	56	150	12 01	55	150	11 06	55	150	10 11	56	151	09 15	55	151	327
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26	24 38	56	152	23 42	57	153	22 45	56	153	21 49	57	153	20 52	57	154	19 55	57	154	18 58	57	154	18 01	56	155	17 05	57	155	16 08	57	155	15 11	57	156	14 14	57	156	13 17	57	156	12 20	57	157	11 23	57	157	334
25	24 57	−56	153	24 01	−57	154	23 04	−57	154	22 07	−57	154	21 10	−57	155	20 13	−57	155	19 16	−57	155	18 19	−57	156	17 22	−57	156	16 25	−57	156	15 28	−58	157	14 30	−57	157	13 33	−57	157	12 36	−57	158	11 39	−57	158	335
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	15°			16°			17°			18°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	360
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42	30 27	51	129	31 18	51	128	32 09	50	128	32 59	50	127	33 49	50	127	34 39	50	126	35 29	50	125	36 19	49	124	37 08	49	124	37 57	49	123	38 46	48	122	39 34	49	122	40 23	47	121	41 10	48	120	41 58	47	119	318
43	29 55	51	128	30 46	50	127	31 36	50	127	32 26	50	126	33 16	50	126	34 06	49	125	34 55	50	124	35 45	49	123	36 34	49	123	37 23	48	122	38 11	48	121	38 59	48	121	39 47	48	120	40 35	47	119	41 22	47	118	317
44	29 23	50	127	30 13	50	127	31 03	50	126	31 53	50	125	32 43	49	125	33 32	49	124	34 21	49	123	35 10	49	122	35 59	49	122	36 48	48	121	37 36	48	120	38 24	48	120	39 12	47	119	39 59	47	118	40 46	46	117	316
45	28 50	+50	126	29 40	+50	126	30 30	+49	125	31 19	+50	124	32 09	+49	124	32 58	+49	123	33 47	+49	122	34 36	+48	122	35 24	+48	121	36 12	+48	120	37 00	+48	119	37 48	+47	119	38 35	+48	118	39 23	+46	117	40 09	+47	116	315
46	28 17	49	125	29 06	50	125	29 56	49	124	30 45	50	123	31 35	48	123	32 23	49	122	33 12	49	121	34 01	48	121	34 49	48	120	35 37	48	119	36 25	47	118	37 12	47	118	37 59	47	117	38 46	46	116	39 32	47	115	314
47	27 43	50	124	28 33	49	124	29 22	49	123	30 11	49	122	31 00	49	122	31 49	48	121	32 37	48	120	33 25	48	120	34 13	48	119	35 01	47	118	35 48	48	117	36 36	46	117	37 22	47	116	38 09	46	115	38 55	46	114	313
48	27 09	49	123	27 58	49	123	28 47	49	122	29 36	49	121	30 25	48	121	31 13	49	120	32 02	47	119	32 49	48	119	33 37	48	118	34 25	47	117	35 12	47	116	35 59	46	116	36 45	47	115	37 32	46	114	38 18	45	113	312
49	26 35	49	122	27 24	49	122	28 13	48	121	29 01	49	120	29 50	48	120	30 38	48	119	31 26	47	118	32 13	48	118	33 01	47	117	33 48	47	116	34 35	47	115	35 22	46	115	36 08	46	114	36 54	46	113	37 40	45	112	311
50	26 00	+49	122	26 49	+48	121	27 37	+49	120	28 26	+48	120	29 14	+48	119	30 02	+48	118	30 50	+47	117	31 37	+47	117	32 24	+47	116	33 11	+47	115	33 58	+46	115	34 44	+47	114	35 31	+46	113	36 17	+45	112	37 02	+45	111	310
51	25 25	48	121	26 13	49	120	27 02	48	119	27 50	48	119	28 38	48	118	29 26	47	117	30 13	47	117	31 00	47	116	31 47	47	115	32 34	47	114	33 21	46	114	34 07	46	113	34 53	45	112	35 38	46	111	36 24	45	110	309
52	24 50	48	120	25 38	48	119	26 26	48	118	27 14	48	118	28 02	47	117	28 49	47	116	29 36	47	116	30 23	47	115	31 10	47	114	31 57	46	113	32 43	46	113	33 29	46	112	34 15	45	111	35 00	45	110	35 45	45	110	308
53	24 14	48	119	25 02	48	118	25 50	48	118	26 38	47	117	27 25	47	116	28 12	47	115	28 59	47	115	29 46	47	114	30 33	46	113	31 19	46	113	32 05	46	112	32 51	46	111	33 37	45	110	34 22	45	109	35 07	44	109	307
54	23 38	48	118	24 26	47	117	25 13	48	117	26 01	47	116	26 48	47	115	27 35	47	115	28 22	47	114	29 09	46	113	29 55	46	112	30 41	46	112	31 27	46	111	32 13	45	110	32 58	45	109	33 43	45	109	34 28	44	108	306
55	23 02	+47	117	23 49	+48	116	24 37	+47	116	25 24	+47	115	26 11	+47	114	26 58	+46	114	27 44	+47	113	28 31	+46	112	29 17	+46	112	30 03	+46	111	30 49	+45	110	31 34	+45	109	32 19	+45	109	33 04	+45	108	33 49	+44	107	305
56	22 25	47	116	23 12	48	116	24 00	47	115	24 47	47	114	25 34	46	114	26 20	47	113	27 07	46	112	27 53	46	111	28 39	46	111	29 25	45	110	30 10	45	109	30 55	45	108	31 40	45	108	32 25	45	107	33 10	44	106	304
57	21 48	47	115	22 35	47	115	23 22	47	114	24 09	47	113	24 56	46	113	25 42	47	112	26 29	46	111	27 15	46	111	28 01	46	110	28 46	45	109	29 31	46	108	30 17	44	108	31 01	45	107	31 46	44	106	32 30	44	105	303
58	21 11	47	115	21 58	47	114	22 45	47	113	23 32	46	113	24 18	46	112	25 04	46	111	25 50	46	110	26 36	46	110	27 22	45	109	28 07	46	108	28 53	44	107	29 37	45	107	30 22	45	106	31 07	44	105	31 51	43	104	302
59	20 34	47	114	21 21	46	113	22 07	47	112	22 54	46	112	23 40	46	111	24 26	46	110	25 12	46	110	25 58	45	109	26 43	45	108	27 28	45	107	28 13	45	107	28 58	45	106	29 43	44	105	30 27	44	104	31 11	44	104	301
60	19 56	+47	113	20 43	+46	112	21 29	+47	112	22 16	+46	111	23 02	+46	110	23 48	+45	109	24 33	+46	109	25 19	+45	108	26 04	+45	107	26 49	+45	107	27 34	+45	106	28 19	+44	105	29 03	+44	104	29 47	+44	104	30 31	+44	103	300
61	19 18	47	112	20 05	46	111	20 51	46	111	21 37	46	110	22 23	46	109	23 09	46	109	23 55	45	108	24 40	45	107	25 25	45	106	26 10	45	106	26 55	44	105	27 39	44	104	28 23	44	103	29 07	44	103	29 51	43	102	299
62	18 40	47	111	19 27	46	111	20 13	46	110	20 59	45	109	21 44	46	109	22 30	45	108	23 15	46	107	24 01	45	106	24 46	45	106	25 31	44	105	26 15	44	104	26 59	45	103	27 44	43	103	28 27	44	102	29 11	43	101	298
63	18 02	46	110	18 48	46	110	19 34	46	109	20 20	46	108	21 06	45	108	21 51	45	107	22 36	45	106	23 21	45	106	24 06	45	105	24 51	44	104	25 35	45	103	26 20	44	103	27 04	43	102	27 47	44	101	28 31	43	100	297
64	17 24	46	110	18 10	45	109	18 55	46	108	19 41	46	108	20 27	45	107	21 12	45	106	21 57	45	105	22 42	45	105	23 27	44	104	24 11	44	103	24 55	45	103	25 40	43	102	26 23	44	101	27 07	43	100	27 50	44	100	296
65	16 45	+46	109	17 31	+45	108	18 16	+46	107	19 02	+45	107	19 47	+45	106	20 32	+45	105	21 17	+45	105	22 02	+45	104	22 47	+44	103	23 31	+44	103	24 15	+44	102	24 59	+44	101	25 43	+44	100	26 27	+43	99	27 10	+43	99	295
66	16 06	46	108	16 52	45	107	17 37	46	107	18 23	45	106	19 08	45	105	19 53	45	105	20 38	44	104	21 22	45	103	22 07	44	102	22 51	44	102	23 35	44	101	24 19	44	100	25 03	42	99	25 46	44	99	26 30	43	98	294
67	15 27	46	107	16 13	45	107	16 58	45	106	17 43	45	105	18 28	45	105	19 13	45	104	19 58	45	103	20 43	44	102	21 27	44	101	22 11	44	101	22 55	44	100	23 39	44	99	24 23	43	99	25 06	43	98	25 49	43	97	293
68	14 48	45	106	15 33	46	106	16 19	46	105	17 04	45	104	17 49	44	104	18 33	45	103	19 18	45	102	20 03	44	102	20 47	44	101	21 31	44	100	22 15	44	99	22 59	43	99	23 42	43	98	24 25	43	97	25 08	43	96	292
69	14 09	45	106	14 54	45	105	15 39	45	104	16 24	45	104	17 09	44	103	17 53	45	102	18 38	44	102	19 22	45	101	20 07	44	100	20 51	43	99	21 34	44	99	22 18	43	98

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
70	13 29	+45	105	14 14	+45	104	14 59	+45	104	15 44	+45	103	16 29	+44	102	17 13	+45	101	17 58	+44	101	18 42	+44	100	19 26	+44	99	20 10	+44	99	20 54	+43	98	21 37	+44	97	22 21	+43	96	23 04	+43	96	23 47	+43	95	290
71	12 50	45	104	13 35	45	103	14 20	44	103	15 04	45	102	15 49	44	101	16 33	45	101	17 18	44	100	18 02	44	99	18 46	44	99	19 30	43	98	20 13	44	97	20 57	43	96	21 40	43	96	22 23	43	95	23 06	43	94	289
72	12 10	45	103	12 55	45	103	13 40	44	102	14 24	45	101	15 09	44	101	15 53	44	100	16 37	44	99	17 21	44	99	18 05	44	98	18 49	44	97	19 33	43	96	20 16	43	96	20 59	43	95	21 42	43	94	22 25	43	93	288
73	11 30	45	103	12 15	44	102	12 59	45	101	13 44	44	101	14 28	45	100	15 13	44	99	15 57	44	98	16 41	44	98	17 25	43	97	18 08	44	96	18 52	43	96	19 35	44	95	20 19	43	94	21 02	42	93	21 44	43	93	287
74	10 50	45	102	11 35	44	101	12 19	45	100	13 04	44	100	13 48	44	99	14 32	44	98	15 16	44	98	16 00	44	97	16 44	44	96	17 28	43	96	18 11	44	95	18 55	43	94	19 38	43	93	20 21	43	93	21 04	42	92	286
75	10 10	+45	101	10 55	+44	100	11 39	+44	100	12 23	+45	99	13 08	+44	98	13 52	+44	98	14 36	+44	97	15 20	+43	96	16 03	+44	96	16 47	+43	95	17 30	+44	94	18 14	+43	93	18 57	+43	93	19 40	+43	92	20 23	+42	91	285
76	09 30	44	100	10 14	45	100	10 59	44	99	11 43	44	98	12 27	44	98	13 11	44	97	13 55	44	96	14 39	44	95	15 23	43	95	16 06	44	94	16 50	43	93	17 33	43	93	18 16	43	92	18 59	43	91	19 42	42	90	284
77	08 49	45	100	09 34	44	99	10 18	44	98	11 02	44	98	11 46	44	97	12 30	44	96	13 14	44	95	13 58	44	95	14 42	43	94	15 25	44	93	16 09	43	93	16 52	43	92	17 35	43	91	18 18	43	90	19 01	42	90	283
78	08 09	44	99	08 53	45	98	09 38	44	97	10 22	44	97	11 06	44	96	11 50	44	95	12 34	43	95	13 17	44	94	14 01	43	93	14 44	44	93	15 28	43	92	16 11	43	91	16 54	43	90	17 37	43	90	18 20	42	89	282
79	07 29	44	98	08 13	44	97	08 57	44	97	09 41	44	96	10 25	44	95	11 09	44	95	11 53	44	94	12 37	43	93	13 20	44	93	14 04	43	92	14 47	43	91	15 30	43	90	16 13	43	89	16 56	43	89	17 39	43	88	281
80	06 48	+44	97	07 32	+44	97	08 16	+44	96	09 00	+44	95	09 44	+44	95	10 28	+44	94	11 12	+44	93	11 56	+43	93	12 39	+44	92	13 23	+43	91	14 06	+43	90	14 49	+43	90	15 32	+43	89	16 15	+43	88	16 58	+43	87	280
81	06 07	45	97	06 52	44	96	07 36	44	95	08 20	44	95	09 04	43	94	09 47	44	93	10 31	44	92	11 15	43	92	11 58	44	91	12 42	43	90	13 25	43	90	14 08	43	89	14 51	43	88	15 34	43	88	16 17	43	87	279
82	05 27	44	96	06 11	44	95	06 55	44	95	07 39	44	94	08 23	43	93	09 06	44	92	09 50	44	92	10 34	43	91	11 17	44	90	12 01	43	90	12 44	43	89	13 27	44	88	14 11	43	88	14 54	42	87	15 36	43	86	278
83	04 46	44	95	05 30	44	94	06 14	44	94	06 58	44	93	07 42	44	92	08 26	43	92	09 09	44	91	09 53	43	90	10 36	44	90	11 20	43	89	12 03	44	88	12 47	43	87	13 30	43	87	14 13	43	86	14 56	42	85	277
84	04 05	44	94	04 49	44	94	05 33	44	93	06 17	44	92	07 01	44	92	07 45	43	91	08 28	44	90	09 12	44	90	09 56	43	89	10 39	43	88	11 22	44	87	12 06	43	87	12 49	43	86	13 32	43	85	14 15	43	85	276
85	03 24	+44	94	04 08	+44	93	04 52	+44	92	05 36	+44	92	06 20	+44	91	07 04	+43	90	07 47	+44	90	08 31	+44	89	09 15	+43	88	09 58	+44	87	10 42	+43	87	11 25	+43	86	12 08	+43	85	12 51	+43	85	13 34	+43	84	275
86	02 44	44	93	03 28	43	92	04 11	44	92	04 55	44	91	05 39	44	90	06 23	44	90	07 07	43	89	07 50	44	88	08 34	43	87	09 17	44	87	10 01	43	86	10 44	43	85	11 27	43	85	12 10	43	84	12 53	43	83	274
87	02 03	44	92	02 47	44	92	03 31	43	91	04 14	44	90	04 58	44	89	05 42	44	89	06 26	43	88	07 09	44	87	07 53	43	87	08 36	44	86	09 20	43	85	10 03	44	85	10 47	43	84	11 30	43	83	12 13	43	82	273
88	01 22	44	91	02 06	44	91	02 50	43	90	03 33	43	89	04 17	44	89	05 01	44	88	05 45	43	87	06 28	44	87	07 12	44	86	07 56	43	85	08 39	44	85	09 23	43	84	10 06	43	83	10 49	43	82	11 32	43	82	272
89	00 41	44	91	01 25	44	90	02 09	44	89	02 53	43	89	03 36	44	88	04 20	44	87	05 04	44	87	05 48	43	86	06 31	44	85	07 15	43	85	07 58	44	84	08 42	43	83	09 25	44	82	10 09	43	82	10 52	43	81	271
90	00 00	+44	90	00 44	+44	89	01 28	+44	89	02 12	+43	88	02 55	+44	87	03 39	+44	87	04 23	+44	86	05 07	+44	85	05 51	+43	85	06 34	+44	84	07 18	+43	83	08 01	+44	82	08 45	+43	82	09 28	+43	81	10 11	+44	80	270
91	−0 41	44	89	00 03	44	89	00 47	44	88	01 31	44	87	02 15	43	87	02 58	44	86	03 42	44	85	04 26	44	84	05 10	44	84	05 54	43	83	06 37	44	82	07 21	43	82	08 04	44	81	08 48	43	80	09 31	43	80	269
92	−1 22	44	89	−0 38	44	88	00 06	44	87	00 50	44	86	01 34	44	86	02 18	44	85	03 02	43	84	03 45	44	84	04 29	44	83	05 13	44	82	05 57	43	82	06 40	44	81	07 24	43	80	08 07	44	80	08 51	43	79	268
93	−2 03	44	88	−1 19	44	87	−0 35	44	86	00 09	44	86	00 53	44	85	01 37	44	84	02 21	44	84	03 05	44	83	03 49	43	82	04 32	44	82	05 16	44	81	06 00	44	80	06 44	43	80	07 27	44	79	08 11	43	78	267
94	−2 44	44	87	−2 00	44	86	−1 16	44	86	−0 32	44	85	00 12	44	84	00 56	44	84	01 40	44	83	02 24	44	82	03 08	44	82	03 52	44	81	04 36	44	80	05 20	43	80	06 03	44	79	06 47	44	78	07 31	43	78	266
95	−3 24	+44	86	−2 40	+44	86	−1 56	+44	85	−1 12	+44	84	−0 28	+44	84	00 16	+44	83	01 00	+44	82	01 44	+44	82	02 28	+44	81	03 12	+44	80	03 56	+43	80	04 39	+44	79	05 23	+44	78	06 07	+44	77	06 51	+44	77	265
96	−4 05	44	86	−3 21	44	85	−2 37	44	84	−1 53	44	84	−1 09	44	83	−0 25	44	82	00 19	44	82	01 03	44	81	01 47	44	80	02 31	44	79	03 15	44	79	03 59	44	78	04 43	44	77	05 27	44	77	06 11	44	76	264
97	−4 46	44	85	−4 02	44	84	−3 18	44	84	−2 34	44	83	−1 50	44	82	−1 06	45	81	−0 21	44	81	00 23	44	80	01 07	44	79	01 51	44	79	02 35	44	78	03 19	44	77	04 03	45	77	04 48	44	76	05 32	43	75	263
98	−5 27	44	84	−4 43	44	83	−3 59	45	83	−3 14	44	82	−2 30	44	81	−1 46	44	81	−1 02	45	80	−0 17	44	79	00 27	44	79	01 11	44	78	01 55	44	77	02 39	45	77	03 24	44	76	04 08	44	75	04 52	44	75	262
99	−6 07	+44	83	−5 23	44	83	−4 39	44	82	−3 55	44	81	−3 11	45	81	−2 26	44	80	−1 42	44	79	−0 58	45	79	−0 13	44	78	00 31	44	77	01 15	45	77	02 00	44	76	02 44	44	75	03 28	45	75	04 13	44	74	261
			100	−6 04	+44	82	−5 20	+45	81	−4 35	+44	81	−3 51	+44	80	−3 07	+45	79	−2 22	+44	79	−1 38	+45	78	−0 53	+44	77	−0 09	+45	77	00 36	+44	76	01 20	+45	75	02 05	+44	75	02 49	+44	74	03 33	+45	73	260
						101	−6 00	+44	81	−5 16	45	80	−4 31	44	79	−3 47	45	79	−3 02	44	78	−2 18	45	77	−1 33	44	77	−0 49	45	76	−0 04	45	75	00 41	44	75	01 25	45	74	02 10	44	73	02 54	45	72	259
									102	−5 56	+45	79	−5 11	44	78	−4 27	45	78	−3 42	45	77	−2 57	44	76	−2 13	45	76	−1 28	45	75	−0 43	44	74	00 01	45	74	00 46	45	73	01 31	44	72	02 15	45	72	258
												103	−5 51	+44	78	−5 07	45	77	−4 22	45	76	−3 37	45	76	−2 52	44	75	−2 08	45	74	−1 23	45	74	−0 38	45	73	00 07	45	72	00 52	45	72	01 37	44	71	257
															104	−5 46	+44	76	−5 02	45	76	−4 17	45	75	−3 32	45	74	−2 47	45	74	−2 02	45	73	−1 17	45	72	−0 32	45	72	00 13	45	71	00 58	45	70	256
																		105	−5 41	+45	75	−4 56	+45	74	−4 11	+45	74	−3 26	+45	73	−2 41	+45	72	−1 56	+45	72	−1 11	+45	71	−0 26	+45	70	00 19	+46	70	255
																		106	−6 21	+45	74	−5 36	46	73	−4 50	45	73	−4 05	45	72	−3 20	45	71	−2 35	46	71	−1 49	45	70	−1 04	45	70	−0 19	46	69	254
																					107	−6 15	+46	73	−5 29	45	72	−4 44	45	71	−3 59	46	71	−3 13	45	70	−2 28	46	69	−1 42	45	69	−0 57	46	68	253
																								108	−6 08	+45	71	−5 23	46	71	−4 37	45	70	−3 52	46	69	−3 06	46	69	−2 20	45	68	−1 35	46	67	252
																														109	−6 01	+45	70	−5 16	46	69	−4 30	46	69	−3 44	46	68	−2 58	46	67	−2 12	45	67	251
																																	110	−5 54	+46	68	−5 08	+46	68	−4 22	+46	67	−3 36	+46	67	−2 50	+46	66	250
																																					111	−5 46	47	67	−4 59	46	66	−4 13	46	66	−3 27	46	65	249
																																					112	−6 23	+46	66	−5 37	46	66	−4 51	47	65	−4 04	46	64	248
																																							113	−6 14	+46	65	−5 28	47	64	−4 41	47	64	247
																																								114	−6 04	+47	64	−5 17	46	63	246
																																									115	−5 54	+47	62	245

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
98	−5 27	−44	84	−6 11	−44	85	262																																								
97	−4 46	44	85	−5 30	44	86	−6 14	−44	86	263																																						
96	−4 05	44	86	−4 49	44	86	−5 33	44	87	−6 17	−44	88	264																																			
95	−3 24	−44	86	−4 08	−44	87	−4 52	−44	88	−5 36	−44	88	−6 20	−44	89	265																															
94	−2 44	44	87	−3 28	43	88	−4 11	44	88	−4 55	44	89	−5 39	44	90	−6 23	−44	90	266																													
93	−2 03	44	88	−2 47	44	88	−3 31	43	89	−4 14	44	90	−4 58	44	91	−5 42	44	91	267																													
92	−1 22	44	89	−2 06	44	89	−2 50	43	90	−3 33	44	91	−4 17	44	91	−5 01	44	92	−5 45	−43	93	268																									
91	−0 41	44	89	−1 25	44	90	−2 09	44	91	−2 53	43	91	−3 36	44	92	−4 20	44	93	−5 04	44	93	−5 48	−43	94	269																					
90	00 00	−44	90	−0 44	−44	91	−1 28	−44	91	−2 12	−43	92	−2 55	−44	93	−3 39	−44	93	−4 23	−44	94	−5 07	−44	95	−5 51	−43	95	270																			
89	00 41	44	91	−0 03	44	91	−0 47	44	92	−1 31	44	93	−2 15	43	93	−2 58	44	94	−3 42	44	95	−4 26	44	96	−5 10	44	96	−5 54	−43	97	271															
88	01 22	44	91	00 38	44	92	−0 06	44	93	−0 50	44	94	−1 34	44	94	−2 18	44	95	−3 02	43	96	−3 45	44	96	−4 29	44	97	−5 13	44	98	−5 57	−43	98	272											
87	02 03	44	92	01 19	44	93	00 35	44	94	−0 09	44	94	−0 53	44	95	−1 37	44	96	−2 21	44	96	−3 05	44	97	−3 49	43	98	−4 32	44	98	−5 16	44	99	−6 00	−44	100	273							
86	02 44	44	93	02 00	44	94	01 16	44	94	00 32	44	95	−0 12	44	96	−0 56	44	96	−1 40	44	97	−2 24	44	98	−3 08	44	98	−3 52	44	99	−4 36	44	100	−5 20	43	100	−6 03	−44	101	274			
85	03 24	−44	94	02 40	−44	94	01 56	−44	95	01 12	−44	96	00 28	−44	96	−0 16	−44	97	−1 00	−44	98	−1 44	−44	98	−2 28	−44	99	−3 12	−44	100	−3 56	−43	100	−4 39	−44	101	−5 23	−44	102	−6 07	−44	103	275		
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83	04 46	44	95	04 02	44	96	03 18	44	96	02 34	44	97	01 50	44	98	01 06	45	99	00 21	44	99	−0 23	44	100	−1 07	44	101	−1 51	44	101	−2 35	44	102	−3 19	44	103	−4 03	45	103	−4 48	44	104	−5 32	43	105	277
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81	06 07	44	97	05 23	44	97	04 39	44	98	03 55	44	99	03 11	45	99	02 26	44	100	01 42	44	101	00 58	45	101	00 13	44	102	−0 31	44	103	−1 15	45	103	−2 00	44	104	−2 44	44	105	−3 28	45	105	−4 13	44	106	279
80	06 48	−44	97	06 04	−44	98	05 20	−45	99	04 35	−44	99	03 51	−44	100	03 07	−45	101	02 22	−44	101	01 38	−45	102	00 53	−44	103	00 09	−45	103	−0 36	−44	104	−1 20	−45	105	−2 05	−44	105	−2 49	−44	106	−3 33	−45	107	280
79	07 29	45	98	06 44	44	99	06 00	44	99	05 16	45	100	04 31	44	101	03 47	45	101	03 02	44	102	02 18	45	103	01 33	44	103	00 49	45	104	00 04	45	105	−0 41	44	105	−1 25	45	106	−2 10	44	107	−2 54	45	108	281
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77	08 49	44	100	08 05	44	100	07 21	45	101	06 36	45	102	05 51	44	102	05 07	45	103	04 22	45	104	03 37	45	104	02 52	44	105	02 08	45	106	01 23	45	106	00 38	45	107	−0 07	45	108	−0 52	45	108	−1 37	44	109	283
76	09 30	45	100	08 45	44	101	08 01	45	102	07 16	45	102	06 31	45	103	05 46	44	104	05 02	45	104	04 17	45	105	03 32	45	106	02 47	45	107	02 02	45	107	01 17	45	108	00 32	45	108	−0 13	45	109	−0 58	45	110	284
75	10 10	−45	101	09 25	−44	102	08 41	−45	102	07 56	−45	103	07 11	−45	104	06 26	−45	104	05 41	−45	105	04 56	−45	106	04 11	−45	106	03 26	−45	107	02 41	−45	108	01 56	−45	108	01 11	−45	109	00 26	−45	110	−0 19	−46	110	285
74	10 50	45	102	10 05	44	103	09 21	45	103	08 36	45	104	07 51	45	105	07 06	45	105	06 21	45	106	05 36	46	107	04 50	45	107	04 05	45	108	03 20	45	109	02 35	46	109	01 49	45	110	01 04	45	110	00 19	46	111	286
73	11 30	45	103	10 45	45	103	10 00	45	104	09 15	45	105	08 30	45	105	07 45	45	106	07 00	45	107	06 15	46	107	05 29	45	108	04 44	45	109	03 59	46	109	03 13	45	110	02 28	46	111	01 42	45	111	00 57	46	112	287
72	12 10	45	103	11 25	45	104	10 40	45	105	09 55	45	105	09 10	46	106	08 24	45	107	07 39	45	107	06 54	46	108	06 08	45	109	05 23	46	109	04 37	45	110	03 52	46	111	03 06	46	111	02 20	45	112	01 35	46	113	288
71	12 50	45	104	12 05	45	105	11 20	46	105	10 34	45	106	09 49	45	107	09 04	46	107	08 18	45	108	07 33	46	109	06 47	46	109	06 01	45	110	05 16	46	111	04 30	46	111	03 44	46	112	02 58	46	113	02 12	45	113	289
70	13 29	−45	105	12 44	−45	106	11 59	−46	106	11 13	−45	107	10 28	−46	108	09 42	−45	108	08 57	−46	109	08 11	−46	110	07 25	−45	110	06 40	−46	111	05 54	−46	112	05 08	−46	112	04 22	−46	113	03 36	−46	113	02 50	−46	114	290

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 47°

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 47°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	14 09	46	106	13 23	45	106	12 38	45	107	11 53	46	108	11 07	46	108	10 21	46	109	09 35	45	110	08 50	46	110	08 04	46	111	07 18	46	112	06 32	46	112	05 46	47	113	04 59	46	114	04 13	46	114	03 27	46	115	291
68	14 48	45	106	14 03	46	107	13 17	46	108	12 31	45	108	11 46	46	109	11 00	46	110	10 14	46	110	09 28	46	111	08 42	46	112	07 56	47	112	07 09	46	113	06 23	46	114	05 37	46	114	04 51	47	115	04 04	46	116	292
67	15 27	45	107	14 42	46	108	13 56	46	109	13 10	46	109	12 24	46	110	11 38	46	111	10 52	46	111	10 06	46	112	09 20	47	113	08 33	46	113	07 47	46	114	07 01	47	114	06 14	46	115	05 28	47	116	04 41	47	116	293
66	16 06	45	108	15 21	46	109	14 35	46	109	13 49	46	110	13 03	47	111	12 16	46	111	11 30	46	112	10 44	47	113	09 57	46	113	09 11	47	114	08 24	46	115	07 38	47	115	06 51	47	116	06 04	47	116	05 17	46	117	294
65	16 45	−46	109	15 59	−46	110	15 13	−46	110	14 27	−46	111	13 41	−47	111	12 54	−46	112	12 08	−46	113	11 22	−47	113	10 35	−47	114	09 48	−47	115	09 01	−46	115	08 15	−47	116	07 28	−47	117	06 41	−47	117	05 54	−47	118	295
64	17 24	46	110	16 38	46	110	15 52	47	111	15 05	46	112	14 19	47	112	13 32	46	113	12 46	47	114	11 59	47	114	11 12	47	115	10 25	47	115	09 38	47	116	08 51	47	117	08 04	47	117	07 17	47	118	06 30	47	119	296
63	18 02	46	110	17 16	46	111	16 30	47	112	15 43	46	112	14 57	47	113	14 10	47	114	13 23	47	114	12 36	47	115	11 49	47	116	11 02	47	116	10 15	47	117	09 28	48	118	08 40	47	118	07 53	47	119	07 06	48	119	297
62	18 40	46	111	17 54	46	112	17 08	47	113	16 21	47	113	15 34	47	114	14 47	47	115	14 00	47	115	13 13	47	116	12 26	47	116	11 39	48	117	10 51	47	118	10 04	48	118	09 16	47	119	08 29	48	120	07 41	48	120	298
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59	20 34	47	114	19 47	47	114	19 00	47	115	18 13	48	116	17 25	47	116	16 38	48	117	15 50	48	118	15 02	47	118	14 15	48	119	13 27	48	119	12 39	48	120	11 51	49	121	11 02	48	121	10 14	48	122	09 26	48	123	301
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57	21 48	47	115	21 01	48	116	20 13	47	117	19 26	48	117	18 38	48	118	17 50	48	119	17 02	48	119	16 14	48	120	15 26	49	121	14 37	48	121	13 49	49	122	13 00	48	122	12 12	49	123	11 23	49	124	10 34	48	124	303
56	22 25	47	116	21 38	48	117	20 50	48	118	20 02	48	118	19 14	48	119	18 26	48	119	17 38	49	120	16 49	48	121	16 01	49	121	15 12	48	122	14 24	49	123	13 35	49	123	12 46	49	124	11 57	49	124	11 08	49	125	304
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53	24 14	48	119	23 26	49	120	22 37	48	120	21 49	49	121	21 00	49	121	20 11	49	122	19 22	49	123	18 33	49	123	17 44	49	124	16 55	49	124	16 06	50	125	15 16	49	126	14 27	50	126	13 37	50	127	12 47	50	127	307
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27	37 25	55	145	36 30	55	146	35 35	56	146	34 39	56	147	33 43	55	147	32 48	56	147	31 52	56	148	30 56	56	148	30 00	56	149	29 04	56	149	28 08	57	150	27 11	56	150	26 15	56	150	25 19	57	151	24 22	56	151	333
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N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
0	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	64 00	+60	180	65 00	+60	180	66 00	+60	180	67 00	+60	180	68 00	+60	180	69 00	+60	180	70 00	+60	180	71 00	+60	180	72 00	+60	180	360
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42	42 45	47	118	43 32	46	117	44 18	46	117	45 04	46	116	45 50	45	115	46 35	45	114	47 20	44	113	48 04	43	112	48 47	43	111	49 30	43	110	50 13	41	109	50 54	42	107	51 36	40	106	52 16	39	105	52 55	39	104	318
43	42 09	47	117	42 56	46	116	43 42	45	116	44 27	46	115	45 13	45	114	45 58	44	113	46 42	44	112	47 26	43	111	48 09	43	110	48 52	42	109	49 34	41	108	50 15	41	107	50 56	40	105	51 36	40	104	52 16	38	103	317
44	41 32	47	116	42 19	46	115	43 05	45	115	43 50	45	114	44 35	45	113	45 20	44	112	46 04	43	111	46 47	43	110	47 30	43	109	48 13	42	108	48 55	41	107	49 36	41	106	50 17	40	104	50 57	39	103	51 36	38	102	316
45	40 56	+46	115	41 42	+45	114	42 27	+45	114	43 12	+45	113	43 57	+45	112	44 42	+43	111	45 25	+44	110	46 09	+43	109	46 52	+42	108	47 34	+41	107	48 15	+42	106	48 57	+40	105	49 37	+40	103	50 17	+39	102	50 56	+38	101	315
46	40 19	45	114	41 04	46	113	41 50	45	113	42 35	44	112	43 19	44	111	44 03	44	110	44 47	43	109	45 30	42	108	46 12	43	107	46 55	41	106	47 36	41	105	48 17	40	104	48 57	40	103	49 37	38	101	50 15	39	100	314
47	39 41	46	113	40 27	45	113	41 12	44	112	41 56	45	111	42 41	44	110	43 25	43	109	44 08	43	108	44 51	42	107	45 33	42	106	46 15	41	105	46 56	41	104	47 37	40	103	48 17	39	102	48 56	39	101	49 35	38	99	313
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51	37 09	44	110	37 53	45	109	38 38	44	108	39 22	43	107	40 05	43	106	40 48	43	105	41 31	42	104	42 13	42	103	42 55	41	102	43 36	40	101	44 16	40	100	44 56	40	99	45 36	39	98	46 15	38	97	46 53	37	96	309
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58	32 34	44	104	33 18	43	103	34 01	43	102	34 44	42	101	35 26	42	100	36 08	42	99	36 50	41	98	37 31	41	98	38 12	41	97	38 53	39	96	39 32	40	95	40 12	39	94	40 51	38	93	41 29	38	92	42 07	37	91	302
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60	31 15	+43	102	31 58	+43	101	32 41	+42	100	33 23	+43	99	34 06	+41	99	34 47	+42	98	35 29	+41	97	36 10	+41	96	36 51	+40	95	37 31	+40	94	38 11	+39	93	38 50	+39	92	39 29	+38	91	40 07	+38	90	40 45	+38	89	300
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62	29 54	43	100	30 37	43	100	31 20	42	99	32 02	42	98	32 44	42	97	33 26	42	96	34 08	41	95	34 49	40	94	35 29	40	93	36 09	40	93	36 49	39	92	37 28	39	91	38 07	39	90	38 46	37	89	39 23	38	88	298
63	29 14	43	100	29 57	43	99	30 40	42	98	31 22	42	97	32 04	41	96	32 45	42	95	33 27	41	95	34 08	40	94	34 48	40	93	35 28	40	92	36 08	39	91	36 47	39	90	37 26	39	89	38 05	38	88	38 43	37	87	297
64	28 34	42	99	29 16	43	98	29 59	42	97	30 41	42	96	31 23	42	95	32 05	41	95	32 46	41	94	33 27	40	93	34 07	40	92	34 47	40	91	35 27	40	90	36 07	38	89	36 45	39	88	37 24	38	87	38 02	37	86	296
65	27 53	+43	98	28 36	+42	97	29 18	+42	96	30 00	+42	96	30 42	+42	95	31 24	+41	94	32 05	+41	93	32 46	+40	92	33 26	+41	91	34 07	+39	90	34 46	+40	89	35 26	+38	89	36 04	+39	88	36 43	+38	87	37 21	+37	86	295
66	27 13	42	97	27 55	43	96	28 38	42	96	29 20	42	95	30 02	41	94	30 43	43	93	31 24	41	92	32 05	41	91	32 46	40	91	33 26	39	90	34 05	40	89	34 45	39	88	35 24	38	87	36 02	38	86	36 40	38	85	294
67	26 32	42	96	27 14	43	96	27 57	42	95	28 39	42	94	29 21	41	93	30 02	41	92	30 43	41	91	31 24	41	91	32 05	40	90	32 45	39	89	33 24	40	88	34 04	39	87	34 43	38	86	35 21	38	85	35 59	38	84	293
68	25 51	43	96	26 34	42	95	27 16	42	94	27 58	42	93	28 40	41	92	29 21	41	92	30 02	41	91	30 43	41	90	31 24	40	89	32 04	40	88	32 44	39	87	33 23	39	86	34 02	39	85	34 41	38	85	35 19	37	84	292
69	25 10	43	95	25 53	42	94	26 35	42	93	27 17	42	92	27 59	41	92	28 40	41	91	29 21	41	90	30 02	41	89	30 43	40	88	31 23	40	87	32 03	39	87	32 42	39	86	33 21	39	85	34 00	38	84	34 38	38	83	291
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME A

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	24 30	+42	94	25 12	+42	93	25 54	+42	93	26 36	+42	92	27 18	+41	91	27 59	+42	90	28 41	+40	89	29 21	+41	88	30 02	+40	88	30 42	+40	87	31 22	+39	86	30 41	40	85	32 01	+39	85	32 40	+39	84	33 19	+38	83	33 57	+38	82	290
71	23 49	42	93	24 31	42	93	25 13	42	92	25 55	42	91	26 37	42	90	27 19	43	89	28 00	40	89	28 40	41	88	29 21	40	87	30 01	40	86	30 41	40	85	31 21	39	84	32 00	39	83	32 39	38	82	33 17	38	82	289
72	23 08	42	93	23 50	43	92	24 33	41	91	25 14	42	90	25 56	42	89	26 38	43	89	27 19	41	88	28 00	40	87	28 40	40	86	29 20	40	85	30 00	40	84	30 40	39	84	31 19	39	83	31 58	38	82	32 36	39	81	288
73	22 27	42	92	23 09	43	91	23 52	42	90	24 34	41	90	25 15	42	89	25 57	43	88	26 38	41	87	27 19	40	86	27 59	41	85	28 40	40	85	29 20	39	84	29 59	40	83	30 39	39	82	31 18	38	81	31 56	38	80	287
74	21 46	43	91	22 29	42	90	23 11	42	90	23 53	41	89	24 34	42	88	25 16	41	87	25 57	41	86	26 38	41	86	27 19	40	85	27 59	40	84	28 39	40	83	29 19	39	82	29 58	39	81	30 37	39	80	31 16	38	80	286
75	21 05	+43	90	21 48	+42	90	22 30	+42	89	23 12	+41	88	23 53	+42	87	24 35	+41	87	25 16	+41	86	25 57	+41	85	26 38	+40	84	27 18	+40	83	27 58	+40	82	28 38	+40	82	29 18	+39	81	29 57	+39	80	30 36	+38	79	285
76	20 24	43	90	21 07	42	89	21 49	42	88	22 31	42	87	23 13	41	87	23 54	41	86	24 35	41	85	25 16	41	84	25 57	41	83	26 38	40	83	27 18	40	82	27 58	39	81	28 37	40	80	29 17	39	79	29 56	38	78	284
77	19 43	43	89	20 26	42	88	21 08	42	87	21 50	42	87	22 32	41	86	23 13	42	85	23 55	41	84	24 36	41	83	25 17	40	83	25 57	40	82	26 37	40	81	27 17	40	80	27 57	39	79	28 36	40	79	29 16	38	78	283
78	19 02	43	88	19 45	42	87	20 27	42	87	21 09	42	86	21 51	42	85	22 33	41	84	23 14	41	84	23 55	41	83	24 36	41	82	25 17	40	81	25 57	40	80	26 37	40	80	27 17	39	79	27 56	40	78	28 36	38	77	282
79	18 22	42	87	19 04	42	87	19 46	42	86	20 28	42	85	21 10	42	84	21 52	43	84	22 33	42	83	23 15	41	82	23 56	40	81	24 36	41	81	25 17	40	80	25 57	40	79	26 37	39	78	27 16	40	77	27 56	39	76	281
80	17 41	+42	87	18 23	+42	86	19 05	+43	85	19 48	+42	85	20 30	+41	84	21 11	+42	83	21 53	+41	82	22 34	+41	81	23 15	+41	81	23 56	+41	80	24 37	+40	79	25 17	+40	78	25 57	+40	77	26 37	+39	77	27 16	+39	76	280
81	17 00	42	86	17 42	43	85	18 25	42	85	19 07	42	84	19 49	42	83	20 31	41	82	21 12	42	82	21 54	41	81	22 35	41	80	23 16	40	79	23 56	41	78	24 37	40	78	25 17	40	77	25 57	39	76	26 36	40	75	279
82	16 19	43	85	17 02	42	85	17 44	42	84	18 26	42	83	19 08	42	82	19 50	42	82	20 32	41	81	21 13	42	80	21 55	41	79	22 36	40	78	23 16	41	78	23 57	40	77	24 37	40	76	25 17	40	75	25 57	39	74	278
83	15 38	43	85	16 21	42	84	17 03	43	83	17 46	42	82	18 28	42	82	19 10	41	81	19 51	42	80	20 33	41	79	21 14	42	79	21 56	40	78	22 36	41	77	23 17	41	76	23 58	40	75	24 38	40	75	25 18	39	74	277
84	14 58	42	84	15 40	43	83	16 23	42	82	17 05	42	82	17 47	42	81	18 29	42	80	19 11	42	79	19 53	41	79	20 34	42	78	21 16	41	77	21 57	40	76	22 37	41	76	23 18	40	75	23 58	40	74	24 38	40	73	276
85	14 17	+43	83	15 00	+42	82	15 42	+43	82	16 25	+42	81	17 07	+42	80	17 49	+42	80	18 31	+42	79	19 13	+41	78	19 54	+42	77	20 36	+41	76	21 17	+41	76	21 58	+41	75	22 39	+40	74	23 19	+40	73	23 59	+40	72	275
86	13 36	43	82	14 19	43	82	15 02	42	81	15 44	43	80	16 27	42	80	17 09	42	79	17 51	42	78	18 33	42	77	19 15	41	77	19 56	41	76	20 37	41	75	21 18	41	74	21 59	41	73	22 40	40	73	23 20	41	72	274
87	12 56	43	82	13 39	42	81	14 21	43	80	15 04	42	80	15 46	43	79	16 29	42	78	17 11	42	77	17 53	42	77	18 35	41	76	19 16	42	75	19 58	41	74	20 39	41	74	21 20	41	73	22 01	41	72	22 42	40	71	273
88	12 15	43	81	12 58	43	80	13 41	43	80	14 24	42	79	15 06	43	78	15 49	42	77	16 31	42	77	17 13	42	76	17 55	42	75	18 37	42	74	19 19	41	74	20 00	41	73	20 41	41	72	21 22	41	71	22 03	40	71	272
89	11 35	43	80	12 18	43	80	13 01	43	79	13 44	42	78	14 26	43	77	15 09	42	77	15 51	43	76	16 34	42	75	17 16	42	75	17 58	41	74	18 39	42	73	19 21	41	72	20 02	41	71	20 43	41	71	21 24	41	70	271
90	10 55	+43	80	11 38	+43	79	12 21	+43	78	13 04	+42	78	13 46	+43	77	14 29	+43	76	15 12	+42	75	15 54	+42	75	16 36	+42	74	17 18	+42	73	18 00	+42	72	18 42	+42	72	19 24	+41	71	20 05	+41	70	20 46	+41	69	270
91	10 14	44	79	10 58	43	78	11 41	43	78	12 24	43	77	13 07	42	76	13 49	43	75	14 32	43	75	15 15	42	74	15 57	42	73	16 39	42	72	17 21	42	72	18 03	42	71	18 45	41	70	19 26	42	69	20 08	41	69	269
92	09 34	44	78	10 18	43	78	11 01	43	77	11 44	43	76	12 27	43	75	13 10	43	75	13 53	42	74	14 35	43	73	15 18	42	73	16 00	43	72	16 43	42	71	17 25	42	70	18 07	41	70	18 48	42	69	19 30	41	68	268
93	08 54	44	78	09 38	43	77	10 21	43	76	11 04	44	75	11 48	43	75	12 31	42	74	13 13	43	73	13 56	43	73	14 39	43	72	15 22	42	71	16 04	42	70	16 46	42	70	17 28	42	69	18 10	42	68	18 52	41	67	267
94	08 14	44	77	08 58	43	76	09 41	44	75	10 25	43	75	11 08	43	74	11 51	43	73	12 34	43	73	13 17	43	72	14 00	43	71	14 43	42	70	15 25	43	70	16 08	42	69	16 50	42	68	17 32	42	67	18 14	42	67	266
95	07 35	+43	76	08 18	+44	75	09 02	+43	75	09 45	+44	74	10 29	+43	73	11 12	+43	73	11 55	+44	72	12 39	+43	71	13 22	+42	70	14 04	+43	70	14 47	+43	69	15 30	+42	68	16 12	+43	68	16 55	+42	67	17 37	+42	66	265
96	06 55	44	75	07 39	44	75	08 23	43	74	09 06	44	73	09 50	43	73	10 33	44	72	11 17	43	71	12 00	43	71	12 43	43	70	13 26	43	69	14 09	43	68	14 52	43	68	15 35	42	67	16 17	42	66	16 59	43	65	264
97	06 15	44	75	06 59	44	74	07 43	44	73	08 27	44	73	09 11	43	72	09 54	44	71	10 38	43	71	11 21	44	70	12 05	43	69	12 48	43	68	13 31	43	68	14 14	43	67	14 57	43	66	15 40	42	66	16 22	43	65	263
98	05 36	44	74	06 20	44	73	07 04	44	73	07 48	44	72	08 32	44	71	09 16	43	71	09 59	44	70	10 43	44	69	11 27	43	68	12 10	43	68	12 53	44	67	13 37	43	66	14 20	43	66	15 03	42	65	15 45	43	64	262
99	04 57	44	73	05 41	44	73	06 25	44	72	07 09	44	71	07 53	44	71	08 37	44	70	09 21	44	69	10 05	44	68	10 49	43	68	11 32	44	67	12 16	43	66	12 59	43	66	13 42	44	65	14 26	43	64	15 09	43	63	261
100	04 18	+44	73	05 02	+44	72	05 46	+45	71	06 31	+44	71	07 15	+44	70	07 59	+44	69	08 43	+44	68	09 27	+44	68	10 11	+44	67	10 55	+43	66	11 38	+44	66	12 22	+43	65	13 05	+44	64	13 49	+43	64	14 32	+43	63	260
101	03 39	44	72	04 23	45	71	05 08	44	70	05 52	44	70	06 36	45	69	07 21	44	68	08 05	44	68	08 49	44	67	09 33	44	66	10 17	44	66	11 01	44	65	11 45	44	64	12 29	43	64	13 12	44	63	13 56	43	62	259
102	03 00	45	71	03 45	44	70	04 29	45	70	05 14	44	69	05 58	45	68	06 43	44	68	07 27	45	67	08 12	44	66	08 56	44	66	09 40	44	65	10 24	44	64	11 08	44	64	11 52	44	63	12 36	44	62	13 20	43	62	258
103	02 21	45	70	03 06	45	70	03 51	45	69	04 36	44	68	05 20	45	68	06 05	45	67	06 50	44	66	07 34	45	66	08 19	44	65	09 03	44	64	09 47	45	64	10 32	44	63	11 16	44	62	12 00	44	62	12 44	44	61	257
104	01 43	45	70	02 28	45	69	03 13	45	68	03 58	45	68	04 43	44	67	05 27	45	66	06 12	45	66	06 57	45	65	07 42	44	64	08 26	45	64	09 11	44	63	09 55	45	62	10 40	44	62	11 24	44	61	12 08	44	60	256
105	01 05	+45	69	01 50	+45	68	02 35	+45	68	03 20	+45	67	04 05	+45	66	04 50	+45	66	05 35	+45	65	06 20	+45	64	07 05	+45	64	07 50	+45	63	08 35	+44	62	09 19	+45	62	10 04	+44	61	10 48	+45	60	11 33	+44	60	255
106	00 27	45	68	01 12	45	68	01 57	45	67	02 42	46	66	03 28	45	66	04 13	45	65	04 58	45	64	05 43	45	64	06 28	45	63	07 13	45	62	07 58	45	62	08 43	45	61	09 28	45	60	10 13	45	60	10 58	44	59	254
107	−0 11	45	67	00 34	46	67	01 20	45	66	02 05	45	66	02 50	46	65	03 36	45	64	04 21	46	64	05 07	45	63	05 52	45	62	06 37	46	62	07 23	45	61	08 08	45	60	08 53	45	60	09 38	45	59	10 23	45	58	253
108	−0 49	46	67	−0 03	45	66	00 42	46	65	01 28	46	65	02 14	45	64	02 59	46	63	03 45	45	63	04 30	46	62	05 16	45	62	06 01	46	61	06 47	45	60	07 32	46	60	08 18	45	59	09 03	45	58	09 48	45	58	252
109	−1 27	46	66	−0 41	46	65	00 05	46	65	00 51	46	64	01 37	46	63	02 23	45	63	03 08	46	62	03 54	46	61	04 40	46	61	05 26	45	60	06 11	46	60	06 57	46	59	07 43	45	58	08 28	46	58	09 14	45	57	251
110	−2 04	+46	65	−1 18	+46	65	−0 32	+46	64	00 14	+46	63	01 00	+46	63	01 46	+46	62	02 32	+46	61	03 18	+46	61	04 04	+46	60	04 50	+46	59	05 36	+46	59	06 22	+46	58	07 08	+46	58	07 54	+46	57	08 40	+45	56	250
111	−2 41	46	65	−1 55	47	64	−1 08	46	63	−0 22	46	63	00 24	46	62	01 10	47	61	01 57	46	61	02 43	46	60	03 29	46	59	04 15	46	59	05 01	47	58	05 48	46	58	06 34	46	57	07 20	46	56	08 06	46	56	249
112	−3 18	47	64	−2 31	46	63	−1 45	47	63	−0 58	46	62	−0 12	47	61	00 35	46	61	01 21	47	60	02 08	46	59	02 54	46	59	03 40	47	58	04 27	46	57	05 13	47	57	06 00	46	56	06 46	46	56	07 32	46	55	248
113	−3 54	47	63	−3 08	47	62	−2 21	47	62	−1 34	46	61	−0 48	47	61	−0 01	47	60	00 46	46	59	01 32	47	59	02 19	47	58	03 06	46	57	03 52	47	57	04 39	47	56	05 26	46	55	06 12	47	55	06 59	46	54	247
114	−4 31	47	62	−3 44	47	62	−2 57	47	61	−2 10	47	60	−1 23	47	60	−0 36	47	59	00 11	47	59	00 58	47	58	01 45	47	57	02 32	46	57	03 18	47	56	04 05	47	55	04 52	47	55	05 39	47	54	06 26	46	54	246
115	−5 07	+47	62	−4 20	+47	61	−3 33	+48	60	−2 45	+47	60	−1 58	+47	59	−1 11	+47	58	−0 24	+47	58	00 23	+47	57	01 10	+47	57	01 57	+48	56	02 45	+47	55	03 32	+47	55	04 19	+47	54	05 06	+47	53	05 53	+47	53	245
116	−5 43	48	61	−4 55	47	60	−4 08	47	60	−3 21	48	59	−2 33	47	58	−1 46	47	58	−0 59	48	57	−0 11	47	56	00 36	48	56	01 24	47	55	02 11	47	55	02 58	48	54	03 46	47	53	04 33	47	53	05 20	48	52	244
117	−6 18	+47	60	−5 31	48	59	−4 43	47	59	−3 56	48	58	−3 08	48	58	−2 20	47	57	−1 33	48	56	−0 45	48	56	00 03	47	55	00 50	48	54	01 38	48	54	02 26	47	53	03 13	48	53	04 01	47	52	04 48	48	51	243
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						119	−5 53	+49	57	−5 04	48	57	−4 16	48	56	−3 28	48	55	−2 40	48	55	−1 52	48	54	−1 04	48	54	−0 16	48	53	00 32	49	52	01 21	48	52	02 09	48	51	02 57	48	51	03 45	48	50	241
									120	−5 39	+49	56	−4 50	+48	55	−4 02	+49	55	−3 13	+48	54	−2 25	+48	53	−1 37	+49	53	−0 48	+48	52	00 00	+49	52	00 49	+48	51	01 37	+48	51	02 25	+49	50	03 14	+48	49	240
									121	−6 12	+48	55	−5 24	49	54	−4 35	49	54	−3 46	48	53	−2 58	49	53	−2 09	48	52	−1 21	49	52	−0 32	49	51	00 17	49	50	01 06	48	50	01 54	49	49	02 43	48	49	239
												122	−5 57	+49	54	−5 08	49	53	−4 19	49	53	−3 30	49	52	−2 41	49	51	−1 52	49	51	−1 03	48	50	−0 15	49	50	00 34	49	49	01 23	49	49	02 12	49	48	238
															123	−5 41	50	52	−4 51	49	52	−4 02	49	51	−3 13	49	51	−2 24	49	50	−1 35	49	49	−0 46	50	49	00 04	49	48	00 53	49	48	01 42	49	47	237
															124	−6 13	+50	52	−5 23	49	51	−4 34	49	50	−3 45	50	50	−2 55	49	49	−1 16	49	48	−0 27	50	48	00 23	49	47	01 12	50	46	236
																		125	−5 55	+50	50	−5 05	+49	50	−4 16	+50	49	−3 26	+50	49	−2 36	+49	48	−1 47	+50	47	−0 57	+50	47	−0 07	+50	46	00 43	+50	46	235
83	−6 15	−44	105	277																	126	−5 36	50	49	−4 46	49	48	−3 57	50	48	−3 07	51	47	−2 16	50	47	−1 26	50	46	−0 36	50	46	00 14	50	45	234
82	−5 36	44	106	−6 20	−44	107	278														127	−6 07	+50	48	−5 17	50	48	−4 27	51	47	−3 36	50	46	−2 46	50	46	−1 56	51	45	−1 05	50	45	−0 15	50	44	233
81	−4 57	44	107	−5 41	44	107	279																		−5 47	51	47	−4 56	50	46	−4 06	51	46	−3 15	50	45	−2 25	51	45	−1 34	50	44	−0 44	51	44	232
80	−4 18	−44	107	−5 02	−44	108	−5 46	−45	109	280															−6 17	+51	46	−5 26	51	45	−4 35	51	45	−3 44	51	44	−2 53	51	44	−2 02	50	43	−1 12	51	43	231
79	−3 39	44	108	−4 23	45	109	−5 08	44	110	−5 52	−44	110	281																		−5 55	+51	45	−5 04	+51	44	−4 13	+52	44	−3 21	+51	43	−2 30	+51	43	−1 39	+51	42	230
78	−3 00	45	109	−3 45	44	110	−4 29	45	110	−5 14	44	111	−5 58	−45	112	282																	131	−5 32	51	43	−4 41	52	43	−3 49	51	42	−2 58	52	42	−2 06	51	41	229
77	−2 21	45	110	−3 06	45	110	−3 51	45	111	−4 36	44	112	−5 20	45	112	−6 05	−45	113	283														132	−6 00	+52	43	−5 08	51	42	−4 17	52	42	−3 25	52	41	−2 33	51	41	228
76	−1 43	45	110	−2 28	45	111	−3 13	45	112	−3 58	45	112	−4 43	44	113	−5 27	45	114	−6 12	−45	114	284													133	−5 36	52	41	−4 44	52	41	−3 52	52	40	−3 00	52	40	227
75	−1 05	−45	111	−1 50	−45	112	−2 35	−45	112	−3 20	−45	113	−4 05	−45	114	−4 50	−45	114	−5 35	−45	115	−6 20	−45	116	285										134	−6 02	+52	41	−5 10	52	40	−4 18	52	40	−3 26	53	39	226
74	−0 27	45	112	−1 12	45	112	−1 57	45	113	−2 42	46	114	−3 28	45	114	−4 13	45	115	−4 58	45	116	−5 43	46	116	286												135	−5 36	+52	39	−4 44	+53	39	−3 51	+52	38	225
73	00 11	45	113	−0 34	46	113	−1 20	45	114	−2 05	45	114	−2 50	46	115	−3 36	45	116	−4 21	46	116	−5 07	45	117	−5 52	−45	118	287								136	−6 02	+53	38	−5 09	53	38	−4 16	52	38	224
72	00 49	46	113	00 03	45	114	−0 42	46	115	−1 28	46	115	−2 14	45	116	−2 59	46	117	−3 45	45	117	−4 30	46	118	−5 16	45	118	−6 01	−46	119	288							137	−5 34	53	37	−4 41	53	37	223
71	01 27	46	114	00 41	46	115	−0 05	46	116	−0 51	46	116	−1 37	46	117	−2 23	45	117	−3 08	46	118	−3 54	46	119	−4 40	46	119	−5 26	45	120	−6 11	−46	120	289						138	−5 59	+54	36	−5 05	53	36	222
70	02 04	−46	115	01 18	−46	115	00 32	−46	116	−0 14	−46	117	−1 00	−46	117	−1 46	−46	118	−2 32	−46	119	−3 18	−46	119	−4 04	−46	120	−4 50	−46	121	−5 36	−46	121	290								139	−5 29	53	35	221
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	′	′	°	° ′	′	°	°
69	02 41	46	115	01 55	47	116	01 08	46	117	00 22	46	117	−0 24	46	118	−1 10	47	119	−1 57	46	119	−2 43	46	120	−3 29	46	121	−4 15	46	121	−5 01	47	122	−5 48	−46	122	291										69
68	03 18	47	116	02 31	46	117	01 45	47	117	00 58	46	118	00 12	47	119	−0 35	46	119	−1 21	47	120	−2 08	46	121	−2 54	46	121	−3 40	47	122	−4 27	46	123	−5 13	47	123	−6 00	−46	124	292							68
67	03 54	46	117	03 08	47	118	02 21	47	118	01 34	46	119	00 48	47	119	00 01	47	120	−0 46	46	121	−1 32	47	121	−2 19	47	122	−3 06	46	123	−3 52	47	123	−4 39	47	124	−5 26	46	125	−6 12	−47	125	293							67
66	04 31	47	118	03 44	47	118	02 57	47	119	02 10	47	120	01 23	47	120	00 36	47	121	−0 11	47	121	−0 58	47	122	−1 45	47	123	−2 32	46	123	−3 18	47	124	−4 05	47	125	−4 52	47	125	−5 39	47	126	294							66
65	05 07	−47	118	04 20	−47	119	03 33	−48	120	02 45	−47	120	01 58	−47	121	01 11	−47	122	00 24	−47	122	−0 23	−47	123	−1 10	−47	123	−1 57	−48	124	−2 45	−47	125	−3 32	−47	125	−4 19	−47	126	−5 06	−47	127	−5 53	−47	127	295	65
64	05 43	48	119	04 55	47	120	04 08	47	120	03 21	48	121	02 33	47	122	01 46	47	122	00 59	48	123	00 11	47	124	−0 36	48	124	−1 24	47	125	−2 11	47	125	−2 58	48	126	−3 46	47	127	−4 33	47	127	−5 20	46	128	296	64
63	06 18	47	120	05 31	48	121	04 43	47	121	03 56	48	122	03 08	48	122	02 20	47	123	01 33	48	124	00 45	48	124	−0 03	47	125	−0 50	48	126	−1 38	48	126	−2 26	47	127	−3 13	48	127	−4 01	47	128	−4 48	48	129	297	63
62	06 53	47	121	06 06	48	121	05 18	48	122	04 30	48	123	03 42	48	123	02 54	47	124	02 07	48	124	01 19	48	125	00 31	48	126	−0 17	48	126	−1 05	48	127	−1 53	48	127	−2 41	48	128	−3 29	47	129	−4 16	48	129	298	62
61	07 28	47	122	06 41	48	122	05 53	49	123	05 04	48	123	04 16	48	124	03 28	48	125	02 40	48	125	01 52	48	126	01 04	48	126	00 16	48	127	−0 32	49	128	−1 21	48	128	−2 09	48	129	−2 57	48	129	−3 45	48	130	299	61
60	08 03	−48	122	07 15	−48	123	06 27	−48	124	05 39	−49	124	04 50	−48	125	04 02	−49	125	03 13	−48	126	02 25	−48	127	01 37	−49	127	00 48	−48	128	00 00	−49	128	−0 49	−48	129	−1 37	−48	129	−2 25	−49	130	−3 14	−48	131	300	60
59	08 38	49	123	07 49	48	124	07 01	49	124	06 12	48	125	05 24	49	126	04 35	49	126	03 46	48	127	02 58	49	127	02 09	48	128	01 21	49	128	00 32	49	129	−0 17	49	130	−1 06	48	130	−1 54	49	131	−2 43	48	131	301	59
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56	10 19	49	126	09 30	49	126	08 41	50	127	07 51	49	127	07 02	49	128	06 13	50	128	05 23	49	129	04 34	49	130	03 45	50	130	02 55	49	131	02 06	50	131	01 16	49	132	00 27	50	132	−0 23	49	133	−1 12	50	134	304	56
55	10 52	−49	126	10 03	−50	127	09 13	−49	127	08 24	−50	128	07 34	−49	129	06 45	−50	129	05 55	−50	130	05 05	−49	130	04 16	−50	131	03 26	−50	131	02 36	−49	132	01 47	−50	133	00 57	−50	133	00 07	−50	134	−0 43	−50	134	305	55
54	11 25	50	127	10 35	49	128	09 46	50	128	08 56	50	129	08 06	50	129	07 16	50	130	06 26	50	131	05 36	50	131	04 46	49	132	03 57	50	132	03 07	51	133	02 16	50	133	01 26	50	134	00 36	50	134	−0 14	50	135	306	54
53	11 57	50	128	11 07	49	129	10 18	50	129	09 28	50	130	08 38	51	130	07 47	50	131	06 57	50	131	06 07	50	132	05 17	50	132	04 27	51	133	03 36	50	134	02 46	50	134	01 56	51	135	01 05	50	135	00 15	50	136	307	53
52	12 29	50	129	11 39	50	129	10 49	50	130	09 59	50	130	09 09	51	131	08 18	50	132	07 28	51	132	06 37	50	133	05 47	51	133	04 56	50	134	04 06	51	134	03 15	50	135	02 25	51	135	01 34	50	136	00 44	51	136	308	52
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50	13 33	−51	130	12 42	−51	131	11 51	−51	132	11 00	−50	132	10 10	−51	133	09 19	−51	133	08 28	−51	134	07 37	−51	134	06 46	−51	135	05 55	−51	135	05 04	−51	136	04 13	−52	136	03 21	−51	137	02 30	−51	137	01 39	−51	138	310	50
49	14 03	50	131	13 13	51	132	12 22	51	132	11 31	52	133	10 39	51	133	09 48	51	134	08 57	52	134	08 06	51	135	07 15	52	136	06 23	51	136	05 32	51	137	04 41	52	137	03 49	51	138	02 58	52	138	02 06	51	139	311	49
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47	15 04	51	133	14 13	52	134	13 21	51	134	12 30	52	135	11 38	52	135	10 46	51	136	09 55	52	136	09 03	52	137	08 11	52	137	07 19	52	138	06 27	51	138	05 36	52	139	04 44	52	139	03 52	52	140	03 00	52	140	313	47
46	15 34	52	134	14 42	52	134	13 50	51	135	12 59	52	135	12 07	52	136	11 15	52	136	10 23	52	137	09 31	52	137	08 39	52	138	07 47	52	138	06 55	53	139	06 02	52	139	05 10	52	140	04 18	52	140	03 26	53	141	314	46
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44	16 32	52	136	15 40	52	136	14 48	53	137	13 55	52	137	13 03	53	138	12 10	52	138	11 18	53	139	10 25	52	139	09 33	53	140	08 40	53	140	07 47	52	141	06 55	53	141	06 02	53	142	05 09	53	142	04 16	52	142	316	44
43	17 00	52	136	16 08	53	137	15 15	52	137	14 23	53	138	13 30	53	138	12 37	52	139	11 45	53	139	10 52	53	140	09 59	53	140	09 06	53	141	08 13	53	141	07 20	53	142	06 27	53	142	05 34	53	143	04 41	53	143	317	43
42	17 28	52	137	16 36	53	138	15 43	53	138	14 50	53	139	13 57	53	139	13 04	53	140	12 11	53	140	11 18	53	141	10 25	53	141	09 32	53	142	08 39	54	142	07 45	53	143	06 52	54	143	05 59	54	144	05 05	53	144	318	42
41	17 56	53	138	17 03	53	139	16 10	53	139	15 17	53	140	14 24	54	140	13 30	53	141	12 37	53	141	11 44	54	142	10 50	53	142	09 57	54	143	09 03	53	143	08 10	54	143	07 16	53	144	06 23	54	144	05 29	53	145	319	41
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39	18 49	53	140	17 56	54	141	17 02	53	141	16 09	54	141	15 15	54	142	14 21	54	142	13 27	53	143	12 34	54	143	11 40	54	144	10 46	54	144	09 52	54	145	08 58	54	145	08 04	54	146	07 10	55	146	06 15	54	146	321	39
38	19 15	53	141	18 22	54	141	17 28	54	142	16 34	54	142	15 40	54	143	14 46	54	143	13 52	54	144	12 58	54	144	12 04	55	145	11 09	54	145	10 15	54	145	09 21	54	146	08 27	55	146	07 32	54	147	06 38	55	147	322	38
37	19 41	54	142	18 47	54	142	17 53	54	143	16 59	55	143	16 04	54	144	15 10	54	144	14 16	55	145	13 21	54	145	12 27	54	145	11 33	55	146	10 38	54	146	09 44	55	147	08 49	55	147	07 54	54	148	07 00	55	148	323	37
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N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 48°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	360
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33	34 08	54	139	35 02	54	138	35 56	53	138	36 49	54	137	37 43	53	137	38 36	53	136	39 29	52	135	40 21	53	135	41 14	52	134	42 06	53	134	42 59	52	133	43 51	51	132	44 42	52	131	45 34	51	131	46 25	50	130	327
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35	33 14	+54	137	34 08	+53	136	35 01	+53	136	35 54	+52	135	36 46	+53	134	37 39	+52	134	38 31	+52	133	39 23	+52	133	40 15	+52	132	41 07	+52	131	41 59	+53	131	42 50	+51	130	43 41	+53	129	44 32	+50	128	45 22	+50	128	325
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37	32 18	53	135	33 11	52	134	34 03	53	133	34 56	52	133	35 48	52	132	36 40	52	132	37 32	51	131	38 23	52	130	39 15	51	130	40 06	51	129	40 57	50	128	41 47	51	128	42 38	50	127	43 28	49	126	44 17	50	125	323
38	31 49	53	134	32 42	52	133	33 34	52	132	34 26	52	132	35 18	52	131	36 10	51	131	37 01	51	130	37 52	51	129	38 43	51	129	39 34	51	128	40 25	50	127	41 15	50	126	42 05	50	126	42 55	49	125	43 44	50	124	322
39	31 20	52	133	32 12	52	132	33 04	52	131	33 56	51	131	34 47	52	130	35 39	51	130	36 30	51	129	37 21	51	128	38 12	50	128	39 02	51	127	39 53	50	126	40 43	49	125	41 32	50	125	42 22	49	124	43 11	49	123	321
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41	30 20	51	131	31 11	52	130	32 03	51	129	32 54	51	129	33 45	51	128	34 36	51	127	35 27	50	127	36 17	50	126	37 07	50	125	37 57	50	125	38 47	49	124	39 36	50	123	40 26	48	123	41 14	49	122	42 03	48	121	319
42	29 49	51	130	30 40	52	129	31 32	51	128	32 23	50	128	33 13	51	127	34 04	50	126	34 54	50	126	35 44	50	125	36 34	50	124	37 24	50	124	38 14	49	123	39 03	49	122	39 52	48	121	40 40	48	121	41 28	48	120	318
43	29 18	51	129	30 09	51	128	31 00	51	127	31 51	50	127	32 41	50	126	33 31	51	125	34 22	49	125	35 11	50	124	36 01	49	123	36 50	50	123	37 40	49	122	38 29	48	121	39 17	48	120	40 05	48	120	40 53	48	119	317
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45	28 14	+51	127	29 05	+50	126	29 55	+50	125	30 45	+50	125	31 35	+50	124	32 25	+50	123	33 15	+49	123	34 04	+49	122	34 53	+49	121	35 42	+49	121	36 31	+48	120	37 19	+48	119	38 07	+48	118	38 55	+47	118	39 42	+48	117	315
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47	27 09	50	125	27 59	50	124	28 49	50	123	29 39	49	123	30 28	49	122	31 17	50	122	32 07	48	121	32 55	49	120	33 44	48	119	34 32	49	119	35 21	47	118	36 08	48	117	36 56	47	116	37 43	47	116	38 30	47	115	313
48	26 36	50	124	27 26	49	123	28 15	50	123	29 05	49	122	29 54	49	121	30 43	49	121	31 32	48	120	32 20	49	119	33 09	48	118	33 57	48	118	34 45	48	117	35 33	47	116	36 20	47	116	37 07	47	115	37 54	46	114	312
49	26 02	50	123	26 52	49	122	27 41	49	122	28 30	49	121	29 19	49	120	30 08	49	120	30 57	48	119	31 45	48	118	32 33	48	118	33 21	48	117	34 09	47	116	34 56	48	115	35 44	46	115	36 30	47	114	37 17	46	113	311
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54	23 10	48	118	23 58	48	118	24 46	48	117	25 34	48	116	26 22	48	116	27 10	48	115	27 58	47	114	28 45	47	114	29 32	47	113	30 19	46	112	31 05	47	112	31 52	46	111	32 38	46	110	33 24	45	109	34 09	45	108	306
55	22 34	+48	117	23 22	+48	117	24 10	+48	116	24 58	+48	116	25 46	+47	115	26 33	+48	114	27 21	+47	113	28 08	+47	113	28 55	+46	112	29 41	+47	111	30 28	+46	111	31 14	+46	110	32 00	+46	109	32 46	+45	108	33 31	+45	108	305
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57	21 22	48	116	22 10	48	115	22 58	47	114	23 45	48	114	24 33	47	113	25 20	47	112	26 07	46	112	26 53	47	111	27 40	46	110	28 26	46	110	29 12	46	109	29 58	46	108	30 44	45	107	31 29	45	107	32 14	45	106	303
58	20 46	48	115	21 34	47	114	22 21	47	114	23 08	48	113	23 56	47	112	24 43	46	112	25 29	47	111	26 16	46	110	27 02	46	109	27 48	46	109	28 34	46	108	29 20	45	107	30 05	46	107	30 51	44	106	31 35	45	105	302
59	20 10	47	114	20 57	47	113	21 44	47	113	22 31	47	112	23 18	47	111	24 05	47	111	24 52	46	110	25 38	46	109	26 24	46	109	27 10	46	108	27 56	45	107	28 41	46	106	29 27	45	106	30 12	45	105	30 57	44	104	301
60	19 33	+47	113	20 20	+47	113	21 07	+47	112	21 54	+47	111	22 41	+46	111	23 27	+47	110	24 14	+46	109	25 00	+46	108	25 46	+46	108	26 32	+46	107	27 18	+45	106	28 03	+45	106	28 48	+45	105	29 33	+45	104	30 18	+44	103	300
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62	18 19	46	112	19 05	47	111	19 52	47	110	20 39	46	110	21 25	47	109	22 12	46	108	22 58	46	108	23 44	45	107	24 29	46	106	25 15	45	105	26 00	45	105	26 45	45	104	27 30	45	103	28 15	44	102	28 59	44	102	298
63	17 41	47	111	18 28	46	110	19 14	47	109	20 01	46	109	20 47	46	108	21 33	46	107	22 19	46	107	23 05	46	106	23 51	45	105	24 36	45	105	25 21	45	104	26 06	45	103	26 51	44	102	27 35	45	102	28 20	44	101	297
64	17 03	47	110	17 50	46	109	18 36	47	109	19 23	46	108	20 09	46	107	20 55	46	107	21 41	45	106	22 26	46	105	23 12	45	104	23 57	45	104	24 42	45	103	25 27	45	102	26 12	44	102	26 56	44	101	27 40	44	100	296
65	16 26	+46	109	17 12	+46	108	17 58	+46	108	18 44	+46	107	19 30	+46	106	20 16	+46	106	21 02	+46	105	21 48	+45	104	22 33	+45	103	23 18	+45	103	24 03	+45	102	24 48	+44	101	25 32	+45	101	26 17	+44	100	27 01	+44	99	295
66	15 48	46	108	16 34	46	108	17 20	46	107	18 06	46	106	18 52	46	106	19 38	45	105	20 23	46	104	21 09	45	104	21 54	45	103	22 39	45	102	23 24	44	101	24 08	45	101	24 53	44	100	25 37	44	99	26 21	44	98	294
67	15 09	47	108	15 56	46	107	16 42	45	106	17 27	46	106	18 13	46	105	18 59	45	104	19 44	45	103	20 29	46	103	21 15	45	102	22 00	44	101	22 44	45	101	23 29	44	100	24 13	44	99	24 57	44	98	25 41	44	98	293
68	14 31	46	107	15 17	46	106	16 03	46	105	16 49	45	105	17 34	46	104	18 20	45	103	19 05	45	103	19 50	45	102	20 35	45	101	21 20	45	101	22 05	44	100	22 49	45	99	23 34	44	98	24 18	43	98	25 01	44	97	292
69	13 52	46	106	14 38	46	105	15 24	46	105	16 10	45	104	16 55	46	103	17 41	45	103	18 26	45	102	19 11	45	101	19 56	45	100	20 41	44	100	21 25	45	99	22 10	44	98	22 54	44	98	23 38	44

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	13 14	+46	105	14 00	+45	104	14 45	+46	104	15 31	+45	103	16 16	+45	102	17 01	+46	102	17 47	+44	101	18 31	+45	100	19 16	+45	100	20 01	+44	99	20 45	+45	98	21 30	+43	98	22 14	+44	97	22 58	+44	96	23 42	+45	95	290
71	12 35	46	104	13 21	45	104	14 06	46	103	14 52	45	102	15 37	45	102	16 22	45	101	17 07	45	100	17 52	45	100	18 37	44	99	19 21	45	98	20 06	44	97	20 50	44	97	21 34	44	96	22 18	44	95	23 02	43	95	289
72	11 56	46	104	12 42	45	103	13 27	45	102	14 12	45	102	14 57	46	101	15 43	45	100	16 28	44	100	17 12	45	99	17 57	45	98	18 42	44	97	19 26	44	97	20 10	44	96	20 54	44	95	21 38	44	95	22 22	43	94	288
73	11 17	45	103	12 02	46	102	12 48	45	101	13 33	45	101	14 18	45	100	15 03	45	99	15 48	45	99	16 33	44	98	17 17	45	97	18 02	44	97	18 46	44	96	19 30	44	95	20 14	44	94	20 58	43	94	21 41	44	93	287
74	10 38	45	102	11 23	45	101	12 08	45	101	12 53	45	100	13 38	45	99	14 23	45	99	15 08	45	98	15 53	44	97	16 37	45	97	17 22	44	96	18 06	44	95	18 50	44	94	19 34	44	94	20 18	43	93	21 01	44	92	286
75	09 58	+46	101	10 44	+45	101	11 29	+45	100	12 14	+45	99	12 59	+45	99	13 44	+44	98	14 28	+45	97	15 13	+44	97	15 57	+45	96	16 42	+44	95	17 26	+44	94	18 10	+44	94	18 54	+44	93	19 38	+43	92	20 21	+44	92	285
76	09 19	45	100	10 04	45	100	10 49	45	99	11 34	45	98	12 19	45	98	13 04	44	97	13 48	45	96	14 33	44	96	15 17	45	95	16 02	44	94	16 46	44	94	17 30	44	93	18 14	44	92	18 58	43	91	19 41	43	91	284
77	08 39	45	100	09 24	45	99	10 09	45	98	10 54	45	98	11 39	45	97	12 24	45	96	13 09	44	96	13 53	44	95	14 37	45	94	15 22	44	94	16 06	44	93	16 50	44	92	17 34	43	91	18 17	44	91	19 01	43	90	283
78	08 00	45	99	08 45	45	98	09 30	45	98	10 15	44	97	10 59	45	96	11 44	45	96	12 29	44	95	13 13	44	94	13 57	45	94	14 42	44	93	15 26	44	92	16 10	44	91	16 54	43	91	17 37	44	90	18 21	43	89	282
79	07 20	45	98	08 05	45	98	08 50	45	97	09 35	44	96	10 19	45	96	11 04	45	95	11 49	44	94	12 33	44	93	13 17	45	93	14 02	44	92	14 46	44	91	15 30	43	91	16 13	44	90	16 57	44	89	17 41	43	89	281
80	06 40	+45	97	07 25	+45	97	08 10	+45	96	08 55	+44	95	09 39	+45	95	10 24	+45	94	11 09	+44	93	11 53	+44	93	12 37	+44	92	13 21	+44	91	14 05	+44	91	14 49	+44	90	15 33	+44	89	16 17	+44	89	17 01	+43	88	280
81	06 01	44	97	06 45	45	96	07 30	45	95	08 15	44	95	08 59	45	94	09 44	44	93	10 28	45	93	11 13	44	92	11 57	44	91	12 41	44	91	13 25	44	90	14 09	44	89	14 53	44	88	15 37	43	88	16 20	44	87	279
82	05 21	44	96	06 05	45	95	06 50	45	95	07 35	44	94	08 19	45	93	09 04	44	93	09 48	45	92	10 33	44	91	11 17	44	91	12 01	44	90	12 45	44	89	13 29	44	88	14 13	44	88	14 57	43	87	15 40	44	86	278
83	04 41	44	95	05 25	45	95	06 10	45	94	06 55	44	93	07 39	45	93	08 24	44	92	09 08	45	91	09 53	44	90	10 37	44	90	11 21	44	89	12 05	44	88	12 49	44	88	13 33	44	87	14 17	43	86	15 00	44	86	277
84	04 01	44	94	04 45	45	94	05 30	45	93	06 15	44	92	06 59	45	92	07 44	44	91	08 28	44	90	09 12	45	90	09 57	44	89	10 41	44	88	11 25	44	88	12 09	44	87	12 53	44	86	13 37	43	86	14 20	44	85	276
85	03 21	+44	94	04 05	+45	93	04 50	+44	92	05 34	+45	92	06 19	+44	91	07 03	+45	90	07 48	+44	90	08 32	+45	89	09 17	+44	88	10 01	+44	88	10 45	+44	87	11 29	+44	86	12 13	+44	86	12 57	+43	85	13 40	+44	84	275
86	02 41	44	93	03 25	45	92	04 10	44	92	04 54	45	91	05 39	44	90	06 23	45	90	07 08	44	89	07 52	44	88	08 36	45	88	09 21	44	87	10 05	44	86	10 49	44	86	11 33	44	85	12 17	43	84	13 00	44	83	274
87	02 00	45	92	02 45	45	92	03 30	44	91	04 14	45	90	04 59	44	90	05 43	45	89	06 28	44	88	07 12	44	88	07 56	45	87	08 41	44	86	09 25	44	85	10 09	44	85	10 53	44	84	11 37	44	83	12 21	43	83	273
88	01 20	45	91	02 05	44	91	02 49	45	90	03 34	45	89	04 19	44	89	05 03	44	88	05 47	45	87	06 32	44	87	07 16	45	86	08 01	44	85	08 45	44	85	09 29	44	84	10 13	44	83	10 57	44	83	11 41	44	82	272
89	00 40	45	91	01 25	44	90	02 09	45	89	02 54	44	89	03 38	45	88	04 23	44	87	05 07	45	87	05 52	44	86	06 36	45	85	07 21	44	85	08 05	44	84	08 49	44	83	09 33	44	83	10 17	44	82	11 01	44	81	271
90	00 00	+45	90	00 45	+44	89	01 29	+45	89	02 14	+44	88	02 58	+45	87	03 43	+44	87	04 27	+45	86	05 12	+44	85	05 56	+45	85	06 41	+44	84	07 25	+44	83	08 09	+44	83	08 53	+44	82	09 37	+44	81	10 21	+44	81	270
91	−0 40	44	89	00 04	45	89	00 49	45	88	01 34	44	87	02 18	45	87	03 03	44	86	03 47	45	85	04 32	44	85	05 16	45	84	06 01	44	83	06 45	44	83	07 29	45	82	08 14	44	81	08 58	44	80	09 42	44	80	269
92	−1 20	44	89	−0 36	45	88	00 09	45	87	00 54	44	87	01 38	45	86	02 23	44	85	03 07	45	84	03 52	44	84	04 36	45	83	05 21	44	82	06 05	45	82	06 50	44	81	07 34	44	80	08 18	44	80	09 02	45	79	268
93	−2 00	44	88	−1 16	45	87	−0 31	44	86	00 13	45	86	00 58	45	85	01 43	44	84	02 27	45	84	03 12	45	83	03 57	44	82	04 41	45	82	05 26	44	81	06 10	44	80	06 54	45	80	07 39	44	79	08 23	44	78	267
94	−2 41	45	87	−1 56	45	86	−1 11	44	86	−0 27	45	85	00 18	45	84	01 03	44	84	01 47	45	83	02 32	45	82	03 17	44	82	04 01	45	81	04 46	44	80	05 30	45	80	06 15	44	79	06 59	45	78	07 44	44	78	266
95	−3 21	+45	86	−2 36	+45	86	−1 51	+44	85	−1 07	+45	84	−0 22	+45	84	00 23	+45	83	01 08	+44	82	01 52	+45	82	02 37	+45	81	03 22	+44	80	04 06	+45	80	04 51	+45	79	05 36	+44	78	06 20	+45	78	07 05	+44	77	265
96	−4 01	45	86	−3 16	45	85	−2 31	45	84	−1 46	44	84	−1 02	45	83	−0 17	45	82	00 28	45	82	01 13	44	81	01 57	45	80	02 42	45	80	03 27	45	79	04 12	44	78	04 56	45	78	05 41	45	77	06 26	44	76	264
97	−4 41	45	85	−3 56	45	84	−3 11	45	83	−2 26	45	83	−1 41	44	82	−0 57	45	81	−0 12	45	81	00 33	45	80	01 18	45	79	02 03	45	79	02 48	44	78	03 32	45	77	04 17	45	77	05 02	45	76	05 47	44	75	263
98	−5 21	45	84	−4 36	45	83	−3 51	45	83	−3 06	45	82	−2 21	45	81	−1 36	45	81	−0 51	45	80	−0 06	45	79	00 39	44	79	01 23	45	78	02 08	45	77	02 53	45	77	03 38	45	76	04 23	45	75	05 08	45	75	262
99	−6 01	+45	83	−5 16	45	83	−4 31	45	82	−3 46	45	81	−3 01	45	81	−2 16	45	80	−1 31	45	79	−0 46	45	79	−0 01	45	78	00 44	45	77	01 29	45	77	02 14	45	76	02 59	45	75	03 44	45	75	04 29	45	74	261
			100	−5 55	+45	82			101	−5 50	+45	80	−5 05	45	80	−4 20	45	79	−3 35	45	78	−2 50	46	78	−2 04	45	77	−1 19	45	76	−0 34	45	76	00 11	46	75	00 57	45	75	01 42	45	74	02 27	45	73	03 12	45	73	260
									102	−5 44	45	79	−4 59	45	78	−4 14	45	78	−3 29	46	77	−2 43	45	76	−1 58	45	76	−1 13	46	75	−0 27	45	74	00 18	45	74	01 03	46	73	01 49	45	72	02 34	45	72	259
									103	−6 24	+45	78	−5 39	46	78	−4 53	45	77	−4 08	46	76	−3 22	45	76	−2 37	46	75	−1 51	45	74	−1 06	46	74	−0 20	45	73	00 25	46	72	01 11	45	72	01 56	45	71	258
												104	−6 18	+46	77	−5 32	45	76	−4 47	46	76	−4 01	45	75	−3 16	46	74	−2 30	46	74	−1 44	45	73	−0 59	46	72	−0 13	45	72	00 32	46	71	01 18	46	70	257
															105	−6 11	+45	75	−5 26	+46	75	−4 40	+46	74	−3 54	+46	73	−3 08	+45	73	−2 23	+46	72	−1 37	+46	72	−0 51	+46	71	−0 05	+45	70	00 40	+46	70	256
																		106	−6 04	+46	74	−5 18	45	73	−4 33	46	73	−3 47	46	72	−3 01	46	71	−2 15	46	71	−1 29	46	70	−0 43	46	70	00 03	46	69	255
																					107	−5 57	+46	73	−5 11	46	72	−4 25	46	71	−3 39	46	71	−2 53	46	70	−2 07	46	69	−1 21	46	69	−0 35	47	68	254
																								108	−5 49	+46	71	−5 03	46	71	−4 17	47	70	−3 30	46	69	−2 44	46	69	−1 58	46	68	−1 12	47	67	253
																											109	−5 41	47	70	−4 54	46	69	−4 08	47	69	−3 21	46	68	−2 35	46	67	−1 49	47	67	252
																														110	−6 18	+46	69	−5 32	+47	68	−4 45	+46	68	−3 59	+47	67	−3 12	+47	66	251
																																	111	−6 09	+47	68	−5 22	47	67	−4 35	46	66	−3 49	47	66	250
																																				112	−5 59	+47	66	−5 12	47	66	−4 25	47	65	249
																																						113	−5 49	+48	65	−5 01	47	64	−3 38	47	64	248
																																							114	−5 37	47	63	−4 14	47	64	247
																																							115	−6 13	+47	63	−4 50	47	63	246
																																									116	−5 26	+48	62	245
																																										−6 01	+48	61	244

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 48°

LAT 48°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 48°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
98	−5 21	−44	84	−6 05	−45	85	262																																									98
97	−4 41	44	85	−5 25	45	85	−6 10	−45	86	263																																						97
96	−4 01	44	86	−4 45	45	86	−5 30	45	87	−6 15	−44	88	264																																			96
95	−3 21	−44	86	−4 05	−45	87	−4 50	−44	88	−5 34	−45	88	−6 19	−44	89	265																																95
94	−2 41	44	87	−3 25	45	88	−4 10	44	88	−4 54	45	89	−5 39	44	90	−6 23	−45	90	266																													94
93	−2 00	45	88	−2 45	45	88	−3 30	44	89	−4 14	45	90	−4 59	44	90	−5 43	45	91	267																													93
92	−1 20	45	89	−2 05	44	89	−2 49	45	90	−3 34	45	91	−4 19	44	91	−5 03	44	92	−5 47	−45	93	268																										92
91	−0 40	45	89	−1 25	44	90	−2 09	45	91	−2 54	44	91	−3 38	45	92	−4 23	44	93	−5 07	45	93	−5 52	−44	94	269																						91
90	00 00	−45	90	−0 45	−44	91	−1 29	−45	91	−2 14	−44	92	−2 58	−45	93	−3 43	−44	93	−4 27	−45	94	−5 12	−44	95	−5 56	−45	95	270																				90
89	00 40	44	91	−0 04	45	91	−0 49	45	92	−1 34	44	93	−2 18	45	93	−3 03	44	94	−3 47	45	95	−4 32	44	95	−5 16	45	96	−6 01	−44	97	271																		89
88	01 20	44	91	00 36	45	92	−0 09	45	93	−0 54	44	93	−1 38	45	94	−2 23	44	95	−3 07	45	96	−3 52	44	96	−4 36	45	97	−5 21	44	98	−6 05	−45	98	272																88
87	02 00	44	92	01 16	45	93	00 31	44	94	−0 13	45	94	−0 58	45	95	−1 43	44	96	−2 27	45	96	−3 12	45	97	−3 57	44	98	−4 41	45	98	−5 26	44	99	−6 10	−44	100	273										87
86	02 41	45	93	01 56	45	94	01 11	44	94	00 27	45	95	−0 18	45	96	−1 03	44	96	−1 47	45	97	−2 32	45	98	−3 17	44	98	−4 01	45	99	−4 46	44	100	−5 30	45	100	−6 15	−44	101	274						86
85	03 21	−45	94	02 36	−45	94	01 51	−44	95	01 07	−45	96	00 22	−45	96	−0 23	−45	97	−1 08	−44	98	−1 52	−45	98	−2 37	−45	99	−3 22	−44	100	−4 06	−45	100	−4 51	−45	101	−5 36	−44	102	−6 20	−45	102	275			85
84	04 01	45	94	03 16	45	95	02 31	45	96	01 46	44	96	01 02	45	97	00 17	45	98	−0 28	45	98	−1 13	44	99	−1 57	45	100	−2 42	45	100	−3 27	45	101	−4 12	44	102	−4 56	45	102	−5 41	45	103	276			84
83	04 41	45	95	03 56	45	96	03 11	45	97	02 26	45	97	01 41	44	98	00 57	45	99	00 12	45	99	−0 33	45	100	−1 18	45	101	−2 03	45	101	−2 48	44	102	−3 32	45	103	−4 17	45	103	−5 02	45	104	−5 47	−44	105	277	83
82	05 21	45	96	04 36	45	97	03 51	45	97	03 06	45	98	02 21	45	99	01 36	45	99	00 51	45	100	00 06	45	101	−0 39	44	101	−1 23	45	102	−2 08	45	103	−2 53	45	103	−3 38	45	104	−4 23	45	105	−5 08	45	105	278	82
81	06 01	45	97	05 16	45	97	04 31	45	98	03 46	45	99	03 01	45	99	02 16	45	100	01 31	45	101	00 46	45	101	00 01	45	102	−0 44	45	103	−1 29	45	103	−2 14	45	104	−2 59	45	105	−3 44	45	105	−4 29	45	106	279	81
80	06 40	−45	97	05 55	−45	98	05 10	−45	99	04 25	−45	99	03 40	−45	100	02 55	−45	101	02 10	−45	101	01 25	−45	102	00 40	−45	103	−0 05	−45	103	−0 50	−45	104	−1 35	−45	105	−2 20	−46	105	−3 06	−45	106	−3 51	−45	107	280	80
79	07 20	45	98	06 35	45	99	05 50	45	100	05 05	45	100	04 20	45	101	03 35	45	102	02 50	46	102	02 04	45	103	01 19	45	104	00 34	45	104	−0 11	46	105	−0 57	45	105	−1 42	45	106	−2 27	45	107	−3 12	45	107	281	79
78	08 00	45	99	07 15	45	100	06 30	46	100	05 44	45	101	04 59	45	102	04 14	45	102	03 29	46	103	02 43	45	104	01 58	45	104	01 13	46	105	00 27	45	106	−0 18	45	106	−1 03	46	107	−1 49	45	108	−2 34	45	108	282	78
77	08 39	45	100	07 54	45	100	07 09	45	101	06 24	45	102	05 39	46	102	04 53	45	103	04 08	46	104	03 22	45	104	02 37	46	105	01 51	45	106	01 06	46	106	00 20	45	107	−0 25	46	108	−1 11	45	108	−1 56	45	109	283	77
76	09 19	45	100	08 34	46	101	07 48	45	102	07 03	45	102	06 18	46	103	05 32	45	104	04 47	46	104	04 01	45	105	03 16	46	106	02 30	46	106	01 44	45	107	00 59	46	108	00 13	45	108	−0 32	46	109	−1 18	46	110	284	76
75	09 58	−45	101	09 13	−45	102	08 28	−46	103	07 42	−45	103	06 57	−46	104	06 11	−45	105	05 26	−46	105	04 40	−46	106	03 54	−46	107	03 08	−45	107	02 23	−46	108	01 37	−46	108	00 51	−46	109	00 05	−45	110	−0 40	−46	110	285	75
74	10 38	46	102	09 52	45	103	09 07	46	103	08 21	45	104	07 36	46	105	06 50	46	105	06 04	46	106	05 18	45	107	04 33	46	107	03 47	46	108	03 01	46	109	02 15	46	109	01 29	46	110	00 43	46	110	−0 03	46	111	286	74
73	11 17	46	103	10 31	45	103	09 46	46	104	09 00	46	105	08 14	45	105	07 29	46	106	06 43	46	107	05 57	46	107	05 11	46	108	04 25	46	109	03 39	46	109	02 53	46	110	02 07	46	111	01 21	46	111	00 35	47	112	287	73
72	11 56	46	104	11 10	45	104	10 25	46	105	09 39	46	106	08 53	46	106	08 07	46	107	07 21	46	108	06 35	46	108	05 49	46	109	05 03	46	109	04 17	47	110	03 30	46	111	02 44	46	111	01 58	46	112	01 12	47	113	288	72
71	12 35	46	104	11 49	46	105	11 03	46	106	10 17	46	106	09 31	46	107	08 45	46	108	07 59	46	108	07 13	46	109	06 27	46	110	05 41	47	110	04 54	46	111	04 08	47	111	03 21	46	112	02 35	46	113	01 49	47	113	289	71
70	13 14	−46	105	12 28	−46	106	11 42	−46	106	10 56	−46	107	10 10	−46	108	09 24	−47	108	08 37	−46	109	07 51	−46	110	07 05	−47	110	06 18	−46	111	05 32	−47	112	04 45	−46	112	03 59	−47	113	03 12	−47	114	02 25	−46	114	290	70
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	13 52	46	106	13 06	46	107	12 20	46	107	11 34	46	108	10 48	46	109	10 02	47	109	09 15	46	110	08 29	47	110	07 42	46	111	06 56	47	112	06 09	47	112	05 22	47	113	04 35	46	114	03 49	47	114	03 02	47	115	291
68	14 31	46	107	13 45	46	107	12 59	47	108	12 12	46	109	11 26	47	109	10 39	46	110	09 53	47	111	09 06	46	111	08 20	47	112	07 33	47	113	06 46	47	113	05 59	47	114	05 12	47	114	04 25	47	115	03 38	47	116	292
67	15 09	46	108	14 23	46	108	13 37	47	109	12 50	46	109	12 04	47	110	11 17	47	111	10 30	46	111	09 44	47	112	08 57	47	113	08 10	47	113	07 23	47	114	06 36	47	115	05 49	48	115	05 01	47	116	04 14	47	116	293
66	15 48	47	108	15 01	46	109	14 15	47	110	13 28	47	110	12 41	46	111	11 55	47	112	11 08	47	112	10 21	47	113	09 34	47	113	08 47	48	114	07 59	47	115	07 12	47	115	06 25	48	116	05 37	47	117	04 50	47	117	294
65	16 26	−47	109	15 39	−47	110	14 52	−46	110	14 06	−47	111	13 19	−47	112	12 32	−47	112	11 45	−47	113	10 58	−48	114	10 10	−47	114	09 23	−47	115	08 36	−48	115	07 48	−47	116	07 01	−48	117	06 13	−47	117	05 26	−48	118	295
64	17 03	46	110	16 17	47	111	15 30	47	111	14 43	47	112	13 56	47	113	13 09	47	113	12 22	48	114	11 34	47	114	10 47	48	115	09 59	47	116	09 12	48	116	08 24	47	117	07 37	48	118	06 49	48	118	06 01	48	119	296
63	17 41	47	111	16 54	47	111	16 07	47	112	15 20	47	113	14 33	47	113	13 46	46	114	12 58	47	115	12 11	46	115	11 23	48	116	10 35	47	116	09 48	48	117	09 00	48	118	08 12	48	118	07 24	48	119	06 36	48	120	297
62	18 19	48	112	17 31	47	112	16 44	47	113	15 57	47	114	15 10	48	114	14 22	47	115	13 35	48	115	12 47	48	116	11 59	48	117	11 11	48	117	10 23	48	118	09 35	48	118	08 47	48	119	07 59	48	120	07 11	48	120	298
61	18 56	47	112	18 09	48	113	17 21	47	114	16 34	48	114	15 46	48	115	14 58	47	116	14 11	48	116	13 23	48	117	12 35	48	117	11 47	48	118	10 59	49	119	10 10	48	119	09 22	48	120	08 34	49	120	07 45	48	121	299
60	19 33	−48	113	18 45	−47	114	17 58	−48	115	17 10	−48	115	16 22	−47	116	15 35	−48	116	14 47	−48	117	13 59	−49	118	13 10	−48	118	12 22	−48	119	11 34	−49	119	10 45	−48	120	09 57	−49	121	09 08	−48	121	08 20	−49	122	300
59	20 10	48	114	19 22	48	115	18 34	48	115	17 46	48	116	16 58	48	117	16 10	48	117	15 22	48	118	14 34	48	118	13 46	49	119	12 57	48	120	12 09	49	120	11 20	49	121	10 31	49	121	09 42	48	122	08 54	49	123	301
58	20 46	48	115	19 58	48	116	19 10	48	116	18 22	48	117	17 34	48	117	16 46	48	118	15 58	49	119	15 09	48	119	14 21	49	120	13 32	49	121	12 43	49	121	11 54	49	122	11 05	49	122	10 16	49	123	09 27	49	123	302
57	21 22	48	116	20 34	48	116	19 46	48	117	18 58	48	118	18 10	49	118	17 21	48	119	16 33	49	120	15 44	49	120	14 55	49	121	14 06	49	121	13 17	49	122	12 28	49	123	11 39	49	123	10 50	49	124	10 01	50	124	303
56	21 58	48	117	21 10	48	117	20 22	48	118	19 34	49	119	18 45	49	119	17 56	49	120	17 07	48	120	16 19	49	121	15 30	50	122	14 40	49	122	13 51	49	123	13 02	49	123	12 13	50	124	11 23	49	125	10 34	50	125	304
55	22 34	−48	117	21 46	−49	118	20 57	−48	119	20 09	−49	119	19 20	−49	120	18 31	−49	121	17 42	−49	121	16 53	−49	122	16 04	−50	122	15 14	−49	123	14 25	−50	124	13 35	−49	124	12 46	−50	125	11 56	−50	125	11 06	−49	126	305
54	23 10	49	118	22 21	49	119	21 32	49	120	20 43	49	120	19 54	49	121	19 05	49	121	18 16	49	122	17 27	50	123	16 37	49	123	15 48	50	124	14 58	50	124	14 08	49	125	13 19	50	126	12 29	50	126	11 39	50	127	306
53	23 45	49	119	22 56	49	120	22 07	49	121	21 18	49	121	20 29	50	122	19 39	49	122	18 50	50	123	18 00	49	124	17 11	50	124	16 21	50	125	15 31	50	125	14 41	50	126	13 51	50	126	13 01	50	127	12 11	51	128	307
52	24 20	49	120	23 31	50	121	22 41	49	121	21 52	49	122	21 03	50	123	20 13	50	123	19 23	49	124	18 34	50	124	17 44	50	125	16 54	50	126	16 04	51	126	15 13	50	127	14 23	50	127	13 33	51	128	12 42	50	128	308
51	24 54	49	121	24 05	49	122	23 16	50	122	22 26	50	123	21 36	49	124	20 47	50	124	19 57	50	125	19 07	51	125	18 16	50	126	17 26	50	126	16 36	51	127	15 45	50	128	14 55	51	128	14 04	50	129	13 14	51	129	309
50	25 28	−49	122	24 39	−50	123	23 49	−49	123	23 00	−50	124	22 10	−50	124	21 20	−50	125	20 30	−51	126	19 39	−50	126	18 49	−51	127	17 58	−50	127	17 08	−51	128	16 17	−51	128	15 26	−51	129	14 35	−50	130	13 45	−51	130	310
49	26 02	49	123	25 13	50	123	24 23	50	124	23 33	50	125	22 43	51	125	21 52	50	126	21 02	51	126	20 11	50	127	19 21	51	128	18 30	51	128	17 39	51	129	16 48	51	129	15 57	51	130	15 06	53	130	14 15	51	131	311
48	26 36	50	124	25 46	50	124	24 56	50	125	24 06	51	126	23 15	50	126	22 25	51	127	21 34	51	127	20 43	51	128	19 52	51	129	19 01	51	129	18 10	51	130	17 19	51	130	16 28	51	131	15 37	52	131	14 46	51	132	312
47	27 09	50	125	26 19	50	125	25 29	51	126	24 38	51	127	23 47	50	127	22 57	51	128	22 06	51	128	21 15	51	129	20 24	52	129	19 32	51	130	18 41	51	131	17 50	52	131	16 58	51	132	16 07	52	132	15 15	52	133	313
46	27 42	51	126	26 51	50	126	26 01	51	127	25 10	51	127	24 19	51	128	23 28	51	129	22 37	51	129	21 46	52	130	20 54	51	130	20 03	52	131	19 11	51	131	18 20	52	132	17 28	52	132	16 36	52	133	15 44	52	134	314
45	28 14	−50	127	27 24	−51	127	26 33	−51	128	25 42	−51	128	24 51	−52	129	23 59	−51	130	23 08	−51	130	22 17	−52	131	21 25	−52	131	20 33	−52	132	19 41	−52	132	18 49	−52	133	17 57	−52	133	17 05	−52	134	16 13	−52	134	315
44	28 46	51	128	27 55	51	128	27 04	51	129	26 13	51	129	25 22	52	130	24 30	51	130	23 39	52	131	22 47	52	132	21 55	52	132	21 03	52	133	20 11	52	133	19 19	53	134	18 26	52	134	17 34	52	135	16 42	53	135	316
43	29 18	51	129	28 27	52	129	27 35	51	130	26 44	52	130	25 52	52	131	25 00	51	131	24 09	52	132	23 17	53	133	22 24	52	133	21 32	52	134	20 40	53	134	19 47	52	135	18 55	53	135	18 02	52	136	17 10	53	136	317
42	29 49	51	130	28 58	52	130	28 06	52	131	27 14	52	131	26 22	52	132	25 30	52	132	24 38	52	133	23 46	52	133	22 54	53	134	22 01	53	135	21 08	52	135	20 16	53	136	19 23	53	136	18 30	53	137	17 37	53	137	318
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0	42 00	−60	180	41 00	−60	180	40 00	−60	180	39 00	−60	180	38 00	−60	180	37 00	−60	180	36 00	−60	180	35 00	−60	180	34 00	−60	180	33 00	−60	180	32 00	−60	180	31 00	−60	180	30 00	−60	180	29 00	−60	180

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	57 00	+59	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	64 00	+60	180	65 00	+60	180	66 00	+60	180	67 00	+60	180	68 00	+60	180	69 00	+60	180	70 00	+60	180	71 00	+60	180	360
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25	51 05	+54	139	51 59	+53	139	52 52	+53	138	53 45	+52	137	54 37	+52	136	55 29	+52	135	56 21	+52	135	57 13	+51	134	58 04	+50	133	58 54	+50	132	59 44	+49	131	60 33	+49	129	61 22	+48	128	62 10	+48	127	62 58	+46	126	335
26	50 39	53	138	51 32	53	137	52 25	52	137	53 17	52	136	54 09	52	135	55 01	51	134	55 52	51	133	56 43	51	132	57 34	50	131	58 24	49	130	59 13	49	129	60 02	48	128	60 50	48	127	61 38	47	125	62 25	46	124	334
27	50 12	52	137	51 04	53	136	51 57	52	135	52 49	51	134	53 40	52	134	54 32	51	133	55 23	50	132	56 13	50	131	57 03	50	130	57 53	49	129	58 42	48	128	59 30	48	126	60 18	47	125	61 05	46	124	61 51	46	123	333
28	49 44	52	135	50 36	52	135	51 28	52	134	52 20	51	133	53 11	51	132	54 02	50	131	54 52	50	130	55 42	50	129	56 32	49	128	57 21	49	127	58 10	47	126	58 57	48	125	59 45	46	124	60 31	46	123	61 17	45	121	332
29	49 15	52	134	50 07	52	133	50 59	51	133	51 50	51	132	52 41	50	131	53 31	51	130	54 22	49	129	55 11	49	128	56 00	49	127	56 49	48	126	57 37	47	125	58 24	47	124	59 11	46	123	59 57	46	121	60 43	44	120	331
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35	46 12	+50	127	47 02	+49	126	47 51	+49	125	48 40	+49	124	49 29	+48	123	50 17	+48	122	51 05	+47	122	51 52	+47	121	52 39	+46	120	53 25	+46	118	54 11	+45	117	54 56	+44	116	55 40	+44	115	56 24	+42	114	57 06	+42	113	325
36	45 40	49	126	46 29	49	125	47 18	49	124	48 07	48	123	48 55	48	122	49 43	47	121	50 30	47	120	51 17	47	119	52 04	46	118	52 50	45	117	53 35	44	116	54 19	44	115	55 03	44	114	55 47	42	113	56 29	42	111	324
37	45 07	49	125	45 56	49	124	46 45	48	123	47 33	48	122	48 21	48	121	49 09	47	120	49 56	46	119	50 42	46	118	51 28	46	117	52 14	45	116	52 59	44	115	53 43	44	114	54 27	42	113	55 09	43	112	55 52	41	110	323
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39	44 00	48	122	44 48	48	122	45 36	48	121	46 24	47	120	47 11	47	119	47 58	47	118	48 45	46	117	49 31	45	116	50 16	45	115	51 01	44	114	51 45	44	113	52 29	43	112	53 12	42	111	53 54	42	109	54 36	41	108	321
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41	42 51	48	120	43 39	48	119	44 27	47	119	45 14	46	118	46 00	47	117	46 47	46	116	47 33	45	115	48 18	45	114	49 03	44	113	49 47	44	112	50 31	43	111	51 14	42	110	51 56	42	109	52 38	41	107	53 19	40	106	319
42	42 16	48	119	43 04	47	118	43 51	47	117	44 38	46	117	45 24	46	116	46 10	46	115	46 56	45	114	47 41	45	113	48 26	44	112	49 10	43	111	49 53	43	110	50 36	42	109	51 18	42	108	52 00	40	106	52 40	41	105	318
43	41 41	47	118	42 28	47	117	43 15	47	116	44 02	46	116	44 48	46	115	45 34	45	114	46 19	45	113	47 04	44	112	47 48	44	111	48 32	43	110	49 15	43	109	49 58	42	108	50 40	41	107	51 21	41	105	52 02	39	104	317
44	41 06	47	117	41 53	46	116	42 39	47	115	43 26	45	115	44 11	46	114	44 57	45	113	45 42	44	112	46 26	45	111	47 11	43	110	47 54	43	109	48 37	42	108	49 19	42	107	50 01	41	106	50 42	41	104	51 23	39	103	316
45	40 30	+46	116	41 16	+47	115	42 03	+46	114	42 49	+46	114	43 35	+45	113	44 20	+45	112	45 05	+44	111	45 49	+44	110	46 33	+43	109	47 16	+43	108	47 59	+42	107	48 41	+41	106	49 22	+41	105	50 03	+40	103	50 43	+40	102	315
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49	38 03	46	112	38 49	45	111	39 34	46	111	40 20	44	110	41 04	45	109	41 49	44	108	42 33	43	107	43 16	43	106	43 59	43	105	44 42	42	104	45 24	41	102	46 06	40	101	46 46	40	100	47 26	40	100	48 06	39	99	311
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55	34 16	+45	107	35 01	+44	106	35 45	+44	105	36 29	+44	104	37 13	+43	103	37 56	+43	103	38 39	+43	102	39 22	+42	101	40 04	+42	100	40 46	+41	99	41 27	+40	98	42 07	+41	97	42 48	+39	96	43 27	+39	95	44 06	+39	94	305
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57	32 59	44	105	33 43	44	104	34 27	44	103	35 11	44	103	35 55	43	102	36 38	42	101	37 20	43	100	38 03	42	99	38 45	41	98	39 26	41	97	40 07	41	96	40 48	40	95	41 28	39	94	42 07	39	93	42 46	38	92	303
58	32 20	44	104	33 04	44	103	33 48	44	103	34 32	43	102	35 15	43	101	35 58	43	100	36 41	42	99	37 23	42	98	38 05	41	97	38 46	41	96	39 27	41	96	40 08	40	95	40 48	39	94	41 27	39	93	42 06	38	92	302
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61	30 23	44	102	31 07	43	101	31 50	44	100	32 34	43	99	33 17	42	98	33 59	43	98	34 42	42	97	35 24	41	96	36 05	41	95	36 46	41	94	37 27	40	93	38 07	40	92	38 47	40	91	39 27	38	90	40 05	39	89	299
62	29 43	44	101	30 27	44	100	31 11	43	99	31 54	43	98	32 37	42	98	33 19	43	97	34 02	42	96	34 44	41	95	35 25	41	94	36 06	41	93	36 47	40	92	37 27	40	91	38 07	39	91	38 46	39	90	39 25	39	89	298
63	29 04	44	100	29 48	43	99	30 31	43	98	31 14	43	98	31 57	43	97	32 40	42	96	33 22	42	95	34 04	41	94	34 45	41	93	35 26	41	93	36 07	40	92	36 47	40	91	37 27	39	90	38 06	39	89	38 45	39	88	297
64	28 24	44	99	29 08	43	98	29 51	43	98	30 34	43	97	31 17	43	96	32 00	42	95	32 42	41	94	33 23	42	94	34 05	41	93	34 46	41	92	35 27	40	91	36 07	40	90	36 47	39	89	37 26	39	88	38 05	39	87	296
65	27 45	+43	98	28 28	+43	98	29 11	+43	97	29 54	+43	96	30 37	+43	95	31 20	+42	94	32 02	+41	94	32 43	+42	93	33 25	+41	92	34 06	+41	91	34 47	+40	90	35 27	+40	89	36 07	+39	88	36 46	+39	87	37 25	+39	86	295
66	27 05	43	98	27 48	44	97	28 32	42	96	29 14	43	95	29 57	42	94	30 39	43	94	31 22	41	93	32 03	42	92	32 45	41	91	33 26	40	90	34 06	41	89	34 47	40	88	35 27	39	88	36 06	39	87	36 45	39	86	294
67	26 25	43	97	27 08	44	96	27 52	42	95	28 34	43	95	29 17	42	94	29 59	42	93	30 41	42	92	31 23	42	91	32 05	41	90	32 46	40	90	33 26	41	89	34 07	39	88	34 46	40	87	35 26	39	86	36 05	39	85	293
68	25 45	43	96	26 28	44	95	27 12	42	95	27 54	43	94	28 37	42	93	29 19	42	92	30 01	42	91	30 43	41	90	31 24	41	90	32 05	41	89	32 46	40	88	33 26	40	87	34 06	40	87	34 46	39	85	35 25	39	84	292
69	25 05	43	95	25 48	44	95	26 32	42	94	27 14	43	93	27 57	42	92	28 39	42	91	29 21	42	91	30 03	41	90	30 44	41	89	31 25	41	88	32 06	40	87	32 46	40	86

