NavSoft's

1992

Nautical Almanac

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Formulae

Dip = 0.971 x $Ht^{½}$ Ht in feet

or

Dip = 1.758 x $Ht^{½}$ Ht in meters

Refraction = 0.96/ Tan(Alt) Altitude > 11°

Parallax = HP x Cos(Alt)

Cos(Zenith Distance) = Sin(Lat) x Sin(Dec) + Cos(Lat) x Cos(Dec) x Cos(LHA)

Tan(Azimuth) = Sin(LHA) / [Cos(Lat) x Tan(Dec) - Sin(Lat) x Cos(LHA)]

ABC Tables

A = Cos(Lat) x Tan(Dec)

B = Sin(Lat) x Cos(LHA)

C = Sin(LHA) / Tan(Azimuth)

or

Azimuth = Atan[C/ Sin(LHA)]

Increments

Sun = 15°/ hour

Moon = 15°.041666'/ hour

Aries = 14°.316666'/ hour

Horizontal Parallaxes and Semi-Diameters for 1992

	Sun	Venus		Mars		Jupiter	Saturn
	SD	HP	SD	HP	SD	SD	SD
Jan 1	16'.3	0'.13	0'.12	0'.06	0'.03	0'.32	0'.11
Jan	16'.3	0'.12	0'.12	0'.06	0'.03	0'.33	0'.11
Feb	16'.2	0'.11	0'.10	0'.07	0'.03	0'.35	0'.11
Mar	16'.1	0'.10	0'.09	0'.07	0'.04	0'.35	0'.12
Apr	15'.9	0'.09	0'.09	0'.07	0'.04	0'.33	0'.12
May	15'.8	0'.09	0'.08	0'.08	0'.04	0'.30	0'.13
Jun	15'.7	0'.08	0'.08	0'.09	0'.05	0'.28	0'.13
Jul	15'.7	0'.09	0'.08	0'.09	0'.05	0'.26	0'.14
Aug	15'.8	0'.09	0'.09	0'.10	0'.05	0'.24	0'.14
Sep	15'.9	0'.10	0'.09	0'.12	0'.06	0'.24	0'.14
Oct	16'.0	0'.11	0'.11	0'.14	0'.07	0'.24	0'.13
Nov	16'.2	0'.13	0'.12	0'.18	0'.09	0'.25	0'.12
Dec	16'.3	0'.16	0'.15	0'.22	0'.12	0'.27	0'.12
Dec 31	16'.3	0'.18	0'.17	0'.23	0'.12	0'.29	0'.12

15th day of each month unless stated

Sun's HP = 0'.15

HP for Jupiter and Saturn < 0'.05

This Almanac was compiled using AstroNav which will print pages for any dates between 9999BC and 9999AD. Further details can be found at navsoft.com/astronav.html

The supplementary tables which do not change from year to year are available at navsoft.com/downloads.html

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1992 January 1, 2, 3 (Wed, Thur, Fri)

GMT	ARIES	VENUS -4.1		MARS +1.4		JUPITER -2.3		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
1 Wednesday 00	99° 54'.6	221° 10'.2	18° 10'.0 S	196° 41'.9	23° 45'.4 S	293° 36'.7	7° 08'.1 N	151° 31'.9	19° 22'.4 S
01	114° 57'.1	236° 09'.6	10'.6	211° 42'.4	45'.5	308° 39'.2	08'.1	166° 34'.0	22'.4
02	129° 59'.6	251° 09'.0	11'.3	226° 42'.8	45'.6	323° 41'.7	08'.1	181° 36'.2	22'.3
03	145° 02'.0	266° 08'.4	12'.0	241° 43'.3	45'.7	338° 44'.1	08'.1	196° 38'.4	22'.2
04	160° 04'.5	281° 07'.7	12'.7	256° 43'.7	45'.8	353° 46'.6	08'.1	211° 40'.6	22'.2
05	175° 07'.0	296° 07'.1	13'.4	271° 44'.2	46'.0	8° 49'.1	08'.2	226° 42'.7	22'.1
06	190° 09'.4	311° 06'.5	14'.1	286° 44'.6	46'.1	23° 51'.5	08'.2	241° 44'.9	22'.0
07	205° 11'.9	326° 05'.9	14'.7	301° 45'.1	46'.2	38° 54'.0	08'.2	256° 47'.1	22'.0
08	220° 14'.3	341° 05'.2	15'.4	316° 45'.6	46'.3	53° 56'.5	08'.2	271° 49'.3	21'.9
09	235° 16'.8	356° 04'.6	16'.1	331° 46'.0	46'.4	68° 59'.0	08'.2	286° 51'.4	21'.8
10	250° 19'.3	11° 04'.0	16'.8	346° 46'.5	46'.5	84° 01'.4	08'.2	301° 53'.6	21'.8
11	265° 21'.7	26° 03'.4	17'.5	1° 46'.9	46'.6	99° 03'.9	08'.2	316° 55'.8	21'.7
12	280° 24'.2	41° 02'.7	18° 18'.2 S	16° 47'.4	23° 46'.7 S	114° 06'.4	7° 08'.3 N	331° 58'.0	19° 21'.6 S
13	295° 26'.7	56° 02'.1	18'.8	31° 47'.8	46'.8	129° 08'.8	08'.3	347° 00'.2	21'.6
14	310° 29'.1	71° 01'.5	19'.5	46° 48'.3	46'.9	144° 11'.3	08'.3	2° 02'.3	21'.5
15	325° 31'.6	86° 00'.8	20'.2	61° 48'.8	47'.0	159° 13'.8	08'.3	17° 04'.5	21'.4
16	340° 34'.1	101° 00'.2	20'.9	76° 49'.2	47'.1	174° 16'.3	08'.3	32° 06'.7	21'.4
17	355° 36'.5	115° 59'.6	21'.5	91° 49'.7	47'.2	189° 18'.7	08'.3	47° 08'.9	21'.3
18	10° 39'.0	130° 58'.9	22'.2	106° 50'.1	47'.3	204° 21'.2	08'.4	62° 11'.0	21'.2
19	25° 41'.5	145° 58'.3	22'.9	121° 50'.6	47'.5	219° 23'.7	08'.4	77° 13'.2	21'.2
20	40° 43'.9	160° 57'.7	23'.6	136° 51'.0	47'.6	234° 26'.1	08'.4	92° 15'.4	21'.1
21	55° 46'.4	175° 57'.0	24'.2	151° 51'.5	47'.7	249° 28'.6	08'.4	107° 17'.6	21'.0
22	70° 48'.8	190° 56'.4	24'.9	166° 51'.9	47'.8	264° 31'.1	08'.4	122° 19'.7	21'.0
23	85° 51'.3	205° 55'.8	25'.6	181° 52'.4	47'.9	279° 33'.6	08'.4	137° 21'.9	20'.9
2 Thursday 00	100° 53'.8	220° 55'.1	18° 26'.2 S	196° 52'.9	23° 48'.0 S	294° 36'.0	7° 08'.5 N	152° 24'.1	19° 20'.8 S
01	115° 56'.2	235° 54'.5	26'.9	211° 53'.3	48'.1	309° 38'.5	08'.5	167° 26'.3	20'.8
02	130° 58'.7	250° 53'.9	27'.6	226° 53'.8	48'.2	324° 41'.0	08'.5	182° 28'.4	20'.7
03	146° 01'.2	265° 53'.2	28'.2	241° 54'.2	48'.3	339° 43'.5	08'.5	197° 30'.6	20'.6
04	161° 03'.6	280° 52'.6	28'.9	256° 54'.7	48'.4	354° 46'.0	08'.5	212° 32'.8	20'.6
05	176° 06'.1	295° 51'.9	29'.6	271° 55'.1	48'.5	9° 48'.4	08'.5	227° 35'.0	20'.5
06	191° 08'.6	310° 51'.3	30'.2	286° 55'.6	48'.6	24° 50'.9	08'.6	242° 37'.1	20'.4
07	206° 11'.0	325° 50'.7	30'.9	301° 56'.0	48'.7	39° 53'.4	08'.6	257° 39'.3	20'.3
08	221° 13'.5	340° 50'.0	31'.6	316° 56'.5	48'.8	54° 55'.9	08'.6	272° 41'.5	20'.3
09	236° 16'.0	355° 49'.4	32'.2	331° 56'.9	48'.9	69° 58'.3	08'.6	287° 43'.7	20'.2
10	251° 18'.4	10° 48'.8	32'.9	346° 57'.4	49'.0	85° 00'.8	08'.6	302° 45'.8	20'.1
11	266° 20'.9	25° 48'.1	33'.5	1° 57'.9	49'.1	100° 03'.3	08'.7	317° 48'.0	20'.1
12	281° 23'.3	40° 47'.5	18° 34'.2 S	16° 58'.3	23° 49'.2 S	115° 05'.8	7° 08'.7 N	332° 50'.2	19° 20'.0 S
13	296° 25'.8	55° 46'.8	34'.9	31° 58'.8	49'.3	130° 08'.3	08'.7	347° 52'.4	19'.9
14	311° 28'.3	70° 46'.2	35'.5	46° 59'.2	49'.4	145° 10'.7	08'.7	2° 54'.5	19'.9
15	326° 30'.7	85° 45'.5	36'.2	61° 59'.7	49'.4	160° 13'.2	08'.7	17° 56'.7	19'.8
16	341° 33'.2	100° 44'.9	36'.8	77° 00'.1	49'.5	175° 15'.7	08'.8	32° 58'.9	19'.7
17	356° 35'.7	115° 44'.3	37'.5	92° 00'.6	49'.6	190° 18'.2	08'.8	48° 01'.1	19'.7
18	11° 38'.1	130° 43'.6	38'.1	107° 01'.0	49'.7	205° 20'.7	08'.8	63° 03'.2	19'.6
19	26° 40'.6	145° 43'.0	38'.8	122° 01'.5	49'.8	220° 23'.1	08'.8	78° 05'.4	19'.5
20	41° 43'.1	160° 42'.3	39'.5	137° 01'.9	49'.9	235° 25'.6	08'.8	93° 07'.6	19'.5
21	56° 45'.5	175° 41'.7	40'.1	152° 02'.4	50'.0	250° 28'.1	08'.9	108° 09'.8	19'.4
22	71° 48'.0	190° 41'.0	40'.8	167° 02'.8	50'.1	265° 30'.6	08'.9	123° 11'.9	19'.3
23	86° 50'.5	205° 40'.4	41'.4	182° 03'.3	50'.2	280° 33'.1	08'.9	138° 14'.1	19'.3
3 Friday 00	101° 52'.9	220° 39'.7	18° 42'.1 S	197° 03'.7	23° 50'.3 S	295° 35'.6	7° 08'.9 N	153° 16'.3	19° 19'.2 S
01	116° 55'.4	235° 39'.1	42'.7	212° 04'.2	50'.4	310° 38'.0	08'.9	168° 18'.5	19'.1
02	131° 57'.8	250° 38'.4	43'.4	227° 04'.6	50'.5	325° 40'.5	09'.0	183° 20'.6	19'.1
03	147° 00'.3	265° 37'.8	44'.0	242° 05'.1	50'.6	340° 43'.0	09'.0	198° 22'.8	19'.0
04	162° 02'.8	280° 37'.1	44'.7	257° 05'.5	50'.7	355° 45'.5	09'.0	213° 25'.0	18'.9
05	177° 05'.2	295° 36'.5	45'.3	272° 06'.0	50'.7	10° 48'.0	09'.0	228° 27'.2	18'.9
06	192° 07'.7	310° 35'.8	45'.9	287° 06'.4	50'.8	25° 50'.5	09'.0	243° 29'.3	18'.8
07	207° 10'.2	325° 35'.2	46'.6	302° 06'.9	50'.9	40° 52'.9	09'.1	258° 31'.5	18'.7
08	222° 12'.6	340° 34'.5	47'.2	317° 07'.3	51'.0	55° 55'.4	09'.1	273° 33'.7	18'.7
09	237° 15'.1	355° 33'.9	47'.9	332° 07'.8	51'.1	70° 57'.9	09'.1	288° 35'.9	18'.6
10	252° 17'.6	10° 33'.2	48'.5	347° 08'.3	51'.2	86° 00'.4	09'.1	303° 38'.0	18'.5
11	267° 20'.0	25° 32'.6	49'.2	2° 08'.7	51'.3	101° 02'.9	09'.1	318° 40'.2	18'.4
12	282° 22'.5	40° 31'.9	18° 49'.8 S	17° 09'.2	23° 51'.4 S	116° 05'.4	7° 09'.2 N	333° 42'.4	19° 18'.4 S
13	297° 25'.0	55° 31'.3	50'.4	32° 09'.6	51'.4	131° 07'.9	09'.2	348° 44'.6	18'.3
14	312° 27'.4	70° 30'.6	51'.1	47° 10'.1	51'.5	146° 10'.3	09'.2	3° 46'.7	18'.2
15	327° 29'.9	85° 30'.0	51'.7	62° 10'.5	51'.6	161° 12'.8	09'.2	18° 48'.9	18'.2
16	342° 32'.3	100° 29'.3	52'.4	77° 11'.0	51'.7	176° 15'.3	09'.3	33° 51'.1	18'.1
17	357° 34'.8	115° 28'.6	53'.0	92° 11'.4	51'.8	191° 17'.8	09'.3	48° 53'.3	18'.0
18	12° 37'.3	130° 28'.0	53'.6	107° 11'.9	51'.9	206° 20'.3	09'.3	63° 55'.4	18'.0
19	27° 39'.7	145° 27'.3	54'.3	122° 12'.3	52'.0	221° 22'.8	09'.3	78° 57'.6	17'.9
20	42° 42'.2	160° 26'.7	54'.9	137° 12'.8	52'.0	236° 25'.3	09'.3	93° 59'.8	17'.8
21	57° 44'.7	175° 26'.0	55'.5	152° 13'.2	52'.1	251° 27'.8	09'.4	109° 01'.9	17'.8
22	72° 47'.1	190° 25'.4	56'.2	167° 13'.6	52'.2	266° 30'.3	09'.4	124° 04'.1	17'.7
23	87° 49'.6	205° 24'.7	56'.8	182° 14'.1	52'.3	281° 32'.8	09'.4	139° 06'.3	17'.6
	M.P. 17:14	v -0'.6	d 0'.7	v 0'.5	d 0'.1	v 2'.5	d 0'.0	v 2'.2	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.2	40° 20'.3 S
Achernar	335° 38'.4	57° 16'.8 S
Acrux	173° 27'.5	63° 03'.1 S
Adhara	255° 24'.7	28° 57'.7 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.6	55° 59'.8 N
Alkaid	153° 11'.5	49° 20'.8 N
Alnair	28° 04'.0	47° 00'.1 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.6	8° 37'.5 S
Alphecca	126° 24'.8	26° 44'.3 N
Alpheratz	358° 00'.2	29° 03'.0 N
Altair	62° 24'.2	8° 50'.8 N
Ankaa	353° 31'.4	42° 21'.1 S
Antares	112° 46'.3	26° 24'.9 S
Arcturus	146° 10'.5	19° 13'.2 N
Atria	108° 03'.1	69° 00'.7 S
Avior	234° 24'.0	59° 29'.0 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.4 N
Canopus	264° 02'.7	52° 41'.5 S
Capella	280° 57'.7	45° 59'.5 N
Deneb	49° 42'.9	45° 15'.3 N
Denebola	182° 49'.9	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.8 S
Dubhe	194° 10'.8	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 54'.1	51° 29'.3 N
Enif	34° 03'.1	9° 50'.4 N
Fomalhaut	15° 41'.7	29° 40'.0 S
Gacrux	172° 18'.9	57° 04'.0 S
Gienah	176° 08'.8	17° 29'.9 S
Hadar	149° 11'.1	60° 19'.9 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.5	34° 23'.4 S
Kochab	137° 19'.8	74° 10'.9 N
Markab	13° 54'.5	15° 09'.9 N
Menkar	314° 31'.6	4° 03'.6 N
Menkent	148° 26'.7	36° 19'.8 S
Miaplacidus	221° 42'.5	69° 40'.9 S
Mirfak	309° 03'.1	49° 50'.3 N
Nunki	76° 18'.5	26° 18'.5 S
Peacock	53° 44'.9	56° 45'.8 S
Polaris	323° 55'.8	89° 14'.1 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 21'.7	12° 33'.8 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.6 S
Rigil Kent	140° 14'.1	60° 47'.9 S
Sabik	102° 31'.3	15° 43'.0 S
Schedar	349° 59'.0	56° 30'.0 N
Shaula	96° 44'.1	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.3 S
Spica	158° 48'.2	11° 07'.3 S
Suhail	223° 03'.9	43° 24'.0 S
Vega	80° 50'.3	38° 46'.5 N
Zuben'ubi	137° 23'.4	16° 00'.6 S

	SHA	Mer.Pass.
Venus	120° 01'.4	09:17
Mars	95° 59'.1	10:52
Jupiter	193° 42'.3	04:21
Saturn	51° 30'.3	13:48

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
179° 14'.1	23° 04'.7 S	227° 00'.2	10'.6	22° 51'.3 S	5'.4	55'.2
194° 13'.8	04'.5	241° 29'.8	10'.5	56'.7	5'.2	
209° 13'.5	04'.3	255° 59'.3	10'.4	23° 01'.9 S	5'.1	
224° 13'.2	04'.1	270° 28'.7	10'.5	07'.0	5'.0	55'.1
239° 12'.9	03'.9	284° 58'.2	10'.4	12'.0	4'.9	
254° 12'.6	03'.7	299° 27'.6	10'.5	16'.9	4'.7	
269° 12'.3	03'.5	313° 57'.1	10'.4	21'.6	4'.6	
284° 12'.0	03'.3	328° 26'.5	10'.3	26'.2	4'.6	
299° 11'.7	03'.1	342° 55'.8	10'.4	30'.8	4'.3	55'.0
314° 11'.4	03'.0	357° 25'.2	10'.3	35'.1	4'.3	
329° 11'.1	02'.8	11° 54'.5	10'.4	39'.4	4'.2	
344° 10'.8	02'.6	26° 23'.9	10'.3	43'.6	4'.0	
359° 10'.5	23° 02'.4 S	40° 53'.2	10'.3	23° 47'.6 S	3'.9	55'.0
14° 10'.2	02'.2	55° 22'.5	10'.2	51'.5	3'.8	
29° 09'.9	02'.0	69° 51'.7	10'.3	55'.3	3'.7	54'.9
44° 09'.6	01'.8	84° 21'.0	10'.3	59'.0	3'.5	
59° 09'.3	01'.6	98° 50'.3	10'.2	24° 02'.5 S	3'.5	
74° 09'.0	01'.4	113° 19'.5	10'.2	06'.0	3'.3	
89° 08'.7	01'.2	127° 48'.7	10'.2	09'.3	3'.2	
104° 08'.4	01'.0	142° 17'.9	10'.2	12'.5	3'.0	
119° 08'.1	00'.8	156° 47'.1	10'.2	15'.5	3'.0	54'.8
134° 07'.8	00'.6	171° 16'.3	10'.2	18'.5	2'.8	
149° 07'.5	00'.4	185° 45'.5	10'.2	21'.3	2'.7	
164° 07'.2	00'.1	200° 14'.7	10'.2	24'.0	2'.6	
179° 06'.9	22° 59'.9 S	214° 43'.9	10'.1	24° 26'.6 S	2'.4	54'.8
194° 06'.6	59'.7	229° 13'.0	10'.2	29'.0	2'.4	
209° 06'.3	59'.5	243° 42'.2	10'.1	31'.4	2'.2	
224° 06'.0	59'.3	258° 11'.3	10'.2	33'.6	2'.1	54'.7
239° 05'.7	59'.1	272° 40'.5	10'.1	35'.7	1'.9	
254° 05'.4	58'.9	287° 09'.6	10'.2	37'.6	1'.9	
269° 05'.1	58'.7	301° 38'.8	10'.1	39'.5	1'.7	
284° 04'.9	58'.5	316° 07'.9	10'.2	41'.2	1'.6	
299° 04'.6	58'.3	330° 37'.1	10'.1	42'.8	1'.4	
314° 04'.3	58'.0	345° 06'.2	10'.2	44'.2	1'.4	54'.6
329° 04'.0	57'.8	359° 35'.4	10'.1	45'.6	1'.2	
344° 03'.7	57'.6	14° 04'.5	10'.2	46'.8	1'.1	
359° 03'.4	22° 57'.4 S	28° 33'.7	10'.1	24° 47'.9 S	1'.0	54'.6
14° 03'.1	57'.2	43° 02'.8	10'.2	48'.9	0'.8	
29° 02'.8	57'.0	57° 32'.0	10'.2	49'.7	0'.8	
44° 02'.5	56'.7	72° 01'.2	10'.2	50'.5	0'.6	
59° 02'.2	56'.5	86° 30'.4	10'.2	51'.1	0'.4	
74° 01'.9	56'.3	100° 59'.6	10'.2	51'.5	0'.4	54'.5
89° 01'.6	56'.1	115° 28'.8	10'.2	51'.9	0'.2	
104° 01'.3	55'.9	129° 58'.0	10'.2	52'.1	0'.2	
119° 01'.0	55'.6	144° 27'.2	10'.2	52'.3	0'.1	
134° 00'.7	55'.4	158° 56'.4	10'.3	52'.2	0'.1	
149° 00'.4	55'.2	173° 25'.7	10'.2	52'.1	0'.2	
164° 00'.2	55'.0	187° 54'.9	10'.3	51'.9	0'.4	
178° 59'.9	22° 54'.7 S	202° 24'.2	10'.3	24° 51'.5 S	0'.5	54'.5
193° 59'.6	54'.5	216° 53'.5	10'.3	51'.0	0'.6	54'.4
208° 59'.3	54'.3	231° 22'.8	10'.4	50'.4	0'.8	
223° 59'.0	54'.1	245° 52'.2	10'.3	49'.6	0'.8	
238° 58'.7	53'.8	260° 21'.5	10'.4	48'.8	1'.0	
253° 58'.4	53'.6	274° 50'.9	10'.4	47'.8	1'.1	
268° 58'.1	53'.4	289° 20'.3	10'.4	46'.7	1'.2	
283° 57'.8	53'.1	303° 49'.7	10'.4	45'.5	1'.4	
298° 57'.5	52'.9	318° 19'.1	10'.5	44'.1	1'.5	
313° 57'.2	52'.7	332° 48'.6	10'.5	42'.6	1'.5	
328° 56'.9	52'.4	347° 18'.1	10'.5	41'.1	1'.7	54'.3
343° 56'.7	52'.2	1° 47'.6	10'.5	39'.4	1'.9	
358° 56'.4	22° 52'.0 S	16° 17'.1	10'.6	24° 37'.5 S	1'.9	54'.3
13° 56'.1	51'.7	30° 46'.7	10'.5	35'.6	2'.1	
28° 55'.8	51'.5	45° 16'.2	10'.7	33'.5	2'.1	
43° 55'.5	51'.3	59° 45'.9	10'.6	31'.4	2'.3	
58° 55'.2	51'.0	74° 15'.5	10'.7	29'.1	2'.4	
73° 54'.9	50'.8	88° 45'.2	10'.7	26'.7	2'.6	
88° 54'.6	50'.5	103° 14'.9	10'.8	24'.1	2'.6	
103° 54'.3	50'.3	117° 44'.7	10'.7	21'.5	2'.8	
118° 54'.0	50'.1	132° 14'.4	10'.8	18'.7	2'.9	54'.2
133° 53'.8	49'.8	146° 44'.2	10'.9	15'.8	3'.0	
148° 53'.5	49'.6	161° 14'.1	10'.9	12'.8	3'.1	
163° 53'.2	49'.3	175° 44'.0	10'.9	09'.7	3'.2	
SD 16'.3	d 0'.2	SD 15'.0		14'.9	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
1	3 03	3 17	12:03	09:11	21:36	26d 11%
2	3 32	3 46	12:04	10:02	22:27	27d 5%
3	4 00	4 14	12:04	10:53	23:18	28d 2%

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1992 January 4, 5, 6 (Sat, Sun, Mon)

GMT		ARIES	VENUS -4.1		MARS +1.4		JUPITER -2.3		SATURN +0.7	
		GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
4 Saturday	00	102° 52'.1	220° 24'.0	18° 57'.4 S	197° 14'.5	23° 52'.4 S	296° 35'.2	7° 09'.4 N	154° 08'.5	19° 17'.6 S
	01	117° 54'.5	235° 23'.4	58'.1	212° 15'.0	52'.4	311° 37'.7	09'.5	169° 10'.6	17'.5
	02	132° 57'.0	250° 22'.7	58'.7	227° 15'.4	52'.5	326° 40'.2	09'.5	184° 12'.8	17'.4
	03	147° 59'.4	265° 22'.0	59'.3	242° 15'.9	52'.6	341° 42'.7	09'.5	199° 15'.0	17'.4
	04	163° 01'.9	280° 21'.4	59'.9	257° 16'.3	52'.7	356° 45'.2	09'.5	214° 17'.2	17'.3
	05	178° 04'.4	295° 20'.7	19° 00'.6 S	272° 16'.8	52'.8	11° 47'.7	09'.6	229° 19'.3	17'.2
	06	193° 06'.8	310° 20'.1	01'.2	287° 17'.2	52'.8	26° 50'.2	09'.6	244° 21'.5	17'.1
	07	208° 09'.3	325° 19'.4	01'.8	302° 17'.7	52'.9	41° 52'.7	09'.6	259° 23'.7	17'.1
	08	223° 11'.8	340° 18'.7	02'.4	317° 18'.1	53'.0	56° 55'.2	09'.6	274° 25'.9	17'.0
	09	238° 14'.2	355° 18'.1	03'.1	332° 18'.6	53'.1	71° 57'.7	09'.7	289° 28'.0	16'.9
	10	253° 16'.7	10° 17'.4	03'.7	347° 19'.0	53'.2	87° 00'.2	09'.7	304° 30'.2	16'.9
	11	268° 19'.2	25° 16'.7	04'.3	2° 19'.5	53'.2	102° 02'.7	09'.7	319° 32'.4	16'.8
	12	283° 21'.6	40° 16'.1	19° 04'.9 S	17° 19'.9	23° 53'.3 S	117° 05'.2	7° 09'.7 N	334° 34'.5	19° 16'.7 S
	13	298° 24'.1	55° 15'.4	05'.6	32° 20'.4	53'.4	132° 07'.6	09'.8	349° 36'.7	16'.7
	14	313° 26'.6	70° 14'.7	06'.2	47° 20'.8	53'.5	147° 10'.1	09'.8	4° 38'.9	16'.6
	15	328° 29'.0	85° 14'.1	06'.8	62° 21'.3	53'.5	162° 12'.6	09'.8	19° 41'.1	16'.5
	16	343° 31'.5	100° 13'.4	07'.4	77° 21'.7	53'.6	177° 15'.1	09'.8	34° 43'.2	16'.5
	17	358° 33'.9	115° 12'.7	08'.0	92° 22'.2	53'.7	192° 17'.6	09'.9	49° 45'.4	16'.4
	18	13° 36'.4	130° 12'.1	08'.6	107° 22'.6	53'.8	207° 20'.1	09'.9	64° 47'.6	16'.3
	19	28° 38'.9	145° 11'.4	09'.3	122° 23'.1	53'.8	222° 22'.6	09'.9	79° 49'.8	16'.3
	20	43° 41'.3	160° 10'.7	09'.9	137° 23'.5	53'.9	237° 25'.1	09'.9	94° 51'.9	16'.2
	21	58° 43'.8	175° 10'.1	10'.5	152° 23'.9	54'.0	252° 27'.6	10'.0	109° 54'.1	16'.1
	22	73° 46'.3	190° 09'.4	11'.1	167° 24'.4	54'.1	267° 30'.1	10'.0	124° 56'.3	16'.0
	23	88° 48'.7	205° 08'.7	11'.7	182° 24'.8	54'.1	282° 32'.6	10'.0	139° 58'.4	16'.0
5 Sunday	00	103° 51'.2	220° 08'.0	19° 12'.3 S	197° 25'.3	23° 54'.2 S	297° 35'.1	7° 10'.0 N	155° 00'.6	19° 15'.9 S
	01	118° 53'.7	235° 07'.4	12'.9	212° 25'.7	54'.3	312° 37'.6	10'.1	170° 02'.8	15'.8
	02	133° 56'.1	250° 06'.7	13'.5	227° 26'.2	54'.3	327° 40'.1	10'.1	185° 05'.0	15'.8
	03	148° 58'.6	265° 06'.0	14'.2	242° 26'.6	54'.4	342° 42'.6	10'.1	200° 07'.1	15'.7
	04	164° 01'.1	280° 05'.3	14'.8	257° 27'.1	54'.5	357° 45'.1	10'.1	215° 09'.3	15'.6
	05	179° 03'.5	295° 04'.7	15'.4	272° 27'.5	54'.5	12° 47'.6	10'.2	230° 11'.5	15'.6
	06	194° 06'.0	310° 04'.0	16'.0	287° 28'.0	54'.6	27° 50'.1	10'.2	245° 13'.6	15'.5
	07	209° 08'.4	325° 03'.3	16'.6	302° 28'.4	54'.7	42° 52'.6	10'.2	260° 15'.8	15'.4
	08	224° 10'.9	340° 02'.6	17'.2	317° 28'.8	54'.8	57° 55'.1	10'.3	275° 18'.0	15'.4
	09	239° 13'.4	355° 02'.0	17'.8	332° 29'.3	54'.8	72° 57'.6	10'.3	290° 20'.2	15'.3
	10	254° 15'.8	10° 01'.3	18'.4	347° 29'.7	54'.9	88° 00'.1	10'.3	305° 22'.3	15'.2
	11	269° 18'.3	25° 00'.6	19'.0	2° 30'.2	55'.0	103° 02'.6	10'.3	320° 24'.5	15'.2
	12	284° 20'.8	39° 59'.9	19° 19'.6 S	17° 30'.6	23° 55'.0 S	118° 05'.1	7° 10'.4 N	335° 26'.7	19° 15'.1 S
	13	299° 23'.2	54° 59'.3	20'.2	32° 31'.1	55'.1	133° 07'.6	10'.4	350° 28'.8	15'.0
	14	314° 25'.7	69° 58'.6	20'.8	47° 31'.5	55'.1	148° 10'.1	10'.4	5° 31'.0	14'.9
	15	329° 28'.2	84° 57'.9	21'.4	62° 32'.0	55'.2	163° 12'.6	10'.5	20° 33'.2	14'.9
	16	344° 30'.6	99° 57'.2	22'.0	77° 32'.4	55'.3	178° 15'.1	10'.5	35° 35'.4	14'.8
	17	359° 33'.1	114° 56'.5	22'.6	92° 32'.8	55'.3	193° 17'.6	10'.5	50° 37'.5	14'.7
	18	14° 35'.6	129° 55'.9	23'.2	107° 33'.3	55'.4	208° 20'.1	10'.5	65° 39'.7	14'.7
	19	29° 38'.0	144° 55'.2	23'.8	122° 33'.7	55'.5	223° 22'.6	10'.6	80° 41'.9	14'.6
	20	44° 40'.5	159° 54'.5	24'.4	137° 34'.2	55'.5	238° 25'.1	10'.6	95° 44'.0	14'.5
	21	59° 42'.9	174° 53'.8	25'.0	152° 34'.6	55'.6	253° 27'.6	10'.6	110° 46'.2	14'.5
	22	74° 45'.4	189° 53'.1	25'.6	167° 35'.1	55'.7	268° 30'.1	10'.7	125° 48'.4	14'.4
	23	89° 47'.9	204° 52'.4	26'.2	182° 35'.5	55'.7	283° 32'.7	10'.7	140° 50'.6	14'.3
6 Monday	00	104° 50'.3	219° 51'.8	19° 26'.7 S	197° 36'.0	23° 55'.8 S	298° 35'.2	7° 10'.7 N	155° 52'.7	19° 14'.3 S
	01	119° 52'.8	234° 51'.1	27'.3	212° 36'.4	55'.8	313° 37'.7	10'.7	170° 54'.9	14'.2
	02	134° 55'.3	249° 50'.4	27'.9	227° 36'.8	55'.9	328° 40'.2	10'.8	185° 57'.1	14'.1
	03	149° 57'.7	264° 49'.7	28'.5	242° 37'.3	56'.0	343° 42'.7	10'.8	200° 59'.2	14'.0
	04	165° 00'.2	279° 49'.0	29'.1	257° 37'.7	56'.0	358° 45'.2	10'.8	216° 01'.4	14'.0
	05	180° 02'.7	294° 48'.3	29'.7	272° 38'.2	56'.1	13° 47'.7	10'.9	231° 03'.6	13'.9
	06	195° 05'.1	309° 47'.6	30'.3	287° 38'.6	56'.1	28° 50'.2	10'.9	246° 05'.8	13'.8
	07	210° 07'.6	324° 47'.0	30'.9	302° 39'.1	56'.2	43° 52'.7	10'.9	261° 07'.9	13'.8
	08	225° 10'.1	339° 46'.3	31'.4	317° 39'.5	56'.3	58° 55'.2	11'.0	276° 10'.1	13'.7
	09	240° 12'.5	354° 45'.6	32'.0	332° 39'.9	56'.3	73° 57'.7	11'.0	291° 12'.3	13'.6
	10	255° 15'.0	9° 44'.9	32'.6	347° 40'.4	56'.4	89° 00'.2	11'.0	306° 14'.4	13'.6
	11	270° 17'.4	24° 44'.2	33'.2	2° 40'.8	56'.4	104° 02'.7	11'.1	321° 16'.6	13'.5
	12	285° 19'.9	39° 43'.5	19° 33'.8 S	17° 41'.3	23° 56'.5 S	119° 05'.3	7° 11'.1 N	336° 18'.8	19° 13'.4 S
	13	300° 22'.4	54° 42'.8	34'.3	32° 41'.7	56'.5	134° 07'.8	11'.1	351° 21'.0	13'.4
	14	315° 24'.8	69° 42'.1	34'.9	47° 42'.1	56'.6	149° 10'.3	11'.1	6° 23'.1	13'.3
	15	330° 27'.3	84° 41'.4	35'.5	62° 42'.6	56'.6	164° 12'.8	11'.2	21° 25'.3	13'.2
	16	345° 29'.8	99° 40'.8	36'.1	77° 43'.0	56'.7	179° 15'.3	11'.2	36° 27'.5	13'.1
	17	0° 32'.2	114° 40'.1	36'.7	92° 43'.5	56'.8	194° 17'.8	11'.2	51° 29'.6	13'.1
	18	15° 34'.7	129° 39'.4	37'.2	107° 43'.9	56'.8	209° 20'.3	11'.3	66° 31'.8	13'.0
	19	30° 37'.2	144° 38'.7	37'.8	122° 44'.4	56'.9	224° 22'.8	11'.3	81° 34'.0	12'.9
	20	45° 39'.6	159° 38'.0	38'.4	137° 44'.8	56'.9	239° 25'.3	11'.3	96° 36'.1	12'.9
	21	60° 42'.1	174° 37'.3	38'.9	152° 45'.2	57'.0	254° 27'.9	11'.4	111° 38'.3	12'.8
	22	75° 44'.5	189° 36'.6	39'.5	167° 45'.7	57'.0	269° 30'.4	11'.4	126° 40'.5	12'.7
	23	90° 47'.0	204° 35'.9	40'.1	182° 46'.1	57'.1	284° 32'.9	11'.4	141° 42'.7	12'.7
		M.P. 17:02	v -0'.7	d 0'.6	v 0'.4	d 0'.1	v 2'.5	d 0'.0	v 2'.2	d 0'.1

STARS		
Name	SHA	Dec
Acamar	315° 30'.2	40° 20'.3 S
Achernar	335° 38'.4	57° 16'.8 S
Acrux	173° 27'.4	63° 03'.1 S
Adhara	255° 24'.7	28° 57'.7 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.6	55° 59'.8 N
Alkaid	153° 11'.5	49° 20'.8 N
Alnair	28° 04'.0	47° 00'.1 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.5	8° 37'.5 S
Alphecca	126° 24'.8	26° 44'.2 N
Alpheratz	358° 00'.2	29° 03'.0 N
Altair	62° 24'.2	8° 50'.8 N
Ankaa	353° 31'.4	42° 21'.1 S
Antares	112° 46'.2	26° 24'.9 S
Arcturus	146° 10'.4	19° 13'.2 N
Atria	108° 03'.1	69° 00'.7 S
Avior	234° 24'.0	59° 29'.0 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.4 N
Canopus	264° 02'.7	52° 41'.5 S
Capella	280° 57'.7	45° 59'.5 N
Deneb	49° 42'.9	45° 15'.2 N
Denebola	182° 49'.8	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.8 S
Dubhe	194° 10'.7	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 54'.1	51° 29'.3 N
Enif	34° 03'.1	9° 50'.4 N
Fomalhaut	15° 41'.7	29° 40'.0 S
Gacrux	172° 18'.9	57° 04'.0 S
Gienah	176° 08'.8	17° 29'.9 S
Hadar	149° 11'.1	60° 19'.9 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.4	34° 23'.3 S
Kochab	137° 19'.8	74° 10'.9 N
Markab	13° 54'.5	15° 09'.9 N
Menkar	314° 31'.6	4° 03'.6 N
Menkent	148° 26'.7	36° 19'.8 S
Miaplacidus	221° 42'.4	69° 41'.0 S
Mirfak	309° 03'.1	49° 50'.3 N
Nunki	76° 18'.5	26° 18'.5 S
Peacock	53° 44'.9	56° 45'.8 S
Polaris	323° 56'.8	89° 14'.1 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 21'.6	12° 33'.8 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.6 S
Rigil Kent	140° 14'.0	60° 47'.9 S
Sabik	102° 31'.2	15° 43'.0 S
Schedar	349° 59'.0	56° 30'.0 N
Shaula	96° 44'.1	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.3 S
Spica	158° 48'.2	11° 07'.3 S
Suhail	223° 03'.9	43° 24'.0 S
Vega	80° 50'.2	38° 46'.5 N
Zuben'ubi	137° 23'.4	16° 00'.6 S

	SHA	Mer.Pass.
Venus	116° 16'.8	09:20
Mars	93° 34'.1	10:50
Jupiter	193° 43'.9	04:09
Saturn	51° 09'.4	13:38

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
178° 52'.9	22° 49'.1 S	190° 13'.9	10'.9	24° 06'.5 S	3'.3	54'.2
193° 52'.6	48'.8	204° 43'.8	11'.0	03'.2	3'.5	
208° 52'.3	48'.6	219° 13'.8	11'.1	23° 59'.7 S	3'.5	
223° 52'.0	48'.3	233° 43'.9	11'.0	56'.2	3'.7	
238° 51'.7	48'.1	248° 13'.9	11'.1	52'.5	3'.8	
253° 51'.5	47'.8	262° 44'.0	11'.2	48'.7	3'.9	
268° 51'.2	47'.6	277° 14'.2	11'.2	44'.8	4'.0	
283° 50'.9	47'.3	291° 44'.4	11'.2	40'.8	4'.1	
298° 50'.6	47'.1	306° 14'.6	11'.3	36'.7	4'.2	54'.1
313° 50'.3	46'.8	320° 44'.9	11'.3	32'.5	4'.4	
328° 50'.0	46'.6	335° 15'.2	11'.4	28'.1	4'.4	
343° 49'.7	46'.3	349° 45'.6	11'.4	23'.7	4'.6	
358° 49'.4	22° 46'.1 S	4° 16'.0	11'.4	23° 19'.1 S	4'.6	54'.1
13° 49'.2	45'.8	18° 46'.4	11'.5	14'.5	4'.8	
28° 48'.9	45'.6	33° 16'.9	11'.6	09'.7	4'.9	
43° 48'.6	45'.3	47° 47'.5	11'.6	04'.8	5'.0	
58° 48'.3	45'.1	62° 18'.1	11'.6	22° 59'.8 S	5'.0	
73° 48'.0	44'.8	76° 48'.7	11'.7	54'.8	5'.2	
88° 47'.7	44'.5	91° 19'.4	11'.7	49'.6	5'.3	
103° 47'.4	44'.3	105° 50'.1	11'.8	44'.3	5'.4	
118° 47'.2	44'.0	120° 20'.9	11'.8	38'.9	5'.5	
133° 46'.9	43'.8	134° 51'.7	11'.9	33'.4	5'.6	
148° 46'.6	43'.5	149° 22'.6	11'.9	27'.8	5'.7	
163° 46'.3	43'.2	163° 53'.5	12'.0	22'.1	5'.8	54'.0
178° 46'.0	22° 43'.0 S	178° 24'.5	12'.0	22° 16'.3 S	5'.9	54'.0
193° 45'.7	42'.7	192° 55'.5	12'.1	10'.4	6'.0	
208° 45'.4	42'.4	207° 26'.6	12'.1	04'.4	6'.1	
223° 45'.2	42'.2	221° 57'.7	12'.2	21° 58'.3 S	6'.2	
238° 44'.9	41'.9	236° 28'.9	12'.2	52'.1	6'.3	
253° 44'.6	41'.6	251° 00'.1	12'.3	45'.8	6'.4	
268° 44'.3	41'.4	265° 31'.4	12'.3	39'.4	6'.5	
283° 44'.0	41'.1	280° 02'.7	12'.4	32'.9	6'.6	
298° 43'.7	40'.8	294° 34'.1	12'.4	26'.3	6'.7	
313° 43'.5	40'.6	309° 05'.5	12'.5	19'.6	6'.7	
328° 43'.2	40'.3	323° 37'.0	12'.6	12'.9	6'.9	
343° 42'.9	40'.0	338° 08'.6	12'.6	06'.0	6'.9	
358° 42'.6	22° 39'.8 S	352° 40'.2	12'.6	20° 59'.1 S	7'.1	54'.0
13° 42'.3	39'.5	7° 11'.8	12'.7	52'.0	7'.1	
28° 42'.1	39'.2	21° 43'.5	12'.8	44'.9	7'.2	
43° 41'.8	38'.9	36° 15'.3	12'.8	37'.7	7'.4	
58° 41'.5	38'.7	50° 47'.1	12'.8	30'.3	7'.4	
73° 41'.2	38'.4	65° 18'.9	12'.9	22'.9	7'.5	
88° 40'.9	38'.1	79° 50'.8	13'.0	15'.4	7'.5	
103° 40'.6	37'.8	94° 22'.8	13'.0	07'.9	7'.7	
118° 40'.4	37'.5	108° 54'.8	13'.1	00'.2	7'.7	
133° 40'.1	37'.3	123° 26'.9	13'.1	19° 52'.5 S	7'.9	
148° 39'.8	37'.0	137° 59'.0	13'.2	44'.6	7'.9	
163° 39'.5	36'.7	152° 31'.2	13'.2	36'.7	8'.0	
178° 39'.2	22° 36'.4 S	167° 03'.4	13'.3	19° 28'.7 S	8'.1	54'.0
193° 39'.0	36'.1	181° 35'.7	13'.3	20'.6	8'.2	
208° 38'.7	35'.8	196° 08'.0	13'.4	12'.4	8'.2	
223° 38'.4	35'.6	210° 40'.4	13'.5	04'.2	8'.3	
238° 38'.1	35'.3	225° 12'.9	13'.5	18° 55'.9 S	8'.4	
253° 37'.8	35'.0	239° 45'.4	13'.5	47'.5	8'.5	53'.9
268° 37'.6	34'.7	254° 17'.9	13'.6	39'.0	8'.6	
283° 37'.3	34'.4	268° 50'.5	13'.7	30'.4	8'.6	
298° 37'.0	34'.1	283° 23'.2	13'.7	21'.8	8'.8	
313° 36'.7	33'.8	297° 55'.9	13'.7	13'.0	8'.8	
328° 36'.5	33'.5	312° 28'.6	13'.8	04'.2	8'.8	
343° 36'.2	33'.3	327° 01'.4	13'.9	17° 55'.4 S	9'.0	
358° 35'.9	22° 33'.0 S	341° 34'.3	13'.9	17° 46'.4 S	9'.0	53'.9
13° 35'.6	32'.7	356° 07'.2	14'.0	37'.4	9'.1	
28° 35'.3	32'.4	10° 40'.2	14'.0	28'.3	9'.1	
43° 35'.1	32'.1	25° 13'.2	14'.0	19'.2	9'.3	
58° 34'.8	31'.8	39° 46'.2	14'.1	09'.9	9'.3	
73° 34'.5	31'.5	54° 19'.3	14'.2	00'.6	9'.3	
88° 34'.2	31'.2	68° 52'.5	14'.2	16° 51'.3 S	9'.5	
103° 34'.0	30'.9	83° 25'.7	14'.3	41'.8	9'.5	
118° 33'.7	30'.6	97° 59'.0	14'.3	32'.3	9'.6	54'.0
133° 33'.4	30'.3	112° 32'.3	14'.3	22'.7	9'.6	
148° 33'.1	30'.0	127° 05'.6	14'.4	13'.1	9'.7	
163° 32'.9	29'.7	141° 39'.0	14'.5	03'.4	9'.8	
SD 16'.3	d 0'.3	SD	14'.7	14'.7	14'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
4	4 28	4 42	12:05	11:42	24:07	29d 0%
5	4 55	5 09	12:05	12:30	00:07	1d 0%
6	5 22	5 36	12:06	13:16	00:53	2d 2%

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1992 January 7, 8, 9 (Tue, Wed, Thur)

GMT	ARIES	VENUS -4.1		MARS +1.4		JUPITER -2.3		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
Tuesday 7 00	105° 49'.5	219° 35'.2	19° 40'.7 S	197° 46'.6	23° 57'.1 S	299° 35'.4	7° 11'.5 N	156° 44'.8	19° 12'.6 S
01	120° 51'.9	234° 34'.5	41'.2	212° 47'.0	57'.2	314° 37'.9	11'.5	171° 47'.0	12'.5
02	135° 54'.4	249° 33'.8	41'.8	227° 47'.4	57'.2	329° 40'.4	11'.5	186° 49'.2	12'.4
03	150° 56'.9	264° 33'.1	42'.4	242° 47'.9	57'.3	344° 42'.9	11'.6	201° 51'.3	12'.4
04	165° 59'.3	279° 32'.4	42'.9	257° 48'.3	57'.3	359° 45'.4	11'.6	216° 53'.5	12'.3
05	181° 01'.8	294° 31'.7	43'.5	272° 48'.8	57'.4	14° 48'.0	11'.6	231° 55'.7	12'.2
06	196° 04'.3	309° 31'.0	44'.1	287° 49'.2	57'.4	29° 50'.5	11'.7	246° 57'.8	12'.2
07	211° 06'.7	324° 30'.3	44'.6	302° 49'.6	57'.5	44° 53'.0	11'.7	262° 00'.0	12'.1
08	226° 09'.2	339° 29'.6	45'.2	317° 50'.1	57'.5	59° 55'.5	11'.7	277° 02'.2	12'.0
09	241° 11'.7	354° 28'.9	45'.7	332° 50'.5	57'.6	74° 58'.0	11'.8	292° 04'.3	12'.0
10	256° 14'.1	9° 28'.2	46'.3	347° 51'.0	57'.6	90° 00'.5	11'.8	307° 06'.5	11'.9
11	271° 16'.6	24° 27'.5	46'.9	2° 51'.4	57'.6	105° 03'.1	11'.8	322° 08'.7	11'.8
12	286° 19'.0	39° 26'.8	19° 47'.4 S	17° 51'.8	23° 57'.7 S	120° 05'.6	7° 11'.9 N	337° 10'.9	19° 11'.7 S
13	301° 21'.5	54° 26'.1	48'.0	32° 52'.3	57'.7	135° 08'.1	11'.9	352° 13'.0	11'.7
14	316° 24'.0	69° 25'.4	48'.5	47° 52'.7	57'.8	150° 10'.6	11'.9	7° 15'.2	11'.6
15	331° 26'.4	84° 24'.7	49'.1	62° 53'.2	57'.8	165° 13'.1	12'.0	22° 17'.4	11'.5
16	346° 28'.9	99° 24'.0	49'.7	77° 53'.6	57'.9	180° 15'.6	12'.0	37° 19'.5	11'.5
17	1° 31'.4	114° 23'.3	50'.2	92° 54'.0	57'.9	195° 18'.2	12'.0	52° 21'.7	11'.4
18	16° 33'.8	129° 22'.6	50'.8	107° 54'.5	58'.0	210° 20'.7	12'.1	67° 23'.9	11'.3
19	31° 36'.3	144° 21'.9	51'.3	122° 54'.9	58'.0	225° 23'.2	12'.1	82° 26'.0	11'.3
20	46° 38'.8	159° 21'.2	51'.9	137° 55'.3	58'.0	240° 25'.7	12'.2	97° 28'.2	11'.2
21	61° 41'.2	174° 20'.5	52'.4	152° 55'.8	58'.1	255° 28'.2	12'.2	112° 30'.4	11'.1
22	76° 43'.7	189° 19'.8	53'.0	167° 56'.2	58'.1	270° 30'.8	12'.2	127° 32'.5	11'.0
23	91° 46'.2	204° 19'.1	53'.5	182° 56'.7	58'.2	285° 33'.3	12'.3	142° 34'.7	11'.0
Wednesday 8 00	106° 48'.6	219° 18'.4	19° 54'.1 S	197° 57'.1	23° 58'.2 S	300° 35'.8	7° 12'.3 N	157° 36'.9	19° 10'.9 S
01	121° 51'.1	234° 17'.7	54'.6	212° 57'.5	58'.2	315° 38'.3	12'.3	172° 39'.1	10'.8
02	136° 53'.5	249° 17'.0	55'.2	227° 58'.0	58'.3	330° 40'.8	12'.4	187° 41'.2	10'.8
03	151° 56'.0	264° 16'.2	55'.7	242° 58'.4	58'.3	345° 43'.4	12'.4	202° 43'.4	10'.7
04	166° 58'.5	279° 15'.5	56'.3	257° 58'.9	58'.4	0° 45'.9	12'.4	217° 45'.6	10'.6
05	182° 00'.9	294° 14'.8	56'.8	272° 59'.3	58'.4	15° 48'.4	12'.5	232° 47'.7	10'.6
06	197° 03'.4	309° 14'.1	57'.3	287° 59'.7	58'.4	30° 50'.9	12'.5	247° 49'.9	10'.5
07	212° 05'.9	324° 13'.4	57'.9	303° 00'.2	58'.5	45° 53'.5	12'.6	262° 52'.1	10'.4
08	227° 08'.3	339° 12'.7	58'.4	318° 00'.6	58'.5	60° 56'.0	12'.6	277° 54'.2	10'.3
09	242° 10'.8	354° 12'.0	59'.0	333° 01'.0	58'.5	75° 58'.5	12'.6	292° 56'.4	10'.3
10	257° 13'.3	9° 11'.3	59'.5	348° 01'.5	58'.6	91° 01'.0	12'.7	307° 58'.6	10'.2
11	272° 15'.7	24° 10'.6	20° 00'.0 S	3° 01'.9	58'.6	106° 03'.6	12'.7	323° 00'.7	10'.1
12	287° 18'.2	39° 09'.9	20° 00'.6 S	18° 02'.4	23° 58'.7 S	121° 06'.1	7° 12'.7 N	338° 02'.9	19° 10'.1 S
13	302° 20'.6	54° 09'.1	01'.1	33° 02'.8	58'.7	136° 08'.6	12'.8	353° 05'.1	10'.0
14	317° 23'.1	69° 08'.4	01'.7	48° 03'.2	58'.7	151° 11'.1	12'.8	8° 07'.2	09'.9
15	332° 25'.6	84° 07'.7	02'.2	63° 03'.7	58'.8	166° 13'.7	12'.8	23° 09'.4	09'.9
16	347° 28'.0	99° 07'.0	02'.7	78° 04'.1	58'.8	181° 16'.2	12'.9	38° 11'.6	09'.8
17	2° 30'.5	114° 06'.3	03'.3	93° 04'.5	58'.8	196° 18'.7	12'.9	53° 13'.8	09'.7
18	17° 33'.0	129° 05'.6	03'.8	108° 05'.0	58'.9	211° 21'.2	13'.0	68° 15'.9	09'.6
19	32° 35'.4	144° 04'.9	04'.3	123° 05'.4	58'.9	226° 23'.8	13'.0	83° 18'.1	09'.6
20	47° 37'.9	159° 04'.1	04'.9	138° 05'.8	58'.9	241° 26'.3	13'.0	98° 20'.3	09'.5
21	62° 40'.4	174° 03'.4	05'.4	153° 06'.3	58'.9	256° 28'.8	13'.1	113° 22'.4	09'.4
22	77° 42'.8	189° 02'.7	05'.9	168° 06'.7	59'.0	271° 31'.3	13'.1	128° 24'.6	09'.4
23	92° 45'.3	204° 02'.0	06'.4	183° 07'.2	59'.0	286° 33'.9	13'.2	143° 26'.8	09'.3
Thursday 9 00	107° 47'.8	219° 01'.3	20° 07'.0 S	198° 07'.6	23° 59'.0 S	301° 36'.4	7° 13'.2 N	158° 28'.9	19° 09'.2 S
01	122° 50'.2	234° 00'.6	07'.5	213° 08'.0	59'.1	316° 38'.9	13'.2	173° 31'.1	09'.1
02	137° 52'.7	248° 59'.8	08'.0	228° 08'.5	59'.1	331° 41'.5	13'.3	188° 33'.3	09'.1
03	152° 55'.1	263° 59'.1	08'.5	243° 08'.9	59'.1	346° 44'.0	13'.3	203° 35'.4	09'.0
04	167° 57'.6	278° 58'.4	09'.1	258° 09'.3	59'.2	1° 46'.5	13'.4	218° 37'.6	08'.9
05	183° 00'.1	293° 57'.7	09'.6	273° 09'.8	59'.2	16° 49'.0	13'.4	233° 39'.8	08'.9
06	198° 02'.5	308° 57'.0	10'.1	288° 10'.2	59'.2	31° 51'.6	13'.4	248° 41'.9	08'.8
07	213° 05'.0	323° 56'.2	10'.6	303° 10'.6	59'.2	46° 54'.1	13'.5	263° 44'.1	08'.7
08	228° 07'.5	338° 55'.5	11'.1	318° 11'.1	59'.3	61° 56'.6	13'.5	278° 46'.3	08'.7
09	243° 09'.9	353° 54'.8	11'.7	333° 11'.5	59'.3	76° 59'.2	13'.6	293° 48'.4	08'.6
10	258° 12'.4	8° 54'.1	12'.2	348° 11'.9	59'.3	92° 01'.7	13'.6	308° 50'.6	08'.5
11	273° 14'.9	23° 53'.3	12'.7	3° 12'.4	59'.3	107° 04'.2	13'.6	323° 52'.8	08'.4
12	288° 17'.3	38° 52'.6	20° 13'.2 S	18° 12'.8	23° 59'.4 S	122° 06'.8	7° 13'.7 N	338° 54'.9	19° 08'.4 S
13	303° 19'.8	53° 51'.9	13'.7	33° 13'.2	59'.4	137° 09'.3	13'.7	353° 57'.1	08'.3
14	318° 22'.3	68° 51'.2	14'.2	48° 13'.7	59'.4	152° 11'.8	13'.8	8° 59'.3	08'.2
15	333° 24'.7	83° 50'.4	14'.8	63° 14'.1	59'.4	167° 14'.4	13'.8	24° 01'.4	08'.2
16	348° 27'.2	98° 49'.7	15'.3	78° 14'.6	59'.5	182° 16'.9	13'.8	39° 03'.6	08'.1
17	3° 29'.6	113° 49'.0	15'.8	93° 15'.0	59'.5	197° 19'.4	13'.9	54° 05'.8	08'.0
18	18° 32'.1	128° 48'.3	16'.3	108° 15'.4	59'.5	212° 22'.0	13'.9	69° 07'.9	07'.9
19	33° 34'.6	143° 47'.5	16'.8	123° 15'.9	59'.5	227° 24'.5	14'.0	84° 10'.1	07'.9
20	48° 37'.0	158° 46'.8	17'.3	138° 16'.3	59'.5	242° 27'.0	14'.0	99° 12'.3	07'.8
21	63° 39'.5	173° 46'.1	17'.8	153° 16'.7	59'.6	257° 29'.6	14'.0	114° 14'.4	07'.7
22	78° 42'.0	188° 45'.4	18'.3	168° 17'.2	59'.6	272° 32'.1	14'.1	129° 16'.6	07'.7
23	93° 44'.4	203° 44'.6	18'.8	183° 17'.6	59'.6	287° 34'.6	14'.1	144° 18'.8	07'.6
	M.P. 16:50	v -0'.7	d 0'.5	v 0'.4	d 0'.0	v 2'.5	d 0'.0	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.2	40° 20'.3 S
Achernar	335° 38'.4	57° 16'.8 S
Acrux	173° 27'.4	63° 03'.1 S
Adhara	255° 24'.7	28° 57'.7 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.5	55° 59'.8 N
Alkaid	153° 11'.5	49° 20'.8 N
Alnair	28° 04'.0	47° 00'.1 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.5	8° 37'.5 S
Alphecca	126° 24'.8	26° 44'.2 N
Alpheratz	358° 00'.2	29° 03'.0 N
Altair	62° 24'.2	8° 50'.8 N
Ankaa	353° 31'.4	42° 21'.1 S
Antares	112° 46'.2	26° 24'.9 S
Arcturus	146° 10'.4	19° 13'.2 N
Atria	108° 03'.0	69° 00'.7 S
Avior	234° 24'.0	59° 29'.0 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.4 N
Canopus	264° 02'.7	52° 41'.5 S
Capella	280° 57'.7	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.2 N
Denebola	182° 49'.8	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.8 S
Dubhe	194° 10'.7	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 54'.1	51° 29'.3 N
Enif	34° 03'.1	9° 50'.4 N
Fomalhaut	15° 41'.7	29° 40'.0 S
Gacrux	172° 18'.8	57° 04'.0 S
Gienah	176° 08'.7	17° 29'.9 S
Hadar	149° 11'.0	60° 19'.9 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.4	34° 23'.3 S
Kochab	137° 19'.7	74° 10'.9 N
Markab	13° 54'.5	15° 09'.9 N
Menkar	314° 31'.6	4° 03'.6 N
Menkent	148° 26'.6	36° 19'.8 S
Miaplacidus	221° 42'.4	69° 41'.0 S
Mirfak	309° 03'.1	49° 50'.3 N
Nunki	76° 18'.5	26° 18'.5 S
Peacock	53° 44'.9	56° 45'.7 S
Polaris	323° 57'.9	89° 14'.1 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 21'.6	12° 33'.8 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.6 S
Rigil Kent	140° 14'.0	60° 47'.9 S
Sabik	102° 31'.2	15° 43'.0 S
Schedar	349° 59'.0	56° 30'.0 N
Shaula	96° 44'.0	37° 05'.9 S
Sirius	258° 47'.4	16° 42'.3 S
Spica	158° 48'.2	11° 07'.3 S
Suhail	223° 03'.9	43° 24'.0 S
Vega	80° 50'.2	38° 46'.5 N
Zuben'ubi	137° 23'.3	16° 00'.6 S

	SHA	Mer.Pass.
Venus	112° 29'.8	09:23
Mars	91° 08'.5	10:48
Jupiter	193° 47'.2	03:57
Saturn	50° 48'.3	13:28

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
7 00	178° 32'.6	22° 29'.4 S	156° 12'.5	14'.5	15° 53'.6 S	9'.8	54'.0
01	193° 32'.3	29'.1	170° 46'.0	14'.5	43'.8	9'.9	
02	208° 32'.0	28'.8	185° 19'.5	14'.6	33'.9	10'.0	
03	223° 31'.8	28'.5	199° 53'.1	14'.6	23'.9	10'.0	
04	238° 31'.5	28'.2	214° 26'.7	14'.7	13'.9	10'.1	
05	253° 31'.2	27'.9	229° 00'.4	14'.8	03'.8	10'.2	
06	268° 30'.9	27'.6	243° 34'.2	14'.7	14° 53'.6 S	10'.2	
07	283° 30'.7	27'.3	258° 07'.9	14'.8	43'.4	10'.3	
08	298° 30'.4	27'.0	272° 41'.7	14'.9	33'.1	10'.3	
09	313° 30'.1	26'.7	287° 15'.6	14'.9	22'.8	10'.4	
10	328° 29'.8	26'.4	301° 49'.5	14'.9	12'.4	10'.4	
11	343° 29'.6	26'.0	316° 23'.4	15'.0	02'.0	10'.5	
12	358° 29'.3	22° 25'.7 S	330° 57'.4	15'.0	13° 51'.5 S	10'.6	54'.0
13	13° 29'.0	25'.4	345° 31'.4	15'.1	40'.9	10'.6	
14	28° 28'.7	25'.1	0° 05'.5	15'.1	30'.3	10'.7	
15	43° 28'.5	24'.8	14° 39'.6	15'.1	19'.6	10'.7	
16	58° 28'.2	24'.5	29° 13'.7	15'.2	08'.9	10'.7	
17	73° 27'.9	24'.2	43° 47'.9	15'.2	12° 58'.2 S	10'.9	
18	88° 27'.7	23'.9	58° 22'.1	15'.3	47'.3	10'.8	
19	103° 27'.4	23'.5	72° 56'.4	15'.3	36'.5	11'.0	
20	118° 27'.1	23'.2	87° 30'.7	15'.3	25'.5	10'.9	
21	133° 26'.8	22'.9	102° 05'.0	15'.3	14'.6	11'.1	
22	148° 26'.6	22'.6	116° 39'.3	15'.4	03'.5	11'.0	
23	163° 26'.3	22'.3	131° 13'.7	15'.5	11° 52'.5 S	11'.1	54'.1
8 00	178° 26'.0	22° 22'.0 S	145° 48'.2	15'.4	11° 41'.4 S	11'.2	54'.1
01	193° 25'.8	21'.6	160° 22'.6	15'.5	30'.2	11'.2	
02	208° 25'.5	21'.3	174° 57'.1	15'.6	19'.0	11'.3	
03	223° 25'.2	21'.0	189° 31'.7	15'.5	07'.7	11'.3	
04	238° 25'.0	20'.7	204° 06'.2	15'.6	10° 56'.4 S	11'.3	
05	253° 24'.7	20'.3	218° 40'.8	15'.6	45'.1	11'.4	
06	268° 24'.4	20'.0	233° 15'.4	15'.7	33'.7	11'.5	
07	283° 24'.2	19'.7	247° 50'.1	15'.7	22'.2	11'.4	
08	298° 23'.9	19'.4	262° 24'.8	15'.7	10'.8	11'.5	
09	313° 23'.6	19'.0	276° 59'.5	15'.7	9° 59'.3 S	11'.6	
10	328° 23'.3	18'.7	291° 34'.2	15'.8	47'.7	11'.6	
11	343° 23'.1	18'.4	306° 09'.0	15'.7	36'.1	11'.6	
12	358° 22'.8	22° 18'.1 S	320° 43'.7	15'.8	9° 24'.5 S	11'.7	54'.1
13	13° 22'.5	17'.7	335° 18'.5	15'.9	12'.8	11'.7	54'.2
14	28° 22'.3	17'.4	349° 53'.4	15'.8	01'.1	11'.8	
15	43° 22'.0	17'.1	4° 28'.2	15'.9	8° 49'.3 S	11'.8	
16	58° 21'.7	16'.7	19° 03'.1	15'.9	37'.5	11'.8	
17	73° 21'.5	16'.4	33° 38'.0	15'.9	25'.7	11'.8	
18	88° 21'.2	16'.1	48° 12'.9	16'.0	13'.9	11'.9	
19	103° 20'.9	15'.7	62° 47'.9	15'.9	02'.0	11'.9	
20	118° 20'.7	15'.4	77° 22'.8	16'.0	7° 50'.1 S	12'.0	
21	133° 20'.4	15'.1	91° 57'.8	16'.0	38'.1	12'.0	
22	148° 20'.1	14'.7	106° 32'.8	16'.0	26'.1	12'.0	
23	163° 19'.9	14'.4	121° 07'.8	16'.0	14'.1	12'.1	54'.3
9 00	178° 19'.6	22° 14'.1 S	135° 42'.8	16'.1	7° 02'.0 S	12'.1	54'.3
01	193° 19'.4	13'.7	150° 17'.9	16'.0	6° 49'.9 S	12'.1	
02	208° 19'.1	13'.4	164° 52'.9	16'.1	37'.8	12'.1	
03	223° 18'.8	13'.0	179° 28'.0	16'.1	25'.7	12'.2	
04	238° 18'.6	12'.7	194° 03'.1	16'.1	13'.5	12'.2	
05	253° 18'.3	12'.4	208° 38'.2	16'.1	01'.3	12'.2	
06	268° 18'.0	12'.0	223° 13'.3	16'.1	5° 49'.1 S	12'.3	
07	283° 17'.8	11'.7	237° 48'.4	16'.1	36'.8	12'.2	54'.4
08	298° 17'.5	11'.3	252° 23'.5	16'.1	24'.6	12'.3	
09	313° 17'.2	11'.0	266° 58'.6	16'.2	12'.3	12'.4	
10	328° 17'.0	10'.6	281° 33'.8	16'.1	4° 59'.9 S	12'.3	
11	343° 16'.7	10'.3	296° 08'.9	16'.2	47'.6	12'.4	
12	358° 16'.5	22° 10'.0 S	310° 44'.1	16'.1	4° 35'.2 S	12'.4	54'.4
13	13° 16'.2	09'.6	325° 19'.2	16'.2	22'.8	12'.4	
14	28° 15'.9	09'.3	339° 54'.4	16'.1	10'.4	12'.5	
15	43° 15'.7	08'.9	354° 29'.5	16'.2	3° 57'.9 S	12'.4	54'.5
16	58° 15'.4	08'.6	9° 04'.7	16'.1	45'.5	12'.5	
17	73° 15'.2	08'.2	23° 39'.8	16'.2	33'.0	12'.5	
18	88° 14'.9	07'.9	38° 15'.0	16'.2	20'.5	12'.5	
19	103° 14'.6	07'.5	52° 50'.2	16'.1	08'.0	12'.6	
20	118° 14'.4	07'.2	67° 25'.3	16'.2	2° 55'.4 S	12'.5	
21	133° 14'.1	06'.8	82° 00'.5	16'.1	42'.9	12'.6	54'.6
22	148° 13'.9	06'.4	96° 35'.6	16'.2	30'.3	12'.6	
23	163° 13'.6	06'.1	111° 10'.8	16'.1	17'.7	12'.6	
	SD 16'.3	d 0'.3	SD 14'.7		14'.8	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
7	5 49	6 02	12:06	14:00	01:38	3d 6%
8	6 15	6 28	12:06	14:42	02:21	4d 11%
9	6 41	6 54	12:07	15:23	03:02	5d 17%

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1992 January 10, 11, 12 (Fri, Sat, Sun)

GMT	ARIES	VENUS -4.1		MARS +1.4		JUPITER -2.3		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
10 Friday 00	108° 46'.9	218° 43'.9	20° 19'.3 S	198° 18'.0	23° 59'.6 S	302° 37'.2	7° 14'.2 N	159° 20'.9	19° 07'.5 S
01	123° 49'.4	233° 43'.2	19'.8	213° 18'.5	59'.6	317° 39'.7	14'.2	174° 23'.1	07'.4
02	138° 51'.8	248° 42'.4	20'.3	228° 18'.9	59'.7	332° 42'.2	14'.3	189° 25'.3	07'.4
03	153° 54'.3	263° 41'.7	20'.8	243° 19'.3	59'.7	347° 44'.8	14'.3	204° 27'.4	07'.3
04	168° 56'.7	278° 41'.0	21'.3	258° 19'.8	59'.7	2° 47'.3	14'.3	219° 29'.6	07'.2
05	183° 59'.2	293° 40'.3	21'.8	273° 20'.2	59'.7	17° 49'.9	14'.4	234° 31'.8	07'.2
06	199° 01'.7	308° 39'.5	22'.3	288° 20'.6	59'.7	32° 52'.4	14'.4	249° 33'.9	07'.1
07	214° 04'.1	323° 38'.8	22'.8	303° 21'.1	59'.7	47° 54'.9	14'.5	264° 36'.1	07'.0
08	229° 06'.6	338° 38'.1	23'.3	318° 21'.5	59'.8	62° 57'.5	14'.5	279° 38'.3	06'.9
09	244° 09'.1	353° 37'.3	23'.8	333° 21'.9	59'.8	78° 00'.0	14'.6	294° 40'.4	06'.9
10	259° 11'.5	8° 36'.6	24'.3	348° 22'.4	59'.8	93° 02'.5	14'.6	309° 42'.6	06'.8
11	274° 14'.0	23° 35'.9	24'.8	3° 22'.8	59'.8	108° 05'.1	14'.6	324° 44'.8	06'.7
12	289° 16'.5	38° 35'.1	20° 25'.3 S	18° 23'.2	23° 59'.8 S	123° 07'.6	7° 14'.7 N	339° 46'.9	19° 06'.7 S
13	304° 18'.9	53° 34'.4	25'.8	33° 23'.7	59'.8	138° 10'.2	14'.7	354° 49'.1	06'.6
14	319° 21'.4	68° 33'.7	26'.3	48° 24'.1	59'.8	153° 12'.7	14'.8	9° 51'.3	06'.5
15	334° 23'.9	83° 32'.9	26'.8	63° 24'.5	59'.9	168° 15'.2	14'.8	24° 53'.4	06'.5
16	349° 26'.3	98° 32'.2	27'.3	78° 25'.0	59'.9	183° 17'.8	14'.9	39° 55'.6	06'.4
17	4° 28'.8	113° 31'.5	27'.8	93° 25'.4	59'.9	198° 20'.3	14'.9	54° 57'.8	06'.3
18	19° 31'.2	128° 30'.7	28'.3	108° 25'.8	59'.9	213° 22'.9	14'.9	69° 59'.9	06'.2
19	34° 33'.7	143° 30'.0	28'.7	123° 26'.3	59'.9	228° 25'.4	15'.0	85° 02'.1	06'.2
20	49° 36'.2	158° 29'.2	29'.2	138° 26'.7	59'.9	243° 27'.9	15'.0	100° 04'.3	06'.1
21	64° 38'.6	173° 28'.5	29'.7	153° 27'.1	59'.9	258° 30'.5	15'.1	115° 06'.4	06'.0
22	79° 41'.1	188° 27'.8	30'.2	168° 27'.5	59'.9	273° 33'.0	15'.1	130° 08'.6	06'.0
23	94° 43'.6	203° 27'.0	30'.7	183° 28'.0	59'.9	288° 35'.6	15'.2	145° 10'.8	05'.9
11 Saturday 00	109° 46'.0	218° 26'.3	20° 31'.2 S	198° 28'.4	24° 00'.0 S	303° 38'.1	7° 15'.2 N	160° 12'.9	19° 05'.8 S
01	124° 48'.5	233° 25'.6	31'.6	213° 28'.8	00'.0	318° 40'.7	15'.3	175° 15'.1	05'.7
02	139° 51'.0	248° 24'.8	32'.1	228° 29'.3	00'.0	333° 43'.2	15'.3	190° 17'.3	05'.7
03	154° 53'.4	263° 24'.1	32'.6	243° 29'.7	00'.0	348° 45'.7	15'.4	205° 19'.4	05'.6
04	169° 55'.9	278° 23'.3	33'.1	258° 30'.1	00'.0	3° 48'.3	15'.4	220° 21'.6	05'.5
05	184° 58'.4	293° 22'.6	33'.6	273° 30'.6	00'.0	18° 50'.8	15'.4	235° 23'.8	05'.5
06	200° 00'.8	308° 21'.8	34'.0	288° 31'.0	00'.0	33° 53'.4	15'.5	250° 25'.9	05'.4
07	215° 03'.3	323° 21'.1	34'.5	303° 31'.4	00'.0	48° 55'.9	15'.5	265° 28'.1	05'.3
08	230° 05'.7	338° 20'.4	35'.0	318° 31'.9	00'.0	63° 58'.5	15'.6	280° 30'.3	05'.2
09	245° 08'.2	353° 19'.6	35'.5	333° 32'.3	00'.0	79° 01'.0	15'.6	295° 32'.4	05'.2
10	260° 10'.7	8° 18'.9	35'.9	348° 32'.7	00'.0	94° 03'.6	15'.7	310° 34'.6	05'.1
11	275° 13'.1	23° 18'.1	36'.4	3° 33'.2	00'.0	109° 06'.1	15'.7	325° 36'.8	05'.0
12	290° 15'.6	38° 17'.4	20° 36'.9 S	18° 33'.6	24° 00'.0 S	124° 08'.7	7° 15'.8 N	340° 38'.9	19° 05'.0 S
13	305° 18'.1	53° 16'.6	37'.3	33° 34'.0	00'.0	139° 11'.2	15'.8	355° 41'.1	04'.9
14	320° 20'.5	68° 15'.9	37'.8	48° 34'.4	00'.0	154° 13'.8	15'.9	10° 43'.3	04'.8
15	335° 23'.0	83° 15'.2	38'.3	63° 34'.9	00'.0	169° 16'.3	15'.9	25° 45'.4	04'.7
16	350° 25'.5	98° 14'.4	38'.7	78° 35'.3	00'.0	184° 18'.9	16'.0	40° 47'.6	04'.7
17	5° 27'.9	113° 13'.7	39'.2	93° 35'.7	00'.0	199° 21'.4	16'.0	55° 49'.8	04'.6
18	20° 30'.4	128° 12'.9	39'.7	108° 36'.2	00'.0	214° 23'.9	16'.0	70° 51'.9	04'.5
19	35° 32'.8	143° 12'.2	40'.1	123° 36'.6	00'.0	229° 26'.5	16'.1	85° 54'.1	04'.5
20	50° 35'.3	158° 11'.4	40'.6	138° 37'.0	00'.0	244° 29'.0	16'.1	100° 56'.3	04'.4
21	65° 37'.8	173° 10'.7	41'.1	153° 37'.5	00'.0	259° 31'.6	16'.2	115° 58'.4	04'.3
22	80° 40'.2	188° 09'.9	41'.5	168° 37'.9	00'.0	274° 34'.1	16'.2	131° 00'.6	04'.2
23	95° 42'.7	203° 09'.2	42'.0	183° 38'.3	00'.0	289° 36'.7	16'.3	146° 02'.8	04'.2
12 Sunday 00	110° 45'.2	218° 08'.4	20° 42'.4 S	198° 38'.7	24° 00'.0 S	304° 39'.2	7° 16'.3 N	161° 04'.9	19° 04'.1 S
01	125° 47'.6	233° 07'.7	42'.9	213° 39'.2	00'.0	319° 41'.8	16'.4	176° 07'.1	04'.0
02	140° 50'.1	248° 06'.9	43'.4	228° 39'.6	00'.0	334° 44'.3	16'.4	191° 09'.3	03'.9
03	155° 52'.6	263° 06'.2	43'.8	243° 40'.0	00'.0	349° 46'.9	16'.5	206° 11'.4	03'.9
04	170° 55'.0	278° 05'.4	44'.3	258° 40'.5	00'.0	4° 49'.5	16'.5	221° 13'.6	03'.8
05	185° 57'.5	293° 04'.7	44'.7	273° 40'.9	00'.0	19° 52'.0	16'.6	236° 15'.8	03'.7
06	201° 00'.0	308° 03'.9	45'.2	288° 41'.3	00'.0	34° 54'.6	16'.6	251° 17'.9	03'.7
07	216° 02'.4	323° 03'.2	45'.6	303° 41'.8	00'.0	49° 57'.1	16'.7	266° 20'.1	03'.6
08	231° 04'.9	338° 02'.4	46'.1	318° 42'.2	00'.0	64° 59'.7	16'.7	281° 22'.2	03'.5
09	246° 07'.3	353° 01'.7	46'.5	333° 42'.6	00'.0	80° 02'.2	16'.8	296° 24'.4	03'.4
10	261° 09'.8	8° 00'.9	47'.0	348° 43'.0	00'.0	95° 04'.8	16'.8	311° 26'.6	03'.4
11	276° 12'.3	23° 00'.2	47'.4	3° 43'.5	00'.0	110° 07'.3	16'.9	326° 28'.7	03'.3
12	291° 14'.7	37° 59'.4	20° 47'.9 S	18° 43'.9	24° 00'.0 S	125° 09'.9	7° 16'.9 N	341° 30'.9	19° 03'.2 S
13	306° 17'.2	52° 58'.7	48'.3	33° 44'.3	00'.0	140° 12'.4	17'.0	356° 33'.1	03'.2
14	321° 19'.7	67° 57'.9	48'.8	48° 44'.8	00'.0	155° 15'.0	17'.0	11° 35'.2	03'.1
15	336° 22'.1	82° 57'.1	49'.2	63° 45'.2	00'.0	170° 17'.5	17'.1	26° 37'.4	03'.0
16	351° 24'.6	97° 56'.4	49'.7	78° 45'.6	23° 59'.9 S	185° 20'.1	17'.1	41° 39'.6	02'.9
17	6° 27'.1	112° 55'.6	50'.1	93° 46'.0	59'.9	200° 22'.7	17'.2	56° 41'.7	02'.9
18	21° 29'.5	127° 54'.9	50'.5	108° 46'.5	59'.9	215° 25'.2	17'.2	71° 43'.9	02'.8
19	36° 32'.0	142° 54'.1	51'.0	123° 46'.9	59'.9	230° 27'.8	17'.3	86° 46'.1	02'.7
20	51° 34'.5	157° 53'.4	51'.4	138° 47'.3	59'.9	245° 30'.3	17'.3	101° 48'.2	02'.7
21	66° 36'.9	172° 52'.6	51'.9	153° 47'.8	59'.9	260° 32'.9	17'.4	116° 50'.4	02'.6
22	81° 39'.4	187° 51'.8	52'.3	168° 48'.2	59'.9	275° 35'.4	17'.4	131° 52'.6	02'.5
23	96° 41'.8	202° 51'.1	52'.7	183° 48'.6	59'.9	290° 38'.0	17'.5	146° 54'.7	02'.4
	M.P. 16:38	v -0'.7	d 0'.5	v 0'.4	d 0'.0	v 2'.5	d 0'.0	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.2	40° 20'.3 S
Achernar	335° 38'.4	57° 16'.8 S
Acrux	173° 27'.3	63° 03'.1 S
Adhara	255° 24'.7	28° 57'.7 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.5	55° 59'.8 N
Alkaid	153° 11'.4	49° 20'.8 N
Alnair	28° 04'.0	47° 00'.1 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.5	8° 37'.5 S
Alphecca	126° 24'.7	26° 44'.2 N
Alpheratz	358° 00'.2	29° 03'.0 N
Altair	62° 24'.2	8° 50'.8 N
Ankaa	353° 31'.5	42° 21'.1 S
Antares	112° 46'.2	26° 24'.9 S
Arcturus	146° 10'.4	19° 13'.2 N
Atria	108° 03'.0	69° 00'.7 S
Avior	234° 24'.0	59° 29'.0 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.4 N
Canopus	264° 02'.7	52° 41'.5 S
Capella	280° 57'.7	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.2 N
Denebola	182° 49'.8	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.8 S
Dubhe	194° 10'.6	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 54'.1	51° 29'.2 N
Enif	34° 03'.1	9° 50'.4 N
Fomalhaut	15° 41'.8	29° 40'.0 S
Gacrux	172° 18'.8	57° 04'.0 S
Gienah	176° 08'.7	17° 29'.9 S
Hadar	149° 11'.0	60° 19'.9 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.4	34° 23'.3 S
Kochab	137° 19'.6	74° 10'.9 N
Markab	13° 54'.5	15° 09'.9 N
Menkar	314° 31'.6	4° 03'.6 N
Menkent	148° 26'.6	36° 19'.8 S
Miaplacidus	221° 42'.4	69° 41'.0 S
Mirfak	309° 03'.1	49° 50'.3 N
Nunki	76° 18'.5	26° 18'.5 S
Peacock	53° 44'.9	56° 45'.7 S
Polaris	323° 59'.1	89° 14'.2 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 21'.6	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.7 S
Rigil Kent	140° 13'.9	60° 47'.9 S
Sabik	102° 31'.2	15° 43'.0 S
Schedar	349° 59'.1	56° 30'.0 N
Shaula	96° 44'.0	37° 05'.9 S
Sirius	258° 47'.4	16° 42'.3 S
Spica	158° 48'.2	11° 07'.3 S
Suhail	223° 03'.9	43° 24'.0 S
Vega	80° 50'.2	38° 46'.5 N
Zuben'ubi	137° 23'.3	16° 00'.6 S

	SHA	Mer.Pass.
Venus	108° 40'.3	09:27
Mars	88° 42'.4	10:46
Jupiter	193° 52'.1	03:45
Saturn	50° 26'.9	13:17

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
10 00	178° 13'.3	22° 05'.7 S	125° 45'.9	16'.1	2° 05'.1 S	12'.6	54'.6
01	193° 13'.1	05'.4	140° 21'.0	16'.1	1° 52'.5 S	12'.6	
02	208° 12'.8	05'.0	154° 56'.1	16'.2	39'.9	12'.7	
03	223° 12'.6	04'.7	169° 31'.3	16'.1	27'.2	12'.6	54'.7
04	238° 12'.3	04'.3	184° 06'.4	16'.0	14'.6	12'.7	
05	253° 12'.0	04'.0	198° 41'.4	16'.1	01'.9	12'.7	
06	268° 11'.8	03'.6	213° 16'.5	16'.1	0° 49'.2 S	12'.6	
07	283° 11'.5	03'.2	227° 51'.6	16'.0	36'.6	12'.7	
08	298° 11'.3	02'.9	242° 26'.6	16'.1	23'.9	12'.8	
09	313° 11'.0	02'.5	257° 01'.7	16'.0	11'.1	12'.7	54'.8
10	328° 10'.8	02'.1	271° 36'.7	16'.0	0° 01'.6 N	12'.7	
11	343° 10'.5	01'.8	286° 11'.7	16'.0	14'.3	12'.7	
12	358° 10'.2	22° 01'.4 S	300° 46'.7	15'.9	0° 27'.0 N	12'.8	54'.8
13	13° 10'.0	01'.0	315° 21'.6	16'.0	39'.8	12'.7	
14	28° 09'.7	00'.7	329° 56'.6	15'.9	52'.5	12'.8	54'.9
15	43° 09'.5	00'.3	344° 31'.5	15'.9	1° 05'.3 N	12'.7	
16	58° 09'.2	21° 59'.9 S	359° 06'.4	15'.9	18'.0	12'.8	
17	73° 09'.0	59'.6	13° 41'.3	15'.8	30'.8	12'.7	
18	88° 08'.7	59'.2	28° 16'.1	15'.9	43'.5	12'.8	
19	103° 08'.5	58'.8	42° 51'.0	15'.8	56'.3	12'.7	55'.0
20	118° 08'.2	58'.5	57° 25'.8	15'.7	2° 09'.0 N	12'.8	
21	133° 07'.9	58'.1	72° 00'.5	15'.8	21'.8	12'.8	
22	148° 07'.7	57'.7	86° 35'.3	15'.7	34'.6	12'.7	
23	163° 07'.4	57'.4	101° 10'.0	15'.7	47'.3	12'.8	55'.1
11 00	178° 07'.2	21° 57'.0 S	115° 44'.7	15'.6	3° 00'.1 N	12'.8	55'.1
01	193° 06'.9	56'.6	130° 19'.3	15'.7	12'.9	12'.7	
02	208° 06'.7	56'.2	144° 54'.0	15'.5	25'.6	12'.8	
03	223° 06'.4	55'.9	159° 28'.5	15'.6	38'.4	12'.7	
04	238° 06'.2	55'.5	174° 03'.1	15'.5	51'.1	12'.8	55'.2
05	253° 05'.9	55'.1	188° 37'.6	15'.5	4° 03'.9 N	12'.7	
06	268° 05'.7	54'.7	203° 12'.1	15'.4	16'.6	12'.7	
07	283° 05'.4	54'.3	217° 46'.5	15'.4	29'.3	12'.8	
08	298° 05'.2	54'.0	232° 20'.9	15'.4	42'.1	12'.7	55'.3
09	313° 04'.9	53'.6	246° 55'.3	15'.3	54'.8	12'.7	
10	328° 04'.7	53'.2	261° 29'.6	15'.3	5° 07'.5 N	12'.7	
11	343° 04'.4	52'.8	276° 03'.9	15'.2	20'.2	12'.7	
12	358° 04'.2	21° 52'.4 S	290° 38'.1	15'.2	5° 32'.9 N	12'.6	55'.4
13	13° 03'.9	52'.1	305° 12'.3	15'.1	45'.5	12'.7	
14	28° 03'.7	51'.7	319° 46'.4	15'.1	58'.2	12'.6	
15	43° 03'.4	51'.3	334° 20'.5	15'.1	6° 10'.8 N	12'.7	
16	58° 03'.2	50'.9	348° 54'.6	14'.9	23'.5	12'.6	55'.5
17	73° 02'.9	50'.5	3° 28'.5	15'.0	36'.1	12'.6	
18	88° 02'.7	50'.1	18° 02'.5	14'.9	48'.7	12'.6	
19	103° 02'.4	49'.7	32° 36'.4	14'.8	7° 01'.3 N	12'.6	55'.6
20	118° 02'.2	49'.4	47° 10'.2	14'.8	13'.9	12'.5	
21	133° 01'.9	49'.0	61° 44'.0	14'.7	26'.4	12'.6	
22	148° 01'.7	48'.6	76° 17'.7	14'.7	39'.0	12'.5	
23	163° 01'.4	48'.2	90° 51'.4	14'.6	51'.5	12'.5	55'.7
12 00	178° 01'.2	21° 47'.8 S	105° 25'.0	14'.6	8° 04'.0 N	12'.5	55'.7
01	193° 00'.9	47'.4	119° 58'.6	14'.5	16'.5	12'.4	
02	208° 00'.7	47'.0	134° 32'.1	14'.4	28'.9	12'.4	55'.8
03	223° 00'.5	46'.6	149° 05'.5	14'.4	41'.3	12'.4	
04	238° 00'.2	46'.2	163° 38'.9	14'.3	53'.7	12'.4	
05	253° 00'.0	45'.8	178° 12'.2	14'.3	9° 06'.1 N	12'.4	
06	267° 59'.7	45'.4	192° 45'.5	14'.2	18'.5	12'.3	55'.9
07	282° 59'.5	45'.0	207° 18'.7	14'.1	30'.8	12'.3	
08	297° 59'.2	44'.6	221° 51'.8	14'.0	43'.1	12'.3	
09	312° 59'.0	44'.2	236° 24'.8	14'.0	55'.4	12'.2	56'.0
10	327° 58'.7	43'.8	250° 57'.8	13'.9	10° 07'.6 N	12'.2	
11	342° 58'.5	43'.4	265° 30'.7	13'.9	19'.8	12'.2	
12	357° 58'.2	21° 43'.0 S	280° 03'.6	13'.7	10° 32'.0 N	12'.2	56'.1
13	12° 58'.0	42'.6	294° 36'.3	13'.7	44'.2	12'.1	
14	27° 57'.8	42'.2	309° 09'.0	13'.7	56'.3	12'.1	
15	42° 57'.5	41'.8	323° 41'.7	13'.5	11° 08'.4 N	12'.0	56'.2
16	57° 57'.3	41'.4	338° 14'.2	13'.5	20'.4	12'.0	
17	72° 57'.0	41'.0	352° 46'.7	13'.4	32'.4	12'.0	
18	87° 56'.8	40'.6	7° 19'.1	13'.3	44'.4	11'.9	56'.3
19	102° 56'.5	40'.2	21° 51'.4	13'.2	56'.3	11'.9	
20	117° 56'.3	39'.8	36° 23'.6	13'.2	12° 08'.2 N	11'.8	
21	132° 56'.1	39'.4	50° 55'.8	13'.1	20'.0	11'.9	56'.4
22	147° 55'.8	39'.0	65° 27'.9	13'.0	31'.9	11'.7	
23	162° 55'.6	38'.6	79° 59'.9	12'.9	43'.6	11'.7	
	SD 16'.3	d 0'.4	SD 14'.9		15'.1	15'.3	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
10	7 06	7 19	12:07	16:04	03:43	6d 25%
11	7 31	7 43	12:08	16:46	04:24	7d 34%
12	7 55	8 07	12:08	17:30	05:07	8d 44%

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1992 January 13, 14, 15 (Mon, Tue, Wed)

GMT	ARIES	VENUS -4.0		MARS +1.4		JUPITER -2.3		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
13 Monday 00	111° 44'.3	217° 50'.3	20° 53'.2 S	198° 49'.0	23° 59'.9 S	305° 40'.6	7° 17'.5 N	161° 56'.9	19° 02'.4 S
01	126° 46'.8	232° 49'.6	53'.6	213° 49'.5	59'.8	320° 43'.1	17'.6	176° 59'.0	02'.3
02	141° 49'.2	247° 48'.8	54'.0	228° 49'.9	59'.8	335° 45'.7	17'.6	192° 01'.2	02'.2
03	156° 51'.7	262° 48'.0	54'.5	243° 50'.3	59'.8	350° 48'.2	17'.7	207° 03'.4	02'.1
04	171° 54'.2	277° 47'.3	54'.9	258° 50'.8	59'.8	5° 50'.8	17'.7	222° 05'.5	02'.1
05	186° 56'.6	292° 46'.5	55'.3	273° 51'.2	59'.8	20° 53'.3	17'.8	237° 07'.7	02'.0
06	201° 59'.1	307° 45'.8	55'.8	288° 51'.6	59'.8	35° 55'.9	17'.8	252° 09'.9	01'.9
07	217° 01'.6	322° 45'.0	56'.2	303° 52'.0	59'.8	50° 58'.5	17'.9	267° 12'.0	01'.9
08	232° 04'.0	337° 44'.2	56'.6	318° 52'.5	59'.7	66° 01'.0	17'.9	282° 14'.2	01'.8
09	247° 06'.5	352° 43'.5	57'.0	333° 52'.9	59'.7	81° 03'.6	18'.0	297° 16'.4	01'.7
10	262° 08'.9	7° 42'.7	57'.5	348° 53'.3	59'.7	96° 06'.1	18'.0	312° 18'.5	01'.6
11	277° 11'.4	22° 42'.0	57'.9	3° 53'.8	59'.7	111° 08'.7	18'.1	327° 20'.7	01'.6
12	292° 13'.9	37° 41'.2	20° 58'.3 S	18° 54'.2	23° 59'.7 S	126° 11'.3	7° 18'.1 N	342° 22'.9	19° 01'.5 S
13	307° 16'.3	52° 40'.4	58'.7	33° 54'.6	59'.7	141° 13'.8	18'.2	357° 25'.0	01'.4
14	322° 18'.8	67° 39'.7	59'.2	48° 55'.0	59'.6	156° 16'.4	18'.2	12° 27'.2	01'.4
15	337° 21'.3	82° 38'.9	59'.6	63° 55'.5	59'.6	171° 19'.0	18'.3	27° 29'.3	01'.3
16	352° 23'.7	97° 38'.1	21° 00'.0 S	78° 55'.9	59'.6	186° 21'.5	18'.4	42° 31'.5	01'.2
17	7° 26'.2	112° 37'.4	00'.4	93° 56'.3	59'.6	201° 24'.1	18'.4	57° 33'.7	01'.1
18	22° 28'.7	127° 36'.6	00'.8	108° 56'.7	59'.6	216° 26'.6	18'.5	72° 35'.8	01'.1
19	37° 31'.1	142° 35'.8	01'.2	123° 57'.2	59'.5	231° 29'.2	18'.5	87° 38'.0	01'.0
20	52° 33'.6	157° 35'.1	01'.7	138° 57'.6	59'.5	246° 31'.8	18'.6	102° 40'.2	00'.9
21	67° 36'.1	172° 34'.3	02'.1	153° 58'.0	59'.5	261° 34'.3	18'.6	117° 42'.3	00'.8
22	82° 38'.5	187° 33'.5	02'.5	168° 58'.5	59'.5	276° 36'.9	18'.7	132° 44'.5	00'.8
23	97° 41'.0	202° 32'.8	02'.9	183° 58'.9	59'.5	291° 39'.5	18'.7	147° 46'.7	00'.7
14 Tuesday 00	112° 43'.4	217° 32'.0	21° 03'.3 S	198° 59'.3	23° 59'.4 S	306° 42'.0	7° 18'.8 N	162° 48'.8	19° 00'.6 S
01	127° 45'.9	232° 31'.2	03'.7	213° 59'.7	59'.4	321° 44'.6	18'.8	177° 51'.0	00'.6
02	142° 48'.4	247° 30'.5	04'.1	229° 00'.2	59'.4	336° 47'.2	18'.9	192° 53'.2	00'.5
03	157° 50'.8	262° 29'.7	04'.5	244° 00'.6	59'.4	351° 49'.7	18'.9	207° 55'.3	00'.4
04	172° 53'.3	277° 28'.9	05'.0	259° 01'.0	59'.3	6° 52'.3	19'.0	222° 57'.5	00'.3
05	187° 55'.8	292° 28'.1	05'.4	274° 01'.4	59'.3	21° 54'.9	19'.1	237° 59'.6	00'.3
06	202° 58'.2	307° 27'.4	05'.8	289° 01'.9	59'.3	36° 57'.4	19'.1	253° 01'.8	00'.2
07	218° 00'.7	322° 26'.6	06'.2	304° 02'.3	59'.3	52° 00'.0	19'.2	268° 04'.0	00'.1
08	233° 03'.2	337° 25'.8	06'.6	319° 02'.7	59'.2	67° 02'.6	19'.2	283° 06'.1	00'.0
09	248° 05'.6	352° 25'.1	07'.0	334° 03'.1	59'.2	82° 05'.1	19'.3	298° 08'.3	00'.0
10	263° 08'.1	7° 24'.3	07'.4	349° 03'.6	59'.2	97° 07'.7	19'.3	313° 10'.5	18° 59'.9 S
11	278° 10'.6	22° 23'.5	07'.8	4° 04'.0	59'.2	112° 10'.3	19'.4	328° 12'.6	59'.8
12	293° 13'.0	37° 22'.7	21° 08'.2 S	19° 04'.4	23° 59'.1 S	127° 12'.8	7° 19'.4 N	343° 14'.8	18° 59'.8 S
13	308° 15'.5	52° 22'.0	08'.6	34° 04'.8	59'.1	142° 15'.4	19'.5	358° 16'.9	59'.7
14	323° 17'.9	67° 21'.2	09'.0	49° 05'.3	59'.1	157° 18'.0	19'.6	13° 19'.1	59'.6
15	338° 20'.4	82° 20'.4	09'.4	64° 05'.7	59'.0	172° 20'.5	19'.6	28° 21'.3	59'.5
16	353° 22'.9	97° 19'.6	09'.8	79° 06'.1	59'.0	187° 23'.1	19'.7	43° 23'.4	59'.5
17	8° 25'.3	112° 18'.9	10'.2	94° 06'.6	59'.0	202° 25'.7	19'.7	58° 25'.6	59'.4
18	23° 27'.8	127° 18'.1	10'.6	109° 07'.0	58'.9	217° 28'.3	19'.8	73° 27'.8	59'.3
19	38° 30'.3	142° 17'.3	11'.0	124° 07'.4	58'.9	232° 30'.8	19'.8	88° 29'.9	59'.2
20	53° 32'.7	157° 16'.5	11'.3	139° 07'.8	58'.9	247° 33'.4	19'.9	103° 32'.1	59'.2
21	68° 35'.2	172° 15'.8	11'.7	154° 08'.3	58'.9	262° 36'.0	19'.9	118° 34'.3	59'.1
22	83° 37'.7	187° 15'.0	12'.1	169° 08'.7	58'.8	277° 38'.5	20'.0	133° 36'.4	59'.0
23	98° 40'.1	202° 14'.2	12'.5	184° 09'.1	58'.8	292° 41'.1	20'.1	148° 38'.6	59'.0
15 Wednesday 00	113° 42'.6	217° 13'.4	21° 12'.9 S	199° 09'.5	23° 58'.8 S	307° 43'.7	7° 20'.1 N	163° 40'.7	18° 58'.9 S
01	128° 45'.0	232° 12'.7	13'.3	214° 10'.0	58'.7	322° 46'.3	20'.2	178° 42'.9	58'.8
02	143° 47'.5	247° 11'.9	13'.7	229° 10'.4	58'.7	337° 48'.8	20'.2	193° 45'.1	58'.7
03	158° 50'.0	262° 11'.1	14'.1	244° 10'.8	58'.6	352° 51'.4	20'.3	208° 47'.2	58'.7
04	173° 52'.4	277° 10'.3	14'.4	259° 11'.2	58'.6	7° 54'.0	20'.3	223° 49'.4	58'.6
05	188° 54'.9	292° 09'.5	14'.8	274° 11'.7	58'.6	22° 56'.6	20'.4	238° 51'.6	58'.5
06	203° 57'.4	307° 08'.8	15'.2	289° 12'.1	58'.5	37° 59'.1	20'.5	253° 53'.7	58'.4
07	218° 59'.8	322° 08'.0	15'.6	304° 12'.5	58'.5	53° 01'.7	20'.5	268° 55'.9	58'.4
08	234° 02'.3	337° 07'.2	16'.0	319° 12'.9	58'.5	68° 04'.3	20'.6	283° 58'.1	58'.3
09	249° 04'.8	352° 06'.4	16'.3	334° 13'.4	58'.4	83° 06'.8	20'.6	299° 00'.2	58'.2
10	264° 07'.2	7° 05'.6	16'.7	349° 13'.8	58'.4	98° 09'.4	20'.7	314° 02'.4	58'.2
11	279° 09'.7	22° 04'.9	17'.1	4° 14'.2	58'.4	113° 12'.0	20'.7	329° 04'.5	58'.1
12	294° 12'.2	37° 04'.1	21° 17'.5 S	19° 14'.6	23° 58'.3 S	128° 14'.6	7° 20'.8 N	344° 06'.7	18° 58'.0 S
13	309° 14'.6	52° 03'.3	17'.8	34° 15'.1	58'.3	143° 17'.2	20'.9	359° 08'.9	57'.9
14	324° 17'.1	67° 02'.5	18'.2	49° 15'.5	58'.2	158° 19'.7	20'.9	14° 11'.0	57'.9
15	339° 19'.5	82° 01'.7	18'.6	64° 15'.9	58'.2	173° 22'.3	21'.0	29° 13'.2	57'.8
16	354° 22'.0	97° 01'.0	19'.0	79° 16'.3	58'.2	188° 24'.9	21'.0	44° 15'.4	57'.7
17	9° 24'.5	112° 00'.2	19'.3	94° 16'.7	58'.1	203° 27'.5	21'.1	59° 17'.5	57'.6
18	24° 26'.9	126° 59'.4	19'.7	109° 17'.2	58'.1	218° 30'.0	21'.2	74° 19'.7	57'.6
19	39° 29'.4	141° 58'.6	20'.1	124° 17'.6	58'.0	233° 32'.6	21'.2	89° 21'.8	57'.5
20	54° 31'.9	156° 57'.8	20'.4	139° 18'.0	58'.0	248° 35'.2	21'.3	104° 24'.0	57'.4
21	69° 34'.3	171° 57'.0	20'.8	154° 18'.4	57'.9	263° 37'.8	21'.3	119° 26'.2	57'.4
22	84° 36'.8	186° 56'.2	21'.2	169° 18'.9	57'.9	278° 40'.4	21'.4	134° 28'.3	57'.3
23	99° 39'.3	201° 55'.5	21'.5	184° 19'.3	57'.9	293° 42'.9	21'.5	149° 30'.5	57'.2
	M.P. 16:26	v -0'.8	d 0'.4	v 0'.4	d 0'.0	v 2'.6	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.2	40° 20'.3 S
Achernar	335° 38'.5	57° 16'.8 S
Acrux	173° 27'.3	63° 03'.1 S
Adhara	255° 24'.7	28° 57'.7 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.4	55° 59'.7 N
Alkaid	153° 11'.4	49° 20'.8 N
Alnair	28° 04'.0	47° 00'.1 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.5	8° 37'.5 S
Alphecca	126° 24'.7	26° 44'.2 N
Alpheratz	358° 00'.3	29° 03'.0 N
Altair	62° 24'.2	8° 50'.8 N
Ankaa	353° 31'.5	42° 21'.1 S
Antares	112° 46'.2	26° 24'.9 S
Arcturus	146° 10'.4	19° 13'.1 N
Atria	108° 03'.0	69° 00'.7 S
Avior	234° 24'.0	59° 29'.0 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.7	52° 41'.6 S
Capella	280° 57'.7	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.2 N
Denebola	182° 49'.8	14° 36'.7 N
Diphda	349° 11'.9	18° 01'.9 S
Dubhe	194° 10'.6	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 54'.1	51° 29'.2 N
Enif	34° 03'.1	9° 50'.4 N
Fomalhaut	15° 41'.8	29° 40'.0 S
Gacrux	172° 18'.8	57° 04'.0 S
Gienah	176° 08'.7	17° 29'.9 S
Hadar	149° 10'.9	60° 19'.9 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.4	34° 23'.3 S
Kochab	137° 19'.6	74° 10'.9 N
Markab	13° 54'.5	15° 09'.9 N
Menkar	314° 31'.7	4° 03'.6 N
Menkent	148° 26'.6	36° 19'.8 S
Miaplacidus	221° 42'.4	69° 41'.0 S
Mirfak	309° 03'.1	49° 50'.3 N
Nunki	76° 18'.5	26° 18'.4 S
Peacock	53° 44'.9	56° 45'.7 S
Polaris	324° 00'.2	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 21'.6	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.7 S
Rigil Kent	140° 13'.9	60° 47'.9 S
Sabik	102° 31'.2	15° 43'.0 S
Schedar	349° 59'.1	56° 30'.0 N
Shaula	96° 44'.0	37° 05'.9 S
Sirius	258° 47'.4	16° 42'.4 S
Spica	158° 48'.1	11° 07'.3 S
Suhail	223° 03'.9	43° 24'.0 S
Vega	80° 50'.2	38° 46'.5 N
Zuben'ubi	137° 23'.3	16° 00'.6 S

	SHA	Mer.Pass.
Venus	104° 48'.5	09:30
Mars	86° 15'.9	10:44
Jupiter	193° 58'.6	03:33
Saturn	50° 05'.4	13:07

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
13 00	177° 55'.3	21° 38'.2 S	94° 31'.8	12'.8	12° 55'.3 N	11'.7	56'.5
01	192° 55'.1	37'.8	109° 03'.6	12'.8	13° 07'.0 N	11'.6	
02	207° 54'.9	37'.4	123° 35'.4	12'.6	18'.6	11'.6	
03	222° 54'.6	37'.0	138° 07'.0	12'.6	30'.2	11'.6	56'.6
04	237° 54'.4	36'.5	152° 38'.6	12'.5	41'.8	11'.4	
05	252° 54'.1	36'.1	167° 10'.1	12'.3	53'.2	11'.5	
06	267° 53'.9	35'.7	181° 41'.4	12'.3	14° 04'.7 N	11'.4	56'.7
07	282° 53'.7	35'.3	196° 12'.7	12'.2	16'.1	11'.3	
08	297° 53'.4	34'.9	210° 43'.9	12'.2	27'.4	11'.2	
09	312° 53'.2	34'.5	225° 15'.1	12'.0	38'.6	11'.3	56'.8
10	327° 53'.0	34'.1	239° 46'.1	11'.9	49'.9	11'.1	
11	342° 52'.7	33'.6	254° 17'.0	11'.8	15° 01'.0 N	11'.1	
12	357° 52'.5	21° 33'.2 S	268° 47'.8	11'.8	15° 12'.1 N	11'.1	56'.9
13	12° 52'.2	32'.8	283° 18'.6	11'.6	23'.2	10'.9	
14	27° 52'.0	32'.4	297° 49'.2	11'.5	34'.1	11'.0	
15	42° 51'.8	32'.0	312° 19'.7	11'.5	45'.1	10'.8	57'.0
16	57° 51'.5	31'.5	326° 50'.2	11'.3	55'.9	10'.8	
17	72° 51'.3	31'.1	341° 20'.5	11'.2	16° 06'.7 N	10'.7	57'.1
18	87° 51'.1	30'.7	355° 50'.7	11'.2	17'.4	10'.7	
19	102° 50'.8	30'.3	10° 20'.9	11'.0	28'.1	10'.6	
20	117° 50'.6	29'.9	24° 50'.9	10'.9	38'.7	10'.5	57'.2
21	132° 50'.4	29'.4	39° 20'.8	10'.9	49'.2	10'.4	
22	147° 50'.1	29'.0	53° 50'.7	10'.7	59'.6	10'.4	
23	162° 49'.9	28'.6	68° 20'.4	10'.6	17° 10'.0 N	10'.3	57'.3
14 00	177° 49'.7	21° 28'.2 S	82° 50'.0	10'.5	17° 20'.3 N	10'.2	57'.3
01	192° 49'.4	27'.7	97° 19'.5	10'.4	30'.5	10'.2	57'.4
02	207° 49'.2	27'.3	111° 48'.9	10'.3	40'.7	10'.1	
03	222° 49'.0	26'.9	126° 18'.2	10'.2	50'.8	9'.9	
04	237° 48'.7	26'.4	140° 47'.4	10'.1	18° 00'.7 N	10'.0	57'.5
05	252° 48'.5	26'.0	155° 16'.5	9'.9	10'.7	9'.8	
06	267° 48'.3	25'.6	169° 45'.4	9'.9	20'.5	9'.7	57'.6
07	282° 48'.0	25'.2	184° 14'.3	9'.7	30'.2	9'.7	
08	297° 47'.8	24'.7	198° 43'.0	9'.7	39'.9	9'.5	
09	312° 47'.6	24'.3	213° 11'.7	9'.5	49'.4	9'.5	57'.7
10	327° 47'.3	23'.9	227° 40'.2	9'.4	58'.9	9'.4	
11	342° 47'.1	23'.4	242° 08'.6	9'.3	19° 08'.3 N	9'.3	57'.8
12	357° 46'.9	21° 23'.0 S	256° 36'.9	9'.2	19° 17'.6 N	9'.2	57'.8
13	12° 46'.6	22'.6	271° 05'.1	9'.1	26'.8	9'.1	
14	27° 46'.4	22'.1	285° 33'.2	8'.9	35'.9	9'.0	57'.9
15	42° 46'.2	21'.7	300° 01'.1	8'.9	44'.9	9'.0	
16	57° 46'.0	21'.2	314° 29'.0	8'.7	53'.9	8'.8	58'.0
17	72° 45'.7	20'.8	328° 56'.7	8'.6	20° 02'.7 N	8'.7	
18	87° 45'.5	20'.4	343° 24'.3	8'.5	11'.4	8'.6	
19	102° 45'.3	19'.9	357° 51'.8	8'.4	20'.0	8'.5	58'.1
20	117° 45'.0	19'.5	12° 19'.2	8'.3	28'.5	8'.4	
21	132° 44'.8	19'.0	26° 46'.5	8'.1	36'.9	8'.3	58'.2
22	147° 44'.6	18'.6	41° 13'.6	8'.1	45'.2	8'.2	
23	162° 44'.4	18'.2	55° 40'.7	7'.9	53'.4	8'.1	
15 00	177° 44'.1	21° 17'.7 S	70° 07'.6	7'.8	21° 01'.5 N	8'.0	58'.3
01	192° 43'.9	17'.3	84° 34'.4	7'.7	09'.5	7'.8	
02	207° 43'.7	16'.8	99° 01'.1	7'.6	17'.3	7'.8	58'.4
03	222° 43'.5	16'.4	113° 27'.7	7'.4	25'.1	7'.6	
04	237° 43'.2	15'.9	127° 54'.1	7'.4	32'.7	7'.5	
05	252° 43'.0	15'.5	142° 20'.5	7'.2	40'.2	7'.4	58'.5
06	267° 42'.8	15'.0	156° 46'.7	7'.1	47'.6	7'.2	
07	282° 42'.6	14'.6	171° 12'.8	7'.0	54'.8	7'.2	58'.6
08	297° 42'.3	14'.1	185° 38'.8	6'.9	22° 02'.0 N	7'.0	
09	312° 42'.1	13'.7	200° 04'.7	6'.8	09'.0	6'.9	
10	327° 41'.9	13'.2	214° 30'.5	6'.6	15'.9	6'.7	58'.7
11	342° 41'.7	12'.8	228° 56'.1	6'.6	22'.6	6'.7	
12	357° 41'.4	21° 12'.3 S	243° 21'.7	6'.4	22° 29'.3 N	6'.5	58'.8
13	12° 41'.2	11'.9	257° 47'.1	6'.4	35'.8	6'.3	
14	27° 41'.0	11'.4	272° 12'.5	6'.2	42'.1	6'.3	
15	42° 40'.8	11'.0	286° 37'.7	6'.1	48'.4	6'.1	58'.9
16	57° 40'.5	10'.5	301° 02'.8	6'.0	54'.5	5'.9	
17	72° 40'.3	10'.1	315° 27'.8	5'.9	23° 00'.4 N	5'.9	59'.0
18	87° 40'.1	09'.6	329° 52'.7	5'.8	06'.3	5'.6	
19	102° 39'.9	09'.2	344° 17'.5	5'.6	11'.9	5'.6	
20	117° 39'.7	08'.7	358° 42'.1	5'.6	17'.5	5'.4	59'.1
21	132° 39'.4	08'.3	13° 06'.7	5'.5	22'.9	5'.2	
22	147° 39'.2	07'.8	27° 31'.2	5'.3	28'.1	5'.1	59'.2
23	162° 39'.0	07'.3	41° 55'.5	5'.3	33'.2	5'.0	
	SD 16'.3	d 0'.4	SD 15'.5		15'.7	16'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
13	8 18	8 30	12:08	18:17	05:53	9d 54%
14	8 41	8 52	12:09	19:09	06:42	10d 65%
15	9 03	9 14	12:09	20:05	07:37	11d 75%

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1992 January 16, 17, 18 (Thur, Fri, Saw)

GMT	ARIES	VENUS -4.0		MARS +1.4		JUPITER -2.4		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
16 Thursday 00	114° 41'.7	216° 54'.7	21° 21'.9 S	199° 19'.7	23° 57'.8 S	308° 45'.5	7° 21'.5 N	164° 32'.7	18° 57'.1 S
01	129° 44'.2	231° 53'.9	22'.3	214° 20'.1	57'.8	323° 48'.1	21'.6	179° 34'.8	57'.1
02	144° 46'.7	246° 53'.1	22'.6	229° 20'.6	57'.7	338° 50'.7	21'.6	194° 37'.0	57'.0
03	159° 49'.1	261° 52'.3	23'.0	244° 21'.0	57'.7	353° 53'.3	21'.7	209° 39'.1	56'.9
04	174° 51'.6	276° 51'.5	23'.3	259° 21'.4	57'.6	8° 55'.8	21'.8	224° 41'.3	56'.8
05	189° 54'.0	291° 50'.7	23'.7	274° 21'.8	57'.6	23° 58'.4	21'.8	239° 43'.5	56'.8
06	204° 56'.5	306° 50'.0	24'.1	289° 22'.3	57'.5	39° 01'.0	21'.9	254° 45'.6	56'.7
07	219° 59'.0	321° 49'.2	24'.4	304° 22'.7	57'.5	54° 03'.6	21'.9	269° 47'.8	56'.6
08	235° 01'.4	336° 48'.4	24'.8	319° 23'.1	57'.4	69° 06'.2	22'.0	284° 50'.0	56'.5
09	250° 03'.9	351° 47'.6	25'.1	334° 23'.5	57'.4	84° 08'.7	22'.1	299° 52'.1	56'.5
10	265° 06'.4	6° 46'.8	25'.5	349° 24'.0	57'.4	99° 11'.3	22'.1	314° 54'.3	56'.4
11	280° 08'.8	21° 46'.0	25'.8	4° 24'.4	57'.3	114° 13'.9	22'.2	329° 56'.4	56'.3
12	295° 11'.3	36° 45'.2	21° 26'.2 S	19° 24'.8	23° 57'.3 S	129° 16'.5	7° 22'.2 N	344° 58'.6	18° 56'.3 S
13	310° 13'.8	51° 44'.4	26'.5	34° 25'.2	57'.2	144° 19'.1	22'.3	0° 00'.8	56'.2
14	325° 16'.2	66° 43'.6	26'.9	49° 25'.7	57'.2	159° 21'.7	22'.4	15° 02'.9	56'.1
15	340° 18'.7	81° 42'.8	27'.2	64° 26'.1	57'.1	174° 24'.2	22'.4	30° 05'.1	56'.0
16	355° 21'.2	96° 42'.1	27'.6	79° 26'.5	57'.1	189° 26'.8	22'.5	45° 07'.3	56'.0
17	10° 23'.6	111° 41'.3	27'.9	94° 26'.9	57'.0	204° 29'.4	22'.5	60° 09'.4	55'.9
18	25° 26'.1	126° 40'.5	28'.3	109° 27'.3	56'.9	219° 32'.0	22'.6	75° 11'.6	55'.8
19	40° 28'.5	141° 39'.7	28'.6	124° 27'.8	56'.9	234° 34'.6	22'.7	90° 13'.7	55'.7
20	55° 31'.0	156° 38'.9	28'.9	139° 28'.2	56'.8	249° 37'.2	22'.7	105° 15'.9	55'.7
21	70° 33'.5	171° 38'.1	29'.3	154° 28'.6	56'.8	264° 39'.7	22'.8	120° 18'.1	55'.6
22	85° 35'.9	186° 37'.3	29'.6	169° 29'.0	56'.7	279° 42'.3	22'.9	135° 20'.2	55'.5
23	100° 38'.4	201° 36'.5	30'.0	184° 29'.5	56'.7	294° 44'.9	22'.9	150° 22'.4	55'.4
17 Friday 00	115° 40'.9	216° 35'.7	21° 30'.3 S	199° 29'.9	23° 56'.6 S	309° 47'.5	7° 23'.0 N	165° 24'.6	18° 55'.4 S
01	130° 43'.3	231° 34'.9	30'.6	214° 30'.3	56'.6	324° 50'.1	23'.0	180° 26'.7	55'.3
02	145° 45'.8	246° 34'.1	31'.0	229° 30'.7	56'.5	339° 52'.7	23'.1	195° 28'.9	55'.2
03	160° 48'.3	261° 33'.3	31'.3	244° 31'.2	56'.5	354° 55'.3	23'.2	210° 31'.0	55'.1
04	175° 50'.7	276° 32'.5	31'.6	259° 31'.6	56'.4	9° 57'.9	23'.2	225° 33'.2	55'.1
05	190° 53'.2	291° 31'.7	32'.0	274° 32'.0	56'.3	25° 00'.4	23'.3	240° 35'.4	55'.0
06	205° 55'.7	306° 30'.9	32'.3	289° 32'.4	56'.3	40° 03'.0	23'.4	255° 37'.5	54'.9
07	220° 58'.1	321° 30'.1	32'.6	304° 32'.8	56'.2	55° 05'.6	23'.4	270° 39'.7	54'.9
08	236° 00'.6	336° 29'.3	33'.0	319° 33'.3	56'.2	70° 08'.2	23'.5	285° 41'.9	54'.8
09	251° 03'.0	351° 28'.5	33'.3	334° 33'.7	56'.1	85° 10'.8	23'.5	300° 44'.0	54'.7
10	266° 05'.5	6° 27'.7	33'.6	349° 34'.1	56'.1	100° 13'.4	23'.6	315° 46'.2	54'.6
11	281° 08'.0	21° 27'.0	33'.9	4° 34'.5	56'.0	115° 16'.0	23'.7	330° 48'.3	54'.6
12	296° 10'.4	36° 26'.2	21° 34'.3 S	19° 35'.0	23° 55'.9 S	130° 18'.6	7° 23'.7 N	345° 50'.5	18° 54'.5 S
13	311° 12'.9	51° 25'.4	34'.6	34° 35'.4	55'.9	145° 21'.2	23'.8	0° 52'.7	54'.4
14	326° 15'.4	66° 24'.6	34'.9	49° 35'.8	55'.8	160° 23'.8	23'.9	15° 54'.8	54'.3
15	341° 17'.8	81° 23'.8	35'.2	64° 36'.2	55'.8	175° 26'.3	23'.9	30° 57'.0	54'.3
16	356° 20'.3	96° 23'.0	35'.6	79° 36'.6	55'.7	190° 28'.9	24'.0	45° 59'.1	54'.2
17	11° 22'.8	111° 22'.2	35'.9	94° 37'.1	55'.6	205° 31'.5	24'.1	61° 01'.3	54'.1
18	26° 25'.2	126° 21'.4	36'.2	109° 37'.5	55'.6	220° 34'.1	24'.1	76° 03'.5	54'.0
19	41° 27'.7	141° 20'.6	36'.5	124° 37'.9	55'.5	235° 36'.7	24'.2	91° 05'.6	54'.0
20	56° 30'.2	156° 19'.8	36'.8	139° 38'.3	55'.4	250° 39'.3	24'.3	106° 07'.8	53'.9
21	71° 32'.6	171° 19'.0	37'.2	154° 38'.8	55'.4	265° 41'.9	24'.3	121° 10'.0	53'.8
22	86° 35'.1	186° 18'.2	37'.5	169° 39'.2	55'.3	280° 44'.5	24'.4	136° 12'.1	53'.7
23	101° 37'.5	201° 17'.4	37'.8	184° 39'.6	55'.2	295° 47'.1	24'.4	151° 14'.3	53'.7
18 Saturday 00	116° 40'.0	216° 16'.6	21° 38'.1 S	199° 40'.0	23° 55'.2 S	310° 49'.7	7° 24'.5 N	166° 16'.4	18° 53'.6 S
01	131° 42'.5	231° 15'.7	38'.4	214° 40'.4	55'.1	325° 52'.3	24'.6	181° 18'.6	53'.5
02	146° 44'.9	246° 14'.9	38'.7	229° 40'.9	55'.0	340° 54'.9	24'.6	196° 20'.8	53'.5
03	161° 47'.4	261° 14'.1	39'.0	244° 41'.3	55'.0	355° 57'.5	24'.7	211° 22'.9	53'.4
04	176° 49'.9	276° 13'.3	39'.3	259° 41'.7	54'.9	11° 00'.1	24'.8	226° 25'.1	53'.3
05	191° 52'.3	291° 12'.5	39'.7	274° 42'.1	54'.8	26° 02'.6	24'.8	241° 27'.2	53'.2
06	206° 54'.8	306° 11'.7	40'.0	289° 42'.5	54'.8	41° 05'.2	24'.9	256° 29'.4	53'.2
07	221° 57'.3	321° 10'.9	40'.3	304° 43'.0	54'.7	56° 07'.8	25'.0	271° 31'.6	53'.1
08	236° 59'.7	336° 10'.1	40'.6	319° 43'.4	54'.6	71° 10'.4	25'.0	286° 33'.7	53'.0
09	252° 02'.2	351° 09'.3	40'.9	334° 43'.8	54'.6	86° 13'.0	25'.1	301° 35'.9	52'.9
10	267° 04'.7	6° 08'.5	41'.2	349° 44'.2	54'.5	101° 15'.6	25'.2	316° 38'.1	52'.9
11	282° 07'.1	21° 07'.7	41'.5	4° 44'.7	54'.4	116° 18'.2	25'.2	331° 40'.2	52'.8
12	297° 09'.6	36° 06'.9	21° 41'.8 S	19° 45'.1	23° 54'.4 S	131° 20'.8	7° 25'.3 N	346° 42'.4	18° 52'.7 S
13	312° 12'.0	51° 06'.1	42'.1	34° 45'.5	54'.3	146° 23'.4	25'.4	1° 44'.5	52'.6
14	327° 14'.5	66° 05'.3	42'.4	49° 45'.9	54'.2	161° 26'.0	25'.4	16° 46'.7	52'.6
15	342° 17'.0	81° 04'.5	42'.7	64° 46'.3	54'.1	176° 28'.6	25'.5	31° 48'.9	52'.5
16	357° 19'.4	96° 03'.7	43'.0	79° 46'.8	54'.1	191° 31'.2	25'.6	46° 51'.0	52'.4
17	12° 21'.9	111° 02'.9	43'.3	94° 47'.2	54'.0	206° 33'.8	25'.6	61° 53'.2	52'.3
18	27° 24'.4	126° 02'.1	43'.6	109° 47'.6	53'.9	221° 36'.4	25'.7	76° 55'.3	52'.3
19	42° 26'.8	141° 01'.3	43'.8	124° 48'.0	53'.9	236° 39'.0	25'.8	91° 57'.5	52'.2
20	57° 29'.3	156° 00'.4	44'.1	139° 48'.4	53'.8	251° 41'.6	25'.8	106° 59'.7	52'.1
21	72° 31'.8	170° 59'.6	44'.4	154° 48'.9	53'.7	266° 44'.2	25'.9	122° 01'.8	52'.0
22	87° 34'.2	185° 58'.8	44'.7	169° 49'.3	53'.6	281° 46'.8	26'.0	137° 04'.0	52'.0
23	102° 36'.7	200° 58'.0	45'.0	184° 49'.7	53'.6	296° 49'.4	26'.0	152° 06'.1	51'.9
	M.P. 16:15	v -0'.8	d 0'.3	v 0'.4	d 0'.1	v 2'.6	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.2	40° 20'.3 S
Achernar	335° 38'.5	57° 16'.8 S
Acrux	173° 27'.2	63° 03'.2 S
Adhara	255° 24'.7	28° 57'.7 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.4	55° 59'.7 N
Alkaid	153° 11'.4	49° 20'.8 N
Alnair	28° 04'.0	47° 00'.1 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.5	8° 37'.6 S
Alphecca	126° 24'.7	26° 44'.2 N
Alpheratz	358° 00'.3	29° 03'.0 N
Altair	62° 24'.2	8° 50'.8 N
Ankaa	353° 31'.5	42° 21'.1 S
Antares	112° 46'.2	26° 24'.9 S
Arcturus	146° 10'.3	19° 13'.1 N
Atria	108° 02'.9	69° 00'.7 S
Avior	234° 24'.0	59° 29'.1 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.7	52° 41'.6 S
Capella	280° 57'.7	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.2 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.9 S
Dubhe	194° 10'.6	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 54'.1	51° 29'.2 N
Enif	34° 03'.1	9° 50'.4 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.7	57° 04'.0 S
Gienah	176° 08'.7	17° 29'.9 S
Hadar	149° 10'.9	60° 19'.9 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.4	34° 23'.3 S
Kochab	137° 19'.5	74° 10'.9 N
Markab	13° 54'.5	15° 09'.9 N
Menkar	314° 31'.7	4° 03'.6 N
Menkent	148° 26'.6	36° 19'.8 S
Miaplacidus	221° 42'.4	69° 41'.0 S
Mirfak	309° 03'.1	49° 50'.3 N
Nunki	76° 18'.5	26° 18'.4 S
Peacock	53° 44'.8	56° 45'.7 S
Polaris	324° 01'.1	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 21'.6	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.7 S
Rigil Kent	140° 13'.8	60° 47'.9 S
Sabik	102° 31'.2	15° 43'.0 S
Schedar	349° 59'.1	56° 30'.0 N
Shaula	96° 44'.0	37° 05'.9 S
Sirius	258° 47'.4	16° 42'.4 S
Spica	158° 48'.1	11° 07'.3 S
Suhail	223° 03'.8	43° 24'.0 S
Vega	80° 50'.2	38° 46'.5 N
Zuben'ubi	137° 23'.3	16° 00'.6 S

	SHA	Mer.Pass.
Venus	100° 54'.8	09:34
Mars	83° 49'.0	10:42
Jupiter	194° 06'.6	03:20
Saturn	49° 43'.7	12:56

	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
16 00	177° 38'.8	21° 06'.9 S	56° 19'.8	5'.1	23° 38'.2 N	4'.8	59'.2
01	192° 38'.6	06'.4	70° 43'.9	5'.1	43'.0	4'.7	59'.3
02	207° 38'.3	05'.9	85° 08'.0	5'.0	47'.7	4'.5	
03	222° 38'.1	05'.5	99° 32'.0	4'.8	52'.2	4'.3	59'.4
04	237° 37'.9	05'.0	113° 55'.8	4'.8	56'.5	4'.2	
05	252° 37'.7	04'.6	128° 19'.6	4'.7	24° 00'.7 N	4'.1	
06	267° 37'.5	04'.1	142° 43'.3	4'.5	04'.8	3'.8	59'.5
07	282° 37'.2	03'.6	157° 06'.8	4'.5	08'.6	3'.8	
08	297° 37'.0	03'.2	171° 30'.3	4'.4	12'.4	3'.5	59'.6
09	312° 36'.8	02'.7	185° 53'.7	4'.3	15'.9	3'.4	
10	327° 36'.6	02'.2	200° 17'.0	4'.2	19'.3	3'.3	
11	342° 36'.4	01'.8	214° 40'.2	4'.2	22'.6	3'.0	59'.7
12	357° 36'.2	21° 01'.3 S	229° 03'.4	4'.0	24° 25'.6 N	2'.9	59'.7
13	12° 35'.9	00'.8	243° 26'.4	4'.0	28'.5	2'.8	
14	27° 35'.7	00'.4	257° 49'.4	3'.9	31'.3	2'.6	59'.8
15	42° 35'.5	20° 59'.9 S	272° 12'.3	3'.8	33'.9	2'.4	
16	57° 35'.3	59'.4	286° 35'.1	3'.7	36'.3	2'.2	59'.9
17	72° 35'.1	58'.9	300° 57'.8	3'.7	38'.5	2'.1	
18	87° 34'.9	58'.5	315° 20'.5	3'.5	40'.6	1'.8	
19	102° 34'.7	58'.0	329° 43'.0	3'.6	42'.4	1'.8	60'.0
20	117° 34'.4	57'.5	344° 05'.6	3'.4	44'.2	1'.5	
21	132° 34'.2	57'.0	358° 28'.0	3'.4	45'.7	1'.4	
22	147° 34'.0	56'.6	12° 50'.4	3'.3	47'.1	1'.2	60'.1
23	162° 33'.8	56'.1	27° 12'.7	3'.3	48'.3	1'.0	
17 00	177° 33'.6	20° 55'.6 S	41° 35'.0	3'.1	24° 49'.3 N	0'.8	60'.1
01	192° 33'.4	55'.1	55° 57'.1	3'.2	50'.1	0'.7	60'.2
02	207° 33'.2	54'.7	70° 19'.3	3'.1	50'.8	0'.4	
03	222° 33'.0	54'.2	84° 41'.4	3'.0	51'.2	0'.3	
04	237° 32'.7	53'.7	99° 03'.4	3'.0	51'.5	0'.1	60'.3
05	252° 32'.5	53'.2	113° 25'.4	2'.9	51'.6	0'.0	
06	267° 32'.3	52'.7	127° 47'.3	2'.9	51'.6	0'.3	
07	282° 32'.1	52'.3	142° 09'.2	2'.8	51'.3	0'.4	60'.4
08	297° 31'.9	51'.8	156° 31'.0	2'.8	50'.9	0'.6	
09	312° 31'.7	51'.3	170° 52'.8	2'.8	50'.3	0'.8	
10	327° 31'.5	50'.8	185° 14'.6	2'.7	49'.5	1'.0	60'.5
11	342° 31'.3	50'.3	199° 36'.3	2'.7	48'.5	1'.2	
12	357° 31'.1	20° 49'.8 S	213° 58'.0	2'.7	24° 47'.3 N	1'.4	60'.5
13	12° 30'.9	49'.4	228° 19'.7	2'.6	45'.9	1'.5	60'.6
14	27° 30'.6	48'.9	242° 41'.3	2'.7	44'.4	1'.7	
15	42° 30'.4	48'.4	257° 03'.0	2'.6	42'.7	2'.0	
16	57° 30'.2	47'.9	271° 24'.6	2'.5	40'.7	2'.1	60'.7
17	72° 30'.0	47'.4	285° 46'.1	2'.6	38'.6	2'.3	
18	87° 29'.8	46'.9	300° 07'.7	2'.5	36'.3	2'.4	
19	102° 29'.6	46'.4	314° 29'.2	2'.5	33'.9	2'.7	
20	117° 29'.4	45'.9	328° 50'.7	2'.6	31'.2	2'.8	60'.8
21	132° 29'.2	45'.4	343° 12'.3	2'.5	28'.4	3'.1	
22	147° 29'.0	45'.0	357° 33'.8	2'.5	25'.3	3'.2	
23	162° 28'.8	44'.5	11° 55'.3	2'.5	22'.1	3'.4	
18 00	177° 28'.6	20° 44'.0 S	26° 16'.8	2'.5	24° 18'.7 N	3'.6	60'.9
01	192° 28'.4	43'.5	40° 38'.3	2'.5	15'.1	3'.8	
02	207° 28'.2	43'.0	54° 59'.8	2'.5	11'.3	3'.9	
03	222° 28'.0	42'.5	69° 21'.3	2'.5	07'.4	4'.2	
04	237° 27'.8	42'.0	83° 42'.8	2'.6	03'.2	4'.3	61'.0
05	252° 27'.6	41'.5	98° 04'.4	2'.5	23° 58'.9 N	4'.6	
06	267° 27'.4	41'.0	112° 25'.9	2'.6	54'.3	4'.7	
07	282° 27'.2	40'.5	126° 47'.5	2'.5	49'.6	4'.9	
08	297° 27'.0	40'.0	141° 09'.0	2'.6	44'.7	5'.0	61'.1
09	312° 26'.8	39'.5	155° 30'.6	2'.7	39'.7	5'.3	
10	327° 26'.6	39'.0	169° 52'.3	2'.6	34'.4	5'.4	
11	342° 26'.3	38'.5	184° 13'.9	2'.7	29'.0	5'.6	
12	357° 26'.1	20° 38'.0 S	198° 35'.6	2'.7	23° 23'.4 N	5'.8	61'.1
13	12° 25'.9	37'.5	212° 57'.3	2'.7	17'.6	6'.0	61'.2
14	27° 25'.7	37'.0	227° 19'.0	2'.8	11'.6	6'.1	
15	42° 25'.5	36'.5	241° 40'.8	2'.8	05'.5	6'.4	
16	57° 25'.3	36'.0	256° 02'.6	2'.9	22° 59'.1 N	6'.5	
17	72° 25'.1	35'.5	270° 24'.5	2'.8	52'.6	6'.7	
18	87° 24'.9	35'.0	284° 46'.3	3'.0	45'.9	6'.8	61'.3
19	102° 24'.7	34'.5	299° 08'.3	3'.0	39'.1	7'.1	
20	117° 24'.5	34'.0	313° 30'.3	3'.0	32'.0	7'.2	
21	132° 24'.3	33'.5	327° 52'.3	3'.1	24'.8	7'.3	
22	147° 24'.2	32'.9	342° 14'.4	3'.1	17'.5	7'.6	
23	162° 24'.0	32'.4	356° 36'.5	3'.2	09'.9	7'.7	
	SD 16'.3	d 0'.5	SD 16'.3		16'.5	16'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
16	9 24	9 35	12:10	21:06	08:35	12d 84%
17	9 45	9 55	12:10	22:10	09:38	13d 92%
18	10 05	10 15	12:10	23:14	10:42	14d 97%

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1992 January 19, 20, 21 (Sun, Mon, Tue)

GMT	ARIES	VENUS -4.0		MARS +1.4		JUPITER -2.4		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
19 Sunday 00	117° 39'.1	215° 57'.2	21° 45'.3 S	199° 50'.1	23° 53'.5 S	311° 52'.0	7° 26'.1 N	167° 08'.3	18° 51'.8 S
01	132° 41'.6	230° 56'.4	45'.6	214° 50'.5	53'.4	326° 54'.6	26'.2	182° 10'.5	51'.8
02	147° 44'.1	245° 55'.6	45'.9	229° 51'.0	53'.3	341° 57'.2	26'.3	197° 12'.6	51'.7
03	162° 46'.5	260° 54'.8	46'.2	244° 51'.4	53'.2	356° 59'.8	26'.3	212° 14'.8	51'.6
04	177° 49'.0	275° 54'.0	46'.4	259° 51'.8	53'.2	12° 02'.4	26'.4	227° 17'.0	51'.5
05	192° 51'.5	290° 53'.2	46'.7	274° 52'.2	53'.1	27° 05'.0	26'.5	242° 19'.1	51'.5
06	207° 53'.9	305° 52'.3	47'.0	289° 52'.7	53'.0	42° 07'.6	26'.5	257° 21'.3	51'.4
07	222° 56'.4	320° 51'.5	47'.3	304° 53'.1	52'.9	57° 10'.2	26'.6	272° 23'.4	51'.3
08	237° 58'.9	335° 50'.7	47'.6	319° 53'.5	52'.9	72° 12'.8	26'.7	287° 25'.6	51'.2
09	253° 01'.3	350° 49'.9	47'.8	334° 53'.9	52'.8	87° 15'.4	26'.7	302° 27'.8	51'.2
10	268° 03'.8	5° 49'.1	48'.1	349° 54'.3	52'.7	102° 18'.0	26'.8	317° 29'.9	51'.1
11	283° 06'.3	20° 48'.3	48'.4	4° 54'.8	52'.6	117° 20'.6	26'.9	332° 32'.1	51'.0
12	298° 08'.7	35° 47'.5	21° 48'.7 S	19° 55'.2	23° 52'.5 S	132° 23'.2	7° 26'.9 N	347° 34'.2	18° 50'.9 S
13	313° 11'.2	50° 46'.7	48'.9	34° 55'.6	52'.5	147° 25'.8	27'.0	2° 36'.4	50'.9
14	328° 13'.6	65° 45'.8	49'.2	49° 56'.0	52'.4	162° 28'.4	27'.1	17° 38'.6	50'.8
15	343° 16'.1	80° 45'.0	49'.5	64° 56'.4	52'.3	177° 31'.1	27'.1	32° 40'.7	50'.7
16	358° 18'.6	95° 44'.2	49'.8	79° 56'.9	52'.2	192° 33'.7	27'.2	47° 42'.9	50'.6
17	13° 21'.0	110° 43'.4	50'.0	94° 57'.3	52'.1	207° 36'.3	27'.3	62° 45'.0	50'.6
18	28° 23'.5	125° 42'.6	50'.3	109° 57'.7	52'.0	222° 38'.9	27'.4	77° 47'.2	50'.5
19	43° 26'.0	140° 41'.8	50'.6	124° 58'.1	52'.0	237° 41'.5	27'.4	92° 49'.4	50'.4
20	58° 28'.4	155° 41'.0	50'.8	139° 58'.5	51'.9	252° 44'.1	27'.5	107° 51'.5	50'.3
21	73° 30'.9	170° 40'.1	51'.1	154° 59'.0	51'.8	267° 46'.7	27'.6	122° 53'.7	50'.3
22	88° 33'.4	185° 39'.3	51'.4	169° 59'.4	51'.7	282° 49'.3	27'.6	137° 55'.8	50'.2
23	103° 35'.8	200° 38'.5	51'.6	184° 59'.8	51'.6	297° 51'.9	27'.7	152° 58'.0	50'.1
20 Monday 00	118° 38'.3	215° 37'.7	21° 51'.9 S	200° 00'.2	23° 51'.5 S	312° 54'.5	7° 27'.8 N	168° 00'.2	18° 50'.0 S
01	133° 40'.8	230° 36'.9	52'.1	215° 00'.6	51'.4	327° 57'.1	27'.9	183° 02'.3	50'.0
02	148° 43'.2	245° 36'.1	52'.4	230° 01'.1	51'.3	342° 59'.7	27'.9	198° 04'.5	49'.9
03	163° 45'.7	260° 35'.2	52'.7	245° 01'.5	51'.3	358° 02'.3	28'.0	213° 06'.6	49'.8
04	178° 48'.1	275° 34'.4	52'.9	260° 01'.9	51'.2	13° 04'.9	28'.1	228° 08'.8	49'.7
05	193° 50'.6	290° 33'.6	53'.2	275° 02'.3	51'.1	28° 07'.6	28'.1	243° 11'.0	49'.7
06	208° 53'.1	305° 32'.8	53'.4	290° 02'.7	51'.0	43° 10'.2	28'.2	258° 13'.1	49'.6
07	223° 55'.5	320° 32'.0	53'.7	305° 03'.2	50'.9	58° 12'.8	28'.3	273° 15'.3	49'.5
08	238° 58'.0	335° 31'.2	53'.9	320° 03'.6	50'.8	73° 15'.4	28'.4	288° 17'.5	49'.4
09	254° 00'.5	350° 30'.3	54'.2	335° 04'.0	50'.7	88° 18'.0	28'.4	303° 19'.6	49'.4
10	269° 02'.9	5° 29'.5	54'.4	350° 04'.4	50'.6	103° 20'.6	28'.5	318° 21'.8	49'.3
11	284° 05'.4	20° 28'.7	54'.7	5° 04'.8	50'.5	118° 23'.2	28'.6	333° 23'.9	49'.2
12	299° 07'.9	35° 27'.9	21° 54'.9 S	20° 05'.3	23° 50'.4 S	133° 25'.8	7° 28'.6 N	348° 26'.1	18° 49'.2 S
13	314° 10'.3	50° 27'.1	55'.2	35° 05'.7	50'.4	148° 28'.4	28'.7	3° 28'.3	49'.1
14	329° 12'.8	65° 26'.2	55'.4	50° 06'.1	50'.3	163° 31'.0	28'.8	18° 30'.4	49'.0
15	344° 15'.3	80° 25'.4	55'.7	65° 06'.5	50'.2	178° 33'.7	28'.9	33° 32'.6	48'.9
16	359° 17'.7	95° 24'.6	55'.9	80° 06'.9	50'.1	193° 36'.3	28'.9	48° 34'.7	48'.9
17	14° 20'.2	110° 23'.8	56'.2	95° 07'.4	50'.0	208° 38'.9	29'.0	63° 36'.9	48'.8
18	29° 22'.6	125° 22'.9	56'.4	110° 07'.8	49'.9	223° 41'.5	29'.1	78° 39'.1	48'.7
19	44° 25'.1	140° 22'.1	56'.6	125° 08'.2	49'.8	238° 44'.1	29'.2	93° 41'.2	48'.6
20	59° 27'.6	155° 21'.3	56'.9	140° 08'.6	49'.7	253° 46'.7	29'.2	108° 43'.4	48'.6
21	74° 30'.0	170° 20'.5	57'.1	155° 09'.0	49'.6	268° 49'.3	29'.3	123° 45'.5	48'.5
22	89° 32'.5	185° 19'.7	57'.4	170° 09'.5	49'.5	283° 51'.9	29'.4	138° 47'.7	48'.4
23	104° 35'.0	200° 18'.8	57'.6	185° 09'.9	49'.4	298° 54'.6	29'.4	153° 49'.9	48'.3
21 Tuesday 00	119° 37'.4	215° 18'.0	21° 57'.8 S	200° 10'.3	23° 49'.3 S	313° 57'.2	7° 29'.5 N	168° 52'.0	18° 48'.3 S
01	134° 39'.9	230° 17'.2	58'.1	215° 10'.7	49'.2	328° 59'.8	29'.6	183° 54'.2	48'.2
02	149° 42'.4	245° 16'.4	58'.3	230° 11'.1	49'.1	344° 02'.4	29'.7	198° 56'.3	48'.1
03	164° 44'.8	260° 15'.5	58'.5	245° 11'.6	49'.0	359° 05'.0	29'.7	213° 58'.5	48'.0
04	179° 47'.3	275° 14'.7	58'.8	260° 12'.0	48'.9	14° 07'.6	29'.8	229° 00'.7	48'.0
05	194° 49'.8	290° 13'.9	59'.0	275° 12'.4	48'.8	29° 10'.3	29'.9	244° 02'.8	47'.9
06	209° 52'.2	305° 13'.1	59'.2	290° 12'.8	48'.7	44° 12'.9	30'.0	259° 05'.0	47'.8
07	224° 54'.7	320° 12'.2	59'.5	305° 13'.2	48'.6	59° 15'.5	30'.0	274° 07'.1	47'.7
08	239° 57'.1	335° 11'.4	59'.7	320° 13'.7	48'.5	74° 18'.1	30'.1	289° 09'.3	47'.7
09	254° 59'.6	350° 10'.6	59'.9	335° 14'.1	48'.4	89° 20'.7	30'.2	304° 11'.5	47'.6
10	270° 02'.1	5° 09'.8	22° 00'.1 S	350° 14'.5	48'.3	104° 23'.3	30'.3	319° 13'.6	47'.5
11	285° 04'.5	20° 08'.9	00'.4	5° 14'.9	48'.2	119° 26'.0	30'.3	334° 15'.8	47'.4
12	300° 07'.0	35° 08'.1	22° 00'.6 S	20° 15'.3	23° 48'.1 S	134° 28'.6	7° 30'.4 N	349° 17'.9	18° 47'.4 S
13	315° 09'.5	50° 07'.3	00'.8	35° 15'.7	48'.0	149° 31'.2	30'.5	4° 20'.1	47'.3
14	330° 11'.9	65° 06'.5	01'.0	50° 16'.2	47'.9	164° 33'.8	30'.6	19° 22'.3	47'.2
15	345° 14'.4	80° 05'.6	01'.2	65° 16'.6	47'.8	179° 36'.4	30'.6	34° 24'.4	47'.1
16	0° 16'.9	95° 04'.8	01'.5	80° 17'.0	47'.7	194° 39'.0	30'.7	49° 26'.6	47'.1
17	15° 19'.3	110° 04'.0	01'.7	95° 17'.4	47'.6	209° 41'.7	30'.8	64° 28'.7	47'.0
18	30° 21'.8	125° 03'.2	01'.9	110° 17'.8	47'.5	224° 44'.3	30'.9	79° 30'.9	46'.9
19	45° 24'.2	140° 02'.3	02'.1	125° 18'.3	47'.4	239° 46'.9	30'.9	94° 33'.1	46'.8
20	60° 26'.7	155° 01'.5	02'.3	140° 18'.7	47'.3	254° 49'.5	31'.0	109° 35'.2	46'.8
21	75° 29'.2	170° 00'.7	02'.5	155° 19'.1	47'.2	269° 52'.1	31'.1	124° 37'.4	46'.7
22	90° 31'.6	184° 59'.8	02'.8	170° 19'.5	47'.1	284° 54'.8	31'.2	139° 39'.5	46'.6
23	105° 34'.1	199° 59'.0	03'.0	185° 19'.9	46'.9	299° 57'.4	31'.2	154° 41'.7	46'.5
	M.P. 16:03	v -0'.8	d 0'.2	v 0'.4	d 0'.1	v 2'.6	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.2	40° 20'.3 S
Achernar	335° 38'.5	57° 16'.8 S
Acrux	173° 27'.2	63° 03'.2 S
Adhara	255° 24'.7	28° 57'.8 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.4	55° 59'.7 N
Alkaid	153° 11'.3	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.1 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.5	8° 37'.6 S
Alphecca	126° 24'.7	26° 44'.2 N
Alpheratz	358° 00'.3	29° 03'.0 N
Altair	62° 24'.1	8° 50'.8 N
Ankaa	353° 31'.5	42° 21'.1 S
Antares	112° 46'.1	26° 24'.9 S
Arcturus	146° 10'.3	19° 13'.1 N
Atria	108° 02'.8	69° 00'.7 S
Avior	234° 24'.0	59° 29'.1 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.7	52° 41'.6 S
Capella	280° 57'.7	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.2 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.8 S
Dubhe	194° 10'.5	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.2 N
Eltanin	90° 54'.0	51° 29'.2 N
Enif	34° 03'.1	9° 50'.4 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.7	57° 04'.0 S
Gienah	176° 08'.6	17° 30'.0 S
Hadar	149° 10'.8	60° 20'.0 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.3	34° 23'.3 S
Kochab	137° 19'.5	74° 10'.8 N
Markab	13° 54'.5	15° 09'.9 N
Menkar	314° 31'.7	4° 03'.6 N
Menkent	148° 26'.5	36° 19'.8 S
Miaplacidus	221° 42'.3	69° 41'.1 S
Mirfak	309° 03'.1	49° 50'.3 N
Nunki	76° 18'.4	26° 18'.4 S
Peacock	53° 44'.8	56° 45'.7 S
Polaris	324° 02'.3	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.6	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.7 S
Rigil Kent	140° 13'.8	60° 47'.9 S
Sabik	102° 31'.1	15° 43'.0 S
Schedar	349° 59'.1	56° 30'.0 N
Shaula	96° 44'.0	37° 05'.9 S
Sirius	258° 47'.4	16° 42'.4 S
Spica	158° 48'.1	11° 07'.3 S
Suhail	223° 03'.8	43° 24'.1 S
Vega	80° 50'.2	38° 46'.4 N
Zuben'ubi	137° 23'.2	16° 00'.6 S

	SHA	Mer.Pass.
Venus	96° 59'.4	09:38
Mars	81° 21'.9	10:40
Jupiter	194° 16'.2	03:08
Saturn	49° 21'.9	12:46

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
19 00	177° 23'.8	20° 31'.9 S	10° 58'.7	3'.2	22° 02'.2 N	7'.9	61'.3
01	192° 23'.6	31'.4	25° 20'.9	3'.3	21° 54'.3 N	8'.0	61'.4
02	207° 23'.4	30'.9	39° 43'.2	3'.3	46'.3	8'.2	
03	222° 23'.2	30'.4	54° 05'.5	3'.4	38'.1	8'.4	
04	237° 23'.0	29'.9	68° 27'.9	3'.5	29'.7	8'.5	
05	252° 22'.8	29'.4	82° 50'.4	3'.6	21'.2	8'.7	
06	267° 22'.6	28'.9	97° 13'.0	3'.6	12'.5	8'.9	
07	282° 22'.4	28'.3	111° 35'.6	3'.6	03'.6	9'.0	
08	297° 22'.2	27'.8	125° 58'.2	3'.8	20° 54'.6 N	9'.2	
09	312° 22'.0	27'.3	140° 21'.0	3'.8	45'.4	9'.3	
10	327° 21'.8	26'.8	154° 43'.8	3'.9	36'.1	9'.5	61'.5
11	342° 21'.6	26'.3	169° 06'.7	3'.9	26'.6	9'.6	
12	357° 21'.4	20° 25'.8 S	183° 29'.6	4'.0	20° 17'.0 N	9'.8	61'.5
13	12° 21'.2	25'.2	197° 52'.6	4'.1	07'.2	9'.9	
14	27° 21'.0	24'.7	212° 15'.7	4'.2	19° 57'.3 N	10'.1	
15	42° 20'.8	24'.2	226° 38'.9	4'.3	47'.2	10'.2	
16	57° 20'.6	23'.7	241° 02'.2	4'.3	37'.0	10'.3	
17	72° 20'.4	23'.2	255° 25'.5	4'.4	26'.7	10'.5	
18	87° 20'.3	22'.6	269° 48'.9	4'.5	16'.2	10'.7	
19	102° 20'.1	22'.1	284° 12'.4	4'.6	05'.5	10'.8	
20	117° 19'.9	21'.6	298° 36'.0	4'.6	18° 54'.7 N	10'.9	
21	132° 19'.7	21'.1	312° 59'.6	4'.8	43'.8	11'.0	
22	147° 19'.5	20'.6	327° 23'.4	4'.8	32'.8	11'.2	
23	162° 19'.3	20'.0	341° 47'.2	4'.9	21'.6	11'.3	
20 00	177° 19'.1	20° 19'.5 S	356° 11'.1	5'.0	18° 10'.3 N	11'.4	61'.5
01	192° 18'.9	19'.0	10° 35'.1	5'.0	17° 58'.9 N	11'.6	
02	207° 18'.7	18'.4	24° 59'.1	5'.2	47'.3	11'.6	
03	222° 18'.5	17'.9	39° 23'.3	5'.3	35'.7	11'.8	
04	237° 18'.4	17'.4	53° 47'.6	5'.3	23'.9	11'.9	
05	252° 18'.2	16'.9	68° 11'.9	5'.4	12'.0	12'.1	
06	267° 18'.0	16'.3	82° 36'.3	5'.5	16° 59'.9 N	12'.1	
07	282° 17'.8	15'.8	97° 00'.8	5'.6	47'.8	12'.3	
08	297° 17'.6	15'.3	111° 25'.4	5'.7	35'.5	12'.4	
09	312° 17'.4	14'.7	125° 50'.1	5'.8	23'.1	12'.5	
10	327° 17'.2	14'.2	140° 14'.9	5'.9	10'.6	12'.5	
11	342° 17'.0	13'.7	154° 39'.8	5'.9	15° 58'.1 N	12'.7	61'.4
12	357° 16'.9	20° 13'.1 S	169° 04'.7	6'.1	15° 45'.4 N	12'.8	61'.4
13	12° 16'.7	12'.6	183° 29'.8	6'.1	32'.6	12'.9	
14	27° 16'.5	12'.1	197° 54'.9	6'.2	19'.7	13'.0	
15	42° 16'.3	11'.5	212° 20'.1	6'.3	06'.7	13'.1	
16	57° 16'.1	11'.0	226° 45'.4	6'.4	14° 53'.6 N	13'.2	
17	72° 15'.9	10'.5	241° 10'.8	6'.5	40'.4	13'.3	
18	87° 15'.7	09'.9	255° 36'.3	6'.6	27'.1	13'.4	
19	102° 15'.6	09'.4	270° 01'.9	6'.7	13'.7	13'.4	
20	117° 15'.4	08'.9	284° 27'.6	6'.7	00'.3	13'.6	
21	132° 15'.2	08'.3	298° 53'.3	6'.9	13° 46'.7 N	13'.6	61'.3
22	147° 15'.0	07'.8	313° 19'.2	6'.9	33'.1	13'.7	
23	162° 14'.8	07'.2	327° 45'.1	7'.0	19'.4	13'.8	
21 00	177° 14'.6	20° 06'.7 S	342° 11'.1	7'.2	13° 05'.6 N	13'.9	61'.3
01	192° 14'.5	06'.1	356° 37'.3	7'.2	12° 51'.7 N	13'.9	
02	207° 14'.3	05'.6	11° 03'.5	7'.2	37'.8	14'.0	
03	222° 14'.1	05'.1	25° 29'.7	7'.4	23'.8	14'.1	
04	237° 13'.9	04'.5	39° 56'.1	7'.5	09'.7	14'.2	61'.2
05	252° 13'.7	04'.0	54° 22'.6	7'.5	11° 55'.5 N	14'.2	
06	267° 13'.6	03'.4	68° 49'.1	7'.6	41'.3	14'.3	
07	282° 13'.4	02'.9	83° 15'.7	7'.8	27'.0	14'.3	
08	297° 13'.2	02'.3	97° 42'.5	7'.8	12'.7	14'.4	
09	312° 13'.0	01'.8	112° 09'.3	7'.8	10° 58'.3 N	14'.5	61'.1
10	327° 12'.8	01'.2	126° 36'.1	8'.0	43'.8	14'.5	
11	342° 12'.7	00'.7	141° 03'.1	8'.0	29'.3	14'.6	
12	357° 12'.5	20° 00'.1 S	155° 30'.1	8'.2	10° 14'.7 N	14'.6	61'.1
13	12° 12'.3	19° 59'.6 S	169° 57'.3	8'.2	00'.1	14'.7	
14	27° 12'.1	59'.0	184° 24'.5	8'.3	9° 45'.4 N	14'.8	61'.0
15	42° 11'.9	58'.5	198° 51'.8	8'.3	30'.6	14'.7	
16	57° 11'.8	57'.9	213° 19'.1	8'.5	15'.9	14'.9	
17	72° 11'.6	57'.4	227° 46'.6	8'.5	01'.0	14'.8	
18	87° 11'.4	56'.8	242° 14'.1	8'.6	8° 46'.2 N	14'.9	60'.9
19	102° 11'.2	56'.3	256° 41'.7	8'.7	31'.3	15'.0	
20	117° 11'.1	55'.7	271° 09'.4	8'.7	16'.3	14'.9	
21	132° 10'.9	55'.2	285° 37'.1	8'.8	01'.4	15'.1	
22	147° 10'.7	54'.6	300° 04'.9	8'.9	7° 46'.3 N	15'.0	60'.8
23	162° 10'.5	54'.1	314° 32'.8	9'.0	31'.3	15'.1	
	SD 16'.3	d 0'.5	SD 16'.7		16'.7	16'.6	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
19	10 25	10 34	12:11	24:16	11:45	15d Full
20	10 43	10 52	12:11	00:16	12:45	16d 99%
21	11 01	11 10	12:11	01:14	13:42	17d 96%

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1992 January 22, 23, 24 (Wed, Thur, Fri)

GMT	ARIES	VENUS -4.0		MARS +1.4		JUPITER -2.4		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
22 Wednesday 00	120° 36'.6	214° 58'.2	22° 03'.2 S	200° 20'.4	23° 46'.8 S	315° 00'.0	7° 31'.3 N	169° 43'.9	18° 46'.5 S
01	135° 39'.0	229° 57'.4	03'.4	215° 20'.8	46'.7	330° 02'.6	31'.4	184° 46'.0	46'.4
02	150° 41'.5	244° 56'.5	03'.6	230° 21'.2	46'.6	345° 05'.2	31'.5	199° 48'.2	46'.3
03	165° 44'.0	259° 55'.7	03'.8	245° 21'.6	46'.5	0° 07'.9	31'.5	214° 50'.3	46'.2
04	180° 46'.4	274° 54'.9	04'.0	260° 22'.0	46'.4	15° 10'.5	31'.6	229° 52'.5	46'.2
05	195° 48'.9	289° 54'.0	04'.2	275° 22'.5	46'.3	30° 13'.1	31'.7	244° 54'.7	46'.1
06	210° 51'.4	304° 53'.2	04'.4	290° 22'.9	46'.2	45° 15'.7	31'.8	259° 56'.8	46'.0
07	225° 53'.8	319° 52'.4	04'.6	305° 23'.3	46'.1	60° 18'.4	31'.9	274° 59'.0	45'.9
08	240° 56'.3	334° 51'.5	04'.8	320° 23'.7	46'.0	75° 21'.0	31'.9	290° 01'.1	45'.9
09	255° 58'.7	349° 50'.7	05'.0	335° 24'.1	45'.8	90° 23'.6	32'.0	305° 03'.3	45'.8
10	271° 01'.2	4° 49'.9	05'.2	350° 24'.5	45'.7	105° 26'.2	32'.1	320° 05'.5	45'.7
11	286° 03'.7	19° 49'.1	05'.4	5° 25'.0	45'.6	120° 28'.9	32'.2	335° 07'.6	45'.6
12	301° 06'.1	34° 48'.2	22° 05'.6 S	20° 25'.4	23° 45'.5 S	135° 31'.5	7° 32'.2 N	350° 09'.8	18° 45'.6 S
13	316° 08'.6	49° 47'.4	05'.8	35° 25'.8	45'.4	150° 34'.1	32'.3	5° 11'.9	45'.5
14	331° 11'.1	64° 46'.6	06'.0	50° 26'.2	45'.3	165° 36'.7	32'.4	20° 14'.1	45'.4
15	346° 13'.5	79° 45'.7	06'.2	65° 26'.6	45'.2	180° 39'.4	32'.5	35° 16'.3	45'.3
16	1° 16'.0	94° 44'.9	06'.4	80° 27'.1	45'.1	195° 42'.0	32'.5	50° 18'.4	45'.3
17	16° 18'.5	109° 44'.1	06'.6	95° 27'.5	44'.9	210° 44'.6	32'.6	65° 20'.6	45'.2
18	31° 20'.9	124° 43'.2	06'.8	110° 27'.9	44'.8	225° 47'.2	32'.7	80° 22'.7	45'.1
19	46° 23'.4	139° 42'.4	06'.9	125° 28'.3	44'.7	240° 49'.9	32'.8	95° 24'.9	45'.0
20	61° 25'.9	154° 41'.6	07'.1	140° 28'.7	44'.6	255° 52'.5	32'.9	110° 27'.1	45'.0
21	76° 28'.3	169° 40'.7	07'.3	155° 29'.2	44'.5	270° 55'.1	32'.9	125° 29'.2	44'.9
22	91° 30'.8	184° 39'.9	07'.5	170° 29'.6	44'.4	285° 57'.7	33'.0	140° 31'.4	44'.8
23	106° 33'.2	199° 39'.1	07'.7	185° 30'.0	44'.2	301° 00'.4	33'.1	155° 33'.5	44'.7
23 Thursday 00	121° 35'.7	214° 38'.2	22° 07'.9 S	200° 30'.4	23° 44'.1 S	316° 03'.0	7° 33'.2 N	170° 35'.7	18° 44'.7 S
01	136° 38'.2	229° 37'.4	08'.1	215° 30'.8	44'.0	331° 05'.6	33'.3	185° 37'.9	44'.6
02	151° 40'.6	244° 36'.6	08'.2	230° 31'.2	43'.9	346° 08'.3	33'.3	200° 40'.0	44'.5
03	166° 43'.1	259° 35'.7	08'.4	245° 31'.7	43'.8	1° 10'.9	33'.4	215° 42'.2	44'.4
04	181° 45'.6	274° 34'.9	08'.6	260° 32'.1	43'.6	16° 13'.5	33'.5	230° 44'.3	44'.4
05	196° 48'.0	289° 34'.0	08'.8	275° 32'.5	43'.5	31° 16'.1	33'.6	245° 46'.5	44'.3
06	211° 50'.5	304° 33'.2	08'.9	290° 32'.9	43'.4	46° 18'.8	33'.7	260° 48'.7	44'.2
07	226° 53'.0	319° 32'.4	09'.1	305° 33'.3	43'.3	61° 21'.4	33'.7	275° 50'.8	44'.1
08	241° 55'.4	334° 31'.5	09'.3	320° 33'.8	43'.2	76° 24'.0	33'.8	290° 53'.0	44'.1
09	256° 57'.9	349° 30'.7	09'.5	335° 34'.2	43'.0	91° 26'.7	33'.9	305° 55'.1	44'.0
10	272° 00'.3	4° 29'.9	09'.6	350° 34'.6	42'.9	106° 29'.3	34'.0	320° 57'.3	43'.9
11	287° 02'.8	19° 29'.0	09'.8	5° 35'.0	42'.8	121° 31'.9	34'.1	335° 59'.5	43'.8
12	302° 05'.3	34° 28'.2	22° 10'.0 S	20° 35'.4	23° 42'.7 S	136° 34'.6	7° 34'.1 N	351° 01'.6	18° 43'.8 S
13	317° 07'.7	49° 27'.4	10'.1	35° 35'.8	42'.5	151° 37'.2	34'.2	6° 03'.8	43'.7
14	332° 10'.2	64° 26'.5	10'.3	50° 36'.3	42'.4	166° 39'.8	34'.3	21° 05'.9	43'.6
15	347° 12'.7	79° 25'.7	10'.5	65° 36'.7	42'.3	181° 42'.4	34'.4	36° 08'.1	43'.5
16	2° 15'.1	94° 24'.8	10'.6	80° 37'.1	42'.2	196° 45'.1	34'.5	51° 10'.3	43'.5
17	17° 17'.6	109° 24'.0	10'.8	95° 37'.5	42'.0	211° 47'.7	34'.5	66° 12'.4	43'.4
18	32° 20'.1	124° 23'.2	11'.0	110° 37'.9	41'.9	226° 50'.3	34'.6	81° 14'.6	43'.3
19	47° 22'.5	139° 22'.3	11'.1	125° 38'.4	41'.8	241° 53'.0	34'.7	96° 16'.7	43'.2
20	62° 25'.0	154° 21'.5	11'.3	140° 38'.8	41'.6	256° 55'.6	34'.8	111° 18'.9	43'.2
21	77° 27'.5	169° 20'.6	11'.5	155° 39'.2	41'.5	271° 58'.2	34'.9	126° 21'.0	43'.1
22	92° 29'.9	184° 19'.8	11'.6	170° 39'.6	41'.4	287° 00'.9	34'.9	141° 23'.2	43'.0
23	107° 32'.4	199° 19'.0	11'.8	185° 40'.0	41'.3	302° 03'.5	35'.0	156° 25'.4	42'.9
24 Friday 00	122° 34'.8	214° 18'.1	22° 11'.9 S	200° 40'.4	23° 41'.1 S	317° 06'.1	7° 35'.1 N	171° 27'.5	18° 42'.9 S
01	137° 37'.3	229° 17'.3	12'.1	215° 40'.9	41'.0	332° 08'.8	35'.2	186° 29'.7	42'.8
02	152° 39'.8	244° 16'.5	12'.2	230° 41'.3	40'.9	347° 11'.4	35'.3	201° 31'.8	42'.7
03	167° 42'.2	259° 15'.6	12'.4	245° 41'.7	40'.7	2° 14'.1	35'.3	216° 34'.0	42'.6
04	182° 44'.7	274° 14'.8	12'.5	260° 42'.1	40'.6	17° 16'.7	35'.4	231° 36'.2	42'.6
05	197° 47'.2	289° 13'.9	12'.7	275° 42'.5	40'.5	32° 19'.3	35'.5	246° 38'.3	42'.5
06	212° 49'.6	304° 13'.1	12'.8	290° 43'.0	40'.3	47° 22'.0	35'.6	261° 40'.5	42'.4
07	227° 52'.1	319° 12'.2	13'.0	305° 43'.4	40'.2	62° 24'.6	35'.7	276° 42'.6	42'.3
08	242° 54'.6	334° 11'.4	13'.1	320° 43'.8	40'.1	77° 27'.2	35'.8	291° 44'.8	42'.3
09	257° 57'.0	349° 10'.6	13'.3	335° 44'.2	40'.0	92° 29'.9	35'.8	306° 47'.0	42'.2
10	272° 59'.5	4° 09'.7	13'.4	350° 44'.6	39'.8	107° 32'.5	35'.9	321° 49'.1	42'.1
11	288° 01'.9	19° 08'.9	13'.6	5° 45'.0	39'.7	122° 35'.1	36'.0	336° 51'.3	42'.0
12	303° 04'.4	34° 08'.0	22° 13'.7 S	20° 45'.5	23° 39'.5 S	137° 37'.8	7° 36'.1 N	351° 53'.4	18° 41'.9 S
13	318° 06'.9	49° 07'.2	13'.9	35° 45'.9	39'.4	152° 40'.4	36'.2	6° 55'.6	41'.9
14	333° 09'.3	64° 06'.4	14'.0	50° 46'.3	39'.3	167° 43'.1	36'.3	21° 57'.8	41'.8
15	348° 11'.8	79° 05'.5	14'.1	65° 46'.7	39'.1	182° 45'.7	36'.3	36° 59'.9	41'.7
16	3° 14'.3	94° 04'.7	14'.3	80° 47'.1	39'.0	197° 48'.3	36'.4	52° 02'.1	41'.6
17	18° 16'.7	109° 03'.8	14'.4	95° 47'.6	38'.9	212° 51'.0	36'.5	67° 04'.2	41'.6
18	33° 19'.2	124° 03'.0	14'.5	110° 48'.0	38'.7	227° 53'.6	36'.6	82° 06'.4	41'.5
19	48° 21'.7	139° 02'.1	14'.7	125° 48'.4	38'.6	242° 56'.3	36'.7	97° 08'.6	41'.4
20	63° 24'.1	154° 01'.3	14'.8	140° 48'.8	38'.5	257° 58'.9	36'.8	112° 10'.7	41'.3
21	78° 26'.6	169° 00'.5	14'.9	155° 49'.2	38'.3	273° 01'.5	36'.8	127° 12'.9	41'.3
22	93° 29'.1	183° 59'.6	15'.1	170° 49'.6	38'.2	288° 04'.2	36'.9	142° 15'.0	41'.2
23	108° 31'.5	198° 58'.8	15'.2	185° 50'.1	38'.0	303° 06'.8	37'.0	157° 17'.2	41'.1
	M.P. 15:51	v -0'.8	d 0'.2	v 0'.4	d 0'.1	v 2'.6	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.3	40° 20'.3 S
Achernar	335° 38'.5	57° 16'.8 S
Acrux	173° 27'.2	63° 03'.2 S
Adhara	255° 24'.7	28° 57'.8 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.3	55° 59'.7 N
Alkaid	153° 11'.3	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.1 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.5	8° 37'.6 S
Alphecca	126° 24'.6	26° 44'.2 N
Alpheratz	358° 00'.3	29° 03'.0 N
Altair	62° 24'.1	8° 50'.8 N
Ankaa	353° 31'.5	42° 21'.1 S
Antares	112° 46'.1	26° 24'.9 S
Arcturus	146° 10'.3	19° 13'.1 N
Atria	108° 02'.8	69° 00'.7 S
Avior	234° 24'.0	59° 29'.1 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.7	52° 41'.6 S
Capella	280° 57'.7	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.2 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.9 S
Dubhe	194° 10'.5	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.2 N
Eltanin	90° 54'.0	51° 29'.2 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.7	57° 04'.0 S
Gienah	176° 08'.6	17° 30'.0 S
Hadar	149° 10'.8	60° 20'.0 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.3	34° 23'.3 S
Kochab	137° 19'.4	74° 10'.8 N
Markab	13° 54'.5	15° 09'.9 N
Menkar	314° 31'.7	4° 03'.6 N
Menkent	148° 26'.5	36° 19'.8 S
Miaplacidus	221° 42'.3	69° 41'.1 S
Mirfak	309° 03'.1	49° 50'.3 N
Nunki	76° 18'.4	26° 18'.4 S
Peacock	53° 44'.8	56° 45'.7 S
Polaris	324° 03'.6	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.5	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.7 S
Rigil Kent	140° 13'.7	60° 47'.9 S
Sabik	102° 31'.1	15° 43'.0 S
Schedar	349° 59'.1	56° 30'.0 N
Shaula	96° 43'.9	37° 05'.9 S
Sirius	258° 47'.4	16° 42'.4 S
Spica	158° 48'.1	11° 07'.3 S
Suhail	223° 03'.8	43° 24'.1 S
Vega	80° 50'.2	38° 46'.4 N
Zuben'ubi	137° 23'.2	16° 00'.6 S

	SHA	Mer.Pass.
Venus	93° 02'.5	09:42
Mars	78° 54'.7	10:38
Jupiter	194° 27'.3	02:55
Saturn	49° 00'.0	12:36

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
22 Wednesday 00	177° 10'.4	19° 53'.5 S	329° 00'.8	9'.0	7° 16'.2 N	15'.1	60'.8
01	192° 10'.2	52'.9	343° 28'.8	9'.1	01'.1	15'.1	
02	207° 10'.0	52'.4	357° 56'.9	9'.2	6° 46'.0 N	15'.2	60'.7
03	222° 09'.8	51'.8	12° 25'.1	9'.3	30'.8	15'.2	
04	237° 09'.7	51'.3	26° 53'.4	9'.3	15'.6	15'.2	
05	252° 09'.5	50'.7	41° 21'.7	9'.4	00'.4	15'.2	60'.6
06	267° 09'.3	50'.1	55° 50'.1	9'.4	5° 45'.2 N	15'.2	
07	282° 09'.2	49'.6	70° 18'.5	9'.5	30'.0	15'.3	
08	297° 09'.0	49'.0	84° 47'.0	9'.6	14'.7	15'.2	
09	312° 08'.8	48'.5	99° 15'.6	9'.7	4° 59'.5 N	15'.3	60'.5
10	327° 08'.6	47'.9	113° 44'.3	9'.7	44'.2	15'.3	
11	342° 08'.5	47'.3	128° 13'.0	9'.7	28'.9	15'.3	
12	357° 08'.3	19° 46'.8 S	142° 41'.7	9'.9	4° 13'.6 N	15'.3	60'.4
13	12° 08'.1	46'.2	157° 10'.6	9'.9	3° 58'.3 N	15'.3	
14	27° 08'.0	45'.6	171° 39'.5	9'.9	43'.0	15'.4	
15	42° 07'.8	45'.1	186° 08'.4	10'.0	27'.6	15'.3	60'.3
16	57° 07'.6	44'.5	200° 37'.4	10'.1	12'.3	15'.3	
17	72° 07'.4	43'.9	215° 06'.5	10'.1	2° 57'.0 N	15'.3	
18	87° 07'.3	43'.4	229° 35'.6	10'.1	41'.7	15'.3	60'.2
19	102° 07'.1	42'.8	244° 04'.7	10'.2	26'.4	15'.3	
20	117° 06'.9	42'.2	258° 33'.9	10'.3	11'.1	15'.3	
21	132° 06'.8	41'.7	273° 03'.2	10'.3	1° 55'.8 N	15'.3	60'.1
22	147° 06'.6	41'.1	287° 32'.5	10'.4	40'.5	15'.3	
23	162° 06'.4	40'.5	302° 01'.9	10'.4	25'.2	15'.3	
23 Thursday 00	177° 06'.3	19° 39'.9 S	316° 31'.3	10'.5	1° 09'.9 N	15'.2	60'.0
01	192° 06'.1	39'.4	331° 00'.8	10'.5	0° 54'.7 N	15'.3	
02	207° 05'.9	38'.8	345° 30'.3	10'.6	39'.4	15'.2	59'.9
03	222° 05'.8	38'.2	359° 59'.9	10'.6	24'.2	15'.2	
04	237° 05'.6	37'.6	14° 29'.5	10'.6	09'.0	15'.2	
05	252° 05'.4	37'.1	28° 59'.1	10'.7	0° 06'.2 S	15'.2	59'.8
06	267° 05'.3	36'.5	43° 28'.8	10'.7	21'.4	15'.1	
07	282° 05'.1	35'.9	57° 58'.5	10'.8	36'.5	15'.1	
08	297° 05'.0	35'.3	72° 28'.3	10'.8	51'.6	15'.1	59'.7
09	312° 04'.8	34'.8	86° 58'.1	10'.8	1° 06'.7 S	15'.1	
10	327° 04'.6	34'.2	101° 27'.9	10'.9	21'.8	15'.1	
11	342° 04'.5	33'.6	115° 57'.8	10'.9	36'.9	15'.0	59'.6
12	357° 04'.3	19° 33'.0 S	130° 27'.7	11'.0	1° 51'.9 S	15'.0	59'.6
13	12° 04'.1	32'.4	144° 57'.7	11'.0	2° 06'.9 S	14'.9	59'.5
14	27° 04'.0	31'.9	159° 27'.7	11'.0	21'.8	14'.9	
15	42° 03'.8	31'.3	173° 57'.7	11'.0	36'.7	14'.9	
16	57° 03'.7	30'.7	188° 27'.7	11'.1	51'.6	14'.9	59'.4
17	72° 03'.5	30'.1	202° 57'.8	11'.1	3° 06'.5 S	14'.8	
18	87° 03'.3	29'.5	217° 27'.9	11'.2	21'.3	14'.8	59'.3
19	102° 03'.2	28'.9	231° 58'.1	11'.1	36'.1	14'.7	
20	117° 03'.0	28'.4	246° 28'.2	11'.2	50'.8	14'.7	
21	132° 02'.9	27'.8	260° 58'.4	11'.3	4° 05'.5 S	14'.7	59'.2
22	147° 02'.7	27'.2	275° 28'.7	11'.2	20'.2	14'.6	
23	162° 02'.5	26'.6	289° 58'.9	11'.3	34'.8	14'.5	
24 Friday 00	177° 02'.4	19° 26'.0 S	304° 29'.2	11'.3	4° 49'.3 S	14'.6	59'.1
01	192° 02'.2	25'.4	318° 59'.5	11'.3	5° 03'.9 S	14'.4	
02	207° 02'.1	24'.8	333° 29'.8	11'.3	18'.3	14'.5	59'.0
03	222° 01'.9	24'.2	348° 00'.1	11'.4	32'.8	14'.3	
04	237° 01'.7	23'.7	2° 30'.5	11'.3	47'.1	14'.4	
05	252° 01'.6	23'.1	17° 00'.8	11'.4	6° 01'.5 S	14'.2	58'.9
06	267° 01'.4	22'.5	31° 31'.2	11'.4	15'.7	14'.2	
07	282° 01'.3	21'.9	46° 01'.6	11'.4	29'.9	14'.2	58'.8
08	297° 01'.1	21'.3	60° 32'.0	11'.5	44'.1	14'.1	
09	312° 01'.0	20'.7	75° 02'.5	11'.4	58'.2	14'.1	
10	327° 00'.8	20'.1	89° 32'.9	11'.5	7° 12'.3 S	14'.0	58'.7
11	342° 00'.6	19'.5	104° 03'.4	11'.5	26'.3	13'.9	
12	357° 00'.5	19° 18'.9 S	118° 33'.9	11'.4	7° 40'.2 S	13'.9	58'.6
13	12° 00'.3	18'.3	133° 04'.3	11'.5	54'.1	13'.8	
14	27° 00'.2	17'.7	147° 34'.8	11'.5	8° 07'.9 S	13'.8	58'.5
15	42° 00'.0	17'.1	162° 05'.3	11'.5	21'.7	13'.7	
16	56° 59'.9	16'.5	176° 35'.8	11'.6	35'.4	13'.6	
17	71° 59'.7	15'.9	191° 06'.4	11'.5	49'.0	13'.6	58'.4
18	86° 59'.6	15'.3	205° 36'.9	11'.5	9° 02'.6 S	13'.5	
19	101° 59'.4	14'.7	220° 07'.4	11'.6	16'.1	13'.4	58'.3
20	116° 59'.3	14'.1	234° 38'.0	11'.5	29'.5	13'.4	
21	131° 59'.1	13'.5	249° 08'.5	11'.5	42'.9	13'.2	
22	146° 59'.0	12'.9	263° 39'.0	11'.6	56'.1	13'.3	58'.2
23	161° 58'.8	12'.3	278° 09'.6	11'.5	10° 09'.4 S	13'.1	
	SD 16'.2	d 0'.6	SD 16'.5		16'.2	16'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
22	11 18	11 26	12:11	02:09	14:35	18d 90%
23	11 35	11 42	12:12	03:00	15:25	19d 82%
24	11 50	11 58	12:12	03:50	16:14	20d 72%

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1992 January 25, 26, 27 (Sat, Sun, Mon)

GMT	ARIES	VENUS -4.0		MARS +1.4		JUPITER -2.4		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
25 Saturday 00	123° 34'.0	213° 57'.9	22° 15'.3 S	200° 50'.5	23° 37'.9 S	318° 09'.5	7° 37'.1 N	172° 19'.4	18° 41'.0 S
01	138° 36'.4	228° 57'.1	15'.5	215° 50'.9	37'.8	333° 12'.1	37'.2	187° 21'.5	41'.0
02	153° 38'.9	243° 56'.2	15'.6	230° 51'.3	37'.6	348° 14'.7	37'.3	202° 23'.7	40'.9
03	168° 41'.4	258° 55'.4	15'.7	245° 51'.7	37'.5	3° 17'.4	37'.3	217° 25'.8	40'.8
04	183° 43'.8	273° 54'.5	15'.8	260° 52'.2	37'.3	18° 20'.0	37'.4	232° 28'.0	40'.7
05	198° 46'.3	288° 53'.7	16'.0	275° 52'.6	37'.2	33° 22'.7	37'.5	247° 30'.1	40'.7
06	213° 48'.8	303° 52'.9	16'.1	290° 53'.0	37'.0	48° 25'.3	37'.6	262° 32'.3	40'.6
07	228° 51'.2	318° 52'.0	16'.2	305° 53'.4	36'.9	63° 27'.9	37'.7	277° 34'.5	40'.5
08	243° 53'.7	333° 51'.2	16'.3	320° 53'.8	36'.8	78° 30'.6	37'.8	292° 36'.6	40'.4
09	258° 56'.2	348° 50'.3	16'.5	335° 54'.2	36'.6	93° 33'.2	37'.8	307° 38'.8	40'.4
10	273° 58'.6	3° 49'.5	16'.6	350° 54'.7	36'.5	108° 35'.9	37'.9	322° 40'.9	40'.3
11	289° 01'.1	18° 48'.6	16'.7	5° 55'.1	36'.3	123° 38'.5	38'.0	337° 43'.1	40'.2
12	304° 03'.6	33° 47'.8	22° 16'.8 S	20° 55'.5	23° 36'.2 S	138° 41'.2	7° 38'.1 N	352° 45'.3	18° 40'.1 S
13	319° 06'.0	48° 46'.9	16'.9	35° 55'.9	36'.0	153° 43'.8	38'.2	7° 47'.4	40'.1
14	334° 08'.5	63° 46'.1	17'.0	50° 56'.3	35'.9	168° 46'.5	38'.3	22° 49'.6	40'.0
15	349° 10'.9	78° 45'.2	17'.1	65° 56'.8	35'.7	183° 49'.1	38'.4	37° 51'.7	39'.9
16	4° 13'.4	93° 44'.4	17'.3	80° 57'.2	35'.6	198° 51'.7	38'.4	52° 53'.9	39'.8
17	19° 15'.9	108° 43'.6	17'.4	95° 57'.6	35'.4	213° 54'.4	38'.5	67° 56'.1	39'.8
18	34° 18'.3	123° 42'.7	17'.5	110° 58'.0	35'.3	228° 57'.0	38'.6	82° 58'.2	39'.7
19	49° 20'.8	138° 41'.9	17'.6	125° 58'.4	35'.2	243° 59'.7	38'.7	98° 00'.4	39'.6
20	64° 23'.3	153° 41'.0	17'.7	140° 58'.8	35'.0	259° 02'.3	38'.8	113° 02'.5	39'.5
21	79° 25'.7	168° 40'.2	17'.8	155° 59'.3	34'.9	274° 05'.0	38'.9	128° 04'.7	39'.5
22	94° 28'.2	183° 39'.3	17'.9	170° 59'.7	34'.7	289° 07'.6	39'.0	143° 06'.9	39'.4
23	109° 30'.7	198° 38'.5	18'.0	186° 00'.1	34'.6	304° 10'.3	39'.0	158° 09'.0	39'.3
26 Sunday 00	124° 33'.1	213° 37'.6	22° 18'.1 S	201° 00'.5	23° 34'.4 S	319° 12'.9	7° 39'.1 N	173° 11'.2	18° 39'.2 S
01	139° 35'.6	228° 36'.8	18'.2	216° 00'.9	34'.3	334° 15'.6	39'.2	188° 13'.3	39'.1
02	154° 38'.0	243° 35'.9	18'.3	231° 01'.4	34'.1	349° 18'.2	39'.3	203° 15'.5	39'.1
03	169° 40'.5	258° 35'.1	18'.4	246° 01'.8	33'.9	4° 20'.9	39'.4	218° 17'.6	39'.0
04	184° 43'.0	273° 34'.2	18'.5	261° 02'.2	33'.8	19° 23'.5	39'.5	233° 19'.8	38'.9
05	199° 45'.4	288° 33'.4	18'.6	276° 02'.6	33'.6	34° 26'.2	39'.6	248° 22'.0	38'.8
06	214° 47'.9	303° 32'.5	18'.7	291° 03'.0	33'.5	49° 28'.8	39'.7	263° 24'.1	38'.8
07	229° 50'.4	318° 31'.7	18'.8	306° 03'.4	33'.3	64° 31'.5	39'.7	278° 26'.3	38'.7
08	244° 52'.8	333° 30'.8	18'.9	321° 03'.9	33'.2	79° 34'.1	39'.8	293° 28'.4	38'.6
09	259° 55'.3	348° 30'.0	19'.0	336° 04'.3	33'.0	94° 36'.8	39'.9	308° 30'.6	38'.5
10	274° 57'.8	3° 29'.1	19'.1	351° 04'.7	32'.9	109° 39'.4	40'.0	323° 32'.8	38'.5
11	290° 00'.2	18° 28'.3	19'.2	6° 05'.1	32'.7	124° 42'.1	40'.1	338° 34'.9	38'.4
12	305° 02'.7	33° 27'.4	22° 19'.2 S	21° 05'.5	23° 32'.6 S	139° 44'.7	7° 40'.2 N	353° 37'.1	18° 38'.3 S
13	320° 05'.2	48° 26'.6	19'.3	36° 06'.0	32'.4	154° 47'.4	40'.3	8° 39'.2	38'.2
14	335° 07'.6	63° 25'.7	19'.4	51° 06'.4	32'.2	169° 50'.0	40'.4	23° 41'.4	38'.2
15	350° 10'.1	78° 24'.9	19'.5	66° 06'.8	32'.1	184° 52'.7	40'.4	38° 43'.6	38'.1
16	5° 12'.5	93° 24'.0	19'.6	81° 07'.2	31'.9	199° 55'.3	40'.5	53° 45'.7	38'.0
17	20° 15'.0	108° 23'.2	19'.7	96° 07'.6	31'.8	214° 58'.0	40'.6	68° 47'.9	37'.9
18	35° 17'.5	123° 22'.3	19'.7	111° 08'.0	31'.6	230° 00'.6	40'.7	83° 50'.0	37'.9
19	50° 19'.9	138° 21'.5	19'.8	126° 08'.5	31'.5	245° 03'.3	40'.8	98° 52'.2	37'.8
20	65° 22'.4	153° 20'.6	19'.9	141° 08'.9	31'.3	260° 05'.9	40'.9	113° 54'.4	37'.7
21	80° 24'.9	168° 19'.8	20'.0	156° 09'.3	31'.1	275° 08'.6	41'.0	128° 56'.5	37'.6
22	95° 27'.3	183° 18'.9	20'.1	171° 09'.7	31'.0	290° 11'.2	41'.1	143° 58'.7	37'.6
23	110° 29'.8	198° 18'.1	20'.1	186° 10'.1	30'.8	305° 13'.9	41'.2	159° 00'.8	37'.5
27 Monday 00	125° 32'.3	213° 17'.2	22° 20'.2 S	201° 10'.6	23° 30'.7 S	320° 16'.5	7° 41'.2 N	174° 03'.0	18° 37'.4 S
01	140° 34'.7	228° 16'.4	20'.3	216° 11'.0	30'.5	335° 19'.2	41'.3	189° 05'.1	37'.3
02	155° 37'.2	243° 15'.5	20'.4	231° 11'.4	30'.3	350° 21'.8	41'.4	204° 07'.3	37'.2
03	170° 39'.7	258° 14'.7	20'.4	246° 11'.8	30'.2	5° 24'.5	41'.5	219° 09'.5	37'.2
04	185° 42'.1	273° 13'.8	20'.5	261° 12'.2	30'.0	20° 27'.2	41'.6	234° 11'.6	37'.1
05	200° 44'.6	288° 13'.0	20'.6	276° 12'.6	29'.8	35° 29'.8	41'.7	249° 13'.8	37'.0
06	215° 47'.0	303° 12'.1	20'.6	291° 13'.1	29'.7	50° 32'.5	41'.8	264° 15'.9	36'.9
07	230° 49'.5	318° 11'.3	20'.7	306° 13'.5	29'.5	65° 35'.1	41'.9	279° 18'.1	36'.9
08	245° 52'.0	333° 10'.4	20'.8	321° 13'.9	29'.3	80° 37'.8	42'.0	294° 20'.3	36'.8
09	260° 54'.4	348° 09'.6	20'.8	336° 14'.3	29'.2	95° 40'.4	42'.0	309° 22'.4	36'.7
10	275° 56'.9	3° 08'.7	20'.9	351° 14'.7	29'.0	110° 43'.1	42'.1	324° 24'.6	36'.6
11	290° 59'.4	18° 07'.9	21'.0	6° 15'.2	28'.9	125° 45'.7	42'.2	339° 26'.7	36'.6
12	306° 01'.8	33° 07'.0	22° 21'.0 S	21° 15'.6	23° 28'.7 S	140° 48'.4	7° 42'.3 N	354° 28'.9	18° 36'.5 S
13	321° 04'.3	48° 06'.2	21'.1	36° 16'.0	28'.5	155° 51'.1	42'.4	9° 31'.1	36'.4
14	336° 06'.8	63° 05'.3	21'.1	51° 16'.4	28'.3	170° 53'.7	42'.5	24° 33'.2	36'.3
15	351° 09'.2	78° 04'.5	21'.2	66° 16'.8	28'.2	185° 56'.4	42'.6	39° 35'.4	36'.3
16	6° 11'.7	93° 03'.6	21'.3	81° 17'.3	28'.0	200° 59'.0	42'.7	54° 37'.5	36'.2
17	21° 14'.1	108° 02'.7	21'.3	96° 17'.7	27'.8	216° 01'.7	42'.8	69° 39'.7	36'.1
18	36° 16'.6	123° 01'.9	21'.4	111° 18'.1	27'.7	231° 04'.3	42'.9	84° 41'.8	36'.0
19	51° 19'.1	138° 01'.0	21'.4	126° 18'.5	27'.5	246° 07'.0	42'.9	99° 44'.0	36'.0
20	66° 21'.5	153° 00'.2	21'.5	141° 18'.9	27'.3	261° 09'.7	43'.0	114° 46'.2	35'.9
21	81° 24'.0	167° 59'.3	21'.5	156° 19'.3	27'.2	276° 12'.3	43'.1	129° 48'.3	35'.8
22	96° 26'.5	182° 58'.5	21'.6	171° 19'.8	27'.0	291° 15'.0	43'.2	144° 50'.5	35'.7
23	111° 28'.9	197° 57'.6	21'.6	186° 20'.2	26'.8	306° 17'.6	43'.3	159° 52'.6	35'.6
	M.P. 15:39	v -0'.8	d 0'.1	v 0'.4	d 0'.2	v 2'.7	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.3	40° 20'.3 S
Achernar	335° 38'.6	57° 16'.8 S
Acrux	173° 27'.1	63° 03'.2 S
Adhara	255° 24'.7	28° 57'.8 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.3	55° 59'.7 N
Alkaid	153° 11'.3	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.1 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.4	8° 37'.6 S
Alphecca	126° 24'.6	26° 44'.2 N
Alpheratz	358° 00'.3	29° 03'.0 N
Altair	62° 24'.1	8° 50'.8 N
Ankaa	353° 31'.5	42° 21'.1 S
Antares	112° 46'.1	26° 24'.9 S
Arcturus	146° 10'.3	19° 13'.1 N
Atria	108° 02'.7	69° 00'.7 S
Avior	234° 24'.0	59° 29'.1 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.8	52° 41'.6 S
Capella	280° 57'.7	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.1 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.9 S
Dubhe	194° 10'.5	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.2 N
Eltanin	90° 54'.0	51° 29'.2 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.6	57° 04'.0 S
Gienah	176° 08'.6	17° 30'.0 S
Hadar	149° 10'.7	60° 20'.0 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.3	34° 23'.3 S
Kochab	137° 19'.3	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.7	4° 03'.6 N
Menkent	148° 26'.5	36° 19'.9 S
Miaplacidus	221° 42'.3	69° 41'.1 S
Mirfak	309° 03'.2	49° 50'.3 N
Nunki	76° 18'.4	26° 18'.4 S
Peacock	53° 44'.8	56° 45'.7 S
Polaris	324° 04'.7	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.5	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.2	8° 12'.7 S
Rigil Kent	140° 13'.7	60° 47'.9 S
Sabik	102° 31'.1	15° 43'.0 S
Schedar	349° 59'.2	56° 30'.0 N
Shaula	96° 43'.9	37° 05'.9 S
Sirius	258° 47'.4	16° 42'.4 S
Spica	158° 48'.0	11° 07'.3 S
Suhail	223° 03'.8	43° 24'.1 S
Vega	80° 50'.2	38° 46'.4 N
Zuben'ubi	137° 23'.2	16° 00'.6 S

	SHA	Mer.Pass.
Venus	89° 04'.5	09:46
Mars	76° 27'.4	10:36
Jupiter	194° 39'.8	02:43
Saturn	48° 38'.1	12:25

	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
25	176° 58'.7	19° 11'.7 S	292° 40'.1	11'.6	10° 22'.5 S	13'.1	58'.1
26	191° 58'.5	11'.1	307° 10'.7	11'.5	35'.6	13'.0	
27	206° 58'.4	10'.5	321° 41'.2	11'.6	48'.6	13'.0	
28	221° 58'.2	09'.9	336° 11'.8	11'.5	11° 01'.6 S	12'.8	58'.0
29	236° 58'.1	09'.3	350° 42'.3	11'.6	14'.4	12'.8	
30	251° 57'.9	08'.7	5° 12'.9	11'.5	27'.2	12'.8	57'.9
31	266° 57'.8	08'.1	19° 43'.4	11'.6	40'.0	12'.6	
32	281° 57'.6	07'.5	34° 14'.0	11'.5	52'.6	12'.6	
33	296° 57'.5	06'.9	48° 44'.5	11'.5	12° 05'.2 S	12'.4	57'.8
34	311° 57'.3	06'.3	63° 15'.0	11'.6	17'.6	12'.4	
35	326° 57'.2	05'.7	77° 45'.6	11'.5	30'.0	12'.4	57'.7
36	341° 57'.0	05'.1	92° 16'.1	11'.5	42'.4	12'.2	
37	356° 56'.9	19° 04'.5 S	106° 46'.6	11'.5	12° 54'.6 S	12'.2	57'.7
38	11° 56'.7	03'.8	121° 17'.1	11'.5	13° 06'.8 S	12'.0	57'.6
39	26° 56'.6	03'.2	135° 47'.6	11'.5	18'.8	12'.0	
40	41° 56'.4	02'.6	150° 18'.1	11'.5	30'.8	12'.0	
41	56° 56'.3	02'.0	164° 48'.6	11'.5	42'.8	11'.8	57'.5
42	71° 56'.2	01'.4	179° 19'.1	11'.4	54'.6	11'.7	
43	86° 56'.0	00'.8	193° 49'.5	11'.5	14° 06'.3 S	11'.7	57'.4
44	101° 55'.9	00'.2	208° 20'.0	11'.4	18'.0	11'.5	
45	116° 55'.7	18° 59'.6 S	222° 50'.4	11'.4	29'.5	11'.5	
46	131° 55'.6	58'.9	237° 20'.8	11'.4	41'.0	11'.4	57'.3
47	146° 55'.4	58'.3	251° 51'.2	11'.4	52'.4	11'.3	
48	161° 55'.3	57'.7	266° 21'.6	11'.4	15° 03'.7 S	11'.2	57'.2
49	176° 55'.1	18° 57'.1 S	280° 52'.0	11'.4	15° 14'.9 S	11'.1	57'.2
50	191° 55'.0	56'.5	295° 22'.4	11'.4	26'.0	11'.1	
51	206° 54'.9	55'.9	309° 52'.8	11'.3	37'.1	10'.9	57'.1
52	221° 54'.7	55'.2	324° 23'.1	11'.3	48'.0	10'.8	
53	236° 54'.6	54'.6	338° 53'.4	11'.3	58'.8	10'.8	
54	251° 54'.4	54'.0	353° 23'.7	11'.3	16° 09'.6 S	10'.6	57'.0
55	266° 54'.3	53'.4	7° 54'.0	11'.3	20'.2	10'.6	
56	281° 54'.2	52'.8	22° 24'.3	11'.3	30'.8	10'.5	
57	296° 54'.0	52'.1	36° 54'.6	11'.2	41'.3	10'.3	56'.9
58	311° 53'.9	51'.5	51° 24'.8	11'.3	51'.6	10'.3	
59	326° 53'.7	50'.9	65° 55'.1	11'.2	17° 01'.9 S	10'.2	56'.8
60	341° 53'.6	50'.3	80° 25'.3	11'.2	12'.1	10'.1	
61	356° 53'.5	18° 49'.6 S	94° 55'.5	11'.1	17° 22'.2 S	9'.9	56'.8
62	11° 53'.3	49'.0	109° 25'.6	11'.2	32'.1	9'.9	56'.7
63	26° 53'.2	48'.4	123° 55'.8	11'.1	42'.0	9'.8	
64	41° 53'.0	47'.8	138° 25'.9	11'.2	51'.8	9'.7	
65	56° 52'.9	47'.1	152° 56'.1	11'.1	18° 01'.5 S	9'.5	56'.6
66	71° 52'.8	46'.5	167° 26'.2	11'.0	11'.0	9'.5	
67	86° 52'.6	45'.9	181° 56'.2	11'.1	20'.5	9'.4	
68	101° 52'.5	45'.2	196° 26'.3	11'.0	29'.9	9'.2	56'.5
69	116° 52'.4	44'.6	210° 56'.3	11'.1	39'.1	9'.2	
70	131° 52'.2	44'.0	225° 26'.4	11'.0	48'.3	9'.0	
71	146° 52'.1	43'.4	239° 56'.4	11'.0	57'.3	9'.0	56'.4
72	161° 52'.0	42'.7	254° 26'.4	10'.9	19° 06'.3 S	8'.8	
73	176° 51'.8	18° 42'.1 S	268° 56'.3	11'.0	19° 15'.1 S	8'.8	56'.4
74	191° 51'.7	41'.5	283° 26'.3	10'.9	23'.9	8'.6	56'.3
75	206° 51'.6	40'.8	297° 56'.2	10'.9	32'.5	8'.5	
76	221° 51'.4	40'.2	312° 26'.1	10'.9	41'.0	8'.5	
77	236° 51'.3	39'.6	326° 56'.0	10'.8	49'.5	8'.3	56'.2
78	251° 51'.2	38'.9	341° 25'.8	10'.9	57'.8	8'.2	
79	266° 51'.0	38'.3	355° 55'.7	10'.8	20° 06'.0 S	8'.1	
80	281° 50'.9	37'.7	10° 25'.5	10'.8	14'.1	8'.0	56'.1
81	296° 50'.8	37'.0	24° 55'.3	10'.8	22'.1	7'.8	
82	311° 50'.6	36'.4	39° 25'.1	10'.7	29'.9	7'.8	
83	326° 50'.5	35'.7	53° 54'.8	10'.8	37'.7	7'.7	56'.0
84	341° 50'.4	35'.1	68° 24'.6	10'.7	45'.4	7'.5	
85	356° 50'.2	18° 34'.5 S	82° 54'.3	10'.7	20° 52'.9 S	7'.4	56'.0
86	11° 50'.1	33'.8	97° 24'.0	10'.7	21° 00'.3 S	7'.3	55'.9
87	26° 50'.0	33'.2	111° 53'.7	10'.6	07'.6	7'.2	
88	41° 49'.8	32'.6	126° 23'.3	10'.7	14'.8	7'.1	
89	56° 49'.7	31'.9	140° 53'.0	10'.6	21'.9	7'.0	
90	71° 49'.6	31'.3	155° 22'.6	10'.6	28'.9	6'.9	55'.8
91	86° 49'.5	30'.6	169° 52'.2	10'.6	35'.8	6'.7	
92	101° 49'.3	30'.0	184° 21'.8	10'.5	42'.5	6'.7	
93	116° 49'.2	29'.3	198° 51'.3	10'.6	49'.2	6'.5	55'.7
94	131° 49'.1	28'.7	213° 20'.9	10'.5	55'.7	6'.4	
95	146° 48'.9	28'.1	227° 50'.4	10'.5	22° 02'.1 S	6'.3	
96	161° 48'.8	27'.4	242° 19'.9	10'.5	08'.4	6'.2	
	SD 16'.2	d 0'.6	SD 15'.7		15'.5	15'.3	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
25	12 05	12 12	12:12	04:38	17:03	21d 62%
26	12 19	12 26	12:12	05:27	17:52	22d 52%
27	12 32	12 39	12:13	06:17	18:42	23d 41%

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1992 January 28, 29, 30 (Tue, Wed, Thur)

GMT	ARIES	VENUS -4.0		MARS +1.4		JUPITER -2.4		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
28 Tuesday 00	126° 31'.4	212° 56'.8	22° 21'.7 S	201° 20'.6	23° 26'.7 S	321° 20'.3	7° 43'.4 N	174° 54'.8	18° 35'.6 S
01	141° 33'.9	227° 55'.9	21'.7	216° 21'.0	26'.5	336° 23'.0	43'.5	189° 57'.0	35'.5
02	156° 36'.3	242° 55'.1	21'.8	231° 21'.4	26'.3	351° 25'.6	43'.6	204° 59'.1	35'.4
03	171° 38'.8	257° 54'.2	21'.8	246° 21'.9	26'.1	6° 28'.3	43'.7	220° 01'.3	35'.3
04	186° 41'.3	272° 53'.4	21'.9	261° 22'.3	26'.0	21° 30'.9	43'.8	235° 03'.4	35'.3
05	201° 43'.7	287° 52'.5	21'.9	276° 22'.7	25'.8	36° 33'.6	43'.9	250° 05'.6	35'.2
06	216° 46'.2	302° 51'.6	21'.9	291° 23'.1	25'.6	51° 36'.3	44'.0	265° 07'.8	35'.1
07	231° 48'.6	317° 50'.8	22'.0	306° 23'.5	25'.4	66° 38'.9	44'.0	280° 09'.9	35'.0
08	246° 51'.1	332° 49'.9	22'.0	321° 23'.9	25'.3	81° 41'.6	44'.1	295° 12'.1	35'.0
09	261° 53'.6	347° 49'.1	22'.0	336° 24'.4	25'.1	96° 44'.3	44'.2	310° 14'.2	34'.9
10	276° 56'.0	2° 48'.2	22'.1	351° 24'.8	24'.9	111° 46'.9	44'.3	325° 16'.4	34'.8
11	291° 58'.5	17° 47'.4	22'.1	6° 25'.2	24'.7	126° 49'.6	44'.4	340° 18'.6	34'.7
12	307° 01'.0	32° 46'.5	22° 22'.2 S	21° 25'.6	23° 24'.6 S	141° 52'.2	7° 44'.5 N	355° 20'.7	18° 34'.7 S
13	322° 03'.4	47° 45'.7	22'.2	36° 26'.0	24'.4	156° 54'.9	44'.6	10° 22'.9	34'.6
14	337° 05'.9	62° 44'.8	22'.2	51° 26'.5	24'.2	171° 57'.6	44'.7	25° 25'.0	34'.5
15	352° 08'.4	77° 44'.0	22'.2	66° 26'.9	24'.0	187° 00'.2	44'.8	40° 27'.2	34'.4
16	7° 10'.8	92° 43'.1	22'.3	81° 27'.3	23'.8	202° 02'.9	44'.9	55° 29'.3	34'.3
17	22° 13'.3	107° 42'.2	22'.3	96° 27'.7	23'.7	217° 05'.6	45'.0	70° 31'.5	34'.3
18	37° 15'.8	122° 41'.4	22'.3	111° 28'.1	23'.5	232° 08'.2	45'.1	85° 33'.7	34'.2
19	52° 18'.2	137° 40'.5	22'.4	126° 28'.6	23'.3	247° 10'.9	45'.2	100° 35'.8	34'.1
20	67° 20'.7	152° 39'.7	22'.4	141° 29'.0	23'.1	262° 13'.6	45'.3	115° 38'.0	34'.0
21	82° 23'.1	167° 38'.8	22'.4	156° 29'.4	22'.9	277° 16'.2	45'.3	130° 40'.1	34'.0
22	97° 25'.6	182° 38'.0	22'.4	171° 29'.8	22'.8	292° 18'.9	45'.4	145° 42'.3	33'.9
23	112° 28'.1	197° 37'.1	22'.5	186° 30'.2	22'.6	307° 21'.6	45'.5	160° 44'.5	33'.8
29 Wednesday 00	127° 30'.5	212° 36'.3	22° 22'.5 S	201° 30'.7	23° 22'.4 S	322° 24'.2	7° 45'.6 N	175° 46'.6	18° 33'.7 S
01	142° 33'.0	227° 35'.4	22'.5	216° 31'.1	22'.2	337° 26'.9	45'.7	190° 48'.8	33'.7
02	157° 35'.5	242° 34'.5	22'.5	231° 31'.5	22'.0	352° 29'.6	45'.8	205° 50'.9	33'.6
03	172° 37'.9	257° 33'.7	22'.5	246° 31'.9	21'.8	7° 32'.2	45'.9	220° 53'.1	33'.5
04	187° 40'.4	272° 32'.8	22'.5	261° 32'.3	21'.7	22° 34'.9	46'.0	235° 55'.3	33'.4
05	202° 42'.9	287° 32'.0	22'.6	276° 32'.8	21'.5	37° 37'.6	46'.1	250° 57'.4	33'.4
06	217° 45'.3	302° 31'.1	22'.6	291° 33'.2	21'.3	52° 40'.2	46'.2	265° 59'.6	33'.3
07	232° 47'.8	317° 30'.3	22'.6	306° 33'.6	21'.1	67° 42'.9	46'.3	281° 01'.7	33'.2
08	247° 50'.3	332° 29'.4	22'.6	321° 34'.0	20'.9	82° 45'.6	46'.4	296° 03'.9	33'.1
09	262° 52'.7	347° 28'.6	22'.6	336° 34'.4	20'.7	97° 48'.2	46'.5	311° 06'.0	33'.0
10	277° 55'.2	2° 27'.7	22'.6	351° 34'.8	20'.5	112° 50'.9	46'.6	326° 08'.2	33'.0
11	292° 57'.6	17° 26'.8	22'.6	6° 35'.3	20'.4	127° 53'.6	46'.7	341° 10'.4	32'.9
12	308° 00'.1	32° 26'.0	22° 22'.6 S	21° 35'.7	23° 20'.2 S	142° 56'.2	7° 46'.8 N	356° 12'.5	18° 32'.8 S
13	323° 02'.6	47° 25'.1	22'.6	36° 36'.1	20'.0	157° 58'.9	46'.8	11° 14'.7	32'.7
14	338° 05'.0	62° 24'.3	22'.6	51° 36'.5	19'.8	173° 01'.6	46'.9	26° 16'.8	32'.7
15	353° 07'.5	77° 23'.4	22'.6	66° 36'.9	19'.6	188° 04'.2	47'.0	41° 19'.0	32'.6
16	8° 10'.0	92° 22'.6	22'.6	81° 37'.4	19'.4	203° 06'.9	47'.1	56° 21'.2	32'.5
17	23° 12'.4	107° 21'.7	22'.6	96° 37'.8	19'.2	218° 09'.6	47'.2	71° 23'.3	32'.4
18	38° 14'.9	122° 20'.8	22'.6	111° 38'.2	19'.0	233° 12'.2	47'.3	86° 25'.5	32'.4
19	53° 17'.4	137° 20'.0	22'.6	126° 38'.6	18'.8	248° 14'.9	47'.4	101° 27'.6	32'.3
20	68° 19'.8	152° 19'.1	22'.6	141° 39'.0	18'.7	263° 17'.6	47'.5	116° 29'.8	32'.2
21	83° 22'.3	167° 18'.3	22'.6	156° 39'.5	18'.5	278° 20'.3	47'.6	131° 32'.0	32'.1
22	98° 24'.7	182° 17'.4	22'.6	171° 39'.9	18'.3	293° 22'.9	47'.7	146° 34'.1	32'.1
23	113° 27'.2	197° 16'.6	22'.6	186° 40'.3	18'.1	308° 25'.6	47'.8	161° 36'.3	32'.0
30 Thursday 00	128° 29'.7	212° 15'.7	22° 22'.6 S	201° 40'.7	23° 17'.9 S	323° 28'.3	7° 47'.9 N	176° 38'.4	18° 31'.9 S
01	143° 32'.1	227° 14'.8	22'.6	216° 41'.1	17'.7	338° 31'.0	48'.0	191° 40'.6	31'.8
02	158° 34'.6	242° 14'.0	22'.6	231° 41'.6	17'.5	353° 33'.6	48'.1	206° 42'.8	31'.7
03	173° 37'.1	257° 13'.1	22'.6	246° 42'.0	17'.3	8° 36'.3	48'.2	221° 44'.9	31'.7
04	188° 39'.5	272° 12'.3	22'.6	261° 42'.4	17'.1	23° 39'.0	48'.3	236° 47'.1	31'.6
05	203° 42'.0	287° 11'.4	22'.6	276° 42'.8	16'.9	38° 41'.6	48'.4	251° 49'.2	31'.5
06	218° 44'.5	302° 10'.6	22'.5	291° 43'.2	16'.7	53° 44'.3	48'.5	266° 51'.4	31'.4
07	233° 46'.9	317° 09'.7	22'.5	306° 43'.7	16'.5	68° 47'.0	48'.6	281° 53'.5	31'.4
08	248° 49'.4	332° 08'.8	22'.5	321° 44'.1	16'.3	83° 49'.7	48'.7	296° 55'.7	31'.3
09	263° 51'.9	347° 08'.0	22'.5	336° 44'.5	16'.1	98° 52'.3	48'.8	311° 57'.9	31'.2
10	278° 54'.3	2° 07'.1	22'.5	351° 44'.9	15'.9	113° 55'.0	48'.9	327° 00'.0	31'.1
11	293° 56'.8	17° 06'.3	22'.5	6° 45'.3	15'.7	128° 57'.7	49'.0	342° 02'.2	31'.1
12	308° 59'.2	32° 05'.4	22° 22'.4 S	21° 45'.8	23° 15'.5 S	144° 00'.4	7° 49'.1 N	357° 04'.3	18° 31'.0 S
13	324° 01'.7	47° 04'.6	22'.4	36° 46'.2	15'.3	159° 03'.0	49'.2	12° 06'.5	30'.9
14	339° 04'.2	62° 03'.7	22'.4	51° 46'.6	15'.1	174° 05'.7	49'.3	27° 08'.7	30'.8
15	354° 06'.6	77° 02'.8	22'.4	66° 47'.0	14'.9	189° 08'.4	49'.3	42° 10'.8	30'.7
16	9° 09'.1	92° 02'.0	22'.3	81° 47'.4	14'.7	204° 11'.1	49'.4	57° 13'.0	30'.7
17	24° 11'.6	107° 01'.1	22'.3	96° 47'.9	14'.5	219° 13'.7	49'.5	72° 15'.1	30'.6
18	39° 14'.0	122° 00'.3	22'.3	111° 48'.3	14'.3	234° 16'.4	49'.6	87° 17'.3	30'.5
19	54° 16'.5	136° 59'.4	22'.3	126° 48'.7	14'.1	249° 19'.1	49'.7	102° 19'.5	30'.4
20	69° 19'.0	151° 58'.5	22'.2	141° 49'.1	13'.9	264° 21'.8	49'.8	117° 21'.6	30'.4
21	84° 21'.4	166° 57'.7	22'.2	156° 49'.5	13'.7	279° 24'.4	49'.9	132° 23'.8	30'.3
22	99° 23'.9	181° 56'.8	22'.2	171° 50'.0	13'.5	294° 27'.1	50'.0	147° 25'.9	30'.2
23	114° 26'.4	196° 56'.0	22'.1	186° 50'.4	13'.3	309° 29'.8	50'.1	162° 28'.1	30'.1
	M.P. 15:27	v -0'.9	d 0'.0	v 0'.4	d 0'.2	v 2'.7	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.3	40° 20'.4 S
Achernar	335° 38'.6	57° 16'.8 S
Acrux	173° 27'.1	63° 03'.2 S
Adhara	255° 24'.7	28° 57'.8 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.3	55° 59'.7 N
Alkaid	153° 11'.2	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.0 S
Alnilam	276° 02'.3	1° 12'.4 S
Alphard	218° 11'.4	8° 37'.6 S
Alphecca	126° 24'.6	26° 44'.2 N
Alpheratz	358° 00'.3	29° 03'.0 N
Altair	62° 24'.1	8° 50'.8 N
Ankaa	353° 31'.5	42° 21'.1 S
Antares	112° 46'.1	26° 24'.9 S
Arcturus	146° 10'.2	19° 13'.1 N
Atria	108° 02'.7	69° 00'.7 S
Avior	234° 24'.0	59° 29'.1 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.8	52° 41'.6 S
Capella	280° 57'.7	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.1 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.9 S
Dubhe	194° 10'.4	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.2 N
Eltanin	90° 54'.0	51° 29'.1 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.6	57° 04'.1 S
Gienah	176° 08'.6	17° 30'.0 S
Hadar	149° 10'.7	60° 20'.0 S
Hamal	328° 18'.8	23° 25'.7 N
Kaus Aust.	84° 05'.3	34° 23'.3 S
Kochab	137° 19'.3	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.7	4° 03'.6 N
Menkent	148° 26'.4	36° 19'.9 S
Miaplacidus	221° 42'.3	69° 41'.1 S
Mirfak	309° 03'.2	49° 50'.3 N
Nunki	76° 18'.4	26° 18'.4 S
Peacock	53° 44'.8	56° 45'.7 S
Polaris	324° 05'.8	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.5	12° 33'.8 N
Regulus	208° 00'.1	12° 00'.2 N
Rigel	281° 27'.2	8° 12'.7 S
Rigil Kent	140° 13'.7	60° 47'.9 S
Sabik	102° 31'.1	15° 43'.0 S
Schedar	349° 59'.2	56° 30'.0 N
Shaula	96° 43'.9	37° 05'.9 S
Sirius	258° 47'.4	16° 42'.4 S
Spica	158° 48'.0	11° 07'.3 S
Suhail	223° 03'.8	43° 24'.1 S
Vega	80° 50'.1	38° 46'.4 N
Zuben'ubi	137° 23'.2	16° 00'.6 S

	SHA	Mer.Pass.
Venus	85° 05'.7	09:50
Mars	74° 00'.1	10:34
Jupiter	194° 53'.7	02:30
Saturn	48° 16'.1	12:15

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
28 00	176° 48'.7	18° 26'.8 S	256° 49'.4	10'.5	22° 14'.6 S	6'.0	55'.6
01	191° 48'.6	26'.1	271° 18'.9	10'.5	20'.6	5'.9	
02	206° 48'.4	25'.5	285° 48'.4	10'.4	26'.5	5'.9	
03	221° 48'.3	24'.8	300° 17'.8	10'.5	32'.4	5'.7	55'.5
04	236° 48'.2	24'.2	314° 47'.3	10'.4	38'.1	5'.6	
05	251° 48'.1	23'.5	329° 16'.7	10'.4	43'.7	5'.4	
06	266° 47'.9	22'.9	343° 46'.1	10'.4	49'.1	5'.4	
07	281° 47'.8	22'.2	358° 15'.5	10'.4	54'.5	5'.2	55'.4
08	296° 47'.7	21'.6	12° 44'.9	10'.3	59'.7	5'.1	
09	311° 47'.6	20'.9	27° 14'.2	10'.4	23° 04'.8 S	5'.0	
10	326° 47'.4	20'.3	41° 43'.6	10'.3	09'.8	4'.9	
11	341° 47'.3	19'.6	56° 12'.9	10'.3	14'.7	4'.7	55'.3
12	356° 47'.2	18° 19'.0 S	70° 42'.2	10'.4	23° 19'.4 S	4'.7	55'.3
13	11° 47'.1	18'.3	85° 11'.6	10'.3	24'.1	4'.5	
14	26° 47'.0	17'.7	99° 40'.9	10'.3	28'.6	4'.4	
15	41° 46'.8	17'.0	114° 10'.2	10'.2	33'.0	4'.3	55'.2
16	56° 46'.7	16'.4	128° 39'.4	10'.3	37'.3	4'.1	
17	71° 46'.6	15'.7	143° 08'.7	10'.3	41'.4	4'.0	
18	86° 46'.5	15'.0	157° 38'.0	10'.2	45'.4	3'.9	
19	101° 46'.4	14'.4	172° 07'.2	10'.3	49'.3	3'.8	55'.1
20	116° 46'.2	13'.7	186° 36'.5	10'.2	53'.1	3'.7	
21	131° 46'.1	13'.1	201° 05'.7	10'.3	56'.8	3'.5	
22	146° 46'.0	12'.4	215° 35'.0	10'.2	24° 00'.3 S	3'.5	
23	161° 45'.9	11'.8	230° 04'.2	10'.2	03'.8	3'.3	
29 00	176° 45'.8	18° 11'.1 S	244° 33'.4	10'.3	24° 07'.1 S	3'.1	55'.0
01	191° 45'.6	10'.4	259° 02'.7	10'.2	10'.2	3'.1	
02	206° 45'.5	09'.8	273° 31'.9	10'.2	13'.3	2'.9	
03	221° 45'.4	09'.1	288° 01'.1	10'.2	16'.2	2'.8	
04	236° 45'.3	08'.5	302° 30'.3	10'.2	19'.0	2'.7	54'.9
05	251° 45'.2	07'.8	316° 59'.5	10'.2	21'.7	2'.6	
06	266° 45'.1	07'.1	331° 28'.7	10'.3	24'.3	2'.4	
07	281° 44'.9	06'.5	345° 58'.0	10'.2	26'.7	2'.4	
08	296° 44'.8	05'.8	0° 27'.2	10'.2	29'.1	2'.2	
09	311° 44'.7	05'.1	14° 56'.4	10'.2	31'.3	2'.0	54'.8
10	326° 44'.6	04'.5	29° 25'.6	10'.2	33'.3	2'.0	
11	341° 44'.5	03'.8	43° 54'.8	10'.3	35'.3	1'.8	
12	356° 44'.4	18° 03'.1 S	58° 24'.1	10'.2	24° 37'.1 S	1'.7	54'.8
13	11° 44'.3	02'.5	72° 53'.3	10'.2	38'.8	1'.6	
14	26° 44'.1	01'.8	87° 22'.5	10'.3	40'.4	1'.5	54'.7
15	41° 44'.0	01'.1	101° 51'.8	10'.2	41'.9	1'.3	
16	56° 43'.9	00'.5	116° 21'.0	10'.3	43'.2	1'.2	
17	71° 43'.8	17° 59'.8 S	130° 50'.3	10'.3	44'.4	1'.1	
18	86° 43'.7	59'.1	145° 19'.6	10'.2	45'.5	1'.0	
19	101° 43'.6	58'.5	159° 48'.8	10'.3	46'.5	0'.9	
20	116° 43'.5	57'.8	174° 18'.1	10'.3	47'.4	0'.7	54'.6
21	131° 43'.4	57'.1	188° 47'.4	10'.3	48'.1	0'.6	
22	146° 43'.2	56'.4	203° 16'.7	10'.3	48'.7	0'.5	
23	161° 43'.1	55'.8	217° 46'.0	10'.4	49'.2	0'.3	
30 00	176° 43'.0	17° 55'.1 S	232° 15'.4	10'.3	24° 49'.5 S	0'.3	54'.6
01	191° 42'.9	54'.4	246° 44'.7	10'.4	49'.8	0'.1	
02	206° 42'.8	53'.8	261° 14'.1	10'.4	49'.9	0'.0	54'.5
03	221° 42'.7	53'.1	275° 43'.5	10'.4	49'.9	0'.1	
04	236° 42'.6	52'.4	290° 12'.9	10'.4	49'.8	0'.3	
05	251° 42'.5	51'.7	304° 42'.3	10'.4	49'.5	0'.3	
06	266° 42'.4	51'.1	319° 11'.7	10'.4	49'.2	0'.5	
07	281° 42'.3	50'.4	333° 41'.1	10'.5	48'.7	0'.6	
08	296° 42'.2	49'.7	348° 10'.6	10'.5	48'.1	0'.7	
09	311° 42'.1	49'.0	2° 40'.1	10'.5	47'.4	0'.9	54'.4
10	326° 41'.9	48'.3	17° 09'.6	10'.5	46'.5	0'.9	
11	341° 41'.8	47'.7	31° 39'.1	10'.6	45'.6	1'.1	
12	356° 41'.7	17° 47'.0 S	46° 08'.7	10'.6	24° 44'.5 S	1'.2	54'.4
13	11° 41'.6	46'.3	60° 38'.3	10'.6	43'.3	1'.3	
14	26° 41'.5	45'.6	75° 07'.9	10'.6	42'.0	1'.5	
15	41° 41'.4	44'.9	89° 37'.5	10'.6	40'.5	1'.5	
16	56° 41'.3	44'.3	104° 07'.1	10'.7	39'.0	1'.7	54'.3
17	71° 41'.2	43'.6	118° 36'.8	10'.7	37'.3	1'.8	
18	86° 41'.1	42'.9	133° 06'.5	10'.8	35'.5	1'.9	
19	101° 41'.0	42'.2	147° 36'.3	10'.7	33'.6	2'.0	
20	116° 40'.9	41'.5	162° 06'.0	10'.8	31'.6	2'.2	
21	131° 40'.8	40'.8	176° 35'.8	10'.8	29'.4	2'.3	
22	146° 40'.7	40'.2	191° 05'.6	10'.9	27'.1	2'.3	
23	161° 40'.6	39'.5	205° 35'.5	10'.9	24'.8	2'.5	
	SD 16'.2	d 0'.7	SD 15'.1		14'.9		14'.8

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
28	12 45	12 51	12:13	07:07	19:33	24d 32%
29	12 57	13 02	12:13	07:58	20:24	25d 23%
30	13 08	13 13	12:13	08:49	21:14	26d 16%

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1992 Jan 31, Feb. 1, 2 (Fri, Sat, Sun)

GMT	ARIES	VENUS -4.0		MARS +1.4		JUPITER -2.4		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
31 Friday 00	129° 28'.8	211° 55'.1	22° 22'.1 S	201° 50'.8	23° 13'.1 S	324° 32'.5	7° 50'.2 N	177° 30'.2	18° 30'.1 S
01	144° 31'.3	226° 54'.3	22'.1	216° 51'.2	12'.9	339° 35'.2	50'.3	192° 32'.4	30'.0
02	159° 33'.7	241° 53'.4	22'.0	231° 51'.6	12'.7	354° 37'.8	50'.4	207° 34'.6	29'.9
03	174° 36'.2	256° 52'.5	22'.0	246° 52'.1	12'.5	9° 40'.5	50'.5	222° 36'.7	29'.8
04	189° 38'.7	271° 51'.7	21'.9	261° 52'.5	12'.3	24° 43'.2	50'.6	237° 38'.9	29'.8
05	204° 41'.1	286° 50'.8	21'.9	276° 52'.9	12'.1	39° 45'.9	50'.7	252° 41'.0	29'.7
06	219° 43'.6	301° 50'.0	21'.9	291° 53'.3	11'.9	54° 48'.6	50'.8	267° 43'.2	29'.6
07	234° 46'.1	316° 49'.1	21'.8	306° 53'.7	11'.7	69° 51'.2	50'.9	282° 45'.4	29'.5
08	249° 48'.5	331° 48'.3	21'.8	321° 54'.2	11'.5	84° 53'.9	51'.0	297° 47'.5	29'.4
09	264° 51'.0	346° 47'.4	21'.7	336° 54'.6	11'.3	99° 56'.6	51'.1	312° 49'.7	29'.4
10	279° 53'.5	1° 46'.5	21'.7	351° 55'.0	11'.1	114° 59'.3	51'.2	327° 51'.8	29'.3
11	294° 55'.9	16° 45'.7	21'.6	6° 55'.4	10'.8	130° 02'.0	51'.3	342° 54'.0	29'.2
12	309° 58'.4	31° 44'.8	22° 21'.6 S	21° 55'.9	23° 10'.6 S	145° 04'.6	7° 51'.4 N	357° 56'.2	18° 29'.1 S
13	325° 00'.9	46° 44'.0	21'.5	36° 56'.3	10'.4	160° 07'.3	51'.5	12° 58'.3	29'.1
14	340° 03'.3	61° 43'.1	21'.5	51° 56'.7	10'.2	175° 10'.0	51'.6	28° 00'.5	29'.0
15	355° 05'.8	76° 42'.2	21'.4	66° 57'.1	10'.0	190° 12'.7	51'.7	43° 02'.6	28'.9
16	10° 08'.2	91° 41'.4	21'.4	81° 57'.5	09'.8	205° 15'.4	51'.8	58° 04'.8	28'.8
17	25° 10'.7	106° 40'.5	21'.3	96° 58'.0	09'.6	220° 18'.0	51'.9	73° 07'.0	28'.8
18	40° 13'.2	121° 39'.7	21'.3	111° 58'.4	09'.4	235° 20'.7	52'.0	88° 09'.1	28'.7
19	55° 15'.6	136° 38'.8	21'.2	126° 58'.8	09'.2	250° 23'.4	52'.1	103° 11'.3	28'.6
20	70° 18'.1	151° 38'.0	21'.1	141° 59'.2	09'.0	265° 26'.1	52'.2	118° 13'.4	28'.5
21	85° 20'.6	166° 37'.1	21'.1	156° 59'.6	08'.7	280° 28'.8	52'.3	133° 15'.6	28'.4
22	100° 23'.0	181° 36'.2	21'.0	172° 00'.1	08'.5	295° 31'.5	52'.4	148° 17'.8	28'.4
23	115° 25'.5	196° 35'.4	21'.0	187° 00'.5	08'.3	310° 34'.1	52'.5	163° 19'.9	28'.3
1 Saturday 00	130° 28'.0	211° 34'.5	22° 20'.9 S	202° 00'.9	23° 08'.1 S	325° 36'.8	7° 52'.6 N	178° 22'.1	18° 28'.2 S
01	145° 30'.4	226° 33'.7	20'.8	217° 01'.3	07'.9	340° 39'.5	52'.7	193° 24'.2	28'.1
02	160° 32'.9	241° 32'.8	20'.8	232° 01'.8	07'.7	355° 42'.2	52'.8	208° 26'.4	28'.1
03	175° 35'.4	256° 31'.9	20'.7	247° 02'.2	07'.5	10° 44'.9	52'.9	223° 28'.5	28'.0
04	190° 37'.8	271° 31'.1	20'.6	262° 02'.6	07'.2	25° 47'.6	53'.0	238° 30'.7	27'.9
05	205° 40'.3	286° 30'.2	20'.6	277° 03'.0	07'.0	40° 50'.2	53'.1	253° 32'.9	27'.8
06	220° 42'.7	301° 29'.4	20'.5	292° 03'.4	06'.8	55° 52'.9	53'.2	268° 35'.0	27'.8
07	235° 45'.2	316° 28'.5	20'.4	307° 03'.9	06'.6	70° 55'.6	53'.3	283° 37'.2	27'.7
08	250° 47'.7	331° 27'.7	20'.4	322° 04'.3	06'.4	85° 58'.3	53'.4	298° 39'.3	27'.6
09	265° 50'.1	346° 26'.8	20'.3	337° 04'.7	06'.2	101° 01'.0	53'.5	313° 41'.5	27'.5
10	280° 52'.6	1° 25'.9	20'.2	352° 05'.1	05'.9	116° 03'.7	53'.6	328° 43'.7	27'.4
11	295° 55'.1	16° 25'.1	20'.1	7° 05'.5	05'.7	131° 06'.4	53'.7	343° 45'.8	27'.4
12	310° 57'.5	31° 24'.2	22° 20'.1 S	22° 06'.0	23° 05'.5 S	146° 09'.0	7° 53'.8 N	358° 48'.0	18° 27'.3 S
13	326° 00'.0	46° 23'.4	20'.0	37° 06'.4	05'.3	161° 11'.7	53'.9	13° 50'.1	27'.2
14	341° 02'.5	61° 22'.5	19'.9	52° 06'.8	05'.1	176° 14'.4	54'.0	28° 52'.3	27'.1
15	356° 04'.9	76° 21'.6	19'.8	67° 07'.2	04'.8	191° 17'.1	54'.1	43° 54'.5	27'.1
16	11° 07'.4	91° 20'.8	19'.7	82° 07'.7	04'.6	206° 19'.8	54'.2	58° 56'.6	27'.0
17	26° 09'.8	106° 19'.9	19'.7	97° 08'.1	04'.4	221° 22'.5	54'.3	73° 58'.8	26'.9
18	41° 12'.3	121° 19'.1	19'.6	112° 08'.5	04'.2	236° 25'.2	54'.4	89° 00'.9	26'.8
19	56° 14'.8	136° 18'.2	19'.5	127° 08'.9	04'.0	251° 27'.9	54'.5	104° 03'.1	26'.8
20	71° 17'.2	151° 17'.4	19'.4	142° 09'.3	03'.7	266° 30'.5	54'.6	119° 05'.3	26'.7
21	86° 19'.7	166° 16'.5	19'.3	157° 09'.8	03'.5	281° 33'.2	54'.7	134° 07'.4	26'.6
22	101° 22'.2	181° 15'.6	19'.2	172° 10'.2	03'.3	296° 35'.9	54'.8	149° 09'.6	26'.5
23	116° 24'.6	196° 14'.8	19'.1	187° 10'.6	03'.1	311° 38'.6	54'.9	164° 11'.7	26'.4
2 Sunday 00	131° 27'.1	211° 13'.9	22° 19'.1 S	202° 11'.0	23° 02'.8 S	326° 41'.3	7° 55'.0 N	179° 13'.9	18° 26'.4 S
01	146° 29'.6	226° 13'.1	19'.0	217° 11'.5	02'.6	341° 44'.0	55'.1	194° 16'.1	26'.3
02	161° 32'.0	241° 12'.2	18'.9	232° 11'.9	02'.4	356° 46'.7	55'.2	209° 18'.2	26'.2
03	176° 34'.5	256° 11'.4	18'.8	247° 12'.3	02'.2	11° 49'.4	55'.3	224° 20'.4	26'.1
04	191° 37'.0	271° 10'.5	18'.7	262° 12'.7	01'.9	26° 52'.1	55'.4	239° 22'.5	26'.1
05	206° 39'.4	286° 09'.6	18'.6	277° 13'.1	01'.7	41° 54'.7	55'.6	254° 24'.7	26'.0
06	221° 41'.9	301° 08'.8	18'.5	292° 13'.6	01'.5	56° 57'.4	55'.7	269° 26'.9	25'.9
07	236° 44'.3	316° 07'.9	18'.4	307° 14'.0	01'.3	72° 00'.1	55'.8	284° 29'.0	25'.8
08	251° 46'.8	331° 07'.1	18'.3	322° 14'.4	01'.0	87° 02'.8	55'.9	299° 31'.2	25'.7
09	266° 49'.3	346° 06'.2	18'.2	337° 14'.8	00'.8	102° 05'.5	56'.0	314° 33'.3	25'.7
10	281° 51'.7	1° 05'.3	18'.1	352° 15'.3	00'.6	117° 08'.2	56'.1	329° 35'.5	25'.6
11	296° 54'.2	16° 04'.5	18'.0	7° 15'.7	00'.3	132° 10'.9	56'.2	344° 37'.7	25'.5
12	311° 56'.7	31° 03'.6	22° 17'.9 S	22° 16'.1	23° 00'.1 S	147° 13'.6	7° 56'.3 N	359° 39'.8	18° 25'.4 S
13	326° 59'.1	46° 02'.8	17'.8	37° 16'.5	22° 59'.9 S	162° 16'.3	56'.4	14° 42'.0	25'.4
14	342° 01'.6	61° 01'.9	17'.7	52° 17'.0	59'.6	177° 19'.0	56'.5	29° 44'.1	25'.3
15	357° 04'.1	76° 01'.1	17'.6	67° 17'.4	59'.4	192° 21'.7	56'.6	44° 46'.3	25'.2
16	12° 06'.5	91° 00'.2	17'.5	82° 17'.8	59'.2	207° 24'.4	56'.7	59° 48'.4	25'.1
17	27° 09'.0	105° 59'.3	17'.3	97° 18'.2	59'.0	222° 27'.1	56'.8	74° 50'.6	25'.1
18	42° 11'.5	120° 58'.5	17'.2	112° 18'.7	58'.7	237° 29'.7	56'.9	89° 52'.8	25'.0
19	57° 13'.9	135° 57'.6	17'.1	127° 19'.1	58'.5	252° 32'.4	57'.0	104° 54'.9	24'.9
20	72° 16'.4	150° 56'.8	17'.0	142° 19'.5	58'.3	267° 35'.1	57'.1	119° 57'.1	24'.8
21	87° 18'.8	165° 55'.9	16'.9	157° 19'.9	58'.0	282° 37'.8	57'.2	134° 59'.2	24'.7
22	102° 21'.3	180° 55'.1	16'.8	172° 20'.3	57'.8	297° 40'.5	57'.3	150° 01'.4	24'.7
23	117° 23'.8	195° 54'.2	16'.7	187° 20'.8	57'.6	312° 43'.2	57'.4	165° 03'.6	24'.6
	M.P. 15:16	v -0'.9	d 0'.1	v 0'.4	d 0'.2	v 2'.7	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.3	40° 20'.4 S
Achernar	335° 38'.6	57° 16'.8 S
Acrux	173° 27'.0	63° 03'.2 S
Adhara	255° 24'.7	28° 57'.8 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.2	55° 59'.7 N
Alkaid	153° 11'.2	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.0 S
Alnilam	276° 02'.3	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.6 S
Alphecca	126° 24'.6	26° 44'.1 N
Alpheratz	358° 00'.3	29° 03'.0 N
Altair	62° 24'.1	8° 50'.8 N
Ankaa	353° 31'.5	42° 21'.1 S
Antares	112° 46'.0	26° 24'.9 S
Arcturus	146° 10'.2	19° 13'.1 N
Atria	108° 02'.6	69° 00'.7 S
Avior	234° 24'.0	59° 29'.2 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.8	52° 41'.7 S
Capella	280° 57'.7	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.1 N
Denebola	182° 49'.6	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.9 S
Dubhe	194° 10'.4	61° 47'.3 N
Elnath	278° 32'.5	28° 36'.2 N
Eltanin	90° 53'.9	51° 29'.1 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.6	57° 04'.1 S
Gienah	176° 08'.5	17° 30'.0 S
Hadar	149° 10'.7	60° 20'.0 S
Hamal	328° 18'.9	23° 25'.7 N
Kaus Aust.	84° 05'.3	34° 23'.3 S
Kochab	137° 19'.2	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.7	4° 03'.6 N
Menkent	148° 26'.4	36° 19'.9 S
Miaplacidus	221° 42'.3	69° 41'.1 S
Mirfak	309° 03'.2	49° 50'.3 N
Nunki	76° 18'.4	26° 18'.4 S
Peacock	53° 44'.8	56° 45'.6 S
Polaris	324° 06'.9	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.5	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.2 N
Rigel	281° 27'.2	8° 12'.7 S
Rigil Kent	140° 13'.6	60° 47'.9 S
Sabik	102° 31'.0	15° 43'.0 S
Schedar	349° 59'.2	56° 30'.0 N
Shaula	96° 43'.9	37° 05'.9 S
Sirius	258° 47'.4	16° 42'.4 S
Spica	158° 48'.0	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.1 S
Vega	80° 50'.1	38° 46'.4 N
Zuben'ubi	137° 23'.1	16° 00'.7 S

	SHA	Mer.Pass.
Venus	81° 06'.6	09:54
Mars	71° 32'.9	10:32
Jupiter	195° 08'.9	02:17
Saturn	47° 54'.1	12:05

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
31 Friday 00	176° 40'.5	17° 38'.8 S	220° 05'.4	10'.9	24° 22'.3 S	2'.6	54'.2
01	191° 40'.4	38'.1	234° 35'.3	10'.9	19'.7	2'.7	
02	206° 40'.3	37'.4	249° 05'.2	11'.0	17'.0	2'.9	
03	221° 40'.2	36'.7	263° 35'.2	11'.0	14'.1	2'.9	
04	236° 40'.1	36'.0	278° 05'.2	11'.1	11'.2	3'.1	
05	251° 40'.0	35'.3	292° 35'.3	11'.0	08'.1	3'.2	
06	266° 39'.9	34'.7	307° 05'.3	11'.2	04'.9	3'.2	
07	281° 39'.8	34'.0	321° 35'.5	11'.1	01'.7	3'.4	
08	296° 39'.7	33'.3	336° 05'.6	11'.2	23° 58'.3 S	3'.6	
09	311° 39'.6	32'.6	350° 35'.8	11'.2	54'.7	3'.6	
10	326° 39'.5	31'.9	5° 06'.0	11'.3	51'.1	3'.7	
11	341° 39'.4	31'.2	19° 36'.3	11'.3	47'.4	3'.9	54'.1
12	356° 39'.3	17° 30'.5 S	34° 06'.6	11'.4	23° 43'.5 S	3'.9	54'.1
13	11° 39'.2	29'.8	48° 37'.0	11'.3	39'.6	4'.1	
14	26° 39'.1	29'.1	63° 07'.3	11'.5	35'.5	4'.1	
15	41° 39'.0	28'.4	77° 37'.8	11'.4	31'.4	4'.3	
16	56° 38'.9	27'.7	92° 08'.2	11'.5	27'.1	4'.4	
17	71° 38'.8	27'.0	106° 38'.7	11'.6	22'.7	4'.5	
18	86° 38'.7	26'.3	121° 09'.3	11'.6	18'.2	4'.6	
19	101° 38'.6	25'.6	135° 39'.9	11'.6	13'.6	4'.7	
20	116° 38'.5	24'.9	150° 10'.5	11'.7	08'.9	4'.8	
21	131° 38'.4	24'.2	164° 41'.2	11'.7	04'.1	4'.9	
22	146° 38'.4	23'.5	179° 11'.9	11'.8	22° 59'.2 S	5'.0	
23	161° 38'.3	22'.9	193° 42'.7	11'.8	54'.2	5'.2	
1 Saturday 00	176° 38'.2	17° 22'.2 S	208° 13'.5	11'.8	22° 49'.0 S	5'.2	54'.0
01	191° 38'.1	21'.5	222° 44'.3	11'.9	43'.8	5'.3	
02	206° 38'.0	20'.8	237° 15'.2	12'.0	38'.5	5'.4	
03	221° 37'.9	20'.1	251° 46'.2	11'.9	33'.1	5'.6	
04	236° 37'.8	19'.3	266° 17'.1	12'.1	27'.5	5'.6	
05	251° 37'.7	18'.6	280° 48'.2	12'.1	21'.9	5'.7	
06	266° 37'.6	17'.9	295° 19'.3	12'.1	16'.2	5'.9	
07	281° 37'.5	17'.2	309° 50'.4	12'.2	10'.3	5'.9	
08	296° 37'.4	16'.5	324° 21'.6	12'.2	04'.4	6'.0	
09	311° 37'.3	15'.8	338° 52'.8	12'.2	21° 58'.4 S	6'.2	
10	326° 37'.3	15'.1	353° 24'.0	12'.4	52'.2	6'.2	
11	341° 37'.2	14'.4	7° 55'.4	12'.3	46'.0	6'.3	
12	356° 37'.1	17° 13'.7 S	22° 26'.7	12'.4	21° 39'.7 S	6'.4	54'.0
13	11° 37'.0	13'.0	36° 58'.1	12'.5	33'.3	6'.5	
14	26° 36'.9	12'.3	51° 29'.6	12'.5	26'.8	6'.6	
15	41° 36'.8	11'.6	66° 01'.1	12'.6	20'.2	6'.7	
16	56° 36'.7	10'.9	80° 32'.7	12'.6	13'.5	6'.8	
17	71° 36'.6	10'.2	95° 04'.3	12'.6	06'.7	6'.9	
18	86° 36'.6	09'.5	109° 35'.9	12'.7	20° 59'.8 S	7'.0	
19	101° 36'.5	08'.8	124° 07'.6	12'.8	52'.8	7'.0	
20	116° 36'.4	08'.1	138° 39'.4	12'.8	45'.8	7'.2	
21	131° 36'.3	07'.3	153° 11'.2	12'.8	38'.6	7'.2	
22	146° 36'.2	06'.6	167° 43'.0	12'.9	31'.4	7'.4	
23	161° 36'.1	05'.9	182° 14'.9	13'.0	24'.0	7'.4	
2 Sunday 00	176° 36'.0	17° 05'.2 S	196° 46'.9	13'.0	20° 16'.6 S	7'.5	54'.0
01	191° 36'.0	04'.5	211° 18'.9	13'.0	09'.1	7'.6	53'.9
02	206° 35'.9	03'.8	225° 50'.9	13'.1	01'.5	7'.7	
03	221° 35'.8	03'.1	240° 23'.0	13'.2	19° 53'.8 S	7'.8	
04	236° 35'.7	02'.4	254° 55'.2	13'.1	46'.0	7'.8	
05	251° 35'.6	01'.6	269° 27'.3	13'.3	38'.2	8'.0	
06	266° 35'.5	00'.9	283° 59'.6	13'.3	30'.2	8'.0	
07	281° 35'.5	00'.2	298° 31'.9	13'.3	22'.2	8'.1	
08	296° 35'.4	16° 59'.5 S	313° 04'.2	13'.4	14'.1	8'.2	
09	311° 35'.3	58'.8	327° 36'.6	13'.4	05'.9	8'.2	
10	326° 35'.2	58'.1	342° 09'.0	13'.5	18° 57'.7 S	8'.4	
11	341° 35'.1	57'.3	356° 41'.5	13'.6	49'.3	8'.4	
12	356° 35'.0	16° 56'.6 S	11° 14'.1	13'.6	18° 40'.9 S	8'.5	53'.9
13	11° 35'.0	55'.9	25° 46'.7	13'.6	32'.4	8'.6	
14	26° 34'.9	55'.2	40° 19'.3	13'.7	23'.8	8'.7	
15	41° 34'.8	54'.5	54° 52'.0	13'.7	15'.1	8'.7	
16	56° 34'.7	53'.8	69° 24'.7	13'.8	06'.4	8'.8	
17	71° 34'.7	53'.0	83° 57'.5	13'.8	17° 57'.6 S	8'.9	
18	86° 34'.6	52'.3	98° 30'.3	13'.9	48'.7	9'.0	
19	101° 34'.5	51'.6	113° 03'.2	13'.9	39'.7	9'.0	
20	116° 34'.4	50'.9	127° 36'.1	14'.0	30'.7	9'.1	
21	131° 34'.3	50'.1	142° 09'.1	14'.0	21'.6	9'.2	
22	146° 34'.3	49'.4	156° 42'.1	14'.0	12'.4	9'.3	
23	161° 34'.2	48'.7	171° 15'.1	14'.1	03'.1	9'.3	54'.0
	SD 16'.2	d 0'.7	SD 14'.7		14'.7	14'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
31	13 18	13 23	12:13	09:39	22:03	27d 9%
1	13 27	13 32	12:14	10:27	22:51	28d 5%
2	13 36	13 40	12:14	11:14	23:36	29d 2%

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1992 February 3, 4, 5 (Mon, Tue, Wed)

GMT	ARIES	VENUS -4.0		MARS +1.3		JUPITER -2.4		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
3 Monday 00	132° 26'.2	210° 53'.3	22° 16'.5 S	202° 21'.2	22° 57'.3 S	327° 45'.9	7° 57'.5 N	180° 05'.7	18° 24'.5 S
01	147° 28'.7	225° 52'.5	16'.4	217° 21'.6	57'.1	342° 48'.6	57'.6	195° 07'.9	24'.4
02	162° 31'.2	240° 51'.6	16'.3	232° 22'.0	56'.8	357° 51'.3	57'.7	210° 10'.0	24'.4
03	177° 33'.6	255° 50'.8	16'.2	247° 22'.5	56'.6	12° 54'.0	57'.8	225° 12'.2	24'.3
04	192° 36'.1	270° 49'.9	16'.1	262° 22'.9	56'.4	27° 56'.7	57'.9	240° 14'.4	24'.2
05	207° 38'.6	285° 49'.1	15'.9	277° 23'.3	56'.1	42° 59'.4	58'.0	255° 16'.5	24'.1
06	222° 41'.0	300° 48'.2	15'.8	292° 23'.7	55'.9	58° 02'.1	58'.1	270° 18'.7	24'.1
07	237° 43'.5	315° 47'.3	15'.7	307° 24'.2	55'.7	73° 04'.8	58'.3	285° 20'.8	24'.0
08	252° 46'.0	330° 46'.5	15'.6	322° 24'.6	55'.4	88° 07'.5	58'.4	300° 23'.0	23'.9
09	267° 48'.4	345° 45'.6	15'.4	337° 25'.0	55'.2	103° 10'.2	58'.5	315° 25'.2	23'.8
10	282° 50'.9	0° 44'.8	15'.3	352° 25'.4	54'.9	118° 12'.9	58'.6	330° 27'.3	23'.7
11	297° 53'.3	15° 43'.9	15'.2	7° 25'.9	54'.7	133° 15'.6	58'.7	345° 29'.5	23'.7
12	312° 55'.8	30° 43'.1	22° 15'.0 S	22° 26'.3	22° 54'.5 S	148° 18'.3	7° 58'.8 N	0° 31'.6	18° 23'.6 S
13	327° 58'.3	45° 42'.2	14'.9	37° 26'.7	54'.2	163° 21'.0	58'.9	15° 33'.8	23'.5
14	343° 00'.7	60° 41'.4	14'.8	52° 27'.1	54'.0	178° 23'.7	59'.0	30° 36'.0	23'.4
15	358° 03'.2	75° 40'.5	14'.6	67° 27'.6	53'.7	193° 26'.4	59'.1	45° 38'.1	23'.4
16	13° 05'.7	90° 39'.6	14'.5	82° 28'.0	53'.5	208° 29'.1	59'.2	60° 40'.3	23'.3
17	28° 08'.1	105° 38'.8	14'.4	97° 28'.4	53'.3	223° 31'.8	59'.3	75° 42'.4	23'.2
18	43° 10'.6	120° 37'.9	14'.2	112° 28'.8	53'.0	238° 34'.4	59'.4	90° 44'.6	23'.1
19	58° 13'.1	135° 37'.1	14'.1	127° 29'.3	52'.8	253° 37'.1	59'.5	105° 46'.8	23'.0
20	73° 15'.5	150° 36'.2	13'.9	142° 29'.7	52'.5	268° 39'.8	59'.6	120° 48'.9	23'.0
21	88° 18'.0	165° 35'.4	13'.8	157° 30'.1	52'.3	283° 42'.5	59'.7	135° 51'.1	22'.9
22	103° 20'.4	180° 34'.5	13'.7	172° 30'.5	52'.0	298° 45'.2	59'.8	150° 53'.2	22'.8
23	118° 22'.9	195° 33'.7	13'.5	187° 31'.0	51'.8	313° 47'.9	59'.9	165° 55'.4	22'.7
4 Tuesday 00	133° 25'.4	210° 32'.8	22° 13'.4 S	202° 31'.4	22° 51'.6 S	328° 50'.6	8° 00'.0 N	180° 57'.6	18° 22'.7 S
01	148° 27'.8	225° 31'.9	13'.2	217° 31'.8	51'.3	343° 53'.3	00'.2	195° 59'.7	22'.6
02	163° 30'.3	240° 31'.1	13'.1	232° 32'.2	51'.1	358° 56'.0	00'.3	211° 01'.9	22'.5
03	178° 32'.8	255° 30'.2	12'.9	247° 32'.7	50'.8	13° 58'.7	00'.4	226° 04'.0	22'.4
04	193° 35'.2	270° 29'.4	12'.8	262° 33'.1	50'.6	29° 01'.4	00'.5	241° 06'.2	22'.4
05	208° 37'.7	285° 28'.5	12'.6	277° 33'.5	50'.3	44° 04'.1	00'.6	256° 08'.4	22'.3
06	223° 40'.2	300° 27'.7	12'.5	292° 33'.9	50'.1	59° 06'.8	00'.7	271° 10'.5	22'.2
07	238° 42'.6	315° 26'.8	12'.3	307° 34'.4	49'.8	74° 09'.6	00'.8	286° 12'.7	22'.1
08	253° 45'.1	330° 26'.0	12'.2	322° 34'.8	49'.6	89° 12'.3	00'.9	301° 14'.8	22'.0
09	268° 47'.6	345° 25'.1	12'.0	337° 35'.2	49'.3	104° 15'.0	01'.0	316° 17'.0	22'.0
10	283° 50'.0	0° 24'.3	11'.9	352° 35'.6	49'.1	119° 17'.7	01'.1	331° 19'.2	21'.9
11	298° 52'.5	15° 23'.4	11'.7	7° 36'.1	48'.8	134° 20'.4	01'.2	346° 21'.3	21'.8
12	313° 54'.9	30° 22'.5	22° 11'.5 S	22° 36'.5	22° 48'.6 S	149° 23'.1	8° 01'.3 N	1° 23'.5	18° 21'.7 S
13	328° 57'.4	45° 21'.7	11'.4	37° 36'.9	48'.3	164° 25'.8	01'.4	16° 25'.6	21'.7
14	343° 59'.9	60° 20'.8	11'.2	52° 37'.3	48'.1	179° 28'.5	01'.5	31° 27'.8	21'.6
15	359° 02'.3	75° 20'.0	11'.1	67° 37'.8	47'.8	194° 31'.2	01'.6	46° 30'.0	21'.5
16	14° 04'.8	90° 19'.1	10'.9	82° 38'.2	47'.6	209° 33'.9	01'.8	61° 32'.1	21'.4
17	29° 07'.3	105° 18'.3	10'.7	97° 38'.6	47'.3	224° 36'.6	01'.9	76° 34'.3	21'.3
18	44° 09'.7	120° 17'.4	10'.6	112° 39'.0	47'.1	239° 39'.3	02'.0	91° 36'.4	21'.3
19	59° 12'.2	135° 16'.6	10'.4	127° 39'.5	46'.8	254° 42'.0	02'.1	106° 38'.6	21'.2
20	74° 14'.7	150° 15'.7	10'.2	142° 39'.9	46'.6	269° 44'.7	02'.2	121° 40'.8	21'.1
21	89° 17'.1	165° 14'.9	10'.1	157° 40'.3	46'.3	284° 47'.4	02'.3	136° 42'.9	21'.0
22	104° 19'.6	180° 14'.0	09'.9	172° 40'.7	46'.1	299° 50'.1	02'.4	151° 45'.1	21'.0
23	119° 22'.1	195° 13'.2	09'.7	187° 41'.2	45'.8	314° 52'.8	02'.5	166° 47'.2	20'.9
5 Wednesday 00	134° 24'.5	210° 12'.3	22° 09'.5 S	202° 41'.6	22° 45'.5 S	329° 55'.5	8° 02'.6 N	181° 49'.4	18° 20'.8 S
01	149° 27'.0	225° 11'.4	09'.4	217° 42'.0	45'.3	344° 58'.2	02'.7	196° 51'.6	20'.7
02	164° 29'.4	240° 10'.6	09'.2	232° 42'.5	45'.0	0° 00'.9	02'.8	211° 53'.7	20'.7
03	179° 31'.9	255° 09'.7	09'.0	247° 42'.9	44'.8	15° 03'.6	02'.9	226° 55'.9	20'.6
04	194° 34'.4	270° 08'.9	08'.8	262° 43'.3	44'.5	30° 06'.3	03'.1	241° 58'.1	20'.5
05	209° 36'.8	285° 08'.0	08'.7	277° 43'.7	44'.3	45° 09'.0	03'.2	257° 00'.2	20'.4
06	224° 39'.3	300° 07'.2	08'.5	292° 44'.2	44'.0	60° 11'.7	03'.3	272° 02'.4	20'.3
07	239° 41'.8	315° 06'.3	08'.3	307° 44'.6	43'.7	75° 14'.4	03'.4	287° 04'.5	20'.3
08	254° 44'.2	330° 05'.5	08'.1	322° 45'.0	43'.5	90° 17'.2	03'.5	302° 06'.7	20'.2
09	269° 46'.7	345° 04'.6	07'.9	337° 45'.4	43'.2	105° 19'.9	03'.6	317° 08'.9	20'.1
10	284° 49'.2	0° 03'.8	07'.7	352° 45'.9	43'.0	120° 22'.6	03'.7	332° 11'.0	20'.0
11	299° 51'.6	15° 02'.9	07'.6	7° 46'.3	42'.7	135° 25'.3	03'.8	347° 13'.2	20'.0
12	314° 54'.1	30° 02'.1	22° 07'.4 S	22° 46'.7	22° 42'.4 S	150° 28'.0	8° 03'.9 N	2° 15'.3	18° 19'.9 S
13	329° 56'.5	45° 01'.2	07'.2	37° 47'.2	42'.2	165° 30'.7	04'.0	17° 17'.5	19'.8
14	344° 59'.0	60° 00'.4	07'.0	52° 47'.6	41'.9	180° 33'.4	04'.1	32° 19'.7	19'.7
15	0° 01'.5	74° 59'.5	06'.8	67° 48'.0	41'.7	195° 36'.1	04'.2	47° 21'.8	19'.6
16	15° 03'.9	89° 58'.7	06'.6	82° 48'.4	41'.4	210° 38'.8	04'.4	62° 24'.0	19'.6
17	30° 06'.4	104° 57'.8	06'.4	97° 48'.9	41'.1	225° 41'.5	04'.5	77° 26'.1	19'.5
18	45° 08'.9	119° 57'.0	06'.2	112° 49'.3	40'.9	240° 44'.2	04'.6	92° 28'.3	19'.4
19	60° 11'.3	134° 56'.1	06'.0	127° 49'.7	40'.6	255° 46'.9	04'.7	107° 30'.5	19'.3
20	75° 13'.8	149° 55'.3	05'.8	142° 50'.2	40'.3	270° 49'.7	04'.8	122° 32'.6	19'.3
21	90° 16'.3	164° 54'.4	05'.6	157° 50'.6	40'.1	285° 52'.4	04'.9	137° 34'.8	19'.2
22	105° 18'.7	179° 53'.6	05'.4	172° 51'.0	39'.8	300° 55'.1	05'.0	152° 36'.9	19'.1
23	120° 21'.2	194° 52'.7	05'.2	187° 51'.4	39'.5	315° 57'.8	05'.1	167° 39'.1	19'.0
	M.P. 15:04	v -0'.9	d 0'.2	v 0'.4	d 0'.3	v 2'.7	d 0'.1	v 2'.2	d 0'.1

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 30'.3	40° 20'.4 S	176° 34'.1	16° 48'.0 S	185° 48'.2	14'.2	16° 53'.8 S	9'.4	54'.0
Achernar	335° 38'.6	57° 16'.8 S	191° 34'.0	47'.2	200° 21'.4	14'.2	44'.4	9'.5	
Acrux	173° 27'.0	63° 03'.2 S	206° 34'.0	46'.5	214° 54'.6	14'.2	34'.9	9'.5	
Adhara	255° 24'.7	28° 57'.8 S	221° 33'.9	45'.8	229° 27'.8	14'.3	25'.4	9'.6	
Aldebaran	291° 07'.5	16° 29'.7 N	236° 33'.8	45'.1	244° 01'.1	14'.3	15'.8	9'.7	
			251° 33'.7	44'.3	258° 34'.4	14'.4	06'.1	9'.7	
Alioth	166° 34'.2	55° 59'.7 N	266° 33'.7	43'.6	273° 07'.8	14'.4	15° 56'.4 S	9'.8	
Alkaid	153° 11'.2	49° 20'.7 N	281° 33'.6	42'.9	287° 41'.2	14'.5	46'.6	9'.9	
Alnair	28° 04'.0	47° 00'.0 S	296° 33'.5	42'.2	302° 14'.7	14'.5	36'.7	9'.9	
Alnilam	276° 02'.3	1° 12'.5 S	311° 33'.4	41'.4	316° 48'.2	14'.5	26'.8	10'.0	
Alphard	218° 11'.4	8° 37'.6 S	326° 33'.4	40'.7	331° 21'.7	14'.6	16'.8	10'.1	
			341° 33'.3	40'.0	345° 55'.3	14'.6	06'.7	10'.1	
Alphecca	126° 24'.5	26° 44'.1 N	356° 33'.2	16° 39'.2 S	0° 28'.9	14'.7	14° 56'.6 S	10'.2	54'.0
Alpheratz	358° 00'.3	29° 03'.0 N	11° 33'.2	38'.5	15° 02'.6	14'.7	46'.4	10'.2	
Altair	62° 24'.1	8° 50'.8 N	26° 33'.1	37'.8	29° 36'.3	14'.8	36'.2	10'.3	
Ankaa	353° 31'.6	42° 21'.1 S	41° 33'.0	37'.0	44° 10'.1	14'.8	25'.9	10'.4	
Antares	112° 46'.0	26° 24'.9 S	56° 32'.9	36'.3	58° 43'.9	14'.8	15'.5	10'.4	
			71° 32'.9	35'.6	73° 17'.7	14'.9	05'.1	10'.5	
Arcturus	146° 10'.2	19° 13'.1 N	86° 32'.8	34'.8	87° 51'.6	14'.9	13° 54'.6 S	10'.5	
Atria	108° 02'.6	69° 00'.7 S	101° 32'.7	34'.1	102° 25'.5	14'.9	44'.1	10'.6	
Avior	234° 24'.0	59° 29'.2 S	116° 32'.7	33'.4	116° 59'.4	15'.0	33'.5	10'.7	
Bellatrix	278° 48'.9	6° 20'.6 N	131° 32'.6	32'.6	131° 33'.4	15'.0	22'.8	10'.7	
Betelgeuse	271° 18'.3	7° 24'.3 N	146° 32'.5	31'.9	146° 07'.4	15'.1	12'.1	10'.7	
			161° 32'.5	31'.2	160° 41'.5	15'.1	01'.4	10'.9	
Canopus	264° 02'.8	52° 41'.7 S	176° 32'.4	16° 30'.4 S	175° 15'.6	15'.1	12° 50'.5 S	10'.8	54'.0
Capella	280° 57'.7	45° 59'.6 N	191° 32'.3	29'.7	189° 49'.7	15'.1	39'.7	10'.9	
Deneb	49° 42'.9	45° 15'.1 N	206° 32'.3	29'.0	204° 23'.8	15'.2	28'.8	11'.0	
Denebola	182° 49'.6	14° 36'.7 N	221° 32'.2	28'.2	218° 58'.0	15'.3	17'.8	11'.0	54'.1
Diphda	349° 12'.0	18° 01'.8 S	236° 32'.1	27'.5	233° 32'.3	15'.2	06'.8	11'.1	
			251° 32'.1	26'.7	248° 06'.5	15'.3	11° 55'.7 S	11'.1	
Dubhe	194° 10'.4	61° 47'.3 N	266° 32'.0	26'.0	262° 40'.8	15'.4	44'.6	11'.2	
Elnath	278° 32'.5	28° 36'.2 N	281° 31'.9	25'.3	277° 15'.2	15'.3	33'.4	11'.2	
Eltanin	90° 53'.9	51° 29'.1 N	296° 31'.9	24'.5	291° 49'.5	15'.4	22'.2	11'.2	
Enif	34° 03'.1	9° 50'.3 N	311° 31'.8	23'.8	306° 23'.9	15'.4	11'.0	11'.3	
Fomalhaut	15° 41'.8	29° 39'.9 S	326° 31'.7	23'.0	320° 58'.3	15'.5	10° 59'.7 S	11'.4	
			341° 31'.7	22'.3	335° 32'.8	15'.4	48'.3	11'.4	
Gacrux	172° 18'.5	57° 04'.1 S	356° 31'.6	16° 21'.6 S	350° 07'.2	15'.5	10° 36'.9 S	11'.4	54'.1
Gienah	176° 08'.5	17° 30'.0 S	11° 31'.5	20'.8	4° 41'.7	15'.6	25'.5	11'.5	
Hadar	149° 10'.6	60° 20'.0 S	26° 31'.5	20'.1	19° 16'.3	15'.5	14'.0	11'.5	
Hamal	328° 18'.9	23° 25'.7 N	41° 31'.4	19'.3	33° 50'.8	15'.6	02'.5	11'.5	
Kaus Aust.	84° 05'.2	34° 23'.3 S	56° 31'.4	18'.6	48° 25'.4	15'.6	9° 51'.0 S	11'.6	
			71° 31'.3	17'.8	63° 00'.0	15'.7	39'.4	11'.7	
Kochab	137° 19'.1	74° 10'.8 N	86° 31'.2	17'.1	77° 34'.7	15'.6	27'.7	11'.7	54'.2
Markab	13° 54'.5	15° 09'.8 N	101° 31'.2	16'.3	92° 09'.3	15'.7	16'.0	11'.7	
Menkar	314° 31'.7	4° 03'.6 N	116° 31'.1	15'.6	106° 44'.0	15'.7	04'.3	11'.7	
Menkent	148° 26'.4	36° 19'.9 S	131° 31'.1	14'.9	121° 18'.7	15'.7	8° 52'.6 S	11'.8	
Miaplacidus	221° 42'.3	69° 41'.2 S	146° 31'.0	14'.1	135° 53'.4	15'.8	40'.8	11'.9	
			161° 30'.9	13'.4	150° 28'.2	15'.8	28'.9	11'.8	
Mirfak	309° 03'.2	49° 50'.3 N	176° 30'.9	16° 12'.6 S	165° 03'.0	15'.8	8° 17'.1 S	11'.9	54'.2
Nunki	76° 18'.3	26° 18'.4 S	191° 30'.8	11'.9	179° 37'.8	15'.8	05'.2	12'.0	
Peacock	53° 44'.8	56° 45'.6 S	206° 30'.8	11'.1	194° 12'.6	15'.8	7° 53'.2 S	11'.9	
Polaris	324° 08'.2	89° 14'.2 N	221° 30'.7	10'.4	208° 47'.4	15'.8	41'.3	12'.0	
Pollux	243° 46'.8	28° 02'.7 N	236° 30'.6	09'.6	223° 22'.2	15'.9	29'.3	12'.1	
			251° 30'.6	08'.9	237° 57'.1	15'.9	17'.2	12'.0	54'.3
Procyon	245° 16'.1	5° 14'.6 N	266° 30'.5	08'.1	252° 32'.0	15'.9	05'.2	12'.1	
Rasalhague	96° 21'.5	12° 33'.7 N	281° 30'.5	07'.4	267° 06'.9	15'.9	6° 53'.1 S	12'.2	
Regulus	208° 00'.1	12° 00'.1 N	296° 30'.4	06'.6	281° 41'.8	15'.9	40'.9	12'.1	
Rigel	281° 27'.2	8° 12'.7 S	311° 30'.4	05'.9	296° 16'.7	16'.0	28'.8	12'.2	
Rigil Kent	140° 13'.6	60° 47'.9 S	326° 30'.3	05'.1	310° 51'.7	15'.9	16'.6	12'.2	
			341° 30'.2	04'.4	325° 26'.6	16'.0	04'.4	12'.2	
Sabik	102° 31'.0	15° 43'.0 S	356° 30'.2	16° 03'.6 S	340° 01'.6	15'.9	5° 52'.2 S	12'.3	54'.3
Schedar	349° 59'.2	56° 30'.0 N	11° 30'.1	02'.8	354° 36'.5	16'.0	39'.9	12'.3	
Shaula	96° 43'.8	37° 05'.9 S	26° 30'.1	02'.1	9° 11'.5	16'.0	27'.6	12'.3	
Sirius	258° 47'.5	16° 42'.4 S	41° 30'.0	01'.3	23° 46'.5	16'.0	15'.3	12'.3	54'.4
Spica	158° 48'.0	11° 07'.4 S	56° 30'.0	00'.6	38° 21'.5	16'.0	03'.0	12'.4	
			71° 29'.9	15° 59'.8 S	52° 56'.5	16'.0	4° 50'.6 S	12'.4	
Suhail	223° 03'.8	43° 24'.2 S	86° 29'.9	59'.1	67° 31'.5	16'.1	38'.2	12'.4	
Vega	80° 50'.1	38° 46'.4 N	101° 29'.8	58'.3	82° 06'.6	16'.0	25'.8	12'.4	
Zuben'ubi	137° 23'.1	16° 00'.7 S	116° 29'.8	57'.5	96° 41'.6	16'.0	13'.4	12'.5	
			131° 29'.7	56'.8	111° 16'.6	16'.1	00'.9	12'.4	
	SHA	Mer.Pass.	146° 29'.7	56'.0	125° 51'.7	16'.0	3° 48'.5 S	12'.5	
Venus	77° 07'.4	09:58	161° 29'.6	55'.3	140° 26'.7	16'.0	36'.0	12'.5	
Mars	69° 06'.0	10:30							
Jupiter	195° 25'.3	02:04							
Saturn	47° 32'.2	11:54	SD 16'.2	d 0'.7	SD 14'.7		14'.7	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
3	13 43	13 47	12:14	11:58	24:20	30d 0%
4	13 50	13 53	12:14	12:41	00:20	1d 1%
5	13 56	13 59	12:14	13:22	01:02	2d 3%

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1992 February 6, 7, 8 (Thur, Fri, Saw)

GMT	ARIES	VENUS -4.0		MARS +1.3		JUPITER -2.5		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
6 Thursday 00	135° 23'.7	209° 51'.9	22° 05'.0 S	202° 51'.9	22° 39'.3 S	331° 00'.5	8° 05'.2 N	182° 41'.3	18° 19'.0 S
01	150° 26'.1	224° 51'.0	04'.8	217° 52'.3	39'.0	346° 03'.2	05'.3	197° 43'.4	18'.9
02	165° 28'.6	239° 50'.2	04'.6	232° 52'.7	38'.7	1° 05'.9	05'.5	212° 45'.6	18'.8
03	180° 31'.0	254° 49'.3	04'.4	247° 53'.2	38'.5	16° 08'.6	05'.6	227° 47'.7	18'.7
04	195° 33'.5	269° 48'.5	04'.2	262° 53'.6	38'.2	31° 11'.3	05'.7	242° 49'.9	18'.6
05	210° 36'.0	284° 47'.6	04'.0	277° 54'.0	37'.9	46° 14'.0	05'.8	257° 52'.1	18'.6
06	225° 38'.4	299° 46'.8	03'.8	292° 54'.4	37'.7	61° 16'.8	05'.9	272° 54'.2	18'.5
07	240° 40'.9	314° 45'.9	03'.6	307° 54'.9	37'.4	76° 19'.5	06'.0	287° 56'.4	18'.4
08	255° 43'.4	329° 45'.1	03'.4	322° 55'.3	37'.1	91° 22'.2	06'.1	302° 58'.6	18'.3
09	270° 45'.8	344° 44'.2	03'.2	337° 55'.7	36'.9	106° 24'.9	06'.2	318° 00'.7	18'.3
10	285° 48'.3	359° 43'.4	03'.0	352° 56'.2	36'.6	121° 27'.6	06'.3	333° 02'.9	18'.2
11	300° 50'.8	14° 42'.5	02'.8	7° 56'.6	36'.3	136° 30'.3	06'.4	348° 05'.0	18'.1
12	315° 53'.2	29° 41'.7	22° 02'.5 S	22° 57'.0	22° 36'.1 S	151° 33'.0	8° 06'.6 N	3° 07'.2	18° 18'.0 S
13	330° 55'.7	44° 40'.8	02'.3	37° 57'.4	35'.8	166° 35'.7	06'.7	18° 09'.4	17'.9
14	345° 58'.1	59° 40'.0	02'.1	52° 57'.9	35'.5	181° 38'.5	06'.8	33° 11'.5	17'.9
15	1° 00'.6	74° 39'.1	01'.9	67° 58'.3	35'.2	196° 41'.2	06'.9	48° 13'.7	17'.8
16	16° 03'.1	89° 38'.3	01'.7	82° 58'.7	35'.0	211° 43'.9	07'.0	63° 15'.8	17'.7
17	31° 05'.5	104° 37'.4	01'.5	97° 59'.2	34'.7	226° 46'.6	07'.1	78° 18'.0	17'.6
18	46° 08'.0	119° 36'.6	01'.2	112° 59'.6	34'.4	241° 49'.3	07'.2	93° 20'.2	17'.6
19	61° 10'.5	134° 35'.7	01'.0	128° 00'.0	34'.2	256° 52'.0	07'.3	108° 22'.3	17'.5
20	76° 12'.9	149° 34'.9	00'.8	143° 00'.4	33'.9	271° 54'.7	07'.4	123° 24'.5	17'.4
21	91° 15'.4	164° 34'.0	00'.6	158° 00'.9	33'.6	286° 57'.4	07'.6	138° 26'.6	17'.3
22	106° 17'.9	179° 33'.2	00'.3	173° 01'.3	33'.3	302° 00'.2	07'.7	153° 28'.8	17'.3
23	121° 20'.3	194° 32'.3	00'.1	188° 01'.7	33'.1	317° 02'.9	07'.8	168° 31'.0	17'.2
7 Friday 00	136° 22'.8	209° 31'.5	21° 59'.9 S	203° 02'.2	22° 32'.8 S	332° 05'.6	8° 07'.9 N	183° 33'.1	18° 17'.1 S
01	151° 25'.3	224° 30'.6	59'.7	218° 02'.6	32'.5	347° 08'.3	08'.0	198° 35'.3	17'.0
02	166° 27'.7	239° 29'.8	59'.4	233° 03'.0	32'.2	2° 11'.0	08'.1	213° 37'.5	16'.9
03	181° 30'.2	254° 28'.9	59'.2	248° 03'.5	31'.9	17° 13'.7	08'.2	228° 39'.6	16'.9
04	196° 32'.6	269° 28'.1	59'.0	263° 03'.9	31'.7	32° 16'.4	08'.3	243° 41'.8	16'.8
05	211° 35'.1	284° 27'.3	58'.7	278° 04'.3	31'.4	47° 19'.2	08'.4	258° 43'.9	16'.7
06	226° 37'.6	299° 26'.4	58'.5	293° 04'.8	31'.1	62° 21'.9	08'.6	273° 46'.1	16'.6
07	241° 40'.0	314° 25'.6	58'.3	308° 05'.2	30'.8	77° 24'.6	08'.7	288° 48'.3	16'.6
08	256° 42'.5	329° 24'.7	58'.0	323° 05'.6	30'.6	92° 27'.3	08'.8	303° 50'.4	16'.5
09	271° 45'.0	344° 23'.9	57'.8	338° 06'.0	30'.3	107° 30'.0	08'.9	318° 52'.6	16'.4
10	286° 47'.4	359° 23'.0	57'.5	353° 06'.5	30'.0	122° 32'.7	09'.0	333° 54'.7	16'.3
11	301° 49'.9	14° 22'.2	57'.3	8° 06'.9	29'.7	137° 35'.5	09'.1	348° 56'.9	16'.2
12	316° 52'.4	29° 21'.3	21° 57'.1 S	23° 07'.3	22° 29'.4 S	152° 38'.2	8° 09'.2 N	3° 59'.1	18° 16'.2 S
13	331° 54'.8	44° 20'.5	56'.8	38° 07'.8	29'.2	167° 40'.9	09'.3	19° 01'.2	16'.1
14	346° 57'.3	59° 19'.6	56'.6	53° 08'.2	28'.9	182° 43'.6	09'.5	34° 03'.4	16'.0
15	1° 59'.8	74° 18'.8	56'.3	68° 08'.6	28'.6	197° 46'.3	09'.6	49° 05'.6	15'.9
16	17° 02'.2	89° 18'.0	56'.1	83° 09'.1	28'.3	212° 49'.1	09'.7	64° 07'.7	15'.9
17	32° 04'.7	104° 17'.1	55'.8	98° 09'.5	28'.0	227° 51'.8	09'.8	79° 09'.9	15'.8
18	47° 07'.1	119° 16'.3	55'.6	113° 09'.9	27'.7	242° 54'.5	09'.9	94° 12'.0	15'.7
19	62° 09'.6	134° 15'.4	55'.3	128° 10'.4	27'.5	257° 57'.2	10'.0	109° 14'.2	15'.6
20	77° 12'.1	149° 14'.6	55'.1	143° 10'.8	27'.2	272° 59'.9	10'.1	124° 16'.4	15'.5
21	92° 14'.5	164° 13'.7	54'.8	158° 11'.2	26'.9	288° 02'.6	10'.2	139° 18'.5	15'.5
22	107° 17'.0	179° 12'.9	54'.6	173° 11'.7	26'.6	303° 05'.4	10'.4	154° 20'.7	15'.4
23	122° 19'.5	194° 12'.1	54'.3	188° 12'.1	26'.3	318° 08'.1	10'.5	169° 22'.8	15'.3
8 Saturday 00	137° 21'.9	209° 11'.2	21° 54'.1 S	203° 12'.5	22° 26'.0 S	333° 10'.8	8° 10'.6 N	184° 25'.0	18° 15'.2 S
01	152° 24'.4	224° 10'.4	53'.8	218° 12'.9	25'.7	348° 13'.5	10'.7	199° 27'.2	15'.2
02	167° 26'.9	239° 09'.5	53'.6	233° 13'.4	25'.5	3° 16'.2	10'.8	214° 29'.3	15'.1
03	182° 29'.3	254° 08'.7	53'.3	248° 13'.8	25'.2	18° 19'.0	10'.9	229° 31'.5	15'.0
04	197° 31'.8	269° 07'.8	53'.0	263° 14'.2	24'.9	33° 21'.7	11'.0	244° 33'.7	14'.9
05	212° 34'.2	284° 07'.0	52'.8	278° 14'.7	24'.6	48° 24'.4	11'.2	259° 35'.8	14'.8
06	227° 36'.7	299° 06'.2	52'.5	293° 15'.1	24'.3	63° 27'.1	11'.3	274° 38'.0	14'.8
07	242° 39'.2	314° 05'.3	52'.3	308° 15'.5	24'.0	78° 29'.8	11'.4	289° 40'.1	14'.7
08	257° 41'.6	329° 04'.5	52'.0	323° 16'.0	23'.7	93° 32'.6	11'.5	304° 42'.3	14'.6
09	272° 44'.1	344° 03'.6	51'.7	338° 16'.4	23'.4	108° 35'.3	11'.6	319° 44'.5	14'.5
10	287° 46'.6	359° 02'.8	51'.5	353° 16'.8	23'.1	123° 38'.0	11'.7	334° 46'.6	14'.5
11	302° 49'.0	14° 01'.9	51'.2	8° 17'.3	22'.9	138° 40'.7	11'.8	349° 48'.8	14'.4
12	317° 51'.5	29° 01'.1	21° 50'.9 S	23° 17'.7	22° 22'.6 S	153° 43'.4	8° 11'.9 N	4° 51'.0	18° 14'.3 S
13	332° 54'.0	44° 00'.3	50'.7	38° 18'.1	22'.3	168° 46'.2	12'.1	19° 53'.1	14'.2
14	347° 56'.4	58° 59'.4	50'.4	53° 18'.6	22'.0	183° 48'.9	12'.2	34° 55'.3	14'.2
15	2° 58'.9	73° 58'.6	50'.1	68° 19'.0	21'.7	198° 51'.6	12'.3	49° 57'.4	14'.1
16	18° 01'.4	88° 57'.7	49'.8	83° 19'.4	21'.4	213° 54'.3	12'.4	64° 59'.6	14'.0
17	33° 03'.8	103° 56'.9	49'.6	98° 19'.9	21'.1	228° 57'.1	12'.5	80° 01'.8	13'.9
18	48° 06'.3	118° 56'.1	49'.3	113° 20'.3	20'.8	243° 59'.8	12'.6	95° 03'.9	13'.8
19	63° 08'.7	133° 55'.2	49'.0	128° 20'.7	20'.5	259° 02'.5	12'.7	110° 06'.1	13'.8
20	78° 11'.2	148° 54'.4	48'.7	143° 21'.2	20'.2	274° 05'.2	12'.9	125° 08'.2	13'.7
21	93° 13'.7	163° 53'.5	48'.5	158° 21'.6	19'.9	289° 08'.0	13'.0	140° 10'.4	13'.6
22	108° 16'.1	178° 52'.7	48'.2	173° 22'.0	19'.6	304° 10'.7	13'.1	155° 12'.6	13'.5
23	123° 18'.6	193° 51'.9	47'.9	188° 22'.5	19'.3	319° 13'.4	13'.2	170° 14'.7	13'.5
	M.P. 14:52	v -0'.8	d 0'.2	v 0'.4	d 0'.3	v 2'.7	d 0'.1	v 2'.2	d 0'.1

STARS		
Name	SHA	Dec
Acamar	315° 30'.4	40° 20'.4 S
Achernar	335° 38'.7	57° 16'.8 S
Acrux	173° 27'.0	63° 03'.3 S
Adhara	255° 24'.7	28° 57'.8 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.2	55° 59'.7 N
Alkaid	153° 11'.2	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.0 S
Alnilam	276° 02'.3	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.6 S
Alphecca	126° 24'.5	26° 44'.1 N
Alpheratz	358° 00'.3	29° 03'.0 N
Altair	62° 24'.1	8° 50'.7 N
Ankaa	353° 31'.6	42° 21'.1 S
Antares	112° 46'.0	26° 24'.9 S
Arcturus	146° 10'.2	19° 13'.1 N
Atria	108° 02'.5	69° 00'.7 S
Avior	234° 24'.0	59° 29'.2 S
Bellatrix	278° 48'.9	6° 20'.6 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.8	52° 41'.7 S
Capella	280° 57'.8	45° 59'.6 N
Deneb	49° 42'.9	45° 15'.1 N
Denebola	182° 49'.6	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.8 S
Dubhe	194° 10'.3	61° 47'.3 N
Elnath	278° 32'.6	28° 36'.2 N
Eltanin	90° 53'.9	51° 29'.1 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.5	57° 04'.1 S
Gienah	176° 08'.5	17° 30'.0 S
Hadar	149° 10'.6	60° 20'.0 S
Hamal	328° 18'.9	23° 25'.7 N
Kaus Aust.	84° 05'.2	34° 23'.3 S
Kochab	137° 19'.1	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.7	4° 03'.6 N
Menkent	148° 26'.4	36° 19'.9 S
Miaplacidus	221° 42'.3	69° 41'.2 S
Mirfak	309° 03'.2	49° 50'.3 N
Nunki	76° 18'.3	26° 18'.4 S
Peacock	53° 44'.7	56° 45'.6 S
Polaris	324° 09'.6	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.4	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.2	8° 12'.7 S
Rigil Kent	140° 13'.5	60° 47'.9 S
Sabik	102° 31'.0	15° 43'.0 S
Schedar	349° 59'.2	56° 29'.9 N
Shaula	96° 43'.8	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.4 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.2 S
Vega	80° 50'.1	38° 46'.4 N
Zuben'ubi	137° 23'.1	16° 00'.7 S

	SHA	Mer.Pass.
Venus	73° 08'.7	10:02
Mars	66° 39'.4	10:28
Jupiter	195° 42'.8	01:51
Saturn	47° 10'.3	11:44

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
176° 29'.6	15° 54'.5 S	155° 01'.7	16'.1	3° 23'.5 S	12'.5	54'.5
191° 29'.5	53'.8	169° 36'.8	16'.0	11'.0	12'.6	
206° 29'.5	53'.0	184° 11'.8	16'.1	2° 58'.4 S	12'.5	
221° 29'.4	52'.2	198° 46'.9	16'.0	45'.9	12'.6	
236° 29'.4	51'.5	213° 21'.9	16'.1	33'.3	12'.6	
251° 29'.3	50'.7	227° 57'.0	16'.0	20'.7	12'.6	
266° 29'.3	49'.9	242° 32'.0	16'.0	08'.1	12'.6	
281° 29'.2	49'.2	257° 07'.0	16'.1	1° 55'.5 S	12'.6	
296° 29'.2	48'.4	271° 42'.1	16'.0	42'.9	12'.6	54'.6
311° 29'.1	47'.7	286° 17'.1	16'.0	30'.3	12'.7	
326° 29'.1	46'.9	300° 52'.1	16'.0	17'.6	12'.6	
341° 29'.0	46'.1	315° 27'.1	16'.0	05'.0	12'.7	
356° 29'.0	15° 45'.4 S	330° 02'.1	16'.0	0° 52'.3 S	12'.6	54'.6
11° 28'.9	44'.6	344° 37'.1	16'.0	39'.7	12'.7	
26° 28'.9	43'.8	359° 12'.1	15'.9	27'.0	12'.7	
41° 28'.8	43'.1	13° 47'.0	16'.0	14'.3	12'.7	54'.7
56° 28'.8	42'.3	28° 22'.0	16'.0	01'.6	12'.7	
71° 28'.8	41'.5	42° 57'.0	15'.9	0° 11'.1 N	12'.7	
86° 28'.7	40'.8	57° 31'.9	15'.9	23'.8	12'.7	
101° 28'.7	40'.0	72° 06'.8	15'.9	36'.5	12'.7	
116° 28'.6	39'.2	86° 41'.7	15'.9	49'.2	12'.7	
131° 28'.6	38'.5	101° 16'.6	15'.9	1° 01'.9 N	12'.7	
146° 28'.5	37'.7	115° 51'.5	15'.8	14'.6	12'.8	54'.8
161° 28'.5	36'.9	130° 26'.3	15'.9	27'.4	12'.7	
176° 28'.5	15° 36'.1 S	145° 01'.2	15'.8	1° 40'.1 N	12'.7	54'.8
191° 28'.4	35'.4	159° 36'.0	15'.8	52'.8	12'.7	
206° 28'.4	34'.6	174° 10'.8	15'.7	2° 05'.5 N	12'.7	
221° 28'.3	33'.8	188° 45'.5	15'.8	18'.2	12'.7	
236° 28'.3	33'.1	203° 20'.3	15'.7	30'.9	12'.7	54'.9
251° 28'.2	32'.3	217° 55'.0	15'.7	43'.6	12'.7	
266° 28'.2	31'.5	232° 29'.7	15'.7	56'.3	12'.7	
281° 28'.2	30'.7	247° 04'.4	15'.6	3° 09'.0 N	12'.7	
296° 28'.1	30'.0	261° 39'.0	15'.7	21'.7	12'.7	
311° 28'.1	29'.2	276° 13'.7	15'.6	34'.4	12'.7	
326° 28'.0	28'.4	290° 48'.3	15'.5	47'.1	12'.7	55'.0
341° 28'.0	27'.6	305° 22'.8	15'.6	59'.8	12'.6	
356° 28'.0	15° 26'.9 S	319° 57'.4	15'.5	4° 12'.4 N	12'.7	55'.0
11° 27'.9	26'.1	334° 31'.9	15'.4	25'.1	12'.6	
26° 27'.9	25'.3	349° 06'.3	15'.5	37'.7	12'.7	
41° 27'.9	24'.5	3° 40'.8	15'.4	50'.4	12'.6	55'.1
56° 27'.8	23'.7	18° 15'.2	15'.4	5° 03'.0 N	12'.6	
71° 27'.8	23'.0	32° 49'.6	15'.3	15'.6	12'.6	
86° 27'.8	22'.2	47° 23'.9	15'.3	28'.2	12'.5	
101° 27'.7	21'.4	61° 58'.2	15'.2	40'.7	12'.6	
116° 27'.7	20'.6	76° 32'.4	15'.3	53'.3	12'.5	
131° 27'.6	19'.8	91° 06'.7	15'.2	6° 05'.8 N	12'.6	55'.2
146° 27'.6	19'.1	105° 40'.9	15'.1	18'.4	12'.5	
161° 27'.6	18'.3	120° 15'.0	15'.1	30'.9	12'.5	
176° 27'.5	15° 17'.5 S	134° 49'.1	15'.1	6° 43'.4 N	12'.5	55'.2
191° 27'.5	16'.7	149° 23'.2	15'.0	55'.9	12'.4	
206° 27'.5	15'.9	163° 57'.2	14'.9	7° 08'.3 N	12'.4	55'.3
221° 27'.4	15'.2	178° 31'.1	15'.0	20'.7	12'.4	
236° 27'.4	14'.4	193° 05'.1	14'.8	33'.1	12'.4	
251° 27'.4	13'.6	207° 38'.9	14'.9	45'.5	12'.4	
266° 27'.3	12'.8	222° 12'.8	14'.8	57'.9	12'.3	55'.4
281° 27'.3	12'.0	236° 46'.6	14'.7	8° 10'.2 N	12'.3	
296° 27'.3	11'.2	251° 20'.3	14'.7	22'.5	12'.3	
311° 27'.3	10'.4	265° 54'.0	14'.6	34'.8	12'.3	
326° 27'.2	09'.7	280° 27'.6	14'.6	47'.1	12'.2	
341° 27'.2	08'.9	295° 01'.2	14'.5	59'.3	12'.2	55'.5
356° 27'.2	15° 08'.1 S	309° 34'.7	14'.5	9° 11'.5 N	12'.2	55'.5
11° 27'.1	07'.3	324° 08'.2	14'.4	23'.7	12'.1	
26° 27'.1	06'.5	338° 41'.6	14'.4	35'.8	12'.1	
41° 27'.1	05'.7	353° 15'.0	14'.3	47'.9	12'.1	
56° 27'.1	04'.9	7° 48'.3	14'.2	10° 00'.0 N	12'.0	55'.6
71° 27'.0	04'.1	22° 21'.5	14'.2	12'.0	12'.1	
86° 27'.0	03'.4	36° 54'.7	14'.1	24'.1	11'.9	
101° 27'.0	02'.6	51° 27'.8	14'.1	36'.0	12'.0	
116° 26'.9	01'.8	66° 00'.9	14'.0	48'.0	11'.9	55'.7
131° 26'.9	01'.0	80° 33'.9	14'.0	59'.9	11'.8	
146° 26'.9	00'.2	95° 06'.9	13'.9	11° 11'.7 N	11'.8	
161° 26'.9	14° 59'.4 S	109° 39'.8	13'.8	23'.5	11'.8	
SD 16'.2	d 0'.8	SD	14'.9	15'.0	15'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
6	14 02	14 04	12:14	14:03	01:43	3d 7%
7	14 06	14 08	12:14	14:45	02:24	4d 12%
8	14 10	14 11	12:14	15:28	03:06	5d 20%

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1992 February 9, 10, 11 (Sun, Mon, Tue)

GMT	ARIES	VENUS -4.0		MARS +1.3		JUPITER -2.5		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
9 Sunday 00	138° 21'.1	208° 51'.0	21° 47'.6 S	203° 22'.9	22° 19'.0 S	334° 16'.1	8° 13'.3 N	185° 16'.9	18° 13'.4 S
01	153° 23'.5	223° 50'.2	47'.3	218° 23'.3	18'.7	349° 18'.8	13'.4	200° 19'.1	13'.3
02	168° 26'.0	238° 49'.3	47'.0	233° 23'.8	18'.4	4° 21'.6	13'.5	215° 21'.2	13'.2
03	183° 28'.5	253° 48'.5	46'.8	248° 24'.2	18'.1	19° 24'.3	13'.7	230° 23'.4	13'.1
04	198° 30'.9	268° 47'.7	46'.5	263° 24'.6	17'.8	34° 27'.0	13'.8	245° 25'.5	13'.1
05	213° 33'.4	283° 46'.8	46'.2	278° 25'.1	17'.6	49° 29'.7	13'.9	260° 27'.7	13'.0
06	228° 35'.8	298° 46'.0	45'.9	293° 25'.5	17'.3	64° 32'.5	14'.0	275° 29'.9	12'.9
07	243° 38'.3	313° 45'.2	45'.6	308° 26'.0	17'.0	79° 35'.2	14'.1	290° 32'.0	12'.8
08	258° 40'.8	328° 44'.3	45'.3	323° 26'.4	16'.7	94° 37'.9	14'.2	305° 34'.2	12'.8
09	273° 43'.2	343° 43'.5	45'.0	338° 26'.8	16'.4	109° 40'.6	14'.4	320° 36'.4	12'.7
10	288° 45'.7	358° 42'.6	44'.7	353° 27'.3	16'.1	124° 43'.4	14'.5	335° 38'.5	12'.6
11	303° 48'.2	13° 41'.8	44'.4	8° 27'.7	15'.8	139° 46'.1	14'.6	350° 40'.7	12'.5
12	318° 50'.6	28° 41'.0	21° 44'.1 S	23° 28'.1	22° 15'.5 S	154° 48'.8	8° 14'.7 N	5° 42'.9	18° 12'.4 S
13	333° 53'.1	43° 40'.1	43'.8	38° 28'.6	15'.1	169° 51'.5	14'.8	20° 45'.0	12'.4
14	348° 55'.6	58° 39'.3	43'.5	53° 29'.0	14'.8	184° 54'.3	14'.9	35° 47'.2	12'.3
15	3° 58'.0	73° 38'.5	43'.2	68° 29'.4	14'.5	199° 57'.0	15'.0	50° 49'.3	12'.2
16	19° 00'.5	88° 37'.6	42'.9	83° 29'.9	14'.2	214° 59'.7	15'.2	65° 51'.5	12'.1
17	34° 03'.0	103° 36'.8	42'.6	98° 30'.3	13'.9	230° 02'.5	15'.3	80° 53'.7	12'.1
18	49° 05'.4	118° 36'.0	42'.3	113° 30'.7	13'.6	245° 05'.2	15'.4	95° 55'.8	12'.0
19	64° 07'.9	133° 35'.1	42'.0	128° 31'.2	13'.3	260° 07'.9	15'.5	110° 58'.0	11'.9
20	79° 10'.3	148° 34'.3	41'.7	143° 31'.6	13'.0	275° 10'.6	15'.6	126° 00'.2	11'.8
21	94° 12'.8	163° 33'.5	41'.4	158° 32'.0	12'.7	290° 13'.4	15'.7	141° 02'.3	11'.8
22	109° 15'.3	178° 32'.6	41'.1	173° 32'.5	12'.4	305° 16'.1	15'.9	156° 04'.5	11'.7
23	124° 17'.7	193° 31'.8	40'.8	188° 32'.9	12'.1	320° 18'.8	16'.0	171° 06'.6	11'.6
10 Monday 00	139° 20'.2	208° 31'.0	21° 40'.5 S	203° 33'.4	22° 11'.8 S	335° 21'.5	8° 16'.1 N	186° 08'.8	18° 11'.5 S
01	154° 22'.7	223° 30'.1	40'.2	218° 33'.8	11'.5	350° 24'.3	16'.2	201° 11'.0	11'.4
02	169° 25'.1	238° 29'.3	39'.9	233° 34'.2	11'.2	5° 27'.0	16'.3	216° 13'.1	11'.4
03	184° 27'.6	253° 28'.5	39'.6	248° 34'.7	10'.9	20° 29'.7	16'.4	231° 15'.3	11'.3
04	199° 30'.1	268° 27'.6	39'.3	263° 35'.1	10'.6	35° 32'.5	16'.6	246° 17'.5	11'.2
05	214° 32'.5	283° 26'.8	38'.9	278° 35'.5	10'.3	50° 35'.2	16'.7	261° 19'.6	11'.1
06	229° 35'.0	298° 26'.0	38'.6	293° 36'.0	10'.0	65° 37'.9	16'.8	276° 21'.8	11'.1
07	244° 37'.5	313° 25'.1	38'.3	308° 36'.4	09'.6	80° 40'.6	16'.9	291° 23'.9	11'.0
08	259° 39'.9	328° 24'.3	38'.0	323° 36'.9	09'.3	95° 43'.4	17'.0	306° 26'.1	10'.9
09	274° 42'.4	343° 23'.5	37'.7	338° 37'.3	09'.0	110° 46'.1	17'.1	321° 28'.3	10'.8
10	289° 44'.8	358° 22'.6	37'.4	353° 37'.7	08'.7	125° 48'.8	17'.3	336° 30'.4	10'.7
11	304° 47'.3	13° 21'.8	37'.0	8° 38'.2	08'.4	140° 51'.6	17'.4	351° 32'.6	10'.7
12	319° 49'.8	28° 21'.0	21° 36'.7 S	23° 38'.6	22° 08'.1 S	155° 54'.3	8° 17'.5 N	6° 34'.8	18° 10'.6 S
13	334° 52'.2	43° 20'.1	36'.4	38° 39'.0	07'.8	170° 57'.0	17'.6	21° 36'.9	10'.5
14	349° 54'.7	58° 19'.3	36'.1	53° 39'.5	07'.5	185° 59'.8	17'.7	36° 39'.1	10'.4
15	4° 57'.2	73° 18'.5	35'.7	68° 39'.9	07'.2	201° 02'.5	17'.8	51° 41'.3	10'.4
16	19° 59'.6	88° 17'.6	35'.4	83° 40'.4	06'.8	216° 05'.2	18'.0	66° 43'.4	10'.3
17	35° 02'.1	103° 16'.8	35'.1	98° 40'.8	06'.5	231° 07'.9	18'.1	81° 45'.6	10'.2
18	50° 04'.6	118° 16'.0	34'.8	113° 41'.2	06'.2	246° 10'.7	18'.2	96° 47'.7	10'.1
19	65° 07'.0	133° 15'.1	34'.4	128° 41'.7	05'.9	261° 13'.4	18'.3	111° 49'.9	10'.0
20	80° 09'.5	148° 14'.3	34'.1	143° 42'.1	05'.6	276° 16'.1	18'.4	126° 52'.1	10'.0
21	95° 11'.9	163° 13'.5	33'.8	158° 42'.5	05'.3	291° 18'.9	18'.5	141° 54'.2	09'.9
22	110° 14'.4	178° 12'.7	33'.4	173° 43'.0	05'.0	306° 21'.6	18'.7	156° 56'.4	09'.8
23	125° 16'.9	193° 11'.8	33'.1	188° 43'.4	04'.6	321° 24'.3	18'.8	171° 58'.6	09'.7
11 Tuesday 00	140° 19'.3	208° 11'.0	21° 32'.8 S	203° 43'.9	22° 04'.3 S	336° 27'.1	8° 18'.9 N	187° 00'.7	18° 09'.7 S
01	155° 21'.8	223° 10'.2	32'.4	218° 44'.3	04'.0	351° 29'.8	19'.0	202° 02'.9	09'.6
02	170° 24'.3	238° 09'.3	32'.1	233° 44'.7	03'.7	6° 32'.5	19'.1	217° 05'.1	09'.5
03	185° 26'.7	253° 08'.5	31'.7	248° 45'.2	03'.4	21° 35'.3	19'.2	232° 07'.2	09'.4
04	200° 29'.2	268° 07'.7	31'.4	263° 45'.6	03'.1	36° 38'.0	19'.4	247° 09'.4	09'.3
05	215° 31'.7	283° 06'.9	31'.1	278° 46'.0	02'.7	51° 40'.7	19'.5	262° 11'.5	09'.3
06	230° 34'.1	298° 06'.0	30'.7	293° 46'.5	02'.4	66° 43'.5	19'.6	277° 13'.7	09'.2
07	245° 36'.6	313° 05'.2	30'.4	308° 46'.9	02'.1	81° 46'.2	19'.7	292° 15'.9	09'.1
08	260° 39'.1	328° 04'.4	30'.0	323° 47'.4	01'.8	96° 48'.9	19'.8	307° 18'.0	09'.0
09	275° 41'.5	343° 03'.6	29'.7	338° 47'.8	01'.5	111° 51'.7	19'.9	322° 20'.2	09'.0
10	290° 44'.0	358° 02'.7	29'.3	353° 48'.2	01'.1	126° 54'.4	20'.1	337° 22'.4	08'.9
11	305° 46'.4	13° 01'.9	29'.0	8° 48'.7	00'.8	141° 57'.1	20'.2	352° 24'.5	08'.8
12	320° 48'.9	28° 01'.1	21° 28'.6 S	23° 49'.1	22° 00'.5 S	156° 59'.9	8° 20'.3 N	7° 26'.7	18° 08'.7 S
13	335° 51'.4	43° 00'.3	28'.3	38° 49'.6	00'.2	172° 02'.6	20'.4	22° 28'.9	08'.7
14	350° 53'.8	57° 59'.4	27'.9	53° 50'.0	21° 59'.9 S	187° 05'.3	20'.5	37° 31'.0	08'.6
15	5° 56'.3	72° 58'.6	27'.6	68° 50'.4	59'.5	202° 08'.1	20'.7	52° 33'.2	08'.5
16	20° 58'.8	87° 57'.8	27'.2	83° 50'.9	59'.2	217° 10'.8	20'.8	67° 35'.3	08'.4
17	36° 01'.2	102° 57'.0	26'.9	98° 51'.3	58'.9	232° 13'.5	20'.9	82° 37'.5	08'.3
18	51° 03'.7	117° 56'.1	26'.5	113° 51'.8	58'.6	247° 16'.3	21'.0	97° 39'.7	08'.3
19	66° 06'.2	132° 55'.3	26'.2	128° 52'.2	58'.2	262° 19'.0	21'.1	112° 41'.8	08'.2
20	81° 08'.6	147° 54'.5	25'.8	143° 52'.6	57'.9	277° 21'.7	21'.2	127° 44'.0	08'.1
21	96° 11'.1	162° 53'.7	25'.4	158° 53'.1	57'.6	292° 24'.5	21'.4	142° 46'.2	08'.0
22	111° 13'.6	177° 52'.8	25'.1	173° 53'.5	57'.3	307° 27'.2	21'.5	157° 48'.3	08'.0
23	126° 16'.0	192° 52'.0	24'.7	188° 54'.0	56'.9	322° 29'.9	21'.6	172° 50'.5	07'.9
	M.P. 14:40	v -0'.8	d 0'.3	v 0'.4	d 0'.3	v 2'.7	d 0'.1	v 2'.2	d 0'.1

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 30'.4	40° 20'.4 S	176° 26'.8	14° 58'.6 S	124° 12'.6	13'.7	11° 35'.3 N	11'.8	55'.8
Achernar	335° 38'.7	57° 16'.8 S	191° 26'.8	57'.8	138° 45'.3	13'.7	47'.1	11'.7	
Acrux	173° 26'.9	63° 03'.3 S	206° 26'.8	57'.0	153° 18'.0	13'.6	58'.8	11'.6	
Adhara	255° 24'.7	28° 57'.8 S	221° 26'.8	56'.2	167° 50'.6	13'.6	12° 10'.4 N	11'.6	
Aldebaran	291° 07'.6	16° 29'.7 N	236° 26'.7	55'.4	182° 23'.2	13'.5	22'.0	11'.6	55'.9
			251° 26'.7	54'.6	196° 55'.7	13'.4	33'.6	11'.5	
Alioth	166° 34'.1	55° 59'.7 N	266° 26'.7	53'.8	211° 28'.1	13'.3	45'.1	11'.5	
Alkaid	153° 11'.1	49° 20'.7 N	281° 26'.7	53'.0	226° 00'.4	13'.3	56'.6	11'.4	
Alnair	28° 04'.0	47° 00'.0 S	296° 26'.7	52'.2	240° 32'.7	13'.2	13° 08'.0 N	11'.4	56'.0
Alnilam	276° 02'.3	1° 12'.5 S	311° 26'.6	51'.5	255° 04'.9	13'.1	19'.4	11'.3	
Alphard	218° 11'.4	8° 37'.6 S	326° 26'.6	50'.7	269° 37'.0	13'.1	30'.7	11'.3	
			341° 26'.6	49'.9	284° 09'.1	12'.9	42'.0	11'.2	
Alphecca	126° 24'.5	26° 44'.1 N	356° 26'.6	14° 49'.1 S	298° 41'.0	12'.9	13° 53'.2 N	11'.1	56'.1
Alpheratz	358° 00'.3	29° 03'.0 N	11° 26'.5	48'.3	313° 12'.9	12'.9	14° 04'.3 N	11'.2	
Altair	62° 24'.1	8° 50'.7 N	26° 26'.5	47'.5	327° 44'.8	12'.7	15'.5	11'.0	
Ankaa	353° 31'.6	42° 21'.1 S	41° 26'.5	46'.7	342° 16'.5	12'.7	26'.5	11'.0	
Antares	112° 46'.0	26° 24'.9 S	56° 26'.5	45'.9	356° 48'.2	12'.6	37'.5	10'.9	56'.2
			71° 26'.5	45'.1	11° 19'.8	12'.5	48'.4	10'.9	
Arcturus	146° 10'.1	19° 13'.1 N	86° 26'.4	44'.3	25° 51'.3	12'.4	59'.3	10'.8	
Atria	108° 02'.5	69° 00'.7 S	101° 26'.4	43'.5	40° 22'.7	12'.3	15° 10'.1 N	10'.8	56'.3
Avior	234° 24'.0	59° 29'.2 S	116° 26'.4	42'.7	54° 54'.0	12'.3	20'.9	10'.7	
Bellatrix	278° 48'.9	6° 20'.5 N	131° 26'.4	41'.9	69° 25'.3	12'.2	31'.6	10'.6	
Betelgeuse	271° 18'.3	7° 24'.3 N	146° 26'.4	41'.1	83° 56'.5	12'.1	42'.2	10'.6	
			161° 26'.4	40'.3	98° 27'.6	12'.0	52'.8	10'.5	56'.4
Canopus	264° 02'.8	52° 41'.7 S	176° 26'.3	14° 39'.5 S	112° 58'.6	11'.9	16° 03'.3 N	10'.5	56'.4
Capella	280° 57'.8	45° 59'.6 N	191° 26'.3	38'.7	127° 29'.5	11'.8	13'.8	10'.3	
Deneb	49° 42'.9	45° 15'.1 N	206° 26'.3	37'.8	142° 00'.3	11'.8	24'.1	10'.3	56'.5
Denebola	182° 49'.6	14° 36'.7 N	221° 26'.3	37'.0	156° 31'.1	11'.7	34'.4	10'.3	
Diphda	349° 12'.0	18° 01'.8 S	236° 26'.3	36'.2	171° 01'.8	11'.5	44'.7	10'.1	
			251° 26'.3	35'.4	185° 32'.3	11'.5	54'.8	10'.1	
Dubhe	194° 10'.3	61° 47'.3 N	266° 26'.2	34'.6	200° 02'.8	11'.4	17° 04'.9 N	10'.0	56'.6
Elnath	278° 32'.6	28° 36'.2 N	281° 26'.2	33'.8	214° 33'.2	11'.3	14'.9	10'.0	
Eltanin	90° 53'.9	51° 29'.1 N	296° 26'.2	33'.0	229° 03'.5	11'.2	24'.9	9'.8	
Enif	34° 03'.1	9° 50'.3 N	311° 26'.2	32'.2	243° 33'.7	11'.2	34'.7	9'.8	56'.7
Fomalhaut	15° 41'.8	29° 39'.9 S	326° 26'.2	31'.4	258° 03'.9	11'.0	44'.5	9'.7	
			341° 26'.2	30'.6	272° 33'.9	10'.9	54'.2	9'.6	
Gacrux	172° 18'.5	57° 04'.1 S	356° 26'.2	14° 29'.8 S	287° 03'.8	10'.9	18° 03'.8 N	9'.6	56'.7
Gienah	176° 08'.5	17° 30'.0 S	11° 26'.1	29'.0	301° 33'.7	10'.7	13'.4	9'.4	56'.8
Hadar	149° 10'.5	60° 20'.0 S	26° 26'.1	28'.2	316° 03'.4	10'.7	22'.8	9'.4	
Hamal	328° 18'.9	23° 25'.7 N	41° 26'.1	27'.4	330° 33'.1	10'.6	32'.2	9'.3	
Kaus Aust.	84° 05'.2	34° 23'.3 S	56° 26'.1	26'.6	345° 02'.7	10'.4	41'.5	9'.2	56'.9
			71° 26'.1	25'.7	359° 32'.1	10'.4	50'.7	9'.1	
Kochab	137° 19'.0	74° 10'.8 N	86° 26'.1	24'.9	14° 01'.5	10'.3	59'.8	9'.1	
Markab	13° 54'.5	15° 09'.8 N	101° 26'.1	24'.1	28° 30'.8	10'.2	19° 08'.9 N	8'.9	57'.0
Menkar	314° 31'.7	4° 03'.6 N	116° 26'.1	23'.3	43° 00'.0	10'.1	17'.8	8'.9	
Menkent	148° 26'.3	36° 19'.9 S	131° 26'.1	22'.5	57° 29'.1	10'.0	26'.7	8'.7	
Miaplacidus	221° 42'.3	69° 41'.2 S	146° 26'.1	21'.7	71° 58'.1	9'.8	35'.4	8'.7	57'.1
			161° 26'.0	20'.9	86° 26'.9	9'.8	44'.1	8'.6	
Mirfak	309° 03'.3	49° 50'.3 N	176° 26'.0	14° 20'.1 S	100° 55'.7	9'.7	19° 52'.7 N	8'.4	57'.1
Nunki	76° 18'.3	26° 18'.4 S	191° 26'.0	19'.2	115° 24'.4	9'.6	20° 01'.1 N	8'.4	57'.2
Peacock	53° 44'.7	56° 45'.6 S	206° 26'.0	18'.4	129° 53'.0	9'.5	09'.5	8'.3	
Polaris	324° 10'.7	89° 14'.2 N	221° 26'.0	17'.6	144° 21'.5	9'.4	17'.8	8'.2	
Pollux	243° 46'.8	28° 02'.7 N	236° 26'.0	16'.8	158° 49'.9	9'.3	26'.0	8'.0	57'.3
			251° 26'.0	16'.0	173° 18'.2	9'.3	34'.0	8'.0	
Procyon	245° 16'.1	5° 14'.6 N	266° 26'.0	15'.2	187° 46'.5	9'.1	42'.0	7'.9	
Rasalhague	96° 21'.4	12° 33'.7 N	281° 26'.0	14'.4	202° 14'.6	9'.0	49'.9	7'.7	57'.4
Regulus	208° 00'.1	12° 00'.1 N	296° 26'.0	13'.5	216° 42'.6	8'.9	57'.6	7'.7	
Rigel	281° 27'.2	8° 12'.7 S	311° 26'.0	12'.7	231° 10'.5	8'.8	21° 05'.3 N	7'.5	
Rigil Kent	140° 13'.5	60° 48'.0 S	326° 26'.0	11'.9	245° 38'.3	8'.7	12'.8	7'.5	57'.5
			341° 26'.0	11'.1	260° 06'.0	8'.6	20'.3	7'.3	
Sabik	102° 31'.0	15° 43'.0 S	356° 26'.0	14° 10'.3 S	274° 33'.6	8'.5	21° 27'.6 N	7'.2	57'.5
Schedar	349° 59'.3	56° 29'.9 N	11° 26'.0	09'.5	289° 01'.1	8'.4	34'.8	7'.1	57'.6
Shaula	96° 43'.8	37° 05'.9 S	26° 25'.9	08'.6	303° 28'.5	8'.4	41'.9	7'.0	
Sirius	258° 47'.5	16° 42'.5 S	41° 25'.9	07'.8	317° 55'.9	8'.2	48'.9	6'.9	
Spica	158° 47'.9	11° 07'.4 S	56° 25'.9	07'.0	332° 23'.1	8'.1	55'.8	6'.7	57'.7
			71° 25'.9	06'.2	346° 50'.2	8'.0	22° 02'.5 N	6'.7	
Suhail	223° 03'.8	43° 24'.2 S	86° 25'.9	05'.4	1° 17'.2	7'.9	09'.2	6'.5	
Vega	80° 50'.1	38° 46'.3 N	101° 25'.9	04'.5	15° 44'.1	7'.9	15'.7	6'.4	57'.8
Zuben'ubi	137° 23'.1	16° 00'.7 S	116° 25'.9	03'.7	30° 11'.0	7'.7	22'.1	6'.2	
			131° 25'.9	02'.9	44° 37'.7	7'.6	28'.3	6'.2	
	SHA	Mer.Pass.	146° 25'.9	02'.1	59° 04'.3	7'.6	34'.5	6'.0	57'.9
Venus	69° 10'.7	10:06	161° 25'.9	01'.3	73° 30'.9	7'.4	40'.5	5'.9	
Mars	64° 13'.2	10:25							
Jupiter	196° 01'.3	01:38							
Saturn	46° 48'.6	11:34	SD 16'.2	d 0'.8	SD	15'.3	15'.5	15'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
9	14 13	14 14	12:14	16:13	03:50	6d 28%
10	14 15	14 15	12:14	17:02	04:37	7d 38%
11	14 16	14 16	12:14	17:55	05:28	8d 48%

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1992 February 12, 13, 14 (Wed, Thur, Fri)

