

Extract from
The Nautical Almanac 2002

May 4 - June 23

Pages 92-125

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2002 May 9

UT	ARIES			VENUS -3.9			MARS +1.6			JUPITER -2.0			SATURN +0.1			STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec				
SATURDAY	4 00	221 42.4	153 27.5 N22	50.4	149 28.5 N23	17.0	119 16.7 N23	09.8	149 02.6 N21	07.2	Acamar	315 25.4 S40	17.9					
	01	236 44.8	168 26.7	50.9	164 29.1	17.2	134 18.7	09.8	164 04.7	07.2	Achernar	335 33.7 S57	13.5					
	02	251 47.3	183 25.9	51.5	179 29.8	17.4	149 20.7	09.7	179 06.9	07.3	Acrux	173 18.8 S63	06.8					
	03	266 49.8	198 25.2	52.0	194 30.4	17.6	164 22.7	09.7	194 09.0	07.3	Adhara	255 19.6 S28	58.7					
	04	281 52.2	213 24.4	52.6	209 31.1	17.9	179 24.7	09.7	209 11.2	07.4	Aldebaran	290 59.8 N16	30.8					
	05	296 54.7	228 23.6	53.1	224 31.8	18.1	194 26.7	09.6	224 13.3	07.4								
	06	311 57.2	243 22.9 N22	53.7	239 32.4 N23	18.3	209 28.8 N23	09.6	239 15.5 N21	07.4	Alioth	166 27.7 N55	57.0					
	07	326 59.6	258 22.1	54.2	254 33.1	18.5	224 30.8	09.6	254 17.6	07.5	Alkaid	153 05.2 N49	18.2					
	08	342 02.1	273 21.3	54.8	269 33.7	18.7	239 32.8	09.5	269 19.8	07.5	Al Na'ir	27 54.7 S46	56.9					
	09	357 04.5	288 20.5	55.3	284 34.4	18.9	254 34.8	09.5	284 21.9	07.6	Alnilam	275 55.5 S 1	12.1					
	10	12 07.0	303 19.8	55.9	299 35.0	19.2	269 36.8	09.5	299 24.1	07.6	Alphard	218 04.7 S 8	40.2					
	11	27 09.5	318 19.0	56.4	314 35.7	19.4	284 38.9	09.4	314 26.2	07.7								
	12	42 11.9	333 18.2 N22	56.9	329 36.3 N23	19.6	299 40.9 N23	09.4	329 28.4 N21	07.7	Alphecca	126 18.0 N26	42.4					
	13	57 14.4	348 17.4	57.5	344 37.0	19.8	314 42.9	09.4	344 30.5	07.7	Alpheratz	357 52.9 N29	05.9					
	14	72 16.9	3 16.7	58.0	359 37.6	20.0	329 44.9	09.3	359 32.7	07.8	Altair	62 16.7 N 8	52.3					
	15	87 19.3	18 15.9	58.6	14 38.3	20.2	344 46.9	09.3	14 34.8	07.8	Ankaa	353 24.6 S42	17.6					
	16	102 21.8	33 15.1	59.1	29 38.9	20.4	359 48.9	09.3	29 37.0	07.9	Antares	112 36.7 S26	26.2					
	17	117 24.3	48 14.3	59.6	44 39.6	20.7	14 50.9	09.2	44 39.1	07.9								
	18	132 26.7	63 13.6 N23	00.2	59 40.2 N23	20.9	29 53.0 N23	09.2	59 41.3 N21	07.9	Arcturus	146 03.4 N19	10.2					
	19	147 29.2	78 12.8	00.7	74 40.9	21.1	44 55.0	09.2	74 43.4	08.0	Atria	107 46.1 S69	01.8					
	20	162 31.6	93 12.0	01.2	89 41.5	21.3	59 57.0	09.1	89 45.6	08.0	Avior	234 21.8 S59	31.3					
	21	177 34.1	108 11.2	01.8	104 42.2	21.5	74 59.0	09.1	104 47.7	08.1	Bellatrix	278 41.7 N 6	21.0					
	22	192 36.6	123 10.5	02.3	119 42.9	21.7	90 01.0	09.1	119 49.9	08.1	Betelgeuse	271 11.0 N 7	24.4					
23	207 39.0	138 09.7	02.8	134 43.5	21.9	105 03.0	09.0	134 52.0	08.1									
SUNDAY	5 00	222 41.5	153 08.9 N23	03.3	149 44.2 N23	22.1	120 05.1 N23	09.0	149 54.2 N21	08.2	Canopus	264 00.4 S52	42.0					
	01	237 44.0	168 08.1	03.9	164 44.8	22.4	135 07.1	09.0	164 56.3	08.2	Capella	280 47.9 N46	00.1					
	02	252 46.4	183 07.3	04.4	179 45.5	22.6	150 09.1	08.9	179 58.5	08.3	Deneb	49 37.5 N45	16.9					
	03	267 48.9	198 06.6	04.9	194 46.1	22.8	165 11.1	08.9	195 00.6	08.3	Denebola	182 42.4 N14	33.6					
	04	282 51.4	213 05.8	05.4	209 46.8	23.0	180 13.1	08.9	210 02.8	08.3	Diphda	349 04.9 S17	58.6					
	05	297 53.8	228 05.0	06.0	224 47.4	23.2	195 15.1	08.8	225 04.9	08.4								
	06	312 56.3	243 04.2 N23	06.5	239 48.1 N23	23.4	210 17.1 N23	08.8	240 07.1 N21	08.4	Dubhe	194 01.9 N61	44.6					
	07	327 58.8	258 03.4	07.0	254 48.7	23.6	225 19.2	08.8	255 09.2	08.5	Elnath	278 24.0 N28	36.6					
	08	343 01.2	273 02.7	07.5	269 49.4	23.8	240 21.2	08.7	270 11.4	08.5	Eltanin	90 49.8 N51	29.1					
	09	358 03.7	288 01.9	08.0	284 50.0	24.0	255 23.2	08.7	285 13.5	08.5	Enif	33 55.8 N 9	52.9					
	10	13 06.1	303 01.1	08.5	299 50.7	24.2	270 25.2	08.7	300 15.7	08.6	Fomalhaut	15 33.7 S29	36.7					
	11	28 08.6	318 00.3	09.1	314 51.3	24.4	285 27.2	08.6	315 17.8	08.6								
	12	43 11.1	332 59.5 N23	09.6	329 52.0 N23	24.7	300 29.2 N23	08.6	330 19.9 N21	08.7	Gacrux	172 10.4 S57	07.7					
	13	58 13.5	347 58.7	10.1	344 52.6	24.9	315 31.2	08.6	345 22.1	08.7	Gienah	176 01.1 S17	33.3					
	14	73 16.0	2 58.0	10.6	359 53.3	25.1	330 33.2	08.5	0 24.2	08.8	Hadar	148 59.9 S60	23.1					
	15	88 18.5	17 57.2	11.1	14 53.9	25.3	345 35.2	08.5	15 26.4	08.8	Hamal	328 11.1 N23	28.2					
	16	103 20.9	32 56.4	11.6	29 54.6	25.5	0 37.3	08.5	30 28.5	08.8	Kaus Aust.	83 55.2 S34	23.0					
	17	118 23.4	47 55.6	12.1	44 55.2	25.7	15 39.3	08.4	45 30.7	08.9								
	18	133 25.9	62 54.8 N23	12.6	59 55.9 N23	25.9	30 41.3 N23	08.4	60 32.8 N21	08.9	Kochab	137 18.2 N74	08.8					
	19	148 28.3	77 54.0	13.1	74 56.6	26.1	45 43.3	08.4	75 35.0	09.0	Markab	13 47.3 N15	12.8					
	20	163 30.8	92 53.2	13.6	89 57.2	26.3	60 45.3	08.3	90 37.1	09.0	Menkar	314 24.6 N 4	05.8					
	21	178 33.3	107 52.5	14.1	104 57.9	26.5	75 47.3	08.3	105 39.3	09.0	Menkent	148 17.6 S36	22.9					
	22	193 35.7	122 51.7	14.7	119 58.5	26.7	90 49.3	08.3	120 41.4	09.1	Miaplacidus	221 41.7 S69	43.8					
23	208 38.2	137 50.9	15.2	134 59.2	26.9	105 51.3	08.2	135 43.6	09.1									
MONDAY	6 00	223 40.6	152 50.1 N23	15.7	149 59.8 N23	27.1	120 53.3 N23	08.2	150 45.7 N21	09.2	Mirfak	308 53.5 N49	52.1					
	01	238 43.1	167 49.3	16.2	165 00.5	27.3	135 55.4	08.2	165 47.9	09.2	Nunki	76 09.0 S26	17.6					
	02	253 45.6	182 48.5	16.6	180 01.1	27.5	150 57.4	08.1	180 50.0	09.2	Peacock	53 32.8 S56	43.5					
	03	268 48.0	197 47.7	17.1	195 01.8	27.7	165 59.4	08.1	195 52.2	09.3	Pollux	243 38.6 N28	01.4					
	04	283 50.5	212 46.9	17.6	210 02.4	27.9	181 01.4	08.1	210 54.3	09.3	Procyon	245 09.0 N 5	13.1					
	05	298 53.0	227 46.2	18.1	225 03.1	28.1	196 03.4	08.0	225 56.4	09.4								
	06	313 55.4	242 45.4 N23	18.6	240 03.7 N23	28.3	211 05.4 N23	08.0	240 58.6 N21	09.4	Rasalhague	96 14.3 N12	33.4					
	07	328 57.9	257 44.6	19.1	255 04.4	28.5	226 07.4	08.0	256 00.7	09.4	Regulus	207 52.7 N11	57.4					
	08	344 00.4	272 43.8	19.6	270 05.0	28.7	241 09.4	07.9	271 02.9	09.5	Rigel	281 20.8 S 8	12.1					
	09	359 02.8	287 43.0	20.1	285 05.7	28.9	256 11.4	07.9	286 05.0	09.5	Rigil Kent.	140 03.3 S60	50.7					
	10	14 05.3	302 42.2	20.6	300 06.3	29.1	271 13.4	07.9	301 07.2	09.6	Sabik	102 22.3 S15	43.7					
	11	29 07.7	317 41.4	21.1	315 07.0	29.3	286 15.4	07.8	316 09.3	09.6								
	12	44 10.2	332 40.6 N23	21.6	330 07.6 N23	29.5	301 17.5 N23	07.8	331 11.5 N21	09.6	Schedar	349 51.2 N56	32.7					
	13	59 12.7	347 39.8	22.0	345 08.3	29.7	316 19.5	07.8	346 13.6	09.7	Shaula	96 33.5 S37	06.3					
	14	74 15.1	2 39.0	22.5	0 08.9	29.9	331 21.5	07.7	1 15.8	09.7	Sirius	258 41.7 S16	43.3					
	15	89 17.6	17 38.3	23.0	15 09.6	30.1	346 23.5	07.7	16 17.9	09.8	Spica	158 40.2 S11	10.4					
	16	104 20.1	32 37.5	23.5	30 10.2	30.3	1 25.5	07.7	31 20.1	09.8	Suhail	222 59.0 S43	26.7					
	17	119 22.5	47 36.7	24.0	45 10.9	30.5	16 27.5	07.6	46 22.2	09.8								
	18	134 25.0	62 35.9 N23	24.5	60 11.5 N23	30.7	31 29.5 N23	07.6	61 24.3 N21	09.9	Vega	80 44.7 N38	46.9					
	19	149 27.5	77 35.1	24.9	75 12.2	30.9	46 31.5	07.6	76 26.5	09.9	Zuben'ubi	137 14.8 S16	03.1					
	20	164 29.9	92 34.3	25.4	90 12.8	31.1	61 33.5	07.5	91 28.6	10.0								
	21	179 32.4	107 33.5	25.9	105 13.5	31.3	76 35.5	07.5	106 30.8	10.0								
	22	194 34.9	122 32.7	26.4	120 14.1	31.5	91 37.5	07.4	121 32.9	10.1	Venus	290 27.4 h	13 48					
23	209 37.3	137 31.9	26.8	135 14.8	31.7	106 39.5	07.4	136 35.1	10.1	Mars	287 02.7	14 00						
										Jupiter	257 23.5	15 58						
										Saturn	287 12.7	13 58						
	h m																	
Mer. Pass.	9 07.7	v -0.8	d 0.5	v 0.7	d 0.2	v 2.0	d 0.0	v 2.1	d 0.0									

UT	SUN		MOON				Lat.	Twilight		Sunrise	Moonrise					
	GHA	Dec	GHA	<i>v</i>	Dec	<i>d</i>		HP	Naut.		Civil	4	5	6	7	
									h m		h m	h m	h m	h m	h m	h m
SATURDAY	d h	° /	° /	° /	° /	° /	° /	N 72	////	////	01 16	■	06 21	05 04	04 30	
	4 00	180 48.1	N15 50.9	268 08.4	11.3	S21 40.4	6.8	55.2	N 70	////	////	02 08	■	05 12	04 37	04 16
	01	195 48.1	51.7	282 38.7	11.4	21 33.6	6.8	55.2	68	////	////	02 40	05 11	04 35	04 17	04 04
	02	210 48.2	52.4	297 09.1	11.5	21 26.8	7.0	55.2	66	////	01 30	03 03	04 20	04 09	04 01	03 54
	03	225 48.2	53.1	311 39.6	11.5	21 19.8	7.1	55.1	64	////	02 07	03 21	03 48	03 49	03 48	03 46
	04	240 48.3	53.9	326 10.1	11.7	21 12.7	7.2	55.1	62	////	02 33	03 35	03 24	03 32	03 36	03 39
	05	255 48.4	54.6	340 40.8	11.7	21 05.5	7.3	55.1	60	01 20	02 52	03 48	03 05	03 18	03 27	03 33
	06	270 48.4	N15 55.3	355 11.5	11.8	S20 58.2	7.3	55.1	N 58	01 54	03 09	03 59	02 49	03 06	03 18	03 28
	07	285 48.5	56.0	9 42.3	11.9	20 50.9	7.5	55.0	56	02 18	03 22	04 08	02 35	02 56	03 11	03 23
	08	300 48.5	56.8	24 13.2	11.9	20 43.4	7.5	55.0	54	02 36	03 34	04 16	02 24	02 47	03 04	03 18
	09	315 48.6	57.5	38 44.1	12.1	20 35.9	7.7	55.0	52	02 52	03 44	04 23	02 13	02 38	02 58	03 14
	10	330 48.7	58.2	53 15.2	12.1	20 28.2	7.7	55.0	50	03 05	03 53	04 30	02 04	02 31	02 53	03 11
	11	345 48.7	58.9	67 46.3	12.2	20 20.5	7.8	55.0	45	03 30	04 11	04 44	01 44	02 15	02 41	03 03
	12	0 48.8	N15 59.7	82 17.5	12.2	S20 12.7	7.9	54.9	N 40	03 50	04 26	04 56	01 28	02 02	02 31	02 56
	13	15 48.8	16 00.4	96 48.7	12.4	20 04.8	8.0	54.9	35	04 05	04 38	05 05	01 15	01 51	02 22	02 51
	14	30 48.9	01.1	111 20.1	12.4	19 56.8	8.0	54.9	30	04 18	04 48	05 14	01 03	01 41	02 15	02 46
	15	45 48.9	01.8	125 51.5	12.5	19 48.8	8.2	54.9	20	04 38	05 05	05 29	00 42	01 24	02 02	02 37
	16	60 49.0	02.5	140 23.0	12.6	19 40.6	8.2	54.8	N 10	04 54	05 19	05 41	00 25	01 09	01 51	02 29
	17	75 49.1	03.3	154 54.6	12.6	19 32.4	8.3	54.8	0	05 07	05 32	05 53	00 08	00 56	01 40	02 22
	18	90 49.1	N16 04.0	169 26.2	12.8	S19 24.1	8.4	54.8	S 10	05 18	05 43	06 05	24 42	00 42	01 29	02 15
	19	105 49.2	04.7	183 58.0	12.8	19 15.7	8.4	54.8	20	05 28	05 54	06 17	24 27	00 27	01 18	02 07
	20	120 49.2	05.4	198 29.8	12.8	19 07.3	8.6	54.8	30	05 38	06 06	06 31	24 10	00 10	01 05	01 58
	21	135 49.3	06.1	213 01.6	13.0	18 58.7	8.6	54.7	35	05 43	06 13	06 39	24 00	00 00	00 57	01 53
22	150 49.3	06.9	227 33.6	13.0	18 50.1	8.7	54.7	40	05 48	06 20	06 49	23 48	24 48	00 48	01 47	
23	165 49.4	07.6	242 05.6	13.1	18 41.4	8.8	54.7	45	05 53	06 28	06 59	23 35	24 38	00 38	01 41	
SUNDAY	5 00	180 49.5	N16 08.3	256 37.7	13.2	S18 32.6	8.8	54.7	S 50	05 59	06 38	07 12	23 18	24 26	00 26	01 33
	01	195 49.5	09.0	271 09.9	13.2	18 23.8	9.0	54.7	52	06 01	06 42	07 18	23 10	24 20	00 20	01 29
	02	210 49.6	09.7	285 42.1	13.3	18 14.8	9.0	54.7	54	06 04	06 46	07 25	23 01	24 13	00 13	01 25
	03	225 49.6	10.5	300 14.4	13.4	18 05.8	9.0	54.6	56	06 07	06 51	07 32	22 52	24 06	00 06	01 20
	04	240 49.7	11.2	314 46.8	13.5	17 56.8	9.2	54.6	58	06 10	06 57	07 40	22 40	23 58	25 15	01 15
	05	255 49.7	11.9	329 19.3	13.5	17 47.6	9.2	54.6	S 60	06 13	07 03	07 50	22 27	23 49	25 09	01 09
	06	270 49.8	N16 12.6	343 51.8	13.6	S17 38.4	9.3	54.6	Lat.	Sunset	Twilight		Moonset			
	07	285 49.8	13.3	358 24.4	13.6	17 29.1	9.3	54.6			Civil	Naut.	4	5	6	7
	08	300 49.9	14.0	12 57.0	13.7	17 19.8	9.4	54.5								
	09	315 49.9	14.7	27 29.7	13.8	17 10.4	9.5	54.5								
	10	330 50.0	15.5	42 02.5	13.9	17 00.9	9.6	54.5								
	11	345 50.0	16.2	56 35.4	13.9	16 51.3	9.6	54.5	N 72	22 48	////	////	■	08 10	10 58	12 59
	12	0 50.1	N16 16.9	71 08.3	14.0	S16 41.7	9.7	54.5	N 70	21 51	////	////	■	09 17	11 23	13 11
	13	15 50.2	17.6	85 41.3	14.1	16 32.0	9.7	54.5	68	21 18	////	////	07 40	09 53	11 41	13 21
	14	30 50.2	18.3	100 14.4	14.1	16 22.3	9.8	54.5	66	20 54	22 30	////	08 31	10 18	11 56	13 29
	15	45 50.3	19.0	114 47.5	14.2	16 12.5	9.9	54.4	64	20 35	21 50	////	09 02	10 38	12 08	13 36
	16	60 50.3	19.7	129 20.7	14.2	16 02.6	9.9	54.4	62	20 20	21 24	////	09 25	10 53	12 19	13 42
	17	75 50.4	20.4	143 53.9	14.3	15 52.7	10.0	54.4	60	20 07	21 03	22 39	09 44	11 06	12 27	13 47
	18	90 50.4	N16 21.1	158 27.2	14.4	S15 42.7	10.1	54.4	N 58	19 56	20 47	22 03	09 59	11 18	12 35	13 51
	19	105 50.5	21.9	173 00.6	14.4	15 32.6	10.1	54.4	56	19 47	20 33	21 38	10 12	11 27	12 42	13 55
	20	120 50.5	22.6	187 34.0	14.5	15 22.5	10.1	54.4	54	19 39	20 21	21 19	10 24	11 36	12 48	13 58
	21	135 50.6	23.3	202 07.5	14.5	15 12.4	10.3	54.4	52	19 31	20 11	21 04	10 34	11 44	12 53	14 02
	22	150 50.6	24.0	216 41.0	14.6	15 02.1	10.2	54.3	50	19 24	20 02	20 50	10 43	11 51	12 58	14 04
23	165 50.7	24.7	231 14.6	14.7	14 51.9	10.4	54.3	45	19 10	19 43	20 24	11 01	12 05	13 08	14 11	
MONDAY	6 00	180 50.7	N16 25.4	245 48.3	14.7	S14 41.5	10.4	54.3	N 40	18 58	19 28	20 05	11 17	12 17	13 17	14 16
	01	195 50.8	26.1	260 22.0	14.8	14 31.1	10.4	54.3	35	18 48	19 16	19 49	11 29	12 28	13 24	14 20
	02	210 50.8	26.8	274 55.8	14.8	14 20.7	10.5	54.3	30	18 40	19 05	19 36	11 41	12 36	13 31	14 24
	03	225 50.9	27.5	289 29.6	14.9	14 10.2	10.6	54.3	20	18 25	18 48	19 16	12 00	12 52	13 42	14 31
	04	240 50.9	28.2	304 03.5	14.9	13 59.6	10.6	54.3	N 10	18 12	18 34	19 00	12 16	13 05	13 52	14 37
	05	255 50.9	28.9	318 37.4	15.0	13 49.0	10.7	54.3	0	18 00	18 22	18 47	12 31	13 17	14 01	14 42
	06	270 51.0	N16 29.6	333 11.4	15.0	S13 38.3	10.7	54.3	S 10	17 48	18 10	18 35	12 47	13 30	14 10	14 47
	07	285 51.0	30.3	347 45.4	15.1	13 27.6	10.7	54.2	20	17 36	17 59	18 25	13 03	13 43	14 19	14 53
	08	300 51.1	31.0	2 19.5	15.2	13 16.9	10.8	54.2	30	17 22	17 47	18 15	13 22	13 58	14 30	15 00
	09	315 51.1	31.7	16 53.7	15.2	13 06.1	10.9	54.2	35	17 14	17 40	18 10	13 32	14 06	14 36	15 03
	10	330 51.2	32.4	31 27.9	15.2	12 55.2	10.9	54.2	40	17 04	17 33	18 05	13 45	14 16	14 43	15 07
	11	345 51.2	33.1	46 02.1	15.3	12 44.3	11.0	54.2	45	16 54	17 25	18 00	13 59	14 27	14 51	15 12
	12	0 51.3	N16 33.8	60 36.4	15.3	S12 33.3	11.0	54.2	S 50	16 41	17 15	17 54	14 17	14 41	15 01	15 18
	13	15 51.3	34.5	75 10.7	15.4	12 22.3	11.0	54.2	52	16 35	17 11	17 51	14 25	14 47	15 05	15 21
	14	30 51.4	35.2	89 45.1	15.4	12 11.3	11.1	54.2	54	16 28	17 06	17 49	14 34	14 54	15 10	15 23
	15	45 51.4	35.9	104 19.5	15.5	12 00.2	11.1	54.2	56	16 20	17 01	17 46	14 45	15 02	15 16	15 27
	16	60 51.5	36.6	118 54.0	15.5	11 49.1	11.2	54.2	58	16 12	16 56	17 43	14 56	15 11	15 22	15 30
	17	75 51.5	37.3	133 28.5	15.5	11 37.9	11.2	54.2	S 60	16 03	16 49	17 40	15 10	15 21	15 28	15 34
	18	90 51.6	N16 38.0	148 03.0	15.6	S11 26.7	11.3	54.2	Day	SUN		MOON				
	19	105 51.6	38.7	1												

UT	ARIES			VENUS -3.9			MARS +1.7			JUPITER -2.0			SATURN +0.1			STARS		
	GHA	GHA	Dec	GHA	Dec		GHA	Dec		GHA	Dec		GHA	Dec		Name	SHA	Dec
TUESDAY	7 00	224 39.8	152 31.1 N23	27.3	150 15.4 N23	31.9	121 41.5 N23	07.4		151 37.2 N21	10.1		Acamar	315 25.4	S40 17.8			
	01	239 42.2	167 30.3	27.8	165 16.1	32.1	136 43.5	07.3		166 39.4	10.2		Achernar	335 33.7	S57 13.5			
	02	254 44.7	182 29.5	28.3	180 16.7	32.3	151 45.5	07.3		181 41.5	10.2		Acrux	173 18.8	S63 06.9			
	03	269 47.2	197 28.7	28.7	195 17.4	32.4	166 47.6	07.3		196 43.7	10.3		Adhara	255 19.7	S28 58.7			
	04	284 49.6	212 27.9	29.2	210 18.0	32.6	181 49.6	07.2		211 45.8	10.3		Aldebaran	290 59.8	N16 30.8			
	05	299 52.1	227 27.1	29.7	225 18.7	32.8	196 51.6	07.2		226 47.9	10.3							
	06	314 54.6	242 26.3 N23	30.1	240 19.3 N23	33.0	211 53.6 N23	07.2		241 50.1 N21	10.4		Alioth	166 27.7	N55 57.0			
	07	329 57.0	257 25.5	30.6	255 20.0	33.2	226 55.6	07.1		256 52.2	10.4		Alkaid	153 05.2	N49 18.2			
	08	344 59.5	272 24.8	31.1	270 20.6	33.4	241 57.6	07.1		271 54.4	10.5		Al Na'ir	27 54.7	S46 56.9			
	09	0 02.0	287 24.0	31.5	285 21.3	33.6	256 59.6	07.1		286 56.5	10.5		Alnilam	275 55.5	S 1 12.1			
	10	15 04.4	302 23.2	32.0	300 21.9	33.8	272 01.6	07.0		301 58.7	10.5		Alphard	218 04.7	S 8 40.2			
	11	30 06.9	317 22.4	32.4	315 22.6	34.0	287 03.6	07.0		317 00.8	10.6							
	12	45 09.4	332 21.6 N23	32.9	330 23.2 N23	34.2	302 05.6 N23	07.0		332 03.0 N21	10.6		Alphecca	126 18.0	N26 42.4			
	13	60 11.8	347 20.8	33.4	345 23.9	34.4	317 07.6	06.9		347 05.1	10.7		Alpheratz	357 52.9	N29 05.9			
	14	75 14.3	2 20.0	33.8	0 24.5	34.5	332 09.6	06.9		2 07.2	10.7		Altair	62 16.7	N 8 52.3			
	15	90 16.7	17 19.2	34.3	15 25.2	34.7	347 11.6	06.9		17 09.4	10.7		Ankaa	353 24.6	S42 17.6			
	16	105 19.2	32 18.4	34.7	30 25.8	34.9	2 13.6	06.8		32 11.5	10.8		Antares	112 36.7	S26 26.2			
	17	120 21.7	47 17.6	35.2	45 26.5	35.1	17 15.6	06.8		47 13.7	10.8							
	18	135 24.1	62 16.8 N23	35.6	60 27.1 N23	35.3	32 17.6 N23	06.7		62 15.8 N21	10.9		Arcturus	146 03.4	N19 10.2			
	19	150 26.6	77 16.0	36.1	75 27.8	35.5	47 19.6	06.7		77 18.0	10.9		Atria	107 46.0	S69 01.8			
	20	165 29.1	92 15.2	36.5	90 28.4	35.7	62 21.6	06.7		92 20.1	10.9		Avior	234 21.9	S59 31.3			
	21	180 31.5	107 14.4	37.0	105 29.1	35.9	77 23.6	06.6		107 22.3	11.0		Bellatrix	278 41.7	N 6 21.0			
	22	195 34.0	122 13.6	37.4	120 29.8	36.0	92 25.6	06.6		122 24.4	11.0		Betelgeuse	271 11.1	N 7 24.4			
23	210 36.5	137 12.8	37.9	135 30.4	36.2	107 27.6	06.6		137 26.5	11.1								
WEDNESDAY	8 00	225 38.9	152 12.0 N23	38.3	150 31.1 N23	36.4	122 29.6 N23	06.5		152 28.7 N21	11.1		Canopus	264 00.4	S52 42.0			
	01	240 41.4	167 11.2	38.8	165 31.7	36.6	137 31.6	06.5		167 30.8	11.1		Capella	280 47.9	N46 00.1			
	02	255 43.8	182 10.4	39.2	180 32.4	36.8	152 33.6	06.5		182 33.0	11.2		Deneb	49 37.4	N45 16.9			
	03	270 46.3	197 09.6	39.6	195 33.0	37.0	167 35.6	06.4		197 35.1	11.2		Denebola	182 42.4	N14 33.6			
	04	285 48.8	212 08.8	40.1	210 33.7	37.2	182 37.6	06.4		212 37.3	11.3		Diphda	349 04.9	S17 58.6			
	05	300 51.2	227 07.9	40.5	225 34.3	37.3	197 39.6	06.4		227 39.4	11.3							
	06	315 53.7	242 07.1 N23	41.0	240 35.0 N23	37.5	212 41.6 N23	06.3		242 41.5 N21	11.3		Dubhe	194 01.9	N61 44.6			
	07	330 56.2	257 06.3	41.4	255 35.6	37.7	227 43.6	06.3		257 43.7	11.4		Einath	278 24.0	N28 36.6			
	08	345 58.6	272 05.5	41.8	270 36.3	37.9	242 45.6	06.2		272 45.8	11.4		Eltanin	90 49.8	N51 29.1			
	09	1 01.1	287 04.7	42.3	285 36.9	38.1	257 47.6	06.2		287 48.0	11.5		Enif	33 55.8	N 9 52.9			
	10	16 03.6	302 03.9	42.7	300 37.6	38.3	272 49.6	06.2		302 50.1	11.5		Fomalhaut	15 33.7	S29 36.6			
	11	31 06.0	317 03.1	43.1	315 38.2	38.4	287 51.6	06.1		317 52.3	11.5							
	12	46 08.5	332 02.3 N23	43.6	330 38.9 N23	38.6	302 53.6 N23	06.1		332 54.4 N21	11.6		Gacrux	172 10.4	S57 07.7			
	13	61 11.0	347 01.5	44.0	345 39.5	38.8	317 55.6	06.1		347 56.5	11.6		Gienah	176 01.1	S17 33.3			
	14	76 13.4	2 00.7	44.4	0 40.2	39.0	332 57.6	06.0		2 58.7	11.7		Hadar	148 59.9	S60 23.1			
	15	91 15.9	16 59.9	44.9	15 40.8	39.2	347 59.6	06.0		16 00.8	11.7		Hamal	328 11.1	N23 28.2			
	16	106 18.3	31 59.1	45.3	30 41.4	39.3	3 01.6	06.0		33 03.0	11.7		Kaus Aust.	83 55.2	S34 23.0			
	17	121 20.8	46 58.3	45.7	45 42.1	39.5	18 03.6	05.9		48 05.1	11.8							
	18	136 23.3	61 57.5 N23	46.1	60 42.7 N23	39.7	33 05.6 N23	05.9		63 07.3 N21	11.8		Kochab	137 18.2	N74 08.8			
	19	151 25.7	76 56.7	46.6	75 43.4	39.9	48 07.6	05.8		78 09.4	11.9		Markab	13 47.3	N15 12.8			
	20	166 28.2	91 55.9	47.0	90 44.0	40.1	63 09.6	05.8		93 11.5	11.9		Menkar	314 24.6	N 4 05.8			
	21	181 30.7	106 55.1	47.4	105 44.7	40.2	78 11.6	05.8		108 13.7	11.9		Menkent	148 17.6	S36 22.9			
	22	196 33.1	121 54.3	47.8	120 45.3	40.4	93 13.6	05.7		123 15.8	12.0		Miaplacidus	221 41.8	S69 43.8			
23	211 35.6	136 53.4	48.2	135 46.0	40.6	108 15.6	05.7		138 18.0	12.0								
THURSDAY	9 00	226 38.1	151 52.6 N23	48.7	150 46.6 N23	40.8	123 17.6 N23	05.7		153 20.1 N21	12.1		Mirfak	308 53.5	N49 52.1			
	01	241 40.5	166 51.8	49.1	165 47.3	41.0	138 19.6	05.6		168 22.2	12.1		Nunki	76 09.0	S26 17.6			
	02	256 43.0	181 51.0	49.5	180 47.9	41.1	153 21.6	05.6		183 24.4	12.1		Peacock	53 32.8	S56 43.5			
	03	271 45.4	196 50.2	49.9	195 48.6	41.3	168 23.6	05.6		198 26.5	12.2		Pollux	243 38.6	N28 01.4			
	04	286 47.9	211 49.4	50.3	210 49.2	41.5	183 25.6	05.5		213 28.7	12.2		Procyon	245 09.1	N 5 13.1			
	05	301 50.4	226 48.6	50.7	225 49.9	41.7	198 27.6	05.5		228 30.8	12.3							
	06	316 52.8	241 47.8 N23	51.1	240 50.5 N23	41.8	213 29.6 N23	05.4		243 33.0 N21	12.3		Rasalhague	96 14.3	N12 33.4			
	07	331 55.3	256 47.0	51.6	255 51.2	42.0	228 31.6	05.4		258 35.1	12.3		Regulus	207 52.8	N11 57.4			
	08	346 57.8	271 46.2	52.0	270 51.8	42.2	243 33.6	05.4		273 37.2	12.4		Rigel	281 20.8	S 8 12.1			
	09	2 00.2	286 45.4	52.4	285 52.5	42.4	258 35.6	05.3		288 39.4	12.4		Rigil Kent.	140 03.3	S60 50.7			
	10	17 02.7	301 44.5	52.8	300 53.1	42.5	273 37.6	05.3		303 41.5	12.5		Sabik	102 22.3	S15 43.7			
	11	32 05.2	316 43.7	53.2	315 53.8	42.7	288 39.6	05.3		318 43.7	12.5							
	12	47 07.6	331 42.9 N23	53.6	330 54.4 N23	42.9	303 41.6 N23	05.2		333 45.8 N21	12.5		Schedar	349 51.2	N56 32.7			
	13	62 10.1	346 42.1	54.0	345 55.1	43.0	318 43.6	05.2		348 47.9	12.6		Shaula	96 33.5	S37 06.3			
	14	77 12.6	1 41.3	54.4	0 55.7	43.2	333 45.6	05.1		3 50.1	12.6		Sirius	258 41.7	S16 43.3			
	15	92 15.0	16 40.5	54.8	15 56.4	43.4	348 47.5	05.1		18 52.2	12.7		Spica	158 40.2	S11 10.4			
	16	107 17.5	31 39.7	55.2	30 57.0	43.6	3 49.5	05.1		33 54.4	12.7		Suhail	222 59.0	S43 26.7			
	17	122 19.9	46 38.9	55.6	45 57.7	43.7	18 51.5	05.0		48 56.5								