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (15°- 29°) SAME NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	24 25	+43	95	25 08	+43	94	25 51	+43	93	26 34	+43	92	27 17	+42	91	27 59	+42	91	28 41	+42	90	29 23	+41	89	30 04	+41	88	30 45	+41	87	31 26	+40	86	32 06	+40	86	32 46	+40	85	33 26	+39	84	34 05	+39	83	290
71	23 45	43	94	24 28	43	93	25 11	43	92	25 54	43	91	26 37	42	91	27 19	42	90	28 01	42	89	28 43	41	88	29 24	41	87	30 05	41	87	30 46	40	86	31 26	40	85	32 06	40	84	32 46	39	83	33 25	39	82	289
72	23 05	43	93	23 48	43	92	24 31	43	92	25 14	42	91	25 56	43	90	26 39	42	89	27 21	41	88	28 02	42	88	28 44	41	87	29 25	41	86	30 06	40	85	30 46	40	84	31 26	40	83	32 06	40	82	32 46	39	82	288
73	22 25	43	92	23 08	43	92	23 51	43	91	24 34	42	90	25 16	43	89	25 59	42	88	26 41	41	88	27 22	42	87	28 04	41	86	28 45	41	85	29 26	40	84	30 06	41	83	30 47	39	83	31 26	40	82	32 06	39	81	287
74	21 45	43	92	22 28	43	91	23 11	43	90	23 54	42	89	24 36	42	88	25 18	43	88	26 01	41	87	26 42	42	86	27 24	41	85	28 05	41	84	28 46	41	84	29 27	40	83	30 07	40	82	30 47	39	81	31 26	40	80	286
75	21 05	+43	91	21 48	+43	90	22 31	+43	89	23 14	+42	89	23 56	+42	88	24 38	+42	87	25 20	+42	86	26 02	+42	85	26 44	+41	85	27 25	+41	84	28 06	+41	83	28 47	+40	82	29 27	+40	81	30 07	+40	80	30 47	+39	80	285
76	20 24	44	90	21 08	43	89	21 51	42	89	22 33	43	88	23 16	42	87	23 58	42	86	24 40	42	85	25 22	42	85	26 04	41	84	26 45	41	83	27 26	41	82	28 07	40	81	28 47	41	81	29 28	39	80	30 07	40	79	284
77	19 44	44	89	20 28	43	89	21 11	42	88	21 53	43	87	22 36	42	86	23 18	42	86	24 00	42	85	24 42	42	84	25 24	41	83	26 05	41	82	26 46	41	82	27 27	41	81	28 08	40	80	28 48	40	79	29 28	40	78	283
78	19 04	43	89	19 47	43	88	20 30	43	87	21 13	43	86	21 56	42	86	22 38	42	85	23 20	42	84	24 02	42	83	24 44	42	82	25 26	41	82	26 07	41	81	26 48	40	80	27 28	41	79	28 09	40	78	28 49	40	78	282
79	18 24	43	88	19 07	43	87	19 50	43	86	20 33	43	86	21 16	42	85	21 58	43	84	22 41	42	83	23 23	41	83	24 04	42	82	24 46	41	81	25 27	41	80	26 08	41	79	26 49	40	79	27 29	41	78	28 10	40	77	281
80	17 44	+43	87	18 27	+43	86	19 10	+43	86	19 53	+43	85	20 36	+42	84	21 18	+43	83	22 01	+42	83	22 43	+42	82	23 25	+41	81	24 06	+42	80	24 48	+41	79	25 29	+41	79	26 10	+40	78	26 50	+41	77	27 31	+40	76	280
81	17 04	43	86	17 47	43	86	18 30	43	85	19 13	43	84	19 56	43	83	20 39	42	83	21 21	42	82	22 03	42	81	22 45	42	80	23 27	41	80	24 08	42	79	24 50	41	78	25 31	40	77	26 11	41	76	26 52	40	76	279
82	16 24	43	86	17 07	43	85	17 50	43	84	18 33	43	83	19 16	43	83	19 59	42	82	20 41	42	81	21 23	43	80	22 06	41	80	22 47	42	79	23 29	41	78	24 10	41	77	24 51	41	77	25 32	41	76	26 13	40	75	278
83	15 44	43	85	16 27	43	84	17 10	43	83	17 53	43	83	18 36	43	82	19 19	43	81	20 02	42	80	20 44	42	80	21 26	42	79	22 08	42	78	22 50	41	77	23 31	41	77	24 12	41	76	24 53	41	75	25 34	41	74	277
84	15 04	43	84	15 47	44	83	16 31	43	83	17 14	43	82	17 57	42	81	18 39	43	81	19 22	42	80	20 04	43	79	20 47	42	78	21 29	42	78	22 11	41	77	22 52	42	76	23 34	41	75	24 15	41	74	24 56	40	74	276
85	14 24	+43	83	15 07	+44	83	15 51	+43	82	16 34	+43	81	17 17	+43	81	18 00	+43	80	18 43	+42	79	19 25	+42	78	20 07	+43	78	20 50	+42	77	21 32	+41	76	22 13	+42	75	22 55	+41	75	23 36	+41	74	24 17	+41	73	275
86	13 44	44	83	14 28	43	82	15 11	43	81	15 54	43	81	16 37	43	80	17 20	43	79	18 03	43	78	18 46	42	78	19 28	43	77	20 11	42	76	20 53	42	75	21 35	41	75	22 16	42	74	22 58	41	73	23 39	41	72	274
87	13 04	44	82	13 48	43	81	14 31	44	81	15 15	43	80	15 58	43	79	16 41	43	78	17 24	43	78	18 07	42	77	18 49	43	76	19 32	42	75	20 14	42	75	20 56	42	74	21 38	41	73	22 19	42	72	23 01	41	72	273
88	12 25	43	81	13 08	44	81	13 52	43	80	14 35	44	79	15 19	43	78	16 02	43	78	16 45	43	77	17 28	42	76	18 10	43	76	18 53	42	75	19 35	42	74	20 17	42	73	20 59	42	73	21 41	42	72	22 23	41	71	272
89	11 45	44	81	12 29	43	80	13 12	44	79	13 56	43	78	14 39	44	78	15 23	43	77	16 06	43	76	16 49	42	76	17 31	43	75	18 14	43	74	18 57	42	73	19 39	42	73	20 21	42	72	21 03	42	71	21 45	41	70	271
90	11 05	+44	80	11 49	+44	79	12 33	+44	78	13 17	+43	78	14 00	+43	77	14 43	+44	76	15 27	+43	76	16 10	+43	75	16 53	+43	74	17 36	+42	73	18 18	+43	73	19 01	+42	72	19 43	+42	71	20 25	+42	70	21 07	+42	70	270
91	10 26	44	79	11 10	44	78	11 54	43	78	12 37	43	77	13 21	44	76	14 05	43	76	14 48	43	75	15 31	43	74	16 14	43	73	16 57	43	73	17 40	43	72	18 23	42	71	19 05	42	71	19 47	42	70	20 29	42	69	269
92	09 47	44	78	10 31	43	78	11 14	44	77	11 58	44	76	12 42	44	76	13 26	43	75	14 09	44	74	14 53	43	73	15 36	43	73	16 19	43	72	17 02	43	71	17 45	42	71	18 27	43	70	19 10	42	69	19 52	42	68	268
93	09 07	44	78	09 51	44	77	10 35	44	76	11 19	44	76	12 03	44	75	12 47	44	74	13 31	43	74	14 14	44	73	14 58	43	72	15 41	43	71	16 24	43	71	17 07	43	70	17 50	42	69	18 32	43	68	19 15	42	68	267
94	08 28	44	77	09 12	44	76	09 56	45	76	10 41	44	75	11 25	43	74	12 08	44	74	12 52	44	73	13 36	43	72	14 19	44	71	15 03	43	71	15 46	43	70	16 29	43	69	17 12	43	69	17 55	43	68	18 38	42	67	266
95	07 49	+44	76	08 33	+45	76	09 18	+44	75	10 02	+44	74	10 46	+44	73	11 30	+44	73	12 14	+44	72	12 58	+43	71	13 41	+44	71	14 25	+44	70	15 09	+43	69	15 52	+43	69	16 35	+43	68	17 18	+43	67	18 01	+43	66	265
96	07 10	45	76	07 55	44	75	08 39	44	74	09 23	45	73	10 08	44	72	10 52	44	72	11 36	44	71	12 20	44	71	13 04	43	70	13 47	44	69	14 31	44	69	15 15	43	68	15 58	43	67	16 41	43	66	17 24	43	66	264
97	06 31	45	75	07 16	44	74	08 00	45	73	08 45	43	73	09 29	45	72	10 14	44	71	10 58	44	71	11 42	44	70	12 26	44	69	13 10	44	69	13 54	43	68	14 37	44	67	15 21	43	67	16 04	44	66	16 48	43	65	263
98	05 53	44	74	06 37	45	73	07 22	45	73	08 07	44	72	08 51	45	71	09 36	44	71	10 20	44	70	11 04	45	69	11 49	44	69	12 33	44	68	13 17	44	67	14 01	43	67	14 44	44	66	15 28	43	65	16 11	44	64	262
99	05 14	45	73	05 59	45	73	06 44	44	72	07 28	45	71	08 13	45	71	08 58	44	70	09 42	45	69	10 27	44	69	11 11	45	68	11 56	44	67	12 40	44	67	13 24	44	66	14 08	44	65	14 52	43	64	15 35	44	64	261
100	04 36	+45	73	05 21	+45	72	06 06	+45	71	06 51	+44	71	07 35	+45	70	08 20	+45	69	09 05	+45	69	09 50	+44	68	10 34	+45	67	11 19	+44	67	12 03	+44	66	12 47	+44	65	13 31	+44	64	14 15	+44	64	14 59	+44	63	260
101	03 57	46	72	04 43	45	71	05 28	45	71	06 13	45	70	06 58	45	69	07 43	45	69	08 28	44	68	09 12	45	67	09 57	45	67	10 42	44	66	11 26	45	65	12 11	44	65	12 55	45	64	13 40	44	63	14 24	44	62	259
102	03 19	46	71	04 05	45	71	04 50	45	70	05 35	45	69	06 20	45	69	07 05	46	68	07 51	45	67	08 36	44	67	09 20	45	66	10 05	45	65	10 50	45	65	11 35	44	64	12 19	45	63	13 04	44	62	13 48	45	62	258
103	02 41	46	70	03 27	45	70	04 12	46	69	04 58	45	68	05 43	45	68	06 28	46	67	07 14	45	66	07 59	45	66	08 44	45	65	09 29	45	64	10 14	45	64	10 59	45	63	11 44	44	62	12 28	45	62	13 13	45	61	257
104	02 04	45	70	02 49	46	69	03 35	45	68	04 20	46	68	05 06	45	67	05 51	46	66	06 37	45	66	07 22	46	65	08 08	45	64	08 53	45	64	09 38	45	63	10 23	45	62	11 08	45	62	11 53	45	61	12 38	45	60	256
105	01 26	+46	69	02 12	+46	68	02 58	+45	68	03 43	+46	67	04 29	+46	66	05 15	+45	66	06 00	+46	65	06 46	+45	64	07 31	+46	64	08 17	+45	63	09 02	+46	62	09 48	+45	62	10 33	+45	61	11 18	+45	60	12 03	+45	60	255
106	00 49	46	68	01 35	46	68	02 21	46	67	03 07	45	66	03 52	46	66	04 38	46	65	05 24	46	64	06 10	46	64	06 56	45	63	07 41	46	62	08 27	45	62	09 12	46	61	09 58	45	60	10 43	46	60	11 29	45	59	254
107	00 12	46	67	00 58	46	67	01 44	46	66	02 30	46	66	03 16	46	65	04 02	46	64	04 48	46	64	05 34	46	63	06 20	46	62	07 06	46	62	07 52	45	61	08 37	46	60	09 23	46	60	10 09	45	59	10 54	46	58	253
108	−0 25	46	67	00 21	46	66	01 07	46	65	01 53	47	65	02 40	46	64	03 26	46	64	04 12	46	63	04 58	46	62	05 44	47	62	06 31	46	61	07 17	46	60	08 03	46	60	08 49	45	59	09 34	46	58	10 20	46	58	252
109	−1 02	46	66	−0 16	47	65	00 31	46	65	01 17	47	64	02 04	46	63	02 50	47	63	03 37	46	62	04 23	46	62	05 09	47	61	05 56	46	60	06 42	46	60	07 28	46	59	08 14	46	58	09 00	46	58	09 46	46	57	251
110	−1 39	+47	65	−0 52	+47	65	−0 05	+46	64	00 41	+47	63	01 28	+47	63	02 15	+46	62	03 01	+47	61	03 48	+46	61	04 34	+47	60	05 21	+46	60	06 07	+47	59	06 54	+46	58	07 40	+47	58	08 27	+46	57	09 13	+46	56	250
111	−2 15	47	64	−1 28	47	64	−0 41	46	63	00 05	47	63	00 52	47	62	01 39	47	61	02 26	47	61	03 13	47	60	04 00	46	59	04 46	47	59	05 33	47	58	06 20	46	58	07 06	47	57	07 53	47	56	08 40	46	56	249
112	−2 51	47	64	−2 04	47	63	−1 17	47	62	−0 30	47	62	00 17	47	61	01 04	47	61	01 51	47	60	02 38	47	59	03 25	47	59	04 12	47	58	04 59	47	58	05 46	47	57	06 33	47	56	07 20	47	56	08 07	46	55	248
113	−3 27	47	63	−2 40	47	62	−1 53	48	62	−1 05	47	61	−0 18	47	61	00 29	47	60	01 16	48	59	02 04	47	59	02 51	47	58	03 38	47	57	04 25	48	57	05 13	47	56	06 00	47	56	06 47	47	55	07 34	47	54	247
114	−4 03	48	62	−3 15	47	62	−2 28	48	61	−1 40	47	60	−0 53	48	60	−0 05	47	59	00 42	48	59	01 30	47	58	02 17	47	57	03 04	48	57	03 52	47	56	04 39	48	55	05 27	47	55	06 14	47	54	07 01	48	54	246
115	−4 38	+48	61	−3 50	+47	61	−3 03	+48	60	−2 15	+48	60	−1 27	+47	59	−0 40	+48	58	00 08	+48	58	00 56	+47	57	01 43	+48	57	02 31	+48	56	03 19	+47	55	04 06	+48	55	04 54	+48	54	05 42	+47	54	06 29	+48	53	245
116	−5 13	48	61	−4 25	47	60	−3 38	48	59	−2 50	48	59	−2 02	48	58	−1 14	48	58	−0 26	48	57	00 22	48	56	01 10	48	56	01 58	48	55	02 46	48	55	03 34	48	54	04 22	47	53	05 09	48	53	05 57	48	52	244
117	−5 48	+48	60	−5 00	48	59	−4 12	48	59	−3 24	48	58	−2 36	48	57	−1 48	49	57	−0 59	48	56	−0 11	48	56	00 37	48	55	01 25	48	55	02 13	48	54	03 01	49	53	03 50	48	53	04 38	48	52	05 26	48	52	243
			118	−5 34	46	59	−4 46	48	58	−3 58	49	57	−3 09	48	57	−2 21	48	56	−1 33	49	56	−0 44	48	55	00 04	49	54	00 53	48	54	01 41	48	53	02 29	49	53	03 18	48	52	04 06	48	51	04 54	49	51	242
			119	−6 09	+49	58	−5 20	49	57	−4 31	48	57	−3 43	49	56	−2 54	48	55	−2 06	49	55	−1 17	49	54	−0 28	48	54	00 20	49	53	01 09	49	52	01 58	48	52	02 46	49	51	03 35	48	51	04 23	49	50	241
						120	−5 54	+49	56	−5 05	+49	56	−4 16	+49	54	−3 27	+49	55	−2 38	+49	54	−1 49	+48	53	−1 01	+49	53	−0 12	+49	52	00 37	+49	52	01 26	+49	51	02 15	+49	51	03 04	+49	50	03 53	+49	49	240
									121	−5 38	49	55	−4 49	49	54	−4 00	49	54	−3 11	50	53	−2 21	49	53	−1 32	49	52	−0 43	49	52	00 06	49	51	00 55	49	50	01 44	49	50	02 33	49	49	03 22	50	49	239
										−6 11	+50	54	−5 21	49	54	−4 32	49	53	−3 43	50	53	−2 53	49	52	−2 04	50	51	−1 14	49	51	−0 25	49	50	00 24	50	50	01 14	49	49	02 03	49	49	02 52	50	48	238
												123	−5 53	+49	53	−5 04	50	52	−4 14	49	52	−3 25	50	51	−2 35	50	51	−1 45	49	50	−0 56	50	49	−0 06	50	49	00 44	49	48	01 33	50	48	02 23	49	47	237
															124	−5 35	49	52	−4 46	50	51	−3 56	50	50	−3 06	50	50	−2 16	50	49	−1 26	50	49	−0 36	50	48	00 14	50	48	01 04	50	47	01 54	49	47	236
																−6 07	+50	51	−5 17	+50	50	−4 27	+51	50	−3 36	+50	49	−2 46	+50	49	−1 56	+50	48	−1 06	+50	47	−0 16	+50	47	00 34	+51	46	01 25	+50	46	235
																		126	−5 47	50	49	−4 57	50	49	−4 07	51	48	−3 16	50	48	−2 26	51	47	−1 35	50	47	−0 45	51	46	00 06	50	46	00 56	50	45	234
																		127	−6 18	+51	49	−5 27	51	48	−4 36	50	48	−3 46	51	47	−2 55	51	46	−2 04	50	46	−1 14	51	45	−0 23	51	45	00 28	50	44	233
																					128	−5 57	+51	47	−5 06	51	47	−4 15	51	46	−3 24	51	46	−2 33	51	45	−1 42	51	45	−0 51	51	44	00 00	51	44	232
																								129	−5 35	51	46	−4 44	52	45	−3 52	51	45	−3 01	51	44	−2 10	51	44	−1 19	51	43	−0 28	52	43	231
																								130	−6 04	+52	45	−5 12	+51	45	−4 21	+52	44	−3 29	+51	44	−2 38	+52	43	−1 46	+51	43	−0 55	+52	42	230
																														131	−5 40	52	44	−4 48	51	43	−3 57	52	43	−3 05	52	42	−2 13	52	42	−1 21	51	41	229
																														132	−6 08	+52	43	−5 16	52	43	−4 24	52	42	−3 32	52	42	−2 40	52	41	−1 48	52	41	228
																																		133	−5 43	53	42	−4 50	52	41	−3 58	52	41	−3 06	52	40	−2 14	53	40	227
																																		134	−6 09	+52	41	−5 17	53	40	−4 24	52	40	−3 32	53	40	−2 39	53	39	226
																																					135	−5 43	+53	40	−4 50	+53	39	−3 57	+53	39	−3 04	+53	38	225
																																					136	−6 08	+53	39	−5 15	53	38	−4 22	53	38	−3 29	53	37	224
																																								137	−5 40	54	38	−4 46	53	37	−3 53	53	37	223
																																							138	−6 04	+54	37	−5 10	53	36	−4 17	54	36	222
																																									139	−5 34	54	36	−4 40	54	35	221
LHA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			LHA

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z$

DECLINATION (15°- 29°) SAME NAME AS LATITUDE

LAT 48°

LAT 48°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 48°

HA	15° Hc d Z	16° Hc d Z	17° Hc d Z	18° Hc d Z	19° Hc d Z	20° Hc d Z	21° Hc d Z	22° Hc d Z	23° Hc d Z	24° Hc d Z	25° Hc d Z	26° Hc d Z	27° Hc d Z	28° Hc d Z	29° Hc d Z	LHA
°	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	°
													140	−5 57 +54 35	−5 03 +54 34	220
													141	−5 25 54 34	219	
													142	−5 47 54 33	218	
													143	−6 09 +55 32	217	
82	−5 53 −44 106	278														
81	−5 14 45 107	−5 59 −45 107	279													
80	−4 36 −45 107	−5 21 −45 108	−6 06 −45 109	280												
79	−3 57 46 108	−4 43 45 109	−5 28 45 109	−6 13 −45 110	281											
78	−3 19 46 109	−4 05 45 109	−4 50 45 110	−5 35 45 111	−6 20 −45 111	282										
77	−2 41 46 110	−3 27 45 110	−4 12 46 111	−4 58 45 112	−5 43 45 112	283										
76	−2 04 45 110	−2 49 46 111	−3 35 45 112	−4 20 46 112	−5 06 45 113	−5 51 −46 114	284									
75	−1 26 −46 111	−2 12 −46 112	−2 58 −45 112	−3 43 −46 113	−4 29 −46 114	−5 15 −45 114	−6 00 −46 115	285								
74	−0 49 46 112	−1 35 46 112	−2 21 46 113	−3 07 45 114	−3 52 46 114	−4 38 46 115	−5 24 46 116	−6 10 −46 116	286							
73	−0 12 46 113	−0 58 46 113	−1 44 46 114	−2 30 46 114	−3 16 46 115	−4 02 46 116	−4 48 46 116	−5 34 46 117	−6 20 −46 118	287						
72	00 25 46 113	−0 21 46 114	−1 07 46 115	−1 53 47 115	−2 40 46 116	−3 26 46 116	−4 12 46 117	−4 58 46 118	−5 44 47 118	288						
71	01 02 46 114	00 16 47 115	−0 31 46 115	−1 17 47 116	−2 04 46 117	−2 50 47 117	−3 37 46 118	−4 23 46 118	−5 09 47 119	−5 56 −46 120	289					
70	01 39 −47 115	00 52 −47 115	00 05 −46 116	−0 41 −47 117	−1 28 −47 117	−2 15 −46 118	−3 01 −47 119	−3 48 −46 119	−4 34 −47 120	−5 21 −46 120	−6 07 −47 121	290				
	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	02 15	47	116	01 28	47	116	00 41	46	117	−0 05	47	117	−0 52	47	118	−1 39	47	119	−2 26	47	119	−3 13	47	120	−4 00	46	121	−4 46	47	121	−5 33	47	122	−6 20	−46	122	291										69
68	02 51	47	116	02 04	47	117	01 17	47	118	00 30	47	118	−0 17	47	119	−1 04	47	119	−1 51	47	120	−2 38	47	121	−3 25	47	121	−4 12	47	122	−4 59	47	122	−5 46	47	123	292										68
67	03 27	47	117	02 40	47	118	01 53	48	118	01 05	47	119	00 18	47	119	−0 29	47	120	−1 16	48	121	−2 04	47	121	−2 51	47	122	−3 38	47	123	−4 25	48	123	−5 13	47	124	−6 00	−47	124	293								67
66	04 03	48	118	03 15	47	118	02 28	48	119	01 40	47	120	00 53	48	120	00 05	47	121	−0 42	48	121	−1 30	47	122	−2 17	47	123	−3 04	48	123	−3 52	47	124	−4 39	48	125	−5 27	47	125	−6 14	−47	126	294						66
65	04 38	−48	119	03 50	−47	119	03 03	−48	120	02 15	−48	120	01 27	−47	121	00 40	−48	122	−0 08	−48	122	−0 56	−47	123	−1 43	−48	123	−2 31	−48	124	−3 19	−47	125	−4 06	−48	125	−4 54	−48	126	−5 42	−47	126	295						65
64	05 13	48	119	04 25	47	120	03 38	48	121	02 50	48	121	02 02	48	122	01 14	48	122	00 26	48	123	−0 22	48	124	−1 10	48	124	−1 58	48	125	−2 46	48	125	−3 34	48	126	−4 22	47	127	−5 09	48	127	−5 57	−48	128	296	64
63	05 48	48	120	05 00	48	121	04 12	48	121	03 24	48	122	02 36	48	123	01 48	49	123	00 59	48	124	00 11	48	124	−0 37	48	125	−1 25	48	125	−2 13	48	126	−3 01	49	127	−3 50	48	127	−4 38	48	128	−5 26	48	128	297	63
62	06 23	49	121	05 34	48	121	04 46	48	122	03 58	49	123	03 09	48	123	02 21	48	124	01 33	49	124	00 44	48	125	−0 04	49	126	−0 53	48	126	−1 41	48	127	−2 29	49	127	−3 18	48	128	−4 06	48	129	−4 54	49	129	298	62
61	06 57	48	122	06 09	49	122	05 20	49	123	04 31	48	123	03 43	49	124	02 54	48	125	02 06	49	125	01 17	49	126	00 28	48	126	−0 20	49	127	−1 09	49	128	−1 58	48	128	−2 46	49	129	−3 35	48	129	−4 23	49	130	299	61
60	07 31	−49	122	06 42	−48	123	05 54	−49	124	05 05	−49	124	04 16	−49	125	03 27	−49	125	02 38	−49	126	01 49	−48	127	01 01	−49	127	00 12	−49	128	−0 37	−49	128	−1 26	−49	129	−2 15	−49	129	−3 04	−49	130	−3 53	−49	131	300	60
59	08 05	49	123	07 16	49	124	06 27	49	124	05 38	49	125	04 49	49	126	04 00	49	126	03 11	50	127	02 21	49	127	01 32	49	128	00 43	49	128	−0 06	49	129	−0 55	49	130	−1 44	49	130	−2 33	49	131	−3 22	50	131	301	59
58	08 38	49	124	07 49	49	125	07 00	49	125	06 11	50	126	05 21	49	126	04 32	49	127	03 43	50	127	02 53	49	128	02 04	50	129	01 14	49	129	00 25	49	130	−0 24	50	130	−1 14	49	131	−2 03	49	131	−2 52	50	132	302	58
57	09 11	49	125	08 22	50	125	07 32	49	126	06 43	50	127	05 53	49	127	05 04	50	128	04 14	49	128	03 25	50	129	02 35	50	129	01 45	49	130	00 56	50	131	00 06	50	131	−0 44	49	132	−1 33	50	132	−2 23	49	133	303	57
56	09 44	50	126	08 54	49	126	08 05	50	127	07 15	50	127	06 25	50	128	05 35	49	128	04 46	50	129	03 56	50	130	03 06	50	130	02 16	50	131	01 26	50	131	00 36	50	132	−0 14	50	132	−1 04	50	133	−1 54	49	133	304	56
55	10 17	−50	126	09 27	−50	127	08 37	−50	128	07 47	−50	128	06 57	−50	129	06 07	−50	129	05 17	−50	130	04 27	−51	130	03 36	−50	131	02 46	−50	131	01 56	−50	132	01 06	−50	133	00 16	−50	133	−0 34	−51	134	−1 25	−50	134	305	55
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0	27 00	−60	180	26 00	−60

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	360
1	41 00	60	179	42 00	60	179	43 00	60	179	44 00	60	179	45 00	60	179	46 00	59	179	46 59	60	179	47 59	60	179	48 59	60	178	49 59	60	178	50 59	60	178	51 59	60	178	52 59	60	178	53 59	60	178	54 59	60	178	359
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64	16 43	47	110	17 30	47	110	18 17	47	109	19 04	47	108	19 51	47	108	20 38	46	107	21 24	46	106	22 10	47	106	22 57	46	105	23 43	45	104	24 28	46	103	25 14	45	103	25 59	46	102	26 45	45	101	27 30	44	101	296
65	16 06	+47	109	16 53	+47	109	17 40	+47	108	18 27	+46	107	19 13	+47	107	20 00	+46	106	20 46	+46	105	21 32	+47	105	22 19	+45	104	23 04	+46	103	23 50	+46	103	24 36	+45	102	25 21	+45	101	26 06	+45	100	26 51	+44	100	295
66	15 29	47	109	16 16	46	108	17 02	47	107	17 49	47	107	18 36	46	106	19 22	46	105	20 08	46	105	20 54	46	104	21 40	46	103	22 26	46	103	23 12	45	102	23 57	45	101	24 42	45	100	25 27	45	100	26 12	45	99	294
67	14 51	47	108	15 38	47	107	16 25	46	106	17 11	47	106	17 58	46	105	18 44	46	104	19 30	46	104	20 16	46	103	21 02	46	102	21 48	45	102	22 33	45	101	23 18	45	100	24 03	45	100	24 48	45	99	25 33	45	98	293
68	14 14	46	107	15 00	47	106	15 47	46	106	16 33	47	105	17 20	46	104	18 06	46	104	18 52	46	103	19 38	45	102	20 23	46	102	21 09	45	101	21 54	46	100	22 40	45	100	23 25	44	99	24 09	45	98	24 54	44	97	292
69	13 36	46	106	14 22	47	106	15 09	46	105	15 55	46	104	16 41	46	104	17 27	46	103	18 13	46	102	18 59	46	101	19 45	45	101	20 30	46

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	12 58	+46	105	13 44	+47	105	14 31	+46	104	15 17	+46	103	16 03	+46	103	16 49	+46	102	17 35	+46	101	18 21	+45	101	19 06	+45	100	19 51	+46	99	20 37	+45	99	21 22	+45	98	22 07	+44	97	22 51	+45	96	23 36	+44	96	290
71	12 20	46	105	13 06	46	104	13 52	47	103	14 39	46	103	15 25	45	102	16 10	46	101	16 56	46	101	17 42	45	100	18 27	46	99	19 13	45	99	19 58	45	98	20 43	45	97	21 28	44	96	22 12	45	96	22 57	44	95	289
72	11 42	46	104	12 28	46	103	13 14	46	102	14 00	46	102	14 46	46	101	15 32	45	100	16 17	46	100	17 03	45	99	17 48	46	98	18 34	45	98	19 19	45	97	20 04	44	96	20 48	45	96	21 33	44	95	22 17	45	94	288
73	11 04	46	103	11 50	46	102	12 36	46	102	13 22	45	101	14 07	46	100	14 53	46	100	15 39	45	99	16 24	45	98	17 09	46	98	17 55	45	97	18 40	44	96	19 24	45	96	20 09	45	95	20 54	44	94	21 38	44	93	287
74	10 25	46	102	11 11	46	102	11 57	46	101	12 43	46	100	13 29	45	100	14 14	46	99	15 00	45	98	15 45	45	98	16 30	45	97	17 15	45	96	18 00	45	95	18 45	45	95	19 30	44	94	20 14	45	93	20 59	44	93	286
75	09 47	+45	101	10 32	+46	101	11 18	+46	100	12 04	+46	99	12 50	+45	99	13 35	+46	98	14 21	+45	97	15 06	+45	97	15 51	+45	96	16 36	+45	95	17 21	+45	95	18 06	+45	94	18 51	+44	93	19 35	+44	93	20 19	+45	92	285
76	09 08	46	101	09 54	46	100	10 40	45	99	11 25	46	99	12 11	45	98	12 56	46	97	13 42	45	97	14 27	45	96	15 12	45	95	15 57	45	95	16 42	45	94	17 27	44	93	18 11	45	93	18 56	44	92	19 40	44	91	284
77	08 29	46	100	09 15	46	99	10 01	45	99	10 46	46	98	11 32	45	97	12 17	46	97	13 03	45	96	13 48	45	95	14 33	45	95	15 18	45	94	16 03	44	93	16 47	45	92	17 32	44	92	18 16	45	91	19 01	44	90	283
78	07 50	46	99	08 36	46	98	09 22	45	98	10 07	46	97	10 53	45	96	11 38	45	96	12 23	46	95	13 09	45	94	13 54	45	94	14 39	44	93	15 23	45	92	16 08	45	92	16 53	44	91	17 37	44	90	18 21	45	90	282
79	07 11	46	98	07 57	46	98	08 43	45	97	09 28	46	96	10 14	45	96	10 59	45	95	11 44	45	94	12 29	45	94	13 14	45	93	13 59	45	92	14 44	45	92	15 29	44	91	16 13	45	90	16 58	44	90	17 42	44	89	281
80	06 32	+46	98	07 18	+46	97	08 04	+45	96	08 49	+45	96	09 34	+46	95	10 20	+45	94	11 05	+45	94	11 50	+45	93	12 35	+45	92	13 20	+45	92	14 05	+44	91	14 49	+45	90	15 34	+44	90	16 18	+45	89	17 03	+44	88	280
81	05 53	46	97	06 39	45	96	07 24	46	96	08 10	45	95	08 55	45	94	09 40	46	94	10 26	45	93	11 11	45	92	11 56	45	91	12 41	44	91	13 25	45	90	14 10	45	89	14 55	44	89	15 39	44	88	16 23	45	87	279
82	05 14	46	96	06 00	45	95	06 45	46	95	07 31	45	94	08 16	45	93	09 01	45	93	09 46	45	92	10 31	45	91	11 16	45	91	12 01	45	90	12 46	45	89	13 31	44	89	14 15	45	88	15 00	44	87	15 44	44	87	278
83	04 35	46	95	05 21	45	95	06 06	45	94	06 51	46	93	07 37	45	93	08 22	45	92	09 07	45	91	09 52	45	91	10 37	45	90	11 22	45	89	12 07	44	89	12 51	45	88	13 36	44	87	14 20	45	87	15 05	44	86	277
84	03 56	45	95	04 41	46	94	05 27	45	93	06 12	45	93	06 57	45	92	07 42	45	91	08 27	46	91	09 13	45	90	09 58	44	89	10 42	45	89	11 27	45	88	12 12	45	87	12 57	44	87	13 41	45	86	14 26	44	85	276
85	03 17	+45	94	04 02	+45	93	04 47	+46	92	05 33	+45	92	06 18	+45	91	07 03	+45	90	07 48	+45	90	08 33	+45	89	09 18	+45	88	10 03	+45	88	10 48	+45	87	11 33	+44	86	12 17	+45	86	13 02	+44	85	13 46	+45	84	275
86	02 37	46	93	03 23	45	92	04 08	45	92	04 53	45	91	05 38	46	90	06 24	45	90	07 09	45	89	07 54	45	88	08 39	45	88	09 24	45	87	10 09	44	86	10 53	45	86	11 38	45	85	12 23	44	84	13 07	45	84	274
87	01 58	45	92	02 43	46	92	03 29	45	91	04 14	45	90	04 59	45	90	05 44	45	89	06 29	46	88	07 15	45	88	08 00	44	87	08 44	45	86	09 29	45	86	10 14	45	85	10 59	45	84	11 44	44	84	12 28	45	83	273
88	01 19	45	92	02 04	45	91	02 49	46	90	03 35	45	90	04 20	45	89	05 05	45	88	05 50	45	88	06 35	45	87	07 20	45	86	08 05	45	86	08 50	45	85	09 35	45	84	10 20	44	84	11 04	45	83	11 49	45	82	272
89	00 39	46	91	01 25	45	90	02 10	45	89	02 55	45	89	03 40	46	88	04 26	45	87	05 11	45	87	05 56	45	86	06 41	45	85	07 26	45	85	08 11	45	84	08 56	45	83	09 41	44	83	10 25	45	82	11 10	45	81	271
90	00 00	+45	90	00 45	+46	89	01 31	+45	89	02 16	+45	88	03 01	+45	87	03 46	+45	87	04 31	+46	86	05 17	+45	85	06 02	+45	85	06 47	+45	84	07 32	+45	83	08 17	+45	83	09 02	+44	82	09 46	+45	81	10 31	+45	81	270
91	−0 39	45	89	00 06	45	89	00 51	45	88	01 36	46	87	02 22	45	87	03 07	45	86	03 52	45	85	04 37	46	85	05 23	45	84	06 08	45	83	06 53	45	83	07 38	45	82	08 23	45	81	09 08	44	81	09 52	45	80	269
92	−1 19	46	88	−0 33	45	88	00 12	45	87	00 57	45	87	01 42	46	86	02 28	45	85	03 13	45	85	03 58	45	84	04 43	46	83	05 29	45	83	06 14	45	82	06 59	45	81	07 44	45	81	08 29	45	80	09 14	44	79	268
93	−1 58	45	88	−1 13	46	87	−0 27	45	86	00 18	45	86	01 03	46	85	01 49	45	84	02 34	45	84	03 19	45	83	04 04	46	82	04 50	45	82	05 35	45	81	06 20	45	81	07 05	45	80	07 50	45	79	08 35	45	79	267
94	−2 37	45	87	−1 52	45	86	−1 07	46	86	−0 21	45	85	00 24	45	84	01 09	46	84	01 55	45	83	02 40	45	82	03 25	46	82	04 11	45	81	04 56	45	80	05 41	45	80	06 26	45	79	07 11	46	78	07 57	45	78	266
95	−3 17	+46	86	−2 31	+45	86	−1 46	+45	85	−1 01	+46	84	−0 15	+45	84	00 30	+46	83	01 16	+45	82	02 01	+45	82	02 46	+46	81	03 32	+45	80	04 17	+45	80	05 02	+46	79	05 48	+45	78	06 33	+45	78	07 18	+45	77	265
96	−3 56	45	85	−3 11	46	85	−2 25	45	84	−1 40	46	84	−0 54	45	83	−0 09	46	82	00 37	45	82	01 22	46	81	02 08	45	80	02 53	46	80	03 39	45	79	04 24	45	78	05 09	46	78	05 55	45	77	06 40	45	76	264
97	−4 35	45	85	−3 50	46	84	−3 04	45	83	−2 19	46	83	−1 33	45	82	−0 48	46	81	−0 02	45	81	00 43	46	80	01 29	45	79	02 14	46	79	03 00	45	78	03 45	46	78	04 31	45	77	05 16	46	76	06 02	45	76	263
98	−5 14	45	84	−4 29	46	83	−3 43	45	83	−2 58	46	82	−2 12	45	81	−1 27	46	81	−0 41	46	80	00 05	45	79	00 50	46	79	01 36	45	78	02 21	46	77	03 07	46	77	03 53	45	76	04 38	46	75	05 24	45	75	262
99	−5 53	+45	83	−5 08	46	83	−4 22	45	82	−3 37	46	81	−2 51	46	81	−2 05	45	80	−1 20	46	79	−0 34	46	79	00 12	45	78	00 57	46	77	01 43	46	77	02 29	45	76	03 14	46	75	04 00	46	75	04 46	45	74	261
100				−5 47	+46	82	−5 01	+45	81	−4 16	+46	80	−3 30	+46	80	−2 44	+46	79	−1 58	+45	79	−1 13	+46	78	−0 27	+46	77	00 19	+46	77	01 05	+46	76	01 51	+45	75	02 36	+46	75	03 22	+46	74	04 08	+46	73	260
101							−5 40	46	80	−4 54	45	80	−4 09	46	79	−3 23	46	78	−2 37	46	78	−1 51	46	77	−1 05	46	76	−0 19	46	76	00 27	46	75	01 13	46	75	01 59	45	74	02 44	46	73	03 30	46	73	259
102							−6 19	+46	80	−5 33	46	79	−4 47	46	78	−4 01	46	78	−3 15	46	77	−2 29	46	76	−1 43	46	76	−0 57	46	75	−0 11	46	74	00 35	46	74	01 21	46	73	02 07	46	73	02 53	46	72	258
103										−6 12	+46	78	−5 26	46	78	−4 40	46	77	−3 54	47	76	−3 07	46	76	−2 21	46	75	−1 35	46	74	−0 49	46	74	−0 03	46	73	00 43	46	72	01 29	46	72	02 15	47	71	257
104													−6 04	+46	77	−5 18	46	76	−4 32	46	75	−3 46	47	75	−2 59	46	74	−2 13	46	74	−1 27	46	73	−0 41	47	72	00 06	46	72	00 52	46	71	01 38	47	70	256
105																−5 56	+46	75	−5 10	+47	75	−4 23	+46	74	−3 37	+46	73	−2 51	+47	73	−2 04	+46	72	−1 18	+46	72	−0 32	+47	71	00 15	+46	70	01 01	+47	70	255
106																			−5 48	+47	74	−5 01	46	73	−4 15	47	73	−3 28	46	72	−2 42	47	71	−1 55	46	71	−1 09	47	70	−0 22	46	69	00 24	47	69	254
107																						−5 39	47	73	−4 52	46	72	−4 06	47	71	−3 19	47	71	−2 32	46	70	−1 46	47	69	−0 59	47	69	−0 12	47	68	253
108																						−6 16	+46	72	−5 30	47	71	−4 43	47	70	−3 56	47	70	−3 09	47	69	−2 22	47	69	−1 35	46	68	−0 49	47	67	252
109																									−6 07	+47	70	−5 20	47	70	−4 33	47	69	−3 46	47	68	−2 59	47	68	−2 12	47	67	−1 25	47	67	251
110																												−5 57	+47	69	−5 10	+48	68	−4 22	+47	68	−3 35	+47	67	−2 48	+47	66	−2 01	+47	66	250
111																															−5 46	47	68	−4 59	48	67	−4 11	47	66	−3 24	47	66	−2 37	48	65	249
112																															−6 22	+47	67	−5 35	48	66	−4 47	47	66	−4 00	48	65	−3 12	47	64	248
113																																		−6 11	+48	65	−5 23	48	65	−4 35	47	64	−3 48	48	64	247
114																																					−5 59	+48	64	−5 11	48	63	−4 23	48	63	246
115																																							−5 46	+48	63	−4 58	+49	62	245
116																																							−6 20	+48	62	−5 32	48	61	244
117																																									−6 07	+49	60	243

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 49°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 49°

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
98	−5 14	−46	84	−6 00	−45	85	262																																								
97	−4 35	46	85	−5 21	45	85	−6 06	−45	86	263																																					
96	−3 56	45	85	−4 41	46	86	−5 27	45	87	−6 12	−45	87	264																																	
95	−3 17	−45	86	−4 02	−45	87	−4 47	−46	88	−5 33	−45	88	−6 18	−45	89	265																													
94	−2 37	46	87	−3 23	45	88	−4 08	45	88	−4 53	45	89	−5 38	46	90	−6 24	−45	90	266																											
93	−1 58	45	88	−2 43	46	88	−3 29	45	89	−4 14	45	90	−4 59	45	90	−5 44	45	91	267																											
92	−1 19	45	88	−2 04	45	89	−2 49	46	90	−3 35	45	90	−4 20	45	91	−5 05	45	92	−5 50	−45	92	268																							
91	−0 39	46	89	−1 25	45	90	−2 10	45	91	−2 55	45	91	−3 40	46	92	−4 26	45	93	−5 11	45	93	−5 56	−45	94	269																			
90	00 00	−45	90	−0 45	−46	91	−1 31	−45	91	−2 16	−45	92	−3 01	−45	93	−3 46	−45	93	−4 31	−46	94	−5 17	−45	95	−6 02	−45	95	270																	
89	00 39	45	91	−0 06	45	91	−0 51	45	92	−1 36	46	93	−2 22	45	93	−3 07	45	94	−3 52	45	95	−4 37	46	95	−5 23	45	96	−6 08	−45	97	271															
88	01 19	46	92	00 33	45	92	−0 12	45	93	−0 57	45	93	−1 42	46	94	−2 28	45	95	−3 13	45	95	−3 58	45	96	−4 43	46	97	−5 29	45	97	−6 14	−45	98	272											
87	01 58	45	92	01 13	46	93	00 27	45	94	−0 18	45	94	−1 03	46	95	−1 49	45	96	−2 34	45	96	−3 19	45	97	−4 04	46	98	−4 50	45	98	−5 35	45	99	−6 20	−45	99	273								
86	02 37	45	93	01 52	45	94	01 07	46	94	00 21	45	95	−0 24	45	96	−1 09	46	96	−1 55	45	97	−2 40	45	98	−3 25	46	98	−4 11	45	99	−4 56	45	100	−5 41	45	100	274								
85	03 17	−46	94	02 31	−45	94	01 46	−45	95	01 01	−46	96	00 15	−45	96	−0 30	−46	97	−1 16	−45	98	−2 01	−45	98	−2 46	−46	99	−3 32	−45	100	−4 17	−45	100	−5 02	−46	101	−5 48	−45	102	275				
84	03 56	45	95	03 11	46	95	02 25	45	96	01 40	46	96	00 54	45	97	00 09	46	98	−0 37	45	98	−1 22	46	99	−2 08	45	100	−2 53	46	100	−3 39	45	101	−4 24	45	102	−5 09	46	102	−5 55	−45	103	276			277
83	04 35	45	95	03 50	46	96	03 04	45	97	02 19	46	97	01 33	45	98	00 48	46	99	00 02	45	99	−0 43	46	100	−1 29	45	101	−2 14	46	101	−3 00	45	102	−3 45	46	102	−4 31	45	103	−5 16	46	104	−6 02	−45	104	277
82	05 14	45	96	04 29	46	97	03 43	45	97	02 58	46	98	02 12	45	99	01 27	46	99	00 41	46	100	−0 05	45	101	−0 50	46	101	−1 36	45	102	−2 21	46	103	−3 07	46	103	−3 53	45	104	−4 38	46	105	−5 24	45	105	278
81	05 53	45	97	05 08	46	97	04 22	45	98	03 37	46	99	02 51	46	99	02 05	45	100	01 20	46	101	00 34	46	101	−0 12	45	102	−0 57	46	103	−1 43	46	103	−2 29	45	104	−3 14	46	105	−4 00	46	105	−4 46	45	106	279
80	06 32	−45	98	05 47	−46	98	05 01	−45	99	04 16	−46	100	03 30	−46	100	02 44	−46	101	01 58	−45	101	01 13	−46	102	00 27	−46	103	−0 19	−46	103	−1 05	−46	104	−1 51	−45	105	−2 36	−46	105	−3 22	−46	106	−4 08	−46	107	280
79	07 11	45	98	06 26	46	99	05 40	46	100	04 54	45	100	04 09	46	101	03 23	46	102	02 37	46	102	01 51	46	103	01 05	46	104	00 19	46	104	−0 27	46	105	−1 13	46	105	−1 59	45	106	−2 44	46	107	−3 30	46	107	281
78	07 50	45	99	07 05	46	100	06 19	46	100	05 33	46	101	04 47	46	102	04 01	46	102	03 15	46	103	02 29	46	104	01 43	46	104	00 57	46	105	00 11	46	106	−0 35	46	106	−1 21	46	107	−2 07	46	107	−2 53	46	108	282
77	08 29	46	100	07 43	45	101	06 58	46	101	06 12	46	102	05 26	46	102	04 40	46	103	03 54	47	104	03 07	46	104	02 21	46	105	01 35	46	106	00 49	46	106	00 03	46	107	−0 43	46	108	−1 29	46	108	−2 15	47	109	283
76	09 08	46	101	08 22	46	101	07 36	46	102	06 50	46	103	06 04	46	103	05 18	46	104	04 32	46	105	03 46	47	105	02 59	46	106	02 13	46	106	01 27	46	107	00 41	47	108	−0 06	46	108	−0 52	46	109	−1 38	47	110	284
75	09 47	−46	101	09 01	−46	102	08 15	−47	103	07 28	−46	103	06 42	−46	104	05 56	−46	105	05 10	−47	105	04 23	−46	106	03 37	−46	107	02 51	−47	107	02 04	−46	108	01 18	−46	108	00 32	−47	109	−0 15	−46	110	−1 01	−47	110	285
74	10 25	46	102	09 39	46	103	08 53	46	104	08 07	47	104	07 20	46	105	06 34	46	105	05 48	47	106	05 01	46	107	04 15	47	107	03 28	46	108	02 42	47	109	01 55	46	109	01 09	47	110	00 22	46	111	−0 24	47	111	286
73	11 04	47	103	10 17	46	104	09 31	46	104	08 45	47	105	07 58	46	106	07 12	47	106	06 25	46	107	05 39	47	107	04 52	46	108	04 06	47	109	03 19	47	109	02 32	46	110	01 46	47	111	00 59	47	111	00 12	47	112	287
72	11 42	46	104	10 56	47	104	10 09	46	105	09 23	47	106	08 36	46	106	07 50	47	107	07 03	47	108	06 16	46	108	05 30	47	109	04 43	47	110	03 56	47	110	03 09	47	111	02 22	47	111	01 35	46	112	00 49	47	113	288
71	12 20	46	105	11 34	47	105	10 47	46	106	10 01	47	107	09 14	47	107	08 27	47	108	07 40	48	108	06 54	47	109	06 07	47	110	05 20	47	110	04 33	47	111	03 46	47	112	02 59	47	112	02 12	47	113	01 25	47	113	289
70	12 58	−47	105	12 11	−46	106	11 25	−47	107	10 38	−47	107	09 51	−48	108	09 05	−47	109	08 18	−47	109	07 31	−47	110	06 44	−47	110	05 57	−47	111	05 10	−48	112	04 22	−47	112	03 35	−47	113	02 48	−47	114	02 01	−47	114	290
LHA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	13 36	47	106	12 49	46	107	12 03	47	107	11 16	47	108	10 29	47	109	09 42	47	109	08 55	47	110	08 08	47	111	07 21	48	111	06 33	47	112	05 46	47	112	04 59	48	113	04 11	47	114	03 24	47	114	02 37	48	115	291
68	14 14	47	107	13 27	47	108	12 40	47	108	11 53	47	109	11 06	47	110	10 19	47	110	09 32	48	111	08 44	47	111	07 57	47	112	07 10	48	113	06 22	47	113	05 35	48	114	04 47	47	114	04 00	48	115	03 12	47	116	292
67	14 51	47	108	14 04	47	108	13 17	47	109	12 30	47	110	11 43	47	110	10 56	48	111	10 08	47	112	09 21	48	112	08 33	47	113	07 46	48	113	06 58	47	114	06 11	48	115	05 23	48	115	04 35	47	116	03 48	48	116	293
66	15 29	47	109	14 42	48	109	13 54	47	110	13 07	47	110	12 20	48	111	11 32	47	112	10 45	48	112	09 57	47	113	09 10	48	114	08 22	48	114	07 34	48	115	06 46	47	115	05 59	48	116	05 11	48	117	04 23	48	117	294
65	16 06	−47	109	15 19	−48	110	14 31	−47	111	13 44	−48	111	12 56	−47	112	12 09	−48	113	11 21	−48	113	10 33	−47	114	09 46	−48	114	08 58	−48	115	08 10	−48	116	07 22	−48	116	06 34	−48	117	05 46	−48	117	04 58	−49	118	295
64	16 43	47	110	15 56	48	111	15 08	47	111	14 21	48	112	13 33	48	113	12 45	48	113	11 57	48	114	11 09	48	115	10 21	48	115	09 33	48	116	08 45	48	116	07 57	48	117	07 09	49	118	06 20	48	118	05 32	48	119	296
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0	41 00	−60	180	40 00	−60	180	39 00	−60	180	38 00	−60	180	37 00	−60	180	36 00	−60	180	35 00	−60	180	34 00	−60	180	33 00	−60	180	32 00	−60	180	31 00	−60	180	30 00	−60	180	29 00	−60	180	28 00	−60	180

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
0	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	64 00	+60	180	65 00	+60	180	66 00	+60	180	67 00	+60	180	68 00	+60	180	69 00	+60	180	70 00	+60	180	360
1	55 59	60	178	56 59	60	178	57 59	60	178	58 59	60	178	59 59	60	178	60 59	60	178	61 59	60	178	62 59	60	178	63 59	60	178	64 59	60	178	65 59	60	178	66 59	60	178	67 59	60	178	68 59	60	178	69 59	60	177	359
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63	28 53	45	101	29 38	44	100	30 22	44	99	31 06	44	98	31 50	43	97	32 33	43	97	33 16	43	96	33 59	42	95	34 41	42	94	35 23	42	93	36 05	41	92	36 46	41	91	37 27	40	91	38 07	40	90	38 47	40	89	297
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66	26 57	44	98	27 41	44	97	28 25	44	97	29 09	43	96	29 52	43	95	30 35	43	94	31 18	43	93	32 01	42	93	32 43	42	92	33 25	42	91	34 07	41	90	34 48	41	89	35 29	40	88	36 09	40	87	36 49	40	86	294
67	26 18	44	97	27 02	44	97	27 46	43	96	28 29	44	95	29 13	43	94	29 56	43	93	30 39	43	93	31 22	42	92	32 04	42	92	32 46	41	90	33 27	42	89	34 09	40	88	34 49	41	88	35 30	40	87	36 10	39	86	293
68	25 38	45	97	26 23	44	96	27 07	43	95	27 50	44	94	28 34	43	94	29 17	43	93	30 00	42	92	30 42	42	91	31 24	42	90	32 06	42	89	32 48	41	89	33 29	41	88	34 10	41	87	34 51	40	86	35 31	39	85	292
69	24 59	44	96	25 43	44	95	26 27	44	94	27 11	43	94	27 54	43	93	28 37	43	92	29 20	43	91	30 03	42	90	30 45	42	90	31 27	42	89	32 09	41	88	32 50	41	87	33 31	40	86	34 11	40	85	34 51	40	84	291
LHA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180°

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
70	24 20	+44	95	25 04	+44	94	25 48	+44	94	26 32	+43	93	27 15	+43	92	27 58	+43	91	28 41	+43	90	29 23	+43	90	30 06	+42	89	30 48	+41	88	31 29	+42	87	32 11	+40	86	32 51	+41	85	33 32	+40	84	34 12	+40	84	290
71	23 41	44	94	24 25	44	93	25 09	43	93	25 52	44	92	26 36	43	91	27 19	43	90	28 02	42	90	28 44	42	89	29 26	42	88	30 08	42	87	30 50	41	86	31 31	41	86	32 12	41	85	32 53	40	84	33 33	40	83	289
72	23 02	44	93	23 46	43	93	24 29	44	92	25 13	43	91	25 56	43	90	26 39	43	90	27 22	43	89	28 05	42	88	28 47	42	87	29 29	42	86	30 11	41	86	30 52	41	85	31 33	41	84	32 14	40	83	32 54	40	82	288
73	22 22	44	93	23 06	44	92	23 50	44	91	24 34	43	90	25 17	43	90	26 00	43	89	26 43	42	88	27 25	43	87	28 08	42	87	28 50	41	86	29 31	42	85	30 13	41	86	30 54	41	83	31 35	40	82	32 15	40	81	287
74	21 43	44	92	22 27	44	91	23 11	43	90	23 54	44	90	24 38	43	89	25 21	43	88	26 04	42	87	26 46	42	87	27 28	43	86	28 11	41	85	28 52	42	84	29 34	41	83	30 15	41	83	30 56	40	82	31 36	40	81	286
75	21 04	+44	91	21 48	+43	90	22 31	+44	90	23 15	+43	89	23 58	+43	88	24 41	+43	87	25 24	+43	87	26 07	+42	86	26 49	+42	85	27 31	+42	84	28 13	+42	83	28 55	+41	83	29 36	+41	82	30 17	+40	81	30 57	+41	80	285
76	20 24	44	90	21 08	44	90	21 52	44	89	22 36	43	88	23 19	43	87	24 02	43	87	24 45	43	86	25 28	42	85	26 10	42	84	26 52	42	84	27 34	42	83	28 16	41	82	28 57	41	81	29 38	41	80	30 19	40	79	284
77	19 45	44	90	20 29	44	89	21 13	43	88	21 56	44	87	22 40	43	87	23 23	43	86	24 06	42	85	24 48	43	84	25 31	42	84	26 13	42	83	26 55	42	82	27 37	41	81	28 18	41	80	28 59	41	80	29 40	41	79	283
78	19 06	43	89	19 49	44	88	20 33	44	87	21 17	43	87	22 00	43	86	22 43	43	85	23 26	43	84	24 09	43	84	24 52	42	83	25 34	42	83	26 16	42	81	26 58	41	81	27 39	42	80	28 21	40	79	29 01	41	78	282
79	18 26	44	88	19 10	44	87	19 54	44	87	20 38	43	86	21 21	43	85	22 04	43	84	22 47	43	84	23 30	43	83	24 13	42	82	24 55	42	81	25 37	42	81	26 19	42	80	27 01	41	79	27 42	41	78	28 23	41	77	281
80	17 47	+44	87	18 31	+44	87	19 15	+43	86	19 58	+44	85	20 42	+43	84	21 25	+43	84	22 08	+43	83	22 51	+43	82	23 34	+42	81	24 16	+42	81	24 58	+42	80	25 40	+42	79	26 22	+42	78	27 04	+41	78	27 45	+41	77	280
81	17 08	44	87	17 52	43	86	18 35	44	85	19 19	44	84	20 03	43	84	20 46	43	83	21 29	43	82	22 12	43	82	22 55	42	81	23 37	43	80	24 20	42	79	25 02	42	78	25 44	41	78	26 25	41	77	27 06	41	76	279
82	16 28	44	86	17 12	44	85	17 56	44	84	18 40	44	84	19 24	43	83	20 07	43	82	20 50	43	82	21 33	43	81	22 16	43	80	22 59	42	79	23 41	42	79	24 23	42	78	25 05	42	77	25 47	41	76	26 28	41	75	278
83	15 49	44	85	16 33	44	84	17 17	44	84	18 01	44	83	18 45	43	82	19 28	43	82	20 11	43	81	20 54	43	80	21 37	43	79	22 20	43	79	23 03	42	78	23 45	42	77	24 27	42	76	25 09	41	75	25 50	42	75	277
84	15 10	44	84	15 54	44	84	16 38	44	83	17 22	44	82	18 06	43	82	18 49	43	81	19 32	44	80	20 16	43	79	20 59	43	79	21 42	42	78	22 24	43	77	23 07	42	76	23 49	42	76	24 31	41	75	25 12	42	74	276
85	14 31	+44	84	15 15	+44	83	15 59	+44	82	16 43	+44	82	17 27	+43	81	18 10	+44	80	18 54	+43	79	19 37	+43	79	20 20	+43	78	21 03	+43	77	21 46	+42	76	22 28	+43	76	23 11	+42	75	23 53	+42	74	24 35	+41	73	275
86	13 52	44	83	14 36	44	82	15 20	44	82	16 04	44	81	16 48	44	80	17 32	43	79	18 15	43	79	18 58	44	78	19 42	43	77	20 25	43	77	21 08	42	76	21 50	43	75	22 33	42	74	23 15	42	73	23 57	42	73	274
87	13 13	44	82	13 57	44	82	14 41	44	81	15 25	44	80	16 09	44	79	16 53	44	79	17 37	43	78	18 20	43	77	19 03	44	77	19 47	43	76	20 30	42	75	21 12	43	74	21 55	42	74	22 37	42	73	23 19	42	72	273
88	12 34	44	81	13 18	44	81	14 02	44	80	14 46	44	79	15 30	44	79	16 14	44	78	16 58	44	77	17 42	43	77	18 25	43	76	19 08	44	75	19 52	42	74	20 34	43	74	21 17	43	73	22 00	42	72	22 42	42	71	272
89	11 55	44	81	12 39	44	80	13 23	45	79	14 08	44	79	14 52	44	78	15 36	44	77	16 20	43	77	17 03	44	76	17 47	43	75	18 30	44	74	19 14	43	74	19 57	43	73	20 40	42	72	21 22	43	71	22 05	42	71	271
90	11 16	+44	80	12 00	+45	79	12 45	+44	79	13 29	+44	78	14 13	+45	77	14 58	+44	77	15 42	+43	76	16 25	+44	75	17 09	+44	74	17 53	+43	74	18 36	+43	73	19 19	+43	72	20 02	+43	72	20 45	+43	71	21 28	+42	70	270
91	10 37	45	79	11 22	44	79	12 06	45	78	12 51	44	77	13 35	44	77	14 19	44	76	15 03	44	75	15 47	44	74	16 31	44	74	17 15	43	73	17 58	44	72	18 42	43	72	19 25	43	71	20 08	43	70	20 51	42	69	269
92	09 58	45	79	10 43	45	78	11 28	44	77	12 12	45	77	12 57	44	76	13 41	44	75	14 25	45	74	15 10	43	74	15 53	44	73	16 37	44	72	17 21	44	72	18 05	43	71	18 48	43	70	19 31	43	69	20 14	43	69	268
93	09 20	45	78	10 05	45	77	10 50	44	76	11 34	45	76	12 19	44	75	13 03	45	74	13 48	44	74	14 32	44	73	15 16	44	72	16 00	44	72	16 44	43	71	17 27	44	70	18 11	43	69	18 54	43	69	19 37	44	68	267
94	08 42	44	77	09 26	45	76	10 11	45	76	10 56	45	75	11 41	44	74	12 25	45	74	13 10	44	73	13 54	44	72	14 38	45	72	15 23	44	71	16 07	43	70	16 50	44	69	17 34	44	69	18 18	43	68	19 01	43	67	266
95	08 03	+45	76	08 48	+45	76	09 33	+45	75	10 18	+45	74	11 03	+45	74	11 48	+44	73	12 32	+45	72	13 17	+44	72	14 01	+44	71	14 45	+45	70	15 30	+44	70	16 14	+44	69	16 58	+43	68	17 41	+44	67	18 25	+43	67	265
96	07 25	45	76	08 10	45	75	08 55	45	74	09 40	45	74	10 25	45	73	11 10	45	72	11 55	44	72	12 39	45	71	13 24	44	70	14 08	45	70	14 53	44	69	15 37	44	68	16 21	44	67	17 05	44	67	17 49	43	66	264
97	06 47	45	75	07 32	45	74	08 17	46	74	09 03	45	73	09 48	45	72	10 33	45	72	11 18	44	71	12 02	45	70	12 47	45	70	13 32	44	69	14 16	45	68	15 01	44	67	15 45	44	67	16 29	44	66	17 13	44	65	263
98	06 09	45	74	06 54	46	74	07 40	45	73	08 25	45	72	09 10	45	72	09 55	45	71	10 40	45	70	11 25	45	70	12 10	45	69	12 55	45	68	13 40	44	67	14 24	45	67	15 09	44	66	15 53	44	65	16 37	44	65	262
99	05 31	46	73	06 17	45	73	07 02	46	72	07 48	45	71	08 33	45	71	09 18	45	70	10 03	46	69	10 49	45	69	11 34	45	68	12 19	44	67	13 03	45	67	13 48	45	66	14 33	44	65	15 17	45	65	16 02	44	64	261
100	04 54	+45	73	05 39	+46	72	06 25	+45	71	07 10	+46	71	07 56	+45	70	08 41	+46	69	09 27	+45	69	10 12	+45	68	10 57	+45	67	11 42	+45	67	12 27	+45	66	13 12	+45	65	13 57	+45	65	14 42	+44	64	15 26	+45	63	260
101	04 16	46	72	05 02	46	71	05 48	45	71	06 33	46	70	07 19	46	69	08 05	45	69	08 50	46	68	09 36	45	67	10 21	45	67	11 06	46	66	11 52	45	65	12 37	45	65	13 22	45	64	14 07	44	63	14 51	45	63	259
102	03 39	46	71	04 25	46	71	05 11	45	70	05 56	46	69	06 42	46	69	07 28	46	68	08 14	45	67	08 59	46	67	09 45	45	66	10 30	46	65	11 16	45	65	12 01	45	64	12 46	46	63	13 32	45	63	14 17	44	62	258
103	03 02	46	70	03 48	46	70	04 34	46	69	05 20	46	69	06 06	46	68	06 52	45	67	07 37	46	67	08 23	46	66	09 09	46	65	09 55	45	65	10 40	46	64	11 26	45	63	12 11	46	63	12 57	45	62	13 42	45	61	257
104	02 25	46	70	03 11	46	69	03 57	46	68	04 43	46	68	05 29	46	67	06 15	46	67	07 01	46	66	07 47	46	65	08 33	46	65	09 19	46	64	10 05	46	63	10 51	45	63	11 36	46	62	12 22	45	61	13 07	46	61	256
105	01 48	+46	69	02 34	+46	68	03 20	+47	68	04 07	+46	67	04 53	+46	66	05 39	+47	66	06 26	+46	65	07 12	+46	65	07 58	+46	64	08 44	+46	63	09 30	+46	63	10 16	+46	62	11 02	+46	61	11 48	+45	61	12 33	+46	60	255
106	01 11	47	68	01 58	46	68	02 44	47	67	03 31	46	66	04 17	47	66	05 04	46	65	05 50	46	64	06 36	47	64	07 23	46	63	08 09	46	63	08 55	46	62	09 41	46	61	10 27	46	61	11 13	46	60	11 59	46	59	254
107	00 35	46	67	01 21	47	67	02 08	47	66	02 55	46	66	03 41	47	65	04 28	47	64	05 15	46	64	06 01	47	63	06 48	46	62	07 34	47	62	08 21	46	61	09 07	46	61	09 53	47	60	10 40	46	59	11 26	46	59	253
108	−0 02	47	67	00 45	47	66	01 32	47	65	02 19	47	65	03 06	47	64	03 53	46	64	04 39	47	63	05 26	47	62	06 13	47	62	07 00	46	61	07 46	47	60	08 33	46	60	09 19	47	59	10 06	46	59	10 52	46	58	252
109	−0 38	47	66	00 09	47	65	00 56	47	65	01 43	47	64	02 30	47	63	03 17	47	63	04 04	47	62	04 51	47	62	05 38	47	61	06 25	47	60	07 12	47	60	07 59	47	59	08 46	46	58	09 32	47	58	10 19	46	57	251
110	−1 14	+48	65	−0 26	+47	65	00 21	+47	64	01 08	+47	63	01 55	+48	63	02 43	+47	62	03 30	+47	62	04 17	+47	61	05 04	+47	60	05 51	+47	60	06 38	+47	59	07 25	+47	58	08 12	+47	58	08 59	+47	57	09 46	+47	57	250
111	−1 49	47	64	−1 02	48	64	−0 14	47	63	00 33	47	63	01 20	48	62	02 08	47	61	02 55	48	61	03 43	47	60	04 30	47	60	05 17	48	59	06 05	47	58	06 52	47	58	07 39	47	57	08 26	47	56	09 13	47	56	249
112	−2 25	48	64	−1 37	48	63	−0 49	47	62	−0 02	48	62	00 46	47	61	01 33	48	61	02 21	48	60	03 09	47	59	03 56	48	59	04 44	47	58	05 31	48	58	06 19	47	57	07 06	48	56	07 54	47	56	08 41	47	55	248
113	−3 00	48	63	−2 12	48	62	−1 24	48	62	−0 36	47	61	00 11	48	61	00 59	48	60	01 47	48	59	02 35	48	59	03 23	47	58	04 10	48	57	04 58	48	57	05 46	48	56	06 34	47	56	07 21	48	55	08 09	47	54	247
114	−3 35	48	62	−2 47	48	62	−1 59	48	61	−1 11	48	60	−0 23	48	60	00 25	48	59	01 13	48	59	02 01	48	58	02 49	48	57	03 37	48	57	04 25	48	56	05 13	48	56	06 01	48	55	06 49	48	54	07 37	48	54	246
115	−4 09	+48	61	−3 21	+48	61	−2 33	+48	60	−1 45	+48	60	−0 57	+49	59	−0 08	+48	58	00 40	+48	58	01 28	+48	57	02 16	+49	57	03 05	+48	56	03 53	+48	55	04 41	+48	55	05 29	+48	54	06 17	+48	54	07 05	+48	53	245
116	−4 44	49	61	−3 55	48	60	−3 07	48	59	−2 19	49	59	−1 30	48	58	−0 42	49	58	00 07	48	57	00 55	49	56	01 44	48	56	02 32	49	55	03 21	48	55	04 09	48	54	04 57	49	53	05 46	48	53	06 34	48	52	244
117	−5 18	49	60	−4 29	48	59	−3 41	49	59	−2 52	49	58	−2 03	48	57	−1 15	49	57	−0 26	49	56	00 23	48	56	01 11	49	55	02 00	49	55	02 49	48	54	03 37	49	53	04 26	48	53	05 14	49	52	06 03	48	52	243
118	−5 52	+49	59	−5 03	49	58	−4 14	49	58	−3 25	48	57	−2 37	49	57	−1 48	49	56	−0 59	49	56	−0 10	49	55	00 39	49	54	01 28	49	54	02 17	49	53	03 06	49	53	03 55	48	52	04 43	49	51	05 32	49	51	242
			119	−5 36	49	58	−4 47	49	57	−3 58	49	56	−3 09	49	56	−2 20	49	55	−1 31	49	55	−0 42	49	54	00 07	49	54	00 56	50	53	01 46	49	52	02 35	49	52	03 24	49	51	04 13	49	51	05 02	49	50	241
			120	−6 10	+50	57	−5 20	+49	56	−4 31	+49	56	−3 42	+50	55	−2 52	+49	55	−2 03	+49	54	−1 14	+50	53	−0 24	+49	53	00 25	+49	52	01 14	+50	52	02 04	+49	51	02 53	+50	51	03 43	+49	50	04 32	+49	49	240
						121	−5 53	+50	55	−5 03	49	55	−4 14	50	54	−3 24	49	54	−2 35	50	53	−1 45	49	53	−0 56	50	52	−0 06	50	52	00 44	49	51	01 33	50	50	02 23	50	50	03 13	49	49	04 02	50	49	239
									122	−5 35	49	54	−4 46	50	54	−3 56	50	53	−3 06	50	52	−2 16	50	52	−1 26	49	51	−0 37	50	51	00 13	50	50	01 03	50	50	01 53	50	49	02 43	50	49	03 33	49	48	238
									123	−6 07	+50	53	−5 17	50	53	−4 27	50	52	−3 37	50	52	−2 47	50	51	−1 57	50	51	−1 07	50	50	−0 17	50	49	00 33	50	49	01 23	51	48	02 14	50	48	03 04	50	47	237
												124	−5 48	50	52	−4 58	50	51	−4 08	50	51	−3 18	51	50	−2 27	50	50	−1 37	50	49	−0 47	51	49	00 04	50	48	00 54	51	48	01 45	50	47	02 35	50	47	236
												125	−6 19	+50	51	−5 29	+51	51	−4 38	+50	50	−3 48	+51	50	−2 57	+50	49	−2 07	+51	48	−1 16	+51	48	−0 25	+50	47	00 25	+51	47	01 16	+50	46	02 06	+51	46	235
															126	−5 59	+51	50	−5 08	51	49	−4 17	50	49	−3 27	51	48	−2 36	51	48	−1 45	51	47	−0 54	51	47	−0 03	51	46	00 48	50	46	01 38	51	45	234
																		127	−5 38	51	49	−4 47	51	48	−3 56	51	47	−3 05	51	47	−2 14	51	46	−1 23	52	46	−0 31	51	45	00 20	51	45	01 11	51	44	233
																		128	−6 07	+51	48	−5 16	51	47	−4 25	52	47	−3 33	51	46	−2 42	51	46	−1 51	52	45	−0 59	51	45	−0 08	51	44	00 43	52	44	232
																					129	−5 45	52	46	−4 53	51	46	−4 02	52	45	−3 10	52	45	−2 18	51	44	−1 27	52	44	−0 35	51	43	00 16	52	43	231
																					130	−6 13	+52	46	−5 21	+52	45	−4 29	+51	45	−3 38	+52	44	−2 46	+52	44	−1 54	+52	43	−1 02	+52	43	−0 10	+52	42	230
																								131	−5 49	52	44	−4 57	52	44	−4 05	52	43	−3 13	52	43	−2 21	53	42	−1 28	52	42	−0 36	52	41	229
																								132	−6 16	+52	43	−5 24	52	43	−4 32	53	43	−3 39	52	42	−2 47	53	42	−1 54	52	41	−1 02	52	41	228
																											133	−5 51	53	42	−4 58	53	42	−4 05	52	41	−3 13	53	41	−2 20	53	40	−1 27	52	40	227
																											134	−6 17	+53	41	−5 24	53	41	−4 31	53	40	−3 38	53	40	−2 45	53	39	−1 52	52	39	226
																														135	−5 49	+53	40	−4 56	+53	40	−4 03	+53	39	−3 10	+53	39	−2 17	+53	38	225
																														136	−6 15	+54	39	−5 21	53	39	−4 28	53	38	−3 35	54	38	−2 41	53	37	224
																																	137	−5 46	54	38	−4 52	53	38	−3 59	54	37	−3 05	54	37	223
																																	138	−6 10	+54	37	−5 16	54	37	−4 22	54	36	−3 28	54	36	222
																																			139	−5 39	54	36	−4 45	54	36	−3 51	54	35	221

15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 49°

LAT 49°

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 49°

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°
																																			140												
																																			141	−6 02	+54	35	−5 08	+55	35	−4 13	+54	34	220
																																			142	−5 30	55	34	−5 52	55	33	−4 35	54	34	219
																																			143	−5 52	55	33	−6 13	+55	32	−4 57	55	33	218
																																									144	−5 18	55	32	217
																																										145	−5 39	56	31	216
																																											−5 59	+56	30	215
82	−6 09	−45	106	278																																										
81	−5 31	46	107	−6 17	−45	107	279																																							
80	−4 54	−45	107	−5 39	−46	108	280																																							
79	−4 16	46	108	−5 02	46	109	−5 48	−45	109	281																																					
78	−3 39	46	109	−4 25	46	109	−5 11	45	110	−5 56	−46	111	282																																		
77	−3 02	46	110	−3 48	46	110	−4 34	46	111	−5 20	46	111	−6 06	−46	112	283																															
76	−2 25	46	110	−3 11	46	111	−3 57	46	112	−4 43	46	112	−5 29	46	113	−6 15	−46	113	284																											
75	−1 48	−46	111	−2 34	−46	112	−3 20	−47	112	−4 07	−46	113	−4 53	−46	114	−5 39	−47	114	285																											
74	−1 11	47	112	−1 58	46	112	−2 44	47	113	−3 31	46	114	−4 17	47	114	−5 04	46	115	−5 50	−46	116	286																							
73	−0 35	46	113	−1 21	47	113	−2 08	47	114	−2 55	46	114	−3 41	47	115	−4 28	47	116	−5 15	46	116	−6 01	−47	117	287																			
72	00 02	47	113	−0 45	47	114	−1 32	47	115	−2 19	47	115	−3 06	47	116	−3 53	46	116	−4 39	47	117	−5 26	47	118	−6 13	−47	118	288															
71	00 38	47	114	−0 09	47	115	−0 56	47	115	−1 43	47	116	−2 30	47	117	−3 17	47	117	−4 04	47	118	−4 51	47	118	−5 38	47	119	289															
70	01 14	−48	115	00 26	−47	115	−0 21	−47	116	−1 08	−47	117	−1 55	−48	117	−2 43	−47	118	−3 30	−47	118	−4 17	−47	119	−5 04	−47	120	−5 51	−47	120	290													
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 49°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	01 49	47	116	01 02	48	116	00 14	47	117	−0 33	47	117	−1 20	48	118	−2 08	47	119	−2 55	48	119	−3 43	47	120	−4 30	47	120	−5 17	48	121	−6 05	−47	122	291													69
68	02 25	48	116	01 37	48	117	00 49	47	118	00 02	48	118	−0 46	47	119	−1 33	48	119	−2 21	48	120	−3 09	47	121	−3 56	48	121	−4 44	47	122	−5 31	48	122	−6 19	−47	123	292											68
67	03 00	48	117	02 12	48	118	01 24	48	118	00 36	47	119	−0 11	48	119	−0 59	48	120	−1 47	48	121	−2 35	48	121	−3 23	47	122	−4 10	48	123	−4 58	48	123	−5 46	48	124	293											67
66	03 35	48	118	02 47	48	118	01 59	48	119	01 11	48	120	00 23	48	120	−0 25	48	121	−1 13	48	121	−2 01	48	122	−2 49	48	123	−3 37	48	123	−4 25	48	124	−5 13	48	124	−6 01	−48	125	294								66
65	04 09	−48	119	03 21	−48	119	02 33	−48	120	01 45	−48	120	00 57	−49	121	00 08	−48	122	−0 40	−48	122	−1 28	−48	123	−2 16	−49	123	−3 05	−48	124	−3 53	−48	125	−4 41	−48	125	−5 29	−48	126	−6 17	−48	126	295					65
64	04 44	49	119	03 55	48	120	03 07	48	121	02 19	49	121	01 30	48	122	00 42	49	122	−0 07	48	123	−0 55	49	124	−1 44	48	124	−2 32	49	125	−3 21	48	125	−4 09	48	126	−4 57	49	127	−5 46	48	127	296					64
63	05 18	49	120	04 29	48	121	03 41	49	121	02 52	49	122	02 03	48	123	01 15	49	123	00 26	49	124	−0 23	48	124	−1 11	49	125	−2 00	49	126	−2 49	48	126	−3 37	49	127	−4 26	48	127	−5 14	49	128	−6 03	−48	128	297	63
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57	08 37	50	125	07 47	50	126	06 57	50	126	06 07	50	127	05 17	50	127	04 27	50	128	03 37	50	128	02 47	50	129	01 57	50	129	01 07	50	130	00 17	50	131	−0 33	50	131	−1 23	51	132	−2 14	50	132	−3 04	50	133	303	57
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53	10 43	50	128	09 53	51	129	09 02	51	129	08 11	51	130	07 20	51	130	06 29	51	131	05 38	51	131	04 47	51	132	03 56	51	133	03 05	51	133	02 14	51	134	01 23	52	134	00 31	51	135	−0 20	51	135	−1 11	51	136	307	53
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23	22 50	58	156	21 52	58	156	20 54	57	156	19 57	58	157	18 59	58	157	18 01	58	157	17 03	57	158	16 06	58	158	15 08	58	158	14 10	58	158	13 12	58	159	12 14	58	159	11 16	58	159	10 18	58	159	09 20	58	160	337	23
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11	25 16	60	168	24 16	59	168	23 17	60	169	22 17	59	169	21 18	60	169	20 18	59	169	19 19	60	169	18 19	59	169	17 20	60	169	16 20	59	170	15 21	60	170	14 21	59	170	13 22	60	170	12 22	59	170	11 23	60	170	349	11
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9	25 30	59	170	24 31	60	170	23 31	60	171	22 31	59	171	21 32	60	171	20 32	60	171	19 32	59	171	18 33	60	171	17 33	59	171	16 34	60	171	15 34	60	172	14 34	59	172	13 35	60	172	12 35	60	172	11 35	59	172	351	9
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1	26 00	60	179	25 00	60	179	24 00	60	179	23 00	60	179	22 00	60	179	21 00	60	179	20 00	60	179	19 00	60	179	18 00	60	179	17 00	60	179	16 00	60	179	15 00	60	179	14 00	60	179	13 00	60	179	12 00	60	179	359	1
0	26 00	−60	180	25 00	−60	180	24 00	−60	180	23 00	−60	180	22 00	−60	180

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
0	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	360
1	40 00	60	179	41 00	60	179	42 00	60	179	43 00	60	179	44 00	60	179	45 00	60	179	46 00	60	179	47 00	60	179	48 00	59	179	48 59	60	178	49 59	60	178	50 59	60	178	51 59	60	178	52 59	60	178	53 59	60	178	359
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7	39 39	59	171	40 38	60	171	41 38	60	171	42 38	59	170	43 37	60	170	44 37	60	170	45 37	59	170	46 36	60	170	47 36	59	170	48 35	60	170	49 35	59	169	50 34	60	169	51 34	59	169	52 33	60	169	53 33	59	169	353
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58	19 55	49	116	20 44	48	115	21 32	49	114	22 21	48	114	23 09	49	113	23 58	48	112	24 46	48	112	25 34	47	111	26 21	48	110	27 09	47	110	27 56	47	109	28 43	47	108	29 30	47	108	30 17	46	107	31 03	46	106	302
59	19 20	49	115	20 09	48	114	20 57	49	113	21 46	48	113	22 34	48	112	23 22	48	112	24 10	47	111	24 57	48	110	25 45	47	110	26 32	48	109	27 20	47	108	28 07	46	107	28 53	47	107	29 40	46	106	30 26	46	105	301
60	18 45	+48	114	19 33	+49	113	20 22	+48	113	21 10	+48	112	21 58	+48	111	22 46	+48	111	23 34	+47	110	24 21	+48	109	25 09	+47	109	25 56	+47	108	26 43	+47	107	27 30	+46	107	28 16	+47	106	29 03	+46	105	29 49	+46	104	300
61	18 09	49	113	18 58	48	112	19 46	48	112	20 34	48	111	21 22	48	110	22 10	47	110	22 57	48	109	23 45	47	108	24 32	47	108	25 19	47	107	26 06	47	106	26 53	46	106	27 39	46	105	28 25	46	104	29 11	46	104	299
62	17 34	48	112	18 22	48	112	19 10	48	111	19 58	48	110	20 46	47	110	21 33	48	109	22 21	47	108	23 08	47	108	23 55	47	107	24 42	47	106	25 29	46	106	26 15	47	105	27 02	46	104	27 48	46	103	28 34	45	103	298
63	16 58	48	111	17 46	48	111	18 34	48	110	19 22	47	109	20 09	48	109	20 57	47	108	21 44	47	107	22 31	47	107	23 18	47	106	24 05	47	105	24 52	46	105	25 38	46	104	26 24	46	103	27 10	46	103	27 56	46	102	297
64	16 22	48	110	17 10	48	110	17 58	47	109	18 45	48	109	19 33	47	108	20 20	47	107	21 07	47	107	21 54	47	106	22 41	47	105	23 28	46	105	24 14	47	104	25 01	46	103	25 47	46	102	26 33	45	102	27 18	46	101	296
65	15 46	+47	110	16 33	+48	109	17 21	+48	108	18 09	+47	108	18 56	+47	107	19 43	+47	106	20 30	+47	106	21 17	+47	105	22 04	+46	104	22 50	+47	104	23 37	+46	103	24 23	+46	102	25 09	+46	102	25 55	+45	101	26 40	+46	100	295
66	15 09	48	109	15 57	47	108	16 44	48	108	17 32	47	107	18 19	47	106	19 06	47	106	19 53	47	105	20 40	46	104	21 26	47	104	22 13	46	103	22 59	46	102	23 45	46	102	24 31	46	101	25 17	45	100	26 02	46	99	294
67	14 33	47	108	15 20	48	107	16 08	47	107	16 55	47	106	17 42	47	105	18 29	47	105	19 16	46	104	20 02	47	103	20 49	46	103	21 35	46	102	22 21	46	101	23 07	46	101	23 53	46	100	24 39	45	99	25 24	46	99	293
68	13 56	47	107	14 43	48	107	15 31	47	106	16 18	47	105	17 05	46	105	17 51	47	104	18 38	47	103	19 25	46	103	20 11	46	102	20 57	47	101	21 44	45	101	22 29	46	100	23 15	46	99	24 01	45	98	24 46	45	98	292
69	13 19	47	106	14 06	47	106	14 53	47	105	15 40	47	104	16 27	47	104	17 14	47	103	18 01	46	102	18 47	46	102	19 33	47	101	20 20	46	100	21 06	45	100	21 51	46	99	22 37	46	98	23 23	45	98	24 08	45	97	291
LHA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° : $Z_n =

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	12 42	+47	106	13 29	+47	105	14 16	+47	104	15 03	+47	104	15 50	+46	103	16 36	+47	102	17 23	+46	102	18 09	+46	101	18 55	+47	100	19 42	+46	100	20 28	+45	99	21 13	+46	98	21 59	+45	98	22 44	+46	97	23 30	+45	96	290
71	12 05	47	105	12 52	47	104	13 39	46	103	14 25	47	103	15 12	47	102	15 59	46	102	16 45	46	101	17 31	46	100	18 17	46	100	19 03	46	99	19 49	46	98	20 35	46	97	21 21	45	97	22 06	45	96	22 51	45	95	289
72	11 27	47	104	12 14	47	103	13 01	47	103	13 48	46	102	14 34	47	101	15 21	46	101	16 07	46	100	16 53	46	99	17 39	46	99	18 25	46	98	19 11	46	97	19 57	45	97	20 42	46	96	21 28	45	95	22 13	45	95	288
73	10 50	47	103	11 37	46	103	12 23	47	102	13 10	46	101	13 56	47	101	14 43	46	100	15 29	46	99	16 15	46	99	17 01	46	98	17 47	46	97	18 33	45	97	19 18	46	96	20 04	45	95	20 49	45	95	21 34	45	94	287
74	10 12	47	102	10 59	47	102	11 46	46	101	12 32	46	100	13 18	47	100	14 05	46	99	14 51	46	98	15 37	46	98	16 23	46	97	17 09	46	96	17 55	45	96	18 40	46	95	19 26	45	94	20 11	45	94	20 56	45	93	286
75	09 35	+46	102	10 21	+47	101	11 08	+46	100	11 54	+46	100	12 40	+47	99	13 27	+46	98	14 13	+46	98	14 59	+46	97	15 45	+45	96	16 30	+46	96	17 16	+46	95	18 02	+45	94	18 47	+45	94	19 32	+45	93	20 17	+45	92	285
76	08 57	46	101	09 43	47	100	10 30	46	100	11 16	46	99	12 02	46	98	12 48	47	98	13 35	45	97	14 20	46	96	15 06	46	96	15 52	46	95	16 38	45	94	17 23	46	94	18 09	45	93	18 54	45	92	19 39	45	91	284
77	08 19	46	100	09 05	47	99	09 52	46	99	10 38	46	98	11 24	46	97	12 10	46	97	12 56	46	96	13 42	46	95	14 28	46	95	15 14	45	94	15 59	46	93	16 45	45	93	17 30	45	92	18 15	45	91	19 00	45	91	283
78	07 41	46	99	08 27	46	99	09 13	47	98	10 00	46	97	10 46	46	97	11 32	46	96	12 18	46	95	13 04	45	95	13 49	46	94	14 35	46	93	15 21	45	93	16 06	45	92	16 51	46	91	17 37	45	91	18 22	45	90	282
79	07 03	46	98	07 49	46	98	08 35	46	97	09 21	46	97	10 07	46	96	10 53	46	95	11 39	46	95	12 25	46	94	13 11	46	93	13 57	45	93	14 42	46	92	15 28	45	91	16 13	45	91	16 58	45	90	17 43	45	89	281
80	06 25	+46	98	07 11	+46	97	07 57	+46	96	08 43	+46	96	09 29	+46	95	10 15	+46	94	11 01	+46	94	11 47	+45	93	12 32	+46	92	13 18	+46	92	14 04	+45	91	14 49	+45	90	15 34	+45	90	16 19	+46	89	17 05	+44	88	280
81	05 46	46	97	06 32	47	96	07 19	46	96	08 05	46	95	08 51	46	94	09 37	45	94	10 22	46	93	11 08	46	92	11 54	46	92	12 40	45	91	13 25	45	90	14 10	46	90	14 56	45	89	15 41	45	88	16 26	45	88	279
82	05 08	46	96	05 54	46	96	06 40	46	95	07 26	46	94	08 12	46	94	08 58	46	93	09 44	46	92	10 30	45	92	11 15	46	91	12 01	45	90	12 46	46	90	13 32	45	89	14 17	45	88	15 02	45	88	15 47	45	87	278
83	04 30	46	95	05 16	46	95	06 02	46	94	06 48	46	93	07 34	46	93	08 20	45	92	09 05	46	91	09 51	46	91	10 37	45	90	11 22	46	90	12 08	45	89	12 53	46	88	13 39	45	88	14 24	45	87	15 09	45	86	277
84	03 51	46	95	04 37	46	94	05 23	46	93	06 09	46	93	06 55	46	92	07 41	46	91	08 27	46	91	09 13	45	90	09 58	46	89	10 44	45	89	11 29	46	88	12 15	45	87	13 00	45	87	13 45	45	86	14 30	45	85	276
85	03 13	+46	94	03 59	+46	93	04 45	+46	93	05 31	+46	92	06 17	+45	91	07 02	+46	91	07 48	+46	90	08 34	+46	89	09 20	+45	89	10 05	+46	88	10 51	+45	87	11 36	+46	87	12 22	+45	86	13 07	+45	85	13 52	+45	85	275
86	02 34	46	93	03 20	46	92	04 06	46	92	04 52	46	91	05 38	46	90	06 24	46	90	07 10	45	89	07 55	46	89	08 41	46	88	09 27	45	87	10 12	46	87	10 58	45	86	11 43	45	85	12 28	46	85	13 14	45	84	274
87	01 56	46	92	02 42	46	92	03 28	46	91	04 14	45	90	04 59	46	90	05 45	46	89	06 31	46	88	07 17	46	88	08 03	45	87	08 48	46	86	09 34	45	86	10 19	46	85	11 05	45	84	11 50	45	84	12 35	46	83	273
88	01 17	46	92	02 03	46	91	02 49	46	90	03 35	46	90	04 21	46	89	05 07	46	88	05 53	45	88	06 38	46	87	07 24	46	86	08 10	45	86	08 55	46	85	09 41	45	84	10 26	46	84	11 12	45	83	11 57	45	82	272
89	00 39	46	91	01 25	45	90	02 10	46	89	02 56	46	89	03 42	46	88	04 28	46	88	05 14	46	87	06 00	46	86	06 46	45	86	07 31	46	85	08 17	46	84	09 03	45	84	09 48	46	83	10 34	45	82	11 19	45	82	271
90	00 00	+46	90	00 46	+46	89	01 32	+46	89	02 18	+46	88	03 04	+46	87	03 50	+46	87	04 36	+45	86	05 21	+46	85	06 07	+46	85	06 53	+46	84	07 39	+45	84	08 24	+46	83	09 10	+45	82	09 55	+46	82	10 41	+45	81	270
91	−0 39	46	89	00 07	46	89	00 53	46	88	01 39	46	87	02 25	46	87	03 11	46	86	03 57	46	85	04 43	46	85	05 29	46	84	06 15	45	83	07 00	46	83	07 46	46	82	08 32	45	81	09 17	46	81	10 03	45	80	269
92	−1 17	46	88	−0 31	46	88	00 15	46	87	01 01	46	87	01 47	46	86	02 33	46	85	03 19	46	85	04 05	45	84	04 50	46	83	05 36	46	83	06 22	46	82	07 08	46	81	07 54	45	81	08 39	46	80	09 25	45	79	268
93	−1 56	46	88	−1 10	46	87	−0 24	46	86	00 22	46	86	01 08	46	85	01 54	46	84	02 40	46	84	03 26	46	83	04 12	46	83	04 58	46	82	05 44	46	81	06 30	46	81	07 16	45	80	08 01	46	79	08 47	46	79	267
94	−2 34	46	87	−1 48	46	86	−1 02	46	86	−0 16	46	85	00 30	46	84	01 16	46	84	02 02	46	83	02 48	46	82	03 34	46	82	04 20	46	81	05 06	46	81	05 52	46	80	06 38	45	79	07 23	46	79	08 09	46	78	266
95	−3 13	+46	86	−2 27	+46	86	−1 41	+46	85	−0 55	+47	84	−0 08	+46	84	00 38	+46	83	01 24	+46	82	02 10	+46	82	02 56	+46	81	03 42	+46	80	04 28	+46	80	05 14	+46	79	06 00	+46	78	06 46	+46	78	07 32	+45	77	265
96	−3 51	46	85	−3 05	46	85	−2 19	46	84	−1 33	46	83	−0 47	46	83	−0 01	47	82	00 46	46	82	01 32	46	81	02 18	46	80	03 04	46	80	03 50	46	79	04 36	46	78	05 22	46	78	06 08	46	77	06 54	46	76	264
97	−4 30	47	85	−3 43	46	84	−2 57	46	83	−2 11	46	83	−1 25	46	82	−0 39	46	81	00 07	47	81	00 54	46	80	01 40	46	80	02 26	46	79	03 12	46	78	03 58	46	78	04 44	47	77	05 31	46	76	06 17	46	76	263
98	−5 08	46	84	−4 22	46	83	−3 36	47	83	−2 49	46	82	−2 03	46	81	−1 17	46	81	−0 31	47	80	00 16	46	79	01 02	46	79	01 48	46	78	02 34	47	77	03 21	46	77	04 07	46	76	04 53	46	76	05 39	46	75	262
99	−5 46	+46	83	−5 00	46	82	−4 14	46	82	−3 28	47	81	−2 41	46	81	−1 55	46	80	−1 09	47	79	−0 22	46	79	00 24	47	78	01 11	46	77	01 57	46	77	02 43	47	76	03 30	46	75	04 16	46	75	05 02	46	74	261
			100	−5 38	+46	82	−4 52	+46	81	−4 06	+47	80	−3 19	+46	80	−2 33	+47	79	−1 46	+46	78	−1 00	+47	78	−0 13	+46	77	00 33	+46	77	01 19	+47	76	02 06	+46	75	02 52	+47	75	03 39	+46	74	04 25	+46	73	260
			101	−6 16	+46	81	−5 30	46	80	−4 44	47	80	−3 57	46	79	−3 11	47	78	−2 24	46	78	−1 38	47	77	−0 51	47	76	−0 04	46	76	00 42	47	75	01 29	46	75	02 15	47	74	03 02	46	73	03 48	47	73	259
						102	−6 08	+47	79	−5 21	46	79	−4 35	47	78	−3 48	46	78	−3 02	47	77	−2 15	47	76	−1 28	46	76	−0 42	47	75	00 05	47	74	00 52	46	74	01 38	47	73	02 25	46	73	03 11	47	72	258
									103	−5 59	+46	78	−5 13	47	77	−4 26	47	77	−3 39	46	76	−2 53	47	76	−2 06	47	75	−1 19	47	74	−0 32	47	74	00 15	46	73	01 01	47	72	01 48	47	72	02 35	47	71	257
												104	−5 50	+47	77	−5 03	46	76	−4 17	47	75	−3 30	47	75	−2 43	47	74	−1 56	47	74	−1 09	47	73	−0 22	47	72	00 25	47	72	01 12	46	71	01 58	47	70	256
															105	−5 41	+47	75	−4 54	+47	75	−4 07	+47	74	−3 20	+47	73	−2 33	+47	73	−1 46	+47	72	−0 59	+47	71	−0 12	+47	71	00 35	+47	70	01 22	+47	70	255
															106	−6 18	+47	74	−5 31	47	74	−4 44	47	73	−3 57	47	73	−3 10	47	72	−2 23	48	71	−1 35	47	71	−0 48	47	70	−0 01	47	69	00 46	47	69	254
																		107	−6 08	+47	73	−5 21	47	72	−4 34	48	72	−3 46	47	71	−2 59	47	71	−2 12	48	70	−1 24	47	69	−0 37	47	69	00 10	48	68	253
																					108	−5 57	+47	72	−5 10	47	71	−4 23	48	70	−3 35	47	70	−2 48	48	69	−2 00	47	69	−1 13	48	68	−0 25	47	67	252
																								109	−5 46	47	70	−4 59	48	70	−4 11	47	69	−3 24	48	68	−2 36	47	68	−1 49	48	67	−1 01	48	67	251
																								110	−6 23	+48	69	−5 35	+48	69	−4 47	+47	68	−4 00	+48	68	−3 12	+48	67	−2 24	+48	66	−1 36	+48	66	250
																											111	−6 11	+48	68	−5 23	48	67	−4 35	48	67	−3 47	48	66	−2 59	48	66	−2 11	48	65	249
																														112	−5 59	+48	67	−5 11	49	66	−4 22	48	65	−3 34	48	65	−2 46	48	64	248
																																	113	−5 46	49	65	−4 57	48	65	−4 09	48	64	−3 21	49	63	247
																																	114	−6 21	+49	64	−5 32	48	64	−4 44	49	63	−3 55	48	63	246
																																				115	−6 07	+49	63	−5 18	+49	62	−4 29	+48	62	245
																																						116	−5 52	+49	62	−5 03	49	61	244
																																								117	−5 37	49	60	243
																																								118	−6 10	+49	60	242

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 50°

LAT 50°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 50°

LAT 50°

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
98	−5 08	−46	84	−5 54	−46	84	262																																								
97	−4 30	46	85	−5 16	46	85	−6 02	−46	86	263																																					
96	−3 51	46	85	−4 37	46	86	−5 23	46	87	−6 09	−46	87	264																																	
95	−3 13	−46	86	−3 59	−46	87	−4 45	−46	87	−5 31	−46	88	−6 17	−45	89	265																													
94	−2 34	46	87	−3 20	46	88	−4 06	46	88	−4 52	46	89	−5 38	46	90	−6 24	−46	90	266																											
93	−1 56	46	88	−2 42	46	88	−3 28	46	89	−4 14	45	90	−4 59	46	90	−5 45	46	91	267																											
92	−1 17	46	88	−2 03	46	89	−2 49	46	90	−3 35	46	90	−4 21	46	91	−5 07	46	92	−5 53	−45	92	268																							
91	−0 39	46	89	−1 25	45	90	−2 10	46	91	−2 56	46	91	−3 42	46	92	−4 28	46	92	−5 14	46	93	−6 00	−46	94	269																			
90	00 00	−46	90	−0 46	−46	91	−1 32	−46	91	−2 18	−46	92	−3 04	−46	93	−3 50	−46	93	−4 36	−45	94	−5 21	−46	95	−6 07	−46	95	270																	
89	00 39	46	91	−0 07	46	91	−0 53	46	92	−1 39	46	93	−2 25	46	93	−3 11	46	94	−3 57	46	95	−4 43	46	95	−5 29	46	96	−6 15	−45	97	271														
88	01 17	46	92	00 31	46	92	−0 15	46	93	−1 01	46	93	−1 47	46	94	−2 33	46	95	−3 19	46	95	−4 05	45	96	−4 50	46	97	−5 36	46	97	−6 22	−46	98	272										
87	01 56	46	92	01 10	46	93	00 24	46	94	−0 22	46	94	−1 08	46	95	−1 54	46	96	−2 40	46	96	−3 26	46	97	−4 12	46	97	−4 58	46	98	−5 44	46	99	273										
86	02 34	46	93	01 48	46	94	01 02	46	94	00 16	46	95	−0 30	46	96	−1 16	46	96	−2 02	46	97	−2 48	46	98	−3 34	46	98	−4 20	46	99	−5 06	46	99	−5 52	−46	100	274							
85	03 13	−46	94	02 27	−46	94	01 41	−46	95	00 55	−47	96	00 08	−46	96	−0 38	−46	97	−1 24	−46	98	−2 10	−46	98	−2 56	−46	99	−3 42	−46	100	−4 28	−46	100	−5 14	−46	101	−6 00	−46	102	275			
84	03 51	46	95	03 05	46	95	02 19	46	96	01 33	46	97	00 47	46	97	00 01	47	98	−0 46	46	98	−1 32	46	99	−2 18	46	100	−3 04	46	100	−3 50	46	101	−4 36	46	102	−5 22	46	102	−6 08	−46	103	276		
83	04 30	47	95	03 43	46	96	02 57	46	97	02 11	46	97	01 25	46	98	00 39	46	99	−0 07	47	99	−0 54	46	100	−1 40	46	100	−2 26	46	101	−3 12	46	102	−3 58	46	102	−4 44	47	103	−5 31	46	104	−6 17	−46	104	277
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70	12 42	−47	106	11 55	−47	106	11 08	−48	107	10 20	−47	107	09 33	−48	108	08 45	−47	109	07 58	−48	109	07 10	−47	110	06 23	−48	111	05 35	−48	111	04 47	−47	112	04 00	−48	112	03 12	−48	113	02 24	−48	114	01 36	−48	114	290
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
69	13 19	47	106	12 32	48	107	11 44	47	108	10 57	48	108	10 09	47	109	09 22	48	110	08 34	48	110	07 46	47	111	06 59	48	111	06 11	48	112	05 23	48	113	04 35	48	113	03 47	48	114	02 59	48	114	02 11	48	115	291
68	13 56	47	107	13 09	48	108	12 21	47	108	11 34	48	109	10 46	48	110	09 58	48	110	09 10	48	111	08 22	47	112	07 35	48	112	06 47	48	113	05 59	48	113	05 11	49	114	04 22	48	115	03 34	48	115	02 46	48	116	292
67	14 33	48	108	13 45	47	109	12 58	48	109	12 10	48	110	11 22	48	111	10 34	48	111	09 46	48	112	08 58	48	112	08 10	48	113	07 22	48	114	06 34	48	114	05 46	49	115	04 57	48	115	04 09	48	116	03 21	49	117	293
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65	15 46	−48	110	14 58	−48	110	14 10	−48	111	13 22	−48	112	12 34	−48	112	11 46	−49	113	10 57	−48	113	10 09	−46	114	09 21	−49	115	08 32	−48	115	07 44	−49	116	06 55	−48	116	06 07	−49	117	05 18	−49	118	04 29	−48	118	295
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0	40 00	−60	180	39 00	−60	180	38 00	−60	180	37 00	−60	180	36 00	−60	180	35 00	−60	180	34 00	−60	180	33 00	−60	180	32 00	−60	180	31 00	−60	180	30 00	−60	180	29 00	−60	180	28 00	−60	180	27 00	−60	180	26 00	−60	180	360
HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 50°

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	64 00	+60	180	65 00	+60	180	66 00	+60	180	67 00	+60	180	68 00	+60	180	69 00	+60	180	360
1	54 59	60	178	55 59	60	178	56 59	60	178	57 59	60	178	58 59	60	178	59 59	60	178	60 59	60	178	61 59	60	178	62 59	60	178	63 59	60	178	64 59	60	178	65 59	60	178	66 59	60	178	67 59	60	178	68 59	60	178	359
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57	32 26	46	106	33 12	46	106	33 58	46	105	34 44	45	104	35 29	45	103	36 14	44	102	36 58	44	101	37 42	44	101	38 26	43	100	39 09	43	99	39 52	43	98	40 35	42	97	41 17	41	96	41 58	41	95	42 39	41	94	303
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62	29 19	46	102	30 05	45	101	30 50	45	100	31 35	45	100	32 20	44	99	33 04	44	98	33 48	43	97	34 31	44	96	35 15	43	96	35 58	42	95	36 40	43	94	37 23	41	93	38 04	42	92	38 46	41	91	39 27	40	90	298
63	28 42	45	101	29 27	45	100	30 12	45	100	30 57	44	99	31 41	45	98	32 26	44	97	33 10	43	96	33 53	43	96	34 36	43	95	35 19	43	94	36 02	42	93	36 44	42	92	37 26	41	91	38 07	41	90	38 48	41	89	297
64	28 04	45	100	28 49	45	100	29 34	45	99	30 19	44	98	31 03	44	97	31 47	44	96	32 31	44	96	33 15	43	95	33 58	43	94	34 41	42	93	35 23	42	92	36 05	42	91	36 47	42	91	37 29	40	90	38 09	41	89	296
65	27 26	+45	99	28 11	+45	99	28 56	+44	98	29 40	+45	97	30 25	+44	96	31 09	+44	96	31 53	+43	95	32 36	+43	94	33 19	+43	93	34 02	+43	92	34 45	+42	92	35 27	+42	91	36 09	+41	90	36 50	+41	89	37 31	+40	88	295
66	26 48	45	99	27 33	45	98	28 18	44	97	29 02	45	96	29 47	44	96	30 31	43	95	31 14	44	94	31 58	43	93	32 41	43	92	33 24	42	92	34 06	42	91	34 48	42	90	35 30	41	89	36 11	41	88	36 52	41	87	294
67	26 10	45	98	26 55	44	97	27 39	45	96	28 24	44	96	29 08	44	95	29 52	44	94	30 36	43	93	31 19	43	92	32 02	43	92	32 45	43	91	33 28	42	90	34 10	42	89	34 52	41	88	35 33	41	87	36 14	40	86	293
68	25 31	45	97	26 16	45	96	27 01	44	96	27 45	45	95	28 30	44	94	29 14	43	93	29 57	44	92	30 41	43	92	31 24	43	91	32 07	42	90	32 49	42	89	33 31	42	88	34 13	41	87	34 54	41	87	35 35	41	86	292
69	24 53	45	96	25 38	45	96	26 23	44	95	27 07	44	94	27 51	44	93	28 35	44	92	29 19	43	92	30 02	43	91	30 45	43	90	31 28	43	89	32 11	42	88	32 53

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
70	24 15	+44	95	24 59	+45	95	25 44	+44	94	26 28	+45	93	27 13	+44	92	27 57	+43	92	28 40	+44	91	29 24	+43	90	30 07	+43	89	30 50	+42	89	31 32	+42	88	32 14	+42	87	32 56	+41	86	33 37	+42	85	34 19	+40	84	290
71	23 36	45	95	24 21	45	94	25 06	44	93	25 50	44	92	26 34	44	92	27 18	44	91	28 02	43	90	28 45	43	89	29 28	43	89	30 11	42	88	30 53	43	87	31 36	42	86	32 18	41	85	32 59	41	84	33 40	41	84	289
72	22 58	45	94	23 43	44	93	24 27	44	92	25 11	45	92	25 56	43	91	26 39	44	90	27 23	43	89	28 06	44	89	28 50	42	88	29 32	43	87	30 15	42	86	30 57	42	85	31 39	42	85	32 21	41	84	33 02	41	83	288
73	22 19	45	93	23 04	45	92	23 49	44	92	24 33	44	91	25 17	44	90	26 01	44	89	26 45	43	89	27 28	43	88	28 11	43	87	28 54	43	86	29 37	42	85	30 19	42	85	31 01	41	84	31 42	42	83	32 24	41	82	287
74	21 41	44	92	22 25	45	92	23 10	44	91	23 54	44	90	24 38	44	89	25 22	44	89	26 06	43	88	26 49	44	87	27 33	42	86	28 15	43	86	28 58	42	85	29 40	42	84	30 22	42	83	31 04	42	82	31 46	41	81	286
75	21 02	+45	92	21 47	+44	91	22 31	+45	90	23 16	+44	89	24 00	+44	89	24 44	+43	88	25 27	+44	87	26 11	+43	86	26 54	+43	86	27 37	+43	85	28 20	+42	84	29 02	+42	83	29 44	+42	82	30 26	+41	82	31 07	+42	81	285
76	20 24	44	91	21 08	45	90	21 53	44	89	22 37	44	89	23 21	44	88	24 05	44	87	24 49	43	86	25 32	44	86	26 16	43	85	26 59	42	84	27 41	43	83	28 24	42	82	29 06	42	82	29 48	41	81	30 29	42	80	284
77	19 45	45	90	20 30	44	89	21 14	45	89	21 59	44	88	22 43	44	87	23 27	43	86	24 10	44	86	24 54	43	85	25 37	43	84	26 20	43	83	27 03	43	83	27 46	42	82	28 28	42	81	29 10	41	80	29 51	42	79	283
78	19 07	44	89	19 51	45	89	20 36	44	88	21 20	44	87	22 04	44	86	22 48	44	86	23 32	44	85	24 16	43	84	24 59	43	83	25 42	43	83	26 25	42	82	27 07	43	81	27 50	42	80	28 32	42	79	29 14	41	79	282
79	18 28	45	88	19 13	44	88	19 57	45	87	20 42	44	86	21 26	44	86	22 10	44	85	22 54	43	84	23 37	44	83	24 21	43	83	25 04	43	82	25 47	42	81	26 29	43	80	27 12	42	80	27 54	42	79	28 36	41	78	281
80	17 49	+45	88	18 34	+45	87	19 19	+44	86	20 03	+44	86	20 47	+44	85	21 31	+44	84	22 15	+44	83	22 59	+43	83	23 42	+44	82	24 26	+43	81	25 09	+42	80	25 51	+43	80	26 34	+42	79	27 16	+42	78	27 58	+42	77	280
81	17 11	45	87	17 56	44	86	18 40	45	86	19 25	44	85	20 09	44	84	20 53	44	83	21 37	44	83	22 21	43	82	23 04	44	81	23 48	43	80	24 31	43	80	25 14	42	79	25 56	43	78	26 39	42	77	27 21	41	77	279
82	16 32	45	86	17 17	45	86	18 02	44	85	18 46	45	84	19 31	44	83	20 15	44	83	20 59	44	82	21 43	43	81	22 26	44	80	23 10	43	80	23 53	43	79	24 36	42	78	25 18	43	77	26 01	42	77	26 43	42	76	278
83	15 54	45	85	16 39	44	85	17 23	45	84	18 08	44	83	18 52	45	83	19 37	44	82	20 21	44	81	21 05	43	80	21 48	44	80	22 32	43	79	23 15	43	78	23 58	43	77	24 41	42	77	25 23	43	76	26 06	42	75	277
84	15 15	45	85	16 00	45	84	16 45	45	83	17 30	44	82	18 14	44	82	18 58	45	81	19 43	44	80	20 27	43	80	21 10	44	79	21 54	43	78	22 37	43	78	23 20	43	77	24 03	43	76	24 46	43	75	25 29	42	74	276
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86	13 59	45	83	14 44	45	83	15 29	44	82	16 13	45	81	16 58	44	80	17 42	45	80	18 27	44	79	19 11	44	78	19 55	44	78	20 39	43	77	21 22	44	76	22 06	43	75	22 49	43	75	23 32	43	74	24 15	42	73	274
87	13 21	45	82	14 06	44	82	14 50	45	81	15 35	45	80	16 20	44	80	17 04	45	79	17 49	44	78	18 33	44	78	19 17	44	77	20 01	44	76	20 45	43	75	21 28	44	75	22 12	43	74	22 55	43	73	23 38	42	72	273
88	12 42	45	82	13 27	45	81	14 12	45	80	14 57	45	80	15 42	45	79	16 27	44	78	17 11	44	78	17 55	45	77	18 40	44	76	19 24	44	75	20 08	43	75	20 51	44	74	21 35	43	73	22 18	43	73	23 01	43	72	272
89	12 04	45	81	12 49	45	80	13 34	45	80	14 19	45	79	15 04	45	78	15 49	45	78	16 34	44	77	17 18	44	76	18 02	44	75	18 46	44	75	19 30	44	74	20 14	44	73	20 58	43	73	21 41	43	72	22 24	43	71	271
90	11 26	+45	80	12 11	+46	80	12 57	+45	79	13 42	+45	78	14 27	+44	78	15 11	+45	77	15 56	+45	76	16 41	+44	75	17 25	+44	75	18 09	+44	74	18 53	+44	73	19 37	+44	73	20 21	+44	72	21 05	+43	71	21 48	+43	70	270
91	10 48	46	79	11 34	45	79	12 19	45	78	13 04	45	77	13 49	45	77	14 34	45	76	15 19	44	75	16 03	45	75	16 48	44	74	17 32	44	73	18 16	45	73	19 01	44	72	19 45	43	71	20 28	44	70	21 12	43	70	269
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93	09 33	45	78	10 18	45	77	11 03	46	77	11 49	45	76	12 34	45	75	13 19	45	75	14 04	45	74	14 49	45	73	15 34	45	73	16 19	44	72	17 03	45	71	17 48	44	71	18 32	44	70	19 16	44	69	20 00	44	68	267
94	08 55	45	77	09 40	46	77	10 26	45	76	11 11	46	75	11 57	45	75	12 42	45	74	13 27	45	73	14 12	45	73	14 57	45	72	15 42	45	71	16 27	44	71	17 11	45	70	17 56	44	69	18 40	44	68	19 24	44	68	266
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96	07 40	46	76	08 26	45	75	09 11	46	74	09 57	46	74	10 43	45	73	11 28	46	72	12 14	45	72	12 59	45	71	13 44	45	70	14 29	45	70	15 14	45	69	15 59	45	68	16 44	45	68	17 29	44	67	18 13	44	66	264
97	07 03	45	75	07 48	46	74	08 34	46	74	09 20	46	73	10 06	46	72	10 52	45	72	11 37	46	71	12 23	45	70	13 08	45	70	13 53	45	69	14 38	45	68	15 23	45	68	16 08	45	67	16 53	45	66	17 38	44	66	263
98	06 25	46	74	07 11	46	74	07 57	46	73	08 43	46	72	09 29	46	72	10 15	46	71	11 01	45	70	11 46	46	70	12 32	45	69	13 17	46	68	14 03	45	68	14 48	45	67	15 33	45	66	16 18	45	66	17 03	44	65	262
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100	05 11	+47	73	05 58	+46	72	06 44	+46	71	07 30	+46	71	08 16	+46	70	09 02	+46	70	09 48	+46	69	10 34	+46	68	11 20	+46	68	12 06	+46	67	12 52	+45	66	13 37	+46	66	14 23	+45	65	15 08	+45	64	15 53	+45	64	260
101	04 35	46	72	05 21	46	71	06 07	47	71	06 54	46	70	07 40	46	69	08 26	46	69	09 12	47	68	09 59	46	68	10 45	46	67	11 31	45	66	12 16	46	66	13 02	46	65	13 48	45	64	14 33	46	64	15 19	45	63	259
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105	02 09	+47	69	02 56	+47	68	03 43	+47	68	04 30	+47	67	05 17	+47	67	06 04	+47	66	06 51	+47	65	07 38	+46	65	08 24	+47	64	09 11	+47	63	09 58	+46	63	10 44	+47	62	11 31	+46	61	12 17	+46	61	13 03	+46	60	255
106	01 33	47	68	02 20	48	68	03 08	47	67	03 55	47	66	04 42	47	66	05 29	47	65	06 16	47	65	07 03	47	64	07 50	47	63	08 37	46	63	09 23	47	62	10 10	47	61	10 57	46	61	11 43	47	60	12 30	46	59	254
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108	00 22	47	67	01 09	48	66	01 57	47	66	02 44	48	65	03 32	47	64	04 19	48	64	05 07	47	63	05 54	47	62	06 41	48	62	07 29	47	61	08 16	47	61	09 03	47	60	09 50	47	59	10 37	47	59	11 24	47	58	252
109	−0 13	47	66	00 34	48	65	01 22	48	65	02 10	47	64	02 57	48	64	03 45	47	63	04 32	48	62	05 20	47	62	06 07	48	61	06 55	47	60	07 42	48	60	08 30	47	59	09 17	47	59	10 04	47	58	10 51	47	57	251
110	−0 48	+47	65	−0 01	+48	65	00 47	+48	64	01 35	+48	63	02 23	+48	63	03 11	+47	62	03 58	+48	62	04 46	+48	61	05 34	+47	60	06 21	+48	60	07 09	+48	59	07 57	+47	59	08 44	+48	58	09 32	+47	57	10 19	+47	57	250
111	−1 23	48	64	−0 35	48	64	00 13	48	63	01 01	48	63	01 49	48	62	02 37	48	62	03 25	48	61	04 13	47	60	05 00	48	59	05 48	48	59	06 36	48	58	07 24	48	58	08 12	47	57	08 59	48	57	09 47	48	56	249
112	−1 58	48	64	−1 10	48	63	−0 22	49	62	00 27	48	62	01 15	48	61	02 03	48	61	02 51	48	60	03 39	48	59	04 27	48	59	05 15	48	58	06 03	48	58	06 51	48	57	07 39	48	56	08 27	48	56	09 15	48	55	248
113	−2 32	48	63	−1 44	48	62	−0 56	49	62	−0 07	48	61	00 41	48	61	01 29	49	60	02 18	48	59	03 06	48	59	03 54	49	58	04 43	48	58	05 31	48	57	06 19	48	56	07 07	49	56	07 56	48	55	08 44	48	55	247
114	−3 07	49	62	−2 18	48	62	−1 30	49	61	−0 41	49	60	00 08	48	60	00 56	49	59	01 45	48	59	02 33	49	58	03 22	48	57	04 10	49	57	04 59	48	56	05 47	49	56	06 36	48	55	07 24	48	54	08 12	49	54	246
115	−3 41	+49	61	−2 52	+49	61	−2 03	+49	60	−1 14	+48	60	−0 26	+49	59	00 23	+49	58	01 12	+49	58	02 01	+48	57	02 49	+49	57	03 38	+49	56	04 27	+49	55	05 16	+48	55	06 04	+49	54	06 53	+48	54	07 41	+49	53	245
116	−4 14	49	61	−3 25	49	60	−2 36	48	59	−1 48	49	59	−0 59	49	58	−0 10	49	58	00 39	49	57	01 28	49	56	02 17	49	56	03 06	49	55	03 55	49	55	04 44	49	54	05 33	49	54	06 22	49	53	07 11	48	52	244
117	−4 48	49	60	−3 59	49	59	−3 10	50	59	−2 20	49	58	−1 31	49	57	−0 42	49	57	00 07	49	56	00 56	50	56	01 46	49	55	02 35	49	55	03 24	49	54	04 13	49	53	05 02	49	53	05 51	49	52	06 40	49	52	243
118	−5 21	49	59	−4 32	50	58	−3 42	49	58	−2 53	49	57	−2 04	50	57	−1 14	49	56	−0 25	50	56	00 25	49	55	01 14	49	54	02 03	50	54	02 53	49	53	03 42	50	53	04 32	49	52	05 21	49	52	06 10	49	51	242
119	−5 54	+50	58	−5 04	49	58	−4 15	50	57	−3 25	49	56	−2 36	50	56	−1 46	50	55	−0 56	49	55	−0 07	50	54	00 43	49	54	01 32	50	53	02 22	50	52	03 12	49	52	04 01	50	51	04 51	49	51	05 40	50	50	241
			120	−5 37	+50	57	−4 47	+50	56	−3 57	+50	56	−3 07	+49	55	−2 18	+50	55	−1 28	+50	54	−0 38	+50	53	00 12	+50	53	01 02	+50	52	01 52	+49	52	02 41	+50	51	03 31	+50	50	04 21	+50	50	05 11	+50	50	240
			121	−6 09	+50	56	−5 19	50	55	−4 29	50	54	−3 39	50	54	−2 49	50	54	−1 59	50	53	−1 09	50	53	−0 19	50	52	00 31	50	52	01 21	51	51	02 12	50	50	03 02	50	50	03 52	50	49	04 42	50	49	239
						122	−5 50	+50	55	−5 00	50	54	−4 10	50	54	−3 20	50	53	−2 30	51	52	−1 39	50	52	−0 49	50	51	00 01	51	51	00 52	50	50	01 42	50	50	02 32	51	49	03 23	50	49	04 13	50	48	238
									123	−5 31	50	53	−4 41	51	53	−3 50	50	52	−3 00	51	52	−2 09	50	51	−1 19	51	51	−0 28	50	50	00 22	51	49	01 13	50	49	02 03	51	48	02 54	50	48	03 44	51	47	237
									124	−6 02	+52	52	−5 11	50	52	−4 21	51	51	−3 30	51	51	−2 39	51	50	−1 48	50	50	−0 58	51	49	−0 07	51	49	00 44	51	48	01 35	50	48	02 25	51	47	03 16	51	47	236
												125	−5 42	+51	51	−4 51	+51	51	−4 00	+51	50	−3 09	+51	50	−2 18	+51	49	−1 27	+51	48	−0 36	+51	48	00 15	+51	47	01 06	+51	47	01 57	+51	46	02 48	+51	46	235
												126	−6 11	+51	50	−5 20	51	50	−4 29	51	49	−3 38	51	49	−2 47	52	48	−1 55	51	48	−1 04	51	47	−0 13	51	47	00 38	52	46	01 30	51	46	02 21	51	45	234
															127	−5 50	52	49	−4 58	51	48	−4 07	52	48	−3 15	51	47	−2 24	52	47	−1 32	51	46	−0 41	52	46	00 11	51	45	01 02	52	45	01 54	51	44	233
															128	−6 18	+51	48	−5 27	52	48	−4 35	52	47	−3 43	51	47	−2 52	52	46	−2 00	52	46	−1 08	51	45	−0 17	52	45	00 35	52	44	01 27	52	44	232
																		129	−5 55	+52	47	−5 03	52	46	−4 11	52	46	−3 19	52	45	−2 27	52	45	−1 35	52	44	−0 43	51	44	00 08	52	43	01 00	52	43	231
																					130	−5 31	+52	46	−4 39	+52	45	−3 47	+53	45	−2 54	+52	44	−2 02	+52	44	−1 10	+52	43	−0 18	+52	43	00 34	+53	42	230
																					131	−5 58	+52	45	−5 06	53	44	−4 13	52	44	−3 21	52	43	−2 29	53	43	−1 36	52	42	−0 44	53	42	00 09	52	41	229
																									132	−5 33	53	43	−4 40	53	43	−3 47	52	42	−2 55	53	42	−2 02	53	41	−1 09	53	41	−0 16	52	41	228
																									133	−5 59	+53	42	−5 06	53	42	−4 13	53	42	−3 20	53	41	−2 27	53	41	−1 34	53	40	−0 41	53	40	227
																												134	−5 32	53	41	−4 39	54	41	−3 45	53	40	−2 52	53	40	−1 59	53	39	−1 06	53	39	226
																															135	−5 57	+53	41	−5 04	+54	40	−4 10	+53	40	−3 17	+54	39	−2 23	+53	39	−1 30	+54	38	225
																																	136	−5 28	53	39	−4 35	54	39	−3 41	54	38	−2 47	53	38	−1 54	54	37	224
																																	137	−5 52	54	38	−4 58	53	38	−4 05	54	38	−3 11	54	37	−2 17	54	37	223
																																	138	−6 16	+54	38	−5 22	54	37	−4 28	54	37	−3 34	54	36	−2 40	55	36	222
																																			139	−5 45	54	36	−4 51	55	36	−3 56	54	35	−3 02	54	35	221
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 50°