GMT	ARIES	VENUS -4.0		MARS +1.3		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
12 Wednesday 00	141° 18'.5	207° 51'.2	21° 24'.4 S	203° 54'.4	21° 56'.6 S	337° 32'.7	8° 21'.7 N	187° 52'.7	18° 07'.8 S
01	156° 20'.9	222° 50'.4	24'.0	218° 54'.9	56'.3	352° 35'.4	21'.8	202° 54'.8	07'.7
02	171° 23'.4	237° 49'.5	23'.6	233° 55'.3	56'.0	7° 38'.2	22'.0	217° 57'.0	07'.6
03	186° 25'.9	252° 48'.7	23'.3	248° 55'.7	55'.6	22° 40'.9	22'.1	232° 59'.2	07'.6
04	201° 28'.3	267° 47'.9	22'.9	263° 56'.2	55'.3	37° 43'.6	22'.2	248° 01'.3	07'.5
05	216° 30'.8	282° 47'.1	22'.5	278° 56'.6	55'.0	52° 46'.4	22'.3	263° 03'.5	07'.4
06	231° 33'.3	297° 46'.3	22'.2	293° 57'.1	54'.7	67° 49'.1	22'.4	278° 05'.7	07'.3
07	246° 35'.7	312° 45'.4	21'.8	308° 57'.5	54'.3	82° 51'.8	22'.6	293° 07'.8	07'.3
08	261° 38'.2	327° 44'.6	21'.4	323° 57'.9	54'.0	97° 54'.6	22'.7	308° 10'.0	07'.2
09	276° 40'.7	342° 43'.8	21'.0	338° 58'.4	53'.7	112° 57'.3	22'.8	323° 12'.1	07'.1
10	291° 43'.1	357° 43'.0	20'.7	353° 58'.8	53'.3	128° 00'.1	22'.9	338° 14'.3	07'.0
11	306° 45'.6	12° 42'.2	20'.3	8° 59'.3	53'.0	143° 02'.8	23'.0	353° 16'.5	06'.9
12	321° 48'.0	27° 41'.3	21° 19'.9 S	23° 59'.7	21° 52'.7 S	158° 05'.5	8° 23'.1 N	8° 18'.6	18° 06'.9 S
13	336° 50'.5	42° 40'.5	19'.5	39° 00'.2	52'.3	173° 08'.3	23'.3	23° 20'.8	06'.8
14	351° 53'.0	57° 39'.7	19'.2	54° 00'.6	52'.0	188° 11'.0	23'.4	38° 23'.0	06'.7
15	6° 55'.4	72° 38'.9	18'.8	69° 01'.0	51'.7	203° 13'.7	23'.5	53° 25'.1	06'.6
16	21° 57'.9	87° 38'.1	18'.4	84° 01'.5	51'.3	218° 16'.5	23'.6	68° 27'.3	06'.6
17	37° 00'.4	102° 37'.2	18'.0	99° 01'.9	51'.0	233° 19'.2	23'.7	83° 29'.5	06'.5
18	52° 02'.8	117° 36'.4	17'.6	114° 02'.4	50'.7	248° 22'.0	23'.9	98° 31'.6	06'.4
19	67° 05'.3	132° 35'.6	17'.3	129° 02'.8	50'.3	263° 24'.7	24'.0	113° 33'.8	06'.3
20	82° 07'.8	147° 34'.8	16'.9	144° 03'.3	50'.0	278° 27'.4	24'.1	128° 36'.0	06'.2
21	97° 10'.2	162° 34'.0	16'.5	159° 03'.7	49'.7	293° 30'.2	24'.2	143° 38'.1	06'.2
22	112° 12'.7	177° 33'.2	16'.1	174° 04'.1	49'.3	308° 32'.9	24'.3	158° 40'.3	06'.1
23	127° 15'.2	192° 32'.3	15'.7	189° 04'.6	49'.0	323° 35'.7	24'.5	173° 42'.5	06'.0
13 Thursday 00	142° 17'.6	207° 31'.5	21° 15'.3 S	204° 05'.0	21° 48'.7 S	338° 38'.4	8° 24'.6 N	188° 44'.6	18° 05'.9 S
01	157° 20'.1	222° 30'.7	14'.9	219° 05'.5	48'.3	353° 41'.1	24'.7	203° 46'.8	05'.9
02	172° 22'.5	237° 29'.9	14'.5	234° 05'.9	48'.0	8° 43'.9	24'.8	218° 48'.9	05'.8
03	187° 25'.0	252° 29'.1	14'.2	249° 06'.4	47'.7	23° 46'.6	24'.9	233° 51'.1	05'.7
04	202° 27'.5	267° 28'.3	13'.8	264° 06'.8	47'.3	38° 49'.3	25'.1	248° 53'.3	05'.6
05	217° 29'.9	282° 27'.4	13'.4	279° 07'.2	47'.0	53° 52'.1	25'.2	263° 55'.4	05'.6
06	232° 32'.4	297° 26'.6	13'.0	294° 07'.7	46'.7	68° 54'.8	25'.3	278° 57'.6	05'.5
07	247° 34'.9	312° 25'.8	12'.6	309° 08'.1	46'.3	83° 57'.6	25'.4	293° 59'.8	05'.4
08	262° 37'.3	327° 25'.0	12'.2	324° 08'.6	46'.0	99° 00'.3	25'.5	309° 01'.9	05'.3
09	277° 39'.8	342° 24'.2	11'.8	339° 09'.0	45'.6	114° 03'.1	25'.7	324° 04'.1	05'.2
10	292° 42'.3	357° 23'.4	11'.4	354° 09'.5	45'.3	129° 05'.8	25'.8	339° 06'.3	05'.2
11	307° 44'.7	12° 22'.6	11'.0	9° 09'.9	45'.0	144° 08'.5	25'.9	354° 08'.4	05'.1
12	322° 47'.2	27° 21'.8	21° 10'.6 S	24° 10'.4	21° 44'.6 S	159° 11'.3	8° 26'.0 N	9° 10'.6	18° 05'.0 S
13	337° 49'.7	42° 20'.9	10'.2	39° 10'.8	44'.3	174° 14'.0	26'.1	24° 12'.8	04'.9
14	352° 52'.1	57° 20'.1	09'.8	54° 11'.2	43'.9	189° 16'.8	26'.3	39° 14'.9	04'.9
15	7° 54'.6	72° 19'.3	09'.4	69° 11'.7	43'.6	204° 19'.5	26'.4	54° 17'.1	04'.8
16	22° 57'.0	87° 18'.5	09'.0	84° 12'.1	43'.2	219° 22'.2	26'.5	69° 19'.3	04'.7
17	37° 59'.5	102° 17'.7	08'.6	99° 12'.6	42'.9	234° 25'.0	26'.6	84° 21'.4	04'.6
18	53° 02'.0	117° 16'.9	08'.1	114° 13'.0	42'.6	249° 27'.7	26'.7	99° 23'.6	04'.5
19	68° 04'.4	132° 16'.1	07'.7	129° 13'.5	42'.2	264° 30'.5	26'.9	114° 25'.8	04'.5
20	83° 06'.9	147° 15'.3	07'.3	144° 13'.9	41'.9	279° 33'.2	27'.0	129° 27'.9	04'.4
21	98° 09'.4	162° 14'.4	06'.9	159° 14'.4	41'.5	294° 36'.0	27'.1	144° 30'.1	04'.3
22	113° 11'.8	177° 13'.6	06'.5	174° 14'.8	41'.2	309° 38'.7	27'.2	159° 32'.3	04'.2
23	128° 14'.3	192° 12'.8	06'.1	189° 15'.3	40'.8	324° 41'.4	27'.4	174° 34'.4	04'.2
14 Friday 00	143° 16'.8	207° 12'.0	21° 05'.7 S	204° 15'.7	21° 40'.5 S	339° 44'.2	8° 27'.5 N	189° 36'.6	18° 04'.1 S
01	158° 19'.2	222° 11'.2	05'.3	219° 16'.1	40'.1	354° 46'.9	27'.6	204° 38'.8	04'.0
02	173° 21'.7	237° 10'.4	04'.8	234° 16'.6	39'.8	9° 49'.7	27'.7	219° 40'.9	03'.9
03	188° 24'.2	252° 09'.6	04'.4	249° 17'.0	39'.5	24° 52'.4	27'.8	234° 43'.1	03'.9
04	203° 26'.6	267° 08'.8	04'.0	264° 17'.5	39'.1	39° 55'.2	28'.0	249° 45'.3	03'.8
05	218° 29'.1	282° 08'.0	03'.6	279° 17'.9	38'.8	54° 57'.9	28'.1	264° 47'.4	03'.7
06	233° 31'.5	297° 07'.2	03'.2	294° 18'.4	38'.4	70° 00'.6	28'.2	279° 49'.6	03'.6
07	248° 34'.0	312° 06'.4	02'.7	309° 18'.8	38'.1	85° 03'.4	28'.3	294° 51'.8	03'.5
08	263° 36'.5	327° 05'.6	02'.3	324° 19'.3	37'.7	100° 06'.1	28'.4	309° 53'.9	03'.5
09	278° 38'.9	342° 04'.7	01'.9	339° 19'.7	37'.4	115° 08'.9	28'.6	324° 56'.1	03'.4
10	293° 41'.4	357° 03'.9	01'.5	354° 20'.2	37'.0	130° 11'.6	28'.7	339° 58'.3	03'.3
11	308° 43'.9	12° 03'.1	01'.0	9° 20'.6	36'.7	145° 14'.4	28'.8	355° 00'.4	03'.2
12	323° 46'.3	27° 02'.3	21° 00'.6 S	24° 21'.1	21° 36'.3 S	160° 17'.1	8° 28'.9 N	10° 02'.6	18° 03'.2 S
13	338° 48'.8	42° 01'.5	00'.2	39° 21'.5	36'.0	175° 19'.9	29'.0	25° 04'.8	03'.1
14	353° 51'.3	57° 00'.7	20° 59'.7 S	54° 22'.0	35'.6	190° 22'.6	29'.2	40° 06'.9	03'.0
15	8° 53'.7	71° 59'.9	59'.3	69° 22'.4	35'.3	205° 25'.3	29'.3	55° 09'.1	02'.9
16	23° 56'.2	86° 59'.1	58'.9	84° 22'.8	34'.9	220° 28'.1	29'.4	70° 11'.3	02'.8
17	38° 58'.7	101° 58'.3	58'.5	99° 23'.3	34'.6	235° 30'.8	29'.5	85° 13'.4	02'.8
18	54° 01'.1	116° 57'.5	58'.0	114° 23'.7	34'.2	250° 33'.6	29'.7	100° 15'.6	02'.7
19	69° 03'.6	131° 56'.7	57'.6	129° 24'.2	33'.8	265° 36'.3	29'.8	115° 17'.8	02'.6
20	84° 06'.0	146° 55'.9	57'.1	144° 24'.6	33'.5	280° 39'.1	29'.9	130° 19'.9	02'.5
21	99° 08'.5	161° 55'.1	56'.7	159° 25'.1	33'.1	295° 41'.8	30'.0	145° 22'.1	02'.5
22	114° 11'.0	176° 54'.3	56'.3	174° 25'.5	32'.8	310° 44'.6	30'.1	160° 24'.3	02'.4
23	129° 13'.4	191° 53'.5	55'.8	189° 26'.0	32'.4	325° 47'.3	30'.3	175° 26'.4	02'.3
	M.P. 14:28	v -0'.8	d 0'.4	v 0'.4	d 0'.3	v 2'.7	d 0'.1	v 2'.2	d 0'.1

STARS		
Name	SHA	Dec
Acamar	315° 30'.4	40° 20'.4 S
Achernar	335° 38'.7	57° 16'.8 S
Acrux	173° 26'.9	63° 03'.3 S
Adhara	255° 24'.7	28° 57'.9 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.1	55° 59'.8 N
Alkaid	153° 11'.1	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.0 S
Alnilam	276° 02'.3	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.6 S
Alphecca	126° 24'.5	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.9 N
Altair	62° 24'.1	8° 50'.7 N
Ankaa	353° 31'.6	42° 21'.0 S
Antares	112° 45'.9	26° 24'.9 S
Arcturus	146° 10'.1	19° 13'.1 N
Atria	108° 02'.4	69° 00'.7 S
Avior	234° 24'.0	59° 29'.2 S
Bellatrix	278° 48'.9	6° 20'.5 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.8	52° 41'.7 S
Capella	280° 57'.8	45° 59'.6 N
Deneb	49° 42'.8	45° 15'.1 N
Denebola	182° 49'.6	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.8 S
Dubhe	194° 10'.3	61° 47'.3 N
Elnath	278° 32'.6	28° 36'.2 N
Eltanin	90° 53'.9	51° 29'.1 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.4	57° 04'.1 S
Gienah	176° 08'.5	17° 30'.1 S
Hadar	149° 10'.5	60° 20'.0 S
Hamal	328° 18'.9	23° 25'.7 N
Kaus Aust.	84° 05'.2	34° 23'.3 S
Kochab	137° 18'.9	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.7	4° 03'.6 N
Menkent	148° 26'.3	36° 19'.9 S
Miaplacidus	221° 42'.3	69° 41'.2 S
Mirfak	309° 03'.3	49° 50'.3 N
Nunki	76° 18'.3	26° 18'.4 S
Peacock	53° 44'.7	56° 45'.6 S
Polaris	324° 11'.7	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.4	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.2	8° 12'.7 S
Rigil Kent	140° 13'.4	60° 48'.0 S
Sabik	102° 31'.0	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.9 N
Shaula	96° 43'.8	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.5 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.2 S
Vega	80° 50'.1	38° 46'.3 N
Zuben'ubi	137° 23'.0	16° 00'.7 S
	SHA	Mer.Pass.
Venus	65° 13'.9	10:10
Mars	61° 47'.4	10:23
Jupiter	196° 20'.8	01:25
Saturn	46° 27'.0	11:23

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
176° 25'.9	14° 00'.4 S	87° 57'.3	7'.3	22° 46'.4 N	5'.8	57'.9
191° 25'.9	13° 59'.6 S	102° 23'.6	7'.3	52'.2	5'.6	58'.0
206° 25'.9	58'.8	116° 49'.9	7'.2	57'.8	5'.5	
221° 25'.9	58'.0	131° 16'.1	7'.0	23° 03'.3 N	5'.4	
236° 25'.9	57'.1	145° 42'.1	7'.0	08'.7	5'.2	58'.1
251° 25'.9	56'.3	160° 08'.1	6'.9	13'.9	5'.1	
266° 25'.9	55'.5	174° 34'.0	6'.8	19'.0	5'.0	
281° 25'.9	54'.7	188° 59'.8	6'.7	24'.0	4'.8	58'.2
296° 25'.9	53'.8	203° 25'.5	6'.6	28'.8	4'.7	
311° 25'.9	53'.0	217° 51'.1	6'.5	33'.5	4'.6	58'.3
326° 25'.9	52'.2	232° 16'.6	6'.4	38'.1	4'.4	
341° 25'.9	51'.4	246° 42'.0	6'.3	42'.5	4'.3	
356° 26'.0	13° 50'.5 S	261° 07'.3	6'.3	23° 46'.8 N	4'.1	58'.4
11° 26'.0	49'.7	275° 32'.6	6'.2	50'.9	4'.0	
26° 26'.0	48'.9	289° 57'.8	6'.1	54'.9	3'.8	
41° 26'.0	48'.0	304° 22'.9	6'.0	58'.7	3'.7	58'.5
56° 26'.0	47'.2	318° 47'.9	5'.9	24° 02'.4 N	3'.6	
71° 26'.0	46'.4	333° 12'.8	5'.8	06'.0	3'.4	
86° 26'.0	45'.6	347° 37'.6	5'.8	09'.4	3'.2	58'.6
101° 26'.0	44'.7	2° 02'.4	5'.7	12'.6	3'.1	
116° 26'.0	43'.9	16° 27'.1	5'.6	15'.7	3'.0	
131° 26'.0	43'.1	30° 51'.7	5'.5	18'.7	2'.7	58'.7
146° 26'.0	42'.2	45° 16'.2	5'.5	21'.4	2'.7	
161° 26'.0	41'.4	59° 40'.7	5'.3	24'.1	2'.5	
176° 26'.0	13° 40'.6 S	74° 05'.0	5'.3	24° 26'.6 N	2'.3	58'.8
191° 26'.0	39'.7	88° 29'.3	5'.3	28'.9	2'.2	
206° 26'.0	38'.9	102° 53'.6	5'.2	31'.1	2'.0	58'.9
221° 26'.0	38'.1	117° 17'.8	5'.1	33'.1	1'.8	
236° 26'.1	37'.2	131° 41'.9	5'.0	34'.9	1'.7	
251° 26'.1	36'.4	146° 05'.9	5'.0	36'.6	1'.6	59'.0
266° 26'.1	35'.6	160° 29'.9	4'.9	38'.2	1'.3	
281° 26'.1	34'.7	174° 53'.8	4'.8	39'.5	1'.2	
296° 26'.1	33'.9	189° 17'.6	4'.8	40'.7	1'.1	59'.1
311° 26'.1	33'.1	203° 41'.4	4'.7	41'.8	0'.9	
326° 26'.1	32'.2	218° 05'.1	4'.7	42'.7	0'.7	
341° 26'.1	31'.4	232° 28'.8	4'.6	43'.4	0'.5	59'.2
356° 26'.1	13° 30'.6 S	246° 52'.4	4'.6	24° 43'.9 N	0'.4	59'.2
11° 26'.2	29'.7	261° 16'.0	4'.5	44'.3	0'.2	
26° 26'.2	28'.9	275° 39'.5	4'.5	44'.5	0'.1	59'.3
41° 26'.2	28'.0	290° 03'.0	4'.4	44'.6	0'.1	
56° 26'.2	27'.2	304° 26'.4	4'.4	44'.5	0'.3	
71° 26'.2	26'.4	318° 49'.8	4'.3	44'.2	0'.5	59'.4
86° 26'.2	25'.5	333° 13'.1	4'.3	43'.7	0'.6	
101° 26'.2	24'.7	347° 36'.4	4'.3	43'.1	0'.8	
116° 26'.2	23'.9	1° 59'.7	4'.2	42'.3	1'.0	59'.5
131° 26'.3	23'.0	16° 22'.9	4'.1	41'.3	1'.1	
146° 26'.3	22'.2	30° 46'.0	4'.2	40'.2	1'.3	
161° 26'.3	21'.3	45° 09'.2	4'.1	38'.9	1'.5	59'.6
176° 26'.3	13° 20'.5 S	59° 32'.3	4'.1	24° 37'.4 N	1'.7	59'.6
191° 26'.3	19'.6	73° 55'.4	4'.0	35'.7	1'.8	
206° 26'.3	18'.8	88° 18'.4	4'.1	33'.9	2'.0	59'.7
221° 26'.4	18'.0	102° 41'.5	4'.0	31'.9	2'.2	
236° 26'.4	17'.1	117° 04'.5	3'.9	29'.7	2'.3	
251° 26'.4	16'.3	131° 27'.4	4'.0	27'.4	2'.5	59'.8
266° 26'.4	15'.4	145° 50'.4	3'.9	24'.9	2'.7	
281° 26'.4	14'.6	160° 13'.3	4'.0	22'.2	2'.9	
296° 26'.4	13'.7	174° 36'.3	3'.9	19'.3	3'.0	59'.9
311° 26'.5	12'.9	188° 59'.2	3'.9	16'.3	3'.3	
326° 26'.5	12'.1	203° 22'.1	3'.9	13'.0	3'.4	
341° 26'.5	11'.2	217° 45'.0	3'.8	09'.6	3'.5	60'.0
356° 26'.5	13° 10'.4 S	232° 07'.8	3'.9	24° 06'.1 N	3'.8	60'.0
11° 26'.5	09'.5	246° 30'.7	3'.9	02'.3	3'.9	
26° 26'.6	08'.7	260° 53'.6	3'.9	23° 58'.4 N	4'.1	60'.1
41° 26'.6	07'.8	275° 16'.5	3'.8	54'.3	4'.2	
56° 26'.6	07'.0	289° 39'.3	3'.9	50'.1	4'.4	
71° 26'.6	06'.1	304° 02'.2	3'.9	45'.7	4'.6	60'.2
86° 26'.6	05'.3	318° 25'.1	3'.9	41'.1	4'.8	
101° 26'.7	04'.4	332° 48'.0	3'.9	36'.3	5'.0	
116° 26'.7	03'.6	347° 10'.9	3'.9	31'.3	5'.1	
131° 26'.7	02'.7	1° 33'.8	3'.9	26'.2	5'.3	60'.3
146° 26'.7	01'.9	15° 56'.7	3'.9	20'.9	5'.4	
161° 26'.8	01'.0	30° 19'.6	3'.9	15'.5	5'.7	
SD 16'.2	d 0'.8	SD	15'.9	16'.1	16'.3	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
12	14 16	14 16	12:14	18:52	06:23	9d 59%
13	14 16	14 15	12:14	19:52	07:21	10d 70%
14	14 15	14 14	12:14	20:53	08:23	11d 80%

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1992 February 15, 16, 17 (Sat, Sun, Mon)

GMT	ARIES	VENUS -4.0		MARS +1.3		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
15 Saturday 00	144° 15'.9	206° 52'.7	20° 55'.4 S	204° 26'.4	21° 32'.1 S	340° 50'.1	8° 30'.4 N	190° 28'.6	18° 02'.2 S
01	159° 18'.4	221° 51'.9	54'.9	219° 26'.9	31'.7	355° 52'.8	30'.5	205° 30'.8	02'.1
02	174° 20'.8	236° 51'.1	54'.5	234° 27'.3	31'.4	10° 55'.5	30'.6	220° 32'.9	02'.1
03	189° 23'.3	251° 50'.3	54'.1	249° 27'.8	31'.0	25° 58'.3	30'.8	235° 35'.1	02'.0
04	204° 25'.8	266° 49'.5	53'.6	264° 28'.2	30'.7	41° 01'.0	30'.9	250° 37'.3	01'.9
05	219° 28'.2	281° 48'.7	53'.2	279° 28'.7	30'.3	56° 03'.8	31'.0	265° 39'.4	01'.8
06	234° 30'.7	296° 47'.9	52'.7	294° 29'.1	29'.9	71° 06'.5	31'.1	280° 41'.6	01'.8
07	249° 33'.2	311° 47'.1	52'.3	309° 29'.6	29'.6	86° 09'.3	31'.2	295° 43'.8	01'.7
08	264° 35'.6	326° 46'.3	51'.8	324° 30'.0	29'.2	101° 12'.0	31'.4	310° 45'.9	01'.6
09	279° 38'.1	341° 45'.5	51'.4	339° 30'.5	28'.9	116° 14'.8	31'.5	325° 48'.1	01'.5
10	294° 40'.5	356° 44'.7	50'.9	354° 30'.9	28'.5	131° 17'.5	31'.6	340° 50'.3	01'.5
11	309° 43'.0	11° 43'.9	50'.5	9° 31'.4	28'.1	146° 20'.3	31'.7	355° 52'.4	01'.4
12	324° 45'.5	26° 43'.1	20° 50'.0 S	24° 31'.8	21° 27'.8 S	161° 23'.0	8° 31'.8 N	10° 54'.6	18° 01'.3 S
13	339° 47'.9	41° 42'.3	49'.6	39° 32'.3	27'.4	176° 25'.8	32'.0	25° 56'.8	01'.2
14	354° 50'.4	56° 41'.5	49'.1	54° 32'.7	27'.1	191° 28'.5	32'.1	40° 58'.9	01'.1
15	9° 52'.9	71° 40'.7	48'.6	69° 33'.2	26'.7	206° 31'.3	32'.2	56° 01'.1	01'.1
16	24° 55'.3	86° 39'.9	48'.2	84° 33'.6	26'.3	221° 34'.0	32'.3	71° 03'.3	01'.0
17	39° 57'.8	101° 39'.1	47'.7	99° 34'.1	26'.0	236° 36'.8	32'.5	86° 05'.4	00'.9
18	55° 00'.3	116° 38'.3	47'.3	114° 34'.5	25'.6	251° 39'.5	32'.6	101° 07'.6	00'.8
19	70° 02'.7	131° 37'.5	46'.8	129° 35'.0	25'.3	266° 42'.3	32'.7	116° 09'.8	00'.8
20	85° 05'.2	146° 36'.7	46'.3	144° 35'.4	24'.9	281° 45'.0	32'.8	131° 11'.9	00'.7
21	100° 07'.6	161° 35'.9	45'.9	159° 35'.9	24'.5	296° 47'.8	33'.0	146° 14'.1	00'.6
22	115° 10'.1	176° 35'.1	45'.4	174° 36'.3	24'.2	311° 50'.5	33'.1	161° 16'.3	00'.5
23	130° 12'.6	191° 34'.3	45'.0	189° 36'.8	23'.8	326° 53'.3	33'.2	176° 18'.4	00'.4
16 Sunday 00	145° 15'.0	206° 33'.5	20° 44'.5 S	204° 37'.2	21° 23'.4 S	341° 56'.0	8° 33'.3 N	191° 20'.6	18° 00'.4 S
01	160° 17'.5	221° 32'.7	44'.0	219° 37'.7	23'.1	356° 58'.8	33'.4	206° 22'.8	00'.3
02	175° 20'.0	236° 31'.9	43'.6	234° 38'.1	22'.7	12° 01'.5	33'.6	221° 24'.9	00'.2
03	190° 22'.4	251° 31'.1	43'.1	249° 38'.6	22'.3	27° 04'.3	33'.7	236° 27'.1	00'.1
04	205° 24'.9	266° 30'.3	42'.6	264° 39'.0	22'.0	42° 07'.0	33'.8	251° 29'.3	00'.1
05	220° 27'.4	281° 29'.5	42'.1	279° 39'.5	21'.6	57° 09'.8	33'.9	266° 31'.4	00'.0
06	235° 29'.8	296° 28'.7	41'.7	294° 39'.9	21'.2	72° 12'.5	34'.1	281° 33'.6	17° 59'.9 S
07	250° 32'.3	311° 28'.0	41'.2	309° 40'.4	20'.9	87° 15'.3	34'.2	296° 35'.8	59'.8
08	265° 34'.8	326° 27'.2	40'.7	324° 40'.8	20'.5	102° 18'.0	34'.3	311° 37'.9	59'.8
09	280° 37'.2	341° 26'.4	40'.2	339° 41'.3	20'.1	117° 20'.8	34'.4	326° 40'.1	59'.7
10	295° 39'.7	356° 25'.6	39'.8	354° 41'.8	19'.8	132° 23'.5	34'.6	341° 42'.3	59'.6
11	310° 42'.1	11° 24'.8	39'.3	9° 42'.2	19'.4	147° 26'.3	34'.7	356° 44'.5	59'.5
12	325° 44'.6	26° 24'.0	20° 38'.8 S	24° 42'.7	21° 19'.0 S	162° 29'.0	8° 34'.8 N	11° 46'.6	17° 59'.4 S
13	340° 47'.1	41° 23'.2	38'.3	39° 43'.1	18'.7	177° 31'.8	34'.9	26° 48'.8	59'.4
14	355° 49'.5	56° 22'.4	37'.8	54° 43'.6	18'.3	192° 34'.5	35'.0	41° 51'.0	59'.3
15	10° 52'.0	71° 21'.6	37'.4	69° 44'.0	17'.9	207° 37'.3	35'.2	56° 53'.1	59'.2
16	25° 54'.5	86° 20'.8	36'.9	84° 44'.5	17'.5	222° 40'.0	35'.3	71° 55'.3	59'.1
17	40° 56'.9	101° 20'.0	36'.4	99° 44'.9	17'.2	237° 42'.8	35'.4	86° 57'.5	59'.1
18	55° 59'.4	116° 19'.3	35'.9	114° 45'.4	16'.8	252° 45'.5	35'.5	101° 59'.6	59'.0
19	71° 01'.9	131° 18'.5	35'.4	129° 45'.8	16'.4	267° 48'.3	35'.7	117° 01'.8	58'.9
20	86° 04'.3	146° 17'.7	34'.9	144° 46'.3	16'.1	282° 51'.0	35'.8	132° 04'.0	58'.8
21	101° 06'.8	161° 16'.9	34'.4	159° 46'.7	15'.7	297° 53'.8	35'.9	147° 06'.1	58'.8
22	116° 09'.3	176° 16'.1	34'.0	174° 47'.2	15'.3	312° 56'.5	36'.0	162° 08'.3	58'.7
23	131° 11'.7	191° 15'.3	33'.5	189° 47'.6	14'.9	327° 59'.3	36'.2	177° 10'.5	58'.6
17 Monday 00	146° 14'.2	206° 14'.5	20° 33'.0 S	204° 48'.1	21° 14'.6 S	343° 02'.0	8° 36'.3 N	192° 12'.6	17° 58'.5 S
01	161° 16'.6	221° 13'.7	32'.5	219° 48'.6	14'.2	358° 04'.8	36'.4	207° 14'.8	58'.4
02	176° 19'.1	236° 13'.0	32'.0	234° 49'.0	13'.8	13° 07'.5	36'.5	222° 17'.0	58'.4
03	191° 21'.6	251° 12'.2	31'.5	249° 49'.5	13'.4	28° 10'.3	36'.6	237° 19'.1	58'.3
04	206° 24'.0	266° 11'.4	31'.0	264° 49'.9	13'.1	43° 13'.0	36'.8	252° 21'.3	58'.2
05	221° 26'.5	281° 10'.6	30'.5	279° 50'.4	12'.7	58° 15'.8	36'.9	267° 23'.5	58'.1
06	236° 29'.0	296° 09'.8	30'.0	294° 50'.8	12'.3	73° 18'.5	37'.0	282° 25'.7	58'.1
07	251° 31'.4	311° 09'.0	29'.5	309° 51'.3	11'.9	88° 21'.3	37'.1	297° 27'.8	58'.0
08	266° 33'.9	326° 08'.2	29'.0	324° 51'.7	11'.5	103° 24'.0	37'.3	312° 30'.0	57'.9
09	281° 36'.4	341° 07'.5	28'.5	339° 52'.2	11'.2	118° 26'.8	37'.4	327° 32'.2	57'.8
10	296° 38'.8	356° 06'.7	28'.0	354° 52'.6	10'.8	133° 29'.5	37'.5	342° 34'.3	57'.8
11	311° 41'.3	11° 05'.9	27'.5	9° 53'.1	10'.4	148° 32'.3	37'.6	357° 36'.5	57'.7
12	326° 43'.8	26° 05'.1	20° 27'.0 S	24° 53'.6	21° 10'.0 S	163° 35'.1	8° 37'.8 N	12° 38'.7	17° 57'.6 S
13	341° 46'.2	41° 04'.3	26'.5	39° 54'.0	09'.7	178° 37'.8	37'.9	27° 40'.8	57'.5
14	356° 48'.7	56° 03'.5	26'.0	54° 54'.5	09'.3	193° 40'.6	38'.0	42° 43'.0	57'.4
15	11° 51'.1	71° 02'.8	25'.5	69° 54'.9	08'.9	208° 43'.3	38'.1	57° 45'.2	57'.4
16	26° 53'.6	86° 02'.0	25'.0	84° 55'.4	08'.5	223° 46'.1	38'.3	72° 47'.3	57'.3
17	41° 56'.1	101° 01'.2	24'.5	99° 55'.8	08'.1	238° 48'.8	38'.4	87° 49'.5	57'.2
18	56° 58'.5	116° 00'.4	23'.9	114° 56'.3	07'.8	253° 51'.6	38'.5	102° 51'.7	57'.1
19	72° 01'.0	130° 59'.6	23'.4	129° 56'.8	07'.4	268° 54'.3	38'.6	117° 53'.9	57'.1
20	87° 03'.5	145° 58'.9	22'.9	144° 57'.2	07'.0	283° 57'.1	38'.8	132° 56'.0	57'.0
21	102° 05'.9	160° 58'.1	22'.4	159° 57'.7	06'.6	298° 59'.8	38'.9	147° 58'.2	56'.9
22	117° 08'.4	175° 57'.3	21'.9	174° 58'.1	06'.2	314° 02'.6	39'.0	163° 00'.4	56'.8
23	132° 10'.9	190° 56'.5	21'.4	189° 58'.6	05'.8	329° 05'.4	39'.1	178° 02'.5	56'.7
	M.P. 14:17	v -0'.8	d 0'.5	v 0'.5	d 0'.4	v 2'.8	d 0'.1	v 2'.2	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.4	40° 20'.3 S
Achernar	335° 38'.7	57° 16'.8 S
Acrux	173° 26'.9	63° 03'.3 S
Adhara	255° 24'.8	28° 57'.9 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.1	55° 59'.8 N
Alkaid	153° 11'.1	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.0 S
Alnilam	276° 02'.4	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.9 N
Altair	62° 24'.0	8° 50'.7 N
Ankaa	353° 31'.6	42° 21'.0 S
Antares	112° 45'.9	26° 24'.9 S
Arcturus	146° 10'.1	19° 13'.1 N
Atria	108° 02'.3	69° 00'.7 S
Avior	234° 24'.0	59° 29'.2 S
Bellatrix	278° 48'.9	6° 20'.5 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.9	52° 41'.7 S
Capella	280° 57'.8	45° 59'.6 N
Deneb	49° 42'.8	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.8 S
Dubhe	194° 10'.3	61° 47'.3 N
Elnath	278° 32'.6	28° 36'.2 N
Eltanin	90° 53'.8	51° 29'.1 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.4	57° 04'.2 S
Gienah	176° 08'.5	17° 30'.1 S
Hadar	149° 10'.4	60° 20'.0 S
Hamal	328° 18'.9	23° 25'.7 N
Kaus Aust.	84° 05'.2	34° 23'.3 S
Kochab	137° 18'.9	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 26'.3	36° 19'.9 S
Miaplacidus	221° 42'.3	69° 41'.2 S
Mirfak	309° 03'.3	49° 50'.3 N
Nunki	76° 18'.3	26° 18'.4 S
Peacock	53° 44'.7	56° 45'.6 S
Polaris	324° 12'.8	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.4	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.2	8° 12'.7 S
Rigil Kent	140° 13'.4	60° 48'.0 S
Sabik	102° 30'.9	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.9 N
Shaula	96° 43'.7	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.5 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.2 S
Vega	80° 50'.0	38° 46'.3 N
Zuben'ubi	137° 23'.0	16° 00'.7 S

	SHA	Mer.Pass.
Venus	61° 18'.5	10:14
Mars	59° 22'.2	10:21
Jupiter	196° 41'.0	01:12
Saturn	46° 05'.6	11:13

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
176° 26'.8	13° 00'.2 S	44° 42'.5	4'.0	23° 09'.8 N	5'.8	60'.4
191° 26'.8	12° 59'.3 S	59° 05'.5	4'.0	04'.0	5'.9	
206° 26'.8	58'.5	73° 28'.5	4'.0	22° 58'.1 N	6'.2	
221° 26'.9	57'.6	87° 51'.5	4'.0	51'.9	6'.3	
236° 26'.9	56'.8	102° 14'.5	4'.0	45'.6	6'.5	60'.5
251° 26'.9	55'.9	116° 37'.5	4'.1	39'.1	6'.6	
266° 26'.9	55'.1	131° 00'.6	4'.1	32'.5	6'.8	
281° 27'.0	54'.2	145° 23'.7	4'.1	25'.7	7'.0	
296° 27'.0	53'.4	159° 46'.8	4'.2	18'.7	7'.1	60'.6
311° 27'.0	52'.5	174° 10'.0	4'.2	11'.6	7'.3	
326° 27'.0	51'.7	188° 33'.2	4'.2	04'.3	7'.5	
341° 27'.1	50'.8	202° 56'.4	4'.3	21° 56'.8 N	7'.6	
356° 27'.1	12° 50'.0 S	217° 19'.7	4'.3	21° 49'.2 N	7'.8	60'.7
11° 27'.1	49'.1	231° 43'.0	4'.3	41'.4	7'.9	
26° 27'.1	48'.3	246° 06'.3	4'.4	33'.5	8'.1	
41° 27'.2	47'.4	260° 29'.7	4'.4	25'.4	8'.3	
56° 27'.2	46'.5	274° 53'.1	4'.5	17'.1	8'.4	
71° 27'.2	45'.7	289° 16'.6	4'.5	08'.7	8'.6	60'.8
86° 27'.3	44'.8	303° 40'.1	4'.6	00'.1	8'.7	
101° 27'.3	44'.0	318° 03'.7	4'.6	20° 51'.4 N	8'.9	
116° 27'.3	43'.1	332° 27'.3	4'.6	42'.5	9'.0	
131° 27'.4	42'.3	346° 50'.9	4'.7	33'.5	9'.2	
146° 27'.4	41'.4	1° 14'.6	4'.8	24'.3	9'.3	60'.9
161° 27'.4	40'.5	15° 38'.4	4'.8	15'.0	9'.4	
176° 27'.4	12° 39'.7 S	30° 02'.2	4'.8	20° 05'.6 N	9'.7	60'.9
191° 27'.5	38'.8	44° 26'.0	4'.9	19° 55'.9 N	9'.7	
206° 27'.5	38'.0	58° 49'.9	5'.0	46'.2	9'.9	
221° 27'.5	37'.1	73° 13'.9	5'.0	36'.3	10'.1	61'.0
236° 27'.6	36'.2	87° 37'.9	5'.1	26'.2	10'.2	
251° 27'.6	35'.4	102° 02'.0	5'.1	16'.0	10'.3	
266° 27'.6	34'.5	116° 26'.1	5'.2	05'.7	10'.5	
281° 27'.7	33'.7	130° 50'.3	5'.3	18° 55'.2 N	10'.6	
296° 27'.7	32'.8	145° 14'.6	5'.3	44'.6	10'.7	
311° 27'.7	31'.9	159° 38'.9	5'.3	33'.9	10'.9	61'.1
326° 27'.8	31'.1	174° 03'.2	5'.5	23'.0	11'.0	
341° 27'.8	30'.2	188° 27'.7	5'.5	12'.0	11'.1	
356° 27'.8	12° 29'.4 S	202° 52'.2	5'.5	18° 00'.9 N	11'.3	61'.1
11° 27'.9	28'.5	217° 16'.7	5'.6	17° 49'.6 N	11'.3	
26° 27'.9	27'.6	231° 41'.3	5'.7	38'.3	11'.5	
41° 28'.0	26'.8	246° 06'.0	5'.8	26'.8	11'.7	
56° 28'.0	25'.9	260° 30'.8	5'.8	15'.1	11'.7	
71° 28'.0	25'.0	274° 55'.6	5'.9	03'.4	11'.9	
86° 28'.1	24'.2	289° 20'.5	5'.9	16° 51'.5 N	12'.0	61'.2
101° 28'.1	23'.3	303° 45'.4	6'.0	39'.5	12'.1	
116° 28'.1	22'.4	318° 10'.4	6'.1	27'.4	12'.2	
131° 28'.2	21'.6	332° 35'.5	6'.2	15'.2	12'.3	
146° 28'.2	20'.7	347° 00'.7	6'.2	02'.9	12'.5	
161° 28'.3	19'.8	1° 25'.9	6'.2	15° 50'.4 N	12'.5	
176° 28'.3	12° 19'.0 S	15° 51'.1	6'.4	15° 37'.9 N	12'.7	61'.2
191° 28'.3	18'.1	30° 16'.5	6'.4	25'.2	12'.8	
206° 28'.4	17'.2	44° 41'.9	6'.5	12'.4	12'.8	
221° 28'.4	16'.4	59° 07'.4	6'.5	14° 59'.6 N	13'.0	
236° 28'.5	15'.5	73° 32'.9	6'.6	46'.6	13'.1	
251° 28'.5	14'.6	87° 58'.5	6'.7	33'.5	13'.1	
266° 28'.5	13'.8	102° 24'.2	6'.8	20'.4	13'.3	
281° 28'.6	12'.9	116° 50'.0	6'.8	07'.1	13'.3	
296° 28'.6	12'.0	131° 15'.8	6'.9	13° 53'.8 N	13'.5	
311° 28'.7	11'.2	145° 41'.7	6'.9	40'.3	13'.5	
326° 28'.7	10'.3	160° 07'.6	7'.0	26'.8	13'.6	
341° 28'.7	09'.4	174° 33'.6	7'.1	13'.2	13'.7	
356° 28'.8	12° 08'.5 S	188° 59'.7	7'.2	12° 59'.5 N	13'.8	61'.2
11° 28'.8	07'.7	203° 25'.9	7'.2	45'.7	13'.9	
26° 28'.9	06'.8	217° 52'.1	7'.3	31'.8	14'.0	
41° 28'.9	05'.9	232° 18'.4	7'.3	17'.8	14'.0	
56° 29'.0	05'.1	246° 44'.7	7'.4	03'.8	14'.1	
71° 29'.0	04'.2	261° 11'.1	7'.5	11° 49'.7 N	14'.2	
86° 29'.0	03'.3	275° 37'.6	7'.6	35'.5	14'.2	
101° 29'.1	02'.4	290° 04'.2	7'.6	21'.3	14'.4	
116° 29'.1	01'.6	304° 30'.8	7'.7	06'.9	14'.4	
131° 29'.2	00'.7	318° 57'.5	7'.7	10° 52'.5 N	14'.4	
146° 29'.2	11° 59'.8 S	333° 24'.2	7'.8	38'.1	14'.5	
161° 29'.3	58'.9	347° 51'.0	7'.9	23'.6	14'.6	
SD 16'.2	d 0'.9	SD 16'.5		16'.6	16'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON ◯ Age/ Vis
15	14 13	14 12	12:14	21:55	09:24	12d 88%
16	14 10	14 09	12:14	22:54	10:25	13d 95%
17	14 07	14 05	12:14	23:50	11:23	14d 99%

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1992 February 18, 19, 20 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +1.3		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
18 Tuesday 00	147° 13'.3	205° 55'.7	20° 20'.9 S	204° 59'.0	21° 05'.5 S	344° 08'.1	8° 39'.3 N	193° 04'.7	17° 56'.7 S
01	162° 15'.8	220° 55'.0	20'.3	219° 59'.5	05'.1	359° 10'.9	39'.4	208° 06'.9	56'.6
02	177° 18'.2	235° 54'.2	19'.8	235° 00'.0	04'.7	14° 13'.6	39'.5	223° 09'.0	56'.5
03	192° 20'.7	250° 53'.4	19'.3	250° 00'.4	04'.3	29° 16'.4	39'.6	238° 11'.2	56'.4
04	207° 23'.2	265° 52'.6	18'.8	265° 00'.9	03'.9	44° 19'.1	39'.8	253° 13'.4	56'.4
05	222° 25'.6	280° 51'.9	18'.3	280° 01'.3	03'.5	59° 21'.9	39'.9	268° 15'.5	56'.3
06	237° 28'.1	295° 51'.1	17'.7	295° 01'.8	03'.1	74° 24'.6	40'.0	283° 17'.7	56'.2
07	252° 30'.6	310° 50'.3	17'.2	310° 02'.2	02'.8	89° 27'.4	40'.1	298° 19'.9	56'.1
08	267° 33'.0	325° 49'.5	16'.7	325° 02'.7	02'.4	104° 30'.1	40'.3	313° 22'.1	56'.1
09	282° 35'.5	340° 48'.7	16'.2	340° 03'.2	02'.0	119° 32'.9	40'.4	328° 24'.2	56'.0
10	297° 38'.0	355° 48'.0	15'.6	355° 03'.6	01'.6	134° 35'.7	40'.5	343° 26'.4	55'.9
11	312° 40'.4	10° 47'.2	15'.1	10° 04'.1	01'.2	149° 38'.4	40'.6	358° 28'.6	55'.8
12	327° 42'.9	25° 46'.4	20° 14'.6 S	25° 04'.5	21° 00'.8 S	164° 41'.2	8° 40'.8 N	13° 30'.7	17° 55'.7 S
13	342° 45'.4	40° 45'.6	14'.0	40° 05'.0	00'.4	179° 43'.9	40'.9	28° 32'.9	55'.7
14	357° 47'.8	55° 44'.9	13'.5	55° 05'.4	00'.0	194° 46'.7	41'.0	43° 35'.1	55'.6
15	12° 50'.3	70° 44'.1	13'.0	70° 05'.9	20° 59'.6 S	209° 49'.4	41'.1	58° 37'.2	55'.5
16	27° 52'.7	85° 43'.3	12'.4	85° 06'.4	59'.3	224° 52'.2	41'.2	73° 39'.4	55'.4
17	42° 55'.2	100° 42'.6	11'.9	100° 06'.8	58'.9	239° 55'.0	41'.4	88° 41'.6	55'.4
18	57° 57'.7	115° 41'.8	11'.4	115° 07'.3	58'.5	254° 57'.7	41'.5	103° 43'.8	55'.3
19	73° 00'.1	130° 41'.0	10'.8	130° 07'.7	58'.1	270° 00'.5	41'.6	118° 45'.9	55'.2
20	88° 02'.6	145° 40'.2	10'.3	145° 08'.2	57'.7	285° 03'.2	41'.7	133° 48'.1	55'.1
21	103° 05'.1	160° 39'.5	09'.8	160° 08'.7	57'.3	300° 06'.0	41'.9	148° 50'.3	55'.1
22	118° 07'.5	175° 38'.7	09'.2	175° 09'.1	56'.9	315° 08'.7	42'.0	163° 52'.4	55'.0
23	133° 10'.0	190° 37'.9	08'.7	190° 09'.6	56'.5	330° 11'.5	42'.1	178° 54'.6	54'.9
19 Wednesday 00	148° 12'.5	205° 37'.2	20° 08'.1 S	205° 10'.0	20° 56'.1 S	345° 14'.3	8° 42'.2 N	193° 56'.8	17° 54'.8 S
01	163° 14'.9	220° 36'.4	07'.6	220° 10'.5	55'.7	0° 17'.0	42'.4	208° 59'.0	54'.8
02	178° 17'.4	235° 35'.6	07'.1	235° 11'.0	55'.3	15° 19'.8	42'.5	224° 01'.1	54'.7
03	193° 19'.8	250° 34'.8	06'.5	250° 11'.4	54'.9	30° 22'.5	42'.6	239° 03'.3	54'.6
04	208° 22'.3	265° 34'.1	06'.0	265° 11'.9	54'.5	45° 25'.3	42'.7	254° 05'.5	54'.5
05	223° 24'.8	280° 33'.3	05'.4	280° 12'.3	54'.2	60° 28'.0	42'.9	269° 07'.6	54'.4
06	238° 27'.2	295° 32'.5	04'.9	295° 12'.8	53'.8	75° 30'.8	43'.0	284° 09'.8	54'.4
07	253° 29'.7	310° 31'.8	04'.3	310° 13'.3	53'.4	90° 33'.6	43'.1	299° 12'.0	54'.3
08	268° 32'.2	325° 31'.0	03'.8	325° 13'.7	53'.0	105° 36'.3	43'.3	314° 14'.2	54'.2
09	283° 34'.6	340° 30'.2	03'.2	340° 14'.2	52'.6	120° 39'.1	43'.4	329° 16'.3	54'.1
10	298° 37'.1	355° 29'.5	02'.7	355° 14'.6	52'.2	135° 41'.8	43'.5	344° 18'.5	54'.1
11	313° 39'.6	10° 28'.7	02'.1	10° 15'.1	51'.8	150° 44'.6	43'.6	359° 20'.7	54'.0
12	328° 42'.0	25° 27'.9	20° 01'.6 S	25° 15'.6	20° 51'.4 S	165° 47'.4	8° 43'.8 N	14° 22'.8	17° 53'.9 S
13	343° 44'.5	40° 27'.2	01'.0	40° 16'.0	51'.0	180° 50'.1	43'.9	29° 25'.0	53'.8
14	358° 47'.0	55° 26'.4	00'.4	55° 16'.5	50'.6	195° 52'.9	44'.0	44° 27'.2	53'.8
15	13° 49'.4	70° 25'.6	19° 59'.9 S	70° 17'.0	50'.2	210° 55'.6	44'.1	59° 29'.3	53'.7
16	28° 51'.9	85° 24'.9	59'.3	85° 17'.4	49'.8	225° 58'.4	44'.3	74° 31'.5	53'.6
17	43° 54'.3	100° 24'.1	58'.8	100° 17'.9	49'.4	241° 01'.1	44'.4	89° 33'.7	53'.5
18	58° 56'.8	115° 23'.3	58'.2	115° 18'.3	49'.0	256° 03'.9	44'.5	104° 35'.9	53'.4
19	73° 59'.3	130° 22'.6	57'.7	130° 18'.8	48'.6	271° 06'.7	44'.6	119° 38'.0	53'.4
20	89° 01'.7	145° 21'.8	57'.1	145° 19'.3	48'.2	286° 09'.4	44'.8	134° 40'.2	53'.3
21	104° 04'.2	160° 21'.1	56'.5	160° 19'.7	47'.8	301° 12'.2	44'.9	149° 42'.4	53'.2
22	119° 06'.7	175° 20'.3	56'.0	175° 20'.2	47'.4	316° 14'.9	45'.0	164° 44'.5	53'.1
23	134° 09'.1	190° 19'.5	55'.4	190° 20'.6	47'.0	331° 17'.7	45'.1	179° 46'.7	53'.1
20 Thursday 00	149° 11'.6	205° 18'.8	19° 54'.8 S	205° 21'.1	20° 46'.6 S	346° 20'.5	8° 45'.3 N	194° 48'.9	17° 53'.0 S
01	164° 14'.1	220° 18'.0	54'.3	220° 21'.6	46'.2	1° 23'.2	45'.4	209° 51'.1	52'.9
02	179° 16'.5	235° 17'.3	53'.7	235° 22'.0	45'.8	16° 26'.0	45'.5	224° 53'.2	52'.8
03	194° 19'.0	250° 16'.5	53'.1	250° 22'.5	45'.4	31° 28'.7	45'.6	239° 55'.4	52'.8
04	209° 21'.5	265° 15'.7	52'.6	265° 23'.0	45'.0	46° 31'.5	45'.8	254° 57'.6	52'.7
05	224° 23'.9	280° 15'.0	52'.0	280° 23'.4	44'.6	61° 34'.3	45'.9	269° 59'.8	52'.6
06	239° 26'.4	295° 14'.2	51'.4	295° 23'.9	44'.1	76° 37'.0	46'.0	285° 01'.9	52'.5
07	254° 28'.8	310° 13'.5	50'.8	310° 24'.4	43'.7	91° 39'.8	46'.1	300° 04'.1	52'.4
08	269° 31'.3	325° 12'.7	50'.3	325° 24'.8	43'.3	106° 42'.5	46'.3	315° 06'.3	52'.4
09	284° 33'.8	340° 11'.9	49'.7	340° 25'.3	42'.9	121° 45'.3	46'.4	330° 08'.4	52'.3
10	299° 36'.2	355° 11'.2	49'.1	355° 25'.7	42'.5	136° 48'.1	46'.5	345° 10'.6	52'.2
11	314° 38'.7	10° 10'.4	48'.5	10° 26'.2	42'.1	151° 50'.8	46'.6	0° 12'.8	52'.1
12	329° 41'.2	25° 09'.7	19° 48'.0 S	25° 26'.7	20° 41'.7 S	166° 53'.6	8° 46'.8 N	15° 15'.0	17° 52'.1 S
13	344° 43'.6	40° 08'.9	47'.4	40° 27'.1	41'.3	181° 56'.3	46'.9	30° 17'.1	52'.0
14	359° 46'.1	55° 08'.2	46'.8	55° 27'.6	40'.9	196° 59'.1	47'.0	45° 19'.3	51'.9
15	14° 48'.6	70° 07'.4	46'.2	70° 28'.1	40'.5	212° 01'.9	47'.1	60° 21'.5	51'.8
16	29° 51'.0	85° 06'.6	45'.6	85° 28'.5	40'.1	227° 04'.6	47'.3	75° 23'.6	51'.8
17	44° 53'.5	100° 05'.9	45'.0	100° 29'.0	39'.7	242° 07'.4	47'.4	90° 25'.8	51'.7
18	59° 55'.9	115° 05'.1	44'.5	115° 29'.5	39'.3	257° 10'.1	47'.5	105° 28'.0	51'.6
19	74° 58'.4	130° 04'.4	43'.9	130° 29'.9	38'.8	272° 12'.9	47'.6	120° 30'.2	51'.5
20	90° 00'.9	145° 03'.6	43'.3	145° 30'.4	38'.4	287° 15'.7	47'.8	135° 32'.3	51'.5
21	105° 03'.3	160° 02'.9	42'.7	160° 30'.9	38'.0	302° 18'.4	47'.9	150° 34'.5	51'.4
22	120° 05'.8	175° 02'.1	42'.1	175° 31'.3	37'.6	317° 21'.2	48'.0	165° 36'.7	51'.3
23	135° 08'.3	190° 01'.4	41'.5	190° 31'.8	37'.2	332° 24'.0	48'.2	180° 38'.9	51'.2
	M.P. 14:05	v -0'.8	d 0'.6	v 0'.5	d 0'.4	v 2'.8	d 0'.1	v 2'.2	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.4	40° 20'.3 S
Achernar	335° 38'.8	57° 16'.8 S
Acrux	173° 26'.8	63° 03'.3 S
Adhara	255° 24'.8	28° 57'.9 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.0	55° 59'.8 N
Alkaid	153° 11'.0	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.0 S
Alnilam	276° 02'.4	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.4	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.9 N
Altair	62° 24'.0	8° 50'.7 N
Ankaa	353° 31'.6	42° 21'.0 S
Antares	112° 45'.9	26° 24'.9 S
Arcturus	146° 10'.1	19° 13'.1 N
Atria	108° 02'.3	69° 00'.7 S
Avior	234° 24'.0	59° 29'.3 S
Bellatrix	278° 48'.9	6° 20'.5 N
Betelgeuse	271° 18'.3	7° 24'.3 N
Canopus	264° 02'.9	52° 41'.7 S
Capella	280° 57'.8	45° 59'.6 N
Deneb	49° 42'.8	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.4 N
Elnath	278° 32'.6	28° 36'.2 N
Eltanin	90° 53'.8	51° 29'.1 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.4	57° 04'.2 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.4	60° 20'.0 S
Hamal	328° 18'.9	23° 25'.7 N
Kaus Aust.	84° 05'.1	34° 23'.3 S
Kochab	137° 18'.8	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 26'.3	36° 19'.9 S
Miaplacidus	221° 42'.3	69° 41'.2 S
Mirfak	309° 03'.3	49° 50'.3 N
Nunki	76° 18'.2	26° 18'.4 S
Peacock	53° 44'.7	56° 45'.6 S
Polaris	324° 14'.1	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.4	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.2	8° 12'.7 S
Rigil Kent	140° 13'.4	60° 48'.0 S
Sabik	102° 30'.9	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.9 N
Shaula	96° 43'.7	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.5 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.2 S
Vega	80° 50'.0	38° 46'.3 N
Zuben'ubi	137° 23'.0	16° 00'.7 S

	SHA	Mer.Pass.
Venus	57° 24'.7	10:18
Mars	56° 57'.6	10:19
Jupiter	197° 01'.8	00:59
Saturn	45° 44'.3	11:03

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
176° 29'.3	11° 58'.1 S	2° 17'.9	7'.9	10° 09'.0 N	14'.7	61'.2
191° 29'.4	57'.2	16° 44'.8	8'.0	9° 54'.3 N	14'.7	
206° 29'.4	56'.3	31° 11'.8	8'.0	39'.6	14'.7	
221° 29'.5	55'.4	45° 38'.8	8'.1	24'.9	14'.8	
236° 29'.5	54'.6	60° 05'.9	8'.2	10'.1	14'.9	
251° 29'.6	53'.7	74° 33'.1	8'.2	8° 55'.2 N	14'.9	61'.1
266° 29'.6	52'.8	89° 00'.3	8'.3	40'.3	15'.0	
281° 29'.7	51'.9	103° 27'.6	8'.4	25'.3	15'.0	
296° 29'.7	51'.1	117° 55'.0	8'.4	10'.3	15'.1	
311° 29'.8	50'.2	132° 22'.4	8'.4	7° 55'.2 N	15'.1	
326° 29'.8	49'.3	146° 49'.8	8'.6	40'.1	15'.1	
341° 29'.9	48'.4	161° 17'.4	8'.5	25'.0	15'.2	
356° 29'.9	11° 47'.5 S	175° 44'.9	8'.7	7° 09'.8 N	15'.2	61'.1
11° 30'.0	46'.7	190° 12'.6	8'.6	6° 54'.6 N	15'.2	61'.0
26° 30'.0	45'.8	204° 40'.2	8'.8	39'.4	15'.3	
41° 30'.1	44'.9	219° 08'.0	8'.8	24'.1	15'.3	
56° 30'.1	44'.0	233° 35'.8	8'.8	08'.8	15'.3	
71° 30'.2	43'.1	248° 03'.6	8'.9	5° 53'.5 N	15'.4	
86° 30'.2	42'.3	262° 31'.5	8'.9	38'.1	15'.4	
101° 30'.3	41'.4	276° 59'.4	9'.0	22'.7	15'.4	60'.9
116° 30'.3	40'.5	291° 27'.4	9'.1	07'.3	15'.4	
131° 30'.4	39'.6	305° 55'.5	9'.1	4° 51'.9 N	15'.5	
146° 30'.4	38'.7	320° 23'.6	9'.1	36'.4	15'.5	
161° 30'.5	37'.9	334° 51'.7	9'.2	20'.9	15'.4	
176° 30'.5	11° 37'.0 S	349° 19'.9	9'.2	4° 05'.5 N	15'.5	60'.8
191° 30'.6	36'.1	3° 48'.1	9'.3	3° 50'.0 N	15'.5	
206° 30'.6	35'.2	18° 16'.4	9'.3	34'.5	15'.6	
221° 30'.7	34'.3	32° 44'.7	9'.4	18'.9	15'.5	
236° 30'.7	33'.4	47° 13'.1	9'.4	03'.4	15'.5	
251° 30'.8	32'.6	61° 41'.5	9'.4	2° 47'.9 N	15'.5	60'.7
266° 30'.9	31'.7	76° 09'.9	9'.5	32'.4	15'.6	
281° 30'.9	30'.8	90° 38'.4	9'.5	16'.8	15'.5	
296° 31'.0	29'.9	105° 06'.9	9'.6	01'.3	15'.6	
311° 31'.0	29'.0	119° 35'.5	9'.6	1° 45'.7 N	15'.5	60'.6
326° 31'.1	28'.1	134° 04'.1	9'.6	30'.2	15'.5	
341° 31'.1	27'.2	148° 32'.7	9'.7	14'.7	15'.5	
356° 31'.2	11° 26'.4 S	163° 01'.4	9'.7	0° 59'.2 N	15'.5	60'.6
11° 31'.2	25'.5	177° 30'.1	9'.7	43'.7	15'.5	60'.5
26° 31'.3	24'.6	191° 58'.8	9'.8	28'.2	15'.5	
41° 31'.4	23'.7	206° 27'.6	9'.8	12'.7	15'.5	
56° 31'.4	22'.8	220° 56'.4	9'.9	0° 02'.8 S	15'.5	
71° 31'.5	21'.9	235° 25'.3	9'.8	18'.3	15'.4	60'.4
86° 31'.5	21'.0	249° 54'.1	10'.0	33'.7	15'.4	
101° 31'.6	20'.1	264° 23'.1	9'.9	49'.1	15'.4	
116° 31'.7	19'.3	278° 52'.0	9'.9	1° 04'.5 S	15'.4	60'.3
131° 31'.7	18'.4	293° 20'.9	10'.0	19'.9	15'.4	
146° 31'.8	17'.5	307° 49'.9	10'.0	35'.3	15'.3	
161° 31'.8	16'.6	322° 18'.9	10'.1	50'.6	15'.3	
176° 31'.9	11° 15'.7 S	336° 48'.0	10'.1	2° 05'.9 S	15'.3	60'.2
191° 32'.0	14'.8	351° 17'.1	10'.0	21'.2	15'.2	
206° 32'.0	13'.9	5° 46'.1	10'.2	36'.4	15'.3	
221° 32'.1	13'.0	20° 15'.3	10'.1	51'.7	15'.1	60'.1
236° 32'.1	12'.1	34° 44'.4	10'.1	3° 06'.8 S	15'.2	
251° 32'.2	11'.2	49° 13'.5	10'.2	22'.0	15'.1	
266° 32'.3	10'.3	63° 42'.7	10'.2	37'.1	15'.1	60'.0
281° 32'.3	09'.5	78° 11'.9	10'.2	52'.2	15'.0	
296° 32'.4	08'.6	92° 41'.1	10'.3	4° 07'.2 S	15'.0	
311° 32'.5	07'.7	107° 10'.4	10'.2	22'.2	14'.9	59'.9
326° 32'.5	06'.8	121° 39'.6	10'.3	37'.1	14'.9	
341° 32'.6	05'.9	136° 08'.9	10'.3	52'.0	14'.9	
356° 32'.6	11° 05'.0 S	150° 38'.2	10'.3	5° 06'.9 S	14'.8	59'.8
11° 32'.7	04'.1	165° 07'.5	10'.3	21'.7	14'.8	
26° 32'.8	03'.2	179° 36'.8	10'.3	36'.5	14'.7	
41° 32'.8	02'.3	194° 06'.1	10'.3	51'.2	14'.7	59'.7
56° 32'.9	01'.4	208° 35'.4	10'.4	6° 05'.9 S	14'.6	
71° 33'.0	00'.5	223° 04'.8	10'.4	20'.5	14'.5	
86° 33'.0	10° 59'.6 S	237° 34'.2	10'.3	35'.0	14'.5	59'.6
101° 33'.1	58'.7	252° 03'.5	10'.4	49'.5	14'.5	
116° 33'.2	57'.8	266° 32'.9	10'.4	7° 04'.0 S	14'.4	
131° 33'.2	56'.9	281° 02'.3	10'.4	18'.4	14'.3	59'.5
146° 33'.3	56'.0	295° 31'.7	10'.4	32'.7	14'.3	
161° 33'.4	55'.1	310° 01'.1	10'.4	47'.0	14'.2	59'.4
SD 16'.2	d 0'.9	SD	16'.6	16'.5	16'.3	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
18	14 03	14 00	12:14	24:44	12:18	15d Full
19	13 58	13 55	12:14	00:44	13:10	16d 98%
20	13 53	13 50	12:14	01:36	14:02	17d 93%

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1992 February 21, 22, 23 (Fri, Sat, Sun)

GMT	ARIES	VENUS -3.9		MARS +1.3		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
21 Friday 00	150° 10'.7	205° 00'.6	19° 40'.9 S	205° 32'.3	20° 36'.8 S	347° 26'.7	8° 48'.3 N	195° 41'.0	17° 51'.1 S
01	165° 13'.2	219° 59'.9	40'.3	220° 32'.7	36'.4	2° 29'.5	48'.4	210° 43'.2	51'.1
02	180° 15'.7	234° 59'.1	39'.8	235° 33'.2	36'.0	17° 32'.2	48'.5	225° 45'.4	51'.0
03	195° 18'.1	249° 58'.4	39'.2	250° 33'.7	35'.6	32° 35'.0	48'.7	240° 47'.5	50'.9
04	210° 20'.6	264° 57'.6	38'.6	265° 34'.1	35'.1	47° 37'.8	48'.8	255° 49'.7	50'.8
05	225° 23'.1	279° 56'.9	38'.0	280° 34'.6	34'.7	62° 40'.5	48'.9	270° 51'.9	50'.8
06	240° 25'.5	294° 56'.1	37'.4	295° 35'.1	34'.3	77° 43'.3	49'.0	285° 54'.1	50'.7
07	255° 28'.0	309° 55'.4	36'.8	310° 35'.5	33'.9	92° 46'.1	49'.2	300° 56'.2	50'.6
08	270° 30'.4	324° 54'.6	36'.2	325° 36'.0	33'.5	107° 48'.8	49'.3	315° 58'.4	50'.5
09	285° 32'.9	339° 53'.9	35'.6	340° 36'.5	33'.1	122° 51'.6	49'.4	331° 00'.6	50'.5
10	300° 35'.4	354° 53'.1	35'.0	355° 36'.9	32'.7	137° 54'.3	49'.5	346° 02'.8	50'.4
11	315° 37'.8	9° 52'.4	34'.4	10° 37'.4	32'.2	152° 57'.1	49'.7	1° 04'.9	50'.3
12	330° 40'.3	24° 51'.6	19° 33'.8 S	25° 37'.9	20° 31'.8 S	167° 59'.9	8° 49'.8 N	16° 07'.1	17° 50'.2 S
13	345° 42'.8	39° 50'.9	33'.2	40° 38'.3	31'.4	183° 02'.6	49'.9	31° 09'.3	50'.2
14	0° 45'.2	54° 50'.1	32'.6	55° 38'.8	31'.0	198° 05'.4	50'.0	46° 11'.5	50'.1
15	15° 47'.7	69° 49'.4	32'.0	70° 39'.3	30'.6	213° 08'.2	50'.2	61° 13'.6	50'.0
16	30° 50'.2	84° 48'.6	31'.4	85° 39'.7	30'.2	228° 10'.9	50'.3	76° 15'.8	49'.9
17	45° 52'.6	99° 47'.9	30'.7	100° 40'.2	29'.7	243° 13'.7	50'.4	91° 18'.0	49'.8
18	60° 55'.1	114° 47'.1	30'.1	115° 40'.7	29'.3	258° 16'.4	50'.6	106° 20'.1	49'.8
19	75° 57'.5	129° 46'.4	29'.5	130° 41'.1	28'.9	273° 19'.2	50'.7	121° 22'.3	49'.7
20	91° 00'.0	144° 45'.6	28'.9	145° 41'.6	28'.5	288° 22'.0	50'.8	136° 24'.5	49'.6
21	106° 02'.5	159° 44'.9	28'.3	160° 42'.1	28'.1	303° 24'.7	50'.9	151° 26'.7	49'.5
22	121° 04'.9	174° 44'.2	27'.7	175° 42'.5	27'.6	318° 27'.5	51'.1	166° 28'.8	49'.5
23	136° 07'.4	189° 43'.4	27'.1	190° 43'.0	27'.2	333° 30'.3	51'.2	181° 31'.0	49'.4
22 Saturday 00	151° 09'.9	204° 42'.7	19° 26'.5 S	205° 43'.5	20° 26'.8 S	348° 33'.0	8° 51'.3 N	196° 33'.2	17° 49'.3 S
01	166° 12'.3	219° 41'.9	25'.9	220° 43'.9	26'.4	3° 35'.8	51'.4	211° 35'.4	49'.2
02	181° 14'.8	234° 41'.2	25'.2	235° 44'.4	26'.0	18° 38'.5	51'.6	226° 37'.5	49'.2
03	196° 17'.3	249° 40'.4	24'.6	250° 44'.9	25'.5	33° 41'.3	51'.7	241° 39'.7	49'.1
04	211° 19'.7	264° 39'.7	24'.0	265° 45'.4	25'.1	48° 44'.1	51'.8	256° 41'.9	49'.0
05	226° 22'.2	279° 39'.0	23'.4	280° 45'.8	24'.7	63° 46'.8	51'.9	271° 44'.1	48'.9
06	241° 24'.7	294° 38'.2	22'.8	295° 46'.3	24'.3	78° 49'.6	52'.1	286° 46'.2	48'.9
07	256° 27'.1	309° 37'.5	22'.1	310° 46'.8	23'.8	93° 52'.4	52'.2	301° 48'.4	48'.8
08	271° 29'.6	324° 36'.7	21'.5	325° 47'.2	23'.4	108° 55'.1	52'.3	316° 50'.6	48'.7
09	286° 32'.0	339° 36'.0	20'.9	340° 47'.7	23'.0	123° 57'.9	52'.5	331° 52'.8	48'.6
10	301° 34'.5	354° 35'.3	20'.3	355° 48'.2	22'.6	139° 00'.7	52'.6	346° 54'.9	48'.5
11	316° 37'.0	9° 34'.5	19'.6	10° 48'.6	22'.1	154° 03'.4	52'.7	1° 57'.1	48'.5
12	331° 39'.4	24° 33'.8	19° 19'.0 S	25° 49'.1	20° 21'.7 S	169° 06'.2	8° 52'.8 N	16° 59'.3	17° 48'.4 S
13	346° 41'.9	39° 33'.0	18'.4	40° 49'.6	21'.3	184° 09'.0	53'.0	32° 01'.5	48'.3
14	1° 44'.4	54° 32'.3	17'.8	55° 50'.1	20'.9	199° 11'.7	53'.1	47° 03'.6	48'.2
15	16° 46'.8	69° 31'.6	17'.1	70° 50'.5	20'.4	214° 14'.5	53'.2	62° 05'.8	48'.2
16	31° 49'.3	84° 30'.8	16'.5	85° 51'.0	20'.0	229° 17'.2	53'.3	77° 08'.0	48'.1
17	46° 51'.8	99° 30'.1	15'.9	100° 51'.5	19'.6	244° 20'.0	53'.5	92° 10'.2	48'.0
18	61° 54'.2	114° 29'.4	15'.2	115° 51'.9	19'.2	259° 22'.8	53'.6	107° 12'.3	47'.9
19	76° 56'.7	129° 28'.6	14'.6	130° 52'.4	18'.7	274° 25'.5	53'.7	122° 14'.5	47'.9
20	91° 59'.1	144° 27'.9	14'.0	145° 52'.9	18'.3	289° 28'.3	53'.8	137° 16'.7	47'.8
21	107° 01'.6	159° 27'.1	13'.3	160° 53'.4	17'.9	304° 31'.1	54'.0	152° 18'.9	47'.7
22	122° 04'.1	174° 26'.4	12'.7	175° 53'.8	17'.4	319° 33'.8	54'.1	167° 21'.0	47'.6
23	137° 06'.5	189° 25'.7	12'.1	190° 54'.3	17'.0	334° 36'.6	54'.2	182° 23'.2	47'.6
23 Sunday 00	152° 09'.0	204° 24'.9	19° 11'.4 S	205° 54'.8	20° 16'.6 S	349° 39'.4	8° 54'.4 N	197° 25'.4	17° 47'.5 S
01	167° 11'.5	219° 24'.2	10'.8	220° 55'.2	16'.1	4° 42'.1	54'.5	212° 27'.6	47'.4
02	182° 13'.9	234° 23'.5	10'.2	235° 55'.7	15'.7	19° 44'.9	54'.6	227° 29'.7	47'.3
03	197° 16'.4	249° 22'.7	09'.5	250° 56'.2	15'.3	34° 47'.7	54'.7	242° 31'.9	47'.2
04	212° 18'.9	264° 22'.0	08'.9	265° 56'.7	14'.9	49° 50'.4	54'.9	257° 34'.1	47'.2
05	227° 21'.3	279° 21'.3	08'.2	280° 57'.1	14'.4	64° 53'.2	55'.0	272° 36'.3	47'.1
06	242° 23'.8	294° 20'.6	07'.6	295° 57'.6	14'.0	79° 56'.0	55'.1	287° 38'.4	47'.0
07	257° 26'.3	309° 19'.8	06'.9	310° 58'.1	13'.6	94° 58'.7	55'.2	302° 40'.6	46'.9
08	272° 28'.7	324° 19'.1	06'.3	325° 58'.6	13'.1	110° 01'.5	55'.4	317° 42'.8	46'.9
09	287° 31'.2	339° 18'.4	05'.7	340° 59'.0	12'.7	125° 04'.3	55'.5	332° 45'.0	46'.8
10	302° 33'.6	354° 17'.6	05'.0	355° 59'.5	12'.3	140° 07'.0	55'.6	347° 47'.1	46'.7
11	317° 36'.1	9° 16'.9	04'.4	11° 00'.0	11'.8	155° 09'.8	55'.7	2° 49'.3	46'.6
12	332° 38'.6	24° 16'.2	19° 03'.7 S	26° 00'.4	20° 11'.4 S	170° 12'.6	8° 55'.9 N	17° 51'.5	17° 46'.6 S
13	347° 41'.0	39° 15'.4	03'.1	41° 00'.9	11'.0	185° 15'.3	56'.0	32° 53'.7	46'.5
14	2° 43'.5	54° 14'.7	02'.4	56° 01'.4	10'.5	200° 18'.1	56'.1	47° 55'.8	46'.4
15	17° 46'.0	69° 14'.0	01'.8	71° 01'.9	10'.1	215° 20'.9	56'.3	62° 58'.0	46'.3
16	32° 48'.4	84° 13'.3	01'.1	86° 02'.3	09'.6	230° 23'.6	56'.4	78° 00'.2	46'.3
17	47° 50'.9	99° 12'.5	00'.4	101° 02'.8	09'.2	245° 26'.4	56'.5	93° 02'.4	46'.2
18	62° 53'.4	114° 11'.8	18° 59'.8 S	116° 03'.3	08'.8	260° 29'.2	56'.6	108° 04'.5	46'.1
19	77° 55'.8	129° 11'.1	59'.1	131° 03'.8	08'.3	275° 31'.9	56'.8	123° 06'.7	46'.0
20	92° 58'.3	144° 10'.4	58'.5	146° 04'.2	07'.9	290° 34'.7	56'.9	138° 08'.9	46'.0
21	108° 00'.8	159° 09'.6	57'.8	161° 04'.7	07'.5	305° 37'.5	57'.0	153° 11'.1	45'.9
22	123° 03'.2	174° 08'.9	57'.2	176° 05'.2	07'.0	320° 40'.2	57'.1	168° 13'.2	45'.8
23	138° 05'.7	189° 08'.2	56'.5	191° 05'.7	06'.6	335° 43'.0	57'.3	183° 15'.4	45'.7
	M.P. 13:53	v -0'.7	d 0'.6	v 0'.5	d 0'.4	v 2'.8	d 0'.1	v 2'.2	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.4	40° 20'.3 S
Achernar	335° 38'.8	57° 16'.8 S
Acrux	173° 26'.8	63° 03'.3 S
Adhara	255° 24'.8	28° 57'.9 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.0	55° 59'.8 N
Alkaid	153° 11'.0	49° 20'.7 N
Alnair	28° 04'.0	47° 00'.0 S
Alnilam	276° 02'.4	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.4	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.9 N
Altair	62° 24'.0	8° 50'.7 N
Ankaa	353° 31'.6	42° 21'.0 S
Antares	112° 45'.8	26° 24'.9 S
Arcturus	146° 10'.0	19° 13'.1 N
Atria	108° 02'.2	69° 00'.7 S
Avior	234° 24'.0	59° 29'.3 S
Bellatrix	278° 49'.0	6° 20'.5 N
Betelgeuse	271° 18'.4	7° 24'.3 N
Canopus	264° 02'.9	52° 41'.7 S
Capella	280° 57'.8	45° 59'.6 N
Deneb	49° 42'.8	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.4 N
Elnath	278° 32'.6	28° 36'.2 N
Eltanin	90° 53'.8	51° 29'.1 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.4	57° 04'.2 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.4	60° 20'.1 S
Hamal	328° 18'.9	23° 25'.6 N
Kaus Aust.	84° 05'.1	34° 23'.3 S
Kochab	137° 18'.8	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 26'.2	36° 19'.9 S
Miaplacidus	221° 42'.3	69° 41'.3 S
Mirfak	309° 03'.3	49° 50'.3 N
Nunki	76° 18'.2	26° 18'.4 S
Peacock	53° 44'.6	56° 45'.6 S
Polaris	324° 15'.2	89° 14'.2 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.3	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.2	8° 12'.7 S
Rigil Kent	140° 13'.3	60° 48'.0 S
Sabik	102° 30'.9	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.9 N
Shaula	96° 43'.7	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.5 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.2 S
Vega	80° 50'.0	38° 46'.3 N
Zuben'ubi	137° 23'.0	16° 00'.7 S

	SHA	Mer.Pass.
Venus	53° 32'.8	10:22
Mars	54° 33'.6	10:17
Jupiter	197° 23'.2	00:46
Saturn	45° 23'.3	10:52

SUN			
GHA	Dec		
176° 33'.4	10° 54'.2 S		
191° 33'.5	53'.3		
206° 33'.6	52'.4		
221° 33'.6	51'.5		
236° 33'.7	50'.6		
251° 33'.8	49'.7		
266° 33'.8	48'.8		
281° 33'.9	47'.9		
296° 34'.0	47'.0		
311° 34'.1	46'.1		
326° 34'.1	45'.2		
341° 34'.2	44'.3		
356° 34'.3	10° 43'.4 S		
11° 34'.3	42'.5		
26° 34'.4	41'.6		
41° 34'.5	40'.7		
56° 34'.6	39'.8		
71° 34'.6	38'.9		
86° 34'.7	38'.0		
101° 34'.8	37'.1		
116° 34'.8	36'.2		
131° 34'.9	35'.3		
146° 35'.0	34'.4		
161° 35'.1	33'.5		
176° 35'.1	10° 32'.6 S		
191° 35'.2	31'.7		
206° 35'.3	30'.8		
221° 35'.4	29'.9		
236° 35'.4	29'.0		
251° 35'.5	28'.1		
266° 35'.6	27'.2		
281° 35'.7	26'.3		
296° 35'.7	25'.4		
311° 35'.8	24'.5		
326° 35'.9	23'.5		
341° 36'.0	22'.6		
356° 36'.0	10° 21'.7 S		
11° 36'.1	20'.8		
26° 36'.2	19'.9		
41° 36'.3	19'.0		
56° 36'.4	18'.1		
71° 36'.4	17'.2		
86° 36'.5	16'.3		
101° 36'.6	15'.4		
116° 36'.7	14'.5		
131° 36'.8	13'.5		
146° 36'.8	12'.6		
161° 36'.9	11'.7		
176° 37'.0	10° 10'.8 S		
191° 37'.1	09'.9		
206° 37'.2	09'.0		
221° 37'.2	08'.1		
236° 37'.3	07'.2		
251° 37'.4	06'.3		
266° 37'.5	05'.3		
281° 37'.6	04'.4		
296° 37'.6	03'.5		
311° 37'.7	02'.6		
326° 37'.8	01'.7		
341° 37'.9	00'.8		
356° 38'.0	9° 59'.9 S		
11° 38'.1	58'.9		
26° 38'.1	58'.0		
41° 38'.2	57'.1		
56° 38'.3	56'.2		
71° 38'.4	55'.3		
86° 38'.5	54'.4		
101° 38'.6	53'.4		
116° 38'.7	52'.5		
131° 38'.7	51'.6		
146° 38'.8	50'.7		
161° 38'.9	49'.8		
SD 16'.2	d 0'.9		

MOON				
GHA	v	Dec	d	HP
324° 30'.5	10'.4	8° 01'.2 S	14'.1	59'.4
338° 59'.9	10'.4	15'.3	14'.1	
353° 29'.3	10'.5	29'.4	14'.0	59'.3
7° 58'.8	10'.4	43'.4	13'.9	
22° 28'.2	10'.4	57'.3	13'.9	
36° 57'.6	10'.4	9° 11'.2 S	13'.8	59'.2
51° 27'.0	10'.5	25'.0	13'.8	
65° 56'.5	10'.4	38'.8	13'.6	59'.1
80° 25'.9	10'.4	52'.4	13'.6	
94° 55'.3	10'.5	10° 06'.0 S	13'.6	
109° 24'.8	10'.4	19'.6	13'.4	59'.0
123° 54'.2	10'.4	33'.0	13'.4	
138° 23'.6	10'.5	10° 46'.4 S	13'.3	58'.9
152° 53'.1	10'.4	59'.7	13'.2	
167° 22'.5	10'.4	11° 12'.9 S	13'.1	
181° 51'.9	10'.4	26'.0	13'.1	58'.8
196° 21'.3	10'.5	39'.1	12'.9	
210° 50'.8	10'.4	52'.0	12'.9	58'.7
225° 20'.2	10'.4	12° 04'.9 S	12'.8	
239° 49'.6	10'.4	17'.7	12'.7	
254° 19'.0	10'.4	30'.4	12'.7	58'.6
268° 48'.4	10'.4	43'.1	12'.5	
283° 17'.8	10'.3	55'.6	12'.5	58'.5
297° 47'.1	10'.4	13° 08'.1 S	12'.3	
312° 16'.5	10'.4	13° 20'.4 S	12'.3	58'.5
326° 45'.9	10'.3	32'.7	12'.2	58'.4
341° 15'.2	10'.4	44'.9	12'.1	
355° 44'.6	10'.3	57'.0	12'.0	58'.3
10° 13'.9	10'.3	14° 09'.0 S	11'.9	
24° 43'.2	10'.4	20'.9	11'.8	
39° 12'.6	10'.3	32'.7	11'.8	58'.2
53° 41'.9	10'.3	44'.5	11'.6	
68° 11'.2	10'.2	56'.1	11'.5	58'.1
82° 40'.4	10'.3	15° 07'.6 S	11'.5	
97° 09'.7	10'.3	19'.1	11'.3	
111° 39'.0	10'.2	30'.4	11'.2	58'.0
126° 08'.2	10'.3	15° 41'.6 S	11'.1	58'.0
140° 37'.5	10'.2	52'.7	11'.1	57'.9
155° 06'.7	10'.2	16° 03'.8 S	10'.9	
169° 35'.9	10'.2	14'.7	10'.8	
184° 05'.1	10'.2	25'.5	10'.8	57'.8
198° 34'.3	10'.2	36'.3	10'.6	
213° 03'.5	10'.1	46'.9	10'.5	57'.7
227° 32'.6	10'.2	57'.4	10'.4	
242° 01'.8	10'.1	17° 07'.8 S	10'.3	
256° 30'.9	10'.1	18'.1	10'.2	57'.6
271° 00'.0	10'.2	28'.3	10'.1	
285° 29'.2	10'.0	38'.4	10'.0	57'.5
299° 58'.2	10'.1	17° 48'.4 S	9'.9	57'.5
314° 27'.3	10'.1	58'.3	9'.7	
328° 56'.4	10'.0	18° 08'.0 S	9'.7	57'.4
343° 25'.4	10'.1	17'.7	9'.5	
357° 54'.5	10'.0	27'.2	9'.4	57'.3
12° 23'.5	10'.0	36'.6	9'.4	
26° 52'.5	10'.0	46'.0	9'.2	
41° 21'.5	10'.0	55'.2	9'.1	57'.2
55° 50'.5	10'.0	19° 04'.3 S	8'.9	
70° 19'.5	9'.9	13'.2	8'.9	57'.1
84° 48'.4	10'.0	22'.1	8'.8	
99° 17'.4	9'.9	30'.9	8'.6	
113° 46'.3	9'.9	19° 39'.5 S	8'.5	57'.0
128° 15'.2	9'.9	48'.0	8'.4	
142° 44'.1	9'.9	56'.4	8'.3	56'.9
157° 13'.0	9'.9	20° 04'.7 S	8'.2	
171° 41'.9	9'.9	12'.9	8'.0	
186° 10'.8	9'.8	20'.9	8'.0	56'.8
200° 39'.6	9'.9	28'.9	7'.8	
215° 08'.5	9'.8	36'.7	7'.7	
229° 37'.3	9'.8	44'.4	7'.5	56'.7
244° 06'.1	9'.8	51'.9	7'.5	
258° 34'.9	9'.8	59'.4	7'.3	
273° 03'.7	9'.8	21° 06'.7 S	7'.2	56'.6
SD 16'.1	15'.8	15'.5		

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
21	13 46	13 43	12:14	02:27	14:52	18d 86%
22	13 40	13 36	12:14	03:18	15:43	19d 78%
23	13 32	13 28	12:13	04:09	16:34	20d 68%

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1992 February 24, 25, 26 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +1.3		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
24 Monday 00	153° 08'.1	204° 07'.5	18° 55'.8 S	206° 06'.1	20° 06'.1 S	350° 45'.8	8° 57'.4 N	198° 17'.6	17° 45'.6 S
01	168° 10'.6	219° 06'.7	55'.2	221° 06'.6	05'.7	5° 48'.5	57'.5	213° 19'.8	45'.6
02	183° 13'.1	234° 06'.0	54'.5	236° 07'.1	05'.3	20° 51'.3	57'.7	228° 22'.0	45'.5
03	198° 15'.5	249° 05'.3	53'.9	251° 07'.6	04'.8	35° 54'.1	57'.8	243° 24'.1	45'.4
04	213° 18'.0	264° 04'.6	53'.2	266° 08'.0	04'.4	50° 56'.8	57'.9	258° 26'.3	45'.3
05	228° 20'.5	279° 03'.9	52'.5	281° 08'.5	03'.9	65° 59'.6	58'.0	273° 28'.5	45'.3
06	243° 22'.9	294° 03'.1	51'.9	296° 09'.0	03'.5	81° 02'.4	58'.2	288° 30'.7	45'.2
07	258° 25'.4	309° 02'.4	51'.2	311° 09'.5	03'.1	96° 05'.1	58'.3	303° 32'.8	45'.1
08	273° 27'.9	324° 01'.7	50'.5	326° 10'.0	02'.6	111° 07'.9	58'.4	318° 35'.0	45'.0
09	288° 30'.3	339° 01'.0	49'.9	341° 10'.4	02'.2	126° 10'.7	58'.5	333° 37'.2	45'.0
10	303° 32'.8	354° 00'.2	49'.2	356° 10'.9	01'.7	141° 13'.4	58'.7	348° 39'.4	44'.9
11	318° 35'.3	8° 59'.5	48'.5	11° 11'.4	01'.3	156° 16'.2	58'.8	3° 41'.5	44'.8
12	333° 37'.7	23° 58'.8	18° 47'.8 S	26° 11'.9	20° 00'.9 S	171° 19'.0	8° 58'.9 N	18° 43'.7	17° 44'.7 S
13	348° 40'.2	38° 58'.1	47'.2	41° 12'.3	00'.4	186° 21'.7	59'.0	33° 45'.9	44'.7
14	3° 42'.6	53° 57'.4	46'.5	56° 12'.8	00'.0	201° 24'.5	59'.2	48° 48'.1	44'.6
15	18° 45'.1	68° 56'.7	45'.8	71° 13'.3	19° 59'.5 S	216° 27'.3	59'.3	63° 50'.3	44'.5
16	33° 47'.6	83° 55'.9	45'.1	86° 13'.8	59'.1	231° 30'.0	59'.4	78° 52'.4	44'.4
17	48° 50'.0	98° 55'.2	44'.5	101° 14'.2	58'.6	246° 32'.8	59'.6	93° 54'.6	44'.4
18	63° 52'.5	113° 54'.5	43'.8	116° 14'.7	58'.2	261° 35'.6	59'.7	108° 56'.8	44'.3
19	78° 55'.0	128° 53'.8	43'.1	131° 15'.2	57'.7	276° 38'.3	59'.8	123° 59'.0	44'.2
20	93° 57'.4	143° 53'.1	42'.4	146° 15'.7	57'.3	291° 41'.1	59'.9	139° 01'.1	44'.1
21	108° 59'.9	158° 52'.4	41'.7	161° 16'.2	56'.8	306° 43'.9	9° 00'.1 N	154° 03'.3	44'.1
22	124° 02'.4	173° 51'.6	41'.1	176° 16'.6	56'.4	321° 46'.6	00'.2	169° 05'.5	44'.0
23	139° 04'.8	188° 50'.9	40'.4	191° 17'.1	55'.9	336° 49'.4	00'.3	184° 07'.7	43'.9
25 Tuesday 00	154° 07'.3	203° 50'.2	18° 39'.7 S	206° 17'.6	19° 55'.5 S	351° 52'.2	9° 00'.4 N	199° 09'.9	17° 43'.8 S
01	169° 09'.7	218° 49'.5	39'.0	221° 18'.1	55'.1	6° 54'.9	00'.6	214° 12'.0	43'.7
02	184° 12'.2	233° 48'.8	38'.3	236° 18'.6	54'.6	21° 57'.7	00'.7	229° 14'.2	43'.7
03	199° 14'.7	248° 48'.1	37'.6	251° 19'.0	54'.2	37° 00'.5	00'.8	244° 16'.4	43'.6
04	214° 17'.1	263° 47'.4	37'.0	266° 19'.5	53'.7	52° 03'.2	01'.0	259° 18'.6	43'.5
05	229° 19'.6	278° 46'.7	36'.3	281° 20'.0	53'.3	67° 06'.0	01'.1	274° 20'.7	43'.4
06	244° 22'.1	293° 45'.9	35'.6	296° 20'.5	52'.8	82° 08'.8	01'.2	289° 22'.9	43'.4
07	259° 24'.5	308° 45'.2	34'.9	311° 20'.9	52'.4	97° 11'.5	01'.3	304° 25'.1	43'.3
08	274° 27'.0	323° 44'.5	34'.2	326° 21'.4	51'.9	112° 14'.3	01'.5	319° 27'.3	43'.2
09	289° 29'.5	338° 43'.8	33'.5	341° 21'.9	51'.5	127° 17'.1	01'.6	334° 29'.5	43'.1
10	304° 31'.9	353° 43'.1	32'.8	356° 22'.4	51'.0	142° 19'.9	01'.7	349° 31'.6	43'.1
11	319° 34'.4	8° 42'.4	32'.1	11° 22'.9	50'.6	157° 22'.6	01'.8	4° 33'.8	43'.0
12	334° 36'.9	23° 41'.7	18° 31'.4 S	26° 23'.3	19° 50'.1 S	172° 25'.4	9° 02'.0 N	19° 36'.0	17° 42'.9 S
13	349° 39'.3	38° 41'.0	30'.7	41° 23'.8	49'.6	187° 28'.2	02'.1	34° 38'.2	42'.8
14	4° 41'.8	53° 40'.3	30'.0	56° 24'.3	49'.2	202° 30'.9	02'.2	49° 40'.3	42'.8
15	19° 44'.2	68° 39'.6	29'.3	71° 24'.8	48'.7	217° 33'.7	02'.4	64° 42'.5	42'.7
16	34° 46'.7	83° 38'.9	28'.6	86° 25'.3	48'.3	232° 36'.5	02'.5	79° 44'.7	42'.6
17	49° 49'.2	98° 38'.1	27'.9	101° 25'.8	47'.8	247° 39'.2	02'.6	94° 46'.9	42'.5
18	64° 51'.6	113° 37'.4	27'.2	116° 26'.2	47'.4	262° 42'.0	02'.7	109° 49'.1	42'.5
19	79° 54'.1	128° 36'.7	26'.5	131° 26'.7	46'.9	277° 44'.8	02'.9	124° 51'.2	42'.4
20	94° 56'.6	143° 36'.0	25'.8	146° 27'.2	46'.5	292° 47'.5	03'.0	139° 53'.4	42'.3
21	109° 59'.0	158° 35'.3	25'.1	161° 27'.7	46'.0	307° 50'.3	03'.1	154° 55'.6	42'.2
22	125° 01'.5	173° 34'.6	24'.4	176° 28'.2	45'.6	322° 53'.1	03'.2	169° 57'.8	42'.2
23	140° 04'.0	188° 33'.9	23'.7	191° 28'.6	45'.1	337° 55'.8	03'.4	185° 00'.0	42'.1
26 Wednesday 00	155° 06'.4	203° 33'.2	18° 23'.0 S	206° 29'.1	19° 44'.6 S	352° 58'.6	9° 03'.5 N	200° 02'.1	17° 42'.0 S
01	170° 08'.9	218° 32'.5	22'.3	221° 29'.6	44'.2	8° 01'.4	03'.6	215° 04'.3	41'.9
02	185° 11'.4	233° 31'.8	21'.6	236° 30'.1	43'.7	23° 04'.2	03'.8	230° 06'.5	41'.9
03	200° 13'.8	248° 31'.1	20'.9	251° 30'.6	43'.3	38° 06'.9	03'.9	245° 08'.7	41'.8
04	215° 16'.3	263° 30'.4	20'.2	266° 31'.1	42'.8	53° 09'.7	04'.0	260° 10'.8	41'.7
05	230° 18'.7	278° 29'.7	19'.5	281° 31'.5	42'.4	68° 12'.5	04'.1	275° 13'.0	41'.6
06	245° 21'.2	293° 29'.0	18'.8	296° 32'.0	41'.9	83° 15'.2	04'.3	290° 15'.2	41'.6
07	260° 23'.7	308° 28'.3	18'.1	311° 32'.5	41'.4	98° 18'.0	04'.4	305° 17'.4	41'.5
08	275° 26'.1	323° 27'.6	17'.3	326° 33'.0	41'.0	113° 20'.8	04'.5	320° 19'.6	41'.4
09	290° 28'.6	338° 26'.9	16'.6	341° 33'.5	40'.5	128° 23'.5	04'.6	335° 21'.7	41'.3
10	305° 31'.1	353° 26'.2	15'.9	356° 34'.0	40'.1	143° 26'.3	04'.8	350° 23'.9	41'.3
11	320° 33'.5	8° 25'.5	15'.2	11° 34'.4	39'.6	158° 29'.1	04'.9	5° 26'.1	41'.2
12	335° 36'.0	23° 24'.8	18° 14'.5 S	26° 34'.9	19° 39'.1 S	173° 31'.8	9° 05'.0 N	20° 28'.3	17° 41'.1 S
13	350° 38'.5	38° 24'.1	13'.8	41° 35'.4	38'.7	188° 34'.6	05'.2	35° 30'.5	41'.0
14	5° 40'.9	53° 23'.4	13'.0	56° 35'.9	38'.2	203° 37'.4	05'.3	50° 32'.6	40'.9
15	20° 43'.4	68° 22'.7	12'.3	71° 36'.4	37'.8	218° 40'.2	05'.4	65° 34'.8	40'.9
16	35° 45'.9	83° 22'.0	11'.6	86° 36'.9	37'.3	233° 42'.9	05'.5	80° 37'.0	40'.8
17	50° 48'.3	98° 21'.3	10'.9	101° 37'.3	36'.8	248° 45'.7	05'.7	95° 39'.2	40'.7
18	65° 50'.8	113° 20'.6	10'.2	116° 37'.8	36'.4	263° 48'.5	05'.8	110° 41'.4	40'.6
19	80° 53'.2	128° 19'.9	09'.4	131° 38'.3	35'.9	278° 51'.2	05'.9	125° 43'.5	40'.6
20	95° 55'.7	143° 19'.2	08'.7	146° 38'.8	35'.4	293° 54'.0	06'.0	140° 45'.7	40'.5
21	110° 58'.2	158° 18'.5	08'.0	161° 39'.3	35'.0	308° 56'.8	06'.2	155° 47'.9	40'.4
22	126° 00'.6	173° 17'.8	07'.3	176° 39'.8	34'.5	323° 59'.5	06'.3	170° 50'.1	40'.3
23	141° 03'.1	188° 17'.2	06'.5	191° 40'.2	34'.0	339° 02'.3	06'.4	185° 52'.3	40'.3
	M.P. 13:41	v -0'.7	d 0'.7	v 0'.5	d 0'.5	v 2'.8	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.5	40° 20'.3 S
Achernar	335° 38'.8	57° 16'.7 S
Acrux	173° 26'.8	63° 03'.4 S
Adhara	255° 24'.8	28° 57'.9 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.0	55° 59'.8 N
Alkaid	153° 11'.0	49° 20'.7 N
Alnair	28° 04'.0	46° 59'.9 S
Alnilam	276° 02'.4	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.4	26° 44'.1 N
Alpheratz	358° 00'.4	29° 02'.9 N
Altair	62° 24'.0	8° 50'.7 N
Ankaa	353° 31'.6	42° 21'.0 S
Antares	112° 45'.8	26° 24'.9 S
Arcturus	146° 10'.0	19° 13'.1 N
Atria	108° 02'.2	69° 00'.7 S
Avior	234° 24'.1	59° 29'.3 S
Bellatrix	278° 49'.0	6° 20'.5 N
Betelgeuse	271° 18'.4	7° 24'.3 N
Canopus	264° 02'.9	52° 41'.7 S
Capella	280° 57'.9	45° 59'.6 N
Deneb	49° 42'.8	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.4 N
Elnath	278° 32'.6	28° 36'.2 N
Eltanin	90° 53'.7	51° 29'.0 N
Enif	34° 03'.1	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.3	57° 04'.2 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.3	60° 20'.1 S
Hamal	328° 18'.9	23° 25'.6 N
Kaus Aust.	84° 05'.1	34° 23'.3 S
Kochab	137° 18'.7	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 26'.2	36° 20'.0 S
Miaplacidus	221° 42'.4	69° 41'.3 S
Mirfak	309° 03'.4	49° 50'.3 N
Nunki	76° 18'.2	26° 18'.4 S
Peacock	53° 44'.6	56° 45'.5 S
Polaris	324° 16'.1	89° 14'.1 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.3	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.3	8° 12'.7 S
Rigil Kent	140° 13'.3	60° 48'.0 S
Sabik	102° 30'.9	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.9 N
Shaula	96° 43'.6	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.5 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.3 S
Vega	80° 50'.0	38° 46'.3 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	49° 42'.9	10:25
Mars	52° 10'.3	10:14
Jupiter	197° 44'.9	00:32
Saturn	45° 02'.6	10:42

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
24 00	176° 39'.0	9° 48'.9 S	287° 32'.5	9'.8	21° 13'.9 S	7'.1	56'.6
01	191° 39'.1	47'.9	302° 01'.3	9'.8	21'.0	7'.0	56'.5
02	206° 39'.2	47'.0	316° 30'.1	9'.7	28'.0	6'.9	
03	221° 39'.3	46'.1	330° 58'.8	9'.8	34'.9	6'.7	
04	236° 39'.3	45'.2	345° 27'.6	9'.7	41'.6	6'.6	56'.4
05	251° 39'.4	44'.3	359° 56'.3	9'.8	48'.2	6'.5	
06	266° 39'.5	43'.4	14° 25'.1	9'.7	54'.7	6'.3	
07	281° 39'.6	42'.4	28° 53'.8	9'.7	22° 01'.0 S	6'.3	56'.3
08	296° 39'.7	41'.5	43° 22'.5	9'.7	07'.3	6'.1	
09	311° 39'.8	40'.6	57° 51'.2	9'.8	13'.4	6'.0	
10	326° 39'.9	39'.7	72° 20'.0	9'.7	19'.4	5'.9	56'.2
11	341° 40'.0	38'.8	86° 48'.7	9'.6	25'.3	5'.7	
12	356° 40'.1	9° 37'.8 S	101° 17'.3	9'.7	22° 31'.0 S	5'.6	56'.2
13	11° 40'.2	36'.9	115° 46'.0	9'.7	36'.6	5'.5	56'.1
14	26° 40'.2	36'.0	130° 14'.7	9'.7	42'.1	5'.4	
15	41° 40'.3	35'.1	144° 43'.4	9'.7	47'.5	5'.2	
16	56° 40'.4	34'.1	159° 12'.1	9'.7	52'.7	5'.2	56'.0
17	71° 40'.5	33'.2	173° 40'.8	9'.6	57'.9	4'.9	
18	86° 40'.6	32'.3	188° 09'.4	9'.7	23° 02'.8 S	4'.9	
19	101° 40'.7	31'.4	202° 38'.1	9'.7	07'.7	4'.8	55'.9
20	116° 40'.8	30'.5	217° 06'.8	9'.7	12'.5	4'.6	
21	131° 40'.9	29'.5	231° 35'.5	9'.6	17'.1	4'.5	
22	146° 41'.0	28'.6	246° 04'.1	9'.7	21'.6	4'.3	55'.8
23	161° 41'.1	27'.7	260° 32'.8	9'.7	25'.9	4'.3	
25 00	176° 41'.2	9° 26'.8 S	275° 01'.5	9'.7	23° 30'.2 S	4'.1	55'.8
01	191° 41'.3	25'.8	289° 30'.2	9'.6	34'.3	4'.0	55'.7
02	206° 41'.3	24'.9	303° 58'.8	9'.7	38'.3	3'.8	
03	221° 41'.4	24'.0	318° 27'.5	9'.7	42'.1	3'.8	
04	236° 41'.5	23'.1	332° 56'.2	9'.7	45'.9	3'.6	
05	251° 41'.6	22'.1	347° 24'.9	9'.7	49'.5	3'.5	55'.6
06	266° 41'.7	21'.2	1° 53'.6	9'.7	53'.0	3'.3	
07	281° 41'.8	20'.3	16° 22'.3	9'.7	56'.3	3'.2	
08	296° 41'.9	19'.4	30° 51'.0	9'.7	59'.5	3'.1	55'.5
09	311° 42'.0	18'.4	45° 19'.7	9'.8	24° 02'.6 S	3'.0	
10	326° 42'.1	17'.5	59° 48'.5	9'.7	05'.6	2'.9	
11	341° 42'.2	16'.6	74° 17'.2	9'.7	08'.5	2'.7	55'.4
12	356° 42'.3	9° 15'.7 S	88° 45'.9	9'.8	24° 11'.2 S	2'.6	55'.4
13	11° 42'.4	14'.7	103° 14'.7	9'.8	13'.8	2'.5	
14	26° 42'.5	13'.8	117° 43'.5	9'.7	16'.3	2'.3	
15	41° 42'.6	12'.9	132° 12'.2	9'.8	18'.6	2'.2	55'.3
16	56° 42'.7	11'.9	146° 41'.0	9'.8	20'.8	2'.1	
17	71° 42'.8	11'.0	161° 09'.8	9'.8	22'.9	2'.0	
18	86° 42'.9	10'.1	175° 38'.6	9'.9	24'.9	1'.8	
19	101° 43'.0	09'.2	190° 07'.5	9'.8	26'.7	1'.8	55'.2
20	116° 43'.1	08'.2	204° 36'.3	9'.9	28'.5	1'.5	
21	131° 43'.2	07'.3	219° 05'.2	9'.8	30'.0	1'.5	
22	146° 43'.3	06'.4	233° 34'.0	9'.9	31'.5	1'.4	
23	161° 43'.4	05'.4	248° 02'.9	9'.9	32'.9	1'.2	55'.1
26 00	176° 43'.5	9° 04'.5 S	262° 31'.8	10'.0	24° 34'.1 S	1'.1	55'.1
01	191° 43'.6	03'.6	277° 00'.8	9'.9	35'.2	0'.9	
02	206° 43'.7	02'.7	291° 29'.7	10'.0	36'.1	0'.9	
03	221° 43'.8	01'.7	305° 58'.7	10'.0	37'.0	0'.7	55'.0
04	236° 43'.9	00'.8	320° 27'.7	10'.0	37'.7	0'.6	
05	251° 44'.0	8° 59'.9 S	334° 56'.7	10'.0	38'.3	0'.5	
06	266° 44'.1	58'.9	349° 25'.7	10'.1	38'.8	0'.3	
07	281° 44'.2	58'.0	3° 54'.8	10'.1	39'.1	0'.2	54'.9
08	296° 44'.3	57'.1	18° 23'.9	10'.1	39'.3	0'.1	
09	311° 44'.4	56'.1	32° 53'.0	10'.1	39'.4	0'.0	
10	326° 44'.5	55'.2	47° 22'.1	10'.2	39'.4	0'.1	
11	341° 44'.6	54'.3	61° 51'.3	10'.1	39'.3	0'.3	
12	356° 44'.7	8° 53'.3 S	76° 20'.4	10'.3	24° 39'.0 S	0'.4	54'.8
13	11° 44'.8	52'.4	90° 49'.7	10'.2	38'.6	0'.5	
14	26° 44'.9	51'.5	105° 18'.9	10'.3	38'.1	0'.6	
15	41° 45'.0	50'.5	119° 48'.2	10'.3	37'.5	0'.8	
16	56° 45'.1	49'.6	134° 17'.5	10'.3	36'.7	0'.9	
17	71° 45'.2	48'.7	148° 46'.8	10'.3	35'.8	0'.9	54'.7
18	86° 45'.3	47'.7	163° 16'.1	10'.4	34'.9	1'.2	
19	101° 45'.4	46'.8	177° 45'.5	10'.4	33'.7	1'.2	
20	116° 45'.5	45'.9	192° 14'.9	10'.5	32'.5	1'.3	
21	131° 45'.6	44'.9	206° 44'.4	10'.5	31'.2	1'.5	
22	146° 45'.7	44'.0	221° 13'.9	10'.5	29'.7	1'.6	54'.6
23	161° 45'.8	43'.1	235° 43'.4	10'.5	28'.1	1'.7	
	SD 16'.2	d 0'.9	SD 15'.3		15'.1	14'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
24	13 24	13 20	12:13	05:00	17:26	21d 58%
25	13 16	13 11	12:13	05:52	18:18	22d 48%
26	13 06	13 02	12:13	06:44	19:09	23d 39%

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1992 February 27, 28, 29 (Thur, Fri, Sat)

GMT	ARIES	VENUS -3.9		MARS +1.3		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
27 Thursday 00	156° 05'.6	203° 16'.5	18° 05'.8 S	206° 40'.7	19° 33'.6 S	354° 05'.1	9° 06'.6 N	200° 54'.4	17° 40'.2 S
01	171° 08'.0	218° 15'.8	05'.1	221° 41'.2	33'.1	9° 07'.9	06'.7	215° 56'.6	40'.1
02	186° 10'.5	233° 15'.1	04'.3	236° 41'.7	32'.6	24° 10'.6	06'.8	230° 58'.8	40'.0
03	201° 13'.0	248° 14'.4	03'.6	251° 42'.2	32'.2	39° 13'.4	06'.9	246° 01'.0	40'.0
04	216° 15'.4	263° 13'.7	02'.9	266° 42'.7	31'.7	54° 16'.2	07'.1	261° 03'.2	39'.9
05	231° 17'.9	278° 13'.0	02'.2	281° 43'.2	31'.2	69° 18'.9	07'.2	276° 05'.3	39'.8
06	246° 20'.3	293° 12'.3	01'.4	296° 43'.7	30'.8	84° 21'.7	07'.3	291° 07'.5	39'.7
07	261° 22'.8	308° 11'.6	00'.7	311° 44'.1	30'.3	99° 24'.5	07'.4	306° 09'.7	39'.7
08	276° 25'.3	323° 10'.9	00'.0	326° 44'.6	29'.8	114° 27'.2	07'.6	321° 11'.9	39'.6
09	291° 27'.7	338° 10'.2	17° 59'.2 S	341° 45'.1	29'.4	129° 30'.0	07'.7	336° 14'.1	39'.5
10	306° 30'.2	353° 09'.6	58'.5	356° 45'.6	28'.9	144° 32'.8	07'.8	351° 16'.3	39'.4
11	321° 32'.7	8° 08'.9	57'.7	11° 46'.1	28'.4	159° 35'.6	07'.9	6° 18'.4	39'.4
12	336° 35'.1	23° 08'.2	17° 57'.0 S	26° 46'.6	19° 28'.0 S	174° 38'.3	9° 08'.1 N	21° 20'.6	17° 39'.3 S
13	351° 37'.6	38° 07'.5	56'.3	41° 47'.1	27'.5	189° 41'.1	08'.2	36° 22'.8	39'.2
14	6° 40'.1	53° 06'.8	55'.5	56° 47'.5	27'.0	204° 43'.9	08'.3	51° 25'.0	39'.1
15	21° 42'.5	68° 06'.1	54'.8	71° 48'.0	26'.6	219° 46'.6	08'.5	66° 27'.2	39'.1
16	36° 45'.0	83° 05'.4	54'.0	86° 48'.5	26'.1	234° 49'.4	08'.6	81° 29'.3	39'.0
17	51° 47'.5	98° 04'.7	53'.3	101° 49'.0	25'.6	249° 52'.2	08'.7	96° 31'.5	38'.9
18	66° 49'.9	113° 04'.1	52'.6	116° 49'.5	25'.1	264° 54'.9	08'.8	111° 33'.7	38'.8
19	81° 52'.4	128° 03'.4	51'.8	131° 50'.0	24'.7	279° 57'.7	09'.0	126° 35'.9	38'.8
20	96° 54'.8	143° 02'.7	51'.1	146° 50'.5	24'.2	295° 00'.5	09'.1	141° 38'.1	38'.7
21	111° 57'.3	158° 02'.0	50'.3	161° 51'.0	23'.7	310° 03'.3	09'.2	156° 40'.2	38'.6
22	126° 59'.8	173° 01'.3	49'.6	176° 51'.5	23'.3	325° 06'.0	09'.3	171° 42'.4	38'.5
23	142° 02'.2	188° 00'.6	48'.8	191° 51'.9	22'.8	340° 08'.8	09'.5	186° 44'.6	38'.5
28 Friday 00	157° 04'.7	203° 00'.0	17° 48'.1 S	206° 52'.4	19° 22'.3 S	355° 11'.6	9° 09'.6 N	201° 46'.8	17° 38'.4 S
01	172° 07'.2	217° 59'.3	47'.3	221° 52'.9	21'.8	10° 14'.3	09'.7	216° 49'.0	38'.3
02	187° 09'.6	232° 58'.6	46'.6	236° 53'.4	21'.4	25° 17'.1	09'.9	231° 51'.2	38'.2
03	202° 12'.1	247° 57'.9	45'.8	251° 53'.9	20'.9	40° 19'.9	10'.0	246° 53'.3	38'.2
04	217° 14'.6	262° 57'.2	45'.1	266° 54'.4	20'.4	55° 22'.6	10'.1	261° 55'.5	38'.1
05	232° 17'.0	277° 56'.6	44'.3	281° 54'.9	19'.9	70° 25'.4	10'.2	276° 57'.7	38'.0
06	247° 19'.5	292° 55'.9	43'.6	296° 55'.4	19'.5	85° 28'.2	10'.4	291° 59'.9	37'.9
07	262° 22'.0	307° 55'.2	42'.8	311° 55'.9	19'.0	100° 31'.0	10'.5	307° 02'.1	37'.9
08	277° 24'.4	322° 54'.5	42'.1	326° 56'.3	18'.5	115° 33'.7	10'.6	322° 04'.2	37'.8
09	292° 26'.9	337° 53'.8	41'.3	341° 56'.8	18'.0	130° 36'.5	10'.7	337° 06'.4	37'.7
10	307° 29'.3	352° 53'.2	40'.5	356° 57'.3	17'.5	145° 39'.3	10'.9	352° 08'.6	37'.6
11	322° 31'.8	7° 52'.5	39'.8	11° 57'.8	17'.1	160° 42'.0	11'.0	7° 10'.8	37'.6
12	337° 34'.3	22° 51'.8	17° 39'.0 S	26° 58'.3	19° 16'.6 S	175° 44'.8	9° 11'.1 N	22° 13'.0	17° 37'.5 S
13	352° 36'.7	37° 51'.1	38'.3	41° 58'.8	16'.1	190° 47'.6	11'.2	37° 15'.2	37'.4
14	7° 39'.2	52° 50'.5	37'.5	56° 59'.3	15'.6	205° 50'.4	11'.4	52° 17'.3	37'.3
15	22° 41'.7	67° 49'.8	36'.7	71° 59'.8	15'.2	220° 53'.1	11'.5	67° 19'.5	37'.3
16	37° 44'.1	82° 49'.1	36'.0	87° 00'.3	14'.7	235° 55'.9	11'.6	82° 21'.7	37'.2
17	52° 46'.6	97° 48'.4	35'.2	102° 00'.8	14'.2	250° 58'.7	11'.8	97° 23'.9	37'.1
18	67° 49'.1	112° 47'.7	34'.4	117° 01'.3	13'.7	266° 01'.4	11'.9	112° 26'.1	37'.0
19	82° 51'.5	127° 47'.1	33'.7	132° 01'.7	13'.2	281° 04'.2	12'.0	127° 28'.3	37'.0
20	97° 54'.0	142° 46'.4	32'.9	147° 02'.2	12'.8	296° 07'.0	12'.1	142° 30'.4	36'.9
21	112° 56'.4	157° 45'.7	32'.1	162° 02'.7	12'.3	311° 09'.7	12'.3	157° 32'.6	36'.8
22	127° 58'.9	172° 45'.1	31'.4	177° 03'.2	11'.8	326° 12'.5	12'.4	172° 34'.8	36'.7
23	143° 01'.4	187° 44'.4	30'.6	192° 03'.7	11'.3	341° 15'.3	12'.5	187° 37'.0	36'.7
29 Saturday 00	158° 03'.8	202° 43'.7	17° 29'.8 S	207° 04'.2	19° 10'.8 S	356° 18'.1	9° 12'.6 N	202° 39'.2	17° 36'.6 S
01	173° 06'.3	217° 43'.0	29'.1	222° 04'.7	10'.3	11° 20'.8	12'.8	217° 41'.4	36'.5
02	188° 08'.8	232° 42'.4	28'.3	237° 05'.2	09'.9	26° 23'.6	12'.9	232° 43'.5	36'.4
03	203° 11'.2	247° 41'.7	27'.5	252° 05'.7	09'.4	41° 26'.4	13'.0	247° 45'.7	36'.4
04	218° 13'.7	262° 41'.0	26'.8	267° 06'.2	08'.9	56° 29'.1	13'.2	262° 47'.9	36'.3
05	233° 16'.2	277° 40'.4	26'.0	282° 06'.7	08'.4	71° 31'.9	13'.3	277° 50'.1	36'.2
06	248° 18'.6	292° 39'.7	25'.2	297° 07'.2	07'.9	86° 34'.7	13'.4	292° 52'.3	36'.1
07	263° 21'.1	307° 39'.0	24'.4	312° 07'.7	07'.4	101° 37'.5	13'.5	307° 54'.5	36'.1
08	278° 23'.6	322° 38'.4	23'.6	327° 08'.2	07'.0	116° 40'.2	13'.7	322° 56'.6	36'.0
09	293° 26'.0	337° 37'.7	22'.9	342° 08'.7	06'.5	131° 43'.0	13'.8	337° 58'.8	35'.9
10	308° 28'.5	352° 37'.0	22'.1	357° 09'.1	06'.0	146° 45'.8	13'.9	353° 01'.0	35'.8
11	323° 30'.9	7° 36'.4	21'.3	12° 09'.6	05'.5	161° 48'.5	14'.0	8° 03'.2	35'.8
12	338° 33'.4	22° 35'.7	17° 20'.5 S	27° 10'.1	19° 05'.0 S	176° 51'.3	9° 14'.2 N	23° 05'.4	17° 35'.7 S
13	353° 35'.9	37° 35'.0	19'.8	42° 10'.6	04'.5	191° 54'.1	14'.3	38° 07'.6	35'.6
14	8° 38'.3	52° 34'.4	19'.0	57° 11'.1	04'.0	206° 56'.8	14'.4	53° 09'.7	35'.5
15	23° 40'.8	67° 33'.7	18'.2	72° 11'.6	03'.6	221° 59'.6	14'.5	68° 11'.9	35'.5
16	38° 43'.3	82° 33'.0	17'.4	87° 12'.1	03'.1	237° 02'.4	14'.7	83° 14'.1	35'.4
17	53° 45'.7	97° 32'.4	16'.6	102° 12'.6	02'.6	252° 05'.2	14'.8	98° 16'.3	35'.3
18	68° 48'.2	112° 31'.7	15'.8	117° 13'.1	02'.1	267° 07'.9	14'.9	113° 18'.5	35'.2
19	83° 50'.7	127° 31'.0	15'.0	132° 13'.6	01'.6	282° 10'.7	15'.0	128° 20'.7	35'.2
20	98° 53'.1	142° 30'.4	14'.3	147° 14'.1	01'.1	297° 13'.5	15'.2	143° 22'.8	35'.1
21	113° 55'.6	157° 29'.7	13'.5	162° 14'.6	00'.6	312° 16'.2	15'.3	158° 25'.0	35'.0
22	128° 58'.1	172° 29'.0	12'.7	177° 15'.1	00'.1	327° 19'.0	15'.4	173° 27'.2	34'.9
23	144° 00'.5	187° 28'.4	11'.9	192° 15'.6	18° 59'.6 S	342° 21'.8	15'.6	188° 29'.4	34'.9
	M.P. 13:29	v -0'.7	d 0'.8	v 0'.5	d 0'.5	v 2'.8	d 0'.1	v 2'.2	d 0'.1

STARS		
Name	SHA	Dec
Acamar	315° 30'.5	40° 20'.3 S
Achernar	335° 38'.8	57° 16'.7 S
Acrux	173° 26'.8	63° 03'.4 S
Adhara	255° 24'.8	28° 57'.9 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.0	55° 59'.8 N
Alkaid	153° 11'.0	49° 20'.7 N
Alnair	28° 04'.0	46° 59'.9 S
Alnilam	276° 02'.4	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.9 N
Altair	62° 24'.0	8° 50'.7 N
Ankaa	353° 31'.6	42° 21'.0 S
Antares	112° 45'.8	26° 24'.9 S
Arcturus	146° 10'.0	19° 13'.1 N
Atria	108° 02'.1	69° 00'.7 S
Avior	234° 24'.1	59° 29'.3 S
Bellatrix	278° 49'.0	6° 20'.5 N
Betelgeuse	271° 18'.4	7° 24'.3 N
Canopus	264° 03'.0	52° 41'.8 S
Capella	280° 57'.9	45° 59'.6 N
Deneb	49° 42'.8	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.4 N
Elnath	278° 32'.6	28° 36'.2 N
Eltanin	90° 53'.7	51° 29'.0 N
Enif	34° 03'.0	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.9 S
Gacrux	172° 18'.3	57° 04'.2 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.3	60° 20'.1 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 05'.1	34° 23'.3 S
Kochab	137° 18'.6	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 26'.2	36° 20'.0 S
Miaplacidus	221° 42'.4	69° 41'.3 S
Mirfak	309° 03'.4	49° 50'.3 N
Nunki	76° 18'.2	26° 18'.4 S
Peacock	53° 44'.6	56° 45'.5 S
Polaris	324° 17'.0	89° 14'.1 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.3	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.3	8° 12'.7 S
Rigil Kent	140° 13'.2	60° 48'.0 S
Sabik	102° 30'.8	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.9 N
Shaula	96° 43'.6	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.5 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.3 S
Vega	80° 49'.9	38° 46'.3 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	45° 55'.3	10:28
Mars	49° 47'.7	10:12
Jupiter	198° 06'.9	00:19
Saturn	44° 42'.1	10:31

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
176° 45'.9	8° 42'.1 S	250° 12'.9	10'.6	24° 26'.4 S	1'.8	54'.6
191° 46'.0	41'.2	264° 42'.5	10'.7	24'.6	1'.9	
206° 46'.1	40'.3	279° 12'.2	10'.6	22'.7	2'.1	
221° 46'.2	39'.3	293° 41'.8	10'.7	20'.6	2'.2	54'.5
236° 46'.3	38'.4	308° 11'.5	10'.7	18'.4	2'.3	
251° 46'.4	37'.5	322° 41'.2	10'.8	16'.1	2'.4	
266° 46'.5	36'.5	337° 11'.0	10'.8	13'.7	2'.5	
281° 46'.6	35'.6	351° 40'.8	10'.9	11'.2	2'.6	
296° 46'.7	34'.6	6° 10'.7	10'.9	08'.6	2'.7	
311° 46'.8	33'.7	20° 40'.6	10'.9	05'.9	2'.9	
326° 47'.0	32'.8	35° 10'.5	10'.9	03'.0	3'.0	54'.4
341° 47'.1	31'.8	49° 40'.4	11'.0	00'.0	3'.1	
356° 47'.2	8° 30'.9 S	64° 10'.4	11'.1	23° 56'.9 S	3'.2	54'.4
11° 47'.3	30'.0	78° 40'.5	11'.1	53'.7	3'.3	
26° 47'.4	29'.0	93° 10'.6	11'.1	50'.4	3'.4	
41° 47'.5	28'.1	107° 40'.7	11'.2	47'.0	3'.5	
56° 47'.6	27'.1	122° 10'.9	11'.2	43'.5	3'.6	
71° 47'.7	26'.2	136° 41'.1	11'.3	39'.9	3'.8	54'.3
86° 47'.8	25'.3	151° 11'.4	11'.3	36'.1	3'.8	
101° 47'.9	24'.3	165° 41'.7	11'.3	32'.3	4'.0	
116° 48'.0	23'.4	180° 12'.0	11'.4	28'.3	4'.1	
131° 48'.1	22'.4	194° 42'.4	11'.4	24'.2	4'.2	
146° 48'.3	21'.5	209° 12'.8	11'.5	20'.0	4'.2	
161° 48'.4	20'.6	223° 43'.3	11'.6	15'.8	4'.4	
176° 48'.5	8° 19'.6 S	238° 13'.9	11'.5	23° 11'.4 S	4'.5	54'.3
191° 48'.6	18'.7	252° 44'.4	11'.6	06'.9	4'.6	54'.2
206° 48'.7	17'.7	267° 15'.0	11'.7	02'.3	4'.7	
221° 48'.8	16'.8	281° 45'.7	11'.7	22° 57'.6 S	4'.9	
236° 48'.9	15'.9	296° 16'.4	11'.8	52'.7	4'.9	
251° 49'.0	14'.9	310° 47'.2	11'.8	47'.8	5'.0	
266° 49'.1	14'.0	325° 18'.0	11'.8	42'.8	5'.1	
281° 49'.3	13'.0	339° 48'.8	11'.9	37'.7	5'.2	
296° 49'.4	12'.1	354° 19'.7	12'.0	32'.5	5'.3	
311° 49'.5	11'.1	8° 50'.7	12'.0	27'.2	5'.5	
326° 49'.6	10'.2	23° 21'.7	12'.0	21'.7	5'.5	
341° 49'.7	09'.3	37° 52'.7	12'.1	16'.2	5'.6	
356° 49'.8	8° 08'.3 S	52° 23'.8	12'.2	22° 10'.6 S	5'.7	54'.1
11° 49'.9	07'.4	66° 55'.0	12'.2	04'.9	5'.8	
26° 50'.0	06'.4	81° 26'.2	12'.2	21° 59'.1 S	6'.0	
41° 50'.2	05'.5	95° 57'.4	12'.3	53'.1	6'.0	
56° 50'.3	04'.5	110° 28'.7	12'.3	47'.1	6'.1	
71° 50'.4	03'.6	125° 00'.0	12'.4	41'.0	6'.2	
86° 50'.5	02'.6	139° 31'.4	12'.5	34'.8	6'.3	
101° 50'.6	01'.7	154° 02'.9	12'.4	28'.5	6'.4	
116° 50'.7	00'.8	168° 34'.3	12'.6	22'.1	6'.5	
131° 50'.8	7° 59'.8 S	183° 05'.9	12'.6	15'.6	6'.5	
146° 51'.0	58'.9	197° 37'.5	12'.6	09'.1	6'.7	
161° 51'.1	57'.9	212° 09'.1	12'.7	02'.4	6'.8	
176° 51'.2	7° 57'.0 S	226° 40'.8	12'.7	20° 55'.6 S	6'.8	54'.1
191° 51'.3	56'.0	241° 12'.5	12'.8	48'.8	7'.0	
206° 51'.4	55'.1	255° 44'.3	12'.8	41'.8	7'.0	
221° 51'.5	54'.1	270° 16'.1	12'.9	34'.8	7'.1	
236° 51'.6	53'.2	284° 48'.0	12'.9	27'.7	7'.2	
251° 51'.8	52'.2	299° 19'.9	13'.0	20'.5	7'.3	54'.0
266° 51'.9	51'.3	313° 51'.9	13'.0	13'.2	7'.4	
281° 52'.0	50'.4	328° 23'.9	13'.1	05'.8	7'.5	
296° 52'.1	49'.4	342° 56'.0	13'.1	19° 58'.3 S	7'.5	
311° 52'.2	48'.5	357° 28'.1	13'.2	50'.8	7'.7	
326° 52'.4	47'.5	12° 00'.3	13'.2	43'.1	7'.7	
341° 52'.5	46'.6	26° 32'.5	13'.3	35'.4	7'.8	
356° 52'.6	7° 45'.6 S	41° 04'.8	13'.3	19° 27'.6 S	7'.9	54'.0
11° 52'.7	44'.7	55° 37'.1	13'.3	19'.7	8'.0	
26° 52'.8	43'.7	70° 09'.4	13'.5	11'.7	8'.0	
41° 52'.9	42'.8	84° 41'.9	13'.4	03'.7	8'.2	
56° 53'.1	41'.8	99° 14'.3	13'.5	18° 55'.5 S	8'.2	
71° 53'.2	40'.9	113° 46'.8	13'.6	47'.3	8'.3	
86° 53'.3	39'.9	128° 19'.4	13'.6	39'.0	8'.4	
101° 53'.4	39'.0	142° 52'.0	13'.6	30'.6	8'.4	
116° 53'.5	38'.0	157° 24'.6	13'.7	22'.2	8'.5	
131° 53'.7	37'.1	171° 57'.3	13'.8	13'.7	8'.7	
146° 53'.8	36'.1	186° 30'.1	13'.7	05'.0	8'.6	
161° 53'.9	35'.2	201° 02'.8	13'.9	17° 56'.4 S	8'.8	
SD 16'.1	d 0'.9	SD	14'.8	14'.8	14'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
27	12 57	12 52	12:13	07:34	19:59	24d 30%
28	12 46	12 41	12:13	08:23	20:47	25d 22%
29	12 35	12 30	12:12	09:10	21:33	26d 14%

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1992 March 1, 2, 3 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +1.3		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
1 Sunday 00	159° 03'.0	202° 27'.7	17° 11'.1 S	207° 16'.1	18° 59'.2 S	357° 24'.6	9° 15'.7 N	203° 31'.6	17° 34'.8 S
01	174° 05'.4	217° 27'.1	10'.3	222° 16'.6	58'.7	12° 27'.3	15'.8	218° 33'.8	34'.7
02	189° 07'.9	232° 26'.4	09'.5	237° 17'.1	58'.2	27° 30'.1	15'.9	233° 36'.0	34'.6
03	204° 10'.4	247° 25'.7	08'.7	252° 17'.6	57'.7	42° 32'.9	16'.1	248° 38'.1	34'.6
04	219° 12'.8	262° 25'.1	07'.9	267° 18'.1	57'.2	57° 35'.6	16'.2	263° 40'.3	34'.5
05	234° 15'.3	277° 24'.4	07'.1	282° 18'.6	56'.7	72° 38'.4	16'.3	278° 42'.5	34'.4
06	249° 17'.8	292° 23'.8	06'.3	297° 19'.1	56'.2	87° 41'.2	16'.4	293° 44'.7	34'.3
07	264° 20'.2	307° 23'.1	05'.5	312° 19'.6	55'.7	102° 44'.0	16'.6	308° 46'.9	34'.3
08	279° 22'.7	322° 22'.5	04'.7	327° 20'.1	55'.2	117° 46'.7	16'.7	323° 49'.1	34'.2
09	294° 25'.2	337° 21'.8	03'.9	342° 20'.6	54'.7	132° 49'.5	16'.8	338° 51'.3	34'.1
10	309° 27'.6	352° 21'.1	03'.2	357° 21'.0	54'.2	147° 52'.3	16'.9	353° 53'.4	34'.1
11	324° 30'.1	7° 20'.5	02'.4	12° 21'.5	53'.7	162° 55'.0	17'.1	8° 55'.6	34'.0
12	339° 32'.6	22° 19'.8	17° 01'.5 S	27° 22'.0	18° 53'.2 S	177° 57'.8	9° 17'.2 N	23° 57'.8	17° 33'.9 S
13	354° 35'.0	37° 19'.2	00'.7	42° 22'.5	52'.7	193° 00'.6	17'.3	39° 00'.0	33'.8
14	9° 37'.5	52° 18'.5	16° 59'.9 S	57° 23'.0	52'.2	208° 03'.3	17'.4	54° 02'.2	33'.8
15	24° 39'.9	67° 17'.9	59'.1	72° 23'.5	51'.8	223° 06'.1	17'.6	69° 04'.4	33'.7
16	39° 42'.4	82° 17'.2	58'.3	87° 24'.0	51'.3	238° 08'.9	17'.7	84° 06'.6	33'.6
17	54° 44'.9	97° 16'.6	57'.5	102° 24'.5	50'.8	253° 11'.7	17'.8	99° 08'.7	33'.5
18	69° 47'.3	112° 15'.9	56'.7	117° 25'.0	50'.3	268° 14'.4	18'.0	114° 10'.9	33'.5
19	84° 49'.8	127° 15'.2	55'.9	132° 25'.5	49'.8	283° 17'.2	18'.1	129° 13'.1	33'.4
20	99° 52'.3	142° 14'.6	55'.1	147° 26'.0	49'.3	298° 20'.0	18'.2	144° 15'.3	33'.3
21	114° 54'.7	157° 13'.9	54'.3	162° 26'.5	48'.8	313° 22'.7	18'.3	159° 17'.5	33'.2
22	129° 57'.2	172° 13'.3	53'.5	177° 27'.0	48'.3	328° 25'.5	18'.5	174° 19'.7	33'.2
23	144° 59'.7	187° 12'.6	52'.7	192° 27'.5	47'.8	343° 28'.3	18'.6	189° 21'.9	33'.1
2 Monday 00	160° 02'.1	202° 12'.0	16° 51'.9 S	207° 28'.0	18° 47'.3 S	358° 31'.1	9° 18'.7 N	204° 24'.0	17° 33'.0 S
01	175° 04'.6	217° 11'.3	51'.1	222° 28'.5	46'.8	13° 33'.8	18'.8	219° 26'.2	32'.9
02	190° 07'.0	232° 10'.7	50'.3	237° 29'.0	46'.3	28° 36'.6	19'.0	234° 28'.4	32'.9
03	205° 09'.5	247° 10'.0	49'.4	252° 29'.5	45'.8	43° 39'.4	19'.1	249° 30'.6	32'.8
04	220° 12'.0	262° 09'.4	48'.6	267° 30'.0	45'.3	58° 42'.1	19'.2	264° 32'.8	32'.7
05	235° 14'.4	277° 08'.7	47'.8	282° 30'.5	44'.8	73° 44'.9	19'.3	279° 35'.0	32'.6
06	250° 16'.9	292° 08'.1	47'.0	297° 31'.0	44'.3	88° 47'.7	19'.5	294° 37'.2	32'.6
07	265° 19'.4	307° 07'.5	46'.2	312° 31'.5	43'.8	103° 50'.5	19'.6	309° 39'.3	32'.5
08	280° 21'.8	322° 06'.8	45'.4	327° 32'.0	43'.3	118° 53'.2	19'.7	324° 41'.5	32'.4
09	295° 24'.3	337° 06'.2	44'.5	342° 32'.5	42'.8	133° 56'.0	19'.8	339° 43'.7	32'.3
10	310° 26'.8	352° 05'.5	43'.7	357° 33'.0	42'.3	148° 58'.8	20'.0	354° 45'.9	32'.3
11	325° 29'.2	7° 04'.9	42'.9	12° 33'.5	41'.8	164° 01'.5	20'.1	9° 48'.1	32'.2
12	340° 31'.7	22° 04'.2	16° 42'.1 S	27° 34'.0	18° 41'.3 S	179° 04'.3	9° 20'.2 N	24° 50'.3	17° 32'.1 S
13	355° 34'.2	37° 03'.6	41'.3	42° 34'.5	40'.8	194° 07'.1	20'.3	39° 52'.5	32'.0
14	10° 36'.6	52° 02'.9	40'.4	57° 35'.1	40'.3	209° 09'.8	20'.5	54° 54'.7	32'.0
15	25° 39'.1	67° 02'.3	39'.6	72° 35'.6	39'.8	224° 12'.6	20'.6	69° 56'.8	31'.9
16	40° 41'.5	82° 01'.7	38'.8	87° 36'.1	39'.3	239° 15'.4	20'.7	84° 59'.0	31'.8
17	55° 44'.0	97° 01'.0	38'.0	102° 36'.6	38'.7	254° 18'.2	20'.8	100° 01'.2	31'.8
18	70° 46'.5	112° 00'.4	37'.1	117° 37'.1	38'.2	269° 20'.9	21'.0	115° 03'.4	31'.7
19	85° 48'.9	126° 59'.7	36'.3	132° 37'.6	37'.7	284° 23'.7	21'.1	130° 05'.6	31'.6
20	100° 51'.4	141° 59'.1	35'.5	147° 38'.1	37'.2	299° 26'.5	21'.2	145° 07'.8	31'.5
21	115° 53'.9	156° 58'.4	34'.7	162° 38'.6	36'.7	314° 29'.2	21'.3	160° 10'.0	31'.5
22	130° 56'.3	171° 57'.8	33'.8	177° 39'.1	36'.2	329° 32'.0	21'.5	175° 12'.2	31'.4
23	145° 58'.8	186° 57'.2	33'.0	192° 39'.6	35'.7	344° 34'.8	21'.6	190° 14'.3	31'.3
3 Tuesday 00	161° 01'.3	201° 56'.5	16° 32'.2 S	207° 40'.1	18° 35'.2 S	359° 37'.5	9° 21'.7 N	205° 16'.5	17° 31'.2 S
01	176° 03'.7	216° 55'.9	31'.3	222° 40'.6	34'.7	14° 40'.3	21'.9	220° 18'.7	31'.2
02	191° 06'.2	231° 55'.2	30'.5	237° 41'.1	34'.2	29° 43'.1	22'.0	235° 20'.9	31'.1
03	206° 08'.6	246° 54'.6	29'.7	252° 41'.6	33'.7	44° 45'.9	22'.1	250° 23'.1	31'.0
04	221° 11'.1	261° 54'.0	28'.8	267° 42'.1	33'.2	59° 48'.6	22'.2	265° 25'.3	30'.9
05	236° 13'.6	276° 53'.3	28'.0	282° 42'.6	32'.7	74° 51'.4	22'.4	280° 27'.5	30'.9
06	251° 16'.0	291° 52'.7	27'.2	297° 43'.1	32'.2	89° 54'.2	22'.5	295° 29'.7	30'.8
07	266° 18'.5	306° 52'.1	26'.3	312° 43'.6	31'.6	104° 56'.9	22'.6	310° 31'.9	30'.7
08	281° 21'.0	321° 51'.4	25'.5	327° 44'.1	31'.1	119° 59'.7	22'.7	325° 34'.0	30'.6
09	296° 23'.4	336° 50'.8	24'.7	342° 44'.6	30'.6	135° 02'.5	22'.9	340° 36'.2	30'.6
10	311° 25'.9	351° 50'.2	23'.8	357° 45'.1	30'.1	150° 05'.3	23'.0	355° 38'.4	30'.5
11	326° 28'.4	6° 49'.5	23'.0	12° 45'.6	29'.6	165° 08'.0	23'.1	10° 40'.6	30'.4
12	341° 30'.8	21° 48'.9	16° 22'.2 S	27° 46'.1	18° 29'.1 S	180° 10'.8	9° 23'.2 N	25° 42'.8	17° 30'.3 S
13	356° 33'.3	36° 48'.3	21'.3	42° 46'.6	28'.6	195° 13'.6	23'.4	40° 45'.0	30'.3
14	11° 35'.8	51° 47'.6	20'.5	57° 47'.1	28'.1	210° 16'.3	23'.5	55° 47'.2	30'.2
15	26° 38'.2	66° 47'.0	19'.6	72° 47'.7	27'.6	225° 19'.1	23'.6	70° 49'.4	30'.1
16	41° 40'.7	81° 46'.4	18'.8	87° 48'.2	27'.1	240° 21'.9	23'.7	85° 51'.6	30'.1
17	56° 43'.1	96° 45'.7	17'.9	102° 48'.7	26'.5	255° 24'.6	23'.9	100° 53'.7	30'.0
18	71° 45'.6	111° 45'.1	17'.1	117° 49'.2	26'.0	270° 27'.4	24'.0	115° 55'.9	29'.9
19	86° 48'.1	126° 44'.5	16'.2	132° 49'.7	25'.5	285° 30'.2	24'.1	130° 58'.1	29'.8
20	101° 50'.5	141° 43'.8	15'.4	147° 50'.2	25'.0	300° 33'.0	24'.2	146° 00'.3	29'.8
21	116° 53'.0	156° 43'.2	14'.6	162° 50'.7	24'.5	315° 35'.7	24'.4	161° 02'.5	29'.7
22	131° 55'.5	171° 42'.6	13'.7	177° 51'.2	24'.0	330° 38'.5	24'.5	176° 04'.7	29'.6
23	146° 57'.9	186° 41'.9	12'.9	192° 51'.7	23'.5	345° 41'.3	24'.6	191° 06'.9	29'.5
	M.P. 13:18	v -0'.6	d 0'.8	v 0'.5	d 0'.5	v 2'.8	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.5	40° 20'.3 S
Achernar	335° 38'.8	57° 16'.7 S
Acrux	173° 26'.7	63° 03'.4 S
Adhara	255° 24'.8	28° 57'.9 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.0	55° 59'.8 N
Alkaid	153° 10'.9	49° 20'.8 N
Alnair	28° 04'.0	46° 59'.9 S
Alnilam	276° 02'.4	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.1 N
Alpheratz	358° 00'.4	29° 02'.9 N
Altair	62° 24'.0	8° 50'.7 N
Ankaa	353° 31'.6	42° 21'.0 S
Antares	112° 45'.8	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.1 N
Atria	108° 02'.0	69° 00'.7 S
Avior	234° 24'.1	59° 29'.3 S
Bellatrix	278° 49'.0	6° 20'.5 N
Betelgeuse	271° 18'.4	7° 24'.3 N
Canopus	264° 03'.0	52° 41'.8 S
Capella	280° 57'.9	45° 59'.6 N
Deneb	49° 42'.8	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.4 N
Elnath	278° 32'.6	28° 36'.2 N
Eltanin	90° 53'.7	51° 29'.0 N
Enif	34° 03'.0	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.8 S
Gacrux	172° 18'.3	57° 04'.2 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.3	60° 20'.1 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 05'.0	34° 23'.3 S
Kochab	137° 18'.6	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 26'.2	36° 20'.0 S
Miaplacidus	221° 42'.4	69° 41'.3 S
Mirfak	309° 03'.4	49° 50'.3 N
Nunki	76° 18'.2	26° 18'.4 S
Peacock	53° 44'.6	56° 45'.5 S
Polaris	324° 18'.1	89° 14'.1 N
Pollux	243° 46'.8	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.3	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.3	8° 12'.7 S
Rigil Kent	140° 13'.2	60° 48'.0 S
Sabik	102° 30'.8	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.9 N
Shaula	96° 43'.6	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.5 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.3 S
Vega	80° 49'.9	38° 46'.3 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	42° 09'.9	10:32
Mars	47° 25'.9	10:10
Jupiter	198° 28'.9	00:06
Saturn	44° 21'.9	10:21

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
1 Sunday 00	176° 54'.0	7° 34'.2 S	215° 35'.7	13'.8	17° 47'.6 S	8'.8	54'.0
01	191° 54'.1	33'.3	230° 08'.5	14'.0	38'.8	9'.0	
02	206° 54'.3	32'.3	244° 41'.5	13'.9	29'.8	8'.9	
03	221° 54'.4	31'.4	259° 14'.4	14'.0	20'.9	9'.1	
04	236° 54'.5	30'.4	273° 47'.4	14'.1	11'.8	9'.1	
05	251° 54'.6	29'.5	288° 20'.5	14'.1	02'.7	9'.2	
06	266° 54'.8	28'.5	302° 53'.6	14'.1	16° 53'.5 S	9'.3	
07	281° 54'.9	27'.6	317° 26'.7	14'.2	44'.2	9'.3	
08	296° 55'.0	26'.6	331° 59'.9	14'.2	34'.9	9'.4	
09	311° 55'.1	25'.7	346° 33'.1	14'.3	25'.5	9'.5	
10	326° 55'.2	24'.7	1° 06'.4	14'.3	16'.0	9'.6	
11	341° 55'.4	23'.8	15° 39'.7	14'.3	06'.4	9'.6	
12	356° 55'.5	7° 22'.8 S	30° 13'.0	14'.4	15° 56'.8 S	9'.7	54'.0
13	11° 55'.6	21'.9	44° 46'.4	14'.5	47'.1	9'.7	
14	26° 55'.7	20'.9	59° 19'.9	14'.4	37'.4	9'.8	54'.1
15	41° 55'.9	19'.9	73° 53'.3	14'.5	27'.6	9'.9	
16	56° 56'.0	19'.0	88° 26'.8	14'.6	17'.7	9'.9	
17	71° 56'.1	18'.0	103° 00'.4	14'.6	07'.8	10'.1	
18	86° 56'.2	17'.1	117° 34'.0	14'.6	14° 57'.7 S	10'.0	
19	101° 56'.4	16'.1	132° 07'.6	14'.7	47'.7	10'.1	
20	116° 56'.5	15'.2	146° 41'.3	14'.7	37'.6	10'.2	
21	131° 56'.6	14'.2	161° 15'.0	14'.7	27'.4	10'.3	
22	146° 56'.7	13'.3	175° 48'.7	14'.8	17'.1	10'.3	
23	161° 56'.9	12'.3	190° 22'.5	14'.8	06'.8	10'.4	
2 Monday 00	176° 57'.0	7° 11'.4 S	204° 56'.3	14'.8	13° 56'.4 S	10'.4	54'.1
01	191° 57'.1	10'.4	219° 30'.1	14'.9	46'.0	10'.5	
02	206° 57'.2	09'.4	234° 04'.0	14'.9	35'.5	10'.5	
03	221° 57'.4	08'.5	248° 37'.9	14'.9	25'.0	10'.6	
04	236° 57'.5	07'.5	263° 11'.8	15'.0	14'.4	10'.7	
05	251° 57'.6	06'.6	277° 45'.8	15'.0	03'.7	10'.7	
06	266° 57'.7	05'.6	292° 19'.8	15'.1	12° 53'.0 S	10'.7	
07	281° 57'.9	04'.7	306° 53'.9	15'.0	42'.3	10'.9	
08	296° 58'.0	03'.7	321° 27'.9	15'.1	31'.4	10'.8	
09	311° 58'.1	02'.8	336° 02'.0	15'.2	20'.6	10'.9	54'.2
10	326° 58'.3	01'.8	350° 36'.2	15'.1	09'.7	11'.0	
11	341° 58'.4	00'.8	5° 10'.3	15'.2	11° 58'.7 S	11'.0	
12	356° 58'.5	6° 59'.9 S	19° 44'.5	15'.3	11° 47'.7 S	11'.1	54'.2
13	11° 58'.6	58'.9	34° 18'.8	15'.2	36'.6	11'.1	
14	26° 58'.8	58'.0	48° 53'.0	15'.3	25'.5	11'.2	
15	41° 58'.9	57'.0	63° 27'.3	15'.3	14'.3	11'.2	
16	56° 59'.0	56'.1	78° 01'.6	15'.3	03'.1	11'.3	
17	71° 59'.2	55'.1	92° 35'.9	15'.3	10° 51'.8 S	11'.3	
18	86° 59'.3	54'.1	107° 10'.2	15'.4	40'.5	11'.3	
19	101° 59'.4	53'.2	121° 44'.6	15'.4	29'.2	11'.4	
20	116° 59'.5	52'.2	136° 19'.0	15'.4	17'.8	11'.5	
21	131° 59'.7	51'.3	150° 53'.4	15'.5	06'.3	11'.5	
22	146° 59'.8	50'.3	165° 27'.9	15'.5	9° 54'.8 S	11'.5	54'.3
23	161° 59'.9	49'.4	180° 02'.4	15'.4	43'.3	11'.6	
3 Tuesday 00	177° 00'.1	6° 48'.4 S	194° 36'.8	15'.5	9° 31'.7 S	11'.6	54'.3
01	192° 00'.2	47'.4	209° 11'.3	15'.6	20'.1	11'.7	
02	207° 00'.3	46'.5	223° 45'.9	15'.5	08'.4	11'.7	
03	222° 00'.5	45'.5	238° 20'.4	15'.6	8° 56'.7 S	11'.7	
04	237° 00'.6	44'.6	252° 55'.0	15'.6	45'.0	11'.8	
05	252° 00'.7	43'.6	267° 29'.6	15'.6	33'.2	11'.8	
06	267° 00'.9	42'.6	282° 04'.2	15'.6	21'.4	11'.8	
07	282° 01'.0	41'.7	296° 38'.8	15'.6	09'.6	11'.9	
08	297° 01'.1	40'.7	311° 13'.4	15'.7	7° 57'.7 S	11'.9	54'.4
09	312° 01'.2	39'.8	325° 48'.1	15'.6	45'.8	12'.0	
10	327° 01'.4	38'.8	340° 22'.7	15'.7	33'.8	12'.0	
11	342° 01'.5	37'.8	354° 57'.4	15'.7	21'.8	12'.0	
12	357° 01'.6	6° 36'.9 S	9° 32'.1	15'.7	7° 09'.8 S	12'.0	54'.4
13	12° 01'.8	35'.9	24° 06'.8	15'.7	6° 57'.8 S	12'.1	
14	27° 01'.9	35'.0	38° 41'.5	15'.7	45'.7	12'.1	
15	42° 02'.0	34'.0	53° 16'.2	15'.8	33'.6	12'.2	
16	57° 02'.2	33'.0	67° 51'.0	15'.7	21'.4	12'.2	
17	72° 02'.3	32'.1	82° 25'.7	15'.7	09'.2	12'.2	54'.5
18	87° 02'.5	31'.1	97° 00'.4	15'.8	5° 57'.0 S	12'.2	
19	102° 02'.6	30'.1	111° 35'.2	15'.8	44'.8	12'.3	
20	117° 02'.7	29'.2	126° 10'.0	15'.7	32'.5	12'.3	
21	132° 02'.9	28'.2	140° 44'.7	15'.8	20'.2	12'.3	
22	147° 03'.0	27'.3	155° 19'.5	15'.8	07'.9	12'.3	
23	162° 03'.1	26'.3	169° 54'.3	15'.8	4° 55'.6 S	12'.4	
	SD 16'.1	d 1'.0	SD	14'.7	14'.8	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
1	12 24	12 18	12:12	09:55	22:17	27d 8%
2	12 12	12 06	12:12	10:39	23:00	28d 4%
3	12 00	11 54	12:12	11:21	23:42	29d 1%

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1992 March 4, 5, 6 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +1.3		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
4 Wednesday 00	162° 00'.4	201° 41'.3	16° 12'.0 S	207° 52'.2	18° 22'.9 S	0° 44'.0	9° 24'.7 N	206° 09'.1	17° 29'.5 S
01	177° 02'.9	216° 40'.7	11'.2	222° 52'.7	22'.4	15° 46'.8	24'.9	221° 11'.3	29'.4
02	192° 05'.3	231° 40'.1	10'.3	237° 53'.2	21'.9	30° 49'.6	25'.0	236° 13'.4	29'.3
03	207° 07'.8	246° 39'.4	09'.5	252° 53'.7	21'.4	45° 52'.3	25'.1	251° 15'.6	29'.2
04	222° 10'.3	261° 38'.8	08'.6	267° 54'.2	20'.9	60° 55'.1	25'.2	266° 17'.8	29'.2
05	237° 12'.7	276° 38'.2	07'.7	282° 54'.8	20'.4	75° 57'.9	25'.4	281° 20'.0	29'.1
06	252° 15'.2	291° 37'.6	06'.9	297° 55'.3	19'.8	91° 00'.7	25'.5	296° 22'.2	29'.0
07	267° 17'.6	306° 36'.9	06'.0	312° 55'.8	19'.3	106° 03'.4	25'.6	311° 24'.4	29'.0
08	282° 20'.1	321° 36'.3	05'.2	327° 56'.3	18'.8	121° 06'.2	25'.7	326° 26'.6	28'.9
09	297° 22'.6	336° 35'.7	04'.3	342° 56'.8	18'.3	136° 09'.0	25'.9	341° 28'.8	28'.8
10	312° 25'.0	351° 35'.1	03'.5	357° 57'.3	17'.8	151° 11'.7	26'.0	356° 31'.0	28'.7
11	327° 27'.5	6° 34'.4	02'.6	12° 57'.8	17'.3	166° 14'.5	26'.1	11° 33'.2	28'.7
12	342° 30'.0	21° 33'.8	16° 01'.8 S	27° 58'.3	18° 16'.7 S	181° 17'.3	9° 26'.2 N	26° 35'.3	17° 28'.6 S
13	357° 32'.4	36° 33'.2	00'.9	42° 58'.8	16'.2	196° 20'.0	26'.3	41° 37'.5	28'.5
14	12° 34'.9	51° 32'.6	00'.0	57° 59'.3	15'.7	211° 22'.8	26'.5	56° 39'.7	28'.4
15	27° 37'.4	66° 31'.9	15° 59'.2 S	72° 59'.9	15'.2	226° 25'.6	26'.6	71° 41'.9	28'.4
16	42° 39'.8	81° 31'.3	58'.3	88° 00'.4	14'.7	241° 28'.3	26'.7	86° 44'.1	28'.3
17	57° 42'.3	96° 30'.7	57'.4	103° 00'.9	14'.1	256° 31'.1	26'.8	101° 46'.3	28'.2
18	72° 44'.7	111° 30'.1	56'.6	118° 01'.4	13'.6	271° 33'.9	27'.0	116° 48'.5	28'.1
19	87° 47'.2	126° 29'.5	55'.7	133° 01'.9	13'.1	286° 36'.7	27'.1	131° 50'.7	28'.1
20	102° 49'.7	141° 28'.8	54'.9	148° 02'.4	12'.6	301° 39'.4	27'.2	146° 52'.9	28'.0
21	117° 52'.1	156° 28'.2	54'.0	163° 02'.9	12'.1	316° 42'.2	27'.3	161° 55'.1	27'.9
22	132° 54'.6	171° 27'.6	53'.1	178° 03'.4	11'.5	331° 45'.0	27'.5	176° 57'.3	27'.9
23	147° 57'.1	186° 27'.0	52'.3	193° 03'.9	11'.0	346° 47'.7	27'.6	191° 59'.4	27'.8
5 Thursday 00	162° 59'.5	201° 26'.4	15° 51'.4 S	208° 04'.4	18° 10'.5 S	1° 50'.5	9° 27'.7 N	207° 01'.6	17° 27'.7 S
01	178° 02'.0	216° 25'.8	50'.5	223° 05'.0	10'.0	16° 53'.3	27'.8	222° 03'.8	27'.6
02	193° 04'.5	231° 25'.1	49'.6	238° 05'.5	09'.4	31° 56'.0	28'.0	237° 06'.0	27'.6
03	208° 06'.9	246° 24'.5	48'.8	253° 06'.0	08'.9	46° 58'.8	28'.1	252° 08'.2	27'.5
04	223° 09'.4	261° 23'.9	47'.9	268° 06'.5	08'.4	62° 01'.6	28'.2	267° 10'.4	27'.4
05	238° 11'.9	276° 23'.3	47'.0	283° 07'.0	07'.9	77° 04'.3	28'.3	282° 12'.6	27'.3
06	253° 14'.3	291° 22'.7	46'.2	298° 07'.5	07'.3	92° 07'.1	28'.5	297° 14'.8	27'.3
07	268° 16'.8	306° 22'.1	45'.3	313° 08'.0	06'.8	107° 09'.9	28'.6	312° 17'.0	27'.2
08	283° 19'.2	321° 21'.5	44'.4	328° 08'.5	06'.3	122° 12'.6	28'.7	327° 19'.2	27'.1
09	298° 21'.7	336° 20'.8	43'.5	343° 09'.1	05'.8	137° 15'.4	28'.8	342° 21'.4	27'.0
10	313° 24'.2	351° 20'.2	42'.7	358° 09'.6	05'.2	152° 18'.2	29'.0	357° 23'.6	27'.0
11	328° 26'.6	6° 19'.6	41'.8	13° 10'.1	04'.7	167° 21'.0	29'.1	12° 25'.7	26'.9
12	343° 29'.1	21° 19'.0	15° 40'.9 S	28° 10'.6	18° 04'.2 S	182° 23'.7	9° 29'.2 N	27° 27'.9	17° 26'.8 S
13	358° 31'.6	36° 18'.4	40'.0	43° 11'.1	03'.7	197° 26'.5	29'.3	42° 30'.1	26'.8
14	13° 34'.0	51° 17'.8	39'.2	58° 11'.6	03'.1	212° 29'.3	29'.4	57° 32'.3	26'.7
15	28° 36'.5	66° 17'.2	38'.3	73° 12'.1	02'.6	227° 32'.0	29'.6	72° 34'.5	26'.6
16	43° 39'.0	81° 16'.6	37'.4	88° 12'.7	02'.1	242° 34'.8	29'.7	87° 36'.7	26'.5
17	58° 41'.4	96° 16'.0	36'.5	103° 13'.2	01'.6	257° 37'.6	29'.8	102° 38'.9	26'.5
18	73° 43'.9	111° 15'.3	35'.6	118° 13'.7	01'.0	272° 40'.3	29'.9	117° 41'.1	26'.4
19	88° 46'.3	126° 14'.7	34'.7	133° 14'.2	00'.5	287° 43'.1	30'.1	132° 43'.3	26'.3
20	103° 48'.8	141° 14'.1	33'.9	148° 14'.7	00'.0	302° 45'.9	30'.2	147° 45'.5	26'.2
21	118° 51'.3	156° 13'.5	33'.0	163° 15'.2	17° 59'.4 S	317° 48'.6	30'.3	162° 47'.7	26'.2
22	133° 53'.7	171° 12'.9	32'.1	178° 15'.7	58'.9	332° 51'.4	30'.4	177° 49'.9	26'.1
23	148° 56'.2	186° 12'.3	31'.2	193° 16'.3	58'.4	347° 54'.2	30'.6	192° 52'.1	26'.0
6 Friday 00	163° 58'.7	201° 11'.7	15° 30'.3 S	208° 16'.8	17° 57'.8 S	2° 56'.9	9° 30'.7 N	207° 54'.3	17° 26'.0 S
01	179° 01'.1	216° 11'.1	29'.4	223° 17'.3	57'.3	17° 59'.7	30'.8	222° 56'.4	25'.9
02	194° 03'.6	231° 10'.5	28'.5	238° 17'.8	56'.8	33° 02'.5	30'.9	237° 58'.6	25'.8
03	209° 06'.1	246° 09'.9	27'.7	253° 18'.3	56'.3	48° 05'.2	31'.1	253° 00'.8	25'.7
04	224° 08'.5	261° 09'.3	26'.8	268° 18'.8	55'.7	63° 08'.0	31'.2	268° 03'.0	25'.7
05	239° 11'.0	276° 08'.7	25'.9	283° 19'.3	55'.2	78° 10'.8	31'.3	283° 05'.2	25'.6
06	254° 13'.5	291° 08'.1	25'.0	298° 19'.9	54'.7	93° 13'.5	31'.4	298° 07'.4	25'.5
07	269° 15'.9	306° 07'.5	24'.1	313° 20'.4	54'.1	108° 16'.3	31'.5	313° 09'.6	25'.4
08	284° 18'.4	321° 06'.9	23'.2	328° 20'.9	53'.6	123° 19'.1	31'.7	328° 11'.8	25'.4
09	299° 20'.8	336° 06'.3	22'.3	343° 21'.4	53'.1	138° 21'.8	31'.8	343° 14'.0	25'.3
10	314° 23'.3	351° 05'.7	21'.4	358° 21'.9	52'.5	153° 24'.6	31'.9	358° 16'.2	25'.2
11	329° 25'.8	6° 05'.1	20'.5	13° 22'.4	52'.0	168° 27'.4	32'.0	13° 18'.4	25'.2
12	344° 28'.2	21° 04'.5	15° 19'.6 S	28° 23'.0	17° 51'.5 S	183° 30'.2	9° 32'.2 N	28° 20'.6	17° 25'.1 S
13	359° 30'.7	36° 03'.9	18'.7	43° 23'.5	50'.9	198° 32'.9	32'.3	43° 22'.8	25'.0
14	14° 33'.2	51° 03'.3	17'.8	58° 24'.0	50'.4	213° 35'.7	32'.4	58° 25'.0	24'.9
15	29° 35'.6	66° 02'.7	16'.9	73° 24'.5	49'.9	228° 38'.5	32'.5	73° 27'.2	24'.9
16	44° 38'.1	81° 02'.1	16'.0	88° 25'.0	49'.3	243° 41'.2	32'.6	88° 29'.4	24'.8
17	59° 40'.6	96° 01'.5	15'.1	103° 25'.6	48'.8	258° 44'.0	32'.8	103° 31'.5	24'.7
18	74° 43'.0	111° 00'.9	14'.2	118° 26'.1	48'.2	273° 46'.8	32'.9	118° 33'.7	24'.6
19	89° 45'.5	126° 00'.3	13'.3	133° 26'.6	47'.7	288° 49'.5	33'.0	133° 35'.9	24'.6
20	104° 47'.9	140° 59'.7	12'.4	148° 27'.1	47'.2	303° 52'.3	33'.1	148° 38'.1	24'.5
21	119° 50'.4	155° 59'.1	11'.5	163° 27'.6	46'.6	318° 55'.1	33'.3	163° 40'.3	24'.4
22	134° 52'.9	170° 58'.5	10'.6	178° 28'.1	46'.1	333° 57'.8	33'.4	178° 42'.5	24'.4
23	149° 55'.3	185° 57'.9	09'.7	193° 28'.7	45'.6	349° 00'.6	33'.5	193° 44'.7	24'.3
	M.P. 13:06	v -0'.6	d 0'.9	v 0'.5	d 0'.5	v 2'.8	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.5	40° 20'.3 S
Achernar	335° 38'.9	57° 16'.7 S
Acrux	173° 26'.7	63° 03'.4 S
Adhara	255° 24'.8	28° 57'.9 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 33'.9	55° 59'.8 N
Alkaid	153° 10'.9	49° 20'.8 N
Alnair	28° 04'.0	46° 59'.9 S
Alnilam	276° 02'.4	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.1 N
Alpheratz	358° 00'.4	29° 02'.9 N
Altair	62° 23'.9	8° 50'.7 N
Ankaa	353° 31'.6	42° 21'.0 S
Antares	112° 45'.7	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.1 N
Atria	108° 02'.0	69° 00'.7 S
Avior	234° 24'.1	59° 29'.3 S
Bellatrix	278° 49'.0	6° 20'.5 N
Betelgeuse	271° 18'.4	7° 24'.3 N
Canopus	264° 03'.0	52° 41'.8 S
Capella	280° 57'.9	45° 59'.6 N
Deneb	49° 42'.7	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.4 N
Elnath	278° 32'.7	28° 36'.2 N
Eltanin	90° 53'.7	51° 29'.0 N
Enif	34° 03'.0	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.8 S
Gacrux	172° 18'.3	57° 04'.2 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.2	60° 20'.1 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 05'.0	34° 23'.3 S
Kochab	137° 18'.5	74° 10'.8 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 26'.1	36° 20'.0 S
Miaplacidus	221° 42'.4	69° 41'.3 S
Mirfak	309° 03'.4	49° 50'.3 N
Nunki	76° 18'.1	26° 18'.4 S
Peacock	53° 44'.5	56° 45'.5 S
Polaris	324° 19'.2	89° 14'.1 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.2	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.3	8° 12'.7 S
Rigil Kent	140° 13'.2	60° 48'.0 S
Sabik	102° 30'.8	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.8 N
Shaula	96° 43'.6	37° 05'.9 S
Sirius	258° 47'.5	16° 42'.5 S
Spica	158° 47'.8	11° 07'.5 S
Suhail	223° 03'.8	43° 24'.3 S
Vega	80° 49'.9	38° 46'.3 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	38° 26'.8	10:35
Mars	45° 04'.9	10:07
Jupiter	198° 51'.0	23:48
Saturn	44° 02'.1	10:10

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
177° 03'.3	6° 25'.3 S	184° 29'.1	15'.8	4° 43'.2 S	12'.4	54'.5
192° 03'.4	24'.4	199° 03'.9	15'.8	30'.8	12'.4	
207° 03'.5	23'.4	213° 38'.7	15'.7	18'.4	12'.4	54'.6
222° 03'.7	22'.4	228° 13'.4	15'.8	06'.0	12'.5	
237° 03'.8	21'.5	242° 48'.2	15'.8	3° 53'.5 S	12'.4	
252° 03'.9	20'.5	257° 23'.0	15'.8	41'.1	12'.5	
267° 04'.1	19'.6	271° 57'.8	15'.8	28'.6	12'.6	
282° 04'.2	18'.6	286° 32'.6	15'.8	16'.0	12'.5	
297° 04'.4	17'.6	301° 07'.4	15'.8	03'.5	12'.5	
312° 04'.5	16'.7	315° 42'.2	15'.8	2° 51'.0 S	12'.6	54'.7
327° 04'.6	15'.7	330° 17'.0	15'.7	38'.4	12'.6	
342° 04'.8	14'.7	344° 51'.7	15'.8	25'.8	12'.6	
357° 04'.9	6° 13'.8 S	359° 26'.5	15'.8	2° 13'.2 S	12'.6	54'.7
12° 05'.0	12'.8	14° 01'.3	15'.7	00'.6	12'.6	
27° 05'.2	11'.8	28° 36'.0	15'.8	1° 48'.0 S	12'.7	
42° 05'.3	10'.9	43° 10'.8	15'.7	35'.3	12'.6	
57° 05'.5	09'.9	57° 45'.5	15'.7	22'.7	12'.7	
72° 05'.6	08'.9	72° 20'.2	15'.8	10'.0	12'.7	54'.8
87° 05'.7	08'.0	86° 55'.0	15'.7	0° 57'.3 S	12'.7	
102° 05'.9	07'.0	101° 29'.7	15'.7	44'.6	12'.7	
117° 06'.0	06'.0	116° 04'.4	15'.7	31'.9	12'.7	
132° 06'.2	05'.1	130° 39'.1	15'.6	19'.2	12'.7	
147° 06'.3	04'.1	145° 13'.7	15'.7	06'.5	12'.7	
162° 06'.4	03'.1	159° 48'.4	15'.6	0° 06'.2 N	12'.7	54'.9
177° 06'.6	6° 02'.2 S	174° 23'.0	15'.6	0° 18'.9 N	12'.7	54'.9
192° 06'.7	01'.2	188° 57'.6	15'.7	31'.6	12'.8	
207° 06'.9	00'.2	203° 32'.3	15'.5	44'.4	12'.7	
222° 07'.0	5° 59'.3 S	218° 06'.8	15'.6	57'.1	12'.7	
237° 07'.1	58'.3	232° 41'.4	15'.6	1° 09'.8 N	12'.8	
252° 07'.3	57'.3	247° 16'.0	15'.5	22'.6	12'.7	
267° 07'.4	56'.4	261° 50'.5	15'.5	35'.3	12'.8	55'.0
282° 07'.6	55'.4	276° 25'.0	15'.5	48'.1	12'.7	
297° 07'.7	54'.4	290° 59'.5	15'.5	2° 00'.8 N	12'.8	
312° 07'.8	53'.5	305° 34'.0	15'.4	13'.6	12'.7	
327° 08'.0	52'.5	320° 08'.4	15'.4	26'.3	12'.7	
342° 08'.1	51'.5	334° 42'.8	15'.4	39'.0	12'.8	
357° 08'.3	5° 50'.6 S	349° 17'.2	15'.4	2° 51'.8 N	12'.7	55'.1
12° 08'.4	49'.6	3° 51'.6	15'.3	3° 04'.5 N	12'.7	
27° 08'.6	48'.6	18° 25'.9	15'.3	17'.2	12'.7	
42° 08'.7	47'.7	33° 00'.2	15'.3	29'.9	12'.7	
57° 08'.8	46'.7	47° 34'.5	15'.3	42'.6	12'.7	
72° 09'.0	45'.7	62° 08'.8	15'.2	55'.3	12'.7	
87° 09'.1	44'.8	76° 43'.0	15'.2	4° 08'.0 N	12'.7	55'.2
102° 09'.3	43'.8	91° 17'.2	15'.1	20'.7	12'.7	
117° 09'.4	42'.8	105° 51'.3	15'.2	33'.4	12'.6	
132° 09'.6	41'.9	120° 25'.5	15'.1	46'.0	12'.7	
147° 09'.7	40'.9	134° 59'.6	15'.0	58'.7	12'.6	
162° 09'.8	39'.9	149° 33'.6	15'.0	5° 11'.3 N	12'.6	
177° 10'.0	5° 38'.9 S	164° 07'.6	15'.0	5° 23'.9 N	12'.6	55'.3
192° 10'.1	38'.0	178° 41'.6	15'.0	36'.5	12'.6	
207° 10'.3	37'.0	193° 15'.6	14'.9	49'.1	12'.6	
222° 10'.4	36'.0	207° 49'.5	14'.9	6° 01'.7 N	12'.5	
237° 10'.6	35'.1	222° 23'.4	14'.8	14'.2	12'.5	
252° 10'.7	34'.1	236° 57'.2	14'.8	26'.7	12'.6	
267° 10'.9	33'.1	251° 31'.0	14'.7	39'.3	12'.5	55'.4
282° 11'.0	32'.2	266° 04'.7	14'.7	51'.8	12'.4	
297° 11'.2	31'.2	280° 38'.4	14'.7	7° 04'.2 N	12'.5	
312° 11'.3	30'.2	295° 12'.1	14'.6	16'.7	12'.4	
327° 11'.4	29'.2	309° 45'.7	14'.6	29'.1	12'.4	
342° 11'.6	28'.3	324° 19'.3	14'.5	41'.5	12'.4	
357° 11'.7	5° 27'.3 S	338° 52'.8	14'.5	7° 53'.9 N	12'.3	55'.5
12° 11'.9	26'.3	353° 26'.3	14'.5	8° 06'.2 N	12'.3	
27° 12'.0	25'.4	7° 59'.8	14'.3	18'.5	12'.3	
42° 12'.2	24'.4	22° 33'.1	14'.4	30'.8	12'.3	
57° 12'.3	23'.4	37° 06'.5	14'.3	43'.1	12'.2	
72° 12'.5	22'.4	51° 39'.8	14'.2	55'.3	12'.2	55'.6
87° 12'.6	21'.5	66° 13'.0	14'.2	9° 07'.5 N	12'.2	
102° 12'.8	20'.5	80° 46'.2	14'.1	19'.7	12'.1	
117° 12'.9	19'.5	95° 19'.3	14'.1	31'.8	12'.2	
132° 13'.1	18'.6	109° 52'.4	14'.1	44'.0	12'.0	
147° 13'.2	17'.6	124° 25'.5	13'.9	56'.0	12'.1	55'.7
162° 13'.4	16'.6	138° 58'.4	14'.0	10° 08'.1 N	12'.0	
SD 16'.1	d 1'.0	SD	14'.9	15'.0	15'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
4	11 47	11 41	12:12	12:02	24:23	30d 0%
5	11 34	11 27	12:11	12:44	00:23	1d 1%
6	11 20	11 13	12:11	13:27	01:05	2d 4%

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1992 March 7, 8, 9 (Sat, Sun, Mon)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
7 Saturday 00	164° 57'.8	200° 57'.3	15° 08'.8 S	208° 29'.2	17° 45'.0 S	4° 03'.4	9° 33'.6 N	208° 46'.9	17° 24'.2 S
01	180° 00'.3	215° 56'.7	07'.9	223° 29'.7	44'.5	19° 06'.1	33'.8	223° 49'.1	24'.1
02	195° 02'.7	230° 56'.1	07'.0	238° 30'.2	43'.9	34° 08'.9	33'.9	238° 51'.3	24'.1
03	210° 05'.2	245° 55'.5	06'.1	253° 30'.7	43'.4	49° 11'.7	34'.0	253° 53'.5	24'.0
04	225° 07'.7	260° 54'.9	05'.2	268° 31'.3	42'.9	64° 14'.4	34'.1	268° 55'.7	23'.9
05	240° 10'.1	275° 54'.3	04'.3	283° 31'.8	42'.3	79° 17'.2	34'.2	283° 57'.9	23'.8
06	255° 12'.6	290° 53'.7	03'.4	298° 32'.3	41'.8	94° 20'.0	34'.4	299° 00'.1	23'.8
07	270° 15'.1	305° 53'.1	02'.5	313° 32'.8	41'.2	109° 22'.7	34'.5	314° 02'.3	23'.7
08	285° 17'.5	320° 52'.5	01'.6	328° 33'.3	40'.7	124° 25'.5	34'.6	329° 04'.5	23'.6
09	300° 20'.0	335° 51'.9	00'.7	343° 33'.9	40'.2	139° 28'.3	34'.7	344° 06'.7	23'.6
10	315° 22'.4	350° 51'.4	14° 59'.7 S	358° 34'.4	39'.6	154° 31'.0	34'.9	359° 08'.9	23'.5
11	330° 24'.9	5° 50'.8	58'.8	13° 34'.9	39'.1	169° 33'.8	35'.0	14° 11'.1	23'.4
12	345° 27'.4	20° 50'.2	14° 57'.9 S	28° 35'.4	17° 38'.5 S	184° 36'.5	9° 35'.1 N	29° 13'.3	17° 23'.3 S
13	0° 29'.8	35° 49'.6	57'.0	43° 35'.9	38'.0	199° 39'.3	35'.2	44° 15'.5	23'.3
14	15° 32'.3	50° 49'.0	56'.1	58° 36'.5	37'.5	214° 42'.1	35'.3	59° 17'.6	23'.2
15	30° 34'.8	65° 48'.4	55'.2	73° 37'.0	36'.9	229° 44'.8	35'.5	74° 19'.8	23'.1
16	45° 37'.2	80° 47'.8	54'.3	88° 37'.5	36'.4	244° 47'.6	35'.6	89° 22'.0	23'.1
17	60° 39'.7	95° 47'.2	53'.3	103° 38'.0	35'.8	259° 50'.4	35'.7	104° 24'.2	23'.0
18	75° 42'.2	110° 46'.6	52'.4	118° 38'.6	35'.3	274° 53'.1	35'.8	119° 26'.4	22'.9
19	90° 44'.6	125° 46'.1	51'.5	133° 39'.1	34'.7	289° 55'.9	35'.9	134° 28'.6	22'.8
20	105° 47'.1	140° 45'.5	50'.6	148° 39'.6	34'.2	304° 58'.7	36'.1	149° 30'.8	22'.8
21	120° 49'.5	155° 44'.9	49'.7	163° 40'.1	33'.6	320° 01'.4	36'.2	164° 33'.0	22'.7
22	135° 52'.0	170° 44'.3	48'.7	178° 40'.6	33'.1	335° 04'.2	36'.3	179° 35'.2	22'.6
23	150° 54'.5	185° 43'.7	47'.8	193° 41'.2	32'.6	350° 07'.0	36'.4	194° 37'.4	22'.5
8 Sunday 00	165° 56'.9	200° 43'.1	14° 46'.9 S	208° 41'.7	17° 32'.0 S	5° 09'.7	9° 36'.6 N	209° 39'.6	17° 22'.5 S
01	180° 59'.4	215° 42'.5	46'.0	223° 42'.2	31'.5	20° 12'.5	36'.7	224° 41'.8	22'.4
02	196° 01'.9	230° 42'.0	45'.1	238° 42'.7	30'.9	35° 15'.3	36'.8	239° 44'.0	22'.3
03	211° 04'.3	245° 41'.4	44'.1	253° 43'.3	30'.4	50° 18'.0	36'.9	254° 46'.2	22'.3
04	226° 06'.8	260° 40'.8	43'.2	268° 43'.8	29'.8	65° 20'.8	37'.0	269° 48'.4	22'.2
05	241° 09'.3	275° 40'.2	42'.3	283° 44'.3	29'.3	80° 23'.6	37'.2	284° 50'.6	22'.1
06	256° 11'.7	290° 39'.6	41'.4	298° 44'.8	28'.7	95° 26'.3	37'.3	299° 52'.8	22'.0
07	271° 14'.2	305° 39'.1	40'.4	313° 45'.4	28'.2	110° 29'.1	37'.4	314° 55'.0	22'.0
08	286° 16'.7	320° 38'.5	39'.5	328° 45'.9	27'.6	125° 31'.9	37'.5	329° 57'.2	21'.9
09	301° 19'.1	335° 37'.9	38'.6	343° 46'.4	27'.1	140° 34'.6	37'.6	344° 59'.4	21'.8
10	316° 21'.6	350° 37'.3	37'.7	358° 46'.9	26'.5	155° 37'.4	37'.8	0° 01'.6	21'.8
11	331° 24'.0	5° 36'.7	36'.7	13° 47'.5	26'.0	170° 40'.1	37'.9	15° 03'.8	21'.7
12	346° 26'.5	20° 36'.1	14° 35'.8 S	28° 48'.0	17° 25'.4 S	185° 42'.9	9° 38'.0 N	30° 06'.0	17° 21'.6 S
13	1° 29'.0	35° 35'.6	34'.9	43° 48'.5	24'.9	200° 45'.7	38'.1	45° 08'.2	21'.5
14	16° 31'.4	50° 35'.0	33'.9	58° 49'.0	24'.3	215° 48'.4	38'.2	60° 10'.4	21'.5
15	31° 33'.9	65° 34'.4	33'.0	73° 49'.6	23'.8	230° 51'.2	38'.4	75° 12'.6	21'.4
16	46° 36'.4	80° 33'.8	32'.1	88° 50'.1	23'.2	245° 54'.0	38'.5	90° 14'.8	21'.3
17	61° 38'.8	95° 33'.3	31'.1	103° 50'.6	22'.7	260° 56'.7	38'.6	105° 17'.0	21'.3
18	76° 41'.3	110° 32'.7	30'.2	118° 51'.1	22'.1	275° 59'.5	38'.7	120° 19'.2	21'.2
19	91° 43'.8	125° 32'.1	29'.3	133° 51'.7	21'.6	291° 02'.3	38'.8	135° 21'.4	21'.1
20	106° 46'.2	140° 31'.5	28'.3	148° 52'.2	21'.0	306° 05'.0	39'.0	150° 23'.6	21'.0
21	121° 48'.7	155° 31'.0	27'.4	163° 52'.7	20'.5	321° 07'.8	39'.1	165° 25'.8	21'.0
22	136° 51'.2	170° 30'.4	26'.5	178° 53'.2	19'.9	336° 10'.6	39'.2	180° 28'.0	20'.9
23	151° 53'.6	185° 29'.8	25'.5	193° 53'.8	19'.4	351° 13'.3	39'.3	195° 30'.2	20'.8
9 Monday 00	166° 56'.1	200° 29'.2	14° 24'.6 S	208° 54'.3	17° 18'.8 S	6° 16'.1	9° 39'.5 N	210° 32'.4	17° 20'.8 S
01	181° 58'.5	215° 28'.7	23'.6	223° 54'.8	18'.3	21° 18'.8	39'.6	225° 34'.6	20'.7
02	197° 01'.0	230° 28'.1	22'.7	238° 55'.4	17'.7	36° 21'.6	39'.7	240° 36'.8	20'.6
03	212° 03'.5	245° 27'.5	21'.8	253° 55'.9	17'.2	51° 24'.4	39'.8	255° 39'.0	20'.5
04	227° 05'.9	260° 26'.9	20'.8	268° 56'.4	16'.6	66° 27'.1	39'.9	270° 41'.2	20'.5
05	242° 08'.4	275° 26'.4	19'.9	283° 56'.9	16'.1	81° 29'.9	40'.1	285° 43'.4	20'.4
06	257° 10'.9	290° 25'.8	18'.9	298° 57'.5	15'.5	96° 32'.7	40'.2	300° 45'.6	20'.3
07	272° 13'.3	305° 25'.2	18'.0	313° 58'.0	14'.9	111° 35'.4	40'.3	315° 47'.7	20'.3
08	287° 15'.8	320° 24'.7	17'.0	328° 58'.5	14'.4	126° 38'.2	40'.4	330° 49'.9	20'.2
09	302° 18'.3	335° 24'.1	16'.1	343° 59'.1	13'.8	141° 40'.9	40'.5	345° 52'.1	20'.1
10	317° 20'.7	350° 23'.5	15'.2	358° 59'.6	13'.3	156° 43'.7	40'.7	0° 54'.3	20'.0
11	332° 23'.2	5° 23'.0	14'.2	14° 00'.1	12'.7	171° 46'.5	40'.8	15° 56'.5	20'.0
12	347° 25'.6	20° 22'.4	14° 13'.3 S	29° 00'.6	17° 12'.2 S	186° 49'.2	9° 40'.9 N	30° 58'.7	17° 19'.9 S
13	2° 28'.1	35° 21'.8	12'.3	44° 01'.2	11'.6	201° 52'.0	41'.0	46° 00'.9	19'.8
14	17° 30'.6	50° 21'.3	11'.4	59° 01'.7	11'.1	216° 54'.8	41'.1	61° 03'.1	19'.8
15	32° 33'.0	65° 20'.7	10'.4	74° 02'.2	10'.5	231° 57'.5	41'.2	76° 05'.3	19'.7
16	47° 35'.5	80° 20'.1	09'.5	89° 02'.8	09'.9	247° 00'.3	41'.4	91° 07'.5	19'.6
17	62° 38'.0	95° 19'.6	08'.5	104° 03'.3	09'.4	262° 03'.0	41'.5	106° 09'.7	19'.5
18	77° 40'.4	110° 19'.0	07'.6	119° 03'.8	08'.8	277° 05'.8	41'.6	121° 11'.9	19'.5
19	92° 42'.9	125° 18'.4	06'.6	134° 04'.4	08'.3	292° 08'.6	41'.7	136° 14'.1	19'.4
20	107° 45'.4	140° 17'.9	05'.7	149° 04'.9	07'.7	307° 11'.3	41'.8	151° 16'.3	19'.3
21	122° 47'.8	155° 17'.3	04'.7	164° 05'.4	07'.1	322° 14'.1	42'.0	166° 18'.5	19'.3
22	137° 50'.3	170° 16'.7	03'.8	179° 05'.9	06'.6	337° 16'.9	42'.1	181° 20'.7	19'.2
23	152° 52'.8	185° 16'.2	02'.8	194° 06'.5	06'.0	352° 19'.6	42'.2	196° 22'.9	19'.1
	M.P. 12:54	v -0'.6	d 0'.9	v 0'.5	d 0'.5	v 2'.8	d 0'.1	v 2'.2	d 0'.1

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 30'.5	40° 20'.3 S	177° 13'.5	5° 15'.6 S	153° 31'.4	13'.8	10° 20'.1 N	11'.9	55'.7
Achernar	335° 38'.9	57° 16'.7 S	192° 13'.7	14'.7	168° 04'.2	13'.8	32'.0	11'.9	
Acrux	173° 26'.7	63° 03'.4 S	207° 13'.8	13'.7	182° 37'.0	13'.8	43'.9	11'.9	
Adhara	255° 24'.9	28° 57'.9 S	222° 14'.0	12'.7	197° 09'.8	13'.7	55'.8	11'.9	
Aldebaran	291° 07'.7	16° 29'.7 N	237° 14'.1	11'.7	211° 42'.5	13'.6	11° 07'.7 N	11'.8	55'.8
			252° 14'.3	10'.8	226° 15'.1	13'.6	19'.5	11'.7	
Alioth	166° 33'.9	55° 59'.8 N	267° 14'.4	09'.8	240° 47'.7	13'.5	31'.2	11'.7	
Alkaid	153° 10'.9	49° 20'.8 N	282° 14'.6	08'.8	255° 20'.2	13'.4	42'.9	11'.7	
Alnair	28° 04'.0	46° 59'.9 S	297° 14'.7	07'.8	269° 52'.6	13'.4	54'.6	11'.6	
Alnilam	276° 02'.4	1° 12'.5 S	312° 14'.9	06'.9	284° 25'.0	13'.4	12° 06'.2 N	11'.6	55'.9
Alphard	218° 11'.4	8° 37'.7 S	327° 15'.0	05'.9	298° 57'.4	13'.2	17'.8	11'.5	
			342° 15'.2	04'.9	313° 29'.6	13'.2	29'.3	11'.5	
Alphecca	126° 24'.3	26° 44'.1 N	357° 15'.3	5° 04'.0 S	328° 01'.8	13'.1	12° 40'.8 N	11'.4	55'.9
Alpheratz	358° 00'.4	29° 02'.9 N	12° 15'.5	03'.0	342° 33'.9	13'.1	52'.2	11'.4	
Altair	62° 23'.9	8° 50'.7 N	27° 15'.6	02'.0	357° 06'.0	13'.0	13° 03'.6 N	11'.3	56'.0
Ankaa	353° 31'.6	42° 21'.0 S	42° 15'.8	01'.0	11° 38'.0	12'.9	14'.9	11'.3	
Antares	112° 45'.7	26° 25'.0 S	57° 15'.9	00'.1	26° 09'.9	12'.9	26'.2	11'.2	
			72° 16'.1	4° 59'.1 S	40° 41'.8	12'.8	37'.4	11'.1	
Arcturus	146° 10'.0	19° 13'.1 N	87° 16'.2	58'.1	55° 13'.6	12'.7	48'.5	11'.1	56'.1
Atria	108° 01'.9	69° 00'.7 S	102° 16'.4	57'.1	69° 45'.3	12'.7	59'.6	11'.1	
Avior	234° 24'.1	59° 29'.3 S	117° 16'.5	56'.2	84° 17'.0	12'.6	14° 10'.7 N	11'.0	
Bellatrix	278° 49'.0	6° 20'.5 N	132° 16'.7	55'.2	98° 48'.6	12'.5	21'.7	10'.9	
Betelgeuse	271° 18'.4	7° 24'.3 N	147° 16'.8	54'.2	113° 20'.1	12'.4	32'.6	10'.9	
			162° 17'.0	53'.2	127° 51'.5	12'.4	43'.5	10'.8	56'.2
Canopus	264° 03'.0	52° 41'.8 S	177° 17'.1	4° 52'.3 S	142° 22'.9	12'.3	14° 54'.3 N	10'.7	56'.2
Capella	280° 57'.9	45° 59'.6 N	192° 17'.3	51'.3	156° 54'.2	12'.2	15° 05'.0 N	10'.7	
Deneb	49° 42'.7	45° 15'.0 N	207° 17'.4	50'.3	171° 25'.4	12'.2	15'.7	10'.6	
Denebola	182° 49'.5	14° 36'.7 N	222° 17'.6	49'.3	185° 56'.6	12'.1	26'.3	10'.5	
Diphda	349° 12'.1	18° 01'.8 S	237° 17'.7	48'.4	200° 27'.7	12'.0	36'.8	10'.5	56'.3
			252° 17'.9	47'.4	214° 58'.7	11'.9	47'.3	10'.4	
Dubhe	194° 10'.2	61° 47'.4 N	267° 18'.1	46'.4	229° 29'.6	11'.9	57'.7	10'.4	
Elnath	278° 32'.7	28° 36'.2 N	282° 18'.2	45'.4	244° 00'.5	11'.7	16° 08'.1 N	10'.2	
Eltanin	90° 53'.6	51° 29'.0 N	297° 18'.4	44'.5	258° 31'.2	11'.7	18'.3	10'.2	
Enif	34° 03'.0	9° 50'.3 N	312° 18'.5	43'.5	273° 01'.9	11'.6	28'.5	10'.1	56'.4
Fomalhaut	15° 41'.8	29° 39'.8 S	327° 18'.7	42'.5	287° 32'.5	11'.6	38'.6	10'.1	
			342° 18'.8	41'.5	302° 03'.1	11'.4	48'.7	10'.0	
Gacrux	172° 18'.3	57° 04'.3 S	357° 19'.0	4° 40'.5 S	316° 33'.5	11'.4	16° 58'.7 N	9'.9	56'.4
Gienah	176° 08'.4	17° 30'.1 S	12° 19'.1	39'.6	331° 03'.9	11'.3	17° 08'.6 N	9'.8	56'.5
Hadar	149° 10'.2	60° 20'.1 S	27° 19'.3	38'.6	345° 34'.2	11'.3	18'.4	9'.7	
Hamal	328° 19'.0	23° 25'.6 N	42° 19'.4	37'.6	0° 04'.5	11'.1	28'.1	9'.7	
Kaus Aust.	84° 05'.0	34° 23'.3 S	57° 19'.6	36'.6	14° 34'.6	11'.1	37'.8	9'.5	
			72° 19'.8	35'.7	29° 04'.7	10'.9	47'.3	9'.5	
Kochab	137° 18'.5	74° 10'.9 N	87° 19'.9	34'.7	43° 34'.6	10'.9	56'.8	9'.5	56'.6
Markab	13° 54'.5	15° 09'.8 N	102° 20'.1	33'.7	58° 04'.5	10'.9	18° 06'.3 N	9'.3	
Menkar	314° 31'.8	4° 03'.6 N	117° 20'.2	32'.7	72° 34'.4	10'.7	15'.6	9'.2	
Menkent	148° 26'.1	36° 20'.0 S	132° 20'.4	31'.8	87° 04'.1	10'.6	24'.8	9'.2	
Miaplacidus	221° 42'.4	69° 41'.4 S	147° 20'.5	30'.8	101° 33'.7	10'.6	34'.0	9'.0	56'.7
			162° 20'.7	29'.8	116° 03'.3	10'.5	43'.0	9'.0	
Mirfak	309° 03'.4	49° 50'.3 N	177° 20'.9	4° 28'.8 S	130° 32'.8	10'.4	18° 52'.0 N	8'.9	56'.7
Nunki	76° 18'.1	26° 18'.4 S	192° 21'.0	27'.8	145° 02'.2	10'.3	19° 00'.9 N	8'.8	
Peacock	53° 44'.5	56° 45'.5 S	207° 21'.2	26'.9	159° 31'.5	10'.3	09'.7	8'.7	56'.8
Polaris	324° 20'.1	89° 14'.1 N	222° 21'.3	25'.9	174° 00'.8	10'.1	18'.4	8'.6	
Pollux	243° 46'.9	28° 02'.7 N	237° 21'.5	24'.9	188° 29'.9	10'.1	27'.0	8'.5	
			252° 21'.6	23'.9	202° 59'.0	10'.0	35'.5	8'.4	
Procyon	245° 16'.1	5° 14'.6 N	267° 21'.8	22'.9	217° 28'.0	9'.9	43'.9	8'.3	
Rasalhague	96° 21'.2	12° 33'.7 N	282° 22'.0	22'.0	231° 56'.9	9'.8	52'.2	8'.2	56'.9
Regulus	208° 00'.1	12° 00'.1 N	297° 22'.1	21'.0	246° 25'.7	9'.8	20° 00'.4 N	8'.1	
Rigel	281° 27'.3	8° 12'.7 S	312° 22'.3	20'.0	260° 54'.5	9'.6	08'.5	8'.1	
Rigil Kent	140° 13'.1	60° 48'.0 S	327° 22'.4	19'.0	275° 23'.1	9'.6	16'.6	7'.9	
			342° 22'.6	18'.1	289° 51'.7	9'.5	24'.5	7'.8	57'.0
Sabik	102° 30'.8	15° 43'.0 S	357° 22'.7	4° 17'.1 S	304° 20'.2	9'.4	20° 32'.3 N	7'.7	57'.0
Schedar	349° 59'.4	56° 29'.8 N	12° 22'.9	16'.1	318° 48'.6	9'.3	40'.0	7'.6	
Shaula	96° 43'.5	37° 05'.9 S	27° 23'.1	15'.1	333° 16'.9	9'.2	47'.6	7'.5	
Sirius	258° 47'.6	16° 42'.5 S	42° 23'.2	14'.1	347° 45'.1	9'.2	55'.1	7'.3	57'.1
Spica	158° 47'.8	11° 07'.5 S	57° 23'.4	13'.2	2° 13'.3	9'.1	21° 02'.4 N	7'.3	
			72° 23'.5	12'.2	16° 41'.4	8'.9	09'.7	7'.2	
Suhail	223° 03'.8	43° 24'.3 S	87° 23'.7	11'.2	31° 09'.3	9'.0	16'.9	7'.0	
Vega	80° 49'.9	38° 46'.3 N	102° 23'.9	10'.2	45° 37'.3	8'.8	23'.9	6'.9	57'.2
Zuben'ubi	137° 22'.9	16° 00'.7 S	117° 24'.0	09'.2	60° 05'.1	8'.7	30'.8	6'.9	
	SHA	Mer.Pass.	132° 24'.2	08'.3	74° 32'.8	8'.7	37'.7	6'.7	
Venus	34° 46'.2	10:38	147° 24'.3	07'.3	89° 00'.5	8'.6	44'.4	6'.6	
Mars	42° 44'.8	10:05	162° 24'.5	06'.3	103° 28'.1	8'.4	51'.0	6'.4	57'.3
Jupiter	199° 12'.8	23:35							
Saturn	43° 42'.7	10:00	SD 16'.1	d 1'.0	SD	15'.2	15'.4	15'.5	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
7	11 06	10 59	12:11	14:12	01:49	3d 9%
8	10 52	10 44	12:11	15:00	02:35	4d 15%
9	10 37	10 29	12:10	15:51	03:25	5d 23%

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1992 March 10, 11, 12 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
10 Tuesday 00	167° 55'.2	200° 15'.6	14° 01'.9 S	209° 07'.0	17° 05'.5 S	7° 22'.4	9° 42'.3 N	211° 25'.1	17° 19'.0 S
01	182° 57'.7	215° 15'.0	00'.9	224° 07'.5	04'.9	22° 25'.1	42'.4	226° 27'.4	19'.0
02	198° 00'.1	230° 14'.5	13° 59'.9 S	239° 08'.1	04'.3	37° 27'.9	42'.6	241° 29'.6	18'.9
03	213° 02'.6	245° 13'.9	59'.0	254° 08'.6	03'.8	52° 30'.7	42'.7	256° 31'.8	18'.8
04	228° 05'.1	260° 13'.4	58'.0	269° 09'.1	03'.2	67° 33'.4	42'.8	271° 34'.0	18'.8
05	243° 07'.5	275° 12'.8	57'.1	284° 09'.7	02'.7	82° 36'.2	42'.9	286° 36'.2	18'.7
06	258° 10'.0	290° 12'.2	56'.1	299° 10'.2	02'.1	97° 38'.9	43'.0	301° 38'.4	18'.6
07	273° 12'.5	305° 11'.7	55'.1	314° 10'.7	01'.5	112° 41'.7	43'.2	316° 40'.6	18'.5
08	288° 14'.9	320° 11'.1	54'.2	329° 11'.3	01'.0	127° 44'.5	43'.3	331° 42'.8	18'.5
09	303° 17'.4	335° 10'.6	53'.2	344° 11'.8	00'.4	142° 47'.2	43'.4	346° 45'.0	18'.4
10	318° 19'.9	350° 10'.0	52'.3	359° 12'.3	16° 59'.8 S	157° 50'.0	43'.5	1° 47'.2	18'.3
11	333° 22'.3	5° 09'.4	51'.3	14° 12'.9	59'.3	172° 52'.7	43'.6	16° 49'.4	18'.3
12	348° 24'.8	20° 08'.9	13° 50'.3 S	29° 13'.4	16° 58'.7 S	187° 55'.5	9° 43'.7 N	31° 51'.6	17° 18'.2 S
13	3° 27'.3	35° 08'.3	49'.4	44° 13'.9	58'.2	202° 58'.3	43'.9	46° 53'.8	18'.1
14	18° 29'.7	50° 07'.8	48'.4	59° 14'.5	57'.6	218° 01'.0	44'.0	61° 56'.0	18'.0
15	33° 32'.2	65° 07'.2	47'.5	74° 15'.0	57'.0	233° 03'.8	44'.1	76° 58'.2	18'.0
16	48° 34'.6	80° 06'.7	46'.5	89° 15'.5	56'.5	248° 06'.5	44'.2	92° 00'.4	17'.9
17	63° 37'.1	95° 06'.1	45'.5	104° 16'.1	55'.9	263° 09'.3	44'.3	107° 02'.6	17'.8
18	78° 39'.6	110° 05'.5	44'.6	119° 16'.6	55'.3	278° 12'.1	44'.5	122° 04'.8	17'.8
19	93° 42'.0	125° 05'.0	43'.6	134° 17'.1	54'.8	293° 14'.8	44'.6	137° 07'.0	17'.7
20	108° 44'.5	140° 04'.4	42'.6	149° 17'.7	54'.2	308° 17'.6	44'.7	152° 09'.2	17'.6
21	123° 47'.0	155° 03'.9	41'.6	164° 18'.2	53'.6	323° 20'.3	44'.8	167° 11'.4	17'.5
22	138° 49'.4	170° 03'.3	40'.7	179° 18'.7	53'.1	338° 23'.1	44'.9	182° 13'.6	17'.5
23	153° 51'.9	185° 02'.8	39'.7	194° 19'.3	52'.5	353° 25'.9	45'.0	197° 15'.8	17'.4
11 Wednesday 00	168° 54'.4	200° 02'.2	13° 38'.7 S	209° 19'.8	16° 51'.9 S	8° 28'.6	9° 45'.2 N	212° 18'.0	17° 17'.3 S
01	183° 56'.8	215° 01'.7	37'.8	224° 20'.3	51'.4	23° 31'.4	45'.3	227° 20'.2	17'.3
02	198° 59'.3	230° 01'.1	36'.8	239° 20'.9	50'.8	38° 34'.1	45'.4	242° 22'.4	17'.2
03	214° 01'.7	245° 00'.6	35'.8	254° 21'.4	50'.2	53° 36'.9	45'.5	257° 24'.6	17'.1
04	229° 04'.2	260° 00'.0	34'.9	269° 21'.9	49'.7	68° 39'.7	45'.6	272° 26'.8	17'.1
05	244° 06'.7	274° 59'.5	33'.9	284° 22'.5	49'.1	83° 42'.4	45'.8	287° 29'.0	17'.0
06	259° 09'.1	289° 58'.9	32'.9	299° 23'.0	48'.5	98° 45'.2	45'.9	302° 31'.2	16'.9
07	274° 11'.6	304° 58'.4	31'.9	314° 23'.6	47'.9	113° 47'.9	46'.0	317° 33'.4	16'.8
08	289° 14'.1	319° 57'.8	31'.0	329° 24'.1	47'.4	128° 50'.7	46'.1	332° 35'.6	16'.8
09	304° 16'.5	334° 57'.3	30'.0	344° 24'.6	46'.8	143° 53'.5	46'.2	347° 37'.8	16'.7
10	319° 19'.0	349° 56'.7	29'.0	359° 25'.2	46'.2	158° 56'.2	46'.3	2° 40'.0	16'.6
11	334° 21'.5	4° 56'.2	28'.0	14° 25'.7	45'.7	173° 59'.0	46'.5	17° 42'.2	16'.6
12	349° 23'.9	19° 55'.6	13° 27'.0 S	29° 26'.2	16° 45'.1 S	189° 01'.7	9° 46'.6 N	32° 44'.4	17° 16'.5 S
13	4° 26'.4	34° 55'.1	26'.1	44° 26'.8	44'.5	204° 04'.5	46'.7	47° 46'.6	16'.4
14	19° 28'.9	49° 54'.5	25'.1	59° 27'.3	44'.0	219° 07'.2	46'.8	62° 48'.8	16'.3
15	34° 31'.3	64° 54'.0	24'.1	74° 27'.9	43'.4	234° 10'.0	46'.9	77° 51'.0	16'.3
16	49° 33'.8	79° 53'.4	23'.1	89° 28'.4	42'.8	249° 12'.8	47'.0	92° 53'.2	16'.2
17	64° 36'.2	94° 52'.9	22'.1	104° 28'.9	42'.2	264° 15'.5	47'.2	107° 55'.4	16'.1
18	79° 38'.7	109° 52'.4	21'.2	119° 29'.5	41'.7	279° 18'.3	47'.3	122° 57'.6	16'.1
19	94° 41'.2	124° 51'.8	20'.2	134° 30'.0	41'.1	294° 21'.0	47'.4	137° 59'.9	16'.0
20	109° 43'.6	139° 51'.3	19'.2	149° 30'.5	40'.5	309° 23'.8	47'.5	153° 02'.1	15'.9
21	124° 46'.1	154° 50'.7	18'.2	164° 31'.1	39'.9	324° 26'.5	47'.6	168° 04'.3	15'.9
22	139° 48'.6	169° 50'.2	17'.2	179° 31'.6	39'.4	339° 29'.3	47'.7	183° 06'.5	15'.8
23	154° 51'.0	184° 49'.6	16'.2	194° 32'.2	38'.8	354° 32'.1	47'.9	198° 08'.7	15'.7
12 Thursday 00	169° 53'.5	199° 49'.1	13° 15'.3 S	209° 32'.7	16° 38'.2 S	9° 34'.8	9° 48'.0 N	213° 10'.9	17° 15'.6 S
01	184° 56'.0	214° 48'.6	14'.3	224° 33'.2	37'.6	24° 37'.6	48'.1	228° 13'.1	15'.6
02	199° 58'.4	229° 48'.0	13'.3	239° 33'.8	37'.1	39° 40'.3	48'.2	243° 15'.3	15'.5
03	215° 00'.9	244° 47'.5	12'.3	254° 34'.3	36'.5	54° 43'.1	48'.3	258° 17'.5	15'.4
04	230° 03'.4	259° 46'.9	11'.3	269° 34'.9	35'.9	69° 45'.8	48'.4	273° 19'.7	15'.4
05	245° 05'.8	274° 46'.4	10'.3	284° 35'.4	35'.3	84° 48'.6	48'.6	288° 21'.9	15'.3
06	260° 08'.3	289° 45'.8	09'.3	299° 35'.9	34'.8	99° 51'.4	48'.7	303° 24'.1	15'.2
07	275° 10'.7	304° 45'.3	08'.3	314° 36'.5	34'.2	114° 54'.1	48'.8	318° 26'.3	15'.2
08	290° 13'.2	319° 44'.8	07'.3	329° 37'.0	33'.6	129° 56'.9	48'.9	333° 28'.5	15'.1
09	305° 15'.7	334° 44'.2	06'.4	344° 37'.6	33'.0	144° 59'.6	49'.0	348° 30'.7	15'.0
10	320° 18'.1	349° 43'.7	05'.4	359° 38'.1	32'.5	160° 02'.4	49'.1	3° 32'.9	14'.9
11	335° 20'.6	4° 43'.2	04'.4	14° 38'.6	31'.9	175° 05'.1	49'.3	18° 35'.1	14'.9
12	350° 23'.1	19° 42'.6	13° 03'.4 S	29° 39'.2	16° 31'.3 S	190° 07'.9	9° 49'.4 N	33° 37'.3	17° 14'.8 S
13	5° 25'.5	34° 42'.1	02'.4	44° 39'.7	30'.7	205° 10'.7	49'.5	48° 39'.5	14'.7
14	20° 28'.0	49° 41'.5	01'.4	59° 40'.3	30'.2	220° 13'.4	49'.6	63° 41'.7	14'.7
15	35° 30'.5	64° 41'.0	00'.4	74° 40'.8	29'.6	235° 16'.2	49'.7	78° 44'.0	14'.6
16	50° 32'.9	79° 40'.5	12° 59'.4 S	89° 41'.4	29'.0	250° 18'.9	49'.8	93° 46'.2	14'.5
17	65° 35'.4	94° 39'.9	58'.4	104° 41'.9	28'.4	265° 21'.7	49'.9	108° 48'.4	14'.5
18	80° 37'.9	109° 39'.4	57'.4	119° 42'.4	27'.8	280° 24'.4	50'.1	123° 50'.6	14'.4
19	95° 40'.3	124° 38'.9	56'.4	134° 43'.0	27'.3	295° 27'.2	50'.2	138° 52'.8	14'.3
20	110° 42'.8	139° 38'.3	55'.4	149° 43'.5	26'.7	310° 29'.9	50'.3	153° 55'.0	14'.2
21	125° 45'.2	154° 37'.8	54'.4	164° 44'.1	26'.1	325° 32'.7	50'.4	168° 57'.2	14'.2
22	140° 47'.7	169° 37'.3	53'.4	179° 44'.6	25'.5	340° 35'.4	50'.5	183° 59'.4	14'.1
23	155° 50'.2	184° 36'.7	52'.4	194° 45'.2	24'.9	355° 38'.2	50'.6	199° 01'.6	14'.0
	M.P. 12:42	v -0'.5	d 1'.0	v 0'.5	d 0'.6	v 2'.8	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.5	40° 20'.3 S
Achernar	335° 38'.9	57° 16'.7 S
Acrux	173° 26'.7	63° 03'.4 S
Adhara	255° 24'.9	28° 57'.9 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 33'.9	55° 59'.8 N
Alkaid	153° 10'.9	49° 20'.8 N
Alnair	28° 03'.9	46° 59'.9 S
Alnilam	276° 02'.5	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.1 N
Alpheratz	358° 00'.4	29° 02'.9 N
Altair	62° 23'.9	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.9 S
Antares	112° 45'.7	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.1 N
Atria	108° 01'.9	69° 00'.7 S
Avior	234° 24'.2	59° 29'.4 S
Bellatrix	278° 49'.0	6° 20'.5 N
Betelgeuse	271° 18'.4	7° 24'.3 N
Canopus	264° 03'.1	52° 41'.8 S
Capella	280° 58'.0	45° 59'.6 N
Deneb	49° 42'.7	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.4 N
Elnath	278° 32'.7	28° 36'.2 N
Eltanin	90° 53'.6	51° 29'.0 N
Enif	34° 03'.0	9° 50'.3 N
Fomalhaut	15° 41'.8	29° 39'.8 S
Gacrux	172° 18'.3	57° 04'.3 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.2	60° 20'.1 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 05'.0	34° 23'.3 S
Kochab	137° 18'.4	74° 10'.9 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 26'.1	36° 20'.0 S
Miaplacidus	221° 42'.5	69° 41'.4 S
Mirfak	309° 03'.4	49° 50'.3 N
Nunki	76° 18'.1	26° 18'.4 S
Peacock	53° 44'.5	56° 45'.5 S
Polaris	324° 20'.8	89° 14'.1 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.2	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.3	8° 12'.7 S
Rigil Kent	140° 13'.1	60° 48'.1 S
Sabik	102° 30'.7	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.8 N
Shaula	96° 43'.5	37° 05'.9 S
Sirius	258° 47'.6	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.8	43° 24'.3 S
Vega	80° 49'.8	38° 46'.3 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	31° 07'.9	10:40
Mars	40° 25'.4	10:02
Jupiter	199° 34'.3	23:22
Saturn	43° 23'.6	09:49

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
177° 24'.7	4° 05'.3 S	117° 55'.5	8'.5	21° 57'.4 N	6'.4	57'.3
192° 24'.8	04'.3	132° 23'.0	8'.3	22° 03'.8 N	6'.2	
207° 25'.0	03'.4	146° 50'.3	8'.3	10'.0	6'.1	
222° 25'.1	02'.4	161° 17'.6	8'.1	16'.1	6'.0	57'.4
237° 25'.3	01'.4	175° 44'.7	8'.1	22'.1	5'.9	
252° 25'.5	00'.4	190° 11'.8	8'.0	28'.0	5'.7	
267° 25'.6	3° 59'.4 S	204° 38'.8	8'.0	33'.7	5'.6	
282° 25'.8	58'.5	219° 05'.8	7'.8	39'.3	5'.5	57'.5
297° 26'.0	57'.5	233° 32'.6	7'.8	44'.8	5'.4	
312° 26'.1	56'.5	247° 59'.4	7'.7	50'.2	5'.2	
327° 26'.3	55'.5	262° 26'.1	7'.7	55'.4	5'.1	
342° 26'.4	54'.5	276° 52'.8	7'.5	23° 00'.5 N	5'.0	57'.6
357° 26'.6	3° 53'.6 S	291° 19'.3	7'.5	23° 05'.5 N	4'.9	57'.6
12° 26'.8	52'.6	305° 45'.8	7'.4	10'.4	4'.7	
27° 26'.9	51'.6	320° 12'.2	7'.4	15'.1	4'.5	
42° 27'.1	50'.6	334° 38'.6	7'.3	19'.6	4'.5	57'.7
57° 27'.3	49'.6	349° 04'.9	7'.2	24'.1	4'.3	
72° 27'.4	48'.6	3° 31'.1	7'.1	28'.4	4'.2	
87° 27'.6	47'.7	17° 57'.2	7'.0	32'.6	4'.0	
102° 27'.7	46'.7	32° 23'.2	7'.0	36'.6	3'.9	57'.8
117° 27'.9	45'.7	46° 49'.2	7'.0	40'.5	3'.7	
132° 28'.1	44'.7	61° 15'.2	6'.8	44'.2	3'.7	
147° 28'.2	43'.7	75° 41'.0	6'.8	47'.9	3'.4	
162° 28'.4	42'.8	90° 06'.8	6'.8	51'.3	3'.4	57'.9
177° 28'.6	3° 41'.8 S	104° 32'.6	6'.6	23° 54'.7 N	3'.2	57'.9
192° 28'.7	40'.8	118° 58'.2	6'.6	57'.9	3'.0	
207° 28'.9	39'.8	133° 23'.8	6'.6	24° 00'.9 N	2'.9	
222° 29'.1	38'.8	147° 49'.4	6'.5	03'.8	2'.8	58'.0
237° 29'.2	37'.8	162° 14'.9	6'.4	06'.6	2'.6	
252° 29'.4	36'.9	176° 40'.3	6'.4	09'.2	2'.4	
267° 29'.5	35'.9	191° 05'.7	6'.3	11'.6	2'.3	
282° 29'.7	34'.9	205° 31'.0	6'.3	13'.9	2'.2	58'.1
297° 29'.9	33'.9	219° 56'.3	6'.2	16'.1	2'.0	
312° 30'.0	32'.9	234° 21'.5	6'.1	18'.1	1'.9	
327° 30'.2	32'.0	248° 46'.6	6'.1	20'.0	1'.7	58'.2
342° 30'.4	31'.0	263° 11'.7	6'.1	21'.7	1'.6	
357° 30'.5	3° 30'.0 S	277° 36'.8	6'.0	24° 23'.3 N	1'.4	58'.2
12° 30'.7	29'.0	292° 01'.8	6'.0	24'.7	1'.2	
27° 30'.9	28'.0	306° 26'.8	5'.9	25'.9	1'.1	58'.3
42° 31'.0	27'.0	320° 51'.7	5'.9	27'.0	1'.0	
57° 31'.2	26'.1	335° 16'.6	5'.8	28'.0	0'.8	
72° 31'.4	25'.1	349° 41'.4	5'.8	28'.8	0'.6	
87° 31'.5	24'.1	4° 06'.2	5'.8	29'.4	0'.5	58'.4
102° 31'.7	23'.1	18° 31'.0	5'.7	29'.9	0'.3	
117° 31'.9	22'.1	32° 55'.7	5'.7	30'.2	0'.2	
132° 32'.0	21'.1	47° 20'.4	5'.6	30'.4	0'.0	
147° 32'.2	20'.2	61° 45'.0	5'.6	30'.4	0'.1	58'.5
162° 32'.4	19'.2	76° 09'.6	5'.6	30'.3	0'.3	
177° 32'.5	3° 18'.2 S	90° 34'.2	5'.6	24° 30'.0 N	0'.5	58'.5
192° 32'.7	17'.2	104° 58'.8	5'.5	29'.5	0'.6	58'.6
207° 32'.9	16'.2	119° 23'.3	5'.5	28'.9	0'.7	
222° 33'.0	15'.2	133° 47'.8	5'.4	28'.2	1'.0	
237° 33'.2	14'.3	148° 12'.2	5'.5	27'.2	1'.1	
252° 33'.4	13'.3	162° 36'.7	5'.4	26'.1	1'.2	58'.7
267° 33'.5	12'.3	177° 01'.1	5'.4	24'.9	1'.4	
282° 33'.7	11'.3	191° 25'.5	5'.4	23'.5	1'.6	
297° 33'.9	10'.3	205° 49'.9	5'.4	21'.9	1'.7	
312° 34'.1	09'.3	220° 14'.3	5'.3	20'.2	1'.9	58'.8
327° 34'.2	08'.4	234° 38'.6	5'.4	18'.3	2'.1	
342° 34'.4	07'.4	249° 03'.0	5'.3	16'.2	2'.2	
357° 34'.6	3° 06'.4 S	263° 27'.3	5'.3	24° 14'.0 N	2'.3	58'.8
12° 34'.7	05'.4	277° 51'.6	5'.3	11'.7	2'.6	58'.9
27° 34'.9	04'.4	292° 15'.9	5'.3	09'.1	2'.7	
42° 35'.1	03'.4	306° 40'.2	5'.3	06'.4	2'.8	
57° 35'.2	02'.4	321° 04'.5	5'.3	03'.6	3'.0	
72° 35'.4	01'.5	335° 28'.8	5'.2	00'.6	3'.2	59'.0
87° 35'.6	00'.5	349° 53'.0	5'.3	23° 57'.4 N	3'.3	
102° 35'.7	2° 59'.5 S	4° 17'.3	5'.3	54'.1	3'.5	
117° 35'.9	58'.5	18° 41'.6	5'.3	50'.6	3'.7	
132° 36'.1	57'.5	33° 05'.9	5'.3	46'.9	3'.8	59'.1
147° 36'.3	56'.5	47° 30'.2	5'.2	43'.1	4'.0	
162° 36'.4	55'.6	61° 54'.4	5'.3	39'.1	4'.1	
SD 16'.1	d 1'.0	SD	15'.7	15'.9	16'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
10	10 22	10 14	12:10	16:45	04:18	6d 33%
11	10 06	9 58	12:10	17:43	05:14	7d 43%
12	9 50	9 42	12:10	18:42	06:12	8d 55%

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1992 March 13, 14, 15 (Fri, Saw, Sun)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
13 Friday 00	170° 52'.6	199° 36'.2	12° 51'.4 S	209° 45'.7	16° 24'.4 S	10° 41'.0	9° 50'.8 N	214° 03'.8	17° 14'.0 S
01	185° 55'.1	214° 35'.7	50'.4	224° 46'.2	23'.8	25° 43'.7	50'.9	229° 06'.0	13'.9
02	200° 57'.6	229° 35'.1	49'.4	239° 46'.8	23'.2	40° 46'.5	51'.0	244° 08'.2	13'.8
03	216° 00'.0	244° 34'.6	48'.4	254° 47'.3	22'.6	55° 49'.2	51'.1	259° 10'.4	13'.8
04	231° 02'.5	259° 34'.1	47'.4	269° 47'.9	22'.0	70° 52'.0	51'.2	274° 12'.6	13'.7
05	246° 05'.0	274° 33'.6	46'.4	284° 48'.4	21'.4	85° 54'.7	51'.3	289° 14'.8	13'.6
06	261° 07'.4	289° 33'.0	45'.4	299° 49'.0	20'.9	100° 57'.5	51'.4	304° 17'.1	13'.5
07	276° 09'.9	304° 32'.5	44'.4	314° 49'.5	20'.3	116° 00'.2	51'.6	319° 19'.3	13'.5
08	291° 12'.4	319° 32'.0	43'.4	329° 50'.1	19'.7	131° 03'.0	51'.7	334° 21'.5	13'.4
09	306° 14'.8	334° 31'.4	42'.4	344° 50'.6	19'.1	146° 05'.7	51'.8	349° 23'.7	13'.3
10	321° 17'.3	349° 30'.9	41'.4	359° 51'.1	18'.5	161° 08'.5	51'.9	4° 25'.9	13'.3
11	336° 19'.7	4° 30'.4	40'.4	14° 51'.7	17'.9	176° 11'.2	52'.0	19° 28'.1	13'.2
12	351° 22'.2	19° 29'.9	12° 39'.3 S	29° 52'.2	16° 17'.4 S	191° 14'.0	9° 52'.1 N	34° 30'.3	17° 13'.1 S
13	6° 24'.7	34° 29'.3	38'.3	44° 52'.8	16'.8	206° 16'.7	52'.2	49° 32'.5	13'.1
14	21° 27'.1	49° 28'.8	37'.3	59° 53'.3	16'.2	221° 19'.5	52'.4	64° 34'.7	13'.0
15	36° 29'.6	64° 28'.3	36'.3	74° 53'.9	15'.6	236° 22'.3	52'.5	79° 36'.9	12'.9
16	51° 32'.1	79° 27'.8	35'.3	89° 54'.4	15'.0	251° 25'.0	52'.6	94° 39'.1	12'.9
17	66° 34'.5	94° 27'.2	34'.3	104° 55'.0	14'.4	266° 27'.8	52'.7	109° 41'.3	12'.8
18	81° 37'.0	109° 26'.7	33'.3	119° 55'.5	13'.8	281° 30'.5	52'.8	124° 43'.5	12'.7
19	96° 39'.5	124° 26'.2	32'.3	134° 56'.1	13'.3	296° 33'.3	52'.9	139° 45'.8	12'.6
20	111° 41'.9	139° 25'.7	31'.3	149° 56'.6	12'.7	311° 36'.0	53'.0	154° 48'.0	12'.6
21	126° 44'.4	154° 25'.1	30'.2	164° 57'.1	12'.1	326° 38'.8	53'.2	169° 50'.2	12'.5
22	141° 46'.8	169° 24'.6	29'.2	179° 57'.7	11'.5	341° 41'.5	53'.3	184° 52'.4	12'.4
23	156° 49'.3	184° 24'.1	28'.2	194° 58'.2	10'.9	356° 44'.3	53'.4	199° 54'.6	12'.4
14 Saturday 00	171° 51'.8	199° 23'.6	12° 27'.2 S	209° 58'.8	16° 10'.3 S	11° 47'.0	9° 53'.5 N	214° 56'.8	17° 12'.3 S
01	186° 54'.2	214° 23'.1	26'.2	224° 59'.3	09'.7	26° 49'.8	53'.6	229° 59'.0	12'.2
02	201° 56'.7	229° 22'.5	25'.2	239° 59'.9	09'.1	41° 52'.5	53'.7	245° 01'.2	12'.2
03	216° 59'.2	244° 22'.0	24'.2	255° 00'.4	08'.5	56° 55'.3	53'.8	260° 03'.4	12'.1
04	232° 01'.6	259° 21'.5	23'.1	270° 01'.0	08'.0	71° 58'.0	53'.9	275° 05'.6	12'.0
05	247° 04'.1	274° 21'.0	22'.1	285° 01'.5	07'.4	87° 00'.8	54'.1	290° 07'.8	12'.0
06	262° 06'.6	289° 20'.5	21'.1	300° 02'.1	06'.8	102° 03'.5	54'.2	305° 10'.0	11'.9
07	277° 09'.0	304° 19'.9	20'.1	315° 02'.6	06'.2	117° 06'.3	54'.3	320° 12'.3	11'.8
08	292° 11'.5	319° 19'.4	19'.1	330° 03'.2	05'.6	132° 09'.0	54'.4	335° 14'.5	11'.7
09	307° 14'.0	334° 18'.9	18'.0	345° 03'.7	05'.0	147° 11'.8	54'.5	350° 16'.7	11'.7
10	322° 16'.4	349° 18'.4	17'.0	0° 04'.3	04'.4	162° 14'.5	54'.6	5° 18'.9	11'.6
11	337° 18'.9	4° 17'.9	16'.0	15° 04'.8	03'.8	177° 17'.3	54'.7	20° 21'.1	11'.5
12	352° 21'.3	19° 17'.3	12° 15'.0 S	30° 05'.4	16° 03'.2 S	192° 20'.0	9° 54'.9 N	35° 23'.3	17° 11'.5 S
13	7° 23'.8	34° 16'.8	14'.0	45° 05'.9	02'.6	207° 22'.8	55'.0	50° 25'.5	11'.4
14	22° 26'.3	49° 16'.3	12'.9	60° 06'.5	02'.1	222° 25'.5	55'.1	65° 27'.7	11'.3
15	37° 28'.7	64° 15'.8	11'.9	75° 07'.0	01'.5	237° 28'.3	55'.2	80° 29'.9	11'.3
16	52° 31'.2	79° 15'.3	10'.9	90° 07'.6	00'.9	252° 31'.0	55'.3	95° 32'.1	11'.2
17	67° 33'.7	94° 14'.8	09'.9	105° 08'.1	00'.3	267° 33'.8	55'.4	110° 34'.4	11'.1
18	82° 36'.1	109° 14'.3	08'.8	120° 08'.7	15° 59'.7 S	282° 36'.5	55'.5	125° 36'.6	11'.1
19	97° 38'.6	124° 13'.7	07'.8	135° 09'.2	59'.1	297° 39'.3	55'.6	140° 38'.8	11'.0
20	112° 41'.1	139° 13'.2	06'.8	150° 09'.8	58'.5	312° 42'.0	55'.8	155° 41'.0	10'.9
21	127° 43'.5	154° 12'.7	05'.8	165° 10'.3	57'.9	327° 44'.8	55'.9	170° 43'.2	10'.9
22	142° 46'.0	169° 12'.2	04'.7	180° 10'.9	57'.3	342° 47'.5	56'.0	185° 45'.4	10'.8
23	157° 48'.5	184° 11'.7	03'.7	195° 11'.4	56'.7	357° 50'.3	56'.1	200° 47'.6	10'.7
15 Sunday 00	172° 50'.9	199° 11'.2	12° 02'.7 S	210° 12'.0	15° 56'.1 S	12° 53'.0	9° 56'.2 N	215° 49'.8	17° 10'.6 S
01	187° 53'.4	214° 10'.7	01'.6	225° 12'.5	55'.5	27° 55'.8	56'.3	230° 52'.0	10'.6
02	202° 55'.8	229° 10'.2	00'.6	240° 13'.1	54'.9	42° 58'.5	56'.4	245° 54'.3	10'.5
03	217° 58'.3	244° 09'.6	11° 59'.6 S	255° 13'.6	54'.3	58° 01'.3	56'.5	260° 56'.5	10'.4
04	233° 00'.8	259° 09'.1	58'.5	270° 14'.2	53'.7	73° 04'.0	56'.7	275° 58'.7	10'.4
05	248° 03'.2	274° 08'.6	57'.5	285° 14'.7	53'.1	88° 06'.8	56'.8	291° 00'.9	10'.3
06	263° 05'.7	289° 08'.1	56'.5	300° 15'.3	52'.5	103° 09'.5	56'.9	306° 03'.1	10'.2
07	278° 08'.2	304° 07'.6	55'.4	315° 15'.8	51'.9	118° 12'.3	57'.0	321° 05'.3	10'.2
08	293° 10'.6	319° 07'.1	54'.4	330° 16'.4	51'.3	133° 15'.0	57'.1	336° 07'.5	10'.1
09	308° 13'.1	334° 06'.6	53'.4	345° 16'.9	50'.8	148° 17'.8	57'.2	351° 09'.7	10'.0
10	323° 15'.6	349° 06'.1	52'.3	0° 17'.5	50'.2	163° 20'.5	57'.3	6° 11'.9	10'.0
11	338° 18'.0	4° 05'.6	51'.3	15° 18'.1	49'.6	178° 23'.3	57'.4	21° 14'.2	09'.9
12	353° 20'.5	19° 05'.1	11° 50'.3 S	30° 18'.6	15° 49'.0 S	193° 26'.0	9° 57'.5 N	36° 16'.4	17° 09'.8 S
13	8° 22'.9	34° 04'.6	49'.2	45° 19'.2	48'.4	208° 28'.7	57'.7	51° 18'.6	09'.8
14	23° 25'.4	49° 04'.1	48'.2	60° 19'.7	47'.8	223° 31'.5	57'.8	66° 20'.8	09'.7
15	38° 27'.9	64° 03'.5	47'.2	75° 20'.3	47'.2	238° 34'.2	57'.9	81° 23'.0	09'.6
16	53° 30'.3	79° 03'.0	46'.1	90° 20'.8	46'.6	253° 37'.0	58'.0	96° 25'.2	09'.5
17	68° 32'.8	94° 02'.5	45'.1	105° 21'.4	46'.0	268° 39'.7	58'.1	111° 27'.4	09'.5
18	83° 35'.3	109° 02'.0	44'.0	120° 21'.9	45'.4	283° 42'.5	58'.2	126° 29'.6	09'.4
19	98° 37'.7	124° 01'.5	43'.0	135° 22'.5	44'.8	298° 45'.2	58'.3	141° 31'.9	09'.3
20	113° 40'.2	139° 01'.0	42'.0	150° 23'.0	44'.2	313° 48'.0	58'.4	156° 34'.1	09'.3
21	128° 42'.7	154° 00'.5	40'.9	165° 23'.6	43'.6	328° 50'.7	58'.5	171° 36'.3	09'.2
22	143° 45'.1	169° 00'.0	39'.9	180° 24'.1	43'.0	343° 53'.5	58'.7	186° 38'.5	09'.1
23	158° 47'.6	183° 59'.5	38'.8	195° 24'.7	42'.4	358° 56'.2	58'.8	201° 40'.7	09'.1
	M.P. 12:30	v -0'.5	d 1'.0	v 0'.5	d 0'.6	v 2'.7	d 0'.1	v 2'.2	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.6	40° 20'.3 S
Achernar	335° 38'.9	57° 16'.7 S
Acrux	173° 26'.7	63° 03'.5 S
Adhara	255° 24'.9	28° 57'.9 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 33'.9	55° 59'.8 N
Alkaid	153° 10'.9	49° 20'.8 N
Alnair	28° 03'.9	46° 59'.9 S
Alnilam	276° 02'.5	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.2	26° 44'.1 N
Alpheratz	358° 00'.4	29° 02'.9 N
Altair	62° 23'.9	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.9 S
Antares	112° 45'.7	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.1 N
Atria	108° 01'.8	69° 00'.7 S
Avior	234° 24'.2	59° 29'.4 S
Bellatrix	278° 49'.0	6° 20'.5 N
Betelgeuse	271° 18'.4	7° 24'.3 N
Canopus	264° 03'.1	52° 41'.8 S
Capella	280° 58'.0	45° 59'.6 N
Deneb	49° 42'.7	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.5 N
Elnath	278° 32'.7	28° 36'.2 N
Eltanin	90° 53'.6	51° 29'.0 N
Enif	34° 03'.0	9° 50'.3 N
Fomalhaut	15° 41'.7	29° 39'.8 S
Gacrux	172° 18'.2	57° 04'.3 S
Gienah	176° 08'.3	17° 30'.1 S
Hadar	149° 10'.1	60° 20'.2 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.9	34° 23'.3 S
Kochab	137° 18'.4	74° 10'.9 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 26'.1	36° 20'.0 S
Miaplacidus	221° 42'.5	69° 41'.4 S
Mirfak	309° 03'.5	49° 50'.2 N
Nunki	76° 18'.1	26° 18'.4 S
Peacock	53° 44'.4	56° 45'.5 S
Polaris	324° 21'.6	89° 14'.1 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.1	5° 14'.6 N
Rasalhague	96° 21'.2	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.3	8° 12'.7 S
Rigil Kent	140° 13'.1	60° 48'.1 S
Sabik	102° 30'.7	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.8 N
Shaula	96° 43'.5	37° 05'.9 S
Sirius	258° 47'.6	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.8	43° 24'.3 S
Vega	80° 49'.8	38° 46'.3 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	27° 31'.8	10:43
Mars	38° 07'.0	10:00
Jupiter	199° 55'.2	23:09
Saturn	43° 05'.0	09:39

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
177° 36'.6	2° 54'.6 S	76° 18'.7	5'.3	23° 35'.0 N	4'.3	59'.1
192° 36'.8	53'.6	90° 43'.0	5'.3	30'.7	4'.4	59'.2
207° 36'.9	52'.6	105° 07'.3	5'.4	26'.3	4'.6	
222° 37'.1	51'.6	119° 31'.7	5'.3	21'.7	4'.8	
237° 37'.3	50'.6	133° 56'.0	5'.3	16'.9	4'.9	
252° 37'.5	49'.6	148° 20'.3	5'.4	12'.0	5'.1	59'.3
267° 37'.6	48'.7	162° 44'.7	5'.4	06'.9	5'.3	
282° 37'.8	47'.7	177° 09'.1	5'.4	01'.6	5'.3	
297° 38'.0	46'.7	191° 33'.5	5'.4	22° 56'.3 N	5'.6	
312° 38'.1	45'.7	205° 57'.9	5'.4	50'.7	5'.7	59'.4
327° 38'.3	44'.7	220° 22'.3	5'.5	45'.0	5'.9	
342° 38'.5	43'.7	234° 46'.8	5'.4	39'.1	6'.0	
357° 38'.7	2° 42'.7 S	249° 11'.2	5'.5	22° 33'.1 N	6'.1	59'.4
12° 38'.8	41'.8	263° 35'.7	5'.5	27'.0	6'.4	59'.5
27° 39'.0	40'.8	278° 00'.2	5'.6	20'.6	6'.4	
42° 39'.2	39'.8	292° 24'.8	5'.6	14'.2	6'.7	
57° 39'.3	38'.8	306° 49'.4	5'.6	07'.5	6'.7	
72° 39'.5	37'.8	321° 14'.0	5'.6	00'.8	7'.0	59'.6
87° 39'.7	36'.8	335° 38'.6	5'.7	21° 53'.8 N	7'.0	
102° 39'.9	35'.8	350° 03'.3	5'.7	46'.8	7'.3	
117° 40'.0	34'.9	4° 28'.0	5'.7	39'.5	7'.3	
132° 40'.2	33'.9	18° 52'.7	5'.8	32'.2	7'.5	
147° 40'.4	32'.9	33° 17'.5	5'.8	24'.7	7'.7	59'.7
162° 40'.6	31'.9	47° 42'.3	5'.8	17'.0	7'.8	
177° 40'.7	2° 30'.9 S	62° 07'.1	5'.9	21° 09'.2 N	8'.0	59'.7
192° 40'.9	29'.9	76° 32'.0	5'.9	01'.2	8'.1	
207° 41'.1	28'.9	90° 56'.9	6'.0	20° 53'.1 N	8'.2	59'.8
222° 41'.3	28'.0	105° 21'.9	6'.0	44'.9	8'.4	
237° 41'.4	27'.0	119° 46'.9	6'.0	36'.5	8'.5	
252° 41'.6	26'.0	134° 11'.9	6'.1	28'.0	8'.7	
267° 41'.8	25'.0	148° 37'.0	6'.1	19'.3	8'.8	
282° 41'.9	24'.0	163° 02'.1	6'.2	10'.5	8'.9	59'.9
297° 42'.1	23'.0	177° 27'.3	6'.2	01'.6	9'.1	
312° 42'.3	22'.0	191° 52'.5	6'.2	19° 52'.5 N	9'.2	
327° 42'.5	21'.1	206° 17'.7	6'.3	43'.3	9'.3	
342° 42'.6	20'.1	220° 43'.0	6'.4	34'.0	9'.5	
357° 42'.8	2° 19'.1 S	235° 08'.4	6'.4	19° 24'.5 N	9'.6	60'.0
12° 43'.0	18'.1	249° 33'.8	6'.4	14'.9	9'.8	
27° 43'.2	17'.1	263° 59'.2	6'.5	05'.1	9'.8	
42° 43'.3	16'.1	278° 24'.7	6'.5	18° 55'.3 N	10'.0	
57° 43'.5	15'.1	292° 50'.2	6'.6	45'.3	10'.1	
72° 43'.7	14'.1	307° 15'.8	6'.6	35'.2	10'.3	
87° 43'.9	13'.2	321° 41'.4	6'.7	24'.9	10'.4	60'.1
102° 44'.0	12'.2	336° 07'.1	6'.8	14'.5	10'.5	
117° 44'.2	11'.2	350° 32'.9	6'.7	04'.0	10'.6	
132° 44'.4	10'.2	4° 58'.6	6'.9	17° 53'.4 N	10'.7	
147° 44'.6	09'.2	19° 24'.5	6'.9	42'.7	10'.9	
162° 44'.8	08'.2	33° 50'.4	6'.9	31'.8	11'.0	
177° 44'.9	2° 07'.2 S	48° 16'.3	7'.0	17° 20'.8 N	11'.0	60'.2
192° 45'.1	06'.3	62° 42'.3	7'.0	09'.8	11'.3	
207° 45'.3	05'.3	77° 08'.3	7'.1	16° 58'.5 N	11'.3	
222° 45'.5	04'.3	91° 34'.4	7'.1	47'.2	11'.4	
237° 45'.6	03'.3	106° 00'.5	7'.2	35'.8	11'.6	
252° 45'.8	02'.3	120° 26'.7	7'.3	24'.2	11'.6	
267° 46'.0	01'.3	134° 53'.0	7'.3	12'.6	11'.8	
282° 46'.2	00'.3	149° 19'.3	7'.3	00'.8	11'.8	60'.3
297° 46'.3	1° 59'.3 S	163° 45'.6	7'.4	15° 49'.0 N	12'.0	
312° 46'.5	58'.4	178° 12'.0	7'.5	37'.0	12'.1	
327° 46'.7	57'.4	192° 38'.5	7'.5	24'.9	12'.2	
342° 46'.9	56'.4	207° 05'.0	7'.6	12'.7	12'.3	
357° 47'.1	1° 55'.4 S	221° 31'.6	7'.6	15° 00'.4 N	12'.3	60'.3
12° 47'.2	54'.4	235° 58'.2	7'.6	14° 48'.1 N	12'.5	
27° 47'.4	53'.4	250° 24'.8	7'.8	35'.6	12'.6	
42° 47'.6	52'.4	264° 51'.6	7'.7	23'.0	12'.7	60'.4
57° 47'.8	51'.4	279° 18'.3	7'.9	10'.3	12'.7	
72° 47'.9	50'.5	293° 45'.2	7'.8	13° 57'.6 N	12'.9	
87° 48'.1	49'.5	308° 12'.0	7'.9	44'.7	12'.9	
102° 48'.3	48'.5	322° 38'.9	8'.0	31'.8	13'.0	
117° 48'.5	47'.5	337° 05'.9	8'.1	18'.8	13'.2	
132° 48'.7	46'.5	351° 33'.0	8'.0	05'.6	13'.2	
147° 48'.8	45'.5	6° 00'.0	8'.2	12° 52'.4 N	13'.3	
162° 49'.0	44'.5	20° 27'.2	8'.1	39'.1	13'.3	
SD 16'.1	d 1'.0	SD 16'.2		16'.3	16'.4	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
13	9 34	9 26	12:09	19:41	07:12	9d 66%
14	9 17	9 09	12:09	20:39	08:11	10d 76%
15	9 01	8 52	12:09	21:35	09:07	11d 85%

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1992 March 16, 17, 18 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
16 Monday 00	173° 50'.1	198° 59'.0	11° 37'.8 S	210° 25'.3	15° 41'.8 S	13° 59'.0	9° 58'.9 N	216° 42'.9	17° 09'.0 S
01	188° 52'.5	213° 58'.5	36'.8	225° 25'.8	41'.2	29° 01'.7	59'.0	231° 45'.1	08'.9
02	203° 55'.0	228° 58'.0	35'.7	240° 26'.4	40'.6	44° 04'.4	59'.1	246° 47'.3	08'.9
03	218° 57'.4	243° 57'.5	34'.7	255° 26'.9	40'.0	59° 07'.2	59'.2	261° 49'.6	08'.8
04	233° 59'.9	258° 57'.0	33'.6	270° 27'.5	39'.4	74° 09'.9	59'.3	276° 51'.8	08'.7
05	249° 02'.4	273° 56'.5	32'.6	285° 28'.0	38'.7	89° 12'.7	59'.4	291° 54'.0	08'.7
06	264° 04'.8	288° 56'.0	31'.5	300° 28'.6	38'.1	104° 15'.4	59'.5	306° 56'.2	08'.6
07	279° 07'.3	303° 55'.5	30'.5	315° 29'.2	37'.5	119° 18'.2	59'.6	321° 58'.4	08'.5
08	294° 09'.8	318° 55'.0	29'.4	330° 29'.7	36'.9	134° 20'.9	59'.8	337° 00'.6	08'.5
09	309° 12'.2	333° 54'.5	28'.4	345° 30'.3	36'.3	149° 23'.7	59'.9	352° 02'.8	08'.4
10	324° 14'.7	348° 54'.0	27'.3	0° 30'.8	35'.7	164° 26'.4	10° 00'.0 N	7° 05'.1	08'.3
11	339° 17'.2	3° 53'.5	26'.3	15° 31'.4	35'.1	179° 29'.1	00'.1	22° 07'.3	08'.3
12	354° 19'.6	18° 53'.0	11° 25'.2 S	30° 31'.9	15° 34'.5 S	194° 31'.9	10° 00'.2 N	37° 09'.5	17° 08'.2 S
13	9° 22'.1	33° 52'.5	24'.2	45° 32'.5	33'.9	209° 34'.6	00'.3	52° 11'.7	08'.1
14	24° 24'.6	48° 52'.0	23'.1	60° 33'.1	33'.3	224° 37'.4	00'.4	67° 13'.9	08'.1
15	39° 27'.0	63° 51'.5	22'.1	75° 33'.6	32'.7	239° 40'.1	00'.5	82° 16'.1	08'.0
16	54° 29'.5	78° 51'.0	21'.0	90° 34'.2	32'.1	254° 42'.9	00'.6	97° 18'.3	07'.9
17	69° 31'.9	93° 50'.5	20'.0	105° 34'.7	31'.5	269° 45'.6	00'.7	112° 20'.6	07'.8
18	84° 34'.4	108° 50'.0	18'.9	120° 35'.3	30'.9	284° 48'.3	00'.9	127° 22'.8	07'.8
19	99° 36'.9	123° 49'.5	17'.9	135° 35'.8	30'.3	299° 51'.1	01'.0	142° 25'.0	07'.7
20	114° 39'.3	138° 49'.0	16'.8	150° 36'.4	29'.7	314° 53'.8	01'.1	157° 27'.2	07'.6
21	129° 41'.8	153° 48'.6	15'.8	165° 37'.0	29'.1	329° 56'.6	01'.2	172° 29'.4	07'.6
22	144° 44'.3	168° 48'.1	14'.7	180° 37'.5	28'.5	344° 59'.3	01'.3	187° 31'.6	07'.5
23	159° 46'.7	183° 47'.6	13'.7	195° 38'.1	27'.9	0° 02'.1	01'.4	202° 33'.8	07'.4
17 Tuesday 00	174° 49'.2	198° 47'.1	11° 12'.6 S	210° 38'.6	15° 27'.2 S	15° 04'.8	10° 01'.5 N	217° 36'.1	17° 07'.4 S
01	189° 51'.7	213° 46'.6	11'.6	225° 39'.2	26'.6	30° 07'.5	01'.6	232° 38'.3	07'.3
02	204° 54'.1	228° 46'.1	10'.5	240° 39'.8	26'.0	45° 10'.3	01'.7	247° 40'.5	07'.2
03	219° 56'.6	243° 45'.6	09'.4	255° 40'.3	25'.4	60° 13'.0	01'.8	262° 42'.7	07'.2
04	234° 59'.0	258° 45'.1	08'.4	270° 40'.9	24'.8	75° 15'.8	01'.9	277° 44'.9	07'.1
05	250° 01'.5	273° 44'.6	07'.3	285° 41'.4	24'.2	90° 18'.5	02'.0	292° 47'.1	07'.0
06	265° 04'.0	288° 44'.1	06'.3	300° 42'.0	23'.6	105° 21'.2	02'.2	307° 49'.4	07'.0
07	280° 06'.4	303° 43'.6	05'.2	315° 42'.6	23'.0	120° 24'.0	02'.3	322° 51'.6	06'.9
08	295° 08'.9	318° 43'.1	04'.2	330° 43'.1	22'.4	135° 26'.7	02'.4	337° 53'.8	06'.8
09	310° 11'.4	333° 42'.7	03'.1	345° 43'.7	21'.8	150° 29'.5	02'.5	352° 56'.0	06'.8
10	325° 13'.8	348° 42'.2	02'.0	0° 44'.2	21'.2	165° 32'.2	02'.6	7° 58'.2	06'.7
11	340° 16'.3	3° 41'.7	01'.0	15° 44'.8	20'.5	180° 35'.0	02'.7	23° 00'.4	06'.6
12	355° 18'.8	18° 41'.2	10° 59'.9 S	30° 45'.4	15° 19'.9 S	195° 37'.7	10° 02'.8 N	38° 02'.7	17° 06'.6 S
13	10° 21'.2	33° 40'.7	58'.8	45° 45'.9	19'.3	210° 40'.4	02'.9	53° 04'.9	06'.5
14	25° 23'.7	48° 40'.2	57'.8	60° 46'.5	18'.7	225° 43'.2	03'.0	68° 07'.1	06'.4
15	40° 26'.2	63° 39'.7	56'.7	75° 47'.0	18'.1	240° 45'.9	03'.1	83° 09'.3	06'.4
16	55° 28'.6	78° 39'.2	55'.7	90° 47'.6	17'.5	255° 48'.7	03'.2	98° 11'.5	06'.3
17	70° 31'.1	93° 38'.8	54'.6	105° 48'.2	16'.9	270° 51'.4	03'.3	113° 13'.7	06'.2
18	85° 33'.5	108° 38'.3	53'.5	120° 48'.7	16'.3	285° 54'.1	03'.5	128° 16'.0	06'.2
19	100° 36'.0	123° 37'.8	52'.5	135° 49'.3	15'.6	300° 56'.9	03'.6	143° 18'.2	06'.1
20	115° 38'.5	138° 37'.3	51'.4	150° 49'.9	15'.0	315° 59'.6	03'.7	158° 20'.4	06'.0
21	130° 40'.9	153° 36'.8	50'.3	165° 50'.4	14'.4	331° 02'.3	03'.8	173° 22'.6	06'.0
22	145° 43'.4	168° 36'.3	49'.3	180° 51'.0	13'.8	346° 05'.1	03'.9	188° 24'.8	05'.9
23	160° 45'.9	183° 35'.8	48'.2	195° 51'.5	13'.2	1° 07'.8	04'.0	203° 27'.0	05'.8
18 Wednesday 00	175° 48'.3	198° 35'.4	10° 47'.1 S	210° 52'.1	15° 12'.6 S	16° 10'.6	10° 04'.1 N	218° 29'.3	17° 05'.8 S
01	190° 50'.8	213° 34'.9	46'.1	225° 52'.7	12'.0	31° 13'.3	04'.2	233° 31'.5	05'.7
02	205° 53'.3	228° 34'.4	45'.0	240° 53'.2	11'.4	46° 16'.0	04'.3	248° 33'.7	05'.6
03	220° 55'.7	243° 33'.9	43'.9	255° 53'.8	10'.7	61° 18'.8	04'.4	263° 35'.9	05'.6
04	235° 58'.2	258° 33'.4	42'.9	270° 54'.4	10'.1	76° 21'.5	04'.5	278° 38'.1	05'.5
05	251° 00'.6	273° 32'.9	41'.8	285° 54'.9	09'.5	91° 24'.3	04'.6	293° 40'.3	05'.4
06	266° 03'.1	288° 32'.5	40'.7	300° 55'.5	08'.9	106° 27'.0	04'.7	308° 42'.6	05'.4
07	281° 05'.6	303° 32'.0	39'.6	315° 56'.1	08'.3	121° 29'.7	04'.8	323° 44'.8	05'.3
08	296° 08'.0	318° 31'.5	38'.6	330° 56'.6	07'.7	136° 32'.5	04'.9	338° 47'.0	05'.2
09	311° 10'.5	333° 31'.0	37'.5	345° 57'.2	07'.0	151° 35'.2	05'.1	353° 49'.2	05'.2
10	326° 13'.0	348° 30'.5	36'.4	0° 57'.8	06'.4	166° 37'.9	05'.2	8° 51'.4	05'.1
11	341° 15'.4	3° 30'.1	35'.3	15° 58'.3	05'.8	181° 40'.7	05'.3	23° 53'.7	05'.0
12	356° 17'.9	18° 29'.6	10° 34'.3 S	30° 58'.9	15° 05'.2 S	196° 43'.4	10° 05'.4 N	38° 55'.9	17° 05'.0 S
13	11° 20'.4	33° 29'.1	33'.2	45° 59'.4	04'.6	211° 46'.2	05'.5	53° 58'.1	04'.9
14	26° 22'.8	48° 28'.6	32'.1	61° 00'.0	04'.0	226° 48'.9	05'.6	69° 00'.3	04'.8
15	41° 25'.3	63° 28'.1	31'.0	76° 00'.6	03'.3	241° 51'.6	05'.7	84° 02'.5	04'.8
16	56° 27'.8	78° 27'.7	30'.0	91° 01'.1	02'.7	256° 54'.4	05'.8	99° 04'.7	04'.7
17	71° 30'.2	93° 27'.2	28'.9	106° 01'.7	02'.1	271° 57'.1	05'.9	114° 07'.0	04'.6
18	86° 32'.7	108° 26'.7	27'.8	121° 02'.3	01'.5	286° 59'.8	06'.0	129° 09'.2	04'.6
19	101° 35'.1	123° 26'.2	26'.7	136° 02'.8	00'.9	302° 02'.6	06'.1	144° 11'.4	04'.5
20	116° 37'.6	138° 25'.8	25'.7	151° 03'.4	00'.2	317° 05'.3	06'.2	159° 13'.6	04'.4
21	131° 40'.1	153° 25'.3	24'.6	166° 04'.0	14° 59'.6 S	332° 08'.0	06'.3	174° 15'.8	04'.4
22	146° 42'.5	168° 24'.8	23'.5	181° 04'.5	59'.0	347° 10'.8	06'.4	189° 18'.1	04'.3
23	161° 45'.0	183° 24'.3	22'.4	196° 05'.1	58'.4	2° 13'.5	06'.5	204° 20'.3	04'.2
	M.P. 12:19	v -0'.5	d 1'.1	v 0'.6	d 0'.6	v 2'.7	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.6	40° 20'.3 S
Achernar	335° 38'.9	57° 16'.7 S
Acrux	173° 26'.7	63° 03'.5 S
Adhara	255° 24'.9	28° 57'.9 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 33'.9	55° 59'.8 N
Alkaid	153° 10'.8	49° 20'.8 N
Alnair	28° 03'.9	46° 59'.8 S
Alnilam	276° 02'.5	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.2	26° 44'.1 N
Alpheratz	358° 00'.4	29° 02'.9 N
Altair	62° 23'.9	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.9 S
Antares	112° 45'.6	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.1 N
Atria	108° 01'.7	69° 00'.7 S
Avior	234° 24'.2	59° 29'.4 S
Bellatrix	278° 49'.1	6° 20'.5 N
Betelgeuse	271° 18'.5	7° 24'.3 N
Canopus	264° 03'.1	52° 41'.8 S
Capella	280° 58'.0	45° 59'.6 N
Deneb	49° 42'.7	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.5 N
Elnath	278° 32'.7	28° 36'.2 N
Eltanin	90° 53'.5	51° 29'.0 N
Enif	34° 03'.0	9° 50'.3 N
Fomalhaut	15° 41'.7	29° 39'.8 S
Gacrux	172° 18'.2	57° 04'.3 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.2 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.9	34° 23'.3 S
Kochab	137° 18'.3	74° 10'.9 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 26'.1	36° 20'.0 S
Miaplacidus	221° 42'.5	69° 41'.4 S
Mirfak	309° 03'.5	49° 50'.2 N
Nunki	76° 18'.0	26° 18'.4 S
Peacock	53° 44'.4	56° 45'.5 S
Polaris	324° 22'.5	89° 14'.1 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.2	5° 14'.6 N
Rasalhague	96° 21'.2	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.3	8° 12'.7 S
Rigil Kent	140° 13'.0	60° 48'.1 S
Sabik	102° 30'.7	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.8 N
Shaula	96° 43'.4	37° 05'.9 S
Sirius	258° 47'.6	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.9	43° 24'.4 S
Vega	80° 49'.8	38° 46'.3 N
Zuben'ubi	137° 22'.8	16° 00'.8 S

	SHA	Mer.Pass.
Venus	23° 57'.9	10:45
Mars	35° 49'.4	09:57
Jupiter	200° 15'.6	22:55
Saturn	42° 46'.9	09:28

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
16 00	177° 49'.2	1° 43'.5 S	34° 54'.3	8'.3	12° 25'.8 N	13'.5	60'.4
01	192° 49'.4	42'.6	49° 21'.6	8'.2	12'.3	13'.5	
02	207° 49'.5	41'.6	63° 48'.8	8'.4	11° 58'.8 N	13'.6	60'.5
03	222° 49'.7	40'.6	78° 16'.2	8'.3	45'.2	13'.7	
04	237° 49'.9	39'.6	92° 43'.5	8'.4	31'.5	13'.7	
05	252° 50'.1	38'.6	107° 10'.9	8'.5	17'.8	13'.8	
06	267° 50'.3	37'.6	121° 38'.4	8'.5	04'.0	13'.9	
07	282° 50'.4	36'.6	136° 05'.9	8'.6	10° 50'.1 N	14'.0	
08	297° 50'.6	35'.6	150° 33'.5	8'.6	36'.1	14'.0	
09	312° 50'.8	34'.7	165° 01'.1	8'.7	22'.1	14'.1	
10	327° 51'.0	33'.7	179° 28'.8	8'.6	08'.0	14'.1	
11	342° 51'.2	32'.7	193° 56'.4	8'.8	9° 53'.9 N	14'.3	
12	357° 51'.3	1° 31'.7 S	208° 24'.2	8'.8	9° 39'.6 N	14'.2	60'.5
13	12° 51'.5	30'.7	222° 52'.0	8'.8	25'.4	14'.4	
14	27° 51'.7	29'.7	237° 19'.8	8'.9	11'.0	14'.3	
15	42° 51'.9	28'.7	251° 47'.7	8'.9	8° 56'.7 N	14'.5	
16	57° 52'.1	27'.7	266° 15'.6	8'.9	42'.2	14'.5	
17	72° 52'.2	26'.8	280° 43'.5	9'.0	27'.7	14'.5	
18	87° 52'.4	25'.8	295° 11'.5	9'.1	13'.2	14'.6	
19	102° 52'.6	24'.8	309° 39'.6	9'.1	7° 58'.6 N	14'.7	
20	117° 52'.8	23'.8	324° 07'.7	9'.1	43'.9	14'.7	
21	132° 53'.0	22'.8	338° 35'.8	9'.1	29'.2	14'.7	
22	147° 53'.1	21'.8	353° 03'.9	9'.2	14'.5	14'.8	
23	162° 53'.3	20'.8	7° 32'.1	9'.2	6° 59'.7 N	14'.8	
17 00	177° 53'.5	1° 19'.8 S	22° 00'.3	9'.3	6° 44'.9 N	14'.8	60'.5
01	192° 53'.7	18'.9	36° 28'.6	9'.3	30'.1	14'.9	
02	207° 53'.9	17'.9	50° 56'.9	9'.3	15'.2	14'.9	
03	222° 54'.1	16'.9	65° 25'.2	9'.4	00'.3	15'.0	
04	237° 54'.2	15'.9	79° 53'.6	9'.4	5° 45'.3 N	15'.0	
05	252° 54'.4	14'.9	94° 22'.0	9'.4	30'.3	15'.0	
06	267° 54'.6	13'.9	108° 50'.4	9'.5	15'.3	15'.1	
07	282° 54'.8	12'.9	123° 18'.9	9'.5	00'.2	15'.0	
08	297° 55'.0	11'.9	137° 47'.4	9'.5	4° 45'.2 N	15'.1	
09	312° 55'.1	10'.9	152° 15'.9	9'.6	30'.1	15'.2	
10	327° 55'.3	10'.0	166° 44'.5	9'.5	14'.9	15'.1	60'.4
11	342° 55'.5	09'.0	181° 13'.0	9'.7	3° 59'.8 N	15'.2	
12	357° 55'.7	1° 08'.0 S	195° 41'.7	9'.6	3° 44'.6 N	15'.2	60'.4
13	12° 55'.9	07'.0	210° 10'.3	9'.7	29'.4	15'.2	
14	27° 56'.1	06'.0	224° 39'.0	9'.6	14'.2	15'.2	
15	42° 56'.2	05'.0	239° 07'.6	9'.8	2° 59'.0 N	15'.2	
16	57° 56'.4	04'.0	253° 36'.4	9'.7	43'.8	15'.2	
17	72° 56'.6	03'.0	268° 05'.1	9'.8	28'.6	15'.3	
18	87° 56'.8	02'.1	282° 33'.9	9'.7	13'.3	15'.2	
19	102° 57'.0	01'.1	297° 02'.6	9'.8	1° 58'.1 N	15'.3	
20	117° 57'.1	00'.1	311° 31'.4	9'.9	42'.8	15'.3	
21	132° 57'.3	0° 59'.1 S	326° 00'.3	9'.8	27'.5	15'.2	60'.3
22	147° 57'.5	58'.1	340° 29'.1	9'.9	12'.3	15'.3	
23	162° 57'.7	57'.1	354° 58'.0	9'.9	0° 57'.0 N	15'.3	
18 00	177° 57'.9	0° 56'.1 S	9° 26'.9	9'.9	0° 41'.7 N	15'.2	60'.3
01	192° 58'.1	55'.1	23° 55'.8	9'.9	26'.5	15'.3	
02	207° 58'.2	54'.2	38° 24'.7	9'.9	11'.2	15'.2	
03	222° 58'.4	53'.2	52° 53'.6	10'.0	0° 04'.0 S	15'.3	
04	237° 58'.6	52'.2	67° 22'.6	9'.9	19'.3	15'.2	60'.2
05	252° 58'.8	51'.2	81° 51'.5	10'.0	34'.5	15'.2	
06	267° 59'.0	50'.2	96° 20'.5	10'.0	49'.7	15'.2	
07	282° 59'.2	49'.2	110° 49'.5	10'.0	1° 04'.9 S	15'.2	
08	297° 59'.3	48'.2	125° 18'.5	10'.0	20'.1	15'.2	
09	312° 59'.5	47'.2	139° 47'.5	10'.0	35'.3	15'.2	
10	327° 59'.7	46'.2	154° 16'.5	10'.1	50'.5	15'.1	60'.1
11	342° 59'.9	45'.3	168° 45'.6	10'.0	2° 05'.6 S	15'.1	
12	358° 00'.1	0° 44'.3 S	183° 14'.6	10'.0	2° 20'.7 S	15'.1	60'.1
13	13° 00'.3	43'.3	197° 43'.6	10'.1	35'.8	15'.1	
14	28° 00'.4	42'.3	212° 12'.7	10'.1	50'.9	15'.1	
15	43° 00'.6	41'.3	226° 41'.8	10'.0	3° 06'.0 S	15'.0	
16	58° 00'.8	40'.3	241° 10'.8	10'.1	21'.0	15'.0	60'.0
17	73° 01'.0	39'.3	255° 39'.9	10'.1	36'.0	14'.9	
18	88° 01'.2	38'.3	270° 09'.0	10'.1	50'.9	15'.0	
19	103° 01'.4	37'.4	284° 38'.1	10'.0	4° 05'.9 S	14'.9	
20	118° 01'.5	36'.4	299° 07'.1	10'.1	20'.8	14'.8	
21	133° 01'.7	35'.4	313° 36'.2	10'.1	35'.6	14'.8	59'.9
22	148° 01'.9	34'.4	328° 05'.3	10'.1	50'.4	14'.8	
23	163° 02'.1	33'.4	342° 34'.4	10'.1	5° 05'.2 S	14'.7	
	SD 16'.1	d 1'.0	SD 16'.5		16'.5		16'.4

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON ◯ Age/ Vis
16	8 44	8 35	12:09	22:29	10:02	12d 93%
17	8 26	8 18	12:08	23:21	10:55	13d 98%
18	8 09	8 00	12:08	24:12	11:47	14d Full

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1992 March 19, 20, 21 (Thur, Fri, Sat)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.5		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
19 Thursday 00	176° 47'.5	198° 23'.9	10° 21'.3 S	211° 05'.7	14° 57'.8 S	17° 16'.2	10° 06'.6 N	219° 22'.5	17° 04'.2 S
01	191° 49'.9	213° 23'.4	20'.3	226° 06'.2	57'.1	32° 19'.0	06'.7	234° 24'.7	04'.1
02	206° 52'.4	228° 22'.9	19'.2	241° 06'.8	56'.5	47° 21'.7	06'.9	249° 26'.9	04'.0
03	221° 54'.9	243° 22'.4	18'.1	256° 07'.4	55'.9	62° 24'.4	07'.0	264° 29'.2	04'.0
04	236° 57'.3	258° 22'.0	17'.0	271° 07'.9	55'.3	77° 27'.2	07'.1	279° 31'.4	03'.9
05	251° 59'.8	273° 21'.5	15'.9	286° 08'.5	54'.7	92° 29'.9	07'.2	294° 33'.6	03'.8
06	267° 02'.2	288° 21'.0	14'.9	301° 09'.1	54'.0	107° 32'.7	07'.3	309° 35'.8	03'.8
07	282° 04'.7	303° 20'.5	13'.8	316° 09'.7	53'.4	122° 35'.4	07'.4	324° 38'.0	03'.7
08	297° 07'.2	318° 20'.1	12'.7	331° 10'.2	52'.8	137° 38'.1	07'.5	339° 40'.3	03'.6
09	312° 09'.6	333° 19'.6	11'.6	346° 10'.8	52'.2	152° 40'.9	07'.6	354° 42'.5	03'.6
10	327° 12'.1	348° 19'.1	10'.5	1° 11'.4	51'.5	167° 43'.6	07'.7	9° 44'.7	03'.5
11	342° 14'.6	3° 18'.7	09'.4	16° 11'.9	50'.9	182° 46'.3	07'.8	24° 46'.9	03'.4
12	357° 17'.0	18° 18'.2	10° 08'.3 S	31° 12'.5	14° 50'.3 S	197° 49'.1	10° 07'.9 N	39° 49'.1	17° 03'.4 S
13	12° 19'.5	33° 17'.7	07'.3	46° 13'.1	49'.7	212° 51'.8	08'.0	54° 51'.4	03'.3
14	27° 22'.0	48° 17'.2	06'.2	61° 13'.6	49'.1	227° 54'.5	08'.1	69° 53'.6	03'.2
15	42° 24'.4	63° 16'.8	05'.1	76° 14'.2	48'.4	242° 57'.2	08'.2	84° 55'.8	03'.2
16	57° 26'.9	78° 16'.3	04'.0	91° 14'.8	47'.8	258° 00'.0	08'.3	99° 58'.0	03'.1
17	72° 29'.4	93° 15'.8	02'.9	106° 15'.3	47'.2	273° 02'.7	08'.4	115° 00'.3	03'.0
18	87° 31'.8	108° 15'.4	01'.8	121° 15'.9	46'.6	288° 05'.4	08'.5	130° 02'.5	03'.0
19	102° 34'.3	123° 14'.9	00'.7	136° 16'.5	45'.9	303° 08'.2	08'.6	145° 04'.7	02'.9
20	117° 36'.7	138° 14'.4	9° 59'.6 S	151° 17'.1	45'.3	318° 10'.9	08'.7	160° 06'.9	02'.8
21	132° 39'.2	153° 14'.0	58'.6	166° 17'.6	44'.7	333° 13'.6	08'.8	175° 09'.1	02'.8
22	147° 41'.7	168° 13'.5	57'.5	181° 18'.2	44'.1	348° 16'.4	08'.9	190° 11'.4	02'.7
23	162° 44'.1	183° 13'.0	56'.4	196° 18'.8	43'.4	3° 19'.1	09'.0	205° 13'.6	02'.6
20 Friday 00	177° 46'.6	198° 12'.6	9° 55'.3 S	211° 19'.3	14° 42'.8 S	18° 21'.8	10° 09'.1 N	220° 15'.8	17° 02'.6 S
01	192° 49'.1	213° 12'.1	54'.2	226° 19'.9	42'.2	33° 24'.6	09'.2	235° 18'.0	02'.5
02	207° 51'.5	228° 11'.6	53'.1	241° 20'.5	41'.5	48° 27'.3	09'.4	250° 20'.3	02'.4
03	222° 54'.0	243° 11'.2	52'.0	256° 21'.1	40'.9	63° 30'.0	09'.5	265° 22'.5	02'.4
04	237° 56'.5	258° 10'.7	50'.9	271° 21'.6	40'.3	78° 32'.8	09'.6	280° 24'.7	02'.3
05	252° 58'.9	273° 10'.2	49'.8	286° 22'.2	39'.7	93° 35'.5	09'.7	295° 26'.9	02'.2
06	268° 01'.4	288° 09'.8	48'.7	301° 22'.8	39'.0	108° 38'.2	09'.8	310° 29'.1	02'.2
07	283° 03'.9	303° 09'.3	47'.6	316° 23'.3	38'.4	123° 40'.9	09'.9	325° 31'.4	02'.1
08	298° 06'.3	318° 08'.8	46'.5	331° 23'.9	37'.8	138° 43'.7	10'.0	340° 33'.6	02'.0
09	313° 08'.8	333° 08'.4	45'.4	346° 24'.5	37'.2	153° 46'.4	10'.1	355° 35'.8	02'.0
10	328° 11'.2	348° 07'.9	44'.3	1° 25'.1	36'.5	168° 49'.1	10'.2	10° 38'.0	01'.9
11	343° 13'.7	3° 07'.4	43'.2	16° 25'.6	35'.9	183° 51'.9	10'.3	25° 40'.3	01'.8
12	358° 16'.2	18° 07'.0	9° 42'.1 S	31° 26'.2	14° 35'.3 S	198° 54'.6	10° 10'.4 N	40° 42'.5	17° 01'.8 S
13	13° 18'.6	33° 06'.5	41'.0	46° 26'.8	34'.6	213° 57'.3	10'.5	55° 44'.7	01'.7
14	28° 21'.1	48° 06'.1	40'.0	61° 27'.3	34'.0	229° 00'.1	10'.6	70° 46'.9	01'.6
15	43° 23'.6	63° 05'.6	38'.9	76° 27'.9	33'.4	244° 02'.8	10'.7	85° 49'.2	01'.6
16	58° 26'.0	78° 05'.1	37'.8	91° 28'.5	32'.7	259° 05'.5	10'.8	100° 51'.4	01'.5
17	73° 28'.5	93° 04'.7	36'.7	106° 29'.1	32'.1	274° 08'.2	10'.9	115° 53'.6	01'.5
18	88° 31'.0	108° 04'.2	35'.6	121° 29'.6	31'.5	289° 11'.0	11'.0	130° 55'.8	01'.4
19	103° 33'.4	123° 03'.8	34'.5	136° 30'.2	30'.8	304° 13'.7	11'.1	145° 58'.0	01'.3
20	118° 35'.9	138° 03'.3	33'.4	151° 30'.8	30'.2	319° 16'.4	11'.2	161° 00'.3	01'.3
21	133° 38'.3	153° 02'.8	32'.3	166° 31'.4	29'.6	334° 19'.1	11'.3	176° 02'.5	01'.2
22	148° 40'.8	168° 02'.4	31'.2	181° 31'.9	29'.0	349° 21'.9	11'.4	191° 04'.7	01'.1
23	163° 43'.3	183° 01'.9	30'.0	196° 32'.5	28'.3	4° 24'.6	11'.5	206° 06'.9	01'.1
21 Saturday 00	178° 45'.7	198° 01'.5	9° 28'.9 S	211° 33'.1	14° 27'.7 S	19° 27'.3	10° 11'.6 N	221° 09'.2	17° 01'.0 S
01	193° 48'.2	213° 01'.0	27'.8	226° 33'.7	27'.1	34° 30'.1	11'.7	236° 11'.4	00'.9
02	208° 50'.7	228° 00'.5	26'.7	241° 34'.2	26'.4	49° 32'.8	11'.8	251° 13'.6	00'.9
03	223° 53'.1	243° 00'.1	25'.6	256° 34'.8	25'.8	64° 35'.5	11'.9	266° 15'.8	00'.8
04	238° 55'.6	257° 59'.6	24'.5	271° 35'.4	25'.2	79° 38'.2	12'.0	281° 18'.1	00'.7
05	253° 58'.1	272° 59'.2	23'.4	286° 36'.0	24'.5	94° 41'.0	12'.1	296° 20'.3	00'.7
06	269° 00'.5	287° 58'.7	22'.3	301° 36'.5	23'.9	109° 43'.7	12'.2	311° 22'.5	00'.6
07	284° 03'.0	302° 58'.3	21'.2	316° 37'.1	23'.3	124° 46'.4	12'.3	326° 24'.7	00'.5
08	299° 05'.5	317° 57'.8	20'.1	331° 37'.7	22'.6	139° 49'.1	12'.4	341° 27'.0	00'.5
09	314° 07'.9	332° 57'.3	19'.0	346° 38'.3	22'.0	154° 51'.9	12'.5	356° 29'.2	00'.4
10	329° 10'.4	347° 56'.9	17'.9	1° 38'.8	21'.4	169° 54'.6	12'.6	11° 31'.4	00'.3
11	344° 12'.8	2° 56'.4	16'.8	16° 39'.4	20'.7	184° 57'.3	12'.7	26° 33'.6	00'.3
12	359° 15'.3	17° 56'.0	9° 15'.7 S	31° 40'.0	14° 20'.1 S	200° 00'.0	10° 12'.8 N	41° 35'.9	17° 00'.2 S
13	14° 17'.8	32° 55'.5	14'.6	46° 40'.6	19'.4	215° 02'.8	12'.9	56° 38'.1	00'.1
14	29° 20'.2	47° 55'.1	13'.5	61° 41'.2	18'.8	230° 05'.5	13'.0	71° 40'.3	00'.1
15	44° 22'.7	62° 54'.6	12'.4	76° 41'.7	18'.2	245° 08'.2	13'.1	86° 42'.5	00'.0
16	59° 25'.2	77° 54'.2	11'.2	91° 42'.3	17'.5	260° 10'.9	13'.2	101° 44'.8	00'.0
17	74° 27'.6	92° 53'.7	10'.1	106° 42'.9	16'.9	275° 13'.7	13'.3	116° 47'.0	16° 59'.9 S
18	89° 30'.1	107° 53'.3	09'.0	121° 43'.5	16'.3	290° 16'.4	13'.4	131° 49'.2	59'.8
19	104° 32'.6	122° 52'.8	07'.9	136° 44'.0	15'.6	305° 19'.1	13'.5	146° 51'.5	59'.8
20	119° 35'.0	137° 52'.4	06'.8	151° 44'.6	15'.0	320° 21'.8	13'.6	161° 53'.7	59'.7
21	134° 37'.5	152° 51'.9	05'.7	166° 45'.2	14'.4	335° 24'.6	13'.7	176° 55'.9	59'.6
22	149° 39'.9	167° 51'.5	04'.6	181° 45'.8	13'.7	350° 27'.3	13'.8	191° 58'.1	59'.6
23	164° 42'.4	182° 51'.0	03'.5	196° 46'.4	13'.1	5° 30'.0	13'.9	207° 00'.4	59'.5
	M.P. 12:07	v -0'.5	d 1'.1	v 0'.6	d 0'.6	v 2'.7	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.6	40° 20'.3 S
Achernar	335° 38'.9	57° 16'.6 S
Acrux	173° 26'.7	63° 03'.5 S
Adhara	255° 24'.9	28° 57'.9 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 33'.9	55° 59'.9 N
Alkaid	153° 10'.8	49° 20'.8 N
Alnair	28° 03'.9	46° 59'.8 S
Alnilam	276° 02'.5	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.2	26° 44'.1 N
Alpheratz	358° 00'.4	29° 02'.9 N
Altair	62° 23'.9	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.9 S
Antares	112° 45'.6	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.1 N
Atria	108° 01'.7	69° 00'.7 S
Avior	234° 24'.2	59° 29'.4 S
Bellatrix	278° 49'.1	6° 20'.5 N
Betelgeuse	271° 18'.5	7° 24'.3 N
Canopus	264° 03'.1	52° 41'.8 S
Capella	280° 58'.0	45° 59'.6 N
Deneb	49° 42'.6	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.5 N
Elnath	278° 32'.7	28° 36'.2 N
Eltanin	90° 53'.5	51° 29'.0 N
Enif	34° 03'.0	9° 50'.3 N
Fomalhaut	15° 41'.7	29° 39'.8 S
Gacrux	172° 18'.2	57° 04'.3 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.2 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.9	34° 23'.3 S
Kochab	137° 18'.3	74° 10'.9 N
Markab	13° 54'.5	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 26'.0	36° 20'.0 S
Miaplacidus	221° 42'.6	69° 41'.4 S
Mirfak	309° 03'.5	49° 50'.2 N
Nunki	76° 18'.0	26° 18'.4 S
Peacock	53° 44'.4	56° 45'.5 S
Polaris	324° 23'.2	89° 14'.1 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.2	5° 14'.6 N
Rasalhague	96° 21'.1	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.4	8° 12'.7 S
Rigil Kent	140° 13'.0	60° 48'.1 S
Sabik	102° 30'.7	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.8 N
Shaula	96° 43'.4	37° 05'.9 S
Sirius	258° 47'.6	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.9	43° 24'.4 S
Vega	80° 49'.8	38° 46'.3 N
Zuben'ubi	137° 22'.8	16° 00'.8 S

	SHA	Mer.Pass.
Venus	20° 26'.0	10:47
Mars	33° 32'.7	09:54
Jupiter	200° 35'.2	22:42
Saturn	42° 29'.2	09:18

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
19 00	178° 02'.3	0° 32'.4 S	357° 03'.5	10'.1	5° 19'.9 S	14'.7	59'.9
01	193° 02'.5	31'.4	11° 32'.6	10'.1	34'.6	14'.7	59'.8
02	208° 02'.7	30'.4	26° 01'.7	10'.0	49'.3	14'.6	
03	223° 02'.8	29'.4	40° 30'.7	10'.1	6° 03'.9 S	14'.6	
04	238° 03'.0	28'.5	54° 59'.8	10'.1	18'.5	14'.5	
05	253° 03'.2	27'.5	69° 28'.9	10'.1	33'.0	14'.5	59'.7
06	268° 03'.4	26'.5	83° 58'.0	10'.0	47'.5	14'.4	
07	283° 03'.6	25'.5	98° 27'.0	10'.1	7° 01'.9 S	14'.3	
08	298° 03'.8	24'.5	112° 56'.1	10'.0	16'.2	14'.3	
09	313° 04'.0	23'.5	127° 25'.1	10'.1	30'.5	14'.3	59'.6
10	328° 04'.1	22'.5	141° 54'.2	10'.0	44'.8	14'.2	
11	343° 04'.3	21'.5	156° 23'.2	10'.1	59'.0	14'.1	
12	358° 04'.5	0° 20'.6 S	170° 52'.3	10'.0	8° 13'.1 S	14'.1	59'.6
13	13° 04'.7	19'.6	185° 21'.3	10'.0	27'.2	14'.0	59'.5
14	28° 04'.9	18'.6	199° 50'.3	10'.0	41'.2	14'.0	
15	43° 05'.1	17'.6	214° 19'.3	10'.0	55'.2	13'.9	
16	58° 05'.2	16'.6	228° 48'.3	10'.0	9° 09'.1 S	13'.8	59'.4
17	73° 05'.4	15'.6	243° 17'.3	10'.0	22'.9	13'.8	
18	88° 05'.6	14'.6	257° 46'.3	9'.9	36'.7	13'.7	
19	103° 05'.8	13'.6	272° 15'.2	10'.0	50'.4	13'.6	
20	118° 06'.0	12'.7	286° 44'.2	9'.9	10° 04'.0 S	13'.5	59'.3
21	133° 06'.2	11'.7	301° 13'.1	9'.9	17'.5	13'.5	
22	148° 06'.4	10'.7	315° 42'.0	9'.9	31'.0	13'.4	
23	163° 06'.6	09'.7	330° 10'.9	9'.9	44'.4	13'.4	59'.2
20 00	178° 06'.7	0° 08'.7 S	344° 39'.8	9'.9	10° 57'.8 S	13'.2	59'.2
01	193° 06'.9	07'.7	359° 08'.7	9'.9	11° 11'.0 S	13'.2	
02	208° 07'.1	06'.7	13° 37'.6	9'.8	24'.2	13'.1	59'.1
03	223° 07'.3	05'.7	28° 06'.4	9'.9	37'.3	13'.0	
04	238° 07'.5	04'.8	42° 35'.3	9'.8	50'.3	12'.9	
05	253° 07'.7	03'.8	57° 04'.1	9'.8	12° 03'.2 S	12'.9	
06	268° 07'.9	02'.8	71° 32'.9	9'.8	16'.1	12'.8	59'.0
07	283° 08'.0	01'.8	86° 01'.7	9'.8	28'.9	12'.7	
08	298° 08'.2	00'.8	100° 30'.5	9'.7	41'.6	12'.6	
09	313° 08'.4	0° 00'.2 N	114° 59'.2	9'.8	54'.2	12'.5	58'.9
10	328° 08'.6	01'.2	129° 28'.0	9'.7	13° 06'.7 S	12'.4	
11	343° 08'.8	02'.2	143° 56'.7	9'.7	19'.1	12'.4	
12	358° 09'.0	0° 03'.1 N	158° 25'.4	9'.7	13° 31'.5 S	12'.2	58'.8
13	13° 09'.2	04'.1	172° 54'.1	9'.6	43'.7	12'.2	
14	28° 09'.3	05'.1	187° 22'.7	9'.7	55'.9	12'.0	
15	43° 09'.5	06'.1	201° 51'.4	9'.6	14° 07'.9 S	12'.0	58'.7
16	58° 09'.7	07'.1	216° 20'.0	9'.6	19'.9	11'.9	
17	73° 09'.9	08'.1	230° 48'.6	9'.6	31'.8	11'.8	
18	88° 10'.1	09'.1	245° 17'.2	9'.6	43'.6	11'.6	58'.6
19	103° 10'.3	10'.1	259° 45'.8	9'.5	55'.2	11'.6	
20	118° 10'.5	11'.0	274° 14'.3	9'.5	15° 06'.8 S	11'.5	
21	133° 10'.7	12'.0	288° 42'.8	9'.6	18'.3	11'.4	58'.5
22	148° 10'.8	13'.0	303° 11'.4	9'.4	29'.7	11'.3	
23	163° 11'.0	14'.0	317° 39'.8	9'.5	41'.0	11'.2	
21 00	178° 11'.2	0° 15'.0 N	332° 08'.3	9'.5	15° 52'.2 S	11'.0	58'.4
01	193° 11'.4	16'.0	346° 36'.8	9'.4	16° 03'.2 S	11'.0	
02	208° 11'.6	17'.0	1° 05'.2	9'.4	14'.2	10'.9	58'.3
03	223° 11'.8	18'.0	15° 33'.6	9'.4	25'.1	10'.8	
04	238° 12'.0	18'.9	30° 02'.0	9'.4	35'.9	10'.6	
05	253° 12'.2	19'.9	44° 30'.4	9'.3	46'.5	10'.6	58'.2
06	268° 12'.3	20'.9	58° 58'.7	9'.4	57'.1	10'.4	
07	283° 12'.5	21'.9	73° 27'.1	9'.3	17° 07'.5 S	10'.4	
08	298° 12'.7	22'.9	87° 55'.4	9'.3	17'.9	10'.2	58'.1
09	313° 12'.9	23'.9	102° 23'.7	9'.3	28'.1	10'.1	
10	328° 13'.1	24'.9	116° 52'.0	9'.2	38'.2	10'.0	
11	343° 13'.3	25'.9	131° 20'.2	9'.3	48'.2	9'.9	58'.0
12	358° 13'.5	0° 26'.8 N	145° 48'.5	9'.2	17° 58'.1 S	9'.8	58'.0
13	13° 13'.7	27'.8	160° 16'.7	9'.2	18° 07'.9 S	9'.6	
14	28° 13'.8	28'.8	174° 44'.9	9'.2	17'.5	9'.6	57'.9
15	43° 14'.0	29'.8	189° 13'.1	9'.1	27'.1	9'.4	
16	58° 14'.2	30'.8	203° 41'.2	9'.2	36'.5	9'.3	57'.8
17	73° 14'.4	31'.8	218° 09'.4	9'.1	45'.8	9'.2	
18	88° 14'.6	32'.8	232° 37'.5	9'.1	55'.0	9'.1	
19	103° 14'.8	33'.7	247° 05'.6	9'.1	19° 04'.1 S	8'.9	57'.7
20	118° 15'.0	34'.7	261° 33'.7	9'.1	13'.0	8'.9	
21	133° 15'.2	35'.7	276° 01'.8	9'.1	21'.9	8'.7	
22	148° 15'.3	36'.7	290° 29'.9	9'.0	30'.6	8'.6	57'.6
23	163° 15'.5	37'.7	304° 57'.9	9'.1	39'.2	8'.5	
	SD 16'.1	d 1'.0	SD 16'.2		16'.0		15'.8

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
19	7 51	7 42	12:08	00:12	12:38	15d 99%
20	7 33	7 24	12:07	01:04	13:29	16d 96%
21	7 16	7 07	12:07	01:55	14:22	17d 90%

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1992 March 22, 23, 24 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.4		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
22 Sunday 00	179° 44'.9	197° 50'.6	9° 02'.4 S	211° 46'.9	14° 12'.4 S	20° 32'.7	10° 14'.0 N	222° 02'.6	16° 59'.4 S
01	194° 47'.3	212° 50'.1	01'.2	226° 47'.5	11'.8	35° 35'.4	14'.1	237° 04'.8	59'.4
02	209° 49'.8	227° 49'.7	00'.1	241° 48'.1	11'.2	50° 38'.2	14'.2	252° 07'.0	59'.3
03	224° 52'.3	242° 49'.2	8° 59'.0 S	256° 48'.7	10'.5	65° 40'.9	14'.3	267° 09'.3	59'.2
04	239° 54'.7	257° 48'.8	57'.9	271° 49'.2	09'.9	80° 43'.6	14'.4	282° 11'.5	59'.2
05	254° 57'.2	272° 48'.3	56'.8	286° 49'.8	09'.2	95° 46'.3	14'.5	297° 13'.7	59'.1
06	269° 59'.7	287° 47'.9	55'.7	301° 50'.4	08'.6	110° 49'.1	14'.6	312° 15'.9	59'.0
07	285° 02'.1	302° 47'.4	54'.5	316° 51'.0	08'.0	125° 51'.8	14'.7	327° 18'.2	59'.0
08	300° 04'.6	317° 47'.0	53'.4	331° 51'.6	07'.3	140° 54'.5	14'.8	342° 20'.4	58'.9
09	315° 07'.1	332° 46'.5	52'.3	346° 52'.1	06'.7	155° 57'.2	14'.9	357° 22'.6	58'.9
10	330° 09'.5	347° 46'.1	51'.2	1° 52'.7	06'.0	170° 59'.9	15'.0	12° 24'.9	58'.8
11	345° 12'.0	2° 45'.6	50'.1	16° 53'.3	05'.4	186° 02'.7	15'.1	27° 27'.1	58'.7
12	0° 14'.4	17° 45'.2	8° 49'.0 S	31° 53'.9	14° 04'.8 S	201° 05'.4	10° 15'.2 N	42° 29'.3	16° 58'.7 S
13	15° 16'.9	32° 44'.7	47'.8	46° 54'.5	04'.1	216° 08'.1	15'.3	57° 31'.5	58'.6
14	30° 19'.4	47° 44'.3	46'.7	61° 55'.0	03'.5	231° 10'.8	15'.4	72° 33'.8	58'.5
15	45° 21'.8	62° 43'.8	45'.6	76° 55'.6	02'.8	246° 13'.5	15'.5	87° 36'.0	58'.5
16	60° 24'.3	77° 43'.4	44'.5	91° 56'.2	02'.2	261° 16'.3	15'.6	102° 38'.2	58'.4
17	75° 26'.8	92° 42'.9	43'.4	106° 56'.8	01'.6	276° 19'.0	15'.7	117° 40'.5	58'.3
18	90° 29'.2	107° 42'.5	42'.2	121° 57'.4	00'.9	291° 21'.7	15'.8	132° 42'.7	58'.3
19	105° 31'.7	122° 42'.1	41'.1	136° 58'.0	00'.3	306° 24'.4	15'.9	147° 44'.9	58'.2
20	120° 34'.2	137° 41'.6	40'.0	151° 58'.5	13° 59'.6 S	321° 27'.1	16'.0	162° 47'.1	58'.1
21	135° 36'.6	152° 41'.2	38'.9	166° 59'.1	59'.0	336° 29'.9	16'.1	177° 49'.4	58'.1
22	150° 39'.1	167° 40'.7	37'.8	181° 59'.7	58'.3	351° 32'.6	16'.2	192° 51'.6	58'.0
23	165° 41'.6	182° 40'.3	36'.6	197° 00'.3	57'.7	6° 35'.3	16'.3	207° 53'.8	58'.0
23 Monday 00	180° 44'.0	197° 39'.8	8° 35'.5 S	212° 00'.9	13° 57'.0 S	21° 38'.0	10° 16'.4 N	222° 56'.1	16° 57'.9 S
01	195° 46'.5	212° 39'.4	34'.4	227° 01'.4	56'.4	36° 40'.7	16'.5	237° 58'.3	57'.8
02	210° 48'.9	227° 39'.0	33'.3	242° 02'.0	55'.8	51° 43'.5	16'.6	253° 00'.5	57'.8
03	225° 51'.4	242° 38'.5	32'.1	257° 02'.6	55'.1	66° 46'.2	16'.7	268° 02'.7	57'.7
04	240° 53'.9	257° 38'.1	31'.0	272° 03'.2	54'.5	81° 48'.9	16'.8	283° 05'.0	57'.6
05	255° 56'.3	272° 37'.6	29'.9	287° 03'.8	53'.8	96° 51'.6	16'.9	298° 07'.2	57'.6
06	270° 58'.8	287° 37'.2	28'.8	302° 04'.4	53'.2	111° 54'.3	17'.0	313° 09'.4	57'.5
07	286° 01'.3	302° 36'.7	27'.6	317° 04'.9	52'.5	126° 57'.0	17'.1	328° 11'.7	57'.4
08	301° 03'.7	317° 36'.3	26'.5	332° 05'.5	51'.9	141° 59'.8	17'.2	343° 13'.9	57'.4
09	316° 06'.2	332° 35'.9	25'.4	347° 06'.1	51'.2	157° 02'.5	17'.2	358° 16'.1	57'.3
10	331° 08'.7	347° 35'.4	24'.3	2° 06'.7	50'.6	172° 05'.2	17'.3	13° 18'.4	57'.2
11	346° 11'.1	2° 35'.0	23'.1	17° 07'.3	49'.9	187° 07'.9	17'.4	28° 20'.6	57'.2
12	1° 13'.6	17° 34'.5	8° 22'.0 S	32° 07'.9	13° 49'.3 S	202° 10'.6	10° 17'.5 N	43° 22'.8	16° 57'.1 S
13	16° 16'.1	32° 34'.1	20'.9	47° 08'.4	48'.7	217° 13'.3	17'.6	58° 25'.0	57'.1
14	31° 18'.5	47° 33'.7	19'.7	62° 09'.0	48'.0	232° 16'.1	17'.7	73° 27'.3	57'.0
15	46° 21'.0	62° 33'.2	18'.6	77° 09'.6	47'.4	247° 18'.8	17'.8	88° 29'.5	56'.9
16	61° 23'.4	77° 32'.8	17'.5	92° 10'.2	46'.7	262° 21'.5	17'.9	103° 31'.7	56'.9
17	76° 25'.9	92° 32'.4	16'.4	107° 10'.8	46'.1	277° 24'.2	18'.0	118° 34'.0	56'.8
18	91° 28'.4	107° 31'.9	15'.2	122° 11'.4	45'.4	292° 26'.9	18'.1	133° 36'.2	56'.7
19	106° 30'.8	122° 31'.5	14'.1	137° 12'.0	44'.8	307° 29'.6	18'.2	148° 38'.4	56'.7
20	121° 33'.3	137° 31'.0	13'.0	152° 12'.5	44'.1	322° 32'.3	18'.3	163° 40'.7	56'.6
21	136° 35'.8	152° 30'.6	11'.8	167° 13'.1	43'.5	337° 35'.1	18'.4	178° 42'.9	56'.5
22	151° 38'.2	167° 30'.2	10'.7	182° 13'.7	42'.8	352° 37'.8	18'.5	193° 45'.1	56'.5
23	166° 40'.7	182° 29'.7	09'.6	197° 14'.3	42'.2	7° 40'.5	18'.6	208° 47'.4	56'.4
24 Tuesday 00	181° 43'.2	197° 29'.3	8° 08'.4 S	212° 14'.9	13° 41'.5 S	22° 43'.2	10° 18'.7 N	223° 49'.6	16° 56'.4 S
01	196° 45'.6	212° 28'.9	07'.3	227° 15'.5	40'.9	37° 45'.9	18'.8	238° 51'.8	56'.3
02	211° 48'.1	227° 28'.4	06'.2	242° 16'.1	40'.2	52° 48'.6	18'.9	253° 54'.1	56'.2
03	226° 50'.5	242° 28'.0	05'.0	257° 16'.6	39'.6	67° 51'.3	19'.0	268° 56'.3	56'.2
04	241° 53'.0	257° 27'.6	03'.9	272° 17'.2	38'.9	82° 54'.1	19'.1	283° 58'.5	56'.1
05	256° 55'.5	272° 27'.1	02'.8	287° 17'.8	38'.3	97° 56'.8	19'.2	299° 00'.8	56'.0
06	271° 57'.9	287° 26'.7	01'.6	302° 18'.4	37'.6	112° 59'.5	19'.3	314° 03'.0	56'.0
07	287° 00'.4	302° 26'.3	00'.5	317° 19'.0	37'.0	128° 02'.2	19'.4	329° 05'.2	55'.9
08	302° 02'.9	317° 25'.8	7° 59'.4 S	332° 19'.6	36'.3	143° 04'.9	19'.4	344° 07'.4	55'.9
09	317° 05'.3	332° 25'.4	58'.2	347° 20'.2	35'.7	158° 07'.6	19'.5	359° 09'.7	55'.8
10	332° 07'.8	347° 25'.0	57'.1	2° 20'.8	35'.0	173° 10'.3	19'.6	14° 11'.9	55'.7
11	347° 10'.3	2° 24'.5	56'.0	17° 21'.3	34'.4	188° 13'.0	19'.7	29° 14'.1	55'.7
12	2° 12'.7	17° 24'.1	7° 54'.8 S	32° 21'.9	13° 33'.7 S	203° 15'.8	10° 19'.8 N	44° 16'.4	16° 55'.6 S
13	17° 15'.2	32° 23'.7	53'.7	47° 22'.5	33'.1	218° 18'.5	19'.9	59° 18'.6	55'.5
14	32° 17'.7	47° 23'.2	52'.5	62° 23'.1	32'.4	233° 21'.2	20'.0	74° 20'.8	55'.5
15	47° 20'.1	62° 22'.8	51'.4	77° 23'.7	31'.8	248° 23'.9	20'.1	89° 23'.1	55'.4
16	62° 22'.6	77° 22'.4	50'.3	92° 24'.3	31'.1	263° 26'.6	20'.2	104° 25'.3	55'.3
17	77° 25'.0	92° 21'.9	49'.1	107° 24'.9	30'.4	278° 29'.3	20'.3	119° 27'.5	55'.3
18	92° 27'.5	107° 21'.5	48'.0	122° 25'.5	29'.8	293° 32'.0	20'.4	134° 29'.8	55'.2
19	107° 30'.0	122° 21'.1	46'.8	137° 26'.1	29'.1	308° 34'.7	20'.5	149° 32'.0	55'.2
20	122° 32'.4	137° 20'.6	45'.7	152° 26'.6	28'.5	323° 37'.4	20'.6	164° 34'.2	55'.1
21	137° 34'.9	152° 20'.2	44'.6	167° 27'.2	27'.8	338° 40'.1	20'.7	179° 36'.5	55'.0
22	152° 37'.4	167° 19'.8	43'.4	182° 27'.8	27'.2	353° 42'.9	20'.8	194° 38'.7	55'.0
23	167° 39'.8	182° 19'.4	42'.3	197° 28'.4	26'.5	8° 45'.6	20'.9	209° 41'.0	54'.9
	M.P. 11:51	v -0'.4	d 1'.1	v 0'.6	d 0'.6	v 2'.7	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.6	40° 20'.3 S
Achernar	335° 38'.9	57° 16'.6 S
Acrux	173° 26'.6	63° 03'.5 S
Adhara	255° 24'.9	28° 57'.9 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 33'.9	55° 59'.9 N
Alkaid	153° 10'.8	49° 20'.8 N
Alnair	28° 03'.9	46° 59'.8 S
Alnilam	276° 02'.5	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.2	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.8 N
Altair	62° 23'.8	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.9 S
Antares	112° 45'.6	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.1 N
Atria	108° 01'.6	69° 00'.7 S
Avior	234° 24'.3	59° 29'.4 S
Bellatrix	278° 49'.1	6° 20'.5 N
Betelgeuse	271° 18'.5	7° 24'.3 N
Canopus	264° 03'.2	52° 41'.8 S
Capella	280° 58'.0	45° 59'.6 N
Deneb	49° 42'.6	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.5 N
Elnath	278° 32'.8	28° 36'.2 N
Eltanin	90° 53'.5	51° 29'.0 N
Enif	34° 02'.9	9° 50'.3 N
Fomalhaut	15° 41'.7	29° 39'.8 S
Gacrux	172° 18'.2	57° 04'.3 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.2 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.8	34° 23'.3 S
Kochab	137° 18'.2	74° 10'.9 N
Markab	13° 54'.5	15° 09'.7 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 26'.0	36° 20'.0 S
Miaplacidus	221° 42'.6	69° 41'.4 S
Mirfak	309° 03'.5	49° 50'.2 N
Nunki	76° 18'.0	26° 18'.4 S
Peacock	53° 44'.4	56° 45'.4 S
Polaris	324° 23'.7	89° 14'.0 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.2	5° 14'.6 N
Rasalhague	96° 21'.1	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.4	8° 12'.7 S
Rigil Kent	140° 13'.0	60° 48'.1 S
Sabik	102° 30'.7	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.8 N
Shaula	96° 43'.4	37° 05'.9 S
Sirius	258° 47'.6	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.9	43° 24'.4 S
Vega	80° 49'.7	38° 46'.3 N
Zuben'ubi	137° 22'.8	16° 00'.8 S

	SHA	Mer.Pass.
Venus	16° 55'.8	10:50
Mars	31° 16'.8	09:52
Jupiter	200° 54'.0	22:29
Saturn	42° 12'.0	09:07

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
22 00	178° 15'.7	0° 38'.7 N	319° 26'.0	9'.0	19° 47'.7 S	8'.4	57'.6
01	193° 15'.9	39'.7	333° 54'.0	9'.0	56'.1	8'.2	57'.5
02	208° 16'.1	40'.6	348° 22'.0	9'.0	20° 04'.3 S	8'.1	
03	223° 16'.3	41'.6	2° 50'.0	9'.0	12'.4	8'.0	57'.4
04	238° 16'.5	42'.6	17° 18'.0	9'.0	20'.4	7'.9	
05	253° 16'.7	43'.6	31° 46'.0	8'.9	28'.3	7'.7	
06	268° 16'.9	44'.6	46° 13'.9	9'.0	36'.0	7'.6	57'.3
07	283° 17'.0	45'.6	60° 41'.9	8'.9	43'.6	7'.5	
08	298° 17'.2	46'.6	75° 09'.8	8'.9	51'.1	7'.4	
09	313° 17'.4	47'.6	89° 37'.7	8'.9	58'.5	7'.2	57'.2
10	328° 17'.6	48'.5	104° 05'.6	8'.9	21° 05'.7 S	7'.1	
11	343° 17'.8	49'.5	118° 33'.5	8'.9	12'.8	7'.0	
12	358° 18'.0	0° 50'.5 N	133° 01'.4	8'.9	21° 19'.8 S	6'.9	57'.1
13	13° 18'.2	51'.5	147° 29'.3	8'.9	26'.7	6'.7	
14	28° 18'.4	52'.5	161° 57'.2	8'.9	33'.4	6'.6	57'.0
15	43° 18'.5	53'.5	176° 25'.1	8'.8	40'.0	6'.5	
16	58° 18'.7	54'.5	190° 52'.9	8'.9	46'.5	6'.4	
17	73° 18'.9	55'.4	205° 20'.8	8'.8	52'.9	6'.2	56'.9
18	88° 19'.1	56'.4	219° 48'.6	8'.9	59'.1	6'.1	
19	103° 19'.3	57'.4	234° 16'.5	8'.8	22° 05'.2 S	5'.9	
20	118° 19'.5	58'.4	248° 44'.3	8'.9	11'.1	5'.9	56'.8
21	133° 19'.7	59'.4	263° 12'.2	8'.8	17'.0	5'.7	
22	148° 19'.9	1° 00'.4 N	277° 40'.0	8'.9	22'.7	5'.5	
23	163° 20'.1	01'.4	292° 07'.9	8'.8	28'.2	5'.5	56'.7
23 00	178° 20'.2	1° 02'.3 N	306° 35'.7	8'.8	22° 33'.7 S	5'.3	56'.7
01	193° 20'.4	03'.3	321° 03'.5	8'.9	39'.0	5'.1	
02	208° 20'.6	04'.3	335° 31'.4	8'.8	44'.1	5'.1	56'.6
03	223° 20'.8	05'.3	349° 59'.2	8'.9	49'.2	4'.9	
04	238° 21'.0	06'.3	4° 27'.1	8'.8	54'.1	4'.8	
05	253° 21'.2	07'.3	18° 54'.9	8'.9	58'.9	4'.6	56'.5
06	268° 21'.4	08'.3	33° 22'.8	8'.8	23° 03'.5 S	4'.6	
07	283° 21'.6	09'.2	47° 50'.6	8'.9	08'.1	4'.3	
08	298° 21'.8	10'.2	62° 18'.5	8'.9	12'.4	4'.3	56'.4
09	313° 21'.9	11'.2	76° 46'.4	8'.8	16'.7	4'.1	
10	328° 22'.1	12'.2	91° 14'.2	8'.9	20'.8	4'.0	
11	343° 22'.3	13'.2	105° 42'.1	8'.9	24'.8	3'.9	56'.3
12	358° 22'.5	1° 14'.2 N	120° 10'.0	8'.9	23° 28'.7 S	3'.7	56'.3
13	13° 22'.7	15'.1	134° 37'.9	8'.9	32'.4	3'.6	
14	28° 22'.9	16'.1	149° 05'.8	8'.9	36'.0	3'.5	56'.2
15	43° 23'.1	17'.1	163° 33'.7	9'.0	39'.5	3'.3	
16	58° 23'.3	18'.1	178° 01'.7	8'.9	42'.8	3'.2	
17	73° 23'.5	19'.1	192° 29'.6	9'.0	46'.0	3'.1	56'.1
18	88° 23'.7	20'.1	206° 57'.6	9'.0	49'.1	2'.9	
19	103° 23'.8	21'.1	221° 25'.6	9'.0	52'.0	2'.8	
20	118° 24'.0	22'.0	235° 53'.6	9'.0	54'.8	2'.7	56'.0
21	133° 24'.2	23'.0	250° 21'.6	9'.0	57'.5	2'.5	
22	148° 24'.4	24'.0	264° 49'.6	9'.1	24° 00'.0 S	2'.4	
23	163° 24'.6	25'.0	279° 17'.7	9'.0	02'.4	2'.3	55'.9
24 00	178° 24'.8	1° 26'.0 N	293° 45'.7	9'.1	24° 04'.7 S	2'.2	55'.9
01	193° 25'.0	27'.0	308° 13'.8	9'.1	06'.9	2'.0	
02	208° 25'.2	27'.9	322° 41'.9	9'.1	08'.9	1'.9	55'.8
03	223° 25'.4	28'.9	337° 10'.0	9'.2	10'.8	1'.7	
04	238° 25'.5	29'.9	351° 38'.2	9'.2	12'.5	1'.7	
05	253° 25'.7	30'.9	6° 06'.4	9'.2	14'.2	1'.5	
06	268° 25'.9	31'.9	20° 34'.6	9'.2	15'.7	1'.3	55'.7
07	283° 26'.1	32'.9	35° 02'.8	9'.2	17'.0	1'.3	
08	298° 26'.3	33'.8	49° 31'.0	9'.3	18'.3	1'.1	
09	313° 26'.5	34'.8	63° 59'.3	9'.3	19'.4	1'.0	55'.6
10	328° 26'.7	35'.8	78° 27'.6	9'.4	20'.4	0'.8	
11	343° 26'.9	36'.8	92° 56'.0	9'.3	21'.2	0'.7	
12	358° 27'.1	1° 37'.8 N	107° 24'.3	9'.4	24° 21'.9 S	0'.6	55'.6
13	13° 27'.3	38'.8	121° 52'.7	9'.4	22'.5	0'.5	55'.5
14	28° 27'.4	39'.7	136° 21'.1	9'.5	23'.0	0'.3	
15	43° 27'.6	40'.7	150° 49'.6	9'.5	23'.3	0'.3	
16	58° 27'.8	41'.7	165° 18'.1	9'.5	23'.6	0'.1	55'.4
17	73° 28'.0	42'.7	179° 46'.6	9'.5	23'.7	0'.1	
18	88° 28'.2	43'.7	194° 15'.1	9'.6	23'.6	0'.1	
19	103° 28'.4	44'.7	208° 43'.7	9'.7	23'.5	0'.3	
20	118° 28'.6	45'.6	223° 12'.4	9'.6	23'.2	0'.5	55'.3
21	133° 28'.8	46'.6	237° 41'.0	9'.7	22'.7	0'.5	
22	148° 29'.0	47'.6	252° 09'.7	9'.8	22'.2	0'.6	
23	163° 29'.1	48'.6	266° 38'.5	9'.7	21'.6	0'.8	
	SD 16'.0	d 1'.0	SD 15'.6		15'.3	15'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
22	6 57	6 48	12:07	02:48	15:15	18d 83%
23	6 39	6 30	12:07	03:42	16:08	19d 75%
24	6 21	6 12	12:06	04:35	17:01	20d 65%

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1992 March 25, 26, 27 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.4		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
25 Wednesday 00	182° 42'.3	197° 18'.9	7° 41'.1 S	212° 29'.0	13° 25'.9 S	23° 48'.3	10° 20'.9 N	224° 43'.2	16° 54'.8 S
01	197° 44'.8	212° 18'.5	40'.0	227° 29'.6	25'.2	38° 51'.0	21'.0	239° 45'.4	54'.8
02	212° 47'.2	227° 18'.1	38'.9	242° 30'.2	24'.6	53° 53'.7	21'.1	254° 47'.7	54'.7
03	227° 49'.7	242° 17'.6	37'.7	257° 30'.8	23'.9	68° 56'.4	21'.2	269° 49'.9	54'.7
04	242° 52'.2	257° 17'.2	36'.6	272° 31'.4	23'.2	83° 59'.1	21'.3	284° 52'.1	54'.6
05	257° 54'.6	272° 16'.8	35'.4	287° 32'.0	22'.6	99° 01'.8	21'.4	299° 54'.4	54'.5
06	272° 57'.1	287° 16'.4	34'.3	302° 32'.5	21'.9	114° 04'.5	21'.5	314° 56'.6	54'.5
07	287° 59'.5	302° 15'.9	33'.1	317° 33'.1	21'.3	129° 07'.2	21'.6	329° 58'.8	54'.4
08	303° 02'.0	317° 15'.5	32'.0	332° 33'.7	20'.6	144° 09'.9	21'.7	345° 01'.1	54'.3
09	318° 04'.5	332° 15'.1	30'.8	347° 34'.3	20'.0	159° 12'.6	21'.8	0° 03'.3	54'.3
10	333° 06'.9	347° 14'.7	29'.7	2° 34'.9	19'.3	174° 15'.4	21'.9	15° 05'.5	54'.2
11	348° 09'.4	2° 14'.2	28'.6	17° 35'.5	18'.6	189° 18'.1	22'.0	30° 07'.8	54'.2
12	3° 11'.9	17° 13'.8	7° 27'.4 S	32° 36'.1	13° 18'.0 S	204° 20'.8	10° 22'.1 N	45° 10'.0	16° 54'.1 S
13	18° 14'.3	32° 13'.4	26'.3	47° 36'.7	17'.3	219° 23'.5	22'.2	60° 12'.2	54'.0
14	33° 16'.8	47° 13'.0	25'.1	62° 37'.3	16'.7	234° 26'.2	22'.2	75° 14'.5	54'.0
15	48° 19'.3	62° 12'.5	24'.0	77° 37'.9	16'.0	249° 28'.9	22'.3	90° 16'.7	53'.9
16	63° 21'.7	77° 12'.1	22'.8	92° 38'.5	15'.4	264° 31'.6	22'.4	105° 18'.9	53'.8
17	78° 24'.2	92° 11'.7	21'.7	107° 39'.0	14'.7	279° 34'.3	22'.5	120° 21'.2	53'.8
18	93° 26'.6	107° 11'.3	20'.5	122° 39'.6	14'.0	294° 37'.0	22'.6	135° 23'.4	53'.7
19	108° 29'.1	122° 10'.8	19'.4	137° 40'.2	13'.4	309° 39'.7	22'.7	150° 25'.7	53'.7
20	123° 31'.6	137° 10'.4	18'.2	152° 40'.8	12'.7	324° 42'.4	22'.8	165° 27'.9	53'.6
21	138° 34'.0	152° 10'.0	17'.1	167° 41'.4	12'.1	339° 45'.1	22'.9	180° 30'.1	53'.5
22	153° 36'.5	167° 09'.6	15'.9	182° 42'.0	11'.4	354° 47'.8	23'.0	195° 32'.4	53'.5
23	168° 39'.0	182° 09'.1	14'.8	197° 42'.6	10'.7	9° 50'.5	23'.1	210° 34'.6	53'.4
26 Thursday 00	183° 41'.4	197° 08'.7	7° 13'.6 S	212° 43'.2	13° 10'.1 S	24° 53'.2	10° 23'.2 N	225° 36'.8	16° 53'.3 S
01	198° 43'.9	212° 08'.3	12'.5	227° 43'.8	09'.4	39° 55'.9	23'.2	240° 39'.1	53'.3
02	213° 46'.4	227° 07'.9	11'.3	242° 44'.4	08'.8	54° 58'.6	23'.3	255° 41'.3	53'.2
03	228° 48'.8	242° 07'.5	10'.2	257° 45'.0	08'.1	70° 01'.3	23'.4	270° 43'.6	53'.2
04	243° 51'.3	257° 07'.0	09'.0	272° 45'.6	07'.4	85° 04'.0	23'.5	285° 45'.8	53'.1
05	258° 53'.8	272° 06'.6	07'.9	287° 46'.2	06'.8	100° 06'.8	23'.6	300° 48'.0	53'.0
06	273° 56'.2	287° 06'.2	06'.7	302° 46'.8	06'.1	115° 09'.5	23'.7	315° 50'.3	53'.0
07	288° 58'.7	302° 05'.8	05'.6	317° 47'.4	05'.4	130° 12'.2	23'.8	330° 52'.5	52'.9
08	304° 01'.1	317° 05'.4	04'.4	332° 48'.0	04'.8	145° 14'.9	23'.9	345° 54'.7	52'.9
09	319° 03'.6	332° 04'.9	03'.3	347° 48'.6	04'.1	160° 17'.6	24'.0	0° 57'.0	52'.8
10	334° 06'.1	347° 04'.5	02'.1	2° 49'.1	03'.5	175° 20'.3	24'.1	15° 59'.2	52'.7
11	349° 08'.5	2° 04'.1	01'.0	17° 49'.7	02'.8	190° 23'.0	24'.2	31° 01'.5	52'.7
12	4° 11'.0	17° 03'.7	6° 59'.8 S	32° 50'.3	13° 02'.1 S	205° 25'.7	10° 24'.2 N	46° 03'.7	16° 52'.6 S
13	19° 13'.5	32° 03'.3	58'.6	47° 50'.9	01'.5	220° 28'.4	24'.3	61° 05'.9	52'.5
14	34° 15'.9	47° 02'.8	57'.5	62° 51'.5	00'.8	235° 31'.1	24'.4	76° 08'.2	52'.5
15	49° 18'.4	62° 02'.4	56'.3	77° 52'.1	00'.1	250° 33'.8	24'.5	91° 10'.4	52'.4
16	64° 20'.9	77° 02'.0	55'.2	92° 52'.7	12° 59'.5 S	265° 36'.5	24'.6	106° 12'.6	52'.4
17	79° 23'.3	92° 01'.6	54'.0	107° 53'.3	58'.8	280° 39'.2	24'.7	121° 14'.9	52'.3
18	94° 25'.8	107° 01'.2	52'.9	122° 53'.9	58'.2	295° 41'.9	24'.8	136° 17'.1	52'.2
19	109° 28'.3	122° 00'.8	51'.7	137° 54'.5	57'.5	310° 44'.6	24'.9	151° 19'.4	52'.2
20	124° 30'.7	137° 00'.3	50'.5	152° 55'.1	56'.8	325° 47'.3	25'.0	166° 21'.6	52'.1
21	139° 33'.2	151° 59'.9	49'.4	167° 55'.7	56'.2	340° 50'.0	25'.0	181° 23'.8	52'.0
22	154° 35'.6	166° 59'.5	48'.2	182° 56'.3	55'.5	355° 52'.7	25'.1	196° 26'.1	52'.0
23	169° 38'.1	181° 59'.1	47'.1	197° 56'.9	54'.8	10° 55'.4	25'.2	211° 28'.3	51'.9
27 Friday 00	184° 40'.6	196° 58'.7	6° 45'.9 S	212° 57'.5	12° 54'.2 S	25° 58'.1	10° 25'.3 N	226° 30'.6	16° 51'.9 S
01	199° 43'.0	211° 58'.3	44'.8	227° 58'.1	53'.5	41° 00'.8	25'.4	241° 32'.8	51'.8
02	214° 45'.5	226° 57'.8	43'.6	242° 58'.7	52'.8	56° 03'.5	25'.5	256° 35'.0	51'.7
03	229° 48'.0	241° 57'.4	42'.4	257° 59'.3	52'.2	71° 06'.2	25'.6	271° 37'.3	51'.7
04	244° 50'.4	256° 57'.0	41'.3	272° 59'.9	51'.5	86° 08'.9	25'.7	286° 39'.5	51'.6
05	259° 52'.9	271° 56'.6	40'.1	288° 00'.5	50'.8	101° 11'.6	25'.8	301° 41'.8	51'.6
06	274° 55'.4	286° 56'.2	39'.0	303° 01'.1	50'.2	116° 14'.3	25'.8	316° 44'.0	51'.5
07	289° 57'.8	301° 55'.8	37'.8	318° 01'.7	49'.5	131° 17'.0	25'.9	331° 46'.2	51'.4
08	305° 00'.3	316° 55'.3	36'.6	333° 02'.3	48'.8	146° 19'.7	26'.0	346° 48'.5	51'.4
09	320° 02'.8	331° 54'.9	35'.5	348° 02'.9	48'.2	161° 22'.4	26'.1	1° 50'.7	51'.3
10	335° 05'.2	346° 54'.5	34'.3	3° 03'.5	47'.5	176° 25'.1	26'.2	16° 53'.0	51'.3
11	350° 07'.7	1° 54'.1	33'.2	18° 04'.1	46'.8	191° 27'.8	26'.3	31° 55'.2	51'.2
12	5° 10'.1	16° 53'.7	6° 32'.0 S	33° 04'.7	12° 46'.2 S	206° 30'.4	10° 26'.4 N	46° 57'.4	16° 51'.1 S
13	20° 12'.6	31° 53'.3	30'.8	48° 05'.3	45'.5	221° 33'.1	26'.5	61° 59'.7	51'.1
14	35° 15'.1	46° 52'.9	29'.7	63° 05'.9	44'.8	236° 35'.8	26'.5	77° 01'.9	51'.0
15	50° 17'.5	61° 52'.5	28'.5	78° 06'.5	44'.2	251° 38'.5	26'.6	92° 04'.2	50'.9
16	65° 20'.0	76° 52'.0	27'.3	93° 07'.1	43'.5	266° 41'.2	26'.7	107° 06'.4	50'.9
17	80° 22'.5	91° 51'.6	26'.2	108° 07'.7	42'.8	281° 43'.9	26'.8	122° 08'.6	50'.8
18	95° 24'.9	106° 51'.2	25'.0	123° 08'.3	42'.1	296° 46'.6	26'.9	137° 10'.9	50'.8
19	110° 27'.4	121° 50'.8	23'.8	138° 08'.9	41'.5	311° 49'.3	27'.0	152° 13'.1	50'.7
20	125° 29'.9	136° 50'.4	22'.7	153° 09'.5	40'.8	326° 52'.0	27'.1	167° 15'.4	50'.6
21	140° 32'.3	151° 50'.0	21'.5	168° 10'.1	40'.1	341° 54'.7	27'.2	182° 17'.6	50'.6
22	155° 34'.8	166° 49'.6	20'.4	183° 10'.7	39'.5	356° 57'.4	27'.2	197° 19'.8	50'.5
23	170° 37'.2	181° 49'.2	19'.2	198° 11'.3	38'.8	12° 00'.1	27'.3	212° 22'.1	50'.5
	M.P. 11:39	v -0'.4	d 1'.2	v 0'.6	d 0'.7	v 2'.7	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.6	40° 20'.3 S
Achernar	335° 38'.9	57° 16'.6 S
Acrux	173° 26'.6	63° 03'.5 S
Adhara	255° 24'.9	28° 57'.9 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 33'.9	55° 59'.9 N
Alkaid	153° 10'.8	49° 20'.8 N
Alnair	28° 03'.8	46° 59'.8 S
Alnilam	276° 02'.5	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.2	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.8 N
Altair	62° 23'.8	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.9 S
Antares	112° 45'.6	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.1 N
Atria	108° 01'.6	69° 00'.7 S
Avior	234° 24'.3	59° 29'.4 S
Bellatrix	278° 49'.1	6° 20'.5 N
Betelgeuse	271° 18'.5	7° 24'.3 N
Canopus	264° 03'.2	52° 41'.8 S
Capella	280° 58'.0	45° 59'.6 N
Deneb	49° 42'.6	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.5 N
Elnath	278° 32'.8	28° 36'.2 N
Eltanin	90° 53'.4	51° 29'.0 N
Enif	34° 02'.9	9° 50'.3 N
Fomalhaut	15° 41'.7	29° 39'.8 S
Gacrux	172° 18'.2	57° 04'.4 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.2 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.8	34° 23'.3 S
Kochab	137° 18'.2	74° 10'.9 N
Markab	13° 54'.5	15° 09'.7 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 26'.0	36° 20'.1 S
Miaplacidus	221° 42'.6	69° 41'.4 S
Mirfak	309° 03'.5	49° 50'.2 N
Nunki	76° 18'.0	26° 18'.4 S
Peacock	53° 44'.3	56° 45'.4 S
Polaris	324° 24'.2	89° 14'.0 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.2	5° 14'.6 N
Rasalhague	96° 21'.1	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.4	8° 12'.7 S
Rigil Kent	140° 13'.0	60° 48'.1 S
Sabik	102° 30'.6	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.8 N
Shaula	96° 43'.4	37° 05'.9 S
Sirius	258° 47'.6	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.9	43° 24'.4 S
Vega	80° 49'.7	38° 46'.3 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	13° 27'.3	10:52
Mars	29° 01'.8	09:49
Jupiter	201° 11'.8	22:16
Saturn	41° 55'.4	08:56

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
178° 29'.3	1° 49'.6 N	281° 07'.2	9'.8	24° 20'.8 S	0'.9	55'.2
193° 29'.5	50'.6	295° 36'.0	9'.9	19'.9	1'.1	
208° 29'.7	51'.5	310° 04'.9	9'.9	18'.8	1'.1	
223° 29'.9	52'.5	324° 33'.8	9'.9	17'.7	1'.3	
238° 30'.1	53'.5	339° 02'.7	10'.0	16'.4	1'.4	55'.1
253° 30'.3	54'.5	353° 31'.7	10'.0	15'.0	1'.5	
268° 30'.5	55'.5	8° 00'.7	10'.1	13'.5	1'.7	
283° 30'.7	56'.5	22° 29'.8	10'.1	11'.8	1'.7	
298° 30'.9	57'.4	36° 58'.9	10'.1	10'.1	1'.9	55'.0
313° 31'.0	58'.4	51° 28'.0	10'.2	08'.2	2'.0	
328° 31'.2	59'.4	65° 57'.2	10'.3	06'.2	2'.1	
343° 31'.4	2° 00'.4 N	80° 26'.5	10'.3	04'.1	2'.2	
358° 31'.6	2° 01'.4 N	94° 55'.8	10'.3	24° 01'.9 S	2'.4	55'.0
13° 31'.8	02'.3	109° 25'.1	10'.4	23° 59'.5 S	2'.4	54'.9
28° 32'.0	03'.3	123° 54'.5	10'.4	57'.1	2'.6	
43° 32'.2	04'.3	138° 23'.9	10'.5	54'.5	2'.7	
58° 32'.4	05'.3	152° 53'.4	10'.5	51'.8	2'.8	
73° 32'.6	06'.3	167° 22'.9	10'.6	49'.0	3'.0	
88° 32'.7	07'.3	181° 52'.5	10'.6	46'.0	3'.0	54'.8
103° 32'.9	08'.2	196° 22'.1	10'.7	43'.0	3'.1	
118° 33'.1	09'.2	210° 51'.8	10'.7	39'.9	3'.3	
133° 33'.3	10'.2	225° 21'.5	10'.8	36'.6	3'.4	
148° 33'.5	11'.2	239° 51'.3	10'.8	33'.2	3'.5	
163° 33'.7	12'.2	254° 21'.1	10'.9	29'.7	3'.6	54'.7
178° 33'.9	2° 13'.1 N	268° 51'.0	10'.9	23° 26'.1 S	3'.7	54'.7
193° 34'.1	14'.1	283° 20'.9	11'.0	22'.4	3'.8	
208° 34'.3	15'.1	297° 50'.9	11'.0	18'.6	3'.9	
223° 34'.5	16'.1	312° 20'.9	11'.1	14'.7	4'.1	
238° 34'.6	17'.1	326° 51'.0	11'.1	10'.6	4'.1	54'.6
253° 34'.8	18'.0	341° 21'.1	11'.2	06'.5	4'.3	
268° 35'.0	19'.0	355° 51'.3	11'.3	02'.2	4'.3	
283° 35'.2	20'.0	10° 21'.6	11'.3	22° 57'.9 S	4'.5	
298° 35'.4	21'.0	24° 51'.9	11'.3	53'.4	4'.5	
313° 35'.6	22'.0	39° 22'.2	11'.4	48'.9	4'.7	
328° 35'.8	22'.9	53° 52'.6	11'.5	44'.2	4'.8	54'.5
343° 36'.0	23'.9	68° 23'.1	11'.5	39'.4	4'.9	
358° 36'.2	2° 24'.9 N	82° 53'.6	11'.6	22° 34'.5 S	5'.0	54'.5
13° 36'.3	25'.9	97° 24'.2	11'.6	29'.5	5'.0	
28° 36'.5	26'.9	111° 54'.8	11'.7	24'.5	5'.2	
43° 36'.7	27'.8	126° 25'.5	11'.7	19'.3	5'.3	
58° 36'.9	28'.8	140° 56'.2	11'.8	14'.0	5'.4	
73° 37'.1	29'.8	155° 27'.0	11'.9	08'.6	5'.5	54'.4
88° 37'.3	30'.8	169° 57'.9	11'.9	03'.1	5'.6	
103° 37'.5	31'.8	184° 28'.8	11'.9	21° 57'.5 S	5'.6	
118° 37'.7	32'.7	198° 59'.7	12'.1	51'.9	5'.8	
133° 37'.9	33'.7	213° 30'.8	12'.0	46'.1	5'.9	
148° 38'.1	34'.7	228° 01'.8	12'.1	40'.2	5'.9	
163° 38'.2	35'.7	242° 32'.9	12'.2	34'.3	6'.1	
178° 38'.4	2° 36'.7 N	257° 04'.1	12'.3	21° 28'.2 S	6'.2	54'.4
193° 38'.6	37'.6	271° 35'.4	12'.3	22'.0	6'.2	
208° 38'.8	38'.6	286° 06'.7	12'.3	15'.8	6'.4	54'.3
223° 39'.0	39'.6	300° 38'.0	12'.4	09'.4	6'.4	
238° 39'.2	40'.6	315° 09'.4	12'.5	03'.0	6'.5	
253° 39'.4	41'.5	329° 40'.9	12'.5	20° 56'.5 S	6'.7	
268° 39'.6	42'.5	344° 12'.4	12'.6	49'.8	6'.7	
283° 39'.8	43'.5	358° 44'.0	12'.6	43'.1	6'.8	
298° 39'.9	44'.5	13° 15'.6	12'.7	36'.3	6'.9	
313° 40'.1	45'.5	27° 47'.3	12'.7	29'.4	6'.9	
328° 40'.3	46'.4	42° 19'.0	12'.8	22'.5	7'.1	
343° 40'.5	47'.4	56° 50'.8	12'.8	15'.4	7'.1	
358° 40'.7	2° 48'.4 N	71° 22'.6	12'.9	20° 08'.3 S	7'.3	54'.3
13° 40'.9	49'.4	85° 54'.5	13'.0	01'.0	7'.3	54'.2
28° 41'.1	50'.4	100° 26'.5	13'.0	19° 53'.7 S	7'.4	
43° 41'.3	51'.3	114° 58'.5	13'.0	46'.3	7'.5	
58° 41'.5	52'.3	129° 30'.5	13'.1	38'.8	7'.6	
73° 41'.7	53'.3	144° 02'.6	13'.2	31'.2	7'.6	
88° 41'.8	54'.3	158° 34'.8	13'.2	23'.6	7'.8	
103° 42'.0	55'.2	173° 07'.0	13'.3	15'.8	7'.8	
118° 42'.2	56'.2	187° 39'.3	13'.3	08'.0	7'.9	
133° 42'.4	57'.2	202° 11'.6	13'.4	00'.1	8'.0	
148° 42'.6	58'.2	216° 44'.0	13'.4	18° 52'.1 S	8'.1	
163° 42'.8	59'.1	231° 16'.4	13'.5	44'.0	8'.1	
SD 16'.0	d 1'.0	SD 15'.0		14'.9	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
25	6 03	5 54	12:06	05:27	17:52	21d 56%
26	5 45	5 36	12:06	06:17	18:41	22d 46%
27	5 27	5 18	12:05	07:05	19:28	23d 37%