UT	SUN		MOON				Lat.	Twilight		Sunrise	Moonrise				
	GHA	Dec	GHA	v	Dec	d		HP	Naut.		Civil	7	8	9	10
									h m		h m	h m	h m	h m	h m
TUESDAY															
7 00	180 51.8	N16 42.2	235 31.2	15.8	S10 18.5	11.5	54.1	N 72	////	////	00 30	04 30	04 04	03 42	03 19
01	195 51.9	42.9	250 06.0	15.9	10 07.0	11.6	54.1	N 70	////	////	01 48	04 16	03 58	03 42	03 26
02	210 51.9	43.6	264 40.9	15.9	9 55.4	11.5	54.1	68	////	////	02 25	04 04	03 53	03 42	03 31
03	225 51.9	44.3	279 15.8	15.9	9 43.9	11.6	54.1	66	////	01 05	02 51	03 54	03 48	03 42	03 36
04	240 52.0	45.0	293 50.7	16.0	9 32.3	11.7	54.1	64	////	01 52	03 11	03 46	03 44	03 42	03 40
05	255 52.0	45.7	308 25.7	16.0	9 20.6	11.7	54.1	62	////	02 21	03 27	03 39	03 41	03 42	03 44
06	270 52.1	N16 46.4	323 00.7	16.0	S 9 08.9	11.7	54.1	60	00 58	02 43	03 40	03 33	03 38	03 42	03 47
07	285 52.1	47.1	337 35.7	16.1	8 57.2	11.7	54.1	N 58	01 40	03 00	03 52	03 28	03 35	03 42	03 50
08	300 52.2	47.7	352 10.8	16.1	8 45.5	11.8	54.1	56	02 07	03 15	04 01	03 23	03 33	03 42	03 52
09	315 52.2	48.4	6 45.9	16.1	8 33.7	11.8	54.1	54	02 27	03 27	04 10	03 18	03 31	03 42	03 54
10	330 52.2	49.1	21 21.0	16.1	8 21.9	11.9	54.1	52	02 44	03 38	04 18	03 14	03 29	03 43	03 56
11	345 52.3	49.8	35 56.1	16.2	8 10.0	11.9	54.1	50	02 58	03 47	04 25	03 11	03 27	03 43	03 58
12	0 52.3	N16 50.5	50 31.3	16.2	S 7 58.1	11.9	54.1	45	03 25	04 07	04 40	03 03	03 23	03 43	04 02
13	15 52.4	51.2	65 06.5	16.2	7 46.2	11.9	54.1	N 40	03 46	04 22	04 52	02 56	03 20	03 43	04 06
14	30 52.4	51.9	79 41.7	16.3	7 34.3	12.0	54.1	35	04 02	04 35	05 03	02 51	03 17	03 43	04 09
15	45 52.4	52.6	94 17.0	16.3	7 22.3	12.0	54.1	30	04 15	04 46	05 12	02 46	03 15	03 43	04 11
16	60 52.5	53.3	108 52.3	16.3	7 10.3	12.0	54.1	20	04 36	05 04	05 27	02 37	03 10	03 43	04 16
17	75 52.5	53.9	123 27.6	16.3	6 58.3	12.0	54.1	N 10	04 53	05 18	05 41	02 29	03 07	03 43	04 20
18	90 52.6	N16 54.6	138 02.9	16.3	S 6 46.3	12.1	54.1	0	05 06	05 31	05 53	02 22	03 03	03 43	04 24
19	105 52.6	55.3	152 38.2	16.4	6 34.2	12.1	54.1	S 10	05 18	05 43	06 05	02 15	02 59	03 43	04 28
20	120 52.6	56.0	167 13.6	16.4	6 22.1	12.1	54.1	20	05 29	05 55	06 18	02 07	02 56	03 44	04 32
21	135 52.7	56.7	181 49.0	16.3	6 10.0	12.2	54.1	30	05 39	06 08	06 33	01 58	02 51	03 44	04 37
22	150 52.7	57.4	196 24.3	16.5	5 57.8	12.1	54.1	35	05 45	06 15	06 42	01 53	02 49	03 44	04 40
23	165 52.7	58.1	210 59.8	16.4	5 45.7	12.2	54.1	40	05 50	06 23	06 51	01 47	02 46	03 44	04 43
8 00	180 52.8	N16 58.7	225 35.2	16.4	S 5 33.5	12.2	54.1	45	05 56	06 31	07 03	01 41	02 42	03 44	04 46
01	195 52.8	16 59.4	240 10.6	16.5	5 21.3	12.3	54.1	S 50	06 03	06 42	07 16	01 33	02 39	03 44	04 51
02	210 52.9	17 00.1	254 46.1	16.5	5 09.0	12.2	54.1	52	06 05	06 46	07 23	01 29	02 37	03 44	04 53
03	225 52.9	00.8	269 21.6	16.4	4 56.8	12.3	54.1	54	06 08	06 51	07 30	01 25	02 35	03 45	04 55
04	240 52.9	01.5	283 57.0	16.5	4 44.5	12.3	54.1	56	06 12	06 57	07 38	01 20	02 32	03 45	04 58
05	255 53.0	02.2	298 32.5	16.5	4 32.2	12.3	54.1	58	06 15	07 03	07 47	01 15	02 30	03 45	05 01
06	270 53.0	N17 02.8	313 08.0	16.6	S 4 19.9	12.4	54.1	S 60	06 19	07 09	07 57	01 09	02 27	03 45	05 04
07	285 53.0	03.5	327 43.6	16.5	4 07.5	12.3	54.1	Lat.	Sunset	Twilight		Moonset			
08	300 53.1	04.2	342 19.1	16.5	3 55.2	12.4	54.1			Civil	Naut.	7	8	9	10
09	315 53.1	04.9	356 54.6	16.6	3 42.8	12.4	54.1			h m	h m	h m	h m	h m	h m
10	330 53.1	05.6	11 30.2	16.5	3 30.4	12.4	54.1	N 72	□	□	□	12 59	14 50	16 39	18 32
11	345 53.2	06.2	26 05.7	16.5	3 18.0	12.4	54.1	N 70	22 11	////	////	13 11	14 53	16 35	18 19
12	0 53.2	N17 06.9	40 41.2	16.6	S 3 05.6	12.4	54.1	68	21 32	////	////	13 21	14 56	16 31	18 09
13	15 53.2	07.6	55 16.8	16.6	2 53.2	12.5	54.1	66	21 05	22 56	////	13 29	14 59	16 29	18 00
14	30 53.3	08.3	69 52.4	16.5	2 40.7	12.4	54.1	64	20 45	22 06	////	13 36	15 01	16 26	17 53
15	45 53.3	08.9	84 27.9	16.6	2 28.3	12.5	54.1	62	20 28	21 35	////	13 42	15 03	16 24	17 47
16	60 53.3	09.6	99 03.5	16.5	2 15.8	12.5	54.1	60	20 15	21 13	23 03	13 47	15 04	16 23	17 42
17	75 53.4	10.3	113 39.0	16.6	2 03.3	12.5	54.1	N 58	20 03	20 55	22 17	13 51	15 06	16 21	17 37
18	90 53.4	N17 11.0	128 14.6	16.6	S 1 50.8	12.5	54.1	56	19 53	20 40	21 49	13 55	15 07	16 20	17 33
19	105 53.4	11.6	142 50.2	16.5	1 38.3	12.5	54.1	54	19 44	20 28	21 28	13 58	15 08	16 18	17 30
20	120 53.5	12.3	157 25.7	16.6	1 25.8	12.5	54.1	52	19 36	20 17	21 11	14 02	15 09	16 17	17 26
21	135 53.5	13.0	172 01.3	16.5	1 13.3	12.5	54.2	50	19 29	20 07	20 57	14 04	15 10	16 16	17 23
22	150 53.5	13.7	186 36.8	16.6	1 00.8	12.6	54.2	45	19 14	19 47	20 29	14 11	15 12	16 14	17 17
23	165 53.6	14.3	201 12.4	16.5	0 48.2	12.5	54.2	N 40	19 01	19 31	20 08	14 16	15 14	16 12	17 12
8 00	180 53.6	N17 15.0	215 47.9	16.6	S 0 35.7	12.6	54.2	35	18 51	19 18	19 52	14 20	15 15	16 11	17 07
01	195 53.6	15.7	230 23.5	16.5	0 23.1	12.5	54.2	30	18 42	19 07	19 38	14 24	15 17	16 09	17 03
02	210 53.7	16.3	244 59.0	16.5	S 0 10.6	12.6	54.2	20	18 26	18 49	19 17	14 31	15 19	16 07	16 56
03	225 53.7	17.0	259 34.5	16.5	N 0 02.0	12.6	54.2	N 10	18 12	18 35	19 00	14 37	15 21	16 05	16 50
04	240 53.7	17.7	274 10.0	16.5	0 14.6	12.5	54.2	0	18 00	18 22	18 47	14 42	15 22	16 03	16 44
05	255 53.7	18.4	288 45.5	16.5	0 27.1	12.6	54.2	S 10	17 47	18 09	18 35	14 47	15 24	16 01	16 38
06	270 53.8	N17 19.0	303 21.0	16.5	N 0 39.7	12.6	54.2	20	17 34	17 57	18 24	14 53	15 26	15 59	16 32
07	285 53.8	19.7	317 56.5	16.4	0 52.3	12.6	54.2	30	17 19	17 44	18 13	15 00	15 28	15 56	16 25
08	300 53.8	20.4	332 31.9	16.5	1 04.9	12.5	54.2	35	17 11	17 37	18 08	15 03	15 29	15 55	16 21
09	315 53.9	21.0	347 07.4	16.4	1 17.4	12.6	54.2	40	17 01	17 30	18 02	15 07	15 30	15 53	16 17
10	330 53.9	21.7	1 42.8	16.4	1 30.0	12.6	54.3	45	16 50	17 21	17 56	15 12	15 32	15 51	16 11
11	345 53.9	22.4	16 18.2	16.4	1 42.6	12.6	54.3	S 50	16 36	17 11	17 50	15 18	15 34	15 49	16 05
12	0 53.9	N17 23.0	30 53.6	16.4	N 1 55.2	12.5	54.3	52	16 29	17 06	17 47	15 21	15 35	15 48	16 02
13	15 54.0	23.7	45 29.0	16.4	2 07.7	12.6	54.3	54	16 22	17 01	17 44	15 23	15 35	15 47	15 59
14	30 54.0	24.4	60 04.4	16.3	2 20.3	12.6	54.3	56	16 14	16 56	17 41	15 27	15 36	15 46	15 56
15	45 54.0	25.0	74 39.7	16.4	2 32.9	12.6	54.3	58	16 05	16 49	17 37	15 30	15 37	15 45	15 52
16	60 54.1	25.7	89 15.1	16.3	2 45.5	12.5	54.3	S 60	15 55	16 43	17 33	15 34	15 39	15 43	15 48
17	75 54.1	26.3	103 50.4	16.2	2 58.0	12.6	54.3	Day	SUN		MOON				
18	90 54.1	N17 27.0	118 25.6	16.3	N 3 10.6	12.5	54.3		Eqn. of Time	Mer.	Mer. Pass.		Age Phase		
19	105 54.1	27.7	133 00.9	16.2	3 23.										

UT	ARIES			VENUS -3.9			MARS +1.7			JUPITER -2.0			SATURN +0.1			STARS			
	GHA	GHA	Dec	GHA	Dec		GHA	Dec		GHA	Dec		GHA	Dec		Name	SHA	Dec	
10 F R I D A Y	00	227 37.2	151 33.2 N23	58.3	151 02.2 N23	44.9	124 05.5 N23	04.8		154 11.5 N21	13.0		Acamar	315 25.3 S40	17.8				
	01	242 39.7	166 32.3	58.7	166 02.9	45.1	139 07.5	04.7		169 13.6	13.1		Achernar	335 33.7 S57	13.5				
	02	257 42.1	181 31.5	59.1	181 03.5	45.3	154 09.5	04.7		184 15.8	13.1		Acrux	173 18.8 S63	06.9				
	03	272 44.6	196 30.7	59.5	196 04.2	45.4	169 11.5	04.7		199 17.9	13.1		Adhara	255 19.7 S28	58.7				
	04	287 47.1	211 29.9	59.9	211 04.8	45.6	184 13.5	04.6		214 20.1	13.2		Aldebaran	290 59.8 N16	30.8				
	05	302 49.5	226 29.1	00.3	226 05.5	45.8	199 15.5	04.6		229 22.2	13.2								
	06	317 52.0	241 28.3 N24	00.6	241 06.1 N23	45.9	214 17.5 N23	04.5		244 24.3 N21	13.3		Alioth	166 27.8 N55	57.1				
	07	332 54.4	256 27.5	01.0	256 06.8	46.1	229 19.4	04.5		259 26.5	13.3		Alkaid	153 05.2 N49	18.2				
	08	347 56.9	271 26.6	01.4	271 07.4	46.3	244 21.4	04.5		274 28.6	13.3		Al Na'ir	27 54.7 S46	56.9				
	09	2 59.4	286 25.8	01.8	286 08.1	46.4	259 23.4	04.4		289 30.8	13.4		Alnilam	275 55.6 S 1	12.1				
	10	18 01.8	301 25.0	02.2	301 08.7	46.6	274 25.4	04.4		304 32.9	13.4		Alphard	218 04.7 S 8	40.2				
	11	33 04.3	316 24.2	02.5	316 09.4	46.8	289 27.4	04.4		319 35.0	13.5								
	12	48 06.8	331 23.4 N24	02.9	331 10.0 N23	46.9	304 29.4 N23	04.3		334 37.2 N21	13.5		Alphecca	126 18.0 N26	42.4				
	13	63 09.2	346 22.6	03.3	346 10.7	47.1	319 31.4	04.3		349 39.3	13.5		Alpheratz	357 52.9 N29	05.9				
	14	78 11.7	1 21.7	03.7	1 11.3	47.3	334 33.4	04.2		4 41.4	13.6		Altair	62 16.6 N 8	52.3				
	15	93 14.2	16 20.9	04.0	16 12.0	47.4	349 35.4	04.2		19 43.6	13.6		Ankaa	353 24.6 S42	17.6				
	16	108 16.6	31 20.1	04.4	31 12.6	47.6	4 37.4	04.2		34 45.7	13.7		Antares	112 36.7 S26	26.2				
	17	123 19.1	46 19.3	04.8	46 13.3	47.7	19 39.4	04.1		49 47.9	13.7								
	18	138 21.5	61 18.5 N24	05.1	61 13.9 N23	47.9	34 41.3 N23	04.1		64 50.0 N21	13.7		Arcturus	146 03.4 N19	10.3				
	19	153 24.0	76 17.6	05.5	76 14.6	48.1	49 43.3	04.1		79 52.1	13.8		Atria	107 46.0 S69	01.8				
	20	168 26.5	91 16.8	05.9	91 15.2	48.2	64 45.3	04.0		94 54.3	13.8		Avior	234 21.9 S59	31.3				
	21	183 28.9	106 16.0	06.2	106 15.9	48.4	79 47.3	04.0		109 56.4	13.9		Bellatrix	278 41.7 N 6	21.0				
	22	198 31.4	121 15.2	06.6	121 16.5	48.6	94 49.3	03.9		124 58.6	13.9		Betelgeuse	271 11.1 N 7	24.4				
23	213 33.9	136 14.4	07.0	136 17.1	48.7	109 51.3	03.9		140 00.7	13.9									
11 S A T U R D A Y	00	228 36.3	151 13.5 N24	07.3	151 17.8 N23	48.9	124 53.3 N23	03.9		155 02.8 N21	14.0		Canopus	264 00.4 S52	42.0				
	01	243 38.8	166 12.7	07.7	166 18.4	49.0	139 55.3	03.8		170 05.0	14.0		Capella	280 47.9 N46	00.1				
	02	258 41.3	181 11.9	08.0	181 19.1	49.2	154 57.3	03.8		185 07.1	14.1		Deneb	49 37.4 N45	16.9				
	03	273 43.7	196 11.1	08.4	196 19.7	49.4	169 59.3	03.7		200 09.3	14.1		Denebola	182 42.4 N14	33.6				
	04	288 46.2	211 10.3	08.8	211 20.4	49.5	185 01.2	03.7		215 11.4	14.1		Diphda	349 04.9 S17	58.6				
	05	303 48.7	226 09.4	09.1	226 21.0	49.7	200 03.2	03.7		230 13.5	14.2								
	06	318 51.1	241 08.6 N24	09.5	241 21.7 N23	49.8	215 05.2 N23	03.6		245 15.7 N21	14.2		Dubhe	194 01.9 N61	44.6				
	07	333 53.6	256 07.8	09.8	256 22.3	50.0	230 07.2	03.6		260 17.8	14.3		Elnath	278 24.1 N28	36.6				
	08	348 56.0	271 07.0	10.2	271 23.0	50.1	245 09.2	03.6		275 19.9	14.3		Eltanin	90 49.8 N51	29.1				
	09	3 58.5	286 06.2	10.5	286 23.6	50.3	260 11.2	03.5		290 22.1	14.3		Enif	33 55.8 N 9	52.9				
	10	19 01.0	301 05.3	10.9	301 24.3	50.5	275 13.2	03.5		305 24.2	14.4		Fomalhaut	15 33.7 S29	36.6				
	11	34 03.4	316 04.5	11.2	316 24.9	50.6	290 15.2	03.4		320 26.4	14.4								
	12	49 05.9	331 03.7 N24	11.6	331 25.6 N23	50.8	305 17.1 N23	03.4		335 28.5 N21	14.5		Gacrux	172 10.5 S57	07.7				
	13	64 08.4	346 02.9	11.9	346 26.2	50.9	320 19.1	03.4		350 30.6	14.5		Gienah	176 01.1 S17	33.3				
	14	79 10.8	1 02.0	12.3	1 26.9	51.1	335 21.1	03.3		5 32.8	14.5		Hadar	148 59.9 S60	23.1				
	15	94 13.3	16 01.2	12.6	16 27.5	51.2	350 23.1	03.3		20 34.9	14.6		Hamal	328 11.1 N23	28.2				
	16	109 15.8	31 00.4	12.9	31 28.2	51.4	5 25.1	03.2		35 37.1	14.6		Kaus Aust.	83 55.1 S34	23.0				
	17	124 18.2	45 59.6	13.3	46 28.8	51.5	20 27.1	03.2		50 39.2	14.7								
	18	139 20.7	60 58.8 N24	13.6	61 29.5 N23	51.7	35 29.1 N23	03.2		65 41.3 N21	14.7		Kochab	137 18.2 N74	08.9				
	19	154 23.1	75 57.9	14.0	76 30.1	51.9	50 31.1	03.1		80 43.5	14.7		Markab	13 47.2 N15	12.8				
	20	169 25.6	90 57.1	14.3	91 30.8	52.0	65 33.0	03.1		95 45.6	14.8		Menkar	314 24.6 N 4	05.8				
	21	184 28.1	105 56.3	14.6	106 31.4	52.2	80 35.0	03.0		110 47.7	14.8		Menkent	148 17.6 S36	22.9				
	22	199 30.5	120 55.5	15.0	121 32.1	52.3	95 37.0	03.0		125 49.9	14.9		Miaplacidus	221 41.8 S69	43.8				
23	214 33.0	135 54.6	15.3	136 32.7	52.5	110 39.0	03.0		140 52.0	14.9									
12 S U N D A Y	00	229 35.5	150 53.8 N24	15.6	151 33.4 N23	52.6	125 41.0 N23	02.9		155 54.2 N21	14.9		Mirfak	308 53.5 N49	52.1				
	01	244 37.9	165 53.0	16.0	166 34.0	52.8	140 43.0	02.9		170 56.3	15.0		Nunki	76 08.9 S26	17.6				
	02	259 40.4	180 52.2	16.3	181 34.7	52.9	155 45.0	02.9		185 58.4	15.0		Peacock	53 32.7 S56	43.5				
	03	274 42.9	195 51.3	16.6	196 35.3	53.1	170 46.9	02.8		201 00.6	15.0		Pollux	243 38.6 N28	01.4				
	04	289 45.3	210 50.5	17.0	211 35.9	53.2	185 48.9	02.8		216 02.7	15.1		Procyon	245 09.1 N 5	13.1				
	05	304 47.8	225 49.7	17.3	226 36.6	53.4	200 50.9	02.7		231 04.8	15.1								
	06	319 50.3	240 48.9 N24	17.6	241 37.2 N23	53.5	215 52.9 N23	02.7		246 07.0 N21	15.2		Rasalhague	96 14.3 N12	33.4				
	07	334 52.7	255 48.0	17.9	256 37.9	53.7	230 54.9	02.7		261 09.1	15.2		Regulus	207 52.8 N11	57.4				
	08	349 55.2	270 47.2	18.3	271 38.5	53.8	245 56.9	02.6		276 11.2	15.2		Rigel	281 20.8 S 8	12.0				
	09	4 57.6	285 46.4	18.6	286 39.2	54.0	260 58.8	02.6		291 13.4	15.3		Rigil Kent.	140 03.3 S60	50.7				
	10	20 00.1	300 45.5	18.9	301 39.8	54.1	276 00.8	02.5		306 15.5	15.3		Sabik	102 22.3 S15	43.7				
	11	35 02.6	315 44.7	19.2	316 40.5	54.3	291 02.8	02.5		321 17.7	15.4								
	12	50 05.0	330 43.9 N24	19.5	331 41.1 N23	54.4	306 04.8 N23	02.5		336 19.8 N21	15.4		Schedar	349 51.2 N56	32.7				
	13	65 07.5	345 43.1	19.9	346 41.8	54.6	321 06.8	02.4		351 21.9	15.4		Shaula	96 33.5 S37	06.3				
	14	80 10.0	0 42.2	20.2	1 42.4	54.7	336 08.8	02.4		6 24.1	15.5		Sirius	258 41.7 S16	43.3				
	15	95 12.4	15 41.4	20.5	16 43.1	54.8	351 10.7	02.3		21 26.2	15.5		Spica	158 40.2 S11	10.4				
	16	110 14.9	30 40.6	20.8	31 43.7	55.0	6 12.7	02.3		36 28.3	15.6		Suhail	222 59.0 S43	26.7				
	17</																		

UT	SUN		MOON				Lat.	Twilight			Moonrise						
	GHA	Dec	GHA	v	Dec	d		HP	Naut.	Civil	Sunrise	10	11	12	13		
									h m	h m	h m	h m	h m	h m	h m	h m	
	° /	° /	° /	' /	° /	' /	' /	°	h m	h m	h m	h m	h m	h m	h m	h m	
	N 72							□	□	□	03 19	02 53	02 17	□			
FRI DAY	10 00	180 54.3	N17 31.0	205 56.8	16.1	N 4	25.8	12.5	54.4	N 70	///	///	01 25	03 26	03 08	02 45	02 06
	01	195 54.3	31.6	220 31.9	16.1	4	38.3	12.4	54.4	68	///	///	02 10	03 31	03 20	03 06	02 47
	02	210 54.3	32.3	235 07.0	16.0	4	50.7	12.5	54.4	66	///	00 28	02 39	03 36	03 30	03 23	03 15
	03	225 54.3	32.9	249 42.0	16.0	5	03.2	12.5	54.4	64	///	01 35	03 01	03 40	03 38	03 37	03 37
	04	240 54.4	33.6	264 17.0	16.0	5	15.7	12.4	54.4	62	///	02 09	03 18	03 44	03 46	03 49	03 55
	05	255 54.4	34.3	278 52.0	16.0	5	28.1	12.5	54.4	60	00 25	02 33	03 33	03 47	03 52	03 59	04 09
	06	270 54.4	N17 34.9	293 27.0	15.9	N 5	40.6	12.4	54.5	N 58	01 25	02 52	03 45	03 50	03 58	04 08	04 22
	07	285 54.4	35.6	308 01.9	15.9	5	53.0	12.4	54.5	56	01 56	03 07	03 55	03 52	04 03	04 16	04 32
	08	300 54.5	36.2	322 36.8	15.8	6	05.4	12.4	54.5	54	02 19	03 20	04 05	03 54	04 07	04 23	04 42
	09	315 54.5	36.9	337 11.6	15.8	6	17.8	12.3	54.5	52	02 36	03 32	04 13	03 56	04 11	04 29	04 51
	10	330 54.5	37.5	351 46.4	15.8	6	30.1	12.4	54.5	50	02 51	03 42	04 20	03 58	04 15	04 35	04 58
	11	345 54.5	38.2	366 21.2	15.7	6	42.5	12.3	54.5	45	03 20	04 02	04 36	04 02	04 23	04 47	05 15
	12	0 54.5	N17 38.8	20 55.9	15.7	N 6	54.8	12.3	54.5	N 40	03 42	04 19	04 49	04 06	04 30	04 57	05 28
	13	15 54.6	39.5	35 30.6	15.7	7	07.1	12.3	54.5	35	03 59	04 32	05 00	04 09	04 36	05 06	05 40
	14	30 54.6	40.2	50 05.3	15.6	7	19.4	12.3	54.6	30	04 12	04 44	05 09	04 11	04 41	05 14	05 50
	15	45 54.6	40.8	64 39.9	15.5	7	31.7	12.2	54.6	20	04 35	05 02	05 26	04 16	04 50	05 27	06 07
	16	60 54.6	41.5	79 14.4	15.6	7	43.9	12.3	54.6	N 10	04 52	05 18	05 40	04 20	04 58	05 39	06 23
	17	75 54.7	42.1	93 49.0	15.4	7	56.2	12.2	54.6	0	05 06	05 31	05 53	04 24	05 06	05 50	06 37
	18	90 54.7	N17 42.8	108 23.4	15.5	N 8	08.4	12.1	54.6	S 10	05 18	05 44	06 06	04 28	05 14	06 01	06 52
	19	105 54.7	43.4	122 57.9	15.4	8	20.5	12.2	54.6	20	05 30	05 56	06 20	04 32	05 22	06 13	07 07
	20	120 54.7	44.1	137 32.3	15.3	8	32.7	12.1	54.6	30	05 41	06 10	06 35	04 37	05 31	06 27	07 25
	21	135 54.7	44.7	152 06.6	15.3	8	44.8	12.1	54.7	35	05 47	06 17	06 44	04 40	05 37	06 35	07 36
	22	150 54.8	45.4	166 40.9	15.3	8	56.9	12.1	54.7	40	05 53	06 25	06 54	04 43	05 43	06 45	07 48
23	165 54.8	46.0	181 15.2	15.2	9	09.0	12.0	54.7	45	05 59	06 35	07 06	04 46	05 50	06 56	08 02	
SAT DAY	11 00	180 54.8	N17 46.6	195 49.4	15.2	N 9	21.0	12.0	54.7	S 50	06 06	06 46	07 21	04 51	05 59	07 09	08 20
	01	195 54.8	47.3	210 23.6	15.1	9	33.0	12.0	54.7	52	06 09	06 50	07 28	04 53	06 03	07 15	08 28
	02	210 54.8	47.9	224 57.7	15.0	9	45.0	11.9	54.7	54	06 13	06 56	07 35	04 55	06 08	07 22	08 38
	03	225 54.9	48.6	239 31.7	15.0	9	56.9	11.9	54.7	56	06 16	07 02	07 43	04 58	06 13	07 30	08 48
	04	240 54.9	49.2	254 05.7	15.0	10	08.8	11.9	54.8	58	06 20	07 08	07 53	05 01	06 18	07 38	09 00
	05	255 54.9	49.9	268 39.7	14.9	10	20.7	11.8	54.8	S 60	06 24	07 15	08 04	05 04	06 24	07 48	09 15
	06	270 54.9	N17 50.5	283 13.6	14.9	N10	32.5	11.8	54.8								
	07	285 54.9	51.2	297 47.5	14.8	10	44.3	11.8	54.8	Lat.	Sunset	Twilight		Moonset			
	08	300 54.9	51.8	312 21.3	14.7	10	56.1	11.7	54.8			Civil	Naut.	10	11	12	13
	09	315 55.0	52.5	326 55.0	14.7	11	07.8	11.7	54.8								
	10	330 55.0	53.1	341 28.7	14.6	11	19.5	11.7	54.9								
	11	345 55.0	53.7	356 02.3	14.6	11	31.2	11.6	54.9	N 72	□	□	□	18 32	20 39	□	□
	12	0 55.0	N17 54.4	10 35.9	14.5	N11	42.8	11.6	54.9	N 70	22 35	///	///	18 19	20 12	22 27	□
	13	15 55.0	55.0	25 09.4	14.4	11	54.4	11.5	54.9	68	21 47	///	///	18 09	19 52	21 47	24 15
	14	30 55.0	55.7	39 42.8	14.4	12	05.9	11.5	54.9	66	21 17	///	///	18 00	19 37	21 20	23 14
	15	45 55.0	56.3	54 16.2	14.4	12	17.4	11.5	54.9	64	20 54	22 23	///	17 53	19 24	20 59	22 40
	16	60 55.1	56.9	68 49.6	14.2	12	28.9	11.4	54.9	62	20 37	21 47	///	17 47	19 13	20 43	22 15
	17	75 55.1	57.6	83 22.8	14.3	12	40.3	11.3	55.0	60	20 22	21 22	///	17 42	19 04	20 29	21 55
	18	90 55.1	N17 58.2	97 56.1	14.1	N12	51.6	11.3	55.0	N 58	20 09	21 03	22 32	17 37	18 56	20 17	21 39
	19	105 55.1	58.8	112 29.2	14.1	13	02.9	11.3	55.0	56	19 59	20 47	22 00	17 33	18 49	20 07	21 25
	20	120 55.1	59.5	127 02.3	14.0	13	14.2	11.2	55.0	54	19 49	20 34	21 36	17 30	18 43	19 58	21 14
	21	135 55.1	60.1	141 35.3	14.0	13	25.4	11.1	55.0	52	19 41	20 22	21 18	17 26	18 37	19 50	21 03
	22	150 55.1	60.8	156 08.3	13.9	13	36.5	11.2	55.0	50	19 33	20 12	21 03	17 23	18 32	19 43	20 54
23	165 55.2	61.4	170 41.2	13.8	13	47.7	11.0	55.1	45	19 17	19 51	20 34	17 17	18 21	19 27	20 35	
SUN DAY	12 00	180 55.2	N18 02.0	185 14.0	13.7	N13	58.7	11.0	55.1	N 40	19 04	19 35	20 12	17 12	18 12	19 15	20 19
	01	195 55.2	02.7	199 46.7	13.7	14	09.7	11.0	55.1	35	18 53	19 21	19 55	17 07	18 05	19 04	20 05
	02	210 55.2	03.3	214 19.4	13.7	14	20.7	10.9	55.1	30	18 44	19 10	19 41	17 03	17 58	18 55	19 54
	03	225 55.2	03.9	228 52.1	13.5	14	31.6	10.8	55.1	20	18 27	18 51	19 18	16 56	17 46	18 39	19 34
	04	240 55.2	04.6	243 24.6	13.5	14	42.4	10.8	55.2	N 10	18 13	18 35	19 01	16 50	17 36	18 25	19 17
	05	255 55.2	05.2	257 57.1	13.4	14	53.2	10.7	55.2	0	18 00	18 22	18 47	16 44	17 27	18 12	19 01
	06	270 55.2	N18 05.8	272 29.5	13.4	N15	03.9	10.7	55.2	S 10	17 47	18 09	18 34	16 38	17 17	18 00	18 45
	07	285 55.3	06.5	287 01.9	13.3	15	14.6	10.6	55.2	20	17 33	17 56	18 23	16 32	17 07	17 46	18 28
	08	300 55.3	07.1	301 34.2	13.2	15	25.2	10.5	55.2	30	17 17	17 42	18 11	16 25	16 56	17 30	18 09
	09	315 55.3	07.7	316 06.4	13.1	15	35.7	10.5	55.2	35	17 08	17 35	18 05	16 21	16 50	17 21	17 57
	10	330 55.3	08.3	330 38.5	13.1	15	46.2	10.5	55.3	40	16 58	17 27	17 59	16 17	16 42	17 11	17 45
	11	345 55.3	09.0	345 10.6	13.0	15	56.7	10.3	55.3	45	16 46	17 17	17 53	16 11	16 33	16 59	17 29
	12	0 55.3	N18 09.6	359 42.6	12.9	N16	07.0	10.3	55.3	S 50	16 31	17 07	17 46	16 05	16 23	16 44	17 11
	13	15 55.3	10.2	14 14.5	12.8	16	17.3	10.2	55.3	52	16 25	17 02	17 43	16 02	16 18	16 38	17 02
	14	30 55.3	10.9	28 46.3	12.8	16	27.5	10.2	55.3	54	16 17	16 56	17 39	15 59	16 13	16 30	16 52
	15	45 55.3	11.5	43 18.1	12.7	16	37.7	10.1	55.3	56	16 09	16 50	17 36	15 56	16 07	16 22	16 41
	16	60 55.4	12.1	57 49.8	12.6	16	47.8</										