LAT 50°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 50°

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
																																	140	−6 08	+55	36	−5 13	+54	35	−4 19	+55	35	−3 24	+55	34	220
																																	141	−5 35	55	34	−4 40	55	34	−3 45	54	33	219
																																	142	−5 57	+58	33	−5 02	56	33	−4 06	55	33	218
																																				143	−5 22	55	32	−4 27	55	32	217
																																				144	−5 43	56	31	−4 47	55	31	216
																																				145	−6 03	+56	31	−5 07	+56	30	215
																																							146	−5 26	56	29	214
																																							147	−5 45	56	29	213
																																							148	−6 03	+56	28	212
81	−5 48	−46	106	279																																										
80	−5 11	−47	107	−5 58	−46	108	280																																							
79	−4 35	46	108	−5 21	46	109	−6 07	−47	109	281																																				
78	−3 58	47	109	−4 45	46	109	−5 31	47	110	−6 18	−46	111	282																																	
77	−3 22	46	109	−4 08	47	110	−4 55	47	111	−5 42	46	111	283																																	
76	−2 45	47	110	−3 32	47	111	−4 19	47	111	−5 06	47	112	−5 53	−46	113	284																														
75	−2 09	−47	111	−2 56	−47	112	−3 43	−47	112	−4 30	−47	113	−5 17	−47	113	−6 04	−47	114	285																											
74	−1 33	47	112	−2 20	48	112	−3 08	47	113	−3 55	47	114	−4 42	47	114	−5 29	47	115	−6 16	−47	115	286																								
73	−0 58	47	113	−1 45	47	113	−2 32	47	114	−3 19	48	114	−4 07	47	115	−4 54	47	116	−5 41	47	116	287																								
72	−0 22	47	113	−1 09	48	114	−1 57	47	114	−2 44	48	115	−3 32	47	116	−4 19	48	116	−5 07	47	117	−5 54	−47	118	288																				
71	00 13	47	114	−0 34	48	115	−1 22	48	115	−2 10	47	116	−2 57	48	116	−3 45	47	117	−4 32	48	118	−5 20	47	118	−6 07	−48	119	289																
70	00 48	−47	115	00 01	−48	115	−0 47	−48	116	−1 35	−48	117	−2 23	−48	117	−3 11	−47	118	−3 58	−48	118	−4 46	−48	119	−5 34	−47	120	290																
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 50°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
69	01 23	48	116	00 35	48	116	−0 13	48	117	−1 01	48	117	−1 49	48	118	−2 37	48	119	−3 25	48	119	−4 13	47	120	−5 00	48	120	−5 48	−48	121	291																		69
68	01 58	48	116	01 10	48	117	00 22	49	118	−0 27	48	118	−1 15	48	119	−2 03	48	119	−2 51	48	120	−3 39	48	121	−4 27	48	121	−5 15	48	122	−6 03	−48	122	292																68
67	02 32	48	117	01 44	48	118	00 56	49	118	00 07	48	119	−0 41	48	119	−1 29	49	120	−2 18	48	121	−3 06	48	121	−3 54	49	122	−4 43	48	122	−5 31	48	123	−6 19	−48	124	293												67
66	03 07	49	118	02 18	48	118	01 30	49	119	00 41	49	120	−0 08	48	120	−0 56	49	121	−1 45	48	121	−2 33	49	122	−3 22	48	123	−4 10	49	123	−4 59	48	124	−5 47	49	124	294												66
65	03 41	−49	119	02 52	−49	119	02 03	−49	120	01 14	−48	120	00 26	−49	121	−0 23	−49	122	−1 12	−49	122	−2 01	−48	123	−2 49	−49	124	−3 38	−49	125	−4 27	−49	125	−5 16	−48	125	−6 04	−49	126	295								65
64	04 14	49	119	03 25	49	120	02 36	48	121	01 48	49	121	00 59	49	122	00 10	49	122	−0 39	49	123	−1 28	49	124	−2 17	49	124	−3 06	49	125	−3 55	49	125	−4 44	49	126	−5 33	49	126	296								64
63	04 48	49	120	03 59	49	121	03 10	50	121	02 20	49	122	01 31	49	123	00 42	49	123	−0 07	49	124	−0 56	50	124	−1 46	49	125	−2 35	49	125	−3 24	49	126	−4 13	49	127	−5 02	49	127	−5 51	−49	128	297						63
62	05 21	49	121	04 32	50	122	03 42	49	122	02 53	49	123	02 04	50	123	01 14	49	124	00 25	50	124	−0 25	49	125	−1 14	49	126	−2 03	50	126	−2 53	49	127	−3 42	50	127	−4 32	49	128	−5 21	49	128	−6 10	−49	129	298	62
61	05 54	50	122	05 04	49	122	04 15	50	123	03 25	49	124	02 36	50	124	01 46	50	125	00 56	49	125	00 07	50	126	−0 43	49	126	−1 32	50	127	−2 22	50	128	−3 12	49	128	−4 01	50	129	−4 51	49	129	−5 40	50	130	299	61
60	06 26	−49	123	05 37	−50	123	04 47	−50	124	03 57	−50	124	03 07	−49	125	02 18	−50	125	01 28	−50	126	00 38	−50	127	−0 12	−50	127	−1 02	−50	128	−1 52	−49	128	−2 41	−50	129	−3 31	−50	129	−4 21	−50	130	−5 11	−50	130	300	60
59	06 59	50	123	06 09	50	124	05 19	50	125	04 29	50	125	03 39	50	126	02 49	50	126	01 59	50	127	01 09	50	127	00 19	50	128	−0 31	50	128	−1 21	51	129	−2 12	50	130	−3 02	50	130	−3 52	50	131	−4 42	50	131	301	59
58	07 31	50	124	06 41	51	125	05 50	50	125	05 00	50	126	04 10	50	126	03 20	50	127	02 30	51	128	01 39	50	128	00 49	50	129	−0 01	51	129	−0 52	50	130	−1 42	50	130	−2 32	51	131	−3 23	50	131	−4 13	50	132	302	58
57	08 02	50	125	07 12	50	126	06 22	51	126	05 31	50	127	04 41	51	127	03 50	50	128	03 00	51	128	02 09	50	129	01 19	51	129	00 28	50	130	−0 22	51	131	−1 13	50	131	−2 03	51	132	−2 54	50	132	−3 44	51	133	303	57
56	08 34	51	126	07 43	50	126	06 53	51	127	06 02	51	128	05 11	50	128	04 21	51	129	03 30	51	129	02 39	51	130	01 48	50	130	00 58	51	131	00 07	51	131	−0 44	51	132	−1 35	50	132	−2 25	51	133	−3 16	51	133	304	56
55	09 05	−51	127	08 14	−51	127	07 23	−51	128	06 32	−50	128	05 42	−51	129	04 51	−51	129	04 00	−51	130	03 09	−51	130	02 18	−51	131	01 27	−51	132	00 36	−51	132	−0 15	−51	133	−1 06	−51	133	−1 57	−51	134	−2 48	−51	134	305	55
54	09 36	51	128	08 45	51	128	07 54	51	129	07 03	52	129	06 11	51	130	05 20	51	130	04 29	51	131	03 38	51	131	02 47	52	132	01 55	51	132	01 04	51	133	00 13	51	133	−0 38	52	134	−1 30	51	134	−2 21	51	135	306	54
53	10 06	51	128	09 15	51	129	08 24	52	129	07 32	51	130	06 41	51	131	05 50	52	131	04 58	51	132	04 07	52	132	03 15	51	133	02 24	52	133	01 32	51	134	00 41	52	134	−0 11	51	135	−1 02	52	135	−1 54	51	136	307	53
52	10 36	51	129	09 45	52	130	08 53	51	130	08 02	52	131	07 10	52	131	06 18	51	132	05 27	52	132	04 35	52	133	03 43	51	133	02 52	52	134	02 00	52	134	01 08	51	135	00 17	52	135	−0 35	52	136	−1 27	52	136	308	52
51	11 06	52	130	10 14	52	131	09 22	51	131	08 31	52	132	07 39	52	132	06 47	52	133	05 55	52	133	05 03	52	134	04 11	52	134	03 19	52	135	02 27	52	135	01 35	52	136	00 43	51	136	−0 08	52	137	−1 00	52	137	309	51
50	11 35	−52	131	10 43	−52	131	09 51	−52	132	08 59	−52	132	08 07	−52	133	07 15	−52	133	06 23	−52	134	05 31	−52	134	04 39	−52	135	03 47	−53	135	02 54	−52	136	02 02	−52	136	01 10	−52	137	00 18	−52	137	−0 34	−53	138	310	50
49	12 04	52	132	11 12	52	132	10 20	52	133	09 28	53	133	08 35	52	134	07 43	52	134	06 51	53	135	05 58	52	135	05 06	53	136	04 13	52	136	03 21	52	137	02 29	53	137	01 36	52	138	00 44	53	138	−0 09	52	139	311	49
48	12 33	53	133	11 40	52	133	10 48	53	134	09 55	52	134	09 03	53	135	08 10	52	135	07 18	53	136	06 25	52	136	05 33	53	137	04 40	53	137	03 47	52	138	02 55	53	138	02 02	53	139	01 09	53	139	00 16	52	139	312	48
47	13 01	53	134	12 08	52	134	11 16	53	135	10 23	53	135	09 30	53	135	08 37	52	136	07 45	53	136	06 52	53	137	05 59	53	138	05 06	53	138	04 13	53	138	03 20	53	139	02 27	53	139	01 34	53	140	00 41	53	140	313	47
46	13 29	53	134	12 36	53	135	11 43	53	135	10 50	53	136	09 57	53	136	09 04	53	137	08 11	53	137	07 18	53	138	06 25	53	138	05 32	53	139	04 39	54	139	03 45	53	140	02 52	53	140	01 59	53	141	01 06	53	141	314	46
45	13 56	−53	135	13 03	−53	136	12 10	−53	136	11 17	−54	137	10 23	−53	137	09 30	−53	138	08 37	−53	138	07 44	−54	139	06 50	−53	139	05 57	−53	139	05 04	−54	140	04 10	−53	140	03 17	−54	141	02 23	−53	141	01 30	−54	142	315	45
44	14 23	53	136	13 30	54	137	12 36	53	137	11 43	54	138	10 49	53	138	09 56	54	138	09 02	53	139	08 09	54	139	07 15	53	140	06 22	54	140	05 28	53	141	04 35	54	141	03 41	54	142	02 47	53	142	01 54	54	143	316	44
43	14 49	53	137	13 56	54	138	13 02	53	138	12 09	54	138	11 15	54	139	10 21	53	139	09 28	54	140	08 34	54	140	07 40	54	141	06 46	54	141	05 52	54	142	04 58	54	142	04 05	54	142	03 11	54	143	02 17	54	143	317	43
42	15 15	53	138	14 22	54	138	13 28	54	139	12 34	54	139	11 40	54	140	10 46	54	140	09 52	54	141	08 58	54	141	08 04	54	142	07 10	54	142	06 16	54	142	05 22	54	143	04 28	54	143	03 34	54	144	02 40	55	144	318	42
41	15 41	54	139	14 47	54	139	13 53	54	140	12 59	54	140	12 05	54	141	11 11	55	141	10 16	54	142	09 22	54	142	08 28	54	142	07 34	55	143	06 39	54	143	05 45	54	144	04 51	55	144	03 56	54	145	03 02	54	145	319	41
40	16 06	−54	140	15 12	−54	140	14 18	−55	141	13 23	−54	141	12 29	−54	142	11 35	−55	142	10 40	−54	142	09 46	−55	143	08 51	−54	143	07 57	−55	144	07 02	−54	144	06 08	−55	144	05 13	−54	145	04 19	−55	145	03 24	−55	146	320	40
39	16 31	55	141	15 36	54	141	14 42	55	142	13 47	54	142	12 53	55	142	11 58	54	143	11 04	55	143	10 09	55	144	09 14	55	144	08 19	54	144	07 25	55	145	06 30	55	145	05 35	55	146	04 40	55	146	03 45	54	147	321	39
38	16 55	55	142	16 00	54	142	15 06	55	142	14 11	55	143	13 16	55	143	12 21	55	144	11 26	54	144	10 32	55	145	09 37	55	145	08 42	55	145	07 47	55	146	06 52	55	146	05 57	55	147	05 02	56	147	04 06	55	147	322	38
37	17 19	55	142	16 24	56	143	15 29	55	143	14 34	55	144	13 39	55	144	12 44	55	145	11 49	55	145	10 54	55	145	09 59	56	146	09 03	55	146	08 08	55	147	07 13	55	147	06 18	56	147	05 22	55	148	04 27	55	148	323	37
36	17 42	55	143	16 47	55	144	15 52	55	144	14 57	56	145	14 01	55	145	13 06	55	145	12 11	56	146	11 15	55	146	10 20	55	147	09 25	56	147	08 29	55	147	07 34	56	148	06 38	55	148	05 43	56	149	04 47	55	149	324	36
35	18 05	−56	144	17 09	−55	145	16 14	−55	145	15 19	−56	146	14 23	−55	146	13 28	−56	146	12 32	−55	147	11 37	−56	147	10 41	−56	148	09 45	−55	148	08 50	−56	148	07 54	−56	149	06 58	−55	149	06 03	−56	149	05 07	−56	150	325	35
34	18 27	56	145	17 31	55	146	16 36	56	146	15 40	55	146	14 45	56	147	13 49	56	147	12 53	56	148	11 57	56	148	11 01	55	148	10 06	56	149	09 10	56	149	08 14	56	149	07 18	56	150	06 22	56	150	05 26	56	151	326	34
33	18 49	56	146	17 53	56	147	16 57	56	147	16 01	56	147	15 05	56	148	14 09	56	148	13 13	56	149	12 17	56	149	11 21	56	149	10 25	56	150	09 29	56	150	08 33	56	150	07 37	56	151	06 41	56	151	05 45	56	151	327	33
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	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 51°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
0	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	360
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35	31 02	+54	138	31 56	+54	137	32 50	+55	137	33 45	+54	136	34 39	+53	136	35 32	+54	135	36 26	+54	135	37 20	+53	134	38 13	+53	134	39 06	+53	133	39 59	+53	133	40 52	+53	132	41 45	+52	131	42 37	+52	131	43 29	+52	130	325
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37	30 10	54	136	31 04	54	135	31 58	54	135	32 52	53	134	33 45	53	134	34 38	54	133	35 32	53	133	36 25	52	132	37 17	53	131	38 10	53	131	39 03	52	130	39 55	52	130	40 47	52	129	41 39	51	128	42 30	52	128	323
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63	16 36	49	112	17 25	48	111	18 13	49	110	19 02	48	110	19 50	48	109	20 38	48	108	21 26	48	108	22 14	47	107	23 01	48	107	23 49	47	106	24 36	47	105	25 23	47	105	26 10	47	104	26 57	46	103	27 43	47	102	297
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65	15 25	+49	110	16 14	+48	109	17 02	+48	109	17 50	+48	108	18 38	+48	107	19 26	+48	107	20 14	+47	106	21 01	+48	105	21 49	+47	105	22 36	+47	104	23 23	+47	103	24 10	+47	103	24 57	+46	102	25 43	+47	101	26 30	+46	101	295
66	14 50	48	109	15 38	48	108	16 26	48	108	17 14	48	107	18 02	48	107	18 50	47	106	19 37	48	105	20 25	47	105	21 12	47	104	21 59	47	103	22 46	47	103	23 33	47	102	24 20	46	101	25 06	46	101	25 52	46	100	294
67	14 14	48	108	15 02	48	108	15 50	48	107	16 38	48	106	17 26	47	106	18 13	48	105	19 01	47	104	19 48	47	104	20 35	47	103	21 22	47	102	22 09	47	102	22 56	47	101	23 43	46	100	24 29	46	100	25 15	46	99	293
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HA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n =

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) SAME NAME AS LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	°
70	12 26	+47	106	13 13	+48	105	14 01	+48	105	14 49	+47	104	15 36	+47	103	16 23	+48	103	17 11	+47	102	17 58	+47	101	18 45	+46	101	19 31	+47	100	20 18	+46	99	21 04	+47	99	21 51	+46	98	22 37	+46	97	23 23	+46	97	290
71	11 49	48	105	12 37	47	104	13 24	48	104	14 12	47	103	14 59	47	102	15 46	48	102	16 34	47	101	17 21	46	101	18 07	47	100	18 54	47	99	19 41	46	99	20 27	46	98	21 13	46	97	21 59	46	96	22 45	46	96	289
72	11 13	47	104	12 00	48	104	12 48	47	103	13 35	47	102	14 22	47	102	15 09	47	101	15 56	47	100	16 43	47	100	17 30	47	99	18 17	46	98	19 03	47	98	19 50	46	97	20 36	46	96	21 22	46	96	22 08	45	95	288
73	10 36	48	103	11 24	47	103	12 11	47	102	12 58	47	101	13 45	47	101	14 32	47	100	15 19	47	100	16 06	47	99	16 53	46	98	17 39	47	98	18 26	46	97	19 12	46	96	19 58	46	96	20 44	46	95	21 30	46	94	287
74	09 59	48	103	10 47	47	102	11 34	47	101	12 21	47	101	13 08	47	100	13 55	47	99	14 42	47	99	15 29	46	98	16 15	47	97	17 02	46	97	17 48	47	96	18 35	46	95	19 21	46	95	20 07	45	94	20 52	46	93	286
75	09 22	+48	102	10 10	+47	101	10 57	+47	101	11 44	+47	100	12 31	+47	99	13 18	+47	99	14 05	+46	98	14 51	+47	97	15 38	+46	97	16 24	+47	96	17 11	+46	95	17 57	+46	95	18 43	+46	94	19 29	+46	93	20 15	+45	93	285
76	08 45	48	101	09 33	47	100	10 20	47	100	11 07	47	99	11 54	46	98	12 40	47	98	13 27	47	97	14 14	48	97	15 00	47	96	15 47	46	95	16 33	46	95	17 19	46	94	18 05	46	93	18 51	46	93	19 37	46	92	284
77	08 08	47	100	08 55	47	100	09 42	47	99	10 29	47	98	11 16	47	98	12 03	47	97	12 50	46	96	13 36	47	96	14 23	46	95	15 09	46	94	15 55	47	94	16 42	46	93	17 28	46	92	18 14	45	92	18 59	46	91	283
78	07 31	47	99	08 18	47	99	09 05	47	98	09 52	47	97	10 39	46	97	11 25	47	96	12 12	47	96	12 59	46	95	13 45	47	94	14 32	46	94	15 18	46	93	16 04	46	92	16 50	46	92	17 36	46	91	18 22	45	90	282
79	06 54	47	99	07 41	47	98	08 28	46	97	09 14	47	97	10 01	47	96	10 48	47	95	11 35	46	95	12 21	46	94	13 07	47	93	13 54	46	93	14 40	46	92	15 26	46	92	16 12	46	91	16 58	46	90	17 44	45	89	281
80	06 16	+47	98	07 03	+47	97	07 50	+47	97	08 37	+47	96	09 24	+46	95	10 10	+47	95	10 57	+46	94	11 43	+47	93	12 30	+46	93	13 16	+46	92	14 02	+46	91	14 48	+46	91	15 34	+46	90	16 20	+46	89	17 06	+46	89	280
81	05 39	47	97	06 26	47	96	07 13	46	96	07 59	47	95	08 46	47	94	09 33	46	94	10 19	47	93	11 06	46	93	11 52	46	92	12 38	47	91	13 25	46	91	14 11	46	90	14 57	46	89	15 43	45	89	16 28	46	88	279
82	05 01	47	96	05 48	47	96	06 35	47	95	07 22	46	94	08 08	47	94	08 55	46	93	09 41	47	92	10 28	46	92	11 14	47	91	12 01	46	90	12 47	46	90	13 33	46	89	14 19	46	89	15 05	46	88	15 51	45	87	278
83	04 24	47	95	05 11	46	95	05 57	47	94	06 44	47	94	07 31	46	93	08 17	47	92	09 04	46	92	09 50	47	91	10 37	46	90	11 23	46	90	12 09	46	89	12 55	46	88	13 41	46	88	14 27	46	87	15 13	46	86	277
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85	03 09	+46	94	03 55	+47	93	04 42	+47	93	05 29	+46	92	06 15	+47	91	07 02	+46	91	07 48	+47	90	08 35	+46	89	09 21	+46	89	10 07	+47	88	10 54	+46	88	11 40	+46	87	12 26	+46	86	13 12	+46	86	13 58	+45	85	275
86	02 31	47	93	03 18	46	92	04 04	47	92	04 51	46	91	05 37	47	91	06 24	46	90	07 10	47	89	07 57	46	89	08 43	47	88	09 30	46	87	10 16	46	87	11 02	46	86	11 48	46	85	12 34	46	85	13 20	46	84	274
87	01 53	47	92	02 40	47	92	03 27	46	91	04 13	47	90	05 00	46	90	05 46	47	89	06 33	46	89	07 19	47	88	08 06	46	87	08 52	46	87	09 38	46	86	10 24	46	85	11 10	46	85	11 56	46	84	12 42	46	83	273
88	01 16	46	92	02 02	47	91	02 49	46	90	03 35	47	90	04 22	46	89	05 08	47	88	05 55	46	88	06 41	47	87	07 28	46	86	08 14	47	86	09 01	46	85	09 47	46	85	10 33	46	84	11 19	46	83	12 05	46	83	272
89	00 38	46	91	01 24	47	90	02 11	47	90	02 58	46	89	03 44	47	88	04 31	46	88	05 17	47	87	06 04	46	86	06 50	47	86	07 37	46	85	08 23	46	84	09 09	46	84	09 55	46	83	10 41	47	82	11 28	45	82	271
90	00 00	+47	90	00 47	+46	89	01 33	+47	89	02 20	+46	88	03 06	+47	87	03 53	+47	87	04 40	+46	86	05 26	+47	86	06 13	+46	85	06 59	+46	84	07 45	+47	84	08 32	+46	83	09 18	+46	82	10 04	+46	82	10 50	+46	81	270
91	−0 38	47	89	00 09	47	89	00 56	46	88	01 42	47	87	02 29	46	87	03 15	47	86	04 02	46	85	04 48	47	85	05 35	46	84	06 21	47	84	07 08	46	83	07 54	47	82	08 41	46	82	09 27	46	81	10 13	46	80	269
92	−1 16	47	88	−0 29	47	88	00 18	46	87	01 04	47	87	01 51	47	86	02 38	46	85	03 24	47	85	04 11	46	84	04 57	47	83	05 44	46	83	06 30	47	82	07 17	46	81	08 03	47	81	08 50	46	80	09 36	46	80	268
93	−1 53	46	88	−1 07	47	87	−0 20	47	86	00 27	46	86	01 13	47	85	02 00	47	85	02 47	46	84	03 33	47	83	04 20	47	83	05 07	46	82	05 53	47	81	06 40	46	81	07 26	46	80	08 12	47	79	08 59	46	79	267
94	−2 31	47	87	−1 44	46	86	−0 58	47	86	−0 11	47	85	00 36	47	84	01 23	46	84	02 09	47	83	02 56	47	82	03 43	46	82	04 29	47	81	05 16	46	81	06 02	47	80	06 49	46	79	07 35	47	79	08 22	46	78	266
95	−3 09	+47	86	−2 22	+47	85	−1 35	+47	85	−0 48	+46	84	−0 02	+47	84	00 45	+47	83	01 32	+46	82	02 18	+47	82	03 05	+47	81	03 52	+47	80	04 39	+46	80	05 25	+47	79	06 12	+46	79	06 58	+47	78	07 45	+46	77	265
96	−3 46	46	85	−3 00	47	85	−2 13	47	84	−1 26	47	83	−0 39	47	83	00 08	46	82	00 54	47	82	01 41	47	81	02 28	47	80	03 15	46	80	04 01	47	79	04 48	47	78	05 35	46	78	06 21	47	77	07 08	47	77	264
97	−4 24	47	85	−3 37	47	84	−2 50	46	83	−2 04	47	83	−1 17	47	82	−0 30	47	81	00 17	47	81	01 04	47	80	01 51	47	80	02 38	46	79	03 24	47	78	04 11	47	78	04 58	47	77	05 45	46	76	06 31	47	76	263
98	−5 01	46	84	−4 15	47	83	−3 28	47	83	−2 41	47	82	−1 54	47	81	−1 07	47	81	−0 20	47	80	00 27	47	79	01 14	47	79	02 01	46	78	02 47	47	78	03 34	47	77	04 21	47	76	05 08	47	76	05 55	47	75	262
99	−5 39	47	83	−4 52	47	82	−4 05	47	82	−3 18	47	81	−2 31	47	80	−1 44	47	80	−0 57	47	79	−0 10	47	79	00 37	47	78	01 24	47	77	02 11	47	77	02 58	47	76	03 45	47	76	04 32	46	75	05 18	47	74	261
100	−6 16	+47	82	−5 29	+46	82	−4 43	+47	81	−3 56	+48	80	−3 08	+47	80	−2 21	+47	79	−1 34	+47	78	−0 47	+47	78	00 00	+47	77	00 47	+47	77	01 34	+47	76	02 21	+47	75	03 08	+47	75	03 55	+47	74	04 42	+47	73	260
			101	−6 07	+47	81	−5 20	47	80	−4 33	47	80	−3 46	48	79	−2 58	47	78	−2 11	47	78	−1 24	47	77	−0 37	47	76	00 10	47	76	00 57	48	75	01 45	47	75	02 32	47	74	03 19	47	73	04 06	47	73	259
						102	−5 57	+47	79	−5 10	47	79	−4 23	48	78	−3 35	47	78	−2 48	47	77	−2 01	47	76	−1 14	48	76	−0 26	47	75	00 21	47	74	01 08	48	74	01 56	47	73	02 43	47	73	03 30	47	72	258
									103	−5 47	48	78	−4 59	47	77	−4 12	47	77	−3 25	47	76	−2 38	48	75	−1 50	47	75	−1 03	48	74	−0 15	47	74	00 32	47	73	01 19	48	72	02 07	47	72	02 54	48	71	257
									104	−6 24	+48	77	−5 36	47	77	−4 49	48	76	−4 01	47	75	−3 14	47	75	−2 27	48	74	−1 39	47	73	−0 52	48	73	−0 04	48	72	00 44	47	72	01 31	48	71	02 19	47	70	256
												105	−6 13	+48	76	−5 25	+47	75	−4 38	+48	75	−3 50	+47	74	−3 03	+48	73	−2 15	+47	73	−1 28	+48	72	−0 40	+48	71	00 08	+47	71	00 55	+48	70	01 43	+48	70	255
															106	−6 02	+48	74	−5 14	47	74	−4 27	48	73	−3 39	48	73	−2 51	48	72	−2 03	47	71	−1 16	48	71	−0 28	48	70	00 20	48	69	01 08	47	69	254
																		107	−5 50	+47	73	−5 03	48	72	−4 15	48	72	−3 27	48	71	−2 39	48	71	−1 51	48	70	−1 03	48	69	−0 15	48	69	00 33	47	68	253
																					108	−5 39	48	72	−4 51	48	71	−4 03	48	70	−3 15	48	70	−2 27	49	69	−1 38	48	69	−0 50	48	68	−0 02	48	67	252
																					109	−6 14	+48	71	−5 26	48	70	−4 38	48	70	−3 50	48	69	−3 02	48	68	−2 14	49	68	−1 25	48	67	−0 37	46	67	251
																								110	−6 02	+49	69	−5 13	+48	69	−4 25	+48	68	−3 37	+49	68	−2 48	+48	67	−2 00	+48	66	−1 12	+49	66	250
																											111	−5 48	+48	68	−5 00	48	67	−4 12	49	67	−3 23	48	66	−2 35	49	66	−1 46	48	65	249
																														112	−5 35	49	67	−4 46	49	66	−3 57	48	65	−3 09	49	65	−2 20	49	64	248
																														113	−6 09	+49	66	−5 20	48	65	−4 32	49	65	−3 43	49	64	−2 54	49	63	247
																																	114	−5 55	+49	64	−5 06	49	64	−4 17	49	63	−3 28	49	63	246
																																			115	−5 39	+49	63	−4 50	+49	62	−4 01	+49	62	245
																																			116	−6 13	+49	62	−5 24	50	62	−4 34	49	61	244
																																						117	−5 57	+50	61	−5 07	50	60	243
																																									118	−5 40	50	59	242
																																									119	−6 12	+50	59	241

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) SAME NAME AS LATITUDE

LAT 51°

LAT 51°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 51°

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
98	−5 01	−47	84	−5 48	−47	84	262																																									
97	−4 24	47	85	−5 11	46	85	−5 57	−47	86	263																																						
96	−3 46	47	85	−4 33	47	86	−5 20	46	87	−6 06	−47	87	264																																			
95	−3 09	−46	86	−3 55	−47	87	−4 42	−47	87	−5 29	−46	88	−6 15	−47	89	265																															
94	−2 31	47	87	−3 18	46	88	−4 04	47	88	−4 51	46	89	−5 37	47	89	266																															
93	−1 53	47	88	−2 40	47	88	−3 27	46	89	−4 13	47	90	−5 00	46	90	−5 46	−47	91	267																											
92	−1 16	46	88	−2 02	47	89	−2 49	46	90	−3 35	47	90	−4 22	46	91	−5 08	47	92	−5 55	−46	92	268																							
91	−0 38	46	89	−1 24	47	90	−2 11	47	90	−2 58	46	91	−3 44	47	92	−4 31	46	92	−5 17	47	93	−6 04	−46	94	269																			
90	00 00	−47	90	−0 47	−46	91	−1 33	−47	91	−2 20	−46	92	−3 06	−47	93	−3 53	−47	93	−4 40	−46	94	−5 26	−47	94	−6 13	−46	95	270																	
89	00 38	47	91	−0 09	47	91	−0 56	46	92	−1 42	47	93	−2 29	46	93	−3 15	47	94	−4 02	46	95	−4 48	47	95	−5 35	46	96	−6 21	−47	96	271															
88	01 16	47	92	00 29	47	92	−0 18	46	93	−1 04	47	93	−1 51	47	94	−2 38	46	95	−3 24	47	95	−4 11	46	96	−4 57	47	97	−5 44	46	97	272															
87	01 53	46	92	01 07	47	93	00 20	47	94	−0 27	46	94	−1 13	47	95	−2 00	47	95	−2 47	46	96	−3 33	47	97	−4 20	47	97	−5 07	46	98	−5 53	−47	99	273													
86	02 31	47	93	01 44	46	94	00 58	47	94	00 11	47	95	−0 36	47	96	−1 23	46	96	−2 09	47	97	−2 56	47	98	−3 43	46	98	−4 29	47	99	−5 16	46	99	−6 02	−47	100	274									
85	03 09	−47	94	02 22	−47	95	01 35	−47	95	00 48	−46	96	00 02	−47	96	−0 45	−47	97	−1 32	−46	98	−2 18	−47	98	−3 05	−47	99	−3 52	−47	100	−4 39	−46	100	−5 25	−47	101	−6 12	−46	101	275					
84	03 46	46	95	03 00	47	95	02 13	47	96	01 26	47	97	00 39	47	97	−0 08	46	98	−0 54	47	98	−1 41	47	99	−2 28	47	100	−3 15	46	100	−4 01	47	101	−4 48	47	102	−5 35	46	102	−6 21	−47	103	276			
83	04 24	47	95	03 37	47	96	02 50	46	97	02 04	47	97	01 17	47	98	00 30	47	99	−0 17	47	99	−1 04	47	100	−1 51	47	100	−2 38	46	101	−3 24	47	102	−4 11	47	102	−4 58	47	103	−5 45	46	104	277			
82	05 01	46	96	04 15	47	97	03 28	47	97	02 41	47	98	01 54	47	99	01 07	47	99	00 20	47	100	−0 27	47	101	−1 14	47	101	−2 01	46	102	−2 47	47	102	−3 34	47	103	−4 21	47	104	−5 08	47	104	−5 55	−47	105	278
81	05 39	47	97	04 52	47	98	04 05	47	98	03 18	47	99	02 31	47	100	01 44	47	100	00 57	47	101	00 10	47	101	−0 37	47	102	−1 24	47	103	−2 11	47	103	−2 58	47	104	−3 45	47	104	−4 32	46	105	−5 18	47	106	279
80	06 16	−47	98	05 29	−46	98	04 43	−47	99	03 56	−48	100	03 08	−47	100	02 21	−47	101	01 34	−47	102	00 47	−47	102	00 00	−47	103	−0 47	−47	103	−1 34	−47	104	−2 21	−47	105	−3 08	−47	105	−3 55	−47	106	−4 42	−47	107	280
79	06 54	47	99	06 07	47	99	05 20	47	100	04 33	47	100	03 46	48	101	02 58	47	102	02 11	47	102	01 24	47	103	00 37	47	104	−0 10	47	104	−0 57	48	105	−1 45	47	105	−2 32	47	106	−3 19	47	107	−4 06	47	107	281
78	07 31	47	99	06 44	47	100	05 57	47	101	05 10	47	101	04 23	48	102	03 35	47	102	02 48	47	103	02 01	47	104	01 14	48	104	00 26	47	105	−0 21	47	106	−1 08	48	106	−1 56	47	107	−2 43	47	107	−3 30	47	108	282
77	08 08	47	100	07 21	47	101	06 34	47	101	05 47	48	102	04 59	47	103	04 12	47	103	03 25	47	104	02 38	48	105	01 50	47	105	01 03	48	106	00 15	47	106	−0 32	47	107	−1 19	48	108	−2 07	47	108	−2 54	48	109	283
76	08 45	47	101	07 58	47	102	07 11	47	102	06 24	48	103	05 36	47	103	04 49	48	104	04 01	47	105	03 14	47	105	02 27	48	106	01 39	47	107	00 52	48	107	00 04	48	108	−0 44	47	108	−1 31	48	109	−2 19	47	110	284
75	09 22	−47	102	08 35	−47	102	07 48	−48	103	07 00	−47	104	06 13	−48	104	05 25	−47	105	04 38	−48	105	03 50	−47	106	03 03	−48	107	02 15	−47	107	01 28	−48	108	00 40	−48	109	−0 08	−47	109	−0 55	−48	110	−1 43	−46	110	285
74	09 59	47	103	09 12	47	103	08 25	48	104	07 37	48	104	06 49	47	105	06 02	48	106	05 14	47	106	04 27	48	107	03 39	48	107	02 51	48	108	02 03	47	109	01 16	48	109	00 28	48	110	−0 20	48	111	−1 08	47	111	286
73	10 36	47	103	09 49	48	104	09 01	47	105	08 14	48	105	07 26	48	106	06 38	48	106	05 50	47	107	05 03	48	108	04 15	48	108	03 27	48	109	02 39	48	109	01 51	48	110	01 03	48	111	00 15	48	111	−0 33	47	112	287
72	11 13	48	104	10 25	47	105	09 38	48	105	08 50	48	106	08 02	48	107	07 14	48	107	06 26	47	108	05 39	48	108	04 51	48	109	04 03	48	110	03 15	48	110	02 27	49	111	01 38	48	111	00 50	48	112	00 02	48	113	288
71	11 49	47	105	11 02	48	106	10 14	48	106	09 26	48	107	08 38	48	107	07 50	48	108	07 02	48	109	06 14	48	109	05 26	48	110	04 38	48	110	03 50	48	111	03 02	48	112	02 14	49	112	01 25	48	113	00 37	48	113	289
70	12 26	−48	106	11 38	−48	106	10 50	−48	107	10 02	−48	108	09 14	−48	108	08 26	−48	109	07 38	−48	109	06 50	−48	110	06 02	−49	111	05 13	−48	111	04 25	−48	112	03 37	−49	112	02 48	−48	113	02 00	−48	114	01 12	−49	114	290
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	13 02	48	107	12 14	48	107	11 26	48	108	10 38	48	108	09 50	48	109	09 02	49	110	08 13	48	110	07 25	48	111	06 37	49	111	05 48	48	112	05 00	48	113	04 12	49	113	03 23	48	114	02 35	49	114	01 46	49	115	291
68	13 38	48	107	12 50	48	108	12 02	48	109	11 14	48	109	10 26	49	110	09 37	48	110	08 49	49	111	08 00	48	112	07 12	49	112	06 23	48	113	05 35	49	113	04 46	49	114	03 57	48	115	03 09	49	115	02 20	49	116	292
67	14 14	48	108	13 26	48	109	12 38	49	109	11 49	48	110	11 01	49	111	10 12	48	111	09 24	49	112	08 35	48	112	07 47	49	113	06 58	49	114	06 09	49	114	05 20	48	115	04 32	49	115	03 43	49	116	02 54	49	117	293
66	14 50	48	109	14 02	49	110	13 13	48	110	12 25	49	111	11 36	48	112	10 48	49	112	09 59	49	113	09 10	49	113	08 21	49	114	07 32	48	114	06 44	49	115	05 55	49	116	05 06	49	116	04 17	49	117	03 28	49	117	294
65	15 25	−48	110	14 37	−48	111	13 49	−49	111	13 00	−49	112	12 11	−49	112	11 22	−48	113	10 34	−49	114	09 45	−49	114	08 56	−49	115	08 07	−49	115	07 18	−49	116	06 29	−50	116	05 39	−49	117	04 50	−49	118	04 01	−49	118	295
64	16 01	49	111	15 12	48	111	14 24	49	112	13 35	49	113	12 46	49	113	11 57	49	114	11 08	49	114	10 19	49	115	09 30	49	116	08 41	49	116	07 52	50	117	07 02	49	117	06 13	49	118	05 24	50	118	04 34	49	119	296
63	16 36	49	112	15 47	48	112	14 59	49	113	14 10	49	113	13 21	49	114	12 32	50	115	11 42	49	115	10 53	49	116	10 04	49	116	09 15	50	117	08 25	49	117	07 36	50	118	06 46	49	119	05 57	50	119	05 07	50	120	297
62	17 11	49	112	16 22	49	113	15 33	49	114	14 44	49	114	13 55	49	115	13 06	50	115	12 16	49	116	11 27	49	117	10 38	50	117	09 48	49	118	08 59	50	118	08 09	50	119	07 19	50	119	06 29	49	120	05 40	50	121	298
61	17 46	49	113	16 57	49	114	16 08	50	115	15 18	49	115	14 29	49	116	13 40	50	116	12 50	49	117	12 01	50	117	11 11	50	118	10 21	49	119	09 32	50	119	08 42	50	120	07 52	50	120	07 02	50	121	06 12	50	121	299
60	18 20	−49	114	17 31	−49	115	16 42	−49	115	15 53	−50	116	15 03	−50	117	14 13	−49	117	13 24	−50	118	12 34	−50	118	11 44	−50	119	10 54	−50	119	10 04	−50	120	09 14	−50	121	08 24	−50	121	07 34	−50	122	06 44	−50	122	300
59	18 55	50	115	18 05	49	116	17 16	50	116	16 26	49	117	15 37	50	117	14 47	50	118	13 57	50	119	13 07	50	119	12 17	50	120	11 27	50	120	10 37	50	121	09 47	50	121	08 57	51	122	08 06	50	122	07 16	50	123	301
58	19 29	50	116	18 39	49	116	17 50	50	117	17 00	50	118	16 10	50	118	15 20	50	119	14 30	50	119	13 40	50	120	12 50	50	121	12 00	51	121	11 09	50	122	10 19	50	122	09 29	53	123	08 38	50	123	07 48	51	124	302
57	20 03	50	117	19 13	50	117	18 23	50	118	17 33	50	119	16 43	50	119	15 53	50	120	15 03	50	120	14 13	51	121	13 22	50	121	12 32	51	122	11 41	50	122	10 51	51	123	10 00	53	124	09 09	50	124	08 19	51	125	303
56	20 36	50	118	19 46	50	118	18 56	50	119	18 06	50	119	17 16	50	120	16 26	51	121	15 35	50	121	14 45	51	122	13 54	50	122	13 04	51	123	12 13	51	123	11 22	51	124	10 31	50	124	09 41	51	125	08 50	51	126	304
55	21 10	−50	119	20 20	−51	119	19 29	−50	120	18 39	−50	120	17 49	−51	121	16 58	−50	121	16 08	−51	122	15 17	−51	123	14 26	−51	123	13 35	−51	124	12 44	−51	124	11 53	−51	125	11 02	−51	125	10 11	−51	126	09 20	−51	126	305
54	21 43	51	119	20 52	50	120	20 02	51	121	19 11	50	121	18 21	51	122	17 30	51	122	16 39	50	123	15 49	51	123	14 58	51	124	14 07	52	125	13 15	51	125	12 24	51	126	11 33	51	126	10 42	52	127	09 50	51	127	306
53	22 15	50	120	21 25	51	121	20 34	50	122	19 44	51	122	18 53	51	123	18 02	51	123	17 11	51	124	16 20	51	124	15 29	51	125	14 38	52	125	13 46	51	126	12 55	52	126	12 03	51	127	11 12	52	128	10 20	51	128	307
52	22 48	51	121	21 57	51	122	21 06	51	122	20 15	51	123	19 24	51	124	18 33	51	124	17 42	51	125	16 51	51	125	16 00	52	126	15 08	51	126	14 17	52	127	13 25	52	127	12 33	51	128	11 42	52	128	10 50	52	129	308
51	23 20	51	122	22 29	51	123	21 38	51	123	20 47	51	124	19 56	52	124	19 04	51	125	18 13	51	126	17 22	52	126	16 30	52	127	15 38	51	127	14 47	52	128	13 55	52	128	13 03	52	129	12 11	52	129	11 19	52	130	309
50	23 52	−51	123	23 01	−52	124	22 09	−51	124	21 18	−51	125	20 27	−52	125	19 35	−51	126	18 44	−52	126	17 52	−52	127	17 00	−52	128	16 08	−52	128	15 16	−52	129	14 24	−52	129	13 32	−52	130	12 40	−52	130	11 48	−52	131	310
49	24 23	51	124	23 32	52	125	22 40	51	125	21 49	52	126	20 57	51	126	20 06	52	127	19 14	52	127	18 22	52	128	17 30	52	128	16 38	52	129	15 46	52	129	14 54	53	130	14 01	52	130	13 09	53	131	12 16	52	131	311
48	24 54	51	125	24 03	52	126	23 11	52	126	22 19	51	127	21 28	52	127	20 36	52	128	19 44	52	128	18 52	53	129	17 59	52	129	17 07	52	130	16 15	53	130	15 22	52	131	14 30	53	131	13 37	52	132	12 45	53	132	312
47	25 25	52	126	24 33	52	126	23 41	51	127	22 50	52	128	21 58	53	128	21 05	52	129	20 13	52	129	19 21	53	130	18 28	52	130	17 36	53	131	16 43	52	131	15 51	53	132	14 58	53	132	14 05	53	133	13 12	53	133	313
46	25 55	52	127	25 03	52	127	24 11	52	128	23 19	52	129	22 27	52	129	21 35	53	130	20 42	52	130	19 50	53	131	18 57	53	131	18 04	52	132	17 12	53	132	16 19	53	133	15 26	53	133	14 33	53	134	13 40	53	134	314
45	26 25	−52	128	25 33	−52	128	24 41	−52	129	23 49	−53	129	22 56	−52	130	22 04	−53	131	21 11	−53	131	20 18	−53	132	19 25	−53	132	18 32	−53	133	17 39	−53	133	16 46	−53	134	15 53	−53	134	15 00	−53	134	14 07	−54	135	315
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0	39 00	−60	180	38 00	−60	180	37 00	−60	180	36 00	−60	180	35 00	−60	180	34 00	−60	180	33 00	−60	180	32 00	−60	180	31 00	−60	180	30 00	−60	180	29 00	−60	180	28 00	−60	180	27 00	−60	180	26 00	−60	180

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
0	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	64 00	+60	180	65 00	+60	180	66 00	+60	180	67 00	+60	180	68 00	+60	180	360
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37	43 22	51	127	44 13	51	126	45 04	50	125	45 54	50	125	46 44	50	124	47 34	50	123	48 24	49	122	49 13	48	121	50 01	49	120	50 50	47	119	51 37	48	119	52 25	46	118	53 11	47	116	53 58	45	115	54 43	45	114	323
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45	39 07	+49	118	39 56	+49	118	40 45	+48	117	41 33	+49	116	42 22	+47	115	43 09	+48	114	43 57	+47	114	44 44	+46	113	45 30	+46	112	46 16	+46	111	47 02	+45	110	47 47	+45	109	48 32	+44	108	49 16	+44	107	50 00	+43	106	315
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63	28 30	46	102	29 16	46	101	30 02	45	100	30 47	46	99	31 33	45	99	32 18	44	98	33 02	45	97	33 47	44	96	34 31	44	95	35 15	43	95	35 58	43	94	36 41	43	93	37 24	42	92	38 06	42	91	38 48	42	90	297
64	27 53	46	101	28 39	46	100	29 25	45	99	30 10	45	99	30 55	45	98	31 40	45	97	32 25	44	96	33 09	44	95	33 53	44	95	34 37	44	94	35 21	43	93	36 04	42	92	36 46	43	91	37 29	41	90	38 10	42	89	296
65	27 16	+46	100	28 02	+45	99	28 47	+46	99	29 33	+45	98	30 18	+45	97	31 03	+44	96	31 47	+45	95	32 32	+44	95	33 16	+43	94	33 59	+44	93	34 43	+43	92	35 26	+43	91	36 09	+42	90	36 51	+42	90	37 33	+41	89	295
66	26 38	46	99	27 24	46	98	28 10	45	98	28 55	45	97	29 40	45	96	30 25	45	95	31 10	44	95	31 54	44	94	32 38	44	93	33 22	43	92	34 05	43	91	34 48	43	91	35 31	42	90	36 13	42	89	36 55	41	88	294
67	26 01	46	98	26 47	45	98	27 32	46	97	28 18	45	96	29 03	45	95	29 48	44	95	30 32	44	94	31 16	44	93	32 00	44	92	32 44	43	91	33 27	43	91	34 10	43	90	34 53	42	89	35 35	42	88	36 17	42	87	293
68	25 24	45	98	26 09	46	97	26 55	45	96	27 40	45	95	28 25	45	95	29 10	44	94	29 54	45	93	30 39	44	92	31 23	43	91	32 06	44	91	32 50	43	90	33 33	42	89	34 15	43	88	34 58	42	87	35 40	41	86	292
69	24 46	46	97	25 32	45	96	26 17	46	95	27 03	44	95	27 47	45	94	28 32	45	93	29 17	44	92	30 01	44	91	30 45	43	91	31 28	44	90	32 12	43	89	32 55	43	88	33 38	42	87	34 20	42	87	35 02	41	86	291
LHA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	24 09	+45	96	24 54	+46	95	25 40	+45	94	26 25	+45	94	27 10	+45	93	27 55	+44	92	28 39	+44	91	29 23	+44	91	30 07	+44	90	30 51	+43	89	31 34	+43	88	32 17	+43	87	33 00	+42	87	33 42	+42	86	34 24	+42	85	290
71	23 31	46	95	24 17	45	94	25 02	45	94	25 47	45	93	26 32	45	92	27 17	44	91	28 01	44	91	28 45	44	90	29 29	44	89	30 13	43	88	30 56	43	88	31 39	43	87	32 22	43	86	33 05	42	85	33 47	41	84	289
72	22 53	46	94	23 39	45	94	24 24	45	93	25 09	45	92	25 54	45	91	26 39	44	91	27 23	45	90	28 08	44	89	28 52	43	88	29 35	44	88	30 19	43	87	31 02	43	86	31 45	42	85	32 27	42	84	33 09	42	83	288
73	22 16	45	94	23 01	46	93	23 47	45	92	24 32	45	91	25 17	44	91	26 01	45	90	26 46	44	89	27 30	44	88	28 14	44	88	28 58	43	87	29 41	43	86	30 24	43	85	31 07	42	84	31 49	43	84	32 32	41	83	287
74	21 38	46	93	22 24	45	92	23 09	45	91	23 54	45	91	24 39	44	90	25 23	45	89	26 08	44	88	26 52	44	88	27 36	44	87	28 20	43	86	29 03	43	85	29 46	43	84	30 29	43	84	31 12	42	83	31 54	42	82	286
75	21 00	+46	92	21 46	+45	91	22 31	+45	91	23 16	+45	90	24 01	+45	89	24 46	+44	88	25 30	+44	88	26 14	+44	87	26 58	+44	86	27 42	+44	85	28 26	+43	85	29 09	+43	84	29 52	+42	83	30 34	+43	82	31 17	+42	81	285
76	20 23	45	91	21 08	45	90	21 53	45	90	22 38	45	89	23 23	45	88	24 08	44	88	24 52	45	87	25 37	44	86	26 21	44	86	27 05	43	85	27 48	43	84	28 31	43	83	29 14	43	82	29 57	43	81	30 40	42	81	284
77	19 45	45	90	20 30	46	90	21 16	45	89	22 01	45	88	22 46	44	88	23 30	45	87	24 15	44	86	24 59	44	85	25 43	44	85	26 27	44	84	27 11	43	83	27 54	43	82	28 37	43	81	29 20	42	81	30 02	43	80	283
78	19 07	46	90	19 53	45	89	20 38	45	88	21 23	45	87	22 08	45	87	22 53	44	86	23 37	44	85	24 21	45	85	25 06	44	84	25 50	43	83	26 33	44	82	27 17	43	82	28 00	43	81	28 43	42	80	29 25	42	79	282
79	18 29	46	89	19 15	45	88	20 00	45	87	20 45	45	87	21 30	45	86	22 15	45	85	23 00	44	85	23 44	44	84	24 28	44	83	25 12	44	82	25 56	43	82	26 39	43	81	27 22	43	80	28 05	43	79	28 48	43	78	281
80	17 52	+45	88	18 37	+45	87	19 22	+46	87	20 08	+45	86	20 53	+44	85	21 37	+45	85	22 22	+44	84	23 06	+45	83	23 51	+44	82	24 35	+43	82	25 18	+44	81	26 02	+43	80	26 45	+43	79	27 28	+43	79	28 11	+43	78	280
81	17 14	45	87	17 59	46	87	18 45	45	86	19 30	45	85	20 15	45	84	21 00	44	84	21 44	45	83	22 29	44	82	23 13	44	82	23 57	44	81	24 41	44	80	25 25	43	79	26 08	43	79	26 51	43	78	27 34	43	77	279
82	16 36	46	87	17 22	45	86	18 07	45	85	18 52	45	84	19 37	45	84	20 22	45	83	21 07	45	82	21 52	44	82	22 36	44	81	23 20	44	80	24 04	44	79	24 48	43	79	25 31	44	78	26 15	43	77	26 58	42	76	278
83	15 59	45	86	16 44	45	85	17 29	46	84	18 15	45	84	19 00	45	83	19 45	45	82	20 30	44	82	21 14	45	81	21 59	44	80	22 43	44	79	23 27	44	79	24 11	43	78	24 54	44	77	25 38	43	76	26 21	43	76	277
84	15 21	45	85	16 06	46	84	16 52	45	84	17 37	45	83	18 22	45	82	19 07	45	82	19 52	45	81	20 37	45	80	21 22	44	79	22 06	44	79	22 50	44	78	23 34	44	77	24 18	43	76	25 01	43	76	25 44	43	75	276
85	14 43	+46	84	15 29	+45	84	16 14	+46	83	17 00	+45	82	17 45	+45	81	18 30	+45	81	19 15	+45	80	20 00	+44	79	20 44	+45	79	21 29	+44	78	22 13	+44	77	22 57	+44	76	23 41	+44	76	24 25	+43	75	25 08	+43	74	275
86	14 06	45	83	14 51	46	83	15 37	45	82	16 22	46	81	17 08	45	81	17 53	45	80	18 38	45	79	19 23	44	79	20 07	45	78	20 52	44	77	21 36	45	77	22 21	43	76	23 04	44	75	23 48	44	74	24 32	43	74	274
87	13 28	46	83	14 14	46	82	15 00	45	81	15 45	46	81	16 31	45	80	17 16	45	79	18 01	45	79	18 46	45	78	19 31	44	77	20 15	45	77	21 00	44	76	21 44	44	75	22 28	44	74	23 12	44	74	23 56	43	73	273
88	12 51	46	82	13 37	45	81	14 22	46	81	15 08	45	80	15 53	46	79	16 39	45	79	17 24	45	78	18 09	45	77	18 54	45	76	19 39	44	76	20 23	45	75	21 08	44	74	21 52	44	74	22 36	44	73	23 20	43	72	272
89	12 13	46	81	12 59	46	81	13 45	46	80	14 31	45	79	15 16	46	79	16 02	45	78	16 47	45	77	17 32	45	76	18 17	45	76	19 02	45	75	19 47	44	74	20 31	45	74	21 16	44	73	22 00	44	72	22 44	44	71	271
90	11 36	+46	80	12 22	+46	80	13 08	+46	79	13 54	+45	78	14 39	+46	78	15 25	+45	77	16 10	+46	76	16 56	+45	76	17 41	+45	75	18 26	+44	74	19 10	+45	74	19 55	+45	73	20 40	+44	72	21 24	+44	71	22 08	+44	71	270
91	10 59	46	80	11 45	46	79	12 31	46	78	13 17	46	78	14 03	45	77	14 48	46	76	15 34	45	76	16 19	45	75	17 04	45	74	17 49	45	74	18 34	45	73	19 19	45	72	20 04	44	72	20 48	44	71	21 32	45	70	269
92	10 22	46	79	11 08	46	78	11 54	46	78	12 40	46	77	13 26	45	76	14 11	46	76	14 57	46	75	15 43	45	74	16 28	45	74	17 13	45	73	17 58	45	72	18 43	45	72	19 28	45	71	20 13	44	70	20 57	44	69	268
93	09 45	46	78	10 31	46	78	11 17	46	77	12 03	46	76	12 49	46	76	13 35	46	75	14 21	45	74	15 06	46	74	15 52	45	73	16 37	45	72	17 22	45	72	18 07	45	71	18 52	45	70	19 37	45	69	20 22	44	69	267
94	09 08	46	77	09 54	46	77	10 40	47	76	11 27	46	75	12 13	46	75	12 59	45	74	13 44	46	73	14 30	46	73	15 16	45	72	16 01	46	71	16 47	45	71	17 32	45	70	18 17	45	69	19 02	45	69	19 47	44	68	266
95	08 31	+47	77	09 18	+46	76	10 04	+46	75	10 50	+46	75	11 36	+46	74	12 22	+46	73	13 08	+46	73	13 54	+46	72	14 40	+46	71	15 26	+45	71	16 11	+45	70	16 56	+46	69	17 42	+45	69	18 27	+45	68	19 12	+45	67	265
96	07 55	46	76	08 41	46	75	09 27	47	75	10 14	46	74	11 00	46	73	11 46	46	73	12 32	46	72	13 18	46	71	14 04	46	71	14 50	46	70	15 36	45	69	16 21	46	69	17 07	45	68	17 52	45	67	18 37	45	67	264
97	07 18	47	75	08 05	46	75	08 51	47	74	09 38	46	73	10 24	46	73	11 10	46	72	11 56	47	71	12 43	46	71	13 29	46	70	14 15	45	69	15 00	46	69	15 46	46	68	16 32	45	67	17 17	45	67	18 02	46	66	263
98	06 42	46	74	07 28	47	74	08 15	46	73	09 01	47	72	09 48	46	72	10 34	47	71	11 21	46	71	12 07	46	70	12 53	46	69	13 39	46	69	14 25	46	68	15 11	46	67	15 57	46	67	16 43	45	66	17 28	45	65	262
99	06 05	47	74	06 52	47	73	07 39	47	72	08 26	46	72	09 12	47	71	09 59	46	70	10 45	47	70	11 32	46	69	12 18	46	69	13 04	46	68	13 50	46	67	14 36	46	67	15 22	46	66	16 08	46	65	16 54	45	65	261
100	05 29	+47	73	06 16	+47	72	07 03	+47	72	07 50	+47	71	08 37	+46	70	09 23	+47	70	10 10	+46	69	10 56	+47	68	11 43	+46	68	12 29	+47	67	13 16	+46	66	14 02	+46	66	14 48	+46	65	15 34	+46	65	16 20	+46	64	260
101	04 53	47	72	05 40	47	71	06 27	47	71	07 14	47	70	08 01	47	70	08 48	47	69	09 35	46	68	10 21	47	68	11 08	47	67	11 55	46	66	12 41	47	66	13 28	46	65	14 14	46	64	15 00	46	64	15 46	46	63	259
102	04 17	47	71	05 04	48	71	05 52	47	70	06 39	47	69	07 26	47	69	08 13	47	68	09 00	47	68	09 47	46	67	10 33	47	66	11 20	47	66	12 07	46	65	12 53	47	64	13 40	46	64	14 26	47	63	15 13	46	62	258
103	03 42	47	71	04 29	47	70	05 16	47	69	06 03	48	69	06 51	47	68	07 38	47	67	08 25	47	67	09 12	47	66	09 59	47	66	10 46	47	65	11 33	46	64	12 19	47	64	13 06	47	63	13 53	46	62	14 39	46	62	257
104	03 06	47	70	03 53	48	69	04 41	47	69	05 28	48	68	06 16	47	67	07 03	47	67	07 50	47	66	08 37	48	65	09 25	47	65	10 12	47	64	10 59	47	64	11 46	47	63	12 33	46	62	13 19	47	62	14 06	47	61	256
105	02 31	+47	69	03 18	+48	68	04 06	+47	68	04 53	+48	67	05 41	+47	67	06 28	+48	66	07 16	+47	65	08 03	+48	65	08 51	+47	64	09 38	+47	64	10 25	+47	63	11 12	+47	62	11 59	+47	62	12 46	+47	61	13 33	+47	60	255
106	01 55	48	68	02 43	48	68	03 31	48	67	04 19	47	66	05 06	48	66	05 54	48	65	06 42	47	65	07 29	48	64	08 17	47	63	09 04	48	63	09 52	47	62	10 39	47	62	11 26	47	61	12 13	47	60	13 00	47	60	254
107	01 20	48	68	02 08	48	67	02 56	48	66	03 44	48	66	04 32	48	65	05 20	48	64	06 08	47	64	06 55	48	63	07 43	48	63	08 31	47	62	09 18	48	61	10 06	47	61	10 53	48	60	11 41	47	60	12 28	47	59	253
108	00 46	48	67	01 34	48	66	02 22	48	66	03 10	48	65	03 58	48	64	04 46	48	64	05 34	48	63	06 22	48	63	07 10	47	62	07 57	48	61	08 45	48	61	09 33	48	60	10 21	47	59	11 08	48	59	11 56	47	58	252
109	00 11	48	66	00 59	49	65	01 48	48	65	02 36	48	64	03 24	48	64	04 12	48	63	05 00	48	62	05 48	48	62	06 36	48	61	07 24	48	61	08 12	48	60	09 00	48	59	09 48	48	59	10 36	48	58	11 24	47	58	251
110	−0 23	+48	65	00 25	+49	65	01 14	+48	64	02 02	+48	63	02 50	+49	63	03 39	+48	62	04 27	+48	62	05 15	+48	61	06 03	+49	60	06 52	+48	60	07 40	+48	59	08 28	+48	59	09 16	+48	58	10 04	+48	57	10 52	+48	57	250
111	−0 57	48	64	−0 09	49	64	00 40	48	63	01 28	49	63	02 17	48	62	03 05	49	61	03 54	48	61	04 42	49	60	05 31	48	60	06 19	49	59	07 08	48	59	07 56	48	58	08 44	48	57	09 32	48	57	10 20	49	56	249
112	−1 31	48	64	−0 43	49	63	00 06	49	62	00 55	49	62	01 44	48	61	02 32	49	61	03 21	49	60	04 10	48	60	04 58	49	59	05 47	48	58	06 35	49	58	07 24	48	57	08 12	49	57	09 01	48	56	09 49	49	55	248
113	−2 05	49	63	−1 16	49	62	−0 27	49	62	00 22	49	61	01 11	48	61	01 59	49	60	02 48	49	59	03 37	49	59	04 26	49	58	05 15	49	58	06 04	48	57	06 52	49	56	07 41	49	56	08 30	48	55	09 18	49	55	247
114	−2 39	50	62	−1 49	49	61	−1 00	49	61	−0 11	49	60	00 38	49	60	01 27	49	59	02 16	49	59	03 05	49	58	03 54	49	57	04 43	49	57	05 32	49	56	06 21	49	56	07 10	49	55	07 59	49	55	08 48	48	54	246
115	−3 12	+49	61	−2 23	+50	61	−1 33	+49	60	−0 44	+49	60	00 05	+50	59	00 55	+49	58	01 44	+49	58	02 33	+49	57	03 22	+50	57	04 12	+49	56	05 01	+49	56	05 50	+49	55	06 39	+49	54	07 28	+49	54	08 17	+49	53	245
116	−3 45	50	60	−2 55	49	60	−2 06	50	59	−1 16	49	59	−0 27	50	58	00 23	49	58	01 12	50	57	02 02	49	56	02 51	49	56	03 40	50	55	04 30	49	55	05 19	50	54	06 09	49	54	06 58	49	53	07 47	49	53	244
117	−4 17	49	60	−3 28	50	59	−2 38	49	59	−1 49	50	58	−0 59	50	57	−0 09	49	57	00 40	50	56	01 30	50	56	02 20	49	55	03 09	50	55	03 59	50	54	04 49	49	53	05 38	50	53	06 28	49	52	07 17	50	52	243
118	−4 50	50	59	−4 00	50	58	−3 10	50	58	−2 20	49	57	−1 31	50	57	−0 41	50	56	00 09	50	56	00 59	50	55	01 49	50	54	02 39	50	54	03 29	50	53	04 19	49	53	05 08	50	52	05 58	50	52	06 48	50	51	242
119	−5 22	50	58	−4 32	50	57	−3 42	50	57	−2 52	50	56	−2 02	50	56	−1 12	50	55	−0 22	50	55	00 28	50	54	01 18	51	54	02 09	50	53	02 59	50	53	03 49	50	52	04 39	50	51	05 29	50	51	06 19	50	50	241
120	−5 54	+50	57	−5 04	+50	57	−4 14	+51	56	−3 23	+50	56	−2 33	+50	55	−1 43	+51	55	−0 52	+50	54	−0 02	+50	53	00 48	+50	53	01 38	+51	52	02 29	+50	52	03 19	+50	51	04 09	+51	51	05 00	+50	50	05 50	+50	50	240
			121	−5 35	50	56	−4 45	51	55	−3 54	50	55	−3 04	51	54	−2 13	50	54	−1 23	51	53	−0 32	50	53	00 18	51	52	01 09	50	52	01 59	51	51	02 50	50	50	03 40	51	50	04 31	50	49	05 21	51	49	239
			122	−6 06	+50	55	−5 16	51	54	−4 25	51	54	−3 34	50	53	−2 44	51	53	−1 53	51	52	−1 02	51	52	−0 11	50	51	00 39	51	51	01 30	51	50	02 21	50	50	03 11	51	49	04 02	51	49	04 53	51	48	238
						123	−5 46	51	54	−4 55	50	53	−4 05	51	53	−3 14	51	52	−2 23	51	52	−1 32	51	51	−0 41	51	51	00 10	51	50	01 01	51	49	01 52	51	49	02 43	51	48	03 34	51	48	04 25	51	47	237
						124	−6 17	+52	53	−5 25	51	52	−4 34	51	52	−3 43	51	51	−2 52	51	51	−2 01	51	50	−1 10	51	50	−0 19	52	49	00 33	51	49	01 24	51	48	02 15	51	48	03 06	51	47	03 57	51	47	236
									125	−5 55	+53	52	−5 04	+51	51	−4 13	+52	51	−3 21	+51	50	−2 30	+52	49	−1 38	+51	49	−0 47	+51	48	00 04	+52	48	00 56	+51	47	01 47	+52	47	02 39	+51	46	03 30	+51	46	235
												126	−5 33	51	50	−4 42	52	50	−3 50	52	49	−2 58	51	49	−2 07	52	48	−1 15	52	48	−0 23	51	47	00 28	52	47	01 20	51	46	02 11	52	46	03 03	52	45	234
												127	−6 02	+52	49	−5 10	52	49	−4 18	51	48	−3 27	52	48	−2 35	52	47	−1 43	52	47	−0 51	52	46	00 01	52	46	00 53	52	45	01 45	52	45	02 37	51	44	233
															128	−5 38	52	48	−4 46	52	48	−3 54	52	47	−3 02	52	47	−2 10	52	46	−1 18	52	46	−0 26	52	45	00 26	52	45	01 18	52	44	02 10	52	44	232
															129	−6 06	+52	47	−5 14	52	47	−4 22	52	46	−3 30	53	46	−2 37	52	45	−1 45	52	45	−0 53	53	44	00 00	52	44	00 52	52	43	01 44	53	43	231
																		130	−5 41	+52	46	−4 49	+53	45	−3 56	+52	45	−3 04	+53	44	−2 11	+52	44	−1 19	+53	43	−0 26	+52	43	00 26	+53	43	01 19	+53	42	230
																		131	−6 08	+52	45	−5 16	53	45	−4 23	53	44	−3 30	53	44	−2 37	52	43	−1 45	53	43	−0 52	53	42	00 01	53	42	00 54	53	41	229
																					132	−5 42	53	44	−4 49	53	43	−3 56	53	43	−3 03	53	42	−2 10	53	42	−1 17	53	41	−0 24	53	41	00 29	53	41	228
																					133	−6 08	+53	43	−5 15	53	43	−4 22	54	42	−3 28	53	42	−2 35	53	41	−1 42	53	41	−0 49	54	40	00 05	53	40	227
																									−5 40	53	42	−4 47	54	41	−3 53	53	41	−3 00	54	40	−2 06	53	40	−1 13	54	39	−0 19	53	39	226
																												−5 11	+53	40	−4 18	+54	40	−3 24	+54	40	−2 30	+54	39	−1 36	+53	39	−0 43	+54	38	225
																														136	−5 36	54	40	−4 42	54	39	−3 48	54	39	−2 54	54	38	−2 00	54	38	−1 06	54	37	224
																														137	−5 59	+54	39	−5 05	54	38	−4 11	54	38	−3 17	54	37	−2 23	54	37	−1 29	55	37	223
																																	138	−5 29	55	38	−4 34	54	37	−3 40	55	37	−2 45	54	36	−1 51	54	36	222
																																	139	−5 51	54	37	−4 57	55	36	−4 02	55	36	−3 07	54	35	−2 13	55	35	221
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 51°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 51°

LHA	15° Hc d Z	16° Hc d Z	17° Hc d Z	18° Hc d Z	19° Hc d Z	20° Hc d Z	21° Hc d Z	22° Hc d Z	23° Hc d Z	24° Hc d Z	25° Hc d Z	26° Hc d Z	27° Hc d Z	28° Hc d Z	29° Hc d Z	LHA
°	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	°
										140	−6 14 +55 36	−5 19 +55 35	−4 24 +55 35	−3 29 +55 35	−2 34 +55 34	220
											141	−5 41 56 35	−4 45 55 34	−3 50 55 34	−2 55 55 33	219
											142	−6 02 +55 34	−5 07 56 33	−4 11 55 33	−3 16 55 33	218
												143	−5 27 55 33	−4 32 56 32	−3 36 55 32	217
												144	−5 47 56 32	−4 51 55 31	−3 56 56 31	216
												145	−6 07 +56 31	−5 11 +56 31	−4 15 +56 30	215
													146	−5 30 56 30	−4 34 56 29	214
													147	−5 48 56 29	−4 52 56 29	213
													148	−6 06 +56 28	−5 10 57 28	212
														149	−5 27 57 27	211
														150	−5 44 +57 26	210
														151	−6 00 +57 25	209
81	−6 05 −47 106	279														
80	−5 29 −47 107	−6 16 −47 108	280													
79	−4 53 47 108	−5 40 47 109	281													
78	−4 17 47 109	−5 04 48 109	−5 52 −47 110	282												
77	−3 42 47 109	−4 29 47 110	−5 16 47 111	−6 03 −48 111	283											
76	−3 06 47 110	−3 53 48 111	−4 41 47 111	−5 28 48 112	−6 16 −47 113	284										
75	−2 31 −47 111	−3 18 −48 112	−4 06 −47 112	−4 53 −48 113	−5 41 −47 113	285										
74	−1 55 48 112	−2 43 48 112	−3 31 48 113	−4 19 47 114	−5 06 48 114	−5 54 −48 115	286									
73	−1 20 48 112	−2 08 48 113	−2 56 48 114	−3 44 48 114	−4 32 48 115	−5 20 48 116	−6 08 −47 116	287								
72	−0 46 48 113	−1 34 48 114	−2 22 48 114	−3 10 48 115	−3 58 48 116	−4 46 48 116	−5 34 48 117	288								
71	−0 11 48 114	−0 59 49 115	−1 48 48 115	−2 36 48 116	−3 24 48 116	−4 12 48 117	−5 00 48 118	−5 48 −48 118	289							
70	00 23 −48 115	−0 25 −49 115	−1 14 −48 116	−2 02 −48 117	−2 50 −49 117	−3 39 −48 118	−4 27 −48 118	−5 15 −48 119	−6 03 −49 120	290						
	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
69	00 57	48	116	00 09	49	116	−0 40	48	117	−1 28	49	117	−2 17	48	118	−3 05	49	119	−3 54	48	119	−4 42	49	120	−5 31	48	120	−6 19	−49	121	291																	
68	01 31	48	116	00 43	49	117	−0 06	49	118	−0 55	49	118	−1 44	48	119	−2 32	49	119	−3 21	49	120	−4 10	48	120	−4 58	49	121	−5 47	48	122	292																	
67	02 05	49	117	01 16	49	118	00 27	49	118	−0 22	49	119	−1 11	48	119	−1 59	49	120	−2 48	49	121	−3 37	49	121	−4 26	49	122	−5 15	49	122	−6 04	−48	123	293															
66	02 39	50	118	01 49	49	119	01 00	49	119	00 11	49	120	−0 38	49	120	−1 27	49	121	−2 16	49	121	−3 05	49	122	−3 54	49	123	−4 43	49	123	−5 32	49	124	294															
65	03 12	−49	119	02 23	−50	119	01 33	−49	120	00 44	−49	120	−0 05	−50	121	−0 55	−49	122	−1 44	−49	122	−2 33	−49	123	−3 22	−50	123	−4 12	−49	124	−5 01	−49	124	−5 50	−49	125	295											
64	03 45	50	120	02 55	49	120	02 06	50	121	01 16	49	121	00 27	50	122	−0 23	49	122	−1 12	50	123	−2 02	49	124	−2 51	49	124	−3 40	50	125	−4 30	49	125	−5 19	50	126	−6 09	−49	126	296						
63	04 17	49	120	03 28	50	121	02 38	49	121	01 49	50	122	00 59	50	123	00 09	49	123	−0 40	50	124	−1 30	50	124	−2 20	49	125	−3 09	50	125	−3 59	50	126	−4 49	49	127	−5 38	50	127	297						
62	04 50	50	121	04 00	50	122	03 10	50	122	02 20	49	123	01 31	50	123	00 41	50	124	−0 09	50	124	−0 59	50	125	−1 49	50	126	−2 39	50	126	−3 29	50	127	−4 19	49	127	−5 08	50	128	−5 58	−50	128	298			
61	05 22	50	122	04 32	50	123	03 42	50	123	02 52	50	124	02 02	50	124	01 12	50	125	00 22	50	125	−0 28	50	126	−1 18	51	126	−2 09	50	127	−2 59	50	127	−3 49	50	128	−4 39	50	129	−5 29	50	129	299		
60	05 54	−50	123	05 04	−50	123	04 14	−51	124	03 23	−50	124	02 33	−50	125	01 43	−51	125	00 52	−50	126	00 02	−50	127	−0 48	−50	127	−1 38	−51	128	−2 29	−50	128	−3 19	−50	129	−4 09	−51	129	−5 00	−50	130	−5 50	−50	130	300
59	06 26	51	124	05 35	50	124	04 45	51	125	03 54	50	125	03 04	51	126	02 13	50	126	01 23	51	127	00 32	50	127	−0 18	51	128	−1 09	50	128	−1 59	51	129	−2 50	50	130	−3 40	51	130	−4 31	50	131	−5 21	51	131	301
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0	24 00	−60	180	23 00	−60	180	22 00	−60	180	21 00	−60	180	20 00	−60	180	19 00	−60	180	18 00	−60	180	17 00	−60	180	16 00	−60	180	15 00	−60	180	14 00	−60	180	13 00	−60	180	12 00	−60	180	11 00	−60	180	10 00	−60	180	360
HA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 51°

FOR AIR NAVIGATION VOL.3

Latitudes 39° - 89°

Table		
Lat 42° - 51°		
Lat 52° - 55°	Lat 52°	88 - 95
	Lat 53°	96 - 103
	Lat 54°	104 - 111
	Lat 55°	112 - 119
Lat 56° - 70°		

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	38 00	+60	180	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	360
1	38 00	60	179	39 00	60	179	40 00	60	179	41 00	60	179	42 00	60	179	43 00	60	179	44 00	60	179	45 00	60	179	46 00	60	179	47 00	60	179	48 00	60	179	49 00	60	179	50 00	60	178	51 00	59	178	51 59	60	178	359
2	37 58	60	177	38 58	60	177	39 58	60	177	40 58	60	177	41 58	60	177	42 58	60	177	43 58	60	177	44 58	60	177	45 58	60	177	46 58	60	177	47 58	60	177	48 58	60	177	49 58	60	177	50 58	60	177	51 58	60	177	358
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66	14 30	49	109	15 19	49	109	16 08	48	108	16 56	49	108	17 45	48	107	18 33	48	106	19 21	48	106	20 09	48	105	20 57	48	104	21 45	48	104	22 33	47	103	23 20	48	102	24 08	47	102	24 55	47	101	25 42	47	100	294
67	13 55	49	108	14 44	48	108	15 32	49	107	16 21	48	107	17 09	48	106	17 57	49	105	18 46	48	105	19 34	47	104	20 21	48	104	21 09	48	103	21 57	47	102	22 44	47	102	23 31	48	101	24 19	46	100	25 05	47	100	293
68	13 20	49	108	14 09	48	107	14 57	48	106	15 45	49	106	16 34	48	105	17 22	48	105	18 10	48	104	18 58	48	103	19 46	47	103	20 33	48	102	21 21	47	101	22 08	47	101	22 55	47	100	23 42	47	99	24 29	47	99	292
69	12 45	48	107	13 33	49	106	14 22	48	106	15 10	48	105	15 58	48	104	16 46	48	104	17 34	48	103	18 22	47	102	19 09	48	102	19 57	47

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	12 09	+49	106	12 58	+48	105	13 46	+48	105	14 34	+48	104	15 22	+48	104	16 10	+48	103	16 58	+48	102	17 46	+47	102	18 33	+48	101	19 21	+47	100	20 08	+47	100	20 55	+47	99	21 42	+47	98	22 29	+47	98	23 16	+46	97	290
71	11 34	48	105	12 22	48	105	13 10	48	104	13 58	48	103	14 46	48	103	15 34	48	102	16 22	47	101	17 09	48	101	17 57	47	100	18 44	48	100	19 32	47	99	20 19	47	98	21 06	46	98	21 52	47	97	22 39	47	96	289
72	10 58	48	104	11 46	48	104	12 34	48	103	13 22	48	103	14 10	48	102	14 58	47	101	15 45	48	101	16 33	47	100	17 20	48	99	18 08	47	99	18 55	47	98	19 42	47	97	20 29	47	97	21 16	46	96	22 02	47	95	288
73	10 22	48	104	11 10	48	103	11 58	48	102	12 46	48	102	13 34	48	101	14 22	47	100	15 09	48	100	15 57	47	99	16 44	47	99	17 31	47	98	18 18	47	97	19 05	47	97	19 52	47	96	20 39	47	95	21 26	46	95	287
74	09 46	48	103	10 34	48	102	11 22	48	102	12 10	48	101	12 58	47	100	13 45	48	100	14 33	47	99	15 20	47	98	16 07	48	98	16 55	47	97	17 42	47	96	18 29	46	96	19 15	47	95	20 02	47	94	20 49	46	94	286
75	09 10	+48	102	09 58	+48	101	10 46	+48	101	11 34	+47	100	12 21	+48	99	13 09	+47	99	13 56	+48	98	14 44	+47	98	15 31	+47	97	16 18	+47	96	17 05	+47	96	17 52	+47	95	18 39	+46	94	19 25	+47	94	20 12	+46	93	285
76	08 34	48	101	09 22	47	101	10 09	48	100	10 57	48	99	11 45	47	99	12 32	48	98	13 20	47	97	14 07	47	97	14 54	47	96	15 41	47	95	16 28	47	95	17 15	47	94	18 02	46	94	18 48	47	93	19 35	46	92	284
77	07 58	47	100	08 45	48	100	09 33	48	99	10 21	47	98	11 08	48	98	11 56	47	97	12 43	47	97	13 30	47	96	14 17	47	95	15 04	47	95	15 51	47	94	16 38	47	93	17 25	47	93	18 12	46	92	18 58	46	91	283
78	07 21	48	100	08 09	47	99	08 56	48	98	09 44	47	98	10 31	48	97	11 19	47	96	12 06	47	96	12 53	48	95	13 41	47	95	14 28	47	94	15 15	46	93	16 01	47	93	16 48	47	92	17 35	46	91	18 21	46	91	282
79	06 45	47	99	07 32	48	98	08 20	47	97	09 07	48	97	09 55	47	96	10 42	47	96	11 29	48	95	12 17	47	94	13 04	47	94	13 51	47	93	14 38	46	92	15 24	47	92	16 11	47	91	16 58	46	90	17 44	46	90	281
80	06 08	+48	98	06 56	+47	97	07 43	+48	97	08 31	+47	96	09 18	+47	95	10 05	+48	95	10 53	+47	94	11 40	+47	94	12 27	+47	93	13 14	+47	92	14 01	+46	92	14 47	+47	91	15 34	+47	90	16 21	+46	90	17 07	+46	89	280
81	05 32	47	97	06 19	48	96	07 07	47	96	07 54	47	95	08 41	48	95	09 29	47	94	10 16	47	93	11 03	47	93	11 50	47	92	12 37	47	91	13 24	47	91	14 11	46	90	14 57	47	90	15 44	46	89	16 30	47	88	279
82	04 55	47	96	05 42	48	96	06 30	47	95	07 17	47	94	08 04	48	94	08 52	47	93	09 39	47	93	10 26	47	92	11 13	47	91	12 00	47	91	12 47	47	90	13 34	46	89	14 20	47	89	15 07	46	88	15 53	47	87	278
83	04 18	48	96	05 06	47	95	05 53	47	94	06 40	48	94	07 28	47	93	08 15	47	92	09 02	47	92	09 49	47	91	10 36	47	91	11 23	47	90	12 10	47	89	12 57	46	89	13 43	47	88	14 30	46	87	15 16	47	87	277
84	03 41	48	95	04 29	47	94	05 16	47	94	06 03	48	93	06 51	47	92	07 38	47	92	08 25	47	91	09 12	47	90	09 59	47	90	10 46	47	89	11 33	47	88	12 20	46	88	13 06	47	87	13 53	47	87	14 40	46	86	276
85	03 05	+47	94	03 52	+47	93	04 39	+47	93	05 26	+48	92	06 14	+47	91	07 01	+47	91	07 48	+47	90	08 35	+47	90	09 22	+47	89	10 09	+47	88	10 56	+47	88	11 43	+47	87	12 30	+46	86	13 16	+47	86	14 03	+46	85	275
86	02 28	47	93	03 15	47	93	04 02	48	92	04 50	47	91	05 37	47	91	06 24	47	90	07 11	47	89	07 58	47	89	08 45	47	88	09 32	47	88	10 19	47	87	11 06	47	86	11 53	46	86	12 39	47	85	13 26	46	84	274
87	01 51	47	92	02 38	47	92	03 25	48	91	04 13	47	91	05 00	47	90	05 47	47	89	06 34	47	89	07 21	47	88	08 08	47	87	08 55	47	87	09 42	47	86	10 29	47	86	11 16	47	85	12 03	46	84	12 49	47	84	273
88	01 14	47	92	02 01	47	91	02 48	48	90	03 36	47	90	04 23	47	89	05 10	47	88	05 57	47	88	06 44	47	87	07 31	47	87	08 18	47	86	09 05	47	85	09 52	47	85	10 39	47	84	11 26	47	83	12 13	46	83	272
89	00 37	47	91	01 24	47	90	02 11	48	90	02 59	47	89	03 46	47	88	04 33	47	88	05 20	48	87	06 08	47	86	06 55	47	86	07 42	47	85	08 29	47	85	09 16	46	84	10 02	47	83	10 49	47	83	11 36	47	82	271
90	00 00	+47	90	00 47	+48	89	01 35	+47	89	02 22	+47	88	03 09	+47	88	03 56	+47	87	04 43	+48	86	05 31	+47	86	06 18	+47	85	07 05	+47	84	07 52	+47	84	08 39	+47	83	09 26	+47	83	10 13	+46	82	10 59	+47	81	270
91	−0 37	47	89	00 10	48	89	00 58	47	88	01 45	47	87	02 32	47	87	03 19	48	86	04 07	47	86	04 54	47	85	05 41	47	84	06 28	47	84	07 15	47	83	08 02	47	82	08 49	47	82	09 36	47	81	10 23	47	81	269
92	−1 14	47	88	−0 27	48	88	00 21	47	87	01 08	47	87	01 55	48	86	02 43	47	85	03 30	47	85	04 17	47	84	05 04	47	83	05 51	48	83	06 39	47	82	07 26	47	82	08 13	47	81	09 00	47	80	09 47	46	80	268
93	−1 51	48	88	−1 03	47	87	−0 16	47	86	00 31	47	86	01 18	48	85	02 06	47	85	02 53	47	84	03 40	48	83	04 28	47	83	05 15	47	82	06 02	47	81	06 49	47	81	07 36	47	80	08 23	47	80	09 10	47	79	267
94	−2 28	48	87	−1 40	47	86	−0 53	47	86	−0 06	48	85	00 42	47	84	01 29	47	84	02 16	48	83	03 04	47	83	03 51	47	82	04 38	48	81	05 26	47	81	06 13	47	80	07 00	47	79	07 47	47	79	08 34	47	78	266
95	−3 05	+48	86	−2 17	+47	85	−1 30	+48	85	−0 42	+47	84	00 05	+47	84	00 52	+48	83	01 40	+47	82	02 27	+47	82	03 14	+48	81	04 02	+47	81	04 49	+47	80	05 36	+48	79	06 24	+47	79	07 11	+47	78	07 58	+47	77	265
96	−3 41	47	85	−2 54	47	85	−2 07	48	84	−1 19	47	83	−0 32	48	83	00 16	47	82	01 03	48	82	01 51	47	81	02 38	47	80	03 25	48	80	04 13	47	79	05 00	47	79	05 47	48	78	06 35	47	77	07 22	47	77	264
97	−4 18	47	84	−3 31	48	84	−2 43	47	83	−1 56	48	83	−1 08	47	82	−0 21	48	81	00 27	47	81	01 14	48	80	02 02	47	80	02 49	48	79	03 37	47	78	04 24	47	78	05 11	48	77	05 59	47	77	06 46	47	76	263
98	−4 55	48	84	−4 07	47	83	−3 20	48	82	−2 32	47	82	−1 45	48	81	−0 57	47	81	−0 10	48	80	00 38	47	79	01 25	48	79	02 13	47	78	03 00	48	78	03 48	47	77	04 35	48	76	05 23	47	76	06 10	48	75	262
99	−5 32	48	83	−4 44	47	82	−3 57	48	82	−3 09	48	81	−2 21	47	80	−1 34	48	80	−0 46	48	79	00 02	47	79	00 49	48	78	01 37	47	77	02 24	48	77	03 12	48	76	04 00	47	76	04 47	48	75	05 35	47	74	261
100	−6 08	+47	82	−5 21	+48	81	−4 33	+48	81	−3 45	+47	80	−2 58	+48	80	−2 10	+48	79	−1 22	+47	78	−0 35	+48	78	00 13	+48	77	01 01	+47	77	01 48	+48	76	02 36	+48	75	03 24	+48	75	04 12	+47	74	04 59	+48	74	260
			101	−5 57	+48	81	−5 09	47	80	−4 22	48	79	−3 34	48	79	−2 46	48	78	−1 58	47	78	−1 11	48	77	−0 23	48	76	00 25	48	76	01 13	47	75	02 00	48	75	02 48	48	74	03 36	48	73	04 24	47	73	259
						102	−5 46	48	79	−4 58	48	79	−4 10	48	78	−3 22	47	77	−2 35	48	77	−1 47	48	76	−0 59	48	76	−0 11	48	75	00 37	48	74	01 25	48	74	02 13	48	73	03 01	48	73	03 49	47	72	258
						103	−6 22	+48	78	−5 34	48	78	−4 46	48	77	−3 58	48	77	−3 10	48	76	−2 22	48	75	−1 34	48	75	−0 46	48	74	00 02	48	74	00 50	48	73	01 38	48	72	02 26	48	72	03 14	47	71	257
									104	−6 10	+48	77	−5 22	48	76	−4 34	48	76	−3 46	48	75	−2 58	48	75	−2 10	48	74	−1 22	48	73	−0 34	48	73	00 14	48	72	01 02	49	72	01 51	48	71	02 39	48	70	256
												105	−5 58	+48	76	−5 10	+48	75	−4 22	+48	74	−3 34	+48	74	−2 46	+49	73	−1 57	+48	73	−1 09	+49	72	−0 21	+48	71	00 27	+49	71	01 16	+48	70	02 04	+48	70	255
															106	−5 46	49	74	−4 57	48	74	−4 09	48	73	−3 21	49	72	−2 33	48	72	−1 44	48	71	−0 56	49	71	−0 07	48	70	00 41	48	70	01 29	49	69	254
															107	−6 21	+48	73	−5 33	49	73	−4 44	48	72	−3 56	49	72	−3 07	48	71	−2 19	48	70	−1 31	49	70	−0 42	48	69	00 06	49	69	00 55	48	68	253
																		108	−6 08	+49	72	−5 19	48	71	−4 31	49	71	−3 42	48	70	−2 54	49	70	−2 05	48	69	−1 17	49	69	−0 28	49	68	00 21	48	67	252
																					109	−5 54	+48	71	−5 06	49	70	−4 17	49	69	−3 28	48	69	−2 40	49	68	−1 51	49	68	−1 02	49	67	−0 13	49	67	251
																								110	−5 40	+49	69	−4 52	+49	68	−4 03	+49	68	−3 14	+49	68	−2 25	+49	67	−1 36	+49	66	−0 47	+49	66	250
																								111	−6 15	+49	68	−5 26	49	68	−4 37	49	67	−3 48	49	67	−2 59	49	66	−2 10	49	66	−1 21	49	65	249
																												112	−6 00	+49	67	−5 11	49	66	−4 22	50	66	−3 32	49	65	−2 43	49	65	−1 54	49	64	248
																															113	−5 45	50	66	−4 55	49	65	−4 06	49	65	−3 17	50	64	−2 27	49	63	247
																															114	−6 18	+49	65	−5 29	50	64	−4 39	49	64	−3 50	50	63	−3 00	50	63	246
																																			115	−6 02	+50	63	−5 12	+50	63	−4 22	+49	62	−3 33	+50	62	245
																																					116	−5 45	50	62	−4 55	50	62	−4 05	50	61	244
																																					117	−6 17	+50	61	−5 27	50	61	−4 37	50	60	243
																																							118	−5 59	+50	60	−5 09	50	59	242
																																									119	−5 41	51	59	241
																																									120	−6 12	+50	58	240

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 52°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 52°

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
99	−5 32	−47	83	−6 19	−48	84	261																																									99
98	−4 55	47	84	−5 42	48	84	262																																								98
97	−4 18	46	84	−5 06	47	85	−5 53	−47	86	263																																					97
96	−3 41	46	85	−4 29	47	86	−5 16	47	86	−6 03	−48	87	264																																		96
95	−3 05	−47	86	−3 52	−47	87	−4 39	−47	87	−5 26	−48	88	−6 14	−47	89	265																															95
94	−2 28	47	87	−3 15	47	87	−4 02	46	88	−4 50	47	89	−5 37	47	89	266																															94
93	−1 51	47	88	−2 38	47	88	−3 25	48	89	−4 13	47	89	−5 00	47	90	−5 47	−47	91	267																											93
92	−1 14	47	88	−2 01	47	89	−2 48	48	90	−3 36	47	90	−4 23	47	91	−5 10	47	92	−5 57	−47	92	268																									92
91	−0 37	47	89	−1 24	47	90	−2 11	48	90	−2 59	47	91	−3 46	47	92	−4 33	47	92	−5 20	48	93	−6 08	−47	94	269																					91
90	00 00	−47	90	−0 47	−48	91	−1 35	−47	91	−2 22	−47	92	−3 09	−47	92	−3 56	−47	93	−4 43	−48	94	−5 31	−47	94	−6 18	−47	95	270																			90
89	00 37	47	91	−0 10	48	91	−0 58	47	92	−1 45	47	93	−2 32	47	93	−3 19	48	94	−4 07	47	94	−4 54	47	95	−5 41	47	96	271																			89
88	01 14	47	92	00 27	48	92	−0 21	47	93	−1 08	47	93	−1 55	48	94	−2 43	47	95	−3 30	47	95	−4 17	47	96	−5 04	47	97	−5 51	−48	97	272																	88
87	01 51	48	92	01 03	47	93	00 16	47	94	−0 31	47	94	−1 18	48	95	−2 06	47	95	−2 53	47	96	−3 40	48	97	−4 28	47	97	−5 15	47	98	−6 02	−47	99	273													87
86	02 28	48	93	01 40	47	94	00 53	47	94	00 06	48	95	−0 42	47	96	−1 29	47	96	−2 16	48	97	−3 04	47	97	−3 51	47	98	−4 38	48	99	−5 26	47	99	−6 13	−47	100	274									86
85	03 05	−48	94	02 17	−47	95	01 30	−48	95	00 42	−47	96	−0 05	−47	96	−0 52	−48	97	−1 40	−47	98	−2 27	−47	98	−3 14	−48	99	−4 02	−47	99	−4 49	−47	100	−5 36	−48	101	275									85
84	03 41	47	95	02 54	47	95	02 07	48	96	01 19	47	97	00 32	48	97	−0 16	47	98	−1 03	48	98	−1 51	47	99	−2 38	47	100	−3 25	48	100	−4 13	47	101	−5 00	47	101	−5 47	−48	102	276						84
83	04 18	47	96	03 31	48	96	02 43	47	97	01 56	48	97	01 08	47	98	00 21	48	99	−0 27	47	99	−1 14	48	100	−2 02	47	100	−2 49	48	101	−3 37	47	102	−4 24	47	102	−5 11	48	103	−5 59	−47	103	277			83
82	04 55	48	96	04 07	47	97	03 20	48	98	02 32	47	98	01 45	48	99	00 57	47	99	00 10	48	100	−0 38	47	101	−1 25	48	101	−2 13	47	102	−3 00	48	102	−3 48	47	103	−4 35	48	104	−5 23	47	104	−6 10	−48	105	278	82
81	05 32	48	97	04 44	47	98	03 57	48	98	03 09	48	99	02 21	47	100	01 34	48	100	00 46	48	101	−0 02	47	101	−0 49	48	102	−1 37	47	103	−2 24	48	103	−3 12	48	104	−4 00	47	104	−4 47	48	105	−5 35	47	106	279	81
80	06 08	−47	98	05 21	−48	99	04 33	−48	99	03 45	−47	100	02 58	−48	100	02 10	−48	101	01 22	−47	102	00 35	−48	102	−0 13	−48	103	−1 01	−47	103	−1 48	−48	104	−2 36	−48	105	−3 24	−48	105	−4 12	−47	106	−4 59	−48	106	280	80
79	06 45	48	99	05 57	48	99	05 09	47	100	04 22	48	101	03 34	48	101	02 46	48	102	01 58	47	102	01 11	48	103	00 23	48	104	−0 25	48	104	−1 13	47	105	−2 00	48	105	−2 48	48	106	−3 36	48	107	−4 24	47	107	281	79
78	07 21	47	100	06 34	48	100	05 46	48	101	04 58	48	101	04 10	48	102	03 22	47	103	02 35	48	103	01 47	48	104	00 59	48	104	00 11	48	105	−0 37	48	106	−1 25	48	106	−2 13	48	107	−3 01	48	107	−3 49	47	108	282	78
77	07 58	48	100	07 10	48	101	06 22	48	102	05 34	48	102	04 46	48	103	03 58	48	103	03 10	48	104	02 22	48	105	01 34	48	105	00 46	48	106	−0 02	48	106	−0 50	48	107	−1 38	48	108	−2 26	48	108	−3 14	47	109	283	77
76	08 34	48	101	07 46	48	102	06 58	48	102	06 10	48	103	05 22	48	104	04 34	48	104	03 46	48	105	02 58	48	105	02 10	48	106	01 22	48	107	00 34	48	107	−0 14	48	108	−1 02	49	108	−1 51	48	109	−2 39	48	110	284	76
75	09 10	−48	102	08 22	−48	103	07 34	−48	103	06 46	−48	104	05 58	−48	104	05 10	−48	105	04 22	−48	106	03 34	−48	106	02 46	−49	107	01 57	−48	107	01 09	−48	108	00 21	−48	109	−0 27	−49	109	−1 16	−48	110	−2 04	−48	110	285	75
74	09 46	48	103	08 58	48	103	08 10	48	104	07 22	48	105	06 34	48	105	05 46	49	106	04 57	48	106	04 09	48	107	03 21	49	108	02 32	48	108	01 44	48	109	00 56	49	109	00 07	48	110	−0 41	48	110	−1 29	49	111	286	74
73	10 22	48	104	09 34	48	104	08 46	48	105	07 58	49	105	07 09	48	106	06 21	48	107	05 33	49	107	04 44	48	108	03 56	49	108	03 07	48	109	02 19	48	110	01 31	49	110	00 42	48	111	−0 06	49	111	−0 55	48	112	287	73
72	10 58	48	104	10 10	48	105	09 22	49	106	08 33	48	106	07 45	49	107	06 56	48	107	06 08	49	108	05 19	48	109	04 31	49	109	03 42	48	110	02 54	49	110	02 05	48	111	01 17	49	111	00 28	49	112	−0 21	48	113	288	72
71	11 34	49	105	10 45	48	106	09 57	48	106	09 09	49	107	08 20	48	108	07 32	49	108	06 43	49	109	05 54	48	109	05 06	49	110	04 17	49	111	03 28	49	111	02 40	49	112	01 51	49	112	01 02	49	113	00 13	49	113	289	71
70	12 09	−48	106	11 21	−49	107	10 32	−48	107	09 44	−49	108	08 55	−48	108	08 07	−49	109	07 18	−49	110	06 29	−49	110	05 40	−48	111	04 52	−49	111	04 03	−49	112	03 14	−49	112	02 25	−49	113	01 36	−49	114	00 47	−49	114	290	70
LHA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 52°

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
90	12 45	49	107	11 56	48	107	11 08	49	108	10 19	49	109	09 30	49	109	08 41	48	110	07 53	49	110	07 04	49	111	06 15	49	112	05 26	49	112	04 37	49	113	03 48	49	113	02 59	49	114	02 10	49	114	01 21	49	115	291
89	13 20	49	108	12 31	48	108	11 43	49	109	10 54	49	109	10 05	49	110	09 16	49	111	08 27	49	111	07 38	49	112	06 49	49	112	06 00	49	113	05 11	49	114	04 22	50	114	03 32	49	115	02 43	49	115	01 54	49	116	292
88	13 55	49	108	13 06	48	109	12 18	49	110	11 29	49	110	10 40	49	111	09 51	49	111	09 02	50	112	08 12	49	113	07 23	49	113	06 34	49	114	05 45	50	114	04 55	49	115	04 06	49	115	03 17	50	116	02 27	49	117	293
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86	15 05	-49	110	14 16	-49	111	13 27	-49	111	12 38	-50	112	11 48	-49	113	10 59	-49	113	10 10	-50	114	09 20	-49	114	08 31	-50	115	07 41	-50	115	06 51	-49	116	06 02	-50	117	05 12	-50	117	04 22	-49	118	03 33	-50	118	295
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78	19 02	50	116	18 12	50	117	17 22	50	117	16 32	50	118	15 42	51	119	14 51	50	119	14 01	51	120	13 10	51	120	12 19	50	121	11 29	51	121	10 38	51	122	09 47	51	122	08 56	51	123	08 05	51	123	07 14	51	124	302
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21	38 00	60	179	37 00	60	179	36 00	60	179	35 00	60	179	34 00	60	179	33 00	60	179	32 00	60	179	31 00	60	179	30 00	60	179	29 00	60	179	28 00	60	179	27 00	60	179	26 00	60	179	25 00	60	179	24 00	60	179	359
20	38 00	-60	180	37 00	-60	180	36 00	-60	180	35 00	-60	180	34 00	-60	180	33 00	-60	180	32 00	-60	180	31 00	-60	180	30 00	-60	180	29 00	-60	180	28 00	-60	180	27 00	-60	180	26 00	-60	180	25 00	-60	180	24 00	-60	180	360
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 52°

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
0	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	64 00	+60	180	65 00	+60	180	66 00	+60	180	67 00	+60	180	360
1	52 59	60	178	53 59	60	178	54 59	60	178	55 59	60	178	56 59	60	178	57 59	60	178	58 59	60	178	59 59	60	178	60 59	60	178	61 59	60	178	62 59	60	178	63 59	60	178	64 59	60	178	65 59	60	178	66 59	60	178	359
2	52 58	60	177	53 58	60	177	54 58	60	177	55 58	60	177	56 58	60	177	57 58	60	176	58 58	60	176	59 58	60	176	60 58	59	176	61 57	60	176	62 57	60	176	63 57	60	176	64 57	60	176	65 57	60	176	66 57	60	176	358
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5	52 47	+60	172	53 47	+60	172	54 47	+59	172	55 46	+60	172	56 46	+60	171	57 46	+59	171	58 45	+60	171	59 45	+60	171	60 45	+59	171	61 44	+60	170	62 44	+60	170	63 44	+59	170	64 43	+60	170	65 43	+59	169	66 42	+60	169	355
6	52 41	60	170	53 41	60	170	54 41	59	170	55 40	60	170	56 40	60	170	57 40	59	169	58 39	60	169	59 39	59	169	60 38	60	169	61 38	59	168	62 37	59	168	63 36	60	168	64 36	59	167	65 35	59	167	66 34	59	167	354
7	52 35	59	169	53 34	60	169	54 34	59	168	55 33	60	168	56 33	59	168	57 32	60	168	58 32	59	167	59 31	59	167	60 30	60	167	61 30	59	167	62 29	59	166	63 28	59	166	64 27	59	165	65 26	59	165	66 25	59	165	353
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11	51 58	59	163	52 57	59	162	53 56	59	162	54 55	58	162	55 53	59	161	56 52	59	161	57 51	58	160	58 49	59	160	59 48	58	160	60 46	58	159	61 44	58	159	62 42	58	158	63 40	58	157	64 38	57	157	65 35	58	156	349
12	51 47	58	161	52 45	59	161	53 44	59	160	54 43	58	160	55 41	58	160	56 39	59	159	57 38	58	159	58 36	58	158	59 34	58	158	60 32	58	157	61 30	58	157	62 28	57	156	63 25	58	156	64 23	57	155	65 20	57	154	348
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14	51 21	58	158	52 19	58	158	53 17	58	157	54 15	58	157	55 13	58	156	56 11	58	156	57 09	58	155	58 07	57	155	59 04	57	154	60 01	58	154	60 59	57	153	61 56	56	152	62 52	57	152	63 49	56	151	64 45	57	150	346
15	51 07	+58	157	52 05	+58	156	53 03	+57	156	54 00	+58	155	54 58	+58	155	55 56	+57	154	56 53	+57	154	57 50	+58	153	58 48	+57	153	59 45	+56	152	60 41	+57	151	61 38	+57	151	62 35	+56	150	63 31	+56	149	64 27	+55	148	345
16	50 52	57	155	51 49	58	155	52 47	57	154	53 44	58	154	54 42	57	153	55 39	57	153	56 36	57	152	57 33	57	152	58 30	57	151	59 27	56	150	60 23	57	150	61 20	56	149	62 16	55	148	63 11	56	147	64 07	55	146	344
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18	50 19	57	152	51 16	57	152	52 13	57	151	53 10	57	151	54 07	56	150	55 03	57	150	56 00	56	149	56 56	56	148	57 52	56	148	58 48	56	147	59 44	55	146	60 39	56	145	61 35	54	145	62 29	55	144	63 24	54	143	342
19	50 01	57	151	50 58	57	150	51 55	56	150	52 51	57	149	53 48	56	149	54 44	57	148	55 41	55	147	56 36	56	147	57 32	56	146	58 28	55	145	59 23	55	145	60 18	55	144	61 13	54	143	62 07	54	142	63 01	54	141	341
20	49 43	+56	149	50 39	+57	149	51 36	+56	148	52 32	+56	148	53 28	+56	147	54 24	+56	146	55 20	+56	146	56 16	+55	145	57 11	+55	144	58 06	+55	144	59 01	+55	143	59 56	+54	142	60 50	+54	141	61 44	+54	140	62 38	+53	139	340
21	49 23	57	148	50 20	56	147	51 16	56	147	52 12	56	146	53 08	56	146	54 04	55	145	54 59	55	144	55 54	55	144	56 49	55	143	57 44	55	142	58 39	54	141	59 33	54	141	60 27	53	140	61 20	53	139	62 13	53	138	339
22	49 03	56	146	49 59	56	146	50 55	56	145	51 51	56	145	52 47	55	144	53 42	55	144	54 37	55	143	55 32	55	142	56 27	54	141	57 21	54	141	58 15	54	140	59 09	53	139	60 02	53	138	60 55	53	137	61 48	52	136	338
23	48 43	55	145	49 38	56	145	50 34	55	144	51 29	56	143	52 25	55	143	53 20	54	142	54 14	55	141	55 09	54	141	56 03	54	140	56 57	54	139	57 51	53	138	58 44	53	137	59 37	53	136	60 30	52	136	61 22	52	135	337
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25	47 59	+55	142	48 54	+55	142	49 49	+55	141	50 44	+54	141	51 38	+55	140	52 33	+54	139	53 27	+54	139	54 21	+53	138	55 14	+53	137	56 07	+53	136	57 00	+53	135	57 53	+52	134	58 45	+52	133	59 37	+51	132	60 28	+51	131	335
26	47 36	55	141	48 31	55	140	49 26	54	140	50 20	54	139	51 14	54	139	52 08	54	138	53 02	54	137	53 56	53	136	54 49	53	136	55 42	52	135	56 34	52	134	57 26	52	133	58 18	51	132	59 09	51	131	60 00	50	130	334
27	47 12	55	140	48 07	54	139	49 01	55	139	49 56	54	138	50 50	53	137	51 43	54	136	52 37	53	136	53 30	53	135	54 23	52	134	55 15	52	133	56 07	52	132	56 59	51	132	57 50	51	131	58 41	50	130	59 31	50	128	333
28	46 48	55	139	47 43	54	138	48 37	53	137	49 30	54	137	50 24	53	136	51 17	54	135	52 11	52	134	53 03	53	134	53 56	52	133	54 48	52	132	55 40	51	131	56 31	51	130	57 22	50	129	58 12	50	128	59 02	49	127	332
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33	44 39	52	132	45 31	53	132	46 24	52	131	47 16	52	130	48 08	52	129	49 00	51	129	49 51	52	128	50 43	50	127	51 33	51	126	52 24	49	125	53 13	50	124	54 03	49	124	54 52	48	123	55 40	48	121	56 28	48	120	327
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37	42 45	52	128	43 37	51	127	44 28	52	126	45 20	50	126	46 10	51	125	47 01	50	124	47 51	50	123	48 41	50	122	49 31	49	121	50 20	48	121	51 08	48	120	51 56	48	119	52 44	47	118	53 31	47	117	54 18	46	116	323
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56	32 27	47	108	33 14	48	108	34 02	47	107	34 49	47	106	35 36	46	105	36 22	47	105	37 09	45	104	37 54	46	103	38 40	45	102	39 25	46	101	40 10	45	100	40 55	44	100	41 39	43	99	42 22	43	98	43 05	43	97	304
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61	29 29	47	104	30 16	47	103	31 03	47	102	31 50	46	102	32 36	46	101	33 22	46	100	34 08	45	99	34 53	45	99	35 38	45	98	36 23	44	97	37 07	45	96	37 52	43	95	38 35	43	94	39 18	43	94	40 01	43	93	299
62	28 53	47	103	29 40	47	102	30 27	46	102	31 13	47	101	32 00	46	100	32 46	45	99	33 31	46	99	34 17	45	98	35 02	44	97	35 46	45	96	36 31	44	95	37 15	43	95	37 58	44	94	38 42	42	93	39 24	43	92	298
63	28 17	47	102	29 04	47	101	29 51	46	101	30 37	46	100	31 23	46	99	32 09	46	99	32 55	45	98	33 40	45	97	34 25	45	96	35 10	44	95	35 54	44	95	36 38	43	94	37 21	44	93	38 05	43	92	38 48	42	91	297
64	27 41	47	101	28 28	46	101	29 14	47	100	30 01	46	99	30 47	46	98	31 33	45	98	32 18	45	97	33 03	45	96	33 48	45	95	34 33	44	95	35 17	44	94	36 01	44	93	36 45	43	92	37 28	43	91	38 11	42	90	296
65	27 05	+47	101	27 52	+46	100	28 38	+46	99	29 24	+46	98	30 10	+46	98	30 56	+45	97	31 41	+45	96	32 26	+45	95	33 11	+45	95	33 56	+44	94	34 40	+44	93	35 24	+44	92	36 08	+43	91	36 51	+43	90	37 34	+42	89	295
66	26 29	46	100	27 15	47	99	28 02	46	98	28 48	46	98	29 34	45	97	30 19	46	96	31 05	45	95	31 50	45	94	32 35	44	94	33 19	44	93	34 03	44	92	34 47	44	91	35 31	43	90	36 14	43	90	36 57	42	89	294
67	25 52	47	99	26 39	46	98	27 25	46	97	28 11	46	97	28 57	45	96	29 42	46	95	30 28	45	94	31 13	45	94	31 58	44	93	32 42	44	92	33 26	44	91	34 10	44	90	34 54	43	90	35 37	43	89	36 20	42	88	293
68	25 16	46	98	26 02	46	97	26 48	46	97	27 34	46	96	28 20	46	95	29 06	45	94	29 51	45	94	30 36	45	93	31 21	44	92	32 05	44	91	32 49	44	91	33 33	44	90	34 17	43	89	35 00	43	88	35 43	42	87	292
69	24 39	46	97	25 25	47	96	26 12	46	96	26 58	45	95	27 43	46	94	28 29	45	94	29 14	45	93	29 59	45	92	30 44	44	91	31 28	44	91	32 12	44	90	32 56	44	89	33 40	43	88	34 23	43	87	35 06	43	86	291
LHA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
70	24 02	+47	96	24 49	+46	96	25 35	+46	95	26 21	+45	94	27 06	+46	94	27 52	+45	93	28 37	+45	92	29 22	+45	91	30 07	+44	90	30 51	+45	90	31 36	+43	89	32 19	+44	88	33 03	+43	87	33 46	+43	86	34 29	+43	86	290
71	23 26	46	96	24 12	46	95	24 58	46	94	25 44	46	93	26 30	45	93	27 15	45	92	28 00	45	91	28 45	45	90	29 30	44	90	30 14	45	89	30 59	43	88	31 42	44	87	32 26	43	87	33 09	43	86	33 52	43	85	289
72	22 49	46	95	23 35	46	94	24 21	46	93	25 07	46	93	25 53	45	92	26 38	45	91	27 23	45	90	28 08	45	90	28 53	44	89	29 37	45	88	30 22	44	87	31 06	43	87	31 49	44	86	32 33	43	85	33 16	42	84	288
73	22 12	46	94	22 58	46	93	23 44	46	93	24 30	46	92	25 16	45	91	26 01	45	90	26 46	45	90	27 31	45	89	28 16	45	88	29 01	44	87	29 45	44	87	30 29	43	86	31 12	44	85	31 56	43	84	32 39	43	83	287
74	21 35	46	93	22 21	46	92	23 07	46	92	23 53	46	91	24 39	45	90	25 24	45	90	26 09	45	89	26 54	45	88	27 39	45	87	28 24	44	87	29 08	44	86	29 52	44	85	30 36	43	84	31 19	43	83	32 02	43	83	286
75	20 58	+46	92	21 44	+46	92	22 30	+46	91	23 16	+46	90	24 02	+45	90	24 47	+45	89	25 32	+45	88	26 17	+45	87	27 02	+45	87	27 47	+44	86	28 31	+44	85	29 15	+44	84	29 59	+43	84	30 42	+44	83	31 26	+42	82	285
76	20 21	46	92	21 07	46	91	21 53	46	90	22 39	46	89	23 25	45	89	24 10	46	88	24 56	45	87	25 41	44	87	26 25	45	86	27 10	44	85	27 54	44	84	28 38	44	84	29 22	44	83	30 06	43	82	30 49	43	81	284
77	19 44	46	91	20 30	46	90	21 16	46	89	22 02	46	89	22 48	45	88	23 33	46	87	24 19	45	87	25 04	45	86	25 49	44	85	26 33	45	84	27 18	44	84	28 02	44	83	28 46	43	82	29 29	44	81	30 13	43	80	283
78	19 07	47	90	19 54	46	89	20 40	45	89	21 25	46	88	22 11	46	87	22 57	45	86	23 42	45	86	24 27	45	85	25 12	44	84	25 56	45	84	26 41	44	83	27 25	44	82	28 09	44	81	28 53	43	81	29 36	43	80	282
79	18 30	47	89	19 17	46	88	20 03	45	88	20 48	46	87	21 34	46	86	22 20	45	86	23 05	45	85	23 50	45	84	24 35	45	84	25 20	44	83	26 04	45	82	26 49	44	81	27 33	43	81	28 16	44	80	29 00	43	79	281
80	17 53	+47	88	18 40	+46	88	19 26	+46	87	20 12	+45	86	20 57	+46	86	21 43	+45	85	22 28	+45	84	23 13	+45	84	23 58	+45	83	24 43	+45	82	25 28	+44	81	26 12	+44	81	26 56	+44	80	27 40	+44	79	28 24	+43	78	280
81	17 17	46	88	18 03	46	87	18 49	46	86	19 35	45	86	20 20	46	85	21 06	45	84	21 51	46	83	22 37	45	83	23 22	45	82	24 07	44	81	24 51	45	81	25 36	44	80	26 20	44	79	27 04	44	78	27 48	43	78	279
82	16 40	46	87	17 26	46	86	18 12	46	85	18 58	46	85	19 44	45	84	20 29	46	83	21 15	45	83	22 00	45	82	22 45	45	81	23 30	45	81	24 15	44	80	24 59	45	79	25 44	44	78	26 28	44	78	27 12	43	77	278
83	16 03	46	86	16 49	46	85	17 35	46	85	18 21	46	84	19 07	46	83	19 53	45	83	20 38	46	82	21 24	45	81	22 09	45	81	22 54	45	80	23 39	44	79	24 23	45	78	25 08	44	78	25 52	44	77	26 36	43	76	277
84	15 26	46	85	16 12	46	85	16 58	46	84	17 44	46	83	18 30	46	83	19 16	46	82	20 02	45	81	20 47	45	81	21 32	45	80	22 17	45	79	23 02	45	78	23 47	44	78	24 31	45	77	25 16	44	76	26 00	44	75	276
85	14 49	+47	84	15 36	+46	84	16 22	+46	83	17 08	+46	82	17 54	+46	82	18 40	+45	81	19 25	+46	80	20 11	+45	80	20 56	+45	79	21 41	+45	78	22 26	+45	78	23 11	+45	77	23 56	+44	76	24 40	+44	75	25 24	+44	75	275
86	14 12	47	84	14 59	46	83	15 45	46	82	16 31	46	82	17 17	46	81	18 03	46	80	18 49	45	80	19 34	46	79	20 20	45	78	21 05	45	78	21 50	45	77	22 35	45	76	23 20	44	75	24 04	45	75	24 49	44	74	274
87	13 36	46	83	14 22	46	82	15 08	47	82	15 55	46	81	16 41	46	80	17 27	46	80	18 13	45	79	18 58	46	78	19 44	45	78	20 29	45	77	21 14	45	76	21 59	45	75	22 44	45	75	23 29	44	74	24 13	44	73	273
88	12 59	47	82	13 46	46	82	14 32	46	81	15 18	46	80	16 04	46	80	16 50	46	79	17 36	46	78	18 22	46	78	19 08	45	77	19 53	45	76	20 38	46	75	21 24	44	75	22 08	45	74	22 53	45	73	23 38	44	73	272
89	12 23	46	81	13 09	47	81	13 56	46	80	14 42	46	79	15 28	46	79	16 14	46	78	17 00	46	77	17 46	46	77	18 32	45	76	19 17	46	75	20 03	45	75	20 48	45	74	21 33	45	73	22 18	45	73	23 03	44	72	271
90	11 46	+47	81	12 33	+46	80	13 19	+47	79	14 06	+46	79	14 52	+46	78	15 38	+46	77	16 24	+46	77	17 10	+46	76	17 56	+46	75	18 42	+45	75	19 27	+46	74	20 13	+45	73	20 58	+45	73	21 43	+45	72	22 28	+44	71	270
91	11 10	46	80	11 56	47	79	12 43	46	79	13 29	47	78	14 16	46	77	15 02	46	77	15 48	46	76	16 34	46	75	17 20	46	75	18 06	46	74	18 52	45	73	19 37	46	73	20 23	45	72	21 08	45	71	21 53	45	70	269
92	10 33	47	79	11 20	47	78	12 07	46	78	12 53	47	77	13 40	46	77	14 26	47	76	15 13	46	75	15 59	46	75	16 45	46	74	17 31	45	73	18 16	46	73	19 02	46	72	19 48	45	71	20 33	45	70	21 18	45	70	268
93	09 57	47	78	10 44	47	78	11 31	46	77	12 17	47	76	13 04	46	76	13 50	47	75	14 37	46	74	15 23	46	74	16 09	46	73	16 55	46	72	17 41	46	72	18 27	46	71	19 13	45	70	19 58	45	70	20 43	46	69	267
94	09 21	47	78	10 08	47	77	10 55	47	76	11 42	46	76	12 28	47	75	13 15	46	74	14 01	47	74	14 48	46	73	15 34	46	72	16 20	46	72	17 06	46	71	17 52	46	70	18 38	46	70	19 24	45	69	20 09	45	68	266
95	08 45	+47	77	09 32	+47	76	10 19	+47	76	11 06	+47	75	11 53	+46	74	12 39	+47	74	13 26	+46	73	14 12	+47	72	14 59	+46	72	15 45	+46	71	16 31	+46	70	17 17	+46	70	18 03	+46	69	18 49	+46	68	19 35	+45	68	265
96	08 09	47	76	08 56	47	75	09 43	47	75	10 30	47	74	11 17	47	74	12 04	47	73	12 51	46	72	13 37	47	72	14 24	46	71	15 10	47	70	15 57	46	70	16 43	46	69	17 29	46	68	18 15	46	68	19 01	45	67	264
97	07 33	48	75	08 21	47	75	09 08	47	74	09 55	47	73	10 42	47	73	11 29	47	72	12 16	46	71	13 02	47	71	13 49	47	70	14 36	46	70	15 22	46	69	16 08	47	68	16 55	46	68	17 41	46	67	18 27	46	66	263
98	06 58	47	74	07 45	47	74	08 32	47	73	09 19	48	73	10 07	47	72	10 54	47	71	11 41	47	71	12 28	46	70	13 14	47	69	14 01	47	69	14 48	46	68	15 34	47	68	16 21	46	67	17 07	46	66	17 53	46	66	262
99	06 22	48	74	07 10	47	73	07 57	47	72	08 44	48	72	09 32	47	71	10 19	47	71	11 06	47	70	11 53	47	69	12 40	47	69	13 27	47	68	14 14	46	67	15 00	47	67	15 47	46	66	16 33	47	65	17 20	46	65	261
100	05 47	+47	73	06 34	+48	72	07 22	+47	72	08 09	+48	71	08 57	+47	70	09 44	+47	70	10 31	+47	69	11 18	+48	69	12 06	+47	68	12 53	+47	67	13 40	+46	67	14 26	+47	66	15 13	+47	65	16 00	+46	65	16 46	+47	64	260
101	05 11	48	72	05 59	48	72	06 47	47	71	07 34	48	70	08 22	47	70	09 09	48	69	09 57	47	68	10 44	47	68	11 31	48	67	12 19	47	67	13 06	47	66	13 53	47	65	14 40	46	65	15 26	47	64	16 13	47	63	259
102	04 36	48	71	05 24	48	71	06 12	48	70	07 00	47	70	07 47	48	69	08 35	48	68	09 23	47	68	10 10	47	67	10 57	48	67	11 45	47	66	12 32	47	65	13 19	47	65	14 06	47	64	14 53	47	63	15 40	47	63	258
103	04 01	48	71	04 49	48	70	05 37	48	69	06 25	48	69	07 13	48	68	08 01	47	68	08 48	48	67	09 36	48	66	10 24	47	66	11 11	48	65	11 59	47	65	12 46	47	64	13 33	47	63	14 20	47	63	15 07	47	62	257
104	03 27	48	70	04 15	48	69	05 03	48	69	05 51	48	68	06 39	48	67	07 27	47	67	08 14	48	66	09 02	48	66	09 50	48	65	10 38	47	64	11 25	48	64	12 13	47	63	13 00	48	63	13 48	47	62	14 35	47	61	256
105	02 52	+48	69	03 40	+48	68	04 28	+49	68	05 17	+48	67	06 05	+48	67	06 53	+48	66	07 41	+48	65	08 29	+48	65	09 17	+48	64	10 05	+47	64	10 52	+48	63	11 40	+48	62	12 28	+47	62	13 15	+48	61	14 03	+47	61	255
106	02 18	48	68	03 06	48	68	03 54	49	67	04 43	48	67	05 31	48	66	06 19	48	65	07 07	48	65	07 55	48	64	08 43	49	64	09 32	47	63	10 19	48	62	11 07	48	62	11 55	48	61	12 43	48	60	13 31	47	60	254
107	01 43	49	68	02 32	48	67	03 20	49	66	04 09	48	66	04 57	49	65	05 46	48	65	06 34	48	64	07 22	49	63	08 11	48	63	08 59	48	62	09 47	48	62	10 35	48	61	11 23	48	60	12 11	48	60	12 59	48	59	253
108	01 09	49	67	01 58	49	66	02 47	48	66	03 35	49	65	04 24	48	64	05 12	49	64	06 01	48	63	06 49	49	63	07 38	48	62	08 26	49	61	09 15	48	61	10 03	48	60	10 51	48	60	11 39	48	59	12 27	48	58	252
109	00 36	48	66	01 24	49	65	02 13	49	65	03 02	49	64	03 51	48	64	04 39	49	63	05 28	49	62	06 17	48	62	07 05	49	61	07 54	48	61	08 42	49	60	09 31	48	60	10 19	49	59	11 08	48	58	11 56	48	58	251
110	00 02	+49	65	00 51	+49	65	01 40	+49	64	02 29	+49	63	03 18	+49	63	04 07	+48	62	04 55	+49	62	05 44	+49	61	06 33	+49	61	07 22	+48	60	08 10	+49	59	08 59	+49	58	09 48	+48	58	10 36	+49	58	11 25	+48	57	250
111	−0 32	50	64	00 18	49	64	01 07	49	63	01 56	49	63	02 45	49	62	03 34	49	62	04 23	49	61	05 12	49	60	06 01	49	60	06 50	49	59	07 39	49	59	08 28	48	58	09 16	49	57	10 05	49	57	10 54	49	56	249
112	−1 05	50	64	−0 15	49	63	00 34	49	62	01 23	49	62	02 12	50	61	03 02	49	61	03 51	49	60	04 40	49	60	05 29	49	59	06 18	49	58	07 07	49	58	07 56	49	57	08 45	49	57	09 34	49	56	10 23	49	56	248
113	−1 38	50	63	−0 48	49	62	00 01	50	62	00 51	49	61	01 40	49	61	02 29	50	60	03 19	49	59	04 08	50	59	04 58	49	58	05 47	49	58	06 36	50	57	07 26	49	57	08 15	49	56	09 04	49	55	09 53	49	55	247
114	−2 10	49	62	−1 21	50	61	−0 31	49	61	00 18	50	60	01 08	50	60	01 58	49	59	02 47	50	59	03 37	49	58	04 26	50	58	05 16	49	57	06 05	50	56	06 55	49	56	07 44	50	55	08 34	49	55	09 23	49	54	246
115	−2 43	+50	61	−1 53	+50	61	−1 03	+49	60	−0 14	+50	60	00 36	+50	59	01 26	+50	58	02 16	+50	58	03 06	+49	57	03 55	+50	57	04 45	+50	56	05 35	+49	56	06 24	+50	55	07 14	+50	54	08 04	+49	54	08 53	+50	53	245
116	−3 15	50	60	−2 25	50	60	−1 35	50	59	−0 45	50	59	00 05	50	58	00 55	50	58	01 45	50	57	02 35	50	57	03 25	49	56	04 14	50	55	05 04	50	55	05 54	50	54	06 44	50	54	07 34	50	53	08 24	49	53	244
117	−3 47	50	60	−2 57	50	59	−2 07	50	59	−1 17	50	58	−0 27	51	57	00 24	50	57	01 14	50	56	02 04	50	56	02 54	50	55	03 44	50	55	04 34	50	54	05 24	50	54	06 14	50	53	07 04	50	52	07 54	50	52	243
118	−4 19	50	59	−3 29	51	58	−2 38	50	58	−1 48	50	57	−0 58	51	57	−0 07	50	56	00 43	51	56	01 34	50	55	02 24	50	54	03 14	51	54	04 05	50	53	04 55	50	53	05 45	50	52	06 35	51	52	07 26	50	51	242
119	−4 50	50	58	−4 00	51	57	−3 09	50	57	−2 19	51	56	−1 28	50	56	−0 38	51	55	00 13	50	55	01 03	51	54	01 54	51	54	02 45	50	53	03 35	51	53	04 26	50	52	05 16	50	51	06 06	51	51	06 57	50	50	241
120	−5 22	+51	57	−4 31	+51	57	−3 40	+51	56	−2 49	+50	56	−1 59	+51	55	−1 08	+51	54	−0 17	+51	54	00 34	+50	53	01 24	+51	52	02 15	+51	52	03 06	+51	51	03 57	+50	51	04 47	+51	51	05 38	+51	50	06 29	+50	50	240
121	−5 52	+50	56	−5 02	51	56	−4 11	51	55	−3 20	51	55	−2 29	51	54	−1 38	51	54	−0 47	51	53	00 04	51	53	00 55	51	52	01 46	51	52	02 37	51	51	03 28	51	51	04 19	51	50	05 10	51	49	06 01	50	49	239
		122		−5 32	51	55	−4 41	51	54	−3 50	51	54	−2 59	52	53	−2 07	51	53	−1 16	51	52	−0 25	51	52	00 26	51	51	01 17	51	51	02 08	52	50	03 00	51	50	03 51	51	49	04 42	51	49	05 33	51	48	238
		123		−6 02	+51	54	−5 11	52	54	−4 19	51	53	−3 28	51	53	−2 37	52	52	−1 45	51	52	−0 54	51	51	−0 03	52	51	00 49	51	50	01 40	52	50	02 32	51	49	03 23	51	48	04 14	52	48	05 06	51	47	237
			124			124	−5 40	51	53	−4 49	52	52	−3 57	51	52	−3 06	52	51	−2 14	51	51	−1 23	52	50	−0 31	52	50	00 21	53	49	01 12	52	49	02 04	51	48	02 55	52	48	03 47	52	47	04 39	51	47	236
			125			125	−6 10	+52	52	−5 18	+52	51	−4 26	+52	51	−3 34	+51	50	−2 43	+52	50	−1 51	+52	49	−0 59	+52	49	−0 07	+52	48	00 45	+51	48	01 36	+52	47	02 28	+52	47	03 20	+52	46	04 12	+52	46	235
						126			126	−5 47	52	51	−4 55	52	50	−4 03	52	50	−3 11	52	49	−2 19	52	49	−1 27	52	48	−0 35	52	48	00 17	52	47	01 09	52	47	02 01	52	46	02 53	52	46	03 45	52	45	234
						127			127	−6 15	+52	50	−5 23	52	49	−4 31	53	49	−3 38	52	48	−2 46	52	48	−1 54	52	47	−1 02	52	47	−0 10	53	46	00 43	52	46	01 35	52	45	02 27	52	45	03 19	53	44	233
									128			128	−5 51	53	49	−4 58	52	48	−4 06	53	48	−3 13	52	47	−2 21	52	47	−1 29	53	46	−0 36	52	46	00 16	53	45	01 09	52	45	02 01	53	44	02 54	52	44	232
												129	−6 18	+52	48	−5 26	53	47	−4 33	53	47	−3 40	52	46	−2 48	53	46	−1 55	53	45	−1 02	52	45	−0 10	53	44	00 43	53	44	01 36	52	43	02 28	53	43	231
																		130	−5 52	+52	46	−5 00	+53	46	−4 07	+53	45	−3 14	+53	45	−2 21	+53	44	−1 28	+53	44	−0 35	+53	44	00 18	+53	43	01 11	+52	43	02 03	+53	42	230
																					131	−5 26	53	45	−4 33	53	45	−3 40	53	44	−2 47	53	44	−1 54	54	43	−1 00	53	43	−0 07	53	42	00 46	53	42	01 39	53	41	229
																					132	−5 52	53	44	−4 59	54	44	−4 05	53	43	−3 12	53	43	−2 19	54	42	−1 25	53	42	−0 32	53	41	00 21	54	41	01 15	53	41	228
																					133	−6 18	+54	43	−5 24	54	43	−4 30	53	42	−3 37	54	42	−2 43	53	42	−1 50	54	41	−0 56	53	41	−0 03	54	40	00 51	53	40	227
																															134	−5 49	54	42	−4 55	54	42	−4 01	53	41	−3 08	54	41	−2 14	54	40	−1 20	54	40	−0 26	53	39	00 27	54	39	226
																															135	−6 14	+54	41	−5 20	+54	41	−4 26	+54	40	−3 32	+54	40	−2 38	+54	40	−1 44	+54	39	−0 50	+54	39	00 04	+54	38	225
																																					136	−5 44	55	40	−4 49	54	40	−3 55	54	39	−2 07	55	38	−1 12	54	38	−0 18	54	37	224
																																					137	−6 07	+54	39	−5 13	55	39	−4 18	54	38	−3 24	55	38	−2 29	54	37	−1 35	55	37	−0 40	54	37	223
																																								138	−5 36	55	38	−4 41	55	37	−3 46	54	37	−2 52	55	37	−1 57	55	36	−1 02	54	36	222
																																								139	−5 58	+55	37	−5 03	55	37	−4 08	55	36	−3 13	54	36	−2 19	55	35	−1 24	55	35	221
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 52°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 52°