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1992 March 28, 29, 30 (Sat, Sun, Mon)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.4		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
28 Saturday 00	185° 39'.7	196° 48'.8	6° 18'.0 S	213° 11'.9	12° 38'.1 S	27° 02'.8	10° 27'.4 N	227° 24'.3	16° 50'.4 S
01	200° 42'.2	211° 48'.4	16'.9	228° 12'.5	37'.5	42° 05'.5	27'.5	242° 26'.6	50'.3
02	215° 44'.6	226° 47'.9	15'.7	243° 13'.1	36'.8	57° 08'.2	27'.6	257° 28'.8	50'.3
03	230° 47'.1	241° 47'.5	14'.5	258° 13'.7	36'.1	72° 10'.9	27'.7	272° 31'.1	50'.2
04	245° 49'.6	256° 47'.1	13'.4	273° 14'.3	35'.4	87° 13'.6	27'.8	287° 33'.3	50'.2
05	260° 52'.0	271° 46'.7	12'.2	288° 14'.9	34'.8	102° 16'.3	27'.8	302° 35'.5	50'.1
06	275° 54'.5	286° 46'.3	11'.0	303° 15'.5	34'.1	117° 19'.0	27'.9	317° 37'.8	50'.0
07	290° 57'.0	301° 45'.9	09'.9	318° 16'.1	33'.4	132° 21'.6	28'.0	332° 40'.0	50'.0
08	305° 59'.4	316° 45'.5	08'.7	333° 16'.7	32'.8	147° 24'.3	28'.1	347° 42'.3	49'.9
09	321° 01'.9	331° 45'.1	07'.5	348° 17'.3	32'.1	162° 27'.0	28'.2	2° 44'.5	49'.9
10	336° 04'.4	346° 44'.7	06'.3	3° 17'.9	31'.4	177° 29'.7	28'.3	17° 46'.8	49'.8
11	351° 06'.8	1° 44'.3	05'.2	18° 18'.5	30'.7	192° 32'.4	28'.4	32° 49'.0	49'.7
12	6° 09'.3	16° 43'.9	6° 04'.0 S	33° 19'.1	12° 30'.1 S	207° 35'.1	10° 28'.4 N	47° 51'.2	16° 49'.7 S
13	21° 11'.7	31° 43'.5	02'.8	48° 19'.7	29'.4	222° 37'.8	28'.5	62° 53'.5	49'.6
14	36° 14'.2	46° 43'.0	01'.7	63° 20'.3	28'.7	237° 40'.5	28'.6	77° 55'.7	49'.6
15	51° 16'.7	61° 42'.6	00'.5	78° 20'.9	28'.0	252° 43'.2	28'.7	92° 58'.0	49'.5
16	66° 19'.1	76° 42'.2	5° 59'.3 S	93° 21'.5	27'.4	267° 45'.9	28'.8	108° 00'.2	49'.4
17	81° 21'.6	91° 41'.8	58'.2	108° 22'.1	26'.7	282° 48'.6	28'.9	123° 02'.5	49'.4
18	96° 24'.1	106° 41'.4	57'.0	123° 22'.7	26'.0	297° 51'.2	29'.0	138° 04'.7	49'.3
19	111° 26'.5	121° 41'.0	55'.8	138° 23'.3	25'.3	312° 53'.9	29'.0	153° 07'.0	49'.3
20	126° 29'.0	136° 40'.6	54'.6	153° 23'.9	24'.7	327° 56'.6	29'.1	168° 09'.2	49'.2
21	141° 31'.5	151° 40'.2	53'.5	168° 24'.5	24'.0	342° 59'.3	29'.2	183° 11'.4	49'.1
22	156° 33'.9	166° 39'.8	52'.3	183° 25'.1	23'.3	358° 02'.0	29'.3	198° 13'.7	49'.1
23	171° 36'.4	181° 39'.4	51'.1	198° 25'.7	22'.6	13° 04'.7	29'.4	213° 15'.9	49'.0
29 Sunday 00	186° 38'.9	196° 39'.0	5° 49'.9 S	213° 26'.3	12° 22'.0 S	28° 07'.4	10° 29'.5 N	228° 18'.2	16° 49'.0 S
01	201° 41'.3	211° 38'.6	48'.8	228° 26'.9	21'.3	43° 10'.1	29'.5	243° 20'.4	48'.9
02	216° 43'.8	226° 38'.2	47'.6	243° 27'.5	20'.6	58° 12'.8	29'.6	258° 22'.7	48'.8
03	231° 46'.2	241° 37'.8	46'.4	258° 28'.2	19'.9	73° 15'.4	29'.7	273° 24'.9	48'.8
04	246° 48'.7	256° 37'.4	45'.3	273° 28'.8	19'.3	88° 18'.1	29'.8	288° 27'.2	48'.7
05	261° 51'.2	271° 37'.0	44'.1	288° 29'.4	18'.6	103° 20'.8	29'.9	303° 29'.4	48'.7
06	276° 53'.6	286° 36'.6	42'.9	303° 30'.0	17'.9	118° 23'.5	30'.0	318° 31'.6	48'.6
07	291° 56'.1	301° 36'.2	41'.7	318° 30'.6	17'.2	133° 26'.2	30'.0	333° 33'.9	48'.5
08	306° 58'.6	316° 35'.8	40'.6	333° 31'.2	16'.6	148° 28'.9	30'.1	348° 36'.1	48'.5
09	322° 01'.0	331° 35'.4	39'.4	348° 31'.8	15'.9	163° 31'.6	30'.2	3° 38'.4	48'.4
10	337° 03'.5	346° 35'.0	38'.2	3° 32'.4	15'.2	178° 34'.3	30'.3	18° 40'.6	48'.4
11	352° 06'.0	1° 34'.6	37'.0	18° 33'.0	14'.5	193° 36'.9	30'.4	33° 42'.9	48'.3
12	7° 08'.4	16° 34'.2	5° 35'.9 S	33° 33'.6	12° 13'.9 S	208° 39'.6	10° 30'.5 N	48° 45'.1	16° 48'.2 S
13	22° 10'.9	31° 33'.8	34'.7	48° 34'.2	13'.2	223° 42'.3	30'.5	63° 47'.4	48'.2
14	37° 13'.3	46° 33'.4	33'.5	63° 34'.8	12'.5	238° 45'.0	30'.6	78° 49'.6	48'.1
15	52° 15'.8	61° 33'.0	32'.3	78° 35'.4	11'.8	253° 47'.7	30'.7	93° 51'.9	48'.1
16	67° 18'.3	76° 32'.6	31'.1	93° 36'.0	11'.1	268° 50'.4	30'.8	108° 54'.1	48'.0
17	82° 20'.7	91° 32'.2	30'.0	108° 36'.6	10'.5	283° 53'.1	30'.9	123° 56'.4	47'.9
18	97° 23'.2	106° 31'.7	28'.8	123° 37'.2	09'.8	298° 55'.7	31'.0	138° 58'.6	47'.9
19	112° 25'.7	121° 31'.3	27'.6	138° 37'.9	09'.1	313° 58'.4	31'.0	154° 00'.8	47'.8
20	127° 28'.1	136° 31'.0	26'.4	153° 38'.5	08'.4	329° 01'.1	31'.1	169° 03'.1	47'.8
21	142° 30'.6	151° 30'.6	25'.3	168° 39'.1	07'.7	344° 03'.8	31'.2	184° 05'.3	47'.7
22	157° 33'.1	166° 30'.2	24'.1	183° 39'.7	07'.1	359° 06'.5	31'.3	199° 07'.6	47'.6
23	172° 35'.5	181° 29'.8	22'.9	198° 40'.3	06'.4	14° 09'.2	31'.4	214° 09'.8	47'.6
30 Monday 00	187° 38'.0	196° 29'.4	5° 21'.7 S	213° 40'.9	12° 05'.7 S	29° 11'.8	10° 31'.4 N	229° 12'.1	16° 47'.5 S
01	202° 40'.5	211° 29'.0	20'.5	228° 41'.5	05'.0	44° 14'.5	31'.5	244° 14'.3	47'.5
02	217° 42'.9	226° 28'.6	19'.4	243° 42'.1	04'.3	59° 17'.2	31'.6	259° 16'.6	47'.4
03	232° 45'.4	241° 28'.2	18'.2	258° 42'.7	03'.7	74° 19'.9	31'.7	274° 18'.8	47'.4
04	247° 47'.8	256° 27'.8	17'.0	273° 43'.3	03'.0	89° 22'.6	31'.8	289° 21'.1	47'.3
05	262° 50'.3	271° 27'.4	15'.8	288° 43'.9	02'.3	104° 25'.3	31'.9	304° 23'.3	47'.2
06	277° 52'.8	286° 27'.0	14'.6	303° 44'.5	01'.6	119° 27'.9	31'.9	319° 25'.6	47'.2
07	292° 55'.2	301° 26'.6	13'.4	318° 45'.2	00'.9	134° 30'.6	32'.0	334° 27'.8	47'.1
08	307° 57'.7	316° 26'.2	12'.3	333° 45'.8	00'.3	149° 33'.3	32'.1	349° 30'.1	47'.1
09	323° 00'.2	331° 25'.8	11'.1	348° 46'.4	11° 59'.6 S	164° 36'.0	32'.2	4° 32'.3	47'.0
10	338° 02'.6	346° 25'.4	09'.9	3° 47'.0	58'.9	179° 38'.7	32'.3	19° 34'.6	46'.9
11	353° 05'.1	1° 25'.0	08'.7	18° 47'.6	58'.2	194° 41'.3	32'.3	34° 36'.8	46'.9
12	8° 07'.6	16° 24'.6	5° 07'.5 S	33° 48'.2	11° 57'.5 S	209° 44'.0	10° 32'.4 N	49° 39'.1	16° 46'.8 S
13	23° 10'.0	31° 24'.2	06'.4	48° 48'.8	56'.8	224° 46'.7	32'.5	64° 41'.3	46'.8
14	38° 12'.5	46° 23'.8	05'.2	63° 49'.4	56'.2	239° 49'.4	32'.6	79° 43'.6	46'.7
15	53° 14'.9	61° 23'.4	04'.0	78° 50'.0	55'.5	254° 52'.1	32'.7	94° 45'.8	46'.6
16	68° 17'.4	76° 23'.0	02'.8	93° 50'.6	54'.8	269° 54'.7	32'.7	109° 48'.1	46'.6
17	83° 19'.9	91° 22'.6	01'.6	108° 51'.2	54'.1	284° 57'.4	32'.8	124° 50'.3	46'.5
18	98° 22'.3	106° 22'.2	00'.4	123° 51'.9	53'.4	300° 00'.1	32'.9	139° 52'.6	46'.5
19	113° 24'.8	121° 21'.8	4° 59'.3 S	138° 52'.5	52'.7	315° 02'.8	33'.0	154° 54'.8	46'.4
20	128° 27'.3	136° 21'.4	58'.1	153° 53'.1	52'.1	330° 05'.5	33'.1	169° 57'.1	46'.4
21	143° 29'.7	151° 21'.0	56'.9	168° 53'.7	51'.4	345° 08'.1	33'.1	184° 59'.3	46'.3
22	158° 32'.2	166° 20'.6	55'.7	183° 54'.3	50'.7	0° 10'.8	33'.2	200° 01'.6	46'.2
23	173° 34'.7	181° 20'.2	54'.5	198° 54'.9	50'.0	15° 13'.5	33'.3	215° 03'.8	46'.2
	M.P. 11:28	v -0'.4	d 1'.2	v 0'.6	d 0'.7	v 2'.7	d 0'.1	v 2'.2	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.6	40° 20'.3 S
Achernar	335° 38'.9	57° 16'.6 S
Acrux	173° 26'.6	63° 03'.6 S
Adhara	255° 25'.0	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.8	55° 59'.9 N
Alkaid	153° 10'.8	49° 20'.8 N
Alnair	28° 03'.8	46° 59'.8 S
Alnilam	276° 02'.5	1° 12'.5 S
Alphard	218° 11'.4	8° 37'.7 S
Alphecca	126° 24'.1	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.8 N
Altair	62° 23'.8	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.9 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.5	69° 00'.7 S
Avior	234° 24'.3	59° 29'.4 S
Bellatrix	278° 49'.1	6° 20'.5 N
Betelgeuse	271° 18'.5	7° 24'.3 N
Canopus	264° 03'.2	52° 41'.8 S
Capella	280° 58'.1	45° 59'.6 N
Deneb	49° 42'.6	45° 14'.9 N
Denebola	182° 49'.4	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.5 N
Elnath	278° 32'.8	28° 36'.2 N
Eltanin	90° 53'.4	51° 29'.0 N
Enif	34° 02'.9	9° 50'.3 N
Fomalhaut	15° 41'.7	29° 39'.8 S
Gacrux	172° 18'.2	57° 04'.4 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.2 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.8	34° 23'.3 S
Kochab	137° 18'.2	74° 10'.9 N
Markab	13° 54'.4	15° 09'.7 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 26'.0	36° 20'.1 S
Miaplacidus	221° 42'.7	69° 41'.5 S
Mirfak	309° 03'.5	49° 50'.2 N
Nunki	76° 17'.9	26° 18'.4 S
Peacock	53° 44'.3	56° 45'.4 S
Polaris	324° 24'.8	89° 14'.0 N
Pollux	243° 46'.9	28° 02'.7 N
Procyon	245° 16'.2	5° 14'.6 N
Rasalhague	96° 21'.1	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.4	8° 12'.7 S
Rigil Kent	140° 12'.9	60° 48'.1 S
Sabik	102° 30'.6	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.7 N
Shaula	96° 43'.3	37° 05'.9 S
Sirius	258° 47'.7	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.9	43° 24'.4 S
Vega	80° 49'.7	38° 46'.3 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	10° 00'.1	10:54
Mars	26° 47'.5	09:46
Jupiter	201° 28'.5	22:04
Saturn	41° 39'.3	08:45

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
178° 43'.0	3° 00'.1 N	245° 48'.9	13'.5	18° 35'.9 S	8'.2	54'.2
193° 43'.2	01'.1	260° 21'.4	13'.6	27'.7	8'.3	
208° 43'.4	02'.1	274° 54'.0	13'.6	19'.4	8'.4	
223° 43'.5	03'.1	289° 26'.6	13'.7	11'.0	8'.4	
238° 43'.7	04'.0	303° 59'.3	13'.7	02'.6	8'.6	
253° 43'.9	05'.0	318° 32'.0	13'.7	17° 54'.0 S	8'.6	
268° 44'.1	06'.0	333° 04'.7	13'.9	45'.4	8'.6	
283° 44'.3	07'.0	347° 37'.6	13'.8	36'.8	8'.8	
298° 44'.5	07'.9	2° 10'.4	13'.9	28'.0	8'.8	
313° 44'.7	08'.9	16° 43'.3	14'.0	19'.2	8'.9	
328° 44'.9	09'.9	31° 16'.3	14'.0	10'.3	9'.0	
343° 45'.1	10'.9	45° 49'.3	14'.1	01'.3	9'.0	
358° 45'.2	3° 11'.8 N	60° 22'.4	14'.1	16° 52'.3 S	9'.1	54'.2
13° 45'.4	12'.8	74° 55'.5	14'.1	43'.2	9'.2	
28° 45'.6	13'.8	89° 28'.6	14'.2	34'.0	9'.2	
43° 45'.8	14'.8	104° 01'.8	14'.2	24'.8	9'.3	
58° 46'.0	15'.7	118° 35'.0	14'.3	15'.5	9'.4	
73° 46'.2	16'.7	133° 08'.3	14'.3	06'.1	9'.4	
88° 46'.4	17'.7	147° 41'.6	14'.4	15° 56'.7 S	9'.5	
103° 46'.6	18'.7	162° 15'.0	14'.4	47'.2	9'.6	
118° 46'.8	19'.6	176° 48'.4	14'.5	37'.6	9'.7	
133° 46'.9	20'.6	191° 21'.9	14'.4	27'.9	9'.7	
148° 47'.1	21'.6	205° 55'.3	14'.6	18'.2	9'.7	
163° 47'.3	22'.6	220° 28'.9	14'.5	08'.5	9'.9	
178° 47'.5	3° 23'.5 N	235° 02'.4	14'.6	14° 58'.6 S	9'.9	54'.2
193° 47'.7	24'.5	249° 36'.0	14'.7	48'.7	9'.9	
208° 47'.9	25'.5	264° 09'.7	14'.7	38'.8	10'.0	
223° 48'.1	26'.5	278° 43'.4	14'.7	28'.8	10'.1	
238° 48'.3	27'.4	293° 17'.1	14'.7	18'.7	10'.1	
253° 48'.4	28'.4	307° 50'.8	14'.8	08'.6	10'.2	
268° 48'.6	29'.4	322° 24'.6	14'.9	13° 58'.4 S	10'.3	
283° 48'.8	30'.3	336° 58'.5	14'.8	48'.1	10'.3	
298° 49'.0	31'.3	351° 32'.3	14'.9	37'.8	10'.3	
313° 49'.2	32'.3	6° 06'.2	15'.0	27'.5	10'.5	
328° 49'.4	33'.3	20° 40'.2	14'.9	17'.0	10'.4	
343° 49'.6	34'.2	35° 14'.1	15'.0	06'.6	10'.6	
358° 49'.8	3° 35'.2 N	49° 48'.1	15'.0	12° 56'.0 S	10'.6	54'.2
13° 50'.0	36'.2	64° 22'.1	15'.1	45'.4	10'.6	
28° 50'.1	37'.2	78° 56'.2	15'.1	34'.8	10'.7	
43° 50'.3	38'.1	93° 30'.3	15'.1	24'.1	10'.7	
58° 50'.5	39'.1	108° 04'.4	15'.2	13'.4	10'.8	
73° 50'.7	40'.1	122° 38'.6	15'.1	02'.6	10'.9	
88° 50'.9	41'.0	137° 12'.7	15'.2	11° 51'.7 S	10'.9	54'.3
103° 51'.1	42'.0	151° 46'.9	15'.3	40'.8	10'.9	
118° 51'.3	43'.0	166° 21'.2	15'.2	29'.9	11'.0	
133° 51'.5	44'.0	180° 55'.4	15'.3	18'.9	11'.1	
148° 51'.6	44'.9	195° 29'.7	15'.3	07'.8	11'.1	
163° 51'.8	45'.9	210° 04'.0	15'.3	10° 56'.7 S	11'.1	
178° 52'.0	3° 46'.9 N	224° 38'.3	15'.4	10° 45'.6 S	11'.2	54'.3
193° 52'.2	47'.8	239° 12'.7	15'.4	34'.4	11'.2	
208° 52'.4	48'.8	253° 47'.1	15'.4	23'.2	11'.3	
223° 52'.6	49'.8	268° 21'.5	15'.4	11'.9	11'.3	
238° 52'.8	50'.8	282° 55'.9	15'.4	00'.6	11'.4	
253° 53'.0	51'.7	297° 30'.3	15'.5	9° 49'.2 S	11'.4	
268° 53'.1	52'.7	312° 04'.8	15'.5	37'.8	11'.4	54'.4
283° 53'.3	53'.7	326° 39'.3	15'.5	26'.4	11'.5	
298° 53'.5	54'.6	341° 13'.8	15'.5	14'.9	11'.6	
313° 53'.7	55'.6	355° 48'.3	15'.5	03'.3	11'.5	
328° 53'.9	56'.6	10° 22'.8	15'.5	8° 51'.8 S	11'.6	
343° 54'.1	57'.6	24° 57'.3	15'.6	40'.2	11'.7	
358° 54'.3	3° 58'.5 N	39° 31'.9	15'.6	8° 28'.5 S	11'.7	54'.4
13° 54'.5	59'.5	54° 06'.5	15'.6	16'.8	11'.7	
28° 54'.6	4° 00'.5 N	68° 41'.1	15'.6	05'.1	11'.8	
43° 54'.8	01'.4	83° 15'.7	15'.6	7° 53'.3 S	11'.8	54'.5
58° 55'.0	02'.4	97° 50'.3	15'.6	41'.5	11'.8	
73° 55'.2	03'.4	112° 24'.9	15'.6	29'.7	11'.9	
88° 55'.4	04'.3	126° 59'.5	15'.7	17'.8	11'.9	
103° 55'.6	05'.3	141° 34'.2	15'.6	05'.9	11'.9	
118° 55'.8	06'.3	156° 08'.8	15'.7	6° 54'.0 S	12'.0	
133° 56'.0	07'.2	170° 43'.5	15'.7	42'.0	12'.0	
148° 56'.1	08'.2	185° 18'.2	15'.6	30'.0	12'.1	
163° 56'.3	09'.2	199° 52'.8	15'.7	17'.9	12'.0	54'.6
SD 16'.0	d 1'.0	SD	14'.8	14'.8	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
28	5 08	4 59	12:05	07:51	20:13	24d 28%
29	4 50	4 41	12:05	08:35	20:56	25d 20%
30	4 32	4 23	12:04	09:17	21:38	26d 13%

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1992 Mar 31, Apr. 1, 2 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.4		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
31 Tuesday 00	188° 37'.1	196° 19'.8	4° 53'.3 S	213° 55'.5	11° 49'.3 S	30° 16'.2	10° 33'.4 N	230° 06'.1	16° 46'.1 S
01	203° 39'.6	211° 19'.4	52'.1	228° 56'.1	48'.6	45° 18'.9	33'.5	245° 08'.3	46'.1
02	218° 42'.1	226° 19'.0	51'.0	243° 56'.8	48'.0	60° 21'.5	33'.5	260° 10'.6	46'.0
03	233° 44'.5	241° 18'.7	49'.8	258° 57'.4	47'.3	75° 24'.2	33'.6	275° 12'.8	45'.9
04	248° 47'.0	256° 18'.3	48'.6	273° 58'.0	46'.6	90° 26'.9	33'.7	290° 15'.1	45'.9
05	263° 49'.4	271° 17'.9	47'.4	288° 58'.6	45'.9	105° 29'.6	33'.8	305° 17'.3	45'.8
06	278° 51'.9	286° 17'.5	46'.2	303° 59'.2	45'.2	120° 32'.2	33'.8	320° 19'.6	45'.8
07	293° 54'.4	301° 17'.1	45'.0	318° 59'.8	44'.5	135° 34'.9	33'.9	335° 21'.8	45'.7
08	308° 56'.8	316° 16'.7	43'.8	334° 00'.4	43'.8	150° 37'.6	34'.0	350° 24'.1	45'.7
09	323° 59'.3	331° 16'.3	42'.6	349° 01'.0	43'.2	165° 40'.3	34'.1	5° 26'.3	45'.6
10	339° 01'.8	346° 15'.9	41'.5	4° 01'.7	42'.5	180° 42'.9	34'.2	20° 28'.6	45'.5
11	354° 04'.2	1° 15'.5	40'.3	19° 02'.3	41'.8	195° 45'.6	34'.2	35° 30'.8	45'.5
12	9° 06'.7	16° 15'.1	4° 39'.1 S	34° 02'.9	11° 41'.1 S	210° 48'.3	10° 34'.3 N	50° 33'.1	16° 45'.4 S
13	24° 09'.2	31° 14'.7	37'.9	49° 03'.5	40'.4	225° 51'.0	34'.4	65° 35'.3	45'.4
14	39° 11'.6	46° 14'.3	36'.7	64° 04'.1	39'.7	240° 53'.6	34'.5	80° 37'.6	45'.3
15	54° 14'.1	61° 13'.9	35'.5	79° 04'.7	39'.0	255° 56'.3	34'.6	95° 39'.8	45'.2
16	69° 16'.6	76° 13'.6	34'.3	94° 05'.3	38'.3	270° 59'.0	34'.6	110° 42'.1	45'.2
17	84° 19'.0	91° 13'.2	33'.1	109° 06'.0	37'.7	286° 01'.7	34'.7	125° 44'.3	45'.1
18	99° 21'.5	106° 12'.8	31'.9	124° 06'.6	37'.0	301° 04'.3	34'.8	140° 46'.6	45'.1
19	114° 23'.9	121° 12'.4	30'.8	139° 07'.2	36'.3	316° 07'.0	34'.9	155° 48'.8	45'.0
20	129° 26'.4	136° 12'.0	29'.6	154° 07'.8	35'.6	331° 09'.7	34'.9	170° 51'.1	45'.0
21	144° 28'.9	151° 11'.6	28'.4	169° 08'.4	34'.9	346° 12'.4	35'.0	185° 53'.3	44'.9
22	159° 31'.3	166° 11'.2	27'.2	184° 09'.0	34'.2	1° 15'.0	35'.1	200° 55'.6	44'.8
23	174° 33'.8	181° 10'.8	26'.0	199° 09'.6	33'.5	16° 17'.7	35'.2	215° 57'.8	44'.8
1 Wednesday 00	189° 36'.3	196° 10'.4	4° 24'.8 S	214° 10'.3	11° 32'.8 S	31° 20'.4	10° 35'.2 N	231° 00'.1	16° 44'.7 S
01	204° 38'.7	211° 10'.0	23'.6	229° 10'.9	32'.1	46° 23'.0	35'.3	246° 02'.4	44'.7
02	219° 41'.2	226° 09'.6	22'.4	244° 11'.5	31'.5	61° 25'.7	35'.4	261° 04'.6	44'.6
03	234° 43'.7	241° 09'.3	21'.2	259° 12'.1	30'.8	76° 28'.4	35'.5	276° 06'.9	44'.6
04	249° 46'.1	256° 08'.9	20'.0	274° 12'.7	30'.1	91° 31'.1	35'.6	291° 09'.1	44'.5
05	264° 48'.6	271° 08'.5	18'.8	289° 13'.3	29'.4	106° 33'.7	35'.6	306° 11'.4	44'.4
06	279° 51'.0	286° 08'.1	17'.7	304° 13'.9	28'.7	121° 36'.4	35'.7	321° 13'.6	44'.4
07	294° 53'.5	301° 07'.7	16'.5	319° 14'.6	28'.0	136° 39'.1	35'.8	336° 15'.9	44'.3
08	309° 56'.0	316° 07'.3	15'.3	334° 15'.2	27'.3	151° 41'.7	35'.9	351° 18'.1	44'.3
09	324° 58'.4	331° 06'.9	14'.1	349° 15'.8	26'.6	166° 44'.4	35'.9	6° 20'.4	44'.2
10	340° 00'.9	346° 06'.5	12'.9	4° 16'.4	25'.9	181° 47'.1	36'.0	21° 22'.6	44'.2
11	355° 03'.4	1° 06'.2	11'.7	19° 17'.0	25'.2	196° 49'.7	36'.1	36° 24'.9	44'.1
12	10° 05'.8	16° 05'.8	4° 10'.5 S	34° 17'.6	11° 24'.5 S	211° 52'.4	10° 36'.2 N	51° 27'.1	16° 44'.0 S
13	25° 08'.3	31° 05'.4	09'.3	49° 18'.3	23'.9	226° 55'.1	36'.2	66° 29'.4	44'.0
14	40° 10'.8	46° 05'.0	08'.1	64° 18'.9	23'.2	241° 57'.8	36'.3	81° 31'.7	43'.9
15	55° 13'.2	61° 04'.6	06'.9	79° 19'.5	22'.5	257° 00'.4	36'.4	96° 33'.9	43'.9
16	70° 15'.7	76° 04'.2	05'.7	94° 20'.1	21'.8	272° 03'.1	36'.5	111° 36'.2	43'.8
17	85° 18'.2	91° 03'.8	04'.5	109° 20'.7	21'.1	287° 05'.8	36'.5	126° 38'.4	43'.8
18	100° 20'.6	106° 03'.4	03'.3	124° 21'.4	20'.4	302° 08'.4	36'.6	141° 40'.7	43'.7
19	115° 23'.1	121° 03'.1	02'.1	139° 22'.0	19'.7	317° 11'.1	36'.7	156° 42'.9	43'.6
20	130° 25'.5	136° 02'.7	00'.9	154° 22'.6	19'.0	332° 13'.8	36'.8	171° 45'.2	43'.6
21	145° 28'.0	151° 02'.3	3° 59'.7 S	169° 23'.2	18'.3	347° 16'.4	36'.8	186° 47'.4	43'.5
22	160° 30'.5	166° 01'.9	58'.5	184° 23'.8	17'.6	2° 19'.1	36'.9	201° 49'.7	43'.5
23	175° 32'.9	181° 01'.5	57'.3	199° 24'.4	16'.9	17° 21'.8	37'.0	216° 52'.0	43'.4
2 Thursday 00	190° 35'.4	196° 01'.1	3° 56'.2 S	214° 25'.1	11° 16'.2 S	32° 24'.4	10° 37'.1 N	231° 54'.2	16° 43'.4 S
01	205° 37'.9	211° 00'.7	55'.0	229° 25'.7	15'.5	47° 27'.1	37'.1	246° 56'.5	43'.3
02	220° 40'.3	226° 00'.4	53'.8	244° 26'.3	14'.8	62° 29'.8	37'.2	261° 58'.7	43'.2
03	235° 42'.8	241° 00'.0	52'.6	259° 26'.9	14'.2	77° 32'.4	37'.3	277° 01'.0	43'.2
04	250° 45'.3	255° 59'.6	51'.4	274° 27'.5	13'.5	92° 35'.1	37'.4	292° 03'.2	43'.1
05	265° 47'.7	270° 59'.2	50'.2	289° 28'.2	12'.8	107° 37'.8	37'.4	307° 05'.5	43'.1
06	280° 50'.2	285° 58'.8	49'.0	304° 28'.8	12'.1	122° 40'.4	37'.5	322° 07'.7	43'.0
07	295° 52'.6	300° 58'.4	47'.8	319° 29'.4	11'.4	137° 43'.1	37'.6	337° 10'.0	43'.0
08	310° 55'.1	315° 58'.0	46'.6	334° 30'.0	10'.7	152° 45'.7	37'.6	352° 12'.3	42'.9
09	325° 57'.6	330° 57'.7	45'.4	349° 30'.6	10'.0	167° 48'.4	37'.7	7° 14'.5	42'.8
10	341° 00'.0	345° 57'.3	44'.2	4° 31'.3	09'.3	182° 51'.1	37'.8	22° 16'.8	42'.8
11	356° 02'.5	0° 56'.9	43'.0	19° 31'.9	08'.6	197° 53'.7	37'.9	37° 19'.0	42'.7
12	11° 05'.0	15° 56'.5	3° 41'.8 S	34° 32'.5	11° 07'.9 S	212° 56'.4	10° 37'.9 N	52° 21'.3	16° 42'.7 S
13	26° 07'.4	30° 56'.1	40'.6	49° 33'.1	07'.2	227° 59'.1	38'.0	67° 23'.5	42'.6
14	41° 09'.9	45° 55'.7	39'.4	64° 33'.7	06'.5	243° 01'.7	38'.1	82° 25'.8	42'.6
15	56° 12'.4	60° 55'.4	38'.2	79° 34'.4	05'.8	258° 04'.4	38'.2	97° 28'.1	42'.5
16	71° 14'.8	75° 55'.0	37'.0	94° 35'.0	05'.1	273° 07'.1	38'.2	112° 30'.3	42'.5
17	86° 17'.3	90° 54'.6	35'.8	109° 35'.6	04'.4	288° 09'.7	38'.3	127° 32'.6	42'.4
18	101° 19'.8	105° 54'.2	34'.6	124° 36'.2	03'.7	303° 12'.4	38'.4	142° 34'.8	42'.3
19	116° 22'.2	120° 53'.8	33'.4	139° 36'.8	03'.0	318° 15'.0	38'.4	157° 37'.1	42'.3
20	131° 24'.7	135° 53'.4	32'.2	154° 37'.5	02'.3	333° 17'.7	38'.5	172° 39'.4	42'.2
21	146° 27'.1	150° 53'.1	31'.0	169° 38'.1	01'.6	348° 20'.4	38'.6	187° 41'.6	42'.2
22	161° 29'.6	165° 52'.7	29'.8	184° 38'.7	00'.9	3° 23'.0	38'.7	202° 43'.9	42'.1
23	176° 32'.1	180° 52'.3	28'.6	199° 39'.3	00'.2	18° 25'.7	38'.7	217° 46'.1	42'.1
	M.P. 11:16	v -0'.4	d 1'.2	v 0'.6	d 0'.7	v 2'.7	d 0'.1	v 2'.3	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.6	40° 20'.2 S
Achernar	335° 39'.0	57° 16'.6 S
Acrux	173° 26'.6	63° 03'.6 S
Adhara	255° 25'.0	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.8	55° 59'.9 N
Alkaid	153° 10'.8	49° 20'.9 N
Alnair	28° 03'.8	46° 59'.8 S
Alnilam	276° 02'.5	1° 12'.5 S
Alphard	218° 11'.5	8° 37'.7 S
Alphecca	126° 24'.1	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.8 N
Altair	62° 23'.8	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.9 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.5	69° 00'.7 S
Avior	234° 24'.3	59° 29'.4 S
Bellatrix	278° 49'.1	6° 20'.5 N
Betelgeuse	271° 18'.5	7° 24'.3 N
Canopus	264° 03'.3	52° 41'.8 S
Capella	280° 58'.1	45° 59'.6 N
Deneb	49° 42'.5	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.8 S
Dubhe	194° 10'.2	61° 47'.5 N
Elnath	278° 32'.8	28° 36'.2 N
Eltanin	90° 53'.4	51° 29'.0 N
Enif	34° 02'.9	9° 50'.3 N
Fomalhaut	15° 41'.7	29° 39'.7 S
Gacrux	172° 18'.2	57° 04'.4 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.2 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.8	34° 23'.3 S
Kochab	137° 18'.1	74° 10'.9 N
Markab	13° 54'.4	15° 09'.7 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 26'.0	36° 20'.1 S
Miaplacidus	221° 42'.7	69° 41'.5 S
Mirfak	309° 03'.5	49° 50'.2 N
Nunki	76° 17'.9	26° 18'.4 S
Peacock	53° 44'.2	56° 45'.4 S
Polaris	324° 25'.4	89° 14'.0 N
Pollux	243° 47'.0	28° 02'.7 N
Procyon	245° 16'.2	5° 14'.6 N
Rasalhague	96° 21'.0	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.4	8° 12'.7 S
Rigil Kent	140° 12'.9	60° 48'.2 S
Sabik	102° 30'.6	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.7 N
Shaula	96° 43'.3	37° 05'.9 S
Sirius	258° 47'.7	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.9	43° 24'.4 S
Vega	80° 49'.7	38° 46'.3 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	6° 34'.2	10:56
Mars	24° 34'.0	09:43
Jupiter	201° 44'.1	21:51
Saturn	41° 23'.8	08:35

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
178° 56'.5	4° 10'.1 N	214° 27'.5	15'.7	6° 05'.9 S	12'.1	54'.6
193° 56'.7	11'.1	229° 02'.2	15'.7	5° 53'.8 S	12'.2	
208° 56'.9	12'.1	243° 36'.9	15'.7	41'.6	12'.1	
223° 57'.1	13'.1	258° 11'.6	15'.7	29'.5	12'.2	
238° 57'.3	14'.0	272° 46'.3	15'.7	17'.3	12'.2	
253° 57'.4	15'.0	287° 21'.0	15'.7	05'.1	12'.3	
268° 57'.6	16'.0	301° 55'.7	15'.7	4° 52'.8 S	12'.2	54'.7
283° 57'.8	16'.9	316° 30'.4	15'.7	40'.6	12'.3	
298° 58'.0	17'.9	331° 05'.1	15'.7	28'.3	12'.3	
313° 58'.2	18'.9	345° 39'.8	15'.6	16'.0	12'.4	
328° 58'.4	19'.8	0° 14'.4	15'.7	03'.6	12'.4	
343° 58'.6	20'.8	14° 49'.1	15'.7	3° 51'.2 S	12'.3	
358° 58'.8	4° 21'.8 N	29° 23'.8	15'.7	3° 38'.9 S	12'.4	54'.7
13° 58'.9	22'.7	43° 58'.5	15'.7	26'.5	12'.5	54'.8
28° 59'.1	23'.7	58° 33'.2	15'.6	14'.0	12'.4	
43° 59'.3	24'.7	73° 07'.8	15'.7	01'.6	12'.5	
58° 59'.5	25'.6	87° 42'.5	15'.6	2° 49'.1 S	12'.5	
73° 59'.7	26'.6	102° 17'.1	15'.7	36'.6	12'.5	
88° 59'.9	27'.6	116° 51'.8	15'.6	24'.1	12'.5	
104° 00'.1	28'.5	131° 26'.4	15'.6	11'.6	12'.6	54'.9
119° 00'.2	29'.5	146° 01'.0	15'.6	1° 59'.0 S	12'.5	
134° 00'.4	30'.5	160° 35'.6	15'.6	46'.5	12'.6	
149° 00'.6	31'.4	175° 10'.2	15'.6	33'.9	12'.6	
164° 00'.8	32'.4	189° 44'.8	15'.6	21'.3	12'.6	
179° 01'.0	4° 33'.3 N	204° 19'.4	15'.5	1° 08'.7 S	12'.6	54'.9
194° 01'.2	34'.3	218° 53'.9	15'.5	0° 56'.1 S	12'.6	55'.0
209° 01'.4	35'.3	233° 28'.4	15'.5	43'.5	12'.7	
224° 01'.5	36'.2	248° 02'.9	15'.5	30'.8	12'.6	
239° 01'.7	37'.2	262° 37'.4	15'.5	18'.2	12'.7	
254° 01'.9	38'.2	277° 11'.9	15'.5	05'.5	12'.6	
269° 02'.1	39'.1	291° 46'.4	15'.4	0° 07'.1 N	12'.7	
284° 02'.3	40'.1	306° 20'.8	15'.4	19'.8	12'.7	55'.1
299° 02'.5	41'.1	320° 55'.2	15'.4	32'.5	12'.7	
314° 02'.6	42'.0	335° 29'.6	15'.4	45'.2	12'.7	
329° 02'.8	43'.0	350° 04'.0	15'.4	57'.9	12'.7	
344° 03'.0	44'.0	4° 38'.4	15'.3	1° 10'.6 N	12'.7	
359° 03'.2	4° 44'.9 N	19° 12'.7	15'.3	1° 23'.3 N	12'.7	55'.2
14° 03'.4	45'.9	33° 47'.0	15'.2	36'.0	12'.7	
29° 03'.6	46'.8	48° 21'.2	15'.3	48'.7	12'.7	
44° 03'.8	47'.8	62° 55'.5	15'.2	2° 01'.4 N	12'.7	
59° 03'.9	48'.8	77° 29'.7	15'.2	14'.1	12'.7	
74° 04'.1	49'.7	92° 03'.9	15'.1	26'.8	12'.7	
89° 04'.3	50'.7	106° 38'.0	15'.2	39'.5	12'.7	55'.3
104° 04'.5	51'.7	121° 12'.2	15'.1	52'.2	12'.7	
119° 04'.7	52'.6	135° 46'.3	15'.0	3° 04'.9 N	12'.7	
134° 04'.9	53'.6	150° 20'.3	15'.0	17'.6	12'.7	
149° 05'.1	54'.5	164° 54'.3	15'.0	30'.3	12'.7	
164° 05'.2	55'.5	179° 28'.3	15'.0	43'.0	12'.7	55'.4
179° 05'.4	4° 56'.5 N	194° 02'.3	14'.9	3° 55'.7 N	12'.7	55'.4
194° 05'.6	57'.4	208° 36'.2	14'.9	4° 08'.4 N	12'.7	
209° 05'.8	58'.4	223° 10'.1	14'.8	21'.1	12'.6	
224° 06'.0	59'.3	237° 43'.9	14'.8	33'.7	12'.7	
239° 06'.2	5° 00'.3 N	252° 17'.7	14'.8	46'.4	12'.6	55'.5
254° 06'.3	01'.3	266° 51'.5	14'.7	59'.0	12'.7	
269° 06'.5	02'.2	281° 25'.2	14'.7	5° 11'.7 N	12'.6	
284° 06'.7	03'.2	295° 58'.9	14'.7	24'.3	12'.6	
299° 06'.9	04'.2	310° 32'.6	14'.6	36'.9	12'.6	
314° 07'.1	05'.1	325° 06'.2	14'.5	49'.5	12'.6	55'.6
329° 07'.3	06'.1	339° 39'.7	14'.5	6° 02'.1 N	12'.5	
344° 07'.4	07'.0	354° 13'.2	14'.5	14'.6	12'.6	
359° 07'.6	5° 08'.0 N	8° 46'.7	14'.4	6° 27'.2 N	12'.5	55'.6
14° 07'.8	09'.0	23° 20'.1	14'.4	39'.7	12'.5	
29° 08'.0	09'.9	37° 53'.5	14'.3	52'.2	12'.5	55'.7
44° 08'.2	10'.9	52° 26'.8	14'.3	7° 04'.7 N	12'.4	
59° 08'.4	11'.8	67° 00'.1	14'.2	17'.1	12'.5	
74° 08'.5	12'.8	81° 33'.3	14'.2	29'.6	12'.4	
89° 08'.7	13'.7	96° 06'.5	14'.2	42'.0	12'.4	
104° 08'.9	14'.7	110° 39'.7	14'.0	54'.4	12'.3	55'.8
119° 09'.1	15'.7	125° 12'.7	14'.0	8° 06'.7 N	12'.4	
134° 09'.3	16'.6	139° 45'.7	14'.0	19'.1	12'.3	
149° 09'.5	17'.6	154° 18'.7	13'.9	31'.4	12'.3	
164° 09'.6	18'.5	168° 51'.6	13'.9	43'.7	12'.2	55'.9
SD 16'.0	d 1'.0	SD	14'.9	15'.0	15'.2	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
31	4 14	4 05	12:04	09:59	22:20	27d 7%
1	3 56	3 48	12:04	10:41	23:02	28d 3%
2	3 39	3 30	12:03	11:24	23:46	29d 1%

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1992 April 3, 4, 5 (Fri, Sat, Sun)

GMT	ARIES	VENUS -3.9		MARS +1.2		JUPITER -2.4		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
3 Friday 00	191° 34'.5	195° 51'.9	3° 27'.4 S	214° 40'.0	10° 59'.5 S	33° 28'.3	10° 38'.8 N	232° 48'.4	16° 42'.0 S
01	206° 37'.0	210° 51'.5	26'.2	229° 40'.6	58'.8	48° 31'.0	38'.9	247° 50'.6	41'.9
02	221° 39'.5	225° 51'.2	25'.0	244° 41'.2	58'.1	63° 33'.7	38'.9	262° 52'.9	41'.9
03	236° 41'.9	240° 50'.8	23'.8	259° 41'.8	57'.4	78° 36'.3	39'.0	277° 55'.2	41'.8
04	251° 44'.4	255° 50'.4	22'.6	274° 42'.4	56'.7	93° 39'.0	39'.1	292° 57'.4	41'.8
05	266° 46'.9	270° 50'.0	21'.4	289° 43'.1	56'.0	108° 41'.6	39'.2	307° 59'.7	41'.7
06	281° 49'.3	285° 49'.6	20'.2	304° 43'.7	55'.3	123° 44'.3	39'.2	323° 01'.9	41'.7
07	296° 51'.8	300° 49'.3	19'.0	319° 44'.3	54'.6	138° 47'.0	39'.3	338° 04'.2	41'.6
08	311° 54'.2	315° 48'.9	17'.8	334° 44'.9	53'.9	153° 49'.6	39'.4	353° 06'.5	41'.6
09	326° 56'.7	330° 48'.5	16'.6	349° 45'.6	53'.2	168° 52'.3	39'.4	8° 08'.7	41'.5
10	341° 59'.2	345° 48'.1	15'.4	4° 46'.2	52'.5	183° 54'.9	39'.5	23° 11'.0	41'.4
11	357° 01'.6	0° 47'.7	14'.2	19° 46'.8	51'.8	198° 57'.6	39'.6	38° 13'.2	41'.4
12	12° 04'.1	15° 47'.3	3° 13'.0 S	34° 47'.4	10° 51'.1 S	214° 00'.2	10° 39'.7 N	53° 15'.5	16° 41'.3 S
13	27° 06'.6	30° 47'.0	11'.8	49° 48'.1	50'.4	229° 02'.9	39'.7	68° 17'.8	41'.3
14	42° 09'.0	45° 46'.6	10'.6	64° 48'.7	49'.7	244° 05'.6	39'.8	83° 20'.0	41'.2
15	57° 11'.5	60° 46'.2	09'.3	79° 49'.3	49'.0	259° 08'.2	39'.9	98° 22'.3	41'.2
16	72° 14'.0	75° 45'.8	08'.1	94° 49'.9	48'.3	274° 10'.9	39'.9	113° 24'.5	41'.1
17	87° 16'.4	90° 45'.5	06'.9	109° 50'.6	47'.6	289° 13'.5	40'.0	128° 26'.8	41'.1
18	102° 18'.9	105° 45'.1	05'.7	124° 51'.2	46'.9	304° 16'.2	40'.1	143° 29'.1	41'.0
19	117° 21'.4	120° 44'.7	04'.5	139° 51'.8	46'.2	319° 18'.8	40'.1	158° 31'.3	40'.9
20	132° 23'.8	135° 44'.3	03'.3	154° 52'.4	45'.5	334° 21'.5	40'.2	173° 33'.6	40'.9
21	147° 26'.3	150° 43'.9	02'.1	169° 53'.1	44'.8	349° 24'.1	40'.3	188° 35'.8	40'.8
22	162° 28'.7	165° 43'.6	00'.9	184° 53'.7	44'.1	4° 26'.8	40'.4	203° 38'.1	40'.8
23	177° 31'.2	180° 43'.2	2° 59'.7 S	199° 54'.3	43'.4	19° 29'.5	40'.4	218° 40'.4	40'.7
4 Saturday 00	192° 33'.7	195° 42'.8	2° 58'.5 S	214° 54'.9	10° 42'.7 S	34° 32'.1	10° 40'.5 N	233° 42'.6	16° 40'.7 S
01	207° 36'.1	210° 42'.4	57'.3	229° 55'.6	42'.0	49° 34'.8	40'.6	248° 44'.9	40'.6
02	222° 38'.6	225° 42'.0	56'.1	244° 56'.2	41'.3	64° 37'.4	40'.6	263° 47'.2	40'.6
03	237° 41'.1	240° 41'.7	54'.9	259° 56'.8	40'.6	79° 40'.1	40'.7	278° 49'.4	40'.5
04	252° 43'.5	255° 41'.3	53'.7	274° 57'.4	39'.9	94° 42'.7	40'.8	293° 51'.7	40'.5
05	267° 46'.0	270° 40'.9	52'.5	289° 58'.1	39'.2	109° 45'.4	40'.8	308° 53'.9	40'.4
06	282° 48'.5	285° 40'.5	51'.3	304° 58'.7	38'.5	124° 48'.0	40'.9	323° 56'.2	40'.3
07	297° 50'.9	300° 40'.2	50'.1	319° 59'.3	37'.8	139° 50'.7	41'.0	338° 58'.5	40'.3
08	312° 53'.4	315° 39'.8	48'.9	335° 00'.0	37'.1	154° 53'.3	41'.0	354° 00'.7	40'.2
09	327° 55'.8	330° 39'.4	47'.7	350° 00'.6	36'.4	169° 56'.0	41'.1	9° 03'.0	40'.2
10	342° 58'.3	345° 39'.0	46'.5	5° 01'.2	35'.7	184° 58'.6	41'.2	24° 05'.3	40'.1
11	358° 00'.8	0° 38'.6	45'.2	20° 01'.8	35'.0	200° 01'.3	41'.2	39° 07'.5	40'.1
12	13° 03'.2	15° 38'.3	2° 44'.0 S	35° 02'.5	10° 34'.3 S	215° 03'.9	10° 41'.3 N	54° 09'.8	16° 40'.0 S
13	28° 05'.7	30° 37'.9	42'.8	50° 03'.1	33'.6	230° 06'.6	41'.4	69° 12'.0	40'.0
14	43° 08'.2	45° 37'.5	41'.6	65° 03'.7	32'.9	245° 09'.2	41'.4	84° 14'.3	39'.9
15	58° 10'.6	60° 37'.1	40'.4	80° 04'.3	32'.2	260° 11'.9	41'.5	99° 16'.6	39'.8
16	73° 13'.1	75° 36'.8	39'.2	95° 05'.0	31'.5	275° 14'.5	41'.6	114° 18'.8	39'.8
17	88° 15'.6	90° 36'.4	38'.0	110° 05'.6	30'.8	290° 17'.2	41'.6	129° 21'.1	39'.7
18	103° 18'.0	105° 36'.0	36'.8	125° 06'.2	30'.1	305° 19'.8	41'.7	144° 23'.4	39'.7
19	118° 20'.5	120° 35'.6	35'.6	140° 06'.9	29'.4	320° 22'.5	41'.8	159° 25'.6	39'.6
20	133° 23'.0	135° 35'.3	34'.4	155° 07'.5	28'.7	335° 25'.1	41'.8	174° 27'.9	39'.6
21	148° 25'.4	150° 34'.9	33'.2	170° 08'.1	28'.0	350° 27'.8	41'.9	189° 30'.2	39'.5
22	163° 27'.9	165° 34'.5	32'.0	185° 08'.7	27'.3	5° 30'.4	42'.0	204° 32'.4	39'.5
23	178° 30'.3	180° 34'.1	30'.8	200° 09'.4	26'.6	20° 33'.1	42'.0	219° 34'.7	39'.4
5 Sunday 00	193° 32'.8	195° 33'.8	2° 29'.5 S	215° 10'.0	10° 25'.8 S	35° 35'.7	10° 42'.1 N	234° 37'.0	16° 39'.4 S
01	208° 35'.3	210° 33'.4	28'.3	230° 10'.6	25'.1	50° 38'.4	42'.2	249° 39'.2	39'.3
02	223° 37'.7	225° 33'.0	27'.1	245° 11'.3	24'.4	65° 41'.0	42'.2	264° 41'.5	39'.2
03	238° 40'.2	240° 32'.6	25'.9	260° 11'.9	23'.7	80° 43'.7	42'.3	279° 43'.7	39'.2
04	253° 42'.7	255° 32'.3	24'.7	275° 12'.5	23'.0	95° 46'.3	42'.4	294° 46'.0	39'.1
05	268° 45'.1	270° 31'.9	23'.5	290° 13'.1	22'.3	110° 49'.0	42'.4	309° 48'.3	39'.1
06	283° 47'.6	285° 31'.5	22'.3	305° 13'.8	21'.6	125° 51'.6	42'.5	324° 50'.5	39'.0
07	298° 50'.1	300° 31'.1	21'.1	320° 14'.4	20'.9	140° 54'.3	42'.6	339° 52'.8	39'.0
08	313° 52'.5	315° 30'.8	19'.9	335° 15'.0	20'.2	155° 56'.9	42'.6	354° 55'.1	38'.9
09	328° 55'.0	330° 30'.4	18'.7	350° 15'.7	19'.5	170° 59'.5	42'.7	9° 57'.3	38'.9
10	343° 57'.5	345° 30'.0	17'.5	5° 16'.3	18'.8	186° 02'.2	42'.8	24° 59'.6	38'.8
11	358° 59'.9	0° 29'.6	16'.2	20° 16'.9	18'.1	201° 04'.8	42'.8	40° 01'.9	38'.8
12	14° 02'.4	15° 29'.3	2° 15'.0 S	35° 17'.6	10° 17'.4 S	216° 07'.5	10° 42'.9 N	55° 04'.1	16° 38'.7 S
13	29° 04'.8	30° 28'.9	13'.8	50° 18'.2	16'.7	231° 10'.1	43'.0	70° 06'.4	38'.7
14	44° 07'.3	45° 28'.5	12'.6	65° 18'.8	15'.9	246° 12'.8	43'.0	85° 08'.7	38'.6
15	59° 09'.8	60° 28'.1	11'.4	80° 19'.5	15'.2	261° 15'.4	43'.1	100° 10'.9	38'.5
16	74° 12'.2	75° 27'.8	10'.2	95° 20'.1	14'.5	276° 18'.1	43'.2	115° 13'.2	38'.5
17	89° 14'.7	90° 27'.4	09'.0	110° 20'.7	13'.8	291° 20'.7	43'.2	130° 15'.5	38'.4
18	104° 17'.2	105° 27'.0	07'.8	125° 21'.4	13'.1	306° 23'.3	43'.3	145° 17'.7	38'.4
19	119° 19'.6	120° 26'.6	06'.6	140° 22'.0	12'.4	321° 26'.0	43'.4	160° 20'.0	38'.3
20	134° 22'.1	135° 26'.3	05'.3	155° 22'.6	11'.7	336° 28'.6	43'.4	175° 22'.3	38'.3
21	149° 24'.6	150° 25'.9	04'.1	170° 23'.2	11'.0	351° 31'.3	43'.5	190° 24'.5	38'.2
22	164° 27'.0	165° 25'.5	02'.9	185° 23'.9	10'.3	6° 33'.9	43'.5	205° 26'.8	38'.2
23	179° 29'.5	180° 25'.2	01'.7	200° 24'.5	09'.6	21° 36'.5	43'.6	220° 29'.1	38'.1
	M.P. 11:04	v -0'.4	d 1'.2	v 0'.6	d 0'.7	v 2'.7	d 0'.1	v 2'.3	d 0'.1

STARS		
Name	SHA	Dec
Acamar	315° 30'.6	40° 20'.2 S
Achernar	335° 39'.0	57° 16'.6 S
Acrux	173° 26'.6	63° 03'.6 S
Adhara	255° 25'.0	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.8	55° 59'.9 N
Alkaid	153° 10'.8	49° 20'.9 N
Alnair	28° 03'.8	46° 59'.8 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.5	8° 37'.7 S
Alphecca	126° 24'.1	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.8 N
Altair	62° 23'.8	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.8 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.4	69° 00'.7 S
Avior	234° 24'.4	59° 29'.4 S
Bellatrix	278° 49'.1	6° 20'.5 N
Betelgeuse	271° 18'.5	7° 24'.3 N
Canopus	264° 03'.3	52° 41'.8 S
Capella	280° 58'.1	45° 59'.6 N
Deneb	49° 42'.5	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.7 S
Dubhe	194° 10'.3	61° 47'.5 N
Elnath	278° 32'.8	28° 36'.1 N
Eltanin	90° 53'.4	51° 29'.0 N
Enif	34° 02'.9	9° 50'.3 N
Fomalhaut	15° 41'.7	29° 39'.7 S
Gacrux	172° 18'.2	57° 04'.4 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.3 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.7	34° 23'.3 S
Kochab	137° 18'.1	74° 11'.0 N
Markab	13° 54'.4	15° 09'.7 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 26'.0	36° 20'.1 S
Miaplacidus	221° 42'.7	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.2 N
Nunki	76° 17'.9	26° 18'.4 S
Peacock	53° 44'.2	56° 45'.4 S
Polaris	324° 25'.7	89° 14'.0 N
Pollux	243° 47'.0	28° 02'.7 N
Procyon	245° 16'.2	5° 14'.6 N
Rasalhague	96° 21'.0	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.4	8° 12'.7 S
Rigil Kent	140° 12'.9	60° 48'.2 S
Sabik	102° 30'.6	15° 43'.0 S
Schedar	349° 59'.4	56° 29'.7 N
Shaula	96° 43'.3	37° 05'.9 S
Sirius	258° 47'.7	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.9	43° 24'.4 S
Vega	80° 49'.6	38° 46'.3 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	3° 09'.1	10:57
Mars	22° 21'.3	09:40
Jupiter	201° 58'.4	21:38
Saturn	41° 09'.0	08:24

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
179° 09'.8	5° 19'.5 N	183° 24'.5	13'.8	8° 55'.9 N	12'.3	55'.9
194° 10'.0	20'.5	197° 57'.3	13'.7	9° 08'.2 N	12'.2	
209° 10'.2	21'.4	212° 30'.0	13'.7	20'.4	12'.1	
224° 10'.4	22'.4	227° 02'.7	13'.7	32'.5	12'.2	
239° 10'.6	23'.3	241° 35'.4	13'.5	44'.7	12'.1	56'.0
254° 10'.7	24'.3	256° 07'.9	13'.6	56'.8	12'.0	
269° 10'.9	25'.2	270° 40'.5	13'.4	10° 08'.8 N	12'.0	
284° 11'.1	26'.2	285° 12'.9	13'.4	20'.8	12'.0	
299° 11'.3	27'.2	299° 45'.3	13'.3	32'.8	12'.0	
314° 11'.5	28'.1	314° 17'.6	13'.3	44'.8	11'.9	56'.1
329° 11'.7	29'.1	328° 49'.9	13'.2	56'.7	11'.8	
344° 11'.8	30'.0	343° 22'.1	13'.1	11° 08'.5 N	11'.9	
359° 12'.0	5° 31'.0 N	357° 54'.2	13'.1	11° 20'.4 N	11'.7	56'.1
14° 12'.2	31'.9	12° 26'.3	13'.0	32'.1	11'.8	
29° 12'.4	32'.9	26° 58'.3	13'.0	43'.9	11'.7	56'.2
44° 12'.6	33'.8	41° 30'.3	12'.8	55'.6	11'.6	
59° 12'.7	34'.8	56° 02'.1	12'.8	12° 07'.2 N	11'.6	
74° 12'.9	35'.8	70° 33'.9	12'.8	18'.8	11'.5	
89° 13'.1	36'.7	85° 05'.7	12'.7	30'.3	11'.5	56'.3
104° 13'.3	37'.7	99° 37'.4	12'.6	41'.8	11'.5	
119° 13'.5	38'.6	114° 09'.0	12'.5	53'.3	11'.4	
134° 13'.7	39'.6	128° 40'.5	12'.5	13° 04'.7 N	11'.3	
149° 13'.8	40'.5	143° 12'.0	12'.4	16'.0	11'.3	
164° 14'.0	41'.5	157° 43'.4	12'.3	27'.3	11'.2	56'.4
179° 14'.2	5° 42'.4 N	172° 14'.7	12'.2	13° 38'.5 N	11'.2	56'.4
194° 14'.4	43'.4	186° 45'.9	12'.2	49'.7	11'.1	
209° 14'.6	44'.3	201° 17'.1	12'.1	14° 00'.8 N	11'.1	
224° 14'.7	45'.3	215° 48'.2	12'.0	11'.9	11'.0	
239° 14'.9	46'.2	230° 19'.2	12'.0	22'.9	10'.9	56'.5
254° 15'.1	47'.2	244° 50'.2	11'.9	33'.8	10'.9	
269° 15'.3	48'.1	259° 21'.1	11'.8	44'.7	10'.8	
284° 15'.5	49'.1	273° 51'.9	11'.7	55'.5	10'.7	
299° 15'.6	50'.1	288° 22'.6	11'.6	15° 06'.2 N	10'.7	56'.6
314° 15'.8	51'.0	302° 53'.2	11'.6	16'.9	10'.6	
329° 16'.0	52'.0	317° 23'.8	11'.5	27'.5	10'.5	
344° 16'.2	52'.9	331° 54'.3	11'.4	38'.0	10'.5	
359° 16'.4	5° 53'.9 N	346° 24'.7	11'.4	15° 48'.5 N	10'.4	56'.6
14° 16'.5	54'.8	0° 55'.1	11'.2	58'.9	10'.3	56'.7
29° 16'.7	55'.8	15° 25'.3	11'.2	16° 09'.2 N	10'.3	
44° 16'.9	56'.7	29° 55'.5	11'.1	19'.5	10'.1	
59° 17'.1	57'.7	44° 25'.6	11'.0	29'.6	10'.1	
74° 17'.3	58'.6	58° 55'.6	11'.0	39'.7	10'.0	
89° 17'.4	59'.6	73° 25'.6	10'.9	49'.7	10'.0	56'.8
104° 17'.6	6° 00'.5 N	87° 55'.5	10'.7	59'.7	9'.8	
119° 17'.8	01'.5	102° 25'.2	10'.7	17° 09'.5 N	9'.8	
134° 18'.0	02'.4	116° 54'.9	10'.7	19'.3	9'.7	
149° 18'.2	03'.4	131° 24'.6	10'.5	29'.0	9'.6	56'.9
164° 18'.3	04'.3	145° 54'.1	10'.5	38'.6	9'.5	
179° 18'.5	6° 05'.3 N	160° 23'.6	10'.4	17° 48'.1 N	9'.5	56'.9
194° 18'.7	06'.2	174° 53'.0	10'.3	57'.6	9'.3	
209° 18'.9	07'.2	189° 22'.3	10'.2	18° 06'.9 N	9'.3	
224° 19'.1	08'.1	203° 51'.5	10'.1	16'.2	9'.2	57'.0
239° 19'.2	09'.1	218° 20'.6	10'.1	25'.4	9'.1	
254° 19'.4	10'.0	232° 49'.7	9'.9	34'.5	8'.9	
269° 19'.6	11'.0	247° 18'.6	9'.9	43'.4	8'.9	
284° 19'.8	11'.9	261° 47'.5	9'.8	52'.3	8'.8	
299° 20'.0	12'.9	276° 16'.3	9'.8	19° 01'.1 N	8'.7	57'.1
314° 20'.1	13'.8	290° 45'.1	9'.6	09'.8	8'.6	
329° 20'.3	14'.7	305° 13'.7	9'.6	18'.4	8'.5	
344° 20'.5	15'.7	319° 42'.3	9'.5	26'.9	8'.5	
359° 20'.7	6° 16'.6 N	334° 10'.8	9'.4	19° 35'.4 N	8'.3	57'.1
14° 20'.8	17'.6	348° 39'.2	9'.3	43'.7	8'.2	57'.2
29° 21'.0	18'.5	3° 07'.5	9'.3	51'.9	8'.1	
44° 21'.2	19'.5	17° 35'.8	9'.1	00'.0	8'.0	
59° 21'.4	20'.4	32° 03'.9	9'.1	20° 08'.0 N	7'.8	
74° 21'.6	21'.4	46° 32'.0	9'.0	15'.8	7'.8	
89° 21'.7	22'.3	61° 00'.0	8'.9	23'.6	7'.7	57'.3
104° 21'.9	23'.3	75° 27'.9	8'.9	31'.3	7'.6	
119° 22'.1	24'.2	89° 55'.8	8'.7	38'.9	7'.4	
134° 22'.3	25'.2	104° 23'.5	8'.7	46'.3	7'.3	
149° 22'.4	26'.1	118° 51'.2	8'.6	53'.6	7'.3	
164° 22'.6	27'.0	133° 18'.8	8'.6	21° 00'.9 N	7'.1	57'.4
SD 16'.0	d 1'.0	SD	15'.3	15'.4	15'.6	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
3	3 21	3 12	12:03	12:09	24:32	0d 0%
4	3 04	2 55	12:03	12:56	00:32	1d 2%
5	2 46	2 38	12:03	13:47	01:21	2d 6%

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1992 April 6, 7, 8 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.4		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
Monday 6 00	194° 31'.9	195° 24'.8	2° 00'.5 S	215° 25'.1	10° 08'.9 S	36° 39'.2	10° 43'.7 N	235° 31'.3	16° 38'.1 S
01	209° 34'.4	210° 24'.4	1° 59'.3 S	230° 25'.8	08'.1	51° 41'.8	43'.7	250° 33'.6	38'.0
02	224° 36'.9	225° 24'.0	58'.1	245° 26'.4	07'.4	66° 44'.5	43'.8	265° 35'.9	38'.0
03	239° 39'.3	240° 23'.7	56'.9	260° 27'.0	06'.7	81° 47'.1	43'.9	280° 38'.1	37'.9
04	254° 41'.8	255° 23'.3	55'.7	275° 27'.7	06'.0	96° 49'.8	43'.9	295° 40'.4	37'.9
05	269° 44'.3	270° 22'.9	54'.4	290° 28'.3	05'.3	111° 52'.4	44'.0	310° 42'.7	37'.8
06	284° 46'.7	285° 22'.5	53'.2	305° 28'.9	04'.6	126° 55'.0	44'.0	325° 44'.9	37'.7
07	299° 49'.2	300° 22'.2	52'.0	320° 29'.6	03'.9	141° 57'.7	44'.1	340° 47'.2	37'.7
08	314° 51'.7	315° 21'.8	50'.8	335° 30'.2	03'.2	157° 00'.3	44'.2	355° 49'.5	37'.6
09	329° 54'.1	330° 21'.4	49'.6	350° 30'.8	02'.5	172° 03'.0	44'.2	10° 51'.8	37'.6
10	344° 56'.6	345° 21'.1	48'.4	5° 31'.5	01'.8	187° 05'.6	44'.3	25° 54'.0	37'.5
11	359° 59'.1	0° 20'.7	47'.2	20° 32'.1	01'.0	202° 08'.2	44'.4	40° 56'.3	37'.5
12	15° 01'.5	15° 20'.3	1° 46'.0 S	35° 32'.7	10° 00'.3 S	217° 10'.9	10° 44'.4 N	55° 58'.6	16° 37'.4 S
13	30° 04'.0	30° 19'.9	44'.7	50° 33'.4	9° 59'.6 S	232° 13'.5	44'.5	71° 00'.8	37'.4
14	45° 06'.4	45° 19'.6	43'.5	65° 34'.0	58'.9	247° 16'.1	44'.5	86° 03'.1	37'.3
15	60° 08'.9	60° 19'.2	42'.3	80° 34'.7	58'.2	262° 18'.8	44'.6	101° 05'.4	37'.3
16	75° 11'.4	75° 18'.8	41'.1	95° 35'.3	57'.5	277° 21'.4	44'.7	116° 07'.6	37'.2
17	90° 13'.8	90° 18'.5	39'.9	110° 35'.9	56'.8	292° 24'.1	44'.7	131° 09'.9	37'.2
18	105° 16'.3	105° 18'.1	38'.7	125° 36'.6	56'.1	307° 26'.7	44'.8	146° 12'.2	37'.1
19	120° 18'.8	120° 17'.7	37'.5	140° 37'.2	55'.3	322° 29'.3	44'.9	161° 14'.5	37'.1
20	135° 21'.2	135° 17'.3	36'.2	155° 37'.8	54'.6	337° 32'.0	44'.9	176° 16'.7	37'.0
21	150° 23'.7	150° 17'.0	35'.0	170° 38'.5	53'.9	352° 34'.6	45'.0	191° 19'.0	37'.0
22	165° 26'.2	165° 16'.6	33'.8	185° 39'.1	53'.2	7° 37'.2	45'.0	206° 21'.3	36'.9
23	180° 28'.6	180° 16'.2	32'.6	200° 39'.7	52'.5	22° 39'.9	45'.1	221° 23'.5	36'.8
Tuesday 7 00	195° 31'.1	195° 15'.9	1° 31'.4 S	215° 40'.4	9° 51'.8 S	37° 42'.5	10° 45'.2 N	236° 25'.8	16° 36'.8 S
01	210° 33'.6	210° 15'.5	30'.2	230° 41'.0	51'.1	52° 45'.1	45'.2	251° 28'.1	36'.7
02	225° 36'.0	225° 15'.1	29'.0	245° 41'.6	50'.4	67° 47'.8	45'.3	266° 30'.3	36'.7
03	240° 38'.5	240° 14'.8	27'.7	260° 42'.3	49'.6	82° 50'.4	45'.3	281° 32'.6	36'.6
04	255° 40'.9	255° 14'.4	26'.5	275° 42'.9	48'.9	97° 53'.0	45'.4	296° 34'.9	36'.6
05	270° 43'.4	270° 14'.0	25'.3	290° 43'.6	48'.2	112° 55'.7	45'.5	311° 37'.2	36'.5
06	285° 45'.9	285° 13'.6	24'.1	305° 44'.2	47'.5	127° 58'.3	45'.5	326° 39'.4	36'.5
07	300° 48'.3	300° 13'.3	22'.9	320° 44'.8	46'.8	143° 00'.9	45'.6	341° 41'.7	36'.4
08	315° 50'.8	315° 12'.9	21'.7	335° 45'.5	46'.1	158° 03'.6	45'.6	356° 44'.0	36'.4
09	330° 53'.3	330° 12'.5	20'.5	350° 46'.1	45'.4	173° 06'.2	45'.7	11° 46'.2	36'.3
10	345° 55'.7	345° 12'.2	19'.2	5° 46'.7	44'.6	188° 08'.8	45'.8	26° 48'.5	36'.3
11	0° 58'.2	0° 11'.8	18'.0	20° 47'.4	43'.9	203° 11'.5	45'.8	41° 50'.8	36'.2
12	16° 00'.7	15° 11'.4	1° 16'.8 S	35° 48'.0	9° 43'.2 S	218° 14'.1	10° 45'.9 N	56° 53'.1	16° 36'.2 S
13	31° 03'.1	30° 11'.1	15'.6	50° 48'.7	42'.5	233° 16'.7	45'.9	71° 55'.3	36'.1
14	46° 05'.6	45° 10'.7	14'.4	65° 49'.3	41'.8	248° 19'.4	46'.0	86° 57'.6	36'.1
15	61° 08'.1	60° 10'.3	13'.2	80° 49'.9	41'.1	263° 22'.0	46'.1	101° 59'.9	36'.0
16	76° 10'.5	75° 09'.9	12'.0	95° 50'.6	40'.4	278° 24'.6	46'.1	117° 02'.2	36'.0
17	91° 13'.0	90° 09'.6	10'.7	110° 51'.2	39'.6	293° 27'.3	46'.2	132° 04'.4	35'.9
18	106° 15'.4	105° 09'.2	09'.5	125° 51'.8	38'.9	308° 29'.9	46'.2	147° 06'.7	35'.9
19	121° 17'.9	120° 08'.8	08'.3	140° 52'.5	38'.2	323° 32'.5	46'.3	162° 09'.0	35'.8
20	136° 20'.4	135° 08'.5	07'.1	155° 53'.1	37'.5	338° 35'.1	46'.4	177° 11'.2	35'.7
21	151° 22'.8	150° 08'.1	05'.9	170° 53'.8	36'.8	353° 37'.8	46'.4	192° 13'.5	35'.7
22	166° 25'.3	165° 07'.7	04'.7	185° 54'.4	36'.1	8° 40'.4	46'.5	207° 15'.8	35'.6
23	181° 27'.8	180° 07'.4	03'.4	200° 55'.0	35'.3	23° 43'.0	46'.5	222° 18'.1	35'.6
Wednesday 8 00	196° 30'.2	195° 07'.0	1° 02'.2 S	215° 55'.7	9° 34'.6 S	38° 45'.7	10° 46'.6 N	237° 20'.3	16° 35'.5 S
01	211° 32'.7	210° 06'.6	01'.0	230° 56'.3	33'.9	53° 48'.3	46'.6	252° 22'.6	35'.5
02	226° 35'.2	225° 06'.3	0° 59'.8 S	245° 57'.0	33'.2	68° 50'.9	46'.7	267° 24'.9	35'.4
03	241° 37'.6	240° 05'.9	58'.6	260° 57'.6	32'.5	83° 53'.5	46'.8	282° 27'.2	35'.4
04	256° 40'.1	255° 05'.5	57'.4	275° 58'.2	31'.8	98° 56'.2	46'.8	297° 29'.4	35'.3
05	271° 42'.5	270° 05'.2	56'.1	290° 58'.9	31'.0	113° 58'.8	46'.9	312° 31'.7	35'.3
06	286° 45'.0	285° 04'.8	54'.9	305° 59'.5	30'.3	129° 01'.4	46'.9	327° 34'.0	35'.2
07	301° 47'.5	300° 04'.4	53'.7	321° 00'.2	29'.6	144° 04'.1	47'.0	342° 36'.3	35'.2
08	316° 49'.9	315° 04'.1	52'.5	336° 00'.8	28'.9	159° 06'.7	47'.1	357° 38'.5	35'.1
09	331° 52'.4	330° 03'.7	51'.3	351° 01'.4	28'.2	174° 09'.3	47'.1	12° 40'.8	35'.1
10	346° 54'.9	345° 03'.3	50'.1	6° 02'.1	27'.4	189° 11'.9	47'.2	27° 43'.1	35'.0
11	1° 57'.3	0° 02'.9	48'.8	21° 02'.7	26'.7	204° 14'.6	47'.2	42° 45'.4	35'.0
12	16° 59'.8	15° 02'.6	0° 47'.6 S	36° 03'.4	9° 26'.0 S	219° 17'.2	10° 47'.3 N	57° 47'.6	16° 34'.9 S
13	32° 02'.3	30° 02'.2	46'.4	51° 04'.0	25'.3	234° 19'.8	47'.3	72° 49'.9	34'.9
14	47° 04'.7	45° 01'.8	45'.2	66° 04'.6	24'.6	249° 22'.4	47'.4	87° 52'.2	34'.8
15	62° 07'.2	60° 01'.5	44'.0	81° 05'.3	23'.9	264° 25'.1	47'.4	102° 54'.5	34'.8
16	77° 09'.7	75° 01'.1	42'.8	96° 05'.9	23'.1	279° 27'.7	47'.5	117° 56'.7	34'.7
17	92° 12'.1	90° 00'.7	41'.5	111° 06'.6	22'.4	294° 30'.3	47'.6	132° 59'.0	34'.7
18	107° 14'.6	105° 00'.4	40'.3	126° 07'.2	21'.7	309° 32'.9	47'.6	148° 01'.3	34'.6
19	122° 17'.0	120° 00'.0	39'.1	141° 07'.8	21'.0	324° 35'.6	47'.7	163° 03'.6	34'.6
20	137° 19'.5	134° 59'.6	37'.9	156° 08'.5	20'.3	339° 38'.2	47'.7	178° 05'.8	34'.5
21	152° 22'.0	149° 59'.3	36'.7	171° 09'.1	19'.5	354° 40'.8	47'.8	193° 08'.1	34'.5
22	167° 24'.4	164° 58'.9	35'.4	186° 09'.8	18'.8	9° 43'.4	47'.8	208° 10'.4	34'.4
23	182° 26'.9	179° 58'.5	34'.2	201° 10'.4	18'.1	24° 46'.0	47'.9	223° 12'.7	34'.4
	M.P. 10:52	v -0'.4	d 1'.2	v 0'.6	d 0'.7	v 2'.6	d 0'.1	v 2'.3	d 0'.1

STARS		
Name	SHA	Dec
Acamar	315° 30'.7	40° 20'.2 S
Achernar	335° 39'.0	57° 16'.5 S
Acrux	173° 26'.6	63° 03'.6 S
Adhara	255° 25'.0	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.8	55° 59'.9 N
Alkaid	153° 10'.8	49° 20'.9 N
Alnair	28° 03'.8	46° 59'.8 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.5	8° 37'.7 S
Alphecca	126° 24'.1	26° 44'.1 N
Alpheratz	358° 00'.3	29° 02'.8 N
Altair	62° 23'.7	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.8 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.4	69° 00'.7 S
Avior	234° 24'.4	59° 29'.4 S
Bellatrix	278° 49'.1	6° 20'.5 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.3	52° 41'.8 S
Capella	280° 58'.1	45° 59'.6 N
Deneb	49° 42'.5	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.1	18° 01'.7 S
Dubhe	194° 10'.3	61° 47'.6 N
Elnath	278° 32'.8	28° 36'.1 N
Eltanin	90° 53'.3	51° 29'.0 N
Enif	34° 02'.9	9° 50'.3 N
Fomalhaut	15° 41'.7	29° 39'.7 S
Gacrux	172° 18'.2	57° 04'.4 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.3 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.7	34° 23'.3 S
Kochab	137° 18'.1	74° 11'.0 N
Markab	13° 54'.4	15° 09'.7 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 26'.0	36° 20'.1 S
Miaplacidus	221° 42'.8	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.2 N
Nunki	76° 17'.9	26° 18'.4 S
Peacock	53° 44'.2	56° 45'.4 S
Polaris	324° 25'.9	89° 14'.0 N
Pollux	243° 47'.0	28° 02'.7 N
Procyon	245° 16'.2	5° 14'.6 N
Rasalhague	96° 21'.0	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.4	8° 12'.7 S
Rigil Kent	140° 12'.9	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.7 N
Shaula	96° 43'.3	37° 05'.9 S
Sirius	258° 47'.7	16° 42'.5 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.0	43° 24'.4 S
Vega	80° 49'.6	38° 46'.3 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	359° 44'.8	10:59
Mars	20° 09'.3	09:37
Jupiter	202° 11'.4	21:25
Saturn	40° 54'.7	08:13

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
179° 22'.8	6° 28'.0 N	147° 46'.4	8'.4	21° 08'.0 N	7'.0	57'.4
194° 23'.0	28'.9	162° 13'.8	8'.4	15'.0	6'.9	
209° 23'.2	29'.9	176° 41'.2	8'.3	21'.9	6'.7	
224° 23'.3	30'.8	191° 08'.5	8'.2	28'.6	6'.7	
239° 23'.5	31'.8	205° 35'.7	8'.2	35'.3	6'.5	57'.5
254° 23'.7	32'.7	220° 02'.9	8'.0	41'.8	6'.4	
269° 23'.9	33'.7	234° 29'.9	8'.0	48'.2	6'.3	
284° 24'.0	34'.6	248° 56'.9	8'.0	54'.5	6'.1	
299° 24'.2	35'.5	263° 23'.9	7'.8	22° 00'.6 N	6'.0	
314° 24'.4	36'.5	277° 50'.7	7'.8	06'.6	6'.0	57'.6
329° 24'.6	37'.4	292° 17'.5	7'.7	12'.6	5'.7	
344° 24'.8	38'.4	306° 44'.2	7'.7	18'.3	5'.7	
359° 24'.9	6° 39'.3 N	321° 10'.9	7'.5	22° 24'.0 N	5'.5	57'.6
14° 25'.1	40'.3	335° 37'.4	7'.5	29'.5	5'.4	
29° 25'.3	41'.2	350° 03'.9	7'.5	34'.9	5'.3	57'.7
44° 25'.5	42'.1	4° 30'.4	7'.3	40'.2	5'.1	
59° 25'.6	43'.1	18° 56'.7	7'.3	45'.3	5'.0	
74° 25'.8	44'.0	33° 23'.0	7'.3	50'.3	4'.8	
89° 26'.0	45'.0	47° 49'.3	7'.2	55'.1	4'.8	
104° 26'.2	45'.9	62° 15'.5	7'.1	59'.9	4'.6	57'.8
119° 26'.3	46'.8	76° 41'.6	7'.0	23° 04'.5 N	4'.4	
134° 26'.5	47'.8	91° 07'.6	7'.0	08'.9	4'.3	
149° 26'.7	48'.7	105° 33'.6	6'.9	13'.2	4'.2	
164° 26'.9	49'.7	119° 59'.5	6'.9	17'.4	4'.1	
179° 27'.0	6° 50'.6 N	134° 25'.4	6'.8	23° 21'.5 N	3'.9	57'.8
194° 27'.2	51'.5	148° 51'.2	6'.8	25'.4	3'.7	57'.9
209° 27'.4	52'.5	163° 17'.0	6'.7	29'.1	3'.6	
224° 27'.6	53'.4	177° 42'.7	6'.6	32'.7	3'.5	
239° 27'.7	54'.4	192° 08'.3	6'.6	36'.2	3'.3	
254° 27'.9	55'.3	206° 33'.9	6'.6	39'.5	3'.2	
269° 28'.1	56'.2	220° 59'.5	6'.5	42'.7	3'.1	58'.0
284° 28'.3	57'.2	235° 25'.0	6'.4	45'.8	2'.9	
299° 28'.4	58'.1	249° 50'.4	6'.4	48'.7	2'.7	
314° 28'.6	59'.1	264° 15'.8	6'.4	51'.4	2'.6	
329° 28'.8	00'.0	278° 41'.2	6'.3	54'.0	2'.5	
344° 29'.0	7° 00'.9 N	293° 06'.5	6'.2	56'.5	2'.3	
359° 29'.1	7° 01'.9 N	307° 31'.7	6'.3	23° 58'.8 N	2'.1	58'.1
14° 29'.3	02'.8	321° 57'.0	6'.2	24° 00'.9 N	2'.1	
29° 29'.5	03'.7	336° 22'.2	6'.1	03'.0	1'.8	
44° 29'.7	04'.7	350° 47'.3	6'.1	04'.8	1'.7	
59° 29'.8	05'.6	5° 12'.4	6'.1	06'.5	1'.6	
74° 30'.0	06'.6	19° 37'.5	6'.0	08'.1	1'.4	58'.2
89° 30'.2	07'.5	34° 02'.5	6'.0	09'.5	1'.3	
104° 30'.4	08'.4	48° 27'.5	6'.0	10'.8	1'.1	
119° 30'.5	09'.4	62° 52'.5	5'.9	11'.9	0'.9	
134° 30'.7	10'.3	77° 17'.4	6'.0	12'.8	0'.8	
149° 30'.9	11'.2	91° 42'.4	5'.8	13'.6	0'.7	
164° 31'.0	12'.2	106° 07'.2	5'.9	14'.3	0'.4	58'.3
179° 31'.2	7° 13'.1 N	120° 32'.1	5'.8	24° 14'.7 N	0'.4	58'.3
194° 31'.4	14'.0	134° 56'.9	5'.9	15'.1	0'.2	
209° 31'.6	15'.0	149° 21'.8	5'.8	15'.3	0'.0	
224° 31'.7	15'.9	163° 46'.6	5'.7	15'.3	0'.1	
239° 31'.9	16'.8	178° 11'.3	5'.8	15'.2	0'.3	
254° 32'.1	17'.8	192° 36'.1	5'.7	14'.9	0'.4	58'.4
269° 32'.3	18'.7	207° 00'.8	5'.8	14'.5	0'.6	
284° 32'.4	19'.6	221° 25'.6	5'.7	13'.9	0'.8	
299° 32'.6	20'.6	235° 50'.3	5'.7	13'.1	0'.9	
314° 32'.8	21'.5	250° 15'.0	5'.7	12'.2	1'.0	
329° 32'.9	22'.4	264° 39'.7	5'.7	11'.2	1'.3	
344° 33'.1	23'.4	279° 04'.4	5'.7	09'.9	1'.3	58'.5
359° 33'.3	7° 24'.3 N	293° 29'.1	5'.6	24° 08'.6 N	1'.6	58'.5
14° 33'.5	25'.2	307° 53'.7	5'.7	07'.0	1'.6	
29° 33'.6	26'.2	322° 18'.4	5'.7	05'.4	1'.9	
44° 33'.8	27'.1	336° 43'.1	5'.6	03'.5	2'.0	
59° 34'.0	28'.0	351° 07'.7	5'.7	01'.5	2'.1	
74° 34'.2	29'.0	5° 32'.4	5'.7	23° 59'.4 N	2'.3	58'.6
89° 34'.3	29'.9	19° 57'.1	5'.7	57'.1	2'.5	
104° 34'.5	30'.8	34° 21'.8	5'.7	54'.6	2'.6	
119° 34'.7	31'.8	48° 46'.5	5'.7	52'.0	2'.8	
134° 34'.8	32'.7	63° 11'.2	5'.7	49'.2	2'.9	
149° 35'.0	33'.6	77° 35'.9	5'.7	46'.3	3'.1	
164° 35'.2	34'.6	92° 00'.6	5'.7	43'.2	3'.2	58'.7
SD 16'.0	d 0'.9	SD	15'.7	15'.8	15'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
6	2 29	2 21	12:02	14:41	02:14	3d 12%
7	2 12	2 04	12:02	15:38	03:10	4d 20%
8	1 55	1 47	12:02	16:37	04:08	5d 29%

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1992 April 9, 10, 11 (Thur, Fri, Saw)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.4		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
9 Thursday 00	197° 29'.4	194° 58'.2	0° 33'.0 S	216° 11'.1	9° 17'.4 S	39° 48'.7	10° 48'.0 N	238° 15'.0	16° 34'.3 S
01	212° 31'.8	209° 57'.8	31'.8	231° 11'.7	16'.7	54° 51'.3	48'.0	253° 17'.2	34'.3
02	227° 34'.3	224° 57'.4	30'.6	246° 12'.3	15'.9	69° 53'.9	48'.1	268° 19'.5	34'.2
03	242° 36'.8	239° 57'.1	29'.4	261° 13'.0	15'.2	84° 56'.5	48'.1	283° 21'.8	34'.2
04	257° 39'.2	254° 56'.7	28'.1	276° 13'.6	14'.5	99° 59'.1	48'.2	298° 24'.1	34'.1
05	272° 41'.7	269° 56'.3	26'.9	291° 14'.3	13'.8	115° 01'.8	48'.2	313° 26'.3	34'.1
06	287° 44'.2	284° 56'.0	25'.7	306° 14'.9	13'.1	130° 04'.4	48'.3	328° 28'.6	34'.0
07	302° 46'.6	299° 55'.6	24'.5	321° 15'.6	12'.3	145° 07'.0	48'.3	343° 30'.9	34'.0
08	317° 49'.1	314° 55'.2	23'.3	336° 16'.2	11'.6	160° 09'.6	48'.4	358° 33'.2	33'.9
09	332° 51'.5	329° 54'.9	22'.0	351° 16'.8	10'.9	175° 12'.2	48'.4	13° 35'.4	33'.9
10	347° 54'.0	344° 54'.5	20'.8	6° 17'.5	10'.2	190° 14'.9	48'.5	28° 37'.7	33'.8
11	2° 56'.5	359° 54'.1	19'.6	21° 18'.1	09'.4	205° 17'.5	48'.6	43° 40'.0	33'.8
12	17° 58'.9	14° 53'.8	0° 18'.4 S	36° 18'.8	9° 08'.7 S	220° 20'.1	10° 48'.6 N	58° 42'.3	16° 33'.7 S
13	33° 01'.4	29° 53'.4	17'.2	51° 19'.4	08'.0	235° 22'.7	48'.7	73° 44'.6	33'.7
14	48° 03'.9	44° 53'.0	16'.0	66° 20'.1	07'.3	250° 25'.3	48'.7	88° 46'.8	33'.6
15	63° 06'.3	59° 52'.7	14'.7	81° 20'.7	06'.6	265° 28'.0	48'.8	103° 49'.1	33'.6
16	78° 08'.8	74° 52'.3	13'.5	96° 21'.4	05'.8	280° 30'.6	48'.8	118° 51'.4	33'.5
17	93° 11'.3	89° 51'.9	12'.3	111° 22'.0	05'.1	295° 33'.2	48'.9	133° 53'.7	33'.5
18	108° 13'.7	104° 51'.6	11'.1	126° 22'.6	04'.4	310° 35'.8	48'.9	148° 56'.0	33'.4
19	123° 16'.2	119° 51'.2	09'.9	141° 23'.3	03'.7	325° 38'.4	49'.0	163° 58'.2	33'.4
20	138° 18'.7	134° 50'.8	08'.6	156° 23'.9	02'.9	340° 41'.0	49'.0	179° 00'.5	33'.3
21	153° 21'.1	149° 50'.5	07'.4	171° 24'.6	02'.2	355° 43'.7	49'.1	194° 02'.8	33'.3
22	168° 23'.6	164° 50'.1	06'.2	186° 25'.2	01'.5	10° 46'.3	49'.1	209° 05'.1	33'.2
23	183° 26'.0	179° 49'.7	05'.0	201° 25'.9	00'.8	25° 48'.9	49'.2	224° 07'.4	33'.2
10 Friday 00	198° 28'.5	194° 49'.4	0° 03'.8 S	216° 26'.5	9° 00'.1 S	40° 51'.5	10° 49'.2 N	239° 09'.6	16° 33'.1 S
01	213° 31'.0	209° 49'.0	02'.5	231° 27'.2	8° 59'.3 S	55° 54'.1	49'.3	254° 11'.9	33'.1
02	228° 33'.4	224° 48'.6	01'.3	246° 27'.8	58'.6	70° 56'.7	49'.4	269° 14'.2	33'.0
03	243° 35'.9	239° 48'.3	00'.1	261° 28'.5	57'.9	85° 59'.3	49'.4	284° 16'.5	33'.0
04	258° 38'.4	254° 47'.9	01'.1	276° 29'.1	57'.2	101° 02'.0	49'.5	299° 18'.8	32'.9
05	273° 40'.8	269° 47'.5	02'.3	291° 29'.8	56'.4	116° 04'.6	49'.5	314° 21'.0	32'.9
06	288° 43'.3	284° 47'.2	03'.6	306° 30'.4	55'.7	131° 07'.2	49'.6	329° 23'.3	32'.8
07	303° 45'.8	299° 46'.8	04'.8	321° 31'.0	55'.0	146° 09'.8	49'.6	344° 25'.6	32'.8
08	318° 48'.2	314° 46'.4	06'.0	336° 31'.7	54'.3	161° 12'.4	49'.7	359° 27'.9	32'.7
09	333° 50'.7	329° 46'.1	07'.2	351° 32'.3	53'.5	176° 15'.0	49'.7	14° 30'.2	32'.7
10	348° 53'.2	344° 45'.7	08'.4	6° 33'.0	52'.8	191° 17'.6	49'.8	29° 32'.4	32'.6
11	3° 55'.6	359° 45'.3	09'.6	21° 33'.6	52'.1	206° 20'.3	49'.8	44° 34'.7	32'.6
12	18° 58'.1	14° 45'.0	0° 10'.9 N	36° 34'.3	8° 51'.4 S	221° 22'.9	10° 49'.9 N	59° 37'.0	16° 32'.5 S
13	34° 00'.5	29° 44'.6	12'.1	51° 34'.9	50'.6	236° 25'.5	49'.9	74° 39'.3	32'.5
14	49° 03'.0	44° 44'.3	13'.3	66° 35'.6	49'.9	251° 28'.1	50'.0	89° 41'.6	32'.4
15	64° 05'.5	59° 43'.9	14'.5	81° 36'.2	49'.2	266° 30'.7	50'.0	104° 43'.9	32'.4
16	79° 07'.9	74° 43'.5	15'.7	96° 36'.9	48'.5	281° 33'.3	50'.1	119° 46'.1	32'.3
17	94° 10'.4	89° 43'.2	17'.0	111° 37'.5	47'.7	296° 35'.9	50'.1	134° 48'.4	32'.3
18	109° 12'.9	104° 42'.8	18'.2	126° 38'.2	47'.0	311° 38'.5	50'.2	149° 50'.7	32'.2
19	124° 15'.3	119° 42'.4	19'.4	141° 38'.8	46'.3	326° 41'.1	50'.2	164° 53'.0	32'.2
20	139° 17'.8	134° 42'.1	20'.6	156° 39'.5	45'.6	341° 43'.7	50'.3	179° 55'.3	32'.1
21	154° 20'.3	149° 41'.7	21'.8	171° 40'.1	44'.8	356° 46'.4	50'.3	194° 57'.5	32'.1
22	169° 22'.7	164° 41'.3	23'.1	186° 40'.8	44'.1	11° 49'.0	50'.4	209° 59'.8	32'.0
23	184° 25'.2	179° 41'.0	24'.3	201° 41'.4	43'.4	26° 51'.6	50'.4	225° 02'.1	32'.0
11 Saturday 00	199° 27'.6	194° 40'.6	0° 25'.5 N	216° 42'.1	8° 42'.7 S	41° 54'.2	10° 50'.5 N	240° 04'.4	16° 31'.9 S
01	214° 30'.1	209° 40'.2	26'.7	231° 42'.7	41'.9	56° 56'.8	50'.5	255° 06'.7	31'.9
02	229° 32'.6	224° 39'.9	27'.9	246° 43'.4	41'.2	71° 59'.4	50'.6	270° 09'.0	31'.8
03	244° 35'.0	239° 39'.5	29'.2	261° 44'.0	40'.5	87° 02'.0	50'.6	285° 11'.2	31'.8
04	259° 37'.5	254° 39'.1	30'.4	276° 44'.7	39'.8	102° 04'.6	50'.7	300° 13'.5	31'.7
05	274° 40'.0	269° 38'.8	31'.6	291° 45'.3	39'.0	117° 07'.2	50'.7	315° 15'.8	31'.7
06	289° 42'.4	284° 38'.4	32'.8	306° 46'.0	38'.3	132° 09'.8	50'.8	330° 18'.1	31'.6
07	304° 44'.9	299° 38'.0	34'.0	321° 46'.6	37'.6	147° 12'.4	50'.8	345° 20'.4	31'.6
08	319° 47'.4	314° 37'.7	35'.3	336° 47'.3	36'.8	162° 15'.0	50'.9	0° 22'.7	31'.5
09	334° 49'.8	329° 37'.3	36'.5	351° 47'.9	36'.1	177° 17'.6	50'.9	15° 25'.0	31'.5
10	349° 52'.3	344° 36'.9	37'.7	6° 48'.6	35'.4	192° 20'.3	51'.0	30° 27'.2	31'.4
11	4° 54'.8	359° 36'.6	38'.9	21° 49'.2	34'.7	207° 22'.9	51'.0	45° 29'.5	31'.4
12	19° 57'.2	14° 36'.2	0° 40'.1 N	36° 49'.9	8° 33'.9 S	222° 25'.5	10° 51'.1 N	60° 31'.8	16° 31'.3 S
13	34° 59'.7	29° 35'.8	41'.4	51° 50'.5	33'.2	237° 28'.1	51'.1	75° 34'.1	31'.3
14	50° 02'.1	44° 35'.5	42'.6	66° 51'.2	32'.5	252° 30'.7	51'.2	90° 36'.4	31'.2
15	65° 04'.6	59° 35'.1	43'.8	81° 51'.8	31'.7	267° 33'.3	51'.2	105° 38'.7	31'.2
16	80° 07'.1	74° 34'.8	45'.0	96° 52'.5	31'.0	282° 35'.9	51'.3	120° 40'.9	31'.1
17	95° 09'.5	89° 34'.4	46'.2	111° 53'.1	30'.3	297° 38'.5	51'.3	135° 43'.2	31'.1
18	110° 12'.0	104° 34'.0	47'.5	126° 53'.8	29'.6	312° 41'.1	51'.4	150° 45'.5	31'.0
19	125° 14'.5	119° 33'.7	48'.7	141° 54'.4	28'.8	327° 43'.7	51'.4	165° 47'.8	31'.0
20	140° 16'.9	134° 33'.3	49'.9	156° 55'.1	28'.1	342° 46'.3	51'.4	180° 50'.1	30'.9
21	155° 19'.4	149° 32'.9	51'.1	171° 55'.7	27'.4	357° 48'.9	51'.5	195° 52'.4	30'.9
22	170° 21'.9	164° 32'.6	52'.3	186° 56'.4	26'.6	12° 51'.5	51'.5	210° 54'.7	30'.9
23	185° 24'.3	179° 32'.2	53'.6	201° 57'.0	25'.9	27° 54'.1	51'.6	225° 56'.9	30'.8
	M.P. 10:40	v -0'.4	d 1'.2	v 0'.6	d 0'.7	v 2'.6	d 0'.1	v 2'.3	d 0'.0

STARS	SHA	Dec
Acamar	315° 30'.7	40° 20'.2 S
Achernar	335° 39'.0	57° 16'.5 S
Acrux	173° 26'.6	63° 03'.6 S
Adhara	255° 25'.0	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.8	56° 00'.0 N
Alkaid	153° 10'.8	49° 20'.9 N
Alnair	28° 03'.7	46° 59'.7 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.5	8° 37'.7 S
Alphecca	126° 24'.1	26° 44'.2 N
Alpheratz	358° 00'.3	29° 02'.8 N
Altair	62° 23'.7	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.8 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.3	69° 00'.7 S
Avior	234° 24'.4	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.5 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.3	52° 41'.8 S
Capella	280° 58'.1	45° 59'.6 N
Deneb	49° 42'.5	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.7 S
Dubhe	194° 10'.3	61° 47'.6 N
Elnath	278° 32'.8	28° 36'.1 N
Eltanin	90° 53'.3	51° 29'.0 N
Enif	34° 02'.8	9° 50'.3 N
Fomalhaut	15° 41'.6	29° 39'.7 S
Gacrux	172° 18'.2	57° 04'.4 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.3 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.7	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.0 N
Markab	13° 54'.4	15° 09'.7 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.1 S
Miaplacidus	221° 42'.8	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.2 N
Nunki	76° 17'.8	26° 18'.4 S
Peacock	53° 44'.1	56° 45'.4 S
Polaris	324° 26'.0	89° 14'.0 N
Pollux	243° 47'.0	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.6 N
Rasalhague	96° 21'.0	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 27'.4	8° 12'.7 S
Rigil Kent	140° 12'.8	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.7 N
Shaula	96° 43'.2	37° 05'.9 S
Sirius	258° 47'.7	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.0	43° 24'.4 S
Vega	80° 49'.6	38° 46'.3 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	356° 20'.9	11:01
Mars	17° 58'.0	09:34
Jupiter	202° 23'.0	21:13
Saturn	40° 41'.1	08:02

SUN	GHA	Dec
9	179° 35'.3	7° 35'.5 N
10	194° 35'.5	36'.4
11	209° 35'.7	37'.3
9	224° 35'.9	38'.3
10	239° 36'.0	39'.2
11	254° 36'.2	40'.1
9	269° 36'.4	41'.1
10	284° 36'.5	42'.0
11	299° 36'.7	42'.9
9	314° 36'.9	43'.8
10	329° 37'.1	44'.8
11	344° 37'.2	45'.7
9	359° 37'.4	7° 46'.6 N
10	14° 37'.6	47'.5
11	29° 37'.7	48'.5
9	44° 37'.9	49'.4
10	59° 38'.1	50'.3
11	74° 38'.2	51'.3
9	89° 38'.4	52'.2
10	104° 38'.6	53'.1
11	119° 38'.7	54'.0
9	134° 38'.9	55'.0
10	149° 39'.1	55'.9
11	164° 39'.2	56'.8
9	179° 39'.4	7° 57'.7 N
10	194° 39'.6	58'.7
11	209° 39'.8	59'.6
9	224° 39'.9	8° 00'.5 N
10	239° 40'.1	01'.4
11	254° 40'.3	02'.3
9	269° 40'.4	03'.3
10	284° 40'.6	04'.2
11	299° 40'.8	05'.1
9	314° 40'.9	06'.0
10	329° 41'.1	07'.0
11	344° 41'.3	07'.9
9	359° 41'.4	8° 08'.8 N
10	14° 41'.6	09'.7
11	29° 41'.8	10'.6
9	44° 41'.9	11'.6
10	59° 42'.1	12'.5
11	74° 42'.3	13'.4
9	89° 42'.4	14'.3
10	104° 42'.6	15'.2
11	119° 42'.8	16'.2
9	134° 42'.9	17'.1
10	149° 43'.1	18'.0
11	164° 43'.3	18'.9
9	179° 43'.4	8° 19'.8 N
10	194° 43'.6	20'.8
11	209° 43'.8	21'.7
9	224° 43'.9	22'.6
10	239° 44'.1	23'.5
11	254° 44'.2	24'.4
9	269° 44'.4	25'.3
10	284° 44'.6	26'.3
11	299° 44'.7	27'.2
9	314° 44'.9	28'.1
10	329° 45'.1	29'.0
11	344° 45'.2	29'.9
9	359° 45'.4	8° 30'.8 N
10	14° 45'.6	31'.8
11	29° 45'.7	32'.7
9	44° 45'.9	33'.6
10	59° 46'.1	34'.5
11	74° 46'.2	35'.4
9	89° 46'.4	36'.3
10	104° 46'.5	37'.2
11	119° 46'.7	38'.2
9	134° 46'.9	39'.1
10	149° 47'.0	40'.0
11	164° 47'.2	40'.9
SD	16'.0	d 0'.9

MOON	GHA	v	Dec	d	HP
9	106° 25'.3	5'.8	23° 40'.0 N	3'.4	58'.7
10	120° 50'.1	5'.7	36'.6	3'.6	
11	135° 14'.8	5'.8	33'.0	3'.7	
9	149° 39'.6	5'.8	29'.3	3'.8	
10	164° 04'.4	5'.8	25'.5	4'.0	
11	178° 29'.2	5'.8	21'.5	4'.2	
9	192° 54'.0	5'.9	17'.3	4'.3	58'.8
10	207° 18'.9	5'.8	13'.0	4'.4	
11	221° 43'.7	5'.9	08'.6	4'.6	
9	236° 08'.6	6'.0	04'.0	4'.8	
10	250° 33'.6	5'.9	22° 59'.2 N	4'.9	
11	264° 58'.5	6'.0	54'.3	5'.1	
9	279° 23'.5	6'.0	22° 49'.2 N	5'.2	58'.9
10	293° 48'.5	6'.1	44'.0	5'.3	
11	308° 13'.6	6'.0	38'.7	5'.5	
9	322° 38'.6	6'.1	33'.2	5'.7	
10	337° 03'.7	6'.2	27'.5	5'.7	
11	351° 28'.9	6'.2	21'.8	6'.0	
9	5° 54'.1	6'.2	15'.8	6'.1	
10	20° 19'.3	6'.2	09'.7	6'.2	59'.0
11	34° 44'.5	6'.3	03'.5	6'.4	
9	49° 09'.8	6'.3	21° 57'.1 N	6'.5	
10	63° 35'.1	6'.4	50'.6	6'.6	
11	78° 00'.5	6'.4	44'.0	6'.8	
9	92° 25'.9	6'.5	21° 37'.2 N	7'.0	59'.0
10	106° 51'.4	6'.5	30'.2	7'.0	
11	121° 16'.9	6'.5	23'.2	7'.2	
9	135° 42'.4	6'.6	16'.0	7'.4	59'.1
10	150° 08'.0	6'.6	08'.6	7'.5	
11	164° 33'.6	6'.7	01'.1	7'.6	
9	178° 59'.3	6'.7	20° 53'.5 N	7'.7	
10	193° 25'.0	6'.8	45'.8	7'.9	
11	207° 50'.8	6'.8	37'.9	8'.0	
9	222° 16'.6	6'.9	29'.9	8'.2	
10	236° 42'.5	6'.9	21'.7	8'.3	
11	251° 08'.4	7'.0	13'.4	8'.4	59'.2
9	265° 34'.4	7'.0	20° 05'.0 N	8'.5	59'.2
10	280° 00'.4	7'.1	19° 56'.5 N	8'.7	
11	294° 26'.5	7'.1	47'.8	8'.8	
9	308° 52'.6	7'.2	39'.0	8'.9	
10	323° 18'.8	7'.2	30'.1	9'.0	
11	337° 45'.0	7'.3	21'.1	9'.2	
9	352° 11'.3	7'.3	11'.9	9'.3	
10	6° 37'.6	7'.4	02'.6	9'.4	59'.3
11	21° 04'.0	7'.4	18° 53'.2 N	9'.5	
9	35° 30'.4	7'.5	43'.7	9'.6	
10	49° 56'.9	7'.6	34'.1	9'.8	
11	64° 23'.5	7'.6	24'.3	9'.9	
9	78° 50'.1	7'.6	18° 14'.4 N	10'.0	59'.3
10	93° 16'.7	7'.7	04'.4	10'.1	
11	107° 43'.4	7'.8	17° 54'.3 N	10'.2	
9	122° 10'.2	7'.8	44'.1	10'.3	
10	136° 37'.0	7'.9	33'.8	10'.4	59'.4
11	151° 03'.9	7'.9	23'.4	10'.6	
9	165° 30'.8	8'.0	12'.8	10'.6	
10	179° 57'.8	8'.1	02'.2	10'.8	
11	194° 24'.9	8'.1	16° 51'.4 N	10'.9	
9	208° 52'.0	8'.1	40'.5	10'.9	
10	223° 19'.1	8'.2	29'.6	11'.1	
11	237° 46'.3	8'.3	18'.5	11'.2	
9	252° 13'.6	8'.3	16° 07'.3 N	11'.2	59'.4
10	266° 40'.9	8'.4	15° 56'.1 N	11'.4	
11	281° 08'.3	8'.4	44'.7	11'.5	
9	295° 35'.7	8'.5	33'.2	11'.5	59'.5
10	310° 03'.2	8'.5	21'.7	11'.7	
11	324° 30'.7	8'.6	10'.0	11'.7	
9	338° 58'.3	8'.7	14° 58'.3 N	11'.9	
10	353° 26'.0	8'.7	46'.4	11'.9	
11	7° 53'.7	8'.7	34'.5	12'.0	
9	22° 21'.4	8'.8	22'.5	12'.1	
10	36° 49'.2	8'.8	10'.4	12'.2	
11	51° 17'.0	9'.0	13° 58'.2 N	12'.3	
SD	16'.0		16'.1	16'.2	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
9	1 39	1 31	12:02	17:35	05:06	6d 40%
10	1 23	1 15	12:01	18:32	06:04	7d 51%
11	1 07	0 59	12:01	19:27	07:00	8d 62%

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1992 April 12, 13, 14 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.3		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
12 Sunday 00	200° 26'.8	194° 31'.8	0° 54'.8 N	216° 57'.7	8° 25'.2 S	42° 56'.7	10° 51'.6 N	240° 59'.2	16° 30'.8 S
01	215° 29'.3	209° 31'.5	56'.0	231° 58'.3	24'.5	57° 59'.3	51'.7	256° 01'.5	30'.7
02	230° 31'.7	224° 31'.1	57'.2	246° 59'.0	23'.7	73° 01'.9	51'.7	271° 03'.8	30'.7
03	245° 34'.2	239° 30'.7	58'.4	261° 59'.6	23'.0	88° 04'.5	51'.8	286° 06'.1	30'.6
04	260° 36'.6	254° 30'.4	59'.7	277° 00'.3	22'.3	103° 07'.1	51'.8	301° 08'.4	30'.6
05	275° 39'.1	269° 30'.0	1° 00'.9 N	292° 00'.9	21'.5	118° 09'.7	51'.9	316° 10'.7	30'.5
06	290° 41'.6	284° 29'.6	02'.1	307° 01'.6	20'.8	133° 12'.3	51'.9	331° 13'.0	30'.5
07	305° 44'.0	299° 29'.3	03'.3	322° 02'.2	20'.1	148° 14'.9	52'.0	346° 15'.2	30'.4
08	320° 46'.5	314° 28'.9	04'.5	337° 02'.9	19'.3	163° 17'.5	52'.0	1° 17'.5	30'.4
09	335° 49'.0	329° 28'.5	05'.8	352° 03'.5	18'.6	178° 20'.1	52'.1	16° 19'.8	30'.3
10	350° 51'.4	344° 28'.2	07'.0	7° 04'.2	17'.9	193° 22'.7	52'.1	31° 22'.1	30'.3
11	5° 53'.9	359° 27'.8	08'.2	22° 04'.9	17'.2	208° 25'.3	52'.1	46° 24'.4	30'.2
12	20° 56'.4	14° 27'.4	1° 09'.4 N	37° 05'.5	8° 16'.4 S	223° 27'.9	10° 52'.2 N	61° 26'.7	16° 30'.2 S
13	35° 58'.8	29° 27'.1	10'.6	52° 06'.2	15'.7	238° 30'.5	52'.2	76° 29'.0	30'.1
14	51° 01'.3	44° 26'.7	11'.9	67° 06'.8	15'.0	253° 33'.1	52'.3	91° 31'.3	30'.1
15	66° 03'.7	59° 26'.4	13'.1	82° 07'.5	14'.2	268° 35'.7	52'.3	106° 33'.5	30'.0
16	81° 06'.2	74° 26'.0	14'.3	97° 08'.1	13'.5	283° 38'.3	52'.4	121° 35'.8	30'.0
17	96° 08'.7	89° 25'.6	15'.5	112° 08'.8	12'.8	298° 40'.9	52'.4	136° 38'.1	29'.9
18	111° 11'.1	104° 25'.3	16'.7	127° 09'.4	12'.0	313° 43'.5	52'.5	151° 40'.4	29'.9
19	126° 13'.6	119° 24'.9	18'.0	142° 10'.1	11'.3	328° 46'.1	52'.5	166° 42'.7	29'.9
20	141° 16'.1	134° 24'.5	19'.2	157° 10'.7	10'.6	343° 48'.7	52'.6	181° 45'.0	29'.8
21	156° 18'.5	149° 24'.2	20'.4	172° 11'.4	09'.8	358° 51'.3	52'.6	196° 47'.3	29'.8
22	171° 21'.0	164° 23'.8	21'.6	187° 12'.0	09'.1	13° 53'.9	52'.6	211° 49'.6	29'.7
23	186° 23'.5	179° 23'.4	22'.8	202° 12'.7	08'.4	28° 56'.5	52'.7	226° 51'.9	29'.7
13 Monday 00	201° 25'.9	194° 23'.1	1° 24'.1 N	217° 13'.4	8° 07'.6 S	43° 59'.1	10° 52'.7 N	241° 54'.1	16° 29'.6 S
01	216° 28'.4	209° 22'.7	25'.3	232° 14'.0	06'.9	59° 01'.6	52'.8	256° 56'.4	29'.6
02	231° 30'.9	224° 22'.3	26'.5	247° 14'.7	06'.2	74° 04'.2	52'.8	271° 58'.7	29'.5
03	246° 33'.3	239° 22'.0	27'.7	262° 15'.3	05'.4	89° 06'.8	52'.9	287° 01'.0	29'.5
04	261° 35'.8	254° 21'.6	28'.9	277° 16'.0	04'.7	104° 09'.4	52'.9	302° 03'.3	29'.4
05	276° 38'.2	269° 21'.2	30'.2	292° 16'.6	04'.0	119° 12'.0	53'.0	317° 05'.6	29'.4
06	291° 40'.7	284° 20'.9	31'.4	307° 17'.3	03'.2	134° 14'.6	53'.0	332° 07'.9	29'.3
07	306° 43'.2	299° 20'.5	32'.6	322° 17'.9	02'.5	149° 17'.2	53'.0	347° 10'.2	29'.3
08	321° 45'.6	314° 20'.1	33'.8	337° 18'.6	01'.8	164° 19'.8	53'.1	2° 12'.5	29'.2
09	336° 48'.1	329° 19'.8	35'.0	352° 19'.3	01'.0	179° 22'.4	53'.1	17° 14'.8	29'.2
10	351° 50'.6	344° 19'.4	36'.3	7° 19'.9	00'.3	194° 25'.0	53'.2	32° 17'.0	29'.1
11	6° 53'.0	359° 19'.0	37'.5	22° 20'.6	7° 59'.6 S	209° 27'.6	53'.2	47° 19'.3	29'.1
12	21° 55'.5	14° 18'.7	1° 38'.7 N	37° 21'.2	7° 58'.8 S	224° 30'.2	10° 53'.3 N	62° 21'.6	16° 29'.1 S
13	36° 58'.0	29° 18'.3	39'.9	52° 21'.9	58'.1	239° 32'.8	53'.3	77° 23'.9	29'.0
14	52° 00'.4	44° 17'.9	41'.1	67° 22'.5	57'.4	254° 35'.3	53'.3	92° 26'.2	29'.0
15	67° 02'.9	59° 17'.6	42'.3	82° 23'.2	56'.6	269° 37'.9	53'.4	107° 28'.5	28'.9
16	82° 05'.3	74° 17'.2	43'.6	97° 23'.9	55'.9	284° 40'.5	53'.4	122° 30'.8	28'.9
17	97° 07'.8	89° 16'.9	44'.8	112° 24'.5	55'.2	299° 43'.1	53'.5	137° 33'.1	28'.8
18	112° 10'.3	104° 16'.5	46'.0	127° 25'.2	54'.4	314° 45'.7	53'.5	152° 35'.4	28'.8
19	127° 12'.7	119° 16'.1	47'.2	142° 25'.8	53'.7	329° 48'.3	53'.6	167° 37'.7	28'.7
20	142° 15'.2	134° 15'.8	48'.4	157° 26'.5	53'.0	344° 50'.9	53'.6	182° 40'.0	28'.7
21	157° 17'.7	149° 15'.4	49'.7	172° 27'.1	52'.2	359° 53'.5	53'.6	197° 42'.3	28'.6
22	172° 20'.1	164° 15'.0	50'.9	187° 27'.8	51'.5	14° 56'.1	53'.7	212° 44'.6	28'.6
23	187° 22'.6	179° 14'.7	52'.1	202° 28'.5	50'.8	29° 58'.7	53'.7	227° 46'.8	28'.5
14 Tuesday 00	202° 25'.1	194° 14'.3	1° 53'.3 N	217° 29'.1	7° 50'.0 S	45° 01'.2	10° 53'.8 N	242° 49'.1	16° 28'.5 S
01	217° 27'.5	209° 13'.9	54'.5	232° 29'.8	49'.3	60° 03'.8	53'.8	257° 51'.4	28'.5
02	232° 30'.0	224° 13'.6	55'.8	247° 30'.4	48'.6	75° 06'.4	53'.8	272° 53'.7	28'.4
03	247° 32'.5	239° 13'.2	57'.0	262° 31'.1	47'.8	90° 09'.0	53'.9	287° 56'.0	28'.4
04	262° 34'.9	254° 12'.8	58'.2	277° 31'.7	47'.1	105° 11'.6	53'.9	302° 58'.3	28'.3
05	277° 37'.4	269° 12'.5	59'.4	292° 32'.4	46'.4	120° 14'.2	54'.0	318° 00'.6	28'.3
06	292° 39'.8	284° 12'.1	2° 00'.6 N	307° 33'.1	45'.6	135° 16'.8	54'.0	333° 02'.9	28'.2
07	307° 42'.3	299° 11'.7	01'.8	322° 33'.7	44'.9	150° 19'.3	54'.0	348° 05'.2	28'.2
08	322° 44'.8	314° 11'.4	03'.1	337° 34'.4	44'.2	165° 21'.9	54'.1	3° 07'.5	28'.1
09	337° 47'.2	329° 11'.0	04'.3	352° 35'.0	43'.4	180° 24'.5	54'.1	18° 09'.8	28'.1
10	352° 49'.7	344° 10'.6	05'.5	7° 35'.7	42'.7	195° 27'.1	54'.2	33° 12'.1	28'.0
11	7° 52'.2	359° 10'.3	06'.7	22° 36'.4	41'.9	210° 29'.7	54'.2	48° 14'.4	28'.0
12	22° 54'.6	14° 09'.9	2° 07'.9 N	37° 37'.0	7° 41'.2 S	225° 32'.3	10° 54'.2 N	63° 16'.7	16° 28'.0 S
13	37° 57'.1	29° 09'.5	09'.2	52° 37'.7	40'.5	240° 34'.9	54'.3	78° 19'.0	27'.9
14	52° 59'.6	44° 09'.2	10'.4	67° 38'.3	39'.7	255° 37'.4	54'.3	93° 21'.3	27'.9
15	68° 02'.0	59° 08'.8	11'.6	82° 39'.0	39'.0	270° 40'.0	54'.4	108° 23'.5	27'.8
16	83° 04'.5	74° 08'.4	12'.8	97° 39'.7	38'.3	285° 42'.6	54'.4	123° 25'.8	27'.8
17	98° 07'.0	89° 08'.1	14'.0	112° 40'.3	37'.5	300° 45'.2	54'.4	138° 28'.1	27'.7
18	113° 09'.4	104° 07'.7	15'.3	127° 41'.0	36'.8	315° 47'.8	54'.5	153° 30'.4	27'.7
19	128° 11'.9	119° 07'.3	16'.5	142° 41'.6	36'.1	330° 50'.4	54'.5	168° 32'.7	27'.6
20	143° 14'.3	134° 07'.0	17'.7	157° 42'.3	35'.3	345° 52'.9	54'.6	183° 35'.0	27'.6
21	158° 16'.8	149° 06'.6	18'.9	172° 43'.0	34'.6	0° 55'.5	54'.6	198° 37'.3	27'.5
22	173° 19'.3	164° 06'.2	20'.1	187° 43'.6	33'.8	15° 58'.1	54'.6	213° 39'.6	27'.5
23	188° 21'.7	179° 05'.9	21'.3	202° 44'.3	33'.1	31° 00'.7	54'.7	228° 41'.9	27'.5
	M.P. 10:29	v -0'.4	d 1'.2	v 0'.7	d 0'.7	v 2'.6	d 0'.0	v 2'.3	d 0'.0

STARS	SHA	Dec
Acamar	315° 30'.7	40° 20'.2 S
Achernar	335° 39'.0	57° 16'.5 S
Acrux	173° 26'.6	63° 03'.6 S
Adhara	255° 25'.0	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.8	56° 00'.0 N
Alkaid	153° 10'.7	49° 20'.9 N
Alnair	28° 03'.7	46° 59'.7 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.5	8° 37'.7 S
Alphecca	126° 24'.1	26° 44'.2 N
Alpheratz	358° 00'.3	29° 02'.8 N
Altair	62° 23'.7	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.8 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.3	69° 00'.7 S
Avior	234° 24'.5	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.5 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.4	52° 41'.8 S
Capella	280° 58'.1	45° 59'.6 N
Deneb	49° 42'.4	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.7 S
Dubhe	194° 10'.3	61° 47'.6 N
Elnath	278° 32'.8	28° 36'.1 N
Eltanin	90° 53'.3	51° 29'.1 N
Enif	34° 02'.8	9° 50'.3 N
Fomalhaut	15° 41'.6	29° 39'.7 S
Gacrux	172° 18'.2	57° 04'.5 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.3 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.7	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.0 N
Markab	13° 54'.4	15° 09'.7 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.1 S
Miaplacidus	221° 42'.9	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.2 N
Nunki	76° 17'.8	26° 18'.4 S
Peacock	53° 44'.1	56° 45'.4 S
Polaris	324° 26'.4	89° 13'.9 N
Pollux	243° 47'.0	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.6 N
Rasalhague	96° 21'.0	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.8	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.7 N
Shaula	96° 43'.2	37° 05'.9 S
Sirius	258° 47'.7	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.0	43° 24'.4 S
Vega	80° 49'.6	38° 46'.3 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	352° 57'.1	11:03
Mars	15° 47'.4	09:31
Jupiter	202° 33'.1	21:00
Saturn	40° 28'.2	07:51

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
179° 47'.4	8° 41'.8 N	65° 45'.0	8'.9	13° 45'.9 N	12'.4	59'.5
194° 47'.5	42'.7	80° 12'.9	9'.0	33'.5	12'.4	
209° 47'.7	43'.6	94° 40'.9	9'.1	21'.1	12'.5	
224° 47'.8	44'.5	109° 09'.0	9'.1	08'.6	12'.6	
239° 48'.0	45'.4	123° 37'.1	9'.1	12° 56'.0 N	12'.7	
254° 48'.2	46'.4	138° 05'.2	9'.2	43'.3	12'.8	59'.6
269° 48'.3	47'.3	152° 33'.4	9'.3	30'.5	12'.8	
284° 48'.5	48'.2	167° 01'.7	9'.3	17'.7	12'.9	
299° 48'.7	49'.1	181° 30'.0	9'.3	04'.8	13'.0	
314° 48'.8	50'.0	195° 58'.3	9'.4	11° 51'.8 N	13'.0	
329° 49'.0	50'.9	210° 26'.7	9'.4	38'.8	13'.1	
344° 49'.1	51'.8	224° 55'.1	9'.5	25'.7	13'.2	
359° 49'.3	8° 52'.7 N	239° 23'.6	9'.6	11° 12'.5 N	13'.3	59'.6
14° 49'.5	53'.6	253° 52'.2	9'.5	10° 59'.2 N	13'.3	
29° 49'.6	54'.5	268° 20'.7	9'.6	45'.9	13'.4	
44° 49'.8	55'.5	282° 49'.3	9'.7	32'.5	13'.4	
59° 49'.9	56'.4	297° 18'.0	9'.7	19'.1	13'.5	
74° 50'.1	57'.3	311° 46'.7	9'.7	05'.6	13'.6	
89° 50'.3	58'.2	326° 15'.4	9'.8	9° 52'.0 N	13'.6	
104° 50'.4	59'.1	340° 44'.2	9'.8	38'.4	13'.7	
119° 50'.6	00'.0	355° 13'.0	9'.9	24'.7	13'.7	
134° 50'.7	9° 00'.9 N	9° 41'.9	9'.9	11'.0	13'.8	
149° 50'.9	01'.8	24° 10'.8	9'.9	8° 57'.2 N	13'.8	
164° 51'.1	02'.7	38° 39'.7	10'.0	43'.4	13'.9	
179° 51'.2	9° 03'.6 N	53° 08'.7	10'.0	8° 29'.5 N	14'.0	59'.6
194° 51'.4	04'.5	67° 37'.7	10'.1	15'.5	14'.0	
209° 51'.5	05'.4	82° 06'.8	10'.1	01'.5	14'.0	
224° 51'.7	06'.3	96° 35'.9	10'.1	7° 47'.5 N	14'.1	
239° 51'.9	07'.2	111° 05'.0	10'.1	33'.4	14'.1	
254° 52'.0	08'.2	125° 34'.1	10'.2	19'.3	14'.1	
269° 52'.2	09'.1	140° 03'.3	10'.2	05'.2	14'.2	
284° 52'.3	10'.0	154° 32'.5	10'.2	6° 51'.0 N	14'.3	
299° 52'.5	10'.9	169° 01'.7	10'.3	36'.7	14'.3	
314° 52'.7	11'.8	183° 31'.0	10'.3	22'.4	14'.3	
329° 52'.8	12'.7	198° 00'.3	10'.3	08'.1	14'.3	
344° 53'.0	13'.6	212° 29'.6	10'.4	5° 53'.8 N	14'.4	
359° 53'.1	9° 14'.5 N	226° 59'.0	10'.4	5° 39'.4 N	14'.4	59'.6
14° 53'.3	15'.4	241° 28'.4	10'.4	25'.0	14'.5	
29° 53'.4	16'.3	255° 57'.8	10'.4	10'.5	14'.4	
44° 53'.6	17'.2	270° 27'.2	10'.5	4° 56'.1 N	14'.5	
59° 53'.8	18'.1	284° 56'.7	10'.5	41'.6	14'.5	
74° 53'.9	19'.0	299° 26'.2	10'.5	27'.1	14'.6	
89° 54'.1	19'.9	313° 55'.7	10'.5	12'.5	14'.6	
104° 54'.2	20'.8	328° 25'.2	10'.5	3° 57'.9 N	14'.6	
119° 54'.4	21'.7	342° 54'.7	10'.6	43'.3	14'.6	
134° 54'.5	22'.6	357° 24'.3	10'.6	28'.7	14'.6	
149° 54'.7	23'.5	11° 53'.9	10'.6	14'.1	14'.6	
164° 54'.9	24'.4	26° 23'.5	10'.6	2° 59'.5 N	14'.7	
179° 55'.0	9° 25'.3 N	40° 53'.1	10'.6	2° 44'.8 N	14'.7	59'.6
194° 55'.2	26'.2	55° 22'.7	10'.7	30'.1	14'.6	
209° 55'.3	27'.1	69° 52'.4	10'.6	15'.5	14'.7	
224° 55'.5	28'.0	84° 22'.0	10'.7	00'.8	14'.7	
239° 55'.6	28'.9	98° 51'.7	10'.7	1° 46'.1 N	14'.8	
254° 55'.8	29'.8	113° 21'.4	10'.7	31'.3	14'.7	
269° 55'.9	30'.7	127° 51'.1	10'.7	16'.6	14'.7	
284° 56'.1	31'.6	142° 20'.8	10'.7	01'.9	14'.7	
299° 56'.3	32'.5	156° 50'.5	10'.7	0° 47'.2 N	14'.8	59'.5
314° 56'.4	33'.4	171° 20'.2	10'.8	32'.4	14'.7	
329° 56'.6	34'.3	185° 50'.0	10'.7	17'.7	14'.7	
344° 56'.7	35'.2	200° 19'.7	10'.8	03'.0	14'.7	
359° 56'.9	9° 36'.1 N	214° 49'.5	10'.7	0° 11'.7 S	14'.8	59'.5
14° 57'.0	37'.0	229° 19'.2	10'.8	26'.5	14'.7	
29° 57'.2	37'.9	243° 49'.0	10'.7	41'.2	14'.7	
44° 57'.3	38'.8	258° 18'.7	10'.8	55'.9	14'.7	
59° 57'.5	39'.6	272° 48'.5	10'.8	1° 10'.6 S	14'.7	
74° 57'.7	40'.5	287° 18'.3	10'.7	25'.3	14'.6	
89° 57'.8	41'.4	301° 48'.0	10'.8	39'.9	14'.7	
104° 58'.0	42'.3	316° 17'.8	10'.7	54'.6	14'.7	
119° 58'.1	43'.2	330° 47'.5	10'.8	2° 09'.3 S	14'.6	59'.4
134° 58'.3	44'.1	345° 17'.3	10'.8	23'.9	14'.6	
149° 58'.4	45'.0	359° 47'.1	10'.7	38'.5	14'.6	
164° 58'.6	45'.9	14° 16'.8	10'.8	53'.1	14'.6	
SD 15'.9	d 0'.9	SD 16'.2		16'.2		16'.2

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
12	0 51	0 43	12:01	20:20	07:54	9d 73%
13	0 35	0 28	12:00	21:11	08:45	10d 83%
14	0 20	0 13	12:00	22:01	09:36	11d 91%

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1992 April 15, 16, 17 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.3		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
15 Wednesday 00	203° 24'.2	194° 05'.5	2° 22'.6 N	217° 44'.9	7° 32'.4 S	46° 03'.3	10° 54'.7 N	243° 44'.2	16° 27'.4 S
01	218° 26'.7	209° 05'.1	23'.8	232° 45'.6	31'.6	61° 05'.8	54'.8	258° 46'.5	27'.4
02	233° 29'.1	224° 04'.8	25'.0	247° 46'.3	30'.9	76° 08'.4	54'.8	273° 48'.8	27'.3
03	248° 31'.6	239° 04'.4	26'.2	262° 46'.9	30'.2	91° 11'.0	54'.8	288° 51'.1	27'.3
04	263° 34'.1	254° 04'.0	27'.4	277° 47'.6	29'.4	106° 13'.6	54'.9	303° 53'.4	27'.2
05	278° 36'.5	269° 03'.7	28'.6	292° 48'.2	28'.7	121° 16'.2	54'.9	318° 55'.7	27'.2
06	293° 39'.0	284° 03'.3	29'.9	307° 48'.9	27'.9	136° 18'.7	54'.9	333° 58'.0	27'.1
07	308° 41'.4	299° 02'.9	31'.1	322° 49'.6	27'.2	151° 21'.3	55'.0	349° 00'.3	27'.1
08	323° 43'.9	314° 02'.6	32'.3	337° 50'.2	26'.5	166° 23'.9	55'.0	4° 02'.6	27'.0
09	338° 46'.4	329° 02'.2	33'.5	352° 50'.9	25'.7	181° 26'.5	55'.1	19° 04'.9	27'.0
10	353° 48'.8	344° 01'.8	34'.7	7° 51'.6	25'.0	196° 29'.1	55'.1	34° 07'.2	27'.0
11	8° 51'.3	359° 01'.4	35'.9	22° 52'.2	24'.2	211° 31'.6	55'.1	49° 09'.5	26'.9
12	23° 53'.8	14° 01'.1	2° 37'.2 N	37° 52'.9	7° 23'.5 S	226° 34'.2	10° 55'.2 N	64° 11'.8	16° 26'.9 S
13	38° 56'.2	29° 00'.7	38'.4	52° 53'.5	22'.8	241° 36'.8	55'.2	79° 14'.1	26'.8
14	53° 58'.7	44° 00'.3	39'.6	67° 54'.2	22'.0	256° 39'.4	55'.2	94° 16'.4	26'.8
15	69° 01'.2	59° 00'.0	40'.8	82° 54'.9	21'.3	271° 41'.9	55'.3	109° 18'.7	26'.7
16	84° 03'.6	73° 59'.6	42'.0	97° 55'.5	20'.5	286° 44'.5	55'.3	124° 21'.0	26'.7
17	99° 06'.1	88° 59'.2	43'.2	112° 56'.2	19'.8	301° 47'.1	55'.4	139° 23'.3	26'.6
18	114° 08'.6	103° 58'.9	44'.5	127° 56'.8	19'.1	316° 49'.7	55'.4	154° 25'.6	26'.6
19	129° 11'.0	118° 58'.5	45'.7	142° 57'.5	18'.3	331° 52'.2	55'.4	169° 27'.9	26'.6
20	144° 13'.5	133° 58'.1	46'.9	157° 58'.2	17'.6	346° 54'.8	55'.5	184° 30'.2	26'.5
21	159° 15'.9	148° 57'.8	48'.1	172° 58'.8	16'.8	1° 57'.4	55'.5	199° 32'.5	26'.5
22	174° 18'.4	163° 57'.4	49'.3	187° 59'.5	16'.1	17° 00'.0	55'.5	214° 34'.8	26'.4
23	189° 20'.9	178° 57'.0	50'.5	203° 00'.2	15'.4	32° 02'.5	55'.6	229° 37'.1	26'.4
16 Thursday 00	204° 23'.3	193° 56'.7	2° 51'.8 N	218° 00'.8	7° 14'.6 S	47° 05'.1	10° 55'.6 N	244° 39'.4	16° 26'.3 S
01	219° 25'.8	208° 56'.3	53'.0	233° 01'.5	13'.9	62° 07'.7	55'.6	259° 41'.7	26'.3
02	234° 28'.3	223° 55'.9	54'.2	248° 02'.2	13'.1	77° 10'.3	55'.7	274° 44'.0	26'.2
03	249° 30'.7	238° 55'.6	55'.4	263° 02'.8	12'.4	92° 12'.8	55'.7	289° 46'.3	26'.2
04	264° 33'.2	253° 55'.2	56'.6	278° 03'.5	11'.7	107° 15'.4	55'.8	304° 48'.6	26'.2
05	279° 35'.7	268° 54'.8	57'.8	293° 04'.1	10'.9	122° 18'.0	55'.8	319° 50'.9	26'.1
06	294° 38'.1	283° 54'.4	59'.1	308° 04'.8	10'.2	137° 20'.5	55'.8	334° 53'.2	26'.1
07	309° 40'.6	298° 54'.1	3° 00'.3 N	323° 05'.5	09'.4	152° 23'.1	55'.9	349° 55'.5	26'.0
08	324° 43'.0	313° 53'.7	01'.5	338° 06'.1	08'.7	167° 25'.7	55'.9	4° 57'.8	26'.0
09	339° 45'.5	328° 53'.3	02'.7	353° 06'.8	08'.0	182° 28'.3	55'.9	20° 00'.1	25'.9
10	354° 48'.0	343° 53'.0	03'.9	8° 07'.5	07'.2	197° 30'.8	56'.0	35° 02'.4	25'.9
11	9° 50'.4	358° 52'.6	05'.1	23° 08'.1	06'.5	212° 33'.4	56'.0	50° 04'.7	25'.9
12	24° 52'.9	13° 52'.2	3° 06'.3 N	38° 08'.8	7° 05'.7 S	227° 36'.0	10° 56'.0 N	65° 07'.0	16° 25'.8 S
13	39° 55'.4	28° 51'.9	07'.6	53° 09'.5	05'.0	242° 38'.5	56'.1	80° 09'.3	25'.8
14	54° 57'.8	43° 51'.5	08'.8	68° 10'.1	04'.3	257° 41'.1	56'.1	95° 11'.6	25'.7
15	70° 00'.3	58° 51'.1	10'.0	83° 10'.8	03'.5	272° 43'.7	56'.1	110° 13'.9	25'.7
16	85° 02'.8	73° 50'.8	11'.2	98° 11'.5	02'.8	287° 46'.3	56'.2	125° 16'.2	25'.6
17	100° 05'.2	88° 50'.4	12'.4	113° 12'.1	02'.0	302° 48'.8	56'.2	140° 18'.5	25'.6
18	115° 07'.7	103° 50'.0	13'.6	128° 12'.8	01'.3	317° 51'.4	56'.2	155° 20'.8	25'.6
19	130° 10'.2	118° 49'.6	14'.8	143° 13'.5	00'.5	332° 54'.0	56'.3	170° 23'.1	25'.5
20	145° 12'.6	133° 49'.3	16'.1	158° 14'.1	6° 59'.8 S	347° 56'.5	56'.3	185° 25'.4	25'.5
21	160° 15'.1	148° 48'.9	17'.3	173° 14'.8	59'.1	2° 59'.1	56'.3	200° 27'.7	25'.4
22	175° 17'.5	163° 48'.5	18'.5	188° 15'.4	58'.3	18° 01'.7	56'.4	215° 30'.0	25'.4
23	190° 20'.0	178° 48'.2	19'.7	203° 16'.1	57'.6	33° 04'.2	56'.4	230° 32'.3	25'.3
17 Friday 00	205° 22'.5	193° 47'.8	3° 20'.9 N	218° 16'.8	6° 56'.8 S	48° 06'.8	10° 56'.4 N	245° 34'.6	16° 25'.3 S
01	220° 24'.9	208° 47'.4	22'.1	233° 17'.4	56'.1	63° 09'.4	56'.5	260° 36'.9	25'.2
02	235° 27'.4	223° 47'.1	23'.3	248° 18'.1	55'.4	78° 11'.9	56'.5	275° 39'.2	25'.2
03	250° 29'.9	238° 46'.7	24'.6	263° 18'.8	54'.6	93° 14'.5	56'.5	290° 41'.5	25'.2
04	265° 32'.3	253° 46'.3	25'.8	278° 19'.4	53'.9	108° 17'.1	56'.6	305° 43'.8	25'.1
05	280° 34'.8	268° 45'.9	27'.0	293° 20'.1	53'.1	123° 19'.6	56'.6	320° 46'.1	25'.1
06	295° 37'.3	283° 45'.6	28'.2	308° 20'.8	52'.4	138° 22'.2	56'.6	335° 48'.4	25'.0
07	310° 39'.7	298° 45'.2	29'.4	323° 21'.4	51'.6	153° 24'.8	56'.7	350° 50'.7	25'.0
08	325° 42'.2	313° 44'.8	30'.6	338° 22'.1	50'.9	168° 27'.3	56'.7	5° 53'.0	24'.9
09	340° 44'.6	328° 44'.5	31'.8	353° 22'.8	50'.1	183° 29'.9	56'.7	20° 55'.3	24'.9
10	355° 47'.1	343° 44'.1	33'.0	8° 23'.4	49'.4	198° 32'.4	56'.8	35° 57'.6	24'.9
11	10° 49'.6	358° 43'.7	34'.3	23° 24'.1	48'.7	213° 35'.0	56'.8	50° 59'.9	24'.8
12	25° 52'.0	13° 43'.3	3° 35'.5 N	38° 24'.8	6° 47'.9 S	228° 37'.6	10° 56'.8 N	66° 02'.2	16° 24'.8 S
13	40° 54'.5	28° 43'.0	36'.7	53° 25'.4	47'.2	243° 40'.1	56'.9	81° 04'.5	24'.7
14	55° 57'.0	43° 42'.6	37'.9	68° 26'.1	46'.4	258° 42'.7	56'.9	96° 06'.8	24'.7
15	70° 59'.4	58° 42'.2	39'.1	83° 26'.8	45'.7	273° 45'.3	56'.9	111° 09'.1	24'.6
16	86° 01'.9	73° 41'.8	40'.3	98° 27'.5	44'.9	288° 47'.8	56'.9	126° 11'.5	24'.6
17	101° 04'.4	88° 41'.5	41'.5	113° 28'.1	44'.2	303° 50'.4	57'.0	141° 13'.8	24'.6
18	116° 06'.8	103° 41'.1	42'.7	128° 28'.8	43'.5	318° 52'.9	57'.0	156° 16'.1	24'.5
19	131° 09'.3	118° 40'.7	44'.0	143° 29'.5	42'.7	333° 55'.5	57'.0	171° 18'.4	24'.5
20	146° 11'.8	133° 40'.4	45'.2	158° 30'.1	42'.0	348° 58'.1	57'.1	186° 20'.7	24'.4
21	161° 14'.2	148° 40'.0	46'.4	173° 30'.8	41'.2	4° 00'.6	57'.1	201° 23'.0	24'.4
22	176° 16'.7	163° 39'.6	47'.6	188° 31'.5	40'.5	19° 03'.2	57'.1	216° 25'.3	24'.4
23	191° 19'.1	178° 39'.2	48'.8	203° 32'.1	39'.7	34° 05'.8	57'.2	231° 27'.6	24'.3
	M.P. 10:17	v -0'.4	d 1'.2	v 0'.7	d 0'.7	v 2'.6	d 0'.0	v 2'.3	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.7	40° 20'.2 S
Achernar	335° 39'.0	57° 16'.5 S
Acrux	173° 26'.6	63° 03'.7 S
Adhara	255° 25'.1	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.8	56° 00'.0 N
Alkaid	153° 10'.7	49° 20'.9 N
Alnair	28° 03'.7	46° 59'.7 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.5	8° 37'.7 S
Alphecca	126° 24'.1	26° 44'.2 N
Alpheratz	358° 00'.3	29° 02'.8 N
Altair	62° 23'.7	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.8 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.2	69° 00'.8 S
Avior	234° 24'.5	59° 29'.5 S
Bellatrix	278° 49'.2	6° 20'.5 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.4	52° 41'.8 S
Capella	280° 58'.2	45° 59'.6 N
Deneb	49° 42'.4	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.7 S
Dubhe	194° 10'.3	61° 47'.6 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.2	51° 29'.1 N
Enif	34° 02'.8	9° 50'.3 N
Fomalhaut	15° 41'.6	29° 39'.7 S
Gacrux	172° 18'.2	57° 04'.5 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.3 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.6	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.0 N
Markab	13° 54'.4	15° 09'.7 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.1 S
Miaplacidus	221° 42'.9	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.2 N
Nunki	76° 17'.8	26° 18'.4 S
Peacock	53° 44'.1	56° 45'.4 S
Polaris	324° 26'.5	89° 13'.9 N
Pollux	243° 47'.0	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.6 N
Rasalhague	96° 20'.9	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.8	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.7 N
Shaula	96° 43'.2	37° 05'.9 S
Sirius	258° 47'.7	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.0	43° 24'.4 S
Vega	80° 49'.5	38° 46'.3 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	349° 33'.3	11:04
Mars	13° 37'.5	09:28
Jupiter	202° 41'.8	20:48
Saturn	40° 16'.0	07:40

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
15 00	179° 58'.7	9° 46'.8 N	28° 46'.6	10'.7	3° 07'.7 S	14'.5	59'.4
01	194° 58'.9	47'.7	43° 16'.3	10'.8	22'.2	14'.6	
02	209° 59'.0	48'.6	57° 46'.1	10'.7	36'.8	14'.5	
03	224° 59'.2	49'.5	72° 15'.8	10'.7	51'.3	14'.4	
04	239° 59'.3	50'.4	86° 45'.5	10'.8	4° 05'.7 S	14'.5	
05	254° 59'.5	51'.3	101° 15'.3	10'.7	20'.2	14'.4	59'.3
06	269° 59'.6	52'.2	115° 45'.0	10'.7	34'.6	14'.4	
07	284° 59'.8	53'.0	130° 14'.7	10'.7	49'.0	14'.4	
08	299° 59'.9	53'.9	144° 44'.4	10'.7	5° 03'.4 S	14'.3	
09	315° 00'.1	54'.8	159° 14'.1	10'.6	17'.7	14'.3	
10	330° 00'.2	55'.7	173° 43'.7	10'.7	32'.0	14'.2	
11	345° 00'.4	56'.6	188° 13'.4	10'.6	46'.2	14'.3	
12	0° 00'.5	9° 57'.5 N	202° 43'.0	10'.7	6° 00'.5 S	14'.1	59'.2
13	15° 00'.7	58'.4	217° 12'.7	10'.6	14'.6	14'.2	
14	30° 00'.8	59'.3	231° 42'.3	10'.6	28'.8	14'.1	
15	45° 01'.0	10° 00'.2 N	246° 11'.9	10'.6	42'.9	14'.0	
16	60° 01'.1	01'.1	260° 41'.5	10'.5	56'.9	14'.0	
17	75° 01'.3	01'.9	275° 11'.0	10'.6	7° 10'.9 S	14'.0	
18	90° 01'.4	02'.8	289° 40'.6	10'.5	24'.9	13'.9	
19	105° 01'.6	03'.7	304° 10'.1	10'.5	38'.8	13'.8	59'.1
20	120° 01'.7	04'.6	318° 39'.6	10'.5	52'.6	13'.9	
21	135° 01'.9	05'.5	333° 09'.1	10'.5	8° 06'.5 S	13'.7	
22	150° 02'.0	06'.4	347° 38'.6	10'.4	20'.2	13'.7	
23	165° 02'.2	07'.3	2° 08'.0	10'.5	33'.9	13'.7	
16 00	180° 02'.3	10° 08'.2 N	16° 37'.5	10'.4	8° 47'.6 S	13'.6	59'.1
01	195° 02'.5	09'.0	31° 06'.9	10'.3	9° 01'.2 S	13'.5	59'.0
02	210° 02'.6	09'.9	45° 36'.2	10'.4	14'.7	13'.5	
03	225° 02'.8	10'.8	60° 05'.6	10'.4	28'.2	13'.4	
04	240° 02'.9	11'.7	74° 35'.0	10'.3	41'.6	13'.4	
05	255° 03'.1	12'.6	89° 04'.3	10'.3	55'.0	13'.3	
06	270° 03'.2	13'.5	103° 33'.6	10'.2	10° 08'.3 S	13'.2	58'.9
07	285° 03'.4	14'.3	118° 02'.8	10'.3	21'.5	13'.2	
08	300° 03'.5	15'.2	132° 32'.1	10'.2	34'.7	13'.1	
09	315° 03'.7	16'.1	147° 01'.3	10'.2	47'.8	13'.0	
10	330° 03'.8	17'.0	161° 30'.5	10'.1	11° 00'.8 S	12'.9	
11	345° 04'.0	17'.9	175° 59'.6	10'.2	13'.7	12'.9	58'.8
12	0° 04'.1	10° 18'.8 N	190° 28'.8	10'.1	11° 26'.6 S	12'.8	58'.8
13	15° 04'.3	19'.6	204° 57'.9	10'.1	39'.4	12'.8	
14	30° 04'.4	20'.5	219° 27'.0	10'.0	52'.2	12'.7	
15	45° 04'.6	21'.4	233° 56'.0	10'.0	12° 04'.9 S	12'.6	
16	60° 04'.7	22'.3	248° 25'.0	10'.0	17'.5	12'.5	58'.7
17	75° 04'.9	23'.2	262° 54'.0	10'.0	30'.0	12'.4	
18	90° 05'.0	24'.1	277° 23'.0	9'.9	42'.4	12'.4	
19	105° 05'.2	24'.9	291° 51'.9	9'.9	54'.8	12'.2	
20	120° 05'.3	25'.8	306° 20'.8	9'.9	13° 07'.0 S	12'.2	58'.6
21	135° 05'.4	26'.7	320° 49'.7	9'.8	19'.2	12'.1	
22	150° 05'.6	27'.6	335° 18'.5	9'.9	31'.3	12'.1	
23	165° 05'.7	28'.5	349° 47'.4	9'.7	43'.4	11'.9	
17 00	180° 05'.9	10° 29'.3 N	4° 16'.1	9'.8	13° 55'.3 S	11'.9	58'.5
01	195° 06'.0	30'.2	18° 44'.9	9'.7	14° 07'.2 S	11'.7	
02	210° 06'.2	31'.1	33° 13'.6	9'.7	18'.9	11'.7	
03	225° 06'.3	32'.0	47° 42'.3	9'.7	30'.6	11'.6	
04	240° 06'.5	32'.8	62° 11'.0	9'.6	42'.2	11'.5	58'.4
05	255° 06'.6	33'.7	76° 39'.6	9'.6	53'.7	11'.4	
06	270° 06'.7	34'.6	91° 08'.2	9'.6	15° 05'.1 S	11'.3	
07	285° 06'.9	35'.5	105° 36'.8	9'.5	16'.4	11'.2	
08	300° 07'.0	36'.4	120° 05'.3	9'.5	27'.6	11'.1	58'.3
09	315° 07'.2	37'.2	134° 33'.8	9'.5	38'.7	11'.0	
10	330° 07'.3	38'.1	149° 02'.3	9'.4	49'.7	10'.9	
11	345° 07'.5	39'.0	163° 30'.7	9'.4	16° 00'.6 S	10'.9	
12	0° 07'.6	10° 39'.9 N	177° 59'.1	9'.4	16° 11'.5 S	10'.7	58'.2
13	15° 07'.8	40'.7	192° 27'.5	9'.4	22'.2	10'.6	
14	30° 07'.9	41'.6	206° 55'.9	9'.3	32'.8	10'.5	
15	45° 08'.0	42'.5	221° 24'.2	9'.3	43'.3	10'.4	
16	60° 08'.2	43'.4	235° 52'.5	9'.2	53'.7	10'.3	58'.1
17	75° 08'.3	44'.2	250° 20'.7	9'.2	17° 04'.0 S	10'.2	
18	90° 08'.5	45'.1	264° 48'.9	9'.2	14'.2	10'.1	
19	105° 08'.6	46'.0	279° 17'.1	9'.2	24'.3	10'.0	
20	120° 08'.8	46'.9	293° 45'.3	9'.1	34'.3	9'.9	58'.0
21	135° 08'.9	47'.7	308° 13'.4	9'.1	44'.2	9'.7	
22	150° 09'.0	48'.6	322° 41'.5	9'.1	53'.9	9'.7	
23	165° 09'.2	49'.5	337° 09'.6	9'.0	18° 03'.6 S	9'.5	57'.9
	SD 15'.9	d 0'.9	SD 16'.1		16'.0	15'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
15	0 05	0 02	12:00	22:51	10:26	12d 96%
16	0 09	0 16	12:00	23:42	11:17	13d 99%
17	0 23	0 30	11:59	24:35	12:08	14d Full

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1992 April 18, 19, 20 (Sat, Sun, Moon)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.3		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
18 Saturday 00	206° 21'.6	193° 38'.9	3° 50'.0 N	218° 32'.8	6° 39'.0 S	49° 08'.3	10° 57'.2 N	246° 29'.9	16° 24'.3 S
01	221° 24'.1	208° 38'.5	51'.2	233° 33'.5	38'.2	64° 10'.9	57'.2	261° 32'.2	24'.2
02	236° 26'.5	223° 38'.1	52'.4	248° 34'.1	37'.5	79° 13'.4	57'.2	276° 34'.5	24'.2
03	251° 29'.0	238° 37'.7	53'.6	263° 34'.8	36'.8	94° 16'.0	57'.3	291° 36'.8	24'.1
04	266° 31'.5	253° 37'.4	54'.9	278° 35'.5	36'.0	109° 18'.5	57'.3	306° 39'.1	24'.1
05	281° 33'.9	268° 37'.0	56'.1	293° 36'.1	35'.3	124° 21'.1	57'.3	321° 41'.4	24'.1
06	296° 36'.4	283° 36'.6	57'.3	308° 36'.8	34'.5	139° 23'.7	57'.4	336° 43'.7	24'.0
07	311° 38'.9	298° 36'.3	58'.5	323° 37'.5	33'.8	154° 26'.2	57'.4	351° 46'.0	24'.0
08	326° 41'.3	313° 35'.9	59'.7	338° 38'.1	33'.0	169° 28'.8	57'.4	6° 48'.4	23'.9
09	341° 43'.8	328° 35'.5	4° 00'.9 N	353° 38'.8	32'.3	184° 31'.3	57'.5	21° 50'.7	23'.9
10	356° 46'.3	343° 35'.1	02'.1	8° 39'.5	31'.5	199° 33'.9	57'.5	36° 53'.0	23'.8
11	11° 48'.7	358° 34'.8	03'.3	23° 40'.2	30'.8	214° 36'.4	57'.5	51° 55'.3	23'.8
12	26° 51'.2	13° 34'.4	4° 04'.5 N	38° 40'.8	6° 30'.0 S	229° 39'.0	10° 57'.5 N	66° 57'.6	16° 23'.8 S
13	41° 53'.6	28° 34'.0	05'.7	53° 41'.5	29'.3	244° 41'.6	57'.6	81° 59'.9	23'.7
14	56° 56'.1	43° 33'.6	07'.0	68° 42'.2	28'.6	259° 44'.1	57'.6	97° 02'.2	23'.7
15	71° 58'.6	58° 33'.3	08'.2	83° 42'.8	27'.8	274° 46'.7	57'.6	112° 04'.5	23'.6
16	87° 01'.0	73° 32'.9	09'.4	98° 43'.5	27'.1	289° 49'.2	57'.7	127° 06'.8	23'.6
17	102° 03'.5	88° 32'.5	10'.6	113° 44'.2	26'.3	304° 51'.8	57'.7	142° 09'.1	23'.6
18	117° 06'.0	103° 32'.1	11'.8	128° 44'.8	25'.6	319° 54'.3	57'.7	157° 11'.4	23'.5
19	132° 08'.4	118° 31'.8	13'.0	143° 45'.5	24'.8	334° 56'.9	57'.7	172° 13'.7	23'.5
20	147° 10'.9	133° 31'.4	14'.2	158° 46'.2	24'.1	349° 59'.4	57'.8	187° 16'.1	23'.4
21	162° 13'.4	148° 31'.0	15'.4	173° 46'.9	23'.3	5° 02'.0	57'.8	202° 18'.4	23'.4
22	177° 15'.8	163° 30'.6	16'.6	188° 47'.5	22'.6	20° 04'.6	57'.8	217° 20'.7	23'.4
23	192° 18'.3	178° 30'.3	17'.8	203° 48'.2	21'.8	35° 07'.1	57'.8	232° 23'.0	23'.3
19 Sunday 00	207° 20'.8	193° 29'.9	4° 19'.0 N	218° 48'.9	6° 21'.1 S	50° 09'.7	10° 57'.9 N	247° 25'.3	16° 23'.3 S
01	222° 23'.2	208° 29'.5	20'.2	233° 49'.5	20'.3	65° 12'.2	57'.9	262° 27'.6	23'.2
02	237° 25'.7	223° 29'.1	21'.5	248° 50'.2	19'.6	80° 14'.8	57'.9	277° 29'.9	23'.2
03	252° 28'.1	238° 28'.8	22'.7	263° 50'.9	18'.8	95° 17'.3	58'.0	292° 32'.2	23'.1
04	267° 30'.6	253° 28'.4	23'.9	278° 51'.6	18'.1	110° 19'.9	58'.0	307° 34'.5	23'.1
05	282° 33'.1	268° 28'.0	25'.1	293° 52'.2	17'.4	125° 22'.4	58'.0	322° 36'.8	23'.1
06	297° 35'.5	283° 27'.6	26'.3	308° 52'.9	16'.6	140° 25'.0	58'.0	337° 39'.1	23'.0
07	312° 38'.0	298° 27'.2	27'.5	323° 53'.6	15'.9	155° 27'.5	58'.1	352° 41'.5	23'.0
08	327° 40'.5	313° 26'.9	28'.7	338° 54'.2	15'.1	170° 30'.1	58'.1	7° 43'.8	22'.9
09	342° 42'.9	328° 26'.5	29'.9	353° 54'.9	14'.4	185° 32'.6	58'.1	22° 46'.1	22'.9
10	357° 45'.4	343° 26'.1	31'.1	8° 55'.6	13'.6	200° 35'.2	58'.1	37° 48'.4	22'.9
11	12° 47'.9	358° 25'.7	32'.3	23° 56'.3	12'.9	215° 37'.7	58'.2	52° 50'.7	22'.8
12	27° 50'.3	13° 25'.4	4° 33'.5 N	38° 56'.9	6° 12'.1 S	230° 40'.3	10° 58'.2 N	67° 53'.0	16° 22'.8 S
13	42° 52'.8	28° 25'.0	34'.7	53° 57'.6	11'.4	245° 42'.8	58'.2	82° 55'.3	22'.7
14	57° 55'.2	43° 24'.6	35'.9	68° 58'.3	10'.6	260° 45'.4	58'.2	97° 57'.6	22'.7
15	72° 57'.7	58° 24'.2	37'.1	83° 59'.0	09'.9	275° 47'.9	58'.3	112° 59'.9	22'.7
16	88° 00'.2	73° 23'.9	38'.3	98° 59'.6	09'.1	290° 50'.5	58'.3	128° 02'.3	22'.6
17	103° 02'.6	88° 23'.5	39'.6	114° 00'.3	08'.4	305° 53'.0	58'.3	143° 04'.6	22'.6
18	118° 05'.1	103° 23'.1	40'.8	129° 01'.0	07'.6	320° 55'.6	58'.3	158° 06'.9	22'.5
19	133° 07'.6	118° 22'.7	42'.0	144° 01'.6	06'.9	335° 58'.1	58'.4	173° 09'.2	22'.5
20	148° 10'.0	133° 22'.3	43'.2	159° 02'.3	06'.1	351° 00'.6	58'.4	188° 11'.5	22'.5
21	163° 12'.5	148° 22'.0	44'.4	174° 03'.0	05'.4	6° 03'.2	58'.4	203° 13'.8	22'.4
22	178° 15'.0	163° 21'.6	45'.6	189° 03'.7	04'.6	21° 05'.7	58'.4	218° 16'.1	22'.4
23	193° 17'.4	178° 21'.2	46'.8	204° 04'.3	03'.9	36° 08'.3	58'.5	233° 18'.4	22'.3
20 Monday 00	208° 19'.9	193° 20'.8	4° 48'.0 N	219° 05'.0	6° 03'.1 S	51° 10'.8	10° 58'.5 N	248° 20'.8	16° 22'.3 S
01	223° 22'.4	208° 20'.4	49'.2	234° 05'.7	02'.4	66° 13'.4	58'.5	263° 23'.1	22'.3
02	238° 24'.8	223° 20'.1	50'.4	249° 06'.4	01'.6	81° 15'.9	58'.5	278° 25'.4	22'.2
03	253° 27'.3	238° 19'.7	51'.6	264° 07'.0	00'.9	96° 18'.5	58'.6	293° 27'.7	22'.2
04	268° 29'.7	253° 19'.3	52'.8	279° 07'.7	00'.1	111° 21'.0	58'.6	308° 30'.0	22'.1
05	283° 32'.2	268° 18'.9	54'.0	294° 08'.4	5° 59'.4 S	126° 23'.6	58'.6	323° 32'.3	22'.1
06	298° 34'.7	283° 18'.5	55'.2	309° 09'.1	58'.6	141° 26'.1	58'.6	338° 34'.6	22'.1
07	313° 37'.1	298° 18'.2	56'.4	324° 09'.7	57'.9	156° 28'.6	58'.7	353° 37'.0	22'.0
08	328° 39'.6	313° 17'.8	57'.6	339° 10'.4	57'.1	171° 31'.2	58'.7	8° 39'.3	22'.0
09	343° 42'.1	328° 17'.4	58'.8	354° 11'.1	56'.4	186° 33'.7	58'.7	23° 41'.6	21'.9
10	358° 44'.5	343° 17'.0	5° 00'.0 N	9° 11'.7	55'.6	201° 36'.3	58'.7	38° 43'.9	21'.9
11	13° 47'.0	358° 16'.6	01'.2	24° 12'.4	54'.9	216° 38'.8	58'.8	53° 46'.2	21'.9
12	28° 49'.5	13° 16'.3	5° 02'.4 N	39° 13'.1	5° 54'.1 S	231° 41'.4	10° 58'.8 N	68° 48'.5	16° 21'.8 S
13	43° 51'.9	28° 15'.9	03'.6	54° 13'.8	53'.4	246° 43'.9	58'.8	83° 50'.8	21'.8
14	58° 54'.4	43° 15'.5	04'.8	69° 14'.4	52'.6	261° 46'.4	58'.8	98° 53'.2	21'.7
15	73° 56'.9	58° 15'.1	06'.0	84° 15'.1	51'.9	276° 49'.0	58'.8	113° 55'.5	21'.7
16	88° 59'.3	73° 14'.7	07'.2	99° 15'.8	51'.1	291° 51'.5	58'.9	128° 57'.8	21'.7
17	104° 01'.8	88° 14'.4	08'.4	114° 16'.5	50'.4	306° 54'.1	58'.9	144° 00'.1	21'.6
18	119° 04'.2	103° 14'.0	09'.6	129° 17'.1	49'.6	321° 56'.6	58'.9	159° 02'.4	21'.6
19	134° 06'.7	118° 13'.6	10'.8	144° 17'.8	48'.9	336° 59'.1	58'.9	174° 04'.7	21'.5
20	149° 09'.2	133° 13'.2	12'.0	159° 18'.5	48'.1	352° 01'.7	59'.0	189° 07'.1	21'.5
21	164° 11'.6	148° 12'.8	13'.2	174° 19'.2	47'.4	7° 04'.2	59'.0	204° 09'.4	21'.5
22	179° 14'.1	163° 12'.4	14'.4	189° 19'.8	46'.6	22° 06'.8	59'.0	219° 11'.7	21'.4
23	194° 16'.6	178° 12'.1	15'.6	204° 20'.5	45'.9	37° 09'.3	59'.0	234° 14'.0	21'.4
	M.P. 10:05	v -0'.4	d 1'.2	v 0'.7	d 0'.7	v 2'.5	d 0'.0	v 2'.3	d 0'.0

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 30'.7	40° 20'.2 S	180° 09'.3	10° 50'.3 N	351° 37'.6	9'.1	18° 13'.1 S	9'.5	57'.9
Achernar	335° 39'.0	57° 16'.5 S	195° 09'.5	51'.2	6° 05'.7	9'.0	22'.6	9'.3	
Acrux	173° 26'.6	63° 03'.7 S	210° 09'.6	52'.1	20° 33'.7	8'.9	31'.9	9'.2	
Adhara	255° 25'.1	28° 57'.9 S	225° 09'.7	53'.0	35° 01'.6	8'.9	41'.1	9'.1	57'.8
Aldebaran	291° 07'.8	16° 29'.7 N	240° 09'.9	53'.8	49° 29'.5	9'.0	50'.2	9'.0	
			255° 10'.0	54'.7	63° 57'.5	8'.8	59'.2	8'.8	
Alioth	166° 33'.8	56° 00'.0 N	270° 10'.2	55'.6	78° 25'.3	8'.9	19° 08'.0 S	8'.8	
Alkaid	153° 10'.7	49° 20'.9 N	285° 10'.3	56'.4	92° 53'.2	8'.8	16'.8	8'.6	57'.7
Alnair	28° 03'.7	46° 59'.7 S	300° 10'.4	57'.3	107° 21'.0	8'.8	25'.4	8'.5	
Alnilam	276° 02'.6	1° 12'.5 S	315° 10'.6	58'.2	121° 48'.8	8'.8	33'.9	8'.4	
Alphard	218° 11'.5	8° 37'.7 S	330° 10'.7	59'.0	136° 16'.6	8'.8	42'.3	8'.2	57'.6
			345° 10'.9	59'.9	150° 44'.4	8'.7	50'.5	8'.2	
Alphecca	126° 24'.0	26° 44'.2 N	0° 11'.0	11° 00'.8 N	165° 12'.1	8'.7	19° 58'.7 S	8'.0	57'.6
Alpheratz	358° 00'.3	29° 02'.8 N	15° 11'.1	01'.6	179° 39'.8	8'.7	20° 06'.7 S	7'.9	57'.5
Altair	62° 23'.6	8° 50'.7 N	30° 11'.3	02'.5	194° 07'.5	8'.7	14'.6	7'.8	
Ankaa	353° 31'.6	42° 20'.8 S	45° 11'.4	03'.4	208° 35'.2	8'.6	22'.4	7'.6	
Antares	112° 45'.4	26° 25'.0 S	60° 11'.6	04'.2	223° 02'.8	8'.6	30'.0	7'.6	
			75° 11'.7	05'.1	237° 30'.4	8'.6	37'.6	7'.4	57'.4
Arcturus	146° 09'.8	19° 13'.1 N	90° 11'.8	06'.0	251° 58'.0	8'.6	45'.0	7'.3	
Atria	108° 01'.2	69° 00'.8 S	105° 12'.0	06'.8	266° 25'.6	8'.6	52'.3	7'.1	
Avior	234° 24'.5	59° 29'.5 S	120° 12'.1	07'.7	280° 53'.2	8'.5	59'.4	7'.0	57'.3
Bellatrix	278° 49'.2	6° 20'.5 N	135° 12'.2	08'.6	295° 20'.7	8'.6	21° 06'.4 S	6'.9	
Betelgeuse	271° 18'.6	7° 24'.3 N	150° 12'.4	09'.4	309° 48'.3	8'.5	13'.3	6'.8	
			165° 12'.5	10'.3	324° 15'.8	8'.5	20'.1	6'.7	
Canopus	264° 03'.4	52° 41'.8 S	180° 12'.7	11° 11'.2 N	338° 43'.3	8'.5	21° 26'.8 S	6'.5	57'.2
Capella	280° 58'.2	45° 59'.6 N	195° 12'.8	12'.0	353° 10'.8	8'.4	33'.3	6'.4	
Deneb	49° 42'.4	45° 14'.9 N	210° 12'.9	12'.9	7° 38'.2	8'.5	39'.7	6'.2	
Denebola	182° 49'.5	14° 36'.7 N	225° 13'.1	13'.8	22° 05'.7	8'.5	45'.9	6'.1	57'.1
Diphda	349° 12'.0	18° 01'.7 S	240° 13'.2	14'.6	36° 33'.2	8'.4	52'.0	6'.0	
			255° 13'.3	15'.5	51° 00'.6	8'.4	58'.0	5'.9	
Dubhe	194° 10'.3	61° 47'.6 N	270° 13'.5	16'.3	65° 28'.0	8'.5	22° 03'.9 S	5'.7	57'.0
Elnath	278° 32'.9	28° 36'.1 N	285° 13'.6	17'.2	79° 55'.5	8'.4	09'.6	5'.6	
Eltanin	90° 53'.2	51° 29'.1 N	300° 13'.7	18'.1	94° 22'.9	8'.4	15'.2	5'.5	
Enif	34° 02'.8	9° 50'.3 N	315° 13'.9	18'.9	108° 50'.3	8'.4	20'.7	5'.3	
Fomalhaut	15° 41'.6	29° 39'.7 S	330° 14'.0	19'.8	123° 17'.7	8'.4	26'.0	5'.3	56'.9
			345° 14'.2	20'.7	137° 45'.1	8'.4	31'.3	5'.0	
Gacrux	172° 18'.2	57° 04'.5 S	0° 14'.3	11° 21'.5 N	152° 12'.5	8'.3	22° 36'.3 S	5'.0	56'.9
Gienah	176° 08'.3	17° 30'.2 S	15° 14'.4	22'.4	166° 39'.8	8'.4	41'.3	4'.8	56'.8
Hadar	149° 09'.9	60° 20'.3 S	30° 14'.6	23'.2	181° 07'.2	8'.4	46'.1	4'.6	
Hamal	328° 19'.0	23° 25'.6 N	45° 14'.7	24'.1	195° 34'.6	8'.4	50'.7	4'.6	
Kaus Aust.	84° 04'.6	34° 23'.3 S	60° 14'.8	25'.0	210° 02'.0	8'.4	55'.3	4'.4	56'.7
			75° 15'.0	25'.8	224° 29'.4	8'.4	59'.7	4'.3	
Kochab	137° 18'.0	74° 11'.0 N	90° 15'.1	26'.7	238° 56'.8	8'.4	23° 04'.0 S	4'.1	
Markab	13° 54'.3	15° 09'.7 N	105° 15'.2	27'.5	253° 24'.2	8'.4	08'.1	4'.0	
Menkar	314° 31'.9	4° 03'.6 N	120° 15'.4	28'.4	267° 51'.6	8'.4	12'.1	3'.9	56'.6
Menkent	148° 25'.9	36° 20'.1 S	135° 15'.5	29'.2	282° 19'.0	8'.4	16'.0	3'.7	
Miaplacidus	221° 42'.9	69° 41'.5 S	150° 15'.6	30'.1	296° 46'.4	8'.4	19'.7	3'.6	
			165° 15'.8	31'.0	311° 13'.8	8'.4	23'.3	3'.5	56'.5
Mirfak	309° 03'.6	49° 50'.1 N	180° 15'.9	11° 31'.8 N	325° 41'.2	8'.4	23° 26'.8 S	3'.3	56'.5
Nunki	76° 17'.8	26° 18'.4 S	195° 16'.0	32'.7	340° 08'.6	8'.5	30'.1	3'.2	
Peacock	53° 44'.0	56° 45'.4 S	210° 16'.2	33'.5	354° 36'.1	8'.4	33'.3	3'.1	56'.4
Polaris	324° 26'.4	89° 13'.9 N	225° 16'.3	34'.4	9° 03'.5	8'.5	36'.4	2'.9	
Pollux	243° 47'.1	28° 02'.7 N	240° 16'.4	35'.2	23° 31'.0	8'.5	39'.3	2'.8	
			255° 16'.5	36'.1	37° 58'.5	8'.4	42'.1	2'.7	
Procyon	245° 16'.3	5° 14'.6 N	270° 16'.7	37'.0	52° 25'.9	8'.5	44'.8	2'.5	56'.3
Rasalhague	96° 20'.9	12° 33'.7 N	285° 16'.8	37'.8	66° 53'.4	8'.6	47'.3	2'.4	
Regulus	208° 00'.1	12° 00'.2 N	300° 16'.9	38'.7	81° 21'.0	8'.5	49'.7	2'.2	
Rigel	281° 27'.5	8° 12'.7 S	315° 17'.1	39'.5	95° 48'.5	8'.6	51'.9	2'.2	56'.2
Rigil Kent	140° 12'.8	60° 48'.2 S	330° 17'.2	40'.4	110° 16'.1	8'.6	54'.1	1'.9	
			345° 17'.3	41'.2	124° 43'.7	8'.6	56'.0	1'.9	
Sabik	102° 30'.5	15° 43'.0 S	0° 17'.5	11° 42'.1 N	139° 11'.3	8'.6	23° 57'.9 S	1'.7	56'.2
Schedar	349° 59'.3	56° 29'.7 N	15° 17'.6	42'.9	153° 38'.9	8'.6	59'.6	1'.6	56'.1
Shaula	96° 43'.2	37° 05'.9 S	30° 17'.7	43'.8	168° 06'.5	8'.7	24° 01'.2 S	1'.5	
Sirius	258° 47'.8	16° 42'.5 S	45° 17'.9	44'.6	182° 34'.2	8'.7	02'.7	1'.3	
Spica	158° 47'.6	11° 07'.5 S	60° 18'.0	45'.5	197° 01'.9	8'.7	04'.0	1'.2	56'.0
			75° 18'.1	46'.3	211° 29'.6	8'.8	05'.2	1'.0	
Suhail	223° 04'.0	43° 24'.4 S	90° 18'.2	47'.2	225° 57'.4	8'.7	06'.2	1'.0	
Vega	80° 49'.5	38° 46'.3 N	105° 18'.4	48'.0	240° 25'.1	8'.8	07'.2	0'.8	
Zuben'ubi	137° 22'.6	16° 00'.8 S	120° 18'.5	48'.9	254° 52'.9	8'.9	08'.0	0'.6	55'.9
	SHA	Mer.Pass.	135° 18'.6	49'.7	269° 20'.8	8'.9	08'.6	0'.6	
Venus	346° 09'.1	11:06	150° 18'.8	50'.6	283° 48'.7	8'.9	09'.2	0'.4	
Mars	11° 28'.1	09:24	165° 18'.9	51'.4	298° 16'.6	8'.9	09'.6	0'.2	55'.8
Jupiter	202° 48'.9	20:36							
Saturn	40° 04'.5	07:29	SD 15'.9	d 0'.9	SD	15'.7	15'.5	15'.3	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
18	0 37	0 44	11:59	00:35	13:01	15d 98%
19	0 50	0 57	11:59	01:28	13:55	16d 94%
20	1 03	1 10	11:59	02:22	14:49	17d 88%

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1992 April 21, 22, 23 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.3		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
21 Tuesday 00	209° 19'.0	193° 11'.7	5° 16'.8 N	219° 21'.2	5° 45'.1 S	52° 11'.8	10° 59'.0 N	249° 16'.3	16° 21'.3 S
01	224° 21'.5	208° 11'.3	18'.0	234° 21'.9	44'.4	67° 14'.4	59'.1	264° 18'.6	21'.3
02	239° 24'.0	223° 10'.9	19'.2	249° 22'.6	43'.6	82° 16'.9	59'.1	279° 21'.0	21'.3
03	254° 26'.4	238° 10'.5	20'.4	264° 23'.2	42'.9	97° 19'.4	59'.1	294° 23'.3	21'.2
04	269° 28'.9	253° 10'.1	21'.6	279° 23'.9	42'.1	112° 22'.0	59'.1	309° 25'.6	21'.2
05	284° 31'.4	268° 09'.8	22'.8	294° 24'.6	41'.4	127° 24'.5	59'.1	324° 27'.9	21'.2
06	299° 33'.8	283° 09'.4	24'.0	309° 25'.3	40'.6	142° 27'.1	59'.2	339° 30'.2	21'.1
07	314° 36'.3	298° 09'.0	25'.2	324° 25'.9	39'.9	157° 29'.6	59'.2	354° 32'.5	21'.1
08	329° 38'.7	313° 08'.6	26'.4	339° 26'.6	39'.1	172° 32'.1	59'.2	9° 34'.9	21'.0
09	344° 41'.2	328° 08'.2	27'.6	354° 27'.3	38'.4	187° 34'.7	59'.2	24° 37'.2	21'.0
10	359° 43'.7	343° 07'.8	28'.8	9° 28'.0	37'.6	202° 37'.2	59'.2	39° 39'.5	21'.0
11	14° 46'.1	358° 07'.5	30'.0	24° 28'.6	36'.9	217° 39'.7	59'.3	54° 41'.8	20'.9
12	29° 48'.6	13° 07'.1	5° 31'.2 N	39° 29'.3	5° 36'.1 S	232° 42'.3	10° 59'.3 N	69° 44'.1	16° 20'.9 S
13	44° 51'.1	28° 06'.7	32'.4	54° 30'.0	35'.4	247° 44'.8	59'.3	84° 46'.4	20'.8
14	59° 53'.5	43° 06'.3	33'.6	69° 30'.7	34'.6	262° 47'.3	59'.3	99° 48'.8	20'.8
15	74° 56'.0	58° 05'.9	34'.8	84° 31'.3	33'.9	277° 49'.9	59'.3	114° 51'.1	20'.8
16	89° 58'.5	73° 05'.5	36'.0	99° 32'.0	33'.1	292° 52'.4	59'.4	129° 53'.4	20'.7
17	105° 00'.9	88° 05'.1	37'.2	114° 32'.7	32'.4	307° 54'.9	59'.4	144° 55'.7	20'.7
18	120° 03'.4	103° 04'.8	38'.4	129° 33'.4	31'.6	322° 57'.5	59'.4	159° 58'.0	20'.7
19	135° 05'.8	118° 04'.4	39'.6	144° 34'.1	30'.9	338° 00'.0	59'.4	175° 00'.4	20'.6
20	150° 08'.3	133° 04'.0	40'.8	159° 34'.7	30'.1	353° 02'.5	59'.4	190° 02'.7	20'.6
21	165° 10'.8	148° 03'.6	42'.0	174° 35'.4	29'.4	8° 05'.1	59'.5	205° 05'.0	20'.5
22	180° 13'.2	163° 03'.2	43'.2	189° 36'.1	28'.6	23° 07'.6	59'.5	220° 07'.3	20'.5
23	195° 15'.7	178° 02'.8	44'.4	204° 36'.8	27'.9	38° 10'.1	59'.5	235° 09'.6	20'.5
22 Wednesday 00	210° 18'.2	193° 02'.4	5° 45'.6 N	219° 37'.4	5° 27'.1 S	53° 12'.7	10° 59'.5 N	250° 12'.0	16° 20'.4 S
01	225° 20'.6	208° 02'.1	46'.8	234° 38'.1	26'.3	68° 15'.2	59'.5	265° 14'.3	20'.4
02	240° 23'.1	223° 01'.7	48'.0	249° 38'.8	25'.6	83° 17'.7	59'.6	280° 16'.6	20'.3
03	255° 25'.6	238° 01'.3	49'.2	264° 39'.5	24'.8	98° 20'.3	59'.6	295° 18'.9	20'.3
04	270° 28'.0	253° 00'.9	50'.4	279° 40'.2	24'.1	113° 22'.8	59'.6	310° 21'.2	20'.3
05	285° 30'.5	268° 00'.5	51'.6	294° 40'.8	23'.3	128° 25'.3	59'.6	325° 23'.6	20'.2
06	300° 33'.0	283° 00'.1	52'.8	309° 41'.5	22'.6	143° 27'.8	59'.6	340° 25'.9	20'.2
07	315° 35'.4	297° 59'.7	54'.0	324° 42'.2	21'.8	158° 30'.4	59'.6	355° 28'.2	20'.2
08	330° 37'.9	312° 59'.3	55'.1	339° 42'.9	21'.1	173° 32'.9	59'.7	10° 30'.5	20'.1
09	345° 40'.3	327° 59'.0	56'.3	354° 43'.6	20'.3	188° 35'.4	59'.7	25° 32'.8	20'.1
10	0° 42'.8	342° 58'.6	57'.5	9° 44'.2	19'.6	203° 38'.0	59'.7	40° 35'.2	20'.0
11	15° 45'.3	357° 58'.2	58'.7	24° 44'.9	18'.8	218° 40'.5	59'.7	55° 37'.5	20'.0
12	30° 47'.7	12° 57'.8	5° 59'.9 N	39° 45'.6	5° 18'.1 S	233° 43'.0	10° 59'.7 N	70° 39'.8	16° 20'.0 S
13	45° 50'.2	27° 57'.4	6° 01'.1 N	54° 46'.3	17'.3	248° 45'.5	59'.8	85° 42'.1	19'.9
14	60° 52'.7	42° 57'.0	02'.3	69° 46'.9	16'.6	263° 48'.1	59'.8	100° 44'.4	19'.9
15	75° 55'.1	57° 56'.6	03'.5	84° 47'.6	15'.8	278° 50'.6	59'.8	115° 46'.8	19'.9
16	90° 57'.6	72° 56'.2	04'.7	99° 48'.3	15'.1	293° 53'.1	59'.8	130° 49'.1	19'.8
17	106° 00'.1	87° 55'.8	05'.9	114° 49'.0	14'.3	308° 55'.6	59'.8	145° 51'.4	19'.8
18	121° 02'.5	102° 55'.4	07'.1	129° 49'.7	13'.5	323° 58'.2	59'.8	160° 53'.7	19'.7
19	136° 05'.0	117° 55'.1	08'.3	144° 50'.3	12'.8	339° 00'.7	59'.9	175° 56'.1	19'.7
20	151° 07'.5	132° 54'.7	09'.5	159° 51'.0	12'.0	354° 03'.2	59'.9	190° 58'.4	19'.7
21	166° 09'.9	147° 54'.3	10'.6	174° 51'.7	11'.3	9° 05'.7	59'.9	206° 00'.7	19'.6
22	181° 12'.4	162° 53'.9	11'.8	189° 52'.4	10'.5	24° 08'.3	59'.9	221° 03'.0	19'.6
23	196° 14'.8	177° 53'.5	13'.0	204° 53'.1	09'.8	39° 10'.8	59'.9	236° 05'.4	19'.6
23 Thursday 00	211° 17'.3	192° 53'.1	6° 14'.2 N	219° 53'.7	5° 09'.0 S	54° 13'.3	10° 59'.9 N	251° 07'.7	16° 19'.5 S
01	226° 19'.8	207° 52'.7	15'.4	234° 54'.4	08'.3	69° 15'.8	59'.9	266° 10'.0	19'.5
02	241° 22'.2	222° 52'.3	16'.6	249° 55'.1	07'.5	84° 18'.4	11° 00'.0 N	281° 12'.3	19'.5
03	256° 24'.7	237° 51'.9	17'.8	264° 55'.8	06'.8	99° 20'.9	00'.0	296° 14'.6	19'.4
04	271° 27'.2	252° 51'.5	19'.0	279° 56'.5	06'.0	114° 23'.4	00'.0	311° 17'.0	19'.4
05	286° 29'.6	267° 51'.1	20'.2	294° 57'.1	05'.3	129° 25'.9	00'.0	326° 19'.3	19'.3
06	301° 32'.1	282° 50'.7	21'.4	309° 57'.8	04'.5	144° 28'.5	00'.0	341° 21'.6	19'.3
07	316° 34'.6	297° 50'.4	22'.5	324° 58'.5	03'.7	159° 31'.0	00'.0	356° 23'.9	19'.3
08	331° 37'.0	312° 50'.0	23'.7	339° 59'.2	03'.0	174° 33'.5	00'.1	11° 26'.3	19'.2
09	346° 39'.5	327° 49'.6	24'.9	354° 59'.9	02'.2	189° 36'.0	00'.1	26° 28'.6	19'.2
10	1° 42'.0	342° 49'.2	26'.1	10° 00'.6	01'.5	204° 38'.5	00'.1	41° 30'.9	19'.2
11	16° 44'.4	357° 48'.8	27'.3	25° 01'.2	00'.7	219° 41'.1	00'.1	56° 33'.2	19'.1
12	31° 46'.9	12° 48'.4	6° 28'.5 N	40° 01'.9	5° 00'.0 S	234° 43'.6	11° 00'.1 N	71° 35'.6	16° 19'.1 S
13	46° 49'.3	27° 48'.0	29'.7	55° 02'.6	4° 59'.2 S	249° 46'.1	00'.1	86° 37'.9	19'.0
14	61° 51'.8	42° 47'.6	30'.9	70° 03'.3	58'.5	264° 48'.6	00'.1	101° 40'.2	19'.0
15	76° 54'.3	57° 47'.2	32'.1	85° 04'.0	57'.7	279° 51'.1	00'.2	116° 42'.5	19'.0
16	91° 56'.7	72° 46'.8	33'.2	100° 04'.6	56'.9	294° 53'.7	00'.2	131° 44'.9	18'.9
17	106° 59'.2	87° 46'.4	34'.4	115° 05'.3	56'.2	309° 56'.2	00'.2	146° 47'.2	18'.9
18	122° 01'.7	102° 46'.0	35'.6	130° 06'.0	55'.4	324° 58'.7	00'.2	161° 49'.5	18'.9
19	137° 04'.1	117° 45'.6	36'.8	145° 06'.7	54'.7	340° 01'.2	00'.2	176° 51'.8	18'.8
20	152° 06'.6	132° 45'.2	38'.0	160° 07'.4	53'.9	355° 03'.7	00'.2	191° 54'.2	18'.8
21	167° 09'.1	147° 44'.8	39'.2	175° 08'.1	53'.2	10° 06'.2	00'.2	206° 56'.5	18'.8
22	182° 11'.5	162° 44'.4	40'.4	190° 08'.7	52'.4	25° 08'.8	00'.2	221° 58'.8	18'.7
23	197° 14'.0	177° 44'.0	41'.5	205° 09'.4	51'.7	40° 11'.3	00'.3	237° 01'.2	18'.7
	M.P. 09:53	v -0'.4	d 1'.2	v 0'.7	d 0'.8	v 2'.5	d 0'.0	v 2'.3	d 0'.0

STARS	SHA	Dec
Acamar	315° 30'.7	40° 20'.2 S
Achernar	335° 39'.0	57° 16'.5 S
Acrux	173° 26'.6	63° 03'.7 S
Adhara	255° 25'.1	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.8	56° 00'.0 N
Alkaid	153° 10'.7	49° 20'.9 N
Alnair	28° 03'.6	46° 59'.7 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.5	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.2 N
Alpheratz	358° 00'.2	29° 02'.8 N
Altair	62° 23'.6	8° 50'.7 N
Ankaa	353° 31'.6	42° 20'.7 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.1	69° 00'.8 S
Avior	234° 24'.5	59° 29'.5 S
Bellatrix	278° 49'.2	6° 20'.5 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.4	52° 41'.8 S
Capella	280° 58'.2	45° 59'.6 N
Deneb	49° 42'.4	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.7 S
Dubhe	194° 10'.4	61° 47'.6 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.2	51° 29'.1 N
Enif	34° 02'.8	9° 50'.3 N
Fomalhaut	15° 41'.6	29° 39'.7 S
Gacrux	172° 18'.2	57° 04'.5 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.3 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.6	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.1 N
Markab	13° 54'.3	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.1 S
Miaplacidus	221° 43'.0	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.1 N
Nunki	76° 17'.7	26° 18'.4 S
Peacock	53° 44'.0	56° 45'.4 S
Polaris	324° 26'.3	89° 13'.9 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.6 N
Rasalhague	96° 20'.9	12° 33'.7 N
Regulus	208° 00'.1	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.8	60° 48'.2 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.7 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 47'.8	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.0	43° 24'.4 S
Vega	80° 49'.5	38° 46'.3 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	342° 44'.3	11:08
Mars	9° 19'.3	09:21
Jupiter	202° 54'.5	20:24
Saturn	39° 53'.8	07:18

SUN				MOON					
GHA	Dec	GHA	v	Dec	d	HP
180° 19'.0	11° 52'.3 N	312° 44'.5	9'.0	24° 09'.8 S	0'.2	55'.8
195° 19'.1	53'.1	327° 12'.5	9'.0	10'.0	0'.0	
210° 19'.3	54'.0	341° 40'.5	9'.0	10'.0	0'.1	
225° 19'.4	54'.8	356° 08'.5	9'.1	09'.9	0'.3	55'.7
240° 19'.5	55'.7	10° 36'.6	9'.1	09'.6	0'.3	
255° 19'.6	56'.5	25° 04'.7	9'.2	09'.3	0'.5	
270° 19'.8	57'.4	39° 32'.9	9'.1	08'.8	0'.7	
285° 19'.9	58'.2	54° 01'.0	9'.3	08'.1	0'.7	55'.6
300° 20'.0	59'.1	68° 29'.3	9'.3	07'.4	0'.9	
315° 20'.2	59'.9	82° 57'.6	9'.3	06'.5	1'.0	
330° 20'.3	12° 00'.7 N	97° 25'.9	9'.3	05'.5	1'.2	
345° 20'.4	01'.6	111° 54'.2	9'.5	04'.3	1'.2	55'.5
0° 20'.5	12° 02'.4 N	126° 22'.7	9'.4	24° 03'.1 S	1'.4	55'.5
15° 20'.7	03'.3	140° 51'.1	9'.5	01'.7	1'.5	
30° 20'.8	04'.1	155° 19'.6	9'.6	00'.2	1'.6	
45° 20'.9	05'.0	169° 48'.2	9'.5	23° 58'.6 S	1'.8	55'.4
60° 21'.0	05'.8	184° 16'.7	9'.7	56'.8	1'.9	
75° 21'.2	06'.7	198° 45'.4	9'.7	54'.9	2'.0	
90° 21'.3	07'.5	213° 14'.1	9'.7	52'.9	2'.1	
105° 21'.4	08'.3	227° 42'.8	9'.8	50'.8	2'.2	55'.3
120° 21'.5	09'.2	242° 11'.6	9'.9	48'.6	2'.4	
135° 21'.7	10'.0	256° 40'.5	9'.8	46'.2	2'.4	
150° 21'.8	10'.9	271° 09'.3	10'.0	43'.8	2'.6	
165° 21'.9	11'.7	285° 38'.3	10'.0	41'.2	2'.7	55'.2
180° 22'.0	12° 12'.5 N	300° 07'.3	10'.0	23° 38'.5 S	2'.9	55'.2
195° 22'.1	13'.4	314° 36'.3	10'.2	35'.6	2'.9	
210° 22'.3	14'.2	329° 05'.5	10'.1	32'.7	3'.1	
225° 22'.4	15'.1	343° 34'.6	10'.2	29'.6	3'.2	
240° 22'.5	15'.9	358° 03'.8	10'.3	26'.4	3'.3	55'.1
255° 22'.6	16'.7	12° 33'.1	10'.3	23'.1	3'.4	
270° 22'.8	17'.6	27° 02'.4	10'.4	19'.7	3'.5	
285° 22'.9	18'.4	41° 31'.8	10'.5	16'.2	3'.6	
300° 23'.0	19'.3	56° 01'.3	10'.5	12'.6	3'.8	55'.0
315° 23'.1	20'.1	70° 30'.8	10'.5	08'.8	3'.8	
330° 23'.2	20'.9	85° 00'.3	10'.6	05'.0	4'.0	
345° 23'.4	21'.8	99° 29'.9	10'.7	01'.0	4'.0	
0° 23'.5	12° 22'.6 N	113° 59'.6	10'.7	22° 57'.0 S	4'.2	55'.0
15° 23'.6	23'.4	128° 29'.3	10'.8	52'.8	4'.3	54'.9
30° 23'.7	24'.3	142° 59'.1	10'.9	48'.5	4'.4	
45° 23'.8	25'.1	157° 29'.0	10'.9	44'.1	4'.5	
60° 24'.0	25'.9	171° 58'.9	11'.0	39'.6	4'.6	
75° 24'.1	26'.8	186° 28'.9	11'.0	35'.0	4'.8	
90° 24'.2	27'.6	200° 58'.9	11'.1	30'.2	4'.8	
105° 24'.3	28'.4	215° 29'.0	11'.2	25'.4	4'.9	54'.8
120° 24'.4	29'.3	229° 59'.2	11'.2	20'.5	5'.0	
135° 24'.6	30'.1	244° 29'.4	11'.3	15'.5	5'.2	
150° 24'.7	30'.9	258° 59'.7	11'.3	10'.3	5'.2	
165° 24'.8	31'.8	273° 30'.0	11'.4	05'.1	5'.3	
180° 24'.9	12° 32'.6 N	288° 00'.4	11'.5	21° 59'.8 S	5'.5	54'.7
195° 25'.0	33'.4	302° 30'.9	11'.5	54'.3	5'.5	
210° 25'.2	34'.3	317° 01'.4	11'.6	48'.8	5'.6	
225° 25'.3	35'.1	331° 32'.0	11'.7	43'.2	5'.8	
240° 25'.4	35'.9	346° 02'.7	11'.7	37'.4	5'.8	
255° 25'.5	36'.8	0° 33'.4	11'.8	31'.6	5'.9	
270° 25'.6	37'.6	15° 04'.2	11'.8	25'.7	6'.0	54'.6
285° 25'.7	38'.4	29° 35'.0	11'.9	19'.7	6'.1	
300° 25'.9	39'.3	44° 05'.9	12'.0	13'.6	6'.3	
315° 26'.0	40'.1	58° 36'.9	12'.0	07'.3	6'.3	
330° 26'.1	40'.9	73° 07'.9	12'.1	01'.0	6'.3	
345° 26'.2	41'.7	87° 39'.0	12'.2	20° 54'.7 S	6'.5	
0° 26'.3	12° 42'.6 N	102° 10'.2	12'.2	20° 48'.2 S	6'.6	54'.6
15° 26'.4	43'.4	116° 41'.4	12'.2	41'.6	6'.7	54'.5
30° 26'.6	44'.2	131° 12'.6	12'.4	34'.9	6'.7	
45° 26'.7	45'.0	145° 44'.0	12'.4	28'.2	6'.9	
60° 26'.8	45'.9	160° 15'.4	12'.4	21'.3	6'.9	
75° 26'.9	46'.7	174° 46'.8	12'.6	14'.4	7'.0	
90° 27'.0	47'.5	189° 18'.4	12'.6	07'.4	7'.1	
105° 27'.1	48'.4	203° 50'.0	12'.6	00'.3	7'.2	
120° 27'.2	49'.2	218° 21'.6	12'.7	19° 53'.1 S	7'.3	
135° 27'.4	50'.0	232° 53'.3	12'.8	45'.8	7'.4	
150° 27'.5	50'.8	247° 25'.1	12'.8	38'.4	7'.4	54'.4
165° 27'.6	51'.6	261° 56'.9	12'.9	31'.0	7'.6	
SD 15'.9	d 0'.8	SD 15'.1		15'.0	14'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
21	1 16	1 22	11:59	03:16	15:42	18d 81%
22	1 28	1 34	11:58	04:08	16:33	19d 72%
23	1 39	1 45	11:58	04:58	17:22	20d 63%

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1992 April 24, 25, 26 (Fri, Saty, Sun)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.3		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
24 Friday 00	212° 16'.4	192° 43'.6	6° 42'.7 N	220° 10'.1	4° 50'.9 S	55° 13'.8	11° 00'.3 N	252° 03'.5	16° 18'.7 S
01	227° 18'.9	207° 43'.3	43'.9	235° 10'.8	50'.2	70° 16'.3	00'.3	267° 05'.8	18'.6
02	242° 21'.4	222° 42'.9	45'.1	250° 11'.5	49'.4	85° 18'.8	00'.3	282° 08'.1	18'.6
03	257° 23'.8	237° 42'.5	46'.3	265° 12'.1	48'.6	100° 21'.3	00'.3	297° 10'.5	18'.5
04	272° 26'.3	252° 42'.1	47'.5	280° 12'.8	47'.9	115° 23'.9	00'.3	312° 12'.8	18'.5
05	287° 28'.8	267° 41'.7	48'.6	295° 13'.5	47'.1	130° 26'.4	00'.3	327° 15'.1	18'.5
06	302° 31'.2	282° 41'.3	49'.8	310° 14'.2	46'.4	145° 28'.9	00'.3	342° 17'.4	18'.4
07	317° 33'.7	297° 40'.9	51'.0	325° 14'.9	45'.6	160° 31'.4	00'.4	357° 19'.8	18'.4
08	332° 36'.2	312° 40'.5	52'.2	340° 15'.6	44'.9	175° 33'.9	00'.4	12° 22'.1	18'.4
09	347° 38'.6	327° 40'.1	53'.4	355° 16'.2	44'.1	190° 36'.4	00'.4	27° 24'.4	18'.3
10	2° 41'.1	342° 39'.7	54'.6	10° 16'.9	43'.4	205° 38'.9	00'.4	42° 26'.8	18'.3
11	17° 43'.6	357° 39'.3	55'.7	25° 17'.6	42'.6	220° 41'.5	00'.4	57° 29'.1	18'.3
12	32° 46'.0	12° 38'.9	6° 56'.9 N	40° 18'.3	4° 41'.8 S	235° 44'.0	11° 00'.4 N	72° 31'.4	16° 18'.2 S
13	47° 48'.5	27° 38'.5	58'.1	55° 19'.0	41'.1	250° 46'.5	00'.4	87° 33'.7	18'.2
14	62° 50'.9	42° 38'.1	59'.3	70° 19'.7	40'.3	265° 49'.0	00'.4	102° 36'.1	18'.2
15	77° 53'.4	57° 37'.7	7° 00'.5 N	85° 20'.3	39'.6	280° 51'.5	00'.5	117° 38'.4	18'.1
16	92° 55'.9	72° 37'.3	01'.6	100° 21'.0	38'.8	295° 54'.0	00'.5	132° 40'.7	18'.1
17	107° 58'.3	87° 36'.9	02'.8	115° 21'.7	38'.1	310° 56'.5	00'.5	147° 43'.1	18'.1
18	123° 00'.8	102° 36'.5	04'.0	130° 22'.4	37'.3	325° 59'.0	00'.5	162° 45'.4	18'.0
19	138° 03'.3	117° 36'.1	05'.2	145° 23'.1	36'.5	341° 01'.6	00'.5	177° 47'.7	18'.0
20	153° 05'.7	132° 35'.7	06'.4	160° 23'.8	35'.8	356° 04'.1	00'.5	192° 50'.1	17'.9
21	168° 08'.2	147° 35'.3	07'.5	175° 24'.4	35'.0	11° 06'.6	00'.5	207° 52'.4	17'.9
22	183° 10'.7	162° 34'.9	08'.7	190° 25'.1	34'.3	26° 09'.1	00'.5	222° 54'.7	17'.9
23	198° 13'.1	177° 34'.5	09'.9	205° 25'.8	33'.5	41° 11'.6	00'.5	237° 57'.0	17'.8
25 Saturday 00	213° 15'.6	192° 34'.1	7° 11'.1 N	220° 26'.5	4° 32'.8 S	56° 14'.1	11° 00'.5 N	252° 59'.4	16° 17'.8 S
01	228° 18'.1	207° 33'.7	12'.3	235° 27'.2	32'.0	71° 16'.6	00'.6	268° 01'.7	17'.8
02	243° 20'.5	222° 33'.3	13'.4	250° 27'.9	31'.2	86° 19'.1	00'.6	283° 04'.0	17'.7
03	258° 23'.0	237° 32'.9	14'.6	265° 28'.6	30'.5	101° 21'.6	00'.6	298° 06'.4	17'.7
04	273° 25'.4	252° 32'.5	15'.8	280° 29'.2	29'.7	116° 24'.1	00'.6	313° 08'.7	17'.7
05	288° 27'.9	267° 32'.1	17'.0	295° 29'.9	29'.0	131° 26'.7	00'.6	328° 11'.0	17'.6
06	303° 30'.4	282° 31'.7	18'.2	310° 30'.6	28'.2	146° 29'.2	00'.6	343° 13'.4	17'.6
07	318° 32'.8	297° 31'.3	19'.3	325° 31'.3	27'.5	161° 31'.7	00'.6	358° 15'.7	17'.6
08	333° 35'.3	312° 30'.9	20'.5	340° 32'.0	26'.7	176° 34'.2	00'.6	13° 18'.0	17'.5
09	348° 37'.8	327° 30'.4	21'.7	355° 32'.7	25'.9	191° 36'.7	00'.6	28° 20'.4	17'.5
10	3° 40'.2	342° 30'.0	22'.9	10° 33'.4	25'.2	206° 39'.2	00'.6	43° 22'.7	17'.5
11	18° 42'.7	357° 29'.6	24'.0	25° 34'.0	24'.4	221° 41'.7	00'.6	58° 25'.0	17'.4
12	33° 45'.2	12° 29'.2	7° 25'.2 N	40° 34'.7	4° 23'.7 S	236° 44'.2	11° 00'.7 N	73° 27'.4	16° 17'.4 S
13	48° 47'.6	27° 28'.8	26'.4	55° 35'.4	22'.9	251° 46'.7	00'.7	88° 29'.7	17'.4
14	63° 50'.1	42° 28'.4	27'.6	70° 36'.1	22'.2	266° 49'.2	00'.7	103° 32'.0	17'.3
15	78° 52'.5	57° 28'.0	28'.7	85° 36'.8	21'.4	281° 51'.7	00'.7	118° 34'.4	17'.3
16	93° 55'.0	72° 27'.6	29'.9	100° 37'.5	20'.6	296° 54'.2	00'.7	133° 36'.7	17'.3
17	108° 57'.5	87° 27'.2	31'.1	115° 38'.2	19'.9	311° 56'.7	00'.7	148° 39'.0	17'.2
18	123° 59'.9	102° 26'.8	32'.3	130° 38'.8	19'.1	326° 59'.2	00'.7	163° 41'.4	17'.2
19	139° 02'.4	117° 26'.4	33'.4	145° 39'.5	18'.4	342° 01'.7	00'.7	178° 43'.7	17'.2
20	154° 04'.9	132° 26'.0	34'.6	160° 40'.2	17'.6	357° 04'.2	00'.7	193° 46'.0	17'.1
21	169° 07'.3	147° 25'.6	35'.8	175° 40'.9	16'.9	12° 06'.7	00'.7	208° 48'.4	17'.1
22	184° 09'.8	162° 25'.2	37'.0	190° 41'.6	16'.1	27° 09'.2	00'.7	223° 50'.7	17'.1
23	199° 12'.3	177° 24'.8	38'.1	205° 42'.3	15'.3	42° 11'.7	00'.7	238° 53'.0	17'.0
26 Sunday 00	214° 14'.7	192° 24'.4	7° 39'.3 N	220° 43'.0	4° 14'.6 S	57° 14'.2	11° 00'.8 N	253° 55'.4	16° 17'.0 S
01	229° 17'.2	207° 24'.0	40'.5	235° 43'.6	13'.8	72° 16'.7	00'.8	268° 57'.7	17'.0
02	244° 19'.7	222° 23'.6	41'.6	250° 44'.3	13'.1	87° 19'.2	00'.8	284° 00'.0	16'.9
03	259° 22'.1	237° 23'.1	42'.8	265° 45'.0	12'.3	102° 21'.7	00'.8	299° 02'.4	16'.9
04	274° 24'.6	252° 22'.7	44'.0	280° 45'.7	11'.6	117° 24'.2	00'.8	314° 04'.7	16'.9
05	289° 27'.0	267° 22'.3	45'.2	295° 46'.4	10'.8	132° 26'.7	00'.8	329° 07'.0	16'.8
06	304° 29'.5	282° 21'.9	46'.3	310° 47'.1	10'.0	147° 29'.2	00'.8	344° 09'.4	16'.8
07	319° 32'.0	297° 21'.5	47'.5	325° 47'.8	09'.3	162° 31'.7	00'.8	359° 11'.7	16'.8
08	334° 34'.4	312° 21'.1	48'.7	340° 48'.4	08'.5	177° 34'.2	00'.8	14° 14'.0	16'.7
09	349° 36'.9	327° 20'.7	49'.8	355° 49'.1	07'.8	192° 36'.7	00'.8	29° 16'.4	16'.7
10	4° 39'.4	342° 20'.3	51'.0	10° 49'.8	07'.0	207° 39'.2	00'.8	44° 18'.7	16'.7
11	19° 41'.8	357° 19'.9	52'.2	25° 50'.5	06'.2	222° 41'.7	00'.8	59° 21'.0	16'.6
12	34° 44'.3	12° 19'.5	7° 53'.3 N	40° 51'.2	4° 05'.5 S	237° 44'.2	11° 00'.8 N	74° 23'.4	16° 16'.6 S
13	49° 46'.8	27° 19'.1	54'.5	55° 51'.9	04'.7	252° 46'.7	00'.8	89° 25'.7	16'.6
14	64° 49'.2	42° 18'.6	55'.7	70° 52'.6	04'.0	267° 49'.2	00'.8	104° 28'.0	16'.5
15	79° 51'.7	57° 18'.2	56'.8	85° 53'.3	03'.2	282° 51'.7	00'.8	119° 30'.4	16'.5
16	94° 54'.2	72° 17'.8	58'.0	100° 53'.9	02'.5	297° 54'.2	00'.8	134° 32'.7	16'.5
17	109° 56'.6	87° 17'.4	59'.2	115° 54'.6	01'.7	312° 56'.7	00'.9	149° 35'.1	16'.4
18	124° 59'.1	102° 17'.0	8° 00'.3 N	130° 55'.3	00'.9	327° 59'.2	00'.9	164° 37'.4	16'.4
19	140° 01'.5	117° 16'.6	01'.5	145° 56'.0	00'.2	343° 01'.7	00'.9	179° 39'.7	16'.4
20	155° 04'.0	132° 16'.2	02'.7	160° 56'.7	3° 59'.4 S	358° 04'.2	00'.9	194° 42'.1	16'.3
21	170° 06'.5	147° 15'.8	03'.8	175° 57'.4	58'.7	13° 06'.7	00'.9	209° 44'.4	16'.3
22	185° 08'.9	162° 15'.3	05'.0	190° 58'.1	57'.9	28° 09'.2	00'.9	224° 46'.7	16'.3
23	200° 11'.4	177° 14'.9	06'.2	205° 58'.8	57'.1	43° 11'.7	00'.9	239° 49'.1	16'.2
	M.P. 09:41	v -0'.4	d 1'.2	v 0'.7	d 0'.8	v 2'.5	d 0'.0	v 2'.3	d 0'.0

STARS		
Name	SHA	Dec
Acamar	315° 30'.7	40° 20'.1 S
Achernar	335° 38'.9	57° 16'.4 S
Acrux	173° 26'.7	63° 03'.7 S
Adhara	255° 25'.1	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.9	56° 00'.0 N
Alkaid	153° 10'.7	49° 21'.0 N
Alnair	28° 03'.6	46° 59'.7 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.5	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.2 N
Alpheratz	358° 00'.2	29° 02'.8 N
Altair	62° 23'.6	8° 50'.7 N
Ankaa	353° 31'.5	42° 20'.7 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.1	69° 00'.8 S
Avior	234° 24'.6	59° 29'.5 S
Bellatrix	278° 49'.2	6° 20'.5 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.5	52° 41'.8 S
Capella	280° 58'.2	45° 59'.6 N
Deneb	49° 42'.3	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.7 S
Dubhe	194° 10'.4	61° 47'.6 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.2	51° 29'.1 N
Enif	34° 02'.7	9° 50'.3 N
Fomalhaut	15° 41'.5	29° 39'.7 S
Gacrux	172° 18'.2	57° 04'.5 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.4 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.1 N
Markab	13° 54'.3	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.0	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.1 N
Nunki	76° 17'.7	26° 18'.4 S
Peacock	53° 43'.9	56° 45'.4 S
Polaris	324° 26'.2	89° 13'.9 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.6 N
Rasalhague	96° 20'.9	12° 33'.7 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.8	60° 48'.3 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 59'.3	56° 29'.6 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 47'.8	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.1	43° 24'.4 S
Vega	80° 49'.5	38° 46'.3 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	339° 18'.5	11:10
Mars	7° 10'.9	09:18
Jupiter	202° 58'.5	20:12
Saturn	39° 43'.8	07:07

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
180° 27'.7	12° 52'.5 N	276° 28'.8	12'.9	19° 23'.4 S	7'.6	54'.4
195° 27'.8	53'.3	291° 00'.7	13'.1	15'.8	7'.7	
210° 27'.9	54'.1	305° 32'.8	13'.0	08'.1	7'.7	
225° 28'.0	54'.9	320° 04'.8	13'.1	00'.4	7'.9	
240° 28'.1	55'.8	334° 36'.9	13'.2	18° 52'.5 S	7'.9	
255° 28'.3	56'.6	349° 09'.1	13'.3	44'.6	8'.0	
270° 28'.4	57'.4	3° 41'.4	13'.3	36'.6	8'.1	
285° 28'.5	58'.2	18° 13'.7	13'.3	28'.5	8'.2	
300° 28'.6	59'.0	32° 46'.0	13'.4	20'.3	8'.2	54'.3
315° 28'.7	59'.9	47° 18'.4	13'.5	12'.1	8'.3	
330° 28'.8	13° 00'.7 N	61° 50'.9	13'.5	03'.8	8'.4	
345° 28'.9	01'.5	76° 23'.4	13'.6	17° 55'.4 S	8'.5	
0° 29'.0	13° 02'.3 N	90° 56'.0	13'.6	17° 46'.9 S	8'.5	54'.3
15° 29'.2	03'.1	105° 28'.6	13'.7	38'.4	8'.6	
30° 29'.3	04'.0	120° 01'.3	13'.8	29'.8	8'.7	
45° 29'.4	04'.8	134° 34'.1	13'.8	21'.1	8'.8	
60° 29'.5	05'.6	149° 06'.9	13'.8	12'.3	8'.8	
75° 29'.6	06'.4	163° 39'.7	13'.9	03'.5	8'.9	
90° 29'.7	07'.2	178° 12'.6	14'.0	16° 54'.6 S	8'.9	
105° 29'.8	08'.0	192° 45'.6	14'.0	45'.7	9'.1	
120° 29'.9	08'.9	207° 18'.6	14'.0	36'.6	9'.1	
135° 30'.0	09'.7	221° 51'.6	14'.1	27'.5	9'.1	
150° 30'.1	10'.5	236° 24'.7	14'.2	18'.4	9'.3	
165° 30'.2	11'.3	250° 57'.9	14'.2	09'.1	9'.3	
180° 30'.4	13° 12'.1 N	265° 31'.1	14'.3	15° 59'.8 S	9'.3	54'.3
195° 30'.5	12'.9	280° 04'.4	14'.3	50'.5	9'.5	
210° 30'.6	13'.8	294° 37'.7	14'.3	41'.0	9'.4	
225° 30'.7	14'.6	309° 11'.0	14'.4	31'.6	9'.6	
240° 30'.8	15'.4	323° 44'.4	14'.5	22'.0	9'.6	
255° 30'.9	16'.2	338° 17'.9	14'.5	12'.4	9'.7	
270° 31'.0	17'.0	352° 51'.4	14'.5	02'.7	9'.7	
285° 31'.1	17'.8	7° 24'.9	14'.6	14° 53'.0 S	9'.8	54'.2
300° 31'.2	18'.6	21° 58'.5	14'.6	43'.2	9'.9	
315° 31'.3	19'.4	36° 32'.1	14'.6	33'.3	9'.9	
330° 31'.4	20'.2	51° 05'.7	14'.8	23'.4	10'.0	
345° 31'.5	21'.1	65° 39'.5	14'.7	13'.4	10'.0	
0° 31'.6	13° 21'.9 N	80° 13'.2	14'.8	14° 03'.4 S	10'.1	54'.2
15° 31'.7	22'.7	94° 47'.0	14'.8	13° 53'.3 S	10'.1	
30° 31'.8	23'.5	109° 20'.8	14'.9	43'.2	10'.2	54'.3
45° 31'.9	24'.3	123° 54'.7	14'.9	33'.0	10'.3	
60° 32'.1	25'.1	138° 28'.6	14'.9	22'.7	10'.3	
75° 32'.2	25'.9	153° 02'.5	15'.0	12'.4	10'.3	
90° 32'.3	26'.7	167° 36'.5	15'.0	02'.1	10'.5	
105° 32'.4	27'.5	182° 10'.5	15'.1	12° 51'.6 S	10'.4	
120° 32'.5	28'.3	196° 44'.6	15'.1	41'.2	10'.5	
135° 32'.6	29'.1	211° 18'.7	15'.1	30'.7	10'.6	
150° 32'.7	29'.9	225° 52'.8	15'.2	20'.1	10'.6	
165° 32'.8	30'.8	240° 27'.0	15'.1	09'.5	10'.7	
180° 32'.9	13° 31'.6 N	255° 01'.1	15'.3	11° 58'.8 S	10'.7	54'.3
195° 33'.0	32'.4	269° 35'.4	15'.2	48'.1	10'.8	
210° 33'.1	33'.2	284° 09'.6	15'.3	37'.3	10'.8	
225° 33'.2	34'.0	298° 43'.9	15'.3	26'.5	10'.9	
240° 33'.3	34'.8	313° 18'.2	15'.4	15'.6	10'.9	
255° 33'.4	35'.6	327° 52'.6	15'.3	04'.7	10'.9	
270° 33'.5	36'.4	342° 26'.9	15'.4	10° 53'.8 S	11'.0	
285° 33'.6	37'.2	357° 01'.3	15'.4	42'.8	11'.1	
300° 33'.7	38'.0	11° 35'.7	15'.5	31'.7	11'.1	
315° 33'.8	38'.8	26° 10'.2	15'.5	20'.6	11'.1	
330° 33'.9	39'.6	40° 44'.7	15'.5	09'.5	11'.2	
345° 34'.0	40'.4	55° 19'.2	15'.5	9° 58'.3 S	11'.2	
0° 34'.1	13° 41'.2 N	69° 53'.7	15'.5	9° 47'.1 S	11'.3	54'.4
15° 34'.2	42'.0	84° 28'.2	15'.6	35'.8	11'.3	
30° 34'.3	42'.8	99° 02'.8	15'.6	24'.5	11'.3	
45° 34'.4	43'.6	113° 37'.4	15'.6	13'.2	11'.4	
60° 34'.5	44'.4	128° 12'.0	15'.6	01'.8	11'.4	
75° 34'.6	45'.2	142° 46'.6	15'.6	8° 50'.4 S	11'.5	
90° 34'.7	46'.0	157° 21'.2	15'.7	38'.9	11'.5	
105° 34'.8	46'.8	171° 55'.9	15'.7	27'.4	11'.5	
120° 34'.9	47'.6	186° 30'.6	15'.6	15'.9	11'.6	
135° 35'.0	48'.4	201° 05'.2	15'.7	04'.3	11'.6	
150° 35'.1	49'.2	215° 39'.9	15'.8	7° 52'.7 S	11'.6	
165° 35'.2	50'.0	230° 14'.7	15'.7	41'.1	11'.7	54'.5
SD 15'.9	d 0'.8	SD	14'.8	14'.8	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
24	1 51	1 56	11:58	05:45	18:07	21d 54%
25	2 01	2 06	11:58	06:29	18:51	22d 44%
26	2 11	2 16	11:58	07:12	19:33	23d 35%

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1992 April 27, 28, 29 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.2		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
27 Monday 00	215° 13'.9	192° 14'.5	8° 07'.3 N	220° 59'.5	3° 56'.4 S	58° 14'.2	11° 00'.9 N	254° 51'.4	16° 16'.2 S
01	230° 16'.3	207° 14'.1	08'.5	236° 00'.1	55'.6	73° 16'.7	00'.9	269° 53'.8	16'.2
02	245° 18'.8	222° 13'.7	09'.7	251° 00'.8	54'.9	88° 19'.2	00'.9	284° 56'.1	16'.1
03	260° 21'.3	237° 13'.3	10'.8	266° 01'.5	54'.1	103° 21'.7	00'.9	299° 58'.4	16'.1
04	275° 23'.7	252° 12'.9	12'.0	281° 02'.2	53'.3	118° 24'.2	00'.9	315° 00'.8	16'.1
05	290° 26'.2	267° 12'.5	13'.2	296° 02'.9	52'.6	133° 26'.7	00'.9	330° 03'.1	16'.0
06	305° 28'.6	282° 12'.0	14'.3	311° 03'.6	51'.8	148° 29'.2	00'.9	345° 05'.4	16'.0
07	320° 31'.1	297° 11'.6	15'.5	326° 04'.3	51'.1	163° 31'.7	00'.9	0° 07'.8	16'.0
08	335° 33'.6	312° 11'.2	16'.7	341° 05'.0	50'.3	178° 34'.1	00'.9	15° 10'.1	15'.9
09	350° 36'.0	327° 10'.8	17'.8	356° 05'.7	49'.5	193° 36'.6	00'.9	30° 12'.5	15'.9
10	5° 38'.5	342° 10'.4	19'.0	11° 06'.3	48'.8	208° 39'.1	00'.9	45° 14'.8	15'.9
11	20° 41'.0	357° 10'.0	20'.1	26° 07'.0	48'.0	223° 41'.6	00'.9	60° 17'.1	15'.8
12	35° 43'.4	12° 09'.5	8° 21'.3 N	41° 07'.7	3° 47'.3 S	238° 44'.1	11° 00'.9 N	75° 19'.5	16° 15'.8 S
13	50° 45'.9	27° 09'.1	22'.5	56° 08'.4	46'.5	253° 46'.6	00'.9	90° 21'.8	15'.8
14	65° 48'.4	42° 08'.7	23'.6	71° 09'.1	45'.8	268° 49'.1	00'.9	105° 24'.2	15'.7
15	80° 50'.8	57° 08'.3	24'.8	86° 09'.8	45'.0	283° 51'.6	00'.9	120° 26'.5	15'.7
16	95° 53'.3	72° 07'.9	25'.9	101° 10'.5	44'.2	298° 54'.1	00'.9	135° 28'.8	15'.7
17	110° 55'.8	87° 07'.5	27'.1	116° 11'.2	43'.5	313° 56'.6	00'.9	150° 31'.2	15'.7
18	125° 58'.2	102° 07'.0	28'.3	131° 11'.9	42'.7	328° 59'.1	00'.9	165° 33'.5	15'.6
19	141° 00'.7	117° 06'.6	29'.4	146° 12'.5	42'.0	344° 01'.5	00'.9	180° 35'.9	15'.6
20	156° 03'.1	132° 06'.2	30'.6	161° 13'.2	41'.2	359° 04'.0	00'.9	195° 38'.2	15'.6
21	171° 05'.6	147° 05'.8	31'.7	176° 13'.9	40'.4	14° 06'.5	00'.9	210° 40'.5	15'.5
22	186° 08'.1	162° 05'.4	32'.9	191° 14'.6	39'.7	29° 09'.0	01'.0	225° 42'.9	15'.5
23	201° 10'.5	177° 04'.9	34'.1	206° 15'.3	38'.9	44° 11'.5	01'.0	240° 45'.2	15'.5
28 Tuesday 00	216° 13'.0	192° 04'.5	8° 35'.2 N	221° 16'.0	3° 38'.2 S	59° 14'.0	11° 01'.0 N	255° 47'.6	16° 15'.4 S
01	231° 15'.5	207° 04'.1	36'.4	236° 16'.7	37'.4	74° 16'.5	01'.0	270° 49'.9	15'.4
02	246° 17'.9	222° 03'.7	37'.5	251° 17'.4	36'.6	89° 19'.0	01'.0	285° 52'.3	15'.4
03	261° 20'.4	237° 03'.3	38'.7	266° 18'.1	35'.9	104° 21'.4	01'.0	300° 54'.6	15'.3
04	276° 22'.9	252° 02'.8	39'.8	281° 18'.8	35'.1	119° 23'.9	01'.0	315° 56'.9	15'.3
05	291° 25'.3	267° 02'.4	41'.0	296° 19'.5	34'.4	134° 26'.4	01'.0	330° 59'.3	15'.3
06	306° 27'.8	282° 02'.0	42'.1	311° 20'.1	33'.6	149° 28'.9	01'.0	346° 01'.6	15'.2
07	321° 30'.2	297° 01'.6	43'.3	326° 20'.8	32'.8	164° 31'.4	01'.0	1° 04'.0	15'.2
08	336° 32'.7	312° 01'.2	44'.5	341° 21'.5	32'.1	179° 33'.9	01'.0	16° 06'.3	15'.2
09	351° 35'.2	327° 00'.7	45'.6	356° 22'.2	31'.3	194° 36'.4	01'.0	31° 08'.7	15'.2
10	6° 37'.6	342° 00'.3	46'.8	11° 22'.9	30'.6	209° 38'.8	01'.0	46° 11'.0	15'.1
11	21° 40'.1	356° 59'.9	47'.9	26° 23'.6	29'.8	224° 41'.3	01'.0	61° 13'.3	15'.1
12	36° 42'.6	11° 59'.5	8° 49'.1 N	41° 24'.3	3° 29'.0 S	239° 43'.8	11° 01'.0 N	76° 15'.7	16° 15'.1 S
13	51° 45'.0	26° 59'.0	50'.2	56° 25'.0	28'.3	254° 46'.3	01'.0	91° 18'.0	15'.0
14	66° 47'.5	41° 58'.6	51'.4	71° 25'.7	27'.5	269° 48'.8	01'.0	106° 20'.4	15'.0
15	81° 50'.0	56° 58'.2	52'.5	86° 26'.4	26'.8	284° 51'.3	01'.0	121° 22'.7	15'.0
16	96° 52'.4	71° 57'.8	53'.7	101° 27'.1	26'.0	299° 53'.7	01'.0	136° 25'.1	14'.9
17	111° 54'.9	86° 57'.3	54'.8	116° 27'.7	25'.2	314° 56'.2	01'.0	151° 27'.4	14'.9
18	126° 57'.4	101° 56'.9	56'.0	131° 28'.4	24'.5	329° 58'.7	01'.0	166° 29'.7	14'.9
19	141° 59'.8	116° 56'.5	57'.1	146° 29'.1	23'.7	345° 01'.2	01'.0	181° 32'.1	14'.8
20	157° 02'.3	131° 56'.1	58'.3	161° 29'.8	23'.0	0° 03'.7	01'.0	196° 34'.4	14'.8
21	172° 04'.7	146° 55'.6	59'.4	176° 30'.5	22'.2	15° 06'.2	01'.0	211° 36'.8	14'.8
22	187° 07'.2	161° 55'.2	9° 00'.6 N	191° 31'.2	21'.4	30° 08'.6	01'.0	226° 39'.1	14'.8
23	202° 09'.7	176° 54'.8	01'.7	206° 31'.9	20'.7	45° 11'.1	01'.0	241° 41'.5	14'.7
29 Wednesday 00	217° 12'.1	191° 54'.4	9° 02'.9 N	221° 32'.6	3° 19'.9 S	60° 13'.6	11° 01'.0 N	256° 43'.8	16° 14'.7 S
01	232° 14'.6	206° 53'.9	04'.0	236° 33'.3	19'.1	75° 16'.1	01'.0	271° 46'.2	14'.7
02	247° 17'.1	221° 53'.5	05'.2	251° 34'.0	18'.4	90° 18'.6	00'.9	286° 48'.5	14'.6
03	262° 19'.5	236° 53'.1	06'.3	266° 34'.7	17'.6	105° 21'.0	00'.9	301° 50'.9	14'.6
04	277° 22'.0	251° 52'.7	07'.5	281° 35'.4	16'.9	120° 23'.5	00'.9	316° 53'.2	14'.6
05	292° 24'.5	266° 52'.2	08'.6	296° 36'.1	16'.1	135° 26'.0	00'.9	331° 55'.5	14'.5
06	307° 26'.9	281° 51'.8	09'.8	311° 36'.7	15'.3	150° 28'.5	00'.9	346° 57'.9	14'.5
07	322° 29'.4	296° 51'.4	10'.9	326° 37'.4	14'.6	165° 30'.9	00'.9	2° 00'.2	14'.5
08	337° 31'.9	311° 50'.9	12'.1	341° 38'.1	13'.8	180° 33'.4	00'.9	17° 02'.6	14'.5
09	352° 34'.3	326° 50'.5	13'.2	356° 38'.8	13'.1	195° 35'.9	00'.9	32° 04'.9	14'.4
10	7° 36'.8	341° 50'.1	14'.4	11° 39'.5	12'.3	210° 38'.4	00'.9	47° 07'.3	14'.4
11	22° 39'.2	356° 49'.7	15'.5	26° 40'.2	11'.5	225° 40'.9	00'.9	62° 09'.6	14'.4
12	37° 41'.7	11° 49'.2	9° 16'.7 N	41° 40'.9	3° 10'.8 S	240° 43'.3	11° 00'.9 N	77° 12'.0	16° 14'.3 S
13	52° 44'.2	26° 48'.8	17'.8	56° 41'.6	10'.0	255° 45'.8	00'.9	92° 14'.3	14'.3
14	67° 46'.6	41° 48'.4	18'.9	71° 42'.3	09'.3	270° 48'.3	00'.9	107° 16'.7	14'.3
15	82° 49'.1	56° 47'.9	20'.1	86° 43'.0	08'.5	285° 50'.8	00'.9	122° 19'.0	14'.2
16	97° 51'.6	71° 47'.5	21'.2	101° 43'.7	07'.7	300° 53'.2	00'.9	137° 21'.4	14'.2
17	112° 54'.0	86° 47'.1	22'.4	116° 44'.4	07'.0	315° 55'.7	00'.9	152° 23'.7	14'.2
18	127° 56'.5	101° 46'.6	23'.5	131° 45'.1	06'.2	330° 58'.2	00'.9	167° 26'.1	14'.2
19	142° 59'.0	116° 46'.2	24'.7	146° 45'.8	05'.5	346° 00'.7	00'.9	182° 28'.4	14'.1
20	158° 01'.4	131° 45'.8	25'.8	161° 46'.5	04'.7	1° 03'.1	00'.9	197° 30'.8	14'.1
21	173° 03'.9	146° 45'.3	26'.9	176° 47'.1	03'.9	16° 05'.6	00'.9	212° 33'.1	14'.1
22	188° 06'.3	161° 44'.9	28'.1	191° 47'.8	03'.2	31° 08'.1	00'.9	227° 35'.4	14'.0
23	203° 08'.8	176° 44'.5	29'.2	206° 48'.5	02'.4	46° 10'.6	00'.9	242° 37'.8	14'.0
	M.P. 09:30	v -0'.4	d 1'.2	v 0'.7	d 0'.8	v 2'.5	d 0'.0	v 2'.3	d 0'.0

STARS	SHA	Dec
Acamar	315° 30'.7	40° 20'.1 S
Achernar	335° 38'.9	57° 16'.4 S
Acrux	173° 26'.7	63° 03'.7 S
Adhara	255° 25'.1	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.9	56° 00'.0 N
Alkaid	153° 10'.7	49° 21'.0 N
Alnair	28° 03'.6	46° 59'.7 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.5	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.2 N
Alpheratz	358° 00'.2	29° 02'.8 N
Altair	62° 23'.6	8° 50'.7 N
Ankaa	353° 31'.5	42° 20'.7 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.1 N
Atria	108° 01'.0	69° 00'.8 S
Avior	234° 24'.6	59° 29'.5 S
Bellatrix	278° 49'.2	6° 20'.5 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.5	52° 41'.7 S
Capella	280° 58'.2	45° 59'.6 N
Deneb	49° 42'.3	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.7 N
Diphda	349° 12'.0	18° 01'.7 S
Dubhe	194° 10'.4	61° 47'.6 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.1	51° 29'.1 N
Enif	34° 02'.7	9° 50'.3 N
Fomalhaut	15° 41'.5	29° 39'.6 S
Gacrux	172° 18'.2	57° 04'.5 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.4 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.1 N
Markab	13° 54'.3	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.1	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.1 N
Nunki	76° 17'.7	26° 18'.4 S
Peacock	53° 43'.9	56° 45'.4 S
Polaris	324° 26'.2	89° 13'.9 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.6 N
Rasalhague	96° 20'.9	12° 33'.7 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.7	60° 48'.3 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 59'.2	56° 29'.6 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 47'.8	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.1	43° 24'.4 S
Vega	80° 49'.4	38° 46'.3 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	335° 51'.5	11:12
Mars	5° 03'.0	09:15
Jupiter	203° 01'.0	44:00
Saturn	39° 34'.6	06:56

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
180° 35'.3	13° 50'.8 N	244° 49'.4	15'.7	7° 29'.4 S	11'.7	54'.5
195° 35'.4	51'.6	259° 24'.1	15'.8	17'.7	11'.8	
210° 35'.5	52'.4	273° 58'.9	15'.7	05'.9	11'.7	
225° 35'.6	53'.2	288° 33'.6	15'.8	6° 54'.2 S	11'.8	
240° 35'.7	54'.0	303° 08'.4	15'.8	42'.4	11'.9	
255° 35'.8	54'.7	317° 43'.2	15'.8	30'.5	11'.9	
270° 35'.9	55'.5	332° 18'.0	15'.8	18'.6	11'.9	
285° 36'.0	56'.3	346° 52'.8	15'.8	06'.7	11'.9	
300° 36'.1	57'.1	1° 27'.6	15'.8	5° 54'.8 S	12'.0	54'.6
315° 36'.2	57'.9	16° 02'.4	15'.8	42'.8	12'.0	
330° 36'.2	58'.7	30° 37'.2	15'.8	30'.8	12'.0	
345° 36'.3	59'.5	45° 12'.0	15'.8	18'.8	12'.0	
0° 36'.4	14° 00'.3 N	59° 46'.8	15'.8	5° 06'.8 S	12'.1	54'.6
15° 36'.5	01'.1	74° 21'.6	15'.8	4° 54'.7 S	12'.1	
30° 36'.6	01'.9	88° 56'.4	15'.8	42'.6	12'.1	
45° 36'.7	02'.7	103° 31'.2	15'.8	30'.5	12'.2	54'.7
60° 36'.8	03'.5	118° 06'.0	15'.8	18'.3	12'.1	
75° 36'.9	04'.2	132° 40'.8	15'.8	06'.2	12'.2	
90° 37'.0	05'.0	147° 15'.6	15'.8	3° 54'.0 S	12'.3	
105° 37'.1	05'.8	161° 50'.4	15'.8	41'.7	12'.2	
120° 37'.2	06'.6	176° 25'.2	15'.8	29'.5	12'.3	
135° 37'.3	07'.4	191° 00'.0	15'.8	17'.2	12'.3	54'.8
150° 37'.4	08'.2	205° 34'.8	15'.7	04'.9	12'.3	
165° 37'.5	09'.0	220° 09'.5	15'.8	2° 52'.6 S	12'.3	
180° 37'.6	14° 09'.8 N	234° 44'.3	15'.8	2° 40'.3 S	12'.3	54'.8
195° 37'.6	10'.5	249° 19'.1	15'.7	28'.0	12'.4	
210° 37'.7	11'.3	263° 53'.8	15'.7	15'.6	12'.4	
225° 37'.8	12'.1	278° 28'.5	15'.7	03'.2	12'.4	54'.9
240° 37'.9	12'.9	293° 03'.2	15'.7	1° 50'.8 S	12'.4	
255° 38'.0	13'.7	307° 37'.9	15'.7	38'.4	12'.4	
270° 38'.1	14'.5	322° 12'.6	15'.7	26'.0	12'.5	
285° 38'.2	15'.3	336° 47'.3	15'.6	13'.5	12'.4	
300° 38'.3	16'.0	351° 21'.9	15'.7	01'.1	12'.5	
315° 38'.4	16'.8	5° 56'.6	15'.6	0° 48'.6 S	12'.5	55'.0
330° 38'.5	17'.6	20° 31'.2	15'.6	36'.1	12'.5	
345° 38'.6	18'.4	35° 05'.8	15'.5	23'.6	12'.5	
0° 38'.6	14° 19'.2 N	49° 40'.3	15'.6	0° 11'.1 S	12'.5	55'.0
15° 38'.7	19'.9	64° 14'.9	15'.5	0° 01'.4 N	12'.5	
30° 38'.8	20'.7	78° 49'.4	15'.5	13'.9	12'.5	55'.1
45° 38'.9	21'.5	93° 23'.9	15'.5	26'.4	12'.6	
60° 39'.0	22'.3	107° 58'.4	15'.5	39'.0	12'.5	
75° 39'.1	23'.1	122° 32'.9	15'.4	51'.5	12'.6	
90° 39'.2	23'.8	137° 07'.3	15'.4	1° 04'.1 N	12'.6	
105° 39'.3	24'.6	151° 41'.7	15'.4	16'.7	12'.5	55'.2
120° 39'.3	25'.4	166° 16'.1	15'.3	29'.2	12'.6	
135° 39'.4	26'.2	180° 50'.4	15'.3	41'.8	12'.6	
150° 39'.5	27'.0	195° 24'.7	15'.3	54'.4	12'.6	
165° 39'.6	27'.7	209° 59'.0	15'.3	2° 07'.0 N	12'.6	55'.3
180° 39'.7	14° 28'.5 N	224° 33'.3	15'.2	2° 19'.6 N	12'.5	55'.3
195° 39'.8	29'.3	239° 07'.5	15'.2	32'.1	12'.6	
210° 39'.9	30'.1	253° 41'.7	15'.1	44'.7	12'.6	
225° 40'.0	30'.8	268° 15'.8	15'.1	57'.3	12'.6	
240° 40'.0	31'.6	282° 49'.9	15'.1	3° 09'.9 N	12'.6	55'.4
255° 40'.1	32'.4	297° 24'.0	15'.0	22'.5	12'.6	
270° 40'.2	33'.2	311° 58'.0	15'.0	35'.1	12'.5	
285° 40'.3	33'.9	326° 32'.0	15'.0	47'.6	12'.6	
300° 40'.4	34'.7	341° 06'.0	14'.9	4° 00'.2 N	12'.6	55'.5
315° 40'.5	35'.5	355° 39'.9	14'.9	12'.8	12'.5	
330° 40'.5	36'.3	10° 13'.8	14'.8	25'.3	12'.6	
345° 40'.6	37'.0	24° 47'.6	14'.8	37'.9	12'.5	
0° 40'.7	14° 37'.8 N	39° 21'.4	14'.7	4° 50'.4 N	12'.6	55'.5
15° 40'.8	38'.6	53° 55'.1	14'.7	5° 03'.0 N	12'.5	55'.6
30° 40'.9	39'.3	68° 28'.8	14'.7	15'.5	12'.5	
45° 41'.0	40'.1	83° 02'.5	14'.6	28'.0	12'.5	
60° 41'.0	40'.9	97° 36'.1	14'.5	40'.5	12'.5	
75° 41'.1	41'.7	112° 09'.6	14'.6	53'.0	12'.5	55'.7
90° 41'.2	42'.4	126° 43'.2	14'.4	6° 05'.5 N	12'.4	
105° 41'.3	43'.2	141° 16'.6	14'.4	17'.9	12'.5	
120° 41'.4	44'.0	155° 50'.0	14'.4	30'.4	12'.4	
135° 41'.5	44'.7	170° 23'.4	14'.3	42'.8	12'.5	55'.8
150° 41'.5	45'.5	184° 56'.7	14'.2	55'.3	12'.4	
165° 41'.6	46'.3	199° 29'.9	14'.2	7° 07'.7 N	12'.3	
SD 15'.9	d 0'.8	SD 14'.9		15'.0	15'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
27	2 21	2 26	11:58	07:54	20:15	24d 26%
28	2 30	2 34	11:57	08:36	20:57	25d 18%
29	2 39	2 43	11:57	09:18	21:40	26d 11%

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1992 Apr 30, May. 1, 2 (Thur, Fri, Sat)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.2		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
30 Thursday 00	218° 11'.3	191° 44'.1	9° 30'.4 N	221° 49'.2	3° 01'.6 S	61° 13'.0	11° 00'.9 N	257° 40'.1	16° 14'.0 S
01	233° 13'.7	206° 43'.6	31'.5	236° 49'.9	00'.9	76° 15'.5	00'.9	272° 42'.5	14'.0
02	248° 16'.2	221° 43'.2	32'.6	251° 50'.6	00'.1	91° 18'.0	00'.9	287° 44'.8	13'.9
03	263° 18'.7	236° 42'.7	33'.8	266° 51'.3	2° 59'.4 S	106° 20'.4	00'.9	302° 47'.2	13'.9
04	278° 21'.1	251° 42'.3	34'.9	281° 52'.0	58'.6	121° 22'.9	00'.9	317° 49'.5	13'.9
05	293° 23'.6	266° 41'.9	36'.1	296° 52'.7	57'.8	136° 25'.4	00'.9	332° 51'.9	13'.8
06	308° 26'.1	281° 41'.4	37'.2	311° 53'.4	57'.1	151° 27'.9	00'.9	347° 54'.2	13'.8
07	323° 28'.5	296° 41'.0	38'.3	326° 54'.1	56'.3	166° 30'.3	00'.8	2° 56'.6	13'.8
08	338° 31'.0	311° 40'.6	39'.5	341° 54'.8	55'.6	181° 32'.8	00'.8	17° 58'.9	13'.8
09	353° 33'.5	326° 40'.1	40'.6	356° 55'.5	54'.8	196° 35'.3	00'.8	33° 01'.3	13'.7
10	8° 35'.9	341° 39'.7	41'.8	11° 56'.2	54'.0	211° 37'.7	00'.8	48° 03'.6	13'.7
11	23° 38'.4	356° 39'.3	42'.9	26° 56'.9	53'.3	226° 40'.2	00'.8	63° 06'.0	13'.7
12	38° 40'.8	11° 38'.8	9° 44'.0 N	41° 57'.6	2° 52'.5 S	241° 42'.7	11° 00'.8 N	78° 08'.3	16° 13'.6 S
13	53° 43'.3	26° 38'.4	45'.2	56° 58'.3	51'.8	256° 45'.2	00'.8	93° 10'.7	13'.6
14	68° 45'.8	41° 38'.0	46'.3	71° 59'.0	51'.0	271° 47'.6	00'.8	108° 13'.0	13'.6
15	83° 48'.2	56° 37'.5	47'.4	86° 59'.6	50'.2	286° 50'.1	00'.8	123° 15'.4	13'.6
16	98° 50'.7	71° 37'.1	48'.6	102° 00'.3	49'.5	301° 52'.6	00'.8	138° 17'.7	13'.5
17	113° 53'.2	86° 36'.6	49'.7	117° 01'.0	48'.7	316° 55'.0	00'.8	153° 20'.1	13'.5
18	128° 55'.6	101° 36'.2	50'.8	132° 01'.7	47'.9	331° 57'.5	00'.8	168° 22'.5	13'.5
19	143° 58'.1	116° 35'.8	52'.0	147° 02'.4	47'.2	347° 00'.0	00'.8	183° 24'.8	13'.4
20	159° 00'.6	131° 35'.3	53'.1	162° 03'.1	46'.4	2° 02'.4	00'.8	198° 27'.2	13'.4
21	174° 03'.0	146° 34'.9	54'.2	177° 03'.8	45'.7	17° 04'.9	00'.8	213° 29'.5	13'.4
22	189° 05'.5	161° 34'.4	55'.4	192° 04'.5	44'.9	32° 07'.4	00'.8	228° 31'.9	13'.4
23	204° 07'.9	176° 34'.0	56'.5	207° 05'.2	44'.1	47° 09'.8	00'.7	243° 34'.2	13'.3
1 Friday 00	219° 10'.4	191° 33'.6	9° 57'.6 N	222° 05'.9	2° 43'.4 S	62° 12'.3	11° 00'.7 N	258° 36'.6	16° 13'.3 S
01	234° 12'.9	206° 33'.1	58'.8	237° 06'.6	42'.6	77° 14'.8	00'.7	273° 38'.9	13'.3
02	249° 15'.3	221° 32'.7	59'.9	252° 07'.3	41'.9	92° 17'.2	00'.7	288° 41'.3	13'.2
03	264° 17'.8	236° 32'.2	10° 01'.0 N	267° 08'.0	41'.1	107° 19'.7	00'.7	303° 43'.6	13'.2
04	279° 20'.3	251° 31'.8	02'.2	282° 08'.7	40'.3	122° 22'.1	00'.7	318° 46'.0	13'.2
05	294° 22'.7	266° 31'.3	03'.3	297° 09'.4	39'.6	137° 24'.6	00'.7	333° 48'.3	13'.2
06	309° 25'.2	281° 30'.9	04'.4	312° 10'.1	38'.8	152° 27'.1	00'.7	348° 50'.7	13'.1
07	324° 27'.7	296° 30'.5	05'.5	327° 10'.8	38'.0	167° 29'.5	00'.7	3° 53'.0	13'.1
08	339° 30'.1	311° 30'.0	06'.7	342° 11'.5	37'.3	182° 32'.0	00'.7	18° 55'.4	13'.1
09	354° 32'.6	326° 29'.6	07'.8	357° 12'.2	36'.5	197° 34'.5	00'.7	33° 57'.7	13'.1
10	9° 35'.1	341° 29'.1	08'.9	12° 12'.9	35'.8	212° 36'.9	00'.7	49° 00'.1	13'.0
11	24° 37'.5	356° 28'.7	10'.1	27° 13'.6	35'.0	227° 39'.4	00'.7	64° 02'.5	13'.0
12	39° 40'.0	11° 28'.2	10° 11'.2 N	42° 14'.3	2° 34'.2 S	242° 41'.9	11° 00'.6 N	79° 04'.8	16° 13'.0 S
13	54° 42'.4	26° 27'.8	12'.3	57° 15'.0	33'.5	257° 44'.3	00'.6	94° 07'.2	12'.9
14	69° 44'.9	41° 27'.4	13'.4	72° 15'.7	32'.7	272° 46'.8	00'.6	109° 09'.5	12'.9
15	84° 47'.4	56° 26'.9	14'.6	87° 16'.4	31'.9	287° 49'.2	00'.6	124° 11'.9	12'.9
16	99° 49'.8	71° 26'.5	15'.7	102° 17'.0	31'.2	302° 51'.7	00'.6	139° 14'.2	12'.9
17	114° 52'.3	86° 26'.0	16'.8	117° 17'.7	30'.4	317° 54'.2	00'.6	154° 16'.6	12'.8
18	129° 54'.8	101° 25'.6	17'.9	132° 18'.4	29'.7	332° 56'.6	00'.6	169° 18'.9	12'.8
19	144° 57'.2	116° 25'.1	19'.1	147° 19'.1	28'.9	347° 59'.1	00'.6	184° 21'.3	12'.8
20	159° 59'.7	131° 24'.7	20'.2	162° 19'.8	28'.1	3° 01'.5	00'.6	199° 23'.7	12'.8
21	175° 02'.2	146° 24'.2	21'.3	177° 20'.5	27'.4	18° 04'.0	00'.6	214° 26'.0	12'.7
22	190° 04'.6	161° 23'.8	22'.4	192° 21'.2	26'.6	33° 06'.5	00'.6	229° 28'.4	12'.7
23	205° 07'.1	176° 23'.3	23'.6	207° 21'.9	25'.9	48° 08'.9	00'.5	244° 30'.7	12'.7
2 Saturday 00	220° 09'.6	191° 22'.9	10° 24'.7 N	222° 22'.6	2° 25'.1 S	63° 11'.4	11° 00'.5 N	259° 33'.1	16° 12'.6 S
01	235° 12'.0	206° 22'.4	25'.8	237° 23'.3	24'.3	78° 13'.8	00'.5	274° 35'.4	12'.6
02	250° 14'.5	221° 22'.0	26'.9	252° 24'.0	23'.6	93° 16'.3	00'.5	289° 37'.8	12'.6
03	265° 16'.9	236° 21'.5	28'.0	267° 24'.7	22'.8	108° 18'.7	00'.5	304° 40'.2	12'.6
04	280° 19'.4	251° 21'.1	29'.2	282° 25'.4	22'.0	123° 21'.2	00'.5	319° 42'.5	12'.5
05	295° 21'.9	266° 20'.6	30'.3	297° 26'.1	21'.3	138° 23'.7	00'.5	334° 44'.9	12'.5
06	310° 24'.3	281° 20'.2	31'.4	312° 26'.8	20'.5	153° 26'.1	00'.5	349° 47'.2	12'.5
07	325° 26'.8	296° 19'.7	32'.5	327° 27'.5	19'.8	168° 28'.6	00'.5	4° 49'.6	12'.5
08	340° 29'.3	311° 19'.3	33'.6	342° 28'.2	19'.0	183° 31'.0	00'.4	19° 51'.9	12'.4
09	355° 31'.7	326° 18'.8	34'.8	357° 28'.9	18'.2	198° 33'.5	00'.4	34° 54'.3	12'.4
10	10° 34'.2	341° 18'.4	35'.9	12° 29'.6	17'.5	213° 35'.9	00'.4	49° 56'.7	12'.4
11	25° 36'.7	356° 17'.9	37'.0	27° 30'.3	16'.7	228° 38'.4	00'.4	64° 59'.0	12'.4
12	40° 39'.1	11° 17'.5	10° 38'.1 N	42° 31'.0	2° 15'.9 S	243° 40'.8	11° 00'.4 N	80° 01'.4	16° 12'.3 S
13	55° 41'.6	26° 17'.0	39'.2	57° 31'.7	15'.2	258° 43'.3	00'.4	95° 03'.7	12'.3
14	70° 44'.0	41° 16'.6	40'.3	72° 32'.4	14'.4	273° 45'.8	00'.4	110° 06'.1	12'.3
15	85° 46'.5	56° 16'.1	41'.5	87° 33'.1	13'.7	288° 48'.2	00'.4	125° 08'.4	12'.3
16	100° 49'.0	71° 15'.7	42'.6	102° 33'.8	12'.9	303° 50'.7	00'.4	140° 10'.8	12'.2
17	115° 51'.4	86° 15'.2	43'.7	117° 34'.5	12'.1	318° 53'.1	00'.3	155° 13'.2	12'.2
18	130° 53'.9	101° 14'.7	44'.8	132° 35'.2	11'.4	333° 55'.6	00'.3	170° 15'.5	12'.2
19	145° 56'.4	116° 14'.3	45'.9	147° 35'.9	10'.6	348° 58'.0	00'.3	185° 17'.9	12'.2
20	160° 58'.8	131° 13'.8	47'.0	162° 36'.6	09'.8	4° 00'.5	00'.3	200° 20'.2	12'.1
21	176° 01'.3	146° 13'.4	48'.1	177° 37'.3	09'.1	19° 02'.9	00'.3	215° 22'.6	12'.1
22	191° 03'.8	161° 12'.9	49'.3	192° 38'.0	08'.3	34° 05'.4	00'.3	230° 25'.0	12'.1
23	206° 06'.2	176° 12'.5	50'.4	207° 38'.7	07'.6	49° 07'.8	00'.3	245° 27'.3	12'.0
	M.P. 09:18	v -0'.4	d 1'.1	v 0'.7	d 0'.8	v 2'.5	d 0'.0	v 2'.4	d 0'.0

STARS	SHA	Dec
Acamar	315° 30'.7	40° 20'.1 S
Achernar	335° 38'.9	57° 16'.4 S
Acrux	173° 26'.7	63° 03'.7 S
Adhara	255° 25'.1	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.9	56° 00'.1 N
Alkaid	153° 10'.7	49° 21'.0 N
Alnair	28° 03'.6	46° 59'.7 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.6	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.2 N
Alpheratz	358° 00'.2	29° 02'.8 N
Altair	62° 23'.6	8° 50'.7 N
Ankaa	353° 31'.5	42° 20'.7 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 01'.0	69° 00'.8 S
Avior	234° 24'.6	59° 29'.5 S
Bellatrix	278° 49'.2	6° 20'.5 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.5	52° 41'.7 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.3	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.8 N
Diphda	349° 12'.0	18° 01'.7 S
Dubhe	194° 10'.4	61° 47'.6 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.1	51° 29'.1 N
Enif	34° 02'.7	9° 50'.3 N
Fomalhaut	15° 41'.5	29° 39'.6 S
Gacrux	172° 18'.2	57° 04'.5 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.4 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.1 N
Markab	13° 54'.3	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.1	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.1 N
Nunki	76° 17'.7	26° 18'.4 S
Peacock	53° 43'.9	56° 45'.3 S
Polaris	324° 26'.0	89° 13'.8 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.6 N
Rasalhague	96° 20'.9	12° 33'.7 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.7	60° 48'.3 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 59'.2	56° 29'.6 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 47'.8	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.1	43° 24'.4 S
Vega	80° 49'.4	38° 46'.3 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	332° 23'.1	11:14
Mars	2° 55'.5	09:11
Jupiter	203° 01'.9	19:48
Saturn	39° 26'.2	06:45

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
180° 41'.7	14° 47'.0 N	214° 03'.1	14'.1	7° 20'.0 N	12'.4	55'.8
195° 41'.8	47'.8	228° 36'.2	14'.1	32'.4	12'.3	55'.9
210° 41'.9	48'.6	243° 09'.3	14'.0	44'.7	12'.4	
225° 41'.9	49'.3	257° 42'.3	14'.0	57'.1	12'.3	
240° 42'.0	50'.1	272° 15'.3	13'.9	8° 09'.4 N	12'.2	
255° 42'.1	50'.9	286° 48'.2	13'.8	21'.6	12'.3	56'.0
270° 42'.2	51'.6	301° 21'.0	13'.8	33'.9	12'.2	
285° 42'.3	52'.4	315° 53'.8	13'.7	46'.1	12'.2	
300° 42'.3	53'.1	330° 26'.5	13'.7	58'.3	12'.2	
315° 42'.4	53'.9	344° 59'.2	13'.6	9° 10'.5 N	12'.1	56'.1
330° 42'.5	54'.7	359° 31'.8	13'.5	22'.6	12'.1	
345° 42'.6	55'.4	14° 04'.3	13'.4	34'.7	12'.1	
0° 42'.7	14° 56'.2 N	28° 36'.7	13'.4	9° 46'.8 N	12'.0	56'.2
15° 42'.7	57'.0	43° 09'.1	13'.4	58'.8	12'.0	
30° 42'.8	57'.7	57° 41'.5	13'.2	10° 10'.8 N	12'.0	
45° 42'.9	58'.5	72° 13'.7	13'.2	22'.8	12'.0	
60° 43'.0	59'.2	86° 45'.9	13'.1	34'.8	11'.9	56'.3
75° 43'.0	00'.0	101° 18'.0	13'.1	46'.7	11'.8	
90° 43'.1	15° 00'.8 N	115° 50'.1	13'.0	58'.5	11'.9	
105° 43'.2	01'.5	130° 22'.1	12'.9	11° 10'.4 N	11'.7	
120° 43'.3	02'.3	144° 54'.0	12'.8	22'.1	11'.8	56'.4
135° 43'.3	03'.0	159° 25'.8	12'.7	33'.9	11'.7	
150° 43'.4	03'.8	173° 57'.5	12'.7	45'.6	11'.7	
165° 43'.5	04'.5	188° 29'.2	12'.6	57'.3	11'.6	
180° 43'.6	15° 05'.3 N	203° 00'.8	12'.6	12° 08'.9 N	11'.5	56'.5
195° 43'.6	06'.1	217° 32'.4	12'.4	20'.4	11'.6	
210° 43'.7	06'.8	232° 03'.8	12'.4	32'.0	11'.4	
225° 43'.8	07'.6	246° 35'.2	12'.3	43'.4	11'.5	
240° 43'.9	08'.3	261° 06'.5	12'.2	54'.9	11'.3	56'.6
255° 43'.9	09'.1	275° 37'.7	12'.2	13° 06'.2 N	11'.4	
270° 44'.0	09'.8	290° 08'.9	12'.0	17'.6	11'.2	
285° 44'.1	10'.6	304° 39'.9	12'.0	28'.8	11'.3	56'.7
300° 44'.2	11'.3	319° 10'.9	11'.9	40'.1	11'.1	
315° 44'.2	12'.1	333° 41'.8	11'.8	51'.2	11'.1	
330° 44'.3	12'.8	348° 12'.6	11'.8	14° 02'.3 N	11'.1	
345° 44'.4	13'.6	2° 43'.4	11'.6	13'.4	11'.0	56'.8
0° 44'.5	15° 14'.3 N	17° 14'.0	11'.6	14° 24'.4 N	10'.9	56'.8
15° 44'.5	15'.1	31° 44'.6	11'.5	35'.3	10'.8	
30° 44'.6	15'.8	46° 15'.1	11'.4	46'.1	10'.8	
45° 44'.7	16'.6	60° 45'.5	11'.3	56'.9	10'.8	56'.9
60° 44'.7	17'.3	75° 15'.8	11'.2	15° 07'.7 N	10'.7	
75° 44'.8	18'.1	89° 46'.0	11'.2	18'.4	10'.6	
90° 44'.9	18'.8	104° 16'.2	11'.0	29'.0	10'.5	57'.0
105° 45'.0	19'.6	118° 46'.2	11'.0	39'.5	10'.5	
120° 45'.0	20'.3	133° 16'.2	10'.9	50'.0	10'.3	
135° 45'.1	21'.1	147° 46'.1	10'.8	16° 00'.3 N	10'.4	
150° 45'.2	21'.8	162° 15'.9	10'.7	10'.7	10'.2	57'.1
165° 45'.2	22'.6	176° 45'.6	10'.6	20'.9	10'.2	
180° 45'.3	15° 23'.3 N	191° 15'.2	10'.5	16° 31'.1 N	10'.1	57'.1
195° 45'.4	24'.1	205° 44'.7	10'.5	41'.2	10'.0	
210° 45'.4	24'.8	220° 14'.2	10'.3	51'.2	9'.9	57'.2
225° 45'.5	25'.6	234° 43'.5	10'.3	17° 01'.1 N	9'.9	
240° 45'.6	26'.3	249° 12'.8	10'.2	11'.0	9'.8	
255° 45'.6	27'.0	263° 42'.0	10'.1	20'.8	9'.7	
270° 45'.7	27'.8	278° 11'.1	9'.9	30'.5	9'.6	57'.3
285° 45'.8	28'.5	292° 40'.0	9'.9	40'.1	9'.5	
300° 45'.9	29'.3	307° 08'.9	9'.9	49'.6	9'.4	
315° 45'.9	30'.0	321° 37'.8	9'.7	59'.0	9'.4	
330° 46'.0	30'.8	336° 06'.5	9'.6	18° 08'.4 N	9'.2	57'.4
345° 46'.1	31'.5	350° 35'.1	9'.6	17'.6	9'.2	
0° 46'.1	15° 32'.2 N	5° 03'.7	9'.4	18° 26'.8 N	9'.1	57'.4
15° 46'.2	33'.0	19° 32'.1	9'.4	35'.9	8'.9	
30° 46'.3	33'.7	34° 00'.5	9'.2	44'.8	8'.9	57'.5
45° 46'.3	34'.5	48° 28'.7	9'.2	53'.7	8'.8	
60° 46'.4	35'.2	62° 56'.9	9'.1	19° 02'.5 N	8'.7	
75° 46'.5	35'.9	77° 25'.0	9'.0	11'.2	8'.6	
90° 46'.5	36'.7	91° 53'.0	8'.9	19'.8	8'.5	57'.6
105° 46'.6	37'.4	106° 20'.9	8'.8	28'.3	8'.3	
120° 46'.6	38'.1	120° 48'.7	8'.7	36'.6	8'.3	
135° 46'.7	38'.9	135° 16'.4	8'.7	44'.9	8'.2	
150° 46'.8	39'.6	149° 44'.1	8'.5	53'.1	8'.1	57'.7
165° 46'.8	40'.4	164° 11'.6	8'.5	20° 01'.2 N	7'.9	
SD 15'.9	d 0'.8	SD 15'.3		15'.5	15'.6	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
30	2 47	2 50	11:57	10:02	22:25	27d 6%
1	2 54	2 58	11:57	10:49	23:13	28d 2%
2	3 01	3 04	11:57	11:39	24:06	29d 0%

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1992 May 3, 4, 5 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.2		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
3 Sunday 00	221° 08'.7	191° 12'.0	10° 51'.5 N	222° 39'.4	2° 06'.8 S	64° 10'.3	11° 00'.3 N	260° 29'.7	16° 12'.0 S
01	236° 11'.2	206° 11'.6	52'.6	237° 40'.1	06'.0	79° 12'.7	00'.2	275° 32'.0	12'.0
02	251° 13'.6	221° 11'.1	53'.7	252° 40'.8	05'.3	94° 15'.2	00'.2	290° 34'.4	12'.0
03	266° 16'.1	236° 10'.6	54'.8	267° 41'.5	04'.5	109° 17'.6	00'.2	305° 36'.8	11'.9
04	281° 18'.5	251° 10'.2	55'.9	282° 42'.2	03'.8	124° 20'.1	00'.2	320° 39'.1	11'.9
05	296° 21'.0	266° 09'.7	57'.0	297° 42'.9	03'.0	139° 22'.5	00'.2	335° 41'.5	11'.9
06	311° 23'.5	281° 09'.3	58'.1	312° 43'.6	02'.2	154° 25'.0	00'.2	350° 43'.8	11'.9
07	326° 25'.9	296° 08'.8	59'.3	327° 44'.3	01'.5	169° 27'.4	00'.2	5° 46'.2	11'.8
08	341° 28'.4	311° 08'.3	11° 00'.4 N	342° 45'.0	00'.7	184° 29'.9	00'.1	20° 48'.6	11'.8
09	356° 30'.9	326° 07'.9	01'.5	357° 45'.7	1° 59'.9 S	199° 32'.3	00'.1	35° 50'.9	11'.8
10	11° 33'.3	341° 07'.4	02'.6	12° 46'.4	59'.2	214° 34'.8	00'.1	50° 53'.3	11'.8
11	26° 35'.8	356° 07'.0	03'.7	27° 47'.1	58'.4	229° 37'.2	00'.1	65° 55'.7	11'.7
12	41° 38'.3	11° 06'.5	11° 04'.8 N	42° 47'.8	1° 57'.7 S	244° 39'.7	11° 00'.1 N	80° 58'.0	16° 11'.7 S
13	56° 40'.7	26° 06'.0	05'.9	57° 48'.5	56'.9	259° 42'.1	00'.1	96° 00'.4	11'.7
14	71° 43'.2	41° 05'.6	07'.0	72° 49'.2	56'.1	274° 44'.6	00'.1	111° 02'.7	11'.7
15	86° 45'.7	56° 05'.1	08'.1	87° 49'.9	55'.4	289° 47'.0	00'.0	126° 05'.1	11'.6
16	101° 48'.1	71° 04'.7	09'.2	102° 50'.6	54'.6	304° 49'.5	00'.0	141° 07'.5	11'.6
17	116° 50'.6	86° 04'.2	10'.3	117° 51'.3	53'.8	319° 51'.9	00'.0	156° 09'.8	11'.6
18	131° 53'.0	101° 03'.7	11'.4	132° 52'.0	53'.1	334° 54'.3	00'.0	171° 12'.2	11'.6
19	146° 55'.5	116° 03'.3	12'.5	147° 52'.7	52'.3	349° 56'.8	00'.0	186° 14'.6	11'.5
20	161° 58'.0	131° 02'.8	13'.6	162° 53'.4	51'.6	4° 59'.2	00'.0	201° 16'.9	11'.5
21	177° 00'.4	146° 02'.3	14'.7	177° 54'.1	50'.8	20° 01'.7	00'.0	216° 19'.3	11'.5
22	192° 02'.9	161° 01'.9	15'.8	192° 54'.8	50'.0	35° 04'.1	10° 59'.9 N	231° 21'.6	11'.5
23	207° 05'.4	176° 01'.4	16'.9	207° 55'.5	49'.3	50° 06'.6	59'.9	246° 24'.0	11'.4
4 Monday 00	222° 07'.8	191° 01'.0	11° 18'.0 N	222° 56'.2	1° 48'.5 S	65° 09'.0	10° 59'.9 N	261° 26'.4	16° 11'.4 S
01	237° 10'.3	206° 00'.5	19'.1	237° 56'.9	47'.7	80° 11'.5	59'.9	276° 28'.7	11'.4
02	252° 12'.8	221° 00'.0	20'.2	252° 57'.6	47'.0	95° 13'.9	59'.9	291° 31'.1	11'.4
03	267° 15'.2	235° 59'.6	21'.3	267° 58'.3	46'.2	110° 16'.3	59'.9	306° 33'.5	11'.4
04	282° 17'.7	250° 59'.1	22'.4	282° 59'.0	45'.5	125° 18'.8	59'.8	321° 35'.8	11'.3
05	297° 20'.1	265° 58'.6	23'.5	297° 59'.7	44'.7	140° 21'.2	59'.8	336° 38'.2	11'.3
06	312° 22'.6	280° 58'.2	24'.6	313° 00'.4	43'.9	155° 23'.7	59'.8	351° 40'.6	11'.3
07	327° 25'.1	295° 57'.7	25'.7	328° 01'.1	43'.2	170° 26'.1	59'.8	6° 42'.9	11'.3
08	342° 27'.5	310° 57'.2	26'.8	343° 01'.8	42'.4	185° 28'.6	59'.8	21° 45'.3	11'.2
09	357° 30'.0	325° 56'.8	27'.9	358° 02'.5	41'.6	200° 31'.0	59'.8	36° 47'.7	11'.2
10	12° 32'.5	340° 56'.3	29'.0	13° 03'.2	40'.9	215° 33'.4	59'.7	51° 50'.0	11'.2
11	27° 34'.9	355° 55'.8	30'.1	28° 03'.9	40'.1	230° 35'.9	59'.7	66° 52'.4	11'.2
12	42° 37'.4	10° 55'.3	11° 31'.2 N	43° 04'.6	1° 39'.4 S	245° 38'.3	10° 59'.7 N	81° 54'.8	16° 11'.1 S
13	57° 39'.9	25° 54'.9	32'.3	58° 05'.3	38'.6	260° 40'.8	59'.7	96° 57'.1	11'.1
14	72° 42'.3	40° 54'.4	33'.4	73° 06'.0	37'.8	275° 43'.2	59'.7	111° 59'.5	11'.1
15	87° 44'.8	55° 53'.9	34'.5	88° 06'.7	37'.1	290° 45'.6	59'.7	127° 01'.9	11'.1
16	102° 47'.3	70° 53'.5	35'.6	103° 07'.4	36'.3	305° 48'.1	59'.6	142° 04'.2	11'.0
17	117° 49'.7	85° 53'.0	36'.7	118° 08'.1	35'.5	320° 50'.5	59'.6	157° 06'.6	11'.0
18	132° 52'.2	100° 52'.5	37'.8	133° 08'.8	34'.8	335° 52'.9	59'.6	172° 09'.0	11'.0
19	147° 54'.6	115° 52'.0	38'.9	148° 09'.5	34'.0	350° 55'.4	59'.6	187° 11'.3	11'.0
20	162° 57'.1	130° 51'.6	40'.0	163° 10'.2	33'.3	5° 57'.8	59'.6	202° 13'.7	10'.9
21	177° 59'.6	145° 51'.1	41'.1	178° 10'.9	32'.5	21° 00'.3	59'.5	217° 16'.1	10'.9
22	193° 02'.0	160° 50'.6	42'.1	193° 11'.6	31'.7	36° 02'.7	59'.5	232° 18'.4	10'.9
23	208° 04'.5	175° 50'.2	43'.2	208° 12'.3	31'.0	51° 05'.1	59'.5	247° 20'.8	10'.9
5 Tuesday 00	223° 07'.0	190° 49'.7	11° 44'.3 N	223° 13'.0	1° 30'.2 S	66° 07'.6	10° 59'.5 N	262° 23'.2	16° 10'.9 S
01	238° 09'.4	205° 49'.2	45'.4	238° 13'.7	29'.4	81° 10'.0	59'.5	277° 25'.5	10'.8
02	253° 11'.9	220° 48'.7	46'.5	253° 14'.4	28'.7	96° 12'.4	59'.5	292° 27'.9	10'.8
03	268° 14'.4	235° 48'.3	47'.6	268° 15'.1	27'.9	111° 14'.9	59'.4	307° 30'.3	10'.8
04	283° 16'.8	250° 47'.8	48'.7	283° 15'.8	27'.2	126° 17'.3	59'.4	322° 32'.6	10'.8
05	298° 19'.3	265° 47'.3	49'.8	298° 16'.5	26'.4	141° 19'.7	59'.4	337° 35'.0	10'.7
06	313° 21'.8	280° 46'.8	50'.9	313° 17'.2	25'.6	156° 22'.2	59'.4	352° 37'.4	10'.7
07	328° 24'.2	295° 46'.4	51'.9	328° 17'.9	24'.9	171° 24'.6	59'.4	7° 39'.7	10'.7
08	343° 26'.7	310° 45'.9	53'.0	343° 18'.6	24'.1	186° 27'.1	59'.3	22° 42'.1	10'.7
09	358° 29'.1	325° 45'.4	54'.1	358° 19'.4	23'.4	201° 29'.5	59'.3	37° 44'.5	10'.7
10	13° 31'.6	340° 44'.9	55'.2	13° 20'.1	22'.6	216° 31'.9	59'.3	52° 46'.8	10'.6
11	28° 34'.1	355° 44'.5	56'.3	28° 20'.8	21'.8	231° 34'.4	59'.3	67° 49'.2	10'.6
12	43° 36'.5	10° 44'.0	11° 57'.4 N	43° 21'.5	1° 21'.1 S	246° 36'.8	10° 59'.3 N	82° 51'.6	16° 10'.6 S
13	58° 39'.0	25° 43'.5	58'.5	58° 22'.2	20'.3	261° 39'.2	59'.2	97° 54'.0	10'.6
14	73° 41'.5	40° 43'.0	59'.5	73° 22'.9	19'.5	276° 41'.6	59'.2	112° 56'.3	10'.5
15	88° 43'.9	55° 42'.5	12° 00'.6 N	88° 23'.6	18'.8	291° 44'.1	59'.2	127° 58'.7	10'.5
16	103° 46'.4	70° 42'.1	01'.7	103° 24'.3	18'.0	306° 46'.5	59'.2	143° 01'.1	10'.5
17	118° 48'.9	85° 41'.6	02'.8	118° 25'.0	17'.3	321° 48'.9	59'.2	158° 03'.4	10'.5
18	133° 51'.3	100° 41'.1	03'.9	133° 25'.7	16'.5	336° 51'.4	59'.1	173° 05'.8	10'.4
19	148° 53'.8	115° 40'.6	04'.9	148° 26'.4	15'.7	351° 53'.8	59'.1	188° 08'.2	10'.4
20	163° 56'.3	130° 40'.1	06'.0	163° 27'.1	15'.0	6° 56'.2	59'.1	203° 10'.6	10'.4
21	178° 58'.7	145° 39'.7	07'.1	178° 27'.8	14'.2	21° 58'.7	59'.1	218° 12'.9	10'.4
22	194° 01'.2	160° 39'.2	08'.2	193° 28'.5	13'.4	37° 01'.1	59'.1	233° 15'.3	10'.4
23	209° 03'.6	175° 38'.7	09'.3	208° 29'.2	12'.7	52° 03'.5	59'.0	248° 17'.7	10'.3
	M.P. 09:06	v -0'.5	d 1'.1	v 0'.7	d 0'.8	v 2'.4	d 0'.0	v 2'.4	d 0'.0

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 30'.7	40° 20'.1 S	180° 46'.9	15° 41'.1 N	178° 39'.1	8'.4	20° 09'.1 N	7'.9	57'.7
Achernar	335° 38'.9	57° 16'.4 S	195° 47'.0	41'.8	193° 06'.5	8'.3	17'.0	7'.7	
Acrux	173° 26'.7	63° 03'.7 S	210° 47'.0	42'.6	207° 33'.8	8'.2	24'.7	7'.6	57'.8
Adhara	255° 25'.1	28° 57'.9 S	225° 47'.1	43'.3	222° 01'.0	8'.1	32'.3	7'.5	
Aldebaran	291° 07'.8	16° 29'.7 N	240° 47'.2	44'.0	236° 28'.1	8'.0	39'.8	7'.4	
			255° 47'.2	44'.8	250° 55'.1	7'.9	47'.2	7'.3	
Alioth	166° 33'.9	56° 00'.1 N	270° 47'.3	45'.5	265° 22'.0	7'.9	54'.5	7'.2	57'.9
Alkaid	153° 10'.7	49° 21'.0 N	285° 47'.3	46'.2	279° 48'.9	7'.8	21° 01'.7 N	7'.0	
Alnair	28° 03'.5	46° 59'.6 S	300° 47'.4	47'.0	294° 15'.7	7'.6	08'.7	7'.0	
Alnilam	276° 02'.6	1° 12'.5 S	315° 47'.5	47'.7	308° 42'.3	7'.6	15'.7	6'.8	
Alphard	218° 11'.6	8° 37'.7 S	330° 47'.5	48'.4	323° 08'.9	7'.6	22'.5	6'.6	58'.0
			345° 47'.6	49'.1	337° 35'.5	7'.4	29'.1	6'.6	
Alphecca	126° 24'.0	26° 44'.2 N	0° 47'.6	15° 49'.9 N	352° 01'.9	7'.4	21° 35'.7 N	6'.4	58'.0
Alpheratz	358° 00'.2	29° 02'.8 N	15° 47'.7	50'.6	6° 28'.3	7'.2	42'.1	6'.4	
Altair	62° 23'.5	8° 50'.8 N	30° 47'.8	51'.3	20° 54'.5	7'.2	48'.5	6'.1	
Ankaa	353° 31'.5	42° 20'.7 S	45° 47'.8	52'.1	35° 20'.7	7'.2	54'.6	6'.1	58'.1
Antares	112° 45'.3	26° 25'.0 S	60° 47'.9	52'.8	49° 46'.9	7'.0	22° 00'.7 N	5'.9	
			75° 48'.0	53'.5	64° 12'.9	7'.0	06'.6	5'.8	
Arcturus	146° 09'.8	19° 13'.2 N	90° 48'.0	54'.2	78° 38'.9	6'.8	12'.4	5'.7	
Atria	108° 01'.0	69° 00'.8 S	105° 48'.1	55'.0	93° 04'.7	6'.9	18'.1	5'.5	58'.2
Avior	234° 24'.7	59° 29'.5 S	120° 48'.1	55'.7	107° 30'.6	6'.7	23'.6	5'.4	
Bellatrix	278° 49'.2	6° 20'.5 N	135° 48'.2	56'.4	121° 56'.3	6'.7	29'.0	5'.2	
Betelgeuse	271° 18'.6	7° 24'.3 N	150° 48'.2	57'.1	136° 22'.0	6'.6	34'.2	5'.1	
			165° 48'.3	57'.9	150° 47'.6	6'.5	39'.3	5'.0	
Canopus	264° 03'.5	52° 41'.7 S	180° 48'.4	15° 58'.6 N	165° 13'.1	6'.5	22° 44'.3 N	4'.9	58'.3
Capella	280° 58'.2	45° 59'.5 N	195° 48'.4	59'.3	179° 38'.6	6'.3	49'.2	4'.7	
Deneb	49° 42'.2	45° 14'.9 N	210° 48'.5	16° 00'.0 N	194° 03'.9	6'.4	53'.9	4'.5	
Denebola	182° 49'.5	14° 36'.8 N	225° 48'.5	00'.8	208° 29'.3	6'.2	58'.4	4'.5	
Diphda	349° 12'.0	18° 01'.6 S	240° 48'.6	01'.5	222° 54'.5	6'.2	23° 02'.9 N	4'.2	
			255° 48'.6	02'.2	237° 19'.7	6'.2	07'.1	4'.2	58'.4
Dubhe	194° 10'.5	61° 47'.7 N	270° 48'.7	02'.9	251° 44'.9	6'.0	11'.3	3'.9	
Elnath	278° 32'.9	28° 36'.1 N	285° 48'.8	03'.7	266° 09'.9	6'.0	15'.2	3'.9	
Eltanin	90° 53'.1	51° 29'.1 N	300° 48'.8	04'.4	280° 34'.9	6'.0	19'.1	3'.7	
Enif	34° 02'.7	9° 50'.3 N	315° 48'.9	05'.1	294° 59'.9	5'.9	22'.8	3'.5	
Fomalhaut	15° 41'.5	29° 39'.6 S	330° 48'.9	05'.8	309° 24'.8	5'.8	26'.3	3'.4	58'.5
			345° 49'.0	06'.5	323° 49'.6	5'.8	29'.7	3'.3	
Gacrux	172° 18'.2	57° 04'.5 S	0° 49'.0	16° 07'.3 N	338° 14'.4	5'.8	23° 33'.0 N	3'.1	58'.5
Gienah	176° 08'.3	17° 30'.2 S	15° 49'.1	08'.0	352° 39'.2	5'.6	36'.1	2'.9	
Hadar	149° 09'.9	60° 20'.4 S	30° 49'.2	08'.7	7° 03'.8	5'.7	39'.0	2'.8	
Hamal	328° 19'.0	23° 25'.6 N	45° 49'.2	09'.4	21° 28'.5	5'.6	41'.8	2'.7	
Kaus Aust.	84° 04'.5	34° 23'.3 S	60° 49'.3	10'.1	35° 53'.1	5'.5	44'.5	2'.5	58'.6
			75° 49'.3	10'.8	50° 17'.6	5'.5	47'.0	2'.3	
Kochab	137° 18'.0	74° 11'.1 N	90° 49'.4	11'.6	64° 42'.1	5'.5	49'.3	2'.2	
Markab	13° 54'.3	15° 09'.8 N	105° 49'.4	12'.3	79° 06'.6	5'.4	51'.5	2'.0	
Menkar	314° 31'.9	4° 03'.6 N	120° 49'.5	13'.0	93° 31'.0	5'.4	53'.5	1'.9	
Menkent	148° 25'.9	36° 20'.2 S	135° 49'.5	13'.7	107° 55'.4	5'.3	55'.4	1'.7	
Miaplacidus	221° 43'.2	69° 41'.5 S	150° 49'.6	14'.4	122° 19'.7	5'.3	57'.1	1'.6	58'.7
			165° 49'.6	15'.1	136° 44'.0	5'.3	58'.7	1'.4	
Mirfak	309° 03'.6	49° 50'.1 N	180° 49'.7	16° 15'.8 N	151° 08'.3	5'.2	24° 00'.1 N	1'.2	58'.7
Nunki	76° 17'.7	26° 18'.4 S	195° 49'.7	16'.6	165° 32'.5	5'.3	01'.3	1'.1	
Peacock	53° 43'.8	56° 45'.3 S	210° 49'.8	17'.3	179° 56'.8	5'.1	02'.4	1'.0	
Polaris	324° 25'.6	89° 13'.8 N	225° 49'.8	18'.0	194° 20'.9	5'.2	03'.4	0'.7	
Pollux	243° 47'.1	28° 02'.7 N	240° 49'.9	18'.7	208° 45'.1	5'.1	04'.1	0'.7	58'.8
			255° 49'.9	19'.4	223° 09'.2	5'.1	04'.8	0'.4	
Procyon	245° 16'.3	5° 14'.6 N	270° 50'.0	20'.1	237° 33'.3	5'.1	05'.2	0'.3	
Rasalhague	96° 20'.8	12° 33'.8 N	285° 50'.0	20'.8	251° 57'.4	5'.1	05'.5	0'.1	
Regulus	208° 00'.2	12° 00'.2 N	300° 50'.1	21'.5	266° 21'.5	5'.1	05'.6	0'.0	
Rigel	281° 27'.5	8° 12'.7 S	315° 50'.1	22'.2	280° 45'.6	5'.0	05'.6	0'.2	
Rigil Kent	140° 12'.7	60° 48'.3 S	330° 50'.2	22'.9	295° 09'.6	5'.0	05'.4	0'.3	
			345° 50'.2	23'.7	309° 33'.6	5'.1	05'.1	0'.5	58'.9
Sabik	102° 30'.4	15° 43'.0 S	0° 50'.3	16° 24'.4 N	323° 57'.7	5'.0	24° 04'.6 N	0'.7	58'.9
Schedar	349° 59'.2	56° 29'.6 N	15° 50'.3	25'.1	338° 21'.7	5'.0	03'.9	0'.8	
Shaula	96° 43'.0	37° 05'.9 S	30° 50'.4	25'.8	352° 45'.7	5'.0	03'.1	1'.0	
Sirius	258° 47'.8	16° 42'.5 S	45° 50'.4	26'.5	7° 09'.7	5'.0	02'.1	1'.1	
Spica	158° 47'.6	11° 07'.5 S	60° 50'.5	27'.2	21° 33'.7	5'.0	01'.0	1'.3	
			75° 50'.5	27'.9	35° 57'.7	5'.0	23° 59'.7 N	1'.5	
Suhail	223° 04'.1	43° 24'.5 S	90° 50'.6	28'.6	50° 21'.7	4'.9	58'.2	1'.6	
Vega	80° 49'.4	38° 46'.3 N	105° 50'.6	29'.3	64° 45'.6	5'.0	56'.6	1'.8	59'.0
Zuben'ubi	137° 22'.6	16° 00'.8 S	120° 50'.7	30'.0	79° 09'.6	5'.1	54'.8	2'.0	
			135° 50'.7	30'.7	93° 33'.7	5'.0	52'.8	2'.1	
	SHA	Mer.Pass.	150° 50'.8	31'.4	107° 57'.7	5'.0	50'.7	2'.3	
Venus	328° 53'.1	11:16	165° 50'.8	32'.1	122° 21'.7	5'.0	48'.4	2'.4	
Mars	0° 48'.4	09:08							
Jupiter	203° 01'.2	19:36							
Saturn	39° 18'.5	06:33	SD 15'.9	d 0'.7	SD 15'.8		15'.9	16'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON ● Age/ Vis
3	3 07	3 10	11:57	12:33	00:06	1d 1%
4	3 13	3 16	11:57	13:31	01:01	2d 4%
5	3 19	3 21	11:57	14:30	02:00	3d 9%

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1992 May 6, 7, 8 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +1.1		JUPITER -2.2		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
6 Wednesday									
00	224° 06'.1	190° 38'.2	12° 10'.3 N	223° 29'.9	1° 11'.9 S	67° 06'.0	10° 59'.0 N	263° 20'.0	16° 10'.3 S
01	239° 08'.6	205° 37'.7	11'.4	238° 30'.6	11'.2	82° 08'.4	59'.0	278° 22'.4	10'.3
02	254° 11'.0	220° 37'.2	12'.5	253° 31'.3	10'.4	97° 10'.8	59'.0	293° 24'.8	10'.3
03	269° 13'.5	235° 36'.8	13'.6	268° 32'.0	09'.6	112° 13'.2	58'.9	308° 27'.2	10'.3
04	284° 16'.0	250° 36'.3	14'.7	283° 32'.7	08'.9	127° 15'.7	58'.9	323° 29'.5	10'.2
05	299° 18'.4	265° 35'.8	15'.7	298° 33'.4	08'.1	142° 18'.1	58'.9	338° 31'.9	10'.2
06	314° 20'.9	280° 35'.3	16'.8	313° 34'.1	07'.3	157° 20'.5	58'.9	353° 34'.3	10'.2
07	329° 23'.4	295° 34'.8	17'.9	328° 34'.8	06'.6	172° 23'.0	58'.9	8° 36'.6	10'.2
08	344° 25'.8	310° 34'.3	19'.0	343° 35'.5	05'.8	187° 25'.4	58'.8	23° 39'.0	10'.1
09	359° 28'.3	325° 33'.8	20'.0	358° 36'.2	05'.1	202° 27'.8	58'.8	38° 41'.4	10'.1
10	14° 30'.8	340° 33'.4	21'.1	13° 36'.9	04'.3	217° 30'.2	58'.8	53° 43'.8	10'.1
11	29° 33'.2	355° 32'.9	22'.2	28° 37'.6	03'.5	232° 32'.7	58'.8	68° 46'.1	10'.1
12	44° 35'.7	10° 32'.4	12° 23'.2 N	43° 38'.4	1° 02'.8 S	247° 35'.1	10° 58'.7 N	83° 48'.5	16° 10'.1 S
13	59° 38'.1	25° 31'.9	24'.3	58° 39'.1	02'.0	262° 37'.5	58'.7	98° 50'.9	10'.0
14	74° 40'.6	40° 31'.4	25'.4	73° 39'.8	01'.3	277° 39'.9	58'.7	113° 53'.3	10'.0
15	89° 43'.1	55° 30'.9	26'.5	88° 40'.5	00'.5	292° 42'.4	58'.7	128° 55'.6	10'.0
16	104° 45'.5	70° 30'.4	27'.5	103° 41'.2	0° 59'.7 S	307° 44'.8	58'.6	143° 58'.0	10'.0
17	119° 48'.0	85° 29'.9	28'.6	118° 41'.9	59'.0	322° 47'.2	58'.6	159° 00'.4	10'.0
18	134° 50'.5	100° 29'.5	29'.7	133° 42'.6	58'.2	337° 49'.6	58'.6	174° 02'.8	09'.9
19	149° 52'.9	115° 29'.0	30'.7	148° 43'.3	57'.4	352° 52'.1	58'.6	189° 05'.1	09'.9
20	164° 55'.4	130° 28'.5	31'.8	163° 44'.0	56'.7	7° 54'.5	58'.6	204° 07'.5	09'.9
21	179° 57'.9	145° 28'.0	32'.9	178° 44'.7	55'.9	22° 56'.9	58'.5	219° 09'.9	09'.9
22	195° 00'.3	160° 27'.5	33'.9	193° 45'.4	55'.2	37° 59'.3	58'.5	234° 12'.3	09'.8
23	210° 02'.8	175° 27'.0	35'.0	208° 46'.1	54'.4	53° 01'.7	58'.5	249° 14'.6	09'.8
7 Thursday									
00	225° 05'.3	190° 26'.5	12° 36'.1 N	223° 46'.8	0° 53'.6 S	68° 04'.2	10° 58'.5 N	264° 17'.0	16° 09'.8 S
01	240° 07'.7	205° 26'.0	37'.1	238° 47'.5	52'.9	83° 06'.6	58'.4	279° 19'.4	09'.8
02	255° 10'.2	220° 25'.5	38'.2	253° 48'.2	52'.1	98° 09'.0	58'.4	294° 21'.8	09'.8
03	270° 12'.6	235° 25'.0	39'.3	268° 48'.9	51'.4	113° 11'.4	58'.4	309° 24'.1	09'.7
04	285° 15'.1	250° 24'.5	40'.3	283° 49'.6	50'.6	128° 13'.8	58'.4	324° 26'.5	09'.7
05	300° 17'.6	265° 24'.0	41'.4	298° 50'.3	49'.8	143° 16'.3	58'.3	339° 28'.9	09'.7
06	315° 20'.0	280° 23'.6	42'.5	313° 51'.0	49'.1	158° 18'.7	58'.3	354° 31'.3	09'.7
07	330° 22'.5	295° 23'.1	43'.5	328° 51'.8	48'.3	173° 21'.1	58'.3	9° 33'.6	09'.7
08	345° 25'.0	310° 22'.6	44'.6	343° 52'.5	47'.5	188° 23'.5	58'.3	24° 36'.0	09'.6
09	0° 27'.4	325° 22'.1	45'.7	358° 53'.2	46'.8	203° 25'.9	58'.2	39° 38'.4	09'.6
10	15° 29'.9	340° 21'.6	46'.7	13° 53'.9	46'.0	218° 28'.4	58'.2	54° 40'.8	09'.6
11	30° 32'.4	355° 21'.1	47'.8	28° 54'.6	45'.3	233° 30'.8	58'.2	69° 43'.2	09'.6
12	45° 34'.8	10° 20'.6	12° 48'.8 N	43° 55'.3	0° 44'.5 S	248° 33'.2	10° 58'.2 N	84° 45'.5	16° 09'.6 S
13	60° 37'.3	25° 20'.1	49'.9	58° 56'.0	43'.7	263° 35'.6	58'.1	99° 47'.9	09'.5
14	75° 39'.7	40° 19'.6	51'.0	73° 56'.7	43'.0	278° 38'.0	58'.1	114° 50'.3	09'.5
15	90° 42'.2	55° 19'.1	52'.0	88° 57'.4	42'.2	293° 40'.5	58'.1	129° 52'.7	09'.5
16	105° 44'.7	70° 18'.6	53'.1	103° 58'.1	41'.5	308° 42'.9	58'.1	144° 55'.0	09'.5
17	120° 47'.1	85° 18'.1	54'.1	118° 58'.8	40'.7	323° 45'.3	58'.0	159° 57'.4	09'.5
18	135° 49'.6	100° 17'.6	55'.2	133° 59'.5	39'.9	338° 47'.7	58'.0	174° 59'.8	09'.4
19	150° 52'.1	115° 17'.1	56'.2	149° 00'.2	39'.2	353° 50'.1	58'.0	190° 02'.2	09'.4
20	165° 54'.5	130° 16'.6	57'.3	164° 00'.9	38'.4	8° 52'.5	57'.9	205° 04'.6	09'.4
21	180° 57'.0	145° 16'.1	58'.3	179° 01'.6	37'.6	23° 55'.0	57'.9	220° 06'.9	09'.4
22	195° 59'.5	160° 15'.6	59'.4	194° 02'.3	36'.9	38° 57'.4	57'.9	235° 09'.3	09'.4
23	211° 01'.9	175° 15'.1	13° 00'.5 N	209° 03'.0	36'.1	53° 59'.8	57'.9	250° 11'.7	09'.3
8 Friday									
00	226° 04'.4	190° 14'.6	13° 01'.5 N	224° 03'.8	0° 35'.4 S	69° 02'.2	10° 57'.8 N	265° 14'.1	16° 09'.3 S
01	241° 06'.9	205° 14'.1	02'.6	239° 04'.5	34'.6	84° 04'.6	57'.8	280° 16'.5	09'.3
02	256° 09'.3	220° 13'.6	03'.6	254° 05'.2	33'.8	99° 07'.0	57'.8	295° 18'.8	09'.3
03	271° 11'.8	235° 13'.1	04'.7	269° 05'.9	33'.1	114° 09'.4	57'.8	310° 21'.2	09'.3
04	286° 14'.2	250° 12'.6	05'.7	284° 06'.6	32'.3	129° 11'.9	57'.7	325° 23'.6	09'.2
05	301° 16'.7	265° 12'.1	06'.8	299° 07'.3	31'.6	144° 14'.3	57'.7	340° 26'.0	09'.2
06	316° 19'.2	280° 11'.6	07'.8	314° 08'.0	30'.8	159° 16'.7	57'.7	355° 28'.4	09'.2
07	331° 21'.6	295° 11'.1	08'.9	329° 08'.7	30'.0	174° 19'.1	57'.6	10° 30'.7	09'.2
08	346° 24'.1	310° 10'.6	09'.9	344° 09'.4	29'.3	189° 21'.5	57'.6	25° 33'.1	09'.2
09	1° 26'.6	325° 10'.1	11'.0	359° 10'.1	28'.5	204° 23'.9	57'.6	40° 35'.5	09'.2
10	16° 29'.0	340° 09'.6	12'.0	14° 10'.8	27'.7	219° 26'.3	57'.6	55° 37'.9	09'.1
11	31° 31'.5	355° 09'.1	13'.1	29° 11'.5	27'.0	234° 28'.7	57'.5	70° 40'.3	09'.1
12	46° 34'.0	10° 08'.6	13° 14'.1 N	44° 12'.2	0° 26'.2 S	249° 31'.2	10° 57'.5 N	85° 42'.6	16° 09'.1 S
13	61° 36'.4	25° 08'.0	15'.2	59° 12'.9	25'.5	264° 33'.6	57'.5	100° 45'.0	09'.1
14	76° 38'.9	40° 07'.5	16'.2	74° 13'.7	24'.7	279° 36'.0	57'.5	115° 47'.4	09'.1
15	91° 41'.4	55° 07'.0	17'.3	89° 14'.4	23'.9	294° 38'.4	57'.4	130° 49'.8	09'.0
16	106° 43'.8	70° 06'.5	18'.3	104° 15'.1	23'.2	309° 40'.8	57'.4	145° 52'.2	09'.0
17	121° 46'.3	85° 06'.0	19'.3	119° 15'.8	22'.4	324° 43'.2	57'.4	160° 54'.6	09'.0
18	136° 48'.7	100° 05'.5	20'.4	134° 16'.5	21'.7	339° 45'.6	57'.3	175° 56'.9	09'.0
19	151° 51'.2	115° 05'.0	21'.4	149° 17'.2	20'.9	354° 48'.0	57'.3	190° 59'.3	09'.0
20	166° 53'.7	130° 04'.5	22'.5	164° 17'.9	20'.1	9° 50'.4	57'.3	206° 01'.7	08'.9
21	181° 56'.1	145° 04'.0	23'.5	179° 18'.6	19'.4	24° 52'.8	57'.2	221° 04'.1	08'.9
22	196° 58'.6	160° 03'.5	24'.6	194° 19'.3	18'.6	39° 55'.3	57'.2	236° 06'.5	08'.9
23	212° 01'.1	175° 03'.0	25'.6	209° 20'.0	17'.9	54° 57'.7	57'.2	251° 08'.9	08'.9
	M.P. 08:54	v -0'.5	d 1'.1	v 0'.7	d 0'.8	v 2'.4	d 0'.0	v 2'.4	d 0'.0

STARS		
Name	SHA	Dec
Acamar	315° 30'.7	40° 20'.1 S
Achernar	335° 38'.9	57° 16'.4 S
Acrux	173° 26'.7	63° 03'.7 S
Adhara	255° 25'.1	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.9	56° 00'.1 N
Alkaid	153° 10'.7	49° 21'.0 N
Alnair	28° 03'.5	46° 59'.6 S
Alnilam	276° 02'.6	1° 12'.5 S
Alphard	218° 11'.6	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.2 N
Alpheratz	358° 00'.1	29° 02'.8 N
Altair	62° 23'.5	8° 50'.8 N
Ankaa	353° 31'.5	42° 20'.7 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.9	69° 00'.8 S
Avior	234° 24'.7	59° 29'.5 S
Bellatrix	278° 49'.2	6° 20'.5 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.5	52° 41'.7 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.2	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.6 S
Dubhe	194° 10'.5	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.1	51° 29'.1 N
Enif	34° 02'.7	9° 50'.3 N
Fomalhaut	15° 41'.5	29° 39'.6 S
Gacrux	172° 18'.2	57° 04'.6 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.4 S
Hamal	328° 19'.0	23° 25'.6 N
Kaus Aust.	84° 04'.4	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.1 N
Markab	13° 54'.2	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.2	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.1 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.8	56° 45'.3 S
Polaris	324° 25'.1	89° 13'.8 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.8	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.7	60° 48'.3 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 59'.2	56° 29'.6 N
Shaula	96° 43'.0	37° 05'.9 S
Sirius	258° 47'.8	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.1	43° 24'.5 S
Vega	80° 49'.4	38° 46'.4 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	325° 21'.3	11:19
Mars	358° 41'.6	09:04
Jupiter	202° 58'.9	19:25
Saturn	39° 11'.8	06:22

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
180° 50'.9	16° 32'.8 N	136° 45'.7	5'.1	23° 46'.0 N	2'.6	59'.0
195° 50'.9	33'.5	151° 09'.8	5'.0	43'.4	2'.7	
210° 51'.0	34'.2	165° 33'.8	5'.1	40'.7	2'.9	
225° 51'.0	34'.9	179° 57'.9	5'.1	37'.8	3'.1	
240° 51'.1	35'.6	194° 22'.0	5'.1	34'.7	3'.2	59'.1
255° 51'.1	36'.3	208° 46'.1	5'.2	31'.5	3'.4	
270° 51'.1	37'.0	223° 10'.3	5'.1	28'.1	3'.6	
285° 51'.2	37'.7	237° 34'.4	5'.2	24'.5	3'.7	
300° 51'.2	38'.4	251° 58'.6	5'.2	20'.8	3'.8	
315° 51'.3	39'.1	266° 22'.8	5'.3	17'.0	4'.0	
330° 51'.3	39'.8	280° 47'.1	5'.2	13'.0	4'.2	
345° 51'.4	40'.5	295° 11'.3	5'.4	08'.8	4'.3	
0° 51'.4	16° 41'.2 N	309° 35'.7	5'.3	23° 04'.5 N	4'.5	59'.1
15° 51'.5	41'.9	324° 00'.0	5'.4	00'.0	4'.6	
30° 51'.5	42'.6	338° 24'.4	5'.4	22° 55'.4 N	4'.8	59'.2
45° 51'.5	43'.3	352° 48'.8	5'.4	50'.6	4'.9	
60° 51'.6	44'.0	7° 13'.2	5'.5	45'.7	5'.1	
75° 51'.6	44'.7	21° 37'.7	5'.5	40'.6	5'.2	
90° 51'.7	45'.4	36° 02'.2	5'.6	35'.4	5'.4	
105° 51'.7	46'.0	50° 26'.8	5'.6	30'.0	5'.5	
120° 51'.8	46'.7	64° 51'.4	5'.7	24'.5	5'.7	
135° 51'.8	47'.4	79° 16'.1	5'.7	18'.8	5'.8	
150° 51'.8	48'.1	93° 40'.8	5'.7	13'.0	6'.0	
165° 51'.9	48'.8	108° 05'.5	5'.8	07'.0	6'.1	
180° 51'.9	16° 49'.5 N	122° 30'.3	5'.9	22° 00'.9 N	6'.2	59'.2
195° 52'.0	50'.2	136° 55'.2	5'.9	21° 54'.7 N	6'.4	
210° 52'.0	50'.9	151° 20'.1	5'.9	48'.3	6'.6	
225° 52'.0	51'.6	165° 45'.0	6'.0	41'.7	6'.7	
240° 52'.1	52'.3	180° 10'.0	6'.1	35'.0	6'.8	
255° 52'.1	52'.9	194° 35'.1	6'.1	28'.2	7'.0	59'.3
270° 52'.2	53'.6	209° 00'.2	6'.2	21'.2	7'.1	
285° 52'.2	54'.3	223° 25'.4	6'.2	14'.1	7'.2	
300° 52'.2	55'.0	237° 50'.6	6'.3	06'.9	7'.4	
315° 52'.3	55'.7	252° 15'.9	6'.3	20° 59'.5 N	7'.5	
330° 52'.3	56'.4	266° 41'.2	6'.4	52'.0	7'.6	
345° 52'.4	57'.1	281° 06'.6	6'.5	44'.4	7'.8	
0° 52'.4	16° 57'.7 N	295° 32'.1	6'.5	20° 36'.6 N	7'.9	59'.3
15° 52'.4	58'.4	309° 57'.6	6'.6	28'.7	8'.1	
30° 52'.5	59'.1	324° 23'.2	6'.6	20'.6	8'.1	
45° 52'.5	59'.8	338° 48'.8	6'.7	12'.5	8'.3	
60° 52'.5	17° 00'.5 N	353° 14'.5	6'.8	04'.2	8'.4	
75° 52'.6	01'.2	7° 40'.3	6'.8	19° 55'.8 N	8'.6	
90° 52'.6	01'.8	22° 06'.1	6'.9	47'.2	8'.7	
105° 52'.6	02'.5	36° 32'.0	7'.0	38'.5	8'.8	
120° 52'.7	03'.2	50° 58'.0	7'.0	29'.7	8'.9	
135° 52'.7	03'.9	65° 24'.0	7'.1	20'.8	9'.0	
150° 52'.8	04'.6	79° 50'.1	7'.2	11'.8	9'.2	
165° 52'.8	05'.2	94° 16'.3	7'.2	02'.6	9'.3	
180° 52'.8	17° 05'.9 N	108° 42'.5	7'.3	18° 53'.3 N	9'.4	59'.3
195° 52'.9	06'.6	123° 08'.8	7'.4	43'.9	9'.5	
210° 52'.9	07'.3	137° 35'.2	7'.4	34'.4	9'.6	
225° 52'.9	07'.9	152° 01'.6	7'.5	24'.8	9'.8	
240° 53'.0	08'.6	166° 28'.1	7'.5	15'.0	9'.8	
255° 53'.0	09'.3	180° 54'.6	7'.7	05'.2	10'.0	
270° 53'.0	10'.0	195° 21'.3	7'.7	17° 55'.2 N	10'.0	
285° 53'.1	10'.7	209° 48'.0	7'.7	45'.2	10'.2	
300° 53'.1	11'.3	224° 14'.7	7'.9	35'.0	10'.3	
315° 53'.1	12'.0	238° 41'.6	7'.9	24'.7	10'.4	
330° 53'.2	12'.7	253° 08'.5	8'.0	14'.3	10'.5	
345° 53'.2	13'.3	267° 35'.5	8'.0	03'.8	10'.6	
0° 53'.2	17° 14'.0 N	282° 02'.5	8'.1	16° 53'.2 N	10'.7	59'.3
15° 53'.3	14'.7	296° 29'.6	8'.2	42'.5	10'.8	
30° 53'.3	15'.4	310° 56'.8	8'.2	31'.7	10'.9	
45° 53'.3	16'.0	325° 24'.0	8'.3	20'.8	11'.0	
60° 53'.4	16'.7	339° 51'.3	8'.4	09'.8	11'.1	
75° 53'.4	17'.4	354° 18'.7	8'.5	15° 58'.7 N	11'.1	
90° 53'.4	18'.0	8° 46'.2	8'.5	47'.6	11'.3	
105° 53'.4	18'.7	23° 13'.7	8'.6	36'.3	11'.4	
120° 53'.5	19'.4	37° 41'.3	8'.6	24'.9	11'.4	
135° 53'.5	20'.0	52° 08'.9	8'.7	13'.5	11'.6	
150° 53'.5	20'.7	66° 36'.6	8'.8	01'.9	11'.6	
165° 53'.6	21'.4	81° 04'.4	8'.8	14° 50'.3 N	11'.7	
SD 15'.8	d 0'.7	SD	16'.1	16'.2	16'.2	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
6	3 23	3 26	11:57	15:30	03:00	4d 17%
7	3 28	3 29	11:57	16:28	03:59	5d 26%
8	3 31	3 33	11:56	17:24	04:56	6d 37%

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1992 May 9, 10, 11 (Sat, Sun, Mon)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.2		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
9 Saturday 00	227° 03'.5	190° 02'.4	13° 26'.6 N	224° 20'.7	0° 17'.1 S	70° 00'.1	10° 57'.2 N	266° 11'.2	16° 08'.9 S
01	242° 06'.0	205° 01'.9	27'.7	239° 21'.4	16'.3	85° 02'.5	57'.1	281° 13'.6	08'.9
02	257° 08'.5	220° 01'.4	28'.7	254° 22'.1	15'.6	100° 04'.9	57'.1	296° 16'.0	08'.8
03	272° 10'.9	235° 00'.9	29'.8	269° 22'.9	14'.8	115° 07'.3	57'.1	311° 18'.4	08'.8
04	287° 13'.4	250° 00'.4	30'.8	284° 23'.6	14'.1	130° 09'.7	57'.0	326° 20'.8	08'.8
05	302° 15'.9	264° 59'.9	31'.8	299° 24'.3	13'.3	145° 12'.1	57'.0	341° 23'.2	08'.8
06	317° 18'.3	279° 59'.4	32'.9	314° 25'.0	12'.5	160° 14'.5	57'.0	356° 25'.5	08'.8
07	332° 20'.8	294° 58'.9	33'.9	329° 25'.7	11'.8	175° 16'.9	56'.9	11° 27'.9	08'.7
08	347° 23'.2	309° 58'.3	34'.9	344° 26'.4	11'.0	190° 19'.3	56'.9	26° 30'.3	08'.7
09	2° 25'.7	324° 57'.8	36'.0	359° 27'.1	10'.3	205° 21'.7	56'.9	41° 32'.7	08'.7
10	17° 28'.2	339° 57'.3	37'.0	14° 27'.8	09'.5	220° 24'.1	56'.9	56° 35'.1	08'.7
11	32° 30'.6	354° 56'.8	38'.0	29° 28'.5	08'.7	235° 26'.5	56'.8	71° 37'.5	08'.7
12	47° 33'.1	9° 56'.3	13° 39'.1 N	44° 29'.2	0° 08'.0 S	250° 28'.9	10° 56'.8 N	86° 39'.8	16° 08'.7 S
13	62° 35'.6	24° 55'.8	40'.1	59° 29'.9	07'.2	265° 31'.3	56'.8	101° 42'.2	08'.6
14	77° 38'.0	39° 55'.3	41'.1	74° 30'.6	06'.5	280° 33'.7	56'.7	116° 44'.6	08'.6
15	92° 40'.5	54° 54'.7	42'.2	89° 31'.4	05'.7	295° 36'.1	56'.7	131° 47'.0	08'.6
16	107° 43'.0	69° 54'.2	43'.2	104° 32'.1	04'.9	310° 38'.6	56'.7	146° 49'.4	08'.6
17	122° 45'.4	84° 53'.7	44'.2	119° 32'.8	04'.2	325° 41'.0	56'.6	161° 51'.8	08'.6
18	137° 47'.9	99° 53'.2	45'.3	134° 33'.5	03'.4	340° 43'.4	56'.6	176° 54'.2	08'.6
19	152° 50'.3	114° 52'.7	46'.3	149° 34'.2	02'.7	355° 45'.8	56'.6	191° 56'.6	08'.5
20	167° 52'.8	129° 52'.1	47'.3	164° 34'.9	01'.9	10° 48'.2	56'.5	206° 58'.9	08'.5
21	182° 55'.3	144° 51'.6	48'.4	179° 35'.6	01'.1	25° 50'.6	56'.5	222° 01'.3	08'.5
22	197° 57'.7	159° 51'.1	49'.4	194° 36'.3	00'.4	40° 53'.0	56'.5	237° 03'.7	08'.5
23	213° 00'.2	174° 50'.6	50'.4	209° 37'.0	00'.4	55° 55'.4	56'.4	252° 06'.1	08'.5
10 Sunday 00	228° 02'.7	189° 50'.1	13° 51'.4 N	224° 37'.7	0° 01'.1 N	70° 57'.8	10° 56'.4 N	267° 08'.5	16° 08'.5 S
01	243° 05'.1	204° 49'.5	52'.5	239° 38'.4	01'.9	86° 00'.2	56'.4	282° 10'.9	08'.4
02	258° 07'.6	219° 49'.0	53'.5	254° 39'.2	02'.7	101° 02'.6	56'.3	297° 13'.3	08'.4
03	273° 10'.1	234° 48'.5	54'.5	269° 39'.9	03'.4	116° 05'.0	56'.3	312° 15'.6	08'.4
04	288° 12'.5	249° 48'.0	55'.5	284° 40'.6	04'.2	131° 07'.4	56'.3	327° 18'.0	08'.4
05	303° 15'.0	264° 47'.5	56'.6	299° 41'.3	04'.9	146° 09'.8	56'.2	342° 20'.4	08'.4
06	318° 17'.5	279° 46'.9	57'.6	314° 42'.0	05'.7	161° 12'.2	56'.2	357° 22'.8	08'.3
07	333° 19'.9	294° 46'.4	58'.6	329° 42'.7	06'.5	176° 14'.6	56'.2	12° 25'.2	08'.3
08	348° 22'.4	309° 45'.9	59'.6	344° 43'.4	07'.2	191° 17'.0	56'.1	27° 27'.6	08'.3
09	3° 24'.8	324° 45'.4	14° 00'.7 N	359° 44'.1	08'.0	206° 19'.4	56'.1	42° 30'.0	08'.3
10	18° 27'.3	339° 44'.8	01'.7	14° 44'.8	08'.7	221° 21'.8	56'.1	57° 32'.4	08'.3
11	33° 29'.8	354° 44'.3	02'.7	29° 45'.5	09'.5	236° 24'.2	56'.0	72° 34'.8	08'.3
12	48° 32'.2	9° 43'.8	14° 03'.7 N	44° 46'.3	0° 10'.3 N	251° 26'.6	10° 56'.0 N	87° 37'.1	16° 08'.3 S
13	63° 34'.7	24° 43'.3	04'.7	59° 47'.0	11'.0	266° 28'.9	56'.0	102° 39'.5	08'.2
14	78° 37'.2	39° 42'.7	05'.7	74° 47'.7	11'.8	281° 31'.3	55'.9	117° 41'.9	08'.2
15	93° 39'.6	54° 42'.2	06'.8	89° 48'.4	12'.5	296° 33'.7	55'.9	132° 44'.3	08'.2
16	108° 42'.1	69° 41'.7	07'.8	104° 49'.1	13'.3	311° 36'.1	55'.9	147° 46'.7	08'.2
17	123° 44'.6	84° 41'.2	08'.8	119° 49'.8	14'.1	326° 38'.5	55'.8	162° 49'.1	08'.2
18	138° 47'.0	99° 40'.6	09'.8	134° 50'.5	14'.8	341° 40'.9	55'.8	177° 51'.5	08'.2
19	153° 49'.5	114° 40'.1	10'.8	149° 51'.2	15'.6	356° 43'.3	55'.8	192° 53'.9	08'.1
20	168° 52'.0	129° 39'.6	11'.8	164° 51'.9	16'.3	11° 45'.7	55'.7	207° 56'.3	08'.1
21	183° 54'.4	144° 39'.0	12'.9	179° 52'.6	17'.1	26° 48'.1	55'.7	222° 58'.7	08'.1
22	198° 56'.9	159° 38'.5	13'.9	194° 53'.4	17'.9	41° 50'.5	55'.7	238° 01'.0	08'.1
23	213° 59'.3	174° 38'.0	14'.9	209° 54'.1	18'.6	56° 52'.9	55'.6	253° 03'.4	08'.1
11 Monday 00	229° 01'.8	189° 37'.4	14° 15'.9 N	224° 54'.8	0° 19'.4 N	71° 55'.3	10° 55'.6 N	268° 05'.8	16° 08'.1 S
01	244° 04'.3	204° 36'.9	16'.9	239° 55'.5	20'.1	86° 57'.7	55'.6	283° 08'.2	08'.0
02	259° 06'.7	219° 36'.4	17'.9	254° 56'.2	20'.9	102° 00'.1	55'.5	298° 10'.6	08'.0
03	274° 09'.2	234° 35'.8	18'.9	269° 56'.9	21'.7	117° 02'.5	55'.5	313° 13'.0	08'.0
04	289° 11'.7	249° 35'.3	19'.9	284° 57'.6	22'.4	132° 04'.9	55'.5	328° 15'.4	08'.0
05	304° 14'.1	264° 34'.8	21'.0	299° 58'.3	23'.2	147° 07'.3	55'.4	343° 17'.8	08'.0
06	319° 16'.6	279° 34'.2	22'.0	314° 59'.0	23'.9	162° 09'.6	55'.4	358° 20'.2	08'.0
07	334° 19'.1	294° 33'.7	23'.0	329° 59'.7	24'.7	177° 12'.0	55'.3	13° 22'.6	07'.9
08	349° 21'.5	309° 33'.2	24'.0	345° 00'.5	25'.5	192° 14'.4	55'.3	28° 25'.0	07'.9
09	4° 24'.0	324° 32'.6	25'.0	0° 01'.2	26'.2	207° 16'.8	55'.3	43° 27'.4	07'.9
10	19° 26'.4	339° 32'.1	26'.0	15° 01'.9	27'.0	222° 19'.2	55'.2	58° 29'.8	07'.9
11	34° 28'.9	354° 31'.6	27'.0	30° 02'.6	27'.7	237° 21'.6	55'.2	73° 32'.1	07'.9
12	49° 31'.4	9° 31'.0	14° 28'.0 N	45° 03'.3	0° 28'.5 N	252° 24'.0	10° 55'.2 N	88° 34'.5	16° 07'.9 S
13	64° 33'.8	24° 30'.5	29'.0	60° 04'.0	29'.2	267° 26'.4	55'.1	103° 36'.9	07'.9
14	79° 36'.3	39° 30'.0	30'.0	75° 04'.7	30'.0	282° 28'.8	55'.1	118° 39'.3	07'.8
15	94° 38'.8	54° 29'.4	31'.0	90° 05'.4	30'.8	297° 31'.2	55'.1	133° 41'.7	07'.8
16	109° 41'.2	69° 28'.9	32'.0	105° 06'.1	31'.5	312° 33'.6	55'.0	148° 44'.1	07'.8
17	124° 43'.7	84° 28'.4	33'.0	120° 06'.9	32'.3	327° 35'.9	55'.0	163° 46'.5	07'.8
18	139° 46'.2	99° 27'.8	34'.0	135° 07'.6	33'.0	342° 38'.3	54'.9	178° 48'.9	07'.8
19	154° 48'.6	114° 27'.3	35'.0	150° 08'.3	33'.8	357° 40'.7	54'.9	193° 51'.3	07'.8
20	169° 51'.1	129° 26'.7	36'.0	165° 09'.0	34'.6	12° 43'.1	54'.9	208° 53'.7	07'.8
21	184° 53'.6	144° 26'.2	37'.0	180° 09'.7	35'.3	27° 45'.5	54'.8	223° 56'.1	07'.7
22	199° 56'.0	159° 25'.7	38'.0	195° 10'.4	36'.1	42° 47'.9	54'.8	238° 58'.5	07'.7
23	214° 58'.5	174° 25'.1	39'.0	210° 11'.1	36'.8	57° 50'.3	54'.8	254° 00'.9	07'.7
	M.P. 08:42	v -0'.5	d 1'.0	v 0'.7	d 0'.8	v 2'.4	d 0'.0	v 2'.4	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.7	40° 20'.1 S
Achernar	335° 38'.9	57° 16'.3 S
Acrux	173° 26'.7	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.9	56° 00'.1 N
Alkaid	153° 10'.7	49° 21'.0 N
Alnair	28° 03'.5	46° 59'.6 S
Alnilam	276° 02'.7	1° 12'.5 S
Alphard	218° 11'.6	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.3 N
Alpheratz	358° 00'.1	29° 02'.8 N
Altair	62° 23'.5	8° 50'.8 N
Ankaa	353° 31'.5	42° 20'.7 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.9	69° 00'.8 S
Avior	234° 24'.7	59° 29'.5 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.5	52° 41'.7 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.2	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.6 S
Dubhe	194° 10'.5	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.2 N
Enif	34° 02'.6	9° 50'.3 N
Fomalhaut	15° 41'.4	29° 39'.6 S
Gacrux	172° 18'.2	57° 04'.6 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.4 S
Hamal	328° 18'.9	23° 25'.6 N
Kaus Aust.	84° 04'.4	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.1 N
Markab	13° 54'.2	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.3	69° 41'.6 S
Mirfak	309° 03'.6	49° 50'.1 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.8	56° 45'.3 S
Polaris	324° 24'.8	89° 13'.8 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.8	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.7	60° 48'.3 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 59'.1	56° 29'.6 N
Shaula	96° 43'.0	37° 05'.9 S
Sirius	258° 47'.8	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.1	43° 24'.5 S
Vega	80° 49'.4	38° 46'.4 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	321° 47'.4	11:21
Mars	356° 35'.1	09:01
Jupiter	202° 55'.1	19:13
Saturn	39° 05'.8	06:10

	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
9	180° 53'.6	17° 22'.0 N	95° 32'.2	8'.9	14° 38'.6 N	11'.8	59'.3
10	195° 53'.6	22'.7	110° 00'.1	9'.0	26'.8	11'.9	
11	210° 53'.7	23'.4	124° 28'.1	9'.0	14'.9	12'.0	
12	225° 53'.7	24'.0	138° 56'.1	9'.1	02'.9	12'.0	
13	240° 53'.7	24'.7	153° 24'.2	9'.2	13° 50'.9 N	12'.1	
14	255° 53'.7	25'.4	167° 52'.4	9'.2	38'.8	12'.2	
15	270° 53'.8	26'.0	182° 20'.6	9'.3	26'.6	12'.3	
16	285° 53'.8	26'.7	196° 48'.9	9'.3	14'.3	12'.4	
17	300° 53'.8	27'.4	211° 17'.2	9'.5	01'.9	12'.4	
18	315° 53'.9	28'.0	225° 45'.7	9'.4	12° 49'.5 N	12'.5	
19	330° 53'.9	28'.7	240° 14'.1	9'.5	37'.0	12'.5	
20	345° 53'.9	29'.3	254° 42'.6	9'.6	24'.5	12'.7	
21	0° 53'.9	17° 30'.0 N	269° 11'.2	9'.7	12° 11'.8 N	12'.7	59'.3
22	15° 54'.0	30'.7	283° 39'.9	9'.7	11° 59'.1 N	12'.7	
23	30° 54'.0	31'.3	298° 08'.6	9'.7	46'.4	12'.9	
24	45° 54'.0	32'.0	312° 37'.3	9'.8	33'.5	12'.9	
25	60° 54'.0	32'.6	327° 06'.1	9'.9	20'.6	12'.9	
26	75° 54'.1	33'.3	341° 35'.0	9'.9	07'.7	13'.0	
27	90° 54'.1	33'.9	356° 03'.9	10'.0	10° 54'.7 N	13'.1	
28	105° 54'.1	34'.6	10° 32'.9	10'.1	41'.6	13'.1	
29	120° 54'.1	35'.3	25° 02'.0	10'.0	28'.5	13'.2	
30	135° 54'.2	35'.9	39° 31'.0	10'.2	15'.3	13'.3	59'.2
31	150° 54'.2	36'.6	54° 00'.2	10'.2	02'.0	13'.3	
32	165° 54'.2	37'.2	68° 29'.4	10'.2	9° 48'.7 N	13'.3	
33	180° 54'.2	17° 37'.9 N	82° 58'.6	10'.3	9° 35'.4 N	13'.4	59'.2
34	195° 54'.3	38'.5	97° 27'.9	10'.3	22'.0	13'.5	
35	210° 54'.3	39'.2	111° 57'.2	10'.4	08'.5	13'.5	
36	225° 54'.3	39'.8	126° 26'.6	10'.4	8° 55'.0 N	13'.5	
37	240° 54'.3	40'.5	140° 56'.0	10'.5	41'.5	13'.6	
38	255° 54'.3	41'.1	155° 25'.5	10'.5	27'.9	13'.6	
39	270° 54'.4	41'.8	169° 55'.0	10'.6	14'.3	13'.7	
40	285° 54'.4	42'.4	184° 24'.6	10'.6	00'.6	13'.7	
41	300° 54'.4	43'.1	198° 54'.2	10'.6	7° 46'.9 N	13'.8	
42	315° 54'.4	43'.7	213° 23'.8	10'.7	33'.1	13'.7	
43	330° 54'.5	44'.4	227° 53'.5	10'.7	19'.4	13'.9	
44	345° 54'.5	45'.0	242° 23'.2	10'.8	05'.5	13'.8	
45	0° 54'.5	17° 45'.7 N	256° 53'.0	10'.8	6° 51'.7 N	13'.9	59'.2
46	15° 54'.5	46'.3	271° 22'.8	10'.8	37'.8	14'.0	
47	30° 54'.5	47'.0	285° 52'.6	10'.9	23'.8	13'.9	59'.1
48	45° 54'.6	47'.6	300° 22'.5	10'.9	09'.9	14'.0	
49	60° 54'.6	48'.3	314° 52'.4	11'.0	5° 55'.9 N	14'.0	
50	75° 54'.6	48'.9	329° 22'.4	11'.0	41'.9	14'.1	
51	90° 54'.6	49'.6	343° 52'.4	11'.0	27'.8	14'.0	
52	105° 54'.6	50'.2	358° 22'.4	11'.0	13'.8	14'.1	
53	120° 54'.7	50'.8	12° 52'.4	11'.1	4° 59'.7 N	14'.2	
54	135° 54'.7	51'.5	27° 22'.5	11'.1	45'.5	14'.1	
55	150° 54'.7	52'.1	41° 52'.6	11'.2	31'.4	14'.2	
56	165° 54'.7	52'.8	56° 22'.8	11'.1	17'.2	14'.1	
57	180° 54'.7	17° 53'.4 N	70° 52'.9	11'.2	4° 03'.1 N	14'.2	59'.1
58	195° 54'.7	54'.1	85° 23'.1	11'.2	3° 48'.9 N	14'.3	
59	210° 54'.8	54'.7	99° 53'.3	11'.3	34'.6	14'.2	
60	225° 54'.8	55'.3	114° 23'.6	11'.2	20'.4	14'.2	59'.0
61	240° 54'.8	56'.0	128° 53'.8	11'.3	06'.2	14'.3	
62	255° 54'.8	56'.6	143° 24'.1	11'.3	2° 51'.9 N	14'.3	
63	270° 54'.8	57'.3	157° 54'.4	11'.3	37'.6	14'.2	
64	285° 54'.8	57'.9	172° 24'.7	11'.4	23'.4	14'.3	
65	300° 54'.9	58'.5	186° 55'.1	11'.4	09'.1	14'.3	
66	315° 54'.9	59'.2	201° 25'.5	11'.3	1° 54'.8 N	14'.3	
67	330° 54'.9	59'.8	215° 55'.8	11'.4	40'.5	14'.3	
68	345° 54'.9	18° 00'.4 N	230° 26'.2	11'.5	26'.2	14'.3	
69	0° 54'.9	18° 01'.1 N	244° 56'.7	11'.4	1° 11'.9 N	14'.3	59'.0
70	15° 54'.9	01'.7	259° 27'.1	11'.4	0° 57'.6 N	14'.4	
71	30° 55'.0	02'.3	273° 57'.5	11'.5	43'.2	14'.3	58'.9
72	45° 55'.0	03'.0	288° 28'.0	11'.5	28'.9	14'.3	
73	60° 55'.0	03'.6	302° 58'.5	11'.4	14'.6	14'.3	
74	75° 55'.0	04'.2	317° 28'.9	11'.5	00'.3	14'.3	
75	90° 55'.0	04'.9	331° 59'.4	11'.5	0° 14'.0 S	14'.3	
76	105° 55'.0	05'.5	346° 29'.9	11'.5	28'.3	14'.3	
77	120° 55'.0	06'.1	1° 00'.4	11'.5	42'.6	14'.2	
78	135° 55'.1	06'.8	15° 30'.9	11'.5	56'.8	14'.3	
79	150° 55'.1	07'.4	30° 01'.4	11'.6	1° 11'.1 S	14'.3	
80	165° 55'.1	08'.0	44° 32'.0	11'.5	25'.4	14'.2	58'.8
	SD 15'.8	d 0'.6	SD	16'.2	16'.1	16'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
9	3 34	3 36	11:56	18:16	05:50	7d 48%
10	3 37	3 38	11:56	19:07	06:42	8d 60%
11	3 39	3 40	11:56	19:56	07:31	9d 71%