UT	ARIES		VENUS -3.9		MARS +1.7		JUPITER -1.9		SATURN +0.1		STARS		
	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
MONDAY	13 00	230 34.6	150 34.0 N24 23.3	151 48.9 N23 56.2	126 28.6 N23 02.0	156 45.4 N21 15.9	Acamar	315 25.3	S40 17.8				
	01	245 37.1	165 33.1 23.6	166 49.6 56.3	141 30.6 01.9	171 47.6 15.9	Achernar	335 33.7	S57 13.5				
	02	260 39.5	180 32.3 23.9	181 50.2 56.4	156 32.5 01.9	186 49.7 16.0	Acruz	173 18.9	S63 06.9				
	03	275 42.0	195 31.5 . . 24.2	196 50.9 . . 56.6	171 34.5 . . 01.9	201 51.8 . . 16.0	Adhara	255 19.7	S28 58.7				
	04	290 44.5	210 30.6 24.5	211 51.5 56.7	186 36.5 01.8	216 54.0 16.0	Aldebaran	290 59.8	N16 30.8				
	05	305 46.9	225 29.8 24.8	226 52.1 56.9	201 38.5 01.8	231 56.1 16.1							
	06	320 49.4	240 29.0 N24 25.1	241 52.8 N23 57.0	216 40.5 N23 01.7	246 58.2 N21 16.1	Alioth	166 27.8	N55 57.1				
	07	335 51.9	255 28.1 25.4	256 53.4 57.1	231 42.5 01.7	262 00.4 16.1	Alkaid	153 05.2	N49 18.3				
	08	350 54.3	270 27.3 25.6	271 54.1 57.3	246 44.4 01.7	277 02.5 16.2	Al Na'ir	27 54.6	S46 56.9				
	09	5 56.8	285 26.5 . . 25.9	286 54.7 . . 57.4	261 46.4 . . 01.6	292 04.6 . . 16.2	Alnilam	275 55.6	S 1 12.1				
	10	20 59.3	300 25.6 26.2	301 55.4 57.6	276 48.4 01.6	307 06.8 16.3	Alphard	218 04.7	S 8 40.2				
	11	36 01.7	315 24.8 26.5	316 56.0 57.7	291 50.4 01.5	322 08.9 16.3							
	12	51 04.2	330 24.0 N24 26.8	331 56.7 N23 57.8	306 52.4 N23 01.5	337 11.1 N21 16.3	Alphecca	126 18.0	N26 42.4				
	13	66 06.6	345 23.2 27.1	346 57.3 58.0	321 54.3 01.4	352 13.2 16.4	Alpheratz	357 52.9	N29 05.9				
	14	81 09.1	0 22.3 27.4	1 58.0 58.1	336 56.3 01.4	7 15.3 16.4	Altair	62 16.6	N 8 52.3				
	15	96 11.6	15 21.5 . . 27.7	16 58.6 . . 58.3	351 58.3 . . 01.4	22 17.5 . . 16.5	Ankaa	353 24.5	S42 17.6				
	16	111 14.0	30 20.7 28.0	31 59.3 58.4	7 00.3 01.3	37 19.6 16.5	Antares	112 36.7	S26 26.2				
	17	126 16.5	45 19.8 28.2	46 59.9 58.5	22 02.2 01.3	52 21.7 16.5							
	18	141 19.0	60 19.0 N24 28.5	62 00.6 N23 58.7	37 04.2 N23 01.2	67 23.9 N21 16.6	Arcturus	146 03.4	N19 10.3				
	19	156 21.4	75 18.2 28.8	77 01.2 58.8	52 06.2 01.2	82 26.0 16.6	Atria	107 46.0	S69 01.8				
	20	171 23.9	90 17.3 29.1	92 01.9 58.9	67 08.2 01.2	97 28.1 16.7	Avior	234 21.9	S59 31.3				
	21	186 26.4	105 16.5 . . 29.4	107 02.5 . . 59.1	82 10.2 . . 01.1	112 30.3 . . 16.7	Bellatrix	278 41.7	N 6 21.0				
	22	201 28.8	120 15.7 29.6	122 03.2 59.2	97 12.1 01.1	127 32.4 16.7	Betelgeuse	271 11.1	N 7 24.4				
23	216 31.3	135 14.8 29.9	137 03.8 59.4	112 14.1 01.0	142 34.5 16.8								
TUESDAY	14 00	231 33.7	150 14.0 N24 30.2	152 04.5 N23 59.5	127 16.1 N23 01.0	157 36.7 N21 16.8	Canopus	264 00.5	S52 42.0				
	01	246 36.2	165 13.2 30.5	167 05.1 59.6	142 18.1 01.0	172 38.8 16.9	Capella	280 47.9	N46 00.1				
	02	261 38.7	180 12.3 30.7	182 05.7 59.8	157 20.1 00.9	187 40.9 16.9	Deneb	49 37.4	N45 17.0				
	03	276 41.1	195 11.5 . . 31.0	197 06.4 23 59.9	172 22.0 . . 00.9	202 43.1 . . 16.9	Denebola	182 42.4	N14 33.6				
	04	291 43.6	210 10.7 31.3	212 07.0 24 00.0	187 24.0 00.8	217 45.2 17.0	Diphda	349 04.9	S17 58.5				
	05	306 46.1	225 09.8 31.5	227 07.7 00.2	202 26.0 00.8	232 47.3 17.0							
	06	321 48.5	240 09.0 N24 31.8	242 08.3 N24 00.3	217 28.0 N23 00.7	247 49.5 N21 17.0	Dubhe	194 02.0	N61 44.6				
	07	336 51.0	255 08.2 32.1	257 09.0 00.4	232 29.9 00.7	262 51.6 17.1	Elnath	278 24.1	N28 36.6				
	08	351 53.5	270 07.3 32.3	272 09.6 00.6	247 31.9 00.7	277 53.7 17.1	Eltanin	90 49.8	N51 29.1				
	09	6 55.9	285 06.5 . . 32.6	287 10.3 . . 00.7	262 33.9 . . 00.6	292 55.9 . . 17.2	Enif	33 55.7	N 9 52.9				
	10	21 58.4	300 05.7 32.9	302 10.9 00.8	277 35.9 00.6	307 58.0 17.2	Fomalhaut	15 33.7	S29 36.6				
	11	37 00.9	315 04.8 33.1	317 11.6 00.9	292 37.8 00.5	323 00.1 17.2							
	12	52 03.3	330 04.0 N24 33.4	332 12.2 N24 01.1	307 39.8 N23 00.5	338 02.3 N21 17.3	Gacrux	172 10.5	S57 07.7				
	13	67 05.8	345 03.2 33.6	347 12.9 01.2	322 41.8 00.5	353 04.4 17.3	Gienah	176 01.2	S17 33.3				
	14	82 08.2	0 02.3 33.9	2 13.5 01.3	337 43.8 00.4	8 06.5 17.4	Hadar	148 59.9	S60 23.1				
	15	97 10.7	15 01.5 . . 34.2	17 14.2 . . 01.5	352 45.7 . . 00.4	23 08.7 . . 17.4	Hamal	328 11.0	N23 28.2				
	16	112 13.2	30 00.6 34.4	32 14.8 01.6	7 47.7 00.3	38 10.8 17.4	Kaus Aust.	83 55.1	S34 23.0				
	17	127 15.6	44 59.8 34.7	47 15.5 01.7	22 49.7 00.3	53 12.9 17.5							
	18	142 18.1	59 59.0 N24 34.9	62 16.1 N24 01.9	37 51.7 N23 00.2	68 15.1 N21 17.5	Kochab	137 18.2	N74 08.9				
	19	157 20.6	74 58.1 35.2	77 16.8 02.0	52 53.6 00.2	83 17.2 17.6	Markab	13 47.2	N15 12.8				
	20	172 23.0	89 57.3 35.4	92 17.4 02.1	67 55.6 00.2	98 19.4 17.6	Menkar	314 24.6	N 4 05.8				
	21	187 25.5	104 56.5 . . 35.7	107 18.1 . . 02.2	82 57.6 . . 00.1	113 21.5 . . 17.6	Menkent	148 17.6	S36 22.9				
	22	202 28.0	119 55.6 35.9	122 18.7 02.4	97 59.6 00.1	128 23.6 17.7	Miaplacidus	221 41.9	S69 43.8				
23	217 30.4	134 54.8 36.2	137 19.4 02.5	113 01.5 00.0	143 25.8 17.7								
WEDNESDAY	15 00	232 32.9	149 54.0 N24 36.4	152 20.0 N24 02.6	128 03.5 N23 00.0	158 27.9 N21 17.8	Mirfak	308 53.5	N49 52.0				
	01	247 35.4	164 53.1 36.7	167 20.6 02.7	143 05.5 23 00.0	173 30.0 17.8	Nunki	76 08.9	S26 17.6				
	02	262 37.8	179 52.3 36.9	182 21.3 02.9	158 07.5 22 59.9	188 32.1 17.8	Peacock	53 32.7	S56 43.5				
	03	277 40.3	194 51.5 . . 37.1	197 21.9 . . 03.0	173 09.4 . . 59.9	203 34.3 . . 17.9	Pollux	243 38.6	N28 01.4				
	04	292 42.7	209 50.6 37.4	212 22.6 03.1	188 11.4 59.8	218 36.4 17.9	Procyon	245 09.1	N 5 13.1				
	05	307 45.2	224 49.8 37.6	227 23.2 03.2	203 13.4 59.8	233 38.5 17.9							
	06	322 47.7	239 48.9 N24 37.9	242 23.9 N24 03.4	218 15.4 N22 59.7	248 40.7 N21 18.0	Rasalhague	96 14.3	N12 33.4				
	07	337 50.1	254 48.1 38.1	257 24.5 03.5	233 17.3 59.7	263 42.8 18.0	Regulus	207 52.8	N11 57.4				
	08	352 52.6	269 47.3 38.3	272 25.2 03.6	248 19.3 59.7	278 44.9 18.1	Rigel	281 20.8	S 8 12.0				
	09	7 55.1	284 46.4 . . 38.6	287 25.8 . . 03.7	263 21.3 . . 59.6	293 47.1 . . 18.1	Rigil Kent.	140 03.3	S60 50.7				
	10	22 57.5	299 45.6 38.8	302 26.5 03.9	278 23.3 59.6	308 49.2 18.1	Sabik	102 22.3	S15 43.7				
	11	38 00.0	314 44.8 39.0	317 27.1 04.0	293 25.2 59.5	323 51.3 18.2							
	12	53 02.5	329 43.9 N24 39.3	332 27.8 N24 04.1	308 27.2 N22 59.5	338 53.5 N21 18.2	Schedar	349 51.1	N56 32.7				
	13	68 04.9	344 43.1 39.5	347 28.4 04.2	323 29.2 59.4	353 55.6 18.3	Shaula	96 33.5	S37 06.3				
	14	83 07.4	359 42.2 39.7	2 29.1 04.3	338 31.1 59.4	8 57.7 18.3	Sirius	258 41.7	S16 43.2				
	15	98 09.9	14 41.4 . . 40.0	17 29.7 . . 04.5	353 33.1 . . 59.4	23 59.9 . . 18.3	Spica	158 40.2	S11 10.4				
	16	113 12.3	29 40.6 40.2	32 30.4 04.6	8 35.1 59.3	39 02.0 18.4	Suhail	222 59.0	S43 26.7				
	17	128 14.8	44 39.7 40.4	47 31.0 04.7	23 37.1 59.3	54 04.1 18.4							
	18	143 17.2	59 38.9 N24 40.6	62 31.7 N24 04.8	38 39.0 N22 59.2	69 06.3 N21 18.4	Vega	80 44.6	N38 46.9				
	19	158 19.7	74 38.0 40.9	77 32.3 04.9	53 41.0 59.2	84 08.4 18.5	Zuben'ubi	137 14.8	S16 03.1				
	20	173 22.2	89 37.2 41.1	92 32.9 05.1	68 43.0 59.1	99 10.5 18.5							
	21	188 24.6	104 36.4 . . 41.3	107 33.6 . . 05.2	83 44.9 . . 59.1	114 12.7 . . 18.6							
	22	203 27.1	119 35.5 41.5	122 34.2 05.3	98 46.9 59.1	129 14.8 18.6	Venus	278 40.2	14 00				
23	218 29.6	134 34.7 41.7	137 34.9 05.4	113 48.9 59.0	144 16.9 18.6	Mars	280 30.7	13 51					
						Jupiter	255 42.3	15 29					
						Saturn	286 02.9	13 28					
	Mer. Pass.	8 32.3	v -0.8 d 0.3	v 0.6 d 0.1	v 2.0 d 0.0	v 2.1 d 0.0							

UT	SUN		MOON				Lat.	Twilight		Sunrise	Moonrise					
	GHA	Dec	GHA	v	Dec	d		HP	Naut.		Civil	13	14	15	16	
									h m		h m	h m	h m	h m	h m	h m
MONDAY	13 00	180 55.4	N18 17.1	174 00.7	12.0	N18 05.9	9.4	55.5	N 70	00 56	02 06	03 37	03 39	03 48	04 17	
	01	195 55.4	17.7	188 31.7	11.9	18 15.3	9.4	55.5	68	01 54	02 47	02 02	02 02	02 02	02 02	
	02	210 55.4	18.3	203 02.6	11.9	18 24.7	9.2	55.6	66	02 27	03 15	03 04	03 04	02 31	02 31	
	03	225 55.4	19.0	217 33.5	11.7	18 33.9	9.2	55.6	64	01 17	02 51	03 37	03 39	03 48	04 17	
	04	240 55.4	19.6	232 04.2	11.7	18 43.1	9.1	55.6	62	01 56	03 10	03 55	04 05	04 24	05 04	
	05	255 55.4	20.2	246 34.9	11.7	18 52.2	9.0	55.6	60	02 23	03 25	04 09	04 25	04 51	05 34	
	06	270 55.5	N18 20.8	261 05.6	11.5	N19 01.2	9.0	55.6	N 58	01 09	02 44	03 38	04 22	04 41	05 11	05 57
	07	285 55.5	21.4	275 36.1	11.5	19 10.2	8.8	55.7	56	01 45	03 00	03 49	04 32	04 56	05 29	06 16
	08	300 55.5	22.1	290 06.6	11.4	19 19.0	8.8	55.7	54	02 10	03 14	03 59	04 42	05 08	05 43	06 32
	09	315 55.5	22.7	304 37.0	11.3	19 27.8	8.7	55.7	52	02 29	03 26	04 08	04 51	05 19	05 56	06 45
	10	330 55.5	23.3	319 07.3	11.2	19 36.5	8.5	55.7	50	02 45	03 37	04 16	04 58	05 28	06 07	06 57
	11	345 55.5	23.9	333 37.5	11.1	19 45.0	8.5	55.7	45	03 15	03 58	04 32	05 15	05 49	06 30	07 22
	12	0 55.5	N18 24.5	348 07.6	11.1	N19 53.5	8.4	55.8	N 40	03 38	04 15	04 46	05 28	06 05	06 49	07 42
	13	15 55.5	25.1	2 37.7	11.0	20 01.9	8.3	55.8	35	03 56	04 29	04 57	05 40	06 19	07 05	07 58
	14	30 55.5	25.8	17 07.7	10.9	20 10.2	8.3	55.8	30	04 10	04 41	05 07	05 50	06 31	07 19	08 12
	15	45 55.5	26.4	31 37.6	10.8	20 18.5	8.1	55.8	20	04 33	05 01	05 24	06 07	06 52	07 42	08 37
	16	60 55.5	27.0	46 07.4	10.8	20 26.6	8.0	55.8	N 10	04 51	05 17	05 39	06 23	07 11	08 02	08 58
	17	75 55.5	27.6	60 37.2	10.7	20 34.6	7.9	55.8	0	05 06	05 31	05 53	06 37	07 28	08 21	09 17
	18	90 55.5	N18 28.2	75 06.9	10.6	N20 42.5	7.8	55.9	S 10	05 19	05 44	06 06	06 52	07 45	08 40	09 37
	19	105 55.5	28.8	89 36.5	10.5	20 50.3	7.8	55.9	20	05 31	05 57	06 21	07 07	08 04	09 01	09 58
	20	120 55.5	29.4	104 06.0	10.4	20 58.1	7.6	55.9	30	05 43	06 12	06 37	07 25	08 25	09 25	10 22
	21	135 55.5	30.0	118 35.4	10.4	21 05.7	7.5	55.9	35	05 49	06 19	06 46	07 36	08 38	09 39	10 37
	22	150 55.5	30.7	133 04.8	10.2	21 13.2	7.5	55.9	40	05 55	06 28	06 57	07 48	08 52	09 55	10 53
23	165 55.5	31.3	147 34.0	10.2	21 20.7	7.3	56.0	45	06 02	06 38	07 10	08 02	09 09	10 14	11 13	
TUESDAY	14 00	180 55.5	N18 31.9	162 03.2	10.2	N21 28.0	7.2	56.0	S 50	06 10	06 49	07 25	08 20	09 31	10 38	11 38
	01	195 55.5	32.5	176 32.4	10.0	21 35.2	7.1	56.0	52	06 13	06 55	07 32	08 28	09 41	10 50	11 50
	02	210 55.5	33.1	191 01.4	10.0	21 42.3	7.0	56.0	54	06 17	07 00	07 40	08 38	09 53	11 04	12 04
	03	225 55.5	33.7	205 30.4	9.9	21 49.3	6.9	56.1	56	06 21	07 07	07 49	08 48	10 06	11 19	12 20
	04	240 55.5	34.3	219 59.3	9.8	21 56.2	6.8	56.1	58	06 25	07 14	07 59	09 00	10 22	11 37	12 39
	05	255 55.5	34.9	234 28.1	9.7	22 03.0	6.7	56.1	S 60	06 29	07 21	08 11	09 15	10 41	12 00	13 03
	06	270 55.5	N18 35.5	248 56.8	9.7	N22 09.7	6.5	56.1	Lat.	Sunset	Twilight		Moonset			
	07	285 55.5	36.1	263 25.5	9.6	22 16.2	6.5	56.1			Civil	Naut.	13	14	15	16
	08	300 55.5	36.7	277 54.1	9.5	22 22.7	6.3	56.2			h m	h m	h m	h m	h m	h m
	09	315 55.5	37.3	292 22.6	9.4	22 29.0	6.2	56.2	N 72	23 08	03 08	03 08	03 08	03 08	03 08	03 08
	10	330 55.5	37.9	306 51.0	9.4	22 35.2	6.1	56.2	N 70	22 04	03 08	03 08	03 08	03 08	03 08	03 08
	11	345 55.5	38.5	321 19.4	9.3	22 41.3	6.0	56.2	68	22 04	03 08	03 08	03 08	03 08	03 08	03 08
	12	0 55.5	N18 39.1	335 47.7	9.2	N22 47.3	5.9	56.2	66	21 29	03 08	03 08	03 08	03 08	03 08	03 08
	13	15 55.5	39.7	350 15.9	9.1	22 53.2	5.8	56.2	64	21 04	03 08	03 08	03 08	03 08	03 08	03 08
	14	30 55.5	40.3	4 44.0	9.1	22 59.0	5.6	56.3	62	20 45	03 08	03 08	03 08	03 08	03 08	03 08
	15	45 55.5	40.9	19 12.1	9.0	23 04.6	5.5	56.3	60	20 29	03 08	03 08	03 08	03 08	03 08	03 08
	16	60 55.5	41.5	33 40.1	9.0	23 10.1	5.4	56.3	N 58	20 16	03 08	03 08	03 08	03 08	03 08	03 08
	17	75 55.5	42.1	48 08.1	8.8	23 15.5	5.3	56.3	56	20 04	03 08	03 08	03 08	03 08	03 08	03 08
	18	90 55.5	N18 42.7	62 35.9	8.8	N23 20.8	5.1	56.4	54	19 54	03 08	03 08	03 08	03 08	03 08	03 08
	19	105 55.5	43.3	77 03.7	8.7	23 25.9	5.1	56.4	52	19 46	03 08	03 08	03 08	03 08	03 08	03 08
	20	120 55.5	43.9	91 31.4	8.7	23 31.0	4.9	56.4	50	19 38	03 08	03 08	03 08	03 08	03 08	03 08
	21	135 55.5	44.5	105 59.1	8.6	23 35.9	4.7	56.4	45	19 21	03 08	03 08	03 08	03 08	03 08	03 08
	22	150 55.5	45.1	120 26.7	8.5	23 40.6	4.7	56.4	N 40	19 07	03 08	03 08	03 08	03 08	03 08	03 08
23	165 55.5	45.7	134 54.2	8.5	23 45.3	4.5	56.5	35	18 57	03 08	03 08	03 08	03 08	03 08	03 08	
WEDNESDAY	15 00	180 55.5	N18 46.3	149 21.7	8.4	N23 49.8	4.4	56.5	30	18 46	03 08	03 08	03 08	03 08	03 08	
	01	195 55.5	46.9	163 49.1	8.3	23 54.2	4.3	56.5	20	18 28	03 08	03 08	03 08	03 08	03 08	
	02	210 55.5	47.5	178 16.4	8.3	23 58.5	4.1	56.5	N 10	18 14	03 08	03 08	03 08	03 08	03 08	
	03	225 55.4	48.1	192 43.7	8.2	24 02.6	4.0	56.5	0	18 00	03 08	03 08	03 08	03 08	03 08	
	04	240 55.4	48.7	207 10.9	8.2	24 06.6	3.9	56.6	S 10	17 46	03 08	03 08	03 08	03 08	03 08	
	05	255 55.4	49.3	221 38.1	8.1	24 10.5	3.7	56.6	20	17 32	03 08	03 08	03 08	03 08	03 08	
	06	270 55.4	N18 49.9	236 05.2	8.0	N24 14.2	3.6	56.6	30	17 15	03 08	03 08	03 08	03 08	03 08	
	07	285 55.4	50.5	250 32.2	8.0	24 17.8	3.5	56.6	35	17 06	03 08	03 08	03 08	03 08	03 08	
	08	300 55.4	51.1	264 59.2	7.9	24 21.3	3.3	56.7	40	16 55	03 08	03 08	03 08	03 08	03 08	
	09	315 55.4	51.7	279 26.1	7.9	24 24.6	3.2	56.7	45	16 42	03 08	03 08	03 08	03 08	03 08	
	10	330 55.4	52.3	293 53.0	7.8	24 27.8	3.0	56.7	S 50	16 27	03 08	03 08	03 08	03 08	03 08	
	11	345 55.4	52.9	308 19.8	7.8	24 30.8	3.0	56.7	52	16 20	03 08	03 08	03 08	03 08	03 08	
	12	0 55.4	N18 53.4	322 46.6	7.7	N24 33.8	2.7	56.7	54	16 12	03 08	03 08	03 08	03 08	03 08	
	13	15 55.4	54.0	337 13.3	7.6	24 36.5	2.7	56.8	56	16 03	03 08	03 08	03 08	03 08	03 08	
	14	30 55.4	54.6	351 39.9	7.7	24 39.2	2.5	56.8	58	15 53	03 08	03 08	03 08	03 08	03 08	
	15	45 55.4	55.2	6 06.6	7.5	24 41.7	2.4	56.8	S 60	15 41	03 08	03 08	03 08	03 08	03 08	
	16	60 55.4	55.8	20 33.1	7.5	24 44.1	2.2	56.8			SUN		MOON			
	17	75 55.3	56.4	34 59.6	7.5	24 46.3	2.1	56.8	Day	Eqn. of Time	Mer.	Mer. Pass.		Age	Phase	
	18	90 55.3	N18 57.0	49 26.1	7.4	N24 48.4	1.9	56.9		00 ^h	12 ^h	Pass.	Upper	Lower	d	%
	19	105 55.3	57.6	63 52.5	7.4	24 50.3	1.8	56.9	13	03 42	03 42	h m	h m	h m	01	1
	20	120 55.3	58.1	78 18.9	7.4	24 52.1	1.6	56.9	14	03 42	03 42	11 56	13 40	01 14	02	4

UT	ARIES			VENUS -3.9			MARS +1.7			JUPITER -1.9			SATURN +0.1			STARS			
	GHA	GHA	Dec	GHA	Dec		GHA	Dec		GHA	Dec		GHA	Dec		Name	SHA	Dec	
16 T H U R S D A Y	00	233 32.0	149 33.9 N24	41.9	152 35.5 N24	05.5	128 50.9 N22	59.0		159 19.1 N21	18.7		Acamar	315 25.3 S40	17.8				
	01	248 34.5	164 33.0	42.2	167 36.2	05.7	143 52.8	58.9		174 21.2	18.7		Achernar	335 33.6 S57	13.5				
	02	263 37.0	179 32.2	42.4	182 36.8	05.8	158 54.8	58.9		189 23.3	18.8		Acruz	173 18.9 S63	06.9				
	03	278 39.4	194 31.3	42.6	197 37.5	05.9	173 56.8	58.8		204 25.5	18.8		Adhara	255 19.7 S28	58.7				
	04	293 41.9	209 30.5	42.8	212 38.1	06.0	188 58.7	58.8		219 27.6	18.8		Aldebaran	290 59.8 N16	30.8				
	05	308 44.4	224 29.7	43.0	227 38.8	06.1	204 00.7	58.8		234 29.7	18.9								
	06	323 46.8	239 28.8 N24	43.2	242 39.4 N24	06.2	219 02.7 N22	58.7		249 31.9 N21	18.9		Alioth	166 27.8 N55	57.1				
	07	338 49.3	254 28.0	43.4	257 40.1	06.4	234 04.6	58.7		264 34.0	19.0		Alkaid	153 05.2 N49	18.3				
	08	353 51.7	269 27.1	43.6	272 40.7	06.5	249 06.6	58.6		279 36.1	19.0		Al Na'ir	27 54.6 S46	56.9				
	09	8 54.2	284 26.3	43.8	287 41.4	06.6	264 08.6	58.6		294 38.2	19.0		Alnilam	275 55.6 S 1	12.1				
	10	23 56.7	299 25.5	44.0	302 42.0	06.7	279 10.6	58.5		309 40.4	19.1		Alphard	218 04.7 S 8	40.2				
	11	38 59.1	314 24.6	44.2	317 42.7	06.8	294 12.5	58.5		324 42.5	19.1								
	12	54 01.6	329 23.8 N24	44.5	332 43.3 N24	06.9	309 14.5 N22	58.5		339 44.6 N21	19.1		Alphecca	126 18.0 N26	42.4				
	13	69 04.1	344 22.9	44.7	347 44.0	07.0	324 16.5	58.4		354 46.8	19.2		Alpheratz	357 52.8 N29	05.9				
	14	84 06.5	359 22.1	44.9	2 44.6	07.2	339 18.4	58.4		9 48.9	19.2		Altair	62 16.6 N 8	52.3				
	15	99 09.0	14 21.3	45.0	17 45.3	07.3	354 20.4	58.3		24 51.0	19.3		Ankaa	353 24.5 S42	17.6				
	16	114 11.5	29 20.4	45.2	32 45.9	07.4	9 22.4	58.3		39 53.2	19.3		Antares	112 36.7 S26	26.2				
	17	129 13.9	44 19.6	45.4	47 46.6	07.5	24 24.3	58.2		54 55.3	19.3								
	18	144 16.4	59 18.7 N24	45.6	62 47.2 N24	07.6	39 26.3 N22	58.2		69 57.4 N21	19.4		Arcturus	146 03.4 N19	10.3				
	19	159 18.8	74 17.9	45.8	77 47.8	07.7	54 28.3	58.1		84 59.6	19.4		Atria	107 45.9 S69	01.8				
	20	174 21.3	89 17.1	46.0	92 48.5	07.8	69 30.2	58.1		100 01.7	19.5		Avior	234 21.9 S59	31.2				
	21	189 23.8	104 16.2	46.2	107 49.1	07.9	84 32.2	58.1		115 03.8	19.5		Bellatrix	278 41.7 N 6	21.0				
	22	204 26.2	119 15.4	46.4	122 49.8	08.0	99 34.2	58.0		130 06.0	19.5		Betelgeuse	271 11.1 N 7	24.4				
23	219 28.7	134 14.5	46.6	137 50.4	08.2	114 36.1	58.0		145 08.1	19.6									
17 F R I D A Y	00	234 31.2	149 13.7 N24	46.8	152 51.1 N24	08.3	129 38.1 N22	57.9		160 10.2 N21	19.6		Canopus	264 00.5 S52	42.0				
	01	249 33.6	164 12.9	47.0	167 51.7	08.4	144 40.1	57.9		175 12.3	19.6		Capella	280 47.9 N46	00.0				
	02	264 36.1	179 12.0	47.1	182 52.4	08.5	159 42.0	57.8		190 14.5	19.7		Deneb	49 37.4 N45	17.0				
	03	279 38.6	194 11.2	47.3	197 53.0	08.6	174 44.0	57.8		205 16.6	19.7		Denebola	182 42.4 N14	33.6				
	04	294 41.0	209 10.3	47.5	212 53.7	08.7	189 46.0	57.8		220 18.7	19.8		Diphda	349 04.9 S17	58.5				
	05	309 43.5	224 09.5	47.7	227 54.3	08.8	204 47.9	57.7		235 20.9	19.8								
	06	324 46.0	239 08.7 N24	47.9	242 55.0 N24	08.9	219 49.9 N22	57.7		250 23.0 N21	19.8		Dubhe	194 02.0 N61	44.6				
	07	339 48.4	254 07.8	48.0	257 55.6	09.0	234 51.9	57.6		265 25.1	19.9		Einath	278 24.0 N28	36.6				
	08	354 50.9	269 07.0	48.2	272 56.3	09.1	249 53.8	57.6		280 27.3	19.9		Eltanin	90 49.8 N51	29.1				
	09	9 53.3	284 06.1	48.4	287 56.9	09.2	264 55.8	57.5		295 29.4	20.0		Enif	33 55.7 N 9	52.9				
	10	24 55.8	299 05.3	48.6	302 57.6	09.3	279 57.8	57.5		310 31.5	20.0		Fomalhaut	15 33.7 S29	36.6				
	11	39 58.3	314 04.4	48.7	317 58.2	09.4	294 59.7	57.4		325 33.7	20.0								
	12	55 00.7	329 03.6 N24	48.9	332 58.9 N24	09.5	310 01.7 N22	57.4		340 35.8 N21	20.1		Gacrux	172 10.5 S57	07.7				
	13	70 03.2	344 02.8	49.1	347 59.5	09.6	325 03.7	57.4		355 37.9	20.1		Gienah	176 01.2 S17	33.3				
	14	85 05.7	359 01.9	49.3	3 00.2	09.8	340 05.6	57.3		10 40.0	20.1		Hadar	148 59.9 S60	23.1				
	15	100 08.1	14 01.1	49.4	18 00.8	09.9	355 07.6	57.3		25 42.2	20.2		Hamal	328 11.0 N23	28.2				
	16	115 10.6	29 00.2	49.6	33 01.5	10.0	10 09.6	57.2		40 44.3	20.2		Kaus Aust.	83 55.1 S34	23.0				
	17	130 13.1	43 59.4	49.8	48 02.1	10.1	25 11.5	57.2		55 46.4	20.3								
	18	145 15.5	58 58.6 N24	49.9	63 02.7 N24	10.2	40 13.5 N22	57.1		70 48.6 N21	20.3		Kochab	137 18.2 N74	08.9				
	19	160 18.0	73 57.7	50.1	78 03.4	10.3	55 15.5	57.1		85 50.7	20.3		Markab	13 47.2 N15	12.8				
	20	175 20.5	88 56.9	50.3	93 04.0	10.4	70 17.4	57.0		100 52.8	20.4		Menkar	314 24.5 N 4	05.8				
	21	190 22.9	103 56.0	50.4	108 04.7	10.5	85 19.4	57.0		115 55.0	20.4		Menkent	148 17.6 S36	23.0				
	22	205 25.4	118 55.2	50.6	123 05.3	10.6	100 21.3	56.9		130 57.1	20.4		Miaplacidus	221 41.9 S69	43.8				
23	220 27.8	133 54.3	50.7	138 06.0	10.7	115 23.3	56.9		145 59.2	20.5									
18 S A T U R D A Y	00	235 30.3	148 53.5 N24	50.9	153 06.6 N24	10.8	130 25.3 N22	56.9		161 01.3 N21	20.5		Mirfak	308 53.5 N49	52.0				
	01	250 32.8	163 52.7	51.0	168 52.3	10.9	145 27.2	56.8		176 03.5	20.6		Nunki	76 08.9 S26	17.6				
	02	265 35.2	178 51.8	51.2	183 07.9	11.0	160 29.2	56.8		191 05.6	20.6		Peacock	53 32.7 S56	43.5				
	03	280 37.7	193 51.0	51.4	198 08.6	11.1	175 31.2	56.7		206 07.7	20.6		Pollux	243 38.6 N28	01.4				
	04	295 40.2	208 50.1	51.5	213 09.2	11.2	190 33.1	56.7		221 09.9	20.7		Procyon	245 09.1 N 5	13.2				
	05	310 42.6	223 49.3	51.7	228 09.9	11.3	205 35.1	56.6		236 12.0	20.7								
	06	325 45.1	238 48.5 N24	51.8	243 10.5 N24	11.4	220 37.1 N22	56.6		251 14.1 N21	20.8		Rasalhague	96 14.3 N12	33.4				
	07	340 47.6	253 47.6	52.0	258 11.2	11.5	235 39.0	56.5		266 16.2	20.8		Regulus	207 52.8 N11	57.4				
	08	355 50.0	268 46.8	52.1	273 11.8	11.6	250 41.0	56.5		281 18.4	20.8		Rigel	281 20.8 S 8	12.0				
	09	10 52.5	283 45.9	52.3	288 12.5	11.7	265 42.9	56.5		296 20.5	20.9		Rigel Kent.	140 03.3 S60	50.7				
	10	25 55.0	298 45.1	52.4	303 13.1	11.8	280 44.9	56.4		311 22.6	20.9		Sabik	102 22.3 S15	43.7				
	11	40 57.4	313 44.2	52.5	318 13.8	11.9	295 46.9	56.4		326 24.8	20.9								
	12	55 59.9	328 43.4 N24	52.7	333 14.4 N24	12.0	310 48.8 N22	56.3		341 26.9 N21	21.0		Schedar	349 51.1 N56	32.7				
	13	71 02.3	343 42.6	52.8	348 15.1	12.1	325 50.8	56.3		356 29.0	21.0		Shaula	96 33.4 S37	06.3				
	14	86 04.8	358 41.7	53.0	3 15.7	12.1	340 52.7	56.2		11 31.1	21.1		Sirius	258 41.7 S16	43.2				
	15	101 07.3	13 40.9	53.1	18 16.4	12.2	355 54.7	56.2		26 33.3	21.1		Spica	158 40.2 S11	10.4				
	16	116 09.7	28 40.0	53.2	33 17.0	12.3	10 56.7	56.1		41 35.4	21.1		Suhail	222 59.0 S43	26.7				

UT	SUN		MOON				Lat.	Twilight			Moonrise				
	GHA	Dec	GHA	v	Dec	d		HP	Naut.	Civil	Sunrise	16	17	18	19
									h m	h m	h m	h m	h m	h m	h m
16 00	180 55.3	N19 00.5	136 04.1	7.2	N24 57.8	1.1	57.0	□	□	□	□	□	□	□	
01	195 55.3	01.1	150 30.3	7.1	24 58.9	0.9	57.0	□	□	01 37	□	□	□	07 22	
02	210 55.3	01.6	164 56.4	7.2	24 59.8	0.8	57.0	////	////	01 37	□	□	□	08 13	
03	225 55.2	02.2	179 22.6	7.1	25 00.6	0.7	57.1	////	////	02 15	□	□	06 34	08 44	
04	240 55.2	02.8	193 48.7	7.0	25 01.3	0.4	57.1	////	00 54	02 41	04 17	05 31	07 16	09 07	
05	255 55.2	03.4	208 14.7	7.1	25 01.7	0.4	57.1	////	01 43	03 02	05 04	06 12	07 44	09 25	
06	270 55.2	N19 04.0	222 40.8	7.0	N25 02.1	0.2	57.1	////	02 13	03 18	05 34	06 40	08 05	09 40	
07	285 55.2	04.5	237 06.8	7.0	25 02.3	0.0	57.1	N 58	00 48	02 36	03 32	05 57	07 02	08 23	
08	300 55.2	05.1	251 32.8	6.9	25 02.3	0.1	57.2	56	01 33	02 53	03 44	06 16	07 20	08 38	
09	315 55.2	05.7	265 58.7	7.0	25 02.2	0.2	57.2	54	02 01	03 08	03 54	06 32	07 35	08 50	
10	330 55.2	06.3	280 24.7	6.9	25 02.0	0.4	57.2	52	02 22	03 21	04 04	06 45	07 48	09 02	
11	345 55.1	06.8	294 50.6	6.9	25 01.6	0.6	57.2	50	02 39	03 32	04 12	06 57	07 59	09 11	
12	0 55.1	N19 07.4	309 16.5	6.9	N25 01.0	0.7	57.3	45	03 11	03 55	04 29	07 22	08 23	09 32	
13	15 55.1	08.0	323 42.4	6.8	25 00.3	0.8	57.3	N 40	03 34	04 12	04 43	07 42	08 42	09 49	
14	30 55.1	08.6	338 08.2	6.9	24 59.5	1.0	57.3	35	03 53	04 27	04 55	07 58	08 58	10 03	
15	45 55.1	09.1	352 34.1	6.8	24 58.5	1.2	57.3	30	04 08	04 39	05 06	08 12	09 12	10 15	
16	60 55.1	09.7	6 59.9	6.8	24 57.3	1.3	57.3	20	04 32	05 00	05 23	08 37	09 35	10 36	
17	75 55.1	10.3	21 25.7	6.8	24 56.0	1.4	57.4	N 10	04 50	05 16	05 39	08 58	09 55	10 54	
18	90 55.0	N19 10.9	35 51.5	6.8	N24 54.6	1.6	57.4	0	05 05	05 31	05 53	09 17	10 14	11 11	
19	105 55.0	11.4	50 17.3	6.8	24 53.0	1.8	57.4	S 10	05 19	05 45	06 07	09 37	10 33	11 27	
20	120 55.0	12.0	64 43.1	6.8	24 51.2	1.9	57.4	20	05 32	05 59	06 22	09 58	10 53	11 45	
21	135 55.0	12.6	79 08.9	6.7	24 49.3	2.0	57.5	30	05 44	06 13	06 39	10 22	11 17	12 06	
22	150 55.0	13.1	93 34.6	6.8	24 47.3	2.2	57.5	35	05 51	06 22	06 49	10 37	11 30	12 18	
23	165 55.0	13.7	108 00.4	6.8	24 45.1	2.4	57.5	40	05 58	06 31	07 00	10 53	11 46	12 31	
17 00	180 55.0	N19 14.3	122 26.2	6.7	N24 42.7	2.5	57.5	45	06 05	06 41	07 13	11 13	12 05	12 48	
01	195 54.9	14.9	136 51.9	6.8	24 40.2	2.6	57.5	S 50	06 13	06 53	07 29	11 38	12 28	13 08	
02	210 54.9	15.4	151 17.7	6.8	24 37.6	2.8	57.6	52	06 17	06 59	07 37	11 50	12 39	13 17	
03	225 54.9	16.0	165 43.5	6.7	24 34.8	3.0	57.6	54	06 21	07 05	07 45	12 04	12 52	13 27	
04	240 54.9	16.6	180 09.2	6.8	24 31.8	3.1	57.6	56	06 25	07 11	07 54	12 20	13 06	13 39	
05	255 54.9	17.1	194 35.0	6.8	24 28.7	3.3	57.6	58	06 30	07 19	08 05	12 39	13 24	13 53	
06	270 54.9	N19 17.7	209 00.8	6.8	N24 25.4	3.4	57.7	S 60	06 35	07 27	08 17	13 03	13 44	14 09	
07	285 54.8	18.3	223 26.6	6.8	24 22.0	3.5	57.7	Lat.	Sunset	Twilight		Moonset			
08	300 54.8	18.8	237 52.4	6.8	24 18.5	3.7	57.7			Civil	Naut.	16	17	18	19
09	315 54.8	19.4	252 18.2	6.8	24 14.8	3.9	57.7			h m	h m	h m	h m	h m	h m
10	330 54.8	19.9	266 44.0	6.8	24 10.9	4.0	57.7	N 72	h m	h m	h m	h m	h m	h m	h m
11	345 54.8	20.5	281 09.8	6.8	24 06.9	4.1	57.8	N 70	□	□	□	□	□	□	04 37
12	0 54.7	N19 21.1	295 35.6	6.9	N24 02.8	4.3	57.8	68	22 21	////	////	□	□	□	03 46
13	15 54.7	21.6	310 01.5	6.9	23 58.5	4.4	57.8	66	21 41	////	////	□	□	03 27	03 13
14	30 54.7	22.2	324 27.4	6.8	23 54.1	4.6	57.8	64	21 14	23 07	////	01 47	02 32	02 45	02 49
15	45 54.7	22.8	338 53.2	7.0	23 49.5	4.8	57.8	62	20 53	22 13	////	01 00	01 50	02 17	02 30
16	60 54.7	23.3	353 19.2	6.9	23 44.7	4.8	57.9	60	20 36	21 42	////	00 30	01 22	01 55	02 14
17	75 54.6	23.9	7 45.1	6.9	23 39.9	5.1	57.9	N 58	20 22	21 19	23 12	00 07	01 00	01 37	02 01
18	90 54.6	N19 24.4	22 11.0	7.0	N23 34.8	5.2	57.9	56	20 10	21 01	22 23	24 42	00 42	01 22	01 49
19	105 54.6	25.0	36 37.0	7.0	23 29.6	5.3	57.9	54	19 59	20 46	21 54	24 27	00 27	01 08	01 39
20	120 54.6	25.6	51 03.0	7.0	23 24.3	5.4	58.0	52	19 50	20 33	21 33	24 14	00 14	00 57	01 30
21	135 54.6	26.1	65 29.0	7.0	23 18.9	5.6	58.0	50	19 42	20 22	21 15	24 02	00 02	00 47	01 22
22	150 54.5	26.7	79 55.0	7.1	23 13.3	5.8	58.0	45	19 24	19 59	20 43	23 38	24 25	00 25	01 04
23	165 54.5	27.2	94 21.1	7.1	23 07.5	5.9	58.0	N 40	19 10	19 41	20 19	23 19	24 08	00 08	00 50
18 00	180 54.5	N19 27.8	108 47.2	7.1	N23 01.6	6.0	58.0	35	18 58	19 26	20 01	23 03	23 53	24 38	00 38
01	195 54.5	28.3	123 13.3	7.2	22 55.6	6.2	58.1	30	18 47	19 14	19 45	22 49	23 40	24 27	00 27
02	210 54.4	28.9	137 39.5	7.2	22 49.4	6.3	58.1	20	18 30	18 53	19 21	22 25	23 18	24 08	00 08
03	225 54.4	29.4	152 05.7	7.2	22 43.1	6.5	58.1	N 10	18 14	18 37	19 03	22 04	22 59	23 52	24 42
04	240 54.4	30.0	166 31.9	7.2	22 36.6	6.6	58.1	0	18 00	18 22	18 47	21 45	22 41	23 37	24 31
05	255 54.4	30.5	180 58.1	7.3	22 30.0	6.7	58.2	S 10	17 46	18 08	18 34	21 25	22 23	23 22	24 19
06	270 54.4	N19 31.1	195 24.4	7.3	N22 23.3	6.9	58.2	20	17 31	17 54	18 21	21 04	22 04	23 05	24 06
07	285 54.3	31.6	209 50.7	7.4	22 16.4	7.0	58.2	30	17 14	17 39	18 08	20 40	21 41	22 46	23 52
08	300 54.3	32.2	224 17.1	7.3	22 09.4	7.2	58.2	35	17 04	17 31	18 01	20 26	21 28	22 35	23 43
09	315 54.3	32.8	238 43.4	7.5	22 02.2	7.3	58.2	40	16 52	17 22	17 55	20 09	21 13	22 22	23 33
10	330 54.3	33.3	253 09.9	7.4	21 54.9	7.4	58.3	45	16 39	17 11	17 47	19 49	20 55	22 07	23 22
11	345 54.2	33.8	267 36.3	7.5	21 47.5	7.6	58.3	S 50	16 23	16 59	17 39	19 25	20 32	21 48	23 08
12	0 54.2	N19 34.4	282 02.8	7.5	N21 39.9	7.7	58.3	52	16 16	16 54	17 35	19 13	20 21	21 39	23 01
13	15 54.2	34.9	296 29.3	7.6	21 32.2	7.8	58.3	54	16 07	16 47	17 31	18 59	20 09	21 29	22 54
14	30 54.2	35.5	310 55.9	7.6	21 24.4	8.0	58.3	56	15 58	16 41	17 27	18 43	19 54	21 17	22 46
15	45 54.1	36.0	325 22.5	7.7	21 16.4	8.1	58.4	58	15 47	16 33	17 22	18 24	19 38	21 04	22 37
16	60 54.1	36.6	339 49.2	7.7	21 08.3	8.2	58.4	S 60	15 35	16 25	17 17	18 00	19 17	20 49	22 26
17	75 54.1	37.1	354 15.9	7.7	21 00.1	8.3	58.4	Day	SUN		MOON				
18	90 54.1	N19 37.7	8 42.6	7.8	N20 51.8	8.5	58.4		Eqn. of Time	Mer.	Mer. Pass.		Age Phase		
19	105 54.0	38.2	23 09.4	7.8	20 43.3	8.6	58.5		00 ^h	12 ^h	Upper	Lower	d	%	
20	120 54.0	38.8	37 36.2	7.8	20 34.7	8.8	58.5		m s	m s	h m	h m			
21	135 54.0	39.3	52 03.0	7.9	20 25.9	8.8	58.5		03 41	03 41	11 56	15 31	03 03	04 17	
22	150 54.0	39.9	66 29.9	8.0	20 17.1	9.0	58.5		03 40	03 39	11 56	16 28	03 59	05 25	
23	165 53.9	40.4	80 56												