LHA	15° Hc d Z	16° Hc d Z	17° Hc d Z	18° Hc d Z	19° Hc d Z	20° Hc d Z	21° Hc d Z	22° Hc d Z	23° Hc d Z	24° Hc d Z	25° Hc d Z	26° Hc d Z	27° Hc d Z	28° Hc d Z	29° Hc d Z	LHA
°	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	°
										140	−5 25 +55 36	−4 30 +55 35	−3 35 +55 35	−2 40 +55 35	−1 45 +55 34	220
										141	−5 46 55 35	−4 51 55 35	−3 56 55 34	−3 01 56 34	−2 05 55 33	219
										142	−6 07 +55 34	−5 12 56 34	−4 16 55 33	−3 21 56 33	−2 25 55 33	218
											143	−5 32 55 33	−4 37 56 33	−3 41 56 32	−2 45 56 32	217
											144	−5 52 56 32	−4 56 56 32	−4 00 56 31	−3 04 56 31	216
											145	−6 11 +56 31	−5 15 +56 31	−4 19 +56 31	−3 23 +56 30	215
												146	−5 34 56 30	−4 38 57 30	−3 41 56 29	214
												147	−5 52 56 29	−4 56 57 29	−3 59 56 29	213
												148	−6 10 +57 28	−5 13 56 28	−4 17 57 28	212
													149	−5 31 57 27	−4 34 57 27	211
													150	−5 47 +57 26	−4 50 +57 26	210
													151	−6 03 +57 25	−5 06 57 25	209
														152	−5 22 58 24	208
														153	−5 37 58 24	207
														154	−5 51 58 23	206
														155	−6 05 +58 22	205
81	−6 22 −48 106	279														
80	−5 47 −47 107	280														
79	−5 11 48 108	−5 59 −48 108	281													
78	−4 36 48 109	−5 24 48 109	−6 12 −48 110	282												
77	−4 01 48 109	−4 49 48 110	−5 37 48 111	283												
76	−3 27 48 110	−4 15 48 111	−5 03 48 111	−5 51 −48 112	284											
75	−2 52 −48 111	−3 40 −48 112	−4 28 −49 112	−5 17 −48 113	−6 05 −48 113	285										
74	−2 18 48 112	−3 06 48 112	−3 54 49 113	−4 43 48 113	−5 31 48 114	−6 19 −48 115	286									
73	−1 43 49 112	−2 32 48 113	−3 20 49 114	−4 09 48 114	−4 57 49 115	−5 46 48 115	287									
72	−1 09 49 113	−1 58 49 114	−2 47 48 114	−3 35 49 115	−4 24 48 116	−5 12 49 116	−6 01 −48 117	288								
71	−0 36 48 114	−1 24 49 115	−2 13 49 115	−3 02 49 116	−3 51 48 116	−4 39 49 117	−5 28 49 118	−6 17 −48 118	289							
70	−0 02 −49 115	−0 51 −49 115	−1 40 −49 116	−2 29 −49 117	−3 18 −49 117	−4 07 −48 118	−4 55 −49 118	−5 44 −49 119	290							
	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
69	00 32	50	116	−0 18	49	116	−1 07	49	117	−1 56	49	117	−2 45	49	118	−3 34	49	118	−4 23	49	119	−5 12	49	120	−6 01	−49	120	291																		
68	01 05	50	116	00 15	49	117	−0 34	49	118	−1 23	49	118	−2 12	50	119	−3 02	49	119	−3 51	49	121	−4 40	49	120	−5 29	49	121	−6 18	−49	122	292																		
67	01 38	50	117	00 48	49	118	−0 01	50	118	−0 51	49	119	−1 40	49	119	−2 29	50	120	−3 19	49	121	−4 08	50	121	−4 58	49	122	−5 47	49	122	293																		
66	02 10	49	118	01 21	50	119	00 31	49	119	−0 18	50	120	−1 08	50	120	−1 58	49	121	−2 47	50	121	−3 37	49	122	−4 26	50	122	−5 16	49	123	−6 05	−50	124	294																	
65	02 43	−50	119	01 53	−50	119	01 03	−49	120	00 14	−50	120	−0 36	−50	121	−1 26	−50	122	−2 16	−50	122	−3 06	−49	123	−3 55	−50	123	−4 45	−50	124	−5 35	−49	124	295																
64	03 15	50	120	02 25	50	120	01 35	50	121	00 45	50	121	−0 05	50	122	−0 55	50	122	−1 45	50	123	−2 35	50	123	−3 25	49	124	−4 14	50	125	−5 04	50	125	−5 54	−50	126	296												
63	03 47	50	120	02 57	50	121	02 07	50	121	01 17	50	122	00 27	51	123	−0 24	50	123	−1 14	50	124	−2 04	50	124	−2 54	50	125	−3 44	50	125	−4 34	50	126	−5 24	50	126	−6 14	−50	127	297								
62	04 19	50	121	03 29	51	122	02 38	50	122	01 48	50	123	00 58	51	123	00 07	50	124	−0 43	51	124	−1 34	50	125	−2 24	50	126	−3 14	51	126	−4 05	50	127	−4 55	50	127	−5 45	50	128	298								
61	04 50	50	122	04 00	51	123	03 09	50	123	02 19	51	124	01 28	50	124	00 38	51	125	−0 13	50	125	−1 03	51	126	−1 54	51	126	−2 45	50	127	−3 35	51	127	−4 26	50	128	−5 16	50	129	−6 06	−51	129	299				
60	05 22	−51	123	04 31	−51	123	03 40	−51	124	02 49	−50	124	01 59	−51	125	01 08	−51	126	00 17	−51	126	−0 34	−50	127	−1 24	−51	127	−2 15	−51	128	−3 06	−51	128	−3 57	−50	129	−4 47	−51	129	−5 38	−51	130	300				
59	05 52	50	124	05 02	51	124	04 11	51	125	03 20	51	125	02 29	51	126	01 38	51	126	00 47	51	127	−0 04	51	127	−0 55	51	128	−1 46	51	128	−2 37	51	129	−3 28	51	129	−4 19	51	130	−5 10	51	131	−6 01	−50	131	301
58	06 23	51	124	05 32	51	125	04 41	51	126	03 50	51	126	02 59	52	127	02 07	51	127	01 16	51	128	00 25	51	128	−0 26	51	129	−1 17	51	129	−2 08	52	130	−3 00	51	130	−3 51	51	131	−4 42	51	131	−5 33	51	132	302
57	06 53	51	125	06 02	51	126	05 11	52	126	04 19	51	127	03 28	51	127	02 37	52	128	01 45	51	128	00 54	51	129	00 03	52	129	−0 49	51	130	−1 40	52	130	−2 32	51	131	−3 23	51	132	−4 14	52	132	−5 06	51	133	303
56	07 23	51	126	06 32	52	127	05 40	51	127	04 49	52	128	03 57	51	128	03 06	52	129	02 14	51	129	01 23	52	130	00 31	52	130	−0 21	51	131	−1 12	52	131	−2 04	51	132	−2 55	52	132	−3 47	52	133	−4 39	51	133	304
55	07 53	−52	127	07 01	−51	127	06 10	−52	128	05 18	−52	129	04 26	−52	129	03 34	−51	130	02 43	−52	130	01 51	−52	131	00 59	−52	131	00 07	−52	132	−0 45	−51	132	−1 36	−52	133	−2 28	−52	133	−3 20	−52	134	−4 12	−52	134	305
54	08 22	52	128	07 30	51	128	06 39	52	129	05 47	52	129	04 55	52	130	04 03	52	130	03 11	52	131	02 19	52	131	01 27	52	132	00 35	52	132	−0 17	52	133	−1 09	52	133	−2 01	52	134	−2 53	52	134	−3 45	52	135	306
53	08 51	52	129	07 59	52	129	07 07	52	130	06 15	52	130	05 23	52	131	04 31	53	131	03 38	52	132	02 46	52	132	01 54	52	133	01 02	52	133	00 10	53	134	−0 43	52	134	−1 35	52	135	−2 27	52	135	−3 19	53	136	307
52	09 20	52	130	08 28	53	130	07 35	52	131	06 43	52	131	05 51	53	131	04 58	52	132	04 06	53	132	03 13	52	133	02 21	52	133	01 29	53	134	00 36	53	134	−0 16	53	135	−1 09	52	135	−2 01	53	136	−2 54	52	136	308
51	09 48	52	130	08 56	53	131	08 03	52	131	07 11	53	132	06 18	52	132	05 26	53	133	04 33	53	133	03 40	52	134	02 48	53	134	01 55	53	135	01 02	52	135	00 10	53	136	−0 43	53	136	−1 36	52	137	−2 28	53	137	309
50	10 16	−52	131	09 24	−53	132	08 31	−53	132	07 38	−53	133	06 45	−53	133	05 52	−52	134	05 00	−53	134	04 07	−53	135	03 14	−53	135	02 21	−53	136	01 28	−53	136	00 35	−53	136	−0 18	−53	137	−1 11	−52	137	−2 03	−53	138	310
49	10 44	53	132	09 51	53	133	08 58	53	133	08 05	53	134	07 12	53	134	06 19	53	134	05 26	53	135	04 33	53	135	03 40	53	136	02 47	53	136	01 54	54	137	01 00	53	137	00 07	53	138	−0 46	53	138	−1 39	53	139	311
48	11 11	53	133	10 18	53	133	09 25	53	134	08 32	54	134	07 38	53	135	06 45	53	135	05 52	53	136	04 59	54	136	04 05	53	137	03 12	53	137	02 19	54	138	01 25	53	138	00 32	53	139	−0 21	54	139	−1 15	53	139	312
47	11 38	53	134	10 45	54	134	09 51	53	135	08 58	54	135	08 04	53	136	07 11	53	136	06 18	54	137	05 24	54	137	04 30	53	138	03 37	54	138	02 43	53	138	01 50	54	139	00 56	53	139	00 03	54	140	−0 51	53	140	313
46	12 04	53	135	11 11	54	135	10 17	53	136	09 24	54	136	08 30	54	137	07 36	53	137	06 43	54	137	05 49	54	138	04 55	54	138	04 01	53	139	03 08	54	139	02 14	54	140	01 20	54	140	00 26	53	141	−0 27	54	141	314
45	12 30	−53	136	11 37	−54	136	10 43	−54	137	09 49	−54	137	08 55	−54	137	08 01	−54	138	07 07	−53	138	06 14	−54	139	05 20	−54	139	04 26	−54	140	03 32	−54	140	02 38	−54	140	01 44	−54	141	00 50	−54	141	−0 04	−54	142	315
44	12 56	54	136	12 02	54	137	11 08	54	137	10 14	54	138	09 20	54	138	08 26	54	139	07 32	54	139	06 38	54	140	05 44	55	140	04 49	54	140	03 55	54	141	03 01	54	141	02 07	55	142	01 12	54	142	00 18	54	143	316
43	13 21	54	137	12 27	54	138	11 33	54	138	10 39	55	139	09 44	54	139	08 50	54	140	07 56	55	140	07 01	54	140	06 07	54	141	05 13	55	141	04 18	54	142	03 24	55	142	02 29	54	143	01 35	55	143	00 40	54	143	317
42	13 46	54	138	12 52	55	139	11 57	54	139	11 03	55	140	10 08	54	140	09 14	55	140	08 19	54	141	07 25	55	141	06 30	54	142	05 36	55	142	04 41	55	143	03 46	54	143	02 52	55	143	01 57	55	144	01 02	54	144	318
41	14 10	54	139	13 16	55	140	12 21	54	140	11 27	55	140	10 32	55	141	09 37	55	141	08 42	54	142	07 48	55	142	06 53	55	143	05 58	55	143	05 03	55	143	04 08	55	144	03 13	54	144	02 19	55	145	01 24	55	145	319
40	14 34	−54	140	13 40	−55	141	12 45	−55	141	11 50	−55	141	10 55	−55	142	10 00	−55	142	09 05	−55	143	08 10	−55	143	07 15	−55	143	06 20	−55	144	05 25	−55	144	04 30	−55	145	03 35	−55	145	02 40	−55	145	01 45	−55	146	320
39	14 58	55	141	14 03	55	141	13 08	55	142	12 13	55	142	11 18	56	143	10 22	55	143	09 27	55	143	08 32	55	144	07 37	55	144	06 42	56	145	05 46	55	145	04 51	55	145	03 56	55	146	03 01	56	146	02 05	55	147	321
38	15 21	55	142	14 26	56	142	13 30	55	143	12 35	55	143	11 40	56	144	10 44	55	144	09 49	55	144	08 54	56	145	07 58	55	145	07 03	56	145	06 07	55	146	05 12	56	146	04 16	55	147	03 21	56	147	02 25	55	147	322
37	15 43	55	143	14 48	55	143	13 53	56	144	12 57	55	144	12 02	56	144	11 06	56	145	10 10	55	145	09 15	56	146	08 19	55	146	07 24	56	146	06 28	56	147	05 32	55	147	04 37	56	147	03 41	56	148	02 45	56	148	323
36	16 05	55	144	15 10	56	144	14 14	55	145	13 19	56	145	12 23	56	145	11 27	56	146	10 31	56	146	09 35	55	146	08 40	56	147	07 44	56	147	06 48	56	148	05 52	56	148	04 56	56	148	04 00	56	149	03 04	56	149	324
35	16 27	−56	145	15 31	−56	145	14 35	−56	145	13 39	−55	146	12 44	−56	146	11 48	−56	147	10 52	−56	147	09 56	−56	147	09 00	−56	148	08 04	−56	148	07 08	−57	148	06 11	−56	149	05 15	−56	149	04 19	−56	149	03 23	−56	150	325
34	16 48	56	146	15 52	56	146	14 56	56	146	14 00	56	147	13 04	56	147	12 08	56	147	11 12	57	148	10 15	56	148	09 19	56	149	08 23	56	149	07 27	57	149	06 30	56	150	05 34	56	150	04 38	57	150	03 41	56	151	326
33	17 09	57	147	16 12	56	147	15 16	56	147	14 20	56	148	13 24	57	148	12 27	56	148	11 31	56	149	10 35	57	149	09 38	56	149	08 42	57	150	07 45	56	150	06 49	57	150	05 52	56	151	04 56	57	151	03 59	56	151	327
32	17 29	57	148	16 32	56	148	15 36	57	148	14 39	56	149	13 43	57	149	12 46	56	149	11 50	57	150	10 53	56	150	09 57	57	150	09 00	57	151	08 03	56	151	07 07	57	151	06 10	57	152	05 13	56	152	04 17	57	152	328
31	17 48	56	148	16 52	57	149	15 55	57	149	14 58	56	150	14 02	57	150	13 05	57	150	12 08	56	151	11 12	57	151	10 15	57	151	09 18	57	152	08 21	57	152	07 24	57	152	06 27	56	152	05 31	57	153	04 34	57	153	329
30	18 07	−56	149	17 11	−57	150	16 14	−57	150	15 17	−57	150	14 20	−57	151	13 23	−57	151	12 26	−57	151	11 29	−57	152	10 32	−57	152	09 35	−57	152	08 38	−57	153	07 41	−57	153	06 44	−57	153	05 47	−57	154	04 50	−57	154	330
29	18 26	57	150	17 29	57	151	16 32	57	151	15 35	57	151	14 38	57	152	13 41	57	152	12 44	58	152	11 46	57	153	10 49	57	153	09 52	57	153	08 55	57	154	07 58	57	154	07 01	58	154	06 03	57	155	05 06	57	155	331
28	18 44	57	151	17 47	57	152	16 50	58	152	15 52	57	152	14 55	57	153	13 58	57	153	13 01	58	153	12 03	57	154	11 06	57	154	10 09	58	154	09 11	57	154	08 14	58	155	07 16	57	155	06 19	57	155	05 22	58	156	332
27	19 01	57	152	18 04	57	153	17 07	58	153	16 09	57	153	15 12	58	154	14 14	57	154	13 17	58	154	12 19	57	154	11 22	58	155	10 24	57	155	09 27	58	155	08 29	57	156	07 32	58	156	06 34	57	156	05 37	58	156	333
26	19 18	57	153	18 21	58	154	17 23	57	154	16 26	58	154	15 28	58	155	14 30	57	155	13 33	58	155	12 35	58	155	11 37	57	156	10 40	58	156	09 42	58	156	08 44	57	157	07 47	58	157	06 49	58	157	05 51	58	157	334
25	19 34	−57	154	18 37	−58	155	17 39	−58	155	16 41	−57	155	15 44	−58	155	14 46	−58	156	13 48	−58	156	12 50	−58	156	11 52	−58	157	10 54	−57	157	09 57	−58	157	08 59	−58	157	08 01	−58	158	07 03	−58	158	06 05	−58	158	335
24	19 50	58	155	18 52	58	156	17 54	57	156	16 57	58	156	15 59	58	156	15 01	58	157	14 03	58	157	13 05	58	157	12 07	58	157	11 09	58	158	10 11	58	158	09 13	58	158	08 15	58	159	07 17	58	159	06 19	59	159	336
23	20 05	58	156	19 07	58	157	18 09	58	157	17 11	58	157	16 13	58	157	15 15	58	158	14 17	58	158	13 19	58	158	12 21	59	158	11 22	58	159	10 24	58	159	09 26	58	159	08 28	58	159	07 30	59	160	06 31	58	160	337
22	20 20	58	157	19 22	59	158	18 23	58	158	17 25	58	158	16 27	58	158	15 29	59	159	14 30	58	159	13 32	58	159	12 34	58	159	11 36	59	160	10 37	58	160	09 39	58	160	08 41	59	160	07 42	58	161	06 44	58	161	338
21	20 34	59	158	19 35	58	159	18 37	58	159	17 39	59	159	16 40	58	159	15 42	58	160	14 44	59	160	13 45	58	160	12 47	59	160	11 48	58	160	10 50	59	161	09 51	58	161	08 53	59	161	07 54	58	161	06 56	59	162	339
20	20 47	−58	159	19 49	−59	160	18 50	−58	160	17 52	−59	160	16 53	−58	160	15 55	−59	160	14 56	−59	161	13 57	−58	161	12 59	−59	161	12 00	−58	161	11 02	−59	162	10 03	−59	162	09 04	−58	162	08 06	−59	162	07 07	−58	162	340
19	21 00	59	160	20 01	58	161	19 03	59	161	18 04	59	161	17 05	58	161	16 07	59	161	15 08	59	162	14 09	58	162	13 11	59	162	12 12	59	162	11 13	59	162	10 14	58	163	09 16	59	163	08 17	59	163	07 18	59	163	341
18	21 12	59	161	20 13	59	162	19 14	58	162	18 16	59	162	17 17	59	162	16 18	59	162	15 19	59	163	14 20	58	163	13 22	59	163	12 23	59	163	11 24	59	163	10 25	59	164	09 26	59	164	08 27	59	164	07 28	58	164	342
17	21 24	59	162	20 25	59	163	19 26	59	163	18 27	59	163	17 28	59	163	16 29	59	163	15 30	59	164	14 31	59	164	13 32	59	164	12 33	59	164	11 34	59	164	10 35	59	164	09 36	59	165	08 37	59	165	07 38	59	165	343
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15	21 45	−59	164	20 46	−60	165	19 46	−59	165	18 47	−59	165	17 48	−59	165	16 49	−59	165	15 50	−59	165	14 51	−60	166	13 51	−59	166	12 52	−59	166	11 53	−59	166	10 54	−59	166	09 55	−60	166	08 55	−59	167	07 56	−59	167	345
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13	22 03	59	166	21 04	59	167	20 05	60	167	19 05	59	167	18 06	59	167	17 07	60	167	16 07	59	167	15 08	60	168	14 08	59	168	13 09	59	168	12 10	60	168	11 10	59	168	10 11	60	168	09 11	59	168	08 12	59	169	347
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11	22 19	59	169	21 20	60	169	20 20	59	169	19 21	60	169	18 21	59	169	17 22	60	169	16 22	59	169	15 23	60	169	14 23	60	170	13 23	59	170	12 24	60	170	11 24	59	170	10 25	60	170	09 25	59	170	08 26	60	170	349
10	22 26	−59	170	21 27	−60	170	20 27	−59	170	19 28	−60	170	18 28	−60	170	17 28	−59	170	16 29	−60	170	15 29	−60	170	14 29	−59	170	13 30	−60	171	12 30	−60	171	11 30	−59	171	10 31	−60	171	09 31	−59	171	08 32	−60	171	350
9	22 33	60	171	21 33	60	171	20 33	59	171	19 34	60	171	18 34	60	171	17 34	59	171	16 35	60	171	15 35	60	171	14 35	60	171	13 35	59	172	12 36	60	172	11 36	60	172	10 36	59	172	09 37	60	172	08 37	60	172	351
8	22 38	59	172	21 39	60	172	20 39	60	172	19 39	60	172	18 39	59	172	17 40	60	172	16 40	60	172	15 40	60	172	14 40	59	172	13 41	60	173	12 41	60	173	11 41	60	173	10 41	59	173	09 42	60	173	08 42	60	173	352
7	22 43	59	173	21 44	60	173	20 44	60	173	19 44	60	173	18 44	60	173	17 44	59	173	16 45	60	173	15 45	60	173	14 45	60	173	13 45	60	173	12 45	59	173	11 46	60	174	10 46	60	174	09 46	60	174	08 46	60	174	353
6	22 48	60	174	21 48	60	174	20 48	60	174	19 48	60	174	18 48	59	174	17 49	60	174	16 49	60	174	15 49	60	174	14 49	60	174	13 49	60	174	12 49	60	174	11 49	60	174	10 49	59	175	09 50	60	175	08 50	60	175	354
5	22 52	−60	175	21 52	−60	175	20 52	−60	175	19 52	−60	175	18 52	−60	175	17 52	−60	175	16 52	−60	175	15 52	−60	175	14 52	−60	175	13 52	−59	175	12 53	−60	175	11 53	−60	175	10 53	−60	175	09 53	−60	176	08 53	−60	176	355
4	22 55	60	176	21 55	60	176	20 55	60	176	19 55	60	176	18 55	60	176	17 55	60	176	16 55	60	176	15 55	60	176	14 55	60	176	13 55	60	176	12 55	60	176	11 55	60	176	10 55	60	176	09 55	60	176	08 55	60	176	356
3	22 57	60	177	21 57	60	177	20 57	60	177	19 57	60	177	18 57	60	177	17 57	60	177	16 57	60	177	15 57	60	177	14 57	60	177	13 57	60	177	12 57	60	177	11 57	60	177	10 57	60	177	09 57	60	177	08 57	60	177	357
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1	23 00	60	179	22 00	60	179	21 00	60	179	20 00	60	179	19 00	60	179	18 00	60	179	17 00	60	179	16 00	60	179	15 00	60	179	14 00	60	179	13 00	60	179	12 00	60	179	11 00	60	179	10 00	60	179	09 00	60	179	359
0	23 00	−60	180	22 00	−60	180	21 00	−60	180	20 00	−60	180	19 00	−60	180	18 00	−60	180	17 00	−60	180	16 00	−60	180	15 00	−60	180	14 00	−60	180	13 00	−60	180	12 00	−60	180	11 00	−60	180	10 00	−60	180	09 00	−60	180	360
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 52°

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 53°

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
0	37 00	+60	180	38 00	+60	180	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	360
1	37 00	60	179	38 00	60	179	39 00	60	179	40 00	60	179	41 00	60	179	42 00	60	179	43 00	60	179	44 00	60	179	45 00	60	179	46 00	60	179	47 00	60	179	48 00	60	179	49 00	60	179	50 00	60	178	51 00	60	178	359
2	36 58	60	177	37 58	60	177	38 58	60	177	39 58	60	177	40 58	60	177	41 58	60	177	42 58	60	177	43 58	60	177	44 58	60	177	45 58	60	177	46 58	60	177	47 58	60	177	48 58	60	177	49 58	60	177	50 58	60	177	358
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20	34 26	+58	155	35 24	+58	155	36 22	+58	155	37 20	+58	155	38 18	+58	154	39 16	+58	154	40 14	+58	154	41 12	+57	153	42 09	+58	153	43 07	+58	152	44 05	+57	152	45 02	+57	152	45 59	+58	151	46 57	+57	151	47 54	+57	150	340
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44	25 39	53	130	26 32	53	129	27 25	53	129	28 18	53	128	29 11	52	127	30 03	53	127	30 56	52	126	31 48	52	126	32 40	52	125	33 32	52	125	34 24	52	124	35 16	51	123	36 07	52	123	36 59	51	122	37 50	50	121	316
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46	24 43	52	128	25 35	53	127	26 28	52	127	27 20	53	126	28 13	52	125	29 05	52	125	29 57	52	124	30 49	52	124	31 41	51	123	32 32	52	123	33 24	51	122	34 15	51	121	35 06	51	121	35 57	50	120	36 47	51	119	314
47	24 14	52	127	25 06	53	126	25 59	52	126	26 51	52	125	27 43	52	124	28 35	52	124	29 27	52	123	30 19	51	123	31 10	52	122	32 02	51	122	32 53	51	121	33 44	51	120	34 35	50	120	35 25	51	119	36 16	50	118	313
48	23 45	52	126	24 37	52	125	25 29	52	125	26 21	52	124	27 13	52	124	28 05	52	123	28 57	51	122	29 48	52	122	30 40	51	121	31 31	51	121	32 22	50	120	33 12	51	119	34 03	50	119	34 53	51	118	35 44	50	117	312
49	23 15	52	125	24 07	52	124	24 59	52	124	25 51	52	123	26 43	52	123	27 35	51	122	28 26	51	121	29 17	51	121	30 08	51	120	30 59	51	120	31 50	51	119	32 41	50	118	33 31	50	118	34 21	50	117	35 11	50	116	311
50	22 45	+52	124	23 37	+52	123	24 29	+52	123	25 21	+51	122	26 12	+52	122	27 04	+51	121	27 55	+51	120	28 46	+51	120	29 37	+51	119	30 28	+51	119	31 19	+50	118	32 09	+50	117	32 59	+50	117	33 49	+50	116	34 39	+50	115	310
51	22 15	52	123	23 07	52	122	23 59	51	122	24 50	51	121	25 41	52	121	26 33	51	120	27 24	51	119	28 15	50	119	29 05	51	118	29 56	50	118	30 46	51	117	31 37	50	116	32 27	50	116	33 17	49	115	34 06	50	114	309
52	21 45	51	122	22 36	52	121	23 28	51	121	24 19	51	120	25 10	51	120	26 01	51	119	26 52	51	119	27 43	51	118	28 34	50	117	29 24	50	117	30 14	50	116	31 04	50	115	31 54	50	115	32 44	49	114	33 33	49	113	308
53	21 14	51	121	22 05	52	120	22 57	51	120	23 48	51	119	24 39	51	119	25 30	50	118	26 20	51	118	27 11	50	117	28 01	51	116	28 52	50	116	29 42	49	115	30 31	50	114	31 21	50	114	32 11	49	113	33 00	49	112	307
54	20 43	51	120	21 34	51	120	22 25	51	119	23 16	51	118	24 07	51	118	24 58	50	117	25 48	51	117	26 39	50	116	27 29	50	115	28 19	50	115	29 09	50	114	29 59	49	114	30 48	49	113	31 37	49	112	32 26	49	112	306
55	20 12	+51	119	21 03	+50	119	21 53	+51	118	22 44	+51	118	23 35	+50	117	24 25	+51	116	25 16	+50	116	26 06	+50	115	26 56	+50	115	27 46	+50	114	28 36	+49	113	29 25	+50	113	30 15	+49	112	31 04	+49	111	31 53	+49	111	305
56	19 40	51	118	20 31	50	118	21 21	51	117	22 12	51	117	23 03	50	116	23 53	50	115	24 43	50	115	25 33	50	114	26 23	50	114	27 13	49	113	28 02	50	112	28 52	49	112	29 41	49	111	30 30	49	110	31 19	48	110	304
57	19 08	51	117	19 59	50	117	20 49	51	116	21 40	50	116	22 30	50	115	23 20	50	115	24 10	50	114	25 00	50	113	25 50	50	113	26 40	49	112	27 29	49	111	28 18	49	111	29 07	49	110	29 56	49	109	30 45	48	109	303
58	18 36	50	117	19 26	51	116	20 17	50	115	21 07	50	115	21 57	50	114	22 47	50	114	23 37	50	113	24 27	49	112	25 16	50	112	26 06	49	111	26 55	49	111	27 44	49	110	28 33	49	109	29 22	49	109	30 11	48	108	302
59	18 03	51	116	18 54	50	115	19 44	50	114	20 34	50	114	21 24	50	113	22 14	50	113	23 04	49	112	23 53	50	111	24 43	49	111	25 32	49	110	26 21	49	110	27 10	49	109	27 59	49	108	28 48	48	108	29 36	48	107	301
60	17 31	+50	115	18 21	+50	114	19 11	+50	114	20 01	+50	113	20 51	+50	112	21 41	+49	112	22 30	+50	111	23 20	+49	111	24 09	+49	110	24 58	+49	109	25 47	+49	109	26 36	+49	108	27 25	+48	107	28 13	+48	107	29 01	+49	106	300
61	16 58	50	114	17 48	50	113	18 38	50	113	19 28	49	112	20 17	50	112	21 07	49	111	21 56	50	110	22 46	49	110	23 35	49	109	24 24	49	108	25 13	49	108	26 02	48	107	26 50	49	107	27 39	48	106	28 27	48	105	299
62	16 25	50	113	17 15	49	112	18 04	50	112	18 54	50	111	19 44	49	111	20 33	49	110	21 22	50	109	22 12	49	109	23 01	49	108	23 50	48	108	24 38	49	107	25 27	48	106	26 15	49	106	27 04	48	105	27 52	48	104	298
63	15 51	50	112	16 41	50	112	17 31	49	111	18 20	50	110	19 10	49	110	19 59	49	109	20 48	49	109	21 37	49	108	22 26	49	107	23 15	49	107	24 04	48	106	24 52	49	105	25 41	48	105	26 29	48	104	27 17	47	103	297
64	15 18	49	111	16 07	50	111	16 57	49	110	17 46	50	110	18 36	49	109	19 25	49	108	20 14	49	108	21 03	49	107	21 52	49	106	22 41	48	106	23 29	48	105	24 17	49	105	25 06	48	104	25 54	48	103	26 42	47	103	296
65	14 44	+50	110	15 34	+49	110	16 23	+49	109	17 12	+49	109	18 01	+50	108	18 51	+49	107	19 40	+48	107	20 28	+49	106	21 17	+49	106	22 06	+48	105	22 54	+48	104	23 42	+49	104	24 31	+47	103	25 18	+48	102	26 06	+48	102	295
66	14 10	50	110	15 00	49	109	15 49	49	108	16 38	49	108	17 27	49	107	18 16	49	107	19 05	49	106	19 54	48	105	20 42	49	105	21 31	48	104	22 19	48	103	23 07	48	103	23 55	48	102	24 43	48	102	25 31	47	101	294
67	13 36	49	109	14 25	49	108	15 14	50	108	16 04	49	107	16 53	48	106	17 41	49	106	18 30	49	105	19 19	48	105	20 07	49	104	20 56	48	103	21 44	48	103	22 32	48	102	23 20	48	101	24 08	47	101	24 55	48	100	293
68	13 02	49	108	13 51	49	107	14 40	49	107	15 29	49	106	16 18	49	105	17 07	48	105	17 55	49	104	18 44	48	104	19 32	48	103	20 20	49	102	21 09	48	102	21 57	47	101	22 44	48	100	23 32	48	100	24 20	47	99	292
69	12 27	49	107	13 16	49	106	14 05	49	106	14 54	49	105	15 43	49	105	16 32	48	104	17 20	49	103	18 09	48	103	18 57	48	102	19 45	48	102	20 33	48	101	21 21	48	100	22 09	48	100	22 57	47	99	23 44	47	98	291
LHA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	11 53	+49	106	12 42	+48	106	13 30	+49	105	14 19	+49	104	15 08	+48	104	15 56	+49	103	16 45	+48	103	17 33	+49	102	18 22	+48	101	19 10	+48	101	19 58	+48	100	20 46	+47	99	21 33	+48	99	22 21	+47	98	23 08	+47	97	290
71	11 18	49	105	12 07	49	105	12 56	48	104	13 44	49	104	14 33	48	103	15 21	49	102	16 10	48	102	16 58	48	101	17 46	48	101	18 34	48	100	19 22	48	99	20 10	48	99	20 58	47	98	21 45	47	97	22 32	48	97	289
72	10 43	49	105	11 32	48	104	12 20	49	103	13 09	49	103	13 58	48	102	14 46	48	102	15 34	48	101	16 22	49	100	17 11	48	100	17 59	47	99	18 46	48	98	19 34	48	98	20 22	47	97	21 09	47	96	21 56	48	96	288
73	10 08	49	104	10 57	48	103	11 45	49	103	12 34	48	102	13 22	49	101	14 11	49	101	14 59	48	100	15 47	48	99	16 35	48	99	17 23	48	98	18 11	47	98	18 58	48	97	19 46	47	96	20 33	48	96	21 21	47	95	287
74	09 33	48	103	10 21	49	102	11 10	48	102	11 58	49	101	12 47	48	100	13 35	48	100	14 23	48	99	15 11	48	99	15 59	48	98	16 47	48	97	17 35	47	97	18 22	48	96	19 10	47	95	19 57	48	95	20 45	47	94	286
75	08 58	+48	102	09 46	+49	101	10 35	+48	101	11 23	+48	100	12 11	+48	100	12 59	+48	99	13 47	+49	98	14 36	+47	98	15 23	+48	97	16 11	+48	97	16 59	+48	96	17 47	+47	95	18 34	+47	95	19 21	+47	94	20 08	+48	93	285
76	08 22	49	101	09 11	48	101	09 59	48	100	10 47	49	99	11 36	48	99	12 24	48	98	13 12	48	98	14 00	48	97	14 48	47	96	15 35	48	96	16 23	48	95	17 11	47	94	17 58	47	94	18 45	47	93	19 32	47	93	284
77	07 47	48	100	08 35	48	100	09 23	49	99	10 12	48	99	11 00	48	98	11 48	48	97	12 36	48	97	13 24	48	96	14 12	47	96	14 59	48	95	15 47	48	94	16 35	47	94	17 22	47	93	18 09	47	92	18 56	47	92	283
78	07 11	49	100	08 00	48	99	08 48	48	98	09 36	48	98	10 24	48	97	11 12	48	97	12 00	48	96	12 48	48	95	13 36	47	95	14 23	48	94	15 11	47	94	15 58	48	93	16 46	47	92	17 33	47	92	18 20	47	91	282
79	06 36	48	99	07 24	48	98	08 12	48	98	09 00	48	97	09 48	48	96	10 36	48	96	11 24	48	95	12 12	48	95	13 00	47	94	13 47	48	93	14 35	47	93	15 22	48	92	16 10	47	91	16 57	47	91	17 44	47	90	281
80	06 00	+48	98	06 48	+48	97	07 36	+48	97	08 24	+48	96	09 12	+48	96	10 00	+48	95	10 48	+48	94	11 36	+48	94	12 24	+47	93	13 11	+48	93	13 59	+47	92	14 46	+48	91	15 34	+47	91	16 21	+47	90	17 08	+47	89	280
81	05 24	48	97	06 12	48	97	07 00	48	96	07 48	48	95	08 36	48	95	09 24	48	94	10 12	48	94	11 00	48	93	11 48	47	92	12 35	48	92	13 23	47	91	14 10	48	90	14 58	47	90	15 45	47	89	16 32	47	89	279
82	04 48	48	96	05 36	48	96	06 24	48	95	07 12	48	95	08 00	48	94	08 48	48	93	09 36	48	93	10 24	47	92	11 11	48	92	11 59	48	91	12 47	47	90	13 34	47	90	14 21	48	89	15 09	47	88	15 56	47	88	278
83	04 12	48	96	05 00	48	95	05 48	48	94	06 36	48	94	07 24	48	93	08 12	48	93	09 00	48	92	09 48	47	91	10 35	48	91	11 23	48	90	12 11	47	89	12 58	47	89	13 45	48	88	14 33	47	88	15 20	47	87	277
84	03 36	48	95	04 24	48	94	05 12	48	94	06 00	48	93	06 48	48	92	07 36	48	92	08 24	48	91	09 12	47	91	09 59	48	90	10 47	47	89	11 34	48	89	12 22	47	88	13 09	48	87	13 57	47	87	14 44	47	86	276
85	03 00	+48	94	03 48	+48	93	04 36	+48	93	05 24	+48	92	06 12	+48	92	07 00	+48	91	07 48	+47	90	08 35	+48	90	09 23	+48	89	10 11	+47	89	10 58	+48	88	11 46	+47	87	12 33	+48	87	13 21	+47	86	14 08	+47	85	275
86	02 24	48	93	03 12	48	93	04 00	48	92	04 48	48	91	05 36	48	91	06 24	48	90	07 12	47	90	07 59	48	89	08 47	48	88	09 35	47	88	10 22	48	87	11 10	47	86	11 57	48	86	12 45	47	85	13 32	47	85	274
87	01 48	48	92	02 36	48	92	03 24	48	91	04 12	48	91	05 00	48	90	05 48	48	89	06 36	47	89	07 23	48	88	08 11	48	88	08 59	47	87	09 46	48	86	10 34	47	86	11 21	48	85	12 09	47	84	12 56	47	84	273
88	01 12	48	92	02 00	48	91	02 48	48	90	03 36	48	90	04 24	48	89	05 12	47	89	05 59	48	88	06 47	48	87	07 35	48	87	08 23	47	86	09 10	48	86	09 58	47	85	10 45	48	84	11 33	47	84	12 20	47	83	272
89	00 36	48	91	01 24	48	90	02 12	48	90	03 00	48	89	03 48	48	88	04 36	47	88	05 23	48	87	06 11	48	87	06 59	48	86	07 47	47	85	08 34	48	85	09 22	47	84	10 09	48	83	10 57	47	83	11 44	47	82	271
90	00 00	+48	90	00 48	+48	89	01 36	+48	89	02 24	+48	88	03 12	+47	88	03 59	+48	87	04 47	+48	86	05 35	+48	86	06 23	+48	85	07 11	+47	85	07 58	+48	84	08 46	+47	83	09 33	+48	83	10 21	+47	82	11 08	+48	81	270
91	−0 36	48	89	00 12	48	89	01 00	48	88	01 48	48	87	02 36	47	87	03 23	48	86	04 11	48	86	04 59	48	85	05 47	48	84	06 35	47	84	07 22	48	83	08 10	48	83	08 58	47	82	09 45	48	81	10 33	47	81	269
92	−1 12	48	88	−0 24	48	88	00 24	48	87	01 12	48	87	02 00	47	86	02 47	48	85	03 35	48	85	04 23	48	84	05 11	48	84	05 59	48	83	06 47	47	82	07 34	48	82	08 22	48	81	09 10	47	81	09 57	48	80	268
93	−1 48	48	88	−1 00	48	87	−0 12	48	86	00 36	48	86	01 24	47	85	02 11	48	85	02 59	48	84	03 47	48	83	04 35	48	83	05 23	48	82	06 11	48	82	06 59	47	81	07 46	48	80	08 34	48	80	09 22	47	79	267
94	−2 24	48	87	−1 36	48	86	−0 48	48	86	00 00	48	85	00 48	48	84	01 36	47	84	02 23	48	83	03 11	48	83	03 59	48	82	04 47	48	81	05 35	48	81	06 23	48	80	07 11	48	80	07 59	47	79	08 46	48	78	266
95	−3 00	+48	86	−2 12	+48	85	−1 24	+48	85	−0 36	+48	84	00 12	+48	84	01 00	+48	83	01 48	+48	82	02 36	+48	82	03 24	+48	81	04 12	+48	81	05 00	+47	80	05 47	+48	79	06 35	+48	79	07 23	+48	78	08 11	+48	78	265
96	−3 36	48	85	−2 48	48	85	−2 00	48	84	−1 12	48	83	−0 24	48	83	00 24	48	82	01 12	48	82	02 00	48	81	02 48	48	80	03 36	48	80	04 24	48	79	05 12	48	79	06 00	48	78	06 48	48	77	07 36	47	77	264
97	−4 12	48	84	−3 24	48	84	−2 36	48	83	−1 48	48	83	−1 00	48	82	−0 12	48	81	00 36	48	81	01 24	48	80	02 12	49	80	03 01	48	79	03 49	48	78	04 37	48	78	05 25	48	77	06 13	48	77	07 01	47	76	263
98	−4 48	48	84	−4 00	48	83	−3 12	48	82	−2 24	48	82	−1 36	48	81	−0 48	49	81	00 01	48	80	00 49	48	79	01 37	48	79	02 25	48	78	03 13	48	78	04 01	49	77	04 50	48	76	05 38	48	76	06 26	48	75	262
99	−5 24	48	83	−4 36	48	82	−3 48	48	82	−3 00	49	81	−2 11	48	80	−1 23	48	80	−0 35	48	79	00 13	49	79	01 02	48	78	01 50	48	77	02 38	48	77	03 26	48	76	04 14	49	76	05 03	48	75	05 51	48	74	261
100	−6 00	+48	82	−5 12	+49	81	−4 23	+48	81	−3 35	+48	80	−2 47	+48	80	−1 59	+49	79	−1 10	+48	78	−0 22	+48	78	00 26	+49	77	01 15	+48	77	02 03	+48	76	02 51	+49	75	03 40	+48	75	04 28	+48	74	05 16	+48	74	260
			101	−5 47	48	81	−4 59	48	80	−4 11	49	79	−3 22	48	79	−2 34	48	78	−1 46	49	78	−0 57	48	77	−0 09	49	76	00 40	48	76	01 28	48	75	02 16	49	75	03 05	48	74	03 53	48	73	04 41	49	73	259
			102	−6 23	+48	80	−5 35	49	79	−4 46	48	79	−3 58	49	78	−3 09	48	77	−2 21	49	77	−1 32	48	76	−0 44	49	76	00 05	48	75	00 53	49	74	01 42	48	74	02 30	49	73	03 19	48	73	04 07	48	72	258
						103	−6 10	+48	78	−5 22	49	78	−4 33	48	77	−3 45	49	77	−2 56	49	76	−2 07	48	75	−1 19	49	75	−0 30	48	74	00 18	49	74	01 07	49	73	01 56	48	72	02 44	49	72	03 33	48	71	257
									104	−5 57	+49	77	−5 08	48	76	−4 20	49	76	−3 31	49	75	−2 42	48	75	−1 54	49	74	−1 05	49	73	−0 16	49	73	00 33	48	72	01 21	49	72	02 10	49	71	02 59	48	71	256
												105	−5 43	+48	76	−4 55	+49	75	−4 06	+49	74	−3 17	+49	74	−2 28	+49	73	−1 39	+48	73	−0 51	+49	72	−0 02	+49	71	00 47	+49	71	01 36	+49	70	02 25	+48	70	255
												106	−6 18	+49	75	−5 29	49	74	−4 40	48	74	−3 52	49	73	−3 03	49	72	−2 14	49	72	−1 25	49	71	−0 36	49	71	00 13	49	70	01 02	49	70	01 51	49	69	254
															107	−6 04	+49	73	−5 15	49	73	−4 26	49	72	−3 37	49	72	−2 48	49	71	−1 59	49	70	−1 10	49	70	−0 21	49	69	00 28	49	69	01 17	49	68	253
																		108	−5 49	+49	72	−5 00	49	71	−4 11	49	71	−3 22	49	70	−2 33	49	70	−1 44	49	69	−0 55	50	68	−0 05	49	68	00 44	49	67	252
																					109	−5 34	49	71	−4 45	49	70	−3 56	49	69	−3 07	50	69	−2 17	49	68	−1 28	49	68	−0 39	50	67	00 11	49	67	251
																					110	−6 08	+49	70	−5 19	+49	69	−4 30	+50	69	−3 40	+49	68	−2 51	+50	67	−2 01	+49	67	−1 12	+50	66	−0 22	+49	66	250
																								111	−5 53	+50	68	−5 03	49	68	−4 14	50	67	−3 24	50	67	−2 34	49	66	−1 45	50	66	−0 55	49	65	249
																											112	−5 37	50	67	−4 47	50	66	−3 57	50	66	−3 07	49	65	−2 18	50	65	−1 28	50	64	248
																											113	−6 10	+50	66	−5 20	50	66	−4 30	50	65	−3 40	50	64	−2 50	50	64	−2 00	50	63	247
																														114	−5 53	+50	65	−5 03	50	64	−4 13	51	64	−3 22	50	63	−2 32	50	63	246
																																	115	−5 35	+50	63	−4 45	+50	63	−3 55	+51	62	−3 04	+50	62	245
																																	116	−6 07	+50	63	−5 17	51	62	−4 26	50	61	−3 36	50	61	244
																																				117	−5 49	51	61	−4 58	51	61	−4 07	50	60	243
																																				118	−6 20	+51	60	−5 29	50	60	−4 39	51	59	242
																																							119	−6 00	+51	59	−5 09	51	58	241
																																									120	−5 40	+51	58	240
																																									121	−6 10	+51	57	239

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 53°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 53°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
99	−5 24	−48	83	−6 12	−48	83	261																																									
98	−4 48	48	84	−5 36	48	84	262																																								
97	−4 12	48	84	−5 00	48	85	−5 48	−48	86	263																																						
96	−3 36	48	85	−4 24	48	86	−5 12	48	86	−6 00	−48	87	264																																		
95	−3 00	−48	86	−3 48	−48	87	−4 36	−48	87	−5 24	−48	88	−6 12	−48	88	265																															
94	−2 24	48	87	−3 12	48	87	−4 00	48	88	−4 48	48	89	−5 36	48	89	266																															
93	−1 48	48	88	−2 36	48	88	−3 24	48	89	−4 12	48	89	−5 00	48	90	−5 48	−48	91	267																											
92	−1 12	48	88	−2 00	48	89	−2 48	48	90	−3 36	48	90	−4 24	48	91	−5 12	47	91	−5 59	−48	92	268																							
91	−0 36	48	89	−1 24	48	90	−2 12	48	90	−3 00	48	91	−3 48	48	92	−4 36	47	92	−5 23	48	93	−6 11	−48	93	269																			
90	00 00	−48	90	−0 48	−48	91	−1 36	−48	91	−2 24	−48	92	−3 12	−47	92	−3 59	−48	93	−4 47	−48	94	−5 35	−48	94	−6 23	−48	95	270																	
89	00 36	48	91	−0 12	48	91	−1 00	48	92	−1 48	48	93	−2 36	47	93	−3 23	48	94	−4 11	48	94	−4 59	48	95	−5 47	48	96	271																	
88	01 12	48	92	00 24	48	92	−0 24	48	93	−1 12	48	93	−2 00	47	94	−2 47	46	95	−3 35	48	95	−4 23	48	96	−5 11	48	96	−5 59	−48	97	272															
87	01 48	48	92	01 00	48	93	00 12	48	94	−0 36	48	94	−1 24	47	95	−2 11	48	95	−2 59	48	96	−3 47	48	97	−4 35	48	97	−5 23	48	98	−6 11	−48	98	273											
86	02 24	48	93	01 36	48	94	00 48	48	94	00 00	48	95	−0 48	48	96	−1 36	47	96	−2 23	48	97	−3 11	48	97	−3 59	48	98	−4 47	48	99	−5 35	48	99	274											
85	03 00	−48	94	02 12	−48	95	01 24	−48	95	00 36	−48	96	−0 12	−48	96	−1 00	−48	97	−1 48	−48	98	−2 36	−48	98	−3 24	−48	99	−4 12	−48	99	−5 00	−47	100	−5 47	−48	101	275								
84	03 36	48	95	02 48	48	95	02 00	48	96	01 12	48	97	00 24	48	97	−0 24	48	98	−1 12	48	98	−2 00	48	99	−2 48	48	100	−3 36	48	100	−4 24	48	101	−5 12	48	101	−6 00	−48	102	276					
83	04 12	48	96	03 24	48	96	02 36	48	97	01 48	48	97	01 00	48	98	00 12	48	99	−0 36	48	99	−1 24	48	100	−2 12	49	100	−3 01	48	101	−3 49	48	102	−4 37	48	102	−5 25	48	103	−6 13	−48	103	277			
82	04 48	48	96	04 00	48	97	03 12	48	98	02 24	48	98	01 36	48	99	00 48	49	99	−0 01	48	100	−0 49	48	101	−1 37	48	101	−2 25	48	102	−3 13	48	102	−4 01	49	103	−4 50	48	104	−5 38	48	104	278		
81	05 24	48	97	04 36	48	98	03 48	48	98	03 00	49	99	02 11	48	100	01 23	48	100	00 35	48	101	−0 13	49	101	−1 02	48	102	−1 50	48	103	−2 38	48	103	−3 26	48	104	−4 14	49	104	−5 03	48	105	−5 51	−48	106	279
80	06 00	−48	98	05 12	−49	99	04 23	−48	99	03 35	−48	100	02 47	−48	100	01 59	−49	101	01 10	−48	102	00 22	−48	102	−0 26	−49	103	−1 15	−48	103	−2 03	−48	104	−2 51	−49	105	−3 40	−48	105	−4 28	−48	106	−5 16	−48	106	280
79	06 36	49	99	05 47	48	99	04 59	48	100	04 11	49	101	03 22	48	101	02 34	48	102	01 46	49	102	00 57	48	103	00 09	49	104	−0 40	48	104	−1 28	48	105	−2 16	49	105	−3 05	48	106	−3 53	48	107	−4 41	49	107	281
78	07 11	48	100	06 23	48	100	05 35	49	101	04 46	48	101	03 58	49	102	03 09	48	103	02 21	49	103	01 32	48	104	00 44	49	104	−0 05	48	105	−0 53	49	106	−1 42	48	106	−2 30	49	107	−3 19	48	107	−4 07	48	108	282
77	07 47	49	100	06 58	48	101	06 10	48	102	05 22	49	102	04 33	48	103	03 45	49	103	02 56	49	104	02 07	48	105	01 19	49	105	00 30	48	106	−0 18	49	106	−1 07	49	107	−1 56	48	108	−2 44	49	108	−3 33	48	109	283
76	08 22	48	101	07 34	49	102	06 45	48	102	05 57	49	103	05 08	48	104	04 20	49	104	03 31	49	105	02 42	48	105	01 54	49	106	01 05	49	107	00 16	49	107	−0 33	48	108	−1 21	49	108	−2 10	49	109	−2 59	48	109	284
75	08 58	−49	102	08 09	−48	103	07 21	−49	103	06 32	−49	104	05 43	−48	104	04 55	−49	105	04 06	−49	106	03 17	−49	106	02 28	−49	107	01 39	−48	107	00 51	−49	108	00 02	−49	109	−0 47	−49	109	−1 36	−49	110	−2 25	−48	110	285
74	09 33	49	103	08 44	48	103	07 56	49	104	07 07	49	105	06 18	49	105	05 29	49	106	04 40	48	106	03 52	49	107	03 03	49	108	02 14	49	108	01 25	49	109	00 36	49	109	−0 13	49	110	−1 02	49	110	−1 51	49	111	286
73	10 08	49	104	09 19	48	104	08 31	49	105	07 42	49	105	06 53	49	106	06 04	49	107	05 15	49	107	04 26	49	108	03 37	49	108	02 48	49	109	01 59	49	110	01 10	49	110	00 21	49	111	−0 28	49	111	−1 17	49	112	287
72	10 43	49	105	09 54	49	105	09 05	49	106	08 16	48	106	07 28	50	107	06 38	49	107	05 49	49	108	05 00	49	109	04 11	49	109	03 22	49	110	02 33	49	110	01 44	49	111	00 55	50	112	00 05	49	112	−0 44	49	113	288
71	11 18	49	105	10 29	49	106	09 40	49	107	08 51	49	107	08 02	49	108	07 13	49	108	06 24	50	109	05 34	49	109	04 45	49	110	03 56	49	111	03 07	50	111	02 17	49	112	01 28	49	112	00 39	50	113	−0 11	49	113	289
70	11 53	−49	106	11 04	−49	107	10 15	−50	107	09 25	−49	108	08 36	−49	109	07 47	−49	109	06 58	−50	110	06 08	−49	110	05 19	−49	111	04 30	−50	111	03 40	−49	112	02 51	−50	113	02 01	−49	113	01 12	−50	114	00 22	−49	114	290
HA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 53°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	12 27	49	107	11 38	49	108	10 49	49	108	10 00	50	109	09 10	49	109	08 21	49	110	07 32	50	111	06 42	49	111	05 53	50	112	05 03	49	112	04 14	50	113	03 24	50	113	02 34	49	114	01 45	50	114	00 55	49	115	291
68	13 02	49	108	12 13	50	108	11 23	49	109	10 34	50	110	09 44	49	110	08 55	50	111	08 05	49	111	07 16	50	112	06 26	49	112	05 37	50	113	04 47	50	114	03 57	50	114	03 07	49	115	02 18	50	115	01 28	50	116	292
67	13 36	49	109	12 47	50	109	11 57	49	110	11 08	50	110	10 18	49	111	09 29	50	112	08 39	50	112	07 49	50	113	06 59	49	113	06 10	50	114	05 20	50	114	04 30	50	115	03 40	50	116	02 50	50	116	02 00	50	117	293
66	14 10	49	110	13 21	50	110	12 31	49	111	11 42	50	111	10 52	50	112	10 02	50	112	09 12	50	113	08 22	49	114	07 33	50	114	06 43	50	115	05 53	50	115	05 03	50	116	04 13	51	116	03 22	50	117	02 32	50	117	294
65	14 44	−50	110	13 54	−49	111	13 05	−50	112	12 15	−50	112	11 25	−50	113	10 35	−50	113	09 45	−50	114	08 55	−50	114	08 05	−50	115	07 15	−50	116	06 25	−50	116	05 35	−50	117	04 45	−50	117	03 55	−51	118	03 04	−50	118	295
64	15 18	50	111	14 28	50	112	13 38	50	112	12 48	50	113	11 58	50	114	11 08	50	114	10 18	50	115	09 28	50	115	08 38	50	116	07 48	51	116	06 57	50	117	06 07	50	117	05 17	51	118	04 26	50	119	03 36	50	119	296
63	15 51	50	112	15 01	49	113	14 12	50	113	13 22	51	114	12 31	50	114	11 41	50	115	10 51	50	116	10 01	51	116	09 10	50	117	08 20	50	117	07 30	51	118	06 39	50	118	05 49	51	119	04 58	51	119	04 07	50	120	297
62	16 25	50	113	15 35	50	114	14 45	51	114	13 54	50	115	13 04	50	115	12 14	51	116	11 23	50	116	10 33	50	117	09 43	51	117	08 52	51	118	08 01	50	119	07 11	51	119	06 20	51	120	05 29	50	120	04 39	51	121	298
61	16 58	50	114	16 08	51	114	15 17	50	115	14 27	50	116	13 37	51	116	12 46	50	117	11 56	51	117	11 05	51	118	10 14	50	118	09 24	51	119	08 33	51	119	07 42	51	120	06 51	51	120	06 00	51	121	05 09	51	122	299
60	17 31	−51	115	16 40	−50	115	15 50	−50	116	15 00	−51	116	14 09	−51	117	13 18	−50	118	12 28	−51	118	11 37	−51	119	10 46	−51	119	09 55	−51	120	09 04	−51	120	08 13	−51	121	07 22	−51	121	06 31	−51	122	05 40	−51	122	300
59	18 03	50	116	17 13	51	116	16 22	50	117	15 32	51	117	14 41	51	118	13 50	51	118	12 59	51	119	12 08	51	120	11 17	51	120	10 26	51	121	09 35	51	121	08 44	51	122	07 53	51	122	07 02	52	123	06 10	51	123	301
58	18 36	51	117	17 45	50	117	16 55	51	118	16 04	51	118	15 13	51	119	14 22	51	119	13 31	51	120	12 40	51	120	11 49	52	121	10 57	51	121	10 06	51	122	09 15	52	122	08 23	51	123	07 32	52	124	06 40	51	124	302
57	19 08	51	117	18 17	51	118	17 26	51	119	16 35	51	119	15 44	51	120	14 53	51	120	14 02	51	121	13 11	52	121	12 19	51	122	11 28	51	122	10 37	52	123	09 45	52	123	08 53	51	124	08 02	52	124	07 10	51	125	303
56	19 40	51	118	18 49	51	119	17 58	51	119	17 07	51	120	16 16	52	121	15 24	51	121	14 33	52	122	13 41	51	122	12 50	52	123	11 58	51	123	11 07	52	124	10 15	52	124	09 23	51	125	08 32	52	125	07 40	52	126	304
55	20 12	−52	119	19 20	−51	120	18 29	−51	120	17 38	−51	121	16 47	−52	121	15 55	−51	122	15 04	−52	122	14 12	−52	123	13 20	−52	124	12 28	−51	124	11 37	−52	125	10 45	−52	125	09 53	−52	126	09 01	−52	126	08 09	−52	127	305
54	20 43	51	120	19 52	52	121	19 00	51	121	18 09	52	122	17 17	51	122	16 26	52	123	15 34	52	123	14 42	52	124	13 50	52	124	12 58	52	125	12 06	52	125	11 14	52	126	10 22	52	126	09 30	52	127	08 38	53	127	306
53	21 14	51	121	20 23	52	122	19 31	52	122	18 39	51	123	17 48	52	123	16 56	52	124	16 04	52	124	15 12	52	125	14 20	52	125	13 28	53	126	12 35	52	126	11 43	52	127	10 51	52	127	09 59	53	128	09 06	52	128	307
52	21 45	52	122	20 53	52	123	20 01	51	123	19 10	52	124	18 18	52	124	17 26	52	125	16 34	53	125	15 41	52	126	14 49	52	126	13 57	53	127	13 04	52	127	12 12	53	128	11 19	52	128	10 27	53	129	09 34	52	129	308
51	22 15	52	123	21 23	51	123	20 32	52	124	19 40	53	125	18 47	52	125	17 55	52	126	17 03	52	126	16 11	53	127	15 18	52	127	14 26	53	128	13 33	53	128	12 40	52	129	11 48	53	129	10 55	53	130	10 02	53	130	309
50	22 45	−52	124	21 53	−52	124	21 01	−52	125	20 09	−52	125	19 17	−53	126	18 24	−52	126	17 32	−53	127	16 39	−52	127	15 47	−53	128	14 54	−53	128	14 01	−53	129	13 08	−52	129	12 16	−53	130	11 23	−53	130	10 30	−53	131	310
49	23 15	52	125	22 23	52	125	21 31	53	126	20 38	52	126	19 46	53	127	18 53	52	127	18 01	53	128	17 08	53	128	16 15	53	129	15 22	53	129	14 29	53	130	13 36	53	130	12 43	53	131	11 50	53	131	10 57	53	132	311
48	23 45	53	126	22 52	52	126	22 00	53	127	21 07	52	127	20 15	53	128	19 22	53	128	18 29	53	129	17 36	53	129	16 43	53	130	15 50	53	130	14 57	54	131	14 03	53	131	13 10	53	132	12 17	53	132	11 24	54	133	312
47	24 14	53	127	23 21	52	127	22 29	53	128	21 36	53	128	20 43	53	129	19 50	53	129	18 57	53	130	18 04	53	130	17 11	54	131	16 17	53	131	15 24	54	132	14 30	53	132	13 37	54	133	12 43	53	133	11 50	54	134	313
46	24 43	53	128	23 50	53	128	22 57	53	129	22 04	53	129	21 11	53	130	20 18	54	130	19 24	53	131	18 31	53	131	17 38	54	132	16 44	53	132	15 51	54	133	14 57	54	133	14 03	53	134	13 10	54	134	12 16	54	134	314
45	25 11	−53	129	24 18	−53	129	23 25	−53	130	22 32	−53	130	21 39	−54	131	20 45	−53	131	19 52	−54	132	18 58	−54	132	18 04	−53	133	17 11	−54	133	16 17	−54	133	15 23	−54	134	14 29	−54	134	13 35	−54	135	12 41	−54	135	315
44	25 39	53	130	24 46	53	130	23 53	54	131	22 59	53	131	22 06	54	132	21 12	54	132	20 18	53	133	19 25	54	133	18 31	54	133	17 37	54	134	16 43	54	134	15 49	54	135	14 55	54	135	14 01	54	136	13 07	55	136	316
43	26 07	54	131	25 13	53	131	24 20	54	132	23 26	53	132	22 33	54	133	21 39	54	133	20 45	54	134	19 51	54	134	18 57	54	134	18 03	54	135	17 09	55	135	16 14	54	136	15 20	54	136	14 26	55	137	13 31	54	137	317
42	26 34	54	132	25 40	53	132	24 47	54	133	23 53	54	133	22 59	54	134	22 05	54	134	21 11	54	134	20 17	55	135	19 22	54	135	18 28	54	136	17 34	55	136	16 39	54	137	15 45	55	137	14 50	54	138	13 56	55	138	318
41	27 01	54	133	26 07	54	133	25 13	54	134	24 19	54	134	23 25	54	135	22 31	55	135	21 36	54	135	20 42	54	136	19 48	55	136	18 53	54	137	17 59	55	137	17 04	55	138	16 09	54	138	15 15	55	139	14 20	55	139	319
40	27 27	−54	134	26 33	−54	134	25 39	−54	135	24 45	−55	135	23 50	−54	135	22 56	−54	136	22 02	−55	136	21 07	−55	137	20 12	−54	137	19 18	−55	138	18 23	−55	138	17 28	−55	139	16 33	−56	139	15 38	−55	139	14 43	−55	140	320
39	27 53	54	135	26 59	55	135	26 04	54	136	25 10	55	136	24 15	54	136	23 21	55	137	22 26	55	137	21 31	54	138	20 37	55	138	19 42	55	139	18 47	55	139	17 52	55	140	16 57	55	140	16 02	56	140	15 06	55	141	321
38	28 19	55	136	27 24	54	136	26 30	55	137	25 35	55	137	24 40	55	137	23 45	55	138	22 50	55	138	21 55	55	139	21 00	55	139	20 05	55	140	19 10	55	140	18 15	55	140	17 20	56	141	16 24	55	141	15 29	55	142	322
37	28 44	55	137	27 49	55	137	26 54	55	138	25 59	55	138	25 04	55	138	24 09	55	139	23 14	55	139	22 19	55	140	21 24	56	140	20 28	55	141	19 33	55	141	18 38	56	141	17 42	55	142	16 47	56	142	15 51	56	143	323
36	29 08	55	138	28 13	55	138	27 18	55	139	26 23	55	139	25 28	55	139	24 33	56	140	23 37	55	140	22 42	55	141	21 47	56	141	20 51	55	142	19 56	56	142	19 00	56	142	18 04	55	143	17 09	56	143	16 13	56	144	324
35	29 32	−55	139	28 37	−55	139	27 42	−55	140	26 47	−56	140	25 51	−55	141	24 56	−56	141	24 00	−55	141	23 05	−56	142	22 09	−56	142	21 13	−55	143	20 18	−56	143	19 22	−56	143	18 26	−56	144	17 30	−56	144	16 34	−56	145	325
34	29 56	56	140	29 00	55	140	28 05	56	141	27 09	55	141	26 14	56	142	25 18	55	142	24 23	56	142	23 27	56	143	22 31	56	143	21 35	56	144	20 39	56	144	19 43	56	144	18 47	56	145	17 51	56	145	16 55	56	145	326
33	30 19	56	141	29 23	55	141	28 28	56	142	27 32	56	142	26 36	56	143	25 40	56	143	24 44	56	143	23 48	56	144	22 52	56	144	21 56	56	145	21 00	56	145	20 04	56	145	19 08	57	146	18 11	56	146	17 15	56	146	327
32	30 41	55	142	29 46	56	142	28 50	56	143	27 54	56	143	26 58	56	144	26 02	56	144	25 06	57	144	24 09	56	145	23 13	56	145	22 17	56	146	21 21	57	146	20 24	56	146	19 28	57	147	18 31	56	147	17 35	57	147	328
31	31 03	56	143	30 07	56	143	29 11	56	144	28 15	56	144	27 19	56	145	26 23	57	145	25 26	56	145	24 30	56	146	23 34	57	146	22 37	57	147	21 40	56	147	20 44	57	147	19 47	56	148	18 51	57	148	17 54	57	148	329
30	31 25	−56	144	30 29	−57	145	29 32	−56	145	28 36	−56	145	27 40	−57	146	26 43	−56	146	25 47	−57	146	24 50	−57	147	23 53	−56	147	22 57	−57	148	22 00	−57	148	21 03	−57	148	20 06	−57	149	19 09	−56	149	18 13	−57	149	330
29	31 46	57	145	30 49	56	146	29 53	57	146	28 56	56	146	28 00	57	147	27 03	57	147	26 06	57	148	25 09	56	148	24 13	57	148	23 16	57	149	22 19	57	149	21 22	57	149	20 25	57	150	19 28	57	150	18 31	57	150	331
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N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
0	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	64 00	+60	180	65 00	+60	180	66 00	+60	180	360
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38	41 40	52	127	42 32	52	127	43 24	51	126	44 15	51	125	45 06	51	124	45 57	51	124	46 48	50	123	47 38	50	122	48 28	50	121	49 18	49	120	50 07	49	120	50 56	48	119	51 44	48	118	52 32	47	117	53 19	47	116	322
39	41 11	52	126	42 03	51	125	42 54	51	125	43 45	51	124	44 36	51	123	45 27	50	123	46 17	50	122	47 07	50	121	47 57	49	120	48 46	49	119	49 35	49	118	50 24	48	117	51 12	47	117	51 59	47	116	52 46	47	115	321
40	40 42	+51	125	41 33	+51	124	42 24	+51	124	43 15	+51	123	44 06	+50	122	44 56	+50	121	45 46	+50	121	46 36	+50	120	47 26	+49	119	48 15	+48	118	49 03	+49	117	49 52	+47	116	50 39	+48	115	51 27	+46	114	52 13	+47	113	320
41	40 12	51	124	41 03	51	123	41 54	51	123	42 45	50	122	43 35	50	121	44 25	50	120	45 15	50	120	46 05	49	119	46 54	49	118	47 43	48	117	48 31	48	116	49 19	48	115	50 07	47	114	50 54	46	113	51 40	46	112	319
42	39 42	51	123	40 33	50	122	41 23	51	121	42 14	50	121	43 04	50	120	43 54	50	119	44 44	49	118	45 33	49	118	46 22	48	117	47 10	48	116	47 58	48	115	48 46	47	114	49 33	47	113	50 20	47	112	51 07	45	111	318
43	39 11	51	122	40 02	50	121	40 52	51	120	41 43	50	120	42 33	49	119	43 22	50	118	44 12	49	117	45 01	48	117	45 49	49	116	46 38	48	115	47 26	47	114	48 13	47	113	49 00	47	112	49 47	46	111	50 33	45	110	317
44	38 40	51	121	39 31	50	120	40 21	50	119	41 11	50	119	42 01	49	118	42 50	50	117	43 40	48	116	44 28	49	116	45 17	48	115	46 05	48	114	46 53	47	113	47 40	47	112	48 27	46	111	49 13	46	110	49 59	45	109	316
45	38 09	+50	120	38 59	+51	119	39 50	+49	118	40 39	+50	118	41 29	+49	117	42 18	+49	116	43 07	+49	115	43 56	+48	114	44 44	+48	114	45 32	+47	113	46 19	+47	112	47 06	+47	111	47 53	+46	110	48 39	+46	109	49 25	+45	108	315
46	37 38	50	119	38 28	50	118	39 18	49	117	40 07	49	117	40 56	50	116	41 46	48	115	42 34	49	114	43 23	48	113	44 11	47	113	44 58	48	112	45 46	46	111	46 32	47	110	47 19	46	109	48 05	45	108	48 50	45	107	314
47	37 06	50	118	37 56	49	117	38 45	50	116	39 35	49	116	40 24	49	115	41 13	48	114	42 01	48	113	42 49	48	112	43 37	48	112	44 25	47	111	45 12	46	110	45 58	47	109	46 45	45	108	47 30	46	107	48 16	44	106	313
48	36 34	49	117	37 23	50	116	38 13	49	115	39 02	49	115	39 51	49	114	40 40	48	113	41 28	48	112	42 16	47	111	43 03	48	111	43 51	47	110	44 38	46	109	45 24	46	108	46 10	46	107	46 56	45	106	47 41	44	105	312
49	36 01	50	116	36 51	49	115	37 40	49	114	38 29	49	114	39 18	48	113	40 06	48	112	40 54	48	111	41 42	48	110	42 30	47	110	43 17	46	109	44 03	47	108	44 50	45	107	45 35	46	106	46 21	45	105	47 06	44	104	311
50	35 29	+49	115	36 18	+49	114	37 07	+49	113	37 56	+48	113	38 44	+49	112	39 33	+48	111	40 21	+47	110	41 08	+47	109	41 55	+47	109	42 42	+47	108	43 29	+46	107	44 15	+46	106	45 01	+45	105	45 46	+45	104	46 31	+44	103	310
51	34 56	49	114	35 45	49	113	36 34	48	112	37 22	49	112	38 11	48	111	38 59	48	110	39 47	47	109	40 34	47	108	41 21	47	108	42 08	46	107	42 54	46	106	43 40	46	105	44 26	45	104	45 11	45	103	45 56	44	102	309
52	34 22	49	113	35 11	49	112	36 00	49	111	36 49	48	111	37 37	48	110	38 25	47	109	39 12	48	108	40 00	47	108	40 47	46	107	41 33	46	106	42 19	46	105	43 05	46	104	43 51	45	103	44 36	44	102	45 20	44	101	308
53	33 49	49	112	34 38	48	111	35 26	49	110	36 15	48	110	37 03	48	109	37 51	47	108	38 38	47	107	39 25	47	107	40 12	46	106	40 58	46	105	41 44	46	104	42 30	45	103	43 15	45	102	44 00	45	101	44 45	44	100	307
54	33 15	49	111	34 04	48	110	34 52	49	109	35 41	48	109	36 29	47	108	37 16	47	107	38 03	47	106	38 50	47	106	39 37	46	105	40 23	46	104	41 09	46	103	41 55	45	102	42 40	45	101	43 25	44	100	44 09	44	100	306
55	32 42	+48	110	33 30	+48	109	34 18	+48	109	35 06	+48	108	35 54	+48	107	36 42	+47	106	37 29	+47	105	38 16	+46	105	39 02	+46	104	39 48	+46	103	40 34	+46	102	41 20	+45	101	42 05	+44	100	42 49	+45	100	43 34	+43	99	305
56	32 07	49	109	32 56	48	108	33 44	48	108	34 32	47	107	35 19	48	106	36 07	47	105	36 54	47	105	37 41	46	104	38 27	46	103	39 13	46	102	39 59	45	101	40 44	45	100	41 29	45	100	42 14	44	99	42 58	43	98	304
57	31 33	48	108	32 21	48	107	33 09	48	107	33 57	48	106	34 45	47	105	35 32	47	104	36 19	46	104	37 05	47	103	37 52	46	102	38 38	45	101	39 23	46	100	40 09	44	100	40 53	45	99	41 38	44	98	42 22	44	97	303
58	30 59	48	107	31 47	48	106	32 35	47	106	33 22	48	105	34 10	47	104	34 57	47	104	35 44	46	103	36 30	46	102	37 16	46	101	38 02	46	100	38 48	45	100	39 33	45	99	40 18	44	98	41 02	44	97	41 46	44	96	302
59	30 24	48	106	31 12	48	106	32 00	47	105	32 47	48	104	33 35	47	103	34 22	46	103	35 08	47	102	35 55	46	101	36 41	46	100	37 27	45	99	38 12	45	99	38 57	45	98	39 42	44	97	40 26	44	96	41 10	44	95	301
60	29 50	+47	105	30 37	+48	105	31 25	+47	104	32 12	+48	103	33 00	+46	103	33 46	+47	102	34 33	+46	101	35 19	+46	100	36 05	+46	99	36 51	+45	99	37 36	+45	98	38 21	+45	97	39 06	+44	96	39 50	+44	95	40 34	+44	94	300
61	29 15	47	104	30 02	48	104	30 50	47	103	31 37	47	102	32 24	47	102	33 11	47	101	33 58	46	100	34 44	46	99	35 30	45	99	36 15	46	98	37 01	45	97	37 46	44	96	38 30	44	95	39 14	44	94	39 58	44	94	299
62	28 40	47	104	29 27	48	103	30 15	47	102	31 02	47	101	31 49	46	101	32 35	47	100	33 22	46	99	34 08	46	98	34 54	45	98	35 39	46	97	36 25	45	96	37 10	44	95	37 54	44	94	38 38	44	94	39 22	43	93	298
63	28 04	48	103	28 52	47	102	29 39	47	101	30 26	47	101	31 13	47	100	32 00	46	99	32 46	46	98	33 32	46	98	34 18	46	97	35 04	45	96	35 49	45	95	36 34	44	94	37 18	44	94	38 02	44	93	38 46	43	92	297
64	27 29	48	102	28 17	47	101	29 04	47	100	29 51	47	100	30 38	46	99	31 24	46	98	32 10	46	98	32 56	46	97	33 42	46	96	34 28	45	95	35 13	45	94	35 58	44	94	36 42	44	93	37 26	44	92	38 10	43	91	296
65	26 54	+47	101	27 41	+47	100	28 28	+47	100	29 15	+47	99	30 02	+46	98	30 48	+47	97	31 35	+46	97	32 21	+45	96	33 06	+46	95	33 52	+45	94	34 37	+45	94	35 22	+44	93	36 06	+44	92	36 50	+44	91	37 34	+43	90	295
66	26 18	48	100	27 06	47	99	27 53	47	99	28 40	46	98	29 26	47	97	30 13	46	97	30 59	46	96	31 45	45	95	32 30	46	94	33 16	45	94	34 01	44	93	34 45	45	92	35 30	44	91	36 14	44	90	36 58	43	89	294
67	25 43	47	99	26 30	47	99	27 17	47	98	28 04	46	97	28 50	47	96	29 37	46	96	30 23	46	95	31 09	45	94	31 54	46	94	32 40	45	93	33 25	44	92	34 09	45	91	34 54	44	90	35 38	44	90	36 22	43	89	293
68	25 07	47	98	25 54	47	98	26 41	47	97	27 28	46	96	28 14	47	96	29 01	46	95	29 47	46	94	30 33	45	93	31 18	46	93	32 04	45	92	32 49	44	91	33 33	45	90	34 18	44	90	35 02	43	89	35 45	44	88	292
69	24 31	47	98	25 18	47	97	26 05	47	96	26 52	46	96	27 38	47	95	28 25	46	94	29 11	46	93	29 57	45	93	30 42	45	92	31 27	45	91	32 12	45	90	32 57	45	90	33 42	44	89	34 26	43	88	35 09	44	87	291
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

Tilbage til Menuen

N. Lat. {LHA greater than 180° Zn = Z; LHA less than 180° Zn = 360° − Z}

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15°			16°			17°			18°			19°		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°
70	23 55	+47	97	24 42	+47	96	25 29	+47	95	26 16	+46	95	27 02	+47	94
71	23 20	47	96	24 07	46	95	24 53	47	95	25 40	46	94	26 26	47	93
72	22 44	47	95	23 31	46	94	24 17	47	94	25 04	46	93	25 50	47	92
73	22 08	47	94	22 55	46	94	23 41	47	93	24 28	46	92	25 14	46	92
74	21 32	46	94	22 18	47	93	23 05	47	92	23 52	46	91	24 38	46	91
75	20 56	+46	93	21 42	+47	92	22 29	+47	91	23 16	+46	91	24 02	+46	90
76	20 19	47	92	21 06	47	91	21 53	47	91	22 40	46	90	23 26	46	89
77	19 43	47	91	20 30	47	90	21 17	46	90	22 03	47	89	22 50	46	88
78	19 07	47	90	19 54	47	90	20 41	46	89	21 27	47	88	22 14	46	88
79	18 31	47	89	19 18	47	89	20 05	46	88	20 51	47	87	21 38	46	87
80	17 55	+47	89	18 42	+47	88	19 29	+46	87	20 15	+47	87	21 02	+46	86
81	17 19	47	88	18 06	47	87	18 53	46	87	19 39	47	86	20 26	46	85
82	16 43	47	87	17 30	47	86	18 17	46	86	19 03	47	85	19 50	46	84
83	16 07	47	86	16 54	47	86	17 41	46	85	18 27	47	84	19 14	46	84
84	15 31	47	86	16 18	47	85	17 05	46	84	17 51	47	84	18 38	46	83
85	14 55	+47	85	15 42	+47	84	16 29	+46	83	17 15	+47	83	18 02	+47	82
86	14 19	47	84	15 06	47	83	15 53	47	83	16 40	46	82	17 26	47	81
87	13 43	47	83	14 30	47	83	15 17	47	82	16 04	47	81	16 51	46	81
88	13 07	47	82	13 54	47	82	14 41	47	81	15 28	47	80	16 15	47	80
89	12 31	48	82	13 19	47	81	14 06	47	80	14 53	47	80	15 40	46	79
90	11 56	+47	81	12 43	+47	80	13 30	+47	80	14 17	+47	79	15 04	+47	78
91	11 20	47	80	12 07	48	79	12 55	47	79	13 42	47	78	14 29	47	78
92	10 45	47	79	11 32	47	79	12 19	48	78	13 07	47	77	13 54	47	77
93	10 09	48	79	10 57	47	78	11 44	47	77	12 31	46	77	13 19	47	76
94	09 34	47	78	10 21	48	77	11 09	47	76	11 56	48	76	12 44	47	75
95	08 59	+47	77	09 46	+48	76	10 34	+47	76	11 21	+48	75	12 09	+47	74
96	08 23	48	76	09 11	48	76	09 59	48	75	10 47	47	74	11 34	48	74
97	07 48	48	75	08 36	48	75	09 24	48	74	10 12	47	74	10 59	48	73
98	07 14	48	75	08 02	47	74	08 49	48	73	09 37	48	73	10 25	48	72
99	06 39	48	74	07 27	48	73	08 15	48	73	09 03	48	72	09 51	48	71
100	06 04	+48	73	06 52	+49	72	07 41	+48	72	08 29	+48	71	09 17	+48	71
101	05 30	48	72	06 18	48	72	07 06	48	71	07 54	49	70	08 43	48	70
102	04 55	49	71	05 44	48	71	06 32	49	70	07 21	48	70	08 09	48	69
103	04 21	49	71	05 10	48	70	05 58	49	70	06 47	48	69	07 35	48	68
104	03 47	49	70	04 36	49	69	05 25	48	69	06 13	49	68	07 02	48	68
105	03 13	+49	69	04 02	+49	69	04 51	+49	68	05 40	+48	67	06 28	+49	67
106	02 40	49	68	03 29	49	68	04 18	48	67	05 06	49	67	05 55	49	66
107	02 06	49	68	02 55	49	67	03 44	49	66	04 33	49	66	05 22	49	65
108	01 33	49	67	02 22	49	66	03 11	50	66	04 01	49	65	04 50	49	64
109	01 00	49	66	01 49	50	65	02 39	49	65	03 28	49	64	04 17	49	64
110	00 27	+50	65	01 17	+49	65	02 06	+50	64	02 56	+49	63	03 45	+49	63
111	−0 06	50	64	00 44	50	64	01 34	49	63	02 23	50	63	03 13	50	62
112	−0 38	50	64	00 12	50	63	01 02	49	62	01 51	50	62	02 41	50	61
113	−1 10	50	63	−0 20	50	62	00 30	50	62	01 20	50	61	02 10	49	61
114	−1 42	50	62	−0 52	50	61	−0 02	50	61	00 48	50	60	01 38	50	60
115	−2 14	+50	61	−1 24	+51	61	−0 33	+50	60	00 17	+50	60	01 07	+50	59
116	−2 46	51	60	−1 55	50	60	−1 05	51	59	−0 14	50	59	00 36	51	58
117	−3 17	51	60	−2 26	50	59	−1 36	51	58	−0 45	51	58	00 06	50	57
118	−3 48	51	59	−2 57	51	58	−2 06	51	58	−1 15	50	57	−0 25	51	57
119	−4 18	50	58	−3 28	51	57	−2 37	51	57	−1 46	51	56	−0 55	51	56
120	−4 49	+51	57	−3 58	+51	57	−3 07	+52	56	−2 15	+51	56	−1 24	+51	55
121	−5 19	51	56	−4 28	52	56	−3 36	51	55	−2 45	51	55	−1 54	52	54
122	−5 49	52	55	−4 57	51	55	−4 06	52	54	−3 14	51	54	−2 23	52	53
123	−6 19	+52	55	−5 27	52	54	−4 35	52	54	−3 43	51	53	−2 52	52	53
124				−5 56	+52	53	−5 04	52	53	−4 12	52	52	−3 20	52	52
125							−5 33	+53	52	−4 40	+52	51	−3 48	+52	51
126							−6 01	+52	51	−5 09	53	51	−4 16	52	50
127										−5 36	52	50	−4 44	53	49
128										−6 04	+53	49	−5 11	53	48
129													−5 38	53	48
130													−6 04	+53	47
	15°			16°			17°			18°			19°		

HA	20°			21°			22°			23°			24°		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°
70	27 49	+46	93	28 35	+46	93	29 21	+45	92	30 06	+45	91	30 51	+45	90
71	27 13	46	92	27 59	45	92	28 44	46	91	29 30	45	90	30 15	45	90
72	26 37	46	92	27 23	45	91	28 08	46	90	28 54	45	89	29 39	45	89
73	26 00	46	91	26 46	46	90	27 32	46	89	28 18	45	89	29 03	45	88
74	25 24	46	90	26 10	46	89	26 56	46	89	27 42	45	88	28 27	45	87
75	24 48	+46	89	25 34	+46	89	26 20	+46	88	27 06	+45	87	27 51	+45	86
76	24 12	46	88	24 58	46	88	25 44	46	87	26 30	45	86	27 15	45	86
77	23 36	46	88	24 22	46	87	25 08	45	86	25 53	46	86	26 39	45	85
78	23 00	46	87	23 46	46	86	24 32	46	85	25 18	45	85	26 03	45	84
79	22 24	46	86	23 10	46	85	23 56	46	85	24 42	45	84	25 27	45	83
80	21 48	+46	85	22 34	+46	85	23 20	+46	84	24 06	+45	83	24 51	+46	83
81	21 12	46	85	21 58	46	84	22 44	46	83	23 30	45	82	24 15	46	82
82	20 36	46	84	21 22	46	83	22 08	46	82	22 54	46	82	23 40	45	81
83	20 00	46	83	20 46	46	82	21 32	46	82	22 18	46	81	23 04	46	80
84	19 24	47	82	20 11	46	82	20 57	46	81	21 43	46	80	22 29	45	79
85	18 49	+46	81	19 35	+46	81	20 21	+46	80	21 07	+46	79	21 53	+46	79
86	18 13	46	81	18 59	47	80	19 46	46	79	20 32	46	79	21 18	46	78
87	17 37	47	80	18 24	46	79	19 10	46	79	19 56	46	78	20 42	46	77
88	17 02	46	79	17 48	47	79	18 35	46	78	19 21	46	77	20 07	46	76
89	16 26	47	78	17 13	47	78	18 00	46	77	18 46	46	76	19 32	46	76
90	15 51	+47	78	16 38	+46	77	17 24	+47	76	18 11	+46	76	18 57	+47	75
91	15 16	47	77	16 03	46	76	16 49	47	76	17 36	47	75	18 23	46	74
92	14 41	47	76	15 28	47	75	16 15	46	75	17 01	47	74	17 48	46	74
93	14 06	47	75	14 53	47	75	15 40	47	74	16 27	46	73	17 13	47	73
94	13 31	47	75	14 18	47	74	15 05	47	73	15 52	47	73	16 39	47	72
95	12 56	+47	74	13 43	+48	73	14 31	+47	73	15 18	+47	72	16 05	+46	71
96	12 22	47	73	13 09	47	72	13 56	47	72	14 43	47	71	15 30	47	71
97	11 47	48	72	12 35	47	72	13 22	47	71	14 09	47	70	14 56	48	70
98	11 13	47	72	12 00	48	71	12 48	47	70	13 35	48	70	14 23	47	69
99	10 39	47	71	11 26	48	70	12 14	48	70	13 02	47	69	13 49	47	68
100	10 05	+47	70	10 52	+48	69	11 40	+46	69	12 28	+48	68	13 16	+47	68
101	09 31	48	69	10 19	48	69	11 07	48	68	11 55	47	67	12 42	48	67
102	08 57	48	69	09 45	48	68	10 33	48	67	11 21	48	67	12 09	48	66
103	08 23	49	68	09 12	48	67	10 00	48	67	10 48	48	66	11 36	48	65
104	07 50	49	67	08 39	48	66	09 27	48	66	10 15	49	65	11 04	48	65
105	07 17	+49	66	08 06	+48	66	08 54	+49	65	09 43	+48	64	10 31	+48	64
106	06 44	49	65	07 33	49	65	08 22	48	64	09 10	49	64	09 59	48	63
107	06 11	49	65	07 00	49	64	07 49	49	64	08 38	49	63	09 27	48	62
108	05 39	49	64	06 28	49	63	07 17	49	63	08 06	49	62	08 55	49	62
109	05 06	50	63	05 56	49	63	06 45	49	62	07 34	49	61	08 23	49	61
110	04 34	+50	62	05 24	+49	62	06 13	+49	61	07 02	+50	61	07 52	+49	60
111	04 03	49	62	04 52	50	61	05 42	49	60	06 31	50	60	07 21	49	59
112	03 31	50	61	04 21	49	60	05 10	50	60	06 00	50	59	06 50	49	59
113	02 59	50	60	03 49	50	59	04 39	50	59	05 29	50	58	06 19	50	58
114	02 28	50	59	03 18	50	59	04 08	51	58	04 59	50	58	05 49	50	57
115	01 57	+51	58	02 48	+50	58	03 38	+50	57	04 28	+50	57	05 18	+51	56
116	01 27	50	58	02 17	51	57	03 08	50	57	03 58	51	56	04 49	50	55
117	00 56	51	57	01 47	51	56	02 38	50	56	03 28	51	55	04 19	50	55
118	00 26	51	56	01 17	51	56	02 08	51	55	02 59	51	54	03 50	50	54
119	−0 04	52	55	00 48	51	55	01 39	51	54	02 30	51	54	03 21	50	53
120	−0 33	+51	54	00 18	+51	54	01 09	+52	53	02 01	+51	53	02 52	+51	52
121	−1 02	51	54	−0 11	52	53	00 41	51	53	01 32	51	52	02 23	52	52
122	−1 31	51	53	−0 40	52	52	00 12	52	52	01 04	51	51	01 55	52	51
123	−2 00	52	52	−1 08	52	52	−0 16	52	51	00 36	51	51	01 27	52	50
124	−2 28	52	51	−1 36	52	51	−0 44	52	50	00 08	52	50	01 00	52	49
125	−2 56	+52	50	−2 04	+52	50	−1 12	+52	49	−0 20	+53	49	00 33	+52	48
126	−3 24	53	50	−2 31	52	49	−1 39	52	49	−0 47	53	48	00 06	52	48
127	−3 51	52	49	−2 59	53	48	−2 06	53	48	−1 13	52	47	−0 21	53	47
128	−4 18	53	48	−3 25	52	47	−2 33	53	47	−1 40	53	47	−0 47	53	46
129	−4 45	53	47	−3 52	53	47	−2 59	53	46	−2 06	53	46	−1 13	53	45
130	−5 11	+53	46	−4 18	+53	46	−3 25	+54	45	−2 31	+53	45	−1 38	+53	44
131	−5 37	53	45	−4 44	54	45	−3 50	53	45	−2 57	54	44	−2 03	53	44
132	−6 03	+54	45	−5 09	54	44	−4 15	53	44	−3 22	54	43	−2 28	54	43
133				−5 34	54	43	−4 40	54	43	−3 46	54	42	−2 52	53	42
134				−5 58	+54	42	−5 04	54	42	−4 10	54	42	−3 16	54	41
135							−5 28	+54	41	−4 34	+54	41	−3 40	+54	40
136							−5 52	54	40	−4 58	55	40	−4 03	54	40
137							−6 15	+54	40	−5 21	55	39	−4 26	55	39
138										−5 43	55	38	−4 48	55	38
139										−6 05	+55	37	−5 10	55	37
	20°			21°			22°			23°			24°		

HA	25°			26°			27°			28°			29°			
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	31 36	+45	90	32 21	+44	89	33 05	+45	88	33 50	+43	87	34 33	+44	86	290
71	31 00	45	89	31 45	44	88	32 29	45	87	33 14	43	86	33 57	44	86	289
72	30 24	45	88	31 09	44	87	31 53	45	86	32 38	43	86	33 21	44	85	288
73	29 48	45	87	30 33	44	86	31 17	45	86	32 02	43	85	32 45	44	84	287
74	29 12	45	86	29 57	44	86	30 41	45	85	31 26	44	84	32 10	43	83	286
75	28 36	+45	86	29 21	+44	85	30 05	+45	84	30 50	+44	83	31 34	+43	83	285
76	28 00	45	85	28 45	44	84	29 29	45	83	30 14	44	83	30 58	44	82	284
77	27 24	45	84	28 09	45	83	28 54	44	83	29 38	44	82	30 22	44	81	283
78	26 48	45	83	27 33	45	83	28 18	44	82	29 02	45	81	29 47	44	80	282
79	26 12	45	83	26 57	45	82	27 42	45	81	28 27	44	80	29 11	44	80	281
80	25 37	+45	82	26 22	+45	81	27 07	+44	80	27 51	+45	80	28 36	+44	79	280
81	25 01	45	81	25 46	45	80	26 31	45	80	27 16	44	79	28 00	44	78	279
82	24 25	45	80	25 10	46	80	25 56	44	79	26 40	45	78	27 25	44	77	278
83	23 50	45	80	24 35	45	79	25 20	45	78	26 05	45	77	26 50	44	77	277
84	23 14	46	79	24 00	45	78	24 45	45	77	25 30	45	77	26 15	44	76	276
85	22 39	+45	78	23 24	+46	77	24 10	+45	77	24 55	+45	76	25 40	+44	75	275
86	22 04	45	77	22 49	46	77	23 35	45	76	24 20	45	75	25 05	45	74	274
87	21 28	46	77	22 14	46	76	23 00	45	75	23 45	45	74	24 30	45	74	273
88	20 53	46	76	21 39	46	75	22 25	45	74	23 10	46	74	23 56	45	73	272
89	20 18	46	75	21 04	46	74	21 50	46	74	22 36	45	73	23 21	45	72	271
90	19 44	+46	74	20 30	+45	74	21 15	+46	73	22 01	+46	72	22 47	+45	72	270
91	19 09	46	74	19 55	46	73	20 41	46	72	21 27	46	72	22 13	45	71	269
92	18 34	47	73	19 21	46	72	20 07	46	71	20 53	46	71	21 39	45	70	268
93	18 00	46	72	18 46	47	71	19 33	46	71	20 19	46	70	21 05	45	69	267
94	17 26	46	71	18 12	47	71	18 59	46	70	19 45	46	69	20 31	46	69	266
95	16 51	+47	71	17 38	+47	70	18 25	+46	69	19 11	+46	69	19 57	+47	68	265
96	16 17	47	70	17 04	47	69	17 51	47	69	18 38	46	68	19 24	46	67	264
97	15 44	47	69	16 31	46	69	17 17	47	68	18 04	47	67	18 51	46	67	263
98	15 10	47	68	15 57	47	68	16 44	47	67	17 31	47	66	18 18	46	66	262
99	14 36	48	68	15 24	47	67	16 11	47	66	16 58	47	66	17 45	47	65	261
100	14 03	+48	67	14 51	+47	66	15 38	+47	66	16 25	+47	65	17 12	+47	64	260
101	13 30	48	66	14 18	47	66	15 05	48	65	15 53	47	64	16 40	47	64	259
102	12 57	48	65	13 45	48	65	14 33	47	64	15 20	46	64	16 08	47	63	258
103	12 24	48	65	13 12	46	64	14 00	48	63	14 48	46	63	15 36	47	62	257
104	11 52	48	64	12 40	48	63	13 28	48	63	14 16	48	62	15 04	47	62	256
105	11 19	+49	63	12 08	+48	63	12 56	+48	62	13 44	+48	61	14 32	+48	61	255
106	10 47	49	62	11 36	48	62	12 24	48	61	13 12	49	61	14 01	48	60	254
107	10 15	49	62	11 04	49	61	11 53	48	61	12 41	48	60	13 29	49	59	253
108	09 44	48	61	10 32	49	60	11 21	49	60	12 10	49	59	12 59	48	59	252
109	09 12	49	60	10 01	49	60	10 50	49	59	11 39	49	58	12 28	49	58	251
110	08 41	+49	59	09 30	+49	59	10 19	+49	58	11 08	+49	58	11 57	+49	57	250
111	08 10	49	59	08 59	50	58	09 49	49	58	10 38	49	57	11 27	49	56	249
112	07 39	50	58	08 29	49	57	09 18	50	57	10 08	49	56	10 57	50	56	248
113	07 09	50	57	07 59	49	57	08 48	50	56	09 38	50	56	10 28	49	55	247
114	06 39	49	56	07 28	50	56	08 18	50	55	09 08	50	55	09 58	50	54	246
115	06 09	+50	56	06 59	+50	55	07 49	+50	55	08 39	+50	54	09 29	+50	53	245
116	05 39	50	55	06 29	51	54	07 20	50	54	08 10	50	53	09 00	50	53	244
117	05 09	51	54	06 00	51	54	06 51	50	53	07 41	50	53	08 31	51	52	243
118	04 40	51	53	05 31	51	53	06 22	50	52	07 12	51	52	08 03	51	51	242
119	04 11	51	53	05 02	51	52	05 53	51	52	06 44	51	51	07 35	51	51	241
120	03 43	+51	52	04 34	+51	51	05 25	+51	51	06 16	+51	50	07 07	+51	50	240
121	03 15	51	51	04 06	51	51	04 57	52	50	05 49	51	50	06 40	51	49	239
122	02 47	51	50	03 38	52	50	04 30	51	49	05 21	52	49	06 13	51	48	238
123	02 19	52	50	03 11	52	49	04 03	51	49	04 54	52	48	05 46	52	47	237
124	01 52	52	49	02 44	52	48	03 36	52	48	04 28	52	47	05 20	52	47	236
125	01 25	+52	48	02 17	+52	47	03 09	+52	47	04 01	+53	46	04 54	+52	46	235
126	00 58	53	47	01 51	52	47	02 43	52	46	03 35	53	46	04 28	52	45	234
127	00 32	52	46	01 24	53	46	02 17	53	45	03 10	52	45	04 02	53	44	233
128	00 06	53	46	00 59	53	45	01 52	52	45	02 44	53	44	03 37	53	44	232
129	−0 20	53	45	00 33	53	44	01 26	53	44	02 19	53	43	03 12	53	43	231
130	−0 45	+53	44	00 08	+54	44	01 02	+53	43	01 55	+53	43	02 48	+53	42	230
131	−1 10	54	43	−0 16	53	43	00 37	54	42	01 31	53	42	02 24	53	41	229
132	−1 34	53	42	−0 41	54	42	00 13	54	41	01 07	53	41	02 00	54	41	228
133	−1 59	54	42	−1 05	54	41	−0 11	54	41	00 43	54	40	01 37	54	40	227
134	−2 22	54	41	−1 28	54	40	−0 34	54	40	00 20	54	39	01 14	54	39	226
135	−2 46	+55	40	−1 51	+54	39	−0 57	+54	39	−0 03	+55	39	00 52	+54	38	225
136	−3 09	55	39	−2 14	54	39	−1 20	55	38	−0 25	54	38	00 29	55	37	224
137	−3 31	55	38	−2 36	54	38	−1 42	55	37	−0 47	55	37	00 08	54	37	223
138	−3 53	55	37	−2 58	54	37	−2 04	55	37	−1 09	55	36	−0 14	55	36	222
139	−4 15	55	37	−3 20	55	36	−2 25	55	36	−1 30	55	35	−0 35	56	35	221
	25°			26°			27°			28°			29°			

LAT 53°

S. Lat. {LHA greater than 180° Zn = 180° − Z; LHA less than 180° Zn = 180° + Z}

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 53°

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 53°

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	140	−5 32	+56	36	−4 36	+55	36	−3 41	+55	35	−2 46	+56	35	−1 50	+55	35	−0 55	+55	34	220
																												141	−5 53	56	35	−4 57	55	35	−4 02	56	35	−3 06	55	34	−2 11	56	34	−1 15	55	33	219
																												142	−6 13	+55	34	−5 18	56	34	−4 22	56	34	−3 26	55	33	−2 31	56	33	−1 35	56	33	218
																															143	−5 38	56	33	−4 42	56	33	−3 46	56	33	−2 50	56	32	−1 54	56	32	217
																															144	−5 57	+56	32	−5 01	56	32	−4 05	56	32	−3 09	56	31	−2 13	56	31	216
																																		145	−5 20	+56	31	−4 24	+56	31	−3 28	+57	30	−2 31	+56	30	215
																																		146	−5 39	57	30	−4 42	56	30	−3 46	57	30	−2 49	56	29	214
																																		147	−5 57	+57	29	−5 00	57	29	−4 03	56	29	−3 07	57	28	213
																																					148	−5 17	57	28	−4 20	56	28	−3 24	57	28	212
																																					149	−5 34	57	27	−4 37	57	27	−3 40	57	27	211
																																					150	−5 51	+58	27	−4 53	+57	26	−3 56	+57	26	210
																																					151	−6 07	+58	26	−5 09	57	25	−4 12	58	25	209
																																								152	−5 24	57	25	−4 27	58	24	208
																																							153	−5 39	57	24	−4 42	58	23	207
																																							154	−5 54	58	23	−4 56	58	23	206
																																							155	−6 07	+58	22	−5 09	+58	22	205
																																										156	−5 22	58	21	204
																																										157	−5 35	58	20	203
																																										158	−5 47	58	19	202
																																										159	−5 59	+59	18	201
80	−6 04	−46	107	280																																											
79	−5 30	48	108	−6 18	−48	108	281																																							
78	−4 55	49	109	−5 44	48	109	282																																							
77	−4 21	49	109	−5 10	48	110	−5 58	−49	110	283																																				
76	−3 47	49	110	−4 36	49	111	−5 25	48	111	−6 13	−49	112	284																																	
75	−3 13	−49	111	−4 02	−49	111	−4 51	−49	112	−5 40	−48	113	285																																	
74	−2 40	49	112	−3 29	49	112	−4 18	48	113	−5 06	49	113	−5 55	−49	114	286																													
73	−2 06	49	112	−2 55	49	113	−3 44	49	114	−4 33	49	114	−5 22	49	115	−6 11	−49	115	287																											
72	−1 33	49	113	−2 22	49	114	−3 11	50	114	−4 01	49	115	−4 50	49	116	−5 39	49	116	288																											
71	−1 00	49	114	−1 49	50	115	−2 39	49	115	−3 28	49	116	−4 17	49	116	−5 06	50	117	−5 56	−49	117	289																							
70	−0 27	−50	115	−1 17	−49	115	−2 06	−50	116	−2 56	−49	117	−3 45	−49	117	−4 34	−50	118	−5 24	−49	118	−6 13	−49	119	290																					
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	00 06	50	116	−0 44	50	116	−1 34	49	117	−2 23	50	117	−3 13	50	118	−4 03	49	118	−4 52	50	119	−5 42	49	120	291																					69
68	00 38	50	116	−0 12	50	117	−1 02	49	118	−1 51	50	118	−2 41	50	119	−3 31	50	119	−4 21	49	120	−5 10	50	120	−6 00	−50	121	292																			68
67	01 10	50	117	00 20	50	118	−0 30	50	118	−1 20	50	119	−2 10	49	119	−2 59	50	120	−3 49	50	121	−4 39	50	121	−5 29	50	122	−6 19	−50	122	293																	67
66	01 42	50	118	00 52	50	119	00 02	50	119	−0 48	50	120	−1 38	50	120	−2 28	50	121	−3 18	50	121	−4 08	51	122	−4 59	50	123	−5 49	50	123	294																	66
65	02 14	−50	119	01 24	−51	119	00 33	−50	120	−0 17	−50	120	−1 07	−50	121	−1 57	−51	122	−2 48	−50	122	−3 38	−50	123	−4 28	−50	123	−5 18	−51	124	−6 09	−50	124	295															65
64	02 46	51	120	01 55	50	120	01 05	51	121	00 14	50	121	−0 36	51	122	−1 27	50	122	−2 17	51	123	−3 08	50	123	−3 58	51	124	−4 49	50	125	−5 39	50	125	296															64
63	03 17	51	120	02 26	50	121	01 36	51	122	00 45	51	122	−0 06	50	123	−0 56	51	123	−1 47	51	124	−2 38	50	124	−3 28	51	125	−4 19	50	125	−5 09	51	126	−6 00	−51	126	297											63
62	03 48	51	121	02 57	51	122	02 06	51	122	01 15	50	123	00 25	51	123	−0 26	51	124	−1 17	51	124	−2 08	51	125	−2 59	51	126	−3 50	50	126	−4 40	51	127	−5 31	51	127	298											62
61	04 18	50	122	03 28	51	123	02 37	51	123	01 46	51	124	00 55	51	124	00 04	52	125	−0 48	51	125	−1 39	51	126	−2 30	51	126	−3 21	50	127	−4 11	51	127	−5 02	51	128	−5 53	−51	128	299							61
60	04 49	−51	123	03 58	−51	123	03 07	−52	124	02 15	−51	124	01 24	−51	125	00 33	−51	126	−0 18	−51	126	−1 09	−52	127	−2 01	−51	127	−2 52	−51	128	−3 43	−51	128	−4 34	−51	129	−5 25	−51	129	−6 16	−51	130	300			60
59	05 19	51	124	04 28	52	124	03 36	51	125	02 45	51	125	01 54	52	126	01 02	51	126	00 11	52	127	−0 41	51	127	−1 32	51	128	−2 23	52	128	−3 15	51	129	−4 06	51	129	−4 57	52	130	−5 49	51	130	301			59
58	05 49	52	125	04 57	51	125	04 06	52	126	03 14	51	126	02 23	52	127	01 31	51	127	00 40	52	128	−0 12	52	128	−1 04	51	129	−1 55	52	129	−2 47	51	130	−3 38	52	130	−4 30	51	131	−5 21	52	131	−6 13	−51	132	302	58
57	06 19	52	125	05 27	52	126	04 35	52	126	03 43	51	127	02 52	52	127	02 00	52	128	01 08	52	128	00 16	52	129	−0 36	51	129	−1 27	52	130	−2 19	52	130	−3 11	52	131	−4 03	51	131	−4 54	52	132	−5 46	52	133	303	57
56	06 48	52	126	05 56	52	127	05 04	52	127	04 12	52	128	03 20	52	128	02 28	52	129	01 36	52	129	00 44	52	130	−0 08	52	130	−1 00	52	131	−1 52	52	131	−2 44	52	132	−3 36	52	132	−4 28	52	133	−5 20	52	133	304	56
55	07 17	−52	127	06 25	−52	128	05 33	−53	128	04 40	−52	129	03 48	−52	129	02 56	−52	130	02 04	−52	130	01 12	−52	131	00 20	−53	131	−0 33	−52	132	−1 25	−52	132	−2 17	−52	133	−3 09	−52	133	−4 01	−53	134	−4 54	−52	134	305	55
54	07 45	52	128	06 53	52	128	06 01	52	129	05 09	53	129	04 16	52	130	03 24	53	130	02 31	52	131	01 39	52	131	00 47	53	132	−0 06	52	132	−0 58	53	133	−1 51	52	133	−2 43	52	134	−3 35	53	134	−4 28	52	135	306	54
53	08 14	53	129	07 21	52	129	06 29	53	130	05 36	52	130	04 44	53	131	03 51	52	131	02 59	53	132	02 06	53	132	01 13	52	133	00 21	53	133	−0 32	52	134	−1 24	53	134	−2 17	53	135	−3 10	52	135	−4 02	53	136	307	53
52	08 42	53	130	07 49	53	130	06 56	52	131	06 04	53	131	05 11	53	132	04 18	53	132	03 25	52	133	02 33	53	133	01 40	53	133	00 47	53	134	−0 06	53	134	−0 59	53	135	−1 52	52	135	−2 44	53	136	−3 37	53	136	308	52
51	09 09	52	131	08 17	53	131	07 24	53	131	06 31	53	132	05 38	53	132	04 45	53	133	03 52	53	133	02 59	53	134	02 06	53	134	01 13	53	135	00 20	53	135	−0 33	53	136	−1 26	53	136	−2 19	53	137	−3 12	53	137	309	51
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HA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			HA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 54°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
0	36 00	+60	180	37 00	+60	180	38 00	+60	180	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	360
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23	32 45	58	152	33 43	58	152	34 41	57	152	35 38	58	151	36 36	57	151	37 33	58	151	38 31	57	150	39 28	57	150	40 25	57	149	41 22	57	149	42 19	57	149	43 16	57	148	44 13	57	148	45 10	57	147	46 07	56	147	337
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28	31 16	57	147	32 13	56	146	33 09	57	146	34 06	56	146	35 02	57	145	35 59	56	145	36 55	56	144	37 51	57	144	38 48	56	143	39 44	56	143	40 40	55	142	41 35	56	142	42 31	56	141	43 27	55	141	44 22	55	140	332
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36	28 24	55	138	29 19	55	138	30 14	55	137	31 09	55	137	32 04	54	136	32 58	55	136	33 53	54	135	34 47	55	135	35 42	54	134	36 36	54	134	37 30	54	133	38 24	54	133	39 18	53	132	40 11	54	131	41 05	53	131	324
37	28 00	55	137	28 55	55	137	29 50	54	136	30 44	55	136	31 39	54	135	32 33	55	135	33 28	54	134	34 22	54	134	35 16	54	133	36 10	54	133	37 04	54	132	37 58	53	131	38 51	54	131	39 45	53	130	40 38	53	130	323
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63	15 29	50	112	16 19	50	112	17 09	50	111	17 59	50	111	18 49	50	110	19 39	50	110	20 29	50	109	21 19	49	108	22 08	50	108	22 58	49	107	23 47	49	106	24 36	49	106	25 25	49	105	26 14	49	105	27 03	48	104	297
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66	13 50	50	110	14 40	50	109	15 30	50	109	16 20	49	108	17 09	50	107	17 59	49	107	18 48	50	106	19 38	49	106	20 27	49	105	21 16	49	104	22 05	49	104	22 54	48	103	23 42	49	103	24 31	48	102	25 19	48	101	294
67	13 17	49	109	14 06	50	108	14 56	50	108	15 46	49	107	16 35	50	107	17 25	49	106	18 14	50	105	19 04	49	105	19 53	49	104	20 42	49	104	21 31	48	103	22 19	49	102	23 08	48	102	23 56	49	101	24 45	48	100	293
68	12 43	50	108	13 33	50	108	14 23	49	107	15 12	50	106	16 02	49	106	16 51	49	105	17 40	49	105	18 29	49	104	19 18	49	103	20 07	49	103	20 56	49	102	21 45	48	102	22 33	49	101	23 22	48	100	24 10	48	100	292
69	12 10	49	107	12 59	50	107	13 49	49	106	14 38	50	106	15 28	49	105	16 17	49	104	17 06	49	104	17 55	49	103	18 44	49	103	19 33	49	102	20 22	48	101	21 10	49	101	21 59	48	100	22 47	48	99	23 35	48	99	291
HA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	11 36	+49	106	12 25	+50	106	13 15	+49	105	14 04	+49	105	14 53	+50	104	15 43	+49	103	16 32	+49	103	17 21	+49	102	18 10	+48	102	18 58	+49	101	19 47	+49	100	20 36	+48	100	21 24	+48	99	22 12	+48	99	23 00	+48	98	290
71	11 02	49	106	11 51	50	105	12 41	49	104	13 30	49	104	14 19	49	103	15 08	49	103	15 57	49	102	16 46	49	101	17 35	49	101	18 24	48	100	19 12	49	100	20 01	48	99	20 49	48	98	21 37	48	98	22 25	48	97	289
72	10 28	49	105	11 17	49	104	12 06	50	104	12 56	49	103	13 45	49	102	14 34	49	102	15 23	49	101	16 12	48	101	17 00	49	100	17 49	48	99	18 37	49	99	19 26	48	98	20 14	48	97	21 02	48	97	21 50	48	96	288
73	09 54	49	104	10 43	49	103	11 32	49	103	12 21	49	102	13 10	49	102	13 59	49	101	14 48	49	100	15 37	49	100	16 26	48	99	17 14	49	99	18 03	48	98	18 51	48	97	19 39	48	97	20 27	48	96	21 15	48	95	287
74	09 19	50	103	10 09	49	102	10 58	49	102	11 47	49	101	12 36	49	101	13 25	48	100	14 13	49	100	15 02	49	99	15 51	48	98	16 39	49	98	17 28	48	97	18 16	48	96	19 04	48	96	19 52	48	95	20 40	48	95	286
75	08 45	+49	102	09 34	+49	102	10 23	+49	101	11 12	+49	100	12 01	+49	100	12 50	+49	99	13 39	+48	99	14 27	+49	98	15 16	+48	97	16 04	+49	97	16 53	+48	96	17 41	+48	96	18 29	+48	95	19 17	+48	94	20 05	+48	94	285
76	08 11	49	101	09 00	48	101	09 48	49	100	10 37	49	100	11 26	49	99	12 15	49	98	13 04	48	98	13 52	49	97	14 41	48	97	15 29	48	96	16 17	49	95	17 06	48	95	17 54	48	94	18 42	48	94	19 30	47	93	284
77	07 36	49	101	08 25	49	100	09 14	49	99	10 03	48	99	10 51	49	98	11 40	49	98	12 29	48	97	13 17	49	96	14 06	48	96	14 54	48	95	15 42	49	95	16 31	48	94	17 19	48	93	18 07	47	93	18 54	48	92	283
78	07 01	49	100	07 50	49	99	08 39	49	99	09 28	48	98	10 16	49	97	11 05	49	97	11 54	48	96	12 42	49	96	13 31	48	95	14 19	48	94	15 07	48	94	15 55	48	93	16 43	48	93	17 31	48	92	18 19	48	91	282
79	06 26	49	99	07 15	49	98	08 04	49	98	08 53	48	97	09 41	49	97	10 30	49	96	11 19	48	95	12 07	48	95	12 55	49	94	13 44	48	94	14 32	48	93	15 20	48	92	16 08	48	92	16 56	48	91	17 44	48	90	281
80	05 51	+49	98	06 40	+49	98	07 29	+49	97	08 18	+48	96	09 06	+49	96	09 55	+48	95	10 43	+49	95	11 32	+48	94	12 20	+49	93	13 09	+48	93	13 57	+48	92	14 45	+48	92	15 33	+48	91	16 21	+48	90	17 09	+47	90	280
81	05 17	48	97	06 05	49	97	06 54	49	96	07 43	48	96	08 31	49	95	09 20	48	94	10 08	49	94	10 57	48	93	11 45	48	93	12 33	48	92	13 21	49	91	14 10	48	91	14 58	48	90	15 46	47	89	16 33	48	89	279
82	04 42	48	96	05 30	49	96	06 19	48	95	07 07	49	95	07 56	49	94	08 45	48	94	09 33	48	93	10 21	49	92	11 10	48	92	11 58	48	91	12 46	48	91	13 34	48	90	14 22	48	89	15 10	48	89	15 58	48	88	278
83	04 06	49	96	04 55	49	95	05 44	48	94	06 32	49	94	07 21	48	93	08 09	49	93	08 58	48	92	09 46	49	92	10 35	48	91	11 23	48	90	12 11	48	90	12 59	48	89	13 47	48	88	14 35	48	88	15 23	48	87	277
84	03 31	49	95	04 20	49	94	05 09	48	94	05 57	49	93	06 46	48	93	07 34	49	92	08 23	48	91	09 11	48	91	09 59	49	90	10 48	48	90	11 36	48	89	12 24	48	88	13 12	48	88	14 00	48	87	14 48	47	86	276
85	02 56	+49	94	03 45	+48	93	04 33	+49	93	05 22	+48	92	06 10	+49	92	06 59	+48	91	07 47	+49	91	08 36	+48	90	09 24	+48	89	10 12	+48	89	11 00	+49	88	11 49	+48	87	12 37	+48	87	13 25	+47	86	14 12	+48	86	275
86	02 21	49	93	03 10	48	93	03 58	49	92	04 47	48	91	05 35	49	91	06 24	48	90	07 12	48	90	08 00	49	89	08 49	48	88	09 37	48	88	10 25	48	87	11 13	48	87	12 01	48	86	12 49	48	85	13 37	48	85	274
87	01 46	48	92	02 34	49	92	03 23	48	91	04 11	49	91	05 00	48	90	05 48	49	89	06 37	48	89	07 25	48	88	08 13	49	88	09 02	48	87	09 50	48	86	10 38	48	86	11 26	48	85	12 14	48	85	13 02	48	84	273
88	01 11	48	92	01 59	49	91	02 48	48	90	03 36	49	90	04 25	48	89	05 13	49	89	06 02	48	88	06 50	48	87	07 38	49	87	08 27	48	86	09 15	48	86	10 03	48	85	10 51	48	84	11 39	48	84	12 27	48	83	272
89	00 35	49	91	01 24	48	90	02 12	49	90	03 01	48	89	03 49	49	88	04 38	48	88	05 26	49	87	06 15	48	87	07 03	48	86	07 51	49	85	08 40	48	85	09 28	48	84	10 16	48	84	11 04	48	83	11 52	48	82	271
90	00 00	+49	90	00 49	+48	89	01 37	+49	89	02 26	+48	88	03 14	+49	88	04 03	+48	87	04 51	+48	86	05 39	+49	86	06 28	+48	85	07 16	+49	85	08 05	+48	84	08 53	+48	83	09 41	+48	83	10 29	+48	82	11 17	+48	82	270
91	−0 35	48	89	00 13	49	89	01 02	48	88	01 50	49	87	02 39	48	87	03 27	49	86	04 16	48	86	05 04	49	85	05 53	48	84	06 41	48	84	07 29	49	83	08 18	48	83	09 06	48	82	09 54	48	81	10 42	48	81	269
92	−1 11	49	88	−0 22	49	88	00 27	48	87	01 15	49	87	02 04	48	86	02 52	49	85	03 41	48	85	04 29	49	84	05 18	48	84	06 06	49	83	06 55	48	82	07 43	48	82	08 31	48	81	09 19	49	81	10 08	48	80	268
93	−1 46	49	88	−0 57	48	87	−0 09	49	86	00 40	49	86	01 29	48	85	02 17	49	85	03 06	48	84	03 54	49	83	04 43	48	83	05 31	49	82	06 20	48	82	07 08	48	81	07 56	49	80	08 45	48	80	09 33	48	79	267
94	−2 21	49	87	−1 32	48	86	−0 44	49	86	00 05	48	85	00 53	49	84	01 42	49	84	02 31	48	83	03 19	49	83	04 08	48	82	04 56	49	81	05 45	48	81	06 33	49	80	07 22	48	80	08 10	48	79	08 58	49	78	266
95	−2 56	+48	86	−2 08	+49	85	−1 19	+49	85	−0 30	+48	84	00 18	+49	84	01 07	+49	83	01 56	+48	82	02 44	+49	82	03 33	+48	81	04 21	+49	81	05 10	+48	80	05 58	+49	79	06 47	+48	79	07 35	+49	78	08 24	+48	78	265
96	−3 31	48	85	−2 43	49	85	−1 54	49	84	−1 05	48	83	−0 17	49	83	00 32	49	82	01 21	48	82	02 09	49	81	02 58	49	80	03 47	48	80	04 35	49	79	05 24	48	79	06 12	49	78	07 01	48	78	07 49	49	77	264
97	−4 06	48	84	−3 18	49	84	−2 29	49	83	−1 40	48	83	−0 52	49	82	−0 03	49	81	00 46	49	81	01 35	48	80	02 23	49	80	03 12	49	79	04 01	48	78	04 49	49	78	05 38	49	77	06 27	48	77	07 15	49	76	263
98	−4 42	49	84	−3 53	49	83	−3 04	49	82	−2 15	48	82	−1 27	49	81	−0 38	49	81	00 11	49	80	01 00	49	79	01 49	48	79	02 37	49	78	03 26	49	78	04 15	49	77	05 04	48	77	05 52	49	76	06 41	48	75	262
99	−5 17	49	83	−4 28	49	82	−3 39	49	82	−2 50	49	81	−2 01	48	80	−1 13	49	80	−0 24	49	79	00 25	49	79	01 14	49	78	02 03	49	77	02 52	49	77	03 41	48	76	04 29	49	76	05 18	49	75	06 07	49	75	261
100	−5 51	+48	82	−5 03	+49	81	−4 14	+49	81	−3 25	+49	80	−2 36	+49	80	−1 47	+49	79	−0 58	+49	78	−0 09	+49	78	00 40	+49	77	01 29	+48	77	02 17	+49	76	03 06	+49	75	03 55	+49	75	04 44	+49	74	05 33	+49	74	260
			101	−5 38	49	80	−4 49	49	80	−4 00	49	79	−3 11	49	79	−2 22	49	78	−1 33	49	78	−0 44	49	77	00 05	49	76	01 43	49	75	02 32	49	75	03 21	49	74	04 10	49	74	04 59	49	73	259
			102	−6 12	+49	80	−5 23	49	79	−4 34	49	78	−3 45	49	78	−2 56	49	77	−2 07	49	77	−1 18	49	76	−0 29	49	76	00 20	49	75	01 09	49	74	01 58	49	74	02 47	49	73	03 36	49	73	04 25	49	72	258
						103	−5 58	+49	78	−5 09	49	78	−4 20	49	77	−3 31	50	77	−2 41	49	76	−1 52	49	75	−1 03	49	75	−0 14	49	74	00 35	49	74	01 24	50	73	02 14	49	73	03 03	49	72	03 52	49	71	257
									104	−5 43	49	77	−4 54	49	76	−4 05	49	76	−3 16	50	75	−2 26	49	75	−1 37	49	74	−0 48	50	73	00 02	49	73	00 51	49	72	01 40	49	72	02 29	50	71	03 19	49	71	256
									105	−6 17	+49	76	−5 28	+49	75	−4 39	+49	75	−3 50	+50	74	−3 00	+49	74	−2 11	+50	73	−1 21	+49	73	−0 32	+49	72	00 17	+50	71	01 07	+49	71	01 56	+49	70	02 45	+50	70	255
												106	−6 02	+49	75	−5 13	50	74	−4 23	49	73	−3 34	49	73	−2 45	50	72	−1 55	49	72	−1 06	50	71	−0 16	49	71	00 33	50	70	01 23	49	70	02 12	50	69	254
															107	−5 47	50	73	−4 57	49	73	−4 08	50	72	−3 18	50	72	−2 28	49	71	−1 39	50	70	−0 49	49	70	00 00	50	69	00 50	50	69	01 40	49	68	253
															108	−6 20	+49	72	−5 31	50	72	−4 41	50	71	−3 51	49	71	−3 02	50	70	−2 12	50	70	−1 22	49	69	−0 33	50	68	00 17	50	68	01 07	50	67	252
																		109	−6 04	+50	71	−5 14	49	70	−4 25	50	70	−3 35	50	69	−2 45	50	69	−1 55	50	68	−1 05	50	68	−0 15	50	67	00 35	49	67	251
																					110	−5 48	+50	70	−4 58	+50	69	−4 08	+50	69	−3 18	+50	68	−2 28	+50	67	−1 38	+50	67	−0 48	+50	66	00 02	+50	66	250
																					111	−6 21	+50	69	−5 31	51	68	−4 40	50	68	−3 50	50	67	−3 00	50	67	−2 10	50	66	−1 20	50	65	−0 30	50	65	249
																									−6 03	+50	67	−5 13	50	67	−4 23	50	66	−3 33	51	66	−2 42	50	65	−1 52	50	65	−1 02	51	64	248
																											113	−5 45	50	66	−4 55	50	65	−4 05	51	65	−3 14	50	64	−2 24	51	64	−1 33	50	63	247
																											114	−6 17	+50	65	−5 27	51	65	−4 36	50	64	−3 46	51	64	−2 55	50	63	−2 05	51	62	246
																																	115	−5 59	+51	64	−5 08	+51	63	−4 17	+50	63	−3 27	+51	62	−2 36	+51	62	245
																																			116	−5 39	50	62	−4 49	51	62	−3 58	51	61	−3 07	51	61	244
																																			117	−6 11	+51	62	−5 20	52	61	−4 28	51	61	−3 37	51	60	243
																																					118	−5 50	51	60	−4 59	51	60	−4 08	51	59	242
																																					119	−6 21	+52	59	−5 29	51	59	−4 38	51	58	241
																																								120	−5 59	+51	58	−5 08	+52	58	240
																																										121	−5 38	52	57	239
																																										122	−6 07	+52	56	238