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1992 May 12, 13, 14 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.1		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
12 Tuesday 00	230° 00'.9	189° 24'.6	14° 40'.0 N	225° 11'.8	0° 37'.6 N	72° 52'.7	10° 54'.7 N	269° 03'.3	16° 07'.7 S
01	245° 03'.4	204° 24'.0	41'.0	240° 12'.5	38'.3	87° 55'.0	54'.7	284° 05'.7	07'.7
02	260° 05'.9	219° 23'.5	42'.0	255° 13'.3	39'.1	102° 57'.4	54'.6	299° 08'.1	07'.7
03	275° 08'.3	234° 22'.9	43'.0	270° 14'.0	39'.9	117° 59'.8	54'.6	314° 10'.5	07'.7
04	290° 10'.8	249° 22'.4	44'.0	285° 14'.7	40'.6	133° 02'.2	54'.6	329° 12'.9	07'.6
05	305° 13'.3	264° 21'.9	45'.0	300° 15'.4	41'.4	148° 04'.6	54'.5	344° 15'.3	07'.6
06	320° 15'.7	279° 21'.3	46'.0	315° 16'.1	42'.1	163° 07'.0	54'.5	359° 17'.6	07'.6
07	335° 18'.2	294° 20'.8	47'.0	330° 16'.8	42'.9	178° 09'.3	54'.4	14° 20'.0	07'.6
08	350° 20'.7	309° 20'.2	48'.0	345° 17'.5	43'.7	193° 11'.7	54'.4	29° 22'.4	07'.6
09	5° 23'.1	324° 19'.7	49'.0	0° 18'.2	44'.4	208° 14'.1	54'.4	44° 24'.8	07'.6
10	20° 25'.6	339° 19'.1	50'.0	15° 19'.0	45'.2	223° 16'.5	54'.3	59° 27'.2	07'.6
11	35° 28'.0	354° 18'.6	51'.0	30° 19'.7	45'.9	238° 18'.9	54'.3	74° 29'.6	07'.5
12	50° 30'.5	9° 18'.0	14° 51'.9 N	45° 20'.4	0° 46'.7 N	253° 21'.3	10° 54'.3 N	89° 32'.0	16° 07'.5 S
13	65° 33'.0	24° 17'.5	52'.9	60° 21'.1	47'.4	268° 23'.7	54'.2	104° 34'.4	07'.5
14	80° 35'.4	39° 16'.9	53'.9	75° 21'.8	48'.2	283° 26'.0	54'.2	119° 36'.8	07'.5
15	95° 37'.9	54° 16'.4	54'.9	90° 22'.5	49'.0	298° 28'.4	54'.1	134° 39'.2	07'.5
16	110° 40'.4	69° 15'.9	55'.9	105° 23'.2	49'.7	313° 30'.8	54'.1	149° 41'.6	07'.5
17	125° 42'.8	84° 15'.3	56'.9	120° 23'.9	50'.5	328° 33'.2	54'.1	164° 44'.0	07'.5
18	140° 45'.3	99° 14'.8	57'.9	135° 24'.6	51'.2	343° 35'.6	54'.0	179° 46'.4	07'.4
19	155° 47'.8	114° 14'.2	58'.9	150° 25'.4	52'.0	358° 37'.9	54'.0	194° 48'.8	07'.4
20	170° 50'.2	129° 13'.7	59'.8	165° 26'.1	52'.7	13° 40'.3	53'.9	209° 51'.2	07'.4
21	185° 52'.7	144° 13'.1	15° 00'.8 N	180° 26'.8	53'.5	28° 42'.7	53'.9	224° 53'.6	07'.4
22	200° 55'.2	159° 12'.6	01'.8	195° 27'.5	54'.3	43° 45'.1	53'.9	239° 56'.0	07'.4
23	215° 57'.6	174° 12'.0	02'.8	210° 28'.2	55'.0	58° 47'.5	53'.8	254° 58'.4	07'.4
13 Wednesday 00	231° 00'.1	189° 11'.5	15° 03'.8 N	225° 28'.9	0° 55'.8 N	73° 49'.8	10° 53'.8 N	270° 00'.8	16° 07'.4 S
01	246° 02'.5	204° 10'.9	04'.8	240° 29'.6	56'.5	88° 52'.2	53'.7	285° 03'.2	07'.3
02	261° 05'.0	219° 10'.3	05'.7	255° 30'.3	57'.3	103° 54'.6	53'.7	300° 05'.6	07'.3
03	276° 07'.5	234° 09'.8	06'.7	270° 31'.1	58'.0	118° 57'.0	53'.6	315° 08'.0	07'.3
04	291° 09'.9	249° 09'.2	07'.7	285° 31'.8	58'.8	133° 59'.4	53'.6	330° 10'.4	07'.3
05	306° 12'.4	264° 08'.7	08'.7	300° 32'.5	59'.6	149° 01'.7	53'.6	345° 12'.8	07'.3
06	321° 14'.9	279° 08'.1	09'.7	315° 33'.2	1° 00'.3 N	164° 04'.1	53'.5	0° 15'.2	07'.3
07	336° 17'.3	294° 07'.6	10'.6	330° 33'.9	01'.1	179° 06'.5	53'.5	15° 17'.6	07'.3
08	351° 19'.8	309° 07'.0	11'.6	345° 34'.6	01'.8	194° 08'.9	53'.4	30° 20'.0	07'.3
09	6° 22'.3	324° 06'.5	12'.6	0° 35'.3	02'.6	209° 11'.2	53'.4	45° 22'.4	07'.2
10	21° 24'.7	339° 05'.9	13'.6	15° 36'.0	03'.3	224° 13'.6	53'.4	60° 24'.8	07'.2
11	36° 27'.2	354° 05'.3	14'.5	30° 36'.8	04'.1	239° 16'.0	53'.3	75° 27'.2	07'.2
12	51° 29'.7	9° 04'.8	15° 15'.5 N	45° 37'.5	1° 04'.9 N	254° 18'.4	10° 53'.3 N	90° 29'.6	16° 07'.2 S
13	66° 32'.1	24° 04'.2	16'.5	60° 38'.2	05'.6	269° 20'.8	53'.2	105° 32'.0	07'.2
14	81° 34'.6	39° 03'.7	17'.5	75° 38'.9	06'.4	284° 23'.1	53'.2	120° 34'.4	07'.2
15	96° 37'.0	54° 03'.1	18'.4	90° 39'.6	07'.1	299° 25'.5	53'.1	135° 36'.8	07'.2
16	111° 39'.5	69° 02'.6	19'.4	105° 40'.3	07'.9	314° 27'.9	53'.1	150° 39'.2	07'.2
17	126° 42'.0	84° 02'.0	20'.4	120° 41'.0	08'.6	329° 30'.3	53'.1	165° 41'.6	07'.1
18	141° 44'.4	99° 01'.4	21'.4	135° 41'.7	09'.4	344° 32'.6	53'.0	180° 44'.0	07'.1
19	156° 46'.9	114° 00'.9	22'.3	150° 42'.5	10'.2	359° 35'.0	53'.0	195° 46'.4	07'.1
20	171° 49'.4	129° 00'.3	23'.3	165° 43'.2	10'.9	14° 37'.4	52'.9	210° 48'.8	07'.1
21	186° 51'.8	143° 59'.8	24'.3	180° 43'.9	11'.7	29° 39'.7	52'.9	225° 51'.2	07'.1
22	201° 54'.3	158° 59'.2	25'.2	195° 44'.6	12'.4	44° 42'.1	52'.8	240° 53'.6	07'.1
23	216° 56'.8	173° 58'.6	26'.2	210° 45'.3	13'.2	59° 44'.5	52'.8	255° 56'.0	07'.1
14 Thursday 00	231° 59'.2	188° 58'.1	15° 27'.2 N	225° 46'.0	1° 13'.9 N	74° 46'.9	10° 52'.8 N	270° 58'.4	16° 07'.1 S
01	247° 01'.7	203° 57'.5	28'.1	240° 46'.7	14'.7	89° 49'.2	52'.7	286° 00'.8	07'.0
02	262° 04'.1	218° 56'.9	29'.1	255° 47'.5	15'.4	104° 51'.6	52'.7	301° 03'.2	07'.0
03	277° 06'.6	233° 56'.4	30'.1	270° 48'.2	16'.2	119° 54'.0	52'.6	316° 05'.7	07'.0
04	292° 09'.1	248° 55'.8	31'.0	285° 48'.9	17'.0	134° 56'.4	52'.6	331° 08'.1	07'.0
05	307° 11'.5	263° 55'.2	32'.0	300° 49'.6	17'.7	149° 58'.7	52'.5	346° 10'.5	07'.0
06	322° 14'.0	278° 54'.7	33'.0	315° 50'.3	18'.5	165° 01'.1	52'.5	1° 12'.9	07'.0
07	337° 16'.5	293° 54'.1	33'.9	330° 51'.0	19'.2	180° 03'.5	52'.5	16° 15'.3	07'.0
08	352° 18'.9	308° 53'.6	34'.9	345° 51'.7	20'.0	195° 05'.8	52'.4	31° 17'.7	07'.0
09	7° 21'.4	323° 53'.0	35'.8	0° 52'.4	20'.7	210° 08'.2	52'.4	46° 20'.1	07'.0
10	22° 23'.9	338° 52'.4	36'.8	15° 53'.2	21'.5	225° 10'.6	52'.3	61° 22'.5	06'.9
11	37° 26'.3	353° 51'.8	37'.8	30° 53'.9	22'.2	240° 13'.0	52'.3	76° 24'.9	06'.9
12	52° 28'.8	8° 51'.3	15° 38'.7 N	45° 54'.6	1° 23'.0 N	255° 15'.3	10° 52'.2 N	91° 27'.3	16° 06'.9 S
13	67° 31'.3	23° 50'.7	39'.7	60° 55'.3	23'.8	270° 17'.7	52'.2	106° 29'.7	06'.9
14	82° 33'.7	38° 50'.1	40'.6	75° 56'.0	24'.5	285° 20'.1	52'.1	121° 32'.1	06'.9
15	97° 36'.2	53° 49'.6	41'.6	90° 56'.7	25'.3	300° 22'.4	52'.1	136° 34'.5	06'.9
16	112° 38'.6	68° 49'.0	42'.5	105° 57'.4	26'.0	315° 24'.8	52'.1	151° 36'.9	06'.9
17	127° 41'.1	83° 48'.4	43'.5	120° 58'.2	26'.8	330° 27'.2	52'.0	166° 39'.3	06'.9
18	142° 43'.6	98° 47'.9	44'.5	135° 58'.9	27'.5	345° 29'.5	52'.0	181° 41'.7	06'.9
19	157° 46'.0	113° 47'.3	45'.4	150° 59'.6	28'.3	0° 31'.9	51'.9	196° 44'.1	06'.8
20	172° 48'.5	128° 46'.7	46'.4	166° 00'.3	29'.0	15° 34'.3	51'.9	211° 46'.5	06'.8
21	187° 51'.0	143° 46'.1	47'.3	181° 01'.0	29'.8	30° 36'.6	51'.8	226° 48'.9	06'.8
22	202° 53'.4	158° 45'.6	48'.3	196° 01'.7	30'.6	45° 39'.0	51'.8	241° 51'.4	06'.8
23	217° 55'.9	173° 45'.0	49'.2	211° 02'.4	31'.3	60° 41'.4	51'.7	256° 53'.8	06'.8
	M.P. 08:31	v -0'.6	d 1'.0	v 0'.7	d 0'.8	v 2'.4	d 0'.0	v 2'.4	d 0'.0

STARS		
Name	SHA	Dec
Acamar	315° 30'.7	40° 20'.0 S
Achernar	335° 38'.9	57° 16'.3 S
Acrux	173° 26'.7	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.9	56° 00'.1 N
Alkaid	153° 10'.8	49° 21'.0 N
Alnair	28° 03'.4	46° 59'.6 S
Alnilam	276° 02'.7	1° 12'.4 S
Alphard	218° 11'.6	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.3 N
Alpheratz	358° 00'.1	29° 02'.8 N
Altair	62° 23'.5	8° 50'.8 N
Ankaa	353° 31'.4	42° 20'.6 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.9	69° 00'.9 S
Avior	234° 24'.8	59° 29'.5 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.6	52° 41'.7 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.2	45° 14'.9 N
Denebola	182° 49'.5	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.6 S
Dubhe	194° 10'.5	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.2 N
Enif	34° 02'.6	9° 50'.3 N
Fomalhaut	15° 41'.4	29° 39'.6 S
Gacrux	172° 18'.3	57° 04'.6 S
Gienah	176° 08'.3	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.4 S
Hamal	328° 18'.9	23° 25'.6 N
Kaus Aust.	84° 04'.4	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.2 N
Markab	13° 54'.2	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.3	69° 41'.5 S
Mirfak	309° 03'.6	49° 50'.1 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.3 S
Polaris	324° 24'.4	89° 13'.8 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.8	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.7	60° 48'.3 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 59'.1	56° 29'.6 N
Shaula	96° 43'.0	37° 05'.9 S
Sirius	258° 47'.8	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.2	43° 24'.4 S
Vega	80° 49'.3	38° 46'.4 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	318° 11'.4	11:24
Mars	354° 28'.8	08:58
Jupiter	202° 49'.8	19:02
Saturn	39° 00'.7	05:59

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
180° 55'.1	18° 08'.7 N	59° 02'.5	11'.5	1° 39'.6 S	14'.3	58'.8
195° 55'.1	09'.3	73° 33'.0	11'.5	53'.9	14'.2	
210° 55'.1	09'.9	88° 03'.5	11'.6	2° 08'.1 S	14'.2	
225° 55'.1	10'.5	102° 34'.1	11'.5	22'.3	14'.2	
240° 55'.1	11'.2	117° 04'.6	11'.5	36'.5	14'.1	
255° 55'.1	11'.8	131° 35'.1	11'.6	50'.6	14'.2	
270° 55'.2	12'.4	146° 05'.7	11'.5	3° 04'.8 S	14'.1	
285° 55'.2	13'.0	160° 36'.2	11'.5	18'.9	14'.1	58'.7
300° 55'.2	13'.7	175° 06'.7	11'.5	33'.0	14'.1	
315° 55'.2	14'.3	189° 37'.2	11'.5	47'.1	14'.1	
330° 55'.2	14'.9	204° 07'.7	11'.5	4° 01'.2 S	14'.0	
345° 55'.2	15'.5	218° 38'.2	11'.5	15'.2	14'.0	
0° 55'.2	18° 16'.2 N	233° 08'.7	11'.5	4° 29'.2 S	14'.0	58'.7
15° 55'.2	16'.8	247° 39'.2	11'.5	43'.2	13'.9	
30° 55'.2	17'.4	262° 09'.7	11'.4	57'.1	13'.9	
45° 55'.2	18'.0	276° 40'.1	11'.5	5° 11'.0 S	13'.9	58'.6
60° 55'.3	18'.6	291° 10'.6	11'.4	24'.9	13'.9	
75° 55'.3	19'.3	305° 41'.0	11'.5	38'.8	13'.8	
90° 55'.3	19'.9	320° 11'.5	11'.4	52'.6	13'.8	
105° 55'.3	20'.5	334° 41'.9	11'.4	6° 06'.4 S	13'.7	
120° 55'.3	21'.1	349° 12'.3	11'.4	20'.1	13'.7	
135° 55'.3	21'.7	3° 42'.7	11'.3	33'.8	13'.7	
150° 55'.3	22'.4	18° 13'.0	11'.4	47'.5	13'.6	58'.5
165° 55'.3	23'.0	32° 43'.4	11'.3	7° 01'.1 S	13'.6	
180° 55'.3	18° 23'.6 N	47° 13'.7	11'.3	7° 14'.7 S	13'.5	58'.5
195° 55'.3	24'.2	61° 44'.0	11'.3	28'.2	13'.5	
210° 55'.3	24'.8	76° 14'.3	11'.3	41'.7	13'.4	
225° 55'.3	25'.4	90° 44'.6	11'.3	55'.1	13'.4	
240° 55'.3	26'.0	105° 14'.9	11'.2	8° 08'.5 S	13'.4	
255° 55'.3	26'.7	119° 45'.1	11'.2	21'.9	13'.3	58'.4
270° 55'.3	27'.3	134° 15'.3	11'.2	35'.2	13'.2	
285° 55'.3	27'.9	148° 45'.5	11'.2	48'.4	13'.2	
300° 55'.4	28'.5	163° 15'.7	11'.1	9° 01'.6 S	13'.2	
315° 55'.4	29'.1	177° 45'.8	11'.1	14'.8	13'.1	
330° 55'.4	29'.7	192° 15'.9	11'.1	27'.9	13'.0	
345° 55'.4	30'.3	206° 46'.0	11'.1	40'.9	13'.0	
0° 55'.4	18° 30'.9 N	221° 16'.1	11'.0	9° 53'.9 S	12'.9	58'.3
15° 55'.4	31'.5	235° 46'.1	11'.0	10° 06'.8 S	12'.8	
30° 55'.4	32'.2	250° 16'.1	11'.0	19'.6	12'.8	
45° 55'.4	32'.8	264° 46'.1	10'.9	32'.4	12'.8	
60° 55'.4	33'.4	279° 16'.0	11'.0	45'.2	12'.6	
75° 55'.4	34'.0	293° 46'.0	10'.8	57'.8	12'.6	
90° 55'.4	34'.6	308° 15'.8	10'.9	11° 10'.4 S	12'.6	58'.2
105° 55'.4	35'.2	322° 45'.7	10'.8	23'.0	12'.5	
120° 55'.4	35'.8	337° 15'.5	10'.8	35'.5	12'.4	
135° 55'.4	36'.4	351° 45'.3	10'.8	47'.9	12'.3	
150° 55'.4	37'.0	6° 15'.1	10'.7	12° 00'.2 S	12'.3	
165° 55'.4	37'.6	20° 44'.8	10'.7	12'.5	12'.2	58'.1
180° 55'.4	18° 38'.2 N	35° 14'.5	10'.7	12° 24'.7 S	12'.1	58'.1
195° 55'.4	38'.8	49° 44'.2	10'.6	36'.8	12'.1	
210° 55'.4	39'.4	64° 13'.8	10'.6	48'.9	11'.9	
225° 55'.4	40'.0	78° 43'.4	10'.6	13° 00'.8 S	11'.9	
240° 55'.4	40'.6	93° 13'.0	10'.5	12'.7	11'.9	
255° 55'.4	41'.2	107° 42'.5	10'.5	24'.6	11'.7	58'.0
270° 55'.4	41'.8	122° 12'.0	10'.5	36'.3	11'.7	
285° 55'.4	42'.4	136° 41'.5	10'.4	48'.0	11'.6	
300° 55'.4	43'.0	151° 10'.9	10'.4	59'.6	11'.5	
315° 55'.4	43'.6	165° 40'.3	10'.3	14° 11'.1 S	11'.4	
330° 55'.4	44'.2	180° 09'.6	10'.3	22'.5	11'.3	57'.9
345° 55'.4	44'.8	194° 38'.9	10'.3	33'.8	11'.3	
0° 55'.4	18° 45'.4 N	209° 08'.2	10'.3	14° 45'.1 S	11'.1	57'.9
15° 55'.4	46'.0	223° 37'.5	10'.2	56'.2	11'.1	
30° 55'.4	46'.6	238° 06'.7	10'.1	15° 07'.3 S	11'.0	
45° 55'.4	47'.2	252° 35'.8	10'.1	18'.3	10'.9	
60° 55'.4	47'.8	267° 04'.9	10'.1	29'.2	10'.8	57'.8
75° 55'.4	48'.4	281° 34'.0	10'.1	40'.0	10'.8	
90° 55'.4	49'.0	296° 03'.1	10'.0	50'.8	10'.6	
105° 55'.4	49'.6	310° 32'.1	10'.0	16° 01'.4 S	10'.5	
120° 55'.4	50'.2	325° 01'.1	9'.9	11'.9	10'.5	
135° 55'.3	50'.7	339° 30'.0	9'.9	22'.4	10'.3	57'.7
150° 55'.3	51'.3	353° 58'.9	9'.9	32'.7	10'.3	
165° 55'.3	51'.9	8° 27'.8	9'.8	43'.0	10'.1	
SD 15'.8	d 0'.6	SD	16'.0	15'.9	15'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
12	3 40	3 41	11:56	20:45	08:20	10d 80%
13	3 41	3 41	11:56	21:34	09:09	11d 88%
14	3 42	3 42	11:56	22:25	09:59	12d 94%

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1992 May 15, 16, 17 (Fri, Sat, Sun)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.1		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
15 Friday 00	232° 58'.4	188° 44'.4	15° 50'.2 N	226° 03'.2	1° 32'.1 N	75° 43'.7	10° 51'.7 N	271° 56'.2	16° 06'.8 S
01	248° 00'.8	203° 43'.9	51'.1	241° 03'.9	32'.8	90° 46'.1	51'.6	286° 58'.6	06'.8
02	263° 03'.3	218° 43'.3	52'.1	256° 04'.6	33'.6	105° 48'.5	51'.6	302° 01'.0	06'.8
03	278° 05'.7	233° 42'.7	53'.0	271° 05'.3	34'.3	120° 50'.8	51'.6	317° 03'.4	06'.8
04	293° 08'.2	248° 42'.1	54'.0	286° 06'.0	35'.1	135° 53'.2	51'.5	332° 05'.8	06'.7
05	308° 10'.7	263° 41'.6	54'.9	301° 06'.7	35'.8	150° 55'.6	51'.5	347° 08'.2	06'.7
06	323° 13'.1	278° 41'.0	55'.9	316° 07'.4	36'.6	165° 57'.9	51'.4	2° 10'.6	06'.7
07	338° 15'.6	293° 40'.4	56'.8	331° 08'.2	37'.3	181° 00'.3	51'.4	17° 13'.0	06'.7
08	353° 18'.1	308° 39'.8	57'.8	346° 08'.9	38'.1	196° 02'.6	51'.3	32° 15'.4	06'.7
09	8° 20'.5	323° 39'.2	58'.7	1° 09'.6	38'.9	211° 05'.0	51'.3	47° 17'.8	06'.7
10	23° 23'.0	338° 38'.7	59'.6	16° 10'.3	39'.6	226° 07'.4	51'.2	62° 20'.2	06'.7
11	38° 25'.5	353° 38'.1	16° 00'.6 N	31° 11'.0	40'.4	241° 09'.7	51'.2	77° 22'.7	06'.7
12	53° 27'.9	8° 37'.5	16° 01'.5 N	46° 11'.7	1° 41'.1 N	256° 12'.1	10° 51'.1 N	92° 25'.1	16° 06'.7 S
13	68° 30'.4	23° 36'.9	02'.5	61° 12'.4	41'.9	271° 14'.5	51'.1	107° 27'.5	06'.6
14	83° 32'.9	38° 36'.3	03'.4	76° 13'.2	42'.6	286° 16'.8	51'.0	122° 29'.9	06'.6
15	98° 35'.3	53° 35'.8	04'.4	91° 13'.9	43'.4	301° 19'.2	51'.0	137° 32'.3	06'.6
16	113° 37'.8	68° 35'.2	05'.3	106° 14'.6	44'.1	316° 21'.5	50'.9	152° 34'.7	06'.6
17	128° 40'.2	83° 34'.6	06'.2	121° 15'.3	44'.9	331° 23'.9	50'.9	167° 37'.1	06'.6
18	143° 42'.7	98° 34'.0	07'.2	136° 16'.0	45'.6	346° 26'.3	50'.8	182° 39'.5	06'.6
19	158° 45'.2	113° 33'.4	08'.1	151° 16'.7	46'.4	1° 28'.6	50'.8	197° 41'.9	06'.6
20	173° 47'.6	128° 32'.9	09'.0	166° 17'.4	47'.1	16° 31'.0	50'.7	212° 44'.3	06'.6
21	188° 50'.1	143° 32'.3	10'.0	181° 18'.2	47'.9	31° 33'.3	50'.7	227° 46'.8	06'.6
22	203° 52'.6	158° 31'.7	10'.9	196° 18'.9	48'.7	46° 35'.7	50'.6	242° 49'.2	06'.6
23	218° 55'.0	173° 31'.1	11'.9	211° 19'.6	49'.4	61° 38'.1	50'.6	257° 51'.6	06'.5
16 Saturday 00	233° 57'.5	188° 30'.5	16° 12'.8 N	226° 20'.3	1° 50'.2 N	76° 40'.4	10° 50'.6 N	272° 54'.0	16° 06'.5 S
01	249° 00'.0	203° 29'.9	13'.7	241° 21'.0	50'.9	91° 42'.8	50'.5	287° 56'.4	06'.5
02	264° 02'.4	218° 29'.3	14'.7	256° 21'.7	51'.7	106° 45'.1	50'.5	302° 58'.8	06'.5
03	279° 04'.9	233° 28'.8	15'.6	271° 22'.4	52'.4	121° 47'.5	50'.4	318° 01'.2	06'.5
04	294° 07'.4	248° 28'.2	16'.5	286° 23'.2	53'.2	136° 49'.9	50'.4	333° 03'.6	06'.5
05	309° 09'.8	263° 27'.6	17'.4	301° 23'.9	53'.9	151° 52'.2	50'.3	348° 06'.0	06'.5
06	324° 12'.3	278° 27'.0	18'.4	316° 24'.6	54'.7	166° 54'.6	50'.3	3° 08'.5	06'.5
07	339° 14'.7	293° 26'.4	19'.3	331° 25'.3	55'.4	181° 56'.9	50'.2	18° 10'.9	06'.5
08	354° 17'.2	308° 25'.8	20'.2	346° 26'.0	56'.2	196° 59'.3	50'.2	33° 13'.3	06'.5
09	9° 19'.7	323° 25'.2	21'.2	1° 26'.7	56'.9	212° 01'.6	50'.1	48° 15'.7	06'.5
10	24° 22'.1	338° 24'.6	22'.1	16° 27'.4	57'.7	227° 04'.0	50'.1	63° 18'.1	06'.4
11	39° 24'.6	353° 24'.1	23'.0	31° 28'.2	58'.4	242° 06'.4	50'.0	78° 20'.5	06'.4
12	54° 27'.1	8° 23'.5	16° 23'.9 N	46° 28'.9	1° 59'.2 N	257° 08'.7	10° 50'.0 N	93° 22'.9	16° 06'.4 S
13	69° 29'.5	23° 22'.9	24'.9	61° 29'.6	2° 00'.0 N	272° 11'.1	49'.9	108° 25'.3	06'.4
14	84° 32'.0	38° 22'.3	25'.8	76° 30'.3	00'.7	287° 13'.4	49'.9	123° 27'.8	06'.4
15	99° 34'.5	53° 21'.7	26'.7	91° 31'.0	01'.5	302° 15'.8	49'.8	138° 30'.2	06'.4
16	114° 36'.9	68° 21'.1	27'.6	106° 31'.7	02'.2	317° 18'.1	49'.8	153° 32'.6	06'.4
17	129° 39'.4	83° 20'.5	28'.6	121° 32'.4	03'.0	332° 20'.5	49'.7	168° 35'.0	06'.4
18	144° 41'.9	98° 19'.9	29'.5	136° 33'.2	03'.7	347° 22'.8	49'.7	183° 37'.4	06'.4
19	159° 44'.3	113° 19'.3	30'.4	151° 33'.9	04'.5	2° 25'.2	49'.6	198° 39'.8	06'.4
20	174° 46'.8	128° 18'.7	31'.3	166° 34'.6	05'.2	17° 27'.6	49'.6	213° 42'.2	06'.4
21	189° 49'.2	143° 18'.1	32'.2	181° 35'.3	06'.0	32° 29'.9	49'.5	228° 44'.7	06'.4
22	204° 51'.7	158° 17'.5	33'.2	196° 36'.0	06'.7	47° 32'.3	49'.5	243° 47'.1	06'.3
23	219° 54'.2	173° 16'.9	34'.1	211° 36'.7	07'.5	62° 34'.6	49'.4	258° 49'.5	06'.3
17 Sunday 00	234° 56'.6	188° 16'.3	16° 35'.0 N	226° 37'.5	2° 08'.2 N	77° 37'.0	10° 49'.4 N	273° 51'.9	16° 06'.3 S
01	249° 59'.1	203° 15'.7	35'.9	241° 38'.2	09'.0	92° 39'.3	49'.3	288° 54'.3	06'.3
02	265° 01'.6	218° 15'.1	36'.8	256° 38'.9	09'.7	107° 41'.7	49'.2	303° 56'.7	06'.3
03	280° 04'.0	233° 14'.5	37'.7	271° 39'.6	10'.5	122° 44'.0	49'.2	318° 59'.1	06'.3
04	295° 06'.5	248° 13'.9	38'.7	286° 40'.3	11'.2	137° 46'.4	49'.1	334° 01'.6	06'.3
05	310° 09'.0	263° 13'.3	39'.6	301° 41'.0	12'.0	152° 48'.7	49'.1	349° 04'.0	06'.3
06	325° 11'.4	278° 12'.8	40'.5	316° 41'.7	12'.7	167° 51'.1	49'.0	4° 06'.4	06'.3
07	340° 13'.9	293° 12'.2	41'.4	331° 42'.5	13'.5	182° 53'.4	49'.0	19° 08'.8	06'.3
08	355° 16'.3	308° 11'.6	42'.3	346° 43'.2	14'.2	197° 55'.8	48'.9	34° 11'.2	06'.3
09	10° 18'.8	323° 11'.0	43'.2	1° 43'.9	15'.0	212° 58'.1	48'.9	49° 13'.6	06'.3
10	25° 21'.3	338° 10'.3	44'.1	16° 44'.6	15'.7	228° 00'.5	48'.8	64° 16'.1	06'.2
11	40° 23'.7	353° 09'.7	45'.0	31° 45'.3	16'.5	243° 02'.8	48'.8	79° 18'.5	06'.2
12	55° 26'.2	8° 09'.1	16° 45'.9 N	46° 46'.0	2° 17'.2 N	258° 05'.2	10° 48'.7 N	94° 20'.9	16° 06'.2 S
13	70° 28'.7	23° 08'.5	46'.8	61° 46'.8	18'.0	273° 07'.5	48'.7	109° 23'.3	06'.2
14	85° 31'.1	38° 07'.9	47'.8	76° 47'.5	18'.8	288° 09'.9	48'.6	124° 25'.7	06'.2
15	100° 33'.6	53° 07'.3	48'.7	91° 48'.2	19'.5	303° 12'.2	48'.6	139° 28'.1	06'.2
16	115° 36'.1	68° 06'.7	49'.6	106° 48'.9	20'.3	318° 14'.6	48'.5	154° 30'.6	06'.2
17	130° 38'.5	83° 06'.1	50'.5	121° 49'.6	21'.0	333° 16'.9	48'.5	169° 33'.0	06'.2
18	145° 41'.0	98° 05'.5	51'.4	136° 50'.3	21'.8	348° 19'.3	48'.4	184° 35'.4	06'.2
19	160° 43'.5	113° 04'.9	52'.3	151° 51'.0	22'.5	3° 21'.6	48'.4	199° 37'.8	06'.2
20	175° 45'.9	128° 04'.3	53'.2	166° 51'.8	23'.3	18° 24'.0	48'.3	214° 40'.2	06'.2
21	190° 48'.4	143° 03'.7	54'.1	181° 52'.5	24'.0	33° 26'.3	48'.3	229° 42'.7	06'.2
22	205° 50'.8	158° 03'.1	55'.0	196° 53'.2	24'.8	48° 28'.6	48'.2	244° 45'.1	06'.2
23	220° 53'.3	173° 02'.5	55'.9	211° 53'.9	25'.5	63° 31'.0	48'.1	259° 47'.5	06'.1
	M.P. 08:19	v -0'.6	d 0'.9	v 0'.7	d 0'.8	v 2'.4	d 0'.0	v 2'.4	d 0'.0

STARS	SHA	Dec
Acamar	315° 30'.7	40° 20'.0 S
Achernar	335° 38'.9	57° 16'.3 S
Acrux	173° 26'.7	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.9	56° 00'.1 N
Alkaid	153° 10'.8	49° 21'.1 N
Alnair	28° 03'.4	46° 59'.6 S
Alnilam	276° 02'.7	1° 12'.4 S
Alphard	218° 11'.6	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.3 N
Alpheratz	358° 00'.1	29° 02'.8 N
Altair	62° 23'.4	8° 50'.8 N
Ankaa	353° 31'.4	42° 20'.6 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.8	69° 00'.9 S
Avior	234° 24'.8	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.6	52° 41'.7 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.1	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.6 S
Dubhe	194° 10'.6	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.2 N
Enif	34° 02'.6	9° 50'.3 N
Fomalhaut	15° 41'.4	29° 39'.6 S
Gacrux	172° 18'.3	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.9	23° 25'.6 N
Kaus Aust.	84° 04'.4	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.2 N
Markab	13° 54'.2	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.3	69° 41'.6 S
Mirfak	309° 03'.5	49° 50'.1 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.3 S
Polaris	324° 23'.7	89° 13'.8 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.8	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.7	60° 48'.4 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 59'.1	56° 29'.6 N
Shaula	96° 43'.0	37° 05'.9 S
Sirius	258° 47'.8	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.2	43° 24'.4 S
Vega	80° 49'.3	38° 46'.4 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	314° 33'.0	11:26
Mars	352° 22'.8	08:54
Jupiter	202° 42'.9	18:50
Saturn	38° 56'.5	05:47

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
180° 55'.3	18° 52'.5 N	22° 56'.6	9'.8	16° 53'.1 S	10'.1	57'.7
195° 55'.3	53'.1	37° 25'.4	9'.7	17° 03'.2 S	9'.9	
210° 55'.3	53'.7	51° 54'.1	9'.7	13'.1	9'.9	57'.6
225° 55'.3	54'.3	66° 22'.8	9'.7	23'.0	9'.7	
240° 55'.3	54'.9	80° 51'.5	9'.6	32'.7	9'.7	
255° 55'.3	55'.5	95° 20'.1	9'.6	42'.4	9'.5	
270° 55'.3	56'.0	109° 48'.7	9'.6	51'.9	9'.5	57'.5
285° 55'.3	56'.6	124° 17'.3	9'.5	18° 01'.4 S	9'.3	
300° 55'.3	57'.2	138° 45'.8	9'.5	10'.7	9'.2	
315° 55'.3	57'.8	153° 14'.3	9'.5	19'.9	9'.2	
330° 55'.3	58'.4	167° 42'.8	9'.4	29'.1	9'.0	
345° 55'.3	59'.0	182° 11'.2	9'.4	38'.1	8'.9	57'.4
0° 55'.3	18° 59'.5 N	196° 39'.6	9'.3	18° 47'.0 S	8'.8	57'.4
15° 55'.2	19° 00'.1 N	211° 07'.9	9'.3	55'.8	8'.7	
30° 55'.2	00'.7	225° 36'.2	9'.3	19° 04'.5 S	8'.5	
45° 55'.2	01'.3	240° 04'.5	9'.2	13'.0	8'.5	
60° 55'.2	01'.9	254° 32'.7	9'.2	21'.5	8'.4	57'.3
75° 55'.2	02'.5	269° 00'.9	9'.2	29'.9	8'.2	
90° 55'.2	03'.0	283° 29'.1	9'.1	38'.1	8'.1	
105° 55'.2	03'.6	297° 57'.2	9'.2	46'.2	8'.0	
120° 55'.2	04'.2	312° 25'.4	9'.0	54'.2	7'.9	57'.2
135° 55'.2	04'.8	326° 53'.4	9'.1	20° 02'.1 S	7'.8	
150° 55'.2	05'.3	341° 21'.5	9'.0	09'.9	7'.6	
165° 55'.1	05'.9	355° 49'.5	9'.0	17'.5	7'.6	
180° 55'.1	19° 06'.5 N	10° 17'.5	8'.9	20° 25'.1 S	7'.4	57'.2
195° 55'.1	07'.1	24° 45'.4	9'.0	32'.5	7'.3	57'.1
210° 55'.1	07'.7	39° 13'.4	8'.9	39'.8	7'.2	
225° 55'.1	08'.2	53° 41'.3	8'.8	47'.0	7'.0	
240° 55'.1	08'.8	68° 09'.1	8'.9	54'.0	6'.9	
255° 55'.1	09'.4	82° 37'.0	8'.8	21° 00'.9 S	6'.9	57'.0
270° 55'.1	09'.9	97° 04'.8	8'.8	07'.8	6'.6	
285° 55'.1	10'.5	111° 32'.6	8'.8	14'.4	6'.6	
300° 55'.0	11'.1	126° 00'.4	8'.7	21'.0	6'.4	
315° 55'.0	11'.7	140° 28'.1	8'.7	27'.4	6'.4	56'.9
330° 55'.0	12'.2	154° 55'.8	8'.7	33'.8	6'.1	
345° 55'.0	12'.8	169° 23'.5	8'.7	39'.9	6'.1	
0° 55'.0	19° 13'.4 N	183° 51'.2	8'.7	21° 46'.0 S	6'.0	56'.9
15° 55'.0	13'.9	198° 18'.9	8'.6	52'.0	5'.8	
30° 55'.0	14'.5	212° 46'.5	8'.6	57'.8	5'.6	56'.8
45° 54'.9	15'.1	227° 14'.1	8'.6	22° 03'.4 S	5'.6	
60° 54'.9	15'.6	241° 41'.7	8'.6	09'.0	5'.4	
75° 54'.9	16'.2	256° 09'.3	8'.6	14'.4	5'.3	
90° 54'.9	16'.8	270° 36'.9	8'.5	19'.7	5'.2	56'.7
105° 54'.9	17'.3	285° 04'.4	8'.6	24'.9	5'.0	
120° 54'.9	17'.9	299° 32'.0	8'.5	29'.9	4'.9	
135° 54'.8	18'.5	313° 59'.5	8'.5	34'.8	4'.8	
150° 54'.8	19'.0	328° 27'.0	8'.6	39'.6	4'.7	56'.6
165° 54'.8	19'.6	342° 54'.6	8'.5	44'.3	4'.5	
180° 54'.8	19° 20'.2 N	357° 22'.1	8'.4	22° 48'.8 S	4'.4	56'.6
195° 54'.8	20'.7	11° 49'.5	8'.5	53'.2	4'.2	
210° 54'.8	21'.3	26° 17'.0	8'.5	57'.4	4'.2	56'.5
225° 54'.7	21'.9	40° 44'.5	8'.5	23° 01'.6 S	3'.9	
240° 54'.7	22'.4	55° 12'.0	8'.4	05'.5	3'.9	
255° 54'.7	23'.0	69° 39'.4	8'.5	09'.4	3'.7	
270° 54'.7	23'.5	84° 06'.9	8'.5	13'.1	3'.6	
285° 54'.7	24'.1	98° 34'.4	8'.4	16'.7	3'.5	56'.4
300° 54'.7	24'.6	113° 01'.8	8'.5	20'.2	3'.3	
315° 54'.6	25'.2	127° 29'.3	8'.5	23'.5	3'.2	
330° 54'.6	25'.8	141° 56'.8	8'.4	26'.7	3'.1	
345° 54'.6	26'.3	156° 24'.2	8'.5	29'.8	2'.9	56'.3
0° 54'.6	19° 26'.9 N	170° 51'.7	8'.5	23° 32'.7 S	2'.8	56'.3
15° 54'.6	27'.4	185° 19'.2	8'.4	35'.5	2'.7	
30° 54'.5	28'.0	199° 46'.6	8'.5	38'.2	2'.5	
45° 54'.5	28'.5	214° 14'.1	8'.5	40'.7	2'.4	56'.2
60° 54'.5	29'.1	228° 41'.6	8'.5	43'.1	2'.3	
75° 54'.5	29'.6	243° 09'.1	8'.6	45'.4	2'.1	
90° 54'.5	30'.2	257° 36'.7	8'.5	47'.5	2'.0	
105° 54'.4	30'.8	272° 04'.2	8'.5	49'.5	1'.9	56'.1
120° 54'.4	31'.3	286° 31'.7	8'.6	51'.4	1'.7	
135° 54'.4	31'.9	300° 59'.3	8'.6	53'.1	1'.6	
150° 54'.4	32'.4	315° 26'.9	8'.6	54'.7	1'.4	
165° 54'.3	33'.0	329° 54'.5	8'.6	56'.1	1'.4	56'.0
SD 15'.8	d 0'.6	SD 15'.6		15'.5	15'.3	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON ◯ Age/ Vis
15	3 41	3 41	11:56	23:17	10:51	13d 98%
16	3 41	3 40	11:56	24:11	11:44	14d Full
17	3 39	3 38	11:56	00:11	12:38	15d 99%

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1992 May 18, 19, 20 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.1		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
18 Monday 00	235° 55'.8	188° 01'.9	16° 56'.8 N	226° 54'.6	2° 26'.3 N	78° 33'.3	10° 48'.1 N	274° 49'.9	16° 06'.1 S
01	250° 58'.2	203° 01'.3	57'.7	241° 55'.3	27'.0	93° 35'.7	48'.0	289° 52'.3	06'.1
02	266° 00'.7	218° 00'.7	58'.6	256° 56'.1	27'.8	108° 38'.0	48'.0	304° 54'.8	06'.1
03	281° 03'.2	233° 00'.1	59'.5	271° 56'.8	28'.5	123° 40'.4	47'.9	319° 57'.2	06'.1
04	296° 05'.6	247° 59'.4	17° 00'.4 N	286° 57'.5	29'.3	138° 42'.7	47'.9	334° 59'.6	06'.1
05	311° 08'.1	262° 58'.8	01'.3	301° 58'.2	30'.0	153° 45'.1	47'.8	350° 02'.0	06'.1
06	326° 10'.6	277° 58'.2	02'.2	316° 58'.9	30'.8	168° 47'.4	47'.8	5° 04'.4	06'.1
07	341° 13'.0	292° 57'.6	03'.1	331° 59'.6	31'.5	183° 49'.7	47'.7	20° 06'.9	06'.1
08	356° 15'.5	307° 57'.0	03'.9	347° 00'.4	32'.3	198° 52'.1	47'.7	35° 09'.3	06'.1
09	11° 18'.0	322° 56'.4	04'.8	2° 01'.1	33'.0	213° 54'.4	47'.6	50° 11'.7	06'.1
10	26° 20'.4	337° 55'.8	05'.7	17° 01'.8	33'.8	228° 56'.8	47'.5	65° 14'.1	06'.1
11	41° 22'.9	352° 55'.2	06'.6	32° 02'.5	34'.5	243° 59'.1	47'.5	80° 16'.5	06'.1
12	56° 25'.3	7° 54'.6	17° 07'.5 N	47° 03'.2	2° 35'.3 N	259° 01'.5	10° 47'.4 N	95° 19'.0	16° 06'.1 S
13	71° 27'.8	22° 53'.9	08'.4	62° 03'.9	36'.0	274° 03'.8	47'.4	110° 21'.4	06'.1
14	86° 30'.3	37° 53'.3	09'.3	77° 04'.7	36'.8	289° 06'.1	47'.3	125° 23'.8	06'.0
15	101° 32'.7	52° 52'.7	10'.2	92° 05'.4	37'.5	304° 08'.5	47'.3	140° 26'.2	06'.0
16	116° 35'.2	67° 52'.1	11'.1	107° 06'.1	38'.3	319° 10'.8	47'.2	155° 28'.6	06'.0
17	131° 37'.7	82° 51'.5	12'.0	122° 06'.8	39'.0	334° 13'.2	47'.2	170° 31'.1	06'.0
18	146° 40'.1	97° 50'.9	12'.8	137° 07'.5	39'.8	349° 15'.5	47'.1	185° 33'.5	06'.0
19	161° 42'.6	112° 50'.2	13'.7	152° 08'.2	40'.5	4° 17'.9	47'.0	200° 35'.9	06'.0
20	176° 45'.1	127° 49'.6	14'.6	167° 08'.9	41'.3	19° 20'.2	47'.0	215° 38'.3	06'.0
21	191° 47'.5	142° 49'.0	15'.5	182° 09'.7	42'.0	34° 22'.5	46'.9	230° 40'.8	06'.0
22	206° 50'.0	157° 48'.4	16'.4	197° 10'.4	42'.7	49° 24'.9	46'.9	245° 43'.2	06'.0
23	221° 52'.5	172° 47'.8	17'.3	212° 11'.1	43'.5	64° 27'.2	46'.8	260° 45'.6	06'.0
19 Tuesday 00	236° 54'.9	187° 47'.2	17° 18'.1 N	227° 11'.8	2° 44'.2 N	79° 29'.6	10° 46'.8 N	275° 48'.0	16° 06'.0 S
01	251° 57'.4	202° 46'.5	19'.0	242° 12'.5	45'.0	94° 31'.9	46'.7	290° 50'.4	06'.0
02	266° 59'.8	217° 45'.9	19'.9	257° 13'.2	45'.7	109° 34'.2	46'.7	305° 52'.9	06'.0
03	282° 02'.3	232° 45'.3	20'.8	272° 14'.0	46'.5	124° 36'.6	46'.6	320° 55'.3	06'.0
04	297° 04'.8	247° 44'.7	21'.7	287° 14'.7	47'.2	139° 38'.9	46'.5	335° 57'.7	06'.0
05	312° 07'.2	262° 44'.0	22'.5	302° 15'.4	48'.0	154° 41'.2	46'.5	351° 00'.1	06'.0
06	327° 09'.7	277° 43'.4	23'.4	317° 16'.1	48'.7	169° 43'.6	46'.4	6° 02'.6	06'.0
07	342° 12'.2	292° 42'.8	24'.3	332° 16'.8	49'.5	184° 45'.9	46'.4	21° 05'.0	05'.9
08	357° 14'.6	307° 42'.2	25'.2	347° 17'.5	50'.2	199° 48'.3	46'.3	36° 07'.4	05'.9
09	12° 17'.1	322° 41'.6	26'.0	2° 18'.3	51'.0	214° 50'.6	46'.3	51° 09'.8	05'.9
10	27° 19'.6	337° 40'.9	26'.9	17° 19'.0	51'.7	229° 52'.9	46'.2	66° 12'.3	05'.9
11	42° 22'.0	352° 40'.3	27'.8	32° 19'.7	52'.5	244° 55'.3	46'.1	81° 14'.7	05'.9
12	57° 24'.5	7° 39'.7	17° 28'.7 N	47° 20'.4	2° 53'.2 N	259° 57'.6	10° 46'.1 N	96° 17'.1	16° 05'.9 S
13	72° 27'.0	22° 39'.1	29'.5	62° 21'.1	54'.0	274° 59'.9	46'.0	111° 19'.5	05'.9
14	87° 29'.4	37° 38'.4	30'.4	77° 21'.8	54'.7	290° 02'.3	46'.0	126° 22'.0	05'.9
15	102° 31'.9	52° 37'.8	31'.3	92° 22'.6	55'.5	305° 04'.6	45'.9	141° 24'.4	05'.9
16	117° 34'.3	67° 37'.2	32'.1	107° 23'.3	56'.2	320° 06'.9	45'.8	156° 26'.8	05'.9
17	132° 36'.8	82° 36'.6	33'.0	122° 24'.0	57'.0	335° 09'.3	45'.8	171° 29'.2	05'.9
18	147° 39'.3	97° 35'.9	33'.9	137° 24'.7	57'.7	350° 11'.6	45'.7	186° 31'.7	05'.9
19	162° 41'.7	112° 35'.3	34'.7	152° 25'.4	58'.5	5° 13'.9	45'.7	201° 34'.1	05'.9
20	177° 44'.2	127° 34'.7	35'.6	167° 26'.1	59'.2	20° 16'.3	45'.6	216° 36'.5	05'.9
21	192° 46'.7	142° 34'.0	36'.5	182° 26'.9	3° 00'.0 N	35° 18'.6	45'.6	231° 38'.9	05'.9
22	207° 49'.1	157° 33'.4	37'.3	197° 27'.6	00'.7	50° 20'.9	45'.5	246° 41'.4	05'.9
23	222° 51'.6	172° 32'.8	38'.2	212° 28'.3	01'.4	65° 23'.3	45'.4	261° 43'.8	05'.9
20 Wednesday 00	237° 54'.1	187° 32'.1	17° 39'.1 N	227° 29'.0	3° 02'.2 N	80° 25'.6	10° 45'.4 N	276° 46'.2	16° 05'.9 S
01	252° 56'.5	202° 31'.5	39'.9	242° 29'.7	02'.9	95° 27'.9	45'.3	291° 48'.7	05'.9
02	267° 59'.0	217° 30'.9	40'.8	257° 30'.4	03'.7	110° 30'.3	45'.3	306° 51'.1	05'.9
03	283° 01'.5	232° 30'.2	41'.6	272° 31'.2	04'.4	125° 32'.6	45'.2	321° 53'.5	05'.9
04	298° 03'.9	247° 29'.6	42'.5	287° 31'.9	05'.2	140° 34'.9	45'.1	336° 55'.9	05'.8
05	313° 06'.4	262° 29'.0	43'.4	302° 32'.6	05'.9	155° 37'.3	45'.1	351° 58'.4	05'.8
06	328° 08'.8	277° 28'.3	44'.2	317° 33'.3	06'.7	170° 39'.6	45'.0	7° 00'.8	05'.8
07	343° 11'.3	292° 27'.7	45'.1	332° 34'.0	07'.4	185° 41'.9	45'.0	22° 03'.2	05'.8
08	358° 13'.8	307° 27'.1	45'.9	347° 34'.7	08'.2	200° 44'.3	44'.9	37° 05'.6	05'.8
09	13° 16'.2	322° 26'.4	46'.8	2° 35'.5	08'.9	215° 46'.6	44'.8	52° 08'.1	05'.8
10	28° 18'.7	337° 25'.8	47'.6	17° 36'.2	09'.7	230° 48'.9	44'.8	67° 10'.5	05'.8
11	43° 21'.2	352° 25'.2	48'.5	32° 36'.9	10'.4	245° 51'.2	44'.7	82° 12'.9	05'.8
12	58° 23'.6	7° 24'.5	17° 49'.3 N	47° 37'.6	3° 11'.1 N	260° 53'.6	10° 44'.7 N	97° 15'.4	16° 05'.8 S
13	73° 26'.1	22° 23'.9	50'.2	62° 38'.3	11'.9	275° 55'.9	44'.6	112° 17'.8	05'.8
14	88° 28'.6	37° 23'.3	51'.0	77° 39'.0	12'.6	290° 58'.2	44'.5	127° 20'.2	05'.8
15	103° 31'.0	52° 22'.6	51'.9	92° 39'.8	13'.4	306° 00'.6	44'.5	142° 22'.7	05'.8
16	118° 33'.5	67° 22'.0	52'.7	107° 40'.5	14'.1	321° 02'.9	44'.4	157° 25'.1	05'.8
17	133° 35'.9	82° 21'.3	53'.6	122° 41'.2	14'.9	336° 05'.2	44'.4	172° 27'.5	05'.8
18	148° 38'.4	97° 20'.7	54'.4	137° 41'.9	15'.6	351° 07'.5	44'.3	187° 29'.9	05'.8
19	163° 40'.9	112° 20'.1	55'.3	152° 42'.6	16'.4	6° 09'.9	44'.2	202° 32'.4	05'.8
20	178° 43'.3	127° 19'.4	56'.1	167° 43'.3	17'.1	21° 12'.2	44'.2	217° 34'.8	05'.8
21	193° 45'.8	142° 18'.8	57'.0	182° 44'.1	17'.9	36° 14'.5	44'.1	232° 37'.2	05'.8
22	208° 48'.3	157° 18'.1	57'.8	197° 44'.8	18'.6	51° 16'.9	44'.1	247° 39'.7	05'.8
23	223° 50'.7	172° 17'.5	58'.7	212° 45'.5	19'.3	66° 19'.2	44'.0	262° 42'.1	05'.8
	M.P. 08:07	v -0'.6	d 0'.9	v 0'.7	d 0'.7	v 2'.3	d 0'.1	v 2'.4	d 0'.0

STARS		
Name	SHA	Dec
Acamar	315° 30'.6	40° 20'.0 S
Achernar	335° 38'.8	57° 16'.3 S
Acrux	173° 26'.7	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 33'.9	56° 00'.1 N
Alkaid	153° 10'.8	49° 21'.1 N
Alnair	28° 03'.4	46° 59'.6 S
Alnilam	276° 02'.7	1° 12'.4 S
Alphard	218° 11'.6	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.3 N
Alpheratz	358° 00'.1	29° 02'.8 N
Altair	62° 23'.4	8° 50'.8 N
Ankaa	353° 31'.4	42° 20'.6 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.8	69° 00'.9 S
Avior	234° 24'.8	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.6	52° 41'.7 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.1	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.6 S
Dubhe	194° 10'.6	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.2 N
Enif	34° 02'.6	9° 50'.4 N
Fomalhaut	15° 41'.4	29° 39'.6 S
Gacrux	172° 18'.3	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.9	23° 25'.6 N
Kaus Aust.	84° 04'.4	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.2 N
Markab	13° 54'.1	15° 09'.8 N
Menkar	314° 31'.9	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.4	69° 41'.6 S
Mirfak	309° 03'.5	49° 50'.1 N
Nunki	76° 17'.5	26° 18'.3 S
Peacock	53° 43'.6	56° 45'.3 S
Polaris	324° 23'.0	89° 13'.8 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.8	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.7	60° 48'.4 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 59'.0	56° 29'.6 N
Shaula	96° 42'.9	37° 05'.9 S
Sirius	258° 47'.9	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.2	43° 24'.4 S
Vega	80° 49'.3	38° 46'.4 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	310° 52'.2	11:29
Mars	350° 16'.9	08:51
Jupiter	202° 34'.6	18:39
Saturn	38° 53'.1	05:36

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
18 00	180° 54'.3	19° 33'.5 N	344° 22'.1	8'.6	23° 57'.5 S	1'.2	56'.0
01	195° 54'.3	34'.1	358° 49'.7	8'.6	58'.7	1'.1	
02	210° 54'.3	34'.6	13° 17'.3	8'.7	59'.8	0'.9	
03	225° 54'.3	35'.1	27° 45'.0	8'.7	24° 00'.7 S	0'.8	
04	240° 54'.2	35'.7	42° 12'.7	8'.7	01'.5	0'.7	55'.9
05	255° 54'.2	36'.2	56° 40'.4	8'.7	02'.2	0'.5	
06	270° 54'.2	36'.8	71° 08'.1	8'.8	02'.7	0'.4	
07	285° 54'.2	37'.3	85° 35'.9	8'.8	03'.1	0'.3	
08	300° 54'.1	37'.9	100° 03'.7	8'.8	03'.4	0'.1	55'.8
09	315° 54'.1	38'.4	114° 31'.5	8'.9	03'.5	0'.1	
10	330° 54'.1	39'.0	128° 59'.4	8'.9	03'.6	0'.1	
11	345° 54'.1	39'.5	143° 27'.3	8'.9	03'.5	0'.3	
12	0° 54'.0	19° 40'.0 N	157° 55'.2	8'.9	24° 03'.2 S	0'.3	55'.7
13	15° 54'.0	40'.6	172° 23'.1	9'.0	02'.9	0'.5	
14	30° 54'.0	41'.1	186° 51'.1	9'.0	02'.4	0'.7	
15	45° 54'.0	41'.7	201° 19'.1	9'.1	01'.7	0'.7	
16	60° 53'.9	42'.2	215° 47'.2	9'.1	01'.0	0'.9	
17	75° 53'.9	42'.8	230° 15'.3	9'.1	00'.1	1'.0	55'.6
18	90° 53'.9	43'.3	244° 43'.4	9'.1	23° 59'.1 S	1'.2	
19	105° 53'.8	43'.8	259° 11'.5	9'.3	57'.9	1'.2	
20	120° 53'.8	44'.4	273° 39'.8	9'.2	56'.7	1'.4	
21	135° 53'.8	44'.9	288° 08'.0	9'.3	55'.3	1'.5	55'.5
22	150° 53'.8	45'.4	302° 36'.3	9'.3	53'.8	1'.6	
23	165° 53'.7	46'.0	317° 04'.6	9'.4	52'.2	1'.8	
19 00	180° 53'.7	19° 46'.5 N	331° 33'.0	9'.4	23° 50'.4 S	1'.9	55'.5
01	195° 53'.7	47'.0	346° 01'.4	9'.5	48'.5	2'.0	
02	210° 53'.6	47'.6	0° 29'.9	9'.5	46'.5	2'.1	55'.4
03	225° 53'.6	48'.1	14° 58'.4	9'.5	44'.4	2'.3	
04	240° 53'.6	48'.6	29° 26'.9	9'.7	42'.1	2'.3	
05	255° 53'.6	49'.2	43° 55'.6	9'.6	39'.8	2'.5	
06	270° 53'.5	49'.7	58° 24'.2	9'.7	37'.3	2'.7	
07	285° 53'.5	50'.2	72° 52'.9	9'.8	34'.6	2'.7	55'.3
08	300° 53'.5	50'.8	87° 21'.7	9'.8	31'.9	2'.8	
09	315° 53'.4	51'.3	101° 50'.5	9'.8	29'.1	3'.0	
10	330° 53'.4	51'.8	116° 19'.3	10'.0	26'.1	3'.1	
11	345° 53'.4	52'.4	130° 48'.3	9'.9	23'.0	3'.2	
12	0° 53'.3	19° 52'.9 N	145° 17'.2	10'.0	23° 19'.8 S	3'.3	55'.2
13	15° 53'.3	53'.4	159° 46'.2	10'.1	16'.5	3'.4	
14	30° 53'.3	53'.9	174° 15'.3	10'.2	13'.1	3'.6	
15	45° 53'.2	54'.5	188° 44'.5	10'.1	09'.5	3'.7	
16	60° 53'.2	55'.0	203° 13'.6	10'.3	05'.8	3'.7	
17	75° 53'.2	55'.5	217° 42'.9	10'.3	02'.1	3'.9	55'.1
18	90° 53'.2	56'.0	232° 12'.2	10'.4	22° 58'.2 S	4'.0	
19	105° 53'.1	56'.6	246° 41'.6	10'.4	54'.2	4'.1	
20	120° 53'.1	57'.1	261° 11'.0	10'.5	50'.1	4'.3	
21	135° 53'.1	57'.6	275° 40'.5	10'.5	45'.8	4'.3	
22	150° 53'.0	58'.1	290° 10'.0	10'.6	41'.5	4'.4	55'.0
23	165° 53'.0	58'.7	304° 39'.6	10'.7	37'.1	4'.6	
20 00	180° 52'.9	19° 59'.2 N	319° 09'.3	10'.7	22° 32'.5 S	4'.6	55'.0
01	195° 52'.9	59'.7	333° 39'.0	10'.8	27'.9	4'.8	
02	210° 52'.9	20° 00'.2 N	348° 08'.8	10'.8	23'.1	4'.9	
03	225° 52'.8	00'.7	2° 38'.6	10'.9	18'.2	4'.9	54'.9
04	240° 52'.8	01'.3	17° 08'.5	11'.0	13'.3	5'.1	
05	255° 52'.8	01'.8	31° 38'.5	11'.0	08'.2	5'.2	
06	270° 52'.7	02'.3	46° 08'.5	11'.1	03'.0	5'.3	
07	285° 52'.7	02'.8	60° 38'.6	11'.2	21° 57'.7 S	5'.4	
08	300° 52'.7	03'.3	75° 08'.8	11'.2	52'.3	5'.5	
09	315° 52'.6	03'.8	89° 39'.0	11'.3	46'.8	5'.5	54'.8
10	330° 52'.6	04'.4	104° 09'.3	11'.3	41'.3	5'.7	
11	345° 52'.6	04'.9	118° 39'.6	11'.4	35'.6	5'.8	
12	0° 52'.5	20° 05'.4 N	133° 10'.0	11'.5	21° 29'.8 S	5'.9	54'.8
13	15° 52'.5	05'.9	147° 40'.5	11'.5	23'.9	6'.0	
14	30° 52'.4	06'.4	162° 11'.0	11'.7	17'.9	6'.1	
15	45° 52'.4	06'.9	176° 41'.7	11'.6	11'.8	6'.1	54'.7
16	60° 52'.4	07'.4	191° 12'.3	11'.8	05'.7	6'.3	
17	75° 52'.3	08'.0	205° 43'.1	11'.8	20° 59'.4 S	6'.4	
18	90° 52'.3	08'.5	220° 13'.9	11'.8	53'.0	6'.4	
19	105° 52'.3	09'.0	234° 44'.7	12'.0	46'.6	6'.6	
20	120° 52'.2	09'.5	249° 15'.7	12'.0	40'.0	6'.6	
21	135° 52'.2	10'.0	263° 46'.7	12'.0	33'.4	6'.7	
22	150° 52'.1	10'.5	278° 17'.7	12'.2	26'.7	6'.8	54'.6
23	165° 52'.1	11'.0	292° 48'.9	12'.1	19'.9	7'.0	
	SD 15'.8	d 0'.5	SD 15'.2		15'.0	14'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
18	3 37	3 36	11:56	01:05	13:32	16d 96%
19	3 35	3 33	11:56	01:58	14:24	17d 92%
20	3 32	3 30	11:56	02:49	15:14	18d 86%

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1992 May 21, 22, 23 (Thur, Fri, Sat)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.1		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
21 Thursday 00	238° 53'.2	187° 16'.9	17° 59'.5 N	227° 46'.2	3° 20'.1 N	81° 21'.5	10° 43'.9 N	277° 44'.5	16° 05'.8 S
01	253° 55'.7	202° 16'.2	18° 00'.4 N	242° 46'.9	20'.8	96° 23'.8	43'.9	292° 47'.0	05'.8
02	268° 58'.1	217° 15'.6	01'.2	257° 47'.6	21'.6	111° 26'.2	43'.8	307° 49'.4	05'.8
03	284° 00'.6	232° 14'.9	02'.0	272° 48'.4	22'.3	126° 28'.5	43'.7	322° 51'.8	05'.8
04	299° 03'.1	247° 14'.3	02'.9	287° 49'.1	23'.1	141° 30'.8	43'.7	337° 54'.3	05'.8
05	314° 05'.5	262° 13'.6	03'.7	302° 49'.8	23'.8	156° 33'.1	43'.6	352° 56'.7	05'.8
06	329° 08'.0	277° 13'.0	04'.6	317° 50'.5	24'.6	171° 35'.5	43'.6	7° 59'.1	05'.8
07	344° 10'.4	292° 12'.3	05'.4	332° 51'.2	25'.3	186° 37'.8	43'.5	23° 01'.5	05'.7
08	359° 12'.9	307° 11'.7	06'.2	347° 52'.0	26'.0	201° 40'.1	43'.4	38° 04'.0	05'.7
09	14° 15'.4	322° 11'.0	07'.1	2° 52'.7	26'.8	216° 42'.4	43'.4	53° 06'.4	05'.7
10	29° 17'.8	337° 10'.4	07'.9	17° 53'.4	27'.5	231° 44'.7	43'.3	68° 08'.8	05'.7
11	44° 20'.3	352° 09'.8	08'.7	32° 54'.1	28'.3	246° 47'.1	43'.3	83° 11'.3	05'.7
12	59° 22'.8	7° 09'.1	18° 09'.6 N	47° 54'.8	3° 29'.0 N	261° 49'.4	10° 43'.2 N	98° 13'.7	16° 05'.7 S
13	74° 25'.2	22° 08'.5	10'.4	62° 55'.5	29'.8	276° 51'.7	43'.1	113° 16'.1	05'.7
14	89° 27'.7	37° 07'.8	11'.2	77° 56'.3	30'.5	291° 54'.0	43'.1	128° 18'.6	05'.7
15	104° 30'.2	52° 07'.2	12'.1	92° 57'.0	31'.3	306° 56'.4	43'.0	143° 21'.0	05'.7
16	119° 32'.6	67° 06'.5	12'.9	107° 57'.7	32'.0	321° 58'.7	42'.9	158° 23'.4	05'.7
17	134° 35'.1	82° 05'.9	13'.7	122° 58'.4	32'.7	337° 01'.0	42'.9	173° 25'.9	05'.7
18	149° 37'.6	97° 05'.2	14'.6	137° 59'.1	33'.5	352° 03'.3	42'.8	188° 28'.3	05'.7
19	164° 40'.0	112° 04'.5	15'.4	152° 59'.8	34'.2	7° 05'.6	42'.7	203° 30'.8	05'.7
20	179° 42'.5	127° 03'.9	16'.2	168° 00'.6	35'.0	22° 08'.0	42'.7	218° 33'.2	05'.7
21	194° 44'.9	142° 03'.2	17'.0	183° 01'.3	35'.7	37° 10'.3	42'.6	233° 35'.6	05'.7
22	209° 47'.4	157° 02'.6	17'.9	198° 02'.0	36'.5	52° 12'.6	42'.6	248° 38'.1	05'.7
23	224° 49'.9	172° 01'.9	18'.7	213° 02'.7	37'.2	67° 14'.9	42'.5	263° 40'.5	05'.7
22 Friday 00	239° 52'.3	187° 01'.3	18° 19'.5 N	228° 03'.4	3° 37'.9 N	82° 17'.2	10° 42'.4 N	278° 42'.9	16° 05'.7 S
01	254° 54'.8	202° 00'.6	20'.3	243° 04'.1	38'.7	97° 19'.6	42'.4	293° 45'.4	05'.7
02	269° 57'.3	217° 00'.0	21'.2	258° 04'.9	39'.4	112° 21'.9	42'.3	308° 47'.8	05'.7
03	284° 59'.7	231° 59'.3	22'.0	273° 05'.6	40'.2	127° 24'.2	42'.2	323° 50'.2	05'.7
04	300° 02'.2	246° 58'.7	22'.8	288° 06'.3	40'.9	142° 26'.5	42'.2	338° 52'.7	05'.7
05	315° 04'.7	261° 58'.0	23'.6	303° 07'.0	41'.7	157° 28'.8	42'.1	353° 55'.1	05'.7
06	330° 07'.1	276° 57'.3	24'.4	318° 07'.7	42'.4	172° 31'.2	42'.0	8° 57'.5	05'.7
07	345° 09'.6	291° 56'.7	25'.3	333° 08'.4	43'.1	187° 33'.5	42'.0	24° 00'.0	05'.7
08	0° 12'.1	306° 56'.0	26'.1	348° 09'.2	43'.9	202° 35'.8	41'.9	39° 02'.4	05'.7
09	15° 14'.5	321° 55'.4	26'.9	3° 09'.9	44'.6	217° 38'.1	41'.8	54° 04'.8	05'.7
10	30° 17'.0	336° 54'.7	27'.7	18° 10'.6	45'.4	232° 40'.4	41'.8	69° 07'.3	05'.7
11	45° 19'.4	351° 54'.0	28'.5	33° 11'.3	46'.1	247° 42'.7	41'.7	84° 09'.7	05'.7
12	60° 21'.9	6° 53'.4	18° 29'.3 N	48° 12'.0	3° 46'.9 N	262° 45'.1	10° 41'.7 N	99° 12'.2	16° 05'.7 S
13	75° 24'.4	21° 52'.7	30'.1	63° 12'.8	47'.6	277° 47'.4	41'.6	114° 14'.6	05'.7
14	90° 26'.8	36° 52'.1	31'.0	78° 13'.5	48'.3	292° 49'.7	41'.5	129° 17'.0	05'.7
15	105° 29'.3	51° 51'.4	31'.8	93° 14'.2	49'.1	307° 52'.0	41'.5	144° 19'.5	05'.7
16	120° 31'.8	66° 50'.7	32'.6	108° 14'.9	49'.8	322° 54'.3	41'.4	159° 21'.9	05'.7
17	135° 34'.2	81° 50'.1	33'.4	123° 15'.6	50'.6	337° 56'.6	41'.3	174° 24'.3	05'.7
18	150° 36'.7	96° 49'.4	34'.2	138° 16'.3	51'.3	352° 58'.9	41'.3	189° 26'.8	05'.7
19	165° 39'.2	111° 48'.8	35'.0	153° 17'.1	52'.0	8° 01'.3	41'.2	204° 29'.2	05'.7
20	180° 41'.6	126° 48'.1	35'.8	168° 17'.8	52'.8	23° 03'.6	41'.1	219° 31'.7	05'.7
21	195° 44'.1	141° 47'.4	36'.6	183° 18'.5	53'.5	38° 05'.9	41'.1	234° 34'.1	05'.7
22	210° 46'.5	156° 46'.8	37'.4	198° 19'.2	54'.3	53° 08'.2	41'.0	249° 36'.5	05'.7
23	225° 49'.0	171° 46'.1	38'.2	213° 19'.9	55'.0	68° 10'.5	40'.9	264° 39'.0	05'.7
23 Saturday 00	240° 51'.5	186° 45'.4	18° 39'.0 N	228° 20'.6	3° 55'.7 N	83° 12'.8	10° 40'.9 N	279° 41'.4	16° 05'.7 S
01	255° 53'.9	201° 44'.8	39'.8	243° 21'.4	56'.5	98° 15'.1	40'.8	294° 43'.9	05'.7
02	270° 56'.4	216° 44'.1	40'.6	258° 22'.1	57'.2	113° 17'.5	40'.7	309° 46'.3	05'.7
03	285° 58'.9	231° 43'.4	41'.4	273° 22'.8	58'.0	128° 19'.8	40'.7	324° 48'.7	05'.7
04	301° 01'.3	246° 42'.8	42'.2	288° 23'.5	58'.7	143° 22'.1	40'.6	339° 51'.2	05'.7
05	316° 03'.8	261° 42'.1	43'.0	303° 24'.2	59'.4	158° 24'.4	40'.5	354° 53'.6	05'.7
06	331° 06'.3	276° 41'.4	43'.8	318° 24'.9	4° 00'.2 N	173° 26'.7	40'.5	9° 56'.1	05'.7
07	346° 08'.7	291° 40'.7	44'.6	333° 25'.7	00'.9	188° 29'.0	40'.4	24° 58'.5	05'.7
08	1° 11'.2	306° 40'.1	45'.4	348° 26'.4	01'.7	203° 31'.3	40'.3	40° 00'.9	05'.7
09	16° 13'.7	321° 39'.4	46'.2	3° 27'.1	02'.4	218° 33'.6	40'.3	55° 03'.4	05'.7
10	31° 16'.1	336° 38'.7	47'.0	18° 27'.8	03'.1	233° 35'.9	40'.2	70° 05'.8	05'.7
11	46° 18'.6	351° 38'.1	47'.8	33° 28'.5	03'.9	248° 38'.3	40'.1	85° 08'.3	05'.7
12	61° 21'.0	6° 37'.4	18° 48'.6 N	48° 29'.3	4° 04'.6 N	263° 40'.6	10° 40'.1 N	100° 10'.7	16° 05'.7 S
13	76° 23'.5	21° 36'.7	49'.4	63° 30'.0	05'.4	278° 42'.9	40'.0	115° 13'.1	05'.7
14	91° 26'.0	36° 36'.0	50'.2	78° 30'.7	06'.1	293° 45'.2	39'.9	130° 15'.6	05'.7
15	106° 28'.4	51° 35'.4	51'.0	93° 31'.4	06'.8	308° 47'.5	39'.8	145° 18'.0	05'.7
16	121° 30'.9	66° 34'.7	51'.8	108° 32'.1	07'.6	323° 49'.8	39'.8	160° 20'.5	05'.7
17	136° 33'.4	81° 34'.0	52'.6	123° 32'.8	08'.3	338° 52'.1	39'.7	175° 22'.9	05'.7
18	151° 35'.8	96° 33'.3	53'.3	138° 33'.6	09'.1	353° 54'.4	39'.6	190° 25'.4	05'.7
19	166° 38'.3	111° 32'.7	54'.1	153° 34'.3	09'.8	8° 56'.7	39'.6	205° 27'.8	05'.7
20	181° 40'.8	126° 32'.0	54'.9	168° 35'.0	10'.5	23° 59'.0	39'.5	220° 30'.2	05'.7
21	196° 43'.2	141° 31'.3	55'.7	183° 35'.7	11'.3	39° 01'.3	39'.4	235° 32'.7	05'.7
22	211° 45'.7	156° 30'.6	56'.5	198° 36'.4	12'.0	54° 03'.7	39'.4	250° 35'.1	05'.7
23	226° 48'.2	171° 30'.0	57'.3	213° 37'.2	12'.8	69° 06'.0	39'.3	265° 37'.6	05'.7
	M.P. 07:55	v -0'.7	d 0'.8	v 0'.7	d 0'.7	v 2'.3	d 0'.1	v 2'.4	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.6	40° 20'.0 S
Achernar	335° 38'.8	57° 16'.3 S
Acrux	173° 26'.8	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 34'.0	56° 00'.1 N
Alkaid	153° 10'.8	49° 21'.1 N
Alnair	28° 03'.3	46° 59'.6 S
Alnilam	276° 02'.7	1° 12'.4 S
Alphard	218° 11'.6	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.3 N
Alpheratz	358° 00'.0	29° 02'.8 N
Altair	62° 23'.4	8° 50'.8 N
Ankaa	353° 31'.4	42° 20'.6 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.8	69° 00'.9 S
Avior	234° 24'.8	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.6	52° 41'.7 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.1	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.8 N
Diphda	349° 11'.9	18° 01'.6 S
Dubhe	194° 10'.6	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.2 N
Enif	34° 02'.5	9° 50'.4 N
Fomalhaut	15° 41'.3	29° 39'.6 S
Gacrux	172° 18'.3	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.9	23° 25'.6 N
Kaus Aust.	84° 04'.3	34° 23'.3 S
Kochab	137° 18'.0	74° 11'.2 N
Markab	13° 54'.1	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.4	69° 41'.6 S
Mirfak	309° 03'.5	49° 50'.0 N
Nunki	76° 17'.5	26° 18'.3 S
Peacock	53° 43'.6	56° 45'.3 S
Polaris	324° 22'.3	89° 13'.8 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.7	12° 33'.8 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.7 S
Rigil Kent	140° 12'.7	60° 48'.4 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 59'.0	56° 29'.6 N
Shaula	96° 42'.9	37° 05'.9 S
Sirius	258° 47'.9	16° 42'.5 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.2	43° 24'.4 S
Vega	80° 49'.3	38° 46'.4 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	307° 08'.9	11:32
Mars	348° 11'.1	08:47
Jupiter	202° 24'.9	18:28
Saturn	38° 50'.6	05:24

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
21 00	180° 52'.1	20° 11'.5 N	307° 20'.0	12'.3	20° 12'.9 S	6'.9	54'.6
01	195° 52'.0	12'.0	321° 51'.3	12'.3	06'.0	7'.1	
02	210° 52'.0	12'.5	336° 22'.6	12'.4	19° 58'.9 S	7'.2	
03	225° 51'.9	13'.0	350° 54'.0	12'.5	51'.7	7'.3	
04	240° 51'.9	13'.5	5° 25'.5	12'.5	44'.4	7'.3	
05	255° 51'.9	14'.0	19° 57'.0	12'.6	37'.1	7'.4	54'.5
06	270° 51'.8	14'.5	34° 28'.6	12'.6	29'.7	7'.5	
07	285° 51'.8	15'.0	49° 00'.2	12'.7	22'.2	7'.6	
08	300° 51'.7	15'.5	63° 31'.9	12'.8	14'.6	7'.7	
09	315° 51'.7	16'.0	78° 03'.7	12'.8	06'.9	7'.7	
10	330° 51'.6	16'.5	92° 35'.5	12'.9	18° 59'.2 S	7'.9	
11	345° 51'.6	17'.0	107° 07'.4	13'.0	51'.3	7'.9	
12	0° 51'.6	20° 17'.5 N	121° 39'.4	13'.0	18° 43'.4 S	8'.0	54'.5
13	15° 51'.5	18'.0	136° 11'.4	13'.1	35'.4	8'.0	
14	30° 51'.5	18'.5	150° 43'.5	13'.1	27'.4	8'.2	54'.4
15	45° 51'.4	19'.0	165° 15'.6	13'.2	19'.2	8'.2	
16	60° 51'.4	19'.5	179° 47'.8	13'.3	11'.0	8'.3	
17	75° 51'.3	20'.0	194° 20'.1	13'.3	02'.7	8'.4	
18	90° 51'.3	20'.5	208° 52'.4	13'.4	17° 54'.3 S	8'.4	
19	105° 51'.3	21'.0	223° 24'.8	13'.5	45'.9	8'.5	
20	120° 51'.2	21'.5	237° 57'.3	13'.5	37'.4	8'.6	
21	135° 51'.2	22'.0	252° 29'.8	13'.6	28'.8	8'.7	
22	150° 51'.1	22'.5	267° 02'.4	13'.6	20'.1	8'.7	
23	165° 51'.1	23'.0	281° 35'.0	13'.7	11'.4	8'.8	
22 00	180° 51'.0	20° 23'.5 N	296° 07'.7	13'.7	17° 02'.6 S	8'.9	54'.3
01	195° 51'.0	24'.0	310° 40'.4	13'.8	16° 53'.7 S	8'.9	
02	210° 50'.9	24'.5	325° 13'.2	13'.9	44'.8	9'.0	
03	225° 50'.9	25'.0	339° 46'.1	13'.9	35'.8	9'.1	
04	240° 50'.8	25'.5	354° 19'.0	14'.0	26'.7	9'.1	
05	255° 50'.8	26'.0	8° 52'.0	14'.0	17'.6	9'.2	
06	270° 50'.7	26'.4	23° 25'.0	14'.1	08'.4	9'.3	
07	285° 50'.7	26'.9	37° 58'.1	14'.1	15° 59'.1 S	9'.3	
08	300° 50'.7	27'.4	52° 31'.2	14'.2	49'.8	9'.4	
09	315° 50'.6	27'.9	67° 04'.4	14'.2	40'.4	9'.5	
10	330° 50'.6	28'.4	81° 37'.6	14'.3	30'.9	9'.5	
11	345° 50'.5	28'.9	96° 10'.9	14'.4	21'.4	9'.6	
12	0° 50'.5	20° 29'.4 N	110° 44'.3	14'.4	15° 11'.8 S	9'.6	54'.3
13	15° 50'.4	29'.8	125° 17'.7	14'.4	02'.2	9'.7	
14	30° 50'.4	30'.3	139° 51'.1	14'.5	14° 52'.5 S	9'.8	
15	45° 50'.3	30'.8	154° 24'.6	14'.6	42'.7	9'.8	
16	60° 50'.3	31'.3	168° 58'.2	14'.5	32'.9	9'.8	
17	75° 50'.2	31'.8	183° 31'.7	14'.7	23'.1	10'.0	
18	90° 50'.2	32'.3	198° 05'.4	14'.7	13'.1	9'.9	54'.2
19	105° 50'.1	32'.7	212° 39'.1	14'.7	03'.2	10'.1	
20	120° 50'.1	33'.2	227° 12'.8	14'.8	13° 53'.1 S	10'.1	
21	135° 50'.0	33'.7	241° 46'.6	14'.8	43'.0	10'.1	
22	150° 50'.0	34'.2	256° 20'.4	14'.9	32'.9	10'.2	
23	165° 49'.9	34'.7	270° 54'.3	14'.9	22'.7	10'.3	
23 00	180° 49'.9	20° 35'.1 N	285° 28'.2	15'.0	13° 12'.4 S	10'.3	54'.2
01	195° 49'.8	35'.6	300° 02'.2	15'.0	02'.1	10'.3	
02	210° 49'.8	36'.1	314° 36'.2	15'.0	12° 51'.8 S	10'.4	
03	225° 49'.7	36'.6	329° 10'.2	15'.1	41'.4	10'.5	
04	240° 49'.7	37'.0	343° 44'.3	15'.1	30'.9	10'.5	
05	255° 49'.6	37'.5	358° 18'.4	15'.2	20'.4	10'.6	
06	270° 49'.5	38'.0	12° 52'.6	15'.2	09'.8	10'.6	
07	285° 49'.5	38'.5	27° 26'.8	15'.2	11° 59'.2 S	10'.6	
08	300° 49'.4	38'.9	42° 01'.0	15'.3	48'.6	10'.7	
09	315° 49'.4	39'.4	56° 35'.3	15'.3	37'.9	10'.7	
10	330° 49'.3	39'.9	71° 09'.6	15'.4	27'.2	10'.8	
11	345° 49'.3	40'.4	85° 44'.0	15'.3	16'.4	10'.8	
12	0° 49'.2	20° 40'.8 N	100° 18'.3	15'.5	11° 05'.6 S	10'.9	54'.2
13	15° 49'.2	41'.3	114° 52'.8	15'.4	10° 54'.7 S	10'.9	
14	30° 49'.1	41'.8	129° 27'.2	15'.5	43'.8	11'.0	
15	45° 49'.1	42'.2	144° 01'.7	15'.5	32'.8	11'.0	
16	60° 49'.0	42'.7	158° 36'.2	15'.5	21'.8	11'.0	54'.3
17	75° 49'.0	43'.2	173° 10'.7	15'.6	10'.8	11'.1	
18	90° 48'.9	43'.6	187° 45'.3	15'.6	9° 59'.7 S	11'.1	
19	105° 48'.8	44'.1	202° 19'.9	15'.6	48'.6	11'.2	
20	120° 48'.8	44'.6	216° 54'.5	15'.7	37'.4	11'.2	
21	135° 48'.7	45'.0	231° 29'.2	15'.7	26'.2	11'.2	
22	150° 48'.7	45'.5	246° 03'.9	15'.7	15'.0	11'.3	
23	165° 48'.6	46'.0	260° 38'.6	15'.7	03'.7	11'.3	
	SD 15'.8	d 0'.5	SD 14'.8		14'.8		14'.8

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
21	3 28	3 26	11:57	03:38	16:01	19d 78%
22	3 24	3 22	11:57	04:23	16:45	20d 70%
23	3 20	3 17	11:57	05:07	17:28	21d 61%

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1992 May 24, 25, 26 (Sun, Mon, Tue)

GMT	ARIES GHA	VENUS -3.9 GHA	VENUS Dec	MARS +1.0 GHA	MARS Dec	JUPITER -2.1 GHA	JUPITER Dec	SATURN +0.6 GHA	SATURN Dec
24 Sunday 00	241° 50'.6	186° 29'.3	18° 58'.1 N	228° 37'.9	4° 13'.5 N	84° 08'.3	10° 39'.2 N	280° 40'.0	16° 05'.7 S
01	256° 53'.1	201° 28'.6	58'.8	243° 38'.6	14'.2	99° 10'.6	39'.2	295° 42'.5	05'.7
02	271° 55'.5	216° 27'.9	59'.6	258° 39'.3	15'.0	114° 12'.9	39'.1	310° 44'.9	05'.7
03	286° 58'.0	231° 27'.3	19° 00'.4 N	273° 40'.0	15'.7	129° 15'.2	39'.0	325° 47'.3	05'.7
04	302° 00'.5	246° 26'.6	01'.2	288° 40'.7	16'.4	144° 17'.5	39'.0	340° 49'.8	05'.7
05	317° 02'.9	261° 25'.9	02'.0	303° 41'.5	17'.2	159° 19'.8	38'.9	355° 52'.2	05'.7
06	332° 05'.4	276° 25'.2	02'.7	318° 42'.2	17'.9	174° 22'.1	38'.8	10° 54'.7	05'.7
07	347° 07'.9	291° 24'.5	03'.5	333° 42'.9	18'.7	189° 24'.4	38'.7	25° 57'.1	05'.7
08	2° 10'.3	306° 23'.8	04'.3	348° 43'.6	19'.4	204° 26'.7	38'.7	40° 59'.6	05'.7
09	17° 12'.8	321° 23'.2	05'.1	3° 44'.3	20'.1	219° 29'.0	38'.6	56° 02'.0	05'.7
10	32° 15'.3	336° 22'.5	05'.8	18° 45'.0	20'.9	234° 31'.3	38'.5	71° 04'.5	05'.7
11	47° 17'.7	351° 21'.8	06'.6	33° 45'.8	21'.6	249° 33'.6	38'.5	86° 06'.9	05'.7
12	62° 20'.2	6° 21'.1	19° 07'.4 N	48° 46'.5	4° 22'.3 N	264° 35'.9	10° 38'.4 N	101° 09'.3	16° 05'.7 S
13	77° 22'.6	21° 20'.4	08'.2	63° 47'.2	23'.1	279° 38'.2	38'.3	116° 11'.8	05'.7
14	92° 25'.1	36° 19'.7	08'.9	78° 47'.9	23'.8	294° 40'.5	38'.3	131° 14'.2	05'.7
15	107° 27'.6	51° 19'.1	09'.7	93° 48'.6	24'.6	309° 42'.8	38'.2	146° 16'.7	05'.7
16	122° 30'.0	66° 18'.4	10'.5	108° 49'.4	25'.3	324° 45'.1	38'.1	161° 19'.1	05'.7
17	137° 32'.5	81° 17'.7	11'.2	123° 50'.1	26'.0	339° 47'.4	38'.0	176° 21'.6	05'.7
18	152° 35'.0	96° 17'.0	12'.0	138° 50'.8	26'.8	354° 49'.7	38'.0	191° 24'.0	05'.7
19	167° 37'.4	111° 16'.3	12'.8	153° 51'.5	27'.5	9° 52'.0	37'.9	206° 26'.5	05'.7
20	182° 39'.9	126° 15'.6	13'.5	168° 52'.2	28'.2	24° 54'.3	37'.8	221° 28'.9	05'.7
21	197° 42'.4	141° 14'.9	14'.3	183° 52'.9	29'.0	39° 56'.6	37'.8	236° 31'.4	05'.7
22	212° 44'.8	156° 14'.2	15'.1	198° 53'.7	29'.7	54° 58'.9	37'.7	251° 33'.8	05'.7
23	227° 47'.3	171° 13'.6	15'.8	213° 54'.4	30'.4	70° 01'.2	37'.6	266° 36'.3	05'.7
25 Monday 00	242° 49'.8	186° 12'.9	19° 16'.6 N	228° 55'.1	4° 31'.2 N	85° 03'.5	10° 37'.5 N	281° 38'.7	16° 05'.7 S
01	257° 52'.2	201° 12'.2	17'.3	243° 55'.8	31'.9	100° 05'.8	37'.5	296° 41'.1	05'.7
02	272° 54'.7	216° 11'.5	18'.1	258° 56'.5	32'.6	115° 08'.1	37'.4	311° 43'.6	05'.7
03	287° 57'.1	231° 10'.8	18'.9	273° 57'.2	33'.4	130° 10'.4	37'.3	326° 46'.0	05'.7
04	302° 59'.6	246° 10'.1	19'.6	288° 58'.0	34'.1	145° 12'.7	37'.3	341° 48'.5	05'.7
05	318° 02'.1	261° 09'.4	20'.4	303° 58'.7	34'.9	160° 15'.0	37'.2	356° 50'.9	05'.7
06	333° 04'.5	276° 08'.7	21'.1	318° 59'.4	35'.6	175° 17'.3	37'.1	11° 53'.4	05'.7
07	348° 07'.0	291° 08'.0	21'.9	334° 00'.1	36'.3	190° 19'.6	37'.0	26° 55'.8	05'.7
08	3° 09'.5	306° 07'.3	22'.6	349° 00'.8	37'.1	205° 21'.9	37'.0	41° 58'.3	05'.7
09	18° 11'.9	321° 06'.6	23'.4	4° 01'.6	37'.8	220° 24'.2	36'.9	57° 00'.7	05'.7
10	33° 14'.4	336° 05'.9	24'.2	19° 02'.3	38'.5	235° 26'.5	36'.8	72° 03'.2	05'.7
11	48° 16'.9	351° 05'.3	24'.9	34° 03'.0	39'.3	250° 28'.8	36'.8	87° 05'.6	05'.7
12	63° 19'.3	6° 04'.6	19° 25'.7 N	49° 03'.7	4° 40'.0 N	265° 31'.1	10° 36'.7 N	102° 08'.1	16° 05'.7 S
13	78° 21'.8	21° 03'.9	26'.4	64° 04'.4	40'.7	280° 33'.4	36'.6	117° 10'.5	05'.7
14	93° 24'.3	36° 03'.2	27'.2	79° 05'.1	41'.5	295° 35'.7	36'.5	132° 13'.0	05'.7
15	108° 26'.7	51° 02'.5	27'.9	94° 05'.9	42'.2	310° 38'.0	36'.5	147° 15'.4	05'.7
16	123° 29'.2	66° 01'.8	28'.7	109° 06'.6	42'.9	325° 40'.3	36'.4	162° 17'.9	05'.7
17	138° 31'.6	81° 01'.1	29'.4	124° 07'.3	43'.7	340° 42'.6	36'.3	177° 20'.3	05'.7
18	153° 34'.1	96° 00'.4	30'.1	139° 08'.0	44'.4	355° 44'.9	36'.2	192° 22'.8	05'.8
19	168° 36'.6	110° 59'.7	30'.9	154° 08'.7	45'.1	10° 47'.2	36'.2	207° 25'.2	05'.8
20	183° 39'.0	125° 59'.0	31'.6	169° 09'.5	45'.9	25° 49'.5	36'.1	222° 27'.7	05'.8
21	198° 41'.5	140° 58'.3	32'.4	184° 10'.2	46'.6	40° 51'.8	36'.0	237° 30'.1	05'.8
22	213° 44'.0	155° 57'.6	33'.1	199° 10'.9	47'.3	55° 54'.1	35'.9	252° 32'.6	05'.8
23	228° 46'.4	170° 56'.9	33'.9	214° 11'.6	48'.1	70° 56'.4	35'.9	267° 35'.0	05'.8
26 Tuesday 00	243° 48'.9	185° 56'.2	19° 34'.6 N	229° 12'.3	4° 48'.8 N	85° 58'.7	10° 35'.8 N	282° 37'.5	16° 05'.8 S
01	258° 51'.4	200° 55'.5	35'.3	244° 13'.0	49'.5	101° 01'.0	35'.7	297° 39'.9	05'.8
02	273° 53'.8	215° 54'.8	36'.1	259° 13'.8	50'.3	116° 03'.3	35'.7	312° 42'.4	05'.8
03	288° 56'.3	230° 54'.1	36'.8	274° 14'.5	51'.0	131° 05'.6	35'.6	327° 44'.8	05'.8
04	303° 58'.7	245° 53'.4	37'.6	289° 15'.2	51'.7	146° 07'.8	35'.5	342° 47'.3	05'.8
05	319° 01'.2	260° 52'.7	38'.3	304° 15'.9	52'.5	161° 10'.1	35'.4	357° 49'.7	05'.8
06	334° 03'.7	275° 52'.0	39'.0	319° 16'.6	53'.2	176° 12'.4	35'.4	12° 52'.2	05'.8
07	349° 06'.1	290° 51'.2	39'.8	334° 17'.4	53'.9	191° 14'.7	35'.3	27° 54'.7	05'.8
08	4° 08'.6	305° 50'.5	40'.5	349° 18'.1	54'.7	206° 17'.0	35'.2	42° 57'.1	05'.8
09	19° 11'.1	320° 49'.8	41'.2	4° 18'.8	55'.4	221° 19'.3	35'.1	57° 59'.6	05'.8
10	34° 13'.5	335° 49'.1	42'.0	19° 19'.5	56'.1	236° 21'.6	35'.1	73° 02'.0	05'.8
11	49° 16'.0	350° 48'.4	42'.7	34° 20'.2	56'.9	251° 23'.9	35'.0	88° 04'.5	05'.8
12	64° 18'.5	5° 47'.7	19° 43'.4 N	49° 20'.9	4° 57'.6 N	266° 26'.2	10° 34'.9 N	103° 06'.9	16° 05'.8 S
13	79° 20'.9	20° 47'.0	44'.1	64° 21'.7	58'.3	281° 28'.5	34'.8	118° 09'.4	05'.8
14	94° 23'.4	35° 46'.3	44'.9	79° 22'.4	59'.1	296° 30'.8	34'.8	133° 11'.8	05'.8
15	109° 25'.9	50° 45'.6	45'.6	94° 23'.1	59'.8	311° 33'.1	34'.7	148° 14'.3	05'.8
16	124° 28'.3	65° 44'.9	46'.3	109° 23'.8	5° 00'.5 N	326° 35'.3	34'.6	163° 16'.7	05'.8
17	139° 30'.8	80° 44'.2	47'.0	124° 24'.5	01'.3	341° 37'.6	34'.5	178° 19'.2	05'.8
18	154° 33'.2	95° 43'.5	47'.8	139° 25'.3	02'.0	356° 39'.9	34'.5	193° 21'.6	05'.8
19	169° 35'.7	110° 42'.8	48'.5	154° 26'.0	02'.7	11° 42'.2	34'.4	208° 24'.1	05'.8
20	184° 38'.2	125° 42'.0	49'.2	169° 26'.7	03'.4	26° 44'.5	34'.3	223° 26'.5	05'.8
21	199° 40'.6	140° 41'.3	49'.9	184° 27'.4	04'.2	41° 46'.8	34'.2	238° 29'.0	05'.8
22	214° 43'.1	155° 40'.6	50'.7	199° 28'.1	04'.9	56° 49'.1	34'.1	253° 31'.5	05'.9
23	229° 45'.6	170° 39'.9	51'.4	214° 28'.8	05'.6	71° 51'.4	34'.1	268° 33'.9	05'.9
	M.P. 07:43	v -0'.7	d 0'.8	v 0'.7	d 0'.7	v 2'.3	d 0'.1	v 2'.4	d 0'.0

STARS Name	SHA	Dec
Acamar	315° 30'.6	40° 20'.0 S
Achernar	335° 38'.8	57° 16'.3 S
Acrux	173° 26'.8	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 34'.0	56° 00'.1 N
Alkaid	153° 10'.8	49° 21'.1 N
Alnair	28° 03'.3	46° 59'.6 S
Alnilam	276° 02'.7	1° 12'.4 S
Alphard	218° 11'.6	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.3 N
Alpheratz	358° 00'.0	29° 02'.8 N
Altair	62° 23'.4	8° 50'.8 N
Ankaa	353° 31'.3	42° 20'.6 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.7	69° 00'.9 S
Avior	234° 24'.9	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.6	52° 41'.7 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.0	45° 15'.0 N
Denebola	182° 49'.5	14° 36'.8 N
Diphda	349° 11'.8	18° 01'.6 S
Dubhe	194° 10'.6	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.2 N
Enif	34° 02'.5	9° 50'.4 N
Fomalhaut	15° 41'.3	29° 39'.5 S
Gacrux	172° 18'.3	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.9	23° 25'.6 N
Kaus Aust.	84° 04'.3	34° 23'.3 S
Kochab	137° 18'.1	74° 11'.2 N
Markab	13° 54'.1	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.5	69° 41'.5 S
Mirfak	309° 03'.5	49° 50'.0 N
Nunki	76° 17'.5	26° 18'.3 S
Peacock	53° 43'.6	56° 45'.3 S
Polaris	324° 21'.8	89° 13'.7 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.7	12° 33'.8 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.6 S
Rigil Kent	140° 12'.7	60° 48'.4 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 59'.0	56° 29'.6 N
Shaula	96° 42'.9	37° 05'.9 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.2	43° 24'.4 S
Vega	80° 49'.3	38° 46'.4 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	303° 23'.1	11:36
Mars	346° 05'.3	08:44
Jupiter	202° 13'.8	18:17
Saturn	38° 48'.9	05:13

SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
180° 48'.6	20° 46'.4 N	275° 13'.3	15'.7	8° 52'.4 S	11'.4	54'.3
195° 48'.5	46'.9	289° 48'.0	15'.8	41'.0	11'.3	
210° 48'.4	47'.3	304° 22'.8	15'.8	29'.7	11'.5	
225° 48'.4	47'.8	318° 57'.6	15'.8	18'.2	11'.4	
240° 48'.3	48'.3	333° 32'.4	15'.9	06'.8	11'.5	
255° 48'.3	48'.7	348° 07'.3	15'.8	7° 55'.3 S	11'.5	
270° 48'.2	49'.2	2° 42'.1	15'.9	43'.8	11'.6	
285° 48'.2	49'.6	17° 17'.0	15'.9	32'.2	11'.6	
300° 48'.1	50'.1	31° 51'.9	15'.9	20'.6	11'.6	
315° 48'.0	50'.6	46° 26'.8	15'.9	09'.0	11'.6	
330° 48'.0	51'.0	61° 01'.7	16'.0	6° 57'.4 S	11'.7	54'.4
345° 47'.9	51'.5	75° 36'.7	15'.9	45'.7	11'.7	
0° 47'.9	20° 51'.9 N	90° 11'.6	16'.0	6° 34'.0 S	11'.7	54'.4
15° 47'.8	52'.4	104° 46'.6	15'.9	22'.3	11'.8	
30° 47'.7	52'.8	119° 21'.5	16'.0	10'.5	11'.8	
45° 47'.7	53'.3	133° 56'.5	16'.0	5° 58'.7 S	11'.8	
60° 47'.6	53'.7	148° 31'.5	16'.0	46'.9	11'.9	
75° 47'.6	54'.2	163° 06'.5	16'.0	35'.0	11'.8	
90° 47'.5	54'.7	177° 41'.5	16'.0	23'.2	11'.9	
105° 47'.4	55'.1	192° 16'.5	16'.1	11'.3	11'.9	
120° 47'.4	55'.6	206° 51'.6	16'.0	4° 59'.4 S	12'.0	54'.5
135° 47'.3	56'.0	221° 26'.6	16'.0	47'.4	11'.9	
150° 47'.3	56'.5	236° 01'.6	16'.1	35'.5	12'.0	
165° 47'.2	56'.9	250° 36'.7	16'.0	23'.5	12'.1	
180° 47'.1	20° 57'.3 N	265° 11'.7	16'.0	4° 11'.4 S	12'.0	54'.5
195° 47'.1	57'.8	279° 46'.7	16'.1	3° 59'.4 S	12'.0	
210° 47'.0	58'.2	294° 21'.8	16'.0	47'.4	12'.1	
225° 46'.9	58'.7	308° 56'.8	16'.0	35'.3	12'.1	
240° 46'.9	59'.1	323° 31'.8	16'.1	23'.2	12'.1	54'.6
255° 46'.8	59'.6	338° 06'.9	16'.0	11'.1	12'.2	
270° 46'.8	21° 00'.0 N	352° 41'.9	16'.0	2° 58'.9 S	12'.1	
285° 46'.7	00'.5	7° 16'.9	16'.0	46'.8	12'.2	
300° 46'.6	00'.9	21° 51'.9	16'.0	34'.6	12'.2	
315° 46'.6	01'.4	36° 26'.9	16'.0	22'.4	12'.2	
330° 46'.5	01'.8	51° 01'.9	16'.0	10'.2	12'.2	54'.7
345° 46'.4	02'.2	65° 36'.9	16'.0	1° 58'.0 S	12'.2	
0° 46'.4	21° 02'.7 N	80° 11'.9	16'.0	1° 45'.8 S	12'.3	54'.7
15° 46'.3	03'.1	94° 46'.9	15'.9	33'.5	12'.2	
30° 46'.2	03'.6	109° 21'.8	16'.0	21'.3	12'.3	
45° 46'.2	04'.0	123° 56'.8	15'.9	09'.0	12'.3	
60° 46'.1	04'.4	138° 31'.7	15'.9	0° 56'.7 S	12'.3	
75° 46'.0	04'.9	153° 06'.6	15'.9	44'.4	12'.3	54'.8
90° 46'.0	05'.3	167° 41'.5	15'.9	32'.1	12'.3	
105° 45'.9	05'.7	182° 16'.4	15'.9	19'.8	12'.4	
120° 45'.8	06'.2	196° 51'.3	15'.8	07'.4	12'.3	
135° 45'.8	06'.6	211° 26'.1	15'.8	0° 04'.9 N	12'.3	
150° 45'.7	07'.0	226° 00'.9	15'.8	17'.2	12'.4	54'.9
165° 45'.6	07'.5	240° 35'.7	15'.8	29'.6	12'.4	
180° 45'.6	21° 07'.9 N	255° 10'.5	15'.8	0° 42'.0 N	12'.3	54'.9
195° 45'.5	08'.3	269° 45'.3	15'.7	54'.3	12'.4	
210° 45'.4	08'.8	284° 20'.0	15'.7	1° 06'.7 N	12'.4	
225° 45'.4	09'.2	298° 54'.7	15'.7	19'.1	12'.4	55'.0
240° 45'.3	09'.6	313° 29'.4	15'.7	31'.5	12'.4	
255° 45'.2	10'.1	328° 04'.1	15'.6	43'.9	12'.4	
270° 45'.2	10'.5	342° 38'.7	15'.6	56'.3	12'.4	
285° 45'.1	10'.9	357° 13'.3	15'.6	2° 08'.7 N	12'.3	
300° 45'.0	11'.4	11° 47'.9	15'.5	21'.0	12'.4	55'.1
315° 45'.0	11'.8	26° 22'.4	15'.5	33'.4	12'.4	
330° 44'.9	12'.2	40° 56'.9	15'.5	45'.8	12'.4	
345° 44'.8	12'.6	55° 31'.4	15'.4	58'.2	12'.4	
0° 44'.7	21° 13'.1 N	70° 05'.8	15'.4	3° 10'.6 N	12'.4	55'.2
15° 44'.7	13'.5	84° 40'.2	15'.3	23'.0	12'.4	
30° 44'.6	13'.9	99° 14'.5	15'.4	35'.4	12'.4	
45° 44'.5	14'.3	113° 48'.9	15'.2	47'.8	12'.4	
60° 44'.5	14'.8	128° 23'.1	15'.3	4° 00'.2 N	12'.4	
75° 44'.4	15'.2	142° 57'.4	15'.2	12'.6	12'.3	55'.3
90° 44'.3	15'.6	157° 31'.6	15'.2	24'.9	12'.4	
105° 44'.3	16'.0	172° 05'.8	15'.1	37'.3	12'.4	
120° 44'.2	16'.4	186° 39'.9	15'.0	49'.7	12'.3	
135° 44'.1	16'.9	201° 13'.9	15'.1	5° 02'.0 N	12'.4	55'.4
150° 44'.0	17'.3	215° 48'.0	15'.0	14'.4	12'.3	
165° 44'.0	17'.7	230° 22'.0	14'.9	26'.7	12'.3	
SD 15'.8	d 0'.4	SD	14'.8	14'.9	15'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
24	3 14	3 12	11:57	05:49	18:09	22d 52%
25	3 09	3 06	11:57	06:30	18:51	23d 42%
26	3 02	2 59	11:57	07:11	19:33	24d 33%

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1992 May 27, 28, 29 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.0		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
27 Wednesday 00	244° 48'.0	185° 39'.2	19° 52'.1 N	229° 29'.6	5° 06'.4 N	86° 53'.7	10° 34'.0 N	283° 36'.4	16° 05'.9 S
01	259° 50'.5	200° 38'.5	52'.8	244° 30'.3	07'.1	101° 55'.9	33'.9	298° 38'.8	05'.9
02	274° 53'.0	215° 37'.8	53'.5	259° 31'.0	07'.8	116° 58'.2	33'.8	313° 41'.3	05'.9
03	289° 55'.4	230° 37'.1	54'.2	274° 31'.7	08'.6	132° 00'.5	33'.8	328° 43'.7	05'.9
04	304° 57'.9	245° 36'.3	55'.0	289° 32'.4	09'.3	147° 02'.8	33'.7	343° 46'.2	05'.9
05	320° 00'.3	260° 35'.6	55'.7	304° 33'.1	10'.0	162° 05'.1	33'.6	358° 48'.7	05'.9
06	335° 02'.8	275° 34'.9	56'.4	319° 33'.9	10'.7	177° 07'.4	33'.5	13° 51'.1	05'.9
07	350° 05'.3	290° 34'.2	57'.1	334° 34'.6	11'.5	192° 09'.7	33'.5	28° 53'.6	05'.9
08	5° 07'.7	305° 33'.5	57'.8	349° 35'.3	12'.2	207° 11'.9	33'.4	43° 56'.0	05'.9
09	20° 10'.2	320° 32'.8	58'.5	4° 36'.0	12'.9	222° 14'.2	33'.3	58° 58'.5	05'.9
10	35° 12'.7	335° 32'.0	59'.2	19° 36'.7	13'.7	237° 16'.5	33'.2	74° 00'.9	05'.9
11	50° 15'.1	350° 31'.3	59'.9	34° 37'.5	14'.4	252° 18'.8	33'.1	89° 03'.4	05'.9
12	65° 17'.6	5° 30'.6	20° 00'.6 N	49° 38'.2	5° 15'.1 N	267° 21'.1	10° 33'.1 N	104° 05'.8	16° 05'.9 S
13	80° 20'.1	20° 29'.9	01'.3	64° 38'.9	15'.9	282° 23'.4	33'.0	119° 08'.3	05'.9
14	95° 22'.5	35° 29'.2	02'.1	79° 39'.6	16'.6	297° 25'.7	32'.9	134° 10'.8	05'.9
15	110° 25'.0	50° 28'.4	02'.8	94° 40'.3	17'.3	312° 27'.9	32'.8	149° 13'.2	05'.9
16	125° 27'.5	65° 27'.7	03'.5	109° 41'.0	18'.0	327° 30'.2	32'.8	164° 15'.7	05'.9
17	140° 29'.9	80° 27'.0	04'.2	124° 41'.8	18'.8	342° 32'.5	32'.7	179° 18'.1	05'.9
18	155° 32'.4	95° 26'.3	04'.9	139° 42'.5	19'.5	357° 34'.8	32'.6	194° 20'.6	05'.9
19	170° 34'.8	110° 25'.6	05'.6	154° 43'.2	20'.2	12° 37'.1	32'.5	209° 23'.1	06'.0
20	185° 37'.3	125° 24'.8	06'.3	169° 43'.9	21'.0	27° 39'.4	32'.4	224° 25'.5	06'.0
21	200° 39'.8	140° 24'.1	07'.0	184° 44'.6	21'.7	42° 41'.6	32'.4	239° 28'.0	06'.0
22	215° 42'.2	155° 23'.4	07'.7	199° 45'.4	22'.4	57° 43'.9	32'.3	254° 30'.4	06'.0
23	230° 44'.7	170° 22'.7	08'.4	214° 46'.1	23'.1	72° 46'.2	32'.2	269° 32'.9	06'.0
28 Thursday 00	245° 47'.2	185° 21'.9	20° 09'.1 N	229° 46'.8	5° 23'.9 N	87° 48'.5	10° 32'.1 N	284° 35'.4	16° 06'.0 S
01	260° 49'.6	200° 21'.2	09'.7	244° 47'.5	24'.6	102° 50'.8	32'.1	299° 37'.8	06'.0
02	275° 52'.1	215° 20'.5	10'.4	259° 48'.2	25'.3	117° 53'.0	32'.0	314° 40'.3	06'.0
03	290° 54'.6	230° 19'.8	11'.1	274° 48'.9	26'.0	132° 55'.3	31'.9	329° 42'.7	06'.0
04	305° 57'.0	245° 19'.0	11'.8	289° 49'.7	26'.8	147° 57'.6	31'.8	344° 45'.2	06'.0
05	320° 59'.5	260° 18'.3	12'.5	304° 50'.4	27'.5	162° 59'.9	31'.7	359° 47'.7	06'.0
06	336° 02'.0	275° 17'.6	13'.2	319° 51'.1	28'.2	178° 02'.2	31'.7	14° 50'.1	06'.0
07	351° 04'.4	290° 16'.9	13'.9	334° 51'.8	29'.0	193° 04'.4	31'.6	29° 52'.6	06'.0
08	6° 06'.9	305° 16'.1	14'.6	349° 52'.5	29'.7	208° 06'.7	31'.5	44° 55'.0	06'.0
09	21° 09'.3	320° 15'.4	15'.3	4° 53'.3	30'.4	223° 09'.0	31'.4	59° 57'.5	06'.0
10	36° 11'.8	335° 14'.7	16'.0	19° 54'.0	31'.1	238° 11'.3	31'.3	75° 00'.0	06'.0
11	51° 14'.3	350° 13'.9	16'.6	34° 54'.7	31'.9	253° 13'.6	31'.3	90° 02'.4	06'.0
12	66° 16'.7	5° 13'.2	20° 17'.3 N	49° 55'.4	5° 32'.6 N	268° 15'.8	10° 31'.2 N	105° 04'.9	16° 06'.1 S
13	81° 19'.2	20° 12'.5	18'.0	64° 56'.1	33'.3	283° 18'.1	31'.1	120° 07'.3	06'.1
14	96° 21'.7	35° 11'.7	18'.7	79° 56'.8	34'.0	298° 20'.4	31'.0	135° 09'.8	06'.1
15	111° 24'.1	50° 11'.0	19'.4	94° 57'.6	34'.8	313° 22'.7	30'.9	150° 12'.3	06'.1
16	126° 26'.6	65° 10'.3	20'.1	109° 58'.3	35'.5	328° 24'.9	30'.9	165° 14'.7	06'.1
17	141° 29'.1	80° 09'.6	20'.7	124° 59'.0	36'.2	343° 27'.2	30'.8	180° 17'.2	06'.1
18	156° 31'.5	95° 08'.8	21'.4	139° 59'.7	36'.9	358° 29'.5	30'.7	195° 19'.7	06'.1
19	171° 34'.0	110° 08'.1	22'.1	155° 00'.4	37'.7	13° 31'.8	30'.6	210° 22'.1	06'.1
20	186° 36'.4	125° 07'.4	22'.8	170° 01'.2	38'.4	28° 34'.1	30'.5	225° 24'.6	06'.1
21	201° 38'.9	140° 06'.6	23'.4	185° 01'.9	39'.1	43° 36'.3	30'.5	240° 27'.0	06'.1
22	216° 41'.4	155° 05'.9	24'.1	200° 02'.6	39'.8	58° 38'.6	30'.4	255° 29'.5	06'.1
23	231° 43'.8	170° 05'.2	24'.8	215° 03'.3	40'.6	73° 40'.9	30'.3	270° 32'.0	06'.1
29 Friday 00	246° 46'.3	185° 04'.4	20° 25'.5 N	230° 04'.0	5° 41'.3 N	88° 43'.2	10° 30'.2 N	285° 34'.4	16° 06'.1 S
01	261° 48'.8	200° 03'.7	26'.1	245° 04'.7	42'.0	103° 45'.4	30'.1	300° 36'.9	06'.1
02	276° 51'.2	215° 02'.9	26'.8	260° 05'.5	42'.7	118° 47'.7	30'.0	315° 39'.4	06'.1
03	291° 53'.7	230° 02'.2	27'.5	275° 06'.2	43'.5	133° 50'.0	30'.0	330° 41'.8	06'.2
04	306° 56'.2	245° 01'.5	28'.1	290° 06'.9	44'.2	148° 52'.3	29'.9	345° 44'.3	06'.2
05	321° 58'.6	260° 00'.7	28'.8	305° 07'.6	44'.9	163° 54'.5	29'.8	0° 46'.8	06'.2
06	337° 01'.1	275° 00'.0	29'.5	320° 08'.3	45'.6	178° 56'.8	29'.7	15° 49'.2	06'.2
07	352° 03'.6	289° 59'.3	30'.1	335° 09'.1	46'.4	193° 59'.1	29'.6	30° 51'.7	06'.2
08	7° 06'.0	304° 58'.5	30'.8	350° 09'.8	47'.1	209° 01'.4	29'.6	45° 54'.1	06'.2
09	22° 08'.5	319° 57'.8	31'.5	5° 10'.5	47'.8	224° 03'.6	29'.5	60° 56'.6	06'.2
10	37° 10'.9	334° 57'.0	32'.1	20° 11'.2	48'.5	239° 05'.9	29'.4	75° 59'.1	06'.2
11	52° 13'.4	349° 56'.3	32'.8	35° 11'.9	49'.3	254° 08'.2	29'.3	91° 01'.5	06'.2
12	67° 15'.9	4° 55'.6	20° 33'.5 N	50° 12'.6	5° 50'.0 N	269° 10'.4	10° 29'.2 N	106° 04'.0	16° 06'.2 S
13	82° 18'.3	19° 54'.8	34'.1	65° 13'.4	50'.7	284° 12'.7	29'.1	121° 06'.5	06'.2
14	97° 20'.8	34° 54'.1	34'.8	80° 14'.1	51'.4	299° 15'.0	29'.1	136° 08'.9	06'.2
15	112° 23'.3	49° 53'.3	35'.4	95° 14'.8	52'.1	314° 17'.3	29'.0	151° 11'.4	06'.2
16	127° 25'.7	64° 52'.6	36'.1	110° 15'.5	52'.9	329° 19'.5	28'.9	166° 13'.9	06'.3
17	142° 28'.2	79° 51'.8	36'.8	125° 16'.2	53'.6	344° 21'.8	28'.8	181° 16'.3	06'.3
18	157° 30'.7	94° 51'.1	37'.4	140° 17'.0	54'.3	359° 24'.1	28'.7	196° 18'.8	06'.3
19	172° 33'.1	109° 50'.4	38'.1	155° 17'.7	55'.0	14° 26'.3	28'.6	211° 21'.3	06'.3
20	187° 35'.6	124° 49'.6	38'.7	170° 18'.4	55'.8	29° 28'.6	28'.6	226° 23'.7	06'.3
21	202° 38'.1	139° 48'.9	39'.4	185° 19'.1	56'.5	44° 30'.9	28'.5	241° 26'.2	06'.3
22	217° 40'.5	154° 48'.1	40'.0	200° 19'.8	57'.2	59° 33'.2	28'.4	256° 28'.7	06'.3
23	232° 43'.0	169° 47'.4	40'.7	215° 20'.5	57'.9	74° 35'.4	28'.3	271° 31'.1	06'.3
	M.P. 07:32	v -0'.7	d 0'.7	v 0'.7	d 0'.7	v 2'.3	d 0'.1	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.6	40° 20'.0 S
Achernar	335° 38'.8	57° 16'.2 S
Acrux	173° 26'.8	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.9 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 34'.0	56° 00'.2 N
Alkaid	153° 10'.8	49° 21'.1 N
Alnair	28° 03'.3	46° 59'.6 S
Alnilam	276° 02'.7	1° 12'.4 S
Alphard	218° 11'.6	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.3 N
Alpheratz	358° 00'.0	29° 02'.8 N
Altair	62° 23'.4	8° 50'.8 N
Ankaa	353° 31'.3	42° 20'.6 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.7	69° 00'.9 S
Avior	234° 24'.9	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.7	7° 24'.3 N
Canopus	264° 03'.6	52° 41'.6 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.0	45° 15'.0 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.8	18° 01'.6 S
Dubhe	194° 10'.7	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.2 N
Enif	34° 02'.5	9° 50'.4 N
Fomalhaut	15° 41'.3	29° 39'.5 S
Gacrux	172° 18'.3	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.9	23° 25'.6 N
Kaus Aust.	84° 04'.3	34° 23'.3 S
Kochab	137° 18'.1	74° 11'.2 N
Markab	13° 54'.1	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.5	69° 41'.5 S
Mirfak	309° 03'.5	49° 50'.0 N
Nunki	76° 17'.5	26° 18'.3 S
Peacock	53° 43'.5	56° 45'.3 S
Polaris	324° 21'.0	89° 13'.7 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.7	12° 33'.8 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.6 S
Rigil Kent	140° 12'.7	60° 48'.4 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 59'.0	56° 29'.6 N
Shaula	96° 42'.9	37° 05'.9 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.2	43° 24'.4 S
Vega	80° 49'.2	38° 46'.4 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	299° 34'.8	11:39
Mars	343° 59'.6	08:40
Jupiter	202° 01'.3	18:06
Saturn	38° 48'.2	05:01

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
27 00	180° 43'.9	21° 18'.1 N	244° 55'.9	14'.9	5° 39'.0 N	12'.3	55'.4
01	195° 43'.8	18'.5	259° 29'.8	14'.8	51'.3	12'.3	55'.5
02	210° 43'.7	19'.0	274° 03'.6	14'.8	6° 03'.6 N	12'.3	
03	225° 43'.7	19'.4	288° 37'.4	14'.7	15'.9	12'.3	
04	240° 43'.6	19'.8	303° 11'.1	14'.7	28'.2	12'.3	
05	255° 43'.5	20'.2	317° 44'.8	14'.6	40'.5	12'.2	55'.6
06	270° 43'.5	20'.6	332° 18'.4	14'.6	52'.7	12'.2	
07	285° 43'.4	21'.0	346° 52'.0	14'.5	7° 04'.9 N	12'.2	
08	300° 43'.3	21'.4	1° 25'.5	14'.5	17'.1	12'.2	55'.7
09	315° 43'.2	21'.8	15° 59'.0	14'.4	29'.3	12'.2	
10	330° 43'.2	22'.3	30° 32'.4	14'.3	41'.5	12'.2	
11	345° 43'.1	22'.7	45° 05'.7	14'.3	53'.7	12'.1	
12	0° 43'.0	21° 23'.1 N	59° 39'.0	14'.2	8° 05'.8 N	12'.1	55'.8
13	15° 42'.9	23'.5	74° 12'.2	14'.2	17'.9	12'.1	
14	30° 42'.9	23'.9	88° 45'.4	14'.1	30'.0	12'.1	
15	45° 42'.8	24'.3	103° 18'.5	14'.0	42'.1	12'.0	
16	60° 42'.7	24'.7	117° 51'.5	14'.0	54'.1	12'.0	55'.9
17	75° 42'.6	25'.1	132° 24'.5	13'.9	9° 06'.1 N	12'.0	
18	90° 42'.5	25'.5	146° 57'.4	13'.9	18'.1	12'.0	
19	105° 42'.5	25'.9	161° 30'.3	13'.7	30'.1	11'.9	56'.0
20	120° 42'.4	26'.3	176° 03'.0	13'.7	42'.0	11'.9	
21	135° 42'.3	26'.7	190° 35'.7	13'.7	53'.9	11'.9	
22	150° 42'.2	27'.1	205° 08'.4	13'.5	10° 05'.8 N	11'.8	
23	165° 42'.2	27'.6	219° 40'.9	13'.5	17'.6	11'.8	56'.1
28 00	180° 42'.1	21° 28'.0 N	234° 13'.4	13'.4	10° 29'.4 N	11'.8	56'.1
01	195° 42'.0	28'.4	248° 45'.8	13'.4	41'.2	11'.7	
02	210° 41'.9	28'.8	263° 18'.2	13'.2	52'.9	11'.7	56'.2
03	225° 41'.9	29'.2	277° 50'.4	13'.2	11° 04'.6 N	11'.7	
04	240° 41'.8	29'.6	292° 22'.6	13'.2	16'.3	11'.6	
05	255° 41'.7	30'.0	306° 54'.8	13'.0	27'.9	11'.6	56'.3
06	270° 41'.6	30'.4	321° 26'.8	13'.0	39'.5	11'.6	
07	285° 41'.5	30'.8	335° 58'.8	12'.8	51'.1	11'.5	
08	300° 41'.5	31'.1	350° 30'.6	12'.8	12° 02'.6 N	11'.5	56'.4
09	315° 41'.4	31'.5	5° 02'.4	12'.8	14'.1	11'.4	
10	330° 41'.3	31'.9	19° 34'.2	12'.6	25'.5	11'.4	
11	345° 41'.2	32'.3	34° 05'.8	12'.6	36'.9	11'.3	
12	0° 41'.1	21° 32'.7 N	48° 37'.4	12'.4	12° 48'.2 N	11'.3	56'.5
13	15° 41'.1	33'.1	63° 08'.8	12'.4	59'.5	11'.2	
14	30° 41'.0	33'.5	77° 40'.2	12'.3	13° 10'.7 N	11'.2	
15	45° 40'.9	33'.9	92° 11'.5	12'.3	21'.9	11'.2	56'.6
16	60° 40'.8	34'.3	106° 42'.8	12'.1	33'.1	11'.1	
17	75° 40'.7	34'.7	121° 13'.9	12'.0	44'.2	11'.0	
18	90° 40'.7	35'.1	135° 44'.9	12'.0	55'.2	11'.0	56'.7
19	105° 40'.6	35'.5	150° 15'.9	11'.9	14° 06'.2 N	10'.9	
20	120° 40'.5	35'.9	164° 46'.8	11'.7	17'.1	10'.9	
21	135° 40'.4	36'.3	179° 17'.5	11'.7	28'.0	10'.8	56'.8
22	150° 40'.3	36'.6	193° 48'.2	11'.6	38'.8	10'.7	
23	165° 40'.2	37'.0	208° 18'.8	11'.5	49'.5	10'.7	
29 00	180° 40'.2	21° 37'.4 N	222° 49'.3	11'.5	15° 00'.2 N	10'.7	56'.9
01	195° 40'.1	37'.8	237° 19'.8	11'.3	10'.9	10'.5	
02	210° 40'.0	38'.2	251° 50'.1	11'.2	21'.4	10'.5	
03	225° 39'.9	38'.6	266° 20'.3	11'.1	31'.9	10'.5	57'.0
04	240° 39'.8	39'.0	280° 50'.4	11'.1	42'.4	10'.4	
05	255° 39'.7	39'.3	295° 20'.5	10'.9	52'.8	10'.3	
06	270° 39'.7	39'.7	309° 50'.4	10'.9	16° 03'.1 N	10'.2	57'.1
07	285° 39'.6	40'.1	324° 20'.3	10'.7	13'.3	10'.2	
08	300° 39'.5	40'.5	338° 50'.0	10'.7	23'.5	10'.0	
09	315° 39'.4	40'.9	353° 19'.7	10'.5	33'.5	10'.1	57'.2
10	330° 39'.3	41'.2	7° 49'.2	10'.5	43'.6	9'.9	
11	345° 39'.2	41'.6	22° 18'.7	10'.3	53'.5	9'.9	
12	0° 39'.2	21° 42'.0 N	36° 48'.0	10'.3	17° 03'.4 N	9'.8	57'.3
13	15° 39'.1	42'.4	51° 17'.3	10'.2	13'.2	9'.7	
14	30° 39'.0	42'.8	65° 46'.5	10'.0	22'.9	9'.6	
15	45° 38'.9	43'.1	80° 15'.5	10'.0	32'.5	9'.6	57'.4
16	60° 38'.8	43'.5	94° 44'.5	9'.9	42'.1	9'.4	
17	75° 38'.7	43'.9	109° 13'.4	9'.7	51'.5	9'.4	
18	90° 38'.6	44'.3	123° 42'.1	9'.7	18° 00'.9 N	9'.3	57'.5
19	105° 38'.6	44'.6	138° 10'.8	9'.6	10'.2	9'.2	
20	120° 38'.5	45'.0	152° 39'.4	9'.4	19'.4	9'.1	
21	135° 38'.4	45'.4	167° 07'.8	9'.4	28'.5	9'.0	57'.6
22	150° 38'.3	45'.8	181° 36'.2	9'.2	37'.5	9'.0	
23	165° 38'.2	46'.1	196° 04'.4	9'.2	46'.5	8'.8	
	SD 15'.8	d 0'.4	SD	15'.2	15'.4	15'.6	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
27	2 56	2 52	11:57	07:54	20:16	25d 24%
28	2 48	2 45	11:57	08:39	21:03	26d 16%
29	2 41	2 37	11:57	09:28	21:53	27d 9%

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1992 May 30, 31, Jun. 1 (Sat, Sun, Mon)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.0		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
30 Saturday 00	247° 45'.4	184° 46'.6	20° 41'.3 N	230° 21'.3	5° 58'.6 N	89° 37'.7	10° 28'.2 N	286° 33'.6	16° 06'.3 S
01	262° 47'.9	199° 45'.9	42'.0	245° 22'.0	59'.4	104° 40'.0	28'.1	301° 36'.1	06'.3
02	277° 50'.4	214° 45'.1	42'.6	260° 22'.7	6° 00'.1 N	119° 42'.2	28'.1	316° 38'.5	06'.3
03	292° 52'.8	229° 44'.4	43'.3	275° 23'.4	00'.8	134° 44'.5	28'.0	331° 41'.0	06'.3
04	307° 55'.3	244° 43'.6	43'.9	290° 24'.1	01'.5	149° 46'.8	27'.9	346° 43'.5	06'.4
05	322° 57'.8	259° 42'.9	44'.6	305° 24'.9	02'.3	164° 49'.0	27'.8	1° 45'.9	06'.4
06	338° 00'.2	274° 42'.1	45'.2	320° 25'.6	03'.0	179° 51'.3	27'.7	16° 48'.4	06'.4
07	353° 02'.7	289° 41'.4	45'.8	335° 26'.3	03'.7	194° 53'.6	27'.6	31° 50'.9	06'.4
08	8° 05'.2	304° 40'.6	46'.5	350° 27'.0	04'.4	209° 55'.8	27'.6	46° 53'.4	06'.4
09	23° 07'.6	319° 39'.9	47'.1	5° 27'.7	05'.1	224° 58'.1	27'.5	61° 55'.8	06'.4
10	38° 10'.1	334° 39'.1	47'.8	20° 28'.4	05'.9	240° 00'.4	27'.4	76° 58'.3	06'.4
11	53° 12'.5	349° 38'.4	48'.4	35° 29'.2	06'.6	255° 02'.6	27'.3	92° 00'.8	06'.4
12	68° 15'.0	4° 37'.6	20° 49'.0 N	50° 29'.9	6° 07'.3 N	270° 04'.9	10° 27'.2 N	107° 03'.2	16° 06'.4 S
13	83° 17'.5	19° 36'.9	49'.7	65° 30'.6	08'.0	285° 07'.2	27'.1	122° 05'.7	06'.4
14	98° 19'.9	34° 36'.1	50'.3	80° 31'.3	08'.7	300° 09'.4	27'.0	137° 08'.2	06'.4
15	113° 22'.4	49° 35'.4	50'.9	95° 32'.0	09'.5	315° 11'.7	27'.0	152° 10'.6	06'.4
16	128° 24'.9	64° 34'.6	51'.6	110° 32'.8	10'.2	330° 14'.0	26'.9	167° 13'.1	06'.5
17	143° 27'.3	79° 33'.9	52'.2	125° 33'.5	10'.9	345° 16'.2	26'.8	182° 15'.6	06'.5
18	158° 29'.8	94° 33'.1	52'.8	140° 34'.2	11'.6	0° 18'.5	26'.7	197° 18'.1	06'.5
19	173° 32'.3	109° 32'.3	53'.5	155° 34'.9	12'.3	15° 20'.8	26'.6	212° 20'.5	06'.5
20	188° 34'.7	124° 31'.6	54'.1	170° 35'.6	13'.0	30° 23'.0	26'.5	227° 23'.0	06'.5
21	203° 37'.2	139° 30'.8	54'.7	185° 36'.3	13'.8	45° 25'.3	26'.5	242° 25'.5	06'.5
22	218° 39'.7	154° 30'.1	55'.4	200° 37'.1	14'.5	60° 27'.6	26'.4	257° 27'.9	06'.5
23	233° 42'.1	169° 29'.3	56'.0	215° 37'.8	15'.2	75° 29'.8	26'.3	272° 30'.4	06'.5
31 Sunday 00	248° 44'.6	184° 28'.6	20° 56'.6 N	230° 38'.5	6° 15'.9 N	90° 32'.1	10° 26'.2 N	287° 32'.9	16° 06'.5 S
01	263° 47'.0	199° 27'.8	57'.2	245° 39'.2	16'.6	105° 34'.3	26'.1	302° 35'.4	06'.5
02	278° 49'.5	214° 27'.0	57'.9	260° 39'.9	17'.4	120° 36'.6	26'.0	317° 37'.8	06'.6
03	293° 52'.0	229° 26'.3	58'.5	275° 40'.7	18'.1	135° 38'.9	25'.9	332° 40'.3	06'.6
04	308° 54'.4	244° 25'.5	59'.1	290° 41'.4	18'.8	150° 41'.1	25'.8	347° 42'.8	06'.6
05	323° 56'.9	259° 24'.8	59'.7	305° 42'.1	19'.5	165° 43'.4	25'.8	2° 45'.2	06'.6
06	338° 59'.4	274° 24'.0	21° 00'.3 N	320° 42'.8	20'.2	180° 45'.7	25'.7	17° 47'.7	06'.6
07	354° 01'.8	289° 23'.3	01'.0	335° 43'.5	20'.9	195° 47'.9	25'.6	32° 50'.2	06'.6
08	9° 04'.3	304° 22'.5	01'.6	350° 44'.2	21'.7	210° 50'.2	25'.5	47° 52'.7	06'.6
09	24° 06'.8	319° 21'.7	02'.2	5° 45'.0	22'.4	225° 52'.4	25'.4	62° 55'.1	06'.6
10	39° 09'.2	334° 21'.0	02'.8	20° 45'.7	23'.1	240° 54'.7	25'.3	77° 57'.6	06'.6
11	54° 11'.7	349° 20'.2	03'.4	35° 46'.4	23'.8	255° 57'.0	25'.2	93° 00'.1	06'.6
12	69° 14'.2	4° 19'.4	21° 04'.0 N	50° 47'.1	6° 24'.5 N	270° 59'.2	10° 25'.2 N	108° 02'.6	16° 06'.6 S
13	84° 16'.6	19° 18'.7	04'.7	65° 47'.8	25'.3	286° 01'.5	25'.1	123° 05'.0	06'.7
14	99° 19'.1	34° 17'.9	05'.3	80° 48'.5	26'.0	301° 03'.7	25'.0	138° 07'.5	06'.7
15	114° 21'.5	49° 17'.2	05'.9	95° 49'.3	26'.7	316° 06'.0	24'.9	153° 10'.0	06'.7
16	129° 24'.0	64° 16'.4	06'.5	110° 50'.0	27'.4	331° 08'.3	24'.8	168° 12'.5	06'.7
17	144° 26'.5	79° 15'.6	07'.1	125° 50'.7	28'.1	346° 10'.5	24'.7	183° 14'.9	06'.7
18	159° 28'.9	94° 14'.9	07'.7	140° 51'.4	28'.8	1° 12'.8	24'.6	198° 17'.4	06'.7
19	174° 31'.4	109° 14'.1	08'.3	155° 52'.1	29'.5	16° 15'.0	24'.5	213° 19'.9	06'.7
20	189° 33'.9	124° 13'.3	08'.9	170° 52'.9	30'.3	31° 17'.3	24'.5	228° 22'.4	06'.7
21	204° 36'.3	139° 12'.6	09'.5	185° 53'.6	31'.0	46° 19'.6	24'.4	243° 24'.8	06'.7
22	219° 38'.8	154° 11'.8	10'.1	200° 54'.3	31'.7	61° 21'.8	24'.3	258° 27'.3	06'.8
23	234° 41'.3	169° 11'.0	10'.7	215° 55'.0	32'.4	76° 24'.1	24'.2	273° 29'.8	06'.8
1 Monday 00	249° 43'.7	184° 10'.3	21° 11'.3 N	230° 55'.7	6° 33'.1 N	91° 26'.3	10° 24'.1 N	288° 32'.3	16° 06'.8 S
01	264° 46'.2	199° 09'.5	11'.9	245° 56'.4	33'.8	106° 28'.6	24'.0	303° 34'.7	06'.8
02	279° 48'.7	214° 08'.7	12'.5	260° 57'.2	34'.6	121° 30'.8	23'.9	318° 37'.2	06'.8
03	294° 51'.1	229° 07'.9	13'.1	275° 57'.9	35'.3	136° 33'.1	23'.8	333° 39'.7	06'.8
04	309° 53'.6	244° 07'.2	13'.7	290° 58'.6	36'.0	151° 35'.4	23'.7	348° 42'.2	06'.8
05	324° 56'.0	259° 06'.4	14'.3	305° 59'.3	36'.7	166° 37'.6	23'.7	3° 44'.6	06'.8
06	339° 58'.5	274° 05'.6	14'.9	321° 00'.0	37'.4	181° 39'.9	23'.6	18° 47'.1	06'.8
07	355° 01'.0	289° 04'.9	15'.5	336° 00'.8	38'.1	196° 42'.1	23'.5	33° 49'.6	06'.9
08	10° 03'.4	304° 04'.1	16'.1	351° 01'.5	38'.8	211° 44'.4	23'.4	48° 52'.1	06'.9
09	25° 05'.9	319° 03'.3	16'.7	6° 02'.2	39'.6	226° 46'.6	23'.3	63° 54'.5	06'.9
10	40° 08'.4	334° 02'.5	17'.3	21° 02'.9	40'.3	241° 48'.9	23'.2	78° 57'.0	06'.9
11	55° 10'.8	349° 01'.8	17'.9	36° 03'.6	41'.0	256° 51'.1	23'.1	93° 59'.5	06'.9
12	70° 13'.3	4° 01'.0	21° 18'.5 N	51° 04'.3	6° 41'.7 N	271° 53'.4	10° 23'.0 N	109° 02'.0	16° 06'.9 S
13	85° 15'.8	19° 00'.2	19'.1	66° 05'.1	42'.4	286° 55'.7	22'.9	124° 04'.5	06'.9
14	100° 18'.2	33° 59'.5	19'.6	81° 05'.8	43'.1	301° 57'.9	22'.9	139° 06'.9	06'.9
15	115° 20'.7	48° 58'.7	20'.2	96° 06'.5	43'.8	317° 00'.2	22'.8	154° 09'.4	06'.9
16	130° 23'.2	63° 57'.9	20'.8	111° 07'.2	44'.5	332° 02'.4	22'.7	169° 11'.9	07'.0
17	145° 25'.6	78° 57'.1	21'.4	126° 07'.9	45'.3	347° 04'.7	22'.6	184° 14'.4	07'.0
18	160° 28'.1	93° 56'.4	22'.0	141° 08'.7	46'.0	2° 06'.9	22'.5	199° 16'.8	07'.0
19	175° 30'.5	108° 55'.6	22'.6	156° 09'.4	46'.7	17° 09'.2	22'.4	214° 19'.3	07'.0
20	190° 33'.0	123° 54'.8	23'.1	171° 10'.1	47'.4	32° 11'.4	22'.3	229° 21'.8	07'.0
21	205° 35'.5	138° 54'.0	23'.7	186° 10'.8	48'.1	47° 13'.7	22'.2	244° 24'.3	07'.0
22	220° 37'.9	153° 53'.2	24'.3	201° 11'.5	48'.8	62° 15'.9	22'.1	259° 26'.8	07'.0
23	235° 40'.4	168° 52'.5	24'.9	216° 12'.2	49'.5	77° 18'.2	22'.0	274° 29'.2	07'.0
	M.P. 07:20	v -0'.8	d 0'.6	v 0'.7	d 0'.7	v 2'.3	d 0'.1	v 2'.5	d 0'.0

STARS	SHA	Dec
Acamar	315° 30'.6	40° 20'.0 S
Achernar	335° 38'.8	57° 16'.2 S
Acrux	173° 26'.8	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.8 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 34'.0	56° 00'.2 N
Alkaid	153° 10'.8	49° 21'.1 N
Alnair	28° 03'.3	46° 59'.6 S
Alnilam	276° 02'.7	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.3 N
Alpheratz	358° 00'.0	29° 02'.8 N
Altair	62° 23'.3	8° 50'.8 N
Ankaa	353° 31'.3	42° 20'.6 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.7	69° 00'.9 S
Avior	234° 24'.9	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.6	52° 41'.6 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.0	45° 15'.0 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.8	18° 01'.5 S
Dubhe	194° 10'.7	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.3 N
Enif	34° 02'.5	9° 50'.4 N
Fomalhaut	15° 41'.3	29° 39'.5 S
Gacrux	172° 18'.3	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.8	23° 25'.6 N
Kaus Aust.	84° 04'.3	34° 23'.3 S
Kochab	137° 18'.1	74° 11'.3 N
Markab	13° 54'.1	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.5	69° 41'.5 S
Mirfak	309° 03'.5	49° 50'.0 N
Nunki	76° 17'.5	26° 18'.3 S
Peacock	53° 43'.5	56° 45'.3 S
Polaris	324° 20'.0	89° 13'.7 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.7	12° 33'.8 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.6 S
Rigil Kent	140° 12'.7	60° 48'.4 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.9	56° 29'.6 N
Shaula	96° 42'.9	37° 05'.9 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.3	43° 24'.4 S
Vega	80° 49'.2	38° 46'.5 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	295° 44'.0	11:43
Mars	341° 53'.9	08:37
Jupiter	201° 47'.5	17:55
Saturn	38° 48'.3	04:49

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
180° 38'.1	21° 46'.5 N	210° 32'.6	9'.0	18° 55'.3 N	8'.7	57'.7
195° 38'.0	46'.9	225° 00'.6	9'.0	19° 04'.0 N	8'.7	
210° 37'.9	47'.2	239° 28'.6	8'.9	12'.7	8'.5	
225° 37'.9	47'.6	253° 56'.5	8'.7	21'.2	8'.5	
240° 37'.8	48'.0	268° 24'.2	8'.7	29'.7	8'.3	57'.8
255° 37'.7	48'.3	282° 51'.9	8'.5	38'.0	8'.3	
270° 37'.6	48'.7	297° 19'.4	8'.5	46'.3	8'.1	
285° 37'.5	49'.1	311° 46'.9	8'.3	54'.4	8'.1	57'.9
300° 37'.4	49'.4	326° 14'.2	8'.3	20° 02'.5 N	7'.9	
315° 37'.3	49'.8	340° 41'.5	8'.1	10'.4	7'.8	
330° 37'.2	50'.2	355° 08'.6	8'.1	18'.2	7'.7	58'.0
345° 37'.2	50'.5	9° 35'.7	7'.9	25'.9	7'.7	
0° 37'.1	21° 50'.9 N	24° 02'.6	7'.8	20° 33'.6 N	7'.4	58'.0
15° 37'.0	51'.3	38° 29'.4	7'.8	41'.0	7'.4	58'.1
30° 36'.9	51'.6	52° 56'.2	7'.7	48'.4	7'.3	
45° 36'.8	52'.0	67° 22'.9	7'.5	55'.7	7'.1	
60° 36'.7	52'.4	81° 49'.4	7'.5	21° 02'.8 N	7'.0	58'.2
75° 36'.6	52'.7	96° 15'.9	7'.3	09'.8	7'.0	
90° 36'.5	53'.1	110° 42'.2	7'.3	16'.8	6'.7	
105° 36'.4	53'.4	125° 08'.5	7'.2	23'.5	6'.7	58'.3
120° 36'.3	53'.8	139° 34'.7	7'.0	30'.2	6'.5	
135° 36'.3	54'.1	154° 00'.7	7'.0	36'.7	6'.5	
150° 36'.2	54'.5	168° 26'.7	6'.9	43'.2	6'.2	
165° 36'.1	54'.9	182° 52'.6	6'.8	49'.4	6'.2	58'.4
180° 36'.0	21° 55'.2 N	197° 18'.4	6'.7	21° 55'.6 N	6'.0	58'.4
195° 35'.9	55'.6	211° 44'.1	6'.6	22° 01'.6 N	5'.9	
210° 35'.8	55'.9	226° 09'.7	6'.5	07'.5	5'.8	58'.5
225° 35'.7	56'.3	240° 35'.2	6'.5	13'.3	5'.6	
240° 35'.6	56'.6	255° 00'.7	6'.3	18'.9	5'.5	
255° 35'.5	57'.0	269° 26'.0	6'.3	24'.4	5'.4	58'.6
270° 35'.4	57'.3	283° 51'.3	6'.1	29'.8	5'.2	
285° 35'.3	57'.7	298° 16'.4	6'.1	35'.0	5'.1	
300° 35'.2	58'.0	312° 41'.5	6'.0	40'.1	4'.9	
315° 35'.1	58'.4	327° 06'.5	5'.9	45'.0	4'.8	58'.7
330° 35'.0	58'.7	341° 31'.4	5'.9	49'.8	4'.7	
345° 35'.0	59'.1	355° 56'.3	5'.8	54'.5	4'.5	
0° 34'.9	21° 59'.4 N	10° 21'.1	5'.6	22° 59'.0 N	4'.4	58'.8
15° 34'.8	59'.8	24° 45'.7	5'.7	23° 03'.4 N	4'.2	
30° 34'.7	22° 00'.1 N	39° 10'.4	5'.5	07'.6	4'.1	
45° 34'.6	00'.5	53° 34'.9	5'.4	11'.7	3'.9	
60° 34'.5	00'.8	67° 59'.3	5'.4	15'.6	3'.8	58'.9
75° 34'.4	01'.1	82° 23'.7	5'.4	19'.4	3'.7	
90° 34'.3	01'.5	96° 48'.1	5'.2	23'.1	3'.4	
105° 34'.2	01'.8	111° 12'.3	5'.2	26'.5	3'.4	
120° 34'.1	02'.2	125° 36'.5	5'.1	29'.9	3'.1	59'.0
135° 34'.0	02'.5	140° 00'.6	5'.1	33'.0	3'.1	
150° 33'.9	02'.9	154° 24'.7	5'.0	36'.1	2'.8	
165° 33'.8	03'.2	168° 48'.7	4'.9	38'.9	2'.7	
180° 33'.7	22° 03'.5 N	183° 12'.6	4'.9	23° 41'.6 N	2'.6	59'.1
195° 33'.6	03'.9	197° 36'.5	4'.8	44'.2	2'.4	
210° 33'.5	04'.2	212° 00'.3	4'.7	46'.6	2'.2	
225° 33'.4	04'.6	226° 24'.0	4'.7	48'.8	2'.1	
240° 33'.3	04'.9	240° 47'.7	4'.7	50'.9	1'.9	59'.2
255° 33'.2	05'.2	255° 11'.4	4'.6	52'.8	1'.8	
270° 33'.1	05'.6	269° 35'.0	4'.6	54'.6	1'.6	
285° 33'.0	05'.9	283° 58'.6	4'.5	56'.2	1'.4	
300° 32'.9	06'.2	298° 22'.1	4'.5	57'.6	1'.3	59'.3
315° 32'.9	06'.6	312° 45'.6	4'.4	58'.9	1'.1	
330° 32'.8	06'.9	327° 09'.0	4'.4	00'.0	0'.9	
345° 32'.7	07'.2	341° 32'.4	4'.3	24° 00'.9 N	0'.8	
0° 32'.6	22° 07'.6 N	355° 55'.7	4'.4	24° 01'.7 N	0'.6	59'.3
15° 32'.5	07'.9	10° 19'.1	4'.2	02'.3	0'.4	59'.4
30° 32'.4	08'.2	24° 42'.3	4'.3	02'.7	0'.3	
45° 32'.3	08'.5	39° 05'.6	4'.2	03'.0	0'.1	
60° 32'.2	08'.9	53° 28'.8	4'.2	03'.1	0'.0	
75° 32'.1	09'.2	67° 52'.0	4'.2	03'.1	0'.3	59'.5
90° 32'.0	09'.5	82° 15'.2	4'.2	02'.8	0'.4	
105° 31'.9	09'.9	96° 38'.4	4'.1	02'.4	0'.5	
120° 31'.8	10'.2	111° 01'.5	4'.1	01'.9	0'.7	
135° 31'.7	10'.5	125° 24'.6	4'.1	01'.2	0'.9	
150° 31'.6	10'.8	139° 47'.7	4'.1	00'.3	1'.1	
165° 31'.5	11'.2	154° 10'.8	4'.1	23° 59'.2 N	1'.2	59'.6
SD 15'.8	d 0'.3	SD 15'.8		16'.0	16'.2	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
30	2 33	2 28	11:58	10:20	22:48	28d 4%
31	2 24	2 20	11:58	11:17	23:47	29d 1%
1	2 15	2 10	11:58	12:17	24:48	0d 0%

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1992 June 2, 3, 4 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.0		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
2 Tuesday									
00	250° 42'.9	183° 51'.7	21° 25'.5 N	231° 13'.0	6° 50'.2 N	92° 20'.4	10° 21'.9 N	289° 31'.7	16° 07'.0 S
01	265° 45'.3	198° 50'.9	26'.0	246° 13'.7	51'.0	107° 22'.7	21'.9	304° 34'.2	07'.1
02	280° 47'.8	213° 50'.1	26'.6	261° 14'.4	51'.7	122° 24'.9	21'.8	319° 36'.7	07'.1
03	295° 50'.3	228° 49'.4	27'.2	276° 15'.1	52'.4	137° 27'.2	21'.7	334° 39'.2	07'.1
04	310° 52'.7	243° 48'.6	27'.8	291° 15'.8	53'.1	152° 29'.4	21'.6	349° 41'.6	07'.1
05	325° 55'.2	258° 47'.8	28'.3	306° 16'.6	53'.8	167° 31'.7	21'.5	4° 44'.1	07'.1
06	340° 57'.7	273° 47'.0	28'.9	321° 17'.3	54'.5	182° 33'.9	21'.4	19° 46'.6	07'.1
07	356° 00'.1	288° 46'.2	29'.5	336° 18'.0	55'.2	197° 36'.2	21'.3	34° 49'.1	07'.1
08	11° 02'.6	303° 45'.4	30'.0	351° 18'.7	55'.9	212° 38'.4	21'.2	49° 51'.6	07'.1
09	26° 05'.0	318° 44'.7	30'.6	6° 19'.4	56'.6	227° 40'.7	21'.1	64° 54'.0	07'.2
10	41° 07'.5	333° 43'.9	31'.2	21° 20'.1	57'.4	242° 42'.9	21'.0	79° 56'.5	07'.2
11	56° 10'.0	348° 43'.1	31'.7	36° 20'.9	58'.1	257° 45'.2	20'.9	94° 59'.0	07'.2
12	71° 12'.4	3° 42'.3	21° 32'.3 N	51° 21'.6	6° 58'.8 N	272° 47'.4	10° 20'.9 N	110° 01'.5	16° 07'.2 S
13	86° 14'.9	18° 41'.5	32'.9	66° 22'.3	59'.5	287° 49'.7	20'.8	125° 04'.0	07'.2
14	101° 17'.4	33° 40'.7	33'.4	81° 23'.0	7° 00'.2 N	302° 51'.9	20'.7	140° 06'.5	07'.2
15	116° 19'.8	48° 40'.0	34'.0	96° 23'.7	00'.9	317° 54'.2	20'.6	155° 08'.9	07'.2
16	131° 22'.3	63° 39'.2	34'.6	111° 24'.4	01'.6	332° 56'.4	20'.5	170° 11'.4	07'.2
17	146° 24'.8	78° 38'.4	35'.1	126° 25'.2	02'.3	347° 58'.7	20'.4	185° 13'.9	07'.3
18	161° 27'.2	93° 37'.6	35'.7	141° 25'.9	03'.0	3° 00'.9	20'.3	200° 16'.4	07'.3
19	176° 29'.7	108° 36'.8	36'.2	156° 26'.6	03'.7	18° 03'.2	20'.2	215° 18'.9	07'.3
20	191° 32'.1	123° 36'.0	36'.8	171° 27'.3	04'.5	33° 05'.4	20'.1	230° 21'.4	07'.3
21	206° 34'.6	138° 35'.2	37'.3	186° 28'.0	05'.2	48° 07'.7	20'.0	245° 23'.8	07'.3
22	221° 37'.1	153° 34'.5	37'.9	201° 28'.8	05'.9	63° 09'.9	19'.9	260° 26'.3	07'.3
23	236° 39'.5	168° 33'.7	38'.4	216° 29'.5	06'.6	78° 12'.2	19'.8	275° 28'.8	07'.3
3 Wednesday									
00	251° 42'.0	183° 32'.9	21° 39'.0 N	231° 30'.2	7° 07'.3 N	93° 14'.4	10° 19'.7 N	290° 31'.3	16° 07'.4 S
01	266° 44'.5	198° 32'.1	39'.5	246° 30'.9	08'.0	108° 16'.6	19'.7	305° 33'.8	07'.4
02	281° 46'.9	213° 31'.3	40'.1	261° 31'.6	08'.7	123° 18'.9	19'.6	320° 36'.3	07'.4
03	296° 49'.4	228° 30'.5	40'.6	276° 32'.3	09'.4	138° 21'.1	19'.5	335° 38'.7	07'.4
04	311° 51'.9	243° 29'.7	41'.2	291° 33'.1	10'.1	153° 23'.4	19'.4	350° 41'.2	07'.4
05	326° 54'.3	258° 28'.9	41'.7	306° 33'.8	10'.8	168° 25'.6	19'.3	5° 43'.7	07'.4
06	341° 56'.8	273° 28'.1	42'.3	321° 34'.5	11'.5	183° 27'.9	19'.2	20° 46'.2	07'.4
07	356° 59'.3	288° 27'.4	42'.8	336° 35'.2	12'.2	198° 30'.1	19'.1	35° 48'.7	07'.4
08	12° 01'.7	303° 26'.6	43'.4	351° 35'.9	12'.9	213° 32'.4	19'.0	50° 51'.2	07'.5
09	27° 04'.2	318° 25'.8	43'.9	6° 36'.7	13'.7	228° 34'.6	18'.9	65° 53'.7	07'.5
10	42° 06'.6	333° 25'.0	44'.5	21° 37'.4	14'.4	243° 36'.8	18'.8	80° 56'.1	07'.5
11	57° 09'.1	348° 24'.2	45'.0	36° 38'.1	15'.1	258° 39'.1	18'.7	95° 58'.6	07'.5
12	72° 11'.6	3° 23'.4	21° 45'.5 N	51° 38'.8	7° 15'.8 N	273° 41'.3	10° 18'.6 N	111° 01'.1	16° 07'.5 S
13	87° 14'.0	18° 22'.6	46'.1	66° 39'.5	16'.5	288° 43'.6	18'.5	126° 03'.6	07'.5
14	102° 16'.5	33° 21'.8	46'.6	81° 40'.2	17'.2	303° 45'.8	18'.4	141° 06'.1	07'.5
15	117° 19'.0	48° 21'.0	47'.1	96° 41'.0	17'.9	318° 48'.1	18'.3	156° 08'.6	07'.6
16	132° 21'.4	63° 20'.2	47'.7	111° 41'.7	18'.6	333° 50'.3	18'.2	171° 11'.1	07'.6
17	147° 23'.9	78° 19'.4	48'.2	126° 42'.4	19'.3	348° 52'.5	18'.1	186° 13'.5	07'.6
18	162° 26'.4	93° 18'.6	48'.8	141° 43'.1	20'.0	3° 54'.8	18'.1	201° 16'.0	07'.6
19	177° 28'.8	108° 17'.8	49'.3	156° 43'.8	20'.7	18° 57'.0	18'.0	216° 18'.5	07'.6
20	192° 31'.3	123° 17'.0	49'.8	171° 44'.5	21'.4	33° 59'.3	17'.9	231° 21'.0	07'.6
21	207° 33'.8	138° 16'.2	50'.3	186° 45'.3	22'.1	49° 01'.5	17'.8	246° 23'.5	07'.6
22	222° 36'.2	153° 15'.4	50'.9	201° 46'.0	22'.8	64° 03'.7	17'.7	261° 26'.0	07'.7
23	237° 38'.7	168° 14'.6	51'.4	216° 46'.7	23'.5	79° 06'.0	17'.6	276° 28'.5	07'.7
4 Thursday									
00	252° 41'.1	183° 13'.8	21° 51'.9 N	231° 47'.4	7° 24'.2 N	94° 08'.2	10° 17'.5 N	291° 31'.0	16° 07'.7 S
01	267° 43'.6	198° 13'.0	52'.5	246° 48'.1	24'.9	109° 10'.5	17'.4	306° 33'.4	07'.7
02	282° 46'.1	213° 12'.2	53'.0	261° 48'.9	25'.6	124° 12'.7	17'.3	321° 35'.9	07'.7
03	297° 48'.5	228° 11'.4	53'.5	276° 49'.6	26'.3	139° 14'.9	17'.2	336° 38'.4	07'.7
04	312° 51'.0	243° 10'.6	54'.0	291° 50'.3	27'.1	154° 17'.2	17'.1	351° 40'.9	07'.7
05	327° 53'.5	258° 09'.8	54'.5	306° 51'.0	27'.8	169° 19'.4	17'.0	6° 43'.4	07'.8
06	342° 55'.9	273° 09'.0	55'.1	321° 51'.7	28'.5	184° 21'.7	16'.9	21° 45'.9	07'.8
07	357° 58'.4	288° 08'.2	55'.6	336° 52'.4	29'.2	199° 23'.9	16'.8	36° 48'.4	07'.8
08	13° 00'.9	303° 07'.4	56'.1	351° 53'.2	29'.9	214° 26'.1	16'.7	51° 50'.9	07'.8
09	28° 03'.3	318° 06'.6	56'.6	6° 53'.9	30'.6	229° 28'.4	16'.6	66° 53'.3	07'.8
10	43° 05'.8	333° 05'.8	57'.1	21° 54'.6	31'.3	244° 30'.6	16'.5	81° 55'.8	07'.8
11	58° 08'.3	348° 05'.0	57'.6	36° 55'.3	32'.0	259° 32'.8	16'.4	96° 58'.3	07'.9
12	73° 10'.7	3° 04'.2	21° 58'.2 N	51° 56'.0	7° 32'.7 N	274° 35'.1	10° 16'.3 N	112° 00'.8	16° 07'.9 S
13	88° 13'.2	18° 03'.4	58'.7	66° 56'.7	33'.4	289° 37'.3	16'.2	127° 03'.3	07'.9
14	103° 15'.6	33° 02'.6	59'.2	81° 57'.5	34'.1	304° 39'.6	16'.1	142° 05'.8	07'.9
15	118° 18'.1	48° 01'.8	59'.7	96° 58'.2	34'.8	319° 41'.8	16'.0	157° 08'.3	07'.9
16	133° 20'.6	63° 01'.0	22° 00'.2 N	111° 58'.9	35'.5	334° 44'.0	15'.9	172° 10'.8	07'.9
17	148° 23'.0	78° 00'.2	00'.7	126° 59'.6	36'.2	349° 46'.3	15'.9	187° 13'.3	07'.9
18	163° 25'.5	92° 59'.4	01'.2	142° 00'.3	36'.9	4° 48'.5	15'.8	202° 15'.8	08'.0
19	178° 28'.0	107° 58'.6	01'.7	157° 01'.1	37'.6	19° 50'.7	15'.7	217° 18'.3	08'.0
20	193° 30'.4	122° 57'.8	02'.2	172° 01'.8	38'.3	34° 53'.0	15'.6	232° 20'.7	08'.0
21	208° 32'.9	137° 57'.0	02'.7	187° 02'.5	39'.0	49° 55'.2	15'.5	247° 23'.2	08'.0
22	223° 35'.4	152° 56'.2	03'.2	202° 03'.2	39'.7	64° 57'.4	15'.4	262° 25'.7	08'.0
23	238° 37'.8	167° 55'.4	03'.7	217° 03'.9	40'.4	79° 59'.7	15'.3	277° 28'.2	08'.0
	M.P. 07:08	v -0'.8	d 0'.5	v 0'.7	d 0'.7	v 2'.2	d 0'.1	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.6	40° 19'.9 S
Achernar	335° 38'.7	57° 16'.2 S
Acrux	173° 26'.8	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.8 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 34'.0	56° 00'.2 N
Alkaid	153° 10'.8	49° 21'.1 N
Alnair	28° 03'.2	46° 59'.6 S
Alnilam	276° 02'.6	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.3 N
Alpheratz	357° 59'.9	29° 02'.8 N
Altair	62° 23'.3	8° 50'.9 N
Ankaa	353° 31'.3	42° 20'.5 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.7	69° 00'.9 S
Avior	234° 24'.9	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.6	52° 41'.6 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 42'.0	45° 15'.0 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.8	18° 01'.5 S
Dubhe	194° 10'.7	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.3 N
Enif	34° 02'.4	9° 50'.4 N
Fomalhaut	15° 41'.2	29° 39'.5 S
Gacrux	172° 18'.3	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.8	23° 25'.6 N
Kaus Aust.	84° 04'.3	34° 23'.3 S
Kochab	137° 18'.1	74° 11'.3 N
Markab	13° 54'.0	15° 09'.8 N
Menkar	314° 31'.8	4° 03'.6 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.6	69° 41'.5 S
Mirfak	309° 03'.4	49° 50'.0 N
Nunki	76° 17'.4	26° 18'.3 S
Peacock	53° 43'.5	56° 45'.3 S
Polaris	324° 19'.0	89° 13'.7 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.7	12° 33'.8 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.6 S
Rigil Kent	140° 12'.7	60° 48'.4 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.9	56° 29'.6 N
Shaula	96° 42'.8	37° 05'.9 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.3	43° 24'.4 S
Vega	80° 49'.2	38° 46'.5 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	291° 50'.9	11:46
Mars	339° 48'.2	08:34
Jupiter	201° 32'.4	17:44
Saturn	38° 49'.3	04:37

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
2 00	180° 31'.4	22° 11'.5 N	168° 33'.9	4'.1	23° 58'.0 N	1'.4	59'.6
01	195° 31'.3	11'.8	182° 57'.0	4'.0	56'.6	1'.6	
02	210° 31'.2	12'.1	197° 20'.0	4'.1	55'.0	1'.7	
03	225° 31'.1	12'.4	211° 43'.1	4'.1	53'.3	1'.9	
04	240° 31'.0	12'.8	226° 06'.2	4'.0	51'.4	2'.1	59'.7
05	255° 30'.9	13'.1	240° 29'.2	4'.1	49'.3	2'.3	
06	270° 30'.8	13'.4	254° 52'.3	4'.1	47'.0	2'.4	
07	285° 30'.7	13'.7	269° 15'.4	4'.0	44'.6	2'.5	
08	300° 30'.6	14'.0	283° 38'.4	4'.1	42'.1	2'.8	
09	315° 30'.5	14'.4	298° 01'.5	4'.1	39'.3	2'.9	
10	330° 30'.4	14'.7	312° 24'.6	4'.1	36'.4	3'.1	
11	345° 30'.3	15'.0	326° 47'.7	4'.1	33'.3	3'.2	59'.8
12	0° 30'.2	22° 15'.3 N	341° 10'.8	4'.2	23° 30'.1 N	3'.4	59'.8
13	15° 30'.1	15'.6	355° 34'.0	4'.1	26'.7	3'.6	
14	30° 30'.0	15'.9	9° 57'.1	4'.2	23'.1	3'.8	
15	45° 29'.9	16'.2	24° 20'.3	4'.2	19'.3	3'.9	
16	60° 29'.8	16'.6	38° 43'.5	4'.2	15'.4	4'.0	
17	75° 29'.6	16'.9	53° 06'.7	4'.3	11'.4	4'.3	
18	90° 29'.5	17'.2	67° 30'.0	4'.2	07'.1	4'.4	
19	105° 29'.4	17'.5	81° 53'.2	4'.4	02'.7	4'.5	59'.9
20	120° 29'.3	17'.8	96° 16'.6	4'.3	22° 58'.2 N	4'.7	
21	135° 29'.2	18'.1	110° 39'.9	4'.4	53'.5	4'.9	
22	150° 29'.1	18'.4	125° 03'.3	4'.4	48'.6	5'.1	
23	165° 29'.0	18'.7	139° 26'.7	4'.5	43'.5	5'.2	
3 00	180° 28'.9	22° 19'.0 N	153° 50'.2	4'.4	22° 38'.3 N	5'.3	59'.9
01	195° 28'.8	19'.3	168° 13'.6	4'.6	33'.0	5'.5	
02	210° 28'.7	19'.6	182° 37'.2	4'.6	27'.5	5'.7	
03	225° 28'.6	20'.0	197° 00'.8	4'.6	21'.8	5'.8	
04	240° 28'.5	20'.3	211° 24'.4	4'.7	16'.0	6'.0	
05	255° 28'.4	20'.6	225° 48'.1	4'.7	10'.0	6'.2	
06	270° 28'.3	20'.9	240° 11'.8	4'.8	03'.8	6'.3	60'.0
07	285° 28'.2	21'.2	254° 35'.6	4'.8	21° 57'.5 N	6'.4	
08	300° 28'.1	21'.5	268° 59'.4	4'.9	51'.1	6'.6	
09	315° 28'.0	21'.8	283° 23'.3	4'.9	44'.5	6'.7	
10	330° 27'.9	22'.1	297° 47'.2	5'.0	37'.8	6'.9	
11	345° 27'.8	22'.4	312° 11'.2	5'.0	30'.9	7'.1	
12	0° 27'.7	22° 22'.7 N	326° 35'.2	5'.1	21° 23'.8 N	7'.2	60'.0
13	15° 27'.6	23'.0	340° 59'.3	5'.2	16'.6	7'.3	
14	30° 27'.5	23'.3	355° 23'.5	5'.2	09'.3	7'.5	
15	45° 27'.4	23'.6	9° 47'.7	5'.3	01'.8	7'.6	
16	60° 27'.2	23'.9	24° 12'.0	5'.3	20° 54'.2 N	7'.8	
17	75° 27'.1	24'.2	38° 36'.3	5'.4	46'.4	7'.9	
18	90° 27'.0	24'.4	53° 00'.7	5'.5	38'.5	8'.0	
19	105° 26'.9	24'.7	67° 25'.2	5'.6	30'.5	8'.2	
20	120° 26'.8	25'.0	81° 49'.8	5'.6	22'.3	8'.3	
21	135° 26'.7	25'.3	96° 14'.4	5'.7	14'.0	8'.5	
22	150° 26'.6	25'.6	110° 39'.1	5'.7	05'.5	8'.5	
23	165° 26'.5	25'.9	125° 03'.8	5'.8	19° 57'.0 N	8'.8	
4 00	180° 26'.4	22° 26'.2 N	139° 28'.6	5'.9	19° 48'.2 N	8'.8	60'.0
01	195° 26'.3	26'.5	153° 53'.5	6'.0	39'.4	9'.0	
02	210° 26'.2	26'.8	168° 18'.5	6'.0	30'.4	9'.1	
03	225° 26'.1	27'.1	182° 43'.5	6'.1	21'.3	9'.2	
04	240° 26'.0	27'.4	197° 08'.6	6'.2	12'.1	9'.4	
05	255° 25'.9	27'.6	211° 33'.8	6'.3	02'.7	9'.4	
06	270° 25'.7	27'.9	225° 59'.1	6'.3	18° 53'.3 N	9'.7	
07	285° 25'.6	28'.2	240° 24'.4	6'.4	43'.6	9'.7	
08	300° 25'.5	28'.5	254° 49'.8	6'.5	33'.9	9'.8	
09	315° 25'.4	28'.8	269° 15'.3	6'.5	24'.1	10'.0	
10	330° 25'.3	29'.1	283° 40'.8	6'.7	14'.1	10'.1	
11	345° 25'.2	29'.4	298° 06'.5	6'.7	04'.0	10'.1	
12	0° 25'.1	22° 29'.6 N	312° 32'.2	6'.8	17° 53'.9 N	10'.3	60'.0
13	15° 25'.0	29'.9	326° 58'.0	6'.8	43'.6	10'.5	
14	30° 24'.9	30'.2	341° 23'.8	7'.0	33'.1	10'.5	
15	45° 24'.8	30'.5	355° 49'.8	7'.0	22'.6	10'.6	
16	60° 24'.7	30'.8	10° 15'.8	7'.1	12'.0	10'.8	
17	75° 24'.5	31'.0	24° 41'.9	7'.2	01'.2	10'.8	
18	90° 24'.4	31'.3	39° 08'.1	7'.2	16° 50'.4 N	10'.9	
19	105° 24'.3	31'.6	53° 34'.3	7'.4	39'.5	11'.1	
20	120° 24'.2	31'.9	68° 00'.7	7'.4	28'.4	11'.1	
21	135° 24'.1	32'.1	82° 27'.1	7'.5	17'.3	11'.3	
22	150° 24'.0	32'.4	96° 53'.6	7'.5	06'.0	11'.3	
23	165° 23'.9	32'.7	111° 20'.1	7'.7	15° 54'.7 N	11'.5	
	SD 15'.8	d 0'.3	SD 16'.3		16'.3		16'.3

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
2	2 06	2 01	11:58	13:18	00:48	1d 2%
3	1 56	1 51	11:58	14:19	01:49	2d 7%
4	1 46	1 41	11:58	15:17	02:49	3d 15%

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1992 June 5, 6, 7 (Fri, Saty, Sun)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.0		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
5 Friday 00	253° 40'.3	182° 54'.6	22° 04'.2 N	232° 04'.6	7° 41'.1 N	95° 01'.9	10° 15'.2 N	292° 30'.7	16° 08'.1 S
01	268° 42'.8	197° 53'.8	04'.7	247° 05'.4	41'.8	110° 04'.1	15'.1	307° 33'.2	08'.1
02	283° 45'.2	212° 53'.0	05'.2	262° 06'.1	42'.5	125° 06'.4	15'.0	322° 35'.7	08'.1
03	298° 47'.7	227° 52'.1	05'.7	277° 06'.8	43'.2	140° 08'.6	14'.9	337° 38'.2	08'.1
04	313° 50'.1	242° 51'.3	06'.2	292° 07'.5	43'.9	155° 10'.8	14'.8	352° 40'.7	08'.1
05	328° 52'.6	257° 50'.5	06'.7	307° 08'.2	44'.6	170° 13'.1	14'.7	7° 43'.2	08'.1
06	343° 55'.1	272° 49'.7	07'.2	322° 08'.9	45'.3	185° 15'.3	14'.6	22° 45'.7	08'.1
07	358° 57'.5	287° 48'.9	07'.7	337° 09'.7	46'.0	200° 17'.5	14'.5	37° 48'.2	08'.2
08	14° 00'.0	302° 48'.1	08'.2	352° 10'.4	46'.7	215° 19'.8	14'.4	52° 50'.7	08'.2
09	29° 02'.5	317° 47'.3	08'.7	7° 11'.1	47'.4	230° 22'.0	14'.3	67° 53'.1	08'.2
10	44° 04'.9	332° 46'.5	09'.2	22° 11'.8	48'.1	245° 24'.2	14'.2	82° 55'.6	08'.2
11	59° 07'.4	347° 45'.7	09'.7	37° 12'.5	48'.8	260° 26'.5	14'.1	97° 58'.1	08'.2
12	74° 09'.9	2° 44'.8	22° 10'.2 N	52° 13'.3	7° 49'.5 N	275° 28'.7	10° 14'.0 N	113° 00'.6	16° 08'.2 S
13	89° 12'.3	17° 44'.0	10'.7	67° 14'.0	50'.2	290° 30'.9	13'.9	128° 03'.1	08'.3
14	104° 14'.8	32° 43'.2	11'.1	82° 14'.7	50'.9	305° 33'.2	13'.8	143° 05'.6	08'.3
15	119° 17'.3	47° 42'.4	11'.6	97° 15'.4	51'.6	320° 35'.4	13'.7	158° 08'.1	08'.3
16	134° 19'.7	62° 41'.6	12'.1	112° 16'.1	52'.3	335° 37'.6	13'.6	173° 10'.6	08'.3
17	149° 22'.2	77° 40'.8	12'.6	127° 16'.8	53'.0	350° 39'.9	13'.5	188° 13'.1	08'.3
18	164° 24'.6	92° 40'.0	13'.1	142° 17'.6	53'.7	5° 42'.1	13'.4	203° 15'.6	08'.3
19	179° 27'.1	107° 39'.2	13'.6	157° 18'.3	54'.4	20° 44'.3	13'.3	218° 18'.1	08'.4
20	194° 29'.6	122° 38'.3	14'.0	172° 19'.0	55'.1	35° 46'.5	13'.2	233° 20'.6	08'.4
21	209° 32'.0	137° 37'.5	14'.5	187° 19'.7	55'.8	50° 48'.8	13'.1	248° 23'.1	08'.4
22	224° 34'.5	152° 36'.7	15'.0	202° 20'.4	56'.5	65° 51'.0	13'.0	263° 25'.6	08'.4
23	239° 37'.0	167° 35'.9	15'.5	217° 21'.1	57'.2	80° 53'.2	12'.9	278° 28'.1	08'.4
6 Saturday 00	254° 39'.4	182° 35'.1	22° 15'.9 N	232° 21'.9	7° 57'.9 N	95° 55'.5	10° 12'.8 N	293° 30'.6	16° 08'.4 S
01	269° 41'.9	197° 34'.3	16'.4	247° 22'.6	58'.6	110° 57'.7	12'.7	308° 33'.1	08'.5
02	284° 44'.4	212° 33'.4	16'.9	262° 23'.3	59'.3	125° 59'.9	12'.6	323° 35'.6	08'.5
03	299° 46'.8	227° 32'.6	17'.4	277° 24'.0	8° 00'.0 N	141° 02'.1	12'.5	338° 38'.1	08'.5
04	314° 49'.3	242° 31'.8	17'.8	292° 24'.7	00'.7	156° 04'.4	12'.4	353° 40'.5	08'.5
05	329° 51'.7	257° 31'.0	18'.3	307° 25'.4	01'.3	171° 06'.6	12'.3	8° 43'.0	08'.5
06	344° 54'.2	272° 30'.2	18'.8	322° 26'.2	02'.0	186° 08'.8	12'.2	23° 45'.5	08'.6
07	359° 56'.7	287° 29'.4	19'.2	337° 26'.9	02'.7	201° 11'.1	12'.1	38° 48'.0	08'.6
08	14° 59'.1	302° 28'.5	19'.7	352° 27'.6	03'.4	216° 13'.3	12'.0	53° 50'.5	08'.6
09	30° 01'.6	317° 27'.7	20'.2	7° 28'.3	04'.1	231° 15'.5	11'.9	68° 53'.0	08'.6
10	45° 04'.1	332° 26'.9	20'.6	22° 29'.0	04'.8	246° 17'.7	11'.8	83° 55'.5	08'.6
11	60° 06'.5	347° 26'.1	21'.1	37° 29'.8	05'.5	261° 20'.0	11'.7	98° 58'.0	08'.6
12	75° 09'.0	2° 25'.3	22° 21'.5 N	52° 30'.5	8° 06'.2 N	276° 22'.2	10° 11'.6 N	114° 00'.5	16° 08'.7 S
13	90° 11'.5	17° 24'.4	22'.0	67° 31'.2	06'.9	291° 24'.4	11'.5	129° 03'.0	08'.7
14	105° 13'.9	32° 23'.6	22'.5	82° 31'.9	07'.6	306° 26'.6	11'.4	144° 05'.5	08'.7
15	120° 16'.4	47° 22'.8	22'.9	97° 32'.6	08'.3	321° 28'.9	11'.3	159° 08'.0	08'.7
16	135° 18'.9	62° 22'.0	23'.4	112° 33'.3	09'.0	336° 31'.1	11'.2	174° 10'.5	08'.7
17	150° 21'.3	77° 21'.1	23'.8	127° 34'.1	09'.7	351° 33'.3	11'.1	189° 13'.0	08'.7
18	165° 23'.8	92° 20'.3	24'.3	142° 34'.8	10'.4	6° 35'.5	11'.0	204° 15'.5	08'.8
19	180° 26'.2	107° 19'.5	24'.7	157° 35'.5	11'.1	21° 37'.8	10'.9	219° 18'.0	08'.8
20	195° 28'.7	122° 18'.7	25'.2	172° 36'.2	11'.8	36° 40'.0	10'.8	234° 20'.5	08'.8
21	210° 31'.2	137° 17'.9	25'.7	187° 36'.9	12'.5	51° 42'.2	10'.7	249° 23'.0	08'.8
22	225° 33'.6	152° 17'.0	26'.1	202° 37'.6	13'.2	66° 44'.4	10'.6	264° 25'.5	08'.8
23	240° 36'.1	167° 16'.2	26'.6	217° 38'.4	13'.9	81° 46'.7	10'.5	279° 28'.0	08'.9
7 Sunday 00	255° 38'.6	182° 15'.4	22° 27'.0 N	232° 39'.1	8° 14'.5 N	96° 48'.9	10° 10'.4 N	294° 30'.5	16° 08'.9 S
01	270° 41'.0	197° 14'.6	27'.4	247° 39'.8	15'.2	111° 51'.1	10'.3	309° 33'.0	08'.9
02	285° 43'.5	212° 13'.7	27'.9	262° 40'.5	15'.9	126° 53'.3	10'.2	324° 35'.5	08'.9
03	300° 46'.0	227° 12'.9	28'.3	277° 41'.2	16'.6	141° 55'.5	10'.1	339° 38'.0	08'.9
04	315° 48'.4	242° 12'.1	28'.8	292° 41'.9	17'.3	156° 57'.8	10'.0	354° 40'.5	08'.9
05	330° 50'.9	257° 11'.2	29'.2	307° 42'.7	18'.0	172° 00'.0	09'.9	9° 43'.0	09'.0
06	345° 53'.4	272° 10'.4	29'.7	322° 43'.4	18'.7	187° 02'.2	09'.8	24° 45'.5	09'.0
07	0° 55'.8	287° 09'.6	30'.1	337° 44'.1	19'.4	202° 04'.4	09'.7	39° 48'.0	09'.0
08	15° 58'.3	302° 08'.8	30'.5	352° 44'.8	20'.1	217° 06'.7	09'.6	54° 50'.5	09'.0
09	31° 00'.7	317° 07'.9	31'.0	7° 45'.5	20'.8	232° 08'.9	09'.5	69° 53'.0	09'.0
10	46° 03'.2	332° 07'.1	31'.4	22° 46'.2	21'.5	247° 11'.1	09'.4	84° 55'.5	09'.1
11	61° 05'.7	347° 06'.3	31'.9	37° 47'.0	22'.2	262° 13'.3	09'.3	99° 58'.0	09'.1
12	76° 08'.1	2° 05'.5	22° 32'.3 N	52° 47'.7	8° 22'.8 N	277° 15'.5	10° 09'.2 N	115° 00'.5	16° 09'.1 S
13	91° 10'.6	17° 04'.6	32'.7	67° 48'.4	23'.5	292° 17'.8	09'.1	130° 03'.0	09'.1
14	106° 13'.1	32° 03'.8	33'.2	82° 49'.1	24'.2	307° 20'.0	08'.9	145° 05'.5	09'.1
15	121° 15'.5	47° 03'.0	33'.6	97° 49'.8	24'.9	322° 22'.2	08'.8	160° 08'.0	09'.2
16	136° 18'.0	62° 02'.1	34'.0	112° 50'.6	25'.6	337° 24'.4	08'.7	175° 10'.5	09'.2
17	151° 20'.5	77° 01'.3	34'.4	127° 51'.3	26'.3	352° 26'.6	08'.6	190° 13'.0	09'.2
18	166° 22'.9	92° 00'.5	34'.9	142° 52'.0	27'.0	7° 28'.9	08'.5	205° 15'.5	09'.2
19	181° 25'.4	106° 59'.6	35'.3	157° 52'.7	27'.7	22° 31'.1	08'.4	220° 18'.0	09'.2
20	196° 27'.8	121° 58'.8	35'.7	172° 53'.4	28'.4	37° 33'.3	08'.3	235° 20'.5	09'.2
21	211° 30'.3	136° 58'.0	36'.2	187° 54'.1	29'.1	52° 35'.5	08'.2	250° 23'.0	09'.3
22	226° 32'.8	151° 57'.1	36'.6	202° 54'.9	29'.7	67° 37'.7	08'.1	265° 25'.6	09'.3
23	241° 35'.2	166° 56'.3	37'.0	217° 55'.6	30'.4	82° 39'.9	08'.0	280° 28'.1	09'.3
	M.P. 06:56	v -0'.8	d 0'.5	v 0'.7	d 0'.7	v 2'.2	d 0'.1	v 2'.5	d 0'.0

STARS		
Name	SHA	Dec
Acamar	315° 30'.6	40° 19'.9 S
Achernar	335° 38'.7	57° 16'.2 S
Acrux	173° 26'.9	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.8 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 34'.0	56° 00'.2 N
Alkaid	153° 10'.8	49° 21'.1 N
Alnair	28° 03'.2	46° 59'.6 S
Alnilam	276° 02'.6	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.4 N
Alpheratz	357° 59'.9	29° 02'.8 N
Altair	62° 23'.3	8° 50'.9 N
Ankaa	353° 31'.2	42° 20'.5 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.2 N
Atria	108° 00'.7	69° 01'.0 S
Avior	234° 24'.9	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.7	52° 41'.6 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 41'.9	45° 15'.0 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.7	18° 01'.5 S
Dubhe	194° 10'.7	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.3 N
Enif	34° 02'.4	9° 50'.4 N
Fomalhaut	15° 41'.2	29° 39'.5 S
Gacrux	172° 18'.4	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.8	23° 25'.6 N
Kaus Aust.	84° 04'.2	34° 23'.3 S
Kochab	137° 18'.2	74° 11'.3 N
Markab	13° 54'.0	15° 09'.9 N
Menkar	314° 31'.8	4° 03'.7 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.6	69° 41'.5 S
Mirfak	309° 03'.4	49° 50'.0 N
Nunki	76° 17'.4	26° 18'.3 S
Peacock	53° 43'.4	56° 45'.3 S
Polaris	324° 18'.2	89° 13'.7 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.7	12° 33'.9 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.6 S
Rigil Kent	140° 12'.7	60° 48'.4 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.8	56° 29'.6 N
Shaula	96° 42'.8	37° 05'.9 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.3	43° 24'.4 S
Vega	80° 49'.2	38° 46'.5 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	287° 55'.6	11:50
Mars	337° 42'.4	08:30
Jupiter	201° 16'.0	17:34
Saturn	38° 51'.1	04:25

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
180° 23'.8	22° 33'.0 N	125° 46'.8	7'.7	15° 43'.2 N	11'.5	59'.9
195° 23'.7	33'.2	140° 13'.5	7'.8	31'.7	11'.6	
210° 23'.6	33'.5	154° 40'.3	7'.9	20'.1	11'.8	
225° 23'.4	33'.8	169° 07'.2	8'.0	08'.3	11'.8	
240° 23'.3	34'.1	183° 34'.2	8'.0	14° 56'.5 N	11'.9	
255° 23'.2	34'.3	198° 01'.2	8'.1	44'.6	11'.9	
270° 23'.1	34'.6	212° 28'.3	8'.2	32'.7	12'.1	
285° 23'.0	34'.9	226° 55'.5	8'.2	20'.6	12'.1	
300° 22'.9	35'.1	241° 22'.7	8'.4	08'.5	12'.3	
315° 22'.8	35'.4	255° 50'.1	8'.4	13° 56'.2 N	12'.3	
330° 22'.7	35'.7	270° 17'.5	8'.5	43'.9	12'.4	
345° 22'.5	35'.9	284° 45'.0	8'.6	31'.5	12'.4	
0° 22'.4	22° 36'.2 N	299° 12'.6	8'.6	13° 19'.1 N	12'.5	59'.8
15° 22'.3	36'.5	313° 40'.2	8'.7	06'.6	12'.6	
30° 22'.2	36'.7	328° 07'.9	8'.8	12° 54'.0 N	12'.7	
45° 22'.1	37'.0	342° 35'.7	8'.9	41'.3	12'.8	
60° 22'.0	37'.3	357° 03'.6	8'.9	28'.5	12'.8	
75° 21'.9	37'.5	11° 31'.5	9'.0	15'.7	12'.9	
90° 21'.8	37'.8	25° 59'.5	9'.0	02'.8	12'.9	
105° 21'.6	38'.1	40° 27'.5	9'.2	11° 49'.9 N	13'.0	
120° 21'.5	38'.3	54° 55'.7	9'.2	36'.9	13'.1	
135° 21'.4	38'.6	69° 23'.9	9'.3	23'.8	13'.1	59'.7
150° 21'.3	38'.8	83° 52'.2	9'.3	10'.7	13'.2	
165° 21'.2	39'.1	98° 20'.5	9'.4	10° 57'.5 N	13'.3	
180° 21'.1	22° 39'.4 N	112° 48'.9	9'.5	10° 44'.2 N	13'.3	59'.7
195° 21'.0	39'.6	127° 17'.4	9'.6	30'.9	13'.3	
210° 20'.9	39'.9	141° 46'.0	9'.6	17'.6	13'.4	
225° 20'.7	40'.1	156° 14'.6	9'.6	04'.2	13'.5	
240° 20'.6	40'.4	170° 43'.2	9'.8	9° 50'.7 N	13'.5	
255° 20'.5	40'.6	185° 12'.0	9'.8	37'.2	13'.5	59'.6
270° 20'.4	40'.9	199° 40'.8	9'.8	23'.7	13'.6	
285° 20'.3	41'.1	214° 09'.6	10'.0	10'.1	13'.7	
300° 20'.2	41'.4	228° 38'.6	9'.9	8° 56'.4 N	13'.7	
315° 20'.1	41'.6	243° 07'.5	10'.1	42'.7	13'.7	
330° 19'.9	41'.9	257° 36'.6	10'.1	29'.0	13'.8	
345° 19'.8	42'.1	272° 05'.7	10'.1	15'.2	13'.8	
0° 19'.7	22° 42'.4 N	286° 34'.8	10'.2	8° 01'.4 N	13'.8	59'.5
15° 19'.6	42'.6	301° 04'.0	10'.3	7° 47'.6 N	13'.9	
30° 19'.5	42'.9	315° 33'.3	10'.3	33'.7	13'.9	
45° 19'.4	43'.1	330° 02'.6	10'.4	19'.8	13'.9	
60° 19'.2	43'.4	344° 32'.0	10'.4	05'.9	14'.0	
75° 19'.1	43'.6	359° 01'.4	10'.5	6° 51'.9 N	14'.0	
90° 19'.0	43'.9	13° 30'.9	10'.5	37'.9	14'.1	59'.4
105° 18'.9	44'.1	28° 00'.4	10'.6	23'.8	14'.0	
120° 18'.8	44'.4	42° 30'.0	10'.6	09'.8	14'.1	
135° 18'.7	44'.6	56° 59'.6	10'.7	5° 55'.7 N	14'.1	
150° 18'.5	44'.8	71° 29'.3	10'.7	41'.6	14'.2	
165° 18'.4	45'.1	85° 59'.0	10'.8	27'.4	14'.1	
180° 18'.3	22° 45'.3 N	100° 28'.8	10'.8	5° 13'.3 N	14'.2	59'.3
195° 18'.2	45'.6	114° 58'.6	10'.8	4° 59'.1 N	14'.2	
210° 18'.1	45'.8	129° 28'.4	10'.9	44'.9	14'.2	
225° 18'.0	46'.1	143° 58'.3	10'.9	30'.7	14'.2	
240° 17'.8	46'.3	158° 28'.2	11'.0	16'.5	14'.2	
255° 17'.7	46'.5	172° 58'.2	11'.0	02'.3	14'.3	
270° 17'.6	46'.8	187° 28'.2	11'.1	3° 48'.0 N	14'.3	59'.2
285° 17'.5	47'.0	201° 58'.3	11'.1	33'.7	14'.2	
300° 17'.4	47'.2	216° 28'.4	11'.1	19'.5	14'.3	
315° 17'.3	47'.5	230° 58'.5	11'.1	05'.2	14'.3	
330° 17'.1	47'.7	245° 28'.6	11'.2	2° 50'.9 N	14'.3	
345° 17'.0	47'.9	259° 58'.8	11'.3	36'.6	14'.3	59'.1
0° 16'.9	22° 48'.2 N	274° 29'.1	11'.2	2° 22'.3 N	14'.3	59'.1
15° 16'.8	48'.4	288° 59'.3	11'.3	08'.0	14'.3	
30° 16'.7	48'.6	303° 29'.6	11'.3	1° 53'.7 N	14'.3	
45° 16'.6	48'.9	317° 59'.9	11'.4	39'.4	14'.3	
60° 16'.4	49'.1	332° 30'.3	11'.3	25'.1	14'.3	
75° 16'.3	49'.3	347° 00'.6	11'.4	10'.8	14'.3	59'.0
90° 16'.2	49'.6	1° 31'.0	11'.5	0° 56'.5 N	14'.3	
105° 16'.1	49'.8	16° 01'.5	11'.4	42'.2	14'.3	
120° 16'.0	50'.0	30° 31'.9	11'.5	27'.9	14'.3	
135° 15'.8	50'.2	45° 02'.4	11'.5	13'.6	14'.3	
150° 15'.7	50'.5	59° 32'.9	11'.5	0° 00'.7 S	14'.2	58'.9
165° 15'.6	50'.7	74° 03'.4	11'.5	14'.9	14'.3	
SD 15'.8	d 0'.2	SD	16'.3	16'.2	16'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
5	1 35	1 30	11:59	16:12	03:45	4d 24%
6	1 25	1 19	11:59	17:04	04:38	5d 35%
7	1 13	1 08	11:59	17:54	05:29	6d 46%

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1992 June 8, 9, 10 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -2.0		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
8 Monday 00	256° 37'.7	181° 55'.5	22° 37'.4 N	232° 56'.3	8° 31'.1 N	97° 42'.2	10° 07'.9 N	295° 30'.6	16° 09'.3 S
01	271° 40'.2	196° 54'.6	37'.8	247° 57'.0	31'.8	112° 44'.4	07'.8	310° 33'.1	09'.3
02	286° 42'.6	211° 53'.8	38'.3	262° 57'.7	32'.5	127° 46'.6	07'.7	325° 35'.6	09'.4
03	301° 45'.1	226° 53'.0	38'.7	277° 58'.4	33'.2	142° 48'.8	07'.6	340° 38'.1	09'.4
04	316° 47'.6	241° 52'.1	39'.1	292° 59'.2	33'.9	157° 51'.0	07'.5	355° 40'.6	09'.4
05	331° 50'.0	256° 51'.3	39'.5	307° 59'.9	34'.6	172° 53'.2	07'.4	10° 43'.1	09'.4
06	346° 52'.5	271° 50'.5	39'.9	323° 00'.6	35'.3	187° 55'.5	07'.3	25° 45'.6	09'.4
07	1° 55'.0	286° 49'.6	40'.3	338° 01'.3	35'.9	202° 57'.7	07'.2	40° 48'.1	09'.5
08	16° 57'.4	301° 48'.8	40'.8	353° 02'.0	36'.6	217° 59'.9	07'.1	55° 50'.6	09'.5
09	31° 59'.9	316° 48'.0	41'.2	8° 02'.7	37'.3	233° 02'.1	07'.0	70° 53'.1	09'.5
10	47° 02'.3	331° 47'.1	41'.6	23° 03'.5	38'.0	248° 04'.3	06'.9	85° 55'.6	09'.5
11	62° 04'.8	346° 46'.3	42'.0	38° 04'.2	38'.7	263° 06'.5	06'.8	100° 58'.1	09'.5
12	77° 07'.3	1° 45'.5	22° 42'.4 N	53° 04'.9	8° 39'.4 N	278° 08'.8	10° 06'.7 N	116° 00'.6	16° 09'.6 S
13	92° 09'.7	16° 44'.6	42'.8	68° 05'.6	40'.1	293° 11'.0	06'.6	131° 03'.1	09'.6
14	107° 12'.2	31° 43'.8	43'.2	83° 06'.3	40'.7	308° 13'.2	06'.4	146° 05'.6	09'.6
15	122° 14'.7	46° 42'.9	43'.6	98° 07'.0	41'.4	323° 15'.4	06'.3	161° 08'.1	09'.6
16	137° 17'.1	61° 42'.1	44'.0	113° 07'.8	42'.1	338° 17'.6	06'.2	176° 10'.6	09'.6
17	152° 19'.6	76° 41'.3	44'.4	128° 08'.5	42'.8	353° 19'.8	06'.1	191° 13'.1	09'.7
18	167° 22'.1	91° 40'.4	44'.8	143° 09'.2	43'.5	8° 22'.0	06'.0	206° 15'.7	09'.7
19	182° 24'.5	106° 39'.6	45'.2	158° 09'.9	44'.2	23° 24'.3	05'.9	221° 18'.2	09'.7
20	197° 27'.0	121° 38'.7	45'.6	173° 10'.6	44'.9	38° 26'.5	05'.8	236° 20'.7	09'.7
21	212° 29'.4	136° 37'.9	46'.0	188° 11'.3	45'.5	53° 28'.7	05'.7	251° 23'.2	09'.7
22	227° 31'.9	151° 37'.1	46'.4	203° 12'.1	46'.2	68° 30'.9	05'.6	266° 25'.7	09'.8
23	242° 34'.4	166° 36'.2	46'.8	218° 12'.8	46'.9	83° 33'.1	05'.5	281° 28'.2	09'.8
9 Tuesday 00	257° 36'.8	181° 35'.4	22° 47'.2 N	233° 13'.5	8° 47'.6 N	98° 35'.3	10° 05'.4 N	296° 30'.7	16° 09'.8 S
01	272° 39'.3	196° 34'.5	47'.6	248° 14'.2	48'.3	113° 37'.5	05'.3	311° 33'.2	09'.8
02	287° 41'.8	211° 33'.7	48'.0	263° 14'.9	49'.0	128° 39'.7	05'.2	326° 35'.7	09'.9
03	302° 44'.2	226° 32'.9	48'.4	278° 15'.6	49'.7	143° 42'.0	05'.1	341° 38'.2	09'.9
04	317° 46'.7	241° 32'.0	48'.8	293° 16'.4	50'.3	158° 44'.2	05'.0	356° 40'.7	09'.9
05	332° 49'.2	256° 31'.2	49'.2	308° 17'.1	51'.0	173° 46'.4	04'.9	11° 43'.2	09'.9
06	347° 51'.6	271° 30'.3	49'.5	323° 17'.8	51'.7	188° 48'.6	04'.7	26° 45'.7	09'.9
07	2° 54'.1	286° 29'.5	49'.9	338° 18'.5	52'.4	203° 50'.8	04'.6	41° 48'.3	10'.0
08	17° 56'.6	301° 28'.6	50'.3	353° 19'.2	53'.1	218° 53'.0	04'.5	56° 50'.8	10'.0
09	32° 59'.0	316° 27'.8	50'.7	8° 19'.9	53'.8	233° 55'.2	04'.4	71° 53'.3	10'.0
10	48° 01'.5	331° 27'.0	51'.1	23° 20'.7	54'.4	248° 57'.4	04'.3	86° 55'.8	10'.0
11	63° 03'.9	346° 26'.1	51'.5	38° 21'.4	55'.1	263° 59'.6	04'.2	101° 58'.3	10'.0
12	78° 06'.4	1° 25'.3	22° 51'.8 N	53° 22'.1	8° 55'.8 N	279° 01'.8	10° 04'.1 N	117° 00'.8	16° 10'.1 S
13	93° 08'.9	16° 24'.4	52'.2	68° 22'.8	56'.5	294° 04'.1	04'.0	132° 03'.3	10'.1
14	108° 11'.3	31° 23'.6	52'.6	83° 23'.5	57'.2	309° 06'.3	03'.9	147° 05'.8	10'.1
15	123° 13'.8	46° 22'.7	53'.0	98° 24'.2	57'.9	324° 08'.5	03'.8	162° 08'.3	10'.1
16	138° 16'.3	61° 21'.9	53'.4	113° 24'.9	58'.5	339° 10'.7	03'.7	177° 10'.8	10'.1
17	153° 18'.7	76° 21'.0	53'.7	128° 25'.7	59'.2	354° 12'.9	03'.6	192° 13'.4	10'.2
18	168° 21'.2	91° 20'.2	54'.1	143° 26'.4	59'.9	9° 15'.1	03'.5	207° 15'.9	10'.2
19	183° 23'.7	106° 19'.3	54'.5	158° 27'.1	9° 00'.6 N	24° 17'.3	03'.4	222° 18'.4	10'.2
20	198° 26'.1	121° 18'.5	54'.8	173° 27'.8	01'.3	39° 19'.5	03'.2	237° 20'.9	10'.2
21	213° 28'.6	136° 17'.7	55'.2	188° 28'.5	01'.9	54° 21'.7	03'.1	252° 23'.4	10'.3
22	228° 31'.1	151° 16'.8	55'.6	203° 29'.2	02'.6	69° 23'.9	03'.0	267° 25'.9	10'.3
23	243° 33'.5	166° 16'.0	56'.0	218° 30'.0	03'.3	84° 26'.1	02'.9	282° 28'.4	10'.3
10 Wednesday 00	258° 36'.0	181° 15'.1	22° 56'.3 N	233° 30'.7	9° 04'.0 N	99° 28'.3	10° 02'.8 N	297° 30'.9	16° 10'.3 S
01	273° 38'.4	196° 14'.3	56'.7	248° 31'.4	04'.7	114° 30'.6	02'.7	312° 33'.4	10'.3
02	288° 40'.9	211° 13'.4	57'.1	263° 32'.1	05'.3	129° 32'.8	02'.6	327° 36'.0	10'.4
03	303° 43'.4	226° 12'.6	57'.4	278° 32'.8	06'.0	144° 35'.0	02'.5	342° 38'.5	10'.4
04	318° 45'.8	241° 11'.7	57'.8	293° 33'.5	06'.7	159° 37'.2	02'.4	357° 41'.0	10'.4
05	333° 48'.3	256° 10'.9	58'.1	308° 34'.3	07'.4	174° 39'.4	02'.3	12° 43'.5	10'.4
06	348° 50'.8	271° 10'.0	58'.5	323° 35'.0	08'.1	189° 41'.6	02'.2	27° 46'.0	10'.5
07	3° 53'.2	286° 09'.2	58'.9	338° 35'.7	08'.7	204° 43'.8	02'.1	42° 48'.5	10'.5
08	18° 55'.7	301° 08'.3	59'.2	353° 36'.4	09'.4	219° 46'.0	01'.9	57° 51'.0	10'.5
09	33° 58'.2	316° 07'.5	59'.6	8° 37'.1	10'.1	234° 48'.2	01'.8	72° 53'.5	10'.5
10	49° 00'.6	331° 06'.6	59'.9	23° 37'.8	10'.8	249° 50'.4	01'.7	87° 56'.1	10'.5
11	64° 03'.1	346° 05'.8	23° 00'.3 N	38° 38'.6	11'.5	264° 52'.6	01'.6	102° 58'.6	10'.6
12	79° 05'.5	1° 04'.9	23° 00'.6 N	53° 39'.3	9° 12'.1 N	279° 54'.8	10° 01'.5 N	118° 01'.1	16° 10'.6 S
13	94° 08'.0	16° 04'.1	01'.0	68° 40'.0	12'.8	294° 57'.0	01'.4	133° 03'.6	10'.6
14	109° 10'.5	31° 03'.2	01'.3	83° 40'.7	13'.5	309° 59'.2	01'.3	148° 06'.1	10'.6
15	124° 12'.9	46° 02'.4	01'.7	98° 41'.4	14'.2	325° 01'.4	01'.2	163° 08'.6	10'.7
16	139° 15'.4	61° 01'.5	02'.0	113° 42'.1	14'.8	340° 03'.6	01'.1	178° 11'.1	10'.7
17	154° 17'.9	76° 00'.6	02'.4	128° 42'.8	15'.5	355° 05'.8	01'.0	193° 13'.6	10'.7
18	169° 20'.3	90° 59'.8	02'.7	143° 43'.6	16'.2	10° 08'.0	00'.8	208° 16'.2	10'.7
19	184° 22'.8	105° 58'.9	03'.1	158° 44'.3	16'.9	25° 10'.2	00'.7	223° 18'.7	10'.7
20	199° 25'.3	120° 58'.1	03'.4	173° 45'.0	17'.6	40° 12'.4	00'.6	238° 21'.2	10'.8
21	214° 27'.7	135° 57'.2	03'.8	188° 45'.7	18'.2	55° 14'.6	00'.5	253° 23'.7	10'.8
22	229° 30'.2	150° 56'.4	04'.1	203° 46'.4	18'.9	70° 16'.8	00'.4	268° 26'.2	10'.8
23	244° 32'.7	165° 55'.5	04'.4	218° 47'.1	19'.6	85° 19'.0	00'.3	283° 28'.7	10'.8
	M.P. 06:44	v -0'.8	d 0'.4	v 0'.7	d 0'.7	v 2'.2	d 0'.1	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.6	40° 19'.9 S
Achernar	335° 38'.7	57° 16'.2 S
Acrux	173° 26'.9	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.8 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 34'.1	56° 00'.2 N
Alkaid	153° 10'.8	49° 21'.1 N
Alnair	28° 03'.2	46° 59'.6 S
Alnilam	276° 02'.6	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.4 N
Alpheratz	357° 59'.9	29° 02'.8 N
Altair	62° 23'.3	8° 50'.9 N
Ankaa	353° 31'.2	42° 20'.5 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.3 N
Atria	108° 00'.6	69° 01'.0 S
Avior	234° 25'.0	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.7	52° 41'.6 S
Capella	280° 58'.2	45° 59'.5 N
Deneb	49° 41'.9	45° 15'.1 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.7	18° 01'.5 S
Dubhe	194° 10'.8	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.3 N
Enif	34° 02'.4	9° 50'.4 N
Fomalhaut	15° 41'.2	29° 39'.5 S
Gacrux	172° 18'.4	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.8	23° 25'.6 N
Kaus Aust.	84° 04'.2	34° 23'.3 S
Kochab	137° 18'.2	74° 11'.3 N
Markab	13° 54'.0	15° 09'.9 N
Menkar	314° 31'.8	4° 03'.7 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.7	69° 41'.5 S
Mirfak	309° 03'.4	49° 50'.0 N
Nunki	76° 17'.4	26° 18'.3 S
Peacock	53° 43'.4	56° 45'.3 S
Polaris	324° 17'.4	89° 13'.7 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.7	12° 33'.9 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.6 S
Rigil Kent	140° 12'.7	60° 48'.4 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.8	56° 29'.6 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 04'.3	43° 24'.4 S
Vega	80° 49'.2	38° 46'.5 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	283° 58'.5	11:54
Mars	335° 36'.6	08:27
Jupiter	200° 58'.5	17:23
Saturn	38° 53'.9	04:13

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
8 Monday 00	180° 15'.5	22° 50'.9 N	88° 33'.9	11'.6	0° 29'.2 S	14'.2	58'.9
01	195° 15'.4	51'.1	103° 04'.5	11'.5	43'.4	14'.3	
02	210° 15'.2	51'.4	117° 35'.0	11'.6	57'.7	14'.2	
03	225° 15'.1	51'.6	132° 05'.6	11'.6	1° 11'.9 S	14'.2	58'.8
04	240° 15'.0	51'.8	146° 36'.2	11'.6	26'.1	14'.2	
05	255° 14'.9	52'.0	161° 06'.8	11'.7	40'.3	14'.1	
06	270° 14'.8	52'.2	175° 37'.5	11'.6	54'.4	14'.2	
07	285° 14'.6	52'.5	190° 08'.1	11'.7	2° 08'.6 S	14'.1	
08	300° 14'.5	52'.7	204° 38'.8	11'.6	22'.7	14'.1	58'.7
09	315° 14'.4	52'.9	219° 09'.4	11'.7	36'.8	14'.1	
10	330° 14'.3	53'.1	233° 40'.1	11'.7	50'.9	14'.0	
11	345° 14'.2	53'.3	248° 10'.8	11'.7	3° 04'.9 S	14'.1	
12	0° 14'.0	22° 53'.6 N	262° 41'.5	11'.7	3° 19'.0 S	14'.0	58'.7
13	15° 13'.9	53'.8	277° 12'.2	11'.7	33'.0	13'.9	58'.6
14	30° 13'.8	54'.0	291° 42'.9	11'.7	46'.9	14'.0	
15	45° 13'.7	54'.2	306° 13'.6	11'.7	4° 00'.9 S	13'.9	
16	60° 13'.6	54'.4	320° 44'.3	11'.7	14'.8	13'.9	
17	75° 13'.4	54'.6	335° 15'.0	11'.7	28'.7	13'.9	
18	90° 13'.3	54'.8	349° 45'.7	11'.7	42'.6	13'.8	58'.5
19	105° 13'.2	55'.0	4° 16'.4	11'.8	56'.4	13'.8	
20	120° 13'.1	55'.3	18° 47'.2	11'.7	5° 10'.2 S	13'.7	
21	135° 13'.0	55'.5	33° 17'.9	11'.7	23'.9	13'.7	
22	150° 12'.8	55'.7	47° 48'.6	11'.7	37'.6	13'.7	
23	165° 12'.7	55'.9	62° 19'.3	11'.7	51'.3	13'.7	58'.4
9 Tuesday 00	180° 12'.6	22° 56'.1 N	76° 50'.0	11'.7	6° 05'.0 S	13'.5	58'.4
01	195° 12'.5	56'.3	91° 20'.7	11'.7	18'.5	13'.6	
02	210° 12'.3	56'.5	105° 51'.4	11'.7	32'.1	13'.5	
03	225° 12'.2	56'.7	120° 22'.1	11'.6	45'.6	13'.5	58'.3
04	240° 12'.1	56'.9	134° 52'.7	11'.7	59'.1	13'.4	
05	255° 12'.0	57'.1	149° 23'.4	11'.7	7° 12'.5 S	13'.4	
06	270° 11'.9	57'.3	163° 54'.1	11'.6	25'.9	13'.3	
07	285° 11'.7	57'.5	178° 24'.7	11'.6	39'.2	13'.3	
08	300° 11'.6	57'.7	192° 55'.3	11'.7	52'.5	13'.3	58'.2
09	315° 11'.5	57'.9	207° 26'.0	11'.6	8° 05'.8 S	13'.1	
10	330° 11'.4	58'.1	221° 56'.6	11'.6	18'.9	13'.2	
11	345° 11'.2	58'.3	236° 27'.2	11'.5	32'.1	13'.1	
12	0° 11'.1	22° 58'.5 N	250° 57'.7	11'.6	8° 45'.2 S	13'.0	58'.2
13	15° 11'.0	58'.7	265° 28'.3	11'.6	58'.2	13'.0	58'.1
14	30° 10'.9	58'.9	279° 58'.9	11'.5	9° 11'.2 S	12'.9	
15	45° 10'.8	59'.1	294° 29'.4	11'.5	24'.1	12'.8	
16	60° 10'.6	59'.3	308° 59'.9	11'.5	36'.9	12'.8	
17	75° 10'.5	59'.5	323° 30'.4	11'.5	49'.7	12'.8	
18	90° 10'.4	59'.7	338° 00'.9	11'.4	10° 02'.5 S	12'.7	58'.0
19	105° 10'.3	59'.9	352° 31'.3	11'.5	15'.2	12'.6	
20	120° 10'.1	23° 00'.1 N	7° 01'.8	11'.4	27'.8	12'.6	
21	135° 10'.0	00'.3	21° 32'.2	11'.4	40'.4	12'.5	
22	150° 09'.9	00'.5	36° 02'.6	11'.3	52'.9	12'.4	57'.9
23	165° 09'.8	00'.7	50° 32'.9	11'.4	11° 05'.3 S	12'.4	
10 Wednesday 00	180° 09'.6	23° 00'.9 N	65° 03'.3	11'.3	11° 17'.7 S	12'.3	57'.9
01	195° 09'.5	01'.1	79° 33'.6	11'.3	30'.0	12'.2	
02	210° 09'.4	01'.2	94° 03'.9	11'.3	42'.2	12'.2	
03	225° 09'.3	01'.4	108° 34'.2	11'.2	54'.4	12'.1	57'.8
04	240° 09'.1	01'.6	123° 04'.4	11'.2	12° 06'.5 S	12'.0	
05	255° 09'.0	01'.8	137° 34'.6	11'.2	18'.5	12'.0	
06	270° 08'.9	02'.0	152° 04'.8	11'.2	30'.5	11'.9	
07	285° 08'.8	02'.2	166° 35'.0	11'.1	42'.4	11'.8	
08	300° 08'.7	02'.4	181° 05'.1	11'.1	54'.2	11'.7	57'.7
09	315° 08'.5	02'.5	195° 35'.2	11'.1	13° 05'.9 S	11'.7	
10	330° 08'.4	02'.7	210° 05'.3	11'.0	17'.6	11'.6	
11	345° 08'.3	02'.9	224° 35'.3	11'.0	29'.2	11'.5	
12	0° 08'.2	23° 03'.1 N	239° 05'.3	11'.0	13° 40'.7 S	11'.4	57'.6
13	15° 08'.0	03'.3	253° 35'.3	11'.0	52'.1	11'.4	
14	30° 07'.9	03'.5	268° 05'.3	10'.9	14° 03'.5 S	11'.2	
15	45° 07'.8	03'.6	282° 35'.2	10'.9	14'.7	11'.2	
16	60° 07'.7	03'.8	297° 05'.1	10'.8	25'.9	11'.1	
17	75° 07'.5	04'.0	311° 34'.9	10'.9	37'.0	11'.1	57'.5
18	90° 07'.4	04'.2	326° 04'.8	10'.8	48'.1	10'.9	
19	105° 07'.3	04'.4	340° 34'.6	10'.7	59'.0	10'.9	
20	120° 07'.1	04'.5	355° 04'.3	10'.7	15° 09'.9 S	10'.7	
21	135° 07'.0	04'.7	9° 34'.0	10'.7	20'.6	10'.7	
22	150° 06'.9	04'.9	24° 03'.7	10'.7	31'.3	10'.6	57'.4
23	165° 06'.8	05'.1	38° 33'.4	10'.6	41'.9	10'.5	
	SD 15'.8	d 0'.2	SD 16'.0		15'.8	15'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
8	1 02	0 56	11:59	18:42	06:18	7d 57%
9	0 51	0 45	11:59	19:31	07:07	8d 68%
10	0 39	0 33	11:59	20:20	07:56	9d 78%

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1992 June 11, 12, 13 (Thur, Fri, Sat)

GMT	ARIES	VENUS -3.9		MARS +1.0		JUPITER -1.9		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
11 Thursday 00	259° 35'.1	180° 54'.7	23° 04'.8 N	233° 47'.9	9° 20'.3 N	100° 21'.2	10° 00'.2 N	298° 31'.3	16° 10'.9 S
01	274° 37'.6	195° 53'.8	05'.1	248° 48'.6	20'.9	115° 23'.4	00'.1	313° 33'.8	10'.9
02	289° 40'.0	210° 53'.0	05'.5	263° 49'.3	21'.6	130° 25'.6	00'.0	328° 36'.3	10'.9
03	304° 42'.5	225° 52'.1	05'.8	278° 50'.0	22'.3	145° 27'.8	9° 59'.9 N	343° 38'.8	10'.9
04	319° 45'.0	240° 51'.2	06'.1	293° 50'.7	23'.0	160° 30'.0	59'.7	358° 41'.3	11'.0
05	334° 47'.4	255° 50'.4	06'.5	308° 51'.4	23'.6	175° 32'.3	59'.6	13° 43'.8	11'.0
06	349° 49'.9	270° 49'.5	06'.8	323° 52'.2	24'.3	190° 34'.5	59'.5	28° 46'.3	11'.0
07	4° 52'.4	285° 48'.7	07'.1	338° 52'.9	25'.0	205° 36'.7	59'.4	43° 48'.9	11'.0
08	19° 54'.8	300° 47'.8	07'.5	353° 53'.6	25'.7	220° 38'.9	59'.3	58° 51'.4	11'.0
09	34° 57'.3	315° 47'.0	07'.8	8° 54'.3	26'.3	235° 41'.1	59'.2	73° 53'.9	11'.1
10	49° 59'.8	330° 46'.1	08'.1	23° 55'.0	27'.0	250° 43'.2	59'.1	88° 56'.4	11'.1
11	65° 02'.2	345° 45'.2	08'.4	38° 55'.7	27'.7	265° 45'.4	59'.0	103° 58'.9	11'.1
12	80° 04'.7	0° 44'.4	23° 08'.8 N	53° 56'.4	9° 28'.4 N	280° 47'.6	9° 58'.9 N	119° 01'.4	16° 11'.1 S
13	95° 07'.2	15° 43'.5	09'.1	68° 57'.2	29'.0	295° 49'.8	58'.7	134° 04'.0	11'.2
14	110° 09'.6	30° 42'.7	09'.4	83° 57'.9	29'.7	310° 52'.0	58'.6	149° 06'.5	11'.2
15	125° 12'.1	45° 41'.8	09'.7	98° 58'.6	30'.4	325° 54'.2	58'.5	164° 09'.0	11'.2
16	140° 14'.5	60° 41'.0	10'.1	113° 59'.3	31'.1	340° 56'.4	58'.4	179° 11'.5	11'.2
17	155° 17'.0	75° 40'.1	10'.4	129° 00'.0	31'.7	355° 58'.6	58'.3	194° 14'.0	11'.3
18	170° 19'.5	90° 39'.2	10'.7	144° 00'.7	32'.4	11° 00'.8	58'.2	209° 16'.6	11'.3
19	185° 21'.9	105° 38'.4	11'.0	159° 01'.5	33'.1	26° 03'.0	58'.1	224° 19'.1	11'.3
20	200° 24'.4	120° 37'.5	11'.3	174° 02'.2	33'.7	41° 05'.2	58'.0	239° 21'.6	11'.3
21	215° 26'.9	135° 36'.7	11'.6	189° 02'.9	34'.4	56° 07'.4	57'.8	254° 24'.1	11'.4
22	230° 29'.3	150° 35'.8	12'.0	204° 03'.6	35'.1	71° 09'.6	57'.7	269° 26'.6	11'.4
23	245° 31'.8	165° 34'.9	12'.3	219° 04'.3	35'.8	86° 11'.8	57'.6	284° 29'.2	11'.4
12 Friday 00	260° 34'.3	180° 34'.1	23° 12'.6 N	234° 05'.0	9° 36'.4 N	101° 14'.0	9° 57'.5 N	299° 31'.7	16° 11'.4 S
01	275° 36'.7	195° 33'.2	12'.9	249° 05'.7	37'.1	116° 16'.2	57'.4	314° 34'.2	11'.5
02	290° 39'.2	210° 32'.3	13'.2	264° 06'.5	37'.8	131° 18'.4	57'.3	329° 36'.7	11'.5
03	305° 41'.6	225° 31'.5	13'.5	279° 07'.2	38'.4	146° 20'.6	57'.2	344° 39'.2	11'.5
04	320° 44'.1	240° 30'.6	13'.8	294° 07'.9	39'.1	161° 22'.8	57'.1	359° 41'.7	11'.5
05	335° 46'.6	255° 29'.8	14'.1	309° 08'.6	39'.8	176° 25'.0	56'.9	14° 44'.3	11'.5
06	350° 49'.0	270° 28'.9	14'.4	324° 09'.3	40'.5	191° 27'.2	56'.8	29° 46'.8	11'.6
07	5° 51'.5	285° 28'.0	14'.7	339° 10'.0	41'.1	206° 29'.4	56'.7	44° 49'.3	11'.6
08	20° 54'.0	300° 27'.2	15'.0	354° 10'.8	41'.8	221° 31'.6	56'.6	59° 51'.8	11'.6
09	35° 56'.4	315° 26'.3	15'.3	9° 11'.5	42'.5	236° 33'.8	56'.5	74° 54'.3	11'.6
10	50° 58'.9	330° 25'.4	15'.6	24° 12'.2	43'.1	251° 36'.0	56'.4	89° 56'.9	11'.7
11	66° 01'.4	345° 24'.6	15'.9	39° 12'.9	43'.8	266° 38'.2	56'.3	104° 59'.4	11'.7
12	81° 03'.8	0° 23'.7	23° 16'.2 N	54° 13'.6	9° 44'.5 N	281° 40'.4	9° 56'.2 N	120° 01'.9	16° 11'.7 S
13	96° 06'.3	15° 22'.8	16'.5	69° 14'.3	45'.1	296° 42'.6	56'.0	135° 04'.4	11'.7
14	111° 08'.8	30° 22'.0	16'.8	84° 15'.0	45'.8	311° 44'.8	55'.9	150° 07'.0	11'.8
15	126° 11'.2	45° 21'.1	17'.1	99° 15'.8	46'.5	326° 46'.9	55'.8	165° 09'.5	11'.8
16	141° 13'.7	60° 20'.3	17'.4	114° 16'.5	47'.2	341° 49'.1	55'.7	180° 12'.0	11'.8
17	156° 16'.1	75° 19'.4	17'.7	129° 17'.2	47'.8	356° 51'.3	55'.6	195° 14'.5	11'.8
18	171° 18'.6	90° 18'.5	18'.0	144° 17'.9	48'.5	11° 53'.5	55'.5	210° 17'.0	11'.9
19	186° 21'.1	105° 17'.7	18'.3	159° 18'.6	49'.2	26° 55'.7	55'.4	225° 19'.6	11'.9
20	201° 23'.5	120° 16'.8	18'.6	174° 19'.3	49'.8	41° 57'.9	55'.2	240° 22'.1	11'.9
21	216° 26'.0	135° 15'.9	18'.8	189° 20'.0	50'.5	57° 00'.1	55'.1	255° 24'.6	11'.9
22	231° 28'.5	150° 15'.1	19'.1	204° 20'.8	51'.2	72° 02'.3	55'.0	270° 27'.1	12'.0
23	246° 30'.9	165° 14'.2	19'.4	219° 21'.5	51'.8	87° 04'.5	54'.9	285° 29'.7	12'.0
13 Saturday 00	261° 33'.4	180° 13'.3	23° 19'.7 N	234° 22'.2	9° 52'.5 N	102° 06'.7	9° 54'.8 N	300° 32'.2	16° 12'.0 S
01	276° 35'.9	195° 12'.5	20'.0	249° 22'.9	53'.2	117° 08'.9	54'.7	315° 34'.7	12'.0
02	291° 38'.3	210° 11'.6	20'.3	264° 23'.6	53'.8	132° 11'.1	54'.6	330° 37'.2	12'.1
03	306° 40'.8	225° 10'.7	20'.5	279° 24'.3	54'.5	147° 13'.2	54'.4	345° 39'.7	12'.1
04	321° 43'.3	240° 09'.8	20'.8	294° 25'.0	55'.2	162° 15'.4	54'.3	0° 42'.3	12'.1
05	336° 45'.7	255° 09'.0	21'.1	309° 25'.8	55'.8	177° 17'.6	54'.2	15° 44'.8	12'.2
06	351° 48'.2	270° 08'.1	21'.4	324° 26'.5	56'.5	192° 19'.8	54'.1	30° 47'.3	12'.2
07	6° 50'.6	285° 07'.2	21'.7	339° 27'.2	57'.2	207° 22'.0	54'.0	45° 49'.8	12'.2
08	21° 53'.1	300° 06'.4	21'.9	354° 27'.9	57'.8	222° 24'.2	53'.9	60° 52'.4	12'.2
09	36° 55'.6	315° 05'.5	22'.2	9° 28'.6	58'.5	237° 26'.4	53'.8	75° 54'.9	12'.3
10	51° 58'.0	330° 04'.6	22'.5	24° 29'.3	59'.2	252° 28'.6	53'.6	90° 57'.4	12'.3
11	67° 00'.5	345° 03'.8	22'.7	39° 30'.0	59'.8	267° 30'.8	53'.5	105° 59'.9	12'.3
12	82° 03'.0	0° 02'.9	23° 23'.0 N	54° 30'.8	10° 00'.5 N	282° 33'.0	9° 53'.4 N	121° 02'.5	16° 12'.3 S
13	97° 05'.4	15° 02'.0	23'.3	69° 31'.5	01'.2	297° 35'.1	53'.3	136° 05'.0	12'.4
14	112° 07'.9	30° 01'.2	23'.5	84° 32'.2	01'.8	312° 37'.3	53'.2	151° 07'.5	12'.4
15	127° 10'.4	45° 00'.3	23'.8	99° 32'.9	02'.5	327° 39'.5	53'.1	166° 10'.0	12'.4
16	142° 12'.8	59° 59'.4	24'.1	114° 33'.6	03'.1	342° 41'.7	52'.9	181° 12'.6	12'.4
17	157° 15'.3	74° 58'.5	24'.3	129° 34'.3	03'.8	357° 43'.9	52'.8	196° 15'.1	12'.5
18	172° 17'.8	89° 57'.7	24'.6	144° 35'.0	04'.5	12° 46'.1	52'.7	211° 17'.6	12'.5
19	187° 20'.2	104° 56'.8	24'.9	159° 35'.8	05'.1	27° 48'.3	52'.6	226° 20'.1	12'.5
20	202° 22'.7	119° 55'.9	25'.1	174° 36'.5	05'.8	42° 50'.5	52'.5	241° 22'.7	12'.5
21	217° 25'.1	134° 55'.1	25'.4	189° 37'.2	06'.5	57° 52'.6	52'.4	256° 25'.2	12'.6
22	232° 27'.6	149° 54'.2	25'.6	204° 37'.9	07'.1	72° 54'.8	52'.2	271° 27'.7	12'.6
23	247° 30'.1	164° 53'.3	25'.9	219° 38'.6	07'.8	87° 57'.0	52'.1	286° 30'.3	12'.6
	M.P. 06:33	v -0'.9	d 0'.3	v 0'.7	d 0'.7	v 2'.2	d 0'.1	v 2'.5	d 0'.0

STARS	SHA	Dec
Acamar	315° 30'.5	40° 19'.9 S
Achernar	335° 38'.6	57° 16'.2 S
Acrux	173° 26'.9	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.8 S
Aldebaran	291° 07'.8	16° 29'.7 N
Alioth	166° 34'.1	56° 00'.2 N
Alkaid	153° 10'.9	49° 21'.1 N
Alnair	28° 03'.1	46° 59'.6 S
Alnilam	276° 02'.6	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.4 N
Alpheratz	357° 59'.9	29° 02'.9 N
Altair	62° 23'.3	8° 50'.9 N
Ankaa	353° 31'.2	42° 20'.5 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.3 N
Atria	108° 00'.6	69° 01'.0 S
Avior	234° 25'.0	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.3 N
Canopus	264° 03'.7	52° 41'.6 S
Capella	280° 58'.2	45° 59'.4 N
Deneb	49° 41'.9	45° 15'.1 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.7	18° 01'.5 S
Dubhe	194° 10'.8	61° 47'.7 N
Elnath	278° 32'.9	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.3 N
Enif	34° 02'.4	9° 50'.4 N
Fomalhaut	15° 41'.2	29° 39'.5 S
Gacrux	172° 18'.4	57° 04'.6 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 09'.9	60° 20'.5 S
Hamal	328° 18'.8	23° 25'.6 N
Kaus Aust.	84° 04'.2	34° 23'.3 S
Kochab	137° 18'.2	74° 11'.3 N
Markab	13° 54'.0	15° 09'.9 N
Menkar	314° 31'.7	4° 03'.7 N
Menkent	148° 25'.9	36° 20'.2 S
Miaplacidus	221° 43'.7	69° 41'.5 S
Mirfak	309° 03'.4	49° 50'.0 N
Nunki	76° 17'.4	26° 18'.3 S
Peacock	53° 43'.4	56° 45'.3 S
Polaris	324° 16'.3	89° 13'.7 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.7	12° 33'.9 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.6 S
Rigil Kent	140° 12'.7	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.8	56° 29'.6 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.3	43° 24'.4 S
Vega	80° 49'.2	38° 46'.5 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	279° 59'.8	11:58
Mars	333° 30'.8	08:23
Jupiter	200° 39'.8	17:13
Saturn	38° 57'.4	04:01

SUN				MOON					
GHA	Dec	GHA	v	Dec	d	HP
180° 06'.6	23° 05'.2 N	53° 03'.0	10'.6	15° 52'.4 S	10'.5	57'.4
195° 06'.5	05'.4	67° 32'.6	10'.5	16° 02'.9 S	10'.3	
210° 06'.4	05'.6	82° 02'.1	10'.5	13'.2	10'.2	57'.3
225° 06'.3	05'.8	96° 31'.6	10'.5	23'.4	10'.2	
240° 06'.1	05'.9	111° 01'.1	10'.5	33'.6	10'.0	
255° 06'.0	06'.1	125° 30'.6	10'.4	43'.6	10'.0	
270° 05'.9	06'.3	140° 00'.0	10'.3	53'.6	9'.8	
285° 05'.8	06'.4	154° 29'.3	10'.4	17° 03'.4 S	9'.8	57'.2
300° 05'.6	06'.6	168° 58'.7	10'.3	13'.2	9'.7	
315° 05'.5	06'.8	183° 28'.0	10'.2	22'.9	9'.5	
330° 05'.4	06'.9	197° 57'.2	10'.3	32'.4	9'.5	
345° 05'.3	07'.1	212° 26'.5	10'.2	41'.9	9'.4	
0° 05'.1	23° 07'.3 N	226° 55'.7	10'.1	17° 51'.3 S	9'.2	57'.1
15° 05'.0	07'.4	241° 24'.8	10'.1	18° 00'.5 S	9'.2	
30° 04'.9	07'.6	255° 53'.9	10'.1	09'.7	9'.1	
45° 04'.7	07'.8	270° 23'.0	10'.1	18'.8	9'.0	
60° 04'.6	07'.9	284° 52'.1	10'.0	27'.8	8'.8	57'.0
75° 04'.5	08'.1	299° 21'.1	10'.0	36'.6	8'.8	
90° 04'.4	08'.2	313° 50'.1	9'.9	45'.4	8'.6	
105° 04'.2	08'.4	328° 19'.0	9'.9	54'.0	8'.6	
120° 04'.1	08'.6	342° 47'.9	9'.9	19° 02'.6 S	8'.4	
135° 04'.0	08'.7	357° 16'.8	9'.8	11'.0	8'.3	56'.9
150° 03'.9	08'.9	11° 45'.6	9'.8	19'.3	8'.3	
165° 03'.7	09'.0	26° 14'.4	9'.8	27'.6	8'.1	
180° 03'.6	23° 09'.2 N	40° 43'.2	9'.7	19° 35'.7 S	8'.0	56'.9
195° 03'.5	09'.4	55° 11'.9	9'.7	43'.7	7'.9	
210° 03'.3	09'.5	69° 40'.6	9'.7	51'.6	7'.8	56'.8
225° 03'.2	09'.7	84° 09'.3	9'.6	59'.4	7'.6	
240° 03'.1	09'.8	98° 37'.9	9'.7	20° 07'.0 S	7'.6	
255° 03'.0	10'.0	113° 06'.6	9'.5	14'.6	7'.4	
270° 02'.8	10'.1	127° 35'.1	9'.6	22'.0	7'.4	
285° 02'.7	10'.3	142° 03'.7	9'.5	29'.4	7'.2	56'.7
300° 02'.6	10'.4	156° 32'.2	9'.5	36'.6	7'.1	
315° 02'.4	10'.6	171° 00'.7	9'.4	43'.7	7'.0	
330° 02'.3	10'.7	185° 29'.1	9'.4	50'.7	6'.8	
345° 02'.2	10'.9	199° 57'.5	9'.4	57'.5	6'.8	56'.6
0° 02'.1	23° 11'.0 N	214° 25'.9	9'.4	21° 04'.3 S	6'.6	56'.6
15° 01'.9	11'.2	228° 54'.3	9'.3	10'.9	6'.5	
30° 01'.8	11'.3	243° 22'.6	9'.3	17'.4	6'.4	
45° 01'.7	11'.5	257° 50'.9	9'.3	23'.8	6'.3	
60° 01'.5	11'.6	272° 19'.2	9'.3	30'.1	6'.1	56'.5
75° 01'.4	11'.8	286° 47'.5	9'.2	36'.2	6'.1	
90° 01'.3	11'.9	301° 15'.7	9'.2	42'.3	5'.9	
105° 01'.2	12'.0	315° 43'.9	9'.2	48'.2	5'.8	
120° 01'.0	12'.2	330° 12'.1	9'.2	54'.0	5'.6	
135° 00'.9	12'.3	344° 40'.3	9'.1	59'.6	5'.6	56'.4
150° 00'.8	12'.5	359° 08'.4	9'.1	22° 05'.2 S	5'.4	
165° 00'.6	12'.6	13° 36'.5	9'.1	10'.6	5'.3	
180° 00'.5	23° 12'.8 N	28° 04'.6	9'.1	22° 15'.9 S	5'.2	56'.4
195° 00'.4	12'.9	42° 32'.7	9'.0	21'.1	5'.0	
210° 00'.3	13'.0	57° 00'.7	9'.1	26'.1	5'.0	56'.3
225° 00'.1	13'.2	71° 28'.8	9'.0	31'.1	4'.8	
240° 00'.0	13'.3	85° 56'.8	9'.0	35'.9	4'.6	
254° 59'.9	13'.4	100° 24'.8	9'.0	40'.5	4'.6	
269° 59'.7	13'.6	114° 52'.8	9'.0	45'.1	4'.4	
284° 59'.6	13'.7	129° 20'.8	8'.9	49'.5	4'.3	56'.2
299° 59'.5	13'.8	143° 48'.7	9'.0	53'.8	4'.2	
314° 59'.3	14'.0	158° 16'.7	8'.9	58'.0	4'.0	
329° 59'.2	14'.1	172° 44'.6	8'.9	23° 02'.0 S	3'.9	
344° 59'.1	14'.2	187° 12'.5	9'.0	05'.9	3'.8	
359° 59'.0	23° 14'.4 N	201° 40'.5	8'.9	23° 09'.7 S	3'.6	56'.1
14° 58'.8	14'.5	216° 08'.4	8'.9	13'.3	3'.6	
29° 58'.7	14'.6	230° 36'.3	8'.9	16'.9	3'.4	
44° 58'.6	14'.8	245° 04'.2	8'.9	20'.3	3'.2	
59° 58'.4	14'.9	259° 32'.1	8'.8	23'.5	3'.2	56'.0
74° 58'.3	15'.0	273° 59'.9	8'.9	26'.7	3'.0	
89° 58'.2	15'.2	288° 27'.8	8'.9	29'.7	2'.9	
104° 58'.0	15'.3	302° 55'.7	8'.9	32'.6	2'.7	
119° 57'.9	15'.4	317° 23'.6	8'.8	35'.3	2'.7	
134° 57'.8	15'.5	331° 51'.4	8'.9	38'.0	2'.5	55'.9
149° 57'.6	15'.7	346° 19'.3	8'.9	40'.5	2'.3	
164° 57'.5	15'.8	0° 47'.2	8'.9	42'.8	2'.3	
SD 15'.7	d 0'.1	SD	15'.6	15'.4	15'.3	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
11	0 27	0 21	12:00	21:11	08:46	10d 86%
12	0 15	0 09	12:00	22:04	09:37	11d 93%
13	0 02	0 04	12:00	22:57	10:30	12d 97%

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1992 June 14, 15, 16 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.9		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
14 Sunday 00	262° 32'.5	179° 52'.4	23° 26'.1 N	234° 39'.3	10° 08'.5 N	102° 59'.2	9° 52'.0 N	301° 32'.8	16° 12'.6 S
01	277° 35'.0	194° 51'.6	26'.4	249° 40'.0	09'.1	118° 01'.4	51'.9	316° 35'.3	12'.7
02	292° 37'.5	209° 50'.7	26'.7	264° 40'.8	09'.8	133° 03'.6	51'.8	331° 37'.8	12'.7
03	307° 39'.9	224° 49'.8	26'.9	279° 41'.5	10'.4	148° 05'.8	51'.7	346° 40'.4	12'.7
04	322° 42'.4	239° 48'.9	27'.2	294° 42'.2	11'.1	163° 08'.0	51'.5	1° 42'.9	12'.8
05	337° 44'.9	254° 48'.1	27'.4	309° 42'.9	11'.8	178° 10'.1	51'.4	16° 45'.4	12'.8
06	352° 47'.3	269° 47'.2	27'.6	324° 43'.6	12'.4	193° 12'.3	51'.3	31° 47'.9	12'.8
07	7° 49'.8	284° 46'.3	27'.9	339° 44'.3	13'.1	208° 14'.5	51'.2	46° 50'.5	12'.8
08	22° 52'.3	299° 45'.4	28'.1	354° 45'.0	13'.7	223° 16'.7	51'.1	61° 53'.0	12'.9
09	37° 54'.7	314° 44'.6	28'.4	9° 45'.8	14'.4	238° 18'.9	51'.0	76° 55'.5	12'.9
10	52° 57'.2	329° 43'.7	28'.6	24° 46'.5	15'.1	253° 21'.1	50'.8	91° 58'.1	12'.9
11	67° 59'.6	344° 42'.8	28'.9	39° 47'.2	15'.7	268° 23'.2	50'.7	107° 00'.6	12'.9
12	83° 02'.1	359° 41'.9	23° 29'.1 N	54° 47'.9	10° 16'.4 N	283° 25'.4	9° 50'.6 N	122° 03'.1	16° 13'.0 S
13	98° 04'.6	14° 41'.1	29'.4	69° 48'.6	17'.0	298° 27'.6	50'.5	137° 05'.6	13'.0
14	113° 07'.0	29° 40'.2	29'.6	84° 49'.3	17'.7	313° 29'.8	50'.4	152° 08'.2	13'.0
15	128° 09'.5	44° 39'.3	29'.8	99° 50'.0	18'.4	328° 32'.0	50'.3	167° 10'.7	13'.0
16	143° 12'.0	59° 38'.4	30'.1	114° 50'.8	19'.0	343° 34'.2	50'.1	182° 13'.2	13'.1
17	158° 14'.4	74° 37'.6	30'.3	129° 51'.5	19'.7	358° 36'.3	50'.0	197° 15'.8	13'.1
18	173° 16'.9	89° 36'.7	30'.5	144° 52'.2	20'.3	13° 38'.5	49'.9	212° 18'.3	13'.1
19	188° 19'.4	104° 35'.8	30'.8	159° 52'.9	21'.0	28° 40'.7	49'.8	227° 20'.8	13'.2
20	203° 21'.8	119° 34'.9	31'.0	174° 53'.6	21'.7	43° 42'.9	49'.7	242° 23'.3	13'.2
21	218° 24'.3	134° 34'.1	31'.2	189° 54'.3	22'.3	58° 45'.1	49'.5	257° 25'.9	13'.2
22	233° 26'.8	149° 33'.2	31'.5	204° 55'.0	23'.0	73° 47'.3	49'.4	272° 28'.4	13'.2
23	248° 29'.2	164° 32'.3	31'.7	219° 55'.7	23'.6	88° 49'.4	49'.3	287° 30'.9	13'.3
15 Monday 00	263° 31'.7	179° 31'.4	23° 31'.9 N	234° 56'.5	10° 24'.3 N	103° 51'.6	9° 49'.2 N	302° 33'.5	16° 13'.3 S
01	278° 34'.1	194° 30'.5	32'.1	249° 57'.2	25'.0	118° 53'.8	49'.1	317° 36'.0	13'.3
02	293° 36'.6	209° 29'.7	32'.4	264° 57'.9	25'.6	133° 56'.0	48'.9	332° 38'.5	13'.4
03	308° 39'.1	224° 28'.8	32'.6	279° 58'.6	26'.3	148° 58'.2	48'.8	347° 41'.1	13'.4
04	323° 41'.5	239° 27'.9	32'.8	294° 59'.3	26'.9	164° 00'.3	48'.7	2° 43'.6	13'.4
05	338° 44'.0	254° 27'.0	33'.0	310° 00'.0	27'.6	179° 02'.5	48'.6	17° 46'.1	13'.4
06	353° 46'.5	269° 26'.2	33'.2	325° 00'.7	28'.2	194° 04'.7	48'.5	32° 48'.7	13'.5
07	8° 48'.9	284° 25'.3	33'.5	340° 01'.5	28'.9	209° 06'.9	48'.4	47° 51'.2	13'.5
08	23° 51'.4	299° 24'.4	33'.7	355° 02'.2	29'.6	224° 09'.1	48'.2	62° 53'.7	13'.5
09	38° 53'.9	314° 23'.5	33'.9	10° 02'.9	30'.2	239° 11'.2	48'.1	77° 56'.3	13'.5
10	53° 56'.3	329° 22'.6	34'.1	25° 03'.6	30'.9	254° 13'.4	48'.0	92° 58'.8	13'.6
11	68° 58'.8	344° 21'.8	34'.3	40° 04'.3	31'.5	269° 15'.6	47'.9	108° 01'.3	13'.6
12	84° 01'.2	359° 20'.9	23° 34'.5 N	55° 05'.0	10° 32'.2 N	284° 17'.8	9° 47'.8 N	123° 03'.8	16° 13'.6 S
13	99° 03'.7	14° 20'.0	34'.7	70° 05'.7	32'.8	299° 20'.0	47'.6	138° 06'.4	13'.7
14	114° 06'.2	29° 19'.1	34'.9	85° 06'.4	33'.5	314° 22'.1	47'.5	153° 08'.9	13'.7
15	129° 08'.6	44° 18'.2	35'.2	100° 07'.2	34'.1	329° 24'.3	47'.4	168° 11'.4	13'.7
16	144° 11'.1	59° 17'.4	35'.4	115° 07'.9	34'.8	344° 26'.5	47'.3	183° 14'.0	13'.7
17	159° 13'.6	74° 16'.5	35'.6	130° 08'.6	35'.5	359° 28'.7	47'.2	198° 16'.5	13'.8
18	174° 16'.0	89° 15'.6	35'.8	145° 09'.3	36'.1	14° 30'.8	47'.0	213° 19'.0	13'.8
19	189° 18'.5	104° 14'.7	36'.0	160° 10'.0	36'.8	29° 33'.0	46'.9	228° 21'.6	13'.8
20	204° 21'.0	119° 13'.8	36'.2	175° 10'.7	37'.4	44° 35'.2	46'.8	243° 24'.1	13'.9
21	219° 23'.4	134° 13'.0	36'.4	190° 11'.4	38'.1	59° 37'.4	46'.7	258° 26'.6	13'.9
22	234° 25'.9	149° 12'.1	36'.6	205° 12'.1	38'.7	74° 39'.6	46'.6	273° 29'.2	13'.9
23	249° 28'.4	164° 11'.2	36'.8	220° 12'.9	39'.4	89° 41'.7	46'.4	288° 31'.7	13'.9
16 Tuesday 00	264° 30'.8	179° 10'.3	23° 37'.0 N	235° 13'.6	10° 40'.0 N	104° 43'.9	9° 46'.3 N	303° 34'.2	16° 14'.0 S
01	279° 33'.3	194° 09'.4	37'.2	250° 14'.3	40'.7	119° 46'.1	46'.2	318° 36'.8	14'.0
02	294° 35'.7	209° 08'.5	37'.4	265° 15'.0	41'.3	134° 48'.3	46'.1	333° 39'.3	14'.0
03	309° 38'.2	224° 07'.7	37'.6	280° 15'.7	42'.0	149° 50'.4	46'.0	348° 41'.9	14'.1
04	324° 40'.7	239° 06'.8	37'.8	295° 16'.4	42'.6	164° 52'.6	45'.8	3° 44'.4	14'.1
05	339° 43'.1	254° 05'.9	37'.9	310° 17'.1	43'.3	179° 54'.8	45'.7	18° 46'.9	14'.1
06	354° 45'.6	269° 05'.0	38'.1	325° 17'.8	43'.9	194° 57'.0	45'.6	33° 49'.5	14'.1
07	9° 48'.1	284° 04'.1	38'.3	340° 18'.6	44'.6	209° 59'.1	45'.5	48° 52'.0	14'.2
08	24° 50'.5	299° 03'.2	38'.5	355° 19'.3	45'.2	225° 01'.3	45'.3	63° 54'.5	14'.2
09	39° 53'.0	314° 02'.4	38'.7	10° 20'.0	45'.9	240° 03'.5	45'.2	78° 57'.1	14'.2
10	54° 55'.5	329° 01'.5	38'.9	25° 20'.7	46'.5	255° 05'.7	45'.1	93° 59'.6	14'.3
11	69° 57'.9	344° 00'.6	39'.1	40° 21'.4	47'.2	270° 07'.8	45'.0	109° 02'.1	14'.3
12	85° 00'.4	358° 59'.7	23° 39'.3 N	55° 22'.1	10° 47'.8 N	285° 10'.0	9° 44'.9 N	124° 04'.7	16° 14'.3 S
13	100° 02'.9	13° 58'.8	39'.4	70° 22'.8	48'.5	300° 12'.2	44'.7	139° 07'.2	14'.4
14	115° 05'.3	28° 57'.9	39'.6	85° 23'.5	49'.1	315° 14'.4	44'.6	154° 09'.7	14'.4
15	130° 07'.8	43° 57'.1	39'.8	100° 24'.3	49'.8	330° 16'.5	44'.5	169° 12'.3	14'.4
16	145° 10'.2	58° 56'.2	40'.0	115° 25'.0	50'.4	345° 18'.7	44'.4	184° 14'.8	14'.4
17	160° 12'.7	73° 55'.3	40'.2	130° 25'.7	51'.1	0° 20'.9	44'.3	199° 17'.4	14'.5
18	175° 15'.2	88° 54'.4	40'.3	145° 26'.4	51'.7	15° 23'.1	44'.1	214° 19'.9	14'.5
19	190° 17'.6	103° 53'.5	40'.5	160° 27'.1	52'.4	30° 25'.2	44'.0	229° 22'.4	14'.5
20	205° 20'.1	118° 52'.6	40'.7	175° 27'.8	53'.0	45° 27'.4	43'.9	244° 25'.0	14'.6
21	220° 22'.6	133° 51'.7	40'.8	190° 28'.5	53'.7	60° 29'.6	43'.8	259° 27'.5	14'.6
22	235° 25'.0	148° 50'.9	41'.0	205° 29'.2	54'.3	75° 31'.7	43'.6	274° 30'.0	14'.6
23	250° 27'.5	163° 50'.0	41'.2	220° 30'.0	55'.0	90° 33'.9	43'.5	289° 32'.6	14'.6
	M.P. 06:21	v -0'.9	d 0'.2	v 0'.7	d 0'.7	v 2'.2	d 0'.1	v 2'.5	d 0'.0

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 30'.5	40° 19'.9 S	179° 57'.4	23° 15'.9 N	15° 15'.1	8'.9	23° 45'.1 S	2'.1	55'.9
Achernar	335° 38'.6	57° 16'.2 S	194° 57'.3	16'.0	29° 43'.0	8'.8	47'.2	1'.9	
Acrux	173° 26'.9	63° 03'.9 S	209° 57'.1	16'.1	44° 10'.8	8'.9	49'.1	1'.9	
Adhara	255° 25'.2	28° 57'.8 S	224° 57'.0	16'.3	58° 38'.7	8'.9	51'.0	1'.7	55'.8
Aldebaran	291° 07'.7	16° 29'.7 N	239° 56'.9	16'.4	73° 06'.6	9'.0	52'.7	1'.6	
			254° 56'.7	16'.5	87° 34'.6	8'.9	54'.3	1'.4	
Alioth	166° 34'.1	56° 00'.2 N	269° 56'.6	16'.6	102° 02'.5	8'.9	55'.7	1'.4	
Alkaid	153° 10'.9	49° 21'.2 N	284° 56'.5	16'.7	116° 30'.4	9'.0	57'.1	1'.2	
Alnair	28° 03'.1	46° 59'.5 S	299° 56'.3	16'.9	130° 58'.4	8'.9	58'.3	1'.0	55'.7
Alnilam	276° 02'.6	1° 12'.4 S	314° 56'.2	17'.0	145° 26'.3	9'.0	59'.3	1'.0	
Alphard	218° 11'.7	8° 37'.7 S	329° 56'.1	17'.1	159° 54'.3	9'.0	24° 00'.3 S	0'.8	
			344° 55'.9	17'.2	174° 22'.3	9'.0	01'.1	0'.7	
Alphecca	126° 23'.9	26° 44'.4 N	359° 55'.8	23° 17'.3 N	188° 50'.3	9'.0	24° 01'.8 S	0'.5	55'.7
Alpheratz	357° 59'.8	29° 02'.9 N	14° 55'.7	17'.4	203° 18'.3	9'.0	02'.3	0'.4	55'.6
Altair	62° 23'.2	8° 50'.9 N	29° 55'.5	17'.5	217° 46'.3	9'.1	02'.7	0'.3	
Ankaa	353° 31'.2	42° 20'.5 S	44° 55'.4	17'.7	232° 14'.4	9'.1	03'.0	0'.2	
Antares	112° 45'.2	26° 25'.0 S	59° 55'.3	17'.8	246° 42'.5	9'.1	03'.2	0'.0	
			74° 55'.2	17'.9	261° 10'.6	9'.1	03'.2	0'.1	
Arcturus	146° 09'.8	19° 13'.3 N	89° 55'.0	18'.0	275° 38'.7	9'.1	03'.1	0'.2	55'.5
Atria	108° 00'.6	69° 01'.0 S	104° 54'.9	18'.1	290° 06'.8	9'.2	02'.9	0'.3	
Avior	234° 25'.0	59° 29'.4 S	119° 54'.8	18'.2	304° 35'.0	9'.2	02'.6	0'.5	
Bellatrix	278° 49'.2	6° 20'.6 N	134° 54'.6	18'.3	319° 03'.2	9'.2	02'.1	0'.6	
Betelgeuse	271° 18'.6	7° 24'.4 N	149° 54'.5	18'.4	333° 31'.4	9'.3	01'.5	0'.7	
			164° 54'.4	18'.5	347° 59'.7	9'.3	00'.8	0'.9	55'.4
Canopus	264° 03'.7	52° 41'.6 S	179° 54'.2	23° 18'.6 N	2° 28'.0	9'.3	23° 59'.9 S	0'.9	55'.4
Capella	280° 58'.1	45° 59'.4 N	194° 54'.1	18'.7	16° 56'.3	9'.4	59'.0	1'.1	
Deneb	49° 41'.9	45° 15'.1 N	209° 54'.0	18'.8	31° 24'.7	9'.3	57'.9	1'.3	
Denebola	182° 49'.6	14° 36'.8 N	224° 53'.8	19'.0	45° 53'.0	9'.4	56'.6	1'.3	
Diphda	349° 11'.7	18° 01'.5 S	239° 53'.7	19'.1	60° 21'.4	9'.5	55'.3	1'.5	
			254° 53'.6	19'.2	74° 49'.9	9'.5	53'.8	1'.6	55'.3
Dubhe	194° 10'.8	61° 47'.7 N	269° 53'.4	19'.3	89° 18'.4	9'.5	52'.2	1'.7	
Elnath	278° 32'.8	28° 36'.1 N	284° 53'.3	19'.4	103° 46'.9	9'.6	50'.5	1'.8	
Eltanin	90° 52'.9	51° 29'.4 N	299° 53'.2	19'.5	118° 15'.5	9'.6	48'.7	2'.0	
Enif	34° 02'.4	9° 50'.4 N	314° 53'.0	19'.6	132° 44'.1	9'.6	46'.7	2'.1	
Fomalhaut	15° 41'.1	29° 39'.5 S	329° 52'.9	19'.7	147° 12'.7	9'.7	44'.6	2'.2	55'.2
			344° 52'.8	19'.8	161° 41'.4	9'.7	42'.4	2'.3	
Gacrux	172° 18'.4	57° 04'.7 S	359° 52'.6	23° 19'.9 N	176° 10'.1	9'.8	23° 40'.1 S	2'.5	55'.2
Gienah	176° 08'.4	17° 30'.2 S	14° 52'.5	19'.9	190° 38'.9	9'.8	37'.6	2'.6	
Hadar	149° 09'.9	60° 20'.6 S	29° 52'.4	20'.0	205° 07'.7	9'.8	35'.0	2'.6	
Hamal	328° 18'.7	23° 25'.6 N	44° 52'.2	20'.1	219° 36'.5	9'.9	32'.4	2'.8	
Kaus Aust.	84° 04'.2	34° 23'.3 S	59° 52'.1	20'.2	234° 05'.4	10'.0	29'.6	3'.0	55'.1
			74° 52'.0	20'.3	248° 34'.4	9'.9	26'.6	3'.0	
Kochab	137° 18'.3	74° 11'.3 N	89° 51'.8	20'.4	263° 03'.3	10'.1	23'.6	3'.2	
Markab	13° 53'.9	15° 09'.9 N	104° 51'.7	20'.5	277° 32'.4	10'.1	20'.4	3'.2	
Menkar	314° 31'.7	4° 03'.7 N	119° 51'.6	20'.6	292° 01'.5	10'.1	17'.2	3'.4	
Menkent	148° 25'.9	36° 20'.2 S	134° 51'.4	20'.7	306° 30'.6	10'.2	13'.8	3'.5	
Miaplacidus	221° 43'.7	69° 41'.5 S	149° 51'.3	20'.8	320° 59'.8	10'.2	10'.3	3'.7	55'.0
			164° 51'.2	20'.9	335° 29'.0	10'.3	06'.6	3'.7	
Mirfak	309° 03'.3	49° 50'.0 N	179° 51'.0	23° 21'.0 N	349° 58'.3	10'.3	23° 02'.9 S	3'.8	55'.0
Nunki	76° 17'.4	26° 18'.3 S	194° 50'.9	21'.1	4° 27'.6	10'.4	22° 59'.1 S	4'.0	
Peacock	53° 43'.3	56° 45'.3 S	209° 50'.8	21'.1	18° 57'.0	10'.4	55'.1	4'.1	
Polaris	324° 15'.1	89° 13'.7 N	224° 50'.6	21'.2	33° 26'.4	10'.5	51'.0	4'.1	
Pollux	243° 47'.2	28° 02'.7 N	239° 50'.5	21'.3	47° 55'.9	10'.6	46'.9	4'.3	54'.9
			254° 50'.4	21'.4	62° 25'.5	10'.6	42'.6	4'.4	
Procyon	245° 16'.4	5° 14'.6 N	269° 50'.2	21'.5	76° 55'.1	10'.6	38'.2	4'.5	
Rasalhague	96° 20'.7	12° 33'.9 N	284° 50'.1	21'.6	91° 24'.7	10'.8	33'.7	4'.7	
Regulus	208° 00'.3	12° 00'.2 N	299° 50'.0	21'.6	105° 54'.5	10'.7	29'.0	4'.7	
Rigel	281° 27'.5	8° 12'.6 S	314° 49'.8	21'.7	120° 24'.2	10'.9	24'.3	4'.8	
Rigil Kent	140° 12'.7	60° 48'.5 S	329° 49'.7	21'.8	134° 54'.1	10'.8	19'.5	5'.0	54'.8
			344° 49'.6	21'.9	149° 23'.9	11'.0	14'.5	5'.0	
Sabik	102° 30'.2	15° 43'.0 S	359° 49'.4	23° 22'.0 N	163° 53'.9	11'.0	22° 09'.5 S	5'.1	54'.8
Schedar	349° 58'.7	56° 29'.6 N	14° 49'.3	22'.1	178° 23'.9	11'.0	04'.4	5'.3	
Shaula	96° 42'.8	37° 06'.0 S	29° 49'.2	22'.1	192° 53'.9	11'.2	21° 59'.1 S	5'.3	
Sirius	258° 47'.9	16° 42'.4 S	44° 49'.0	22'.2	207° 24'.1	11'.1	53'.8	5'.5	
Spica	158° 47'.7	11° 07'.5 S	59° 48'.9	22'.3	221° 54'.2	11'.3	48'.3	5'.5	
			74° 48'.8	22'.4	236° 24'.5	11'.3	42'.8	5'.7	54'.7
Suhail	223° 04'.3	43° 24'.4 S	89° 48'.6	22'.4	250° 54'.8	11'.4	37'.1	5'.8	
Vega	80° 49'.2	38° 46'.5 N	104° 48'.5	22'.5	265° 25'.2	11'.4	31'.3	5'.8	
Zuben'ubi	137° 22'.6	16° 00'.8 S	119° 48'.4	22'.6	279° 55'.6	11'.5	25'.5	6'.0	
			134° 48'.2	22'.7	294° 26'.1	11'.5	19'.5	6'.0	
	SHA	Mer.Pass.	149° 48'.1	22'.7	308° 56'.6	11'.6	13'.5	6'.2	
Venus	275° 59'.7	12:03	164° 48'.0	22'.8	323° 27'.2	11'.7	07'.3	6'.2	
Mars	331° 24'.8	08:20							
Jupiter	200° 19'.9	17:02							
Saturn	39° 01'.8	03:49	SD 15'.7	d 0'.1	SD 15'.2		15'.0	14'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
14	0 10	0 16	12:00	23:50	11:23	13d 99%
15	0 23	0 29	12:00	24:42	12:16	14d Full
16	0 36	0 42	12:01	00:42	13:07	15d 98%

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1992 June 17, 18, 19 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.9		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
17 Wednesday 00	265° 30'.0	178° 49'.1	23° 41'.4 N	235° 30'.7	10° 55'.6 N	105° 36'.1	9° 43'.4 N	304° 35'.1	16° 14'.7 S
01	280° 32'.4	193° 48'.2	41'.5	250° 31'.4	56'.3	120° 38'.3	43'.3	319° 37'.7	14'.7
02	295° 34'.9	208° 47'.3	41'.7	265° 32'.1	56'.9	135° 40'.4	43'.2	334° 40'.2	14'.7
03	310° 37'.4	223° 46'.4	41'.9	280° 32'.8	57'.6	150° 42'.6	43'.0	349° 42'.7	14'.8
04	325° 39'.8	238° 45'.5	42'.0	295° 33'.5	58'.2	165° 44'.8	42'.9	4° 45'.3	14'.8
05	340° 42'.3	253° 44'.7	42'.2	310° 34'.2	58'.9	180° 46'.9	42'.8	19° 47'.8	14'.8
06	355° 44'.7	268° 43'.8	42'.3	325° 34'.9	59'.5	195° 49'.1	42'.7	34° 50'.3	14'.9
07	10° 47'.2	283° 42'.9	42'.5	340° 35'.7	11° 00'.2 N	210° 51'.3	42'.5	49° 52'.9	14'.9
08	25° 49'.7	298° 42'.0	42'.7	355° 36'.4	00'.8	225° 53'.5	42'.4	64° 55'.4	14'.9
09	40° 52'.1	313° 41'.1	42'.8	10° 37'.1	01'.5	240° 55'.6	42'.3	79° 58'.0	15'.0
10	55° 54'.6	328° 40'.2	43'.0	25° 37'.8	02'.1	255° 57'.8	42'.2	95° 00'.5	15'.0
11	70° 57'.1	343° 39'.3	43'.1	40° 38'.5	02'.8	271° 00'.0	42'.0	110° 03'.0	15'.0
12	85° 59'.5	358° 38'.4	23° 43'.3 N	55° 39'.2	11° 03'.4 N	286° 02'.1	9° 41'.9 N	125° 05'.6	16° 15'.0 S
13	101° 02'.0	13° 37'.6	43'.4	70° 39'.9	04'.0	301° 04'.3	41'.8	140° 08'.1	15'.1
14	116° 04'.5	28° 36'.7	43'.6	85° 40'.6	04'.7	316° 06'.5	41'.7	155° 10'.7	15'.1
15	131° 06'.9	43° 35'.8	43'.7	100° 41'.3	05'.3	331° 08'.6	41'.5	170° 13'.2	15'.1
16	146° 09'.4	58° 34'.9	43'.9	115° 42'.1	06'.0	346° 10'.8	41'.4	185° 15'.7	15'.2
17	161° 11'.9	73° 34'.0	44'.0	130° 42'.8	06'.6	1° 13'.0	41'.3	200° 18'.3	15'.2
18	176° 14'.3	88° 33'.1	44'.2	145° 43'.5	07'.3	16° 15'.1	41'.2	215° 20'.8	15'.2
19	191° 16'.8	103° 32'.2	44'.3	160° 44'.2	07'.9	31° 17'.3	41'.1	230° 23'.4	15'.3
20	206° 19'.2	118° 31'.3	44'.5	175° 44'.9	08'.6	46° 19'.5	40'.9	245° 25'.9	15'.3
21	221° 21'.7	133° 30'.5	44'.6	190° 45'.6	09'.2	61° 21'.6	40'.8	260° 28'.5	15'.3
22	236° 24'.2	148° 29'.6	44'.8	205° 46'.3	09'.8	76° 23'.8	40'.7	275° 31'.0	15'.3
23	251° 26'.6	163° 28'.7	44'.9	220° 47'.0	10'.5	91° 26'.0	40'.6	290° 33'.5	15'.4
18 Thursday 00	266° 29'.1	178° 27'.8	23° 45'.0 N	235° 47'.8	11° 11'.1 N	106° 28'.1	9° 40'.4 N	305° 36'.1	16° 15'.4 S
01	281° 31'.6	193° 26'.9	45'.2	250° 48'.5	11'.8	121° 30'.3	40'.3	320° 38'.6	15'.4
02	296° 34'.0	208° 26'.0	45'.3	265° 49'.2	12'.4	136° 32'.5	40'.2	335° 41'.2	15'.5
03	311° 36'.5	223° 25'.1	45'.5	280° 49'.9	13'.1	151° 34'.6	40'.1	350° 43'.7	15'.5
04	326° 39'.0	238° 24'.2	45'.6	295° 50'.6	13'.7	166° 36'.8	39'.9	5° 46'.2	15'.5
05	341° 41'.4	253° 23'.3	45'.7	310° 51'.3	14'.3	181° 39'.0	39'.8	20° 48'.8	15'.6
06	356° 43'.9	268° 22'.4	45'.9	325° 52'.0	15'.0	196° 41'.1	39'.7	35° 51'.3	15'.6
07	11° 46'.3	283° 21'.6	46'.0	340° 52'.7	15'.6	211° 43'.3	39'.6	50° 53'.9	15'.6
08	26° 48'.8	298° 20'.7	46'.1	355° 53'.4	16'.3	226° 45'.5	39'.4	65° 56'.4	15'.7
09	41° 51'.3	313° 19'.8	46'.2	10° 54'.2	16'.9	241° 47'.6	39'.3	80° 59'.0	15'.7
10	56° 53'.7	328° 18'.9	46'.4	25° 54'.9	17'.6	256° 49'.8	39'.2	96° 01'.5	15'.7
11	71° 56'.2	343° 18'.0	46'.5	40° 55'.6	18'.2	271° 52'.0	39'.1	111° 04'.0	15'.8
12	86° 58'.7	358° 17'.1	23° 46'.6 N	55° 56'.3	11° 18'.8 N	286° 54'.1	9° 38'.9 N	126° 06'.6	16° 15'.8 S
13	102° 01'.1	13° 16'.2	46'.7	70° 57'.0	19'.5	301° 56'.3	38'.8	141° 09'.1	15'.8
14	117° 03'.6	28° 15'.3	46'.9	85° 57'.7	20'.1	316° 58'.5	38'.7	156° 11'.7	15'.9
15	132° 06'.1	43° 14'.4	47'.0	100° 58'.4	20'.8	332° 00'.6	38'.6	171° 14'.2	15'.9
16	147° 08'.5	58° 13'.5	47'.1	115° 59'.1	21'.4	347° 02'.8	38'.4	186° 16'.8	15'.9
17	162° 11'.0	73° 12'.7	47'.2	130° 59'.8	22'.0	2° 05'.0	38'.3	201° 19'.3	15'.9
18	177° 13'.5	88° 11'.8	47'.3	146° 00'.5	22'.7	17° 07'.1	38'.2	216° 21'.9	16'.0
19	192° 15'.9	103° 10'.9	47'.5	161° 01'.3	23'.3	32° 09'.3	38'.1	231° 24'.4	16'.0
20	207° 18'.4	118° 10'.0	47'.6	176° 02'.0	24'.0	47° 11'.4	37'.9	246° 26'.9	16'.0
21	222° 20'.8	133° 09'.1	47'.7	191° 02'.7	24'.6	62° 13'.6	37'.8	261° 29'.5	16'.1
22	237° 23'.3	148° 08'.2	47'.8	206° 03'.4	25'.2	77° 15'.8	37'.7	276° 32'.0	16'.1
23	252° 25'.8	163° 07'.3	47'.9	221° 04'.1	25'.9	92° 17'.9	37'.5	291° 34'.6	16'.1
19 Friday 00	267° 28'.2	178° 06'.4	23° 48'.0 N	236° 04'.8	11° 26'.5 N	107° 20'.1	9° 37'.4 N	306° 37'.1	16° 16'.2 S
01	282° 30'.7	193° 05'.5	48'.1	251° 05'.5	27'.1	122° 22'.3	37'.3	321° 39'.7	16'.2
02	297° 33'.2	208° 04'.6	48'.2	266° 06'.2	27'.8	137° 24'.4	37'.2	336° 42'.2	16'.2
03	312° 35'.6	223° 03'.7	48'.4	281° 06'.9	28'.4	152° 26'.6	37'.0	351° 44'.8	16'.3
04	327° 38'.1	238° 02'.8	48'.5	296° 07'.7	29'.1	167° 28'.7	36'.9	6° 47'.3	16'.3
05	342° 40'.6	253° 02'.0	48'.6	311° 08'.4	29'.7	182° 30'.9	36'.8	21° 49'.9	16'.3
06	357° 43'.0	268° 01'.1	48'.7	326° 09'.1	30'.3	197° 33'.1	36'.7	36° 52'.4	16'.4
07	12° 45'.5	283° 00'.2	48'.8	341° 09'.8	31'.0	212° 35'.2	36'.5	51° 54'.9	16'.4
08	27° 48'.0	297° 59'.3	48'.9	356° 10'.5	31'.6	227° 37'.4	36'.4	66° 57'.5	16'.4
09	42° 50'.4	312° 58'.4	49'.0	11° 11'.2	32'.2	242° 39'.5	36'.3	82° 00'.0	16'.5
10	57° 52'.9	327° 57'.5	49'.1	26° 11'.9	32'.9	257° 41'.7	36'.2	97° 02'.6	16'.5
11	72° 55'.3	342° 56'.6	49'.2	41° 12'.6	33'.5	272° 43'.9	36'.0	112° 05'.1	16'.5
12	87° 57'.8	357° 55'.7	23° 49'.3 N	56° 13'.3	11° 34'.1 N	287° 46'.0	9° 35'.9 N	127° 07'.7	16° 16'.6 S
13	103° 00'.3	12° 54'.8	49'.4	71° 14'.0	34'.8	302° 48'.2	35'.8	142° 10'.2	16'.6
14	118° 02'.7	27° 53'.9	49'.4	86° 14'.8	35'.4	317° 50'.3	35'.6	157° 12'.8	16'.6
15	133° 05'.2	42° 53'.0	49'.5	101° 15'.5	36'.1	332° 52'.5	35'.5	172° 15'.3	16'.7
16	148° 07'.7	57° 52'.1	49'.6	116° 16'.2	36'.7	347° 54'.7	35'.4	187° 17'.9	16'.7
17	163° 10'.1	72° 51'.2	49'.7	131° 16'.9	37'.3	2° 56'.8	35'.3	202° 20'.4	16'.7
18	178° 12'.6	87° 50'.3	49'.8	146° 17'.6	38'.0	17° 59'.0	35'.1	217° 23'.0	16'.8
19	193° 15'.1	102° 49'.4	49'.9	161° 18'.3	38'.6	33° 01'.1	35'.0	232° 25'.5	16'.8
20	208° 17'.5	117° 48'.6	50'.0	176° 19'.0	39'.2	48° 03'.3	34'.9	247° 28'.1	16'.8
21	223° 20'.0	132° 47'.7	50'.1	191° 19'.7	39'.9	63° 05'.5	34'.7	262° 30'.6	16'.9
22	238° 22'.5	147° 46'.8	50'.1	206° 20'.4	40'.5	78° 07'.6	34'.6	277° 33'.2	16'.9
23	253° 24'.9	162° 45'.9	50'.2	221° 21'.2	41'.1	93° 09'.8	34'.5	292° 35'.7	16'.9
	M.P. 06:09	v -0'.9	d 0'.1	v 0'.7	d 0'.6	v 2'.2	d 0'.1	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.5	40° 19'.9 S
Achernar	335° 38'.6	57° 16'.1 S
Acrux	173° 27'.0	63° 03'.9 S
Adhara	255° 25'.2	28° 57'.8 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 34'.1	56° 00'.2 N
Alkaid	153° 10'.9	49° 21'.2 N
Alnair	28° 03'.1	46° 59'.5 S
Alnilam	276° 02'.6	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.4 N
Alpheratz	357° 59'.8	29° 02'.9 N
Altair	62° 23'.2	8° 50'.9 N
Ankaa	353° 31'.1	42° 20'.5 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.3 N
Atria	108° 00'.6	69° 01'.0 S
Avior	234° 25'.0	59° 29'.4 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.4 N
Canopus	264° 03'.7	52° 41'.5 S
Capella	280° 58'.1	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.1 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.7	18° 01'.5 S
Dubhe	194° 10'.8	61° 47'.7 N
Elnath	278° 32'.8	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.4 N
Enif	34° 02'.3	9° 50'.5 N
Fomalhaut	15° 41'.1	29° 39'.5 S
Gacrux	172° 18'.4	57° 04'.7 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.6 S
Hamal	328° 18'.7	23° 25'.6 N
Kaus Aust.	84° 04'.2	34° 23'.3 S
Kochab	137° 18'.3	74° 11'.3 N
Markab	13° 53'.9	15° 09'.9 N
Menkar	314° 31'.7	4° 03'.7 N
Menkent	148° 25'.9	36° 20'.3 S
Miaplacidus	221° 43'.8	69° 41'.5 S
Mirfak	309° 03'.3	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.3	56° 45'.3 S
Polaris	324° 14'.0	89° 13'.7 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.6	12° 33'.9 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.5	8° 12'.6 S
Rigil Kent	140° 12'.7	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.7	56° 29'.6 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.3	43° 24'.4 S
Vega	80° 49'.1	38° 46'.6 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	271° 58'.7	12:07
Mars	329° 18'.7	08:16
Jupiter	199° 59'.0	16:52
Saturn	39° 07'.0	03:37

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
17 00	179° 47'.8	23° 22'.9 N	337° 57'.9	11'.7	21° 01'.1 S	6'.3	54'.6
01	194° 47'.7	23'.0	352° 28'.6	11'.8	20° 54'.8 S	6'.5	
02	209° 47'.6	23'.0	6° 59'.4	11'.9	48'.3	6'.5	
03	224° 47'.4	23'.1	21° 30'.3	11'.9	41'.8	6'.6	
04	239° 47'.3	23'.2	36° 01'.2	12'.0	35'.2	6'.7	
05	254° 47'.2	23'.2	50° 32'.2	12'.0	28'.5	6'.8	
06	269° 47'.0	23'.3	65° 03'.2	12'.1	21'.7	6'.9	
07	284° 46'.9	23'.4	79° 34'.3	12'.2	14'.8	7'.0	
08	299° 46'.8	23'.4	94° 05'.5	12'.2	07'.8	7'.0	54'.5
09	314° 46'.6	23'.5	108° 36'.7	12'.3	00'.8	7'.2	
10	329° 46'.5	23'.6	123° 08'.0	12'.4	19° 53'.6 S	7'.2	
11	344° 46'.4	23'.6	137° 39'.4	12'.4	46'.4	7'.4	
12	359° 46'.2	23° 23'.7 N	152° 10'.8	12'.5	19° 39'.0 S	7'.4	54'.5
13	14° 46'.1	23'.7	166° 42'.3	12'.5	31'.6	7'.5	
14	29° 46'.0	23'.8	181° 13'.8	12'.6	24'.1	7'.5	
15	44° 45'.8	23'.9	195° 45'.4	12'.7	16'.6	7'.7	
16	59° 45'.7	23'.9	210° 17'.1	12'.8	08'.9	7'.7	54'.4
17	74° 45'.5	24'.0	224° 48'.9	12'.7	01'.2	7'.9	
18	89° 45'.4	24'.0	239° 20'.6	12'.9	18° 53'.3 S	7'.9	
19	104° 45'.3	24'.1	253° 52'.5	12'.9	45'.4	7'.9	
20	119° 45'.1	24'.2	268° 24'.4	13'.0	37'.5	8'.1	
21	134° 45'.0	24'.2	282° 56'.4	13'.1	29'.4	8'.1	
22	149° 44'.9	24'.3	297° 28'.5	13'.1	21'.3	8'.2	
23	164° 44'.7	24'.3	312° 00'.6	13'.1	13'.1	8'.3	
18 00	179° 44'.6	23° 24'.4 N	326° 32'.7	13'.3	18° 04'.8 S	8'.4	54'.4
01	194° 44'.5	24'.4	341° 05'.0	13'.3	17° 56'.4 S	8'.4	
02	209° 44'.3	24'.5	355° 37'.3	13'.3	48'.0	8'.5	54'.3
03	224° 44'.2	24'.5	10° 09'.6	13'.4	39'.5	8'.6	
04	239° 44'.1	24'.6	24° 42'.0	13'.5	30'.9	8'.7	
05	254° 43'.9	24'.6	39° 14'.5	13'.5	22'.2	8'.7	
06	269° 43'.8	24'.7	53° 47'.0	13'.6	13'.5	8'.8	
07	284° 43'.7	24'.7	68° 19'.6	13'.7	04'.7	8'.9	
08	299° 43'.5	24'.8	82° 52'.3	13'.7	16° 55'.8 S	8'.9	
09	314° 43'.4	24'.8	97° 25'.0	13'.8	46'.9	9'.0	
10	329° 43'.3	24'.9	111° 57'.8	13'.8	37'.9	9'.1	
11	344° 43'.1	24'.9	126° 30'.6	13'.9	28'.8	9'.1	
12	359° 43'.0	23° 25'.0 N	141° 03'.5	13'.9	16° 19'.7 S	9'.2	54'.3
13	14° 42'.8	25'.0	155° 36'.4	14'.0	10'.5	9'.3	54'.2
14	29° 42'.7	25'.1	170° 09'.4	14'.1	01'.2	9'.3	
15	44° 42'.6	25'.1	184° 42'.5	14'.1	15° 51'.9 S	9'.4	
16	59° 42'.4	25'.2	199° 15'.6	14'.1	42'.5	9'.5	
17	74° 42'.3	25'.2	213° 48'.7	14'.2	33'.0	9'.5	
18	89° 42'.2	25'.2	228° 21'.9	14'.3	23'.5	9'.5	
19	104° 42'.0	25'.3	242° 55'.2	14'.3	14'.0	9'.7	
20	119° 41'.9	25'.3	257° 28'.5	14'.4	04'.3	9'.7	
21	134° 41'.8	25'.4	272° 01'.9	14'.4	14° 54'.6 S	9'.7	
22	149° 41'.6	25'.4	286° 35'.3	14'.5	44'.9	9'.8	
23	164° 41'.5	25'.4	301° 08'.8	14'.5	35'.1	9'.9	
19 00	179° 41'.4	23° 25'.5 N	315° 42'.3	14'.6	14° 25'.2 S	9'.9	54'.2
01	194° 41'.2	25'.5	330° 15'.9	14'.7	15'.3	10'.0	
02	209° 41'.1	25'.5	344° 49'.6	14'.6	05'.3	10'.0	
03	224° 41'.0	25'.6	359° 23'.2	14'.8	13° 55'.3 S	10'.1	
04	239° 40'.8	25'.6	13° 57'.0	14'.8	45'.2	10'.2	
05	254° 40'.7	25'.7	28° 30'.8	14'.8	35'.0	10'.2	
06	269° 40'.6	25'.7	43° 04'.6	14'.9	24'.8	10'.2	
07	284° 40'.4	25'.7	57° 38'.5	14'.9	14'.6	10'.3	
08	299° 40'.3	25'.7	72° 12'.4	14'.9	04'.3	10'.3	54'.1
09	314° 40'.1	25'.8	86° 46'.3	15'.1	12° 54'.0 S	10'.4	
10	329° 40'.0	25'.8	101° 20'.4	15'.0	43'.6	10'.5	
11	344° 39'.9	25'.8	115° 54'.4	15'.1	33'.1	10'.5	
12	359° 39'.7	23° 25'.9 N	130° 28'.5	15'.1	12° 22'.6 S	10'.5	54'.1
13	14° 39'.6	25'.9	145° 02'.6	15'.2	12'.1	10'.6	
14	29° 39'.5	25'.9	159° 36'.8	15'.3	01'.5	10'.6	
15	44° 39'.3	25'.9	174° 11'.1	15'.2	11° 50'.9 S	10'.7	
16	59° 39'.2	26'.0	188° 45'.3	15'.3	40'.2	10'.7	
17	74° 39'.1	26'.0	203° 19'.6	15'.4	29'.5	10'.7	
18	89° 38'.9	26'.0	217° 54'.0	15'.4	18'.8	10'.9	
19	104° 38'.8	26'.0	232° 28'.4	15'.4	07'.9	10'.8	
20	119° 38'.7	26'.1	247° 02'.8	15'.4	10° 57'.1 S	10'.9	
21	134° 38'.5	26'.1	261° 37'.2	15'.5	46'.2	10'.9	
22	149° 38'.4	26'.1	276° 11'.7	15'.6	35'.3	11'.0	
23	164° 38'.2	26'.1	290° 46'.3	15'.5	24'.3	11'.0	
	SD 15'.7	d 0'.0	SD 14'.8		14'.8	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
17	0 48	0 55	12:01	01:31	13:55	16d 95%
18	1 01	1 08	12:01	02:18	14:41	17d 90%
19	1 14	1 21	12:01	03:03	15:24	18d 84%

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1992 June 20, 21, 22 (Sat, Sun, Mon)

GMT	ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.9		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
20 Saturday 00	268° 27'.4	177° 45'.0	23° 50'.3 N	236° 21'.9	11° 41'.8 N	108° 11'.9	9° 34'.4 N	307° 38'.3	16° 17'.0 S
01	283° 29'.8	192° 44'.1	50'.4	251° 22'.6	42'.4	123° 14'.1	34'.2	322° 40'.8	17'.0
02	298° 32'.3	207° 43'.2	50'.5	266° 23'.3	43'.0	138° 16'.2	34'.1	337° 43'.4	17'.0
03	313° 34'.8	222° 42'.3	50'.5	281° 24'.0	43'.7	153° 18'.4	34'.0	352° 45'.9	17'.1
04	328° 37'.2	237° 41'.4	50'.6	296° 24'.7	44'.3	168° 20'.6	33'.8	7° 48'.5	17'.1
05	343° 39'.7	252° 40'.5	50'.7	311° 25'.4	44'.9	183° 22'.7	33'.7	22° 51'.0	17'.1
06	358° 42'.2	267° 39'.6	50'.8	326° 26'.1	45'.5	198° 24'.9	33'.6	37° 53'.6	17'.2
07	13° 44'.6	282° 38'.7	50'.8	341° 26'.8	46'.2	213° 27'.0	33'.5	52° 56'.1	17'.2
08	28° 47'.1	297° 37'.8	50'.9	356° 27'.5	46'.8	228° 29'.2	33'.3	67° 58'.7	17'.2
09	43° 49'.6	312° 36'.9	51'.0	11° 28'.2	47'.4	243° 31'.3	33'.2	83° 01'.2	17'.3
10	58° 52'.0	327° 36'.0	51'.1	26° 29'.0	48'.1	258° 33'.5	33'.1	98° 03'.8	17'.3
11	73° 54'.5	342° 35'.1	51'.1	41° 29'.7	48'.7	273° 35'.7	32'.9	113° 06'.3	17'.3
12	88° 56'.9	357° 34'.2	23° 51'.2 N	56° 30'.4	11° 49'.3 N	288° 37'.8	9° 32'.8 N	128° 08'.9	16° 17'.4 S
13	103° 59'.4	12° 33'.4	51'.3	71° 31'.1	50'.0	303° 40'.0	32'.7	143° 11'.4	17'.4
14	119° 01'.9	27° 32'.5	51'.3	86° 31'.8	50'.6	318° 42'.1	32'.6	158° 14'.0	17'.4
15	134° 04'.3	42° 31'.6	51'.4	101° 32'.5	51'.2	333° 44'.3	32'.4	173° 16'.5	17'.5
16	149° 06'.8	57° 30'.7	51'.4	116° 33'.2	51'.9	348° 46'.4	32'.3	188° 19'.1	17'.5
17	164° 09'.3	72° 29'.8	51'.5	131° 33'.9	52'.5	3° 48'.6	32'.2	203° 21'.6	17'.5
18	179° 11'.7	87° 28'.9	51'.6	146° 34'.6	53'.1	18° 50'.7	32'.0	218° 24'.2	17'.6
19	194° 14'.2	102° 28'.0	51'.6	161° 35'.3	53'.7	33° 52'.9	31'.9	233° 26'.7	17'.6
20	209° 16'.7	117° 27'.1	51'.7	176° 36'.1	54'.4	48° 55'.0	31'.8	248° 29'.3	17'.6
21	224° 19'.1	132° 26'.2	51'.7	191° 36'.8	55'.0	63° 57'.2	31'.7	263° 31'.8	17'.7
22	239° 21'.6	147° 25'.3	51'.8	206° 37'.5	55'.6	78° 59'.4	31'.5	278° 34'.4	17'.7
23	254° 24'.1	162° 24'.4	51'.8	221° 38'.2	56'.3	94° 01'.5	31'.4	293° 36'.9	17'.7
21 Sunday 00	269° 26'.5	177° 23'.5	23° 51'.9 N	236° 38'.9	11° 56'.9 N	109° 03'.7	9° 31'.3 N	308° 39'.5	16° 17'.8 S
01	284° 29'.0	192° 22'.6	51'.9	251° 39'.6	57'.5	124° 05'.8	31'.1	323° 42'.0	17'.8
02	299° 31'.4	207° 21'.7	52'.0	266° 40'.3	58'.1	139° 08'.0	31'.0	338° 44'.6	17'.8
03	314° 33'.9	222° 20'.8	52'.0	281° 41'.0	58'.8	154° 10'.1	30'.9	353° 47'.1	17'.9
04	329° 36'.4	237° 19'.9	52'.1	296° 41'.7	59'.4	169° 12'.3	30'.7	8° 49'.7	17'.9
05	344° 38'.8	252° 19'.0	52'.1	311° 42'.4	12° 00'.0 N	184° 14'.4	30'.6	23° 52'.2	17'.9
06	359° 41'.3	267° 18'.1	52'.2	326° 43'.1	00'.6	199° 16'.6	30'.5	38° 54'.8	18'.0
07	14° 43'.8	282° 17'.2	52'.2	341° 43'.9	01'.3	214° 18'.7	30'.3	53° 57'.3	18'.0
08	29° 46'.2	297° 16'.3	52'.3	356° 44'.6	01'.9	229° 20'.9	30'.2	68° 59'.9	18'.0
09	44° 48'.7	312° 15'.4	52'.3	11° 45'.3	02'.5	244° 23'.0	30'.1	84° 02'.5	18'.1
10	59° 51'.2	327° 14'.5	52'.3	26° 46'.0	03'.1	259° 25'.2	30'.0	99° 05'.0	18'.1
11	74° 53'.6	342° 13'.7	52'.4	41° 46'.7	03'.8	274° 27'.3	29'.8	114° 07'.6	18'.1
12	89° 56'.1	357° 12'.8	23° 52'.4 N	56° 47'.4	12° 04'.4 N	289° 29'.5	9° 29'.7 N	129° 10'.1	16° 18'.2 S
13	104° 58'.6	12° 11'.9	52'.4	71° 48'.1	05'.0	304° 31'.6	29'.6	144° 12'.7	18'.2
14	120° 01'.0	27° 11'.0	52'.5	86° 48'.8	05'.6	319° 33'.8	29'.4	159° 15'.2	18'.3
15	135° 03'.5	42° 10'.1	52'.5	101° 49'.5	06'.3	334° 35'.9	29'.3	174° 17'.8	18'.3
16	150° 05'.9	57° 09'.2	52'.5	116° 50'.2	06'.9	349° 38'.1	29'.2	189° 20'.3	18'.3
17	165° 08'.4	72° 08'.3	52'.6	131° 50'.9	07'.5	4° 40'.2	29'.0	204° 22'.9	18'.4
18	180° 10'.9	87° 07'.4	52'.6	146° 51'.7	08'.1	19° 42'.4	28'.9	219° 25'.4	18'.4
19	195° 13'.3	102° 06'.5	52'.6	161° 52'.4	08'.8	34° 44'.5	28'.8	234° 28'.0	18'.4
20	210° 15'.8	117° 05'.6	52'.7	176° 53'.1	09'.4	49° 46'.7	28'.6	249° 30'.6	18'.5
21	225° 18'.3	132° 04'.7	52'.7	191° 53'.8	10'.0	64° 48'.8	28'.5	264° 33'.1	18'.5
22	240° 20'.7	147° 03'.8	52'.7	206° 54'.5	10'.6	79° 51'.0	28'.4	279° 35'.7	18'.5
23	255° 23'.2	162° 02'.9	52'.7	221° 55'.2	11'.3	94° 53'.1	28'.2	294° 38'.2	18'.6
22 Monday 00	270° 25'.7	177° 02'.0	23° 52'.8 N	236° 55'.9	12° 11'.9 N	109° 55'.3	9° 28'.1 N	309° 40'.8	16° 18'.6 S
01	285° 28'.1	192° 01'.1	52'.8	251° 56'.6	12'.5	124° 57'.4	28'.0	324° 43'.3	18'.6
02	300° 30'.6	207° 00'.2	52'.8	266° 57'.3	13'.1	139° 59'.6	27'.8	339° 45'.9	18'.7
03	315° 33'.0	221° 59'.3	52'.8	281° 58'.0	13'.7	155° 01'.7	27'.7	354° 48'.4	18'.7
04	330° 35'.5	236° 58'.4	52'.8	296° 58'.7	14'.4	170° 03'.9	27'.6	9° 51'.0	18'.7
05	345° 38'.0	251° 57'.5	52'.8	311° 59'.4	15'.0	185° 06'.0	27'.5	24° 53'.6	18'.8
06	0° 40'.4	266° 56'.6	52'.9	327° 00'.2	15'.6	200° 08'.2	27'.3	39° 56'.1	18'.8
07	15° 42'.9	281° 55'.7	52'.9	342° 00'.9	16'.2	215° 10'.3	27'.2	54° 58'.7	18'.9
08	30° 45'.4	296° 54'.8	52'.9	357° 01'.6	16'.8	230° 12'.5	27'.1	70° 01'.2	18'.9
09	45° 47'.8	311° 53'.9	52'.9	12° 02'.3	17'.5	245° 14'.6	26'.9	85° 03'.8	18'.9
10	60° 50'.3	326° 53'.0	52'.9	27° 03'.0	18'.1	260° 16'.7	26'.8	100° 06'.3	19'.0
11	75° 52'.8	341° 52'.1	52'.9	42° 03'.7	18'.7	275° 18'.9	26'.7	115° 08'.9	19'.0
12	90° 55'.2	356° 51'.2	23° 52'.9 N	57° 04'.4	12° 19'.3 N	290° 21'.0	9° 26'.5 N	130° 11'.5	16° 19'.0 S
13	105° 57'.7	11° 50'.3	52'.9	72° 05'.1	19'.9	305° 23'.2	26'.4	145° 14'.0	19'.1
14	121° 00'.2	26° 49'.4	52'.9	87° 05'.8	20'.6	320° 25'.3	26'.3	160° 16'.6	19'.1
15	136° 02'.6	41° 48'.6	52'.9	102° 06'.5	21'.2	335° 27'.5	26'.1	175° 19'.1	19'.1
16	151° 05'.1	56° 47'.7	52'.9	117° 07'.2	21'.8	350° 29'.6	26'.0	190° 21'.7	19'.2
17	166° 07'.5	71° 46'.8	52'.9	132° 07'.9	22'.4	5° 31'.8	25'.9	205° 24'.3	19'.2
18	181° 10'.0	86° 45'.9	52'.9	147° 08'.6	23'.0	20° 33'.9	25'.7	220° 26'.8	19'.2
19	196° 12'.5	101° 45'.0	52'.9	162° 09'.4	23'.7	35° 36'.1	25'.6	235° 29'.4	19'.3
20	211° 14'.9	116° 44'.1	52'.9	177° 10'.1	24'.3	50° 38'.2	25'.5	250° 31'.9	19'.3
21	226° 17'.4	131° 43'.2	52'.9	192° 10'.8	24'.9	65° 40'.3	25'.3	265° 34'.5	19'.4
22	241° 19'.9	146° 42'.3	52'.9	207° 11'.5	25'.5	80° 42'.5	25'.2	280° 37'.0	19'.4
23	256° 22'.3	161° 41'.4	52'.9	222° 12'.2	26'.1	95° 44'.6	25'.1	295° 39'.6	19'.4
	M.P. 05:57	v -0'.9	d 0'.0	v 0'.7	d 0'.6	v 2'.2	d 0'.1	v 2'.6	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.5	40° 19'.8 S
Achernar	335° 38'.6	57° 16'.1 S
Acrux	173° 27'.0	63° 03'.9 S
Adhara	255° 25'.2	28° 57'.8 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 34'.2	56° 00'.2 N
Alkaid	153° 10'.9	49° 21'.2 N
Alnair	28° 03'.0	46° 59'.5 S
Alnilam	276° 02'.6	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 23'.9	26° 44'.4 N
Alpheratz	357° 59'.8	29° 02'.9 N
Altair	62° 23'.2	8° 50'.9 N
Ankaa	353° 31'.1	42° 20'.5 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.3 N
Atria	108° 00'.6	69° 01'.0 S
Avior	234° 25'.0	59° 29'.3 S
Bellatrix	278° 49'.2	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.4 N
Canopus	264° 03'.7	52° 41'.5 S
Capella	280° 58'.1	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.1 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.6	18° 01'.5 S
Dubhe	194° 10'.8	61° 47'.7 N
Elnath	278° 32'.8	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.4 N
Enif	34° 02'.3	9° 50'.5 N
Fomalhaut	15° 41'.1	29° 39'.5 S
Gacrux	172° 18'.5	57° 04'.7 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.6 S
Hamal	328° 18'.7	23° 25'.6 N
Kaus Aust.	84° 04'.2	34° 23'.3 S
Kochab	137° 18'.4	74° 11'.3 N
Markab	13° 53'.9	15° 09'.9 N
Menkar	314° 31'.7	4° 03'.7 N
Menkent	148° 25'.9	36° 20'.3 S
Miaplacidus	221° 43'.8	69° 41'.5 S
Mirfak	309° 03'.3	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.3	56° 45'.3 S
Polaris	324° 13'.1	89° 13'.7 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.6	12° 33'.9 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.4	8° 12'.6 S
Rigil Kent	140° 12'.8	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.7	56° 29'.6 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.3	43° 24'.4 S
Vega	80° 49'.1	38° 46'.6 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	267° 57'.0	12:11
Mars	327° 12'.4	08:13
Jupiter	199° 37'.1	16:41
Saturn	39° 13'.0	03:25

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
179° 38'.1	23° 26'.2 N	305° 20'.8	15'.6	10° 13'.3 S	11'.0	54'.1
194° 38'.0	26'.2	319° 55'.4	15'.7	02'.3	11'.1	
209° 37'.8	26'.2	334° 30'.1	15'.6	9° 51'.2 S	11'.1	
224° 37'.7	26'.2	349° 04'.7	15'.7	40'.1	11'.2	
239° 37'.6	26'.2	3° 39'.4	15'.8	28'.9	11'.2	
254° 37'.4	26'.2	18° 14'.2	15'.7	17'.7	11'.2	
269° 37'.3	26'.3	32° 48'.9	15'.8	06'.5	11'.3	
284° 37'.2	26'.3	47° 23'.7	15'.8	8° 55'.2 S	11'.3	
299° 37'.0	26'.3	61° 58'.5	15'.9	43'.9	11'.3	
314° 36'.9	26'.3	76° 33'.4	15'.8	32'.6	11'.4	
329° 36'.8	26'.3	91° 08'.2	15'.9	21'.2	11'.4	
344° 36'.6	26'.3	105° 43'.1	15'.9	09'.8	11'.4	
359° 36'.5	23° 26'.3 N	120° 18'.0	16'.0	7° 58'.4 S	11'.5	54'.1
14° 36'.4	26'.3	134° 53'.0	16'.0	46'.9	11'.5	54'.2
29° 36'.2	26'.4	149° 28'.0	15'.9	35'.4	11'.5	
44° 36'.1	26'.4	164° 02'.9	16'.1	23'.9	11'.6	
59° 35'.9	26'.4	178° 38'.0	16'.0	12'.3	11'.5	
74° 35'.8	26'.4	193° 13'.0	16'.0	00'.8	11'.6	
89° 35'.7	26'.4	207° 48'.0	16'.1	6° 49'.2 S	11'.7	
104° 35'.5	26'.4	222° 23'.1	16'.1	37'.5	11'.6	
119° 35'.4	26'.4	236° 58'.2	16'.1	25'.9	11'.7	
134° 35'.3	26'.4	251° 33'.3	16'.1	14'.2	11'.7	
149° 35'.1	26'.4	266° 08'.4	16'.2	02'.5	11'.8	
164° 35'.0	26'.4	280° 43'.6	16'.1	5° 50'.7 S	11'.7	
179° 34'.9	23° 26'.4 N	295° 18'.7	16'.2	5° 39'.0 S	11'.8	54'.2
194° 34'.7	26'.4	309° 53'.9	16'.2	27'.2	11'.8	
209° 34'.6	26'.4	324° 29'.1	16'.1	15'.4	11'.8	
224° 34'.5	26'.4	339° 04'.2	16'.2	03'.6	11'.9	
239° 34'.3	26'.4	353° 39'.4	16'.3	4° 51'.7 S	11'.9	
254° 34'.2	26'.4	8° 14'.7	16'.2	39'.8	11'.9	
269° 34'.0	26'.4	22° 49'.9	16'.2	27'.9	11'.9	54'.3
284° 33'.9	26'.4	37° 25'.1	16'.2	16'.0	11'.9	
299° 33'.8	26'.4	52° 00'.3	16'.3	04'.1	11'.9	
314° 33'.6	26'.4	66° 35'.6	16'.2	3° 52'.2 S	12'.0	
329° 33'.5	26'.4	81° 10'.8	16'.3	40'.2	12'.0	
344° 33'.4	26'.4	95° 46'.1	16'.2	28'.2	12'.0	
359° 33'.2	23° 26'.4 N	110° 21'.3	16'.3	3° 16'.2 S	12'.0	54'.3
14° 33'.1	26'.4	124° 56'.6	16'.2	04'.2	12'.0	
29° 33'.0	26'.4	139° 31'.8	16'.3	2° 52'.2 S	12'.1	
44° 32'.8	26'.4	154° 07'.1	16'.2	40'.1	12'.1	
59° 32'.7	26'.4	168° 42'.3	16'.3	28'.0	12'.0	54'.4
74° 32'.6	26'.4	183° 17'.6	16'.2	16'.0	12'.1	
89° 32'.4	26'.3	197° 52'.8	16'.3	03'.9	12'.1	
104° 32'.3	26'.3	212° 28'.1	16'.2	1° 51'.8 S	12'.1	
119° 32'.2	26'.3	227° 03'.3	16'.3	39'.7	12'.2	
134° 32'.0	26'.3	241° 38'.6	16'.2	27'.5	12'.1	
149° 31'.9	26'.3	256° 13'.8	16'.2	15'.4	12'.1	
164° 31'.7	26'.3	270° 49'.0	16'.2	03'.3	12'.2	
179° 31'.6	23° 26'.3 N	285° 24'.2	16'.2	0° 51'.1 S	12'.1	54'.5
194° 31'.5	26'.3	299° 59'.4	16'.2	39'.0	12'.2	
209° 31'.3	26'.2	314° 34'.6	16'.2	26'.8	12'.2	
224° 31'.2	26'.2	329° 09'.8	16'.2	14'.6	12'.2	
239° 31'.1	26'.2	343° 45'.0	16'.1	02'.4	12'.2	
254° 30'.9	26'.2	358° 20'.1	16'.2	0° 09'.8 N	12'.2	
269° 30'.8	26'.2	12° 55'.3	16'.1	22'.0	12'.2	
284° 30'.7	26'.1	27° 30'.4	16'.1	34'.2	12'.2	54'.6
299° 30'.5	26'.1	42° 05'.5	16'.1	46'.4	12'.2	
314° 30'.4	26'.1	56° 40'.6	16'.1	58'.6	12'.2	
329° 30'.3	26'.1	71° 15'.7	16'.0	1° 10'.8 N	12'.2	
344° 30'.1	26'.1	85° 50'.7	16'.1	23'.0	12'.2	
359° 30'.0	23° 26'.0 N	100° 25'.8	16'.0	1° 35'.2 N	12'.3	54'.6
14° 29'.9	26'.0	115° 00'.8	15'.9	47'.5	12'.2	54'.7
29° 29'.7	26'.0	129° 35'.7	16'.0	59'.7	12'.2	
44° 29'.6	26'.0	144° 10'.7	15'.9	2° 11'.9 N	12'.2	
59° 29'.5	25'.9	158° 45'.6	16'.0	24'.1	12'.2	
74° 29'.3	25'.9	173° 20'.6	15'.8	36'.3	12'.2	
89° 29'.2	25'.9	187° 55'.4	15'.9	48'.5	12'.3	
104° 29'.0	25'.9	202° 30'.3	15'.8	3° 00'.8 N	12'.2	54'.8
119° 28'.9	25'.8	217° 05'.1	15'.8	13'.0	12'.2	
134° 28'.8	25'.8	231° 39'.9	15'.8	25'.2	12'.2	
149° 28'.6	25'.8	246° 14'.7	15'.7	37'.4	12'.2	
164° 28'.5	25'.7	260° 49'.4	15'.7	49'.6	12'.2	
SD 15'.7	d 0'.0	SD	14'.8	14'.8	14'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
20	1 27	1 34	12:02	03:45	16:06	19d 76%
21	1 40	1 47	12:02	04:26	16:46	20d 68%
22	1 53	2 00	12:02	05:07	17:27	21d 58%

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1992 June 23, 24, 25 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.9		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
23 Tuesday 00	271° 24'.8	176° 40'.5	23° 52'.9 N	237° 12'.9	12° 26'.7 N	110° 46'.8	9° 24'.9 N	310° 42'.2	16° 19'.5 S
01	286° 27'.3	191° 39'.6	52'.9	252° 13'.6	27'.4	125° 48'.9	24'.8	325° 44'.7	19'.5
02	301° 29'.7	206° 38'.7	52'.9	267° 14'.3	28'.0	140° 51'.1	24'.7	340° 47'.3	19'.5
03	316° 32'.2	221° 37'.8	52'.9	282° 15'.0	28'.6	155° 53'.2	24'.5	355° 49'.9	19'.6
04	331° 34'.6	236° 36'.9	52'.9	297° 15'.7	29'.2	170° 55'.4	24'.4	10° 52'.4	19'.6
05	346° 37'.1	251° 36'.0	52'.9	312° 16'.4	29'.8	185° 57'.5	24'.2	25° 55'.0	19'.6
06	1° 39'.6	266° 35'.1	52'.8	327° 17'.1	30'.4	200° 59'.6	24'.1	40° 57'.5	19'.7
07	16° 42'.0	281° 34'.2	52'.8	342° 17'.9	31'.0	216° 01'.8	24'.0	56° 00'.1	19'.7
08	31° 44'.5	296° 33'.3	52'.8	357° 18'.6	31'.7	231° 03'.9	23'.8	71° 02'.7	19'.8
09	46° 47'.0	311° 32'.4	52'.8	12° 19'.3	32'.3	246° 06'.1	23'.7	86° 05'.2	19'.8
10	61° 49'.4	326° 31'.5	52'.8	27° 20'.0	32'.9	261° 08'.2	23'.6	101° 07'.8	19'.8
11	76° 51'.9	341° 30'.6	52'.8	42° 20'.7	33'.5	276° 10'.4	23'.4	116° 10'.3	19'.9
12	91° 54'.4	356° 29'.7	23° 52'.7 N	57° 21'.4	12° 34'.1 N	291° 12'.5	9° 23'.3 N	131° 12'.9	16° 19'.9 S
13	106° 56'.8	11° 28'.8	52'.7	72° 22'.1	34'.7	306° 14'.6	23'.2	146° 15'.5	19'.9
14	121° 59'.3	26° 27'.9	52'.7	87° 22'.8	35'.3	321° 16'.8	23'.0	161° 18'.0	20'.0
15	137° 01'.8	41° 27'.0	52'.7	102° 23'.5	36'.0	336° 18'.9	22'.9	176° 20'.6	20'.0
16	152° 04'.2	56° 26'.1	52'.6	117° 24'.2	36'.6	351° 21'.1	22'.8	191° 23'.1	20'.1
17	167° 06'.7	71° 25'.2	52'.6	132° 24'.9	37'.2	6° 23'.2	22'.6	206° 25'.7	20'.1
18	182° 09'.1	86° 24'.3	52'.6	147° 25'.6	37'.8	21° 25'.3	22'.5	221° 28'.3	20'.1
19	197° 11'.6	101° 23'.4	52'.5	162° 26'.3	38'.4	36° 27'.5	22'.4	236° 30'.8	20'.2
20	212° 14'.1	116° 22'.5	52'.5	177° 27'.0	39'.0	51° 29'.6	22'.2	251° 33'.4	20'.2
21	227° 16'.5	131° 21'.7	52'.5	192° 27'.8	39'.6	66° 31'.8	22'.1	266° 36'.0	20'.2
22	242° 19'.0	146° 20'.8	52'.4	207° 28'.5	40'.2	81° 33'.9	22'.0	281° 38'.5	20'.3
23	257° 21'.5	161° 19'.9	52'.4	222° 29'.2	40'.9	96° 36'.0	21'.8	296° 41'.1	20'.3
24 Wednesday 00	272° 23'.9	176° 19'.0	23° 52'.4 N	237° 29'.9	12° 41'.5 N	111° 38'.2	9° 21'.7 N	311° 43'.6	16° 20'.4 S
01	287° 26'.4	191° 18'.1	52'.3	252° 30'.6	42'.1	126° 40'.3	21'.5	326° 46'.2	20'.4
02	302° 28'.9	206° 17'.2	52'.3	267° 31'.3	42'.7	141° 42'.5	21'.4	341° 48'.8	20'.4
03	317° 31'.3	221° 16'.3	52'.3	282° 32'.0	43'.3	156° 44'.6	21'.3	356° 51'.3	20'.5
04	332° 33'.8	236° 15'.4	52'.2	297° 32'.7	43'.9	171° 46'.7	21'.1	11° 53'.9	20'.5
05	347° 36'.3	251° 14'.5	52'.2	312° 33'.4	44'.5	186° 48'.9	21'.0	26° 56'.5	20'.5
06	2° 38'.7	266° 13'.6	52'.1	327° 34'.1	45'.1	201° 51'.0	20'.9	41° 59'.0	20'.6
07	17° 41'.2	281° 12'.7	52'.1	342° 34'.8	45'.7	216° 53'.2	20'.7	57° 01'.6	20'.6
08	32° 43'.6	296° 11'.8	52'.0	357° 35'.5	46'.3	231° 55'.3	20'.6	72° 04'.2	20'.7
09	47° 46'.1	311° 10'.9	52'.0	12° 36'.2	47'.0	246° 57'.4	20'.5	87° 06'.7	20'.7
10	62° 48'.6	326° 10'.0	51'.9	27° 36'.9	47'.6	261° 59'.6	20'.3	102° 09'.3	20'.7
11	77° 51'.0	341° 09'.1	51'.9	42° 37'.7	48'.2	277° 01'.7	20'.2	117° 11'.8	20'.8
12	92° 53'.5	356° 08'.2	23° 51'.8 N	57° 38'.4	12° 48'.8 N	292° 03'.8	9° 20'.0 N	132° 14'.4	16° 20'.8 S
13	107° 56'.0	11° 07'.3	51'.8	72° 39'.1	49'.4	307° 06'.0	19'.9	147° 17'.0	20'.8
14	122° 58'.4	26° 06'.4	51'.7	87° 39'.8	50'.0	322° 08'.1	19'.8	162° 19'.5	20'.9
15	138° 00'.9	41° 05'.5	51'.7	102° 40'.5	50'.6	337° 10'.3	19'.6	177° 22'.1	20'.9
16	153° 03'.4	56° 04'.6	51'.6	117° 41'.2	51'.2	352° 12'.4	19'.5	192° 24'.7	21'.0
17	168° 05'.8	71° 03'.7	51'.6	132° 41'.9	51'.8	7° 14'.5	19'.4	207° 27'.2	21'.0
18	183° 08'.3	86° 02'.8	51'.5	147° 42'.6	52'.4	22° 16'.7	19'.2	222° 29'.8	21'.0
19	198° 10'.7	101° 01'.9	51'.4	162° 43'.3	53'.0	37° 18'.8	19'.1	237° 32'.4	21'.1
20	213° 13'.2	116° 01'.0	51'.4	177° 44'.0	53'.6	52° 20'.9	19'.0	252° 34'.9	21'.1
21	228° 15'.7	131° 00'.1	51'.3	192° 44'.7	54'.2	67° 23'.1	18'.8	267° 37'.5	21'.1
22	243° 18'.1	145° 59'.2	51'.2	207° 45'.4	54'.9	82° 25'.2	18'.7	282° 40'.1	21'.2
23	258° 20'.6	160° 58'.4	51'.2	222° 46'.1	55'.5	97° 27'.3	18'.5	297° 42'.6	21'.2
25 Thursday 00	273° 23'.1	175° 57'.5	23° 51'.1 N	237° 46'.8	12° 56'.1 N	112° 29'.5	9° 18'.4 N	312° 45'.2	16° 21'.3 S
01	288° 25'.5	190° 56'.6	51'.0	252° 47'.5	56'.7	127° 31'.6	18'.3	327° 47'.8	21'.3
02	303° 28'.0	205° 55'.7	51'.0	267° 48'.2	57'.3	142° 33'.7	18'.1	342° 50'.3	21'.3
03	318° 30'.5	220° 54'.8	50'.9	282° 49'.0	57'.9	157° 35'.9	18'.0	357° 52'.9	21'.4
04	333° 32'.9	235° 53'.9	50'.8	297° 49'.7	58'.5	172° 38'.0	17'.9	12° 55'.5	21'.4
05	348° 35'.4	250° 53'.0	50'.8	312° 50'.4	59'.1	187° 40'.1	17'.7	27° 58'.0	21'.5
06	3° 37'.9	265° 52'.1	50'.7	327° 51'.1	59'.7	202° 42'.3	17'.6	43° 00'.6	21'.5
07	18° 40'.3	280° 51'.2	50'.6	342° 51'.8	13° 00'.3 N	217° 44'.4	17'.4	58° 03'.2	21'.5
08	33° 42'.8	295° 50'.3	50'.5	357° 52'.5	00'.9	232° 46'.6	17'.3	73° 05'.7	21'.6
09	48° 45'.2	310° 49'.4	50'.5	12° 53'.2	01'.5	247° 48'.7	17'.2	88° 08'.3	21'.6
10	63° 47'.7	325° 48'.5	50'.4	27° 53'.9	02'.1	262° 50'.8	17'.0	103° 10'.9	21'.6
11	78° 50'.2	340° 47'.6	50'.3	42° 54'.6	02'.7	277° 53'.0	16'.9	118° 13'.4	21'.7
12	93° 52'.6	355° 46'.7	23° 50'.2 N	57° 55'.3	13° 03'.3 N	292° 55'.1	9° 16'.7 N	133° 16'.0	16° 21'.7 S
13	108° 55'.1	10° 45'.8	50'.1	72° 56'.0	03'.9	307° 57'.2	16'.6	148° 18'.6	21'.8
14	123° 57'.6	25° 44'.9	50'.1	87° 56'.7	04'.5	322° 59'.3	16'.5	163° 21'.1	21'.8
15	139° 00'.0	40° 44'.0	50'.0	102° 57'.4	05'.1	338° 01'.5	16'.3	178° 23'.7	21'.8
16	154° 02'.5	55° 43'.1	49'.9	117° 58'.1	05'.7	353° 03'.6	16'.2	193° 26'.3	21'.9
17	169° 05'.0	70° 42'.2	49'.8	132° 58'.8	06'.3	8° 05'.7	16'.1	208° 28'.9	21'.9
18	184° 07'.4	85° 41'.3	49'.7	147° 59'.5	06'.9	23° 07'.9	15'.9	223° 31'.4	22'.0
19	199° 09'.9	100° 40'.5	49'.6	163° 00'.3	07'.5	38° 10'.0	15'.8	238° 34'.0	22'.0
20	214° 12'.4	115° 39'.6	49'.5	178° 01'.0	08'.1	53° 12'.1	15'.6	253° 36'.6	22'.0
21	229° 14'.8	130° 38'.7	49'.4	193° 01'.7	08'.7	68° 14'.3	15'.5	268° 39'.1	22'.1
22	244° 17'.3	145° 37'.8	49'.3	208° 02'.4	09'.3	83° 16'.4	15'.4	283° 41'.7	22'.1
23	259° 19'.7	160° 36'.9	49'.2	223° 03'.1	09'.9	98° 18'.5	15'.2	298° 44'.3	22'.2
	M.P. 05:46	v -0'.9	d 0'.1	v 0'.7	d 0'.6	v 2'.1	d 0'.1	v 2'.6	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.5	40° 19'.8 S
Achernar	335° 38'.5	57° 16'.1 S
Acrux	173° 27'.0	63° 03'.9 S
Adhara	255° 25'.2	28° 57'.8 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 34'.2	56° 00'.2 N
Alkaid	153° 10'.9	49° 21'.2 N
Alnair	28° 03'.0	46° 59'.5 S
Alnilam	276° 02'.6	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.4 N
Alpheratz	357° 59'.8	29° 02'.9 N
Altair	62° 23'.2	8° 50'.9 N
Ankaa	353° 31'.1	42° 20'.5 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.3 N
Atria	108° 00'.6	69° 01'.0 S
Avior	234° 25'.0	59° 29'.3 S
Bellatrix	278° 49'.1	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.4 N
Canopus	264° 03'.7	52° 41'.5 S
Capella	280° 58'.1	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.1 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.6	18° 01'.4 S
Dubhe	194° 10'.9	61° 47'.7 N
Elnath	278° 32'.8	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.4 N
Enif	34° 02'.3	9° 50'.5 N
Fomalhaut	15° 41'.1	29° 39'.5 S
Gacrux	172° 18'.5	57° 04'.7 S
Gienah	176° 08'.4	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.6 S
Hamal	328° 18'.7	23° 25'.6 N
Kaus Aust.	84° 04'.2	34° 23'.3 S
Kochab	137° 18'.4	74° 11'.3 N
Markab	13° 53'.9	15° 09'.9 N
Menkar	314° 31'.7	4° 03'.7 N
Menkent	148° 25'.9	36° 20'.3 S
Miaplacidus	221° 43'.8	69° 41'.5 S
Mirfak	309° 03'.3	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.2	56° 45'.4 S
Polaris	324° 12'.0	89° 13'.6 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.6 N
Rasalhague	96° 20'.6	12° 33'.9 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.4	8° 12'.6 S
Rigil Kent	140° 12'.8	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.6	56° 29'.6 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.4 S
Vega	80° 49'.1	38° 46'.6 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	263° 55'.0	12:15
Mars	325° 05'.9	08:10
Jupiter	199° 14'.2	16:31
Saturn	39° 19'.7	03:13