UT	ARIES			VENUS -4.0			MARS +1.7			JUPITER -1.9			SATURN +0.1			STARS			
	GHA	GHA	Dec	GHA	Dec		GHA	Dec		GHA	Dec		GHA	Dec		Name	SHA	Dec	
1900 S U N D A Y	236 29.5	148 33.3	N24 54.3	153 22.2	N24 13.1		131 12.4	N22 55.8		161 52.4	N21 21.4		Acamar	315 25.3	S40 17.8				
	01 251 31.9	163 32.4	54.4	168 22.8	13.2		146 14.3	55.7		176 54.6	21.5		Achernar	335 33.6	S57 13.4				
	02 266 34.4	178 31.6	54.5	183 23.5	13.3		161 16.3	55.7		191 56.7	21.5		Acrux	173 18.9	S63 06.9				
	03 281 36.8	193 30.8	54.7	198 24.1	13.4		176 18.2	55.6		206 58.8	21.6		Adhara	255 19.7	S28 58.6				
	04 296 39.3	208 29.9	54.8	213 24.8	13.5		191 20.2	55.6		222 00.9	21.6		Aldebaran	290 59.8	N16 30.8				
	05 311 41.8	223 29.1	54.9	228 25.4	13.5		206 22.2	55.5		237 03.1	21.6								
	06 326 44.2	238 28.2	N24 55.0	243 26.1	N24 13.6		221 24.1	N22 55.5		252 05.2	N21 21.7		Alioth	166 27.8	N55 57.1				
	07 341 46.7	253 27.4	55.2	258 26.7	13.7		236 26.1	55.4		267 07.3	21.7		Alkaid	153 05.2	N49 18.3				
	08 356 49.2	268 26.6	55.3	273 27.4	13.8		251 28.0	55.4		282 09.5	21.7		Al Na'ir	27 54.6	S46 56.9				
	09 11 51.6	283 25.7	55.4	288 28.0	13.9		266 30.0	55.4		297 11.6	21.8		Alnilam	275 55.6	S 1 12.1				
	10 26 54.1	298 24.9	55.5	303 28.7	14.0		281 32.0	55.3		312 13.7	21.8		Alphard	218 04.7	S 8 40.2				
	11 41 56.6	313 24.0	55.6	318 29.3	14.1		296 33.9	55.3		327 15.8	21.9								
	12 56 59.0	328 23.2	N24 55.7	333 30.0	N24 14.2		311 35.9	N22 55.2		342 18.0	N21 21.9		Alphecca	126 18.0	N26 42.4				
	13 72 01.5	343 22.3	55.8	348 30.6	14.3		326 37.8	55.2		357 20.1	21.9		Alpheratz	357 52.8	N29 05.9				
	14 87 03.9	358 21.5	56.0	3 31.3	14.3		341 39.8	55.1		12 22.2	22.0		Altair	62 16.6	N 8 52.3				
	15 102 06.4	13 20.7	56.1	18 31.9	14.4		356 41.7	55.1		27 24.4	22.0		Ankaa	353 24.5	S42 17.6				
	16 117 08.9	28 19.8	56.2	33 32.6	14.5		11 43.7	55.0		42 26.5	22.0		Antares	112 36.7	S26 26.3				
	17 132 11.3	43 19.0	56.3	48 33.2	14.6		26 45.7	55.0		57 28.6	22.1								
	18 147 13.8	58 18.1	N24 56.4	63 33.9	N24 14.7		41 47.6	N22 54.9		72 30.7	N21 22.1		Arcturus	146 03.4	N19 10.3				
	19 162 16.3	73 17.3	56.5	78 34.5	14.8		56 49.6	54.9		87 32.9	22.2		Atria	107 45.9	S69 01.9				
	20 177 18.7	88 16.4	56.6	93 35.2	14.9		71 51.5	54.8		102 35.0	22.2		Avior	234 22.0	S59 31.2				
	21 192 21.2	103 15.6	56.7	108 35.8	14.9		86 53.5	54.8		117 37.1	22.2		Bellatrix	278 41.7	N 6 21.1				
	22 207 23.7	118 14.8	56.8	123 36.5	15.0		101 55.5	54.7		132 39.3	22.3		Betelgeuse	271 11.1	N 7 24.4				
23 222 26.1	133 13.9	56.9	138 37.1	15.1		116 57.4	54.7		147 41.4	22.3									
2000 M O N D A Y	237 28.6	148 13.1	N24 57.0	153 37.8	N24 15.2		131 59.4	N22 54.7		162 43.5	N21 22.3		Canopus	264 00.5	S52 42.0				
	01 252 31.1	163 12.2	57.1	168 38.4	15.3		147 01.3	54.6		177 45.6	22.4		Capella	280 47.9	N46 00.0				
	02 267 33.5	178 11.4	57.2	183 39.1	15.4		162 03.3	54.6		192 47.8	22.4		Deneb	49 37.3	N45 17.0				
	03 282 36.0	193 10.5	57.3	198 39.7	15.5		177 05.2	54.5		207 49.9	22.5		Denebola	182 42.4	N14 33.6				
	04 297 38.4	208 09.7	57.4	213 40.4	15.5		192 07.2	54.5		222 52.0	22.5		Diphda	349 04.8	S17 58.5				
	05 312 40.9	223 08.9	57.5	228 41.0	15.6		207 09.1	54.4		237 54.1	22.5								
	06 327 43.4	238 08.0	N24 57.6	243 41.7	N24 15.7		222 11.1	N22 54.4		252 56.3	N21 22.6		Dubhe	194 02.0	N61 44.6				
	07 342 45.8	253 07.2	57.6	258 42.3	15.8		237 13.1	54.3		267 58.4	22.6		Elnath	278 24.0	N28 36.6				
	08 357 48.3	268 06.3	57.7	273 42.9	15.8		252 15.0	54.3		283 00.5	22.6		Eltanin	90 49.7	N51 29.1				
	09 12 50.8	283 05.5	57.8	288 43.6	15.9		267 17.0	54.2		298 02.7	22.7		Enif	33 55.7	N 9 52.9				
	10 27 53.2	298 04.7	57.9	303 44.2	16.0		282 18.9	54.2		313 04.8	22.7		Fomalhaut	15 33.6	S29 36.6				
	11 42 55.7	313 03.8	58.0	318 44.9	16.1		297 20.9	54.1		328 06.9	22.8								
	12 57 58.2	328 03.0	N24 58.1	333 45.5	N24 16.2		312 22.8	N22 54.1		343 09.0	N21 22.8		Gacrux	172 10.5	S57 07.7				
	13 73 00.6	343 02.1	58.2	348 46.2	16.2		327 24.8	54.0		358 11.2	22.8		Gienah	176 01.2	S17 33.3				
	14 88 03.1	358 01.3	58.2	3 46.8	16.3		342 26.8	54.0		13 13.3	22.9		Hadar	148 59.9	S60 23.2				
	15 103 05.6	13 00.4	58.3	18 47.5	16.4		357 28.7	53.9		28 15.4	22.9		Hamal	328 11.0	N23 28.2				
	16 118 08.0	27 59.6	58.4	33 48.1	16.5		12 30.7	53.9		43 17.5	22.9		Kaus Aust.	83 55.1	S34 23.0				
	17 133 10.5	42 58.8	58.5	48 48.8	16.6		27 32.6	53.9		58 19.7	23.0								
	18 148 12.9	57 57.9	N24 58.5	63 49.4	N24 16.6		42 34.6	N22 53.8		73 21.8	N21 23.0		Kochab	137 17.8	N74 08.9				
	19 163 15.4	72 57.1	58.6	78 50.1	16.7		57 36.5	53.8		88 23.9	23.1		Markab	13 47.2	N15 12.8				
	20 178 17.9	87 56.2	58.7	93 50.7	16.8		72 38.5	53.7		103 26.0	23.1		Menkar	314 24.5	N 4 05.8				
	21 193 20.3	102 55.4	58.8	108 51.4	16.9		87 40.4	53.7		118 28.2	23.1		Menkent	148 17.6	S36 23.0				
	22 208 22.8	117 54.6	58.8	123 52.0	16.9		102 42.4	53.6		133 30.3	23.2		Miaplacidus	221 42.0	S69 43.8				
23 223 25.3	132 53.7	58.9	138 52.7	17.0		117 44.3	53.6		148 32.4	23.2									
2100 T U E S D A Y	238 27.7	147 52.9	N24 59.0	153 53.3	N24 17.1		132 46.3	N22 53.5		163 34.6	N21 23.2		Mirfak	308 53.5	N49 52.0				
	01 253 30.2	162 52.0	59.0	168 54.0	17.2		147 48.3	53.5		178 36.7	23.3		Nunki	76 08.9	S26 17.6				
	02 268 32.7	177 51.2	59.1	183 54.6	17.2		162 50.2	53.4		193 38.8	23.3		Peacock	53 32.6	S56 43.5				
	03 283 35.1	192 50.3	59.2	198 55.3	17.3		177 52.2	53.4		208 40.9	23.4		Pollux	243 38.6	N28 01.4				
	04 298 37.6	207 49.5	59.2	213 55.9	17.4		192 54.1	53.3		223 43.1	23.4		Procyon	245 09.1	N 5 13.2				
	05 313 40.0	222 48.7	59.3	228 56.6	17.5		207 56.1	53.3		238 45.2	23.4								
	06 328 42.5	237 47.8	N24 59.4	243 57.2	N24 17.5		222 58.0	N22 53.2		253 47.3	N21 23.5		Rasalhague	96 14.3	N12 33.4				
	07 343 45.0	252 47.0	59.4	258 57.9	17.6		238 00.0	53.2		268 49.4	23.5		Regulus	207 52.8	N11 57.4				
	08 358 47.4	267 46.1	59.5	273 58.5	17.7		253 01.9	53.1		283 51.6	23.5		Rigel	281 20.8	S 8 12.0				
	09 13 49.9	282 45.3	59.5	288 59.2	17.8		268 03.9	53.1		298 53.7	23.6		Rigil Kent.	140 03.3	S60 50.7				
	10 28 52.4	297 44.5	59.6	303 59.8	17.8		283 05.8	53.0		313 55.8	23.6		Sabik	102 22.3	S15 43.7				
	11 43 54.8	312 43.6	59.6	319 00.5	17.9		298 07.8	53.0		328 57.9	23.7								
	12 58 57.3	327 42.8	N24 59.7	334 01.1	N24 18.0		313 09.7	N22 52.9		344 00.1	N21 23.7		Schedar	349 51.1	N56 32.7				
	13 73 59.8	342 41.9	59.7	349 01.8	18.0		328 11.7	52.9		359 02.2	23.7		Shaula	96 33.4	S37 06.3				
	14 89 02.2	357 41.1	59.8	4 02.4	18.1		343 13.6	52.8		14 04.3	23.8		Sirius	258 41.7	S16 43.2				
	15 104 04.7	12 40.3	59.8	19 03.1	18.2		358 15.6	52.8		29 06.4	23.8		Spica	158 40.2	S11 10.4				
	16 119 07.2	27 39.4	59.9	34 03.7	18.2		13 17.5	52.7		44 08.6	23.8		Suhail	222 59.1	S43 26.7				

UT	ARIES		VENUS -4.0		MARS +1.7		JUPITER -1.9		SATURN +0.1		STARS		
	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
WEDNESDAY	22 00	239 26.9	147 32.7 N25 00.2	154 08.9 N24 18.8	133 33.2 N22 52.4	164 25.6 N21 24.1	Acamar	315 25.3	S40 17.8				
	01	254 29.3	162 31.9 00.3	169 09.6 18.9	148 35.1 52.3	179 27.7 24.2	Achernar	335 33.6	S57 13.4				
	02	269 31.8	177 31.0 00.3	184 10.2 18.9	163 37.1 52.3	194 29.8 24.2	Acrux	173 18.9	S63 06.9				
	03	284 34.3	192 30.2 . . 00.3	199 10.9 . . 19.0	178 39.0 . . 52.2	209 32.0 . . 24.2	Adhara	255 19.7	S28 58.6				
	04	299 36.7	207 29.3 00.4	214 11.5 19.0	193 41.0 52.2	224 34.1 24.3	Aldebaran	290 59.8	N16 30.8				
	05	314 39.2	222 28.5 00.4	229 12.2 19.1	208 42.9 52.1	239 36.2 24.3							
	06	329 41.7	237 27.7 N25 00.4	244 12.8 N24 19.2	223 44.9 N22 52.1	254 38.3 N21 24.4	Alioth	166 27.8	N55 57.1				
	07	344 44.1	252 26.8 00.5	259 13.5 19.2	238 46.8 52.0	269 40.5 24.4	Alkaid	153 05.3	N49 18.3				
	08	359 46.6	267 26.0 00.5	274 14.1 19.3	253 48.8 52.0	284 42.6 24.4	Al Na'ir	27 54.5	S46 56.9				
	09	14 49.0	282 25.1 . . 00.5	289 14.8 . . 19.4	268 50.7 . . 51.9	299 44.7 . . 24.5	Alnilam	275 55.6	S 1 12.1				
	10	29 51.5	297 24.3 00.6	304 15.4 19.4	283 52.7 51.9	314 46.8 24.5	Alphard	218 04.8	S 8 40.1				
	11	44 54.0	312 23.5 00.6	319 16.1 19.5	298 54.6 51.8	329 49.0 24.5							
	12	59 56.4	327 22.6 N25 00.6	334 16.7 N24 19.6	313 56.6 N22 51.8	344 51.1 N21 24.6	Alphecca	126 18.0	N26 42.4				
	13	74 58.9	342 21.8 00.6	349 17.4 19.6	328 58.5 51.7	359 53.2 24.6	Alpheratz	357 52.8	N29 05.9				
	14	90 01.4	357 21.0 00.6	4 18.0 19.7	344 00.5 51.7	14 55.3 24.7	Altair	62 16.6	N 8 52.3				
	15	105 03.8	12 20.1 . . 00.7	19 18.7 . . 19.7	359 02.4 . . 51.6	29 57.5 . . 24.7	Ankaa	353 24.5	S42 17.6				
	16	120 06.3	27 19.3 00.7	34 19.3 19.8	14 04.3 51.6	44 59.6 24.7	Antares	112 36.7	S26 26.3				
	17	135 08.8	42 18.4 00.7	49 20.0 19.9	29 06.3 51.5	60 01.7 24.8							
	18	150 11.2	57 17.6 N25 00.7	64 20.6 N24 19.9	44 08.2 N22 51.5	75 03.8 N21 24.8	Arcturus	146 03.4	N19 10.3				
	19	165 13.7	72 16.8 00.7	79 21.3 20.0	59 10.2 51.4	90 06.0 24.8	Atria	107 45.9	S69 01.9				
	20	180 16.1	87 15.9 00.7	94 21.9 20.0	74 12.1 51.4	105 08.1 24.9	Avior	234 22.0	S59 31.2				
	21	195 18.6	102 15.1 . . 00.8	109 22.6 . . 20.1	89 14.1 . . 51.3	120 10.2 . . 24.9	Bellatrix	278 41.7	N 6 21.1				
	22	210 21.1	117 14.2 00.8	124 23.2 20.2	104 16.0 51.3	135 12.3 24.9	Betelgeuse	271 11.1	N 7 24.4				
23	225 23.5	132 13.4 00.8	139 23.9 20.2	119 18.0 51.2	150 14.5 25.0								
THURSDAY	23 00	240 26.0	147 12.6 N25 00.8	154 24.5 N24 20.3	134 19.9 N22 51.2	165 16.6 N21 25.0	Canopus	264 00.5	S52 42.0				
	01	255 28.5	162 11.7 00.8	169 25.2 20.3	149 21.9 51.1	180 18.7 25.1	Capella	280 47.9	N46 00.0				
	02	270 30.9	177 10.9 00.8	184 25.8 20.4	164 23.8 51.1	195 20.8 25.1	Deneb	49 37.3	N45 17.0				
	03	285 33.4	192 10.1 . . 00.8	199 26.5 . . 20.4	179 25.8 . . 51.0	210 23.0 . . 25.1	Denebola	182 42.8	N14 33.7				
	04	300 35.9	207 09.2 00.8	214 27.1 20.5	194 27.7 51.0	225 25.1 25.2	Diphda	349 04.4	S17 58.5				
	05	315 38.3	222 08.4 00.8	229 27.8 20.6	209 29.7 50.9	240 27.2 25.2							
	06	330 40.8	237 07.5 N25 00.8	244 28.4 N24 20.6	224 31.6 N22 50.9	255 29.3 N21 25.2	Dubhe	194 02.0	N61 44.7				
	07	345 43.3	252 06.7 00.8	259 29.1 20.7	239 33.6 50.8	270 31.5 25.3	Elnath	278 24.1	N28 36.6				
	08	0 45.7	267 05.9 00.8	274 29.7 20.7	254 35.5 50.8	285 33.6 25.3	Eltanin	90 49.7	N51 29.1				
	09	15 48.2	282 05.0 . . 00.8	289 30.4 . . 20.8	269 37.5 . . 50.7	300 35.7 . . 25.4	Enif	33 55.7	N 9 52.9				
	10	30 50.6	297 04.2 00.8	304 31.0 20.8	284 39.4 50.7	315 37.8 25.4	Fomalhaut	15 33.6	S29 36.6				
	11	45 53.1	312 03.4 00.8	319 31.7 20.9	299 41.4 50.6	330 39.9 25.4							
	12	60 55.6	327 02.5 N25 00.8	334 32.3 N24 20.9	314 43.3 N22 50.6	345 42.1 N21 25.5	Gacrux	172 10.5	S57 07.7				
	13	75 58.0	342 01.7 00.8	349 33.0 21.0	329 45.2 50.5	0 44.2 25.5	Gienah	176 01.2	S17 33.3				
	14	91 00.5	357 00.9 00.8	4 33.6 21.0	344 47.2 50.5	15 46.3 25.5	Hadar	148 59.9	S60 23.2				
	15	106 03.0	12 00.0 . . 00.8	19 34.3 . . 21.1	359 49.1 . . 50.4	30 48.4 . . 25.6	Hamal	328 11.0	N23 28.2				
	16	121 05.4	26 59.2 00.8	34 35.0 21.2	14 51.1 50.4	45 50.6 25.6	Kaus Aust.	83 55.1	S34 23.0				
	17	136 07.9	41 58.4 00.7	49 35.6 21.2	29 53.0 50.3	60 52.7 25.6							
	18	151 10.4	56 57.5 N25 00.7	64 36.3 N24 21.3	44 55.0 N22 50.3	75 54.8 N21 25.7	Kochab	137 18.3	N74 08.9				
	19	166 12.8	71 56.7 00.7	79 36.9 21.3	59 56.9 50.2	90 56.9 25.7	Markab	13 47.1	N15 12.8				
	20	181 15.3	86 55.8 00.7	94 37.6 21.4	74 58.9 50.2	105 59.1 25.8	Menkar	314 24.5	N 4 05.8				
	21	196 17.7	101 55.0 . . 00.7	109 38.2 . . 21.4	90 00.8 . . 50.1	121 01.2 . . 25.8	Menkent	148 17.6	S36 23.0				
	22	211 20.2	116 54.2 00.7	124 38.9 21.5	105 02.8 50.1	136 03.3 25.8	Miaplacidus	221 42.0	S69 43.8				
23	226 22.7	131 53.3 00.6	139 39.5 21.5	120 04.7 50.0	151 05.4 25.9								
FRIDAY	24 00	241 25.1	146 52.5 N25 00.6	154 40.2 N24 21.6	135 06.6 N22 50.0	166 07.6 N21 25.9	Mirfak	308 53.5	N49 52.0				
	01	256 27.6	161 51.7 00.6	169 40.8 21.6	150 08.6 49.9	181 09.7 25.9	Nunki	76 08.8	S26 17.6				
	02	271 30.1	176 50.8 00.6	184 41.5 21.7	165 10.5 49.9	196 11.8 26.0	Peacock	53 32.6	S56 43.5				
	03	286 32.5	191 50.0 . . 00.5	199 42.1 . . 21.7	180 12.5 . . 49.8	211 13.9 . . 26.0	Pollux	243 38.6	N28 01.4				
	04	301 35.0	206 49.2 00.5	214 42.8 21.8	195 14.4 49.8	226 16.1 26.0	Procyon	245 09.1	N 5 13.2				
	05	316 37.5	221 48.3 00.5	229 43.4 21.8	210 16.4 49.7	241 18.2 26.1							
	06	331 39.9	236 47.5 N25 00.5	244 44.1 N24 21.8	225 18.3 N22 49.7	256 20.3 N21 26.1	Rasalhague	96 14.2	N12 33.4				
	07	346 42.4	251 46.7 00.4	259 44.7 21.9	240 20.3 49.6	271 22.4 26.2	Regulus	207 52.8	N11 57.5				
	08	1 44.9	266 45.8 00.4	274 45.4 21.9	255 22.2 49.6	286 24.5 26.2	Rigel	281 20.8	S 8 12.0				
	09	16 47.3	281 45.0 . . 00.4	289 46.0 . . 22.0	270 24.1 . . 49.5	301 26.7 . . 26.2	Rigil Kent.	140 03.3	S60 50.8				
	10	31 49.8	296 44.2 00.3	304 46.7 22.0	285 26.1 49.5	316 28.8 26.3	Sabik	102 22.2	S15 43.7				
	11	46 52.2	311 43.3 00.3	319 47.3 22.1	300 28.0 49.4	331 30.9 26.3							
	12	61 54.7	326 42.5 N25 00.3	334 48.0 N24 22.1	315 30.0 N22 49.4	346 33.0 N21 26.3	Schedar	349 51.0	N56 32.7				
	13	76 57.2	341 41.7 00.2	349 48.6 22.2	330 31.9 49.3	1 35.2 26.4	Shaula	96 33.4	S37 06.3				
	14	91 59.6	356 40.8 00.2	4 49.3 22.2	345 33.9 49.3	16 37.3 26.4	Sirius	258 41.7	S16 43.2				
	15	107 02.1	11 40.0 . . 00.2	19 49.9 . . 22.3	0 35.8 . . 49.2	31 39.4 . . 26.4	Spica	158 40.2	S11 10.4				
	16	122 04.6	26 39.2 00.1	34 50.6 22.3	15 37.7 49.1	46 41.5 26.5	Suhail	222 59.1	S43 26.7				
	17	137 07.0	41 38.3 00.1	49 51.2 22.3	30 39.7 49.1	61 43.7 26.5							
	18	152 09.5	56 37.5 N25 00.0	64 51.9 N24 22.4	45 41.6 N22 49.0	76 45.8 N21 26.6	Vega	80 44.5	N38 46.9				
	19	167 12.0	71 36.7 25 00.0	79 52.5 22.4	60 43.6 49.0	91 47.9 26.6	Zuben'ubi	137 14.8	S16 03.1				
	20	182 14.4	86 35.8 24 59.9	94 53.2 22.5	75 45.5 48.9	106 50.0 26.6							
	21	197 16.9	101 35.0 . . 59.9	109 53.9 . . 22.5	90 47.5 . . 48.9	121 52.2 . . 26.7							
	22	212 19.4	116 34.2 59.8	124 54.5 22.6	105 49.4 48.8	136 54.3 26.7	Venus	266 46.6	h 12 m				
23	227 21.8	131 33.4 59.8	139 55.2 22.6	120 51.3 48.8	151 56.4 26.7	Mars	273 58.5	13 42					
						Jupiter	253 53.9	15 01					
						Saturn	284 50.6	12 57					
	Mer. Pass.	7 57.0	v -0.8 d 0.0	v 0.7 d 0.1	v 1.9 d 0.1	v 2.1 d 0.0							

UT	SUN		MOON				Lat.	Twilight			Moonrise				
	GHA	Dec	GHA	<i>v</i>	Dec	<i>d</i>		HP	Naut.	Civil	Sunrise	25	26	27	28
									h m	h m	h m	h m	h m	h m	h m
25	180 47.6	N20 52.7	20 21.8	8.8	S13 05.1	13.3	59.9								
00	180 47.6	N20 52.7	20 21.8	8.8	S13 05.1	13.3	59.9								
01	195 47.6	53.1	34 49.6	8.6	13 18.4	13.2	59.9	///	///	00 21	20 50	24 02	00 02		
02	210 47.5	53.6	49 17.2	8.6	13 31.6	13.1	59.9	///	///	01 38	20 23	22 36			
03	225 47.4	54.0	63 44.8	8.6	13 44.7	13.1	59.9	///	///	02 14	20 02	21 59	23 51	25 18	
04	240 47.4	54.5	78 12.4	8.5	13 57.8	13.0	59.8	///	01 00	02 40	19 46	21 32	23 11	24 27	
05	255 47.3	54.9	92 39.9	8.5	14 10.8	12.9	59.8	///	01 45	03 00	19 32	21 12	22 43	23 55	
06	270 47.3	N20 55.4	107 07.4	8.4	S14 23.7	12.8	59.8	///	02 13	03 16	19 20	20 55	22 21	23 31	
07	285 47.2	55.8	121 34.8	8.3	14 36.5	12.7	59.8	56	00 54	02 35	03 30	19 10	20 41	22 04	23 12
08	300 47.1	56.3	136 02.1	8.3	14 49.2	12.6	59.8	54	01 35	02 52	03 42	19 01	20 28	21 49	22 56
09	315 47.1	56.7	150 29.4	8.3	15 01.8	12.5	59.8	52	02 02	03 07	03 52	18 53	20 18	21 36	22 42
10	330 47.0	57.2	164 56.7	8.2	15 14.3	12.4	59.8	50	02 22	03 20	04 01	18 46	20 08	21 24	22 30
11	345 46.9	57.6	179 23.9	8.1	15 26.7	12.3	59.7	45	02 59	03 45	04 21	18 31	19 48	21 01	22 05
12	0 46.9	N20 58.1	193 51.0	8.1	S15 39.0	12.2	59.7	N 40	03 25	04 05	04 36	18 18	19 32	20 42	21 45
13	15 46.8	58.5	208 18.1	8.0	15 51.2	12.1	59.7	35	03 46	04 21	04 50	18 08	19 18	20 26	21 28
14	30 46.8	59.0	222 45.1	8.0	16 03.3	12.0	59.7	30	04 02	04 34	05 01	17 59	19 07	20 12	21 14
15	45 46.7	59.4	237 12.1	8.0	16 15.3	11.9	59.7	20	04 28	04 57	05 21	17 43	18 47	19 49	20 49
16	60 46.6	59.8	251 39.1	7.8	16 27.2	11.8	59.7	N 10	04 48	05 15	05 38	17 30	18 29	19 29	20 28
17	75 46.6	21 00.3	266 05.9	7.9	16 39.0	11.7	59.6	0	05 05	05 31	05 53	17 17	18 13	19 11	20 09
18	90 46.5	N21 00.7	280 32.8	7.7	S16 50.7	11.6	59.6	S 10	05 21	05 46	06 09	17 04	17 57	18 52	19 49
19	105 46.4	01.2	294 59.5	7.8	17 02.3	11.5	59.6	20	05 35	06 02	06 25	16 51	17 40	18 32	19 28
20	120 46.4	01.6	309 26.3	7.6	17 13.8	11.3	59.6	30	05 49	06 18	06 44	16 36	17 20	18 10	19 04
21	135 46.3	02.1	323 52.9	7.6	17 25.1	11.2	59.6	35	05 57	06 28	06 55	16 27	17 09	17 57	18 50
22	150 46.3	02.5	338 19.5	7.6	17 36.3	11.2	59.5	40	06 04	06 38	07 08	16 17	16 56	17 41	18 33
23	165 46.2	02.9	352 46.1	7.5	17 47.5	11.0	59.5	45	06 13	06 50	07 22	16 06	16 41	17 23	18 14
26	180 46.1	N21 03.4	7 12.6	7.5	S17 58.5	10.9	59.5	S 50	06 23	07 03	07 40	15 52	16 22	17 01	17 49
00	180 46.1	N21 03.4	7 12.6	7.5	S17 58.5	10.9	59.5	52	06 27	07 10	07 49	15 45	16 14	16 50	17 37
01	195 46.1	03.8	21 39.1	7.4	18 09.4	10.8	59.5	54	06 32	07 17	07 58	15 38	16 04	16 38	17 24
02	210 46.0	04.3	36 05.5	7.4	18 20.2	10.6	59.5	56	06 37	07 24	08 09	15 30	15 53	16 24	17 08
03	225 45.9	04.7	50 31.9	7.3	18 30.8	10.5	59.4	58	06 42	07 33	08 21	15 22	15 40	16 08	16 50
04	240 45.9	05.1	64 58.2	7.3	18 41.3	10.4	59.4	S 60	06 48	07 43	08 35	15 11	15 26	15 49	16 27
05	255 45.8	05.6	79 24.5	7.2	18 51.7	10.3	59.4								
06	270 45.7	N21 06.0	93 50.7	7.1	S19 02.0	10.2	59.4								
07	285 45.7	06.4	108 16.8	7.2	19 12.2	10.0	59.4	Lat.	Sunset	Twilight		Moonset			
08	300 45.6	06.9	122 43.0	7.0	19 22.2	9.9	59.4			Civil	Naut.	25	26	27	28
09	315 45.5	07.3	137 09.0	7.1	19 32.1	9.8	59.3								
10	330 45.5	07.7	151 35.1	7.0	19 41.9	9.7	59.3								
11	345 45.4	08.2	166 01.1	6.9	19 51.6	9.5	59.3								
12	0 45.3	N21 08.6	180 27.0	6.9	S20 01.1	9.4	59.2	N 70				01 30			
13	15 45.3	09.0	194 52.9	6.9	20 10.5	9.2	59.2	68				01 55	01 11		
14	30 45.2	09.5	209 18.8	6.8	20 19.7	9.1	59.2	66	22 19	///	///	02 30	02 21	02 06	
15	45 45.1	09.9	223 44.6	6.7	20 28.8	9.0	59.2	64	21 42	///	///	02 43	02 42	02 44	02 52
16	60 45.1	10.3	238 10.3	6.8	20 37.8	8.8	59.1	62	21 16	23 00	///	02 54	03 00	03 11	03 33
17	75 45.0	10.7	252 36.1	6.7	20 46.6	8.7	59.1	60	20 56	22 12	///	03 03	03 15	03 32	04 02
18	90 44.9	N21 11.2	267 01.8	6.6	S20 55.3	8.6	59.1	N 58	20 39	21 43	///	03 12	03 27	03 50	04 24
19	105 44.9	11.6	281 27.4	6.6	21 03.9	8.4	59.1	56	20 25	21 21	23 05	03 19	03 38	04 04	04 41
20	120 44.8	12.0	295 53.0	6.6	21 12.3	8.3	59.0	54	20 13	21 03	22 21	03 25	03 48	04 17	04 57
21	135 44.7	12.5	310 18.6	6.5	21 20.6	8.2	59.0	52	20 03	20 48	21 54	03 31	03 56	04 28	05 10
22	150 44.7	12.9	324 44.1	6.5	21 28.8	8.0	59.0	50	19 53	20 35	21 33	03 37	04 04	04 38	05 21
23	165 44.6	13.3	339 09.6	6.5	21 36.8	7.8	59.0	45	19 34	20 10	20 56	03 48	04 21	04 59	05 45
27	180 44.5	N21 13.7	353 35.1	6.5	S21 44.6	7.7	58.9	N 40	19 18	19 50	20 29	03 58	04 34	05 16	06 05
00	195 44.4	14.2	8 00.6	6.4	21 52.3	7.6	58.9	35	19 05	19 33	20 09	04 06	04 46	05 30	06 21
01	210 44.4	14.6	22 26.0	6.3	21 59.9	7.4	58.9	30	18 53	19 20	19 52	04 14	04 56	05 43	06 35
02	225 44.3	15.0	36 51.3	6.4	22 07.3	7.3	58.9	20	18 33	18 57	19 26	04 27	05 14	06 04	06 59
03	240 44.2	15.4	51 16.7	6.3	22 14.6	7.1	58.8	N 10	18 16	18 39	19 06	04 38	05 29	06 23	07 19
04	255 44.2	15.8	65 42.0	6.3	22 21.7	7.0	58.8	0	18 01	18 23	18 49	04 48	05 43	06 40	07 39
05	270 44.1	N21 16.3	80 07.3	6.3	S22 28.7	6.8	58.8	S 10	17 45	18 07	18 33	04 59	05 58	06 58	07 58
06	285 44.0	16.7	94 32.6	6.2	22 35.5	6.7	58.7	20	17 28	17 52	18 19	05 10	06 13	07 17	08 18
07	300 44.0	17.1	108 57.8	6.3	22 42.2	6.6	58.7	30	17 10	17 35	18 05	05 23	06 31	07 38	08 42
08	315 43.9	17.5	123 23.1	6.2	22 48.8	6.3	58.7	35	16 59	17 26	17 57	05 31	06 42	07 51	08 56
09	330 43.8	17.9	137 48.3	6.2	22 55.1	6.3	58.7	40	16 46	17 16	17 49	05 39	06 54	08 06	09 13
10	345 43.7	18.4	152 13.5	6.1	23 01.4	6.0	58.6	45	16 31	17 04	17 40	05 50	07 08	08 23	09 32
11	0 43.7	N21 18.8	166 38.6	6.2	S23 07.4	6.0	58.6	S 50	16 13	16 50	17 31	06 02	07 25	08 45	09 56
12	15 43.6	19.2	181 03.8	6.1	23 13.4	5.7	58.6	52	16 05	16 44	17 26	06 08	07 33	08 55	10 08
13	30 43.5	19.6	195 28.9	6.1	23 19.1	5.7	58.5	54	15 55	16 37	17 22	06 14	07 43	09 07	10 21
14	45 43.5	20.0	209 54.0	6.1	23 24.8	5.4	58.5	56	15 45	16 29	17 17	06 21	07 53	09 20	10 37
15	60 43.4	20.4	224 19.1	6.1	23 30.2	5.3	58.5	58	15 32	16 21	17 11	06 29	08 05	09 36	10 55
16	75 43.3	20.8	238 44.2	6.1	23 35.5	5.2	58.4	S 60	15 18	16 11	17 05	06 38	08 19	09 55	11 18
17	90 43.2	N21 21.3	253 09.3	6.1	S23 40.7	5.0	58.4								