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 54°

LAT 54°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 54°

LAT 54°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°
99	−5 17	−48	83	−6 05	−49	83	261																																								
98	−4 42	48	84	−5 30	49	84	−6 19	−48	85	262																																						
97	−4 06	49	84	−4 55	49	85	−5 44	48	86	263																																						
96	−3 31	49	85	−4 20	49	86	−5 09	48	86	−5 57	−49	87	264																																		
95	−2 56	−49	86	−3 45	−48	87	−4 33	−49	87	−5 22	−48	88	−6 10	−49	88	265																														
94	−2 21	49	87	−3 10	48	87	−3 58	49	88	−4 47	48	89	−5 35	49	89	266																														
93	−1 46	48	88	−2 34	49	88	−3 23	48	89	−4 11	49	89	−5 00	48	90	−5 48	−49	91	267																										
92	−1 11	48	88	−1 59	49	89	−2 48	48	90	−3 36	49	90	−4 25	48	91	−5 13	49	91	−6 02	−48	92	268																						
91	−0 35	49	89	−1 24	48	90	−2 12	49	90	−3 01	48	91	−3 49	49	92	−4 38	48	92	−5 26	49	93	−6 15	−48	93	269																		
90	00 00	−49	90	−0 49	−48	91	−1 37	−49	91	−2 26	−48	92	−3 14	−49	92	−4 03	−48	93	−4 51	−48	94	−5 39	−49	94	270																		
89	00 35	48	91	−0 13	49	91	−1 02	48	92	−1 50	49	93	−2 39	48	93	−3 27	49	94	−4 16	48	94	−5 04	49	95	−5 53	−48	96	271																
88	01 11	49	92	00 22	49	92	−0 27	48	93	−1 15	49	93	−2 04	48	94	−2 52	49	95	−3 41	48	95	−4 29	49	96	−5 18	48	96	−6 06	−49	97	272													
87	01 46	49	92	00 57	48	93	00 09	49	94	−0 40	49	94	−1 29	48	95	−2 17	49	95	−3 06	48	96	−3 54	49	97	−4 43	48	97	−5 31	49	98	−6 20	−48	98	273										
86	02 21	49	93	01 32	48	94	00 44	49	94	−0 05	48	95	−0 53	49	96	−1 42	49	96	−2 31	48	97	−3 19	49	97	−4 08	48	98	−4 56	49	99	−5 45	48	99	274										
85	02 56	−48	94	02 08	−49	95	01 19	−49	95	00 30	−48	96	−0 18	−49	96	−1 07	−49	97	−1 56	−48	98	−2 44	−49	98	−3 33	−48	99	−4 21	−49	99	−5 10	−48	100	−5 58	−49	101	275						
84	03 31	48	95	02 43	49	95	01 54	49	96	01 05	48	97	00 17	49	97	−0 32	49	98	−1 21	48	98	−2 09	49	99	−2 58	49	100	−3 47	48	100	−4 35	49	101	−5 24	48	101	−6 12	−49	102	276				
83	04 06	48	96	03 18	49	96	02 29	49	97	01 40	48	97	00 52	49	98	00 03	49	99	−0 46	49	99	−1 35	48	100	−2 23	49	100	−3 12	49	101	−4 01	48	102	−4 49	49	102	−5 38	49	103	277				
82	04 42	49	96	03 53	49	97	03 04	49	98	02 15	48	98	01 27	49	99	00 38	49	99	−0 11	49	100	−1 00	49	101	−1 49	48	101	−2 37	49	102	−3 26	49	102	−4 15	49	103	−5 04	48	103	−5 52	−49	104	278		
81	05 17	49	97	04 28	49	98	03 39	49	98	02 50	49	99	02 01	48	100	01 13	49	100	00 24	49	101	−0 25	49	101	−1 14	49	102	−2 03	49	103	−2 52	49	103	−3 41	48	104	−4 29	49	104	−5 18	49	105	−6 07	−49	105	279
80	05 51	−48	98	05 03	−49	99	04 14	−49	99	03 25	−49	100	02 36	−49	100	01 47	−49	101	00 58	−49	102	00 09	−49	102	−0 40	−49	103	−1 29	−48	103	−2 17	−49	104	−3 06	−49	105	−3 55	−49	105	−4 44	−49	106	−5 33	−49	106	280
79	06 26	48	99	05 38	49	100	04 49	49	100	04 00	49	101	03 11	49	101	02 22	49	102	01 33	49	102	00 44	49	103	−0 05	49	104	−0 54	49	104	−1 43	49	105	−2 32	49	105	−3 21	49	106	−4 10	49	106	−4 59	49	107	281
78	07 01	49	100	06 12	49	100	05 23	49	101	04 34	49	102	03 45	49	102	02 56	49	103	02 07	49	103	01 18	49	104	00 29	49	104	−0 20	49	105	−1 09	49	106	−1 58	49	106	−2 47	49	107	−3 36	49	107	−4 25	49	108	282
77	07 36	49	101	06 47	49	101	05 58	49	102	05 09	49	102	04 20	49	103	03 31	50	103	02 41	49	104	01 52	49	105	01 03	49	105	00 14	49	106	−0 35	49	106	−1 24	50	107	−2 14	49	107	−3 03	49	108	−3 52	49	109	283
76	08 11	50	101	07 21	49	102	06 32	49	103	05 43	49	103	04 54	49	104	04 05	49	104	03 16	50	105	02 26	49	105	01 37	49	106	00 48	50	107	−0 02	49	107	−0 51	49	108	−1 40	49	108	−2 29	50	109	−3 19	49	109	284
75	08 45	−49	102	07 56	−49	103	07 07	−50	103	06 17	−49	104	05 28	−49	105	04 39	−49	105	03 50	−50	106	03 00	−49	106	02 11	−50	107	01 21	−49	107	00 32	−49	108	−0 17	−50	109	−1 07	−49	109	−1 56	−49	110	−2 45	−50	110	285
74	09 19	49	103	08 30	49	104	07 41	49	104	06 52	50	105	06 02	49	105	05 13	50	106	04 23	49	107	03 34	49	107	02 45	50	108	01 55	49	108	01 06	50	109	00 16	49	109	−0 33	50	110	−1 23	49	110	−2 12	50	111	286
73	09 54	50	104	09 04	49	104	08 15	49	105	07 26	50	106	06 36	49	106	05 47	50	107	04 57	49	107	04 08	50	108	03 18	50	108	02 28	49	109	01 39	50	110	00 49	49	110	00 00	50	111	−0 50	50	111	−1 40	49	112	287
72	10 28	49	105	09 39	50	105	08 49	49	106	08 00	50	106	07 10	50	107	06 20	49	108	05 31	50	108	04 41	50	109	03 51	49	109	03 02	50	110	02 12	50	110	01 22	49	111	00 33	50	112	−0 17	50	112	−1 07	50	113	288
71	11 02	50	106	10 12	49	106	09 23	50	107	08 33	49	107	07 44	50	108	06 54	50	108	06 04	50	109	05 14	49	110	04 25	50	110	03 35	50	111	02 45	50	111	01 55	50	112	01 05	50	112	00 15	50	113	−0 35	49	113	289
70	11 36	−50	106	10 46	−49	107	09 57	−50	108	09 07	−50	108	08 17	−50	109	07 27	−50	109	06 37	−49	110	05 48	−50	110	04 58	−50	111	04 08	−50	111	03 18	−50	112	02 28	−50	113	01 38	−50	113	00 48	−50	114	−0 02	−50	114	290
HA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
60	12 10	50	107	11 20	50	108	10 30	50	108	09 40	50	109	08 50	49	110	08 01	50	110	07 11	50	111	06 21	50	111	05 31	51	112	04 40	50	112	03 50	50	113	03 00	50	113	02 10	50	114	01 20	50	115	00 30	50	115	291
59	12 43	50	108	11 53	49	109	11 04	50	109	10 14	50	110	09 24	50	110	08 34	51	111	07 43	50	111	06 53	50	112	06 03	50	113	05 13	50	113	04 23	50	114	03 33	51	114	02 42	50	115	01 52	50	115	01 02	51	116	292
58	13 17	50	109	12 27	50	110	11 37	50	110	10 47	50	111	09 57	51	111	09 06	50	112	08 16	50	112	07 26	50	113	06 36	51	113	05 45	50	114	04 55	50	115	04 05	51	115	03 14	50	116	02 24	51	116	01 33	50	117	293
57	13 50	50	110	13 00	50	110	12 10	50	111	11 20	51	112	10 29	50	112	09 39	50	113	08 49	51	113	07 58	50	114	07 08	51	114	06 17	50	115	05 27	51	115	04 36	50	116	03 46	51	116	02 55	50	117	02 05	51	118	294
56	14 23	−50	111	13 33	−50	111	12 43	−51	112	11 52	−50	112	11 02	−50	113	10 12	−51	113	09 21	−50	114	08 31	−51	115	07 40	−51	115	06 49	−50	116	05 59	−51	116	05 08	−51	117	04 17	−50	117	03 27	−51	118	02 36	−51	118	295
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HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (15°- 29°) SAME NAME AS LATITUDE

LAT 54°

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
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	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
70	23 48	+48	97	24 36	+47	97	25 23	+48	96	26 11	+47	95	26 58	+47	95	27 45	+47	94	28 32	+46	93	29 18	+47	92	30 05	+46	92	30 51	+45	91	31 36	+46	90	32 22	+45	89	33 07	+45	89	33 52	+45	88	34 37	+44	87	290
71	23 13	48	96	24 01	47	96	24 48	48	95	25 36	47	94	26 23	47	94	27 10	47	93	27 57	46	92	28 43	46	92	29 29	46	91	30 15	46	90	31 01	46	89	31 47	45	89	32 32	45	88	33 17	45	87	34 02	44	86	289
72	22 38	48	96	23 26	47	95	24 13	47	94	25 00	48	94	25 48	47	93	26 35	46	92	27 21	47	91	28 08	46	91	28 54	46	90	29 40	46	89	30 26	46	89	31 12	45	88	31 57	45	87	32 42	44	86	33 26	45	85	288
73	22 03	48	95	22 51	47	94	23 38	47	93	24 25	47	93	25 12	47	92	25 59	47	91	26 46	47	91	27 33	46	90	28 19	46	89	29 05	46	88	29 51	45	88	30 36	46	87	31 22	45	86	32 07	44	85	32 51	45	85	287
74	21 28	47	94	22 15	48	93	23 03	47	93	23 50	47	92	24 37	47	91	25 24	47	91	26 11	46	90	26 57	47	89	27 44	46	88	28 30	45	88	29 15	46	87	30 01	45	86	30 46	45	85	31 31	45	85	32 16	45	84	286
75	20 53	+47	93	21 40	+48	92	22 28	+47	92	23 15	+47	91	24 02	+47	90	24 49	+46	90	25 35	+47	89	26 22	+46	88	27 08	+46	88	27 54	+46	87	28 40	+46	86	29 26	+45	85	30 11	+45	85	30 56	+45	84	31 41	+45	83	285
76	20 17	46	92	21 05	47	92	21 52	48	91	22 40	47	90	23 27	47	90	24 14	46	89	25 00	47	88	25 47	46	88	26 33	46	87	27 19	46	86	28 05	46	85	28 51	45	85	29 36	45	84	30 21	45	83	31 06	45	82	284
77	19 42	48	91	20 30	47	91	21 17	47	90	22 04	47	89	22 51	47	89	23 38	47	88	24 25	47	87	25 12	46	87	25 58	46	86	26 44	46	85	27 30	46	85	28 16	45	84	29 01	45	83	29 46	45	82	30 31	45	82	283
78	19 07	47	91	19 54	48	90	20 42	47	89	21 29	47	89	22 16	47	88	23 03	47	87	23 50	46	87	24 36	47	86	25 23	46	85	26 09	46	85	26 55	46	84	27 41	45	83	28 26	45	82	29 11	45	82	29 56	45	81	282
79	18 32	47	90	19 19	47	89	20 06	48	89	20 54	47	88	21 41	47	87	22 28	47	87	23 15	46	86	24 01	47	85	24 48	46	84	25 34	46	84	26 20	46	83	27 06	45	82	27 51	46	82	28 37	45	81	29 22	45	80	281
80	17 56	+48	89	18 44	+47	88	19 31	+48	88	20 19	+47	87	21 06	+47	86	21 53	+46	86	22 39	+47	85	23 26	+47	84	24 13	+46	84	24 59	+46	83	25 45	+46	82	26 31	+45	82	27 16	+46	81	28 02	+45	80	28 47	+45	79	280
81	17 21	48	88	18 09	47	88	18 56	47	87	19 43	47	86	20 30	47	86	21 17	47	85	22 04	47	84	22 51	46	84	23 37	47	83	24 24	46	82	25 10	46	82	25 56	46	81	26 42	45	80	27 27	45	79	28 12	45	79	279
82	16 46	47	87	17 33	48	87	18 21	47	86	19 08	47	85	19 55	47	85	20 42	47	84	21 29	47	83	22 16	47	83	23 03	46	82	23 49	46	81	24 35	46	81	25 21	46	80	26 07	45	79	26 52	46	79	27 38	45	78	278
83	16 11	47	87	16 58	48	86	17 46	47	85	18 33	47	85	19 20	47	84	20 07	47	83	20 54	47	83	21 41	47	82	22 28	46	81	23 14	46	81	24 00	46	80	24 46	46	79	25 32	46	79	26 18	45	78	27 03	46	77	277
84	15 35	48	86	16 23	47	85	17 10	48	85	17 58	47	84	18 45	47	83	19 32	47	83	20 19	47	82	21 06	47	81	21 53	46	81	22 39	47	80	23 26	46	79	24 12	46	79	24 58	46	78	25 44	45	77	26 29	45	76	276
85	15 00	+48	85	15 48	+47	84	16 35	+48	84	17 23	+47	83	18 10	+47	82	18 57	+47	82	19 44	+47	81	20 31	+47	80	21 18	+47	80	22 05	+46	79	22 51	+46	78	23 37	+46	78	24 23	+46	77	25 09	+46	76	25 55	+45	76	275
86	14 25	48	84	15 13	47	84	16 00	48	83	16 48	47	82	17 35	47	82	18 22	48	81	19 10	47	80	19 57	46	80	20 43	47	79	21 30	47	78	22 17	46	78	23 03	46	77	23 49	46	76	24 35	46	76	25 21	45	75	274
87	13 50	48	83	14 38	47	83	15 25	48	82	16 13	47	82	17 00	48	81	17 48	47	80	18 35	47	80	19 22	47	79	20 09	47	78	20 56	46	78	21 42	47	77	22 29	46	76	23 15	46	76	24 01	46	75	24 47	45	74	273
88	13 15	48	83	14 03	48	82	14 51	47	81	15 38	48	81	16 26	47	80	17 13	47	79	18 00	47	79	18 47	47	78	19 34	47	78	20 21	47	77	21 08	46	76	21 54	47	76	22 41	46	75	23 27	46	74	24 13	46	73	272
89	12 40	48	82	13 28	48	81	14 16	47	81	15 03	48	80	15 51	47	79	16 38	48	79	17 26	47	78	18 13	47	77	19 00	47	77	19 47	47	76	20 34	46	75	21 20	47	75	22 07	46	74	22 53	46	73	23 39	46	73	271
90	12 05	+48	81	12 53	+48	80	13 41	+48	80	14 29	+47	79	15 16	+48	79	16 04	+47	78	16 51	+48	77	17 39	+47	77	18 26	+47	76	19 13	+47	75	20 00	+46	75	20 46	+47	74	21 33	+46	73	22 19	+47	73	23 06	+46	72	270
91	11 30	48	80	12 18	48	80	13 06	48	79	13 54	48	78	14 42	47	78	15 29	48	77	16 17	47	77	17 04	48	76	17 52	47	75	18 39	47	75	19 26	46	74	20 12	47	73	20 59	47	73	21 46	46	72	22 32	46	71	269
92	10 56	48	79	11 44	48	79	12 32	48	78	13 20	47	78	14 07	48	77	14 55	48	76	15 43	47	76	16 30	47	75	17 17	48	74	18 05	47	74	18 52	47	73	19 39	47	73	20 26	46	72	21 12	47	71	21 59	46	70	268
93	10 21	48	79	11 09	48	78	11 57	48	77	12 45	48	77	13 33	48	76	14 21	48	76	15 09	47	75	15 56	48	74	16 44	47	74	17 31	47	73	18 18	47	72	19 05	47	72	19 52	47	71	20 39	47	70	21 26	46	70	267
94	09 47	48	78	10 35	48	77	11 23	48	77	12 11	48	76	12 59	48	75	13 47	48	75	14 35	47	74	15 22	48	74	16 10	47	73	16 57	48	72	17 45	47	72	18 32	47	71	19 19	47	70	20 06	47	70	20 53	46	69	266
95	09 12	+48	77	10 00	+49	77	10 49	+48	76	11 37	+48	75	12 25	+48	75	13 13	+48	74	14 01	+47	73	14 48	+48	73	15 36	+48	72	16 24	+47	72	17 11	+48	71	17 59	+47	70	18 46	+47	70	19 33	+47	69	20 20	+47	68	265
96	08 38	48	76	09 26	48	76	10 14	49	75	11 03	48	75	11 51	48	74	12 39	48	73	13 27	48	73	14 15	48	72	15 03	47	71	15 50	48	71	16 38	47	70	17 25	48	70	18 13	47	69	19 00	47	68	19 47	47	68	264
97	08 04	48	76	08 52	48	75	09 40	49	74	10 29	48	74	11 17	48	73	12 05	48	73	12 53	48	72	13 41	48	71	14 29	48	71	15 17	48	70	16 05	47	69	16 52	48	69	17 40	47	68	18 27	48	68	19 15	47	67	263
98	07 29	49	75	08 18	49	74	09 07	48	74	09 55	48	73	10 43	49	72	11 32	48	72	12 20	48	71	13 08	48	71	13 56	48	70	14 44	48	69	15 32	48	69	16 20	47	68	17 07	48	67	17 55	47	67	18 42	47	66	262
99	06 56	48	74	07 44	49	73	08 33	48	73	09 21	49	72	10 10	48	72	10 58	49	71	11 47	48	70	12 35	48	70	13 23	48	69	14 11	48	69	14 59	48	68	15 47	48	67	16 35	47	67	17 22	48	66	18 10	47	65	261
100	06 22	+48	73	07 10	+49	73	07 59	+49	72	08 48	+48	71	09 36	+49	71	10 25	+48	70	11 13	+49	70	12 02	+48	69	12 50	+48	68	13 38	+49	68	14 27	+48	67	15 15	+48	67	16 03	+47	66	16 50	+48	65	17 38	+48	65	260
101	05 48	49	72	06 37	49	72	07 26	48	71	08 14	49	71	09 03	49	70	09 52	48	69	10 40	49	69	11 29	48	68	12 17	49	68	13 06	48	67	13 54	48	66	14 42	48	66	15 30	48	65	16 18	48	65	17 06	48	64	259
102	05 14	49	72	06 03	49	71	06 52	49	70	07 41	49	70	08 30	49	69	09 19	49	69	10 08	48	68	10 56	49	67	11 45	48	67	12 33	49	66	13 22	48	66	14 10	49	65	14 59	48	64	15 47	48	64	16 35	48	63	258
103	04 41	49	71	05 30	49	70	06 19	49	70	07 08	49	69	07 57	49	68	08 46	49	68	09 35	49	67	10 24	49	67	11 13	48	66	12 01	49	66	12 50	48	65	13 38	49	64	14 27	48	64	15 15	48	63	16 03	48	62	257
104	04 08	49	70	04 57	49	69	05 46	49	69	06 35	49	68	07 24	50	68	08 14	49	67	09 03	49	67	09 52	48	66	10 40	49	65	11 29	49	65	12 18	49	64	13 07	48	64	13 55	49	63	14 44	48	62	15 32	48	62	256
105	03 35	+49	69	04 24	+49	69	05 13	+50	68	06 03	+49	67	06 52	+49	67	07 41	+49	66	08 30	+49	66	09 19	+49	65	10 08	+49	65	10 57	+49	64	11 46	+49	63	12 35	+49	63	13 24	+49	62	14 13	+48	62	15 01	+49	61	255
106	03 02	49	68	03 51	50	68	04 41	49	67	05 30	50	67	06 20	49	66	07 09	49	66	07 58	50	65	08 48	49	64	09 37	49	64	10 26	49	63	11 15	49	63	12 04	49	62	12 53	49	61	13 42	48	61	14 30	49	60	254
107	02 29	50	68	03 19	49	67	04 08	50	66	04 58	49	66	05 47	50	65	06 37	49	65	07 26	50	64	08 16	49	64	09 05	49	63	09 54	50	62	10 44	49	62	11 33	49	61	12 22	49	61	13 11	49	60	14 00	49	60	253
108	01 57	49	67	02 46	50	66	03 36	50	66	04 26	50	65	05 16	49	65	06 05	50	64	06 55	49	63	07 44	50	63	08 34	49	62	09 23	50	62	10 13	49	61	11 02	49	61	11 51	50	60	12 41	49	59	13 30	49	59	252
109	01 24	50	66	02 14	50	65	03 04	50	65	03 54	50	64	04 44	50	64	05 34	49	63	06 23	50	63	07 13	50	62	08 03	49	62	08 52	50	61	09 42	49	60	10 31	50	60	11 21	49	59	12 10	50	59	13 00	49	58	251
110	00 52	+50	65	01 42	+50	65	02 32	+50	64	03 22	+50	64	04 12	+50	63	05 02	+50	62	05 52	+50	62	06 42	+50	61	07 32	+50	61	08 22	+49	60	09 11	+50	60	10 01	+50	59	10 51	+49	58	11 40	+50	58	12 30	+49	57	250
111	00 20	51	64	01 11	50	64	02 01	50	63	02 51	50	63	03 41	50	62	04 31	50	62	05 21	50	61	06 11	50	61	07 01	50	60	07 51	50	59	08 41	50	59	09 31	50	58	10 21	50	58	11 11	49	57	12 00	50	57	249
112	−0 11	50	64	00 39	50	63	01 29	51	62	02 20	50	62	03 10	50	61	04 00	50	61	04 50	51	60	05 41	50	60	06 31	50	59	07 21	50	59	08 11	50	58	09 01	50	58	09 51	50	57	10 41	50	56	11 31	50	56	248
113	−0 43	51	63	00 08	50	62	00 58	51	62	01 49	50	61	02 39	50	61	03 29	51	60	04 20	50	60	05 10	51	59	06 01	50	58	06 51	50	58	07 41	50	57	08 31	51	57	09 22	50	56	10 12	50	56	11 02	50	55	247
114	−1 14	51	62	−0 23	50	61	00 27	51	61	01 18	50	60	02 08	51	60	02 59	51	59	03 50	50	59	04 40	51	58	05 31	50	58	06 21	51	57	07 12	50	57	08 02	50	56	08 52	51	55	09 43	50	55	10 33	50	54	246
115	−1 45	+51	61	−0 54	+50	61	−0 04	+51	60	00 47	+51	60	01 38	+51	59	02 29	+51	58	03 20	+50	58	04 10	+51	57	05 01	+51	57	05 52	+50	56	06 42	+51	56	07 33	+51	55	08 24	+50	55	09 14	+51	54	10 05	+50	54	245
116	−2 16	51	60	−1 25	51	60	−0 34	51	59	00 17	51	59	01 08	51	58	01 59	51	58	02 50	51	57	03 41	51	57	04 32	50	56	05 22	51	56	06 13	51	55	07 04	51	54	07 55	51	54	08 46	50	53	09 36	51	53	244
117	−2 46	51	60	−1 55	51	59	−1 04	51	58	−0 13	51	58	00 38	51	57	01 29	51	57	02 20	51	56	03 11	51	56	04 02	52	55	04 54	51	55	05 45	51	54	06 36	51	54	07 27	50	53	08 17	51	53	09 08	51	52	243
118	−3 17	52	59	−2 25	51	58	−1 34	51	58	−0 43	52	57	00 09	52	57	01 00	51	56	01 51	51	56	02 42	52	55	03 34	51	55	04 25	51	54	05 16	51	53	06 07	51	53	06 58	52	52	07 50	51	52	08 41	51	51	242
119	−3 47	52	58	−2 55	51	57	−2 04	52	57	−1 12	51	56	−0 21	52	56	00 31	51	55	01 22	52	55	02 14	51	54	03 05	51	54	03 56	52	53	04 48	51	53	05 39	52	52	06 31	51	52	07 22	51	51	08 13	51	51	241
120	−4 16	+51	57	−3 25	+52	57	−2 33	+52	56	−1 41	+51	55	−0 50	+52	55	00 02	+51	54	00 53	+52	54	01 45	+52	53	02 37	+51	53	03 28	+52	52	04 20	+52	52	05 12	+51	51	06 03	+52	51	06 55	+51	50	07 46	+52	50	240
121	−4 46	52	56	−3 54	52	56	−3 02	52	55	−2 10	51	55	−1 19	52	54	−0 27	52	54	00 25	52	53	01 17	52	53	02 09	52	52	03 01	51	52	03 52	52	51	04 44	52	51	05 36	52	50	06 28	51	50	07 19	52	49	239
122	−5 15	52	55	−4 23	52	55	−3 31	52	54	−2 39	52	54	−1 47	52	53	−0 55	52	53	−0 03	52	52	00 49	52	52	01 41	52	51	02 33	52	51	03 25	52	50	04 17	52	50	05 09	52	49	06 01	52	49	06 53	52	48	238
123	−5 44	52	55	−4 52	53	54	−3 59	52	54	−3 07	52	53	−2 15	52	53	−1 23	52	52	−0 31	52	52	00 21	53	51	01 14	52	51	02 06	52	50	02 58	52	50	03 50	52	49	04 42	53	49	05 35	52	48	06 27	52	48	237
124	−6 12	+52	54	−5 20	52	53	−4 28	53	53	−3 35	52	52	−2 43	52	52	−1 51	53	51	−0 58	52	51	−0 06	53	50	00 47	52	50	01 39	52	49	02 31	53	49	03 24	52	48	04 16	52	48	05 08	53	47	06 01	52	47	236
		125		−5 48	+52	52	−4 56	+53	52	−4 03	+53	51	−3 10	+52	51	−2 18	+53	50	−1 25	+52	50	−0 33	+53	49	00 20	+52	49	01 12	+53	48	02 05	+53	48	02 58	+52	47	03 50	+53	47	04 43	+52	47	05 35	+53	46	235
		126		−6 16	+53	51	−5 23	53	51	−4 30	52	51	−3 38	53	50	−2 45	53	50	−1 52	53	49	−0 59	52	49	−0 07	53	48	00 46	53	48	01 39	53	47	02 32	52	47	03 24	53	46	04 17	53	46	05 10	53	45	234
			127			51	−5 50	53	50	−4 57	52	50	−4 05	53	49	−3 12	53	49	−2 19	53	48	−1 26	53	48	−0 33	53	47	00 20	53	47	01 13	53	46	02 06	53	46	02 59	53	45	03 52	53	45	04 45	53	45	233
			128			50	−6 17	+53	49	−5 24	53	49	−4 31	53	48	−3 38	53	48	−2 45	53	47	−1 52	53	47	−0 58	53	47	−0 05	53	46	00 48	53	46	01 41	53	45	02 34	53	45	03 27	54	44	04 21	53	44	232
						129			48	−5 51	54	48	−4 57	53	48	−4 04	53	47	−3 11	54	47	−2 17	53	46	−1 24	54	46	−0 30	53	45	00 23	53	45	01 16	54	44	02 10	53	44	03 03	53	43	03 56	54	43	231
						130	−6 17	+54	47	−5 23	+53	47	−4 30	+54	46	−3 36	+54	46	−2 42	+53	45	−1 49	+54	45	−0 55	+53	44	−0 02	+54	44	00 52	+53	44	01 45	+54	43	02 39	+53	43	03 32	+54	42	230
									131	−5 49	54	46	−4 55	54	45	−4 01	54	45	−3 07	53	44	−2 14	54	44	−1 20	54	43	−0 26	54	43	00 28	53	43	01 21	54	42	02 15	54	42	03 09	54	41	229
									132	−6 14	+54	45	−5 20	54	45	−4 26	54	44	−3 32	54	44	−2 38	54	43	−1 44	54	43	−0 50	54	42	00 04	54	42	00 58	54	41	01 52	54	41	02 46	54	41	228
												133	−5 44	54	44	−4 50	54	43	−3 56	54	43	−3 02	54	42	−2 08	54	42	−1 14	55	42	−0 19	54	41	00 35	54	41	01 29	54	40	02 23	54	40	227
												134	−6 08	+54	43	−5 14	54	42	−4 20	54	42	−3 26	55	42	−2 31	54	41	−1 37	55	41	−0 42	54	40	00 12	54	40	01 06	55	39	02 01	54	39	226
																		135	−5 38	+55	42	−4 43	+54	41	−3 49	+55	41	−2 54	+54	40	−2 00	+55	40	−1 05	+55	39	−0 10	+54	39	00 44	+55	39	01 39	+54	38	225
																		136	−6 01	+55	41	−5 06	54	40	−4 12	55	40	−3 17	55	39	−2 22	55	39	−1 27	55	39	−0 32	54	38	00 22	55	38	01 17	55	37	224
																					137	−5 29	55	39	−4 34	55	39	−3 39	55	39	−2 44	55	38	−1 49	55	38	−0 54	55	37	00 01	55	37	00 56	55	37	223
																					138	−5 51	55	39	−4 56	55	38	−4 01	55	38	−3 06	55	38	−2 11	56	37	−1 15	55	37	−0 20	55	36	00 35	55	36	222
																					139	−6 13	+55	38	−5 18	56	37	−4 22	55	37	−3 27	55	37	−2 32	56	36	−1 36	55	36	−0 41	56	35	00 15	55	35	221

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 54°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 54°

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°
140																									−5 39	+56	36	−4 43	+55	36	−3 48	+56	36	−2 52	+55	35	−1 57	+56	35	−1 01	+56	35	−0 05	+55	34	220
141																									−5 59	+55	36	−5 04	56	35	−4 08	56	35	−3 12	55	35	−2 17	56	34	−1 21	56	34	−0 25	56	33	219
142																												−5 24	56	34	−4 28	56	34	−3 32	56	34	−2 36	56	33	−1 40	56	33	−0 44	56	33	218
143																												−5 44	56	34	−4 48	57	33	−3 51	56	33	−2 55	56	32	−1 59	56	32	−1 03	56	32	217
144																												−6 03	+56	33	−5 07	57	32	−4 10	56	32	−3 14	56	32	−2 18	57	31	−1 21	56	31	216
145																															−5 25	+56	31	−4 29	+57	31	−3 32	+56	31	−2 36	+57	30	−1 39	+56	30	215
146																															−5 43	56	31	−4 47	57	30	−3 50	57	30	−2 53	56	30	−1 57	57	29	214
147																															−6 01	+57	30	−5 04	56	29	−4 08	57	29	−3 11	57	29	−2 14	57	28	213
148																																		−5 21	57	29	−4 24	57	28	−3 27	57	28	−2 30	57	28	212
149																																		−5 38	57	28	−4 41	57	27	−3 44	57	27	−2 47	58	27	211
150																																		−5 54	+57	27	−4 57	+57	27	−4 00	+58	26	−3 02	+57	26	210
151																																		−6 10	+58	26	−5 12	57	26	−4 15	58	25	−3 17	57	25	209
152																																					−5 28	58	25	−4 30	58	25	−3 32	57	24	208
153																																					−5 42	58	24	−4 44	58	24	−3 46	57	23	207
154																																					−5 56	58	23	−4 58	58	23	−4 00	58	23	206
155																																					−6 10	+58	22	−5 12	+58	22	−4 14	+59	22	205
156																																							−5 25	59	21	−4 26	58	21	204
157																																							−5 37	58	20	−4 39	59	20	203
158																																							−5 49	58	19	−4 51	59	19	202
159																																							−6 01	+59	19	−5 02	59	18	201
160																																										−5 13	+59	17	200
161																																										−5 23	59	17	199
162																																										−5 33	59	16	198
163																																										−5 42	59	15	197
164																																										−5 51	59	14	196
165																																										−5 59	+59	13	195

80	−6 22	−48	107	280																																									
79	−5 48	49	108	281																																									
78	−5 14	49	108	−6 03	−49	109	282																																						
77	−4 41	49	109	−5 30	49	110	−6 19	−49	110	283																																			
76	−4 08	49	110	−4 57	49	111	−5 46	49	111	284																																			
75	−3 35	−49	111	−4 24	−49	111	−5 13	−50	112	−6 03	−49	113	285																																
74	−3 02	49	112	−3 51	50	112	−4 41	49	113	−5 30	50	113	−6 20	−49	114	286																												
73	−2 29	50	112	−3 19	49	113	−4 08	50	114	−4 58	49	114	−5 47	50	115	287																												
72	−1 57	49	113	−2 46	50	114	−3 36	50	114	−4 26	50	115	−5 16	49	115	−6 05	−50	116	288																										
71	−1 24	50	114	−2 14	50	115	−3 04	50	115	−3 54	50	116	−4 44	50	116	−5 34	49	117	289																										
70	−0 52	−50	115	−1 42	−50	115	−2 32	−50	116	−3 22	−50	116	−4 12	−50	117	−5 02	−50	118	−5 52	−50	118	290																						
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°		

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	−0 20	51	116	−1 11	50	116	−2 01	50	117	−2 51	50	117	−3 41	50	118	−4 31	50	118	−5 21	50	119	−6 11	−50	119	291																					
68	00 11	50	116	−0 39	50	117	−1 29	51	118	−2 20	50	118	−3 10	50	119	−4 00	50	119	−4 50	51	120	−5 41	50	120	292																					
67	00 43	51	117	−0 08	50	118	−0 58	51	118	−1 49	50	119	−2 39	50	119	−3 29	51	120	−4 20	50	120	−5 10	51	121	−6 01	−50	122	293																					
66	01 14	51	118	00 23	50	119	−0 27	51	119	−1 18	50	120	−2 08	51	120	−2 59	51	121	−3 50	50	121	−4 40	51	122	−5 31	50	122	294																					
65	01 45	−51	119	00 54	−50	119	00 04	−51	120	−0 47	−51	120	−1 38	−51	121	−2 29	−51	122	−3 20	−50	122	−4 10	−51	123	−5 01	−51	123	−5 52	−50	124	295																					
64	02 16	51	120	01 25	51	120	00 34	51	121	−0 17	51	121	−1 08	51	122	−1 59	51	122	−2 50	51	123	−3 41	51	123	−4 32	50	124	−5 22	51	124	−6 13	−51	125	296																					
63	02 46	51	120	01 55	51	121	01 04	51	122	00 13	51	122	−0 38	51	123	−1 29	51	123	−2 20	51	124	−3 11	51	124	−4 02	52	125	−4 54	51	125	−5 45	51	126	297																					
62	03 17	52	121	02 25	51	122	01 34	51	122	00 43	52	123	−0 09	51	123	−1 00	51	124	−1 51	51	124	−2 42	52	125	−3 34	51	125	−4 25	51	126	−5 16	51	127	−6 07	−51	127	298																				
61	03 47	52	122	02 55	51	123	02 04	52	123	01 12	51	124	00 21	52	124	−0 31	51	125	−1 22	52	125	−2 14	51	126	−3 05	51	126	−3 56	52	127	−4 48	51	127	−5 39	52	128	299																				
60	04 16	−51	123	03 25	−52	123	02 33	−52	124	01 41	−51	125	00 50	−52	125	−0 02	−51	126	−0 53	−52	126	−1 45	−52	127	−2 37	−51	127	−3 28	−52	128	−4 20	−52	128	−5 12	−51	129	−6 03	−52	129	300								
59	04 46	52	124	03 54	52	124	03 02	52	125	02 10	51	125	01 19	52	126	00 27	52	126	−0 25	52	127	−1 17	52	127	−2 09	52	128	−3 01	51	128	−3 52	52	129	−4 44	52	129	−5 36	52	130	301								
58	05 15	52	125	04 23	52	125	03 31	52	126	02 39	52	126	01 47	52	127	00 55	52	127	00 03	52	128	−0 49	52	128	−1 41	52	129	−2 33	52	129	−3 25	52	130	−4 17	52	130	−5 09	52	131	−6 01	−52	131	302				
57	05 44	52	125	04 52	53	126	03 59	52	126	03 07	52	127	02 15	52	127	01 23	52	128	00 31	52	128	−0 21	53	129	−1 14	52	129	−2 06	52	130	−2 58	52	130	−3 50	52	131	−4 42	53	131	−5 35	52	132	303				
56	06 12	52	126	05 20	52	127	04 28	53	127	03 35	52	128	02 43	52	128	01 51	53	129	00 58	52	129	00 06	53	130	−0 47	52	130	−1 39	52	131	−2 31	53	131	−3 24	52	132	−4 16	52	132	−5 08	53	133	−6 01	−52	133	304
55	06 41	−53	127	05 48	−52	128	04 56	−53	128	04 03	−53	129	03 10	−52	129	02 18	−53	130	01 25	−52	130	00 33	−53	131	−0 20	−52	131	−1 12	−53	132	−2 05	−53	132	−2 58	−52	133	−3 50	−53	133	−4 43	−52	133	−5 35	−53	134	305
54	07 09	53	128	06 16	53	129	05 23	53	129	04 30	52	129	03 38	53	130	02 45	53	130	01 52	53	131	00 59	52	131	00 07	53	132	−0 46	53	132	−1 39	53	133	−2 32	52	133	−3 24	53	134	−4 17	53	134	−5 10	53	135	306
53	07 36	53	129	06 43	53	129	05 50	53	130	04 57	52	130	04 05	53	131	03 12	53	131	02 19	53	132	01 26	53	132	00 33	53	133	−0 20	53	133	−1 13	53	134	−2 06	53	134	−2 59	53	135	−3 52	53	135	−4 45	53	135	307
52	08 03	53	130	07 10	53	130	06 17	53	131	05 24	53	131	04 31	53	132	03 38	53	132	02 45	53	133	01 52	54	133	00 58	53	133	00 05	53	134	−0 48	53	134	−1 41	53	135	−2 34	53	135	−3 27	54	136	−4 21	53	136	308
51	08 30	53	131	07 37	53	131	06 44	53	132	05 51	54	132	04 57	53	132	04 04	53	133	03 11	54	133	02 17	53	134	01 24	54	134	00 30	53	135	−0 23	53	135	−1 16	54	136	−2 10	53	136	−3 03	53	137	−3 56	54	137	309
50	08 57	−53	131	08 04	−54	132	07 10	−53	132	06 17	−54	133	05 23	−53	133	04 30	−54	134	03 36	−54	134	02 42	−53	135	01 49	−54	135	00 55	−53	136	00 02	−54	136	−0 52	−53	136	−1 45	−54	137	−2 39	−53	137	−3 32	−54	138	310
49	09 23	53	132	08 30	54	133	07 36	54	133	06 42	53	134	05 49	54	134	04 55	54	135	04 01	54	135	03 07	53	136	02 14	54	136	01 20	54	136	00 26	54	137	−0 28	53	137	−1 21	54	138	−2 15	54	138	−3 09	54	139	311
48	09 49	54	133	08 55	54	134	08 01	53	134	07 08	54	135	06 14	54	135	05 20	54	135	04 26	54	136	03 32	54	136	02 38	54	137	01 44	54	137	00 50	54	138	−0 04	54	138	−0 58	54	139	−1 52	54	139	−2 46	54	139	312
47	10 15	54	134	09 21	54	135	08 27	54	135	07 33	55	135	06 38	54	136	05 44	54	136	04 50	54	137	03 56	54	137	03 02	54	138	02 08	54	138	01 14	55	138	00 19	54	139	−0 35	54	139	−1 29	54	140	−2 23	54	140	313
46	10 40	54	135	09 46	55	135	08 51	54	136	07 57	54	136	07 03	55	137	06 08	54	137	05 14	54	138	04 20	54	138	03 26	55	138	02 31	54	139	01 37	55	139	00 42	54	140	−0 12	54	140	−1 06	55	141	−2 01	54	141	314
45	11 04	−54	136	10 10	−54	136	09 16	−55	137	08 21	−54	137	07 27	−55	138	06 32	−54	138	05 38	−55	138	04 43	−54	139	03 49	−55	139	02 54	−54	140	02 00	−55	140	01 05	−55	141	00 10	−54	141	−0 44	−55	141	−1 39	−54	142	315
44	11 29	55	137	10 34	54	137	09 40	55	138	08 45	55	138	07 50	54	138	06 56	55	139	06 01	55	139	05 06	54	140	04 12	55	140	03 17	55	141	02 22	55	141	01 27	55	141	00 32	54	142	−0 22	55	142	−1 17	55	143	316
43	11 53	55	138	10 58	55	138	10 03	55	139	09 08	54	139	08 14	55	139	07 19	55	140	06 24	55	140	05 29	55	141	04 34	55	141	03 39	55	141	02 44	55	142	01 49	55	142	00 54	55	143	−0 01	55	143	−0 56	55	143	317
42	12 16	55	139	11 21	55	139	10 26	55	139	09 31	55	140	08 36	55	140	07 41	55	141	06 46	55	141	05 51	55	141	04 56	55	142	04 01	55	142	03 06	55	143	02 11	56	143	01 15	55	143	00 20	55	144	−0 35	55	144	318
41	12 39	55	139	11 44	55	140	10 49	55	140	09 54	55	141	08 59	56	141	08 03	55	141	07 08	55	142	06 13	55	142	05 18	56	143	04 22	55	143	03 27	55	143	02 32	56	144	01 36	55	144	00 41	56	145	−0 15	55	145	319
40	13 02	−55	140	12 07	−56	141	11 11	−55	141	10 16	−55	142	09 21	−56	142	08 25	−55	142	07 30	−56	143	06 34	−55	143	05 39	−56	144	04 43	−55	144	03 48	−56	144	02 52	−55	145	01 57	−56	145	01 01	−56	145	00 05	−55	146	320
39	13 24	55	141	12 29	56	142	11 33	55	142	10 38	56	142	09 42	56	143	08 46	55	143	07 51	56	144	06 55	56	144	05 59	55	144	05 04	56	145	04 08	56	145	03 12	55	145	02 17	56	146	01 21	56	146	00 25	56	147	321
38	13 46	56	142	12 50	55	143	11 55	56	143	10 59	56	143	10 03	56	144	09 07	55	144	08 12	56	145	07 16	56	145	06 20	56	145	05 24	56	146	04 28	56	146	03 32	56	146	02 36	56	147	01 40	56	147	00 44	56	147	322
37	14 08	56	143	13 12	56	144	12 16	56	144	11 20	56	144	10 24	56	145	09 28	56	145	08 32	56	145	07 36	56	146	06 40	56	146	05 44	56	146	04 48	57	147	03 51	56	147	02 55	56	148	01 59	56	148	01 03	56	148	323
36	14 28	56	144	13 32	56	144	12 36	56	145	11 40	56	145	10 44	56	146	09 48	56	146	08 52	57	146	07 55	56	147	06 59	56	147	06 03	56	147	05 07	57	148	04 10	56	148	03 14	56	148	02 18	57	149	01 21	56	149	324
35	14 49	−56	145	13 53	−57	145	12 56	−56	146	12 00	−56	146	11 04	−57	146	10 07	−56	147	09 11	−56	147	08 15	−57	147	07 18	−56	148	06 22	−57	148	05 25	−56	149	04 29	−57	149	03 32	−56	149	02 36	−57	150	01 39	−56	150	325
34	15 09	57	146	14 12	56	146	13 16	57	147	12 19	56	147	11 23	57	147	10 26	56	148	09 30	57	148	08 33	56	148	07 37	57	149	06 40	57	149	05 43	56	149	04 47	57	150	03 50	57	150	02 53	56	150	01 57	57	151	326
33	15 28	56	147	14 32	57	147	13 35	57	148	12 38	56	148	11 42	57	148	10 45	57	149	09 48	56	149	08 52	57	149	07 55	57	150	06 58	57	150	06 01	57	150	05 04	56	151	04 08	57	151	03 11	57	151	02 14	57	152	327
32	15 47	56	148	14 51	57	148	13 54	57	149	12 57	57	149	12 00	57	149	11 03	57	150	10 06	57	150	09 09	57	150	08 12	57	150	07 15	57	151	06 18	57	151	05 21	57	151	04 24	57	152	03 27	57	152	02 30	57	152	328
31	16 06	57	149	15 09	57	149	14 12	57	149	13 15	57	150	12 18	57	150	11 21	57	150	10 24	57	151	09 27	57	151	08 30	58	151	07 32	57	152	06 35	57	152	05 38	57	152	04 41	57	153	03 44	57	153	02 47	58	153	329
30	16 24	−57	150	15 27	−57	150	14 30	−58	150	13 32	−57	151	12 35	−57	151	11 38	−57	151	10 41	−58	152	09 43	−57	152	08 46	−57	152	07 49	−57	153	06 52	−58	153	05 54	−57	153	04 57	−57	153	04 00	−58	154	03 02	−57	154	330
29	16 41	57	151	15 44	57	151	14 47	58	151	13 49	57	152	12 52	57	152	11 55	58	152	10 57	57	153	10 00	58	153	09 02	57	153	08 05	58	153	07 07	57	154	06 10	58	154	05 12	57	154	04 15	58	155	03 17	57	155	331
28	16 58	57	152	16 01	58	152	15 03	57	152	14 06	58	153	13 08	57	153	12 11	58	153	11 13	57	153	10 16	58	154	09 18	58	154	08 20	57	154	07 23	58	155	06 25	57	155	05 28	58	155	04 30	58	155	03 32	57	156	332
27	17 15	58	153	16 17	57	153	15 20	58	153	14 22	58	154	13 24	58	154	12 26	57	154	11 29	58	154	10 31	58	155	09 33	58	155	08 35	57	155	07 38	58	155	06 40	58	156	05 42	58	156	04 44	58	156	03 46	57	157	333
26	17 31	58	154	16 33	58	154	15 35	58	154	14 37	58	154	13 39	57	155	12 42	58	155	11 44	58	155	10 46	58	156	09 48	58	156	08 50	58	156	07 52	58	156	06 54	58	157	05 56	58	157	04 58	58	157	04 00	58	157	334
25	17 46	−58	155	16 48	−58	155	15 50	−58	155	14 52	−58	155	13 54	−58	156	12 56	−58	156	11 58	−58	156	11 00	−58	156	10 02	−58	157	09 04	−58	157	08 06	−58	157	07 08	−58	157	06 10	−58	158	05 12	−58	158	04 14	−59	158	335
24	18 01	58	156	17 03	58	156	16 05	58	156	15 07	58	156	14 09	59	157	13 10	58	157	12 12	58	157	11 14	58	157	10 16	58	158	09 18	59	158	08 19	58	158	07 21	58	158	06 23	58	159	05 25	59	159	04 26	58	159	336
23	18 15	58	157	17 17	58	157	16 19	58	157	15 21	59	157	14 22	58	158	13 24	58	158	12 26	59	158	11 27	58	158	10 29	58	159	09 31	59	159	08 32	58	159	07 34	58	159	06 36	59	159	05 37	58	160	04 39	59	160	337
22	18 29	58	158	17 31	59	158	16 32	58	158	15 34	59	158	14 35	58	159	13 37	58	159	12 39	59	159	11 40	58	159	10 42	59	159	09 43	58	160	08 45	59	160	07 46	58	160	06 48	59	160	05 49	58	161	04 51	59	161	338
21	18 42	58	159	17 44	59	159	16 45	58	159	15 47	59	159	14 48	59	159	13 49	58	160	12 51	59	160	11 52	58	160	10 54	59	160	09 55	59	161	08 56	58	161	07 58	59	161	06 59	58	161	06 01	59	161	05 02	59	162	339
20	18 55	−59	160	17 56	−59	160	16 57	−58	160	15 59	−59	160	15 00	−59	160	14 01	−58	161	13 03	−59	161	12 04	−59	161	11 05	−58	161	10 07	−59	161	09 08	−59	162	08 09	−59	162	07 10	−58	162	06 12	−59	162	05 13	−59	163	340
19	19 07	59	161	18 08	59	161	17 09	59	161	16 10	58	161	15 12	59	161	14 13	59	162	13 14	59	162	12 15	59	162	11 16	59	162	10 17	58	162	09 19	59	163	08 20	59	163	07 21	59	163	06 22	59	163	05 23	59	163	341
18	19 18	59	162	18 19	59	162	17 20	58	162	16 22	59	162	15 23	59	162	14 24	59	163	13 25	59	163	12 26	59	163	11 27	59	163	10 28	59	163	09 29	59	164	08 30	59	164	07 31	59	164	06 32	59	164	05 33	59	164	342
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16	19 39	59	164	18 40	59	164	17 41	59	164	16 42	59	164	15 43	59	164	14 44	59	164	13 45	60	165	12 45	59	165	11 46	59	165	10 47	59	165	09 48	59	165	08 49	60	165	07 49	59	166	06 50	59	166	05 51	59	166	344
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1	21 00	60	179	20 00	60	179	19 00	60	179	18 00	60	179	17 00	60	179	16 00	60	179	15 00	60	179	14 00	60	179	13 00	60	179	12 00	60	179	11 00	60	179	10 00	60	179	09 00	60	179	08 00	60	179	07 00	60	179	359
0	21 00	−60	180	20 00	−60	180	19 00	−60	180	18 00	−60	180	17 00	−60	180	16 00	−60	180	15 00	−60	180	14 00	−60	180	13 00	−60	180	12 00	−60	180	11 00	−60	180	10 00	−60	180	09 00	−60	180	08 00	−60	180	07 00	−60	180	360
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 54°

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 55°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
0	35 00	+60	180	36 00	+60	180	37 00	+60	180	38 00	+60	180	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	360
1	35 00	60	179	36 00	60	179	37 00	60	179	38 00	60	179	39 00	60	179	40 00	60	179	41 00	60	179	42 00	60	179	43 00	60	179	44 00	60	179	45 00	60	179	46 00	60	177	47 00	60	179	48 00	60	179	49 00	60	179	359
2	34 59	60	178	35 59	59	178	36 58	60	177	37 58	60	177	38 58	60	177	39 58	60	177	40 58	60	177	41 58	60	177	42 58	60	177	43 58	60	177	44 58	60	177	45 58	60	177	46 58	60	177	47 58	60	177	48 58	60	177	358
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49	22 06	53	125	22 59	53	125	23 52	53	124	24 45	53	124	25 38	52	123	26 30	53	123	27 23	52	122	28 15	52	122	29 07	52	121	29 59	52	121	30 51	52	120	31 43	51	119	32 34	52	119	33 26	51	118	34 17	51	118	311
50	21 38	+53	125	22 31	+53	124	23 24	+52	123	24 16	+53	123	25 09	+52	122	26 01	+52	122	26 53	+53	121	27 46	+52	121	28 38	+51	120	29 29	+52	120	30 21	+52	119	31 13	+51	118	32 04	+51	118	32 55	+51	117	33 46	+51	117	310
51	21 10	52	124	22 02	53	123	22 55	52	123	23 47	53	122	24 40	52	121	25 32	52	121	26 24	52	120	27 16	52	120	28 08	51	119	28 59	52	119	29 51	51	118	30 42	52	117	31 34	51	117	32 25	50	116	33 15	51	116	309
52	20 41	52	123	21 33	53	122	22 26	52	122	23 18	52	121	24 10	52	121	25 02	52	120	25 54	52	119	26 46	52	119	27 38	51	118	28 29	51	118	29 20	52	117	30 12	51	116	31 03	51	116	31 54	50	115	32 44	51	115	308
53	20 12	52	122	21 04	52	121	21 56	52	121	22 48	52	120	23 40	52	120	24 32	52	119	25 24	52	118	26 16	51	118	27 07	51	117	27 58	52	117	28 50	51	116	29 41	51	116	30 32	50	115	31 22	51	114	32 13	50	114	307
54	19 42	52	121	20 34	52	120	21 26	52	120	22 18	52	119	23 10	52	119	24 02	52	118	24 54	51	118	25 45	51	117	26 36	52	116	27 28	51	116	28 19	51	115	29 10	50	115	30 00	51	114	30 51	50	113	31 41	50	113	306
55	19 12	+52	120	20 04	+52	119	20 56	+52	119	21 48	+52	118	22 40	+51	118	23 31	+52	117	24 23	+51	117	25 14	+51	116	26 05	+52	115	26 57	+50	115	27 47	+51	114	28 38	+51	114	29 29	+50	113	30 19	+50	112	31 09	+50	112	305
56	18 42	52	119	19 34	52	118	20 26	52	118	21 18	51	117	22 09	52	117	23 01	51	116	23 52	51	116	24 43	51	115	25 34	51	114	26 25	51	114	27 16	51	113	28 07	50	113	28 57	50	112	29 47	50	111	30 37	50	111	304
57	18 12	52	118	19 04	52	117	19 56	51	117	20 47	51	116	21 38	52	116	22 30	51	115	23 21	51	115	24 12	51	114	25 03	51	114	25 54	50	113	26 44	51	112	27 35	50	112	28 25	50	111	29 15	50	111	30 05	50	110	303
58	17 42	51	117	18 33	52	117	19 25	51	116	20 16	51	115	21 07	51	115	21 58	51	114	22 49	51	114	23 40	51	113	24 31	51	113	25 22	50	112	26 12	51	111	27 03	50	111	27 53	50	110	28 43	50	110	29 33	49	109	302
59	17 11	51	116	18 02	52	116	18 54	51	115	19 45	51	115	20 36	51	114	21 27	51	113	22 18	51	113	23 09	50	112	23 59	51	112	24 50	50	111	25 40	50	111	26 30	50	110	27 20	50	109	28 10	50	109	29 00	50	108	301
60	16 40	+51	115	17 31	+51	115	18 22	+51	114	19 13	+51	114	20 04	+51	113	20 55	+51	113	21 46	+51	112	22 37	+50	111	23 27	+51	111	24 18	+50	110	25 08	+50	110	25 58	+50	109	26 48	+50	108	27 38	+49	108	28 27	+50	107	300
61	16 09	51	114	17 00	51	114	17 51	51	113	18 42	51	113	19 33	50	112	20 23	51	112	21 14	51	111	22 05	50	110	22 55	50	110	23 45	50	109	24 35	50	109	25 25	50	108	26 15	50	107	27 05	49	107	27 54	50	106	299
62	15 37	51	114	16 28	51	113	17 19	51	112	18 10	51	112	19 01	50	111	19 51	51	111	20 42	50	110	21 32	50	110	22 22	51	109	23 13	50	108	24 03	49	108	24 52	50	107	25 42	50	107	26 32	49	106	27 21	49	105	298
63	15 06	50	113	15 56	51	112	16 47	51	112	17 38	51	111	18 29	50	110	19 19	50	110	20 09	51	109	21 00	50	109	21 50	50	108	22 40	50	108	23 30	50	107	24 20	49	106	25 09	50	106	25 59	49	105	26 48	49	104	297
64	14 34	51	112	15 25	50	111	16 15	51	111	17 06	50	110	17 56	51	110	18 47	50	109	19 37	50	108	20 27	50	108	21 17	50	107	22 07	50	107	22 57	49	106	23 46	50	105	24 36	49	105	25 25	49	104	26 14	49	104	296
65	14 02	+50	111	14 52	+51	110	15 43	+50	110	16 33	+51	109	17 24	+50	109	18 14	+50	108	19 04	+50	108	19 54	+50	107	20 44	+50	106	21 34	+50	106	22 24	+49	105	23 13	+50	105	24 03	+49	104	24 52	+49	103	25 41	+49	103	295
66	13 29	51	110	14 20	50	109	15 10	51	109	16 01	50	108	16 51	50	108	17 41	50	107	18 31	50	107	19 21	50	106	20 11	50	105	21 01	49	105	21 50	50	104	22 40	49	104	23 29	49	103	24 18	49	102	25 07	49	102	294
67	12 57	50	109	13 47	51	109	14 38	50	108	15 28	50	107	16 18	50	107	17 08	50	106	17 58	50	106	18 48	50	105	19 38	49	105	20 27	50	104	21 17	49	103	22 06	50	103	22 56	49	102	23 45	49	102	24 34	48	101	293
68	12 24	51	108	13 15	50	108	14 05	50	107	14 55	50	107	15 45	50	106	16 35	50	105	17 25	50	105	18 15	49	104	19 04	50	104	19 54	49	103	20 43	50	103	21 33	49	102	22 22	49	101	23 11	49	101	24 00	48	100	292
69	11 52	50	107	12 42	50	107	13 32	50	106	14 22	50	106	15 12	50	105	16 02	50	105	16 52	49	104	17 41	50	103	18 31	49	103	19 20	50	102	20 10	49	102	20 59	49	101	21 48	49	100	22 37	49	100	23 26	48	99	291
HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	11 19	+50	107	12 09	+50	106	12 59	+50	105	13 49	+50	105	14 39	+50	104	15 29	+49	104	16 18	+50	103	17 08	+49	103	17 57	+50	102	18 47	+49	101	19 36	+49	101	20 25	+49	100	21 14	+49	100	22 03	+49	99	22 52	+48	98	290
71	10 46	50	106	11 36	50	105	12 26	50	105	13 16	49	104	14 05	50	103	14 55	50	103	15 45	49	102	16 34	50	102	17 24	49	101	18 13	49	101	19 02	49	100	19 51	49	99	20 40	49	99	21 29	49	98	22 18	48	97	289
72	10 13	49	105	11 02	50	104	11 52	50	104	12 42	50	103	13 32	49	103	14 21	50	102	15 11	49	101	16 00	50	101	16 50	49	100	17 39	49	100	18 28	49	99	19 17	49	98	20 06	49	98	20 55	48	97	21 43	49	97	288
73	09 39	50	104	10 29	50	103	11 19	50	103	12 09	49	102	12 58	50	102	13 48	49	101	14 37	50	101	15 27	49	100	16 16	49	99	17 05	49	99	17 54	49	98	18 43	49	98	19 32	49	97	20 21	48	96	21 09	49	96	287
74	09 06	50	103	09 56	49	103	10 45	50	102	11 35	49	102	12 24	50	101	13 14	49	100	14 03	50	100	14 53	49	99	15 42	49	99	16 31	49	98	17 20	49	97	18 09	49	97	18 58	48	96	19 46	49	96	20 35	48	95	286
75	08 32	+50	102	09 22	+50	102	10 12	+49	101	11 01	+50	101	11 51	+49	100	12 40	+49	100	13 29	+50	99	14 19	+49	98	15 08	+49	98	15 57	+49	97	16 46	+49	97	17 35	+49	96	18 24	+48	95	19 12	+49	95	20 01	+48	94	285
76	07 59	49	102	08 48	50	101	09 38	49	100	10 27	50	100	11 17	49	99	12 06	49	99	12 55	50	98	13 45	49	98	14 34	49	97	15 23	49	96	16 12	49	96	17 01	48	95	17 49	49	94	18 38	48	94	19 26	49	93	284
77	07 25	49	101	08 14	50	100	09 04	49	100	09 53	50	99	10 43	49	98	11 32	49	98	12 21	49	97	13 10	49	97	13 59	49	96	14 48	49	95	15 37	49	95	16 26	49	94	17 15	49	94	18 04	48	93	18 52	48	92	283
78	06 51	49	100	07 40	50	99	08 30	49	99	09 19	50	98	10 09	49	98	10 58	49	97	11 47	49	96	12 36	49	96	13 25	49	95	14 14	49	95	15 03	49	94	15 52	49	93	16 41	48	93	17 29	49	92	18 18	48	92	282
79	06 17	49	99	07 06	50	98	07 56	49	98	08 45	49	97	09 34	50	97	10 24	49	96	11 13	49	96	12 02	49	95	12 51	49	94	13 40	49	94	14 29	49	93	15 18	48	93	16 06	49	92	16 55	48	91	17 43	49	91	281
80	05 43	+49	98	06 32	+50	98	07 22	+49	97	08 11	+49	96	09 00	+49	96	09 49	+50	95	10 39	+49	95	11 28	+49	94	12 17	+49	94	13 06	+48	93	13 54	+49	92	14 43	+49	92	15 32	+48	91	16 20	+49	91	17 09	+48	90	280
81	05 09	49	97	05 58	50	97	06 48	49	96	07 37	49	96	08 26	49	95	09 15	49	95	10 04	49	94	10 53	49	93	11 42	49	93	12 31	49	92	13 20	49	92	14 09	48	91	14 57	49	90	15 46	48	90	16 34	49	89	279
82	04 35	49	97	05 24	49	96	06 13	49	95	07 02	50	95	07 52	49	94	08 41	49	94	09 30	49	93	10 19	49	93	11 08	49	92	11 57	49	91	12 46	48	91	13 34	49	90	14 23	49	90	15 12	48	89	16 00	48	88	278
83	04 00	50	96	04 50	49	95	05 39	49	95	06 28	49	94	07 17	49	93	08 06	50	93	08 56	49	92	09 45	48	92	10 33	49	91	11 22	49	91	12 11	49	90	13 00	49	89	13 49	48	89	14 37	49	88	15 26	48	88	277
84	03 26	49	95	04 15	50	94	05 05	49	94	05 54	49	93	06 43	49	93	07 32	49	92	08 21	49	91	09 10	49	91	09 59	49	90	10 48	49	90	11 37	48	89	12 25	49	89	13 14	49	88	14 03	48	87	14 51	49	87	276
85	02 52	+49	94	03 41	+49	94	04 30	+49	93	05 19	+50	92	06 09	+49	92	06 58	+49	91	07 47	+49	91	08 36	+49	90	09 25	+49	89	10 14	+48	89	11 02	+49	88	11 51	+49	88	12 40	+48	87	13 28	+49	86	14 17	+48	86	275
86	02 18	49	93	03 07	49	93	03 56	49	92	04 45	49	92	05 34	49	91	06 23	49	90	07 12	49	90	08 01	49	89	08 50	49	89	09 39	49	88	10 28	49	87	11 17	48	87	12 05	49	86	12 54	49	86	13 43	48	85	274
87	01 43	49	92	02 32	50	92	03 22	49	91	04 11	49	91	05 00	49	90	05 49	49	90	06 38	49	89	07 27	49	88	08 16	49	88	09 05	49	87	09 54	48	87	10 42	49	86	11 31	49	85	12 20	48	85	13 08	49	84	273
88	01 09	49	92	01 58	49	91	02 47	49	90	03 36	49	90	04 25	49	89	05 14	49	89	06 03	49	88	06 52	49	88	07 41	49	87	08 30	49	86	09 19	49	86	10 08	49	85	10 57	48	85	11 45	49	84	12 34	49	83	272
89	00 34	50	91	01 24	49	90	02 13	49	90	03 02	49	89	03 51	49	89	04 40	49	88	05 29	49	87	06 18	49	87	07 07	49	86	07 56	49	86	08 45	49	85	09 34	49	84	10 23	48	84	11 11	49	83	12 00	48	83	271
90	00 00	+49	90	00 49	+49	89	01 38	+49	89	02 27	+50	88	03 17	+49	88	04 06	+49	87	04 55	+49	87	05 44	+49	86	06 33	+49	85	07 22	+49	85	08 11	+49	84	09 00	+48	84	09 48	+49	83	10 37	+49	82	11 26	+48	82	270
91	−0 34	49	89	00 15	49	89	01 04	49	88	01 53	49	87	02 42	49	87	03 31	49	86	04 20	49	86	05 09	49	85	05 58	49	85	06 47	49	84	07 36	49	83	08 25	49	83	09 14	49	82	10 03	49	82	10 52	48	81	269
92	−1 09	49	88	−0 20	50	88	00 30	49	87	01 19	49	87	02 08	49	86	02 57	49	85	03 46	49	85	04 35	49	84	05 24	49	84	06 13	49	83	07 02	49	83	07 51	49	82	08 40	49	81	09 29	49	81	10 18	49	80	268
93	−1 43	49	88	−0 54	49	87	−0 05	49	86	00 44	50	86	01 34	49	85	02 23	49	85	03 12	49	84	04 01	49	84	04 50	49	83	05 39	49	82	06 28	49	82	07 17	49	81	08 06	49	81	08 55	49	80	09 44	49	79	267
94	−2 18	50	87	−1 28	49	86	−0 39	49	86	00 10	49	85	00 59	49	84	01 48	50	84	02 38	49	83	03 27	49	83	04 16	49	82	05 05	49	82	05 54	49	81	06 43	49	80	07 32	49	80	08 21	49	79	09 10	49	79	266
95	−2 52	+49	86	−2 03	+50	85	−1 13	+49	85	−0 24	+49	84	00 25	+49	84	01 14	+49	83	02 03	+50	82	02 53	+49	82	03 42	+49	81	04 31	+49	81	05 20	+49	80	06 09	+49	80	06 58	+49	79	07 47	+49	78	08 36	+49	78	265
96	−3 26	49	85	−2 37	49	85	−1 48	50	84	−0 58	49	83	−0 09	49	83	00 40	49	82	01 29	50	82	02 19	49	81	03 08	49	81	03 57	49	80	04 46	50	79	05 36	49	79	06 25	49	78	07 14	49	78	08 03	49	77	264
97	−4 00	49	84	−3 11	49	84	−2 22	49	83	−1 33	50	83	−0 43	49	82	00 06	49	81	00 55	50	81	01 45	49	80	02 34	49	80	03 23	50	79	04 13	49	79	05 02	49	78	05 51	49	77	06 40	49	77	07 29	49	76	263
98	−4 35	50	83	−3 45	49	83	−2 56	49	82	−2 07	50	82	−1 17	49	81	−0 28	49	81	00 21	50	80	01 11	49	79	02 00	50	79	02 50	49	78	03 39	49	78	04 28	50	77	05 18	49	77	06 07	49	76	06 56	49	75	262
99	−5 09	49	83	−4 20	50	82	−3 30	49	81	−2 41	50	81	−1 51	49	80	−1 02	50	80	−0 12	49	79	00 37	49	79	01 26	50	78	02 16	49	77	03 05	50	77	03 55	49	76	04 44	49	76	05 33	50	75	06 23	49	75	261
100	−5 43	+49	82	−4 54	+50	81	−4 04	+49	81	−3 15	+50	80	−2 25	+49	80	−1 36	+50	79	−0 46	+49	78	00 03	+50	78	00 53	+49	77	01 42	+50	77	02 32	+49	76	03 21	+50	76	04 11	+49	75	05 00	+50	74	05 50	+49	74	260
101	−6 17	+49	81	−5 28	50	80	−4 38	49	80	−3 49	50	79	−2 59	50	79	−2 09	49	78	−1 20	50	78	−0 30	49	77	00 19	50	76	01 09	49	76	01 58	50	75	02 48	50	75	03 38	49	74	04 27	50	74	05 17	49	73	259
			102	−6 01	+49	80	−5 12	50	79	−4 22	49	78	−3 33	50	78	−2 43	50	77	−1 53	49	77	−1 04	50	76	−0 14	50	76	00 36	49	75	01 25	50	74	02 15	50	74	03 05	49	73	03 54	50	73	04 44	49	72	258
						103	−5 46	50	78	−4 56	50	78	−4 06	49	77	−3 17	50	76	−2 27	50	76	−1 37	50	75	−0 47	49	75	00 02	50	74	00 52	50	74	01 42	50	73	02 32	49	73	03 21	50	72	04 11	50	71	257
						104	−6 19	+50	77	−5 29	49	77	−4 40	50	76	−3 50	50	76	−3 00	50	75	−2 10	50	75	−1 20	49	74	−0 31	50	73	00 19	50	73	01 09	50	72	01 59	50	72	02 49	50	71	03 39	49	71	256
									105	−6 03	+50	76	−5 13	+50	75	−4 23	+50	75	−3 33	+50	74	−2 43	+50	74	−1 53	+49	73	−1 04	+50	73	−0 14	+50	72	00 36	+50	71	01 26	+50	71	02 16	+50	70	03 06	+50	70	255
												106	−5 46	50	75	−4 56	50	74	−4 06	50	73	−3 16	50	73	−2 26	50	72	−1 36	50	72	−0 46	50	71	00 04	50	71	00 54	50	70	01 44	50	70	02 34	50	69	254
												107	−6 19	+50	74	−5 29	50	73	−4 39	50	73	−3 49	50	72	−2 59	50	71	−2 09	50	71	−1 19	50	70	−0 29	51	70	00 22	50	69	01 12	50	69	02 02	50	68	253
															108	−6 02	+50	72	−5 12	50	72	−4 22	50	71	−3 32	51	71	−2 41	50	70	−1 51	50	70	−1 01	50	69	−0 11	51	68	00 40	50	68	01 30	50	67	252
																		109	−5 45	51	71	−4 54	50	70	−4 04	50	70	−3 14	51	69	−2 23	50	69	−1 33	51	68	−0 42	50	68	00 08	50	67	00 58	51	67	251
																		110	−6 17	+50	70	−5 27	+51	70	−4 36	+50	69	−3 46	+51	68	−2 55	+50	68	−2 05	+51	67	−1 14	+50	67	−0 24	+51	66	00 27	+50	66	250
																					111	−5 59	+51	69	−5 08	50	68	−4 18	51	68	−3 27	51	67	−2 36	50	67	−1 46	51	66	−0 55	51	65	−0 04	50	65	249
																								112	−5 40	51	67	−4 49	50	67	−3 59	51	66	−3 08	51	66	−2 17	51	65	−1 26	51	65	−0 35	50	64	248
																								113	−6 12	+51	66	−5 21	51	66	−4 30	51	65	−3 39	51	65	−2 48	51	64	−1 57	51	64	−1 06	51	63	247
																											114	−5 52	+51	65	−5 01	51	65	−4 10	51	64	−3 19	51	64	−2 28	51	63	−1 37	51	62	246
																														115	−5 32	+51	64	−4 41	+51	63	−3 50	+51	63	−2 59	+52	62	−2 07	+51	62	245
																														116	−6 03	+51	63	−5 12	52	62	−4 20	51	62	−3 29	51	61	−2 38	52	61	244
																																	117	−5 42	52	62	−4 50	51	61	−3 59	52	60	−3 07	51	60	243
																																	118	−6 12	+52	61	−5 20	51	60	−4 29	52	60	−3 37	52	59	242
																																				119	−5 50	52	59	−4 58	51	59	−4 07	52	58	241
																																				120	−6 20	+52	58	−5 28	+52	58	−4 36	+52	57	240
																																						121	−5 57	+52	57	−5 05	53	57	239
																																								122	−5 33	52	56	238
																																								123	−6 01	+52	55	237

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°

S. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 55°

LAT 55°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 55°

LAT 55°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
99	−5 09	−49	83	−5 58	−50	83	261																																							
98	−4 35	49	83	−5 24	49	84	−6 13	−49	85	262																																					
97	−4 00	50	84	−4 50	49	85	−5 39	49	85	263																																					
96	−3 26	49	85	−4 15	50	86	−5 05	49	86	−5 54	−49	87	264																																	
95	−2 52	−49	86	−3 41	−49	86	−4 30	−49	87	−5 19	−50	88	−6 09	−49	88	265																															
94	−2 18	49	87	−3 07	49	87	−3 56	49	88	−4 45	49	88	−5 34	49	89	266																															
93	−1 43	49	88	−2 32	50	88	−3 22	49	89	−4 11	49	89	−5 00	49	90	−5 49	−49	90	267																											
92	−1 09	49	88	−1 58	49	89	−2 47	49	90	−3 36	49	90	−4 25	49	91	−5 14	49	91	−6 03	−49	92	268																							
91	−0 34	50	89	−1 24	49	90	−2 13	49	90	−3 02	49	91	−3 51	49	91	−4 40	49	92	−5 29	49	93	−6 18	−49	93	269																			
90	00 00	−49	90	−0 49	−49	91	−1 38	−49	91	−2 27	−50	92	−3 17	−49	92	−4 06	−49	93	−4 55	−49	93	−5 44	−49	94	270																			
89	00 34	49	91	−0 15	49	91	−1 04	49	92	−1 53	49	93	−2 42	49	93	−3 31	49	94	−4 20	49	94	−5 09	49	95	−5 58	−49	95	271																	
88	01 09	49	92	00 20	50	92	−0 30	49	93	−1 19	49	93	−2 08	49	94	−2 57	49	95	−3 46	49	95	−4 35	49	96	−5 24	49	96	−6 13	−49	97	272													
87	01 43	49	92	00 54	49	93	00 05	49	94	−0 44	50	94	−1 34	49	95	−2 23	49	95	−3 12	49	96	−4 01	49	96	−4 50	49	97	−5 39	49	98	273													
86	02 18	50	93	01 28	49	94	00 39	49	94	−0 10	49	95	−0 59	49	96	−1 48	50	96	−2 38	49	97	−3 27	49	97	−4 16	49	98	−5 05	49	98	−5 54	−49	99	274									
85	02 52	−49	94	02 03	−50	95	01 13	−49	95	00 24	−49	96	−0 25	−49	96	−1 14	−49	97	−2 03	−50	98	−2 53	−49	98	−3 42	−49	99	−4 31	−49	99	−5 20	−49	100	−6 09	−49	100	275						
84	03 26	49	95	02 37	49	95	01 48	50	96	00 58	49	97	00 09	49	97	−0 40	49	98	−1 29	50	98	−2 19	49	99	−3 08	49	99	−3 57	49	100	−4 46	50	101	−5 36	49	101	276						
83	04 00	49	96	03 11	49	96	02 22	49	97	01 33	50	97	00 43	49	98	−0 06	49	99	−0 55	50	99	−1 45	49	100	−2 34	49	100	−3 23	50	101	−4 13	49	101	−5 02	49	102	−5 51	−49	103	277			
82	04 35	50	97	03 45	49	97	02 56	49	98	02 07	50	98	01 17	49	99	00 28	49	99	−0 21	50	100	−1 11	49	101	−2 00	50	101	−2 50	49	102	−3 39	49	102	−4 28	50	103	−5 18	49	103	−6 07	−49	104	278		
81	05 09	49	97	04 20	50	98	03 30	49	99	02 41	50	99	01 51	49	100	01 02	50	100	00 12	49	101	−0 37	49	101	−1 26	50	102	−2 16	49	103	−3 05	50	103	−3 55	49	104	−4 44	49	104	−5 33	50	105	279		
80	05 43	−49	98	04 54	−50	99	04 04	−49	99	03 15	−50	100	02 25	−49	100	01 36	−50	101	00 46	−49	102	−0 03	−50	102	−0 53	−49	103	−1 42	−50	103	−2 32	−49	104	−3 21	−50	104	−4 11	−49	105	−5 00	−50	106	−5 50	−49	106	280
79	06 17	49	99	05 28	50	100	04 38	49	100	03 49	50	101	02 59	50	101	02 09	49	102	01 20	50	102	00 30	49	103	−0 19	50	104	−1 09	49	104	−1 58	50	105	−2 48	50	105	−3 38	49	106	−4 27	50	106	−5 17	49	107	281
78	06 51	50	100	06 01	49	100	05 12	50	101	04 22	49	102	03 33	50	102	02 43	50	103	01 53	49	103	01 04	50	104	00 14	50	104	−0 36	49	105	−1 25	50	106	−2 15	50	106	−3 05	49	107	−3 54	50	107	−4 44	49	108	282
77	07 25	50	101	06 35	49	101	05 46	50	102	04 56	50	102	04 06	49	103	03 17	50	104	02 27	50	104	01 37	50	105	00 47	49	105	−0 02	50	106	−0 52	50	106	−1 42	50	107	−2 32	49	107	−3 21	50	108	−4 11	50	109	283
76	07 59	50	102	07 09	50	102	06 19	50	103	05 29	49	103	04 40	50	104	03 50	50	104	03 00	50	105	02 10	50	105	01 20	49	106	00 31	50	107	−0 19	50	107	−1 09	50	108	−1 59	50	108	−2 49	50	109	−3 39	49	109	284
75	08 32	−49	102	07 43	−50	103	06 53	−50	104	06 03	−50	104	05 13	−50	105	04 23	−50	105	03 33	−50	106	02 43	−50	106	01 53	−49	107	01 04	−50	107	00 14	−50	108	−0 36	−50	109	−1 26	−50	109	−2 16	−50	110	−3 06	−50	110	285
74	09 06	−50	103	08 16	50	104	07 26	50	104	06 36	50	105	05 46	50	105	04 56	50	106	04 06	50	107	03 16	50	107	02 26	50	108	01 36	50	108	00 46	50	109	−0 04	50	109	−0 54	50	110	−1 44	50	110	−2 34	50	111	286
73	09 39	50	104	08 49	50	105	07 59	50	105	07 09	50	106	06 19	50	106	05 29	50	107	04 39	50	107	03 49	50	108	02 59	50	109	02 09	50	109	01 19	50	110	00 29	51	110	−0 22	50	111	−1 12	50	111	−2 02	50	112	287
72	10 13	50	105	09 23	50	105	08 33	50	106	07 43	51	107	06 52	50	107	06 02	50	108	05 12	50	108	04 22	50	109	03 32	51	109	02 41	50	110	01 51	50	110	01 01	50	111	00 11	51	112	−0 40	50	112	−1 30	50	113	288
71	10 46	50	106	09 56	50	106	09 06	51	107	08 15	50	107	07 25	50	108	06 35	50	109	05 45	51	109	04 54	50	110	04 04	50	110	03 14	51	111	02 23	50	111	01 33	51	112	00 42	50	112	−0 08	50	113	−0 58	51	113	289
70	11 19	−50	107	10 29	−51	107	09 38	−50	108	08 48	−50	108	07 58	−51	109	07 07	−50	109	06 17	−50	110	05 27	−51	110	04 36	−50	111	03 46	−51	112	02 55	−50	112	02 05	−51	113	01 14	−50	113	00 24	−51	114	−0 27	−50	114	290
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) CONTRARY NAME TO LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	11 52	51	107	11 01	50	108	10 11	50	109	09 21	51	109	08 30	50	110	07 40	51	110	06 49	50	111	05 59	51	111	05 08	50	112	04 18	51	112	03 27	51	113	02 36	50	113	01 46	51	114	00 55	51	115	00 04	50	115	291
68	12 24	50	108	11 34	50	109	10 44	51	109	09 53	50	110	09 03	51	111	08 12	51	111	07 21	50	112	06 31	51	112	05 40	51	113	04 49	50	113	03 59	51	114	03 08	51	114	02 17	51	115	01 26	51	115	00 35	50	116	292
67	12 57	50	109	12 07	51	110	11 16	51	110	10 25	50	111	09 35	51	111	08 44	51	112	07 53	50	112	07 03	51	113	06 12	51	114	05 21	51	114	04 30	51	115	03 39	51	115	02 48	51	116	01 57	51	116	01 06	51	117	293
66	13 29	50	110	12 39	51	111	11 48	50	111	10 58	51	112	10 07	51	112	09 16	51	113	08 25	51	113	07 34	51	114	06 43	51	114	05 52	51	115	05 01	51	115	04 10	51	116	03 19	51	116	02 28	51	117	01 37	51	118	294
65	14 02	−51	111	13 11	−51	111	12 20	−51	112	11 29	−50	113	10 39	−51	113	09 48	−51	114	08 57	−51	114	08 06	−52	115	07 14	−51	115	06 23	−51	116	05 32	−51	116	04 41	−51	117	03 50	−51	117	02 59	−52	118	02 07	−51	118	295
64	14 34	51	112	13 43	51	112	12 52	51	113	12 01	51	113	11 10	51	114	10 19	51	114	09 28	51	115	08 37	52	116	07 45	51	116	06 54	51	117	06 03	51	117	05 12	52	118	04 20	51	118	03 29	51	119	02 38	52	119	296
63	15 06	51	113	14 15	51	113	13 24	51	114	12 33	52	114	11 41	51	115	10 50	51	115	09 59	51	116	09 08	52	116	08 16	51	117	07 25	52	117	06 33	51	118	05 42	52	118	04 50	51	119	03 59	52	120	03 07	51	120	297
62	15 37	51	114	14 46	51	114	13 55	51	115	13 04	51	115	12 13	52	116	11 21	51	116	10 30	52	117	09 38	51	117	08 47	52	118	07 55	51	118	07 04	52	119	06 12	52	119	05 20	51	120	04 29	52	120	03 37	52	121	298
61	16 09	51	114	15 18	52	115	14 26	51	115	13 35	52	116	12 43	51	117	11 52	52	117	11 00	51	118	10 09	52	118	09 17	52	119	08 25	51	119	07 34	52	120	06 42	52	120	05 50	52	121	04 58	53	121	04 07	52	122	299
60	16 40	−51	115	15 49	−52	116	14 57	−51	116	14 06	−52	117	13 14	−52	117	12 22	−51	118	11 31	−52	118	10 39	−52	119	09 47	−52	120	08 55	−51	120	08 04	−52	121	07 12	−52	121	06 20	−52	122	05 28	−52	122	04 36	−52	123	300
59	17 11	52	116	16 19	51	117	15 28	52	117	14 36	51	118	13 45	52	118	12 53	52	119	12 01	52	119	11 09	52	120	10 17	52	120	09 25	52	121	08 33	52	121	07 41	52	122	06 49	52	122	05 57	52	123	05 05	53	123	301
58	17 42	52	117	16 50	52	118	15 58	51	118	15 07	52	119	14 15	52	119	13 23	52	120	12 31	52	120	11 39	52	121	10 47	53	121	09 54	52	122	09 02	52	122	08 10	52	123	07 18	53	123	06 25	52	124	05 33	52	124	302
57	18 12	52	118	17 20	51	119	16 29	52	119	15 37	52	120	14 45	52	120	13 53	53	121	13 00	52	121	12 08	52	122	11 16	52	122	10 24	53	123	09 31	52	123	08 39	53	124	07 46	52	124	06 54	53	125	06 01	52	125	303
56	18 42	51	119	17 51	52	119	16 59	53	120	16 06	52	120	15 14	52	121	14 22	52	122	13 30	53	122	12 37	52	123	11 45	53	123	10 52	52	124	10 00	53	124	09 07	52	124	08 15	53	125	07 22	53	125	06 29	52	126	304
55	19 12	−52	120	18 20	−52	120	17 28	−52	121	16 36	−52	121	15 44	−53	122	14 51	−52	122	13 59	−53	123	13 06	−52	123	12 14	−53	124	11 21	−53	124	10 28	−52	125	09 36	−53	125	08 43	−53	126	07 50	−53	126	06 57	−53	127	305
54	19 42	52	121	18 50	52	121	17 58	53	122	17 05	52	122	16 13	53	123	15 20	53	123	14 27	52	124	13 35	53	124	12 42	53	125	11 49	53	125	10 56	53	126	10 03	52	126	09 11	53	127	08 18	53	127	07 25	53	128	306
53	20 12	53	122	19 19	52	122	18 27	53	123	17 34	53	123	16 41	52	124	15 49	53	124	14 56	53	125	14 03	53	125	13 10	53	126	12 17	53	126	11 24	53	127	10 31	53	127	09 38	53	128	08 45	53	128	07 52	54	129	307
52	20 41	53	123	19 48	53	123	18 55	52	124	18 03	53	124	17 10	53	125	16 17	53	125	15 24	53	126	14 31	53	126	13 38	53	127	12 45	53	127	11 52	54	128	10 58	53	128	10 05	53	128	09 12	54	129	08 18	53	129	308
51	21 10	53	124	20 17	53	124	19 24	53	125	18 31	53	125	17 38	53	126	16 45	53	126	15 52	53	127	14 59	54	127	14 05	53	127	13 12	53	128	12 19	54	128	11 25	53	129	10 32	54	129	09 38	53	130	08 45	54	130	309
50	21 38	−53	125	20 45	−53	125	19 52	−53	126	18 59	−53	126	18 06	−53	126	17 13	−54	127	16 19	−53	127	15 26	−53	128	14 33	−54	128	13 39	−53	129	12 46	−54	129	11 52	−54	130	10 58	−53	130	10 05	−54	131	09 11	−54	131	310
49	22 06	53	125	21 13	53	126	20 20	53	126	19 27	54	127	18 33	53	127	17 40	54	128	16 46	53	128	15 53	54	129	14 59	53	129	14 06	54	130	13 12	54	130	12 18	54	131	11 24	53	131	10 31	54	132	09 37	54	132	311
48	22 34	53	126	21 41	53	127	20 48	54	127	19 54	53	128	19 01	54	128	18 07	54	129	17 13	53	129	16 20	54	130	15 26	54	130	14 32	54	131	13 38	54	131	12 44	54	132	11 50	54	132	10 56	54	132	10 02	54	133	312
47	23 02	54	127	22 08	53	128	21 15	54	128	20 21	54	129	19 27	53	129	18 34	54	130	17 40	54	130	16 46	54	131	15 52	54	131	14 58	54	132	14 04	54	132	13 10	55	132	12 15	54	133	11 21	54	133	10 27	54	134	313
46	23 29	54	128	22 35	54	129	21 41	53	129	20 48	54	130	19 54	54	130	19 00	54	131	18 06	54	131	17 12	54	132	16 18	55	132	15 23	54	133	14 29	54	133	13 35	54	133	12 41	55	134	11 46	54	134	10 52	55	135	314
45	23 56	−54	129	23 02	−54	130	22 08	−54	130	21 14	−54	131	20 20	−54	131	19 26	−54	132	18 32	−55	132	17 37	−54	133	16 43	−54	133	15 49	−55	133	14 54	−54	134	14 00	−55	134	13 05	−54	135	12 11	−55	135	11 16	−55	136	315
44	24 22	54	130	23 28	54	131	22 34	54	131	21 40	54	132	20 46	55	132	19 51	54	133	18 57	55	133	18 02	54	134	17 08	55	134	16 13	54	134	15 19	55	135	14 24	55	135	13 29	54	136	12 35	55	136	11 40	55	137	316
43	24 48	54	131	23 54	54	132	23 00	55	132	22 05	54	133	21 11	55	133	20 16	54	134	19 22	55	134	18 27	54	134	17 33	55	135	16 38	55	135	15 43	55	136	14 48	55	136	13 53	55	137	12 58	55	137	12 03	55	137	317
42	25 14	55	132	24 19	54	133	23 25	55	133	22 30	54	134	21 36	55	134	20 41	55	135	19 46	54	135	18 52	55	135	17 57	55	136	17 02	55	136	16 07	55	137	15 12	55	137	14 17	55	138	13 22	56	138	12 26	55	138	318
41	25 39	55	133	24 44	54	134	23 50	55	134	22 55	55	135	22 00	55	135	21 05	55	136	20 10	55	136	19 15	55	136	18 20	55	137	17 25	55	137	16 30	55	138	15 35	55	138	14 40	56	138	13 44	55	139	12 49	55	139	319
40	26 04	−55	134	25 09	−55	135	24 14	−55	135	23 19	−55	136	22 24	−55	136	21 29	−55	137	20 34	−55	137	19 39	−55	137	18 44	−56	138	17 48	−55	138	16 53	−55	139	15 58	−56	139	15 02	−55	139	14 07	−56	140	13 11	−55	140	320
39	26 28	55	135	25 33	55	136	24 38	55	136	23 43	55	137	22 48	55	137	21 53	56	137	20 57	55	138	20 02	55	138	19 07	56	139	18 11	55	139	17 16	56	140	16 20	55	140	15 25	56	140	14 29	56	141	13 33	56	141	321
38	26 52	55	136	25 57	55	137	25 02	55	137	24 07	56	138	23 11	55	138	22 16	56	138	21 20	55	139	20 25	56	139	19 29	55	140	18 34	56	140	17 38	56	140	16 42	56	141	15 46	56	141	14 50	55	142	13 55	56	142	322
37	27 16	56	137	26 20	55	138	25 25	55	138	24 30	56	139	23 34	56	139	22 38	55	139	21 43	56	140	20 47	56	140	19 51	56	141	18 55	56	141	17 59	55	141	17 04	56	142	16 08	56	142	15 12	56	143	14 16	57	143	323
36	27 39	56	138	26 43	55	139	25 48	56	139	24 52	56	140	23 56	55	140	23 01	56	140	22 05	56	141	21 09	56	141	20 13	56	142	19 17	56	142	18 21	56	142	17 25	57	143	16 28	56	143	15 32	56	144	14 36	56	144	324
35	28 01	−55	139	27 06	−56	140	26 10	−56	140	25 14	−56	141	24 18	−56	141	23 22	−56	142	22 26	−56	142	21 30	−56	142	20 34	−56	143	19 38	−57	143	18 41	−56	143	17 45	−56	144	16 49	−57	144	15 52	−56	144	14 56	−56	145	325
34	28 24	56	141	27 28	56	141	26 32	56	141	25 36	56	142	24 40	57	142	23 43	56	143	22 47	56	143	21 51	56	143	20 55	57	144	19 58	56	144	19 02	57	144	18 05	56	145	17 09	57	145	16 12	56	145	15 16	57	146	326
33	28 45	56	142	27 49	56	142	26 53	56	142	25 57	57	143	25 00	56	143	24 04	56	144	23 08	57	144	22 11	56	144	21 15	57	145	20 18	56	145	19 22	57	145	18 25	57	146	17 28	56	146	16 32	57	146	15 35	57	147	327
32	29 06	56	143	28 10	56	143	27 14	57	143	26 17	56	144	25 21	57	144	24 24	56	145	23 28	57	145	22 31	57	145	21 34	56	146	20 38	57	146	19 41	57	146	18 44	57	147	17 47	57	147	16 50	57	147	15 53	57	148	328
31	29 27	57	144	28 30	56	144	27 34	57	145	26 37	56	145	25 41	57	145	24 44	57	146	23 47	57	146	22 50	56	146	21 54	57	147	20 57	57	147	20 00	57	147	19 03	57	148	18 06	57	148	17 09	57	148	16 12	58	149	329
30	29 47	−57	145	28 50	−56	145	27 54	−57	146	26 57	−57	146	26 00	−57	146	25 03	−57	147	24 06	−57	147	23 09	−57	147	22 12	−57	148	21 15	−57	148	20 18	−57	148	19 21	−57	149	18 24	−58	149	17 26	−57	149	16 29	−57	150	330
29	30 07	57	146	29 10	57	146	28 13	57	147	27 16	57	147	26 19	57	147	25 22	57	148	24 25	57	148	23 28	58	148	22 30	57	149	21 33	57	149	20 36	57	149	19 39	58	150	18 41	57	150	17 44	58	150	16 46	57	151	331
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N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	64 00	+60	180	360
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41	39 04	52	125	39 56	52	125	40 48	52	124	41 40	52	123	42 32	51	123	43 23	52	122	44 15	50	121	45 05	51	121	45 56	50	120	46 46	50	119	47 36	50	118	48 26	49	117	49 15	49	116	50 04	48	116	50 52	48	115	319
42	38 35	53	124	39 28	51	124	40 19	52	123	41 11	52	122	42 03	51	122	42 54	51	121	43 45	51	120	44 36	50	119	45 26	50	119	46 16	50	118	47 06	49	117	47 55	49	116	48 44	49	115	49 33	48	114	50 21	48	113	318
43	38 07	52	123	38 59	51	123	39 50	52	122	40 42	51	121	41 33	51	120	42 24	51	120	43 15	50	119	44 05	51	118	44 56	49	118	45 45	50	117	46 35	49	116	47 24	49	115	48 13	48	114	49 01	48	113	49 49	48	112	317
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45	37 08	+52	121	38 00	+51	120	38 51	+51	120	39 42	+51	119	40 33	+51	118	41 24	+50	118	42 14	+50	117	43 04	+50	116	43 54	+49	115	44 43	+50	115	45 33	+48	114	46 21	+49	113	47 10	+48	112	47 58	+47	111	48 45	+47	110	315
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47	36 09	51	119	37 00	51	118	37 51	51	118	38 42	50	117	39 32	50	116	40 22	50	116	41 12	50	115	42 02	49	114	42 51	49	113	43 40	49	113	44 29	48	112	45 17	48	111	46 05	48	110	46 53	47	109	47 40	47	108	313
48	35 39	51	118	36 30	50	117	37 20	51	117	38 11	50	116	39 01	50	115	39 51	50	115	40 41	49	114	41 30	50	113	42 20	48	112	43 08	49	112	43 57	48	111	44 45	48	110	45 33	47	109	46 20	47	108	47 07	47	107	312
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55	31 59	+50	111	32 49	+50	110	33 39	+49	110	34 28	+50	109	35 18	+49	108	36 07	+48	108	36 57	+49	107	37 44	+48	106	38 32	+48	105	39 20	+47	105	40 07	+47	104	40 54	+47	103	41 41	+46	102	42 27	+47	101	43 14	+45	101	305
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57	30 55	49	109	31 44	50	109	32 34	49	108	33 23	49	107	34 12	49	107	35 01	48	106	35 49	48	106	36 37	48	104	37 25	48	104	38 13	47	103	39 00	47	102	39 47	47	101	40 34	46	100	41 20	46	100	42 06	45	99	303
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59	29 50	49	107	30 39	49	107	31 28	49	106	32 17	49	105	33 06	48	105	33 54	48	104	34 42	48	103	35 30	48	103	36 18	47	102	37 05	47	101	37 52	47	100	38 39	47	99	39 26	46	99	40 12	45	98	40 57	46	97	301
60	29 17	+49	106	30 06	+49	106	30 55	+49	105	31 44	+48	104	32 32	+49	104	33 21	+48	103	34 09	+48	102	34 57	+47	102	35 44	+47	101	36 31	+48	100	37 19	+46	99	38 05	+47	99	38 52	+46	98	39 38	+45	97	40 23	+46	96	300
61	28 44	49	106	29 33	49	105	30 22	48	104	31 10	49	104	31 59	48	103	32 47	48	102	33 35	48	101	34 23	47	101	35 10	48	100	35 58	47	99	36 45	46	98	37 31	46	98	38 17	46	97	39 03	46	96	39 49	45	95	299
62	28 10	49	105	28 59	49	104	29 48	49	103	30 37	48	103	31 25	48	102	32 13	48	101	33 01	48	101	33 49	47	100	34 36	48	99	35 24	46	98	36 10	47	98	36 57	46	97	37 43	46	96	38 29	46	95	39 15	45	94	298
63	27 37	49	104	28 26	49	103	29 15	48	102	30 03	48	102	30 51	49	101	31 40	47	100	32 27	48	100	33 15	47	99	34 02	47	98	34 49	47	97	35 36	47	97	36 23	46	96	37 09	46	95	37 55	45	94	38 40	46	93	297
64	27 03	49	103	27 52	49	102	28 41	48	102	29 29	49	101	30 18	48	100	31 06	47	99	31 53	48	99	32 41	47	98	33 28	47	97	34 15	47	97	35 02	47	96	35 49	46	95	36 35	46	94	37 21	45	93	38 06	45	93	296
65	26 30	+49	102	27 19	+48	101	28 07	+49	101	28 56	+48	100	29 44	+48	99	30 32	+47	99	31 19	+48	98	32 07	+47	97	32 54	+47	96	33 41	+47	96	34 28	+46	95	35 14	+46	94	36 00	+46	93	36 46	+46	93	37 32	+45	92	295
66	25 56	49	101	26 45	48	100	27 33	49	100	28 22	48	99	29 10	48	98	29 58	47	98	30 45	48	97	31 33	47	96	32 20	47	96	33 07	47	95	33 54	46	94	34 40	46	93	35 26	46	93	36 12	45	92	36 57	45	91	294
67	25 22	49	100	26 11	48	100	26 59	49	99	27 48	48	98	28 36	47	98	29 23	48	97	30 11	47	96	30 58	48	95	31 46	47	95	32 33	46	94	33 19	47	93	34 06	46	93	34 52	45	92	35 37	46	91	36 23	45	90	293
68	24 48	49	99	25 37	48	99	26 25	48	98	27 13	48	97	28 01	48	97	28 49	48	96	29 37	47	95	30 24	47	95	31 11	47	94	31 58	47	93	32 45	46	92	33 31	46	92	34 17	46	91	35 03	45	90	35 48	46	89	292
69	24 14	49	99	25 03	48	98	25 51	48	97	26 39	48	97	27 27	48	96	28 15	48	95	29 03	47	94	29 50	47	94	30 37	47	93	31 24	46	92	32 10	47	92	32 57	46	91

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	23 40	+49	98	24 29	+48	97	25 17	+48	96	26 05	+48	96	26 53	+48	95	27 41	+47	94	28 28	+48	94	29 16	+47	93	30 03	+46	92	30 49	+47	92	31 36	+46	91	32 22	+46	90	33 08	+46	89	33 54	+46	88	34 40	+45	88	290
71	23 06	49	97	23 55	48	96	24 43	48	96	25 31	48	95	26 19	47	94	27 06	48	94	27 54	47	93	28 41	47	92	29 28	47	91	30 15	47	91	31 02	46	90	31 48	46	89	32 34	46	88	33 20	45	88	34 05	45	87	289
72	22 32	48	96	23 20	49	95	24 09	48	95	24 57	47	94	25 44	48	93	26 32	47	93	27 19	48	92	28 07	47	91	28 54	47	91	29 41	46	90	30 27	46	89	31 13	47	88	32 00	45	88	32 45	46	87	33 31	45	86	288
73	21 58	48	95	22 46	48	94	23 34	48	94	24 22	48	93	25 10	48	93	25 58	47	92	26 45	47	91	27 32	47	90	28 19	47	90	29 06	47	89	29 53	46	88	30 39	46	88	31 25	46	87	32 11	46	86	32 57	45	85	287
74	21 23	49	94	22 12	48	94	23 00	48	93	23 48	48	92	24 36	47	92	25 23	48	91	26 11	47	90	26 58	47	90	27 45	47	89	28 32	46	88	29 18	47	88	30 05	46	87	30 51	46	86	31 37	45	85	32 22	46	85	286
75	20 49	+48	93	21 37	+48	93	22 25	+48	92	23 13	+48	92	24 01	+48	91	24 49	+47	90	25 36	+47	90	26 23	+48	89	27 11	+46	88	27 57	+47	87	28 44	+46	87	29 30	+47	86	30 17	+45	85	31 02	+46	85	31 48	+45	84	285
76	20 15	48	93	21 03	48	92	21 51	48	91	22 39	48	91	23 27	47	90	24 14	48	89	25 02	47	89	25 49	47	88	26 36	47	87	27 23	47	87	28 10	46	86	28 56	46	85	29 42	46	84	30 28	46	84	31 14	45	83	284
77	19 40	49	92	20 29	48	91	21 17	48	91	22 05	47	90	22 52	48	89	23 40	47	89	24 27	48	88	25 15	47	87	26 02	47	87	26 49	46	86	27 35	47	85	28 22	46	84	29 08	46	84	29 54	46	83	30 40	45	82	283
78	19 06	48	91	19 54	48	90	20 42	48	90	21 30	48	89	22 18	48	88	23 06	47	88	23 53	47	87	24 40	47	86	25 27	47	86	26 14	47	85	27 01	47	84	27 48	46	84	28 34	46	83	29 20	46	82	30 06	45	81	282
79	18 32	48	90	19 20	48	90	20 08	48	89	20 56	48	88	21 44	47	88	22 31	48	87	23 19	47	86	24 06	47	86	24 53	47	85	25 40	47	84	26 27	46	84	27 13	47	83	28 00	46	82	28 46	46	81	29 32	45	81	281
80	17 57	+48	89	18 45	+48	89	19 33	+48	88	20 21	+48	87	21 09	+48	87	21 57	+47	86	22 44	+48	85	23 32	+47	85	24 19	+47	84	25 06	+47	83	25 53	+46	83	26 39	+47	82	27 26	+46	81	28 12	+46	81	28 58	+45	80	280
81	17 23	48	89	18 11	48	88	18 59	48	87	19 47	48	87	20 35	48	86	21 23	47	85	22 10	47	85	22 57	48	84	23 45	47	83	24 32	47	83	25 19	46	82	26 05	47	81	26 52	46	81	27 38	46	80	28 24	46	79	279
82	16 48	49	88	17 37	48	87	18 25	48	86	19 13	48	86	20 01	47	85	20 48	48	85	21 36	47	84	22 23	48	83	23 11	47	83	23 58	47	82	24 45	46	81	25 31	47	80	26 18	46	80	27 04	46	79	27 50	46	78	278
83	16 14	48	87	17 02	48	86	17 50	48	86	18 38	48	85	19 26	48	84	20 14	48	84	21 02	47	83	21 49	47	82	22 36	48	82	23 24	47	81	24 11	46	80	24 57	47	80	25 44	46	79	26 30	47	78	27 17	45	78	277
84	15 40	48	86	16 28	48	85	17 16	48	85	18 04	48	84	18 52	48	84	19 40	48	83	20 28	47	82	21 15	47	82	22 02	48	81	22 50	47	80	23 37	47	80	24 24	46	79	25 10	47	78	25 57	46	78	26 43	46	77	276
85	15 05	+49	85	15 54	+48	85	16 42	+48	84	17 30	+48	83	18 18	+48	83	19 06	+47	82	19 53	+48	82	20 41	+47	81	21 28	+48	80	22 16	+47	80	23 03	+47	79	23 50	+47	78	24 37	+46	77	25 23	+47	77	26 10	+46	76	275
86	14 31	48	84	15 19	49	84	16 08	48	83	16 56	48	83	17 44	48	82	18 32	47	81	19 19	48	81	20 07	48	80	20 55	47	79	21 42	47	79	22 29	47	78	23 16	47	77	24 03	47	77	24 50	46	76	25 36	46	75	274
87	13 57	48	84	14 45	48	83	15 33	49	82	16 22	48	82	17 10	48	81	17 58	48	81	18 46	47	80	19 33	48	79	20 21	47	79	21 08	48	78	21 56	47	77	22 43	47	77	23 30	46	76	24 16	47	75	25 03	46	75	273
88	13 23	48	83	14 11	48	82	14 59	49	82	15 48	48	81	16 36	48	80	17 24	48	80	18 12	47	79	18 59	48	79	19 47	48	78	20 35	47	77	21 22	47	77	22 09	47	76	22 56	47	75	23 43	47	75	24 30	46	74	272
89	12 48	49	82	13 37	48	81	14 25	49	81	15 14	48	80	16 02	48	80	16 50	48	79	17 38	48	78	18 26	48	78	19 14	47	77	20 01	48	76	20 49	47	76	21 36	47	75	22 23	47	74	23 10	47	74	23 57	46	73	271
90	12 14	+49	81	13 03	+48	81	13 51	+49	80	14 40	+48	79	15 28	+48	79	16 16	+48	78	17 04	+48	78	17 52	+48	77	18 40	+48	76	19 28	+47	76	20 15	+48	75	21 03	+47	74	21 50	+47	74	22 37	+47	73	23 24	+47	72	270
91	11 40	49	80	12 29	49	80	13 18	48	79	14 06	48	79	14 54	49	78	15 43	48	77	16 31	48	77	17 19	48	76	18 07	47	76	18 54	48	75	19 42	48	74	20 30	47	74	21 17	47	73	22 04	47	72	22 51	47	72	269
92	11 07	48	80	11 55	49	79	12 44	48	78	13 32	49	78	14 21	48	77	15 09	48	77	15 57	48	76	16 45	48	75	17 33	48	75	18 21	48	74	19 09	48	73	19 57	47	73	20 44	47	72	21 31	48	72	22 19	47	71	268
93	10 33	48	79	11 21	49	78	12 10	49	78	12 59	48	77	13 47	49	76	14 36	48	76	15 24	48	75	16 12	48	75	17 00	48	74	17 48	48	73	18 36	48	73	19 24	47	72	20 11	48	71	20 59	47	71	21 46	47	70	267
94	09 59	49	78	10 48	49	77	11 37	48	77	12 25	49	76	13 14	48	76	14 02	49	75	14 51	48	74	15 39	48	74	16 27	48	73	17 15	48	73	18 03	48	72	18 51	48	71	19 39	47	71	20 26	46	70	21 14	47	69	266
95	09 25	+49	77	10 14	+49	77	11 03	+49	76	11 52	+49	75	12 41	+48	75	13 29	+49	74	14 18	+48	74	15 06	+48	73	15 54	+49	72	16 43	+48	72	17 31	+48	71	18 19	+47	71	19 06	+48	70	19 54	+48	69	20 42	+47	69	265
96	08 52	49	76	09 41	49	76	10 30	49	75	11 19	48	75	12 07	49	74	12 56	49	74	13 45	48	73	14 33	49	72	15 22	48	72	16 10	48	71	16 58	48	70	17 46	48	70	18 34	48	69	19 22	48	69	20 10	47	68	264
97	08 18	50	76	09 08	49	75	09 57	48	75	10 45	49	74	11 34	49	73	12 23	49	73	13 12	48	72	14 00	49	72	14 49	48	71	15 37	49	70	16 26	48	70	17 14	48	69	18 02	48	68	18 50	48	68	19 38	48	67	263
98	07 45	49	75	08 34	49	74	09 23	49	74	10 12	49	73	11 01	49	73	11 50	49	72	12 39	49	71	13 28	49	71	14 17	48	70	15 05	49	70	15 54	48	69	16 42	48	68	17 30	48	68	18 18	48	67	19 06	48	66	262
99	07 12	49	74	08 01	49	73	08 50	50	73	09 40	49	72	10 29	49	72	11 18	49	71	12 07	48	71	12 55	49	70	13 44	49	69	14 33	49	69	15 22	48	68	16 10	48	68	16 58	49	67	17 47	48	66	18 35	48	66	261
100	06 39	+49	73	07 28	+50	73	08 18	+49	72	09 07	+49	72	09 56	+49	71	10 45	+49	70	11 34	+49	70	12 23	+49	69	13 12	+49	69	14 01	+49	68	14 50	+48	67	15 38	+49	67	16 27	+48	66	17 15	+49	66	18 04	+48	65	260
101	06 06	50	72	06 56	49	72	07 45	49	71	08 34	50	71	09 24	49	70	10 13	49	70	11 02	49	69	11 51	49	68	12 40	49	68	13 29	49	67	14 18	49	67	15 07	48	66	15 55	49	65	16 44	49	65	17 33	48	64	259
102	05 33	50	72	06 23	49	71	07 12	50	71	08 02	49	70	08 51	50	69	09 41	49	69	10 30	49	68	11 19	49	68	12 08	49	67	12 57	49	66	13 46	49	66	14 35	49	65	15 24	49	65	16 13	49	64	17 02	48	63	258
103	05 01	49	71	05 50	50	70	06 40	50	70	07 30	49	69	08 19	50	69	09 09	49	68	09 58	49	67	10 47	50	67	11 37	49	66	12 26	49	66	13 15	49	65	14 04	49	65	14 53	49	64	15 42	49	63	16 31	49	63	257
104	04 28	50	70	05 18	50	70	06 08	50	69	06 58	49	68	07 47	50	68	08 37	49	67	09 26	50	67	10 16	49	66	11 05	50	66	11 55	49	65	12 44	49	64	13 33	49	64	14 22	50	63	15 12	48	63	16 00	49	62	256
105	03 56	+50	69	04 46	+50	69	05 36	+50	68	06 26	+49	68	07 15	+50	67	08 05	+50	66	08 55	+50	66	09 45	+49	65	10 34	+50	65	11 24	+49	64	12 13	+50	64	13 03	+49	63	13 52	+49	62	14 41	+49	62	15 30	+49	61	255
106	03 24	50	68	04 14	50	68	05 04	50	67	05 54	50	67	06 44	50	66	07 34	50	66	08 24	49	65	09 13	50	65	10 03	50	64	10 53	49	63	11 42	50	63	12 32	49	62	13 21	50	62	14 11	49	61	15 00	49	61	254
107	02 52	50	68	03 42	50	67	04 32	50	67	05 22	50	66	06 12	50	65	07 02	50	65	07 52	50	64	08 42	50	64	09 32	50	63	10 22	50	63	11 12	50	62	12 02	49	61	12 51	50	61	13 41	49	60	14 30	50	60	253
108	02 20	51	67	03 11	50	66	04 01	50	66	04 51	50	65	05 41	50	65	06 31	51	64	07 22	50	64	08 12	50	63	09 02	50	62	09 52	50	62	10 42	49	61	11 31	50	61	12 21	50	60	13 11	50	60	14 01	49	59	252
109	01 49	50	66	02 39	51	65	03 30	50	65	04 20	50	64	05 10	51	64	06 01	50	63	06 51	50	63	07 41	50	62	08 31	50	62	09 21	51	61	10 12	50	61	11 02	50	60	11 52	49	59	12 41	50	59	13 31	50	58	251
110	01 17	+51	65	02 08	+50	65	02 58	+51	64	03 49	+50	64	04 39	+51	63	05 30	+50	63	06 20	+51	62	07 11	+50	61	08 01	+50	61	08 51	+51	60	09 42	+50	60	10 32	+50	59	11 22	+50	59	12 12	+50	58	13 02	+50	58	250
111	00 46	51	64	01 37	51	64	02 28	50	63	03 18	51	63	04 09	51	62	05 00	50	62	05 50	51	61	06 41	50	61	07 31	51	60	08 22	50	60	09 12	50	59	10 02	51	58	10 53	50	58	11 43	50	57	12 33	50	57	249
112	00 15	51	64	01 06	51	63	01 57	51	63	02 48	51	62	03 39	50	61	04 29	51	61	05 20	51	60	06 11	50	60	07 01	51	59	07 52	51	59	08 43	50	58	09 33	51	58	10 24	50	57	11 14	51	57	12 05	50	56	248
113	−0 15	51	63	00 36	51	62	01 27	51	62	02 18	50	61	03 08	51	61	03 59	51	60	04 50	51	60	05 41	51	59	06 32	51	59	07 23	51	58	08 14	50	57	09 04	51	57	09 55	51	56	10 46	50	56	11 36	51	55	247
114	−0 46	51	62	00 05	51	61	00 56	51	61	01 47	52	60	02 39	51	60	03 30	51	59	04 21	51	59	05 12	51	58	06 03	51	58	06 54	51	57	07 45	51	57	08 36	50	56	09 26	51	56	10 17	51	55	11 08	51	55	246
115	−1 16	+51	61	−0 25	+51	61	00 26	+52	60	01 18	+51	60	02 09	+51	59	03 00	+51	59	03 51	+52	58	04 43	+51	57	05 34	+51	57	06 25	+51	56	07 16	+51	56	08 07	+51	55	08 58	+51	55	09 49	+51	54	10 40	+51	54	245
116	−1 46	51	60	−0 55	52	60	−0 03	51	59	00 48	52	59	01 40	51	58	02 31	51	58	03 22	52	57	04 14	51	57	05 05	51	56	05 56	52	56	06 48	51	55	07 39	51	55	08 30	51	54	09 21	51	54	10 12	52	53	244
117	−2 16	52	59	−1 24	51	59	−0 33	52	58	00 19	51	58	01 10	52	57	02 02	52	57	02 54	51	56	03 45	52	56	04 37	51	55	05 28	52	55	06 20	51	54	07 11	51	54	08 02	52	53	08 54	51	53	09 45	51	52	243
118	−2 45	51	59	−1 54	52	58	−1 02	52	58	−0 10	52	57	00 42	51	57	01 33	52	56	02 25	52	56	03 17	51	55	04 08	52	55	05 00	52	54	05 52	51	54	06 43	52	53	07 35	52	53	08 27	51	52	09 18	52	51	242
119	−3 15	52	58	−2 23	52	57	−1 31	52	57	−0 39	52	56	00 13	52	56	01 05	52	55	01 57	52	55	02 49	52	54	03 41	51	54	04 32	52	53	05 24	52	53	06 16	52	52	07 08	52	52	08 00	51	51	08 51	52	51	241
120	−3 44	+52	57	−2 52	+52	56	−2 00	+53	56	−1 07	+52	55	−0 15	+52	55	00 37	+52	54	01 29	+52	54	02 21	+52	53	03 13	+52	53	04 05	+52	52	04 57	+52	52	05 49	+52	51	06 41	+52	51	07 33	+52	50	08 25	+52	50	240
121	−4 12	52	56	−3 20	52	56	−2 28	52	55	−1 36	53	55	−0 43	52	54	00 09	52	54	01 01	52	53	01 53	53	53	02 46	52	52	03 38	52	52	04 30	52	51	05 22	52	51	06 14	52	50	07 06	53	50	07 59	52	49	239
122	−4 41	53	55	−3 48	52	55	−2 56	52	54	−2 04	53	54	−1 11	52	53	−0 19	53	53	00 34	52	52	01 26	53	52	02 19	52	51	03 11	52	51	04 03	53	50	04 56	52	50	05 48	52	49	06 40	53	49	07 33	52	48	238
123	−5 09	53	54	−4 16	52	54	−3 24	53	53	−2 31	52	53	−1 39	53	52	−0 46	53	52	00 07	52	52	00 59	53	51	01 52	52	51	02 44	53	50	03 37	53	50	04 30	52	49	05 22	53	49	06 15	52	48	07 07	53	48	237
124	−5 37	53	54	−4 44	53	53	−3 51	52	53	−2 59	53	52	−2 06	53	52	−1 13	53	51	−0 20	53	51	00 33	52	50	01 25	53	50	02 18	53	49	03 11	53	49	04 04	52	48	04 56	53	48	05 49	53	47	06 42	52	47	236
125	−6 04	+53	53	−5 11	+53	52	−4 18	+52	52	−3 26	+53	51	−2 33	+53	51	−1 40	+53	50	−0 47	+53	50	00 06	+53	49	00 59	+53	49	01 52	+53	48	02 45	+53	48	03 38	+53	48	04 31	+53	47	05 24	+53	47	06 17	+53	46	235
			126	−5 38	53	51	−4 45	53	51	−3 52	53	50	−2 59	53	50	−2 06	53	50	−1 13	53	49	−0 20	53	49	00 33	54	48	01 27	53	48	02 20	53	47	03 13	53	47	04 06	53	46	04 59	53	46	05 52	53	45	234
			127	−6 05	+53	51	−5 12	53	50	−4 19	54	50	−3 25	53	49	−2 32	53	49	−1 39	54	48	−0 45	53	48	00 08	53	47	01 01	54	47	01 55	53	46	02 48	53	46	03 41	54	45	04 35	53	45	05 28	53	45	233
						128	−5 38	53	49	−4 45	54	49	−3 51	53	48	−2 58	54	48	−2 04	53	47	−1 11	54	47	−0 17	53	47	00 36	54	46	01 30	53	46	02 23	54	45	03 17	53	45	04 10	54	44	05 04	53	44	232
						129	−6 04	+54	48	−5 10	53	48	−4 17	54	47	−3 23	54	47	−2 29	53	47	−1 36	54	46	−0 42	54	46	00 12	53	45	01 05	54	45	01 59	54	44	02 53	54	44	03 47	53	43	04 40	54	43	231
												130	−5 36	+54	47	−4 42	+54	47	−3 48	+54	46	−2 54	+54	46	−2 00	+54	45	−1 06	+54	45	−0 12	+53	44	00 41	+54	44	01 35	+54	44	02 29	+54	43	03 23	+54	43	04 17	+54	42	230
												131	−6 01	+54	46	−5 07	54	46	−4 13	54	45	−3 19	54	45	−2 25	55	44	−1 30	54	44	−0 36	54	44	00 18	54	43	01 12	54	43	02 06	54	42	03 00	54	42	03 54	54	41	229
															132	−5 31	54	45	−4 37	54	44	−3 43	55	44	−2 48	54	44	−1 54	54	43	−1 00	54	43	−0 06	55	42	00 49	54	42	01 43	54	41	02 37	54	41	03 31	55	41	228
															133	−5 55	+54	44	−5 01	55	44	−4 06	54	43	−3 12	54	43	−2 18	55	42	−1 23	54	42	−0 29	55	42	00 26	54	41	01 20	55	41	02 15	54	40	03 09	55	40	227
																		134	−5 24	54	43	−4 30	55	42	−3 35	54	42	−2 41	55	42	−1 46	55	41	−0 51	54	41	00 03	55	40	00 58	55	40	01 53	54	39	02 47	55	39	226
																								135	−5 48	+55	42	−4 53	+55	41	−3 58	+55	41	−3 03	+55	41	−2 08	+54	40	−1 14	+55	40	−0 19	+55	39	00 36	+55	39	01 31	+55	39	02 26	+55	38	225
																								136	−6 10	+55	41	−5 15	55	41	−4 20	55	40	−3 25	55	40	−2 30	55	39	−1 35	55	39	−0 40	55	39	00 15	55	38	01 10	55	38	02 05	55	37	224
																																		137	−5 38	56	40	−4 42	55	39	−3 47	55	39	−2 52	55	39	−1 57	55	38	−1 02	56	38	−0 06	55	37	00 49	55	37	01 44	55	37	223
																																		138	−5 59	+55	39	−5 04	55	39	−4 09	56	38	−3 13	55	38	−2 18	55	37	−1 23	56	37	−0 27	55	37	00 28	56	36	01 24	55	36	222
																																													139	−5 25	55	38	−4 30	56	37	−3 34	55	37	−2 39	56	37	−1 43	56	36	−0 47	55	36	00 08	56	35	01 04	55	35	221