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
23 Tuesday 00	179° 28'.4	23° 25'.7 N	275° 24'.1	15'.7	4° 01'.8 N	12'.1	54'.9
01	194° 28'.2	25'.7	289° 58'.8	15'.6	13'.9	12'.2	
02	209° 28'.1	25'.6	304° 33'.4	15'.6	26'.1	12'.2	
03	224° 28'.0	25'.6	319° 08'.0	15'.6	38'.3	12'.1	
04	239° 27'.8	25'.6	333° 42'.6	15'.5	50'.4	12'.2	
05	254° 27'.7	25'.5	348° 17'.1	15'.5	5° 02'.6 N	12'.1	55'.0
06	269° 27'.6	25'.5	2° 51'.6	15'.4	14'.7	12'.1	
07	284° 27'.4	25'.5	17° 26'.0	15'.4	26'.8	12'.2	
08	299° 27'.3	25'.4	32° 00'.4	15'.4	39'.0	12'.1	
09	314° 27'.2	25'.4	46° 34'.8	15'.3	51'.1	12'.1	55'.1
10	329° 27'.0	25'.3	61° 09'.1	15'.3	6° 03'.2 N	12'.0	
11	344° 26'.9	25'.3	75° 43'.4	15'.2	15'.2	12'.1	
12	359° 26'.8	23° 25'.3 N	90° 17'.6	15'.2	6° 27'.3 N	12'.0	55'.1
13	14° 26'.6	25'.2	104° 51'.8	15'.1	39'.3	12'.1	55'.2
14	29° 26'.5	25'.2	119° 25'.9	15'.1	51'.4	12'.0	
15	44° 26'.4	25'.1	134° 00'.0	15'.0	7° 03'.4 N	12'.0	
16	59° 26'.2	25'.1	148° 34'.0	15'.0	15'.4	11'.9	
17	74° 26'.1	25'.1	163° 08'.0	14'.9	27'.3	12'.0	55'.3
18	89° 26'.0	25'.0	177° 41'.9	14'.8	39'.3	11'.9	
19	104° 25'.8	25'.0	192° 15'.7	14'.9	51'.2	12'.0	
20	119° 25'.7	24'.9	206° 49'.6	14'.7	8° 03'.2 N	11'.8	
21	134° 25'.5	24'.9	221° 23'.3	14'.7	15'.0	11'.9	55'.4
22	149° 25'.4	24'.8	235° 57'.0	14'.7	26'.9	11'.9	
23	164° 25'.3	24'.8	250° 30'.7	14'.6	38'.8	11'.8	
24 Wednesday 00	179° 25'.1	23° 24'.7 N	265° 04'.3	14'.5	8° 50'.6 N	11'.8	55'.4
01	194° 25'.0	24'.7	279° 37'.8	14'.5	9° 02'.4 N	11'.8	55'.5
02	209° 24'.9	24'.6	294° 11'.3	14'.4	14'.2	11'.7	
03	224° 24'.7	24'.6	308° 44'.7	14'.3	25'.9	11'.7	
04	239° 24'.6	24'.5	323° 18'.0	14'.3	37'.6	11'.7	
05	254° 24'.5	24'.5	337° 51'.3	14'.2	49'.3	11'.7	55'.6
06	269° 24'.3	24'.4	352° 24'.5	14'.1	10° 01'.0 N	11'.6	
07	284° 24'.2	24'.4	6° 57'.6	14'.1	12'.6	11'.6	
08	299° 24'.1	24'.3	21° 30'.7	14'.0	24'.2	11'.5	55'.7
09	314° 23'.9	24'.3	36° 03'.7	14'.0	35'.7	11'.6	
10	329° 23'.8	24'.2	50° 36'.7	13'.9	47'.3	11'.5	
11	344° 23'.7	24'.1	65° 09'.6	13'.8	58'.8	11'.4	
12	359° 23'.5	23° 24'.1 N	79° 42'.4	13'.7	11° 10'.2 N	11'.5	55'.8
13	14° 23'.4	24'.0	94° 15'.1	13'.7	21'.7	11'.3	
14	29° 23'.3	24'.0	108° 47'.8	13'.5	33'.0	11'.4	
15	44° 23'.1	23'.9	123° 20'.3	13'.6	44'.4	11'.3	55'.9
16	59° 23'.0	23'.8	137° 52'.9	13'.4	55'.7	11'.3	
17	74° 22'.9	23'.8	152° 25'.3	13'.3	12° 07'.0 N	11'.2	
18	89° 22'.7	23'.7	166° 57'.6	13'.3	18'.2	11'.2	56'.0
19	104° 22'.6	23'.7	181° 29'.9	13'.2	29'.4	11'.1	
20	119° 22'.5	23'.6	196° 02'.1	13'.1	40'.5	11'.1	
21	134° 22'.3	23'.5	210° 34'.2	13'.1	51'.6	11'.1	56'.1
22	149° 22'.2	23'.5	225° 06'.3	12'.9	13° 02'.7 N	11'.0	
23	164° 22'.1	23'.4	239° 38'.2	12'.9	13'.7	11'.0	
25 Thursday 00	179° 21'.9	23° 23'.3 N	254° 10'.1	12'.8	13° 24'.7 N	10'.9	56'.2
01	194° 21'.8	23'.3	268° 41'.9	12'.7	35'.6	10'.8	
02	209° 21'.7	23'.2	283° 13'.6	12'.6	46'.4	10'.9	
03	224° 21'.5	23'.1	297° 45'.2	12'.6	57'.3	10'.7	
04	239° 21'.4	23'.1	312° 16'.8	12'.4	14° 08'.0 N	10'.7	56'.3
05	254° 21'.3	23'.0	326° 48'.2	12'.4	18'.7	10'.7	
06	269° 21'.1	22'.9	341° 19'.6	12'.3	29'.4	10'.6	
07	284° 21'.0	22'.9	355° 50'.9	12'.2	40'.0	10'.5	56'.4
08	299° 20'.9	22'.8	10° 22'.1	12'.1	50'.5	10'.5	
09	314° 20'.7	22'.7	24° 53'.2	12'.0	15° 01'.0 N	10'.4	56'.5
10	329° 20'.6	22'.6	39° 24'.2	11'.9	11'.4	10'.4	
11	344° 20'.5	22'.6	53° 55'.1	11'.8	21'.8	10'.3	
12	359° 20'.3	23° 22'.5 N	68° 25'.9	11'.7	15° 32'.1 N	10'.3	56'.6
13	14° 20'.2	22'.4	82° 56'.6	11'.6	42'.4	10'.2	
14	29° 20'.1	22'.3	97° 27'.2	11'.6	52'.6	10'.1	
15	44° 20'.0	22'.3	111° 57'.8	11'.4	16° 02'.7 N	10'.0	56'.7
16	59° 19'.8	22'.2	126° 28'.2	11'.4	12'.7	10'.0	
17	74° 19'.7	22'.1	140° 58'.6	11'.2	22'.7	9'.9	
18	89° 19'.6	22'.0	155° 28'.8	11'.2	32'.6	9'.9	56'.8
19	104° 19'.4	21'.9	169° 59'.0	11'.0	42'.5	9'.7	
20	119° 19'.3	21'.9	184° 29'.0	11'.0	52'.2	9'.7	
21	134° 19'.2	21'.8	198° 59'.0	10'.8	17° 01'.9 N	9'.7	56'.9
22	149° 19'.0	21'.7	213° 28'.8	10'.8	11'.6	9'.5	
23	164° 18'.9	21'.6	227° 58'.6	10'.6	21'.1	9'.5	
	SD 15'.7	d 0'.1	SD 15'.0		15'.2	15'.4	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
23	2 06	2 13	12:02	05:48	18:09	22d 49%
24	2 19	2 26	12:02	06:31	18:54	23d 39%
25	2 32	2 38	12:03	07:17	19:41	24d 29%

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1992 June 26, 27, 28 (Fri, Sat, Sun)

GMT	ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.9		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
26 Friday 00	274° 22'.2	175° 36'.0	23° 49'.1 N	238° 03'.8	13° 10'.5 N	113° 20'.7	9° 15'.1 N	313° 46'.8	16° 22'.2 S
01	289° 24'.7	190° 35'.1	49'.1	253° 04'.5	11'.1	128° 22'.8	14'.9	328° 49'.4	22'.2
02	304° 27'.1	205° 34'.2	49'.0	268° 05'.2	11'.7	143° 24'.9	14'.8	343° 52'.0	22'.3
03	319° 29'.6	220° 33'.3	48'.9	283° 05'.9	12'.3	158° 27'.1	14'.7	358° 54'.6	22'.3
04	334° 32'.1	235° 32'.4	48'.8	298° 06'.6	12'.9	173° 29'.2	14'.5	13° 57'.1	22'.4
05	349° 34'.5	250° 31'.5	48'.7	313° 07'.3	13'.5	188° 31'.3	14'.4	28° 59'.7	22'.4
06	4° 37'.0	265° 30'.6	48'.5	328° 08'.0	14'.1	203° 33'.4	14'.2	44° 02'.3	22'.4
07	19° 39'.5	280° 29'.7	48'.4	343° 08'.7	14'.7	218° 35'.6	14'.1	59° 04'.8	22'.5
08	34° 41'.9	295° 28'.8	48'.3	358° 09'.4	15'.3	233° 37'.7	14'.0	74° 07'.4	22'.5
09	49° 44'.4	310° 27'.9	48'.2	13° 10'.1	15'.9	248° 39'.8	13'.8	89° 10'.0	22'.6
10	64° 46'.8	325° 27'.0	48'.1	28° 10'.8	16'.5	263° 42'.0	13'.7	104° 12'.5	22'.6
11	79° 49'.3	340° 26'.2	48'.0	43° 11'.5	17'.1	278° 44'.1	13'.5	119° 15'.1	22'.6
12	94° 51'.8	355° 25'.3	23° 47'.9 N	58° 12'.3	13° 17'.7 N	293° 46'.2	9° 13'.4 N	134° 17'.7	16° 22'.7 S
13	109° 54'.2	10° 24'.4	47'.8	73° 13'.0	18'.3	308° 48'.4	13'.3	149° 20'.3	22'.7
14	124° 56'.7	25° 23'.5	47'.7	88° 13'.7	18'.9	323° 50'.5	13'.1	164° 22'.8	22'.8
15	139° 59'.2	40° 22'.6	47'.6	103° 14'.4	19'.5	338° 52'.6	13'.0	179° 25'.4	22'.8
16	155° 01'.6	55° 21'.7	47'.4	118° 15'.1	20'.1	353° 54'.7	12'.8	194° 28'.0	22'.8
17	170° 04'.1	70° 20'.8	47'.3	133° 15'.8	20'.7	8° 56'.9	12'.7	209° 30'.6	22'.9
18	185° 06'.6	85° 19'.9	47'.2	148° 16'.5	21'.3	23° 59'.0	12'.6	224° 33'.1	22'.9
19	200° 09'.0	100° 19'.0	47'.1	163° 17'.2	21'.9	39° 01'.1	12'.4	239° 35'.7	23'.0
20	215° 11'.5	115° 18'.1	47'.0	178° 17'.9	22'.5	54° 03'.2	12'.3	254° 38'.3	23'.0
21	230° 14'.0	130° 17'.2	46'.8	193° 18'.6	23'.1	69° 05'.4	12'.1	269° 40'.8	23'.0
22	245° 16'.4	145° 16'.3	46'.7	208° 19'.3	23'.7	84° 07'.5	12'.0	284° 43'.4	23'.1
23	260° 18'.9	160° 15'.4	46'.6	223° 20'.0	24'.2	99° 09'.6	11'.8	299° 46'.0	23'.1
27 Saturday 00	275° 21'.3	175° 14'.6	23° 46'.5 N	238° 20'.7	13° 24'.8 N	114° 11'.8	9° 11'.7 N	314° 48'.6	16° 23'.2 S
01	290° 23'.8	190° 13'.7	46'.3	253° 21'.4	25'.4	129° 13'.9	11'.6	329° 51'.1	23'.2
02	305° 26'.3	205° 12'.8	46'.2	268° 22'.1	26'.0	144° 16'.0	11'.4	344° 53'.7	23'.2
03	320° 28'.7	220° 11'.9	46'.1	283° 22'.8	26'.6	159° 18'.1	11'.3	359° 56'.3	23'.3
04	335° 31'.2	235° 11'.0	46'.0	298° 23'.5	27'.2	174° 20'.3	11'.1	14° 58'.9	23'.3
05	350° 33'.7	250° 10'.1	45'.8	313° 24'.2	27'.8	189° 22'.4	11'.0	30° 01'.4	23'.4
06	5° 36'.1	265° 09'.2	45'.7	328° 24'.9	28'.4	204° 24'.5	10'.9	45° 04'.0	23'.4
07	20° 38'.6	280° 08'.3	45'.6	343° 25'.6	29'.0	219° 26'.6	10'.7	60° 06'.6	23'.4
08	35° 41'.1	295° 07'.4	45'.4	358° 26'.4	29'.6	234° 28'.8	10'.6	75° 09'.2	23'.5
09	50° 43'.5	310° 06'.5	45'.3	13° 27'.1	30'.2	249° 30'.9	10'.4	90° 11'.7	23'.5
10	65° 46'.0	325° 05'.6	45'.2	28° 27'.8	30'.8	264° 33'.0	10'.3	105° 14'.3	23'.6
11	80° 48'.5	340° 04'.7	45'.0	43° 28'.5	31'.4	279° 35'.1	10'.2	120° 16'.9	23'.6
12	95° 50'.9	355° 03'.9	23° 44'.9 N	58° 29'.2	13° 31'.9 N	294° 37'.3	9° 10'.0 N	135° 19'.4	16° 23'.6 S
13	110° 53'.4	10° 03'.0	44'.7	73° 29'.9	32'.5	309° 39'.4	09'.9	150° 22'.0	23'.7
14	125° 55'.8	25° 02'.1	44'.6	88° 30'.6	33'.1	324° 41'.5	09'.7	165° 24'.6	23'.7
15	140° 58'.3	40° 01'.2	44'.4	103° 31'.3	33'.7	339° 43'.6	09'.6	180° 27'.2	23'.8
16	156° 00'.8	55° 00'.3	44'.3	118° 32'.0	34'.3	354° 45'.8	09'.4	195° 29'.8	23'.8
17	171° 03'.2	69° 59'.4	44'.2	133° 32'.7	34'.9	9° 47'.9	09'.3	210° 32'.3	23'.8
18	186° 05'.7	84° 58'.5	44'.0	148° 33'.4	35'.5	24° 50'.0	09'.2	225° 34'.9	23'.9
19	201° 08'.2	99° 57'.6	43'.9	163° 34'.1	36'.1	39° 52'.1	09'.0	240° 37'.5	23'.9
20	216° 10'.6	114° 56'.7	43'.7	178° 34'.8	36'.7	54° 54'.3	08'.9	255° 40'.1	24'.0
21	231° 13'.1	129° 55'.8	43'.6	193° 35'.5	37'.3	69° 56'.4	08'.7	270° 42'.6	24'.0
22	246° 15'.6	144° 55'.0	43'.4	208° 36'.2	37'.8	84° 58'.5	08'.6	285° 45'.2	24'.0
23	261° 18'.0	159° 54'.1	43'.3	223° 36'.9	38'.4	100° 00'.6	08'.4	300° 47'.8	24'.1
28 Sunday 00	276° 20'.5	174° 53'.2	23° 43'.1 N	238° 37'.6	13° 39'.0 N	115° 02'.7	9° 08'.3 N	315° 50'.4	16° 24'.1 S
01	291° 23'.0	189° 52'.3	42'.9	253° 38'.3	39'.6	130° 04'.9	08'.2	330° 52'.9	24'.2
02	306° 25'.4	204° 51'.4	42'.8	268° 39'.0	40'.2	145° 07'.0	08'.0	345° 55'.5	24'.2
03	321° 27'.9	219° 50'.5	42'.6	283° 39'.7	40'.8	160° 09'.1	07'.9	0° 58'.1	24'.3
04	336° 30'.3	234° 49'.6	42'.5	298° 40'.5	41'.4	175° 11'.2	07'.7	16° 00'.7	24'.3
05	351° 32'.8	249° 48'.7	42'.3	313° 41'.2	42'.0	190° 13'.4	07'.6	31° 03'.2	24'.3
06	6° 35'.3	264° 47'.8	42'.1	328° 41'.9	42'.5	205° 15'.5	07'.4	46° 05'.8	24'.4
07	21° 37'.7	279° 47'.0	42'.0	343° 42'.6	43'.1	220° 17'.6	07'.3	61° 08'.4	24'.4
08	36° 40'.2	294° 46'.1	41'.8	358° 43'.3	43'.7	235° 19'.7	07'.2	76° 11'.0	24'.5
09	51° 42'.7	309° 45'.2	41'.6	13° 44'.0	44'.3	250° 21'.8	07'.0	91° 13'.6	24'.5
10	66° 45'.1	324° 44'.3	41'.5	28° 44'.7	44'.9	265° 24'.0	06'.9	106° 16'.1	24'.5
11	81° 47'.6	339° 43'.4	41'.3	43° 45'.4	45'.5	280° 26'.1	06'.7	121° 18'.7	24'.6
12	96° 50'.1	354° 42'.5	23° 41'.1 N	58° 46'.1	13° 46'.1 N	295° 28'.2	9° 06'.6 N	136° 21'.3	16° 24'.6 S
13	111° 52'.5	9° 41'.6	41'.0	73° 46'.8	46'.6	310° 30'.3	06'.4	151° 23'.9	24'.7
14	126° 55'.0	24° 40'.7	40'.8	88° 47'.5	47'.2	325° 32'.4	06'.3	166° 26'.4	24'.7
15	141° 57'.5	39° 39'.9	40'.6	103° 48'.2	47'.8	340° 34'.6	06'.1	181° 29'.0	24'.8
16	156° 59'.9	54° 39'.0	40'.5	118° 48'.9	48'.4	355° 36'.7	06'.0	196° 31'.6	24'.8
17	172° 02'.4	69° 38'.1	40'.3	133° 49'.6	49'.0	10° 38'.8	05'.9	211° 34'.2	24'.8
18	187° 04'.8	84° 37'.2	40'.1	148° 50'.3	49'.6	25° 40'.9	05'.7	226° 36'.8	24'.9
19	202° 07'.3	99° 36'.3	39'.9	163° 51'.0	50'.1	40° 43'.0	05'.6	241° 39'.3	24'.9
20	217° 09'.8	114° 35'.4	39'.7	178° 51'.7	50'.7	55° 45'.2	05'.4	256° 41'.9	25'.0
21	232° 12'.2	129° 34'.5	39'.6	193° 52'.4	51'.3	70° 47'.3	05'.3	271° 44'.5	25'.0
22	247° 14'.7	144° 33'.7	39'.4	208° 53'.1	51'.9	85° 49'.4	05'.1	286° 47'.1	25'.1
23	262° 17'.2	159° 32'.8	39'.2	223° 53'.8	52'.5	100° 51'.5	05'.0	301° 49'.7	25'.1
	M.P. 05:34	v -0'.9	d 0'.1	v 0'.7	d 0'.6	v 2'.1	d 0'.1	v 2'.6	d 0'.0

STARS		
Name	SHA	Dec
Acamar	315° 30'.4	40° 19'.8 S
Achernar	335° 38'.5	57° 16'.1 S
Acrux	173° 27'.0	63° 03'.9 S
Adhara	255° 25'.2	28° 57'.7 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 34'.2	56° 00'.2 N
Alkaid	153° 10'.9	49° 21'.2 N
Alnair	28° 03'.0	46° 59'.5 S
Alnilam	276° 02'.6	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.4 N
Alpheratz	357° 59'.7	29° 02'.9 N
Altair	62° 23'.2	8° 50'.9 N
Ankaa	353° 31'.1	42° 20'.5 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.3 N
Atria	108° 00'.6	69° 01'.0 S
Avior	234° 25'.1	59° 29'.3 S
Bellatrix	278° 49'.1	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.4 N
Canopus	264° 03'.7	52° 41'.5 S
Capella	280° 58'.1	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.1 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.6	18° 01'.4 S
Dubhe	194° 10'.9	61° 47'.7 N
Elnath	278° 32'.8	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.4 N
Enif	34° 02'.3	9° 50'.5 N
Fomalhaut	15° 41'.0	29° 39'.5 S
Gacrux	172° 18'.5	57° 04'.7 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.6 S
Hamal	328° 18'.6	23° 25'.6 N
Kaus Aust.	84° 04'.2	34° 23'.3 S
Kochab	137° 18'.5	74° 11'.4 N
Markab	13° 53'.8	15° 09'.9 N
Menkar	314° 31'.7	4° 03'.7 N
Menkent	148° 25'.9	36° 20'.3 S
Miaplacidus	221° 43'.8	69° 41'.5 S
Mirfak	309° 03'.2	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.2	56° 45'.4 S
Polaris	324° 10'.7	89° 13'.6 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.7 N
Rasalhague	96° 20'.6	12° 33'.9 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.4	8° 12'.6 S
Rigil Kent	140° 12'.8	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.6	56° 29'.6 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.9	16° 42'.4 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.4 S
Vega	80° 49'.1	38° 46'.6 N
Zuben'ubi	137° 22'.6	16° 00'.8 S
	SHA	Mer.Pass.
Venus	259° 53'.2	12:20
Mars	322° 59'.4	08:06
Jupiter	198° 50'.4	16:21
Saturn	39° 27'.2	03:00

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
179° 18'.8	23° 21'.5 N	242° 28'.2	10'.6	17° 30'.6 N	9'.4	57'.0
194° 18'.6	21'.4	256° 57'.8	10'.4	40'.0	9'.3	
209° 18'.5	21'.4	271° 27'.2	10'.4	49'.3	9'.3	57'.1
224° 18'.4	21'.3	285° 56'.6	10'.2	58'.6	9'.1	
239° 18'.2	21'.2	300° 25'.8	10'.2	18° 07'.7 N	9'.1	
254° 18'.1	21'.1	314° 55'.0	10'.0	16'.8	9'.0	57'.2
269° 18'.0	21'.0	329° 24'.0	9'.9	25'.8	8'.9	
284° 17'.8	20'.9	343° 52'.9	9'.9	34'.7	8'.8	
299° 17'.7	20'.8	358° 21'.8	9'.7	43'.5	8'.8	57'.3
314° 17'.6	20'.8	12° 50'.5	9'.6	52'.3	8'.6	
329° 17'.4	20'.7	27° 19'.1	9'.5	19° 00'.9 N	8'.6	57'.4
344° 17'.3	20'.6	41° 47'.6	9'.4	09'.5	8'.4	
359° 17'.2	23° 20'.5 N	56° 16'.0	9'.3	19° 17'.9 N	8'.4	57'.4
14° 17'.1	20'.4	70° 44'.3	9'.2	26'.3	8'.3	57'.5
29° 16'.9	20'.3	85° 12'.5	9'.1	34'.6	8'.1	
44° 16'.8	20'.2	99° 40'.6	9'.0	42'.7	8'.1	
59° 16'.7	20'.1	114° 08'.6	8'.9	50'.8	8'.0	57'.6
74° 16'.5	20'.0	128° 36'.5	8'.8	58'.8	7'.9	
89° 16'.4	19'.9	143° 04'.3	8'.7	20° 06'.7 N	7'.7	57'.7
104° 16'.3	19'.8	157° 32'.0	8'.5	14'.4	7'.7	
119° 16'.1	19'.7	171° 59'.5	8'.5	22'.1	7'.6	
134° 16'.0	19'.6	186° 27'.0	8'.3	29'.7	7'.4	57'.8
149° 15'.9	19'.5	200° 54'.3	8'.3	37'.1	7'.4	
164° 15'.7	19'.4	215° 21'.6	8'.1	44'.5	7'.2	
179° 15'.6	23° 19'.3 N	229° 48'.7	8'.1	20° 51'.7 N	7'.1	57'.9
194° 15'.5	19'.2	244° 15'.8	7'.9	58'.8	7'.1	
209° 15'.4	19'.1	258° 42'.7	7'.8	21° 05'.9 N	6'.9	58'.0
224° 15'.2	19'.0	273° 09'.5	7'.7	12'.8	6'.7	
239° 15'.1	18'.9	287° 36'.2	7'.7	19'.5	6'.7	
254° 15'.0	18'.8	302° 02'.9	7'.5	26'.2	6'.6	58'.1
269° 14'.8	18'.7	316° 29'.4	7'.4	32'.8	6'.4	
284° 14'.7	18'.6	330° 55'.8	7'.3	39'.2	6'.3	
299° 14'.6	18'.5	345° 22'.1	7'.2	45'.5	6'.2	58'.2
314° 14'.4	18'.4	359° 48'.3	7'.1	51'.7	6'.0	
329° 14'.3	18'.3	14° 14'.4	7'.0	57'.7	6'.0	58'.3
344° 14'.2	18'.2	28° 40'.4	6'.9	22° 03'.7 N	5'.8	
359° 14'.1	23° 18'.1 N	43° 06'.3	6'.8	22° 09'.5 N	5'.7	58'.3
14° 13'.9	17'.9	57° 32'.1	6'.7	15'.2	5'.5	58'.4
29° 13'.8	17'.8	71° 57'.8	6'.7	20'.7	5'.4	
44° 13'.7	17'.7	86° 23'.5	6'.5	26'.1	5'.3	
59° 13'.5	17'.6	100° 49'.0	6'.4	31'.4	5'.2	58'.5
74° 13'.4	17'.5	115° 14'.4	6'.3	36'.6	5'.0	
89° 13'.3	17'.4	129° 39'.7	6'.2	41'.6	4'.9	58'.6
104° 13'.1	17'.3	144° 04'.9	6'.2	46'.5	4'.7	
119° 13'.0	17'.2	158° 30'.1	6'.0	51'.2	4'.6	
134° 12'.9	17'.0	172° 55'.1	6'.0	55'.8	4'.5	58'.7
149° 12'.8	16'.9	187° 20'.1	5'.8	23° 00'.3 N	4'.3	
164° 12'.6	16'.8	201° 44'.9	5'.8	04'.6	4'.2	
179° 12'.5	23° 16'.7 N	216° 09'.7	5'.7	23° 08'.8 N	4'.0	58'.8
194° 12'.4	16'.6	230° 34'.4	5'.6	12'.8	3'.9	
209° 12'.2	16'.5	244° 59'.0	5'.5	16'.7	3'.8	
224° 12'.1	16'.3	259° 23'.5	5'.4	20'.5	3'.6	58'.9
239° 12'.0	16'.2	273° 47'.9	5'.4	24'.1	3'.4	
254° 11'.9	16'.1	288° 12'.3	5'.2	27'.5	3'.3	59'.0
269° 11'.7	16'.0	302° 36'.5	5'.2	30'.8	3'.1	
284° 11'.6	15'.9	317° 00'.7	5'.1	33'.9	3'.0	
299° 11'.5	15'.7	331° 24'.8	5'.1	36'.9	2'.9	59'.1
314° 11'.3	15'.6	345° 48'.9	4'.9	39'.8	2'.7	
329° 11'.2	15'.5	0° 12'.8	4'.9	42'.5	2'.5	
344° 11'.1	15'.4	14° 36'.7	4'.8	45'.0	2'.3	59'.2
359° 11'.0	23° 15'.2 N	29° 00'.5	4'.8	23° 47'.3 N	2'.3	59'.2
14° 10'.8	15'.1	43° 24'.3	4'.6	49'.6	2'.0	
29° 10'.7	15'.0	57° 47'.9	4'.7	51'.6	1'.9	59'.3
44° 10'.6	14'.8	72° 11'.6	4'.5	53'.5	1'.7	
59° 10'.5	14'.7	86° 35'.1	4'.5	55'.2	1'.6	
74° 10'.3	14'.6	100° 58'.6	4'.4	56'.8	1'.4	59'.4
89° 10'.2	14'.5	115° 22'.0	4'.4	58'.2	1'.3	
104° 10'.1	14'.3	129° 45'.4	4'.3	59'.5	1'.0	
119° 09'.9	14'.2	144° 08'.7	4'.2	24° 00'.5 N	1'.0	59'.5
134° 09'.8	14'.1	158° 31'.9	4'.3	01'.5	0'.7	
149° 09'.7	13'.9	172° 55'.2	4'.1	02'.2	0'.6	
164° 09'.6	13'.8	187° 18'.3	4'.1	02'.8	0'.4	59'.6
SD 15'.7	d 0'.1	SD 15'.6		15'.9	16'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON ● Age/ Vis
26	2 45	2 51	12:03	08:07	20:33	25d 20%
27	2 57	3 04	12:03	09:01	21:29	26d 12%
28	3 10	3 16	12:03	09:59	22:30	27d 6%

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1992 Jun 29, 30, Jul. 1 (Mon, Tue, Wed)

GMT		ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.8		SATURN +0.4	
		GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
29 Monday	00	277° 19'.6	174° 31'.9	23° 39'.0 N	238° 54'.5	13° 53'.1 N	115° 53'.6	9° 04'.8 N	316° 52'.2	16° 25'.1 S
	01	292° 22'.1	189° 31'.0	38'.8	253° 55'.2	53'.6	130° 55'.7	04'.7	331° 54'.8	25'.2
	02	307° 24'.6	204° 30'.1	38'.6	268° 55'.9	54'.2	145° 57'.9	04'.6	346° 57'.4	25'.2
	03	322° 27'.0	219° 29'.2	38'.5	283° 56'.6	54'.8	161° 00'.0	04'.4	2° 00'.0	25'.3
	04	337° 29'.5	234° 28'.3	38'.3	298° 57'.4	55'.4	176° 02'.1	04'.3	17° 02'.6	25'.3
	05	352° 32'.0	249° 27'.5	38'.1	313° 58'.1	56'.0	191° 04'.2	04'.1	32° 05'.1	25'.3
	06	7° 34'.4	264° 26'.6	37'.9	328° 58'.8	56'.5	206° 06'.3	04'.0	47° 07'.7	25'.4
	07	22° 36'.9	279° 25'.7	37'.7	343° 59'.5	57'.1	221° 08'.5	03'.8	62° 10'.3	25'.4
	08	37° 39'.3	294° 24'.8	37'.5	359° 00'.2	57'.7	236° 10'.6	03'.7	77° 12'.9	25'.5
	09	52° 41'.8	309° 23'.9	37'.3	14° 00'.9	58'.3	251° 12'.7	03'.5	92° 15'.5	25'.5
	10	67° 44'.3	324° 23'.0	37'.1	29° 01'.6	58'.9	266° 14'.8	03'.4	107° 18'.0	25'.6
	11	82° 46'.7	339° 22'.1	36'.9	44° 02'.3	59'.4	281° 16'.9	03'.2	122° 20'.6	25'.6
	12	97° 49'.2	354° 21'.3	23° 36'.7 N	59° 03'.0	14° 00'.0 N	296° 19'.0	9° 03'.1 N	137° 23'.2	16° 25'.6 S
	13	112° 51'.7	9° 20'.4	36'.5	74° 03'.7	00'.6	311° 21'.2	03'.0	152° 25'.8	25'.7
	14	127° 54'.1	24° 19'.5	36'.3	89° 04'.4	01'.2	326° 23'.3	02'.8	167° 28'.4	25'.7
	15	142° 56'.6	39° 18'.6	36'.1	104° 05'.1	01'.8	341° 25'.4	02'.7	182° 31'.0	25'.8
	16	157° 59'.1	54° 17'.7	35'.9	119° 05'.8	02'.3	356° 27'.5	02'.5	197° 33'.5	25'.8
	17	173° 01'.5	69° 16'.8	35'.7	134° 06'.5	02'.9	11° 29'.6	02'.4	212° 36'.1	25'.9
	18	188° 04'.0	84° 16'.0	35'.5	149° 07'.2	03'.5	26° 31'.7	02'.2	227° 38'.7	25'.9
	19	203° 06'.4	99° 15'.1	35'.3	164° 07'.9	04'.1	41° 33'.8	02'.1	242° 41'.3	25'.9
	20	218° 08'.9	114° 14'.2	35'.1	179° 08'.6	04'.6	56° 36'.0	01'.9	257° 43'.9	26'.0
	21	233° 11'.4	129° 13'.3	34'.9	194° 09'.3	05'.2	71° 38'.1	01'.8	272° 46'.4	26'.0
	22	248° 13'.8	144° 12'.4	34'.7	209° 10'.0	05'.8	86° 40'.2	01'.6	287° 49'.0	26'.1
	23	263° 16'.3	159° 11'.6	34'.4	224° 10'.7	06'.4	101° 42'.3	01'.5	302° 51'.6	26'.1
30 Tuesday	00	278° 18'.8	174° 10'.7	23° 34'.2 N	239° 11'.4	14° 06'.9 N	116° 44'.4	9° 01'.4 N	317° 54'.2	16° 26'.2 S
	01	293° 21'.2	189° 09'.8	34'.0	254° 12'.1	07'.5	131° 46'.5	01'.2	332° 56'.8	26'.2
	02	308° 23'.7	204° 08'.9	33'.8	269° 12'.8	08'.1	146° 48'.6	01'.1	347° 59'.4	26'.2
	03	323° 26'.2	219° 08'.0	33'.6	284° 13'.5	08'.7	161° 50'.8	00'.9	3° 01'.9	26'.3
	04	338° 28'.6	234° 07'.1	33'.4	299° 14'.2	09'.2	176° 52'.9	00'.8	18° 04'.5	26'.3
	05	353° 31'.1	249° 06'.3	33'.1	314° 14'.9	09'.8	191° 55'.0	00'.6	33° 07'.1	26'.4
	06	8° 33'.6	264° 05'.4	32'.9	329° 15'.7	10'.4	206° 57'.1	00'.5	48° 09'.7	26'.4
	07	23° 36'.0	279° 04'.5	32'.7	344° 16'.4	11'.0	221° 59'.2	00'.3	63° 12'.3	26'.5
	08	38° 38'.5	294° 03'.6	32'.5	359° 17'.1	11'.5	237° 01'.3	00'.2	78° 14'.9	26'.5
	09	53° 40'.9	309° 02'.7	32'.3	14° 17'.8	12'.1	252° 03'.4	00'.0	93° 17'.4	26'.5
	10	68° 43'.4	324° 01'.9	32'.0	29° 18'.5	12'.7	267° 05'.6	8° 59'.9 N	108° 20'.0	26'.6
	11	83° 45'.9	339° 01'.0	31'.8	44° 19'.2	13'.3	282° 07'.7	59'.7	123° 22'.6	26'.6
	12	98° 48'.3	354° 00'.1	23° 31'.6 N	59° 19'.9	14° 13'.8 N	297° 09'.8	8° 59'.6 N	138° 25'.2	16° 26'.7 S
	13	113° 50'.8	8° 59'.2	31'.3	74° 20'.6	14'.4	312° 11'.9	59'.4	153° 27'.8	26'.7
	14	128° 53'.3	23° 58'.3	31'.1	89° 21'.3	15'.0	327° 14'.0	59'.3	168° 30'.4	26'.8
	15	143° 55'.7	38° 57'.5	30'.9	104° 22'.0	15'.6	342° 16'.1	59'.1	183° 33'.0	26'.8
	16	158° 58'.2	53° 56'.6	30'.6	119° 22'.7	16'.1	357° 18'.2	59'.0	198° 35'.5	26'.9
	17	174° 00'.7	68° 55'.7	30'.4	134° 23'.4	16'.7	12° 20'.3	58'.9	213° 38'.1	26'.9
	18	189° 03'.1	83° 54'.8	30'.2	149° 24'.1	17'.3	27° 22'.5	58'.7	228° 40'.7	26'.9
	19	204° 05'.6	98° 54'.0	29'.9	164° 24'.8	17'.8	42° 24'.6	58'.6	243° 43'.3	27'.0
	20	219° 08'.1	113° 53'.1	29'.7	179° 25'.5	18'.4	57° 26'.7	58'.4	258° 45'.9	27'.0
	21	234° 10'.5	128° 52'.2	29'.5	194° 26'.2	19'.0	72° 28'.8	58'.3	273° 48'.5	27'.1
	22	249° 13'.0	143° 51'.3	29'.2	209° 26'.9	19'.5	87° 30'.9	58'.1	288° 51'.1	27'.1
	23	264° 15'.4	158° 50'.4	29'.0	224° 27'.6	20'.1	102° 33'.0	58'.0	303° 53'.6	27'.2
1 Wednesday	00	279° 17'.9	173° 49'.6	23° 28'.7 N	239° 28'.3	14° 20'.7 N	117° 35'.1	8° 57'.8 N	318° 56'.2	16° 27'.2 S
	01	294° 20'.4	188° 48'.7	28'.5	254° 29'.0	21'.3	132° 37'.2	57'.7	333° 58'.8	27'.2
	02	309° 22'.8	203° 47'.8	28'.3	269° 29'.7	21'.8	147° 39'.3	57'.5	349° 01'.4	27'.3
	03	324° 25'.3	218° 46'.9	28'.0	284° 30'.4	22'.4	162° 41'.4	57'.4	4° 04'.0	27'.3
	04	339° 27'.8	233° 46'.1	27'.8	299° 31'.1	23'.0	177° 43'.6	57'.2	19° 06'.6	27'.4
	05	354° 30'.2	248° 45'.2	27'.5	314° 31'.8	23'.5	192° 45'.7	57'.1	34° 09'.2	27'.4
	06	9° 32'.7	263° 44'.3	27'.3	329° 32'.5	24'.1	207° 47'.8	56'.9	49° 11'.7	27'.5
	07	24° 35'.2	278° 43'.4	27'.0	344° 33'.2	24'.7	222° 49'.9	56'.8	64° 14'.3	27'.5
	08	39° 37'.6	293° 42'.6	26'.8	359° 33'.9	25'.2	237° 52'.0	56'.6	79° 16'.9	27'.6
	09	54° 40'.1	308° 41'.7	26'.5	14° 34'.6	25'.8	252° 54'.1	56'.5	94° 19'.5	27'.6
	10	69° 42'.6	323° 40'.8	26'.2	29° 35'.3	26'.4	267° 56'.2	56'.3	109° 22'.1	27'.6
	11	84° 45'.0	338° 39'.9	26'.0	44° 36'.0	26'.9	282° 58'.3	56'.2	124° 24'.7	27'.7
	12	99° 47'.5	353° 39'.1	23° 25'.7 N	59° 36'.8	14° 27'.5 N	298° 00'.4	8° 56'.0 N	139° 27'.3	16° 27'.7 S
	13	114° 49'.9	8° 38'.2	25'.5	74° 37'.5	28'.1	313° 02'.5	55'.9	154° 29'.9	27'.8
	14	129° 52'.4	23° 37'.3	25'.2	89° 38'.2	28'.6	328° 04'.6	55'.7	169° 32'.4	27'.8
	15	144° 54'.9	38° 36'.4	25'.0	104° 38'.9	29'.2	343° 06'.7	55'.6	184° 35'.0	27'.9
	16	159° 57'.3	53° 35'.6	24'.7	119° 39'.6	29'.8	358° 08'.9	55'.4	199° 37'.6	27'.9
	17	174° 59'.8	68° 34'.7	24'.4	134° 40'.3	30'.3	13° 11'.0	55'.3	214° 40'.2	28'.0
	18	190° 02'.3	83° 33'.8	24'.2	149° 41'.0	30'.9	28° 13'.1	55'.1	229° 42'.8	28'.0
	19	205° 04'.7	98° 32'.9	23'.9	164° 41'.7	31'.5	43° 15'.2	55'.0	244° 45'.4	28'.0
	20	220° 07'.2	113° 32'.1	23'.6	179° 42'.4	32'.0	58° 17'.3	54'.8	259° 48'.0	28'.1
	21	235° 09'.7	128° 31'.2	23'.4	194° 43'.1	32'.6	73° 19'.4	54'.7	274° 50'.6	28'.1
	22	250° 12'.1	143° 30'.3	23'.1	209° 43'.8	33'.2	88° 21'.5	54'.5	289° 53'.2	28'.2
	23	265° 14'.6	158° 29'.4	22'.8	224° 44'.5	33'.7	103° 23'.6	54'.4	304° 55'.7	28'.2
		M.P. 05:22	v -0'.9	d 0'.2	v 0'.7	d 0'.6	v 2'.1	d 0'.1	v 2'.6	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.4	40° 19'.8 S
Achernar	335° 38'.5	57° 16'.1 S
Acrux	173° 27'.1	63° 03'.9 S
Adhara	255° 25'.2	28° 57'.7 S
Aldebaran	291° 07'.7	16° 29'.7 N
Alioth	166° 34'.2	56° 00'.2 N
Alkaid	153° 11'.0	49° 21'.2 N
Alnair	28° 02'.9	46° 59'.5 S
Alnilam	276° 02'.6	1° 12'.4 S
Alphard	218° 11'.7	8° 37'.7 S
Alphecca	126° 24'.0	26° 44'.4 N
Alpheratz	357° 59'.7	29° 02'.9 N
Altair	62° 23'.2	8° 51'.0 N
Ankaa	353° 31'.0	42° 20'.4 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.3 N
Atria	108° 00'.6	69° 01'.0 S
Avior	234° 25'.1	59° 29'.3 S
Bellatrix	278° 49'.1	6° 20'.6 N
Betelgeuse	271° 18'.6	7° 24'.4 N
Canopus	264° 03'.7	52° 41'.5 S
Capella	280° 58'.1	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.2 N
Denebola	182° 49'.6	14° 36'.8 N
Diphda	349° 11'.6	18° 01'.4 S
Dubhe	194° 10'.9	61° 47'.7 N
Elnath	278° 32'.8	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.4 N
Enif	34° 02'.3	9° 50'.5 N
Fomalhaut	15° 41'.0	29° 39'.4 S
Gacrux	172° 18'.5	57° 04'.7 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.6 S
Hamal	328° 18'.6	23° 25'.6 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 18'.5	74° 11'.4 N
Markab	13° 53'.8	15° 09'.9 N
Menkar	314° 31'.6	4° 03'.7 N
Menkent	148° 25'.9	36° 20'.3 S
Miaplacidus	221° 43'.9	69° 41'.5 S
Mirfak	309° 03'.2	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.2	56° 45'.4 S
Polaris	324° 09'.3	89° 13'.6 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.7 N
Rasalhague	96° 20'.6	12° 33'.9 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.4	8° 12'.5 S
Rigil Kent	140° 12'.8	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.5	56° 29'.6 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.8	16° 42'.3 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.3 S
Vega	80° 49'.1	38° 46'.6 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	255° 51'.9	12:24
Mars	320° 52'.7	08:03
Jupiter	198° 25'.7	16:11
Saturn	39° 35'.4	02:48

SUN				MOON				
GHA	Dec	GHA	v	Dec	d	HP
179° 09'.4	23° 13'.7 N	201° 41'.4	4'.1	24° 03'.2 N	0'.3	59'.6
194° 09'.3	13'.5	216° 04'.5	4'.0	03'.5	0'.0	
209° 09'.2	13'.4	230° 27'.5	4'.0	03'.5	0'.0	
224° 09'.1	13'.3	244° 50'.5	3'.9	03'.5	0'.3	59'.7
239° 08'.9	13'.1	259° 13'.4	3'.9	03'.2	0'.4	
254° 08'.8	13'.0	273° 36'.3	3'.8	02'.8	0'.6	
269° 08'.7	12'.8	287° 59'.1	3'.9	02'.2	0'.8	59'.8
284° 08'.6	12'.7	302° 22'.0	3'.8	01'.4	0'.9	
299° 08'.4	12'.6	316° 44'.8	3'.7	00'.5	1'.1	
314° 08'.3	12'.4	331° 07'.5	3'.8	23° 59'.4 N	1'.3	59'.9
329° 08'.2	12'.3	345° 30'.3	3'.7	58'.1	1'.5	
344° 08'.0	12'.1	359° 53'.0	3'.7	56'.6	1'.6	
359° 07'.9	23° 12'.0 N	14° 15'.7	3'.6	23° 55'.0 N	1'.8	59'.9
14° 07'.8	11'.8	28° 38'.3	3'.7	53'.2	1'.9	60'.0
29° 07'.7	11'.7	43° 01'.0	3'.6	51'.3	2'.2	
44° 07'.5	11'.6	57° 23'.6	3'.7	49'.1	2'.3	
59° 07'.4	11'.4	71° 46'.3	3'.6	46'.8	2'.5	
74° 07'.3	11'.3	86° 08'.9	3'.6	44'.3	2'.6	60'.1
89° 07'.2	11'.1	100° 31'.5	3'.6	41'.7	2'.9	
104° 07'.0	11'.0	114° 54'.1	3'.6	38'.8	3'.0	
119° 06'.9	10'.8	129° 16'.7	3'.6	35'.8	3'.1	
134° 06'.8	10'.7	143° 39'.3	3'.6	32'.7	3'.4	60'.2
149° 06'.7	10'.5	158° 01'.9	3'.5	29'.3	3'.5	
164° 06'.5	10'.4	172° 24'.4	3'.7	25'.8	3'.7	
179° 06'.4	23° 10'.2 N	186° 47'.1	3'.6	23° 22'.1 N	3'.9	60'.2
194° 06'.3	10'.1	201° 09'.7	3'.6	18'.2	4'.0	60'.3
209° 06'.2	09'.9	215° 32'.3	3'.6	14'.2	4'.2	
224° 06'.1	09'.8	229° 54'.9	3'.6	10'.0	4'.4	
239° 05'.9	09'.6	244° 17'.5	3'.7	05'.6	4'.5	
254° 05'.8	09'.5	258° 40'.2	3'.7	01'.1	4'.7	
269° 05'.7	09'.3	273° 02'.9	3'.7	22° 56'.4 N	4'.9	60'.4
284° 05'.6	09'.1	287° 25'.6	3'.7	51'.5	5'.0	
299° 05'.4	09'.0	301° 48'.3	3'.7	46'.5	5'.3	
314° 05'.3	08'.8	316° 11'.0	3'.8	41'.2	5'.3	
329° 05'.2	08'.7	330° 33'.8	3'.8	35'.9	5'.6	
344° 05'.1	08'.5	344° 56'.6	3'.8	30'.3	5'.7	60'.5
359° 04'.9	23° 08'.3 N	359° 19'.4	3'.9	22° 24'.6 N	5'.9	60'.5
14° 04'.8	08'.2	13° 42'.3	3'.9	18'.7	6'.0	
29° 04'.7	08'.0	28° 05'.2	3'.9	12'.7	6'.2	
44° 04'.6	07'.9	42° 28'.1	4'.0	06'.5	6'.4	
59° 04'.4	07'.7	56° 51'.1	4'.0	00'.1	6'.5	
74° 04'.3	07'.5	71° 14'.1	4'.0	21° 53'.6 N	6'.7	60'.6
89° 04'.2	07'.4	85° 37'.1	4'.1	46'.9	6'.8	
104° 04'.1	07'.2	100° 00'.2	4'.2	40'.1	7'.0	
119° 04'.0	07'.0	114° 23'.4	4'.1	33'.1	7'.2	
134° 03'.8	06'.9	128° 46'.5	4'.3	25'.9	7'.3	
149° 03'.7	06'.7	143° 09'.8	4'.2	18'.6	7'.5	
164° 03'.6	06'.5	157° 33'.0	4'.4	11'.1	7'.6	
179° 03'.5	23° 06'.4 N	171° 56'.4	4'.4	21° 03'.5 N	7'.7	60'.7
194° 03'.3	06'.2	186° 19'.8	4'.4	20° 55'.8 N	8'.0	
209° 03'.2	06'.0	200° 43'.2	4'.5	47'.8	8'.0	
224° 03'.1	05'.9	215° 06'.7	4'.5	39'.8	8'.3	
239° 03'.0	05'.7	229° 30'.2	4'.6	31'.5	8'.3	
254° 02'.9	05'.5	243° 53'.8	4'.7	23'.2	8'.5	
269° 02'.7	05'.3	258° 17'.5	4'.7	14'.7	8'.7	
284° 02'.6	05'.2	272° 41'.2	4'.8	06'.0	8'.8	
299° 02'.5	05'.0	287° 05'.0	4'.9	19° 57'.2 N	8'.9	
314° 02'.4	04'.8	301° 28'.9	4'.9	48'.3	9'.1	
329° 02'.3	04'.7	315° 52'.8	5'.0	39'.2	9'.2	60'.8
344° 02'.1	04'.5	330° 16'.8	5'.0	30'.0	9'.4	
359° 02'.0	23° 04'.3 N	344° 40'.8	5'.1	19° 20'.6 N	9'.5	60'.8
14° 01'.9	04'.1	359° 04'.9	5'.2	11'.1	9'.6	
29° 01'.8	03'.9	13° 29'.1	5'.3	01'.5	9'.8	
44° 01'.7	03'.8	27° 53'.4	5'.3	18° 51'.7 N	9'.9	
59° 01'.5	03'.6	42° 17'.7	5'.4	41'.8	10'.0	
74° 01'.4	03'.4	56° 42'.1	5'.5	31'.8	10'.1	
89° 01'.3	03'.2	71° 06'.6	5'.5	21'.7	10'.3	
104° 01'.2	03'.0	85° 31'.1	5'.6	11'.4	10'.4	
119° 01'.1	02'.9	99° 55'.7	5'.7	01'.0	10'.5	
134° 00'.9	02'.7	114° 20'.4	5'.7	17° 50'.5 N	10'.6	
149° 00'.8	02'.5	128° 45'.1	5'.9	39'.9	10'.8	
164° 00'.7	02'.3	143° 10'.0	5'.9	29'.1	10'.9	
SD 15'.7	d 0'.2	SD 16'.3		16'.5	16'.6	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
29	3 22	3 28	12:03	11:00	23:32	28d 1%
30	3 34	3 40	12:04	12:03	24:34	29d 0%
1	3 46	3 52	12:04	13:04	00:34	1d 1%

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1992 July 2, 3, 4 (Thur, Fri, Sat)

GMT		ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.8		SATURN +0.4	
		GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
2 Thursday	00	280° 17'.1	173° 28'.6	23° 22'.6 N	239° 45'.2	14° 34'.3 N	118° 25'.7	8° 54'.2 N	319° 58'.3	16° 28'.3 S
	01	295° 19'.5	188° 27'.7	22'.3	254° 45'.9	34'.8	133° 27'.8	54'.1	335° 00'.9	28'.3
	02	310° 22'.0	203° 26'.8	22'.0	269° 46'.6	35'.4	148° 29'.9	53'.9	350° 03'.5	28'.4
	03	325° 24'.4	218° 26'.0	21'.7	284° 47'.3	36'.0	163° 32'.0	53'.8	5° 06'.1	28'.4
	04	340° 26'.9	233° 25'.1	21'.5	299° 48'.0	36'.5	178° 34'.1	53'.6	20° 08'.7	28'.5
	05	355° 29'.4	248° 24'.2	21'.2	314° 48'.7	37'.1	193° 36'.2	53'.5	35° 11'.3	28'.5
	06	10° 31'.8	263° 23'.3	20'.9	329° 49'.4	37'.7	208° 38'.3	53'.3	50° 13'.9	28'.5
	07	25° 34'.3	278° 22'.5	20'.6	344° 50'.1	38'.2	223° 40'.5	53'.2	65° 16'.5	28'.6
	08	40° 36'.8	293° 21'.6	20'.3	359° 50'.8	38'.8	238° 42'.6	53'.0	80° 19'.0	28'.6
	09	55° 39'.2	308° 20'.7	20'.1	14° 51'.5	39'.3	253° 44'.7	52'.9	95° 21'.6	28'.7
	10	70° 41'.7	323° 19'.9	19'.8	29° 52'.2	39'.9	268° 46'.8	52'.7	110° 24'.2	28'.7
	11	85° 44'.2	338° 19'.0	19'.5	44° 52'.9	40'.5	283° 48'.9	52'.6	125° 26'.8	28'.8
	12	100° 46'.6	353° 18'.1	23° 19'.2 N	59° 53'.6	14° 41'.0 N	298° 51'.0	8° 52'.4 N	140° 29'.4	16° 28'.8 S
	13	115° 49'.1	8° 17'.3	18'.9	74° 54'.3	41'.6	313° 53'.1	52'.3	155° 32'.0	28'.9
	14	130° 51'.6	23° 16'.4	18'.6	89° 55'.0	42'.1	328° 55'.2	52'.1	170° 34'.6	28'.9
	15	145° 54'.0	38° 15'.5	18'.3	104° 55'.7	42'.7	343° 57'.3	52'.0	185° 37'.2	29'.0
	16	160° 56'.5	53° 14'.7	18'.1	119° 56'.4	43'.3	358° 59'.4	51'.8	200° 39'.8	29'.0
	17	175° 58'.9	68° 13'.8	17'.8	134° 57'.1	43'.8	14° 01'.5	51'.7	215° 42'.4	29'.0
	18	191° 01'.4	83° 12'.9	17'.5	149° 57'.8	44'.4	29° 03'.6	51'.5	230° 45'.0	29'.1
	19	206° 03'.9	98° 12'.0	17'.2	164° 58'.5	44'.9	44° 05'.7	51'.4	245° 47'.5	29'.1
	20	221° 06'.3	113° 11'.2	16'.9	179° 59'.2	45'.5	59° 07'.8	51'.2	260° 50'.1	29'.2
	21	236° 08'.8	128° 10'.3	16'.6	194° 59'.9	46'.0	74° 09'.9	51'.1	275° 52'.7	29'.2
	22	251° 11'.3	143° 09'.4	16'.3	210° 00'.6	46'.6	89° 12'.0	50'.9	290° 55'.3	29'.3
	23	266° 13'.7	158° 08'.6	16'.0	225° 01'.3	47'.2	104° 14'.1	50'.8	305° 57'.9	29'.3
3 Friday	00	281° 16'.2	173° 07'.7	23° 15'.7 N	240° 02'.1	14° 47'.7 N	119° 16'.2	8° 50'.6 N	321° 00'.5	16° 29'.4 S
	01	296° 18'.7	188° 06'.9	15'.4	255° 02'.8	48'.3	134° 18'.3	50'.5	336° 03'.1	29'.4
	02	311° 21'.1	203° 06'.0	15'.1	270° 03'.5	48'.8	149° 20'.4	50'.3	351° 05'.7	29'.5
	03	326° 23'.6	218° 05'.1	14'.8	285° 04'.2	49'.4	164° 22'.5	50'.2	6° 08'.3	29'.5
	04	341° 26'.0	233° 04'.3	14'.5	300° 04'.9	49'.9	179° 24'.6	50'.0	21° 10'.9	29'.5
	05	356° 28'.5	248° 03'.4	14'.2	315° 05'.6	50'.5	194° 26'.7	49'.9	36° 13'.5	29'.6
	06	11° 31'.0	263° 02'.5	13'.9	330° 06'.3	51'.1	209° 28'.8	49'.7	51° 16'.1	29'.6
	07	26° 33'.4	278° 01'.7	13'.6	345° 07'.0	51'.6	224° 30'.9	49'.6	66° 18'.7	29'.7
	08	41° 35'.9	293° 00'.8	13'.2	0° 07'.7	52'.2	239° 33'.0	49'.4	81° 21'.3	29'.7
	09	56° 38'.4	307° 59'.9	12'.9	15° 08'.4	52'.7	254° 35'.1	49'.3	96° 23'.8	29'.8
	10	71° 40'.8	322° 59'.1	12'.6	30° 09'.1	53'.3	269° 37'.2	49'.1	111° 26'.4	29'.8
	11	86° 43'.3	337° 58'.2	12'.3	45° 09'.8	53'.8	284° 39'.3	49'.0	126° 29'.0	29'.9
	12	101° 45'.8	352° 57'.3	23° 12'.0 N	60° 10'.5	14° 54'.4 N	299° 41'.4	8° 48'.8 N	141° 31'.6	16° 29'.9 S
	13	116° 48'.2	7° 56'.5	11'.7	75° 11'.2	54'.9	314° 43'.5	48'.7	156° 34'.2	30'.0
	14	131° 50'.7	22° 55'.6	11'.4	90° 11'.9	55'.5	329° 45'.6	48'.5	171° 36'.8	30'.0
	15	146° 53'.2	37° 54'.8	11'.0	105° 12'.6	56'.0	344° 47'.7	48'.3	186° 39'.4	30'.1
	16	161° 55'.6	52° 53'.9	10'.7	120° 13'.3	56'.6	359° 49'.8	48'.2	201° 42'.0	30'.1
	17	176° 58'.1	67° 53'.0	10'.4	135° 14'.0	57'.1	14° 51'.9	48'.0	216° 44'.6	30'.1
	18	192° 00'.5	82° 52'.2	10'.1	150° 14'.7	57'.7	29° 54'.0	47'.9	231° 47'.2	30'.2
	19	207° 03'.0	97° 51'.3	09'.8	165° 15'.4	58'.3	44° 56'.1	47'.7	246° 49'.8	30'.2
	20	222° 05'.5	112° 50'.4	09'.4	180° 16'.1	58'.8	59° 58'.2	47'.6	261° 52'.4	30'.3
	21	237° 07'.9	127° 49'.6	09'.1	195° 16'.8	59'.4	75° 00'.3	47'.4	276° 55'.0	30'.3
	22	252° 10'.4	142° 48'.7	08'.8	210° 17'.5	59'.9	90° 02'.4	47'.3	291° 57'.6	30'.4
	23	267° 12'.9	157° 47'.9	08'.5	225° 18'.2	15° 00'.5 N	105° 04'.5	47'.1	307° 00'.2	30'.4
4 Saturday	00	282° 15'.3	172° 47'.0	23° 08'.1 N	240° 18'.9	15° 01'.0 N	120° 06'.6	8° 47'.0 N	322° 02'.8	16° 30'.5 S
	01	297° 17'.8	187° 46'.1	07'.8	255° 19'.6	01'.6	135° 08'.7	46'.8	337° 05'.4	30'.5
	02	312° 20'.3	202° 45'.3	07'.5	270° 20'.3	02'.1	150° 10'.8	46'.7	352° 07'.9	30'.6
	03	327° 22'.7	217° 44'.4	07'.1	285° 21'.0	02'.7	165° 12'.9	46'.5	7° 10'.5	30'.6
	04	342° 25'.2	232° 43'.6	06'.8	300° 21'.7	03'.2	180° 15'.0	46'.4	22° 13'.1	30'.7
	05	357° 27'.7	247° 42'.7	06'.5	315° 22'.4	03'.8	195° 17'.1	46'.2	37° 15'.7	30'.7
	06	12° 30'.1	262° 41'.9	06'.1	330° 23'.1	04'.3	210° 19'.2	46'.1	52° 18'.3	30'.8
	07	27° 32'.6	277° 41'.0	05'.8	345° 23'.8	04'.9	225° 21'.3	45'.9	67° 20'.9	30'.8
	08	42° 35'.0	292° 40'.1	05'.5	0° 24'.5	05'.4	240° 23'.4	45'.7	82° 23'.5	30'.8
	09	57° 37'.5	307° 39'.3	05'.1	15° 25'.2	05'.9	255° 25'.5	45'.6	97° 26'.1	30'.9
	10	72° 40'.0	322° 38'.4	04'.8	30° 25'.9	06'.5	270° 27'.6	45'.4	112° 28'.7	30'.9
	11	87° 42'.4	337° 37'.6	04'.4	45° 26'.6	07'.0	285° 29'.7	45'.3	127° 31'.3	31'.0
	12	102° 44'.9	352° 36'.7	23° 04'.1 N	60° 27'.3	15° 07'.6 N	300° 31'.8	8° 45'.1 N	142° 33'.9	16° 31'.0 S
	13	117° 47'.4	7° 35'.9	03'.8	75° 28'.0	08'.1	315° 33'.9	45'.0	157° 36'.5	31'.1
	14	132° 49'.8	22° 35'.0	03'.4	90° 28'.7	08'.7	330° 36'.0	44'.8	172° 39'.1	31'.1
	15	147° 52'.3	37° 34'.1	03'.1	105° 29'.4	09'.2	345° 38'.1	44'.7	187° 41'.7	31'.2
	16	162° 54'.8	52° 33'.3	02'.7	120° 30'.1	09'.8	0° 40'.2	44'.5	202° 44'.3	31'.2
	17	177° 57'.2	67° 32'.4	02'.4	135° 30'.8	10'.3	15° 42'.3	44'.4	217° 46'.9	31'.3
	18	192° 59'.7	82° 31'.6	02'.0	150° 31'.5	10'.9	30° 44'.4	44'.2	232° 49'.5	31'.3
	19	208° 02'.1	97° 30'.7	01'.7	165° 32'.3	11'.4	45° 46'.5	44'.1	247° 52'.1	31'.4
	20	223° 04'.6	112° 29'.9	01'.3	180° 33'.0	12'.0	60° 48'.6	43'.9	262° 54'.7	31'.4
	21	238° 07'.1	127° 29'.0	01'.0	195° 33'.7	12'.5	75° 50'.7	43'.7	277° 57'.3	31'.5
	22	253° 09'.5	142° 28'.2	00'.6	210° 34'.4	13'.1	90° 52'.8	43'.6	292° 59'.9	31'.5
	23	268° 12'.0	157° 27'.3	00'.2	225° 35'.1	13'.6	105° 54'.9	43'.4	308° 02'.5	31'.6
		M.P. 05:10	v -0'.9	d 0'.3	v 0'.7	d 0'.6	v 2'.1	d 0'.2	v 2'.6	d 0'.0

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 30'.4	40° 19'.8 S	179° 00'.6	23° 02'.1 N	157° 34'.9	6'.0	17° 18'.2 N	11'.0	60'.8
Achernar	335° 38'.4	57° 16'.1 S	194° 00'.5	01'.9	171° 59'.9	6'.0	07'.2	11'.1	
Acrux	173° 27'.1	63° 03'.9 S	209° 00'.3	01'.8	186° 24'.9	6'.2	16° 56'.1 N	11'.2	
Adhara	255° 25'.2	28° 57'.7 S	224° 00'.2	01'.6	200° 50'.1	6'.2	44'.9	11'.3	
Aldebaran	291° 07'.6	16° 29'.7 N	239° 00'.1	01'.4	215° 15'.3	6'.3	33'.6	11'.5	
			254° 00'.0	01'.2	229° 40'.6	6'.3	22'.1	11'.5	
Alioth	166° 34'.2	56° 00'.2 N	268° 59'.9	01'.0	244° 05'.9	6'.5	10'.6	11'.7	
Alkaid	153° 11'.0	49° 21'.2 N	283° 59'.7	00'.8	258° 31'.4	6'.5	15° 58'.9 N	11'.7	
Alnair	28° 02'.9	46° 59'.5 S	298° 59'.6	00'.6	272° 56'.9	6'.6	47'.2	11'.9	
Alnilam	276° 02'.6	1° 12'.3 S	313° 59'.5	00'.4	287° 22'.5	6'.7	35'.3	11'.9	
Alphard	218° 11'.7	8° 37'.7 S	328° 59'.4	00'.2	301° 48'.2	6'.7	23'.4	12'.1	
			343° 59'.3	00'.0	316° 13'.9	6'.9	11'.3	12'.1	
Alphecca	126° 24'.0	26° 44'.4 N	358° 59'.2	22° 59'.8 N	330° 39'.8	6'.9	14° 59'.2 N	12'.3	60'.8
Alpheratz	357° 59'.7	29° 02'.9 N	13° 59'.0	59'.7	345° 05'.7	7'.0	46'.9	12'.3	
Altair	62° 23'.2	8° 51'.0 N	28° 58'.9	59'.5	359° 31'.7	7'.0	34'.6	12'.4	
Ankaa	353° 31'.0	42° 20'.4 S	43° 58'.8	59'.3	13° 57'.7	7'.2	22'.2	12'.5	
Antares	112° 45'.2	26° 25'.0 S	58° 58'.7	59'.1	28° 23'.9	7'.2	09'.7	12'.7	60'.7
			73° 58'.6	58'.9	42° 50'.1	7'.3	13° 57'.0 N	12'.6	
Arcturus	146° 09'.8	19° 13'.3 N	88° 58'.5	58'.7	57° 16'.4	7'.4	44'.4	12'.8	
Atria	108° 00'.6	69° 01'.1 S	103° 58'.3	58'.5	71° 42'.8	7'.5	31'.6	12'.9	
Avior	234° 25'.1	59° 29'.3 S	118° 58'.2	58'.3	86° 09'.3	7'.5	18'.7	12'.9	
Bellatrix	278° 49'.1	6° 20'.6 N	133° 58'.1	58'.1	100° 35'.8	7'.6	05'.8	13'.0	
Betelgeuse	271° 18'.6	7° 24'.4 N	148° 58'.0	57'.9	115° 02'.4	7'.7	12° 52'.8 N	13'.1	
			163° 57'.9	57'.7	129° 29'.1	7'.7	39'.7	13'.2	
Canopus	264° 03'.7	52° 41'.5 S	178° 57'.8	22° 57'.5 N	143° 55'.8	7'.9	12° 26'.5 N	13'.2	60'.7
Capella	280° 58'.0	45° 59'.4 N	193° 57'.6	57'.3	158° 22'.7	7'.9	13'.3	13'.3	
Deneb	49° 41'.8	45° 15'.2 N	208° 57'.5	57'.1	172° 49'.6	8'.0	00'.0	13'.4	
Denebola	182° 49'.6	14° 36'.8 N	223° 57'.4	56'.9	187° 16'.6	8'.0	11° 46'.6 N	13'.4	60'.6
Diphda	349° 11'.5	18° 01'.4 S	238° 57'.3	56'.7	201° 43'.6	8'.2	33'.2	13'.5	
			253° 57'.2	56'.5	216° 10'.8	8'.2	19'.7	13'.6	
Dubhe	194° 10'.9	61° 47'.7 N	268° 57'.1	56'.2	230° 38'.0	8'.3	06'.1	13'.6	
Elnath	278° 32'.8	28° 36'.1 N	283° 57'.0	56'.0	245° 05'.3	8'.3	10° 52'.5 N	13'.7	
Eltanin	90° 52'.9	51° 29'.4 N	298° 56'.8	55'.8	259° 32'.6	8'.4	38'.8	13'.7	
Enif	34° 02'.2	9° 50'.5 N	313° 56'.7	55'.6	274° 00'.0	8'.5	25'.1	13'.8	
Fomalhaut	15° 41'.0	29° 39'.4 S	328° 56'.6	55'.4	288° 27'.5	8'.6	11'.3	13'.9	60'.5
			343° 56'.5	55'.2	302° 55'.1	8'.6	9° 57'.4 N	13'.9	
Gacrux	172° 18'.5	57° 04'.7 S	358° 56'.4	22° 55'.0 N	317° 22'.7	8'.7	9° 43'.5 N	13'.9	60'.5
Gienah	176° 08'.5	17° 30'.2 S	13° 56'.3	54'.8	331° 50'.4	8'.8	29'.6	14'.0	
Hadar	149° 10'.0	60° 20'.6 S	28° 56'.2	54'.6	346° 18'.2	8'.8	15'.6	14'.1	
Hamal	328° 18'.6	23° 25'.6 N	43° 56'.0	54'.4	0° 46'.0	8'.9	01'.5	14'.1	
Kaus Aust.	84° 04'.1	34° 23'.3 S	58° 55'.9	54'.1	15° 13'.9	9'.0	8° 47'.4 N	14'.1	
			73° 55'.8	53'.9	29° 41'.9	9'.0	33'.3	14'.2	60'.4
Kochab	137° 18'.6	74° 11'.4 N	88° 55'.7	53'.7	44° 09'.9	9'.1	19'.1	14'.2	
Markab	13° 53'.8	15° 10'.0 N	103° 55'.6	53'.5	58° 38'.0	9'.2	04'.9	14'.3	
Menkar	314° 31'.6	4° 03'.7 N	118° 55'.5	53'.3	73° 06'.2	9'.2	7° 50'.6 N	14'.3	
Menkent	148° 25'.9	36° 20'.3 S	133° 55'.4	53'.1	87° 34'.4	9'.3	36'.3	14'.3	
Miaplacidus	221° 43'.9	69° 41'.5 S	148° 55'.2	52'.9	102° 02'.7	9'.3	22'.0	14'.4	60'.3
			163° 55'.1	52'.6	116° 31'.0	9'.4	07'.6	14'.4	
Mirfak	309° 03'.2	49° 50'.0 N	178° 55'.0	22° 52'.4 N	130° 59'.4	9'.5	6° 53'.2 N	14'.4	60'.3
Nunki	76° 17'.3	26° 18'.3 S	193° 54'.9	52'.2	145° 27'.9	9'.5	38'.8	14'.5	
Peacock	53° 43'.2	56° 45'.4 S	208° 54'.8	52'.0	159° 56'.4	9'.6	24'.3	14'.5	
Polaris	324° 08'.2	89° 13'.6 N	223° 54'.7	51'.8	174° 25'.0	9'.6	09'.8	14'.5	60'.2
Pollux	243° 47'.2	28° 02'.7 N	238° 54'.6	51'.5	188° 53'.6	9'.7	5° 55'.3 N	14'.5	
			253° 54'.5	51'.3	203° 22'.3	9'.8	40'.8	14'.5	
Procyon	245° 16'.4	5° 14'.7 N	268° 54'.3	51'.1	217° 51'.1	9'.8	26'.3	14'.6	
Rasalhague	96° 20'.6	12° 33'.9 N	283° 54'.2	50'.9	232° 19'.9	9'.8	11'.7	14'.6	
Regulus	208° 00'.3	12° 00'.2 N	298° 54'.1	50'.6	246° 48'.7	9'.9	4° 57'.1 N	14'.6	60'.1
Rigel	281° 27'.4	8° 12'.5 S	313° 54'.0	50'.4	261° 17'.6	10'.0	42'.5	14'.6	
Rigil Kent	140° 12'.8	60° 48'.5 S	328° 53'.9	50'.2	275° 46'.6	10'.0	27'.9	14'.6	
			343° 53'.8	50'.0	290° 15'.6	10'.0	13'.3	14'.7	
Sabik	102° 30'.2	15° 43'.0 S	358° 53'.7	22° 49'.7 N	304° 44'.6	10'.1	3° 58'.6 N	14'.6	60'.0
Schedar	349° 58'.5	56° 29'.6 N	13° 53'.6	49'.5	319° 13'.7	10'.2	44'.0	14'.7	
Shaula	96° 42'.7	37° 06'.0 S	28° 53'.5	49'.3	333° 42'.9	10'.2	29'.3	14'.7	
Sirius	258° 47'.8	16° 42'.3 S	43° 53'.3	49'.1	348° 12'.1	10'.2	14'.6	14'.6	
Spica	158° 47'.7	11° 07'.5 S	58° 53'.2	48'.8	2° 41'.3	10'.3	3° 00'.0 N	14'.7	
			73° 53'.1	48'.6	17° 10'.6	10'.3	45'.3	14'.7	59'.9
Suhail	223° 04'.4	43° 24'.3 S	88° 53'.0	48'.4	31° 39'.9	10'.4	30'.6	14'.7	
Vega	80° 49'.1	38° 46'.6 N	103° 52'.9	48'.1	46° 09'.3	10'.4	15'.9	14'.7	
Zuben'ubi	137° 22'.6	16° 00'.8 S	118° 52'.8	47'.9	60° 38'.7	10'.4	01'.2	14'.6	
			133° 52'.7	47'.7	75° 08'.1	10'.5	1° 46'.6 N	14'.7	59'.8
	SHA	Mer.Pass.	148° 52'.6	47'.4	89° 37'.6	10'.5	31'.9	14'.7	
Venus	251° 51'.5	12:28	163° 52'.5	47'.2	104° 07'.1	10'.6	17'.2	14'.6	
Mars	318° 45'.9	07:59							
Jupiter	198° 00'.0	16:01							
Saturn	39° 44'.3	02:36	SD 15'.7	d 0'.2	SD 16'.6		16'.5		16'.4

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
2	3 57	4 03	12:04	14:02	01:33	2d 6%
3	4 09	4 14	12:04	14:57	02:30	3d 13%
4	4 20	4 25	12:04	15:49	03:23	4d 22%

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1992 July 5, 6, 7 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.8		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
5 Sunday 00	283° 14'.5	172° 26'.5	22° 59'.9 N	240° 35'.8	15° 14'.1 N	120° 57'.0	8° 43'.3 N	323° 05'.1	16° 31'.6 S
01	298° 16'.9	187° 25'.6	59'.5	255° 36'.5	14'.7	135° 59'.0	43'.1	338° 07'.7	31'.6
02	313° 19'.4	202° 24'.7	59'.2	270° 37'.2	15'.2	151° 01'.1	43'.0	353° 10'.3	31'.7
03	328° 21'.9	217° 23'.9	58'.8	285° 37'.9	15'.8	166° 03'.2	42'.8	8° 12'.9	31'.7
04	343° 24'.3	232° 23'.0	58'.5	300° 38'.6	16'.3	181° 05'.3	42'.7	23° 15'.5	31'.8
05	358° 26'.8	247° 22'.2	58'.1	315° 39'.3	16'.9	196° 07'.4	42'.5	38° 18'.1	31'.8
06	13° 29'.3	262° 21'.3	57'.7	330° 40'.0	17'.4	211° 09'.5	42'.4	53° 20'.7	31'.9
07	28° 31'.7	277° 20'.5	57'.4	345° 40'.7	17'.9	226° 11'.6	42'.2	68° 23'.3	31'.9
08	43° 34'.2	292° 19'.6	57'.0	0° 41'.4	18'.5	241° 13'.7	42'.0	83° 25'.9	32'.0
09	58° 36'.6	307° 18'.8	56'.6	15° 42'.1	19'.0	256° 15'.8	41'.9	98° 28'.5	32'.0
10	73° 39'.1	322° 17'.9	56'.3	30° 42'.8	19'.6	271° 17'.9	41'.7	113° 31'.1	32'.1
11	88° 41'.6	337° 17'.1	55'.9	45° 43'.5	20'.1	286° 20'.0	41'.6	128° 33'.7	32'.1
12	103° 44'.0	352° 16'.2	22° 55'.5 N	60° 44'.2	15° 20'.6 N	301° 22'.1	8° 41'.4 N	143° 36'.3	16° 32'.2 S
13	118° 46'.5	7° 15'.4	55'.1	75° 44'.9	21'.2	316° 24'.2	41'.3	158° 38'.9	32'.2
14	133° 49'.0	22° 14'.5	54'.8	90° 45'.6	21'.7	331° 26'.3	41'.1	173° 41'.5	32'.3
15	148° 51'.4	37° 13'.7	54'.4	105° 46'.3	22'.3	346° 28'.4	41'.0	188° 44'.1	32'.3
16	163° 53'.9	52° 12'.8	54'.0	120° 47'.0	22'.8	1° 30'.5	40'.8	203° 46'.7	32'.4
17	178° 56'.4	67° 12'.0	53'.6	135° 47'.7	23'.3	16° 32'.5	40'.6	218° 49'.3	32'.4
18	193° 58'.8	82° 11'.2	53'.3	150° 48'.4	23'.9	31° 34'.6	40'.5	233° 51'.9	32'.5
19	209° 01'.3	97° 10'.3	52'.9	165° 49'.1	24'.4	46° 36'.7	40'.3	248° 54'.5	32'.5
20	224° 03'.8	112° 09'.5	52'.5	180° 49'.8	25'.0	61° 38'.8	40'.2	263° 57'.1	32'.6
21	239° 06'.2	127° 08'.6	52'.1	195° 50'.5	25'.5	76° 40'.9	40'.0	278° 59'.7	32'.6
22	254° 08'.7	142° 07'.8	51'.7	210° 51'.2	26'.0	91° 43'.0	39'.9	294° 02'.3	32'.7
23	269° 11'.1	157° 06'.9	51'.4	225° 51'.9	26'.6	106° 45'.1	39'.7	309° 04'.9	32'.7
6 Monday 00	284° 13'.6	172° 06'.1	22° 51'.0 N	240° 52'.6	15° 27'.1 N	121° 47'.2	8° 39'.6 N	324° 07'.5	16° 32'.7 S
01	299° 16'.1	187° 05'.2	50'.6	255° 53'.3	27'.7	136° 49'.3	39'.4	339° 10'.1	32'.8
02	314° 18'.5	202° 04'.4	50'.2	270° 54'.0	28'.2	151° 51'.4	39'.2	354° 12'.7	32'.8
03	329° 21'.0	217° 03'.5	49'.8	285° 54'.7	28'.7	166° 53'.5	39'.1	9° 15'.3	32'.9
04	344° 23'.5	232° 02'.7	49'.4	300° 55'.4	29'.3	181° 55'.6	38'.9	24° 17'.9	32'.9
05	359° 25'.9	247° 01'.8	49'.0	315° 56'.1	29'.8	196° 57'.6	38'.8	39° 20'.5	33'.0
06	14° 28'.4	262° 01'.0	48'.6	330° 56'.8	30'.3	211° 59'.7	38'.6	54° 23'.1	33'.0
07	29° 30'.9	277° 00'.2	48'.2	345° 57'.5	30'.9	227° 01'.8	38'.5	69° 25'.7	33'.1
08	44° 33'.3	291° 59'.3	47'.9	0° 58'.2	31'.4	242° 03'.9	38'.3	84° 28'.3	33'.1
09	59° 35'.8	306° 58'.5	47'.5	15° 58'.9	31'.9	257° 06'.0	38'.1	99° 30'.9	33'.2
10	74° 38'.2	321° 57'.6	47'.1	30° 59'.6	32'.5	272° 08'.1	38'.0	114° 33'.5	33'.2
11	89° 40'.7	336° 56'.8	46'.7	46° 00'.3	33'.0	287° 10'.2	37'.8	129° 36'.1	33'.3
12	104° 43'.2	351° 55'.9	22° 46'.3 N	61° 01'.0	15° 33'.5 N	302° 12'.3	8° 37'.7 N	144° 38'.7	16° 33'.3 S
13	119° 45'.6	6° 55'.1	45'.9	76° 01'.7	34'.1	317° 14'.4	37'.5	159° 41'.3	33'.4
14	134° 48'.1	21° 54'.3	45'.5	91° 02'.4	34'.6	332° 16'.5	37'.4	174° 43'.9	33'.4
15	149° 50'.6	36° 53'.4	45'.1	106° 03'.1	35'.1	347° 18'.5	37'.2	189° 46'.5	33'.5
16	164° 53'.0	51° 52'.6	44'.7	121° 03'.8	35'.7	2° 20'.6	37'.0	204° 49'.1	33'.5
17	179° 55'.5	66° 51'.7	44'.3	136° 04'.5	36'.2	17° 22'.7	36'.9	219° 51'.7	33'.6
18	194° 58'.0	81° 50'.9	43'.8	151° 05'.2	36'.7	32° 24'.8	36'.7	234° 54'.3	33'.6
19	210° 00'.4	96° 50'.1	43'.4	166° 05'.9	37'.3	47° 26'.9	36'.6	249° 56'.9	33'.7
20	225° 02'.9	111° 49'.2	43'.0	181° 06'.6	37'.8	62° 29'.0	36'.4	264° 59'.5	33'.7
21	240° 05'.4	126° 48'.4	42'.6	196° 07'.3	38'.3	77° 31'.1	36'.3	280° 02'.1	33'.8
22	255° 07'.8	141° 47'.5	42'.2	211° 08'.0	38'.9	92° 33'.2	36'.1	295° 04'.7	33'.8
23	270° 10'.3	156° 46'.7	41'.8	226° 08'.7	39'.4	107° 35'.3	35'.9	310° 07'.3	33'.9
7 Tuesday 00	285° 12'.7	171° 45'.9	22° 41'.4 N	241° 09'.4	15° 39'.9 N	122° 37'.3	8° 35'.8 N	325° 09'.9	16° 33'.9 S
01	300° 15'.2	186° 45'.0	41'.0	256° 10'.1	40'.5	137° 39'.4	35'.6	340° 12'.5	34'.0
02	315° 17'.7	201° 44'.2	40'.6	271° 10'.8	41'.0	152° 41'.5	35'.5	355° 15'.1	34'.0
03	330° 20'.1	216° 43'.4	40'.1	286° 11'.5	41'.5	167° 43'.6	35'.3	10° 17'.7	34'.1
04	345° 22'.6	231° 42'.5	39'.7	301° 12'.3	42'.1	182° 45'.7	35'.2	25° 20'.3	34'.1
05	0° 25'.1	246° 41'.7	39'.3	316° 13'.0	42'.6	197° 47'.8	35'.0	40° 22'.9	34'.2
06	15° 27'.5	261° 40'.9	38'.9	331° 13'.7	43'.1	212° 49'.9	34'.8	55° 25'.5	34'.2
07	30° 30'.0	276° 40'.0	38'.5	346° 14'.4	43'.6	227° 52'.0	34'.7	70° 28'.2	34'.3
08	45° 32'.5	291° 39'.2	38'.0	1° 15'.1	44'.2	242° 54'.0	34'.5	85° 30'.8	34'.3
09	60° 34'.9	306° 38'.3	37'.6	16° 15'.8	44'.7	257° 56'.1	34'.4	100° 33'.4	34'.4
10	75° 37'.4	321° 37'.5	37'.2	31° 16'.5	45'.2	272° 58'.2	34'.2	115° 36'.0	34'.4
11	90° 39'.9	336° 36'.7	36'.8	46° 17'.2	45'.8	288° 00'.3	34'.1	130° 38'.6	34'.5
12	105° 42'.3	351° 35'.8	22° 36'.3 N	61° 17'.9	15° 46'.3 N	303° 02'.4	8° 33'.9 N	145° 41'.2	16° 34'.5 S
13	120° 44'.8	6° 35'.0	35'.9	76° 18'.6	46'.8	318° 04'.5	33'.7	160° 43'.8	34'.5
14	135° 47'.2	21° 34'.2	35'.5	91° 19'.3	47'.3	333° 06'.6	33'.6	175° 46'.4	34'.6
15	150° 49'.7	36° 33'.3	35'.1	106° 20'.0	47'.9	348° 08'.6	33'.4	190° 49'.0	34'.6
16	165° 52'.2	51° 32'.5	34'.6	121° 20'.7	48'.4	3° 10'.7	33'.3	205° 51'.6	34'.7
17	180° 54'.6	66° 31'.7	34'.2	136° 21'.4	48'.9	18° 12'.8	33'.1	220° 54'.2	34'.7
18	195° 57'.1	81° 30'.9	33'.8	151° 22'.1	49'.4	33° 14'.9	32'.9	235° 56'.8	34'.8
19	210° 59'.6	96° 30'.0	33'.3	166° 22'.8	50'.0	48° 17'.0	32'.8	250° 59'.4	34'.8
20	226° 02'.0	111° 29'.2	32'.9	181° 23'.5	50'.5	63° 19'.1	32'.6	266° 02'.0	34'.9
21	241° 04'.5	126° 28'.4	32'.5	196° 24'.2	51'.0	78° 21'.1	32'.5	281° 04'.6	34'.9
22	256° 07'.0	141° 27'.5	32'.0	211° 24'.9	51'.5	93° 23'.2	32'.3	296° 07'.2	35'.0
23	271° 09'.4	156° 26'.7	31'.6	226° 25'.6	52'.1	108° 25'.3	32'.1	311° 09'.8	35'.0
	M.P. 04:58	v -0'.8	d 0'.4	v 0'.7	d 0'.5	v 2'.1	d 0'.2	v 2'.6	d 0'.0

Name	SHA	Dec
Acamar	315° 30'.4	40° 19'.8 S
Achernar	335° 38'.4	57° 16'.1 S
Acrux	173° 27'.1	63° 03'.9 S
Adhara	255° 25'.2	28° 57'.7 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.3	56° 00'.2 N
Alkaid	153° 11'.0	49° 21'.2 N
Alnair	28° 02'.9	46° 59'.5 S
Alnilam	276° 02'.5	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.0	26° 44'.5 N
Alpheratz	357° 59'.7	29° 02'.9 N
Altair	62° 23'.1	8° 51'.0 N
Ankaa	353° 31'.0	42° 20'.4 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.3 N
Atria	108° 00'.6	69° 01'.1 S
Avior	234° 25'.1	59° 29'.3 S
Bellatrix	278° 49'.1	6° 20'.6 N
Betelgeuse	271° 18'.5	7° 24'.4 N
Canopus	264° 03'.6	52° 41'.4 S
Capella	280° 58'.0	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.2 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.5	18° 01'.4 S
Dubhe	194° 11'.0	61° 47'.7 N
Elnath	278° 32'.7	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.5 N
Enif	34° 02'.2	9° 50'.5 N
Fomalhaut	15° 41'.0	29° 39'.4 S
Gacrux	172° 18'.6	57° 04'.7 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.6 S
Hamal	328° 18'.6	23° 25'.6 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 18'.6	74° 11'.4 N
Markab	13° 53'.8	15° 10'.0 N
Menkar	314° 31'.6	4° 03'.7 N
Menkent	148° 26'.0	36° 20'.3 S
Miaplacidus	221° 43'.9	69° 41'.4 S
Mirfak	309° 03'.2	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.1	56° 45'.4 S
Polaris	324° 07'.1	89° 13'.6 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.7 N
Rasalhague	96° 20'.6	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.4	8° 12'.5 S
Rigil Kent	140° 12'.8	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.5	56° 29'.6 N
Shaula	96° 42'.7	37° 06'.0 S
Sirius	258° 47'.8	16° 42'.3 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.3 S
Vega	80° 49'.1	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	247° 52'.5	12:32
Mars	316° 39'.0	07:56
Jupiter	197° 33'.6	15:51
Saturn	39° 53'.9	02:23

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
5 Sunday 00	178° 52'.4	22° 47'.0 N	118° 36'.7	10'.6	1° 02'.6 N	14'.7	59'.7
01	193° 52'.3	46'.7	133° 06'.3	10'.6	0° 47'.9 N	14'.7	
02	208° 52'.1	46'.5	147° 35'.9	10'.7	33'.2	14'.6	
03	223° 52'.0	46'.3	162° 05'.6	10'.7	18'.6	14'.6	
04	238° 51'.9	46'.0	176° 35'.3	10'.7	04'.0	14'.6	59'.6
05	253° 51'.8	45'.8	191° 05'.0	10'.8	0° 10'.6 S	14'.6	
06	268° 51'.7	45'.5	205° 34'.8	10'.8	25'.2	14'.6	
07	283° 51'.6	45'.3	220° 04'.6	10'.8	39'.8	14'.6	
08	298° 51'.5	45'.1	234° 34'.4	10'.8	54'.4	14'.5	59'.5
09	313° 51'.4	44'.8	249° 04'.2	10'.9	1° 08'.9 S	14'.5	
10	328° 51'.3	44'.6	263° 34'.1	10'.9	23'.4	14'.5	
11	343° 51'.2	44'.3	278° 04'.0	10'.9	37'.9	14'.5	
12	358° 51'.1	22° 44'.1 N	292° 33'.9	10'.9	1° 52'.4 S	14'.4	59'.4
13	13° 51'.0	43'.9	307° 03'.8	11'.0	2° 06'.8 S	14'.5	
14	28° 50'.9	43'.6	321° 33'.8	11'.0	21'.3	14'.4	
15	43° 50'.7	43'.4	336° 03'.8	11'.0	35'.7	14'.3	59'.3
16	58° 50'.6	43'.1	350° 33'.8	11'.0	50'.0	14'.4	
17	73° 50'.5	42'.9	5° 03'.8	11'.1	3° 04'.4 S	14'.3	
18	88° 50'.4	42'.6	19° 33'.9	11'.0	18'.7	14'.3	
19	103° 50'.3	42'.4	34° 03'.9	11'.1	33'.0	14'.2	59'.2
20	118° 50'.2	42'.1	48° 34'.0	11'.1	47'.2	14'.2	
21	133° 50'.1	41'.9	63° 04'.1	11'.1	4° 01'.4 S	14'.2	
22	148° 50'.0	41'.6	77° 34'.2	11'.1	15'.6	14'.1	59'.1
23	163° 49'.9	41'.4	92° 04'.3	11'.1	29'.7	14'.1	
6 Monday 00	178° 49'.8	22° 41'.1 N	106° 34'.4	11'.2	4° 43'.8 S	14'.1	59'.1
01	193° 49'.7	40'.9	121° 04'.6	11'.1	57'.9	14'.0	59'.0
02	208° 49'.6	40'.6	135° 34'.7	11'.2	5° 11'.9 S	14'.0	
03	223° 49'.5	40'.4	150° 04'.9	11'.2	25'.9	13'.9	
04	238° 49'.4	40'.1	164° 35'.1	11'.2	39'.8	13'.9	
05	253° 49'.3	39'.9	179° 05'.3	11'.1	53'.7	13'.8	58'.9
06	268° 49'.2	39'.6	193° 35'.4	11'.2	6° 07'.5 S	13'.8	
07	283° 49'.1	39'.3	208° 05'.6	11'.2	21'.3	13'.8	
08	298° 49'.0	39'.1	222° 35'.8	11'.2	35'.1	13'.7	58'.8
09	313° 48'.9	38'.8	237° 06'.0	11'.2	48'.8	13'.6	
10	328° 48'.8	38'.6	251° 36'.2	11'.2	7° 02'.4 S	13'.6	
11	343° 48'.7	38'.3	266° 06'.4	11'.2	16'.0	13'.6	
12	358° 48'.6	22° 38'.1 N	280° 36'.6	11'.2	7° 29'.6 S	13'.5	58'.7
13	13° 48'.4	37'.8	295° 06'.8	11'.2	43'.1	13'.4	
14	28° 48'.3	37'.5	309° 37'.0	11'.3	56'.5	13'.4	
15	43° 48'.2	37'.3	324° 07'.3	11'.2	8° 09'.9 S	13'.3	58'.6
16	58° 48'.1	37'.0	338° 37'.5	11'.1	23'.2	13'.3	
17	73° 48'.0	36'.7	353° 07'.6	11'.2	36'.5	13'.2	
18	88° 47'.9	36'.5	7° 37'.8	11'.2	49'.7	13'.2	58'.5
19	103° 47'.8	36'.2	22° 08'.0	11'.2	9° 02'.9 S	13'.1	
20	118° 47'.7	36'.0	36° 38'.2	11'.2	16'.0	13'.0	
21	133° 47'.6	35'.7	51° 08'.4	11'.2	29'.0	13'.0	
22	148° 47'.5	35'.4	65° 38'.6	11'.1	42'.0	12'.9	58'.4
23	163° 47'.4	35'.2	80° 08'.7	11'.2	54'.9	12'.8	
7 Tuesday 00	178° 47'.3	22° 34'.9 N	94° 38'.9	11'.1	10° 07'.7 S	12'.8	58'.4
01	193° 47'.2	34'.6	109° 09'.0	11'.2	20'.5	12'.7	58'.3
02	208° 47'.1	34'.3	123° 39'.2	11'.1	33'.2	12'.6	
03	223° 47'.0	34'.1	138° 09'.3	11'.1	45'.8	12'.6	
04	238° 46'.9	33'.8	152° 39'.4	11'.1	58'.4	12'.5	58'.2
05	253° 46'.8	33'.5	167° 09'.5	11'.1	11° 10'.9 S	12'.4	
06	268° 46'.7	33'.3	181° 39'.6	11'.1	23'.3	12'.4	
07	283° 46'.6	33'.0	196° 09'.7	11'.0	35'.7	12'.3	58'.1
08	298° 46'.5	32'.7	210° 39'.7	11'.1	48'.0	12'.2	
09	313° 46'.4	32'.4	225° 09'.8	11'.0	12° 00'.2 S	12'.1	
10	328° 46'.3	32'.2	239° 39'.8	11'.0	12'.3	12'.1	
11	343° 46'.2	31'.9	254° 09'.8	11'.0	24'.4	11'.9	58'.0
12	358° 46'.1	22° 31'.6 N	268° 39'.8	11'.0	12° 36'.3 S	12'.0	58'.0
13	13° 46'.0	31'.3	283° 09'.8	10'.9	48'.3	11'.8	
14	28° 45'.9	31'.1	297° 39'.7	11'.0	13° 00'.1 S	11'.7	57'.9
15	43° 45'.8	30'.8	312° 09'.7	10'.9	11'.8	11'.7	
16	58° 45'.7	30'.5	326° 39'.6	10'.9	23'.5	11'.6	
17	73° 45'.6	30'.2	341° 09'.5	10'.9	35'.1	11'.5	57'.8
18	88° 45'.5	30'.0	355° 39'.4	10'.8	46'.6	11'.4	
19	103° 45'.4	29'.7	10° 09'.2	10'.9	58'.0	11'.3	
20	118° 45'.3	29'.4	24° 39'.1	10'.8	14° 09'.3 S	11'.3	
21	133° 45'.2	29'.1	39° 08'.9	10'.8	20'.6	11'.2	57'.7
22	148° 45'.2	28'.8	53° 38'.7	10'.8	31'.8	11'.0	
23	163° 45'.1	28'.5	68° 08'.5	10'.7	42'.8	11'.0	
	SD 15'.7	d 0'.3	SD 16'.2		16'.0	15'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
5	4 30	4 36	12:05	16:39	04:14	5d 32%
6	4 41	4 46	12:05	17:28	05:04	6d 43%
7	4 50	4 55	12:05	18:18	05:53	7d 54%

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1992 July 8, 9, 10 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.8		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
8 Wednesday 00	286° 11'.9	171° 25'.9	22° 31'.1 N	241° 26'.3	15° 52'.6 N	123° 27'.4	8° 32'.0 N	326° 12'.4	16° 35'.1 S
01	301° 14'.3	186° 25'.0	30'.7	256° 27'.0	53'.1	138° 29'.5	31'.8	341° 15'.0	35'.1
02	316° 16'.8	201° 24'.2	30'.2	271° 27'.7	53'.6	153° 31'.6	31'.7	356° 17'.7	35'.2
03	331° 19'.3	216° 23'.4	29'.8	286° 28'.4	54'.2	168° 33'.7	31'.5	11° 20'.3	35'.2
04	346° 21'.7	231° 22'.6	29'.4	301° 29'.1	54'.7	183° 35'.7	31'.4	26° 22'.9	35'.3
05	1° 24'.2	246° 21'.7	28'.9	316° 29'.8	55'.2	198° 37'.8	31'.2	41° 25'.5	35'.3
06	16° 26'.7	261° 20'.9	28'.5	331° 30'.5	55'.7	213° 39'.9	31'.0	56° 28'.1	35'.4
07	31° 29'.1	276° 20'.1	28'.0	346° 31'.2	56'.3	228° 42'.0	30'.9	71° 30'.7	35'.4
08	46° 31'.6	291° 19'.2	27'.6	1° 31'.9	56'.8	243° 44'.1	30'.7	86° 33'.3	35'.5
09	61° 34'.1	306° 18'.4	27'.1	16° 32'.6	57'.3	258° 46'.2	30'.6	101° 35'.9	35'.5
10	76° 36'.5	321° 17'.6	26'.7	31° 33'.3	57'.8	273° 48'.2	30'.4	116° 38'.5	35'.6
11	91° 39'.0	336° 16'.8	26'.2	46° 34'.0	58'.3	288° 50'.3	30'.2	131° 41'.1	35'.6
12	106° 41'.5	351° 15'.9	22° 25'.8 N	61° 34'.7	15° 58'.9 N	303° 52'.4	8° 30'.1 N	146° 43'.7	16° 35'.7 S
13	121° 43'.9	6° 15'.1	25'.3	76° 35'.4	59'.4	318° 54'.5	29'.9	161° 46'.3	35'.7
14	136° 46'.4	21° 14'.3	24'.8	91° 36'.1	59'.9	333° 56'.6	29'.8	176° 48'.9	35'.8
15	151° 48'.8	36° 13'.5	24'.4	106° 36'.8	16° 00'.4 N	348° 58'.7	29'.6	191° 51'.6	35'.8
16	166° 51'.3	51° 12'.6	23'.9	121° 37'.5	00'.9	4° 00'.7	29'.4	206° 54'.2	35'.9
17	181° 53'.8	66° 11'.8	23'.5	136° 38'.2	01'.5	19° 02'.8	29'.3	221° 56'.8	35'.9
18	196° 56'.2	81° 11'.0	23'.0	151° 38'.9	02'.0	34° 04'.9	29'.1	236° 59'.4	36'.0
19	211° 58'.7	96° 10'.2	22'.6	166° 39'.6	02'.5	49° 07'.0	29'.0	252° 02'.0	36'.0
20	227° 01'.2	111° 09'.4	22'.1	181° 40'.3	03'.0	64° 09'.1	28'.8	267° 04'.6	36'.1
21	242° 03'.6	126° 08'.5	21'.6	196° 41'.0	03'.5	79° 11'.1	28'.6	282° 07'.2	36'.1
22	257° 06'.1	141° 07'.7	21'.2	211° 41'.7	04'.1	94° 13'.2	28'.5	297° 09'.8	36'.2
23	272° 08'.6	156° 06'.9	20'.7	226° 42'.4	04'.6	109° 15'.3	28'.3	312° 12'.4	36'.2
9 Thursday 00	287° 11'.0	171° 06'.1	22° 20'.2 N	241° 43'.1	16° 05'.1 N	124° 17'.4	8° 28'.1 N	327° 15'.0	16° 36'.3 S
01	302° 13'.5	186° 05'.3	19'.8	256° 43'.8	05'.6	139° 19'.5	28'.0	342° 17'.6	36'.3
02	317° 16'.0	201° 04'.4	19'.3	271° 44'.5	06'.1	154° 21'.5	27'.8	357° 20'.2	36'.4
03	332° 18'.4	216° 03'.6	18'.8	286° 45'.2	06'.6	169° 23'.6	27'.7	12° 22'.9	36'.4
04	347° 20'.9	231° 02'.8	18'.3	301° 45'.9	07'.2	184° 25'.7	27'.5	27° 25'.5	36'.5
05	2° 23'.3	246° 02'.0	17'.9	316° 46'.6	07'.7	199° 27'.8	27'.3	42° 28'.1	36'.5
06	17° 25'.8	261° 01'.2	17'.4	331° 47'.3	08'.2	214° 29'.9	27'.2	57° 30'.7	36'.6
07	32° 28'.3	276° 00'.3	16'.9	346° 48'.0	08'.7	229° 31'.9	27'.0	72° 33'.3	36'.6
08	47° 30'.7	290° 59'.5	16'.4	1° 48'.7	09'.2	244° 34'.0	26'.9	87° 35'.9	36'.7
09	62° 33'.2	305° 58'.7	16'.0	16° 49'.4	09'.7	259° 36'.1	26'.7	102° 38'.5	36'.7
10	77° 35'.7	320° 57'.9	15'.5	31° 50'.1	10'.2	274° 38'.2	26'.5	117° 41'.1	36'.8
11	92° 38'.1	335° 57'.1	15'.0	46° 50'.8	10'.8	289° 40'.3	26'.4	132° 43'.7	36'.8
12	107° 40'.6	350° 56'.3	22° 14'.5 N	61° 51'.5	16° 11'.3 N	304° 42'.3	8° 26'.2 N	147° 46'.3	16° 36'.9 S
13	122° 43'.1	5° 55'.4	14'.0	76° 52'.2	11'.8	319° 44'.4	26'.1	162° 49'.0	36'.9
14	137° 45'.5	20° 54'.6	13'.6	91° 52'.9	12'.3	334° 46'.5	25'.9	177° 51'.6	37'.0
15	152° 48'.0	35° 53'.8	13'.1	106° 53'.6	12'.8	349° 48'.6	25'.7	192° 54'.2	37'.0
16	167° 50'.4	50° 53'.0	12'.6	121° 54'.3	13'.3	4° 50'.7	25'.6	207° 56'.8	37'.1
17	182° 52'.9	65° 52'.2	12'.1	136° 55'.0	13'.8	19° 52'.7	25'.4	222° 59'.4	37'.2
18	197° 55'.4	80° 51'.4	11'.6	151° 55'.7	14'.4	34° 54'.8	25'.2	238° 02'.0	37'.2
19	212° 57'.8	95° 50'.6	11'.1	166° 56'.4	14'.9	49° 56'.9	25'.1	253° 04'.6	37'.3
20	228° 00'.3	110° 49'.7	10'.6	181° 57'.1	15'.4	64° 59'.0	24'.9	268° 07'.2	37'.3
21	243° 02'.8	125° 48'.9	10'.1	196° 57'.8	15'.9	80° 01'.1	24'.8	283° 09'.8	37'.4
22	258° 05'.2	140° 48'.1	09'.6	211° 58'.5	16'.4	95° 03'.1	24'.6	298° 12'.4	37'.4
23	273° 07'.7	155° 47'.3	09'.2	226° 59'.2	16'.9	110° 05'.2	24'.4	313° 15'.1	37'.5
10 Friday 00	288° 10'.2	170° 46'.5	22° 08'.7 N	241° 59'.9	16° 17'.4 N	125° 07'.3	8° 24'.3 N	328° 17'.7	16° 37'.5 S
01	303° 12'.6	185° 45'.7	08'.2	257° 00'.6	17'.9	140° 09'.4	24'.1	343° 20'.3	37'.6
02	318° 15'.1	200° 44'.9	07'.7	272° 01'.3	18'.4	155° 11'.4	24'.0	358° 22'.9	37'.6
03	333° 17'.6	215° 44'.1	07'.2	287° 02'.0	19'.0	170° 13'.5	23'.8	13° 25'.5	37'.7
04	348° 20'.0	230° 43'.3	06'.7	302° 02'.7	19'.5	185° 15'.6	23'.6	28° 28'.1	37'.7
05	3° 22'.5	245° 42'.4	06'.2	317° 03'.4	20'.0	200° 17'.7	23'.5	43° 30'.7	37'.8
06	18° 24'.9	260° 41'.6	05'.7	332° 04'.1	20'.5	215° 19'.7	23'.3	58° 33'.3	37'.8
07	33° 27'.4	275° 40'.8	05'.2	347° 04'.8	21'.0	230° 21'.8	23'.1	73° 36'.0	37'.9
08	48° 29'.9	290° 40'.0	04'.7	2° 05'.5	21'.5	245° 23'.9	23'.0	88° 38'.6	37'.9
09	63° 32'.3	305° 39'.2	04'.2	17° 06'.2	22'.0	260° 26'.0	22'.8	103° 41'.2	38'.0
10	78° 34'.8	320° 38'.4	03'.7	32° 06'.9	22'.5	275° 28'.1	22'.7	118° 43'.8	38'.0
11	93° 37'.3	335° 37'.6	03'.1	47° 07'.6	23'.0	290° 30'.1	22'.5	133° 46'.4	38'.1
12	108° 39'.7	350° 36'.8	22° 02'.6 N	62° 08'.3	16° 23'.5 N	305° 32'.2	8° 22'.3 N	148° 49'.0	16° 38'.1 S
13	123° 42'.2	5° 36'.0	02'.1	77° 09'.0	24'.0	320° 34'.3	22'.2	163° 51'.6	38'.2
14	138° 44'.7	20° 35'.2	01'.6	92° 09'.7	24'.5	335° 36'.4	22'.0	178° 54'.2	38'.2
15	153° 47'.1	35° 34'.4	01'.1	107° 10'.4	25'.1	350° 38'.4	21'.8	193° 56'.9	38'.3
16	168° 49'.6	50° 33'.6	00'.6	122° 11'.1	25'.6	5° 40'.5	21'.7	208° 59'.5	38'.3
17	183° 52'.1	65° 32'.8	00'.1	137° 11'.8	26'.1	20° 42'.6	21'.5	224° 02'.1	38'.4
18	198° 54'.5	80° 32'.0	21° 59'.6 N	152° 12'.5	26'.6	35° 44'.7	21'.3	239° 04'.7	38'.4
19	213° 57'.0	95° 31'.1	59'.1	167° 13'.2	27'.1	50° 46'.7	21'.2	254° 07'.3	38'.5
20	228° 59'.4	110° 30'.3	58'.5	182° 13'.9	27'.6	65° 48'.8	21'.0	269° 09'.9	38'.5
21	244° 01'.9	125° 29'.5	58'.0	197° 14'.6	28'.1	80° 50'.9	20'.9	284° 12'.5	38'.6
22	259° 04'.4	140° 28'.7	57'.5	212° 15'.3	28'.6	95° 53'.0	20'.7	299° 15'.1	38'.6
23	274° 06'.8	155° 27'.9	57'.0	227° 16'.0	29'.1	110° 55'.0	20'.5	314° 17'.8	38'.7
	M.P. 04:47	v -0'.8	d 0'.5	v 0'.7	d 0'.5	v 2'.1	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.3	40° 19'.8 S
Achernar	335° 38'.4	57° 16'.1 S
Acrux	173° 27'.1	63° 03'.9 S
Adhara	255° 25'.2	28° 57'.7 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.3	56° 00'.2 N
Alkaid	153° 11'.0	49° 21'.2 N
Alnair	28° 02'.9	46° 59'.5 S
Alnilam	276° 02'.5	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.0	26° 44'.5 N
Alpheratz	357° 59'.6	29° 02'.9 N
Altair	62° 23'.1	8° 51'.0 N
Ankaa	353° 30'.9	42° 20'.4 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.8	19° 13'.3 N
Atria	108° 00'.6	69° 01'.1 S
Avior	234° 25'.1	59° 29'.3 S
Bellatrix	278° 49'.1	6° 20'.6 N
Betelgeuse	271° 18'.5	7° 24'.4 N
Canopus	264° 03'.6	52° 41'.4 S
Capella	280° 58'.0	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.2 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.5	18° 01'.4 S
Dubhe	194° 11'.0	61° 47'.6 N
Elnath	278° 32'.7	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.5 N
Enif	34° 02'.2	9° 50'.5 N
Fomalhaut	15° 40'.9	29° 39'.4 S
Gacrux	172° 18'.6	57° 04'.7 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.6 S
Hamal	328° 18'.5	23° 25'.6 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 18'.7	74° 11'.4 N
Markab	13° 53'.7	15° 10'.0 N
Menkar	314° 31'.6	4° 03'.7 N
Menkent	148° 26'.0	36° 20'.3 S
Miaplacidus	221° 43'.9	69° 41'.4 S
Mirfak	309° 03'.1	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.1	56° 45'.4 S
Polaris	324° 05'.7	89° 13'.6 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.7 N
Rasalhague	96° 20'.6	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.4	8° 12'.5 S
Rigil Kent	140° 12'.9	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.4	56° 29'.6 N
Shaula	96° 42'.7	37° 06'.0 S
Sirius	258° 47'.8	16° 42'.3 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.3 S
Vega	80° 49'.1	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	243° 55'.1	12:36
Mars	314° 32'.1	07:53
Jupiter	197° 06'.4	15:41
Saturn	40° 04'.0	02:11

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
8 Wednesday 00	178° 45'.0	22° 28'.3 N	82° 38'.2	10'.8	14° 53'.8 S	10'.9	57'.6
01	193° 44'.9	28'.0	97° 08'.0	10'.7	15° 04'.7 S	10'.9	
02	208° 44'.8	27'.7	111° 37'.7	10'.7	15'.6	10'.7	
03	223° 44'.7	27'.4	126° 07'.4	10'.6	26'.3	10'.6	
04	238° 44'.6	27'.1	140° 37'.0	10'.6	36'.9	10'.6	57'.5
05	253° 44'.5	26'.8	155° 06'.6	10'.7	47'.5	10'.4	
06	268° 44'.4	26'.5	169° 36'.3	10'.5	57'.9	10'.4	
07	283° 44'.3	26'.3	184° 05'.8	10'.6	16° 08'.3 S	10'.2	57'.4
08	298° 44'.2	26'.0	198° 35'.4	10'.5	18'.5	10'.2	
09	313° 44'.1	25'.7	213° 04'.9	10'.5	28'.7	10'.1	
10	328° 44'.0	25'.4	227° 34'.4	10'.5	38'.8	10'.0	
11	343° 43'.9	25'.1	242° 03'.9	10'.5	48'.8	9'.8	57'.3
12	358° 43'.8	22° 24'.8 N	256° 33'.4	10'.4	16° 58'.6 S	9'.8	57'.3
13	13° 43'.7	24'.5	271° 02'.8	10'.4	17° 08'.4 S	9'.7	
14	28° 43'.6	24'.2	285° 32'.2	10'.4	18'.1	9'.6	57'.2
15	43° 43'.5	23'.9	300° 01'.6	10'.3	27'.7	9'.5	
16	58° 43'.4	23'.6	314° 30'.9	10'.3	37'.2	9'.4	
17	73° 43'.3	23'.3	329° 00'.2	10'.3	46'.6	9'.2	
18	88° 43'.2	23'.0	343° 29'.5	10'.3	55'.8	9'.2	57'.1
19	103° 43'.2	22'.7	357° 58'.8	10'.2	18° 05'.0 S	9'.1	
20	118° 43'.1	22'.4	12° 28'.0	10'.3	14'.1	9'.0	
21	133° 43'.0	22'.1	26° 57'.3	10'.1	23'.1	8'.8	57'.0
22	148° 42'.9	21'.8	41° 26'.4	10'.2	31'.9	8'.8	
23	163° 42'.8	21'.5	55° 55'.6	10'.1	40'.7	8'.7	
9 Thursday 00	178° 42'.7	22° 21'.2 N	70° 24'.7	10'.1	18° 49'.4 S	8'.5	57'.0
01	193° 42'.6	20'.9	84° 53'.8	10'.1	57'.9	8'.5	56'.9
02	208° 42'.5	20'.6	99° 22'.9	10'.1	19° 06'.4 S	8'.3	
03	223° 42'.4	20'.3	113° 52'.0	10'.0	14'.7	8'.2	
04	238° 42'.3	20'.0	128° 21'.0	10'.0	22'.9	8'.1	
05	253° 42'.2	19'.7	142° 50'.0	10'.0	31'.0	8'.0	56'.8
06	268° 42'.1	19'.4	157° 19'.0	9'.9	39'.0	7'.9	
07	283° 42'.1	19'.1	171° 47'.9	9'.9	46'.9	7'.8	
08	298° 42'.0	18'.8	186° 16'.8	9'.9	54'.7	7'.7	
09	313° 41'.9	18'.5	200° 45'.7	9'.9	20° 02'.4 S	7'.6	56'.7
10	328° 41'.8	18'.2	215° 14'.6	9'.8	10'.0	7'.4	
11	343° 41'.7	17'.9	229° 43'.4	9'.8	17'.4	7'.4	
12	358° 41'.6	22° 17'.6 N	244° 12'.2	9'.8	20° 24'.8 S	7'.2	56'.6
13	13° 41'.5	17'.3	258° 41'.0	9'.8	32'.0	7'.1	
14	28° 41'.4	17'.0	273° 09'.8	9'.7	39'.1	7'.0	
15	43° 41'.3	16'.7	287° 38'.5	9'.8	46'.1	6'.9	
16	58° 41'.2	16'.4	302° 07'.3	9'.7	53'.0	6'.7	56'.5
17	73° 41'.2	16'.0	316° 36'.0	9'.6	59'.7	6'.7	
18	88° 41'.1	15'.7	331° 04'.6	9'.7	21° 06'.4 S	6'.5	
19	103° 41'.0	15'.4	345° 33'.3	9'.6	12'.9	6'.4	
20	118° 40'.9	15'.1	0° 01'.9	9'.6	19'.3	6'.3	56'.4
21	133° 40'.8	14'.8	14° 30'.5	9'.6	25'.6	6'.2	
22	148° 40'.7	14'.5	28° 59'.1	9'.6	31'.8	6'.1	
23	163° 40'.6	14'.2	43° 27'.7	9'.5	37'.9	5'.9	
10 Friday 00	178° 40'.5	22° 13'.8 N	57° 56'.2	9'.6	21° 43'.8 S	5'.8	56'.3
01	193° 40'.4	13'.5	72° 24'.8	9'.5	49'.6	5'.7	
02	208° 40'.4	13'.2	86° 53'.3	9'.5	55'.3	5'.6	
03	223° 40'.3	12'.9	101° 21'.8	9'.5	22° 00'.9 S	5'.5	
04	238° 40'.2	12'.6	115° 50'.3	9'.4	06'.4	5'.3	56'.2
05	253° 40'.1	12'.3	130° 18'.7	9'.5	11'.7	5'.2	
06	268° 40'.0	11'.9	144° 47'.2	9'.4	16'.9	5'.1	
07	283° 39'.9	11'.6	159° 15'.6	9'.4	22'.0	5'.0	
08	298° 39'.8	11'.3	173° 44'.0	9'.4	27'.0	4'.8	
09	313° 39'.8	11'.0	188° 12'.4	9'.4	31'.8	4'.7	56'.1
10	328° 39'.7	10'.6	202° 40'.8	9'.3	36'.5	4'.6	
11	343° 39'.6	10'.3	217° 09'.1	9'.4	41'.1	4'.5	
12	358° 39'.5	22° 10'.0 N	231° 37'.5	9'.3	22° 45'.6 S	4'.4	56'.1
13	13° 39'.4	09'.7	246° 05'.8	9'.4	50'.0	4'.2	56'.0
14	28° 39'.3	09'.3	260° 34'.2	9'.3	54'.2	4'.1	
15	43° 39'.2	09'.0	275° 02'.5	9'.3	58'.3	4'.0	
16	58° 39'.2	08'.7	289° 30'.8	9'.3	23° 02'.3 S	3'.8	
17	73° 39'.1	08'.4	303° 59'.1	9'.3	06'.1	3'.8	55'.9
18	88° 39'.0	08'.0	318° 27'.4	9'.3	09'.9	3'.6	
19	103° 38'.9	07'.7	332° 55'.7	9'.3	13'.5	3'.5	
20	118° 38'.8	07'.4	347° 24'.0	9'.3	17'.0	3'.3	
21	133° 38'.7	07'.1	1° 52'.3	9'.3	20'.3	3'.2	
22	148° 38'.7	06'.7	16° 20'.6	9'.2	23'.5	3'.1	55'.8
23	163° 38'.6	06'.4	30° 48'.8	9'.3	26'.6	3'.0	
	SD 15'.7	d 0'.3	SD 15'.6		15'.4	15'.3	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
8	5 00	5 05	12:05	19:08	06:43	8d 65%
9	5 09	5 13	12:05	20:00	07:34	9d 75%
10	5 18	5 22	12:05	20:52	08:26	10d 83%

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1992 July 11, 12, 13 (Sat, Sun, Mon)

GMT		ARIES	VENUS -3.9		MARS +0.9		JUPITER -1.8		SATURN +0.3	
		GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
11 Saturday	00	289° 09'.3	170° 27'.1	21° 56'.5 N	242° 16'.7	16° 29'.6 N	125° 57'.1	8° 20'.4 N	329° 20'.4	16° 38'.7 S
	01	304° 11'.8	185° 26'.3	55'.9	257° 17'.4	30'.1	140° 59'.2	20'.2	344° 23'.0	38'.8
	02	319° 14'.2	200° 25'.5	55'.4	272° 18'.1	30'.6	156° 01'.3	20'.0	359° 25'.6	38'.8
	03	334° 16'.7	215° 24'.7	54'.9	287° 18'.8	31'.1	171° 03'.3	19'.9	14° 28'.2	38'.9
	04	349° 19'.2	230° 23'.9	54'.4	302° 19'.5	31'.6	186° 05'.4	19'.7	29° 30'.8	38'.9
	05	4° 21'.6	245° 23'.1	53'.8	317° 20'.2	32'.1	201° 07'.5	19'.5	44° 33'.4	39'.0
	06	19° 24'.1	260° 22'.3	53'.3	332° 20'.9	32'.6	216° 09'.5	19'.4	59° 36'.1	39'.0
	07	34° 26'.6	275° 21'.5	52'.8	347° 21'.6	33'.1	231° 11'.6	19'.2	74° 38'.7	39'.1
	08	49° 29'.0	290° 20'.7	52'.2	2° 22'.3	33'.6	246° 13'.7	19'.1	89° 41'.3	39'.1
	09	64° 31'.5	305° 19'.9	51'.7	17° 23'.0	34'.1	261° 15'.8	18'.9	104° 43'.9	39'.2
	10	79° 33'.9	320° 19'.1	51'.2	32° 23'.8	34'.6	276° 17'.8	18'.7	119° 46'.5	39'.3
	11	94° 36'.4	335° 18'.3	50'.6	47° 24'.5	35'.1	291° 19'.9	18'.6	134° 49'.1	39'.3
	12	109° 38'.9	350° 17'.5	21° 50'.1 N	62° 25'.2	16° 35'.6 N	306° 22'.0	8° 18'.4 N	149° 51'.8	16° 39'.4 S
	13	124° 41'.3	5° 16'.7	49'.6	77° 25'.9	36'.1	321° 24'.1	18'.2	164° 54'.4	39'.4
	14	139° 43'.8	20° 16'.0	49'.0	92° 26'.6	36'.6	336° 26'.1	18'.1	179° 57'.0	39'.5
	15	154° 46'.3	35° 15'.2	48'.5	107° 27'.3	37'.1	351° 28'.2	17'.9	194° 59'.6	39'.5
	16	169° 48'.7	50° 14'.4	48'.0	122° 28'.0	37'.6	6° 30'.3	17'.7	210° 02'.2	39'.6
	17	184° 51'.2	65° 13'.6	47'.4	137° 28'.7	38'.1	21° 32'.3	17'.6	225° 04'.8	39'.6
	18	199° 53'.7	80° 12'.8	46'.9	152° 29'.4	38'.6	36° 34'.4	17'.4	240° 07'.4	39'.7
	19	214° 56'.1	95° 12'.0	46'.3	167° 30'.1	39'.1	51° 36'.5	17'.2	255° 10'.1	39'.7
	20	229° 58'.6	110° 11'.2	45'.8	182° 30'.8	39'.6	66° 38'.6	17'.1	270° 12'.7	39'.8
	21	245° 01'.1	125° 10'.4	45'.3	197° 31'.5	40'.1	81° 40'.6	16'.9	285° 15'.3	39'.8
	22	260° 03'.5	140° 09'.6	44'.7	212° 32'.2	40'.6	96° 42'.7	16'.8	300° 17'.9	39'.9
	23	275° 06'.0	155° 08'.8	44'.2	227° 32'.9	41'.1	111° 44'.8	16'.6	315° 20'.5	39'.9
12 Sunday	00	290° 08'.4	170° 08'.0	21° 43'.6 N	242° 33'.6	16° 41'.6 N	126° 46'.8	8° 16'.4 N	330° 23'.1	16° 40'.0 S
	01	305° 10'.9	185° 07'.2	43'.1	257° 34'.3	42'.1	141° 48'.9	16'.3	345° 25'.8	40'.0
	02	320° 13'.4	200° 06'.4	42'.5	272° 35'.0	42'.6	156° 51'.0	16'.1	0° 28'.4	40'.1
	03	335° 15'.8	215° 05'.6	42'.0	287° 35'.7	43'.1	171° 53'.1	15'.9	15° 31'.0	40'.1
	04	350° 18'.3	230° 04'.8	41'.4	302° 36'.4	43'.6	186° 55'.1	15'.8	30° 33'.6	40'.2
	05	5° 20'.8	245° 04'.1	40'.9	317° 37'.1	44'.1	201° 57'.2	15'.6	45° 36'.2	40'.2
	06	20° 23'.2	260° 03'.3	40'.3	332° 37'.8	44'.6	216° 59'.3	15'.4	60° 38'.8	40'.3
	07	35° 25'.7	275° 02'.5	39'.8	347° 38'.5	45'.1	232° 01'.3	15'.3	75° 41'.5	40'.3
	08	50° 28'.2	290° 01'.7	39'.2	2° 39'.2	45'.6	247° 03'.4	15'.1	90° 44'.1	40'.4
	09	65° 30'.6	305° 00'.9	38'.6	17° 39'.9	46'.1	262° 05'.5	14'.9	105° 46'.7	40'.5
	10	80° 33'.1	320° 00'.1	38'.1	32° 40'.6	46'.6	277° 07'.5	14'.8	120° 49'.3	40'.5
	11	95° 35'.5	334° 59'.3	37'.5	47° 41'.3	47'.1	292° 09'.6	14'.6	135° 51'.9	40'.6
	12	110° 38'.0	349° 58'.5	21° 37'.0 N	62° 42'.0	16° 47'.6 N	307° 11'.7	8° 14'.4 N	150° 54'.5	16° 40'.6 S
	13	125° 40'.5	4° 57'.8	36'.4	77° 42'.7	48'.0	322° 13'.8	14'.3	165° 57'.2	40'.7
	14	140° 42'.9	19° 57'.0	35'.8	92° 43'.4	48'.5	337° 15'.8	14'.1	180° 59'.8	40'.7
	15	155° 45'.4	34° 56'.2	35'.3	107° 44'.1	49'.0	352° 17'.9	13'.9	196° 02'.4	40'.8
	16	170° 47'.9	49° 55'.4	34'.7	122° 44'.8	49'.5	7° 20'.0	13'.8	211° 05'.0	40'.8
	17	185° 50'.3	64° 54'.6	34'.1	137° 45'.5	50'.0	22° 22'.0	13'.6	226° 07'.6	40'.9
	18	200° 52'.8	79° 53'.8	33'.6	152° 46'.2	50'.5	37° 24'.1	13'.4	241° 10'.2	40'.9
	19	215° 55'.3	94° 53'.0	33'.0	167° 46'.9	51'.0	52° 26'.2	13'.3	256° 12'.9	41'.0
	20	230° 57'.7	109° 52'.3	32'.4	182° 47'.6	51'.5	67° 28'.2	13'.1	271° 15'.5	41'.0
	21	246° 00'.2	124° 51'.5	31'.9	197° 48'.3	52'.0	82° 30'.3	12'.9	286° 18'.1	41'.1
	22	261° 02'.7	139° 50'.7	31'.3	212° 49'.0	52'.5	97° 32'.4	12'.8	301° 20'.7	41'.1
	23	276° 05'.1	154° 49'.9	30'.7	227° 49'.7	53'.0	112° 34'.4	12'.6	316° 23'.3	41'.2
13 Monday	00	291° 07'.6	169° 49'.1	21° 30'.1 N	242° 50'.4	16° 53'.5 N	127° 36'.5	8° 12'.4 N	331° 26'.0	16° 41'.2 S
	01	306° 10'.0	184° 48'.4	29'.6	257° 51'.1	53'.9	142° 38'.6	12'.3	346° 28'.6	41'.3
	02	321° 12'.5	199° 47'.6	29'.0	272° 51'.8	54'.4	157° 40'.6	12'.1	1° 31'.2	41'.3
	03	336° 15'.0	214° 46'.8	28'.4	287° 52'.5	54'.9	172° 42'.7	11'.9	16° 33'.8	41'.4
	04	351° 17'.4	229° 46'.0	27'.8	302° 53'.2	55'.4	187° 44'.8	11'.8	31° 36'.4	41'.5
	05	6° 19'.9	244° 45'.2	27'.3	317° 53'.9	55'.9	202° 46'.8	11'.6	46° 39'.1	41'.5
	06	21° 22'.4	259° 44'.5	26'.7	332° 54'.6	56'.4	217° 48'.9	11'.4	61° 41'.7	41'.6
	07	36° 24'.8	274° 43'.7	26'.1	347° 55'.3	56'.9	232° 51'.0	11'.3	76° 44'.3	41'.6
	08	51° 27'.3	289° 42'.9	25'.5	2° 56'.0	57'.4	247° 53'.0	11'.1	91° 46'.9	41'.7
	09	66° 29'.8	304° 42'.1	24'.9	17° 56'.7	57'.9	262° 55'.1	10'.9	106° 49'.5	41'.7
	10	81° 32'.2	319° 41'.3	24'.4	32° 57'.4	58'.3	277° 57'.2	10'.8	121° 52'.2	41'.8
	11	96° 34'.7	334° 40'.6	23'.8	47° 58'.1	58'.8	292° 59'.2	10'.6	136° 54'.8	41'.8
	12	111° 37'.2	349° 39'.8	21° 23'.2 N	62° 58'.8	16° 59'.3 N	308° 01'.3	8° 10'.4 N	151° 57'.4	16° 41'.9 S
	13	126° 39'.6	4° 39'.0	22'.6	77° 59'.5	59'.8	323° 03'.4	10'.3	167° 00'.0	41'.9
	14	141° 42'.1	19° 38'.2	22'.0	93° 00'.2	17° 00'.3 N	338° 05'.4	10'.1	182° 02'.6	42'.0
	15	156° 44'.5	34° 37'.5	21'.4	108° 00'.9	00'.8	353° 07'.5	09'.9	197° 05'.3	42'.0
	16	171° 47'.0	49° 36'.7	20'.8	123° 01'.6	01'.3	8° 09'.6	09'.8	212° 07'.9	42'.1
	17	186° 49'.5	64° 35'.9	20'.2	138° 02'.3	01'.7	23° 11'.6	09'.6	227° 10'.5	42'.1
	18	201° 51'.9	79° 35'.1	19'.6	153° 03'.0	02'.2	38° 13'.7	09'.4	242° 13'.1	42'.2
	19	216° 54'.4	94° 34'.4	19'.0	168° 03'.7	02'.7	53° 15'.8	09'.3	257° 15'.7	42'.2
	20	231° 56'.9	109° 33'.6	18'.5	183° 04'.4	03'.2	68° 17'.8	09'.1	272° 18'.4	42'.3
	21	246° 59'.3	124° 32'.8	17'.9	198° 05'.1	03'.7	83° 19'.9	08'.9	287° 21'.0	42'.4
	22	262° 01'.8	139° 32'.0	17'.3	213° 05'.8	04'.2	98° 22'.0	08'.8	302° 23'.6	42'.4
	23	277° 04'.3	154° 31'.3	16'.7	228° 06'.5	04'.6	113° 24'.0	08'.6	317° 26'.2	42'.5
		M.P. 04:35	v -0'.8	d 0'.6	v 0'.7	d 0'.5	v 2'.1	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.3	40° 19'.8 S
Achernar	335° 38'.3	57° 16'.1 S
Acrux	173° 27'.2	63° 03'.9 S
Adhara	255° 25'.2	28° 57'.7 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.3	56° 00'.2 N
Alkaid	153° 11'.0	49° 21'.2 N
Alnair	28° 02'.8	46° 59'.5 S
Alnilam	276° 02'.5	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.0	26° 44'.5 N
Alpheratz	357° 59'.6	29° 03'.0 N
Altair	62° 23'.1	8° 51'.0 N
Ankaa	353° 30'.9	42° 20'.4 S
Antares	112° 45'.2	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.3 N
Atria	108° 00'.6	69° 01'.1 S
Avior	234° 25'.1	59° 29'.3 S
Bellatrix	278° 49'.1	6° 20'.6 N
Betelgeuse	271° 18'.5	7° 24'.4 N
Canopus	264° 03'.6	52° 41'.4 S
Capella	280° 58'.0	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.2 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.5	18° 01'.4 S
Dubhe	194° 11'.0	61° 47'.6 N
Elnath	278° 32'.7	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.5 N
Enif	34° 02'.2	9° 50'.5 N
Fomalhaut	15° 40'.9	29° 39'.4 S
Gacrux	172° 18'.6	57° 04'.7 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.6 S
Hamal	328° 18'.5	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 18'.7	74° 11'.4 N
Markab	13° 53'.7	15° 10'.0 N
Menkar	314° 31'.5	4° 03'.7 N
Menkent	148° 26'.0	36° 20'.3 S
Miaplacidus	221° 44'.0	69° 41'.4 S
Mirfak	309° 03'.1	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.1	56° 45'.4 S
Polaris	324° 04'.3	89° 13'.6 N
Pollux	243° 47'.2	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.7 N
Rasalhague	96° 20'.6	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.4	8° 12'.5 S
Rigil Kent	140° 12'.9	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.4	56° 29'.7 N
Shaula	96° 42'.7	37° 06'.0 S
Sirius	258° 47'.8	16° 42'.3 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.3 S
Vega	80° 49'.1	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	239° 59'.6	12:40
Mars	312° 25'.1	07:49
Jupiter	196° 38'.4	15:31
Saturn	40° 14'.7	01:58

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
11 00	178° 38'.5	22° 06'.1 N	45° 17'.1	9'.3	23° 29'.6 S	2'.9	55'.8
01	193° 38'.4	05'.7	59° 45'.4	9'.3	32'.5	2'.7	
02	208° 38'.3	05'.4	74° 13'.7	9'.2	35'.2	2'.6	
03	223° 38'.2	05'.1	88° 41'.9	9'.3	37'.8	2'.5	55'.7
04	238° 38'.2	04'.7	103° 10'.2	9'.3	40'.3	2'.3	
05	253° 38'.1	04'.4	117° 38'.5	9'.3	42'.6	2'.2	
06	268° 38'.0	04'.1	132° 06'.8	9'.2	44'.8	2'.1	
07	283° 37'.9	03'.7	146° 35'.0	9'.3	46'.9	2'.0	55'.6
08	298° 37'.8	03'.4	161° 03'.3	9'.3	48'.9	1'.8	
09	313° 37'.7	03'.0	175° 31'.6	9'.3	50'.7	1'.7	
10	328° 37'.7	02'.7	189° 59'.9	9'.3	52'.4	1'.6	
11	343° 37'.6	02'.4	204° 28'.2	9'.3	54'.0	1'.5	
12	358° 37'.5	22° 02'.0 N	218° 56'.5	9'.4	23° 55'.5 S	1'.3	55'.5
13	13° 37'.4	01'.7	233° 24'.9	9'.3	56'.8	1'.2	
14	28° 37'.3	01'.3	247° 53'.2	9'.3	58'.0	1'.1	
15	43° 37'.3	01'.0	262° 21'.5	9'.4	59'.1	0'.9	
16	58° 37'.2	00'.7	276° 49'.9	9'.4	24° 00'.0 S	0'.9	
17	73° 37'.1	00'.3	291° 18'.3	9'.4	00'.9	0'.7	55'.4
18	88° 37'.0	22° 00'.0 N	305° 46'.7	9'.4	01'.6	0'.5	
19	103° 36'.9	59'.6	320° 15'.1	9'.4	02'.1	0'.5	
20	118° 36'.9	59'.3	334° 43'.5	9'.4	02'.6	0'.3	
21	133° 36'.8	58'.9	349° 11'.9	9'.5	02'.9	0'.2	
22	148° 36'.7	58'.6	3° 40'.4	9'.4	03'.1	0'.1	
23	163° 36'.6	58'.2	18° 08'.8	9'.5	03'.2	0'.1	55'.3
12 00	178° 36'.6	21° 57'.9 N	32° 37'.3	9'.6	24° 03'.1 S	0'.2	55'.3
01	193° 36'.5	57'.6	47° 05'.9	9'.5	02'.9	0'.3	
02	208° 36'.4	57'.2	61° 34'.4	9'.6	02'.6	0'.4	
03	223° 36'.3	56'.9	76° 03'.0	9'.5	02'.2	0'.5	
04	238° 36'.2	56'.5	90° 31'.5	9'.7	01'.7	0'.7	55'.2
05	253° 36'.2	56'.2	105° 00'.2	9'.6	01'.0	0'.8	
06	268° 36'.1	55'.8	119° 28'.8	9'.7	00'.2	0'.9	
07	283° 36'.0	55'.4	133° 57'.5	9'.6	23° 59'.3 S	1'.1	
08	298° 35'.9	55'.1	148° 26'.1	9'.8	58'.2	1'.1	
09	313° 35'.9	54'.7	162° 54'.9	9'.7	57'.1	1'.3	
10	328° 35'.8	54'.4	177° 23'.6	9'.8	55'.8	1'.4	55'.1
11	343° 35'.7	54'.0	191° 52'.4	9'.8	54'.4	1'.6	
12	358° 35'.6	21° 53'.7 N	206° 21'.2	9'.9	23° 52'.8 S	1'.6	55'.1
13	13° 35'.6	53'.3	220° 50'.1	9'.8	51'.2	1'.8	
14	28° 35'.5	53'.0	235° 18'.9	9'.9	49'.4	1'.9	
15	43° 35'.4	52'.6	249° 47'.8	10'.0	47'.5	2'.0	55'.0
16	58° 35'.3	52'.3	264° 16'.8	10'.0	45'.5	2'.1	
17	73° 35'.3	51'.9	278° 45'.8	10'.0	43'.4	2'.3	
18	88° 35'.2	51'.5	293° 14'.8	10'.1	41'.1	2'.3	
19	103° 35'.1	51'.2	307° 43'.9	10'.1	38'.8	2'.5	
20	118° 35'.0	50'.8	322° 13'.0	10'.1	36'.3	2'.6	
21	133° 35'.0	50'.5	336° 42'.1	10'.2	33'.7	2'.7	
22	148° 34'.9	50'.1	351° 11'.3	10'.2	31'.0	2'.9	54'.9
23	163° 34'.8	49'.7	5° 40'.5	10'.2	28'.1	2'.9	
13 00	178° 34'.7	21° 49'.4 N	20° 09'.7	10'.3	23° 25'.2 S	3'.1	54'.9
01	193° 34'.7	49'.0	34° 39'.0	10'.4	22'.1	3'.2	
02	208° 34'.6	48'.6	49° 08'.4	10'.4	18'.9	3'.2	
03	223° 34'.5	48'.3	63° 37'.8	10'.4	15'.7	3'.4	
04	238° 34'.4	47'.9	78° 07'.2	10'.5	12'.3	3'.6	54'.8
05	253° 34'.4	47'.5	92° 36'.7	10'.5	08'.7	3'.6	
06	268° 34'.3	47'.2	107° 06'.2	10'.6	05'.1	3'.7	
07	283° 34'.2	46'.8	121° 35'.8	10'.6	01'.4	3'.9	
08	298° 34'.2	46'.4	136° 05'.4	10'.6	22° 57'.5 S	4'.0	
09	313° 34'.1	46'.1	150° 35'.0	10'.8	53'.5	4'.0	
10	328° 34'.0	45'.7	165° 04'.8	10'.7	49'.5	4'.2	
11	343° 33'.9	45'.3	179° 34'.5	10'.8	45'.3	4'.3	54'.7
12	358° 33'.9	21° 45'.0 N	194° 04'.3	10'.9	22° 41'.0 S	4'.4	54'.7
13	13° 33'.8	44'.6	208° 34'.2	10'.9	36'.6	4'.5	
14	28° 33'.7	44'.2	223° 04'.1	11'.0	32'.1	4'.6	
15	43° 33'.7	43'.8	237° 34'.1	11'.0	27'.5	4'.8	
16	58° 33'.6	43'.5	252° 04'.1	11'.0	22'.7	4'.8	
17	73° 33'.5	43'.1	266° 34'.1	11'.1	17'.9	4'.9	
18	88° 33'.5	42'.7	281° 04'.2	11'.2	13'.0	5'.1	54'.6
19	103° 33'.4	42'.3	295° 34'.4	11'.2	07'.9	5'.1	
20	118° 33'.3	42'.0	310° 04'.6	11'.3	02'.8	5'.2	
21	133° 33'.3	41'.6	324° 34'.9	11'.4	21° 57'.6 S	5'.4	
22	148° 33'.2	41'.2	339° 05'.3	11'.3	52'.2	5'.4	
23	163° 33'.1	40'.8	353° 35'.6	11'.5	46'.8	5'.6	
	SD 15'.7	d 0'.4	SD 15'.1		15'.0	14'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
11	5 26	5 30	12:05	21:45	09:19	11d 90%
12	5 34	5 37	12:06	22:36	10:11	12d 95%
13	5 41	5 44	12:06	23:26	11:02	13d 98%

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1992 July 14, 15, 16 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +0.8		JUPITER -1.8		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
14 Tuesday 00	292° 06'.7	169° 30'.5	21° 16'.1 N	243° 07'.2	17° 05'.1 N	128° 26'.1	8° 08'.4 N	332° 28'.8	16° 42'.5 S
01	307° 09'.2	184° 29'.7	15'.5	258° 07'.9	05'.6	143° 28'.2	08'.3	347° 31'.5	42'.6
02	322° 11'.7	199° 29'.0	14'.9	273° 08'.6	06'.1	158° 30'.2	08'.1	2° 34'.1	42'.6
03	337° 14'.1	214° 28'.2	14'.3	288° 09'.3	06'.6	173° 32'.3	07'.9	17° 36'.7	42'.7
04	352° 16'.6	229° 27'.4	13'.7	303° 10'.0	07'.1	188° 34'.4	07'.8	32° 39'.3	42'.7
05	7° 19'.0	244° 26'.7	13'.0	318° 10'.7	07'.5	203° 36'.4	07'.6	47° 41'.9	42'.8
06	22° 21'.5	259° 25'.9	12'.4	333° 11'.4	08'.0	218° 38'.5	07'.4	62° 44'.6	42'.8
07	37° 24'.0	274° 25'.1	11'.8	348° 12'.1	08'.5	233° 40'.5	07'.3	77° 47'.2	42'.9
08	52° 26'.4	289° 24'.3	11'.2	3° 12'.8	09'.0	248° 42'.6	07'.1	92° 49'.8	42'.9
09	67° 28'.9	304° 23'.6	10'.6	18° 13'.5	09'.5	263° 44'.7	06'.9	107° 52'.4	43'.0
10	82° 31'.4	319° 22'.8	10'.0	33° 14'.2	09'.9	278° 46'.7	06'.8	122° 55'.0	43'.0
11	97° 33'.8	334° 22'.0	09'.4	48° 14'.9	10'.4	293° 48'.8	06'.6	137° 57'.7	43'.1
12	112° 36'.3	349° 21'.3	21° 08'.8 N	63° 15'.6	17° 10'.9 N	308° 50'.9	8° 06'.4 N	153° 00'.3	16° 43'.2 S
13	127° 38'.8	4° 20'.5	08'.2	78° 16'.3	11'.4	323° 52'.9	06'.2	168° 02'.9	43'.2
14	142° 41'.2	19° 19'.8	07'.6	93° 17'.0	11'.9	338° 55'.0	06'.1	183° 05'.5	43'.3
15	157° 43'.7	34° 19'.0	06'.9	108° 17'.7	12'.3	353° 57'.0	05'.9	198° 08'.2	43'.3
16	172° 46'.2	49° 18'.2	06'.3	123° 18'.4	12'.8	8° 59'.1	05'.7	213° 10'.8	43'.4
17	187° 48'.6	64° 17'.5	05'.7	138° 19'.1	13'.3	24° 01'.2	05'.6	228° 13'.4	43'.4
18	202° 51'.1	79° 16'.7	05'.1	153° 19'.8	13'.8	39° 03'.2	05'.4	243° 16'.0	43'.5
19	217° 53'.5	94° 15'.9	04'.5	168° 20'.5	14'.3	54° 05'.3	05'.2	258° 18'.6	43'.5
20	232° 56'.0	109° 15'.2	03'.9	183° 21'.2	14'.7	69° 07'.4	05'.1	273° 21'.3	43'.6
21	247° 58'.5	124° 14'.4	03'.2	198° 21'.9	15'.2	84° 09'.4	04'.9	288° 23'.9	43'.6
22	263° 00'.9	139° 13'.6	02'.6	213° 22'.6	15'.7	99° 11'.5	04'.7	303° 26'.5	43'.7
23	278° 03'.4	154° 12'.9	02'.0	228° 23'.3	16'.2	114° 13'.5	04'.6	318° 29'.1	43'.7
15 Wednesday 00	293° 05'.9	169° 12'.1	21° 01'.4 N	243° 24'.0	17° 16'.6 N	129° 15'.6	8° 04'.4 N	333° 31'.8	16° 43'.8 S
01	308° 08'.3	184° 11'.4	00'.7	258° 24'.7	17'.1	144° 17'.7	04'.2	348° 34'.4	43'.9
02	323° 10'.8	199° 10'.6	00'.1	273° 25'.4	17'.6	159° 19'.7	04'.1	3° 37'.0	43'.9
03	338° 13'.3	214° 09'.8	20° 59'.5 N	288° 26'.1	18'.1	174° 21'.8	03'.9	18° 39'.6	44'.0
04	353° 15'.7	229° 09'.1	58'.9	303° 26'.8	18'.5	189° 23'.9	03'.7	33° 42'.3	44'.0
05	8° 18'.2	244° 08'.3	58'.2	318° 27'.5	19'.0	204° 25'.9	03'.5	48° 44'.9	44'.1
06	23° 20'.6	259° 07'.6	57'.6	333° 28'.2	19'.5	219° 28'.0	03'.4	63° 47'.5	44'.1
07	38° 23'.1	274° 06'.8	57'.0	348° 28'.9	20'.0	234° 30'.0	03'.2	78° 50'.1	44'.2
08	53° 25'.6	289° 06'.1	56'.3	3° 29'.6	20'.4	249° 32'.1	03'.0	93° 52'.8	44'.2
09	68° 28'.0	304° 05'.3	55'.7	18° 30'.3	20'.9	264° 34'.2	02'.9	108° 55'.4	44'.3
10	83° 30'.5	319° 04'.5	55'.1	33° 31'.0	21'.4	279° 36'.2	02'.7	123° 58'.0	44'.3
11	98° 33'.0	334° 03'.8	54'.4	48° 31'.7	21'.9	294° 38'.3	02'.5	139° 00'.6	44'.4
12	113° 35'.4	349° 03'.0	20° 53'.8 N	63° 32'.4	17° 22'.3 N	309° 40'.3	8° 02'.4 N	154° 03'.2	16° 44'.5 S
13	128° 37'.9	4° 02'.3	53'.1	78° 33'.1	22'.8	324° 42'.4	02'.2	169° 05'.9	44'.5
14	143° 40'.4	19° 01'.5	52'.5	93° 33'.8	23'.3	339° 44'.5	02'.0	184° 08'.5	44'.6
15	158° 42'.8	34° 00'.8	51'.9	108° 34'.5	23'.7	354° 46'.5	01'.8	199° 11'.1	44'.6
16	173° 45'.3	49° 00'.0	51'.2	123° 35'.2	24'.2	9° 48'.6	01'.7	214° 13'.7	44'.7
17	188° 47'.8	63° 59'.3	50'.6	138° 35'.9	24'.7	24° 50'.6	01'.5	229° 16'.4	44'.7
18	203° 50'.2	78° 58'.5	49'.9	153° 36'.6	25'.2	39° 52'.7	01'.3	244° 19'.0	44'.8
19	218° 52'.7	93° 57'.8	49'.3	168° 37'.3	25'.6	54° 54'.8	01'.2	259° 21'.6	44'.8
20	233° 55'.1	108° 57'.0	48'.7	183° 38'.0	26'.1	69° 56'.8	01'.0	274° 24'.2	44'.9
21	248° 57'.6	123° 56'.3	48'.0	198° 38'.7	26'.6	84° 58'.9	00'.8	289° 26'.9	44'.9
22	264° 00'.1	138° 55'.5	47'.4	213° 39'.4	27'.0	100° 00'.9	00'.7	304° 29'.5	45'.0
23	279° 02'.5	153° 54'.8	46'.7	228° 40'.1	27'.5	115° 03'.0	00'.5	319° 32'.1	45'.0
16 Thursday 00	294° 05'.0	168° 54'.0	20° 46'.1 N	243° 40'.8	17° 28'.0 N	130° 05'.0	8° 00'.3 N	334° 34'.7	16° 45'.1 S
01	309° 07'.5	183° 53'.3	45'.4	258° 41'.5	28'.5	145° 07'.1	00'.1	349° 37'.4	45'.2
02	324° 09'.9	198° 52'.5	44'.8	273° 42'.2	28'.9	160° 09'.2	00'.0	4° 40'.0	45'.2
03	339° 12'.4	213° 51'.8	44'.1	288° 42'.9	29'.4	175° 11'.2	7° 59'.8 N	19° 42'.6	45'.3
04	354° 14'.9	228° 51'.0	43'.5	303° 43'.6	29'.9	190° 13'.3	59'.6	34° 45'.2	45'.3
05	9° 17'.3	243° 50'.3	42'.8	318° 44'.3	30'.3	205° 15'.3	59'.5	49° 47'.9	45'.4
06	24° 19'.8	258° 49'.5	42'.1	333° 45'.0	30'.8	220° 17'.4	59'.3	64° 50'.5	45'.4
07	39° 22'.3	273° 48'.8	41'.5	348° 45'.7	31'.3	235° 19'.5	59'.1	79° 53'.1	45'.5
08	54° 24'.7	288° 48'.0	40'.8	3° 46'.4	31'.7	250° 21'.5	58'.9	94° 55'.7	45'.5
09	69° 27'.2	303° 47'.3	40'.2	18° 47'.1	32'.2	265° 23'.6	58'.8	109° 58'.4	45'.6
10	84° 29'.6	318° 46'.5	39'.5	33° 47'.8	32'.7	280° 25'.6	58'.6	125° 01'.0	45'.6
11	99° 32'.1	333° 45'.8	38'.9	48° 48'.5	33'.1	295° 27'.7	58'.4	140° 03'.6	45'.7
12	114° 34'.6	348° 45'.1	20° 38'.2 N	63° 49'.2	17° 33'.6 N	310° 29'.7	7° 58'.3 N	155° 06'.3	16° 45'.8 S
13	129° 37'.0	3° 44'.3	37'.5	78° 49'.9	34'.1	325° 31'.8	58'.1	170° 08'.9	45'.8
14	144° 39'.5	18° 43'.6	36'.9	93° 50'.6	34'.5	340° 33'.9	57'.9	185° 11'.5	45'.9
15	159° 42'.0	33° 42'.8	36'.2	108° 51'.3	35'.0	355° 35'.9	57'.7	200° 14'.1	45'.9
16	174° 44'.4	48° 42'.1	35'.5	123° 52'.0	35'.4	10° 38'.0	57'.6	215° 16'.8	46'.0
17	189° 46'.9	63° 41'.3	34'.9	138° 52'.7	35'.9	25° 40'.0	57'.4	230° 19'.4	46'.0
18	204° 49'.4	78° 40'.6	34'.2	153° 53'.4	36'.4	40° 42'.1	57'.2	245° 22'.0	46'.1
19	219° 51'.8	93° 39'.9	33'.5	168° 54'.1	36'.8	55° 44'.1	57'.1	260° 24'.6	46'.1
20	234° 54'.3	108° 39'.1	32'.9	183° 54'.8	37'.3	70° 46'.2	56'.9	275° 27'.3	46'.2
21	249° 56'.8	123° 38'.4	32'.2	198° 55'.5	37'.8	85° 48'.2	56'.7	290° 29'.9	46'.3
22	264° 59'.2	138° 37'.6	31'.5	213° 56'.2	38'.2	100° 50'.3	56'.5	305° 32'.5	46'.3
23	280° 01'.7	153° 36'.9	30'.8	228° 56'.9	38'.7	115° 52'.4	56'.4	320° 35'.1	46'.4
	M.P. 04:23	v -0'.8	d 0'.6	v 0'.7	d 0'.5	v 2'.1	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.3	40° 19'.7 S
Achernar	335° 38'.3	57° 16'.1 S
Acrux	173° 27'.2	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.7 S
Aldebaran	291° 07'.6	16° 29'.7 N
Alioth	166° 34'.3	56° 00'.2 N
Alkaid	153° 11'.0	49° 21'.2 N
Alnair	28° 02'.8	46° 59'.5 S
Alnilam	276° 02'.5	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.0	26° 44'.5 N
Alpheratz	357° 59'.6	29° 03'.0 N
Altair	62° 23'.1	8° 51'.0 N
Ankaa	353° 30'.9	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 09'.9	19° 13'.3 N
Atria	108° 00'.7	69° 01'.1 S
Avior	234° 25'.1	59° 29'.2 S
Bellatrix	278° 49'.0	6° 20'.6 N
Betelgeuse	271° 18'.5	7° 24'.4 N
Canopus	264° 03'.6	52° 41'.4 S
Capella	280° 57'.9	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.3 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.4	18° 01'.4 S
Dubhe	194° 11'.0	61° 47'.6 N
Elnath	278° 32'.7	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.5 N
Enif	34° 02'.2	9° 50'.6 N
Fomalhaut	15° 40'.9	29° 39'.4 S
Gacrux	172° 18'.6	57° 04'.7 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.6 S
Hamal	328° 18'.5	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 18'.8	74° 11'.4 N
Markab	13° 53'.7	15° 10'.0 N
Menkar	314° 31'.5	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.3 S
Miaplacidus	221° 44'.0	69° 41'.4 S
Mirfak	309° 03'.1	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.1	56° 45'.4 S
Polaris	324° 03'.1	89° 13'.6 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.7 N
Rasalhague	96° 20'.6	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.3	8° 12'.5 S
Rigil Kent	140° 12'.9	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.4	56° 29'.7 N
Shaula	96° 42'.7	37° 06'.0 S
Sirius	258° 47'.8	16° 42'.3 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.3 S
Vega	80° 49'.1	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	236° 06'.3	12:44
Mars	310° 18'.1	07:46
Jupiter	196° 09'.7	15:21
Saturn	40° 25'.9	01:46

GMT	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
14 00	178° 33'.0	21° 40'.5 N	8° 06'.1	11'.5	21° 41'.2 S	5'.6	54'.6
01	193° 33'.0	40'.1	22° 36'.6	11'.5	35'.6	5'.7	
02	208° 32'.9	39'.7	37° 07'.1	11'.6	29'.9	5'.9	54'.5
03	223° 32'.8	39'.3	51° 37'.7	11'.7	24'.0	5'.9	
04	238° 32'.8	38'.9	66° 08'.4	11'.7	18'.1	6'.1	
05	253° 32'.7	38'.6	80° 39'.1	11'.8	12'.0	6'.1	
06	268° 32'.6	38'.2	95° 09'.9	11'.8	05'.9	6'.2	
07	283° 32'.6	37'.8	109° 40'.7	11'.9	20° 59'.7 S	6'.3	
08	298° 32'.5	37'.4	124° 11'.6	12'.0	53'.4	6'.4	
09	313° 32'.4	37'.0	138° 42'.6	12'.0	47'.0	6'.6	
10	328° 32'.4	36'.6	153° 13'.6	12'.1	40'.4	6'.5	54'.4
11	343° 32'.3	36'.2	167° 44'.7	12'.1	33'.9	6'.7	
12	358° 32'.2	21° 35'.9 N	182° 15'.8	12'.2	20° 27'.2 S	6'.8	54'.4
13	13° 32'.2	35'.5	196° 47'.0	12'.2	20'.4	6'.9	
14	28° 32'.1	35'.1	211° 18'.2	12'.3	13'.5	6'.9	
15	43° 32'.0	34'.7	225° 49'.5	12'.4	06'.6	7'.1	
16	58° 32'.0	34'.3	240° 20'.9	12'.4	19° 59'.5 S	7'.1	
17	73° 31'.9	33'.9	254° 52'.3	12'.5	52'.4	7'.3	
18	88° 31'.9	33'.5	269° 23'.8	12'.5	45'.1	7'.3	
19	103° 31'.8	33'.1	283° 55'.3	12'.6	37'.8	7'.3	54'.3
20	118° 31'.7	32'.8	298° 26'.9	12'.6	30'.5	7'.5	
21	133° 31'.7	32'.4	312° 58'.5	12'.7	23'.0	7'.6	
22	148° 31'.6	32'.0	327° 30'.2	12'.8	15'.4	7'.6	
23	163° 31'.5	31'.6	342° 02'.0	12'.8	07'.8	7'.8	
15 00	178° 31'.5	21° 31'.2 N	356° 33'.8	12'.9	19° 00'.0 S	7'.8	54'.3
01	193° 31'.4	30'.8	11° 05'.7	13'.0	18° 52'.2 S	7'.8	
02	208° 31'.3	30'.4	25° 37'.7	13'.0	44'.4	8'.0	
03	223° 31'.3	30'.0	40° 09'.7	13'.0	36'.4	8'.0	
04	238° 31'.2	29'.6	54° 41'.7	13'.1	28'.4	8'.2	
05	253° 31'.2	29'.2	69° 13'.8	13'.2	20'.2	8'.2	
06	268° 31'.1	28'.8	83° 46'.0	13'.2	12'.0	8'.2	54'.2
07	283° 31'.0	28'.4	98° 18'.2	13'.3	03'.8	8'.4	
08	298° 31'.0	28'.0	112° 50'.5	13'.4	17° 55'.4 S	8'.4	
09	313° 30'.9	27'.6	127° 22'.9	13'.4	47'.0	8'.5	
10	328° 30'.9	27'.2	141° 55'.3	13'.5	38'.5	8'.6	
11	343° 30'.8	26'.8	156° 27'.8	13'.5	29'.9	8'.6	
12	358° 30'.7	21° 26'.4 N	171° 00'.3	13'.5	17° 21'.3 S	8'.7	54'.2
13	13° 30'.7	26'.0	185° 32'.8	13'.7	12'.6	8'.8	
14	28° 30'.6	25'.6	200° 05'.5	13'.7	03'.8	8'.9	
15	43° 30'.6	25'.2	214° 38'.2	13'.7	16° 54'.9 S	8'.9	
16	58° 30'.5	24'.8	229° 10'.9	13'.8	46'.0	9'.0	
17	73° 30'.4	24'.4	243° 43'.7	13'.9	37'.0	9'.0	
18	88° 30'.4	24'.0	258° 16'.6	13'.9	28'.0	9'.2	
19	103° 30'.3	23'.6	272° 49'.5	13'.9	18'.8	9'.2	54'.1
20	118° 30'.3	23'.2	287° 22'.4	14'.0	09'.6	9'.2	
21	133° 30'.2	22'.8	301° 55'.4	14'.1	00'.4	9'.3	
22	148° 30'.1	22'.4	316° 28'.5	14'.1	15° 51'.1 S	9'.4	
23	163° 30'.1	21'.9	331° 01'.6	14'.2	41'.7	9'.5	
16 00	178° 30'.0	21° 21'.5 N	345° 34'.8	14'.2	15° 32'.2 S	9'.5	54'.1
01	193° 30'.0	21'.1	0° 08'.0	14'.3	22'.7	9'.5	
02	208° 29'.9	20'.7	14° 41'.3	14'.4	13'.2	9'.7	
03	223° 29'.9	20'.3	29° 14'.7	14'.3	03'.5	9'.6	
04	238° 29'.8	19'.9	43° 48'.0	14'.5	14° 53'.9 S	9'.8	
05	253° 29'.7	19'.5	58° 21'.5	14'.4	44'.1	9'.8	
06	268° 29'.7	19'.1	72° 54'.9	14'.6	34'.3	9'.8	
07	283° 29'.6	18'.7	87° 28'.5	14'.6	24'.5	10'.0	
08	298° 29'.6	18'.2	102° 02'.1	14'.6	14'.5	9'.9	
09	313° 29'.5	17'.8	116° 35'.7	14'.7	04'.6	10'.1	
10	328° 29'.5	17'.4	131° 09'.4	14'.7	13° 54'.5 S	10'.0	
11	343° 29'.4	17'.0	145° 43'.1	14'.8	44'.5	10'.2	
12	358° 29'.4	21° 16'.6 N	160° 16'.9	14'.8	13° 34'.3 S	10'.2	54'.1
13	13° 29'.3	16'.2	174° 50'.7	14'.9	24'.1	10'.2	54'.0
14	28° 29'.2	15'.7	189° 24'.6	14'.9	13'.9	10'.3	
15	43° 29'.2	15'.3	203° 58'.5	14'.9	03'.6	10'.3	
16	58° 29'.1	14'.9	218° 32'.4	15'.0	12° 53'.3 S	10'.4	
17	73° 29'.1	14'.5	233° 06'.4	15'.1	42'.9	10'.4	
18	88° 29'.0	14'.1	247° 40'.5	15'.1	32'.5	10'.5	
19	103° 29'.0	13'.6	262° 14'.6	15'.1	22'.0	10'.5	
20	118° 28'.9	13'.2	276° 48'.7	15'.2	11'.5	10'.6	
21	133° 28'.9	12'.8	291° 22'.9	15'.2	00'.9	10'.6	
22	148° 28'.8	12'.4	305° 57'.1	15'.2	11° 50'.3 S	10'.7	
23	163° 28'.8	12'.0	320° 31'.3	15'.3	39'.6	10'.7	
	SD 15'.7	d 0'.4	SD	14'.8	14'.8	14'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
14	5 48	5 51	12:06	24:14	11:51	14d Full
15	5 54	5 57	12:06	00:14	12:37	15d 99%
16	6 00	6 02	12:06	00:59	13:21	16d 97%

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1992 July 17, 18, 19 (Fri, Sat, Sun)

GMT	ARIES	VENUS -3.9		MARS +0.8		JUPITER -1.8		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
17 Friday 00	295° 04'.1	168° 36'.2	20° 30'.2 N	243° 57'.6	17° 39'.2 N	130° 54'.4	7° 56'.2 N	335° 37'.8	16° 46'.4 S
01	310° 06'.6	183° 35'.4	29'.5	258° 58'.3	39'.6	145° 56'.5	56'.0	350° 40'.4	46'.5
02	325° 09'.1	198° 34'.7	28'.8	273° 59'.0	40'.1	160° 58'.5	55'.9	5° 43'.0	46'.5
03	340° 11'.5	213° 34'.0	28'.1	288° 59'.7	40'.5	176° 00'.6	55'.7	20° 45'.7	46'.6
04	355° 14'.0	228° 33'.2	27'.5	304° 00'.4	41'.0	191° 02'.6	55'.5	35° 48'.3	46'.6
05	10° 16'.5	243° 32'.5	26'.8	319° 01'.1	41'.5	206° 04'.7	55'.3	50° 50'.9	46'.7
06	25° 18'.9	258° 31'.8	26'.1	334° 01'.8	41'.9	221° 06'.7	55'.2	65° 53'.5	46'.7
07	40° 21'.4	273° 31'.0	25'.4	349° 02'.5	42'.4	236° 08'.8	55'.0	80° 56'.2	46'.8
08	55° 23'.9	288° 30'.3	24'.7	4° 03'.2	42'.8	251° 10'.9	54'.8	95° 58'.8	46'.9
09	70° 26'.3	303° 29'.6	24'.1	19° 03'.9	43'.3	266° 12'.9	54'.7	111° 01'.4	46'.9
10	85° 28'.8	318° 28'.8	23'.4	34° 04'.6	43'.8	281° 15'.0	54'.5	126° 04'.0	47'.0
11	100° 31'.2	333° 28'.1	22'.7	49° 05'.3	44'.2	296° 17'.0	54'.3	141° 06'.7	47'.0
12	115° 33'.7	348° 27'.4	20° 22'.0 N	64° 06'.0	17° 44'.7 N	311° 19'.1	7° 54'.1 N	156° 09'.3	16° 47'.1 S
13	130° 36'.2	3° 26'.6	21'.3	79° 06'.7	45'.1	326° 21'.1	54'.0	171° 11'.9	47'.1
14	145° 38'.6	18° 25'.9	20'.6	94° 07'.4	45'.6	341° 23'.2	53'.8	186° 14'.6	47'.2
15	160° 41'.1	33° 25'.2	19'.9	109° 08'.1	46'.0	356° 25'.2	53'.6	201° 17'.2	47'.2
16	175° 43'.6	48° 24'.4	19'.2	124° 08'.8	46'.5	11° 27'.3	53'.4	216° 19'.8	47'.3
17	190° 46'.0	63° 23'.7	18'.6	139° 09'.5	47'.0	26° 29'.3	53'.3	231° 22'.4	47'.4
18	205° 48'.5	78° 23'.0	17'.9	154° 10'.2	47'.4	41° 31'.4	53'.1	246° 25'.1	47'.4
19	220° 51'.0	93° 22'.2	17'.2	169° 10'.9	47'.9	56° 33'.4	52'.9	261° 27'.7	47'.5
20	235° 53'.4	108° 21'.5	16'.5	184° 11'.6	48'.3	71° 35'.5	52'.8	276° 30'.3	47'.5
21	250° 55'.9	123° 20'.8	15'.8	199° 12'.3	48'.8	86° 37'.5	52'.6	291° 33'.0	47'.6
22	265° 58'.4	138° 20'.1	15'.1	214° 13'.0	49'.2	101° 39'.6	52'.4	306° 35'.6	47'.6
23	281° 00'.8	153° 19'.3	14'.4	229° 13'.7	49'.7	116° 41'.7	52'.2	321° 38'.2	47'.7
18 Saturday 00	296° 03'.3	168° 18'.6	20° 13'.7 N	244° 14'.4	17° 50'.1 N	131° 43'.7	7° 52'.1 N	336° 40'.8	16° 47'.7 S
01	311° 05'.7	183° 17'.9	13'.0	259° 15'.1	50'.6	146° 45'.8	51'.9	351° 43'.5	47'.8
02	326° 08'.2	198° 17'.2	12'.3	274° 15'.8	51'.1	161° 47'.8	51'.7	6° 46'.1	47'.9
03	341° 10'.7	213° 16'.4	11'.6	289° 16'.5	51'.5	176° 49'.9	51'.5	21° 48'.7	47'.9
04	356° 13'.1	228° 15'.7	10'.9	304° 17'.2	52'.0	191° 51'.9	51'.4	36° 51'.4	48'.0
05	11° 15'.6	243° 15'.0	10'.2	319° 17'.9	52'.4	206° 54'.0	51'.2	51° 54'.0	48'.0
06	26° 18'.1	258° 14'.3	09'.5	334° 18'.6	52'.9	221° 56'.0	51'.0	66° 56'.6	48'.1
07	41° 20'.5	273° 13'.5	08'.8	349° 19'.3	53'.3	236° 58'.1	50'.9	81° 59'.3	48'.1
08	56° 23'.0	288° 12'.8	08'.1	4° 20'.0	53'.8	252° 00'.1	50'.7	97° 01'.9	48'.2
09	71° 25'.5	303° 12'.1	07'.4	19° 20'.7	54'.2	267° 02'.2	50'.5	112° 04'.5	48'.2
10	86° 27'.9	318° 11'.4	06'.7	34° 21'.4	54'.7	282° 04'.2	50'.3	127° 07'.1	48'.3
11	101° 30'.4	333° 10'.6	05'.9	49° 22'.1	55'.1	297° 06'.3	50'.2	142° 09'.8	48'.3
12	116° 32'.9	348° 09'.9	20° 05'.2 N	64° 22'.8	17° 55'.6 N	312° 08'.3	7° 50'.0 N	157° 12'.4	16° 48'.4 S
13	131° 35'.3	3° 09'.2	04'.5	79° 23'.5	56'.0	327° 10'.4	49'.8	172° 15'.0	48'.5
14	146° 37'.8	18° 08'.5	03'.8	94° 24'.2	56'.5	342° 12'.4	49'.6	187° 17'.7	48'.5
15	161° 40'.2	33° 07'.8	03'.1	109° 24'.9	56'.9	357° 14'.5	49'.5	202° 20'.3	48'.6
16	176° 42'.7	48° 07'.0	02'.4	124° 25'.6	57'.4	12° 16'.5	49'.3	217° 22'.9	48'.6
17	191° 45'.2	63° 06'.3	01'.7	139° 26'.3	57'.8	27° 18'.6	49'.1	232° 25'.6	48'.7
18	206° 47'.6	78° 05'.6	01'.0	154° 27'.0	58'.3	42° 20'.6	48'.9	247° 28'.2	48'.7
19	221° 50'.1	93° 04'.9	00'.2	169° 27'.7	58'.7	57° 22'.7	48'.8	262° 30'.8	48'.8
20	236° 52'.6	108° 04'.2	19° 59'.5 N	184° 28'.4	59'.2	72° 24'.7	48'.6	277° 33'.4	48'.9
21	251° 55'.0	123° 03'.5	58'.8	199° 29'.1	59'.6	87° 26'.8	48'.4	292° 36'.1	48'.9
22	266° 57'.5	138° 02'.7	58'.1	214° 29'.8	18° 00'.1 N	102° 28'.8	48'.2	307° 38'.7	49'.0
23	282° 00'.0	153° 02'.0	57'.4	229° 30'.5	00'.5	117° 30'.9	48'.1	322° 41'.3	49'.0
19 Sunday 00	297° 02'.4	168° 01'.3	19° 56'.6 N	244° 31'.2	18° 01'.0 N	132° 32'.9	7° 47'.9 N	337° 44'.0	16° 49'.1 S
01	312° 04'.9	183° 00'.6	55'.9	259° 31'.9	01'.4	147° 35'.0	47'.7	352° 46'.6	49'.1
02	327° 07'.3	197° 59'.9	55'.2	274° 32'.6	01'.9	162° 37'.0	47'.5	7° 49'.2	49'.2
03	342° 09'.8	212° 59'.2	54'.5	289° 33'.3	02'.3	177° 39'.1	47'.4	22° 51'.9	49'.2
04	357° 12'.3	227° 58'.5	53'.7	304° 34'.0	02'.8	192° 41'.1	47'.2	37° 54'.5	49'.3
05	12° 14'.7	242° 57'.7	53'.0	319° 34'.7	03'.2	207° 43'.2	47'.0	52° 57'.1	49'.4
06	27° 17'.2	257° 57'.0	52'.3	334° 35'.4	03'.6	222° 45'.2	46'.8	67° 59'.8	49'.4
07	42° 19'.7	272° 56'.3	51'.6	349° 36'.1	04'.1	237° 47'.3	46'.7	83° 02'.4	49'.5
08	57° 22'.1	287° 55'.6	50'.8	4° 36'.8	04'.5	252° 49'.3	46'.5	98° 05'.0	49'.5
09	72° 24'.6	302° 54'.9	50'.1	19° 37'.5	05'.0	267° 51'.4	46'.3	113° 07'.7	49'.6
10	87° 27'.1	317° 54'.2	49'.4	34° 38'.2	05'.4	282° 53'.4	46'.1	128° 10'.3	49'.6
11	102° 29'.5	332° 53'.5	48'.6	49° 38'.9	05'.9	297° 55'.5	46'.0	143° 12'.9	49'.7
12	117° 32'.0	347° 52'.8	19° 47'.9 N	64° 39'.6	18° 06'.3 N	312° 57'.5	7° 45'.8 N	158° 15'.6	16° 49'.7 S
13	132° 34'.5	2° 52'.1	47'.2	79° 40'.3	06'.8	327° 59'.6	45'.6	173° 18'.2	49'.8
14	147° 36'.9	17° 51'.4	46'.4	94° 41'.0	07'.2	343° 01'.6	45'.4	188° 20'.8	49'.9
15	162° 39'.4	32° 50'.6	45'.7	109° 41'.7	07'.6	358° 03'.7	45'.3	203° 23'.4	49'.9
16	177° 41'.8	47° 49'.9	45'.0	124° 42'.4	08'.1	13° 05'.7	45'.1	218° 26'.1	50'.0
17	192° 44'.3	62° 49'.2	44'.2	139° 43'.1	08'.5	28° 07'.8	44'.9	233° 28'.7	50'.0
18	207° 46'.8	77° 48'.5	43'.5	154° 43'.8	09'.0	43° 09'.8	44'.7	248° 31'.3	50'.1
19	222° 49'.2	92° 47'.8	42'.7	169° 44'.5	09'.4	58° 11'.9	44'.6	263° 34'.0	50'.1
20	237° 51'.7	107° 47'.1	42'.0	184° 45'.2	09'.9	73° 13'.9	44'.4	278° 36'.6	50'.2
21	252° 54'.2	122° 46'.4	41'.3	199° 45'.9	10'.3	88° 15'.9	44'.2	293° 39'.2	50'.3
22	267° 56'.6	137° 45'.7	40'.5	214° 46'.6	10'.7	103° 18'.0	44'.0	308° 41'.9	50'.3
23	282° 59'.1	152° 45'.0	39'.8	229° 47'.3	11'.2	118° 20'.0	43'.9	323° 44'.5	50'.4
	M.P. 04:11	v -0'.7	d 0'.7	v 0'.7	d 0'.5	v 2'.1	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.3	40° 19'.7 S
Achernar	335° 38'.2	57° 16'.0 S
Acrux	173° 27'.2	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.7 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.3	56° 00'.2 N
Alkaid	153° 11'.1	49° 21'.2 N
Alnair	28° 02'.8	46° 59'.5 S
Alnilam	276° 02'.5	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.0	26° 44'.5 N
Alpheratz	357° 59'.6	29° 03'.0 N
Altair	62° 23'.1	8° 51'.0 N
Ankaa	353° 30'.9	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 09'.9	19° 13'.3 N
Atria	108° 00'.7	69° 01'.1 S
Avior	234° 25'.1	59° 29'.2 S
Bellatrix	278° 49'.0	6° 20'.7 N
Betelgeuse	271° 18'.5	7° 24'.4 N
Canopus	264° 03'.6	52° 41'.4 S
Capella	280° 57'.9	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.3 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.4	18° 01'.4 S
Dubhe	194° 11'.0	61° 47'.6 N
Elnath	278° 32'.7	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.5 N
Enif	34° 02'.1	9° 50'.6 N
Fomalhaut	15° 40'.9	29° 39'.4 S
Gacrux	172° 18'.6	57° 04'.6 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.6 S
Hamal	328° 18'.5	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 18'.8	74° 11'.4 N
Markab	13° 53'.7	15° 10'.0 N
Menkar	314° 31'.5	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.3 S
Miaplacidus	221° 44'.0	69° 41'.4 S
Mirfak	309° 03'.0	49° 50'.0 N
Nunki	76° 17'.2	26° 18'.3 S
Peacock	53° 43'.1	56° 45'.4 S
Polaris	324° 01'.9	89° 13'.6 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.7 N
Rasalhague	96° 20'.6	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.3	8° 12'.5 S
Rigil Kent	140° 12'.9	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.3	56° 29'.7 N
Shaula	96° 42'.7	37° 06'.0 S
Sirius	258° 47'.8	16° 42'.3 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.3 S
Vega	80° 49'.1	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	232° 15'.3	12:47
Mars	308° 11'.1	07:43
Jupiter	195° 40'.4	15:11
Saturn	40° 37'.6	01:33

	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
17	178° 28'.7	21° 11'.5 N	335° 05'.6	15'.4	11° 28'.9 S	10'.8	54'.0
18	193° 28'.7	11'.1	349° 40'.0	15'.3	18'.1	10'.8	
19	208° 28'.6	10'.7	4° 14'.3	15'.4	07'.3	10'.8	
20	223° 28'.6	10'.3	18° 48'.7	15'.5	10° 56'.5 S	10'.9	
21	238° 28'.5	09'.8	33° 23'.2	15'.5	45'.6	10'.9	
22	253° 28'.5	09'.4	47° 57'.7	15'.5	34'.7	11'.0	
23	268° 28'.4	09'.0	62° 32'.2	15'.6	23'.7	11'.0	
24	283° 28'.4	08'.5	77° 06'.8	15'.6	12'.7	11'.0	
25	298° 28'.3	08'.1	91° 41'.4	15'.6	01'.7	11'.1	
26	313° 28'.3	07'.7	106° 16'.0	15'.6	9° 50'.6 S	11'.1	
27	328° 28'.2	07'.3	120° 50'.6	15'.7	39'.5	11'.1	
28	343° 28'.2	06'.8	135° 25'.3	15'.8	28'.4	11'.2	
29	358° 28'.1	21° 06'.4 N	150° 00'.1	15'.7	9° 17'.2 S	11'.2	54'.0
30	13° 28'.1	06'.0	164° 34'.8	15'.8	06'.0	11'.3	
31	28° 28'.0	05'.5	179° 09'.6	15'.8	8° 54'.7 S	11'.3	
32	43° 28'.0	05'.1	193° 44'.4	15'.9	43'.4	11'.3	
33	58° 27'.9	04'.7	208° 19'.3	15'.8	32'.1	11'.3	
34	73° 27'.9	04'.2	222° 54'.1	15'.9	20'.8	11'.4	
35	88° 27'.8	03'.8	237° 29'.0	16'.0	09'.4	11'.4	
36	103° 27'.8	03'.4	252° 04'.0	15'.9	7° 58'.0 S	11'.5	
37	118° 27'.7	02'.9	266° 38'.9	16'.0	46'.5	11'.5	
38	133° 27'.7	02'.5	281° 13'.9	16'.0	35'.0	11'.5	
39	148° 27'.6	02'.0	295° 48'.9	16'.0	23'.5	11'.5	
40	163° 27'.6	01'.6	310° 23'.9	16'.1	12'.0	11'.5	
41	178° 27'.5	21° 01'.2 N	324° 59'.0	16'.0	7° 00'.5 S	11'.6	54'.0
42	193° 27'.5	00'.7	339° 34'.0	16'.1	6° 48'.9 S	11'.6	
43	208° 27'.4	00'.3	354° 09'.1	16'.1	37'.3	11'.7	
44	223° 27'.4	20° 59'.8 N	8° 44'.2	16'.2	25'.6	11'.6	
45	238° 27'.3	59'.4	23° 19'.4	16'.1	14'.0	11'.7	
46	253° 27'.3	59'.0	37° 54'.5	16'.2	02'.3	11'.7	
47	268° 27'.2	58'.5	52° 29'.7	16'.2	5° 50'.6 S	11'.7	
48	283° 27'.2	58'.1	67° 04'.9	16'.2	38'.9	11'.8	
49	298° 27'.2	57'.6	81° 40'.1	16'.2	27'.1	11'.7	54'.1
50	313° 27'.1	57'.2	96° 15'.3	16'.2	15'.4	11'.8	
51	328° 27'.1	56'.7	110° 50'.5	16'.3	03'.6	11'.8	
52	343° 27'.0	56'.3	125° 25'.8	16'.3	4° 51'.8 S	11'.9	
53	358° 27'.0	20° 55'.8 N	140° 01'.1	16'.2	4° 39'.9 S	11'.8	54'.1
54	13° 26'.9	55'.4	154° 36'.3	16'.3	28'.1	11'.9	
55	28° 26'.9	55'.0	169° 11'.6	16'.3	16'.2	11'.9	
56	43° 26'.8	54'.5	183° 46'.9	16'.3	04'.3	11'.9	
57	58° 26'.8	54'.1	198° 22'.2	16'.3	3° 52'.4 S	11'.9	
58	73° 26'.8	53'.6	212° 57'.5	16'.3	40'.5	11'.9	
59	88° 26'.7	53'.2	227° 32'.8	16'.4	28'.6	11'.9	
60	103° 26'.7	52'.7	242° 08'.2	16'.3	16'.7	12'.0	
61	118° 26'.6	52'.3	256° 43'.5	16'.4	04'.7	12'.0	
62	133° 26'.6	51'.8	271° 18'.9	16'.3	2° 52'.7 S	12'.0	
63	148° 26'.6	51'.3	285° 54'.2	16'.3	40'.7	12'.0	
64	163° 26'.5	50'.9	300° 29'.5	16'.4	28'.7	12'.0	
65	178° 26'.5	20° 50'.4 N	315° 04'.9	16'.4	2° 16'.7 S	12'.0	54'.1
66	193° 26'.4	50'.0	329° 40'.3	16'.3	04'.7	12'.0	54'.2
67	208° 26'.4	49'.5	344° 15'.6	16'.4	1° 52'.7 S	12'.1	
68	223° 26'.3	49'.1	358° 51'.0	16'.3	40'.6	12'.0	
69	238° 26'.3	48'.6	13° 26'.3	16'.4	28'.6	12'.1	
70	253° 26'.3	48'.2	28° 01'.7	16'.3	16'.5	12'.0	
71	268° 26'.2	47'.7	42° 37'.0	16'.4	04'.5	12'.1	
72	283° 26'.2	47'.2	57° 12'.4	16'.3	0° 52'.4 S	12'.1	
73	298° 26'.1	46'.8	71° 47'.7	16'.3	40'.3	12'.1	
74	313° 26'.1	46'.3	86° 23'.0	16'.4	28'.2	12'.1	
75	328° 26'.1	45'.9	100° 58'.4	16'.3	16'.1	12'.0	
76	343° 26'.0	45'.4	115° 33'.7	16'.3	04'.1	12'.1	54'.3
77	358° 26'.0	20° 44'.9 N	130° 09'.0	16'.3	0° 08'.0 N	12'.1	54'.3
78	13° 26'.0	44'.5	144° 44'.3	16'.3	20'.1	12'.1	
79	28° 25'.9	44'.0	159° 19'.6	16'.3	32'.2	12'.2	
80	43° 25'.9	43'.6	173° 54'.9	16'.3	44'.4	12'.1	
81	58° 25'.8	43'.1	188° 30'.2	16'.2	56'.5	12'.1	
82	73° 25'.8	42'.6	203° 05'.4	16'.3	1° 08'.6 N	12'.1	
83	88° 25'.8	42'.2	217° 40'.7	16'.2	20'.7	12'.1	
84	103° 25'.7	41'.7	232° 15'.9	16'.2	32'.8	12'.1	
85	118° 25'.7	41'.2	246° 51'.1	16'.2	44'.9	12'.1	54'.4
86	133° 25'.7	40'.8	261° 26'.3	16'.2	57'.0	12'.1	
87	148° 25'.6	40'.3	276° 01'.5	16'.2	2° 09'.1 N	12'.1	
88	163° 25'.6	39'.8	290° 36'.7	16'.1	21'.2	12'.1	
	SD 15'.7	d 0'.4	SD 14'.7		14'.7	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
17	6 05	6 07	12:06	01:43	14:03	17d 93%
18	6 10	6 12	12:06	02:24	14:44	18d 88%
19	6 14	6 16	12:06	03:05	15:25	19d 81%

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1992 July 20, 21, 22 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +0.8		JUPITER -1.8		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
20 Monday 00	298° 01'.6	167° 44'.3	19° 39'.0 N	244° 48'.0	18° 11'.6 N	133° 22'.1	7° 43'.7 N	338° 47'.1	16° 50'.4 S
01	313° 04'.0	182° 43'.6	38'.3	259° 48'.7	12'.1	148° 24'.1	43'.5	353° 49'.8	50'.5
02	328° 06'.5	197° 42'.9	37'.5	274° 49'.4	12'.5	163° 26'.2	43'.3	8° 52'.4	50'.5
03	343° 08'.9	212° 42'.2	36'.8	289° 50'.1	12'.9	178° 28'.2	43'.2	23° 55'.0	50'.6
04	358° 11'.4	227° 41'.5	36'.0	304° 50'.8	13'.4	193° 30'.3	43'.0	38° 57'.7	50'.6
05	13° 13'.9	242° 40'.8	35'.3	319° 51'.6	13'.8	208° 32'.3	42'.8	54° 00'.3	50'.7
06	28° 16'.3	257° 40'.1	34'.5	334° 52'.3	14'.3	223° 34'.4	42'.6	69° 02'.9	50'.8
07	43° 18'.8	272° 39'.4	33'.8	349° 53'.0	14'.7	238° 36'.4	42'.5	84° 05'.6	50'.8
08	58° 21'.3	287° 38'.7	33'.0	4° 53'.7	15'.1	253° 38'.5	42'.3	99° 08'.2	50'.9
09	73° 23'.7	302° 38'.0	32'.3	19° 54'.4	15'.6	268° 40'.5	42'.1	114° 10'.8	50'.9
10	88° 26'.2	317° 37'.3	31'.5	34° 55'.1	16'.0	283° 42'.6	41'.9	129° 13'.5	51'.0
11	103° 28'.7	332° 36'.6	30'.8	49° 55'.8	16'.4	298° 44'.6	41'.8	144° 16'.1	51'.0
12	118° 31'.1	347° 35'.9	19° 30'.0 N	64° 56'.5	18° 16'.9 N	313° 46'.6	7° 41'.6 N	159° 18'.7	16° 51'.1 S
13	133° 33'.6	2° 35'.2	29'.3	79° 57'.2	17'.3	328° 48'.7	41'.4	174° 21'.4	51'.2
14	148° 36'.1	17° 34'.5	28'.5	94° 57'.9	17'.7	343° 50'.7	41'.2	189° 24'.0	51'.2
15	163° 38'.5	32° 33'.8	27'.7	109° 58'.6	18'.2	358° 52'.8	41'.0	204° 26'.6	51'.3
16	178° 41'.0	47° 33'.1	27'.0	124° 59'.3	18'.6	13° 54'.8	40'.9	219° 29'.3	51'.3
17	193° 43'.4	62° 32'.4	26'.2	140° 00'.0	19'.1	28° 56'.9	40'.7	234° 31'.9	51'.4
18	208° 45'.9	77° 31'.7	25'.5	155° 00'.7	19'.5	43° 58'.9	40'.5	249° 34'.5	51'.4
19	223° 48'.4	92° 31'.0	24'.7	170° 01'.4	19'.9	59° 01'.0	40'.3	264° 37'.2	51'.5
20	238° 50'.8	107° 30'.3	23'.9	185° 02'.1	20'.4	74° 03'.0	40'.2	279° 39'.8	51'.5
21	253° 53'.3	122° 29'.7	23'.2	200° 02'.8	20'.8	89° 05'.0	40'.0	294° 42'.4	51'.6
22	268° 55'.8	137° 29'.0	22'.4	215° 03'.5	21'.2	104° 07'.1	39'.8	309° 45'.1	51'.7
23	283° 58'.2	152° 28'.3	21'.6	230° 04'.2	21'.7	119° 09'.1	39'.6	324° 47'.7	51'.7
21 Tuesday 00	299° 00'.7	167° 27'.6	19° 20'.9 N	245° 04'.9	18° 22'.1 N	134° 11'.2	7° 39'.5 N	339° 50'.4	16° 51'.8 S
01	314° 03'.2	182° 26'.9	20'.1	260° 05'.6	22'.5	149° 13'.2	39'.3	354° 53'.0	51'.8
02	329° 05'.6	197° 26'.2	19'.3	275° 06'.3	23'.0	164° 15'.3	39'.1	9° 55'.6	51'.9
03	344° 08'.1	212° 25'.5	18'.6	290° 07'.0	23'.4	179° 17'.3	38'.9	24° 58'.3	51'.9
04	359° 10'.6	227° 24'.8	17'.8	305° 07'.7	23'.8	194° 19'.4	38'.7	40° 00'.9	52'.0
05	14° 13'.0	242° 24'.1	17'.0	320° 08'.4	24'.3	209° 21'.4	38'.6	55° 03'.5	52'.1
06	29° 15'.5	257° 23'.4	16'.2	335° 09'.1	24'.7	224° 23'.4	38'.4	70° 06'.2	52'.1
07	44° 17'.9	272° 22'.8	15'.5	350° 09'.8	25'.1	239° 25'.5	38'.2	85° 08'.8	52'.2
08	59° 20'.4	287° 22'.1	14'.7	5° 10'.5	25'.5	254° 27'.5	38'.0	100° 11'.4	52'.2
09	74° 22'.9	302° 21'.4	13'.9	20° 11'.2	26'.0	269° 29'.6	37'.9	115° 14'.1	52'.3
10	89° 25'.3	317° 20'.7	13'.1	35° 11'.9	26'.4	284° 31'.6	37'.7	130° 16'.7	52'.3
11	104° 27'.8	332° 20'.0	12'.4	50° 12'.6	26'.8	299° 33'.7	37'.5	145° 19'.3	52'.4
12	119° 30'.3	347° 19'.3	19° 11'.6 N	65° 13'.3	18° 27'.3 N	314° 35'.7	7° 37'.3 N	160° 22'.0	16° 52'.5 S
13	134° 32'.7	2° 18'.6	10'.8	80° 14'.0	27'.7	329° 37'.7	37'.2	175° 24'.6	52'.5
14	149° 35'.2	17° 18'.0	10'.0	95° 14'.7	28'.1	344° 39'.8	37'.0	190° 27'.2	52'.6
15	164° 37'.7	32° 17'.3	09'.2	110° 15'.4	28'.5	359° 41'.8	36'.8	205° 29'.9	52'.6
16	179° 40'.1	47° 16'.6	08'.4	125° 16'.1	29'.0	14° 43'.9	36'.6	220° 32'.5	52'.7
17	194° 42'.6	62° 15'.9	07'.7	140° 16'.8	29'.4	29° 45'.9	36'.4	235° 35'.2	52'.7
18	209° 45'.0	77° 15'.2	06'.9	155° 17'.5	29'.8	44° 48'.0	36'.3	250° 37'.8	52'.8
19	224° 47'.5	92° 14'.5	06'.1	170° 18'.2	30'.3	59° 50'.0	36'.1	265° 40'.4	52'.9
20	239° 50'.0	107° 13'.9	05'.3	185° 18'.9	30'.7	74° 52'.0	35'.9	280° 43'.1	52'.9
21	254° 52'.4	122° 13'.2	04'.5	200° 19'.6	31'.1	89° 54'.1	35'.7	295° 45'.7	53'.0
22	269° 54'.9	137° 12'.5	03'.7	215° 20'.3	31'.5	104° 56'.1	35'.6	310° 48'.3	53'.0
23	284° 57'.4	152° 11'.8	02'.9	230° 21'.0	32'.0	119° 58'.2	35'.4	325° 51'.0	53'.1
22 Wednesday 00	299° 59'.8	167° 11'.1	19° 02'.2 N	245° 21'.7	18° 32'.4 N	135° 00'.2	7° 35'.2 N	340° 53'.6	16° 53'.1 S
01	315° 02'.3	182° 10'.5	01'.4	260° 22'.4	32'.8	150° 02'.2	35'.0	355° 56'.2	53'.2
02	330° 04'.8	197° 09'.8	00'.6	275° 23'.1	33'.2	165° 04'.3	34'.8	10° 58'.9	53'.3
03	345° 07'.2	212° 09'.1	18° 59'.8 N	290° 23'.8	33'.7	180° 06'.3	34'.7	26° 01'.5	53'.3
04	0° 09'.7	227° 08'.4	59'.0	305° 24'.5	34'.1	195° 08'.4	34'.5	41° 04'.2	53'.4
05	15° 12'.2	242° 07'.8	58'.2	320° 25'.2	34'.5	210° 10'.4	34'.3	56° 06'.8	53'.4
06	30° 14'.6	257° 07'.1	57'.4	335° 25'.9	34'.9	225° 12'.4	34'.1	71° 09'.4	53'.5
07	45° 17'.1	272° 06'.4	56'.6	350° 26'.6	35'.4	240° 14'.5	33'.9	86° 12'.1	53'.5
08	60° 19'.5	287° 05'.7	55'.8	5° 27'.3	35'.8	255° 16'.5	33'.8	101° 14'.7	53'.6
09	75° 22'.0	302° 05'.1	55'.0	20° 28'.0	36'.2	270° 18'.6	33'.6	116° 17'.3	53'.7
10	90° 24'.5	317° 04'.4	54'.2	35° 28'.7	36'.6	285° 20'.6	33'.4	131° 20'.0	53'.7
11	105° 26'.9	332° 03'.7	53'.4	50° 29'.4	37'.0	300° 22'.6	33'.2	146° 22'.6	53'.8
12	120° 29'.4	347° 03'.0	18° 52'.6 N	65° 30'.1	18° 37'.5 N	315° 24'.7	7° 33'.1 N	161° 25'.2	16° 53'.8 S
13	135° 31'.9	2° 02'.4	51'.8	80° 30'.8	37'.9	330° 26'.7	32'.9	176° 27'.9	53'.9
14	150° 34'.3	17° 01'.7	51'.0	95° 31'.5	38'.3	345° 28'.8	32'.7	191° 30'.5	53'.9
15	165° 36'.8	32° 01'.0	50'.2	110° 32'.2	38'.7	0° 30'.8	32'.5	206° 33'.2	54'.0
16	180° 39'.3	47° 00'.4	49'.4	125° 32'.9	39'.2	15° 32'.8	32'.3	221° 35'.8	54'.1
17	195° 41'.7	61° 59'.7	48'.6	140° 33'.6	39'.6	30° 34'.9	32'.2	236° 38'.4	54'.1
18	210° 44'.2	76° 59'.0	47'.8	155° 34'.4	40'.0	45° 36'.9	32'.0	251° 41'.1	54'.2
19	225° 46'.6	91° 58'.3	47'.0	170° 35'.1	40'.4	60° 39'.0	31'.8	266° 43'.7	54'.2
20	240° 49'.1	106° 57'.7	46'.2	185° 35'.8	40'.8	75° 41'.0	31'.6	281° 46'.3	54'.3
21	255° 51'.6	121° 57'.0	45'.3	200° 36'.5	41'.3	90° 43'.0	31'.4	296° 49'.0	54'.3
22	270° 54'.0	136° 56'.3	44'.5	215° 37'.2	41'.7	105° 45'.1	31'.3	311° 51'.6	54'.4
23	285° 56'.5	151° 55'.7	43'.7	230° 37'.9	42'.1	120° 47'.1	31'.1	326° 54'.3	54'.5
	M.P. 03:59	v -0'.7	d 0'.8	v 0'.7	d 0'.4	v 2'.0	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.2	40° 19'.7 S
Achernar	335° 38'.2	57° 16'.0 S
Acrux	173° 27'.2	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.6 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.4	56° 00'.2 N
Alkaid	153° 11'.1	49° 21'.2 N
Alnair	28° 02'.8	46° 59'.5 S
Alnilam	276° 02'.5	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.0	26° 44'.5 N
Alpheratz	357° 59'.5	29° 03'.0 N
Altair	62° 23'.1	8° 51'.0 N
Ankaa	353° 30'.8	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 09'.9	19° 13'.3 N
Atria	108° 00'.7	69° 01'.1 S
Avior	234° 25'.1	59° 29'.2 S
Bellatrix	278° 49'.0	6° 20'.7 N
Betelgeuse	271° 18'.5	7° 24'.4 N
Canopus	264° 03'.6	52° 41'.4 S
Capella	280° 57'.9	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.3 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.4	18° 01'.4 S
Dubhe	194° 11'.0	61° 47'.6 N
Elnath	278° 32'.7	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.5 N
Enif	34° 02'.1	9° 50'.6 N
Fomalhaut	15° 40'.8	29° 39'.4 S
Gacrux	172° 18'.7	57° 04'.6 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.2	60° 20'.6 S
Hamal	328° 18'.4	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 18'.9	74° 11'.4 N
Markab	13° 53'.7	15° 10'.0 N
Menkar	314° 31'.5	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.3 S
Miaplacidus	221° 44'.0	69° 41'.4 S
Mirfak	309° 03'.0	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.1	56° 45'.4 S
Polaris	324° 00'.7	89° 13'.6 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.4	5° 14'.7 N
Rasalhague	96° 20'.6	12° 34'.0 N
Regulus	208° 00'.4	12° 00'.2 N
Rigel	281° 27'.3	8° 12'.5 S
Rigil Kent	140° 13'.0	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.3	56° 29'.7 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.8	16° 42'.3 S
Spica	158° 47'.8	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.3 S
Vega	80° 49'.1	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	228° 26'.9	12:51
Mars	306° 04'.2	07:39
Jupiter	195° 10'.5	15:01
Saturn	40° 49'.7	01:20

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
20 00	178° 25'.5	20° 39'.4 N	305° 11'.8	16'.2	2° 33'.3 N	12'.1	54'.4
01	193° 25'.5	38'.9	319° 47'.0	16'.1	45'.4	12'.0	
02	208° 25'.5	38'.4	334° 22'.1	16'.0	57'.4	12'.1	
03	223° 25'.4	38'.0	348° 57'.1	16'.1	3° 09'.5 N	12'.1	54'.5
04	238° 25'.4	37'.5	3° 32'.2	16'.0	21'.6	12'.1	
05	253° 25'.4	37'.0	18° 07'.2	16'.0	33'.7	12'.0	
06	268° 25'.3	36'.5	32° 42'.2	16'.0	45'.7	12'.1	
07	283° 25'.3	36'.1	47° 17'.2	16'.0	57'.8	12'.0	
08	298° 25'.3	35'.6	61° 52'.2	15'.9	4° 09'.8 N	12'.0	
09	313° 25'.2	35'.1	76° 27'.1	15'.9	21'.8	12'.0	
10	328° 25'.2	34'.6	91° 02'.0	15'.9	33'.8	12'.0	54'.6
11	343° 25'.2	34'.2	105° 36'.9	15'.8	45'.8	12'.0	
12	358° 25'.1	20° 33'.7 N	120° 11'.7	15'.8	4° 57'.8 N	12'.0	54'.6
13	13° 25'.1	33'.2	134° 46'.5	15'.8	5° 09'.8 N	12'.0	
14	28° 25'.1	32'.7	149° 21'.3	15'.7	21'.8	11'.9	
15	43° 25'.0	32'.3	163° 56'.0	15'.7	33'.7	12'.0	
16	58° 25'.0	31'.8	178° 30'.7	15'.7	45'.7	11'.9	54'.7
17	73° 25'.0	31'.3	193° 05'.4	15'.6	57'.6	11'.9	
18	88° 24'.9	30'.8	207° 40'.0	15'.6	6° 09'.5 N	11'.9	
19	103° 24'.9	30'.4	222° 14'.6	15'.6	21'.4	11'.9	
20	118° 24'.9	29'.9	236° 49'.2	15'.5	33'.3	11'.8	
21	133° 24'.9	29'.4	251° 23'.7	15'.5	45'.1	11'.9	54'.8
22	148° 24'.8	28'.9	265° 58'.2	15'.4	57'.0	11'.8	
23	163° 24'.8	28'.4	280° 32'.6	15'.4	7° 08'.8 N	11'.8	
21 00	178° 24'.8	20° 27'.9 N	295° 07'.0	15'.4	7° 20'.6 N	11'.7	54'.8
01	193° 24'.7	27'.5	309° 41'.4	15'.3	32'.3	11'.8	
02	208° 24'.7	27'.0	324° 15'.7	15'.2	44'.1	11'.7	54'.9
03	223° 24'.7	26'.5	338° 49'.9	15'.2	55'.8	11'.7	
04	238° 24'.6	26'.0	353° 24'.1	15'.2	8° 07'.5 N	11'.7	
05	253° 24'.6	25'.5	7° 58'.3	15'.1	19'.2	11'.7	
06	268° 24'.6	25'.0	22° 32'.4	15'.1	30'.9	11'.6	
07	283° 24'.6	24'.5	37° 06'.5	15'.0	42'.5	11'.6	55'.0
08	298° 24'.5	24'.1	51° 40'.5	14'.9	54'.1	11'.6	
09	313° 24'.5	23'.6	66° 14'.4	15'.0	9° 05'.7 N	11'.5	
10	328° 24'.5	23'.1	80° 48'.4	14'.8	17'.2	11'.5	
11	343° 24'.4	22'.6	95° 22'.2	14'.8	28'.7	11'.5	
12	358° 24'.4	20° 22'.1 N	109° 56'.0	14'.8	9° 40'.2 N	11'.5	55'.1
13	13° 24'.4	21'.6	124° 29'.8	14'.7	51'.7	11'.4	
14	28° 24'.4	21'.1	139° 03'.5	14'.6	10° 03'.1 N	11'.4	
15	43° 24'.3	20'.6	153° 37'.1	14'.6	14'.5	11'.4	
16	58° 24'.3	20'.1	168° 10'.7	14'.5	25'.9	11'.3	55'.2
17	73° 24'.3	19'.6	182° 44'.2	14'.4	37'.2	11'.3	
18	88° 24'.3	19'.1	197° 17'.6	14'.4	48'.5	11'.2	
19	103° 24'.2	18'.7	211° 51'.0	14'.4	59'.7	11'.2	
20	118° 24'.2	18'.2	226° 24'.4	14'.2	11° 10'.9 N	11'.2	55'.3
21	133° 24'.2	17'.7	240° 57'.6	14'.2	22'.1	11'.2	
22	148° 24'.2	17'.2	255° 30'.8	14'.2	33'.3	11'.1	
23	163° 24'.1	16'.7	270° 04'.0	14'.1	44'.4	11'.0	
22 00	178° 24'.1	20° 16'.2 N	284° 37'.1	14'.0	11° 55'.4 N	11'.1	55'.4
01	193° 24'.1	15'.7	299° 10'.1	13'.9	12° 06'.5 N	11'.0	
02	208° 24'.1	15'.2	313° 43'.0	13'.9	17'.5	10'.9	
03	223° 24'.0	14'.7	328° 15'.9	13'.8	28'.4	10'.9	
04	238° 24'.0	14'.2	342° 48'.7	13'.7	39'.3	10'.8	55'.5
05	253° 24'.0	13'.7	357° 21'.4	13'.7	50'.1	10'.8	
06	268° 24'.0	13'.2	11° 54'.1	13'.6	13° 00'.9 N	10'.8	
07	283° 23'.9	12'.7	26° 26'.7	13'.5	11'.7	10'.7	55'.6
08	298° 23'.9	12'.2	40° 59'.2	13'.4	22'.4	10'.7	
09	313° 23'.9	11'.7	55° 31'.6	13'.4	33'.1	10'.6	
10	328° 23'.9	11'.2	70° 04'.0	13'.3	43'.7	10'.6	
11	343° 23'.9	10'.7	84° 36'.3	13'.2	54'.3	10'.5	55'.7
12	358° 23'.8	20° 10'.2 N	99° 08'.5	13'.1	14° 04'.8 N	10'.4	55'.7
13	13° 23'.8	09'.7	113° 40'.6	13'.1	15'.2	10'.4	
14	28° 23'.8	09'.2	128° 12'.7	12'.9	25'.6	10'.4	55'.8
15	43° 23'.8	08'.6	142° 44'.6	12'.9	36'.0	10'.3	
16	58° 23'.8	08'.1	157° 16'.5	12'.8	46'.3	10'.2	
17	73° 23'.7	07'.6	171° 48'.3	12'.8	56'.5	10'.2	
18	88° 23'.7	07'.1	186° 20'.1	12'.6	15° 06'.7 N	10'.2	55'.9
19	103° 23'.7	06'.6	200° 51'.7	12'.6	16'.9	10'.0	
20	118° 23'.7	06'.1	215° 23'.3	12'.5	26'.9	10'.0	
21	133° 23'.7	05'.6	229° 54'.8	12'.4	36'.9	10'.0	56'.0
22	148° 23'.6	05'.1	244° 26'.2	12'.3	46'.9	9'.9	
23	163° 23'.6	04'.6	258° 57'.5	12'.2	56'.8	9'.8	
	SD 15'.7	d 0'.5	SD 14'.9		15'.0	15'.2	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
20	6 18	6 19	12:06	03:45	16:06	20d 73%
21	6 21	6 22	12:06	04:27	16:49	21d 64%
22	6 24	6 25	12:06	05:11	17:34	22d 54%

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1992 July 23, 24, 25 (Thur, Fri, Sat)

GMT	ARIES	VENUS -3.9		MARS +0.8		JUPITER -1.7		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
23 Thursday 00	300° 59'.0	166° 55'.0	18° 42'.9 N	245° 38'.6	18° 42'.5 N	135° 49'.2	7° 30'.9 N	341° 56'.9	16° 54'.5 S
01	316° 01'.4	181° 54'.3	42'.1	260° 39'.3	42'.9	150° 51'.2	30'.7	356° 59'.5	54'.6
02	331° 03'.9	196° 53'.7	41'.3	275° 40'.0	43'.3	165° 53'.2	30'.5	12° 02'.2	54'.6
03	346° 06'.4	211° 53'.0	40'.5	290° 40'.7	43'.8	180° 55'.3	30'.4	27° 04'.8	54'.7
04	1° 08'.8	226° 52'.3	39'.7	305° 41'.4	44'.2	195° 57'.3	30'.2	42° 07'.4	54'.7
05	16° 11'.3	241° 51'.7	38'.8	320° 42'.1	44'.6	210° 59'.4	30'.0	57° 10'.1	54'.8
06	31° 13'.8	256° 51'.0	38'.0	335° 42'.8	45'.0	226° 01'.4	29'.8	72° 12'.7	54'.9
07	46° 16'.2	271° 50'.3	37'.2	350° 43'.5	45'.4	241° 03'.4	29'.6	87° 15'.4	54'.9
08	61° 18'.7	286° 49'.7	36'.4	5° 44'.2	45'.8	256° 05'.5	29'.5	102° 18'.0	55'.0
09	76° 21'.1	301° 49'.0	35'.6	20° 44'.9	46'.3	271° 07'.5	29'.3	117° 20'.6	55'.0
10	91° 23'.6	316° 48'.4	34'.7	35° 45'.6	46'.7	286° 09'.5	29'.1	132° 23'.3	55'.1
11	106° 26'.1	331° 47'.7	33'.9	50° 46'.3	47'.1	301° 11'.6	28'.9	147° 25'.9	55'.1
12	121° 28'.5	346° 47'.0	18° 33'.1 N	65° 47'.0	18° 47'.5 N	316° 13'.6	7° 28'.7 N	162° 28'.6	16° 55'.2 S
13	136° 31'.0	1° 46'.4	32'.3	80° 47'.7	47'.9	331° 15'.7	28'.6	177° 31'.2	55'.3
14	151° 33'.5	16° 45'.7	31'.4	95° 48'.4	48'.3	346° 17'.7	28'.4	192° 33'.8	55'.3
15	166° 35'.9	31° 45'.1	30'.6	110° 49'.1	48'.7	1° 19'.7	28'.2	207° 36'.5	55'.4
16	181° 38'.4	46° 44'.4	29'.8	125° 49'.8	49'.2	16° 21'.8	28'.0	222° 39'.1	55'.4
17	196° 40'.9	61° 43'.7	29'.0	140° 50'.5	49'.6	31° 23'.8	27'.8	237° 41'.7	55'.5
18	211° 43'.3	76° 43'.1	28'.1	155° 51'.2	50'.0	46° 25'.8	27'.7	252° 44'.4	55'.5
19	226° 45'.8	91° 42'.4	27'.3	170° 51'.9	50'.4	61° 27'.9	27'.5	267° 47'.0	55'.6
20	241° 48'.3	106° 41'.8	26'.5	185° 52'.6	50'.8	76° 29'.9	27'.3	282° 49'.7	55'.7
21	256° 50'.7	121° 41'.1	25'.6	200° 53'.3	51'.2	91° 31'.9	27'.1	297° 52'.3	55'.7
22	271° 53'.2	136° 40'.5	24'.8	215° 54'.0	51'.6	106° 34'.0	26'.9	312° 54'.9	55'.8
23	286° 55'.6	151° 39'.8	24'.0	230° 54'.7	52'.0	121° 36'.0	26'.8	327° 57'.6	55'.8
24 Friday 00	301° 58'.1	166° 39'.2	18° 23'.1 N	245° 55'.4	18° 52'.4 N	136° 38'.1	7° 26'.6 N	343° 00'.2	16° 55'.9 S
01	317° 00'.6	181° 38'.5	22'.3	260° 56'.1	52'.9	151° 40'.1	26'.4	358° 02'.9	55'.9
02	332° 03'.0	196° 37'.8	21'.5	275° 56'.8	53'.3	166° 42'.1	26'.2	13° 05'.5	56'.0
03	347° 05'.5	211° 37'.2	20'.6	290° 57'.5	53'.7	181° 44'.2	26'.0	28° 08'.1	56'.1
04	2° 08'.0	226° 36'.5	19'.8	305° 58'.2	54'.1	196° 46'.2	25'.9	43° 10'.8	56'.1
05	17° 10'.4	241° 35'.9	19'.0	320° 58'.9	54'.5	211° 48'.2	25'.7	58° 13'.4	56'.2
06	32° 12'.9	256° 35'.2	18'.1	335° 59'.6	54'.9	226° 50'.3	25'.5	73° 16'.1	56'.2
07	47° 15'.4	271° 34'.6	17'.3	351° 00'.4	55'.3	241° 52'.3	25'.3	88° 18'.7	56'.3
08	62° 17'.8	286° 33'.9	16'.4	6° 01'.1	55'.7	256° 54'.3	25'.1	103° 21'.3	56'.4
09	77° 20'.3	301° 33'.3	15'.6	21° 01'.8	56'.1	271° 56'.4	25'.0	118° 24'.0	56'.4
10	92° 22'.8	316° 32'.6	14'.8	36° 02'.5	56'.5	286° 58'.4	24'.8	133° 26'.6	56'.5
11	107° 25'.2	331° 32'.0	13'.9	51° 03'.2	56'.9	302° 00'.4	24'.6	148° 29'.3	56'.5
12	122° 27'.7	346° 31'.3	18° 13'.1 N	66° 03'.9	18° 57'.4 N	317° 02'.5	7° 24'.4 N	163° 31'.9	16° 56'.6 S
13	137° 30'.1	1° 30'.7	12'.2	81° 04'.6	57'.8	332° 04'.5	24'.2	178° 34'.5	56'.6
14	152° 32'.6	16° 30'.0	11'.4	96° 05'.3	58'.2	347° 06'.5	24'.0	193° 37'.2	56'.7
15	167° 35'.1	31° 29'.4	10'.5	111° 06'.0	58'.6	2° 08'.6	23'.9	208° 39'.8	56'.8
16	182° 37'.5	46° 28'.7	09'.7	126° 06'.7	59'.0	17° 10'.6	23'.7	223° 42'.5	56'.8
17	197° 40'.0	61° 28'.1	08'.8	141° 07'.4	59'.4	32° 12'.7	23'.5	238° 45'.1	56'.9
18	212° 42'.5	76° 27'.5	08'.0	156° 08'.1	59'.8	47° 14'.7	23'.3	253° 47'.7	56'.9
19	227° 44'.9	91° 26'.8	07'.1	171° 08'.8	19° 00'.2 N	62° 16'.7	23'.1	268° 50'.4	57'.0
20	242° 47'.4	106° 26'.2	06'.3	186° 09'.5	00'.6	77° 18'.8	23'.0	283° 53'.0	57'.0
21	257° 49'.9	121° 25'.5	05'.4	201° 10'.2	01'.0	92° 20'.8	22'.8	298° 55'.7	57'.1
22	272° 52'.3	136° 24'.9	04'.6	216° 10'.9	01'.4	107° 22'.8	22'.6	313° 58'.3	57'.2
23	287° 54'.8	151° 24'.2	03'.7	231° 11'.6	01'.8	122° 24'.9	22'.4	329° 00'.9	57'.2
25 Saturday 00	302° 57'.2	166° 23'.6	18° 02'.9 N	246° 12'.3	19° 02'.2 N	137° 26'.9	7° 22'.2 N	344° 03'.6	16° 57'.3 S
01	317° 59'.7	181° 22'.9	02'.0	261° 13'.0	02'.6	152° 28'.9	22'.0	359° 06'.2	57'.3
02	333° 02'.2	196° 22'.3	01'.2	276° 13'.7	03'.0	167° 31'.0	21'.9	14° 08'.9	57'.4
03	348° 04'.6	211° 21'.7	00'.3	291° 14'.4	03'.4	182° 33'.0	21'.7	29° 11'.5	57'.4
04	3° 07'.1	226° 21'.0	17° 59'.4 N	306° 15'.1	03'.8	197° 35'.0	21'.5	44° 14'.1	57'.5
05	18° 09'.6	241° 20'.4	58'.6	321° 15'.8	04'.2	212° 37'.1	21'.3	59° 16'.8	57'.6
06	33° 12'.0	256° 19'.7	57'.7	336° 16'.5	04'.6	227° 39'.1	21'.1	74° 19'.4	57'.6
07	48° 14'.5	271° 19'.1	56'.9	351° 17'.2	05'.0	242° 41'.1	21'.0	89° 22'.1	57'.7
08	63° 17'.0	286° 18'.5	56'.0	6° 17'.9	05'.4	257° 43'.2	20'.8	104° 24'.7	57'.7
09	78° 19'.4	301° 17'.8	55'.1	21° 18'.7	05'.8	272° 45'.2	20'.6	119° 27'.4	57'.8
10	93° 21'.9	316° 17'.2	54'.3	36° 19'.4	06'.2	287° 47'.2	20'.4	134° 30'.0	57'.9
11	108° 24'.4	331° 16'.6	53'.4	51° 20'.1	06'.6	302° 49'.2	20'.2	149° 32'.6	57'.9
12	123° 26'.8	346° 15'.9	17° 52'.5 N	66° 20'.8	19° 07'.0 N	317° 51'.3	7° 20'.0 N	164° 35'.3	16° 58'.0 S
13	138° 29'.3	1° 15'.3	51'.7	81° 21'.5	07'.4	332° 53'.3	19'.9	179° 37'.9	58'.0
14	153° 31'.7	16° 14'.7	50'.8	96° 22'.2	07'.8	347° 55'.3	19'.7	194° 40'.6	58'.1
15	168° 34'.2	31° 14'.0	49'.9	111° 22'.9	08'.2	2° 57'.4	19'.5	209° 43'.2	58'.1
16	183° 36'.7	46° 13'.4	49'.1	126° 23'.6	08'.6	17° 59'.4	19'.3	224° 45'.8	58'.2
17	198° 39'.1	61° 12'.7	48'.2	141° 24'.3	09'.0	33° 01'.4	19'.1	239° 48'.5	58'.3
18	213° 41'.6	76° 12'.1	47'.3	156° 25'.0	09'.4	48° 03'.5	18'.9	254° 51'.1	58'.3
19	228° 44'.1	91° 11'.5	46'.5	171° 25'.7	09'.8	63° 05'.5	18'.8	269° 53'.8	58'.4
20	243° 46'.5	106° 10'.8	45'.6	186° 26'.4	10'.2	78° 07'.5	18'.6	284° 56'.4	58'.4
21	258° 49'.0	121° 10'.2	44'.7	201° 27'.1	10'.6	93° 09'.6	18'.4	299° 59'.1	58'.5
22	273° 51'.5	136° 09'.6	43'.8	216° 27'.8	11'.0	108° 11'.6	18'.2	315° 01'.7	58'.5
23	288° 53'.9	151° 09'.0	43'.0	231° 28'.5	11'.4	123° 13'.6	18'.0	330° 04'.3	58'.6
	M.P. 03:48	v -0'.6	d 0'.8	v 0'.7	d 0'.4	v 2'.0	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.2	40° 19'.7 S
Achernar	335° 38'.2	57° 16'.0 S
Acrux	173° 27'.3	63° 03'.8 S
Adhara	255° 25'.2	28° 57'.6 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.4	56° 00'.2 N
Alkaid	153° 11'.1	49° 21'.2 N
Alnair	28° 02'.8	46° 59'.6 S
Alnilam	276° 02'.5	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.0	26° 44'.5 N
Alpheratz	357° 59'.5	29° 03'.0 N
Altair	62° 23'.1	8° 51'.0 N
Ankaa	353° 30'.8	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 09'.9	19° 13'.3 N
Atria	108° 00'.7	69° 01'.1 S
Avior	234° 25'.1	59° 29'.2 S
Bellatrix	278° 49'.0	6° 20'.7 N
Betelgeuse	271° 18'.5	7° 24'.4 N
Canopus	264° 03'.6	52° 41'.4 S
Capella	280° 57'.9	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.3 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.4	18° 01'.4 S
Dubhe	194° 11'.1	61° 47'.6 N
Elnath	278° 32'.6	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.6 N
Enif	34° 02'.1	9° 50'.6 N
Fomalhaut	15° 40'.8	29° 39'.4 S
Gacrux	172° 18'.7	57° 04'.6 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.2	60° 20'.6 S
Hamal	328° 18'.4	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 18'.9	74° 11'.4 N
Markab	13° 53'.6	15° 10'.0 N
Menkar	314° 31'.5	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.3 S
Miaplacidus	221° 44'.0	69° 41'.4 S
Mirfak	309° 03'.0	49° 50'.0 N
Nunki	76° 17'.2	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.4 S
Polaris	323° 59'.3	89° 13'.6 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.7 N
Rasalhague	96° 20'.6	12° 34'.0 N
Regulus	208° 00'.4	12° 00'.2 N
Rigel	281° 27'.3	8° 12'.5 S
Rigil Kent	140° 13'.0	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.3	56° 29'.7 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.8	16° 42'.3 S
Spica	158° 47'.8	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.2 S
Vega	80° 49'.1	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	224° 41'.0	12:54
Mars	303° 57'.3	07:36
Jupiter	194° 39'.9	14:51
Saturn	41° 02'.1	01:08

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
178° 23'.6	20° 04'.1 N	273° 28'.7	12'.2	16° 06'.6 N	9'.7	56'.1
193° 23'.6	03'.6	287° 59'.9	12'.0	16'.3	9'.7	
208° 23'.6	03'.0	302° 30'.9	12'.0	26'.0	9'.7	
223° 23'.5	02'.5	317° 01'.9	11'.9	35'.7	9'.5	56'.2
238° 23'.5	02'.0	331° 32'.8	11'.7	45'.2	9'.5	
253° 23'.5	01'.5	346° 03'.5	11'.7	54'.7	9'.4	
268° 23'.5	01'.0	0° 34'.2	11'.6	17° 04'.1 N	9'.4	56'.3
283° 23'.5	00'.5	15° 04'.8	11'.5	13'.5	9'.2	
298° 23'.5	20° 00'.0 N	29° 35'.3	11'.5	22'.7	9'.2	
313° 23'.4	59'.4	44° 05'.8	11'.3	31'.9	9'.2	56'.4
328° 23'.4	58'.9	58° 36'.1	11'.2	41'.1	9'.0	
343° 23'.4	58'.4	73° 06'.3	11'.1	50'.1	9'.0	
358° 23'.4	19° 57'.9 N	87° 36'.4	11'.1	17° 59'.1 N	8'.9	56'.5
13° 23'.4	57'.4	102° 06'.5	10'.9	18° 08'.0 N	8'.8	
28° 23'.4	56'.8	116° 36'.4	10'.9	16'.8	8'.7	
43° 23'.4	56'.3	131° 06'.3	10'.7	25'.5	8'.6	56'.6
58° 23'.3	55'.8	145° 36'.0	10'.7	34'.1	8'.6	
73° 23'.3	55'.3	160° 05'.7	10'.6	42'.7	8'.5	
88° 23'.3	54'.8	174° 35'.3	10'.4	51'.2	8'.4	56'.7
103° 23'.3	54'.2	189° 04'.7	10'.4	59'.6	8'.3	
118° 23'.3	53'.7	203° 34'.1	10'.3	19° 07'.9 N	8'.2	
133° 23'.3	53'.2	218° 03'.4	10'.1	16'.1	8'.2	56'.8
148° 23'.3	52'.7	232° 32'.5	10'.1	24'.3	8'.0	
163° 23'.2	52'.1	247° 01'.6	10'.0	32'.3	7'.9	56'.9
178° 23'.2	19° 51'.6 N	261° 30'.6	9'.8	19° 40'.2 N	7'.9	56'.9
193° 23'.2	51'.1	275° 59'.4	9'.8	48'.1	7'.8	
208° 23'.2	50'.6	290° 28'.2	9'.7	55'.9	7'.6	57'.0
223° 23'.2	50'.0	304° 56'.9	9'.5	20° 03'.5 N	7'.6	
238° 23'.2	49'.5	319° 25'.4	9'.5	11'.1	7'.5	
253° 23'.2	49'.0	333° 53'.9	9'.4	18'.6	7'.3	57'.1
268° 23'.2	48'.5	348° 22'.3	9'.2	25'.9	7'.3	
283° 23'.2	47'.9	2° 50'.5	9'.2	33'.2	7'.2	57'.2
298° 23'.1	47'.4	17° 18'.7	9'.1	40'.4	7'.0	
313° 23'.1	46'.9	31° 46'.8	9'.0	47'.4	7'.0	
328° 23'.1	46'.3	46° 14'.8	8'.8	54'.4	6'.8	57'.3
343° 23'.1	45'.8	60° 42'.6	8'.8	21° 01'.2 N	6'.8	
358° 23'.1	19° 45'.3 N	75° 10'.4	8'.7	21° 08'.0 N	6'.6	57'.3
13° 23'.1	44'.7	89° 38'.1	8'.5	14'.6	6'.5	57'.4
28° 23'.1	44'.2	104° 05'.6	8'.5	21'.1	6'.4	
43° 23'.1	43'.7	118° 33'.1	8'.3	27'.5	6'.4	57'.5
58° 23'.1	43'.1	133° 00'.4	8'.3	33'.9	6'.1	
73° 23'.1	42'.6	147° 27'.7	8'.2	40'.0	6'.1	
88° 23'.0	42'.1	161° 54'.9	8'.0	46'.1	6'.0	57'.6
103° 23'.0	41'.5	176° 21'.9	8'.0	52'.1	5'.8	
118° 23'.0	41'.0	190° 48'.9	7'.9	57'.9	5'.7	57'.7
133° 23'.0	40'.5	205° 15'.8	7'.8	22° 03'.6 N	5'.6	
148° 23'.0	39'.9	219° 42'.6	7'.6	09'.2	5'.5	
163° 23'.0	39'.4	234° 09'.2	7'.6	14'.7	5'.3	57'.8
178° 23'.0	19° 38'.8 N	248° 35'.8	7'.5	22° 20'.0 N	5'.3	57'.8
193° 23'.0	38'.3	263° 02'.3	7'.4	25'.3	5'.1	
208° 23'.0	37'.8	277° 28'.7	7'.3	30'.4	5'.0	57'.9
223° 23'.0	37'.2	291° 55'.0	7'.2	35'.4	4'.8	
238° 23'.0	36'.7	306° 21'.2	7'.1	40'.2	4'.7	58'.0
253° 23'.0	36'.1	320° 47'.3	7'.0	44'.9	4'.6	
268° 23'.0	35'.6	335° 13'.3	6'.9	49'.5	4'.5	
283° 23'.0	35'.1	349° 39'.2	6'.8	54'.0	4'.3	58'.1
298° 23'.0	34'.5	4° 05'.0	6'.7	58'.3	4'.2	
313° 23'.0	34'.0	18° 30'.7	6'.7	23° 02'.5 N	4'.0	58'.2
328° 23'.0	33'.4	32° 56'.4	6'.5	06'.5	3'.9	
343° 22'.9	32'.9	47° 21'.9	6'.5	10'.4	3'.8	
358° 22'.9	19° 32'.3 N	61° 47'.4	6'.4	23° 14'.2 N	3'.7	58'.3
13° 22'.9	31'.8	76° 12'.8	6'.3	17'.9	3'.5	
28° 22'.9	31'.2	90° 38'.1	6'.2	21'.4	3'.3	58'.4
43° 22'.9	30'.7	105° 03'.3	6'.1	24'.7	3'.2	
58° 22'.9	30'.1	119° 28'.4	6'.0	27'.9	3'.1	
73° 22'.9	29'.6	133° 53'.4	6'.0	31'.0	2'.9	58'.5
88° 22'.9	29'.0	148° 18'.4	5'.8	33'.9	2'.8	
103° 22'.9	28'.5	162° 43'.2	5'.8	36'.7	2'.6	58'.6
118° 22'.9	27'.9	177° 08'.0	5'.8	39'.3	2'.5	
133° 22'.9	27'.4	191° 32'.8	5'.6	41'.8	2'.3	
148° 22'.9	26'.8	205° 57'.4	5'.6	44'.1	2'.2	58'.7
163° 22'.9	26'.3	220° 22'.0	5'.4	46'.3	2'.1	
SD 15'.7	d 0'.5	SD 15'.4		15'.6	15'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
23	6 26	6 26	12:06	05:58	18:22	23d 44%
24	6 27	6 28	12:06	06:48	19:15	24d 34%
25	6 28	6 28	12:06	07:43	20:12	25d 24%

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1992 July 26, 27, 28 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +0.8		JUPITER -1.7		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
26 Sunday 00	303° 56'.4	166° 08'.3	17° 42'.1 N	246° 29'.2	19° 11'.8 N	138° 15'.7	7° 17'.9 N	345° 07'.0	16° 58'.7 S
01	318° 58'.9	181° 07'.7	41'.2	261° 29'.9	12'.2	153° 17'.7	17'.7	0° 09'.6	58'.7
02	334° 01'.3	196° 07'.1	40'.3	276° 30'.6	12'.6	168° 19'.7	17'.5	15° 12'.3	58'.8
03	349° 03'.8	211° 06'.4	39'.5	291° 31'.3	13'.0	183° 21'.7	17'.3	30° 14'.9	58'.8
04	4° 06'.2	226° 05'.8	38'.6	306° 32'.0	13'.4	198° 23'.8	17'.1	45° 17'.5	58'.9
05	19° 08'.7	241° 05'.2	37'.7	321° 32'.7	13'.8	213° 25'.8	16'.9	60° 20'.2	59'.0
06	34° 11'.2	256° 04'.6	36'.8	336° 33'.4	14'.2	228° 27'.8	16'.8	75° 22'.8	59'.0
07	49° 13'.6	271° 03'.9	35'.9	351° 34'.2	14'.6	243° 29'.9	16'.6	90° 25'.5	59'.1
08	64° 16'.1	286° 03'.3	35'.1	6° 34'.9	14'.9	258° 31'.9	16'.4	105° 28'.1	59'.1
09	79° 18'.6	301° 02'.7	34'.2	21° 35'.6	15'.3	273° 33'.9	16'.2	120° 30'.8	59'.2
10	94° 21'.0	316° 02'.1	33'.3	36° 36'.3	15'.7	288° 36'.0	16'.0	135° 33'.4	59'.2
11	109° 23'.5	331° 01'.4	32'.4	51° 37'.0	16'.1	303° 38'.0	15'.8	150° 36'.0	59'.3
12	124° 26'.0	346° 00'.8	17° 31'.5 N	66° 37'.7	19° 16'.5 N	318° 40'.0	7° 15'.7 N	165° 38'.7	16° 59'.4 S
13	139° 28'.4	1° 00'.2	30'.6	81° 38'.4	16'.9	333° 42'.0	15'.5	180° 41'.3	59'.4
14	154° 30'.9	15° 59'.6	29'.8	96° 39'.1	17'.3	348° 44'.1	15'.3	195° 44'.0	59'.5
15	169° 33'.4	30° 58'.9	28'.9	111° 39'.8	17'.7	3° 46'.1	15'.1	210° 46'.6	59'.5
16	184° 35'.8	45° 58'.3	28'.0	126° 40'.5	18'.1	18° 48'.1	14'.9	225° 49'.3	59'.6
17	199° 38'.3	60° 57'.7	27'.1	141° 41'.2	18'.5	33° 50'.2	14'.7	240° 51'.9	59'.7
18	214° 40'.7	75° 57'.1	26'.2	156° 41'.9	18'.9	48° 52'.2	14'.5	255° 54'.5	59'.7
19	229° 43'.2	90° 56'.4	25'.3	171° 42'.6	19'.3	63° 54'.2	14'.4	270° 57'.2	59'.8
20	244° 45'.7	105° 55'.8	24'.4	186° 43'.3	19'.6	78° 56'.3	14'.2	285° 59'.8	59'.8
21	259° 48'.1	120° 55'.2	23'.5	201° 44'.0	20'.0	93° 58'.3	14'.0	301° 02'.5	59'.9
22	274° 50'.6	135° 54'.6	22'.6	216° 44'.7	20'.4	109° 00'.3	13'.8	316° 05'.1	59'.9
23	289° 53'.1	150° 54'.0	21'.7	231° 45'.4	20'.8	124° 02'.3	13'.6	331° 07'.8	17° 00'.0 S
27 Monday 00	304° 55'.5	165° 53'.4	17° 20'.8 N	246° 46'.1	19° 21'.2 N	139° 04'.4	7° 13'.4 N	346° 10'.4	17° 00'.1 S
01	319° 58'.0	180° 52'.7	19'.9	261° 46'.9	21'.6	154° 06'.4	13'.3	1° 13'.0	00'.1
02	335° 00'.5	195° 52'.1	19'.0	276° 47'.6	22'.0	169° 08'.4	13'.1	16° 15'.7	00'.2
03	350° 02'.9	210° 51'.5	18'.1	291° 48'.3	22'.4	184° 10'.5	12'.9	31° 18'.3	00'.2
04	5° 05'.4	225° 50'.9	17'.2	306° 49'.0	22'.7	199° 12'.5	12'.7	46° 21'.0	00'.3
05	20° 07'.9	240° 50'.3	16'.3	321° 49'.7	23'.1	214° 14'.5	12'.5	61° 23'.6	00'.4
06	35° 10'.3	255° 49'.7	15'.4	336° 50'.4	23'.5	229° 16'.5	12'.3	76° 26'.3	00'.4
07	50° 12'.8	270° 49'.0	14'.5	351° 51'.1	23'.9	244° 18'.6	12'.2	91° 28'.9	00'.5
08	65° 15'.2	285° 48'.4	13'.6	6° 51'.8	24'.3	259° 20'.6	12'.0	106° 31'.5	00'.5
09	80° 17'.7	300° 47'.8	12'.7	21° 52'.5	24'.7	274° 22'.6	11'.8	121° 34'.2	00'.6
10	95° 20'.2	315° 47'.2	11'.8	36° 53'.2	25'.1	289° 24'.6	11'.6	136° 36'.8	00'.6
11	110° 22'.6	330° 46'.6	10'.9	51° 53'.9	25'.4	304° 26'.7	11'.4	151° 39'.5	00'.7
12	125° 25'.1	345° 46'.0	17° 10'.0 N	66° 54'.6	19° 25'.8 N	319° 28'.7	7° 11'.2 N	166° 42'.1	17° 00'.8 S
13	140° 27'.6	0° 45'.4	09'.1	81° 55'.3	26'.2	334° 30'.7	11'.0	181° 44'.8	00'.8
14	155° 30'.0	15° 44'.8	08'.2	96° 56'.0	26'.6	349° 32'.8	10'.9	196° 47'.4	00'.9
15	170° 32'.5	30° 44'.1	07'.3	111° 56'.7	27'.0	4° 34'.8	10'.7	211° 50'.1	00'.9
16	185° 35'.0	45° 43'.5	06'.4	126° 57'.4	27'.4	19° 36'.8	10'.5	226° 52'.7	01'.0
17	200° 37'.4	60° 42'.9	05'.5	141° 58'.2	27'.7	34° 38'.8	10'.3	241° 55'.3	01'.1
18	215° 39'.9	75° 42'.3	04'.6	156° 58'.9	28'.1	49° 40'.9	10'.1	256° 58'.0	01'.1
19	230° 42'.4	90° 41'.7	03'.7	171° 59'.6	28'.5	64° 42'.9	09'.9	272° 00'.6	01'.2
20	245° 44'.8	105° 41'.1	02'.7	187° 00'.3	28'.9	79° 44'.9	09'.8	287° 03'.3	01'.2
21	260° 47'.3	120° 40'.5	01'.8	202° 01'.0	29'.3	94° 46'.9	09'.6	302° 05'.9	01'.3
22	275° 49'.7	135° 39'.9	00'.9	217° 01'.7	29'.7	109° 49'.0	09'.4	317° 08'.6	01'.3
23	290° 52'.2	150° 39'.3	00'.0	232° 02'.4	30'.0	124° 51'.0	09'.2	332° 11'.2	01'.4
28 Tuesday 00	305° 54'.7	165° 38'.7	16° 59'.1 N	247° 03'.1	19° 30'.4 N	139° 53'.0	7° 09'.0 N	347° 13'.9	17° 01'.5 S
01	320° 57'.1	180° 38'.1	58'.2	262° 03'.8	30'.8	154° 55'.0	08'.8	2° 16'.5	01'.5
02	335° 59'.6	195° 37'.5	57'.3	277° 04'.5	31'.2	169° 57'.1	08'.6	17° 19'.1	01'.6
03	351° 02'.1	210° 36'.9	56'.3	292° 05'.2	31'.6	184° 59'.1	08'.5	32° 21'.8	01'.6
04	6° 04'.5	225° 36'.3	55'.4	307° 05'.9	31'.9	200° 01'.1	08'.3	47° 24'.4	01'.7
05	21° 07'.0	240° 35'.7	54'.5	322° 06'.6	32'.3	215° 03'.1	08'.1	62° 27'.1	01'.8
06	36° 09'.5	255° 35'.1	53'.6	337° 07'.3	32'.7	230° 05'.2	07'.9	77° 29'.7	01'.8
07	51° 11'.9	270° 34'.5	52'.7	352° 08'.1	33'.1	245° 07'.2	07'.7	92° 32'.4	01'.9
08	66° 14'.4	285° 33'.8	51'.7	7° 08'.8	33'.4	260° 09'.2	07'.5	107° 35'.0	01'.9
09	81° 16'.8	300° 33'.2	50'.8	22° 09'.5	33'.8	275° 11'.2	07'.3	122° 37'.7	02'.0
10	96° 19'.3	315° 32'.6	49'.9	37° 10'.2	34'.2	290° 13'.3	07'.2	137° 40'.3	02'.0
11	111° 21'.8	330° 32'.0	49'.0	52° 10'.9	34'.6	305° 15'.3	07'.0	152° 42'.9	02'.1
12	126° 24'.2	345° 31'.4	16° 48'.0 N	67° 11'.6	19° 35'.0 N	320° 17'.3	7° 06'.8 N	167° 45'.6	17° 02'.2 S
13	141° 26'.7	0° 30'.8	47'.1	82° 12'.3	35'.3	335° 19'.3	06'.6	182° 48'.2	02'.2
14	156° 29'.2	15° 30'.3	46'.2	97° 13'.0	35'.7	350° 21'.4	06'.4	197° 50'.9	02'.3
15	171° 31'.6	30° 29'.7	45'.3	112° 13'.7	36'.1	5° 23'.4	06'.2	212° 53'.5	02'.3
16	186° 34'.1	45° 29'.1	44'.3	127° 14'.4	36'.5	20° 25'.4	06'.0	227° 56'.2	02'.4
17	201° 36'.6	60° 28'.5	43'.4	142° 15'.1	36'.8	35° 27'.4	05'.9	242° 58'.8	02'.5
18	216° 39'.0	75° 27'.9	42'.5	157° 15'.8	37'.2	50° 29'.5	05'.7	258° 01'.5	02'.5
19	231° 41'.5	90° 27'.3	41'.6	172° 16'.5	37'.6	65° 31'.5	05'.5	273° 04'.1	02'.6
20	246° 44'.0	105° 26'.7	40'.6	187° 17'.3	38'.0	80° 33'.5	05'.3	288° 06'.7	02'.6
21	261° 46'.4	120° 26'.1	39'.7	202° 18'.0	38'.3	95° 35'.5	05'.1	303° 09'.4	02'.7
22	276° 48'.9	135° 25'.5	38'.8	217° 18'.7	38'.7	110° 37'.6	04'.9	318° 12'.0	02'.8
23	291° 51'.3	150° 24'.9	37'.8	232° 19'.4	39'.1	125° 39'.6	04'.7	333° 14'.7	02'.8
	M.P. 03:36	v -0'.6	d 0'.9	v 0'.7	d 0'.4	v 2'.0	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.2	40° 19'.7 S
Achernar	335° 38'.1	57° 16'.0 S
Acrux	173° 27'.3	63° 03'.8 S
Adhara	255° 25'.1	28° 57'.6 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.4	56° 00'.2 N
Alkaid	153° 11'.1	49° 21'.2 N
Alnair	28° 02'.7	46° 59'.6 S
Alnilam	276° 02'.4	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.0	26° 44'.5 N
Alpheratz	357° 59'.5	29° 03'.0 N
Altair	62° 23'.1	8° 51'.0 N
Ankaa	353° 30'.8	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 09'.9	19° 13'.3 N
Atria	108° 00'.7	69° 01'.1 S
Avior	234° 25'.1	59° 29'.2 S
Bellatrix	278° 49'.0	6° 20'.7 N
Betelgeuse	271° 18'.4	7° 24'.4 N
Canopus	264° 03'.6	52° 41'.3 S
Capella	280° 57'.8	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.3 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.3	18° 01'.4 S
Dubhe	194° 11'.1	61° 47'.6 N
Elnath	278° 32'.6	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.6 N
Enif	34° 02'.1	9° 50'.6 N
Fomalhaut	15° 40'.8	29° 39'.4 S
Gacrux	172° 18'.7	57° 04'.6 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.2	60° 20'.6 S
Hamal	328° 18'.4	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 19'.0	74° 11'.4 N
Markab	13° 53'.6	15° 10'.0 N
Menkar	314° 31'.4	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.3 S
Miaplacidus	221° 44'.0	69° 41'.3 S
Mirfak	309° 02'.9	49° 50'.0 N
Nunki	76° 17'.2	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.4 S
Polaris	323° 57'.9	89° 13'.6 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.7 N
Rasalhague	96° 20'.6	12° 34'.0 N
Regulus	208° 00'.4	12° 00'.2 N
Rigel	281° 27'.3	8° 12'.5 S
Rigil Kent	140° 13'.0	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.2	56° 29'.7 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.8	16° 42'.3 S
Spica	158° 47'.8	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.2 S
Vega	80° 49'.1	38° 46'.8 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	220° 57'.8	12:57
Mars	301° 50'.6	07:33
Jupiter	194° 08'.8	14:42
Saturn	41° 14'.9	00:55

	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
26 00	178° 22'.9	19° 25'.7 N	234° 46'.4	5'.5	23° 48'.4 N	1'.8	58'.8
01	193° 22'.9	25'.2	249° 10'.9	5'.3	50'.2	1'.8	
02	208° 22'.9	24'.6	263° 35'.2	5'.3	52'.0	1'.5	
03	223° 22'.9	24'.1	277° 59'.5	5'.2	53'.5	1'.4	58'.9
04	238° 22'.9	23'.5	292° 23'.7	5'.1	54'.9	1'.3	
05	253° 22'.9	23'.0	306° 47'.8	5'.1	56'.2	1'.1	59'.0
06	268° 22'.9	22'.4	321° 11'.9	5'.0	57'.3	1'.0	
07	283° 22'.9	21'.9	335° 35'.9	5'.0	58'.3	0'.7	
08	298° 22'.9	21'.3	349° 59'.9	4'.8	59'.0	0'.7	59'.1
09	313° 22'.9	20'.7	4° 23'.7	4'.9	59'.7	0'.4	
10	328° 22'.9	20'.2	18° 47'.6	4'.7	24° 00'.1 N	0'.3	59'.2
11	343° 22'.9	19'.6	33° 11'.3	4'.8	00'.4	0'.2	
12	358° 22'.9	19° 19'.1 N	47° 35'.1	4'.6	24° 00'.6 N	0'.0	59'.2
13	13° 22'.9	18'.5	61° 58'.7	4'.6	00'.6	0'.2	59'.3
14	28° 22'.9	17'.9	76° 22'.3	4'.6	00'.4	0'.3	
15	43° 22'.9	17'.4	90° 45'.9	4'.5	00'.1	0'.6	
16	58° 22'.9	16'.8	105° 09'.4	4'.5	23° 59'.5 N	0'.6	59'.4
17	73° 22'.9	16'.3	119° 32'.9	4'.4	58'.9	0'.9	
18	88° 23'.0	15'.7	133° 56'.3	4'.4	58'.0	1'.0	59'.5
19	103° 23'.0	15'.1	148° 19'.7	4'.3	57'.0	1'.1	
20	118° 23'.0	14'.6	162° 43'.0	4'.3	55'.9	1'.4	
21	133° 23'.0	14'.0	177° 06'.3	4'.3	54'.5	1'.5	59'.6
22	148° 23'.0	13'.4	191° 29'.6	4'.2	53'.0	1'.6	
23	163° 23'.0	12'.9	205° 52'.8	4'.2	51'.4	1'.9	
27 00	178° 23'.0	19° 12'.3 N	220° 16'.0	4'.2	23° 49'.5 N	2'.0	59'.7
01	193° 23'.0	11'.7	234° 39'.2	4'.1	47'.5	2'.2	
02	208° 23'.0	11'.2	249° 02'.3	4'.1	45'.3	2'.3	
03	223° 23'.0	10'.6	263° 25'.4	4'.1	43'.0	2'.5	59'.8
04	238° 23'.0	10'.0	277° 48'.5	4'.1	40'.5	2'.7	
05	253° 23'.0	09'.5	292° 11'.6	4'.0	37'.8	2'.9	59'.9
06	268° 23'.0	08'.9	306° 34'.6	4'.0	34'.9	3'.0	
07	283° 23'.0	08'.3	320° 57'.6	4'.0	31'.9	3'.2	
08	298° 23'.0	07'.8	335° 20'.6	4'.0	28'.7	3'.3	60'.0
09	313° 23'.0	07'.2	349° 43'.6	4'.0	25'.4	3'.6	
10	328° 23'.0	06'.6	4° 06'.6	4'.0	21'.8	3'.6	
11	343° 23'.1	06'.1	18° 29'.6	3'.9	18'.2	3'.9	60'.1
12	358° 23'.1	19° 05'.5 N	32° 52'.5	4'.0	23° 14'.3 N	4'.0	60'.1
13	13° 23'.1	04'.9	47° 15'.5	4'.0	10'.3	4'.3	
14	28° 23'.1	04'.3	61° 38'.5	3'.9	06'.0	4'.3	60'.2
15	43° 23'.1	03'.8	76° 01'.4	3'.9	01'.7	4'.6	
16	58° 23'.1	03'.2	90° 24'.3	4'.0	22° 57'.1 N	4'.7	
17	73° 23'.1	02'.6	104° 47'.3	3'.9	52'.4	4'.8	60'.3
18	88° 23'.1	02'.0	119° 10'.2	4'.0	47'.6	5'.1	
19	103° 23'.1	01'.5	133° 33'.2	4'.0	42'.5	5'.2	
20	118° 23'.1	00'.9	147° 56'.2	3'.9	37'.3	5'.4	
21	133° 23'.2	00'.3	162° 19'.1	4'.0	31'.9	5'.5	60'.4
22	148° 23'.2	18° 59'.7 N	176° 42'.1	4'.0	26'.4	5'.7	
23	163° 23'.2	59'.1	191° 05'.1	4'.0	20'.7	5'.9	
28 00	178° 23'.2	18° 58'.6 N	205° 28'.1	4'.1	22° 14'.8 N	6'.0	60'.5
01	193° 23'.2	58'.0	219° 51'.2	4'.0	08'.8	6'.2	
02	208° 23'.2	57'.4	234° 14'.2	4'.1	02'.6	6'.4	
03	223° 23'.2	56'.8	248° 37'.3	4'.1	21° 56'.2 N	6'.5	
04	238° 23'.2	56'.2	263° 00'.4	4'.1	49'.7	6'.7	60'.6
05	253° 23'.3	55'.7	277° 23'.5	4'.1	43'.0	6'.9	
06	268° 23'.3	55'.1	291° 46'.6	4'.2	36'.1	7'.0	
07	283° 23'.3	54'.5	306° 09'.8	4'.2	29'.1	7'.1	60'.7
08	298° 23'.3	53'.9	320° 33'.0	4'.2	22'.0	7'.4	
09	313° 23'.3	53'.3	334° 56'.2	4'.2	14'.6	7'.5	
10	328° 23'.3	52'.7	349° 19'.4	4'.3	07'.1	7'.6	
11	343° 23'.3	52'.2	3° 42'.7	4'.3	20° 59'.5 N	7'.8	60'.8
12	358° 23'.3	18° 51'.6 N	18° 06'.0	4'.4	20° 51'.7 N	7'.9	60'.8
13	13° 23'.4	51'.0	32° 29'.4	4'.4	43'.8	8'.1	
14	28° 23'.4	50'.4	46° 52'.8	4'.4	35'.7	8'.3	
15	43° 23'.4	49'.8	61° 16'.2	4'.5	27'.4	8'.4	
16	58° 23'.4	49'.2	75° 39'.7	4'.5	19'.0	8'.6	60'.9
17	73° 23'.4	48'.6	90° 03'.2	4'.6	10'.4	8'.7	
18	88° 23'.4	48'.1	104° 26'.8	4'.6	01'.7	8'.8	
19	103° 23'.5	47'.5	118° 50'.4	4'.7	19° 52'.9 N	9'.0	
20	118° 23'.5	46'.9	133° 14'.1	4'.7	43'.9	9'.2	
21	133° 23'.5	46'.3	147° 37'.8	4'.7	34'.7	9'.2	61'.0
22	148° 23'.5	45'.7	162° 01'.5	4'.8	25'.5	9'.5	
23	163° 23'.5	45'.1	176° 25'.3	4'.8	16'.0	9'.5	
	SD 15'.7	d 0'.6	SD	16'.1	16'.4	16'.6	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
26	6 28	6 28	12:06	08:42	21:12	26d 15%
27	6 28	6 28	12:06	09:43	22:14	27d 8%
28	6 27	6 27	12:06	10:45	23:15	28d 3%

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1992 July 29, 30, 31 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +0.8		JUPITER -1.7		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
29 Wednesday 00	306° 53'.8	165° 24'.3	16° 36'.9 N	247° 20'.1	19° 39'.5 N	140° 41'.6	7° 04'.5 N	348° 17'.3	17° 02'.9 S
01	321° 56'.3	180° 23'.7	36'.0	262° 20'.8	39'.8	155° 43'.6	04'.4	3° 20'.0	02'.9
02	336° 58'.7	195° 23'.1	35'.0	277° 21'.5	40'.2	170° 45'.7	04'.2	18° 22'.6	03'.0
03	352° 01'.2	210° 22'.5	34'.1	292° 22'.2	40'.6	185° 47'.7	04'.0	33° 25'.3	03'.0
04	7° 03'.7	225° 21'.9	33'.1	307° 22'.9	40'.9	200° 49'.7	03'.8	48° 27'.9	03'.1
05	22° 06'.1	240° 21'.3	32'.2	322° 23'.6	41'.3	215° 51'.7	03'.6	63° 30'.6	03'.2
06	37° 08'.6	255° 20'.7	31'.3	337° 24'.3	41'.7	230° 53'.7	03'.4	78° 33'.2	03'.2
07	52° 11'.1	270° 20'.2	30'.3	352° 25'.1	42'.1	245° 55'.8	03'.2	93° 35'.8	03'.3
08	67° 13'.5	285° 19'.6	29'.4	7° 25'.8	42'.4	260° 57'.8	03'.1	108° 38'.5	03'.3
09	82° 16'.0	300° 19'.0	28'.4	22° 26'.5	42'.8	275° 59'.8	02'.9	123° 41'.1	03'.4
10	97° 18'.5	315° 18'.4	27'.5	37° 27'.2	43'.2	291° 01'.8	02'.7	138° 43'.8	03'.5
11	112° 20'.9	330° 17'.8	26'.6	52° 27'.9	43'.5	306° 03'.9	02'.5	153° 46'.4	03'.5
12	127° 23'.4	345° 17'.2	16° 25'.6 N	67° 28'.6	19° 43'.9 N	321° 05'.9	7° 02'.3 N	168° 49'.1	17° 03'.6 S
13	142° 25'.8	0° 16'.6	24'.7	82° 29'.3	44'.3	336° 07'.9	02'.1	183° 51'.7	03'.6
14	157° 28'.3	15° 16'.0	23'.7	97° 30'.0	44'.6	351° 09'.9	01'.9	198° 54'.4	03'.7
15	172° 30'.8	30° 15'.5	22'.8	112° 30'.7	45'.0	6° 12'.0	01'.7	213° 57'.0	03'.8
16	187° 33'.2	45° 14'.9	21'.8	127° 31'.4	45'.4	21° 14'.0	01'.6	228° 59'.7	03'.8
17	202° 35'.7	60° 14'.3	20'.9	142° 32'.1	45'.7	36° 16'.0	01'.4	244° 02'.3	03'.9
18	217° 38'.2	75° 13'.7	19'.9	157° 32'.9	46'.1	51° 18'.0	01'.2	259° 05'.0	03'.9
19	232° 40'.6	90° 13'.1	19'.0	172° 33'.6	46'.5	66° 20'.0	01'.0	274° 07'.6	04'.0
20	247° 43'.1	105° 12'.5	18'.0	187° 34'.3	46'.8	81° 22'.1	00'.8	289° 10'.2	04'.0
21	262° 45'.6	120° 11'.9	17'.1	202° 35'.0	47'.2	96° 24'.1	00'.6	304° 12'.9	04'.1
22	277° 48'.0	135° 11'.4	16'.1	217° 35'.7	47'.6	111° 26'.1	00'.4	319° 15'.5	04'.2
23	292° 50'.5	150° 10'.8	15'.2	232° 36'.4	47'.9	126° 28'.1	00'.3	334° 18'.2	04'.2
30 Thursday 00	307° 53'.0	165° 10'.2	16° 14'.2 N	247° 37'.1	19° 48'.3 N	141° 30'.1	7° 00'.1 N	349° 20'.8	17° 04'.3 S
01	322° 55'.4	180° 09'.6	13'.3	262° 37'.8	48'.7	156° 32'.2	6° 59'.9 N	4° 23'.5	04'.3
02	337° 57'.9	195° 09'.0	12'.3	277° 38'.5	49'.0	171° 34'.2	59'.7	19° 26'.1	04'.4
03	353° 00'.3	210° 08'.5	11'.4	292° 39'.2	49'.4	186° 36'.2	59'.5	34° 28'.8	04'.5
04	8° 02'.8	225° 07'.9	10'.4	307° 40'.0	49'.8	201° 38'.2	59'.3	49° 31'.4	04'.5
05	23° 05'.3	240° 07'.3	09'.5	322° 40'.7	50'.1	216° 40'.3	59'.1	64° 34'.1	04'.6
06	38° 07'.7	255° 06'.7	08'.5	337° 41'.4	50'.5	231° 42'.3	58'.9	79° 36'.7	04'.6
07	53° 10'.2	270° 06'.1	07'.5	352° 42'.1	50'.9	246° 44'.3	58'.8	94° 39'.4	04'.7
08	68° 12'.7	285° 05'.6	06'.6	7° 42'.8	51'.2	261° 46'.3	58'.6	109° 42'.0	04'.8
09	83° 15'.1	300° 05'.0	05'.6	22° 43'.5	51'.6	276° 48'.3	58'.4	124° 44'.7	04'.8
10	98° 17'.6	315° 04'.4	04'.7	37° 44'.2	51'.9	291° 50'.4	58'.2	139° 47'.3	04'.9
11	113° 20'.1	330° 03'.8	03'.7	52° 44'.9	52'.3	306° 52'.4	58'.0	154° 49'.9	04'.9
12	128° 22'.5	345° 03'.3	16° 02'.7 N	67° 45'.6	19° 52'.7 N	321° 54'.4	6° 57'.8 N	169° 52'.6	17° 05'.0 S
13	143° 25'.0	0° 02'.7	01'.8	82° 46'.3	53'.0	336° 56'.4	57'.6	184° 55'.2	05'.0
14	158° 27'.4	15° 02'.1	00'.8	97° 47'.1	53'.4	351° 58'.4	57'.4	199° 57'.9	05'.1
15	173° 29'.9	30° 01'.5	15° 59'.9 N	112° 47'.8	53'.8	7° 00'.5	57'.2	215° 00'.5	05'.2
16	188° 32'.4	45° 01'.0	58'.9	127° 48'.5	54'.1	22° 02'.5	57'.1	230° 03'.2	05'.2
17	203° 34'.8	60° 00'.4	57'.9	142° 49'.2	54'.5	37° 04'.5	56'.9	245° 05'.8	05'.3
18	218° 37'.3	74° 59'.8	57'.0	157° 49'.9	54'.8	52° 06'.5	56'.7	260° 08'.5	05'.3
19	233° 39'.8	89° 59'.3	56'.0	172° 50'.6	55'.2	67° 08'.5	56'.5	275° 11'.1	05'.4
20	248° 42'.2	104° 58'.7	55'.0	187° 51'.3	55'.5	82° 10'.6	56'.3	290° 13'.8	05'.5
21	263° 44'.7	119° 58'.1	54'.1	202° 52'.0	55'.9	97° 12'.6	56'.1	305° 16'.4	05'.5
22	278° 47'.2	134° 57'.5	53'.1	217° 52'.7	56'.3	112° 14'.6	55'.9	320° 19'.1	05'.6
23	293° 49'.6	149° 57'.0	52'.1	232° 53'.5	56'.6	127° 16'.6	55'.7	335° 21'.7	05'.6
31 Friday 00	308° 52'.1	164° 56'.4	15° 51'.1 N	247° 54'.2	19° 57'.0 N	142° 18'.6	6° 55'.6 N	350° 24'.4	17° 05'.7 S
01	323° 54'.6	179° 55'.8	50'.2	262° 54'.9	57'.3	157° 20'.6	55'.4	5° 27'.0	05'.8
02	338° 57'.0	194° 55'.3	49'.2	277° 55'.6	57'.7	172° 22'.7	55'.2	20° 29'.7	05'.8
03	353° 59'.5	209° 54'.7	48'.2	292° 56'.3	58'.1	187° 24'.7	55'.0	35° 32'.3	05'.9
04	9° 01'.9	224° 54'.1	47'.3	307° 57'.0	58'.4	202° 26'.7	54'.8	50° 34'.9	05'.9
05	24° 04'.4	239° 53'.6	46'.3	322° 57'.7	58'.8	217° 28'.7	54'.6	65° 37'.6	06'.0
06	39° 06'.9	254° 53'.0	45'.3	337° 58'.4	59'.1	232° 30'.7	54'.4	80° 40'.2	06'.0
07	54° 09'.3	269° 52'.4	44'.3	352° 59'.2	59'.5	247° 32'.8	54'.2	95° 42'.9	06'.1
08	69° 11'.8	284° 51'.9	43'.3	7° 59'.9	59'.8	262° 34'.8	54'.0	110° 45'.5	06'.2
09	84° 14'.3	299° 51'.3	42'.4	23° 00'.6	20° 00'.2 N	277° 36'.8	53'.9	125° 48'.2	06'.2
10	99° 16'.7	314° 50'.7	41'.4	38° 01'.3	00'.5	292° 38'.8	53'.7	140° 50'.8	06'.3
11	114° 19'.2	329° 50'.2	40'.4	53° 02'.0	00'.9	307° 40'.8	53'.5	155° 53'.5	06'.3
12	129° 21'.7	344° 49'.6	15° 39'.4 N	68° 02'.7	20° 01'.2 N	322° 42'.8	6° 53'.3 N	170° 56'.1	17° 06'.4 S
13	144° 24'.1	359° 49'.0	38'.5	83° 03'.4	01'.6	337° 44'.9	53'.1	185° 58'.8	06'.5
14	159° 26'.6	14° 48'.5	37'.5	98° 04'.1	02'.0	352° 46'.9	52'.9	201° 01'.4	06'.5
15	174° 29'.1	29° 47'.9	36'.5	113° 04'.8	02'.3	7° 48'.9	52'.7	216° 04'.1	06'.6
16	189° 31'.5	44° 47'.4	35'.5	128° 05'.6	02'.7	22° 50'.9	52'.5	231° 06'.7	06'.6
17	204° 34'.0	59° 46'.8	34'.5	143° 06'.3	03'.0	37° 52'.9	52'.3	246° 09'.4	06'.7
18	219° 36'.4	74° 46'.2	33'.5	158° 07'.0	03'.4	52° 55'.0	52'.2	261° 12'.0	06'.8
19	234° 38'.9	89° 45'.7	32'.6	173° 07'.7	03'.7	67° 57'.0	52'.0	276° 14'.7	06'.8
20	249° 41'.4	104° 45'.1	31'.6	188° 08'.4	04'.1	82° 59'.0	51'.8	291° 17'.3	06'.9
21	264° 43'.8	119° 44'.6	30'.6	203° 09'.1	04'.4	98° 01'.0	51'.6	306° 20'.0	06'.9
22	279° 46'.3	134° 44'.0	29'.6	218° 09'.8	04'.8	113° 03'.0	51'.4	321° 22'.6	07'.0
23	294° 48'.8	149° 43'.4	28'.6	233° 10'.6	05'.1	128° 05'.0	51'.2	336° 25'.2	07'.0
	M.P. 03:24	v -0'.6	d 1'.0	v 0'.7	d 0'.4	v 2'.0	d 0'.2	v 2'.6	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.2	40° 19'.7 S
Achernar	335° 38'.1	57° 16'.0 S
Acrux	173° 27'.3	63° 03'.8 S
Adhara	255° 25'.1	28° 57'.6 S
Aldebaran	291° 07'.5	16° 29'.7 N
Alioth	166° 34'.4	56° 00'.2 N
Alkaid	153° 11'.1	49° 21'.2 N
Alnair	28° 02'.7	46° 59'.6 S
Alnilam	276° 02'.4	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.1	26° 44'.5 N
Alpheratz	357° 59'.5	29° 03'.0 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.7	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 09'.9	19° 13'.3 N
Atria	108° 00'.8	69° 01'.1 S
Avior	234° 25'.1	59° 29'.2 S
Bellatrix	278° 48'.9	6° 20'.7 N
Betelgeuse	271° 18'.4	7° 24'.4 N
Canopus	264° 03'.5	52° 41'.3 S
Capella	280° 57'.8	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.3 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.3	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.6 N
Elnath	278° 32'.6	28° 36'.1 N
Eltanin	90° 52'.9	51° 29'.6 N
Enif	34° 02'.1	9° 50'.6 N
Fomalhaut	15° 40'.8	29° 39'.4 S
Gacrux	172° 18'.7	57° 04'.6 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.2	60° 20'.6 S
Hamal	328° 18'.4	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 19'.1	74° 11'.4 N
Markab	13° 53'.6	15° 10'.1 N
Menkar	314° 31'.4	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.3 S
Miaplacidus	221° 44'.0	69° 41'.3 S
Mirfak	309° 02'.9	49° 50'.0 N
Nunki	76° 17'.2	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.4 S
Polaris	323° 56'.6	89° 13'.6 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.7 N
Rasalhague	96° 20'.6	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.2	8° 12'.5 S
Rigil Kent	140° 13'.0	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.2	56° 29'.7 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.7	16° 42'.2 S
Spica	158° 47'.8	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.2 S
Vega	80° 49'.1	38° 46'.8 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	217° 17'.2	13:00
Mars	299° 44'.2	07:29
Jupiter	193° 37'.2	14:32
Saturn	41° 27'.9	00:42

SUN				MOON					
GHA	Dec	GHA	v	Dec	d	HP
178° 23'.5	18° 44'.5 N	190° 49'.1	4'.9	19° 06'.5 N	9'.7	61'.0
193° 23'.6	43'.9	205° 13'.0	5'.0	18° 56'.8 N	9'.9	
208° 23'.6	43'.3	219° 37'.0	5'.0	46'.9	10'.0	61'.1
223° 23'.6	42'.7	234° 01'.0	5'.1	36'.9	10'.1	
238° 23'.6	42'.1	248° 25'.1	5'.1	26'.8	10'.3	
253° 23'.6	41'.5	262° 49'.2	5'.2	16'.5	10'.3	
268° 23'.7	40'.9	277° 13'.4	5'.2	06'.2	10'.6	
283° 23'.7	40'.3	291° 37'.6	5'.3	17° 55'.6 N	10'.6	
298° 23'.7	39'.8	306° 01'.9	5'.3	45'.0	10'.8	
313° 23'.7	39'.2	320° 26'.2	5'.4	34'.2	10'.9	61'.2
328° 23'.7	38'.6	334° 50'.6	5'.5	23'.3	11'.0	
343° 23'.8	38'.0	349° 15'.1	5'.5	12'.3	11'.1	
358° 23'.8	18° 37'.4 N	3° 39'.6	5'.6	17° 01'.2 N	11'.3	61'.2
13° 23'.8	36'.8	18° 04'.2	5'.7	16° 49'.9 N	11'.4	
28° 23'.8	36'.2	32° 28'.9	5'.7	38'.5	11'.5	
43° 23'.8	35'.6	46° 53'.6	5'.7	27'.0	11'.6	
58° 23'.9	35'.0	61° 18'.3	5'.9	15'.4	11'.7	
73° 23'.9	34'.4	75° 43'.2	5'.9	03'.7	11'.9	
88° 23'.9	33'.8	90° 08'.1	5'.9	15° 51'.8 N	11'.9	61'.3
103° 23'.9	33'.2	104° 33'.0	6'.1	39'.9	12'.1	
118° 24'.0	32'.6	118° 58'.1	6'.1	27'.8	12'.2	
133° 24'.0	32'.0	133° 23'.2	6'.1	15'.6	12'.3	
148° 24'.0	31'.4	147° 48'.3	6'.3	03'.3	12'.3	
163° 24'.0	30'.7	162° 13'.6	6'.2	14° 51'.0 N	12'.5	
178° 24'.1	18° 30'.1 N	176° 38'.8	6'.4	14° 38'.5 N	12'.6	61'.3
193° 24'.1	29'.5	191° 04'.2	6'.4	25'.9	12'.7	
208° 24'.1	28'.9	205° 29'.6	6'.5	13'.2	12'.8	
223° 24'.1	28'.3	219° 55'.1	6'.6	00'.4	12'.8	
238° 24'.2	27'.7	234° 20'.7	6'.6	13° 47'.6 N	13'.0	
253° 24'.2	27'.1	248° 46'.3	6'.7	34'.6	13'.0	
268° 24'.2	26'.5	263° 12'.0	6'.7	21'.6	13'.2	
283° 24'.2	25'.9	277° 37'.7	6'.8	08'.4	13'.2	
298° 24'.3	25'.3	292° 03'.5	6'.9	12° 55'.2 N	13'.3	
313° 24'.3	24'.7	306° 29'.4	7'.0	41'.9	13'.4	
328° 24'.3	24'.1	320° 55'.4	7'.0	28'.5	13'.5	
343° 24'.3	23'.5	335° 21'.4	7'.0	15'.0	13'.5	
358° 24'.4	18° 22'.8 N	349° 47'.4	7'.2	12° 01'.5 N	13'.7	61'.3
13° 24'.4	22'.2	4° 13'.6	7'.2	11° 47'.8 N	13'.7	
28° 24'.4	21'.6	18° 39'.8	7'.3	34'.1	13'.7	
43° 24'.4	21'.0	33° 06'.1	7'.3	20'.4	13'.9	
58° 24'.5	20'.4	47° 32'.4	7'.4	06'.5	13'.9	
73° 24'.5	19'.8	61° 58'.8	7'.5	10° 52'.6 N	14'.0	
88° 24'.5	19'.2	76° 25'.3	7'.5	38'.6	14'.0	
103° 24'.6	18'.6	90° 51'.8	7'.6	24'.6	14'.1	
118° 24'.6	17'.9	105° 18'.4	7'.6	10'.5	14'.2	
133° 24'.6	17'.3	119° 45'.0	7'.7	9° 56'.3 N	14'.2	
148° 24'.6	16'.7	134° 11'.7	7'.8	42'.1	14'.3	61'.2
163° 24'.7	16'.1	148° 38'.5	7'.8	27'.8	14'.4	
178° 24'.7	18° 15'.5 N	163° 05'.3	7'.9	9° 13'.4 N	14'.4	61'.2
193° 24'.7	14'.9	177° 32'.2	8'.0	8° 59'.0 N	14'.4	
208° 24'.8	14'.2	191° 59'.2	8'.0	44'.6	14'.5	
223° 24'.8	13'.6	206° 26'.2	8'.1	30'.1	14'.6	
238° 24'.8	13'.0	220° 53'.3	8'.1	15'.5	14'.6	
253° 24'.9	12'.4	235° 20'.4	8'.2	00'.9	14'.6	
268° 24'.9	11'.8	249° 47'.6	8'.2	7° 46'.3 N	14'.7	
283° 24'.9	11'.1	264° 14'.8	8'.3	31'.6	14'.7	
298° 25'.0	10'.5	278° 42'.1	8'.4	16'.9	14'.7	61'.1
313° 25'.0	09'.9	293° 09'.5	8'.4	02'.2	14'.8	
328° 25'.0	09'.3	307° 36'.9	8'.5	6° 47'.4 N	14'.8	
343° 25'.1	08'.6	322° 04'.4	8'.5	32'.6	14'.9	
358° 25'.1	18° 08'.0 N	336° 31'.9	8'.5	6° 17'.7 N	14'.9	61'.1
13° 25'.1	07'.4	350° 59'.4	8'.7	02'.8	14'.9	
28° 25'.2	06'.8	5° 27'.1	8'.6	5° 47'.9 N	14'.9	
43° 25'.2	06'.2	19° 54'.7	8'.8	33'.0	15'.0	61'.0
58° 25'.2	05'.5	34° 22'.5	8'.7	18'.0	15'.0	
73° 25'.3	04'.9	48° 50'.2	8'.8	03'.0	15'.0	
88° 25'.3	04'.3	63° 18'.0	8'.9	4° 48'.0 N	15'.0	
103° 25'.3	03'.6	77° 45'.9	8'.9	33'.0	15'.1	
118° 25'.4	03'.0	92° 13'.8	9'.0	17'.9	15'.0	60'.9
133° 25'.4	02'.4	106° 41'.8	9'.0	02'.9	15'.1	
148° 25'.4	01'.8	121° 09'.8	9'.1	3° 47'.8 N	15'.1	
163° 25'.5	01'.1	135° 37'.9	9'.0	32'.7	15'.1	
SD 15'.8	d 0'.6	SD 16'.7		16'.7		16'.6

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

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

	SUN			MOON		
Day	Eqn. of Time 00h	Eqn. of Time 12h	Mer. Pass.	Mer. Pass. Upper	Mer. Pass. Lower	Age/ Vis
29	6 26	6 25	12:06	11:45	24:14	29d 0%
30	6 24	6 23	12:06	12:42	00:14	1d 1%
31	6 21	6 20	12:06	13:37	01:10	2d 4%

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1992 August 1, 2, 3 (Sat, Sun, Mon)

GMT	ARIES	VENUS -3.9		MARS +0.8		JUPITER -1.7		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
1 Saturday 00	309° 51'.2	164° 42'.9	15° 27'.6 N	248° 11'.3	20° 05'.5 N	143° 07'.1	6° 51'.0 N	351° 27'.9	17° 07'.1 S
01	324° 53'.7	179° 42'.3	26'.6	263° 12'.0	05'.8	158° 09'.1	50'.8	6° 30'.5	07'.2
02	339° 56'.2	194° 41'.8	25'.6	278° 12'.7	06'.2	173° 11'.1	50'.6	21° 33'.2	07'.2
03	354° 58'.6	209° 41'.2	24'.7	293° 13'.4	06'.5	188° 13'.1	50'.4	36° 35'.8	07'.3
04	10° 01'.1	224° 40'.7	23'.7	308° 14'.1	06'.9	203° 15'.1	50'.3	51° 38'.5	07'.3
05	25° 03'.5	239° 40'.1	22'.7	323° 14'.8	07'.2	218° 17'.1	50'.1	66° 41'.1	07'.4
06	40° 06'.0	254° 39'.6	21'.7	338° 15'.5	07'.6	233° 19'.2	49'.9	81° 43'.8	07'.5
07	55° 08'.5	269° 39'.0	20'.7	353° 16'.3	07'.9	248° 21'.2	49'.7	96° 46'.4	07'.5
08	70° 10'.9	284° 38'.4	19'.7	8° 17'.0	08'.3	263° 23'.2	49'.5	111° 49'.1	07'.6
09	85° 13'.4	299° 37'.9	18'.7	23° 17'.7	08'.6	278° 25'.2	49'.3	126° 51'.7	07'.6
10	100° 15'.9	314° 37'.3	17'.7	38° 18'.4	09'.0	293° 27'.2	49'.1	141° 54'.4	07'.7
11	115° 18'.3	329° 36'.8	16'.7	53° 19'.1	09'.3	308° 29'.2	48'.9	156° 57'.0	07'.8
12	130° 20'.8	344° 36'.2	15° 15'.7 N	68° 19'.8	20° 09'.6 N	323° 31'.2	6° 48'.7 N	171° 59'.7	17° 07'.8 S
13	145° 23'.3	359° 35'.7	14'.7	83° 20'.5	10'.0	338° 33'.3	48'.5	187° 02'.3	07'.9
14	160° 25'.7	14° 35'.1	13'.7	98° 21'.3	10'.3	353° 35'.3	48'.4	202° 05'.0	07'.9
15	175° 28'.2	29° 34'.6	12'.7	113° 22'.0	10'.7	8° 37'.3	48'.2	217° 07'.6	08'.0
16	190° 30'.7	44° 34'.0	11'.7	128° 22'.7	11'.0	23° 39'.3	48'.0	232° 10'.3	08'.1
17	205° 33'.1	59° 33'.5	10'.7	143° 23'.4	11'.4	38° 41'.3	47'.8	247° 12'.9	08'.1
18	220° 35'.6	74° 32'.9	09'.7	158° 24'.1	11'.7	53° 43'.3	47'.6	262° 15'.6	08'.2
19	235° 38'.0	89° 32'.4	08'.7	173° 24'.8	12'.1	68° 45'.4	47'.4	277° 18'.2	08'.2
20	250° 40'.5	104° 31'.8	07'.7	188° 25'.5	12'.4	83° 47'.4	47'.2	292° 20'.9	08'.3
21	265° 43'.0	119° 31'.3	06'.7	203° 26'.3	12'.7	98° 49'.4	47'.0	307° 23'.5	08'.3
22	280° 45'.4	134° 30'.8	05'.7	218° 27'.0	13'.1	113° 51'.4	46'.8	322° 26'.2	08'.4
23	295° 47'.9	149° 30'.2	04'.7	233° 27'.7	13'.4	128° 53'.4	46'.6	337° 28'.8	08'.5
2 Sunday 00	310° 50'.4	164° 29'.7	15° 03'.7 N	248° 28'.4	20° 13'.8 N	143° 55'.4	6° 46'.5 N	352° 31'.5	17° 08'.5 S
01	325° 52'.8	179° 29'.1	02'.7	263° 29'.1	14'.1	158° 57'.4	46'.3	7° 34'.1	08'.6
02	340° 55'.3	194° 28'.6	01'.7	278° 29'.8	14'.5	173° 59'.5	46'.1	22° 36'.8	08'.6
03	355° 57'.8	209° 28'.0	00'.7	293° 30'.5	14'.8	189° 01'.5	45'.9	37° 39'.4	08'.7
04	11° 00'.2	224° 27'.5	14° 59'.7 N	308° 31'.3	15'.1	204° 03'.5	45'.7	52° 42'.0	08'.8
05	26° 02'.7	239° 26'.9	58'.6	323° 32'.0	15'.5	219° 05'.5	45'.5	67° 44'.7	08'.8
06	41° 05'.2	254° 26'.4	57'.6	338° 32'.7	15'.8	234° 07'.5	45'.3	82° 47'.3	08'.9
07	56° 07'.6	269° 25'.9	56'.6	353° 33'.4	16'.2	249° 09'.5	45'.1	97° 50'.0	08'.9
08	71° 10'.1	284° 25'.3	55'.6	8° 34'.1	16'.5	264° 11'.5	44'.9	112° 52'.6	09'.0
09	86° 12'.5	299° 24'.8	54'.6	23° 34'.8	16'.8	279° 13'.6	44'.7	127° 55'.3	09'.1
10	101° 15'.0	314° 24'.2	53'.6	38° 35'.6	17'.2	294° 15'.6	44'.6	142° 57'.9	09'.1
11	116° 17'.5	329° 23'.7	52'.6	53° 36'.3	17'.5	309° 17'.6	44'.4	158° 00'.6	09'.2
12	131° 19'.9	344° 23'.2	14° 51'.6 N	68° 37'.0	20° 17'.9 N	324° 19'.6	6° 44'.2 N	173° 03'.2	17° 09'.2 S
13	146° 22'.4	359° 22'.6	50'.5	83° 37'.7	18'.2	339° 21'.6	44'.0	188° 05'.9	09'.3
14	161° 24'.9	14° 22'.1	49'.5	98° 38'.4	18'.5	354° 23'.6	43'.8	203° 08'.5	09'.3
15	176° 27'.3	29° 21'.5	48'.5	113° 39'.1	18'.9	9° 25'.6	43'.6	218° 11'.2	09'.4
16	191° 29'.8	44° 21'.0	47'.5	128° 39'.9	19'.2	24° 27'.7	43'.4	233° 13'.8	09'.5
17	206° 32'.3	59° 20'.5	46'.5	143° 40'.6	19'.5	39° 29'.7	43'.2	248° 16'.5	09'.5
18	221° 34'.7	74° 19'.9	45'.5	158° 41'.3	19'.9	54° 31'.7	43'.0	263° 19'.1	09'.6
19	236° 37'.2	89° 19'.4	44'.4	173° 42'.0	20'.2	69° 33'.7	42'.8	278° 21'.8	09'.6
20	251° 39'.6	104° 18'.9	43'.4	188° 42'.7	20'.6	84° 35'.7	42'.6	293° 24'.4	09'.7
21	266° 42'.1	119° 18'.3	42'.4	203° 43'.4	20'.9	99° 37'.7	42'.4	308° 27'.1	09'.8
22	281° 44'.6	134° 17'.8	41'.4	218° 44'.2	21'.2	114° 39'.7	42'.3	323° 29'.7	09'.8
23	296° 47'.0	149° 17'.3	40'.4	233° 44'.9	21'.6	129° 41'.7	42'.1	338° 32'.4	09'.9
3 Monday 00	311° 49'.5	164° 16'.7	14° 39'.3 N	248° 45'.6	20° 21'.9 N	144° 43'.8	6° 41'.9 N	353° 35'.0	17° 09'.9 S
01	326° 52'.0	179° 16'.2	38'.3	263° 46'.3	22'.2	159° 45'.8	41'.7	8° 37'.7	10'.0
02	341° 54'.4	194° 15'.7	37'.3	278° 47'.0	22'.6	174° 47'.8	41'.5	23° 40'.3	10'.1
03	356° 56'.9	209° 15'.1	36'.3	293° 47'.7	22'.9	189° 49'.8	41'.3	38° 43'.0	10'.1
04	11° 59'.4	224° 14'.6	35'.2	308° 48'.5	23'.2	204° 51'.8	41'.1	53° 45'.6	10'.2
05	27° 01'.8	239° 14'.1	34'.2	323° 49'.2	23'.6	219° 53'.8	40'.9	68° 48'.3	10'.2
06	42° 04'.3	254° 13'.5	33'.2	338° 49'.9	23'.9	234° 55'.8	40'.7	83° 50'.9	10'.3
07	57° 06'.8	269° 13'.0	32'.2	353° 50'.6	24'.2	249° 57'.8	40'.5	98° 53'.6	10'.4
08	72° 09'.2	284° 12'.5	31'.1	8° 51'.3	24'.6	264° 59'.9	40'.3	113° 56'.2	10'.4
09	87° 11'.7	299° 11'.9	30'.1	23° 52'.0	24'.9	280° 01'.9	40'.1	128° 58'.9	10'.5
10	102° 14'.1	314° 11'.4	29'.1	38° 52'.8	25'.2	295° 03'.9	40'.0	144° 01'.5	10'.5
11	117° 16'.6	329° 10'.9	28'.1	53° 53'.5	25'.6	310° 05'.9	39'.8	159° 04'.2	10'.6
12	132° 19'.1	344° 10'.4	14° 27'.0 N	68° 54'.2	20° 25'.9 N	325° 07'.9	6° 39'.6 N	174° 06'.8	17° 10'.6 S
13	147° 21'.5	359° 09'.8	26'.0	83° 54'.9	26'.2	340° 09'.9	39'.4	189° 09'.5	10'.7
14	162° 24'.0	14° 09'.3	25'.0	98° 55'.6	26'.6	355° 11'.9	39'.2	204° 12'.1	10'.8
15	177° 26'.5	29° 08'.8	23'.9	113° 56'.4	26'.9	10° 13'.9	39'.0	219° 14'.8	10'.8
16	192° 28'.9	44° 08'.3	22'.9	128° 57'.1	27'.2	25° 15'.9	38'.8	234° 17'.4	10'.9
17	207° 31'.4	59° 07'.7	21'.9	143° 57'.8	27'.5	40° 18'.0	38'.6	249° 20'.1	10'.9
18	222° 33'.9	74° 07'.2	20'.8	158° 58'.5	27'.9	55° 20'.0	38'.4	264° 22'.7	11'.0
19	237° 36'.3	89° 06'.7	19'.8	173° 59'.2	28'.2	70° 22'.0	38'.2	279° 25'.4	11'.1
20	252° 38'.8	104° 06'.2	18'.8	188° 59'.9	28'.5	85° 24'.0	38'.0	294° 28'.0	11'.1
21	267° 41'.2	119° 05'.6	17'.7	204° 00'.7	28'.9	100° 26'.0	37'.8	309° 30'.7	11'.2
22	282° 43'.7	134° 05'.1	16'.7	219° 01'.4	29'.2	115° 28'.0	37'.7	324° 33'.3	11'.2
23	297° 46'.2	149° 04'.6	15'.6	234° 02'.1	29'.5	130° 30'.0	37'.5	339° 36'.0	11'.3
	M.P. 03:12	v -0'.5	d 1'.0	v 0'.7	d 0'.3	v 2'.0	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.1	40° 19'.7 S
Achernar	335° 38'.1	57° 16'.0 S
Acrux	173° 27'.3	63° 03'.8 S
Adhara	255° 25'.1	28° 57'.6 S
Aldebaran	291° 07'.4	16° 29'.7 N
Alioth	166° 34'.4	56° 00'.2 N
Alkaid	153° 11'.2	49° 21'.2 N
Alnair	28° 02'.7	46° 59'.6 S
Alnilam	276° 02'.4	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.1	26° 44'.5 N
Alpheratz	357° 59'.4	29° 03'.0 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.7	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 09'.9	19° 13'.3 N
Atria	108° 00'.8	69° 01'.2 S
Avior	234° 25'.1	59° 29'.1 S
Bellatrix	278° 48'.9	6° 20'.7 N
Betelgeuse	271° 18'.4	7° 24'.4 N
Canopus	264° 03'.5	52° 41'.3 S
Capella	280° 57'.8	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.4 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.3	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.6 N
Elnath	278° 32'.6	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.6 N
Enif	34° 02'.1	9° 50'.6 N
Fomalhaut	15° 40'.8	29° 39'.4 S
Gacrux	172° 18'.7	57° 04'.6 S
Gienah	176° 08'.5	17° 30'.2 S
Hadar	149° 10'.3	60° 20'.6 S
Hamal	328° 18'.3	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 19'.1	74° 11'.4 N
Markab	13° 53'.6	15° 10'.1 N
Menkar	314° 31'.4	4° 03'.8 N
Menkent	148° 26'.1	36° 20'.2 S
Miaplacidus	221° 44'.0	69° 41'.3 S
Mirfak	309° 02'.9	49° 50'.0 N
Nunki	76° 17'.2	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.5 S
Polaris	323° 55'.4	89° 13'.6 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.7 N
Rasalhague	96° 20'.7	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.2	8° 12'.4 S
Rigil Kent	140° 13'.0	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.2	56° 29'.7 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.7	16° 42'.2 S
Spica	158° 47'.8	11° 07'.5 S
Suhail	223° 04'.4	43° 24'.2 S
Vega	80° 49'.1	38° 46'.8 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	213° 39'.3	13:02
Mars	297° 38'.0	07:26
Jupiter	193° 05'.1	14:22
Saturn	41° 41'.1	00:30

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
1 Saturday 00	178° 25'.5	18° 00'.5 N	150° 05'.9	9'.2	3° 17'.6 N	15'.1	60'.9
01	193° 25'.6	17° 59'.9 N	164° 34'.1	9'.2	02'.5	15'.1	60'.8
02	208° 25'.6	59'.2	179° 02'.3	9'.2	2° 47'.4 N	15'.1	
03	223° 25'.6	58'.6	193° 30'.5	9'.3	32'.3	15'.1	
04	238° 25'.7	58'.0	207° 58'.8	9'.3	17'.2	15'.1	
05	253° 25'.7	57'.3	222° 27'.1	9'.3	02'.1	15'.1	
06	268° 25'.7	56'.7	236° 55'.4	9'.4	1° 47'.0 N	15'.2	60'.7
07	283° 25'.8	56'.1	251° 23'.8	9'.4	31'.8	15'.1	
08	298° 25'.8	55'.4	265° 52'.2	9'.5	16'.7	15'.1	
09	313° 25'.9	54'.8	280° 20'.7	9'.5	01'.6	15'.1	
10	328° 25'.9	54'.2	294° 49'.2	9'.5	0° 46'.5 N	15'.0	60'.6
11	343° 25'.9	53'.5	309° 17'.7	9'.5	31'.5	15'.1	
12	358° 26'.0	17° 52'.9 N	323° 46'.2	9'.6	0° 16'.4 N	15'.1	60'.6
13	13° 26'.0	52'.3	338° 14'.8	9'.6	01'.3	15'.0	
14	28° 26'.1	51'.6	352° 43'.4	9'.7	0° 13'.7 S	15'.1	60'.5
15	43° 26'.1	51'.0	7° 12'.1	9'.7	28'.8	15'.0	
16	58° 26'.1	50'.4	21° 40'.8	9'.7	43'.8	15'.0	
17	73° 26'.2	49'.7	36° 09'.5	9'.7	58'.8	15'.0	60'.4
18	88° 26'.2	49'.1	50° 38'.2	9'.8	1° 13'.8 S	14'.9	
19	103° 26'.3	48'.4	65° 07'.0	9'.8	28'.7	14'.9	
20	118° 26'.3	47'.8	79° 35'.8	9'.8	43'.6	14'.9	
21	133° 26'.4	47'.2	94° 04'.6	9'.9	58'.5	14'.9	60'.3
22	148° 26'.4	46'.5	108° 33'.5	9'.8	2° 13'.4 S	14'.9	
23	163° 26'.4	45'.9	123° 02'.3	9'.9	28'.3	14'.8	
2 Sunday 00	178° 26'.5	17° 45'.2 N	137° 31'.2	9'.9	2° 43'.1 S	14'.8	60'.2
01	193° 26'.5	44'.6	152° 00'.1	10'.0	57'.9	14'.7	
02	208° 26'.6	44'.0	166° 29'.1	9'.9	3° 12'.6 S	14'.7	
03	223° 26'.6	43'.3	180° 58'.0	10'.0	27'.3	14'.7	
04	238° 26'.7	42'.7	195° 27'.0	10'.0	42'.0	14'.7	60'.1
05	253° 26'.7	42'.0	209° 56'.0	10'.0	56'.7	14'.6	
06	268° 26'.8	41'.4	224° 25'.0	10'.0	4° 11'.3 S	14'.6	
07	283° 26'.8	40'.7	238° 54'.0	10'.1	25'.9	14'.5	60'.0
08	298° 26'.8	40'.1	253° 23'.1	10'.0	40'.4	14'.5	
09	313° 26'.9	39'.4	267° 52'.1	10'.1	54'.9	14'.4	
10	328° 26'.9	38'.8	282° 21'.2	10'.1	5° 09'.3 S	14'.4	59'.9
11	343° 27'.0	38'.2	296° 50'.3	10'.1	23'.7	14'.3	
12	358° 27'.0	17° 37'.5 N	311° 19'.4	10'.1	5° 38'.0 S	14'.3	59'.9
13	13° 27'.1	36'.9	325° 48'.5	10'.1	52'.3	14'.3	59'.8
14	28° 27'.1	36'.2	340° 17'.6	10'.2	6° 06'.6 S	14'.2	
15	43° 27'.2	35'.6	354° 46'.8	10'.1	20'.8	14'.1	
16	58° 27'.2	34'.9	9° 15'.9	10'.2	34'.9	14'.1	59'.7
17	73° 27'.3	34'.3	23° 45'.1	10'.1	49'.0	14'.0	
18	88° 27'.3	33'.6	38° 14'.2	10'.2	7° 03'.0 S	14'.0	
19	103° 27'.4	33'.0	52° 43'.4	10'.1	17'.0	13'.9	59'.6
20	118° 27'.4	32'.3	67° 12'.5	10'.2	30'.9	13'.9	
21	133° 27'.5	31'.7	81° 41'.7	10'.2	44'.8	13'.8	
22	148° 27'.5	31'.0	96° 10'.9	10'.2	58'.6	13'.7	59'.5
23	163° 27'.6	30'.3	110° 40'.1	10'.2	8° 12'.3 S	13'.7	
3 Monday 00	178° 27'.6	17° 29'.7 N	125° 09'.3	10'.2	8° 26'.0 S	13'.6	59'.4
01	193° 27'.7	29'.0	139° 38'.5	10'.2	39'.6	13'.6	
02	208° 27'.7	28'.4	154° 07'.7	10'.1	53'.2	13'.4	
03	223° 27'.8	27'.7	168° 36'.8	10'.2	9° 06'.6 S	13'.4	59'.3
04	238° 27'.8	27'.1	183° 06'.0	10'.2	20'.0	13'.4	
05	253° 27'.9	26'.4	197° 35'.2	10'.2	33'.4	13'.3	
06	268° 27'.9	25'.8	212° 04'.4	10'.2	46'.7	13'.2	59'.2
07	283° 28'.0	25'.1	226° 33'.6	10'.2	59'.9	13'.1	
08	298° 28'.0	24'.4	241° 02'.8	10'.2	10° 13'.0 S	13'.1	
09	313° 28'.1	23'.8	255° 32'.0	10'.2	26'.1	12'.9	59'.1
10	328° 28'.1	23'.1	270° 01'.2	10'.1	39'.0	12'.9	
11	343° 28'.2	22'.5	284° 30'.3	10'.2	51'.9	12'.9	
12	358° 28'.2	17° 21'.8 N	298° 59'.5	10'.2	11° 04'.8 S	12'.7	59'.0
13	13° 28'.3	21'.2	313° 28'.7	10'.1	17'.5	12'.7	
14	28° 28'.3	20'.5	327° 57'.8	10'.2	30'.2	12'.6	58'.9
15	43° 28'.4	19'.8	342° 27'.0	10'.1	42'.8	12'.5	
16	58° 28'.4	19'.2	356° 56'.1	10'.2	55'.3	12'.4	
17	73° 28'.5	18'.5	11° 25'.3	10'.1	12° 07'.7 S	12'.4	58'.8
18	88° 28'.6	17'.8	25° 54'.4	10'.1	20'.1	12'.3	
19	103° 28'.6	17'.2	40° 23'.5	10'.2	32'.4	12'.1	
20	118° 28'.7	16'.5	54° 52'.7	10'.1	44'.5	12'.1	58'.7
21	133° 28'.7	15'.9	69° 21'.8	10'.1	56'.6	12'.1	
22	148° 28'.8	15'.2	83° 50'.9	10'.0	13° 08'.7 S	11'.9	58'.6
23	163° 28'.8	14'.5	98° 19'.9	10'.1	20'.6	11'.8	
	SD 15'.8	d 0'.6	SD 16'.5		16'.3	16'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
1	6 18	6 16	12:06	14:30	02:04	3d 11%
2	6 14	6 12	12:06	15:22	02:56	4d 19%
3	6 10	6 07	12:06	16:13	03:47	5d 29%

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1992 August 4, 5, 6 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +0.7		JUPITER -1.7		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
4 Tuesday 00	312° 48'.6	164° 04'.1	14° 14'.6 N	249° 02'.8	20° 29'.8 N	145° 32'.0	6° 37'.3 N	354° 38'.6	17° 11'.4 S
01	327° 51'.1	179° 03'.5	13'.6	264° 03'.5	30'.2	160° 34'.0	37'.1	9° 41'.3	11'.4
02	342° 53'.6	194° 03'.0	12'.5	279° 04'.3	30'.5	175° 36'.1	36'.9	24° 43'.9	11'.5
03	357° 56'.0	209° 02'.5	11'.5	294° 05'.0	30'.8	190° 38'.1	36'.7	39° 46'.6	11'.5
04	12° 58'.5	224° 02'.0	10'.4	309° 05'.7	31'.1	205° 40'.1	36'.5	54° 49'.2	11'.6
05	28° 01'.0	239° 01'.5	09'.4	324° 06'.4	31'.5	220° 42'.1	36'.3	69° 51'.9	11'.6
06	43° 03'.4	254° 00'.9	08'.4	339° 07'.1	31'.8	235° 44'.1	36'.1	84° 54'.5	11'.7
07	58° 05'.9	269° 00'.4	07'.3	354° 07'.9	32'.1	250° 46'.1	35'.9	99° 57'.2	11'.8
08	73° 08'.4	283° 59'.9	06'.3	9° 08'.6	32'.4	265° 48'.1	35'.7	114° 59'.8	11'.8
09	88° 10'.8	298° 59'.4	05'.2	24° 09'.3	32'.8	280° 50'.1	35'.5	130° 02'.5	11'.9
10	103° 13'.3	313° 58'.9	04'.2	39° 10'.0	33'.1	295° 52'.1	35'.3	145° 05'.1	11'.9
11	118° 15'.7	328° 58'.4	03'.1	54° 10'.7	33'.4	310° 54'.1	35'.1	160° 07'.8	12'.0
12	133° 18'.2	343° 57'.8	14° 02'.1 N	69° 11'.5	20° 33'.7 N	325° 56'.1	6° 35'.0 N	175° 10'.4	17° 12'.1 S
13	148° 20'.7	358° 57'.3	01'.0	84° 12'.2	34'.1	340° 58'.2	34'.8	190° 13'.1	12'.1
14	163° 23'.1	13° 56'.8	00'.0	99° 12'.9	34'.4	356° 00'.2	34'.6	205° 15'.7	12'.2
15	178° 25'.6	28° 56'.3	13° 59'.0 N	114° 13'.6	34'.7	11° 02'.2	34'.4	220° 18'.4	12'.2
16	193° 28'.1	43° 55'.8	57'.9	129° 14'.3	35'.0	26° 04'.2	34'.2	235° 21'.0	12'.3
17	208° 30'.5	58° 55'.3	56'.9	144° 15'.1	35'.3	41° 06'.2	34'.0	250° 23'.7	12'.4
18	223° 33'.0	73° 54'.7	55'.8	159° 15'.8	35'.7	56° 08'.2	33'.8	265° 26'.3	12'.4
19	238° 35'.5	88° 54'.2	54'.8	174° 16'.5	36'.0	71° 10'.2	33'.6	280° 29'.0	12'.5
20	253° 37'.9	103° 53'.7	53'.7	189° 17'.2	36'.3	86° 12'.2	33'.4	295° 31'.6	12'.5
21	268° 40'.4	118° 53'.2	52'.7	204° 17'.9	36'.6	101° 14'.2	33'.2	310° 34'.3	12'.6
22	283° 42'.9	133° 52'.7	51'.6	219° 18'.7	36'.9	116° 16'.2	33'.0	325° 36'.9	12'.6
23	298° 45'.3	148° 52'.2	50'.5	234° 19'.4	37'.3	131° 18'.2	32'.8	340° 39'.6	12'.7
5 Wednesday 00	313° 47'.8	163° 51'.7	13° 49'.5 N	249° 20'.1	20° 37'.6 N	146° 20'.3	6° 32'.6 N	355° 42'.2	17° 12'.8 S
01	328° 50'.2	178° 51'.2	48'.4	264° 20'.8	37'.9	161° 22'.3	32'.4	10° 44'.9	12'.8
02	343° 52'.7	193° 50'.7	47'.4	279° 21'.5	38'.2	176° 24'.3	32'.3	25° 47'.5	12'.9
03	358° 55'.2	208° 50'.2	46'.3	294° 22'.3	38'.5	191° 26'.3	32'.1	40° 50'.2	12'.9
04	13° 57'.6	223° 49'.6	45'.3	309° 23'.0	38'.9	206° 28'.3	31'.9	55° 52'.8	13'.0
05	29° 00'.1	238° 49'.1	44'.2	324° 23'.7	39'.2	221° 30'.3	31'.7	70° 55'.5	13'.1
06	44° 02'.6	253° 48'.6	43'.2	339° 24'.4	39'.5	236° 32'.3	31'.5	85° 58'.1	13'.1
07	59° 05'.0	268° 48'.1	42'.1	354° 25'.1	39'.8	251° 34'.3	31'.3	101° 00'.8	13'.2
08	74° 07'.5	283° 47'.6	41'.0	9° 25'.9	40'.1	266° 36'.3	31'.1	116° 03'.4	13'.2
09	89° 10'.0	298° 47'.1	40'.0	24° 26'.6	40'.4	281° 38'.3	30'.9	131° 06'.1	13'.3
10	104° 12'.4	313° 46'.6	38'.9	39° 27'.3	40'.8	296° 40'.3	30'.7	146° 08'.7	13'.4
11	119° 14'.9	328° 46'.1	37'.9	54° 28'.0	41'.1	311° 42'.3	30'.5	161° 11'.4	13'.4
12	134° 17'.3	343° 45'.6	13° 36'.8 N	69° 28'.8	20° 41'.4 N	326° 44'.4	6° 30'.3 N	176° 14'.0	17° 13'.5 S
13	149° 19'.8	358° 45'.1	35'.7	84° 29'.5	41'.7	341° 46'.4	30'.1	191° 16'.7	13'.5
14	164° 22'.3	13° 44'.6	34'.7	99° 30'.2	42'.0	356° 48'.4	29'.9	206° 19'.3	13'.6
15	179° 24'.7	28° 44'.1	33'.6	114° 30'.9	42'.3	11° 50'.4	29'.7	221° 22'.0	13'.6
16	194° 27'.2	43° 43'.6	32'.5	129° 31'.6	42'.7	26° 52'.4	29'.5	236° 24'.6	13'.7
17	209° 29'.7	58° 43'.1	31'.5	144° 32'.4	43'.0	41° 54'.4	29'.3	251° 27'.3	13'.8
18	224° 32'.1	73° 42'.6	30'.4	159° 33'.1	43'.3	56° 56'.4	29'.2	266° 29'.9	13'.8
19	239° 34'.6	88° 42'.1	29'.4	174° 33'.8	43'.6	71° 58'.4	29'.0	281° 32'.6	13'.9
20	254° 37'.1	103° 41'.6	28'.3	189° 34'.5	43'.9	87° 00'.4	28'.8	296° 35'.2	13'.9
21	269° 39'.5	118° 41'.1	27'.2	204° 35'.3	44'.2	102° 02'.4	28'.6	311° 37'.9	14'.0
22	284° 42'.0	133° 40'.6	26'.1	219° 36'.0	44'.5	117° 04'.4	28'.4	326° 40'.5	14'.1
23	299° 44'.5	148° 40'.1	25'.1	234° 36'.7	44'.8	132° 06'.4	28'.2	341° 43'.2	14'.1
6 Thursday 00	314° 46'.9	163° 39'.6	13° 24'.0 N	249° 37'.4	20° 45'.2 N	147° 08'.4	6° 28'.0 N	356° 45'.8	17° 14'.2 S
01	329° 49'.4	178° 39'.1	22'.9	264° 38'.2	45'.5	162° 10'.4	27'.8	11° 48'.5	14'.2
02	344° 51'.8	193° 38'.6	21'.9	279° 38'.9	45'.8	177° 12'.5	27'.6	26° 51'.1	14'.3
03	359° 54'.3	208° 38'.1	20'.8	294° 39'.6	46'.1	192° 14'.5	27'.4	41° 53'.8	14'.4
04	14° 56'.8	223° 37'.6	19'.7	309° 40'.3	46'.4	207° 16'.5	27'.2	56° 56'.4	14'.4
05	29° 59'.2	238° 37'.1	18'.7	324° 41'.0	46'.7	222° 18'.5	27'.0	71° 59'.1	14'.5
06	45° 01'.7	253° 36'.6	17'.6	339° 41'.8	47'.0	237° 20'.5	26'.8	87° 01'.7	14'.5
07	60° 04'.2	268° 36'.1	16'.5	354° 42'.5	47'.3	252° 22'.5	26'.6	102° 04'.4	14'.6
08	75° 06'.6	283° 35'.6	15'.4	9° 43'.2	47'.6	267° 24'.5	26'.4	117° 07'.0	14'.6
09	90° 09'.1	298° 35'.1	14'.4	24° 43'.9	48'.0	282° 26'.5	26'.2	132° 09'.7	14'.7
10	105° 11'.6	313° 34'.6	13'.3	39° 44'.7	48'.3	297° 28'.5	26'.0	147° 12'.3	14'.8
11	120° 14'.0	328° 34'.1	12'.2	54° 45'.4	48'.6	312° 30'.5	25'.8	162° 15'.0	14'.8
12	135° 16'.5	343° 33'.6	13° 11'.1 N	69° 46'.1	20° 48'.9 N	327° 32'.5	6° 25'.7 N	177° 17'.6	17° 14'.9 S
13	150° 19'.0	358° 33'.1	10'.1	84° 46'.8	49'.2	342° 34'.5	25'.5	192° 20'.3	14'.9
14	165° 21'.4	13° 32'.6	09'.0	99° 47'.6	49'.5	357° 36'.5	25'.3	207° 22'.9	15'.0
15	180° 23'.9	28° 32'.1	07'.9	114° 48'.3	49'.8	12° 38'.5	25'.1	222° 25'.6	15'.1
16	195° 26'.3	43° 31'.6	06'.8	129° 49'.0	50'.1	27° 40'.5	24'.9	237° 28'.2	15'.1
17	210° 28'.8	58° 31'.1	05'.7	144° 49'.7	50'.4	42° 42'.5	24'.7	252° 30'.9	15'.2
18	225° 31'.3	73° 30'.7	04'.7	159° 50'.5	50'.7	57° 44'.5	24'.5	267° 33'.5	15'.2
19	240° 33'.7	88° 30'.2	03'.6	174° 51'.2	51'.0	72° 46'.5	24'.3	282° 36'.2	15'.3
20	255° 36'.2	103° 29'.7	02'.5	189° 51'.9	51'.3	87° 48'.6	24'.1	297° 38'.8	15'.3
21	270° 38'.7	118° 29'.2	01'.4	204° 52'.6	51'.6	102° 50'.6	23'.9	312° 41'.5	15'.4
22	285° 41'.1	133° 28'.7	00'.3	219° 53'.4	51'.9	117° 52'.6	23'.7	327° 44'.1	15'.5
23	300° 43'.6	148° 28'.2	12° 59'.3 N	234° 54'.1	52'.2	132° 54'.6	23'.5	342° 46'.8	15'.5
	M.P. 03:00	v -0'.5	d 1'.1	v 0'.7	d 0'.3	v 2'.0	d 0'.2	v 2'.6	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.1	40° 19'.7 S
Achernar	335° 38'.0	57° 16'.0 S
Acrux	173° 27'.4	63° 03'.8 S
Adhara	255° 25'.1	28° 57'.6 S
Aldebaran	291° 07'.4	16° 29'.7 N
Alioth	166° 34'.5	56° 00'.2 N
Alkaid	153° 11'.2	49° 21'.2 N
Alnair	28° 02'.7	46° 59'.6 S
Alnilam	276° 02'.4	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.1	26° 44'.5 N
Alpheratz	357° 59'.4	29° 03'.1 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.7	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 09'.9	19° 13'.3 N
Atria	108° 00'.8	69° 01'.2 S
Avior	234° 25'.1	59° 29'.1 S
Bellatrix	278° 48'.9	6° 20'.7 N
Betelgeuse	271° 18'.4	7° 24'.4 N
Canopus	264° 03'.5	52° 41'.3 S
Capella	280° 57'.8	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.4 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.3	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.6 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.6 N
Enif	34° 02'.1	9° 50'.6 N
Fomalhaut	15° 40'.7	29° 39'.4 S
Gacrux	172° 18'.7	57° 04'.6 S
Gienah	176° 08'.6	17° 30'.2 S
Hadar	149° 10'.3	60° 20'.6 S
Hamal	328° 18'.3	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 19'.2	74° 11'.4 N
Markab	13° 53'.6	15° 10'.1 N
Menkar	314° 31'.4	4° 03'.8 N
Menkent	148° 26'.1	36° 20'.2 S
Miaplacidus	221° 44'.0	69° 41'.3 S
Mirfak	309° 02'.8	49° 50'.0 N
Nunki	76° 17'.2	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.5 S
Polaris	323° 54'.1	89° 13'.6 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.7 N
Rasalhague	96° 20'.7	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.2	8° 12'.4 S
Rigil Kent	140° 13'.1	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.1	56° 29'.7 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.7	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 04'.4	43° 24'.2 S
Vega	80° 49'.1	38° 46'.8 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	210° 03'.9	13:05
Mars	295° 32'.3	07:22
Jupiter	192° 32'.5	14:13
Saturn	41° 54'.4	00:17

SUN			
GHA	Dec		
178° 28'.9	17° 13'.9 N		
193° 28'.9	13'.2		
208° 29'.0	12'.5		
223° 29'.1	11'.9		
238° 29'.1	11'.2		
253° 29'.2	10'.5		
268° 29'.2	09'.9		
283° 29'.3	09'.2		
298° 29'.3	08'.5		
313° 29'.4	07'.9		
328° 29'.5	07'.2		
343° 29'.5	06'.5		
358° 29'.6	17° 05'.8 N		
13° 29'.6	05'.2		
28° 29'.7	04'.5		
43° 29'.8	03'.8		
58° 29'.8	03'.2		
73° 29'.9	02'.5		
88° 29'.9	01'.8		
103° 30'.0	01'.1		
118° 30'.1	00'.5		
133° 30'.1	16° 59'.8 N		
148° 30'.2	59'.1		
163° 30'.3	58'.4		
178° 30'.3	16° 57'.8 N		
193° 30'.4	57'.1		
208° 30'.4	56'.4		
223° 30'.5	55'.7		
238° 30'.6	55'.0		
253° 30'.6	54'.4		
268° 30'.7	53'.7		
283° 30'.8	53'.0		
298° 30'.8	52'.3		
313° 30'.9	51'.6		
328° 31'.0	51'.0		
343° 31'.0	50'.3		
358° 31'.1	16° 49'.6 N		
13° 31'.2	48'.9		
28° 31'.2	48'.2		
43° 31'.3	47'.5		
58° 31'.4	46'.9		
73° 31'.4	46'.2		
88° 31'.5	45'.5		
103° 31'.6	44'.8		
118° 31'.6	44'.1		
133° 31'.7	43'.4		
148° 31'.8	42'.7		
163° 31'.8	42'.1		
178° 31'.9	16° 41'.4 N		
193° 32'.0	40'.7		
208° 32'.0	40'.0		
223° 32'.1	39'.3		
238° 32'.2	38'.6		
253° 32'.3	37'.9		
268° 32'.3	37'.2		
283° 32'.4	36'.5		
298° 32'.5	35'.9		
313° 32'.5	35'.2		
328° 32'.6	34'.5		
343° 32'.7	33'.8		
358° 32'.8	16° 33'.1 N		
13° 32'.8	32'.4		
28° 32'.9	31'.7		
43° 33'.0	31'.0		
58° 33'.1	30'.3		
73° 33'.1	29'.6		
88° 33'.2	28'.9		
103° 33'.3	28'.2		
118° 33'.4	27'.5		
133° 33'.4	26'.8		
148° 33'.5	26'.1		
163° 33'.6	25'.4		
SD 15'.8	d 0'.7		

MOON				
GHA	v	Dec	d	HP
112° 49'.0	10'.1	13° 32'.4 S	11'.8	58'.6
127° 18'.1	10'.0	44'.2	11'.6	58'.5
141° 47'.1	10'.1	55'.8	11'.6	
156° 16'.2	10'.0	14° 07'.4 S	11'.4	
170° 45'.2	10'.0	18'.8	11'.4	58'.4
185° 14'.2	10'.0	30'.2	11'.3	
199° 43'.2	10'.0	41'.5	11'.2	
214° 12'.2	9'.9	52'.7	11'.1	58'.3
228° 41'.1	10'.0	15° 03'.8 S	11'.0	
243° 10'.1	9'.9	14'.8	10'.9	58'.2
257° 39'.0	10'.0	25'.7	10'.8	
272° 08'.0	9'.9	36'.5	10'.7	
286° 36'.9	9'.9	15° 47'.2 S	10'.6	58'.1
301° 05'.8	9'.9	57'.8	10'.5	
315° 34'.7	9'.8	16° 08'.3 S	10'.4	
330° 03'.5	9'.9	18'.7	10'.3	58'.0
344° 32'.4	9'.8	29'.0	10'.2	
359° 01'.2	9'.8	39'.2	10'.1	57'.9
13° 30'.0	9'.8	49'.3	10'.0	
27° 58'.8	9'.8	59'.3	9'.9	
42° 27'.6	9'.8	17° 09'.2 S	9'.7	57'.8
56° 56'.4	9'.7	18'.9	9'.7	
71° 25'.1	9'.8	28'.6	9'.6	
85° 53'.9	9'.7	38'.2	9'.4	57'.7
100° 22'.6	9'.7	17° 47'.6 S	9'.4	57'.7
114° 51'.3	9'.7	57'.0	9'.2	
129° 20'.0	9'.6	18° 06'.2 S	9'.2	57'.6
143° 48'.6	9'.7	15'.4	9'.0	
158° 17'.3	9'.6	24'.4	8'.9	57'.5
172° 45'.9	9'.6	33'.3	8'.8	
187° 14'.5	9'.6	42'.1	8'.7	
201° 43'.1	9'.6	50'.8	8'.5	57'.4
216° 11'.7	9'.6	59'.3	8'.5	
230° 40'.3	9'.6	19° 07'.8 S	8'.4	
245° 08'.9	9'.5	16'.2	8'.2	57'.3
259° 37'.4	9'.5	24'.4	8'.1	
274° 05'.9	9'.5	19° 32'.5 S	8'.0	57'.3
288° 34'.4	9'.5	40'.5	7'.9	57'.2
303° 02'.9	9'.5	48'.4	7'.8	
317° 31'.4	9'.5	56'.2	7'.6	
331° 59'.9	9'.4	20° 03'.8 S	7'.6	57'.1
346° 28'.3	9'.4	11'.4	7'.4	
0° 56'.7	9'.5	18'.8	7'.3	
15° 25'.2	9'.4	26'.1	7'.1	57'.0
29° 53'.6	9'.4	33'.2	7'.1	
44° 22'.0	9'.3	40'.3	6'.9	
58° 50'.3	9'.4	47'.2	6'.9	56'.9
73° 18'.7	9'.4	54'.1	6'.7	
87° 47'.1	9'.3	21° 00'.8 S	6'.6	56'.9
102° 15'.4	9'.3	07'.4	6'.4	56'.8
116° 43'.7	9'.4	13'.8	6'.3	
131° 12'.1	9'.3	20'.1	6'.3	
145° 40'.4	9'.3	26'.4	6'.1	56'.7
160° 08'.7	9'.3	32'.5	5'.9	
174° 37'.0	9'.3	38'.4	5'.9	
189° 05'.3	9'.2	44'.3	5'.7	56'.6
203° 33'.5	9'.3	50'.0	5'.6	
218° 01'.8	9'.3	55'.6	5'.5	
232° 30'.1	9'.2	22° 01'.1 S	5'.3	56'.5
246° 58'.3	9'.3	06'.4	5'.3	
261° 26'.6	9'.2	22° 11'.7 S	5'.1	56'.5
275° 54'.8	9'.2	16'.8	4'.9	56'.4
290° 23'.0	9'.3	21'.7	4'.9	
304° 51'.3	9'.2	26'.6	4'.7	
319° 19'.5	9'.2	31'.3	4'.6	
333° 47'.7	9'.2	35'.9	4'.5	56'.3
348° 15'.9	9'.3	40'.4	4'.4	
2° 44'.2	9'.2	44'.8	4'.2	
17° 12'.4	9'.2	49'.0	4'.1	56'.2
31° 40'.6	9'.2	53'.1	4'.0	
46° 08'.8	9'.2	57'.1	3'.8	
60° 37'.0	9'.3	23° 00'.9 S	3'.7	56'.1
SD 15'.8	15'.6	15'.4		

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
4	6 05	6 02	12:06	17:04	04:38	6d 40%
5	5 59	5 56	12:06	17:56	05:30	7d 51%
6	5 52	5 49	12:06	18:49	06:22	8d 61%

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1992 August 7, 8, 9 (Fri, Sat, Sun)

GMT	ARIES	VENUS -3.9		MARS +0.7		JUPITER -1.7		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
7 Friday 00	315° 46'.1	163° 27'.7	12° 58'.2 N	249° 54'.8	20° 52'.5 N	147° 56'.6	6° 23'.3 N	357° 49'.4	17° 15'.6 S
01	330° 48'.5	178° 27'.2	57'.1	264° 55'.5	52'.8	162° 58'.6	23'.1	12° 52'.1	15'.6
02	345° 51'.0	193° 26'.7	56'.0	279° 56'.3	53'.2	178° 00'.6	22'.9	27° 54'.7	15'.7
03	0° 53'.5	208° 26'.3	54'.9	294° 57'.0	53'.5	193° 02'.6	22'.7	42° 57'.4	15'.8
04	15° 55'.9	223° 25'.8	53'.8	309° 57'.7	53'.8	208° 04'.6	22'.5	58° 00'.0	15'.8
05	30° 58'.4	238° 25'.3	52'.8	324° 58'.4	54'.1	223° 06'.6	22'.3	73° 02'.7	15'.9
06	46° 00'.8	253° 24'.8	51'.7	339° 59'.2	54'.4	238° 08'.6	22'.1	88° 05'.3	15'.9
07	61° 03'.3	268° 24'.3	50'.6	354° 59'.9	54'.7	253° 10'.6	21'.9	103° 08'.0	16'.0
08	76° 05'.8	283° 23'.8	49'.5	10° 00'.6	55'.0	268° 12'.6	21'.7	118° 10'.6	16'.0
09	91° 08'.2	298° 23'.3	48'.4	25° 01'.4	55'.3	283° 14'.6	21'.6	133° 13'.3	16'.1
10	106° 10'.7	313° 22'.9	47'.3	40° 02'.1	55'.6	298° 16'.6	21'.4	148° 15'.9	16'.2
11	121° 13'.2	328° 22'.4	46'.2	55° 02'.8	55'.9	313° 18'.6	21'.2	163° 18'.6	16'.2
12	136° 15'.6	343° 21'.9	12° 45'.1 N	70° 03'.5	20° 56'.2 N	328° 20'.6	6° 21'.0 N	178° 21'.2	17° 16'.3 S
13	151° 18'.1	358° 21'.4	44'.0	85° 04'.3	56'.5	343° 22'.6	20'.8	193° 23'.9	16'.3
14	166° 20'.6	13° 20'.9	42'.9	100° 05'.0	56'.8	358° 24'.6	20'.6	208° 26'.5	16'.4
15	181° 23'.0	28° 20'.5	41'.9	115° 05'.7	57'.1	13° 26'.6	20'.4	223° 29'.2	16'.5
16	196° 25'.5	43° 20'.0	40'.8	130° 06'.4	57'.4	28° 28'.6	20'.2	238° 31'.8	16'.5
17	211° 27'.9	58° 19'.5	39'.7	145° 07'.2	57'.7	43° 30'.6	20'.0	253° 34'.5	16'.6
18	226° 30'.4	73° 19'.0	38'.6	160° 07'.9	58'.0	58° 32'.6	19'.8	268° 37'.1	16'.6
19	241° 32'.9	88° 18'.5	37'.5	175° 08'.6	58'.3	73° 34'.6	19'.6	283° 39'.8	16'.7
20	256° 35'.3	103° 18'.0	36'.4	190° 09'.3	58'.6	88° 36'.7	19'.4	298° 42'.4	16'.8
21	271° 37'.8	118° 17'.6	35'.3	205° 10'.1	58'.9	103° 38'.7	19'.2	313° 45'.1	16'.8
22	286° 40'.3	133° 17'.1	34'.2	220° 10'.8	59'.2	118° 40'.7	19'.0	328° 47'.7	16'.9
23	301° 42'.7	148° 16'.6	33'.1	235° 11'.5	59'.5	133° 42'.7	18'.8	343° 50'.4	16'.9
8 Saturday 00	316° 45'.2	163° 16'.1	12° 32'.0 N	250° 12'.3	20° 59'.7 N	148° 44'.7	6° 18'.6 N	358° 53'.0	17° 17'.0 S
01	331° 47'.7	178° 15'.7	30'.9	265° 13'.0	21° 00'.0 N	163° 46'.7	18'.4	13° 55'.7	17'.0
02	346° 50'.1	193° 15'.2	29'.8	280° 13'.7	00'.3	178° 48'.7	18'.2	28° 58'.3	17'.1
03	1° 52'.6	208° 14'.7	28'.7	295° 14'.4	00'.6	193° 50'.7	18'.0	44° 01'.0	17'.2
04	16° 55'.1	223° 14'.2	27'.6	310° 15'.2	00'.9	208° 52'.7	17'.8	59° 03'.6	17'.2
05	31° 57'.5	238° 13'.8	26'.5	325° 15'.9	01'.2	223° 54'.7	17'.6	74° 06'.3	17'.3
06	47° 00'.0	253° 13'.3	25'.4	340° 16'.6	01'.5	238° 56'.7	17'.4	89° 08'.9	17'.3
07	62° 02'.4	268° 12'.8	24'.3	355° 17'.4	01'.8	253° 58'.7	17'.2	104° 11'.6	17'.4
08	77° 04'.9	283° 12'.3	23'.2	10° 18'.1	02'.1	269° 00'.7	17'.0	119° 14'.2	17'.5
09	92° 07'.4	298° 11'.9	22'.1	25° 18'.8	02'.4	284° 02'.7	16'.9	134° 16'.9	17'.5
10	107° 09'.8	313° 11'.4	21'.0	40° 19'.5	02'.7	299° 04'.7	16'.7	149° 19'.5	17'.6
11	122° 12'.3	328° 10'.9	19'.9	55° 20'.3	03'.0	314° 06'.7	16'.5	164° 22'.2	17'.6
12	137° 14'.8	343° 10'.4	12° 18'.8 N	70° 21'.0	21° 03'.3 N	329° 08'.7	6° 16'.3 N	179° 24'.8	17° 17'.7 S
13	152° 17'.2	358° 10'.0	17'.7	85° 21'.7	03'.6	344° 10'.7	16'.1	194° 27'.5	17'.7
14	167° 19'.7	13° 09'.5	16'.6	100° 22'.5	03'.9	359° 12'.7	15'.9	209° 30'.1	17'.8
15	182° 22'.2	28° 09'.0	15'.5	115° 23'.2	04'.2	14° 14'.7	15'.7	224° 32'.8	17'.9
16	197° 24'.6	43° 08'.6	14'.4	130° 23'.9	04'.5	29° 16'.7	15'.5	239° 35'.4	17'.9
17	212° 27'.1	58° 08'.1	13'.3	145° 24'.6	04'.7	44° 18'.7	15'.3	254° 38'.1	18'.0
18	227° 29'.6	73° 07'.6	12'.1	160° 25'.4	05'.0	59° 20'.7	15'.1	269° 40'.7	18'.0
19	242° 32'.0	88° 07'.1	11'.0	175° 26'.1	05'.3	74° 22'.7	14'.9	284° 43'.4	18'.1
20	257° 34'.5	103° 06'.7	09'.9	190° 26'.8	05'.6	89° 24'.7	14'.7	299° 46'.0	18'.2
21	272° 36'.9	118° 06'.2	08'.8	205° 27'.6	05'.9	104° 26'.7	14'.5	314° 48'.7	18'.2
22	287° 39'.4	133° 05'.7	07'.7	220° 28'.3	06'.2	119° 28'.7	14'.3	329° 51'.3	18'.3
23	302° 41'.9	148° 05'.3	06'.6	235° 29'.0	06'.5	134° 30'.7	14'.1	344° 54'.0	18'.3
9 Sunday 00	317° 44'.3	163° 04'.8	12° 05'.5 N	250° 29'.8	21° 06'.8 N	149° 32'.7	6° 13'.9 N	359° 56'.6	17° 18'.4 S
01	332° 46'.8	178° 04'.3	04'.4	265° 30'.5	07'.1	164° 34'.7	13'.7	14° 59'.3	18'.4
02	347° 49'.3	193° 03'.9	03'.3	280° 31'.2	07'.3	179° 36'.7	13'.5	30° 01'.9	18'.5
03	2° 51'.7	208° 03'.4	02'.2	295° 31'.9	07'.6	194° 38'.7	13'.3	45° 04'.6	18'.6
04	17° 54'.2	223° 02'.9	01'.0	310° 32'.7	07'.9	209° 40'.7	13'.1	60° 07'.2	18'.6
05	32° 56'.7	238° 02'.5	11° 59'.9 N	325° 33'.4	08'.2	224° 42'.7	12'.9	75° 09'.9	18'.7
06	47° 59'.1	253° 02'.0	58'.8	340° 34'.1	08'.5	239° 44'.7	12'.7	90° 12'.5	18'.7
07	63° 01'.6	268° 01'.5	57'.7	355° 34'.9	08'.8	254° 46'.7	12'.5	105° 15'.2	18'.8
08	78° 04'.1	283° 01'.1	56'.6	10° 35'.6	09'.1	269° 48'.7	12'.3	120° 17'.8	18'.9
09	93° 06'.5	298° 00'.6	55'.5	25° 36'.3	09'.4	284° 50'.7	12'.1	135° 20'.5	18'.9
10	108° 09'.0	313° 00'.2	54'.3	40° 37'.1	09'.6	299° 52'.7	11'.9	150° 23'.1	19'.0
11	123° 11'.4	327° 59'.7	53'.2	55° 37'.8	09'.9	314° 54'.7	11'.7	165° 25'.8	19'.0
12	138° 13'.9	342° 59'.2	11° 52'.1 N	70° 38'.5	21° 10'.2 N	329° 56'.7	6° 11'.5 N	180° 28'.4	17° 19'.1 S
13	153° 16'.4	357° 58'.8	51'.0	85° 39'.3	10'.5	344° 58'.7	11'.3	195° 31'.1	19'.1
14	168° 18'.8	12° 58'.3	49'.9	100° 40'.0	10'.8	0° 00'.7	11'.1	210° 33'.7	19'.2
15	183° 21'.3	27° 57'.9	48'.8	115° 40'.7	11'.1	15° 02'.7	10'.9	225° 36'.4	19'.3
16	198° 23'.8	42° 57'.4	47'.6	130° 41'.5	11'.3	30° 04'.7	10'.7	240° 39'.0	19'.3
17	213° 26'.2	57° 56'.9	46'.5	145° 42'.2	11'.6	45° 06'.7	10'.5	255° 41'.7	19'.4
18	228° 28'.7	72° 56'.5	45'.4	160° 42'.9	11'.9	60° 08'.7	10'.4	270° 44'.3	19'.4
19	243° 31'.2	87° 56'.0	44'.3	175° 43'.7	12'.2	75° 10'.7	10'.2	285° 47'.0	19'.5
20	258° 33'.6	102° 55'.6	43'.2	190° 44'.4	12'.5	90° 12'.7	10'.0	300° 49'.6	19'.5
21	273° 36'.1	117° 55'.1	42'.0	205° 45'.1	12'.8	105° 14'.7	09'.8	315° 52'.3	19'.6
22	288° 38'.6	132° 54'.6	40'.9	220° 45'.9	13'.0	120° 16'.7	09'.6	330° 54'.9	19'.7
23	303° 41'.0	147° 54'.2	39'.8	235° 46'.6	13'.3	135° 18'.7	09'.4	345° 57'.6	19'.7
	M.P. 02:49	v -0'.5	d 1'.1	v 0'.7	d 0'.3	v 2'.0	d 0'.2	v 2'.7	d 0'.1