UT	ARIES	VENUS -4.0		MARS +1.7		JUPITER -1.9		SATURN +0.0		STARS		
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
TUESDAY	28 00	245 21.7	145 33.2 N24	155 42.9 N24	24.7	138 12.8 N22	44.9	169 31.3 N21	29.3	Acamar	315 25.3 S40	17.7
	01	260 24.2	160 32.4	170 43.5	24.7	153 14.7	44.8	184 33.4	29.4	Achernar	335 33.5 S57	13.4
	02	275 26.6	175 31.6	185 44.2	24.7	168 16.7	44.8	199 35.5	29.4	Acrux	173 18.9 S63	06.9
	03	290 29.1	190 30.8	200 44.8	24.7	183 18.6	44.7	214 37.7	29.4	Adhara	255 19.7 S28	58.6
	04	305 31.6	205 29.9	215 45.5	24.7	198 20.5	44.7	229 39.8	29.5	Aldebaran	290 59.8 N16	30.8
	05	320 34.0	220 29.1	230 46.2	24.7	213 22.5	44.6	244 41.9	29.5			
	06	335 36.5	235 28.3 N24	245 46.8 N24	24.7	228 24.4 N22	44.6	259 44.0 N21	29.6	Alioth	166 27.8 N55	57.1
	07	350 39.0	250 27.5	260 47.5	24.8	243 26.3	44.5	274 46.1	29.6	Alkaid	153 05.3 N49	18.3
	08	5 41.4	265 26.7	275 48.1	24.8	258 28.3	44.5	289 48.3	29.6	Al Na'ir	27 54.5 S46	56.9
	09	20 43.9	280 25.9	290 48.8	24.8	273 30.2	44.4	304 50.4	29.7	Alnilam	275 55.6 S 1	12.1
	10	35 46.3	295 25.0	305 49.4	24.8	288 32.1	44.3	319 52.5	29.7	Alphard	218 04.8 S 8	40.1
	11	50 48.8	310 24.2	320 50.1	24.8	303 34.1	44.3	334 54.6	29.7			
	12	65 51.3	325 23.4 N24	335 50.7 N24	24.8	318 36.0 N22	44.2	349 56.7 N21	29.8	Alphecca	126 18.0 N26	42.4
	13	80 53.7	340 22.6	350 51.4	24.8	333 37.9	44.2	4 58.9	29.8	Alpheratz	357 52.7 N29	05.9
	14	95 56.2	355 21.8	5 52.1	24.8	348 39.9	44.1	20 01.0	29.8	Altair	62 16.5 N 8	52.3
	15	110 58.7	10 21.0	20 52.7	24.8	3 41.8	44.1	35 03.1	29.9	Ankaa	353 24.4 S42	17.5
	16	126 01.1	25 20.2	35 53.4	24.9	18 43.7	44.0	50 05.2	29.9	Antares	112 36.6 S26	26.3
	17	141 03.6	40 19.4	50 54.0	24.9	33 45.7	44.0	65 07.3	29.9			
	18	156 06.1	55 18.5 N24	65 54.7 N24	24.9	48 47.6 N22	43.9	80 09.5 N21	30.0	Arcturus	146 03.4 N19	10.3
	19	171 08.5	70 17.7	80 55.3	24.9	63 49.5	43.8	95 11.6	30.0	Atria	107 45.8 S69	01.9
	20	186 11.0	85 16.9	95 56.0	24.9	78 51.5	43.8	110 13.7	30.0	Avior	234 22.0 S59	31.2
	21	201 13.4	100 16.1	110 56.7	24.9	93 53.4	43.7	125 15.8	30.1	Bellatrix	278 41.7 N 6	21.1
	22	216 15.9	115 15.3	125 57.3	24.9	108 55.3	43.7	140 17.9	30.1	Betelgeuse	271 11.1 N 7	24.4
23	231 18.4	130 14.5	140 58.0	24.9	123 57.3	43.6	155 20.1	30.1				
WEDNESDAY	29 00	246 20.8	145 13.7 N24	155 58.6 N24	24.9	138 59.2 N22	43.6	170 22.2 N21	30.2	Canopus	264 00.5 S52	41.9
	01	261 23.3	160 12.9	170 59.3	24.9	154 01.1	43.5	185 24.3	30.2	Capella	280 47.9 N46	00.0
	02	276 25.8	175 12.1	185 59.9	24.9	169 03.0	43.5	200 26.4	30.3	Deneb	49 37.3 N45	17.0
	03	291 28.2	190 11.3	201 00.6	24.9	184 05.0	43.4	215 28.5	30.3	Denebola	182 42.4 N14	33.7
	04	306 30.7	205 10.4	216 01.2	24.9	199 06.9	43.3	230 30.7	30.3	Diphda	349 04.8 S17	58.5
	05	321 33.2	220 09.6	231 01.9	25.0	214 08.8	43.3	245 32.8	30.4			
	06	336 35.6	235 08.8 N24	246 02.6 N24	25.0	229 10.8 N22	43.2	260 34.9 N21	30.4	Dubhe	194 02.1 N61	44.7
	07	351 38.1	250 08.0	261 03.2	25.0	244 12.7	43.2	275 37.0	30.4	El Nath	278 24.0 N28	36.6
	08	6 40.6	265 07.2	276 03.9	25.0	259 14.6	43.1	290 39.1	30.5	Eltanin	90 49.7 N51	29.2
	09	21 43.0	280 06.4	291 04.5	25.0	274 16.6	43.1	305 41.3	30.5	Enif	33 55.6 N 9	53.0
	10	36 45.5	295 05.6	306 05.2	25.0	289 18.5	43.0	320 43.4	30.5	Fomalhaut	15 33.6 S29	36.6
	11	51 47.9	310 04.8	321 05.8	25.0	304 20.4	43.0	335 45.5	30.6			
	12	66 50.4	325 04.0 N24	336 06.5 N24	25.0	319 22.3 N22	42.9	350 47.6 N21	30.6	Gacrux	172 10.5 S57	07.8
	13	81 52.9	340 03.2	351 07.2	25.0	334 24.3	42.8	5 49.7	30.6	Gienah	176 01.2 S17	33.3
	14	96 55.3	355 02.4	6 07.8	25.0	349 26.2	42.8	20 51.9	30.7	Hadar	148 59.9 S60	23.2
	15	111 57.8	10 01.6	21 08.5	25.0	4 28.1	42.7	35 54.0	30.7	Hamal	328 10.9 N23	28.2
	16	127 00.3	25 00.8	36 09.1	25.0	19 30.1	42.7	50 56.1	30.7	Kaus Aust.	83 50.5 S34	23.0
	17	142 02.7	40 00.0	51 09.8	25.0	34 32.0	42.6	65 58.2	30.8			
	18	157 05.2	54 59.1 N24	66 10.4 N24	25.0	49 33.9 N22	42.6	81 00.3 N21	30.8	Kochab	137 18.3 N74	08.9
	19	172 07.7	69 58.3	81 11.1	25.0	64 35.9	42.5	96 02.5	30.8	Markab	13 47.1 N15	12.8
	20	187 10.1	84 57.5	96 11.8	25.0	79 37.8	42.4	111 04.6	30.9	Menkar	314 24.5 N 4	05.8
	21	202 12.6	99 56.7	111 12.4	25.0	94 39.7	42.4	126 06.7	30.9	Menkent	148 17.6 S36	23.0
	22	217 15.1	114 55.9	126 13.1	25.0	109 41.6	42.3	141 08.8	30.9	Miaplacidus	221 42.1 S69	43.8
23	232 17.5	129 55.1	141 13.7	25.0	124 43.6	42.3	156 10.9	31.0				
THURSDAY	30 00	247 20.0	144 54.3 N24	156 14.4 N24	25.0	139 45.5 N22	42.2	171 13.1 N21	31.0	Mirfak	308 53.4 N49	52.0
	01	262 22.4	159 53.5	171 15.0	25.0	154 47.4	42.2	186 15.2	31.0	Nunki	76 08.8 S26	17.6
	02	277 24.9	174 52.7	186 15.7	25.0	169 49.4	42.1	201 17.3	31.1	Peacock	53 32.5 S56	43.5
	03	292 27.4	189 51.9	201 16.4	25.0	184 51.3	42.0	216 19.4	31.1	Pollux	243 38.6 N28	01.4
	04	307 29.8	204 51.1	216 17.0	25.0	199 53.2	42.0	231 21.5	31.2	Procyon	245 09.1 N 5	13.2
	05	322 32.3	219 50.3	231 17.7	25.0	214 55.1	41.9	246 23.7	31.2			
	06	337 34.8	234 49.5 N24	246 18.3 N24	25.0	229 57.1 N22	41.9	261 25.8 N21	31.2	Rasalhague	96 14.2 N12	33.4
	07	352 37.2	249 48.7	261 19.0	25.0	244 59.0	41.8	276 27.9	31.3	Regulus	207 52.8 N11	57.5
	08	7 39.7	264 47.9	276 19.7	25.0	260 00.9	41.8	291 30.0	31.3	Rigel	281 20.8 S 8	12.0
	09	22 42.2	279 47.1	291 20.3	25.0	275 02.9	41.7	306 32.1	31.3	Rigil Kent.	140 03.3 S60	50.8
	10	37 44.6	294 46.3	306 21.0	25.0	290 04.8	41.6	321 34.2	31.4	Sabik	102 22.2 S15	43.7
	11	52 47.1	309 45.5	321 21.6	25.0	305 06.7	41.6	336 36.4	31.4			
	12	67 49.6	324 44.7 N24	336 22.3 N24	24.9	320 08.6 N22	41.5	351 38.5 N21	31.4	Schedar	349 51.0 N56	32.7
	13	82 52.0	339 43.9	351 22.9	24.9	335 10.6	41.5	6 40.6	31.5	Shaula	96 33.4 S37	06.3
	14	97 54.5	354 43.1	6 23.6	24.9	350 12.5	41.4	21 42.7	31.5	Sirius	258 41.7 S16	43.2
	15	112 56.9	9 42.3	21 24.3	24.9	5 14.4	41.4	36 44.8	31.5	Spica	158 40.2 S11	10.4
	16	127 59.4	24 41.5	36 24.9	24.9	20 16.3	41.3	51 47.0	31.6	Suhail	222 59.1 S43	26.7
	17	143 01.9	39 40.7	51 25.6	24.9	35 18.3	41.2	66 49.1	31.6			
	18	158 04.3	54 39.9 N24	66 26.2 N24	24.9	50 20.2 N22	41.2	81 51.2 N21	31.6	Vega	80 44.5 N38	47.0
	19	173 06.8	69 39.1	81 26.9	24.9	65 22.1	41.1	96 53.3	31.7	Zuben'ubi	137 14.8 S16	03.1
	20	188 09.3	84 38.3	96 27.6	24.9	80 24.0	41.1	111 55.4	31.7		SHA	Mer. Pass.
	21	203 11.7	99 37.5	111 28.2	24.9	95 26.0	41.0	126 57.6	31.7			
	22	218 14.2	114 36.7	126 28.9	24.9	110 27.9	41.0	141 59.7	31.8	Venus	258 52.8	14 20
23	233 16.7	129 35.9	141 29.5	24.9	125 29.8	40.9	157 01.8	31.8	Mars	269 37.8	13 35	
									Jupiter	252 38.3	14 42	
									Saturn	284 01.3	12 37	

UT	SUN		MOON				Lat.	Twilight			Moonrise				
	GHA	Dec	GHA	v	Dec	d		HP	Naut.	Civil	Sunrise	28	29	30	31
									h m	h m	h m	h m	h m	h m	h m
28 00	180 42.8	N21 23.7	339 39.7	6.1	S24 08.4	4.0	58.2	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
01	195 42.7	24.1	354 04.8	6.1	24 12.4	4.0	58.2	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
02	210 42.6	24.5	8 29.9	6.1	24 16.4	3.7	58.2	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
03	225 42.6	24.9	22 55.0	6.0	24 20.1	3.6	58.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
04	240 42.5	25.3	37 20.0	6.1	24 23.7	3.4	58.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
05	255 42.4	25.7	51 45.1	6.1	24 27.1	3.3	58.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
06	270 42.3	N21 26.2	66 10.2	6.1	S24 30.4	3.2	58.0	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
07	285 42.3	26.6	80 35.3	6.2	24 33.6	2.9	58.0	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
08	300 42.2	27.0	95 00.5	6.1	24 36.5	2.8	58.0	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
09	315 42.1	27.4	109 25.6	6.2	24 39.3	2.7	57.9	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
10	330 42.0	27.8	123 50.8	6.1	24 42.0	2.5	57.9	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
11	345 42.0	28.2	138 15.9	6.2	24 44.5	2.3	57.9	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
12	0 41.9	N21 28.6	152 41.1	6.3	S24 46.8	2.2	57.8	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
13	15 41.8	29.0	167 06.4	6.2	24 49.0	2.0	57.8	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
14	30 41.7	29.4	181 31.6	6.3	24 51.0	1.9	57.8	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
15	45 41.7	29.8	195 56.9	6.3	24 52.9	1.7	57.7	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
16	60 41.6	30.2	210 22.2	6.3	24 54.6	1.6	57.7	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
17	75 41.5	30.6	224 47.5	6.3	24 56.2	1.4	57.7	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
18	90 41.4	N21 31.0	239 12.8	6.4	S24 57.6	1.3	57.6	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
19	105 41.3	31.4	253 38.2	6.4	24 58.9	1.1	57.6	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
20	120 41.3	31.8	268 03.6	6.5	25 00.0	0.9	57.6	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
21	135 41.2	32.2	282 29.1	6.5	25 00.9	0.8	57.5	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
22	150 41.1	32.5	296 54.6	6.5	25 01.7	0.6	57.5	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
23	165 41.0	32.9	311 20.1	6.5	25 02.3	0.5	57.5	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
29 00	180 40.9	N21 33.3	325 45.6	6.7	S25 02.8	0.4	57.4	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
01	195 40.9	33.7	340 11.3	6.6	25 03.2	0.1	57.4	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
02	210 40.8	34.1	354 36.9	6.7	25 03.3	0.1	57.4	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
03	225 40.7	34.5	9 02.6	6.7	25 03.4	0.1	57.3	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
04	240 40.6	34.9	23 28.3	6.8	25 03.3	0.3	57.3	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
05	255 40.5	35.3	37 54.1	6.9	25 03.0	0.4	57.3	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
06	270 40.5	N21 35.7	52 20.0	6.8	S25 02.6	0.6	57.2	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
07	285 40.4	36.1	66 45.8	7.0	25 02.0	0.7	57.2	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
08	300 40.3	36.5	81 11.8	7.0	25 01.3	0.9	57.2	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
09	315 40.2	36.8	95 37.8	7.0	25 00.4	1.0	57.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
10	330 40.1	37.2	110 03.8	7.1	24 59.4	1.1	57.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
11	345 40.1	37.6	124 29.9	7.2	24 58.3	1.3	57.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
12	0 40.0	N21 38.0	138 56.1	7.2	S24 57.0	1.5	57.0	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
13	15 39.9	38.4	153 22.3	7.3	24 55.5	1.6	57.0	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
14	30 39.8	38.8	167 48.6	7.3	24 53.9	1.7	57.0	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
15	45 39.7	39.2	182 14.9	7.4	24 52.2	1.9	56.9	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
16	60 39.7	39.5	196 41.3	7.4	24 50.3	2.0	56.9	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
17	75 39.6	39.9	211 07.7	7.6	24 48.3	2.2	56.9	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
18	90 39.5	N21 40.3	225 34.3	7.6	S24 46.1	2.3	56.9	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
19	105 39.4	40.7	240 00.9	7.6	24 43.8	2.4	56.8	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
20	120 39.3	41.1	254 27.5	7.8	24 41.4	2.6	56.8	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
21	135 39.2	41.4	268 54.3	7.7	24 38.8	2.7	56.8	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
22	150 39.2	41.8	283 21.0	7.9	24 36.1	2.8	56.7	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
23	165 39.1	42.2	297 47.9	8.0	24 33.3	3.0	56.7	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
30 00	180 39.0	N21 42.6	312 14.9	8.0	S24 30.3	3.1	56.7	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
01	195 38.9	43.0	326 41.9	8.0	24 27.2	3.3	56.6	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
02	210 38.8	43.3	341 08.9	8.2	24 23.9	3.4	56.6	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
03	225 38.7	43.7	355 36.1	8.2	24 20.5	3.5	56.6	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
04	240 38.6	44.1	10 03.3	8.3	24 17.0	3.6	56.5	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
05	255 38.6	44.5	24 30.6	8.4	24 13.4	3.8	56.5	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
06	270 38.5	N21 44.8	38 58.0	8.5	S24 09.6	3.9	56.5	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
07	285 38.4	45.2	53 25.5	8.5	24 05.7	4.0	56.4	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
08	300 38.3	45.6	67 53.0	8.6	24 01.7	4.2	56.4	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
09	315 38.2	45.9	82 20.6	8.7	23 57.5	4.3	56.4	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
10	330 38.1	46.3	96 48.3	8.8	23 53.2	4.4	56.3	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
11	345 38.1	46.7	111 16.1	8.9	23 48.8	4.5	56.3	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
12	0 38.0	N21 47.1	125 44.0	8.9	S23 44.3	4.7	56.3	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
13	15 37.9	47.4	140 11.9	9.0	23 39.6	4.8	56.2	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
14	30 37.8	47.8	154 39.9	9.1	23 34.8	4.9	56.2	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
15	45 37.7	48.2	169 08.0	9.2	23 29.9	5.0	56.2	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
16	60 37.6	48.5	183 36.2	9.3	23 24.9	5.1	56.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
17	75 37.5	48.9	198 04.5	9.4	23 19.8	5.3	56.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
18	90 37.4	N21 49.3	212 32.9	9.4	S23 14.5	5.3	56.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
19	105 37.4	49.6	227 01.3	9.5	23 09.2	5.5	56.1	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
20	120 37.3	50.0	241 29.8	9.6	23 03.7	5.6	56.0	01 26	02 06	02 06	25 18	01 18	01 52	02 01	
21	135 37.2	50.4	255 58.4	9.7	22 58.1	5.7	56.0	01 26	02 06	02 06	25 18	01 18	01 52	02	

UT	ARIES		VENUS -4.0		MARS +1.7		JUPITER -1.9		SATURN +0.0		STARS		
	GHA	GHA Dec	GHA Dec	GHA Dec	GHA Dec	GHA Dec	GHA Dec	GHA Dec	Name	SHA	Dec		
31 F R I D A Y	00	248 19.1	144 35.1 N24 39.6	156 30.2 N24 24.9	140 31.8 N22 40.8	172 03.9 N21 31.8	Acamar	315 25.3	S40 17.7				
	01	263 21.6	159 34.3 39.4	171 30.8 24.8	155 33.7 40.8	187 06.0 31.9	Achernar	335 33.5	S57 13.4				
	02	278 24.1	174 33.5 39.1	186 31.5 24.8	170 35.6 40.7	202 08.2 31.9	Acrux	173 19.0	S63 06.9				
	03	293 26.5	189 32.7 . . 38.9	201 32.2 . . 24.8	185 37.5 . . 40.7	217 10.3 . . 31.9	Adhara	255 19.7	S28 58.6				
	04	308 29.0	204 32.0 38.7	216 32.8 24.8	200 39.5 40.6	232 12.4 32.0	Aldebaran	290 59.8	N16 30.8				
	05	323 31.4	219 31.2 38.4	231 33.5 24.8	215 41.4 40.6	247 14.5 32.0							
	06	338 33.9	234 30.4 N24 38.2	246 34.1 N24 24.8	230 43.3 N22 40.5	262 16.6 N21 32.0	Alioth	166 27.9	N55 57.1				
	07	353 36.4	249 29.6 38.0	261 34.8 24.8	245 45.2 40.4	277 18.7 32.1	Alkaid	153 05.3	N49 18.3				
	08	8 38.8	264 28.8 37.7	276 35.5 24.8	260 47.2 40.4	292 20.9 32.1	Al Na'ir	27 54.4	S46 56.9				
	09	23 41.3	279 28.0 . . 37.5	291 36.1 . . 24.8	275 49.1 . . 40.3	307 23.0 . . 32.1	Alnilam	275 55.5	S 1 12.1				
	10	38 43.8	294 27.2 37.3	306 36.8 24.7	290 51.0 40.3	322 25.1 32.2	Alphard	218 04.8	S 8 40.1				
	11	53 46.2	309 26.4 37.0	321 37.4 24.7	305 52.9 40.2	337 27.2 32.2							
	12	68 48.7	324 25.6 N24 36.8	336 38.1 N24 24.7	320 54.9 N22 40.1	352 29.3 N21 32.3	Alphecca	126 18.0	N26 42.5				
	13	83 51.2	339 24.8 36.5	351 38.8 24.7	335 56.8 40.1	7 31.5 32.3	Alpheratz	357 52.7	N29 05.9				
	14	98 53.6	354 24.0 36.3	6 39.4 24.7	350 58.7 40.0	22 33.6 32.3	Altair	62 16.5	N 8 52.3				
	15	113 56.1	9 23.2 . . 36.0	21 40.1 . . 24.7	6 00.6 . . 40.0	37 35.7 . . 32.4	Ankaa	353 24.4	S42 17.5				
	16	128 58.6	24 22.4 35.8	36 40.7 24.7	21 02.6 39.9	52 37.8 32.4	Antares	112 36.6	S26 26.3				
	17	144 01.0	39 21.6 35.5	51 41.4 24.6	36 04.5 39.9	67 39.9 32.4							
	18	159 03.5	54 20.9 N24 35.3	66 42.1 N24 24.6	51 06.4 N22 39.8	82 42.1 N21 32.5	Arcturus	146 03.4	N19 10.3				
	19	174 05.9	69 20.1 35.0	81 42.7 24.6	66 08.3 39.7	97 44.2 32.5	Atria	107 45.8	S69 01.9				
	20	189 08.4	84 19.3 34.8	96 43.4 24.6	81 10.2 39.7	112 46.3 32.5	Avior	234 22.1	S59 31.2				
	21	204 10.9	99 18.5 . . 34.5	111 44.0 . . 24.6	96 12.2 . . 39.6	127 48.4 . . 32.6	Bellatrix	278 41.7	N 6 21.1				
	22	219 13.3	114 17.7 34.3	126 44.7 24.6	111 14.1 39.6	142 50.5 32.6	Betelgeuse	271 11.1	N 7 24.4				
23	234 15.8	129 16.9 34.0	141 45.4 24.5	126 16.0 39.5	157 52.6 32.6								
1 S A T U R D A Y	00	249 18.3	144 16.1 N24 33.8	156 46.0 N24 24.5	141 17.9 N22 39.4	172 54.8 N21 32.7	Canopus	264 00.5	S52 41.9				
	01	264 20.7	159 15.3 33.5	171 46.7 24.5	156 19.9 39.4	187 56.9 32.7	Capella	280 47.8	N46 00.0				
	02	279 23.2	174 14.5 33.3	186 47.3 24.5	171 21.8 39.3	202 59.0 32.7	Deneb	49 37.2	N45 17.0				
	03	294 25.7	189 13.8 . . 33.0	201 48.0 . . 24.5	186 23.7 . . 39.3	218 01.1 . . 32.8	Denebola	182 42.4	N14 33.7				
	04	309 28.1	204 13.0 32.7	216 48.7 24.4	201 25.6 39.2	233 03.2 32.8	Diphda	349 04.8	S17 58.5				
	05	324 30.6	219 12.2 32.5	231 49.3 24.4	216 27.6 39.2	248 05.4 32.8							
	06	339 33.0	234 11.4 N24 32.2	246 50.0 N24 24.4	231 29.5 N22 39.1	263 07.5 N21 32.9	Dubhe	194 02.1	N61 44.7				
	07	354 35.5	249 10.6 32.0	261 50.6 24.4	246 31.4 39.0	278 09.6 32.9	El Nath	278 24.0	N28 36.6				
	08	9 38.0	264 09.8 31.7	276 51.3 24.4	261 33.3 39.0	293 11.7 32.9	Eltanin	90 49.7	N51 29.2				
	09	24 40.4	279 09.0 . . 31.4	291 52.0 . . 24.3	276 35.3 . . 38.9	308 13.8 . . 33.0	Enif	33 55.6	N 9 53.0				
	10	39 42.9	294 08.3 31.2	306 52.6 24.3	291 37.2 38.9	323 15.9 33.0	Fomalhaut	15 33.5	S29 36.6				
	11	54 45.4	309 07.5 30.9	321 53.3 24.3	306 39.1 38.8	338 18.1 33.0							
	12	69 47.8	324 06.7 N24 30.6	336 53.9 N24 24.3	321 41.0 N22 38.7	353 20.2 N21 33.1	Gacrux	172 10.5	S57 07.8				
	13	84 50.3	339 05.9 30.3	351 54.6 24.2	336 42.9 38.7	8 22.3 33.1	Gienah	176 01.2	S17 33.3				
	14	99 52.8	354 05.1 30.1	6 55.3 24.2	351 44.9 38.6	23 24.4 33.1	Hadar	149 00.0	S60 23.2				
	15	114 55.2	9 04.3 . . 29.8	21 55.9 . . 24.2	6 46.8 . . 38.6	38 26.5 . . 33.2	Hamal	328 10.9	N23 28.2				
	16	129 57.7	24 03.6 29.5	36 56.6 24.2	21 48.7 38.5	53 28.7 33.2	Kaus Aust.	83 55.0	S34 23.0				
	17	145 00.2	39 02.8 29.3	51 57.2 24.2	36 50.6 38.4	68 30.8 33.2							
	18	160 02.6	54 02.0 N24 29.0	66 57.9 N24 24.1	51 52.6 N22 38.4	83 32.9 N21 33.3	Kochab	137 18.3	N74 08.9				
	19	175 05.1	69 01.2 28.7	81 58.6 24.1	66 54.5 38.3	98 35.0 33.3	Markab	13 47.1	N15 12.8				
	20	190 07.5	84 00.4 28.4	96 59.2 24.1	81 56.4 38.3	113 37.1 33.3	Menkar	314 24.5	N 4 05.8				
	21	205 10.0	98 59.7 . . 28.1	111 59.9 . . 24.1	96 58.3 . . 38.2	128 39.2 . . 33.4	Menkent	148 17.6	S36 23.0				
	22	220 12.5	113 58.9 27.9	127 00.6 24.0	112 00.2 38.1	143 41.4 33.4	Miaplacidus	221 42.1	S69 43.8				
23	235 14.9	128 58.1 27.6	142 01.2 24.0	127 02.2 38.1	158 43.5 33.4								
2 S U N D A Y	00	250 17.4	143 57.3 N24 27.3	157 01.9 N24 24.0	142 04.1 N22 38.0	173 45.6 N21 33.5	Mirfak	308 53.4	N49 52.0				
	01	265 19.9	158 56.5 27.0	172 02.5 24.0	157 06.0 38.0	188 47.7 33.5	Nunki	76 08.8	S26 17.6				
	02	280 22.3	173 55.8 26.7	187 03.2 23.9	172 07.9 37.9	203 49.8 33.5	Peacock	53 32.5	S56 43.5				
	03	295 24.8	188 55.0 . . 26.4	202 03.9 . . 23.9	187 09.8 . . 37.8	218 52.0 . . 33.6	Pollux	243 38.6	N28 01.4				
	04	310 27.3	203 54.2 26.1	217 04.5 23.9	202 11.8 37.8	233 54.1 33.6	Procyon	245 09.1	N 5 13.2				
	05	325 29.7	218 53.4 25.8	232 05.2 23.8	217 13.7 37.7	248 56.2 33.6							
	06	340 32.2	233 52.6 N24 25.6	247 05.8 N24 23.8	232 15.6 N22 37.7	263 58.3 N21 33.7	Rasalhague	96 14.2	N12 33.4				
	07	355 34.7	248 51.9 25.3	262 06.5 23.8	247 17.5 37.6	279 00.4 33.7	Regulus	207 52.8	N11 57.5				
	08	10 37.1	263 51.1 25.0	277 07.2 23.8	262 19.4 37.5	294 02.5 33.7	Rigel	281 20.8	S 8 12.0				
	09	25 39.6	278 50.3 . . 24.7	292 07.8 . . 23.7	277 21.4 . . 37.5	309 04.7 . . 33.8	Rigil Kent.	140 03.3	S60 50.8				
	10	40 42.0	293 49.5 24.4	307 08.5 23.7	292 23.3 37.4	324 06.8 33.8	Sabik	102 22.2	S15 43.7				
	11	55 44.5	308 48.8 24.1	322 09.2 23.7	307 25.2 37.4	339 08.9 33.8							
	12	70 47.0	323 48.0 N24 23.8	337 09.8 N24 23.6	322 27.1 N22 37.3	354 11.0 N21 33.9	Schedar	349 50.9	N56 32.7				
	13	85 49.4	338 47.2 23.5	352 10.5 23.6	337 29.0 37.2	9 13.1 33.9	Shaula	96 33.3	S37 06.3				
	14	100 51.9	353 46.4 23.2	7 11.1 23.6	352 31.0 37.2	24 15.3 33.9	Sirius	258 41.7	S16 43.2				
	15	115 54.4	8 45.7 . . 22.9	22 11.8 . . 23.5	7 32.9 . . 37.1	39 17.4 . . 34.0	Spica	158 40.3	S11 10.4				
	16	130 56.8	23 44.9 22.6	37 12.5 23.5	22 34.8 37.1	54 19.5 34.0	Suhail	222 59.1	S43 26.7				
	17	145 59.3	38 44.1 22.3	52 13.1 23.5	37 36.7 37.0	69 21.6 34.0							
	18	161 01.8	53 43.3 N24 22.0	67 13.8 N24 23.4	52 38.6 N22 36.9	84 23.7 N21 34.1	Vega	80 44.5	N38 47.0				
	19	176 04.2	68 42.6 21.7	82 14.5 23.4	67 40.6 36.9	99 25.8 34.1	Zuben'ubi	137 14.8	S16 03.1				
	20	191 06.7	83 41.8 21.4	97 15.1 23.4	82 42.5 36.8	114 28.0 34.1							
	21	206 09.1	98 41.0 . . 21.0	112 15.8 . . 23.3	97 44.4 . . 36.8	129 30.1 . . 34.2							
	22	221 11.6	113 40.3 20.7	127 16.4 23.3	112 46.3 36.7	144 32.2 34.2	Venus	254 57.9	h 14 24				
23	236 14.1	128 39.5 20.4	142 17.1 23.3	127 48.2 36.6	159 34.3 34.2	Mars	267 27.8	13 32					
						Jupiter	251 59.7	14 33					
						Saturn	283 36.5	12 27					
	Mer. Pass.	7 21.6	v -0.8 d 0.3	v 0.7 d 0.0	v 1.9 d 0.1	v 2.1 d 0.0							