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 55°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 55°

LHA	15° Hc d Z	16° Hc d Z	17° Hc d Z	18° Hc d Z	19° Hc d Z	20° Hc d Z	21° Hc d Z	22° Hc d Z	23° Hc d Z	24° Hc d Z	25° Hc d Z	26° Hc d Z	27° Hc d Z	28° Hc d Z	29° Hc d Z	LHA
°	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	° ′ ′ °	°
140								−5 46 +56 37	−4 50 +55 36	−3 55 +56 36	−2 59 +58 36	−2 03 +56 35	−1 07 +55 35	−0 12 +56 35	00 44 +56 34	220
141								−6 07 +56 36	−5 11 56 36	−4 15 56 35	−3 19 56 35	−2 23 56 34	−1 27 56 34	−0 31 56 34	00 25 56 33	219
142									−5 30 56 35	−4 34 56 34	−3 38 56 34	−2 42 56 34	−1 46 56 33	−0 50 56 33	00 06 56 33	218
143									−5 50 56 34	−4 54 57 33	−3 57 56 33	−3 01 56 33	−2 05 57 32	−1 08 56 32	−0 12 56 32	217
144									−6 09 +57 33	−5 12 56 33	−4 16 57 32	−3 19 56 32	−2 23 57 32	−1 26 56 31	−0 30 57 31	216
145										−5 31 +57 32	−4 34 +57 31	−3 37 +56 31	−2 41 +57 31	−1 44 +57 30	−0 47 +56 30	215
146										−5 49 57 31	−4 52 57 31	−3 55 57 30	−2 58 57 30	−2 01 56 30	−1 05 57 29	214
147										−6 06 +57 30	−5 09 57 30	−4 12 57 29	−3 15 57 29	−2 18 57 29	−1 21 57 28	213
148											−5 26 57 29	−4 29 57 29	−3 32 58 28	−2 34 57 28	−1 37 57 28	212
149											−5 42 57 28	−4 45 57 28	−3 48 58 27	−2 50 57 27	−1 53 57 27	211
150											−5 58 +57 27	−5 01 +58 27	−4 03 +57 27	−3 06 +58 26	−2 08 +57 26	210
151												−5 16 58 26	−4 18 57 26	−3 21 58 25	−2 23 57 25	209
152												−5 31 58 25	−4 33 58 25	−3 35 57 25	−2 38 58 24	208
153												−5 45 58 24	−4 47 58 24	−3 49 58 24	−2 51 57 23	207
154												−5 59 +58 23	−5 01 58 23	−4 03 58 23	−3 05 58 23	206
155													−5 14 +58 22	−4 16 +58 22	−3 18 +58 22	205
156													−5 27 58 21	−4 29 59 21	−3 30 58 21	204
157													−5 39 58 20	−4 41 59 20	−3 42 58 20	203
158													−5 51 58 20	−4 53 59 19	−3 54 59 19	202
159													−6 02 +58 19	−5 04 59 19	−4 05 59 18	201
160														−5 14 +58 18	−4 16 +59 17	200
161														−5 25 59 17	−4 26 59 17	199
162														−5 34 59 16	−4 35 59 16	198
163														−5 43 59 15	−4 44 59 15	197
164														−5 52 59 14	−4 53 59 14	196
165														−6 00 +59 13	−5 01 +59 13	195
166															−5 09 60 12	194
167															−5 16 60 11	193
168															−5 22 59 11	192
169															−5 28 59 10	191
170															−5 34 +60 9	190
171															−5 39 60 8	189
172															−5 43 60 7	188
173															−5 47 60 6	187
174															−5 51 60 5	186
175															−5 53 +60 4	185
176															−5 56 60 4	184
177															−5 58 60 3	183
178															−5 59 60 2	182
179															−6 00 60 1	181

79	−6 06 −50 108	281														
78	−5 33 50 108	282														
77	−5 01 49 109	−5 50 −50 110	283													
76	−4 28 50 110	−5 18 50 110	−6 08 −50 111	284												
75	−3 56 −50 111	−4 46 −50 111	−5 36 −50 112	285												
74	−3 24 50 112	−4 14 50 112	−5 04 50 113	−5 54 −50 113	286											
73	−2 52 50 112	−3 42 50 113	−4 32 50 113	−5 22 50 114	−6 12 −50 115	287										
72	−2 20 51 113	−3 11 50 114	−4 01 50 114	−4 51 50 115	−5 41 50 115	288										
71	−1 49 50 114	−2 39 51 115	−3 30 50 115	−4 20 50 116	−5 10 51 116	−6 01 −50 117	289									
70	−1 17 −51 115	−2 08 −50 115	−2 58 −51 116	−3 49 −50 116	−4 39 −51 117	−5 30 −50 117	290									
	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LHA	15° Hc d Z	16° Hc d Z	17° Hc d Z	18° Hc d Z	19° Hc d Z	20° Hc d Z	21° Hc d Z	22° Hc d Z	23° Hc d Z	24° Hc d Z	25° Hc d Z	26° Hc d Z	27° Hc d Z	28° Hc d Z	29° Hc d Z	LHA
69	−0 46 51 116	−1 37 53 116	−2 28 50 117	−3 18 51 117	−4 09 51 118	−5 00 50 118	−5 50 −51 119	291								
68	−0 15 51 116	−1 06 53 117	−1 57 51 117	−2 48 51 118	−3 39 50 119	−4 29 51 119	−5 20 51 120	−6 11 −50 120	292							
67	00 15 51 117	−0 36 53 118	−1 27 51 118	−2 18 50 119	−3 08 51 119	−3 59 51 120	−4 50 51 120	−5 41 51 121	293							
66	00 46 51 118	−0 05 53 119	−0 56 51 119	−1 47 52 120	−2 39 51 120	−3 30 51 121	−4 21 51 121	−5 12 51 122	−6 03 −51 122	294						
65	01 16 −51 119	00 25 −53 119	−0 26 −52 120	−1 18 −51 120	−2 09 −51 121	−3 00 −51 121	−3 51 −52 122	−4 43 −51 123	−5 34 −51 123	295						
64	01 46 51 120	00 55 53 120	00 03 51 121	−0 48 52 121	−1 40 51 122	−2 31 51 122	−3 22 52 123	−4 14 51 123	−5 05 51 124	−5 56 −52 124	296					
63	02 16 52 121	01 24 51 121	00 33 52 122	−0 19 51 122	−1 10 52 123	−2 02 52 123	−2 54 51 124	−3 45 52 124	−4 37 51 125	−5 28 52 125	297					
62	02 45 51 121	01 54 52 122	01 02 52 122	00 10 52 123	−0 42 51 123	−1 33 52 124	−2 25 52 124	−3 17 51 125	−4 08 52 125	−5 00 52 126	−5 52 −51 126	298				
61	03 15 52 122	02 23 52 123	01 31 52 123	00 39 52 124	−0 13 52 124	−1 05 52 125	−1 57 52 125	−2 49 52 126	−3 41 51 126	−4 32 52 127	−5 24 52 127	−6 16 −52 128	299			
60	03 44 −52 123	02 52 −52 124	02 00 −53 124	01 07 −52 125	00 15 −52 125	−0 37 −52 126	−1 29 −52 126	−2 21 −52 127	−3 13 −52 127	−4 05 −52 128	−4 57 −52 128	−5 49 −52 129	300			
59	04 12 52 124	03 20 52 124	02 28 52 125	01 36 53 125	00 43 52 126	−0 09 52 126	−1 01 52 127	−1 53 53 127	−2 46 52 128	−3 38 52 128	−4 30 52 129	−5 22 52 129	−6 14 −52 130	301		
58	04 41 53 125	03 48 52 125	02 56 52 126	02 04 53 126	01 11 52 127	00 19 53 127	−0 34 52 128	−1 26 53 128	−2 19 52 129	−3 11 52 129	−4 03 53 130	−4 56 52 130	−5 48 52 131	302		
57	05 09 53 126	04 16 52 126	03 24 53 127	02 31 52 127	01 39 53 128	00 46 53 128	−0 07 52 128	−0 59 53 129	−1 52 52 129	−2 44 53 130	−3 37 53 130	−4 30 52 131	−5 22 53 131	−6 15 −52 132	303	
56	05 37 53 126	04 44 53 127	03 51 52 127	02 59 53 128	02 06 53 128	01 13 53 129	00 20 53 129	−0 33 52 130	−1 25 53 130	−2 18 53 131	−3 11 53 131	−4 04 52 132	−4 56 53 132	−5 49 53 133	304	
55	06 04 −53 127	05 11 −53 128	04 18 −52 128	03 26 −53 129	02 33 −53 129	01 40 −53 130	00 47 −53 130	−0 06 −53 131	−0 59 −53 131	−1 52 −53 132	−2 45 −53 132	−3 38 −53 132	−4 31 −53 133	−5 24 −53 133	−6 17 −53 134	305
54	06 32 54 128	05 38 53 129	04 45 53 129	03 52 53 130	02 59 53 130	02 06 53 130	01 13 53 131	00 20 53 131	−0 33 54 132	−1 27 53 132	−2 20 53 133	−3 13 53 133	−4 06 53 134	−4 59 53 134	−5 52 53 135	306
53	06 58 53 129	06 05 53 129	05 12 53 130	04 19 54 130	03 25 53 131	02 32 53 131	01 39 54 132	00 45 53 132	−0 08 53 133	−1 01 54 133	−1 55 53 134	−2 48 53 134	−3 41 54 135	−4 35 53 135	−5 28 53 135	307
52	07 25 53 130	06 32 54 130	05 38 53 131	04 45 54 131	03 51 53 132	02 58 54 132	02 04 53 133	01 11 54 133	00 17 53 133	−0 36 54 134	−1 30 53 134	−2 23 54 135	−3 17 53 135	−4 10 54 136	−5 04 53 136	308
51	07 51 53 131	06 58 54 131	06 04 54 132	05 10 53 132	04 17 54 133	03 23 54 133	02 29 53 133	01 36 54 134	00 42 54 134	−0 12 53 135	−1 05 54 135	−1 59 54 136	−2 53 54 136	−3 47 53 137	−4 40 54 137	309
50	08 17 −54 132	07 23 −53 132	06 30 −54 132	05 36 −54 133	04 42 −54 133	03 48 −54 134	02 54 −54 134	02 00 −54 135	01 06 −54 135	00 12 −53 136	−0 41 −54 136	−1 35 −54 136	−2 29 −54 137	−3 23 −54 137	−4 17 −54 138	310
49	08 43 54 132	07 49 54 133	06 55 54 133	06 01 54 134	05 07 54 134	04 13 54 135	03 19 54 135	02 25 55 136	01 30 54 136	00 36 54 136	−0 18 54 137	−1 12 54 137	−2 06 54 138	−3 00 54 138	−3 54 54 139	311
48	09 08 54 133	08 14 54 134	07 20 55 134	06 25 54 135	05 31 54 135	04 37 54 136	03 43 55 136	02 48 54 136	01 54 54 137	01 00 54 137	00 06 55 138	−0 49 54 138	−1 43 54 139	−2 37 54 139	−3 31 55 139	312
47	09 33 55 134	08 38 54 135	07 44 54 135	06 50 55 136	05 55 54 136	05 01 55 136	04 06 54 137	03 12 54 137	02 18 55 138	01 23 54 138	00 29 55 138	−0 26 54 139	−1 20 55 139	−2 15 54 140	−3 09 55 140	313
46	09 57 54 135	09 03 55 136	08 08 54 136	07 14 55 136	06 19 55 137	05 24 54 137	04 30 55 138	03 35 54 138	02 41 55 138	01 46 55 139	00 51 54 139	−0 03 55 140	−0 58 55 140	−1 53 54 141	−2 47 55 141	314
45	10 21 −54 136	09 27 −55 136	08 32 −55 137	07 37 −55 137	06 42 −54 138	05 48 −55 138	04 53 −55 139	03 58 −55 139	03 03 −55 139	02 08 −54 140	01 14 −55 140	00 19 −55 141	−0 36 −55 141	−1 31 −55 141	−2 26 −55 142	315
44	10 45 55 137	09 50 55 137	08 55 55 138	08 00 55 138	07 05 55 139	06 10 55 139	05 15 55 139	04 20 55 140	03 25 55 140	02 30 55 141	01 35 55 141	00 40 55 141	−0 15 55 142	−1 10 55 142	−2 05 55 143	316
43	11 08 55 138	10 13 55 138	09 18 55 139	08 23 55 139	07 28 55 139	06 33 55 140	05 38 56 140	04 42 55 141	03 47 55 141	02 52 55 141	01 57 55 142	01 02 56 142	00 06 55 143	−0 49 55 143	−1 44 55 143	317
42	11 31 55 139	10 36 55 139	09 41 56 140	08 45 55 140	07 50 55 140	06 55 56 141	05 59 55 141	05 04 55 141	04 09 56 142	03 13 55 142	02 18 55 143	01 23 56 143	00 27 55 143	−0 28 56 144	−1 24 55 144	318
41	11 54 56 140	10 58 55 140	10 03 56 140	09 07 55 141	08 12 56 141	07 16 55 142	06 21 56 142	05 25 55 142	04 30 56 143	03 34 55 143	02 39 56 143	01 43 56 144	00 47 55 144	−0 08 56 145	−1 04 55 145	319
40	12 16 −56 141	11 20 −55 141	10 25 −56 141	09 29 −56 142	08 33 −55 142	07 38 −56 142	06 42 −56 143	05 46 −56 143	04 50 −55 144	03 55 −56 144	02 59 −56 144	02 03 −56 145	01 07 −55 145	00 12 −56 145	−0 44 −56 146	320
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14	19 00 59 166	18 01 60 166	17 01 59 166	16 02 59 166	15 03 60 166	14 03 59 166	13 04 60 167	12 04 59 167	11 05 59 167	10 06 60 167	09 06 59 167	08 07 60 167	07 07 59 167	06 08 59 168	05 09 60 168	346
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10	19 29 −59 170	18 30 −60 170	17 30 −60 170	16 30 −59 170	15 31 −60 170	14 31 −60 170	13 31 −59 170	12 32 −60 171	11 32 −60 171	10 32 −60 171	09 32 −59 171	08 33 −60 171	07 33 −60 171	06 33 −59 171	05 34 −60 171	350
9	19 35 60 171	18 35 59 171	17 36 60 171	16 36 60 171	15 36 60 171	14 36 59 171	13 37 60 171	12 37 60 171	11 37 60 172	10 37 59 172	09 38 60 172	08 38 60 172	07 38 60 172	06 38 59 172	05 39 60 172	351
8	19 40 59 172	18 41 60 172	17 41 60 172	16 41 60 172	15 41 60 172	14 41 59 172	13 42 60 172	12 42 60 172	11 42 60 173	10 42 60 173	09 42 59 173	08 43 60 173	07 43 60 173	06 43 60 173	05 43 60 173	352
7	19 45 60 173	18 45 60 173	17 45 60 173	16 45 59 173	15 46 60 173	14 46 60 173	13 46 60 173	12 46 60 173	11 46 60 173	10 46 60 173	09 46 59 174	08 47 60 174	07 47 60 174	06 47 60 174	05 47 60 174	353
6	19 49 60 174	18 49 60 174	17 49 60 174	16 49 60 174	15 49 60 174	14 49 59 174	13 50 60 174	12 50 60 174	11 50 60 174	10 50 60 174	09 50 60 174	08 50 60 175	07 50 60 175	06 50 59 175	05 51 60 175	354
5	19 52 −60 175	18 52 −60 175	17 52 −59 175	16 53 −60 175	15 53 −60 175	14 53 −60 175	13 53 −60 175	12 53 −60 175	11 53 −60 175	10 53 −60 175	09 53 −60 175	08 53 −60 175	07 53 −60 176	06 53 −60 176	05 53 −60 176	355
4	19 55 60 176	18 55 60 176	17 55 60 176	16 55 60 176	15 55 60 176	14 55 60 176	13 55 60 176	12 55 60 176	11 55 59 176	10 56 60 176	09 56 60 176	08 56 60 176	07 56 60 176	06 56 60 176	05 56 60 176	356
3	19 57 60 177	18 57 60 177	17 57 60 177	16 57 60 177	15 57 60 177	14 57 60 177	13 57 60 177	12 57 60 177	11 57 60 177	10 57 59 177	09 58 60 177	08 58 60 177	07 58 60 177	06 58 60 177	05 58 60 177	357
2	19 59 60 178	18 59 60 178	17 59 60 178	16 59 60 178	15 59 60 178	14 59 60 178	13 59 60 178	12 59 60 178	11 59 60 178	10 59 60 178	09 59 60 178	08 59 60 178	07 59 60 178	06 59 60 178	05 59 60 178	358
1	20 00 60 179	19 00 60 179	18 00 60 179	17 00 60 179	16 00 60 179	15 00 60 179	14 00 60 179	13 00 60 179	12 00 60 179	11 00 60 179	10 00 60 179	09 00 60 179	08 00 60 179	07 00 60 179	06 00 60 179	359
0	20 00 −60 180	19 00 −60 180	18 00 −60 180	17 00 −60 180	16 00 −60 180	15 00 −60 180	14 00 −60 180	13 00 −60 180	12 00 −60 180	11 00 −60 180	10 00 −60 180	09 00 −60 180	08 00 −60 180	07 00 −60 180	06 00 −60 180	360
	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 55°

FOR AIR NAVIGATION VOL.3

Latitudes 39° - 89°

Table		
Lat 42° - 51°		
Lat 52° - 55°		
Lat 56° - 70°	Lat 56°	120 - 127
	Lat 57°	128 - 135
	Lat 58°	136 - 143
	Lat 59°	144-151
	Lat 70°	232-236

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	34 00	+60	180	35 00	+60	180	36 00	+60	180	37 00	+60	180	38 00	+60	180	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	360
1	34 00	60	179	35 00	60	179	36 00	60	179	37 00	60	179	38 00	60	179	39 00	60	179	40 00	60	179	41 00	60	179	42 00	60	179	43 00	60	179	44 00	60	179	45 00	60	179	46 00	60	179	47 00	60	179	48 00	60	179	359
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36	26 54	56	139	27 50	55	138	28 45	56	138	29 41	55	137	30 36	56	137	31 32	55	137	32 27	55	136	33 22	55	136	34 17	55	135	35 12	55	135	36 07	55	134	37 02	55	134	37 57	54	133	38 51	54	133	39 45	55	132	324
37	26 32	55	138	27 27	56	137	28 23	55	137	29 18	55	136	30 13	55	136	31 08	56	136	32 04	55	135	32 59	55	135	33 54	54	134	34 48	55	134	35 43	54	133	36 37	55	133	37 32	54	132	38 26	54	132	39 20	54	131	323
38	26 09	55	137	27 04	55	136	27 59	56	136	28 55	55	135	29 50	55	135	30 45	55	134	31 40	54	134	32 34	55	134	33 29	55	133	34 24	54	133	35 18	55	132	36 13	54	131	37 07	54	131	38 01	54	130	38 55	53	130	322
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41	24 58	55	134	25 53	54	133	26 47	55	133	27 42	55	132	28 37	54	132	29 31	54	131	30 25	55	131	31 20	54	130	32 14	54	130	33 08	54	129	34 02	53	129	34 55	54	128	35 49	53	128	36 42	54	127	37 36	53	127	319
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55	18 42	+53	120	19 35	+52	120	20 27	+53	119	21 20	+52	119	22 12	+52	118	23 04	+52	118	23 56	+52	117	24 48	+51	116	25 39	+52	116	26 31	+52	115	27 23	+51	115	28 14	+51	114	29 05	+51	114	29 56	+51	113	30 47	+51	112	305
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57	17 44	52	118	18 36	52	118	19 28	52	117	20 20	52	117	21 12	52	116	22 04	52	116	22 56	51	115	23 47	52	115	24 39	51	114	25 30	51	113	26 21	51	113	27 12	51	112	28 03	51	112	28 54	50	111	29 44	51	110	303
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62	15 13	52	114	16 05	51	113	16 56	51	113	17 47	52	112	18 39	51	112	19 30	51	111	20 21	51	111	21 12	51	110	22 03	50	109	22 53	51	109	23 44	51	108	24 35	50	108	25 25	50	107	26 15	50	106	27 05	50	106	298
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66	13 09	51	110	14 00	51	110	14 51	51	109	15 42	51	109	16 33	50	108	17 23	51	108	18 14	50	107	19 04	51	106	19 55	50	106	20 45	50	105	21 35	50	105	22 25	50	104	23 15	50	103	24 05	50	103	24 55	49	102	294
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68	12 06	50	109	12 56	51	108	13 47	51	107	14 38	50	107	15 28	51	106	16 19	50	106	17 09	51	105	18 00	50	105	18 50	50	104	19 40	50	103	20 30	50	103	21 20	50	102	22 10	50	102	23 00	49	101	23 49	49	100	292
69	11 34	50	108	12 24	51	107	13 15	51	107	14 06	50	106	14 56	51	105	15 47	50	105	16 37	50	104	17 27	50	104	18 17	50	103	19 07	50	103	19 57	50	102	20 47	50	101

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
70	11 02	+50	107	11 52	+51	106	12 43	+50	106	13 33	+51	105	14 24	+50	105	15 14	+50	104	16 04	+51	103	16 55	+50	103	17 45	+50	102	18 35	+50	102	19 25	+49	101	20 14	+50	101	21 04	+49	100	21 53	+50	99	22 43	+49	99	290
71	10 29	51	106	11 20	50	105	12 10	51	105	13 01	50	104	13 51	51	104	14 42	50	103	15 32	50	103	16 22	50	102	17 12	50	101	18 02	50	101	18 52	49	100	19 41	50	100	20 31	49	99	21 20	50	98	22 10	49	98	289
72	09 57	51	105	10 48	50	105	11 38	50	104	12 28	51	103	13 19	50	103	14 09	50	102	14 59	50	102	15 49	50	101	16 39	50	101	17 29	50	100	18 19	49	99	19 08	50	99	19 58	49	98	20 47	49	98	21 36	50	97	288
73	09 25	50	104	10 15	50	104	11 05	51	103	11 56	50	103	12 46	50	102	13 36	50	101	14 26	50	101	15 16	50	100	16 06	50	100	16 56	49	99	17 45	50	99	18 35	49	98	19 24	50	97	20 14	49	97	21 03	49	96	287
74	08 52	50	103	09 42	51	103	10 33	50	102	11 23	50	102	12 13	50	101	13 03	50	101	13 53	50	100	14 43	50	99	15 33	50	99	16 23	49	98	17 12	50	98	18 02	49	97	18 51	49	97	19 40	50	96	20 30	49	95	286
75	08 19	+51	103	09 10	+50	102	10 00	+50	101	10 50	+50	101	11 40	+50	100	12 30	+50	100	13 20	+50	99	14 10	+50	99	15 00	+49	98	15 49	+50	97	16 39	+49	97	17 28	+50	96	18 18	+49	96	19 07	+49	95	19 56	+49	94	285
76	07 46	51	102	08 37	50	101	09 27	50	101	10 17	50	100	11 07	50	99	11 57	50	99	12 47	50	98	13 37	49	98	14 26	50	97	15 16	50	97	16 06	49	96	16 55	49	95	17 44	50	95	18 34	49	94	19 23	49	94	284
77	07 14	50	101	08 04	50	100	08 54	50	100	09 44	50	99	10 34	50	99	11 24	50	98	12 14	49	97	13 03	50	97	13 53	50	96	14 43	49	96	15 32	50	95	16 22	49	95	17 11	49	94	18 00	49	93	18 49	49	93	283
78	06 41	50	100	07 31	50	99	08 21	50	99	09 11	50	98	10 01	49	98	10 50	50	97	11 40	50	97	12 30	50	96	13 20	49	95	14 09	50	95	14 59	49	94	15 48	49	94	16 37	50	93	17 27	49	93	18 16	49	92	282
79	06 08	50	99	06 58	49	99	07 47	50	98	08 37	50	97	09 27	50	97	10 17	50	96	11 07	50	96	11 57	49	95	12 46	50	95	13 36	49	94	14 25	50	93	15 15	49	93	16 04	49	92	16 53	49	92	17 42	49	91	281
80	05 34	+50	98	06 24	+50	98	07 14	+50	97	08 04	+50	97	08 54	+50	96	09 44	+49	96	10 33	+50	95	11 23	+50	94	12 13	+49	94	13 02	+50	93	13 52	+49	93	14 41	+49	92	15 30	+50	91	16 20	+49	91	17 09	+49	90	280
81	05 01	50	97	05 51	50	97	06 41	50	96	07 31	50	96	08 21	49	95	09 10	50	95	10 00	50	94	10 50	49	94	11 39	50	93	12 29	49	92	13 18	50	92	14 08	49	91	14 57	49	91	15 46	49	90	16 35	49	89	279
82	04 28	50	97	05 18	50	96	06 08	49	96	06 57	50	95	07 47	50	94	08 37	50	94	09 27	49	93	10 16	50	93	11 06	49	92	11 55	50	92	12 45	49	91	13 34	49	90	14 23	49	90	15 12	50	89	16 02	49	89	278
83	03 54	50	96	04 44	50	95	05 34	50	95	06 24	50	94	07 14	49	94	08 03	50	93	08 53	50	92	09 43	49	92	10 32	50	91	11 22	49	91	12 11	49	90	13 00	50	90	13 50	49	89	14 39	49	88	15 28	49	88	277
84	03 21	50	95	04 11	50	94	05 01	49	94	05 50	50	93	06 40	50	93	07 30	50	92	08 20	49	92	09 09	50	91	09 59	49	90	10 48	50	90	11 38	49	89	12 27	49	89	13 16	49	88	14 05	50	88	14 55	49	87	276
85	02 48	+49	94	03 37	+50	94	04 27	+50	93	05 17	+50	92	06 07	+49	92	06 56	+50	91	07 46	+50	91	08 36	+49	90	09 25	+50	90	10 15	+49	89	11 04	+49	88	11 53	+50	88	12 43	+49	87	13 32	+49	87	14 21	+49	86	275
86	02 14	50	93	03 04	50	93	03 54	49	92	04 43	50	92	05 33	50	91	06 23	49	91	07 12	50	90	08 02	50	89	08 52	49	89	09 41	49	88	10 30	50	88	11 20	49	87	12 09	49	86	12 58	50	86	13 48	49	85	274
87	01 41	49	92	02 30	50	92	03 20	50	91	04 10	50	91	05 00	49	90	05 49	50	90	06 39	49	89	07 28	50	89	08 18	50	88	09 08	49	87	09 57	49	87	10 46	50	86	11 36	49	86	12 25	49	85	13 14	49	85	273
88	01 07	50	92	01 57	50	91	02 47	49	91	03 36	50	90	04 26	50	89	05 16	49	89	06 05	50	88	06 55	49	88	07 44	50	87	08 34	49	87	09 23	50	86	10 13	49	85	11 02	50	85	11 52	49	84	12 41	49	84	272
89	00 34	49	91	01 23	50	90	02 13	50	90	03 03	49	89	03 52	50	89	04 42	50	88	05 32	49	87	06 21	50	87	07 11	50	86	08 01	49	86	08 50	49	85	09 39	50	85	10 29	49	84	11 18	49	83	12 07	50	83	271
90	00 00	+50	90	00 50	+49	89	01 39	+50	89	02 29	+50	88	03 19	+50	88	04 09	+49	87	04 58	+50	87	05 48	+50	86	06 38	+49	86	07 27	+50	85	08 17	+49	84	09 06	+50	84	09 56	+49	83	10 45	+49	83	11 34	+49	82	270
91	−0 34	50	89	00 16	50	89	01 06	50	88	01 56	49	87	02 45	50	87	03 35	50	86	04 25	49	86	05 14	50	85	06 04	50	85	06 54	49	84	07 43	50	84	08 33	49	83	09 22	50	82	10 12	49	82	11 01	49	81	269
92	−1 07	50	88	−0 17	49	88	00 32	50	87	01 22	50	87	02 12	50	86	03 02	49	86	03 51	50	85	04 41	50	84	05 31	49	84	06 20	50	83	07 10	50	83	08 00	49	82	08 49	49	82	09 38	50	81	10 28	49	80	268
93	−1 41	50	88	−0 51	50	87	−0 01	50	86	00 49	49	86	01 38	50	85	02 28	50	85	03 18	50	84	04 08	49	84	04 57	50	83	05 47	50	82	06 37	49	82	07 26	50	81	08 16	49	81	09 05	50	80	09 55	49	80	267
94	−2 14	50	87	−1 24	49	86	−0 35	50	86	00 15	50	85	01 05	50	84	01 55	50	84	02 45	49	83	03 34	50	83	04 24	50	82	05 14	50	82	06 04	49	81	06 53	50	81	07 43	49	80	08 32	50	79	09 22	49	79	266
95	−2 48	+50	86	−1 58	+50	85	−1 08	+50	85	−0 18	+50	84	00 32	+49	84	01 21	+50	83	02 11	+50	83	03 01	+50	82	03 51	+50	81	04 41	+49	81	05 30	+50	80	06 20	+50	80	07 10	+49	79	07 59	+50	79	08 49	+50	78	265
96	−3 21	50	85	−2 31	50	84	−1 41	49	84	−0 52	50	83	−0 02	50	83	00 48	50	82	01 38	50	82	02 28	50	81	03 18	50	81	04 08	49	80	04 57	50	79	05 47	50	79	06 37	50	78	07 27	49	78	08 16	50	77	264
97	−3 54	49	84	−3 05	50	84	−2 15	50	83	−1 25	50	83	−0 35	50	82	00 15	50	81	01 05	50	81	01 55	50	80	02 45	50	80	03 35	49	79	04 24	50	79	05 14	50	78	06 04	50	78	06 54	50	77	07 44	49	76	263
98	−4 28	50	83	−3 38	50	83	−2 48	50	82	−1 58	50	82	−1 08	50	81	−0 18	50	81	00 32	50	80	01 22	50	79	02 12	50	79	03 02	50	78	03 52	49	78	04 41	50	77	05 31	50	77	06 21	50	76	07 11	50	76	262
99	−5 01	50	83	−4 11	50	82	−3 21	50	81	−2 31	50	81	−1 41	50	80	−0 51	50	80	−0 01	50	79	00 49	50	79	01 39	50	78	02 29	50	78	03 19	50	77	04 09	50	76	04 59	50	76	05 49	50	75	06 39	49	75	261
100	−5 34	+50	82	−4 44	+50	81	−3 54	+50	81	−3 04	+50	80	−2 14	+50	79	−1 24	+50	79	−0 34	+50	78	00 16	+50	78	01 06	+50	77	01 56	+50	77	02 46	+50	76	03 36	+50	76	04 26	+50	75	05 16	+50	75	06 06	+50	74	260
101	−6 08	+51	81	−5 17	50	80	−4 27	50	80	−3 37	50	79	−2 47	50	79	−1 57	50	78	−1 07	50	78	−0 17	50	77	00 33	51	76	01 24	50	76	02 14	50	75	03 04	50	75	03 54	50	74	04 44	50	74	05 34	50	73	259
			102	−5 50	+50	79	−5 00	50	79	−4 10	50	78	−3 20	50	78	−2 30	50	77	−1 40	51	77	−0 49	50	76	00 01	50	76	00 51	50	75	01 41	51	75	02 32	50	74	03 22	50	73	04 12	50	73	05 02	50	72	258
			103				−5 33	50	78	−4 43	50	78	−3 53	51	77	−3 02	50	76	−2 12	50	76	−1 22	50	75	−0 32	51	75	00 19	50	74	01 09	50	74	01 59	51	73	02 50	50	73	03 40	50	72	04 30	50	72	257
			104				−6 06	+50	77	−5 16	51	77	−4 25	50	76	−3 35	50	76	−2 45	51	75	−1 54	50	74	−1 04	51	74	−0 13	50	73	00 37	50	73	01 27	51	72	02 18	50	72	03 08	50	71	03 58	51	71	256
									105	−5 48	+50	76	−4 58	+51	75	−4 07	+50	75	−3 17	+50	74	−2 27	+51	74	−1 36	+50	73	−0 46	+51	73	00 05	+50	72	00 55	+51	71	01 46	+50	71	02 36	+51	70	03 27	+50	70	255
									106	−6 21	+51	75	−5 30	50	74	−4 40	51	74	−3 49	50	73	−2 59	51	73	−2 08	50	72	−1 18	51	72	−0 27	51	71	00 24	50	71	01 14	51	70	02 05	50	70	02 55	51	69	254
												107	−6 03	+51	74	−5 12	51	73	−4 21	50	73	−3 31	51	72	−2 40	51	71	−1 49	50	71	−0 59	51	70	−0 08	51	70	00 43	50	69	01 33	51	69	02 24	51	68	253
															108	−5 44	51	72	−4 53	51	72	−4 02	50	71	−3 12	51	71	−2 21	51	70	−1 30	51	70	−0 39	50	69	00 11	51	68	01 02	51	68	01 53	51	67	252
															109	−6 16	+51	71	−5 25	51	71	−4 34	51	70	−3 43	51	70	−2 52	51	69	−2 01	50	69	−1 11	51	68	−0 20	51	68	00 31	51	67	01 22	51	67	251
																		110	−5 57	+51	70	−5 06	+51	69	−4 15	+51	68	−3 24	+51	68	−2 33	+51	68	−1 42	+51	67	−0 51	+51	67	00 00	+52	66	00 52	+51	66	250
																					111	−5 37	51	69	−4 46	51	68	−3 55	51	68	−3 04	52	67	−2 12	51	67	−1 21	51	66	−0 30	51	65	00 21	51	65	249
																					112	−6 08	+51	68	−5 17	51	67	−4 26	52	67	−3 34	51	66	−2 43	51	66	−1 52	51	65	−1 01	52	65	−0 09	51	64	248
																								113	−5 48	52	66	−4 05	51	65	−3 14	52	65	−2 22	51	64	−1 31	52	64	−0 39	51	63	247
																								114	−6 18	+51	66	−5 27	52	65	−4 35	51	64	−3 44	52	64	−2 52	51	63	−2 01	52	63	−1 09	51	62	246
																															115	−5 57	+51	64	−5 06	+52	64	−4 14	+52	63	−3 22	+51	63	−2 31	+52	62	−1 39	+52	62	245
																																	116	−5 36	52	63	−4 44	52	62	−3 52	52	62	−3 00	52	61	−2 08	52	61	244
																																	117	−6 05	+52	62	−5 13	52	61	−4 21	52	61	−3 29	52	60	−2 37	52	60	243
																																				118	−5 43	52	61	−4 51	53	60	−3 58	52	60	−3 06	52	59	242
																																				119	−6 12	+52	60	−5 20	53	59	−4 27	52	59	−3 35	52	58	241
																																							120	−5 48	+52	58	−4 56	+53	58	−4 03	+52	57	240
																																							121	−6 17	+53	58	−5 24	53	57	−4 31	52	57	239
																																									122	−5 52	53	56	−4 59	52	56	238
																																									123	−6 20	+53	55	−5 27	53	55	237
																																											124	−5 54	+53	54	236

LHA	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 56°

LAT 56°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 56°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
99	−5 01	−50	83	−5 51	−50	83	261																																							
98	−4 28	50	83	−5 18	50	84	−6 08	−49	84	262																																						
97	−3 54	50	84	−4 44	50	85	−5 34	50	85	263																																						
96	−3 21	50	85	−4 11	50	86	−5 01	49	86	−5 50	−50	87	264																																		
95	−2 48	−49	86	−3 37	−50	86	−4 27	−50	87	−5 17	−50	88	−6 07	−49	88	265																														
94	−2 14	50	87	−3 04	50	87	−3 54	49	88	−4 43	50	88	−5 33	50	89	266																														
93	−1 41	49	88	−2 30	50	88	−3 20	50	89	−4 10	50	89	−5 00	49	90	−5 49	−50	90	267																										
92	−1 07	50	88	−1 57	50	89	−2 47	49	89	−3 36	50	90	−4 26	50	91	−5 16	49	91	−6 05	−50	92	268																						
91	−0 34	49	89	−1 23	50	90	−2 13	50	90	−3 03	49	91	−3 52	50	91	−4 42	50	92	−5 32	49	93	−6 21	−50	93	269																		
90	00 00	−50	90	−0 50	−49	91	−1 39	−50	91	−2 29	−50	92	−3 19	−50	92	−4 09	−49	93	−4 58	−50	93	−5 48	−50	94	270																		
89	00 34	50	91	−0 16	50	91	−1 06	50	92	−1 56	49	93	−2 45	50	93	−3 35	50	94	−4 25	49	94	−5 14	50	95	−6 04	−50	95	271																
88	01 07	50	92	00 17	49	92	−0 32	50	93	−1 22	50	93	−2 12	50	94	−3 02	49	94	−3 51	50	95	−4 41	50	96	−5 31	49	96	−6 20	−50	97	272													
87	01 41	50	92	00 51	50	93	00 01	50	94	−0 49	49	94	−1 38	50	95	−2 28	50	95	−3 18	50	96	−4 08	49	96	−4 57	50	97	−5 47	50	98	273													
86	02 14	50	93	01 24	49	94	00 35	50	94	−0 15	50	95	−1 05	50	96	−1 55	50	96	−2 45	49	97	−3 34	50	97	−4 24	50	98	−5 14	50	98	−6 04	−49	99	274									
85	02 48	−50	94	01 58	−50	95	01 08	−50	95	00 18	−50	96	−0 32	−49	96	−1 21	−50	97	−2 11	−50	97	−3 01	−50	98	−3 51	−50	99	−4 41	−49	99	−5 30	−50	100	−6 20	−50	100	275						
84	03 21	50	95	02 31	50	96	01 41	49	96	00 52	50	97	00 02	50	97	−0 48	50	98	−1 38	50	98	−2 28	50	99	−3 18	50	99	−4 08	49	100	−4 57	50	101	−5 47	50	101	276						
83	03 54	49	96	03 05	50	96	02 15	50	97	01 25	50	97	00 35	50	98	−0 15	50	99	−1 05	50	99	−1 55	50	100	−2 45	50	100	−3 35	49	101	−4 24	50	101	−5 14	50	102	−6 04	−50	102	277			
82	04 28	50	97	03 38	50	97	02 48	50	98	01 58	50	98	01 08	50	99	00 18	50	99	−0 32	50	100	−1 22	50	101	−2 12	50	101	−3 02	50	102	−3 52	49	102	−4 41	50	103	−5 31	50	103	−6 21	−50	104	
81	05 01	50	97	04 11	50	98	03 21	50	99	02 31	50	99	01 41	50	100	00 51	50	100	00 01	50	101	−0 49	50	101	−1 39	50	102	−2 29	50	102	−3 19	50	103	−4 09	50	104	−4 59	50	104	−5 49	50	105	278	
80	05 34	−50	98	04 44	−50	99	03 54	−50	99	03 04	−50	100	02 14	−50	101	01 24	−50	101	00 34	−50	102	−0 16	−50	102	−1 06	−50	103	−1 56	−50	103	−2 46	−50	104	−3 36	−50	104	−4 26	−50	105	−5 16	−50	105	−6 06	−50	106	280
79	06 08	51	99	05 17	50	100	04 27	50	100	03 37	50	101	02 47	50	101	01 57	50	102	01 07	50	102	00 17	50	103	−0 33	51	104	−1 24	50	104	−2 14	50	105	−3 04	50	105	−3 54	50	106	−4 44	50	106	−5 34	50	107	281
78	06 41	51	100	05 50	50	101	05 00	50	101	04 10	50	102	03 20	50	102	02 30	50	103	01 40	51	103	00 49	50	104	−0 01	50	104	−0 51	50	105	−1 41	51	105	−2 32	50	106	−3 22	50	107	−4 12	50	107	−5 02	50	108	282
77	07 14	51	101	06 23	50	101	05 33	50	102	04 43	50	102	03 53	51	103	03 02	50	104	02 12	50	104	01 22	50	105	00 32	51	105	−0 19	50	106	−1 09	50	106	−1 59	51	107	−2 50	50	107	−3 40	50	108	−4 30	50	108	283
76	07 46	50	102	06 56	50	102	06 06	50	103	05 16	51	103	04 25	50	104	03 35	50	104	02 45	51	105	01 54	50	106	01 04	51	106	00 13	50	107	−0 37	50	107	−1 27	51	108	−2 18	50	108	−3 08	50	109	−3 58	51	109	284
75	08 19	−50	103	07 29	−50	103	06 39	−51	104	05 48	−50	104	04 58	−51	105	04 07	−50	105	03 17	−50	106	02 27	−51	106	01 36	−50	107	00 46	−51	107	−0 05	−50	108	−0 55	−51	109	−1 46	−50	109	−2 36	−51	110	−3 27	−50	110	285
74	08 52	50	103	08 02	51	104	07 11	50	104	06 21	51	105	05 30	50	106	04 40	51	106	03 49	50	107	02 59	51	107	02 08	50	108	01 18	51	108	00 27	51	109	−0 24	50	109	−1 14	51	110	−2 05	50	110	−2 55	51	111	286
73	09 25	51	104	08 34	50	105	07 44	51	105	06 53	50	106	06 03	51	106	05 12	51	107	04 21	50	107	03 31	51	108	02 40	51	109	01 49	50	109	00 59	51	110	00 08	51	110	−0 43	50	111	−1 33	51	111	−2 24	51	112	287
72	09 57	50	105	09 07	51	106	08 16	51	106	07 25	50	107	06 35	51	107	05 44	51	108	04 53	51	108	04 02	50	109	03 12	51	109	02 21	51	110	01 30	51	110	00 39	50	111	−0 11	51	112	−1 02	51	112	−1 53	51	113	288
71	10 29	50	106	09 39	51	106	08 48	51	107	07 57	50	108	07 07	51	108	06 16	51	109	05 25	51	109	04 34	51	110	03 43	51	110	02 52	51	111	02 01	50	111	01 11	51	112	00 20	51	112	−0 31	51	113	−1 22	51	113	289
70	11 02	−51	107	10 11	−51	107	09 20	−51	108	08 29	−51	108	07 38	−50	109	06 48	−51	109	05 57	−51	110	05 06	−51	111	04 15	−51	111	03 24	−51	112	02 33	−51	112	01 42	−51	113	00 51	−51	113	00 00	−52	114	−0 52	−51	114	290
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
60	11 34	51	108	10 43	51	108	09 52	51	109	09 01	51	109	08 10	51	110	07 19	51	110	06 28	51	111	05 37	51	111	04 46	51	112	03 55	51	112	03 04	52	113	02 12	51	113	01 21	51	114	00 30	51	115	−0 21	51	115	291
68	12 06	51	109	11 15	51	109	10 24	51	110	09 33	51	110	08 42	52	111	07 50	51	111	06 59	51	112	06 08	51	112	05 17	51	113	04 26	52	113	03 34	51	114	02 43	51	114	01 52	51	115	01 01	52	115	00 09	51	116	292
67	12 37	51	109	11 46	51	110	10 55	51	110	10 04	51	111	09 13	51	112	08 22	52	112	07 30	51	113	06 39	51	113	05 48	52	114	04 56	51	114	04 05	51	115	03 14	52	115	02 22	51	116	01 31	52	116	00 39	51	117	293
66	13 09	51	110	12 18	51	111	11 27	52	111	10 35	51	112	09 44	51	112	08 53	52	113	08 01	51	113	07 10	52	114	06 18	51	114	05 27	52	115	04 35	51	116	03 44	52	116	02 52	51	117	02 01	52	117	01 09	51	118	294
65	13 40	−51	111	12 49	−51	112	11 58	−52	112	11 06	−51	113	10 15	−52	113	09 23	−51	114	08 32	−52	114	07 40	−51	115	06 49	−52	115	05 57	−51	116	05 06	−52	116	04 14	−52	117	03 22	−51	117	02 31	−52	118	01 39	−52	118	295
64	14 11	51	112	13 20	51	113	12 29	52	113	11 37	51	114	10 46	52	114	09 54	52	115	09 02	51	115	08 11	52	116	07 19	52	116	06 27	51	117	05 36	52	117	04 44	52	118	03 52	52	118	03 00	52	119	02 08	52	119	296
63	14 42	51	113	13 51	52	113	12 59	51	114	12 08	52	114	11 16	52	115	10 24	51	116	09 33	52	116	08 41	52	117	07 49	52	117	06 57	52	118	06 05	52	118	05 13	52	119	04 21	52	119	03 29	52	120	02 37	52	120	297
62	15 13	51	114	14 22	52	114	13 30	52	115	12 38	52	115	11 46	51	116	10 55	52	116	10 03	52	117	09 11	52	117	08 19	52	118	07 27	52	118	06 35	52	119	05 43	52	119	04 51	53	120	03 58	52	120	03 06	52	121	298
61	15 44	52	115	14 52	52	115	14 00	52	116	13 08	51	116	12 17	52	117	11 25	52	117	10 33	53	118	09 40	52	118	08 48	52	119	07 56	52	119	07 04	52	120	06 12	52	120	05 20	53	121	04 27	52	121	03 35	52	122	299
60	16 14	−52	116	15 22	−52	116	14 30	−52	117	13 38	−52	117	12 46	−52	118	11 54	−52	118	11 02	−52	119	10 10	−52	119	09 18	−53	120	08 25	−52	120	07 33	−52	121	06 41	−53	121	05 48	−52	122	04 56	−53	122	04 03	−52	123	300
59	16 44	52	116	15 52	52	117	15 00	52	118	14 08	52	118	13 16	52	119	12 24	53	119	11 31	52	120	10 39	52	120	09 47	53	121	08 54	52	121	08 02	53	122	07 09	52	122	06 17	53	122	05 24	53	123	04 31	52	123	301
58	17 14	52	117	16 22	52	118	15 30	52	118	14 38	53	119	13 45	52	119	12 53	53	120	12 00	52	120	11 08	53	121	10 15	52	121	09 23	53	122	08 30	52	122	07 38	53	123	06 45	53	123	05 52	53	124	04 59	52	124	302
57	17 44	52	118	16 52	53	119	15 59	52	119	15 07	53	120	14 14	52	120	13 22	53	121	12 29	52	121	11 37	53	122	10 44	53	122	09 51	53	123	08 58	52	123	08 06	53	124	07 13	53	124	06 20	53	125	05 27	53	125	303
56	18 13	52	119	17 21	53	120	16 28	52	120	15 36	53	121	14 43	52	121	13 51	53	122	12 58	53	122	12 05	53	123	11 12	53	123	10 19	53	124	09 26	53	124	08 33	53	125	07 40	53	125	06 47	53	126	05 54	53	126	304
55	18 42	−52	120	17 50	−53	121	16 57	−52	121	16 05	−53	122	15 12	−53	122	14 19	−53	123	13 26	−53	123	12 33	−53	124	11 40	−53	124	10 47	−53	125	09 54	−53	125	09 01	−53	125	08 08	−54	126	07 14	−53	126	06 21	−53	127	305
54	19 11	52	121	18 19	53	122	17 26	53	122	16 33	53	123	15 40	53	123	14 47	53	124	13 54	53	124	13 01	53	124	12 08	53	125	11 15	54	125	10 21	53	126	09 28	53	126	08 35	54	127	07 41	53	127	06 48	54	128	306
53	19 40	53	122	18 47	53	122	17 54	53	123	17 01	53	123	16 08	53	124	15 15	53	124	14 22	54	125	13 28	53	125	12 35	53	126	11 42	54	126	10 48	53	127	09 55	54	127	09 01	53	128	08 08	54	128	07 14	53	129	307
52	20 08	53	123	19 15	53	123	18 22	53	124	17 29	53	124	16 36	54	125	15 42	53	125	14 49	53	126	13 56	54	126	13 02	53	127	12 09	54	127	11 15	54	128	10 21	53	128	09 28	54	129	08 34	54	129	07 40	53	130	308
51	20 36	53	124	19 43	53	124	18 50	54	125	17 56	53	125	17 03	53	126	16 10	54	126	15 16	54	127	14 22	53	127	13 29	54	128	12 35	54	128	11 41	53	129	10 48	54	129	09 54	54	129	09 00	54	130	08 06	54	130	309
50	21 04	−53	125	20 11	−54	125	19 17	−53	126	18 24	−54	126	17 30	−54	127	16 36	−53	127	15 43	−54	128	14 49	−54	128	13 55	−54	129	13 01	−54	129	12 07	−54	130	11 13	−54	130	10 19	−54	130	09 25	−54	131	08 31	−54	131	310
49	21 31	53	126	20 38	54	126	19 44	53	127	18 51	54	127	17 57	54	128	17 03	54	128	16 09	54	129	15 15	54	129	14 21	54	130	13 27	54	130	12 33	54	130	11 39	54	131	10 45	54	131	09 51	55	132	08 56	54	132	311
48	21 58	53	127	21 05	54	127	20 11	54	128	19 17	54	128	18 23	54	129	17 29	54	129	16 35	54	130	15 41	54	130	14 47	54	130	13 53	54	131	12 59	55	131	12 04	54	132	11 10	54	132	10 16	55	133	09 21	54	133	312
47	22 25	54	128	21 31	54	128	20 37	54	129	19 43	54	129	18 49	54	130	17 55	54	130	17 01	54	130	16 07	55	131	15 12	54	131	14 18	54	132	13 24	55	132	12 29	54	133	11 35	55	133	10 40	55	134	09 45	54	134	313
46	22 51	54	129	21 57	54	129	21 03	54	130	20 09	54	130	19 15	54	131	18 21	55	131	17 26	54	131	16 32	55	132	15 37	54	132	14 43	55	133	13 48	54	133	12 54	55	134	11 59	55	134	11 04	55	134	10 09	54	135	314
45	23 17	−54	130	22 23	−54	130	21 29	−54	131	20 35	−55	131	19 40	−54	131	18 46	−55	132	17 51	−54	132	16 57	−55	133	16 02	−55	133	15 07	−55	134	14 12	−54	134	13 18	−55	135	12 23	−55	135	11 28	−55	135	10 33	−55	136	315
44	23 43	54	131	22 49	55	131	21 54	54	132	21 00	55	132	20 05	54	132	19 11	55	133	18 16	55	133	17 21	55	134	16 26	55	134	15 31	55	135	14 36	55	135	13 41	55	135	12 46	55	136	11 51	55	136	10 56	55	137	316
43	24 08	54	132	23 14	55	132	22 19	54	133	21 25	55	133	20 30	55	133	19 35	55	134	18 40	55	134	17 45	55	135	16 50	55	135	15 55	55	136	15 00	55	136	14 05	55	136	13 10	56	137	12 14	55	137	11 19	55	138	317
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0	34 00	−60	180	33 00	−60	180	32 00	−60	180	31 00	−60	180	30 00	−60	180	29 00	−60	180	28 00	−60	180	27 00	−60	180	26 00	−60	180	25 00	−60	180	24 00	−60	180	23 00	−60	180	22 00	−60	180	21 00	−60	180

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
0	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	63 00	+60	180	360
1	49 00	60	179	50 00	60	179	51 00	60	178	52 00	60	178	53 00	60	178	54 00	60	178	55 00	60	178	56 00	60	178	57 00	59	178	57 59	60	178	58 59	60	178	59 59	60	178	60 59	60	178	61 59	60	178	62 59	60	178	359
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25	44 45	+57	145	45 42	+56	144	46 38	+57	144	47 35	+56	143	48 31	+56	143	49 27	+56	142	50 23	+55	142	51 18	+56	141	52 14	+55	141	53 09	+55	140	54 04	+55	139	54 59	+54	139	55 53	+55	138	56 48	+53	137	57 41	+54	136	335
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35	41 04	+55	133	41 59	+54	132	42 53	+54	132	43 47	+53	131	44 40	+54	130	45 34	+53	130	46 27	+53	129	47 20	+53	128	48 13	+52	128	49 05	+52	127	49 57	+52	126	50 49	+52	125	51 41	+51	124	52 32	+50	124	53 22	+51	123	325
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37	40 14	54	130	41 08	54	130	42 02	53	129	42 55	53	129	43 48	53	128	44 41	53	127	45 34	52	127	46 26	53	126	47 19	51	125	48 10	52	124	49 02	53	124	49 53	51	123	50 44	51	122	51 35	50	121	52 25	50	120	323
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47	35 39	52	120	36 31	52	119	37 23	51	118	38 14	51	118	39 05	51	117	39 56	51	116	40 47	50	116	41 37	50	115	42 27	50	114	43 17	49	113	44 06	50	113	44 56	48	112	45 44	49	111	46 33	48	110	47 21	47	109	313
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63	27 22	50	104	28 12	49	104	29 01	50	103	29 51	49	102	30 40	48	102	31 28	49	101	32 17	48	100	33 05	48	100	33 53	48	99	34 41	48	98	35 29	47	97	36 16	47	97	37 03	47	96	37 50	46	95	38 36	46	94	297
64	26 50	49	103	27 39	50	103	28 29	49	102	29 18	49	101	30 07	49	101	30 55	49	100	31 44	48	99	32 32	48	99	33 20	48	98	34 08	48	97	34 56	47	97	35 43	47	96	36 30	47	95	37 17	46	94	38 03	46	93	296
65	26 17	+50	102	27 07	+49	102	27 56	+49	101	28 45	+49	101	29 34	+48	100	30 22	+49	99	31 11	+48	99	31 59	+48	98	32 47	+48	97	33 35	+47	96	34 22	+47	96	35 09	+47	95	35 56	+47	94	36 43	+46	93	37 29	+46	93	295
66	25 44	50	102	26 34	49	101	27 23	49	100	28 12	49	100	29 01	48	99	29 49	49	98	30 38	48	98	31 26	48	97	32 14	47	96	33 01	48	96	33 49	47	95	34 36	47	94	35 23	47	93	36 10	46	92	36 56	46	92	294
67	25 11	50	101	26 01	49	100	26 50	49	99	27 39	48	99	28 27	49	98	29 16	48	97	30 04	48	97	30 52	48	96	31 40	48	95	32 28	47	95	33 15	48	94	34 03	46	93	34 49	47	92	35 36	46	92	36 22	46	91	293
68	24 38	50	100	25 28	49	99	26 17	48	99	27 05	49	98	27 54	49	97	28 43	48	97	29 31	48	96	30 19	48	95	31 07	48	95	31 55	47	94	32 42	47	93	33 29	47	92	34 16	46	92	35 02	47	91	35 49	46	90	292
69	24 05	49	99	24 54	49	98	25 43	49	98	26 32	49	97	27 21	48	96	28 09	49	96	28 58	48	95	29 46	47	94	30 33	48	94	31 21	47	93	32 08	48	92	32 56	46	91	33 42	47	91	34 29	46	90	35 15	46	89	291
HA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **S

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
70	23 32	+49	98	24 21	+49	97	25 10	+49	97	25 59	+48	96	26 47	+49	96	27 36	+48	95	28 24	+48	94	29 12	+48	94	30 00	+48	93	30 48	+47	92	31 35	+47	91	32 22	+47	91	33 09	+46	90	33 55	+47	89	34 42	+46	88	290
71	22 59	49	97	23 48	49	97	24 37	49	96	25 26	48	95	26 14	48	95	27 02	49	94	27 51	48	93	28 39	47	93	29 26	48	92	30 14	47	91	31 01	47	91	31 48	47	90	32 35	47	89	33 22	46	88	34 08	46	88	289
72	22 26	49	96	23 15	48	96	24 03	49	95	24 52	49	94	25 41	48	94	26 29	48	93	27 17	48	93	28 05	48	92	28 53	47	91	29 40	48	90	30 28	47	90	31 15	47	89	32 02	46	88	32 48	47	88	33 35	46	87	288
73	21 52	49	96	22 41	49	95	23 30	49	94	24 19	48	94	25 07	48	93	25 55	49	92	26 44	48	92	27 32	47	91	28 19	48	90	29 07	47	90	29 54	47	89	30 41	47	88	31 28	47	87	32 15	46	87	33 01	46	86	287
74	21 19	49	95	22 08	48	94	22 56	49	93	23 45	49	93	24 34	48	92	25 22	48	91	26 10	48	91	26 58	48	90	27 46	47	89	28 33	48	89	29 21	47	88	30 08	47	87	30 55	46	87	31 41	47	86	32 28	46	85	286
75	20 45	+49	94	21 34	+49	93	22 23	+49	93	23 12	+48	92	24 00	+48	91	24 48	+49	91	25 37	+47	90	26 24	+48	89	27 12	+48	89	28 00	+47	88	28 47	+47	87	29 34	+47	87	30 21	+47	86	31 08	+46	85	31 54	+46	84	285
76	20 12	49	93	21 01	48	92	21 49	49	92	22 38	49	91	23 27	48	90	24 15	48	90	25 03	48	89	25 51	48	89	26 39	47	88	27 26	48	87	28 14	47	86	29 01	47	86	29 48	46	85	30 34	47	84	31 21	46	84	284
77	19 38	49	92	20 27	49	92	21 16	49	91	22 05	48	90	22 53	48	90	23 41	48	89	24 29	48	88	25 17	48	88	26 05	48	87	26 53	47	86	27 40	47	86	28 27	47	85	29 14	47	84	30 01	47	84	30 48	46	83	283
78	19 05	49	91	19 54	48	91	20 42	49	90	21 31	48	89	22 19	49	89	23 08	48	88	23 56	48	88	24 44	48	87	25 32	47	86	26 19	48	86	27 07	47	85	27 54	47	84	28 41	47	83	29 28	46	83	30 14	47	82	282
79	18 31	49	90	19 20	49	90	20 09	48	89	20 57	49	89	21 46	48	88	22 34	48	87	23 22	48	87	24 10	48	86	24 58	48	85	25 46	47	85	26 33	48	84	27 21	47	83	28 08	47	83	28 55	46	82	29 41	47	81	281
80	17 58	+49	90	18 47	+48	89	19 35	+49	88	20 24	+48	88	21 12	+49	87	22 01	+48	87	22 49	+48	86	23 37	+48	85	24 25	+47	85	25 12	+48	84	26 00	+47	83	26 47	+47	83	27 34	+47	82	28 21	+47	81	29 08	+46	80	280
81	17 24	49	89	18 13	49	88	19 02	48	88	19 50	49	87	20 39	48	86	21 27	48	86	22 15	49	85	23 04	47	84	23 51	48	84	24 39	48	83	25 27	47	82	26 14	47	82	27 01	47	81	27 48	47	80	28 35	47	80	279
82	16 51	48	88	17 39	49	87	18 28	49	87	19 17	48	86	20 05	49	86	20 54	48	85	21 42	48	84	22 30	48	84	23 18	48	83	24 06	47	82	24 53	48	82	25 41	47	81	26 28	47	80	27 15	47	80	28 02	47	79	278
83	16 17	49	87	17 06	49	87	17 55	48	86	18 43	49	85	19 32	48	85	20 20	49	84	21 09	48	83	21 57	48	83	22 45	48	82	23 33	47	82	24 20	48	81	25 08	47	80	25 55	47	80	26 42	47	79	27 29	47	78	277
84	15 44	48	86	16 32	49	86	17 21	49	85	18 10	49	85	18 59	48	84	19 47	48	83	20 35	49	83	21 24	48	82	22 12	48	81	23 00	47	81	23 47	48	80	24 35	47	79	25 22	47	79	26 09	47	78	26 56	47	77	276
85	15 10	+49	86	15 59	+49	85	16 48	+49	84	17 37	+48	84	18 25	+49	83	19 14	+48	82	20 02	+48	82	20 50	+48	81	21 38	+48	81	22 26	+48	80	23 14	+48	79	24 02	+47	79	24 49	+48	78	25 37	+47	77	26 24	+47	77	275
86	14 37	49	85	15 26	49	84	16 15	48	84	17 03	49	83	17 52	49	82	18 41	48	82	19 29	48	81	20 17	48	80	21 05	48	80	21 53	48	79	22 41	48	79	23 29	48	78	24 17	47	77	25 04	47	76	25 51	47	76	274
87	14 03	49	84	14 52	49	83	15 41	49	83	16 30	49	82	17 19	48	82	18 07	49	81	18 56	48	80	19 44	48	80	20 32	49	79	21 21	47	78	22 08	48	78	22 56	48	77	23 44	47	76	24 31	48	76	25 19	47	75	273
88	13 30	49	83	14 19	49	83	15 08	49	82	15 57	49	81	16 46	48	81	17 34	49	80	18 23	48	79	19 11	49	79	20 00	48	78	20 48	48	78	21 36	48	77	22 24	47	76	23 11	48	76	23 59	47	75	24 46	47	74	272
89	12 57	49	82	13 46	49	82	14 35	49	81	15 24	49	81	16 13	48	80	17 01	49	79	17 50	48	79	18 38	49	78	19 27	48	77	20 15	48	77	21 03	48	76	21 51	48	76	22 39	48	75	23 27	47	74	24 14	47	74	271
90	12 23	+50	81	13 13	+49	81	14 02	+49	80	14 51	+49	80	15 40	+48	79	16 28	+49	78	17 17	+49	78	18 06	+48	77	18 54	+48	77	19 42	+49	76	20 31	+48	75	21 19	+48	75	22 07	+47	74	22 54	+48	73	23 42	+47	73	270
91	11 50	49	81	12 39	50	80	13 29	49	79	14 18	49	79	15 07	48	78	15 55	49	78	16 44	49	77	17 33	48	76	18 21	49	76	19 10	48	75	19 58	48	75	20 46	48	74	21 34	48	73	22 22	48	73	23 10	47	72	269
92	11 17	49	80	12 06	50	79	12 56	49	79	13 45	49	78	14 34	49	78	15 23	49	77	16 12	48	76	17 00	49	76	17 49	48	75	18 37	49	74	19 26	48	74	20 14	48	73	21 02	48	73	21 50	48	72	22 38	48	71	268
93	10 44	50	79	11 34	49	78	12 23	49	78	13 12	49	77	14 01	49	77	14 50	49	76	15 39	49	76	16 28	49	75	17 17	48	74	18 05	49	74	18 54	48	73	19 42	48	72	20 30	48	72	21 18	48	71	22 06	48	71	267
94	10 11	50	78	11 01	49	78	11 50	49	77	12 39	50	76	13 29	49	76	14 18	49	75	15 07	49	75	15 56	48	74	16 44	49	74	17 33	49	73	18 22	48	72	19 10	49	72	19 59	48	71	20 47	48	70	21 35	48	70	266
95	09 39	+49	77	10 28	+49	77	11 17	+50	76	12 07	+49	76	12 56	+49	75	13 45	+49	75	14 34	+49	74	15 23	+49	73	16 12	+49	73	17 01	+49	72	17 50	+48	72	18 38	+49	71	19 27	+48	70	20 15	+48	70	21 03	+48	69	265
96	09 06	49	77	09 55	50	76	10 45	49	75	11 34	50	75	12 24	49	74	13 13	49	74	14 02	49	73	14 51	49	73	15 40	49	72	16 29	49	71	17 18	49	71	18 07	48	70	18 55	49	70	19 44	48	69	20 32	48	68	264
97	08 33	50	76	09 23	49	75	10 12	50	75	11 02	49	74	11 51	50	74	12 41	49	73	13 30	49	72	14 19	49	72	15 08	50	71	15 58	48	71	16 46	49	70	17 35	49	69	18 24	49	69	19 13	48	68	20 01	48	68	263
98	08 01	49	75	08 50	50	74	09 40	50	74	10 30	49	73	11 19	50	73	12 09	49	72	12 58	50	72	13 48	49	71	14 37	49	70	15 26	49	70	16 15	49	69	17 04	49	69	17 53	49	68	18 42	48	67	19 30	49	67	262
99	07 28	50	74	08 18	50	74	09 08	50	73	09 58	49	73	10 47	50	72	11 37	49	71	12 26	50	71	13 16	49	70	14 05	50	70	14 55	49	69	15 44	49	68	16 33	49	68	17 22	49	67	18 11	48	67	18 59	49	66	261
100	06 56	+50	73	07 46	+50	73	08 36	+50	72	09 26	+50	72	10 16	+49	71	11 05	+50	71	11 55	+49	70	12 44	+50	69	13 34	+49	69	14 23	+50	68	15 13	+49	68	16 02	+49	67	16 51	+49	66	17 40	+49	66	18 29	+49	65	260
101	06 24	50	72	07 14	50	72	08 04	50	71	08 54	50	71	09 44	50	70	10 34	49	70	11 23	50	69	12 13	50	69	13 03	49	68	13 52	50	67	14 42	49	67	15 31	49	66	16 20	49	66	17 09	50	65	17 59	48	65	259
102	05 52	50	72	06 42	50	71	07 32	50	71	08 22	50	70	09 12	50	70	10 02	50	69	10 52	50	68	11 42	50	68	12 32	49	67	13 21	50	67	14 11	49	66	15 00	50	66	15 50	49	65	16 39	49	64	17 28	49	64	258
103	05 20	51	71	06 11	50	70	07 01	50	70	07 51	50	69	08 41	50	69	09 31	50	68	10 21	50	68	11 11	50	67	12 01	50	66	12 51	49	66	13 40	50	65	14 30	50	65	15 20	49	64	16 09	49	64	16 58	50	63	257
104	04 49	50	70	05 39	50	70	06 29	51	69	07 20	50	68	08 10	50	68	09 00	50	67	09 50	50	67	10 40	50	66	11 30	50	66	12 20	50	65	13 10	50	65	14 00	49	64	14 49	50	63	15 39	50	63	16 29	49	62	256
105	04 17	+51	69	05 08	+50	69	05 58	+50	68	06 48	+51	68	07 39	+50	67	08 29	+50	67	09 19	+51	66	10 10	+50	65	11 00	+50	65	11 50	+50	64	12 40	+50	64	13 30	+49	63	14 19	+50	63	15 09	+50	62	15 59	+50	61	255
106	03 46	51	69	04 37	50	68	05 27	51	67	06 18	50	67	07 08	50	66	07 58	51	66	08 49	50	65	09 39	50	65	10 29	51	64	11 20	50	64	12 10	50	63	13 00	50	62	13 50	50	62	14 40	50	61	15 30	49	61	254
107	03 15	51	68	04 06	50	67	04 56	51	67	05 47	50	66	06 37	51	66	07 28	50	65	08 18	51	64	09 09	50	64	09 59	51	63	10 50	50	63	11 40	50	62	12 30	50	62	13 20	50	61	14 10	50	61	15 00	50	60	253
108	02 44	51	67	03 35	50	66	04 25	51	66	05 16	51	65	06 07	51	65	06 58	50	64	07 48	51	64	08 39	50	63	09 29	51	63	10 20	50	62	11 10	51	61	12 01	50	61	12 51	50	60	13 41	50	60	14 31	51	59	252
109	02 13	51	66	03 04	51	66	03 55	51	65	04 46	51	64	05 37	50	64	06 27	51	63	07 18	51	63	08 09	51	62	09 00	50	62	09 50	51	61	10 41	51	61	11 32	50	60	12 22	50	60	13 12	51	59	14 03	50	58	251
110	01 43	+51	65	02 34	+51	65	03 25	+51	64	04 16	+51	64	05 07	+51	63	05 58	+50	63	06 48	+51	62	07 39	+51	62	08 30	+51	61	09 21	+51	60	10 12	+51	60	11 03	+50	59	11 53	+51	59	12 44	+50	58	13 34	+51	58	250
111	01 12	51	64	02 03	52	64	02 55	51	63	03 46	51	63	04 37	51	62	05 28	51	62	06 19	51	61	07 10	51	61	08 01	51	60	08 52	51	60	09 43	51	59	10 34	51	59	11 25	50	58	12 15	51	58	13 06	51	57	249
112	00 42	51	64	01 33	52	63	02 25	51	63	03 16	51	62	04 07	51	62	04 58	52	61	05 50	51	60	06 41	51	60	07 32	51	59	08 23	51	59	09 14	51	58	10 05	51	58	10 56	51	57	11 47	51	57	12 38	51	56	248
113	00 12	52	63	01 04	51	62	01 55	51	62	02 46	52	61	03 38	51	61	04 29	52	60	05 21	51	60	06 12	51	59	07 03	52	59	07 55	51	58	08 46	51	58	09 37	51	57	10 28	51	57	11 19	51	56	12 10	51	55	247
114	−0 18	52	62	00 34	52	61	01 26	53	61	02 17	52	60	03 09	51	60	04 00	52	59	04 52	51	59	05 43	52	58	06 35	51	58	07 26	52	57	08 18	51	57	09 09	51	56	10 00	52	56	10 52	51	55	11 43	51	55	246
115	−0 47	+52	61	00 05	+53	61	00 56	+53	60	01 48	+52	60	02 40	+51	59	03 31	+52	59	04 23	+53	58	05 15	+51	58	06 06	+52	57	06 58	+52	57	07 50	+51	56	08 41	+52	55	09 33	+53	55	10 24	+51	54	11 15	+52	54	245
116	−1 16	52	60	−0 24	51	60	00 27	52	59	01 19	52	59	02 11	52	58	03 03	52	58	03 55	52	57	04 47	51	57	05 38	52	56	06 30	52	56	07 22	52	55	08 14	51	55	09 05	52	54	09 57	52	54	10 49	51	53	244
117	−1 45	52	59	−0 53	52	59	−0 01	52	58	00 51	52	58	01 43	52	57	02 35	52	57	03 27	52	56	04 19	52	56	05 11	52	55	06 03	52	55	06 55	51	54	07 46	52	54	08 38	52	53	09 30	52	53	10 22	52	52	243
118	−2 14	52	59	−1 22	52	58	−0 30	52	58	00 22	53	57	01 15	52	57	02 07	52	56	02 59	52	56	03 51	52	55	04 43	52	55	05 35	52	54	06 27	52	54	07 19	52	53	08 11	52	53	09 03	52	52	09 55	52	52	242
119	−2 43	53	58	−1 50	52	57	−0 58	52	57	−0 06	53	56	00 47	52	56	01 39	52	55	02 31	53	55	03 24	52	54	04 16	52	54	05 08	52	53	06 00	53	53	06 53	52	52	07 45	52	52	08 37	52	51	09 29	52	51	241
120	−3 11	+53	57	−2 18	+52	56	−1 26	+53	56	−0 33	+52	55	00 19	+53	55	01 12	+52	54	02 04	+53	54	02 57	+52	54	03 49	+52	53	04 41	+53	53	05 34	+52	52	06 26	+53	52	07 19	+52	51	08 11	+52	51	09 03	+53	50	240
121	−3 39	53	56	−2 46	52	56	−1 54	53	55	−1 01	53	55	−0 08	52	54	00 44	53	54	01 37	53	53	02 30	52	53	03 22	53	52	04 15	53	52	05 08	52	51	06 00	53	51	06 53	52	50	07 45	53	50	08 38	52	49	239
122	−4 07	53	55	−3 14	53	55	−2 21	53	54	−1 28	53	54	−0 35	53	53	00 18	52	53	01 10	53	52	02 03	53	52	02 56	53	51	03 49	53	51	04 42	52	50	05 34	53	50	06 27	53	50	07 20	52	49	08 12	53	49	238
123	−4 34	53	54	−3 41	53	54	−2 48	53	53	−1 55	53	53	−1 02	53	52	−0 09	53	52	00 44	53	51	01 37	53	51	02 30	53	51	03 23	53	50	04 16	53	50	05 09	53	49	06 02	53	49	06 55	53	48	07 47	53	48	237
124	−5 01	53	54	−4 08	53	53	−3 15	53	53	−2 22	53	52	−1 29	54	52	−0 35	53	51	00 18	53	51	01 11	53	50	02 04	53	50	02 57	53	49	03 50	54	49	04 44	53	48	05 37	53	48	06 30	53	47	07 23	53	47	236
125	−5 28	+53	53	−4 35	+54	52	−3 41	+53	52	−2 48	+53	51	−1 55	+54	51	−1 01	+53	50	−0 08	+53	50	00 45	+54	49	01 39	+53	49	02 32	+53	49	03 25	+54	48	04 19	+53	48	05 12	+53	47	06 05	+53	47	06 58	+54	46	235
126	−5 54	+53	52	−5 01	53	51	−4 08	54	51	−3 14	53	50	−2 21	54	50	−1 27	53	50	−0 34	54	49	00 20	53	49	01 13	54	48	02 07	53	48	03 00	54	47	03 54	53	47	04 47	54	46	05 41	53	46	06 34	54	45	234
			127	−5 27	54	50	−4 33	53	50	−3 40	54	50	−2 46	54	49	−1 52	53	49	−0 59	54	48	−0 05	54	48	00 49	53	47	01 42	54	47	02 36	54	46	03 30	53	46	04 23	54	46	05 17	54	45	06 11	53	45	233
			128	−5 53	54	50	−4 59	54	49	−4 05	54	49	−3 11	54	48	−2 17	53	48	−1 24	54	47	−0 30	54	47	00 24	54	47	01 18	54	46	02 12	54	46	03 06	54	45	04 00	53	45	04 53	54	44	05 47	54	44	232
			129	−6 18	+54	49	−5 24	54	48	−4 30	54	48	−3 36	54	47	−2 42	54	47	−1 48	54	47	−0 54	54	46	00 00	54	46	00 54	54	45	01 48	54	45	02 42	54	44	03 36	54	44	04 30	54	43	05 24	54	43	231
						130	−5 49	+54	47	−4 55	+54	47	−4 01	+55	47	−3 06	+54	46	−2 12	+54	46	−1 18	+54	45	−0 24	+54	45	00 30	+55	44	01 25	+54	44	02 19	+54	44	03 13	+54	43	04 07	+54	43	05 01	+55	42	230
						131	−6 14	+55	47	−5 19	54	46	−4 25	55	46	−3 30	54	45	−2 36	54	45	−1 42	55	44	−0 47	54	44	00 07	54	44	01 01	55	43	01 56	54	43	02 50	55	42	03 45	54	42	04 39	54	41	229
									132	−5 43	54	45	−4 49	55	45	−3 54	54	44	−3 00	55	44	−2 05	55	43	−1 10	54	43	−0 16	55	43	00 39	54	42	01 33	55	42	02 28	54	42	03 22	55	41	04 17	54	41	228
									133	−6 07	+55	44	−5 12	55	44	−4 17	54	44	−3 23	55	43	−2 28	55	43	−1 33	55	42	−0 38	54	42	00 16	55	42	01 11	55	41	02 06	54	41	03 00	55	40	03 55	55	40	227
												134	−5 35	55	43	−4 40	55	43	−3 45	54	42	−2 51	55	42	−1 56	55	41	−1 01	55	41	−0 06	55	41	00 49	55	40	01 44	55	40	02 39	55	39	03 34	55	39	226
												135	−5 58	+55	42	−5 03	+55	42	−4 08	+55	41	−3 13	+55	41	−2 18	+55	41	−1 23	+56	40	−0 27	+55	40	00 28	+55	39	01 23	+55	39	02 18	+55	39	03 13	+55	38	225
															136	−5 25	55	41	−4 30	55	41	−3 35	56	40	−2 39	55	40	−1 44	55	39	−0 49	55	39	00 06	56	39	01 02	55	38	01 57	55	38	02 52	56	37	224
															137	−5 47	55	40	−4 52	56	40	−3 56	55	39	−3 01	56	39	−2 05	55	39	−1 10	56	38	−0 14	55	38	00 41	56	37	01 37	55	37	02 32	56	37	223
															138	−6 08	+55	39	−5 13	56	39	−4 17	55	38	−3 22	56	38	−2 26	56	38	−1 30	55	37	−0 35	56	37	00 21	56	37	01 17	55	36	02 12	56	36	222
																		139	−5 34	56	38	−4 38	56	38	−3 42	56	37	−2 46	56	37	−1 50	55	37	−0 55	56	36	00 01	56	36	00 57	56	35	01 53	56	35	221
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 56°

LAT 56°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 56°

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°
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																																																180

	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	
78	−5 52 −50 108	282														
77	−5 20 −51 109	−6 11 −50 110	283													
76	−4 49 −50 110	−5 39 −50 110	284													
75	−4 17 −51 111	−5 08 −50 111	−5 58 −50 112	285												
74	−3 46 −51 111	−4 37 −50 112	−5 27 −51 113	−6 18 −50 113	286											
73	−3 15 −51 112	−4 06 −50 113	−4 56 −51 113	−5 47 −50 114	287											
72	−2 44 −51 113	−3 35 −50 114	−4 25 −51 114	−5 16 −51 115	−6 07 −51 115	288										
71	−2 13 −51 114	−3 04 −51 114	−3 55 −51 115	−4 46 −51 116	−5 37 −50 116	289										
70	−1 43 −51 115	−2 34 −51 115	−3 25 −51 116	−4 16 −51 116	−5 07 −51 117	−5 58 −50 117	290									

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
69	−1 12	51	116	−2 03	52	116	−2 55	51	117	−3 46	51	117	−4 37	51	118	−5 28	51	118	−6 19	−51	119	291																								69
68	−0 42	51	116	−1 33	52	117	−2 25	51	117	−3 16	51	118	−4 07	51	118	−4 58	52	119	−5 50	51	120	292																								68
67	−0 12	52	117	−1 04	51	118	−1 55	51	118	−2 46	52	119	−3 38	51	119	−4 29	52	120	−5 21	51	120	−6 12	−51	121	293																						67
66	00 18	52	118	−0 34	52	119	−1 26	51	119	−2 17	52	120	−3 09	51	120	−4 00	52	121	−4 52	51	121	−5 43	52	122	294																						66
65	00 47	−52	119	−0 05	−51	119	−0 56	−52	120	−1 48	−52	120	−2 40	−51	121	−3 31	−52	121	−4 23	−52	122	−5 15	−51	122	−6 06	−52	123	295																						65
64	01 16	52	120	00 24	51	120	−0 27	52	121	−1 19	52	121	−2 11	52	122	−3 03	52	122	−3 55	52	123	−4 47	51	123	−5 38	52	124	296																						64
63	01 45	52	121	00 53	52	121	00 01	52	122	−0 51	52	122	−1 43	52	123	−2 35	52	123	−3 27	52	124	−4 19	52	124	−5 11	52	125	−6 03	−52	125	297																						63
62	02 14	52	121	01 22	52	122	00 30	52	122	−0 22	53	123	−1 15	52	123	−2 07	52	124	−2 59	52	124	−3 51	52	125	−4 43	52	125	−5 35	52	126	298																						62
61	02 43	53	122	01 50	52	123	00 58	52	123	00 06	53	124	−0 47	52	124	−1 39	52	125	−2 31	53	125	−3 24	52	126	−4 16	52	126	−5 08	52	127	−6 00	−53	127	299																						61
60	03 11	−53	123	02 18	−52	124	01 26	−53	124	00 33	−52	125	−0 19	−53	125	−1 12	−52	126	−2 04	−53	126	−2 57	−52	126	−3 49	−52	127	−4 41	−53	127	−5 34	−52	128	300																						60
59	03 39	53	124	02 46	52	124	01 54	53	125	01 01	53	125	00 08	53	126	−0 44	53	126	−1 37	53	127	−2 30	52	127	−3 22	53	128	−4 15	53	128	−5 08	52	129	−6 00	−53	129	301																						59
58	04 07	53	125	03 14	53	125	02 21	53	126	01 28	53	126	00 35	53	127	−0 18	52	127	−1 10	53	128	−2 03	53	128	−2 56	53	129	−3 49	53	129	−4 42	52	130	−5 34	53	130	302																						58
57	04 34	53	126	03 41	53	126	02 48	53	127	01 55	53	127	01 02	53	128	00 09	53	128	−0 44	53	128	−1 37	53	129	−2 30	53	129	−3 23	53	130	−4 16	53	130	−5 09	53	131	−6 02	−53	131	303																						57
56	05 01	53	126	04 08	53	127	03 15	53	127	02 22	53	128	01 29	54	128	00 35	53	129	−0 18	53	129	−1 11	53	130	−2 04	53	130	−2 57	53	131	−3 50	54	131	−4 44	53	132	−5 37	53	132	304																						56
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53	06 21	54	129	05 27	54	130	04 33	53	130	03 40	54	130	02 46	54	131	01 52	53	131	00 59	54	132	00 05	54	132	−0 49	53	133	−1 42	54	133	−2 36	54	134	−3 30	53	134	−4 23	54	134	−5 17	54	135	−6 11	−53	135	307
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39	11 50	56	142	10 54	56	142	09 58	56	142	09 02	56	143	08 06	56	143	07 10	56	143	06 14	56	144	05 18	56	144	04 22	56	144	03 26	56	145	02 30	57	145	01 33	56	146	00 37	56	146	−0 19	56	146	−1 15	56	147	321
38	12 11	56	143	11 15	56	143	10 19	56	143	09 23	57	144	08 26	56	144	07 30	56	144	06 34	57	145	05 37	56	145	04 41	56	145	03 45	56	146	02 49	57	146	01 52	56	146	00 56	56	147	00 00	57	147	−0 57	56	147	322
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29	14 57	58	151	13 59	58	151	13 01	57	152	12 04	58	152	11 06	58	152	10 08	57	152	09 11	58	153	08 13	58	153	07 15	57	153	06 18	58	154	05 20	58	154	04 22	58	154	03 24	57	154	02 27	58	155	01 29	58	155	331
28	15 13	58	152	14 15	58	152	13 17	58	153	12 19	58	153	11 21	57	153	10 24	58	153	09 26	58	154	08 28	58	154	07 30	58	154	06 32	58	154	05 34	58	155	04 36	57	155	03 39	58	155	02 41	58	155	01 43	58	156	332
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25	15 58	−59	155	14 59	−58	155	14 01	−58	155	13 03	−58	156	12 05	−58	156	11 07	−59	156	10 08	−58	156	09 10	−58	157	08 12	−58	157	07 14	−59	157	06 15	−58	157	05 17	−58	158	04 19	−59	158	03 20	−58	158	02 22	−58	158	335
24	16 12	59	156	15 13	58	156	14 15	58	156	13 17	59	157	12 18	58	157	11 20	58	157	10 22	59	157	09 23	58	158	08 25	59	158	07 26	58	158	06 28	58	158	05 30	59	158	04 31	58	159	03 33	59	159	02 34	58	159	336
23	16 25	59	157	15 27	59	157	14 28	58	157	13 30	59	158	12 31	58	158	11 33	59	158	10 34	58	158	09 36	59	158	08 37	58	159	07 39	59	159	06 40	58	159	05 42	59	159	04 43	58	160	03 45	59	160	02 46	59	160	337
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21	16 50	58	159	15 52	59	159	14 53	59	159	13 54	58	159	12 56	59	160	11 57	59	160	10 58	59	160	09 59	58	160	09 01	59	160	08 02	59	161	07 03	59	161	06 04	58	161	05 06	59	161	04 07	59	162	03 08	59	162	339
20	17 02	−59	160	16 03	−58	160	15 05	−59	160	14 06	−59	160	13 07	−59	161	12 08	−59	161	11 09	−59	161	10 10	−58	161	09 12	−59	161	08 13	−59	162	07 14	−59	162	06 15	−59	162	05 16	−59	162	04 17	−59	162	03 18	−59	163	340
19	17 14	59	161	16 15	59	161	15 16	59	161	14 17	59	161	13 18	59	162	12 19	59	162	11 20	59	162	10 21	59	162	09 22	59	162	08 23	59	163	07 24	59	163	06 25	59	163	05 26	59	163	04 27	59	163	03 28	59	163	341
18	17 24	59	162	16 25	59	162	15 26	59	162	14 27	59	162	13 28	59	163	12 29	59	163	11 30	59	163	10 31	59	163	09 32	59	163	08 33	59	163	07 34	59	164	06 35	59	164	05 36	59	164	04 37	60	164	03 37	59	164	342
17	17 35	60	163	16 35	59	163	15 36	59	163	14 37	59	163	13 38	59	163	12 39	59	164	11 40	59	164	10 41	60	164	09 41	59	164	08 42	59	164	07 43	59	164	06 44	59	165	05 45	59	165	04 46	60	165	03 46	59	165	343
16	17 44	59	164	16 45	59	164	15 46	59	164	14 47	60	164	13 47	59	164	12 48	59	165	11 49	59	165	10 50	60	165	09 50	59	165	08 51	59	165	07 52	60	165	06 52	59	166	05 53	59	166	04 54	59	166	03 55	60	166	344
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14	18 02	60	166	17 02	59	166	16 03	59	166	15 04	60	166	14 04	59	166	13 05	60	167	12 05	59	167	11 06	59	167	10 07	60	167	09 07	59	167	08 08	60	167	07 08	59	167	06 09	60	167	05 09	59	168	04 10	60	168	346
13	18 10	60	167	17 10	59	167	16 11	60	167	15 11	59	167	14 12	60	167	13 12	59	167	12 13	59	168	11 13	59	168	10 14	60	168	09 14	59	168	08 15	60	168	07 15	59	168	06 16	60	168	05 16	59	168	04 17	60	169	347
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11	18 24	60	169	17 24	59	169	16 25	60	169	15 25	60	169	14 25	59	169	13 26	60	169	12 26	59	169	11 27	60	170	10 27	60	170	09 27	59	170	08 28	60	170	07 28	60	170	06 28	59	170	05 29	60	170	04 29	60	170	349
10	18 30	−59	170	17 31	−60	170	16 31	−60	170	15 31	−60	170	14 31	−59	170	13 32	−60	170	12 32	−60	170	11 32	−59	171	10 33	−60	171	09 33	−60	171	08 33	−59	171	07 34	−60	171	06 34	−60	171	05 34	−60	171	04 34	−59	171	350
9	18 36	60	171	17 36	60	171	16 36	59	171	15 37	60	171	14 37	60	171	13 37	60	171	12 37	59	171	11 38	60	171	10 38	60	172	09 38	60	172	08 38	59	172	07 39	60	172	06 39	60	172	05 39	60	172	04 39	60	172	351
8	18 41	60	172	17 41	60	172	16 41	59	172	15 42	60	172	14 42	60	172	13 42	60	172	12 42	60	172	11 42	60	172	10 42	59	173	09 43	60	173	08 43	60	173	07 43	60	173	06 43	60	173	05 43	59	173	04 44	60	173	352
7	18 45	59	173	17 46	60	173	16 46	60	173	15 46	60	173	14 46	60	173	13 46	60	173	12 46	60	173	11 46	59	173	10 47	60	173	09 47	60	174	08 47	60	174	07 47	60	174	06 47	60	174	05 47	60	174	04 47	59	174	353
6	18 49	60	174	17 49	60	174	16 49	59	174	15 50	60	174	14 50	60	174	13 50	60	174	12 50	60	174	11 50	60	174	10 50	60	174	09 50	60	174	08 50	60	174	07 50	59	175	06 51	60	175	05 51	60	175	04 51	60	175	354
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4	18 55	60	176	17 55	60	176	16 55	60	176	15 55	60	176	14 55	60	176	13 55	59	176	12 56	60	176	11 56	60	176	10 56	60	176	09 56	60	176	08 56	60	176	07 56	60	176	06 56	60	176	05 56	60	176	04 56	60	176	356
3	18 57	60	177	17 57	60	177	16 57	60	177	15 57	60	177	14 57	60	177	13 57	60	177	12 57	59	177	11 58	60	177	10 58	60	177	09 58	60	177	08 58	60	177	07 58	60	177	06 58	60	177	05 58	60	177	04 58	60	177	357
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1	19 00	60	179	18 00	60	179	17 00	60	179	16 00	60	179	15 00	60	179	14 00	60	179	13 00	60	179	12 00	60	179	11 00	60	179	10 00	60	179	09 00	60	179	08 00	60	179	07 00	60	179	06 00	60	179	05 00	60	179	359
0	19 00	−60	180	18 00	−60	180	17 00	−60	180	16 00	−60	180	15 00	−60	180	14 00	−60	180	13 00	−60	180	12 00	−60	180	11 00	−60	180	10 00	−60	180	09 00	−60	180	08 00	−60	180	07 00	−60	180	06 00	−60	180	05 00	−60	180	360
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 56°

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 57°

LAT 57°

LHA	0° Hc	0° d	0° Z	1° Hc	1° d	1° Z	2° Hc	2° d	2° Z	3° Hc	3° d	3° Z	4° Hc	4° d	4° Z	5° Hc	5° d	5° Z	6° Hc	6° d	6° Z	7° Hc	7° d	7° Z	8° Hc	8° d	8° Z	9° Hc	9° d	9° Z	10° Hc	10° d	10° Z	11° Hc	11° d	11° Z	12° Hc	12° d	12° Z	13° Hc	13° d	13° Z	14° Hc	14° d	14° Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	33 00	+60	180	34 00	+60	180	35 00	+60	180	36 00	+60	180	37 00	+60	180	38 00	+60	180	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	360
1	33 00	60	179	34 00	60	179	35 00	60	179	36 00	60	179	37 00	60	179	38 00	60	179	39 00	60	179	40 00	60	179	41 00	60	179	42 00	60	179	43 00	60	179	44 00	60	179	45 00	60	179	46 00	60	179	47 00	60	179	359
2	32 59	60	178	33 59	60	178	34 59	60	178	35 59	60	178	36 59	60	178	37 59	60	177	38 59	60	177	39 59	60	177	40 59	59	177	41 58	60	177	42 58	60	177	43 58	60	177	44 58	60	177	45 58	60	177	46 58	60	177	358
3	32 57	60	176	33 57	60	176	34 57	60	176	35 57	60	176	36 57	60	176	37 57	60	176	38 57	60	176	39 57	60	176	40 57	60	176	41 57	60	176	42 57	60	176	43 57	59	176	44 56	60	176	45 56	60	176	46 56	60	176	357
4	32 55	60	175	33 55	59	175	34 54	60	175	35 54	60	175	36 54	60	175	37 54	60	175	38 54	60	175	39 54	60	175	40 54	60	175	41 54	60	175	42 54	60	175	43 54	60	175	44 54	60	174	45 54	60	174	46 54	59	174	356
5	32 52	+59	174	33 51	+60	174	34 51	+60	174	35 51	+60	174	36 51	+60	174	37 51	+60	174	38 51	+60	174	39 51	+60	174	40 51	+60	173	41 51	+59	173	42 50	+60	173	43 50	+60	173	44 50	+60	173	45 50	+60	173	46 50	+60	173	355
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66	12 48	51	110	13 39	52	110	14 31	51	109	15 22	52	109	16 14	51	108	17 05	51	108	17 56	51	107	18 47	51	107	19 38	51	106	20 29	51	105	21 20	51	105	22 11	50	104	23 01	51	104	23 52	50	103	24 42	50	103	294
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68	11 46	52	109	12 38	51	108	13 29	51	108	14 20	51	107	15 11	52	107	16 03	51	106	16 54	50	105	17 44	51	105	18 35	51	104	19 26	51	104	20 17	50	103	21 07	51	103	21 58	50	102	22 48	50	101	23 38	50	101	292
69	11 15	52	108	12 07	51	107	12 58	51	107	13

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	10 44	+51	107	11 35	+51	106	12 26	+52	106	13 18	+51	105	14 09	+50	105	14 59	+51	104	15 50	+51	104	16 41	+51	103	17 32	+50	103	18 22	+51	102	19 13	+50	101	20 03	+50	101	20 53	+51	100	21 44	+50	100	22 34	+49	99	290
71	10 13	51	106	11 04	51	106	11 55	51	105	12 46	51	104	13 37	51	104	14 28	50	103	15 18	51	103	16 09	51	102	17 00	50	102	17 50	51	101	18 41	50	101	19 31	50	100	20 21	50	99	21 11	50	99	22 01	50	98	289
72	09 41	51	105	10 32	51	105	11 23	51	104	12 14	51	104	13 05	51	103	13 56	51	103	14 47	50	102	15 37	51	101	16 28	50	101	17 18	51	100	18 09	50	100	18 59	50	99	19 49	50	99	20 39	50	98	21 29	50	97	288
73	09 10	51	104	10 01	51	104	10 52	50	103	11 42	51	103	12 33	51	102	13 24	51	102	14 15	50	101	15 05	51	101	15 56	50	100	16 46	50	99	17 36	50	99	18 26	51	98	19 17	50	98	20 07	49	97	20 56	50	97	287
74	08 38	51	104	09 29	51	103	10 20	51	102	11 11	50	102	12 01	51	101	12 52	50	101	13 42	51	100	14 33	50	100	15 23	51	99	16 14	50	99	17 04	50	98	17 54	50	97	18 44	50	97	19 34	50	96	20 24	50	96	286
75	08 06	+51	103	08 57	+51	102	09 48	+50	102	10 38	+51	101	11 29	+51	100	12 20	+50	100	13 10	+51	99	14 01	+50	99	14 51	+50	98	15 41	+51	98	16 32	+50	97	17 22	+50	97	18 12	+50	96	19 02	+49	95	19 51	+50	95	285
76	07 34	51	102	08 25	51	101	09 16	50	101	10 06	51	100	10 57	50	100	11 47	51	99	12 38	50	99	13 28	51	98	14 19	50	97	15 09	50	97	15 59	50	96	16 49	50	96	17 39	50	95	18 29	50	95	19 19	49	94	284
77	07 02	51	101	07 53	51	100	08 44	50	100	09 34	51	99	10 25	50	99	11 15	51	98	12 06	50	98	12 56	50	97	13 46	50	97	14 36	51	96	15 27	50	95	16 17	50	95	17 07	49	94	17 56	50	94	18 46	50	93	283
78	06 30	51	100	07 21	50	100	08 11	51	99	09 02	50	98	09 52	51	98	10 43	50	97	11 33	51	97	12 24	50	96	13 14	50	96	14 04	50	95	14 54	50	95	15 44	50	94	16 34	50	93	17 24	50	93	18 14	49	92	282
79	05 58	50	99	06 48	51	99	07 39	51	98	08 30	50	98	09 20	50	97	10 10	51	97	11 01	50	96	11 51	50	95	12 41	50	95	13 31	50	94	14 21	50	94	15 11	50	93	16 01	50	93	16 51	50	92	17 41	50	91	281
80	05 26	+50	98	06 16	+51	98	07 07	+50	97	07 57	+51	97	08 48	+50	96	09 38	+50	96	10 28	+50	95	11 18	+51	95	12 09	+50	94	12 59	+50	93	13 49	+50	93	14 39	+50	92	15 29	+50	92	16 19	+49	91	17 08	+50	91	280
81	04 53	51	98	05 44	50	97	06 34	51	96	07 25	50	96	08 15	50	95	09 05	51	95	09 56	50	94	10 46	50	94	11 36	50	93	12 26	50	93	13 16	50	92	14 06	50	91	14 56	50	91	15 46	50	90	16 36	49	90	279
82	04 21	50	97	05 11	51	96	06 02	50	96	06 52	50	95	07 42	51	95	08 33	50	94	09 23	50	93	10 13	50	93	11 03	51	92	11 54	50	92	12 44	49	91	13 33	50	91	14 23	50	90	15 13	50	89	16 03	49	89	278
83	03 48	51	96	04 39	50	95	05 29	51	95	06 20	50	94	07 10	50	94	08 00	50	93	08 50	51	93	09 41	50	92	10 31	50	91	11 21	50	91	12 11	50	90	13 01	50	90	13 51	49	89	14 40	50	89	15 30	50	88	277
84	03 16	50	95	04 06	51	94	04 57	50	94	05 47	50	93	06 37	51	93	07 28	50	92	08 18	50	92	09 08	50	91	09 58	50	91	10 48	50	90	11 38	50	90	12 28	50	89	13 18	50	88	14 08	50	88	14 58	49	87	276
85	02 43	+51	94	03 34	+50	94	04 24	+50	93	05 14	+51	93	06 05	+50	92	06 55	+50	91	07 45	+50	91	08 35	+50	90	09 25	+50	90	10 15	+51	89	11 06	+49	89	11 55	+50	88	12 45	+50	88	13 35	+50	87	14 25	+50	86	275
86	02 11	50	93	03 01	50	93	03 51	51	92	04 42	50	92	05 32	50	91	06 22	50	91	07 12	51	90	08 03	50	90	08 53	50	89	09 43	50	88	10 33	50	88	11 23	50	87	12 13	50	87	13 03	49	86	13 52	50	86	274
87	01 38	50	93	02 28	51	92	03 19	50	91	04 09	50	91	04 59	51	90	05 50	50	90	06 40	50	89	07 30	50	89	08 20	50	88	09 10	50	88	10 00	50	87	10 50	50	86	11 40	50	86	12 30	50	85	13 20	49	85	273
88	01 05	51	92	01 56	50	91	02 46	50	91	03 36	51	90	04 27	50	89	05 17	50	89	06 07	50	88	06 57	50	88	07 47	51	87	08 38	50	87	09 28	50	86	10 18	50	86	11 08	49	85	11 57	50	84	12 47	50	84	272
89	00 33	50	91	01 23	50	90	02 13	51	90	03 04	50	89	03 54	50	89	04 44	50	88	05 34	51	88	06 25	50	87	07 15	50	86	08 05	50	86	08 55	50	85	09 45	50	85	10 35	50	84	11 25	50	84	12 15	50	83	271
90	00 00	+50	90	00 50	+51	89	01 41	+50	89	02 31	+50	88	03 21	+51	88	04 12	+50	87	05 02	+50	87	05 52	+50	86	06 42	+50	86	07 32	+50	85	08 22	+51	85	09 13	+50	84	10 03	+49	83	10 52	+50	83	11 42	+50	82	270
91	−0 33	51	89	00 18	50	89	01 08	50	88	01 58	51	88	02 49	50	87	03 39	50	86	04 29	50	86	05 19	51	85	06 10	50	85	07 00	50	84	07 50	50	84	08 40	50	83	09 30	50	83	10 20	50	82	11 10	50	81	269
92	−1 05	50	88	−0 15	50	88	00 35	51	87	01 26	50	87	02 16	50	86	03 06	51	86	03 57	50	85	04 47	50	85	05 37	50	84	06 27	50	83	07 17	51	83	08 08	50	82	08 58	50	82	09 48	50	81	10 38	50	81	268
93	−1 38	50	87	−0 48	51	87	00 03	50	86	00 53	50	86	01 43	51	85	02 34	50	85	03 24	50	84	04 14	51	84	05 05	50	83	05 55	50	83	06 45	50	82	07 35	50	81	08 25	51	81	09 16	50	80	10 06	50	80	267
94	−2 11	51	87	−1 20	50	86	−0 30	50	86	00 20	51	85	01 11	50	84	02 01	51	84	02 52	50	83	03 42	50	83	04 32	50	82	05 22	51	82	06 13	50	81	07 03	50	81	07 53	50	80	08 43	50	80	09 33	50	79	266
95	−2 43	+50	86	−1 53	+51	85	−1 02	+50	85	−0 12	+50	84	00 38	+51	84	01 29	+50	83	02 19	+50	83	03 09	+51	82	04 00	+50	81	04 50	+51	81	05 41	+50	80	06 31	+50	80	07 21	+50	79	08 11	+50	79	09 01	+51	78	265
96	−3 16	51	85	−2 25	50	84	−1 35	50	84	−0 45	51	83	00 06	50	83	00 56	51	82	01 47	50	82	02 37	51	81	03 28	50	81	04 18	50	80	05 08	51	80	05 59	50	79	06 49	50	78	07 39	50	78	08 29	51	77	264
97	−3 48	50	84	−2 58	51	84	−2 07	50	83	−1 17	50	82	−0 27	51	82	00 24	50	81	01 14	51	81	02 05	50	80	02 55	51	80	03 46	50	79	04 36	51	79	05 27	50	78	06 17	50	78	07 07	51	77	07 58	50	77	263
98	−4 21	51	83	−3 30	50	83	−2 40	51	82	−1 49	50	82	−0 59	51	81	−0 08	50	81	00 42	51	80	01 33	50	79	02 23	51	79	03 14	50	78	04 04	51	78	04 55	50	77	05 45	51	77	06 36	50	76	07 26	50	76	262
99	−4 53	50	82	−4 03	51	82	−3 12	50	81	−2 22	51	81	−1 31	50	80	−0 41	51	80	00 10	51	79	01 01	50	79	01 51	51	78	02 42	50	78	03 32	51	77	04 23	50	77	05 13	51	76	06 04	50	75	06 54	51	75	261
100	−5 26	+51	82	−4 35	+51	81	−3 44	+50	81	−2 54	+51	80	−2 03	+50	79	−1 13	+51	79	−0 22	+51	78	00 29	+50	78	01 19	+51	77	02 10	+51	77	03 01	+50	76	03 51	+51	76	04 42	+50	75	05 32	+51	75	06 23	+50	74	260
101	−5 58	+51	81	−5 07	50	80	−4 17	51	80	−3 26	51	79	−2 35	50	79	−1 45	51	78	−0 54	51	78	−0 03	50	77	00 47	51	76	01 38	51	76	02 29	51	75	03 20	50	75	04 10	51	74	05 01	50	74	05 51	51	73	259
			102	−5 39	50	79	−4 49	51	79	−3 58	51	78	−3 07	50	78	−2 17	51	77	−1 26	51	77	−0 35	51	76	00 16	51	76	01 07	50	75	01 57	51	75	02 48	51	74	03 39	51	73	04 30	50	73	05 20	51	72	258
			103	−6 12	+51	79	−5 21	51	78	−4 30	51	77	−3 39	51	77	−2 48	50	76	−1 58	51	76	−1 07	51	75	−0 16	51	75	00 35	51	74	01 26	51	74	02 17	51	73	03 08	50	73	03 58	51	72	04 49	51	72	257
						104	−5 53	+51	77	−5 02	51	77	−4 11	51	76	−3 20	51	76	−2 29	51	75	−1 38	51	74	−0 47	51	74	00 04	51	73	00 55	51	73	01 46	50	72	02 36	51	72	03 27	51	71	04 18	51	71	256
									105	−5 34	+51	76	−4 43	+51	75	−3 52	+51	75	−3 01	+51	74	−2 10	+51	74	−1 19	+51	73	−0 28	+51	73	00 23	+51	72	01 14	+51	72	02 05	+51	71	02 56	+51	70	03 47	+51	70	255
									106	−6 05	+51	75	−5 14	51	74	−4 23	51	74	−3 32	51	73	−2 41	51	73	−1 50	51	72	−0 59	51	72	−0 08	52	71	00 44	51	71	01 35	51	70	02 26	51	70	03 17	51	69	254
												107	−5 46	52	73	−4 54	51	73	−4 03	51	72	−3 12	51	72	−2 21	51	71	−1 30	52	71	−0 38	51	70	00 13	51	70	01 04	51	69	01 55	51	69	02 46	52	68	253
												108	−6 17	+51	73	−5 26	52	72	−4 34	51	72	−3 43	51	71	−2 52	52	71	−2 00	51	70	−1 09	51	70	−0 18	51	69	00 33	52	68	01 25	51	68	02 16	51	67	252
															109	−5 57	+52	71	−5 05	51	71	−4 14	51	70	−3 23	52	70	−2 31	51	69	−1 40	52	69	−0 48	51	68	00 03	52	68	00 55	51	67	01 46	51	67	251
																		110	−5 36	+51	70	−4 45	+52	69	−3 53	+51	69	−3 02	+52	68	−2 10	+52	68	−1 18	+51	67	−0 27	+52	67	00 25	+51	66	01 16	+52	66	250
																		111	−6 07	+52	69	−5 15	52	69	−4 23	51	68	−3 32	52	67	−2 40	51	67	−1 49	52	66	−0 57	52	66	−0 05	51	65	00 46	52	65	249
																					112	−5 45	51	68	−4 54	52	67	−4 02	52	67	−3 10	52	66	−2 18	51	66	−1 27	52	65	−0 35	52	65	00 17	52	64	248
																					113	−6 16	+52	67	−5 24	52	66	−4 32	52	66	−3 40	52	65	−2 48	52	65	−1 56	52	64	−1 04	52	64	−0 12	52	63	247
																								114	−5 54	+52	65	−5 02	52	65	−4 10	52	64	−3 18	52	64	−2 26	53	63	−1 33	52	63	−0 41	52	62	246
																											115	−5 31	+52	64	−4 39	+52	64	−3 47	+52	63	−2 55	+53	63	−2 02	+52	62	−1 10	+52	62	245
																											116	−6 00	+52	63	−5 08	52	63	−4 16	52	62	−3 24	53	62	−2 31	52	61	−1 39	52	61	244
																														117	−5 37	53	62	−4 45	53	61	−3 52	52	61	−3 00	53	60	−2 07	52	60	243
																														118	−6 06	+53	61	−5 13	52	60	−4 21	53	60	−3 28	53	60	−2 35	52	59	242
																																	119	−5 41	52	60	−4 49	53	59	−3 56	53	59	−3 03	52	58	241
																																	120	−6 10	+53	59	−5 17	+53	58	−4 24	+53	58	−3 31	+53	57	240
																																			121	−5 44	53	57	−4 51	53	57	−3 58	53	56	239
																																			122	−6 12	+53	57	−5 19	54	56	−4 25	53	56	238
																																						123	−5 46	54	55	−4 52	53	55	237
																																						124	−6 12	+53	54	−5 19	54	54	236
																																									125	−5 45	+54	53	235
																																									126	−6 11	+54	52	234

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 57°

LAT 57°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 57°

LAT 57°

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
100	−5 26	−50	82	−6 16	−51	82	260																																									
99	−4 53	51	82	−5 44	50	83	261																																								
98	−4 21	50	83	−5 11	51	84	−6 02	−90	84	262																																						
97	−3 48	51	84	−4 39	50	85	−5 29	51	85	−6 20	−50	86	263																																			
96	−3 16	50	85	−4 06	51	86	−4 57	50	86	−5 47	50	87	264																																			
95	−2 43	−51	86	−3 34	−50	86	−4 24	−50	87	−5 14	−51	87	−6 05	−50	88	265																															
94	−2 11	50	87	−3 01	50	87	−3 51	51	88	−4 42	50	88	−5 32	50	89	−6 22	−50	89	266																												
93	−1 38	50	87	−2 28	51	88	−3 19	50	89	−4 09	50	89	−4 59	51	90	−5 50	50	90	267																												
92	−1 05	51	88	−1 56	50	89	−2 46	50	89	−3 36	51	90	−4 27	50	91	−5 17	50	91	−6 07	−50	92	268																								
91	−0 33	50	89	−1 23	50	90	−2 13	51	90	−3 04	50	91	−3 54	50	91	−4 44	50	92	−5 34	51	92	269																								
90	00 00	−50	90	−0 50	−51	91	−1 41	−50	91	−2 31	−50	92	−3 21	−51	92	−4 12	−50	93	−5 02	−50	93	−5 52	−50	94	270																				
89	00 33	51	91	−0 18	50	91	−1 08	50	92	−1 58	51	92	−2 49	50	93	−3 39	50	94	−4 29	50	94	−5 19	51	95	−6 10	−50	95	271																		
88	01 05	50	92	00 15	50	92	−0 35	51	93	−1 26	50	93	−2 16	50	94	−3 06	51	94	−3 57	50	95	−4 47	50	95	−5 37	50	96	272																		
87	01 38	50	93	00 48	51	93	−0 03	50	94	−0 53	50	94	−1 43	51	95	−2 34	50	95	−3 24	50	96	−4 14	51	96	−5 05	50	97	−5 55	−50	97	273														
86	02 11	51	93	01 20	50	94	00 30	50	94	−0 20	51	95	−1 11	50	96	−2 01	51	96	−2 52	50	97	−3 42	50	97	−4 32	50	98	−5 22	51	98	−6 13	−50	99	274												
85	02 43	−50	94	01 53	−51	95	01 02	−50	95	00 12	−50	96	−0 38	−51	96	−1 29	−50	97	−2 19	−50	97	−3 09	−51	98	−4 00	−50	99	−4 50	−51	99	−5 41	−50	100	275												
84	03 16	51	95	02 25	50	96	01 35	50	96	00 45	51	97	−0 06	50	97	−0 56	51	98	−1 47	50	98	−2 37	51	99	−3 28	50	99	−4 18	50	100	−5 08	51	100	−5 59	−50	101	276								
83	03 48	50	96	02 58	51	96	02 07	50	97	01 17	50	98	00 27	51	98	−0 24	50	99	−1 14	51	99	−2 05	50	100	−2 55	51	100	−3 46	50	101	−4 36	51	101	−5 27	50	102	−6 17	−50	102	277				
82	04 21	51	97	03 30	50	97	02 40	51	98	01 49	50	98	00 59	51	99	00 08	50	99	−0 42	51	100	−1 33	50	101	−2 23	51	101	−3 14	50	102	−4 04	51	102	−4 55	50	103	−5 45	51	103	278				
81	04 53	50	98	04 03	51	98	03 12	50	99	02 22	51	99	01 31	50	100	00 41	51	100	−0 10	51	101	−1 01	50	101	−1 51	51	102	−2 42	50	102	−3 32	51	103	−4 23	50	103	−5 13	51	104	−6 04	−50	105	279		
80	05 26	−51	98	04 35	−51	99	03 44	−50	99	02 54	−51	100	02 03	−50	101	01 13	−51	101	00 22	−51	102	−0 29	−50	102	−1 19	−51	103	−2 10	−51	103	−3 01	−50	104	−3 51	−51	104	−4 42	−50	105	−5 32	−51	105	280		
79	05 58	51	99	05 07	50	100	04 17	51	100	03 26	51	101	02 35	50	101	01 45	51	102	00 54	51	102	00 03	50	103	−0 47	51	104	−1 38	51	104	−2 29	51	105	−3 20	50	105	−4 10	51	106	−5 01	50	106	−5 51	−51	107	281
78	06 30	51	100	05 39	50	101	04 49	51	101	03 58	51	102	03 07	50	102	02 17	51	103	01 26	51	103	00 35	51	104	−0 16	51	104	−1 07	50	105	−1 57	51	105	−2 48	51	106	−3 39	51	107	−4 30	50	107	−5 20	51	108	282
77	07 02	50	101	06 12	51	101	05 21	51	102	04 30	51	103	03 39	51	103	02 48	50	104	01 58	51	104	01 07	51	105	00 16	51	105	−0 35	51	106	−1 26	51	106	−2 17	51	107	−3 08	50	107	−3 58	51	108	−4 49	51	108	283
76	07 34	51	102	06 43	50	102	05 53	51	103	05 02	51	103	04 11	51	104	03 20	51	104	02 29	51	105	01 38	51	106	00 47	51	106	−0 04	51	107	−0 55	51	107	−1 46	50	108	−2 36	51	108	−3 27	51	109	−4 18	51	109	284
75	08 06	−51	103	07 15	−51	103	06 24	−50	104	05 34	−51	104	04 43	−51	105	03 52	−51	105	03 01	−51	106	02 10	−51	106	01 19	−51	107	00 28	−51	107	−0 23	−51	108	−1 14	−51	108	−2 05	−51	109	−2 56	−51	110	−3 47	−51	110	285
74	08 38	51	104	07 47	51	104	06 56	51	105	06 05	51	105	05 14	51	106	04 23	51	106	03 32	51	107	02 41	51	107	01 50	51	108	00 59	51	108	00 08	52	109	−0 44	51	109	−1 35	51	110	−2 26	51	110	−3 17	51	111	286
73	09 10	51	104	08 19	51	105	07 28	51	105	06 37	51	106	05 46	52	107	04 54	51	107	04 03	51	108	03 12	51	108	02 21	51	109	01 30	52	109	00 38	51	110	−0 13	51	110	−1 04	51	111	−1 55	51	111	−2 46	52	112	287
72	09 41	51	105	08 50	51	106	07 59	51	106	07 08	51	107	06 17	51	107	05 26	52	108	04 34	51	108	03 43	51	109	02 52	52	109	02 00	51	110	01 09	51	110	00 18	51	111	−0 33	52	112	−1 25	51	112	−2 16	51	113	288
71	10 13	51	106	09 22	52	107	08 30	51	107	07 39	51	108	06 48	51	108	05 57	52	109	05 05	51	109	04 14	51	110	03 23	52	110	02 31	51	111	01 40	52	111	00 48	51	112	−0 03	52	112	−0 55	51	113	−1 46	53	113	289
70	10 44	−51	107	09 53	−51	108	09 02	−52	108	08 10	−51	109	07 19	−52	109	06 27	−51	110	05 36	−51	110	04 45	−52	111	03 53	−51	111	03 02	−52	112	02 10	−52	112	01 18	−51	113	00 27	−52	113	−0 25	−51	114	−1 16	−52	114	290
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	11 15	51	108	10 24	51	108	09 33	52	109	08 41	51	109	07 50	52	110	06 58	51	110	06 07	52	111	05 15	52	111	04 23	51	112	03 32	52	113	02 40	51	113	01 49	52	114	00 57	52	114	00 05	51	115	−0 46	52	115	291
68	11 46	51	109	10 55	52	109	10 03	51	110	09 12	52	110	08 20	51	111	07 29	52	111	06 37	52	112	05 45	51	112	04 54	52	113	04 02	52	113	03 10	52	114	02 18	51	114	01 27	52	115	00 35	52	115	−0 17	52	116	292
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1	33 00	60	179	32 00	60	179	31 00	60	179	30 00	60	179	29 00	60	179	28 00	60	179	27 00	60	179	26 00	60	179	25 00	60	179	24 00	60	179	23 00	60	179	22 00	60	179	21 00	60	179	20 00	60	179	19 00	60	179	359
0	33 00	−60	180	32 00	−60	180	31 00	−60	180	30 00	−60	180	29 00	−60	180	28 00	−60	180	27 00	−60	180	26 00	−60	180	25 00	−60	180	24 00	−60	180	23 00	−60	180	22 00	−60	180	21 00	−60	180	20 00	−60	180