STARS	SHA	Dec
Acamar	315° 30'.1	40° 19'.7 S
Achernar	335° 38'.0	57° 16'.0 S
Acrux	173° 27'.4	63° 03'.8 S
Adhara	255° 25'.1	28° 57'.6 S
Aldebaran	291° 07'.4	16° 29'.7 N
Alioth	166° 34'.5	56° 00'.2 N
Alkaid	153° 11'.2	49° 21'.2 N
Alnair	28° 02'.7	46° 59'.6 S
Alnilam	276° 02'.4	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.1	26° 44'.5 N
Alpheratz	357° 59'.4	29° 03'.1 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.7	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 10'.0	19° 13'.3 N
Atria	108° 00'.8	69° 01'.2 S
Avior	234° 25'.1	59° 29'.1 S
Bellatrix	278° 48'.9	6° 20'.7 N
Betelgeuse	271° 18'.4	7° 24'.4 N
Canopus	264° 03'.5	52° 41'.3 S
Capella	280° 57'.7	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.4 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.3	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.5 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.6 N
Enif	34° 02'.1	9° 50'.6 N
Fomalhaut	15° 40'.7	29° 39'.4 S
Gacrux	172° 18'.8	57° 04'.6 S
Gienah	176° 08'.6	17° 30'.2 S
Hadar	149° 10'.3	60° 20'.6 S
Hamal	328° 18'.3	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 19'.2	74° 11'.4 N
Markab	13° 53'.6	15° 10'.1 N
Menkar	314° 31'.3	4° 03'.8 N
Menkent	148° 26'.1	36° 20'.2 S
Miaplacidus	221° 44'.0	69° 41'.3 S
Mirfak	309° 02'.8	49° 50'.0 N
Nunki	76° 17'.2	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.5 S
Polaris	323° 52'.6	89° 13'.7 N
Pollux	243° 47'.1	28° 02'.7 N
Procyon	245° 16'.3	5° 14'.7 N
Rasalhague	96° 20'.7	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.2	8° 12'.4 S
Rigil Kent	140° 13'.1	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.1	56° 29'.8 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.7	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 04'.4	43° 24'.2 S
Vega	80° 49'.2	38° 46'.8 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	206° 30'.9	13:07
Mars	293° 27'.1	07:19
Jupiter	191° 59'.5	14:03
Saturn	42° 07'.8	00:04

SUN			
GHA	Dec		
178° 33'.7	16° 24'.7 N		
193° 33'.7	24'.0		
208° 33'.8	23'.3		
223° 33'.9	22'.6		
238° 34'.0	21'.9		
253° 34'.0	21'.2		
268° 34'.1	20'.5		
283° 34'.2	19'.8		
298° 34'.3	19'.1		
313° 34'.3	18'.4		
328° 34'.4	17'.7		
343° 34'.5	17'.0		
358° 34'.6	16° 16'.3 N		
13° 34'.7	15'.6		
28° 34'.7	14'.9		
43° 34'.8	14'.2		
58° 34'.9	13'.5		
73° 35'.0	12'.8		
88° 35'.1	12'.1		
103° 35'.1	11'.4		
118° 35'.2	10'.7		
133° 35'.3	09'.9		
148° 35'.4	09'.2		
163° 35'.5	08'.5		
178° 35'.5	16° 07'.8 N		
193° 35'.6	07'.1		
208° 35'.7	06'.4		
223° 35'.8	05'.7		
238° 35'.9	05'.0		
253° 36'.0	04'.3		
268° 36'.0	03'.5		
283° 36'.1	02'.8		
298° 36'.2	02'.1		
313° 36'.3	01'.4		
328° 36'.4	00'.7		
343° 36'.5	16° 00'.0 N		
358° 36'.5	15° 59'.3 N		
13° 36'.6	58'.5		
28° 36'.7	57'.8		
43° 36'.8	57'.1		
58° 36'.9	56'.4		
73° 37'.0	55'.7		
88° 37'.1	55'.0		
103° 37'.1	54'.2		
118° 37'.2	53'.5		
133° 37'.3	52'.8		
148° 37'.4	52'.1		
163° 37'.5	51'.4		
178° 37'.6	15° 50'.6 N		
193° 37'.7	49'.9		
208° 37'.8	49'.2		
223° 37'.9	48'.5		
238° 37'.9	47'.8		
253° 38'.0	47'.0		
268° 38'.1	46'.3		
283° 38'.2	45'.6		
298° 38'.3	44'.9		
313° 38'.4	44'.1		
328° 38'.5	43'.4		
343° 38'.6	42'.7		
358° 38'.7	15° 42'.0 N		
13° 38'.8	41'.2		
28° 38'.8	40'.5		
43° 38'.9	39'.8		
58° 39'.0	39'.1		
73° 39'.1	38'.3		
88° 39'.2	37'.6		
103° 39'.3	36'.9		
118° 39'.4	36'.1		
133° 39'.5	35'.4		
148° 39'.6	34'.7		
163° 39'.7	34'.0		
SD 15'.8	d 0'.7		

MOON				
GHA	v	Dec	d	HP
75° 05'.3	9'.2	23° 04'.6 S	3'.6	56'.1
89° 33'.5	9'.2	08'.2	3'.5	
104° 01'.7	9'.2	11'.7	3'.3	
118° 29'.9	9'.3	15'.0	3'.2	56'.0
132° 58'.2	9'.2	18'.2	3'.1	
147° 26'.4	9'.3	21'.3	3'.0	
161° 54'.7	9'.2	24'.3	2'.8	55'.9
176° 22'.9	9'.3	27'.1	2'.7	
190° 51'.2	9'.2	29'.8	2'.6	
205° 19'.4	9'.3	32'.4	2'.5	
219° 47'.7	9'.3	34'.9	2'.3	55'.8
234° 16'.0	9'.3	37'.2	2'.2	
248° 44'.3	9'.3	23° 39'.4 S	2'.1	55'.8
263° 12'.6	9'.3	41'.5	1'.9	
277° 40'.9	9'.4	43'.4	1'.8	55'.7
292° 09'.3	9'.3	45'.2	1'.7	
306° 37'.6	9'.4	46'.9	1'.6	
321° 06'.0	9'.4	48'.5	1'.5	
335° 34'.4	9'.4	50'.0	1'.3	55'.6
350° 02'.8	9'.4	51'.3	1'.2	
4° 31'.2	9'.4	52'.5	1'.0	
18° 59'.6	9'.5	53'.5	1'.0	
33° 28'.1	9'.4	54'.5	0'.8	55'.5
47° 56'.5	9'.5	55'.3	0'.7	
62° 25'.0	9'.5	23° 56'.0 S	0'.6	55'.5
76° 53'.5	9'.6	56'.6	0'.4	
91° 22'.1	9'.5	57'.0	0'.3	55'.4
105° 50'.6	9'.6	57'.3	0'.2	
120° 19'.2	9'.6	57'.5	0'.1	
134° 47'.8	9'.7	57'.6	0'.1	
149° 16'.5	9'.6	57'.5	0'.1	55'.3
163° 45'.1	9'.7	57'.4	0'.3	
178° 13'.8	9'.7	57'.1	0'.5	
192° 42'.5	9'.8	56'.6	0'.5	
207° 11'.3	9'.7	56'.1	0'.7	
221° 40'.0	9'.8	55'.4	0'.8	55'.2
236° 08'.8	9'.9	23° 54'.6 S	0'.9	55'.2
250° 37'.7	9'.8	53'.7	1'.0	
265° 06'.5	9'.9	52'.7	1'.2	
279° 35'.4	9'.9	51'.5	1'.2	
294° 04'.3	10'.0	50'.3	1'.4	55'.1
308° 33'.3	10'.0	48'.9	1'.5	
323° 02'.3	10'.0	47'.4	1'.7	
337° 31'.3	10'.1	45'.7	1'.7	
352° 00'.4	10'.1	44'.0	1'.9	55'.0
6° 29'.5	10'.2	42'.1	1'.9	
20° 58'.7	10'.1	40'.2	2'.1	
35° 27'.8	10'.3	38'.1	2'.3	
49° 57'.1	10'.2	23° 35'.8 S	2'.3	55'.0
64° 26'.3	10'.3	33'.5	2'.4	
78° 55'.6	10'.4	31'.1	2'.6	54'.9
93° 25'.0	10'.3	28'.5	2'.7	
107° 54'.3	10'.5	25'.8	2'.8	
122° 23'.8	10'.4	23'.0	2'.9	
136° 53'.2	10'.5	20'.1	3'.0	
151° 22'.7	10'.6	17'.1	3'.1	54'.8
165° 52'.3	10'.6	14'.0	3'.3	
180° 21'.9	10'.6	10'.7	3'.3	
194° 51'.5	10'.7	07'.4	3'.5	
209° 21'.2	10'.8	03'.9	3'.6	
223° 51'.0	10'.7	23° 00'.3 S	3'.7	54'.8
238° 20'.7	10'.9	22° 56'.6 S	3'.8	54'.7
252° 50'.6	10'.8	52'.8	3'.9	
267° 20'.4	11'.0	48'.9	4'.0	
281° 50'.4	10'.9	44'.9	4'.1	
296° 20'.3	11'.1	40'.8	4'.2	
310° 50'.4	11'.0	36'.6	4'.3	
325° 20'.4	11'.2	32'.3	4'.5	54'.6
339° 50'.6	11'.1	27'.8	4'.5	
354° 20'.7	11'.2	23'.3	4'.7	
8° 50'.9	11'.3	18'.6	4'.7	
23° 21'.2	11'.3	13'.9	4'.9	
SD 15'.2	15'.0	14'.9		

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
7	5 46	5 42	12:06	19:41	07:15	9d 71%
8	5 38	5 34	12:06	20:33	08:07	10d 79%
9	5 30	5 26	12:05	21:23	08:58	11d 87%

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1992 August 10, 11, 12 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +0.7		JUPITER -1.7		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
10 Monday 00	318° 43'.5	162° 53'.7	11° 38'.7 N	250° 47'.3	21° 13'.6 N	150° 20'.7	6° 09'.2 N	1° 00'.2	17° 19'.8 S
01	333° 45'.9	177° 53'.3	37'.5	265° 48'.1	13'.9	165° 22'.7	09'.0	16° 02'.9	19'.8
02	348° 48'.4	192° 52'.8	36'.4	280° 48'.8	14'.2	180° 24'.7	08'.8	31° 05'.5	19'.9
03	3° 50'.9	207° 52'.4	35'.3	295° 49'.5	14'.5	195° 26'.7	08'.6	46° 08'.2	20'.0
04	18° 53'.3	222° 51'.9	34'.2	310° 50'.3	14'.7	210° 28'.7	08'.4	61° 10'.8	20'.0
05	33° 55'.8	237° 51'.4	33'.0	325° 51'.0	15'.0	225° 30'.7	08'.2	76° 13'.5	20'.1
06	48° 58'.3	252° 51'.0	31'.9	340° 51'.7	15'.3	240° 32'.7	08'.0	91° 16'.1	20'.1
07	64° 00'.7	267° 50'.5	30'.8	355° 52'.5	15'.6	255° 34'.7	07'.8	106° 18'.8	20'.2
08	79° 03'.2	282° 50'.1	29'.6	10° 53'.2	15'.8	270° 36'.7	07'.6	121° 21'.4	20'.2
09	94° 05'.7	297° 49'.6	28'.5	25° 53'.9	16'.1	285° 38'.7	07'.4	136° 24'.1	20'.3
10	109° 08'.1	312° 49'.2	27'.4	40° 54'.7	16'.4	300° 40'.7	07'.2	151° 26'.7	20'.4
11	124° 10'.6	327° 48'.7	26'.3	55° 55'.4	16'.7	315° 42'.7	07'.0	166° 29'.4	20'.4
12	139° 13'.0	342° 48'.3	11° 25'.1 N	70° 56'.1	21° 17'.0 N	330° 44'.7	6° 06'.8 N	181° 32'.0	17° 20'.5 S
13	154° 15'.5	357° 47'.8	24'.0	85° 56'.9	17'.2	345° 46'.7	06'.6	196° 34'.7	20'.5
14	169° 18'.0	12° 47'.4	22'.9	100° 57'.6	17'.5	0° 48'.7	06'.4	211° 37'.3	20'.6
15	184° 20'.4	27° 46'.9	21'.7	115° 58'.3	17'.8	15° 50'.7	06'.2	226° 40'.0	20'.7
16	199° 22'.9	42° 46'.5	20'.6	130° 59'.1	18'.1	30° 52'.7	06'.0	241° 42'.6	20'.7
17	214° 25'.4	57° 46'.0	19'.5	145° 59'.8	18'.3	45° 54'.7	05'.8	256° 45'.3	20'.8
18	229° 27'.8	72° 45'.6	18'.3	161° 00'.5	18'.6	60° 56'.7	05'.6	271° 47'.9	20'.8
19	244° 30'.3	87° 45'.1	17'.2	176° 01'.3	18'.9	75° 58'.7	05'.4	286° 50'.6	20'.9
20	259° 32'.8	102° 44'.7	16'.1	191° 02'.0	19'.2	91° 00'.7	05'.2	301° 53'.2	20'.9
21	274° 35'.2	117° 44'.2	14'.9	206° 02'.7	19'.4	106° 02'.7	05'.0	316° 55'.9	21'.0
22	289° 37'.7	132° 43'.8	13'.8	221° 03'.5	19'.7	121° 04'.7	04'.8	331° 58'.5	21'.1
23	304° 40'.2	147° 43'.3	12'.7	236° 04'.2	20'.0	136° 06'.7	04'.6	347° 01'.2	21'.1
11 Tuesday 00	319° 42'.6	162° 42'.9	11° 11'.5 N	251° 04'.9	21° 20'.3 N	151° 08'.7	6° 04'.4 N	2° 03'.8	17° 21'.2 S
01	334° 45'.1	177° 42'.4	10'.4	266° 05'.7	20'.5	166° 10'.7	04'.2	17° 06'.5	21'.2
02	349° 47'.5	192° 42'.0	09'.3	281° 06'.4	20'.8	181° 12'.7	04'.0	32° 09'.1	21'.3
03	4° 50'.0	207° 41'.5	08'.1	296° 07'.1	21'.1	196° 14'.7	03'.8	47° 11'.8	21'.3
04	19° 52'.5	222° 41'.1	07'.0	311° 07'.9	21'.4	211° 16'.7	03'.6	62° 14'.4	21'.4
05	34° 54'.9	237° 40'.7	05'.8	326° 08'.6	21'.6	226° 18'.7	03'.4	77° 17'.1	21'.5
06	49° 57'.4	252° 40'.2	04'.7	341° 09'.4	21'.9	241° 20'.7	03'.2	92° 19'.7	21'.5
07	64° 59'.9	267° 39'.8	03'.6	356° 10'.1	22'.2	256° 22'.7	03'.0	107° 22'.4	21'.6
08	80° 02'.3	282° 39'.3	02'.4	11° 10'.8	22'.4	271° 24'.7	02'.8	122° 25'.0	21'.6
09	95° 04'.8	297° 38'.9	01'.3	26° 11'.6	22'.7	286° 26'.7	02'.6	137° 27'.7	21'.7
10	110° 07'.3	312° 38'.4	00'.1	41° 12'.3	23'.0	301° 28'.7	02'.4	152° 30'.3	21'.7
11	125° 09'.7	327° 38'.0	10° 59'.0 N	56° 13'.0	23'.3	316° 30'.7	02'.2	167° 33'.0	21'.8
12	140° 12'.2	342° 37'.6	10° 57'.8 N	71° 13'.8	21° 23'.5 N	331° 32'.6	6° 02'.0 N	182° 35'.6	17° 21'.9 S
13	155° 14'.7	357° 37'.1	56'.7	86° 14'.5	23'.8	346° 34'.6	01'.8	197° 38'.3	21'.9
14	170° 17'.1	12° 36'.7	55'.6	101° 15'.3	24'.1	1° 36'.6	01'.6	212° 40'.9	22'.0
15	185° 19'.6	27° 36'.2	54'.4	116° 16'.0	24'.3	16° 38'.6	01'.4	227° 43'.6	22'.0
16	200° 22'.0	42° 35'.8	53'.3	131° 16'.7	24'.6	31° 40'.6	01'.2	242° 46'.2	22'.1
17	215° 24'.5	57° 35'.3	52'.1	146° 17'.5	24'.9	46° 42'.6	01'.0	257° 48'.9	22'.2
18	230° 27'.0	72° 34'.9	51'.0	161° 18'.2	25'.1	61° 44'.6	00'.8	272° 51'.5	22'.2
19	245° 29'.4	87° 34'.5	49'.8	176° 18'.9	25'.4	76° 46'.6	00'.6	287° 54'.2	22'.3
20	260° 31'.9	102° 34'.0	48'.7	191° 19'.7	25'.7	91° 48'.6	00'.4	302° 56'.8	22'.3
21	275° 34'.4	117° 33'.6	47'.5	206° 20'.4	25'.9	106° 50'.6	00'.2	317° 59'.5	22'.4
22	290° 36'.8	132° 33'.2	46'.4	221° 21'.2	26'.2	121° 52'.6	00'.0	333° 02'.1	22'.4
23	305° 39'.3	147° 32'.7	45'.2	236° 21'.9	26'.5	136° 54'.6	5° 59'.8 N	348° 04'.8	22'.5
12 Wednesday 00	320° 41'.8	162° 32'.3	10° 44'.1 N	251° 22'.6	21° 26'.7 N	151° 56'.6	5° 59'.6 N	3° 07'.4	17° 22'.6 S
01	335° 44'.2	177° 31'.8	42'.9	266° 23'.4	27'.0	166° 58'.6	59'.4	18° 10'.1	22'.6
02	350° 46'.7	192° 31'.4	41'.8	281° 24'.1	27'.3	182° 00'.6	59'.2	33° 12'.7	22'.7
03	5° 49'.1	207° 31'.0	40'.6	296° 24'.8	27'.5	197° 02'.6	59'.0	48° 15'.4	22'.7
04	20° 51'.6	222° 30'.5	39'.5	311° 25'.6	27'.8	212° 04'.6	58'.8	63° 18'.0	22'.8
05	35° 54'.1	237° 30'.1	38'.3	326° 26'.3	28'.1	227° 06'.6	58'.6	78° 20'.7	22'.8
06	50° 56'.5	252° 29'.7	37'.2	341° 27'.1	28'.3	242° 08'.6	58'.4	93° 23'.3	22'.9
07	65° 59'.0	267° 29'.2	36'.0	356° 27'.8	28'.6	257° 10'.6	58'.2	108° 26'.0	23'.0
08	81° 01'.5	282° 28'.8	34'.9	11° 28'.5	28'.9	272° 12'.6	58'.0	123° 28'.6	23'.0
09	96° 03'.9	297° 28'.4	33'.7	26° 29'.3	29'.1	287° 14'.6	57'.8	138° 31'.3	23'.1
10	111° 06'.4	312° 27'.9	32'.6	41° 30'.0	29'.4	302° 16'.6	57'.6	153° 33'.9	23'.1
11	126° 08'.9	327° 27'.5	31'.4	56° 30'.8	29'.6	317° 18'.6	57'.4	168° 36'.6	23'.2
12	141° 11'.3	342° 27'.1	10° 30'.3 N	71° 31'.5	21° 29'.9 N	332° 20'.6	5° 57'.2 N	183° 39'.2	17° 23'.2 S
13	156° 13'.8	357° 26'.6	29'.1	86° 32'.2	30'.2	347° 22'.6	57'.0	198° 41'.9	23'.3
14	171° 16'.3	12° 26'.2	28'.0	101° 33'.0	30'.4	2° 24'.5	56'.8	213° 44'.5	23'.4
15	186° 18'.7	27° 25'.8	26'.8	116° 33'.7	30'.7	17° 26'.5	56'.6	228° 47'.2	23'.4
16	201° 21'.2	42° 25'.3	25'.7	131° 34'.5	31'.0	32° 28'.5	56'.4	243° 49'.8	23'.5
17	216° 23'.6	57° 24'.9	24'.5	146° 35'.2	31'.2	47° 30'.5	56'.2	258° 52'.4	23'.5
18	231° 26'.1	72° 24'.5	23'.3	161° 35'.9	31'.5	62° 32'.5	56'.0	273° 55'.1	23'.6
19	246° 28'.6	87° 24'.0	22'.2	176° 36'.7	31'.7	77° 34'.5	55'.8	288° 57'.7	23'.6
20	261° 31'.0	102° 23'.6	21'.0	191° 37'.4	32'.0	92° 36'.5	55'.6	304° 00'.4	23'.7
21	276° 33'.5	117° 23'.2	19'.9	206° 38'.2	32'.3	107° 38'.5	55'.4	319° 03'.0	23'.8
22	291° 36'.0	132° 22'.8	18'.7	221° 38'.9	32'.5	122° 40'.5	55'.2	334° 05'.7	23'.8
23	306° 38'.4	147° 22'.3	17'.5	236° 39'.6	32'.8	137° 42'.5	55'.0	349° 08'.3	23'.9
	M.P. 02:37	v -0'.4	d 1'.1	v 0'.7	d 0'.3	v 2'.0	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.1	40° 19'.7 S
Achernar	335° 38'.0	57° 16'.0 S
Acrux	173° 27'.4	63° 03'.8 S
Adhara	255° 25'.1	28° 57'.6 S
Aldebaran	291° 07'.4	16° 29'.7 N
Alioth	166° 34'.5	56° 00'.2 N
Alkaid	153° 11'.2	49° 21'.2 N
Alnair	28° 02'.6	46° 59'.6 S
Alnilam	276° 02'.3	1° 12'.3 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.1	26° 44'.5 N
Alpheratz	357° 59'.4	29° 03'.1 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.4 S
Antares	112° 45'.2	26° 25'.1 S
Arcturus	146° 10'.0	19° 13'.3 N
Atria	108° 00'.9	69° 01'.2 S
Avior	234° 25'.1	59° 29'.1 S
Bellatrix	278° 48'.9	6° 20'.7 N
Betelgeuse	271° 18'.3	7° 24'.4 N
Canopus	264° 03'.5	52° 41'.3 S
Capella	280° 57'.7	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.4 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.2	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.5 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 53'.0	51° 29'.6 N
Enif	34° 02'.1	9° 50'.7 N
Fomalhaut	15° 40'.7	29° 39'.4 S
Gacrux	172° 18'.8	57° 04'.6 S
Gienah	176° 08'.6	17° 30'.2 S
Hadar	149° 10'.3	60° 20'.6 S
Hamal	328° 18'.3	23° 25'.7 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 19'.3	74° 11'.4 N
Markab	13° 53'.5	15° 10'.1 N
Menkar	314° 31'.3	4° 03'.8 N
Menkent	148° 26'.1	36° 20'.2 S
Miaplacidus	221° 44'.0	69° 41'.3 S
Mirfak	309° 02'.7	49° 50'.0 N
Nunki	76° 17'.2	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.5 S
Polaris	323° 51'.4	89° 13'.7 N
Pollux	243° 47'.0	28° 02'.6 N
Procyon	245° 16'.3	5° 14'.7 N
Rasalhague	96° 20'.7	12° 34'.0 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.2	8° 12'.4 S
Rigil Kent	140° 13'.1	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.1	56° 29'.8 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.7	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 04'.4	43° 24'.2 S
Vega	80° 49'.2	38° 46'.8 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	203° 00'.3	13:10
Mars	291° 22'.3	07:15
Jupiter	191° 26'.1	13:54
Saturn	42° 21'.2	23:48

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
10 00	178° 39'.8	15° 33'.2 N	37° 51'.5	11'.4	22° 09'.0 S	4'.9	54'.6
01	193° 39'.9	32'.5	52° 21'.9	11'.4	04'.1	5'.1	
02	208° 40'.0	31'.8	66° 52'.3	11'.5	21° 59'.0 S	5'.1	54'.5
03	223° 40'.1	31'.0	81° 22'.8	11'.6	53'.9	5'.3	
04	238° 40'.2	30'.3	95° 53'.4	11'.5	48'.6	5'.4	
05	253° 40'.3	29'.6	110° 23'.9	11'.7	43'.2	5'.4	
06	268° 40'.3	28'.8	124° 54'.6	11'.7	37'.8	5'.6	
07	283° 40'.4	28'.1	139° 25'.3	11'.7	32'.2	5'.6	
08	298° 40'.5	27'.4	153° 56'.0	11'.8	26'.6	5'.8	
09	313° 40'.6	26'.6	168° 26'.8	11'.9	20'.8	5'.8	54'.4
10	328° 40'.7	25'.9	182° 57'.7	11'.9	15'.0	6'.0	
11	343° 40'.8	25'.2	197° 28'.6	11'.9	09'.0	6'.0	
12	358° 40'.9	15° 24'.4 N	211° 59'.5	12'.1	21° 03'.0 S	6'.1	54'.4
13	13° 41'.0	23'.7	226° 30'.6	12'.0	20° 56'.9 S	6'.3	
14	28° 41'.1	22'.9	241° 01'.6	12'.1	50'.6	6'.3	
15	43° 41'.2	22'.2	255° 32'.7	12'.2	44'.3	6'.4	
16	58° 41'.3	21'.5	270° 03'.9	12'.3	37'.9	6'.5	
17	73° 41'.4	20'.7	284° 35'.2	12'.3	31'.4	6'.6	
18	88° 41'.5	20'.0	299° 06'.5	12'.3	24'.8	6'.7	54'.3
19	103° 41'.6	19'.3	313° 37'.8	12'.4	18'.1	6'.7	
20	118° 41'.7	18'.5	328° 09'.2	12'.5	11'.4	6'.9	
21	133° 41'.8	17'.8	342° 40'.7	12'.5	04'.5	6'.9	
22	148° 41'.9	17'.0	357° 12'.2	12'.5	19° 57'.6 S	7'.1	
23	163° 42'.0	16'.3	11° 43'.7	12'.7	50'.5	7'.1	
11 00	178° 42'.1	15° 15'.6 N	26° 15'.4	12'.6	19° 43'.4 S	7'.2	54'.3
01	193° 42'.2	14'.8	40° 47'.0	12'.8	36'.2	7'.3	
02	208° 42'.3	14'.1	55° 18'.8	12'.8	28'.9	7'.3	
03	223° 42'.4	13'.3	69° 50'.6	12'.8	21'.6	7'.5	54'.2
04	238° 42'.5	12'.6	84° 22'.4	12'.9	14'.1	7'.5	
05	253° 42'.6	11'.8	98° 54'.3	13'.0	06'.6	7'.6	
06	268° 42'.7	11'.1	113° 26'.3	13'.0	18° 59'.0 S	7'.7	
07	283° 42'.8	10'.4	127° 58'.3	13'.0	51'.3	7'.8	
08	298° 42'.9	09'.6	142° 30'.3	13'.2	43'.5	7'.9	
09	313° 43'.0	08'.9	157° 02'.5	13'.1	35'.6	7'.9	
10	328° 43'.1	08'.1	171° 34'.6	13'.3	27'.7	8'.0	
11	343° 43'.2	07'.4	186° 06'.9	13'.2	19'.7	8'.1	
12	358° 43'.3	15° 06'.6 N	200° 39'.1	13'.4	18° 11'.6 S	8'.2	54'.2
13	13° 43'.4	05'.9	215° 11'.5	13'.4	03'.4	8'.2	
14	28° 43'.5	05'.1	229° 43'.9	13'.4	17° 55'.2 S	8'.3	
15	43° 43'.6	04'.4	244° 16'.3	13'.5	46'.9	8'.4	54'.1
16	58° 43'.8	03'.6	258° 48'.8	13'.6	38'.5	8'.5	
17	73° 43'.9	02'.9	273° 21'.4	13'.6	30'.0	8'.5	
18	88° 44'.0	02'.1	287° 54'.0	13'.6	21'.5	8'.6	
19	103° 44'.1	01'.4	302° 26'.6	13'.7	12'.9	8'.7	
20	118° 44'.2	00'.6	316° 59'.3	13'.8	04'.2	8'.7	
21	133° 44'.3	14° 59'.9 N	331° 32'.1	13'.8	16° 55'.5 S	8'.9	
22	148° 44'.4	59'.1	346° 04'.9	13'.9	46'.6	8'.9	
23	163° 44'.5	58'.4	0° 37'.8	13'.9	37'.7	8'.9	
12 00	178° 44'.6	14° 57'.6 N	15° 10'.7	14'.0	16° 28'.8 S	9'.0	54'.1
01	193° 44'.7	56'.9	29° 43'.7	14'.0	19'.8	9'.1	
02	208° 44'.8	56'.1	44° 16'.7	14'.1	10'.7	9'.2	
03	223° 44'.9	55'.4	58° 49'.8	14'.1	01'.5	9'.2	
04	238° 45'.0	54'.6	73° 22'.9	14'.1	15° 52'.3 S	9'.3	
05	253° 45'.1	53'.9	87° 56'.0	14'.3	43'.0	9'.3	
06	268° 45'.2	53'.1	102° 29'.3	14'.2	33'.7	9'.4	54'.0
07	283° 45'.3	52'.4	117° 02'.5	14'.3	24'.3	9'.5	
08	298° 45'.5	51'.6	131° 35'.8	14'.4	14'.8	9'.5	
09	313° 45'.6	50'.9	146° 09'.2	14'.4	05'.3	9'.6	
10	328° 45'.7	50'.1	160° 42'.6	14'.5	14° 55'.7 S	9'.6	
11	343° 45'.8	49'.4	175° 16'.1	14'.5	46'.1	9'.8	
12	358° 45'.9	14° 48'.6 N	189° 49'.6	14'.5	14° 36'.3 S	9'.7	54'.0
13	13° 46'.0	47'.8	204° 23'.1	14'.6	26'.6	9'.8	
14	28° 46'.1	47'.1	218° 56'.7	14'.7	16'.8	9'.9	
15	43° 46'.2	46'.3	233° 30'.4	14'.7	06'.9	10'.0	
16	58° 46'.3	45'.6	248° 04'.1	14'.7	13° 56'.9 S	9'.9	
17	73° 46'.4	44'.8	262° 37'.8	14'.8	47'.0	10'.1	
18	88° 46'.5	44'.0	277° 11'.6	14'.8	36'.9	10'.1	
19	103° 46'.7	43'.3	291° 45'.4	14'.9	26'.8	10'.1	
20	118° 46'.8	42'.5	306° 19'.3	14'.9	16'.7	10'.2	
21	133° 46'.9	41'.8	320° 53'.2	14'.9	06'.5	10'.3	
22	148° 47'.0	41'.0	335° 27'.1	15'.0	12° 56'.2 S	10'.3	
23	163° 47'.1	40'.3	350° 01'.1	15'.0	45'.9	10'.3	
	SD 15'.8	d 0'.7	SD	14'.8	14'.8	14'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
10	5 21	5 16	12:05	22:12	09:48	12d 92%
11	5 12	5 07	12:05	22:57	10:35	13d 97%
12	5 02	4 57	12:05	23:41	11:20	14d 99%

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1992 August 13, 14, 15 (Thur, Fri, Sat)

GMT	ARIES	VENUS -3.9		MARS +0.7		JUPITER -1.7		SATURN +0.2	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
13 Thursday 00	321° 40'.9	162° 21'.9	10° 16'.4 N	251° 40'.4	21° 33'.0 N	152° 44'.5	5° 54'.8 N	4° 11'.0	17° 23'.9 S
01	336° 43'.4	177° 21'.5	15'.2	266° 41'.1	33'.3	167° 46'.5	54'.6	19° 13'.6	24'.0
02	351° 45'.8	192° 21'.0	14'.1	281° 41'.9	33'.5	182° 48'.5	54'.4	34° 16'.3	24'.0
03	6° 48'.3	207° 20'.6	12'.9	296° 42'.6	33'.8	197° 50'.5	54'.2	49° 18'.9	24'.1
04	21° 50'.8	222° 20'.2	11'.7	311° 43'.4	34'.1	212° 52'.5	54'.0	64° 21'.6	24'.2
05	36° 53'.2	237° 19'.8	10'.6	326° 44'.1	34'.3	227° 54'.5	53'.8	79° 24'.2	24'.2
06	51° 55'.7	252° 19'.3	09'.4	341° 44'.8	34'.6	242° 56'.5	53'.6	94° 26'.9	24'.3
07	66° 58'.1	267° 18'.9	08'.3	356° 45'.6	34'.8	257° 58'.5	53'.4	109° 29'.5	24'.3
08	82° 00'.6	282° 18'.5	07'.1	11° 46'.3	35'.1	273° 00'.4	53'.2	124° 32'.2	24'.4
09	97° 03'.1	297° 18'.1	05'.9	26° 47'.1	35'.3	288° 02'.4	53'.0	139° 34'.8	24'.4
10	112° 05'.5	312° 17'.6	04'.8	41° 47'.8	35'.6	303° 04'.4	52'.8	154° 37'.5	24'.5
11	127° 08'.0	327° 17'.2	03'.6	56° 48'.6	35'.9	318° 06'.4	52'.6	169° 40'.1	24'.6
12	142° 10'.5	342° 16'.8	10° 02'.4 N	71° 49'.3	21° 36'.1 N	333° 08'.4	5° 52'.4 N	184° 42'.8	17° 24'.6 S
13	157° 12'.9	357° 16'.4	01'.3	86° 50'.0	36'.4	348° 10'.4	52'.2	199° 45'.4	24'.7
14	172° 15'.4	12° 15'.9	00'.1	101° 50'.8	36'.6	3° 12'.4	52'.0	214° 48'.1	24'.7
15	187° 17'.9	27° 15'.5	9° 58'.9 N	116° 51'.5	36'.9	18° 14'.4	51'.8	229° 50'.7	24'.8
16	202° 20'.3	42° 15'.1	57'.8	131° 52'.3	37'.1	33° 16'.4	51'.6	244° 53'.4	24'.8
17	217° 22'.8	57° 14'.7	56'.6	146° 53'.0	37'.4	48° 18'.4	51'.4	259° 56'.0	24'.9
18	232° 25'.2	72° 14'.3	55'.4	161° 53'.8	37'.6	63° 20'.4	51'.2	274° 58'.7	25'.0
19	247° 27'.7	87° 13'.8	54'.3	176° 54'.5	37'.9	78° 22'.4	51'.0	290° 01'.3	25'.0
20	262° 30'.2	102° 13'.4	53'.1	191° 55'.2	38'.1	93° 24'.4	50'.8	305° 04'.0	25'.1
21	277° 32'.6	117° 13'.0	51'.9	206° 56'.0	38'.4	108° 26'.4	50'.6	320° 06'.6	25'.1
22	292° 35'.1	132° 12'.6	50'.7	221° 56'.7	38'.6	123° 28'.4	50'.4	335° 09'.3	25'.2
23	307° 37'.6	147° 12'.2	49'.6	236° 57'.5	38'.9	138° 30'.3	50'.2	350° 11'.9	25'.2
14 Friday 00	322° 40'.0	162° 11'.7	9° 48'.4 N	251° 58'.2	21° 39'.1 N	153° 32'.3	5° 50'.0 N	5° 14'.6	17° 25'.3 S
01	337° 42'.5	177° 11'.3	47'.2	266° 59'.0	39'.4	168° 34'.3	49'.8	20° 17'.2	25'.4
02	352° 45'.0	192° 10'.9	46'.1	281° 59'.7	39'.6	183° 36'.3	49'.6	35° 19'.9	25'.4
03	7° 47'.4	207° 10'.5	44'.9	297° 00'.5	39'.9	198° 38'.3	49'.4	50° 22'.5	25'.5
04	22° 49'.9	222° 10'.1	43'.7	312° 01'.2	40'.1	213° 40'.3	49'.2	65° 25'.2	25'.5
05	37° 52'.4	237° 09'.6	42'.5	327° 01'.9	40'.4	228° 42'.3	49'.0	80° 27'.8	25'.6
06	52° 54'.8	252° 09'.2	41'.4	342° 02'.7	40'.6	243° 44'.3	48'.8	95° 30'.5	25'.6
07	67° 57'.3	267° 08'.8	40'.2	357° 03'.4	40'.9	258° 46'.3	48'.6	110° 33'.1	25'.7
08	82° 59'.7	282° 08'.4	39'.0	12° 04'.2	41'.1	273° 48'.3	48'.4	125° 35'.8	25'.8
09	98° 02'.2	297° 08'.0	37'.8	27° 04'.9	41'.4	288° 50'.3	48'.2	140° 38'.4	25'.8
10	113° 04'.7	312° 07'.6	36'.7	42° 05'.7	41'.6	303° 52'.3	48'.0	155° 41'.1	25'.9
11	128° 07'.1	327° 07'.1	35'.5	57° 06'.4	41'.9	318° 54'.3	47'.8	170° 43'.7	25'.9
12	143° 09'.6	342° 06'.7	9° 34'.3 N	72° 07'.2	21° 42'.1 N	333° 56'.3	5° 47'.6 N	185° 46'.3	17° 26'.0 S
13	158° 12'.1	357° 06'.3	33'.1	87° 07'.9	42'.4	348° 58'.2	47'.4	200° 49'.0	26'.0
14	173° 14'.5	12° 05'.9	32'.0	102° 08'.7	42'.6	4° 00'.2	47'.2	215° 51'.6	26'.1
15	188° 17'.0	27° 05'.5	30'.8	117° 09'.4	42'.9	19° 02'.2	47'.0	230° 54'.3	26'.2
16	203° 19'.5	42° 05'.1	29'.6	132° 10'.2	43'.1	34° 04'.2	46'.8	245° 56'.9	26'.2
17	218° 21'.9	57° 04'.7	28'.4	147° 10'.9	43'.4	49° 06'.2	46'.6	260° 59'.6	26'.3
18	233° 24'.4	72° 04'.2	27'.2	162° 11'.6	43'.6	64° 08'.2	46'.4	276° 02'.2	26'.3
19	248° 26'.9	87° 03'.8	26'.1	177° 12'.4	43'.8	79° 10'.2	46'.2	291° 04'.9	26'.4
20	263° 29'.3	102° 03'.4	24'.9	192° 13'.1	44'.1	94° 12'.2	46'.0	306° 07'.5	26'.4
21	278° 31'.8	117° 03'.0	23'.7	207° 13'.9	44'.3	109° 14'.2	45'.8	321° 10'.2	26'.5
22	293° 34'.2	132° 02'.6	22'.5	222° 14'.6	44'.6	124° 16'.2	45'.6	336° 12'.8	26'.6
23	308° 36'.7	147° 02'.2	21'.3	237° 15'.4	44'.8	139° 18'.2	45'.4	351° 15'.5	26'.6
15 Saturday 00	323° 39'.2	162° 01'.8	9° 20'.2 N	252° 16'.1	21° 45'.1 N	154° 20'.2	5° 45'.2 N	6° 18'.1	17° 26'.7 S
01	338° 41'.6	177° 01'.4	19'.0	267° 16'.9	45'.3	169° 22'.1	45'.0	21° 20'.8	26'.7
02	353° 44'.1	192° 01'.0	17'.8	282° 17'.6	45'.6	184° 24'.1	44'.8	36° 23'.4	26'.8
03	8° 46'.6	207° 00'.5	16'.6	297° 18'.4	45'.8	199° 26'.1	44'.6	51° 26'.1	26'.8
04	23° 49'.0	222° 00'.1	15'.4	312° 19'.1	46'.0	214° 28'.1	44'.4	66° 28'.7	26'.9
05	38° 51'.5	236° 59'.7	14'.2	327° 19'.9	46'.3	229° 30'.1	44'.2	81° 31'.4	27'.0
06	53° 54'.0	251° 59'.3	13'.1	342° 20'.6	46'.5	244° 32'.1	44'.0	96° 34'.0	27'.0
07	68° 56'.4	266° 58'.9	11'.9	357° 21'.4	46'.8	259° 34'.1	43'.8	111° 36'.7	27'.1
08	83° 58'.9	281° 58'.5	10'.7	12° 22'.1	47'.0	274° 36'.1	43'.6	126° 39'.3	27'.1
09	99° 01'.3	296° 58'.1	09'.5	27° 22'.9	47'.2	289° 38'.1	43'.4	141° 42'.0	27'.2
10	114° 03'.8	311° 57'.7	08'.3	42° 23'.6	47'.5	304° 40'.1	43'.2	156° 44'.6	27'.2
11	129° 06'.3	326° 57'.3	07'.1	57° 24'.4	47'.7	319° 42'.1	43'.0	171° 47'.3	27'.3
12	144° 08'.7	341° 56'.9	9° 05'.9 N	72° 25'.1	21° 48'.0 N	334° 44'.0	5° 42'.8 N	186° 49'.9	17° 27'.3 S
13	159° 11'.2	356° 56'.5	04'.8	87° 25'.9	48'.2	349° 46'.0	42'.6	201° 52'.5	27'.4
14	174° 13'.7	11° 56'.1	03'.6	102° 26'.6	48'.4	4° 48'.0	42'.4	216° 55'.2	27'.5
15	189° 16'.1	26° 55'.7	02'.4	117° 27'.4	48'.7	19° 50'.0	42'.2	231° 57'.8	27'.5
16	204° 18'.6	41° 55'.3	01'.2	132° 28'.1	48'.9	34° 52'.0	42'.0	247° 00'.5	27'.6
17	219° 21'.1	56° 54'.8	00'.0	147° 28'.9	49'.2	49° 54'.0	41'.8	262° 03'.1	27'.6
18	234° 23'.5	71° 54'.4	8° 58'.8 N	162° 29'.6	49'.4	64° 56'.0	41'.6	277° 05'.8	27'.7
19	249° 26'.0	86° 54'.0	57'.6	177° 30'.4	49'.6	79° 58'.0	41'.4	292° 08'.4	27'.7
20	264° 28'.5	101° 53'.6	56'.4	192° 31'.1	49'.9	95° 00'.0	41'.2	307° 11'.1	27'.8
21	279° 30'.9	116° 53'.2	55'.2	207° 31'.9	50'.1	110° 02'.0	41'.0	322° 13'.7	27'.9
22	294° 33'.4	131° 52'.8	54'.1	222° 32'.6	50'.3	125° 04'.0	40'.8	337° 16'.4	27'.9
23	309° 35'.8	146° 52'.4	52'.9	237° 33'.4	50'.6	140° 05'.9	40'.6	352° 19'.0	28'.0
	M.P. 02:25	v -0'.4	d 1'.2	v 0'.7	d 0'.2	v 2'.0	d 0'.2	v 2'.6	d 0'.1

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 30'.0	40° 19'.7 S	178° 47'.2	14° 39'.5 N	4° 35'.1	15'.1	12° 35'.6 S	10'.4	54'.0
Achernar	335° 37'.9	57° 16'.0 S	193° 47'.3	38'.7	19° 09'.2	15'.1	25'.2	10'.5	
Acrux	173° 27'.4	63° 03'.8 S	208° 47'.4	38'.0	33° 43'.3	15'.1	14'.7	10'.5	
Adhara	255° 25'.0	28° 57'.6 S	223° 47'.6	37'.2	48° 17'.4	15'.2	04'.2	10'.5	
Aldebaran	291° 07'.3	16° 29'.8 N	238° 47'.7	36'.4	62° 51'.6	15'.3	11° 53'.7 S	10'.6	
			253° 47'.8	35'.7	77° 25'.9	15'.2	43'.1	10'.6	
Alioth	166° 34'.5	56° 00'.1 N	268° 47'.9	34'.9	92° 00'.1	15'.3	32'.5	10'.7	
Alkaid	153° 11'.2	49° 21'.2 N	283° 48'.0	34'.2	106° 34'.4	15'.4	21'.8	10'.7	
Alnair	28° 02'.6	46° 59'.6 S	298° 48'.1	33'.4	121° 08'.8	15'.3	11'.1	10'.8	
Alnilam	276° 02'.3	1° 12'.2 S	313° 48'.2	32'.6	135° 43'.1	15'.4	00'.3	10'.8	
Alphard	218° 11'.7	8° 37'.6 S	328° 48'.3	31'.9	150° 17'.5	15'.5	10° 49'.5 S	10'.9	
			343° 48'.5	31'.1	164° 52'.0	15'.5	38'.6	10'.9	
Alphecca	126° 24'.1	26° 44'.5 N	358° 48'.6	14° 30'.3 N	179° 26'.5	15'.5	10° 27'.7 S	10'.9	54'.0
Alpheratz	357° 59'.4	29° 03'.1 N	13° 48'.7	29'.6	194° 01'.0	15'.5	16'.8	10'.9	
Altair	62° 23'.1	8° 51'.1 N	28° 48'.8	28'.8	208° 35'.5	15'.6	05'.9	11'.1	
Ankaa	353° 30'.6	42° 20'.4 S	43° 48'.9	28'.0	223° 10'.1	15'.6	9° 54'.8 S	11'.0	
Antares	112° 45'.2	26° 25'.1 S	58° 49'.0	27'.3	237° 44'.7	15'.6	43'.8	11'.1	
			73° 49'.2	26'.5	252° 19'.3	15'.7	32'.7	11'.1	
Arcturus	146° 10'.0	19° 13'.3 N	88° 49'.3	25'.7	266° 54'.0	15'.7	21'.6	11'.2	
Atria	108° 00'.9	69° 01'.2 S	103° 49'.4	25'.0	281° 28'.7	15'.7	10'.4	11'.1	
Avior	234° 25'.1	59° 29'.1 S	118° 49'.5	24'.2	296° 03'.4	15'.8	8° 59'.3 S	11'.3	
Bellatrix	278° 48'.8	6° 20'.7 N	133° 49'.6	23'.4	310° 38'.2	15'.7	48'.0	11'.2	
Betelgeuse	271° 18'.3	7° 24'.4 N	148° 49'.7	22'.6	325° 12'.9	15'.8	36'.8	11'.3	
			163° 49'.9	21'.9	339° 47'.7	15'.9	25'.5	11'.3	
Canopus	264° 03'.4	52° 41'.3 S	178° 50'.0	14° 21'.1 N	354° 22'.6	15'.8	8° 14'.2 S	11'.4	54'.0
Capella	280° 57'.7	45° 59'.4 N	193° 50'.1	20'.3	8° 57'.4	15'.9	02'.8	11'.4	
Deneb	49° 41'.7	45° 15'.4 N	208° 50'.2	19'.6	23° 32'.3	15'.9	7° 51'.4 S	11'.4	
Denebola	182° 49'.7	14° 36'.8 N	223° 50'.3	18'.8	38° 07'.2	16'.0	40'.0	11'.4	
Diphda	349° 11'.2	18° 01'.3 S	238° 50'.4	18'.0	52° 42'.2	15'.9	28'.6	11'.5	
			253° 50'.6	17'.2	67° 17'.1	16'.0	17'.1	11'.5	
Dubhe	194° 11'.1	61° 47'.5 N	268° 50'.7	16'.5	81° 52'.1	16'.0	05'.6	11'.5	
Elnath	278° 32'.5	28° 36'.1 N	283° 50'.8	15'.7	96° 27'.1	16'.0	6° 54'.1 S	11'.6	
Eltanin	90° 53'.0	51° 29'.6 N	298° 50'.9	14'.9	111° 02'.1	16'.0	42'.5	11'.6	
Enif	34° 02'.1	9° 50'.7 N	313° 51'.0	14'.2	125° 37'.1	16'.1	30'.9	11'.6	
Fomalhaut	15° 40'.7	29° 39'.4 S	328° 51'.2	13'.4	140° 12'.2	16'.1	19'.3	11'.6	
			343° 51'.3	12'.6	154° 47'.3	16'.1	07'.7	11'.7	
Gacrux	172° 18'.8	57° 04'.6 S	358° 51'.4	14° 11'.8 N	169° 22'.4	16'.1	5° 56'.0 S	11'.6	54'.0
Gienah	176° 08'.6	17° 30'.1 S	13° 51'.5	11'.1	183° 57'.5	16'.1	44'.4	11'.7	
Hadar	149° 10'.4	60° 20'.6 S	28° 51'.6	10'.3	198° 32'.6	16'.1	32'.7	11'.8	
Hamal	328° 18'.2	23° 25'.7 N	43° 51'.8	09'.5	213° 07'.7	16'.2	20'.9	11'.7	
Kaus Aust.	84° 04'.1	34° 23'.3 S	58° 51'.9	08'.7	227° 42'.9	16'.1	09'.2	11'.8	
			73° 52'.0	07'.9	242° 18'.0	16'.2	4° 57'.4 S	11'.7	
Kochab	137° 19'.3	74° 11'.4 N	88° 52'.1	07'.2	256° 53'.2	16'.2	45'.7	11'.8	
Markab	13° 53'.5	15° 10'.1 N	103° 52'.3	06'.4	271° 28'.4	16'.2	33'.9	11'.9	
Menkar	314° 31'.3	4° 03'.8 N	118° 52'.4	05'.6	286° 03'.6	16'.2	22'.0	11'.8	
Menkent	148° 26'.1	36° 20'.2 S	133° 52'.5	04'.8	300° 38'.8	16'.3	10'.2	11'.9	
Miaplacidus	221° 44'.0	69° 41'.3 S	148° 52'.6	04'.1	315° 14'.1	16'.2	3° 58'.3 S	11'.8	
			163° 52'.7	03'.3	329° 49'.3	16'.2	46'.5	11'.9	
Mirfak	309° 02'.7	49° 50'.0 N	178° 52'.9	14° 02'.5 N	344° 24'.5	16'.3	3° 34'.6 S	11'.9	54'.0
Nunki	76° 17'.2	26° 18'.3 S	193° 53'.0	01'.7	358° 59'.8	16'.3	22'.7	11'.9	
Peacock	53° 43'.0	56° 45'.5 S	208° 53'.1	00'.9	13° 35'.1	16'.2	10'.8	12'.0	54'.1
Polaris	323° 50'.2	89° 13'.7 N	223° 53'.2	00'.1	28° 10'.3	16'.3	2° 58'.8 S	11'.9	
Pollux	243° 47'.0	28° 02'.6 N	238° 53'.4	13° 59'.4 N	42° 45'.6	16'.3	46'.9	11'.9	
			253° 53'.5	58'.6	57° 20'.9	16'.2	35'.0	12'.0	
Procyon	245° 16'.3	5° 14'.7 N	268° 53'.6	57'.8	71° 56'.1	16'.3	23'.0	12'.0	
Rasalhague	96° 20'.7	12° 34'.0 N	283° 53'.7	57'.0	86° 31'.4	16'.3	11'.0	12'.0	
Regulus	208° 00'.3	12° 00'.2 N	298° 53'.9	56'.2	101° 06'.7	16'.3	1° 59'.0 S	12'.0	
Rigel	281° 27'.1	8° 12'.4 S	313° 54'.0	55'.5	115° 42'.0	16'.3	47'.0	12'.0	
Rigil Kent	140° 13'.1	60° 48'.5 S	328° 54'.1	54'.7	130° 17'.3	16'.3	35'.0	12'.0	
			343° 54'.2	53'.9	144° 52'.6	16'.3	23'.0	12'.0	
Sabik	102° 30'.2	15° 43'.0 S	358° 54'.4	13° 53'.1 N	159° 27'.9	16'.2	1° 11'.0 S	12'.0	54'.1
Schedar	349° 58'.0	56° 29'.8 N	13° 54'.5	52'.3	174° 03'.1	16'.3	0° 59'.0 S	12'.0	
Shaula	96° 42'.8	37° 06'.0 S	28° 54'.6	51'.5	188° 38'.4	16'.3	47'.0	12'.1	
Sirius	258° 47'.7	16° 42'.2 S	43° 54'.7	50'.7	203° 13'.7	16'.3	34'.9	12'.0	
Spica	158° 47'.8	11° 07'.4 S	58° 54'.9	50'.0	217° 49'.0	16'.2	22'.9	12'.1	
			73° 55'.0	49'.2	232° 24'.2	16'.3	10'.8	12'.0	54'.2
Suhail	223° 04'.4	43° 24'.2 S	88° 55'.1	48'.4	246° 59'.5	16'.3	0° 01'.2 N	12'.1	
Vega	80° 49'.2	38° 46'.8 N	103° 55'.2	47'.6	261° 34'.8	16'.2	13'.3	12'.0	
Zuben'ubi	137° 22'.7	16° 00'.8 S	118° 55'.4	46'.8	276° 10'.0	16'.2	25'.3	12'.1	
			133° 55'.5	46'.0	290° 45'.2	16'.3	37'.4	12'.0	
	SHA	Mer.Pass.	148° 55'.6	45'.2	305° 20'.5	16'.2	49'.4	12'.1	
Venus	199° 31'.7	13:12	163° 55'.8	44'.4	319° 55'.7	16'.2	1° 01'.5 N	12'.0	
Mars	289° 18'.2	07:12							
Jupiter	190° 52'.3	13:44							
Saturn	42° 34'.5	23:35	SD 15'.8	d 0'.8	SD 14'.7		14'.7	14'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
13	4 51	4 46	12:05	24:23	12:02	15d Full
14	4 40	4 35	12:05	00:23	12:44	16d 99%
15	4 29	4 23	12:04	01:04	13:24	17d 96%

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1992 August 16, 17, 18 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +0.7		JUPITER -1.7		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
16 Sunday 00	324° 38'.3	161° 52'.0	8° 51'.7 N	252° 34'.1	21° 50'.8 N	155° 07'.9	5° 40'.4 N	7° 21'.7	17° 28'.0 S
01	339° 40'.8	176° 51'.6	50'.5	267° 34'.9	51'.0	170° 09'.9	40'.2	22° 24'.3	28'.1
02	354° 43'.2	191° 51'.2	49'.3	282° 35'.6	51'.3	185° 11'.9	40'.0	37° 27'.0	28'.1
03	9° 45'.7	206° 50'.8	48'.1	297° 36'.4	51'.5	200° 13'.9	39'.8	52° 29'.6	28'.2
04	24° 48'.2	221° 50'.4	46'.9	312° 37'.1	51'.8	215° 15'.9	39'.6	67° 32'.3	28'.2
05	39° 50'.6	236° 50'.0	45'.7	327° 37'.9	52'.0	230° 17'.9	39'.4	82° 34'.9	28'.3
06	54° 53'.1	251° 49'.6	44'.5	342° 38'.6	52'.2	245° 19'.9	39'.2	97° 37'.6	28'.4
07	69° 55'.6	266° 49'.2	43'.3	357° 39'.4	52'.5	260° 21'.9	39'.0	112° 40'.2	28'.4
08	84° 58'.0	281° 48'.8	42'.1	12° 40'.1	52'.7	275° 23'.8	38'.7	127° 42'.8	28'.5
09	100° 00'.5	296° 48'.4	40'.9	27° 40'.9	52'.9	290° 25'.8	38'.5	142° 45'.5	28'.5
10	115° 02'.9	311° 48'.0	39'.7	42° 41'.6	53'.2	305° 27'.8	38'.3	157° 48'.1	28'.6
11	130° 05'.4	326° 47'.6	38'.5	57° 42'.4	53'.4	320° 29'.8	38'.1	172° 50'.8	28'.6
12	145° 07'.9	341° 47'.2	8° 37'.3 N	72° 43'.1	21° 53'.6 N	335° 31'.8	5° 37'.9 N	187° 53'.4	17° 28'.7 S
13	160° 10'.3	356° 46'.8	36'.1	87° 43'.9	53'.9	350° 33'.8	37'.7	202° 56'.1	28'.8
14	175° 12'.8	11° 46'.4	34'.9	102° 44'.6	54'.1	5° 35'.8	37'.5	217° 58'.7	28'.8
15	190° 15'.3	26° 46'.0	33'.7	117° 45'.4	54'.3	20° 37'.8	37'.3	233° 01'.4	28'.9
16	205° 17'.7	41° 45'.6	32'.5	132° 46'.1	54'.5	35° 39'.8	37'.1	248° 04'.0	28'.9
17	220° 20'.2	56° 45'.2	31'.4	147° 46'.9	54'.8	50° 41'.8	36'.9	263° 06'.7	29'.0
18	235° 22'.7	71° 44'.8	30'.2	162° 47'.7	55'.0	65° 43'.7	36'.7	278° 09'.3	29'.0
19	250° 25'.1	86° 44'.4	29'.0	177° 48'.4	55'.2	80° 45'.7	36'.5	293° 12'.0	29'.1
20	265° 27'.6	101° 44'.0	27'.8	192° 49'.2	55'.5	95° 47'.7	36'.3	308° 14'.6	29'.1
21	280° 30'.1	116° 43'.7	26'.6	207° 49'.9	55'.7	110° 49'.7	36'.1	323° 17'.3	29'.2
22	295° 32'.5	131° 43'.3	25'.4	222° 50'.7	55'.9	125° 51'.7	35'.9	338° 19'.9	29'.3
23	310° 35'.0	146° 42'.9	24'.2	237° 51'.4	56'.2	140° 53'.7	35'.7	353° 22'.6	29'.3
17 Monday 00	325° 37'.4	161° 42'.5	8° 22'.9 N	252° 52'.2	21° 56'.4 N	155° 55'.7	5° 35'.5 N	8° 25'.2	17° 29'.4 S
01	340° 39'.9	176° 42'.1	21'.7	267° 52'.9	56'.6	170° 57'.7	35'.3	23° 27'.8	29'.4
02	355° 42'.4	191° 41'.7	20'.5	282° 53'.7	56'.8	185° 59'.7	35'.1	38° 30'.5	29'.5
03	10° 44'.8	206° 41'.3	19'.3	297° 54'.4	57'.1	201° 01'.6	34'.9	53° 33'.1	29'.5
04	25° 47'.3	221° 40'.9	18'.1	312° 55'.2	57'.3	216° 03'.6	34'.7	68° 35'.8	29'.6
05	40° 49'.8	236° 40'.5	16'.9	327° 56'.0	57'.5	231° 05'.6	34'.5	83° 38'.4	29'.6
06	55° 52'.2	251° 40'.1	15'.7	342° 56'.7	57'.7	246° 07'.6	34'.3	98° 41'.1	29'.7
07	70° 54'.7	266° 39'.7	14'.5	357° 57'.5	58'.0	261° 09'.6	34'.1	113° 43'.7	29'.8
08	85° 57'.2	281° 39'.3	13'.3	12° 58'.2	58'.2	276° 11'.6	33'.9	128° 46'.4	29'.8
09	100° 59'.6	296° 38'.9	12'.1	27° 59'.0	58'.4	291° 13'.6	33'.7	143° 49'.0	29'.9
10	116° 02'.1	311° 38'.5	10'.9	42° 59'.7	58'.6	306° 15'.6	33'.5	158° 51'.7	29'.9
11	131° 04'.5	326° 38'.1	09'.7	58° 00'.5	58'.9	321° 17'.5	33'.3	173° 54'.3	30'.0
12	146° 07'.0	341° 37'.8	8° 08'.5 N	73° 01'.2	21° 59'.1 N	336° 19'.5	5° 33'.1 N	188° 57'.0	17° 30'.0 S
13	161° 09'.5	356° 37'.4	07'.3	88° 02'.0	59'.3	351° 21'.5	32'.9	203° 59'.6	30'.1
14	176° 11'.9	11° 37'.0	06'.1	103° 02'.8	59'.5	6° 23'.5	32'.7	219° 02'.2	30'.1
15	191° 14'.4	26° 36'.6	04'.9	118° 03'.5	59'.8	21° 25'.5	32'.5	234° 04'.9	30'.2
16	206° 16'.9	41° 36'.2	03'.7	133° 04'.3	22° 00'.0 N	36° 27'.5	32'.3	249° 07'.5	30'.3
17	221° 19'.3	56° 35'.8	02'.5	148° 05'.0	00'.2	51° 29'.5	32'.1	264° 10'.2	30'.3
18	236° 21'.8	71° 35'.4	01'.3	163° 05'.8	00'.4	66° 31'.5	31'.8	279° 12'.8	30'.4
19	251° 24'.3	86° 35'.0	00'.1	178° 06'.5	00'.7	81° 33'.4	31'.6	294° 15'.5	30'.4
20	266° 26'.7	101° 34'.6	7° 58'.8 N	193° 07'.3	00'.9	96° 35'.4	31'.4	309° 18'.1	30'.5
21	281° 29'.2	116° 34'.3	57'.6	208° 08'.1	01'.1	111° 37'.4	31'.2	324° 20'.8	30'.5
22	296° 31'.7	131° 33'.9	56'.4	223° 08'.8	01'.3	126° 39'.4	31'.0	339° 23'.4	30'.6
23	311° 34'.1	146° 33'.5	55'.2	238° 09'.6	01'.5	141° 41'.4	30'.8	354° 26'.1	30'.6
18 Tuesday 00	326° 36'.6	161° 33'.1	7° 54'.0 N	253° 10'.3	22° 01'.8 N	156° 43'.4	5° 30'.6 N	9° 28'.7	17° 30'.7 S
01	341° 39'.0	176° 32'.7	52'.8	268° 11'.1	02'.0	171° 45'.4	30'.4	24° 31'.3	30'.8
02	356° 41'.5	191° 32'.3	51'.6	283° 11'.8	02'.2	186° 47'.4	30'.2	39° 34'.0	30'.8
03	11° 44'.0	206° 31'.9	50'.4	298° 12'.6	02'.4	201° 49'.3	30'.0	54° 36'.6	30'.9
04	26° 46'.4	221° 31'.5	49'.2	313° 13'.4	02'.6	216° 51'.3	29'.8	69° 39'.3	30'.9
05	41° 48'.9	236° 31'.2	47'.9	328° 14'.1	02'.9	231° 53'.3	29'.6	84° 41'.9	31'.0
06	56° 51'.4	251° 30'.8	46'.7	343° 14'.9	03'.1	246° 55'.3	29'.4	99° 44'.6	31'.0
07	71° 53'.8	266° 30'.4	45'.5	358° 15'.6	03'.3	261° 57'.3	29'.2	114° 47'.2	31'.1
08	86° 56'.3	281° 30'.0	44'.3	13° 16'.4	03'.5	276° 59'.3	29'.0	129° 49'.9	31'.1
09	101° 58'.8	296° 29'.6	43'.1	28° 17'.2	03'.7	292° 01'.3	28'.8	144° 52'.5	31'.2
10	117° 01'.2	311° 29'.2	41'.9	43° 17'.9	04'.0	307° 03'.2	28'.6	159° 55'.2	31'.3
11	132° 03'.7	326° 28'.9	40'.7	58° 18'.7	04'.2	322° 05'.2	28'.4	174° 57'.8	31'.3
12	147° 06'.2	341° 28'.5	7° 39'.4 N	73° 19'.4	22° 04'.4 N	337° 07'.2	5° 28'.2 N	190° 00'.4	17° 31'.4 S
13	162° 08'.6	356° 28'.1	38'.2	88° 20'.2	04'.6	352° 09'.2	28'.0	205° 03'.1	31'.4
14	177° 11'.1	11° 27'.7	37'.0	103° 21'.0	04'.8	7° 11'.2	27'.8	220° 05'.7	31'.5
15	192° 13'.5	26° 27'.3	35'.8	118° 21'.7	05'.0	22° 13'.2	27'.6	235° 08'.4	31'.5
16	207° 16'.0	41° 26'.9	34'.6	133° 22'.5	05'.3	37° 15'.2	27'.4	250° 11'.0	31'.6
17	222° 18'.5	56° 26'.6	33'.4	148° 23'.2	05'.5	52° 17'.2	27'.2	265° 13'.7	31'.6
18	237° 20'.9	71° 26'.2	32'.2	163° 24'.0	05'.7	67° 19'.1	27'.0	280° 16'.3	31'.7
19	252° 23'.4	86° 25'.8	30'.9	178° 24'.8	05'.9	82° 21'.1	26'.8	295° 19'.0	31'.8
20	267° 25'.9	101° 25'.4	29'.7	193° 25'.5	06'.1	97° 23'.1	26'.5	310° 21'.6	31'.8
21	282° 28'.3	116° 25'.0	28'.5	208° 26'.3	06'.3	112° 25'.1	26'.3	325° 24'.3	31'.9
22	297° 30'.8	131° 24'.6	27'.3	223° 27'.0	06'.5	127° 27'.1	26'.1	340° 26'.9	31'.9
23	312° 33'.3	146° 24'.3	26'.1	238° 27'.8	06'.8	142° 29'.1	25'.9	355° 29'.5	32'.0
	M.P. 02:13	v -0'.4	d 1'.2	v 0'.8	d 0'.2	v 2'.0	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.0	40° 19'.7 S
Achernar	335° 37'.9	57° 16'.0 S
Acrux	173° 27'.4	63° 03'.8 S
Adhara	255° 25'.0	28° 57'.5 S
Aldebaran	291° 07'.3	16° 29'.8 N
Alioth	166° 34'.5	56° 00'.1 N
Alkaid	153° 11'.2	49° 21'.2 N
Alnair	28° 02'.6	46° 59'.6 S
Alnilam	276° 02'.3	1° 12'.2 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.1	26° 44'.5 N
Alpheratz	357° 59'.4	29° 03'.1 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.4 S
Antares	112° 45'.3	26° 25'.1 S
Arcturus	146° 10'.0	19° 13'.3 N
Atria	108° 00'.9	69° 01'.2 S
Avior	234° 25'.0	59° 29'.1 S
Bellatrix	278° 48'.8	6° 20'.7 N
Betelgeuse	271° 18'.3	7° 24'.4 N
Canopus	264° 03'.4	52° 41'.2 S
Capella	280° 57'.6	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.4 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.2	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.5 N
Elnath	278° 32'.5	28° 36'.1 N
Eltanin	90° 53'.1	51° 29'.6 N
Enif	34° 02'.1	9° 50'.7 N
Fomalhaut	15° 40'.7	29° 39'.4 S
Gacrux	172° 18'.8	57° 04'.6 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.4	60° 20'.6 S
Hamal	328° 18'.2	23° 25'.8 N
Kaus Aust.	84° 04'.1	34° 23'.3 S
Kochab	137° 19'.4	74° 11'.4 N
Markab	13° 53'.5	15° 10'.1 N
Menkar	314° 31'.3	4° 03'.8 N
Menkent	148° 26'.1	36° 20'.2 S
Miaplacidus	221° 44'.0	69° 41'.2 S
Mirfak	309° 02'.7	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.5 S
Polaris	323° 49'.1	89° 13'.7 N
Pollux	243° 47'.0	28° 02'.6 N
Procyon	245° 16'.2	5° 14'.7 N
Rasalhague	96° 20'.7	12° 34'.1 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.4 S
Rigil Kent	140° 13'.2	60° 48'.5 S
Sabik	102° 30'.2	15° 43'.0 S
Schedar	349° 58'.0	56° 29'.8 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.6	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 04'.4	43° 24'.1 S
Vega	80° 49'.2	38° 46'.8 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	196° 05'.0	13:14
Mars	287° 14'.7	07:08
Jupiter	190° 18'.2	13:34
Saturn	42° 47'.8	23:22

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
16 00	178° 55'.9	13° 43'.7 N	334° 30'.9	16'.2	1° 13'.5 N	12'.1	54'.2
01	193° 56'.0	42'.9	349° 06'.1	16'.2	25'.6	12'.0	
02	208° 56'.1	42'.1	3° 41'.3	16'.2	37'.6	12'.1	
03	223° 56'.3	41'.3	18° 16'.5	16'.1	49'.7	12'.0	
04	238° 56'.4	40'.5	32° 51'.6	16'.2	2° 01'.7 N	12'.0	54'.3
05	253° 56'.5	39'.7	47° 26'.8	16'.1	13'.7	12'.1	
06	268° 56'.7	38'.9	62° 01'.9	16'.1	25'.8	12'.0	
07	283° 56'.8	38'.1	76° 37'.0	16'.1	37'.8	12'.0	
08	298° 56'.9	37'.3	91° 12'.1	16'.1	49'.8	12'.0	
09	313° 57'.1	36'.5	105° 47'.2	16'.0	3° 01'.8 N	12'.0	
10	328° 57'.2	35'.7	120° 22'.2	16'.1	13'.8	12'.0	
11	343° 57'.3	34'.9	134° 57'.3	16'.0	25'.8	12'.0	
12	358° 57'.4	13° 34'.2 N	149° 32'.3	16'.0	3° 37'.8 N	12'.0	54'.3
13	13° 57'.6	33'.4	164° 07'.3	16'.0	49'.8	11'.9	
14	28° 57'.7	32'.6	178° 42'.3	15'.9	4° 01'.7 N	12'.0	54'.4
15	43° 57'.8	31'.8	193° 17'.2	15'.9	13'.7	11'.9	
16	58° 58'.0	31'.0	207° 52'.1	15'.9	25'.6	12'.0	
17	73° 58'.1	30'.2	222° 27'.0	15'.9	37'.6	11'.9	
18	88° 58'.2	29'.4	237° 01'.9	15'.8	49'.5	11'.9	
19	103° 58'.4	28'.6	251° 36'.7	15'.9	5° 01'.4 N	11'.9	
20	118° 58'.5	27'.8	266° 11'.6	15'.7	13'.3	11'.8	
21	133° 58'.6	27'.0	280° 46'.3	15'.8	25'.1	11'.9	
22	148° 58'.8	26'.2	295° 21'.1	15'.7	37'.0	11'.8	54'.5
23	163° 58'.9	25'.4	309° 55'.8	15'.7	48'.8	11'.8	
17 00	178° 59'.0	13° 24'.6 N	324° 30'.5	15'.7	6° 00'.6 N	11'.8	54'.5
01	193° 59'.2	23'.8	339° 05'.2	15'.6	12'.4	11'.8	
02	208° 59'.3	23'.0	353° 39'.8	15'.6	24'.2	11'.8	
03	223° 59'.4	22'.2	8° 14'.4	15'.6	36'.0	11'.7	
04	238° 59'.6	21'.4	22° 49'.0	15'.5	47'.7	11'.7	
05	253° 59'.7	20'.6	37° 23'.5	15'.5	59'.4	11'.7	54'.6
06	268° 59'.8	19'.8	51° 58'.0	15'.5	7° 11'.1 N	11'.7	
07	284° 00'.0	19'.0	66° 32'.5	15'.4	22'.8	11'.6	
08	299° 00'.1	18'.2	81° 06'.9	15'.4	34'.4	11'.7	
09	314° 00'.3	17'.4	95° 41'.3	15'.3	46'.1	11'.6	
10	329° 00'.4	16'.6	110° 15'.6	15'.3	57'.7	11'.5	
11	344° 00'.5	15'.8	124° 49'.9	15'.3	8° 09'.2 N	11'.6	54'.7
12	359° 00'.7	13° 15'.0 N	139° 24'.2	15'.2	8° 20'.8 N	11'.5	54'.7
13	14° 00'.8	14'.2	153° 58'.4	15'.2	32'.3	11'.5	
14	29° 00'.9	13'.4	168° 32'.6	15'.1	43'.8	11'.4	
15	44° 01'.1	12'.6	183° 06'.7	15'.1	55'.2	11'.5	
16	59° 01'.2	11'.8	197° 40'.8	15'.0	9° 06'.7 N	11'.4	
17	74° 01'.4	11'.0	212° 14'.8	15'.0	18'.1	11'.3	54'.8
18	89° 01'.5	10'.2	226° 48'.8	15'.0	29'.4	11'.4	
19	104° 01'.6	09'.4	241° 22'.8	14'.9	40'.8	11'.3	
20	119° 01'.8	08'.6	255° 56'.7	14'.8	52'.1	11'.2	
21	134° 01'.9	07'.8	270° 30'.5	14'.8	10° 03'.3 N	11'.3	
22	149° 02'.0	06'.9	285° 04'.3	14'.8	14'.6	11'.2	
23	164° 02'.2	06'.1	299° 38'.1	14'.7	25'.8	11'.1	54'.9
18 00	179° 02'.3	13° 05'.3 N	314° 11'.8	14'.6	10° 36'.9 N	11'.2	54'.9
01	194° 02'.5	04'.5	328° 45'.4	14'.6	48'.1	11'.0	
02	209° 02'.6	03'.7	343° 19'.0	14'.5	59'.1	11'.1	
03	224° 02'.7	02'.9	357° 52'.5	14'.5	11° 10'.2 N	11'.0	
04	239° 02'.9	02'.1	12° 26'.0	14'.4	21'.2	11'.0	55'.0
05	254° 03'.0	01'.3	26° 59'.4	14'.4	32'.2	10'.9	
06	269° 03'.2	00'.5	41° 32'.8	14'.3	43'.1	10'.9	
07	284° 03'.3	12° 59'.7 N	56° 06'.1	14'.3	54'.0	10'.8	
08	299° 03'.4	58'.9	70° 39'.4	14'.2	12° 04'.8 N	10'.8	
09	314° 03'.6	58'.1	85° 12'.6	14'.1	15'.6	10'.8	55'.1
10	329° 03'.7	57'.2	99° 45'.7	14'.1	26'.4	10'.7	
11	344° 03'.9	56'.4	114° 18'.8	14'.0	37'.1	10'.6	
12	359° 04'.0	12° 55'.6 N	128° 51'.8	14'.0	12° 47'.7 N	10'.6	55'.1
13	14° 04'.1	54'.8	143° 24'.8	13'.9	58'.3	10'.6	
14	29° 04'.3	54'.0	157° 57'.7	13'.8	13° 08'.9 N	10'.5	55'.2
15	44° 04'.4	53'.2	172° 30'.5	13'.8	19'.4	10'.5	
16	59° 04'.6	52'.4	187° 03'.3	13'.7	29'.9	10'.4	
17	74° 04'.7	51'.6	201° 36'.0	13'.6	40'.3	10'.4	
18	89° 04'.9	50'.7	216° 08'.6	13'.6	50'.7	10'.3	
19	104° 05'.0	49'.9	230° 41'.2	13'.5	14° 01'.0 N	10'.2	55'.3
20	119° 05'.1	49'.1	245° 13'.7	13'.4	11'.2	10'.2	
21	134° 05'.3	48'.3	259° 46'.1	13'.4	21'.4	10'.2	
22	149° 05'.4	47'.5	274° 18'.5	13'.2	31'.6	10'.0	
23	164° 05'.6	46'.7	288° 50'.7	13'.3	41'.6	10'.1	55'.4
	SD 15'.8	d 0'.8	SD 14'.8		14'.9	15'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
16	4 17	4 10	12:04	01:45	14:05	18d 92%
17	4 04	3 58	12:04	02:26	14:47	19d 86%
18	3 51	3 44	12:04	03:09	15:31	20d 78%

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1992 August 19, 20, 21 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +0.7		JUPITER -1.7		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
19 Wednesday 00	327° 35'.7	161° 23'.9	7° 24'.8 N	253° 28'.6	22° 07'.0 N	157° 31'.1	5° 25'.7 N	10° 32'.2	17° 32'.0 S
01	342° 38'.2	176° 23'.5	23'.6	268° 29'.3	07'.2	172° 33'.0	25'.5	25° 34'.8	32'.1
02	357° 40'.6	191° 23'.1	22'.4	283° 30'.1	07'.4	187° 35'.0	25'.3	40° 37'.5	32'.1
03	12° 43'.1	206° 22'.8	21'.2	298° 30'.9	07'.6	202° 37'.0	25'.1	55° 40'.1	32'.2
04	27° 45'.6	221° 22'.4	20'.0	313° 31'.6	07'.8	217° 39'.0	24'.9	70° 42'.8	32'.2
05	42° 48'.0	236° 22'.0	18'.7	328° 32'.4	08'.0	232° 41'.0	24'.7	85° 45'.4	32'.3
06	57° 50'.5	251° 21'.6	17'.5	343° 33'.1	08'.2	247° 43'.0	24'.5	100° 48'.1	32'.4
07	72° 53'.0	266° 21'.2	16'.3	358° 33'.9	08'.5	262° 45'.0	24'.3	115° 50'.7	32'.4
08	87° 55'.4	281° 20'.9	15'.1	13° 34'.7	08'.7	277° 46'.9	24'.1	130° 53'.3	32'.5
09	102° 57'.9	296° 20'.5	13'.9	28° 35'.4	08'.9	292° 48'.9	23'.9	145° 56'.0	32'.5
10	118° 00'.4	311° 20'.1	12'.6	43° 36'.2	09'.1	307° 50'.9	23'.7	160° 58'.6	32'.6
11	133° 02'.8	326° 19'.7	11'.4	58° 37'.0	09'.3	322° 52'.9	23'.5	176° 01'.3	32'.6
12	148° 05'.3	341° 19'.4	7° 10'.2 N	73° 37'.7	22° 09'.5 N	337° 54'.9	5° 23'.3 N	191° 03'.9	17° 32'.7 S
13	163° 07'.8	356° 19'.0	09'.0	88° 38'.5	09'.7	352° 56'.9	23'.1	206° 06'.6	32'.7
14	178° 10'.2	11° 18'.6	07'.7	103° 39'.3	09'.9	7° 58'.9	22'.9	221° 09'.2	32'.8
15	193° 12'.7	26° 18'.2	06'.5	118° 40'.0	10'.1	23° 00'.8	22'.7	236° 11'.9	32'.9
16	208° 15'.1	41° 17'.8	05'.3	133° 40'.8	10'.3	38° 02'.8	22'.5	251° 14'.5	32'.9
17	223° 17'.6	56° 17'.5	04'.1	148° 41'.5	10'.6	53° 04'.8	22'.3	266° 17'.1	33'.0
18	238° 20'.1	71° 17'.1	02'.8	163° 42'.3	10'.8	68° 06'.8	22'.1	281° 19'.8	33'.0
19	253° 22'.5	86° 16'.7	01'.6	178° 43'.1	11'.0	83° 08'.8	21'.8	296° 22'.4	33'.1
20	268° 25'.0	101° 16'.3	00'.4	193° 43'.8	11'.2	98° 10'.8	21'.6	311° 25'.1	33'.1
21	283° 27'.5	116° 16'.0	6° 59'.2 N	208° 44'.6	11'.4	113° 12'.7	21'.4	326° 27'.7	33'.2
22	298° 29'.9	131° 15'.6	57'.9	223° 45'.4	11'.6	128° 14'.7	21'.2	341° 30'.4	33'.2
23	313° 32'.4	146° 15'.2	56'.7	238° 46'.1	11'.8	143° 16'.7	21'.0	356° 33'.0	33'.3
20 Thursday 00	328° 34'.9	161° 14'.9	6° 55'.5 N	253° 46'.9	22° 12'.0 N	158° 18'.7	5° 20'.8 N	11° 35'.6	17° 33'.3 S
01	343° 37'.3	176° 14'.5	54'.3	268° 47'.7	12'.2	173° 20'.7	20'.6	26° 38'.3	33'.4
02	358° 39'.8	191° 14'.1	53'.0	283° 48'.4	12'.4	188° 22'.7	20'.4	41° 40'.9	33'.5
03	13° 42'.2	206° 13'.7	51'.8	298° 49'.2	12'.6	203° 24'.7	20'.2	56° 43'.6	33'.5
04	28° 44'.7	221° 13'.4	50'.6	313° 50'.0	12'.8	218° 26'.6	20'.0	71° 46'.2	33'.6
05	43° 47'.2	236° 13'.0	49'.3	328° 50'.7	13'.0	233° 28'.6	19'.8	86° 48'.9	33'.6
06	58° 49'.6	251° 12'.6	48'.1	343° 51'.5	13'.2	248° 30'.6	19'.6	101° 51'.5	33'.7
07	73° 52'.1	266° 12'.2	46'.9	358° 52'.3	13'.4	263° 32'.6	19'.4	116° 54'.2	33'.7
08	88° 54'.6	281° 11'.9	45'.7	13° 53'.0	13'.6	278° 34'.6	19'.2	131° 56'.8	33'.8
09	103° 57'.0	296° 11'.5	44'.4	28° 53'.8	13'.8	293° 36'.6	19'.0	146° 59'.4	33'.8
10	118° 59'.5	311° 11'.1	43'.2	43° 54'.6	14'.1	308° 38'.5	18'.8	162° 02'.1	33'.9
11	134° 02'.0	326° 10'.8	42'.0	58° 55'.3	14'.3	323° 40'.5	18'.6	177° 04'.7	33'.9
12	149° 04'.4	341° 10'.4	6° 40'.7 N	73° 56'.1	22° 14'.5 N	338° 42'.5	5° 18'.4 N	192° 07'.4	17° 34'.0 S
13	164° 06'.9	356° 10'.0	39'.5	88° 56'.9	14'.7	353° 44'.5	18'.2	207° 10'.0	34'.1
14	179° 09'.4	11° 09'.7	38'.3	103° 57'.6	14'.9	8° 46'.5	18'.0	222° 12'.7	34'.1
15	194° 11'.8	26° 09'.3	37'.0	118° 58'.4	15'.1	23° 48'.5	17'.7	237° 15'.3	34'.2
16	209° 14'.3	41° 08'.9	35'.8	133° 59'.2	15'.3	38° 50'.4	17'.5	252° 17'.9	34'.2
17	224° 16'.7	56° 08'.5	34'.6	148° 59'.9	15'.5	53° 52'.4	17'.3	267° 20'.6	34'.3
18	239° 19'.2	71° 08'.2	33'.3	164° 00'.7	15'.7	68° 54'.4	17'.1	282° 23'.2	34'.3
19	254° 21'.7	86° 07'.8	32'.1	179° 01'.5	15'.9	83° 56'.4	16'.9	297° 25'.9	34'.4
20	269° 24'.1	101° 07'.4	30'.9	194° 02'.3	16'.1	98° 58'.4	16'.7	312° 28'.5	34'.4
21	284° 26'.6	116° 07'.1	29'.6	209° 03'.0	16'.3	114° 00'.4	16'.5	327° 31'.2	34'.5
22	299° 29'.1	131° 06'.7	28'.4	224° 03'.8	16'.5	129° 02'.3	16'.3	342° 33'.8	34'.5
23	314° 31'.5	146° 06'.3	27'.2	239° 04'.6	16'.7	144° 04'.3	16'.1	357° 36'.4	34'.6
21 Friday 00	329° 34'.0	161° 06'.0	6° 25'.9 N	254° 05'.3	22° 16'.9 N	159° 06'.3	5° 15'.9 N	12° 39'.1	17° 34'.6 S
01	344° 36'.5	176° 05'.6	24'.7	269° 06'.1	17'.1	174° 08'.3	15'.7	27° 41'.7	34'.7
02	359° 38'.9	191° 05'.2	23'.5	284° 06'.9	17'.3	189° 10'.3	15'.5	42° 44'.4	34'.8
03	14° 41'.4	206° 04'.9	22'.2	299° 07'.6	17'.5	204° 12'.3	15'.3	57° 47'.0	34'.8
04	29° 43'.9	221° 04'.5	21'.0	314° 08'.4	17'.7	219° 14'.2	15'.1	72° 49'.7	34'.9
05	44° 46'.3	236° 04'.1	19'.8	329° 09'.2	17'.8	234° 16'.2	14'.9	87° 52'.3	34'.9
06	59° 48'.8	251° 03'.8	18'.5	344° 10'.0	18'.0	249° 18'.2	14'.7	102° 54'.9	35'.0
07	74° 51'.2	266° 03'.4	17'.3	359° 10'.7	18'.2	264° 20'.2	14'.5	117° 57'.6	35'.0
08	89° 53'.7	281° 03'.0	16'.1	14° 11'.5	18'.4	279° 22'.2	14'.3	133° 00'.2	35'.1
09	104° 56'.2	296° 02'.7	14'.8	29° 12'.3	18'.6	294° 24'.2	14'.0	148° 02'.9	35'.1
10	119° 58'.6	311° 02'.3	13'.6	44° 13'.0	18'.8	309° 26'.1	13'.8	163° 05'.5	35'.2
11	135° 01'.1	326° 01'.9	12'.3	59° 13'.8	19'.0	324° 28'.1	13'.6	178° 08'.1	35'.2
12	150° 03'.6	341° 01'.6	6° 11'.1 N	74° 14'.6	22° 19'.2 N	339° 30'.1	5° 13'.4 N	193° 10'.8	17° 35'.3 S
13	165° 06'.0	356° 01'.2	09'.9	89° 15'.4	19'.4	354° 32'.1	13'.2	208° 13'.4	35'.3
14	180° 08'.5	11° 00'.9	08'.6	104° 16'.1	19'.6	9° 34'.1	13'.0	223° 16'.1	35'.4
15	195° 11'.0	26° 00'.5	07'.4	119° 16'.9	19'.8	24° 36'.1	12'.8	238° 18'.7	35'.5
16	210° 13'.4	41° 00'.1	06'.1	134° 17'.7	20'.0	39° 38'.0	12'.6	253° 21'.4	35'.5
17	225° 15'.9	55° 59'.8	04'.9	149° 18'.4	20'.2	54° 40'.0	12'.4	268° 24'.0	35'.6
18	240° 18'.4	70° 59'.4	03'.7	164° 19'.2	20'.4	69° 42'.0	12'.2	283° 26'.6	35'.6
19	255° 20'.8	85° 59'.0	02'.4	179° 20'.0	20'.6	84° 44'.0	12'.0	298° 29'.3	35'.7
20	270° 23'.3	100° 58'.7	01'.2	194° 20'.8	20'.8	99° 46'.0	11'.8	313° 31'.9	35'.7
21	285° 25'.7	115° 58'.3	5° 59'.9 N	209° 21'.5	21'.0	114° 47'.9	11'.6	328° 34'.6	35'.8
22	300° 28'.2	130° 58'.0	58'.7	224° 22'.3	21'.2	129° 49'.9	11'.4	343° 37'.2	35'.8
23	315° 30'.7	145° 57'.6	57'.5	239° 23'.1	21'.3	144° 51'.9	11'.2	358° 39'.8	35'.9
	M.P. 02:01	v -0'.4	d 1'.2	v 0'.8	d 0'.2	v 2'.0	d 0'.2	v 2'.6	d 0'.1

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 30'.0	40° 19'.7 S	179° 05'.7	12° 45'.9 N	303° 23'.0	13'.1	14° 51'.7 N	9'.9	55'.4
Achernar	335° 37'.9	57° 16'.0 S	194° 05'.9	45'.0	317° 55'.1	13'.1	15° 01'.6 N	10'.0	
Acrux	173° 27'.5	63° 03'.7 S	209° 06'.0	44'.2	332° 27'.2	13'.0	11'.6	9'.8	
Adhara	255° 25'.0	28° 57'.5 S	224° 06'.2	43'.4	346° 59'.2	13'.0	21'.4	9'.8	55'.5
Aldebaran	291° 07'.3	16° 29'.8 N	239° 06'.3	42'.6	1° 31'.2	12'.8	31'.2	9'.7	
			254° 06'.4	41'.8	16° 03'.0	12'.8	40'.9	9'.7	
Alioth	166° 34'.6	56° 00'.1 N	269° 06'.6	41'.0	30° 34'.8	12'.7	50'.6	9'.6	
Alkaid	153° 11'.3	49° 21'.2 N	284° 06'.7	40'.1	45° 06'.5	12'.7	16° 00'.2 N	9'.5	55'.6
Alnair	28° 02'.6	46° 59'.6 S	299° 06'.9	39'.3	59° 38'.2	12'.5	09'.7	9'.5	
Alnilam	276° 02'.3	1° 12'.2 S	314° 07'.0	38'.5	74° 09'.7	12'.5	19'.2	9'.4	
Alphard	218° 11'.7	8° 37'.6 S	329° 07'.2	37'.7	88° 41'.2	12'.4	28'.6	9'.3	
			344° 07'.3	36'.9	103° 12'.6	12'.4	37'.9	9'.3	55'.7
Alphecca	126° 24'.2	26° 44'.5 N	359° 07'.5	12° 36'.0 N	117° 44'.0	12'.2	16° 47'.2 N	9'.2	55'.7
Alpheratz	357° 59'.3	29° 03'.1 N	14° 07'.6	35'.2	132° 15'.2	12'.2	56'.4	9'.1	
Altair	62° 23'.1	8° 51'.1 N	29° 07'.8	34'.4	146° 46'.4	12'.1	17° 05'.5 N	9'.1	
Ankaa	353° 30'.6	42° 20'.4 S	44° 07'.9	33'.6	161° 17'.5	12'.0	14'.6	9'.0	55'.8
Antares	112° 45'.3	26° 25'.0 S	59° 08'.1	32'.8	175° 48'.5	11'.9	23'.6	8'.9	
			74° 08'.2	31'.9	190° 19'.4	11'.9	32'.5	8'.8	
Arcturus	146° 10'.0	19° 13'.3 N	89° 08'.3	31'.1	204° 50'.3	11'.8	41'.3	8'.7	
Atria	108° 01'.0	69° 01'.2 S	104° 08'.5	30'.3	219° 21'.1	11'.7	50'.0	8'.7	55'.9
Avior	234° 25'.0	59° 29'.1 S	119° 08'.6	29'.5	233° 51'.8	11'.6	58'.7	8'.6	
Bellatrix	278° 48'.8	6° 20'.7 N	134° 08'.8	28'.6	248° 22'.4	11'.5	18° 07'.3 N	8'.5	
Betelgeuse	271° 18'.3	7° 24'.4 N	149° 08'.9	27'.8	262° 52'.9	11'.5	15'.8	8'.5	56'.0
			164° 09'.1	27'.0	277° 23'.4	11'.3	24'.3	8'.3	
Canopus	264° 03'.4	52° 41'.2 S	179° 09'.2	12° 26'.2 N	291° 53'.7	11'.3	18° 32'.6 N	8'.3	56'.0
Capella	280° 57'.6	45° 59'.4 N	194° 09'.4	25'.3	306° 24'.0	11'.2	40'.9	8'.2	
Deneb	49° 41'.7	45° 15'.4 N	209° 09'.5	24'.5	320° 54'.2	11'.1	49'.1	8'.1	56'.1
Denebola	182° 49'.7	14° 36'.8 N	224° 09'.7	23'.7	335° 24'.3	11'.0	57'.2	8'.0	
Diphda	349° 11'.2	18° 01'.3 S	239° 09'.8	22'.9	349° 54'.3	11'.0	19° 05'.2 N	8'.0	
			254° 10'.0	22'.0	4° 24'.3	10'.8	13'.2	7'.8	56'.2
Dubhe	194° 11'.1	61° 47'.5 N	269° 10'.1	21'.2	18° 54'.1	10'.8	21'.0	7'.8	
Elnath	278° 32'.4	28° 36'.1 N	284° 10'.3	20'.4	33° 23'.9	10'.7	28'.8	7'.6	
Eltanin	90° 53'.1	51° 29'.7 N	299° 10'.4	19'.6	47° 53'.6	10'.6	36'.4	7'.6	56'.3
Enif	34° 02'.1	9° 50'.7 N	314° 10'.6	18'.7	62° 23'.2	10'.5	44'.0	7'.5	
Fomalhaut	15° 40'.7	29° 39'.4 S	329° 10'.7	17'.9	76° 52'.7	10'.4	51'.5	7'.4	
			344° 10'.9	17'.1	91° 22'.1	10'.3	58'.9	7'.3	
Gacrux	172° 18'.8	57° 04'.6 S	359° 11'.0	12° 16'.3 N	105° 51'.4	10'.3	20° 06'.2 N	7'.2	56'.4
Gienah	176° 08'.6	17° 30'.1 S	14° 11'.2	15'.4	120° 20'.7	10'.1	13'.4	7'.1	
Hadar	149° 10'.4	60° 20'.6 S	29° 11'.3	14'.6	134° 49'.8	10'.1	20'.5	7'.0	
Hamal	328° 18'.2	23° 25'.8 N	44° 11'.5	13'.8	149° 18'.9	10'.0	27'.5	6'.9	56'.5
Kaus Aust.	84° 04'.1	34° 23'.3 S	59° 11'.6	12'.9	163° 47'.9	9'.9	34'.4	6'.8	
			74° 11'.8	12'.1	178° 16'.8	9'.8	41'.2	6'.7	
Kochab	137° 19'.5	74° 11'.4 N	89° 11'.9	11'.3	192° 45'.6	9'.7	47'.9	6'.6	56'.6
Markab	13° 53'.5	15° 10'.1 N	104° 12'.1	10'.4	207° 14'.3	9'.7	54'.5	6'.5	
Menkar	314° 31'.3	4° 03'.8 N	119° 12'.3	09'.6	221° 43'.0	9'.5	21° 01'.0 N	6'.4	
Menkent	148° 26'.1	36° 20'.2 S	134° 12'.4	08'.8	236° 11'.5	9'.5	07'.4	6'.3	56'.7
Miaplacidus	221° 44'.0	69° 41'.2 S	149° 12'.6	08'.0	250° 40'.0	9'.4	13'.7	6'.2	
			164° 12'.7	07'.1	265° 08'.4	9'.3	19'.9	6'.0	
Mirfak	309° 02'.7	49° 50'.0 N	179° 12'.9	12° 06'.3 N	279° 36'.7	9'.2	21° 25'.9 N	6'.0	56'.8
Nunki	76° 17'.3	26° 18'.3 S	194° 13'.0	05'.5	294° 04'.9	9'.1	31'.9	5'.9	
Peacock	53° 43'.0	56° 45'.5 S	209° 13'.2	04'.6	308° 33'.0	9'.0	37'.8	5'.7	
Polaris	323° 47'.8	89° 13'.7 N	224° 13'.3	03'.8	323° 01'.0	9'.0	43'.5	5'.6	56'.9
Pollux	243° 47'.0	28° 02'.6 N	239° 13'.5	03'.0	337° 29'.0	8'.8	49'.1	5'.5	
			254° 13'.6	02'.1	351° 56'.8	8'.8	54'.6	5'.5	
Procyon	245° 16'.2	5° 14'.7 N	269° 13'.8	01'.3	6° 24'.6	8'.7	22° 00'.1 N	5'.2	57'.0
Rasalhague	96° 20'.7	12° 34'.1 N	284° 13'.9	00'.5	20° 52'.3	8'.6	05'.3	5'.2	
Regulus	208° 00'.3	12° 00'.2 N	299° 14'.1	11° 59'.6 N	35° 19'.9	8'.5	10'.5	5'.1	
Rigel	281° 27'.1	8° 12'.4 S	314° 14'.3	58'.8	49° 47'.4	8'.4	15'.6	4'.9	57'.1
Rigil Kent	140° 13'.2	60° 48'.5 S	329° 14'.4	57'.9	64° 14'.8	8'.4	20'.5	4'.8	
			344° 14'.6	57'.1	78° 42'.2	8'.2	25'.3	4'.7	
Sabik	102° 30'.2	15° 43'.0 S	359° 14'.7	11° 56'.3 N	93° 09'.4	8'.2	22° 30'.0 N	4'.6	57'.2
Schedar	349° 58'.0	56° 29'.8 N	14° 14'.9	55'.4	107° 36'.6	8'.1	34'.6	4'.4	
Shaula	96° 42'.8	37° 06'.0 S	29° 15'.0	54'.6	122° 03'.7	8'.0	39'.0	4'.4	
Sirius	258° 47'.6	16° 42'.2 S	44° 15'.2	53'.8	136° 30'.7	8'.0	43'.4	4'.2	57'.3
Spica	158° 47'.8	11° 07'.4 S	59° 15'.4	52'.9	150° 57'.7	7'.8	47'.6	4'.0	
			74° 15'.5	52'.1	165° 24'.5	7'.8	51'.6	4'.0	57'.4
Suhail	223° 04'.4	43° 24'.1 S	89° 15'.7	51'.3	179° 51'.3	7'.7	55'.6	3'.8	
Vega	80° 49'.2	38° 46'.8 N	104° 15'.8	50'.4	194° 18'.0	7'.6	59'.4	3'.7	
Zuben'ubi	137° 22'.7	16° 00'.8 S	119° 16'.0	49'.6	208° 44'.6	7'.6	23° 03'.1 N	3'.6	57'.5
			134° 16'.1	48'.7	223° 11'.2	7'.4	06'.7	3'.4	
	SHA	Mer.Pass.	149° 16'.3	47'.9	237° 37'.6	7'.4	10'.1	3'.3	
Venus	192° 40'.0	13:15	164° 16'.5	47'.1	252° 04'.0	7'.3	13'.4	3'.2	57'.6
Mars	285° 12'.0	07:05							
Jupiter	189° 43'.8	13:25							
Saturn	43° 00'.8	23:10	SD 15'.8	d 0'.8	SD 15'.2		15'.4	15'.6	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
19	3 37	3 30	12:04	03:54	16:17	21d 69%
20	3 23	3 16	12:03	04:42	17:07	22d 60%
21	3 09	3 01	12:03	05:33	18:01	23d 49%

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1992 August 22, 23, 24 (Sat, Sun, Mon)

GMT	ARIES	VENUS -3.9		MARS +0.6		JUPITER -1.7		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
22 Saturday 00	330° 33'.1	160° 57'.2	5° 56'.2 N	254° 23'.9	22° 21'.5 N	159° 53'.9	5° 11'.0 N	13° 42'.5	17° 35'.9 S
01	345° 35'.6	175° 56'.9	55'.0	269° 24'.6	21'.7	174° 55'.9	10'.8	28° 45'.1	36'.0
02	0° 38'.1	190° 56'.5	53'.7	284° 25'.4	21'.9	189° 57'.9	10'.5	43° 47'.8	36'.0
03	15° 40'.5	205° 56'.2	52'.5	299° 26'.2	22'.1	204° 59'.8	10'.3	58° 50'.4	36'.1
04	30° 43'.0	220° 55'.8	51'.2	314° 27'.0	22'.3	220° 01'.8	10'.1	73° 53'.1	36'.1
05	45° 45'.5	235° 55'.4	50'.0	329° 27'.7	22'.5	235° 03'.8	09'.9	88° 55'.7	36'.2
06	60° 47'.9	250° 55'.1	48'.8	344° 28'.5	22'.7	250° 05'.8	09'.7	103° 58'.3	36'.3
07	75° 50'.4	265° 54'.7	47'.5	359° 29'.3	22'.9	265° 07'.8	09'.5	119° 01'.0	36'.3
08	90° 52'.8	280° 54'.4	46'.3	14° 30'.1	23'.1	280° 09'.7	09'.3	134° 03'.6	36'.4
09	105° 55'.3	295° 54'.0	45'.0	29° 30'.8	23'.2	295° 11'.7	09'.1	149° 06'.3	36'.4
10	120° 57'.8	310° 53'.6	43'.8	44° 31'.6	23'.4	310° 13'.7	08'.9	164° 08'.9	36'.5
11	136° 00'.2	325° 53'.3	42'.5	59° 32'.4	23'.6	325° 15'.7	08'.7	179° 11'.5	36'.5
12	151° 02'.7	340° 52'.9	5° 41'.3 N	74° 33'.2	22° 23'.8 N	340° 17'.7	5° 08'.5 N	194° 14'.2	17° 36'.6 S
13	166° 05'.2	355° 52'.6	40'.0	89° 33'.9	24'.0	355° 19'.7	08'.3	209° 16'.8	36'.6
14	181° 07'.6	10° 52'.2	38'.8	104° 34'.7	24'.2	10° 21'.6	08'.1	224° 19'.5	36'.7
15	196° 10'.1	25° 51'.8	37'.6	119° 35'.5	24'.4	25° 23'.6	07'.9	239° 22'.1	36'.7
16	211° 12'.6	40° 51'.5	36'.3	134° 36'.3	24'.6	40° 25'.6	07'.7	254° 24'.7	36'.8
17	226° 15'.0	55° 51'.1	35'.1	149° 37'.1	24'.7	55° 27'.6	07'.4	269° 27'.4	36'.8
18	241° 17'.5	70° 50'.8	33'.8	164° 37'.8	24'.9	70° 29'.6	07'.2	284° 30'.0	36'.9
19	256° 20'.0	85° 50'.4	32'.6	179° 38'.6	25'.1	85° 31'.5	07'.0	299° 32'.7	36'.9
20	271° 22'.4	100° 50'.1	31'.3	194° 39'.4	25'.3	100° 33'.5	06'.8	314° 35'.3	37'.0
21	286° 24'.9	115° 49'.7	30'.1	209° 40'.2	25'.5	115° 35'.5	06'.6	329° 37'.9	37'.1
22	301° 27'.3	130° 49'.3	28'.8	224° 40'.9	25'.7	130° 37'.5	06'.4	344° 40'.6	37'.1
23	316° 29'.8	145° 49'.0	27'.6	239° 41'.7	25'.9	145° 39'.5	06'.2	359° 43'.2	37'.2
23 Sunday 00	331° 32'.3	160° 48'.6	5° 26'.3 N	254° 42'.5	22° 26'.0 N	160° 41'.4	5° 06'.0 N	14° 45'.9	17° 37'.2 S
01	346° 34'.7	175° 48'.3	25'.1	269° 43'.3	26'.2	175° 43'.4	05'.8	29° 48'.5	37'.3
02	1° 37'.2	190° 47'.9	23'.8	284° 44'.1	26'.4	190° 45'.4	05'.6	44° 51'.1	37'.3
03	16° 39'.7	205° 47'.6	22'.6	299° 44'.8	26'.6	205° 47'.4	05'.4	59° 53'.8	37'.4
04	31° 42'.1	220° 47'.2	21'.3	314° 45'.6	26'.8	220° 49'.4	05'.2	74° 56'.4	37'.4
05	46° 44'.6	235° 46'.9	20'.1	329° 46'.4	27'.0	235° 51'.4	05'.0	89° 59'.1	37'.5
06	61° 47'.1	250° 46'.5	18'.8	344° 47'.2	27'.1	250° 53'.3	04'.8	105° 01'.7	37'.5
07	76° 49'.5	265° 46'.1	17'.6	359° 48'.0	27'.3	265° 55'.3	04'.6	120° 04'.3	37'.6
08	91° 52'.0	280° 45'.8	16'.3	14° 48'.7	27'.5	280° 57'.3	04'.3	135° 07'.0	37'.6
09	106° 54'.5	295° 45'.4	15'.1	29° 49'.5	27'.7	295° 59'.3	04'.1	150° 09'.6	37'.7
10	121° 56'.9	310° 45'.1	13'.8	44° 50'.3	27'.9	311° 01'.3	03'.9	165° 12'.3	37'.7
11	136° 59'.4	325° 44'.7	12'.6	59° 51'.1	28'.0	326° 03'.2	03'.7	180° 14'.9	37'.8
12	152° 01'.8	340° 44'.4	5° 11'.3 N	74° 51'.9	22° 28'.2 N	341° 05'.2	5° 03'.5 N	195° 17'.5	17° 37'.8 S
13	167° 04'.3	355° 44'.0	10'.1	89° 52'.6	28'.4	356° 07'.2	03'.3	210° 20'.2	37'.9
14	182° 06'.8	10° 43'.7	08'.8	104° 53'.4	28'.6	11° 09'.2	03'.1	225° 22'.8	38'.0
15	197° 09'.2	25° 43'.3	07'.6	119° 54'.2	28'.8	26° 11'.2	02'.9	240° 25'.5	38'.0
16	212° 11'.7	40° 43'.0	06'.3	134° 55'.0	28'.9	41° 13'.1	02'.7	255° 28'.1	38'.1
17	227° 14'.2	55° 42'.6	05'.1	149° 55'.8	29'.1	56° 15'.1	02'.5	270° 30'.7	38'.1
18	242° 16'.6	70° 42'.3	03'.8	164° 56'.6	29'.3	71° 17'.1	02'.3	285° 33'.4	38'.2
19	257° 19'.1	85° 41'.9	02'.6	179° 57'.3	29'.5	86° 19'.1	02'.1	300° 36'.0	38'.2
20	272° 21'.6	100° 41'.6	01'.3	194° 58'.1	29'.7	101° 21'.1	01'.9	315° 38'.6	38'.3
21	287° 24'.0	115° 41'.2	00'.1	209° 58'.9	29'.8	116° 23'.0	01'.7	330° 41'.3	38'.3
22	302° 26'.5	130° 40'.9	4° 58'.8 N	224° 59'.7	30'.0	131° 25'.0	01'.4	345° 43'.9	38'.4
23	317° 29'.0	145° 40'.5	57'.5	240° 00'.5	30'.2	146° 27'.0	01'.2	0° 46'.6	38'.4
24 Monday 00	332° 31'.4	160° 40'.2	4° 56'.3 N	255° 01'.3	22° 30'.4 N	161° 29'.0	5° 01'.0 N	15° 49'.2	17° 38'.5 S
01	347° 33'.9	175° 39'.8	55'.0	270° 02'.0	30'.5	176° 31'.0	00'.8	30° 51'.8	38'.5
02	2° 36'.3	190° 39'.5	53'.8	285° 02'.8	30'.7	191° 32'.9	00'.6	45° 54'.5	38'.6
03	17° 38'.8	205° 39'.1	52'.5	300° 03'.6	30'.9	206° 34'.9	00'.4	60° 57'.1	38'.6
04	32° 41'.3	220° 38'.8	51'.3	315° 04'.4	31'.1	221° 36'.9	00'.2	75° 59'.8	38'.7
05	47° 43'.7	235° 38'.4	50'.0	330° 05'.2	31'.3	236° 38'.9	00'.0	91° 02'.4	38'.7
06	62° 46'.2	250° 38'.1	48'.8	345° 06'.0	31'.4	251° 40'.9	4° 59'.8 N	106° 05'.0	38'.8
07	77° 48'.7	265° 37'.7	47'.5	0° 06'.7	31'.6	266° 42'.8	59'.6	121° 07'.7	38'.8
08	92° 51'.1	280° 37'.4	46'.2	15° 07'.5	31'.8	281° 44'.8	59'.4	136° 10'.3	38'.9
09	107° 53'.6	295° 37'.0	45'.0	30° 08'.3	32'.0	296° 46'.8	59'.2	151° 12'.9	38'.9
10	122° 56'.1	310° 36'.7	43'.7	45° 09'.1	32'.1	311° 48'.8	59'.0	166° 15'.6	39'.0
11	137° 58'.5	325° 36'.3	42'.5	60° 09'.9	32'.3	326° 50'.7	58'.8	181° 18'.2	39'.0
12	153° 01'.0	340° 36'.0	4° 41'.2 N	75° 10'.7	22° 32'.5 N	341° 52'.7	4° 58'.5 N	196° 20'.9	17° 39'.1 S
13	168° 03'.5	355° 35'.6	40'.0	90° 11'.5	32'.6	356° 54'.7	58'.3	211° 23'.5	39'.2
14	183° 05'.9	10° 35'.3	38'.7	105° 12'.2	32'.8	11° 56'.7	58'.1	226° 26'.1	39'.2
15	198° 08'.4	25° 34'.9	37'.4	120° 13'.0	33'.0	26° 58'.7	57'.9	241° 28'.8	39'.3
16	213° 10'.8	40° 34'.6	36'.2	135° 13'.8	33'.2	42° 00'.6	57'.7	256° 31'.4	39'.3
17	228° 13'.3	55° 34'.2	34'.9	150° 14'.6	33'.3	57° 02'.6	57'.5	271° 34'.0	39'.4
18	243° 15'.8	70° 33'.9	33'.7	165° 15'.4	33'.5	72° 04'.6	57'.3	286° 36'.7	39'.4
19	258° 18'.2	85° 33'.5	32'.4	180° 16'.2	33'.7	87° 06'.6	57'.1	301° 39'.3	39'.5
20	273° 20'.7	100° 33'.2	31'.2	195° 17'.0	33'.8	102° 08'.6	56'.9	316° 42'.0	39'.5
21	288° 23'.2	115° 32'.8	29'.9	210° 17'.8	34'.0	117° 10'.5	56'.7	331° 44'.6	39'.6
22	303° 25'.6	130° 32'.5	28'.6	225° 18'.5	34'.2	132° 12'.5	56'.5	346° 47'.2	39'.6
23	318° 28'.1	145° 32'.1	27'.4	240° 19'.3	34'.4	147° 14'.5	56'.3	1° 49'.9	39'.7
	M.P. 01:50	v -0'.4	d 1'.3	v 0'.8	d 0'.2	v 2'.0	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 30'.0	40° 19'.7 S
Achernar	335° 37'.9	57° 16'.0 S
Acrux	173° 27'.5	63° 03'.7 S
Adhara	255° 25'.0	28° 57'.5 S
Aldebaran	291° 07'.3	16° 29'.8 N
Alioth	166° 34'.6	56° 00'.1 N
Alkaid	153° 11'.3	49° 21'.2 N
Alnair	28° 02'.6	46° 59'.6 S
Alnilam	276° 02'.3	1° 12'.2 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.2	26° 44'.5 N
Alpheratz	357° 59'.3	29° 03'.1 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.4 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.3 N
Atria	108° 01'.0	69° 01'.2 S
Avior	234° 25'.0	59° 29'.0 S
Bellatrix	278° 48'.8	6° 20'.7 N
Betelgeuse	271° 18'.3	7° 24'.5 N
Canopus	264° 03'.4	52° 41'.2 S
Capella	280° 57'.6	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.5 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.2	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.5 N
Elnath	278° 32'.4	28° 36'.1 N
Eltanin	90° 53'.1	51° 29'.7 N
Enif	34° 02'.0	9° 50'.7 N
Fomalhaut	15° 40'.7	29° 39'.4 S
Gacrux	172° 18'.8	57° 04'.5 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.4	60° 20'.6 S
Hamal	328° 18'.2	23° 25'.8 N
Kaus Aust.	84° 04'.2	34° 23'.3 S
Kochab	137° 19'.5	74° 11'.4 N
Markab	13° 53'.5	15° 10'.1 N
Menkar	314° 31'.2	4° 03'.9 N
Menkent	148° 26'.1	36° 20'.2 S
Miaplacidus	221° 44'.0	69° 41'.2 S
Mirfak	309° 02'.6	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.5 S
Polaris	323° 46'.4	89° 13'.7 N
Pollux	243° 47'.0	28° 02'.6 N
Procyon	245° 16'.2	5° 14'.7 N
Rasalhague	96° 20'.7	12° 34'.1 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.4 S
Rigil Kent	140° 13'.2	60° 48'.5 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 58'.0	56° 29'.8 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.6	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 04'.3	43° 24'.1 S
Vega	80° 49'.2	38° 46'.9 N
Zuben'ubi	137° 22'.7	16° 00'.7 S

	SHA	Mer.Pass.
Venus	189° 16'.4	13:17
Mars	283° 10'.2	07:01
Jupiter	189° 09'.2	13:15
Saturn	43° 13'.6	22:57

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
22 00	179° 16'.6	11° 46'.2 N	266° 30'.3	7'.3	23° 16'.6 N	3'.0	57'.6
01	194° 16'.8	45'.4	280° 56'.6	7'.1	19'.6	2'.9	
02	209° 16'.9	44'.5	295° 22'.7	7'.1	22'.5	2'.7	57'.7
03	224° 17'.1	43'.7	309° 48'.8	7'.1	25'.2	2'.7	
04	239° 17'.2	42'.8	324° 14'.9	6'.9	27'.9	2'.4	57'.8
05	254° 17'.4	42'.0	338° 40'.8	6'.9	30'.3	2'.4	
06	269° 17'.6	41'.2	353° 06'.7	6'.8	32'.7	2'.2	
07	284° 17'.7	40'.3	7° 32'.5	6'.7	34'.9	2'.0	57'.9
08	299° 17'.9	39'.5	21° 58'.2	6'.7	36'.9	2'.0	
09	314° 18'.0	38'.6	36° 23'.9	6'.6	38'.9	1'.7	
10	329° 18'.2	37'.8	50° 49'.5	6'.5	40'.6	1'.7	58'.0
11	344° 18'.4	36'.9	65° 15'.0	6'.5	42'.3	1'.5	
12	359° 18'.5	11° 36'.1 N	79° 40'.5	6'.4	23° 43'.8 N	1'.3	58'.1
13	14° 18'.7	35'.3	94° 05'.9	6'.4	45'.1	1'.2	
14	29° 18'.8	34'.4	108° 31'.3	6'.3	46'.3	1'.1	
15	44° 19'.0	33'.6	122° 56'.6	6'.2	47'.4	0'.9	58'.2
16	59° 19'.2	32'.7	137° 21'.8	6'.2	48'.3	0'.7	
17	74° 19'.3	31'.9	151° 47'.0	6'.1	49'.0	0'.7	
18	89° 19'.5	31'.0	166° 12'.1	6'.1	49'.7	0'.4	58'.3
19	104° 19'.7	30'.2	180° 37'.2	6'.0	50'.1	0'.3	
20	119° 19'.8	29'.3	195° 02'.2	5'.9	50'.4	0'.2	58'.4
21	134° 20'.0	28'.5	209° 27'.1	5'.9	50'.6	0'.0	
22	149° 20'.1	27'.6	223° 52'.0	5'.9	50'.6	0'.1	
23	164° 20'.3	26'.8	238° 16'.9	5'.8	50'.5	0'.3	58'.5
23 00	179° 20'.5	11° 26'.0 N	252° 41'.7	5'.8	23° 50'.2 N	0'.5	58'.5
01	194° 20'.6	25'.1	267° 06'.5	5'.7	49'.7	0'.6	
02	209° 20'.8	24'.3	281° 31'.2	5'.6	49'.1	0'.7	58'.6
03	224° 20'.9	23'.4	295° 55'.8	5'.7	48'.4	0'.9	
04	239° 21'.1	22'.6	310° 20'.5	5'.6	47'.5	1'.1	58'.7
05	254° 21'.3	21'.7	324° 45'.1	5'.5	46'.4	1'.2	
06	269° 21'.4	20'.9	339° 09'.6	5'.5	45'.2	1'.4	
07	284° 21'.6	20'.0	353° 34'.1	5'.5	43'.8	1'.5	58'.8
08	299° 21'.8	19'.2	7° 58'.6	5'.4	42'.3	1'.7	
09	314° 21'.9	18'.3	22° 23'.0	5'.4	40'.6	1'.9	58'.9
10	329° 22'.1	17'.5	36° 47'.4	5'.4	38'.7	2'.0	
11	344° 22'.3	16'.6	51° 11'.8	5'.3	36'.7	2'.1	
12	359° 22'.4	11° 15'.8 N	65° 36'.1	5'.3	23° 34'.6 N	2'.4	59'.0
13	14° 22'.6	14'.9	80° 00'.4	5'.3	32'.2	2'.4	
14	29° 22'.8	14'.0	94° 24'.7	5'.3	29'.8	2'.7	
15	44° 22'.9	13'.2	108° 49'.0	5'.2	27'.1	2'.8	59'.1
16	59° 23'.1	12'.3	123° 13'.2	5'.2	24'.3	2'.9	
17	74° 23'.3	11'.5	137° 37'.4	5'.2	21'.4	3'.1	59'.2
18	89° 23'.4	10'.6	152° 01'.6	5'.2	18'.3	3'.3	
19	104° 23'.6	09'.8	166° 25'.8	5'.1	15'.0	3'.4	
20	119° 23'.8	08'.9	180° 49'.9	5'.2	11'.6	3'.6	59'.3
21	134° 23'.9	08'.1	195° 14'.1	5'.1	08'.0	3'.8	
22	149° 24'.1	07'.2	209° 38'.2	5'.1	04'.2	3'.9	
23	164° 24'.2	06'.4	224° 02'.3	5'.1	00'.3	4'.0	59'.4
24 00	179° 24'.4	11° 05'.5 N	238° 26'.4	5'.0	22° 56'.3 N	4'.3	59'.4
01	194° 24'.6	04'.6	252° 50'.4	5'.1	52'.0	4'.4	
02	209° 24'.8	03'.8	267° 14'.5	5'.1	47'.6	4'.5	59'.5
03	224° 24'.9	02'.9	281° 38'.6	5'.0	43'.1	4'.7	
04	239° 25'.1	02'.1	296° 02'.6	5'.1	38'.4	4'.9	59'.6
05	254° 25'.3	01'.2	310° 26'.7	5'.1	33'.5	5'.0	
06	269° 25'.4	00'.4	324° 50'.8	5'.0	28'.5	5'.1	
07	284° 25'.6	10° 59'.5 N	339° 14'.8	5'.1	23'.4	5'.4	59'.7
08	299° 25'.8	58'.7	353° 38'.9	5'.0	18'.0	5'.5	
09	314° 25'.9	57'.8	8° 02'.9	5'.1	12'.5	5'.6	
10	329° 26'.1	56'.9	22° 27'.0	5'.0	06'.9	5'.8	59'.8
11	344° 26'.3	56'.1	36° 51'.0	5'.1	01'.1	6'.0	
12	359° 26'.4	10° 55'.2 N	51° 15'.1	5'.1	21° 55'.1 N	6'.1	59'.8
13	14° 26'.6	54'.4	65° 39'.2	5'.1	49'.0	6'.3	59'.9
14	29° 26'.8	53'.5	80° 03'.3	5'.0	42'.7	6'.4	
15	44° 26'.9	52'.6	94° 27'.3	5'.2	36'.3	6'.6	
16	59° 27'.1	51'.8	108° 51'.5	5'.1	29'.7	6'.7	60'.0
17	74° 27'.3	50'.9	123° 15'.6	5'.1	23'.0	6'.9	
18	89° 27'.4	50'.1	137° 39'.7	5'.2	16'.1	7'.0	
19	104° 27'.6	49'.2	152° 03'.9	5'.1	09'.1	7'.2	60'.1
20	119° 27'.8	48'.3	166° 28'.0	5'.2	01'.9	7'.3	
21	134° 28'.0	47'.5	180° 52'.2	5'.2	20° 54'.6 N	7'.5	
22	149° 28'.1	46'.6	195° 16'.4	5'.2	47'.1	7'.7	60'.2
23	164° 28'.3	45'.7	209° 40'.6	5'.3	39'.4	7'.8	
	SD 15'.8	d 0'.9	SD 15'.8		16'.1	16'.3	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
22	2 54	2 46	12:03	06:29	18:57	24d 39%
23	2 38	2 31	12:03	07:27	19:57	25d 28%
24	2 23	2 15	12:02	08:26	20:56	26d 18%

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1992 August 25, 26, 27 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +0.6		JUPITER -1.7		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
25 Tuesday 00	333° 30'.6	160° 31'.8	4° 26'.1 N	255° 20'.1	22° 34'.5 N	162° 16'.5	4° 56'.1 N	16° 52'.5	17° 39'.7 S
01	348° 33'.0	175° 31'.5	24'.9	270° 20'.9	34'.7	177° 18'.5	55'.8	31° 55'.1	39'.8
02	3° 35'.5	190° 31'.1	23'.6	285° 21'.7	34'.9	192° 20'.4	55'.6	46° 57'.8	39'.8
03	18° 37'.9	205° 30'.8	22'.3	300° 22'.5	35'.0	207° 22'.4	55'.4	62° 00'.4	39'.9
04	33° 40'.4	220° 30'.4	21'.1	315° 23'.3	35'.2	222° 24'.4	55'.2	77° 03'.1	39'.9
05	48° 42'.9	235° 30'.1	19'.8	330° 24'.1	35'.4	237° 26'.4	55'.0	92° 05'.7	40'.0
06	63° 45'.3	250° 29'.7	18'.5	345° 24'.9	35'.5	252° 28'.3	54'.8	107° 08'.3	40'.0
07	78° 47'.8	265° 29'.4	17'.3	0° 25'.6	35'.7	267° 30'.3	54'.6	122° 11'.0	40'.1
08	93° 50'.3	280° 29'.0	16'.0	15° 26'.4	35'.9	282° 32'.3	54'.4	137° 13'.6	40'.1
09	108° 52'.7	295° 28'.7	14'.8	30° 27'.2	36'.0	297° 34'.3	54'.2	152° 16'.2	40'.2
10	123° 55'.2	310° 28'.3	13'.5	45° 28'.0	36'.2	312° 36'.3	54'.0	167° 18'.9	40'.2
11	138° 57'.7	325° 28'.0	12'.2	60° 28'.8	36'.4	327° 38'.2	53'.8	182° 21'.5	40'.3
12	154° 00'.1	340° 27'.7	4° 11'.0 N	75° 29'.6	22° 36'.5 N	342° 40'.2	4° 53'.6 N	197° 24'.1	17° 40'.3 S
13	169° 02'.6	355° 27'.3	09'.7	90° 30'.4	36'.7	357° 42'.2	53'.3	212° 26'.8	40'.4
14	184° 05'.1	10° 27'.0	08'.5	105° 31'.2	36'.9	12° 44'.2	53'.1	227° 29'.4	40'.4
15	199° 07'.5	25° 26'.6	07'.2	120° 32'.0	37'.0	27° 46'.1	52'.9	242° 32'.1	40'.5
16	214° 10'.0	40° 26'.3	05'.9	135° 32'.8	37'.2	42° 48'.1	52'.7	257° 34'.7	40'.6
17	229° 12'.4	55° 25'.9	04'.7	150° 33'.6	37'.4	57° 50'.1	52'.5	272° 37'.3	40'.6
18	244° 14'.9	70° 25'.6	03'.4	165° 34'.3	37'.5	72° 52'.1	52'.3	287° 40'.0	40'.7
19	259° 17'.4	85° 25'.3	02'.1	180° 35'.1	37'.7	87° 54'.1	52'.1	302° 42'.6	40'.7
20	274° 19'.8	100° 24'.9	00'.9	195° 35'.9	37'.9	102° 56'.0	51'.9	317° 45'.2	40'.8
21	289° 22'.3	115° 24'.6	3° 59'.6 N	210° 36'.7	38'.0	117° 58'.0	51'.7	332° 47'.9	40'.8
22	304° 24'.8	130° 24'.2	58'.3	225° 37'.5	38'.2	133° 00'.0	51'.5	347° 50'.5	40'.9
23	319° 27'.2	145° 23'.9	57'.1	240° 38'.3	38'.4	148° 02'.0	51'.3	2° 53'.1	40'.9
26 Wednesday 00	334° 29'.7	160° 23'.5	3° 55'.8 N	255° 39'.1	22° 38'.5 N	163° 03'.9	4° 51'.1 N	17° 55'.8	17° 41'.0 S
01	349° 32'.2	175° 23'.2	54'.5	270° 39'.9	38'.7	178° 05'.9	50'.9	32° 58'.4	41'.0
02	4° 34'.6	190° 22'.9	53'.3	285° 40'.7	38'.8	193° 07'.9	50'.6	48° 01'.0	41'.1
03	19° 37'.1	205° 22'.5	52'.0	300° 41'.5	39'.0	208° 09'.9	50'.4	63° 03'.7	41'.1
04	34° 39'.6	220° 22'.2	50'.7	315° 42'.3	39'.2	223° 11'.9	50'.2	78° 06'.3	41'.2
05	49° 42'.0	235° 21'.8	49'.5	330° 43'.1	39'.3	238° 13'.8	50'.0	93° 09'.0	41'.2
06	64° 44'.5	250° 21'.5	48'.2	345° 43'.9	39'.5	253° 15'.8	49'.8	108° 11'.6	41'.3
07	79° 46'.9	265° 21'.2	46'.9	0° 44'.7	39'.6	268° 17'.8	49'.6	123° 14'.2	41'.3
08	94° 49'.4	280° 20'.8	45'.7	15° 45'.5	39'.8	283° 19'.8	49'.4	138° 16'.9	41'.4
09	109° 51'.9	295° 20'.5	44'.4	30° 46'.3	40'.0	298° 21'.7	49'.2	153° 19'.5	41'.4
10	124° 54'.3	310° 20'.1	43'.1	45° 47'.1	40'.1	313° 23'.7	49'.0	168° 22'.1	41'.5
11	139° 56'.8	325° 19'.8	41'.9	60° 47'.9	40'.3	328° 25'.7	48'.8	183° 24'.8	41'.5
12	154° 59'.3	340° 19'.5	3° 40'.6 N	75° 48'.6	22° 40'.4 N	343° 27'.7	4° 48'.6 N	198° 27'.4	17° 41'.6 S
13	170° 01'.7	355° 19'.1	39'.3	90° 49'.4	40'.6	358° 29'.7	48'.3	213° 30'.0	41'.6
14	185° 04'.2	10° 18'.8	38'.1	105° 50'.2	40'.8	13° 31'.6	48'.1	228° 32'.7	41'.7
15	200° 06'.7	25° 18'.4	36'.8	120° 51'.0	40'.9	28° 33'.6	47'.9	243° 35'.3	41'.7
16	215° 09'.1	40° 18'.1	35'.5	135° 51'.8	41'.1	43° 35'.6	47'.7	258° 37'.9	41'.8
17	230° 11'.6	55° 17'.8	34'.3	150° 52'.6	41'.2	58° 37'.6	47'.5	273° 40'.6	41'.8
18	245° 14'.1	70° 17'.4	33'.0	165° 53'.4	41'.4	73° 39'.5	47'.3	288° 43'.2	41'.9
19	260° 16'.5	85° 17'.1	31'.7	180° 54'.2	41'.6	88° 41'.5	47'.1	303° 45'.8	41'.9
20	275° 19'.0	100° 16'.7	30'.5	195° 55'.0	41'.7	103° 43'.5	46'.9	318° 48'.5	42'.0
21	290° 21'.4	115° 16'.4	29'.2	210° 55'.8	41'.9	118° 45'.5	46'.7	333° 51'.1	42'.0
22	305° 23'.9	130° 16'.1	27'.9	225° 56'.6	42'.0	133° 47'.4	46'.5	348° 53'.7	42'.1
23	320° 26'.4	145° 15'.7	26'.7	240° 57'.4	42'.2	148° 49'.4	46'.3	3° 56'.4	42'.1
27 Thursday 00	335° 28'.8	160° 15'.4	3° 25'.4 N	255° 58'.2	22° 42'.3 N	163° 51'.4	4° 46'.1 N	18° 59'.0	17° 42'.2 S
01	350° 31'.3	175° 15'.0	24'.1	270° 59'.0	42'.5	178° 53'.4	45'.8	34° 01'.6	42'.2
02	5° 33'.8	190° 14'.7	22'.8	285° 59'.8	42'.6	193° 55'.3	45'.6	49° 04'.3	42'.3
03	20° 36'.2	205° 14'.4	21'.6	301° 00'.6	42'.8	208° 57'.3	45'.4	64° 06'.9	42'.3
04	35° 38'.7	220° 14'.0	20'.3	316° 01'.4	43'.0	223° 59'.3	45'.2	79° 09'.5	42'.4
05	50° 41'.2	235° 13'.7	19'.0	331° 02'.2	43'.1	239° 01'.3	45'.0	94° 12'.2	42'.4
06	65° 43'.6	250° 13'.4	17'.8	346° 03'.0	43'.3	254° 03'.3	44'.8	109° 14'.8	42'.5
07	80° 46'.1	265° 13'.0	16'.5	1° 03'.8	43'.4	269° 05'.2	44'.6	124° 17'.4	42'.5
08	95° 48'.5	280° 12'.7	15'.2	16° 04'.6	43'.6	284° 07'.2	44'.4	139° 20'.1	42'.6
09	110° 51'.0	295° 12'.4	14'.0	31° 05'.4	43'.7	299° 09'.2	44'.2	154° 22'.7	42'.6
10	125° 53'.5	310° 12'.0	12'.7	46° 06'.2	43'.9	314° 11'.2	44'.0	169° 25'.3	42'.7
11	140° 55'.9	325° 11'.7	11'.4	61° 07'.0	44'.0	329° 13'.1	43'.8	184° 28'.0	42'.7
12	155° 58'.4	340° 11'.3	3° 10'.1 N	76° 07'.8	22° 44'.2 N	344° 15'.1	4° 43'.5 N	199° 30'.6	17° 42'.8 S
13	171° 00'.9	355° 11'.0	08'.9	91° 08'.6	44'.3	359° 17'.1	43'.3	214° 33'.2	42'.8
14	186° 03'.3	10° 10'.7	07'.6	106° 09'.4	44'.5	14° 19'.1	43'.1	229° 35'.9	42'.9
15	201° 05'.8	25° 10'.3	06'.3	121° 10'.2	44'.6	29° 21'.0	42'.9	244° 38'.5	42'.9
16	216° 08'.3	40° 10'.0	05'.0	136° 11'.0	44'.8	44° 23'.0	42'.7	259° 41'.1	43'.0
17	231° 10'.7	55° 09'.7	03'.8	151° 11'.8	44'.9	59° 25'.0	42'.5	274° 43'.8	43'.0
18	246° 13'.2	70° 09'.3	02'.5	166° 12'.6	45'.1	74° 27'.0	42'.3	289° 46'.4	43'.1
19	261° 15'.7	85° 09'.0	01'.2	181° 13'.4	45'.2	89° 28'.9	42'.1	304° 49'.0	43'.1
20	276° 18'.1	100° 08'.7	00'.0	196° 14'.2	45'.4	104° 30'.9	41'.9	319° 51'.7	43'.2
21	291° 20'.6	115° 08'.3	2° 58'.7 N	211° 15'.1	45'.5	119° 32'.9	41'.7	334° 54'.3	43'.2
22	306° 23'.0	130° 08'.0	57'.4	226° 15'.9	45'.7	134° 34'.9	41'.5	349° 56'.9	43'.3
23	321° 25'.5	145° 07'.6	56'.1	241° 16'.7	45'.8	149° 36'.8	41'.2	4° 59'.6	43'.3
	M.P. 01:38	v -0'.3	d 1'.3	v 0'.8	d 0'.2	v 2'.0	d 0'.2	v 2'.6	d 0'.1

Name	SHA	Dec
Acamar	315° 29'.9	40° 19'.7 S
Achernar	335° 37'.8	57° 16'.1 S
Acrux	173° 27'.5	63° 03'.7 S
Adhara	255° 25'.0	28° 57'.5 S
Aldebaran	291° 07'.2	16° 29'.8 N
Alioth	166° 34'.6	56° 00'.1 N
Alkaid	153° 11'.3	49° 21'.2 N
Alnair	28° 02'.6	46° 59'.6 S
Alnilam	276° 02'.2	1° 12'.2 S
Alphard	218° 11'.7	8° 37'.6 S
Alphecca	126° 24'.2	26° 44'.5 N
Alpheratz	357° 59'.3	29° 03'.1 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.4 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.3 N
Atria	108° 01'.0	69° 01'.2 S
Avior	234° 25'.0	59° 29'.0 S
Bellatrix	278° 48'.8	6° 20'.7 N
Betelgeuse	271° 18'.2	7° 24'.5 N
Canopus	264° 03'.3	52° 41'.2 S
Capella	280° 57'.5	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.5 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.2	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.5 N
Elnath	278° 32'.4	28° 36'.1 N
Eltanin	90° 53'.1	51° 29'.7 N
Enif	34° 02'.0	9° 50'.7 N
Fomalhaut	15° 40'.7	29° 39'.4 S
Gacrux	172° 18'.8	57° 04'.5 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.4	60° 20'.6 S
Hamal	328° 18'.1	23° 25'.8 N
Kaus Aust.	84° 04'.2	34° 23'.4 S
Kochab	137° 19'.6	74° 11'.4 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.2	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.2 S
Miaplacidus	221° 44'.0	69° 41'.2 S
Mirfak	309° 02'.6	49° 50'.0 N
Nunki	76° 17'.3	26° 18'.3 S
Peacock	53° 43'.0	56° 45'.5 S
Polaris	323° 45'.2	89° 13'.7 N
Pollux	243° 46'.9	28° 02'.6 N
Procyon	245° 16'.2	5° 14'.7 N
Rasalhague	96° 20'.7	12° 34'.1 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.1	8° 12'.4 S
Rigil Kent	140° 13'.2	60° 48'.5 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 57'.9	56° 29'.9 N
Shaula	96° 42'.8	37° 06'.0 S
Sirius	258° 47'.6	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 04'.3	43° 24'.1 S
Vega	80° 49'.2	38° 46'.9 N
Zuben'ubi	137° 22'.7	16° 00'.7 S

	SHA	Mer.Pass.
Venus	185° 53'.8	13:19
Mars	281° 09'.4	06:57
Jupiter	188° 34'.2	13:06
Saturn	43° 26'.1	22:44

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
25 00	179° 28'.5	10° 44'.9 N	224° 04'.9	5'.3	20° 31'.6 N	7'.9	60'.2
01	194° 28'.6	44'.0	238° 29'.2	5'.2	23'.7	8'.1	60'.3
02	209° 28'.8	43'.2	252° 53'.4	5'.4	15'.6	8'.2	
03	224° 29'.0	42'.3	267° 17'.8	5'.3	07'.4	8'.4	
04	239° 29'.2	41'.4	281° 42'.1	5'.4	19° 59'.0 N	8'.5	60'.4
05	254° 29'.3	40'.6	296° 06'.5	5'.4	50'.5	8'.7	
06	269° 29'.5	39'.7	310° 30'.9	5'.4	41'.8	8'.8	
07	284° 29'.7	38'.8	324° 55'.3	5'.5	33'.0	8'.9	
08	299° 29'.8	38'.0	339° 19'.8	5'.5	24'.1	9'.1	60'.5
09	314° 30'.0	37'.1	353° 44'.3	5'.5	15'.0	9'.2	
10	329° 30'.2	36'.2	8° 08'.8	5'.6	05'.8	9'.4	
11	344° 30'.4	35'.4	22° 33'.4	5'.6	18° 56'.4 N	9'.5	60'.6
12	359° 30'.5	10° 34'.5 N	36° 58'.0	5'.6	18° 46'.9 N	9'.6	60'.6
13	14° 30'.7	33'.6	51° 22'.6	5'.7	37'.3	9'.8	
14	29° 30'.9	32'.8	65° 47'.3	5'.7	27'.5	9'.9	
15	44° 31'.1	31'.9	80° 12'.0	5'.7	17'.6	10'.0	60'.7
16	59° 31'.2	31'.0	94° 36'.7	5'.8	07'.6	10'.2	
17	74° 31'.4	30'.2	109° 01'.5	5'.8	17° 57'.4 N	10'.3	
18	89° 31'.6	29'.3	123° 26'.3	5'.8	47'.1	10'.4	
19	104° 31'.8	28'.4	137° 51'.1	5'.9	36'.7	10'.6	60'.8
20	119° 31'.9	27'.6	152° 16'.0	6'.0	26'.1	10'.6	
21	134° 32'.1	26'.7	166° 41'.0	6'.0	15'.5	10'.9	
22	149° 32'.3	25'.8	181° 06'.0	6'.0	04'.6	10'.9	
23	164° 32'.5	25'.0	195° 31'.0	6'.0	16° 53'.7 N	11'.0	60'.9
26 00	179° 32'.6	10° 24'.1 N	209° 56'.0	6'.1	16° 42'.7 N	11'.2	60'.9
01	194° 32'.8	23'.2	224° 21'.1	6'.2	31'.5	11'.3	
02	209° 33'.0	22'.3	238° 46'.3	6'.2	20'.2	11'.4	
03	224° 33'.2	21'.5	253° 11'.5	6'.2	08'.8	11'.5	
04	239° 33'.3	20'.6	267° 36'.7	6'.3	15° 57'.3 N	11'.6	61'.0
05	254° 33'.5	19'.7	282° 02'.0	6'.3	45'.7	11'.8	
06	269° 33'.7	18'.9	296° 27'.3	6'.4	33'.9	11'.9	
07	284° 33'.9	18'.0	310° 52'.7	6'.4	22'.0	11'.9	
08	299° 34'.0	17'.1	325° 18'.1	6'.5	10'.1	12'.1	
09	314° 34'.2	16'.2	339° 43'.6	6'.5	14° 58'.0 N	12'.2	61'.1
10	329° 34'.4	15'.4	354° 09'.1	6'.6	45'.8	12'.3	
11	344° 34'.6	14'.5	8° 34'.7	6'.6	33'.5	12'.4	
12	359° 34'.7	10° 13'.6 N	23° 00'.3	6'.6	14° 21'.1 N	12'.5	61'.1
13	14° 34'.9	12'.8	37° 25'.9	6'.7	08'.6	12'.6	
14	29° 35'.1	11'.9	51° 51'.6	6'.7	13° 56'.0 N	12'.7	
15	44° 35'.3	11'.0	66° 17'.3	6'.8	43'.3	12'.7	61'.2
16	59° 35'.5	10'.1	80° 43'.1	6'.9	30'.6	12'.9	
17	74° 35'.6	09'.3	95° 09'.0	6'.9	17'.7	13'.0	
18	89° 35'.8	08'.4	109° 34'.9	6'.9	04'.7	13'.1	
19	104° 36'.0	07'.5	124° 00'.8	7'.0	12° 51'.6 N	13'.1	
20	119° 36'.2	06'.6	138° 26'.8	7'.0	38'.5	13'.3	
21	134° 36'.3	05'.8	152° 52'.8	7'.0	25'.2	13'.3	
22	149° 36'.5	04'.9	167° 18'.8	7'.2	11'.9	13'.4	
23	164° 36'.7	04'.0	181° 45'.0	7'.1	11° 58'.5 N	13'.5	61'.3
27 00	179° 36'.9	10° 03'.1 N	196° 11'.1	7'.2	11° 45'.0 N	13'.6	61'.3
01	194° 37'.1	02'.3	210° 37'.3	7'.3	31'.4	13'.7	
02	209° 37'.2	01'.4	225° 03'.6	7'.3	17'.7	13'.7	
03	224° 37'.4	00'.5	239° 29'.9	7'.3	04'.0	13'.8	
04	239° 37'.6	9° 59'.6 N	253° 56'.2	7'.4	10° 50'.2 N	13'.9	
05	254° 37'.8	58'.7	268° 22'.6	7'.5	36'.3	14'.0	
06	269° 38'.0	57'.9	282° 49'.1	7'.4	22'.3	14'.0	
07	284° 38'.1	57'.0	297° 15'.5	7'.6	08'.3	14'.1	
08	299° 38'.3	56'.1	311° 42'.1	7'.5	9° 54'.2 N	14'.2	
09	314° 38'.5	55'.2	326° 08'.6	7'.6	40'.0	14'.2	
10	329° 38'.7	54'.3	340° 35'.2	7'.7	25'.8	14'.3	
11	344° 38'.9	53'.5	355° 01'.9	7'.7	11'.5	14'.3	
12	359° 39'.0	9° 52'.6 N	9° 28'.6	7'.7	8° 57'.2 N	14'.5	61'.3
13	14° 39'.2	51'.7	23° 55'.3	7'.8	42'.7	14'.4	61'.4
14	29° 39'.4	50'.8	38° 22'.1	7'.8	28'.3	14'.5	
15	44° 39'.6	49'.9	52° 48'.9	7'.9	13'.8	14'.6	
16	59° 39'.8	49'.1	67° 15'.8	7'.9	7° 59'.2 N	14'.6	
17	74° 39'.9	48'.2	81° 42'.7	8'.0	44'.6	14'.7	
18	89° 40'.1	47'.3	96° 09'.7	7'.9	29'.9	14'.7	
19	104° 40'.3	46'.4	110° 36'.6	8'.1	15'.2	14'.8	
20	119° 40'.5	45'.5	125° 03'.7	8'.0	00'.4	14'.8	
21	134° 40'.7	44'.7	139° 30'.7	8'.1	6° 45'.6 N	14'.9	
22	149° 40'.9	43'.8	153° 57'.8	8'.2	30'.7	14'.8	
23	164° 41'.0	42'.9	168° 25'.0	8'.1	15'.9	15'.0	61'.3
	SD 15'.8	d 0'.9	SD 16'.5		16'.7	16'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
25	2 06	1 58	12:02	09:26	21:55	27d 10%
26	1 50	1 41	12:02	10:24	22:53	28d 4%
27	1 33	1 24	12:01	11:21	23:48	29d 1%

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1992 August 28, 29, 30 (Fri, Sat, Sun)

GMT	ARIES	VENUS -3.9		MARS +0.6		JUPITER -1.7		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
28 Friday 00	336° 28'.0	160° 07'.3	2° 54'.9 N	256° 17'.5	22° 46'.0 N	164° 38'.8	4° 41'.0 N	20° 02'.2	17° 43'.4 S
01	351° 30'.4	175° 07'.0	53'.6	271° 18'.3	46'.1	179° 40'.8	40'.8	35° 04'.8	43'.4
02	6° 32'.9	190° 06'.6	52'.3	286° 19'.1	46'.3	194° 42'.8	40'.6	50° 07'.4	43'.5
03	21° 35'.4	205° 06'.3	51'.0	301° 19'.9	46'.4	209° 44'.7	40'.4	65° 10'.1	43'.5
04	36° 37'.8	220° 06'.0	49'.8	316° 20'.7	46'.6	224° 46'.7	40'.2	80° 12'.7	43'.6
05	51° 40'.3	235° 05'.6	48'.5	331° 21'.5	46'.7	239° 48'.7	40'.0	95° 15'.3	43'.6
06	66° 42'.8	250° 05'.3	47'.2	346° 22'.3	46'.9	254° 50'.7	39'.8	110° 18'.0	43'.7
07	81° 45'.2	265° 05'.0	45'.9	1° 23'.1	47'.0	269° 52'.6	39'.6	125° 20'.6	43'.7
08	96° 47'.7	280° 04'.6	44'.7	16° 23'.9	47'.2	284° 54'.6	39'.4	140° 23'.2	43'.8
09	111° 50'.1	295° 04'.3	43'.4	31° 24'.7	47'.3	299° 56'.6	39'.2	155° 25'.9	43'.8
10	126° 52'.6	310° 04'.0	42'.1	46° 25'.5	47'.5	314° 58'.6	38'.9	170° 28'.5	43'.9
11	141° 55'.1	325° 03'.6	40'.8	61° 26'.3	47'.6	330° 00'.5	38'.7	185° 31'.1	43'.9
12	156° 57'.5	340° 03'.3	2° 39'.6 N	76° 27'.1	22° 47'.7 N	345° 02'.5	4° 38'.5 N	200° 33'.8	17° 44'.0 S
13	172° 00'.0	355° 03'.0	38'.3	91° 27'.9	47'.9	0° 04'.5	38'.3	215° 36'.4	44'.0
14	187° 02'.5	10° 02'.6	37'.0	106° 28'.8	48'.0	15° 06'.5	38'.1	230° 39'.0	44'.1
15	202° 04'.9	25° 02'.3	35'.7	121° 29'.6	48'.2	30° 08'.4	37'.9	245° 41'.7	44'.1
16	217° 07'.4	40° 02'.0	34'.5	136° 30'.4	48'.3	45° 10'.4	37'.7	260° 44'.3	44'.2
17	232° 09'.9	55° 01'.6	33'.2	151° 31'.2	48'.5	60° 12'.4	37'.5	275° 46'.9	44'.2
18	247° 12'.3	70° 01'.3	31'.9	166° 32'.0	48'.6	75° 14'.4	37'.3	290° 49'.5	44'.3
19	262° 14'.8	85° 01'.0	30'.6	181° 32'.8	48'.8	90° 16'.3	37'.1	305° 52'.2	44'.3
20	277° 17'.3	100° 00'.6	29'.4	196° 33'.6	48'.9	105° 18'.3	36'.8	320° 54'.8	44'.4
21	292° 19'.7	115° 00'.3	28'.1	211° 34'.4	49'.0	120° 20'.3	36'.6	335° 57'.4	44'.4
22	307° 22'.2	130° 00'.0	26'.8	226° 35'.2	49'.2	135° 22'.3	36'.4	351° 00'.1	44'.5
23	322° 24'.6	144° 59'.7	25'.5	241° 36'.0	49'.3	150° 24'.2	36'.2	6° 02'.7	44'.5
29 Saturday 00	337° 27'.1	159° 59'.3	2° 24'.2 N	256° 36'.8	22° 49'.5 N	165° 26'.2	4° 36'.0 N	21° 05'.3	17° 44'.6 S
01	352° 29'.6	174° 59'.0	23'.0	271° 37'.7	49'.6	180° 28'.2	35'.8	36° 08'.0	44'.6
02	7° 32'.0	189° 58'.7	21'.7	286° 38'.5	49'.7	195° 30'.2	35'.6	51° 10'.6	44'.7
03	22° 34'.5	204° 58'.3	20'.4	301° 39'.3	49'.9	210° 32'.1	35'.4	66° 13'.2	44'.7
04	37° 37'.0	219° 58'.0	19'.1	316° 40'.1	50'.0	225° 34'.1	35'.2	81° 15'.8	44'.8
05	52° 39'.4	234° 57'.7	17'.9	331° 40'.9	50'.2	240° 36'.1	35'.0	96° 18'.5	44'.8
06	67° 41'.9	249° 57'.3	16'.6	346° 41'.7	50'.3	255° 38'.1	34'.8	111° 21'.1	44'.9
07	82° 44'.4	264° 57'.0	15'.3	1° 42'.5	50'.4	270° 40'.0	34'.5	126° 23'.7	44'.9
08	97° 46'.8	279° 56'.7	14'.0	16° 43'.3	50'.6	285° 42'.0	34'.3	141° 26'.4	45'.0
09	112° 49'.3	294° 56'.3	12'.7	31° 44'.1	50'.7	300° 44'.0	34'.1	156° 29'.0	45'.0
10	127° 51'.8	309° 56'.0	11'.5	46° 45'.0	50'.9	315° 46'.0	33'.9	171° 31'.6	45'.1
11	142° 54'.2	324° 55'.7	10'.2	61° 45'.8	51'.0	330° 47'.9	33'.7	186° 34'.3	45'.1
12	157° 56'.7	339° 55'.3	2° 08'.9 N	76° 46'.6	22° 51'.1 N	345° 49'.9	4° 33'.5 N	201° 36'.9	17° 45'.2 S
13	172° 59'.1	354° 55'.0	07'.6	91° 47'.4	51'.3	0° 51'.9	33'.3	216° 39'.5	45'.2
14	188° 01'.6	9° 54'.7	06'.4	106° 48'.2	51'.4	15° 53'.9	33'.1	231° 42'.1	45'.3
15	203° 04'.1	24° 54'.4	05'.1	121° 49'.0	51'.6	30° 55'.8	32'.9	246° 44'.8	45'.3
16	218° 06'.5	39° 54'.0	03'.8	136° 49'.8	51'.7	45° 57'.8	32'.7	261° 47'.4	45'.4
17	233° 09'.0	54° 53'.7	02'.5	151° 50'.7	51'.8	60° 59'.8	32'.4	276° 50'.0	45'.4
18	248° 11'.5	69° 53'.4	01'.2	166° 51'.5	52'.0	76° 01'.8	32'.2	291° 52'.7	45'.5
19	263° 13'.9	84° 53'.0	00'.0	181° 52'.3	52'.1	91° 03'.7	32'.0	306° 55'.3	45'.5
20	278° 16'.4	99° 52'.7	1° 58'.7 N	196° 53'.1	52'.2	106° 05'.7	31'.8	321° 57'.9	45'.6
21	293° 18'.9	114° 52'.4	57'.4	211° 53'.9	52'.4	121° 07'.7	31'.6	337° 00'.5	45'.6
22	308° 21'.3	129° 52'.1	56'.1	226° 54'.7	52'.5	136° 09'.7	31'.4	352° 03'.2	45'.6
23	323° 23'.8	144° 51'.7	54'.8	241° 55'.5	52'.6	151° 11'.6	31'.2	7° 05'.8	45'.7
30 Sunday 00	338° 26'.2	159° 51'.4	1° 53'.6 N	256° 56'.4	22° 52'.8 N	166° 13'.6	4° 31'.0 N	22° 08'.4	17° 45'.7 S
01	353° 28'.7	174° 51'.1	52'.3	271° 57'.2	52'.9	181° 15'.6	30'.8	37° 11'.0	45'.8
02	8° 31'.2	189° 50'.7	51'.0	286° 58'.0	53'.1	196° 17'.6	30'.6	52° 13'.7	45'.8
03	23° 33'.6	204° 50'.4	49'.7	301° 58'.8	53'.2	211° 19'.5	30'.3	67° 16'.3	45'.9
04	38° 36'.1	219° 50'.1	48'.4	316° 59'.6	53'.3	226° 21'.5	30'.1	82° 18'.9	45'.9
05	53° 38'.6	234° 49'.7	47'.2	332° 00'.4	53'.5	241° 23'.5	29'.9	97° 21'.6	46'.0
06	68° 41'.0	249° 49'.4	45'.9	347° 01'.3	53'.6	256° 25'.4	29'.7	112° 24'.2	46'.0
07	83° 43'.5	264° 49'.1	44'.6	2° 02'.1	53'.7	271° 27'.4	29'.5	127° 26'.8	46'.1
08	98° 46'.0	279° 48'.8	43'.3	17° 02'.9	53'.9	286° 29'.4	29'.3	142° 29'.4	46'.1
09	113° 48'.4	294° 48'.4	42'.0	32° 03'.7	54'.0	301° 31'.4	29'.1	157° 32'.1	46'.2
10	128° 50'.9	309° 48'.1	40'.7	47° 04'.5	54'.1	316° 33'.3	28'.9	172° 34'.7	46'.2
11	143° 53'.4	324° 47'.8	39'.5	62° 05'.4	54'.2	331° 35'.3	28'.7	187° 37'.3	46'.3
12	158° 55'.8	339° 47'.5	1° 38'.2 N	77° 06'.2	22° 54'.4 N	346° 37'.3	4° 28'.5 N	202° 39'.9	17° 46'.3 S
13	173° 58'.3	354° 47'.1	36'.9	92° 07'.0	54'.5	1° 39'.3	28'.2	217° 42'.6	46'.4
14	189° 00'.7	9° 46'.8	35'.6	107° 07'.8	54'.6	16° 41'.2	28'.0	232° 45'.2	46'.4
15	204° 03'.2	24° 46'.5	34'.3	122° 08'.6	54'.8	31° 43'.2	27'.8	247° 47'.8	46'.5
16	219° 05'.7	39° 46'.1	33'.1	137° 09'.5	54'.9	46° 45'.2	27'.6	262° 50'.5	46'.5
17	234° 08'.1	54° 45'.8	31'.8	152° 10'.3	55'.0	61° 47'.2	27'.4	277° 53'.1	46'.6
18	249° 10'.6	69° 45'.5	30'.5	167° 11'.1	55'.2	76° 49'.1	27'.2	292° 55'.7	46'.6
19	264° 13'.1	84° 45'.2	29'.2	182° 11'.9	55'.3	91° 51'.1	27'.0	307° 58'.3	46'.7
20	279° 15'.5	99° 44'.8	27'.9	197° 12'.7	55'.4	106° 53'.1	26'.8	323° 01'.0	46'.7
21	294° 18'.0	114° 44'.5	26'.6	212° 13'.6	55'.5	121° 55'.0	26'.6	338° 03'.6	46'.8
22	309° 20'.5	129° 44'.2	25'.4	227° 14'.4	55'.7	136° 57'.0	26'.3	353° 06'.2	46'.8
23	324° 22'.9	144° 43'.8	24'.1	242° 15'.2	55'.8	151° 59'.0	26'.1	8° 08'.8	46'.8
	M.P. 01:26	v -0'.3	d 1'.3	v 0'.8	d 0'.1	v 2'.0	d 0'.2	v 2'.6	d 0'.0

STARS	SHA	Dec
Acamar	315° 29'.9	40° 19'.7 S
Achernar	335° 37'.8	57° 16'.1 S
Acrux	173° 27'.5	63° 03'.7 S
Adhara	255° 25'.0	28° 57'.5 S
Aldebaran	291° 07'.2	16° 29'.8 N
Alioth	166° 34'.6	56° 00'.1 N
Alkaid	153° 11'.3	49° 21'.1 N
Alnair	28° 02'.6	46° 59'.6 S
Alnilam	276° 02'.2	1° 12'.2 S
Alphard	218° 11'.6	8° 37'.6 S
Alphecca	126° 24'.2	26° 44'.5 N
Alpheratz	357° 59'.3	29° 03'.2 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.4 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.3 N
Atria	108° 01'.1	69° 01'.2 S
Avior	234° 25'.0	59° 29'.0 S
Bellatrix	278° 48'.7	6° 20'.7 N
Betelgeuse	271° 18'.2	7° 24'.5 N
Canopus	264° 03'.3	52° 41'.2 S
Capella	280° 57'.5	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.5 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.1	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.4 N
Elnath	278° 32'.3	28° 36'.1 N
Eltanin	90° 53'.1	51° 29'.7 N
Enif	34° 02'.0	9° 50'.7 N
Fomalhaut	15° 40'.6	29° 39'.4 S
Gacrux	172° 18'.9	57° 04'.5 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.5	60° 20'.5 S
Hamal	328° 18'.1	23° 25'.8 N
Kaus Aust.	84° 04'.2	34° 23'.4 S
Kochab	137° 19'.6	74° 11'.4 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.2	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.2 S
Miaplacidus	221° 44'.0	69° 41'.2 S
Mirfak	309° 02'.6	49° 50'.1 N
Nunki	76° 17'.3	26° 18'.4 S
Peacock	53° 43'.0	56° 45'.5 S
Polaris	323° 44'.2	89° 13'.7 N
Pollux	243° 46'.9	28° 02'.6 N
Procyon	245° 16'.2	5° 14'.7 N
Rasalhague	96° 20'.7	12° 34'.1 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.0	8° 12'.4 S
Rigil Kent	140° 13'.3	60° 48'.5 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 57'.9	56° 29'.9 N
Shaula	96° 42'.9	37° 06'.0 S
Sirius	258° 47'.6	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.3	43° 24'.1 S
Vega	80° 49'.2	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	182° 32'.2	13:20
Mars	279° 09'.7	06:53
Jupiter	187° 59'.1	12:57
Saturn	43° 38'.2	22:32

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
179° 41'.2	9° 42'.0 N	182° 52'.1	8'.2	6° 00'.9 N	14'.9	61'.3
194° 41'.4	41'.1	197° 19'.3	8'.3	5° 46'.0 N	15'.0	
209° 41'.6	40'.2	211° 46'.6	8'.3	31'.0	15'.1	
224° 41'.8	39'.4	226° 13'.9	8'.3	15'.9	15'.0	
239° 42'.0	38'.5	240° 41'.2	8'.3	00'.9	15'.1	
254° 42'.1	37'.6	255° 08'.5	8'.4	4° 45'.8 N	15'.1	
269° 42'.3	36'.7	269° 35'.9	8'.4	30'.7	15'.2	
284° 42'.5	35'.8	284° 03'.3	8'.5	15'.5	15'.1	
299° 42'.7	34'.9	298° 30'.8	8'.5	00'.4	15'.2	
314° 42'.9	34'.1	312° 58'.3	8'.5	3° 45'.2 N	15'.2	
329° 43'.1	33'.2	327° 25'.8	8'.5	30'.0	15'.2	
344° 43'.2	32'.3	341° 53'.3	8'.6	14'.8	15'.2	
359° 43'.4	9° 31'.4 N	356° 20'.9	8'.6	2° 59'.6 N	15'.3	61'.3
14° 43'.6	30'.5	10° 48'.5	8'.6	44'.3	15'.2	61'.2
29° 43'.8	29'.6	25° 16'.1	8'.7	29'.1	15'.3	
44° 44'.0	28'.7	39° 43'.8	8'.6	13'.8	15'.2	
59° 44'.2	27'.8	54° 11'.4	8'.8	1° 58'.6 N	15'.3	
74° 44'.4	27'.0	68° 39'.2	8'.7	43'.3	15'.3	
89° 44'.5	26'.1	83° 06'.9	8'.7	28'.0	15'.3	
104° 44'.7	25'.2	97° 34'.6	8'.8	12'.7	15'.2	
119° 44'.9	24'.3	112° 02'.4	8'.8	0° 57'.5 N	15'.3	
134° 45'.1	23'.4	126° 30'.2	8'.8	42'.2	15'.3	61'.1
149° 45'.3	22'.5	140° 58'.0	8'.9	26'.9	15'.2	
164° 45'.5	21'.6	155° 25'.9	8'.8	11'.7	15'.3	
179° 45'.7	9° 20'.7 N	169° 53'.7	8'.9	0° 03'.6 S	15'.2	61'.1
194° 45'.8	19'.8	184° 21'.6	8'.9	18'.8	15'.3	
209° 46'.0	19'.0	198° 49'.5	9'.0	34'.1	15'.2	
224° 46'.2	18'.1	213° 17'.5	8'.9	49'.3	15'.2	61'.0
239° 46'.4	17'.2	227° 45'.4	9'.0	1° 04'.5 S	15'.2	
254° 46'.6	16'.3	242° 13'.4	8'.9	19'.7	15'.2	
269° 46'.8	15'.4	256° 41'.3	9'.0	34'.9	15'.1	
284° 47'.0	14'.5	271° 09'.3	9'.0	50'.0	15'.1	
299° 47'.2	13'.6	285° 37'.3	9'.0	2° 05'.1 S	15'.1	60'.9
314° 47'.3	12'.7	300° 05'.3	9'.1	20'.2	15'.1	
329° 47'.5	11'.8	314° 33'.4	9'.0	35'.3	15'.1	
344° 47'.7	10'.9	329° 01'.4	9'.1	50'.4	15'.0	
359° 47'.9	9° 10'.0 N	343° 29'.5	9'.0	3° 05'.4 S	15'.0	60'.9
14° 48'.1	09'.2	357° 57'.5	9'.1	20'.4	14'.9	60'.8
29° 48'.3	08'.3	12° 25'.6	9'.1	35'.3	14'.9	
44° 48'.5	07'.4	26° 53'.7	9'.1	50'.2	14'.9	
59° 48'.7	06'.5	41° 21'.8	9'.1	4° 05'.1 S	14'.9	
74° 48'.8	05'.6	55° 49'.9	9'.1	20'.0	14'.8	60'.7
89° 49'.0	04'.7	70° 18'.0	9'.1	34'.8	14'.8	
104° 49'.2	03'.8	84° 46'.1	9'.2	49'.6	14'.7	
119° 49'.4	02'.9	99° 14'.3	9'.1	5° 04'.3 S	14'.7	
134° 49'.6	02'.0	113° 42'.4	9'.1	19'.0	14'.6	60'.6
149° 49'.8	01'.1	128° 10'.5	9'.2	33'.6	14'.6	
164° 50'.0	00'.2	142° 38'.7	9'.1	48'.2	14'.5	
179° 50'.2	8° 59'.3 N	157° 06'.8	9'.2	6° 02'.7 S	14'.5	60'.5
194° 50'.4	58'.4	171° 35'.0	9'.1	17'.2	14'.5	
209° 50'.6	57'.5	186° 03'.1	9'.2	31'.7	14'.3	
224° 50'.7	56'.6	200° 31'.3	9'.1	46'.0	14'.4	
239° 50'.9	55'.7	214° 59'.4	9'.2	7° 00'.4 S	14'.2	60'.4
254° 51'.1	54'.8	229° 27'.6	9'.1	14'.6	14'.2	
269° 51'.3	53'.9	243° 55'.7	9'.2	28'.8	14'.2	
284° 51'.5	53'.0	258° 23'.9	9'.1	43'.0	14'.1	60'.3
299° 51'.7	52'.1	272° 52'.0	9'.2	57'.1	14'.0	
314° 51'.9	51'.2	287° 20'.2	9'.2	8° 11'.1 S	14'.0	
329° 52'.1	50'.3	301° 48'.4	9'.1	25'.1	13'.9	60'.2
344° 52'.3	49'.5	316° 16'.5	9'.1	39'.0	13'.8	
359° 52'.5	8° 48'.6 N	330° 44'.6	9'.2	8° 52'.8 S	13'.8	60'.2
14° 52'.7	47'.7	345° 12'.8	9'.1	9° 06'.6 S	13'.7	60'.1
29° 52'.9	46'.8	359° 40'.9	9'.1	20'.3	13'.6	
44° 53'.0	45'.9	14° 09'.0	9'.2	33'.9	13'.5	
59° 53'.2	45'.0	28° 37'.2	9'.1	47'.4	13'.5	60'.0
74° 53'.4	44'.1	43° 05'.3	9'.1	10° 00'.9 S	13'.4	
89° 53'.6	43'.2	57° 33'.4	9'.1	14'.3	13'.3	
104° 53'.8	42'.3	72° 01'.5	9'.1	27'.6	13'.3	59'.9
119° 54'.0	41'.4	86° 29'.6	9'.1	40'.9	13'.1	
134° 54'.2	40'.5	100° 57'.7	9'.1	54'.0	13'.1	
149° 54'.4	39'.6	115° 25'.8	9'.1	11° 07'.1 S	13'.0	59'.8
164° 54'.6	38'.7	129° 53'.9	9'.0	20'.1	13'.0	
SD 15'.8	d 0'.9	SD 16'.7		16'.6	16'.4	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
28	1 15	1 07	12:01	12:15	24:42	0d 0%
29	0 58	0 49	12:01	13:08	00:42	1d 3%
30	0 40	0 31	12:01	14:01	01:35	2d 9%

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1992 Aug 31, Sep. 1, 2 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +0.6		JUPITER -1.7		SATURN +0.3	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
31 Monday 00	339° 25'.4	159° 43'.5	1° 22'.8 N	257° 16'.0	22° 55'.9 N	167° 01'.0	4° 25'.9 N	23° 11'.5	17° 46'.9 S
01	354° 27'.8	174° 43'.2	21'.5	272° 16'.8	56'.1	182° 02'.9	25'.7	38° 14'.1	46'.9
02	9° 30'.3	189° 42'.9	20'.2	287° 17'.7	56'.2	197° 04'.9	25'.5	53° 16'.7	47'.0
03	24° 32'.8	204° 42'.5	18'.9	302° 18'.5	56'.3	212° 06'.9	25'.3	68° 19'.3	47'.0
04	39° 35'.2	219° 42'.2	17'.7	317° 19'.3	56'.4	227° 08'.9	25'.1	83° 22'.0	47'.1
05	54° 37'.7	234° 41'.9	16'.4	332° 20'.1	56'.6	242° 10'.8	24'.9	98° 24'.6	47'.1
06	69° 40'.2	249° 41'.6	15'.1	347° 21'.0	56'.7	257° 12'.8	24'.7	113° 27'.2	47'.2
07	84° 42'.6	264° 41'.2	13'.8	2° 21'.8	56'.8	272° 14'.8	24'.5	128° 29'.8	47'.2
08	99° 45'.1	279° 40'.9	12'.5	17° 22'.6	56'.9	287° 16'.8	24'.2	143° 32'.5	47'.3
09	114° 47'.6	294° 40'.6	11'.2	32° 23'.4	57'.1	302° 18'.7	24'.0	158° 35'.1	47'.3
10	129° 50'.0	309° 40'.3	10'.0	47° 24'.3	57'.2	317° 20'.7	23'.8	173° 37'.7	47'.4
11	144° 52'.5	324° 39'.9	08'.7	62° 25'.1	57'.3	332° 22'.7	23'.6	188° 40'.3	47'.4
12	159° 55'.0	339° 39'.6	1° 07'.4 N	77° 25'.9	22° 57'.4 N	347° 24'.6	4° 23'.4 N	203° 43'.0	17° 47'.5 S
13	174° 57'.4	354° 39'.3	06'.1	92° 26'.7	57'.6	2° 26'.6	23'.2	218° 45'.6	47'.5
14	189° 59'.9	9° 39'.0	04'.8	107° 27'.6	57'.7	17° 28'.6	23'.0	233° 48'.2	47'.6
15	205° 02'.3	24° 38'.6	03'.5	122° 28'.4	57'.8	32° 30'.6	22'.8	248° 50'.8	47'.6
16	220° 04'.8	39° 38'.3	02'.3	137° 29'.2	57'.9	47° 32'.5	22'.6	263° 53'.5	47'.7
17	235° 07'.3	54° 38'.0	01'.0	152° 30'.0	58'.1	62° 34'.5	22'.3	278° 56'.1	47'.7
18	250° 09'.7	69° 37'.7	0° 59'.7 N	167° 30'.9	58'.2	77° 36'.5	22'.1	293° 58'.7	47'.8
19	265° 12'.2	84° 37'.3	58'.4	182° 31'.7	58'.3	92° 38'.5	21'.9	309° 01'.3	47'.8
20	280° 14'.7	99° 37'.0	57'.1	197° 32'.5	58'.4	107° 40'.4	21'.7	324° 04'.0	47'.8
21	295° 17'.1	114° 36'.7	55'.8	212° 33'.4	58'.6	122° 42'.4	21'.5	339° 06'.6	47'.9
22	310° 19'.6	129° 36'.4	54'.5	227° 34'.2	58'.7	137° 44'.4	21'.3	354° 09'.2	47'.9
23	325° 22'.1	144° 36'.0	53'.3	242° 35'.0	58'.8	152° 46'.3	21'.1	9° 11'.8	48'.0
1 Tuesday 00	340° 24'.5	159° 35'.7	0° 52'.0 N	257° 35'.8	22° 58'.9 N	167° 48'.3	4° 20'.9 N	24° 14'.5	17° 48'.0 S
01	355° 27'.0	174° 35'.4	50'.7	272° 36'.7	59'.0	182° 50'.3	20'.7	39° 17'.1	48'.1
02	10° 29'.4	189° 35'.1	49'.4	287° 37'.5	59'.2	197° 52'.3	20'.5	54° 19'.7	48'.1
03	25° 31'.9	204° 34'.7	48'.1	302° 38'.3	59'.3	212° 54'.2	20'.2	69° 22'.3	48'.2
04	40° 34'.4	219° 34'.4	46'.8	317° 39'.2	59'.4	227° 56'.2	20'.0	84° 25'.0	48'.2
05	55° 36'.8	234° 34'.1	45'.6	332° 40'.0	59'.5	242° 58'.2	19'.8	99° 27'.6	48'.3
06	70° 39'.3	249° 33'.8	44'.3	347° 40'.8	59'.6	258° 00'.1	19'.6	114° 30'.2	48'.3
07	85° 41'.8	264° 33'.4	43'.0	2° 41'.6	59'.8	273° 02'.1	19'.4	129° 32'.8	48'.4
08	100° 44'.2	279° 33'.1	41'.7	17° 42'.5	59'.9	288° 04'.1	19'.2	144° 35'.4	48'.4
09	115° 46'.7	294° 32'.8	40'.4	32° 43'.3	23° 00'.0 N	303° 06'.1	19'.0	159° 38'.1	48'.5
10	130° 49'.2	309° 32'.5	39'.1	47° 44'.1	00'.1	318° 08'.0	18'.8	174° 40'.7	48'.5
11	145° 51'.6	324° 32'.1	37'.8	62° 45'.0	00'.2	333° 10'.0	18'.6	189° 43'.3	48'.5
12	160° 54'.1	339° 31'.8	0° 36'.6 N	77° 45'.8	23° 00'.4 N	348° 12'.0	4° 18'.3 N	204° 45'.9	17° 48'.6 S
13	175° 56'.6	354° 31'.5	35'.3	92° 46'.6	00'.5	3° 14'.0	18'.1	219° 48'.6	48'.6
14	190° 59'.0	9° 31'.2	34'.0	107° 47'.5	00'.6	18° 15'.9	17'.9	234° 51'.2	48'.7
15	206° 01'.5	24° 30'.8	32'.7	122° 48'.3	00'.7	33° 17'.9	17'.7	249° 53'.8	48'.7
16	221° 03'.9	39° 30'.5	31'.4	137° 49'.1	00'.8	48° 19'.9	17'.5	264° 56'.4	48'.8
17	236° 06'.4	54° 30'.2	30'.1	152° 50'.0	00'.9	63° 21'.8	17'.3	279° 59'.0	48'.8
18	251° 08'.9	69° 29'.9	28'.8	167° 50'.8	01'.1	78° 23'.8	17'.1	295° 01'.7	48'.9
19	266° 11'.3	84° 29'.5	27'.6	182° 51'.6	01'.2	93° 25'.8	16'.9	310° 04'.3	48'.9
20	281° 13'.8	99° 29'.2	26'.3	197° 52'.5	01'.3	108° 27'.8	16'.7	325° 06'.9	49'.0
21	296° 16'.3	114° 28'.9	25'.0	212° 53'.3	01'.4	123° 29'.7	16'.4	340° 09'.5	49'.0
22	311° 18'.7	129° 28'.6	23'.7	227° 54'.1	01'.5	138° 31'.7	16'.2	355° 12'.2	49'.1
23	326° 21'.2	144° 28'.2	22'.4	242° 55'.0	01'.6	153° 33'.7	16'.0	10° 14'.8	49'.1
2 Wednesday 00	341° 23'.7	159° 27'.9	0° 21'.1 N	257° 55'.8	23° 01'.8 N	168° 35'.6	4° 15'.8 N	25° 17'.4	17° 49'.1 S
01	356° 26'.1	174° 27'.6	19'.8	272° 56'.6	01'.9	183° 37'.6	15'.6	40° 20'.0	49'.2
02	11° 28'.6	189° 27'.3	18'.5	287° 57'.5	02'.0	198° 39'.6	15'.4	55° 22'.6	49'.2
03	26° 31'.1	204° 26'.9	17'.3	302° 58'.3	02'.1	213° 41'.6	15'.2	70° 25'.3	49'.3
04	41° 33'.5	219° 26'.6	16'.0	317° 59'.1	02'.2	228° 43'.5	15'.0	85° 27'.9	49'.3
05	56° 36'.0	234° 26'.3	14'.7	333° 00'.0	02'.3	243° 45'.5	14'.8	100° 30'.5	49'.4
06	71° 38'.4	249° 26'.0	13'.4	348° 00'.8	02'.4	258° 47'.5	14'.5	115° 33'.1	49'.4
07	86° 40'.9	264° 25'.7	12'.1	3° 01'.6	02'.6	273° 49'.4	14'.3	130° 35'.7	49'.5
08	101° 43'.4	279° 25'.3	10'.8	18° 02'.5	02'.7	288° 51'.4	14'.1	145° 38'.4	49'.5
09	116° 45'.8	294° 25'.0	09'.5	33° 03'.3	02'.8	303° 53'.4	13'.9	160° 41'.0	49'.6
10	131° 48'.3	309° 24'.7	08'.3	48° 04'.2	02'.9	318° 55'.4	13'.7	175° 43'.6	49'.6
11	146° 50'.8	324° 24'.4	07'.0	63° 05'.0	03'.0	333° 57'.3	13'.5	190° 46'.2	49'.7
12	161° 53'.2	339° 24'.0	0° 05'.7 N	78° 05'.8	23° 03'.1 N	348° 59'.3	4° 13'.3 N	205° 48'.8	17° 49'.7 S
13	176° 55'.7	354° 23'.7	04'.4	93° 06'.7	03'.2	4° 01'.3	13'.1	220° 51'.5	49'.7
14	191° 58'.2	9° 23'.4	03'.1	108° 07'.5	03'.3	19° 03'.2	12'.9	235° 54'.1	49'.8
15	207° 00'.6	24° 23'.1	01'.8	123° 08'.4	03'.4	34° 05'.2	12'.6	250° 56'.7	49'.8
16	222° 03'.1	39° 22'.7	00'.5	138° 09'.2	03'.6	49° 07'.2	12'.4	265° 59'.3	49'.9
17	237° 05'.5	54° 22'.4	00'.8	153° 10'.0	03'.7	64° 09'.2	12'.2	281° 01'.9	49'.9
18	252° 08'.0	69° 22'.1	02'.0	168° 10'.9	03'.8	79° 11'.1	12'.0	296° 04'.6	50'.0
19	267° 10'.5	84° 21'.8	03'.3	183° 11'.7	03'.9	94° 13'.1	11'.8	311° 07'.2	50'.0
20	282° 12'.9	99° 21'.5	04'.6	198° 12'.6	04'.0	109° 15'.1	11'.6	326° 09'.8	50'.1
21	297° 15'.4	114° 21'.1	05'.9	213° 13'.4	04'.1	124° 17'.0	11'.4	341° 12'.4	50'.1
22	312° 17'.9	129° 20'.8	07'.2	228° 14'.2	04'.2	139° 19'.0	11'.2	356° 15'.0	50'.2
23	327° 20'.3	144° 20'.5	08'.5	243° 15'.1	04'.3	154° 21'.0	10'.9	11° 17'.7	50'.2
	M.P. 01:14	v -0'.3	d 1'.3	v 0'.8	d 0'.1	v 2'.0	d 0'.2	v 2'.6	d 0'.0

STARS	SHA	Dec
Acamar	315° 29'.9	40° 19'.7 S
Achernar	335° 37'.8	57° 16'.1 S
Acrux	173° 27'.5	63° 03'.7 S
Adhara	255° 24'.9	28° 57'.5 S
Aldebaran	291° 07'.2	16° 29'.8 N
Alioth	166° 34'.6	56° 00'.1 N
Alkaid	153° 11'.3	49° 21'.1 N
Alnair	28° 02'.6	46° 59'.6 S
Alnilam	276° 02'.2	1° 12'.2 S
Alphard	218° 11'.6	8° 37'.5 S
Alphecca	126° 24'.2	26° 44'.5 N
Alpheratz	357° 59'.3	29° 03'.2 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.4 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.3 N
Atria	108° 01'.1	69° 01'.2 S
Avior	234° 25'.0	59° 29'.0 S
Bellatrix	278° 48'.7	6° 20'.7 N
Betelgeuse	271° 18'.2	7° 24'.5 N
Canopus	264° 03'.3	52° 41'.2 S
Capella	280° 57'.5	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.5 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.1	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.4 N
Elnath	278° 32'.3	28° 36'.1 N
Eltanin	90° 53'.2	51° 29'.7 N
Enif	34° 02'.0	9° 50'.7 N
Fomalhaut	15° 40'.6	29° 39'.4 S
Gacrux	172° 18'.9	57° 04'.5 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.5	60° 20'.5 S
Hamal	328° 18'.1	23° 25'.8 N
Kaus Aust.	84° 04'.2	34° 23'.4 S
Kochab	137° 19'.7	74° 11'.3 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.2	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.2 S
Miaplacidus	221° 44'.0	69° 41'.2 S
Mirfak	309° 02'.5	49° 50'.1 N
Nunki	76° 17'.3	26° 18'.4 S
Peacock	53° 43'.0	56° 45'.5 S
Polaris	323° 43'.0	89° 13'.7 N
Pollux	243° 46'.9	28° 02'.6 N
Procyon	245° 16'.2	5° 14'.7 N
Rasalhague	96° 20'.8	12° 34'.1 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.0	8° 12'.4 S
Rigil Kent	140° 13'.3	60° 48'.5 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 57'.9	56° 29'.9 N
Shaula	96° 42'.9	37° 06'.0 S
Sirius	258° 47'.6	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.3	43° 24'.1 S
Vega	80° 49'.3	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	179° 11'.2	13:22
Mars	277° 11'.3	06:49
Jupiter	187° 23'.8	12:47
Saturn	43° 49'.9	22:19

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
179° 54'.8	8° 37'.8 N	144° 21'.9	9'.1	11° 33'.1 S	12'.8	59'.8
194° 55'.0	36'.9	158° 50'.0	9'.0	45'.9	12'.7	59'.7
209° 55'.2	35'.9	173° 18'.0	9'.1	58'.6	12'.7	
224° 55'.4	35'.0	187° 46'.1	9'.0	12° 11'.3 S	12'.6	
239° 55'.6	34'.1	202° 14'.1	9'.0	23'.9	12'.5	59'.6
254° 55'.8	33'.2	216° 42'.1	9'.0	36'.4	12'.4	
269° 55'.9	32'.3	231° 10'.1	9'.0	48'.8	12'.3	59'.5
284° 56'.1	31'.4	245° 38'.1	9'.0	13° 01'.1 S	12'.2	
299° 56'.3	30'.5	260° 06'.1	9'.0	13'.3	12'.1	
314° 56'.5	29'.6	274° 34'.1	9'.0	25'.4	12'.0	59'.4
329° 56'.7	28'.7	289° 02'.1	8'.9	37'.4	12'.0	
344° 56'.9	27'.8	303° 30'.0	9'.0	49'.4	11'.8	
359° 57'.1	8° 26'.9 N	317° 58'.0	8'.9	14° 01'.2 S	11'.7	59'.3
14° 57'.3	26'.0	332° 25'.9	8'.9	12'.9	11'.7	
29° 57'.5	25'.1	346° 53'.8	8'.9	24'.6	11'.5	59'.2
44° 57'.7	24'.2	1° 21'.7	8'.9	36'.1	11'.5	
59° 57'.9	23'.3	15° 49'.6	8'.9	47'.6	11'.3	
74° 58'.1	22'.4	30° 17'.5	8'.8	58'.9	11'.2	59'.1
89° 58'.3	21'.5	44° 45'.3	8'.9	15° 10'.1 S	11'.1	
104° 58'.5	20'.6	59° 13'.2	8'.8	21'.2	11'.1	59'.0
119° 58'.7	19'.7	73° 41'.0	8'.9	32'.3	10'.9	
134° 58'.9	18'.8	88° 08'.9	8'.8	43'.2	10'.8	
149° 59'.1	17'.9	102° 36'.7	8'.8	54'.0	10'.7	58'.9
164° 59'.3	17'.0	117° 04'.5	8'.7	16° 04'.7 S	10'.6	
179° 59'.5	8° 16'.1 N	131° 32'.2	8'.8	16° 15'.3 S	10'.5	58'.8
194° 59'.7	15'.1	146° 00'.0	8'.8	25'.8	10'.4	
209° 59'.9	14'.2	160° 27'.8	8'.7	36'.2	10'.2	
225° 00'.1	13'.3	174° 55'.5	8'.8	46'.4	10'.2	58'.7
240° 00'.3	12'.4	189° 23'.3	8'.7	56'.6	10'.0	
255° 00'.5	11'.5	203° 51'.0	8'.7	17° 06'.6 S	9'.9	
270° 00'.7	10'.6	218° 18'.7	8'.7	16'.5	9'.9	58'.6
285° 00'.9	09'.7	232° 46'.4	8'.7	26'.4	9'.7	
300° 01'.1	08'.8	247° 14'.1	8'.6	36'.1	9'.5	58'.5
315° 01'.2	07'.9	261° 41'.7	8'.7	45'.6	9'.5	
330° 01'.4	07'.0	276° 09'.4	8'.7	55'.1	9'.4	
345° 01'.6	06'.1	290° 37'.1	8'.6	18° 04'.5 S	9'.2	58'.4
0° 01'.8	8° 05'.2 N	305° 04'.7	8'.6	18° 13'.7 S	9'.1	58'.4
15° 02'.0	04'.2	319° 32'.3	8'.6	22'.8	9'.0	58'.3
30° 02'.2	03'.3	333° 59'.9	8'.6	31'.8	8'.9	
45° 02'.4	02'.4	348° 27'.5	8'.6	40'.7	8'.7	
60° 02'.6	01'.5	2° 55'.1	8'.6	49'.4	8'.7	58'.2
75° 02'.8	00'.6	17° 22'.7	8'.6	58'.1	8'.5	
90° 03'.0	7° 59'.7 N	31° 50'.3	8'.5	19° 06'.6 S	8'.4	58'.1
105° 03'.2	58'.8	46° 17'.8	8'.6	15'.0	8'.2	
120° 03'.4	57'.9	60° 45'.4	8'.5	23'.2	8'.2	
135° 03'.6	57'.0	75° 12'.9	8'.6	31'.4	8'.0	58'.0
150° 03'.8	56'.0	89° 40'.5	8'.5	39'.4	7'.9	
165° 04'.0	55'.1	104° 08'.0	8'.5	47'.3	7'.8	57'.9
180° 04'.2	7° 54'.2 N	118° 35'.5	8'.6	19° 55'.1 S	7'.6	57'.9
195° 04'.4	53'.3	133° 03'.1	8'.5	20° 02'.7 S	7'.6	
210° 04'.6	52'.4	147° 30'.6	8'.5	10'.3	7'.4	57'.8
225° 04'.8	51'.5	161° 58'.1	8'.5	17'.7	7'.2	
240° 05'.0	50'.6	176° 25'.6	8'.5	24'.9	7'.2	57'.7
255° 05'.2	49'.7	190° 53'.1	8'.4	32'.1	7'.0	
270° 05'.4	48'.7	205° 20'.5	8'.5	39'.1	6'.9	
285° 05'.6	47'.8	219° 48'.0	8'.5	46'.0	6'.8	57'.6
300° 05'.8	46'.9	234° 15'.5	8'.5	52'.8	6'.6	
315° 06'.0	46'.0	248° 43'.0	8'.5	59'.4	6'.5	57'.5
330° 06'.2	45'.1	263° 10'.5	8'.4	21° 05'.9 S	6'.4	
345° 06'.4	44'.2	277° 37'.9	8'.5	12'.3	6'.2	
0° 06'.6	7° 43'.3 N	292° 05'.4	8'.5	21° 18'.5 S	6'.1	57'.4
15° 06'.9	42'.3	306° 32'.9	8'.4	24'.6	6'.0	
30° 07'.1	41'.4	321° 00'.3	8'.5	30'.6	5'.9	57'.3
45° 07'.3	40'.5	335° 27'.8	8'.5	36'.5	5'.7	
60° 07'.5	39'.6	349° 55'.3	8'.5	42'.2	5'.6	
75° 07'.7	38'.7	4° 22'.8	8'.4	47'.8	5'.5	57'.2
90° 07'.9	37'.8	18° 50'.2	8'.5	53'.3	5'.3	
105° 08'.1	36'.8	33° 17'.7	8'.5	58'.6	5'.2	
120° 08'.3	35'.9	47° 45'.2	8'.5	22° 03'.8 S	5'.1	57'.1
135° 08'.5	35'.0	62° 12'.7	8'.5	08'.9	5'.0	
150° 08'.7	34'.1	76° 40'.2	8'.5	13'.9	4'.8	57'.0
165° 08'.9	33'.2	91° 07'.7	8'.5	18'.7	4'.7	
SD 15'.9	d 0'.9	SD 16'.2		15'.9	15'.6	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
31	0 21	0 12	12:00	14:54	02:28	3d 16%
1	0 03	0 07	12:00	15:48	03:21	4d 25%
2	0 17	0 26	12:00	16:42	04:15	5d 35%

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1992 September 3, 4, 5 (Thur, Fri, Sat)

GMT	ARIES	VENUS -3.9		MARS +0.6		JUPITER -1.7		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
3 Thursday 00	342° 22'.8	159° 20'.2	0° 09'.8 S	258° 15'.9	23° 04'.4 N	169° 23'.0	4° 10'.7 N	26° 20'.3	17° 50'.2 S
01	357° 25'.3	174° 19'.8	11'.1	273° 16'.8	04'.5	184° 24'.9	10'.5	41° 22'.9	50'.3
02	12° 27'.7	189° 19'.5	12'.3	288° 17'.6	04'.6	199° 26'.9	10'.3	56° 25'.5	50'.3
03	27° 30'.2	204° 19'.2	13'.6	303° 18'.4	04'.8	214° 28'.9	10'.1	71° 28'.1	50'.4
04	42° 32'.7	219° 18'.9	14'.9	318° 19'.3	04'.9	229° 30'.8	09'.9	86° 30'.8	50'.4
05	57° 35'.1	234° 18'.5	16'.2	333° 20'.1	05'.0	244° 32'.8	09'.7	101° 33'.4	50'.5
06	72° 37'.6	249° 18'.2	17'.5	348° 21'.0	05'.1	259° 34'.8	09'.5	116° 36'.0	50'.5
07	87° 40'.0	264° 17'.9	18'.8	3° 21'.8	05'.2	274° 36'.8	09'.3	131° 38'.6	50'.6
08	102° 42'.5	279° 17'.6	20'.1	18° 22'.7	05'.3	289° 38'.7	09'.0	146° 41'.2	50'.6
09	117° 45'.0	294° 17'.3	21'.4	33° 23'.5	05'.4	304° 40'.7	08'.8	161° 43'.9	50'.6
10	132° 47'.4	309° 16'.9	22'.6	48° 24'.3	05'.5	319° 42'.7	08'.6	176° 46'.5	50'.7
11	147° 49'.9	324° 16'.6	23'.9	63° 25'.2	05'.6	334° 44'.6	08'.4	191° 49'.1	50'.7
12	162° 52'.4	339° 16'.3	0° 25'.2 S	78° 26'.0	23° 05'.7 N	349° 46'.6	4° 08'.2 N	206° 51'.7	17° 50'.8 S
13	177° 54'.8	354° 16'.0	26'.5	93° 26'.9	05'.8	4° 48'.6	08'.0	221° 54'.3	50'.8
14	192° 57'.3	9° 15'.6	27'.8	108° 27'.7	05'.9	19° 50'.5	07'.8	236° 56'.9	50'.9
15	207° 59'.8	24° 15'.3	29'.1	123° 28'.6	06'.0	34° 52'.5	07'.6	251° 59'.6	50'.9
16	223° 02'.2	39° 15'.0	30'.4	138° 29'.4	06'.1	49° 54'.5	07'.4	267° 02'.2	51'.0
17	238° 04'.7	54° 14'.7	31'.7	153° 30'.3	06'.2	64° 56'.5	07'.1	282° 04'.8	51'.0
18	253° 07'.2	69° 14'.4	33'.0	168° 31'.1	06'.3	79° 58'.4	06'.9	297° 07'.4	51'.1
19	268° 09'.6	84° 14'.0	34'.2	183° 32'.0	06'.4	95° 00'.4	06'.7	312° 10'.0	51'.1
20	283° 12'.1	99° 13'.7	35'.5	198° 32'.8	06'.5	110° 02'.4	06'.5	327° 12'.6	51'.1
21	298° 14'.5	114° 13'.4	36'.8	213° 33'.6	06'.6	125° 04'.3	06'.3	342° 15'.3	51'.2
22	313° 17'.0	129° 13'.1	38'.1	228° 34'.5	06'.7	140° 06'.3	06'.1	357° 17'.9	51'.2
23	328° 19'.5	144° 12'.7	39'.4	243° 35'.3	06'.8	155° 08'.3	05'.9	12° 20'.5	51'.3
4 Friday 00	343° 21'.9	159° 12'.4	0° 40'.7 S	258° 36'.2	23° 06'.9 N	170° 10'.3	4° 05'.7 N	27° 23'.1	17° 51'.3 S
01	358° 24'.4	174° 12'.1	42'.0	273° 37'.0	07'.0	185° 12'.2	05'.4	42° 25'.7	51'.4
02	13° 26'.9	189° 11'.8	43'.3	288° 37'.9	07'.1	200° 14'.2	05'.2	57° 28'.3	51'.4
03	28° 29'.3	204° 11'.5	44'.5	303° 38'.7	07'.3	215° 16'.2	05'.0	72° 31'.0	51'.5
04	43° 31'.8	219° 11'.1	45'.8	318° 39'.6	07'.4	230° 18'.1	04'.8	87° 33'.6	51'.5
05	58° 34'.3	234° 10'.8	47'.1	333° 40'.4	07'.5	245° 20'.1	04'.6	102° 36'.2	51'.5
06	73° 36'.7	249° 10'.5	48'.4	348° 41'.3	07'.6	260° 22'.1	04'.4	117° 38'.8	51'.6
07	88° 39'.2	264° 10'.2	49'.7	3° 42'.1	07'.7	275° 24'.0	04'.2	132° 41'.4	51'.6
08	103° 41'.7	279° 09'.8	51'.0	18° 43'.0	07'.8	290° 26'.0	04'.0	147° 44'.0	51'.7
09	118° 44'.1	294° 09'.5	52'.3	33° 43'.8	07'.9	305° 28'.0	03'.8	162° 46'.7	51'.7
10	133° 46'.6	309° 09'.2	53'.6	48° 44'.7	07'.9	320° 30'.0	03'.5	177° 49'.3	51'.8
11	148° 49'.0	324° 08'.9	54'.8	63° 45'.5	08'.0	335° 31'.9	03'.3	192° 51'.9	51'.8
12	163° 51'.5	339° 08'.6	0° 56'.1 S	78° 46'.4	23° 08'.1 N	350° 33'.9	4° 03'.1 N	207° 54'.5	17° 51'.9 S
13	178° 54'.0	354° 08'.2	57'.4	93° 47'.2	08'.2	5° 35'.9	02'.9	222° 57'.1	51'.9
14	193° 56'.4	9° 07'.9	58'.7	108° 48'.1	08'.3	20° 37'.8	02'.7	237° 59'.7	51'.9
15	208° 58'.9	24° 07'.6	1° 00'.0 S	123° 48'.9	08'.4	35° 39'.8	02'.5	253° 02'.3	52'.0
16	224° 01'.4	39° 07'.3	01'.3	138° 49'.8	08'.5	50° 41'.8	02'.3	268° 05'.0	52'.0
17	239° 03'.8	54° 06'.9	02'.6	153° 50'.6	08'.6	65° 43'.7	02'.1	283° 07'.6	52'.1
18	254° 06'.3	69° 06'.6	03'.9	168° 51'.5	08'.7	80° 45'.7	01'.8	298° 10'.2	52'.1
19	269° 08'.8	84° 06'.3	05'.2	183° 52'.4	08'.8	95° 47'.7	01'.6	313° 12'.8	52'.2
20	284° 11'.2	99° 06'.0	06'.4	198° 53'.2	08'.9	110° 49'.7	01'.4	328° 15'.4	52'.2
21	299° 13'.7	114° 05'.7	07'.7	213° 54'.1	09'.0	125° 51'.6	01'.2	343° 18'.0	52'.2
22	314° 16'.1	129° 05'.3	09'.0	228° 54'.9	09'.1	140° 53'.6	01'.0	358° 20'.7	52'.3
23	329° 18'.6	144° 05'.0	10'.3	243° 55'.8	09'.2	155° 55'.6	00'.8	13° 23'.3	52'.3
5 Saturday 00	344° 21'.1	159° 04'.7	1° 11'.6 S	258° 56'.6	23° 09'.3 N	170° 57'.5	4° 00'.6 N	28° 25'.9	17° 52'.4 S
01	359° 23'.5	174° 04'.4	12'.9	273° 57'.5	09'.4	185° 59'.5	00'.4	43° 28'.5	52'.4
02	14° 26'.0	189° 04'.0	14'.2	288° 58'.3	09'.5	201° 01'.5	00'.1	58° 31'.1	52'.5
03	29° 28'.5	204° 03'.7	15'.5	303° 59'.2	09'.6	216° 03'.4	3° 59'.9 N	73° 33'.7	52'.5
04	44° 30'.9	219° 03'.4	16'.7	319° 00'.0	09'.7	231° 05'.4	59'.7	88° 36'.3	52'.6
05	59° 33'.4	234° 03'.1	18'.0	334° 00'.9	09'.8	246° 07'.4	59'.5	103° 38'.9	52'.6
06	74° 35'.9	249° 02'.8	19'.3	349° 01'.8	09'.9	261° 09'.4	59'.3	118° 41'.6	52'.6
07	89° 38'.3	264° 02'.4	20'.6	4° 02'.6	10'.0	276° 11'.3	59'.1	133° 44'.2	52'.7
08	104° 40'.8	279° 02'.1	21'.9	19° 03'.5	10'.1	291° 13'.3	58'.9	148° 46'.8	52'.7
09	119° 43'.3	294° 01'.8	23'.2	34° 04'.3	10'.2	306° 15'.3	58'.7	163° 49'.4	52'.8
10	134° 45'.7	309° 01'.5	24'.5	49° 05'.2	10'.2	321° 17'.2	58'.4	178° 52'.0	52'.8
11	149° 48'.2	324° 01'.1	25'.8	64° 06'.0	10'.3	336° 19'.2	58'.2	193° 54'.6	52'.9
12	164° 50'.6	339° 00'.8	1° 27'.1 S	79° 06'.9	23° 10'.4 N	351° 21'.2	3° 58'.0 N	208° 57'.2	17° 52'.9 S
13	179° 53'.1	354° 00'.5	28'.3	94° 07'.8	10'.5	6° 23'.1	57'.8	223° 59'.9	52'.9
14	194° 55'.6	9° 00'.2	29'.6	109° 08'.6	10'.6	21° 25'.1	57'.6	239° 02'.5	53'.0
15	209° 58'.0	23° 59'.9	30'.9	124° 09'.5	10'.7	36° 27'.1	57'.4	254° 05'.1	53'.0
16	225° 00'.5	38° 59'.5	32'.2	139° 10'.3	10'.8	51° 29'.1	57'.2	269° 07'.7	53'.1
17	240° 03'.0	53° 59'.2	33'.5	154° 11'.2	10'.9	66° 31'.0	57'.0	284° 10'.3	53'.1
18	255° 05'.4	68° 58'.9	34'.8	169° 12'.1	11'.0	81° 33'.0	56'.8	299° 12'.9	53'.2
19	270° 07'.9	83° 58'.6	36'.1	184° 12'.9	11'.1	96° 35'.0	56'.5	314° 15'.5	53'.2
20	285° 10'.4	98° 58'.2	37'.4	199° 13'.8	11'.2	111° 36'.9	56'.3	329° 18'.1	53'.2
21	300° 12'.8	113° 57'.9	38'.6	214° 14'.6	11'.3	126° 38'.9	56'.1	344° 20'.8	53'.3
22	315° 15'.3	128° 57'.6	39'.9	229° 15'.5	11'.3	141° 40'.9	55'.9	359° 23'.4	53'.3
23	330° 17'.8	143° 57'.3	41'.2	244° 16'.4	11'.4	156° 42'.8	55'.7	14° 26'.0	53'.4
	M.P. 01:02	v -0'.3	d 1'.3	v 0'.9	d 0'.1	v 2'.0	d 0'.2	v 2'.6	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.9	40° 19'.7 S
Achernar	335° 37'.7	57° 16'.1 S
Acrux	173° 27'.5	63° 03'.7 S
Adhara	255° 24'.9	28° 57'.5 S
Aldebaran	291° 07'.2	16° 29'.8 N
Alioth	166° 34'.6	56° 00'.1 N
Alkaid	153° 11'.3	49° 21'.1 N
Alnair	28° 02'.6	46° 59'.6 S
Alnilam	276° 02'.2	1° 12'.2 S
Alphard	218° 11'.6	8° 37'.5 S
Alphecca	126° 24'.2	26° 44'.5 N
Alpheratz	357° 59'.3	29° 03'.2 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.4 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.3 N
Atria	108° 01'.2	69° 01'.2 S
Avior	234° 24'.9	59° 29'.0 S
Bellatrix	278° 48'.7	6° 20'.7 N
Betelgeuse	271° 18'.2	7° 24'.5 N
Canopus	264° 03'.3	52° 41'.2 S
Capella	280° 57'.5	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.5 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.1	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.4 N
Elnath	278° 32'.3	28° 36'.1 N
Eltanin	90° 53'.2	51° 29'.7 N
Enif	34° 02'.0	9° 50'.7 N
Fomalhaut	15° 40'.6	29° 39'.4 S
Gacrux	172° 18'.9	57° 04'.5 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.5	60° 20'.5 S
Hamal	328° 18'.1	23° 25'.8 N
Kaus Aust.	84° 04'.2	34° 23'.4 S
Kochab	137° 19'.8	74° 11'.3 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.1	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.2 S
Miaplacidus	221° 43'.9	69° 41'.1 S
Mirfak	309° 02'.5	49° 50'.1 N
Nunki	76° 17'.3	26° 18'.4 S
Peacock	53° 43'.0	56° 45'.6 S
Polaris	323° 41'.8	89° 13'.7 N
Pollux	243° 46'.9	28° 02'.6 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 20'.8	12° 34'.1 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.0	8° 12'.4 S
Rigil Kent	140° 13'.3	60° 48'.5 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 57'.9	56° 29'.9 N
Shaula	96° 42'.9	37° 06'.0 S
Sirius	258° 47'.5	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.3	43° 24'.1 S
Vega	80° 49'.3	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	175° 50'.5	13:23
Mars	275° 14'.3	06:45
Jupiter	186° 48'.3	12:38
Saturn	44° 01'.2	22:07

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
3 Thursday 00	180° 09'.1	7° 32'.3 N	105° 35'.2	8'.5	22° 23'.4 S	4'.5	57'.0
01	195° 09'.3	31'.3	120° 02'.7	8'.5	27'.9	4'.4	56'.9
02	210° 09'.5	30'.4	134° 30'.2	8'.6	32'.3	4'.3	
03	225° 09'.7	29'.5	148° 57'.8	8'.5	36'.6	4'.2	
04	240° 09'.9	28'.6	163° 25'.3	8'.5	40'.8	4'.0	56'.8
05	255° 10'.1	27'.7	177° 52'.8	8'.6	44'.8	3'.9	
06	270° 10'.3	26'.8	192° 20'.4	8'.6	48'.7	3'.8	
07	285° 10'.5	25'.8	206° 48'.0	8'.6	52'.5	3'.6	56'.7
08	300° 10'.7	24'.9	221° 15'.6	8'.6	56'.1	3'.5	
09	315° 10'.9	24'.0	235° 43'.2	8'.6	59'.6	3'.4	56'.6
10	330° 11'.1	23'.1	250° 10'.8	8'.6	23° 03'.0 S	3'.2	
11	345° 11'.3	22'.2	264° 38'.4	8'.7	06'.2	3'.1	
12	0° 11'.5	7° 21'.2 N	279° 06'.1	8'.6	23° 09'.3 S	3'.0	56'.5
13	15° 11'.7	20'.3	293° 33'.7	8'.7	12'.3	2'.8	
14	30° 11'.9	19'.4	308° 01'.4	8'.7	15'.1	2'.7	
15	45° 12'.1	18'.5	322° 29'.1	8'.8	17'.8	2'.6	56'.4
16	60° 12'.3	17'.6	336° 56'.9	8'.7	20'.4	2'.5	
17	75° 12'.5	16'.6	351° 24'.6	8'.8	22'.9	2'.3	
18	90° 12'.8	15'.7	5° 52'.4	8'.7	25'.2	2'.2	56'.3
19	105° 13'.0	14'.8	20° 20'.1	8'.9	27'.4	2'.0	
20	120° 13'.2	13'.9	34° 48'.0	8'.8	29'.4	2'.0	
21	135° 13'.4	13'.0	49° 15'.8	8'.8	31'.4	1'.8	56'.2
22	150° 13'.6	12'.0	63° 43'.6	8'.9	33'.2	1'.7	
23	165° 13'.8	11'.1	78° 11'.5	8'.9	34'.9	1'.5	
4 Friday 00	180° 14'.0	7° 10'.2 N	92° 39'.4	9'.0	23° 36'.4 S	1'.4	56'.1
01	195° 14'.2	09'.3	107° 07'.4	8'.9	37'.8	1'.3	
02	210° 14'.4	08'.3	121° 35'.3	9'.0	39'.1	1'.1	
03	225° 14'.6	07'.4	136° 03'.3	9'.0	40'.2	1'.1	56'.0
04	240° 14'.8	06'.5	150° 31'.3	9'.1	41'.3	0'.9	
05	255° 15'.0	05'.6	164° 59'.4	9'.1	42'.2	0'.7	
06	270° 15'.2	04'.6	179° 27'.5	9'.1	42'.9	0'.7	55'.9
07	285° 15'.4	03'.7	193° 55'.6	9'.1	43'.6	0'.5	
08	300° 15'.6	02'.8	208° 23'.7	9'.2	44'.1	0'.4	
09	315° 15'.8	01'.9	222° 51'.9	9'.2	44'.5	0'.3	
10	330° 16'.1	01'.0	237° 20'.1	9'.2	44'.8	0'.1	55'.8
11	345° 16'.3	00'.0	251° 48'.3	9'.3	44'.9	0'.0	
12	0° 16'.5	6° 59'.1 N	266° 16'.6	9'.3	23° 44'.9 S	0'.1	55'.8
13	15° 16'.7	58'.2	280° 44'.9	9'.4	44'.8	0'.2	55'.7
14	30° 16'.9	57'.3	295° 13'.3	9'.4	44'.6	0'.4	
15	45° 17'.1	56'.3	309° 41'.7	9'.4	44'.2	0'.5	
16	60° 17'.3	55'.4	324° 10'.1	9'.4	43'.7	0'.6	
17	75° 17'.5	54'.5	338° 38'.5	9'.5	43'.1	0'.7	55'.6
18	90° 17'.7	53'.6	353° 07'.0	9'.6	42'.4	0'.9	
19	105° 17'.9	52'.6	7° 35'.6	9'.6	41'.5	1'.0	
20	120° 18'.1	51'.7	22° 04'.2	9'.6	40'.5	1'.1	55'.5
21	135° 18'.3	50'.8	36° 32'.8	9'.7	39'.4	1'.2	
22	150° 18'.5	49'.8	51° 01'.5	9'.7	38'.2	1'.3	
23	165° 18'.8	48'.9	65° 30'.2	9'.7	36'.9	1'.5	
5 Saturday 00	180° 19'.0	6° 48'.0 N	79° 58'.9	9'.8	23° 35'.4 S	1'.5	55'.4
01	195° 19'.2	47'.1	94° 27'.7	9'.9	33'.9	1'.7	
02	210° 19'.4	46'.1	108° 56'.6	9'.9	32'.2	1'.9	
03	225° 19'.6	45'.2	123° 25'.5	9'.9	30'.3	1'.9	
04	240° 19'.8	44'.3	137° 54'.4	10'.0	28'.4	2'.0	55'.3
05	255° 20'.0	43'.4	152° 23'.4	10'.0	26'.4	2'.2	
06	270° 20'.2	42'.4	166° 52'.4	10'.1	24'.2	2'.3	
07	285° 20'.4	41'.5	181° 21'.5	10'.1	21'.9	2'.4	
08	300° 20'.6	40'.6	195° 50'.6	10'.2	19'.5	2'.5	55'.2
09	315° 20'.8	39'.6	210° 19'.8	10'.2	17'.0	2'.7	
10	330° 21'.1	38'.7	224° 49'.0	10'.3	14'.3	2'.7	
11	345° 21'.3	37'.8	239° 18'.3	10'.3	11'.6	2'.9	
12	0° 21'.5	6° 36'.9 N	253° 47'.6	10'.4	23° 08'.7 S	2'.9	55'.1
13	15° 21'.7	35'.9	268° 17'.0	10'.4	05'.8	3'.1	
14	30° 21'.9	35'.0	282° 46'.4	10'.5	02'.7	3'.2	
15	45° 22'.1	34'.1	297° 15'.9	10'.5	22° 59'.5 S	3'.3	
16	60° 22'.3	33'.1	311° 45'.4	10'.6	56'.2	3'.4	55'.0
17	75° 22'.5	32'.2	326° 15'.0	10'.6	52'.8	3'.5	
18	90° 22'.7	31'.3	340° 44'.6	10'.7	49'.3	3'.7	
19	105° 22'.9	30'.3	355° 14'.3	10'.7	45'.6	3'.7	
20	120° 23'.2	29'.4	9° 44'.0	10'.8	41'.9	3'.9	
21	135° 23'.4	28'.5	24° 13'.8	10'.9	38'.0	3'.9	54'.9
22	150° 23'.6	27'.6	38° 43'.7	10'.9	34'.1	4'.1	
23	165° 23'.8	26'.6	53° 13'.6	10'.9	30'.0	4'.2	
	SD 15'.9	d 0'.9	SD 15'.4		15'.2		15'.0

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
3	0 36	0 46	11:59	17:36	05:09	6d 46%
4	0 56	1 05	11:59	18:29	06:02	7d 56%
5	1 15	1 25	11:59	19:20	06:54	8d 65%

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1992 September 6, 7, 8 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +0.5		JUPITER -1.7		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
6 Sunday 00	345° 20'.2	158° 57'.0	1° 42'.5 S	259° 17'.2	23° 11'.5 N	171° 44'.8	3° 55'.5 N	29° 28'.6	17° 53'.4 S
01	0° 22'.7	173° 56'.6	43'.8	274° 18'.1	11'.6	186° 46'.8	55'.3	44° 31'.2	53'.5
02	15° 25'.1	188° 56'.3	45'.1	289° 19'.0	11'.7	201° 48'.7	55'.1	59° 33'.8	53'.5
03	30° 27'.6	203° 56'.0	46'.4	304° 19'.8	11'.8	216° 50'.7	54'.8	74° 36'.4	53'.5
04	45° 30'.1	218° 55'.7	47'.7	319° 20'.7	11'.9	231° 52'.7	54'.6	89° 39'.0	53'.6
05	60° 32'.5	233° 55'.3	48'.9	334° 21'.5	12'.0	246° 54'.7	54'.4	104° 41'.6	53'.6
06	75° 35'.0	248° 55'.0	50'.2	349° 22'.4	12'.1	261° 56'.6	54'.2	119° 44'.3	53'.7
07	90° 37'.5	263° 54'.7	51'.5	4° 23'.3	12'.1	276° 58'.6	54'.0	134° 46'.9	53'.7
08	105° 39'.9	278° 54'.4	52'.8	19° 24'.1	12'.2	292° 00'.6	53'.8	149° 49'.5	53'.8
09	120° 42'.4	293° 54'.0	54'.1	34° 25'.0	12'.3	307° 02'.5	53'.6	164° 52'.1	53'.8
10	135° 44'.9	308° 53'.7	55'.4	49° 25'.9	12'.4	322° 04'.5	53'.4	179° 54'.7	53'.8
11	150° 47'.3	323° 53'.4	56'.7	64° 26'.7	12'.5	337° 06'.5	53'.1	194° 57'.3	53'.9
12	165° 49'.8	338° 53'.1	1° 58'.0 S	79° 27'.6	23° 12'.6 N	352° 08'.4	3° 52'.9 N	209° 59'.9	17° 53'.9 S
13	180° 52'.3	353° 52'.8	59'.2	94° 28'.5	12'.7	7° 10'.4	52'.7	225° 02'.5	54'.0
14	195° 54'.7	8° 52'.4	2° 00'.5 S	109° 29'.3	12'.7	22° 12'.4	52'.5	240° 05'.1	54'.0
15	210° 57'.2	23° 52'.1	01'.8	124° 30'.2	12'.8	37° 14'.3	52'.3	255° 07'.7	54'.0
16	225° 59'.6	38° 51'.8	03'.1	139° 31'.1	12'.9	52° 16'.3	52'.1	270° 10'.4	54'.1
17	241° 02'.1	53° 51'.5	04'.4	154° 31'.9	13'.0	67° 18'.3	51'.9	285° 13'.0	54'.1
18	256° 04'.6	68° 51'.1	05'.7	169° 32'.8	13'.1	82° 20'.3	51'.7	300° 15'.6	54'.2
19	271° 07'.0	83° 50'.8	07'.0	184° 33'.7	13'.2	97° 22'.2	51'.4	315° 18'.2	54'.2
20	286° 09'.5	98° 50'.5	08'.3	199° 34'.5	13'.3	112° 24'.2	51'.2	330° 20'.8	54'.3
21	301° 12'.0	113° 50'.2	09'.5	214° 35'.4	13'.3	127° 26'.2	51'.0	345° 23'.4	54'.3
22	316° 14'.4	128° 49'.8	10'.8	229° 36'.3	13'.4	142° 28'.1	50'.8	0° 26'.0	54'.3
23	331° 16'.9	143° 49'.5	12'.1	244° 37'.1	13'.5	157° 30'.1	50'.6	15° 28'.6	54'.4
7 Monday 00	346° 19'.4	158° 49'.2	2° 13'.4 S	259° 38'.0	23° 13'.6 N	172° 32'.1	3° 50'.4 N	30° 31'.2	17° 54'.4 S
01	1° 21'.8	173° 48'.9	14'.7	274° 38'.9	13'.7	187° 34'.0	50'.2	45° 33'.8	54'.5
02	16° 24'.3	188° 48'.6	16'.0	289° 39'.7	13'.7	202° 36'.0	50'.0	60° 36'.4	54'.5
03	31° 26'.7	203° 48'.2	17'.3	304° 40'.6	13'.8	217° 38'.0	49'.7	75° 39'.1	54'.6
04	46° 29'.2	218° 47'.9	18'.5	319° 41'.5	13'.9	232° 39'.9	49'.5	90° 41'.7	54'.6
05	61° 31'.7	233° 47'.6	19'.8	334° 42'.3	14'.0	247° 41'.9	49'.3	105° 44'.3	54'.6
06	76° 34'.1	248° 47'.3	21'.1	349° 43'.2	14'.1	262° 43'.9	49'.1	120° 46'.9	54'.7
07	91° 36'.6	263° 46'.9	22'.4	4° 44'.1	14'.2	277° 45'.8	48'.9	135° 49'.5	54'.7
08	106° 39'.1	278° 46'.6	23'.7	19° 45'.0	14'.2	292° 47'.8	48'.7	150° 52'.1	54'.8
09	121° 41'.5	293° 46'.3	25'.0	34° 45'.8	14'.3	307° 49'.8	48'.5	165° 54'.7	54'.8
10	136° 44'.0	308° 46'.0	26'.3	49° 46'.7	14'.4	322° 51'.8	48'.3	180° 57'.3	54'.8
11	151° 46'.5	323° 45'.6	27'.5	64° 47'.6	14'.5	337° 53'.7	48'.0	195° 59'.9	54'.9
12	166° 48'.9	338° 45'.3	2° 28'.8 S	79° 48'.4	23° 14'.6 N	352° 55'.7	3° 47'.8 N	211° 02'.5	17° 54'.9 S
13	181° 51'.4	353° 45'.0	30'.1	94° 49'.3	14'.6	7° 57'.7	47'.6	226° 05'.1	55'.0
14	196° 53'.9	8° 44'.7	31'.4	109° 50'.2	14'.7	22° 59'.6	47'.4	241° 07'.7	55'.0
15	211° 56'.3	23° 44'.3	32'.7	124° 51'.1	14'.8	38° 01'.6	47'.2	256° 10'.4	55'.1
16	226° 58'.8	38° 44'.0	34'.0	139° 51'.9	14'.9	53° 03'.6	47'.0	271° 13'.0	55'.1
17	242° 01'.2	53° 43'.7	35'.3	154° 52'.8	15'.0	68° 05'.5	46'.8	286° 15'.6	55'.1
18	257° 03'.7	68° 43'.4	36'.6	169° 53'.7	15'.0	83° 07'.5	46'.6	301° 18'.2	55'.2
19	272° 06'.2	83° 43'.0	37'.8	184° 54'.6	15'.1	98° 09'.5	46'.3	316° 20'.8	55'.2
20	287° 08'.6	98° 42'.7	39'.1	199° 55'.4	15'.2	113° 11'.4	46'.1	331° 23'.4	55'.3
21	302° 11'.1	113° 42'.4	40'.4	214° 56'.3	15'.3	128° 13'.4	45'.9	346° 26'.0	55'.3
22	317° 13'.6	128° 42'.1	41'.7	229° 57'.2	15'.3	143° 15'.4	45'.7	1° 28'.6	55'.3
23	332° 16'.0	143° 41'.8	43'.0	244° 58'.1	15'.4	158° 17'.3	45'.5	16° 31'.2	55'.4
8 Tuesday 00	347° 18'.5	158° 41'.4	2° 44'.3 S	259° 58'.9	23° 15'.5 N	173° 19'.3	3° 45'.3 N	31° 33'.8	17° 55'.4 S
01	2° 21'.0	173° 41'.1	45'.5	274° 59'.8	15'.6	188° 21'.3	45'.1	46° 36'.4	55'.5
02	17° 23'.4	188° 40'.8	46'.8	290° 00'.7	15'.7	203° 23'.3	44'.9	61° 39'.0	55'.5
03	32° 25'.9	203° 40'.5	48'.1	305° 01'.6	15'.7	218° 25'.2	44'.6	76° 41'.6	55'.5
04	47° 28'.4	218° 40'.1	49'.4	320° 02'.4	15'.8	233° 27'.2	44'.4	91° 44'.2	55'.6
05	62° 30'.8	233° 39'.8	50'.7	335° 03'.3	15'.9	248° 29'.2	44'.2	106° 46'.8	55'.6
06	77° 33'.3	248° 39'.5	52'.0	350° 04'.2	16'.0	263° 31'.1	44'.0	121° 49'.4	55'.7
07	92° 35'.7	263° 39'.2	53'.3	5° 05'.1	16'.0	278° 33'.1	43'.8	136° 52'.1	55'.7
08	107° 38'.2	278° 38'.8	54'.5	20° 06'.0	16'.1	293° 35'.1	43'.6	151° 54'.7	55'.8
09	122° 40'.7	293° 38'.5	55'.8	35° 06'.8	16'.2	308° 37'.0	43'.4	166° 57'.3	55'.8
10	137° 43'.1	308° 38'.2	57'.1	50° 07'.7	16'.3	323° 39'.0	43'.1	181° 59'.9	55'.8
11	152° 45'.6	323° 37'.9	58'.4	65° 08'.6	16'.3	338° 41'.0	42'.9	197° 02'.5	55'.9
12	167° 48'.1	338° 37'.5	2° 59'.7 S	80° 09'.5	23° 16'.4 N	353° 42'.9	3° 42'.7 N	212° 05'.1	17° 55'.9 S
13	182° 50'.5	353° 37'.2	3° 01'.0 S	95° 10'.4	16'.5	8° 44'.9	42'.5	227° 07'.7	56'.0
14	197° 53'.0	8° 36'.9	02'.2	110° 11'.2	16'.5	23° 46'.9	42'.3	242° 10'.3	56'.0
15	212° 55'.5	23° 36'.6	03'.5	125° 12'.1	16'.6	38° 48'.8	42'.1	257° 12'.9	56'.0
16	227° 57'.9	38° 36'.2	04'.8	140° 13'.0	16'.7	53° 50'.8	41'.9	272° 15'.5	56'.1
17	243° 00'.4	53° 35'.9	06'.1	155° 13'.9	16'.8	68° 52'.8	41'.7	287° 18'.1	56'.1
18	258° 02'.8	68° 35'.6	07'.4	170° 14'.8	16'.8	83° 54'.7	41'.4	302° 20'.7	56'.2
19	273° 05'.3	83° 35'.2	08'.7	185° 15'.6	16'.9	98° 56'.7	41'.2	317° 23'.3	56'.2
20	288° 07'.8	98° 34'.9	10'.0	200° 16'.5	17'.0	113° 58'.7	41'.0	332° 25'.9	56'.2
21	303° 10'.2	113° 34'.6	11'.2	215° 17'.4	17'.1	129° 00'.7	40'.8	347° 28'.5	56'.3
22	318° 12'.7	128° 34'.3	12'.5	230° 18'.3	17'.1	144° 02'.6	40'.6	2° 31'.1	56'.3
23	333° 15'.2	143° 33'.9	13'.8	245° 19'.2	17'.2	159° 04'.6	40'.4	17° 33'.7	56'.4
	M.P. 00:51	v -0'.3	d 1'.3	v 0'.9	d 0'.1	v 2'.0	d 0'.2	v 2'.6	d 0'.0

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 29'.8	40° 19'.7 S	180° 24'.0	6° 25'.7 N	67° 43'.5	11'.0	22° 25'.8 S	4'.2	54'.9
Achernar	335° 37'.7	57° 16'.1 S	195° 24'.2	24'.8	82° 13'.5	11'.1	21'.6	4'.4	54'.8
Acrux	173° 27'.5	63° 03'.7 S	210° 24'.4	23'.8	96° 43'.6	11'.1	17'.2	4'.5	
Adhara	255° 24'.9	28° 57'.5 S	225° 24'.6	22'.9	111° 13'.7	11'.2	12'.7	4'.6	
Aldebaran	291° 07'.2	16° 29'.8 N	240° 24'.8	22'.0	125° 43'.9	11'.2	08'.1	4'.7	
			255° 25'.1	21'.0	140° 14'.1	11'.3	03'.4	4'.8	
Alioth	166° 34'.6	56° 00'.0 N	270° 25'.3	20'.1	154° 44'.4	11'.4	21° 58'.6 S	4'.9	54'.7
Alkaid	153° 11'.4	49° 21'.1 N	285° 25'.5	19'.2	169° 14'.8	11'.4	53'.7	5'.0	
Alnair	28° 02'.6	46° 59'.7 S	300° 25'.7	18'.2	183° 45'.2	11'.4	48'.7	5'.1	
Alnilam	276° 02'.1	1° 12'.2 S	315° 25'.9	17'.3	198° 15'.6	11'.5	43'.6	5'.2	
Alphard	218° 11'.6	8° 37'.5 S	330° 26'.1	16'.4	212° 46'.1	11'.6	38'.4	5'.2	
			345° 26'.3	15'.4	227° 16'.7	11'.6	33'.2	5'.4	
Alphecca	126° 24'.2	26° 44'.5 N	0° 26'.5	6° 14'.5 N	241° 47'.3	11'.7	21° 27'.8 S	5'.5	54'.6
Alpheratz	357° 59'.3	29° 03'.2 N	15° 26'.8	13'.6	256° 18'.0	11'.8	22'.3	5'.6	
Altair	62° 23'.1	8° 51'.1 N	30° 27'.0	12'.6	270° 48'.8	11'.8	16'.7	5'.7	
Ankaa	353° 30'.5	42° 20'.5 S	45° 27'.2	11'.7	285° 19'.6	11'.8	11'.0	5'.7	
Antares	112° 45'.3	26° 25'.0 S	60° 27'.4	10'.8	299° 50'.4	12'.0	05'.3	5'.9	
			75° 27'.6	09'.8	314° 21'.4	11'.9	20° 59'.4 S	6'.0	
Arcturus	146° 10'.1	19° 13'.3 N	90° 27'.8	08'.9	328° 52'.3	12'.1	53'.4	6'.0	54'.5
Atria	108° 01'.2	69° 01'.2 S	105° 28'.0	08'.0	343° 23'.4	12'.1	47'.4	6'.2	
Avior	234° 24'.9	59° 29'.0 S	120° 28'.2	07'.0	357° 54'.5	12'.1	41'.2	6'.2	
Bellatrix	278° 48'.7	6° 20'.7 N	135° 28'.5	06'.1	12° 25'.6	12'.2	35'.0	6'.3	
Betelgeuse	271° 18'.2	7° 24'.5 N	150° 28'.7	05'.2	26° 56'.8	12'.3	28'.7	6'.4	
			165° 28'.9	04'.2	41° 28'.1	12'.3	22'.3	6'.5	
Canopus	264° 03'.2	52° 41'.2 S	180° 29'.1	6° 03'.3 N	55° 59'.4	12'.4	20° 15'.8 S	6'.6	54'.5
Capella	280° 57'.4	45° 59'.4 N	195° 29'.3	02'.4	70° 30'.8	12'.4	09'.2	6'.7	54'.4
Deneb	49° 41'.7	45° 15'.5 N	210° 29'.5	01'.4	85° 02'.2	12'.5	02'.5	6'.8	
Denebola	182° 49'.7	14° 36'.8 N	225° 29'.7	00'.5	99° 33'.7	12'.6	19° 55'.7 S	6'.8	
Diphda	349° 11'.1	18° 01'.3 S	240° 29'.9	5° 59'.5 N	114° 05'.3	12'.6	48'.9	7'.0	
			255° 30'.2	58'.6	128° 36'.9	12'.6	41'.9	7'.0	
Dubhe	194° 11'.1	61° 47'.4 N	270° 30'.4	57'.7	143° 08'.5	12'.8	34'.9	7'.1	
Elnath	278° 32'.3	28° 36'.1 N	285° 30'.6	56'.7	157° 40'.3	12'.8	27'.8	7'.2	
Eltanin	90° 53'.2	51° 29'.7 N	300° 30'.8	55'.8	172° 12'.1	12'.8	20'.6	7'.3	54'.3
Enif	34° 02'.0	9° 50'.7 N	315° 31'.0	54'.9	186° 43'.9	12'.9	13'.3	7'.3	
Fomalhaut	15° 40'.6	29° 39'.4 S	330° 31'.2	53'.9	201° 15'.8	12'.9	06'.0	7'.5	
			345° 31'.4	53'.0	215° 47'.7	13'.0	18° 58'.5 S	7'.5	
Gacrux	172° 18'.9	57° 04'.5 S	0° 31'.7	5° 52'.0 N	230° 19'.7	13'.1	18° 51'.0 S	7'.6	54'.3
Gienah	176° 08'.6	17° 30'.1 S	15° 31'.9	51'.1	244° 51'.8	13'.1	43'.4	7'.6	
Hadar	149° 10'.5	60° 20'.5 S	30° 32'.1	50'.2	259° 23'.9	13'.2	35'.8	7'.8	
Hamal	328° 18'.1	23° 25'.8 N	45° 32'.3	49'.2	273° 56'.1	13'.2	28'.0	7'.8	
Kaus Aust.	84° 04'.2	34° 23'.4 S	60° 32'.5	48'.3	288° 28'.3	13'.3	20'.2	7'.9	
			75° 32'.7	47'.4	303° 00'.6	13'.3	12'.3	8'.0	54'.2
Kochab	137° 19'.8	74° 11'.3 N	90° 32'.9	46'.4	317° 32'.9	13'.4	04'.3	8'.1	
Markab	13° 53'.5	15° 10'.2 N	105° 33'.2	45'.5	332° 05'.3	13'.5	17° 56'.2 S	8'.1	
Menkar	314° 31'.1	4° 03'.9 N	120° 33'.4	44'.5	346° 37'.8	13'.5	48'.1	8'.2	
Menkent	148° 26'.2	36° 20'.2 S	135° 33'.6	43'.6	1° 10'.3	13'.5	39'.9	8'.3	
Miaplacidus	221° 43'.9	69° 41'.1 S	150° 33'.8	42'.7	15° 42'.8	13'.6	31'.6	8'.3	
			165° 34'.0	41'.7	30° 15'.4	13'.7	23'.3	8'.5	
Mirfak	309° 02'.5	49° 50'.1 N	180° 34'.2	5° 40'.8 N	44° 48'.1	13'.7	17° 14'.8 S	8'.5	54'.2
Nunki	76° 17'.3	26° 18'.4 S	195° 34'.5	39'.8	59° 20'.8	13'.8	06'.3	8'.5	
Peacock	53° 43'.0	56° 45'.6 S	210° 34'.7	38'.9	73° 53'.6	13'.8	16° 57'.8 S	8'.6	
Polaris	323° 40'.7	89° 13'.7 N	225° 34'.9	38'.0	88° 26'.4	13'.8	49'.2	8'.7	
Pollux	243° 46'.9	28° 02'.6 N	240° 35'.1	37'.0	102° 59'.2	14'.0	40'.5	8'.8	54'.1
			255° 35'.3	36'.1	117° 32'.2	13'.9	31'.7	8'.9	
Procyon	245° 16'.1	5° 14'.7 N	270° 35'.5	35'.1	132° 05'.1	14'.0	22'.8	8'.9	
Rasalhague	96° 20'.8	12° 34'.1 N	285° 35'.7	34'.2	146° 38'.1	14'.1	13'.9	8'.9	
Regulus	208° 00'.3	12° 00'.2 N	300° 36'.0	33'.3	161° 11'.2	14'.1	05'.0	9'.1	
Rigel	281° 27'.0	8° 12'.4 S	315° 36'.2	32'.3	175° 44'.3	14'.2	15° 55'.9 S	9'.1	
Rigil Kent	140° 13'.3	60° 48'.5 S	330° 36'.4	31'.4	190° 17'.5	14'.2	46'.8	9'.1	
			345° 36'.6	30'.4	204° 50'.7	14'.3	37'.7	9'.2	
Sabik	102° 30'.3	15° 43'.0 S	0° 36'.8	5° 29'.5 N	219° 24'.0	14'.3	15° 28'.5 S	9'.3	54'.1
Schedar	349° 57'.9	56° 29'.9 N	15° 37'.0	28'.6	233° 57'.3	14'.3	19'.2	9'.4	
Shaula	96° 42'.9	37° 06'.0 S	30° 37'.3	27'.6	248° 30'.6	14'.4	09'.8	9'.4	
Sirius	258° 47'.5	16° 42'.2 S	45° 37'.5	26'.7	263° 04'.0	14'.5	00'.4	9'.4	
Spica	158° 47'.9	11° 07'.4 S	60° 37'.7	25'.7	277° 37'.5	14'.5	14° 51'.0 S	9'.6	
			75° 37'.9	24'.8	292° 11'.0	14'.5	41'.4	9'.6	
Suhail	223° 04'.3	43° 24'.1 S	90° 38'.1	23'.8	306° 44'.5	14'.6	31'.8	9'.6	
Vega	80° 49'.3	38° 46'.9 N	105° 38'.3	22'.9	321° 18'.1	14'.6	22'.2	9'.7	
Zuben'ubi	137° 22'.8	16° 00'.7 S	120° 38'.6	22'.0	335° 51'.7	14'.7	12'.5	9'.8	54'.0
			135° 38'.8	21'.0	350° 25'.4	14'.7	02'.7	9'.8	
	SHA	Mer.Pass.	150° 39'.0	20'.1	4° 59'.1	14'.7	13° 52'.9 S	9'.8	
Venus	172° 29'.8	13:25	165° 39'.2	19'.1	19° 32'.8	14'.8	43'.1	10'.0	
Mars	273° 18'.6	06:41							
Jupiter	186° 12'.7	12:28							
Saturn	44° 11'.9	21:54	SD 15'.9	d 0'.9	SD	14'.9	14'.8	14'.7	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
6	1 36	1 46	11:58	20:09	07:44	9d 74%
7	1 56	2 06	11:58	20:55	08:32	10d 82%
8	2 17	2 27	11:58	21:39	09:18	11d 89%

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1992 September 9, 10, 11 (Wed, Thur, Fri)

GMT	ARIES	VENUS -3.9		MARS +0.5		JUPITER -1.7		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
9 Wednesday 00	348° 17'.6	158° 33'.6	3° 15'.1 S	260° 20'.1	23° 17'.3 N	174° 06'.6	3° 40'.2 N	32° 36'.3	17° 56'.4 S
01	3° 20'.1	173° 33'.3	16'.4	275° 20'.9	17'.3	189° 08'.5	40'.0	47° 38'.9	56'.4
02	18° 22'.6	188° 33'.0	17'.7	290° 21'.8	17'.4	204° 10'.5	39'.7	62° 41'.5	56'.5
03	33° 25'.0	203° 32'.6	18'.9	305° 22'.7	17'.5	219° 12'.5	39'.5	77° 44'.1	56'.5
04	48° 27'.5	218° 32'.3	20'.2	320° 23'.6	17'.5	234° 14'.4	39'.3	92° 46'.7	56'.6
05	63° 30'.0	233° 32'.0	21'.5	335° 24'.5	17'.6	249° 16'.4	39'.1	107° 49'.3	56'.6
06	78° 32'.4	248° 31'.7	22'.8	350° 25'.4	17'.7	264° 18'.4	38'.9	122° 51'.9	56'.6
07	93° 34'.9	263° 31'.3	24'.1	5° 26'.3	17'.8	279° 20'.3	38'.7	137° 54'.5	56'.7
08	108° 37'.3	278° 31'.0	25'.4	20° 27'.1	17'.8	294° 22'.3	38'.5	152° 57'.1	56'.7
09	123° 39'.8	293° 30'.7	26'.6	35° 28'.0	17'.9	309° 24'.3	38'.3	167° 59'.8	56'.8
10	138° 42'.3	308° 30'.3	27'.9	50° 28'.9	18'.0	324° 26'.2	38'.0	183° 02'.4	56'.8
11	153° 44'.7	323° 30'.0	29'.2	65° 29'.8	18'.0	339° 28'.2	37'.8	198° 05'.0	56'.8
12	168° 47'.2	338° 29'.7	3° 30'.5 S	80° 30'.7	23° 18'.1 N	354° 30'.2	3° 37'.6 N	213° 07'.6	17° 56'.9 S
13	183° 49'.7	353° 29'.4	31'.8	95° 31'.6	18'.2	9° 32'.1	37'.4	228° 10'.2	56'.9
14	198° 52'.1	8° 29'.0	33'.0	110° 32'.5	18'.2	24° 34'.1	37'.2	243° 12'.8	57'.0
15	213° 54'.6	23° 28'.7	34'.3	125° 33'.3	18'.3	39° 36'.1	37'.0	258° 15'.4	57'.0
16	228° 57'.1	38° 28'.4	35'.6	140° 34'.2	18'.4	54° 38'.0	36'.8	273° 18'.0	57'.0
17	243° 59'.5	53° 28'.1	36'.9	155° 35'.1	18'.4	69° 40'.0	36'.5	288° 20'.6	57'.1
18	259° 02'.0	68° 27'.7	38'.2	170° 36'.0	18'.5	84° 42'.0	36'.3	303° 23'.2	57'.1
19	274° 04'.5	83° 27'.4	39'.5	185° 36'.9	18'.6	99° 43'.9	36'.1	318° 25'.8	57'.2
20	289° 06'.9	98° 27'.1	40'.7	200° 37'.8	18'.6	114° 45'.9	35'.9	333° 28'.4	57'.2
21	304° 09'.4	113° 26'.7	42'.0	215° 38'.7	18'.7	129° 47'.9	35'.7	348° 31'.0	57'.2
22	319° 11'.8	128° 26'.4	43'.3	230° 39'.6	18'.8	144° 49'.8	35'.5	3° 33'.6	57'.3
23	334° 14'.3	143° 26'.1	44'.6	245° 40'.5	18'.8	159° 51'.8	35'.3	18° 36'.2	57'.3
10 Thursday 00	349° 16'.8	158° 25'.8	3° 45'.9 S	260° 41'.4	23° 18'.9 N	174° 53'.8	3° 35'.1 N	33° 38'.8	17° 57'.3 S
01	4° 19'.2	173° 25'.4	47'.1	275° 42'.2	19'.0	189° 55'.8	34'.8	48° 41'.4	57'.4
02	19° 21'.7	188° 25'.1	48'.4	290° 43'.1	19'.0	204° 57'.7	34'.6	63° 44'.0	57'.4
03	34° 24'.2	203° 24'.8	49'.7	305° 44'.0	19'.1	219° 59'.7	34'.4	78° 46'.6	57'.5
04	49° 26'.6	218° 24'.4	51'.0	320° 44'.9	19'.1	235° 01'.7	34'.2	93° 49'.2	57'.5
05	64° 29'.1	233° 24'.1	52'.3	335° 45'.8	19'.2	250° 03'.6	34'.0	108° 51'.8	57'.5
06	79° 31'.6	248° 23'.8	53'.5	350° 46'.7	19'.3	265° 05'.6	33'.8	123° 54'.4	57'.6
07	94° 34'.0	263° 23'.5	54'.8	5° 47'.6	19'.3	280° 07'.6	33'.6	138° 57'.0	57'.6
08	109° 36'.5	278° 23'.1	56'.1	20° 48'.5	19'.4	295° 09'.5	33'.4	153° 59'.6	57'.7
09	124° 38'.9	293° 22'.8	57'.4	35° 49'.4	19'.5	310° 11'.5	33'.1	169° 02'.2	57'.7
10	139° 41'.4	308° 22'.5	58'.7	50° 50'.3	19'.5	325° 13'.5	32'.9	184° 04'.8	57'.7
11	154° 43'.9	323° 22'.1	59'.9	65° 51'.2	19'.6	340° 15'.4	32'.7	199° 07'.4	57'.8
12	169° 46'.3	338° 21'.8	4° 01'.2 S	80° 52'.1	23° 19'.7 N	355° 17'.4	3° 32'.5 N	214° 10'.0	17° 57'.8 S
13	184° 48'.8	353° 21'.5	02'.5	95° 53'.0	19'.7	10° 19'.4	32'.3	229° 12'.6	57'.9
14	199° 51'.3	8° 21'.2	03'.8	110° 53'.9	19'.8	25° 21'.3	32'.1	244° 15'.2	57'.9
15	214° 53'.7	23° 20'.8	05'.1	125° 54'.8	19'.8	40° 23'.3	31'.9	259° 17'.8	57'.9
16	229° 56'.2	38° 20'.5	06'.3	140° 55'.7	19'.9	55° 25'.3	31'.6	274° 20'.4	58'.0
17	244° 58'.7	53° 20'.2	07'.6	155° 56'.6	20'.0	70° 27'.2	31'.4	289° 23'.0	58'.0
18	260° 01'.1	68° 19'.8	08'.9	170° 57'.5	20'.0	85° 29'.2	31'.2	304° 25'.6	58'.0
19	275° 03'.6	83° 19'.5	10'.2	185° 58'.3	20'.1	100° 31'.2	31'.0	319° 28'.2	58'.1
20	290° 06'.1	98° 19'.2	11'.5	200° 59'.2	20'.1	115° 33'.1	30'.8	334° 30'.8	58'.1
21	305° 08'.5	113° 18'.8	12'.7	216° 00'.1	20'.2	130° 35'.1	30'.6	349° 33'.4	58'.2
22	320° 11'.0	128° 18'.5	14'.0	231° 01'.0	20'.3	145° 37'.1	30'.4	4° 36'.0	58'.2
23	335° 13'.4	143° 18'.2	15'.3	246° 01'.9	20'.3	160° 39'.0	30'.2	19° 38'.6	58'.2
11 Friday 00	350° 15'.9	158° 17'.8	4° 16'.6 S	261° 02'.8	23° 20'.4 N	175° 41'.0	3° 29'.9 N	34° 41'.2	17° 58'.3 S
01	5° 18'.4	173° 17'.5	17'.8	276° 03'.7	20'.4	190° 43'.0	29'.7	49° 43'.8	58'.3
02	20° 20'.8	188° 17'.2	19'.1	291° 04'.6	20'.5	205° 44'.9	29'.5	64° 46'.3	58'.4
03	35° 23'.3	203° 16'.9	20'.4	306° 05'.5	20'.6	220° 46'.9	29'.3	79° 48'.9	58'.4
04	50° 25'.8	218° 16'.5	21'.7	321° 06'.4	20'.6	235° 48'.9	29'.1	94° 51'.5	58'.4
05	65° 28'.2	233° 16'.2	23'.0	336° 07'.3	20'.7	250° 50'.8	28'.9	109° 54'.1	58'.5
06	80° 30'.7	248° 15'.9	24'.2	351° 08'.2	20'.7	265° 52'.8	28'.7	124° 56'.7	58'.5
07	95° 33'.2	263° 15'.5	25'.5	6° 09'.1	20'.8	280° 54'.8	28'.4	139° 59'.3	58'.5
08	110° 35'.6	278° 15'.2	26'.8	21° 10'.0	20'.8	295° 56'.7	28'.2	155° 01'.9	58'.6
09	125° 38'.1	293° 14'.9	28'.1	36° 10'.9	20'.9	310° 58'.7	28'.0	170° 04'.5	58'.6
10	140° 40'.5	308° 14'.5	29'.3	51° 11'.8	21'.0	326° 00'.7	27'.8	185° 07'.1	58'.7
11	155° 43'.0	323° 14'.2	30'.6	66° 12'.7	21'.0	341° 02'.6	27'.6	200° 09'.7	58'.7
12	170° 45'.5	338° 13'.9	4° 31'.9 S	81° 13'.7	23° 21'.1 N	356° 04'.6	3° 27'.4 N	215° 12'.3	17° 58'.7 S
13	185° 47'.9	353° 13'.5	33'.2	96° 14'.6	21'.1	11° 06'.6	27'.2	230° 14'.9	58'.8
14	200° 50'.4	8° 13'.2	34'.4	111° 15'.5	21'.2	26° 08'.6	27'.0	245° 17'.5	58'.8
15	215° 52'.9	23° 12'.9	35'.7	126° 16'.4	21'.2	41° 10'.5	26'.7	260° 20'.1	58'.8
16	230° 55'.3	38° 12'.5	37'.0	141° 17'.3	21'.3	56° 12'.5	26'.5	275° 22'.7	58'.9
17	245° 57'.8	53° 12'.2	38'.3	156° 18'.2	21'.3	71° 14'.5	26'.3	290° 25'.3	58'.9
18	261° 00'.3	68° 11'.9	39'.5	171° 19'.1	21'.4	86° 16'.4	26'.1	305° 27'.9	59'.0
19	276° 02'.7	83° 11'.5	40'.8	186° 20'.0	21'.5	101° 18'.4	25'.9	320° 30'.5	59'.0
20	291° 05'.2	98° 11'.2	42'.1	201° 20'.9	21'.5	116° 20'.4	25'.7	335° 33'.1	59'.0
21	306° 07'.7	113° 10'.9	43'.4	216° 21'.8	21'.6	131° 22'.3	25'.5	350° 35'.7	59'.1
22	321° 10'.1	128° 10'.5	44'.6	231° 22'.7	21'.6	146° 24'.3	25'.2	5° 38'.3	59'.1
23	336° 12'.6	143° 10'.2	45'.9	246° 23'.6	21'.7	161° 26'.3	25'.0	20° 40'.9	59'.1
	M.P. 00:39	v -0'.3	d 1'.3	v 0'.9	d 0'.1	v 2'.0	d 0'.2	v 2'.6	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.8	40° 19'.7 S
Achernar	335° 37'.7	57° 16'.1 S
Acrux	173° 27'.5	63° 03'.7 S
Adhara	255° 24'.9	28° 57'.5 S
Aldebaran	291° 07'.1	16° 29'.8 N
Alioth	166° 34'.6	56° 00'.0 N
Alkaid	153° 11'.4	49° 21'.1 N
Alnair	28° 02'.6	46° 59'.7 S
Alnilam	276° 02'.1	1° 12'.2 S
Alphard	218° 11'.6	8° 37'.5 S
Alphecca	126° 24'.2	26° 44'.5 N
Alpheratz	357° 59'.3	29° 03'.2 N
Altair	62° 23'.1	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.5 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.3 N
Atria	108° 01'.2	69° 01'.2 S
Avior	234° 24'.9	59° 29'.0 S
Bellatrix	278° 48'.7	6° 20'.7 N
Betelgeuse	271° 18'.1	7° 24'.5 N
Canopus	264° 03'.2	52° 41'.2 S
Capella	280° 57'.4	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.5 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.1	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.4 N
Elnath	278° 32'.2	28° 36'.1 N
Eltanin	90° 53'.2	51° 29'.7 N
Enif	34° 02'.0	9° 50'.7 N
Fomalhaut	15° 40'.6	29° 39'.4 S
Gacrux	172° 18'.9	57° 04'.5 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.5	60° 20'.5 S
Hamal	328° 18'.1	23° 25'.8 N
Kaus Aust.	84° 04'.2	34° 23'.4 S
Kochab	137° 19'.9	74° 11'.3 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.1	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.2 S
Miaplacidus	221° 43'.9	69° 41'.1 S
Mirfak	309° 02'.4	49° 50'.1 N
Nunki	76° 17'.3	26° 18'.4 S
Peacock	53° 43'.1	56° 45'.6 S
Polaris	323° 39'.7	89° 13'.8 N
Pollux	243° 46'.9	28° 02'.6 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 20'.8	12° 34'.1 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 27'.0	8° 12'.4 S
Rigil Kent	140° 13'.4	60° 48'.5 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 57'.8	56° 29'.9 N
Shaula	96° 42'.9	37° 06'.0 S
Sirius	258° 47'.5	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.3	43° 24'.1 S
Vega	80° 49'.3	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	169° 09'.0	13:27
Mars	271° 24'.6	06:37
Jupiter	185° 37'.0	12:19
Saturn	44° 22'.0	21:42

	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
9	180° 39'.4	5° 18'.2 N	34° 06'.6	14'.9	13° 33'.1 S	9'.9	54'.0
10	195° 39'.6	17'.2	48° 40'.5	14'.9	23'.2	10'.1	
11	210° 39'.9	16'.3	63° 14'.4	14'.9	13'.1	10'.0	
12	225° 40'.1	15'.4	77° 48'.3	14'.9	03'.1	10'.2	
13	240° 40'.3	14'.4	92° 22'.2	15'.0	12° 52'.9 S	10'.1	
14	255° 40'.5	13'.5	106° 56'.2	15'.1	42'.8	10'.3	
15	270° 40'.7	12'.5	121° 30'.3	15'.0	32'.5	10'.3	
16	285° 40'.9	11'.6	136° 04'.3	15'.2	22'.2	10'.3	
17	300° 41'.2	10'.6	150° 38'.5	15'.1	11'.9	10'.4	
18	315° 41'.4	09'.7	165° 12'.6	15'.2	01'.5	10'.4	
19	330° 41'.6	08'.7	179° 46'.8	15'.2	11° 51'.1 S	10'.5	
20	345° 41'.8	07'.8	194° 21'.0	15'.3	40'.6	10'.5	
21	0° 42'.0	5° 06'.9 N	208° 55'.3	15'.2	11° 30'.1 S	10'.5	54'.0
22	15° 42'.3	05'.9	223° 29'.5	15'.4	19'.6	10'.7	
23	30° 42'.5	05'.0	238° 03'.9	15'.3	08'.9	10'.6	
24	45° 42'.7	04'.0	252° 38'.2	15'.4	10° 58'.3 S	10'.7	
25	60° 42'.9	03'.1	267° 12'.6	15'.4	47'.6	10'.7	
26	75° 43'.1	02'.1	281° 47'.0	15'.5	36'.9	10'.8	
27	90° 43'.3	01'.2	296° 21'.5	15'.5	26'.1	10'.8	
28	105° 43'.6	00'.2	310° 56'.0	15'.5	15'.3	10'.9	
29	120° 43'.8	4° 59'.3 N	325° 30'.5	15'.5	04'.4	10'.9	
30	135° 44'.0	58'.3	340° 05'.0	15'.6	9° 53'.5 S	10'.9	
31	150° 44'.2	57'.4	354° 39'.6	15'.6	42'.6	11'.0	
32	165° 44'.4	56'.4	9° 14'.2	15'.6	31'.6	11'.0	
33	180° 44'.7	4° 55'.5 N	23° 48'.8	15'.7	9° 20'.6 S	11'.1	54'.0
34	195° 44'.9	54'.6	38° 23'.5	15'.6	09'.5	11'.0	
35	210° 45'.1	53'.6	52° 58'.1	15'.7	8° 58'.5 S	11'.2	
36	225° 45'.3	52'.7	67° 32'.8	15'.8	47'.3	11'.1	
37	240° 45'.5	51'.7	82° 07'.6	15'.7	36'.2	11'.2	
38	255° 45'.7	50'.8	96° 42'.3	15'.8	25'.0	11'.2	
39	270° 46'.0	49'.8	111° 17'.1	15'.8	13'.8	11'.3	
40	285° 46'.2	48'.9	125° 51'.9	15'.8	02'.5	11'.3	
41	300° 46'.4	47'.9	140° 26'.7	15'.8	7° 51'.2 S	11'.3	
42	315° 46'.6	47'.0	155° 01'.5	15'.9	39'.9	11'.3	
43	330° 46'.8	46'.0	169° 36'.4	15'.9	28'.6	11'.4	
44	345° 47'.1	45'.1	184° 11'.3	15'.9	17'.2	11'.4	
45	0° 47'.3	4° 44'.1 N	198° 46'.2	15'.9	7° 05'.8 S	11'.5	54'.0
46	15° 47'.5	43'.2	213° 21'.1	15'.9	6° 54'.3 S	11'.4	
47	30° 47'.7	42'.2	227° 56'.0	16'.0	42'.9	11'.5	
48	45° 47'.9	41'.3	242° 31'.0	15'.9	31'.4	11'.5	
49	60° 48'.2	40'.3	257° 05'.9	16'.0	19'.9	11'.6	
50	75° 48'.4	39'.4	271° 40'.9	16'.0	08'.3	11'.6	
51	90° 48'.6	38'.4	286° 15'.9	16'.0	5° 56'.7 S	11'.5	
52	105° 48'.8	37'.5	300° 50'.9	16'.0	45'.2	11'.7	
53	120° 49'.0	36'.5	315° 25'.9	16'.1	33'.5	11'.6	54'.1
54	135° 49'.3	35'.6	330° 01'.0	16'.0	21'.9	11'.7	
55	150° 49'.5	34'.6	344° 36'.0	16'.1	10'.2	11'.6	
56	165° 49'.7	33'.7	359° 11'.1	16'.0	4° 58'.6 S	11'.8	
57	180° 49'.9	4° 32'.7 N	13° 46'.1	16'.1	4° 46'.8 S	11'.7	54'.1
58	195° 50'.1	31'.8	28° 21'.2	16'.1	35'.1	11'.7	
59	210° 50'.4	30'.8	42° 56'.3	16'.1	23'.4	11'.8	
60	225° 50'.6	29'.9	57° 31'.4	16'.1	11'.6	11'.8	
61	240° 50'.8	28'.9	72° 06'.5	16'.1	3° 59'.8 S	11'.8	
62	255° 51'.0	28'.0	86° 41'.6	16'.1	48'.0	11'.8	
63	270° 51'.2	27'.0	101° 16'.7	16'.1	36'.2	11'.8	
64	285° 51'.5	26'.1	115° 51'.8	16'.2	24'.4	11'.9	
65	300° 51'.7	25'.1	130° 27'.0	16'.1	12'.5	11'.8	
66	315° 51'.9	24'.2	145° 02'.1	16'.1	00'.7	11'.9	
67	330° 52'.1	23'.2	159° 37'.2	16'.1	2° 48'.8 S	11'.9	
68	345° 52'.3	22'.3	174° 12'.3	16'.2	36'.9	11'.9	
69	0° 52'.6	4° 21'.3 N	188° 47'.5	16'.1	2° 25'.0 S	11'.9	54'.1
70	15° 52'.8	20'.4	203° 22'.6	16'.1	13'.1	11'.9	
71	30° 53'.0	19'.4	217° 57'.7	16'.2	01'.2	12'.0	54'.2
72	45° 53'.2	18'.5	232° 32'.9	16'.1	1° 49'.2 S	11'.9	
73	60° 53'.4	17'.5	247° 08'.0	16'.1	37'.3	12'.0	
74	75° 53'.7	16'.6	261° 43'.1	16'.2	25'.3	11'.9	
75	90° 53'.9	15'.6	276° 18'.3	16'.1	13'.4	12'.0	
76	105° 54'.1	14'.6	290° 53'.4	16'.1	01'.4	12'.0	
77	120° 54'.3	13'.7	305° 28'.5	16'.1	0° 49'.4 S	12'.0	
78	135° 54'.6	12'.7	320° 03'.6	16'.1	37'.4	12'.0	
79	150° 54'.8	11'.8	334° 38'.7	16'.1	25'.4	12'.0	
80	165° 55'.0	10'.8	349° 13'.8	16'.1	13'.4	12'.0	
SD	15'.9	d 0'.9	SD	14'.7	14'.7	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
9	2 37	2 48	11:57	22:22	10:01	12d 94%
10	2 58	3 09	11:57	23:03	10:43	13d 98%
11	3 19	3 30	11:57	23:44	11:24	14d 99%

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1992 September 12, 13, 14 (Sat, Sun, Mon)

GMT		ARIES	VENUS -3.9		MARS +0.5		JUPITER -1.7		SATURN +0.4	
		GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
12	00	351° 15'.0	158° 09'.9	4° 47'.2 S	261° 24'.5	23° 21'.7 N	176° 28'.2	3° 24'.8 N	35° 43'.5	17° 59'.2 S
	01	6° 17'.5	173° 09'.5	48'.5	276° 25'.4	21'.8	191° 30'.2	24'.6	50° 46'.1	59'.2
	02	21° 20'.0	188° 09'.2	49'.7	291° 26'.3	21'.8	206° 32'.2	24'.4	65° 48'.6	59'.3
	03	36° 22'.4	203° 08'.9	51'.0	306° 27'.2	21'.9	221° 34'.1	24'.2	80° 51'.2	59'.3
Saturday	04	51° 24'.9	218° 08'.5	52'.3	321° 28'.1	21'.9	236° 36'.1	24'.0	95° 53'.8	59'.3
	05	66° 27'.4	233° 08'.2	53'.6	336° 29'.1	22'.0	251° 38'.1	23'.8	110° 56'.4	59'.4
	06	81° 29'.8	248° 07'.9	54'.8	351° 30'.0	22'.0	266° 40'.0	23'.5	125° 59'.0	59'.4
	07	96° 32'.3	263° 07'.5	56'.1	6° 30'.9	22'.1	281° 42'.0	23'.3	141° 01'.6	59'.4
	08	111° 34'.8	278° 07'.2	57'.4	21° 31'.8	22'.1	296° 44'.0	23'.1	156° 04'.2	59'.5
	09	126° 37'.2	293° 06'.9	58'.7	36° 32'.7	22'.2	311° 45'.9	22'.9	171° 06'.8	59'.5
	10	141° 39'.7	308° 06'.5	59'.9	51° 33'.6	22'.2	326° 47'.9	22'.7	186° 09'.4	59'.6
	11	156° 42'.1	323° 06'.2	5° 01'.2 S	66° 34'.5	22'.3	341° 49'.9	22'.5	201° 12'.0	59'.6
	12	171° 44'.6	338° 05'.8	5° 02'.5 S	81° 35'.4	23° 22'.3 N	356° 51'.8	3° 22'.3 N	216° 14'.6	17° 59'.6 S
	13	186° 47'.1	353° 05'.5	03'.8	96° 36'.3	22'.4	11° 53'.8	22'.0	231° 17'.2	59'.7
	14	201° 49'.5	8° 05'.2	05'.0	111° 37'.2	22'.4	26° 55'.8	21'.8	246° 19'.8	59'.7
	15	216° 52'.0	23° 04'.8	06'.3	126° 38'.2	22'.5	41° 57'.7	21'.6	261° 22'.4	59'.7
	16	231° 54'.5	38° 04'.5	07'.6	141° 39'.1	22'.5	56° 59'.7	21'.4	276° 25'.0	59'.8
	17	246° 56'.9	53° 04'.2	08'.8	156° 40'.0	22'.6	72° 01'.7	21'.2	291° 27'.6	59'.8
	18	261° 59'.4	68° 03'.8	10'.1	171° 40'.9	22'.6	87° 03'.6	21'.0	306° 30'.1	59'.8
	19	277° 01'.9	83° 03'.5	11'.4	186° 41'.8	22'.7	102° 05'.6	20'.8	321° 32'.7	59'.9
	20	292° 04'.3	98° 03'.2	12'.7	201° 42'.7	22'.7	117° 07'.6	20'.6	336° 35'.3	59'.9
	21	307° 06'.8	113° 02'.8	13'.9	216° 43'.6	22'.8	132° 09'.5	20'.3	351° 37'.9	18° 00'.0 S
	22	322° 09'.3	128° 02'.5	15'.2	231° 44'.5	22'.8	147° 11'.5	20'.1	6° 40'.5	00'.0
	23	337° 11'.7	143° 02'.1	16'.5	246° 45'.5	22'.9	162° 13'.5	19'.9	21° 43'.1	00'.0
13	00	352° 14'.2	158° 01'.8	5° 17'.7 S	261° 46'.4	23° 22'.9 N	177° 15'.4	3° 19'.7 N	36° 45'.7	18° 00'.1 S
	01	7° 16'.6	173° 01'.5	19'.0	276° 47'.3	23'.0	192° 17'.4	19'.5	51° 48'.3	00'.1
	02	22° 19'.1	188° 01'.1	20'.3	291° 48'.2	23'.0	207° 19'.4	19'.3	66° 50'.9	00'.1
	03	37° 21'.6	203° 00'.8	21'.5	306° 49'.1	23'.1	222° 21'.3	19'.1	81° 53'.5	00'.2
Sunday	04	52° 24'.0	218° 00'.5	22'.8	321° 50'.0	23'.1	237° 23'.3	18'.8	96° 56'.1	00'.2
	05	67° 26'.5	233° 00'.1	24'.1	336° 51'.0	23'.2	252° 25'.3	18'.6	111° 58'.7	00'.2
	06	82° 29'.0	247° 59'.8	25'.4	351° 51'.9	23'.2	267° 27'.2	18'.4	127° 01'.2	00'.3
	07	97° 31'.4	262° 59'.4	26'.6	6° 52'.8	23'.3	282° 29'.2	18'.2	142° 03'.8	00'.3
	08	112° 33'.9	277° 59'.1	27'.9	21° 53'.7	23'.3	297° 31'.2	18'.0	157° 06'.4	00'.4
	09	127° 36'.4	292° 58'.8	29'.2	36° 54'.6	23'.3	312° 33'.1	17'.8	172° 09'.0	00'.4
	10	142° 38'.8	307° 58'.4	30'.4	51° 55'.5	23'.4	327° 35'.1	17'.6	187° 11'.6	00'.4
	11	157° 41'.3	322° 58'.1	31'.7	66° 56'.5	23'.4	342° 37'.1	17'.4	202° 14'.2	00'.5
	12	172° 43'.7	337° 57'.7	5° 33'.0 S	81° 57'.4	23° 23'.5 N	357° 39'.0	3° 17'.1 N	217° 16'.8	18° 00'.5 S
	13	187° 46'.2	352° 57'.4	34'.2	96° 58'.3	23'.5	12° 41'.0	16'.9	232° 19'.4	00'.5
	14	202° 48'.7	7° 57'.1	35'.5	111° 59'.2	23'.6	27° 43'.0	16'.7	247° 22'.0	00'.6
	15	217° 51'.1	22° 56'.7	36'.8	127° 00'.1	23'.6	42° 44'.9	16'.5	262° 24'.6	00'.6
	16	232° 53'.6	37° 56'.4	38'.0	142° 01'.1	23'.7	57° 46'.9	16'.3	277° 27'.1	00'.6
	17	247° 56'.1	52° 56'.0	39'.3	157° 02'.0	23'.7	72° 48'.9	16'.1	292° 29'.7	00'.7
	18	262° 58'.5	67° 55'.7	40'.6	172° 02'.9	23'.7	87° 50'.8	15'.9	307° 32'.3	00'.7
	19	278° 01'.0	82° 55'.4	41'.8	187° 03'.8	23'.8	102° 52'.8	15'.6	322° 34'.9	00'.8
	20	293° 03'.5	97° 55'.0	43'.1	202° 04'.7	23'.8	117° 54'.8	15'.4	337° 37'.5	00'.8
	21	308° 05'.9	112° 54'.7	44'.4	217° 05'.7	23'.9	132° 56'.7	15'.2	352° 40'.1	00'.8
	22	323° 08'.4	127° 54'.3	45'.6	232° 06'.6	23'.9	147° 58'.7	15'.0	7° 42'.7	00'.9
	23	338° 10'.9	142° 54'.0	46'.9	247° 07'.5	24'.0	163° 00'.7	14'.8	22° 45'.3	00'.9
14	00	353° 13'.3	157° 53'.7	5° 48'.2 S	262° 08'.4	23° 24'.0 N	178° 02'.6	3° 14'.6 N	37° 47'.9	18° 00'.9 S
	01	8° 15'.8	172° 53'.3	49'.4	277° 09'.4	24'.0	193° 04'.6	14'.4	52° 50'.4	01'.0
	02	23° 18'.2	187° 53'.0	50'.7	292° 10'.3	24'.1	208° 06'.6	14'.2	67° 53'.0	01'.0
	03	38° 20'.7	202° 52'.6	52'.0	307° 11'.2	24'.1	223° 08'.5	13'.9	82° 55'.6	01'.0
Monday	04	53° 23'.2	217° 52'.3	53'.2	322° 12'.1	24'.2	238° 10'.5	13'.7	97° 58'.2	01'.1
	05	68° 25'.6	232° 51'.9	54'.5	337° 13'.1	24'.2	253° 12'.5	13'.5	113° 00'.8	01'.1
	06	83° 28'.1	247° 51'.6	55'.8	352° 14'.0	24'.2	268° 14'.4	13'.3	128° 03'.4	01'.1
	07	98° 30'.6	262° 51'.3	57'.0	7° 14'.9	24'.3	283° 16'.4	13'.1	143° 06'.0	01'.2
	08	113° 33'.0	277° 50'.9	58'.3	22° 15'.8	24'.3	298° 18'.4	12'.9	158° 08'.6	01'.2
	09	128° 35'.5	292° 50'.6	59'.6	37° 16'.8	24'.4	313° 20'.3	12'.7	173° 11'.1	01'.2
	10	143° 38'.0	307° 50'.2	6° 00'.8 S	52° 17'.7	24'.4	328° 22'.3	12'.4	188° 13'.7	01'.3
	11	158° 40'.4	322° 49'.9	02'.1	67° 18'.6	24'.4	343° 24'.3	12'.2	203° 16'.3	01'.3
	12	173° 42'.9	337° 49'.5	6° 03'.4 S	82° 19'.5	23° 24'.5 N	358° 26'.2	3° 12'.0 N	218° 18'.9	18° 01'.3 S
	13	188° 45'.4	352° 49'.2	04'.6	97° 20'.5	24'.5	13° 28'.2	11'.8	233° 21'.5	01'.4
	14	203° 47'.8	7° 48'.9	05'.9	112° 21'.4	24'.6	28° 30'.2	11'.6	248° 24'.1	01'.4
	15	218° 50'.3	22° 48'.5	07'.2	127° 22'.3	24'.6	43° 32'.1	11'.4	263° 26'.7	01'.5
	16	233° 52'.7	37° 48'.2	08'.4	142° 23'.3	24'.6	58° 34'.1	11'.2	278° 29'.3	01'.5
	17	248° 55'.2	52° 47'.8	09'.7	157° 24'.2	24'.7	73° 36'.1	10'.9	293° 31'.8	01'.5
	18	263° 57'.7	67° 47'.5	10'.9	172° 25'.1	24'.7	88° 38'.0	10'.7	308° 34'.4	01'.6
	19	279° 00'.1	82° 47'.1	12'.2	187° 26'.0	24'.8	103° 40'.0	10'.5	323° 37'.0	01'.6
	20	294° 02'.6	97° 46'.8	13'.5	202° 27'.0	24'.8	118° 42'.0	10'.3	338° 39'.6	01'.6
	21	309° 05'.1	112° 46'.4	14'.7	217° 27'.9	24'.8	133° 43'.9	10'.1	353° 42'.2	01'.7
	22	324° 07'.5	127° 46'.1	16'.0	232° 28'.8	24'.9	148° 45'.9	09'.9	8° 44'.8	01'.7
	23	339° 10'.0	142° 45'.7	17'.2	247° 29'.8	24'.9	163° 47'.9	09'.7	23° 47'.4	01'.7
		M.P. 00:27	v -0'.3	d 1'.3	v 0'.9	d 0'.0	v 2'.0	d 0'.2	v 2'.6	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.8	40° 19'.7 S
Achernar	335° 37'.7	57° 16'.1 S
Acrux	173° 27'.6	63° 03'.6 S
Adhara	255° 24'.9	28° 57'.5 S
Aldebaran	291° 07'.1	16° 29'.8 N
Alioth	166° 34'.6	56° 00'.0 N
Alkaid	153° 11'.4	49° 21'.1 N
Alnair	28° 02'.6	46° 59'.7 S
Alnilam	276° 02'.1	1° 12'.2 S
Alphard	218° 11'.6	8° 37'.5 S
Alphecca	126° 24'.3	26° 44'.5 N
Alpheratz	357° 59'.2	29° 03'.2 N
Altair	62° 23'.2	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.5 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.3 N
Atria	108° 01'.3	69° 01'.2 S
Avior	234° 24'.9	59° 29'.0 S
Bellatrix	278° 48'.6	6° 20'.7 N
Betelgeuse	271° 18'.1	7° 24'.5 N
Canopus	264° 03'.2	52° 41'.2 S
Capella	280° 57'.4	45° 59'.4 N
Deneb	49° 41'.7	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.1	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.4 N
Elnath	278° 32'.2	28° 36'.1 N
Eltanin	90° 53'.3	51° 29'.7 N
Enif	34° 02'.0	9° 50'.7 N
Fomalhaut	15° 40'.6	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.5 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.5 S
Hamal	328° 18'.0	23° 25'.8 N
Kaus Aust.	84° 04'.2	34° 23'.4 S
Kochab	137° 19'.9	74° 11'.3 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.1	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.2 S
Miaplacidus	221° 43'.9	69° 41'.1 S
Mirfak	309° 02'.4	49° 50'.1 N
Nunki	76° 17'.3	26° 18'.4 S
Peacock	53° 43'.1	56° 45'.6 S
Polaris	323° 38'.8	89° 13'.8 N
Pollux	243° 46'.8	28° 02'.6 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 20'.8	12° 34'.1 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 26'.9	8° 12'.4 S
Rigil Kent	140° 13'.4	60° 48'.5 S
Sabik	102° 30'.3	15° 43'.0 S
Schedar	349° 57'.8	56° 29'.9 N
Shaula	96° 42'.9	37° 06'.0 S
Sirius	258° 47'.5	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.3	43° 24'.0 S
Vega	80° 49'.3	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	165° 47'.6	13:28
Mars	269° 32'.2	06:33
Jupiter	185° 01'.3	12:09
Saturn	44° 31'.5	21:29

	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
12 00	180° 55'.2	4° 09'.9 N	3° 48'.9	16'.1	0° 01'.4 S	12'.0	54'.2
03	225° 55'.9	07'.0	47° 34'.1	16'.1	34'.6	12'.0	54'.3
06	270° 56'.5	04'.2	91° 19'.2	16'.0	1° 10'.6 N	12'.0	
09	315° 57'.2	01'.3	135° 04'.2	16'.0	46'.6	12'.0	
12	330° 57'.4	00'.3	149° 39'.2	15'.9	58'.6	12'.0	
15	345° 57'.7	3° 59'.4 N	164° 14'.1	16'.0	2° 10'.6 N	12'.0	
18	0° 57'.9	3° 58'.4 N	178° 49'.1	15'.9	2° 22'.6 N	12'.0	54'.3
21	15° 58'.1	57'.5	193° 24'.0	15'.9	34'.6	12'.0	54'.4
00	30° 58'.3	56'.5	207° 58'.9	15'.9	46'.6	12'.0	
03	45° 58'.5	55'.6	222° 33'.8	15'.8	58'.6	11'.9	
06	60° 58'.8	54'.6	237° 08'.6	15'.8	3° 10'.5 N	12'.0	
09	75° 59'.0	53'.7	251° 43'.4	15'.9	22'.5	11'.9	
12	90° 59'.2	52'.7	266° 18'.3	15'.8	34'.4	12'.0	
15	105° 59'.4	51'.7	280° 53'.1	15'.7	46'.4	11'.9	
18	120° 59'.6	50'.8	295° 27'.8	15'.8	58'.3	11'.9	
21	135° 59'.9	49'.8	310° 02'.6	15'.7	4° 10'.2 N	11'.9	
00	151° 00'.1	48'.9	324° 37'.3	15'.7	22'.1	11'.9	
03	166° 00'.3	47'.9	339° 12'.0	15'.6	34'.0	11'.9	54'.5
06	181° 00'.5	3° 47'.0 N	353° 46'.6	15'.7	4° 45'.9 N	11'.9	54'.5
09	196° 00'.8	46'.0	8° 21'.3	15'.6	57'.8	11'.8	
12	211° 01'.0	45'.0	22° 55'.9	15'.6	5° 09'.6 N	11'.8	
15	226° 01'.2	44'.1	37° 30'.5	15'.5	21'.4	11'.9	
18	241° 01'.4	43'.1	52° 05'.0	15'.6	33'.3	11'.8	
21	256° 01'.6	42'.2	66° 39'.6	15'.5	45'.1	11'.7	
00	271° 01'.9	41'.2	81° 14'.1	15'.4	56'.8	11'.8	
03	286° 02'.1	40'.3	95° 48'.5	15'.4	6° 08'.6 N	11'.8	54'.6
06	301° 02'.3	39'.3	110° 22'.9	15'.4	20'.4	11'.7	
09	316° 02'.5	38'.3	124° 57'.3	15'.4	32'.1	11'.7	
12	331° 02'.8	37'.4	139° 31'.7	15'.3	43'.8	11'.7	
15	346° 03'.0	36'.4	154° 06'.0	15'.3	55'.5	11'.6	
18	1° 03'.2	3° 35'.5 N	168° 40'.3	15'.3	7° 07'.1 N	11'.6	54'.6
21	16° 03'.4	34'.5	183° 14'.6	15'.2	18'.7	11'.7	
00	31° 03'.6	33'.6	197° 48'.8	15'.2	30'.4	11'.5	
03	46° 03'.9	32'.6	212° 23'.0	15'.1	41'.9	11'.6	54'.7
06	61° 04'.1	31'.6	226° 57'.1	15'.1	53'.5	11'.5	
09	76° 04'.3	30'.7	241° 31'.2	15'.1	8° 05'.0 N	11'.5	
12	91° 04'.5	29'.7	256° 05'.3	15'.0	16'.5	11'.5	
15	106° 04'.8	28'.8	270° 39'.3	15'.0	28'.0	11'.4	
18	121° 05'.0	27'.8	285° 13'.3	14'.9	39'.4	11'.5	
21	136° 05'.2	26'.8	299° 47'.2	14'.9	50'.9	11'.3	
00	151° 05'.4	25'.9	314° 21'.1	14'.8	9° 02'.2 N	11'.4	54'.8
03	166° 05'.6	24'.9	328° 54'.9	14'.8	13'.6	11'.3	
06	181° 05'.9	3° 24'.0 N	343° 28'.7	14'.8	9° 24'.9 N	11'.3	54'.8
09	196° 06'.1	23'.0	358° 02'.5	14'.7	36'.2	11'.3	
12	211° 06'.3	22'.1	12° 36'.2	14'.7	47'.5	11'.2	
15	226° 06'.5	21'.1	27° 09'.9	14'.6	58'.7	11'.1	
18	241° 06'.8	20'.1	41° 43'.5	14'.6	10° 09'.8 N	11'.2	
21	256° 07'.0	19'.2	56° 17'.1	14'.5	21'.0	11'.1	54'.9
00	271° 07'.2	18'.2	70° 50'.6	14'.5	32'.1	11'.1	
03	286° 07'.4	17'.3	85° 24'.1	14'.4	43'.2	11'.0	
06	301° 07'.7	16'.3	99° 57'.5	14'.4	54'.2	11'.0	
09	316° 07'.9	15'.3	114° 30'.9	14'.3	11° 05'.2 N	10'.9	
12	331° 08'.1	14'.4	129° 04'.2	14'.3	16'.1	10'.9	
15	346° 08'.3	13'.4	143° 37'.5	14'.2	27'.0	10'.9	55'.0
18	1° 08'.5	3° 12'.5 N	158° 10'.7	14'.1	11° 37'.9 N	10'.8	55'.0
21	16° 08'.8	11'.5	172° 43'.8	14'.1	48'.7	10'.8	
00	31° 09'.0	10'.5	187° 16'.9	14'.1	59'.5	10'.7	
03	46° 09'.2	09'.6	201° 50'.0	14'.0	12° 10'.2 N	10'.7	
06	61° 09'.4	08'.6	216° 23'.0	13'.9	20'.9	10'.6	
09	76° 09'.7	07'.6	230° 55'.9	13'.9	31'.5	10'.6	55'.1
12	91° 09'.9	06'.7	245° 28'.8	13'.9	42'.1	10'.5	
15	106° 10'.1	05'.7	260° 01'.7	13'.7	52'.6	10'.5	
18	121° 10'.3	04'.8	274° 34'.4	13'.7	13° 03'.1 N	10'.4	
21	136° 10'.6	03'.8	289° 07'.1	13'.7	13'.5	10'.4	
00	151° 10'.8	02'.8	303° 39'.8	13'.6	23'.9	10'.3	
03	166° 11'.0	01'.9	318° 12'.4	13'.5	34'.2	10'.3	55'.2
	SD 15'.9	d 1'.0	SD	14'.8	14'.9	15'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
12	3 40	3 51	11:56	24:26	12:05	15d Full
13	4 02	4 12	11:56	00:26	12:47	16d 98%
14	4 23	4 34	11:55	01:08	13:30	17d 94%

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1992 September 15, 16, 17 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +0.5		JUPITER -1.7		SATURN +0.4	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
15 Tuesday 00	354° 12'.5	157° 45'.4	6° 18'.5 S	262° 30'.7	23° 24'.9 N	178° 49'.8	3° 09'.5 N	38° 49'.9	18° 01'.8 S
01	9° 14'.9	172° 45'.1	19'.8	277° 31'.6	25'.0	193° 51'.8	09'.2	53° 52'.5	01'.8
02	24° 17'.4	187° 44'.7	21'.0	292° 32'.6	25'.0	208° 53'.8	09'.0	68° 55'.1	01'.8
03	39° 19'.8	202° 44'.4	22'.3	307° 33'.5	25'.1	223° 55'.7	08'.8	83° 57'.7	01'.9
04	54° 22'.3	217° 44'.0	23'.6	322° 34'.4	25'.1	238° 57'.7	08'.6	99° 00'.3	01'.9
05	69° 24'.8	232° 43'.7	24'.8	337° 35'.4	25'.1	253° 59'.7	08'.4	114° 02'.9	01'.9
06	84° 27'.2	247° 43'.3	26'.1	352° 36'.3	25'.2	269° 01'.6	08'.2	129° 05'.5	02'.0
07	99° 29'.7	262° 43'.0	27'.3	7° 37'.2	25'.2	284° 03'.6	08'.0	144° 08'.0	02'.0
08	114° 32'.2	277° 42'.6	28'.6	22° 38'.2	25'.2	299° 05'.6	07'.7	159° 10'.6	02'.0
09	129° 34'.6	292° 42'.3	29'.9	37° 39'.1	25'.3	314° 07'.5	07'.5	174° 13'.2	02'.1
10	144° 37'.1	307° 41'.9	31'.1	52° 40'.0	25'.3	329° 09'.5	07'.3	189° 15'.8	02'.1
11	159° 39'.6	322° 41'.6	32'.4	67° 41'.0	25'.3	344° 11'.5	07'.1	204° 18'.4	02'.1
12	174° 42'.0	337° 41'.2	6° 33'.6 S	82° 41'.9	23° 25'.4 N	359° 13'.4	3° 06'.9 N	219° 21'.0	18° 02'.2 S
13	189° 44'.5	352° 40'.9	34'.9	97° 42'.9	25'.4	14° 15'.4	06'.7	234° 23'.5	02'.2
14	204° 47'.0	7° 40'.5	36'.1	112° 43'.8	25'.4	29° 17'.4	06'.5	249° 26'.1	02'.2
15	219° 49'.4	22° 40'.2	37'.4	127° 44'.7	25'.5	44° 19'.3	06'.2	264° 28'.7	02'.3
16	234° 51'.9	37° 39'.8	38'.7	142° 45'.7	25'.5	59° 21'.3	06'.0	279° 31'.3	02'.3
17	249° 54'.3	52° 39'.5	39'.9	157° 46'.6	25'.5	74° 23'.3	05'.8	294° 33'.9	02'.3
18	264° 56'.8	67° 39'.1	41'.2	172° 47'.5	25'.6	89° 25'.2	05'.6	309° 36'.5	02'.4
19	279° 59'.3	82° 38'.8	42'.4	187° 48'.5	25'.6	104° 27'.2	05'.4	324° 39'.0	02'.4
20	295° 01'.7	97° 38'.4	43'.7	202° 49'.4	25'.6	119° 29'.2	05'.2	339° 41'.6	02'.4
21	310° 04'.2	112° 38'.1	45'.0	217° 50'.4	25'.7	134° 31'.1	05'.0	354° 44'.2	02'.5
22	325° 06'.7	127° 37'.7	46'.2	232° 51'.3	25'.7	149° 33'.1	04'.8	9° 46'.8	02'.5
23	340° 09'.1	142° 37'.4	47'.5	247° 52'.2	25'.7	164° 35'.1	04'.5	24° 49'.4	02'.5
16 Wednesday 00	355° 11'.6	157° 37'.0	6° 48'.7 S	262° 53'.2	23° 25'.8 N	179° 37'.0	3° 04'.3 N	39° 52'.0	18° 02'.6 S
01	10° 14'.1	172° 36'.7	50'.0	277° 54'.1	25'.8	194° 39'.0	04'.1	54° 54'.5	02'.6
02	25° 16'.5	187° 36'.3	51'.2	292° 55'.1	25'.8	209° 41'.0	03'.9	69° 57'.1	02'.6
03	40° 19'.0	202° 36'.0	52'.5	307° 56'.0	25'.9	224° 42'.9	03'.7	84° 59'.7	02'.7
04	55° 21'.4	217° 35'.6	53'.7	322° 56'.9	25'.9	239° 44'.9	03'.5	100° 02'.3	02'.7
05	70° 23'.9	232° 35'.3	55'.0	337° 57'.9	25'.9	254° 46'.9	03'.3	115° 04'.9	02'.7
06	85° 26'.4	247° 34'.9	56'.3	352° 58'.8	25'.9	269° 48'.8	03'.0	130° 07'.4	02'.8
07	100° 28'.8	262° 34'.6	57'.5	7° 59'.8	26'.0	284° 50'.8	02'.8	145° 10'.0	02'.8
08	115° 31'.3	277° 34'.2	58'.8	23° 00'.7	26'.0	299° 52'.8	02'.6	160° 12'.6	02'.8
09	130° 33'.8	292° 33'.9	7° 00'.0 S	38° 01'.7	26'.0	314° 54'.7	02'.4	175° 15'.2	02'.9
10	145° 36'.2	307° 33'.5	01'.3	53° 02'.6	26'.1	329° 56'.7	02'.2	190° 17'.8	02'.9
11	160° 38'.7	322° 33'.2	02'.5	68° 03'.5	26'.1	344° 58'.7	02'.0	205° 20'.3	02'.9
12	175° 41'.2	337° 32'.8	7° 03'.8 S	83° 04'.5	23° 26'.1 N	0° 00'.6	3° 01'.8 N	220° 22'.9	18° 03'.0 S
13	190° 43'.6	352° 32'.5	05'.0	98° 05'.4	26'.1	15° 02'.6	01'.5	235° 25'.5	03'.0
14	205° 46'.1	7° 32'.1	06'.3	113° 06'.4	26'.2	30° 04'.6	01'.3	250° 28'.1	03'.0
15	220° 48'.6	22° 31'.8	07'.5	128° 07'.3	26'.2	45° 06'.5	01'.1	265° 30'.7	03'.1
16	235° 51'.0	37° 31'.4	08'.8	143° 08'.3	26'.2	60° 08'.5	00'.9	280° 33'.3	03'.1
17	250° 53'.5	52° 31'.0	10'.0	158° 09'.2	26'.3	75° 10'.5	00'.7	295° 35'.8	03'.1
18	265° 55'.9	67° 30'.7	11'.3	173° 10'.2	26'.3	90° 12'.4	00'.5	310° 38'.4	03'.2
19	280° 58'.4	82° 30'.3	12'.5	188° 11'.1	26'.3	105° 14'.4	00'.3	325° 41'.0	03'.2
20	296° 00'.9	97° 30'.0	13'.8	203° 12'.1	26'.3	120° 16'.4	00'.0	340° 43'.6	03'.2
21	311° 03'.3	112° 29'.6	15'.0	218° 13'.0	26'.4	135° 18'.3	2° 59'.8 N	355° 46'.1	03'.3
22	326° 05'.8	127° 29'.3	16'.3	233° 14'.0	26'.4	150° 20'.3	59'.6	10° 48'.7	03'.3
23	341° 08'.3	142° 28'.9	17'.5	248° 14'.9	26'.4	165° 22'.3	59'.4	25° 51'.3	03'.3
17 Thursday 00	356° 10'.7	157° 28'.6	7° 18'.8 S	263° 15'.9	23° 26'.4 N	180° 24'.2	2° 59'.2 N	40° 53'.9	18° 03'.4 S
01	11° 13'.2	172° 28'.2	20'.0	278° 16'.8	26'.5	195° 26'.2	59'.0	55° 56'.5	03'.4
02	26° 15'.7	187° 27'.8	21'.3	293° 17'.8	26'.5	210° 28'.2	58'.8	70° 59'.0	03'.4
03	41° 18'.1	202° 27'.5	22'.5	308° 18'.7	26'.5	225° 30'.1	58'.6	86° 01'.6	03'.5
04	56° 20'.6	217° 27'.1	23'.8	323° 19'.7	26'.5	240° 32'.1	58'.3	101° 04'.2	03'.5
05	71° 23'.1	232° 26'.8	25'.0	338° 20'.6	26'.6	255° 34'.1	58'.1	116° 06'.8	03'.5
06	86° 25'.5	247° 26'.4	26'.3	353° 21'.6	26'.6	270° 36'.0	57'.9	131° 09'.4	03'.6
07	101° 28'.0	262° 26'.1	27'.5	8° 22'.5	26'.6	285° 38'.0	57'.7	146° 11'.9	03'.6
08	116° 30'.4	277° 25'.7	28'.8	23° 23'.5	26'.6	300° 40'.0	57'.5	161° 14'.5	03'.6
09	131° 32'.9	292° 25'.3	30'.0	38° 24'.4	26'.7	315° 41'.9	57'.3	176° 17'.1	03'.7
10	146° 35'.4	307° 25'.0	31'.3	53° 25'.4	26'.7	330° 43'.9	57'.1	191° 19'.7	03'.7
11	161° 37'.8	322° 24'.6	32'.5	68° 26'.3	26'.7	345° 45'.9	56'.8	206° 22'.2	03'.7
12	176° 40'.3	337° 24'.3	7° 33'.8 S	83° 27'.3	23° 26'.7 N	0° 47'.8	2° 56'.6 N	221° 24'.8	18° 03'.7 S
13	191° 42'.8	352° 23'.9	35'.0	98° 28'.2	26'.8	15° 49'.8	56'.4	236° 27'.4	03'.8
14	206° 45'.2	7° 23'.6	36'.3	113° 29'.2	26'.8	30° 51'.8	56'.2	251° 30'.0	03'.8
15	221° 47'.7	22° 23'.2	37'.5	128° 30'.1	26'.8	45° 53'.7	56'.0	266° 32'.6	03'.8
16	236° 50'.2	37° 22'.8	38'.8	143° 31'.1	26'.8	60° 55'.7	55'.8	281° 35'.1	03'.9
17	251° 52'.6	52° 22'.5	40'.0	158° 32'.1	26'.9	75° 57'.7	55'.6	296° 37'.7	03'.9
18	266° 55'.1	67° 22'.1	41'.2	173° 33'.0	26'.9	90° 59'.6	55'.3	311° 40'.3	03'.9
19	281° 57'.5	82° 21'.7	42'.5	188° 34'.0	26'.9	106° 01'.6	55'.1	326° 42'.9	04'.0
20	297° 00'.0	97° 21'.4	43'.7	203° 34'.9	26'.9	121° 03'.6	54'.9	341° 45'.4	04'.0
21	312° 02'.5	112° 21'.0	45'.0	218° 35'.9	26'.9	136° 05'.5	54'.7	356° 48'.0	04'.0
22	327° 04'.9	127° 20'.7	46'.2	233° 36'.8	27'.0	151° 07'.5	54'.5	11° 50'.6	04'.1
23	342° 07'.4	142° 20'.3	47'.5	248° 37'.8	27'.0	166° 09'.5	54'.3	26° 53'.2	04'.1
	M.P. 00:15	v -0'.4	d 1'.3	v 0'.9	d 0'.0	v 2'.0	d 0'.2	v 2'.6	d 0'.0

STARS	SHA	Dec
Acamar	315° 29'.8	40° 19'.7 S
Achernar	335° 37'.7	57° 16'.1 S
Acrux	173° 27'.6	63° 03'.6 S
Adhara	255° 24'.8	28° 57'.5 S
Aldebaran	291° 07'.1	16° 29'.8 N
Alioth	166° 34'.7	56° 00'.0 N
Alkaid	153° 11'.4	49° 21'.1 N
Alnair	28° 02'.6	46° 59'.7 S
Alnilam	276° 02'.1	1° 12'.2 S
Alphard	218° 11'.6	8° 37'.5 S
Alphecca	126° 24'.3	26° 44'.5 N
Alpheratz	357° 59'.2	29° 03'.2 N
Altair	62° 23'.2	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.5 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.3 N
Atria	108° 01'.3	69° 01'.2 S
Avior	234° 24'.8	59° 28'.9 S
Bellatrix	278° 48'.6	6° 20'.7 N
Betelgeuse	271° 18'.1	7° 24'.5 N
Canopus	264° 03'.1	52° 41'.2 S
Capella	280° 57'.3	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.1	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.3 N
Elnath	278° 32'.2	28° 36'.1 N
Eltanin	90° 53'.3	51° 29'.7 N
Enif	34° 02'.1	9° 50'.7 N
Fomalhaut	15° 40'.6	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.4 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.5 S
Hamal	328° 18'.0	23° 25'.8 N
Kaus Aust.	84° 04'.3	34° 23'.4 S
Kochab	137° 20'.0	74° 11'.3 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.1	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.2 S
Miaplacidus	221° 43'.8	69° 41'.1 S
Mirfak	309° 02'.4	49° 50'.1 N
Nunki	76° 17'.4	26° 18'.4 S
Peacock	53° 43'.1	56° 45'.6 S
Polaris	323° 37'.8	89° 13'.8 N
Pollux	243° 46'.8	28° 02'.6 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 20'.8	12° 34'.1 N
Regulus	208° 00'.3	12° 00'.2 N
Rigel	281° 26'.9	8° 12'.4 S
Rigil Kent	140° 13'.4	60° 48'.4 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.0 N
Shaula	96° 43'.0	37° 06'.0 S
Sirius	258° 47'.5	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.2	43° 24'.0 S
Vega	80° 49'.3	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	162° 25'.4	13:30
Mars	267° 41'.6	06:28
Jupiter	184° 25'.4	12:00
Saturn	44° 40'.4	21:17

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
181° 11'.2	3° 00'.9 N	332° 44'.9	13'.5	13° 44'.5 N	10'.2	55'.2
196° 11'.4	3° 00'.0 N	347° 17'.4	13'.4	54'.7	10'.2	
211° 11'.7	59'.0	1° 49'.8	13'.3	14° 04'.9 N	10'.1	
226° 11'.9	58'.0	16° 22'.1	13'.3	15'.0	10'.0	
241° 12'.1	57'.1	30° 54'.4	13'.2	25'.0	10'.0	55'.3
256° 12'.3	56'.1	45° 26'.6	13'.2	35'.0	10'.0	
271° 12'.6	55'.1	59° 58'.8	13'.1	45'.0	9'.8	
286° 12'.8	54'.2	74° 30'.9	13'.0	54'.8	9'.8	
301° 13'.0	53'.2	89° 02'.9	13'.0	15° 04'.6 N	9'.8	
316° 13'.2	52'.3	103° 34'.9	12'.9	14'.4	9'.7	
331° 13'.5	51'.3	118° 06'.8	12'.8	24'.1	9'.6	55'.4
346° 13'.7	50'.3	132° 38'.6	12'.8	33'.7	9'.5	
1° 13'.9	2° 49'.4 N	147° 10'.4	12'.7	15° 43'.2 N	9'.5	55'.4
16° 14'.1	48'.4	161° 42'.1	12'.6	52'.7	9'.4	
31° 14'.3	47'.4	176° 13'.7	12'.6	16° 02'.1 N	9'.4	
46° 14'.6	46'.5	190° 45'.3	12'.5	11'.5	9'.3	55'.5
61° 14'.8	45'.5	205° 16'.8	12'.4	20'.8	9'.2	
76° 15'.0	44'.6	219° 48'.2	12'.4	30'.0	9'.1	
91° 15'.2	43'.6	234° 19'.6	12'.2	39'.1	9'.1	
106° 15'.5	42'.6	248° 50'.8	12'.3	48'.2	9'.0	
121° 15'.7	41'.7	263° 22'.1	12'.1	57'.2	8'.9	55'.6
136° 15'.9	40'.7	277° 53'.2	12'.1	17° 06'.1 N	8'.9	
151° 16'.1	39'.7	292° 24'.3	12'.0	15'.0	8'.8	
166° 16'.4	38'.8	306° 55'.3	11'.9	23'.8	8'.7	
181° 16'.6	2° 37'.8 N	321° 26'.2	11'.9	17° 32'.5 N	8'.6	55'.6
196° 16'.8	36'.8	335° 57'.1	11'.8	41'.1	8'.5	55'.7
211° 17'.0	35'.9	350° 27'.9	11'.7	49'.6	8'.5	
226° 17'.2	34'.9	4° 58'.6	11'.6	58'.1	8'.4	
241° 17'.5	33'.9	19° 29'.2	11'.6	18° 06'.5 N	8'.3	
256° 17'.7	33'.0	33° 59'.8	11'.5	14'.8	8'.2	55'.8
271° 17'.9	32'.0	48° 30'.3	11'.4	23'.0	8'.1	
286° 18'.1	31'.1	63° 00'.7	11'.4	31'.1	8'.1	
301° 18'.4	30'.1	77° 31'.1	11'.2	39'.2	7'.9	
316° 18'.6	29'.1	92° 01'.3	11'.2	47'.1	7'.9	
331° 18'.8	28'.2	106° 31'.5	11'.2	55'.0	7'.8	55'.9
346° 19'.0	27'.2	121° 01'.7	11'.0	19° 02'.8 N	7'.7	
1° 19'.3	2° 26'.2 N	135° 31'.7	11'.0	19° 10'.5 N	7'.6	55'.9
16° 19'.5	25'.3	150° 01'.7	10'.9	18'.1	7'.5	
31° 19'.7	24'.3	164° 31'.6	10'.9	25'.6	7'.4	56'.0
46° 19'.9	23'.3	179° 01'.5	10'.7	33'.0	7'.4	
61° 20'.2	22'.4	193° 31'.2	10'.7	40'.4	7'.2	
76° 20'.4	21'.4	208° 00'.9	10'.6	47'.6	7'.2	
91° 20'.6	20'.4	222° 30'.5	10'.5	54'.8	7'.0	
106° 20'.8	19'.5	237° 00'.0	10'.5	20° 01'.8 N	7'.0	56'.1
121° 21'.0	18'.5	251° 29'.5	10'.4	08'.8	6'.8	
136° 21'.3	17'.5	265° 58'.9	10'.3	15'.6	6'.8	
151° 21'.5	16'.6	280° 28'.2	10'.2	22'.4	6'.6	
166° 21'.7	15'.6	294° 57'.4	10'.2	29'.0	6'.6	56'.2
181° 21'.9	2° 14'.6 N	309° 26'.6	10'.1	20° 35'.6 N	6'.4	56'.2
196° 22'.2	13'.7	323° 55'.7	10'.0	42'.0	6'.4	
211° 22'.4	12'.7	338° 24'.7	10'.0	48'.4	6'.2	
226° 22'.6	11'.7	352° 53'.7	9'.8	54'.6	6'.2	56'.3
241° 22'.8	10'.8	7° 22'.5	9'.8	21° 00'.8 N	6'.0	
256° 23'.1	09'.8	21° 51'.3	9'.7	06'.8	6'.0	
271° 23'.3	08'.8	36° 20'.0	9'.7	12'.8	5'.8	
286° 23'.5	07'.9	50° 48'.7	9'.6	18'.6	5'.7	56'.4
301° 23'.7	06'.9	65° 17'.3	9'.5	24'.3	5'.6	
316° 23'.9	05'.9	79° 45'.8	9'.4	29'.9	5'.5	
331° 24'.2	05'.0	94° 14'.2	9'.4	35'.4	5'.4	
346° 24'.4	04'.0	108° 42'.6	9'.3	40'.8	5'.3	56'.5
1° 24'.6	2° 03'.0 N	123° 10'.9	9'.2	21° 46'.1 N	5'.1	56'.5
16° 24'.8	02'.1	137° 39'.1	9'.1	51'.2	5'.1	
31° 25'.1	01'.1	152° 07'.2	9'.1	56'.3	4'.9	
46° 25'.3	00'.1	166° 35'.3	9'.0	22° 01'.2 N	4'.8	56'.6
61° 25'.5	1° 59'.2 N	181° 03'.3	9'.0	06'.0	4'.7	
76° 25'.7	58'.2	195° 31'.3	8'.9	10'.7	4'.6	
91° 26'.0	57'.2	209° 59'.2	8'.8	15'.3	4'.5	56'.7
106° 26'.2	56'.3	224° 27'.0	8'.7	19'.8	4'.3	
121° 26'.4	55'.3	238° 54'.7	8'.7	24'.1	4'.3	
136° 26'.6	54'.3	253° 22'.4	8'.6	28'.4	4'.1	
151° 26'.8	53'.4	267° 50'.0	8'.5	32'.5	4'.0	56'.8
166° 27'.1	52'.4	282° 17'.5	8'.5	36'.5	3'.8	
SD 15'.9	d 1'.0	SD	15'.1	15'.2	15'.4	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
15	4 44	4 55	11:55	01:52	14:16	18d 89%
16	5 06	5 17	11:55	02:39	15:04	19d 82%
17	5 27	5 38	11:54	03:29	15:56	20d 74%

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1992 September 18, 19, 20 (Fri, Sat, Sun)

GMT	ARIES GHA	VENUS -3.9 GHA	VENUS Dec	MARS +0.4 GHA	MARS Dec	JUPITER -1.7 GHA	JUPITER Dec	SATURN +0.5 GHA	SATURN Dec
18 Friday 00	357° 09'.9	157° 19'.9	7° 48'.7 S	263° 38'.8	23° 27'.0 N	181° 11'.4	2° 54'.1 N	41° 55'.7	18° 04'.1 S
01	12° 12'.3	172° 19'.6	50'.0	278° 39'.7	27'.0	196° 13'.4	53'.9	56° 58'.3	04'.2
02	27° 14'.8	187° 19'.2	51'.2	293° 40'.7	27'.1	211° 15'.4	53'.6	72° 00'.9	04'.2
03	42° 17'.3	202° 18'.9	52'.4	308° 41'.6	27'.1	226° 17'.3	53'.4	87° 03'.5	04'.2
04	57° 19'.7	217° 18'.5	53'.7	323° 42'.6	27'.1	241° 19'.3	53'.2	102° 06'.0	04'.3
05	72° 22'.2	232° 18'.1	54'.9	338° 43'.6	27'.1	256° 21'.3	53'.0	117° 08'.6	04'.3
06	87° 24'.7	247° 17'.8	56'.2	353° 44'.5	27'.1	271° 23'.2	52'.8	132° 11'.2	04'.3
07	102° 27'.1	262° 17'.4	57'.4	8° 45'.5	27'.2	286° 25'.2	52'.6	147° 13'.8	04'.3
08	117° 29'.6	277° 17'.0	58'.7	23° 46'.4	27'.2	301° 27'.2	52'.4	162° 16'.3	04'.4
09	132° 32'.0	292° 16'.7	59'.9	38° 47'.4	27'.2	316° 29'.1	52'.1	177° 18'.9	04'.4
10	147° 34'.5	307° 16'.3	8° 01'.1 S	53° 48'.4	27'.2	331° 31'.1	51'.9	192° 21'.5	04'.4
11	162° 37'.0	322° 15'.9	02'.4	68° 49'.3	27'.2	346° 33'.1	51'.7	207° 24'.1	04'.5
12	177° 39'.4	337° 15'.6	8° 03'.6 S	83° 50'.3	23° 27'.2 N	1° 35'.0	2° 51'.5 N	222° 26'.6	18° 04'.5 S
13	192° 41'.9	352° 15'.2	04'.9	98° 51'.3	27'.3	16° 37'.0	51'.3	237° 29'.2	04'.5
14	207° 44'.4	7° 14'.9	06'.1	113° 52'.2	27'.3	31° 39'.0	51'.1	252° 31'.8	04'.6
15	222° 46'.8	22° 14'.5	07'.3	128° 53'.2	27'.3	46° 40'.9	50'.9	267° 34'.4	04'.6
16	237° 49'.3	37° 14'.1	08'.6	143° 54'.2	27'.3	61° 42'.9	50'.6	282° 36'.9	04'.6
17	252° 51'.8	52° 13'.8	09'.8	158° 55'.1	27'.3	76° 44'.9	50'.4	297° 39'.5	04'.7
18	267° 54'.2	67° 13'.4	11'.1	173° 56'.1	27'.4	91° 46'.8	50'.2	312° 42'.1	04'.7
19	282° 56'.7	82° 13'.0	12'.3	188° 57'.0	27'.4	106° 48'.8	50'.0	327° 44'.6	04'.7
20	297° 59'.2	97° 12'.7	13'.5	203° 58'.0	27'.4	121° 50'.8	49'.8	342° 47'.2	04'.7
21	313° 01'.6	112° 12'.3	14'.8	218° 59'.0	27'.4	136° 52'.7	49'.6	357° 49'.8	04'.8
22	328° 04'.1	127° 11'.9	16'.0	233° 59'.9	27'.4	151° 54'.7	49'.4	12° 52'.4	04'.8
23	343° 06'.5	142° 11'.6	17'.2	249° 00'.9	27'.4	166° 56'.7	49'.1	27° 54'.9	04'.8
19 Saturday 00	358° 09'.0	157° 11'.2	8° 18'.5 S	264° 01'.9	23° 27'.5 N	181° 58'.6	2° 48'.9 N	42° 57'.5	18° 04'.9 S
01	13° 11'.5	172° 10'.8	19'.7	279° 02'.9	27'.5	197° 00'.6	48'.7	58° 00'.1	04'.9
02	28° 13'.9	187° 10'.4	21'.0	294° 03'.8	27'.5	212° 02'.6	48'.5	73° 02'.7	04'.9
03	43° 16'.4	202° 10'.1	22'.2	309° 04'.8	27'.5	227° 04'.5	48'.3	88° 05'.2	05'.0
04	58° 18'.9	217° 09'.7	23'.4	324° 05'.8	27'.5	242° 06'.5	48'.1	103° 07'.8	05'.0
05	73° 21'.3	232° 09'.3	24'.7	339° 06'.7	27'.5	257° 08'.5	47'.9	118° 10'.4	05'.0
06	88° 23'.8	247° 09'.0	25'.9	354° 07'.7	27'.5	272° 10'.4	47'.7	133° 12'.9	05'.0
07	103° 26'.3	262° 08'.6	27'.1	9° 08'.7	27'.6	287° 12'.4	47'.4	148° 15'.5	05'.1
08	118° 28'.7	277° 08'.2	28'.4	24° 09'.6	27'.6	302° 14'.4	47'.2	163° 18'.1	05'.1
09	133° 31'.2	292° 07'.9	29'.6	39° 10'.6	27'.6	317° 16'.3	47'.0	178° 20'.7	05'.1
10	148° 33'.7	307° 07'.5	30'.8	54° 11'.6	27'.6	332° 18'.3	46'.8	193° 23'.2	05'.2
11	163° 36'.1	322° 07'.1	32'.1	69° 12'.6	27'.6	347° 20'.3	46'.6	208° 25'.8	05'.2
12	178° 38'.6	337° 06'.8	8° 33'.3 S	84° 13'.5	23° 27'.6 N	2° 22'.2	2° 46'.4 N	223° 28'.4	18° 05'.2 S
13	193° 41'.0	352° 06'.4	34'.5	99° 14'.5	27'.6	17° 24'.2	46'.2	238° 30'.9	05'.3
14	208° 43'.5	7° 06'.0	35'.8	114° 15'.5	27'.7	32° 26'.2	45'.9	253° 33'.5	05'.3
15	223° 46'.0	22° 05'.6	37'.0	129° 16'.5	27'.7	47° 28'.1	45'.7	268° 36'.1	05'.3
16	238° 48'.4	37° 05'.3	38'.2	144° 17'.4	27'.7	62° 30'.1	45'.5	283° 38'.6	05'.3
17	253° 50'.9	52° 04'.9	39'.5	159° 18'.4	27'.7	77° 32'.1	45'.3	298° 41'.2	05'.4
18	268° 53'.4	67° 04'.5	40'.7	174° 19'.4	27'.7	92° 34'.0	45'.1	313° 43'.8	05'.4
19	283° 55'.8	82° 04'.1	41'.9	189° 20'.4	27'.7	107° 36'.0	44'.9	328° 46'.4	05'.4
20	298° 58'.3	97° 03'.8	43'.2	204° 21'.3	27'.7	122° 38'.0	44'.7	343° 48'.9	05'.5
21	314° 00'.8	112° 03'.4	44'.4	219° 22'.3	27'.7	137° 39'.9	44'.4	358° 51'.5	05'.5
22	329° 03'.2	127° 03'.0	45'.6	234° 23'.3	27'.8	152° 41'.9	44'.2	13° 54'.1	05'.5
23	344° 05'.7	142° 02'.6	46'.8	249° 24'.3	27'.8	167° 43'.9	44'.0	28° 56'.6	05'.5
20 Sunday 00	359° 08'.1	157° 02'.3	8° 48'.1 S	264° 25'.2	23° 27'.8 N	182° 45'.8	2° 43'.8 N	43° 59'.2	18° 05'.6 S
01	14° 10'.6	172° 01'.9	49'.3	279° 26'.2	27'.8	197° 47'.8	43'.6	59° 01'.8	05'.6
02	29° 13'.1	187° 01'.5	50'.5	294° 27'.2	27'.8	212° 49'.8	43'.4	74° 04'.3	05'.6
03	44° 15'.5	202° 01'.2	51'.8	309° 28'.2	27'.8	227° 51'.7	43'.2	89° 06'.9	05'.7
04	59° 18'.0	217° 00'.8	53'.0	324° 29'.2	27'.8	242° 53'.7	43'.0	104° 09'.5	05'.7
05	74° 20'.5	232° 00'.4	54'.2	339° 30'.1	27'.8	257° 55'.7	42'.7	119° 12'.0	05'.7
06	89° 22'.9	247° 00'.0	55'.4	354° 31'.1	27'.8	272° 57'.6	42'.5	134° 14'.6	05'.8
07	104° 25'.4	261° 59'.6	56'.7	9° 32'.1	27'.9	287° 59'.6	42'.3	149° 17'.2	05'.8
08	119° 27'.9	276° 59'.3	57'.9	24° 33'.1	27'.9	303° 01'.6	42'.1	164° 19'.7	05'.8
09	134° 30'.3	291° 58'.9	59'.1	39° 34'.1	27'.9	318° 03'.5	41'.9	179° 22'.3	05'.8
10	149° 32'.8	306° 58'.5	9° 00'.4 S	54° 35'.0	27'.9	333° 05'.5	41'.7	194° 24'.9	05'.9
11	164° 35'.3	321° 58'.1	01'.6	69° 36'.0	27'.9	348° 07'.5	41'.5	209° 27'.4	05'.9
12	179° 37'.7	336° 57'.8	9° 02'.8 S	84° 37'.0	23° 27'.9 N	3° 09'.4	2° 41'.2 N	224° 30'.0	18° 05'.9 S
13	194° 40'.2	351° 57'.4	04'.0	99° 38'.0	27'.9	18° 11'.4	41'.0	239° 32'.6	06'.0
14	209° 42'.6	6° 57'.0	05'.3	114° 39'.0	27'.9	33° 13'.3	40'.8	254° 35'.1	06'.0
15	224° 45'.1	21° 56'.6	06'.5	129° 40'.0	27'.9	48° 15'.3	40'.6	269° 37'.7	06'.0
16	239° 47'.6	36° 56'.2	07'.7	144° 40'.9	27'.9	63° 17'.3	40'.4	284° 40'.3	06'.0
17	254° 50'.0	51° 55'.9	08'.9	159° 41'.9	27'.9	78° 19'.2	40'.2	299° 42'.8	06'.1
18	269° 52'.5	66° 55'.5	10'.2	174° 42'.9	28'.0	93° 21'.2	40'.0	314° 45'.4	06'.1
19	284° 55'.0	81° 55'.1	11'.4	189° 43'.9	28'.0	108° 23'.2	39'.7	329° 48'.0	06'.1
20	299° 57'.4	96° 54'.7	12'.6	204° 44'.9	28'.0	123° 25'.1	39'.5	344° 50'.5	06'.2
21	314° 59'.9	111° 54'.3	13'.8	219° 45'.9	28'.0	138° 27'.1	39'.3	359° 53'.1	06'.2
22	330° 02'.4	126° 54'.0	15'.0	234° 46'.9	28'.0	153° 29'.1	39'.1	14° 55'.7	06'.2
23	345° 04'.8	141° 53'.6	16'.3	249° 47'.8	28'.0	168° 31'.0	38'.9	29° 58'.2	06'.2
	M.P. 00:03	v -0'.4	d 1'.2	v 1'.0	d 0'.0	v 2'.0	d 0'.2	v 2'.6	d 0'.0

STARS Name	SHA	Dec
Acamar	315° 29'.8	40° 19'.7 S
Achernar	335° 37'.6	57° 16'.1 S
Acrux	173° 27'.6	63° 03'.6 S
Adhara	255° 24'.8	28° 57'.5 S
Aldebaran	291° 07'.1	16° 29'.8 N
Alioth	166° 34'.7	56° 00'.0 N
Alkaid	153° 11'.4	49° 21'.1 N
Alnair	28° 02'.6	46° 59'.7 S
Alnilam	276° 02'.1	1° 12'.2 S
Alphard	218° 11'.6	8° 37'.5 S
Alphecca	126° 24'.3	26° 44'.5 N
Alpheratz	357° 59'.2	29° 03'.2 N
Altair	62° 23'.2	8° 51'.2 N
Ankaa	353° 30'.5	42° 20'.5 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.3 N
Atria	108° 01'.4	69° 01'.2 S
Avior	234° 24'.8	59° 28'.9 S
Bellatrix	278° 48'.6	6° 20'.7 N
Betelgeuse	271° 18'.1	7° 24'.5 N
Canopus	264° 03'.1	52° 41'.2 S
Capella	280° 57'.3	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.1	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.3 N
Elnath	278° 32'.2	28° 36'.1 N
Eltanin	90° 53'.3	51° 29'.7 N
Enif	34° 02'.1	9° 50'.7 N
Fomalhaut	15° 40'.6	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.4 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.5 S
Hamal	328° 18'.0	23° 25'.8 N
Kaus Aust.	84° 04'.3	34° 23'.4 S
Kochab	137° 20'.0	74° 11'.3 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.1	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.2 S
Miaplacidus	221° 43'.8	69° 41'.1 S
Mirfak	309° 02'.3	49° 50'.1 N
Nunki	76° 17'.4	26° 18'.4 S
Peacock	53° 43'.1	56° 45'.6 S
Polaris	323° 36'.7	89° 13'.8 N
Pollux	243° 46'.8	28° 02'.6 N
Procyon	245° 16'.1	5° 14'.7 N
Rasalhague	96° 20'.8	12° 34'.1 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 26'.9	8° 12'.4 S
Rigil Kent	140° 13'.4	60° 48'.4 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.0 N
Shaula	96° 43'.0	37° 06'.0 S
Sirius	258° 47'.4	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.2	43° 24'.0 S
Vega	80° 49'.4	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	159° 02'.2	13:32
Mars	265° 52'.9	06:23
Jupiter	183° 49'.6	11:51
Saturn	44° 48'.5	21:05

SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
181° 27'.3	1° 51'.4 N	296° 45'.0	8'.4	22° 40'.3 N	3'.8	56'.8
196° 27'.5	50'.5	311° 12'.4	8'.3	44'.1	3'.6	
211° 27'.7	49'.5	325° 39'.7	8'.3	47'.7	3'.5	56'.9
226° 28'.0	48'.5	340° 07'.0	8'.2	51'.2	3'.3	
241° 28'.2	47'.6	354° 34'.2	8'.2	54'.5	3'.2	
256° 28'.4	46'.6	9° 01'.4	8'.1	57'.7	3'.2	57'.0
271° 28'.6	45'.6	23° 28'.5	8'.0	23° 00'.9 N	2'.9	
286° 28'.8	44'.7	37° 55'.5	8'.0	03'.8	2'.9	
301° 29'.1	43'.7	52° 22'.5	7'.9	06'.7	2'.7	
316° 29'.3	42'.7	66° 49'.4	7'.9	09'.4	2'.6	57'.1
331° 29'.5	41'.7	81° 16'.3	7'.8	12'.0	2'.4	
346° 29'.7	40'.8	95° 43'.1	7'.8	14'.4	2'.4	
1° 30'.0	1° 39'.8 N	110° 09'.9	7'.7	23° 16'.8 N	2'.2	57'.2
16° 30'.2	38'.8	124° 36'.6	7'.6	19'.0	2'.0	
31° 30'.4	37'.9	139° 03'.2	7'.6	21'.0	1'.9	
46° 30'.6	36'.9	153° 29'.8	7'.5	22'.9	1'.8	
61° 30'.9	35'.9	167° 56'.3	7'.5	24'.7	1'.7	57'.3
76° 31'.1	35'.0	182° 22'.8	7'.5	26'.4	1'.5	
91° 31'.3	34'.0	196° 49'.3	7'.3	27'.9	1'.4	
106° 31'.5	33'.0	211° 15'.6	7'.4	29'.3	1'.2	57'.4
121° 31'.7	32'.1	225° 42'.0	7'.3	30'.5	1'.1	
136° 32'.0	31'.1	240° 08'.3	7'.2	31'.6	1'.0	
151° 32'.2	30'.1	254° 34'.5	7'.2	32'.6	0'.8	57'.5
166° 32'.4	29'.1	269° 00'.7	7'.2	33'.4	0'.7	
181° 32'.6	1° 28'.2 N	283° 26'.9	7'.1	23° 34'.1 N	0'.6	57'.5
196° 32'.9	27'.2	297° 53'.0	7'.1	34'.7	0'.4	
211° 33'.1	26'.2	312° 19'.1	7'.0	35'.1	0'.2	57'.6
226° 33'.3	25'.3	326° 45'.1	7'.0	35'.3	0'.2	
241° 33'.5	24'.3	341° 11'.1	6'.9	35'.5	0'.1	
256° 33'.7	23'.3	355° 37'.0	7'.0	35'.4	0'.1	57'.7
271° 34'.0	22'.4	10° 03'.0	6'.8	35'.3	0'.3	
286° 34'.2	21'.4	24° 28'.8	6'.9	35'.0	0'.5	
301° 34'.4	20'.4	38° 54'.7	6'.8	34'.5	0'.6	57'.8
316° 34'.6	19'.4	53° 20'.5	6'.8	33'.9	0'.7	
331° 34'.9	18'.5	67° 46'.3	6'.7	33'.2	0'.9	
346° 35'.1	17'.5	82° 12'.0	6'.7	32'.3	1'.0	
1° 35'.3	1° 16'.5 N	96° 37'.7	6'.7	23° 31'.3 N	1'.2	57'.9
16° 35'.5	15'.6	111° 03'.4	6'.7	30'.1	1'.3	
31° 35'.7	14'.6	125° 29'.1	6'.6	28'.8	1'.4	
46° 36'.0	13'.6	139° 54'.7	6'.6	27'.4	1'.6	58'.0
61° 36'.2	12'.7	154° 20'.3	6'.6	25'.8	1'.8	
76° 36'.4	11'.7	168° 45'.9	6'.6	24'.0	1'.9	
91° 36'.6	10'.7	183° 11'.5	6'.5	22'.1	2'.0	58'.1
106° 36'.9	09'.7	197° 37'.0	6'.6	20'.1	2'.2	
121° 37'.1	08'.8	212° 02'.6	6'.5	17'.9	2'.4	
136° 37'.3	07'.8	226° 28'.1	6'.5	15'.5	2'.4	58'.2
151° 37'.5	06'.8	240° 53'.6	6'.4	13'.1	2'.7	
166° 37'.7	05'.9	255° 19'.0	6'.5	10'.4	2'.7	
181° 38'.0	1° 04'.9 N	269° 44'.5	6'.4	23° 07'.7 N	3'.0	58'.3
196° 38'.2	03'.9	284° 09'.9	6'.5	04'.7	3'.0	
211° 38'.4	02'.9	298° 35'.4	6'.4	01'.7	3'.3	
226° 38'.6	02'.0	313° 00'.8	6'.4	22° 58'.4 N	3'.3	58'.4
241° 38'.8	01'.0	327° 26'.2	6'.4	55'.1	3'.5	
256° 39'.1	00'.0	341° 51'.6	6'.4	51'.6	3'.7	
271° 39'.3	0° 59'.1 N	356° 17'.0	6'.3	47'.9	3'.8	
286° 39'.5	58'.1	10° 42'.3	6'.4	44'.1	4'.0	58'.5
301° 39'.7	57'.1	25° 07'.7	6'.4	40'.1	4'.1	
316° 40'.0	56'.1	39° 33'.1	6'.4	36'.0	4'.2	
331° 40'.2	55'.2	53° 58'.5	6'.3	31'.8	4'.4	58'.6
346° 40'.4	54'.2	68° 23'.8	6'.4	27'.4	4'.5	
1° 40'.6	0° 53'.2 N	82° 49'.2	6'.4	22° 22'.9 N	4'.7	58'.6
16° 40'.8	52'.3	97° 14'.6	6'.3	18'.2	4'.9	58'.7
31° 41'.1	51'.3	111° 39'.9	6'.4	13'.3	4'.9	
46° 41'.3	50'.3	126° 05'.3	6'.4	08'.4	5'.2	
61° 41'.5	49'.3	140° 30'.7	6'.3	03'.2	5'.2	58'.8
76° 41'.7	48'.4	154° 56'.0	6'.4	21° 58'.0 N	5'.4	
91° 41'.9	47'.4	169° 21'.4	6'.4	52'.6	5'.6	
106° 42'.2	46'.4	183° 46'.8	6'.4	47'.0	5'.7	58'.9
121° 42'.4	45'.5	198° 12'.2	6'.4	41'.3	5'.8	
136° 42'.6	44'.5	212° 37'.6	6'.4	35'.5	6'.0	
151° 42'.8	43'.5	227° 03'.0	6'.5	29'.5	6'.1	
166° 43'.0	42'.5	241° 28'.5	6'.4	23'.4	6'.3	59'.0
SD 15'.9	d 1'.0	SD 15'.6		15'.8	16'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
18	5 49	5 59	11:54	04:23	16:50	21d 64%
19	6 10	6 21	11:54	05:18	17:47	22d 54%
20	6 31	6 42	11:53	06:15	18:44	23d 43%

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1992 September 21, 22, 23 (Mon, Tue, Wed)

GMT	ARIES	VENUS -3.9		MARS +0.4		JUPITER -1.7		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
21 Monday 00	0° 07'.3	156° 53'.2	9° 17'.5 S	264° 48'.8	23° 28'.0 N	183° 33'.0	2° 38'.7 N	45° 00'.8	18° 06'.3 S
01	15° 09'.8	171° 52'.8	18'.7	279° 49'.8	28'.0	198° 35'.0	38'.5	60° 03'.4	06'.3
02	30° 12'.2	186° 52'.4	19'.9	294° 50'.8	28'.0	213° 36'.9	38'.3	75° 05'.9	06'.3
03	45° 14'.7	201° 52'.1	21'.1	309° 51'.8	28'.0	228° 38'.9	38'.0	90° 08'.5	06'.3
04	60° 17'.1	216° 51'.7	22'.4	324° 52'.8	28'.0	243° 40'.9	37'.8	105° 11'.1	06'.4
05	75° 19'.6	231° 51'.3	23'.6	339° 53'.8	28'.0	258° 42'.8	37'.6	120° 13'.6	06'.4
06	90° 22'.1	246° 50'.9	24'.8	354° 54'.8	28'.0	273° 44'.8	37'.4	135° 16'.2	06'.4
07	105° 24'.5	261° 50'.5	26'.0	9° 55'.8	28'.0	288° 46'.8	37'.2	150° 18'.8	06'.5
08	120° 27'.0	276° 50'.1	27'.2	24° 56'.7	28'.0	303° 48'.7	37'.0	165° 21'.3	06'.5
09	135° 29'.5	291° 49'.8	28'.5	39° 57'.7	28'.1	318° 50'.7	36'.8	180° 23'.9	06'.5
10	150° 31'.9	306° 49'.4	29'.7	54° 58'.7	28'.1	333° 52'.7	36'.5	195° 26'.4	06'.5
11	165° 34'.4	321° 49'.0	30'.9	69° 59'.7	28'.1	348° 54'.6	36'.3	210° 29'.0	06'.6
12	180° 36'.9	336° 48'.6	9° 32'.1 S	85° 00'.7	23° 28'.1 N	3° 56'.6	2° 36'.1 N	225° 31'.6	18° 06'.6 S
13	195° 39'.3	351° 48'.2	33'.3	100° 01'.7	28'.1	18° 58'.6	35'.9	240° 34'.1	06'.6
14	210° 41'.8	6° 47'.8	34'.6	115° 02'.7	28'.1	34° 00'.5	35'.7	255° 36'.7	06'.7
15	225° 44'.3	21° 47'.4	35'.8	130° 03'.7	28'.1	49° 02'.5	35'.5	270° 39'.3	06'.7
16	240° 46'.7	36° 47'.1	37'.0	145° 04'.7	28'.1	64° 04'.5	35'.3	285° 41'.8	06'.7
17	255° 49'.2	51° 46'.7	38'.2	160° 05'.7	28'.1	79° 06'.4	35'.0	300° 44'.4	06'.7
18	270° 51'.6	66° 46'.3	39'.4	175° 06'.7	28'.1	94° 08'.4	34'.8	315° 47'.0	06'.8
19	285° 54'.1	81° 45'.9	40'.6	190° 07'.7	28'.1	109° 10'.4	34'.6	330° 49'.5	06'.8
20	300° 56'.6	96° 45'.5	41'.8	205° 08'.7	28'.1	124° 12'.3	34'.4	345° 52'.1	06'.8
21	315° 59'.0	111° 45'.1	43'.1	220° 09'.7	28'.1	139° 14'.3	34'.2	0° 54'.6	06'.8
22	331° 01'.5	126° 44'.7	44'.3	235° 10'.7	28'.1	154° 16'.3	34'.0	15° 57'.2	06'.9
23	346° 04'.0	141° 44'.3	45'.5	250° 11'.7	28'.1	169° 18'.2	33'.8	30° 59'.8	06'.9
22 Tuesday 00	1° 06'.4	156° 44'.0	9° 46'.7 S	265° 12'.7	23° 28'.1 N	184° 20'.2	2° 33'.6 N	46° 02'.3	18° 06'.9 S
01	16° 08'.9	171° 43'.6	47'.9	280° 13'.7	28'.1	199° 22'.2	33'.3	61° 04'.9	07'.0
02	31° 11'.4	186° 43'.2	49'.1	295° 14'.7	28'.1	214° 24'.1	33'.1	76° 07'.4	07'.0
03	46° 13'.8	201° 42'.8	50'.3	310° 15'.7	28'.1	229° 26'.1	32'.9	91° 10'.0	07'.0
04	61° 16'.3	216° 42'.4	51'.5	325° 16'.7	28'.1	244° 28'.1	32'.7	106° 12'.6	07'.0
05	76° 18'.7	231° 42'.0	52'.8	340° 17'.6	28'.1	259° 30'.0	32'.5	121° 15'.1	07'.1
06	91° 21'.2	246° 41'.6	54'.0	355° 18'.7	28'.1	274° 32'.0	32'.3	136° 17'.7	07'.1
07	106° 23'.7	261° 41'.2	55'.2	10° 19'.7	28'.1	289° 34'.0	32'.1	151° 20'.3	07'.1
08	121° 26'.1	276° 40'.8	56'.4	25° 20'.7	28'.1	304° 35'.9	31'.8	166° 22'.8	07'.1
09	136° 28'.6	291° 40'.4	57'.6	40° 21'.7	28'.1	319° 37'.9	31'.6	181° 25'.4	07'.2
10	151° 31'.1	306° 40'.1	58'.8	55° 22'.7	28'.1	334° 39'.9	31'.4	196° 27'.9	07'.2
11	166° 33'.5	321° 39'.7	10° 00'.0 S	70° 23'.7	28'.1	349° 41'.8	31'.2	211° 30'.5	07'.2
12	181° 36'.0	336° 39'.3	10° 01'.2 S	85° 24'.7	23° 28'.1 N	4° 43'.8	2° 31'.0 N	226° 33'.1	18° 07'.2 S
13	196° 38'.5	351° 38'.9	02'.4	100° 25'.7	28'.1	19° 45'.8	30'.8	241° 35'.6	07'.3
14	211° 40'.9	6° 38'.5	03'.6	115° 26'.7	28'.1	34° 47'.7	30'.6	256° 38'.2	07'.3
15	226° 43'.4	21° 38'.1	04'.9	130° 27'.7	28'.1	49° 49'.7	30'.3	271° 40'.7	07'.3
16	241° 45'.9	36° 37'.7	06'.1	145° 28'.7	28'.1	64° 51'.7	30'.1	286° 43'.3	07'.4
17	256° 48'.3	51° 37'.3	07'.3	160° 29'.7	28'.1	79° 53'.6	29'.9	301° 45'.8	07'.4
18	271° 50'.8	66° 36'.9	08'.5	175° 30'.7	28'.1	94° 55'.6	29'.7	316° 48'.4	07'.4
19	286° 53'.2	81° 36'.5	09'.7	190° 31'.7	28'.1	109° 57'.6	29'.5	331° 51'.0	07'.4
20	301° 55'.7	96° 36'.1	10'.9	205° 32'.7	28'.1	124° 59'.5	29'.3	346° 53'.5	07'.5
21	316° 58'.2	111° 35'.7	12'.1	220° 33'.7	28'.1	140° 01'.5	29'.1	1° 56'.1	07'.5
22	332° 00'.6	126° 35'.3	13'.3	235° 34'.7	28'.1	155° 03'.5	28'.9	16° 58'.6	07'.5
23	347° 03'.1	141° 34'.9	14'.5	250° 35'.7	28'.1	170° 05'.5	28'.6	32° 01'.2	07'.5
23 Wednesday 00	2° 05'.6	156° 34'.5	10° 15'.7 S	265° 36'.7	23° 28'.1 N	185° 07'.4	2° 28'.4 N	47° 03'.8	18° 07'.6 S
01	17° 08'.0	171° 34'.1	16'.9	280° 37'.7	28'.1	200° 09'.4	28'.2	62° 06'.3	07'.6
02	32° 10'.5	186° 33'.7	18'.1	295° 38'.7	28'.1	215° 11'.4	28'.0	77° 08'.9	07'.6
03	47° 13'.0	201° 33'.3	19'.3	310° 39'.8	28'.1	230° 13'.3	27'.8	92° 11'.4	07'.6
04	62° 15'.4	216° 32'.9	20'.5	325° 40'.8	28'.1	245° 15'.3	27'.6	107° 14'.0	07'.7
05	77° 17'.9	231° 32'.5	21'.7	340° 41'.8	28'.1	260° 17'.3	27'.4	122° 16'.5	07'.7
06	92° 20'.4	246° 32'.1	22'.9	355° 42'.8	28'.1	275° 19'.2	27'.1	137° 19'.1	07'.7
07	107° 22'.8	261° 31'.7	24'.1	10° 43'.8	28'.1	290° 21'.2	26'.9	152° 21'.7	07'.7
08	122° 25'.3	276° 31'.3	25'.3	25° 44'.8	28'.1	305° 23'.2	26'.7	167° 24'.2	07'.8
09	137° 27'.7	291° 30'.9	26'.5	40° 45'.8	28'.1	320° 25'.1	26'.5	182° 26'.8	07'.8
10	152° 30'.2	306° 30'.5	27'.7	55° 46'.8	28'.1	335° 27'.1	26'.3	197° 29'.3	07'.8
11	167° 32'.7	321° 30'.1	28'.9	70° 47'.9	28'.1	350° 29'.1	26'.1	212° 31'.9	07'.8
12	182° 35'.1	336° 29'.7	10° 30'.1 S	85° 48'.9	23° 28'.1 N	5° 31'.0	2° 25'.9 N	227° 34'.4	18° 07'.9 S
13	197° 37'.6	351° 29'.3	31'.3	100° 49'.9	28'.1	20° 33'.0	25'.7	242° 37'.0	07'.9
14	212° 40'.1	6° 28'.9	32'.5	115° 50'.9	28'.1	35° 35'.0	25'.4	257° 39'.6	07'.9
15	227° 42'.5	21° 28'.5	33'.7	130° 51'.9	28'.0	50° 36'.9	25'.2	272° 42'.1	07'.9
16	242° 45'.0	36° 28'.1	34'.9	145° 52'.9	28'.0	65° 38'.9	25'.0	287° 44'.7	08'.0
17	257° 47'.5	51° 27'.7	36'.1	160° 53'.9	28'.0	80° 40'.9	24'.8	302° 47'.2	08'.0
18	272° 49'.9	66° 27'.3	37'.3	175° 55'.0	28'.0	95° 42'.8	24'.6	317° 49'.8	08'.0
19	287° 52'.4	81° 26'.9	38'.5	190° 56'.0	28'.0	110° 44'.8	24'.4	332° 52'.3	08'.0
20	302° 54'.8	96° 26'.5	39'.7	205° 57'.0	28'.0	125° 46'.8	24'.2	347° 54'.9	08'.1
21	317° 57'.3	111° 26'.1	40'.9	220° 58'.0	28'.0	140° 48'.7	23'.9	2° 57'.4	08'.1
22	332° 59'.8	126° 25'.7	42'.1	235° 59'.0	28'.0	155° 50'.7	23'.7	18° 00'.0	08'.1
23	348° 02'.2	141° 25'.3	43'.3	251° 00'.0	28'.0	170° 52'.7	23'.5	33° 02'.6	08'.1
	M.P. 23:52	v -0'.4	d 1'.2	v 1'.0	d 0'.0	v 2'.0	d 0'.2	v 2'.6	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.7	40° 19'.7 S
Achernar	335° 37'.6	57° 16'.1 S
Acrux	173° 27'.6	63° 03'.6 S
Adhara	255° 24'.8	28° 57'.5 S
Aldebaran	291° 07'.0	16° 29'.8 N
Alioth	166° 34'.7	56° 00'.0 N
Alkaid	153° 11'.4	49° 21'.1 N
Alnair	28° 02'.6	46° 59'.7 S
Alnilam	276° 02'.0	1° 12'.2 S
Alphard	218° 11'.5	8° 37'.5 S
Alphecca	126° 24'.3	26° 44'.5 N
Alpheratz	357° 59'.2	29° 03'.2 N
Altair	62° 23'.2	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.5 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.3 N
Atria	108° 01'.4	69° 01'.2 S
Avior	234° 24'.8	59° 28'.9 S
Bellatrix	278° 48'.6	6° 20'.7 N
Betelgeuse	271° 18'.0	7° 24'.5 N
Canopus	264° 03'.1	52° 41'.2 S
Capella	280° 57'.3	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.0	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.3 N
Elnath	278° 32'.1	28° 36'.1 N
Eltanin	90° 53'.3	51° 29'.7 N
Enif	34° 02'.1	9° 50'.7 N
Fomalhaut	15° 40'.6	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.4 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.5 S
Hamal	328° 18'.0	23° 25'.9 N
Kaus Aust.	84° 04'.3	34° 23'.4 S
Kochab	137° 20'.0	74° 11'.3 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.0	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.1 S
Miaplacidus	221° 43'.8	69° 41'.1 S
Mirfak	309° 02'.3	49° 50'.1 N
Nunki	76° 17'.4	26° 18'.4 S
Peacock	53° 43'.1	56° 45'.6 S
Polaris	323° 35'.8	89° 13'.8 N
Pollux	243° 46'.8	28° 02'.6 N
Procyon	245° 16'.0	5° 14'.7 N
Rasalhague	96° 20'.9	12° 34'.1 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 26'.9	8° 12'.4 S
Rigil Kent	140° 13'.4	60° 48'.4 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.0 N
Shaula	96° 43'.0	37° 06'.0 S
Sirius	258° 47'.4	16° 42'.1 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.2	43° 24'.0 S
Vega	80° 49'.4	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	155° 37'.5	13:33
Mars	264° 06'.2	06:19
Jupiter	183° 13'.8	11:41
Saturn	44° 55'.9	20:52

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
21 00	181° 43'.3	0° 41'.6 N	255° 53'.9	6'.5	21° 17'.1 N	6'.4	59'.0
01	196° 43'.5	40'.6	270° 19'.4	6'.4	10'.7	6'.6	
02	211° 43'.7	39'.6	284° 44'.8	6'.5	04'.1	6'.7	59'.1
03	226° 43'.9	38'.6	299° 10'.3	6'.5	20° 57'.4 N	6'.8	
04	241° 44'.2	37'.7	313° 35'.8	6'.5	50'.6	7'.0	
05	256° 44'.4	36'.7	328° 01'.3	6'.5	43'.6	7'.1	59'.2
06	271° 44'.6	35'.7	342° 26'.8	6'.6	36'.5	7'.2	
07	286° 44'.8	34'.8	356° 52'.4	6'.6	29'.3	7'.4	
08	301° 45'.0	33'.8	11° 18'.0	6'.6	21'.9	7'.5	59'.3
09	316° 45'.3	32'.8	25° 43'.6	6'.6	14'.4	7'.7	
10	331° 45'.5	31'.8	40° 09'.2	6'.6	06'.7	7'.8	
11	346° 45'.7	30'.9	54° 34'.8	6'.6	19° 58'.9 N	7'.9	
12	1° 45'.9	0° 29'.9 N	69° 00'.4	6'.7	19° 51'.0 N	8'.1	59'.4
13	16° 46'.1	28'.9	83° 26'.1	6'.7	42'.9	8'.2	
14	31° 46'.4	27'.9	97° 51'.8	6'.7	34'.7	8'.3	
15	46° 46'.6	27'.0	112° 17'.5	6'.8	26'.4	8'.5	59'.5
16	61° 46'.8	26'.0	126° 43'.3	6'.8	17'.9	8'.6	
17	76° 47'.0	25'.0	141° 09'.1	6'.8	09'.3	8'.7	
18	91° 47'.2	24'.1	155° 34'.9	6'.8	00'.6	8'.9	59'.6
19	106° 47'.5	23'.1	170° 00'.7	6'.8	18° 51'.7 N	8'.9	
20	121° 47'.7	22'.1	184° 26'.5	6'.9	42'.8	9'.2	
21	136° 47'.9	21'.1	198° 52'.4	6'.9	33'.6	9'.2	
22	151° 48'.1	20'.2	213° 18'.3	7'.0	24'.4	9'.4	59'.7
23	166° 48'.3	19'.2	227° 44'.3	6'.9	15'.0	9'.4	
22 00	181° 48'.6	0° 18'.2 N	242° 10'.2	7'.0	18° 05'.6 N	9'.6	59'.7
01	196° 48'.8	17'.2	256° 36'.2	7'.1	17° 56'.0 N	9'.8	59'.8
02	211° 49'.0	16'.3	271° 02'.3	7'.0	46'.2	9'.8	
03	226° 49'.2	15'.3	285° 28'.3	7'.1	36'.4	10'.0	
04	241° 49'.4	14'.3	299° 54'.4	7'.1	26'.4	10'.1	
05	256° 49'.6	13'.3	314° 20'.5	7'.2	16'.3	10'.2	59'.9
06	271° 49'.9	12'.4	328° 46'.7	7'.2	06'.1	10'.3	
07	286° 50'.1	11'.4	343° 12'.9	7'.2	16° 55'.8 N	10'.5	
08	301° 50'.3	10'.4	357° 39'.1	7'.3	45'.3	10'.5	
09	316° 50'.5	09'.5	12° 05'.4	7'.2	34'.8	10'.7	60'.0
10	331° 50'.7	08'.5	26° 31'.6	7'.3	24'.1	10'.8	
11	346° 51'.0	07'.5	40° 57'.9	7'.4	13'.3	10'.9	
12	1° 51'.2	0° 06'.5 N	55° 24'.3	7'.4	16° 02'.4 N	11'.0	60'.0
13	16° 51'.4	05'.6	69° 50'.7	7'.4	15° 51'.4 N	11'.1	60'.1
14	31° 51'.6	04'.6	84° 17'.1	7'.4	40'.3	11'.3	
15	46° 51'.8	03'.6	98° 43'.5	7'.5	29'.0	11'.3	
16	61° 52'.1	02'.6	113° 10'.0	7'.5	17'.7	11'.4	
17	76° 52'.3	01'.7	127° 36'.5	7'.6	06'.3	11'.6	60'.2
18	91° 52'.5	00'.7	142° 03'.1	7'.6	14° 54'.7 N	11'.6	
19	106° 52'.7	0° 00'.3 S	156° 29'.7	7'.6	43'.1	11'.8	
20	121° 52'.9	01'.3	170° 56'.3	7'.6	31'.3	11'.8	
21	136° 53'.1	02'.2	185° 22'.9	7'.7	19'.5	12'.0	60'.3
22	151° 53'.4	03'.2	199° 49'.6	7'.7	07'.5	12'.0	
23	166° 53'.6	04'.2	214° 16'.3	7'.8	13° 55'.5 N	12'.1	
23 00	181° 53'.8	0° 05'.1 S	228° 43'.1	7'.8	13° 43'.4 N	12'.3	60'.3
01	196° 54'.0	06'.1	243° 09'.9	7'.8	31'.1	12'.3	60'.4
02	211° 54'.2	07'.1	257° 36'.7	7'.8	18'.8	12'.4	
03	226° 54'.5	08'.1	272° 03'.5	7'.9	06'.4	12'.5	
04	241° 54'.7	09'.0	286° 30'.4	7'.9	12° 53'.9 N	12'.6	
05	256° 54'.9	10'.0	300° 57'.3	8'.0	41'.3	12'.7	
06	271° 55'.1	11'.0	315° 24'.3	8'.0	28'.6	12'.8	60'.5
07	286° 55'.3	12'.0	329° 51'.3	8'.0	15'.8	12'.8	
08	301° 55'.5	12'.9	344° 18'.3	8'.0	03'.0	13'.0	
09	316° 55'.8	13'.9	358° 45'.3	8'.1	11° 50'.0 N	13'.0	
10	331° 56'.0	14'.9	13° 12'.4	8'.1	37'.0	13'.1	
11	346° 56'.2	15'.9	27° 39'.5	8'.2	23'.9	13'.2	
12	1° 56'.4	0° 16'.8 S	42° 06'.7	8'.1	11° 10'.7 N	13'.3	60'.6
13	16° 56'.6	17'.8	56° 33'.8	8'.2	10° 57'.4 N	13'.3	
14	31° 56'.9	18'.8	71° 01'.0	8'.2	44'.1	13'.4	
15	46° 57'.1	19'.8	85° 28'.2	8'.3	30'.7	13'.5	
16	61° 57'.3	20'.7	99° 55'.5	8'.3	17'.2	13'.5	
17	76° 57'.5	21'.7	114° 22'.8	8'.3	03'.7	13'.7	
18	91° 57'.7	22'.7	128° 50'.1	8'.4	9° 50'.0 N	13'.6	60'.7
19	106° 57'.9	23'.7	143° 17'.5	8'.3	36'.4	13'.8	
20	121° 58'.2	24'.6	157° 44'.8	8'.4	22'.6	13'.8	
21	136° 58'.4	25'.6	172° 12'.2	8'.5	08'.8	13'.9	
22	151° 58'.6	26'.6	186° 39'.7	8'.4	8° 54'.9 N	14'.0	
23	166° 58'.8	27'.6	201° 07'.1	8'.5	40'.9	14'.0	
	SD 15'.9	d 1'.0	SD 16'.2		16'.4		16'.5

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
21	6 53	7 03	11:53	07:13	19:42	24d 32%
22	7 14	7 24	11:53	08:10	20:38	25d 22%
23	7 35	7 45	11:52	09:05	21:32	26d 13%

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1992 September 24, 25, 26 (Thur, Fri, Sat)

GMT	ARIES	VENUS -3.9		MARS +0.4		JUPITER -1.7		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
24 Thursday 00	3° 04'.7	156° 24'.9	10° 44'.5 S	266° 01'.1	23° 28'.0 N	185° 54'.6	2° 23'.3 N	48° 05'.1	18° 08'.2 S
01	18° 07'.2	171° 24'.5	45'.7	281° 02'.1	28'.0	200° 56'.6	23'.1	63° 07'.7	08'.2
02	33° 09'.6	186° 24'.1	46'.9	296° 03'.1	28'.0	215° 58'.6	22'.9	78° 10'.2	08'.2
03	48° 12'.1	201° 23'.7	48'.1	311° 04'.1	28'.0	231° 00'.5	22'.7	93° 12'.8	08'.2
04	63° 14'.6	216° 23'.3	49'.3	326° 05'.1	28'.0	246° 02'.5	22'.5	108° 15'.3	08'.3
05	78° 17'.0	231° 22'.9	50'.5	341° 06'.2	28'.0	261° 04'.5	22'.2	123° 17'.9	08'.3
06	93° 19'.5	246° 22'.5	51'.6	356° 07'.2	28'.0	276° 06'.4	22'.0	138° 20'.4	08'.3
07	108° 22'.0	261° 22'.1	52'.8	11° 08'.2	27'.9	291° 08'.4	21'.8	153° 23'.0	08'.3
08	123° 24'.4	276° 21'.7	54'.0	26° 09'.2	27'.9	306° 10'.4	21'.6	168° 25'.5	08'.4
09	138° 26'.9	291° 21'.3	55'.2	41° 10'.3	27'.9	321° 12'.3	21'.4	183° 28'.1	08'.4
10	153° 29'.3	306° 20'.8	56'.4	56° 11'.3	27'.9	336° 14'.3	21'.2	198° 30'.6	08'.4
11	168° 31'.8	321° 20'.4	57'.6	71° 12'.3	27'.9	351° 16'.3	21'.0	213° 33'.2	08'.4
12	183° 34'.3	336° 20'.0	10° 58'.8 S	86° 13'.3	23° 27'.9 N	6° 18'.2	2° 20'.7 N	228° 35'.7	18° 08'.5 S
13	198° 36'.7	351° 19'.6	11° 00'.0 S	101° 14'.3	27'.9	21° 20'.2	20'.5	243° 38'.3	08'.5
14	213° 39'.2	6° 19'.2	01'.2	116° 15'.4	27'.9	36° 22'.2	20'.3	258° 40'.8	08'.5
15	228° 41'.7	21° 18'.8	02'.4	131° 16'.4	27'.9	51° 24'.1	20'.1	273° 43'.4	08'.5
16	243° 44'.1	36° 18'.4	03'.5	146° 17'.4	27'.9	66° 26'.1	19'.9	288° 46'.0	08'.6
17	258° 46'.6	51° 18'.0	04'.7	161° 18'.5	27'.9	81° 28'.1	19'.7	303° 48'.5	08'.6
18	273° 49'.1	66° 17'.6	05'.9	176° 19'.5	27'.9	96° 30'.0	19'.5	318° 51'.1	08'.6
19	288° 51'.5	81° 17'.2	07'.1	191° 20'.5	27'.8	111° 32'.0	19'.3	333° 53'.6	08'.6
20	303° 54'.0	96° 16'.7	08'.3	206° 21'.5	27'.8	126° 34'.0	19'.0	348° 56'.2	08'.7
21	318° 56'.4	111° 16'.3	09'.5	221° 22'.6	27'.8	141° 35'.9	18'.8	3° 58'.7	08'.7
22	333° 58'.9	126° 15'.9	10'.7	236° 23'.6	27'.8	156° 37'.9	18'.6	19° 01'.3	08'.7
23	349° 01'.4	141° 15'.5	11'.8	251° 24'.6	27'.8	171° 39'.9	18'.4	34° 03'.8	08'.7
25 Friday 00	4° 03'.8	156° 15'.1	11° 13'.0 S	266° 25'.7	23° 27'.8 N	186° 41'.8	2° 18'.2 N	49° 06'.4	18° 08'.8 S
01	19° 06'.3	171° 14'.7	14'.2	281° 26'.7	27'.8	201° 43'.8	18'.0	64° 08'.9	08'.8
02	34° 08'.8	186° 14'.3	15'.4	296° 27'.7	27'.8	216° 45'.8	17'.8	79° 11'.5	08'.8
03	49° 11'.2	201° 13'.9	16'.6	311° 28'.7	27'.8	231° 47'.7	17'.6	94° 14'.0	08'.8
04	64° 13'.7	216° 13'.4	17'.8	326° 29'.8	27'.7	246° 49'.7	17'.3	109° 16'.6	08'.9
05	79° 16'.2	231° 13'.0	18'.9	341° 30'.8	27'.7	261° 51'.7	17'.1	124° 19'.1	08'.9
06	94° 18'.6	246° 12'.6	20'.1	356° 31'.8	27'.7	276° 53'.6	16'.9	139° 21'.7	08'.9
07	109° 21'.1	261° 12'.2	21'.3	11° 32'.9	27'.7	291° 55'.6	16'.7	154° 24'.2	08'.9
08	124° 23'.6	276° 11'.8	22'.5	26° 33'.9	27'.7	306° 57'.6	16'.5	169° 26'.8	08'.9
09	139° 26'.0	291° 11'.4	23'.7	41° 34'.9	27'.7	321° 59'.5	16'.3	184° 29'.3	09'.0
10	154° 28'.5	306° 10'.9	24'.9	56° 36'.0	27'.7	337° 01'.5	16'.1	199° 31'.9	09'.0
11	169° 30'.9	321° 10'.5	26'.0	71° 37'.0	27'.7	352° 03'.5	15'.8	214° 34'.4	09'.0
12	184° 33'.4	336° 10'.1	11° 27'.2 S	86° 38'.0	23° 27'.7 N	7° 05'.4	2° 15'.6 N	229° 37'.0	18° 09'.0 S
13	199° 35'.9	351° 09'.7	28'.4	101° 39'.1	27'.6	22° 07'.4	15'.4	244° 39'.5	09'.1
14	214° 38'.3	6° 09'.3	29'.6	116° 40'.1	27'.6	37° 09'.4	15'.2	259° 42'.1	09'.1
15	229° 40'.8	21° 08'.9	30'.7	131° 41'.2	27'.6	52° 11'.4	15'.0	274° 44'.6	09'.1
16	244° 43'.3	36° 08'.4	31'.9	146° 42'.2	27'.6	67° 13'.3	14'.8	289° 47'.2	09'.1
17	259° 45'.7	51° 08'.0	33'.1	161° 43'.2	27'.6	82° 15'.3	14'.6	304° 49'.7	09'.2
18	274° 48'.2	66° 07'.6	34'.3	176° 44'.3	27'.6	97° 17'.3	14'.4	319° 52'.2	09'.2
19	289° 50'.7	81° 07'.2	35'.5	191° 45'.3	27'.6	112° 19'.2	14'.1	334° 54'.8	09'.2
20	304° 53'.1	96° 06'.8	36'.6	206° 46'.3	27'.5	127° 21'.2	13'.9	349° 57'.3	09'.2
21	319° 55'.6	111° 06'.3	37'.8	221° 47'.4	27'.5	142° 23'.2	13'.7	4° 59'.9	09'.2
22	334° 58'.1	126° 05'.9	39'.0	236° 48'.4	27'.5	157° 25'.1	13'.5	20° 02'.4	09'.3
23	350° 00'.5	141° 05'.5	40'.2	251° 49'.5	27'.5	172° 27'.1	13'.3	35° 05'.0	09'.3
26 Saturday 00	5° 03'.0	156° 05'.1	11° 41'.3 S	266° 50'.5	23° 27'.5 N	187° 29'.1	2° 13'.1 N	50° 07'.5	18° 09'.3 S
01	20° 05'.4	171° 04'.6	42'.5	281° 51'.6	27'.5	202° 31'.0	12'.9	65° 10'.1	09'.3
02	35° 07'.9	186° 04'.2	43'.7	296° 52'.6	27'.5	217° 33'.0	12'.7	80° 12'.6	09'.4
03	50° 10'.4	201° 03'.8	44'.8	311° 53'.6	27'.4	232° 35'.0	12'.4	95° 15'.2	09'.4
04	65° 12'.8	216° 03'.4	46'.0	326° 54'.7	27'.4	247° 36'.9	12'.2	110° 17'.7	09'.4
05	80° 15'.3	231° 03'.0	47'.2	341° 55'.7	27'.4	262° 38'.9	12'.0	125° 20'.3	09'.4
06	95° 17'.8	246° 02'.5	48'.4	356° 56'.8	27'.4	277° 40'.9	11'.8	140° 22'.8	09'.4
07	110° 20'.2	261° 02'.1	49'.5	11° 57'.8	27'.4	292° 42'.8	11'.6	155° 25'.4	09'.5
08	125° 22'.7	276° 01'.7	50'.7	26° 58'.9	27'.4	307° 44'.8	11'.4	170° 27'.9	09'.5
09	140° 25'.2	291° 01'.3	51'.9	41° 59'.9	27'.4	322° 46'.8	11'.2	185° 30'.4	09'.5
10	155° 27'.6	306° 00'.8	53'.0	57° 00'.9	27'.3	337° 48'.7	10'.9	200° 33'.0	09'.5
11	170° 30'.1	321° 00'.4	54'.2	72° 02'.0	27'.3	352° 50'.7	10'.7	215° 35'.5	09'.6
12	185° 32'.5	336° 00'.0	11° 55'.4 S	87° 03'.0	23° 27'.3 N	7° 52'.7	2° 10'.5 N	230° 38'.1	18° 09'.6 S
13	200° 35'.0	350° 59'.5	56'.5	102° 04'.1	27'.3	22° 54'.6	10'.3	245° 40'.6	09'.6
14	215° 37'.5	5° 59'.1	57'.7	117° 05'.1	27'.3	37° 56'.6	10'.1	260° 43'.2	09'.6
15	230° 39'.9	20° 58'.7	58'.9	132° 06'.2	27'.3	52° 58'.6	09'.9	275° 45'.7	09'.6
16	245° 42'.4	35° 58'.3	12° 00'.1 S	147° 07'.2	27'.2	68° 00'.5	09'.7	290° 48'.3	09'.7
17	260° 44'.9	50° 57'.8	01'.2	162° 08'.3	27'.2	83° 02'.5	09'.5	305° 50'.8	09'.7
18	275° 47'.3	65° 57'.4	02'.4	177° 09'.3	27'.2	98° 04'.5	09'.2	320° 53'.3	09'.7
19	290° 49'.8	80° 57'.0	03'.5	192° 10'.4	27'.2	113° 06'.5	09'.0	335° 55'.9	09'.7
20	305° 52'.3	95° 56'.6	04'.7	207° 11'.4	27'.2	128° 08'.4	08'.8	350° 58'.4	09'.8
21	320° 54'.7	110° 56'.1	05'.9	222° 12'.5	27'.1	143° 10'.4	08'.6	6° 01'.0	09'.8
22	335° 57'.2	125° 55'.7	07'.0	237° 13'.5	27'.1	158° 12'.4	08'.4	21° 03'.5	09'.8
23	350° 59'.7	140° 55'.3	08'.2	252° 14'.6	27'.1	173° 14'.3	08'.2	36° 06'.1	09'.8
	M.P. 23:40	v -0'.4	d 1'.2	v 1'.0	d 0'.0	v 2'.0	d 0'.2	v 2'.5	d 0'.0

STARS	SHA	Dec
Acamar	315° 29'.7	40° 19'.7 S
Achernar	335° 37'.6	57° 16'.1 S
Acrux	173° 27'.6	63° 03'.6 S
Adhara	255° 24'.8	28° 57'.5 S
Aldebaran	291° 07'.0	16° 29'.8 N
Alioth	166° 34'.7	56° 00'.0 N
Alkaid	153° 11'.4	49° 21'.0 N
Alnair	28° 02'.6	46° 59'.7 S
Alnilam	276° 02'.0	1° 12'.2 S
Alphard	218° 11'.5	8° 37'.5 S
Alphecca	126° 24'.3	26° 44'.5 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.2	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.5 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.3 N
Atria	108° 01'.4	69° 01'.2 S
Avior	234° 24'.7	59° 28'.9 S
Bellatrix	278° 48'.5	6° 20'.7 N
Betelgeuse	271° 18'.0	7° 24'.5 N
Canopus	264° 03'.0	52° 41'.2 S
Capella	280° 57'.2	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.0	18° 01'.3 S
Dubhe	194° 11'.1	61° 47'.3 N
Elnath	278° 32'.1	28° 36'.1 N
Eltanin	90° 53'.4	51° 29'.7 N
Enif	34° 02'.1	9° 50'.7 N
Fomalhaut	15° 40'.6	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.4 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.4 S
Hamal	328° 18'.0	23° 25'.9 N
Kaus Aust.	84° 04'.3	34° 23'.4 S
Kochab	137° 20'.1	74° 11'.3 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.0	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.1 S
Miaplacidus	221° 43'.7	69° 41'.1 S
Mirfak	309° 02'.3	49° 50'.1 N
Nunki	76° 17'.4	26° 18'.4 S
Peacock	53° 43'.1	56° 45'.6 S
Polaris	323° 35'.1	89° 13'.8 N
Pollux	243° 46'.7	28° 02'.6 N
Procyon	245° 16'.0	5° 14'.7 N
Rasalhague	96° 20'.9	12° 34'.1 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 26'.8	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.4 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.0 N
Shaula	96° 43'.0	37° 06'.0 S
Sirius	258° 47'.4	16° 42'.1 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.2	43° 24'.0 S
Vega	80° 49'.4	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	152° 11'.3	13:35
Mars	262° 21'.8	06:14
Jupiter	182° 38'.0	11:32
Saturn	45° 02'.5	20:40

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
181° 59'.0	0° 28'.5 S	215° 34'.6	8'.5	8° 26'.9 N	14'.0	60'.7
196° 59'.2	29'.5	230° 02'.1	8'.5	12'.9	14'.1	60'.8
211° 59'.5	30'.5	244° 29'.6	8'.6	7° 58'.8 N	14'.2	
226° 59'.7	31'.4	258° 57'.2	8'.5	44'.6	14'.3	
241° 59'.9	32'.4	273° 24'.7	8'.6	30'.3	14'.2	
257° 00'.1	33'.4	287° 52'.3	8'.7	16'.1	14'.4	
272° 00'.3	34'.4	302° 20'.0	8'.6	01'.7	14'.3	
287° 00'.5	35'.3	316° 47'.6	8'.7	6° 47'.4 N	14'.5	
302° 00'.7	36'.3	331° 15'.3	8'.7	32'.9	14'.4	
317° 01'.0	37'.3	345° 43'.0	8'.7	18'.5	14'.5	
332° 01'.2	38'.3	0° 10'.7	8'.7	04'.0	14'.6	60'.9
347° 01'.4	39'.2	14° 38'.4	8'.7	5° 49'.4 N	14'.6	
2° 01'.6	0° 40'.2 S	29° 06'.1	8'.8	5° 34'.8 N	14'.6	60'.9
17° 01'.8	41'.2	43° 33'.9	8'.8	20'.2	14'.7	
32° 02'.0	42'.2	58° 01'.7	8'.8	05'.5	14'.7	
47° 02'.3	43'.1	72° 29'.5	8'.8	4° 50'.8 N	14'.7	
62° 02'.5	44'.1	86° 57'.3	8'.8	36'.1	14'.8	
77° 02'.7	45'.1	101° 25'.1	8'.9	21'.3	14'.8	
92° 02'.9	46'.1	115° 53'.0	8'.9	06'.5	14'.8	
107° 03'.1	47'.0	130° 20'.9	8'.8	3° 51'.7 N	14'.8	
122° 03'.3	48'.0	144° 48'.7	8'.9	36'.9	14'.9	
137° 03'.6	49'.0	159° 16'.6	8'.9	22'.0	14'.9	
152° 03'.8	50'.0	173° 44'.5	8'.9	07'.1	14'.9	
167° 04'.0	50'.9	188° 12'.4	9'.0	2° 52'.2 N	15'.0	
182° 04'.2	0° 51'.9 S	202° 40'.4	8'.9	2° 37'.2 N	14'.9	60'.9
197° 04'.4	52'.9	217° 08'.3	8'.9	22'.3	15'.0	
212° 04'.6	53'.9	231° 36'.2	9'.0	07'.3	14'.9	
227° 04'.8	54'.8	246° 04'.2	9'.0	1° 52'.4 N	15'.0	
242° 05'.1	55'.8	260° 32'.2	8'.9	37'.4	15'.0	
257° 05'.3	56'.8	275° 00'.1	9'.0	22'.4	15'.0	
272° 05'.5	57'.8	289° 28'.1	9'.0	07'.4	15'.0	
287° 05'.7	58'.7	303° 56'.1	9'.0	0° 52'.4 N	15'.1	
302° 05'.9	59'.7	318° 24'.1	9'.0	37'.3	15'.0	
317° 06'.1	1° 00'.7 S	332° 52'.1	9'.0	22'.3	15'.0	
332° 06'.3	01'.7	347° 20'.1	9'.0	07'.3	15'.0	
347° 06'.6	02'.6	1° 48'.1	9'.0	0° 07'.7 S	15'.0	
2° 06'.8	1° 03'.6 S	16° 16'.1	9'.0	0° 22'.7 S	15'.0	60'.9
17° 07'.0	04'.6	30° 44'.1	9'.0	37'.7	15'.0	
32° 07'.2	05'.6	45° 12'.1	9'.0	52'.7	15'.0	
47° 07'.4	06'.5	59° 40'.1	9'.0	1° 07'.7 S	15'.0	
62° 07'.6	07'.5	74° 08'.1	9'.0	22'.7	15'.0	
77° 07'.8	08'.5	88° 36'.1	9'.0	37'.7	15'.0	
92° 08'.0	09'.4	103° 04'.1	9'.0	52'.7	14'.9	
107° 08'.3	10'.4	117° 32'.1	9'.0	2° 07'.6 S	14'.9	
122° 08'.5	11'.4	132° 00'.1	9'.0	22'.5	14'.9	60'.8
137° 08'.7	12'.4	146° 28'.1	9'.0	37'.4	14'.9	
152° 08'.9	13'.3	160° 56'.1	9'.0	52'.3	14'.9	
167° 09'.1	14'.3	175° 24'.1	9'.0	3° 07'.2 S	14'.8	
182° 09'.3	1° 15'.3 S	189° 52'.1	9'.0	3° 22'.0 S	14'.9	60'.8
197° 09'.5	16'.3	204° 20'.1	9'.0	36'.9	14'.8	
212° 09'.8	17'.2	218° 48'.1	8'.9	51'.7	14'.7	
227° 10'.0	18'.2	233° 16'.0	9'.0	4° 06'.4 S	14'.7	
242° 10'.2	19'.2	247° 44'.0	9'.0	21'.1	14'.7	
257° 10'.4	20'.2	262° 12'.0	8'.9	35'.8	14'.7	60'.7
272° 10'.6	21'.1	276° 39'.9	8'.9	50'.5	14'.6	
287° 10'.8	22'.1	291° 07'.8	9'.0	5° 05'.1 S	14'.6	
302° 11'.0	23'.1	305° 35'.8	8'.9	19'.7	14'.6	
317° 11'.2	24'.1	320° 03'.7	8'.9	34'.3	14'.5	
332° 11'.5	25'.0	334° 31'.6	8'.9	48'.8	14'.4	
347° 11'.7	26'.0	348° 59'.5	8'.8	6° 03'.2 S	14'.5	
2° 11'.9	1° 27'.0 S	3° 27'.3	8'.9	6° 17'.7 S	14'.3	60'.6
17° 12'.1	28'.0	17° 55'.2	8'.9	32'.0	14'.4	
32° 12'.3	28'.9	32° 23'.1	8'.8	46'.4	14'.2	
47° 12'.5	29'.9	46° 50'.9	8'.8	7° 00'.6 S	14'.3	
62° 12'.7	30'.9	61° 18'.7	8'.8	14'.9	14'.1	
77° 12'.9	31'.9	75° 46'.5	8'.8	29'.0	14'.1	60'.5
92° 13'.1	32'.8	90° 14'.3	8'.8	43'.1	14'.1	
107° 13'.4	33'.8	104° 42'.1	8'.8	57'.2	14'.0	
122° 13'.6	34'.8	119° 09'.9	8'.7	8° 11'.2 S	13'.9	
137° 13'.8	35'.8	133° 37'.6	8'.7	25'.1	13'.9	
152° 14'.0	36'.7	148° 05'.3	8'.7	39'.0	13'.8	60'.4
167° 14'.2	37'.7	162° 33'.0	8'.7	52'.8	13'.8	
SD 16'.0	d 1'.0	SD	16'.6	16'.6	16'.5	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON ● Age/ Vis
24	7 56	8 06	11:52	09:59	22:26	27d 6%
25	8 16	8 27	11:52	10:53	23:19	28d 2%
26	8 37	8 47	11:51	11:46	24:12	0d 0%

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1992 September 27, 28, 29 (Sun, Mon, Tue)

GMT	ARIES	VENUS -3.9		MARS +0.3		JUPITER -1.7		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
27 Sunday 00	6° 02'.1	155° 54'.8	12° 09'.4 S	267° 15'.6	23° 27'.1 N	188° 16'.3	2° 08'.0 N	51° 08'.6	18° 09'.8 S
01	21° 04'.6	170° 54'.4	10'.5	282° 16'.7	27'.1	203° 18'.3	07'.8	66° 11'.1	09'.9
02	36° 07'.0	185° 54'.0	11'.7	297° 17'.7	27'.1	218° 20'.2	07'.5	81° 13'.7	09'.9
03	51° 09'.5	200° 53'.5	12'.9	312° 18'.8	27'.0	233° 22'.2	07'.3	96° 16'.2	09'.9
04	66° 12'.0	215° 53'.1	14'.0	327° 19'.9	27'.0	248° 24'.2	07'.1	111° 18'.8	09'.9
05	81° 14'.4	230° 52'.7	15'.2	342° 20'.9	27'.0	263° 26'.1	06'.9	126° 21'.3	09'.9
06	96° 16'.9	245° 52'.2	16'.3	357° 22'.0	27'.0	278° 28'.1	06'.7	141° 23'.9	10'.0
07	111° 19'.4	260° 51'.8	17'.5	12° 23'.0	27'.0	293° 30'.1	06'.5	156° 26'.4	10'.0
08	126° 21'.8	275° 51'.4	18'.7	27° 24'.1	26'.9	308° 32'.0	06'.3	171° 28'.9	10'.0
09	141° 24'.3	290° 50'.9	19'.8	42° 25'.1	26'.9	323° 34'.0	06'.1	186° 31'.5	10'.0
10	156° 26'.8	305° 50'.5	21'.0	57° 26'.2	26'.9	338° 36'.0	05'.8	201° 34'.0	10'.1
11	171° 29'.2	320° 50'.1	22'.1	72° 27'.3	26'.9	353° 37'.9	05'.6	216° 36'.6	10'.1
12	186° 31'.7	335° 49'.6	12° 23'.3 S	87° 28'.3	23° 26'.9 N	8° 39'.9	2° 05'.4 N	231° 39'.1	18° 10'.1 S
13	201° 34'.1	350° 49'.2	24'.4	102° 29'.4	26'.8	23° 41'.9	05'.2	246° 41'.7	10'.1
14	216° 36'.6	5° 48'.8	25'.6	117° 30'.4	26'.8	38° 43'.8	05'.0	261° 44'.2	10'.1
15	231° 39'.1	20° 48'.3	26'.8	132° 31'.5	26'.8	53° 45'.8	04'.8	276° 46'.7	10'.2
16	246° 41'.5	35° 47'.9	27'.9	147° 32'.5	26'.8	68° 47'.8	04'.6	291° 49'.3	10'.2
17	261° 44'.0	50° 47'.4	29'.1	162° 33'.6	26'.8	83° 49'.8	04'.4	306° 51'.8	10'.2
18	276° 46'.5	65° 47'.0	30'.2	177° 34'.7	26'.7	98° 51'.7	04'.1	321° 54'.4	10'.2
19	291° 48'.9	80° 46'.6	31'.4	192° 35'.7	26'.7	113° 53'.7	03'.9	336° 56'.9	10'.2
20	306° 51'.4	95° 46'.1	32'.5	207° 36'.8	26'.7	128° 55'.7	03'.7	351° 59'.4	10'.3
21	321° 53'.9	110° 45'.7	33'.7	222° 37'.9	26'.7	143° 57'.6	03'.5	7° 02'.0	10'.3
22	336° 56'.3	125° 45'.2	34'.8	237° 38'.9	26'.7	158° 59'.6	03'.3	22° 04'.5	10'.3
23	351° 58'.8	140° 44'.8	36'.0	252° 40'.0	26'.6	174° 01'.6	03'.1	37° 07'.1	10'.3
28 Monday 00	7° 01'.3	155° 44'.4	12° 37'.1 S	267° 41'.0	23° 26'.6 N	189° 03'.5	2° 02'.9 N	52° 09'.6	18° 10'.3 S
01	22° 03'.7	170° 43'.9	38'.3	282° 42'.1	26'.6	204° 05'.5	02'.7	67° 12'.1	10'.4
02	37° 06'.2	185° 43'.5	39'.4	297° 43'.2	26'.6	219° 07'.5	02'.4	82° 14'.7	10'.4
03	52° 08'.6	200° 43'.0	40'.6	312° 44'.2	26'.5	234° 09'.4	02'.2	97° 17'.2	10'.4
04	67° 11'.1	215° 42'.6	41'.7	327° 45'.3	26'.5	249° 11'.4	02'.0	112° 19'.7	10'.4
05	82° 13'.6	230° 42'.2	42'.9	342° 46'.4	26'.5	264° 13'.4	01'.8	127° 22'.3	10'.4
06	97° 16'.0	245° 41'.7	44'.0	357° 47'.4	26'.5	279° 15'.3	01'.6	142° 24'.8	10'.5
07	112° 18'.5	260° 41'.3	45'.2	12° 48'.5	26'.5	294° 17'.3	01'.4	157° 27'.4	10'.5
08	127° 21'.0	275° 40'.8	46'.3	27° 49'.6	26'.4	309° 19'.3	01'.2	172° 29'.9	10'.5
09	142° 23'.4	290° 40'.4	47'.5	42° 50'.7	26'.4	324° 21'.2	01'.0	187° 32'.4	10'.5
10	157° 25'.9	305° 39'.9	48'.6	57° 51'.7	26'.4	339° 23'.2	00'.7	202° 35'.0	10'.5
11	172° 28'.4	320° 39'.5	49'.8	72° 52'.8	26'.4	354° 25'.2	00'.5	217° 37'.5	10'.6
12	187° 30'.8	335° 39'.0	12° 50'.9 S	87° 53'.9	23° 26'.3 N	9° 27'.2	2° 00'.3 N	232° 40'.0	18° 10'.6 S
13	202° 33'.3	350° 38'.6	52'.1	102° 54'.9	26'.3	24° 29'.1	00'.1	247° 42'.6	10'.6
14	217° 35'.7	5° 38'.2	53'.2	117° 56'.0	26'.3	39° 31'.1	1° 59'.9 N	262° 45'.1	10'.6
15	232° 38'.2	20° 37'.7	54'.3	132° 57'.1	26'.3	54° 33'.1	59'.7	277° 47'.7	10'.6
16	247° 40'.7	35° 37'.3	55'.5	147° 58'.1	26'.2	69° 35'.0	59'.5	292° 50'.2	10'.7
17	262° 43'.1	50° 36'.8	56'.6	162° 59'.2	26'.2	84° 37'.0	59'.3	307° 52'.7	10'.7
18	277° 45'.6	65° 36'.4	57'.8	178° 00'.3	26'.2	99° 39'.0	59'.0	322° 55'.3	10'.7
19	292° 48'.1	80° 35'.9	58'.9	193° 01'.4	26'.2	114° 40'.9	58'.8	337° 57'.8	10'.7
20	307° 50'.5	95° 35'.5	13° 00'.1 S	208° 02'.4	26'.1	129° 42'.9	58'.6	353° 00'.3	10'.7
21	322° 53'.0	110° 35'.0	01'.2	223° 03'.5	26'.1	144° 44'.9	58'.4	8° 02'.9	10'.8
22	337° 55'.5	125° 34'.6	02'.3	238° 04'.6	26'.1	159° 46'.8	58'.2	23° 05'.4	10'.8
23	352° 57'.9	140° 34'.1	03'.5	253° 05'.7	26'.1	174° 48'.8	58'.0	38° 07'.9	10'.8
29 Tuesday 00	8° 00'.4	155° 33'.7	13° 04'.6 S	268° 06'.7	23° 26'.0 N	189° 50'.8	1° 57'.8 N	53° 10'.5	18° 10'.8 S
01	23° 02'.9	170° 33'.2	05'.8	283° 07'.8	26'.0	204° 52'.8	57'.6	68° 13'.0	10'.8
02	38° 05'.3	185° 32'.8	06'.9	298° 08'.9	26'.0	219° 54'.7	57'.3	83° 15'.6	10'.9
03	53° 07'.8	200° 32'.3	08'.0	313° 10'.0	26'.0	234° 56'.7	57'.1	98° 18'.1	10'.9
04	68° 10'.2	215° 31'.9	09'.2	328° 11'.1	25'.9	249° 58'.7	56'.9	113° 20'.6	10'.9
05	83° 12'.7	230° 31'.4	10'.3	343° 12'.1	25'.9	265° 00'.6	56'.7	128° 23'.2	10'.9
06	98° 15'.2	245° 31'.0	11'.4	358° 13'.2	25'.9	280° 02'.6	56'.5	143° 25'.7	10'.9
07	113° 17'.6	260° 30'.5	12'.6	13° 14'.3	25'.9	295° 04'.6	56'.3	158° 28'.2	10'.9
08	128° 20'.1	275° 30'.1	13'.7	28° 15'.4	25'.8	310° 06'.5	56'.1	173° 30'.8	11'.0
09	143° 22'.6	290° 29'.6	14'.8	43° 16'.4	25'.8	325° 08'.5	55'.9	188° 33'.3	11'.0
10	158° 25'.0	305° 29'.1	16'.0	58° 17'.5	25'.8	340° 10'.5	55'.7	203° 35'.8	11'.0
11	173° 27'.5	320° 28'.7	17'.1	73° 18'.6	25'.7	355° 12'.4	55'.4	218° 38'.4	11'.0
12	188° 30'.0	335° 28'.2	13° 18'.2 S	88° 19'.7	23° 25'.7 N	10° 14'.4	1° 55'.2 N	233° 40'.9	18° 11'.0 S
13	203° 32'.4	350° 27'.8	19'.4	103° 20'.8	25'.7	25° 16'.4	55'.0	248° 43'.4	11'.1
14	218° 34'.9	5° 27'.3	20'.5	118° 21'.9	25'.7	40° 18'.4	54'.8	263° 46'.0	11'.1
15	233° 37'.4	20° 26'.9	21'.6	133° 22'.9	25'.6	55° 20'.3	54'.6	278° 48'.5	11'.1
16	248° 39'.8	35° 26'.4	22'.8	148° 24'.0	25'.6	70° 22'.3	54'.4	293° 51'.0	11'.1
17	263° 42'.3	50° 26'.0	23'.9	163° 25'.1	25'.6	85° 24'.3	54'.2	308° 53'.6	11'.1
18	278° 44'.7	65° 25'.5	25'.0	178° 26'.2	25'.6	100° 26'.2	54'.0	323° 56'.1	11'.2
19	293° 47'.2	80° 25'.0	26'.2	193° 27'.3	25'.5	115° 28'.2	53'.7	338° 58'.6	11'.2
20	308° 49'.7	95° 24'.6	27'.3	208° 28'.4	25'.5	130° 30'.2	53'.5	354° 01'.2	11'.2
21	323° 52'.1	110° 24'.1	28'.4	223° 29'.5	25'.5	145° 32'.1	53'.3	9° 03'.7	11'.2
22	338° 54'.6	125° 23'.7	29'.5	238° 30'.5	25'.4	160° 34'.1	53'.1	24° 06'.2	11'.2
23	353° 57'.1	140° 23'.2	30'.7	253° 31'.6	25'.4	175° 36'.1	52'.9	39° 08'.7	11'.2
	M.P. 23:28	v -0'.4	d 1'.1	v 1'.1	d 0'.0	v 2'.0	d 0'.2	v 2'.5	d 0'.0

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 29'.7	40° 19'.7 S	182° 14'.4	1° 38'.7 S	177° 00'.7	8'.7	9° 06'.6 S	13'.7	60'.4
Achernar	335° 37'.6	57° 16'.2 S	197° 14'.6	39'.6	191° 28'.4	8'.6	20'.3	13'.6	
Acrux	173° 27'.6	63° 03'.6 S	212° 14'.8	40'.6	205° 56'.0	8'.7	33'.9	13'.6	
Adhara	255° 24'.7	28° 57'.5 S	227° 15'.0	41'.6	220° 23'.7	8'.6	47'.5	13'.4	60'.3
Aldebaran	291° 07'.0	16° 29'.8 N	242° 15'.3	42'.6	234° 51'.3	8'.6	10° 00'.9 S	13'.5	
			257° 15'.5	43'.5	249° 18'.9	8'.6	14'.4	13'.3	
Alioth	166° 34'.7	55° 59'.9 N	272° 15'.7	44'.5	263° 46'.5	8'.5	27'.7	13'.3	
Alkaid	153° 11'.4	49° 21'.0 N	287° 15'.9	45'.5	278° 14'.0	8'.6	41'.0	13'.1	60'.2
Alnair	28° 02'.6	46° 59'.7 S	302° 16'.1	46'.5	292° 41'.6	8'.5	54'.1	13'.1	
Alnilam	276° 02'.0	1° 12'.2 S	317° 16'.3	47'.4	307° 09'.1	8'.5	11° 07'.2 S	13'.1	
Alphard	218° 11'.5	8° 37'.5 S	332° 16'.5	48'.4	321° 36'.6	8'.4	20'.3	12'.9	
			347° 16'.7	49'.4	336° 04'.0	8'.5	33'.2	12'.9	60'.1
Alphecca	126° 24'.3	26° 44'.5 N	2° 16'.9	1° 50'.4 S	350° 31'.5	8'.4	11° 46'.1 S	12'.8	60'.1
Alpheratz	357° 59'.2	29° 03'.3 N	17° 17'.1	51'.3	4° 58'.9	8'.4	58'.9	12'.7	
Altair	62° 23'.2	8° 51'.2 N	32° 17'.4	52'.3	19° 26'.3	8'.4	12° 11'.6 S	12'.6	
Ankaa	353° 30'.4	42° 20'.5 S	47° 17'.6	53'.3	33° 53'.7	8'.4	24'.2	12'.5	60'.0
Antares	112° 45'.4	26° 25'.0 S	62° 17'.8	54'.3	48° 21'.1	8'.3	36'.7	12'.4	
			77° 18'.0	55'.2	62° 48'.4	8'.3	49'.1	12'.4	
Arcturus	146° 10'.1	19° 13'.3 N	92° 18'.2	56'.2	77° 15'.7	8'.3	13° 01'.5 S	12'.2	59'.9
Atria	108° 01'.5	69° 01'.2 S	107° 18'.4	57'.2	91° 43'.0	8'.3	13'.7	12'.2	
Avior	234° 24'.7	59° 28'.9 S	122° 18'.6	58'.1	106° 10'.3	8'.2	25'.9	12'.0	
Bellatrix	278° 48'.5	6° 20'.7 N	137° 18'.8	59'.1	120° 37'.5	8'.3	37'.9	12'.0	59'.8
Betelgeuse	271° 18'.0	7° 24'.5 N	152° 19'.0	2° 00'.1 S	135° 04'.8	8'.2	49'.9	11'.9	
			167° 19'.2	01'.1	149° 32'.0	8'.1	14° 01'.8 S	11'.8	
Canopus	264° 03'.0	52° 41'.2 S	182° 19'.4	2° 02'.0 S	163° 59'.1	8'.2	14° 13'.6 S	11'.6	59'.8
Capella	280° 57'.2	45° 59'.4 N	197° 19'.7	03'.0	178° 26'.3	8'.1	25'.2	11'.6	59'.7
Deneb	49° 41'.8	45° 15'.6 N	212° 19'.9	04'.0	192° 53'.4	8'.1	36'.8	11'.5	
Denebola	182° 49'.7	14° 36'.8 N	227° 20'.1	05'.0	207° 20'.5	8'.1	48'.3	11'.3	
Diphda	349° 11'.0	18° 01'.3 S	242° 20'.3	05'.9	221° 47'.6	8'.1	59'.6	11'.3	59'.6
			257° 20'.5	06'.9	236° 14'.7	8'.1	15° 10'.9 S	11'.1	
Dubhe	194° 11'.0	61° 47'.3 N	272° 20'.7	07'.9	250° 41'.8	8'.0	22'.0	11'.1	
Elnath	278° 32'.1	28° 36'.1 N	287° 20'.9	08'.9	265° 08'.8	8'.0	33'.1	10'.9	59'.5
Eltanin	90° 53'.4	51° 29'.7 N	302° 21'.1	09'.8	279° 35'.8	8'.0	44'.0	10'.9	
Enif	34° 02'.1	9° 50'.8 N	317° 21'.3	10'.8	294° 02'.8	7'.9	54'.9	10'.7	
Fomalhaut	15° 40'.6	29° 39'.5 S	332° 21'.5	11'.8	308° 29'.7	8'.0	16° 05'.6 S	10'.6	59'.4
			347° 21'.7	12'.7	322° 56'.7	7'.9	16'.2	10'.5	
Gacrux	172° 18'.9	57° 04'.4 S	2° 21'.9	2° 13'.7 S	337° 23'.6	7'.9	16° 26'.7 S	10'.4	59'.4
Gienah	176° 08'.6	17° 30'.1 S	17° 22'.2	14'.7	351° 50'.5	7'.9	37'.1	10'.3	59'.3
Hadar	149° 10'.6	60° 20'.4 S	32° 22'.4	15'.7	6° 17'.4	7'.8	47'.4	10'.1	
Hamal	328° 18'.0	23° 25'.9 N	47° 22'.6	16'.6	20° 44'.2	7'.9	57'.5	10'.1	
Kaus Aust.	84° 04'.3	34° 23'.4 S	62° 22'.8	17'.6	35° 11'.1	7'.8	17° 07'.6 S	9'.9	59'.2
			77° 23'.0	18'.6	49° 37'.9	7'.8	17'.5	9'.8	
Kochab	137° 20'.1	74° 11'.2 N	92° 23'.2	19'.6	64° 04'.7	7'.8	27'.3	9'.7	59'.1
Markab	13° 53'.5	15° 10'.2 N	107° 23'.4	20'.5	78° 31'.5	7'.7	37'.0	9'.6	
Menkar	314° 31'.0	4° 03'.9 N	122° 23'.6	21'.5	92° 58'.2	7'.8	46'.6	9'.4	
Menkent	148° 26'.3	36° 20'.1 S	137° 23'.8	22'.5	107° 25'.0	7'.7	56'.0	9'.3	59'.0
Miaplacidus	221° 43'.7	69° 41'.1 S	152° 24'.0	23'.4	121° 51'.7	7'.7	18° 05'.3 S	9'.2	
			167° 24'.2	24'.4	136° 18'.4	7'.7	14'.5	9'.1	
Mirfak	309° 02'.3	49° 50'.1 N	182° 24'.4	2° 25'.4 S	150° 45'.1	7'.7	18° 23'.6 S	9'.0	58'.9
Nunki	76° 17'.4	26° 18'.4 S	197° 24'.6	26'.4	165° 11'.8	7'.7	32'.6	8'.8	
Peacock	53° 43'.2	56° 45'.6 S	212° 24'.8	27'.3	179° 38'.5	7'.6	41'.4	8'.7	
Polaris	323° 34'.3	89° 13'.8 N	227° 25'.0	28'.3	194° 05'.1	7'.7	50'.1	8'.6	58'.8
Pollux	243° 46'.7	28° 02'.6 N	242° 25'.3	29'.3	208° 31'.8	7'.6	58'.7	8'.5	
			257° 25'.5	30'.3	222° 58'.4	7'.6	19° 07'.2 S	8'.3	58'.7
Procyon	245° 16'.0	5° 14'.7 N	272° 25'.7	31'.2	237° 25'.0	7'.6	15'.5	8'.2	
Rasalhague	96° 20'.9	12° 34'.1 N	287° 25'.9	32'.2	251° 51'.6	7'.6	23'.7	8'.1	
Regulus	208° 00'.2	12° 00'.2 N	302° 26'.1	33'.2	266° 18'.2	7'.6	31'.8	7'.9	58'.6
Rigel	281° 26'.8	8° 12'.4 S	317° 26'.3	34'.1	280° 44'.8	7'.5	39'.7	7'.8	
Rigil Kent	140° 13'.5	60° 48'.4 S	332° 26'.5	35'.1	295° 11'.3	7'.6	47'.5	7'.7	
			347° 26'.7	36'.1	309° 37'.9	7'.6	55'.2	7'.6	58'.5
Sabik	102° 30'.4	15° 43'.0 S	2° 26'.9	2° 37'.1 S	324° 04'.5	7'.5	20° 02'.8 S	7'.4	58'.5
Schedar	349° 57'.8	56° 30'.0 N	17° 27'.1	38'.0	338° 31'.0	7'.5	10'.2	7'.3	58'.4
Shaula	96° 43'.0	37° 06'.0 S	32° 27'.3	39'.0	352° 57'.5	7'.6	17'.5	7'.1	
Sirius	258° 47'.4	16° 42'.1 S	47° 27'.5	40'.0	7° 24'.1	7'.5	24'.6	7'.1	
Spica	158° 47'.9	11° 07'.4 S	62° 27'.7	40'.9	21° 50'.6	7'.5	31'.7	6'.8	58'.3
			77° 27'.9	41'.9	36° 17'.1	7'.5	38'.5	6'.8	
Suhail	223° 04'.2	43° 24'.0 S	92° 28'.1	42'.9	50° 43'.6	7'.6	45'.3	6'.6	
Vega	80° 49'.4	38° 46'.9 N	107° 28'.3	43'.9	65° 10'.2	7'.5	51'.9	6'.5	58'.2
Zuben'ubi	137° 22'.8	16° 00'.7 S	122° 28'.5	44'.8	79° 36'.7	7'.5	58'.4	6'.4	
			137° 28'.7	45'.8	94° 03'.2	7'.5	21° 04'.8 S	6'.2	58'.1
	SHA	Mer.Pass.							
Venus	148° 43'.1	13:37							
Mars	260° 39'.8	06:09							
Jupiter	182° 02'.3	11:22							
Saturn	45° 08'.3	20:28	SD 16'.0	d 1'.0	SD 16'.4		16'.2		15'.9

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
27	8 57	9 07	11:51	12:39	00:12	1d 2%
28	9 17	9 27	11:51	13:34	01:06	2d 6%
29	9 37	9 47	11:50	14:29	02:01	3d 12%

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1992 Sep 30, Oct. 1, 2 (Wed, Thur, Fri)

GMT		ARIES	VENUS -3.9		MARS +0.3		JUPITER -1.7		SATURN +0.5	
		GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
30	00	8° 59'.5	155° 22'.7	13° 31'.8 S	268° 32'.7	23° 25'.4 N	190° 38'.0	1° 52'.7 N	54° 11'.3	18° 11'.3 S
	01	24° 02'.0	170° 22'.3	32'.9	283° 33'.8	25'.4	205° 40'.0	52'.5	69° 13'.8	11'.3
	02	39° 04'.5	185° 21'.8	34'.0	298° 34'.9	25'.3	220° 42'.0	52'.3	84° 16'.3	11'.3
	03	54° 06'.9	200° 21'.4	35'.2	313° 36'.0	25'.3	235° 44'.0	52'.0	99° 18'.9	11'.3
	04	69° 09'.4	215° 20'.9	36'.3	328° 37'.1	25'.3	250° 45'.9	51'.8	114° 21'.4	11'.3
	05	84° 11'.8	230° 20'.4	37'.4	343° 38'.2	25'.2	265° 47'.9	51'.6	129° 23'.9	11'.3
Wednesday	06	99° 14'.3	245° 20'.0	38'.5	358° 39'.3	25'.2	280° 49'.9	51'.4	144° 26'.5	11'.4
	07	114° 16'.8	260° 19'.5	39'.7	13° 40'.4	25'.2	295° 51'.8	51'.2	159° 29'.0	11'.4
	08	129° 19'.2	275° 19'.0	40'.8	28° 41'.4	25'.1	310° 53'.8	51'.0	174° 31'.5	11'.4
	09	144° 21'.7	290° 18'.6	41'.9	43° 42'.5	25'.1	325° 55'.8	50'.8	189° 34'.1	11'.4
	10	159° 24'.2	305° 18'.1	43'.0	58° 43'.6	25'.1	340° 57'.7	50'.6	204° 36'.6	11'.4
	11	174° 26'.6	320° 17'.7	44'.1	73° 44'.7	25'.1	355° 59'.7	50'.4	219° 39'.1	11'.5
	12	189° 29'.1	335° 17'.2	13° 45'.3 S	88° 45'.8	23° 25'.0 N	11° 01'.7	1° 50'.1 N	234° 41'.6	18° 11'.5 S
	13	204° 31'.6	350° 16'.7	46'.4	103° 46'.9	25'.0	26° 03'.7	49'.9	249° 44'.2	11'.5
	14	219° 34'.0	5° 16'.3	47'.5	118° 48'.0	25'.0	41° 05'.6	49'.7	264° 46'.7	11'.5
	15	234° 36'.5	20° 15'.8	48'.6	133° 49'.1	24'.9	56° 07'.6	49'.5	279° 49'.2	11'.5
	16	249° 39'.0	35° 15'.3	49'.7	148° 50'.2	24'.9	71° 09'.6	49'.3	294° 51'.8	11'.5
	17	264° 41'.4	50° 14'.9	50'.9	163° 51'.3	24'.9	86° 11'.5	49'.1	309° 54'.3	11'.6
	18	279° 43'.9	65° 14'.4	52'.0	178° 52'.4	24'.8	101° 13'.5	48'.9	324° 56'.8	11'.6
	19	294° 46'.3	80° 13'.9	53'.1	193° 53'.5	24'.8	116° 15'.5	48'.7	339° 59'.3	11'.6
	20	309° 48'.8	95° 13'.5	54'.2	208° 54'.6	24'.8	131° 17'.4	48'.4	355° 01'.9	11'.6
	21	324° 51'.3	110° 13'.0	55'.3	223° 55'.7	24'.7	146° 19'.4	48'.2	10° 04'.4	11'.6
	22	339° 53'.7	125° 12'.5	56'.4	238° 56'.8	24'.7	161° 21'.4	48'.0	25° 06'.9	11'.6
	23	354° 56'.2	140° 12'.0	57'.5	253° 57'.9	24'.7	176° 23'.4	47'.8	40° 09'.4	11'.7
1	00	9° 58'.7	155° 11'.6	13° 58'.7 S	268° 59'.0	23° 24'.7 N	191° 25'.3	1° 47'.6 N	55° 12'.0	18° 11'.7 S
	01	25° 01'.1	170° 11'.1	59'.8	284° 00'.1	24'.6	206° 27'.3	47'.4	70° 14'.5	11'.7
	02	40° 03'.6	185° 10'.6	14° 00'.9 S	299° 01'.2	24'.6	221° 29'.3	47'.2	85° 17'.0	11'.7
	03	55° 06'.1	200° 10'.2	02'.0	314° 02'.3	24'.6	236° 31'.2	47'.0	100° 19'.6	11'.7
	04	70° 08'.5	215° 09'.7	03'.1	329° 03'.4	24'.5	251° 33'.2	46'.8	115° 22'.1	11'.7
	05	85° 11'.0	230° 09'.2	04'.2	344° 04'.5	24'.5	266° 35'.2	46'.5	130° 24'.6	11'.8
Thursday	06	100° 13'.5	245° 08'.7	05'.3	359° 05'.6	24'.5	281° 37'.1	46'.3	145° 27'.1	11'.8
	07	115° 15'.9	260° 08'.3	06'.4	14° 06'.7	24'.4	296° 39'.1	46'.1	160° 29'.7	11'.8
	08	130° 18'.4	275° 07'.8	07'.5	29° 07'.8	24'.4	311° 41'.1	45'.9	175° 32'.2	11'.8
	09	145° 20'.8	290° 07'.3	08'.7	44° 08'.9	24'.4	326° 43'.1	45'.7	190° 34'.7	11'.8
	10	160° 23'.3	305° 06'.8	09'.8	59° 10'.0	24'.3	341° 45'.0	45'.5	205° 37'.2	11'.8
	11	175° 25'.8	320° 06'.4	10'.9	74° 11'.1	24'.3	356° 47'.0	45'.3	220° 39'.8	11'.9
	12	190° 28'.2	335° 05'.9	14° 12'.0 S	89° 12'.2	23° 24'.3 N	11° 49'.0	1° 45'.1 N	235° 42'.3	18° 11'.9 S
	13	205° 30'.7	350° 05'.4	13'.1	104° 13'.3	24'.2	26° 50'.9	44'.9	250° 44'.8	11'.9
	14	220° 33'.2	5° 04'.9	14'.2	119° 14'.5	24'.2	41° 52'.9	44'.6	265° 47'.3	11'.9
	15	235° 35'.6	20° 04'.5	15'.3	134° 15'.6	24'.2	56° 54'.9	44'.4	280° 49'.9	11'.9
	16	250° 38'.1	35° 04'.0	16'.4	149° 16'.7	24'.1	71° 56'.9	44'.2	295° 52'.4	11'.9
	17	265° 40'.6	50° 03'.5	17'.5	164° 17'.8	24'.1	86° 58'.8	44'.0	310° 54'.9	12'.0
	18	280° 43'.0	65° 03'.0	18'.6	179° 18'.9	24'.1	102° 00'.8	43'.8	325° 57'.4	12'.0
	19	295° 45'.5	80° 02'.6	19'.7	194° 20'.0	24'.0	117° 02'.8	43'.6	341° 00'.0	12'.0
	20	310° 48'.0	95° 02'.1	20'.8	209° 21'.1	24'.0	132° 04'.7	43'.4	356° 02'.5	12'.0
	21	325° 50'.4	110° 01'.6	21'.9	224° 22'.2	23'.9	147° 06'.7	43'.2	11° 05'.0	12'.0
	22	340° 52'.9	125° 01'.1	23'.0	239° 23'.3	23'.9	162° 08'.7	42'.9	26° 07'.5	12'.0
	23	355° 55'.3	140° 00'.6	24'.1	254° 24'.5	23'.9	177° 10'.6	42'.7	41° 10'.1	12'.1
2	00	10° 57'.8	155° 00'.2	14° 25'.2 S	269° 25'.6	23° 23'.8 N	192° 12'.6	1° 42'.5 N	56° 12'.6	18° 12'.1 S
	01	26° 00'.3	169° 59'.7	26'.3	284° 26'.7	23'.8	207° 14'.6	42'.3	71° 15'.1	12'.1
	02	41° 02'.7	184° 59'.2	27'.4	299° 27'.8	23'.8	222° 16'.6	42'.1	86° 17'.6	12'.1
	03	56° 05'.2	199° 58'.7	28'.5	314° 28'.9	23'.7	237° 18'.5	41'.9	101° 20'.1	12'.1
	04	71° 07'.7	214° 58'.2	29'.6	329° 30'.0	23'.7	252° 20'.5	41'.7	116° 22'.7	12'.1
	05	86° 10'.1	229° 57'.7	30'.7	344° 31'.1	23'.7	267° 22'.5	41'.5	131° 25'.2	12'.1
Friday	06	101° 12'.6	244° 57'.3	31'.8	359° 32'.3	23'.6	282° 24'.4	41'.3	146° 27'.7	12'.2
	07	116° 15'.1	259° 56'.8	32'.9	14° 33'.4	23'.6	297° 26'.4	41'.0	161° 30'.2	12'.2
	08	131° 17'.5	274° 56'.3	34'.0	29° 34'.5	23'.6	312° 28'.4	40'.8	176° 32'.8	12'.2
	09	146° 20'.0	289° 55'.8	35'.1	44° 35'.6	23'.5	327° 30'.4	40'.6	191° 35'.3	12'.2
	10	161° 22'.4	304° 55'.3	36'.2	59° 36'.7	23'.5	342° 32'.3	40'.4	206° 37'.8	12'.2
	11	176° 24'.9	319° 54'.8	37'.3	74° 37'.8	23'.5	357° 34'.3	40'.2	221° 40'.3	12'.2
	12	191° 27'.4	334° 54'.4	14° 38'.4 S	89° 39'.0	23° 23'.4 N	12° 36'.3	1° 40'.0 N	236° 42'.8	18° 12'.3 S
	13	206° 29'.8	349° 53'.9	39'.4	104° 40'.1	23'.4	27° 38'.2	39'.8	251° 45'.4	12'.3
	14	221° 32'.3	4° 53'.4	40'.5	119° 41'.2	23'.3	42° 40'.2	39'.6	266° 47'.9	12'.3
	15	236° 34'.8	19° 52'.9	41'.6	134° 42'.3	23'.3	57° 42'.2	39'.4	281° 50'.4	12'.3
	16	251° 37'.2	34° 52'.4	42'.7	149° 43'.4	23'.3	72° 44'.2	39'.1	296° 52'.9	12'.3
	17	266° 39'.7	49° 51'.9	43'.8	164° 44'.6	23'.2	87° 46'.1	38'.9	311° 55'.5	12'.3
	18	281° 42'.2	64° 51'.4	44'.9	179° 45'.7	23'.2	102° 48'.1	38'.7	326° 58'.0	12'.3
	19	296° 44'.6	79° 50'.9	46'.0	194° 46'.8	23'.2	117° 50'.1	38'.5	342° 00'.5	12'.4
	20	311° 47'.1	94° 50'.4	47'.1	209° 47'.9	23'.1	132° 52'.0	38'.3	357° 03'.0	12'.4
	21	326° 49'.6	109° 50'.0	48'.2	224° 49'.1	23'.1	147° 54'.0	38'.1	12° 05'.5	12'.4
	22	341° 52'.0	124° 49'.5	49'.2	239° 50'.2	23'.0	162° 56'.0	37'.9	27° 08'.0	12'.4
	23	356° 54'.5	139° 49'.0	50'.3	254° 51'.3	23'.0	177° 58'.0	37'.7	42° 10'.6	12'.4
		M.P. 23:16	v -0'.5	d 1'.1	v 1'.1	d 0'.0	v 2'.0	d 0'.2	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.7	40° 19'.7 S
Achernar	335° 37'.6	57° 16'.2 S
Acrux	173° 27'.5	63° 03'.6 S
Adhara	255° 24'.7	28° 57'.5 S
Aldebaran	291° 07'.0	16° 29'.8 N
Alioth	166° 34'.7	55° 59'.9 N
Alkaid	153° 11'.4	49° 21'.0 N
Alnair	28° 02'.7	46° 59'.7 S
Alnilam	276° 02'.0	1° 12'.2 S
Alphard	218° 11'.5	8° 37'.5 S
Alphecca	126° 24'.3	26° 44'.5 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.2	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.5 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.3 N
Atria	108° 01'.5	69° 01'.2 S
Avior	234° 24'.7	59° 28'.9 S
Bellatrix	278° 48'.5	6° 20'.7 N
Betelgeuse	271° 18'.0	7° 24'.5 N
Canopus	264° 03'.0	52° 41'.2 S
Capella	280° 57'.2	45° 59'.4 N
Deneb	49° 41'.8	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.8 N
Diphda	349° 11'.0	18° 01'.3 S
Dubhe	194° 11'.0	61° 47'.3 N
Elnath	278° 32'.1	28° 36'.1 N
Eltanin	90° 53'.4	51° 29'.7 N
Enif	34° 02'.1	9° 50'.8 N
Fomalhaut	15° 40'.6	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.4 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.4 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.3	34° 23'.4 S
Kochab	137° 20'.2	74° 11'.2 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.0	4° 03'.9 N
Menkent	148° 26'.3	36° 20'.1 S
Miaplacidus	221° 43'.7	69° 41'.0 S
Mirfak	309° 02'.2	49° 50'.1 N
Nunki	76° 17'.4	26° 18'.4 S
Peacock	53° 43'.2	56° 45'.6 S
Polaris	323° 33'.3	89° 13'.9 N
Pollux	243° 46'.7	28° 02'.6 N
Procyon	245° 16'.0	5° 14'.7 N
Rasalhague	96° 20'.9	12° 34'.1 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 26'.8	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.4 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.0 N
Shaula	96° 43'.0	37° 06'.0 S
Sirius	258° 47'.3	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.1	43° 24'.0 S
Vega	80° 49'.4	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	145° 12'.9	13:40
Mars	259° 00'.3	06:04
Jupiter	181° 26'.7	11:13
Saturn	45° 13'.3	20:16

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
30 00	182° 29'.3	2° 48'.7 S	137° 22'.7	7'.5	21° 23'.0 S	5'.8	58'.0
01	197° 29'.5	49'.7	151° 49'.2	7'.6	28'.8	5'.7	
02	212° 29'.8	50'.7	166° 15'.8	7'.5	34'.5	5'.5	57'.9
03	227° 30'.0	51'.6	180° 42'.3	7'.5	40'.0	5'.4	
04	242° 30'.2	52'.6	195° 08'.8	7'.6	45'.4	5'.3	
05	257° 30'.4	53'.6	209° 35'.4	7'.5	50'.7	5'.1	57'.8
06	272° 30'.6	54'.5	224° 01'.9	7'.5	55'.8	5'.0	
07	287° 30'.8	55'.5	238° 28'.4	7'.6	22° 00'.8 S	4'.9	57'.7
08	302° 31'.0	56'.5	252° 55'.0	7'.6	05'.7	4'.7	
09	317° 31'.2	57'.5	267° 21'.6	7'.6	10'.4	4'.5	
10	332° 31'.4	58'.4	281° 48'.2	7'.6	14'.9	4'.5	57'.6
11	347° 31'.6	59'.4	296° 14'.8	7'.6	19'.4	4'.3	
12	2° 31'.8	3° 00'.4 S	310° 41'.4	7'.6	22° 23'.7 S	4'.1	57'.6
13	17° 32'.0	01'.3	325° 08'.0	7'.6	27'.8	4'.1	57'.5
14	32° 32'.2	02'.3	339° 34'.6	7'.7	31'.9	3'.8	
15	47° 32'.4	03'.3	354° 01'.3	7'.6	35'.7	3'.8	57'.4
16	62° 32'.6	04'.3	8° 27'.9	7'.7	39'.5	3'.6	
17	77° 32'.8	05'.2	22° 54'.6	7'.7	43'.1	3'.5	
18	92° 33'.0	06'.2	37° 21'.3	7'.8	46'.6	3'.3	57'.3
19	107° 33'.2	07'.2	51° 48'.1	7'.7	49'.9	3'.2	
20	122° 33'.4	08'.1	66° 14'.8	7'.8	53'.1	3'.1	
21	137° 33'.6	09'.1	80° 41'.6	7'.8	56'.2	2'.9	57'.2
22	152° 33'.8	10'.1	95° 08'.4	7'.8	59'.1	2'.8	
23	167° 34'.0	11'.0	109° 35'.2	7'.8	23° 01'.9 S	2'.6	57'.1
1 00	182° 34'.2	3° 12'.0 S	124° 02'.0	7'.9	23° 04'.5 S	2'.5	57'.1
01	197° 34'.4	13'.0	138° 28'.9	7'.9	07'.0	2'.4	
02	212° 34'.6	14'.0	152° 55'.8	7'.9	09'.4	2'.2	57'.0
03	227° 34'.8	14'.9	167° 22'.7	8'.0	11'.6	2'.1	
04	242° 35'.0	15'.9	181° 49'.7	8'.0	13'.7	2'.0	
05	257° 35'.2	16'.9	196° 16'.7	8'.0	15'.7	1'.8	56'.9
06	272° 35'.4	17'.8	210° 43'.7	8'.0	17'.5	1'.7	
07	287° 35'.6	18'.8	225° 10'.7	8'.1	19'.2	1'.6	56'.8
08	302° 35'.8	19'.8	239° 37'.8	8'.1	20'.8	1'.4	
09	317° 36'.0	20'.7	254° 04'.9	8'.2	22'.2	1'.3	
10	332° 36'.2	21'.7	268° 32'.1	8'.2	23'.5	1'.2	56'.7
11	347° 36'.4	22'.7	282° 59'.3	8'.2	24'.7	1'.0	
12	2° 36'.6	3° 23'.6 S	297° 26'.5	8'.3	23° 25'.7 S	0'.9	56'.7
13	17° 36'.8	24'.6	311° 53'.8	8'.3	26'.6	0'.7	56'.6
14	32° 37'.0	25'.6	326° 21'.1	8'.3	27'.3	0'.7	
15	47° 37'.2	26'.6	340° 48'.4	8'.4	28'.0	0'.5	
16	62° 37'.4	27'.5	355° 15'.8	8'.4	28'.5	0'.3	56'.5
17	77° 37'.6	28'.5	9° 43'.2	8'.5	28'.8	0'.3	
18	92° 37'.8	29'.5	24° 10'.7	8'.5	29'.1	0'.1	
19	107° 38'.0	30'.4	38° 38'.2	8'.5	29'.2	0'.1	56'.4
20	122° 38'.2	31'.4	53° 05'.7	8'.6	29'.1	0'.1	
21	137° 38'.4	32'.4	67° 33'.3	8'.7	29'.0	0'.3	56'.3
22	152° 38'.6	33'.3	82° 01'.0	8'.7	28'.7	0'.4	
23	167° 38'.8	34'.3	96° 28'.7	8'.7	28'.3	0'.6	
2 00	182° 39'.0	3° 35'.3 S	110° 56'.4	8'.8	23° 27'.7 S	0'.6	56'.2
01	197° 39'.2	36'.2	125° 24'.2	8'.8	27'.1	0'.8	
02	212° 39'.4	37'.2	139° 52'.0	8'.9	26'.3	1'.0	
03	227° 39'.6	38'.2	154° 19'.9	9'.0	25'.3	1'.0	56'.1
04	242° 39'.8	39'.1	168° 47'.9	9'.0	24'.3	1'.2	
05	257° 40'.0	40'.1	183° 15'.9	9'.0	23'.1	1'.3	
06	272° 40'.2	41'.1	197° 43'.9	9'.1	21'.8	1'.4	
07	287° 40'.4	42'.0	212° 12'.0	9'.1	20'.4	1'.5	56'.0
08	302° 40'.6	43'.0	226° 40'.1	9'.2	18'.9	1'.7	
09	317° 40'.8	44'.0	241° 08'.3	9'.3	17'.2	1'.8	
10	332° 41'.0	45'.0	255° 36'.6	9'.3	15'.4	1'.9	55'.9
11	347° 41'.2	45'.9	270° 04'.9	9'.4	13'.5	2'.0	
12	2° 41'.4	3° 46'.9 S	284° 33'.3	9'.4	23° 11'.5 S	2'.2	55'.9
13	17° 41'.5	47'.9	299° 01'.7	9'.5	09'.3	2'.3	55'.8
14	32° 41'.7	48'.8	313° 30'.2	9'.5	07'.0	2'.4	
15	47° 41'.9	49'.8	327° 58'.7	9'.6	04'.6	2'.5	
16	62° 42'.1	50'.8	342° 27'.3	9'.7	02'.1	2'.6	55'.7
17	77° 42'.3	51'.7	356° 56'.0	9'.7	22° 59'.5 S	2'.7	
18	92° 42'.5	52'.7	11° 24'.7	9'.8	56'.8	2'.9	
19	107° 42'.7	53'.7	25° 53'.5	9'.8	53'.9	2'.9	55'.6
20	122° 42'.9	54'.6	40° 22'.3	9'.9	51'.0	3'.1	
21	137° 43'.1	55'.6	54° 51'.2	10'.0	47'.9	3'.2	
22	152° 43'.3	56'.6	69° 20'.2	10'.0	44'.7	3'.3	
23	167° 43'.5	57'.5	83° 49'.2	10'.1	41'.4	3'.5	55'.5
	SD 16'.0	d 1'.0	SD	15'.7	15'.4	15'.2	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
30	9 57	10 07	11:50	15:25	02:57	4d 21%
1	10 16	10 26	11:50	16:20	03:52	5d 30%
2	10 36	10 45	11:49	17:13	04:46	6d 39%

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1992 October 3, 4, 5 (Sat, Sun, Mon)

GMT	ARIES	VENUS -3.9		MARS +0.3		JUPITER -1.7		SATURN +0.5	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
3 Saturday 00	11° 56'.9	154° 48'.5	14° 51'.4 S	269° 52'.4	23° 23'.0 N	192° 59'.9	1° 37'.5 N	57° 13'.1	18° 12'.4 S
01	26° 59'.4	169° 48'.0	52'.5	284° 53'.6	22'.9	208° 01'.9	37'.3	72° 15'.6	12'.4
02	42° 01'.9	184° 47'.5	53'.6	299° 54'.7	22'.9	223° 03'.9	37'.0	87° 18'.1	12'.5
03	57° 04'.3	199° 47'.0	54'.7	314° 55'.8	22'.9	238° 05'.8	36'.8	102° 20'.6	12'.5
04	72° 06'.8	214° 46'.5	55'.7	329° 56'.9	22'.8	253° 07'.8	36'.6	117° 23'.2	12'.5
05	87° 09'.3	229° 46'.0	56'.8	344° 58'.1	22'.8	268° 09'.8	36'.4	132° 25'.7	12'.5
06	102° 11'.7	244° 45'.5	57'.9	359° 59'.2	22'.7	283° 11'.8	36'.2	147° 28'.2	12'.5
07	117° 14'.2	259° 45'.0	59'.0	15° 00'.3	22'.7	298° 13'.7	36'.0	162° 30'.7	12'.5
08	132° 16'.7	274° 44'.5	15° 00'.1 S	30° 01'.5	22'.7	313° 15'.7	35'.8	177° 33'.2	12'.5
09	147° 19'.1	289° 44'.0	01'.2	45° 02'.6	22'.6	328° 17'.7	35'.6	192° 35'.8	12'.6
10	162° 21'.6	304° 43'.5	02'.2	60° 03'.7	22'.6	343° 19'.6	35'.4	207° 38'.3	12'.6
11	177° 24'.1	319° 43'.0	03'.3	75° 04'.9	22'.5	358° 21'.6	35'.1	222° 40'.8	12'.6
12	192° 26'.5	334° 42'.6	15° 04'.4 S	90° 06'.0	23° 22'.5 N	13° 23'.6	1° 34'.9 N	237° 43'.3	18° 12'.6 S
13	207° 29'.0	349° 42'.1	05'.5	105° 07'.1	22'.5	28° 25'.6	34'.7	252° 45'.8	12'.6
14	222° 31'.4	4° 41'.6	06'.5	120° 08'.3	22'.4	43° 27'.5	34'.5	267° 48'.3	12'.6
15	237° 33'.9	19° 41'.1	07'.6	135° 09'.4	22'.4	58° 29'.5	34'.3	282° 50'.9	12'.6
16	252° 36'.4	34° 40'.6	08'.7	150° 10'.5	22'.3	73° 31'.5	34'.1	297° 53'.4	12'.7
17	267° 38'.8	49° 40'.1	09'.8	165° 11'.7	22'.3	88° 33'.5	33'.9	312° 55'.9	12'.7
18	282° 41'.3	64° 39'.6	10'.8	180° 12'.8	22'.3	103° 35'.4	33'.7	327° 58'.4	12'.7
19	297° 43'.8	79° 39'.1	11'.9	195° 13'.9	22'.2	118° 37'.4	33'.5	343° 00'.9	12'.7
20	312° 46'.2	94° 38'.6	13'.0	210° 15'.1	22'.2	133° 39'.4	33'.2	358° 03'.4	12'.7
21	327° 48'.7	109° 38'.1	14'.1	225° 16'.2	22'.1	148° 41'.3	33'.0	13° 06'.0	12'.7
22	342° 51'.2	124° 37'.6	15'.1	240° 17'.3	22'.1	163° 43'.3	32'.8	28° 08'.5	12'.7
23	357° 53'.6	139° 37'.1	16'.2	255° 18'.5	22'.1	178° 45'.3	32'.6	43° 11'.0	12'.7
4 Sunday 00	12° 56'.1	154° 36'.6	15° 17'.3 S	270° 19'.6	23° 22'.0 N	193° 47'.3	1° 32'.4 N	58° 13'.5	18° 12'.8 S
01	27° 58'.6	169° 36'.1	18'.3	285° 20'.8	22'.0	208° 49'.2	32'.2	73° 16'.0	12'.8
02	43° 01'.0	184° 35'.5	19'.4	300° 21'.9	21'.9	223° 51'.2	32'.0	88° 18'.5	12'.8
03	58° 03'.5	199° 35'.0	20'.5	315° 23'.0	21'.9	238° 53'.2	31'.8	103° 21'.0	12'.8
04	73° 05'.9	214° 34'.5	21'.5	330° 24'.2	21'.9	253° 55'.1	31'.6	118° 23'.6	12'.8
05	88° 08'.4	229° 34'.0	22'.6	345° 25'.3	21'.8	268° 57'.1	31'.4	133° 26'.1	12'.8
06	103° 10'.9	244° 33'.5	23'.7	0° 26'.5	21'.8	283° 59'.1	31'.1	148° 28'.6	12'.8
07	118° 13'.3	259° 33'.0	24'.7	15° 27'.6	21'.7	299° 01'.1	30'.9	163° 31'.1	12'.9
08	133° 15'.8	274° 32'.5	25'.8	30° 28'.7	21'.7	314° 03'.0	30'.7	178° 33'.6	12'.9
09	148° 18'.3	289° 32'.0	26'.9	45° 29'.9	21'.6	329° 05'.0	30'.5	193° 36'.1	12'.9
10	163° 20'.7	304° 31'.5	27'.9	60° 31'.0	21'.6	344° 07'.0	30'.3	208° 38'.6	12'.9
11	178° 23'.2	319° 31'.0	29'.0	75° 32'.2	21'.6	359° 09'.0	30'.1	223° 41'.2	12'.9
12	193° 25'.7	334° 30'.5	15° 30'.1 S	90° 33'.3	23° 21'.5 N	14° 10'.9	1° 29'.9 N	238° 43'.7	18° 12'.9 S
13	208° 28'.1	349° 30'.0	31'.1	105° 34'.5	21'.5	29° 12'.9	29'.7	253° 46'.2	12'.9
14	223° 30'.6	4° 29'.5	32'.2	120° 35'.6	21'.4	44° 14'.9	29'.5	268° 48'.7	12'.9
15	238° 33'.0	19° 29'.0	33'.2	135° 36'.8	21'.4	59° 16'.8	29'.2	283° 51'.2	13'.0
16	253° 35'.5	34° 28'.5	34'.3	150° 37'.9	21'.4	74° 18'.8	29'.0	298° 53'.7	13'.0
17	268° 38'.0	49° 27'.9	35'.4	165° 39'.1	21'.3	89° 20'.8	28'.8	313° 56'.2	13'.0
18	283° 40'.4	64° 27'.4	36'.4	180° 40'.2	21'.3	104° 22'.8	28'.6	328° 58'.7	13'.0
19	298° 42'.9	79° 26'.9	37'.5	195° 41'.4	21'.2	119° 24'.7	28'.4	344° 01'.3	13'.0
20	313° 45'.4	94° 26'.4	38'.5	210° 42'.5	21'.2	134° 26'.7	28'.2	359° 03'.8	13'.0
21	328° 47'.8	109° 25'.9	39'.6	225° 43'.7	21'.1	149° 28'.7	28'.0	14° 06'.3	13'.0
22	343° 50'.3	124° 25'.4	40'.7	240° 44'.8	21'.1	164° 30'.7	27'.8	29° 08'.8	13'.0
23	358° 52'.8	139° 24'.9	41'.7	255° 46'.0	21'.1	179° 32'.6	27'.6	44° 11'.3	13'.1
5 Monday 00	13° 55'.2	154° 24'.4	15° 42'.8 S	270° 47'.1	23° 21'.0 N	194° 34'.6	1° 27'.4 N	59° 13'.8	18° 13'.1 S
01	28° 57'.7	169° 23'.8	43'.8	285° 48'.3	21'.0	209° 36'.6	27'.1	74° 16'.3	13'.1
02	44° 00'.2	184° 23'.3	44'.9	300° 49'.4	20'.9	224° 38'.5	26'.9	89° 18'.8	13'.1
03	59° 02'.6	199° 22'.8	45'.9	315° 50'.6	20'.9	239° 40'.5	26'.7	104° 21'.3	13'.1
04	74° 05'.1	214° 22'.3	47'.0	330° 51'.7	20'.8	254° 42'.5	26'.5	119° 23'.9	13'.1
05	89° 07'.5	229° 21'.8	48'.0	345° 52'.9	20'.8	269° 44'.5	26'.3	134° 26'.4	13'.1
06	104° 10'.0	244° 21'.3	49'.1	0° 54'.0	20'.7	284° 46'.4	26'.1	149° 28'.9	13'.1
07	119° 12'.5	259° 20'.8	50'.1	15° 55'.2	20'.7	299° 48'.4	25'.9	164° 31'.4	13'.2
08	134° 14'.9	274° 20'.2	51'.2	30° 56'.3	20'.7	314° 50'.4	25'.7	179° 33'.9	13'.2
09	149° 17'.4	289° 19'.7	52'.2	45° 57'.5	20'.6	329° 52'.4	25'.5	194° 36'.4	13'.2
10	164° 19'.9	304° 19'.2	53'.3	60° 58'.7	20'.6	344° 54'.3	25'.3	209° 38'.9	13'.2
11	179° 22'.3	319° 18'.7	54'.3	75° 59'.8	20'.5	359° 56'.3	25'.0	224° 41'.4	13'.2
12	194° 24'.8	334° 18'.2	15° 55'.4 S	91° 01'.0	23° 20'.5 N	14° 58'.3	1° 24'.8 N	239° 43'.9	18° 13'.2 S
13	209° 27'.3	349° 17'.6	56'.4	106° 02'.1	20'.4	30° 00'.3	24'.6	254° 46'.4	13'.2
14	224° 29'.7	4° 17'.1	57'.5	121° 03'.3	20'.4	45° 02'.2	24'.4	269° 48'.9	13'.2
15	239° 32'.2	19° 16'.6	58'.5	136° 04'.5	20'.3	60° 04'.2	24'.2	284° 51'.5	13'.2
16	254° 34'.7	34° 16'.1	59'.5	151° 05'.6	20'.3	75° 06'.2	24'.0	299° 54'.0	13'.3
17	269° 37'.1	49° 15'.6	16° 00'.6 S	166° 06'.8	20'.3	90° 08'.1	23'.8	314° 56'.5	13'.3
18	284° 39'.6	64° 15'.0	01'.6	181° 07'.9	20'.2	105° 10'.1	23'.6	329° 59'.0	13'.3
19	299° 42'.0	79° 14'.5	02'.7	196° 09'.1	20'.2	120° 12'.1	23'.4	345° 01'.5	13'.3
20	314° 44'.5	94° 14'.0	03'.7	211° 10'.3	20'.1	135° 14'.1	23'.2	0° 04'.0	13'.3
21	329° 47'.0	109° 13'.5	04'.8	226° 11'.4	20'.1	150° 16'.0	23'.0	15° 06'.5	13'.3
22	344° 49'.4	124° 12'.9	05'.8	241° 12'.6	20'.0	165° 18'.0	22'.7	30° 09'.0	13'.3
23	359° 51'.9	139° 12'.4	06'.8	256° 13'.8	20'.0	180° 20'.0	22'.5	45° 11'.5	13'.3
	M.P. 23:04	v -0'.5	d 1'.1	v 1'.1	d 0'.0	v 2'.0	d 0'.2	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.7	40° 19'.7 S
Achernar	335° 37'.6	57° 16'.2 S
Acrux	173° 27'.5	63° 03'.6 S
Adhara	255° 24'.7	28° 57'.5 S
Aldebaran	291° 07'.0	16° 29'.8 N
Alioth	166° 34'.7	55° 59'.9 N
Alkaid	153° 11'.4	49° 21'.0 N
Alnair	28° 02'.7	46° 59'.7 S
Alnilam	276° 02'.0	1° 12'.2 S
Alphard	218° 11'.5	8° 37'.5 S
Alphecca	126° 24'.3	26° 44'.5 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.2	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.5 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.3 N
Atria	108° 01'.5	69° 01'.1 S
Avior	234° 24'.6	59° 28'.9 S
Bellatrix	278° 48'.5	6° 20'.7 N
Betelgeuse	271° 18'.0	7° 24'.5 N
Canopus	264° 03'.0	52° 41'.2 S
Capella	280° 57'.1	45° 59'.4 N
Deneb	49° 41'.9	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.3 S
Dubhe	194° 11'.0	61° 47'.2 N
Elnath	278° 32'.0	28° 36'.1 N
Eltanin	90° 53'.4	51° 29'.7 N
Enif	34° 02'.1	9° 50'.8 N
Fomalhaut	15° 40'.6	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.4 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.4 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.3	34° 23'.4 S
Kochab	137° 20'.2	74° 11'.2 N
Markab	13° 53'.5	15° 10'.2 N
Menkar	314° 31'.0	4° 03'.9 N
Menkent	148° 26'.3	36° 20'.1 S
Miaplacidus	221° 43'.6	69° 41'.0 S
Mirfak	309° 02'.2	49° 50'.2 N
Nunki	76° 17'.4	26° 18'.4 S
Peacock	53° 43'.2	56° 45'.6 S
Polaris	323° 32'.5	89° 13'.9 N
Pollux	243° 46'.7	28° 02'.6 N
Procyon	245° 15'.9	5° 14'.7 N
Rasalhague	96° 20'.9	12° 34'.1 N
Regulus	208° 00'.2	12° 00'.2 N
Rigel	281° 26'.8	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.4 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 57'.7	56° 30'.1 N
Shaula	96° 43'.0	37° 06'.0 S
Sirius	258° 47'.3	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.1	43° 24'.0 S
Vega	80° 49'.5	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	141° 40'.5	13:42
Mars	257° 23'.5	05:58
Jupiter	180° 51'.2	11:03
Saturn	45° 17'.4	20:04

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
3 00	182° 43'.7	3° 58'.5 S	98° 18'.3	10'.1	22° 37'.9 S	3'.5	55'.5
01	197° 43'.9	59'.5	112° 47'.4	10'.2	34'.4	3'.7	
02	212° 44'.1	4° 00'.4 S	127° 16'.6	10'.3	30'.7	3'.7	
03	227° 44'.3	01'.4	141° 45'.9	10'.3	27'.0	3'.9	55'.4
04	242° 44'.5	02'.4	156° 15'.2	10'.4	23'.1	3'.9	
05	257° 44'.7	03'.3	170° 44'.6	10'.5	19'.2	4'.1	
06	272° 44'.9	04'.3	185° 14'.1	10'.5	15'.1	4'.2	55'.3
07	287° 45'.1	05'.3	199° 43'.6	10'.6	10'.9	4'.3	
08	302° 45'.3	06'.2	214° 13'.2	10'.6	06'.6	4'.4	
09	317° 45'.4	07'.2	228° 42'.8	10'.8	02'.2	4'.5	
10	332° 45'.6	08'.1	243° 12'.6	10'.8	21° 57'.7 S	4'.6	55'.2
11	347° 45'.8	09'.1	257° 42'.4	10'.8	53'.1	4'.7	
12	2° 46'.0	4° 10'.1 S	272° 12'.2	10'.9	21° 48'.4 S	4'.8	55'.2
13	17° 46'.2	11'.0	286° 42'.1	11'.0	43'.6	5'.0	
14	32° 46'.4	12'.0	301° 12'.1	11'.1	38'.6	5'.0	55'.1
15	47° 46'.6	13'.0	315° 42'.2	11'.1	33'.6	5'.1	
16	62° 46'.8	13'.9	330° 12'.3	11'.1	28'.5	5'.2	
17	77° 47'.0	14'.9	344° 42'.4	11'.3	23'.3	5'.3	
18	92° 47'.2	15'.9	359° 12'.7	11'.3	18'.0	5'.4	55'.0
19	107° 47'.4	16'.8	13° 43'.0	11'.4	12'.6	5'.5	
20	122° 47'.6	17'.8	28° 13'.4	11'.4	07'.1	5'.6	
21	137° 47'.8	18'.8	42° 43'.8	11'.5	01'.5	5'.7	
22	152° 48'.0	19'.7	57° 14'.3	11'.6	20° 55'.8 S	5'.8	
23	167° 48'.1	20'.7	71° 44'.9	11'.6	50'.0	5'.9	54'.9
4 00	182° 48'.3	4° 21'.7 S	86° 15'.5	11'.7	20° 44'.1 S	6'.0	54'.9
01	197° 48'.5	22'.6	100° 46'.2	11'.8	38'.1	6'.1	
02	212° 48'.7	23'.6	115° 17'.0	11'.9	32'.0	6'.1	
03	227° 48'.9	24'.6	129° 47'.9	11'.9	25'.9	6'.3	54'.8
04	242° 49'.1	25'.5	144° 18'.8	11'.9	19'.6	6'.3	
05	257° 49'.3	26'.5	158° 49'.7	12'.1	13'.3	6'.4	
06	272° 49'.5	27'.4	173° 20'.8	12'.1	06'.9	6'.6	
07	287° 49'.7	28'.4	187° 51'.9	12'.1	00'.3	6'.6	
08	302° 49'.9	29'.4	202° 23'.0	12'.3	19° 53'.7 S	6'.7	
09	317° 50'.1	30'.3	216° 54'.3	12'.3	47'.0	6'.7	54'.7
10	332° 50'.2	31'.3	231° 25'.6	12'.3	40'.3	6'.9	
11	347° 50'.4	32'.3	245° 56'.9	12'.4	33'.4	7'.0	
12	2° 50'.6	4° 33'.2 S	260° 28'.3	12'.5	19° 26'.4 S	7'.0	54'.7
13	17° 50'.8	34'.2	274° 59'.8	12'.6	19'.4	7'.1	
14	32° 51'.0	35'.1	289° 31'.4	12'.6	12'.3	7'.2	54'.6
15	47° 51'.2	36'.1	304° 03'.0	12'.7	05'.1	7'.3	
16	62° 51'.4	37'.1	318° 34'.7	12'.7	18° 57'.8 S	7'.3	
17	77° 51'.6	38'.0	333° 06'.4	12'.8	50'.5	7'.5	
18	92° 51'.8	39'.0	347° 38'.2	12'.9	43'.0	7'.5	
19	107° 51'.9	40'.0	2° 10'.1	12'.9	35'.5	7'.6	
20	122° 52'.1	40'.9	16° 42'.0	13'.0	27'.9	7'.6	54'.5
21	137° 52'.3	41'.9	31° 14'.0	13'.0	20'.3	7'.8	
22	152° 52'.5	42'.8	45° 46'.0	13'.2	12'.5	7'.8	
23	167° 52'.7	43'.8	60° 18'.2	13'.1	04'.7	7'.9	
5 00	182° 52'.9	4° 44'.8 S	74° 50'.3	13'.3	17° 56'.8 S	8'.0	54'.5
01	197° 53'.1	45'.7	89° 22'.6	13'.2	48'.8	8'.0	
02	212° 53'.3	46'.7	103° 54'.8	13'.4	40'.8	8'.1	
03	227° 53'.5	47'.7	118° 27'.2	13'.4	32'.7	8'.2	54'.4
04	242° 53'.6	48'.6	132° 59'.6	13'.5	24'.5	8'.3	
05	257° 53'.8	49'.6	147° 32'.1	13'.5	16'.2	8'.3	
06	272° 54'.0	50'.5	162° 04'.6	13'.6	07'.9	8'.4	
07	287° 54'.2	51'.5	176° 37'.2	13'.6	16° 59'.5 S	8'.5	
08	302° 54'.4	52'.5	191° 09'.8	13'.7	51'.0	8'.5	
09	317° 54'.6	53'.4	205° 42'.5	13'.7	42'.5	8'.6	
10	332° 54'.8	54'.4	220° 15'.2	13'.9	33'.9	8'.7	
11	347° 54'.9	55'.3	234° 48'.1	13'.8	25'.2	8'.7	54'.3
12	2° 55'.1	4° 56'.3 S	249° 20'.9	13'.9	16° 16'.5 S	8'.8	54'.3
13	17° 55'.3	57'.3	263° 53'.8	14'.0	07'.7	8'.9	
14	32° 55'.5	58'.2	278° 26'.8	14'.0	15° 58'.8 S	8'.9	
15	47° 55'.7	59'.2	292° 59'.8	14'.1	49'.9	9'.0	
16	62° 55'.9	5° 00'.1 S	307° 32'.9	14'.1	40'.9	9'.0	
17	77° 56'.1	01'.1	322° 06'.0	14'.2	31'.9	9'.2	
18	92° 56'.2	02'.1	336° 39'.2	14'.2	22'.7	9'.1	
19	107° 56'.4	03'.0	351° 12'.4	14'.3	13'.6	9'.3	
20	122° 56'.6	04'.0	5° 45'.7	14'.3	04'.3	9'.3	54'.2
21	137° 56'.8	04'.9	20° 19'.0	14'.4	14° 55'.0 S	9'.3	
22	152° 57'.0	05'.9	34° 52'.4	14'.4	45'.7	9'.4	
23	167° 57'.2	06'.9	49° 25'.8	14'.5	36'.3	9'.5	
	SD 16'.0	d 1'.0	SD 15'.0		14'.9		14'.8

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
3	10 54	11 04	11:49	18:03	05:38	7d 49%
4	11 13	11 22	11:49	18:51	06:27	8d 59%
5	11 31	11 40	11:48	19:36	07:14	9d 68%

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1992 October 6, 7, 8 (Tue, Wed, Thur)

GMT	ARIES	VENUS -3.9		MARS +0.2		JUPITER -1.7		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
6 Tuesday 00	14° 54'.4	154° 11'.9	16° 07'.9 S	271° 14'.9	23° 19'.9 N	195° 22'.0	1° 22'.3 N	60° 14'.0	18° 13'.3 S
01	29° 56'.8	169° 11'.4	08'.9	286° 16'.1	19'.9	210° 23'.9	22'.1	75° 16'.5	13'.4
02	44° 59'.3	184° 10'.8	10'.0	301° 17'.3	19'.8	225° 25'.9	21'.9	90° 19'.0	13'.4
03	60° 01'.8	199° 10'.3	11'.0	316° 18'.4	19'.8	240° 27'.9	21'.7	105° 21'.5	13'.4
04	75° 04'.2	214° 09'.8	12'.0	331° 19'.6	19'.8	255° 29'.9	21'.5	120° 24'.0	13'.4
05	90° 06'.7	229° 09'.3	13'.1	346° 20'.8	19'.7	270° 31'.8	21'.3	135° 26'.6	13'.4
06	105° 09'.1	244° 08'.7	14'.1	1° 21'.9	19'.7	285° 33'.8	21'.1	150° 29'.1	13'.4
07	120° 11'.6	259° 08'.2	15'.1	16° 23'.1	19'.6	300° 35'.8	20'.9	165° 31'.6	13'.4
08	135° 14'.1	274° 07'.7	16'.2	31° 24'.3	19'.6	315° 37'.8	20'.6	180° 34'.1	13'.4
09	150° 16'.5	289° 07'.1	17'.2	46° 25'.4	19'.5	330° 39'.7	20'.4	195° 36'.6	13'.4
10	165° 19'.0	304° 06'.6	18'.2	61° 26'.6	19'.5	345° 41'.7	20'.2	210° 39'.1	13'.5
11	180° 21'.5	319° 06'.1	19'.3	76° 27'.8	19'.4	0° 43'.7	20'.0	225° 41'.6	13'.5
12	195° 23'.9	334° 05'.6	16° 20'.3 S	91° 29'.0	23° 19'.4 N	15° 45'.7	1° 19'.8 N	240° 44'.1	18° 13'.5 S
13	210° 26'.4	349° 05'.0	21'.3	106° 30'.1	19'.3	30° 47'.6	19'.6	255° 46'.6	13'.5
14	225° 28'.9	4° 04'.5	22'.4	121° 31'.3	19'.3	45° 49'.6	19'.4	270° 49'.1	13'.5
15	240° 31'.3	19° 04'.0	23'.4	136° 32'.5	19'.2	60° 51'.6	19'.2	285° 51'.6	13'.5
16	255° 33'.8	34° 03'.4	24'.4	151° 33'.6	19'.2	75° 53'.6	19'.0	300° 54'.1	13'.5
17	270° 36'.3	49° 02'.9	25'.4	166° 34'.8	19'.1	90° 55'.5	18'.8	315° 56'.6	13'.5
18	285° 38'.7	64° 02'.4	26'.5	181° 36'.0	19'.1	105° 57'.5	18'.6	330° 59'.1	13'.5
19	300° 41'.2	79° 01'.8	27'.5	196° 37'.2	19'.1	120° 59'.5	18'.3	346° 01'.6	13'.5
20	315° 43'.6	94° 01'.3	28'.5	211° 38'.3	19'.0	136° 01'.5	18'.1	1° 04'.1	13'.6
21	330° 46'.1	109° 00'.8	29'.5	226° 39'.5	19'.0	151° 03'.4	17'.9	16° 06'.6	13'.6
22	345° 48'.6	124° 00'.2	30'.6	241° 40'.7	18'.9	166° 05'.4	17'.7	31° 09'.1	13'.6
23	0° 51'.0	138° 59'.7	31'.6	256° 41'.9	18'.9	181° 07'.4	17'.5	46° 11'.6	13'.6
7 Wednesday 00	15° 53'.5	153° 59'.2	16° 32'.6 S	271° 43'.1	23° 18'.8 N	196° 09'.4	1° 17'.3 N	61° 14'.1	18° 13'.6 S
01	30° 56'.0	168° 58'.6	33'.6	286° 44'.2	18'.8	211° 11'.3	17'.1	76° 16'.6	13'.6
02	45° 58'.4	183° 58'.1	34'.6	301° 45'.4	18'.7	226° 13'.3	16'.9	91° 19'.1	13'.6
03	61° 00'.9	198° 57'.5	35'.7	316° 46'.6	18'.7	241° 15'.3	16'.7	106° 21'.6	13'.6
04	76° 03'.4	213° 57'.0	36'.7	331° 47'.8	18'.6	256° 17'.3	16'.5	121° 24'.1	13'.6
05	91° 05'.8	228° 56'.5	37'.7	346° 49'.0	18'.6	271° 19'.2	16'.3	136° 26'.6	13'.6
06	106° 08'.3	243° 55'.9	38'.7	1° 50'.1	18'.5	286° 21'.2	16'.0	151° 29'.2	13'.7
07	121° 10'.7	258° 55'.4	39'.7	16° 51'.3	18'.5	301° 23'.2	15'.8	166° 31'.7	13'.7
08	136° 13'.2	273° 54'.8	40'.8	31° 52'.5	18'.4	316° 25'.2	15'.6	181° 34'.2	13'.7
09	151° 15'.7	288° 54'.3	41'.8	46° 53'.7	18'.4	331° 27'.1	15'.4	196° 36'.7	13'.7
10	166° 18'.1	303° 53'.8	42'.8	61° 54'.9	18'.3	346° 29'.1	15'.2	211° 39'.2	13'.7
11	181° 20'.6	318° 53'.2	43'.8	76° 56'.1	18'.3	1° 31'.1	15'.0	226° 41'.7	13'.7
12	196° 23'.1	333° 52'.7	16° 44'.8 S	91° 57'.3	23° 18'.2 N	16° 33'.1	1° 14'.8 N	241° 44'.2	18° 13'.7 S
13	211° 25'.5	348° 52'.1	45'.8	106° 58'.4	18'.2	31° 35'.0	14'.6	256° 46'.7	13'.7
14	226° 28'.0	3° 51'.6	46'.8	121° 59'.6	18'.1	46° 37'.0	14'.4	271° 49'.2	13'.7
15	241° 30'.5	18° 51'.0	47'.9	137° 00'.8	18'.1	61° 39'.0	14'.2	286° 51'.7	13'.7
16	256° 32'.9	33° 50'.5	48'.9	152° 02'.0	18'.0	76° 41'.0	14'.0	301° 54'.2	13'.7
17	271° 35'.4	48° 50'.0	49'.9	167° 03'.2	18'.0	91° 42'.9	13'.7	316° 56'.7	13'.8
18	286° 37'.9	63° 49'.4	50'.9	182° 04'.4	17'.9	106° 44'.9	13'.5	331° 59'.2	13'.8
19	301° 40'.3	78° 48'.9	51'.9	197° 05'.6	17'.9	121° 46'.9	13'.3	347° 01'.7	13'.8
20	316° 42'.8	93° 48'.3	52'.9	212° 06'.8	17'.8	136° 48'.9	13'.1	2° 04'.2	13'.8
21	331° 45'.2	108° 47'.8	53'.9	227° 08'.0	17'.8	151° 50'.8	12'.9	17° 06'.7	13'.8
22	346° 47'.7	123° 47'.2	54'.9	242° 09'.1	17'.7	166° 52'.8	12'.7	32° 09'.2	13'.8
23	1° 50'.2	138° 46'.7	55'.9	257° 10'.3	17'.7	181° 54'.8	12'.5	47° 11'.7	13'.8
8 Thursday 00	16° 52'.6	153° 46'.1	16° 56'.9 S	272° 11'.5	23° 17'.6 N	196° 56'.8	1° 12'.3 N	62° 14'.2	18° 13'.8 S
01	31° 55'.1	168° 45'.6	57'.9	287° 12'.7	17'.6	211° 58'.7	12'.1	77° 16'.7	13'.8
02	46° 57'.6	183° 45'.0	58'.9	302° 13'.9	17'.5	227° 00'.7	11'.9	92° 19'.1	13'.8
03	62° 00'.0	198° 44'.5	59'.9	317° 15'.1	17'.5	242° 02'.7	11'.7	107° 21'.6	13'.8
04	77° 02'.5	213° 43'.9	17° 00'.9 S	332° 16'.3	17'.4	257° 04'.7	11'.4	122° 24'.1	13'.8
05	92° 05'.0	228° 43'.4	01'.9	347° 17'.5	17'.4	272° 06'.6	11'.2	137° 26'.6	13'.9
06	107° 07'.4	243° 42'.8	02'.9	2° 18'.7	17'.3	287° 08'.6	11'.0	152° 29'.1	13'.9
07	122° 09'.9	258° 42'.3	04'.0	17° 19'.9	17'.3	302° 10'.6	10'.8	167° 31'.6	13'.9
08	137° 12'.4	273° 41'.7	04'.9	32° 21'.1	17'.2	317° 12'.6	10'.6	182° 34'.1	13'.9
09	152° 14'.8	288° 41'.2	05'.9	47° 22'.3	17'.2	332° 14'.5	10'.4	197° 36'.6	13'.9
10	167° 17'.3	303° 40'.6	06'.9	62° 23'.5	17'.1	347° 16'.5	10'.2	212° 39'.1	13'.9
11	182° 19'.7	318° 40'.1	07'.9	77° 24'.7	17'.1	2° 18'.5	10'.0	227° 41'.6	13'.9
12	197° 22'.2	333° 39'.5	17° 08'.9 S	92° 25'.9	23° 17'.0 N	17° 20'.5	1° 09'.8 N	242° 44'.1	18° 13'.9 S
13	212° 24'.7	348° 39'.0	09'.9	107° 27'.1	17'.0	32° 22'.4	09'.6	257° 46'.6	13'.9
14	227° 27'.1	3° 38'.4	10'.9	122° 28'.3	16'.9	47° 24'.4	09'.4	272° 49'.1	13'.9
15	242° 29'.6	18° 37'.9	11'.9	137° 29'.5	16'.9	62° 26'.4	09'.2	287° 51'.6	13'.9
16	257° 32'.1	33° 37'.3	12'.9	152° 30'.7	16'.8	77° 28'.4	08'.9	302° 54'.1	13'.9
17	272° 34'.5	48° 36'.7	13'.9	167° 31'.9	16'.8	92° 30'.4	08'.7	317° 56'.6	14'.0
18	287° 37'.0	63° 36'.2	14'.9	182° 33'.1	16'.7	107° 32'.3	08'.5	332° 59'.1	14'.0
19	302° 39'.5	78° 35'.6	15'.9	197° 34'.3	16'.7	122° 34'.3	08'.3	348° 01'.6	14'.0
20	317° 41'.9	93° 35'.1	16'.9	212° 35'.5	16'.6	137° 36'.3	08'.1	3° 04'.1	14'.0
21	332° 44'.4	108° 34'.5	17'.9	227° 36'.7	16'.6	152° 38'.3	07'.9	18° 06'.6	14'.0
22	347° 46'.8	123° 34'.0	18'.9	242° 37'.9	16'.5	167° 40'.2	07'.7	33° 09'.1	14'.0
23	2° 49'.3	138° 33'.4	19'.9	257° 39'.1	16'.5	182° 42'.2	07'.5	48° 11'.6	14'.0
	M.P. 22:53	v -0'.5	d 1'.0	v 1'.2	d 0'.0	v 2'.0	d 0'.2	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.6	40° 19'.7 S
Achernar	335° 37'.6	57° 16'.2 S
Acrux	173° 27'.5	63° 03'.5 S
Adhara	255° 24'.7	28° 57'.5 S
Aldebaran	291° 06'.9	16° 29'.8 N
Alioth	166° 34'.7	55° 59'.9 N
Alkaid	153° 11'.4	49° 21'.0 N
Alnair	28° 02'.7	46° 59'.7 S
Alnilam	276° 01'.9	1° 12'.2 S
Alphard	218° 11'.5	8° 37'.5 S
Alphecca	126° 24'.4	26° 44'.5 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.2	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.5 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.3 N
Atria	108° 01'.6	69° 01'.1 S
Avior	234° 24'.6	59° 28'.9 S
Bellatrix	278° 48'.5	6° 20'.7 N
Betelgeuse	271° 17'.9	7° 24'.5 N
Canopus	264° 02'.9	52° 41'.2 S
Capella	280° 57'.1	45° 59'.4 N
Deneb	49° 41'.9	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 11'.0	61° 47'.2 N
Elnath	278° 32'.0	28° 36'.1 N
Eltanin	90° 53'.5	51° 29'.7 N
Enif	34° 02'.1	9° 50'.8 N
Fomalhaut	15° 40'.6	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.4 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.4 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.4	34° 23'.4 S
Kochab	137° 20'.2	74° 11'.2 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 31'.0	4° 03'.9 N
Menkent	148° 26'.3	36° 20'.1 S
Miaplacidus	221° 43'.6	69° 41'.0 S
Mirfak	309° 02'.2	49° 50'.2 N
Nunki	76° 17'.5	26° 18'.4 S
Peacock	53° 43'.2	56° 45'.6 S
Polaris	323° 32'.0	89° 13'.9 N
Pollux	243° 46'.6	28° 02'.6 N
Procyon	245° 15'.9	5° 14'.7 N
Rasalhague	96° 20'.9	12° 34'.1 N
Regulus	208° 00'.2	12° 00'.1 N
Rigel	281° 26'.8	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.4 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 57'.7	56° 30'.1 N
Shaula	96° 43'.1	37° 06'.0 S
Sirius	258° 47'.3	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.1	43° 24'.0 S
Vega	80° 49'.5	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	138° 05'.7	13:45
Mars	255° 49'.6	05:53
Jupiter	180° 15'.9	10:54
Saturn	45° 20'.6	19:52

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
182° 57'.4	5° 07'.8 S	63° 59'.3	14'.5	14° 26'.8 S	9'.5	54'.2
197° 57'.5	08'.8	78° 32'.8	14'.6	17'.3	9'.6	
212° 57'.7	09'.7	93° 06'.4	14'.6	07'.7	9'.7	
227° 57'.9	10'.7	107° 40'.0	14'.7	13° 58'.0 S	9'.7	
242° 58'.1	11'.7	122° 13'.7	14'.7	48'.3	9'.7	
257° 58'.3	12'.6	136° 47'.4	14'.7	38'.6	9'.8	
272° 58'.5	13'.6	151° 21'.1	14'.8	28'.8	9'.9	
287° 58'.6	14'.5	165° 54'.9	14'.9	18'.9	9'.9	
302° 58'.8	15'.5	180° 28'.8	14'.8	09'.0	9'.9	
317° 59'.0	16'.5	195° 02'.6	15'.0	12° 59'.1 S	10'.0	
332° 59'.2	17'.4	209° 36'.6	14'.9	49'.1	10'.1	
347° 59'.4	18'.4	224° 10'.5	15'.0	39'.0	10'.1	54'.1
2° 59'.5	5° 19'.3 S	238° 44'.5	15'.1	12° 28'.9 S	10'.2	54'.1
17° 59'.7	20'.3	253° 18'.6	15'.1	18'.7	10'.2	
32° 59'.9	21'.2	267° 52'.7	15'.1	08'.5	10'.2	
48° 00'.1	22'.2	282° 26'.8	15'.1	11° 58'.3 S	10'.3	
63° 00'.3	23'.2	297° 00'.9	15'.2	48'.0	10'.4	
78° 00'.5	24'.1	311° 35'.1	15'.2	37'.6	10'.3	
93° 00'.6	25'.1	326° 09'.3	15'.3	27'.3	10'.5	
108° 00'.8	26'.0	340° 43'.6	15'.3	16'.8	10'.5	
123° 01'.0	27'.0	355° 17'.9	15'.3	06'.3	10'.5	
138° 01'.2	27'.9	9° 52'.2	15'.4	10° 55'.8 S	10'.5	
153° 01'.4	28'.9	24° 26'.6	15'.4	45'.3	10'.6	
168° 01'.5	29'.9	39° 01'.0	15'.4	34'.7	10'.7	
183° 01'.7	5° 30'.8 S	53° 35'.4	15'.5	10° 24'.0 S	10'.7	54'.1
198° 01'.9	31'.8	68° 09'.9	15'.5	13'.3	10'.7	
213° 02'.1	32'.7	82° 44'.4	15'.5	02'.6	10'.8	
228° 02'.3	33'.7	97° 18'.9	15'.5	9° 51'.8 S	10'.8	
243° 02'.4	34'.6	111° 53'.4	15'.6	41'.0	10'.8	
258° 02'.6	35'.6	126° 28'.0	15'.6	30'.2	10'.9	
273° 02'.8	36'.6	141° 02'.6	15'.6	19'.3	10'.9	
288° 03'.0	37'.5	155° 37'.2	15'.7	08'.4	11'.0	
303° 03'.2	38'.5	170° 11'.9	15'.7	8° 57'.4 S	11'.0	
318° 03'.3	39'.4	184° 46'.6	15'.7	46'.4	11'.0	
333° 03'.5	40'.4	199° 21'.3	15'.7	35'.4	11'.0	
348° 03'.7	41'.3	213° 56'.0	15'.8	24'.4	11'.1	
3° 03'.9	5° 42'.3 S	228° 30'.8	15'.7	8° 13'.3 S	11'.2	54'.1
18° 04'.0	43'.2	243° 05'.5	15'.8	02'.1	11'.1	
33° 04'.2	44'.2	257° 40'.3	15'.8	7° 51'.0 S	11'.2	
48° 04'.4	45'.1	272° 15'.1	15'.9	39'.8	11'.2	
63° 04'.6	46'.1	286° 50'.0	15'.8	28'.6	11'.3	
78° 04'.8	47'.1	301° 24'.8	15'.9	17'.3	11'.2	
93° 04'.9	48'.0	315° 59'.7	15'.9	06'.1	11'.4	
108° 05'.1	49'.0	330° 34'.6	15'.9	6° 54'.7 S	11'.3	
123° 05'.3	49'.9	345° 09'.5	15'.9	43'.4	11'.4	
138° 05'.5	50'.9	359° 44'.4	15'.9	32'.0	11'.4	
153° 05'.6	51'.8	14° 19'.3	16'.0	20'.6	11'.4	
168° 05'.8	52'.8	28° 54'.3	15'.9	09'.2	11'.4	
183° 06'.0	5° 53'.7 S	43° 29'.2	16'.0	5° 57'.8 S	11'.5	54'.1
198° 06'.2	54'.7	58° 04'.2	16'.0	46'.3	11'.5	
213° 06'.3	55'.6	72° 39'.2	16'.0	34'.8	11'.5	
228° 06'.5	56'.6	87° 14'.2	16'.0	23'.3	11'.5	54'.2
243° 06'.7	57'.5	101° 49'.2	16'.0	11'.8	11'.6	
258° 06'.9	58'.5	116° 24'.2	16'.0	00'.2	11'.6	
273° 07'.0	59'.5	130° 59'.2	16'.0	4° 48'.6 S	11'.6	
288° 07'.2	6° 00'.4 S	145° 34'.2	16'.1	37'.0	11'.6	
303° 07'.4	01'.4	160° 09'.3	16'.0	25'.4	11'.7	
318° 07'.6	02'.3	174° 44'.3	16'.1	13'.7	11'.6	
333° 07'.7	03'.3	189° 19'.4	16'.0	02'.1	11'.7	
348° 07'.9	04'.2	203° 54'.4	16'.1	3° 50'.4 S	11'.7	
3° 08'.1	6° 05'.2 S	218° 29'.5	16'.0	3° 38'.7 S	11'.7	54'.2
18° 08'.3	06'.1	233° 04'.5	16'.1	27'.0	11'.8	
33° 08'.4	07'.1	247° 39'.6	16'.0	15'.2	11'.7	
48° 08'.6	08'.0	262° 14'.6	16'.1	03'.5	11'.8	
63° 08'.8	09'.0	276° 49'.7	16'.1	2° 51'.7 S	11'.8	
78° 09'.0	09'.9	291° 24'.8	16'.0	39'.9	11'.8	
93° 09'.1	10'.9	305° 59'.8	16'.1	28'.1	11'.8	
108° 09'.3	11'.8	320° 34'.9	16'.0	16'.3	11'.8	54'.3
123° 09'.5	12'.8	335° 09'.9	16'.1	04'.5	11'.9	
138° 09'.6	13'.7	349° 45'.0	16'.0	1° 52'.6 S	11'.8	
153° 09'.8	14'.7	4° 20'.0	16'.1	40'.8	11'.9	
168° 10'.0	15'.6	18° 55'.1	16'.0	28'.9	11'.8	
SD 16'.0	d 1'.0	SD	14'.8	14'.7	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
6	11 49	11 58	11:48	20:19	07:58	10d 76%
7	12 07	12 15	11:48	21:01	08:40	11d 84%
8	12 24	12 32	11:47	21:42	09:22	12d 90%

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1992 October 9, 10, 11 (Fri, Sat, Sun)

GMT	ARIES	VENUS -3.9		MARS +0.2		JUPITER -1.7		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
9 Friday 00	17° 51'.8	153° 32'.8	17° 20'.8 S	272° 40'.3	23° 16'.4 N	197° 44'.2	1° 07'.3 N	63° 14'.1	18° 14'.0 S
01	32° 54'.2	168° 32'.3	21'.8	287° 41'.5	16'.4	212° 46'.2	07'.1	78° 16'.6	14'.0
02	47° 56'.7	183° 31'.7	22'.8	302° 42'.7	16'.3	227° 48'.1	06'.9	93° 19'.1	14'.0
03	62° 59'.2	198° 31'.2	23'.8	317° 44'.0	16'.3	242° 50'.1	06'.7	108° 21'.6	14'.0
04	78° 01'.6	213° 30'.6	24'.8	332° 45'.2	16'.2	257° 52'.1	06'.4	123° 24'.0	14'.0
05	93° 04'.1	228° 30'.0	25'.8	347° 46'.4	16'.2	272° 54'.1	06'.2	138° 26'.5	14'.0
06	108° 06'.6	243° 29'.5	26'.8	2° 47'.6	16'.1	287° 56'.0	06'.0	153° 29'.0	14'.1
07	123° 09'.0	258° 28'.9	27'.7	17° 48'.8	16'.0	302° 58'.0	05'.8	168° 31'.5	14'.1
08	138° 11'.5	273° 28'.3	28'.7	32° 50'.0	16'.0	318° 00'.0	05'.6	183° 34'.0	14'.1
09	153° 14'.0	288° 27'.8	29'.7	47° 51'.2	15'.9	333° 02'.0	05'.4	198° 36'.5	14'.1
10	168° 16'.4	303° 27'.2	30'.7	62° 52'.4	15'.9	348° 04'.0	05'.2	213° 39'.0	14'.1
11	183° 18'.9	318° 26'.6	31'.7	77° 53'.6	15'.8	3° 05'.9	05'.0	228° 41'.5	14'.1
12	198° 21'.3	333° 26'.1	17° 32'.6 S	92° 54'.9	23° 15'.8 N	18° 07'.9	1° 04'.8 N	243° 44'.0	18° 14'.1 S
13	213° 23'.8	348° 25'.5	33'.6	107° 56'.1	15'.7	33° 09'.9	04'.6	258° 46'.5	14'.1
14	228° 26'.3	3° 24'.9	34'.6	122° 57'.3	15'.7	48° 11'.9	04'.4	273° 49'.0	14'.1
15	243° 28'.7	18° 24'.4	35'.6	137° 58'.5	15'.6	63° 13'.8	04'.2	288° 51'.5	14'.1
16	258° 31'.2	33° 23'.8	36'.5	152° 59'.7	15'.6	78° 15'.8	04'.0	303° 54'.0	14'.1
17	273° 33'.7	48° 23'.2	37'.5	168° 00'.9	15'.5	93° 17'.8	03'.7	318° 56'.4	14'.1
18	288° 36'.1	63° 22'.7	38'.5	183° 02'.2	15'.5	108° 19'.8	03'.5	333° 58'.9	14'.1
19	303° 38'.6	78° 22'.1	39'.5	198° 03'.4	15'.4	123° 21'.8	03'.3	349° 01'.4	14'.1
20	318° 41'.1	93° 21'.5	40'.4	213° 04'.6	15'.4	138° 23'.7	03'.1	4° 03'.9	14'.1
21	333° 43'.5	108° 21'.0	41'.4	228° 05'.8	15'.3	153° 25'.7	02'.9	19° 06'.4	14'.2
22	348° 46'.0	123° 20'.4	42'.4	243° 07'.0	15'.2	168° 27'.7	02'.7	34° 08'.9	14'.2
23	3° 48'.4	138° 19'.8	43'.4	258° 08'.2	15'.2	183° 29'.7	02'.5	49° 11'.4	14'.2
10 Saturday 00	18° 50'.9	153° 19'.2	17° 44'.3 S	273° 09'.5	23° 15'.1 N	198° 31'.6	1° 02'.3 N	64° 13'.9	18° 14'.2 S
01	33° 53'.4	168° 18'.7	45'.3	288° 10'.7	15'.1	213° 33'.6	02'.1	79° 16'.4	14'.2
02	48° 55'.8	183° 18'.1	46'.3	303° 11'.9	15'.0	228° 35'.6	01'.9	94° 18'.9	14'.2
03	63° 58'.3	198° 17'.5	47'.2	318° 13'.1	15'.0	243° 37'.6	01'.7	109° 21'.4	14'.2
04	79° 00'.8	213° 17'.0	48'.2	333° 14'.4	14'.9	258° 39'.6	01'.5	124° 23'.8	14'.2
05	94° 03'.2	228° 16'.4	49'.2	348° 15'.6	14'.9	273° 41'.5	01'.3	139° 26'.3	14'.2
06	109° 05'.7	243° 15'.8	50'.1	3° 16'.8	14'.8	288° 43'.5	01'.0	154° 28'.8	14'.2
07	124° 08'.2	258° 15'.2	51'.1	18° 18'.0	14'.8	303° 45'.5	00'.8	169° 31'.3	14'.2
08	139° 10'.6	273° 14'.7	52'.1	33° 19'.3	14'.7	318° 47'.5	00'.6	184° 33'.8	14'.2
09	154° 13'.1	288° 14'.1	53'.0	48° 20'.5	14'.7	333° 49'.4	00'.4	199° 36'.3	14'.2
10	169° 15'.6	303° 13'.5	54'.0	63° 21'.7	14'.6	348° 51'.4	00'.2	214° 38'.8	14'.2
11	184° 18'.0	318° 12'.9	54'.9	78° 22'.9	14'.5	3° 53'.4	00'.0	229° 41'.3	14'.2
12	199° 20'.5	333° 12'.3	17° 55'.9 S	93° 24'.2	23° 14'.5 N	18° 55'.4	0° 59'.8 N	244° 43'.8	18° 14'.2 S
13	214° 22'.9	348° 11'.8	56'.9	108° 25'.4	14'.4	33° 57'.4	59'.6	259° 46'.2	14'.2
14	229° 25'.4	3° 11'.2	57'.8	123° 26'.6	14'.4	48° 59'.3	59'.4	274° 48'.7	14'.3
15	244° 27'.9	18° 10'.6	58'.8	138° 27'.9	14'.3	64° 01'.3	59'.2	289° 51'.2	14'.3
16	259° 30'.3	33° 10'.0	59'.7	153° 29'.1	14'.3	79° 03'.3	59'.0	304° 53'.7	14'.3
17	274° 32'.8	48° 09'.4	18° 00'.7 S	168° 30'.3	14'.2	94° 05'.3	58'.8	319° 56'.2	14'.3
18	289° 35'.3	63° 08'.9	01'.7	183° 31'.6	14'.2	109° 07'.2	58'.6	334° 58'.7	14'.3
19	304° 37'.7	78° 08'.3	02'.6	198° 32'.8	14'.1	124° 09'.2	58'.4	350° 01'.2	14'.3
20	319° 40'.2	93° 07'.7	03'.6	213° 34'.0	14'.1	139° 11'.2	58'.1	5° 03'.7	14'.3
21	334° 42'.7	108° 07'.1	04'.5	228° 35'.3	14'.0	154° 13'.2	57'.9	20° 06'.1	14'.3
22	349° 45'.1	123° 06'.5	05'.5	243° 36'.5	13'.9	169° 15'.2	57'.7	35° 08'.6	14'.3
23	4° 47'.6	138° 06'.0	06'.4	258° 37'.7	13'.9	184° 17'.1	57'.5	50° 11'.1	14'.3
11 Sunday 00	19° 50'.0	153° 05'.4	18° 07'.4 S	273° 39'.0	23° 13'.8 N	199° 19'.1	0° 57'.3 N	65° 13'.6	18° 14'.3 S
01	34° 52'.5	168° 04'.8	08'.3	288° 40'.2	13'.8	214° 21'.1	57'.1	80° 16'.1	14'.3
02	49° 55'.0	183° 04'.2	09'.3	303° 41'.4	13'.7	229° 23'.1	56'.9	95° 18'.6	14'.3
03	64° 57'.4	198° 03'.6	10'.2	318° 42'.7	13'.7	244° 25'.1	56'.7	110° 21'.1	14'.3
04	79° 59'.9	213° 03'.0	11'.2	333° 43'.9	13'.6	259° 27'.0	56'.5	125° 23'.5	14'.3
05	95° 02'.4	228° 02'.4	12'.1	348° 45'.1	13'.6	274° 29'.0	56'.3	140° 26'.0	14'.3
06	110° 04'.8	243° 01'.9	13'.1	3° 46'.4	13'.5	289° 31'.0	56'.1	155° 28'.5	14'.3
07	125° 07'.3	258° 01'.3	14'.0	18° 47'.6	13'.4	304° 33'.0	55'.9	170° 31'.0	14'.3
08	140° 09'.8	273° 00'.7	15'.0	33° 48'.9	13'.4	319° 35'.0	55'.7	185° 33'.5	14'.3
09	155° 12'.2	288° 00'.1	15'.9	48° 50'.1	13'.3	334° 36'.9	55'.5	200° 36'.0	14'.4
10	170° 14'.7	302° 59'.5	16'.8	63° 51'.3	13'.3	349° 38'.9	55'.2	215° 38'.5	14'.4
11	185° 17'.2	317° 58'.9	17'.8	78° 52'.6	13'.2	4° 40'.9	55'.0	230° 40'.9	14'.4
12	200° 19'.6	332° 58'.3	18° 18'.7 S	93° 53'.8	23° 13'.2 N	19° 42'.9	0° 54'.8 N	245° 43'.4	18° 14'.4 S
13	215° 22'.1	347° 57'.7	19'.7	108° 55'.1	13'.1	34° 44'.8	54'.6	260° 45'.9	14'.4
14	230° 24'.5	2° 57'.1	20'.6	123° 56'.3	13'.0	49° 46'.8	54'.4	275° 48'.4	14'.4
15	245° 27'.0	17° 56'.6	21'.5	138° 57'.6	13'.0	64° 48'.8	54'.2	290° 50'.9	14'.4
16	260° 29'.5	32° 56'.0	22'.5	153° 58'.8	12'.9	79° 50'.8	54'.0	305° 53'.4	14'.4
17	275° 31'.9	47° 55'.4	23'.4	169° 00'.1	12'.9	94° 52'.8	53'.8	320° 55'.8	14'.4
18	290° 34'.4	62° 54'.8	24'.4	184° 01'.3	12'.8	109° 54'.7	53'.6	335° 58'.3	14'.4
19	305° 36'.9	77° 54'.2	25'.3	199° 02'.6	12'.8	124° 56'.7	53'.4	351° 00'.8	14'.4
20	320° 39'.3	92° 53'.6	26'.2	214° 03'.8	12'.7	139° 58'.7	53'.2	6° 03'.3	14'.4
21	335° 41'.8	107° 53'.0	27'.2	229° 05'.1	12'.7	155° 00'.7	53'.0	21° 05'.8	14'.4
22	350° 44'.3	122° 52'.4	28'.1	244° 06'.3	12'.6	170° 02'.7	52'.8	36° 08'.3	14'.4
23	5° 46'.7	137° 51'.8	29'.0	259° 07'.6	12'.5	185° 04'.6	52'.6	51° 10'.7	14'.4
	M.P. 22:41	v -0'.6	d 1'.0	v 1'.2	d 0'.1	v 2'.0	d 0'.2	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.6	40° 19'.7 S
Achernar	335° 37'.6	57° 16'.2 S
Acrux	173° 27'.5	63° 03'.5 S
Adhara	255° 24'.7	28° 57'.5 S
Aldebaran	291° 06'.9	16° 29'.8 N
Alioth	166° 34'.7	55° 59'.9 N
Alkaid	153° 11'.4	49° 21'.0 N
Alnair	28° 02'.7	46° 59'.8 S
Alnilam	276° 01'.9	1° 12'.2 S
Alphard	218° 11'.4	8° 37'.5 S
Alphecca	126° 24'.4	26° 44'.5 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.3	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.6 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.6	69° 01'.1 S
Avior	234° 24'.6	59° 28'.9 S
Bellatrix	278° 48'.4	6° 20'.7 N
Betelgeuse	271° 17'.9	7° 24'.5 N
Canopus	264° 02'.9	52° 41'.2 S
Capella	280° 57'.1	45° 59'.4 N
Deneb	49° 41'.9	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 11'.0	61° 47'.2 N
Elnath	278° 32'.0	28° 36'.1 N
Eltanin	90° 53'.5	51° 29'.7 N
Enif	34° 02'.1	9° 50'.8 N
Fomalhaut	15° 40'.6	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.3 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.7	60° 20'.4 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.4	34° 23'.4 S
Kochab	137° 20'.3	74° 11'.2 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.9	4° 03'.9 N
Menkent	148° 26'.3	36° 20'.1 S
Miaplacidus	221° 43'.5	69° 41'.0 S
Mirfak	309° 02'.2	49° 50'.2 N
Nunki	76° 17'.5	26° 18'.4 S
Peacock	53° 43'.3	56° 45'.6 S
Polaris	323° 31'.5	89° 13'.9 N
Pollux	243° 46'.6	28° 02'.6 N
Procyon	245° 15'.9	5° 14'.7 N
Rasalhague	96° 20'.9	12° 34'.1 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 26'.7	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.4 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.7	56° 30'.1 N
Shaula	96° 43'.1	37° 06'.0 S
Sirius	258° 47'.3	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.1	43° 24'.0 S
Vega	80° 49'.5	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	134° 28'.3	13:47
Mars	254° 18'.6	05:47
Jupiter	179° 40'.7	10:44
Saturn	45° 23'.0	19:40

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
183° 10'.2	6° 16'.6 S	33° 30'.1	16'.0	1° 17'.1 S	11'.9	54'.3
198° 10'.3	17'.5	48° 05'.1	16'.0	05'.2	11'.9	
213° 10'.5	18'.5	62° 40'.1	16'.0	0° 53'.3 S	11'.9	
228° 10'.7	19'.4	77° 15'.1	16'.0	41'.4	11'.9	
243° 10'.8	20'.4	91° 50'.1	16'.0	29'.5	11'.9	
258° 11'.0	21'.3	106° 25'.1	16'.0	17'.6	11'.9	
273° 11'.2	22'.3	121° 00'.1	16'.0	05'.7	11'.9	54'.4
288° 11'.4	23'.2	135° 35'.1	15'.9	0° 06'.2 N	12'.0	
303° 11'.5	24'.2	150° 10'.0	16'.0	18'.2	11'.9	
318° 11'.7	25'.1	164° 45'.0	15'.9	30'.1	11'.9	
333° 11'.9	26'.1	179° 19'.9	15'.9	42'.0	12'.0	
348° 12'.0	27'.0	193° 54'.8	15'.9	54'.0	11'.9	
3° 12'.2	6° 28'.0 S	208° 29'.7	15'.9	1° 05'.9 N	11'.9	54'.4
18° 12'.4	28'.9	223° 04'.6	15'.8	17'.8	12'.0	
33° 12'.5	29'.9	237° 39'.4	15'.9	29'.8	11'.9	
48° 12'.7	30'.8	252° 14'.3	15'.8	41'.7	11'.9	54'.5
63° 12'.9	31'.8	266° 49'.1	15'.8	53'.6	12'.0	
78° 13'.0	32'.7	281° 23'.9	15'.8	2° 05'.6 N	11'.9	
93° 13'.2	33'.6	295° 58'.7	15'.8	17'.5	11'.9	
108° 13'.4	34'.6	310° 33'.5	15'.7	29'.4	12'.0	
123° 13'.5	35'.5	325° 08'.2	15'.7	41'.4	11'.9	
138° 13'.7	36'.5	339° 42'.9	15'.7	53'.3	11'.9	
153° 13'.9	37'.4	354° 17'.6	15'.7	3° 05'.2 N	11'.9	
168° 14'.0	38'.4	8° 52'.3	15'.6	17'.1	11'.9	
183° 14'.2	6° 39'.3 S	23° 26'.9	15'.6	3° 29'.0 N	11'.9	54'.6
198° 14'.4	40'.3	38° 01'.5	15'.6	40'.9	11'.9	
213° 14'.5	41'.2	52° 36'.1	15'.6	52'.8	11'.9	
228° 14'.7	42'.2	67° 10'.7	15'.5	4° 04'.7 N	11'.8	
243° 14'.9	43'.1	81° 45'.2	15'.5	16'.5	11'.9	
258° 15'.0	44'.1	96° 19'.7	15'.5	28'.4	11'.8	
273° 15'.2	45'.0	110° 54'.2	15'.4	40'.2	11'.8	
288° 15'.4	46'.0	125° 28'.6	15'.4	52'.0	11'.9	54'.7
303° 15'.5	46'.9	140° 03'.0	15'.4	5° 03'.9 N	11'.8	
318° 15'.7	47'.8	154° 37'.4	15'.3	15'.7	11'.7	
333° 15'.9	48'.8	169° 11'.7	15'.3	27'.4	11'.8	
348° 16'.0	49'.7	183° 46'.0	15'.3	39'.2	11'.8	
3° 16'.2	6° 50'.7 S	198° 20'.3	15'.3	5° 51'.0 N	11'.7	54'.7
18° 16'.4	51'.6	212° 54'.6	15'.2	6° 02'.7 N	11'.7	
33° 16'.5	52'.6	227° 28'.8	15'.1	14'.4	11'.7	54'.8
48° 16'.7	53'.5	242° 02'.9	15'.1	26'.1	11'.7	
63° 16'.9	54'.5	256° 37'.0	15'.1	37'.8	11'.7	
78° 17'.0	55'.4	271° 11'.1	15'.1	49'.5	11'.6	
93° 17'.2	56'.3	285° 45'.2	15'.0	7° 01'.1 N	11'.6	
108° 17'.3	57'.3	300° 19'.2	14'.9	12'.7	11'.6	
123° 17'.5	58'.2	314° 53'.1	15'.0	24'.3	11'.6	
138° 17'.7	59'.2	329° 27'.1	14'.9	35'.9	11'.5	54'.9
153° 17'.8	7° 00'.1 S	344° 01'.0	14'.8	47'.4	11'.6	
168° 18'.0	01'.1	358° 34'.8	14'.8	59'.0	11'.4	
183° 18'.2	7° 02'.0 S	13° 08'.6	14'.7	8° 10'.4 N	11'.5	54'.9
198° 18'.3	02'.9	27° 42'.3	14'.7	21'.9	11'.4	
213° 18'.5	03'.9	42° 16'.0	14'.7	33'.3	11'.5	
228° 18'.6	04'.8	56° 49'.7	14'.6	44'.8	11'.3	
243° 18'.8	05'.8	71° 23'.3	14'.6	56'.1	11'.4	55'.0
258° 19'.0	06'.7	85° 56'.9	14'.5	9° 07'.5 N	11'.3	
273° 19'.1	07'.7	100° 30'.4	14'.4	18'.8	11'.3	
288° 19'.3	08'.6	115° 03'.8	14'.5	30'.1	11'.2	
303° 19'.4	09'.5	129° 37'.3	14'.3	41'.3	11'.3	
318° 19'.6	10'.5	144° 10'.6	14'.3	52'.6	11'.1	
333° 19'.8	11'.4	158° 43'.9	14'.3	10° 03'.7 N	11'.2	55'.1
348° 19'.9	12'.4	173° 17'.2	14'.2	14'.9	11'.1	
3° 20'.1	7° 13'.3 S	187° 50'.4	14'.2	10° 26'.0 N	11'.1	55'.1
18° 20'.2	14'.2	202° 23'.6	14'.1	37'.1	11'.0	
33° 20'.4	15'.2	216° 56'.7	14'.0	48'.1	11'.0	
48° 20'.6	16'.1	231° 29'.7	14'.0	59'.1	10'.9	
63° 20'.7	17'.1	246° 02'.7	14'.0	11° 10'.0 N	10'.9	55'.2
78° 20'.9	18'.0	260° 35'.7	13'.9	20'.9	10'.9	
93° 21'.0	18'.9	275° 08'.6	13'.8	31'.8	10'.8	
108° 21'.2	19'.9	289° 41'.4	13'.8	42'.6	10'.8	
123° 21'.4	20'.8	304° 14'.2	13'.7	53'.4	10'.7	
138° 21'.5	21'.8	318° 46'.9	13'.6	12° 04'.1 N	10'.7	
153° 21'.7	22'.7	333° 19'.5	13'.6	14'.8	10'.7	55'.3
168° 21'.8	23'.6	347° 52'.1	13'.5	25'.5	10'.5	
SD 16'.0	d 0'.9	SD	14'.8	14'.9	15'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
9	12 40	12 48	11:47	22:23	10:03	13d 95%
10	12 57	13 04	11:47	23:06	10:44	14d 98%
11	13 12	13 20	11:47	23:50	11:28	15d Full

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1992 October 12, 13, 14 (Mon, Tue, Wed)

GMT	ARIES	VENUS -4.0		MARS +0.1		JUPITER -1.7		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
12 Monday 00	20° 49'.2	152° 51'.2	18° 30'.0 S	274° 08'.8	23° 12'.5 N	200° 06'.6	0° 52'.4 N	66° 13'.2	18° 14'.4 S
01	35° 51'.7	167° 50'.6	30'.9	289° 10'.1	12'.4	215° 08'.6	52'.1	81° 15'.7	14'.4
02	50° 54'.1	182° 50'.0	31'.8	304° 11'.3	12'.4	230° 10'.6	51'.9	96° 18'.2	14'.4
03	65° 56'.6	197° 49'.4	32'.8	319° 12'.6	12'.3	245° 12'.6	51'.7	111° 20'.7	14'.4
04	80° 59'.0	212° 48'.8	33'.7	334° 13'.8	12'.3	260° 14'.5	51'.5	126° 23'.1	14'.4
05	96° 01'.5	227° 48'.2	34'.6	349° 15'.1	12'.2	275° 16'.5	51'.3	141° 25'.6	14'.4
06	111° 04'.0	242° 47'.6	35'.5	4° 16'.3	12'.1	290° 18'.5	51'.1	156° 28'.1	14'.4
07	126° 06'.4	257° 47'.0	36'.5	19° 17'.6	12'.1	305° 20'.5	50'.9	171° 30'.6	14'.4
08	141° 08'.9	272° 46'.4	37'.4	34° 18'.8	12'.0	320° 22'.5	50'.7	186° 33'.1	14'.4
09	156° 11'.4	287° 45'.8	38'.3	49° 20'.1	12'.0	335° 24'.4	50'.5	201° 35'.5	14'.4
10	171° 13'.8	302° 45'.2	39'.2	64° 21'.3	11'.9	350° 26'.4	50'.3	216° 38'.0	14'.4
11	186° 16'.3	317° 44'.6	40'.2	79° 22'.6	11'.9	5° 28'.4	50'.1	231° 40'.5	14'.5
12	201° 18'.8	332° 44'.0	18° 41'.1 S	94° 23'.9	23° 11'.8 N	20° 30'.4	0° 49'.9 N	246° 43'.0	18° 14'.5 S
13	216° 21'.2	347° 43'.4	42'.0	109° 25'.1	11'.7	35° 32'.4	49'.7	261° 45'.5	14'.5
14	231° 23'.7	2° 42'.8	42'.9	124° 26'.4	11'.7	50° 34'.3	49'.5	276° 47'.9	14'.5
15	246° 26'.1	17° 42'.2	43'.8	139° 27'.6	11'.6	65° 36'.3	49'.3	291° 50'.4	14'.5
16	261° 28'.6	32° 41'.6	44'.8	154° 28'.9	11'.6	80° 38'.3	49'.0	306° 52'.9	14'.5
17	276° 31'.1	47° 41'.0	45'.7	169° 30'.2	11'.5	95° 40'.3	48'.8	321° 55'.4	14'.5
18	291° 33'.5	62° 40'.4	46'.6	184° 31'.4	11'.5	110° 42'.3	48'.6	336° 57'.9	14'.5
19	306° 36'.0	77° 39'.8	47'.5	199° 32'.7	11'.4	125° 44'.2	48'.4	352° 00'.3	14'.5
20	321° 38'.5	92° 39'.2	48'.4	214° 33'.9	11'.3	140° 46'.2	48'.2	7° 02'.8	14'.5
21	336° 40'.9	107° 38'.6	49'.4	229° 35'.2	11'.3	155° 48'.2	48'.0	22° 05'.3	14'.5
22	351° 43'.4	122° 38'.0	50'.3	244° 36'.5	11'.2	170° 50'.2	47'.8	37° 07'.8	14'.5
23	6° 45'.9	137° 37'.4	51'.2	259° 37'.7	11'.2	185° 52'.2	47'.6	52° 10'.3	14'.5
13 Tuesday 00	21° 48'.3	152° 36'.7	18° 52'.1 S	274° 39'.0	23° 11'.1 N	200° 54'.2	0° 47'.4 N	67° 12'.7	18° 14'.5 S
01	36° 50'.8	167° 36'.1	53'.0	289° 40'.3	11'.1	215° 56'.1	47'.2	82° 15'.2	14'.5
02	51° 53'.3	182° 35'.5	53'.9	304° 41'.5	11'.0	230° 58'.1	47'.0	97° 17'.7	14'.5
03	66° 55'.7	197° 34'.9	54'.8	319° 42'.8	10'.9	246° 00'.1	46'.8	112° 20'.2	14'.5
04	81° 58'.2	212° 34'.3	55'.7	334° 44'.1	10'.9	261° 02'.1	46'.6	127° 22'.6	14'.5
05	97° 00'.6	227° 33'.7	56'.6	349° 45'.3	10'.8	276° 04'.1	46'.4	142° 25'.1	14'.5
06	112° 03'.1	242° 33'.1	57'.5	4° 46'.6	10'.8	291° 06'.0	46'.2	157° 27'.6	14'.5
07	127° 05'.6	257° 32'.5	58'.5	19° 47'.9	10'.7	306° 08'.0	46'.0	172° 30'.1	14'.5
08	142° 08'.0	272° 31'.9	59'.4	34° 49'.2	10'.6	321° 10'.0	45'.8	187° 32'.5	14'.5
09	157° 10'.5	287° 31'.3	19° 00'.3 S	49° 50'.4	10'.6	336° 12'.0	45'.5	202° 35'.0	14'.5
10	172° 13'.0	302° 30'.6	01'.2	64° 51'.7	10'.5	351° 14'.0	45'.3	217° 37'.5	14'.5
11	187° 15'.4	317° 30'.0	02'.1	79° 53'.0	10'.5	6° 15'.9	45'.1	232° 40'.0	14'.5
12	202° 17'.9	332° 29'.4	19° 03'.0 S	94° 54'.2	23° 10'.4 N	21° 17'.9	0° 44'.9 N	247° 42'.4	18° 14'.5 S
13	217° 20'.4	347° 28'.8	03'.9	109° 55'.5	10'.4	36° 19'.9	44'.7	262° 44'.9	14'.5
14	232° 22'.8	2° 28'.2	04'.8	124° 56'.8	10'.3	51° 21'.9	44'.5	277° 47'.4	14'.5
15	247° 25'.3	17° 27'.6	05'.7	139° 58'.1	10'.2	66° 23'.9	44'.3	292° 49'.9	14'.5
16	262° 27'.7	32° 26'.9	06'.6	154° 59'.3	10'.2	81° 25'.9	44'.1	307° 52'.3	14'.5
17	277° 30'.2	47° 26'.3	07'.5	170° 00'.6	10'.1	96° 27'.8	43'.9	322° 54'.8	14'.5
18	292° 32'.7	62° 25'.7	08'.4	185° 01'.9	10'.1	111° 29'.8	43'.7	337° 57'.3	14'.5
19	307° 35'.1	77° 25'.1	09'.3	200° 03'.2	10'.0	126° 31'.8	43'.5	352° 59'.8	14'.5
20	322° 37'.6	92° 24'.5	10'.2	215° 04'.5	09'.9	141° 33'.8	43'.3	8° 02'.2	14'.5
21	337° 40'.1	107° 23'.9	11'.1	230° 05'.7	09'.9	156° 35'.8	43'.1	23° 04'.7	14'.5
22	352° 42'.5	122° 23'.2	12'.0	245° 07'.0	09'.8	171° 37'.7	42'.9	38° 07'.2	14'.5
23	7° 45'.0	137° 22'.6	12'.8	260° 08'.3	09'.8	186° 39'.7	42'.7	53° 09'.7	14'.5
14 Wednesday 00	22° 47'.5	152° 22'.0	19° 13'.7 S	275° 09'.6	23° 09'.7 N	201° 41'.7	0° 42'.5 N	68° 12'.1	18° 14'.5 S
01	37° 49'.9	167° 21'.4	14'.6	290° 10'.9	09'.6	216° 43'.7	42'.3	83° 14'.6	14'.5
02	52° 52'.4	182° 20'.8	15'.5	305° 12'.1	09'.6	231° 45'.7	42'.1	98° 17'.1	14'.5
03	67° 54'.9	197° 20'.1	16'.4	320° 13'.4	09'.5	246° 47'.7	41'.8	113° 19'.6	14'.5
04	82° 57'.3	212° 19'.5	17'.3	335° 14'.7	09'.5	261° 49'.6	41'.6	128° 22'.0	14'.5
05	97° 59'.8	227° 18'.9	18'.2	350° 16'.0	09'.4	276° 51'.6	41'.4	143° 24'.5	14'.5
06	113° 02'.2	242° 18'.3	19'.1	5° 17'.3	09'.3	291° 53'.6	41'.2	158° 27'.0	14'.5
07	128° 04'.7	257° 17'.6	20'.0	20° 18'.6	09'.3	306° 55'.6	41'.0	173° 29'.4	14'.5
08	143° 07'.2	272° 17'.0	20'.9	35° 19'.8	09'.2	321° 57'.6	40'.8	188° 31'.9	14'.5
09	158° 09'.6	287° 16'.4	21'.7	50° 21'.1	09'.2	336° 59'.6	40'.6	203° 34'.4	14'.5
10	173° 12'.1	302° 15'.8	22'.6	65° 22'.4	09'.1	352° 01'.5	40'.4	218° 36'.9	14'.6
11	188° 14'.6	317° 15'.1	23'.5	80° 23'.7	09'.1	7° 03'.5	40'.2	233° 39'.3	14'.6
12	203° 17'.0	332° 14'.5	19° 24'.4 S	95° 25'.0	23° 09'.0 N	22° 05'.5	0° 40'.0 N	248° 41'.8	18° 14'.6 S
13	218° 19'.5	347° 13'.9	25'.3	110° 26'.3	08'.9	37° 07'.5	39'.8	263° 44'.3	14'.6
14	233° 22'.0	2° 13'.3	26'.1	125° 27'.6	08'.9	52° 09'.5	39'.6	278° 46'.8	14'.6
15	248° 24'.4	17° 12'.6	27'.0	140° 28'.9	08'.8	67° 11'.4	39'.4	293° 49'.2	14'.6
16	263° 26'.9	32° 12'.0	27'.9	155° 30'.2	08'.8	82° 13'.4	39'.2	308° 51'.7	14'.6
17	278° 29'.4	47° 11'.4	28'.8	170° 31'.5	08'.7	97° 15'.4	39'.0	323° 54'.2	14'.6
18	293° 31'.8	62° 10'.7	29'.7	185° 32'.7	08'.6	112° 17'.4	38'.8	338° 56'.6	14'.6
19	308° 34'.3	77° 10'.1	30'.5	200° 34'.0	08'.6	127° 19'.4	38'.6	353° 59'.1	14'.6
20	323° 36'.7	92° 09'.5	31'.4	215° 35'.3	08'.5	142° 21'.4	38'.4	9° 01'.6	14'.6
21	338° 39'.2	107° 08'.8	32'.3	230° 36'.6	08'.5	157° 23'.3	38'.2	24° 04'.0	14'.6
22	353° 41'.7	122° 08'.2	33'.2	245° 37'.9	08'.4	172° 25'.3	38'.0	39° 06'.5	14'.6
23	8° 44'.1	137° 07'.6	34'.0	260° 39'.2	08'.3	187° 27'.3	37'.7	54° 09'.0	14'.6
	M.P. 22:29	v -0'.6	d 0'.9	v 1'.3	d 0'.1	v 2'.0	d 0'.2	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.6	40° 19'.8 S
Achernar	335° 37'.6	57° 16'.2 S
Acrux	173° 27'.5	63° 03'.5 S
Adhara	255° 24'.6	28° 57'.5 S
Aldebaran	291° 06'.9	16° 29'.8 N
Alioth	166° 34'.7	55° 59'.9 N
Alkaid	153° 11'.5	49° 21'.0 N
Alnair	28° 02'.7	46° 59'.8 S
Alnilam	276° 01'.9	1° 12'.2 S
Alphard	218° 11'.4	8° 37'.5 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.3	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.6 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.6	69° 01'.1 S
Avior	234° 24'.5	59° 28'.9 S
Bellatrix	278° 48'.4	6° 20'.7 N
Betelgeuse	271° 17'.9	7° 24'.5 N
Canopus	264° 02'.9	52° 41'.2 S
Capella	280° 57'.1	45° 59'.4 N
Deneb	49° 41'.9	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.9	61° 47'.2 N
Elnath	278° 32'.0	28° 36'.1 N
Eltanin	90° 53'.5	51° 29'.7 N
Enif	34° 02'.1	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.5 S
Gacrux	172° 18'.9	57° 04'.3 S
Gienah	176° 08'.6	17° 30'.1 S
Hadar	149° 10'.7	60° 20'.4 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.4	34° 23'.4 S
Kochab	137° 20'.3	74° 11'.2 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.9	4° 03'.9 N
Menkent	148° 26'.3	36° 20'.1 S
Miaplacidus	221° 43'.5	69° 41'.0 S
Mirfak	309° 02'.2	49° 50'.2 N
Nunki	76° 17'.5	26° 18'.4 S
Peacock	53° 43'.3	56° 45'.6 S
Polaris	323° 30'.9	89° 13'.9 N
Pollux	243° 46'.6	28° 02'.6 N
Procyon	245° 15'.9	5° 14'.7 N
Rasalhague	96° 21'.0	12° 34'.1 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 26'.7	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.3 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.7	56° 30'.1 N
Shaula	96° 43'.1	37° 06'.0 S
Sirius	258° 47'.3	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.0	43° 24'.0 S
Vega	80° 49'.5	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	130° 48'.4	13:50
Mars	252° 50'.7	05:41
Jupiter	179° 05'.8	10:35
Saturn	45° 24'.4	19:28

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
183° 22'.0	7° 24'.6 S	2° 24'.6	13'.5	12° 36'.0 N	10'.6	55'.3
198° 22'.1	25'.5	16° 57'.1	13'.4	46'.6	10'.5	
213° 22'.3	26'.4	31° 29'.5	13'.4	57'.1	10'.4	
228° 22'.4	27'.4	46° 01'.9	13'.3	13° 07'.5 N	10'.4	55'.4
243° 22'.6	28'.3	60° 34'.2	13'.2	17'.9	10'.3	
258° 22'.8	29'.3	75° 06'.4	13'.2	28'.2	10'.3	
273° 22'.9	30'.2	89° 38'.6	13'.1	38'.5	10'.2	
288° 23'.1	31'.1	104° 10'.7	13'.0	48'.7	10'.2	
303° 23'.2	32'.1	118° 42'.7	13'.0	58'.9	10'.1	
318° 23'.4	33'.0	133° 14'.7	12'.9	14° 09'.0 N	10'.1	55'.5
333° 23'.5	33'.9	147° 46'.6	12'.8	19'.1	10'.0	
348° 23'.7	34'.9	162° 18'.4	12'.8	29'.1	9'.9	
3° 23'.8	7° 35'.8 S	176° 50'.2	12'.7	14° 39'.0 N	9'.9	55'.5
18° 24'.0	36'.8	191° 21'.9	12'.7	48'.9	9'.8	
33° 24'.2	37'.7	205° 53'.6	12'.6	58'.7	9'.7	55'.6
48° 24'.3	38'.6	220° 25'.2	12'.5	15° 08'.4 N	9'.7	
63° 24'.5	39'.6	234° 56'.7	12'.4	18'.1	9'.6	
78° 24'.6	40'.5	249° 28'.1	12'.4	27'.7	9'.6	
93° 24'.8	41'.4	263° 59'.5	12'.3	37'.3	9'.5	
108° 24'.9	42'.4	278° 30'.8	12'.2	46'.8	9'.4	
123° 25'.1	43'.3	293° 02'.0	12'.2	56'.2	9'.3	55'.7
138° 25'.2	44'.2	307° 33'.2	12'.1	16° 05'.5 N	9'.3	
153° 25'.4	45'.2	322° 04'.3	12'.1	14'.8	9'.2	
168° 25'.5	46'.1	336° 35'.4	11'.9	24'.0	9'.1	
183° 25'.7	7° 47'.0 S	351° 06'.3	11'.9	16° 33'.1 N	9'.1	55'.7
198° 25'.8	48'.0	5° 37'.2	11'.8	42'.2	9'.0	55'.8
213° 26'.0	48'.9	20° 08'.0	11'.8	51'.2	8'.9	
228° 26'.1	49'.8	34° 38'.8	11'.7	17° 00'.1 N	8'.8	
243° 26'.3	50'.8	49° 09'.5	11'.6	08'.9	8'.8	
258° 26'.4	51'.7	63° 40'.1	11'.5	17'.7	8'.6	
273° 26'.6	52'.6	78° 10'.6	11'.5	26'.3	8'.6	55'.9
288° 26'.7	53'.6	92° 41'.1	11'.4	34'.9	8'.5	
303° 26'.9	54'.5	107° 11'.5	11'.3	43'.4	8'.5	
318° 27'.0	55'.4	121° 41'.8	11'.3	51'.9	8'.3	
333° 27'.2	56'.4	136° 12'.1	11'.1	18° 00'.2 N	8'.3	
348° 27'.3	57'.3	150° 42'.2	11'.1	08'.5	8'.2	56'.0
3° 27'.5	7° 58'.2 S	165° 12'.3	11'.1	18° 16'.7 N	8'.1	56'.0
18° 27'.6	59'.2	179° 42'.4	11'.0	24'.8	8'.0	
33° 27'.8	8° 00'.1 S	194° 12'.4	10'.9	32'.8	7'.9	
48° 27'.9	01'.0	208° 42'.3	10'.8	40'.7	7'.8	
63° 28'.1	02'.0	223° 12'.1	10'.7	48'.5	7'.7	56'.1
78° 28'.2	02'.9	237° 41'.8	10'.7	56'.2	7'.7	
93° 28'.4	03'.8	252° 11'.5	10'.6	19° 03'.9 N	7'.6	
108° 28'.5	04'.8	266° 41'.1	10'.6	11'.5	7'.4	
123° 28'.7	05'.7	281° 10'.7	10'.4	18'.9	7'.4	
138° 28'.8	06'.6	295° 40'.1	10'.4	26'.3	7'.3	56'.2
153° 28'.9	07'.6	310° 09'.5	10'.3	33'.6	7'.1	
168° 29'.1	08'.5	324° 38'.8	10'.3	40'.7	7'.1	
183° 29'.2	8° 09'.4 S	339° 08'.1	10'.2	19° 47'.8 N	7'.0	56'.2
198° 29'.4	10'.3	353° 37'.3	10'.1	54'.8	6'.9	
213° 29'.5	11'.3	8° 06'.4	10'.0	20° 01'.7 N	6'.8	56'.3
228° 29'.7	12'.2	22° 35'.4	10'.0	08'.5	6'.6	
243° 29'.8	13'.1	37° 04'.4	9'.9	15'.1	6'.6	
258° 30'.0	14'.1	51° 33'.3	9'.8	21'.7	6'.5	
273° 30'.1	15'.0	66° 02'.1	9'.8	28'.2	6'.4	
288° 30'.3	15'.9	80° 30'.9	9'.7	34'.6	6'.2	56'.4
303° 30'.4	16'.8	94° 59'.6	9'.6	40'.8	6'.2	
318° 30'.5	17'.8	109° 28'.2	9'.6	47'.0	6'.1	
333° 30'.7	18'.7	123° 56'.8	9'.5	53'.1	5'.9	
348° 30'.8	19'.6	138° 25'.3	9'.4	59'.0	5'.8	
3° 31'.0	8° 20'.6 S	152° 53'.7	9'.3	21° 04'.8 N	5'.8	56'.5
18° 31'.1	21'.5	167° 22'.0	9'.3	10'.6	5'.6	
33° 31'.3	22'.4	181° 50'.3	9'.3	16'.2	5'.5	
48° 31'.4	23'.3	196° 18'.6	9'.1	21'.7	5'.4	
63° 31'.5	24'.3	210° 46'.7	9'.1	27'.1	5'.2	
78° 31'.7	25'.2	225° 14'.8	9'.1	32'.3	5'.2	56'.6
93° 31'.8	26'.1	239° 42'.9	8'.9	37'.5	5'.1	
108° 32'.0	27'.0	254° 10'.8	8'.9	42'.6	4'.9	
123° 32'.1	28'.0	268° 38'.7	8'.9	47'.5	4'.8	
138° 32'.2	28'.9	283° 06'.6	8'.8	52'.3	4'.7	
153° 32'.4	29'.8	297° 34'.4	8'.7	57'.0	4'.6	56'.7
168° 32'.5	30'.7	312° 02'.1	8'.6	22° 01'.6 N	4'.4	
SD 16'.0	d 0'.9	SD	15'.1	15'.3	15'.4	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON ◯ Age/ Vis
12	13 28	13 35	11:46	24:37	12:13	16d 99%
13	13 42	13 50	11:46	00:37	13:01	17d 97%
14	13 57	14 04	11:46	01:26	13:52	18d 92%

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1992 October 15, 16, 17 (Thur, Fri, Sat)

GMT	ARIES	VENUS -4.0		MARS +0.1		JUPITER -1.7		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
15 Thursday 00	23° 46'.6	152° 06'.9	19° 34'.9 S	275° 40'.5	23° 08'.3 N	202° 29'.3	0° 37'.5 N	69° 11'.4	18° 14'.6 S
01	38° 49'.1	167° 06'.3	35'.8	290° 41'.8	08'.2	217° 31'.3	37'.3	84° 13'.9	14'.6
02	53° 51'.5	182° 05'.7	36'.6	305° 43'.1	08'.2	232° 33'.3	37'.1	99° 16'.4	14'.6
03	68° 54'.0	197° 05'.0	37'.5	320° 44'.4	08'.1	247° 35'.2	36'.9	114° 18'.9	14'.6
04	83° 56'.5	212° 04'.4	38'.4	335° 45'.7	08'.0	262° 37'.2	36'.7	129° 21'.3	14'.6
05	98° 58'.9	227° 03'.8	39'.2	350° 47'.0	08'.0	277° 39'.2	36'.5	144° 23'.8	14'.6
06	114° 01'.4	242° 03'.1	40'.1	5° 48'.3	07'.9	292° 41'.2	36'.3	159° 26'.3	14'.6
07	129° 03'.8	257° 02'.5	41'.0	20° 49'.6	07'.9	307° 43'.2	36'.1	174° 28'.7	14'.6
08	144° 06'.3	272° 01'.9	41'.8	35° 50'.9	07'.8	322° 45'.2	35'.9	189° 31'.2	14'.6
09	159° 08'.8	287° 01'.2	42'.7	50° 52'.2	07'.7	337° 47'.1	35'.7	204° 33'.7	14'.6
10	174° 11'.2	302° 00'.6	43'.6	65° 53'.5	07'.7	352° 49'.1	35'.5	219° 36'.1	14'.6
11	189° 13'.7	317° 00'.0	44'.4	80° 54'.8	07'.6	7° 51'.1	35'.3	234° 38'.6	14'.6
12	204° 16'.2	331° 59'.3	19° 45'.3 S	95° 56'.1	23° 07'.6 N	22° 53'.1	0° 35'.1 N	249° 41'.1	18° 14'.6 S
13	219° 18'.6	346° 58'.7	46'.2	110° 57'.4	07'.5	37° 55'.1	34'.9	264° 43'.5	14'.6
14	234° 21'.1	1° 58'.0	47'.0	125° 58'.7	07'.4	52° 57'.1	34'.7	279° 46'.0	14'.6
15	249° 23'.6	16° 57'.4	47'.9	141° 00'.1	07'.4	67° 59'.1	34'.5	294° 48'.5	14'.6
16	264° 26'.0	31° 56'.8	48'.7	156° 01'.4	07'.3	83° 01'.0	34'.3	309° 50'.9	14'.6
17	279° 28'.5	46° 56'.1	49'.6	171° 02'.7	07'.3	98° 03'.0	34'.1	324° 53'.4	14'.6
18	294° 31'.0	61° 55'.5	50'.4	186° 04'.0	07'.2	113° 05'.0	33'.9	339° 55'.9	14'.6
19	309° 33'.4	76° 54'.8	51'.3	201° 05'.3	07'.1	128° 07'.0	33'.7	354° 58'.3	14'.6
20	324° 35'.9	91° 54'.2	52'.2	216° 06'.6	07'.1	143° 09'.0	33'.5	10° 00'.8	14'.6
21	339° 38'.3	106° 53'.5	53'.0	231° 07'.9	07'.0	158° 11'.0	33'.3	25° 03'.3	14'.6
22	354° 40'.8	121° 52'.9	53'.9	246° 09'.2	07'.0	173° 12'.9	33'.0	40° 05'.7	14'.6
23	9° 43'.3	136° 52'.2	54'.7	261° 10'.5	06'.9	188° 14'.9	32'.8	55° 08'.2	14'.6
16 Friday 00	24° 45'.7	151° 51'.6	19° 55'.6 S	276° 11'.8	23° 06'.8 N	203° 16'.9	0° 32'.6 N	70° 10'.7	18° 14'.5 S
01	39° 48'.2	166° 51'.0	56'.4	291° 13'.2	06'.8	218° 18'.9	32'.4	85° 13'.1	14'.5
02	54° 50'.7	181° 50'.3	57'.3	306° 14'.5	06'.7	233° 20'.9	32'.2	100° 15'.6	14'.5
03	69° 53'.1	196° 49'.7	58'.1	321° 15'.8	06'.7	248° 22'.9	32'.0	115° 18'.1	14'.5
04	84° 55'.6	211° 49'.0	59'.0	336° 17'.1	06'.6	263° 24'.9	31'.8	130° 20'.5	14'.5
05	99° 58'.1	226° 48'.4	59'.8	351° 18'.4	06'.5	278° 26'.8	31'.6	145° 23'.0	14'.5
06	115° 00'.5	241° 47'.7	20° 00'.6 S	6° 19'.7	06'.5	293° 28'.8	31'.4	160° 25'.4	14'.5
07	130° 03'.0	256° 47'.1	01'.5	21° 21'.1	06'.4	308° 30'.8	31'.2	175° 27'.9	14'.5
08	145° 05'.5	271° 46'.4	02'.3	36° 22'.4	06'.4	323° 32'.8	31'.0	190° 30'.4	14'.5
09	160° 07'.9	286° 45'.8	03'.2	51° 23'.7	06'.3	338° 34'.8	30'.8	205° 32'.8	14'.5
10	175° 10'.4	301° 45'.1	04'.0	66° 25'.0	06'.2	353° 36'.8	30'.6	220° 35'.3	14'.5
11	190° 12'.8	316° 44'.5	04'.9	81° 26'.3	06'.2	8° 38'.7	30'.4	235° 37'.8	14'.5
12	205° 15'.3	331° 43'.8	20° 05'.7 S	96° 27'.7	23° 06'.1 N	23° 40'.7	0° 30'.2 N	250° 40'.2	18° 14'.5 S
13	220° 17'.8	346° 43'.2	06'.5	111° 29'.0	06'.0	38° 42'.7	30'.0	265° 42'.7	14'.5
14	235° 20'.2	1° 42'.5	07'.4	126° 30'.3	06'.0	53° 44'.7	29'.8	280° 45'.1	14'.5
15	250° 22'.7	16° 41'.9	08'.2	141° 31'.6	05'.9	68° 46'.7	29'.6	295° 47'.6	14'.5
16	265° 25'.2	31° 41'.2	09'.1	156° 32'.9	05'.9	83° 48'.7	29'.4	310° 50'.1	14'.5
17	280° 27'.6	46° 40'.6	09'.9	171° 34'.3	05'.8	98° 50'.7	29'.2	325° 52'.5	14'.5
18	295° 30'.1	61° 39'.9	10'.7	186° 35'.6	05'.7	113° 52'.6	29'.0	340° 55'.0	14'.5
19	310° 32'.6	76° 39'.2	11'.6	201° 36'.9	05'.7	128° 54'.6	28'.8	355° 57'.5	14'.5
20	325° 35'.0	91° 38'.6	12'.4	216° 38'.2	05'.6	143° 56'.6	28'.6	10° 59'.9	14'.5
21	340° 37'.5	106° 37'.9	13'.2	231° 39'.6	05'.6	158° 58'.6	28'.4	26° 02'.4	14'.5
22	355° 40'.0	121° 37'.3	14'.1	246° 40'.9	05'.5	174° 00'.6	28'.2	41° 04'.8	14'.5
23	10° 42'.4	136° 36'.6	14'.9	261° 42'.2	05'.4	189° 02'.6	28'.0	56° 07'.3	14'.5
17 Saturday 00	25° 44'.9	151° 36'.0	20° 15'.7 S	276° 43'.6	23° 05'.4 N	204° 04'.6	0° 27'.7 N	71° 09'.8	18° 14'.5 S
01	40° 47'.3	166° 35'.3	16'.5	291° 44'.9	05'.3	219° 06'.5	27'.5	86° 12'.2	14'.5
02	55° 49'.8	181° 34'.6	17'.4	306° 46'.2	05'.3	234° 08'.5	27'.3	101° 14'.7	14'.5
03	70° 52'.3	196° 34'.0	18'.2	321° 47'.6	05'.2	249° 10'.5	27'.1	116° 17'.1	14'.5
04	85° 54'.7	211° 33'.3	19'.0	336° 48'.9	05'.1	264° 12'.5	26'.9	131° 19'.6	14'.5
05	100° 57'.2	226° 32'.7	19'.8	351° 50'.2	05'.1	279° 14'.5	26'.7	146° 22'.1	14'.5
06	115° 59'.7	241° 32'.0	20'.7	6° 51'.6	05'.0	294° 16'.5	26'.5	161° 24'.5	14'.5
07	131° 02'.1	256° 31'.3	21'.5	21° 52'.9	05'.0	309° 18'.5	26'.3	176° 27'.0	14'.5
08	146° 04'.6	271° 30'.7	22'.3	36° 54'.2	04'.9	324° 20'.4	26'.1	191° 29'.4	14'.5
09	161° 07'.1	286° 30'.0	23'.1	51° 55'.6	04'.8	339° 22'.4	25'.9	206° 31'.9	14'.5
10	176° 09'.5	301° 29'.4	23'.9	66° 56'.9	04'.8	354° 24'.4	25'.7	221° 34'.4	14'.5
11	191° 12'.0	316° 28'.7	24'.8	81° 58'.2	04'.7	9° 26'.4	25'.5	236° 36'.8	14'.5
12	206° 14'.5	331° 28'.0	20° 25'.6 S	96° 59'.6	23° 04'.7 N	24° 28'.4	0° 25'.3 N	251° 39'.3	18° 14'.5 S
13	221° 16'.9	346° 27'.4	26'.4	112° 00'.9	04'.6	39° 30'.4	25'.1	266° 41'.7	14'.5
14	236° 19'.4	1° 26'.7	27'.2	127° 02'.2	04'.5	54° 32'.4	24'.9	281° 44'.2	14'.5
15	251° 21'.8	16° 26'.0	28'.0	142° 03'.6	04'.5	69° 34'.4	24'.7	296° 46'.7	14'.5
16	266° 24'.3	31° 25'.4	28'.8	157° 04'.9	04'.4	84° 36'.3	24'.5	311° 49'.1	14'.5
17	281° 26'.8	46° 24'.7	29'.7	172° 06'.3	04'.3	99° 38'.3	24'.3	326° 51'.6	14'.5
18	296° 29'.2	61° 24'.0	30'.5	187° 07'.6	04'.3	114° 40'.3	24'.1	341° 54'.0	14'.5
19	311° 31'.7	76° 23'.4	31'.3	202° 09'.0	04'.2	129° 42'.3	23'.9	356° 56'.5	14'.5
20	326° 34'.2	91° 22'.7	32'.1	217° 10'.3	04'.2	144° 44'.3	23'.7	11° 58'.9	14'.5
21	341° 36'.6	106° 22'.0	32'.9	232° 11'.6	04'.1	159° 46'.3	23'.5	27° 01'.4	14'.5
22	356° 39'.1	121° 21'.4	33'.7	247° 13'.0	04'.0	174° 48'.3	23'.3	42° 03'.9	14'.5
23	11° 41'.6	136° 20'.7	34'.5	262° 14'.3	04'.0	189° 50'.3	23'.1	57° 06'.3	14'.4
	M.P. 22:17	v -0'.7	d 0'.8	v 1'.3	d 0'.1	v 2'.0	d 0'.2	v 2'.5	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.6	40° 19'.8 S
Achernar	335° 37'.5	57° 16'.2 S
Acrux	173° 27'.5	63° 03'.5 S
Adhara	255° 24'.6	28° 57'.5 S
Aldebaran	291° 06'.9	16° 29'.8 N
Alioth	166° 34'.7	55° 59'.8 N
Alkaid	153° 11'.5	49° 20'.9 N
Alnair	28° 02'.7	46° 59'.8 S
Alnilam	276° 01'.9	1° 12'.2 S
Alphard	218° 11'.4	8° 37'.5 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.3	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.6 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.7	69° 01'.1 S
Avior	234° 24'.5	59° 28'.9 S
Bellatrix	278° 48'.4	6° 20'.7 N
Betelgeuse	271° 17'.9	7° 24'.5 N
Canopus	264° 02'.8	52° 41'.2 S
Capella	280° 57'.0	45° 59'.4 N
Deneb	49° 41'.9	45° 15'.6 N
Denebola	182° 49'.7	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.9	61° 47'.2 N
Elnath	278° 32'.0	28° 36'.1 N
Eltanin	90° 53'.5	51° 29'.7 N
Enif	34° 02'.1	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.5 S
Gacrux	172° 18'.8	57° 04'.3 S
Gienah	176° 08'.5	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.4 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.4	34° 23'.4 S
Kochab	137° 20'.3	74° 11'.1 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.9	4° 03'.9 N
Menkent	148° 26'.3	36° 20'.1 S
Miaplacidus	221° 43'.4	69° 41'.0 S
Mirfak	309° 02'.1	49° 50'.2 N
Nunki	76° 17'.5	26° 18'.4 S
Peacock	53° 43'.3	56° 45'.6 S
Polaris	323° 30'.2	89° 14'.0 N
Pollux	243° 46'.6	28° 02'.5 N
Procyon	245° 15'.9	5° 14'.7 N
Rasalhague	96° 21'.0	12° 34'.1 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 26'.7	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.3 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.7	56° 30'.1 N
Shaula	96° 43'.1	37° 06'.0 S
Sirius	258° 47'.2	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.0	43° 24'.0 S
Vega	80° 49'.5	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	127° 05'.9	13:53
Mars	251° 26'.1	05:35
Jupiter	178° 31'.2	10:25
Saturn	45° 24'.9	19:16

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
15 00	183° 32'.7	8° 31'.7 S	326° 29'.7	8'.7	22° 06'.0 N	4'.4	56'.7
01	198° 32'.8	32'.6	340° 57'.4	8'.5	10'.4	4'.2	
02	213° 32'.9	33'.5	355° 24'.9	8'.5	14'.6	4'.1	
03	228° 33'.1	34'.4	9° 52'.4	8'.4	18'.7	4'.0	56'.8
04	243° 33'.2	35'.4	24° 19'.8	8'.4	22'.7	3'.8	
05	258° 33'.4	36'.3	38° 47'.2	8'.3	26'.5	3'.7	
06	273° 33'.5	37'.2	53° 14'.5	8'.3	30'.2	3'.6	
07	288° 33'.6	38'.1	67° 41'.8	8'.2	33'.8	3'.5	56'.9
08	303° 33'.8	39'.1	82° 09'.0	8'.2	37'.3	3'.3	
09	318° 33'.9	40'.0	96° 36'.2	8'.1	40'.6	3'.3	
10	333° 34'.0	40'.9	111° 03'.3	8'.0	43'.9	3'.1	
11	348° 34'.2	41'.8	125° 30'.3	8'.0	47'.0	2'.9	
12	3° 34'.3	8° 42'.7 S	139° 57'.3	8'.0	22° 49'.9 N	2'.9	57'.0
13	18° 34'.5	43'.7	154° 24'.3	7'.9	52'.8	2'.7	
14	33° 34'.6	44'.6	168° 51'.2	7'.9	55'.5	2'.5	
15	48° 34'.7	45'.5	183° 18'.1	7'.8	58'.0	2'.5	
16	63° 34'.9	46'.4	197° 44'.9	7'.8	23° 00'.5 N	2'.3	
17	78° 35'.0	47'.4	212° 11'.7	7'.7	02'.8	2'.2	57'.1
18	93° 35'.1	48'.3	226° 38'.4	7'.7	05'.0	2'.0	
19	108° 35'.3	49'.2	241° 05'.1	7'.6	07'.0	1'.9	
20	123° 35'.4	50'.1	255° 31'.7	7'.6	08'.9	1'.8	
21	138° 35'.5	51'.0	269° 58'.3	7'.6	10'.7	1'.6	
22	153° 35'.7	52'.0	284° 24'.9	7'.5	12'.3	1'.5	57'.2
23	168° 35'.8	52'.9	298° 51'.4	7'.5	13'.8	1'.4	
16 00	183° 35'.9	8° 53'.8 S	313° 17'.9	7'.5	23° 15'.2 N	1'.2	57'.2
01	198° 36'.1	54'.7	327° 44'.4	7'.4	16'.4	1'.1	
02	213° 36'.2	55'.6	342° 10'.8	7'.4	17'.5	1'.0	57'.3
03	228° 36'.3	56'.6	356° 37'.2	7'.3	18'.5	0'.8	
04	243° 36'.5	57'.5	11° 03'.5	7'.4	19'.3	0'.7	
05	258° 36'.6	58'.4	25° 29'.9	7'.3	20'.0	0'.6	
06	273° 36'.7	59'.3	39° 56'.2	7'.2	20'.6	0'.4	
07	288° 36'.9	9° 00'.2 S	54° 22'.4	7'.3	21'.0	0'.2	57'.4
08	303° 37'.0	01'.1	68° 48'.7	7'.2	21'.2	0'.2	
09	318° 37'.1	02'.1	83° 14'.9	7'.2	21'.4	0'.0	
10	333° 37'.3	03'.0	97° 41'.1	7'.1	21'.4	0'.2	
11	348° 37'.4	03'.9	112° 07'.2	7'.2	21'.2	0'.3	57'.5
12	3° 37'.5	9° 04'.8 S	126° 33'.4	7'.1	23° 20'.9 N	0'.4	57'.5
13	18° 37'.7	05'.7	140° 59'.5	7'.1	20'.5	0'.6	
14	33° 37'.8	06'.7	155° 25'.6	7'.1	19'.9	0'.7	
15	48° 37'.9	07'.6	169° 51'.7	7'.0	19'.2	0'.8	
16	63° 38'.1	08'.5	184° 17'.7	7'.1	18'.4	1'.0	57'.6
17	78° 38'.2	09'.4	198° 43'.8	7'.0	17'.4	1'.2	
18	93° 38'.3	10'.3	213° 09'.8	7'.0	16'.2	1'.2	
19	108° 38'.4	11'.2	227° 35'.8	7'.0	15'.0	1'.4	
20	123° 38'.6	12'.1	242° 01'.8	7'.0	13'.6	1'.6	
21	138° 38'.7	13'.1	256° 27'.8	7'.0	12'.0	1'.7	57'.7
22	153° 38'.8	14'.0	270° 53'.8	6'.9	10'.3	1'.8	
23	168° 39'.0	14'.9	285° 19'.7	7'.0	08'.5	2'.0	
17 00	183° 39'.1	9° 15'.8 S	299° 45'.7	7'.0	23° 06'.5 N	2'.1	57'.7
01	198° 39'.2	16'.7	314° 11'.7	6'.9	04'.4	2'.3	57'.8
02	213° 39'.3	17'.6	328° 37'.6	7'.0	02'.1	2'.4	
03	228° 39'.5	18'.6	343° 03'.6	6'.9	22° 59'.7 N	2'.6	
04	243° 39'.6	19'.5	357° 29'.5	6'.9	57'.1	2'.6	
05	258° 39'.7	20'.4	11° 55'.4	7'.0	54'.5	2'.9	
06	273° 39'.8	21'.3	26° 21'.4	6'.9	51'.6	2'.9	57'.9
07	288° 40'.0	22'.2	40° 47'.3	7'.0	48'.7	3'.2	
08	303° 40'.1	23'.1	55° 13'.3	6'.9	45'.5	3'.2	
09	318° 40'.2	24'.0	69° 39'.2	6'.9	42'.3	3'.4	
10	333° 40'.3	24'.9	84° 05'.1	7'.0	38'.9	3'.5	58'.0
11	348° 40'.5	25'.9	98° 31'.1	7'.0	35'.4	3'.7	
12	3° 40'.6	9° 26'.8 S	112° 57'.1	6'.9	22° 31'.7 N	3'.8	58'.0
13	18° 40'.7	27'.7	127° 23'.0	7'.0	27'.9	4'.0	
14	33° 40'.8	28'.6	141° 49'.0	7'.0	23'.9	4'.1	
15	48° 41'.0	29'.5	156° 15'.0	7'.0	19'.8	4'.2	58'.1
16	63° 41'.1	30'.4	170° 41'.0	7'.0	15'.6	4'.4	
17	78° 41'.2	31'.3	185° 07'.0	7'.0	11'.2	4'.5	
18	93° 41'.3	32'.2	199° 33'.0	7'.0	06'.7	4'.6	
19	108° 41'.5	33'.1	213° 59'.0	7'.1	02'.1	4'.8	58'.2
20	123° 41'.6	34'.1	228° 25'.1	7'.1	21° 57'.3 N	4'.9	
21	138° 41'.7	35'.0	242° 51'.2	7'.0	52'.4	5'.1	
22	153° 41'.8	35'.9	257° 17'.2	7'.1	47'.3	5'.2	
23	168° 41'.9	36'.8	271° 43'.3	7'.1	42'.1	5'.3	
	SD 16'.0	d 0'.9	SD 15'.5		15'.7		15'.8

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
15	14 10	14 17	11:46	02:19	14:46	19d 86%
16	14 24	14 30	11:46	03:14	15:42	20d 78%
17	14 36	14 42	11:45	04:10	16:39	21d 68%

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1992 October 18, 19, 20 (Sun, Mon, Tue)

GMT	ARIES	VENUS -4.0		MARS +0.1		JUPITER -1.7		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
18 Sunday 00	26° 44'.0	151° 20'.0	20° 35'.3 S	277° 15'.7	23° 03'.9 N	204° 52'.2	0° 22'.9 N	72° 08'.8	18° 14'.4 S
01	41° 46'.5	166° 19'.4	36'.1	292° 17'.0	03'.9	219° 54'.2	22'.7	87° 11'.2	14'.4
02	56° 48'.9	181° 18'.7	36'.9	307° 18'.4	03'.8	234° 56'.2	22'.5	102° 13'.7	14'.4
03	71° 51'.4	196° 18'.0	37'.7	322° 19'.7	03'.7	249° 58'.2	22'.3	117° 16'.1	14'.4
04	86° 53'.9	211° 17'.3	38'.5	337° 21'.1	03'.7	265° 00'.2	22'.1	132° 18'.6	14'.4
05	101° 56'.3	226° 16'.7	39'.4	352° 22'.4	03'.6	280° 02'.2	21'.9	147° 21'.0	14'.4
06	116° 58'.8	241° 16'.0	40'.2	7° 23'.8	03'.6	295° 04'.2	21'.7	162° 23'.5	14'.4
07	132° 01'.3	256° 15'.3	41'.0	22° 25'.1	03'.5	310° 06'.1	21'.5	177° 26'.0	14'.4
08	147° 03'.7	271° 14'.7	41'.8	37° 26'.5	03'.4	325° 08'.1	21'.3	192° 28'.4	14'.4
09	162° 06'.2	286° 14'.0	42'.6	52° 27'.8	03'.4	340° 10'.1	21'.1	207° 30'.9	14'.4
10	177° 08'.7	301° 13'.3	43'.3	67° 29'.2	03'.3	355° 12'.1	20'.9	222° 33'.3	14'.4
11	192° 11'.1	316° 12'.6	44'.1	82° 30'.5	03'.2	10° 14'.1	20'.6	237° 35'.8	14'.4
12	207° 13'.6	331° 12'.0	20° 44'.9 S	97° 31'.9	23° 03'.2 N	25° 16'.1	0° 20'.4 N	252° 38'.2	18° 14'.4 S
13	222° 16'.1	346° 11'.3	45'.7	112° 33'.2	03'.1	40° 18'.1	20'.2	267° 40'.7	14'.4
14	237° 18'.5	1° 10'.6	46'.5	127° 34'.6	03'.1	55° 20'.1	20'.0	282° 43'.1	14'.4
15	252° 21'.0	16° 09'.9	47'.3	142° 36'.0	03'.0	70° 22'.1	19'.8	297° 45'.6	14'.4
16	267° 23'.4	31° 09'.2	48'.1	157° 37'.3	02'.9	85° 24'.0	19'.6	312° 48'.0	14'.4
17	282° 25'.9	46° 08'.6	48'.9	172° 38'.7	02'.9	100° 26'.0	19'.4	327° 50'.5	14'.4
18	297° 28'.4	61° 07'.9	49'.7	187° 40'.0	02'.8	115° 28'.0	19'.2	342° 53'.0	14'.4
19	312° 30'.8	76° 07'.2	50'.5	202° 41'.4	02'.8	130° 30'.0	19'.0	357° 55'.4	14'.4
20	327° 33'.3	91° 06'.5	51'.3	217° 42'.8	02'.7	145° 32'.0	18'.8	12° 57'.9	14'.4
21	342° 35'.8	106° 05'.8	52'.1	232° 44'.1	02'.6	160° 34'.0	18'.6	28° 00'.3	14'.4
22	357° 38'.2	121° 05'.2	52'.8	247° 45'.5	02'.6	175° 36'.0	18'.4	43° 02'.8	14'.4
23	12° 40'.7	136° 04'.5	53'.6	262° 46'.8	02'.5	190° 38'.0	18'.2	58° 05'.2	14'.4
19 Monday 00	27° 43'.2	151° 03'.8	20° 54'.4 S	277° 48'.2	23° 02'.5 N	205° 40'.0	0° 18'.0 N	73° 07'.7	18° 14'.3 S
01	42° 45'.6	166° 03'.1	55'.2	292° 49'.6	02'.4	220° 41'.9	17'.8	88° 10'.1	14'.3
02	57° 48'.1	181° 02'.4	56'.0	307° 50'.9	02'.3	235° 43'.9	17'.6	103° 12'.6	14'.3
03	72° 50'.6	196° 01'.8	56'.8	322° 52'.3	02'.3	250° 45'.9	17'.4	118° 15'.0	14'.3
04	87° 53'.0	211° 01'.1	57'.5	337° 53'.7	02'.2	265° 47'.9	17'.2	133° 17'.5	14'.3
05	102° 55'.5	226° 00'.4	58'.3	352° 55'.0	02'.2	280° 49'.9	17'.0	148° 19'.9	14'.3
06	117° 57'.9	240° 59'.7	59'.1	7° 56'.4	02'.1	295° 51'.9	16'.8	163° 22'.4	14'.3
07	133° 00'.4	255° 59'.0	59'.9	22° 57'.8	02'.0	310° 53'.9	16'.6	178° 24'.8	14'.3
08	148° 02'.9	270° 58'.3	21° 00'.7 S	37° 59'.1	02'.0	325° 55'.9	16'.4	193° 27'.3	14'.3
09	163° 05'.3	285° 57'.6	01'.4	53° 00'.5	01'.9	340° 57'.9	16'.2	208° 29'.7	14'.3
10	178° 07'.8	300° 57'.0	02'.2	68° 01'.9	01'.8	355° 59'.8	16'.0	223° 32'.2	14'.3
11	193° 10'.3	315° 56'.3	03'.0	83° 03'.2	01'.8	11° 01'.8	15'.8	238° 34'.6	14'.3
12	208° 12'.7	330° 55'.6	21° 03'.8 S	98° 04'.6	23° 01'.7 N	26° 03'.8	0° 15'.6 N	253° 37'.1	18° 14'.3 S
13	223° 15'.2	345° 54'.9	04'.5	113° 06'.0	01'.7	41° 05'.8	15'.4	268° 39'.5	14'.3
14	238° 17'.7	0° 54'.2	05'.3	128° 07'.4	01'.6	56° 07'.8	15'.2	283° 42'.0	14'.3
15	253° 20'.1	15° 53'.5	06'.1	143° 08'.7	01'.5	71° 09'.8	15'.0	298° 44'.4	14'.3
16	268° 22'.6	30° 52'.8	06'.8	158° 10'.1	01'.5	86° 11'.8	14'.8	313° 46'.9	14'.3
17	283° 25'.1	45° 52'.1	07'.6	173° 11'.5	01'.4	101° 13'.8	14'.6	328° 49'.3	14'.3
18	298° 27'.5	60° 51'.4	08'.4	188° 12'.9	01'.4	116° 15'.8	14'.4	343° 51'.8	14'.3
19	313° 30'.0	75° 50'.7	09'.1	203° 14'.2	01'.3	131° 17'.7	14'.2	358° 54'.2	14'.3
20	328° 32'.4	90° 50'.1	09'.9	218° 15'.6	01'.2	146° 19'.7	14'.0	13° 56'.7	14'.2
21	343° 34'.9	105° 49'.4	10'.7	233° 17'.0	01'.2	161° 21'.7	13'.8	28° 59'.1	14'.2
22	358° 37'.4	120° 48'.7	11'.4	248° 18'.4	01'.1	176° 23'.7	13'.6	44° 01'.6	14'.2
23	13° 39'.8	135° 48'.0	12'.2	263° 19'.8	01'.1	191° 25'.7	13'.4	59° 04'.0	14'.2
20 Tuesday 00	28° 42'.3	150° 47'.3	21° 12'.9 S	278° 21'.1	23° 01'.0 N	206° 27'.7	0° 13'.2 N	74° 06'.5	18° 14'.2 S
01	43° 44'.8	165° 46'.6	13'.7	293° 22'.5	00'.9	221° 29'.7	13'.0	89° 08'.9	14'.2
02	58° 47'.2	180° 45'.9	14'.5	308° 23'.9	00'.9	236° 31'.7	12'.8	104° 11'.4	14'.2
03	73° 49'.7	195° 45'.2	15'.2	323° 25'.3	00'.8	251° 33'.7	12'.6	119° 13'.8	14'.2
04	88° 52'.2	210° 44'.5	16'.0	338° 26'.7	00'.8	266° 35'.7	12'.4	134° 16'.3	14'.2
05	103° 54'.6	225° 43'.8	16'.7	353° 28'.1	00'.7	281° 37'.6	12'.2	149° 18'.7	14'.2
06	118° 57'.1	240° 43'.1	17'.5	8° 29'.4	00'.6	296° 39'.6	12'.0	164° 21'.1	14'.2
07	133° 59'.5	255° 42'.4	18'.2	23° 30'.8	00'.6	311° 41'.6	11'.8	179° 23'.6	14'.2
08	149° 02'.0	270° 41'.7	19'.0	38° 32'.2	00'.5	326° 43'.6	11'.6	194° 26'.0	14'.2
09	164° 04'.5	285° 41'.0	19'.8	53° 33'.6	00'.4	341° 45'.6	11'.4	209° 28'.5	14'.2
10	179° 06'.9	300° 40'.3	20'.5	68° 35'.0	00'.4	356° 47'.6	11'.2	224° 30'.9	14'.2
11	194° 09'.4	315° 39'.6	21'.3	83° 36'.4	00'.3	11° 49'.6	11'.0	239° 33'.4	14'.2
12	209° 11'.9	330° 38'.9	21° 22'.0 S	98° 37'.8	23° 00'.3 N	26° 51'.6	0° 10'.8 N	254° 35'.8	18° 14'.2 S
13	224° 14'.3	345° 38'.2	22'.8	113° 39'.2	00'.2	41° 53'.6	10'.6	269° 38'.3	14'.1
14	239° 16'.8	0° 37'.5	23'.5	128° 40'.6	00'.1	56° 55'.6	10'.4	284° 40'.7	14'.1
15	254° 19'.3	15° 36'.8	24'.2	143° 42'.0	00'.1	71° 57'.6	10'.2	299° 43'.2	14'.1
16	269° 21'.7	30° 36'.1	25'.0	158° 43'.3	00'.0	86° 59'.5	10'.0	314° 45'.6	14'.1
17	284° 24'.2	45° 35'.4	25'.7	173° 44'.7	00'.0	102° 01'.5	09'.8	329° 48'.1	14'.1
18	299° 26'.7	60° 34'.7	26'.5	188° 46'.1	22° 59'.9 N	117° 03'.5	09'.6	344° 50'.5	14'.1
19	314° 29'.1	75° 34'.0	27'.2	203° 47'.5	59'.8	132° 05'.5	09'.4	359° 52'.9	14'.1
20	329° 31'.6	90° 33'.3	28'.0	218° 48'.9	59'.8	147° 07'.5	09'.2	14° 55'.4	14'.1
21	344° 34'.0	105° 32'.6	28'.7	233° 50'.3	59'.7	162° 09'.5	09'.0	29° 57'.8	14'.1
22	359° 36'.5	120° 31'.9	29'.4	248° 51'.7	59'.7	177° 11'.5	08'.8	45° 00'.3	14'.1
23	14° 39'.0	135° 31'.2	30'.2	263° 53'.1	59'.6	192° 13'.5	08'.6	60° 02'.7	14'.1
	M.P. 22:05	v -0'.7	d 0'.8	v 1'.4	d 0'.1	v 2'.0	d 0'.2	v 2'.4	d 0'.0

STARS	SHA	Dec
Acamar	315° 29'.6	40° 19'.8 S
Achernar	335° 37'.5	57° 16'.3 S
Acrux	173° 27'.5	63° 03'.5 S
Adhara	255° 24'.6	28° 57'.5 S
Aldebaran	291° 06'.9	16° 29'.8 N
Alioth	166° 34'.6	55° 59'.8 N
Alkaid	153° 11'.4	49° 20'.9 N
Alnair	28° 02'.7	46° 59'.8 S
Alnilam	276° 01'.9	1° 12'.2 S
Alphard	218° 11'.4	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.3	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.6 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.7	69° 01'.1 S
Avior	234° 24'.5	59° 28'.9 S
Bellatrix	278° 48'.4	6° 20'.7 N
Betelgeuse	271° 17'.8	7° 24'.4 N
Canopus	264° 02'.8	52° 41'.2 S
Capella	280° 57'.0	45° 59'.4 N
Deneb	49° 41'.9	45° 15'.6 N
Denebola	182° 49'.6	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.9	61° 47'.2 N
Elnath	278° 31'.9	28° 36'.1 N
Eltanin	90° 53'.6	51° 29'.7 N
Enif	34° 02'.1	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.5 S
Gacrux	172° 18'.8	57° 04'.3 S
Gienah	176° 08'.5	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.3 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.4	34° 23'.4 S
Kochab	137° 20'.4	74° 11'.1 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.9	4° 03'.9 N
Menkent	148° 26'.3	36° 20'.1 S
Miaplacidus	221° 43'.4	69° 41'.0 S
Mirfak	309° 02'.1	49° 50'.2 N
Nunki	76° 17'.5	26° 18'.4 S
Peacock	53° 43'.3	56° 45'.7 S
Polaris	323° 29'.7	89° 14'.0 N
Pollux	243° 46'.5	28° 02'.5 N
Procyon	245° 15'.8	5° 14'.7 N
Rasalhague	96° 21'.0	12° 34'.1 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 26'.7	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.3 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.7	56° 30'.1 N
Shaula	96° 43'.1	37° 06'.0 S
Sirius	258° 47'.2	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.0	43° 24'.0 S
Vega	80° 49'.6	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	123° 20'.6	13:56
Mars	250° 05'.0	05:28
Jupiter	177° 56'.8	10:16
Saturn	45° 24'.5	19:04

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
183° 42'.1	9° 37'.7 S	286° 09'.4	7'.2	21° 36'.8 N	5'.5	58'.3
198° 42'.2	38'.6	300° 35'.6	7'.1	31'.3	5'.6	
213° 42'.3	39'.5	315° 01'.7	7'.2	25'.7	5'.7	
228° 42'.4	40'.4	329° 27'.9	7'.2	20'.0	5'.9	
243° 42'.5	41'.3	343° 54'.1	7'.2	14'.1	6'.0	58'.4
258° 42'.7	42'.2	358° 20'.3	7'.3	08'.1	6'.1	
273° 42'.8	43'.1	12° 46'.6	7'.2	02'.0	6'.3	
288° 42'.9	44'.0	27° 12'.8	7'.3	20° 55'.7 N	6'.4	
303° 43'.0	45'.0	41° 39'.1	7'.4	49'.3	6'.5	
318° 43'.1	45'.9	56° 05'.5	7'.3	42'.8	6'.7	58'.5
333° 43'.3	46'.8	70° 31'.8	7'.4	36'.1	6'.8	
348° 43'.4	47'.7	84° 58'.2	7'.4	29'.3	6'.9	
3° 43'.5	9° 48'.6 S	99° 24'.6	7'.4	20° 22'.4 N	7'.0	58'.5
18° 43'.6	49'.5	113° 51'.0	7'.5	15'.4	7'.2	
33° 43'.7	50'.4	128° 17'.5	7'.5	08'.2	7'.3	58'.6
48° 43'.9	51'.3	142° 44'.0	7'.5	00'.9	7'.4	
63° 44'.0	52'.2	157° 10'.5	7'.5	19° 53'.5 N	7'.6	
78° 44'.1	53'.1	171° 37'.0	7'.6	45'.9	7'.7	
93° 44'.2	54'.0	186° 03'.6	7'.6	38'.2	7'.8	58'.7
108° 44'.3	54'.9	200° 30'.2	7'.7	30'.4	7'.9	
123° 44'.4	55'.8	214° 56'.9	7'.7	22'.5	8'.1	
138° 44'.5	56'.7	229° 23'.6	7'.7	14'.4	8'.1	
153° 44'.7	57'.6	243° 50'.3	7'.7	06'.3	8'.3	
168° 44'.8	58'.5	258° 17'.0	7'.8	18° 58'.0 N	8'.4	58'.8
183° 44'.9	9° 59'.4 S	272° 43'.8	7'.8	18° 49'.6 N	8'.6	58'.8
198° 45'.0	10° 00'.3 S	287° 10'.6	7'.9	41'.0	8'.6	
213° 45'.1	01'.2	301° 37'.5	7'.9	32'.4	8'.8	
228° 45'.2	02'.1	316° 04'.4	7'.9	23'.6	8'.9	
243° 45'.3	03'.0	330° 31'.3	7'.9	14'.7	9'.0	58'.9
258° 45'.5	03'.9	344° 58'.2	8'.0	05'.7	9'.1	
273° 45'.6	04'.8	359° 25'.2	8'.1	17° 56'.6 N	9'.2	
288° 45'.7	05'.7	13° 52'.3	8'.0	47'.4	9'.3	
303° 45'.8	06'.6	28° 19'.3	8'.1	38'.1	9'.5	
318° 45'.9	07'.5	42° 46'.4	8'.2	28'.6	9'.5	59'.0
333° 46'.0	08'.4	57° 13'.6	8'.1	19'.1	9'.7	
348° 46'.1	09'.3	71° 40'.7	8'.3	09'.4	9'.8	
3° 46'.2	10° 10'.2 S	86° 08'.0	8'.2	16° 59'.6 N	9'.9	59'.0
18° 46'.4	11'.1	100° 35'.2	8'.3	49'.7	10'.0	
33° 46'.5	12'.0	115° 02'.5	8'.3	39'.7	10'.1	59'.1
48° 46'.6	12'.9	129° 29'.8	8'.4	29'.6	10'.2	
63° 46'.7	13'.8	143° 57'.2	8'.4	19'.4	10'.3	
78° 46'.8	14'.7	158° 24'.6	8'.4	09'.1	10'.4	
93° 46'.9	15'.6	172° 52'.0	8'.5	15° 58'.7 N	10'.5	
108° 47'.0	16'.5	187° 19'.5	8'.5	48'.2	10'.6	59'.2
123° 47'.1	17'.4	201° 47'.0	8'.6	37'.6	10'.7	
138° 47'.2	18'.3	216° 14'.6	8'.5	26'.9	10'.8	
153° 47'.3	19'.2	230° 42'.1	8'.7	16'.1	11'.0	
168° 47'.4	20'.1	245° 09'.8	8'.6	05'.1	11'.0	
183° 47'.6	10° 21'.0 S	259° 37'.4	8'.7	14° 54'.1 N	11'.1	59'.3
198° 47'.7	21'.9	274° 05'.1	8'.7	43'.0	11'.1	
213° 47'.8	22'.8	288° 32'.8	8'.8	31'.9	11'.3	
228° 47'.9	23'.7	303° 00'.6	8'.8	20'.6	11'.4	
243° 48'.0	24'.6	317° 28'.4	8'.8	09'.2	11'.5	
258° 48'.1	25'.5	331° 56'.2	8'.9	13° 57'.7 N	11'.5	59'.4
273° 48'.2	26'.4	346° 24'.1	8'.9	46'.2	11'.7	
288° 48'.3	27'.3	0° 52'.0	9'.0	34'.5	11'.7	
303° 48'.4	28'.2	15° 20'.0	8'.9	22'.8	11'.8	
318° 48'.5	29'.1	29° 47'.9	9'.1	11'.0	11'.9	
333° 48'.6	30'.0	44° 16'.0	9'.0	12° 59'.1 N	12'.0	
348° 48'.7	30'.9	58° 44'.0	9'.1	47'.1	12'.1	59'.5
3° 48'.8	10° 31'.8 S	73° 12'.1	9'.1	12° 35'.0 N	12'.1	59'.5
18° 48'.9	32'.7	87° 40'.2	9'.1	22'.9	12'.2	
33° 49'.0	33'.6	102° 08'.3	9'.2	10'.7	12'.3	
48° 49'.1	34'.4	116° 36'.5	9'.2	11° 58'.4 N	12'.4	
63° 49'.2	35'.3	131° 04'.7	9'.2	46'.0	12'.4	
78° 49'.3	36'.2	145° 32'.9	9'.3	33'.6	12'.6	59'.6
93° 49'.4	37'.1	160° 01'.2	9'.3	21'.0	12'.6	
108° 49'.5	38'.0	174° 29'.5	9'.3	08'.4	12'.6	
123° 49'.6	38'.9	188° 57'.8	9'.4	10° 55'.8 N	12'.8	
138° 49'.7	39'.8	203° 26'.2	9'.3	43'.0	12'.8	
153° 49'.8	40'.7	217° 54'.5	9'.4	30'.2	12'.9	
168° 50'.0	41'.6	232° 22'.9	9'.5	17'.3	12'.9	59'.7
SD 16'.1	d 0'.9	SD	15'.9	16'.1	16'.2	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
18	14 48	14 54	11:45	05:07	17:35	22d 58%
19	14 59	15 05	11:45	06:02	18:30	23d 46%
20	15 10	15 15	11:45	06:56	19:23	24d 35%

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1992 October 21, 22, 23 (Wed, Thur, Fri)

GMT	ARIES	VENUS -4.0		MARS +0.0		JUPITER -1.7		SATURN +0.6	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
21 Wednesday 00	29° 41'.4	150° 30'.5	21° 30'.9 S	278° 54'.5	22° 59'.5 N	207° 15'.5	0° 08'.4 N	75° 05'.2	18° 14'.1 S
01	44° 43'.9	165° 29'.8	31'.7	293° 55'.9	59'.5	222° 17'.5	08'.2	90° 07'.6	14'.1
02	59° 46'.4	180° 29'.1	32'.4	308° 57'.3	59'.4	237° 19'.5	08'.0	105° 10'.0	14'.1
03	74° 48'.8	195° 28'.4	33'.1	323° 58'.7	59'.4	252° 21'.5	07'.8	120° 12'.5	14'.1
04	89° 51'.3	210° 27'.6	33'.9	339° 00'.1	59'.3	267° 23'.4	07'.6	135° 14'.9	14'.0
05	104° 53'.8	225° 26'.9	34'.6	354° 01'.5	59'.2	282° 25'.4	07'.4	150° 17'.4	14'.0
06	119° 56'.2	240° 26'.2	35'.3	9° 02'.9	59'.2	297° 27'.4	07'.2	165° 19'.8	14'.0
07	134° 58'.7	255° 25'.5	36'.1	24° 04'.3	59'.1	312° 29'.4	07'.0	180° 22'.3	14'.0
08	150° 01'.2	270° 24'.8	36'.8	39° 05'.7	59'.1	327° 31'.4	06'.8	195° 24'.7	14'.0
09	165° 03'.6	285° 24'.1	37'.5	54° 07'.1	59'.0	342° 33'.4	06'.6	210° 27'.1	14'.0
10	180° 06'.1	300° 23'.4	38'.2	69° 08'.5	58'.9	357° 35'.4	06'.4	225° 29'.6	14'.0
11	195° 08'.5	315° 22'.7	39'.0	84° 10'.0	58'.9	12° 37'.4	06'.2	240° 32'.0	14'.0
12	210° 11'.0	330° 22'.0	21° 39'.7 S	99° 11'.4	22° 58'.8 N	27° 39'.4	0° 06'.0 N	255° 34'.5	18° 14'.0 S
13	225° 13'.5	345° 21'.2	40'.4	114° 12'.8	58'.8	42° 41'.4	05'.8	270° 36'.9	14'.0
14	240° 15'.9	0° 20'.5	41'.1	129° 14'.2	58'.7	57° 43'.4	05'.6	285° 39'.4	14'.0
15	255° 18'.4	15° 19'.8	41'.9	144° 15'.6	58'.6	72° 45'.4	05'.4	300° 41'.8	14'.0
16	270° 20'.9	30° 19'.1	42'.6	159° 17'.0	58'.6	87° 47'.4	05'.2	315° 44'.2	14'.0
17	285° 23'.3	45° 18'.4	43'.3	174° 18'.4	58'.5	102° 49'.3	05'.0	330° 46'.7	13'.9
18	300° 25'.8	60° 17'.7	44'.0	189° 19'.8	58'.5	117° 51'.3	04'.8	345° 49'.1	13'.9
19	315° 28'.3	75° 17'.0	44'.7	204° 21'.2	58'.4	132° 53'.3	04'.6	0° 51'.6	13'.9
20	330° 30'.7	90° 16'.2	45'.5	219° 22'.7	58'.3	147° 55'.3	04'.4	15° 54'.0	13'.9
21	345° 33'.2	105° 15'.5	46'.2	234° 24'.1	58'.3	162° 57'.3	04'.2	30° 56'.4	13'.9
22	0° 35'.6	120° 14'.8	46'.9	249° 25'.5	58'.2	177° 59'.3	04'.0	45° 58'.9	13'.9
23	15° 38'.1	135° 14'.1	47'.6	264° 26'.9	58'.2	193° 01'.3	03'.8	61° 01'.3	13'.9
22 Thursday 00	30° 40'.6	150° 13'.4	21° 48'.3 S	279° 28'.3	22° 58'.1 N	208° 03'.3	0° 03'.6 N	76° 03'.8	18° 13'.9 S
01	45° 43'.0	165° 12'.7	49'.0	294° 29'.7	58'.0	223° 05'.3	03'.4	91° 06'.2	13'.9
02	60° 45'.5	180° 11'.9	49'.7	309° 31'.2	58'.0	238° 07'.3	03'.2	106° 08'.6	13'.9
03	75° 48'.0	195° 11'.2	50'.5	324° 32'.6	57'.9	253° 09'.3	03'.0	121° 11'.1	13'.9
04	90° 50'.4	210° 10'.5	51'.2	339° 34'.0	57'.9	268° 11'.3	02'.8	136° 13'.5	13'.9
05	105° 52'.9	225° 09'.8	51'.9	354° 35'.4	57'.8	283° 13'.3	02'.6	151° 15'.9	13'.8
06	120° 55'.4	240° 09'.1	52'.6	9° 36'.8	57'.7	298° 15'.3	02'.4	166° 18'.4	13'.8
07	135° 57'.8	255° 08'.3	53'.3	24° 38'.3	57'.7	313° 17'.3	02'.2	181° 20'.8	13'.8
08	151° 00'.3	270° 07'.6	54'.0	39° 39'.7	57'.6	328° 19'.2	02'.0	196° 23'.3	13'.8
09	166° 02'.8	285° 06'.9	54'.7	54° 41'.1	57'.6	343° 21'.2	01'.8	211° 25'.7	13'.8
10	181° 05'.2	300° 06'.2	55'.4	69° 42'.5	57'.5	358° 23'.2	01'.6	226° 28'.1	13'.8
11	196° 07'.7	315° 05'.5	56'.1	84° 44'.0	57'.4	13° 25'.2	01'.4	241° 30'.6	13'.8
12	211° 10'.1	330° 04'.7	21° 56'.8 S	99° 45'.4	22° 57'.4 N	28° 27'.2	0° 01'.2 N	256° 33'.0	18° 13'.8 S
13	226° 12'.6	345° 04'.0	57'.5	114° 46'.8	57'.3	43° 29'.2	01'.0	271° 35'.4	13'.8
14	241° 15'.1	0° 03'.3	58'.2	129° 48'.2	57'.3	58° 31'.2	00'.8	286° 37'.9	13'.8
15	256° 17'.5	15° 02'.6	58'.9	144° 49'.7	57'.2	73° 33'.2	00'.6	301° 40'.3	13'.8
16	271° 20'.0	30° 01'.8	59'.6	159° 51'.1	57'.2	88° 35'.2	00'.4	316° 42'.8	13'.8
17	286° 22'.5	45° 01'.1	22° 00'.3 S	174° 52'.5	57'.1	103° 37'.2	00'.2	331° 45'.2	13'.7
18	301° 24'.9	60° 00'.4	01'.0	189° 54'.0	57'.0	118° 39'.2	00'.0	346° 47'.6	13'.7
19	316° 27'.4	74° 59'.7	01'.7	204° 55'.4	57'.0	133° 41'.2	00'.2	1° 50'.1	13'.7
20	331° 29'.9	89° 58'.9	02'.4	219° 56'.8	56'.9	148° 43'.2	00'.4	16° 52'.5	13'.7
21	346° 32'.3	104° 58'.2	03'.1	234° 58'.3	56'.9	163° 45'.2	00'.6	31° 54'.9	13'.7
22	1° 34'.8	119° 57'.5	03'.8	249° 59'.7	56'.8	178° 47'.2	00'.8	46° 57'.4	13'.7
23	16° 37'.2	134° 56'.7	04'.4	265° 01'.1	56'.7	193° 49'.2	01'.0	61° 59'.8	13'.7
23 Friday 00	31° 39'.7	149° 56'.0	22° 05'.1 S	280° 02'.6	22° 56'.7 N	208° 51'.2	0° 01'.2 S	77° 02'.2	18° 13'.7 S
01	46° 42'.2	164° 55'.3	05'.8	295° 04'.0	56'.6	223° 53'.2	01'.4	92° 04'.7	13'.7
02	61° 44'.6	179° 54'.6	06'.5	310° 05'.4	56'.6	238° 55'.1	01'.6	107° 07'.1	13'.7
03	76° 47'.1	194° 53'.8	07'.2	325° 06'.9	56'.5	253° 57'.1	01'.8	122° 09'.5	13'.7
04	91° 49'.6	209° 53'.1	07'.9	340° 08'.3	56'.4	268° 59'.1	02'.0	137° 12'.0	13'.6
05	106° 52'.0	224° 52'.4	08'.6	355° 09'.8	56'.4	284° 01'.1	02'.2	152° 14'.4	13'.6
06	121° 54'.5	239° 51'.6	09'.2	10° 11'.2	56'.3	299° 03'.1	02'.4	167° 16'.8	13'.6
07	136° 57'.0	254° 50'.9	09'.9	25° 12'.7	56'.3	314° 05'.1	02'.6	182° 19'.3	13'.6
08	151° 59'.4	269° 50'.2	10'.6	40° 14'.1	56'.2	329° 07'.1	02'.8	197° 21'.7	13'.6
09	167° 01'.9	284° 49'.4	11'.3	55° 15'.5	56'.2	344° 09'.1	03'.0	212° 24'.1	13'.6
10	182° 04'.4	299° 48'.7	12'.0	70° 17'.0	56'.1	359° 11'.1	03'.2	227° 26'.6	13'.6
11	197° 06'.8	314° 48'.0	12'.6	85° 18'.4	56'.0	14° 13'.1	03'.4	242° 29'.0	13'.6
12	212° 09'.3	329° 47'.2	22° 13'.3 S	100° 19'.9	22° 56'.0 N	29° 15'.1	0° 03'.6 S	257° 31'.4	18° 13'.6 S
13	227° 11'.7	344° 46'.5	14'.0	115° 21'.3	55'.9	44° 17'.1	03'.8	272° 33'.9	13'.6
14	242° 14'.2	359° 45'.8	14'.7	130° 22'.8	55'.9	59° 19'.1	04'.0	287° 36'.3	13'.5
15	257° 16'.7	14° 45'.0	15'.3	145° 24'.2	55'.8	74° 21'.1	04'.2	302° 38'.7	13'.5
16	272° 19'.1	29° 44'.3	16'.0	160° 25'.7	55'.7	89° 23'.1	04'.4	317° 41'.2	13'.5
17	287° 21'.6	44° 43'.5	16'.7	175° 27'.1	55'.7	104° 25'.1	04'.6	332° 43'.6	13'.5
18	302° 24'.1	59° 42'.8	17'.4	190° 28'.6	55'.6	119° 27'.1	04'.8	347° 46'.0	13'.5
19	317° 26'.5	74° 42'.1	18'.0	205° 30'.0	55'.6	134° 29'.1	05'.0	2° 48'.5	13'.5
20	332° 29'.0	89° 41'.3	18'.7	220° 31'.5	55'.5	149° 31'.1	05'.2	17° 50'.9	13'.5
21	347° 31'.5	104° 40'.6	19'.4	235° 32'.9	55'.5	164° 33'.1	05'.4	32° 53'.3	13'.5
22	2° 33'.9	119° 39'.8	20'.0	250° 34'.4	55'.4	179° 35'.1	05'.6	47° 55'.8	13'.5
23	17° 36'.4	134° 39'.1	20'.7	265° 35'.8	55'.3	194° 37'.1	05'.8	62° 58'.2	13'.5
	M.P. 21:54	v -0'.7	d 0'.7	v 1'.4	d 0'.1	v 2'.0	d 0'.2	v 2'.4	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.6	40° 19'.8 S
Achernar	335° 37'.5	57° 16'.3 S
Acrux	173° 27'.4	63° 03'.5 S
Adhara	255° 24'.6	28° 57'.5 S
Aldebaran	291° 06'.8	16° 29'.8 N
Alioth	166° 34'.6	55° 59'.8 N
Alkaid	153° 11'.4	49° 20'.9 N
Alnair	28° 02'.7	46° 59'.8 S
Alnilam	276° 01'.8	1° 12'.2 S
Alphard	218° 11'.4	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.3	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.6 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.7	69° 01'.1 S
Avior	234° 24'.4	59° 28'.9 S
Bellatrix	278° 48'.4	6° 20'.7 N
Betelgeuse	271° 17'.8	7° 24'.4 N
Canopus	264° 02'.8	52° 41'.2 S
Capella	280° 57'.0	45° 59'.4 N
Deneb	49° 42'.0	45° 15'.6 N
Denebola	182° 49'.6	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.9	61° 47'.1 N
Elnath	278° 31'.9	28° 36'.1 N
Eltanin	90° 53'.6	51° 29'.7 N
Enif	34° 02'.1	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.5 S
Gacrux	172° 18'.8	57° 04'.3 S
Gienah	176° 08'.5	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.3 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.4	34° 23'.4 S
Kochab	137° 20'.4	74° 11'.1 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.9	4° 03'.9 N
Menkent	148° 26'.3	36° 20'.1 S
Miaplacidus	221° 43'.3	69° 41'.0 S
Mirfak	309° 02'.1	49° 50'.2 N
Nunki	76° 17'.5	26° 18'.4 S
Peacock	53° 43'.4	56° 45'.7 S
Polaris	323° 29'.4	89° 14'.0 N
Pollux	243° 46'.5	28° 02'.5 N
Procyon	245° 15'.8	5° 14'.7 N
Rasalhague	96° 21'.0	12° 34'.1 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 26'.7	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.3 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.7	56° 30'.1 N
Shaula	96° 43'.1	37° 06'.0 S
Sirius	258° 47'.2	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 04'.0	43° 24'.0 S
Vega	80° 49'.6	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	119° 32'.8	14:00
Mars	248° 47'.7	05:22
Jupiter	177° 22'.7	10:06
Saturn	45° 23'.2	18:53

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
183° 50'.1	10° 42'.5 S	246° 51'.4	9'.4	10° 04'.4 N	13'.0	59'.7
198° 50'.2	43'.4	261° 19'.8	9'.5	9° 51'.4 N	13'.1	
213° 50'.3	44'.3	275° 48'.3	9'.5	38'.3	13'.1	
228° 50'.4	45'.1	290° 16'.8	9'.6	25'.2	13'.2	
243° 50'.5	46'.0	304° 45'.4	9'.5	12'.0	13'.3	
258° 50'.6	46'.9	319° 13'.9	9'.6	8° 58'.7 N	13'.3	
273° 50'.6	47'.8	333° 42'.5	9'.6	45'.4	13'.4	59'.8
288° 50'.7	48'.7	348° 11'.1	9'.7	32'.0	13'.4	
303° 50'.8	49'.6	2° 39'.8	9'.6	18'.6	13'.5	
318° 50'.9	50'.5	17° 08'.4	9'.7	05'.1	13'.5	
333° 51'.0	51'.4	31° 37'.1	9'.7	7° 51'.6 N	13'.6	
348° 51'.1	52'.2	46° 05'.8	9'.7	38'.0	13'.7	
3° 51'.2	10° 53'.1 S	60° 34'.5	9'.7	7° 24'.3 N	13'.6	59'.8
18° 51'.3	54'.0	75° 03'.2	9'.8	10'.7	13'.8	59'.9
33° 51'.4	54'.9	89° 32'.0	9'.7	6° 56'.9 N	13'.8	
48° 51'.5	55'.8	104° 00'.7	9'.8	43'.1	13'.8	
63° 51'.6	56'.7	118° 29'.5	9'.8	29'.3	13'.9	
78° 51'.7	57'.6	132° 58'.3	9'.8	15'.4	13'.9	
93° 51'.8	58'.5	147° 27'.1	9'.8	01'.5	13'.9	
108° 51'.9	59'.3	161° 55'.9	9'.9	5° 47'.6 N	14'.0	
123° 52'.0	11° 00'.2 S	176° 24'.8	9'.8	33'.6	14'.0	
138° 52'.1	01'.1	190° 53'.6	9'.9	19'.6	14'.1	
153° 52'.2	02'.0	205° 22'.5	9'.9	05'.5	14'.1	60'.0
168° 52'.3	02'.9	219° 51'.4	9'.8	4° 51'.4 N	14'.1	
183° 52'.4	11° 03'.8 S	234° 20'.2	9'.9	4° 37'.3 N	14'.2	60'.0
198° 52'.5	04'.6	248° 49'.1	9'.9	23'.1	14'.2	
213° 52'.6	05'.5	263° 18'.0	9'.9	08'.9	14'.2	
228° 52'.7	06'.4	277° 46'.9	10'.0	3° 54'.7 N	14'.2	
243° 52'.7	07'.3	292° 15'.9	9'.9	40'.5	14'.3	
258° 52'.8	08'.2	306° 44'.8	9'.9	26'.2	14'.3	
273° 52'.9	09'.1	321° 13'.7	9'.9	11'.9	14'.3	
288° 53'.0	09'.9	335° 42'.6	10'.0	2° 57'.6 N	14'.3	
303° 53'.1	10'.8	350° 11'.6	9'.9	43'.3	14'.4	
318° 53'.2	11'.7	4° 40'.5	10'.0	28'.9	14'.4	
333° 53'.3	12'.6	19° 09'.5	9'.9	14'.5	14'.4	60'.1
348° 53'.4	13'.5	33° 38'.4	9'.9	00'.1	14'.4	
3° 53'.5	11° 14'.3 S	48° 07'.3	10'.0	1° 45'.7 N	14'.4	60'.1
18° 53'.6	15'.2	62° 36'.3	9'.9	31'.3	14'.4	
33° 53'.7	16'.1	77° 05'.2	10'.0	16'.9	14'.5	
48° 53'.7	17'.0	91° 34'.2	9'.9	02'.4	14'.4	
63° 53'.8	17'.9	106° 03'.1	9'.9	0° 48'.0 N	14'.5	
78° 53'.9	18'.7	120° 32'.0	10'.0	33'.5	14'.5	
93° 54'.0	19'.6	135° 01'.0	9'.9	19'.0	14'.4	
108° 54'.1	20'.5	149° 29'.9	9'.9	04'.6	14'.5	
123° 54'.2	21'.4	163° 58'.8	9'.9	0° 09'.9 S	14'.5	
138° 54'.3	22'.3	178° 27'.7	9'.9	24'.4	14'.5	
153° 54'.4	23'.1	192° 56'.6	9'.9	38'.9	14'.4	
168° 54'.4	24'.0	207° 25'.5	9'.9	53'.3	14'.5	
183° 54'.5	11° 24'.9 S	221° 54'.4	9'.9	1° 07'.8 S	14'.5	60'.1
198° 54'.6	25'.8	236° 23'.3	9'.9	22'.3	14'.4	
213° 54'.7	26'.6	250° 52'.2	9'.8	36'.7	14'.5	
228° 54'.8	27'.5	265° 21'.0	9'.9	51'.2	14'.4	
243° 54'.9	28'.4	279° 49'.9	9'.8	2° 05'.6 S	14'.4	
258° 55'.0	29'.3	294° 18'.7	9'.8	20'.0	14'.5	
273° 55'.0	30'.1	308° 47'.5	9'.8	34'.5	14'.4	
288° 55'.1	31'.0	323° 16'.3	9'.8	48'.9	14'.4	
303° 55'.2	31'.9	337° 45'.1	9'.8	3° 03'.3 S	14'.3	
318° 55'.3	32'.8	352° 13'.9	9'.7	17'.6	14'.4	
333° 55'.4	33'.6	6° 42'.6	9'.7	32'.0	14'.3	
348° 55'.5	34'.5	21° 11'.3	9'.8	46'.3	14'.3	
3° 55'.5	11° 35'.4 S	35° 40'.1	9'.7	4° 00'.6 S	14'.3	60'.1
18° 55'.6	36'.3	50° 08'.8	9'.6	14'.9	14'.3	
33° 55'.7	37'.1	64° 37'.4	9'.7	29'.2	14'.2	
48° 55'.8	38'.0	79° 06'.1	9'.6	43'.4	14'.2	
63° 55'.9	38'.9	93° 34'.7	9'.6	57'.6	14'.2	
78° 56'.0	39'.7	108° 03'.3	9'.6	5° 11'.8 S	14'.1	
93° 56'.0	40'.6	122° 31'.9	9'.6	25'.9	14'.1	
108° 56'.1	41'.5	137° 00'.5	9'.5	40'.0	14'.1	
123° 56'.2	42'.4	151° 29'.0	9'.6	54'.1	14'.0	
138° 56'.3	43'.2	165° 57'.6	9'.5	6° 08'.1 S	14'.0	
153° 56'.4	44'.1	180° 26'.1	9'.4	22'.1	14'.0	
168° 56'.4	45'.0	194° 54'.5	9'.5	36'.1	13'.9	
SD 16'.1	d 0'.9	SD	16'.3	16'.4	16'.4	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
21	15 20	15 25	11:45	07:49	20:15	25d 25%
22	15 29	15 34	11:44	08:41	21:06	26d 15%
23	15 38	15 42	11:44	09:32	21:58	27d 8%

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1992 October 24, 25, 26 (Sat, Sun, Mon)

GMT	ARIES	VENUS -4.0		MARS 0.0		JUPITER -1.7		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
24 Saturday 00	32° 38'.8	149° 38'.4	22° 21'.4 S	280° 37'.3	22° 55'.3 N	209° 39'.1	0° 06'.0 S	78° 00'.6	18° 13'.4 S
01	47° 41'.3	164° 37'.6	22'.0	295° 38'.7	55'.2	224° 41'.1	06'.2	93° 03'.1	13'.4
02	62° 43'.8	179° 36'.9	22'.7	310° 40'.2	55'.2	239° 43'.0	06'.4	108° 05'.5	13'.4
03	77° 46'.2	194° 36'.1	23'.3	325° 41'.7	55'.1	254° 45'.0	06'.6	123° 07'.9	13'.4
04	92° 48'.7	209° 35'.4	24'.0	340° 43'.1	55'.1	269° 47'.0	06'.8	138° 10'.3	13'.4
05	107° 51'.2	224° 34'.7	24'.7	355° 44'.6	55'.0	284° 49'.0	07'.0	153° 12'.8	13'.4
06	122° 53'.6	239° 33'.9	25'.3	10° 46'.0	54'.9	299° 51'.0	07'.2	168° 15'.2	13'.4
07	137° 56'.1	254° 33'.2	26'.0	25° 47'.5	54'.9	314° 53'.0	07'.4	183° 17'.6	13'.4
08	152° 58'.6	269° 32'.4	26'.6	40° 49'.0	54'.8	329° 55'.0	07'.6	198° 20'.1	13'.4
09	168° 01'.0	284° 31'.7	27'.3	55° 50'.4	54'.8	344° 57'.0	07'.7	213° 22'.5	13'.3
10	183° 03'.5	299° 30'.9	27'.9	70° 51'.9	54'.7	359° 59'.0	07'.9	228° 24'.9	13'.3
11	198° 06'.0	314° 30'.2	28'.6	85° 53'.3	54'.7	15° 01'.0	08'.1	243° 27'.4	13'.3
12	213° 08'.4	329° 29'.4	22° 29'.2 S	100° 54'.8	22° 54'.6 N	30° 03'.0	0° 08'.3 S	258° 29'.8	18° 13'.3 S
13	228° 10'.9	344° 28'.7	29'.9	115° 56'.3	54'.5	45° 05'.0	08'.5	273° 32'.2	13'.3
14	243° 13'.3	359° 28'.0	30'.5	130° 57'.7	54'.5	60° 07'.0	08'.7	288° 34'.6	13'.3
15	258° 15'.8	14° 27'.2	31'.2	145° 59'.2	54'.4	75° 09'.0	08'.9	303° 37'.1	13'.3
16	273° 18'.3	29° 26'.5	31'.8	161° 00'.7	54'.4	90° 11'.0	09'.1	318° 39'.5	13'.3
17	288° 20'.7	44° 25'.7	32'.5	176° 02'.2	54'.3	105° 13'.0	09'.3	333° 41'.9	13'.3
18	303° 23'.2	59° 25'.0	33'.1	191° 03'.6	54'.3	120° 15'.0	09'.5	348° 44'.3	13'.2
19	318° 25'.7	74° 24'.2	33'.8	206° 05'.1	54'.2	135° 17'.0	09'.7	3° 46'.8	13'.2
20	333° 28'.1	89° 23'.5	34'.4	221° 06'.6	54'.1	150° 19'.0	09'.9	18° 49'.2	13'.2
21	348° 30'.6	104° 22'.7	35'.0	236° 08'.0	54'.1	165° 21'.0	10'.1	33° 51'.6	13'.2
22	3° 33'.1	119° 22'.0	35'.7	251° 09'.5	54'.0	180° 23'.0	10'.3	48° 54'.1	13'.2
23	18° 35'.5	134° 21'.2	36'.3	266° 11'.0	54'.0	195° 25'.0	10'.5	63° 56'.5	13'.2
25 Sunday 00	33° 38'.0	149° 20'.5	22° 37'.0 S	281° 12'.5	22° 53'.9 N	210° 27'.0	0° 10'.7 S	78° 58'.9	18° 13'.2 S
01	48° 40'.5	164° 19'.7	37'.6	296° 13'.9	53'.9	225° 29'.0	10'.9	94° 01'.3	13'.2
02	63° 42'.9	179° 19'.0	38'.2	311° 15'.4	53'.8	240° 31'.0	11'.1	109° 03'.8	13'.1
03	78° 45'.4	194° 18'.2	38'.9	326° 16'.9	53'.7	255° 33'.0	11'.3	124° 06'.2	13'.1
04	93° 47'.8	209° 17'.4	39'.5	341° 18'.4	53'.7	270° 35'.0	11'.5	139° 08'.6	13'.1
05	108° 50'.3	224° 16'.7	40'.1	356° 19'.8	53'.6	285° 37'.0	11'.7	154° 11'.0	13'.1
06	123° 52'.8	239° 15'.9	40'.8	11° 21'.3	53'.6	300° 39'.0	11'.9	169° 13'.5	13'.1
07	138° 55'.2	254° 15'.2	41'.4	26° 22'.8	53'.5	315° 41'.0	12'.1	184° 15'.9	13'.1
08	153° 57'.7	269° 14'.4	42'.0	41° 24'.3	53'.5	330° 43'.0	12'.3	199° 18'.3	13'.1
09	169° 00'.2	284° 13'.7	42'.7	56° 25'.8	53'.4	345° 45'.0	12'.5	214° 20'.7	13'.1
10	184° 02'.6	299° 12'.9	43'.3	71° 27'.3	53'.4	0° 47'.0	12'.7	229° 23'.2	13'.1
11	199° 05'.1	314° 12'.2	43'.9	86° 28'.7	53'.3	15° 49'.0	12'.9	244° 25'.6	13'.0
12	214° 07'.6	329° 11'.4	22° 44'.5 S	101° 30'.2	22° 53'.2 N	30° 51'.0	0° 13'.1 S	259° 28'.0	18° 13'.0 S
13	229° 10'.0	344° 10'.6	45'.2	116° 31'.7	53'.2	45° 53'.0	13'.3	274° 30'.4	13'.0
14	244° 12'.5	359° 09'.9	45'.8	131° 33'.2	53'.1	60° 55'.0	13'.5	289° 32'.9	13'.0
15	259° 14'.9	14° 09'.1	46'.4	146° 34'.7	53'.1	75° 57'.0	13'.7	304° 35'.3	13'.0
16	274° 17'.4	29° 08'.4	47'.0	161° 36'.2	53'.0	90° 59'.0	13'.9	319° 37'.7	13'.0
17	289° 19'.9	44° 07'.6	47'.7	176° 37'.7	53'.0	106° 01'.0	14'.0	334° 40'.1	13'.0
18	304° 22'.3	59° 06'.9	48'.3	191° 39'.2	52'.9	121° 03'.0	14'.2	349° 42'.6	13'.0
19	319° 24'.8	74° 06'.1	48'.9	206° 40'.6	52'.9	136° 05'.0	14'.4	4° 45'.0	12'.9
20	334° 27'.3	89° 05'.3	49'.5	221° 42'.1	52'.8	151° 07'.0	14'.6	19° 47'.4	12'.9
21	349° 29'.7	104° 04'.6	50'.1	236° 43'.6	52'.7	166° 09'.0	14'.8	34° 49'.8	12'.9
22	4° 32'.2	119° 03'.8	50'.7	251° 45'.1	52'.7	181° 11'.0	15'.0	49° 52'.2	12'.9
23	19° 34'.7	134° 03'.0	51'.4	266° 46'.6	52'.6	196° 13'.0	15'.2	64° 54'.7	12'.9
26 Monday 00	34° 37'.1	149° 02'.3	22° 52'.0 S	281° 48'.1	22° 52'.6 N	211° 15'.0	0° 15'.4 S	79° 57'.1	18° 12'.9 S
01	49° 39'.6	164° 01'.5	52'.6	296° 49'.6	52'.5	226° 17'.0	15'.6	94° 59'.5	12'.9
02	64° 42'.1	179° 00'.8	53'.2	311° 51'.1	52'.5	241° 19'.0	15'.8	110° 01'.9	12'.8
03	79° 44'.5	194° 00'.0	53'.8	326° 52'.6	52'.4	256° 21'.0	16'.0	125° 04'.4	12'.8
04	94° 47'.0	208° 59'.2	54'.4	341° 54'.1	52'.4	271° 23'.0	16'.2	140° 06'.8	12'.8
05	109° 49'.4	223° 58'.5	55'.0	356° 55'.6	52'.3	286° 25'.0	16'.4	155° 09'.2	12'.8
06	124° 51'.9	238° 57'.7	55'.6	11° 57'.1	52'.3	301° 27'.0	16'.6	170° 11'.6	12'.8
07	139° 54'.4	253° 56'.9	56'.2	26° 58'.6	52'.2	316° 29'.0	16'.8	185° 14'.0	12'.8
08	154° 56'.8	268° 56'.2	56'.8	42° 00'.1	52'.1	331° 31'.0	17'.0	200° 16'.5	12'.8
09	169° 59'.3	283° 55'.4	57'.4	57° 01'.6	52'.1	346° 33'.0	17'.2	215° 18'.9	12'.8
10	185° 01'.8	298° 54'.6	58'.0	72° 03'.1	52'.0	1° 35'.0	17'.4	230° 21'.3	12'.7
11	200° 04'.2	313° 53'.9	58'.6	87° 04'.6	52'.0	16° 37'.0	17'.6	245° 23'.7	12'.7
12	215° 06'.7	328° 53'.1	22° 59'.2 S	102° 06'.1	22° 51'.9 N	31° 39'.0	0° 17'.8 S	260° 26'.1	18° 12'.7 S
13	230° 09'.2	343° 52'.3	59'.8	117° 07'.6	51'.9	46° 41'.0	18'.0	275° 28'.6	12'.7
14	245° 11'.6	358° 51'.6	23° 00'.4 S	132° 09'.1	51'.8	61° 43'.0	18'.2	290° 31'.0	12'.7
15	260° 14'.1	13° 50'.8	01'.0	147° 10'.6	51'.8	76° 45'.0	18'.4	305° 33'.4	12'.7
16	275° 16'.5	28° 50'.0	01'.6	162° 12'.1	51'.7	91° 47'.0	18'.6	320° 35'.8	12'.7
17	290° 19'.0	43° 49'.3	02'.2	177° 13'.7	51'.7	106° 49'.0	18'.7	335° 38'.2	12'.6
18	305° 21'.5	58° 48'.5	02'.8	192° 15'.2	51'.6	121° 51'.0	18'.9	350° 40'.7	12'.6
19	320° 23'.9	73° 47'.7	03'.4	207° 16'.7	51'.5	136° 53'.0	19'.1	5° 43'.1	12'.6
20	335° 26'.4	88° 47'.0	04'.0	222° 18'.2	51'.5	151° 55'.0	19'.3	20° 45'.5	12'.6
21	350° 28'.9	103° 46'.2	04'.6	237° 19'.7	51'.4	166° 57'.0	19'.5	35° 47'.9	12'.6
22	5° 31'.3	118° 45'.4	05'.2	252° 21'.2	51'.4	181° 59'.0	19'.7	50° 50'.3	12'.6
23	20° 33'.8	133° 44'.6	05'.7	267° 22'.7	51'.3	197° 01'.0	19'.9	65° 52'.7	12'.6
	M.P. 21:42	v -0'.8	d 0'.6	v 1'.5	d 0'.1	v 2'.0	d 0'.2	v 2'.4	d 0'.0

STARS	SHA	Dec
Acamar	315° 29'.6	40° 19'.8 S
Achernar	335° 37'.5	57° 16'.3 S
Acrux	173° 27'.4	63° 03'.5 S
Adhara	255° 24'.5	28° 57'.5 S
Aldebaran	291° 06'.8	16° 29'.8 N
Alioth	166° 34'.6	55° 59'.8 N
Alkaid	153° 11'.4	49° 20'.9 N
Alnair	28° 02'.8	46° 59'.8 S
Alnilam	276° 01'.8	1° 12'.2 S
Alphard	218° 11'.3	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.3	8° 51'.2 N
Ankaa	353° 30'.4	42° 20'.6 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.7	69° 01'.1 S
Avior	234° 24'.4	59° 28'.9 S
Bellatrix	278° 48'.3	6° 20'.7 N
Betelgeuse	271° 17'.8	7° 24'.4 N
Canopus	264° 02'.7	52° 41'.2 S
Capella	280° 57'.0	45° 59'.4 N
Deneb	49° 42'.0	45° 15'.7 N
Denebola	182° 49'.6	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.8	61° 47'.1 N
Elnath	278° 31'.9	28° 36'.1 N
Eltanin	90° 53'.6	51° 29'.7 N
Enif	34° 02'.2	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.5 S
Gacrux	172° 18'.8	57° 04'.3 S
Gienah	176° 08'.5	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.3 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.5	34° 23'.4 S
Kochab	137° 20'.4	74° 11'.1 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.9	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.1 S
Miaplacidus	221° 43'.3	69° 41'.0 S
Mirfak	309° 02'.1	49° 50'.2 N
Nunki	76° 17'.5	26° 18'.4 S
Peacock	53° 43'.4	56° 45'.7 S
Polaris	323° 29'.1	89° 14'.0 N
Pollux	243° 46'.5	28° 02'.5 N
Procyon	245° 15'.8	5° 14'.7 N
Rasalhague	96° 21'.0	12° 34'.1 N
Regulus	208° 00'.1	12° 00'.1 N
Rigel	281° 26'.7	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.3 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.7	56° 30'.2 N
Shaula	96° 43'.1	37° 06'.0 S
Sirius	258° 47'.2	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 03'.9	43° 24'.0 S
Vega	80° 49'.6	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	115° 42'.5	14:03
Mars	247° 34'.5	05:15
Jupiter	176° 49'.0	09:57
Saturn	45° 20'.9	18:41

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
183° 56'.5	11° 45'.8 S	209° 23'.0	9'.4	6° 50'.0 S	13'.9	60'.0
198° 56'.6	46'.7	223° 51'.4	9'.4	7° 03'.9 S	13'.8	
213° 56'.7	47'.6	238° 19'.8	9'.3	17'.7	13'.8	
228° 56'.7	48'.4	252° 48'.1	9'.4	31'.5	13'.7	
243° 56'.8	49'.3	267° 16'.5	9'.3	45'.2	13'.7	
258° 56'.9	50'.2	281° 44'.8	9'.2	58'.9	13'.7	
273° 57'.0	51'.0	296° 13'.0	9'.3	8° 12'.6 S	13'.6	
288° 57'.1	51'.9	310° 41'.3	9'.2	26'.2	13'.5	
303° 57'.1	52'.8	325° 09'.5	9'.2	39'.7	13'.5	
318° 57'.2	53'.6	339° 37'.7	9'.1	53'.2	13'.4	
333° 57'.3	54'.5	354° 05'.8	9'.1	9° 06'.6 S	13'.4	
348° 57'.4	55'.4	8° 33'.9	9'.1	20'.0	13'.3	59'.9
3° 57'.4	11° 56'.2 S	23° 02'.0	9'.1	9° 33'.3 S	13'.2	59'.9
18° 57'.5	57'.1	37° 30'.1	9'.0	46'.5	13'.2	
33° 57'.6	58'.0	51° 58'.1	9'.0	59'.7	13'.1	
48° 57'.7	58'.8	66° 26'.1	8'.9	10° 12'.8 S	13'.1	
63° 57'.7	59'.7	80° 54'.0	8'.9	25'.9	12'.9	
78° 57'.8	12° 00'.6 S	95° 21'.9	8'.9	38'.8	12'.9	
93° 57'.9	01'.4	109° 49'.8	8'.9	51'.7	12'.9	
108° 58'.0	02'.3	124° 17'.7	8'.8	11° 04'.6 S	12'.8	59'.8
123° 58'.0	03'.2	138° 45'.5	8'.8	17'.4	12'.7	
138° 58'.1	04'.0	153° 13'.3	8'.7	30'.1	12'.6	
153° 58'.2	04'.9	167° 41'.0	8'.7	42'.7	12'.5	
168° 58'.2	05'.7	182° 08'.7	8'.7	55'.2	12'.5	
183° 58'.3	12° 06'.6 S	196° 36'.4	8'.6	12° 07'.7 S	12'.4	59'.8
198° 58'.4	07'.5	211° 04'.0	8'.6	20'.1	12'.3	59'.7
213° 58'.5	08'.3	225° 31'.6	8'.6	32'.4	12'.2	
228° 58'.5	09'.2	239° 59'.2	8'.5	44'.6	12'.2	
243° 58'.6	10'.1	254° 26'.7	8'.5	56'.8	12'.0	
258° 58'.7	10'.9	268° 54'.2	8'.4	13° 08'.8 S	12'.0	
273° 58'.7	11'.8	283° 21'.6	8'.4	20'.8	11'.9	
288° 58'.8	12'.6	297° 49'.0	8'.4	32'.7	11'.8	59'.6
303° 58'.9	13'.5	312° 16'.4	8'.3	44'.5	11'.7	
318° 58'.9	14'.3	326° 43'.7	8'.3	56'.2	11'.6	
333° 59'.0	15'.2	341° 11'.0	8'.3	14° 07'.8 S	11'.5	
348° 59'.1	16'.1	355° 38'.3	8'.2	19'.3	11'.5	
3° 59'.1	12° 16'.9 S	10° 05'.5	8'.2	14° 30'.8 S	11'.3	59'.5
18° 59'.2	17'.8	24° 32'.7	8'.1	42'.1	11'.2	
33° 59'.3	18'.6	38° 59'.8	8'.2	53'.3	11'.2	
48° 59'.3	19'.5	53° 27'.0	8'.0	15° 04'.5 S	11'.0	
63° 59'.4	20'.4	67° 54'.0	8'.1	15'.5	10'.9	
78° 59'.5	21'.2	82° 21'.1	8'.0	26'.4	10'.9	59'.4
93° 59'.5	22'.1	96° 48'.1	8'.0	37'.3	10'.7	
108° 59'.6	22'.9	111° 15'.1	7'.9	48'.0	10'.6	
123° 59'.7	23'.8	125° 42'.0	7'.9	58'.6	10'.6	
138° 59'.7	24'.6	140° 08'.9	7'.9	16° 09'.2 S	10'.4	59'.3
153° 59'.8	25'.5	154° 35'.8	7'.8	19'.6	10'.3	
168° 59'.9	26'.3	169° 02'.6	7'.8	29'.9	10'.2	
183° 59'.9	12° 27'.2 S	183° 29'.4	7'.7	16° 40'.1 S	10'.1	59'.3
199° 00'.0	28'.0	197° 56'.1	7'.8	50'.2	9'.9	
214° 00'.1	28'.9	212° 22'.9	7'.7	17° 00'.1 S	9'.9	59'.2
229° 00'.1	29'.8	226° 49'.6	7'.6	10'.0	9'.7	
244° 00'.2	30'.6	241° 16'.2	7'.7	19'.7	9'.7	
259° 00'.2	31'.5	255° 42'.9	7'.6	29'.4	9'.5	
274° 00'.3	32'.3	270° 09'.5	7'.5	38'.9	9'.4	59'.1
289° 00'.4	33'.2	284° 36'.0	7'.6	48'.3	9'.3	
304° 00'.4	34'.0	299° 02'.6	7'.5	57'.6	9'.1	
319° 00'.5	34'.9	313° 29'.1	7'.4	18° 06'.7 S	9'.1	59'.0
334° 00'.5	35'.7	327° 55'.5	7'.5	15'.8	8'.9	
349° 00'.6	36'.6	342° 22'.0	7'.4	24'.7	8'.8	
4° 00'.7	12° 37'.4 S	356° 48'.4	7'.4	18° 33'.5 S	8'.7	59'.0
19° 00'.7	38'.3	11° 14'.8	7'.4	42'.2	8'.5	58'.9
34° 00'.8	39'.1	25° 41'.2	7'.3	50'.7	8'.5	
49° 00'.8	40'.0	40° 07'.5	7'.3	59'.2	8'.3	
64° 00'.9	40'.8	54° 33'.8	7'.3	19° 07'.5 S	8'.1	
79° 01'.0	41'.7	69° 00'.1	7'.3	15'.6	8'.1	58'.8
94° 01'.0	42'.5	83° 26'.4	7'.2	23'.7	7'.9	
109° 01'.1	43'.4	97° 52'.6	7'.3	31'.6	7'.8	
124° 01'.1	44'.2	112° 18'.9	7'.2	39'.4	7'.7	58'.7
139° 01'.2	45'.1	126° 45'.1	7'.2	47'.1	7'.5	
154° 01'.3	45'.9	141° 11'.3	7'.1	54'.6	7'.4	
169° 01'.3	46'.7	155° 37'.4	7'.2	20° 02'.0 S	7'.3	58'.6
SD 16'.1	d 0'.9	SD 16'.3		16'.2	16'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
24	15 46	15 50	11:44	10:24	22:51	28d 3%
25	15 53	15 56	11:44	11:18	23:46	29d 0%
26	16 00	16 03	11:44	12:13	24:41	1d 1%

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1992 October 27, 28, 29 (Tue, Wed, Thur)

GMT	ARIES	VENUS -4.0		MARS -0.1		JUPITER -1.7		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
27 Tuesday 00	35° 36'.3	148° 43'.9	23° 06'.3 S	282° 24'.2	22° 51'.3 N	212° 03'.0	0° 20'.1 S	80° 55'.2	18° 12'.5 S
01	50° 38'.7	163° 43'.1	06'.9	297° 25'.8	51'.2	227° 05'.0	20'.3	95° 57'.6	12'.5
02	65° 41'.2	178° 42'.3	07'.5	312° 27'.3	51'.2	242° 07'.0	20'.5	111° 00'.0	12'.5
03	80° 43'.7	193° 41'.5	08'.1	327° 28'.8	51'.1	257° 09'.0	20'.7	126° 02'.4	12'.5
04	95° 46'.1	208° 40'.8	08'.7	342° 30'.3	51'.1	272° 11'.0	20'.9	141° 04'.8	12'.5
05	110° 48'.6	223° 40'.0	09'.2	357° 31'.8	51'.0	287° 13'.0	21'.1	156° 07'.2	12'.5
06	125° 51'.0	238° 39'.2	09'.8	12° 33'.3	51'.0	302° 15'.0	21'.3	171° 09'.7	12'.5
07	140° 53'.5	253° 38'.4	10'.4	27° 34'.9	50'.9	317° 17'.0	21'.5	186° 12'.1	12'.4
08	155° 56'.0	268° 37'.7	11'.0	42° 36'.4	50'.9	332° 19'.0	21'.7	201° 14'.5	12'.4
09	170° 58'.4	283° 36'.9	11'.6	57° 37'.9	50'.8	347° 21'.0	21'.9	216° 16'.9	12'.4
10	186° 00'.9	298° 36'.1	12'.1	72° 39'.4	50'.8	2° 23'.0	22'.1	231° 19'.3	12'.4
11	201° 03'.4	313° 35'.3	12'.7	87° 41'.0	50'.7	17° 25'.0	22'.3	246° 21'.7	12'.4
12	216° 05'.8	328° 34'.6	23° 13'.3 S	102° 42'.5	22° 50'.6 N	32° 27'.0	0° 22'.4 S	261° 24'.2	18° 12'.4 S
13	231° 08'.3	343° 33'.8	13'.9	117° 44'.0	50'.6	47° 29'.0	22'.6	276° 26'.6	12'.4
14	246° 10'.8	358° 33'.0	14'.4	132° 45'.5	50'.5	62° 31'.0	22'.8	291° 29'.0	12'.3
15	261° 13'.2	13° 32'.2	15'.0	147° 47'.1	50'.5	77° 33'.0	23'.0	306° 31'.4	12'.3
16	276° 15'.7	28° 31'.5	15'.6	162° 48'.6	50'.4	92° 35'.1	23'.2	321° 33'.8	12'.3
17	291° 18'.2	43° 30'.7	16'.1	177° 50'.1	50'.4	107° 37'.1	23'.4	336° 36'.2	12'.3
18	306° 20'.6	58° 29'.9	16'.7	192° 51'.7	50'.3	122° 39'.1	23'.6	351° 38'.7	12'.3
19	321° 23'.1	73° 29'.1	17'.3	207° 53'.2	50'.3	137° 41'.1	23'.8	6° 41'.1	12'.3
20	336° 25'.5	88° 28'.3	17'.8	222° 54'.7	50'.2	152° 43'.1	24'.0	21° 43'.5	12'.3
21	351° 28'.0	103° 27'.6	18'.4	237° 56'.3	50'.2	167° 45'.1	24'.2	36° 45'.9	12'.2
22	6° 30'.5	118° 26'.8	18'.9	252° 57'.8	50'.1	182° 47'.1	24'.4	51° 48'.3	12'.2
23	21° 32'.9	133° 26'.0	19'.5	267° 59'.3	50'.1	197° 49'.1	24'.6	66° 50'.7	12'.2
28 Wednesday 00	36° 35'.4	148° 25'.2	23° 20'.1 S	283° 00'.9	22° 50'.0 N	212° 51'.1	0° 24'.8 S	81° 53'.1	18° 12'.2 S
01	51° 37'.9	163° 24'.4	20'.6	298° 02'.4	50'.0	227° 53'.1	25'.0	96° 55'.5	12'.2
02	66° 40'.3	178° 23'.6	21'.2	313° 03'.9	49'.9	242° 55'.1	25'.2	111° 58'.0	12'.2
03	81° 42'.8	193° 22'.9	21'.7	328° 05'.5	49'.9	257° 57'.1	25'.4	127° 00'.4	12'.1
04	96° 45'.3	208° 22'.1	22'.3	343° 07'.0	49'.8	272° 59'.1	25'.6	142° 02'.8	12'.1
05	111° 47'.7	223° 21'.3	22'.8	358° 08'.6	49'.8	288° 01'.1	25'.7	157° 05'.2	12'.1
06	126° 50'.2	238° 20'.5	23'.4	13° 10'.1	49'.7	303° 03'.1	25'.9	172° 07'.6	12'.1
07	141° 52'.7	253° 19'.7	24'.0	28° 11'.6	49'.7	318° 05'.1	26'.1	187° 10'.0	12'.1
08	156° 55'.1	268° 18'.9	24'.5	43° 13'.2	49'.6	333° 07'.1	26'.3	202° 12'.4	12'.1
09	171° 57'.6	283° 18'.2	25'.1	58° 14'.7	49'.6	348° 09'.1	26'.5	217° 14'.8	12'.0
10	187° 00'.0	298° 17'.4	25'.6	73° 16'.3	49'.5	3° 11'.1	26'.7	232° 17'.3	12'.0
11	202° 02'.5	313° 16'.6	26'.1	88° 17'.8	49'.5	18° 13'.1	26'.9	247° 19'.7	12'.0
12	217° 05'.0	328° 15'.8	23° 26'.7 S	103° 19'.4	22° 49'.4 N	33° 15'.1	0° 27'.1 S	262° 22'.1	18° 12'.0 S
13	232° 07'.4	343° 15'.0	27'.2	118° 20'.9	49'.4	48° 17'.1	27'.3	277° 24'.5	12'.0
14	247° 09'.9	358° 14'.2	27'.8	133° 22'.5	49'.3	63° 19'.1	27'.5	292° 26'.9	12'.0
15	262° 12'.4	13° 13'.4	28'.3	148° 24'.0	49'.3	78° 21'.2	27'.7	307° 29'.3	12'.0
16	277° 14'.8	28° 12'.6	28'.9	163° 25'.6	49'.2	93° 23'.2	27'.9	322° 31'.7	11'.9
17	292° 17'.3	43° 11'.8	29'.4	178° 27'.1	49'.2	108° 25'.2	28'.1	337° 34'.1	11'.9
18	307° 19'.8	58° 11'.1	29'.9	193° 28'.7	49'.1	123° 27'.2	28'.3	352° 36'.5	11'.9
19	322° 22'.2	73° 10'.3	30'.5	208° 30'.2	49'.1	138° 29'.2	28'.5	7° 39'.0	11'.9
20	337° 24'.7	88° 09'.5	31'.0	223° 31'.8	49'.0	153° 31'.2	28'.7	22° 41'.4	11'.9
21	352° 27'.1	103° 08'.7	31'.6	238° 33'.3	49'.0	168° 33'.2	28'.8	37° 43'.8	11'.9
22	7° 29'.6	118° 07'.9	32'.1	253° 34'.9	48'.9	183° 35'.2	29'.0	52° 46'.2	11'.8
23	22° 32'.1	133° 07'.1	32'.6	268° 36'.4	48'.9	198° 37'.2	29'.2	67° 48'.6	11'.8
29 Thursday 00	37° 34'.5	148° 06'.3	23° 33'.2 S	283° 38'.0	22° 48'.8 N	213° 39'.2	0° 29'.4 S	82° 51'.0	18° 11'.8 S
01	52° 37'.0	163° 05'.5	33'.7	298° 39'.5	48'.8	228° 41'.2	29'.6	97° 53'.4	11'.8
02	67° 39'.5	178° 04'.7	34'.2	313° 41'.1	48'.7	243° 43'.2	29'.8	112° 55'.8	11'.8
03	82° 41'.9	193° 03'.9	34'.7	328° 42'.7	48'.7	258° 45'.2	30'.0	127° 58'.2	11'.8
04	97° 44'.4	208° 03'.1	35'.3	343° 44'.2	48'.6	273° 47'.2	30'.2	143° 00'.6	11'.7
05	112° 46'.9	223° 02'.4	35'.8	358° 45'.8	48'.6	288° 49'.2	30'.4	158° 03'.0	11'.7
06	127° 49'.3	238° 01'.6	36'.3	13° 47'.4	48'.5	303° 51'.2	30'.6	173° 05'.5	11'.7
07	142° 51'.8	253° 00'.8	36'.9	28° 48'.9	48'.5	318° 53'.2	30'.8	188° 07'.9	11'.7
08	157° 54'.3	268° 00'.0	37'.4	43° 50'.5	48'.4	333° 55'.3	31'.0	203° 10'.3	11'.7
09	172° 56'.7	282° 59'.2	37'.9	58° 52'.0	48'.4	348° 57'.3	31'.2	218° 12'.7	11'.7
10	187° 59'.2	297° 58'.4	38'.4	73° 53'.6	48'.3	3° 59'.3	31'.4	233° 15'.1	11'.6
11	203° 01'.6	312° 57'.6	38'.9	88° 55'.2	48'.3	19° 01'.3	31'.5	248° 17'.5	11'.6
12	218° 04'.1	327° 56'.8	23° 39'.5 S	103° 56'.7	22° 48'.2 N	34° 03'.3	0° 31'.7 S	263° 19'.9	18° 11'.6 S
13	233° 06'.6	342° 56'.0	40'.0	118° 58'.3	48'.2	49° 05'.3	31'.9	278° 22'.3	11'.6
14	248° 09'.0	357° 55'.2	40'.5	133° 59'.9	48'.1	64° 07'.3	32'.1	293° 24'.7	11'.6
15	263° 11'.5	12° 54'.4	41'.0	149° 01'.5	48'.1	79° 09'.3	32'.3	308° 27'.1	11'.5
16	278° 14'.0	27° 53'.6	41'.5	164° 03'.0	48'.1	94° 11'.3	32'.5	323° 29'.5	11'.5
17	293° 16'.4	42° 52'.8	42'.0	179° 04'.6	48'.0	109° 13'.3	32'.7	338° 31'.9	11'.5
18	308° 18'.9	57° 52'.0	42'.5	194° 06'.2	48'.0	124° 15'.3	32'.9	353° 34'.3	11'.5
19	323° 21'.4	72° 51'.2	43'.1	209° 07'.7	47'.9	139° 17'.3	33'.1	8° 36'.7	11'.5
20	338° 23'.8	87° 50'.4	43'.6	224° 09'.3	47'.9	154° 19'.3	33'.3	23° 39'.2	11'.5
21	353° 26'.3	102° 49'.6	44'.1	239° 10'.9	47'.8	169° 21'.3	33'.5	38° 41'.6	11'.4
22	8° 28'.8	117° 48'.8	44'.6	254° 12'.5	47'.8	184° 23'.4	33'.7	53° 44'.0	11'.4
23	23° 31'.2	132° 48'.0	45'.1	269° 14'.0	47'.7	199° 25'.4	33'.9	68° 46'.4	11'.4
	M.P. 21:30	v -0'.8	d 0'.5	v 1'.5	d 0'.1	v 2'.0	d 0'.2	v 2'.4	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.6	40° 19'.8 S
Achernar	335° 37'.5	57° 16'.3 S
Acrux	173° 27'.4	63° 03'.5 S
Adhara	255° 24'.5	28° 57'.5 S
Aldebaran	291° 06'.8	16° 29'.8 N
Alioth	166° 34'.6	55° 59'.8 N
Alkaid	153° 11'.4	49° 20'.9 N
Alnair	28° 02'.8	46° 59'.8 S
Alnilam	276° 01'.8	1° 12'.3 S
Alphard	218° 11'.3	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.3 N
Altair	62° 23'.3	8° 51'.2 N
Ankaa	353° 30'.5	42° 20'.6 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.7	69° 01'.1 S
Avior	234° 24'.4	59° 28'.9 S
Bellatrix	278° 48'.3	6° 20'.7 N
Betelgeuse	271° 17'.8	7° 24'.4 N
Canopus	264° 02'.7	52° 41'.2 S
Capella	280° 56'.9	45° 59'.4 N
Deneb	49° 42'.0	45° 15'.7 N
Denebola	182° 49'.6	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.8	61° 47'.1 N
Elnath	278° 31'.9	28° 36'.1 N
Eltanin	90° 53'.6	51° 29'.7 N
Enif	34° 02'.2	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.6 S
Gacrux	172° 18'.8	57° 04'.3 S
Gienah	176° 08'.5	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.3 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.5	34° 23'.4 S
Kochab	137° 20'.4	74° 11'.1 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.9	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.1 S
Miaplacidus	221° 43'.2	69° 41'.0 S
Mirfak	309° 02'.0	49° 50'.2 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.4	56° 45'.7 S
Polaris	323° 28'.6	89° 14'.0 N
Pollux	243° 46'.5	28° 02'.5 N
Procyon	245° 15'.8	5° 14'.7 N
Rasalhague	96° 21'.0	12° 34'.1 N
Regulus	208° 00'.0	12° 00'.1 N
Rigel	281° 26'.6	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.3 S
Sabik	102° 30'.5	15° 42'.9 S
Schedar	349° 57'.7	56° 30'.2 N
Shaula	96° 43'.2	37° 06'.0 S
Sirius	258° 47'.1	16° 42'.2 S
Spica	158° 47'.9	11° 07'.4 S
Suhail	223° 03'.9	43° 24'.0 S
Vega	80° 49'.6	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	111° 49'.8	14:07
Mars	246° 25'.5	05:07
Jupiter	176° 15'.7	09:47
Saturn	45° 17'.7	18:29

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
184° 01'.4	12° 47'.6 S	170° 03'.6	7'.1	20° 09'.3 S	7'.1	58'.6
199° 01'.4	48'.4	184° 29'.7	7'.1	16'.4	7'.0	
214° 01'.5	49'.3	198° 55'.8	7'.1	23'.4	6'.9	
229° 01'.5	50'.1	213° 21'.9	7'.1	30'.3	6'.7	58'.5
244° 01'.6	51'.0	227° 48'.0	7'.1	37'.0	6'.6	
259° 01'.6	51'.8	242° 14'.1	7'.0	43'.6	6'.5	
274° 01'.7	52'.7	256° 40'.1	7'.1	50'.1	6'.3	58'.4
289° 01'.7	53'.5	271° 06'.2	7'.0	56'.4	6'.2	
304° 01'.8	54'.3	285° 32'.2	7'.0	21° 02'.6 S	6'.1	
319° 01'.9	55'.2	299° 58'.2	7'.0	08'.7	5'.9	58'.3
334° 01'.9	56'.0	314° 24'.2	7'.1	14'.6	5'.8	
349° 02'.0	56'.9	328° 50'.3	7'.0	20'.4	5'.7	
4° 02'.0	12° 57'.7 S	343° 16'.3	7'.0	21° 26'.1 S	5'.5	58'.2
19° 02'.1	58'.6	357° 42'.3	7'.0	31'.6	5'.3	
34° 02'.1	59'.4	12° 08'.3	7'.0	36'.9	5'.3	
49° 02'.2	13° 00'.2 S	26° 34'.3	7'.0	42'.2	5'.1	58'.1
64° 02'.2	01'.1	41° 00'.3	7'.0	47'.3	4'.9	
79° 02'.3	01'.9	55° 26'.3	7'.0	52'.2	4'.8	
94° 02'.3	02'.8	69° 52'.3	7'.0	57'.0	4'.7	58'.0
109° 02'.4	03'.6	84° 18'.3	7'.0	22° 01'.7 S	4'.5	
124° 02'.4	04'.4	98° 44'.3	7'.0	06'.2	4'.4	
139° 02'.5	05'.3	113° 10'.3	7'.0	10'.6	4'.3	
154° 02'.5	06'.1	127° 36'.3	7'.0	14'.9	4'.1	57'.9
169° 02'.6	06'.9	142° 02'.3	7'.1	19'.0	4'.0	
184° 02'.6	13° 07'.8 S	156° 28'.4	7'.0	22° 23'.0 S	3'.8	57'.9
199° 02'.7	08'.6	170° 54'.4	7'.1	26'.8	3'.7	57'.8
214° 02'.7	09'.5	185° 20'.5	7'.0	30'.5	3'.5	
229° 02'.8	10'.3	199° 46'.5	7'.1	34'.0	3'.4	
244° 02'.8	11'.1	214° 12'.6	7'.1	37'.4	3'.3	57'.7
259° 02'.9	12'.0	228° 38'.7	7'.1	40'.7	3'.1	
274° 02'.9	12'.8	243° 04'.8	7'.2	43'.8	3'.0	
289° 02'.9	13'.6	257° 31'.0	7'.1	46'.8	2'.9	57'.6
304° 03'.0	14'.5	271° 57'.1	7'.2	49'.7	2'.7	
319° 03'.0	15'.3	286° 23'.3	7'.2	52'.4	2'.5	57'.5
334° 03'.1	16'.1	300° 49'.5	7'.2	54'.9	2'.4	
349° 03'.1	17'.0	315° 15'.7	7'.2	57'.3	2'.3	
4° 03'.2	13° 17'.8 S	329° 41'.9	7'.3	22° 59'.6 S	2'.2	57'.4
19° 03'.2	18'.6	344° 08'.2	7'.3	23° 01'.8 S	2'.0	
34° 03'.3	19'.5	358° 34'.5	7'.3	03'.8	1'.8	
49° 03'.3	20'.3	13° 00'.8	7'.4	05'.6	1'.7	57'.3
64° 03'.3	21'.1	27° 27'.2	7'.3	07'.3	1'.6	
79° 03'.4	22'.0	41° 53'.5	7'.5	08'.9	1'.5	
94° 03'.4	22'.8	56° 20'.0	7'.4	10'.4	1'.3	57'.2
109° 03'.5	23'.6	70° 46'.4	7'.5	11'.7	1'.1	
124° 03'.5	24'.5	85° 12'.9	7'.5	12'.8	1'.1	
139° 03'.6	25'.3	99° 39'.4	7'.6	13'.9	0'.9	57'.1
154° 03'.6	26'.1	114° 06'.0	7'.6	14'.8	0'.7	
169° 03'.6	26'.9	128° 32'.6	7'.6	15'.5	0'.6	
184° 03'.7	13° 27'.8 S	142° 59'.2	7'.7	23° 16'.1 S	0'.5	57'.0
199° 03'.7	28'.6	157° 25'.9	7'.7	16'.6	0'.3	
214° 03'.8	29'.4	171° 52'.6	7'.7	16'.9	0'.3	
229° 03'.8	30'.3	186° 19'.3	7'.8	17'.2	0'.0	56'.9
244° 03'.8	31'.1	200° 46'.1	7'.9	17'.2	0'.0	
259° 03'.9	31'.9	215° 13'.0	7'.9	17'.2	0'.2	
274° 03'.9	32'.7	229° 39'.9	7'.9	17'.0	0'.4	56'.8
289° 04'.0	33'.6	244° 06'.8	8'.0	16'.6	0'.4	
304° 04'.0	34'.4	258° 33'.8	8'.0	16'.2	0'.6	
319° 04'.0	35'.2	273° 00'.8	8'.1	15'.6	0'.7	56'.7
334° 04'.1	36'.0	287° 27'.9	8'.1	14'.9	0'.9	
349° 04'.1	36'.9	301° 55'.0	8'.2	14'.0	1'.0	
4° 04'.1	13° 37'.7 S	316° 22'.2	8'.3	23° 13'.0 S	1'.1	56'.6
19° 04'.2	38'.5	330° 49'.5	8'.3	11'.9	1'.2	
34° 04'.2	39'.3	345° 16'.8	8'.3	10'.7	1'.4	
49° 04'.2	40'.2	359° 44'.1	8'.4	09'.3	1'.5	56'.5
64° 04'.3	41'.0	14° 11'.5	8'.5	07'.8	1'.7	
79° 04'.3	41'.8	28° 39'.0	8'.5	06'.1	1'.7	
94° 04'.4	42'.6	43° 06'.5	8'.6	04'.4	1'.9	56'.4
109° 04'.4	43'.4	57° 34'.1	8'.6	02'.5	2'.0	
124° 04'.4	44'.3	72° 01'.7	8'.7	00'.5	2'.1	
139° 04'.5	45'.1	86° 29'.4	8'.8	22° 58'.4 S	2'.3	56'.3
154° 04'.5	45'.9	100° 57'.2	8'.8	56'.1	2'.4	
169° 04'.5	46'.7	115° 25'.0	8'.9	53'.7	2'.5	
SD 16'.1	d 0'.8	SD 15'.9		15'.7		15'.4

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
27	16 05	16 08	11:44	13:10	00:41	2d 4%
28	16 10	16 13	11:44	14:06	01:38	3d 9%
29	16 15	16 16	11:44	15:01	02:34	4d 15%

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1992 Oct 30, 31, Nov. 1 (Fri, Sat, Sun)

GMT		ARIES	VENUS -4.0		MARS -0.1		JUPITER -1.7		SATURN +0.7	
		GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
30 Friday	00	38° 33'.7	147° 47'.2	23° 45'.6 S	284° 15'.6	22° 47'.7 N	214° 27'.4	0° 34'.0 S	83° 48'.8	18° 11'.4 S
	01	53° 36'.1	162° 46'.4	46'.1	299° 17'.2	47'.6	229° 29'.4	34'.2	98° 51'.2	11'.4
	02	68° 38'.6	177° 45'.6	46'.6	314° 18'.8	47'.6	244° 31'.4	34'.4	113° 53'.6	11'.4
	03	83° 41'.1	192° 44'.8	47'.1	329° 20'.4	47'.5	259° 33'.4	34'.6	128° 56'.0	11'.3
	04	98° 43'.5	207° 44'.0	47'.6	344° 21'.9	47'.5	274° 35'.4	34'.8	143° 58'.4	11'.3
	05	113° 46'.0	222° 43'.2	48'.1	359° 23'.5	47'.4	289° 37'.4	35'.0	159° 00'.8	11'.3
	06	128° 48'.5	237° 42'.4	48'.6	14° 25'.1	47'.4	304° 39'.4	35'.2	174° 03'.2	11'.3
	07	143° 50'.9	252° 41'.6	49'.1	29° 26'.7	47'.4	319° 41'.4	35'.4	189° 05'.6	11'.3
	08	158° 53'.4	267° 40'.8	49'.6	44° 28'.3	47'.3	334° 43'.4	35'.6	204° 08'.0	11'.2
	09	173° 55'.9	282° 40'.0	50'.1	59° 29'.9	47'.3	349° 45'.4	35'.8	219° 10'.4	11'.2
	10	188° 58'.3	297° 39'.2	50'.6	74° 31'.5	47'.2	4° 47'.5	36'.0	234° 12'.8	11'.2
	11	204° 00'.8	312° 38'.4	51'.1	89° 33'.0	47'.2	19° 49'.5	36'.2	249° 15'.2	11'.2
	12	219° 03'.3	327° 37'.6	23° 51'.6 S	104° 34'.6	22° 47'.1 N	34° 51'.5	0° 36'.3 S	264° 17'.6	18° 11'.2 S
	13	234° 05'.7	342° 36'.8	52'.0	119° 36'.2	47'.1	49° 53'.5	36'.5	279° 20'.0	11'.2
	14	249° 08'.2	357° 36'.0	52'.5	134° 37'.8	47'.0	64° 55'.5	36'.7	294° 22'.4	11'.1
	15	264° 10'.6	12° 35'.2	53'.0	149° 39'.4	47'.0	79° 57'.5	36'.9	309° 24'.8	11'.1
	16	279° 13'.1	27° 34'.4	53'.5	164° 41'.0	46'.9	94° 59'.5	37'.1	324° 27'.2	11'.1
	17	294° 15'.6	42° 33'.5	54'.0	179° 42'.6	46'.9	110° 01'.5	37'.3	339° 29'.6	11'.1
	18	309° 18'.0	57° 32'.7	54'.5	194° 44'.2	46'.9	125° 03'.5	37'.5	354° 32'.0	11'.1
	19	324° 20'.5	72° 31'.9	55'.0	209° 45'.8	46'.8	140° 05'.5	37'.7	9° 34'.4	11'.0
	20	339° 23'.0	87° 31'.1	55'.4	224° 47'.4	46'.8	155° 07'.6	37'.9	24° 36'.8	11'.0
	21	354° 25'.4	102° 30'.3	55'.9	239° 49'.0	46'.7	170° 09'.6	38'.1	39° 39'.2	11'.0
	22	9° 27'.9	117° 29'.5	56'.4	254° 50'.6	46'.7	185° 11'.6	38'.3	54° 41'.6	11'.0
	23	24° 30'.4	132° 28'.7	56'.9	269° 52'.2	46'.6	200° 13'.6	38'.4	69° 44'.0	11'.0
31 Saturday	00	39° 32'.8	147° 27'.9	23° 57'.4 S	284° 53'.8	22° 46'.6 N	215° 15'.6	0° 38'.6 S	84° 46'.4	18° 10'.9 S
	01	54° 35'.3	162° 27'.1	57'.8	299° 55'.4	46'.5	230° 17'.6	38'.8	99° 48'.8	10'.9
	02	69° 37'.8	177° 26'.3	58'.3	314° 57'.0	46'.5	245° 19'.6	39'.0	114° 51'.2	10'.9
	03	84° 40'.2	192° 25'.5	58'.8	329° 58'.6	46'.5	260° 21'.6	39'.2	129° 53'.6	10'.9
	04	99° 42'.7	207° 24'.7	59'.3	345° 00'.2	46'.4	275° 23'.6	39'.4	144° 56'.0	10'.9
	05	114° 45'.1	222° 23'.8	59'.7	0° 01'.8	46'.4	290° 25'.6	39'.6	159° 58'.4	10'.9
	06	129° 47'.6	237° 23'.0	24° 00'.2 S	15° 03'.4	46'.3	305° 27'.7	39'.8	175° 00'.8	10'.8
	07	144° 50'.1	252° 22'.2	00'.7	30° 05'.0	46'.3	320° 29'.7	40'.0	190° 03'.2	10'.8
	08	159° 52'.5	267° 21'.4	01'.1	45° 06'.6	46'.2	335° 31'.7	40'.2	205° 05'.6	10'.8
	09	174° 55'.0	282° 20'.6	01'.6	60° 08'.2	46'.2	350° 33'.7	40'.4	220° 08'.0	10'.8
	10	189° 57'.5	297° 19'.8	02'.1	75° 09'.8	46'.1	5° 35'.7	40'.5	235° 10'.4	10'.8
	11	204° 59'.9	312° 19'.0	02'.5	90° 11'.4	46'.1	20° 37'.7	40'.7	250° 12'.8	10'.7
	12	220° 02'.4	327° 18'.2	24° 03'.0 S	105° 13'.1	22° 46'.1 N	35° 39'.7	0° 40'.9 S	265° 15'.2	18° 10'.7 S
	13	235° 04'.9	342° 17'.3	03'.5	120° 14'.7	46'.0	50° 41'.7	41'.1	280° 17'.6	10'.7
	14	250° 07'.3	357° 16'.5	03'.9	135° 16'.3	46'.0	65° 43'.7	41'.3	295° 20'.0	10'.7
	15	265° 09'.8	12° 15'.7	04'.4	150° 17'.9	45'.9	80° 45'.8	41'.5	310° 22'.4	10'.7
	16	280° 12'.2	27° 14'.9	04'.8	165° 19'.5	45'.9	95° 47'.8	41'.7	325° 24'.8	10'.6
	17	295° 14'.7	42° 14'.1	05'.3	180° 21'.1	45'.8	110° 49'.8	41'.9	340° 27'.2	10'.6
	18	310° 17'.2	57° 13'.3	05'.7	195° 22'.7	45'.8	125° 51'.8	42'.1	355° 29'.6	10'.6
	19	325° 19'.6	72° 12'.5	06'.2	210° 24'.4	45'.8	140° 53'.8	42'.3	10° 32'.0	10'.6
	20	340° 22'.1	87° 11'.6	06'.7	225° 26'.0	45'.7	155° 55'.8	42'.4	25° 34'.4	10'.6
	21	355° 24'.6	102° 10'.8	07'.1	240° 27'.6	45'.7	170° 57'.8	42'.6	40° 36'.8	10'.5
	22	10° 27'.0	117° 10'.0	07'.6	255° 29'.2	45'.6	185° 59'.8	42'.8	55° 39'.2	10'.5
	23	25° 29'.5	132° 09'.2	08'.0	270° 30'.8	45'.6	201° 01'.9	43'.0	70° 41'.6	10'.5
1 Sunday	00	40° 32'.0	147° 08'.4	24° 08'.5 S	285° 32'.5	22° 45'.6 N	216° 03'.9	0° 43'.2 S	85° 44'.0	18° 10'.5 S
	01	55° 34'.4	162° 07'.6	08'.9	300° 34'.1	45'.5	231° 05'.9	43'.4	100° 46'.4	10'.5
	02	70° 36'.9	177° 06'.7	09'.4	315° 35'.7	45'.5	246° 07'.9	43'.6	115° 48'.8	10'.4
	03	85° 39'.4	192° 05'.9	09'.8	330° 37'.3	45'.4	261° 09'.9	43'.8	130° 51'.2	10'.4
	04	100° 41'.8	207° 05'.1	10'.2	345° 39'.0	45'.4	276° 11'.9	44'.0	145° 53'.6	10'.4
	05	115° 44'.3	222° 04'.3	10'.7	0° 40'.6	45'.4	291° 13'.9	44'.2	160° 56'.0	10'.4
	06	130° 46'.7	237° 03'.5	11'.1	15° 42'.2	45'.3	306° 15'.9	44'.3	175° 58'.4	10'.4
	07	145° 49'.2	252° 02'.7	11'.6	30° 43'.8	45'.3	321° 18'.0	44'.5	191° 00'.8	10'.3
	08	160° 51'.7	267° 01'.8	12'.0	45° 45'.5	45'.2	336° 20'.0	44'.7	206° 03'.2	10'.3
	09	175° 54'.1	282° 01'.0	12'.4	60° 47'.1	45'.2	351° 22'.0	44'.9	221° 05'.6	10'.3
	10	190° 56'.6	297° 00'.2	12'.9	75° 48'.7	45'.1	6° 24'.0	45'.1	236° 08'.0	10'.3
	11	205° 59'.1	311° 59'.4	13'.3	90° 50'.4	45'.1	21° 26'.0	45'.3	251° 10'.4	10'.3
	12	221° 01'.5	326° 58'.6	24° 13'.8 S	105° 52'.0	22° 45'.1 N	36° 28'.0	0° 45'.5 S	266° 12'.7	18° 10'.2 S
	13	236° 04'.0	341° 57'.7	14'.2	120° 53'.6	45'.0	51° 30'.0	45'.7	281° 15'.1	10'.2
	14	251° 06'.5	356° 56'.9	14'.6	135° 55'.3	45'.0	66° 32'.0	45'.9	296° 17'.5	10'.2
	15	266° 08'.9	11° 56'.1	15'.0	150° 56'.9	45'.0	81° 34'.1	46'.0	311° 19'.9	10'.2
	16	281° 11'.4	26° 55'.3	15'.5	165° 58'.5	44'.9	96° 36'.1	46'.2	326° 22'.3	10'.2
	17	296° 13'.9	41° 54'.5	15'.9	181° 00'.2	44'.9	111° 38'.1	46'.4	341° 24'.7	10'.1
	18	311° 16'.3	56° 53'.6	16'.3	196° 01'.8	44'.8	126° 40'.1	46'.6	356° 27'.1	10'.1
	19	326° 18'.8	71° 52'.8	16'.8	211° 03'.5	44'.8	141° 42'.1	46'.8	11° 29'.5	10'.1
	20	341° 21'.2	86° 52'.0	17'.2	226° 05'.1	44'.8	156° 44'.1	47'.0	26° 31'.9	10'.1
	21	356° 23'.7	101° 51'.2	17'.6	241° 06'.7	44'.7	171° 46'.1	47'.2	41° 34'.3	10'.0
	22	11° 26'.2	116° 50'.3	18'.0	256° 08'.4	44'.7	186° 48'.2	47'.4	56° 36'.7	10'.0
	23	26° 28'.6	131° 49'.5	18'.5	271° 10'.0	44'.6	201° 50'.2	47'.6	71° 39'.1	10'.0
		M.P. 21:18	v -0'.8	d 0'.5	v 1'.6	d 0'.0	v 2'.0	d 0'.2	v 2'.4	d 0'.0

STARS		
Name	SHA	Dec
Acamar	315° 29'.6	40° 19'.8 S
Achernar	335° 37'.5	57° 16'.3 S
Acrux	173° 27'.4	63° 03'.5 S
Adhara	255° 24'.5	28° 57'.5 S
Aldebaran	291° 06'.8	16° 29'.8 N
Alioth	166° 34'.6	55° 59'.8 N
Alkaid	153° 11'.4	49° 20'.9 N
Alnair	28° 02'.8	46° 59'.8 S
Alnilam	276° 01'.8	1° 12'.3 S
Alphard	218° 11'.3	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.4 N
Altair	62° 23'.3	8° 51'.2 N
Ankaa	353° 30'.5	42° 20'.6 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.8	69° 01'.1 S
Avior	234° 24'.3	59° 28'.9 S
Bellatrix	278° 48'.3	6° 20'.7 N
Betelgeuse	271° 17'.8	7° 24'.4 N
Canopus	264° 02'.7	52° 41'.2 S
Capella	280° 56'.9	45° 59'.4 N
Deneb	49° 42'.0	45° 15'.7 N
Denebola	182° 49'.6	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.8	61° 47'.1 N
Elnath	278° 31'.8	28° 36'.1 N
Eltanin	90° 53'.7	51° 29'.6 N
Enif	34° 02'.2	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.6 S
Gacrux	172° 18'.7	57° 04'.3 S
Gienah	176° 08'.5	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.3 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.4	74° 11'.1 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.9	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.1 S
Miaplacidus	221° 43'.2	69° 41'.0 S
Mirfak	309° 02'.0	49° 50'.3 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.4	56° 45'.7 S
Polaris	323° 28'.3	89° 14'.0 N
Pollux	243° 46'.4	28° 02'.5 N
Procyon	245° 15'.7	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	208° 00'.0	12° 00'.1 N
Rigel	281° 26'.6	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.3 S
Sabik	102° 30'.5	15° 42'.9 S
Schedar	349° 57'.7	56° 30'.2 N
Shaula	96° 43'.2	37° 06'.0 S
Sirius	258° 47'.1	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.9	43° 24'.0 S
Vega	80° 49'.6	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	107° 55'.1	14:11
Mars	245° 21'.0	05:00
Jupiter	175° 42'.8	09:38
Saturn	45° 13'.6	18:18

SUN				MOON				
GHA	Dec	GHA	v	Dec	d	HP
184° 04'.6	13° 47'.6 S	129° 52'.9	8'.9	22° 51'.2 S	2'.6	56'.3
199° 04'.6	48'.4	144° 20'.8	9'.0	48'.6	2'.7	56'.2
214° 04'.6	49'.2	158° 48'.8	9'.1	45'.9	2'.9	
229° 04'.6	50'.0	173° 16'.9	9'.2	43'.0	3'.0	
244° 04'.7	50'.8	187° 45'.1	9'.2	40'.0	3'.1	56'.1
259° 04'.7	51'.6	202° 13'.3	9'.2	36'.9	3'.2	
274° 04'.7	52'.5	216° 41'.5	9'.4	33'.7	3'.3	
289° 04'.8	53'.3	231° 09'.9	9'.4	30'.4	3'.5	56'.0
304° 04'.8	54'.1	245° 38'.3	9'.5	26'.9	3'.5	
319° 04'.8	54'.9	260° 06'.8	9'.5	23'.4	3'.7	
334° 04'.9	55'.7	274° 35'.3	9'.6	19'.7	3'.8	55'.9
349° 04'.9	56'.5	289° 03'.9	9'.7	15'.9	3'.9	
4° 04'.9	13° 57'.4 S	303° 32'.6	9'.7	22° 12'.0 S	4'.0	55'.9
19° 04'.9	58'.2	318° 01'.3	9'.9	08'.0	4'.2	
34° 05'.0	59'.0	332° 30'.2	9'.9	03'.8	4'.2	55'.8
49° 05'.0	59'.8	346° 59'.1	9'.9	21° 59'.6 S	4'.3	
64° 05'.0	14° 00'.6 S	1° 28'.0	10'.1	55'.3	4'.5	
79° 05'.1	01'.4	15° 57'.1	10'.1	50'.8	4'.6	55'.7
94° 05'.1	02'.2	30° 26'.2	10'.2	46'.2	4'.6	
109° 05'.1	03'.1	44° 55'.4	10'.2	41'.6	4'.8	
124° 05'.1	03'.9	59° 24'.6	10'.3	36'.8	4'.9	
139° 05'.2	04'.7	73° 53'.9	10'.4	31'.9	5'.0	55'.6
154° 05'.2	05'.5	88° 23'.3	10'.5	26'.9	5'.0	
169° 05'.2	06'.3	102° 52'.8	10'.5	21'.9	5'.2	
184° 05'.2	14° 07'.1 S	117° 22'.3	10'.7	21° 16'.7 S	5'.3	55'.5
199° 05'.3	07'.9	131° 52'.0	10'.6	11'.4	5'.4	
214° 05'.3	08'.7	146° 21'.6	10'.8	06'.0	5'.5	
229° 05'.3	09'.5	160° 51'.4	10'.9	00'.5	5'.6	
244° 05'.3	10'.3	175° 21'.3	10'.9	20° 54'.9 S	5'.7	55'.4
259° 05'.4	11'.2	189° 51'.2	10'.9	49'.2	5'.7	
274° 05'.4	12'.0	204° 21'.1	11'.1	43'.5	5'.9	
289° 05'.4	12'.8	218° 51'.2	11'.1	37'.6	6'.0	
304° 05'.4	13'.6	233° 21'.3	11'.2	31'.6	6'.0	55'.3
319° 05'.4	14'.4	247° 51'.5	11'.3	25'.6	6'.2	
334° 05'.5	15'.2	262° 21'.8	11'.4	19'.4	6'.2	
349° 05'.5	16'.0	276° 52'.2	11'.4	13'.2	6'.4	
4° 05'.5	14° 16'.8 S	291° 22'.6	11'.5	20° 06'.8 S	6'.4	55'.2
19° 05'.5	17'.6	305° 53'.1	11'.6	00'.4	6'.5	
34° 05'.5	18'.4	320° 23'.7	11'.6	19° 53'.9 S	6'.6	
49° 05'.6	19'.2	334° 54'.3	11'.8	47'.3	6'.7	
64° 05'.6	20'.0	349° 25'.1	11'.8	40'.6	6'.8	55'.1
79° 05'.6	20'.8	3° 55'.9	11'.8	33'.8	6'.9	
94° 05'.6	21'.6	18° 26'.7	12'.0	26'.9	6'.9	
109° 05'.6	22'.4	32° 57'.7	12'.0	20'.0	7'.1	
124° 05'.7	23'.2	47° 28'.7	12'.1	12'.9	7'.1	
139° 05'.7	24'.0	61° 59'.8	12'.1	05'.8	7'.2	55'.0
154° 05'.7	24'.8	76° 30'.9	12'.2	18° 58'.6 S	7'.3	
169° 05'.7	25'.6	91° 02'.1	12'.3	51'.3	7'.3	
184° 05'.7	14° 26'.4 S	105° 33'.4	12'.4	18° 44'.0 S	7'.5	55'.0
199° 05'.7	27'.2	120° 04'.8	12'.4	36'.5	7'.5	54'.9
214° 05'.8	28'.0	134° 36'.2	12'.6	29'.0	7'.6	
229° 05'.8	28'.8	149° 07'.8	12'.5	21'.4	7'.7	
244° 05'.8	29'.6	163° 39'.3	12'.7	13'.7	7'.8	
259° 05'.8	30'.4	178° 11'.0	12'.7	05'.9	7'.8	
274° 05'.8	31'.2	192° 42'.7	12'.8	17° 58'.1 S	7'.9	54'.8
289° 05'.8	32'.0	207° 14'.5	12'.8	50'.2	8'.0	
304° 05'.8	32'.8	221° 46'.3	13'.0	42'.2	8'.0	
319° 05'.9	33'.6	236° 18'.3	13'.0	34'.2	8'.1	
334° 05'.9	34'.4	250° 50'.3	13'.0	26'.1	8'.2	
349° 05'.9	35'.2	265° 22'.3	13'.1	17'.9	8'.3	
4° 05'.9	14° 36'.0 S	279° 54'.4	13'.2	17° 09'.6 S	8'.3	54'.7
19° 05'.9	36'.8	294° 26'.6	13'.3	01'.3	8'.5	
34° 05'.9	37'.6	308° 58'.9	13'.3	16° 52'.8 S	8'.4	
49° 05'.9	38'.4	323° 31'.2	13'.4	44'.4	8'.6	
64° 05'.9	39'.2	338° 03'.6	13'.4	35'.8	8'.6	
79° 06'.0	40'.0	352° 36'.0	13'.5	27'.2	8'.6	54'.6
94° 06'.0	40'.8	7° 08'.5	13'.6	18'.6	8'.8	
109° 06'.0	41'.6	21° 41'.1	13'.6	09'.8	8'.8	
124° 06'.0	42'.4	36° 13'.7	13'.7	01'.0	8'.9	
139° 06'.0	43'.2	50° 46'.4	13'.8	15° 52'.1 S	8'.9	
154° 06'.0	44'.0	65° 19'.2	13'.8	43'.2	9'.0	
169° 06'.0	44'.7	79° 52'.0	13'.9	34'.2	9'.0	
SD 16'.1	d 0'.8	SD	15'.2	15'.1	14'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
30	16 18	16 20	11:44	15:54	03:28	5d 23%
31	16 21	16 22	11:44	16:44	04:19	6d 32%
1	16 23	16 24	11:44	17:31	05:08	7d 42%

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1992 November 2, 3, 4 (Mon, Tue, Wed)

GMT	ARIES	VENUS -4.0		MARS -0.2		JUPITER -1.7		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
2 Monday 00	41° 31'.1	146° 48'.7	24° 18'.9 S	286° 11'.7	22° 44'.6 N	216° 52'.2	0° 47'.7 S	86° 41'.5	18° 10'.0 S
01	56° 33'.6	161° 47'.9	19'.3	301° 13'.3	44'.6	231° 54'.2	47'.9	101° 43'.9	10'.0
02	71° 36'.0	176° 47'.0	19'.7	316° 15'.0	44'.5	246° 56'.2	48'.1	116° 46'.3	09'.9
03	86° 38'.5	191° 46'.2	20'.1	331° 16'.6	44'.5	261° 58'.2	48'.3	131° 48'.6	09'.9
04	101° 41'.0	206° 45'.4	20'.5	346° 18'.3	44'.4	277° 00'.3	48'.5	146° 51'.0	09'.9
05	116° 43'.4	221° 44'.6	21'.0	1° 19'.9	44'.4	292° 02'.3	48'.7	161° 53'.4	09'.9
06	131° 45'.9	236° 43'.7	21'.4	16° 21'.6	44'.4	307° 04'.3	48'.9	176° 55'.8	09'.9
07	146° 48'.3	251° 42'.9	21'.8	31° 23'.2	44'.3	322° 06'.3	49'.1	191° 58'.2	09'.8
08	161° 50'.8	266° 42'.1	22'.2	46° 24'.9	44'.3	337° 08'.3	49'.3	207° 00'.6	09'.8
09	176° 53'.3	281° 41'.3	22'.6	61° 26'.5	44'.3	352° 10'.3	49'.4	222° 03'.0	09'.8
10	191° 55'.7	296° 40'.4	23'.0	76° 28'.2	44'.2	7° 12'.3	49'.6	237° 05'.4	09'.8
11	206° 58'.2	311° 39'.6	23'.4	91° 29'.8	44'.2	22° 14'.4	49'.8	252° 07'.8	09'.7
12	222° 00'.7	326° 38'.8	24° 23'.8 S	106° 31'.5	22° 44'.1 N	37° 16'.4	0° 50'.0 S	267° 10'.2	18° 09'.7 S
13	237° 03'.1	341° 38'.0	24'.2	121° 33'.1	44'.1	52° 18'.4	50'.2	282° 12'.6	09'.7
14	252° 05'.6	356° 37'.1	24'.6	136° 34'.8	44'.1	67° 20'.4	50'.4	297° 14'.9	09'.7
15	267° 08'.1	11° 36'.3	25'.0	151° 36'.5	44'.0	82° 22'.4	50'.6	312° 17'.3	09'.7
16	282° 10'.5	26° 35'.5	25'.4	166° 38'.1	44'.0	97° 24'.4	50'.8	327° 19'.7	09'.6
17	297° 13'.0	41° 34'.6	25'.8	181° 39'.8	44'.0	112° 26'.5	50'.9	342° 22'.1	09'.6
18	312° 15'.5	56° 33'.8	26'.2	196° 41'.4	43'.9	127° 28'.5	51'.1	357° 24'.5	09'.6
19	327° 17'.9	71° 33'.0	26'.6	211° 43'.1	43'.9	142° 30'.5	51'.3	12° 26'.9	09'.6
20	342° 20'.4	86° 32'.2	27'.0	226° 44'.8	43'.9	157° 32'.5	51'.5	27° 29'.3	09'.5
21	357° 22'.8	101° 31'.3	27'.4	241° 46'.4	43'.8	172° 34'.5	51'.7	42° 31'.7	09'.5
22	12° 25'.3	116° 30'.5	27'.8	256° 48'.1	43'.8	187° 36'.5	51'.9	57° 34'.1	09'.5
23	27° 27'.8	131° 29'.7	28'.2	271° 49'.8	43'.8	202° 38'.6	52'.1	72° 36'.4	09'.5
3 Tuesday 00	42° 30'.2	146° 28'.8	24° 28'.6 S	286° 51'.4	22° 43'.7 N	217° 40'.6	0° 52'.3 S	87° 38'.8	18° 09'.5 S
01	57° 32'.7	161° 28'.0	29'.0	301° 53'.1	43'.7	232° 42'.6	52'.4	102° 41'.2	09'.4
02	72° 35'.2	176° 27'.2	29'.4	316° 54'.8	43'.6	247° 44'.6	52'.6	117° 43'.6	09'.4
03	87° 37'.6	191° 26'.3	29'.8	331° 56'.4	43'.6	262° 46'.6	52'.8	132° 46'.0	09'.4
04	102° 40'.1	206° 25'.5	30'.2	346° 58'.1	43'.6	277° 48'.6	53'.0	147° 48'.4	09'.4
05	117° 42'.6	221° 24'.7	30'.5	1° 59'.8	43'.5	292° 50'.7	53'.2	162° 50'.8	09'.3
06	132° 45'.0	236° 23'.8	30'.9	17° 01'.5	43'.5	307° 52'.7	53'.4	177° 53'.2	09'.3
07	147° 47'.5	251° 23'.0	31'.3	32° 03'.1	43'.5	322° 54'.7	53'.6	192° 55'.5	09'.3
08	162° 50'.0	266° 22'.2	31'.7	47° 04'.8	43'.4	337° 56'.7	53'.8	207° 57'.9	09'.3
09	177° 52'.4	281° 21'.3	32'.1	62° 06'.5	43'.4	352° 58'.7	53'.9	223° 00'.3	09'.3
10	192° 54'.9	296° 20'.5	32'.5	77° 08'.2	43'.4	8° 00'.7	54'.1	238° 02'.7	09'.2
11	207° 57'.3	311° 19'.7	32'.8	92° 09'.8	43'.3	23° 02'.8	54'.3	253° 05'.1	09'.2
12	222° 59'.8	326° 18'.8	24° 33'.2 S	107° 11'.5	22° 43'.3 N	38° 04'.8	0° 54'.5 S	268° 07'.5	18° 09'.2 S
13	238° 02'.3	341° 18'.0	33'.6	122° 13'.2	43'.3	53° 06'.8	54'.7	283° 09'.9	09'.2
14	253° 04'.7	356° 17'.2	34'.0	137° 14'.9	43'.2	68° 08'.8	54'.9	298° 12'.2	09'.1
15	268° 07'.2	11° 16'.3	34'.3	152° 16'.6	43'.2	83° 10'.8	55'.1	313° 14'.6	09'.1
16	283° 09'.7	26° 15'.5	34'.7	167° 18'.3	43'.2	98° 12'.9	55'.3	328° 17'.0	09'.1
17	298° 12'.1	41° 14'.7	35'.1	182° 19'.9	43'.1	113° 14'.9	55'.4	343° 19'.4	09'.1
18	313° 14'.6	56° 13'.8	35'.4	197° 21'.6	43'.1	128° 16'.9	55'.6	358° 21'.8	09'.0
19	328° 17'.1	71° 13'.0	35'.8	212° 23'.3	43'.1	143° 18'.9	55'.8	13° 24'.2	09'.0
20	343° 19'.5	86° 12'.2	36'.2	227° 25'.0	43'.0	158° 20'.9	56'.0	28° 26'.6	09'.0
21	358° 22'.0	101° 11'.3	36'.5	242° 26'.7	43'.0	173° 22'.9	56'.2	43° 28'.9	09'.0
22	13° 24'.4	116° 10'.5	36'.9	257° 28'.4	43'.0	188° 25'.0	56'.4	58° 31'.3	08'.9
23	28° 26'.9	131° 09'.7	37'.3	272° 30'.1	42'.9	203° 27'.0	56'.6	73° 33'.7	08'.9
4 Wednesday 00	43° 29'.4	146° 08'.8	24° 37'.6 S	287° 31'.8	22° 42'.9 N	218° 29'.0	0° 56'.7 S	88° 36'.1	18° 08'.9 S
01	58° 31'.8	161° 08'.0	38'.0	302° 33'.4	42'.9	233° 31'.0	56'.9	103° 38'.5	08'.9
02	73° 34'.3	176° 07'.1	38'.4	317° 35'.1	42'.8	248° 33'.0	57'.1	118° 40'.9	08'.9
03	88° 36'.8	191° 06'.3	38'.7	332° 36'.8	42'.8	263° 35'.1	57'.3	133° 43'.2	08'.8
04	103° 39'.2	206° 05'.5	39'.1	347° 38'.5	42'.8	278° 37'.1	57'.5	148° 45'.6	08'.8
05	118° 41'.7	221° 04'.6	39'.4	2° 40'.2	42'.8	293° 39'.1	57'.7	163° 48'.0	08'.8
06	133° 44'.2	236° 03'.8	39'.8	17° 41'.9	42'.7	308° 41'.1	57'.9	178° 50'.4	08'.8
07	148° 46'.6	251° 02'.9	40'.1	32° 43'.6	42'.7	323° 43'.1	58'.1	193° 52'.8	08'.7
08	163° 49'.1	266° 02'.1	40'.5	47° 45'.3	42'.7	338° 45'.2	58'.2	208° 55'.2	08'.7
09	178° 51'.6	281° 01'.3	40'.8	62° 47'.0	42'.6	353° 47'.2	58'.4	223° 57'.5	08'.7
10	193° 54'.0	296° 00'.4	41'.2	77° 48'.7	42'.6	8° 49'.2	58'.6	238° 59'.9	08'.7
11	208° 56'.5	310° 59'.6	41'.5	92° 50'.4	42'.6	23° 51'.2	58'.8	254° 02'.3	08'.6
12	223° 58'.9	325° 58'.8	24° 41'.9 S	107° 52'.1	22° 42'.5 N	38° 53'.2	0° 59'.0 S	269° 04'.7	18° 08'.6 S
13	239° 01'.4	340° 57'.9	42'.2	122° 53'.8	42'.5	53° 55'.3	59'.2	284° 07'.1	08'.6
14	254° 03'.9	355° 57'.1	42'.6	137° 55'.5	42'.5	68° 57'.3	59'.4	299° 09'.4	08'.6
15	269° 06'.3	10° 56'.2	42'.9	152° 57'.2	42'.4	83° 59'.3	59'.5	314° 11'.8	08'.5
16	284° 08'.8	25° 55'.4	43'.3	167° 58'.9	42'.4	99° 01'.3	59'.7	329° 14'.2	08'.5
17	299° 11'.3	40° 54'.6	43'.6	183° 00'.7	42'.4	114° 03'.3	59'.9	344° 16'.6	08'.5
18	314° 13'.7	55° 53'.7	44'.0	198° 02'.4	42'.4	129° 05'.4	1° 00'.1 S	359° 19'.0	08'.5
19	329° 16'.2	70° 52'.9	44'.3	213° 04'.1	42'.3	144° 07'.4	00'.3	14° 21'.4	08'.4
20	344° 18'.7	85° 52'.0	44'.6	228° 05'.8	42'.3	159° 09'.4	00'.5	29° 23'.7	08'.4
21	359° 21'.1	100° 51'.2	45'.0	243° 07'.5	42'.3	174° 11'.4	00'.6	44° 26'.1	08'.4
22	14° 23'.6	115° 50'.3	45'.3	258° 09'.2	42'.2	189° 13'.5	00'.8	59° 28'.5	08'.4
23	29° 26'.1	130° 49'.5	45'.6	273° 10'.9	42'.2	204° 15'.5	01'.0	74° 30'.9	08'.3
	M.P. 21:07	v -0'.8	d 0'.4	v 1'.7	d 0'.0	v 2'.0	d 0'.2	v 2'.4	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.5	40° 19'.8 S
Achernar	335° 37'.5	57° 16'.3 S
Acrux	173° 27'.3	63° 03'.4 S
Adhara	255° 24'.5	28° 57'.5 S
Aldebaran	291° 06'.8	16° 29'.8 N
Alioth	166° 34'.6	55° 59'.7 N
Alkaid	153° 11'.4	49° 20'.8 N
Alnair	28° 02'.8	46° 59'.8 S
Alnilam	276° 01'.8	1° 12'.3 S
Alphard	218° 11'.3	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.4 N
Altair	62° 23'.4	8° 51'.2 N
Ankaa	353° 30'.5	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.8	69° 01'.0 S
Avior	234° 24'.3	59° 28'.9 S
Bellatrix	278° 48'.3	6° 20'.7 N
Betelgeuse	271° 17'.7	7° 24'.4 N
Canopus	264° 02'.7	52° 41'.3 S
Capella	280° 56'.9	45° 59'.4 N
Deneb	49° 42'.0	45° 15'.7 N
Denebola	182° 49'.6	14° 36'.7 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.7	61° 47'.1 N
Elnath	278° 31'.8	28° 36'.1 N
Eltanin	90° 53'.7	51° 29'.6 N
Enif	34° 02'.2	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.6 S
Gacrux	172° 18'.7	57° 04'.3 S
Gienah	176° 08'.5	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.3 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.4	74° 11'.0 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.9	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.1 S
Miaplacidus	221° 43'.1	69° 41'.0 S
Mirfak	309° 02'.0	49° 50'.3 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.5	56° 45'.7 S
Polaris	323° 28'.2	89° 14'.1 N
Pollux	243° 46'.4	28° 02'.5 N
Procyon	245° 15'.7	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	208° 00'.0	12° 00'.1 N
Rigel	281° 26'.6	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.3 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.2 N
Shaula	96° 43'.2	37° 06'.0 S
Sirius	258° 47'.1	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.0 S
Vega	80° 49'.6	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	103° 58'.6	14:15
Mars	244° 21'.2	04:52
Jupiter	175° 10'.3	09:28
Saturn	45° 08'.6	18:07