UT	SUN		MOON				Lat.	Twilight			Moonrise				
	GHA	Dec	GHA	<i>v</i>	Dec	<i>d</i>		HP	Naut.	Civil	Sunrise	31	1	2	3
									h m	h m	h m	h m	h m	h m	h m
31 FRI DAY	00	180 36.9 N21 51.4	299 24.8 9.9	S22	40.6	6.0	55.9	N 72	☐	☐	☐	■	■	03 38	02 55
	01	195 36.8 51.8	313 53.7 10.1	22 34.6	6.2	55.9	N 70	☐	☐	☐	■	03 57	03 03	02 37	02 22
	02	210 36.7 52.2	328 22.8 10.1	22 28.4	6.2	55.9	66	////	////	01 13	02 42	02 27	02 18	02 10	
	03	225 36.6 52.5	342 51.9 10.2	22 22.2	6.4	55.8	64	////	////	01 58	02 01	02 02	02 02	02 00	
	04	240 36.6 52.9	357 21.1 10.3	22 15.8	6.5	55.8	62	////	////	02 28	01 32	01 43	01 48	01 51	
	05	255 36.5 53.2	11 50.4 10.4	22 09.3	6.6	55.8	60	////	01 27	02 50	01 10	01 27	01 37	01 44	
	06	270 36.4 N21 53.6	26 19.8 10.5	S22	02.7	6.6	55.7	N 58	////	02 01	03 07	00 52	01 13	01 27	01 37
	07	285 36.3 54.0	40 49.3 10.6	21 56.1	6.8	55.7	56	////	02 25	03 22	00 37	01 01	01 18	01 31	
	08	300 36.2 54.3	55 18.9 10.6	21 49.3	6.9	55.7	54	01 19	02 44	03 35	00 24	00 51	01 11	01 26	
	09	315 36.1 54.7	69 48.5 10.7	21 42.4	7.0	55.7	52	01 50	03 00	03 46	00 13	00 42	01 04	01 21	
	10	330 36.0 55.0	84 18.2 10.9	21 35.4	7.1	55.6	50	02 13	03 13	03 56	00 03	00 33	00 57	01 17	
	11	345 35.9 55.4	98 48.1 10.9	21 28.3	7.1	55.6	45	02 53	03 40	04 17	24 16	00 16	00 44	01 07	
	12	0 35.8 N21 55.7	113 18.0 11.0	S21	21.2	7.3	55.6	N 40	03 21	04 01	04 33	24 01	00 01	00 33	01 00
	13	15 35.7 56.1	127 48.0 11.1	21 13.9	7.4	55.5	35	03 42	04 18	04 47	23 49	24 23	00 23	00 53	
	14	30 35.7 56.4	142 18.1 11.2	21 06.5	7.5	55.5	30	04 00	04 32	04 59	23 38	24 14	00 14	00 47	
	15	45 35.6 56.8	156 48.3 11.2	20 59.0	7.5	55.5	20	04 27	04 56	05 20	23 20	24 00	00 00	00 36	
	16	60 35.5 57.1	171 18.5 11.4	20 51.5	7.7	55.5	N 10	04 48	05 15	05 38	23 04	23 47	24 27	00 27	
	17	75 35.4 57.5	185 48.9 11.4	20 43.8	7.7	55.4	0	05 06	05 32	05 54	22 49	23 35	24 18	00 18	
	18	90 35.3 N21 57.8	200 19.3 11.5	S20	36.1	7.8	55.4	S 10	05 22	05 48	06 10	22 33	23 23	24 10	00 10
	19	105 35.2 58.2	214 49.8 11.6	20 28.3	8.0	55.4	20	05 37	06 04	06 28	22 17	23 10	24 00	00 00	
	20	120 35.1 58.5	229 20.4 11.7	20 20.3	8.0	55.4	30	05 52	06 21	06 48	21 58	22 55	23 50	24 43	
	21	135 35.0 58.9	243 51.1 11.8	20 12.3	8.1	55.3	35	06 00	06 31	06 59	21 47	22 46	23 44	24 40	
	22	150 34.9 59.2	258 21.9 11.9	20 04.2	8.2	55.3	40	06 08	06 42	07 12	21 35	22 36	23 37	24 35	
23	165 34.8 59.6	272 52.8 11.9	19 56.0	8.2	55.3	45	06 18	06 55	07 28	21 20	22 25	23 28	24 31		
1 SAT DAY	00	180 34.7 N21 59.9	287 23.7 12.0	S19	47.8	8.4	55.3	S 50	06 28	07 09	07 47	21 01	22 10	23 18	24 25
	01	195 34.6 22 00.3	301 54.7 12.1	19 39.4	8.4	55.2	52	06 33	07 16	07 56	20 53	22 04	23 14	24 22	
	02	210 34.5 00.6	316 25.8 12.2	19 31.0	8.5	55.2	54	06 38	07 23	08 06	20 43	21 56	23 09	24 20	
	03	225 34.5 01.0	330 57.0 12.3	19 22.5	8.6	55.2	56	06 44	07 32	08 17	20 32	21 48	23 03	24 16	
	04	240 34.4 01.3	345 28.3 12.4	19 13.9	8.7	55.2	58	06 50	07 41	08 31	20 19	21 39	22 57	24 13	
	05	255 34.3 01.7	359 59.7 12.4	19 05.2	8.8	55.1	S 60	06 56	07 51	08 46	20 04	21 28	22 50	24 09	
	06	270 34.2 N22 02.0	14 31.1 12.6	S18	56.4	8.8	55.1	Lat.	Sunset	Twilight		Moonset			
	07	285 34.1 02.3	29 02.7 12.6	18 47.6	8.9	55.1				Civil	Naut.	31	1	2	3
	08	300 34.0 02.7	43 34.3 12.7	18 38.7	9.0	55.1									
	09	315 33.9 03.0	58 06.0 12.7	18 29.7	9.1	55.1									
	10	330 33.8 03.4	72 37.7 12.9	18 20.6	9.1	55.0									
	11	345 33.7 03.7	87 09.6 12.9	18 11.5	9.2	55.0	N 72	☐	☐	☐	■	■	08 12	10 25	
	12	0 33.6 N22 04.0	101 41.5 13.0	S18	02.3	9.3	55.0	N 70	☐	☐	☐	■	06 18	08 47	10 41
	13	15 33.5 04.4	116 13.5 13.1	17 53.0	9.4	55.0	68	☐	☐	☐	■	07 13	09 11	10 54	
	14	30 33.4 04.7	130 45.6 13.1	17 43.6	9.4	54.9	66	22 46	////	////	05 49	07 46	09 29	11 05	
	15	45 33.3 05.0	145 17.7 13.3	17 34.2	9.5	54.9	64	21 59	////	////	06 30	08 10	09 44	11 14	
	16	60 33.2 05.4	159 50.0 13.3	17 24.7	9.6	54.9	62	21 30	////	////	06 58	08 29	09 57	11 21	
	17	75 33.1 05.7	174 22.3 13.4	17 15.1	9.6	54.9	60	21 07	22 32	////	07 20	08 44	10 07	11 28	
	18	90 33.0 N22 06.1	188 54.7 13.4	S17	05.5	9.7	54.9	N 58	20 49	21 57	////	07 37	08 57	10 16	11 33
	19	105 32.9 06.4	203 27.1 13.6	16 55.8	9.7	54.8	56	20 34	21 32	////	07 52	09 08	10 24	11 38	
	20	120 32.8 06.7	217 59.7 13.6	16 46.1	9.9	54.8	54	20 21	21 13	22 39	08 04	09 18	10 31	11 43	
	21	135 32.7 07.1	232 32.3 13.7	16 36.2	9.9	54.8	52	20 10	20 57	22 07	08 15	09 27	10 38	11 47	
	22	150 32.6 07.4	247 05.0 13.7	16 26.3	9.9	54.8	50	20 00	20 43	21 44	08 25	09 34	10 43	11 51	
23	165 32.5 07.7	261 37.7 13.9	16 16.4	10.0	54.8	45	19 39	20 16	21 03	08 46	09 51	10 56	11 59		
2 SUN DAY	00	180 32.4 N22 08.0	276 10.6 13.9	S16	06.4	10.1	54.8	N 40	19 23	19 55	20 35	09 02	10 04	11 06	12 05
	01	195 32.4 08.4	290 43.5 13.9	15 56.3	10.1	54.7	35	19 08	19 38	20 14	09 16	10 16	11 14	12 11	
	02	210 32.3 08.7	305 16.4 14.0	15 46.2	10.2	54.7	30	18 56	19 23	19 56	09 28	10 26	11 22	12 16	
	03	225 32.2 09.0	319 49.4 14.2	15 36.0	10.3	54.7	20	18 36	19 00	19 29	09 49	10 43	11 35	12 24	
	04	240 32.1 09.4	334 22.6 14.1	15 25.7	10.3	54.7	N 10	18 18	18 41	19 08	10 07	10 58	11 46	12 32	
	05	255 32.0 09.7	348 55.7 14.3	15 15.4	10.4	54.7	0	18 01	18 24	18 50	10 23	11 11	11 56	12 39	
	06	270 31.9 N22 10.0	3 29.0 14.3	S15	05.0	10.4	54.7	S 10	17 45	18 08	18 34	10 40	11 25	12 07	12 45
	07	285 31.8 10.3	18 02.3 14.3	14 54.6	10.5	54.6	20	17 28	17 51	18 19	10 57	11 39	12 18	12 53	
	08	300 31.7 10.7	32 35.6 14.5	14 44.1	10.5	54.6	30	17 08	17 34	18 03	11 17	11 56	12 30	13 01	
	09	315 31.6 11.0	47 09.1 14.4	14 33.6	10.6	54.6	35	16 56	17 24	17 55	11 29	12 06	12 37	13 06	
	10	330 31.5 11.3	61 42.5 14.6	14 23.0	10.6	54.6	40	16 43	17 13	17 47	11 42	12 16	12 45	13 11	
	11	345 31.4 11.6	76 16.1 14.6	14 12.4	10.7	54.6	45	16 28	17 01	17 37	11 58	12 29	12 55	13 17	
	12	0 31.3 N22 12.0	90 49.7 14.7	S14	01.7	10.8	54.6	S 50	16 08	16 46	17 27	12 17	12 45	13 06	13 24
	13	15 31.2 12.3	105 23.4 14.7	13 50.9	10.7	54.5	52	15 59	16 39	17 22	12 27	12 52	13 11	13 28	
	14	30 31.1 12.6	119 57.1 14.8	13 40.2	10.9	54.5	54	15 49	16 32	17 17	12 37	13 00	13 17	13 31	
	15	45 31.0 12.9	134 30.9 14.9	13 29.3	10.9	54.5	56	15 38	16 23	17 11	12 48	13 09	13 24	13 35	
	16	60 30.9 13.2	149 04.8 14.9	13 18.4	10.9	54.5	58	15 25	16 14	17 05	13 01	13 19	13 31	13 40	
	17	75 30.8 13.6	163 38.7 15.0	13 07.5	11.0	54.5	S 60	15 09	16 04	16 59	13 17	13 30	13 39	13 45	
	18	90 30.7 N22 13.9	178 12.7 15.0	S12	56.5	11.0	54.5	Day	SUN		MOON				
	19	105 30.6 14.2	192 46.7 15.1	12 45.5	11.1	54.5			Eqn. of Time	Mer.	Mer. Pass.		Age Phase		
	20	120 30.5 14.5	207 20.8 15.1	12 34.4	11.1	54.5			00 ^h	12 ^h	Pass.	Upper	Lower	d %	
	21	135 30.4 14.8	221 54.9 15.2	12 23.3	11.2	54.4			m s	m s	h m	h m	h m	d %	
	22	150 30.3 15.1	236 29.1 15.2	12 12.1	11.2	54.4			02 28	02 24	11 58	04 11	16 36	19 74	
23	165 30.2 15.5	251 03.3 15.3	S12	00.9	11.2	54.4		02 19	02 15	11 58	05 00	17 23	20 64		
	SD 15.8 <i>d</i> 0.3	SD 15.1 15.0 14.9													

UT	SUN		MOON				Lat.	Twilight			Moonrise				
	GHA	Dec	GHA	v	Dec	d		HP	Naut.	Civil	Sunrise	3	4	5	6
									h m	h m	h m	h m	h m	h m	h m
d h	° /	° /	° /	'	° /	'	'	°	h m	h m	h m	h m	h m	h m	h m
MONDAY	3 00	180 30.1 N22 15.8	265 37.6 15.4	S11	49.7 11.3	54.4	N 72	□	□	□	02 55	02 27	02 04	01 41	
	01	195 30.0 16.1	280 12.0 15.3	11	38.4 11.4	54.4	N 70	□	□	□	02 37	02 18	02 01	01 45	
	02	210 29.9 16.4	294 46.3 15.5	11	27.0 11.3	54.4	68	□	□	□	02 50	02 10	01 59	01 48	
	03	225 29.8 . . 16.7	309 20.8 15.5	11	15.7 11.5	54.4	66	////	////	01 00	02 10	02 04	01 57	01 51	
	04	240 29.7 17.0	323 55.3 15.5	11	04.2 11.4	54.4	64	////	////	01 51	02 00	01 58	01 56	01 54	
	05	255 29.6 17.3	338 29.8 15.6	10	52.8 11.5	54.4	62	////	////	02 22	01 51	01 53	01 55	01 56	
	06	270 29.4 N22 17.6	353 04.4 15.6	S10	41.3 11.5	54.3	60	////	01 18	02 45	01 44	01 49	01 53	01 58	
	07	285 29.3 17.9	7 39.0 15.6	10	29.8 11.6	54.3	N 58	////	01 55	03 04	01 37	01 45	01 52	01 59	
	08	300 29.2 18.3	22 13.6 15.7	10	18.2 11.6	54.3	56	////	02 21	03 19	01 31	01 42	01 52	02 01	
	09	315 29.1 . . 18.6	36 48.3 15.8	10	06.6 11.6	54.3	54	01 11	02 40	03 32	01 26	01 39	01 51	02 02	
	10	330 29.0 18.9	51 23.1 15.8	9	55.0 11.7	54.3	52	01 45	02 57	03 44	01 21	01 36	01 50	02 04	
	11	345 28.9 19.2	65 57.9 15.8	9	43.3 11.7	54.3	50	02 09	03 11	03 54	01 17	01 34	01 49	02 05	
	12	0 28.8 N22 19.5	80 32.7 15.9	S 9	31.6 11.7	54.3	45	02 51	03 39	04 15	01 07	01 28	01 48	02 07	
	13	15 28.7 19.8	95 07.6 15.9	9	19.9 11.8	54.3	N 40	03 19	04 00	04 32	01 00	01 24	01 47	02 09	
	14	30 28.6 20.1	109 42.5 15.9	9	08.1 11.8	54.3	35	03 41	04 17	04 46	00 53	01 20	01 46	02 11	
	15	45 28.5 . . 20.4	124 17.4 16.0	8	56.3 11.8	54.3	30	03 59	04 32	04 59	00 47	01 16	01 45	02 13	
	16	60 28.4 20.7	138 52.4 16.0	8	44.5 11.9	54.3	20	04 27	04 55	05 20	00 36	01 10	01 43	02 15	
	17	75 28.3 21.0	153 27.4 16.0	8	32.6 11.9	54.3	N 10	04 48	05 15	05 38	00 27	01 05	01 41	02 18	
	18	90 28.2 N22 21.3	168 02.4 16.1	S 8	20.7 11.9	54.3	0	05 06	05 32	05 55	00 18	01 00	01 40	02 20	
	19	105 28.1 21.6	182 37.5 16.1	8	08.8 12.0	54.3	S 10	05 22	05 49	06 11	00 10	00 55	01 39	02 23	
	20	120 28.0 21.9	197 12.6 16.2	7	56.8 11.9	54.2	20	05 38	06 05	06 29	00 00	00 49	01 37	02 25	
	21	135 27.9 . . 22.2	211 47.8 16.1	7	44.9 12.0	54.2	30	05 53	06 23	06 49	24 43	00 43	01 36	02 28	
	22	150 27.8 22.5	226 22.9 16.2	7	32.9 12.1	54.2	45	06 01	06 33	07 01	24 40	00 40	01 35	02 30	
	23	165 27.7 22.8	240 58.1 16.3	7	20.8 12.0	54.2	30	06 10	06 44	07 14	24 35	00 35	01 34	02 32	
	00	180 27.6 N22 23.1	255 33.4 16.2	S 7	08.8 12.1	54.2	45	06 20	06 57	07 30	24 31	00 31	01 32	02 34	
	01	195 27.5 23.4	270 08.6 16.3	6	56.7 12.1	54.2	S 50	06 31	07 12	07 50	24 25	00 25	01 31	02 37	
	02	210 27.4 23.7	284 43.9 16.3	6	44.6 12.1	54.2	52	06 36	07 19	07 59	24 22	00 22	01 30	02 38	
	03	225 27.3 . . 24.0	299 19.2 16.3	6	32.5 12.2	54.2	54	06 41	07 26	08 09	24 20	00 20	01 30	02 40	
	04	240 27.2 24.3	313 54.5 16.4	6	20.3 12.2	54.2	56	06 47	07 35	08 21	24 16	00 16	01 29	02 41	
	05	255 27.0 24.6	328 29.9 16.4	6	08.1 12.2	54.2	58	06 53	07 44	08 35	24 13	00 13	01 28	02 43	
	06	270 26.9 N22 24.9	343 05.3 16.4	S 5	55.9 12.2	54.2	S 60	07 00	07 55	08 51	24 09	00 09	01 27	02 45	
	07	285 26.8 25.2	357 40.7 16.4	5	43.7 12.2	54.2	Lat.	Sunset	Twilight		Moonset				
	08	300 26.7 25.5	12 16.1 16.4	5	31.5 12.3	54.2			Civil	Naut.	3	4	5	6	
	09	315 26.6 . . 25.7	26 51.5 16.5	5	19.2 12.3	54.2	°	h m	h m	h m	h m	h m	h m	h m	
	10	330 26.5 26.0	41 27.0 16.4	5	06.9 12.3	54.2	N 72	□	□	□	10 25	12 19	14 08	15 58	
	11	345 26.4 26.3	56 02.4 16.5	4	54.6 12.3	54.2	N 70	□	□	□	10 41	12 26	14 07	15 49	
	12	0 26.3 N22 26.6	70 37.9 16.5	S 4	42.3 12.3	54.2	68	□	□	□	10 54	12 31	14 06	15 42	
	13	15 26.2 26.9	85 13.4 16.5	4	30.0 12.4	54.2	66	23 01	////	////	11 05	12 36	14 06	15 36	
	14	30 26.1 27.2	99 48.9 16.5	4	17.6 12.4	54.2	64	22 07	////	////	11 14	12 40	14 05	15 31	
	15	45 26.0 . . 27.5	114 24.4 16.6	4	05.2 12.4	54.2	62	21 36	////	////	11 21	12 43	14 05	15 27	
	16	60 25.9 27.8	129 00.0 16.5	3	52.8 12.4	54.2	60	21 12	22 41	////	11 28	12 46	14 04	15 23	
	17	75 25.8 28.1	143 35.5 16.6	3	40.4 12.4	54.2	N 58	20 54	22 03	////	11 33	12 49	14 04	15 20	
	18	90 25.7 N22 28.3	158 11.1 16.6	S 3	28.0 12.4	54.2	56	20 38	21 37	////	11 38	12 51	14 04	15 17	
	19	105 25.5 28.6	172 46.7 16.5	3	15.6 12.4	54.2	54	20 25	21 17	22 48	11 43	12 53	14 03	15 14	
	20	120 25.4 28.9	187 22.2 16.6	3	03.2 12.5	54.2	52	20 13	21 00	22 13	11 47	12 55	14 03	15 11	
	21	135 25.3 . . 29.2	201 57.8 16.6	2	50.7 12.5	54.2	50	20 03	20 46	21 48	11 51	12 57	14 03	15 09	
	22	150 25.2 29.5	216 33.4 16.6	2	38.2 12.4	54.2	45	19 42	20 18	21 07	11 59	13 01	14 02	15 04	
	23	165 25.1 29.8	231 09.0 16.6	2	25.8 12.5	54.2	N 40	19 25	19 57	20 38	12 05	13 04	14 02	15 01	
	00	180 25.0 N22 30.0	245 44.6 16.6	S 2	13.3 12.5	54.2	35	19 10	19 40	20 16	12 11	13 06	14 01	14 57	
	01	195 24.9 30.3	260 20.2 16.6	2	00.8 12.6	54.2	30	18 58	19 25	19 58	12 16	13 09	14 01	14 54	
	02	210 24.8 30.6	274 55.8 16.6	1	48.2 12.5	54.2	20	18 37	19 01	19 30	12 24	13 13	14 00	14 49	
	03	225 24.7 . . 30.9	289 31.4 16.6	1	35.7 12.5	54.2	N 10	18 19	18 42	19 08	12 32	13 16	14 00	14 44	
	04	240 24.6 31.2	304 07.0 16.6	1	23.2 12.5	54.2	0	18 02	18 24	18 50	12 39	13 19	13 59	14 40	
	05	255 24.5 31.4	318 42.6 16.6	1	10.7 12.6	54.2	S 10	17 45	18 08	18 34	12 45	13 22	13 59	14 36	
	06	270 24.3 N22 31.7	333 18.2 16.6	S 0	58.1 12.5	54.2	20	17 28	17 51	18 19	12 53	13 26	13 58	14 31	
	07	285 24.2 32.0	347 53.8 16.6	0	45.6 12.6	54.3	30	17 07	17 33	18 03	13 01	13 30	13 58	14 26	
	08	300 24.1 32.3	2 29.4 16.6	0	33.0 12.6	54.3	35	16 56	17 23	17 55	13 06	13 32	13 57	14 23	
	09	315 24.0 . . 32.5	17 05.0 16.6	0	20.4 12.5	54.3	40	16 42	17 12	17 46	13 11	13 34	13 57	14 20	
	10	330 23.9 32.8	31 40.6 16.5	S 0	07.9 12.6	54.3	45	16 26	17 00	17 36	13 17	13 37	13 56	14 16	
	11	345 23.8 33.1	46 16.1 16.6	N 0	04.7 12.6	54.3	S 50	16 07	16 44	17 25	13 24	13 40	13 56	14 11	
	12	0 23.7 N22 33.4	60 51.7 16.6	N 0	17.3 12.5	54.3	52	15 57	16 37	17 21	13 28	13 42	13 56	14 09	
	13	15 23.6 33.6	75 27.3 16.5	0	29.8 12.6	54.3	54	15 47	16 30	17 15	13 31	13 44	13 55	14 07	
	14	30 23.5 33.9	90 02.8 16.5	0	42.4 12.6	54.3	56	15 35	16 21	17 10	13 35	13 46	13 55	14 04	
	15	45 23.3 . . 34.2	104 38.3 16.6	0	55.0 12.6	54.3	58	15 22	16 12	17 03	13 40	13 48	13 55	14 02	
	16	60 23.2 34.5	119 13.9 16.5	1	07.6 12.6	54.3	S 60	15 05	16 01	16 57	13 45	13 50	13 54	13 59	
	17	75 23.1 34.7	133 49.4 16.5	1	20.2 12.5	54.3	Day	SUN		MOON					
	18	90 23.0 N22 35.0	148 24.9 16.4	N 1	32.7 12.6	54.3		Eqn. of Time	Mer.	Mer. Pass.		Age Phase			
	19	105 22.9 35.3	163 00.3 16.5	1	45.3 12.6	54.3		00 ^h	12 ^h	Pass.	Upper	Lower	d %		
	20	120 22.8 35.5	177 35.8 16.5	1	57.9 12.6	54.3		d	m s	m s	h m	h m	h m	%	
	21	135 22.7 . . 35.8	192 11.3 16.4	2	10.5 12.6	54.3		3	02 00</						

UT	ARIES		VENUS -4.0		MARS +1.7		JUPITER -1.9		SATURN +0.0		STARS		
	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
T H U R S D A Y	6 00	254 14.0	142 44.3 N23 54.5	158 05.7 N24 19.8	145 08.1 N22 32.1	177 08.9 N21 36.6	Acamar	315 25.2	S40 17.7				
	01	269 16.4	157 43.6 54.1	173 06.4 19.8	160 10.0 32.0	192 11.0 36.7	Achernar	335 33.5	S57 13.4				
	02	284 18.9	172 42.8 53.7	188 07.0 19.7	175 11.9 32.0	207 13.1 36.7	Acruz	173 19.0	S63 06.9				
	03	299 21.3	187 42.1 . . 53.3	203 07.7 . . 19.6	190 13.8 . . 31.9	222 15.2 . . 36.7	Adhara	255 19.7	S28 58.6				
	04	314 23.8	202 41.4 52.9	218 08.4 19.6	205 15.7 31.8	237 17.3 36.8	Aldebaran	290 59.7	N16 30.8				
	05	329 26.3	217 40.6 52.5	233 09.0 19.5	220 17.6 31.8	252 19.4 36.8							
	06	344 28.7	232 39.9 N23 52.1	248 09.7 N24 19.5	235 19.5 N22 31.7	267 21.6 N21 36.8	Alioth	166 27.9	N55 57.1				
	07	359 31.2	247 39.2 51.7	263 10.4 19.4	250 21.4 31.6	282 23.7 36.8	Alkaid	153 05.3	N49 18.3				
	08	14 33.7	262 38.4 51.3	278 11.0 19.3	265 23.4 31.6	297 25.8 36.9	Al Na'ir	27 54.4	S46 56.8				
	09	29 36.1	277 37.7 . . 50.9	293 11.7 . . 19.3	280 25.3 . . 31.5	312 27.9 . . 36.9	Alnilam	275 55.5	S 1 12.1				
	10	44 38.6	292 37.0 50.5	308 12.4 19.2	295 27.2 31.4	327 30.0 36.9	Alphard	218 04.8	S 8 40.1				
	11	59 41.1	307 36.2 50.1	323 13.0 19.1	310 29.1 31.4	342 32.1 37.0							
	12	74 43.5	322 35.5 N23 49.7	338 13.7 N24 19.1	325 31.0 N22 31.3	357 34.3 N21 37.0	Alphecca	126 18.0	N26 42.5				
	13	89 46.0	337 34.8 49.3	353 14.4 19.0	340 32.9 31.3	12 36.4 37.0	Alpheratz	357 52.7	N29 05.9				
	14	104 48.5	352 34.0 48.9	8 15.0 19.0	355 34.8 31.2	27 38.5 37.1	Altair	62 16.5	N 8 52.4				
	15	119 50.9	7 33.3 . . 48.5	23 15.7 . . 18.9	10 36.7 . . 31.1	42 40.6 . . 37.1	Ankaa	353 24.3	S42 17.5				
	16	134 53.4	22 32.6 48.0	38 16.4 18.8	25 38.6 31.1	57 42.7 37.1	Antares	112 36.6	S26 26.3				
	17	149 55.8	37 31.8 47.6	53 17.0 18.8	40 40.6 31.0	72 44.8 37.2							
	18	164 58.3	52 31.1 N23 47.2	68 17.7 N24 18.7	55 42.5 N22 30.9	87 47.0 N21 37.2	Arcturus	146 03.4	N19 10.3				
	19	180 00.8	67 30.4 46.8	83 18.4 18.6	70 44.4 30.9	102 49.1 37.2	Atria	107 45.8	S69 01.9				
	20	195 03.2	82 29.6 46.4	98 19.1 18.6	85 46.3 30.8	117 51.2 37.3	Avior	234 22.1	S59 31.2				
	21	210 05.7	97 28.9 . . 46.0	113 19.7 . . 18.5	100 48.2 . . 30.7	132 53.3 . . 37.3	Bellatrix	278 41.7	N 6 21.1				
	22	225 08.2	112 28.2 45.5	128 20.4 18.4	115 50.1 30.7	147 55.4 37.3	Betelgeuse	271 11.1	N 7 24.4				
23	240 10.6	127 27.4 45.1	143 21.1 18.4	130 52.0 30.6	162 57.5 37.4								
F R I D A Y	7 00	255 13.1	142 26.7 N23 44.7	158 21.7 N24 18.3	145 53.9 N22 30.5	177 59.6 N21 37.4	Canopus	264 00.6	S52 41.9				
	01	270 15.6	157 26.0 44.3	173 22.4 18.2	160 55.8 30.5	193 01.8 37.4	Capella	280 47.8	N46 00.0				
	02	285 18.0	172 25.3 43.8	188 23.1 18.2	175 57.7 30.4	208 03.9 37.5	Deneb	49 37.2	N45 17.0				
	03	300 20.5	187 24.5 . . 43.4	203 23.7 . . 18.1	190 59.7 . . 30.4	223 06.0 . . 37.5	Denebola	182 42.4	N14 33.7				
	04	315 22.9	202 23.8 43.0	218 24.4 18.0	206 01.6 30.3	238 08.1 37.5	Diphda	349 04.7	S17 58.4				
	05	330 25.4	217 23.1 42.6	233 25.1 17.9	221 03.5 30.2	253 10.2 37.5							
	06	345 27.9	232 22.3 N23 42.1	248 25.8 N24 17.9	236 05.4 N22 30.2	268 12.3 N21 37.6	Dubhe	194 02.1	N61 44.7				
	07	0 30.3	247 21.6 41.7	263 26.4 17.8	251 07.3 30.1	283 14.5 37.6	Elnath	278 24.0	N28 36.5				
	08	15 32.8	262 20.9 41.3	278 27.1 17.7	266 09.2 30.0	298 16.6 37.6	Eltanin	90 49.7	N51 29.2				
	09	30 35.3	277 20.2 . . 40.8	293 27.8 . . 17.7	281 11.1 . . 30.0	313 18.7 . . 37.7	Enif	33 55.6	N 9 53.0				
	10	45 37.7	292 19.4 40.4	308 28.4 17.6	296 13.0 29.9	328 20.8 37.7	Fomalhaut	15 33.5	S29 36.5				
	11	60 40.2	307 18.7 40.0	323 29.1 17.5	311 14.9 29.8	343 22.9 37.7							
	12	75 42.7	322 18.0 N23 39.5	338 29.8 N24 17.5	326 16.8 N22 29.8	358 25.0 N21 37.8	Gacrux	172 10.6	S57 07.8				
	13	90 45.1	337 17.3 39.1	353 30.4 17.4	341 18.8 29.7	13 27.2 37.8	Gienah	176 01.2	S17 33.3				
	14	105 47.6	352 16.6 38.6	8 31.1 17.3	356 20.7 29.6	28 29.3 37.8	Hadar	149 00.0	S60 23.2				
	15	120 50.1	7 15.8 . . 38.2	23 31.8 . . 17.2	11 22.6 . . 29.6	43 31.4 . . 37.9	Hamal	328 10.9	N23 28.2				
	16	135 52.5	22 15.1 37.8	38 32.5 17.2	26 24.5 29.5	58 33.5 37.9	Kaus Aust.	83 55.0	S34 23.0				
	17	150 55.0	37 14.4 37.3	53 33.1 17.1	41 26.4 29.4	73 35.6 37.9							
	18	165 57.4	52 13.7 N23 36.9	68 33.8 N24 17.0	56 28.3 N22 29.4	88 37.7 N21 38.0	Kochab	137 18.4	N74 09.0				
	19	180 59.9	67 13.0 36.4	83 34.5 16.9	71 30.2 29.3	103 39.9 38.0	Markab	13 47.0	N15 12.9				
	20	196 02.4	82 12.2 36.0	98 35.1 16.9	86 32.1 29.2	118 42.0 38.0	Menkar	314 24.5	N 4 05.8				
	21	211 04.8	97 11.5 . . 35.5	113 35.8 . . 16.8	101 34.0 . . 29.2	133 44.1 . . 38.1	Menkent	148 17.6	S36 23.0				
	22	226 07.3	112 10.8 35.1	128 36.5 16.7	116 35.9 29.1	148 46.2 38.1	Miaplacidus	221 42.2	S69 43.8				
23	241 09.8	127 10.1 34.6	143 37.2 16.6	131 37.8 29.0	163 48.3 38.1								
S A T U R D A Y	8 00	256 12.2	142 09.4 N23 34.2	158 37.8 N24 16.6	146 39.7 N22 29.0	178 50.4 N21 38.1	Miraf	308 53.4	N49 52.0				
	01	271 14.7	157 08.6 33.7	173 38.5 16.5	161 41.7 28.9	193 52.6 38.2	Nunki	76 08.7	S26 17.6				
	02	286 17.2	172 07.9 33.3	188 39.2 16.4	176 43.6 28.8	208 54.7 38.2	Peacock	53 32.4	S56 43.5				
	03	301 19.6	187 07.2 . . 32.8	203 39.8 . . 16.3	191 45.5 . . 28.8	223 56.8 . . 38.2	Pollux	243 38.6	N28 01.4				
	04	316 22.1	202 06.5 32.4	218 40.5 16.3	206 47.4 28.7	238 58.9 38.3	Procyon	245 09.1	N 5 13.2				
	05	331 24.6	217 05.8 31.9	233 41.2 16.2	221 49.3 28.6	254 01.0 38.3							
	06	346 27.0	232 05.1 N23 31.5	248 41.9 N24 16.1	236 51.2 N22 28.6	269 03.1 N21 38.3	Rasalhague	96 14.2	N12 33.5				
	07	1 29.5	247 04.4 31.0	263 42.5 16.0	251 53.1 28.5	284 05.3 38.4	Regulus	207 52.8	N11 57.5				
	08	16 31.9	262 03.6 30.6	278 43.2 15.9	266 55.0 28.4	299 07.4 38.4	Rigel	281 20.8	S 8 12.0				
	09	31 34.4	277 02.9 . . 30.1	293 43.9 . . 15.9	281 56.9 . . 28.4	314 09.5 . . 38.4	Rigil Kent.	140 03.4	S60 50.8				
	10	46 36.9	292 02.2 29.6	308 44.5 15.8	296 58.8 28.3	329 11.6 38.5	Sabik	102 22.2	S15 43.7				
	11	61 39.3	307 01.5 29.2	323 45.2 15.7	312 00.7 28.2	344 13.7 38.5							
	12	76 41.8	322 00.8 N23 28.7	338 45.9 N24 15.6	327 02.6 N22 28.2	359 15.8 N21 38.5	Schedar	349 50.9	N56 32.7				
	13	91 44.3	337 00.1 28.2	353 46.6 15.5	342 04.5 28.1	14 17.9 38.6	Shaula	96 33.3	S37 06.3				
	14	106 46.7	351 59.4 27.8	8 47.2 15.5	357 06.4 28.0	29 20.1 38.6	Sirius	258 41.8	S16 43.2				
	15	121 49.2	6 58.7 . . 27.3	23 47.9 . . 15.4	12 08.4 . . 28.0	44 22.2 . . 38.6	Spica	158 40.3	S11 10.4				
	16	136 51.7	21 58.0 26.8	38 48.6 15.3	27 10.3 27.9	59 24.3 38.6	Suhail	222 59.2	S43 26.7				
	17	151 54.1	36 57.3 26.4	53 49.3 15.2	42 12.2 27.8	74 26.4 38.7							
	18	166 56.6	51 56.5 N23 25.9	68 49.9 N24 15.1	57 14.1 N22 27.8	89 28.5 N21 38.7	Vega	80 44.5	N38 47.0				
	19	181 59.0	66 55.8 25.4	83 50.6 15.1	72 16.0 27.7	104 30.6 38.7	Zuben'ubi	137 14.8	S16 03.1				
	20	197 01.5	81 55.1 25.0	98 51.3 15.0	87 17.9 27.6	119 32.8 38.8							
	21	212 04.0	96 54.4 . . 24.5	113 51.9 . . 14.9	102 19.8 . . 27.6	134 34.9 . . 38.8							
	22	227 06.4	111 53.7 24.0	128 52.6 14.8	117 21.7 27.5	149 37.0 38.8	Venus	247 13.6	h 14 31				
23	242 08.9	126 53.0 23.5	143 53.3 14.7	132 23.6 27.4	164 39.1 38.9	Mars	263 08.6	13 26					
						Jupiter	250 40.8	14 15					
						Saturn	282 46.6	12 06					
	h m												
Mer. Pass.	6 58.0	v -0.7 d 0.4	v 0.7 d 0.1	v 1.9 d 0.1	v 2.1 d 0.0								

UT	SUN		MOON				Lat.	Twilight			Moonrise					
	GHA	Dec	GHA	v	Dec	d		HP	Naut.	Civil	Sunrise	6	7	8	9	
									h m	h m	h m	h m	h m	h m	h m	h m
d h	° /	° /	° /	' /	° /	' /	' /	°	h m	h m	h m	h m	h m	h m	h m	
6 00	180 22.3	N22 36.6	235 57.5	16.3	N 2	48.2	12.6	54.4	□	□	□	01 41	01 17	{ ⁰⁰ ₂₃ { ⁴⁶ ₅₁ }	□	
01	195 22.2	36.9	250 32.8	16.4	3	00.8	12.5	54.4	□	□	□	01 45	01 28	01 08	00 38	
02	210 22.1	37.1	265 08.2	16.3	3	13.3	12.6	54.4	□	□	□	01 48	01 37	01 25	01 08	
03	225 22.0	37.4	279 43.5	16.3	3	25.9	12.5	54.4	////	////	00 46	01 51	01 45	01 39	01 31	
04	240 21.9	37.6	294 18.8	16.3	3	38.4	12.5	54.4	////	////	01 45	01 54	01 52	01 50	01 50	
05	255 21.8	37.9	308 54.1	16.2	3	50.9	12.6	54.4	////	////	02 18	01 56	01 58	02 00	02 05	
06	270 21.7	N22 38.2	323 29.3	16.2	N 4	03.5	12.5	54.4	////	01 10	02 42	01 58	02 03	02 09	02 17	
07	285 21.5	38.4	338 04.5	16.2	4	16.0	12.5	54.5	N 58	////	01 50	03 01	01 59	02 07	02 16	
08	300 21.4	38.7	352 39.7	16.2	4	28.5	12.5	54.5	56	////	02 17	03 17	02 01	02 11	02 23	
09	315 21.3	38.9	367 14.9	16.1	4	41.0	12.5	54.5	54	01 04	02 38	03 30	02 02	02 15	02 29	
10	330 21.2	39.2	7 50.0	16.1	4	53.5	12.4	54.5	52	01 41	02 54	03 42	02 04	02 18	02 34	
11	345 21.1	39.5	21 25.0	16.1	4	53.5	12.4	54.5	50	02 06	03 09	03 52	02 05	02 21	02 39	
12	0 21.0	N22 39.7	35 00.2	16.0	N 5	18.4	12.4	54.5	45	02 49	03 37	04 14	02 07	02 27	02 50	
13	15 20.9	40.0	65 35.2	16.0	5	30.8	12.5	54.5	N 40	03 18	03 59	04 31	02 09	02 33	02 59	
14	30 20.7	40.2	80 10.2	16.0	5	43.3	12.4	54.5	35	03 40	04 16	04 46	02 11	02 38	03 06	
15	45 20.6	40.5	94 45.2	15.9	5	55.7	12.4	54.5	30	03 58	04 31	04 58	02 13	02 42	03 13	
16	60 20.5	40.7	109 20.1	15.9	6	08.1	12.4	54.6	20	04 26	04 55	05 20	02 15	02 49	03 25	
17	75 20.4	41.0	123 55.0	15.9	6	20.5	12.3	54.6	N 10	04 48	05 15	05 38	02 18	02 56	03 35	
18	90 20.3	N22 41.2	138 29.9	15.8	N 6	32.8	12.4	54.6	0	05 07	05 33	05 55	02 20	03 02	03 45	
19	105 20.2	41.5	153 04.7	15.7	6	45.2	12.3	54.6	S 10	05 23	05 49	06 12	02 23	03 08	03 55	
20	120 20.0	41.8	167 39.4	15.8	6	57.5	12.3	54.6	20	05 39	06 06	06 30	02 25	03 14	04 05	
21	135 19.9	42.0	182 14.2	15.7	7	09.8	12.3	54.6	30	05 55	06 24	06 50	02 28	03 22	04 17	
22	150 19.8	42.3	196 48.9	15.6	7	22.1	12.3	54.6	35	06 03	06 34	07 02	02 30	03 26	04 25	
23	165 19.7	42.5	211 23.5	15.6	7	34.4	12.2	54.7	40	06 12	06 46	07 16	02 32	03 31	04 33	
7 00	180 19.6	N22 42.7	225 58.1	15.6	N 7	46.6	12.3	54.7	45	06 22	06 59	07 32	02 34	03 37	04 42	
01	195 19.5	43.0	240 32.7	15.5	7	58.9	12.2	54.7	S 50	06 33	07 14	07 52	02 37	03 44	04 54	
02	210 19.4	43.2	255 07.2	15.5	8	11.1	12.1	54.7	52	06 38	07 21	08 02	02 38	03 48	04 59	
03	225 19.2	43.5	269 41.7	15.4	8	23.2	12.2	54.7	54	06 43	07 29	08 12	02 40	03 51	05 05	
04	240 19.1	43.7	284 16.1	15.3	8	35.4	12.1	54.7	56	06 49	07 38	08 24	02 41	03 55	05 11	
05	255 19.0	44.0	298 50.4	15.4	8	47.5	12.1	54.8	58	06 56	07 48	08 38	02 43	04 00	05 19	
06	270 18.9	N22 44.2	313 24.8	15.2	N 8	59.6	12.1	54.8	S 60	07 03	07 59	08 55	02 45	04 05	05 27	
07	285 18.8	44.5	327 59.0	15.3	9	11.7	12.1	54.8	Lat.	Sunset	Twilight		Moonset			
08	300 18.7	44.7	342 33.3	15.1	9	23.8	12.0	54.8	Civil	Naut.	6	7	8	9		
09	315 18.5	45.0	357 07.4	15.1	9	35.8	12.0	54.8	h m	h m	h m	h m	h m	h m	h m	
10	330 18.4	45.2	11 41.5	15.1	9	47.8	11.9	54.8	N 72	□	□	□	15 58	17 58	20 27	
11	345 18.3	45.4	26 15.6	15.0	9	59.7	11.9	54.9	N 70	□	□	□	15 49	17 38	19 42	
12	0 18.2	N22 45.7	40 49.6	14.9	N10	11.6	11.9	54.9	68	□	□	□	15 42	17 23	19 13	
13	15 18.1	45.9	55 23.5	14.9	10	23.5	11.9	54.9	66	23 17	////	////	15 36	17 10	18 51	
14	30 17.9	46.2	69 57.4	14.9	10	35.4	11.8	54.9	64	22 14	////	////	15 31	17 00	18 34	
15	45 17.8	46.4	84 31.3	14.8	10	47.2	11.8	54.9	62	21 41	////	////	15 27	16 51	18 20	
16	60 17.7	46.6	99 05.1	14.7	10	59.0	11.8	54.9	60	21 17	22 50	////	15 23	16 44	18 08	
17	75 17.6	46.9	113 38.8	14.6	11	10.8	11.7	55.0	N 58	20 57	22 09	////	15 20	16 37	17 58	
18	90 17.5	N22 47.1	128 12.4	14.6	N11	22.5	11.6	55.0	56	20 41	21 42	////	15 17	16 31	17 49	
19	105 17.4	47.3	142 46.0	14.6	11	34.1	11.7	55.0	54	20 28	21 21	22 56	15 14	16 26	17 41	
20	120 17.2	47.6	157 19.6	14.4	11	45.8	11.6	55.0	52	20 16	21 04	22 18	15 11	16 22	17 34	
21	135 17.1	47.8	171 53.0	14.4	11	57.4	11.5	55.0	50	20 06	20 49	21 53	15 09	16 17	17 27	
22	150 17.0	48.0	186 26.4	14.4	12	08.9	11.6	55.1	45	19 44	20 21	21 10	15 04	16 08	17 14	
23	165 16.9	48.3	200 59.8	14.3	12	20.5	11.4	55.1	N 40	19 26	19 59	20 40	15 01	16 01	17 03	
8 00	180 16.8	N22 48.5	215 33.1	14.2	N12	31.9	11.5	55.1	35	19 12	19 41	20 18	14 57	15 54	16 53	
01	195 16.6	48.7	230 06.3	14.1	12	43.4	11.3	55.1	30	18 59	19 27	20 00	14 54	15 49	16 45	
02	210 16.5	49.0	244 39.4	14.1	12	54.7	11.4	55.1	20	18 38	19 02	19 31	14 49	15 39	16 31	
03	225 16.4	49.2	259 12.5	14.0	13	06.1	11.3	55.1	N 10	18 20	18 42	19 09	14 44	15 30	16 18	
04	240 16.3	49.4	273 45.5	13.9	13	17.4	11.2	55.2	0	18 02	18 25	18 51	14 40	15 22	16 07	
05	255 16.2	49.7	288 18.4	13.9	13	28.6	11.2	55.2	S 10	17 46	18 08	18 34	14 36	15 14	15 55	
06	270 16.0	N22 49.9	302 51.3	13.8	N13	39.8	11.2	55.2	20	17 28	17 51	18 19	14 31	15 06	15 43	
07	285 15.9	50.1	317 24.1	13.7	13	51.0	11.1	55.2	30	17 07	17 33	18 03	14 26	14 56	15 29	
08	300 15.8	50.3	331 56.8	13.7	14	02.1	11.0	55.2	35	16 55	17 23	17 55	14 23	14 51	15 21	
09	315 15.7	50.6	346 29.5	13.6	14	13.1	11.0	55.3	40	16 41	17 12	17 46	14 20	14 44	15 12	
10	330 15.6	50.8	1 02.1	13.5	14	24.1	10.9	55.3	45	16 25	16 59	17 36	14 16	14 37	15 01	
11	345 15.4	51.0	15 34.6	13.4	14	35.0	10.9	55.3	S 50	16 05	16 43	17 24	14 11	14 28	14 48	
12	0 15.3	N22 51.2	30 07.0	13.4	N14	45.9	10.8	55.3	52	15 56	16 36	17 19	14 09	14 24	14 42	
13	15 15.2	51.5	44 39.4	13.3	14	56.7	10.8	55.4	54	15 45	16 28	17 14	14 07	14 20	14 35	
14	30 15.1	51.7	59 11.7	13.2	15	07.5	10.7	55.4	56	15 33	16 20	17 08	14 04	14 15	14 28	
15	45 15.0	51.9	73 43.9	13.1	15	18.2	10.7	55.4	58	15 19	16 10	17 02	14 02	14 10	14 20	
16	60 14.8	52.1	88 16.0	13.1	15	28.9	10.6	55.4	S 60	15 03	15 59	16 55	13 59	14 04	14 11	
17	75 14.7	52.3	102 48.1	12.9	15	39.5	10.5	55.4	Day	SUN		MOON				
18	90 14.6	N22 52.6	117 20.0	12.9	N15	50.0	10.5	55.5	Eqn. of Time	Mer.	Mer. Pass.		Age		Phase	
19	105 14.5	52.8	131 51.9	12.8	16	00.5	10.4	55.5	00 ^h	12 ^h	Pass.	Upper	Lower	d	%	
20	120 14.4	53.0	146 23.7	12.8	16	10.9	10.3	55.5	m s	m s	h m	h m	h m	d	%	
21	135 14.2	53.2	160 55.5	12.6	16	21.2	10.									