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	62 00	+60	180	360
1	48 00	60	179	49 00	60	179	50 00	60	179	51 00	60	178	52 00	60	178	53 00	60	178	54 00	60	178	55 00	60	178	56 00	60	178	57 00	60	178	58 00	60	178	59 00	60	178	60 00	60	178	61 00	60	178	62 00	60	178	359
2	47 58	60	177	48 58	60	177	49 58	60	177	50 58	60	177	51 58	60	177	52 58	60	177	53 58	60	177	54 58	60	177	55 58	60	177	56 58	60	177	57 58	60	177	58 58	60	177	59 58	60	176	60 58	60	176	61 58	60	176	358
3	47 56	60	176	48 56	60	176	49 56	60	176	50 56	60	175	51 56	60	175	52 56	60	175	53 56	60	175	54 56	60	175	55 56	60	175	56 56	60	175	57 56	60	175	58 56	59	175	59 55	60	175	60 55	60	174	61 55	60	174	357
4	47 53	60	174	48 53	60	174	49 53	60	174	50 53	60	174	51 53	60	174	52 53	60	174	53 53	60	174	54 53	60	174	55 53	59	173	56 52	60	173	57 52	60	173	58 52	60	173	59 52	60	173	60 52	60	173	61 52	59	173	356
5	47 50	+60	173	48 50	+59	173	49 49	+60	173	50 49	+60	172	51 49	+60	172	52 49	+60	172	53 49	+60	172	54 49	+59	172	55 48	+60	172	56 48	+60	172	57 48	+60	171	58 48	+59	171	59 47	+60	171	60 47	+60	171	61 47	+59	171	355
6	47 45	60	171	48 45	60	171	49 45	60	171	50 45	59	171	51 44	60	171	52 44	60	171	53 44	59	171	54 43	60	170	55 43	60	170	56 43	60	170	57 43	59	170	58 42	60	170	59 42	59	169	60 41	60	169	61 41	60	169	354
7	47 40	60	170	48 40	59	170	49 39	60	170	50 39	60	169	51 39	59	169	52 38	60	169	53 38	60	169	54 38	59	169	55 37	60	169	56 37	59	168	57 36	60	168	58 36	59	168	59 35	60	168	60 35	59	167	61 34	60	167	353
8	47 34	59	169	48 33	60	168	49 33	60	168	50 33	59	168	51 32	60	168	52 32	59	168	53 31	60	167	54 31	59	167	55 30	60	167	56 30	59	167	57 29	59	166	58 28	60	166	59 28	59	166	60 27	59	166	61 26	60	165	352
9	47 27	59	167	48 26	60	167	49 26	59	167	50 25	60	166	51 25	59	166	52 24	60	166	53 24	59	166	54 23	59	166	55 22	60	165	56 22	59	165	57 21	59	165	58 20	59	164	59 19	59	164	60 18	60	164	61 18	59	163	351
10	47 19	+60	166	48 19	+59	165	49 18	+59	165	50 17	+60	165	51 17	+59	165	52 16	+59	165	53 15	+59	164	54 14	+60	164	55 14	+59	164	56 13	+59	163	57 12	+59	163	58 11	+59	163	59 10	+59	162	60 09	+59	162	61 08	+59	162	350
11	47 11	59	164	48 10	59	164	49 09	59	164	50 08	60	164	51 08	59	163	52 07	59	163	53 06	59	163	54 05	59	162	55 04	59	162	56 03	59	162	57 02	59	161	58 01	59	161	59 00	58	161	59 58	59	160	60 57	59	160	349
12	47 01	60	163	48 01	59	163	49 00	59	162	49 59	59	162	50 58	59	162	51 57	59	162	52 56	59	161	53 55	59	161	54 54	58	161	55 52	59	160	56 51	59	160	57 50	58	159	58 48	59	159	59 47	58	159	60 45	59	158	348
13	46 51	59	161	47 50	59	161	48 49	59	161	49 48	59	161	50 47	59	160	51 46	59	160	52 45	59	160	53 44	58	159	54 42	59	159	55 41	58	159	56 39	59	158	57 38	58	158	58 36	59	157	59 35	58	157	60 33	58	156	347
14	46 41	59	160	47 40	58	160	48 38	59	160	49 37	59	159	50 36	59	159	51 35	58	159	52 33	59	158	53 32	58	158	54 30	59	157	55 29	58	157	56 27	58	157	57 25	58	156	58 23	58	156	59 21	58	155	60 19	58	155	346
15	46 29	+59	159	47 28	+59	158	48 27	+58	158	49 25	+59	158	50 24	+58	157	51 22	+59	157	52 21	+58	157	53 19	+58	156	54 17	+58	156	55 15	+59	155	56 14	+57	155	57 11	+58	155	58 09	+58	154	59 07	+58	154	60 05	+57	153	345
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17	46 04	58	156	47 02	59	156	48 01	58	155	48 59	58	155	49 57	58	155	50 55	58	154	51 53	58	154	52 51	58	153	53 49	58	153	54 47	57	152	55 44	58	152	56 42	57	151	57 39	57	151	58 36	57	150	59 33	57	150	343
18	45 50	59	155	46 49	58	154	47 47	58	154	48 45	58	154	49 43	58	153	50 41	57	153	51 38	58	152	52 36	58	152	53 34	57	151	54 31	58	151	55 29	57	150	56 26	57	150	57 23	57	149	58 20	57	149	59 17	56	148	342
19	45 36	58	153	46 34	58	153	47 32	58	153	48 30	58	152	49 28	57	152	50 25	58	151	51 23	57	151	52 20	58	150	53 18	57	150	54 15	57	149	55 12	57	149	56 09	57	148	57 06	56	148	58 02	57	147	58 59	56	146	341
20	45 21	+58	152	46 19	+58	152	47 17	+57	151	48 14	+58	151	49 12	+57	150	50 09	+58	150	51 07	+57	149	52 04	+57	149	53 01	+57	148	53 58	+57	148	54 55	+56	147	55 51	+57	147	56 48	+56	146	57 44	+56	146	58 40	+56	145	340
21	45 05	58	151	46 03	57	150	47 00	58	150	47 58	57	149	48 55	58	149	49 53	57	148	50 50	57	148	51 47	57	148	52 44	56	147	53 40	57	146	54 37	56	146	55 33	56	145	56 29	56	145	57 25	56	144	58 21	56	143	339
22	44 49	57	149	45 46	58	149	46 44	57	148	47 41	57	148	48 38	57	148	49 35	57	147	50 32	57	147	51 29	56	146	52 25	57	146	53 22	56	145	54 18	56	144	55 14	56	144	56 10	56	143	57 06	55	142	58 01	56	142	338
23	44 32	57	148	45 29	57	148	46 26	57	147	47 23	57	147	48 20	57	146	49 17	57	146	50 14	56	145	51 10	57	145	52 07	56	144	53 03	56	144	53 59	56	143	54 55	55	142	55 50	56	142	56 46	55	141	57 41	55	140	337
24	44 14	57	147	45 11	57	146	46 08	57	146	47 05	57	145	48 02	56	145	48 58	57	144	49 55	56	144	50 51	56	143	51 47	56	143	52 43	56	142	53 39	55	142	54 34	56	141	55 30	55	140	56 25	55	140	57 20	54	139	336
25	43 56	+57	145	44 53	+57	145	45 50	+56	145	46 46	+57	144	47 43	+56	144	48 39	+56	143	49 35	+56	143	50 31	+56	142	51 27	+56	141	52 23	+55	141	53 18	+55	140	54 13	+55	139	55 08	+55	139	56 03	+55	138	56 58	+54	137	335
26	43 37	57	144	44 34	56	144	45 30	57	143	46 27	56	143	47 23	56	142	48 19	56	142	49 15	56	141	50 11	55	141	51 06	56	140	52 02	55	139	52 57	55	139	53 52	55	138	54 47	54	137	55 41	54	137	56 35	54	136	334
27	43 18	56	143	44 14	57	142	45 11	56	142	46 07	56	141	47 03	56	141	47 59	55	140	48 54	56	140	49 50	55	139	50 45	55	139	51 40	55	138	52 35	55	137	53 30	54	137	54 24	54	136	55 18	54	135	56 12	54	134	333
28	42 58	56	142	43 54	56	141	44 50	56	141	45 46	56	140	46 42	55	140	47 37	56	139	48 33	55	139	49 28	55	138	50 23	55	137	51 18	55	137	52 13	54	136	53 07	54	135	54 01	54	135	54 55	54	134	55 49	53	133	332
29	42 37	56	140	43 33	56	140	44 29	56	139	45 25	55	139	46 20	56	138	47 16	55	138	48 11	55	137	49 06	55	137	50 01	54	136	50 55	55	135	51 50	54	135	52 44	54	134	53 38	53	133	54 31	54	132	55 25	52	132	331
30	42 16	+56	139	43 12	+56	139	44 08	+55	138	45 03	+55	138	45 58	+56	137	46 54	+54	137	47 48	+55	136	48 43	+55	135	49 38	+54	135	50 32	+54	134	51 26	+54	133	52 20	+54	133	53 14	+53	132	54 07	+53	131	55 00	+52	130	330
31	41 55	55	138	42 50	56	138	43 46	55	137	44 41	55	136	45 36	55	136	46 31	54	135	47 25	55	135	48 20	54	134	49 14	54	133	50 08	54	133	51 02	54	132	51 56	53	131	52 49	53	131	53 42	53	130	54 35	52	129	329
32	41 33	55	137	42 28	55	136	43 23	55	136	44 18	55	135	45 13	55	135	46 08	54	134	47 02	54	133	47 56	54	133	48 50	54	132	49 44	54	131	50 38	53	131	51 31	53	130	52 24	53	129	53 17	52	129	54 09	52	128	328
33	41 10	55	136	42 05	55	135	43 00	55	135	43 55	54	134	44 49	55	133	45 44	54	133	46 38	54	132	47 32	54	132	48 26	53	131	49 19	54	130	50 13	53	130	51 06	52	129	51 58	53	128	52 51	52	127	53 43	52	126	327
34	40 47	55	134	41 42	55	134	42 37	54	133	43 31	54	133	44 25	55	132	45 20	54	132	46 14	53	131	47 07	54	130	48 01	53	130	48 54	53	129	49 47	53	128	50 40	53	128	51 33	52	127	52 25	51	126	53 16	52	125	326
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41	37 53	54	127	38 47	53	126	39 40	53	125	40 33	53	125	41 26	52	124	42 18	53	124	43 11	52	123	44 03	52	122	44 55	52	121	45 47	51	121	46 38	51	120	47 29	51	119	48 20	50	118	49 10	50	118	50 00	50	117	319
42	37 27	53	126	38 20	53	125	39 13	53	124	40 06	53	124	40 59	52	123	41 51	52	122	42 43	52	122	43 35	52	121	44 27	51	120	45 18	52	120	46 10	50	119	47 00	51	118	47 51	50	117	48 41	50	117	49 31	49	116	318
43	37 00	53	124	37 53	53	124	38 46	53	123	39 39	52	123	40 31	52	122	41 23	52	121	42 15	52	121	43 07	52	120	43 59	51	119	44 50	51	119	45 41	50	118	46 31	51	117	47 22	50	116	48 12	49	115	49 01	50	115	317
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45	36 05	+53	122	36 58	+53	122	37 51	+52	121	38 43	+52	120	39 35	+52	120	40 27	+51	119	41 18	+52	119	42 10	+51	118	43 01	+51	117	43 52	+50	116	44 42	+51	116	45 33	+50	115	46 23	+49	114	47 12	+49	113	48 01	+49	112	315
46	35 38	52	121	36 30	52	121	37 22	53	120	38 15	51	119	39 06	52	119	39 58	52	118	40 50	51	117	41 41	51	117	42 32	50	116	43 22	51	115	44 13	50	115	45 03	50	114	45 53	49	113	46 42	49	112	47 31	49	111	314
47	35 10	52	120	36 02	52	120	36 54	52	119	37 46	52	118	38 38	51	118	39 29	51	117	40 20	51	116	41 11	51	116	42 02	51	115	42 53	50	114	43 43	50	114	44 33	49	113	45 22	50	112	46 12	49	111	47 01	49	110	313
48	34 41	52	119	35 33	52	119	36 25	52	118	37 17	52	117	38 09	51	117	39 00	51	116	39 51	51	115	40 42	50	115	41 32	51	114	42 23	50	113	43 13	50	112	44 03	49	112	44 52	49	111	45 41	49	110	46 30	48	109	312
49	34 13	51	118	35 04	52	118	35 56	52	117	36 48	51	116	37 39	51	116	38 30	51	115	39 21	51	114	40 12	50	114	41 02	51	113	41 53	50	112	42 43	49	111	43 32	49	111	44 21	49	110	45 10	49	109	45 59	48	108	311
50	33 44	+51	117	34 35	+52	117	35 27	+51	116	36 18	+52	115	37 10	+51	115	38 01	+50	114	38 51	+51	113	39 42	+50	113	40 32	+50	112	41 22	+50	111	42 12	+49	110	43 01	+50	110	43 51	+48	109	44 39	+49	108	45 28	+48	107	310
51	33 14	52	116	34 06	51	116	34 57	52	115	35 49	51	114	36 40	51	114	37 31	50	113	38 21	51	112	39 12	50	112	40 02	50	111	40 52	49	110	41 41	50	109	42 31	49	109	43 20	48	108	44 08	48	107	44 56	48	106	309
52	32 45	51	115	33 36	52	115	34 28	51	114	35 19	51	113	36 10	51	113	37 01	50	112	37 51	50	111	38 41	50	111	39 31	50	110	40 21	49	109	41 10	50	108	42 00	48	108	42 48	49	107	43 37	48	106	44 25	48	105	308
53	32 15	52	114	33 07	51	114	33 58	51	113	34 49	51	112	35 40	50	112	36 30	50	111	37 20	51	110	38 11	49	110	39 00	50	109	39 50	49	108	40 39	49	107	41 28	49	107	42 17	48	106	43 05	48	105	43 53	48	104	307
54	31 45	52	113	32 37	51	113	33 28	50	112	34 18	51	111	35 09	50	111	35 59	51	110	36 50	50	109	37 40	49	109	38 29	50	108	39 19	49	107	40 08	49	106	40 57	48	106	41 45	49	105	42 34	48	104	43 22	47	103	306
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60	28 42	+50	108	29 32	+50	107	30 22	+51	106	31 13	+49	106	32 02	+50	105	32 52	+50	104	33 42	+49	104	34 31	+49	103	35 20	+49	102	36 09	+49	102	36 58	+48	101	37 46	+48	100	38 34	+48	99	39 22	+47	99	40 09	+47	98	300
61	28 10	51	107	29 01	50	106	29 51	50	105	30 41	50	105	31 31	49	104	32 20	50	103	33 10	49	103	33 59	49	102	34 48	49	101	35 37	48	101	36 25	49	100	37 14	48	99	38 02	47	98	38 49	47	98	39 36	47	97	299
62	27 39	50	106	28 29	50	105	29 19	50	104	30 09	50	104	30 59	50	103	31 49	49	102	32 38	49	102	33 27	49	101	34 16	49	100	35 05	48	100	35 53	48	99	36 41	48	98	37 29	48	97	38 17	47	97	39 04	47	96	298
63	27 07	51	105	27 58	50	104	28 48	50	104	29 38	49	103	30 27	50	102	31 17	49	102	32 06	49	101	32 55	49	100	33 44	48	100	34 32	49	99	35 21	48	98	36 09	48	97	36 57	47	97	37 44	47	96	38 31	47	95	297
64	26 36	50	104	27 26	50	103	28 16	50	103	29 06	49	102	29 55	50	101	30 45	49	101	31 34	49	100	32 23	49	99	33 12	48	99	34 00	48	98	34 48	48	97	35 36	48	96	36 24	48	96	37 12	47	95	37 59	47	94	296
65	26 04	+50	103	26 54	+50	102	27 44	+50	102	28 34	+49	101	29 23	+49	100	30 12	+50	100	31 02	+49	99	31 51	+48	98	32 39	+49	98	33 28	+48	97	34 16	+48	96	35 04	+48	96	35 52	+47	95	36 39	+47	94	37 26	+47	93	295
66	25 32	50	102	26 22	50	101	27 12	49	101	28 01	50	100	28 51	49	100	29 40	49	99	30 29	49	98	31 18	49	98	32 07	48	97	32 55	48	96	33 43	48	95	34 31	48	95	35 19	48	94	36 07	47	93	36 54	46	92	294
67	25 00	50	101	25 50	50	101	26 40	49	100	27 29	50	99	28 19	49	99	29 08	49	98	29 57	49	97	30 46	48	97	31 34	49	96	32 23	48	95	33 11	48	95	33 59	48	94	34 47	47	93	35 34	47	92	36 21	47	92	293
68	24 28	50	100	25 18	49	100	26 07	50	99	26 57	49	98	27 46	49	98	28 35	49	97	29 24	49	96	30 13	49	96	31 02	48	95	31 50	48	94	32 38	48	94	33 26	48	93	34 14	47	92	35 01	47	92	35 48	47	91	292
69	23 56	49	99	24 45	50	99	25 35	50	98	26 25	49	98	27 14	49	97	28 03	49	96	28 52	49	96	29 41	48	95	30 29	49	94	31 18	48	94	32 06	48	93	32 54	47	92

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	23 23	+50	99	24 13	+50	98	25 03	+49	97	25 52	+49	97	26 41	+50	96	27 31	+48	95	28 19	+49	95	29 08	+49	94	29 57	+48	93	30 45	+48	93	31 33	+48	92	32 21	+48	91	33 09	+47	91	33 56	+47	90	34 43	+47	89	290
71	22 51	50	98	23 41	49	97	24 30	50	96	25 20	49	96	26 09	49	95	26 58	49	95	27 47	49	94	28 36	48	93	29 24	48	93	30 12	48	92	31 00	48	91	31 48	48	90	32 36	47	90	33 23	47	89	34 10	47	88	289
72	22 19	49	97	23 08	50	96	23 58	49	96	24 47	49	95	25 36	49	94	26 25	49	94	27 14	49	93	28 03	48	92	28 51	49	92	29 40	48	91	30 28	48	90	31 16	47	90	32 03	48	89	32 51	47	88	33 38	47	87	288
73	21 46	50	96	22 36	49	95	23 25	50	95	24 15	49	94	25 04	49	93	25 53	49	93	26 42	48	92	27 30	49	92	28 19	48	91	29 07	48	90	29 55	48	89	30 43	48	89	31 31	47	88	32 18	47	87	33 05	47	87	287
74	21 14	49	95	22 03	50	94	22 53	49	94	23 42	49	93	24 31	49	93	25 20	49	92	26 09	49	91	26 58	48	91	27 46	48	90	28 34	48	89	29 22	48	89	30 10	48	88	30 58	47	87	31 45	47	87	32 32	47	86	286
75	20 41	+50	94	21 31	+49	94	22 20	+49	93	23 09	+49	92	23 58	+49	92	24 47	+49	91	25 36	+49	90	26 25	+48	90	27 13	+49	89	28 02	+48	88	28 50	+48	88	29 38	+47	87	30 25	+48	86	31 13	+47	86	32 00	+47	85	285
76	20 08	50	93	20 58	49	93	21 47	50	92	22 37	49	92	23 26	49	91	24 15	49	90	25 04	48	90	25 52	49	89	26 41	48	88	27 29	48	88	28 17	48	87	29 05	48	86	29 53	47	86	30 40	47	85	31 27	47	84	284
77	19 36	49	93	20 25	50	92	21 15	49	91	22 04	49	91	22 53	49	90	23 42	49	89	24 31	49	89	25 20	48	88	26 08	48	88	26 56	48	87	27 44	48	86	28 32	48	85	29 20	48	85	30 08	47	84	30 55	47	83	283
78	19 03	50	92	19 53	49	91	20 42	49	90	21 31	49	90	22 20	49	89	23 09	49	89	23 58	49	88	24 47	48	87	25 35	49	87	26 24	48	86	27 12	48	85	28 00	48	85	28 48	47	84	29 35	47	83	30 22	47	83	282
79	18 31	49	91	19 20	49	90	20 09	50	90	20 59	49	89	21 48	49	88	22 37	49	88	23 26	48	87	24 14	49	87	25 03	48	86	25 51	48	85	26 39	48	85	27 27	48	84	28 15	48	83	29 03	47	82	29 50	47	82	281
80	17 58	+49	90	18 47	+50	89	19 37	+49	89	20 26	+49	88	21 15	+49	88	22 04	+49	87	22 53	+49	86	23 42	+48	86	24 30	+49	85	25 19	+48	84	26 07	+48	84	26 55	+48	83	27 43	+47	82	28 30	+48	82	29 18	+47	81	280
81	17 25	50	89	18 15	49	89	19 04	49	88	19 53	49	87	20 42	49	87	21 31	49	86	22 20	49	85	23 09	49	85	23 58	48	84	24 46	48	84	25 34	48	83	26 22	48	82	27 10	48	82	27 58	47	81	28 45	48	80	279
82	16 52	50	88	17 42	49	88	18 31	50	87	19 21	49	87	20 10	49	86	20 59	49	85	21 48	49	85	22 37	48	84	23 25	49	83	24 14	48	83	25 02	48	82	25 50	48	81	26 38	48	81	27 26	47	80	28 13	48	79	278
83	16 20	49	87	17 09	50	87	17 59	49	86	18 48	49	86	19 37	49	85	20 26	49	84	21 15	49	84	22 04	49	83	22 53	48	83	23 41	49	82	24 30	48	81	25 18	48	81	26 06	48	80	26 54	47	79	27 41	48	79	277
84	15 47	50	87	16 37	49	86	17 26	50	85	18 16	49	85	19 05	49	84	19 54	49	84	20 43	49	83	21 32	48	82	22 20	49	82	23 09	48	81	23 57	49	81	24 46	48	80	25 34	48	79	26 22	47	79	27 09	48	78	276
85	15 15	+49	86	16 04	+50	85	16 54	+49	85	17 43	+49	84	18 32	+49	83	19 21	+49	83	20 10	+49	82	20 59	+49	82	21 48	+49	81	22 37	+48	80	23 25	+48	80	24 13	+49	79	25 02	+48	78	25 50	+47	78	26 37	+48	77	275
86	14 42	50	85	15 32	49	84	16 21	50	84	17 11	49	83	18 00	49	83	18 49	49	82	19 38	49	81	20 27	49	81	21 16	49	80	22 05	48	80	22 53	48	79	23 41	49	78	24 30	48	78	25 18	48	77	26 06	47	76	274
87	14 09	50	84	14 59	50	84	15 49	49	83	16 38	49	82	17 27	50	82	18 17	49	81	19 06	49	81	19 55	49	80	20 44	48	79	21 32	49	79	22 21	48	78	23 09	49	77	23 58	48	77	24 46	48	76	25 34	48	76	273
88	13 37	50	83	14 27	49	83	15 16	50	82	16 06	49	82	16 55	49	81	17 44	50	80	18 34	49	80	19 23	49	79	20 12	48	79	21 00	49	78	21 49	49	77	22 38	48	77	23 26	48	76	24 14	48	75	25 02	48	75	272
89	13 05	49	83	13 54	50	82	14 44	49	81	15 33	50	81	16 23	49	80	17 12	49	80	18 01	50	79	18 51	49	78	19 40	49	78	20 29	48	77	21 17	49	77	22 06	48	76	22 54	49	75	23 43	48	75	24 31	48	74	271
90	12 32	+50	82	13 22	+50	81	14 12	+49	81	15 01	+50	80	15 51	+49	79	16 40	+49	79	17 29	+50	78	18 19	+49	78	19 08	+49	77	19 57	+49	76	20 46	+48	76	21 34	+49	75	22 23	+48	74	23 11	+48	74	23 59	+49	73	270
91	12 00	50	81	12 50	49	80	13 39	50	80	14 29	50	79	15 19	49	79	16 08	50	78	16 58	49	77	17 47	49	77	18 36	49	76	19 25	49	76	20 14	49	75	21 03	48	74	21 51	49	74	22 40	48	73	23 28	48	72	269
92	11 28	50	80	12 18	49	79	13 07	50	79	13 57	50	78	14 47	49	78	15 36	50	77	16 26	49	77	17 15	49	76	18 04	49	75	18 53	49	75	19 42	49	74	20 31	49	74	21 20	49	73	22 09	48	72	22 57	48	72	268
93	10 56	49	79	11 45	50	79	12 35	50	78	13 25	50	78	14 15	49	77	15 04	50	76	15 54	49	76	16 43	50	75	17 33	49	75	18 22	49	74	19 11	49	73	20 00	49	73	20 49	49	72	21 38	48	72	22 26	49	71	267
94	10 23	50	78	11 13	50	78	12 03	50	77	12 53	50	77	13 43	50	76	14 33	49	76	15 22	50	75	16 12	49	74	17 01	50	74	17 51	49	73	18 40	49	73	19 29	49	72	20 18	49	71	21 07	48	71	21 55	49	70	266
95	09 52	+50	78	10 42	+50	77	11 32	+49	76	12 21	+50	76	13 11	+50	75	14 01	+50	75	14 51	+49	74	15 40	+50	74	16 30	+49	73	17 19	+50	72	18 09	+49	72	18 58	+49	71	19 47	+49	71	20 36	+49	70	21 25	+48	69	265
96	09 20	50	77	10 10	50	76	11 00	50	76	11 50	50	75	12 40	50	75	13 30	49	74	14 19	50	73	15 09	50	73	15 59	49	72	16 48	50	72	17 38	49	71	18 27	49	70	19 16	49	70	20 05	49	69	20 54	49	69	264
97	08 48	50	76	09 38	50	75	10 28	50	75	11 18	50	74	12 08	50	74	12 58	50	73	13 48	50	73	14 38	50	72	15 28	49	71	16 17	50	71	17 07	49	70	17 56	50	70	18 46	49	69	19 35	49	68	20 24	49	68	263
98	08 16	51	75	09 07	50	75	09 57	50	74	10 47	50	73	11 37	50	73	12 27	50	72	13 17	50	72	14 07	50	71	14 57	50	71	15 47	49	70	16 36	50	69	17 26	49	69	18 15	49	68	19 04	50	68	19 54	49	67	262
99	07 45	50	74	08 35	50	74	09 25	51	73	10 16	50	73	11 06	50	72	11 56	50	72	12 46	50	71	13 36	50	70	14 26	50	70	15 16	50	69	16 06	49	69	16 55	50	68	17 45	49	68	18 34	50	67	19 24	49	66	261
100	07 13	+51	74	08 04	+50	73	08 54	+51	72	09 45	+50	72	10 35	+50	71	11 25	+50	71	12 15	+50	70	13 05	+50	70	13 55	+50	69	14 45	+50	68	15 35	+50	68	16 25	+50	67	17 15	+49	67	18 04	+50	66	18 54	+49	66	260
101	06 42	51	73	07 33	50	72	08 23	51	72	09 14	50	71	10 04	50	71	10 54	51	70	11 45	50	69	12 35	50	69	13 25	50	68	14 15	50	68	15 05	50	67	15 55	50	67	16 45	50	66	17 35	49	65	18 24	50	65	259
102	06 11	51	72	07 02	50	71	07 52	51	71	08 43	50	70	09 33	51	70	10 24	50	69	11 14	50	69	12 04	51	68	12 55	50	67	13 45	50	67	14 35	50	66	15 25	50	66	16 15	50	65	17 05	50	65	17 55	49	64	258
103	05 40	51	71	06 31	50	71	07 21	51	70	08 12	51	69	09 03	50	69	09 53	51	68	10 44	50	68	11 34	51	67	12 25	50	67	13 15	50	66	14 05	50	66	14 55	51	65	15 46	50	64	16 36	49	64	17 25	50	63	257
104	05 09	51	70	06 00	51	70	06 51	51	69	07 42	50	69	08 32	51	68	09 23	51	68	10 14	50	67	11 04	51	66	11 55	50	66	12 45	51	65	13 36	50	65	14 26	50	64	15 16	50	64	16 06	50	63	16 56	50	63	256
105	04 38	+51	69	05 29	+51	69	06 20	+51	68	07 11	+51	68	08 02	+51	67	08 53	+51	67	09 44	+50	66	10 34	+51	66	11 25	+51	65	12 16	+50	65	13 06	+51	64	13 57	+50	63	14 47	+50	63	15 37	+50	62	16 27	+51	62	255
106	04 08	51	69	04 59	51	68	05 50	51	68	06 41	51	67	07 32	51	66	08 23	51	66	09 14	51	65	10 05	50	65	10 55	51	64	11 46	51	64	12 37	50	63	13 27	51	63	14 18	50	62	15 08	51	62	15 59	50	61	254
107	03 38	51	68	04 29	51	67	05 20	51	67	06 11	51	66	07 02	51	66	07 53	51	65	08 44	52	65	09 35	51	64	10 26	51	64	11 17	51	63	12 08	51	62	12 59	50	62	13 49	51	61	14 40	50	61	15 30	51	60	253
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110	02 08	+51	65	02 59	+52	65	03 51	+51	64	04 42	+52	64	05 34	+51	63	06 25	+52	63	07 17	+51	62	08 08	+51	62	08 59	+52	61	09 51	+51	61	10 42	+51	60	11 33	+51	60	12 24	+51	59	13 15	+51	58	14 06	+51	58	250
111	01 38	52	64	02 30	51	64	03 21	52	63	04 13	52	63	05 05	51	62	05 56	52	62	06 48	51	61	07 39	52	61	08 31	51	60	09 22	52	60	10 14	51	59	11 05	51	59	11 56	51	58	12 47	52	58	13 39	51	57	249
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113	00 40	51	63	01 31	52	62	02 23	52	62	03 15	52	61	04 07	52	61	04 59	52	60	05 51	52	60	06 43	51	59	07 34	52	59	08 26	52	58	09 18	52	58	10 10	51	57	11 01	52	57	11 53	51	56	12 44	52	56	247
114	00 11	52	62	01 03	52	61	01 55	52	61	02 47	52	60	03 39	52	60	04 31	52	59	05 23	52	59	06 15	52	58	07 07	52	58	07 59	51	57	08 50	52	57	09 42	52	56	10 34	52	56	11 26	51	55	12 17	52	55	246
115	−0 18	+52	61	00 34	+52	61	01 26	+52	60	02 18	+53	60	03 11	+52	59	04 03	+52	59	04 55	+52	58	05 47	+52	58	06 39	+52	57	07 31	+52	57	08 23	+52	56	09 15	+52	56	10 07	+52	55	10 59	+52	55	11 51	+52	54	245
116	−0 47	53	60	00 06	52	60	00 58	52	59	01 50	53	59	02 43	52	58	03 35	52	58	04 27	52	57	05 19	53	57	06 12	52	56	07 04	52	56	07 56	52	55	08 48	52	55	09 40	52	54	10 32	52	54	11 24	52	53	244
117	−1 15	53	59	−0 22	52	59	00 30	53	58	01 23	52	58	02 15	52	57	03 07	53	57	04 00	52	56	04 52	53	56	05 45	52	56	06 37	52	55	07 29	53	55	08 22	52	54	09 14	52	54	10 06	52	53	10 58	52	53	243
118	−1 43	53	59	−0 50	52	58	00 02	53	58	00 55	53	57	01 48	52	57	02 40	53	56	03 33	52	56	04 25	53	55	05 18	52	55	06 10	53	54	07 03	52	54	07 55	53	53	08 48	52	53	09 40	53	52	10 33	52	52	242
119	−2 11	53	58	−1 18	53	57	−0 25	53	57	00 28	52	56	01 20	53	56	02 13	53	55	03 06	53	55	03 59	52	54	04 51	53	54	05 44	53	53	06 37	52	53	07 29	53	52	08 22	52	52	09 14	53	51	10 07	52	51	241
120	−2 38	+53	57	−1 45	+53	56	−0 52	+53	56	00 01	+52	55	00 53	+53	55	01 46	+53	55	02 39	+53	54	03 32	+53	54	04 25	+53	53	05 18	+53	53	06 11	+53	52	07 04	+52	52	07 56	+53	51	08 49	+53	51	09 42	+52	50	240
121	−3 05	53	56	−2 12	53	56	−1 19	53	55	−0 26	53	55	00 27	53	54	01 20	53	54	02 13	53	53	03 06	53	53	03 59	53	52	04 52	53	52	05 45	53	51	06 38	53	51	07 31	53	50	08 24	53	50	09 17	53	49	239
122	−3 32	53	55	−2 39	53	55	−1 46	53	54	−0 53	54	54	00 01	53	53	00 54	53	53	01 47	53	52	02 40	53	52	03 33	54	51	04 27	53	51	05 20	53	51	06 13	53	50	07 06	53	50	07 59	53	49	08 52	53	49	238
123	−3 59	53	54	−3 06	54	54	−2 12	53	53	−1 19	53	53	−0 26	54	52	00 28	53	52	01 21	54	52	02 15	53	51	03 08	53	51	04 01	54	50	04 55	53	50	05 48	53	49	06 41	53	49	07 34	54	48	08 28	53	48	237
124	−4 25	53	53	−3 32	54	53	−2 38	53	53	−1 45	54	52	−0 51	53	52	00 02	54	51	00 56	53	51	01 49	54	50	02 43	53	50	03 36	54	49	04 30	53	49	05 23	54	48	06 17	53	48	07 10	54	48	08 04	53	47	236
125	−4 51	+53	53	−3 58	+54	52	−3 04	+54	52	−2 10	+53	51	−1 17	+54	51	−0 23	+54	50	00 31	+53	50	01 24	+54	49	02 18	+54	49	03 12	+53	49	04 05	+54	48	04 59	+54	48	05 53	+53	47	06 46	+54	47	07 40	+53	46	235
126	−5 17	54	52	−4 23	53	51	−3 30	54	51	−2 36	54	50	−1 42	54	50	−0 48	54	49	00 06	54	49	01 00	54	49	01 54	53	48	02 47	54	48	03 41	54	47	04 35	54	47	05 29	54	46	06 23	53	46	07 16	54	46	234
127	−5 43	54	51	−4 49	54	50	−3 55	54	50	−3 01	54	50	−2 07	54	49	−1 13	54	49	−0 19	54	48	00 35	54	48	01 29	54	47	02 23	54	47	03 17	54	46	04 11	54	46	05 05	54	46	05 59	54	45	06 53	54	45	233
128	−6 08	+54	50	−5 14	54	50	−4 20	55	49	−3 25	54	49	−2 31	54	48	−1 37	54	48	−0 43	54	47	00 11	54	47	01 05	55	47	02 00	54	46	02 54	54	46	03 48	54	45	04 42	54	45	05 36	54	44	06 30	55	44	232
		129		−5 38	54	49	−4 44	54	48	−3 50	54	48	−2 56	55	47	−2 01	54	47	−1 07	55	47	−0 12	54	46	00 42	54	46	01 36	55	45	02 31	54	45	03 25	54	44	04 19	55	44	05 14	54	44	06 08	54	43	231
		130		−6 03	+55	48	−5 08	+54	47	−4 14	+55	47	−3 19	+54	47	−2 25	+55	46	−1 30	+54	46	−0 36	+55	45	00 19	+54	45	01 13	+55	44	02 08	+54	44	03 02	+55	44	03 57	+54	43	04 51	+55	43	05 46	+54	42	230
			131			131	−5 32	54	46	−4 38	55	46	−3 43	55	46	−2 48	54	45	−1 54	55	45	−0 59	55	44	−0 04	55	44	00 51	54	44	01 45	55	43	02 40	55	43	03 35	54	42	04 29	55	42	05 24	55	42	229
			132			132	−5 56	+55	46	−5 01	55	45	−4 06	55	45	−3 11	55	44	−2 16	54	44	−1 22	55	44	−0 27	55	43	00 28	55	43	01 23	55	42	02 18	55	42	03 13	55	41	04 08	54	41	05 02	55	41	228
									133	−5 24	55	44	−4 29	55	44	−3 34	55	44	−2 39	55	43	−1 44	55	43	−0 49	55	42	00 06	55	42	01 01	55	42	01 56	55	41	02 51	55	41	03 46	55	40	04 41	55	40	227
									134	−5 47	56	43	−4 51	55	43	−3 56	55	43	−3 01	55	42	−2 06	55	42	−1 11	55	41	−0 16	56	41	00 40	55	41	01 35	55	40	02 30	55	40	03 25	55	40	04 20	56	39	226
									135	−6 09	+55	43	−5 14	+56	42	−4 18	+55	42	−3 23	+55	41	−2 28	+56	41	−1 32	+55	40	−0 37	+56	40	00 19	+56	40	01 14	+55	39	02 09	+56	39	03 05	+55	39	04 00	+56	38	225
												136	−5 35	56	41	−4 40	56	41	−3 44	55	41	−2 49	56	40	−1 53	55	40	−0 58	56	39	00 53	56	39	01 49	55	38	02 44	56	38	03 40	55	38	224
												137	−5 57	+56	40	−5 01	56	40	−4 05	55	40	−3 10	56	39	−2 14	56	39	−1 18	55	39	−0 23	56	38	00 33	56	38	01 29	56	37	02 25	55	37	03 20	56	37	223
															138	−5 22	56	39	−4 26	56	39	−3 30	56	38	−2 34	56	38	−1 38	55	38	−0 43	56	37	00 13	56	37	01 09	56	37	02 05	56	36	03 01	56	36	222
															139	−5 42	56	38	−4 46	56	38	−3 50	56	38	−2 54	56	37	−1 58	56	37	−1 02	56	36	−0 06	56	36	00 50	56	36	01 46	56	35	02 42	56	35	221

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 57°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°
																140	−6	02	+56	37	−5	06	+56	37	−4	10	+56	37	−3	14	+56	36	−2	18	+57	36	−1	21	+56	36	−0	25	+56	35	00	31	+56	35	01	27	+56	35	02	23	+57	34	220
																			141	−5	26	57	36	−4	29	56	36	−3	33	56	35	−2	37	57	35	−1	40	56	35	−0	44	56	34	00	12	57	34	01	09	56	34	02	05	57	33	219
																			142	−5	45	57	35	−4	48	56	35	−3	52	57	35	−2	55	56	34	−1	59	57	34	−1	02	56	34	−0	06	57	33	00	51	56	33	01	47	57	33	218
																			143	−6	03	+56	34	−5	07	57	34	−4	10	57	34	−3	13	56	33	−2	17	57	33	−1	20	57	33	−0	23	56	32	00	33	57	32	01	30	57	32	217
																						144	−5	25	57	33	−4	28	57	33	−3	31	57	33	−2	34	56	32	−1	38	57	32	−0	41	57	32	00	16	57	31	01	13	57	31	216
																						145	−5	43	+57	32	−4	46	+57	32	−3	49	+57	32	−2	52	+57	31	−1	55	+57	31	−0	58	+57	31	−0	01	+57	30	00	56	+57	30	215
																						146	−6	00	+57	31	−5	03	57	31	−4	06	58	31	−3	08	57	31	−2	11	57	30	−1	14	57	30	−0	17	57	30	00	40	57	29	214
																										147	−5	19	57	30	−4	22	57	30	−3	25	57	30	−2	28	58	29	−1	30	57	29	−0	33	57	29	00	24	58	28	213
																										148	−5	36	58	29	−4	38	57	29	−3	41	58	29	−2	43	57	28	−1	46	58	28	−0	48	57	28	00	09	57	28	212
																										149	−5	51	57	28	−4	54	58	28	−3	56	57	28	−2	59	58	28	−2	01	58	27	−1	03	57	27	−0	06	58	27	211
																										150	−6	07	+58	28	−5	09	+58	27	−4	11	+57	27	−3	14	+58	27	−2	16	+58	26	−1	18	+58	26	−0	20	+57	26	210
																													151	−5	24	58	26	−4	26	58	26	−3	28	58	26	−2	30	58	26	−1	32	58	25	−0	34	57	25	209
																													152	−5	38	58	26	−4	40	58	25	−3	42	58	25	−2	44	58	25	−1	46	58	25	−0	48	58	24	208
																													153	−5	52	58	25	−4	54	58	24	−3	56	58	24	−2	58	59	24	−1	59	58	24	−1	01	58	23	207
																													154	−6	05	+58	24	−5	07	58	24	−4	09	58	23	−3	11	59	23	−2	12	58	23	−1	14	58	23	206
																																155	−5	20	+58	23	−4	22	+59	22	−3	23	+58	22	−2	25	+59	22	−1	26	+58	22	205
																																156	−5	32	58	22	−4	34	59	22	−3	35	58	21	−2	37	59	21	−1	38	58	21	204
																																157	−5	44	58	21	−4	46	59	21	−3	47	59	20	−2	48	58	20	−1	50	59	20	203
																																158	−5	56	59	20	−4	57	59	20	−3	58	59	20	−2	59	58	19	−2	01	59	19	202
																																159	−6	06	+58	19	−5	08	59	19	−4	09	59	19	−3	10	59	18	−2	11	59	18	201
																																			160	−5	18	+59	18	−4	19	+59	18	−3	20	+59	18	−2	21	+59	17	200
																																			161	−5	28	59	17	−4	29	59	17	−3	30	59	17	−2	31	59	17	199
																																			162	−5	37	59	16	−4	38	59	16	−3	39	59	16	−2	40	59	16	198
																																			163	−5	46	59	15	−4	47	59	15	−3	48	60	15	−2	48	59	15	197
																																			164	−5	54	59	14	−4	55	59	14	−3	56	60	14	−2	56	59	14	196
																																			165	−6	02	+59	14	−5	03	+60	13	−4	03	+59	13	−3	04	+59	13	195
																																						166	−5	10	59	12	−4	11	60	12	−3	11	59	12	194
																																						167	−5	17	60	12	−4	17	59	11	−3	18	60	11	193
																																						168	−5	23	59	11	−4	24	60	11	−3	24	59	10	192
																																						169	−5	29	59	10	−4	30	60	10	−3	30	60	10	191
																																						170	−5	35	+60	9	−4	35	+60	9	−3	35	+60	9	190
																																						171	−5	39	59	8	−4	40	60	8	−3	40	60	8	189
																																						172	−5	44	60	7	−4	44	60	7	−3	44	60	7	188
																																						173	−5	47	59	6	−4	48	60	6	−3	48	60	6	187
																																						174	−5	51	60	5	−4	51	60	5	−3	51	60	5	186
																																						175	−5	54	+60	4	−4	54	+60	4	−3	54	+60	4	185
																																						176	−5	56	60	4	−4	56	60	4	−3	56	60	4	184
																																						177	−5	58	60	3	−4	58	60	3	−3	58	60	3	183
																																						178	−5	59	60	2	−4	59	60	2	−3	59	60	2	182
																																						179	−6	00	60	1	−5	00	60	1	−4	00	60	1	181
																																											180	−5	00	+60	0	−4	00	+60	0	180
78	−6	11	−51	108	282																																											
77	−5	40	51	109	283																																											
76	−5	09	51	110	−6	00	−51	110	284																																						
75	−4	38	−51	111	−5	29	−51	111	−6	20	−51	112	285																																		
74	−4	08	51	111	−4	59	51	112	−5	50	51	112	286																																		
73	−3	38	51	112	−4	29	51	113	−5	20	51	113	−6	11	−51	114	287																														
72	−3	07	52	113	−3	59	51	114	−4	50	51	114	−5	41	51	115	288																														
71	−2	37	52	114	−3	29	51	114	−4	20	52	115	−5	12	51	115	−6	03	−51	116	289																								
70	−2	08	−51	115	−2	59	−52	115	−3	51	−51	116	−4	42	−52	116	−5	34	−51	117	290																								
HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
69	−1 38	52	116	−2 30	51	116	−3 21	52	117	−4 13	52	117	−5 05	51	118	−5 56	−52	118	291																													69
68	−1 09	52	116	−2 01	51	117	−2 52	52	117	−3 44	52	118	−4 36	51	118	−5 27	52	119	−6 19	−52	119	292																											68
67	−0 40	51	117	−1 31	52	118	−2 23	52	118	−3 15	52	119	−4 07	52	119	−4 59	52	120	−5 51	52	120	293																											67
66	−0 11	52	118	−1 03	52	119	−1 55	52	119	−2 47	52	120	−3 39	52	120	−4 31	52	121	−5 23	52	121	−6 15	−52	122	294																							66
65	00 18	−52	119	−0 34	−52	119	−1 26	−52	120	−2 18	−53	120	−3 11	−52	121	−4 03	−52	121	−4 55	−52	122	−5 47	−52	122	295																							65
64	00 47	53	120	−0 06	52	120	−0 58	52	121	−1 50	53	121	−2 43	52	122	−3 35	52	122	−4 27	52	123	−5 19	53	123	−6 12	−52	124	296																					64
63	01 15	53	121	00 22	52	121	−0 30	53	122	−1 23	52	122	−2 15	52	123	−3 07	53	123	−4 00	52	124	−4 52	53	124	−5 45	52	124	297																					63
62	01 43	53	121	00 50	52	122	−0 02	53	122	−0 55	53	123	−1 48	52	123	−2 40	53	124	−3 33	52	124	−4 25	53	125	−5 18	52	125	−6 10	−53	126	298																			62
61	02 11	53	122	01 18	53	123	00 25	53	123	−0 28	52	124	−1 20	53	124	−2 13	53	125	−3 06	53	125	−3 59	52	126	−4 51	53	126	−5 44	53	127	299																			61
60	02 38	−53	123	01 45	−53	124	00 52	−53	124	−0 01	−52	125	−0 53	−53	125	−1 46	−53	125	−2 39	−53	126	−3 32	−53	126	−4 25	−53	127	−5 18	−53	127	−6 11	−53	128	300																	60
59	03 05	53	124	02 12	53	124	01 19	53	125	00 26	53	125	−0 27	53	126	−1 20	53	126	−2 13	53	127	−3 06	53	127	−3 59	53	128	−4 52	53	128	−5 45	53	129	301																	59
58	03 32	53	125	02 39	53	125	01 46	53	126	00 53	54	126	−0 01	53	127	−0 54	53	127	−1 47	53	128	−2 40	53	128	−3 33	54	129	−4 27	53	129	−5 20	53	129	−6 13	−53	130	302													58
57	03 59	53	126	03 06	54	126	02 12	53	127	01 19	53	127	00 26	54	128	−0 28	53	128	−1 21	54	128	−2 15	53	129	−3 08	53	129	−4 01	54	130	−4 55	53	130	−5 48	53	131	303													57
56	04 25	53	127	03 32	54	127	02 38	53	127	01 45	54	128	00 51	53	128	−0 02	54	129	−0 56	53	129	−1 49	54	130	−2 43	53	130	−3 36	54	131	−4 30	53	131	−5 23	54	132	−6 17	−53	132	304								56
55	04 51	−53	127	03 58	−54	128	03 04	−54	128	02 10	−53	129	01 17	−54	129	00 23	−54	130	−0 31	−53	130	−1 24	−54	131	−2 18	−54	131	−3 12	−53	131	−4 05	−54	132	−4 59	−54	132	−5 53	−53	133	305								55
54	05 17	54	128	04 23	53	129	03 30	54	129	02 36	54	130	01 42	54	130	00 48	54	131	−0 06	54	131	−1 00	54	131	−1 54	53	132	−2 47	54	132	−3 41	54	133	−4 35	54	133	−5 29	54	134	306								54
53	05 43	54	129	04 49	54	130	03 55	54	130	03 01	54	130	02 07	54	131	01 13	54	131	00 19	54	132	−0 35	54	132	−1 29	54	133	−2 23	54	133	−3 17	54	134	−4 11	54	134	−5 05	54	134	−5 59	−54	135	307					53
52	06 08	54	130	05 14	54	130	04 20	55	131	03 25	54	131	02 31	54	132	01 37	54	132	00 43	54	133	−0 11	54	133	−1 05	55	133	−2 00	54	134	−2 54	54	134	−3 48	54	135	−4 42	54	135	−5 36	54	136	308					52
51	06 33	55	131	05 38	54	131	04 44	54	132	03 50	54	132	02 56	55	133	02 01	54	133	01 07	55	133	00 12	54	134	−0 42	54	134	−1 36	55	135	−2 31	54	136	−3 25	54	136	−4 19	55	136	−5 14	54	136	−6 08	−54	137	309	51
50	06 57	−54	132	06 03	−55	132	05 08	−54	133	04 14	−55	133	03 19	−54	133	02 25	−55	134	01 30	−54	134	00 36	−55	135	−0 19	−54	135	−1 13	−55	136	−2 08	−54	136	−3 02	−55	136	−3 57	−54	137	−4 51	−55	137	−5 46	−54	138	310	50
49	07 22	55	133	06 27	55	133	05 32	54	134	04 38	55	134	03 43	55	134	02 48	54	135	01 54	55	135	00 59	55	136	00 04	55	136	−0 51	54	136	−1 45	55	137	−2 40	55	137	−3 35	54	138	−4 29	55	138	−5 24	55	138	311	49
48	07 45	54	134	06 51	55	134	05 56	55	134	05 01	55	135	04 06	55	135	03 11	55	136	02 16	54	136	01 22	55	136	00 27	55	137	−0 28	55	137	−1 23	55	138	−2 18	55	138	−3 13	55	138	−4 08	54	139	−5 02	55	139	312	48
47	08 09	55	134	07 14	55	135	06 19	55	135	05 24	55	136	04 29	55	136	03 34	55	136	02 39	55	137	01 44	55	137	00 49	55	138	−0 06	55	138	−1 01	55	138	−1 56	55	139	−2 51	55	139	−3 46	55	140	−4 41	55	140	313	47
46	08 32	55	135	07 37	55	136	06 42	55	136	05 47	56	137	04 51	55	137	03 56	55	137	03 01	55	138	02 06	55	138	01 11	55	139	00 16	56	139	−0 40	55	139	−1 35	55	140	−2 30	55	140	−3 25	55	140	−4 20	56	141	314	46
45	08 55	−55	136	08 00	−56	137	07 04	−55	137	06 09	−55	137	05 14	−56	138	04 18	−55	138	03 23	−55	139	02 28	−56	139	01 32	−55	139	00 37	−56	140	−0 19	−55	140	−1 14	−55	141	−2 09	−56	141	−3 05	−55	141	−4 00	−55	142	315	45
44	09 17	55	137	08 22	56	138	07 26	55	138	06 31	56	138	05 35	55	139	04 40	56	139	03 44	55	139	02 49	56	140	01 53	55	140	00 58	56	141	00 02	55	141	−0 53	56	141	−1 49	55	142	−2 44	56	142	−3 40	55	142	316	44
43	09 39	55	138	08 44	56	138	07 48	56	139	06 52	55	139	05 57	56	140	05 01	56	140	04 05	55	140	03 10	56	141	02 14	56	141	01 18	55	141	00 23	56	142	−0 33	56	142	−1 29	56	143	−2 25	55	143	−3 20	56	143	317	43
42	10 01	56	139	09 05	56	139	08 09	55	140	07 14	56	140	06 18	56	140	05 22	56	141	04 26	56	141	03 30	56	142	02 34	56	142	01 38	55	142	00 43	56	143	−0 13	56	143	−1 09	56	143	−2 05	56	144	−3 01	56	144	318	42
41	10 22	56	140	09 26	56	140	08 30	56	141	07 34	56	141	06 38	56	141	05 42	56	142	04 46	56	142	03 50	56	142	02 54	56	143	01 58	56	143	01 02	56	144	00 06	56	144	−0 50	56	144	−1 46	56	145	−2 42	56	145	319	41
40	10 43	−56	141	09 47	−56	141	08 51	−56	142	07 55	−56	142	06 59	−57	142	06 02	−56	143	05 06	−56	143	04 10	−56	143	03 14	−56	144	02 18	−57	144	01 21	−56	144	00 25	−56	145	−0 31	−56	145	−1 27	−56	145	−2 23	−57	146	320	40
39	11 03	56	142	10 07	56	142	09 11	56	142	08 15	57	143	07 18	56	143	06 22	56	143	05 26	57	144	04 29	56	144	03 33	56	145	02 37	57	145	01 40	56	145	00 44	56	146	−0 12	57	146	−1 09	56	146	−2 05	57	147	321	39
38	11 23	56	143	10 27	56	143	09 31	57	143	08 34	56	144	07 38	57	144	06 41	56	144	05 45	57	145	04 48	56	145	03 52	57	145	02 55	56	146	01 59	57	146	01 02	56	146	00 06	57	147	−0 51	56	147	−1 47	57	147	322	38
37	11 43	57	144	10 46	56	144	09 50	57	144	08 53	56	145	07 57	57	145	07 00	57	145	06 03	56	146	05 07	57	146	04 10	57	146	03 13	56	147	02 17	57	147	01 20	57	147	00 23	56	148	−0 33	57	148	−1 30	57	148	323	37
36	12 02	56	145	11 06	57	145	10 09	57	145	09 12	57	146	08 15	57	146	07 18	56	146	06 22	57	146	05 25	57	147	04 28	57	147	03 31	57	147	02 34	56	148	01 38	57	148	00 41	57	148	−0 16	57	149	−1 13	57	149	324	36
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19	16 17	59	161	15 18	59	161	14 19	59	161	13 20	59	161	12 21	59	162	11 22	59	162	10 23	59	162	09 24	59	162	08 25	59	162	07 26	59	163	06 27	59	163	05 28	59	163	04 29	59	163	03 30	59	163	02 31	59	163	341	19
18	16 27	59	162	15 28	59	162	14 29	59	162	13 30	59	162	12 31	59	163	11 32	59	163	10 33	59	163	09 34	59	163	08 35	60	163	07 35	59	163	06 36	59	164	05 37	59	164	04 38	59	164	03 39	59	164	02 40	59	164	342	18
17	16 37	59	163	15 38	59	163	14 39	59	163	13 40	60	163	12 40	59	164	11 41	59	164	10 42	59	164	09 43	59	164	08 44	60	164	07 44	59	164	06 45	59	165	05 46	59	165	04 47	59	165	03 48	60	165	02 48	59	165	343	17
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1	18 00	60	179	17 00	60	179	16 00	60	179	15 00	60	179	14 00	60	179	13 00	60	179	12 00	60	179	11 00	60	179	10 00	60	179	09 00	60	179	08 00	60	179	07 00	60	179	06 00	60	179	05 00	60	179	04 00	60	179	359	1
0	18 00	−60	180	17 00	−60	180	16 00	−60	180	15 00	−60	180	14 00	−60	180	13 00	−60	180	12 00	−60	180	11 00	−60	180	10 00	−60	180	09 00	−60	180	08 00	−60	180	07 00	−60	180	06 00	−60	180	05 00	−60	180	04 00	−60	180	360	0
HA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			HA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 57°

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 58°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
0	32 00	+60	180	33 00	+60	180	34 00	+60	180	35 00	+60	180	36 00	+60	180	37 00	+60	180	38 00	+60	180	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	360
1	32 00	60	179	33 00	60	179	34 00	60	179	35 00	60	179	36 00	60	179	37 00	60	179	38 00	60	179	39 00	60	179	40 00	60	179	41 00	60	179	42 00	60	179	43 00	60	179	44 00	60	179	45 00	60	179	46 00	60	179	359
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19	30 04	59	158	31 03	59	158	32 02	58	157	33 00	59	157	33 59	59	157	34 58	58	157	35 56	59	156	36 55	59	156	37 54	58	156	38 52	59	156	39 51	58	155	40 49	58	155	41 47	59	155	42 46	58	154	43 44	58	154	341
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35	25 44	+56	140	26 40	+56	140	27 36	+57	140	28 33	+56	139	29 29	+56	139	30 25	+56	139	31 21	+56	138	32 17	+56	138	33 13	+56	137	34 09	+56	137	35 05	+56	136	36 01	+55	136	36 56	+56	135	37 52	+55	135	38 47	+55	134	325
36	25 23	56	139	26 19	57	139	27 16	56	139	28 12	56	138	29 08	56	138	30 04	56	137	31 00	56	137	31 56	56	137	32 52	55	136	33 47	56	136	34 43	55	135	35 38	56	135	36 34	55	134	37 29	55	134	38 24	55	133	324
37	25 02	56	138	25 58	56	138	26 54	56	138	27 50	56	137	28 46	56	137	29 42	56	136	30 38	56	136	31 34	55	135	32 29	56	135	33 25	55	135	34 20	55	134	35 15	56	134	36 11	55	133	37 06	55	133	38 01	54	132	323
38	24 41	56	137	25 37	56	137	26 33	56	137	27 29	55	136	28 24	56	136	29 20	56	135	30 16	55	135	31 11	56	134	32 07	55	134	33 02	55	134	33 57	55	133	34 52	55	133	35 47	55	132	36 42	55	132	37 37	54	131	322
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42	23 11	56	133	24 07	55	133	25 02	55	132	25 57	55	132	26 52	55	132	27 47	55	131	28 42	55	131	29 37	55	130	30 32	54	130	31 26	55	129	32 21	54	129	33 15	55	128	34 10	54	128	35 04	54	127	35 58	54	127	318
43	22 48	56	132	23 43	55	132	24 38	55	131	25 33	55	131	26 28	55	131	27 23	55	130	28 18	55	130	29 13	54	129	30 07	55	129	31 02	54	128	31 56	54	128	32 50	54	127	33 44	54	127	34 38	54	126	35 32	54	126	317
44	22 24	55	131	23 19	55	131	24 14	55	130	25 09	55	130	26 04	55	130	26 59	54	129	27 53	55	129	28 48	54	128	29 42	54	128	30 36	55	127	31 31	54	127	32 25	54	126	33 19	53	126	34 12	54	125	35 06	54	125	316
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50	19 55	+54	125	20 49	+54	125	21 43	+54	125	22 37	+54	124	23 31	+54	124	24 25	+53	123	25 18	+54	123	26 12	+53	122	27 05	+54	122	27 59	+53	121	28 52	+53	121	29 45	+53	120	30 38	+53	119	31 31	+52	119	32 23	+53	118	310
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52	19 02	54	124	19 56	54	123	20 50	54	123	21 44	53	122	22 37	54	122	23 31	53	121	24 24	53	121	25 17	53	120	26 10	54	120	27 04	52	119	27 56	53	119	28 49	53	118	29 42	52	117	30 34	53	117	31 27	52	116	308
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63	13 55	53	113	14 48	52	113	15 40	52	112	16 32	52	112	17 24	52	111	18 16	53	111	19 09	51	110	20 00	52	110	20 52	52	109	21 44	52	109	22 36	51	108	23 27	51	108	24 18	52	107	25 10	51	106	26 01	51	106	297
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65	12 56	+53	112	13 49	+52	111	14 41	+52	111	15 33	+52	110	16 25	+52	110	17 17	+52	109	18 09	+51	108	19 00	+52	108	19 52	+51	107	20 43	+52	107	21 35	+51	106	22 26	+51	106	23 17	+51	105	24 08	+51	105	24 59	+51	104	295
66	12 27	52	111	13 19	52	110	14 11	52	110	15 03	52	109	15 55	52	109	16 47	51	108	17 38	52	108	18 30	51	107	19 21	52	106	20 13	51	106	21 04	52	105	21 56	51	105	22 47	51	104	23 38	51	104	24 29	50	103	294
67	11 57	52	110	12 49	52	109	13 41	52	109	14 33	52	108	15 25	51	108	16 16	52	107	17 08	51	107	17 59	52	106	18 51	51	106	19 42	52	105	20 34	51	104	21 25	51	104	22 16	51	103	23 07	50	103	23 57	51	102	293
68	11 27	52	109	12 19	52	108	13 11	51	108	14 02	52	107	14 54	52	107	15 46	51	106	16 37	52	106	17 29	51	105	18 20	52	105	19 12	51	104	20 03	51	104	20 54	51	103	21 45	51	103	22 36	50	102	23 26	51	101	292
69	10 57	52	108	11 49	51	108	12 40	52	107	13 32	52	106	14 24	51	106	15 15	52	105	16 07	51	105	16 58	51	104	17 49	52	104	18 41	51	103	19 32	51	103	20 23	51	102	21 14	50	102	22 04	51	101	22 55	51	100	291
HA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n =

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	10 27	+51	107	11 18	+52	107	12 10	+52	106	13 02	+51	106	13 53	+52	105	14 45	+51	105	15 36	+51	104	16 27	+51	103	17 18	+52	103	18 10	+51	102	19 01	+51	102	19 52	+50	101	20 42	+51	101	21 33	+51	100	22 24	+50	100	290
71	09 56	52	106	10 48	51	106	11 39	52	105	12 31	51	105	13 22	52	104	14 14	51	104	15 05	51	103	15 56	51	103	16 47	52	102	17 39	50	101	18 29	51	101	19 20	51	100	20 11	51	100	21 02	50	99	21 52	51	99	289
72	09 25	52	105	10 17	52	105	11 09	51	104	12 00	51	104	12 51	52	103	13 43	51	103	14 34	51	102	15 25	51	102	16 16	51	101	17 07	51	101	17 58	51	100	18 49	51	99	19 40	50	99	20 30	51	98	21 21	50	98	288
73	08 55	51	105	09 46	52	104	10 38	51	103	11 29	51	103	12 20	52	102	13 12	51	102	14 03	51	101	14 54	51	101	15 45	53	100	16 36	51	100	17 27	51	99	18 18	50	99	19 08	51	98	19 59	50	97	20 49	51	97	287
74	08 24	51	104	09 15	52	103	10 07	51	103	10 58	51	102	11 49	52	102	12 41	51	101	13 32	51	100	14 23	51	100	15 14	51	99	16 05	50	99	16 55	51	98	17 46	51	98	18 37	50	97	19 27	51	97	20 18	50	96	286
75	07 53	+51	103	08 44	+52	102	09 36	+51	102	10 27	+51	101	11 18	+51	101	12 09	+51	100	13 00	+51	100	13 51	+51	99	14 42	+51	99	15 33	+51	98	16 24	+51	97	17 15	+50	97	18 05	+51	96	18 56	+50	96	19 46	+50	95	285
76	07 22	51	102	08 13	51	101	09 04	52	101	09 56	51	100	10 47	51	100	11 38	51	99	12 29	51	99	13 20	51	98	14 11	51	98	15 02	50	97	15 52	51	97	16 43	51	96	17 34	50	95	18 24	50	95	19 14	51	94	284
77	06 51	51	101	07 42	51	101	08 33	51	100	09 24	51	99	10 15	51	99	11 06	51	98	11 57	51	98	12 48	51	97	13 39	51	97	14 30	51	96	15 21	50	96	16 11	51	95	17 02	50	95	17 52	51	94	18 43	50	93	283
78	06 20	51	100	07 11	51	100	08 02	51	99	08 53	51	99	09 44	51	98	10 35	51	98	11 26	51	97	12 17	51	96	13 08	50	96	13 58	51	95	14 49	51	95	15 40	50	94	16 30	51	94	17 21	50	93	18 11	50	93	282
79	05 48	51	99	06 39	51	99	07 30	51	98	08 21	51	98	09 12	51	97	10 03	51	97	10 54	51	96	11 45	51	96	12 36	51	95	13 27	50	95	14 17	51	94	15 08	51	93	15 59	50	93	16 49	50	92	17 39	50	92	281
80	05 17	+51	99	06 08	+51	98	06 59	+51	97	07 50	+51	97	08 41	+51	96	09 32	+51	96	10 23	+51	95	11 14	+50	95	12 04	+51	94	12 55	+51	94	13 46	+50	93	14 36	+51	93	15 27	+50	92	16 17	+50	91	17 07	+51	91	280
81	04 45	51	98	05 36	51	97	06 27	51	97	07 18	51	96	08 09	51	96	09 00	51	95	09 51	51	94	10 42	51	94	11 33	50	93	12 23	51	93	13 14	50	92	14 04	51	92	14 55	50	91	15 45	51	91	16 36	50	90	279
82	04 14	51	97	05 05	51	96	05 56	51	96	06 47	51	95	07 38	51	95	08 29	50	94	09 19	51	94	10 10	51	93	11 01	51	93	11 52	50	92	12 42	51	91	13 33	50	91	14 23	51	90	15 14	50	90	16 04	50	89	278
83	03 42	51	96	04 33	51	95	05 24	51	95	06 15	51	94	07 06	51	94	07 57	51	93	08 48	50	93	09 38	51	92	10 29	51	92	11 20	50	91	12 10	51	91	13 01	50	90	13 51	51	89	14 42	50	89	15 32	50	88	277
84	03 11	50	95	04 01	51	95	04 52	51	94	05 43	51	94	06 34	51	93	07 25	51	92	08 16	51	92	09 07	50	91	09 57	51	91	10 48	51	90	11 39	50	90	12 29	51	89	13 20	50	89	14 10	50	88	15 00	51	87	276
85	02 39	+51	94	03 30	+51	94	04 21	+51	93	05 12	+50	93	06 02	+51	92	06 53	+51	92	07 44	+51	91	08 35	+51	91	09 26	+50	90	10 16	+51	89	11 07	+50	89	11 57	+51	88	12 48	+50	88	13 38	+51	87	14 29	+50	87	275
86	02 07	51	93	02 58	51	93	03 49	51	92	04 40	51	92	05 31	50	91	06 21	51	91	07 12	51	90	08 03	51	90	08 54	50	89	09 44	51	89	10 35	51	88	11 26	50	87	12 16	50	87	13 06	51	86	13 57	50	86	274
87	01 35	51	93	02 26	51	92	03 17	51	91	04 08	51	91	04 59	51	90	05 50	50	90	06 40	51	89	07 31	51	89	08 22	51	88	09 13	50	88	10 03	51	87	10 54	50	87	11 44	51	86	12 35	50	86	13 25	50	85	273
88	01 04	50	92	01 54	51	91	02 45	51	91	03 36	51	90	04 27	51	90	05 18	51	89	06 09	50	89	06 59	51	88	07 50	51	87	08 41	50	87	09 31	51	86	10 22	51	86	11 13	50	85	12 03	50	85	12 53	51	84	272
89	00 32	51	91	01 23	51	90	02 14	50	90	03 04	51	89	03 55	51	89	04 46	51	88	05 37	51	88	06 28	50	87	07 18	51	87	08 09	51	86	09 00	50	86	09 50	51	85	10 41	50	84	11 31	51	84	12 22	50	83	271
90	00 00	+51	90	00 51	+51	89	01 42	+51	89	02 33	+50	88	03 23	+51	88	04 14	+51	87	05 05	+51	87	05 56	+51	86	06 47	+50	86	07 37	+51	85	08 28	+51	85	09 19	+50	84	10 09	+51	84	11 00	+50	83	11 50	+51	82	270
91	−0 32	51	89	00 19	51	89	01 10	51	88	02 01	51	88	02 52	51	87	03 43	50	86	04 33	51	86	05 24	51	85	06 15	51	85	07 06	50	84	07 56	51	84	08 47	51	83	09 38	50	83	10 28	51	82	11 19	50	82	269
92	−1 04	51	88	−0 13	51	88	00 38	51	87	01 29	51	87	02 20	51	86	03 11	51	86	04 02	51	85	04 53	50	85	05 43	51	84	06 34	51	84	07 25	51	83	08 16	50	82	09 06	51	82	09 57	50	81	10 47	51	81	268
93	−1 35	51	87	−0 44	50	87	00 06	51	86	00 57	51	86	01 48	51	85	02 39	51	85	03 30	51	84	04 21	51	84	05 12	51	83	06 03	50	83	06 53	51	82	07 44	51	82	08 35	50	81	09 25	51	81	10 16	51	80	267
94	−2 07	51	87	−1 16	51	86	−0 25	51	86	00 26	51	85	01 17	51	84	02 08	50	84	02 58	51	83	03 49	51	83	04 40	51	82	05 31	51	82	06 22	51	81	07 13	50	81	08 03	51	80	08 54	51	80	09 45	50	79	266
95	−2 39	+51	86	−1 48	+51	85	−0 57	+51	85	−0 06	+51	84	00 45	+51	84	01 36	+51	83	02 27	+51	83	03 18	+51	82	04 09	+51	82	05 00	+50	81	05 50	+51	80	06 41	+51	80	07 32	+51	79	08 23	+51	79	09 14	+50	78	265
96	−3 11	51	85	−2 20	51	84	−1 29	51	84	−0 38	51	83	00 13	51	83	01 04	51	82	01 55	51	82	02 46	51	81	03 37	51	81	04 28	51	80	05 19	51	80	06 10	51	79	07 01	51	79	07 52	53	78	08 43	50	77	264
97	−3 42	51	84	−2 51	51	84	−2 00	51	83	−1 09	51	82	−0 18	51	82	00 33	51	81	01 24	51	81	02 15	51	80	03 06	51	80	03 57	51	79	04 48	51	79	05 39	51	78	06 30	51	78	07 21	51	77	08 12	50	77	263
98	−4 14	51	83	−3 23	51	83	−2 32	51	82	−1 41	51	82	−0 50	52	81	00 02	51	81	00 53	51	80	01 44	51	80	02 35	51	79	03 26	51	78	04 17	51	78	05 08	51	77	05 59	51	77	06 50	51	76	07 41	51	76	262
99	−4 45	51	82	−3 54	51	82	−3 03	51	81	−2 12	51	81	−1 21	51	80	−0 30	51	80	00 21	51	79	01 12	52	79	02 04	51	78	02 55	51	78	03 46	51	77	04 37	51	77	05 28	51	76	06 19	51	76	07 10	51	75	261
100	−5 17	+51	81	−4 26	+51	81	−3 35	+52	80	−2 43	+51	80	−1 52	+51	79	−1 01	+51	79	−0 10	+51	78	00 41	+51	78	01 32	+52	77	02 24	+51	77	03 15	+51	76	04 06	+51	76	04 57	+51	75	05 48	+51	75	06 39	+51	74	260
101	−5 48	51	81	−4 57	51	80	−4 06	51	80	−3 15	52	79	−2 23	51	79	−1 32	51	78	−0 41	51	78	00 10	52	77	01 02	51	76	01 53	51	76	02 44	51	75	03 35	51	75	04 26	52	74	05 18	51	74	06 09	51	73	259
102	−6 20	+52	80	−5 28	51	79	−4 37	51	79	−3 46	51	78	−2 55	52	78	−2 03	51	77	−1 12	51	77	−0 21	52	76	00 31	51	76	01 22	51	75	02 13	52	75	03 05	51	74	03 56	51	74	04 47	51	73	05 38	52	72	258
			103	−6 00	+52	78	−5 08	51	78	−4 17	51	77	−3 26	52	77	−2 34	51	76	−1 43	52	76	−0 51	51	75	00 00	51	75	00 51	52	74	01 43	51	74	02 34	51	73	03 25	52	73	04 17	51	72	05 08	51	72	257
						104	−5 39	51	77	−4 48	52	77	−3 56	51	76	−3 05	51	75	−2 14	52	75	−1 22	51	74	−0 31	52	74	00 21	51	73	01 12	52	73	02 04	51	72	02 55	52	72	03 47	51	71	04 38	51	71	256
						105	−6 10	+51	76	−5 19	+52	76	−4 27	+51	75	−3 36	+52	75	−2 44	+51	74	−1 53	+52	74	−1 01	+51	73	−0 10	+52	73	00 42	+51	72	01 33	+52	72	02 25	+52	71	03 17	+51	71	04 08	+52	70	255
									106	−5 49	51	75	−4 58	52	74	−4 06	51	74	−3 15	52	73	−2 23	51	73	−1 32	52	72	−0 40	52	72	00 12	51	71	01 03	52	71	01 55	52	70	02 47	51	70	03 38	52	69	254
									107	−6 20	+52	74	−5 28	51	73	−4 37	52	73	−3 45	52	72	−2 53	51	72	−2 02	52	71	−1 10	52	71	−0 18	51	70	00 33	52	70	01 25	52	69	02 17	52	69	03 09	51	68	253
												108	−5 59	+52	73	−5 07	52	72	−4 15	51	72	−3 24	52	71	−2 32	52	71	−1 40	52	70	−0 48	52	70	00 04	51	69	00 55	52	68	01 47	52	68	02 39	52	67	252
															109	−5 37	52	71	−4 45	51	71	−3 54	52	70	−3 02	52	70	−2 10	52	69	−1 18	52	69	−0 26	52	68	00 26	52	68	01 18	52	67	02 10	52	67	251
															110	−6 07	+52	70	−5 15	+52	70	−4 23	+52	69	−3 31	+52	69	−2 39	+52	68	−1 47	+52	68	−0 55	+52	67	−0 03	+52	67	00 49	+52	66	01 41	+52	66	250
																		111	−5 45	52	69	−4 53	52	68	−4 01	52	68	−3 09	52	67	−2 17	52	67	−1 25	53	66	−0 32	52	66	00 20	52	65	01 12	52	65	249
																		112	−6 15	+52	68	−5 23	53	68	−4 30	52	67	−3 38	52	67	−2 46	52	66	−1 54	53	66	−1 01	52	65	−0 09	52	65	00 43	52	64	248
																					113	−5 52	+52	67	−5 00	53	66	−4 07	52	66	−3 15	53	65	−2 22	52	65	−1 30	52	64	−0 38	53	64	00 15	52	63	247
																								114	−5 29	53	65	−4 36	52	65	−3 44	53	64	−2 51	52	64	−1 59	53	63	−1 06	52	63	−0 14	53	62	246
																								115	−5 57	+52	64	−5 05	+53	64	−4 12	+52	64	−3 20	+53	63	−2 27	+53	63	−1 34	+52	62	−0 42	+53	62	245
																											116	−5 33	52	63	−4 41	53	63	−3 48	53	62	−2 55	53	62	−2 02	52	61	−1 10	53	61	244
																											117	−6 01	+52	62	−5 09	53	62	−4 16	53	61	−3 23	53	61	−2 30	53	60	−1 37	53	60	243
																														118	−5 37	53	61	−4 44	53	60	−3 51	53	60	−2 58	53	59	−2 05	53	59	242
																														119	−6 04	+53	60	−5 11	53	60	−4 18	53	59	−3 25	53	59	−2 32	53	58	241
																																		120	−5 38	+53	59	−4 45	+53	58	−3 52	+53	58	−2 59	+54	57	240
																																		121	−6 05	+53	58	−5 12	53	57	−4 19	54	57	−3 25	53	56	239
																																					122	−5 39	54	56	−4 45	53	56	−3 52	54	56	238
																																					123	−6 05	+54	56	−5 11	53	55	−4 18	54	55	237
																																							124	−5 37	54	54	−4 43	53	54	236
																																							125	−6 03	+54	53	−5 09	+54	53	235
																																									126	−5 34	54	52	234
																																									127	−5 59	+54	51	233

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 58°

LAT 58°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 58°

HA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	HA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
100	−5 17	−51	81	−6 08	−51	82	260																																									100
99	−4 45	51	82	−5 36	51	83	261																																								99
98	−4 14	51	83	−5 05	51	84	−5 56	−51	84	262																																					98
97	−3 42	51	84	−4 33	51	85	−5 24	51	85	−6 15	−51	86	263																																			97
96	−3 11	50	85	−4 01	51	85	−4 52	51	86	−5 43	51	86	264																																			96
95	−2 39	−51	86	−3 30	−51	86	−4 21	−51	87	−5 12	−50	87	−6 02	−51	88	265																															95
94	−2 07	51	87	−2 58	51	87	−3 49	51	88	−4 40	51	88	−5 31	50	89	−6 21	−51	89	266																													94
93	−1 35	51	87	−2 26	51	88	−3 17	51	89	−4 08	51	89	−4 59	51	90	−5 50	50	90	267																													93
92	−1 04	50	88	−1 54	51	89	−2 45	51	89	−3 36	51	90	−4 27	51	90	−5 18	51	91	−6 09	−50	91	268																											92
91	−0 32	51	89	−1 23	51	90	−2 14	50	90	−3 04	51	91	−3 55	51	91	−4 46	51	92	−5 37	51	92	269																											91
90	00 00	−51	90	−0 51	−51	91	−1 42	−51	91	−2 33	−50	92	−3 23	−51	92	−4 14	−51	93	−5 05	−51	93	−5 56	−51	94	270																							90
89	00 32	51	91	−0 19	51	91	−1 10	51	92	−2 01	51	92	−2 52	51	93	−3 43	50	94	−4 33	51	94	−5 24	51	95	−6 15	−51	95	271																					89
88	01 04	51	92	00 13	51	92	−0 38	51	93	−1 29	51	93	−2 20	51	94	−3 11	51	94	−4 02	51	95	−4 53	50	95	−5 43	51	96	272																					88
87	01 35	51	93	00 44	50	93	−0 06	51	94	−0 57	51	94	−1 48	51	95	−2 39	51	95	−3 30	51	96	−4 21	51	96	−5 12	51	97	−6 03	−50	97	273																	87
86	02 07	51	93	01 16	51	94	00 25	51	94	−0 26	51	95	−1 17	51	96	−2 08	50	96	−2 58	51	97	−3 49	51	97	−4 40	51	98	−5 31	51	98	274																	86
85	02 39	−51	94	01 48	−51	95	00 57	−51	95	00 06	−51	96	−0 45	−51	96	−1 36	−51	97	−2 27	−51	97	−3 18	−51	98	−4 09	−51	98	−5 00	−50	99	−5 50	−51	100	275													85
84	03 11	51	95	02 20	51	96	01 29	51	96	00 38	51	97	−0 13	51	97	−1 04	51	98	−1 55	51	98	−2 46	51	99	−3 37	51	99	−4 28	51	100	−5 19	51	100	−6 10	−51	101	276										84
83	03 42	51	96	02 51	51	96	02 00	51	97	01 09	51	98	00 18	51	98	−0 33	51	99	−1 24	51	99	−2 15	51	100	−3 06	51	100	−3 57	51	101	−4 48	51	101	−5 39	51	102	277										83
82	04 14	51	97	03 23	51	97	02 32	51	98	01 41	51	98	00 50	52	99	−0 02	51	99	−0 53	51	100	−1 44	51	100	−2 35	51	101	−3 26	51	102	−4 17	51	102	−5 08	51	103	−5 59	−51	103	278							82
81	04 45	51	98	03 54	51	98	03 03	51	99	02 12	51	99	01 21	51	100	00 30	51	100	−0 21	51	101	−1 12	52	101	−2 04	51	102	−2 55	51	102	−3 46	51	103	−4 37	51	103	−5 28	51	104	−6 19	−51	104	279				81
80	05 17	−51	99	04 26	−51	99	03 35	−52	100	02 43	−51	100	01 52	−51	101	01 01	−51	101	00 10	−51	102	−0 41	−51	102	−1 32	−52	103	−2 24	−51	103	−3 15	−51	104	−4 06	−51	104	−4 57	−51	105	−5 48	−51	105	280				80
79	05 48	51	99	04 57	51	100	04 06	51	100	03 15	52	101	02 23	51	101	01 32	51	102	00 41	51	102	−0 10	52	103	−1 02	51	104	−1 53	51	104	−2 44	51	105	−3 35	51	105	−4 26	52	106	−5 18	51	106	−6 09	−51	107	281	79
78	06 20	52	100	05 28	51	101	04 37	51	101	03 46	51	102	02 55	52	102	02 03	51	103	01 12	51	103	00 21	52	104	−0 31	51	104	−1 22	51	105	−2 13	52	105	−3 05	51	106	−3 56	51	106	−4 47	51	107	−5 38	52	108	282	78
77	06 51	51	101	06 00	52	102	05 08	51	102	04 17	51	103	03 26	52	103	02 34	51	104	01 43	52	104	00 51	51	105	00 00	51	105	−0 51	52	106	−1 43	51	106	−2 34	51	107	−3 25	52	107	−4 17	51	108	−5 08	51	108	283	77
76	07 22	51	102	06 31	52	102	05 39	51	103	04 48	52	103	03 56	51	104	03 05	51	105	02 14	52	105	01 22	51	106	00 31	52	106	−0 21	51	107	−1 12	52	107	−2 04	51	108	−2 55	52	108	−3 47	51	109	−4 38	51	109	284	76
75	07 53	−51	103	07 02	−52	103	06 10	−51	104	05 19	−52	104	04 27	−51	105	03 36	−52	105	02 44	−51	106	01 53	−52	106	01 01	−51	107	00 10	−52	107	−0 42	−51	108	−1 33	−52	108	−2 25	−52	109	−3 17	−51	109	−4 08	−51	110	285	75
74	08 24	52	104	07 32	51	104	06 41	52	105	05 49	51	105	04 58	52	106	04 06	51	106	03 15	52	107	02 23	51	107	01 32	52	108	00 40	52	108	−0 12	51	109	−1 03	52	109	−1 55	52	110	−2 47	51	110	−3 38	52	111	286	74
73	08 55	52	105	08 03	51	105	07 12	52	106	06 20	52	106	05 28	51	107	04 37	52	107	03 45	52	108	02 53	51	108	02 02	52	109	01 10	52	109	00 18	51	110	−0 33	52	110	−1 25	52	111	−2 17	52	111	−3 09	51	112	287	73
72	09 25	51	105	08 34	52	106	07 42	51	106	06 51	52	107	05 59	52	107	05 07	52	108	04 15	51	108	03 24	52	109	02 32	52	109	01 40	52	110	00 48	52	110	−0 04	51	111	−0 55	52	112	−1 47	52	112	−2 39	52	113	288	72
71	09 56	52	106	09 04	51	107	08 13	52	107	07 21	52	108	06 29	52	108	05 37	52	109	04 45	51	109	03 54	52	110	03 02	52	110	02 10	52	111	01 18	52	111	00 26	52	112	−0 26	52	112	−1 18	52	113	−2 10	52	113	289	71
70	10 27	−52	107	09 35	−52	108	08 43	−52	108	07 51	−52	109	06 59	−52	109	06 07	−52	110	05 15	−52	110	04 23	−52	111	03 31	−52	111	02 39	−52	112	01 47	−52	112	00 55	−52	113	00 03	−52	113	−0 49	−52	114	−1 41	−52	114	290	70
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°
69	10 57	52	108	10 05	52	109	09 13	52	109	08 21	52	110	07 29	52	110	06 37	52	111	05 45	52	111	04 53	52	112	04 01	52	112	03 09	52	113	02 17	52	113	01 25	53	114	00 32	52	114	−0 20	52	115	−1 12	52	115	291
68	11 27	52	109	10 35	52	109	09 43	52	110	08 51	52	110	07 59	52	111	07 07	52	111	06 15	52	112	05 23	53	112	04 30	52	113	03 38	52	113	02 46	52	114	01 54	53	114	01 01	52	115	00 09	52	115	−0 43	52	116	292
67	11 57	52	110	11 05	52	110	10 13	52	111	09 21	52	111	08 29	53	112	07 36	52	112	06 44	52	113	05 52	52	113	05 00	53	114	04 07	52	114	03 15	53	115	02 22	52	115	01 30	52	116	00 38	53	116	−0 15	52	117	293
66	12 27	52	111	11 35	52	111	10 43	53	112	09 50	52	112	08 58	52	113	08 06	53	113	07 13	52	114	06 21	52	114	05 29	53	115	04 36	52	115	03 44	53	116	02 51	52	116	01 59	53	117	01 06	52	117	00 14	53	118	294
65	12 56	−52	112	12 04	−52	112	11 12	−52	113	10 20	−53	113	09 27	−52	114	08 35	−53	114	07 42	−52	115	06 50	−53	115	05 57	−52	116	05 05	−53	116	04 12	−52	116	03 20	−53	117	02 27	−53	117	01 34	−52	118	00 42	−53	118	295
64	13 26	52	112	12 34	53	113	11 41	52	113	10 49	53	114	09 56	52	114	09 04	53	115	08 11	52	115	07 19	53	116	06 26	53	116	05 33	52	117	04 41	53	117	03 48	53	118	02 55	53	118	02 02	52	119	01 10	53	119	296
63	13 55	52	113	13 03	53	114	12 10	52	114	11 18	53	115	10 25	53	115	09 32	52	116	08 40	53	116	07 47	53	117	06 54	53	117	06 01	52	118	05 09	53	118	04 16	53	119	03 23	53	119	02 30	53	120	01 37	53	120	297
62	14 24	52	114	13 32	53	115	12 39	53	115	11 46	52	116	10 54	53	116	10 01	53	117	09 08	53	117	08 15	53	118	07 22	53	118	06 29	52	119	05 37	53	119	04 44	53	120	03 51	53	120	02 58	53	121	02 05	53	121	298
61	14 53	52	115	14 01	53	116	13 08	53	116	12 15	53	117	11 22	53	117	10 29	53	118	09 36	53	118	08 43	53	119	07 50	53	119	06 57	53	120	06 04	53	120	05 11	53	120	04 18	53	121	03 25	53	121	02 32	53	122	299
60	15 22	−53	116	14 29	−53	117	13 36	−53	117	12 43	−53	118	11 50	−53	118	10 57	−53	119	10 04	−53	119	09 11	−53	119	08 18	−53	120	07 25	−53	120	06 32	−54	121	05 38	−53	121	04 45	−53	122	03 52	−53	122	02 59	−54	123	300
59	15 50	53	117	14 57	53	117	14 04	53	118	13 11	53	118	12 18	53	119	11 25	53	119	10 32	53	120	09 39	54	120	08 45	53	121	07 52	53	121	06 59	54	122	06 05	53	122	05 12	53	123	04 19	54	123	03 25	53	124	301
58	16 19	54	118	15 25	53	118	14 32	53	119	13 39	53	119	12 46	53	120	11 53	54	120	10 59	53	121	10 06	53	121	09 13	54	122	08 19	53	122	07 26	54	123	06 32	53	123	05 39	54	124	04 45	53	124	03 52	54	124	302
57	16 47	54	119	15 53	53	119	15 00	53	120	14 07	54	120	13 13	53	121	12 20	53	121	11 27	54	122	10 33	53	122	09 40	54	123	08 46	54	123	07 52	53	124	06 59	54	124	06 05	54	124	05 11	53	125	04 18	54	125	303
56	17 14	53	120	16 21	53	120	15 28	54	121	14 34	53	121	13 41	54	122	12 47	54	122	11 53	53	123	11 00	54	123	10 06	54	123	09 12	53	124	08 19	54	124	07 25	54	125	06 31	54	125	05 37	54	126	04 43	53	126	304
55	17 42	−54	121	16 48	−53	121	15 55	−54	122	15 01	−53	122	14 08	−54	123	13 14	−54	123	12 20	−54	123	11 26	−53	124	10 33	−54	124	09 39	−54	125	08 45	−54	125	07 51	−54	126	06 57	−54	126	06 03	−54	127	05 09	−54	127	305
54	18 09	54	122	17 15	53	122	16 22	54	123	15 28	54	123	14 34	54	124	13 40	53	124	12 47	54	124	11 53	54	125	10 59	54	125	10 05	54	126	09 11	54	126	08 17	55	127	07 22	54	127	06 28	54	128	05 34	54	128	306
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N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 58°

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	61 00	+60	180	360
1	47 00	60	179	48 00	60	179	49 00	60	179	50 00	60	179	51 00	60	178	52 00	60	178	53 00	60	178	54 00	60	178	55 00	60	178	56 00	60	178	57 00	60	178	58 00	60	178	59 00	60	178	60 00	59	178	60 59	60	178	359
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26	42 49	56	145	43 45	57	144	44 42	57	144	45 39	56	143	46 35	57	143	47 32	56	142	48 28	56	142	49 24	56	141	50 20	56	141	51 16	55	140	52 11	56	140	53 07	55	139	54 02	55	138	54 57	55	138	55 52	54	137	334
27	42 30	57	144	43 27	56	143	44 23	57	143	45 20	56	142	46 16	56	142	47 12	56	141	48 08	56	141	49 04	56	140	50 00	55	139	50 55	56	139	51 51	55	138	52 46	55	138	53 41	54	137	54 35	55	136	55 30	54	135	333
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37	38 55	55	132	39 50	55	131	40 45	54	131	41 39	54	130	42 33	54	129	43 27	54	129	44 21	53	128	45 14	54	128	46 08	53	127	47 01	53	126	47 54	53	126	48 47	52	125	49 39	52	124	50 31	52	123	51 23	51	123	323
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62	27 22	51	106	28 13	51	106	29 04	51	105	29 55	50	104	30 45	50	104	31 35	50	103	32 25	50	102	33 15	50	102	34 05	49	101	34 54	49	100	35 43	49	100	36 32	49	99	37 21	48	98	38 09	48	98	38 57	48	97	298
63	26 52	51	105	27 43	50	105	28 33	51	104	29 24	50	103	30 14	50	103	31 04	50	102	31 54	50	102	32 44	50	101	33 34	49	100	34 23	49	99	35 12	49	99	36 01	48	98	36 49	49	97	37 38	48	97	38 26	48	96	297
64	26 21	51	104	27 12	50	104	28 02	51	103	28 53	50	103	29 43	50	102	30 33	50	101	31 23	50	101	32 13	49	100	33 02	50	99	33 52	49	99	34 41	48	98	35 29	49	97	36 18	48	96	37 06	48	96	37 54	48	95	296
65	25 50	+51	103	26 41	+50	103	27 31	+51	102	28 22	+50	102	29 12	+50	101	30 02	+50	100	30 52	+49	100	31 41	+50	99	32 31	+49	98	33 20	+49	98	34 09	+49	97	34 58	+48	96	35 46	+48	96	36 34	+48	95	37 22	+48	94	295
66	25 19	51	103	26 10	50	102	27 00	51	101	27 51	50	101	28 41	50	100	29 31	49	99	30 20	50	99	31 10	49	98	31 59	50	97	32 49	48	97	33 37	49	96	34 26	49	95	35 15	48	95	36 03	48	94	36 51	47	93	294
67	24 48	51	102	25 39	50	101	26 29	50	100	27 19	50	100	28 09	50	99	28 59	50	99	29 49	49	98	30 38	50	97	31 28	49	97	32 17	49	96	33 06	48	95	33 54	49	95	34 43	48	94	35 31	48	93	36 19	48	92	293
68	24 17	50	101	25 07	51	100	25 58	50	100	26 48	50	99	27 38	50	98	28 28	49	98	29 17	50	97	30 07	49	96	30 56	49	96	31 45	49	95	32 34	49	94	33 23	48	94	34 11	48	93	34 59	48	92	35 47	48	91	292
69	23 46	50	100	24 36	50	99	25 26	50	99	26 16	50	98	27 06	50	97	27 56	50	97	28 46	49	96	29 35	50	95	30 25	49	95	31 14	48	94	32 02	49	93	32 51

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
70	23 14	+51	99	24 05	+50	98	24 55	+50	98	25 45	+50	97	26 35	+50	97	27 25	+49	96	28 14	+50	95	29 04	+49	95	29 53	+49	94	30 42	+49	93	31 31	+48	93	32 19	+49	92	33 08	+48	91	33 56	+48	91	34 44	+47	90	290
71	22 43	50	98	23 33	50	97	24 23	50	97	25 13	50	96	26 03	50	96	26 53	50	95	27 43	49	94	28 32	49	94	29 21	49	93	30 10	49	92	30 59	48	92	31 47	49	91	32 36	48	90	33 24	48	90	34 12	47	89	289
72	22 11	51	97	23 02	50	97	23 52	50	96	24 42	50	95	25 32	49	95	26 21	50	94	27 11	49	94	28 00	49	93	28 49	49	92	29 38	49	92	30 27	49	91	31 16	48	90	32 04	48	90	32 52	48	89	33 40	48	88	288
73	21 40	50	96	22 30	50	96	23 20	50	95	24 10	50	95	25 00	50	94	25 50	49	93	26 39	49	93	27 28	50	92	28 18	49	91	29 07	48	91	29 55	49	90	30 44	48	89	31 32	48	88	32 20	48	88	33 08	48	87	287
74	21 08	50	95	21 58	50	95	22 48	50	94	23 38	50	94	24 28	50	93	25 18	49	92	26 07	50	92	26 57	49	91	27 46	49	91	28 35	49	90	29 24	48	89	30 12	48	89	31 00	49	88	31 49	48	87	32 37	47	86	286
75	20 36	+51	95	21 27	+50	94	22 17	+50	93	23 07	+49	93	23 56	+50	92	24 46	+50	92	25 36	+49	91	26 25	+49	90	27 14	+49	90	28 03	+49	89	28 52	+48	88	29 40	+49	88	30 29	+48	87	31 17	+48	86	32 05	+47	86	285
76	20 05	50	94	20 55	50	93	21 45	50	93	22 35	50	92	23 25	49	91	24 14	50	91	25 04	49	90	25 53	49	89	26 42	49	89	27 31	49	88	28 20	49	88	29 09	48	87	29 57	48	86	30 45	48	85	31 33	48	85	284
77	19 33	50	93	20 23	50	92	21 13	50	92	22 03	50	91	22 53	49	90	23 42	50	90	24 32	49	89	25 21	49	89	26 10	49	88	26 59	49	87	27 48	49	87	28 37	48	86	29 25	48	85	30 13	48	85	31 01	48	84	283
78	19 01	50	92	19 51	50	91	20 41	50	91	21 31	50	90	22 21	50	90	23 11	49	89	24 00	49	88	24 49	50	88	25 39	49	87	26 28	48	87	27 16	49	86	28 05	49	85	28 54	48	85	29 42	48	84	30 30	48	83	282
79	18 29	51	91	19 20	50	91	20 10	49	90	20 59	50	89	21 49	50	89	22 39	49	88	23 28	50	88	24 18	49	87	25 07	49	86	25 56	49	86	26 45	48	85	27 33	49	84	28 22	48	84	29 10	48	83	29 58	48	82	281
80	17 58	+50	90	18 48	+50	90	19 38	+50	89	20 28	+49	89	21 17	+50	88	22 07	+50	87	22 57	+49	87	23 46	+49	86	24 35	+49	85	25 24	+49	85	26 13	+49	84	27 02	+48	84	27 50	+49	83	28 39	+48	82	29 27	+48	82	280
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82	16 54	50	89	17 44	50	88	18 34	50	87	19 24	50	87	20 14	50	86	21 04	49	86	21 53	50	85	22 43	49	84	23 32	49	84	24 21	49	83	25 10	49	83	25 59	48	82	26 47	49	81	27 36	48	81	28 24	48	80	278
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89	13 12	51	83	14 03	50	82	14 53	50	82	15 43	50	81	16 33	50	80	17 23	50	80	18 13	50	79	19 03	49	79	19 52	50	78	20 42	49	78	21 31	49	77	22 20	49	76	23 09	49	76	23 58	49	75	24 47	49	74	271
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91	12 09	51	81	13 00	50	81	13 50	50	80	14 40	50	79	15 30	50	79	16 20	50	78	17 10	50	78	18 00	50	77	18 50	50	77	19 40	49	76	20 29	50	75	21 19	49	75	22 08	49	74	22 57	49	73	23 46	49	73	269
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93	11 07	50	79	11 57	51	79	12 48	50	78	13 38	50	78	14 28	50	77	15 18	51	77	16 09	50	76	16 59	49	75	17 48	50	75	18 38	50	74	19 28	50	74	20 18	49	73	21 07	49	73	21 56	50	72	22 46	49	71	267
94	10 35	51	79	11 26	50	78	12 16	51	77	13 07	50	77	13 57	51	76	14 48	50	76	15 38	50	75	16 28	50	75	17 18	50	74	18 08	50	74	18 58	49	73	19 47	50	72	20 37	49	72	21 26	50	71	22 16	49	71	266
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97	09 02	51	76	09 53	51	76	10 44	50	75	11 34	51	74	12 25	51	74	13 16	50	73	14 06	50	73	14 56	51	72	15 47	50	72	16 37	50	71	17 27	50	71	18 17	50	70	19 07	50	69	19 57	49	69	20 46	50	68	263
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105	05 00	+51	69	05 51	+51	69	06 42	+52	68	07 34	+51	68	08 25	+51	67	09 16	+52	67	10 08	+51	66	10 59	+51	66	11 50	+51	65	12 41	+51	65	13 32	+51	64	14 23	+51	64	15 14	+51	63	16 05	+51	63	16 56	+50	62	255
106	04 30	51	69	05 21	52	68	06 13	51	68	07 04	52	67	07 56	51	67	08 47	52	66	09 39	51	66	10 30	51	65	11 21	52	64	12 13	51	64	13 04	51	63	13 55	51	63	14 46	51	62	15 37	51	62	16 28	51	61	254
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121	−2 32	54	56	−1 38	53	56	−0 45	54	55	00 09	53	55	01 02	53	54	01 55	54	54	02 49	53	53	03 42	54	53	04 36	53	52	05 29	54	52	06 23	53	51	07 16	53	51	08 09	54	50	09 03	53	50	09 56	53	50	239
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123	−3 24	54	54	−2 30	54	54	−1 36	53	53	−0 43	54	53	00 11	54	52	01 05	54	52	01 59	53	52	02 52	54	51	03 46	54	51	04 40	53	50	05 33	54	50	06 27	54	49	07 21	53	49	08 14	54	48	09 08	53	48	237
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125	−4 15	+54	53	−3 21	+54	52	−2 27	+54	52	−1 33	+54	51	−0 39	+54	51	00 15	+54	50	01 09	+54	50	02 03	+54	49	02 57	+54	49	03 51	+54	48	04 45	+54	48	05 39	+54	48	06 33	+54	47	07 27	+54	47	08 21	+54	46	235
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			131	−5 46	55	47	−4 51	55	46	−3 56	55	46	−3 01	55	46	−2 06	55	45	−1 11	55	45	−0 16	55	44	00 39	55	44	01 34	55	44	02 29	55	43	03 24	55	43	04 19	55	42	05 14	55	42	06 09	55	42	229
			132	−6 09	+55	46	−5 14	55	46	−4 19	55	45	−3 24	56	45	−2 28	55	44	−1 33	55	44	−0 38	55	44	00 17	55	43	01 12	55	43	02 07	55	42	03 02	56	42	03 58	55	42	04 53	55	41	05 48	55	41	228
						133	−5 36	55	45	−4 41	55	44	−3 46	56	44	−2 50	55	43	−1 55	55	43	−1 00	55	43	−0 05	56	42	00 51	55	42	01 46	55	42	02 41	56	41	03 37	55	41	04 32	55	40	05 27	56	40	227
						134	−5 58	+55	44	−5 03	55	43	−4 08	56	43	−3 12	55	43	−2 17	56	42	−1 21	55	42	−0 26	56	41	00 30	55	41	01 25	56	41	02 21	55	40	03 16	56	40	04 12	55	40	05 07	55	39	226
									135	−5 25	+56	42	−4 29	+56	42	−3 33	+55	42	−2 38	+56	41	−1 42	+55	41	−0 47	+56	41	00 09	+56	40	01 05	+55	40	02 00	+56	39	02 56	+55	39	03 51	+56	39	04 47	+56	38	225
									136	−5 46	56	42	−4 50	56	41	−3 54	55	41	−2 59	56	40	−2 03	56	40	−1 07	56	40	−0 11	55	39	00 44	56	39	01 40	56	38	02 36	56	38	03 32	56	38	04 28	55	38	224
									137	−6 07	+56	41	−5 11	56	40	−4 15	56	40	−3 19	56	40	−2 23	56	39	−1 27	56	39	−0 31	56	38	00 25	56	38	01 21	55	38	02 16	56	37	03 12	56	37	04 08	56	37	223
													−5 31	56	39	−4 35	56	39	−3 39	56	39	−2 43	56	38	−1 47	56	38	−0 51	56	38	00 05	56	37	01 01	56	37	01 57	56	37	02 53	57	36	03 50	56	36	222
													−5 51	56	39	−4 55	56	38	−3 59	56	38	−3 03	57	38	−2 06	56	37	−1 10	56	37	−0 14	56	36	00 42	57	36	01 39	56	36	02 35	56	35	03 31	56	35	221

15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 58°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

HA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
140													−6 11	+56	38	−5 15	+57	37	−4 18	+56	37	−3 22	+56	37	−2 26	+57	36	−1 29	+56	36	−0 33	+57	36	00 24	+56	35	01 20	+57	35	02 17	+56	35	03 13	+56	34	220
141																−5 34	57	36	−4 37	56	36	−3 41	57	36	−2 44	56	35	−1 48	57	35	−0 51	57	35	00 06	56	34	01 02	57	34	01 59	56	34	02 55	57	33	219
142																−5 52	56	36	−4 56	57	35	−3 59	57	35	−3 02	56	35	−2 06	57	34	−1 09	57	34	−0 12	56	34	00 44	57	33	01 41	57	33	02 38	57	33	218
143																−6 11	+57	35	−5 14	57	34	−4 17	57	34	−3 20	57	34	−2 23	56	33	−1 27	57	33	−0 30	57	33	00 27	57	32	01 24	57	32	02 21	57	32	217
144																			−5 32	57	33	−4 35	57	33	−3 38	57	33	−2 41	57	33	−1 44	57	32	−0 47	57	32	00 10	57	32	01 07	57	31	02 04	57	31	216
145																			−5 49	+57	33	−4 52	+57	32	−3 55	+57	32	−2 58	+58	32	−2 00	+57	31	−1 03	+57	31	−0 06	+57	31	00 51	+57	30	01 48	+57	30	215
146																			−6 06	+57	32	−5 09	58	31	−4 11	57	31	−3 14	57	31	−2 17	58	30	−1 19	57	30	−0 22	57	30	00 35	57	30	01 32	58	29	214
147																						−5 25	57	30	−4 28	58	30	−3 30	57	30	−2 33	58	30	−1 35	57	29	−0 38	58	29	00 20	57	29	01 17	58	28	213
148																						−5 41	58	30	−4 43	57	29	−3 46	58	29	−2 48	57	29	−1 51	58	28	−0 53	58	28	00 05	57	28	01 02	58	28	212
149																						−5 56	57	29	−4 59	58	28	−4 01	58	28	−3 03	57	28	−2 06	58	28	−1 08	58	27	−0 10	58	27	00 48	57	27	211
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158																												−5 58	59	20	−4 59	59	20	−4 00	58	20	−3 02	59	20	−2 03	59	19	−1 04	59	19	202
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161																															−5 30	60	17	−4 30	59	17	−3 31	59	17	−2 32	59	17	−1 33	59	17	199
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163																															−5 47	59	15	−4 48	59	15	−3 49	59	15	−2 50	60	15	−1 50	59	15	197
164																															−5 56	60	15	−4 56	59	14	−3 57	59	14	−2 58	60	14	−1 58	59	14	196
165																															−6 03	+59	14	−5 04	+59	14	−4 05	+60	13	−3 05	+59	13	−2 06	+60	13	195
166																																		−5 11	59	13	−4 12	60	12	−3 12	59	12	−2 13	60	12	194
167																																		−5 18	60	12	−4 18	59	12	−3 19	60	11	−2 19	59	11	193
168																																		−5 24	60	11	−4 24	59	11	−3 25	60	11	−2 25	59	10	192
169																																		−5 30	60	10	−4 30	60	10	−3 30	59	10	−2 31	60	10	191
170																																		−5 35	+60	9	−4 35	+59	9	−3 36	+60	9	−2 36	+60	9	190
171																																		−5 40	60	8	−4 40	60	8	−3 40	60	8	−2 40	59	8	189
172																																		−5 44	60	7	−4 44	60	7	−3 44	60	7	−2 44	59	7	188
173																																		−5 48	60	6	−4 48	60	6	−3 48	60	6	−2 48	60	6	187
174																																		−5 51	60	5	−4 51	60	5	−3 51	60	5	−2 51	60	5	186
175																																		−5 54	+60	5	−4 54	+60	4	−3 54	+60	4	−2 54	+60	4	185
176																																		−5 56	60	4	−4 56	60	4	−3 56	60	4	−2 56	60	4	184
177																																		−5 58	60	3	−4 58	60	3	−3 58	60	3	−2 58	60	3	183
178																																		−5 59	60	2	−4 59	60	2	−3 59	60	2	−2 59	60	2	182
179																																		−6 00	60	1	−5 00	60	1	−4 00	60	1	−3 00	60	1	181
180																																					−5 00	+60	0	−4 00	+60	0	−3 00	+60	0	180

77	−5 59	−52	109	283																																									
76	−5 29	−52	110	284																																									
75	−5 00	−51	111	−5 51	−51	111	285																																							
74	−4 30	−51	111	−5 21	−52	112	−6 13	−51	112	286																																				
73	−4 00	−52	112	−4 52	−52	113	−5 44	−51	113	287																																				
72	−3 31	−52	113	−4 23	−51	114	−5 14	−52	114	−6 06	−52	115	288																																
71	−3 02	−52	114	−3 54	−52	114	−4 46	−52	115	−5 37	−52	115	289																																
70	−2 33	−52	115	−3 25	−52	115	−4 17	−52	116	−5 09	−52	116	−6 01	−52	117	290																												

15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
69																291																															69
68																−5 56	−53	119	292																															68
67	−1 07	52	117	−1 59	53	118	−2 52	52	118	−3 44	52	119	−4 36	53	119	−5 29	52	120	293																													67
66	−0 39	52	118	−1 31	53	119	−2 24	52	119	−3 16	53	120	−4 09	52	120	−5 01	53	120	−5 54	−52	121	294																												66
65	−0 11	−53	119	−1 04	−52	119	−1 56	−53	120	−2 49	−52	120	−3 41	−53	121	−4 34	−53	121	−5 27	−52	122	295																												65
64	00 17	53	120	−0 36	53	120	−1 29	52	121	−2 21	53	121	−3 14	53	122	−4 07	53	122	−5 00	52	123	−5 52	−53	123	296																									64
63	00 44	53	121	−0 09	52	121	−1 01	53	122	−1 54	53	122	−2 47	53	122	−3 40	53	123	−4 33	53	123	−5 26	53	124	297																									63
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60	02 05	−53	123	01 12	−53	124	00 19	−54	124	−0 35	−53	125	−1 28	−53	125	−2 21	−54	125	−3 15	−53	126	−4 08	−53	126	−5 01	−53	127	−5 54	−54	127	300																						60
59	02 32	54	124	01 38	53	124	00 45	54	125	−0 09	53	125	−1 02	53	126	−1 55	54	126	−2 49	53	127	−3 42	54	127	−4 36	53	128	−5 29	54	128	301																						59
58	02 58	54	125	02 04	53	125	01 11	54	126	00 17	53	126	−0 36	54	127	−1 30	54	127	−2 24	53	128	−3 17	54	128	−4 11	53	128	−5 04	54	129	−5 58	−53	129	302																						58
57	03 24	54	126	02 30	54	126	01 36	53	127	00 43	54	127	−0 11	54	128	−1 05	54	128	−1 59	53	128	−2 52	54	129	−3 46	54	129	−4 40	53	130	−5 33	54	130	303																						57
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0	17 00	−60	180	16 00	−60	180	15 00	−60	180	14 00	−60	180	13 00	−60	180	12 00	−60	180	11 00	−60	180	10 00	−60	180	09 00	−60	180	08 00	−60	180	07 00	−60	180	06 00	−60	180	05 00	−60	180	04 00	−60	180	03 00	−60	180	360
LHA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 58°

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	31 00	+60	180	32 00	+60	180	33 00	+60	180	34 00	+60	180	35 00	+60	180	36 00	+60	180	37 00	+60	180	38 00	+60	180	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	360
1	31 00	60	179	32 00	60	179	33 00	60	179	34 00	60	179	35 00	60	179	36 00	60	179	37 00	60	179	38 00	60	179	39 00	60	179	40 00	60	179	41 00	60	179	42 00	60	179	43 00	60	179	44 00	60	179	45 00	60	179	359
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52	18 29	54	124	19 23	55	123	20 18	54	123	21 12	54	122	22 06	53	122	22 59	54	121	23 53	54	121	24 47	54	121	25 41	53	120	26 34	54	120	27 28	53	119	28 21	53	118	29 14	53	118	30 07	53	117	31 00	53	117	308
53	18 03	54	123	18 57	54	122	19 51	54	122	20 45	54	121	21 39	54	121	22 33	54	121	23 27	53	120	24 20	54	120	25 14	53	119	26 07	53	119	27 00	54	118	27 54	53	117	28 47	53	117	29 40	52	116	30 32	53	116	307
54	17 37	54	122	18 31	54	121	19 25	54	121	20 19	54	121	21 13	53	120	22 06	54	120	23 00	53	119	23 53	54	119	24 47	53	118	25 40	53	118	26 33	53	117	27 26	53	117	28 19	53	116	29 12	52	115	30 04	53	115	306
55	17 11	+54	121	18 05	+53	121	18 58	+54	120	19 52	+54	120	20 46	+53	119	21 39	+54	119	22 33	+53	118	23 26	+53	118	24 19	+53	117	25 12	+53	117	26 05	+53	116	26 58	+53	116	27 51	+53	115	28 44	+52	114	29 36	+53	114	305
56	16 44	54	120	17 38	54	120	18 32	53	119	19 25	54	119	20 19	53	118	21 12	53	118	22 05	53	117	22 58	54	117	23 52	53	116	24 45	52	116	25 37	53	115	26 30	53	115	27 23	52	114	28 15	53	113	29 08	52	113	304
57	16 17	54	119	17 11	53	119	18 04	54	118	18 58	53	118	19 51	53	117	20 44	54	117	21 38	53	116	22 31	53	116	23 24	53	115	24 17	52	115	25 09	53	114	26 02	53	114	26 55	52	113	27 47	52	113	28 39	52	112	303
58	15 50	54	118	16 44	53	118	17 37	53	117	18 30	54	117	19 24	53	116	20 17	53	116	21 10	53	115	22 03	53	115	22 56	52	114	23 48	53	114	24 41	53	113	25 34	52	113	26 26	52	112	27 18	53	112	28 11	52	111	302
59	15 23	53	117	16 16	54	117	17 10	53	116	18 03	53	116	18 56	53	115	19 49	53	115	20 42	53	114	21 35	52	114	22 27	53	113	23 20	53	113	24 13	52	112	25 05	52	112	25 57	53	111	26 50	52	111	27 42	52	110	301
60	14 55	+54	116	15 49	+53	116	16 42	+53	115	17 35	+53	115	18 28	+53	114	19 21	+52	114	20 13	+53	113	21 06	+53	113	21 59	+52	112	22 51	+53	112	23 44	+52	111	24 36	+52	111	25 28	+53	110	26 21	+52	110	27 13	+51	109	300
61	14 28	53	115	15 21	53	115	16 14	53	114	17 07	53	114	18 00	52	113	18 52	53	113	19 45	53	112	20 38	52	112	21 30	53	111	22 23	52	111	23 15	52	110	24 07	52	110	24 59	52	109	25 51	52	109	26 43	52	108	299
62	14 00	53	115	14 53	52	114	15 45	53	114	16 38	53	113	17 31	53	113	18 24	52	112	19 16	53	112	20 09	52	111	21 01	53	110	21 54	52	110	22 46	52	109	23 38	52	109	24 30	52	108	25 22	52	108	26 14	51	107	298
63	13 31	53	114	14 24	53	113	15 17	53	113	16 10	52	112	17 02	53	112	17 55	53	111	18 48	52	111	19 40	52	110	20 32	53	110	21 25	52	109	22 17	52	108	23 09	52	108	24 01	52	107	24 53	51	107	25 44	52	106	297
64	13 03	53	113	13 56	52	112	14 48	53	112	15 41	53	111	16 34	52	111	17 26	53	110	18 19	52	110	19 11	52	109	20 03	52	109	20 55	52	108	21 47	52	108	22 39	52	107	23 31	52	107	24 23	52	106	25 15	51	105	296
65	12 34	+53	112	13 27	+53	111	14 20	+52	111	15 12	+53	110	16 05	+52	110	16 57	+52	109	17 49	+53	109	18 42	+52	108	19 34	+52	108	20 26	+52	107	21 18	+52	107	22 10	+51	106	23 01	+52	106	23 53	+52	105	24 45	+51	104	295
66	12 06	52	111	12 58	53	110	13 51	52	110	14 43	52	109	15 35	53	109	16 28	52	108	17 20	52	108	18 12	52	107	19 04	52	107	19 56	52	106	20 48	52	106	21 40	52	105	22 32	51	105	23 23	52	104	24 15	51	104	294
67	11 37	52	110	12 29	52	109	13 21	53	109	14 14	52	108	15 06	52	108	15 58	53	107	16 51	52	107	17 43	52	106	18 35	52	106	19 27	51	105	20 18	52	105	21 10	52	104	22 02	51	104	22 53	52	103	23 45	51	103	293
68	11 07	53	109	12 00	52	109	12 52	52	108	13 44	53	108	14 37	52	107	15 29	52	107	16 21	52	106	17 13	52	106	18 05	52	105	18 57	51	104	19 48	52	104	20 40	52	103	21 32	51	103	22 23	51	102	23 14	52	102	292
69	10 38	52	108	11 30	53	108	12 23	52	107	13 15	52	107	14 07	52	106	14 59	52	106	15 51	52	105	16 43	52	105	17 35	52	104	18 27	53	104	19 18	52	103	20 10	53	103

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) SAME NAME AS LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°
70	10 09	+52	107	11 01	+52	107	11 53	+52	106	12 45	+52	106	13 37	+52	105	14 29	+52	105	15 21	+52	104	16 13	+52	104	17 05	+52	103	17 57	+51	103	18 48	+52	102	19 40	+51	102	20 31	+51	101	21 22	+52	101	22 14	+51	100	290
71	09 39	52	106	10 31	52	106	11 23	52	105	12 15	52	105	13 07	52	104	13 59	52	104	14 51	52	103	15 43	52	103	16 35	51	102	17 26	52	102	18 18	51	101	19 09	52	101	20 01	51	100	20 52	51	100	21 43	51	99	289
72	09 09	53	106	10 02	52	105	10 54	52	105	11 46	51	104	12 37	52	104	13 29	52	103	14 21	52	102	15 13	52	102	16 05	51	101	16 56	52	101	17 48	51	100	18 39	51	100	19 30	52	99	20 22	51	99	21 13	51	98	288
73	08 40	52	105	09 32	52	104	10 24	52	104	11 16	51	103	12 07	52	103	12 59	52	102	13 51	52	102	14 43	51	101	15 34	52	101	16 26	51	100	17 17	52	99	18 09	51	99	19 00	51	98	19 51	51	98	20 42	51	97	287
74	08 10	52	104	09 02	52	103	09 54	51	103	10 45	52	102	11 37	52	102	12 29	52	101	13 21	51	101	14 12	52	100	15 04	51	100	15 55	52	99	16 47	51	99	17 38	51	98	18 29	51	98	19 20	51	97	20 11	51	96	286
75	07 40	+52	103	08 32	+51	102	09 23	+52	102	10 15	+52	101	11 07	+52	101	11 59	+51	100	12 50	+52	100	13 42	+51	99	14 33	+52	99	15 25	+51	98	16 16	+51	98	17 07	+52	97	17 59	+51	97	18 50	+51	96	19 41	+50	96	285
76	07 09	52	102	08 01	52	102	08 53	52	101	09 45	51	101	10 36	52	100	11 28	52	99	12 20	51	99	13 11	52	98	14 03	51	98	14 54	51	97	15 45	52	97	16 37	51	96	17 28	51	96	18 19	51	95	19 10	51	95	284
77	06 39	52	101	07 31	52	101	08 23	51	100	09 14	52	100	10 06	52	99	10 58	51	99	11 49	52	98	12 41	51	98	13 32	51	97	14 23	52	97	15 15	51	96	16 06	51	95	16 57	51	95	17 48	51	94	18 39	51	94	283
78	06 09	52	100	07 01	51	100	07 52	52	99	08 44	51	99	09 35	52	98	10 27	52	98	11 19	51	97	12 10	51	97	13 01	52	96	13 53	51	96	14 44	51	95	15 35	51	95	16 26	51	94	17 17	51	93	18 08	51	93	282
79	05 38	52	99	06 30	52	99	07 22	51	98	08 13	52	98	09 05	51	97	09 56	52	97	10 48	51	96	11 39	52	96	12 31	51	95	13 22	51	95	14 13	51	94	15 04	51	94	15 55	51	93	16 46	51	93	17 37	51	92	281
80	05 08	+51	99	05 59	+52	98	06 51	+52	98	07 43	+51	97	08 34	+52	97	09 26	+51	96	10 17	+51	95	11 08	+52	95	12 00	+51	94	12 51	+51	94	13 42	+51	93	14 33	+51	93	15 24	+51	92	16 15	+51	92	17 06	+51	91	280
81	04 37	52	98	05 29	51	97	06 20	52	97	07 12	51	96	08 03	52	96	08 55	51	95	09 46	52	95	10 38	51	94	11 29	51	94	12 20	51	93	13 11	52	93	14 03	51	92	14 54	51	91	15 45	50	91	16 35	51	90	279
82	04 07	51	97	04 58	52	96	05 50	51	96	06 41	52	95	07 33	51	95	08 24	51	94	09 15	52	94	10 07	51	93	10 58	51	93	11 49	52	92	12 41	51	92	13 32	51	91	14 23	51	91	15 14	51	90	16 05	50	89	278
83	03 36	51	96	04 27	52	95	05 19	51	95	06 10	52	94	07 02	51	94	07 53	52	93	08 45	51	93	09 36	51	92	10 27	51	92	11 18	52	91	12 10	51	91	13 01	51	90	13 52	51	90	14 43	51	89	15 34	50	89	277
84	03 05	52	95	03 57	51	95	04 48	52	94	05 40	51	94	06 31	51	93	07 22	52	93	08 14	51	92	09 05	51	92	09 56	52	91	10 48	51	90	11 39	51	90	12 30	51	89	13 21	51	89	14 12	51	88	15 03	51	88	276
85	02 34	+52	94	03 26	+51	94	04 17	+52	93	05 09	+51	93	06 00	+52	92	06 52	+51	92	07 43	+51	91	08 34	+51	91	09 25	+52	90	10 17	+51	90	11 08	+51	89	11 59	+51	89	12 50	+51	88	13 41	+51	87	14 32	+51	87	275
86	02 04	51	93	02 55	51	93	03 46	52	92	04 38	51	92	05 29	52	91	06 21	51	91	07 12	51	90	08 03	52	90	08 55	51	89	09 46	51	89	10 37	51	88	11 28	51	88	12 19	51	87	13 10	51	87	14 01	51	86	274
87	01 33	51	93	02 24	52	92	03 16	51	92	04 07	51	91	04 58	52	91	05 50	51	90	06 41	51	89	07 32	52	89	08 24	51	88	09 15	51	88	10 06	51	87	10 57	51	87	11 48	51	86	12 39	51	86	13 30	51	85	273
88	01 02	51	92	01 53	52	91	02 45	51	91	03 36	51	90	04 27	52	90	05 19	51	89	06 10	52	89	07 02	51	88	07 53	51	88	08 44	51	87	09 35	51	87	10 26	51	86	11 17	52	85	12 09	50	85	12 59	51	84	272
89	00 31	51	91	01 22	52	90	02 14	51	90	03 05	52	89	03 57	51	89	04 48	51	88	05 39	52	88	06 31	51	87	07 22	51	87	08 13	51	86	09 04	52	86	09 56	51	85	10 47	51	85	11 38	51	84	12 29	51	84	271
90	00 00	+51	90	00 51	+52	89	01 43	+51	89	02 34	+52	88	03 26	+51	88	04 17	+51	87	05 08	+52	87	06 00	+51	86	06 51	+51	86	07 42	+52	85	08 34	+51	85	09 25	+51	84	10 16	+51	84	11 07	+51	83	11 58	+51	83	270
91	−0 31	52	89	00 21	51	89	01 12	51	88	02 03	52	88	02 55	51	87	03 46	52	87	04 38	51	86	05 29	51	86	06 20	52	85	07 12	51	84	08 03	51	84	08 54	51	83	09 45	51	83	10 36	51	82	11 27	51	82	269
92	−1 02	52	88	−0 10	51	88	00 41	52	87	01 33	51	87	02 24	51	86	03 15	52	86	04 07	51	85	04 58	52	85	05 50	51	84	06 41	51	84	07 32	51	83	08 23	52	83	09 15	51	82	10 06	51	82	10 57	51	81	268
93	−1 33	52	87	−0 41	51	87	00 10	52	86	01 02	51	86	01 53	52	85	02 45	51	85	03 36	51	84	04 27	52	84	05 19	51	83	06 10	51	83	07 01	52	82	07 53	51	82	08 44	51	81	09 35	51	81	10 26	52	80	267
94	−2 04	52	87	−1 12	51	86	−0 21	52	86	00 31	51	85	01 22	52	85	02 14	51	84	03 05	52	83	03 57	51	83	04 48	52	82	05 40	51	82	06 31	51	81	07 22	52	81	08 14	51	80	09 05	51	80	09 56	51	79	266
95	−2 34	+51	86	−1 43	+52	85	−0 51	+51	85	00 00	+52	84	00 52	+51	84	01 43	+52	83	02 35	+51	83	03 26	+52	82	04 18	+51	82	05 09	+51	81	06 00	+52	81	06 52	+51	80	07 43	+51	80	08 34	+52	79	09 26	+51	78	265
96	−3 05	51	85	−2 14	52	84	−1 22	51	84	−0 31	52	83	00 21	51	83	01 12	52	82	02 04	51	82	02 55	52	81	03 47	51	81	04 38	52	80	05 30	51	80	06 21	52	79	07 13	51	79	08 04	51	78	08 55	52	78	264
97	−3 36	52	84	−2 44	51	83	−1 53	52	83	−1 01	51	82	−0 10	52	82	00 42	51	81	01 33	52	81	02 25	52	80	03 17	51	80	04 08	52	79	05 00	51	79	05 51	52	78	06 43	51	78	07 34	51	77	08 25	52	77	263
98	−4 07	52	83	−3 15	52	83	−2 23	51	82	−1 32	52	82	−0 40	51	81	00 11	52	81	01 03	52	80	01 55	51	80	02 46	52	79	03 38	51	79	04 29	52	78	05 21	51	78	06 12	52	77	07 04	51	76	07 55	52	76	262
99	−4 37	51	82	−3 46	52	82	−2 54	52	81	−2 02	51	81	−1 11	52	80	−0 19	52	80	00 33	51	79	01 24	52	79	02 16	51	78	03 07	52	78	03 59	52	77	04 51	51	77	05 42	52	76	06 34	51	76	07 25	52	75	261
100	−5 08	+52	81	−4 16	+51	81	−3 25	+52	80	−2 33	+52	80	−1 41	+52	79	−0 49	+51	79	00 02	+52	78	00 54	+52	78	01 46	+51	77	02 37	+52	77	03 29	+52	76	04 21	+51	76	05 12	+52	75	06 04	+52	75	06 56	+51	74	260
101	−5 38	51	81	−4 47	52	80	−3 55	52	80	−3 03	52	79	−2 11	51	79	−1 20	52	78	−0 28	52	77	00 24	52	77	01 16	51	76	02 07	52	76	02 59	52	75	03 51	52	75	04 43	51	74	05 34	52	74	06 26	52	73	259
102	−6 09	+52	80	−5 17	52	79	−4 25	51	79	−3 34	52	78	−2 42	52	78	−1 50	52	77	−0 58	52	77	−0 06	52	76	00 46	51	76	01 37	52	75	02 29	52	75	03 21	52	74	04 13	52	74	05 05	51	73	05 56	52	73	258
			103	−5 47	51	78	−4 56	52	78	−4 04	52	77	−3 12	52	77	−2 20	52	76	−1 28	52	76	−0 36	52	75	00 16	52	75	01 08	51	74	01 59	52	74	02 51	52	73	03 43	52	73	04 35	52	72	05 27	52	72	257
			104	−6 18	+52	77	−5 26	52	77	−4 34	52	76	−3 42	52	76	−2 50	52	75	−1 58	52	75	−1 06	52	74	−0 14	52	74	00 38	52	73	01 30	52	73	02 22	52	72	03 14	52	72	04 06	52	71	04 58	52	71	256
						105	−5 56	+52	76	−5 04	+52	76	−4 12	+52	75	−3 20	+52	75	−2 28	+52	74	−1 36	+52	74	−0 44	+52	73	00 08	+52	73	01 00	+52	72	01 52	+52	72	02 44	+52	71	03 36	+53	71	04 29	+51	70	255
									106	−5 34	52	75	−4 42	52	74	−3 50	53	74	−2 57	52	73	−2 05	52	73	−1 13	52	72	−0 21	52	72	00 31	52	71	01 23	52	71	02 15	52	70	03 07	53	70	04 00	52	69	254
									107	−6 03	+52	74	−5 11	52	73	−4 19	52	73	−3 27	52	72	−2 35	52	72	−1 43	53	71	−0 50	52	71	00 02	52	70	00 54	52	70	01 46	53	69	02 39	52	69	03 31	52	68	253
												108	−5 41	52	72	−4 49	53	72	−3 56	52	71	−3 04	52	71	−2 12	53	70	−1 19	52	70	−0 27	52	69	00 25	52	69	01 17	53	69	02 10	52	68	03 02	52	68	252
												109	−6 10	+52	72	−5 18	52	71	−4 26	53	71	−3 33	52	70	−2 41	53	70	−1 48	52	69	−0 56	52	69	−0 04	53	68	00 49	52	68	01 41	53	67	02 34	52	67	251
															110	−5 47	+52	70	−4 55	+53	70	−4 02	+52	69	−3 10	+53	69	−2 17	+52	68	−1 25	+53	68	−0 32	+52	67	00 20	+53	67	01 13	+52	66	02 05	+53	66	250
															111	−6 16	+52	69	−5 24	53	69	−4 31	53	68	−3 38	52	68	−2 46	53	67	−1 53	52	67	−1 01	53	66	−0 08	53	66	00 45	52	65	01 37	53	65	249
																		112	−5 52	+53	68	−5 00	53	67	−4 07	53	67	−3 14	52	67	−2 22	53	66	−1 29	53	66	−0 36	53	65	00 17	52	65	01 09	53	64	248
																					113	−5 28	53	67	−4 35	53	66	−3 42	52	66	−2 50	53	65	−1 57	53	65	−1 04	53	64	−0 11	53	64	00 42	52	63	247
																					114	−5 56	+53	66	−5 03	52	65	−4 11	53	65	−3 18	53	64	−2 25	53	64	−1 32	53	63	−0 39	53	63	00 14	53	62	246
																									115	−5 31	+53	64	−4 38	+53	64	−3 45	+53	63	−2 52	+53	63	−1 59	+53	63	−1 06	+53	62	−0 13	+53	62	245
																									116	−5 59	+53	63	−5 06	53	63	−4 13	53	63	−3 20	53	62	−2 27	54	62	−1 33	53	61	−0 40	53	61	244
																												117	−5 33	53	62	−4 40	53	62	−3 47	53	61	−2 54	54	61	−2 00	53	60	−1 07	53	60	243
																												118	−6 01	+54	61	−5 07	53	61	−4 14	53	60	−3 21	54	60	−2 27	53	59	−1 34	54	59	242
																															119	−5 34	53	60	−4 41	54	59	−3 47	53	59	−2 54	54	59	−2 00	54	58	241
																															120	−6 01	+54	59	−5 07	+53	59	−4 14	+54	58	−3 20	+54	58	−2 26	+54	57	240
																																		121	−5 33	53	58	−4 40	54	57	−3 46	54	57	−2 52	54	56	239
																																		122	−5 59	+54	57	−5 05	53	56	−4 12	54	56	−3 18	54	56	238
																																					123	−5 31	54	56	−4 37	54	55	−3 43	54	55	237
																																					124	−5 56	+54	55	−5 02	54	54	−4 08	54	54	236
																																								125	−5 27	+54	53	−4 33	+55	53	235
																																							126	−5 52	55	52	−4 57	54	52	234
																																							127	−6 16	+55	52	−5 21	54	51	233
																																									128	−5 45	54	50	232
																																									129	−6 09	+55	49	231