UT	ARIES			VENUS -4.0			MARS +1.7			JUPITER -1.9			SATURN +0.0			STARS			
	GHA	GHA	Dec	GHA	Dec		GHA	Dec		GHA	Dec		GHA	Dec		Name	SHA	Dec	
S U N D A Y	9 00	257 11.4	141 52.3 N23	158 54.0 N24	146 14.6		147 25.5 N22	27.4		179 41.2 N21	38.9		179 41.2 N21	38.9		Acamar	315 25.2 S40	17.7	
	01	272 13.8	156 51.6	22.6	173 54.6	14.6		162 27.4	27.3		194 43.3	38.9		194 43.3	38.9	Achernar	335 33.4 S57	13.3	
	02	287 16.3	171 50.9	22.1	188 55.3	14.5		177 29.3	27.2		209 45.5	39.0		209 45.5	39.0	Acrux	173 19.0 S63	06.9	
	03	302 18.8	186 50.2	21.6	203 56.0	14.4		192 31.2	27.2		224 47.6	39.0		224 47.6	39.0	Adhara	255 19.7 S28	58.6	
	04	317 21.2	201 49.5	21.1	218 56.7	14.3		207 33.1	27.1		239 49.7	39.0		239 49.7	39.0	Aldebaran	290 59.7 N16	30.8	
	05	332 23.7	216 48.8	20.7	233 57.3	14.2		222 35.0	27.0		254 51.8	39.0		254 51.8	39.0				
	06	347 26.2	231 48.1 N23	20.2	248 58.0 N24	14.1		237 36.9 N22	27.0		269 53.9 N21	39.1		269 53.9 N21	39.1	Alioth	166 27.9 N55	57.1	
	07	2 28.6	246 47.4	19.7	263 58.7	14.0		252 38.9	26.9		284 56.0	39.1		284 56.0	39.1	Alkaid	153 05.3 N49	18.4	
	08	17 31.1	261 46.7	19.2	278 59.4	13.9		267 40.8	26.8		299 58.2	39.1		299 58.2	39.1	Al Na'ir	27 54.4 S46	56.8	
	09	32 33.5	276 46.0	18.7	294 00.0	13.9		282 42.7	26.8		315 00.3	39.2		315 00.3	39.2	Alnilam	275 55.5 S 1	12.0	
	10	47 36.0	291 45.3	18.2	309 00.7	13.8		297 44.6	26.7		330 02.4	39.2		330 02.4	39.2	Alphard	218 04.8 S 8	40.1	
	11	62 38.5	306 44.6	17.7	324 01.4	13.7		312 46.5	26.6		345 04.5	39.2		345 04.5	39.2				
	12	77 40.9	321 43.9 N23	17.2	339 02.1 N24	13.6		327 48.4 N22	26.6		0 06.6 N21	39.3		0 06.6 N21	39.3	Alphecca	126 18.0 N26	42.5	
	13	92 43.4	336 43.2	16.8	354 02.7	13.5		342 50.3	26.5		15 08.7	39.3		15 08.7	39.3	Alpheratz	357 52.6 N29	05.9	
	14	107 45.9	351 42.5	16.3	9 03.4	13.4		357 52.2	26.4		30 10.9	39.3		30 10.9	39.3	Altair	62 16.4 N 8	52.4	
	15	122 48.3	6 41.8	15.8	24 04.1	13.3		12 54.1	26.4		45 13.0	39.4		45 13.0	39.4	Ankaa	353 24.3 S42	17.5	
	16	137 50.8	21 41.1	15.3	39 04.8	13.2		27 56.0	26.3		60 15.1	39.4		60 15.1	39.4	Antares	112 36.6 S26	26.3	
	17	152 53.3	36 40.4	14.8	54 05.4	13.2		42 57.9	26.2		75 17.2	39.4		75 17.2	39.4				
	18	167 55.7	51 39.7 N23	14.3	69 06.1 N24	13.1		57 59.8 N22	26.2		90 19.3 N21	39.4		90 19.3 N21	39.4	Arcturus	146 03.4 N19	10.3	
	19	182 58.2	66 39.0	13.8	84 06.8	13.0		73 01.7	26.1		105 21.4	39.5		105 21.4	39.5	Atria	107 45.8 S69	02.0	
	20	198 00.7	81 38.3	13.3	99 07.5	12.9		88 03.6	26.0		120 23.5	39.5		120 23.5	39.5	Avior	234 22.1 S59	31.2	
	21	213 03.1	96 37.6	12.8	114 08.1	12.8		103 05.5	26.0		135 25.7	39.5		135 25.7	39.5	Bellatrix	278 41.7 N 6	21.1	
	22	228 05.6	111 36.9	12.3	129 08.8	12.7		118 07.4	25.9		150 27.8	39.6		150 27.8	39.6	Betelgeuse	271 11.1 N 7	24.4	
23	243 08.0	126 36.2	11.8	144 09.5	12.6		133 09.3	25.8		165 29.9	39.6		165 29.9	39.6					
M O N D A Y	10 00	258 10.5	141 35.5 N23	159 10.2 N24	12.5		148 11.2 N22	25.8		180 32.0 N21	39.6		180 32.0 N21	39.6		Canopus	264 00.6 S52	41.9	
	01	273 13.0	156 34.9	10.8	174 10.8	12.4		163 13.1	25.7		195 34.1	39.7		195 34.1	39.7	Capella	280 47.8 N46	00.0	
	02	288 15.4	171 34.2	10.3	189 11.5	12.3		178 15.0	25.6		210 36.2	39.7		210 36.2	39.7	Deneb	49 37.2 N45	17.1	
	03	303 17.9	186 33.5	09.8	204 12.2	12.2		193 16.9	25.6		225 38.4	39.7		225 38.4	39.7	Denebola	182 42.5 N14	33.7	
	04	318 20.4	201 32.8	09.3	219 12.9	12.1		208 18.9	25.5		240 40.5	39.8		240 40.5	39.8	Diphda	349 04.7 S17	58.4	
	05	333 22.8	216 32.1	08.7	234 13.5	12.0		223 20.8	25.4		255 42.6	39.8		255 42.6	39.8				
	06	348 25.3	231 31.4 N23	08.2	249 14.2 N24	12.0		238 22.7 N22	25.4		270 44.7 N21	39.8		270 44.7 N21	39.8	Dubhe	194 02.2 N61	44.7	
	07	3 27.8	246 30.7	07.7	264 14.9	11.9		253 24.6	25.3		285 46.8	39.8		285 46.8	39.8	Einath	278 24.0 N28	36.5	
	08	18 30.2	261 30.0	07.2	279 15.6	11.8		268 26.5	25.2		300 48.9	39.9		300 48.9	39.9	Eltanin	90 49.6 N51	29.2	
	09	33 32.7	276 29.3	06.7	294 16.2	11.7		283 28.4	25.1		315 51.1	39.9		315 51.1	39.9	Enif	33 55.5 N 9	53.0	
	10	48 35.2	291 28.7	06.2	309 16.9	11.6		298 30.3	25.1		330 53.2	39.9		330 53.2	39.9	Fomalhaut	15 33.5 S29	36.5	
	11	63 37.6	306 28.0	05.7	324 17.6	11.5		313 32.2	25.0		345 55.3	40.0		345 55.3	40.0				
	12	78 40.1	321 27.3 N23	05.2	339 18.3 N24	11.4		328 34.1 N22	24.9		0 57.4 N21	40.0		0 57.4 N21	40.0	Gacrux	172 10.6 S57	07.8	
	13	93 42.5	336 26.6	04.6	354 18.9	11.3		343 36.0	24.9		15 59.5	40.0		15 59.5	40.0	Gienah	176 01.2 S17	33.3	
	14	108 45.0	351 25.9	04.1	9 19.6	11.2		358 37.9	24.8		31 01.6	40.1		31 01.6	40.1	Hadar	149 00.0 S60	23.2	
	15	123 47.5	6 25.2	03.6	24 20.3	11.1		13 39.8	24.7		46 03.8	40.1		46 03.8	40.1	Hamal	328 10.9 N23	23.2	
	16	138 49.9	21 24.5	03.1	39 21.0	11.0		28 41.7	24.7		61 05.9	40.1		61 05.9	40.1	Kaus Aust.	83 54.9 S34	23.0	
	17	153 52.4	36 23.9	02.6	54 21.7	10.9		43 43.6	24.6		76 08.0	40.2		76 08.0	40.2				
	18	168 54.9	51 23.2 N23	02.0	69 22.3 N24	10.8		58 45.5 N22	24.5		91 10.1 N21	40.2		91 10.1 N21	40.2	Kochab	137 18.4 N74	09.0	
	19	183 57.3	66 22.5	01.5	84 23.0	10.7		73 47.4	24.5		106 12.2	40.2		106 12.2	40.2	Markab	13 47.0 N15	12.9	
	20	198 59.8	81 21.8	01.0	99 23.7	10.6		88 49.3	24.4		121 14.3	40.2		121 14.3	40.2	Menkar	314 24.4 N 4	05.8	
	21	214 02.3	96 21.1	00.5	114 24.4	10.5		103 51.2	24.3		136 16.4	40.3		136 16.4	40.3	Menkent	148 17.6 S36	23.0	
	22	229 04.7	111 20.5	00.0	129 25.0	10.4		118 53.1	24.3		151 18.6	40.3		151 18.6	40.3	Miaplacidus	221 42.2 S69	43.8	
23	244 07.2	126 19.8	59.4	144 25.7	10.3		133 55.0	24.2		166 20.7	40.3		166 20.7	40.3					
T U E S D A Y	11 00	259 09.7	141 19.1 N22	159 26.4 N24	10.2		148 56.9 N22	24.1		181 22.8 N21	40.4		181 22.8 N21	40.4		Mirfak	308 53.4 N49	52.0	
	01	274 12.1	156 18.4	58.3	174 27.1	10.1		163 58.8	24.1		196 24.9	40.4		196 24.9	40.4	Nunki	76 08.7 S26	17.6	
	02	289 14.6	171 17.7	57.8	189 27.7	10.0		179 00.7	24.0		211 27.0	40.4		211 27.0	40.4	Peacock	53 32.4 S56	43.5	
	03	304 17.0	186 17.1	57.3	204 28.4	09.9		194 02.6	23.9		226 29.1	40.5		226 29.1	40.5	Pollux	243 38.6 N28	01.4	
	04	319 19.5	201 16.4	56.7	219 29.1	09.8		209 04.5	23.8		241 31.3	40.5		241 31.3	40.5	Procyon	245 09.1 N 5	13.2	
	05	334 22.0	216 15.7	56.2	234 29.8	09.7		224 06.4	23.8		256 33.4	40.5		256 33.4	40.5				
	06	349 24.4	231 15.0 N22	55.7	249 30.5 N24	09.6		239 08.3 N22	23.7		271 35.5 N21	40.5		271 35.5 N21	40.5	Rasalhague	96 14.2 N12	33.5	
	07	4 26.9	246 14.4	55.1	264 31.1	09.5		254 10.2	23.6		286 37.6	40.6		286 37.6	40.6	Regulus	207 52.9 N11	57.5	
	08	19 29.4	261 13.7	54.6	279 31.8	09.4		269 12.1	23.6		301 39.7	40.6		301 39.7	40.6	Rigel	281 20.8 S 8	12.0	
	09	34 31.8	276 13.0	54.1	294 32.5	09.3		284 14.0	23.5		316 41.8	40.6		316 41.8	40.6	Rigil Kent.	140 03.4 S60	50.8	
	10	49 34.3	291 12.3	53.5	309 33.2	09.2		299 15.9	23.4		331 44.0	40.7		331 44.0	40.7	Sabik	102 22.2 S15	43.7	
	11	64 36.8	306 11.7	53.0	324 33.9	09.1		314 17.8	23.4		346 46.1	40.7		346 46.1	40.7				
	12	79 39.2	321 11.0 N22	52.4	339 34.5 N24	09.0		32											

UT	ARIES			VENUS -4.0			MARS +1.7			JUPITER -1.8			SATURN +0.0			STARS		
	GHA	GHA	Dec	GHA	Dec		GHA	Dec		GHA	Dec		GHA	Dec		Name	SHA	Dec
SATURDAY	15 00	263 06.2	140 16.6	N22 03.2	160 31.9	N23 59.0	151 59.2	N22 17.3		184 45.9	N21 43.2		Acamar	315 25.2	S40 17.6			
	01	278 08.7	155 16.0	02.6	175 32.6	58.9	167 01.1	17.2		199 48.1	43.2		Achernar	335 33.4	S57 13.3			
	02	293 11.1	170 15.3	01.9	190 33.3	58.7	182 03.0	17.2		214 50.2	43.3		Acruz	173 19.1	S63 07.0			
	03	308 13.6	185 14.7	.. 01.3	205 33.9	.. 58.6	197 04.9	.. 17.1		229 52.3	.. 43.3		Adhara	255 19.7	S28 58.5			
	04	323 16.1	200 14.1	00.7	220 34.6	58.5	212 06.8	17.0		244 54.4	43.3		Aldebaran	290 59.7	N16 30.8			
	05	338 18.5	215 13.5	22 00.0	235 35.3	58.3	227 08.7	16.9		259 56.5	43.3							
	06	353 21.0	230 12.9	N21 59.4	250 36.0	N23 58.2	242 10.6	N22 16.9		274 58.6	N21 43.4		Alioth	166 27.9	N55 57.2			
	07	8 23.5	245 12.2	58.8	265 36.7	58.1	257 12.5	16.8		290 00.8	43.4		Alkaid	153 05.3	N49 18.4			
	08	23 25.9	260 11.6	58.1	280 37.4	57.9	272 14.4	16.7		305 02.9	43.4		Al Na'ir	27 54.3	S46 56.8			
	09	38 28.4	275 11.0	.. 57.5	295 38.1	.. 57.8	287 16.3	.. 16.7		320 05.0	.. 43.5		Alnilam	275 55.5	S 1 12.0			
	10	53 30.9	290 10.4	56.9	310 38.8	57.7	302 18.2	16.6		335 07.1	43.5		Alphard	218 04.8	S 8 40.1			
	11	68 33.3	305 09.8	56.2	325 39.4	57.5	317 20.1	16.5		350 09.2	43.5							
	12	83 35.8	320 09.2	N21 55.6	340 40.1	N23 57.4	332 21.9	N22 16.4		5 11.3	N21 43.5		Alphecca	126 18.0	N26 42.5			
	13	98 38.2	335 08.5	54.9	355 40.8	57.2	347 23.8	16.4		20 13.5	43.6		Alpheratz	357 52.6	N29 06.0			
	14	113 40.7	350 07.9	54.3	10 41.5	57.1	2 25.7	16.3		35 15.6	43.6		Altair	62 16.4	N 8 52.4			
	15	128 43.2	5 07.3	.. 53.6	25 42.2	.. 57.0	17 27.6	.. 16.2		50 17.7	.. 43.6		Ankaa	353 24.2	S42 17.5			
	16	143 45.6	20 06.7	53.0	40 42.9	56.8	32 29.5	16.1		65 19.8	43.7		Antares	112 36.6	S26 26.3			
	17	158 48.1	35 06.1	52.4	55 43.6	56.7	47 31.4	16.1		80 21.9	43.7							
	18	173 50.6	50 05.5	N21 51.7	70 44.3	N23 56.6	62 33.3	N22 16.0		95 24.0	N21 43.7		Arcturus	146 03.4	N19 10.3			
	19	188 53.0	65 04.9	51.1	85 45.0	56.4	77 35.2	15.9		110 26.2	43.7		Atria	107 45.7	S69 02.0			
	20	203 55.5	80 04.3	50.4	100 45.6	56.3	92 37.1	15.8		125 28.3	43.8		Avior	234 22.2	S59 31.2			
	21	218 58.0	95 03.7	.. 49.8	115 46.3	.. 56.1	107 39.0	.. 15.8		140 30.4	.. 43.8		Bellatrix	278 41.7	N 6 21.1			
	22	234 00.4	110 03.0	49.1	130 47.0	56.0	122 40.9	15.7		155 32.5	43.8		Betelgeuse	271 11.0	N 7 24.5			
23	249 02.9	125 02.4	48.5	145 47.7	55.9	137 42.8	15.6		170 34.6	43.9								
SUNDAY	16 00	264 05.4	140 01.8	N21 47.8	160 48.4	N23 55.7	152 44.7	N22 15.5	185 36.7	N21 43.9		Canopus	264 00.6	S52 41.8				
	01	279 07.8	155 01.2	47.2	175 49.1	55.6	167 46.6	15.5	200 38.9	43.9		Capella	280 47.8	N46 00.0				
	02	294 10.3	170 00.6	46.5	190 49.8	55.4	182 48.5	15.4	215 41.0	43.9		Deneb	49 37.1	N45 17.1				
	03	309 12.7	185 00.0	.. 45.8	205 50.5	.. 55.3	197 50.4	.. 15.3	230 43.1	.. 44.0		Denebola	182 42.5	N14 33.7				
	04	324 15.2	199 59.4	45.2	220 51.2	55.2	212 52.3	15.2	245 45.2	44.0		Diphda	349 04.6	S17 58.4				
	05	339 17.7	214 58.8	44.5	235 51.9	55.0	227 54.2	15.2	260 47.3	44.0								
	06	354 20.1	229 58.2	N21 43.9	250 52.5	N23 54.9	242 56.0	N22 15.1		275 49.4	N21 44.1		Dubhe	194 02.2	N61 44.7			
	07	9 22.6	244 57.6	43.2	265 53.2	54.7	257 57.9	15.0		290 51.6	44.1		Elnath	278 24.0	N28 36.5			
	08	24 25.1	259 57.0	42.6	280 53.9	54.6	272 59.8	15.0		305 53.7	44.1		Eltanin	90 49.6	N51 29.3			
	09	39 27.5	274 56.4	.. 41.9	295 54.6	.. 54.4	288 01.7	.. 14.9		320 55.8	.. 44.1		Enif	33 55.5	N 9 53.0			
	10	54 30.0	289 55.8	41.2	310 55.3	54.3	303 03.6	14.8		335 57.9	44.2		Fomalhaut	15 33.4	S29 36.5			
	11	69 32.5	304 55.2	40.6	325 56.0	54.2	318 05.5	14.7		351 00.0	44.2							
	12	84 34.9	319 54.6	N21 39.9	340 56.7	N23 54.0	333 07.4	N22 14.7		6 02.1	N21 44.2		Gacrux	172 10.6	S57 07.8			
	13	99 37.4	334 54.0	39.2	355 57.4	53.9	348 09.3	14.6		21 04.3	44.2		Gienah	176 01.2	S17 33.3			
	14	114 39.9	349 53.4	38.6	10 58.1	53.7	3 11.2	14.5		36 06.4	44.3		Hadar	149 00.0	S60 23.2			
	15	129 42.3	4 52.8	.. 37.9	25 58.8	.. 53.6	18 13.1	.. 14.4		51 08.5	.. 44.3		Hamal	328 10.8	N23 28.2			
	16	144 44.8	19 52.2	37.2	40 59.4	53.4	33 15.0	14.4		66 10.6	44.3		Kaus Aust.	83 54.9	S34 23.0			
	17	159 47.2	34 51.6	36.6	56 00.1	53.3	48 16.9	14.3		81 12.7	44.4							
	18	174 49.7	49 51.0	N21 35.9	71 00.8	N23 53.1	63 18.8	N22 14.2		96 14.8	N21 44.4		Kochab	137 18.5	N74 09.0			
	19	189 52.2	64 50.4	35.2	86 01.5	53.0	78 20.7	14.1		111 17.0	44.4		Markab	13 46.9	N15 12.9			
	20	204 54.6	79 49.8	34.6	101 02.2	52.8	93 22.6	14.1		126 19.1	44.4		Menkar	314 24.4	N 4 05.9			
	21	219 57.1	94 49.2	.. 33.9	116 02.9	.. 52.7	108 24.4	.. 14.0		141 21.2	.. 44.5		Menkent	148 17.7	S36 23.0			
	22	234 59.6	109 48.6	33.2	131 03.6	52.5	123 26.3	13.9		156 23.3	44.5		Miaplacidus	221 42.3	S69 43.8			
23	250 02.0	124 48.0	32.5	146 04.3	52.4	138 28.2	13.8		171 25.4	44.5								
MONDAY	17 00	265 04.5	139 47.4	N21 31.9	161 05.0	N23 52.3	153 30.1	N22 13.8	186 27.5	N21 44.6		Mirfak	308 53.3	N49 52.0				
	01	280 07.0	154 46.8	31.2	176 05.7	52.1	168 32.0	13.7	201 29.7	44.6		Nunki	76 08.7	S26 17.6				
	02	295 09.4	169 46.2	30.5	191 06.4	52.0	183 33.9	13.6	216 31.8	44.6		Peacock	53 32.3	S56 43.5				
	03	310 11.9	184 45.7	.. 29.8	206 07.1	.. 51.8	198 35.8	.. 13.5	231 33.9	.. 44.6		Pollux	243 38.6	N28 01.3				
	04	325 14.3	199 45.1	29.1	221 07.8	51.7	213 37.7	13.5	246 36.0	44.7		Procyon	245 09.1	N 5 13.2				
	05	340 16.8	214 44.5	28.5	236 08.4	51.5	228 39.6	13.4	261 38.1	44.7								
	06	355 19.3	229 43.9	N21 27.8	251 09.1	N23 51.4	243 41.5	N22 13.3		276 40.2	N21 44.7		Rasalhague	96 14.2	N12 33.5			
	07	10 21.7	244 43.3	27.1	266 09.8	51.2	258 43.4	13.2		291 42.4	44.8		Regulus	207 52.9	N11 57.5			
	08	25 24.2	259 42.7	26.4	281 10.5	51.1	273 45.3	13.2		306 44.5	44.8		Rigel	281 20.7	S 8 11.9			
	09	40 26.7	274 42.1	.. 25.7	296 11.2	.. 50.9	288 47.2	.. 13.1		321 46.6	.. 44.8		Rigil Kent.	140 03.4	S60 50.8			
	10	55 29.1	289 41.5	25.0	311 11.9	50.8	303 49.1	13.0		336 48.7	44.8		Sabik	102 22.2	S15 43.7			
	11	70 31.6	304 41.0	24.4	326 12.6	50.6	318 50.9	12.9		351 50.8	44.9							
	12	85 34.1	319 40.4	N21 23.7	341 13.3	N23 50.5	333 52.8	N22 12.9		6 52.9	N21 44.9		Schedar	349 50.8	N56 32.7			
	13	100 36.5	334 39.8	23.0	356 14.0	50.3	348 54.7	12.8		21 55.1	44.9		Shaula	96 33.3	S37 06.4			
	14	115 39.0	349 39.2	22.3	11 14.7	50.1	3 56.6	12.7		36 57.2	44.9		Sirius	258 41.7	S16 43.1			
	15	130 41.5	4 38.6	.. 21.6	26 15.4	.. 50.0	18 58.5	.. 12.6		51 59.3	.. 45.0		Spica	158 40.3	S11 10.4			
	16	145 43.9	19 38.0	20.9	41 16.1	49.8	34 00.4	12.6		67 01.4	45.0		Suhail	222 59.2	S43 26.6			
	17	160 46.4	34 37.5	20.2	56 16.8	49.7	49 02.3											

UT	SUN		MOON				Lat.	Twilight			Moonrise					
	GHA	Dec	GHA	v	Dec	d		HP	Naut.	Civil	Sunrise	15	16	17	18	
									h m	h m	h m	h m	h m	h m	h m	h m
	° /	° /	° /	'	° /	'	°	h m	h m	h m	h m	h m	h m	h m		
	° /	° /	° /	'	° /	'	N 72	□	□	□	□	06 57	09 38	11 55		
SATURDAY	15 00	179 55.3	N23 17.5	125 15.7	7.5	N20 48.9	8.6	58.6	N 70	□	□	□	□	07 35	09 53	12 00
	01	194 55.2	17.6	139 42.2	7.6	20 40.3	8.7	58.6	68	□	□	□	05 39	08 01	10 06	12 04
	02	209 55.1	17.7	154 08.8	7.5	20 31.6	8.9	58.6	66	□	□	□	06 18	08 21	10 16	12 07
	03	224 54.9	17.8	168 35.3	7.7	20 22.7	9.0	58.6	64	////	////	01 32	06 46	08 37	10 25	12 10
	04	239 54.8	17.9	183 02.0	7.7	20 13.7	9.1	58.7	62	////	////	02 10	07 07	08 50	10 32	12 12
	05	254 54.7	18.0	197 28.7	7.8	20 04.6	9.3	58.7	60	////	00 52	02 36	07 24	09 01	10 38	12 14
	06	269 54.5	N23 18.1	211 55.5	7.8	N19 55.3	9.4	58.7	N 58	////	01 41	02 56	07 38	09 11	10 44	12 16
	07	284 54.4	18.3	226 22.3	7.8	19 45.9	9.5	58.7	56	////	02 11	03 13	07 50	09 19	10 48	12 17
	08	299 54.3	18.4	240 49.1	8.0	19 36.4	9.6	58.7	54	00 48	02 33	03 27	08 01	09 26	10 53	12 18
	09	314 54.1	18.5	255 16.1	7.9	19 26.8	9.7	58.7	52	01 33	02 51	03 39	08 10	09 33	10 57	12 20
	10	329 54.0	18.6	269 43.0	8.1	19 17.1	9.9	58.7	50	02 00	03 06	03 50	08 18	09 39	11 00	12 21
	11	344 53.9	18.7	284 10.1	8.1	19 07.2	9.9	58.8	45	02 46	03 35	04 13	08 36	09 52	11 08	12 23
	12	359 53.7	N23 18.8	298 37.2	8.1	N18 57.3	10.1	58.8	N 40	03 16	03 58	04 31	08 50	10 02	11 14	12 25
	13	14 53.6	18.9	313 04.3	8.3	18 47.2	10.2	58.8	35	03 39	04 16	04 46	09 03	10 11	11 20	12 27
	14	29 53.5	19.0	327 31.6	8.2	18 37.0	10.3	58.8	30	03 58	04 31	04 59	09 13	10 19	11 24	12 29
	15	44 53.3	19.1	341 58.8	8.4	18 26.7	10.4	58.8	20	04 27	04 56	05 21	09 31	10 33	11 33	12 32
	16	59 53.2	19.2	356 26.2	8.4	18 16.3	10.6	58.8	N 10	04 49	05 16	05 39	09 47	10 44	11 40	12 34
	17	74 53.0	19.3	10 53.6	8.4	18 05.7	10.6	58.8	0	05 08	05 34	05 57	10 02	10 55	11 47	12 36
	18	89 52.9	N23 19.4	25 21.0	8.5	N17 55.1	10.8	58.8	S 10	05 25	05 52	06 14	10 16	11 06	11 53	12 39
	19	104 52.8	19.5	39 48.5	8.6	17 44.3	10.8	58.9	20	05 41	06 09	06 33	10 32	11 18	12 01	12 41
	20	119 52.6	19.6	54 16.1	8.6	17 33.5	11.0	58.9	30	05 58	06 28	06 54	10 50	11 31	12 09	12 44
	21	134 52.5	19.7	68 43.7	8.7	17 22.5	11.1	58.9	35	06 06	06 38	07 06	11 00	11 39	12 13	12 45
	22	149 52.4	19.8	83 11.4	8.7	17 11.4	11.1	58.9	40	06 16	06 50	07 20	11 12	11 47	12 19	12 47
23	164 52.2	19.9	97 39.1	8.8	17 00.3	11.3	58.9	45	06 26	07 03	07 37	11 26	11 58	12 25	12 49	
SUNDAY	16 00	179 52.1	N23 20.0	112 06.9	8.9	N16 49.0	11.4	58.9	S 50	06 38	07 19	07 58	11 43	12 10	12 32	12 52
	01	194 52.0	20.1	126 34.8	8.9	16 37.6	11.4	58.9	52	06 43	07 27	08 08	11 51	12 15	12 35	12 53
	02	209 51.8	20.2	141 02.7	9.0	16 26.2	11.6	58.9	54	06 49	07 35	08 19	12 00	12 21	12 39	12 54
	03	224 51.7	20.3	155 30.7	9.0	16 14.6	11.7	58.9	56	06 55	07 44	08 31	12 09	12 28	12 43	12 56
	04	239 51.6	20.4	169 58.7	9.1	16 02.9	11.7	59.0	58	07 02	07 54	08 46	12 21	12 36	12 48	12 57
	05	254 51.4	20.5	184 26.8	9.1	15 51.2	11.9	59.0	S 60	07 09	08 06	09 03	12 33	12 45	12 53	12 59
	06	269 51.3	N23 20.5	198 54.9	9.2	N15 39.3	11.9	59.0								
	07	284 51.2	20.6	213 23.1	9.3	15 27.4	12.1	59.0	Lat.	Sunset	Twilight		Moonset			
	08	299 51.0	20.7	227 51.4	9.3	15 15.3	12.1	59.0			Civil	Naut.	15	16	17	18
	09	314 50.9	20.8	242 19.7	9.3	15 03.2	12.2	59.0								
	10	329 50.8	20.9	256 48.0	9.4	14 51.0	12.3	59.0								
	11	344 50.6	21.0	271 16.4	9.5	14 38.7	12.4	59.0	N 72	□	□	□	□	02 49	01 57	01 25
	12	359 50.5	N23 21.1	285 44.9	9.5	N14 26.3	12.5	59.0	N 70	□	□	□	□	02 09	01 39	01 18
	13	14 50.4	21.2	300 13.4	9.6	14 13.8	12.5	59.0	68	□	□	□	02 10	01 41	01 24	01 11
	14	29 50.2	21.3	314 42.0	9.7	14 01.3	12.7	59.1	66	□	□	□	01 30	01 20	01 12	01 06
	15	44 50.1	21.3	329 10.7	9.6	13 48.6	12.7	59.1	64	22 30	////	////	01 02	01 03	01 02	01 01
	16	59 49.9	21.4	343 39.3	9.8	13 35.9	12.8	59.1	62	21 52	////	////	00 40	00 49	00 54	00 57
	17	74 49.8	21.5	358 08.1	9.8	13 23.1	12.8	59.1	60	21 26	23 10	////	00 22	00 37	00 46	00 53
	18	89 49.7	N23 21.6	12 36.9	9.8	N13 10.3	13.0	59.1	N 58	21 05	22 21	////	00 08	00 26	00 40	00 50
	19	104 49.5	21.7	27 05.7	9.9	12 57.3	13.0	59.1	56	20 49	21 51	////	24 17	00 17	00 34	00 47
	20	119 49.4	21.8	41 34.6	9.9	12 44.3	13.1	59.1	54	20 34	21 29	23 15	24 09	00 09	00 28	00 45
	21	134 49.3	21.8	56 03.5	10.0	12 31.2	13.2	59.1	52	20 22	21 11	22 29	24 02	00 02	00 24	00 42
	22	149 49.1	21.9	70 32.5	10.1	12 18.0	13.2	59.1	50	20 11	20 56	22 01	23 55	24 19	00 19	00 40
23	164 49.0	22.0	85 01.6	10.0	12 04.8	13.4	59.1	45	19 49	20 26	21 16	23 41	24 10	00 10	00 35	
MONDAY	17 00	179 48.9	N23 22.1	99 30.6	10.2	N11 51.4	13.3	59.1	N 40	19 31	20 04	20 45	23 29	24 02	00 02	00 32
	01	194 48.7	22.2	113 59.8	10.1	11 38.1	13.5	59.1	35	19 16	19 45	20 22	23 19	23 55	24 28	00 28
	02	209 48.6	22.2	128 28.9	10.3	11 24.6	13.5	59.2	30	19 03	19 30	20 04	23 10	23 49	24 25	00 25
	03	224 48.5	22.3	142 58.2	10.2	11 11.1	13.6	59.2	20	18 41	19 05	19 35	22 54	23 38	24 20	00 20
	04	239 48.3	22.4	157 27.4	10.3	10 57.5	13.6	59.2	N 10	18 22	18 45	19 12	22 40	23 29	24 15	00 15
	05	254 48.2	22.5	171 56.7	10.4	10 43.9	13.7	59.2	0	18 04	18 27	18 53	22 28	23 20	24 10	00 10
	06	269 48.1	N23 22.5	186 26.1	10.4	N10 30.2	13.8	59.2	S 10	17 47	18 10	18 36	22 15	23 11	24 06	00 06
	07	284 47.9	22.6	200 55.5	10.4	10 16.4	13.8	59.2	20	17 28	17 52	18 20	22 01	23 01	24 01	00 01
	08	299 47.8	22.7	215 24.9	10.5	10 02.6	13.9	59.2	30	17 07	17 34	18 03	21 45	22 50	23 55	25 00
	09	314 47.6	22.8	229 54.4	10.5	9 48.7	13.9	59.2	35	16 55	17 23	17 55	21 35	22 44	23 52	24 59
	10	329 47.5	22.8	244 23.9	10.5	9 34.8	14.0	59.2	40	16 41	17 11	17 45	21 25	22 37	23 48	24 59
	11	344 47.4	22.9	258 53.4	10.6	9 20.8	14.1	59.2	45	16 24	16 58	17 35	21 12	22 28	23 44	24 59
	12	359 47.2	N23 23.0	273 23.0	10.6	N 9 06.7	14.0	59.2	S 50	16 03	16 42	17 23	20 56	22 18	23 39	24 59
	13	14 47.1	23.0	287 52.6	10.7	8 52.7	14.2	59.2	52	15 53	16 34	17 18	20 49	22 13	23 36	24 59
	14	29 47.0	23.1	302 22.3	10.7	8 38.5	14.2	59.2	54	15 42	16 26	17 12	20 41	22 07	23 33	24 59
	15	44 46.8	23.2	316 52.0	10.7	8 24.3	14.2	59.2	56	15 30	16 17	17 06	20 32	22 01	23 30	24 59
	16	59 46.7	23.2	331 21.7	10.8	8 10.1	14.3	59.3	58	15 15	16 07	16 59	20 21	21 55	23 27	24 59
	17	74 46.6	23.3	345 51.5	10.7	7 55.8	14.4	59.3	S 60	14 58	15 55	16 52	20 09	21 47	23 23	24 59
	18	89 46.4	N23 23.4	0 21.2	10.9	N 7 41.4	14.3	59.3								