LHA	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) SAME NAME AS LATITUDE

LAT 59°

LAT 59°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 59°

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°
100	−5 08	−51	81	−5 59	−52	82	260																																							100
99	−4 37	52	82	−5 29	51	83	−6 20	−52	83	261																																					99
98	−4 07	51	83	−4 58	52	84	−5 50	51	84	262																																					98
97	−3 36	51	84	−4 27	52	85	−5 19	51	85	−6 10	−52	86	263																																			97
96	−3 05	52	85	−3 57	51	85	−4 48	52	86	−5 40	51	86	264																																			96
95	−2 34	−52	86	−3 26	−51	86	−4 17	−52	87	−5 09	−51	87	−6 00	−52	88	265																															95
94	−2 04	51	87	−2 55	51	87	−3 46	52	88	−4 38	51	88	−5 29	52	89	−6 21	−51	89	266																													94
93	−1 33	51	87	−2 24	52	88	−3 16	51	88	−4 07	51	89	−4 58	52	89	−5 50	51	90	267																													93
92	−1 02	51	88	−1 53	52	89	−2 45	51	89	−3 36	51	90	−4 27	52	90	−5 19	51	91	−6 10	−52	91	268																											92
91	−0 31	51	89	−1 22	52	90	−2 14	51	90	−3 05	52	91	−3 57	51	91	−4 48	51	92	−5 39	52	92	269																											91
90	00 00	−51	90	−0 51	−52	91	−1 43	−51	91	−2 34	−52	92	−3 26	−51	92	−4 17	−51	93	−5 08	−52	93	−6 00	−51	94	270																							90
89	00 31	52	91	−0 21	51	91	−1 12	51	92	−2 03	52	92	−2 55	51	93	−3 46	52	93	−4 38	51	94	−5 29	51	94	−6 20	−52	95	271																					89
88	01 02	52	92	00 10	51	92	−0 41	52	93	−1 33	51	93	−2 24	51	94	−3 15	52	94	−4 07	51	95	−4 58	52	95	−5 50	51	96	272																					88
87	01 33	52	93	00 41	51	93	−0 10	52	94	−1 02	51	94	−1 53	52	95	−2 45	51	95	−3 36	51	96	−4 27	52	96	−5 19	51	97	−6 10	−51	97	273																			87
86	02 04	52	93	01 12	51	94	00 21	52	94	−0 31	51	95	−1 22	52	95	−2 14	51	96	−3 05	52	97	−3 57	51	97	−4 48	52	98	−5 40	51	98	274																			86
85	02 34	−53	94	01 43	−52	95	00 51	−51	95	00 00	−52	96	−0 52	−51	96	−1 43	−52	97	−2 35	−51	97	−3 26	−52	98	−4 18	−51	98	−5 09	−51	99	−6 00	−52	99	275															85
84	03 05	51	95	02 14	52	96	01 22	51	96	00 31	52	97	−0 21	51	97	−1 12	52	98	−2 04	51	98	−2 55	52	99	−3 47	51	99	−4 38	52	100	−5 30	51	100	276															84
83	03 36	52	96	02 44	51	97	01 53	52	97	01 01	51	98	00 10	52	98	−0 42	51	99	−1 33	52	99	−2 25	52	100	−3 17	51	100	−4 08	52	101	−5 00	51	101	−5 51	−52	102	277											83
82	04 07	52	97	03 15	52	97	02 23	51	98	01 32	52	98	00 40	51	99	−0 11	52	99	−1 03	52	100	−1 55	51	100	−2 46	52	101	−3 38	51	101	−4 29	52	102	−5 21	51	102	−6 12	−52	103	278							82
81	04 37	51	98	03 46	52	98	02 54	52	99	02 02	51	99	01 11	52	100	00 19	52	100	−0 33	51	101	−1 24	52	101	−2 16	51	102	−3 07	52	102	−3 59	52	103	−4 51	51	103	−5 42	52	104	279							81
80	05 08	−52	99	04 16	−51	99	03 25	−52	100	02 33	−52	100	01 41	−52	101	00 49	−51	101	−0 02	−52	102	−0 54	−52	102	−1 46	−51	103	−2 37	−52	103	−3 29	−52	104	−4 21	−51	104	−5 12	−52	105	−6 04	−52	105	280			80
79	05 38	51	99	04 47	52	100	03 55	52	100	03 03	52	101	02 11	51	101	01 20	52	102	00 28	52	103	−0 24	52	103	−1 16	51	104	−2 07	52	104	−2 59	52	105	−3 51	52	105	−4 43	51	106	−5 34	52	106	281			79
78	06 09	52	100	05 17	52	101	04 25	51	101	03 34	52	102	02 42	52	102	01 50	52	103	00 58	52	103	00 06	52	104	−0 46	51	104	−1 37	52	105	−2 29	52	105	−3 21	52	106	−4 13	52	106	−5 05	51	107	−5 56	−52	107	282	78
77	06 39	52	101	05 47	51	102	04 56	52	102	04 04	52	103	03 12	52	103	02 20	52	104	01 28	52	104	00 36	52	105	−0 16	52	105	−1 08	51	106	−1 59	52	106	−2 51	52	107	−3 43	52	107	−4 35	52	108	−5 27	52	108	283	77
76	07 09	51	102	06 18	52	103	05 26	52	103	04 34	52	104	03 42	52	104	02 50	52	105	01 58	52	105	01 06	52	106	00 14	52	106	−0 38	52	107	−1 30	52	107	−2 22	52	108	−3 14	52	108	−4 06	52	109	−4 58	52	109	284	76
75	07 40	−52	103	06 48	−52	103	05 56	−52	104	05 04	−52	104	04 12	−52	105	03 20	−52	105	02 28	−52	106	01 36	−52	106	00 44	−52	107	−0 08	−52	107	−1 00	−52	108	−1 52	−52	108	−2 44	−52	109	−3 36	−53	109	−4 29	−51	110	285	75
74	08 10	52	104	07 18	52	104	06 26	52	105	05 34	52	105	04 42	52	106	03 50	53	106	02 57	52	107	02 05	52	107	01 13	52	108	−0 31	52	109	−1 23	52	109	−2 15	52	110	−3 07	53	110	−4 00	52	111	286	74
73	08 40	52	105	07 48	52	105	06 56	53	106	06 03	52	106	05 11	52	107	04 19	52	107	03 27	52	108	02 35	52	108	01 43	53	109	00 50	52	109	−0 02	52	110	−0 54	52	110	−1 46	53	111	−2 39	52	111	−3 31	52	112	287	73
72	09 09	52	106	08 17	52	106	07 25	52	107	06 33	52	107	05 41	52	108	04 49	53	108	03 56	52	109	03 04	52	109	02 12	53	110	01 19	52	110	00 27	52	111	−0 25	52	111	−1 17	53	111	−2 10	52	112	−3 02	52	112	288	72
71	09 39	52	106	08 47	52	107	07 55	53	107	07 02	52	108	06 10	52	108	05 18	52	109	04 26	53	109	03 33	52	110	02 41	53	110	01 48	52	111	00 56	52	111	00 04	53	112	−0 49	52	112	−1 41	53	113	−2 34	52	113	289	71
70	10 09	−53	107	09 16	−52	108	08 24	−52	108	07 32	−53	109	06 39	−52	109	05 47	−52	110	04 55	−53	110	04 02	−52	111	03 10	−53	111	02 17	−52	112	01 25	−53	112	00 32	−52	113	−0 20	−53	113	−1 13	−52	114	−2 05	−53	114	290	70
LHA	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 59°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°	′	′	°
69	10 38	52	108	09 46	53	109	08 53	52	109	08 01	52	110	07 09	53	110	06 16	52	111	05 24	53	111	04 31	53	112	03 38	52	112	02 46	53	113	01 53	52	113	01 01	53	114	00 08	53	114	−0 45	52	115	−1 37	53	115	291
68	11 07	52	109	10 15	52	110	09 23	53	110	08 30	53	111	07 37	52	111	06 45	53	112	05 52	52	112	05 00	53	113	04 07	53	113	03 14	52	113	02 22	53	114	01 29	53	114	00 36	53	115	−0 17	52	115	−1 09	53	116	292
67	11 37	53	110	10 44	53	110	09 51	52	111	08 59	53	111	08 06	52	112	07 14	53	112	06 21	53	113	05 28	53	113	04 35	53	114	03 42	52	114	02 50	53	115	01 57	53	115	01 04	53	116	00 11	53	116	−0 42	52	117	293
66	12 06	53	111	11 13	53	111	10 20	52	112	09 28	53	112	08 35	53	113	07 42	53	113	06 49	53	114	05 56	53	114	05 03	52	115	04 11	53	115	03 18	53	116	02 25	53	116	01 32	53	117	00 39	53	117	−0 14	53	118	294
65	12 34	−52	112	11 42	−53	112	10 49	−53	113	09 56	−53	113	09 03	−53	114	08 10	−53	114	07 17	−53	115	06 24	−53	115	05 31	−53	116	04 38	−53	116	03 45	−53	117	02 52	−53	117	01 59	−53	117	01 06	−53	118	00 13	−53	118	295
64	13 03	53	113	12 10	53	113	11 17	53	114	10 24	53	114	09 31	53	115	08 38	53	115	07 45	53	116	06 52	53	116	05 59	53	117	05 06	53	117	04 13	53	117	03 20	53	118	02 27	54	118	01 33	53	119	00 40	53	119	296
63	13 31	55	114	12 38	53	114	11 45	53	115	10 52	53	115	09 59	53	116	09 06	53	116	08 13	53	116	07 20	53	117	06 27	54	117	05 33	53	118	04 40	53	118	03 47	53	119	02 54	54	119	02 00	53	120	01 07	53	120	297
62	14 00	53	115	13 07	54	115	12 13	53	115	11 20	53	116	10 27	53	116	09 34	53	117	08 41	54	117	07 47	53	118	06 54	53	118	06 01	54	119	05 07	53	119	04 14	53	120	03 21	54	120	02 27	53	121	01 34	54	121	298
61	14 28	54	115	13 34	53	116	12 41	53	116	11 48	53	117	10 55	54	117	10 01	53	118	09 08	53	118	08 15	54	119	07 21	53	119	06 28	54	120	05 34	53	120	04 41	54	121	03 47	53	121	02 54	54	122	02 00	54	122	299
60	14 55	−53	116	14 02	−53	117	13 09	−54	117	12 15	−53	118	11 22	−53	118	10 29	−54	119	09 35	−53	119	08 42	−54	120	07 48	−54	120	06 54	−53	121	06 01	−54	121	05 07	−53	121	04 14	−54	122	03 20	−54	122	02 26	−54	123	300
59	15 23	53	117	14 30	54	118	13 36	53	118	12 43	54	119	11 49	53	119	10 56	54	120	10 02	54	120	09 08	53	120	08 15	54	121	07 21	54	121	06 27	54	122	05 33	53	122	04 40	54	123	03 46	54	123	02 52	54	124	301
58	15 50	53	118	14 57	54	119	14 03	53	119	13 10	54	120	12 16	54	120	11 22	53	120	10 29	54	121	09 35	54	121	08 41	54	122	07 47	54	122	06 53	54	123	05 59	54	123	05 05	53	124	04 12	54	124	03 18	54	124	302
57	16 17	53	119	15 24	54	120	14 30	54	120	13 36	53	120	12 43	54	121	11 49	54	121	10 55	54	122	10 01	54	122	09 07	54	123	08 13	54	123	07 19	54	124	06 25	54	124	05 31	54	124	04 37	54	125	03 43	54	125	303
56	16 44	53	120	15 51	54	120	14 57	54	121	14 03	54	121	13 09	54	122	12 15	54	122	11 21	54	123	10 27	54	123	09 33	54	124	08 39	54	124	07 45	54	125	06 51	55	125	05 56	54	125	05 02	54	126	04 08	54	126	304
55	17 11	−54	121	16 17	−54	121	15 23	−54	122	14 29	−54	122	13 35	−54	123	12 41	−54	123	11 47	−54	124	10 53	−54	124	09 59	−55	125	09 04	−54	125	08 10	−54	125	07 16	−55	126	06 21	−54	126	05 27	−54	127	04 33	−55	127	305
54	17 37	54	122	16 43	54	122	15 49	54	123	14 55	54	123	14 01	54	124	13 07	54	124	12 13	55	125	11 18	54	125	10 24	54	125	09 30	55	126	08 35	54	126	07 41	55	127	06 46	54	127	05 52	55	128	04 57	54	128	306
53	18 03	54	123	17 09	54	123	16 15	54	124	15 21	54	124	14 27	55	125	13 32	54	125	12 38	55	126	11 43	54	126	10 49	55	126	09 54	54	127	09 00	55	127	08 05	54	128	07 11	55	128	06 16	55	128	05 21	54	129	307
52	18 29	54	124	17 35	54	124	16 41	55	125	15 46	54	125	14 52	55	126	13 57	54	126	13 03	55	126	12 08	54	127	11 14	55	127	10 19	55	128	09 24	54	128	08 30	55	129	07 35	55	129	06 40	55	129	05 45	54	130	308
51	18 55	55	125	18 00	54	125	17 06	55	126	16 11	54	126	15 17	55	127	14 22	54	127	13 28	55	127	12 33	55	128	11 38	55	128	10 43	54	129	09 49	55	129	08 54	55	129	07 59	55	130	07 04	55	130	06 09	55	131	309
50	19 20	−55	126	18 25	−54	126	17 31	−55	127	16 36	−54	127	15 42	−55	127	14 47	−55	128	13 52	−55	128	12 57	−55	129	12 02	−55	129	11 07	−55	130	10 12	−55	130	09 17	−55	130	08 22	−55	131	07 27	−55	131	06 32	−55	132	310
49	19 45	55	127	18 50	54	127	17 56	55	128	17 01	55	128	16 06	55	128	15 11	55	129	14 16	55	129	13 21	55	130	12 26	55	130	11 31	55	130	10 36	55	131	09 41	55	131	08 46	56	132	07 50	55	132	06 55	55	132	311
48	20 10	55	128	19 15	55	128	18 20	55	129	17 25	55	129	16 30	55	129	15 35	55	130	14 40	55	130	13 45	55	131	12 50	56	131	11 54	55	131	10 59	55	132	10 04	55	132	09 09	56	133	08 13	56	133	07 18	56	133	312
47	20 34	55	129	19 39	55	129	18 44	55	129	17 49	55	130	16 54	56	130	15 58	55	131	15 03	55	131	14 08	55	132	13 13	56	132	12 17	55	132	11 22	55	133	10 27	56	133	09 31	55	134	08 36	56	134	07 40	55	134	313
46	20 58	55	130	20 03	55	130	19 08	56	130	18 12	55	131	17 17	55	131	16 22	56	132	15 26	55	132	14 31	56	132	13 35	55	133	12 40	56	133	11 44	55	134	10 49	56	134	09 53	55	134	08 58	56	135	08 02	56	135	314
45	21 21	−55	131	20 26	−55	131	19 31	−55	131	18 36	−56	132	17 40	−55	132	16 45	−56	133	15 49	−55	133	14 54	−56	133	13 58	−56	134	13 02	−55	134	12 07	−56	135	11 11	−56	135	10 15	−56	135	09 19	−55	136	08 24	−56	136	315
44	21 45	56	132	20 49	55	132	19 54	56	132	18 58	55	133	18 03	56	133	17 07	55	134	16 12	56	134	15 16	56	134	14 20	56	135	13 24	56	135	12 28	55	136	11 33	56	136	10 37	56	136	09 41	56	137	08 45	56	137	316
43	22 08	56	133	21 12	55	133	20 17	56	133	19 21	56	134	18 25	56	134	17 29	55	135	16 34	56	135	15 38	56	135	14 42	56	136	13 46	56	136	12 50	56	136	11 54	56	137	10 58	56	137	10 02	56	138	09 06	56	138	317
42	22 30	55	134	21 35	56	134	20 39	56	134	19 43	56	135	18 47	56	135	17 51	56	136	16 55	56	136	15 59	56	136	15 03	56	137	14 07	56	137	13 11	56	137	12 15	56	138	11 19	56	138	10 23	57	138	09 26	56	139	318
41	22 52	55	135	21 57	56	135	21 01	56	135	20 05	56	136	19 09	56	136	18 13	56	137	17 17	57	137	16 20	56	137	15 24	56	138	14 28	56	138	13 32	56	138	12 36	57	139	11 39	56	139	10 43	56	139	09 47	57	140	319
40	23 14	−56	136	22 18	−56	136	21 22	−56	136	20 26	−56	137	19 30	−56	137	18 34	−57	138	17 37	−56	138	16 41	−56	138	15 45	−56	139	14 49	−57	139	13 52	−56	140	12 56	−57	140	11 59	−56	140	11 03	−57	140	10 06	−56	141	320
39	23 36	56	137	22 40	57	137	21 43	56	137	20 47	56	138	19 51	57	138	18 54	56	138	17 58	56	139	17 02	57	139	16 05	56	140	15 09	57	140	14 12	56	140	13 16	57	141	12 19	57	141	11 22	56	141	10 26	57	142	321
38	23 57	57	138	23 00	56	138	22 04	56	138	21 08	57	139	20 11	56	139	19 15	57	139	18 18	56	140	17 22	57	140	16 25	57	141	15 28	56	141	14 32	57	141	13 35	57	142	12 38	57	142	11 41	56	142	10 45	57	143	322
37	24 17	56	139	23 21	57	139	22 24	56	139	21 28	57	140	20 31	56	140	19 35	57	140	18 38	57	141	17 41	57	141	16 44	56	142	15 48	57	142	14 51	57	142	13 54	57	143	12 57	57	143	12 00	57	143	11 03	57	143	323
36	24 37	56	140	23 41	57	140	22 44	56	140	21 48	57	141	20 51	57	141	19 54	57	141	18 57	57	142	18 00	57	142	17 03	57	142	16 06	56	143	15 10	57	143	14 13	57	143	13 16	57	144	12 19	58	144	11 21	57	144	324
35	24 57	−56	141	24 01	−57	141	23 04	−57	141	22 07	−57	142	21 10	−57	142	20 13	−57	142	19 16	−57	143	18 19	−57	143	17 22	−57	143	16 25	−57	144	15 28	−57	144	14 31	−57	144	13 34	−58	145	12 36	−57	145	11 39	−57	145	325
34	25 17	57	142	24 20	57	142	23 23	57	142	22 26	57	143	21 29	57	143	20 32	57	143	19 35	58	144	18 37	57	144	17 40	57	144	16 43	57	145	15 46	58	145	14 48	57	145	13 51	57	146	12 54	57	146	11 57	58	146	326
33	25 35	57	143	24 38	57	143	23 41	57	144	22 44	57	144	21 47	57	144	20 50	57	145	19 53	58	145	18 55	57	145	17 58	57	145	17 01	58	146	16 03	57	146	15 06	58	146	14 08	57	147	13 11	58	147	12 13	57	147	327
32	25 54	57	144	24 57	58	144	23 59	57	145	23 02	57	145	22 05	57	145	21 08	58	146	20 10	57	146	19 13	58	146	18 15	57	146	17 18	58	147	16 20	57	147	15 23	58	147	14 25	57	148	13 28	58	148	12 30	58	148	328
31	26 12	57	145	25 15	58	145	24 17	57	146	23 20	58	146	22 22	57	146	21 25	58	147	20 27	57	147	19 30	58	147	18 32	58	147	17 34	57	148	16 37	58	148	15 39	58	148	14 41	57	149	13 44	58	149	12 46	58	149	329
30	26 29	−57	146	25 32	−58	146	24 34	−57	147	23 37	−58	147	22 39	−57	147	21 42	−58	148	20 44	−58	148	19 46	−58	148	18 48	−57	148	17 51	−58	149	16 53	−58	149	15 55	−58	149	14 57	−57	150	14 00	−58	150	13 02	−58	150	330
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N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 59°

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
0	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	50 00	+60	180	51 00	+60	180	52 00	+60	180	53 00	+60	180	54 00	+60	180	55 00	+60	180	56 00	+60	180	57 00	+60	180	58 00	+60	180	59 00	+60	180	60 00	+60	180	360
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38	37 52	55	131	38 47	55	131	39 42	54	130	40 36	55	130	41 31	54	129	42 25	54	128	43 19	54	128	44 13	54	127	45 07	53	127	46 00	54	126	46 54	53	125	47 47	52	125	48 39	53	124	49 32	52	123	50 24	52	122	322
39	37 29	54	130	38 23	55	129	39 18	54	129	40 12	55	128	41 07	54	128	42 01	54	127	42 55	53	127	43 48	54	126	44 42	53	125	45 35	53	125	46 28	53	124	47 21	53	123	48 14	52	123	49 06	52	122	49 58	51	121	321
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41	36 41	54	128	37 35	54	127	38 29	54	127	39 23	54	126	40 17	54	126	41 11	53	125	42 04	54	124	42 58	53	124	43 51	53	123	44 44	52	122	45 36	53	122	46 29	52	121	47 21	52	120	48 13	51	120	49 04	52	119	319
42	36 16	54	127	37 10	54	126	38 04	54	126	38 58	54	125	39 52	53	124	40 45	54	124	41 39	53	123	42 32	53	123	43 25	52	122	44 17	53	121	45 10	52	121	46 02	52	120	46 54	52	119	47 46	51	118	48 37	51	118	318
43	35 51	54	126	36 45	54	125	37 39	54	125	38 33	53	124	39 26	54	123	40 20	53	123	41 13	53	122	42 06	52	122	42 58	53	121	43 51	52	120	44 43	52	120	45 35	52	119	46 27	51	118	47 18	52	117	48 10	50	117	317
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45	35 00	+54	124	35 54	+53	123	36 47	+54	122	37 41	+53	122	38 34	+53	121	39 27	+53	121	40 20	+52	120	41 12	+53	119	42 05	+52	119	42 57	+52	118	43 49	+52	117	44 41	+51	117	45 32	+51	116	46 23	+51	115	47 14	+50	114	315
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50	32 48	+53	118	33 41	+52	118	34 33	+53	117	35 26	+52	117	36 18	+53	116	37 11	+52	115	38 03	+51	115	38 54	+52	114	39 46	+51	113	40 37	+52	113	41 29	+50	112	42 19	+51	111	43 10	+50	111	44 00	+50	110	44 50	+50	109	310
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62	27 05	52	107	27 57	51	106	28 48	52	106	29 40	51	105	30 31	50	104	31 21	51	104	32 12	51	103	33 03	50	102	33 53	50	102	34 43	50	101	35 33	50	100	36 23	49	100	37 12	49	99	38 01	49	98	38 50	49	98	298
63	26 36	53	106	27 27	52	105	28 19	51	105	29 10	51	104	30 01	50	103	30 51	51	103	31 42	50	102	32 32	51	101	33 23	50	101	34 13	49	100	35 02	50	99	35 52	49	99	36 41	49	98	37 30	49	97	38 19	49	97	297
64	26 06	53	105	26 57	52	104	27 49	51	104	28 40	50	103	29 30	51	102	30 21	51	102	31 12	50	101	32 02	50	101	32 52	50	100	33 42	50	99	34 32	49	99	35 21	50	98	36 11	49	97	37 00	49	96	37 49	48	96	296
65	25 36	+53	104	26 27	+51	103	27 18	+51	103	28 09	+51	102	29 00	+51	102	29 51	+50	101	30 41	+51	100	31 32	+50	100	32 22	+50	99	33 12	+49	98	34 01	+50	98	34 51	+49	97	35 40	+49	96	36 29	+49	96	37 18	+48	95	295
66	25 06	51	103	25 57	51	102	26 48	51	102	27 39	51	101	28 30	51	101	29 21	50	100	30 11	50	99	31 01	50	99	31 51	50	98	32 41	50	97	33 31	49	97	34 20	49	96	35 09	49	95	35 58	49	95	36 47	48	94	294
67	24 36	51	102	25 27	51	101	26 18	51	101	27 09	51	100	28 00	50	100	28 50	50	99	29 40	51	98	30 31	50	98	31 21	49	97	32 10	50	97	33 00	49	96	33 49	50	95	34 39	48	95	35 27	49	94	36 16	49	93	293
68	24 06	51	101	24 57	51	101	25 48	50	99	26 38	51	99	27 29	50	99	28 19	51	98	29 10	50	98	30 00	50	97	30 50	50	96	31 40	49	96	32 29	50	95	33 19	49	94	34 08	49	94	34 57	48	93	35 45	49	92	292
69	23 35	51	100	24 26	51	100	25 17	51	99	26 08	50	99	26 58	51	98	27 49	50	97	28 39	50	97	29 29	50	96	30 19	50	95	31 09	49	95	31 58	50	94	32 48	49	93	33 37	49	93	34 26	48	92	35 14	49	91	291

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 59°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) SAME NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
70	23 05	+51	99	23 56	+51	99	24 47	+50	98	25 37	+51	98	26 28	+50	97	27 18	+50	96	28 08	+50	96	28 58	+50	95	29 48	+50	95	30 38	+50	94	31 28	+49	93	32 17	+49	93	33 06	+49	92	33 55	+48	91	34 43	+49	90	290
71	22 34	51	98	23 25	51	98	24 16	51	97	25 07	50	97	25 57	50	96	26 47	51	96	27 38	50	95	28 28	50	94	29 18	49	94	30 07	50	93	30 57	49	92	31 46	49	92	32 35	49	91	33 24	49	90	34 13	48	90	289
72	22 04	50	98	22 54	51	97	23 45	51	96	24 36	50	96	25 26	51	95	26 17	50	95	27 07	50	94	27 57	50	93	28 47	49	93	29 36	50	92	30 26	49	91	31 15	49	91	32 04	49	90	32 53	49	89	33 42	48	89	288
73	21 33	51	97	22 24	51	96	23 15	50	96	24 05	51	95	24 56	50	94	25 46	50	94	26 36	50	93	27 26	50	93	28 16	49	92	29 05	50	91	29 55	49	91	30 44	49	90	31 33	49	89	32 22	49	89	33 11	48	88	287
74	21 02	51	96	21 53	51	95	22 44	50	95	23 34	51	94	24 25	50	94	25 15	50	93	26 05	50	92	26 55	50	92	27 45	50	91	28 35	49	90	29 24	49	90	30 13	49	89	31 02	49	88	31 51	49	88	32 40	48	87	286
75	20 31	+51	95	21 22	+51	94	22 13	+50	94	23 03	+51	93	23 54	+50	93	24 44	+50	92	25 34	+50	91	26 24	+50	91	27 14	+50	90	28 04	+49	90	28 53	+49	89	29 42	+50	88	30 32	+48	88	31 20	+49	87	32 09	+48	86	285
76	20 01	50	94	20 51	51	94	21 42	51	93	22 33	50	92	23 23	50	92	24 13	50	91	25 03	50	91	25 53	50	90	26 43	50	89	27 33	49	89	28 22	50	88	29 12	49	87	30 01	49	87	30 50	48	86	31 38	49	85	284
77	19 30	51	93	20 21	50	93	21 11	51	92	22 02	50	91	22 52	50	91	23 42	50	90	24 32	50	90	25 22	50	89	26 12	50	88	27 02	49	88	27 51	50	87	28 41	49	87	29 30	49	86	30 19	48	85	31 07	49	85	283
78	18 59	51	92	19 50	50	92	20 40	51	91	21 31	50	91	22 21	50	90	23 11	51	89	24 02	50	89	24 52	49	88	25 41	50	87	26 31	50	87	27 21	49	86	28 10	49	86	28 59	49	85	29 48	49	84	30 37	48	84	282
79	18 28	51	91	19 19	50	91	20 09	51	90	21 00	50	90	21 50	51	89	22 41	50	89	23 31	50	88	24 21	49	87	25 10	50	87	26 00	50	86	26 50	49	86	27 39	49	85	28 28	49	84	29 17	49	84	30 06	49	83	281
80	17 57	+51	91	18 48	+51	90	19 39	+50	89	20 29	+50	89	21 19	+51	88	22 10	+50	88	23 00	+50	87	23 50	+50	87	24 40	+49	86	25 29	+50	85	26 19	+49	85	27 08	+50	84	27 58	+49	83	28 47	+48	83	29 35	+49	82	280
81	17 26	51	90	18 17	51	89	19 08	50	89	19 58	51	88	20 49	50	87	21 39	50	87	22 29	50	86	23 19	50	86	24 09	50	85	24 59	49	84	25 48	50	84	26 38	49	83	27 27	49	83	28 16	49	82	29 05	48	81	279
82	16 55	51	89	17 46	51	88	18 37	50	88	19 27	51	87	20 18	50	87	21 08	50	86	21 58	50	85	22 48	50	85	23 38	50	84	24 28	49	84	25 17	50	83	26 07	49	82	26 56	49	82	27 45	49	81	28 34	49	80	278
83	16 24	51	88	17 15	51	88	18 06	50	87	18 56	51	86	19 47	50	86	20 37	50	85	21 27	50	85	22 17	50	84	23 07	50	83	23 57	50	83	24 47	49	82	25 36	50	82	26 26	49	81	27 15	49	80	28 04	49	80	277
84	15 54	50	87	16 44	51	87	17 35	51	86	18 26	50	86	19 16	50	85	20 06	51	84	20 57	50	84	21 47	50	83	22 37	50	83	23 27	49	82	24 16	50	81	25 06	49	81	25 55	49	80	26 44	49	80	27 33	49	79	276
85	15 23	+51	86	16 14	+50	86	17 04	+51	85	17 55	+50	85	18 45	+51	84	19 36	+50	84	20 26	+50	83	21 16	+50	82	22 06	+50	82	22 56	+50	81	23 46	+49	81	24 35	+50	80	25 25	+49	79	26 14	+49	79	27 03	+49	78	275
86	14 52	51	86	15 43	50	85	16 33	51	84	17 24	51	84	18 15	50	83	19 05	50	83	19 55	50	82	20 45	51	82	21 36	49	81	22 25	50	80	23 15	50	80	24 05	49	79	24 54	50	79	25 44	49	78	26 33	49	77	274
87	14 21	51	85	15 12	51	84	16 03	50	84	16 53	51	83	17 44	50	82	18 34	51	82	19 25	50	81	20 15	50	81	21 05	50	80	21 55	50	80	22 45	50	79	23 35	49	78	24 24	50	78	25 14	49	77	26 03	49	76	273
88	13 50	51	84	14 41	51	83	15 32	51	83	16 23	50	82	17 13	51	82	18 04	50	81	18 54	50	80	19 44	51	80	20 35	50	79	21 25	50	79	22 15	49	78	23 04	50	78	23 54	50	77	24 44	49	76	25 33	49	76	272
89	13 20	51	83	14 11	50	82	15 01	51	82	15 52	51	81	16 43	50	81	17 33	51	80	18 24	50	80	19 14	50	79	20 04	50	78	20 54	50	78	21 44	50	77	22 34	50	77	23 24	50	76	24 14	49	75	25 03	49	75	271
90	12 49	+51	82	13 40	+51	82	14 31	+51	81	15 22	+50	80	16 12	+51	80	17 03	+50	79	17 53	+51	79	18 44	+50	78	19 34	+50	78	20 24	+50	77	21 14	+50	76	22 04	+50	76	22 54	+50	75	23 44	+49	75	24 33	+50	74	270
91	12 18	51	81	13 09	51	81	14 00	51	80	14 51	51	80	15 42	51	79	16 33	50	79	17 23	51	78	18 14	50	77	19 04	50	77	19 54	50	76	20 44	50	76	21 34	50	75	22 24	50	74	23 14	50	74	24 04	49	73	269
92	11 48	51	80	12 39	51	80	13 30	51	79	14 21	51	79	15 12	50	78	16 02	51	78	16 53	50	77	17 43	51	77	18 34	50	76	19 24	50	75	20 14	51	75	21 05	50	74	21 55	49	74	22 44	50	73	23 34	50	72	268
93	11 18	51	80	12 09	51	79	13 00	51	79	13 51	50	78	14 41	51	77	15 32	51	77	16 23	50	76	17 13	51	76	18 04	50	75	18 54	51	75	19 45	50	74	20 35	50	73	21 25	50	73	22 15	50	72	23 05	49	72	267
94	10 47	51	79	11 38	51	78	12 29	51	78	13 20	51	77	14 11	51	77	15 02	51	76	15 53	51	76	16 44	50	75	17 34	51	74	18 25	50	74	19 15	50	73	20 05	50	73	20 55	51	72	21 46	49	72	22 35	50	71	266
95	10 17	+51	78	11 08	+51	77	11 59	+51	77	12 50	+51	76	13 41	+51	76	14 32	+51	75	15 23	+51	75	16 14	+50	74	17 04	+51	74	17 55	+50	73	18 45	+51	72	19 36	+50	72	20 26	+50	71	21 16	+50	71	22 06	+50	70	265
96	09 47	51	77	10 38	51	77	11 29	51	76	12 20	51	76	13 11	51	75	14 02	51	74	14 53	51	74	15 44	51	73	16 35	51	73	17 26	50	72	18 16	51	72	19 07	50	71	19 57	50	71	20 47	50	70	21 37	50	69	264
97	09 17	51	76	10 08	51	76	10 59	51	75	11 50	52	75	12 42	51	74	13 33	51	74	14 24	51	73	15 15	50	73	16 05	51	72	16 56	51	71	17 47	50	71	18 37	51	70	19 28	50	70	20 18	50	69	21 08	51	69	263
98	08 47	51	75	09 38	51	75	10 29	52	74	11 21	51	74	12 12	51	73	13 03	51	73	13 54	51	72	14 45	51	72	15 36	51	71	16 27	51	71	17 18	50	70	18 08	51	69	18 59	50	69	19 49	51	68	20 40	50	68	262
99	08 17	51	75	09 08	52	74	10 00	51	74	10 51	51	73	11 42	52	72	12 34	51	72	13 25	51	71	14 16	51	71	15 07	52	70	15 58	51	70	16 49	51	69	17 40	50	69	18 30	51	68	19 21	50	68	20 11	51	67	261
100	07 47	+52	74	08 39	+51	73	09 30	+52	73	10 22	+51	72	11 13	+51	72	12 04	+52	71	12 56	+51	71	13 47	+51	70	14 38	+51	70	15 29	+51	69	16 20	+51	68	17 11	+51	68	18 02	+50	67	18 52	+51	67	19 43	+50	66	260
101	07 18	51	73	08 09	52	72	09 01	51	72	09 52	52	71	10 44	51	71	11 35	51	70	12 26	52	70	13 18	51	69	14 09	51	69	15 00	51	68	15 51	51	68	16 42	51	67	17 33	51	67	18 24	51	66	19 15	50	65	259
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103	06 19	51	71	07 10	52	71	08 02	52	70	08 54	52	70	09 46	51	69	10 37	52	69	11 29	51	68	12 20	52	68	13 12	51	67	14 03	51	67	14 54	52	66	15 46	51	66	16 37	51	65	17 28	51	64	18 19	51	64	257
104	05 50	51	70	06 41	52	70	07 33	52	69	08 25	52	69	09 17	52	68	10 09	51	68	11 00	52	67	11 52	51	67	12 43	52	66	13 35	51	66	14 26	52	65	15 18	51	65	16 09	51	64	17 00	51	64	17 51	51	63	256
105	05 20	+52	70	06 12	+52	69	07 04	+52	69	07 56	+52	68	08 48	+52	68	09 40	+52	67	10 32	+51	67	11 23	+52	66	12 15	+52	65	13 07	+51	65	13 58	+52	64	14 50	+51	64	15 41	+52	63	16 33	+51	63	17 24	+51	62	255
106	04 52	52	69	05 44	52	68	06 36	52	68	07 28	52	67	08 20	52	67	09 12	51	66	10 03	52	66	10 55	52	65	11 47	52	65	12 39	52	64	13 31	53	64	14 22	52	63	15 14	51	63	16 05	52	62	16 57	51	62	254
107	04 23	52	68	05 15	52	67	06 07	52	67	06 59	52	66	07 51	52	66	08 43	52	65	09 35	52	65	10 27	52	64	11 19	52	64	12 11	52	63	13 03	52	63	13 55	51	62	14 46	52	62	15 38	51	61	16 29	52	61	253
108	03 54	53	67	04 47	52	67	05 39	52	66	06 31	52	66	07 23	52	65	08 15	53	65	09 08	52	64	10 00	52	64	10 52	52	63	11 44	52	63	12 36	51	62	13 27	52	62	14 19	52	61	15 11	52	60	16 03	51	60	252
109	03 26	52	66	04 18	53	66	05 11	52	65	06 03	52	65	06 55	53	64	07 48	52	64	08 40	52	63	09 32	52	63	10 24	52	62	11 16	52	62	12 08	52	61	13 00	52	61	13 52	52	60	14 44	52	60	15 36	52	59	251
110	02 58	+52	65	03 50	+53	65	04 43	+52	64	05 35	+53	64	06 28	+52	63	07 20	+52	63	08 12	+52	62	09 05	+52	62	09 57	+52	61	10 49	+52	61	11 41	+52	60	12 33	+53	60	13 26	+52	59	14 18	+52	59	15 10	+52	58	250
111	02 30	52	65	03 22	53	64	04 15	53	64	05 08	52	63	06 00	53	63	06 53	52	62	07 45	53	62	08 38	52	61	09 30	52	61	10 22	53	60	11 15	52	60	12 07	52	59	12 59	52	59	13 51	52	58	14 43	52	58	249
112	02 02	53	64	02 55	52	63	03 47	53	63	04 40	53	62	05 33	52	62	06 25	53	61	07 18	53	61	08 11	52	60	09 03	53	60	09 56	52	59	10 48	52	59	11 40	53	58	12 33	52	58	13 25	52	57	14 17	53	57	248
113	01 34	53	63	02 27	53	62	03 20	53	62	04 13	53	61	05 06	52	61	05 58	53	60	06 51	53	60	07 44	52	59	08 36	53	59	09 29	53	58	10 22	52	58	11 14	53	58	12 07	52	57	12 59	53	57	13 52	52	56	247
114	01 07	53	62	02 00	53	61	02 53	53	61	03 46	53	61	04 39	53	60	05 32	52	60	06 24	53	59	07 17	53	59	08 10	53	58	09 03	53	58	09 56	52	57	10 48	53	57	11 41	53	56	12 34	52	56	13 26	53	55	246
115	00 40	+53	61	01 33	+53	61	02 26	+53	60	03 19	+53	60	04 12	+53	59	05 05	+53	59	05 58	+53	58	06 51	+53	58	07 44	+53	57	08 37	+53	57	09 30	+53	56	10 23	+52	56	11 15	+53	55	12 08	+53	55	13 01	+52	54	245
116	00 13	53	60	01 06	53	60	01 59	53	59	02 52	54	59	03 46	53	58	04 39	53	58	05 32	53	57	06 25	53	57	07 18	53	57	08 11	53	56	09 04	53	56	09 57	53	55	10 50	53	55	11 43	53	54	12 36	53	54	244
117	−0 14	54	59	00 40	53	59	01 33	53	58	02 26	53	58	03 19	54	58	04 13	53	57	05 06	53	57	05 59	53	56	06 52	54	56	07 46	53	55	08 39	53	55	09 32	53	54	10 25	53	54	11 18	53	53	12 11	53	53	243
118	−0 40	53	59	00 13	54	58	01 07	53	58	02 00	53	57	02 53	54	57	03 47	53	56	04 40	54	56	05 34	53	55	06 27	54	55	07 20	54	54	08 14	53	54	09 07	53	53	10 00	53	53	10 53	54	53	11 47	53	52	242
119	−1 06	53	58	−0 13	54	57	00 41	53	57	01 34	54	56	02 28	53	56	03 21	54	55	04 15	53	55	05 08	54	55	06 02	53	54	06 55	54	54	07 49	53	53	08 42	54	53	09 36	53	52	10 29	53	52	11 22	54	51	241
120	−1 32	+53	57	−0 39	+54	56	00 15	+54	56	01 09	+53	55	02 02	+54	55	02 56	+54	55	03 50	+53	54	04 43	+54	54	05 37	+54	53	06 31	+53	53	07 24	+54	52	08 18	+53	52	09 11	+54	51	10 05	+53	51	10 58	+54	50	240
121	−1 58	54	56	−1 04	53	55	−0 11	54	55	00 43	54	55	01 37	54	54	02 31	54	54	03 25	54	53	04 19	53	53	05 12	54	52	06 06	54	52	07 00	54	52	07 54	53	51	08 47	54	51	09 41	54	50	10 35	53	50	239
122	−2 24	54	55	−1 30	54	55	−0 36	54	54	00 18	54	54	01 12	54	53	02 06	54	53	03 00	54	52	03 54	54	52	04 48	54	52	05 42	54	51	06 36	54	51	07 30	54	50	08 24	53	50	09 17	54	49	10 11	54	49	238
123	−2 49	54	54	−1 55	54	54	−1 01	54	53	−0 07	56	53	00 48	54	52	01 42	54	52	02 36	54	52	03 30	54	51	04 24	54	51	05 18	54	50	06 12	54	50	07 06	54	49	08 00	54	49	08 54	54	49	09 48	54	48	237
124	−3 14	54	53	−2 20	55	53	−1 25	54	52	−0 31	54	52	00 23	54	52	01 17	55	51	02 12	54	51	03 06	54	50	04 00	54	50	04 54	55	49	05 49	54	49	06 43	54	49	07 37	54	48	08 31	54	48	09 25	54	47	236
125	−3 38	+54	52	−2 44	+54	52	−1 50	+55	52	−0 55	+54	51	−0 01	+55	51	00 54	+54	50	01 48	+54	50	02 42	+55	49	03 37	+54	49	04 31	+54	49	05 25	+55	48	06 20	+54	48	07 14	+54	47	08 08	+55	47	09 03	+54	47	235
126	−4 03	55	52	−3 08	54	51	−2 14	55	51	−1 19	54	50	−0 25	55	50	00 30	54	49	01 24	55	49	02 19	54	49	03 13	55	48	04 08	56	48	05 03	54	47	05 57	54	47	06 51	55	47	07 46	54	46	08 40	55	46	234
127	−4 27	55	51	−3 32	54	50	−2 38	55	50	−1 43	55	49	−0 48	55	49	00 07	54	49	01 01	55	48	01 56	55	48	02 51	54	47	03 45	55	47	04 40	55	47	05 35	54	46	06 29	55	46	07 24	54	45	08 18	55	45	233
128	−4 51	55	50	−3 56	55	49	−3 01	55	49	−2 06	55	49	−1 11	55	48	−0 16	54	48	00 38	55	47	01 33	55	47	02 28	55	47	03 23	55	46	04 18	54	46	05 12	55	45	06 07	55	45	07 02	55	45	07 57	54	44	232
129	−5 14	55	49	−4 19	55	49	−3 24	55	48	−2 29	56	48	−1 34	55	47	−0 39	55	47	00 16	55	47	01 11	55	46	02 06	55	46	03 01	55	45	03 56	55	45	04 51	55	45	05 46	54	44	06 40	55	44	07 35	55	43	231
130	−5 37	+55	48	−4 42	+55	48	−3 47	+55	47	−2 52	+55	47	−1 57	+55	46	−1 02	+56	46	−0 06	+55	46	00 49	+55	45	01 44	+55	45	02 39	+55	44	03 34	+55	44	04 29	+55	44	05 24	+55	43	06 19	+55	43	07 14	+55	42	230
131	−6 00	+55	47	−5 05	55	47	−4 10	56	46	−3 14	55	46	−2 19	55	46	−1 24	56	45	−0 28	55	45	00 27	55	44	01 22	55	44	02 17	56	44	03 13	55	43	04 08	55	43	05 03	55	42	05 58	56	42	06 54	55	42	229
			132	−5 27	55	46	−4 32	56	45	−3 36	55	45	−2 41	56	45	−1 45	55	44	−0 50	55	44	00 05	56	44	01 01	55	43	01 56	56	43	02 52	55	42	03 47	55	42	04 42	56	42	05 38	55	41	06 33	56	41	228
			133	−5 49	55	45	−4 54	56	45	−3 58	56	44	−3 02	55	44	−2 07	56	43	−1 11	55	43	−0 16	56	43	00 40	55	42	01 35	56	42	02 31	56	42	03 27	55	41	04 22	56	41	05 18	55	40	06 13	56	40	227
			134	−6 11	+56	44	−5 15	56	44	−4 19	55	43	−3 24	56	43	−2 28	56	43	−1 32	55	42	−0 37	56	42	00 19	56	41	01 15	56	41	02 11	55	41	03 06	56	40	04 02	56	40	04 58	55	40	05 53	56	39	226
			135				−5 36	+56	43	−4 40	+56	42	−3 45	+56	42	−2 49	+56	42	−1 53	+56	41	−0 57	+56	41	−0 01	+56	41	00 55	+56	40	01 51	+56	40	02 47	+55	40	03 42	+56	39	04 38	+56	39	05 34	+56	38	225
			136				−5 57	+56	42	−5 01	56	42	−4 05	56	41	−3 09	56	41	−2 13	56	40	−1 17	56	40	−0 21	56	40	00 35	56	39	01 31	56	39	02 27	56	39	03 23	56	38	04 19	56	38	05 15	56	38	224
									137	−5 21	56	41	−4 25	56	40	−3 29	56	40	−2 33	56	40	−1 37	56	39	−0 41	57	39	00 16	56	39	01 12	56	38	02 08	56	38	03 04	56	37	04 00	56	37	04 56	57	37	223
									138	−5 41	56	40	−4 45	56	39	−3 49	57	39	−2 52	56	39	−1 56	56	38	−1 00	57	38	−0 03	56	38	00 53	56	37	01 49	56	37	02 45	57	37	03 42	56	36	04 38	56	36	222
									139	−6 01	+56	39	−5 05	57	39	−4 08	56	38	−3 12	57	38	−2 15	56	37	−1 19	57	37	−0 22	56	37	00 34	57	36	01 31	56	36	02 27	57	36	03 24	56	35	04 20	57	35	221
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°-

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 59°

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
140													−5 24	+57	38	−4 27	+57	37	−3 30	+56	37	−2 34	+57	37	−1 37	+56	36	−0 41	+57	36	00 16	+57	36	01 13	+56	35	02 09	+57	35	03 06	+57	35	04 03	+56	34	220
141													−5 42	57	37	−4 45	56	36	−3 49	57	36	−2 52	57	36	−1 55	57	35	−0 58	56	35	00 55	57	34	01 52	57	34	02 49	56	34	03 45	57	33	219
142													−6 01	+57	36	−5 04	57	36	−4 07	57	35	−3 10	57	35	−2 13	57	35	−1 16	57	34	00 38	57	34	01 35	57	33	02 32	56	33	03 28	57	33	218
143																−5 21	57	35	−4 24	57	34	−3 27	57	34	−2 30	57	34	−1 33	57	33	−0 36	57	33	00 21	57	33	01 18	57	32	02 15	57	32	03 12	57	32	217
144																−5 39	57	34	−4 42	58	33	−3 44	57	33	−2 47	57	33	−1 50	57	32	−0 53	57	32	00 04	57	32	01 01	58	32	01 59	57	31	02 56	57	31	216
145																−5 56	+58	33	−4 58	+57	33	−4 01	+57	32	−3 04	+58	32	−2 06	+57	32	−1 09	+57	31	−0 12	+58	31	00 46	+57	31	01 43	+57	30	02 40	+57	30	215
146																−6 12	+57	32	−5 15	58	32	−4 17	57	31	−3 20	58	31	−2 22	57	31	−1 25	57	30	−0 28	58	30	00 30	57	30	01 27	58	30	02 25	57	29	214
147																			−5 31	58	31	−4 33	57	30	−3 36	58	30	−2 38	58	30	−1 40	57	30	−0 43	58	29	00 15	57	29	01 12	58	29	02 10	57	28	213
148																			−5 46	57	30	−4 49	58	30	−3 51	58	29	−2 53	57	29	−1 56	58	29	−0 58	58	28	00 00	58	28	00 58	57	28	01 55	58	28	212
149																			−6 02	+58	29	−5 04	58	29	−4 06	58	28	−3 08	58	28	−2 10	58	28	−1 12	58	28	−0 14	57	27	00 43	58	27	01 41	58	27	211
150																						−5 18	+58	28	−4 20	+58	27	−3 22	+58	27	−2 24	+58	27	−1 26	+58	27	−0 28	+58	26	00 30	+58	26	01 28	+57	26	210
151																						−5 32	58	27	−4 34	58	27	−3 36	58	26	−2 38	58	26	−1 40	58	26	−0 42	58	26	00 16	58	25	01 14	58	25	209
152																						−5 46	58	26	−4 48	58	26	−3 50	58	25	−2 52	59	25	−1 53	58	25	−0 55	58	25	00 03	58	24	01 01	59	24	208
153																						−6 00	+59	25	−5 01	58	25	−4 03	58	25	−3 05	59	24	−2 06	58	24	−1 08	58	24	−0 10	59	24	00 49	58	23	207
154																									−5 14	59	24	−4 15	58	24	−3 17	58	23	−2 19	59	23	−1 20	58	23	−0 22	59	23	00 37	58	23	206
155																									−5 26	+58	23	−4 28	+59	23	−3 29	+58	23	−2 31	+59	22	−1 32	+59	22	−0 33	+58	22	00 25	+59	22	205
156																									−5 38	59	22	−4 39	58	22	−3 41	59	22	−2 42	59	21	−1 43	58	21	−0 45	59	21	00 14	59	21	204
157																									−5 49	58	21	−4 51	59	21	−3 52	59	21	−2 53	59	21	−1 54	58	20	−0 56	59	20	00 03	59	20	203
158																									−6 00	+58	20	−5 02	59	20	−4 03	59	20	−3 04	59	20	−2 05	59	20	−1 06	59	19	−0 07	59	19	202
159																												−5 12	59	19	−4 13	59	19	−3 14	59	19	−2 15	59	19	−1 16	59	18	−0 17	59	18	201
160																												−5 22	+59	18	−4 23	+59	18	−3 24	+59	18	−2 25	+59	18	−1 26	+59	18	−0 27	+59	17	200
161																												−5 31	59	17	−4 32	59	17	−3 33	59	17	−2 34	59	17	−1 35	59	17	−0 36	60	17	199
162																												−5 40	59	16	−4 41	59	16	−3 42	59	16	−2 43	60	16	−1 43	59	16	−0 44	59	16	198
163																												−5 49	59	16	−4 50	60	15	−3 50	59	15	−2 51	59	15	−1 52	60	15	−0 52	59	15	197
164																												−5 57	59	15	−4 58	60	15	−3 58	59	14	−2 59	60	14	−1 59	59	14	−1 00	59	14	196
165																															−6 05	+60	14	−5 05	+59	14	−4 06	+60	13	−3 06	+59	13	−2 07	+60	13	−1 07	+59	13	195
166																																	−5 12	59	13	−4 13	60	13	−3 13	59	12	−2 14	60	12	−1 14	60	12	194
167																																	−5 19	60	12	−4 19	60	12	−3 19	59	12	−2 20	60	11	−1 20	59	11	193
168																																	−5 25	60	11	−4 25	60	11	−3 25	59	11	−2 26	60	11	−1 26	60	10	192
169																																	−5 30	59	10	−4 31	60	10	−3 31	60	10	−2 31	59	10	−1 32	60	10	191
170																																	−5 35	+59	9	−4 36	+60	9	−3 36	+60	9	−2 36	+60	9	−1 36	+59	9	190
171																																	−5 40	60	8	−4 40	59	8	−3 41	60	8	−2 41	60	8	−1 41	60	8	189
172																																	−5 44	60	7	−4 44	59	7	−3 45	60	7	−2 45	60	7	−1 45	60	7	188
173																																	−5 48	60	6	−4 48	60	6	−3 48	60	6	−2 48	60	6	−1 48	59	6	187
174																																	−5 51	60	5	−4 51	60	5	−3 51	60	5	−2 51	59	5	−1 52	60	5	186
175																																	−5 54	+60	5	−4 54	+60	5	−3 54	+60	4	−2 54	+60	4	−1 54	+60	4	185
176																																	−5 56	60	4	−4 56	60	4	−3 56	60	4	−2 56	60	4	−1 56	60	3	184
177																																	−5 58	60	3	−4 58	60	3	−3 58	60	3	−2 58	60	3	−1 58	60	3	183
178																																	−5 59	60	2	−4 59	60	2	−3 59	60	2	−2 59	60	2	−1 59	60	2	182
179																																	−6 00	60	1	−5 00	60	1	−4 00	60	1	−3 00	60	1	−2 00	60	1	181
180																																				−5 00	+60	0	−4 00	+60	0	−3 00	+60	0	−2 00	+60	0	180

77	−6 19	−51	109	283																																										
76	−5 50	−51	110	284																																										
75	−5 20	−52	110	−6 12	−52	111	285																																							
74	−4 52	−52	111	−5 44	−52	112	286																																							
73	−4 23	−52	112	−5 15	−52	113	−6 07	−52	113	287																																				
72	−3 54	−53	113	−4 47	−53	113	−5 39	−52	114	288																																				
71	−3 26	−52	114	−4 18	−53	114	−5 11	−52	115	−6 03	−52	115	289																																	
70	−2 58	−52	115	−3 50	−53	115	−4 43	−52	116	−5 35	−53	116	290																																	

LHA	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	LHA
	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
69	-2 30	52	115	-3 22	53	116	-4 15	53	116	-5 08	52	117	-6 00	-53	117	291																																
68	-2 02	53	116	-2 55	52	117	-3 47	53	117	-4 40	53	118	-5 33	52	118	292																																
67	-1 34	53	117	-2 27	53	118	-3 20	53	118	-4 13	53	119	-5 06	52	119	-5 58	-53	120	293																														
66	-1 07	53	118	-2 00	53	119	-2 53	53	119	-3 46	53	119	-4 39	53	120	-5 32	52	120	294																														
65	-0 40	-53	119	-1 33	-53	119	-2 26	-53	120	-3 19	-53	120	-4 12	-53	121	-5 05	-53	121	-5 58	-53	122	295																										
64	-0 13	53	120	-1 06	53	120	-1 59	53	121	-2 52	54	121	-3 46	53	122	-4 39	53	122	-5 32	53	123	296																										
63	00 14	54	121	-0 40	53	121	-1 33	53	122	-2 26	53	122	-3 19	54	122	-4 13	53	123	-5 06	53	123	-5 59	-53	124	297																							
62	00 40	53	121	-0 13	54	122	-1 07	53	122	-2 00	53	123	-2 53	54	123	-3 47	53	124	-4 40	54	124	-5 34	53	125	298																							
61	01 06	53	122	00 13	54	123	-0 41	53	123	-1 34	54	124	-2 28	53	124	-3 21	54	125	-4 15	53	125	-5 08	54	125	-6 02	-53	126	299																				
60	01 32	-53	123	00 39	-54	124	-0 15	-54	124	-1 09	-53	125	-2 02	-54	125	-2 56	-54	125	-3 50	-53	126	-4 43	-54	126	-5 37	-54	127	300																				
59	01 58	54	124	01 04	53	125	00 11	54	125	-0 43	54	125	-1 37	54	126	-2 31	54	126	-3 25	54	127	-4 19	53	127	-5 12	54	128	-6 06	-54	128	301																			
58	02 24	54	125	01 30	54	125	00 36	54	126	-0 18	54	126	-1 12	54	127	-2 06	54	127	-3 00	54	128	-3 54	54	128	-4 48	54	128	-5 42	54	129	302																			
57	02 49	54	126	01 55	54	126	01 01	54	127	00 07	55	127	-0 48	54	128	-1 42	54	128	-2 36	54	128	-3 30	54	129	-4 24	54	129	-5 18	54	130	-6 12	-54	130	303															
56	03 14	54	127	02 20	55	127	01 25	54	128	00 31	54	128	-0 23	54	128	-1 17	55	129	-2 12	54	129	-3 06	54	130	-4 00	54	130	-4 54	55	131	-5 49	54	131	304															
55	03 38	-54	128	02 44	-54	128	01 50	-55	128	00 55	-54	129	00 01	-55	129	-0 54	-54	130	-1 48	-54	130	-2 42	-55	131	-3 37	-54	131	-4 31	-54	131	-5 25	-55	132	305															
54	04 03	55	128	03 08	54	129	02 14	55	129	01 19	54	130	00 25	55	130	-0 30	54	131	-1 24	55	131	-2 19	54	131	-3 13	55	132	-4 08	55	132	-5 03	54	133	-5 57	-54	133	306											
53	04 27	55	129	03 32	54	130	02 38	55	130	01 43	55	131	00 48	55	131	-0 07	54	131	-1 01	55	132	-1 56	55	132	-2 51	54	133	-3 45	55	133	-4 40	55	133	-5 35	54	134	307											
52	04 51	55	130	03 56	55	131	03 01	55	131	02 06	55	131	01 11	55	132	00 16	54	132	-0 38	55	133	-1 33	55	133	-2 28	55	133	-3 23	55	134	-4 18	54	134	-5 12	55	135	-6 07	-55	135	308							
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49	06 00	55	133	05 05	55	133	04 10	56	134	03 14	55	134	02 19	55	134	01 24	56	135	00 28	55	135	-0 27	55	136	-1 22	55	136	-2 17	56	136	-3 13	55	137	-4 08	55	137	-5 03	55	138	-5 58	-56	138	311				
48	06 22	55	134	05 27	55	134	04 32	56	135	03 36	55	135	02 41	56	135	01 45	55	136	00 50	55	136	-0 05	56	136	-1 01	55	137	-1 56	56	137	-2 52	55	138	-3 47	55	138	-4 42	56	138	-5 38	55	139	312				
47	06 45	56	135	05 49	55	135	04 54	56	135	03 58	56	136	03 02	55	136	02 07	56	137	01 11	55	137	00 16	56	137	-0 40	55	138	-1 35	56	138	-2 31	56	138	-3 27	55	139	-4 22	56	139	-5 18	55	140	-6 13	-56	140	313
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45	07 28	-56	136	06 32	-56	137	05 36	-56	137	04 40	-55	138	03 45	-56	138	02 49	-56	138	01 53	-56	139	00 57	-56	139	00 01	-56	139	-0 55	-56	140	-1 51	-56	140	-2 47	-55	140	-3 42	-56	141	-4 38	-56	141	-5 34	-56	142	315
44	07 49	56	137	06 53	56	138	05 57	56	138	05 01	56	138	04 05	56	139	03 09	56	139	02 13	56	140	01 17	56	140	00 21	56	140	-0 35	56	141	-1 31	56	141	-2 27	56	141	-3 23	56	142	-4 19	56	142	-5 15	56	142	316
43	08 10	56	138	07 14	56	139	06 18	57	139	05 21	56	139	04 25	56	140	03 29	56	140	02 33	56	140	01 37	56	141	00 41	57	141	-0 16	56	141	-1 12	56	142	-2 08	56	142	-3 04	56	143	-4 00	56	143	-4 56	57	143	317
42	08 30	56	139	07 34	56	140	06 38	57	140	05 41	56	140	04 45	56	141	03 49	57	141	02 52	56	141	01 56	56	142	01 00	57	142	00 03	56	142	-0 53	56	143	-1 49	56	143	-2 45	57	143	-3 42	56	144	-4 38	56	144	318
41	08 50	56	140	07 54	57	140	06 57	56	141	06 01	56	141	05 05	57	141	04 08	56	142	03 12	57	142	02 15	56	143	01 19	57	143	00 22	56	143	-0 34	57	144	-1 31	56	144	-2 27	57	144	-3 24	56	145	-4 20	57	145	319
40	09 10	-57	141	08 13	-56	141	07 17	-57	142	06 20	-56	142	05 24	-57	142	04 27	-57	143	03 30	-56	143	02 34	-57	143	01 37	-56	144	00 41	-57	144	-0 16	-57	144	-1 13	-56	145	-2 09	-57	145	-3 06	-57	145	-4 03	-56	146	320
39	09 29	57	142	08 32	56	142	07 36	57	143	06 39	57	143	05 42	57	143	04 45	56	144	03 49	57	144	02 52	57	144	01 55	57	145	00 58	56	145	00 02	57	145	-0 55	57	146	-1 52	57	146	-2 49	56	146	-3 45	57	147	321
38	09 48	57	143	08 51	57	143	07 54	57	144	06 57	56	144	06 01	57	144	05 04	57	144	04 07	57	145	03 10	57	145	02 13	57	145	01 16	57	146	00 19	57	146	-0 38	57	146	-1 35	57	147	-2 32	56	147	-3 28	57	147	322
37	10 06	57	144	09 09	57	144	08 12	57	144	07 15	57	145	06 18	57	145	05 21	57	145	04 24	57	146	03 27	57	146	02 30	57	146	01 33	57	147	00 36	57	147	-0 21	57	147	-1 18	57	148	-2 15	57	148	-3 12	57	148	323
36	10 24	57	145	09 27	57	145	08 30	57	145	07 33	57	146	06 36	57	146	05 39	57	146	04 42	58	147	03 44	57	147	02 47	57	147	01 50	57	148	00 53	57	148	-0 04	57	148	-1 01	58	148	-1 59	57	149	-2 56	57	149	324
35	10 42	-57	146	09 45	-57	146	08 48	-58	146	07 50	-57	147	06 53	-57	147	05 56	-58	147	04 58	-57	147	04 01	-57	148	03 04	-58	148	02 06	-57	148	01 09	-57	149	00 12	-58	149	-0 46	-57	149	-1 43	-57	150	-2 40	-57	150	325
34	10 59	57	147	10 02	58	147	09 04	57	147	08 07	57	148	07 10	58	148	06 12	57	148	05 15	58	148	04 17	57	149	03 20	58	149	02 22	57	149	01 25	57	150	00 28	58	150	-0 30	57	150	-1 27	58	150	-2 25	57	151	326
33	11 16	57	148	10 19	58	148	09 21	58	148	08 23	57	148	07 26	58	149	06 28	57	149	05 31	58	149	04 33	57	150	03 36	58	150	02 38	58	150	01 40	57	150	00 43	58	151	-0 15	57	151	-1 12	58	151	-2 10	57	152	327
32	11 32	57	149	10 35	58	149	09 37	58	149	08 39	57	149	07 42	58	150	06 44	58	150	05 46	57	150	04 49	58	150	03 51	58	151	02 53	57	151	01 56	58	151	00 58	58	152	00 00	58	152	-0 58	57	152	-1 55	58	152	328
31	11 48	57	149	10 51	58	150	09 53	58	150	08 55	58	150	07 57	58	151	06 59	57	151	06 02	58	151	05 04	58	151	04 06	58	152	03 08	58	152	02 10	58	152	01 12	58	152	00 14	57	153	-0 43	58	153	-1 41	58	153	329
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29	12 19	58	151	11 21	58	152	10 23	58	152	09 25	58	152	08 27	58	152	07 29	58	153	06 31	59	153	05 32	58	153	04 34	58	153	03 36	58	154	02 38	58	154	01 40	58	154	00 42	58	154	-0 16	58	155	-1 14	58	155	331
28	12 33	58	152	11 35	58	153	10 37	58	153	09 39	58	153	08 41	58	153	07 43	59	154	06 44	58	154	05 46	58	154	04 48	58	154	03 50	58	155	02 52	59	155	01 53	58	155	00 55	58	155	-0 03	58	156	-1 01	59	156	332
27	12 48	59	153	11 49	58	154	10 51	58	154	09 53	59	154	08 54	58	154	07 56	58	154	06 58	58	155	06 00	59	155	05 01	58	155	04 03	58	155	03 05	59	156	02 06	58	156	01 08	58	156	00 10	59	156	-0 49	58	157	333
26	13 01	58	154	12 03	59	154	11 04	58	155	10 06	58	155	09 08	59	155	08 09	58	155	07 11	59	156	06 12	58	156	05 14	59	156	04 15	58	156	03 17	58	157	02 19	59	157	01 20	58	157	00 22	59	157	-0 37	58	157	334
25	13 14	-58	155	12 16	-59	155	11 17	-58	156	10 19	-59	156	09 20	-58	156	08 22	-59	156	07 23	-58	157	06 25	-59	157	05 26	-58	157	04 28	-59	157	03 29	-58	157	02 31	-59	158	01 32	-59	158	00 33	-58	158	-0 25	-59	158	335
24	13 27	58	156	12 29	59	156	11 30	59	157	10 31	58	157	09 33	59	157	08 34	59	157	07 35	58	157	06 37	59	158	05 38	59	158	04 39	58	158	03 41	59	158	02 42	59	159	01 43	58	159	00 45	59	159	-0 14	59	159	336
23	13 39	58	157	12 41	59	157	11 42	59	158	10 43	59	158	09 44	58	158	08 46	59	158	07 47	59	158	06 48	59	159	05 49	58	159	04 51	59	159	03 52	59	159	02 53	59	159	01 54	58	160	00 56	59	160	-0 03	59	160	337
22	13 51	59	158	12 52	59	158	11 53	58	159	10 55	59	159	09 56	59	159	08 57	59	159	07 58	59	159	06 59	59	160	06 00	58	160	05 02	59	160	04 03	59	160	03 04	59	160	02 05	59	160	01 06	59	161	00 07	59	161	338
21	14 02	59	159	13 03	58	159	12 05	59	159	11 06	59	160	10 07	59	160	09 08	59	160	08 09	59	160	07 10	59	160	06 11	59	161	05 12	59	161	04 13	59	161	03 14	59	161	02 15	59	161	01 16	59	162	00 17	59	162	339
20	14 13	-59	160	13 14	-59	160	12 15	-59	160	11 16	-59	161	10 17	-59	161	09 18	-59	161	08 19	-59	161	07 20	-59	161	06 21	-59	162	05 22	-59	162	04 23	-59	162	03 24	-59	162	02 25	-59	162	01 26	-59	162	00 27	-59	163	340
19	14 23	59	161	13 24	59	161	12 25	59	161	11 26	59	162	10 27	59	162	09 28	59	162	08 29	59	162	07 30	60	162	06 30	59	162	05 31	59	163	04 32	59	163	03 33	59	163	02 34	59	163	01 35	59	163	00 36	60	163	341
18	14 33	59	162	13 34	59	162	12 35	59	162	11 36	60	163	10 36	59	163	09 37	59	163	08 38	59	163	07 39	59	163	06 40	60	163	05 40	59	164	04 41	59	164	03 42	59	164	02 43	60	164	01 43	59	164	00 44	59	164	342
17	14 43	60	163	13 43	59	163	12 44	59	163	11 45	60	164	10 45	59	164	09 46	59	164	08 47	60	164	07 47	59	164	06 48	59	164	05 49	59	164	04 50	60	165	03 50	59	165	02 51	59	165	01 52	60	165	00 52	59	165	343
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15	15 00	-60	165	14 00	-59	165	13 01	-60	165	12 01	-59	165	11 02	-60	166	10 02	-59	166	09 03	-60	166	08 03	-59	166	07 04	-59	166	06 05	-60	166	05 05	-59	166	04 06	-60	167	03 06	-59	167	02 07	-60	167	01 07	-59	167	345
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13	15 14	59	167	14 15	60	167	13 15	59	167	12 16	60	167	11 16	59	167	10 17	60	168	09 17	60	168	08 17	59	168	07 18	60	168	06 18	59	168	05 19	60	168	04 19	60	168	03 19	59	168	02 20	60	169	01 20	59	169	347
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10	15 33	-60	170	14 33	-59	170	13 34	-60	170	12 34	-60	170	11 34	-60	170	10 34	-59	170	09 35	-60	171	08 35	-60	171	07 35	-60	171	06 35	-60	171	05 35	-59	171	04 36	-60	171	03 36	-60	171	02 36	-60	171	01 36	-59	171	350
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8	15 43	60	172	14 43	60	172	13 43	60	172	12 43	60	172	11 43	59	172	10 44	60	172	09 44	60	172	08 44	60	172	07 44	60	173	06 44	60	173	05 44	60	173	04 44	59	173	03 45	60	173	02 45	60	173	01 45	60	173	352
7	15 47	60	173	14 47	60	173	13 47	60	173	12 47	60	173	11 47	60	173	10 47	60	173	09 47	59	173	08 48	60	173	07 48	60	173	06 48	60	174	05 48	60	174	04 48	60	174	03 48	60	174	02 48	60	174	01 48	59	174	353
6	15 50	60	174	14 50	60	174	13 50	59	174	12 51	60	174	11 51	60	174	10 51	60	174	09 51	60	174	08 51	60	174	07 51	60	174	06 51	60	174	05 51	60	175	04 51	60	175	03 51	60	175	02 51	59	175	01 52	60	175	354
5	15 53	-60	175	14 53	-60	175	13 53	-60	175	12 53	-60	175	11 53	-59	175	10 54	-60	175	09 54	-60	175	08 54	-60	175	07 54	-60	175	06 54	-60	175	05 54	-60	175	04 54	-60	175	03 54	-60	176	02 54	-60	176	01 54	-60	176	355
4	15 56	60	176	14 56	60	176	13 56	60	176	12 56	60	176	11 56	60	176	10 56	60	176	09 56	60	176	08 56	60	176	07 56	60	176	06 56	60	176	05 56	60	176	04 56	60	176	03 56	60	176	02 56	60	176	01 56	60	177	356
3	15 58	60	177	14 58	60	177	13 58	60	177	12 58	60	177	11 58	60	177	10 58	60	177	09 58	60	177	08 58	60	177	07 58	60	177	06 58	60	177	05 58	60	177	04 58	60	177	03 58	60	177	02 58	60	177	01 58	60	177	357
2	15 59	60	178	14 59	60	178	13 59	60	178	12 59	60	178	11 59	60	178	10 59	60	178	09 59	60	178	08 59	60	178	07 59	60	178	06 59	60	178	05 59	60	178	04 59	60	178	03 59	60	178	02 59	60	178	01 59	60	178	358
1	16 00	60	179	15 00	60	179	14 00	60	179	13 00	60	179	12 00	60	179	11 00	60	179	10 00	60	179	09 00	60	179	08 00	60	179	07 00	60	179	06 00	60	179	05 00	60	179	04 00	60	179	03 00	60	179	02 00	60	179	359
0	16 00	-60	180	15 00	-60	180	14 00	-60	180	13 00	-60	180	12 00	-60	180	11 00	-60	180	10 00	-60	180	09 00	-60	180	08 00	-60	180	07 00	-60	180	06 00	-60	180	05 00	-60	180	04 00	-60	180	03 00	-60	180	02 00	-60	180	360
LHA	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			LHA

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 59°

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 70°

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	° ′	′	°	°
0	20 00	+60	180	21 00	+60	180	22 00	+60	180	23 00	+60	180	24 00	+60	180	25 00	+60	180	26 00	+60	180	27 00	+60	180	28 00	+60	180	29 00	+60	180	30 00	+60	180	31 00	+60	180	32 00	+60	180	33 00	+60	180	34 00	+60	180	360
2	19 59	60	178	20 59	60	178	21 59	60	178	22 59	60	178	23 59	60	178	24 59	60	178	25 59	60	178	26 59	60	178	27 59	60	178	28 59	60	178	29 59	60	178	30 59	60	178	31 59	60	178	32 59	60	178	33 59	60	178	358
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6	19 53	60	174	20 53	60	174	21 53	60	174	22 53	60	173	23 53	60	173	24 53	60	173	25 53	60	173	26 53	60	173	27 53	60	173	28 53	60	173	29 53	60	173	30 53	60	173	31 53	60	173	32 53	59	173	33 52	60	173	354
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			120				−7 56	+57	61	−6 59	+57	61	−6 02	+57	60	−5 05	+58	60	−4 07	+57	60	−3 10	+57	59	−2 13	+58	59	−1 15	+57	59	−0 18	+57	59	00 39	+58	58	01 37	+57	58	02 34	+57	58	03 31	+58	57	240
			122				−8 32	+58	59	−7 34	57	59	−6 37	57	58	−5 40	58	58	−4 42	57	58	−3 45	58	58	−2 47	57	57	−1 50	57	57	−0 53	58	57	00 05	57	56	01 02	58	56	02 00	57	56	02 57	57	55	238
									124	−8 09	+57	57	−7 12	58	56	−6 14	57	56	−5 17	58	56	−4 19	57	56	−3 22	58	55	−2 24	57	55	−1 27	58	55	−0 29	58	54	00 29	57	54	01 26	58	54	02 24	57	54	236
												126	−7 45	57	55	−6 48	58	54	−5 50	57	54	−4 53	58	54	−3 55	58	53	−2 57	57	53	−2 00	58	53	−1 02	58	53	−0 04	57	52	00 53	58	52	01 51	58	52	234
												128	−8 19	+58	53	−7 21	58	52	−6 23	58	52	−5 25	57	52	−4 28	58	52	−3 30	58	51	−2 32	58	51	−1 34	58	51	−0 36	57	50	00 21	58	50	01 19	58	50	232
																		130	−7 53	+58	50	−6 55	+58	50	−5 57	+58	50	−4 59	+58	50	−4 01	+58	49	−3 03	+57	49	−2 06	+58	49	−1 08	+58	48	00 48	+58	48	230
																		132	−8 24	+58	48	−7 26	58	48	−6 28	58	48	−5 30	58	48	−4 32	58	47	−3 34	58	47	−2 36	58	47	−1 38	58	47	−0 40	58	46	228
																					134	−7 56	58	46	−6 58	58	46	−6 00	58	46	−5 02	58	45	−4 04	59	45	−3 05	58	45	−2 07	58	45	−1 09	58	45	−0 11	58	44	226
																					136	−8 25	+58	44	−7 27	58	44	−6 29	58	44	−5 31	59	44	−4 32	58	43	−3 34	58	43	−2 36	59	43	−1 37	58	43	−0 39	58	42	224
																								138	−7 55	58	42	−6 57	59	42	−5 58	58	42	−5 00	58	41	−4 02	59	41	−3 03	58	41	−2 05	59	41	−1 06	58	40	222
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LAT 70°

N. Lat. { LHA greater than 180° : $Z_n = Z$; LHA less than 180° : $Z_n = 360° - Z$

DECLINATION (0°- 14°) **SAME** NAME AS LATITUDE

LHA	0° Hc	d	Z	1° Hc	d	Z	2° Hc	d	Z	3° Hc	d	Z	4° Hc	d	Z	5° Hc	d	Z	6° Hc	d	Z	7° Hc	d	Z	8° Hc	d	Z	9° Hc	d	Z	10° Hc	d	Z	11° Hc	d	Z	12° Hc	d	Z	13° Hc	d	Z	14° Hc	d	Z	LHA
°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°	°	′	°
																						140																												
																							−8 22	+58	40	−7 24	+59	40	−6 25	+58	40	−5 27	+59	39	−4 28	+58	39	−3 30	+59	39	−2 31	+59	39	−1 32	+58	39	220
																									142			−7 49	58	38	−6 51	59	38	−5 52	59	38	−4 53	58	37	−3 55	59	37	−2 56	58	37	−1 58	59	37	218
																						144			−8 14	+59	36	−7 15	58	36	−6 17	59	36	−5 18	59	35	−4 19	59	35	−3 20	59	35	−2 21	58	35	216
																												−7 39	59	34	−6 40	59	34	−5 41	59	33	−4 42	58	33	−3 43	59	33	−2 44	59	33	214
																												148			−8 01	+59	32	−7 02	59	32	−6 03	59	32	−5 04	59	31	−4 05	59	31	−3 06	59	31	212
																																		150			−7 23	+59	30	−6 24	+59	30	−5 25	+59	29	−4 26	+59	29	−3 27	+59	29	210
																																		152			−7 43	59	28	−6 44	60	28	−5 44	59	27	−4 45	59	27	−3 46	59	27	208
																																		154			−8 01	+59	26	−7 02	59	26	−6 03	60	26	−5 03	59	25	−4 04	59	25	206
																																								156	−7 19	59	24	−6 20	60	24	−5 20	59	23	−4 21	59	23	204
																																								158	−7 35	59	22	−6 36	60	22	−5 36	59	22	−4 37	60	21	202
																																								160	−7 50	+60	20	−6 50	+60	20	−5 50	+59	20	−4 51	+60	19	200
																																								162	−8 03	+60	18	−7 03	59	18	−6 04	60	18	−5 04	60	18	198
																																										164	−7 15	60	16	−6 15	59	16	−5 16	60	16	196
112	−7 22	−57	69	−8 19	−56	70	248																																			166	−7 26	60	14	−6 26	60	14	−5 26	60	14	194
110	−6 43	−57	71	−7 40	−57	71	250																																			168	−7 35	60	12	−6 35	60	12	−5 35	60	12	192
108	−6 04	57	73	−7 01	56	73	−7 57	−57	74	252																																170	−7 42	+60	10	−6 42	+59	10	−5 43	+60	10	190
106	−5 25	56	75	−6 21	57	75	−7 18	56	76	−8 14	−57	76	254																													172	−7 49	60	8	−6 49	60	8	−5 49	60	8	188
104	−4 45	56	77	−5 41	57	77	−6 38	56	77	−7 34	57	78	−8 31	−56	78	256																									174	−7 54	60	6	−6 54	60	6	−5 54	60	6	186
102	−4 05	56	79	−5 01	57	79	−5 58	56	79	−6 54	57	80	−7 51	56	80	258																									176	−7 57	60	4	−6 57	60	4	−5 57	60	4	184
100	−3 24	−57	81	−4 21	−56	81	−5 17	−57	81	−6 14	−56	82	−7 10	−57	82	−8 07	−56	82	260																					178	−7 59	60	2	−6 59	60	2	−5 59	60	2	182
98	−2 44	56	82	−3 40	57	83	−4 37	56	83	−5 33	56	83	−6 29	57	84	−7 26	56	84	−8 22	−57	85	262																			180	−8 00	+60	0	−7 00	+60	0	−6 00	+60	0	180
96	−2 03	56	84	−2 59	57	85	−3 56	56	85	−4 52	57	85	−5 49	56	86	−6 45	56	86	−7 41	57	86	264																													
94	−1 22	56	86	−2 18	57	87	−3 15	56	87	−4 11	57	87	−5 08	56	88	−6 04	56	88	−7 00	57	88	−7 57	−56	89	266																								
92	−0 41	56	88	−1 37	57	88	−2 34	56	89	−3 30	57	89	−4 27	56	89	−5 23	56	90	−6 19	57	90	−7 16	56	91	−8 12	−56	91	268																						
90	00 00	−56	90	−0 56	−57	90	−1 53	−56	91	−2 49	−57	91	−3 46	−56	91	−4 42	−56	92	−5 38	−57	92	−6 35	−56	92	−7 31	−56	93	−8 27	−56	93	270																			
88	00 41	56	92	−0 15	57	92	−1 12	56	93	−2 08	56	93	−3 04	57	93	−4 01	56	94	−4 57	57	94	−5 54	56	94	−6 50	56	95	−7 46	57	95	272																			
86	01 22	56	94	00 26	57	94	−0 31	56	94	−1 27	57	95	−2 24	56	95	−3 20	56	95	−4 16	57	96	−5 13	56	96	−6 09	56	96	−7 05	57	97	−8 02	−56	97	274																	
84	02 03	56	96	01 07	57	96	00 10	56	96	−0 46	57	97	−1 43	56	97	−2 39	57	97	−3 36	56	98	−4 32	56	98	−5 28	57	98	−6 25	56	99	−7 21	56	99	−8 17	−57	99	276												
82	02 44	57	98	01 47	56	98	00 51	57	98	−0 06	56	99	−1 02	57	99	−1 59	56	99	−2 55	56	100	−3 51	57	100	−4 48	56	100	−5 44	57	101	−6 41	56	101	−7 37	56	101	−8 33	−57	102	278								
80	03 24	−56	99	02 28	−57	100	01 31	−56	100	00 35	−57	100	−0 22	−56	101	−1 18	−57	101	−2 15	−56	101	−3 11	−57	102	−4 08	−56	102	−5 04	−57	102	−6 01	−56	103	−6 57	−56	103	−7 53	−57	103	280							
78	04 05	57	101	03 08	56	102	02 12	57	102	01 15	56	102	00 19	57	103	−0 38	57	103	−1 35	56	103	−2 31	57	104	−3 28	56	104	−4 24	57	104	−5 21	56	105	−6 17	57	105	−7 14	56	105	−8 10	−57	106	282				
76	04 45	57	103	03 48	56	104	02 52	57	104	01 55	57	104	00 58	56	105	00 02	57	105	−0 55	56	105	−1 51	57	106	−2 48	57	106	−3 45	56	106	−4 41	57	107	−5 38	56	107	−6 34	57	107	−7 31	56	108	−8 27	−57	108	284
74	05 25	57	105	04 28	57	105	03 31	56	106	02 35	57	106	01 38	57	106	00 41	56	107	−0 15	57	107	−1 12	57	107	−2 09	56	108	−3 05	57	108	−4 02	57	108	−4 59	56	109	−5 55	57	109	−6 52	56	109	−7 48	57	110	286
72	06 04	57	107	05 07	56	107	04 11	57	108	03 14	57	108	02 17	57	108	01 20	56	109	00 24	57	109	−0 33	57	109	−1 30	57	110	−2 27	56	110	−3 23	57	110	−4 20	57	111	−5 17	56	111	−6 13	57	111	−7 10	57	112	288
70	06 43	−57	109	05 46	−57	109	04 49	−56	110	03 53	−57	110	02 56	−57	110	01 59	−57	110	01 02	−57	111	00 05	−56	111	−0 51	−57	111	−1 48	−57	112	−2 45	−57	112	−3 42	−57	112	−4 39	−56	113	−5 35	−57	113	−6 32	−57	113	290
68	07 22	57	111	06 25	57	111	05 28	57	111	04 31	57	112	03 34	57	112	02 37	57	112	01 40	57	113	00 43	56	113	−0 13	57	113	−1 10	57	114	−2 07	57	114	−3 04	57	114	−4 01	57	115	−4 58	57	115	−5 55	57	115	292
66	08 00	57	113	07 03	57	113	06 06	57	113	05 09	57	114	04 12	57	114	03 15	57	114	02 18	57	115	01 21	57	115	00 24	57	115	−0 33	57	116	−1 30	57	116	−2 27	57	116	−3 24	57	116	−4 21	57	117	−5 18	57	117	294
64	08 37	57	115	07 40	57	115	06 43	57	115	05 46	57	116	04 49	57	116	03 52	57	116	02 55	57	116	01 58	57	117	01 01	57	117	00 04	57	117	−0 53	57	118	−1 50	58	118	−2 48	57	118	−3 45	57	119	−4 42	57	119	296
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60	09 51	−57	118	08 54	−58	119	07 56	−57	119	06 59	−57	119	06 02	−57	120	05 05	−58	120	04 07	−57	120	03 10	−57	121	02 13	−58	121	01 15	−57	121	00 18	−57	121	−0 39	−58	122	−1 37	−57	122	−2 34	−57	122	−3 31	−58	123	300
58	10 27	58	120	09 29	57	121	08 32	58	121	07 34	57	121	06 37	57	122	05 40	58	122	04 42	57	122	03 45	58	122	02 47	57	123	01 50	57	123	00 53	58	123	−0 05	57	124	−1 02	58	124	−2 00	57	124	−2 57	57	125	302
56	11 02	58	122	10 04	57	123	09 07	58	123	08 09	57	123	07 12	58	124	06 14	57	124	05 17	58	124	04 19	57	124	03 22	58	125	02 24	57	125	01 27	58	125	00 29	58	126	−0 29	57	126	−1 26	58	126	−2 24	57	126	304
54	11 36	58	124	10 38	57	125	09 41	58	125	08 43	58	125	07 45	57	125	06 48	58	126	05 50	57	126	04 53	58	126	03 55	58	127	02 57	57	127	02 00	58	127	01 02	58	127	00 04	57	128	−0 53	58	128	−1 51	58	128	306
52	12 09	57	126	11 12	58	127	10 14	58	127	09 16	57	127	08 19	58	127	07 21	58	128	06 23	58	128	05 25	57	128	04 28	58	128	03 30	58	129	02 32	58	129	01 34	58	129	00 36	57	130	−0 21	58	130	−1 19	58	130	308
50	12 42	−56	128	11 44	−58	129	10 46	−57	129	09 49	−58	129	08 51	−58	129	07 53	−58	130	06 55	−58	130	05 57	−58	130	04 59	−58	130	04 01	−58	131	03 03	−57	131	02 06	−58	131	01 08	−58	131	00 10	−58	132	−0 48	−58	132	310
48	13 14	58	130	12 16	58	131	11 18	58	131	10 20	58	131	09 22	58	131	08 24	58	132	07 26	58	132	06 28	58	132	05 30	58	132	04 32	58	133	03 34	58	133	02 36	58	133	01 38	58	133	00 40	58	134	−0 18	58	134	312
46	13 45	58	132	12 47	58	132	11 49	59	133	10 50	58	133	09 52	58	133	08 54	58	134	07 56	58	134	06 58	58	134	06 00	58	134	05 02	58	135	04 04	59	135	03 05	58	135	02 07	58	135	01 09	58	135	00 11	58	136	314
44	14 15	59	134	13 16	58	134	12 18	58	135	11 20	58	135	10 22	58	135	09 24	59	135	08 25	58	136	07 27	58	136	06 29	58	136	05 31	59	136	04 32	58	137	03 34	58	137	02 36	59	137	01 37	58	137	00 39	58	138	316
42	14 43	58	136	13 45	58	136	12 47	58	137	11 49	59	137	10 50	58	137	09 52	59	137	08 53	58	138	07 55	58	138	06 57	59	138	05 58	58	138	05 00	58	139	04 02	59	139	03 03	58	139	02 05	59	139	01 06	58	140	318
40	15 11	−58	138	14 13	−59	138	13 14	−58	139	12 16	−58	139	11 18	−59	139	10 19	−58	139	09 21	−59	140	08 22	−58	140	07 24	−59	140	06 25	−58	140	05 27	−59	141	04 28	−58	141	03 30	−59	141	02 31	−59	141	01 32	−58	141	320
38	15 38	58	140	14 40	59	140	13 41	59	141	12 42	58	141	11 44	59	141	10 45	58	141	09 47	59	142	08 48	59	142	07 49	58	142	06 51	59	142	05 52	59	142	04 53	58	143	03 55	59	143	02 56	58	143	01 58	59	143	322
36	16 04	59	142	15 05	59	143	14 06	58	143	13 08	59	143	12 09	59	143	11 10	58	143	10 12	59	144	09 13	59	144	08 14	59	144	07 15	58	144	06 17	59	144	05 18	59	145	04 19	59	145	03 20	59	145	02 21	58	145	324
34	16 28	58	144	15 30	59	145	14 31	59	145	13 32	59	145	12 33	59	145	11 34	59	145	10 35	58	146	09 37	59	146	08 38	59	146	07 39	59	146	06 40	59	146	05 41	59	147	04 42	59	147	03 43	59	147	02 44	59	147	326
32	16 52	59	146	15 53	59	147	14 54	59	147	13 55	59	147	12 56	59	147	11 57	59	147	10 58	59	148	09 59	59	148	09 00	59	148	08 01	59	148	07 02	59	148	06 03	59	148	05 04	59	149	04 05	59	149	03 06	59	149	328
30	17 14	−59	148	16 15	−59	149	15 16	−59	149	14 17	−59	149	13 18	−60	149	12 18	−59	149	11 19	−59	150	10 20	−59	150	09 21	−59	150	08 22	−59	150	07 23	−59	150	06 24	−59	150	05 25	−59	151	04 26	−59	151	03 27	−59	151	330
28	17 35	60	150	16 35	59	151	15 36	59	151	14 37	59	151	13 38	59	151	12 39	59	151	11 40	60	152	10 40	59	152	09 41	59	152	08 42	59	152	07 43	59	152	06 44	60	152	05 44	59	153	04 45	59	153	03 46	59	153	332
26	17 54	59	153	16 55	59	153	15 56	60	153	14 56	59	153	13 57	59	153	12 58	59	153	11 59	60	154	10 59	59	154	10 00	59	154	09 01	60	154	08 01	59	154	07 02	59	154	06 03	60	154	05 03	59	155	04 04	59	155	334
24	18 12	59	155	17 13	59	155	16 14	60	155	15 14	59	155	14 15	59	155	13 16	60	155	12 16	59	156	11 17	60	156	10 17	59	156	09 18	59	156	08 19	60	156	07 19	59	156	06 20	60	156	05 20	59	157	04 21	59	157	336
22	18 29	59	157	17 30	60	157	16 30	59	157	15 31	60	157	14 31	59	157	13 32	59	157	12 33	60	158	11 33	59	158	10 34	60	158	09 34	59	158	08 35	60	158	07 35	59	158	06 36	60	158	05 36	59	158	04 37	60	159	338
20	18 45	−60	159	17 45	−59	159	16 46	−60	159	15 46	−59	159	14 47	−60	159	13 47	−59	159	12 48	−60	160	11 48	−60	160	10 48	−59	160	09 49	−60	160	08 49	−59	160	07 50	−60	160	06 50	−60	160	05 50	−59	160	04 51	−60	161	340
18	18 59	60	161	17 59	59	161	17 00	60	161	16 00	60	161	15 00	59	161	14 01	60	162	13 01	60	162	12 01	59	162	11 02	60	162	10 02	59	162	09 03	60	162	08 03	60	162	07 03	59	162	06 04	60	162	05 04	60	162	342
16	19 12	60	163	18 12	60	163	17 12	59	163	16 13	60	163	15 13	60	163	14 13	60	164	13 13	59	164	12 14	60	164	11 14	60	164	10 14	59	164	09 15	60	164	08 15	60	164	07 15	60	164	06 15	59	164	05 16	60	164	344
14	19 23	60	165	18 23	60	165	17 23	59	165	16 24	60	165	15 24	60	166	14 24	60	166	13 24	60	166	12 24	59	166	11 25	60	166	10 25	60	166	09 25	60	166	08 25	59	166	07 26	60	166	06 26	60	166	05 26	60	166	346
12	19 33	60	167	18 33	60	167	17 33	60	167	16 33	60	167	15 33	59	168	14 34	60	168	13 34	60	168	12 34	60	168	11 34	60	168	10 34	60	168	09 34	60	168	08 34	59	168	07 35	60	168	06 35	60	168	05 35	60	168	348
10	19 41	−60	169	18 41	−60	169	17 41	−60	170	16 41	−60	170	15 41	−59	170	14 42	−60	170	13 42	−60	170	12 42	−60	170	11 42	−60	170	10 42	−60	170	09 42	−60	170	08 42	−60	170	07 42	−60	170	06 42	−59	170	05 43	−60	170	350
8	19 48	60	171	18 48	60	172	17 48	60	172	16 48	60	172	15 48	60	172	14 48	60	172	13 48	60	172	12 48	60	172	11 48	60	172	10 48	59	172	09 49	60	172	08 49	60	172	07 49	60	172	06 49	60	172	05 49	60	172	352
6	19 53	60	174	18 53	60	174	17 53	60	174	16 53	60	174	15 53	60	174	14 53	60	174	13 53	60	174	12 53	60	174	11 53	59	174	10 54	60	174	09 54	60	174	08 54	60	174	07 54	60	174	06 54	60	174	05 54	60	174	354
4	19 57	60	176	18 57	60	176	17 57	60	176	16 57	60	176	15 57	60	176	14 57	60	176	13 57	60	176	12 57	60	176	11 57	60	176	10 57	60	176	09 57	60	176	08 57	60	176	07 57	60	176	06 57	60	176	05 57	60	176	356
2	19 59	60	178	18 59	60	178	17 59	60	178	16 59	60	178	15 59	60	178	14 59	60	178	13 59	60	178	12 59	60	178	11 59	60	178	10 59	60	178	09 59	60	178	08 59	60	178	07 59	60	178	06 59	60	178	05 59	60	178	358
0	20 00	−60	180	19 00	−60	180	18 00	−60	180	17 00	−60	180	16 00	−60	180	15 00	−60	180	14 00	−60	180	13 00	−60	180	12 00	−60	180	11 00	−60	180	10 00	−60	180	09 00	−60	180	08 00	−60	180	07 00	−60	180	06 00	−60	180	360
	0°			1°			2°			3°			4°			5°			6°			7°			8°			9°			10°			11°			12°			13°			14°			

S. Lat. { LHA greater than 180° : $Z_n = 180° - Z$; LHA less than 180° : $Z_n = 180° + Z$

DECLINATION (0°- 14°) **CONTRARY** NAME TO LATITUDE

LAT 70°

N. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LAT 70°

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
0	35 00	+60	180	36 00	+60	180	37 00	+60	180	38 00	+60	180	39 00	+60	180	40 00	+60	180	41 00	+60	180	42 00	+60	180	43 00	+60	180	44 00	+60	180	45 00	+60	180	46 00	+60	180	47 00	+60	180	48 00	+60	180	49 00	+60	180	360
2	34 59	60	178	35 59	60	178	36 59	60	178	37 59	60	178	38 59	60	178	39 59	60	178	40 59	60	178	41 59	60	178	42 59	60	177	43 59	60	177	44 59	60	177	45 59	60	177	46 59	60	177	47 59	60	177	48 59	60	177	358
4	34 57	60	175	35 57	60	175	36 57	60	175	37 57	60	175	38 57	59	175	39 56	60	175	40 56	60	175	41 56	60	175	42 56	60	175	43 56	60	175	44 56	60	175	45 56	60	175	46 56	60	175	47 56	59	175	48 56	60	175	356
6	34 52	60	173	35 52	60	173	36 52	60	173	37 52	60	173	38 52	60	173	39 52	60	173	40 52	60	173	41 52	60	173	42 52	60	172	43 52	60	172	44 52	60	172	45 52	60	172	46 52	60	172	47 52	59	172	48 51	60	172	354
8	34 47	59	171	35 46	60	171	36 46	60	170	37 46	60	170	38 46	60	170	39 46	60	170	40 46	60	170	41 46	60	170	42 46	59	170	43 45	60	170	44 45	60	170	45 45	60	170	46 45	60	170	47 45	60	169	48 45	60	169	352
10	34 39	+60	168	35 39	+60	168	36 39	+59	168	37 38	+60	168	38 38	+60	168	39 38	+60	168	40 38	+60	168	41 38	+60	168	42 38	+59	167	43 37	+60	167	44 37	+60	167	45 37	+60	167	46 37	+60	167	47 37	+59	167	48 36	+60	167	350
12	34 30	60	166	35 30	59	166	36 29	60	166	37 29	60	166	38 29	60	165	39 29	59	165	40 28	60	165	41 28	60	165	42 28	60	165	43 28	59	165	44 27	60	165	45 27	60	165	46 27	59	164	47 26	60	164	48 26	60	164	348
14	34 19	60	164	35 19	59	163	36 18	60	163	37 18	60	163	38 18	59	163	39 17	60	163	40 17	60	163	41 17	59	163	42 16	60	162	43 16	60	162	44 16	59	162	45 15	60	162	46 15	59	162	47 14	60	162	48 14	59	161	346
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18	33 53	59	159	34 52	60	159	35 52	59	159	36 51	60	158	37 51	59	158	38 50	59	158	39 49	60	158	40 49	59	158	41 48	60	158	42 48	59	157	43 47	59	157	44 46	60	157	45 46	59	157	46 45	59	157	47 44	59	156	342
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132	01 16	58	46	02 14	58	46	03 12	58	45	04 10	58	45	05 08	58	45	06 06	58	45	07 04	58	44	08 02	58	44	09 00	59	44	09 58	58	44	10 56	58	43	11 54	58	43	12 52	58	43	13 50	58	43	14 48	58	42	228
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138	−0 08	59	40	00 51	58	40	01 49	58	40	02 47	59	40	03 46	58	39	04 44	59	39	05 43	58	39	06 41	58	39	07 39	59	38	08 38	58	38	09 36	58	38	10 34	59	38	11 33	58	37	12 31	58	37	13 29	59	37	222
	15°			16°			17°			18°			19°			20°			21°			22°			23°			24°			25°			26°			27°			28°			29°			

S. Lat. { LHA greater than 180° / LHA less than 180° — $Z_n = 180° - Z$ / $Z_n = 180° + Z$

N. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = Z$ / $Z_n = 360° - Z$

DECLINATION (15°- 29°) **SAME** NAME AS LATITUDE

LHA	15° Hc	d	Z	16° Hc	d	Z	17° Hc	d	Z	18° Hc	d	Z	19° Hc	d	Z	20° Hc	d	Z	21° Hc	d	Z	22° Hc	d	Z	23° Hc	d	Z	24° Hc	d	Z	25° Hc	d	Z	26° Hc	d	Z	27° Hc	d	Z	28° Hc	d	Z	29° Hc	d	Z	LHA
140	−0 34	+59	38	00 25	+58	38	01 23	+59	38	02 22	+58	38	03 20	+59	38	04 19	+58	37	05 17	+59	37	06 16	+58	37	07 14	+59	37	08 13	+58	36	09 11	+59	36	10 10	+58	36	11 08	+59	36	12 07	+58	35	13 05	+59	35	220
142	−0 59	59	36	00 00	58	36	00 58	59	36	01 57	59	36	02 56	58	36	03 54	59	35	04 53	59	35	05 52	58	35	06 50	59	35	07 49	59	35	08 48	58	34	09 46	59	34	10 45	58	34	11 43	59	34	12 42	59	34	218
144	−1 23	59	35	−0 24	59	34	00 35	59	34	01 34	58	34	02 32	59	34	03 31	59	34	04 30	59	33	05 29	58	33	06 27	59	33	07 26	59	33	08 25	59	33	09 24	58	32	10 22	59	32	11 21	59	32	12 20	59	32	216
146	−1 45	58	33	−0 47	59	33	00 12	59	32	01 11	59	32	02 10	59	32	03 09	59	32	04 08	59	32	05 07	59	31	06 06	59	31	07 05	58	31	08 03	59	31	09 02	59	31	10 01	59	30	11 00	59	30	11 59	59	30	214
148	−2 07	59	31	−1 08	59	31	−0 09	59	30	00 50	59	30	01 49	59	30	02 48	59	30	03 47	59	30	04 46	59	30	05 45	59	29	06 44	59	29	07 43	59	29	08 42	59	29	09 41	59	29	10 40	59	28	11 39	59	28	212
150	−2 28	+60	29	−1 28	+59	29	−0 29	+59	29	00 30	+59	28	01 29	+59	28	02 28	+59	28	03 27	+59	28	04 26	+59	28	05 25	+60	28	06 25	+59	27	07 24	+59	27	08 23	+59	27	09 22	+59	27	10 21	+59	27	11 20	+59	26	210
152	−2 47	59	27	−1 48	60	27	−0 48	59	27	00 11	59	27	01 10	59	26	02 09	60	26	03 09	59	26	04 08	59	26	05 07	59	26	06 06	59	26	07 05	60	25	08 05	59	25	09 04	59	25	10 03	59	25	11 02	59	25	208
154	−3 05	60	25	−2 05	59	25	−1 06	59	25	−0 07	60	25	00 53	59	24	01 52	59	24	02 51	59	24	03 50	60	24	04 50	59	24	05 49	59	24	06 48	60	24	07 48	59	23	08 47	59	23	09 46	60	23	10 46	59	23	206
156	−3 22	60	23	−2 22	59	23	−1 23	60	23	−0 23	59	23	00 36	60	23	01 36	59	22	02 35	59	22	03 34	60	22	04 34	59	22	05 33	60	22	06 33	59	22	07 32	59	22	08 31	60	21	09 31	59	21	10 30	60	21	204
158	−3 37	59	21	−2 38	60	21	−1 38	59	21	−0 39	60	21	00 21	59	21	01 20	60	21	02 20	59	20	03 19	60	20	04 19	59	20	05 18	60	20	06 18	60	20	07 17	60	20	08 17	59	20	09 16	60	20	10 16	59	19	202
160	−3 51	+59	19	−2 52	+60	19	−1 52	+59	19	−0 53	+60	19	00 07	+60	19	01 07	+59	19	02 06	+60	19	03 06	+59	19	04 05	+60	18	05 05	+60	18	06 05	+59	18	07 04	+60	18	08 04	+59	18	09 03	+60	18	10 03	+59	18	200
162	−4 04	59	17	−3 05	60	17	−2 05	60	17	−1 05	59	17	−0 06	60	17	00 54	60	17	01 54	59	17	02 53	60	17	03 53	60	17	04 53	59	16	05 52	60	16	06 52	60	16	07 52	59	16	08 51	60	16	09 51	60	16	198
164	−4 16	60	15	−3 16	60	15	−2 16	59	15	−1 17	60	15	−0 17	60	15	00 43	60	15	01 43	59	15	02 42	60	15	03 42	60	15	04 42	59	15	05 41	60	15	06 41	60	14	07 41	60	14	08 41	59	14	09 40	60	14	196
166	−4 26	60	14	−3 26	59	13	−2 27	60	13	−1 27	60	13	−0 27	60	13	00 33	60	13	01 33	59	13	02 32	60	13	03 32	60	13	04 32	60	13	05 32	60	13	06 32	59	13	07 31	60	13	08 31	60	12	09 31	60	12	194
168	−4 35	60	12	−3 35	60	12	−2 35	59	11	−1 36	60	11	−0 36	60	11	00 24	60	11	01 24	60	11	02 24	60	11	03 24	60	11	04 24	59	11	05 23	60	11	06 23	60	11	07 23	60	11	08 23	60	11	09 23	60	11	192
170	−4 43	+60	10	−3 43	+60	10	−2 43	+60	10	−1 43	+60	10	−0 43	+60	9	00 17	+60	9	01 17	+60	9	02 17	+59	9	03 16	+60	9	04 16	+60	9	05 16	+60	9	06 16	+60	9	07 16	+60	9	08 16	+60	9	09 16	+60	9	190
172	−4 49	60	8	−3 49	60	8	−2 49	60	8	−1 49	60	8	−0 49	60	8	00 11	60	8	01 11	60	7	02 11	60	7	03 11	59	7	04 10	60	7	05 10	60	7	06 10	60	7	07 10	60	7	08 10	60	7	09 10	60	7	188
174	−4 54	60	6	−3 54	60	6	−2 54	60	6	−1 54	60	6	−0 54	60	6	00 06	60	6	01 06	60	6	02 06	60	6	03 06	60	6	04 06	60	5	05 06	60	5	06 06	60	5	07 06	60	5	08 06	60	5	09 06	60	5	186
176	−4 57	60	4	−3 57	60	4	−2 57	60	4	−1 57	60	4	−0 57	60	4	00 03	60	4	01 03	60	4	02 03	60	4	03 03	60	4	04 03	60	4	05 03	60	4	06 03	60	4	07 03	60	4	08 03	60	4	09 03	60	4	184
178	−4 59	60	2	−3 59	60	2	−2 59	60	2	−1 59	60	2	−0 59	60	2	00 01	60	2	01 01	60	2	02 01	60	2	03 01	60	2	04 01	60	2	05 01	60	2	06 01	60	2	07 01	60	2	08 01	60	2	09 01	60	2	182
180	−5 00	+60	0	−4 00	+60	0	−3 00	+60	0	−2 00	+60	0	−1 00	+60	0	00 00	+60	0	01 00	+60	0	02 00	+60	0	03 00	+60	0	04 00	+60	0	05 00	+60	0	06 00	+60	0	07 00	+60	0	08 00	+60	0	09 00	+60	0	180

72	−8 07	−56	112	288																																										
70	−7 29	−57	114	−8 26	−56	114	290																																							
68	−6 52	−56	116	−7 48	−57	116	292																																							
66	−6 15	−57	117	−7 12	−57	118	−8 09	−57	118	294																																					
64	−5 39	−57	119	−6 36	−57	120	−7 33	−57	120	−8 30	−57	120	296																																	
62	−5 03	−57	121	−6 00	−58	121	−6 58	−57	122	−7 55	−57	122	298																																	
60	−4 29	−57	123	−5 26	−57	123	−6 23	−57	124	−7 20	−58	124	−8 18	−57	124	300																													
58	−3 54	−58	125	−4 52	−57	125	−5 49	−58	125	−6 47	−57	126	−7 44	−57	126	302																													
56	−3 21	−58	127	−4 19	−57	127	−5 16	−58	127	−6 14	−57	128	−7 11	−58	128	−8 09	−57	128	304																									
54	−2 49	−57	129	−3 46	−58	129	−4 44	−58	129	−5 42	−57	129	−6 39	−58	130	−7 37	−57	130	306																									
52	−2 17	−58	130	−3 15	−57	131	−4 12	−58	131	−5 10	−58	131	−6 08	−58	131	−7 06	−57	132	−8 03	−58	132	308																					
50	−1 46	−58	132	−2 44	−58	133	−3 42	−58	133	−4 40	−58	133	−5 38	−58	133	−6 36	−57	134	−7 33	−58	134	310																					
48	−1 16	−58	134	−2 14	−58	134	−3 12	−58	135	−4 10	−58	135	−5 08	−58	135	−6 06	−58	135	−7 04	−58	136	−8 02	−58	136	312																	
46	−0 47	−58	136	−1 45	−58	136	−2 43	−59	136	−3 42	−58	137	−4 40	−58	137	−5 38	−58	137	−6 36	−58	137	−7 34	−58	138	314																	
44	−0 19	−58	138	−1 17	−59	138	−2 16	−58	138	−3 14	−58	139	−4 12	−59	139	−5 11	−58	139	−6 09	−58	139	−7 07	−58	140	−8 05	−59	140	316													
42	00 08	−59	140	−0 51	−58	140	−1 49	−58	140	−2 47	−59	140	−3 46	−58	141	−4 44	−59	141	−5 43	−58	141	−6 41	−58	141	−7 39	−59	142	318													
40	00 34	−59	142	−0 25	−58	142	−1 23	−59	142	−2 22	−58	142	−3 20	−59	142	−4 19	−58	143	−5 17	−59	143	−6 16	−58	143	−7 14	−59	143	−8 13	−58	144	320										
38	00 59	−59	144	00 00	−58	144	−0 58	−59	144	−1 57	−59	144	−2 56	−58	144	−3 54	−59	145	−4 53	−59	145	−5 52	−58	145	−6 50	−59	145	−7 49	−59	145	322										
36	01 23	−59	145	00 24	−59	146	−0 35	−59	146	−1 34	−58	146	−2 32	−59	146	−3 31	−59	146	−4 30	−59	147	−5 29	−58	147	−6 27	−59	147	−7 26	−59	147	324										
34	01 45	−58	147	00 47	−59	147	−0 12	−59	148	−1 11	−59	148	−2 10	−59	148	−3 09	−59	148	−4 08	−59	148	−5 07	−59	149	−6 06	−59	149	−7 05	−58	149	−8 03	−59	149	326							
32	02 07	−59	149	01 08	−59	149	00 09	−59	150	−0 50	−59	150	−1 49	−59	150	−2 48	−59	150	−3 47	−59	150	−4 46	−59	150	−5 45	−59	151	−6 44	−59	151	−7 43	−59	151	328							
30	02 28	−60	151	01 28	−59	151	00 29	−59	151	−0 30	−59	152	−1 29	−59	152	−2 28	−59	152	−3 27	−59	152	−4 26	−59	152	−5 25	−60	152	−6 25	−59	153	−7 24	−59	153	330							
28	02 47	−59	153	01 48	−60	153	00 48	−59	153	−0 11	−59	153	−1 10	−59	154	−2 09	−60	154	−3 09	−59	154	−4 08	−59	154	−5 07	−59	154	−6 06	−59	154	−7 05	−60	155	−8 05	−59	155	332				
26	03 05	−60	155	02 05	−59	155	01 06	−59	155	00 07	−60	155	−0 53	−59	156	−1 52	−59	156	−2 51	−59	156	−3 50	−60	156	−4 50	−59	156	−5 49	−59	156	−6 48	−60	156	−7 48	−59	157	334				
24	03 22	−60	157	02 22	−59	157	01 23	−60	157	00 23	−59	157	−0 36	−60	157	−1 36	−59	158	−2 35	−59	158	−3 34	−60	158	−4 34	−59	158	−5 33	−60	158	−6 33	−59	158	−7 32	−59	158	336				
22	03 37	−59	159	02 38	−60	159	01 38	−59	159	00 39	−60	159	−0 21	−59	159	−1 20	−60	159	−2 20	−59	160	−3 19	−60	160	−4 19	−59	160	−5 18	−60	160	−6 18	−59	160	−7 17	−60	160	338				
20	03 51	−59	161	02 52	−60	161	01 52	−59	161	00 53	−60	161	−0 07	−60	161	−1 07	−59	161	−2 06	−60	161	−3 06	−59	161	−4 05	−60	162	−5 05	−60	162	−6 05	−59	162	−7 04	−60	162	−8 04	−59	162	340	
18	04 04	−59	163	03 05	−60	163	02 05	−60	163	01 05	−59	163	00 06	−60	163	−0 54	−60	163	−1 54	−59	163	−2 53	−60	163	−3 53	−60	163	−4 53	−59	164	−5 52	−60	164	−6 52	−60	164	−7 52	−59	164	342	
16	04 16	−60	165	03 16	−60	165	02 16	−59	165	01 17	−60	165	00 17	−60	165	−0 43	−60	165	−1 43	−59	165	−2 42	−60	165	−3 42	−60	165	−4 42	−59	165	−5 41	−60	166	−6 41	−60	166	−7 41	−60	166	344	
14	04 26	−60	166	03 26	−59	167	02 27	−60	167	01 27	−60	167	00 27	−60	167	−0 33	−60	167	−1 33	−59	167	−2 32	−60	167	−3 32	−60	167	−4 32	−60	167	−5 32	−60	167	−6 32	−59	167	−7 31	−60	167	346	
12	04 35	−60	168	03 35	−60	168	02 35	−59	169	01 36	−60	169	00 36	−60	169	−0 24	−60	169	−1 24	−60	169	−2 24	−60	169	−3 24	−60	169	−4 24	−59	169	−5 23	−60	169	−6 23	−60	169	−7 23	−60	169	348	
10	04 43	−60	170	03 43	−60	170	02 43	−60	170	01 43	−60	170	00 43	−60	171	−0 17	−60	171	−1 17	−60	171	−2 17	−59	171	−3 16	−60	171	−4 16	−60	171	−5 16	−60	171	−6 16	−60	171	−7 16	−60	171	350	
8	04 49	−60	172	03 49	−60	172	02 49	−60	172	01 49	−60	172	00 49	−60	172	−0 11	−60	172	−1 11	−60	173	−2 11	−60	173	−3 11	−59	173	−4 10	−60	173	−5 10	−60	173	−6 10	−60	173	−7 10	−60	173	352	
6	04 54	−60	174	03 54	−60	174	02 54	−60	174	01 54	−60	174	00 54	−60	174	−0 06	−60	174	−1 06	−60	174	−2 06	−60	174	−3 06	−60	174	−4 06	−60	175	−5 06	−60	175	−6 06	−60	175	−7 06	−60	175	354	
4	04 57	−60	176	03 57	−60	176	02 57	−60	176	01 57	−60	176	00 57	−60	176	−0 03	−60	176	−1 03	−60	176	−2 03	−60	176	−3 03	−60	176	−4 03	−60	176	−5 03	−60	176	−6 03	−60	176	−7 03	−60	176	356	
2	04 59	−60	178	03 59	−60	178	02 59	−60	178	01 59	−60	178	00 59	−60	178	−0 01	−60	178	−1 01	−60	178	−2 01	−60	178	−3 01	−60	178	−4 01	−60	178	−5 01	−60	178	−6 01	−60	178	−7 01	−60	178	358	
0	05 00	−60	180	04 00	−60	180	03 00	−60	180	02 00	−60	180	01 00	−60	180	00 00	−60	180	−1 00	−60	180	−2 00	−60	180	−3 00	−60	180	−4 00	−60	180	−5 00	−60	180	−6 00	−60	180	−7 00	−60	180	360	

15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°

S. Lat. { LHA greater than 180° / LHA less than 180° } $Z_n = 180° - Z$ / $Z_n = 180° + Z$

DECLINATION (15°- 29°) **CONTRARY** NAME TO LATITUDE

LAT 70°

LAT 70°

Udgivet af:
IVER C. WEILBACH & CO. A/S

Layout og teknik:
Antracit