UT	ARIES		VENUS -4.0		MARS +1.7		JUPITER -1.8		SATURN +0.0		STARS		
	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec
1800 TUESDAY	266 03.6	139 33.4 N21 15.3	161 21.6 N23 48.6	154 15.5 N22 11.9	187 18.3 N21 45.2	Acamar	315 25.2	S40 17.6					
	281 06.1	154 32.8 14.6	176 22.3 48.4	169 17.4 11.9	202 20.5 45.2	Achernar	335 33.3	S57 13.3					
	296 08.6	169 32.3 13.9	191 23.0 48.3	184 19.3 11.8	217 22.6 45.3	Acrux	173 19.1	S63 07.0					
	311 11.0	184 31.7 . . 13.2	206 23.7 . . 48.1	199 21.2 . . 11.7	232 24.7 . . 45.3	Adhara	255 19.7	S28 58.5					
	326 13.5	199 31.1 12.5	221 24.4 48.0	214 23.1 11.6	247 26.8 45.3	Aldebaran	290 59.7	N16 30.8					
	341 16.0	214 30.5 11.8	236 25.1 47.8	229 25.0 11.6	262 28.9 45.4								
	356 18.4	229 30.0 N21 11.1	251 25.8 N23 47.7	244 26.9 N22 11.5	277 31.1 N21 45.4	Alioth	166 28.0	N55 57.2					
	11 20.9	244 29.4 10.4	266 26.5 47.5	259 28.8 11.4	292 33.2 45.4	Alkaid	153 05.4	N49 18.4					
	26 23.3	259 28.8 09.7	281 27.2 47.3	274 30.7 11.3	307 35.3 45.4	Al Na'ir	27 54.3	S46 56.8					
	41 25.8	274 28.2 . . 09.0	296 27.9 . . 47.2	289 32.6 . . 11.3	322 37.4 . . 45.5	Alnilam	275 55.5	S 1 12.0					
	56 28.3	289 27.7 08.3	311 28.6 47.0	304 34.4 11.2	337 39.5 45.5	Alphard	218 04.8	S 8 40.1					
	71 30.7	304 27.1 07.6	326 29.3 46.9	319 36.3 11.1	352 41.6 45.5								
	86 33.2	319 26.5 N21 06.9	341 30.0 N23 46.7	334 38.2 N22 11.0	7 43.8 N21 45.6	Alphecca	126 18.0	N26 42.5					
	101 35.7	334 26.0 06.2	356 30.7 46.5	349 40.1 11.0	22 45.9 45.6	Alpheratz	357 52.6	N29 06.0					
	116 38.1	349 25.4 05.5	11 31.4 46.4	4 42.0 10.9	37 48.0 45.6	Altair	62 16.4	N 8 52.4					
	131 40.6	4 24.8 . . 04.7	26 32.1 . . 46.2	19 43.9 . . 10.8	52 50.1 . . 45.6	Ankaa	353 24.2	S42 17.4					
	146 43.1	19 24.3 04.0	41 32.8 46.1	34 45.8 10.7	67 52.2 45.7	Antares	112 36.6	S26 26.3					
	161 45.5	34 23.7 03.3	56 33.5 45.9	49 47.7 10.6	82 54.3 45.7								
	176 48.0	49 23.1 N21 02.6	71 34.2 N23 45.7	64 49.6 N22 10.6	97 56.5 N21 45.7	Arcturus	146 03.4	N19 10.3					
	191 50.4	64 22.6 01.9	86 34.9 45.6	79 51.5 10.5	112 58.6 45.7	Atria	107 45.7	S69 02.0					
	206 52.9	79 22.0 01.2	101 35.6 45.4	94 53.4 10.4	128 00.7 45.8	Avior	234 22.2	S59 31.1					
	221 55.4	94 21.4 21 00.4	116 36.3 . . 45.2	109 55.2 . . 10.3	143 02.8 . . 45.8	Bellatrix	278 41.7	N 6 21.1					
	236 57.8	109 20.9 20 59.7	131 36.9 45.1	124 57.1 10.3	158 04.9 45.8	Betelgeuse	271 11.0	N 7 24.5					
252 00.3	124 20.3 59.0	146 37.6 44.9	139 59.0 10.2	173 07.0 45.8									
1900 WEDNESDAY	267 02.8	139 19.8 N20 58.3	161 38.3 N23 44.8	155 00.9 N22 10.1	188 09.2 N21 45.9	Canopus	264 00.6	S52 41.8					
	282 05.2	154 19.2 57.6	176 39.0 44.6	170 02.8 10.0	203 11.3 45.9	Capella	280 47.8	N46 00.0					
	297 07.7	169 18.6 56.8	191 39.7 44.4	185 04.7 10.0	218 13.4 45.9	Deneb	49 37.1	N45 17.1					
	312 10.2	184 18.1 . . 56.1	206 40.4 . . 44.3	200 06.6 . . 09.9	233 15.5 . . 46.0	Denebola	182 42.5	N14 33.7					
	327 12.6	199 17.5 55.4	221 41.1 44.1	215 08.5 09.8	248 17.6 46.0	Diphda	349 04.6	S17 58.4					
	342 15.1	214 17.0 54.7	236 41.8 43.9	230 10.4 09.7	263 19.8 46.0								
	357 17.6	229 16.4 N20 53.9	251 42.5 N23 43.8	245 12.3 N22 09.6	278 21.9 N21 46.0	Dubhe	194 02.2	N61 44.7					
	12 20.0	244 15.9 53.2	266 43.2 43.6	260 14.1 09.6	293 24.0 46.1	Einath	278 24.0	N28 36.5					
	27 22.5	259 15.3 52.5	281 43.9 43.4	275 16.0 09.5	308 26.1 46.1	Eltanin	90 49.6	N51 29.3					
	42 24.9	274 14.7 . . 51.7	296 44.6 . . 43.3	290 17.9 . . 09.4	323 28.2 . . 46.1	Enif	33 55.5	N 9 53.0					
	57 27.4	289 14.2 51.0	311 45.3 43.1	305 19.8 09.3	338 30.3 46.1	Fomalhaut	15 33.4	S29 36.5					
	72 29.9	304 13.6 50.3	326 46.0 42.9	320 21.7 09.3	353 32.5 46.2								
	87 32.3	319 13.1 N20 49.5	341 46.7 N23 42.8	335 23.6 N22 09.2	8 34.6 N21 46.2	Gacrux	172 10.7	S57 07.8					
	102 34.8	334 12.5 48.8	356 47.4 42.6	350 25.5 09.1	23 36.7 46.2	Gienah	176 01.2	S17 33.3					
	117 37.3	349 12.0 48.1	11 48.1 42.4	5 27.4 09.0	38 38.8 46.3	Hadar	149 00.0	S60 23.3					
	132 39.7	4 11.4 . . 47.3	26 48.8 . . 42.3	20 29.3 . . 09.0	53 40.9 . . 46.3	Hamal	328 10.8	N23 28.2					
	147 42.2	19 10.9 46.6	41 49.5 42.1	35 31.2 08.9	68 43.1 46.3	Kaus Aust.	83 54.9	S34 23.0					
	162 44.7	34 10.3 45.9	56 50.2 41.9	50 33.0 08.8	83 45.2 46.3								
	177 47.1	49 09.8 N20 45.1	71 50.9 N23 41.8	65 34.9 N22 08.7	98 47.3 N21 46.4	Kochab	137 18.5	N74 09.0					
	192 49.6	64 09.2 44.4	86 51.6 41.6	80 36.8 08.6	113 49.4 46.4	Markab	13 46.9	N15 12.9					
	207 52.1	79 08.7 43.7	101 52.3 41.4	95 38.7 08.6	128 51.5 46.4	Menkar	314 24.4	N 4 05.9					
	222 54.5	94 08.1 . . 42.9	116 53.0 . . 41.2	110 40.6 . . 08.5	143 53.6 . . 46.4	Menkent	148 17.7	S36 23.0					
	237 57.0	109 07.6 42.2	131 53.7 41.1	125 42.5 08.4	158 55.8 46.5	Miaplacidus	221 42.3	S69 43.8					
252 59.4	124 07.0 41.4	146 54.4 40.9	140 44.4 08.3	173 57.9 46.5									
2000 THURSDAY	268 01.9	139 06.5 N20 40.7	161 55.1 N23 40.7	155 46.3 N22 08.3	189 00.0 N21 46.5	Mirfak	308 53.3	N49 52.0					
	283 04.4	154 06.0 39.9	176 55.8 40.6	170 48.2 08.2	204 02.1 46.5	Nunki	76 08.7	S26 17.6					
	298 06.8	169 05.4 39.2	191 56.5 40.4	185 50.0 08.1	219 04.2 46.6	Peacock	53 32.3	S56 43.5					
	313 09.3	184 04.9 . . 38.4	206 57.2 . . 40.2	200 51.9 . . 08.0	234 06.3 . . 46.6	Pollux	243 38.6	N28 01.3					
	328 11.8	199 04.3 37.7	221 57.9 40.0	215 53.8 07.9	249 08.5 46.6	Procyon	245 09.1	N 5 13.2					
	343 14.2	214 03.8 37.0	236 58.6 39.9	230 55.7 07.9	264 10.6 46.7								
	358 16.7	229 03.2 N20 36.2	251 59.3 N23 39.7	245 57.6 N22 07.8	279 12.7 N21 46.7	Rasalhague	96 14.2	N12 33.5					
	13 19.2	244 02.7 35.5	267 00.0 39.5	260 59.5 07.7	294 14.8 46.7	Regulus	207 52.9	N11 57.5					
	28 21.6	259 02.2 34.7	282 00.7 39.3	276 01.4 07.6	309 16.9 46.7	Rigel	281 20.7	S 8 11.9					
	43 24.1	274 01.6 . . 34.0	297 01.4 . . 39.2	291 03.3 . . 07.5	324 19.1 . . 46.8	Rigil Kent.	140 03.4	S60 50.9					
	58 26.5	289 01.1 33.2	312 02.1 39.0	306 05.2 07.5	339 21.2 46.8	Sabik	102 22.2	S15 43.7					
	73 29.0	304 00.5 32.4	327 02.8 38.8	321 07.0 07.4	354 23.3 46.8								
	88 31.5	319 00.0 N20 31.7	342 03.5 N23 38.6	336 08.9 N22 07.3	9 25.4 N21 46.8	Schedar	349 50.7	N56 32.7					
	103 33.9	333 59.5 30.9	357 04.2 38.5	351 10.8 07.2	24 27.5 46.9	Shaula	96 33.3	S37 06.4					
	118 36.4	348 58.9 30.2	12 04.9 38.3	6 12.7 07.2	39 29.7 46.9	Sirius	258 41.7	S16 43.1					
	133 38.9	3 58.4 . . 29.4	27 05.6 . . 38.1	21 14.6 . . 07.1	54 31.8 . . 46.9	Spica	158 40.3	S11 10.4					
	148 41.3	18 57.9 28.7	42 06.4 37.9	36 16.5 07.0	69 33.9 46.9	Suhail	222 59.2	S43 26.6					
	163 43.8	33 57.3 27.9	57 07.1 37.8	51 18.4 06.9	84 36.0 47.0								
	178 46.3	48 56.8 N20 27.1	72 07.8 N23 37.6	66 20.3 N22 06.8	99 38.1 N21 47.0	Vega	80 44.4	N38 47.1					
	193 48.7	63 56.3 26.4	87 08.5 37.4	81 22.1 06.8	114 40.2 47.0	Zuben'ubi	137 14.8	S16 03.1					
	208 51.2	78 55.7 25.6	102 09.2 37.2	96 24.0 06.7	129 42.4 47.0								
	223 53.7	93 55.2 . . 24.9	117 09.9 . . 37.1	111 25.9 . . 06.6	144 44.5 . . 47.1								
	238 56.1	108 54.7 24.1	132 10.6 36.9	126 27.8 06.5	159 46.6 47.1	Venus	232 17.0	14 43					
253 58.6	123 54.1 23.3	147 11.3 36.7	141 29.7 06.4	174 48.7 47.1	Mars	254 35.6	13 13						
					Jupiter	247 58.1	13 38						
					Saturn	281 06.4	11 26						

UT	SUN		MOON				Lat.	Twilight			Moonrise					
	GHA	Dec	GHA	v	Dec	d		HP	Naut.	Civil	Sunrise	18	19	20	21	
									h m	h m	h m	h m	h m	h m	h m	h m
18 00	179 45.6	N23 23.8	87 20.6	11.0	N 6	14.6	14.6	59.3	☐	☐	☐	11 55	14 09	16 28	19 13	
01	194 45.5	23.8	101 50.6	11.0	N 0	00.0	14.7	59.3	☐	☐	☐	12 00	14 04	16 11	18 32	
02	209 45.3	23.9	116 20.6	11.0	5	45.3	14.7	59.3	☐	☐	☐	12 04	14 00	15 58	18 05	
03	224 45.2	23.9	130 50.6	11.1	5	30.6	14.7	59.3	☐	☐	☐	12 07	13 56	15 48	17 44	
04	239 45.1	24.0	145 20.7	11.1	5	15.9	14.7	59.3	////	////	01 31	12 10	13 54	15 39	17 28	
05	254 44.9	24.1	159 50.8	11.1	5	01.2	14.8	59.3	////	////	02 09	12 12	13 51	15 32	17 14	
06	269 44.8	N23 24.1	174 20.9	11.1	N 4	46.4	14.8	59.3	////	00 49	02 35	12 14	13 49	15 25	17 03	
07	284 44.7	24.2	188 51.0	11.1	4	31.6	14.8	59.3	////	01 40	02 56	12 16	13 47	15 20	16 53	
08	299 44.5	24.2	203 21.1	11.1	4	16.8	14.9	59.3	////	02 10	03 13	12 17	13 46	15 15	16 45	
09	314 44.4	24.3	217 51.2	11.2	4	01.9	14.8	59.3	00 45	02 32	03 27	12 18	13 44	15 10	16 37	
10	329 44.3	24.3	232 21.4	11.2	3	47.1	14.9	59.3	01 32	02 50	03 39	12 20	13 43	15 06	16 30	
11	344 44.1	24.4	246 51.6	11.2	3	32.2	14.9	59.3	02 00	03 06	03 50	12 21	13 41	15 03	16 24	
12	359 44.0	N23 24.4	261 21.8	11.2	N 3	17.3	15.0	59.3	02 46	03 35	04 13	12 23	13 39	14 55	16 11	
13	14 43.8	24.5	275 52.0	11.2	3	02.3	14.9	59.3	N 40	03 16	03 58	04 31	12 25	13 37	14 48	16 01
14	29 43.7	24.5	290 22.2	11.2	2	47.4	15.0	59.3	35	03 39	04 16	04 46	12 27	13 35	14 43	15 51
15	44 43.6	24.6	304 52.4	11.3	2	32.4	15.0	59.4	30	03 58	04 31	04 59	12 29	13 33	14 38	15 44
16	59 43.4	24.6	319 22.7	11.2	2	17.4	14.9	59.4	20	04 27	04 56	05 21	12 32	13 30	14 30	15 30
17	74 43.3	24.7	333 52.9	11.2	2	02.5	15.1	59.4	N 10	04 50	05 17	05 40	12 34	13 28	14 22	15 18
18	89 43.2	N23 24.7	348 23.1	11.3	N 1	47.4	15.0	59.4	0	05 09	05 35	05 58	12 36	13 26	14 16	15 07
19	104 43.0	24.8	2 53.4	11.3	1	32.4	15.0	59.4	S 10	05 26	05 52	06 15	12 39	13 23	14 09	14 56
20	119 42.9	24.8	17 23.7	11.2	1	17.4	15.0	59.4	20	05 42	06 10	06 34	12 41	13 21	14 02	14 45
21	134 42.8	24.9	31 53.9	11.3	1	02.4	15.1	59.4	30	05 59	06 28	06 55	12 44	13 18	13 54	14 32
22	149 42.6	24.9	46 24.2	11.3	0	47.3	15.0	59.4	35	06 07	06 39	07 07	12 45	13 17	13 49	14 24
23	164 42.5	25.0	60 54.5	11.2	0	32.3	15.1	59.4	40	06 17	06 51	07 21	12 47	13 15	13 44	14 15
19 00	179 42.4	N23 25.0	75 24.7	11.3	N 0	17.2	15.0	59.4	45	06 27	07 04	07 38	12 49	13 13	13 38	14 06
01	194 42.2	25.1	89 55.0	11.2	N 0	02.2	15.1	59.4	S 50	06 39	07 21	07 59	12 52	13 11	13 31	13 54
02	209 42.1	25.1	104 25.2	11.3	S 0	12.9	15.0	59.4	52	06 44	07 28	08 09	12 53	13 10	13 28	13 48
03	224 41.9	25.1	118 55.5	11.3	0	27.9	15.1	59.4	54	06 50	07 36	08 20	12 54	13 09	13 24	13 42
04	239 41.8	25.2	133 25.8	11.2	0	43.0	15.0	59.4	56	06 56	07 45	08 33	12 56	13 08	13 20	13 35
05	254 41.7	25.2	147 56.0	11.3	0	58.0	15.1	59.4	58	07 03	07 56	08 47	12 57	13 06	13 16	13 28
06	269 41.5	N23 25.3	162 26.3	11.2	S 1	13.1	15.0	59.4	S 60	07 10	08 07	09 05	12 59	13 05	13 11	13 19
07	284 41.4	25.3	176 56.5	11.2	1	28.1	15.1	59.4	Lat.	Sunset	Twilight		Moonset			
08	299 41.3	25.3	191 26.7	11.2	1	43.2	15.0	59.4			Civil	Naut.	18	19	20	21
09	314 41.1	25.4	205 56.9	11.2	1	58.2	15.0	59.4			h m	h m	h m	h m	h m	h m
10	329 41.0	25.4	220 27.1	11.2	2	13.2	15.0	59.4			h m	h m	h m	h m	h m	h m
11	344 40.9	25.5	234 57.3	11.2	2	28.2	15.0	59.4	N 72	☐	☐	☐	01 25	00 59	⁰³ ₂₃ ³² ₅₉	23 04
12	359 40.7	N23 25.5	249 27.5	11.2	S 2	43.2	15.0	59.4	N 70	☐	☐	☐	01 18	00 59	00 40	⁰³ ₂₃ ³⁸ ₄₈
13	14 40.6	25.5	263 57.7	11.1	2	58.2	14.9	59.4	68	☐	☐	☐	01 11	00 59	00 47	00 33
14	29 40.4	25.6	278 27.8	11.2	3	13.1	15.0	59.4	66	☐	☐	☐	01 06	00 59	00 53	00 45
15	44 40.3	25.6	292 58.0	11.1	3	28.1	14.9	59.4	64	22 32	////	////	01 01	00 59	00 57	00 56
16	59 40.2	25.6	307 28.1	11.1	3	43.0	14.9	59.4	62	21 54	////	////	00 57	00 59	01 02	01 05
17	74 40.0	25.7	321 58.2	11.1	3	57.9	14.9	59.4	60	21 27	23 14	////	00 53	00 59	01 05	01 12
18	89 39.9	N23 25.7	336 28.3	11.0	S 4	12.8	14.9	59.4	N 58	21 07	22 23	////	00 50	00 59	01 09	01 19
19	104 39.8	25.7	350 58.3	11.1	4	27.7	14.8	59.4	56	20 50	21 53	////	00 47	00 59	01 12	01 25
20	119 39.6	25.8	5 28.4	11.0	4	42.5	14.8	59.4	54	20 36	21 30	23 18	00 45	00 59	01 14	01 31
21	134 39.5	25.8	19 58.4	11.0	4	57.3	14.8	59.4	52	20 23	21 12	22 31	00 42	01 00	01 17	01 35
22	149 39.4	25.8	34 28.4	11.0	5	12.1	14.7	59.4	50	20 12	20 57	22 03	00 40	01 00	01 19	01 40
23	164 39.2	25.8	48 58.4	10.9	5	26.8	14.8	59.4	45	19 50	20 27	21 17	00 35	01 00	01 24	01 50
20 00	179 39.1	N23 25.9	63 28.3	10.9	S 5	41.6	14.7	59.4	N 40	19 32	20 05	20 46	00 32	01 00	01 28	01 58
01	194 39.0	25.9	77 58.2	10.9	5	56.3	14.6	59.3	35	19 17	19 46	20 23	00 28	01 00	01 31	02 05
02	209 38.8	25.9	92 28.1	10.9	6	10.9	14.7	59.3	30	19 04	19 31	20 05	00 25	01 00	01 34	02 11
03	224 38.7	25.9	106 58.0	10.8	6	25.6	14.6	59.3	20	18 42	19 06	19 35	00 20	01 00	01 40	02 21
04	239 38.5	26.0	121 27.8	10.8	6	40.2	14.5	59.3	N 10	18 23	18 46	19 13	00 15	01 00	01 45	02 31
05	254 38.4	26.0	135 57.6	10.8	6	54.7	14.5	59.3	0	18 05	18 28	18 54	00 10	01 00	01 49	02 40
06	269 38.3	N23 26.0	150 27.4	10.7	S 7	09.2	14.5	59.3	S 10	17 48	18 10	18 37	00 06	01 00	01 54	02 49
07	284 38.1	26.0	164 57.1	10.7	7	23.7	14.5	59.3	20	17 29	17 53	18 20	00 01	01 00	01 58	02 58
08	299 38.0	26.1	179 26.8	10.7	7	38.2	14.4	59.3	30	17 08	17 34	18 04	25 00	01 00	02 04	03 09
09	314 37.9	26.1	193 56.5	10.7	7	52.6	14.3	59.3	35	16 55	17 23	17 55	24 59	00 59	02 07	03 15
10	329 37.7	26.1	208 26.2	10.6	8	06.9	14.3	59.3	40	16 41	17 12	17 46	24 59	00 59	02 11	03 23
11	344 37.6	26.1	222 55.8	10.5	8	21.2	14.3	59.3	45	16 24	16 58	17 35	24 59	00 59	02 15	03 31
12	359 37.5	N23 26.1	237 25.3	10.5	S 8	35.5	14.2	59.3	S 50	16 03	16 42	17 24	24 59	00 59	02 20	03 41
13	14 37.3	26.2	251 54.8	10.5	8	49.7	14.2	59.3	52	15 54	16 35	17 18	24 59	00 59	02 22	03 46
14	29 37.2	26.2	266 24.3	10.5	9	03.9	14.1	59.3	54	15 42	16 26	17 13	24 59	00 59	02 25	03 51
15	44 37.1	26.2	280 53.8	10.4	9	18.0	14.0	59.3	56	15 30	16 17	17 06	24 59	00 59	02 28	03 57
16	59 36.9	26.2	295 23.2	10.4	9	32.0	14.1	59.3	58	15 15	16 07	17 00	24 59	00 59	02 31	04 04
17	74 36.8	26.2	309 52.6	10.3	9	46.1	13.9	59.3	S 60	14 57	15 55	16 52	24 59	00 59	02 34	04 11
18	89 36.6	N23 26.2														

UT	SUN		MOON				Lat.	Twilight			Moonrise					
	GHA	Dec	GHA	v	Dec	d		HP	Naut.	Civil	Sunrise	21	22	23	24	
									h m	h m	h m	h m	h m	h m	h m	h m
d h	° /	° /	° /	'	° /	'	'	°	h m	h m	h m	h m	h m	h m	h m	
21 00	179 35.8	N23 26.3	51 16.9	10.0	S11 22.5	13.5	59.2	N 72	☐	☐	☐	19 13	■	■	■	
01	194 35.7	26.3	65 45.9	10.0	11 36.0	13.5	59.2	N 70	☐	☐	☐	18 32	■	■	■	
02	209 35.6	26.3	80 14.9	9.9	11 49.5	13.3	59.2	68	☐	☐	☐	18 05	■	■	■	
03	224 35.4	26.3	94 43.8	9.9	12 02.8	13.4	59.2	66	☐	☐	☐	17 44	19 49	22 13	■	
04	239 35.3	26.3	109 12.7	9.8	12 16.2	13.2	59.2	64	////	////	01 31	17 28	19 20	21 14	22 56	
05	254 35.2	26.3	123 41.5	9.8	12 29.4	13.2	59.2	62	////	////	02 09	17 14	18 59	20 40	22 08	
06	269 35.0	N23 26.3	138 10.3	9.7	S12 42.6	13.1	59.2	60	////	00 49	02 36	17 03	18 41	20 16	21 37	
07	284 34.9	26.3	152 39.0	9.7	12 55.7	13.0	59.2	N 58	////	01 40	02 56	16 53	18 27	19 56	21 14	
08	299 34.7	26.4	167 07.7	9.6	13 08.7	13.0	59.2	56	////	02 11	03 13	16 45	18 14	19 40	20 55	
09	314 34.6	26.4	181 36.3	9.5	13 21.7	12.8	59.2	54	00 45	02 33	03 28	16 37	18 04	19 26	20 39	
10	329 34.5	26.4	196 04.8	9.6	13 34.5	12.8	59.1	52	01 32	02 51	03 40	16 30	17 54	19 14	20 25	
11	344 34.3	26.4	210 33.4	9.4	13 47.3	12.7	59.1	50	02 00	03 06	03 51	16 24	17 45	19 03	20 13	
12	359 34.2	N23 26.4	225 01.8	9.4	S14 00.0	12.7	59.1	45	02 46	03 36	04 13	16 11	17 27	18 41	19 49	
13	14 34.1	26.4	239 30.2	9.4	14 12.7	12.5	59.1	N 40	03 17	03 59	04 31	16 01	17 13	18 23	19 29	
14	29 33.9	26.4	253 58.6	9.3	14 25.2	12.5	59.1	35	03 40	04 17	04 47	15 51	17 01	18 08	19 13	
15	44 33.8	26.4	268 26.9	9.2	14 37.7	12.3	59.1	30	03 59	04 32	05 00	15 44	16 50	17 56	18 59	
16	59 33.7	26.4	282 55.1	9.2	14 50.0	12.3	59.1	20	04 28	04 57	05 22	15 30	16 31	17 34	18 34	
17	74 33.5	26.4	297 23.3	9.1	15 02.3	12.2	59.1	N 10	04 50	05 18	05 41	15 18	16 16	17 15	18 14	
18	89 33.4	N23 26.4	311 51.4	9.1	S15 14.5	12.1	59.1	0	05 09	05 36	05 58	15 07	16 01	16 57	17 54	
19	104 33.3	26.4	326 19.5	9.0	15 26.6	12.0	59.0	S 10	05 27	05 53	06 16	14 56	15 46	16 39	17 35	
20	119 33.1	26.4	340 47.5	9.0	15 38.6	11.9	59.0	20	05 43	06 10	06 34	14 45	15 31	16 21	17 15	
21	134 33.0	26.3	355 15.5	8.9	15 50.5	11.9	59.0	30	05 59	06 29	06 56	14 32	15 13	15 59	16 51	
22	149 32.8	26.3	9 43.4	8.9	16 02.4	11.7	59.0	35	06 08	06 40	07 08	14 24	15 03	15 47	16 37	
23	164 32.7	26.3	24 11.3	8.8	16 14.1	11.6	59.0	40	06 17	06 52	07 22	14 15	14 51	15 32	16 21	
22 00	179 32.6	N23 26.3	38 39.1	8.7	S16 25.7	11.5	59.0	45	06 28	07 05	07 39	14 06	14 37	15 15	16 02	
01	194 32.4	26.3	53 06.8	8.7	16 37.2	11.5	59.0	S 50	06 40	07 21	08 00	13 54	14 21	14 55	15 38	
02	209 32.3	26.3	67 34.5	8.6	16 48.7	11.3	59.0	52	06 45	07 29	08 10	13 48	14 13	14 45	15 26	
03	224 32.2	26.3	82 02.1	8.6	17 00.0	11.2	58.9	54	06 51	07 37	08 21	13 42	14 04	14 34	15 13	
04	239 32.0	26.3	96 29.7	8.5	17 11.2	11.1	58.9	56	06 57	07 46	08 34	13 35	13 55	14 21	14 59	
05	254 31.9	26.3	110 57.2	8.4	17 22.3	11.0	58.9	58	07 04	07 56	08 48	13 28	13 44	14 06	14 41	
06	269 31.8	N23 26.3	125 24.6	8.4	S17 33.3	10.9	58.9	S 60	07 11	08 08	09 06	13 19	13 31	13 49	14 20	
07	284 31.6	26.3	139 52.0	8.4	17 44.2	10.8	58.9	Lat.	Sunset	Twilight			Moonset			
08	299 31.5	26.2	154 19.4	8.3	17 55.0	10.7	58.9			Civil	Naut.	21	22	23	24	
09	314 31.4	26.2	168 46.7	8.2	18 05.7	10.6	58.9	°	h m	h m	h m	h m	h m	h m	h m	
10	329 31.2	26.2	183 13.9	8.2	18 16.3	10.5	58.8	N 72	☐	☐	☐	23 04	■	■	■	
11	344 31.1	26.2	197 41.1	8.1	18 26.8	10.3	58.8	N 70	☐	☐	☐	(09 18)	■	■	■	
12	359 31.0	N23 26.2	212 08.2	8.1	S18 37.1	10.2	58.8	68	☐	☐	☐	00 33	■	■	■	
13	14 30.8	26.2	226 35.3	8.0	18 47.3	10.2	58.8	66	☐	☐	☐	00 45	00 37	00 26	■	
14	29 30.7	26.1	241 02.3	7.9	18 57.5	10.0	58.8	64	22 33	////	////	00 56	00 55	00 55	01 00	
15	44 30.6	26.1	255 29.2	7.9	19 07.5	9.8	58.8	62	21 54	////	////	01 05	01 09	01 18	01 34	
16	59 30.4	26.1	269 56.1	7.9	19 17.3	9.8	58.8	60	21 28	23 14	////	01 12	01 22	01 36	01 59	
17	74 30.3	26.1	284 23.0	7.8	19 27.1	9.7	58.7	N 58	21 07	22 23	////	01 19	01 32	01 51	02 19	
18	89 30.2	N23 26.1	298 49.8	7.7	S19 36.8	9.5	58.7	56	20 51	21 53	////	01 25	01 42	02 04	02 35	
19	104 30.0	26.1	313 16.5	7.7	19 46.3	9.4	58.7	54	20 36	21 31	23 19	01 31	01 50	02 15	02 49	
20	119 29.9	26.0	327 43.2	7.6	19 55.7	9.2	58.7	52	20 24	21 13	22 31	01 35	01 58	02 25	03 02	
21	134 29.7	26.0	342 09.8	7.6	20 04.9	9.2	58.7	50	20 13	20 58	22 03	01 40	02 04	02 34	03 13	
22	149 29.6	26.0	356 36.4	7.5	20 14.1	9.0	58.7	45	19 50	20 28	21 18	01 50	02 19	02 54	03 36	
23	164 29.5	26.0	11 02.9	7.5	20 23.1	8.9	58.6	N 40	19 32	20 05	20 47	01 58	02 31	03 09	03 54	
23 00	179 29.3	N23 25.9	25 29.4	7.5	S20 32.0	8.8	58.6	35	19 17	19 47	20 24	02 05	02 41	03 22	04 09	
01	194 29.2	25.9	39 55.9	7.3	20 40.8	8.6	58.6	30	19 04	19 32	20 05	02 11	02 50	03 34	04 23	
02	209 29.1	25.9	54 22.2	7.4	20 49.4	8.5	58.6	20	18 42	19 07	19 36	02 21	03 06	03 54	04 46	
03	224 28.9	25.9	68 48.6	7.3	20 57.9	8.4	58.6	N 10	18 23	18 46	19 13	02 31	03 20	04 11	05 06	
04	239 28.8	25.8	83 14.9	7.2	21 06.3	8.2	58.6	0	18 06	18 28	18 54	02 40	03 32	04 27	05 24	
05	254 28.7	25.8	97 41.1	7.2	21 14.5	8.1	58.5	S 10	17 48	18 11	18 37	02 49	03 45	04 44	05 43	
06	269 28.5	N23 25.8	112 07.3	7.2	S21 22.6	8.0	58.5	20	17 30	17 54	18 21	02 58	03 59	05 01	06 03	
07	284 28.4	25.7	126 33.5	7.1	21 30.6	7.8	58.5	30	17 08	17 35	18 05	03 09	04 15	05 21	06 26	
08	299 28.3	25.7	140 59.6	7.0	21 38.4	7.7	58.5	35	16 56	17 24	17 56	03 15	04 24	05 33	06 40	
09	314 28.1	25.7	155 25.6	7.0	21 46.1	7.6	58.5	40	16 42	17 12	17 46	03 23	04 35	05 47	06 55	
10	329 28.0	25.6	169 51.6	7.0	21 53.7	7.4	58.4	45	16 25	16 59	17 36	03 31	04 48	06 03	07 14	
11	344 27.9	25.6	184 17.6	7.0	22 01.1	7.3	58.4	S 50	16 04	16 43	17 24	03 41	05 03	06 23	07 37	
12	359 27.7	N23 25.6	198 43.6	6.9	S22 08.4	7.1	58.4	52	15 54	16 35	17 19	03 46	05 10	06 32	07 49	
13	14 27.6	25.6	213 09.5	6.8	22 15.5	7.0	58.4	54	15 43	16 27	17 13	03 51	05 18	06 43	08 01	
14	29 27.5	25.5	227 35.3	6.9	22 22.5	6.9	58.4	56	15 30	16 18	17 07	03 57	05 27	06 55	08 16	
15	44 27.3	25.5	242 01.2	6.7	22 29.4	6.7	58.3	58	15 16	16 08	17 00	04 04	05 37	07 09	08 33	
16	59 27.2	25.4	256 26.9	6.8	22 36.1	6.5	58.3	S 60	14 58	15 56	16 53	04 11	05 49	07 26	08 55	
17	74 27.1	25.4	270 52.7	6.7	22 42.6	6.5	58.3	Day	SUN			MOON				
18	89 26.9	N23 25.4	285 18.4	6.7	S22 49.1	6.3	58.3		Eqn. of Time	Mer.	Mer. Pass.		Age		Phase	
19	104 26.8	25.3	299 44.1	6.7	22 55.4	6.1	58.3		00 ^h	Pass.	Upper	Lower	d	%		
20	119 26.7															