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
2 Monday 00	184° 06'.0	14° 45'.5 S	94° 24'.9	13'.9	15° 25'.2 S	9'.1	54'.5
01	199° 06'.0	46'.3	108° 57'.8	14'.0	16'.1	9'.2	
02	214° 06'.0	47'.1	123° 30'.8	14'.1	06'.9	9'.2	
03	229° 06'.0	47'.9	138° 03'.9	14'.1	14° 57'.7 S	9'.3	
04	244° 06'.1	48'.7	152° 37'.0	14'.1	48'.4	9'.4	
05	259° 06'.1	49'.5	167° 10'.1	14'.3	39'.0	9'.4	
06	274° 06'.1	50'.3	181° 43'.4	14'.2	29'.6	9'.4	
07	289° 06'.1	51'.1	196° 16'.6	14'.4	20'.2	9'.5	54'.4
08	304° 06'.1	51'.8	210° 50'.0	14'.4	10'.7	9'.6	
09	319° 06'.1	52'.6	225° 23'.4	14'.4	01'.1	9'.6	
10	334° 06'.1	53'.4	239° 56'.8	14'.5	13° 51'.5 S	9'.7	
11	349° 06'.1	54'.2	254° 30'.3	14'.5	41'.8	9'.7	
12	4° 06'.1	14° 55'.0 S	269° 03'.8	14'.6	13° 32'.1 S	9'.8	54'.4
13	19° 06'.1	55'.8	283° 37'.4	14'.6	22'.3	9'.8	
14	34° 06'.1	56'.6	298° 11'.0	14'.7	12'.5	9'.9	
15	49° 06'.1	57'.3	312° 44'.7	14'.8	02'.6	9'.9	
16	64° 06'.1	58'.1	327° 18'.5	14'.8	12° 52'.7 S	10'.0	
17	79° 06'.1	58'.9	341° 52'.3	14'.8	42'.7	10'.0	54'.3
18	94° 06'.1	59'.7	356° 26'.1	14'.9	32'.7	10'.1	
19	109° 06'.1	15° 00'.5 S	11° 00'.0	14'.9	22'.6	10'.1	
20	124° 06'.1	01'.3	25° 33'.9	15'.0	12'.5	10'.2	
21	139° 06'.1	02'.0	40° 07'.9	15'.0	02'.3	10'.2	
22	154° 06'.1	02'.8	54° 41'.9	15'.0	11° 52'.1 S	10'.3	
23	169° 06'.1	03'.6	69° 15'.9	15'.1	41'.8	10'.2	
3 Tuesday 00	184° 06'.1	15° 04'.4 S	83° 50'.0	15'.2	11° 31'.6 S	10'.4	54'.3
01	199° 06'.1	05'.2	98° 24'.2	15'.1	21'.2	10'.4	
02	214° 06'.1	05'.9	112° 58'.3	15'.3	10'.8	10'.4	
03	229° 06'.1	06'.7	127° 32'.6	15'.2	00'.4	10'.5	
04	244° 06'.1	07'.5	142° 06'.8	15'.3	10° 49'.9 S	10'.5	
05	259° 06'.1	08'.3	156° 41'.1	15'.4	39'.4	10'.5	
06	274° 06'.1	09'.1	171° 15'.5	15'.3	28'.9	10'.6	54'.2
07	289° 06'.1	09'.8	185° 49'.8	15'.4	18'.3	10'.6	
08	304° 06'.1	10'.6	200° 24'.2	15'.5	07'.7	10'.7	
09	319° 06'.1	11'.4	214° 58'.7	15'.4	9° 57'.0 S	10'.7	
10	334° 06'.1	12'.2	229° 33'.1	15'.6	46'.3	10'.7	
11	349° 06'.1	12'.9	244° 07'.7	15'.5	35'.6	10'.8	
12	4° 06'.1	15° 13'.7 S	258° 42'.2	15'.6	9° 24'.8 S	10'.8	54'.2
13	19° 06'.1	14'.5	273° 16'.8	15'.6	14'.0	10'.9	
14	34° 06'.1	15'.3	287° 51'.4	15'.6	03'.1	10'.8	
15	49° 06'.1	16'.0	302° 26'.0	15'.7	8° 52'.3 S	11'.0	
16	64° 06'.1	16'.8	317° 00'.7	15'.7	41'.3	10'.9	
17	79° 06'.1	17'.6	331° 35'.4	15'.7	30'.4	11'.0	
18	94° 06'.1	18'.4	346° 10'.1	15'.7	19'.4	11'.0	
19	109° 06'.1	19'.1	0° 44'.8	15'.8	08'.4	11'.0	
20	124° 06'.0	19'.9	15° 19'.6	15'.8	7° 57'.4 S	11'.1	
21	139° 06'.0	20'.7	29° 54'.4	15'.8	46'.3	11'.1	
22	154° 06'.0	21'.5	44° 29'.2	15'.8	35'.2	11'.1	
23	169° 06'.0	22'.2	59° 04'.0	15'.9	24'.1	11'.2	
4 Wednesday 00	184° 06'.0	15° 23'.0 S	73° 38'.9	15'.9	7° 12'.9 S	11'.2	54'.2
01	199° 06'.0	23'.8	88° 13'.8	15'.9	01'.7	11'.2	
02	214° 06'.0	24'.5	102° 48'.7	15'.9	6° 50'.5 S	11'.2	
03	229° 06'.0	25'.3	117° 23'.6	15'.9	39'.3	11'.3	
04	244° 06'.0	26'.1	131° 58'.5	16'.0	28'.0	11'.3	
05	259° 06'.0	26'.8	146° 33'.5	16'.0	16'.7	11'.3	
06	274° 06'.0	27'.6	161° 08'.5	16'.0	05'.4	11'.4	
07	289° 06'.0	28'.4	175° 43'.5	16'.0	5° 54'.0 S	11'.3	
08	304° 05'.9	29'.1	190° 18'.5	16'.0	42'.7	11'.4	
09	319° 05'.9	29'.9	204° 53'.5	16'.0	31'.3	11'.4	
10	334° 05'.9	30'.7	219° 28'.5	16'.1	19'.9	11'.5	
11	349° 05'.9	31'.4	234° 03'.6	16'.0	08'.4	11'.4	
12	4° 05'.9	15° 32'.2 S	248° 38'.6	16'.1	4° 57'.0 S	11'.5	54'.2
13	19° 05'.9	33'.0	263° 13'.7	16'.1	45'.5	11'.5	
14	34° 05'.9	33'.7	277° 48'.8	16'.0	34'.0	11'.5	
15	49° 05'.9	34'.5	292° 23'.8	16'.1	22'.5	11'.6	
16	64° 05'.8	35'.3	306° 58'.9	16'.1	10'.9	11'.5	
17	79° 05'.8	36'.0	321° 34'.0	16'.1	3° 59'.4 S	11'.6	
18	94° 05'.8	36'.8	336° 09'.1	16'.1	47'.8	11'.6	54'.3
19	109° 05'.8	37'.5	350° 44'.2	16'.1	36'.2	11'.6	
20	124° 05'.8	38'.3	5° 19'.3	16'.2	24'.6	11'.6	
21	139° 05'.8	39'.1	19° 54'.5	16'.1	13'.0	11'.7	
22	154° 05'.7	39'.8	34° 29'.6	16'.1	01'.3	11'.6	
23	169° 05'.7	40'.6	49° 04'.7	16'.1	2° 49'.7 S	11'.7	
	SD 16'.1	d 0'.8	SD 14'.8		14'.8		14'.8

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
2	16 24	16 24	11:44	18:15	05:53	8d 51%
3	16 24	16 24	11:44	18:57	06:36	9d 61%
4	16 24	16 24	11:44	19:38	07:18	10d 70%

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1992 November 5, 6, 7 (Thur, Fri, Saw)

GMT	ARIES	VENUS -4.0		MARS -0.2		JUPITER -1.7		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
5 Thursday 00	44° 28'.5	145° 48'.7	24° 46'.0 S	288° 12'.6	22° 42'.2 N	219° 17'.5	1° 01'.2 S	89° 33'.3	18° 08'.3 S
01	59° 31'.0	160° 47'.8	46'.3	303° 14'.4	42'.2	234° 19'.5	01'.4	104° 35'.6	08'.3
02	74° 33'.4	175° 47'.0	46'.6	318° 16'.1	42'.1	249° 21'.5	01'.6	119° 38'.0	08'.3
03	89° 35'.9	190° 46'.1	47'.0	333° 17'.8	42'.1	264° 23'.6	01'.8	134° 40'.4	08'.2
04	104° 38'.4	205° 45'.3	47'.3	348° 19'.5	42'.1	279° 25'.6	01'.9	149° 42'.8	08'.2
05	119° 40'.8	220° 44'.4	47'.6	3° 21'.2	42'.0	294° 27'.6	02'.1	164° 45'.2	08'.2
06	134° 43'.3	235° 43'.6	47'.9	18° 23'.0	42'.0	309° 29'.6	02'.3	179° 47'.5	08'.2
07	149° 45'.8	250° 42'.8	48'.3	33° 24'.7	42'.0	324° 31'.7	02'.5	194° 49'.9	08'.1
08	164° 48'.2	265° 41'.9	48'.6	48° 26'.4	42'.0	339° 33'.7	02'.7	209° 52'.3	08'.1
09	179° 50'.7	280° 41'.1	48'.9	63° 28'.1	41'.9	354° 35'.7	02'.9	224° 54'.7	08'.1
10	194° 53'.2	295° 40'.2	49'.2	78° 29'.8	41'.9	9° 37'.7	03'.1	239° 57'.0	08'.1
11	209° 55'.6	310° 39'.4	49'.6	93° 31'.6	41'.9	24° 39'.7	03'.2	254° 59'.4	08'.0
12	224° 58'.1	325° 38'.5	24° 49'.9 S	108° 33'.3	22° 41'.9 N	39° 41'.8	1° 03'.4 S	270° 01'.8	18° 08'.0 S
13	240° 00'.5	340° 37'.7	50'.2	123° 35'.0	41'.8	54° 43'.8	03'.6	285° 04'.2	08'.0
14	255° 03'.0	355° 36'.8	50'.5	138° 36'.8	41'.8	69° 45'.8	03'.8	300° 06'.6	08'.0
15	270° 05'.5	10° 36'.0	50'.8	153° 38'.5	41'.8	84° 47'.8	04'.0	315° 08'.9	07'.9
16	285° 07'.9	25° 35'.1	51'.1	168° 40'.2	41'.8	99° 49'.9	04'.2	330° 11'.3	07'.9
17	300° 10'.4	40° 34'.3	51'.4	183° 41'.9	41'.7	114° 51'.9	04'.3	345° 13'.7	07'.9
18	315° 12'.9	55° 33'.5	51'.8	198° 43'.7	41'.7	129° 53'.9	04'.5	0° 16'.1	07'.9
19	330° 15'.3	70° 32'.6	52'.1	213° 45'.4	41'.7	144° 55'.9	04'.7	15° 18'.4	07'.8
20	345° 17'.8	85° 31'.8	52'.4	228° 47'.1	41'.7	159° 58'.0	04'.9	30° 20'.8	07'.8
21	0° 20'.3	100° 30'.9	52'.7	243° 48'.9	41'.6	175° 00'.0	05'.1	45° 23'.2	07'.8
22	15° 22'.7	115° 30'.1	53'.0	258° 50'.6	41'.6	190° 02'.0	05'.3	60° 25'.6	07'.8
23	30° 25'.2	130° 29'.2	53'.3	273° 52'.4	41'.6	205° 04'.0	05'.4	75° 27'.9	07'.7
6 Friday 00	45° 27'.7	145° 28'.4	24° 53'.6 S	288° 54'.1	22° 41'.6 N	220° 06'.0	1° 05'.6 S	90° 30'.3	18° 07'.7 S
01	60° 30'.1	160° 27'.5	53'.9	303° 55'.8	41'.5	235° 08'.1	05'.8	105° 32'.7	07'.7
02	75° 32'.6	175° 26'.7	54'.2	318° 57'.6	41'.5	250° 10'.1	06'.0	120° 35'.1	07'.7
03	90° 35'.0	190° 25'.8	54'.5	333° 59'.3	41'.5	265° 12'.1	06'.2	135° 37'.4	07'.6
04	105° 37'.5	205° 25'.0	54'.8	349° 01'.1	41'.5	280° 14'.1	06'.4	150° 39'.8	07'.6
05	120° 40'.0	220° 24'.1	55'.1	4° 02'.8	41'.4	295° 16'.2	06'.6	165° 42'.2	07'.6
06	135° 42'.4	235° 23'.3	55'.4	19° 04'.6	41'.4	310° 18'.2	06'.7	180° 44'.6	07'.6
07	150° 44'.9	250° 22'.4	55'.7	34° 06'.3	41'.4	325° 20'.2	06'.9	195° 46'.9	07'.5
08	165° 47'.4	265° 21'.6	56'.0	49° 08'.0	41'.4	340° 22'.2	07'.1	210° 49'.3	07'.5
09	180° 49'.8	280° 20'.7	56'.3	64° 09'.8	41'.3	355° 24'.3	07'.3	225° 51'.7	07'.5
10	195° 52'.3	295° 19'.9	56'.6	79° 11'.5	41'.3	10° 26'.3	07'.5	240° 54'.1	07'.4
11	210° 54'.8	310° 19'.0	56'.9	94° 13'.3	41'.3	25° 28'.3	07'.7	255° 56'.4	07'.4
12	225° 57'.2	325° 18'.2	24° 57'.1 S	109° 15'.0	22° 41'.3 N	40° 30'.3	1° 07'.8 S	270° 58'.8	18° 07'.4 S
13	240° 59'.7	340° 17'.3	57'.4	124° 16'.8	41'.3	55° 32'.4	08'.0	286° 01'.2	07'.4
14	256° 02'.1	355° 16'.5	57'.7	139° 18'.6	41'.2	70° 34'.4	08'.2	301° 03'.6	07'.3
15	271° 04'.6	10° 15'.6	58'.0	154° 20'.3	41'.2	85° 36'.4	08'.4	316° 05'.9	07'.3
16	286° 07'.1	25° 14'.8	58'.3	169° 22'.1	41'.2	100° 38'.4	08'.6	331° 08'.3	07'.3
17	301° 09'.5	40° 13'.9	58'.6	184° 23'.8	41'.2	115° 40'.5	08'.8	346° 10'.7	07'.3
18	316° 12'.0	55° 13'.1	58'.8	199° 25'.6	41'.1	130° 42'.5	08'.9	1° 13'.1	07'.2
19	331° 14'.5	70° 12'.2	59'.1	214° 27'.3	41'.1	145° 44'.5	09'.1	16° 15'.4	07'.2
20	346° 16'.9	85° 11'.4	59'.4	229° 29'.1	41'.1	160° 46'.5	09'.3	31° 17'.8	07'.2
21	1° 19'.4	100° 10'.5	59'.7	244° 30'.9	41'.1	175° 48'.6	09'.5	46° 20'.2	07'.2
22	16° 21'.9	115° 09'.7	25° 00'.0 S	259° 32'.6	41'.1	190° 50'.6	09'.7	61° 22'.5	07'.1
23	31° 24'.3	130° 08'.8	00'.2	274° 34'.4	41'.0	205° 52'.6	09'.8	76° 24'.9	07'.1
7 Saturday 00	46° 26'.8	145° 08'.0	25° 00'.5 S	289° 36'.1	22° 41'.0 N	220° 54'.7	1° 10'.0 S	91° 27'.3	18° 07'.1 S
01	61° 29'.3	160° 07'.1	00'.8	304° 37'.9	41'.0	235° 56'.7	10'.2	106° 29'.7	07'.0
02	76° 31'.7	175° 06'.3	01'.1	319° 39'.7	41'.0	250° 58'.7	10'.4	121° 32'.0	07'.0
03	91° 34'.2	190° 05'.4	01'.3	334° 41'.4	41'.0	266° 00'.7	10'.6	136° 34'.4	07'.0
04	106° 36'.6	205° 04'.6	01'.6	349° 43'.2	40'.9	281° 02'.8	10'.8	151° 36'.8	07'.0
05	121° 39'.1	220° 03'.7	01'.9	4° 45'.0	40'.9	296° 04'.8	10'.9	166° 39'.1	06'.9
06	136° 41'.6	235° 02'.9	02'.1	19° 46'.7	40'.9	311° 06'.8	11'.1	181° 41'.5	06'.9
07	151° 44'.0	250° 02'.0	02'.4	34° 48'.5	40'.9	326° 08'.8	11'.3	196° 43'.9	06'.9
08	166° 46'.5	265° 01'.2	02'.7	49° 50'.3	40'.9	341° 10'.9	11'.5	211° 46'.3	06'.9
09	181° 49'.0	280° 00'.3	02'.9	64° 52'.1	40'.8	356° 12'.9	11'.7	226° 48'.6	06'.8
10	196° 51'.4	294° 59'.5	03'.2	79° 53'.8	40'.8	11° 14'.9	11'.9	241° 51'.0	06'.8
11	211° 53'.9	309° 58'.6	03'.4	94° 55'.6	40'.8	26° 17'.0	12'.0	256° 53'.4	06'.8
12	226° 56'.4	324° 57'.8	25° 03'.7 S	109° 57'.4	22° 40'.8 N	41° 19'.0	1° 12'.2 S	271° 55'.7	18° 06'.7 S
13	241° 58'.8	339° 56'.9	04'.0	124° 59'.2	40'.8	56° 21'.0	12'.4	286° 58'.1	06'.7
14	257° 01'.3	354° 56'.0	04'.2	140° 00'.9	40'.7	71° 23'.0	12'.6	302° 00'.5	06'.7
15	272° 03'.8	9° 55'.2	04'.5	155° 02'.7	40'.7	86° 25'.1	12'.8	317° 02'.8	06'.7
16	287° 06'.2	24° 54'.3	04'.7	170° 04'.5	40'.7	101° 27'.1	12'.9	332° 05'.2	06'.6
17	302° 08'.7	39° 53'.5	05'.0	185° 06'.3	40'.7	116° 29'.1	13'.1	347° 07'.6	06'.6
18	317° 11'.1	54° 52'.6	05'.2	200° 08'.1	40'.7	131° 31'.2	13'.3	2° 09'.9	06'.6
19	332° 13'.6	69° 51'.8	05'.5	215° 09'.9	40'.7	146° 33'.2	13'.5	17° 12'.3	06'.5
20	347° 16'.1	84° 50'.9	05'.7	230° 11'.6	40'.6	161° 35'.2	13'.7	32° 14'.7	06'.5
21	2° 18'.5	99° 50'.1	06'.0	245° 13'.4	40'.6	176° 37'.2	13'.9	47° 17'.1	06'.5
22	17° 21'.0	114° 49'.2	06'.2	260° 15'.2	40'.6	191° 39'.3	14'.0	62° 19'.4	06'.5
23	32° 23'.5	129° 48'.4	06'.5	275° 17'.0	40'.6	206° 41'.3	14'.2	77° 21'.8	06'.4
	M.P. 20:55	v -0'.8	d 0'.3	v 1'.8	d 0'.0	v 2'.0	d 0'.2	v 2'.4	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.5	40° 19'.9 S
Achernar	335° 37'.6	57° 16'.3 S
Acrux	173° 27'.3	63° 03'.4 S
Adhara	255° 24'.4	28° 57'.5 S
Aldebaran	291° 06'.8	16° 29'.8 N
Alioth	166° 34'.6	55° 59'.7 N
Alkaid	153° 11'.4	49° 20'.8 N
Alnair	28° 02'.8	46° 59'.8 S
Alnilam	276° 01'.7	1° 12'.3 S
Alphard	218° 11'.3	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.4 N
Altair	62° 23'.4	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.2 N
Atria	108° 01'.8	69° 01'.0 S
Avior	234° 24'.2	59° 28'.9 S
Bellatrix	278° 48'.3	6° 20'.7 N
Betelgeuse	271° 17'.7	7° 24'.4 N
Canopus	264° 02'.6	52° 41'.3 S
Capella	280° 56'.8	45° 59'.4 N
Deneb	49° 42'.1	45° 15'.7 N
Denebola	182° 49'.6	14° 36'.6 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.7	61° 47'.1 N
Elnath	278° 31'.8	28° 36'.1 N
Eltanin	90° 53'.7	51° 29'.6 N
Enif	34° 02'.2	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.6 S
Gacrux	172° 18'.7	57° 04'.3 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.3 S
Hamal	328° 17'.9	23° 25'.9 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.4	74° 11'.0 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.1 S
Miaplacidus	221° 43'.1	69° 41'.0 S
Mirfak	309° 02'.0	49° 50'.3 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.5	56° 45'.7 S
Polaris	323° 28'.2	89° 14'.1 N
Pollux	243° 46'.4	28° 02'.5 N
Procyon	245° 15'.7	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	208° 00'.0	12° 00'.1 N
Rigel	281° 26'.6	8° 12'.4 S
Rigil Kent	140° 13'.5	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.2 N
Shaula	96° 43'.2	37° 06'.0 S
Sirius	258° 47'.1	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.0 S
Vega	80° 49'.7	38° 46'.9 N
Zuben'ubi	137° 22'.9	16° 00'.7 S

	SHA	Mer.Pass.
Venus	100° 00'.7	14:19
Mars	243° 26'.4	04:44
Jupiter	174° 38'.4	09:18
Saturn	45° 02'.7	17:55

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
5 Thursday 00	184° 05'.7	15° 41'.4 S	63° 39'.8	16'.1	2° 38'.0 S	11'.7	54'.3
01	199° 05'.7	42'.1	78° 14'.9	16'.2	26'.3	11'.7	
02	214° 05'.7	42'.9	92° 50'.1	16'.1	14'.6	11'.7	
03	229° 05'.7	43'.6	107° 25'.2	16'.1	02'.9	11'.7	
04	244° 05'.6	44'.4	122° 00'.3	16'.1	1° 51'.2 S	11'.7	
05	259° 05'.6	45'.1	136° 35'.4	16'.1	39'.5	11'.8	
06	274° 05'.6	45'.9	151° 10'.5	16'.1	27'.7	11'.7	
07	289° 05'.6	46'.7	165° 45'.6	16'.1	16'.0	11'.8	
08	304° 05'.6	47'.4	180° 20'.7	16'.1	04'.2	11'.8	54'.4
09	319° 05'.6	48'.2	194° 55'.8	16'.0	0° 52'.4 S	11'.7	
10	334° 05'.5	48'.9	209° 30'.8	16'.1	40'.7	11'.8	
11	349° 05'.5	49'.7	224° 05'.9	16'.0	28'.9	11'.8	
12	4° 05'.5	15° 50'.4 S	238° 40'.9	16'.1	0° 17'.1 S	11'.8	54'.4
13	19° 05'.5	51'.2	253° 16'.0	16'.0	05'.3	11'.8	
14	34° 05'.4	51'.9	267° 51'.0	16'.0	0° 06'.5 N	11'.8	
15	49° 05'.4	52'.7	282° 26'.0	16'.0	18'.3	11'.8	
16	64° 05'.4	53'.4	297° 01'.0	16'.0	30'.1	11'.9	
17	79° 05'.4	54'.2	311° 36'.0	16'.0	42'.0	11'.8	
18	94° 05'.4	54'.9	326° 11'.0	15'.9	53'.8	11'.8	54'.5
19	109° 05'.3	55'.7	340° 45'.9	16'.0	1° 05'.6 N	11'.8	
20	124° 05'.3	56'.4	355° 20'.9	15'.9	17'.4	11'.9	
21	139° 05'.3	57'.2	9° 55'.8	15'.9	29'.3	11'.8	
22	154° 05'.3	57'.9	24° 30'.7	15'.9	41'.1	11'.8	
23	169° 05'.2	58'.7	39° 05'.6	15'.8	52'.9	11'.8	
6 Friday 00	184° 05'.2	15° 59'.4 S	53° 40'.4	15'.9	2° 04'.7 N	11'.9	54'.5
01	199° 05'.2	16° 00'.2 S	68° 15'.3	15'.8	16'.6	11'.8	
02	214° 05'.2	00'.9	82° 50'.1	15'.7	28'.4	11'.8	54'.6
03	229° 05'.1	01'.7	97° 24'.8	15'.8	40'.2	11'.8	
04	244° 05'.1	02'.4	111° 59'.6	15'.7	52'.0	11'.8	
05	259° 05'.1	03'.2	126° 34'.3	15'.7	3° 03'.8 N	11'.8	
06	274° 05'.1	03'.9	141° 09'.0	15'.7	15'.6	11'.8	
07	289° 05'.0	04'.7	155° 43'.7	15'.7	27'.4	11'.8	
08	304° 05'.0	05'.4	170° 18'.4	15'.6	39'.2	11'.8	
09	319° 05'.0	06'.2	184° 53'.0	15'.6	51'.0	11'.8	54'.7
10	334° 04'.9	06'.9	199° 27'.6	15'.5	4° 02'.8 N	11'.8	
11	349° 04'.9	07'.6	214° 02'.1	15'.6	14'.6	11'.7	
12	4° 04'.9	16° 08'.4 S	228° 36'.7	15'.5	4° 26'.3 N	11'.8	54'.7
13	19° 04'.9	09'.1	243° 11'.2	15'.4	38'.1	11'.7	
14	34° 04'.8	09'.9	257° 45'.6	15'.4	49'.8	11'.7	
15	49° 04'.8	10'.6	272° 20'.0	15'.4	5° 01'.5 N	11'.7	
16	64° 04'.8	11'.4	286° 54'.4	15'.4	13'.2	11'.7	54'.8
17	79° 04'.7	12'.1	301° 28'.8	15'.3	24'.9	11'.7	
18	94° 04'.7	12'.8	316° 03'.1	15'.3	36'.6	11'.7	
19	109° 04'.7	13'.6	330° 37'.4	15'.2	48'.3	11'.7	
20	124° 04'.6	14'.3	345° 11'.6	15'.2	00'.0	11'.6	
21	139° 04'.6	15'.1	359° 45'.8	15'.2	6° 11'.6 N	11'.6	
22	154° 04'.6	15'.8	14° 20'.0	15'.1	23'.2	11'.6	54'.9
23	169° 04'.5	16'.5	28° 54'.1	15'.0	34'.8	11'.6	
7 Saturday 00	184° 04'.5	16° 17'.3 S	43° 28'.1	15'.1	6° 46'.4 N	11'.6	54'.9
01	199° 04'.5	18'.0	58° 02'.2	15'.0	58'.0	11'.6	
02	214° 04'.4	18'.7	72° 36'.2	14'.9	7° 09'.6 N	11'.5	
03	229° 04'.4	19'.5	87° 10'.1	14'.9	21'.1	11'.5	
04	244° 04'.4	20'.2	101° 44'.0	14'.8	32'.6	11'.5	55'.0
05	259° 04'.3	21'.0	116° 17'.8	14'.8	44'.1	11'.4	
06	274° 04'.3	21'.7	130° 51'.6	14'.8	55'.5	11'.5	
07	289° 04'.3	22'.4	145° 25'.4	14'.7	8° 07'.0 N	11'.4	
08	304° 04'.2	23'.2	159° 59'.1	14'.6	18'.4	11'.4	
09	319° 04'.2	23'.9	174° 32'.7	14'.6	29'.8	11'.3	55'.1
10	334° 04'.1	24'.6	189° 06'.3	14'.6	41'.1	11'.4	
11	349° 04'.1	25'.4	203° 39'.9	14'.5	52'.5	11'.3	
12	4° 04'.1	16° 26'.1 S	218° 13'.4	14'.4	9° 03'.8 N	11'.2	55'.1
13	19° 04'.0	26'.8	232° 46'.8	14'.4	15'.0	11'.3	
14	34° 04'.0	27'.5	247° 20'.2	14'.3	26'.3	11'.2	55'.2
15	49° 04'.0	28'.3	261° 53'.5	14'.3	37'.5	11'.2	
16	64° 03'.9	29'.0	276° 26'.8	14'.2	48'.7	11'.1	
17	79° 03'.9	29'.7	291° 00'.0	14'.2	59'.8	11'.1	
18	94° 03'.8	30'.5	305° 33'.2	14'.1	10° 10'.9 N	11'.1	
19	109° 03'.8	31'.2	320° 06'.3	14'.0	22'.0	11'.1	55'.3
20	124° 03'.7	31'.9	334° 39'.3	14'.0	33'.1	11'.0	
21	139° 03'.7	32'.6	349° 12'.3	14'.0	44'.1	10'.9	
22	154° 03'.7	33'.4	3° 45'.3	13'.8	55'.0	11'.0	
23	169° 03'.6	34'.1	18° 18'.1	13'.8	11° 06'.0 N	10'.9	
	SD 16'.1	d 0'.7	SD 14'.8		14'.9	15'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
5	16 23	16 22	11:44	20:19	07:59	11d 78%
6	16 21	16 20	11:44	21:01	08:40	12d 85%
7	16 18	16 16	11:44	21:45	09:22	13d 91%

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1992 November 8, 9, 10 (Sun, Mon, Tue)

GMT	ARIES	VENUS -4.0		MARS -0.3		JUPITER -1.7		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
8 Sunday 00	47° 25'.9	144° 47'.5	25° 06'.7 S	290° 18'.8	22° 40'.6 N	221° 43'.3	1° 14'.4 S	92° 24'.2	18° 06'.4 S
01	62° 28'.4	159° 46'.6	06'.9	305° 20'.6	40'.6	236° 45'.4	14'.6	107° 26'.5	06'.4
02	77° 30'.9	174° 45'.8	07'.2	320° 22'.4	40'.5	251° 47'.4	14'.8	122° 28'.9	06'.4
03	92° 33'.3	189° 44'.9	07'.4	335° 24'.2	40'.5	266° 49'.4	14'.9	137° 31'.3	06'.3
04	107° 35'.8	204° 44'.1	07'.7	350° 25'.9	40'.5	281° 51'.4	15'.1	152° 33'.6	06'.3
05	122° 38'.2	219° 43'.2	07'.9	5° 27'.7	40'.5	296° 53'.5	15'.3	167° 36'.0	06'.3
06	137° 40'.7	234° 42'.4	08'.1	20° 29'.5	40'.5	311° 55'.5	15'.5	182° 38'.4	06'.2
07	152° 43'.2	249° 41'.5	08'.4	35° 31'.3	40'.5	326° 57'.5	15'.7	197° 40'.7	06'.2
08	167° 45'.6	264° 40'.7	08'.6	50° 33'.1	40'.4	341° 59'.6	15'.8	212° 43'.1	06'.2
09	182° 48'.1	279° 39'.8	08'.8	65° 34'.9	40'.4	357° 01'.6	16'.0	227° 45'.5	06'.2
10	197° 50'.6	294° 38'.9	09'.1	80° 36'.7	40'.4	12° 03'.6	16'.2	242° 47'.8	06'.1
11	212° 53'.0	309° 38'.1	09'.3	95° 38'.5	40'.4	27° 05'.7	16'.4	257° 50'.2	06'.1
12	227° 55'.5	324° 37'.2	25° 09'.5 S	110° 40'.3	22° 40'.4 N	42° 07'.7	1° 16'.6 S	272° 52'.6	18° 06'.1 S
13	242° 58'.0	339° 36'.4	09'.8	125° 42'.1	40'.4	57° 09'.7	16'.8	287° 54'.9	06'.0
14	258° 00'.4	354° 35'.5	10'.0	140° 43'.9	40'.4	72° 11'.7	16'.9	302° 57'.3	06'.0
15	273° 02'.9	9° 34'.7	10'.2	155° 45'.7	40'.4	87° 13'.8	17'.1	317° 59'.7	06'.0
16	288° 05'.4	24° 33'.8	10'.4	170° 47'.5	40'.3	102° 15'.8	17'.3	333° 02'.0	05'.9
17	303° 07'.8	39° 32'.9	10'.7	185° 49'.4	40'.3	117° 17'.8	17'.5	348° 04'.4	05'.9
18	318° 10'.3	54° 32'.1	10'.9	200° 51'.2	40'.3	132° 19'.9	17'.7	3° 06'.7	05'.9
19	333° 12'.7	69° 31'.2	11'.1	215° 53'.0	40'.3	147° 21'.9	17'.8	18° 09'.1	05'.9
20	348° 15'.2	84° 30'.4	11'.3	230° 54'.8	40'.3	162° 23'.9	18'.0	33° 11'.5	05'.8
21	3° 17'.7	99° 29'.5	11'.5	245° 56'.6	40'.3	177° 26'.0	18'.2	48° 13'.8	05'.8
22	18° 20'.1	114° 28'.6	11'.7	260° 58'.4	40'.3	192° 28'.0	18'.4	63° 16'.2	05'.8
23	33° 22'.6	129° 27'.8	12'.0	276° 00'.2	40'.2	207° 30'.0	18'.6	78° 18'.6	05'.7
9 Monday 00	48° 25'.1	144° 26'.9	25° 12'.2 S	291° 02'.0	22° 40'.2 N	222° 32'.1	1° 18'.7 S	93° 20'.9	18° 05'.7 S
01	63° 27'.5	159° 26'.1	12'.4	306° 03'.8	40'.2	237° 34'.1	18'.9	108° 23'.3	05'.7
02	78° 30'.0	174° 25'.2	12'.6	321° 05'.7	40'.2	252° 36'.1	19'.1	123° 25'.7	05'.7
03	93° 32'.5	189° 24'.4	12'.8	336° 07'.5	40'.2	267° 38'.2	19'.3	138° 28'.0	05'.6
04	108° 34'.9	204° 23'.5	13'.0	351° 09'.3	40'.2	282° 40'.2	19'.5	153° 30'.4	05'.6
05	123° 37'.4	219° 22'.6	13'.2	6° 11'.1	40'.2	297° 42'.2	19'.6	168° 32'.7	05'.6
06	138° 39'.8	234° 21'.8	13'.4	21° 12'.9	40'.2	312° 44'.2	19'.8	183° 35'.1	05'.5
07	153° 42'.3	249° 20'.9	13'.6	36° 14'.8	40'.2	327° 46'.3	20'.0	198° 37'.5	05'.5
08	168° 44'.8	264° 20'.1	13'.8	51° 16'.6	40'.1	342° 48'.3	20'.2	213° 39'.8	05'.5
09	183° 47'.2	279° 19'.2	14'.0	66° 18'.4	40'.1	357° 50'.3	20'.4	228° 42'.2	05'.4
10	198° 49'.7	294° 18'.3	14'.2	81° 20'.2	40'.1	12° 52'.4	20'.5	243° 44'.6	05'.4
11	213° 52'.2	309° 17'.5	14'.4	96° 22'.1	40'.1	27° 54'.4	20'.7	258° 46'.9	05'.4
12	228° 54'.6	324° 16'.6	25° 14'.6 S	111° 23'.9	22° 40'.1 N	42° 56'.4	1° 20'.9 S	273° 49'.3	18° 05'.4 S
13	243° 57'.1	339° 15'.8	14'.8	126° 25'.7	40'.1	57° 58'.5	21'.1	288° 51'.6	05'.3
14	258° 59'.6	354° 14'.9	15'.0	141° 27'.5	40'.1	73° 00'.5	21'.3	303° 54'.0	05'.3
15	274° 02'.0	9° 14'.0	15'.2	156° 29'.4	40'.1	88° 02'.5	21'.4	318° 56'.4	05'.3
16	289° 04'.5	24° 13'.2	15'.4	171° 31'.2	40'.1	103° 04'.6	21'.6	333° 58'.7	05'.2
17	304° 07'.0	39° 12'.3	15'.6	186° 33'.0	40'.1	118° 06'.6	21'.8	349° 01'.1	05'.2
18	319° 09'.4	54° 11'.5	15'.8	201° 34'.9	40'.1	133° 08'.6	22'.0	4° 03'.4	05'.2
19	334° 11'.9	69° 10'.6	16'.0	216° 36'.7	40'.0	148° 10'.7	22'.1	19° 05'.8	05'.1
20	349° 14'.3	84° 09'.7	16'.2	231° 38'.5	40'.0	163° 12'.7	22'.3	34° 08'.2	05'.1
21	4° 16'.8	99° 08'.9	16'.4	246° 40'.4	40'.0	178° 14'.7	22'.5	49° 10'.5	05'.1
22	19° 19'.3	114° 08'.0	16'.6	261° 42'.2	40'.0	193° 16'.8	22'.7	64° 12'.9	05'.1
23	34° 21'.7	129° 07'.2	16'.7	276° 44'.1	40'.0	208° 18'.8	22'.9	79° 15'.2	05'.0
10 Tuesday 00	49° 24'.2	144° 06'.3	25° 16'.9 S	291° 45'.9	22° 40'.0 N	223° 20'.9	1° 23'.0 S	94° 17'.6	18° 05'.0 S
01	64° 26'.7	159° 05'.4	17'.1	306° 47'.7	40'.0	238° 22'.9	23'.2	109° 20'.0	05'.0
02	79° 29'.1	174° 04'.6	17'.3	321° 49'.6	40'.0	253° 24'.9	23'.4	124° 22'.3	04'.9
03	94° 31'.6	189° 03'.7	17'.5	336° 51'.4	40'.0	268° 27'.0	23'.6	139° 24'.7	04'.9
04	109° 34'.1	204° 02'.9	17'.6	351° 53'.3	40'.0	283° 29'.0	23'.8	154° 27'.0	04'.9
05	124° 36'.5	219° 02'.0	17'.8	6° 55'.1	40'.0	298° 31'.0	23'.9	169° 29'.4	04'.8
06	139° 39'.0	234° 01'.1	18'.0	21° 57'.0	40'.0	313° 33'.1	24'.1	184° 31'.8	04'.8
07	154° 41'.5	249° 00'.3	18'.2	36° 58'.8	40'.0	328° 35'.1	24'.3	199° 34'.1	04'.8
08	169° 43'.9	263° 59'.4	18'.3	52° 00'.7	40'.0	343° 37'.1	24'.5	214° 36'.5	04'.7
09	184° 46'.4	278° 58'.6	18'.5	67° 02'.5	40'.0	358° 39'.2	24'.6	229° 38'.8	04'.7
10	199° 48'.8	293° 57'.7	18'.7	82° 04'.4	39'.9	13° 41'.2	24'.8	244° 41'.2	04'.7
11	214° 51'.3	308° 56'.8	18'.9	97° 06'.2	39'.9	28° 43'.2	25'.0	259° 43'.6	04'.7
12	229° 53'.8	323° 56'.0	25° 19'.0 S	112° 08'.1	22° 39'.9 N	43° 45'.3	1° 25'.2 S	274° 45'.9	18° 04'.6 S
13	244° 56'.2	338° 55'.1	19'.2	127° 09'.9	39'.9	58° 47'.3	25'.4	289° 48'.3	04'.6
14	259° 58'.7	353° 54'.2	19'.4	142° 11'.8	39'.9	73° 49'.3	25'.5	304° 50'.6	04'.6
15	275° 01'.2	8° 53'.4	19'.5	157° 13'.6	39'.9	88° 51'.4	25'.7	319° 53'.0	04'.5
16	290° 03'.6	23° 52'.5	19'.7	172° 15'.5	39'.9	103° 53'.4	25'.9	334° 55'.3	04'.5
17	305° 06'.1	38° 51'.7	19'.8	187° 17'.3	39'.9	118° 55'.5	26'.1	349° 57'.7	04'.5
18	320° 08'.6	53° 50'.8	20'.0	202° 19'.2	39'.9	133° 57'.5	26'.3	5° 00'.0	04'.4
19	335° 11'.0	68° 49'.9	20'.2	217° 21'.1	39'.9	148° 59'.5	26'.4	20° 02'.4	04'.4
20	350° 13'.5	83° 49'.1	20'.3	232° 22'.9	39'.9	164° 01'.6	26'.6	35° 04'.8	04'.4
21	5° 16'.0	98° 48'.2	20'.5	247° 24'.8	39'.9	179° 03'.6	26'.8	50° 07'.1	04'.3
22	20° 18'.4	113° 47'.4	20'.6	262° 26'.7	39'.9	194° 05'.6	27'.0	65° 09'.5	04'.3
23	35° 20'.9	128° 46'.5	20'.8	277° 28'.5	39'.9	209° 07'.7	27'.1	80° 11'.8	04'.3
	M.P. 20:43	v -0'.9	d 0'.2	v 1'.8	d 0'.0	v 2'.0	d 0'.2	v 2'.4	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.5	40° 19'.9 S
Achernar	335° 37'.6	57° 16'.4 S
Acrux	173° 27'.3	63° 03'.4 S
Adhara	255° 24'.4	28° 57'.6 S
Aldebaran	291° 06'.8	16° 29'.8 N
Alioth	166° 34'.6	55° 59'.7 N
Alkaid	153° 11'.4	49° 20'.8 N
Alnair	28° 02'.9	46° 59'.8 S
Alnilam	276° 01'.7	1° 12'.3 S
Alphard	218° 11'.2	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.4 N
Alpheratz	357° 59'.2	29° 03'.4 N
Altair	62° 23'.4	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.1 N
Atria	108° 01'.8	69° 01'.0 S
Avior	234° 24'.2	59° 28'.9 S
Bellatrix	278° 48'.3	6° 20'.7 N
Betelgeuse	271° 17'.7	7° 24'.4 N
Canopus	264° 02'.6	52° 41'.3 S
Capella	280° 56'.8	45° 59'.4 N
Deneb	49° 42'.1	45° 15'.7 N
Denebola	182° 49'.5	14° 36'.6 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.7	61° 47'.1 N
Elnath	278° 31'.8	28° 36'.1 N
Eltanin	90° 53'.7	51° 29'.6 N
Enif	34° 02'.2	9° 50'.8 N
Fomalhaut	15° 40'.7	29° 39'.6 S
Gacrux	172° 18'.7	57° 04'.3 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.6	60° 20'.3 S
Hamal	328° 17'.8	23° 25'.9 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.5	74° 11'.0 N
Markab	13° 53'.5	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.0 S
Miaplacidus	221° 43'.0	69° 41'.0 S
Mirfak	309° 02'.0	49° 50'.3 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.5	56° 45'.7 S
Polaris	323° 28'.2	89° 14'.1 N
Pollux	243° 46'.4	28° 02'.5 N
Procyon	245° 15'.7	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	207° 59'.9	12° 00'.1 N
Rigel	281° 26'.6	8° 12'.5 S
Rigil Kent	140° 13'.5	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.2 N
Shaula	96° 43'.2	37° 06'.0 S
Sirius	258° 47'.1	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.0 S
Vega	80° 49'.7	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	96° 01'.9	14:23
Mars	242° 37'.0	04:35
Jupiter	174° 07'.0	09:09
Saturn	44° 55'.9	17:44

	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
8 Sunday 00	184° 03'.6	16° 34'.8 S	32° 50'.9	13'.8	11° 16'.9 N	10'.8	55'.4
01	199° 03'.5	35'.6	47° 23'.7	13'.6	27'.7	10'.8	
02	214° 03'.5	36'.3	61° 56'.3	13'.7	38'.5	10'.8	
03	229° 03'.5	37'.0	76° 29'.0	13'.5	49'.3	10'.7	
04	244° 03'.4	37'.7	91° 01'.5	13'.5	12° 00'.0 N	10'.7	
05	259° 03'.4	38'.4	105° 34'.0	13'.4	10'.7	10'.6	55'.5
06	274° 03'.3	39'.2	120° 06'.4	13'.4	21'.3	10'.6	
07	289° 03'.3	39'.9	134° 38'.8	13'.3	31'.9	10'.6	
08	304° 03'.2	40'.6	149° 11'.1	13'.2	42'.5	10'.5	
09	319° 03'.2	41'.3	163° 43'.3	13'.1	53'.0	10'.4	55'.6
10	334° 03'.1	42'.1	178° 15'.4	13'.1	13° 03'.4 N	10'.4	
11	349° 03'.1	42'.8	192° 47'.5	13'.0	13'.8	10'.3	
12	4° 03'.0	16° 43'.5 S	207° 19'.5	13'.0	13° 24'.1 N	10'.3	55'.6
13	19° 03'.0	44'.2	221° 51'.5	12'.8	34'.4	10'.3	
14	34° 03'.0	44'.9	236° 23'.3	12'.8	44'.7	10'.1	55'.7
15	49° 02'.9	45'.7	250° 55'.1	12'.8	54'.8	10'.2	
16	64° 02'.9	46'.4	265° 26'.9	12'.6	14° 05'.0 N	10'.0	
17	79° 02'.8	47'.1	279° 58'.5	12'.6	15'.0	10'.0	
18	94° 02'.8	47'.8	294° 30'.1	12'.5	25'.0	10'.0	55'.8
19	109° 02'.7	48'.5	309° 01'.6	12'.5	35'.0	9'.9	
20	124° 02'.7	49'.2	323° 33'.1	12'.3	44'.9	9'.8	
21	139° 02'.6	50'.0	338° 04'.4	12'.3	54'.7	9'.8	
22	154° 02'.6	50'.7	352° 35'.7	12'.3	15° 04'.5 N	9'.7	
23	169° 02'.5	51'.4	7° 07'.0	12'.1	14'.2	9'.6	55'.9
9 Monday 00	184° 02'.5	16° 52'.1 S	21° 38'.1	12'.1	15° 23'.8 N	9'.6	55'.9
01	199° 02'.4	52'.8	36° 09'.2	12'.0	33'.4	9'.5	
02	214° 02'.4	53'.5	50° 40'.2	11'.9	42'.9	9'.5	
03	229° 02'.3	54'.2	65° 11'.1	11'.8	52'.4	9'.4	56'.0
04	244° 02'.2	55'.0	79° 41'.9	11'.8	16° 01'.8 N	9'.3	
05	259° 02'.2	55'.7	94° 12'.7	11'.7	11'.1	9'.2	
06	274° 02'.1	56'.4	108° 43'.4	11'.6	20'.3	9'.2	
07	289° 02'.1	57'.1	123° 14'.0	11'.5	29'.5	9'.1	56'.1
08	304° 02'.0	57'.8	137° 44'.5	11'.4	38'.6	9'.0	
09	319° 02'.0	58'.5	152° 14'.9	11'.4	47'.6	8'.9	
10	334° 01'.9	59'.2	166° 45'.3	11'.3	56'.5	8'.9	
11	349° 01'.9	59'.9	181° 15'.6	11'.2	17° 05'.4 N	8'.8	
12	4° 01'.8	17° 00'.6 S	195° 45'.8	11'.1	17° 14'.2 N	8'.7	56'.2
13	19° 01'.8	01'.3	210° 15'.9	11'.1	22'.9	8'.6	
14	34° 01'.7	02'.0	224° 46'.0	11'.0	31'.5	8'.6	
15	49° 01'.6	02'.8	239° 16'.0	10'.9	40'.1	8'.4	
16	64° 01'.6	03'.5	253° 45'.9	10'.8	48'.5	8'.4	56'.3
17	79° 01'.5	04'.2	268° 15'.7	10'.7	56'.9	8'.3	
18	94° 01'.5	04'.9	282° 45'.4	10'.7	18° 05'.2 N	8'.2	
19	109° 01'.4	05'.6	297° 15'.1	10'.6	13'.4	8'.2	
20	124° 01'.4	06'.3	311° 44'.7	10'.5	21'.6	8'.0	56'.4
21	139° 01'.3	07'.0	326° 14'.2	10'.4	29'.6	8'.0	
22	154° 01'.2	07'.7	340° 43'.6	10'.3	37'.6	7'.8	
23	169° 01'.2	08'.4	355° 12'.9	10'.3	45'.4	7'.8	
10 Tuesday 00	184° 01'.1	17° 09'.1 S	9° 42'.2	10'.2	18° 53'.2 N	7'.7	56'.5
01	199° 01'.1	09'.8	24° 11'.4	10'.1	19° 00'.9 N	7'.6	
02	214° 01'.0	10'.5	38° 40'.5	10'.0	08'.5	7'.4	
03	229° 00'.9	11'.2	53° 09'.5	10'.0	15'.9	7'.4	
04	244° 00'.9	11'.9	67° 38'.5	9'.8	23'.3	7'.3	
05	259° 00'.8	12'.6	82° 07'.3	9'.8	30'.6	7'.2	56'.6
06	274° 00'.8	13'.3	96° 36'.1	9'.7	37'.8	7'.1	
07	289° 00'.7	14'.0	111° 04'.8	9'.7	44'.9	7'.0	
08	304° 00'.6	14'.7	125° 33'.5	9'.5	51'.9	6'.9	
09	319° 00'.6	15'.4	140° 02'.0	9'.5	58'.8	6'.8	56'.7
10	334° 00'.5	16'.1	154° 30'.5	9'.4	20° 05'.6 N	6'.7	
11	349° 00'.4	16'.8	168° 58'.9	9'.3	12'.3	6'.6	
12	4° 00'.4	17° 17'.5 S	183° 27'.2	9'.3	20° 18'.9 N	6'.5	56'.7
13	19° 00'.3	18'.2	197° 55'.5	9'.2	25'.4	6'.4	56'.8
14	34° 00'.2	18'.9	212° 23'.7	9'.1	31'.8	6'.3	
15	49° 00'.2	19'.6	226° 51'.8	9'.0	38'.1	6'.1	
16	64° 00'.1	20'.3	241° 19'.8	8'.9	44'.2	6'.1	
17	79° 00'.0	20'.9	255° 47'.7	8'.9	50'.3	5'.9	
18	94° 00'.0	21'.6	270° 15'.6	8'.8	56'.2	5'.9	56'.9
19	108° 59'.9	22'.3	284° 43'.4	8'.8	21° 02'.1 N	5'.7	
20	123° 59'.8	23'.0	299° 11'.2	8'.6	07'.8	5'.6	
21	138° 59'.8	23'.7	313° 38'.8	8'.6	13'.4	5'.5	
22	153° 59'.7	24'.4	328° 06'.4	8'.5	18'.9	5'.3	57'.0
23	168° 59'.6	25'.1	342° 33'.9	8'.5	24'.2	5'.3	
	SD 16'.2	d 0'.7	SD 15'.2		15'.3	15'.5	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
8	16 14	16 12	11:44	22:31	10:07	14d 96%
9	16 10	16 07	11:44	23:20	10:55	15d 99%
10	16 05	16 02	11:44	24:12	11:46	16d Full

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1992 November 11, 12, 13 (Wed, Thur, Fri)

GMT	ARIES	VENUS -4.0		MARS -0.4		JUPITER -1.8		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
11 Wednesday 00	50° 23'.3	143° 45'.6	25° 20'.9 S	292° 30'.4	22° 39'.9 N	224° 09'.7	1° 27'.3 S	95° 14'.2	18° 04'.2 S
01	65° 25'.8	158° 44'.8	21'.1	307° 32'.3	39'.9	239° 11'.7	27'.5	110° 16'.5	04'.2
02	80° 28'.3	173° 43'.9	21'.2	322° 34'.1	39'.9	254° 13'.8	27'.7	125° 18'.9	04'.2
03	95° 30'.7	188° 43'.0	21'.4	337° 36'.0	39'.9	269° 15'.8	27'.8	140° 21'.3	04'.2
04	110° 33'.2	203° 42'.2	21'.5	352° 37'.9	39'.9	284° 17'.9	28'.0	155° 23'.6	04'.1
05	125° 35'.7	218° 41'.3	21'.7	7° 39'.7	39'.9	299° 19'.9	28'.2	170° 26'.0	04'.1
06	140° 38'.1	233° 40'.5	21'.8	22° 41'.6	39'.9	314° 21'.9	28'.4	185° 28'.3	04'.1
07	155° 40'.6	248° 39'.6	22'.0	37° 43'.5	39'.9	329° 24'.0	28'.6	200° 30'.7	04'.0
08	170° 43'.1	263° 38'.7	22'.1	52° 45'.4	39'.9	344° 26'.0	28'.7	215° 33'.0	04'.0
09	185° 45'.5	278° 37'.9	22'.3	67° 47'.2	39'.9	359° 28'.0	28'.9	230° 35'.4	04'.0
10	200° 48'.0	293° 37'.0	22'.4	82° 49'.1	39'.9	14° 30'.1	29'.1	245° 37'.7	03'.9
11	215° 50'.4	308° 36'.1	22'.5	97° 51'.0	39'.9	29° 32'.1	29'.3	260° 40'.1	03'.9
12	230° 52'.9	323° 35'.3	25° 22'.7 S	112° 52'.9	22° 39'.9 N	44° 34'.2	1° 29'.4 S	275° 42'.4	18° 03'.9 S
13	245° 55'.4	338° 34'.4	22'.8	127° 54'.8	39'.9	59° 36'.2	29'.6	290° 44'.8	03'.8
14	260° 57'.8	353° 33'.6	22'.9	142° 56'.6	39'.9	74° 38'.2	29'.8	305° 47'.1	03'.8
15	276° 00'.3	8° 32'.7	23'.1	157° 58'.5	39'.9	89° 40'.3	30'.0	320° 49'.5	03'.8
16	291° 02'.8	23° 31'.8	23'.2	173° 00'.4	39'.9	104° 42'.3	30'.1	335° 51'.9	03'.7
17	306° 05'.2	38° 31'.0	23'.3	188° 02'.3	39'.9	119° 44'.4	30'.3	350° 54'.2	03'.7
18	321° 07'.7	53° 30'.1	23'.5	203° 04'.2	39'.9	134° 46'.4	30'.5	5° 56'.6	03'.7
19	336° 10'.2	68° 29'.2	23'.6	218° 06'.1	39'.9	149° 48'.4	30'.7	20° 58'.9	03'.6
20	351° 12'.6	83° 28'.4	23'.7	233° 08'.0	39'.9	164° 50'.5	30'.9	36° 01'.3	03'.6
21	6° 15'.1	98° 27'.5	23'.8	248° 09'.9	39'.9	179° 52'.5	31'.0	51° 03'.6	03'.6
22	21° 17'.6	113° 26'.7	24'.0	263° 11'.7	39'.9	194° 54'.6	31'.2	66° 06'.0	03'.5
23	36° 20'.0	128° 25'.8	24'.1	278° 13'.6	39'.9	209° 56'.6	31'.4	81° 08'.3	03'.5
12 Thursday 00	51° 22'.5	143° 24'.9	25° 24'.2 S	293° 15'.5	22° 39'.9 N	224° 58'.6	1° 31'.6 S	96° 10'.7	18° 03'.5 S
01	66° 24'.9	158° 24'.1	24'.3	308° 17'.4	39'.9	240° 00'.7	31'.7	111° 13'.0	03'.4
02	81° 27'.4	173° 23'.2	24'.5	323° 19'.3	39'.9	255° 02'.7	31'.9	126° 15'.4	03'.4
03	96° 29'.9	188° 22'.3	24'.6	338° 21'.2	39'.9	270° 04'.8	32'.1	141° 17'.7	03'.4
04	111° 32'.3	203° 21'.5	24'.7	353° 23'.1	39'.9	285° 06'.8	32'.3	156° 20'.1	03'.3
05	126° 34'.8	218° 20'.6	24'.8	8° 25'.0	39'.9	300° 08'.8	32'.4	171° 22'.4	03'.3
06	141° 37'.3	233° 19'.8	24'.9	23° 26'.9	39'.9	315° 10'.9	32'.6	186° 24'.8	03'.3
07	156° 39'.7	248° 18'.9	25'.0	38° 28'.8	39'.9	330° 12'.9	32'.8	201° 27'.1	03'.2
08	171° 42'.2	263° 18'.0	25'.1	53° 30'.7	39'.9	345° 15'.0	33'.0	216° 29'.5	03'.2
09	186° 44'.7	278° 17'.2	25'.3	68° 32'.6	39'.9	0° 17'.0	33'.1	231° 31'.8	03'.2
10	201° 47'.1	293° 16'.3	25'.4	83° 34'.5	39'.9	15° 19'.0	33'.3	246° 34'.2	03'.1
11	216° 49'.6	308° 15'.4	25'.5	98° 36'.4	39'.9	30° 21'.1	33'.5	261° 36'.5	03'.1
12	231° 52'.1	323° 14'.6	25° 25'.6 S	113° 38'.3	22° 39'.9 N	45° 23'.1	1° 33'.7 S	276° 38'.9	18° 03'.1 S
13	246° 54'.5	338° 13'.7	25'.7	128° 40'.3	39'.9	60° 25'.2	33'.8	291° 41'.2	03'.0
14	261° 57'.0	353° 12'.8	25'.8	143° 42'.2	40'.0	75° 27'.2	34'.0	306° 43'.6	03'.0
15	276° 59'.4	8° 12'.0	25'.9	158° 44'.1	40'.0	90° 29'.2	34'.2	321° 45'.9	03'.0
16	292° 01'.9	23° 11'.1	26'.0	173° 46'.0	40'.0	105° 31'.3	34'.4	336° 48'.3	02'.9
17	307° 04'.4	38° 10'.3	26'.1	188° 47'.9	40'.0	120° 33'.3	34'.5	351° 50'.6	02'.9
18	322° 06'.8	53° 09'.4	26'.2	203° 49'.8	40'.0	135° 35'.4	34'.7	6° 53'.0	02'.9
19	337° 09'.3	68° 08'.5	26'.3	218° 51'.7	40'.0	150° 37'.4	34'.9	21° 55'.3	02'.8
20	352° 11'.8	83° 07'.7	26'.4	233° 53'.6	40'.0	165° 39'.5	35'.1	36° 57'.7	02'.8
21	7° 14'.2	98° 06'.8	26'.5	248° 55'.6	40'.0	180° 41'.5	35'.2	52° 00'.0	02'.8
22	22° 16'.7	113° 05'.9	26'.6	263° 57'.5	40'.0	195° 43'.5	35'.4	67° 02'.4	02'.7
23	37° 19'.2	128° 05'.1	26'.7	278° 59'.4	40'.0	210° 45'.6	35'.6	82° 04'.7	02'.7
13 Friday 00	52° 21'.6	143° 04'.2	25° 26'.8 S	294° 01'.3	22° 40'.0 N	225° 47'.6	1° 35'.8 S	97° 07'.1	18° 02'.7 S
01	67° 24'.1	158° 03'.4	26'.9	309° 03'.2	40'.0	240° 49'.7	35'.9	112° 09'.4	02'.6
02	82° 26'.6	173° 02'.5	26'.9	324° 05'.2	40'.0	255° 51'.7	36'.1	127° 11'.8	02'.6
03	97° 29'.0	188° 01'.6	27'.0	339° 07'.1	40'.0	270° 53'.8	36'.3	142° 14'.1	02'.6
04	112° 31'.5	203° 00'.8	27'.1	354° 09'.0	40'.1	285° 55'.8	36'.5	157° 16'.4	02'.5
05	127° 33'.9	217° 59'.9	27'.2	9° 11'.0	40'.1	300° 57'.8	36'.6	172° 18'.8	02'.5
06	142° 36'.4	232° 59'.0	27'.3	24° 12'.9	40'.1	315° 59'.9	36'.8	187° 21'.1	02'.5
07	157° 38'.9	247° 58'.2	27'.4	39° 14'.8	40'.1	331° 01'.9	37'.0	202° 23'.5	02'.4
08	172° 41'.3	262° 57'.3	27'.5	54° 16'.7	40'.1	346° 04'.0	37'.2	217° 25'.8	02'.4
09	187° 43'.8	277° 56'.4	27'.5	69° 18'.7	40'.1	1° 06'.0	37'.3	232° 28'.2	02'.4
10	202° 46'.3	292° 55'.6	27'.6	84° 20'.6	40'.1	16° 08'.1	37'.5	247° 30'.5	02'.3
11	217° 48'.7	307° 54'.7	27'.7	99° 22'.5	40'.1	31° 10'.1	37'.7	262° 32'.9	02'.3
12	232° 51'.2	322° 53'.9	25° 27'.8 S	114° 24'.5	22° 40'.1 N	46° 12'.1	1° 37'.9 S	277° 35'.2	18° 02'.3 S
13	247° 53'.7	337° 53'.0	27'.8	129° 26'.4	40'.1	61° 14'.2	38'.0	292° 37'.6	02'.2
14	262° 56'.1	352° 52'.1	27'.9	144° 28'.3	40'.2	76° 16'.2	38'.2	307° 39'.9	02'.2
15	277° 58'.6	7° 51'.3	28'.0	159° 30'.3	40'.2	91° 18'.3	38'.4	322° 42'.3	02'.2
16	293° 01'.1	22° 50'.4	28'.1	174° 32'.2	40'.2	106° 20'.3	38'.6	337° 44'.6	02'.1
17	308° 03'.5	37° 49'.5	28'.1	189° 34'.2	40'.2	121° 22'.4	38'.7	352° 46'.9	02'.1
18	323° 06'.0	52° 48'.7	28'.2	204° 36'.1	40'.2	136° 24'.4	38'.9	7° 49'.3	02'.1
19	338° 08'.4	67° 47'.8	28'.3	219° 38'.1	40'.2	151° 26'.5	39'.1	22° 51'.6	02'.0
20	353° 10'.9	82° 47'.0	28'.3	234° 40'.0	40'.2	166° 28'.5	39'.3	37° 54'.0	02'.0
21	8° 13'.4	97° 46'.1	28'.4	249° 41'.9	40'.2	181° 30'.6	39'.4	52° 56'.3	02'.0
22	23° 15'.8	112° 45'.2	28'.5	264° 43'.9	40'.3	196° 32'.6	39'.6	67° 58'.7	01'.9
23	38° 18'.3	127° 44'.4	28'.5	279° 45'.8	40'.3	211° 34'.6	39'.8	83° 01'.0	01'.9
	M.P. 20:31	v -0'.9	d 0'.1	v 1'.9	d 0'.0	v 2'.0	d 0'.2	v 2'.3	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.5	40° 19'.9 S
Achernar	335° 37'.6	57° 16'.4 S
Acrux	173° 27'.2	63° 03'.4 S
Adhara	255° 24'.4	28° 57'.6 S
Aldebaran	291° 06'.7	16° 29'.8 N
Alioth	166° 34'.5	55° 59'.7 N
Alkaid	153° 11'.4	49° 20'.8 N
Alnair	28° 02'.9	46° 59'.8 S
Alnilam	276° 01'.7	1° 12'.3 S
Alphard	218° 11'.2	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.3 N
Alpheratz	357° 59'.2	29° 03'.4 N
Altair	62° 23'.4	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.1 N
Atria	108° 01'.8	69° 01'.0 S
Avior	234° 24'.2	59° 28'.9 S
Bellatrix	278° 48'.2	6° 20'.7 N
Betelgeuse	271° 17'.7	7° 24'.4 N
Canopus	264° 02'.6	52° 41'.3 S
Capella	280° 56'.8	45° 59'.4 N
Deneb	49° 42'.1	45° 15'.7 N
Denebola	182° 49'.5	14° 36'.6 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.6	61° 47'.0 N
Elnath	278° 31'.8	28° 36'.1 N
Eltanin	90° 53'.7	51° 29'.6 N
Enif	34° 02'.2	9° 50'.8 N
Fomalhaut	15° 40'.8	29° 39'.6 S
Gacrux	172° 18'.6	57° 04'.3 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.5	60° 20'.3 S
Hamal	328° 17'.8	23° 25'.9 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.5	74° 11'.0 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.0 S
Miaplacidus	221° 43'.0	69° 41'.0 S
Mirfak	309° 02'.0	49° 50'.3 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.5	56° 45'.6 S
Polaris	323° 28'.0	89° 14'.1 N
Pollux	243° 46'.3	28° 02'.5 N
Procyon	245° 15'.7	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	207° 59'.9	12° 00'.1 N
Rigel	281° 26'.6	8° 12'.5 S
Rigil Kent	140° 13'.5	60° 48'.2 S
Sabik	102° 30'.5	15° 42'.9 S
Schedar	349° 57'.8	56° 30'.2 N
Shaula	96° 43'.2	37° 06'.0 S
Sirius	258° 47'.0	16° 42'.2 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.8	43° 24'.0 S
Vega	80° 49'.7	38° 46'.9 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	92° 02'.4	14:27
Mars	241° 53'.0	04:26
Jupiter	173° 36'.2	08:59
Saturn	44° 48'.2	17:33

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
11 00	183° 59'.6	17° 25'.8 S	357° 01'.4	8'.4	21° 29'.5 N	5'.1	57'.0
01	198° 59'.5	26'.5	11° 28'.8	8'.3	34'.6	5'.0	
02	213° 59'.4	27'.2	25° 56'.1	8'.2	39'.6	4'.9	
03	228° 59'.4	27'.9	40° 23'.3	8'.2	44'.5	4'.8	57'.1
04	243° 59'.3	28'.5	54° 50'.5	8'.1	49'.3	4'.7	
05	258° 59'.2	29'.2	69° 17'.6	8'.1	54'.0	4'.5	
06	273° 59'.2	29'.9	83° 44'.7	8'.0	58'.5	4'.4	
07	288° 59'.1	30'.6	98° 11'.7	7'.9	22° 02'.9 N	4'.3	57'.2
08	303° 59'.0	31'.3	112° 38'.6	7'.9	07'.2	4'.1	
09	318° 58'.9	32'.0	127° 05'.5	7'.8	11'.3	4'.1	
10	333° 58'.9	32'.7	141° 32'.3	7'.7	15'.4	3'.9	
11	348° 58'.8	33'.3	155° 59'.0	7'.7	19'.3	3'.7	
12	3° 58'.7	17° 34'.0 S	170° 25'.7	7'.7	22° 23'.0 N	3'.7	57'.3
13	18° 58'.6	34'.7	184° 52'.4	7'.5	26'.7	3'.5	
14	33° 58'.6	35'.4	199° 18'.9	7'.5	30'.2	3'.4	
15	48° 58'.5	36'.1	213° 45'.4	7'.5	33'.6	3'.2	
16	63° 58'.4	36'.7	228° 11'.9	7'.4	36'.8	3'.2	57'.4
17	78° 58'.3	37'.4	242° 38'.3	7'.4	40'.0	3'.0	
18	93° 58'.3	38'.1	257° 04'.7	7'.3	43'.0	2'.8	
19	108° 58'.2	38'.8	271° 31'.0	7'.2	45'.8	2'.7	
20	123° 58'.1	39'.5	285° 57'.2	7'.3	48'.5	2'.6	
21	138° 58'.0	40'.1	300° 23'.5	7'.1	51'.1	2'.5	57'.5
22	153° 58'.0	40'.8	314° 49'.6	7'.1	53'.6	2'.3	
23	168° 57'.9	41'.5	329° 15'.7	7'.1	55'.9	2'.2	
12 00	183° 57'.8	17° 42'.2 S	343° 41'.8	7'.0	22° 58'.1 N	2'.0	57'.5
01	198° 57'.7	42'.9	358° 07'.8	7'.0	23° 00'.1 N	1'.9	
02	213° 57'.7	43'.5	12° 33'.8	7'.0	02'.0	1'.8	57'.6
03	228° 57'.6	44'.2	26° 59'.8	6'.9	03'.8	1'.6	
04	243° 57'.5	44'.9	41° 25'.7	6'.9	05'.4	1'.5	
05	258° 57'.4	45'.6	55° 51'.6	6'.8	06'.9	1'.3	
06	273° 57'.3	46'.2	70° 17'.4	6'.8	08'.2	1'.2	
07	288° 57'.3	46'.9	84° 43'.2	6'.8	09'.4	1'.1	57'.7
08	303° 57'.2	47'.6	99° 09'.0	6'.7	10'.5	0'.9	
09	318° 57'.1	48'.3	113° 34'.7	6'.7	11'.4	0'.8	
10	333° 57'.0	48'.9	128° 00'.4	6'.7	12'.2	0'.7	
11	348° 56'.9	49'.6	142° 26'.1	6'.6	12'.9	0'.4	
12	3° 56'.8	17° 50'.3 S	156° 51'.7	6'.7	23° 13'.3 N	0'.4	57'.8
13	18° 56'.8	50'.9	171° 17'.4	6'.6	13'.7	0'.2	
14	33° 56'.7	51'.6	185° 43'.0	6'.5	13'.9	0'.1	
15	48° 56'.6	52'.3	200° 08'.5	6'.6	14'.0	0'.1	
16	63° 56'.5	52'.9	214° 34'.1	6'.5	13'.9	0'.2	
17	78° 56'.4	53'.6	228° 59'.6	6'.5	13'.7	0'.4	57'.9
18	93° 56'.3	54'.3	243° 25'.1	6'.5	13'.3	0'.5	
19	108° 56'.3	54'.9	257° 50'.6	6'.5	12'.8	0'.6	
20	123° 56'.2	55'.6	272° 16'.1	6'.5	12'.2	0'.8	
21	138° 56'.1	56'.3	286° 41'.6	6'.4	11'.4	1'.0	
22	153° 56'.0	56'.9	301° 07'.0	6'.5	10'.4	1'.1	
23	168° 55'.9	57'.6	315° 32'.5	6'.4	09'.3	1'.2	58'.0
13 00	183° 55'.8	17° 58'.3 S	329° 57'.9	6'.4	23° 08'.1 N	1'.4	58'.0
01	198° 55'.7	58'.9	344° 23'.3	6'.5	06'.7	1'.5	
02	213° 55'.7	59'.6	358° 48'.8	6'.4	05'.2	1'.7	
03	228° 55'.6	18° 00'.3 S	13° 14'.2	6'.4	03'.5	1'.8	
04	243° 55'.5	00'.9	27° 39'.6	6'.4	01'.7	2'.0	
05	258° 55'.4	01'.6	42° 05'.0	6'.4	22° 59'.7 N	2'.1	58'.1
06	273° 55'.3	02'.2	56° 30'.4	6'.4	57'.6	2'.2	
07	288° 55'.2	02'.9	70° 55'.8	6'.4	55'.4	2'.4	
08	303° 55'.1	03'.6	85° 21'.2	6'.4	53'.0	2'.5	
09	318° 55'.0	04'.2	99° 46'.6	6'.5	50'.5	2'.7	
10	333° 54'.9	04'.9	114° 12'.1	6'.4	47'.8	2'.9	58'.2
11	348° 54'.9	05'.5	128° 37'.5	6'.4	44'.9	2'.9	
12	3° 54'.8	18° 06'.2 S	143° 02'.9	6'.5	22° 42'.0 N	3'.1	58'.2
13	18° 54'.7	06'.9	157° 28'.4	6'.4	38'.9	3'.3	
14	33° 54'.6	07'.5	171° 53'.8	6'.5	35'.6	3'.4	
15	48° 54'.5	08'.2	186° 19'.3	6'.5	32'.2	3'.5	
16	63° 54'.4	08'.8	200° 44'.8	6'.5	28'.7	3'.7	
17	78° 54'.3	09'.5	215° 10'.3	6'.5	25'.0	3'.9	58'.3
18	93° 54'.2	10'.1	229° 35'.8	6'.5	21'.1	3'.9	
19	108° 54'.1	10'.8	244° 01'.3	6'.6	17'.2	4'.1	
20	123° 54'.0	11'.4	258° 26'.9	6'.5	13'.1	4'.3	
21	138° 53'.9	12'.1	272° 52'.4	6'.6	08'.8	4'.4	
22	153° 53'.8	12'.8	287° 18'.0	6'.6	04'.4	4'.5	
23	168° 53'.7	13'.4	301° 43'.6	6'.7	21° 59'.9 N	4'.7	58'.4
	SD 16'.2	d 0'.7	SD 15'.6		15'.7	15'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
11	15 58	15 55	11:44	00:12	12:40	17d 99%
12	15 51	15 48	11:44	01:08	13:36	18d 95%
13	15 44	15 39	11:44	02:05	14:34	19d 89%

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1992 November 14, 15, 16 (Sat, Sun, Mon)

GMT	ARIES	VENUS -4.0		MARS -0.4		JUPITER -1.8		SATURN +0.7	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
14 Saturday 00	53° 20'.8	142° 43'.5	25° 28'.6 S	294° 47'.8	22° 40'.3 N	226° 36'.7	1° 39'.9 S	98° 03'.4	18° 01'.8 S
01	68° 23'.2	157° 42'.6	28'.6	309° 49'.7	40'.3	241° 38'.7	40'.1	113° 05'.7	01'.8
02	83° 25'.7	172° 41'.8	28'.7	324° 51'.7	40'.3	256° 40'.8	40'.3	128° 08'.0	01'.8
03	98° 28'.2	187° 40'.9	28'.8	339° 53'.6	40'.3	271° 42'.8	40'.5	143° 10'.4	01'.7
04	113° 30'.6	202° 40'.1	28'.8	354° 55'.6	40'.3	286° 44'.9	40'.6	158° 12'.7	01'.7
05	128° 33'.1	217° 39'.2	28'.9	9° 57'.6	40'.4	301° 46'.9	40'.8	173° 15'.1	01'.7
06	143° 35'.5	232° 38'.3	28'.9	24° 59'.5	40'.4	316° 49'.0	41'.0	188° 17'.4	01'.6
07	158° 38'.0	247° 37'.5	29'.0	40° 01'.5	40'.4	331° 51'.0	41'.2	203° 19'.8	01'.6
08	173° 40'.5	262° 36'.6	29'.0	55° 03'.4	40'.4	346° 53'.1	41'.3	218° 22'.1	01'.6
09	188° 42'.9	277° 35'.7	29'.1	70° 05'.4	40'.4	1° 55'.1	41'.5	233° 24'.4	01'.5
10	203° 45'.4	292° 34'.9	29'.1	85° 07'.4	40'.4	16° 57'.1	41'.7	248° 26'.8	01'.5
11	218° 47'.9	307° 34'.0	29'.2	100° 09'.3	40'.4	31° 59'.2	41'.8	263° 29'.1	01'.5
12	233° 50'.3	322° 33'.2	25° 29'.2 S	115° 11'.3	22° 40'.5 N	47° 01'.2	1° 42'.0 S	278° 31'.5	18° 01'.4 S
13	248° 52'.8	337° 32'.3	29'.3	130° 13'.2	40'.5	62° 03'.3	42'.2	293° 33'.8	01'.4
14	263° 55'.3	352° 31'.4	29'.3	145° 15'.2	40'.5	77° 05'.3	42'.4	308° 36'.2	01'.4
15	278° 57'.7	7° 30'.6	29'.3	160° 17'.2	40'.5	92° 07'.4	42'.5	323° 38'.5	01'.3
16	294° 00'.2	22° 29'.7	29'.4	175° 19'.1	40'.5	107° 09'.4	42'.7	338° 40'.8	01'.3
17	309° 02'.7	37° 28'.8	29'.4	190° 21'.1	40'.5	122° 11'.5	42'.9	353° 43'.2	01'.2
18	324° 05'.1	52° 28'.0	29'.5	205° 23'.1	40'.6	137° 13'.5	43'.1	8° 45'.5	01'.2
19	339° 07'.6	67° 27'.1	29'.5	220° 25'.1	40'.6	152° 15'.6	43'.2	23° 47'.9	01'.2
20	354° 10'.0	82° 26'.3	29'.5	235° 27'.0	40'.6	167° 17'.6	43'.4	38° 50'.2	01'.1
21	9° 12'.5	97° 25'.4	29'.6	250° 29'.0	40'.6	182° 19'.7	43'.6	53° 52'.5	01'.1
22	24° 15'.0	112° 24'.5	29'.6	265° 31'.0	40'.6	197° 21'.7	43'.7	68° 54'.9	01'.1
23	39° 17'.4	127° 23'.7	29'.6	280° 33'.0	40'.7	212° 23'.8	43'.9	83° 57'.2	01'.0
15 Sunday 00	54° 19'.9	142° 22'.8	25° 29'.7 S	295° 34'.9	22° 40'.7 N	227° 25'.8	1° 44'.1 S	98° 59'.6	18° 01'.0 S
01	69° 22'.4	157° 22'.0	29'.7	310° 36'.9	40'.7	242° 27'.9	44'.3	114° 01'.9	01'.0
02	84° 24'.8	172° 21'.1	29'.7	325° 38'.9	40'.7	257° 29'.9	44'.4	129° 04'.2	00'.9
03	99° 27'.3	187° 20'.2	29'.7	340° 40'.9	40'.7	272° 32'.0	44'.6	144° 06'.6	00'.9
04	114° 29'.8	202° 19'.4	29'.8	355° 42'.9	40'.8	287° 34'.0	44'.8	159° 08'.9	00'.8
05	129° 32'.2	217° 18'.5	29'.8	10° 44'.8	40'.8	302° 36'.1	44'.9	174° 11'.3	00'.8
06	144° 34'.7	232° 17'.6	29'.8	25° 46'.8	40'.8	317° 38'.1	45'.1	189° 13'.6	00'.8
07	159° 37'.2	247° 16'.8	29'.8	40° 48'.8	40'.8	332° 40'.2	45'.3	204° 15'.9	00'.7
08	174° 39'.6	262° 15'.9	29'.8	55° 50'.8	40'.8	347° 42'.2	45'.5	219° 18'.3	00'.7
09	189° 42'.1	277° 15'.1	29'.9	70° 52'.8	40'.9	2° 44'.3	45'.6	234° 20'.6	00'.7
10	204° 44'.5	292° 14'.2	29'.9	85° 54'.8	40'.9	17° 46'.3	45'.8	249° 22'.9	00'.6
11	219° 47'.0	307° 13'.3	29'.9	100° 56'.8	40'.9	32° 48'.4	46'.0	264° 25'.3	00'.6
12	234° 49'.5	322° 12'.5	25° 29'.9 S	115° 58'.8	22° 40'.9 N	47° 50'.4	1° 46'.1 S	279° 27'.6	18° 00'.6 S
13	249° 51'.9	337° 11'.6	29'.9	131° 00'.8	40'.9	62° 52'.5	46'.3	294° 30'.0	00'.5
14	264° 54'.4	352° 10'.8	29'.9	146° 02'.8	41'.0	77° 54'.5	46'.5	309° 32'.3	00'.5
15	279° 56'.9	7° 09'.9	29'.9	161° 04'.8	41'.0	92° 56'.6	46'.7	324° 34'.6	00'.4
16	294° 59'.3	22° 09'.0	30'.0	176° 06'.8	41'.0	107° 58'.6	46'.8	339° 37'.0	00'.4
17	310° 01'.8	37° 08'.2	30'.0	191° 08'.8	41'.0	123° 00'.7	47'.0	354° 39'.3	00'.4
18	325° 04'.3	52° 07'.3	30'.0	206° 10'.8	41'.1	138° 02'.7	47'.2	9° 41'.7	00'.3
19	340° 06'.7	67° 06'.5	30'.0	221° 12'.8	41'.1	153° 04'.8	47'.3	24° 44'.0	00'.3
20	355° 09'.2	82° 05'.6	30'.0	236° 14'.8	41'.1	168° 06'.8	47'.5	39° 46'.3	00'.3
21	10° 11'.7	97° 04'.7	30'.0	251° 16'.8	41'.1	183° 08'.9	47'.7	54° 48'.7	00'.2
22	25° 14'.1	112° 03'.9	30'.0	266° 18'.8	41'.2	198° 10'.9	47'.9	69° 51'.0	00'.2
23	40° 16'.6	127° 03'.0	30'.0	281° 20'.8	41'.2	213° 13'.0	48'.0	84° 53'.3	00'.1
16 Monday 00	55° 19'.0	142° 02'.2	25° 30'.0 S	296° 22'.8	22° 41'.2 N	228° 15'.0	1° 48'.2 S	99° 55'.7	18° 00'.1 S
01	70° 21'.5	157° 01'.3	30'.0	311° 24'.8	41'.2	243° 17'.1	48'.4	114° 58'.0	00'.1
02	85° 24'.0	172° 00'.4	30'.0	326° 26'.8	41'.3	258° 19'.1	48'.5	130° 00'.3	00'.0
03	100° 26'.4	186° 59'.6	30'.0	341° 28'.8	41'.3	273° 21'.2	48'.7	145° 02'.7	00'.0
04	115° 28'.9	201° 58'.7	30'.0	356° 30'.8	41'.3	288° 23'.2	48'.9	160° 05'.0	00'.0
05	130° 31'.4	216° 57'.9	30'.0	11° 32'.8	41'.3	303° 25'.3	49'.0	175° 07'.3	17° 59'.9 S
06	145° 33'.8	231° 57'.0	30'.0	26° 34'.9	41'.4	318° 27'.3	49'.2	190° 09'.7	59'.9
07	160° 36'.3	246° 56'.1	29'.9	41° 36'.9	41'.4	333° 29'.4	49'.4	205° 12'.0	59'.9
08	175° 38'.8	261° 55'.3	29'.9	56° 38'.9	41'.4	348° 31'.4	49'.6	220° 14'.4	59'.8
09	190° 41'.2	276° 54'.4	29'.9	71° 40'.9	41'.4	3° 33'.5	49'.7	235° 16'.7	59'.8
10	205° 43'.7	291° 53'.6	29'.9	86° 42'.9	41'.5	18° 35'.5	49'.9	250° 19'.0	59'.7
11	220° 46'.2	306° 52'.7	29'.9	101° 44'.9	41'.5	33° 37'.6	50'.1	265° 21'.4	59'.7
12	235° 48'.6	321° 51'.9	25° 29'.9 S	116° 47'.0	22° 41'.5 N	48° 39'.6	1° 50'.2 S	280° 23'.7	17° 59'.7 S
13	250° 51'.1	336° 51'.0	29'.9	131° 49'.0	41'.6	63° 41'.7	50'.4	295° 26'.0	59'.6
14	265° 53'.5	351° 50'.1	29'.8	146° 51'.0	41'.6	78° 43'.8	50'.6	310° 28'.4	59'.6
15	280° 56'.0	6° 49'.3	29'.8	161° 53'.0	41'.6	93° 45'.8	50'.7	325° 30'.7	59'.5
16	295° 58'.5	21° 48'.4	29'.8	176° 55'.1	41'.6	108° 47'.9	50'.9	340° 33'.0	59'.5
17	311° 00'.9	36° 47'.6	29'.8	191° 57'.1	41'.7	123° 49'.9	51'.1	355° 35'.4	59'.5
18	326° 03'.4	51° 46'.7	29'.8	206° 59'.1	41'.7	138° 52'.0	51'.2	10° 37'.7	59'.4
19	341° 05'.9	66° 45'.9	29'.7	222° 01'.2	41'.7	153° 54'.0	51'.4	25° 40'.0	59'.4
20	356° 08'.3	81° 45'.0	29'.7	237° 03'.2	41'.8	168° 56'.1	51'.6	40° 42'.4	59'.4
21	11° 10'.8	96° 44'.1	29'.7	252° 05'.2	41'.8	183° 58'.1	51'.8	55° 44'.7	59'.3
22	26° 13'.3	111° 43'.3	29'.6	267° 07'.3	41'.8	199° 00'.2	51'.9	70° 47'.0	59'.3
23	41° 15'.7	126° 42'.4	29'.6	282° 09'.3	41'.9	214° 02'.2	52'.1	85° 49'.4	59'.2
	M.P. 20:19	v -0'.9	d 0'.0	v 2'.0	d 0'.0	v 2'.1	d 0'.2	v 2'.3	d 0'.0

STARS			SUN		MOON				
Name	SHA	Dec	GHA	Dec	GHA	v	Dec	d	HP
Acamar	315° 29'.5	40° 19'.9 S	183° 53'.6	18° 14'.1 S	316° 09'.3	6'.6	21° 55'.2 N	4'.8	58'.4
Achernar	335° 37'.6	57° 16'.4 S	198° 53'.6	14'.7	330° 34'.9	6'.7	50'.4	4'.9	
Acrux	173° 27'.2	63° 03'.4 S	213° 53'.5	15'.4	345° 00'.6	6'.7	45'.5	5'.1	
Adhara	255° 24'.4	28° 57'.6 S	228° 53'.4	16'.0	359° 26'.3	6'.8	40'.4	5'.2	
Aldebaran	291° 06'.7	16° 29'.8 N	243° 53'.3	16'.7	13° 52'.1	6'.8	35'.2	5'.4	
			258° 53'.2	17'.3	28° 17'.9	6'.8	29'.8	5'.5	
Alioth	166° 34'.5	55° 59'.7 N	273° 53'.1	17'.9	42° 43'.7	6'.8	24'.3	5'.6	58'.5
Alkaid	153° 11'.4	49° 20'.8 N	288° 53'.0	18'.6	57° 09'.5	6'.9	18'.7	5'.8	
Alnair	28° 02'.9	46° 59'.8 S	303° 52'.9	19'.2	71° 35'.4	6'.9	12'.9	5'.9	
Alnilam	276° 01'.7	1° 12'.3 S	318° 52'.8	19'.9	86° 01'.3	6'.9	07'.0	6'.0	
Alphard	218° 11'.2	8° 37'.6 S	333° 52'.7	20'.5	100° 27'.2	7'.0	01'.0	6'.2	
			348° 52'.6	21'.2	114° 53'.2	7'.0	20° 54'.8 N	6'.3	
Alphecca	126° 24'.4	26° 44'.3 N	3° 52'.5	18° 21'.8 S	129° 19'.2	7'.0	20° 48'.5 N	6'.4	58'.5
Alpheratz	357° 59'.2	29° 03'.4 N	18° 52'.4	22'.5	143° 45'.2	7'.1	42'.1	6'.6	58'.6
Altair	62° 23'.4	8° 51'.1 N	33° 52'.3	23'.1	158° 11'.3	7'.1	35'.5	6'.6	
Ankaa	353° 30'.5	42° 20'.7 S	48° 52'.2	23'.8	172° 37'.4	7'.2	28'.9	6'.9	
Antares	112° 45'.5	26° 25'.0 S	63° 52'.1	24'.4	187° 03'.6	7'.2	22'.0	6'.9	
			78° 52'.0	25'.0	201° 29'.8	7'.2	15'.1	7'.1	
Arcturus	146° 10'.1	19° 13'.1 N	93° 51'.9	25'.7	215° 56'.0	7'.3	08'.0	7'.2	
Atria	108° 01'.8	69° 01'.0 S	108° 51'.8	26'.3	230° 22'.3	7'.3	00'.8	7'.3	
Avior	234° 24'.1	59° 29'.0 S	123° 51'.7	27'.0	244° 48'.6	7'.4	19° 53'.5 N	7'.4	
Bellatrix	278° 48'.2	6° 20'.7 N	138° 51'.6	27'.6	259° 15'.0	7'.4	46'.1	7'.6	58'.7
Betelgeuse	271° 17'.7	7° 24'.4 N	153° 51'.5	28'.2	273° 41'.4	7'.5	38'.5	7'.7	
			168° 51'.3	28'.9	288° 07'.9	7'.5	30'.8	7'.8	
Canopus	264° 02'.6	52° 41'.3 S	183° 51'.2	18° 29'.5 S	302° 34'.4	7'.6	19° 23'.0 N	7'.9	58'.7
Capella	280° 56'.8	45° 59'.4 N	198° 51'.1	30'.2	317° 01'.0	7'.5	15'.1	8'.1	
Deneb	49° 42'.1	45° 15'.6 N	213° 51'.0	30'.8	331° 27'.5	7'.7	07'.0	8'.1	
Denebola	182° 49'.5	14° 36'.6 N	228° 50'.9	31'.4	345° 54'.2	7'.7	18° 58'.9 N	8'.3	
Diphda	349° 11'.0	18° 01'.4 S	243° 50'.8	32'.1	0° 20'.9	7'.7	50'.6	8'.4	
			258° 50'.7	32'.7	14° 47'.6	7'.8	42'.2	8'.5	58'.8
Dubhe	194° 10'.6	61° 47'.0 N	273° 50'.6	33'.3	29° 14'.4	7'.8	33'.7	8'.7	
Elnath	278° 31'.7	28° 36'.1 N	288° 50'.5	34'.0	43° 41'.2	7'.9	25'.0	8'.7	
Eltanin	90° 53'.7	51° 29'.6 N	303° 50'.4	34'.6	58° 08'.1	8'.0	16'.3	8'.9	
Enif	34° 02'.2	9° 50'.8 N	318° 50'.3	35'.2	72° 35'.1	7'.9	07'.4	8'.9	
Fomalhaut	15° 40'.8	29° 39'.6 S	333° 50'.2	35'.9	87° 02'.0	8'.1	17° 58'.5 N	9'.1	
			348° 50'.1	36'.5	101° 29'.1	8'.1	49'.4	9'.2	
Gacrux	172° 18'.6	57° 04'.2 S	3° 50'.0	18° 37'.1 S	115° 56'.2	8'.1	17° 40'.2 N	9'.3	58'.8
Gienah	176° 08'.4	17° 30'.1 S	18° 49'.8	37'.8	130° 23'.3	8'.2	30'.9	9'.4	
Hadar	149° 10'.5	60° 20'.3 S	33° 49'.7	38'.4	144° 50'.5	8'.2	21'.5	9'.5	58'.9
Hamal	328° 17'.8	23° 25'.9 N	48° 49'.6	39'.0	159° 17'.7	8'.3	12'.0	9'.6	
Kaus Aust.	84° 04'.5	34° 23'.3 S	63° 49'.5	39'.6	173° 45'.0	8'.3	02'.4	9'.8	
			78° 49'.4	40'.3	188° 12'.3	8'.4	16° 52'.6 N	9'.8	
Kochab	137° 20'.5	74° 11'.0 N	93° 49'.3	40'.9	202° 39'.7	8'.4	42'.8	9'.9	
Markab	13° 53'.6	15° 10'.3 N	108° 49'.2	41'.5	217° 07'.1	8'.5	32'.9	10'.0	
Menkar	314° 30'.8	4° 03'.9 N	123° 49'.1	42'.2	231° 34'.6	8'.6	22'.9	10'.1	
Menkent	148° 26'.2	36° 20'.0 S	138° 49'.0	42'.8	246° 02'.2	8'.5	12'.8	10'.3	
Miaplacidus	221° 42'.9	69° 41'.0 S	153° 48'.8	43'.4	260° 29'.7	8'.7	02'.5	10'.3	
			168° 48'.7	44'.0	274° 57'.4	8'.7	15° 52'.2 N	10'.4	
Mirfak	309° 02'.0	49° 50'.3 N	183° 48'.6	18° 44'.7 S	289° 25'.1	8'.7	15° 41'.8 N	10'.5	59'.0
Nunki	76° 17'.6	26° 18'.4 S	198° 48'.5	45'.3	303° 52'.8	8'.8	31'.3	10'.6	
Peacock	53° 43'.5	56° 45'.6 S	213° 48'.4	45'.9	318° 20'.6	8'.8	20'.7	10'.7	
Polaris	323° 28'.0	89° 14'.1 N	228° 48'.3	46'.5	332° 48'.4	8'.9	10'.0	10'.8	
Pollux	243° 46'.3	28° 02'.5 N	243° 48'.2	47'.1	347° 16'.3	8'.9	14° 59'.2 N	10'.8	
			258° 48'.0	47'.8	1° 44'.2	9'.0	48'.4	11'.0	
Procyon	245° 15'.6	5° 14'.6 N	273° 47'.9	48'.4	16° 12'.2	9'.1	37'.4	11'.0	
Rasalhague	96° 21'.0	12° 34'.0 N	288° 47'.8	49'.0	30° 40'.3	9'.0	26'.4	11'.2	
Regulus	207° 59'.9	12° 00'.0 N	303° 47'.7	49'.6	45° 08'.3	9'.2	15'.2	11'.2	
Rigel	281° 26'.5	8° 12'.5 S	318° 47'.6	50'.2	59° 36'.5	9'.2	04'.0	11'.3	
Rigil Kent	140° 13'.5	60° 48'.2 S	333° 47'.5	50'.9	74° 04'.7	9'.2	13° 52'.7 N	11'.4	
			348° 47'.3	51'.5	88° 32'.9	9'.3	41'.3	11'.4	
Sabik	102° 30'.5	15° 43'.0 S	3° 47'.2	18° 52'.1 S	103° 01'.2	9'.3	13° 29'.9 N	11'.6	59'.1
Schedar	349° 57'.8	56° 30'.2 N	18° 47'.1	52'.7	117° 29'.5	9'.3	18'.3	11'.6	
Shaula	96° 43'.2	37° 06'.0 S	33° 47'.0	53'.3	131° 57'.8	9'.5	06'.7	11'.7	
Sirius	258° 47'.0	16° 42'.3 S	48° 46'.9	53'.9	146° 26'.3	9'.4	12° 55'.0 N	11'.8	
Spica	158° 47'.8	11° 07'.4 S	63° 46'.8	54'.6	160° 54'.7	9'.5	43'.2	11'.8	
			78° 46'.6	55'.2	175° 23'.2	9'.6	31'.4	11'.9	
Suhail	223° 03'.7	43° 24'.0 S	93° 46'.5	55'.8	189° 51'.8	9'.6	19'.5	12'.0	
Vega	80° 49'.7	38° 46'.8 N	108° 46'.4	56'.4	204° 20'.4	9'.6	07'.5	12'.1	
Zuben'ubi	137° 22'.8	16° 00'.7 S	123° 46'.3	57'.0	218° 49'.0	9'.7	11° 55'.4 N	12'.1	
			138° 46'.2	57'.6	233° 17'.7	9'.7	43'.3	12'.3	
	SHA	Mer.Pass.	153° 46'.0	58'.2	247° 46'.4	9'.8	31'.0	12'.2	
Venus	88° 02'.9	14:31	168° 45'.9	58'.8	262° 15'.2	9'.8	18'.8	12'.4	
Mars	241° 15'.0	04:17							
Jupiter	173° 05'.9	08:49							
Saturn	44° 39'.7	17:21	SD 16'.2	d 0'.6	SD 16'.0		16'.0		16'.1

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
14	15 35	15 30	11:44	03:02	15:31	20d 81%
15	15 25	15 20	11:45	03:59	16:26	21d 72%
16	15 15	15 09	11:45	04:53	17:19	22d 61%

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1992 November 17, 18, 19 (Tue, Wed, Thur)

GMT	ARIES	VENUS -4.1		MARS -0.5		JUPITER -1.8		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
17 Tuesday 00	56° 18'.2	141° 41'.6	25° 29'.6 S	297° 11'.3	22° 41'.9 N	229° 04'.3	1° 52'.3 S	100° 51'.7	17° 59'.2 S
01	71° 20'.6	156° 40'.7	29'.5	312° 13'.4	41'.9	244° 06'.4	52'.4	115° 54'.0	59'.2
02	86° 23'.1	171° 39'.9	29'.5	327° 15'.4	41'.9	259° 08'.4	52'.6	130° 56'.4	59'.1
03	101° 25'.6	186° 39'.0	29'.5	342° 17'.5	42'.0	274° 10'.5	52'.8	145° 58'.7	59'.1
04	116° 28'.0	201° 38'.1	29'.4	357° 19'.5	42'.0	289° 12'.5	52'.9	161° 01'.0	59'.1
05	131° 30'.5	216° 37'.3	29'.4	12° 21'.5	42'.0	304° 14'.6	53'.1	176° 03'.3	59'.0
06	146° 33'.0	231° 36'.4	29'.4	27° 23'.6	42'.1	319° 16'.6	53'.3	191° 05'.7	59'.0
07	161° 35'.4	246° 35'.6	29'.3	42° 25'.6	42'.1	334° 18'.7	53'.4	206° 08'.0	58'.9
08	176° 37'.9	261° 34'.7	29'.3	57° 27'.7	42'.1	349° 20'.7	53'.6	221° 10'.3	58'.9
09	191° 40'.4	276° 33'.9	29'.2	72° 29'.7	42'.2	4° 22'.8	53'.8	236° 12'.7	58'.9
10	206° 42'.8	291° 33'.0	29'.2	87° 31'.8	42'.2	19° 24'.8	53'.9	251° 15'.0	58'.8
11	221° 45'.3	306° 32'.2	29'.2	102° 33'.8	42'.2	34° 26'.9	54'.1	266° 17'.3	58'.8
12	236° 47'.8	321° 31'.3	25° 29'.1 S	117° 35'.9	22° 42'.3 N	49° 29'.0	1° 54'.3 S	281° 19'.7	17° 58'.7 S
13	251° 50'.2	336° 30'.4	29'.1	132° 37'.9	42'.3	64° 31'.0	54'.5	296° 22'.0	58'.7
14	266° 52'.7	351° 29'.6	29'.0	147° 40'.0	42'.3	79° 33'.1	54'.6	311° 24'.3	58'.7
15	281° 55'.1	6° 28'.7	29'.0	162° 42'.0	42'.4	94° 35'.1	54'.8	326° 26'.7	58'.6
16	296° 57'.6	21° 27'.9	28'.9	177° 44'.1	42'.4	109° 37'.2	55'.0	341° 29'.0	58'.6
17	312° 00'.1	36° 27'.0	28'.8	192° 46'.2	42'.5	124° 39'.2	55'.1	356° 31'.3	58'.5
18	327° 02'.5	51° 26'.2	28'.8	207° 48'.2	42'.5	139° 41'.3	55'.3	11° 33'.6	58'.5
19	342° 05'.0	66° 25'.3	28'.7	222° 50'.3	42'.5	154° 43'.4	55'.5	26° 36'.0	58'.5
20	357° 07'.5	81° 24'.5	28'.7	237° 52'.4	42'.6	169° 45'.4	55'.6	41° 38'.3	58'.4
21	12° 09'.9	96° 23'.6	28'.6	252° 54'.4	42'.6	184° 47'.5	55'.8	56° 40'.6	58'.4
22	27° 12'.4	111° 22'.8	28'.6	267° 56'.5	42'.6	199° 49'.5	56'.0	71° 43'.0	58'.4
23	42° 14'.9	126° 21'.9	28'.5	282° 58'.5	42'.7	214° 51'.6	56'.1	86° 45'.3	58'.3
18 Wednesday 00	57° 17'.3	141° 21'.0	25° 28'.4 S	298° 00'.6	22° 42'.7 N	229° 53'.6	1° 56'.3 S	101° 47'.6	17° 58'.3 S
01	72° 19'.8	156° 20'.2	28'.4	313° 02'.7	42'.8	244° 55'.7	56'.5	116° 49'.9	58'.2
02	87° 22'.3	171° 19'.3	28'.3	328° 04'.8	42'.8	259° 57'.8	56'.6	131° 52'.3	58'.2
03	102° 24'.7	186° 18'.5	28'.2	343° 06'.8	42'.8	274° 59'.8	56'.8	146° 54'.6	58'.2
04	117° 27'.2	201° 17'.6	28'.2	358° 08'.9	42'.9	290° 01'.9	57'.0	161° 56'.9	58'.1
05	132° 29'.6	216° 16'.8	28'.1	13° 11'.0	42'.9	305° 03'.9	57'.1	176° 59'.3	58'.1
06	147° 32'.1	231° 15'.9	28'.0	28° 13'.1	42'.9	320° 06'.0	57'.3	192° 01'.6	58'.0
07	162° 34'.6	246° 15'.1	28'.0	43° 15'.1	43'.0	335° 08'.1	57'.5	207° 03'.9	58'.0
08	177° 37'.0	261° 14'.2	27'.9	58° 17'.2	43'.0	350° 10'.1	57'.6	222° 06'.2	58'.0
09	192° 39'.5	276° 13'.4	27'.8	73° 19'.3	43'.1	5° 12'.2	57'.8	237° 08'.6	57'.9
10	207° 42'.0	291° 12'.5	27'.7	88° 21'.4	43'.1	20° 14'.2	58'.0	252° 10'.9	57'.9
11	222° 44'.4	306° 11'.7	27'.7	103° 23'.4	43'.1	35° 16'.3	58'.1	267° 13'.2	57'.8
12	237° 46'.9	321° 10'.8	25° 27'.6 S	118° 25'.5	22° 43'.2 N	50° 18'.3	1° 58'.3 S	282° 15'.5	17° 57'.8 S
13	252° 49'.4	336° 10'.0	27'.5	133° 27'.6	43'.2	65° 20'.4	58'.5	297° 17'.9	57'.8
14	267° 51'.8	351° 09'.1	27'.4	148° 29'.7	43'.3	80° 22'.5	58'.6	312° 20'.2	57'.7
15	282° 54'.3	6° 08'.3	27'.4	163° 31'.8	43'.3	95° 24'.5	58'.8	327° 22'.5	57'.7
16	297° 56'.7	21° 07'.4	27'.3	178° 33'.9	43'.3	110° 26'.6	59'.0	342° 24'.8	57'.6
17	312° 59'.2	36° 06'.6	27'.2	193° 36'.0	43'.4	125° 28'.6	59'.1	357° 27'.2	57'.6
18	328° 01'.7	51° 05'.7	27'.1	208° 38'.1	43'.4	140° 30'.7	59'.3	12° 29'.5	57'.6
19	343° 04'.1	66° 04'.9	27'.0	223° 40'.2	43'.5	155° 32'.8	59'.5	27° 31'.8	57'.5
20	358° 06'.6	81° 04'.0	26'.9	238° 42'.2	43'.5	170° 34'.8	59'.6	42° 34'.1	57'.5
21	13° 09'.1	96° 03'.2	26'.8	253° 44'.3	43'.6	185° 36'.9	59'.8	57° 36'.5	57'.4
22	28° 11'.5	111° 02'.3	26'.7	268° 46'.4	43'.6	200° 38'.9	2° 00'.0 S	72° 38'.8	57'.4
23	43° 14'.0	126° 01'.5	26'.7	283° 48'.5	43'.6	215° 41'.0	00'.1	87° 41'.1	57'.4
19 Thursday 00	58° 16'.5	141° 00'.6	25° 26'.6 S	298° 50'.6	22° 43'.7 N	230° 43'.1	2° 00'.3 S	102° 43'.4	17° 57'.3 S
01	73° 18'.9	155° 59'.8	26'.5	313° 52'.7	43'.7	245° 45'.1	00'.5	117° 45'.8	57'.3
02	88° 21'.4	170° 58'.9	26'.4	328° 54'.8	43'.8	260° 47'.2	00'.6	132° 48'.1	57'.2
03	103° 23'.9	185° 58'.1	26'.3	343° 56'.9	43'.8	275° 49'.3	00'.8	147° 50'.4	57'.2
04	118° 26'.3	200° 57'.2	26'.2	358° 59'.0	43'.9	290° 51'.3	01'.0	162° 52'.7	57'.2
05	133° 28'.8	215° 56'.4	26'.1	14° 01'.2	43'.9	305° 53'.4	01'.1	177° 55'.1	57'.1
06	148° 31'.2	230° 55'.5	26'.0	29° 03'.3	44'.0	320° 55'.4	01'.3	192° 57'.4	57'.1
07	163° 33'.7	245° 54'.7	25'.9	44° 05'.4	44'.0	335° 57'.5	01'.4	207° 59'.7	57'.0
08	178° 36'.2	260° 53'.8	25'.8	59° 07'.5	44'.1	350° 59'.6	01'.6	223° 02'.0	57'.0
09	193° 38'.6	275° 53'.0	25'.7	74° 09'.6	44'.1	6° 01'.6	01'.8	238° 04'.4	56'.9
10	208° 41'.1	290° 52'.1	25'.6	89° 11'.7	44'.1	21° 03'.7	01'.9	253° 06'.7	56'.9
11	223° 43'.6	305° 51'.3	25'.4	104° 13'.8	44'.2	36° 05'.8	02'.1	268° 09'.0	56'.9
12	238° 46'.0	320° 50'.4	25° 25'.3 S	119° 15'.9	22° 44'.2 N	51° 07'.8	2° 02'.3 S	283° 11'.3	17° 56'.8 S
13	253° 48'.5	335° 49'.6	25'.2	134° 18'.0	44'.3	66° 09'.9	02'.4	298° 13'.7	56'.8
14	268° 51'.0	350° 48'.7	25'.1	149° 20'.2	44'.3	81° 11'.9	02'.6	313° 16'.0	56'.7
15	283° 53'.4	5° 47'.9	25'.0	164° 22'.3	44'.4	96° 14'.0	02'.8	328° 18'.3	56'.7
16	298° 55'.9	20° 47'.1	24'.9	179° 24'.4	44'.4	111° 16'.1	02'.9	343° 20'.6	56'.7
17	313° 58'.3	35° 46'.2	24'.8	194° 26'.5	44'.5	126° 18'.1	03'.1	358° 22'.9	56'.6
18	329° 00'.8	50° 45'.4	24'.7	209° 28'.6	44'.5	141° 20'.2	03'.3	13° 25'.3	56'.6
19	344° 03'.3	65° 44'.5	24'.5	224° 30'.8	44'.6	156° 22'.3	03'.4	28° 27'.6	56'.5
20	359° 05'.7	80° 43'.7	24'.4	239° 32'.9	44'.6	171° 24'.3	03'.6	43° 29'.9	56'.5
21	14° 08'.2	95° 42'.8	24'.3	254° 35'.0	44'.7	186° 26'.4	03'.8	58° 32'.2	56'.5
22	29° 10'.7	110° 42'.0	24'.2	269° 37'.2	44'.7	201° 28'.4	03'.9	73° 34'.6	56'.4
23	44° 13'.1	125° 41'.1	24'.1	284° 39'.3	44'.8	216° 30'.5	04'.1	88° 36'.9	56'.4
	M.P. 20:08	v -0'.9	d 0'.1	v 2'.1	d 0'.0	v 2'.1	d 0'.2	v 2'.3	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.5	40° 19'.9 S
Achernar	335° 37'.6	57° 16'.4 S
Acrux	173° 27'.2	63° 03'.4 S
Adhara	255° 24'.4	28° 57'.6 S
Aldebaran	291° 06'.7	16° 29'.8 N
Alioth	166° 34'.5	55° 59'.6 N
Alkaid	153° 11'.4	49° 20'.7 N
Alnair	28° 02'.9	46° 59'.8 S
Alnilam	276° 01'.7	1° 12'.3 S
Alphard	218° 11'.2	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.3 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.4	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.1 N
Atria	108° 01'.8	69° 01'.0 S
Avior	234° 24'.1	59° 29'.0 S
Bellatrix	278° 48'.2	6° 20'.7 N
Betelgeuse	271° 17'.7	7° 24'.4 N
Canopus	264° 02'.5	52° 41'.3 S
Capella	280° 56'.8	45° 59'.5 N
Deneb	49° 42'.1	45° 15'.6 N
Denebola	182° 49'.5	14° 36'.6 N
Diphda	349° 11'.0	18° 01'.4 S
Dubhe	194° 10'.6	61° 47'.0 N
Elnath	278° 31'.7	28° 36'.1 N
Eltanin	90° 53'.7	51° 29'.6 N
Enif	34° 02'.2	9° 50'.8 N
Fomalhaut	15° 40'.8	29° 39'.6 S
Gacrux	172° 18'.6	57° 04'.2 S
Gienah	176° 08'.4	17° 30'.1 S
Hadar	149° 10'.5	60° 20'.2 S
Hamal	328° 17'.8	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.4	74° 10'.9 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.9 N
Menkent	148° 26'.2	36° 20'.0 S
Miaplacidus	221° 42'.9	69° 41'.0 S
Mirfak	309° 02'.0	49° 50'.3 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.6	56° 45'.6 S
Polaris	323° 28'.3	89° 14'.2 N
Pollux	243° 46'.3	28° 02'.5 N
Procyon	245° 15'.6	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	207° 59'.9	12° 00'.0 N
Rigel	281° 26'.5	8° 12'.5 S
Rigil Kent	140° 13'.4	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.3 N
Shaula	96° 43'.2	37° 06'.0 S
Sirius	258° 47'.0	16° 42'.3 S
Spica	158° 47'.8	11° 07'.4 S
Suhail	223° 03'.7	43° 24'.0 S
Vega	80° 49'.7	38° 46'.8 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	84° 03'.7	14:35
Mars	240° 43'.3	04:07
Jupiter	172° 36'.3	08:39
Saturn	44° 30'.3	17:10

	SUN		MOON				
	GHA	Dec	GHA	v	Dec	d	HP
17	183° 45'.8	18° 59'.5 S	276° 44'.0	9'.8	11° 06'.4 N	12'.4	59'.1
18	198° 45'.7	19° 00'.1 S	291° 12'.8	9'.9	10° 54'.0 N	12'.4	
19	213° 45'.5	00'.7	305° 41'.7	9'.9	41'.6	12'.6	59'.2
20	228° 45'.4	01'.3	320° 10'.6	10'.0	29'.0	12'.6	
21	243° 45'.3	01'.9	334° 39'.6	10'.0	16'.4	12'.6	
22	258° 45'.2	02'.5	349° 08'.6	10'.1	03'.8	12'.7	
23	273° 45'.0	03'.1	3° 37'.7	10'.0	9° 51'.1 N	12'.8	
24	288° 44'.9	03'.7	18° 06'.7	10'.1	38'.3	12'.8	
25	303° 44'.8	04'.3	32° 35'.8	10'.2	25'.5	12'.9	
26	318° 44'.7	04'.9	47° 05'.0	10'.2	12'.6	12'.9	
27	333° 44'.5	05'.5	61° 34'.2	10'.2	8° 59'.7 N	13'.0	
28	348° 44'.4	06'.1	76° 03'.4	10'.2	46'.7	13'.0	
29	3° 44'.3	19° 06'.7 S	90° 32'.6	10'.3	8° 33'.7 N	13'.1	59'.2
30	18° 44'.2	07'.3	105° 01'.9	10'.3	20'.6	13'.1	
31	33° 44'.0	07'.9	119° 31'.2	10'.4	07'.5	13'.2	
32	48° 43'.9	08'.5	134° 00'.6	10'.4	7° 54'.3 N	13'.2	
33	63° 43'.8	09'.1	148° 30'.0	10'.4	41'.1	13'.3	
34	78° 43'.6	09'.7	162° 59'.4	10'.4	27'.8	13'.3	
35	93° 43'.5	10'.3	177° 28'.8	10'.5	14'.5	13'.3	
36	108° 43'.4	10'.9	191° 58'.3	10'.4	01'.2	13'.4	
37	123° 43'.3	11'.5	206° 27'.7	10'.6	6° 47'.8 N	13'.5	
38	138° 43'.1	12'.1	220° 57'.3	10'.5	34'.3	13'.4	59'.3
39	153° 43'.0	12'.7	235° 26'.8	10'.6	20'.9	13'.5	
40	168° 42'.9	13'.3	249° 56'.4	10'.5	07'.4	13'.6	
41	183° 42'.7	19° 13'.9 S	264° 25'.9	10'.6	5° 53'.8 N	13'.6	59'.3
42	198° 42'.6	14'.5	278° 55'.5	10'.7	40'.2	13'.6	
43	213° 42'.5	15'.1	293° 25'.2	10'.6	26'.6	13'.6	
44	228° 42'.3	15'.7	307° 54'.8	10'.7	13'.0	13'.7	
45	243° 42'.2	16'.3	322° 24'.5	10'.7	4° 59'.3 N	13'.7	
46	258° 42'.1	16'.9	336° 54'.2	10'.7	45'.6	13'.7	
47	273° 41'.9	17'.5	351° 23'.9	10'.7	31'.9	13'.7	
48	288° 41'.8	18'.1	5° 53'.6	10'.7	18'.2	13'.8	
49	303° 41'.7	18'.7	20° 23'.3	10'.8	04'.4	13'.8	
50	318° 41'.5	19'.3	34° 53'.1	10'.8	3° 50'.6 N	13'.8	
51	333° 41'.4	19'.9	49° 22'.9	10'.7	36'.8	13'.9	
52	348° 41'.3	20'.4	63° 52'.6	10'.8	22'.9	13'.8	
53	3° 41'.1	19° 21'.0 S	78° 22'.4	10'.8	3° 09'.1 N	13'.9	59'.3
54	18° 41'.0	21'.6	92° 52'.2	10'.9	2° 55'.2 N	13'.9	
55	33° 40'.9	22'.2	107° 22'.1	10'.8	41'.3	13'.9	
56	48° 40'.7	22'.8	121° 51'.9	10'.8	27'.4	13'.9	
57	63° 40'.6	23'.4	136° 21'.7	10'.8	13'.5	14'.0	
58	78° 40'.4	24'.0	150° 51'.5	10'.9	1° 59'.5 N	13'.9	
59	93° 40'.3	24'.6	165° 21'.4	10'.8	45'.6	14'.0	
60	108° 40'.2	25'.1	179° 51'.2	10'.9	31'.6	14'.0	
61	123° 40'.0	25'.7	194° 21'.1	10'.9	17'.6	13'.9	
62	138° 39'.9	26'.3	208° 51'.0	10'.8	03'.7	14'.0	
63	153° 39'.8	26'.9	223° 20'.8	10'.9	0° 49'.7 N	14'.0	
64	168° 39'.6	27'.5	237° 50'.7	10'.9	35'.7	14'.0	
65	183° 39'.5	19° 28'.1 S	252° 20'.6	10'.8	0° 21'.7 N	14'.0	59'.3
66	198° 39'.3	28'.6	266° 50'.4	10'.9	07'.7	14'.0	
67	213° 39'.2	29'.2	281° 20'.3	10'.9	0° 06'.3 S	14'.0	
68	228° 39'.1	29'.8	295° 50'.2	10'.8	20'.3	14'.0	
69	243° 38'.9	30'.4	310° 20'.0	10'.9	34'.3	14'.0	
70	258° 38'.8	30'.9	324° 49'.9	10'.8	48'.3	14'.0	
71	273° 38'.6	31'.5	339° 19'.7	10'.9	1° 02'.3 S	14'.0	
72	288° 38'.5	32'.1	353° 49'.6	10'.8	16'.3	14'.0	
73	303° 38'.3	32'.7	8° 19'.4	10'.8	30'.3	13'.9	
74	318° 38'.2	33'.3	22° 49'.2	10'.9	44'.2	14'.0	
75	333° 38'.1	33'.8	37° 19'.1	10'.8	58'.2	13'.9	
76	348° 37'.9	34'.4	51° 48'.9	10'.8	2° 12'.1 S	14'.0	
77	3° 37'.8	19° 35'.0 S	66° 18'.7	10'.8	2° 26'.1 S	13'.9	59'.3
78	18° 37'.6	35'.6	80° 48'.5	10'.8	40'.0	13'.9	
79	33° 37'.5	36'.1	95° 18'.3	10'.7	53'.9	13'.9	
80	48° 37'.3	36'.7	109° 48'.0	10'.8	3° 07'.8 S	13'.9	
81	63° 37'.2	37'.3	124° 17'.8	10'.7	21'.7	13'.8	
82	78° 37'.0	37'.8	138° 47'.5	10'.8	35'.5	13'.9	
83	93° 36'.9	38'.4	153° 17'.3	10'.7	49'.4	13'.8	
84	108° 36'.7	39'.0	167° 47'.0	10'.7	4° 03'.2 S	13'.8	
85	123° 36'.6	39'.6	182° 16'.7	10'.6	17'.0	13'.8	
86	138° 36'.4	40'.1	196° 46'.3	10'.7	30'.8	13'.7	
87	153° 36'.3	40'.7	211° 16'.0	10'.6	44'.5	13'.7	
88	168° 36'.2	41'.3	225° 45'.6	10'.6	58'.2	13'.7	
	SD 16'.2	d 0'.6	SD 16'.1		16'.2		16'.2

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
17	15 03	14 57	11:45	05:45	18:10	23d 50%
18	14 51	14 45	11:45	06:36	19:01	24d 39%
19	14 38	14 31	11:45	07:26	19:51	25d 28%

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1992 November 20, 21, 22 (Fri, Sat, Sun)

GMT	ARIES	VENUS -4.1		MARS -0.6		JUPITER -1.8		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
20 Friday 00	59° 15'.6	140° 40'.3	25° 23'.9 S	299° 41'.4	22° 44'.8 N	231° 32'.6	2° 04'.2 S	103° 39'.2	17° 56'.3 S
01	74° 18'.1	155° 39'.4	23'.8	314° 43'.5	44'.9	246° 34'.6	04'.4	118° 41'.5	56'.3
02	89° 20'.5	170° 38'.6	23'.7	329° 45'.7	44'.9	261° 36'.7	04'.6	133° 43'.8	56'.2
03	104° 23'.0	185° 37'.8	23'.6	344° 47'.8	45'.0	276° 38'.8	04'.7	148° 46'.2	56'.2
04	119° 25'.5	200° 36'.9	23'.4	359° 49'.9	45'.0	291° 40'.8	04'.9	163° 48'.5	56'.2
05	134° 27'.9	215° 36'.1	23'.3	14° 52'.1	45'.1	306° 42'.9	05'.1	178° 50'.8	56'.1
06	149° 30'.4	230° 35'.2	23'.2	29° 54'.2	45'.1	321° 45'.0	05'.2	193° 53'.1	56'.1
07	164° 32'.8	245° 34'.4	23'.0	44° 56'.4	45'.2	336° 47'.0	05'.4	208° 55'.4	56'.0
08	179° 35'.3	260° 33'.5	22'.9	59° 58'.5	45'.2	351° 49'.1	05'.6	223° 57'.8	56'.0
09	194° 37'.8	275° 32'.7	22'.8	75° 00'.6	45'.3	6° 51'.2	05'.7	239° 00'.1	56'.0
10	209° 40'.2	290° 31'.9	22'.6	90° 02'.8	45'.4	21° 53'.2	05'.9	254° 02'.4	55'.9
11	224° 42'.7	305° 31'.0	22'.5	105° 04'.9	45'.4	36° 55'.3	06'.0	269° 04'.7	55'.9
12	239° 45'.2	320° 30'.2	25° 22'.4 S	120° 07'.1	22° 45'.5 N	51° 57'.4	2° 06'.2 S	284° 07'.0	17° 55'.8 S
13	254° 47'.6	335° 29'.3	22'.2	135° 09'.2	45'.5	66° 59'.4	06'.4	299° 09'.4	55'.8
14	269° 50'.1	350° 28'.5	22'.1	150° 11'.4	45'.6	82° 01'.5	06'.5	314° 11'.7	55'.7
15	284° 52'.6	5° 27'.6	21'.9	165° 13'.5	45'.6	97° 03'.6	06'.7	329° 14'.0	55'.7
16	299° 55'.0	20° 26'.8	21'.8	180° 15'.7	45'.7	112° 05'.6	06'.9	344° 16'.3	55'.7
17	314° 57'.5	35° 26'.0	21'.6	195° 17'.8	45'.7	127° 07'.7	07'.0	359° 18'.6	55'.6
18	330° 00'.0	50° 25'.1	21'.5	210° 20'.0	45'.8	142° 09'.8	07'.2	14° 20'.9	55'.6
19	345° 02'.4	65° 24'.3	21'.3	225° 22'.2	45'.8	157° 11'.8	07'.4	29° 23'.3	55'.5
20	0° 04'.9	80° 23'.4	21'.2	240° 24'.3	45'.9	172° 13'.9	07'.5	44° 25'.6	55'.5
21	15° 07'.3	95° 22'.6	21'.0	255° 26'.5	46'.0	187° 16'.0	07'.7	59° 27'.9	55'.4
22	30° 09'.8	110° 21'.8	20'.9	270° 28'.6	46'.0	202° 18'.0	07'.8	74° 30'.2	55'.4
23	45° 12'.3	125° 20'.9	20'.7	285° 30'.8	46'.1	217° 20'.1	08'.0	89° 32'.5	55'.4
21 Saturday 00	60° 14'.7	140° 20'.1	25° 20'.6 S	300° 33'.0	22° 46'.1 N	232° 22'.2	2° 08'.2 S	104° 34'.9	17° 55'.3 S
01	75° 17'.2	155° 19'.3	20'.4	315° 35'.1	46'.2	247° 24'.2	08'.3	119° 37'.2	55'.3
02	90° 19'.7	170° 18'.4	20'.3	330° 37'.3	46'.2	262° 26'.3	08'.5	134° 39'.5	55'.2
03	105° 22'.1	185° 17'.6	20'.1	345° 39'.5	46'.3	277° 28'.4	08'.7	149° 41'.8	55'.2
04	120° 24'.6	200° 16'.7	20'.0	0° 41'.6	46'.4	292° 30'.4	08'.8	164° 44'.1	55'.1
05	135° 27'.1	215° 15'.9	19'.8	15° 43'.8	46'.4	307° 32'.5	09'.0	179° 46'.4	55'.1
06	150° 29'.5	230° 15'.1	19'.6	30° 46'.0	46'.5	322° 34'.6	09'.1	194° 48'.8	55'.1
07	165° 32'.0	245° 14'.2	19'.5	45° 48'.1	46'.5	337° 36'.6	09'.3	209° 51'.1	55'.0
08	180° 34'.4	260° 13'.4	19'.3	60° 50'.3	46'.6	352° 38'.7	09'.5	224° 53'.4	55'.0
09	195° 36'.9	275° 12'.6	19'.1	75° 52'.5	46'.7	7° 40'.8	09'.6	239° 55'.7	54'.9
10	210° 39'.4	290° 11'.7	19'.0	90° 54'.7	46'.7	22° 42'.8	09'.8	254° 58'.0	54'.9
11	225° 41'.8	305° 10'.9	18'.8	105° 56'.8	46'.8	37° 44'.9	09'.9	270° 00'.3	54'.8
12	240° 44'.3	320° 10'.0	25° 18'.6 S	120° 59'.0	22° 46'.8 N	52° 47'.0	2° 10'.1 S	285° 02'.6	17° 54'.8 S
13	255° 46'.8	335° 09'.2	18'.5	136° 01'.2	46'.9	67° 49'.1	10'.3	300° 05'.0	54'.8
14	270° 49'.2	350° 08'.4	18'.3	151° 03'.4	47'.0	82° 51'.1	10'.4	315° 07'.3	54'.7
15	285° 51'.7	5° 07'.5	18'.1	166° 05'.6	47'.0	97° 53'.2	10'.6	330° 09'.6	54'.7
16	300° 54'.2	20° 06'.7	17'.9	181° 07'.7	47'.1	112° 55'.3	10'.8	345° 11'.9	54'.6
17	315° 56'.6	35° 05'.9	17'.8	196° 09'.9	47'.1	127° 57'.3	10'.9	0° 14'.2	54'.6
18	330° 59'.1	50° 05'.0	17'.6	211° 12'.1	47'.2	142° 59'.4	11'.1	15° 16'.5	54'.5
19	346° 01'.6	65° 04'.2	17'.4	226° 14'.3	47'.3	158° 01'.5	11'.2	30° 18'.8	54'.5
20	1° 04'.0	80° 03'.4	17'.2	241° 16'.5	47'.3	173° 03'.5	11'.4	45° 21'.2	54'.5
21	16° 06'.5	95° 02'.5	17'.1	256° 18'.7	47'.4	188° 05'.6	11'.6	60° 23'.5	54'.4
22	31° 08'.9	110° 01'.7	16'.9	271° 20'.9	47'.5	203° 07'.7	11'.7	75° 25'.8	54'.4
23	46° 11'.4	125° 00'.9	16'.7	286° 23'.1	47'.5	218° 09'.8	11'.9	90° 28'.1	54'.3
22 Sunday 00	61° 13'.9	140° 00'.0	25° 16'.5 S	301° 25'.3	22° 47'.6 N	233° 11'.8	2° 12'.0 S	105° 30'.4	17° 54'.3 S
01	76° 16'.3	154° 59'.2	16'.3	316° 27'.5	47'.7	248° 13'.9	12'.2	120° 32'.7	54'.2
02	91° 18'.8	169° 58'.4	16'.1	331° 29'.7	47'.7	263° 16'.0	12'.4	135° 35'.0	54'.2
03	106° 21'.3	184° 57'.5	15'.9	346° 31'.9	47'.8	278° 18'.0	12'.5	150° 37'.4	54'.2
04	121° 23'.7	199° 56'.7	15'.8	1° 34'.1	47'.9	293° 20'.1	12'.7	165° 39'.7	54'.1
05	136° 26'.2	214° 55'.9	15'.6	16° 36'.3	47'.9	308° 22'.2	12'.8	180° 42'.0	54'.1
06	151° 28'.7	229° 55'.0	15'.4	31° 38'.5	48'.0	323° 24'.3	13'.0	195° 44'.3	54'.0
07	166° 31'.1	244° 54'.2	15'.2	46° 40'.7	48'.0	338° 26'.3	13'.2	210° 46'.6	54'.0
08	181° 33'.6	259° 53'.4	15'.0	61° 42'.9	48'.1	353° 28'.4	13'.3	225° 48'.9	53'.9
09	196° 36'.1	274° 52'.6	14'.8	76° 45'.1	48'.2	8° 30'.5	13'.5	240° 51'.2	53'.9
10	211° 38'.5	289° 51'.7	14'.6	91° 47'.3	48'.3	23° 32'.5	13'.7	255° 53'.5	53'.8
11	226° 41'.0	304° 50'.9	14'.4	106° 49'.5	48'.3	38° 34'.6	13'.8	270° 55'.9	53'.8
12	241° 43'.4	319° 50'.1	25° 14'.2 S	121° 51'.7	22° 48'.4 N	53° 36'.7	2° 14'.0 S	285° 58'.2	17° 53'.8 S
13	256° 45'.9	334° 49'.2	14'.0	136° 54'.0	48'.5	68° 38'.8	14'.1	301° 00'.5	53'.7
14	271° 48'.4	349° 48'.4	13'.8	151° 56'.2	48'.5	83° 40'.8	14'.3	316° 02'.8	53'.7
15	286° 50'.8	4° 47'.6	13'.6	166° 58'.4	48'.6	98° 42'.9	14'.5	331° 05'.1	53'.6
16	301° 53'.3	19° 46'.8	13'.4	182° 00'.6	48'.7	113° 45'.0	14'.6	346° 07'.4	53'.6
17	316° 55'.8	34° 45'.9	13'.2	197° 02'.8	48'.7	128° 47'.1	14'.8	1° 09'.7	53'.5
18	331° 58'.2	49° 45'.1	13'.0	212° 05'.0	48'.8	143° 49'.1	14'.9	16° 12'.0	53'.5
19	347° 00'.7	64° 44'.3	12'.8	227° 07'.3	48'.9	158° 51'.2	15'.1	31° 14'.3	53'.4
20	2° 03'.2	79° 43'.4	12'.5	242° 09'.5	48'.9	173° 53'.3	15'.2	46° 16'.7	53'.4
21	17° 05'.6	94° 42'.6	12'.3	257° 11'.7	49'.0	188° 55'.4	15'.4	61° 19'.0	53'.4
22	32° 08'.1	109° 41'.8	12'.1	272° 13'.9	49'.1	203° 57'.4	15'.6	76° 21'.3	53'.3
23	47° 10'.5	124° 41'.0	11'.9	287° 16'.2	49'.2	218° 59'.5	15'.7	91° 23'.6	53'.3
	M.P. 19:56	v -0'.8	d 0'.2	v 2'.2	d 0'.1	v 2'.1	d 0'.2	v 2'.3	d 0'.0

STARS	SHA	Dec
Acamar	315° 29'.5	40° 19'.9 S
Achernar	335° 37'.6	57° 16'.4 S
Acrux	173° 27'.1	63° 03'.4 S
Adhara	255° 24'.3	28° 57'.6 S
Aldebaran	291° 06'.7	16° 29'.8 N
Alioth	166° 34'.5	55° 59'.6 N
Alkaid	153° 11'.3	49° 20'.7 N
Alnair	28° 02'.9	46° 59'.8 S
Alnilam	276° 01'.7	1° 12'.3 S
Alphard	218° 11'.1	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.3 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.4	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.1	19° 13'.1 N
Atria	108° 01'.8	69° 01'.0 S
Avior	234° 24'.1	59° 29'.0 S
Bellatrix	278° 48'.2	6° 20'.7 N
Betelgeuse	271° 17'.6	7° 24'.4 N
Canopus	264° 02'.5	52° 41'.3 S
Capella	280° 56'.7	45° 59'.5 N
Deneb	49° 42'.2	45° 15'.6 N
Denebola	182° 49'.5	14° 36'.6 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.5	61° 47'.0 N
Elnath	278° 31'.7	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.6 N
Enif	34° 02'.3	9° 50'.8 N
Fomalhaut	15° 40'.8	29° 39'.6 S
Gacrux	172° 18'.5	57° 04'.2 S
Gienah	176° 08'.3	17° 30'.1 S
Hadar	149° 10'.5	60° 20'.2 S
Hamal	328° 17'.8	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.4	74° 10'.9 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.9 N
Menkent	148° 26'.1	36° 20'.0 S
Miaplacidus	221° 42'.8	69° 41'.0 S
Mirfak	309° 01'.9	49° 50'.3 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.6	56° 45'.6 S
Polaris	323° 28'.5	89° 14'.2 N
Pollux	243° 46'.3	28° 02'.5 N
Procyon	245° 15'.6	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	207° 59'.8	12° 00'.0 N
Rigel	281° 26'.5	8° 12'.5 S
Rigil Kent	140° 13'.4	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.3 N
Shaula	96° 43'.2	37° 06'.0 S
Sirius	258° 47'.0	16° 42'.3 S
Spica	158° 47'.7	11° 07'.4 S
Suhail	223° 03'.7	43° 24'.0 S
Vega	80° 49'.7	38° 46'.8 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	80° 05'.4	14:39
Mars	240° 18'.2	03:57
Jupiter	172° 07'.4	08:29
Saturn	44° 20'.1	16:59

SUN				MOON				
GHA	Dec	GHA	v	Dec	d	HP
183° 36'.0	19° 41'.8 S	240° 15'.2	10'.6	5° 11'.9 S	13'.7	59'.3
198° 35'.9	42'.4	254° 44'.8	10'.6	25'.6	13'.6	
213° 35'.7	43'.0	269° 14'.4	10'.5	39'.2	13'.6	59'.2
228° 35'.6	43'.5	283° 43'.9	10'.6	52'.8	13'.6	
243° 35'.4	44'.1	298° 13'.5	10'.5	6° 06'.4 S	13'.5	
258° 35'.3	44'.6	312° 43'.0	10'.4	19'.9	13'.5	
273° 35'.1	45'.2	327° 12'.4	10'.5	33'.4	13'.4	
288° 35'.0	45'.8	341° 41'.9	10'.4	46'.8	13'.4	
303° 34'.8	46'.3	356° 11'.3	10'.4	7° 00'.2 S	13'.4	
318° 34'.6	46'.9	10° 40'.7	10'.4	13'.6	13'.4	
333° 34'.5	47'.5	25° 10'.1	10'.3	27'.0	13'.3	
348° 34'.3	48'.0	39° 39'.4	10'.3	40'.3	13'.2	
3° 34'.2	19° 48'.6 S	54° 08'.7	10'.3	7° 53'.5 S	13'.2	59'.2
18° 34'.0	49'.1	68° 38'.0	10'.2	8° 06'.7 S	13'.2	
33° 33'.9	49'.7	83° 07'.2	10'.2	19'.9	13'.1	
48° 33'.7	50'.2	97° 36'.4	10'.2	33'.0	13'.0	
63° 33'.6	50'.8	112° 05'.6	10'.1	46'.0	13'.0	
78° 33'.4	51'.4	126° 34'.7	10'.1	59'.0	13'.0	
93° 33'.3	51'.9	141° 03'.8	10'.1	9° 12'.0 S	12'.9	59'.1
108° 33'.1	52'.5	155° 32'.9	10'.1	24'.9	12'.8	
123° 33'.0	53'.0	170° 02'.0	10'.0	37'.7	12'.8	
138° 32'.8	53'.6	184° 31'.0	9'.9	50'.5	12'.8	
153° 32'.6	54'.1	198° 59'.9	10'.0	10° 03'.3 S	12'.6	
168° 32'.5	54'.7	213° 28'.9	9'.8	15'.9	12'.6	
183° 32'.3	19° 55'.2 S	227° 57'.7	9'.9	10° 28'.5 S	12'.6	59'.1
198° 32'.2	55'.8	242° 26'.6	9'.8	41'.1	12'.5	
213° 32'.0	56'.3	256° 55'.4	9'.8	53'.6	12'.4	
228° 31'.8	56'.9	271° 24'.2	9'.7	11° 06'.0 S	12'.4	
243° 31'.7	57'.4	285° 52'.9	9'.7	18'.4	12'.3	
258° 31'.5	58'.0	300° 21'.6	9'.7	30'.7	12'.2	
273° 31'.4	58'.5	314° 50'.3	9'.6	42'.9	12'.1	59'.0
288° 31'.2	59'.1	329° 18'.9	9'.6	55'.0	12'.1	
303° 31'.1	59'.6	343° 47'.5	9'.5	12° 07'.1 S	12'.0	
318° 30'.9	20° 00'.2 S	358° 16'.0	9'.5	19'.1	12'.0	
333° 30'.7	00'.7	12° 44'.5	9'.5	31'.1	11'.8	
348° 30'.6	01'.3	27° 13'.0	9'.4	42'.9	11'.8	
3° 30'.4	20° 01'.8 S	41° 41'.4	9'.3	12° 54'.7 S	11'.7	59'.0
18° 30'.2	02'.4	56° 09'.7	9'.4	13° 06'.4 S	11'.6	
33° 30'.1	02'.9	70° 38'.1	9'.2	18'.0	11'.6	
48° 29'.9	03'.4	85° 06'.3	9'.3	29'.6	11'.5	58'.9
63° 29'.8	04'.0	99° 34'.6	9'.2	41'.1	11'.3	
78° 29'.6	04'.5	114° 02'.8	9'.1	52'.4	11'.3	
93° 29'.4	05'.1	128° 30'.9	9'.1	14° 03'.7 S	11'.3	
108° 29'.3	05'.6	142° 59'.0	9'.1	15'.0	11'.1	
123° 29'.1	06'.1	157° 27'.1	9'.0	26'.1	11'.0	
138° 28'.9	06'.7	171° 55'.1	9'.0	37'.1	11'.0	
153° 28'.8	07'.2	186° 23'.1	8'.9	48'.1	10'.9	
168° 28'.6	07'.8	200° 51'.0	8'.9	59'.0	10'.7	58'.8
183° 28'.4	20° 08'.3 S	215° 18'.9	8'.8	15° 09'.7 S	10'.7	58'.8
198° 28'.3	08'.8	229° 46'.7	8'.8	20'.4	10'.6	
213° 28'.1	09'.4	244° 14'.5	8'.8	31'.0	10'.5	
228° 27'.9	09'.9	258° 42'.3	8'.7	41'.5	10'.4	
243° 27'.8	10'.4	273° 10'.0	8'.7	51'.9	10'.3	
258° 27'.6	11'.0	287° 37'.7	8'.6	16° 02'.2 S	10'.2	58'.7
273° 27'.4	11'.5	302° 05'.3	8'.6	12'.4	10'.1	
288° 27'.3	12'.0	316° 32'.9	8'.5	22'.5	10'.0	
303° 27'.1	12'.6	331° 00'.4	8'.5	32'.5	9'.9	
318° 26'.9	13'.1	345° 27'.9	8'.4	42'.4	9'.8	
333° 26'.8	13'.6	359° 55'.3	8'.4	52'.2	9'.7	
348° 26'.6	14'.1	14° 22'.7	8'.4	17° 01'.9 S	9'.5	
3° 26'.4	20° 14'.7 S	28° 50'.1	8'.3	17° 11'.4 S	9'.5	58'.6
18° 26'.3	15'.2	43° 17'.4	8'.3	20'.9	9'.4	
33° 26'.1	15'.7	57° 44'.7	8'.2	30'.3	9'.3	
48° 25'.9	16'.3	72° 11'.9	8'.2	39'.6	9'.1	
63° 25'.7	16'.8	86° 39'.1	8'.2	48'.7	9'.1	
78° 25'.6	17'.3	101° 06'.3	8'.1	57'.8	8'.9	
93° 25'.4	17'.8	115° 33'.4	8'.1	18° 06'.7 S	8'.8	58'.5
108° 25'.2	18'.4	130° 00'.5	8'.0	15'.5	8'.7	
123° 25'.0	18'.9	144° 27'.5	8'.0	24'.2	8'.6	
138° 24'.9	19'.4	158° 54'.5	7'.9	32'.8	8'.5	
153° 24'.7	19'.9	173° 21'.4	8'.0	41'.3	8'.3	
168° 24'.5	20'.5	187° 48'.4	7'.8	49'.6	8'.3	58'.4
SD 16'.2	d 0'.5	SD	16'.1	16'.1	16'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
20	14 24	14 17	11:46	08:16	20:41	26d 18%
21	14 10	14 02	11:46	09:07	21:34	27d 10%
22	13 54	13 46	11:46	10:00	22:28	28d 4%

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1992 November 23, 24, 25 (Mon, Tue, Wed)

GMT	ARIES	VENUS -4.1		MARS -0.6		JUPITER -1.8		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
23 Monday 00	62° 13'.0	139° 40'.1	25° 11'.7 S	302° 18'.4	22° 49'.2 N	234° 01'.6	2° 15'.9 S	106° 25'.9	17° 53'.2 S
01	77° 15'.5	154° 39'.3	11'.5	317° 20'.6	49'.3	249° 03'.6	16'.0	121° 28'.2	53'.2
02	92° 17'.9	169° 38'.5	11'.3	332° 22'.9	49'.4	264° 05'.7	16'.2	136° 30'.5	53'.1
03	107° 20'.4	184° 37'.7	11'.0	347° 25'.1	49'.4	279° 07'.8	16'.4	151° 32'.8	53'.1
04	122° 22'.9	199° 36'.8	10'.8	2° 27'.3	49'.5	294° 09'.9	16'.5	166° 35'.1	53'.0
05	137° 25'.3	214° 36'.0	10'.6	17° 29'.6	49'.6	309° 11'.9	16'.7	181° 37'.4	53'.0
06	152° 27'.8	229° 35'.2	10'.4	32° 31'.8	49'.7	324° 14'.0	16'.8	196° 39'.8	52'.9
07	167° 30'.3	244° 34'.4	10'.2	47° 34'.0	49'.7	339° 16'.1	17'.0	211° 42'.1	52'.9
08	182° 32'.7	259° 33'.5	09'.9	62° 36'.3	49'.8	354° 18'.2	17'.2	226° 44'.4	52'.9
09	197° 35'.2	274° 32'.7	09'.7	77° 38'.5	49'.9	9° 20'.3	17'.3	241° 46'.7	52'.8
10	212° 37'.7	289° 31'.9	09'.5	92° 40'.8	50'.0	24° 22'.3	17'.5	256° 49'.0	52'.8
11	227° 40'.1	304° 31'.1	09'.2	107° 43'.0	50'.0	39° 24'.4	17'.6	271° 51'.3	52'.7
12	242° 42'.6	319° 30'.3	25° 09'.0 S	122° 45'.3	22° 50'.1 N	54° 26'.5	2° 17'.8 S	286° 53'.6	17° 52'.7 S
13	257° 45'.0	334° 29'.4	08'.8	137° 47'.5	50'.2	69° 28'.6	17'.9	301° 55'.9	52'.6
14	272° 47'.5	349° 28'.6	08'.6	152° 49'.8	50'.3	84° 30'.6	18'.1	316° 58'.2	52'.6
15	287° 50'.0	4° 27'.8	08'.3	167° 52'.0	50'.3	99° 32'.7	18'.3	332° 00'.5	52'.5
16	302° 52'.4	19° 27'.0	08'.1	182° 54'.3	50'.4	114° 34'.8	18'.4	347° 02'.8	52'.5
17	317° 54'.9	34° 26'.2	07'.8	197° 56'.5	50'.5	129° 36'.9	18'.6	2° 05'.1	52'.5
18	332° 57'.4	49° 25'.3	07'.6	212° 58'.8	50'.6	144° 38'.9	18'.7	17° 07'.4	52'.4
19	347° 59'.8	64° 24'.5	07'.4	228° 01'.0	50'.6	159° 41'.0	18'.9	32° 09'.8	52'.4
20	3° 02'.3	79° 23'.7	07'.1	243° 03'.3	50'.7	174° 43'.1	19'.1	47° 12'.1	52'.3
21	18° 04'.8	94° 22'.9	06'.9	258° 05'.5	50'.8	189° 45'.2	19'.2	62° 14'.4	52'.3
22	33° 07'.2	109° 22'.1	06'.6	273° 07'.8	50'.9	204° 47'.3	19'.4	77° 16'.7	52'.2
23	48° 09'.7	124° 21'.2	06'.4	288° 10'.1	50'.9	219° 49'.3	19'.5	92° 19'.0	52'.2
24 Tuesday 00	63° 12'.2	139° 20'.4	25° 06'.2 S	303° 12'.3	22° 51'.0 N	234° 51'.4	2° 19'.7 S	107° 21'.3	17° 52'.1 S
01	78° 14'.6	154° 19'.6	05'.9	318° 14'.6	51'.1	249° 53'.5	19'.8	122° 23'.6	52'.1
02	93° 17'.1	169° 18'.8	05'.7	333° 16'.9	51'.2	264° 55'.6	20'.0	137° 25'.9	52'.0
03	108° 19'.5	184° 18'.0	05'.4	348° 19'.1	51'.3	279° 57'.6	20'.2	152° 28'.2	52'.0
04	123° 22'.0	199° 17'.2	05'.2	3° 21'.4	51'.3	294° 59'.7	20'.3	167° 30'.5	51'.9
05	138° 24'.5	214° 16'.3	04'.9	18° 23'.7	51'.4	310° 01'.8	20'.5	182° 32'.8	51'.9
06	153° 26'.9	229° 15'.5	04'.7	33° 25'.9	51'.5	325° 03'.9	20'.6	197° 35'.1	51'.9
07	168° 29'.4	244° 14'.7	04'.4	48° 28'.2	51'.6	340° 06'.0	20'.8	212° 37'.4	51'.8
08	183° 31'.9	259° 13'.9	04'.2	63° 30'.5	51'.7	355° 08'.0	20'.9	227° 39'.7	51'.8
09	198° 34'.3	274° 13'.1	03'.9	78° 32'.8	51'.7	10° 10'.1	21'.1	242° 42'.0	51'.7
10	213° 36'.8	289° 12'.3	03'.6	93° 35'.0	51'.8	25° 12'.2	21'.3	257° 44'.3	51'.7
11	228° 39'.3	304° 11'.5	03'.4	108° 37'.3	51'.9	40° 14'.3	21'.4	272° 46'.6	51'.6
12	243° 41'.7	319° 10'.6	25° 03'.1 S	123° 39'.6	22° 52'.0 N	55° 16'.4	2° 21'.6 S	287° 49'.0	17° 51'.6 S
13	258° 44'.2	334° 09'.8	02'.9	138° 41'.9	52'.1	70° 18'.4	21'.7	302° 51'.3	51'.5
14	273° 46'.7	349° 09'.0	02'.6	153° 44'.2	52'.2	85° 20'.5	21'.9	317° 53'.6	51'.5
15	288° 49'.1	4° 08'.2	02'.3	168° 46'.4	52'.2	100° 22'.6	22'.0	332° 55'.9	51'.4
16	303° 51'.6	19° 07'.4	02'.1	183° 48'.7	52'.3	115° 24'.7	22'.2	347° 58'.2	51'.4
17	318° 54'.0	34° 06'.6	01'.8	198° 51'.0	52'.4	130° 26'.8	22'.3	3° 00'.5	51'.3
18	333° 56'.5	49° 05'.8	01'.5	213° 53'.3	52'.5	145° 28'.8	22'.5	18° 02'.8	51'.3
19	348° 59'.0	64° 05'.0	01'.3	228° 55'.6	52'.6	160° 30'.9	22'.7	33° 05'.1	51'.3
20	4° 01'.4	79° 04'.1	01'.0	243° 57'.9	52'.7	175° 33'.0	22'.8	48° 07'.4	51'.2
21	19° 03'.9	94° 03'.3	00'.7	259° 00'.2	52'.7	190° 35'.1	23'.0	63° 09'.7	51'.2
22	34° 06'.4	109° 02'.5	00'.5	274° 02'.5	52'.8	205° 37'.2	23'.1	78° 12'.0	51'.1
23	49° 08'.8	124° 01'.7	00'.2	289° 04'.8	52'.9	220° 39'.2	23'.3	93° 14'.3	51'.1
25 Wednesday 00	64° 11'.3	139° 00'.9	24° 59'.9 S	304° 07'.1	22° 53'.0 N	235° 41'.3	2° 23'.4 S	108° 16'.6	17° 51'.0 S
01	79° 13'.8	154° 00'.1	59'.6	319° 09'.4	53'.1	250° 43'.4	23'.6	123° 18'.9	51'.0
02	94° 16'.2	168° 59'.3	59'.3	334° 11'.7	53'.2	265° 45'.5	23'.8	138° 21'.2	50'.9
03	109° 18'.7	183° 58'.5	59'.1	349° 14'.0	53'.3	280° 47'.6	23'.9	153° 23'.5	50'.9
04	124° 21'.1	198° 57'.7	58'.8	4° 16'.3	53'.3	295° 49'.7	24'.1	168° 25'.8	50'.8
05	139° 23'.6	213° 56'.9	58'.5	19° 18'.6	53'.4	310° 51'.7	24'.2	183° 28'.1	50'.8
06	154° 26'.1	228° 56'.1	58'.2	34° 20'.9	53'.5	325° 53'.8	24'.4	198° 30'.4	50'.7
07	169° 28'.5	243° 55'.3	57'.9	49° 23'.2	53'.6	340° 55'.9	24'.5	213° 32'.7	50'.7
08	184° 31'.0	258° 54'.5	57'.7	64° 25'.5	53'.7	355° 58'.0	24'.7	228° 35'.0	50'.6
09	199° 33'.5	273° 53'.6	57'.4	79° 27'.8	53'.8	11° 00'.1	24'.8	243° 37'.3	50'.6
10	214° 35'.9	288° 52'.8	57'.1	94° 30'.1	53'.9	26° 02'.2	25'.0	258° 39'.6	50'.5
11	229° 38'.4	303° 52'.0	56'.8	109° 32'.4	54'.0	41° 04'.2	25'.1	273° 41'.9	50'.5
12	244° 40'.9	318° 51'.2	24° 56'.5 S	124° 34'.7	22° 54'.0 N	56° 06'.3	2° 25'.3 S	288° 44'.2	17° 50'.5 S
13	259° 43'.3	333° 50'.4	56'.2	139° 37'.1	54'.1	71° 08'.4	25'.5	303° 46'.5	50'.4
14	274° 45'.8	348° 49'.6	55'.9	154° 39'.4	54'.2	86° 10'.5	25'.6	318° 48'.8	50'.4
15	289° 48'.3	3° 48'.8	55'.6	169° 41'.7	54'.3	101° 12'.6	25'.8	333° 51'.1	50'.3
16	304° 50'.7	18° 48'.0	55'.3	184° 44'.0	54'.4	116° 14'.7	25'.9	348° 53'.4	50'.3
17	319° 53'.2	33° 47'.2	55'.0	199° 46'.3	54'.5	131° 16'.7	26'.1	3° 55'.7	50'.2
18	334° 55'.6	48° 46'.4	54'.7	214° 48'.7	54'.6	146° 18'.8	26'.2	18° 58'.0	50'.2
19	349° 58'.1	63° 45'.6	54'.4	229° 51'.0	54'.7	161° 20'.9	26'.4	34° 00'.3	50'.1
20	5° 00'.6	78° 44'.8	54'.1	244° 53'.3	54'.8	176° 23'.0	26'.5	49° 02'.6	50'.1
21	20° 03'.0	93° 44'.0	53'.8	259° 55'.6	54'.9	191° 25'.1	26'.7	64° 04'.9	50'.0
22	35° 05'.5	108° 43'.2	53'.5	274° 58'.0	55'.0	206° 27'.2	26'.8	79° 07'.2	50'.0
23	50° 08'.0	123° 42'.4	53'.2	290° 00'.3	55'.1	221° 29'.3	27'.0	94° 09'.5	49'.9
	M.P. 19:44	v -0'.8	d 0'.3	v 2'.3	d 0'.1	v 2'.1	d 0'.2	v 2'.3	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.5	40° 19'.9 S
Achernar	335° 37'.6	57° 16'.4 S
Acrux	173° 27'.1	63° 03'.4 S
Adhara	255° 24'.3	28° 57'.6 S
Aldebaran	291° 06'.7	16° 29'.8 N
Alioth	166° 34'.4	55° 59'.6 N
Alkaid	153° 11'.3	49° 20'.7 N
Alnair	28° 02'.9	46° 59'.8 S
Alnilam	276° 01'.6	1° 12'.3 S
Alphard	218° 11'.1	8° 37'.6 S
Alphecca	126° 24'.4	26° 44'.3 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.4	8° 51'.1 N
Ankaa	353° 30'.5	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.1 N
Atria	108° 01'.8	69° 01'.0 S
Avior	234° 24'.0	59° 29'.0 S
Bellatrix	278° 48'.2	6° 20'.7 N
Betelgeuse	271° 17'.6	7° 24'.4 N
Canopus	264° 02'.5	52° 41'.4 S
Capella	280° 56'.7	45° 59'.5 N
Deneb	49° 42'.2	45° 15'.6 N
Denebola	182° 49'.4	14° 36'.6 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.5	61° 47'.0 N
Elnath	278° 31'.7	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.5 N
Enif	34° 02'.3	9° 50'.8 N
Fomalhaut	15° 40'.8	29° 39'.6 S
Gacrux	172° 18'.5	57° 04'.2 S
Gienah	176° 08'.3	17° 30'.1 S
Hadar	149° 10'.4	60° 20'.2 S
Hamal	328° 17'.8	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.4	74° 10'.9 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.9 N
Menkent	148° 26'.1	36° 20'.0 S
Miaplacidus	221° 42'.8	69° 41'.0 S
Mirfak	309° 01'.9	49° 50'.3 N
Nunki	76° 17'.6	26° 18'.4 S
Peacock	53° 43'.6	56° 45'.6 S
Polaris	323° 28'.7	89° 14'.2 N
Pollux	243° 46'.2	28° 02'.5 N
Procyon	245° 15'.6	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	207° 59'.8	12° 00'.0 N
Rigel	281° 26'.5	8° 12'.5 S
Rigil Kent	140° 13'.4	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.3 N
Shaula	96° 43'.2	37° 06'.0 S
Sirius	258° 47'.0	16° 42'.3 S
Spica	158° 47'.7	11° 07'.4 S
Suhail	223° 03'.6	43° 24'.0 S
Vega	80° 49'.7	38° 46'.8 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	76° 08'.3	14:43
Mars	240° 00'.2	03:47
Jupiter	171° 39'.3	08:19
Saturn	44° 09'.1	16:48

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
23 00	183° 24'.4	20° 21'.0 S	202° 15'.2	7'.9	18° 57'.9 S	8'.1	58'.4
01	198° 24'.2	21'.5	216° 42'.1	7'.8	19° 06'.0 S	8'.0	
02	213° 24'.0	22'.0	231° 08'.9	7'.8	14'.0	7'.9	
03	228° 23'.8	22'.5	245° 35'.7	7'.7	21'.9	7'.7	
04	243° 23'.7	23'.0	260° 02'.4	7'.7	29'.6	7'.7	58'.3
05	258° 23'.5	23'.6	274° 29'.1	7'.7	37'.3	7'.5	
06	273° 23'.3	24'.1	288° 55'.8	7'.6	44'.8	7'.4	
07	288° 23'.1	24'.6	303° 22'.4	7'.6	52'.2	7'.2	
08	303° 22'.9	25'.1	317° 49'.0	7'.6	59'.4	7'.2	
09	318° 22'.8	25'.6	332° 15'.6	7'.6	20° 06'.6 S	7'.0	58'.2
10	333° 22'.6	26'.1	346° 42'.2	7'.5	13'.6	6'.9	
11	348° 22'.4	26'.7	1° 08'.7	7'.5	20'.5	6'.8	
12	3° 22'.2	20° 27'.2 S	15° 35'.2	7'.4	20° 27'.3 S	6'.6	58'.2
13	18° 22'.1	27'.7	30° 01'.6	7'.5	33'.9	6'.5	
14	33° 21'.9	28'.2	44° 28'.1	7'.4	40'.4	6'.4	58'.1
15	48° 21'.7	28'.7	58° 54'.5	7'.4	46'.8	6'.2	
16	63° 21'.5	29'.2	73° 20'.9	7'.4	53'.0	6'.1	
17	78° 21'.3	29'.7	87° 47'.3	7'.3	59'.1	6'.0	
18	93° 21'.2	30'.2	102° 13'.6	7'.3	21° 05'.1 S	5'.9	58'.0
19	108° 21'.0	30'.7	116° 39'.9	7'.3	11'.0	5'.7	
20	123° 20'.8	31'.3	131° 06'.2	7'.3	16'.7	5'.6	
21	138° 20'.6	31'.8	145° 32'.5	7'.3	22'.3	5'.4	
22	153° 20'.4	32'.3	159° 58'.8	7'.2	27'.7	5'.3	
23	168° 20'.3	32'.8	174° 25'.0	7'.3	33'.0	5'.2	57'.9
24 00	183° 20'.1	20° 33'.3 S	188° 51'.3	7'.2	21° 38'.2 S	5'.1	57'.9
01	198° 19'.9	33'.8	203° 17'.5	7'.2	43'.3	4'.9	
02	213° 19'.7	34'.3	217° 43'.7	7'.2	48'.2	4'.7	
03	228° 19'.5	34'.8	232° 09'.9	7'.2	52'.9	4'.7	57'.8
04	243° 19'.3	35'.3	246° 36'.1	7'.2	57'.6	4'.5	
05	258° 19'.2	35'.8	261° 02'.3	7'.2	22° 02'.1 S	4'.4	
06	273° 19'.0	36'.3	275° 28'.5	7'.1	06'.5	4'.2	
07	288° 18'.8	36'.8	289° 54'.6	7'.2	10'.7	4'.1	57'.7
08	303° 18'.6	37'.3	304° 20'.8	7'.1	14'.8	3'.9	
09	318° 18'.4	37'.8	318° 46'.9	7'.2	18'.7	3'.8	
10	333° 18'.2	38'.3	333° 13'.1	7'.2	22'.5	3'.7	
11	348° 18'.0	38'.8	347° 39'.3	7'.1	26'.2	3'.6	57'.6
12	3° 17'.9	20° 39'.3 S	2° 05'.4	7'.2	22° 29'.8 S	3'.4	57'.6
13	18° 17'.7	39'.8	16° 31'.6	7'.1	33'.2	3'.2	
14	33° 17'.5	40'.3	30° 57'.7	7'.2	36'.4	3'.1	
15	48° 17'.3	40'.8	45° 23'.9	7'.1	39'.5	3'.0	57'.5
16	63° 17'.1	41'.3	59° 50'.0	7'.2	42'.5	2'.9	
17	78° 16'.9	41'.8	74° 16'.2	7'.2	45'.4	2'.7	
18	93° 16'.7	42'.3	88° 42'.4	7'.2	48'.1	2'.5	
19	108° 16'.5	42'.8	103° 08'.6	7'.2	50'.6	2'.4	57'.4
20	123° 16'.4	43'.2	117° 34'.8	7'.2	53'.0	2'.3	
21	138° 16'.2	43'.7	132° 01'.0	7'.2	55'.3	2'.2	
22	153° 16'.0	44'.2	146° 27'.2	7'.3	57'.5	2'.0	
23	168° 15'.8	44'.7	160° 53'.5	7'.2	59'.5	1'.8	57'.3
25 00	183° 15'.6	20° 45'.2 S	175° 19'.7	7'.3	23° 01'.3 S	1'.8	57'.3
01	198° 15'.4	45'.7	189° 46'.0	7'.3	03'.1	1'.6	
02	213° 15'.2	46'.2	204° 12'.3	7'.3	04'.7	1'.4	
03	228° 15'.0	46'.7	218° 38'.6	7'.4	06'.1	1'.3	57'.2
04	243° 14'.8	47'.2	233° 05'.0	7'.3	07'.4	1'.2	
05	258° 14'.6	47'.6	247° 31'.3	7'.4	08'.6	1'.0	
06	273° 14'.4	48'.1	261° 57'.7	7'.4	09'.6	0'.9	57'.1
07	288° 14'.3	48'.6	276° 24'.1	7'.5	10'.5	0'.8	
08	303° 14'.1	49'.1	290° 50'.6	7'.5	11'.3	0'.6	
09	318° 13'.9	49'.6	305° 17'.1	7'.5	11'.9	0'.5	
10	333° 13'.7	50'.1	319° 43'.6	7'.5	12'.4	0'.4	57'.0
11	348° 13'.5	50'.5	334° 10'.1	7'.6	12'.8	0'.2	
12	3° 13'.3	20° 51'.0 S	348° 36'.7	7'.6	23° 13'.0 S	0'.0	57'.0
13	18° 13'.1	51'.5	3° 03'.3	7'.6	13'.0	0'.0	
14	33° 12'.9	52'.0	17° 29'.9	7'.7	13'.0	0'.2	56'.9
15	48° 12'.7	52'.5	31° 56'.6	7'.7	12'.8	0'.3	
16	63° 12'.5	52'.9	46° 23'.3	7'.7	12'.5	0'.5	
17	78° 12'.3	53'.4	60° 50'.0	7'.8	12'.0	0'.6	56'.8
18	93° 12'.1	53'.9	75° 16'.8	7'.9	11'.4	0'.7	
19	108° 11'.9	54'.4	89° 43'.7	7'.8	10'.7	0'.9	
20	123° 11'.7	54'.8	104° 10'.5	7'.9	09'.8	1'.0	
21	138° 11'.5	55'.3	118° 37'.4	8'.0	08'.8	1'.1	56'.7
22	153° 11'.3	55'.8	133° 04'.4	8'.0	07'.7	1'.3	
23	168° 11'.1	56'.3	147° 31'.4	8'.1	06'.4	1'.4	
	SD 16'.2	d 0'.5	SD 15'.9		15'.7	15'.5	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
23	13 38	13 29	11:47	10:55	23:23	29d 1%
24	13 21	13 12	11:47	11:51	24:19	0d 0%
25	13 03	12 54	11:47	12:47	00:19	1d 1%

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1992 November 26, 27, 28 (Thur, Fri, Sat)

GMT	ARIES	VENUS -4.1		MARS -0.7		JUPITER -1.8		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
26 Thursday 00	65° 10'.4	138° 41'.6	24° 52'.9 S	305° 02'.6	22° 55'.1 N	236° 31'.3	2° 27'.2 S	109° 11'.8	17° 49'.9 S
01	80° 12'.9	153° 40'.8	52'.6	320° 05'.0	55'.2	251° 33'.4	27'.3	124° 14'.1	49'.8
02	95° 15'.4	168° 40'.0	52'.3	335° 07'.3	55'.3	266° 35'.5	27'.5	139° 16'.4	49'.8
03	110° 17'.8	183° 39'.2	52'.0	350° 09'.6	55'.4	281° 37'.6	27'.6	154° 18'.7	49'.7
04	125° 20'.3	198° 38'.4	51'.7	5° 12'.0	55'.5	296° 39'.7	27'.8	169° 21'.0	49'.7
05	140° 22'.8	213° 37'.6	51'.4	20° 14'.3	55'.6	311° 41'.8	27'.9	184° 23'.3	49'.6
06	155° 25'.2	228° 36'.8	51'.1	35° 16'.7	55'.7	326° 43'.9	28'.1	199° 25'.6	49'.6
07	170° 27'.7	243° 36'.0	50'.8	50° 19'.0	55'.8	341° 45'.9	28'.2	214° 27'.9	49'.5
08	185° 30'.1	258° 35'.2	50'.5	65° 21'.3	55'.9	356° 48'.0	28'.4	229° 30'.2	49'.5
09	200° 32'.6	273° 34'.4	50'.1	80° 23'.7	56'.0	11° 50'.1	28'.5	244° 32'.5	49'.4
10	215° 35'.1	288° 33'.6	49'.8	95° 26'.0	56'.1	26° 52'.2	28'.7	259° 34'.8	49'.4
11	230° 37'.5	303° 32'.8	49'.5	110° 28'.4	56'.2	41° 54'.3	28'.8	274° 37'.1	49'.3
12	245° 40'.0	318° 32'.0	24° 49'.2 S	125° 30'.7	22° 56'.3 N	56° 56'.4	2° 29'.0 S	289° 39'.4	17° 49'.3 S
13	260° 42'.5	333° 31'.2	48'.9	140° 33'.1	56'.4	71° 58'.5	29'.1	304° 41'.7	49'.3
14	275° 44'.9	348° 30'.5	48'.5	155° 35'.4	56'.5	87° 00'.6	29'.3	319° 44'.0	49'.2
15	290° 47'.4	3° 29'.7	48'.2	170° 37'.8	56'.6	102° 02'.6	29'.5	334° 46'.3	49'.2
16	305° 49'.9	18° 28'.9	47'.9	185° 40'.1	56'.7	117° 04'.7	29'.6	349° 48'.6	49'.1
17	320° 52'.3	33° 28'.1	47'.6	200° 42'.5	56'.8	132° 06'.8	29'.8	4° 50'.9	49'.1
18	335° 54'.8	48° 27'.3	47'.2	215° 44'.9	56'.9	147° 08'.9	29'.9	19° 53'.2	49'.0
19	350° 57'.3	63° 26'.5	46'.9	230° 47'.2	57'.0	162° 11'.0	30'.1	34° 55'.5	49'.0
20	5° 59'.7	78° 25'.7	46'.6	245° 49'.6	57'.1	177° 13'.1	30'.2	49° 57'.8	48'.9
21	21° 02'.2	93° 24'.9	46'.3	260° 51'.9	57'.2	192° 15'.2	30'.4	65° 00'.1	48'.9
22	36° 04'.6	108° 24'.1	45'.9	275° 54'.3	57'.3	207° 17'.3	30'.5	80° 02'.4	48'.8
23	51° 07'.1	123° 23'.3	45'.6	290° 56'.7	57'.4	222° 19'.4	30'.7	95° 04'.7	48'.8
27 Friday 00	66° 09'.6	138° 22'.5	24° 45'.3 S	305° 59'.0	22° 57'.5 N	237° 21'.4	2° 30'.8 S	110° 07'.0	17° 48'.7 S
01	81° 12'.0	153° 21'.7	44'.9	321° 01'.4	57'.6	252° 23'.5	31'.0	125° 09'.2	48'.7
02	96° 14'.5	168° 21'.0	44'.6	336° 03'.8	57'.7	267° 25'.6	31'.1	140° 11'.5	48'.6
03	111° 17'.0	183° 20'.2	44'.3	351° 06'.1	57'.8	282° 27'.7	31'.3	155° 13'.8	48'.6
04	126° 19'.4	198° 19'.4	43'.9	6° 08'.5	57'.9	297° 29'.8	31'.4	170° 16'.1	48'.5
05	141° 21'.9	213° 18'.6	43'.6	21° 10'.9	58'.0	312° 31'.9	31'.6	185° 18'.4	48'.5
06	156° 24'.4	228° 17'.8	43'.2	36° 13'.3	58'.1	327° 34'.0	31'.7	200° 20'.7	48'.4
07	171° 26'.8	243° 17'.0	42'.9	51° 15'.6	58'.2	342° 36'.1	31'.9	215° 23'.0	48'.4
08	186° 29'.3	258° 16'.2	42'.5	66° 18'.0	58'.3	357° 38'.2	32'.0	230° 25'.3	48'.3
09	201° 31'.8	273° 15'.4	42'.2	81° 20'.4	58'.4	12° 40'.3	32'.2	245° 27'.6	48'.3
10	216° 34'.2	288° 14'.7	41'.9	96° 22'.8	58'.5	27° 42'.3	32'.3	260° 29'.9	48'.2
11	231° 36'.7	303° 13'.9	41'.5	111° 25'.2	58'.6	42° 44'.4	32'.5	275° 32'.2	48'.2
12	246° 39'.1	318° 13'.1	24° 41'.2 S	126° 27'.6	22° 58'.7 N	57° 46'.5	2° 32'.6 S	290° 34'.5	17° 48'.1 S
13	261° 41'.6	333° 12'.3	40'.8	141° 29'.9	58'.8	72° 48'.6	32'.8	305° 36'.8	48'.1
14	276° 44'.1	348° 11'.5	40'.5	156° 32'.3	58'.9	87° 50'.7	32'.9	320° 39'.1	48'.0
15	291° 46'.5	3° 10'.7	40'.1	171° 34'.7	59'.0	102° 52'.8	33'.1	335° 41'.4	48'.0
16	306° 49'.0	18° 10'.0	39'.8	186° 37'.1	59'.1	117° 54'.9	33'.2	350° 43'.7	47'.9
17	321° 51'.5	33° 09'.2	39'.4	201° 39'.5	59'.2	132° 57'.0	33'.4	5° 46'.0	47'.9
18	336° 53'.9	48° 08'.4	39'.0	216° 41'.9	59'.3	147° 59'.1	33'.6	20° 48'.3	47'.8
19	351° 56'.4	63° 07'.6	38'.7	231° 44'.3	59'.4	163° 01'.2	33'.7	35° 50'.5	47'.8
20	6° 58'.9	78° 06'.8	38'.3	246° 46'.7	59'.5	178° 03'.3	33'.9	50° 52'.8	47'.7
21	22° 01'.3	93° 06'.1	38'.0	261° 49'.1	59'.6	193° 05'.4	34'.0	65° 55'.1	47'.7
22	37° 03'.8	108° 05'.3	37'.6	276° 51'.5	59'.8	208° 07'.4	34'.2	80° 57'.4	47'.6
23	52° 06'.3	123° 04'.5	37'.2	291° 53'.9	59'.9	223° 09'.5	34'.3	95° 59'.7	47'.6
28 Saturday 00	67° 08'.7	138° 03'.7	24° 36'.9 S	306° 56'.3	23° 00'.0 N	238° 11'.6	2° 34'.5 S	111° 02'.0	17° 47'.5 S
01	82° 11'.2	153° 02'.9	36'.5	321° 58'.7	00'.1	253° 13'.7	34'.6	126° 04'.3	47'.5
02	97° 13'.6	168° 02'.2	36'.2	337° 01'.1	00'.2	268° 15'.8	34'.8	141° 06'.6	47'.4
03	112° 16'.1	183° 01'.4	35'.8	352° 03'.5	00'.3	283° 17'.9	34'.9	156° 08'.9	47'.4
04	127° 18'.6	198° 00'.6	35'.4	7° 05'.9	00'.4	298° 20'.0	35'.1	171° 11'.2	47'.3
05	142° 21'.0	212° 59'.8	35'.1	22° 08'.3	00'.5	313° 22'.1	35'.2	186° 13'.5	47'.3
06	157° 23'.5	227° 59'.1	34'.7	37° 10'.7	00'.6	328° 24'.2	35'.4	201° 15'.8	47'.2
07	172° 26'.0	242° 58'.3	34'.3	52° 13'.2	00'.7	343° 26'.3	35'.5	216° 18'.0	47'.2
08	187° 28'.4	257° 57'.5	33'.9	67° 15'.6	00'.8	358° 28'.4	35'.7	231° 20'.3	47'.1
09	202° 30'.9	272° 56'.7	33'.6	82° 18'.0	01'.0	13° 30'.5	35'.8	246° 22'.6	47'.1
10	217° 33'.4	287° 56'.0	33'.2	97° 20'.4	01'.1	28° 32'.6	36'.0	261° 24'.9	47'.0
11	232° 35'.8	302° 55'.2	32'.8	112° 22'.8	01'.2	43° 34'.7	36'.1	276° 27'.2	47'.0
12	247° 38'.3	317° 54'.4	24° 32'.4 S	127° 25'.2	23° 01'.3 N	58° 36'.8	2° 36'.3 S	291° 29'.5	17° 46'.9 S
13	262° 40'.7	332° 53'.6	32'.1	142° 27'.7	01'.4	73° 38'.9	36'.4	306° 31'.8	46'.9
14	277° 43'.2	347° 52'.9	31'.7	157° 30'.1	01'.5	88° 41'.0	36'.5	321° 34'.1	46'.8
15	292° 45'.7	2° 52'.1	31'.3	172° 32'.5	01'.6	103° 43'.1	36'.7	336° 36'.4	46'.8
16	307° 48'.1	17° 51'.3	30'.9	187° 34'.9	01'.7	118° 45'.1	36'.8	351° 38'.7	46'.7
17	322° 50'.6	32° 50'.5	30'.5	202° 37'.4	01'.9	133° 47'.2	37'.0	6° 41'.0	46'.7
18	337° 53'.1	47° 49'.8	30'.1	217° 39'.8	02'.0	148° 49'.3	37'.1	21° 43'.2	46'.6
19	352° 55'.5	62° 49'.0	29'.8	232° 42'.2	02'.1	163° 51'.4	37'.3	36° 45'.5	46'.6
20	7° 58'.0	77° 48'.2	29'.4	247° 44'.7	02'.2	178° 53'.5	37'.4	51° 47'.8	46'.5
21	23° 00'.5	92° 47'.5	29'.0	262° 47'.1	02'.3	193° 55'.6	37'.6	66° 50'.1	46'.5
22	38° 02'.9	107° 46'.7	28'.6	277° 49'.5	02'.4	208° 57'.7	37'.7	81° 52'.4	46'.4
23	53° 05'.4	122° 45'.9	28'.2	292° 52'.0	02'.5	223° 59'.8	37'.9	96° 54'.7	46'.4
	M.P. 19:32	v -0'.8	d 0'.3	v 2'.4	d 0'.1	v 2'.1	d 0'.2	v 2'.3	d 0'.0

Name	SHA	Dec
Acamar	315° 29'.5	40° 20'.0 S
Achernar	335° 37'.6	57° 16'.4 S
Acrux	173° 27'.0	63° 03'.4 S
Adhara	255° 24'.3	28° 57'.6 S
Aldebaran	291° 06'.7	16° 29'.8 N
Alioth	166° 34'.4	55° 59'.6 N
Alkaid	153° 11'.3	49° 20'.7 N
Alnair	28° 02'.9	46° 59'.8 S
Alnilam	276° 01'.6	1° 12'.3 S
Alphard	218° 11'.1	8° 37'.7 S
Alphecca	126° 24'.4	26° 44'.3 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.4	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.1 N
Atria	108° 01'.8	69° 00'.9 S
Avior	234° 24'.0	59° 29'.0 S
Bellatrix	278° 48'.2	6° 20'.7 N
Betelgeuse	271° 17'.6	7° 24'.4 N
Canopus	264° 02'.5	52° 41'.4 S
Capella	280° 56'.7	45° 59'.5 N
Deneb	49° 42'.2	45° 15'.6 N
Denebola	182° 49'.4	14° 36'.6 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.4	61° 47'.0 N
Elnath	278° 31'.7	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.5 N
Enif	34° 02'.3	9° 50'.8 N
Fomalhaut	15° 40'.8	29° 39'.6 S
Gacrux	172° 18'.5	57° 04'.2 S
Gienah	176° 08'.3	17° 30'.1 S
Hadar	149° 10'.4	60° 20'.2 S
Hamal	328° 17'.8	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.4	74° 10'.9 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.9 N
Menkent	148° 26'.1	36° 20'.0 S
Miaplacidus	221° 42'.7	69° 41'.1 S
Mirfak	309° 01'.9	49° 50'.3 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.6	56° 45'.6 S
Polaris	323° 28'.9	89° 14'.2 N
Pollux	243° 46'.2	28° 02'.5 N
Procyon	245° 15'.5	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	207° 59'.8	12° 00'.0 N
Rigel	281° 26'.5	8° 12'.5 S
Rigil Kent	140° 13'.4	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.8	56° 30'.3 N
Shaula	96° 43'.2	37° 05'.9 S
Sirius	258° 46'.9	16° 42'.3 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.6	43° 24'.1 S
Vega	80° 49'.7	38° 46'.8 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	72° 13'.0	14:47
Mars	239° 49'.5	03:36
Jupiter	171° 11'.9	08:09
Saturn	43° 57'.4	16:37

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
26 00	183° 10'.9	20° 56'.7 S	161° 58'.5	8'.1	23° 05'.0 S	1'.5	56'.7
01	198° 10'.7	57'.2	176° 25'.6	8'.1	03'.5	1'.6	56'.6
02	213° 10'.5	57'.7	190° 52'.7	8'.3	01'.9	1'.8	
03	228° 10'.3	58'.2	205° 20'.0	8'.2	00'.1	1'.9	
04	243° 10'.1	58'.6	219° 47'.2	8'.3	22° 58'.2 S	2'.0	56'.5
05	258° 09'.9	59'.1	234° 14'.5	8'.4	56'.2	2'.2	
06	273° 09'.7	59'.6	248° 41'.9	8'.4	54'.0	2'.3	
07	288° 09'.5	21° 00'.0 S	263° 09'.3	8'.5	51'.7	2'.4	
08	303° 09'.3	00'.5	277° 36'.8	8'.5	49'.3	2'.5	56'.4
09	318° 09'.1	01'.0	292° 04'.3	8'.6	46'.8	2'.7	
10	333° 08'.9	01'.4	306° 31'.9	8'.7	44'.1	2'.8	
11	348° 08'.7	01'.9	320° 59'.6	8'.7	41'.3	2'.9	
12	3° 08'.5	21° 02'.4 S	335° 27'.3	8'.8	22° 38'.4 S	3'.0	56'.3
13	18° 08'.3	02'.8	349° 55'.1	8'.8	35'.4	3'.2	
14	33° 08'.1	03'.3	4° 22'.9	8'.9	32'.2	3'.2	
15	48° 07'.9	03'.8	18° 50'.8	9'.0	29'.0	3'.4	
16	63° 07'.7	04'.2	33° 18'.8	9'.0	25'.6	3'.5	56'.2
17	78° 07'.5	04'.7	47° 46'.8	9'.1	22'.1	3'.6	
18	93° 07'.3	05'.1	62° 14'.9	9'.1	18'.5	3'.8	
19	108° 07'.1	05'.6	76° 43'.0	9'.2	14'.7	3'.8	56'.1
20	123° 06'.9	06'.1	91° 11'.2	9'.3	10'.9	4'.0	
21	138° 06'.7	06'.5	105° 39'.5	9'.4	06'.9	4'.1	
22	153° 06'.5	07'.0	120° 07'.9	9'.4	02'.8	4'.2	
23	168° 06'.3	07'.4	134° 36'.3	9'.5	21° 58'.6 S	4'.3	56'.0
27 00	183° 06'.1	21° 07'.9 S	149° 04'.8	9'.6	21° 54'.3 S	4'.4	56'.0
01	198° 05'.9	08'.3	163° 33'.4	9'.6	49'.9	4'.6	
02	213° 05'.7	08'.8	178° 02'.0	9'.7	45'.3	4'.6	
03	228° 05'.5	09'.3	192° 30'.7	9'.8	40'.7	4'.8	55'.9
04	243° 05'.3	09'.7	206° 59'.5	9'.8	35'.9	4'.8	
05	258° 05'.1	10'.2	221° 28'.3	9'.9	31'.1	5'.0	
06	273° 04'.8	10'.6	235° 57'.2	10'.0	26'.1	5'.1	
07	288° 04'.6	11'.1	250° 26'.2	10'.1	21'.0	5'.1	55'.8
08	303° 04'.4	11'.5	264° 55'.3	10'.1	15'.9	5'.3	
09	318° 04'.2	12'.0	279° 24'.4	10'.2	10'.6	5'.4	
10	333° 04'.0	12'.4	293° 53'.6	10'.3	05'.2	5'.5	
11	348° 03'.8	12'.9	308° 22'.9	10'.4	20° 59'.7 S	5'.6	55'.7
12	3° 03'.6	21° 13'.3 S	322° 52'.3	10'.4	20° 54'.1 S	5'.7	55'.7
13	18° 03'.4	13'.8	337° 21'.7	10'.5	48'.4	5'.8	
14	33° 03'.2	14'.2	351° 51'.2	10'.6	42'.6	5'.9	
15	48° 03'.0	14'.7	6° 20'.8	10'.6	36'.7	5'.9	55'.6
16	63° 02'.8	15'.1	20° 50'.4	10'.7	30'.8	6'.1	
17	78° 02'.5	15'.5	35° 20'.1	10'.8	24'.7	6'.2	
18	93° 02'.3	16'.0	49° 49'.9	10'.9	18'.5	6'.3	
19	108° 02'.1	16'.4	64° 19'.8	11'.0	12'.2	6'.4	55'.5
20	123° 01'.9	16'.9	78° 49'.8	11'.0	05'.8	6'.4	
21	138° 01'.7	17'.3	93° 19'.8	11'.1	19° 59'.4 S	6'.6	
22	153° 01'.5	17'.8	107° 49'.9	11'.2	52'.8	6'.6	
23	168° 01'.3	18'.2	122° 20'.1	11'.2	46'.2	6'.8	55'.4
28 00	183° 01'.1	21° 18'.6 S	136° 50'.3	11'.4	19° 39'.4 S	6'.8	55'.4
01	198° 00'.8	19'.1	151° 20'.7	11'.4	32'.6	6'.9	
02	213° 00'.6	19'.5	165° 51'.1	11'.5	25'.7	7'.0	
03	228° 00'.4	20'.0	180° 21'.6	11'.5	18'.7	7'.1	55'.3
04	243° 00'.2	20'.4	194° 52'.1	11'.6	11'.6	7'.1	
05	258° 00'.0	20'.8	209° 22'.7	11'.7	04'.5	7'.3	
06	272° 59'.8	21'.3	223° 53'.4	11'.8	18° 57'.2 S	7'.3	
07	287° 59'.6	21'.7	238° 24'.2	11'.9	49'.9	7'.5	55'.2
08	302° 59'.3	22'.1	252° 55'.1	11'.9	42'.4	7'.5	
09	317° 59'.1	22'.6	267° 26'.0	12'.0	34'.9	7'.5	
10	332° 58'.9	23'.0	281° 57'.0	12'.1	27'.4	7'.7	
11	347° 58'.7	23'.4	296° 28'.1	12'.1	19'.7	7'.8	
12	2° 58'.5	21° 23'.9 S	310° 59'.2	12'.3	18° 11'.9 S	7'.8	55'.1
13	17° 58'.3	24'.3	325° 30'.5	12'.3	04'.1	7'.9	
14	32° 58'.1	24'.7	340° 01'.8	12'.3	17° 56'.2 S	7'.9	
15	47° 57'.8	25'.2	354° 33'.1	12'.5	48'.3	8'.1	
16	62° 57'.6	25'.6	9° 04'.6	12'.5	40'.2	8'.1	
17	77° 57'.4	26'.0	23° 36'.1	12'.6	32'.1	8'.2	55'.0
18	92° 57'.2	26'.4	38° 07'.7	12'.7	23'.9	8'.3	
19	107° 57'.0	26'.9	52° 39'.4	12'.7	15'.6	8'.3	
20	122° 56'.7	27'.3	67° 11'.1	12'.8	07'.3	8'.4	
21	137° 56'.5	27'.7	81° 42'.9	12'.9	16° 58'.9 S	8'.5	
22	152° 56'.3	28'.1	96° 14'.8	12'.9	50'.4	8'.5	54'.9
23	167° 56'.1	28'.6	110° 46'.7	13'.0	41'.9	8'.7	
	SD 16'.2	d 0'.4	SD 15'.3		15'.2	15'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
26	12 44	12 35	11:47	13:42	01:15	2d 5%
27	12 25	12 15	11:48	14:34	02:08	3d 10%
28	12 05	11 54	11:48	15:23	02:59	4d 17%

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1992 Nov 29, 30, Dec. 1 (Sun, Mon, Tue)

GMT	ARIES	VENUS -4.1		MARS -0.8		JUPITER -1.8		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
29 Sunday 00	68° 07'.9	137° 45'.2	24° 27'.8 S	307° 54'.4	23° 02'.7 N	239° 01'.9	2° 38'.0 S	111° 57'.0	17° 46'.3 S
01	83° 10'.3	152° 44'.4	27'.4	322° 56'.8	02'.8	254° 04'.0	38'.2	126° 59'.3	46'.3
02	98° 12'.8	167° 43'.6	27'.0	337° 59'.3	02'.9	269° 06'.1	38'.3	142° 01'.6	46'.2
03	113° 15'.2	182° 42'.9	26'.6	353° 01'.7	03'.0	284° 08'.2	38'.5	157° 03'.8	46'.2
04	128° 17'.7	197° 42'.1	26'.2	8° 04'.2	03'.1	299° 10'.3	38'.6	172° 06'.1	46'.1
05	143° 20'.2	212° 41'.3	25'.8	23° 06'.6	03'.2	314° 12'.4	38'.8	187° 08'.4	46'.1
06	158° 22'.6	227° 40'.6	25'.4	38° 09'.1	03'.3	329° 14'.5	38'.9	202° 10'.7	46'.0
07	173° 25'.1	242° 39'.8	25'.0	53° 11'.5	03'.5	344° 16'.6	39'.1	217° 13'.0	46'.0
08	188° 27'.6	257° 39'.0	24'.6	68° 14'.0	03'.6	359° 18'.7	39'.2	232° 15'.3	45'.9
09	203° 30'.0	272° 38'.3	24'.2	83° 16'.4	03'.7	14° 20'.8	39'.4	247° 17'.6	45'.9
10	218° 32'.5	287° 37'.5	23'.8	98° 18'.9	03'.8	29° 22'.9	39'.5	262° 19'.9	45'.8
11	233° 35'.0	302° 36'.8	23'.4	113° 21'.3	03'.9	44° 25'.0	39'.7	277° 22'.1	45'.8
12	248° 37'.4	317° 36'.0	24° 23'.0 S	128° 23'.8	23° 04'.1 N	59° 27'.1	2° 39'.8 S	292° 24'.4	17° 45'.7 S
13	263° 39'.9	332° 35'.2	22'.6	143° 26'.2	04'.2	74° 29'.2	40'.0	307° 26'.7	45'.7
14	278° 42'.4	347° 34'.5	22'.2	158° 28'.7	04'.3	89° 31'.3	40'.1	322° 29'.0	45'.6
15	293° 44'.8	2° 33'.7	21'.8	173° 31'.2	04'.4	104° 33'.4	40'.3	337° 31'.3	45'.5
16	308° 47'.3	17° 32'.9	21'.4	188° 33'.6	04'.5	119° 35'.5	40'.4	352° 33'.6	45'.5
17	323° 49'.7	32° 32'.2	21'.0	203° 36'.1	04'.7	134° 37'.6	40'.5	7° 35'.9	45'.4
18	338° 52'.2	47° 31'.4	20'.6	218° 38'.6	04'.8	149° 39'.7	40'.7	22° 38'.2	45'.4
19	353° 54'.7	62° 30'.7	20'.1	233° 41'.0	04'.9	164° 41'.8	40'.8	37° 40'.4	45'.3
20	8° 57'.1	77° 29'.9	19'.7	248° 43'.5	05'.0	179° 43'.9	41'.0	52° 42'.7	45'.3
21	23° 59'.6	92° 29'.2	19'.3	263° 46'.0	05'.1	194° 46'.0	41'.1	67° 45'.0	45'.2
22	39° 02'.1	107° 28'.4	18'.9	278° 48'.4	05'.3	209° 48'.1	41'.3	82° 47'.3	45'.2
23	54° 04'.5	122° 27'.6	18'.5	293° 50'.9	05'.4	224° 50'.2	41'.4	97° 49'.6	45'.1
30 Monday 00	69° 07'.0	137° 26'.9	24° 18'.1 S	308° 53'.4	23° 05'.5 N	239° 52'.3	2° 41'.6 S	112° 51'.9	17° 45'.1 S
01	84° 09'.5	152° 26'.1	17'.6	323° 55'.9	05'.6	254° 54'.4	41'.7	127° 54'.2	45'.0
02	99° 11'.9	167° 25'.4	17'.2	338° 58'.3	05'.8	269° 56'.5	41'.9	142° 56'.4	45'.0
03	114° 14'.4	182° 24'.6	16'.8	354° 00'.8	05'.9	284° 58'.6	42'.0	157° 58'.7	44'.9
04	129° 16'.9	197° 23'.9	16'.4	9° 03'.3	06'.0	300° 00'.7	42'.2	173° 01'.0	44'.9
05	144° 19'.3	212° 23'.1	15'.9	24° 05'.8	06'.1	315° 02'.8	42'.3	188° 03'.3	44'.8
06	159° 21'.8	227° 22'.4	15'.5	39° 08'.3	06'.3	330° 04'.9	42'.5	203° 05'.6	44'.8
07	174° 24'.2	242° 21'.6	15'.1	54° 10'.7	06'.4	345° 07'.0	42'.6	218° 07'.9	44'.7
08	189° 26'.7	257° 20'.9	14'.7	69° 13'.2	06'.5	0° 09'.1	42'.7	233° 10'.1	44'.7
09	204° 29'.2	272° 20'.1	14'.2	84° 15'.7	06'.6	15° 11'.2	42'.9	248° 12'.4	44'.6
10	219° 31'.6	287° 19'.4	13'.8	99° 18'.2	06'.8	30° 13'.3	43'.0	263° 14'.7	44'.6
11	234° 34'.1	302° 18'.6	13'.4	114° 20'.7	06'.9	45° 15'.4	43'.2	278° 17'.0	44'.5
12	249° 36'.6	317° 17'.9	24° 12'.9 S	129° 23'.2	23° 07'.0 N	60° 17'.5	2° 43'.3 S	293° 19'.3	17° 44'.5 S
13	264° 39'.0	332° 17'.1	12'.5	144° 25'.7	07'.1	75° 19'.6	43'.5	308° 21'.6	44'.4
14	279° 41'.5	347° 16'.4	12'.0	159° 28'.2	07'.3	90° 21'.7	43'.6	323° 23'.9	44'.4
15	294° 44'.0	2° 15'.6	11'.6	174° 30'.7	07'.4	105° 23'.8	43'.8	338° 26'.1	44'.3
16	309° 46'.4	17° 14'.9	11'.2	189° 33'.2	07'.5	120° 25'.9	43'.9	353° 28'.4	44'.2
17	324° 48'.9	32° 14'.1	10'.7	204° 35'.7	07'.6	135° 28'.0	44'.1	8° 30'.7	44'.2
18	339° 51'.3	47° 13'.4	10'.3	219° 38'.2	07'.8	150° 30'.2	44'.2	23° 33'.0	44'.1
19	354° 53'.8	62° 12'.6	09'.8	234° 40'.7	07'.9	165° 32'.3	44'.3	38° 35'.3	44'.1
20	9° 56'.3	77° 11'.9	09'.4	249° 43'.2	08'.0	180° 34'.4	44'.5	53° 37'.6	44'.0
21	24° 58'.7	92° 11'.1	09'.0	264° 45'.7	08'.2	195° 36'.5	44'.6	68° 39'.8	44'.0
22	40° 01'.2	107° 10'.4	08'.5	279° 48'.2	08'.3	210° 38'.6	44'.8	83° 42'.1	43'.9
23	55° 03'.7	122° 09'.7	08'.1	294° 50'.7	08'.4	225° 40'.7	44'.9	98° 44'.4	43'.9
1 Tuesday 00	70° 06'.1	137° 08'.9	24° 07'.6 S	309° 53'.2	23° 08'.5 N	240° 42'.8	2° 45'.1 S	113° 46'.7	17° 43'.8 S
01	85° 08'.6	152° 08'.2	07'.2	324° 55'.7	08'.7	255° 44'.9	45'.2	128° 49'.0	43'.8
02	100° 11'.1	167° 07'.4	06'.7	339° 58'.3	08'.8	270° 47'.0	45'.4	143° 51'.2	43'.7
03	115° 13'.5	182° 06'.7	06'.3	355° 00'.8	08'.9	285° 49'.1	45'.5	158° 53'.5	43'.7
04	130° 16'.0	197° 05'.9	05'.8	10° 03'.3	09'.1	300° 51'.2	45'.6	173° 55'.8	43'.6
05	145° 18'.5	212° 05'.2	05'.4	25° 05'.8	09'.2	315° 53'.3	45'.8	188° 58'.1	43'.6
06	160° 20'.9	227° 04'.5	04'.9	40° 08'.3	09'.3	330° 55'.4	45'.9	204° 00'.4	43'.5
07	175° 23'.4	242° 03'.7	04'.4	55° 10'.9	09'.5	345° 57'.5	46'.1	219° 02'.7	43'.5
08	190° 25'.8	257° 03'.0	04'.0	70° 13'.4	09'.6	0° 59'.6	46'.2	234° 04'.9	43'.4
09	205° 28'.3	272° 02'.3	03'.5	85° 15'.9	09'.7	16° 01'.7	46'.4	249° 07'.2	43'.3
10	220° 30'.8	287° 01'.5	03'.1	100° 18'.4	09'.9	31° 03'.8	46'.5	264° 09'.5	43'.3
11	235° 33'.2	302° 00'.8	02'.6	115° 21'.0	10'.0	46° 05'.9	46'.7	279° 11'.8	43'.2
12	250° 35'.7	317° 00'.0	24° 02'.1 S	130° 23'.5	23° 10'.1 N	61° 08'.1	2° 46'.8 S	294° 14'.1	17° 43'.2 S
13	265° 38'.2	331° 59'.3	01'.7	145° 26'.0	10'.3	76° 10'.2	46'.9	309° 16'.3	43'.1
14	280° 40'.6	346° 58'.6	01'.2	160° 28'.5	10'.4	91° 12'.3	47'.1	324° 18'.6	43'.1
15	295° 43'.1	1° 57'.8	00'.8	175° 31'.1	10'.5	106° 14'.4	47'.2	339° 20'.9	43'.0
16	310° 45'.6	16° 57'.1	00'.3	190° 33'.6	10'.7	121° 16'.5	47'.4	354° 23'.2	43'.0
17	325° 48'.0	31° 56'.4	23° 59'.8 S	205° 36'.2	10'.8	136° 18'.6	47'.5	9° 25'.5	42'.9
18	340° 50'.5	46° 55'.6	59'.3	220° 38'.7	10'.9	151° 20'.7	47'.7	24° 27'.7	42'.9
19	355° 53'.0	61° 54'.9	58'.9	235° 41'.2	11'.1	166° 22'.8	47'.8	39° 30'.0	42'.8
20	10° 55'.4	76° 54'.2	58'.4	250° 43'.8	11'.2	181° 24'.9	47'.9	54° 32'.3	42'.8
21	25° 57'.9	91° 53'.4	57'.9	265° 46'.3	11'.3	196° 27'.0	48'.1	69° 34'.6	42'.7
22	41° 00'.3	106° 52'.7	57'.5	280° 48'.9	11'.5	211° 29'.1	48'.2	84° 36'.9	42'.6
23	56° 02'.8	121° 52'.0	57'.0	295° 51'.4	11'.6	226° 31'.2	48'.4	99° 39'.1	42'.6
	M.P. 19:20	v -0'.7	d 0'.4	v 2'.5	d 0'.1	v 2'.1	d 0'.1	v 2'.3	d 0'.1

STARS		
Name	SHA	Dec
Acamar	315° 29'.5	40° 20'.0 S
Achernar	335° 37'.7	57° 16'.5 S
Acrux	173° 27'.0	63° 03'.4 S
Adhara	255° 24'.3	28° 57'.6 S
Aldebaran	291° 06'.7	16° 29'.8 N
Alioth	166° 34'.4	55° 59'.6 N
Alkaid	153° 11'.3	49° 20'.7 N
Alnair	28° 03'.0	46° 59'.8 S
Alnilam	276° 01'.6	1° 12'.3 S
Alphard	218° 11'.1	8° 37'.7 S
Alphecca	126° 24'.4	26° 44'.3 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.4	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.1 N
Atria	108° 01'.8	69° 00'.9 S
Avior	234° 24'.0	59° 29'.0 S
Bellatrix	278° 48'.1	6° 20'.7 N
Betelgeuse	271° 17'.6	7° 24'.4 N
Canopus	264° 02'.5	52° 41'.4 S
Capella	280° 56'.7	45° 59'.5 N
Deneb	49° 42'.2	45° 15'.6 N
Denebola	182° 49'.4	14° 36'.6 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.4	61° 47'.0 N
Elnath	278° 31'.7	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.5 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.8	29° 39'.6 S
Gacrux	172° 18'.4	57° 04'.2 S
Gienah	176° 08'.3	17° 30'.1 S
Hadar	149° 10'.4	60° 20'.2 S
Hamal	328° 17'.8	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.4	74° 10'.9 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.9 N
Menkent	148° 26'.1	36° 20'.0 S
Miaplacidus	221° 42'.7	69° 41'.1 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.6	56° 45'.6 S
Polaris	323° 29'.4	89° 14'.2 N
Pollux	243° 46'.2	28° 02'.5 N
Procyon	245° 15'.5	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	207° 59'.8	12° 00'.0 N
Rigel	281° 26'.5	8° 12'.5 S
Rigil Kent	140° 13'.3	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.9	56° 30'.3 N
Shaula	96° 43'.2	37° 05'.9 S
Sirius	258° 46'.9	16° 42'.3 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.6	43° 24'.1 S
Vega	80° 49'.7	38° 46'.8 N
Zuben'ubi	137° 22'.8	16° 00'.7 S

	SHA	Mer.Pass.
Venus	68° 19'.9	14:51
Mars	239° 46'.4	03:24
Jupiter	170° 45'.3	07:59
Saturn	43° 44'.9	16:26

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
182° 55'.9	21° 29'.0 S	125° 18'.7	13'.1	16° 33'.2 S	8'.6	54'.9
197° 55'.6	29'.4	139° 50'.8	13'.2	24'.6	8'.8	
212° 55'.4	29'.8	154° 23'.0	13'.2	15'.8	8'.8	
227° 55'.2	30'.3	168° 55'.2	13'.3	07'.0	8'.9	54'.8
242° 55'.0	30'.7	183° 27'.5	13'.3	15° 58'.1 S	8'.9	
257° 54'.8	31'.1	197° 59'.8	13'.4	49'.2	9'.0	
272° 54'.5	31'.5	212° 32'.2	13'.5	40'.2	9'.1	
287° 54'.3	31'.9	227° 04'.7	13'.6	31'.1	9'.1	
302° 54'.1	32'.3	241° 37'.3	13'.6	22'.0	9'.2	
317° 53'.9	32'.8	256° 09'.9	13'.7	12'.8	9'.2	54'.7
332° 53'.7	33'.2	270° 42'.6	13'.7	03'.6	9'.3	
347° 53'.4	33'.6	285° 15'.3	13'.8	14° 54'.3 S	9'.4	
2° 53'.2	21° 34'.0 S	299° 48'.1	13'.9	14° 44'.9 S	9'.4	54'.7
17° 53'.0	34'.4	314° 21'.0	13'.9	35'.5	9'.5	
32° 52'.8	34'.8	328° 53'.9	14'.0	26'.0	9'.5	
47° 52'.5	35'.2	343° 26'.9	14'.1	16'.5	9'.6	54'.6
62° 52'.3	35'.7	358° 00'.0	14'.1	06'.9	9'.6	
77° 52'.1	36'.1	12° 33'.1	14'.1	13° 57'.3 S	9'.7	
92° 51'.9	36'.5	27° 06'.2	14'.3	47'.6	9'.8	
107° 51'.6	36'.9	41° 39'.5	14'.3	37'.8	9'.8	
122° 51'.4	37'.3	56° 12'.8	14'.3	28'.0	9'.8	
137° 51'.2	37'.7	70° 46'.1	14'.4	18'.2	9'.9	
152° 51'.0	38'.1	85° 19'.5	14'.5	08'.3	9'.9	54'.5
167° 50'.7	38'.5	99° 53'.0	14'.5	12° 58'.4 S	10'.0	
182° 50'.5	21° 38'.9 S	114° 26'.5	14'.5	12° 48'.4 S	10'.1	54'.5
197° 50'.3	39'.3	129° 00'.0	14'.6	38'.3	10'.0	
212° 50'.0	39'.7	143° 33'.6	14'.7	28'.3	10'.2	
227° 49'.8	40'.1	158° 07'.3	14'.7	18'.1	10'.1	
242° 49'.6	40'.5	172° 41'.0	14'.8	08'.0	10'.2	
257° 49'.4	40'.9	187° 14'.8	14'.8	11° 57'.8 S	10'.3	
272° 49'.1	41'.3	201° 48'.6	14'.9	47'.5	10'.3	54'.4
287° 48'.9	41'.7	216° 22'.5	14'.9	37'.2	10'.4	
302° 48'.7	42'.1	230° 56'.4	15'.0	26'.8	10'.3	
317° 48'.4	42'.5	245° 30'.4	15'.0	16'.5	10'.5	
332° 48'.2	42'.9	260° 04'.4	15'.1	06'.0	10'.4	
347° 48'.0	43'.3	274° 38'.5	15'.1	10° 55'.6 S	10'.5	
2° 47'.8	21° 43'.7 S	289° 12'.6	15'.1	10° 45'.1 S	10'.6	54'.4
17° 47'.5	44'.1	303° 46'.7	15'.2	34'.5	10'.6	
32° 47'.3	44'.5	318° 20'.9	15'.3	23'.9	10'.6	
47° 47'.1	44'.9	332° 55'.2	15'.3	13'.3	10'.6	54'.3
62° 46'.8	45'.3	347° 29'.5	15'.3	02'.7	10'.7	
77° 46'.6	45'.7	2° 03'.8	15'.3	9° 52'.0 S	10'.7	
92° 46'.4	46'.1	16° 38'.1	15'.5	41'.3	10'.8	
107° 46'.1	46'.5	31° 12'.6	15'.4	30'.5	10'.8	
122° 45'.9	46'.9	45° 47'.0	15'.5	19'.7	10'.8	
137° 45'.7	47'.3	60° 21'.5	15'.5	08'.9	10'.9	
152° 45'.4	47'.7	74° 56'.0	15'.5	8° 58'.0 S	10'.9	
167° 45'.2	48'.1	89° 30'.5	15'.6	47'.1	10'.9	
182° 45'.0	21° 48'.4 S	104° 05'.1	15'.7	8° 36'.2 S	11'.0	54'.3
197° 44'.7	48'.8	118° 39'.8	15'.6	25'.2	10'.9	
212° 44'.5	49'.2	133° 14'.4	15'.7	14'.3	11'.1	
227° 44'.3	49'.6	147° 49'.1	15'.7	03'.2	11'.0	
242° 44'.0	50'.0	162° 23'.8	15'.8	7° 52'.2 S	11'.1	
257° 43'.8	50'.4	176° 58'.6	15'.7	41'.1	11'.1	
272° 43'.6	50'.8	191° 33'.3	15'.9	30'.0	11'.1	
287° 43'.3	51'.1	206° 08'.2	15'.8	18'.9	11'.1	54'.2
302° 43'.1	51'.5	220° 43'.0	15'.9	07'.8	11'.2	
317° 42'.9	51'.9	235° 17'.9	15'.8	6° 56'.6 S	11'.2	
332° 42'.6	52'.3	249° 52'.7	16'.0	45'.4	11'.2	
347° 42'.4	52'.7	264° 27'.7	15'.9	34'.2	11'.3	
2° 42'.2	21° 53'.1 S	279° 02'.6	16'.0	6° 22'.9 S	11'.2	54'.2
17° 41'.9	53'.4	293° 37'.6	16'.0	11'.7	11'.3	
32° 41'.7	53'.8	308° 12'.6	16'.0	00'.4	11'.3	
47° 41'.4	54'.2	322° 47'.6	16'.0	5° 49'.1 S	11'.4	
62° 41'.2	54'.6	337° 22'.6	16'.0	37'.7	11'.3	
77° 41'.0	54'.9	351° 57'.6	16'.1	26'.4	11'.4	
92° 40'.7	55'.3	6° 32'.7	16'.1	15'.0	11'.4	
107° 40'.5	55'.7	21° 07'.8	16'.1	03'.6	11'.4	
122° 40'.3	56'.1	35° 42'.9	16'.1	4° 52'.2 S	11'.5	
137° 40'.0	56'.4	50° 18'.0	16'.1	40'.7	11'.4	
152° 39'.8	56'.8	64° 53'.1	16'.2	29'.3	11'.5	
167° 39'.5	57'.2	79° 28'.3	16'.1	17'.8	11'.5	
SD 16'.2	d 0'.4	SD	14'.9	14'.8	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
29	11 44	11 33	11:48	16:08	03:46	5d 25%
30	11 22	11 11	11:49	16:52	04:30	6d 34%
1	11 00	10 49	11:49	17:33	05:12	7d 43%

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1992 December 2, 3, 4 (Wed, Thur, Fri)

GMT	ARIES	VENUS -4.1		MARS -0.8		JUPITER -1.8		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
2 Wednesday 00	71° 05'.3	136° 51'.2	23° 56'.5 S	310° 54'.0	23° 11'.8 N	241° 33'.4	2° 48'.5 S	114° 41'.4	17° 42'.5 S
01	86° 07'.7	151° 50'.5	56'.0	325° 56'.5	11'.9	256° 35'.5	48'.7	129° 43'.7	42'.5
02	101° 10'.2	166° 49'.8	55'.6	340° 59'.1	12'.0	271° 37'.6	48'.8	144° 46'.0	42'.4
03	116° 12'.7	181° 49'.1	55'.1	356° 01'.6	12'.2	286° 39'.7	48'.9	159° 48'.2	42'.4
04	131° 15'.1	196° 48'.3	54'.6	11° 04'.2	12'.3	301° 41'.8	49'.1	174° 50'.5	42'.3
05	146° 17'.6	211° 47'.6	54'.1	26° 06'.7	12'.4	316° 43'.9	49'.2	189° 52'.8	42'.3
06	161° 20'.1	226° 46'.9	53'.6	41° 09'.3	12'.6	331° 46'.0	49'.4	204° 55'.1	42'.2
07	176° 22'.5	241° 46'.2	53'.1	56° 11'.8	12'.7	346° 48'.1	49'.5	219° 57'.4	42'.2
08	191° 25'.0	256° 45'.4	52'.7	71° 14'.4	12'.9	1° 50'.2	49'.6	234° 59'.6	42'.1
09	206° 27'.4	271° 44'.7	52'.2	86° 17'.0	13'.0	16° 52'.4	49'.8	250° 01'.9	42'.1
10	221° 29'.9	286° 44'.0	51'.7	101° 19'.5	13'.1	31° 54'.5	49'.9	265° 04'.2	42'.0
11	236° 32'.4	301° 43'.3	51'.2	116° 22'.1	13'.3	46° 56'.6	50'.1	280° 06'.5	41'.9
12	251° 34'.8	316° 42'.5	23° 50'.7 S	131° 24'.7	23° 13'.4 N	61° 58'.7	2° 50'.2 S	295° 08'.7	17° 41'.9 S
13	266° 37'.3	331° 41'.8	50'.2	146° 27'.2	13'.6	77° 00'.8	50'.4	310° 11'.0	41'.8
14	281° 39'.8	346° 41'.1	49'.7	161° 29'.8	13'.7	92° 02'.9	50'.5	325° 13'.3	41'.8
15	296° 42'.2	1° 40'.4	49'.2	176° 32'.4	13'.8	107° 05'.0	50'.6	340° 15'.6	41'.7
16	311° 44'.7	16° 39'.7	48'.7	191° 34'.9	14'.0	122° 07'.1	50'.8	355° 17'.9	41'.7
17	326° 47'.2	31° 38'.9	48'.2	206° 37'.5	14'.1	137° 09'.2	50'.9	10° 20'.1	41'.6
18	341° 49'.6	46° 38'.2	47'.7	221° 40'.1	14'.3	152° 11'.4	51'.1	25° 22'.4	41'.6
19	356° 52'.1	61° 37'.5	47'.2	236° 42'.7	14'.4	167° 13'.5	51'.2	40° 24'.7	41'.5
20	11° 54'.6	76° 36'.8	46'.7	251° 45'.2	14'.6	182° 15'.6	51'.3	55° 27'.0	41'.5
21	26° 57'.0	91° 36'.1	46'.2	266° 47'.8	14'.7	197° 17'.7	51'.5	70° 29'.2	41'.4
22	41° 59'.5	106° 35'.3	45'.7	281° 50'.4	14'.8	212° 19'.8	51'.6	85° 31'.5	41'.3
23	57° 01'.9	121° 34'.6	45'.2	296° 53'.0	15'.0	227° 21'.9	51'.8	100° 33'.8	41'.3
3 Thursday 00	72° 04'.4	136° 33'.9	23° 44'.7 S	311° 55'.6	23° 15'.1 N	242° 24'.0	2° 51'.9 S	115° 36'.1	17° 41'.2 S
01	87° 06'.9	151° 33'.2	44'.2	326° 58'.2	15'.3	257° 26'.1	52'.1	130° 38'.3	41'.2
02	102° 09'.3	166° 32'.5	43'.7	342° 00'.8	15'.4	272° 28'.3	52'.2	145° 40'.6	41'.1
03	117° 11'.8	181° 31'.8	43'.2	357° 03'.3	15'.6	287° 30'.4	52'.3	160° 42'.9	41'.1
04	132° 14'.3	196° 31'.1	42'.7	12° 05'.9	15'.7	302° 32'.5	52'.5	175° 45'.2	41'.0
05	147° 16'.7	211° 30'.3	42'.2	27° 08'.5	15'.9	317° 34'.6	52'.6	190° 47'.4	41'.0
06	162° 19'.2	226° 29'.6	41'.7	42° 11'.1	16'.0	332° 36'.7	52'.8	205° 49'.7	40'.9
07	177° 21'.7	241° 28'.9	41'.2	57° 13'.7	16'.2	347° 38'.8	52'.9	220° 52'.0	40'.8
08	192° 24'.1	256° 28'.2	40'.7	72° 16'.3	16'.3	2° 41'.0	53'.0	235° 54'.3	40'.8
09	207° 26'.6	271° 27'.5	40'.2	87° 18'.9	16'.5	17° 43'.1	53'.2	250° 56'.5	40'.7
10	222° 29'.0	286° 26'.8	39'.6	102° 21'.5	16'.6	32° 45'.2	53'.3	265° 58'.8	40'.7
11	237° 31'.5	301° 26'.1	39'.1	117° 24'.1	16'.7	47° 47'.3	53'.5	281° 01'.1	40'.6
12	252° 34'.0	316° 25'.4	23° 38'.6 S	132° 26'.7	23° 16'.9 N	62° 49'.4	2° 53'.6 S	296° 03'.4	17° 40'.6 S
13	267° 36'.4	331° 24'.7	38'.1	147° 29'.3	17'.0	77° 51'.5	53'.7	311° 05'.6	40'.5
14	282° 38'.9	346° 24'.0	37'.6	162° 31'.9	17'.2	92° 53'.6	53'.9	326° 07'.9	40'.5
15	297° 41'.4	1° 23'.2	37'.1	177° 34'.5	17'.3	107° 55'.8	54'.0	341° 10'.2	40'.4
16	312° 43'.8	16° 22'.5	36'.5	192° 37'.2	17'.5	122° 57'.9	54'.1	356° 12'.5	40'.4
17	327° 46'.3	31° 21'.8	36'.0	207° 39'.8	17'.6	138° 00'.0	54'.3	11° 14'.7	40'.3
18	342° 48'.8	46° 21'.1	35'.5	222° 42'.4	17'.8	153° 02'.1	54'.4	26° 17'.0	40'.2
19	357° 51'.2	61° 20'.4	35'.0	237° 45'.0	17'.9	168° 04'.2	54'.6	41° 19'.3	40'.2
20	12° 53'.7	76° 19'.7	34'.4	252° 47'.6	18'.1	183° 06'.3	54'.7	56° 21'.6	40'.1
21	27° 56'.2	91° 19'.0	33'.9	267° 50'.2	18'.2	198° 08'.5	54'.8	71° 23'.8	40'.1
22	42° 58'.6	106° 18'.3	33'.4	282° 52'.8	18'.4	213° 10'.6	55'.0	86° 26'.1	40'.0
23	58° 01'.1	121° 17'.6	32'.8	297° 55'.5	18'.5	228° 12'.7	55'.1	101° 28'.4	40'.0
4 Friday 00	73° 03'.5	136° 16'.9	23° 32'.3 S	312° 58'.1	23° 18'.7 N	243° 14'.8	2° 55'.3 S	116° 30'.6	17° 39'.9 S
01	88° 06'.0	151° 16'.2	31'.8	328° 00'.7	18'.8	258° 16'.9	55'.4	131° 32'.9	39'.9
02	103° 08'.5	166° 15'.5	31'.3	343° 03'.3	19'.0	273° 19'.1	55'.5	146° 35'.2	39'.8
03	118° 10'.9	181° 14'.8	30'.7	358° 06'.0	19'.2	288° 21'.2	55'.7	161° 37'.5	39'.7
04	133° 13'.4	196° 14'.1	30'.2	13° 08'.6	19'.3	303° 23'.3	55'.8	176° 39'.7	39'.7
05	148° 15'.9	211° 13'.4	29'.6	28° 11'.2	19'.5	318° 25'.4	56'.0	191° 42'.0	39'.6
06	163° 18'.3	226° 12'.7	29'.1	43° 13'.9	19'.6	333° 27'.5	56'.1	206° 44'.3	39'.6
07	178° 20'.8	241° 12'.0	28'.6	58° 16'.5	19'.8	348° 29'.6	56'.2	221° 46'.5	39'.5
08	193° 23'.3	256° 11'.3	28'.0	73° 19'.1	19'.9	3° 31'.8	56'.4	236° 48'.8	39'.5
09	208° 25'.7	271° 10'.6	27'.5	88° 21'.8	20'.1	18° 33'.9	56'.5	251° 51'.1	39'.4
10	223° 28'.2	286° 09'.9	26'.9	103° 24'.4	20'.2	33° 36'.0	56'.6	266° 53'.4	39'.3
11	238° 30'.7	301° 09'.2	26'.4	118° 27'.0	20'.4	48° 38'.1	56'.8	281° 55'.6	39'.3
12	253° 33'.1	316° 08'.5	23° 25'.9 S	133° 29'.7	23° 20'.5 N	63° 40'.2	2° 56'.9 S	296° 57'.9	17° 39'.2 S
13	268° 35'.6	331° 07'.8	25'.3	148° 32'.3	20'.7	78° 42'.4	57'.1	312° 00'.2	39'.2
14	283° 38'.0	346° 07'.2	24'.8	163° 35'.0	20'.8	93° 44'.5	57'.2	327° 02'.4	39'.1
15	298° 40'.5	1° 06'.5	24'.2	178° 37'.6	21'.0	108° 46'.6	57'.3	342° 04'.7	39'.1
16	313° 43'.0	16° 05'.8	23'.7	193° 40'.3	21'.2	123° 48'.7	57'.5	357° 07'.0	39'.0
17	328° 45'.4	31° 05'.1	23'.1	208° 42'.9	21'.3	138° 50'.8	57'.6	12° 09'.3	39'.0
18	343° 47'.9	46° 04'.4	22'.6	223° 45'.6	21'.5	153° 53'.0	57'.7	27° 11'.5	38'.9
19	358° 50'.4	61° 03'.7	22'.0	238° 48'.2	21'.6	168° 55'.1	57'.9	42° 13'.8	38'.8
20	13° 52'.8	76° 03'.0	21'.5	253° 50'.9	21'.8	183° 57'.2	58'.0	57° 16'.1	38'.8
21	28° 55'.3	91° 02'.3	20'.9	268° 53'.5	21'.9	198° 59'.3	58'.2	72° 18'.3	38'.7
22	43° 57'.8	106° 01'.6	20'.4	283° 56'.2	22'.1	214° 01'.5	58'.3	87° 20'.6	38'.7
23	59° 00'.2	121° 01'.0	19'.8	298° 58'.8	22'.3	229° 03'.6	58'.4	102° 22'.9	38'.6
	M.P. 19:09	v -0'.7	d 0'.5	v 2'.6	d 0'.1	v 2'.1	d 0'.1	v 2'.3	d 0'.1

Name	SHA	Dec
Acamar	315° 29'.5	40° 20'.0 S
Achernar	335° 37'.7	57° 16'.5 S
Acrux	173° 27'.0	63° 03'.4 S
Adhara	255° 24'.3	28° 57'.7 S
Aldebaran	291° 06'.7	16° 29'.8 N
Alioth	166° 34'.3	55° 59'.6 N
Alkaid	153° 11'.3	49° 20'.7 N
Alnair	28° 03'.0	46° 59'.8 S
Alnilam	276° 01'.6	1° 12'.3 S
Alphard	218° 11'.0	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.2 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.4	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.7 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.0 N
Atria	108° 01'.8	69° 00'.9 S
Avior	234° 23'.9	59° 29'.0 S
Bellatrix	278° 48'.1	6° 20'.7 N
Betelgeuse	271° 17'.6	7° 24'.4 N
Canopus	264° 02'.4	52° 41'.4 S
Capella	280° 56'.7	45° 59'.5 N
Deneb	49° 42'.2	45° 15'.6 N
Denebola	182° 49'.4	14° 36'.5 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.3	61° 47'.0 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.5 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.8	29° 39'.6 S
Gacrux	172° 18'.4	57° 04'.2 S
Gienah	176° 08'.2	17° 30'.1 S
Hadar	149° 10'.3	60° 20'.2 S
Hamal	328° 17'.8	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.4	74° 10'.8 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 26'.1	36° 20'.0 S
Miaplacidus	221° 42'.6	69° 41'.1 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.6 S
Polaris	323° 29'.9	89° 14'.2 N
Pollux	243° 46'.2	28° 02'.5 N
Procyon	245° 15'.5	5° 14'.6 N
Rasalhague	96° 21'.0	12° 34'.0 N
Regulus	207° 59'.7	12° 00'.0 N
Rigel	281° 26'.5	8° 12'.5 S
Rigil Kent	140° 13'.3	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.9	56° 30'.3 N
Shaula	96° 43'.2	37° 05'.9 S
Sirius	258° 46'.9	16° 42'.3 S
Spica	158° 47'.7	11° 07'.5 S
Suhail	223° 03'.6	43° 24'.1 S
Vega	80° 49'.7	38° 46'.8 N
Zuben'ubi	137° 22'.7	16° 00'.7 S

	SHA	Mer.Pass.
Venus	64° 29'.5	14:54
Mars	239° 51'.2	03:12
Jupiter	170° 19'.6	07:49
Saturn	43° 31'.7	16:15

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
2 Wednesday 00	182° 39'.3	21° 57'.6 S	94° 03'.4	16'.2	4° 06'.3 S	11'.5	54'.2
01	197° 39'.1	57'.9	108° 38'.6	16'.2	3° 54'.8 S	11'.5	
02	212° 38'.8	58'.3	123° 13'.8	16'.2	43'.3	11'.5	
03	227° 38'.6	58'.7	137° 49'.0	16'.2	31'.8	11'.5	
04	242° 38'.3	59'.0	152° 24'.2	16'.2	20'.3	11'.6	
05	257° 38'.1	59'.4	166° 59'.4	16'.2	08'.7	11'.6	
06	272° 37'.9	59'.8	181° 34'.6	16'.3	2° 57'.1 S	11'.5	
07	287° 37'.6	22° 00'.1 S	196° 09'.9	16'.2	45'.6	11'.6	
08	302° 37'.4	00'.5	210° 45'.1	16'.2	34'.0	11'.6	
09	317° 37'.1	00'.9	225° 20'.3	16'.3	22'.4	11'.7	
10	332° 36'.9	01'.2	239° 55'.6	16'.2	10'.7	11'.6	
11	347° 36'.6	01'.6	254° 30'.8	16'.2	1° 59'.1 S	11'.6	54'.3
12	2° 36'.4	22° 02'.0 S	269° 06'.0	16'.3	1° 47'.5 S	11'.7	54'.3
13	17° 36'.2	02'.3	283° 41'.3	16'.2	35'.8	11'.6	
14	32° 35'.9	02'.7	298° 16'.5	16'.3	24'.2	11'.7	
15	47° 35'.7	03'.0	312° 51'.8	16'.2	12'.5	11'.6	
16	62° 35'.4	03'.4	327° 27'.0	16'.2	00'.9	11'.7	
17	77° 35'.2	03'.8	342° 02'.2	16'.3	0° 49'.2 S	11'.7	
18	92° 34'.9	04'.1	356° 37'.5	16'.2	37'.5	11'.7	
19	107° 34'.7	04'.5	11° 12'.7	16'.2	25'.8	11'.7	
20	122° 34'.4	04'.8	25° 47'.9	16'.2	14'.1	11'.7	
21	137° 34'.2	05'.2	40° 23'.1	16'.2	02'.4	11'.7	
22	152° 34'.0	05'.5	54° 58'.3	16'.2	0° 09'.3 N	11'.7	
23	167° 33'.7	05'.9	69° 33'.5	16'.2	21'.0	11'.7	
3 Thursday 00	182° 33'.5	22° 06'.2 S	84° 08'.7	16'.2	0° 32'.7 N	11'.7	54'.3
01	197° 33'.2	06'.6	98° 43'.9	16'.2	44'.4	11'.7	
02	212° 33'.0	06'.9	113° 19'.1	16'.1	56'.1	11'.7	54'.4
03	227° 32'.7	07'.3	127° 54'.2	16'.1	1° 07'.8 N	11'.7	
04	242° 32'.5	07'.6	142° 29'.3	16'.2	19'.5	11'.7	
05	257° 32'.2	08'.0	157° 04'.5	16'.1	31'.2	11'.7	
06	272° 32'.0	08'.3	171° 39'.6	16'.0	42'.9	11'.7	
07	287° 31'.7	08'.7	186° 14'.6	16'.1	54'.6	11'.7	
08	302° 31'.5	09'.0	200° 49'.7	16'.1	2° 06'.3 N	11'.7	
09	317° 31'.2	09'.4	215° 24'.8	16'.0	18'.0	11'.7	
10	332° 31'.0	09'.7	229° 59'.8	16'.0	29'.7	11'.7	
11	347° 30'.7	10'.1	244° 34'.8	16'.0	41'.4	11'.7	54'.5
12	2° 30'.5	22° 10'.4 S	259° 09'.8	16'.0	2° 53'.1 N	11'.7	54'.5
13	17° 30'.2	10'.8	273° 44'.8	15'.9	3° 04'.8 N	11'.7	
14	32° 30'.0	11'.1	288° 19'.7	15'.9	16'.5	11'.6	
15	47° 29'.7	11'.5	302° 54'.6	15'.9	28'.1	11'.7	
16	62° 29'.5	11'.8	317° 29'.5	15'.9	39'.8	11'.7	
17	77° 29'.2	12'.1	332° 04'.4	15'.8	51'.5	11'.6	
18	92° 29'.0	12'.5	346° 39'.2	15'.8	4° 03'.1 N	11'.6	
19	107° 28'.7	12'.8	1° 14'.0	15'.8	14'.7	11'.7	54'.6
20	122° 28'.5	13'.2	15° 48'.8	15'.7	26'.4	11'.6	
21	137° 28'.2	13'.5	30° 23'.5	15'.8	38'.0	11'.6	
22	152° 28'.0	13'.8	44° 58'.3	15'.6	49'.6	11'.6	
23	167° 27'.7	14'.2	59° 32'.9	15'.7	5° 01'.2 N	11'.6	
4 Friday 00	182° 27'.5	22° 14'.5 S	74° 07'.6	15'.6	5° 12'.8 N	11'.5	54'.6
01	197° 27'.2	14'.8	88° 42'.2	15'.6	24'.3	11'.6	
02	212° 27'.0	15'.2	103° 16'.8	15'.5	35'.9	11'.5	54'.7
03	227° 26'.7	15'.5	117° 51'.3	15'.5	47'.4	11'.5	
04	242° 26'.5	15'.8	132° 25'.8	15'.5	58'.9	11'.6	
05	257° 26'.2	16'.2	147° 00'.3	15'.4	6° 10'.5 N	11'.4	
06	272° 26'.0	16'.5	161° 34'.7	15'.4	21'.9	11'.5	
07	287° 25'.7	16'.8	176° 09'.1	15'.4	33'.4	11'.5	
08	302° 25'.5	17'.2	190° 43'.5	15'.3	44'.9	11'.4	54'.8
09	317° 25'.2	17'.5	205° 17'.8	15'.2	56'.3	11'.4	
10	332° 25'.0	17'.8	219° 52'.0	15'.2	7° 07'.7 N	11'.4	
11	347° 24'.7	18'.1	234° 26'.2	15'.2	19'.1	11'.4	
12	2° 24'.4	22° 18'.5 S	249° 00'.4	15'.1	7° 30'.5 N	11'.4	54'.8
13	17° 24'.2	18'.8	263° 34'.5	15'.1	41'.9	11'.3	54'.9
14	32° 23'.9	19'.1	278° 08'.6	15'.0	53'.2	11'.3	
15	47° 23'.7	19'.4	292° 42'.6	15'.0	8° 04'.5 N	11'.3	
16	62° 23'.4	19'.8	307° 16'.6	15'.0	15'.8	11'.3	
17	77° 23'.2	20'.1	321° 50'.6	14'.8	27'.1	11'.2	
18	92° 22'.9	20'.4	336° 24'.4	14'.9	38'.3	11'.2	55'.0
19	107° 22'.7	20'.7	350° 58'.3	14'.8	49'.5	11'.2	
20	122° 22'.4	21'.1	5° 32'.1	14'.7	9° 00'.7 N	11'.1	
21	137° 22'.1	21'.4	20° 05'.8	14'.6	11'.8	11'.2	
22	152° 21'.9	21'.7	34° 39'.4	14'.7	23'.0	11'.1	
23	167° 21'.6	22'.0	49° 13'.1	14'.5	34'.1	11'.0	55'.1
	SD 16'.2	d 0'.3	SD	14'.8	14'.8	14'.9	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
2	10 38	10 26	11:50	18:14	05:54	8d 52%
3	10 14	10 02	11:50	18:55	06:34	9d 62%
4	9 50	9 38	11:50	19:37	07:16	10d 71%

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1992 December 5, 6, 7 (Sat, Sun, Mon)

GMT	ARIES	VENUS -4.1		MARS -0.9		JUPITER -1.9		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
5 Saturday 00	74° 02'.7	136° 00'.3	23° 19'.2 S	314° 01'.5	23° 22'.4 N	244° 05'.7	2° 58'.6 S	117° 25'.1	17° 38'.6 S
01	89° 05'.1	150° 59'.6	18'.7	329° 04'.2	22'.6	259° 07'.8	58'.7	132° 27'.4	38'.5
02	104° 07'.6	165° 58'.9	18'.1	344° 06'.8	22'.7	274° 09'.9	58'.8	147° 29'.7	38'.4
03	119° 10'.1	180° 58'.2	17'.6	359° 09'.5	22'.9	289° 12'.1	59'.0	162° 32'.0	38'.4
04	134° 12'.5	195° 57'.5	17'.0	14° 12'.2	23'.1	304° 14'.2	59'.1	177° 34'.2	38'.3
05	149° 15'.0	210° 56'.8	16'.4	29° 14'.8	23'.2	319° 16'.3	59'.2	192° 36'.5	38'.3
06	164° 17'.5	225° 56'.2	15'.9	44° 17'.5	23'.4	334° 18'.4	59'.4	207° 38'.8	38'.2
07	179° 19'.9	240° 55'.5	15'.3	59° 20'.2	23'.5	349° 20'.6	59'.5	222° 41'.0	38'.2
08	194° 22'.4	255° 54'.8	14'.7	74° 22'.8	23'.7	4° 22'.7	59'.7	237° 43'.3	38'.1
09	209° 24'.9	270° 54'.1	14'.2	89° 25'.5	23'.9	19° 24'.8	59'.8	252° 45'.6	38'.0
10	224° 27'.3	285° 53'.4	13'.6	104° 28'.2	24'.0	34° 26'.9	59'.9	267° 47'.8	38'.0
11	239° 29'.8	300° 52'.8	13'.0	119° 30'.9	24'.2	49° 29'.1	3° 00'.1 S	282° 50'.1	37'.9
12	254° 32'.3	315° 52'.1	23° 12'.5 S	134° 33'.5	23° 24'.3 N	64° 31'.2	3° 00'.2 S	297° 52'.4	17° 37'.9 S
13	269° 34'.7	330° 51'.4	11'.9	149° 36'.2	24'.5	79° 33'.3	00'.3	312° 54'.6	37'.8
14	284° 37'.2	345° 50'.7	11'.3	164° 38'.9	24'.7	94° 35'.4	00'.5	327° 56'.9	37'.8
15	299° 39'.6	0° 50'.0	10'.8	179° 41'.6	24'.8	109° 37'.5	00'.6	342° 59'.2	37'.7
16	314° 42'.1	15° 49'.4	10'.2	194° 44'.3	25'.0	124° 39'.7	00'.7	358° 01'.4	37'.6
17	329° 44'.6	30° 48'.7	09'.6	209° 47'.0	25'.2	139° 41'.8	00'.9	13° 03'.7	37'.6
18	344° 47'.0	45° 48'.0	09'.0	224° 49'.6	25'.3	154° 43'.9	01'.0	28° 06'.0	37'.5
19	359° 49'.5	60° 47'.3	08'.5	239° 52'.3	25'.5	169° 46'.1	01'.1	43° 08'.2	37'.5
20	14° 52'.0	75° 46'.7	07'.9	254° 55'.0	25'.7	184° 48'.2	01'.3	58° 10'.5	37'.4
21	29° 54'.4	90° 46'.0	07'.3	269° 57'.7	25'.8	199° 50'.3	01'.4	73° 12'.8	37'.4
22	44° 56'.9	105° 45'.3	06'.7	285° 00'.4	26'.0	214° 52'.4	01'.5	88° 15'.0	37'.3
23	59° 59'.4	120° 44'.7	06'.1	300° 03'.1	26'.2	229° 54'.6	01'.7	103° 17'.3	37'.2
6 Sunday 00	75° 01'.8	135° 44'.0	23° 05'.5 S	315° 05'.8	23° 26'.3 N	244° 56'.7	3° 01'.8 S	118° 19'.6	17° 37'.2 S
01	90° 04'.3	150° 43'.3	05'.0	330° 08'.5	26'.5	259° 58'.8	02'.0	133° 21'.8	37'.1
02	105° 06'.8	165° 42'.6	04'.4	345° 11'.2	26'.6	275° 00'.9	02'.1	148° 24'.1	37'.1
03	120° 09'.2	180° 42'.0	03'.8	0° 13'.9	26'.8	290° 03'.1	02'.2	163° 26'.4	37'.0
04	135° 11'.7	195° 41'.3	03'.2	15° 16'.6	27'.0	305° 05'.2	02'.4	178° 28'.6	36'.9
05	150° 14'.1	210° 40'.6	02'.6	30° 19'.3	27'.1	320° 07'.3	02'.5	193° 30'.9	36'.9
06	165° 16'.6	225° 40'.0	02'.0	45° 22'.0	27'.3	335° 09'.4	02'.6	208° 33'.2	36'.8
07	180° 19'.1	240° 39'.3	01'.4	60° 24'.7	27'.5	350° 11'.6	02'.8	223° 35'.4	36'.8
08	195° 21'.5	255° 38'.6	00'.8	75° 27'.5	27'.7	5° 13'.7	02'.9	238° 37'.7	36'.7
09	210° 24'.0	270° 38'.0	00'.2	90° 30'.2	27'.8	20° 15'.8	03'.0	253° 40'.0	36'.7
10	225° 26'.5	285° 37'.3	22° 59'.7 S	105° 32'.9	28'.0	35° 18'.0	03'.2	268° 42'.2	36'.6
11	240° 28'.9	300° 36'.6	59'.1	120° 35'.6	28'.2	50° 20'.1	03'.3	283° 44'.5	36'.5
12	255° 31'.4	315° 36'.0	22° 58'.5 S	135° 38'.3	23° 28'.3 N	65° 22'.2	3° 03'.4 S	298° 46'.8	17° 36'.5 S
13	270° 33'.9	330° 35'.3	57'.9	150° 41'.0	28'.5	80° 24'.3	03'.6	313° 49'.0	36'.4
14	285° 36'.3	345° 34'.7	57'.3	165° 43'.7	28'.7	95° 26'.5	03'.7	328° 51'.3	36'.4
15	300° 38'.8	0° 34'.0	56'.7	180° 46'.5	28'.8	110° 28'.6	03'.8	343° 53'.6	36'.3
16	315° 41'.2	15° 33'.3	56'.1	195° 49'.2	29'.0	125° 30'.7	04'.0	358° 55'.8	36'.3
17	330° 43'.7	30° 32'.7	55'.5	210° 51'.9	29'.2	140° 32'.9	04'.1	13° 58'.1	36'.2
18	345° 46'.2	45° 32'.0	54'.9	225° 54'.6	29'.3	155° 35'.0	04'.2	29° 00'.3	36'.1
19	0° 48'.6	60° 31'.4	54'.3	240° 57'.4	29'.5	170° 37'.1	04'.4	44° 02'.6	36'.1
20	15° 51'.1	75° 30'.7	53'.6	256° 00'.1	29'.7	185° 39'.3	04'.5	59° 04'.9	36'.0
21	30° 53'.6	90° 30'.0	53'.0	271° 02'.8	29'.9	200° 41'.4	04'.6	74° 07'.1	36'.0
22	45° 56'.0	105° 29'.4	52'.4	286° 05'.6	30'.0	215° 43'.5	04'.8	89° 09'.4	35'.9
23	60° 58'.5	120° 28'.7	51'.8	301° 08'.3	30'.2	230° 45'.6	04'.9	104° 11'.7	35'.8
7 Monday 00	76° 01'.0	135° 28'.1	22° 51'.2 S	316° 11'.0	23° 30'.4 N	245° 47'.8	3° 05'.0 S	119° 13'.9	17° 35'.8 S
01	91° 03'.4	150° 27'.4	50'.6	331° 13'.8	30'.5	260° 49'.9	05'.2	134° 16'.2	35'.7
02	106° 05'.9	165° 26'.8	50'.0	346° 16'.5	30'.7	275° 52'.0	05'.3	149° 18'.5	35'.7
03	121° 08'.4	180° 26'.1	49'.4	1° 19'.2	30'.9	290° 54'.2	05'.4	164° 20'.7	35'.6
04	136° 10'.8	195° 25'.5	48'.8	16° 22'.0	31'.1	305° 56'.3	05'.6	179° 23'.0	35'.5
05	151° 13'.3	210° 24'.8	48'.2	31° 24'.7	31'.2	320° 58'.4	05'.7	194° 25'.2	35'.5
06	166° 15'.7	225° 24'.2	47'.5	46° 27'.5	31'.4	336° 00'.6	05'.8	209° 27'.5	35'.4
07	181° 18'.2	240° 23'.5	46'.9	61° 30'.2	31'.6	351° 02'.7	05'.9	224° 29'.8	35'.4
08	196° 20'.7	255° 22'.9	46'.3	76° 33'.0	31'.8	6° 04'.8	06'.1	239° 32'.0	35'.3
09	211° 23'.1	270° 22'.2	45'.7	91° 35'.7	31'.9	21° 07'.0	06'.2	254° 34'.3	35'.3
10	226° 25'.6	285° 21'.6	45'.1	106° 38'.5	32'.1	36° 09'.1	06'.3	269° 36'.6	35'.2
11	241° 28'.1	300° 20'.9	44'.4	121° 41'.2	32'.3	51° 11'.2	06'.5	284° 38'.8	35'.1
12	256° 30'.5	315° 20'.3	22° 43'.8 S	136° 44'.0	23° 32'.5 N	66° 13'.4	3° 06'.6 S	299° 41'.1	17° 35'.1 S
13	271° 33'.0	330° 19'.6	43'.2	151° 46'.7	32'.6	81° 15'.5	06'.7	314° 43'.3	35'.0
14	286° 35'.5	345° 19'.0	42'.6	166° 49'.5	32'.8	96° 17'.6	06'.9	329° 45'.6	35'.0
15	301° 37'.9	0° 18'.3	42'.0	181° 52'.3	33'.0	111° 19'.8	07'.0	344° 47'.9	34'.9
16	316° 40'.4	15° 17'.7	41'.3	196° 55'.0	33'.2	126° 21'.9	07'.1	359° 50'.1	34'.8
17	331° 42'.9	30° 17'.0	40'.7	211° 57'.8	33'.3	141° 24'.0	07'.3	14° 52'.4	34'.8
18	346° 45'.3	45° 16'.4	40'.1	227° 00'.5	33'.5	156° 26'.2	07'.4	29° 54'.6	34'.7
19	1° 47'.8	60° 15'.8	39'.4	242° 03'.3	33'.7	171° 28'.3	07'.5	44° 56'.9	34'.7
20	16° 50'.2	75° 15'.1	38'.8	257° 06'.1	33'.9	186° 30'.4	07'.7	59° 59'.2	34'.6
21	31° 52'.7	90° 14'.5	38'.2	272° 08'.8	34'.1	201° 32'.6	07'.8	75° 01'.4	34'.5
22	46° 55'.2	105° 13'.8	37'.5	287° 11'.6	34'.2	216° 34'.7	07'.9	90° 03'.7	34'.5
23	61° 57'.6	120° 13'.2	36'.9	302° 14'.4	34'.4	231° 36'.8	08'.0	105° 05'.9	34'.4
	M.P. 18:57	v -0'.7	d 0'.6	v 2'.7	d 0'.2	v 2'.1	d 0'.1	v 2'.3	d 0'.1

Name	SHA	Dec
Acamar	315° 29'.6	40° 20'.0 S
Achernar	335° 37'.7	57° 16'.5 S
Acrux	173° 26'.9	63° 03'.4 S
Adhara	255° 24'.2	28° 57'.7 S
Aldebaran	291° 06'.7	16° 29'.8 N
Alioth	166° 34'.3	55° 59'.6 N
Alkaid	153° 11'.2	49° 20'.6 N
Alnair	28° 03'.0	46° 59'.8 S
Alnilam	276° 01'.6	1° 12'.3 S
Alphard	218° 11'.0	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.2 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.5	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.8 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.0 N
Atria	108° 01'.8	69° 00'.9 S
Avior	234° 23'.9	59° 29'.0 S
Bellatrix	278° 48'.1	6° 20'.6 N
Betelgeuse	271° 17'.6	7° 24'.4 N
Canopus	264° 02'.4	52° 41'.4 S
Capella	280° 56'.7	45° 59'.5 N
Deneb	49° 42'.2	45° 15'.6 N
Denebola	182° 49'.3	14° 36'.5 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.3	61° 47'.0 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.5 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.8	29° 39'.6 S
Gacrux	172° 18'.4	57° 04'.2 S
Gienah	176° 08'.2	17° 30'.1 S
Hadar	149° 10'.3	60° 20'.2 S
Hamal	328° 17'.8	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.3	74° 10'.8 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.0 S
Miaplacidus	221° 42'.6	69° 41'.1 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.6 S
Polaris	323° 30'.4	89° 14'.3 N
Pollux	243° 46'.2	28° 02'.5 N
Procyon	245° 15'.5	5° 14'.6 N
Rasalhague	96° 21'.0	12° 33'.9 N
Regulus	207° 59'.7	12° 00'.0 N
Rigel	281° 26'.5	8° 12'.5 S
Rigil Kent	140° 13'.3	60° 48'.2 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.9	56° 30'.3 N
Shaula	96° 43'.2	37° 05'.9 S
Sirius	258° 46'.9	16° 42'.3 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 03'.5	43° 24'.1 S
Vega	80° 49'.7	38° 46'.8 N
Zuben'ubi	137° 22'.7	16° 00'.7 S

	SHA	Mer.Pass.
Venus	60° 42'.2	14:58
Mars	240° 04'.0	02:59
Jupiter	169° 54'.9	07:39
Saturn	43° 17'.7	16:04

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
5 Saturday 00	182° 21'.4	22° 22'.3 S	63° 46'.6	14'.5	9° 45'.1 N	11'.1	55'.1
01	197° 21'.1	22'.6	78° 20'.1	14'.5	56'.2	11'.0	
02	212° 20'.9	23'.0	92° 53'.6	14'.3	10° 07'.2 N	10'.9	
03	227° 20'.6	23'.3	107° 26'.9	14'.4	18'.1	11'.0	
04	242° 20'.3	23'.6	122° 00'.3	14'.2	29'.1	10'.9	55'.2
05	257° 20'.1	23'.9	136° 33'.5	14'.2	40'.0	10'.8	
06	272° 19'.8	24'.2	151° 06'.7	14'.2	50'.8	10'.9	
07	287° 19'.6	24'.5	165° 39'.9	14'.1	11° 01'.7 N	10'.8	
08	302° 19'.3	24'.8	180° 13'.0	14'.0	12'.5	10'.7	55'.3
09	317° 19'.0	25'.1	194° 46'.0	13'.9	23'.2	10'.7	
10	332° 18'.8	25'.5	209° 18'.9	13'.9	33'.9	10'.7	
11	347° 18'.5	25'.8	223° 51'.8	13'.8	44'.6	10'.6	
12	2° 18'.3	22° 26'.1 S	238° 24'.6	13'.8	11° 55'.2 N	10'.6	55'.4
13	17° 18'.0	26'.4	252° 57'.4	13'.6	12° 05'.8 N	10'.6	
14	32° 17'.7	26'.7	267° 30'.0	13'.7	16'.4	10'.5	
15	47° 17'.5	27'.0	282° 02'.7	13'.5	26'.9	10'.5	
16	62° 17'.2	27'.3	296° 35'.2	13'.5	37'.4	10'.4	55'.5
17	77° 17'.0	27'.6	311° 07'.7	13'.4	47'.8	10'.3	
18	92° 16'.7	27'.9	325° 40'.1	13'.3	58'.1	10'.4	
19	107° 16'.4	28'.2	340° 12'.4	13'.3	13° 08'.5 N	10'.2	
20	122° 16'.2	28'.5	354° 44'.7	13'.1	18'.7	10'.3	55'.6
21	137° 15'.9	28'.8	9° 16'.8	13'.2	29'.0	10'.2	
22	152° 15'.6	29'.1	23° 49'.0	13'.0	39'.2	10'.1	
23	167° 15'.4	29'.4	38° 21'.0	13'.0	49'.3	10'.0	
6 Sunday 00	182° 15'.1	22° 29'.7 S	52° 53'.0	12'.8	13° 59'.3 N	10'.1	55'.7
01	197° 14'.9	30'.0	67° 24'.8	12'.8	14° 09'.4 N	9'.9	
02	212° 14'.6	30'.3	81° 56'.6	12'.8	19'.3	9'.9	
03	227° 14'.3	30'.6	96° 28'.4	12'.6	29'.2	9'.9	
04	242° 14'.1	30'.9	111° 00'.0	12'.6	39'.1	9'.8	55'.8
05	257° 13'.8	31'.2	125° 31'.6	12'.5	48'.9	9'.7	
06	272° 13'.5	31'.5	140° 03'.1	12'.4	58'.6	9'.7	
07	287° 13'.3	31'.8	154° 34'.5	12'.3	15° 08'.3 N	9'.6	
08	302° 13'.0	32'.1	169° 05'.8	12'.3	17'.9	9'.6	55'.9
09	317° 12'.7	32'.4	183° 37'.1	12'.1	27'.5	9'.5	
10	332° 12'.5	32'.7	198° 08'.2	12'.1	37'.0	9'.4	
11	347° 12'.2	33'.0	212° 39'.3	12'.0	46'.4	9'.4	56'.0
12	2° 11'.9	22° 33'.2 S	227° 10'.3	12'.0	15° 55'.8 N	9'.3	56'.0
13	17° 11'.7	33'.5	241° 41'.3	11'.8	16° 05'.1 N	9'.2	
14	32° 11'.4	33'.8	256° 12'.1	11'.7	14'.3	9'.2	
15	47° 11'.1	34'.1	270° 42'.8	11'.7	23'.5	9'.1	56'.1
16	62° 10'.9	34'.4	285° 13'.5	11'.6	32'.6	9'.0	
17	77° 10'.6	34'.7	299° 44'.1	11'.5	41'.6	8'.9	
18	92° 10'.3	35'.0	314° 14'.6	11'.4	50'.5	8'.9	56'.2
19	107° 10'.1	35'.3	328° 45'.0	11'.3	59'.4	8'.8	
20	122° 09'.8	35'.5	343° 15'.3	11'.3	17° 08'.2 N	8'.8	
21	137° 09'.5	35'.8	357° 45'.6	11'.1	17'.0	8'.6	
22	152° 09'.3	36'.1	12° 15'.7	11'.1	25'.6	8'.6	56'.3
23	167° 09'.0	36'.4	26° 45'.8	11'.0	34'.2	8'.5	
7 Monday 00	182° 08'.7	22° 36'.7 S	41° 15'.8	10'.8	17° 42'.7 N	8'.4	56'.3
01	197° 08'.5	37'.0	55° 45'.6	10'.8	51'.1	8'.3	56'.4
02	212° 08'.2	37'.2	70° 15'.4	10'.8	59'.4	8'.3	
03	227° 07'.9	37'.5	84° 45'.2	10'.6	18° 07'.7 N	8'.2	
04	242° 07'.7	37'.8	99° 14'.8	10'.5	15'.9	8'.1	56'.5
05	257° 07'.4	38'.1	113° 44'.3	10'.5	24'.0	8'.0	
06	272° 07'.1	38'.3	128° 13'.8	10'.3	32'.0	7'.9	
07	287° 06'.9	38'.6	142° 43'.1	10'.3	39'.9	7'.8	
08	302° 06'.6	38'.9	157° 12'.4	10'.2	47'.7	7'.7	56'.6
09	317° 06'.3	39'.2	171° 41'.6	10'.1	55'.4	7'.7	
10	332° 06'.0	39'.4	186° 10'.7	10'.0	19° 03'.1 N	7'.5	
11	347° 05'.8	39'.7	200° 39'.7	9'.9	10'.6	7'.5	56'.7
12	2° 05'.5	22° 40'.0 S	215° 08'.6	9'.8	19° 18'.1 N	7'.4	56'.7
13	17° 05'.2	40'.3	229° 37'.4	9'.7	25'.5	7'.2	
14	32° 05'.0	40'.5	244° 06'.1	9'.7	32'.7	7'.2	56'.8
15	47° 04'.7	40'.8	258° 34'.8	9'.5	39'.9	7'.1	
16	62° 04'.4	41'.1	273° 03'.3	9'.5	47'.0	7'.0	
17	77° 04'.1	41'.3	287° 31'.8	9'.4	54'.0	6'.9	
18	92° 03'.9	41'.6	302° 00'.2	9'.3	20° 00'.9 N	6'.7	56'.9
19	107° 03'.6	41'.9	316° 28'.5	9'.2	07'.6	6'.7	
20	122° 03'.3	42'.1	330° 56'.7	9'.1	14'.3	6'.6	
21	137° 03'.1	42'.4	345° 24'.8	9'.0	20'.9	6'.5	57'.0
22	152° 02'.8	42'.7	359° 52'.8	9'.0	27'.4	6'.3	
23	167° 02'.5	42'.9	14° 20'.8	8'.8	33'.7	6'.3	
	SD 16'.2	d 0'.3	SD	15'.1	15'.3	15'.4	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
5	9 26	9 14	11:51	20:22	07:59	11d 79%
6	9 01	8 48	11:51	21:09	08:45	12d 87%
7	8 35	8 23	11:52	22:00	09:34	13d 93%

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1992 December 8, 9, 10 (Tue, Wed, Thur)

GMT	ARIES	VENUS -4.2		MARS -1.0		JUPITER -1.9		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
8 Tuesday 00	77° 00'.1	135° 12'.6	22° 36'.3 S	317° 17'.2	23° 34'.6 N	246° 39'.0	3° 08'.2 S	120° 08'.2	17° 34'.4 S
01	92° 02'.6	150° 11'.9	35'.6	332° 19'.9	34'.8	261° 41'.1	08'.3	135° 10'.5	34'.3
02	107° 05'.0	165° 11'.3	35'.0	347° 22'.7	35'.0	276° 43'.2	08'.4	150° 12'.7	34'.2
03	122° 07'.5	180° 10'.6	34'.4	2° 25'.5	35'.1	291° 45'.4	08'.6	165° 15'.0	34'.2
04	137° 10'.0	195° 10'.0	33'.7	17° 28'.3	35'.3	306° 47'.5	08'.7	180° 17'.2	34'.1
05	152° 12'.4	210° 09'.4	33'.1	32° 31'.0	35'.5	321° 49'.7	08'.8	195° 19'.5	34'.1
06	167° 14'.9	225° 08'.7	32'.4	47° 33'.8	35'.7	336° 51'.8	09'.0	210° 21'.8	34'.0
07	182° 17'.4	240° 08'.1	31'.8	62° 36'.6	35'.9	351° 53'.9	09'.1	225° 24'.0	33'.9
08	197° 19'.8	255° 07'.5	31'.2	77° 39'.4	36'.0	6° 56'.1	09'.2	240° 26'.3	33'.9
09	212° 22'.3	270° 06'.8	30'.5	92° 42'.2	36'.2	21° 58'.2	09'.3	255° 28'.5	33'.8
10	227° 24'.7	285° 06'.2	29'.9	107° 45'.0	36'.4	37° 00'.3	09'.5	270° 30'.8	33'.8
11	242° 27'.2	300° 05'.6	29'.2	122° 47'.8	36'.6	52° 02'.5	09'.6	285° 33'.1	33'.7
12	257° 29'.7	315° 04'.9	22° 28'.6 S	137° 50'.6	23° 36'.8 N	67° 04'.6	3° 09'.7 S	300° 35'.3	17° 33'.6 S
13	272° 32'.1	330° 04'.3	27'.9	152° 53'.4	36'.9	82° 06'.8	09'.9	315° 37'.6	33'.6
14	287° 34'.6	345° 03'.7	27'.3	167° 56'.2	37'.1	97° 08'.9	10'.0	330° 39'.8	33'.5
15	302° 37'.1	0° 03'.1	26'.6	182° 58'.9	37'.3	112° 11'.0	10'.1	345° 42'.1	33'.5
16	317° 39'.5	15° 02'.4	26'.0	198° 01'.7	37'.5	127° 13'.2	10'.3	0° 44'.4	33'.4
17	332° 42'.0	30° 01'.8	25'.3	213° 04'.5	37'.7	142° 15'.3	10'.4	15° 46'.6	33'.3
18	347° 44'.5	45° 01'.2	24'.7	228° 07'.3	37'.9	157° 17'.4	10'.5	30° 48'.9	33'.3
19	2° 46'.9	60° 00'.6	24'.0	243° 10'.2	38'.0	172° 19'.6	10'.6	45° 51'.1	33'.2
20	17° 49'.4	74° 59'.9	23'.4	258° 13'.0	38'.2	187° 21'.7	10'.8	60° 53'.4	33'.2
21	32° 51'.8	89° 59'.3	22'.7	273° 15'.8	38'.4	202° 23'.9	10'.9	75° 55'.6	33'.1
22	47° 54'.3	104° 58'.7	22'.1	288° 18'.6	38'.6	217° 26'.0	11'.0	90° 57'.9	33'.0
23	62° 56'.8	119° 58'.1	21'.4	303° 21'.4	38'.8	232° 28'.1	11'.2	106° 00'.2	33'.0
9 Wednesday 00	77° 59'.2	134° 57'.4	22° 20'.7 S	318° 24'.2	23° 39'.0 N	247° 30'.3	3° 11'.3 S	121° 02'.4	17° 32'.9 S
01	93° 01'.7	149° 56'.8	20'.1	333° 27'.0	39'.2	262° 32'.4	11'.4	136° 04'.7	32'.9
02	108° 04'.2	164° 56'.2	19'.4	348° 29'.8	39'.3	277° 34'.6	11'.5	151° 06'.9	32'.8
03	123° 06'.6	179° 55'.6	18'.8	3° 32'.6	39'.5	292° 36'.7	11'.7	166° 09'.2	32'.7
04	138° 09'.1	194° 55'.0	18'.1	18° 35'.5	39'.7	307° 38'.8	11'.8	181° 11'.4	32'.7
05	153° 11'.6	209° 54'.3	17'.4	33° 38'.3	39'.9	322° 41'.0	11'.9	196° 13'.7	32'.6
06	168° 14'.0	224° 53'.7	16'.8	48° 41'.1	40'.1	337° 43'.1	12'.1	211° 16'.0	32'.6
07	183° 16'.5	239° 53'.1	16'.1	63° 43'.9	40'.3	352° 45'.3	12'.2	226° 18'.2	32'.5
08	198° 19'.0	254° 52'.5	15'.4	78° 46'.7	40'.5	7° 47'.4	12'.3	241° 20'.5	32'.4
09	213° 21'.4	269° 51'.9	14'.8	93° 49'.6	40'.7	22° 49'.6	12'.4	256° 22'.7	32'.4
10	228° 23'.9	284° 51'.3	14'.1	108° 52'.4	40'.8	37° 51'.7	12'.6	271° 25'.0	32'.3
11	243° 26'.3	299° 50'.6	13'.4	123° 55'.2	41'.0	52° 53'.8	12'.7	286° 27'.2	32'.3
12	258° 28'.8	314° 50'.0	22° 12'.7 S	138° 58'.1	23° 41'.2 N	67° 56'.0	3° 12'.8 S	301° 29'.5	17° 32'.2 S
13	273° 31'.3	329° 49'.4	12'.1	154° 00'.9	41'.4	82° 58'.1	12'.9	316° 31'.8	32'.1
14	288° 33'.7	344° 48'.8	11'.4	169° 03'.7	41'.6	98° 00'.3	13'.1	331° 34'.0	32'.1
15	303° 36'.2	359° 48'.2	10'.7	184° 06'.6	41'.8	113° 02'.4	13'.2	346° 36'.3	32'.0
16	318° 38'.7	14° 47'.6	10'.0	199° 09'.4	42'.0	128° 04'.6	13'.3	1° 38'.5	31'.9
17	333° 41'.1	29° 47'.0	09'.4	214° 12'.2	42'.2	143° 06'.7	13'.5	16° 40'.8	31'.9
18	348° 43'.6	44° 46'.4	08'.7	229° 15'.1	42'.4	158° 08'.8	13'.6	31° 43'.0	31'.8
19	3° 46'.1	59° 45'.8	08'.0	244° 17'.9	42'.5	173° 11'.0	13'.7	46° 45'.3	31'.8
20	18° 48'.5	74° 45'.1	07'.3	259° 20'.8	42'.7	188° 13'.1	13'.8	61° 47'.5	31'.7
21	33° 51'.0	89° 44'.5	06'.6	274° 23'.6	42'.9	203° 15'.3	14'.0	76° 49'.8	31'.6
22	48° 53'.5	104° 43'.9	06'.0	289° 26'.4	43'.1	218° 17'.4	14'.1	91° 52'.0	31'.6
23	63° 55'.9	119° 43'.3	05'.3	304° 29'.3	43'.3	233° 19'.6	14'.2	106° 54'.3	31'.5
10 Thursday 00	78° 58'.4	134° 42'.7	22° 04'.6 S	319° 32'.1	23° 43'.5 N	248° 21'.7	3° 14'.3 S	121° 56'.6	17° 31'.5 S
01	94° 00'.8	149° 42'.1	03'.9	334° 35'.0	43'.7	263° 23'.8	14'.5	136° 58'.8	31'.4
02	109° 03'.3	164° 41'.5	03'.2	349° 37'.8	43'.9	278° 26'.0	14'.6	152° 01'.1	31'.3
03	124° 05'.8	179° 40'.9	02'.5	4° 40'.7	44'.1	293° 28'.1	14'.7	167° 03'.3	31'.3
04	139° 08'.2	194° 40'.3	01'.9	19° 43'.6	44'.3	308° 30'.3	14'.8	182° 05'.6	31'.2
05	154° 10'.7	209° 39'.7	01'.2	34° 46'.4	44'.5	323° 32'.4	15'.0	197° 07'.8	31'.1
06	169° 13'.2	224° 39'.1	00'.5	49° 49'.3	44'.7	338° 34'.6	15'.1	212° 10'.1	31'.1
07	184° 15'.6	239° 38'.5	21° 59'.8 S	64° 52'.1	44'.8	353° 36'.7	15'.2	227° 12'.3	31'.0
08	199° 18'.1	254° 37'.9	59'.1	79° 55'.0	45'.0	8° 38'.9	15'.3	242° 14'.6	31'.0
09	214° 20'.6	269° 37'.3	58'.4	94° 57'.9	45'.2	23° 41'.0	15'.5	257° 16'.8	30'.9
10	229° 23'.0	284° 36'.7	57'.7	110° 00'.7	45'.4	38° 43'.2	15'.6	272° 19'.1	30'.8
11	244° 25'.5	299° 36'.1	57'.0	125° 03'.6	45'.6	53° 45'.3	15'.7	287° 21'.3	30'.8
12	259° 28'.0	314° 35'.5	21° 56'.3 S	140° 06'.5	23° 45'.8 N	68° 47'.5	3° 15'.8 S	302° 23'.6	17° 30'.7 S
13	274° 30'.4	329° 34'.9	55'.6	155° 09'.3	46'.0	83° 49'.6	16'.0	317° 25'.9	30'.7
14	289° 32'.9	344° 34'.3	54'.9	170° 12'.2	46'.2	98° 51'.8	16'.1	332° 28'.1	30'.6
15	304° 35'.3	359° 33'.7	54'.2	185° 15'.1	46'.4	113° 53'.9	16'.2	347° 30'.4	30'.5
16	319° 37'.8	14° 33'.1	53'.5	200° 17'.9	46'.6	128° 56'.0	16'.3	2° 32'.6	30'.5
17	334° 40'.3	29° 32'.6	52'.8	215° 20'.8	46'.8	143° 58'.2	16'.5	17° 34'.9	30'.4
18	349° 42'.7	44° 32'.0	52'.1	230° 23'.7	47'.0	159° 00'.3	16'.6	32° 37'.1	30'.3
19	4° 45'.2	59° 31'.4	51'.4	245° 26'.6	47'.2	174° 02'.5	16'.7	47° 39'.4	30'.3
20	19° 47'.7	74° 30'.8	50'.7	260° 29'.5	47'.4	189° 04'.6	16'.8	62° 41'.6	30'.2
21	34° 50'.1	89° 30'.2	50'.0	275° 32'.3	47'.6	204° 06'.8	17'.0	77° 43'.9	30'.2
22	49° 52'.6	104° 29'.6	49'.3	290° 35'.2	47'.8	219° 08'.9	17'.1	92° 46'.1	30'.1
23	64° 55'.1	119° 29'.0	48'.6	305° 38'.1	48'.0	234° 11'.1	17'.2	107° 48'.4	30'.0
	M.P. 18:45	v -0'.6	d 0'.7	v 2'.8	d 0'.2	v 2'.1	d 0'.1	v 2'.3	d 0'.1

Name	SHA	Dec
Acamar	315° 29'.6	40° 20'.0 S
Achernar	335° 37'.7	57° 16'.5 S
Acrux	173° 26'.9	63° 03'.4 S
Adhara	255° 24'.2	28° 57'.7 S
Aldebaran	291° 06'.6	16° 29'.8 N
Alioth	166° 34'.3	55° 59'.5 N
Alkaid	153° 11'.2	49° 20'.6 N
Alnair	28° 03'.0	46° 59'.8 S
Alnilam	276° 01'.6	1° 12'.4 S
Alphard	218° 11'.0	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.2 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.5	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.8 S
Antares	112° 45'.5	26° 25'.0 S
Arcturus	146° 10'.0	19° 13'.0 N
Atria	108° 01'.7	69° 00'.9 S
Avior	234° 23'.9	59° 29'.1 S
Bellatrix	278° 48'.1	6° 20'.6 N
Betelgeuse	271° 17'.6	7° 24'.4 N
Canopus	264° 02'.4	52° 41'.4 S
Capella	280° 56'.6	45° 59'.5 N
Deneb	49° 42'.3	45° 15'.6 N
Denebola	182° 49'.3	14° 36'.5 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.3	61° 47'.0 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.5 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.9	29° 39'.6 S
Gacrux	172° 18'.3	57° 04'.2 S
Gienah	176° 08'.2	17° 30'.1 S
Hadar	149° 10'.3	60° 20'.2 S
Hamal	328° 17'.8	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.3	74° 10'.8 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.0 S
Miaplacidus	221° 42'.5	69° 41'.1 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.6 S
Polaris	323° 30'.8	89° 14'.3 N
Pollux	243° 46'.1	28° 02'.5 N
Procyon	245° 15'.5	5° 14'.5 N
Rasalhague	96° 21'.0	12° 33'.9 N
Regulus	207° 59'.7	12° 00'.0 N
Rigel	281° 26'.4	8° 12'.5 S
Rigil Kent	140° 13'.3	60° 48'.1 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.9	56° 30'.3 N
Shaula	96° 43'.2	37° 05'.9 S
Sirius	258° 46'.9	16° 42'.3 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 03'.5	43° 24'.1 S
Vega	80° 49'.8	38° 46'.8 N
Zuben'ubi	137° 22'.7	16° 00'.7 S

	SHA	Mer.Pass.
Venus	56° 58'.2	15:01
Mars	240° 25'.0	02:46
Jupiter	169° 31'.0	07:29
Saturn	43° 03'.2	15:53

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
8 00	182° 02'.2	22° 43'.2 S	28° 48'.6	8'.8	20° 40'.0 N	6'.1	57'.1
01	197° 02'.0	43'.4	43° 16'.4	8'.7	46'.1	6'.1	
02	212° 01'.7	43'.7	57° 44'.1	8'.6	52'.2	5'.9	
03	227° 01'.4	44'.0	72° 11'.7	8'.5	58'.1	5'.8	
04	242° 01'.1	44'.2	86° 39'.2	8'.4	21° 03'.9 N	5'.7	57'.2
05	257° 00'.9	44'.5	101° 06'.6	8'.4	09'.6	5'.6	
06	272° 00'.6	44'.7	115° 34'.0	8'.2	15'.2	5'.5	
07	287° 00'.3	45'.0	130° 01'.2	8'.2	20'.7	5'.3	57'.3
08	302° 00'.0	45'.3	144° 28'.4	8'.1	26'.0	5'.3	
09	316° 59'.8	45'.5	158° 55'.5	8'.0	31'.3	5'.1	
10	331° 59'.5	45'.8	173° 22'.5	8'.0	36'.4	5'.0	57'.4
11	346° 59'.2	46'.0	187° 49'.5	7'.8	41'.4	4'.9	
12	1° 58'.9	22° 46'.3 S	202° 16'.3	7'.8	21° 46'.3 N	4'.7	57'.4
13	16° 58'.7	46'.5	216° 43'.1	7'.7	51'.0	4'.6	
14	31° 58'.4	46'.8	231° 09'.8	7'.7	55'.6	4'.6	57'.5
15	46° 58'.1	47'.0	245° 36'.5	7'.5	22° 00'.2 N	4'.3	
16	61° 57'.8	47'.3	260° 03'.0	7'.5	04'.5	4'.3	
17	76° 57'.6	47'.5	274° 29'.5	7'.4	08'.8	4'.1	57'.6
18	91° 57'.3	47'.8	288° 55'.9	7'.3	12'.9	4'.0	
19	106° 57'.0	48'.0	303° 22'.2	7'.3	16'.9	3'.9	
20	121° 56'.7	48'.3	317° 48'.5	7'.2	20'.8	3'.7	57'.7
21	136° 56'.5	48'.5	332° 14'.7	7'.1	24'.5	3'.6	
22	151° 56'.2	48'.8	346° 40'.8	7'.0	28'.1	3'.5	
23	166° 55'.9	49'.0	1° 06'.8	7'.0	31'.6	3'.4	
9 00	181° 55'.6	22° 49'.2 S	15° 32'.8	6'.9	22° 35'.0 N	3'.2	57'.8
01	196° 55'.3	49'.5	29° 58'.7	6'.9	38'.2	3'.0	
02	211° 55'.1	49'.7	44° 24'.6	6'.8	41'.2	3'.0	
03	226° 54'.8	50'.0	58° 50'.4	6'.7	44'.2	2'.8	57'.9
04	241° 54'.5	50'.2	73° 16'.1	6'.6	47'.0	2'.7	
05	256° 54'.2	50'.5	87° 41'.7	6'.6	49'.7	2'.5	
06	271° 54'.0	50'.7	102° 07'.3	6'.6	52'.2	2'.4	
07	286° 53'.7	50'.9	116° 32'.9	6'.5	54'.6	2'.2	58'.0
08	301° 53'.4	51'.2	130° 58'.4	6'.4	56'.8	2'.1	
09	316° 53'.1	51'.4	145° 23'.8	6'.4	58'.9	2'.0	
10	331° 52'.8	51'.6	159° 49'.2	6'.3	23° 00'.9 N	1'.8	
11	346° 52'.6	51'.9	174° 14'.5	6'.3	02'.7	1'.7	58'.1
12	1° 52'.3	22° 52'.1 S	188° 39'.8	6'.2	23° 04'.4 N	1'.5	58'.1
13	16° 52'.0	52'.3	203° 05'.0	6'.2	05'.9	1'.4	
14	31° 51'.7	52'.6	217° 30'.2	6'.1	07'.3	1'.2	58'.2
15	46° 51'.4	52'.8	231° 55'.3	6'.1	08'.5	1'.1	
16	61° 51'.2	53'.0	246° 20'.4	6'.0	09'.6	1'.0	
17	76° 50'.9	53'.3	260° 45'.4	6'.0	10'.6	0'.8	
18	91° 50'.6	53'.5	275° 10'.4	5'.9	11'.4	0'.7	58'.3
19	106° 50'.3	53'.7	289° 35'.3	6'.0	12'.1	0'.5	
20	121° 50'.0	54'.0	304° 00'.3	5'.8	12'.6	0'.3	
21	136° 49'.7	54'.2	318° 25'.1	5'.9	12'.9	0'.2	
22	151° 49'.5	54'.4	332° 50'.0	5'.8	13'.1	0'.1	58'.4
23	166° 49'.2	54'.6	347° 14'.8	5'.8	13'.2	0'.1	
10 00	181° 48'.9	22° 54'.9 S	1° 39'.6	5'.7	23° 13'.1 N	0'.2	58'.4
01	196° 48'.6	55'.1	16° 04'.3	5'.7	12'.9	0'.4	
02	211° 48'.3	55'.3	30° 29'.0	5'.7	12'.5	0'.5	58'.5
03	226° 48'.1	55'.5	44° 53'.7	5'.7	12'.0	0'.7	
04	241° 47'.8	55'.8	59° 18'.4	5'.6	11'.3	0'.9	
05	256° 47'.5	56'.0	73° 43'.0	5'.6	10'.4	0'.9	
06	271° 47'.2	56'.2	88° 07'.6	5'.6	09'.5	1'.2	58'.6
07	286° 46'.9	56'.4	102° 32'.2	5'.6	08'.3	1'.3	
08	301° 46'.6	56'.6	116° 56'.8	5'.6	07'.0	1'.4	
09	316° 46'.3	56'.9	131° 21'.4	5'.5	05'.6	1'.6	
10	331° 46'.1	57'.1	145° 45'.9	5'.6	04'.0	1'.8	
11	346° 45'.8	57'.3	160° 10'.5	5'.5	02'.2	1'.9	58'.7
12	1° 45'.5	22° 57'.5 S	174° 35'.0	5'.5	23° 00'.3 N	2'.0	58'.7
13	16° 45'.2	57'.7	188° 59'.5	5'.5	22° 58'.3 N	2'.2	
14	31° 44'.9	57'.9	203° 24'.0	5'.5	56'.1	2'.4	
15	46° 44'.6	58'.1	217° 48'.5	5'.5	53'.7	2'.5	58'.8
16	61° 44'.4	58'.4	232° 13'.0	5'.5	51'.2	2'.7	
17	76° 44'.1	58'.6	246° 37'.5	5'.5	48'.5	2'.8	
18	91° 43'.8	58'.8	261° 02'.0	5'.5	45'.7	2'.9	
19	106° 43'.5	59'.0	275° 26'.5	5'.5	42'.8	3'.2	
20	121° 43'.2	59'.2	289° 51'.0	5'.5	39'.6	3'.2	58'.9
21	136° 42'.9	59'.4	304° 15'.5	5'.5	36'.4	3'.4	
22	151° 42'.6	59'.6	318° 40'.0	5'.6	33'.0	3'.6	
23	166° 42'.4	59'.8	333° 04'.6	5'.5	29'.4	3'.7	
	SD 16'.2	d 0'.2	SD 15'.6		15'.8	16'.0	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
8	8 09	7 56	11:52	22:55	10:28	14d 97%
9	7 43	7 30	11:53	23:53	11:24	15d Full
10	7 16	7 03	11:53	24:52	12:23	16d Full

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1992 December 11, 12, 13 (Fri, Sat, Sun)

GMT	ARIES	VENUS -4.2		MARS -1.0		JUPITER -1.9		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
11 Friday 00	79° 57'.5	134° 28'.4	21° 47'.9 S	320° 41'.0	23° 48'.2 N	249° 13'.2	3° 17'.3 S	122° 50'.6	17° 30'.0 S
01	95° 00'.0	149° 27'.8	47'.2	335° 43'.9	48'.4	264° 15'.4	17'.5	137° 52'.9	29'.9
02	110° 02'.5	164° 27'.3	46'.5	350° 46'.8	48'.6	279° 17'.5	17'.6	152° 55'.1	29'.8
03	125° 04'.9	179° 26'.7	45'.8	5° 49'.7	48'.8	294° 19'.7	17'.7	167° 57'.4	29'.8
04	140° 07'.4	194° 26'.1	45'.0	20° 52'.6	49'.0	309° 21'.8	17'.8	182° 59'.6	29'.7
05	155° 09'.8	209° 25'.5	44'.3	35° 55'.5	49'.2	324° 24'.0	18'.0	198° 01'.9	29'.7
06	170° 12'.3	224° 24'.9	43'.6	50° 58'.4	49'.4	339° 26'.1	18'.1	213° 04'.1	29'.6
07	185° 14'.8	239° 24'.3	42'.9	66° 01'.3	49'.6	354° 28'.3	18'.2	228° 06'.4	29'.5
08	200° 17'.2	254° 23'.7	42'.2	81° 04'.2	49'.8	9° 30'.4	18'.3	243° 08'.6	29'.5
09	215° 19'.7	269° 23'.2	41'.5	96° 07'.1	50'.0	24° 32'.6	18'.5	258° 10'.9	29'.4
10	230° 22'.2	284° 22'.6	40'.8	111° 10'.0	50'.2	39° 34'.7	18'.6	273° 13'.1	29'.3
11	245° 24'.6	299° 22'.0	40'.0	126° 12'.9	50'.4	54° 36'.9	18'.7	288° 15'.4	29'.3
12	260° 27'.1	314° 21'.4	21° 39'.3 S	141° 15'.8	23° 50'.6 N	69° 39'.0	3° 18'.8 S	303° 17'.6	17° 29'.2 S
13	275° 29'.6	329° 20'.9	38'.6	156° 18'.7	50'.8	84° 41'.2	18'.9	318° 19'.9	29'.2
14	290° 32'.0	344° 20'.3	37'.9	171° 21'.6	51'.0	99° 43'.3	19'.1	333° 22'.1	29'.1
15	305° 34'.5	359° 19'.7	37'.1	186° 24'.5	51'.2	114° 45'.5	19'.2	348° 24'.4	29'.0
16	320° 37'.0	14° 19'.1	36'.4	201° 27'.4	51'.4	129° 47'.7	19'.3	3° 26'.6	29'.0
17	335° 39'.4	29° 18'.5	35'.7	216° 30'.3	51'.6	144° 49'.8	19'.4	18° 28'.9	28'.9
18	350° 41'.9	44° 18'.0	35'.0	231° 33'.2	51'.8	159° 52'.0	19'.6	33° 31'.1	28'.8
19	5° 44'.3	59° 17'.4	34'.3	246° 36'.2	52'.0	174° 54'.1	19'.7	48° 33'.4	28'.8
20	20° 46'.8	74° 16'.8	33'.5	261° 39'.1	52'.2	189° 56'.3	19'.8	63° 35'.6	28'.7
21	35° 49'.3	89° 16'.3	32'.8	276° 42'.0	52'.4	204° 58'.4	19'.9	78° 37'.9	28'.7
22	50° 51'.7	104° 15'.7	32'.1	291° 44'.9	52'.6	220° 00'.6	20'.0	93° 40'.1	28'.6
23	65° 54'.2	119° 15'.1	31'.3	306° 47'.8	52'.8	235° 02'.7	20'.2	108° 42'.4	28'.5
12 Saturday 00	80° 56'.7	134° 14'.5	21° 30'.6 S	321° 50'.8	23° 53'.0 N	250° 04'.9	3° 20'.3 S	123° 44'.6	17° 28'.5 S
01	95° 59'.1	149° 14'.0	29'.9	336° 53'.7	53'.2	265° 07'.0	20'.4	138° 46'.9	28'.4
02	111° 01'.6	164° 13'.4	29'.1	351° 56'.6	53'.4	280° 09'.2	20'.5	153° 49'.1	28'.3
03	126° 04'.1	179° 12'.8	28'.4	6° 59'.6	53'.6	295° 11'.3	20'.7	168° 51'.4	28'.3
04	141° 06'.5	194° 12'.3	27'.7	22° 02'.5	53'.8	310° 13'.5	20'.8	183° 53'.6	28'.2
05	156° 09'.0	209° 11'.7	26'.9	37° 05'.4	54'.0	325° 15'.7	20'.9	198° 55'.9	28'.1
06	171° 11'.5	224° 11'.1	26'.2	52° 08'.4	54'.2	340° 17'.8	21'.0	213° 58'.1	28'.1
07	186° 13'.9	239° 10'.6	25'.5	67° 11'.3	54'.4	355° 20'.0	21'.1	229° 00'.4	28'.0
08	201° 16'.4	254° 10'.0	24'.7	82° 14'.2	54'.6	10° 22'.1	21'.3	244° 02'.6	28'.0
09	216° 18'.8	269° 09'.4	24'.0	97° 17'.2	54'.8	25° 24'.3	21'.4	259° 04'.9	27'.9
10	231° 21'.3	284° 08'.9	23'.2	112° 20'.1	55'.0	40° 26'.4	21'.5	274° 07'.1	27'.8
11	246° 23'.8	299° 08'.3	22'.5	127° 23'.1	55'.2	55° 28'.6	21'.6	289° 09'.4	27'.8
12	261° 26'.2	314° 07'.8	21° 21'.8 S	142° 26'.0	23° 55'.4 N	70° 30'.7	3° 21'.7 S	304° 11'.6	17° 27'.7 S
13	276° 28'.7	329° 07'.2	21'.0	157° 28'.9	55'.7	85° 32'.9	21'.9	319° 13'.9	27'.6
14	291° 31'.2	344° 06'.6	20'.3	172° 31'.9	55'.9	100° 35'.1	22'.0	334° 16'.1	27'.6
15	306° 33'.6	359° 06'.1	19'.5	187° 34'.8	56'.1	115° 37'.2	22'.1	349° 18'.3	27'.5
16	321° 36'.1	14° 05'.5	18'.8	202° 37'.8	56'.3	130° 39'.4	22'.2	4° 20'.6	27'.5
17	336° 38'.6	29° 05'.0	18'.0	217° 40'.7	56'.5	145° 41'.5	22'.3	19° 22'.8	27'.4
18	351° 41'.0	44° 04'.4	17'.3	232° 43'.7	56'.7	160° 43'.7	22'.5	34° 25'.1	27'.3
19	6° 43'.5	59° 03'.9	16'.5	247° 46'.6	56'.9	175° 45'.9	22'.6	49° 27'.3	27'.3
20	21° 46'.0	74° 03'.3	15'.8	262° 49'.6	57'.1	190° 48'.0	22'.7	64° 29'.6	27'.2
21	36° 48'.4	89° 02'.8	15'.0	277° 52'.6	57'.3	205° 50'.2	22'.8	79° 31'.8	27'.1
22	51° 50'.9	104° 02'.2	14'.3	292° 55'.5	57'.5	220° 52'.3	22'.9	94° 34'.1	27'.1
23	66° 53'.3	119° 01'.6	13'.5	307° 58'.5	57'.7	235° 54'.5	23'.1	109° 36'.3	27'.0
13 Sunday 00	81° 55'.8	134° 01'.1	21° 12'.8 S	323° 01'.4	23° 57'.9 N	250° 56'.6	3° 23'.2 S	124° 38'.6	17° 26'.9 S
01	96° 58'.3	149° 00'.5	12'.0	338° 04'.4	58'.1	265° 58'.8	23'.3	139° 40'.8	26'.9
02	112° 00'.7	164° 00'.0	11'.3	353° 07'.4	58'.4	281° 01'.0	23'.4	154° 43'.1	26'.8
03	127° 03'.2	178° 59'.4	10'.5	8° 10'.3	58'.6	296° 03'.1	23'.5	169° 45'.3	26'.7
04	142° 05'.7	193° 58'.9	09'.7	23° 13'.3	58'.8	311° 05'.3	23'.7	184° 47'.5	26'.7
05	157° 08'.1	208° 58'.3	09'.0	38° 16'.3	59'.0	326° 07'.4	23'.8	199° 49'.8	26'.6
06	172° 10'.6	223° 57'.8	08'.2	53° 19'.3	59'.2	341° 09'.6	23'.9	214° 52'.0	26'.6
07	187° 13'.1	238° 57'.3	07'.5	68° 22'.2	59'.4	356° 11'.8	24'.0	229° 54'.3	26'.5
08	202° 15'.5	253° 56'.7	06'.7	83° 25'.2	59'.6	11° 13'.9	24'.1	244° 56'.5	26'.4
09	217° 18'.0	268° 56'.2	05'.9	98° 28'.2	59'.8	26° 16'.1	24'.3	259° 58'.8	26'.4
10	232° 20'.4	283° 55'.6	05'.2	113° 31'.2	24° 00'.0 N	41° 18'.2	24'.4	275° 01'.0	26'.3
11	247° 22'.9	298° 55'.1	04'.4	128° 34'.1	00'.2	56° 20'.4	24'.5	290° 03'.3	26'.2
12	262° 25'.4	313° 54'.5	21° 03'.6 S	143° 37'.1	24° 00'.5 N	71° 22'.6	3° 24'.6 S	305° 05'.5	17° 26'.2 S
13	277° 27'.8	328° 54'.0	02'.9	158° 40'.1	00'.7	86° 24'.7	24'.7	320° 07'.8	26'.1
14	292° 30'.3	343° 53'.4	02'.1	173° 43'.1	00'.9	101° 26'.9	24'.9	335° 10'.0	26'.0
15	307° 32'.8	358° 52'.9	01'.3	188° 46'.1	01'.1	116° 29'.1	25'.0	350° 12'.2	26'.0
16	322° 35'.2	13° 52'.4	00'.6	203° 49'.1	01'.3	131° 31'.2	25'.1	5° 14'.5	25'.9
17	337° 37'.7	28° 51'.8	20° 59'.8 S	218° 52'.1	01'.5	146° 33'.4	25'.2	20° 16'.7	25'.8
18	352° 40'.2	43° 51'.3	59'.0	233° 55'.0	01'.7	161° 35'.5	25'.3	35° 19'.0	25'.8
19	7° 42'.6	58° 50'.8	58'.3	248° 58'.0	01'.9	176° 37'.7	25'.4	50° 21'.2	25'.7
20	22° 45'.1	73° 50'.2	57'.5	264° 01'.0	02'.2	191° 39'.9	25'.6	65° 23'.5	25'.7
21	37° 47'.6	88° 49'.7	56'.7	279° 04'.0	02'.4	206° 42'.0	25'.7	80° 25'.7	25'.6
22	52° 50'.0	103° 49'.1	55'.9	294° 07'.0	02'.6	221° 44'.2	25'.8	95° 27'.9	25'.5
23	67° 52'.5	118° 48'.6	55'.2	309° 10'.0	02'.8	236° 46'.4	25'.9	110° 30'.2	25'.5
	M.P. 18:33	v -0'.6	d 0'.7	v 2'.9	d 0'.2	v 2'.2	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 29'.6	40° 20'.0 S
Achernar	335° 37'.7	57° 16'.5 S
Acrux	173° 26'.8	63° 03'.4 S
Adhara	255° 24'.2	28° 57'.7 S
Aldebaran	291° 06'.6	16° 29'.8 N
Alioth	166° 34'.2	55° 59'.5 N
Alkaid	153° 11'.2	49° 20'.6 N
Alnair	28° 03'.0	46° 59'.8 S
Alnilam	276° 01'.6	1° 12'.4 S
Alphard	218° 11'.0	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.2 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.5	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.8 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.0 N
Atria	108° 01'.7	69° 00'.9 S
Avior	234° 23'.8	59° 29'.1 S
Bellatrix	278° 48'.1	6° 20'.6 N
Betelgeuse	271° 17'.5	7° 24'.4 N
Canopus	264° 02'.4	52° 41'.5 S
Capella	280° 56'.6	45° 59'.5 N
Deneb	49° 42'.3	45° 15'.6 N
Denebola	182° 49'.3	14° 36'.5 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.2	61° 46'.9 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.4 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.9	29° 39'.6 S
Gacrux	172° 18'.3	57° 04'.2 S
Gienah	176° 08'.2	17° 30'.2 S
Hadar	149° 10'.2	60° 20'.2 S
Hamal	328° 17'.8	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.3	74° 10'.8 N
Markab	13° 53'.6	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.0 S
Miaplacidus	221° 42'.5	69° 41'.1 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.6 S
Polaris	323° 31'.4	89° 14'.3 N
Pollux	243° 46'.1	28° 02'.5 N
Procyon	245° 15'.4	5° 14'.5 N
Rasalhague	96° 21'.0	12° 33'.9 N
Regulus	207° 59'.7	12° 00'.0 N
Rigel	281° 26'.4	8° 12'.6 S
Rigil Kent	140° 13'.2	60° 48'.1 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.9	56° 30'.3 N
Shaula	96° 43'.2	37° 05'.9 S
Sirius	258° 46'.9	16° 42'.4 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 03'.5	43° 24'.1 S
Vega	80° 49'.8	38° 46'.7 N
Zuben'ubi	137° 22'.7	16° 00'.7 S

	SHA	Mer.Pass.
Venus	53° 17'.9	15:04
Mars	240° 54'.1	02:32
Jupiter	169° 08'.2	07:19
Saturn	42° 48'.0	15:43

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
11 00	181° 42'.1	23° 00'.0 S	347° 29'.1	5'.5	22° 25'.7 N	3'.9	58'.9
01	196° 41'.8	00'.2	1° 53'.6	5'.6	21'.8	4'.0	59'.0
02	211° 41'.5	00'.4	16° 18'.2	5'.6	17'.8	4'.2	
03	226° 41'.2	00'.6	30° 42'.8	5'.5	13'.6	4'.3	
04	241° 40'.9	00'.8	45° 07'.3	5'.6	09'.3	4'.5	
05	256° 40'.6	01'.0	59° 31'.9	5'.7	04'.8	4'.6	
06	271° 40'.3	01'.3	73° 56'.6	5'.6	00'.2	4'.7	
07	286° 40'.1	01'.5	88° 21'.2	5'.7	21° 55'.5 N	5'.0	59'.1
08	301° 39'.8	01'.7	102° 45'.9	5'.7	50'.5	5'.0	
09	316° 39'.5	01'.9	117° 10'.6	5'.7	45'.5	5'.2	
10	331° 39'.2	02'.0	131° 35'.3	5'.7	40'.3	5'.3	
11	346° 38'.9	02'.2	146° 00'.0	5'.8	35'.0	5'.5	
12	1° 38'.6	23° 02'.4 S	160° 24'.8	5'.8	21° 29'.5 N	5'.7	59'.1
13	16° 38'.3	02'.6	174° 49'.6	5'.8	23'.8	5'.7	59'.2
14	31° 38'.0	02'.8	189° 14'.4	5'.9	18'.1	5'.9	
15	46° 37'.8	03'.0	203° 39'.3	5'.9	12'.2	6'.1	
16	61° 37'.5	03'.2	218° 04'.2	5'.9	06'.1	6'.2	
17	76° 37'.2	03'.4	232° 29'.1	6'.0	20° 59'.9 N	6'.3	
18	91° 36'.9	03'.6	246° 54'.1	6'.0	53'.6	6'.5	
19	106° 36'.6	03'.8	261° 19'.1	6'.0	47'.1	6'.6	59'.3
20	121° 36'.3	04'.0	275° 44'.1	6'.1	40'.5	6'.8	
21	136° 36'.0	04'.2	290° 09'.2	6'.1	33'.7	6'.9	
22	151° 35'.7	04'.4	304° 34'.3	6'.2	26'.8	7'.0	
23	166° 35'.4	04'.6	318° 59'.5	6'.2	19'.8	7'.1	
12 00	181° 35'.1	23° 04'.7 S	333° 24'.7	6'.2	20° 12'.7 N	7'.3	59'.3
01	196° 34'.9	04'.9	347° 49'.9	6'.3	05'.4	7'.5	
02	211° 34'.6	05'.1	2° 15'.2	6'.4	19° 57'.9 N	7'.5	
03	226° 34'.3	05'.3	16° 40'.6	6'.4	50'.4	7'.7	59'.4
04	241° 34'.0	05'.5	31° 06'.0	6'.4	42'.7	7'.8	
05	256° 33'.7	05'.7	45° 31'.4	6'.5	34'.9	7'.9	
06	271° 33'.4	05'.8	59° 56'.9	6'.6	27'.0	8'.1	
07	286° 33'.1	06'.0	74° 22'.5	6'.5	18'.9	8'.2	
08	301° 32'.8	06'.2	88° 48'.0	6'.7	10'.7	8'.3	
09	316° 32'.5	06'.4	103° 13'.7	6'.7	02'.4	8'.5	
10	331° 32'.2	06'.6	117° 39'.4	6'.7	18° 53'.9 N	8'.5	
11	346° 31'.9	06'.7	132° 05'.1	6'.8	45'.4	8'.7	
12	1° 31'.6	23° 06'.9 S	146° 30'.9	6'.9	18° 36'.7 N	8'.8	59'.4
13	16° 31'.4	07'.1	160° 56'.8	6'.9	27'.9	9'.0	59'.5
14	31° 31'.1	07'.3	175° 22'.7	7'.0	18'.9	9'.0	
15	46° 30'.8	07'.5	189° 48'.7	7'.0	09'.9	9'.2	
16	61° 30'.5	07'.6	204° 14'.7	7'.1	00'.7	9'.2	
17	76° 30'.2	07'.8	218° 40'.8	7'.1	17° 51'.5 N	9'.4	
18	91° 29'.9	08'.0	233° 06'.9	7'.2	42'.1	9'.5	
19	106° 29'.6	08'.1	247° 33'.1	7'.2	32'.6	9'.6	
20	121° 29'.3	08'.3	261° 59'.3	7'.4	23'.0	9'.8	
21	136° 29'.0	08'.5	276° 25'.7	7'.3	13'.2	9'.8	
22	151° 28'.7	08'.7	290° 52'.0	7'.5	03'.4	9'.9	
23	166° 28'.4	08'.8	305° 18'.5	7'.4	16° 53'.5 N	10'.1	
13 00	181° 28'.1	23° 09'.0 S	319° 44'.9	7'.6	16° 43'.4 N	10'.1	59'.5
01	196° 27'.8	09'.2	334° 11'.5	7'.6	33'.3	10'.3	
02	211° 27'.5	09'.3	348° 38'.1	7'.7	23'.0	10'.3	
03	226° 27'.2	09'.5	3° 04'.8	7'.7	12'.7	10'.5	
04	241° 27'.0	09'.7	17° 31'.5	7'.8	02'.2	10'.5	59'.6
05	256° 26'.7	09'.8	31° 58'.3	7'.8	15° 51'.7 N	10'.7	
06	271° 26'.4	10'.0	46° 25'.1	7'.9	41'.0	10'.7	
07	286° 26'.1	10'.1	60° 52'.0	8'.0	30'.3	10'.9	
08	301° 25'.8	10'.3	75° 19'.0	8'.0	19'.4	10'.9	
09	316° 25'.5	10'.5	89° 46'.0	8'.1	08'.5	11'.0	
10	331° 25'.2	10'.6	104° 13'.1	8'.1	14° 57'.5 N	11'.2	
11	346° 24'.9	10'.8	118° 40'.2	8'.3	46'.3	11'.2	
12	1° 24'.6	23° 11'.0 S	133° 07'.5	8'.2	14° 35'.1 N	11'.3	59'.6
13	16° 24'.3	11'.1	147° 34'.7	8'.3	23'.8	11'.4	
14	31° 24'.0	11'.3	162° 02'.0	8'.4	12'.4	11'.4	
15	46° 23'.7	11'.4	176° 29'.4	8'.5	01'.0	11'.6	
16	61° 23'.4	11'.6	190° 56'.9	8'.5	13° 49'.4 N	11'.6	
17	76° 23'.1	11'.7	205° 24'.4	8'.6	37'.8	11'.7	
18	91° 22'.8	11'.9	219° 52'.0	8'.6	26'.1	11'.8	
19	106° 22'.5	12'.0	234° 19'.6	8'.7	14'.3	11'.9	
20	121° 22'.2	12'.2	248° 47'.3	8'.7	02'.4	12'.0	
21	136° 21'.9	12'.3	263° 15'.0	8'.8	12° 50'.4 N	12'.0	
22	151° 21'.6	12'.5	277° 42'.8	8'.9	38'.4	12'.1	
23	166° 21'.3	12'.6	292° 10'.7	8'.9	26'.3	12'.1	
	SD 16'.2	d 0'.2	SD 16'.1		16'.2	16'.2	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
11	6 49	6 35	11:53	00:52	13:22	17d 97%
12	6 21	6 07	11:54	01:51	14:19	18d 92%
13	5 53	5 39	11:54	02:47	15:15	19d 85%

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1992 December 14, 15, 16 (Mon, Tue, Wed)

GMT	ARIES	VENUS -4.2		MARS -1.1		JUPITER -1.9		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
14 Monday 00	82° 54'.9	133° 48'.1	20° 54'.4 S	324° 13'.0	24° 03'.0 N	251° 48'.5	3° 26'.0 S	125° 32'.4	17° 25'.4 S
01	97° 57'.4	148° 47'.5	53'.6	339° 16'.0	03'.2	266° 50'.7	26'.2	140° 34'.7	25'.3
02	112° 59'.9	163° 47'.0	52'.8	354° 19'.0	03'.4	281° 52'.9	26'.3	155° 36'.9	25'.3
03	128° 02'.3	178° 46'.5	52'.0	9° 22'.0	03'.7	296° 55'.0	26'.4	170° 39'.2	25'.2
04	143° 04'.8	193° 46'.0	51'.3	24° 25'.0	03'.9	311° 57'.2	26'.5	185° 41'.4	25'.1
05	158° 07'.3	208° 45'.4	50'.5	39° 28'.1	04'.1	326° 59'.3	26'.6	200° 43'.6	25'.1
06	173° 09'.7	223° 44'.9	49'.7	54° 31'.1	04'.3	342° 01'.5	26'.7	215° 45'.9	25'.0
07	188° 12'.2	238° 44'.4	48'.9	69° 34'.1	04'.5	357° 03'.7	26'.9	230° 48'.1	24'.9
08	203° 14'.7	253° 43'.8	48'.1	84° 37'.1	04'.7	12° 05'.8	27'.0	245° 50'.4	24'.9
09	218° 17'.1	268° 43'.3	47'.3	99° 40'.1	04'.9	27° 08'.0	27'.1	260° 52'.6	24'.8
10	233° 19'.6	283° 42'.8	46'.6	114° 43'.1	05'.2	42° 10'.2	27'.2	275° 54'.9	24'.7
11	248° 22'.1	298° 42'.3	45'.8	129° 46'.1	05'.4	57° 12'.3	27'.3	290° 57'.1	24'.7
12	263° 24'.5	313° 41'.7	20° 45'.0 S	144° 49'.2	24° 05'.6 N	72° 14'.5	3° 27'.4 S	305° 59'.3	17° 24'.6 S
13	278° 27'.0	328° 41'.2	44'.2	159° 52'.2	05'.8	87° 16'.7	27'.6	321° 01'.6	24'.5
14	293° 29'.4	343° 40'.7	43'.4	174° 55'.2	06'.0	102° 18'.8	27'.7	336° 03'.8	24'.5
15	308° 31'.9	358° 40'.2	42'.6	189° 58'.2	06'.2	117° 21'.0	27'.8	351° 06'.1	24'.4
16	323° 34'.4	13° 39'.6	41'.8	205° 01'.2	06'.5	132° 23'.2	27'.9	6° 08'.3	24'.3
17	338° 36'.8	28° 39'.1	41'.0	220° 04'.3	06'.7	147° 25'.3	28'.0	21° 10'.5	24'.3
18	353° 39'.3	43° 38'.6	40'.2	235° 07'.3	06'.9	162° 27'.5	28'.1	36° 12'.8	24'.2
19	8° 41'.8	58° 38'.1	39'.4	250° 10'.3	07'.1	177° 29'.7	28'.2	51° 15'.0	24'.2
20	23° 44'.2	73° 37'.6	38'.6	265° 13'.4	07'.3	192° 31'.8	28'.4	66° 17'.3	24'.1
21	38° 46'.7	88° 37'.0	37'.8	280° 16'.4	07'.5	207° 34'.0	28'.5	81° 19'.5	24'.0
22	53° 49'.2	103° 36'.5	37'.1	295° 19'.4	07'.8	222° 36'.2	28'.6	96° 21'.8	24'.0
23	68° 51'.6	118° 36'.0	36'.3	310° 22'.5	08'.0	237° 38'.4	28'.7	111° 24'.0	23'.9
15 Tuesday 00	83° 54'.1	133° 35'.5	20° 35'.5 S	325° 25'.5	24° 08'.2 N	252° 40'.5	3° 28'.8 S	126° 26'.2	17° 23'.8 S
01	98° 56'.5	148° 35'.0	34'.7	340° 28'.5	08'.4	267° 42'.7	28'.9	141° 28'.5	23'.8
02	113° 59'.0	163° 34'.5	33'.9	355° 31'.6	08'.6	282° 44'.9	29'.1	156° 30'.7	23'.7
03	129° 01'.5	178° 34'.0	33'.1	10° 34'.6	08'.9	297° 47'.0	29'.2	171° 33'.0	23'.6
04	144° 03'.9	193° 33'.4	32'.3	25° 37'.7	09'.1	312° 49'.2	29'.3	186° 35'.2	23'.6
05	159° 06'.4	208° 32'.9	31'.4	40° 40'.7	09'.3	327° 51'.4	29'.4	201° 37'.4	23'.5
06	174° 08'.9	223° 32'.4	30'.6	55° 43'.8	09'.5	342° 53'.5	29'.5	216° 39'.7	23'.4
07	189° 11'.3	238° 31'.9	29'.8	70° 46'.8	09'.7	357° 55'.7	29'.6	231° 41'.9	23'.4
08	204° 13'.8	253° 31'.4	29'.0	85° 49'.9	10'.0	12° 57'.9	29'.7	246° 44'.2	23'.3
09	219° 16'.3	268° 30'.9	28'.2	100° 52'.9	10'.2	28° 00'.1	29'.9	261° 46'.4	23'.2
10	234° 18'.7	283° 30'.4	27'.4	115° 56'.0	10'.4	43° 02'.2	30'.0	276° 48'.6	23'.2
11	249° 21'.2	298° 29'.9	26'.6	130° 59'.0	10'.6	58° 04'.4	30'.1	291° 50'.9	23'.1
12	264° 23'.7	313° 29'.4	20° 25'.8 S	146° 02'.1	24° 10'.8 N	73° 06'.6	3° 30'.2 S	306° 53'.1	17° 23'.0 S
13	279° 26'.1	328° 28'.9	25'.0	161° 05'.1	11'.1	88° 08'.7	30'.3	321° 55'.4	23'.0
14	294° 28'.6	343° 28'.4	24'.2	176° 08'.2	11'.3	103° 10'.9	30'.4	336° 57'.6	22'.9
15	309° 31'.0	358° 27'.9	23'.4	191° 11'.3	11'.5	118° 13'.1	30'.5	351° 59'.8	22'.8
16	324° 33'.5	13° 27'.4	22'.6	206° 14'.3	11'.7	133° 15'.3	30'.7	7° 02'.1	22'.8
17	339° 36'.0	28° 26'.9	21'.7	221° 17'.4	11'.9	148° 17'.4	30'.8	22° 04'.3	22'.7
18	354° 38'.4	43° 26'.4	20'.9	236° 20'.4	12'.2	163° 19'.6	30'.9	37° 06'.5	22'.6
19	9° 40'.9	58° 25'.9	20'.1	251° 23'.5	12'.4	178° 21'.8	31'.0	52° 08'.8	22'.6
20	24° 43'.4	73° 25'.4	19'.3	266° 26'.6	12'.6	193° 23'.9	31'.1	67° 11'.0	22'.5
21	39° 45'.8	88° 24'.9	18'.5	281° 29'.6	12'.8	208° 26'.1	31'.2	82° 13'.3	22'.4
22	54° 48'.3	103° 24'.4	17'.7	296° 32'.7	13'.1	223° 28'.3	31'.3	97° 15'.5	22'.4
23	69° 50'.8	118° 23'.9	16'.8	311° 35'.8	13'.3	238° 30'.5	31'.4	112° 17'.7	22'.3
16 Wednesday 00	84° 53'.2	133° 23'.4	20° 16'.0 S	326° 38'.9	24° 13'.5 N	253° 32'.6	3° 31'.6 S	127° 20'.0	17° 22'.2 S
01	99° 55'.7	148° 22'.9	15'.2	341° 41'.9	13'.7	268° 34'.8	31'.7	142° 22'.2	22'.2
02	114° 58'.2	163° 22'.4	14'.4	356° 45'.0	13'.9	283° 37'.0	31'.8	157° 24'.5	22'.1
03	130° 00'.6	178° 21'.9	13'.5	11° 48'.1	14'.2	298° 39'.2	31'.9	172° 26'.7	22'.0
04	145° 03'.1	193° 21'.4	12'.7	26° 51'.2	14'.4	313° 41'.3	32'.0	187° 28'.9	22'.0
05	160° 05'.5	208° 20'.9	11'.9	41° 54'.3	14'.6	328° 43'.5	32'.1	202° 31'.2	21'.9
06	175° 08'.0	223° 20'.4	11'.1	56° 57'.3	14'.8	343° 45'.7	32'.2	217° 33'.4	21'.8
07	190° 10'.5	238° 19'.9	10'.2	72° 00'.4	15'.1	358° 47'.9	32'.3	232° 35'.6	21'.8
08	205° 12'.9	253° 19'.4	09'.4	87° 03'.5	15'.3	13° 50'.0	32'.5	247° 37'.9	21'.7
09	220° 15'.4	268° 18'.9	08'.6	102° 06'.6	15'.5	28° 52'.2	32'.6	262° 40'.1	21'.6
10	235° 17'.9	283° 18'.4	07'.8	117° 09'.7	15'.7	43° 54'.4	32'.7	277° 42'.3	21'.6
11	250° 20'.3	298° 18'.0	06'.9	132° 12'.8	16'.0	58° 56'.6	32'.8	292° 44'.6	21'.5
12	265° 22'.8	313° 17'.5	20° 06'.1 S	147° 15'.9	24° 16'.2 N	73° 58'.7	3° 32'.9 S	307° 46'.8	17° 21'.4 S
13	280° 25'.3	328° 17'.0	05'.3	162° 19'.0	16'.4	89° 00'.9	33'.0	322° 49'.1	21'.4
14	295° 27'.7	343° 16'.5	04'.4	177° 22'.1	16'.6	104° 03'.1	33'.1	337° 51'.3	21'.3
15	310° 30'.2	358° 16'.0	03'.6	192° 25'.2	16'.9	119° 05'.3	33'.2	352° 53'.5	21'.2
16	325° 32'.6	13° 15'.5	02'.8	207° 28'.3	17'.1	134° 07'.5	33'.3	7° 55'.8	21'.2
17	340° 35'.1	28° 15'.0	01'.9	222° 31'.4	17'.3	149° 09'.6	33'.5	22° 58'.0	21'.1
18	355° 37'.6	43° 14'.6	01'.1	237° 34'.5	17'.5	164° 11'.8	33'.6	38° 00'.2	21'.0
19	10° 40'.0	58° 14'.1	00'.3	252° 37'.6	17'.8	179° 14'.0	33'.7	53° 02'.5	21'.0
20	25° 42'.5	73° 13'.6	19° 59'.4 S	267° 40'.7	18'.0	194° 16'.2	33'.8	68° 04'.7	20'.9
21	40° 45'.0	88° 13'.1	58'.6	282° 43'.8	18'.2	209° 18'.3	33'.9	83° 06'.9	20'.8
22	55° 47'.4	103° 12'.6	57'.7	297° 46'.9	18'.4	224° 20'.5	34'.0	98° 09'.2	20'.8
23	70° 49'.9	118° 12'.2	56'.9	312° 50'.0	18'.7	239° 22'.7	34'.1	113° 11'.4	20'.7
	M.P. 18:21	v -0'.5	d 0'.8	v 3'.1	d 0'.2	v 2'.2	d 0'.1	v 2'.2	d 0'.1

STARS	SHA	Dec
Acamar	315° 29'.6	40° 20'.0 S
Achernar	335° 37'.7	57° 16'.5 S
Acrux	173° 26'.8	63° 03'.4 S
Adhara	255° 24'.2	28° 57'.7 S
Aldebaran	291° 06'.6	16° 29'.8 N
Alioth	166° 34'.2	55° 59'.5 N
Alkaid	153° 11'.2	49° 20'.6 N
Alnair	28° 03'.0	46° 59'.8 S
Alnilam	276° 01'.6	1° 12'.4 S
Alphard	218° 10'.9	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.2 N
Alpheratz	357° 59'.3	29° 03'.4 N
Altair	62° 23'.5	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.8 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.0 N
Atria	108° 01'.7	69° 00'.9 S
Avior	234° 23'.8	59° 29'.1 S
Bellatrix	278° 48'.1	6° 20'.6 N
Betelgeuse	271° 17'.5	7° 24'.4 N
Canopus	264° 02'.4	52° 41'.5 S
Capella	280° 56'.6	45° 59'.5 N
Deneb	49° 42'.3	45° 15'.6 N
Denebola	182° 49'.3	14° 36'.5 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.2	61° 46'.9 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.4 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.9	29° 39'.6 S
Gacrux	172° 18'.2	57° 04'.2 S
Gienah	176° 08'.1	17° 30'.2 S
Hadar	149° 10'.2	60° 20'.2 S
Hamal	328° 17'.9	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.2	74° 10'.8 N
Markab	13° 53'.7	15° 10'.3 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 26'.0	36° 20'.0 S
Miaplacidus	221° 42'.4	69° 41'.1 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.6 S
Polaris	323° 32'.2	89° 14'.3 N
Pollux	243° 46'.1	28° 02'.5 N
Procyon	245° 15'.4	5° 14'.5 N
Rasalhague	96° 21'.0	12° 33'.9 N
Regulus	207° 59'.6	11° 59'.9 N
Rigel	281° 26'.4	8° 12'.6 S
Rigil Kent	140° 13'.2	60° 48'.1 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 57'.9	56° 30'.3 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 46'.9	16° 42'.4 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 03'.5	43° 24'.1 S
Vega	80° 49'.8	38° 46'.7 N
Zuben'ubi	137° 22'.7	16° 00'.8 S

	SHA	Mer.Pass.
Venus	49° 41'.4	15:06
Mars	241° 31'.4	02:18
Jupiter	168° 46'.4	07:08
Saturn	42° 32'.2	15:32

SUN	GHA	Dec
14	181° 21'.0	23° 12'.8 S
15	196° 20'.7	12'.9
16	211° 20'.4	13'.1
17	226° 20'.1	13'.2
18	241° 19'.8	13'.4
19	256° 19'.5	13'.5
20	271° 19'.2	13'.7
21	286° 18'.9	13'.8
22	301° 18'.6	14'.0
23	316° 18'.3	14'.1
24	331° 18'.0	14'.2
25	346° 17'.8	14'.4
26	1° 17'.5	23° 14'.5 S
27	16° 17'.2	14'.7
28	31° 16'.9	14'.8
29	46° 16'.6	14'.9
30	61° 16'.3	15'.1
31	76° 16'.0	15'.2
32	91° 15'.7	15'.3
33	106° 15'.4	15'.5
34	121° 15'.1	15'.6
35	136° 14'.8	15'.7
36	151° 14'.5	15'.9
37	166° 14'.2	16'.0
38	181° 13'.9	23° 16'.1 S
39	196° 13'.6	16'.3
40	211° 13'.3	16'.4
41	226° 13'.0	16'.5
42	241° 12'.7	16'.6
43	256° 12'.4	16'.8
44	271° 12'.0	16'.9
45	286° 11'.7	17'.0
46	301° 11'.4	17'.1
47	316° 11'.1	17'.3
48	331° 10'.8	17'.4
49	346° 10'.5	17'.5
50	1° 10'.2	23° 17'.6 S
51	16° 09'.9	17'.7
52	31° 09'.6	17'.9
53	46° 09'.3	18'.0
54	61° 09'.0	18'.1
55	76° 08'.7	18'.2
56	91° 08'.4	18'.3
57	106° 08'.1	18'.4
58	121° 07'.8	18'.5
59	136° 07'.5	18'.7
60	151° 07'.2	18'.8
61	166° 06'.9	18'.9
62	181° 06'.6	23° 19'.0 S
63	196° 06'.3	19'.1
64	211° 06'.0	19'.2
65	226° 05'.7	19'.3
66	241° 05'.4	19'.4
67	256° 05'.1	19'.5
68	271° 04'.8	19'.6
69	286° 04'.5	19'.7
70	301° 04'.2	19'.8
71	316° 03'.9	19'.9
72	331° 03'.6	20'.0
73	346° 03'.3	20'.1
74	1° 03'.0	23° 20'.2 S
75	16° 02'.7	20'.3
76	31° 02'.4	20'.4
77	46° 02'.0	20'.5
78	61° 01'.7	20'.6
79	76° 01'.4	20'.7
80	91° 01'.1	20'.8
81	106° 00'.8	20'.9
82	121° 00'.5	21'.0
83	136° 00'.2	21'.1
84	150° 59'.9	21'.2
85	165° 59'.6	21'.3
SD	16'.3	d 0'.1

MOON	GHA	v	Dec	d	HP
14	306° 38'.6	8'.9	12° 14'.2 N	12'.3	59'.6
15	321° 06'.5	9'.1	01'.9	12'.3	
16	335° 34'.6	9'.0	11° 49'.6 N	12'.4	
17	350° 02'.6	9'.2	37'.2	12'.4	
18	4° 30'.8	9'.2	24'.8	12'.5	
19	18° 59'.0	9'.2	12'.3	12'.6	
20	33° 27'.2	9'.3	10° 59'.7 N	12'.6	
21	47° 55'.5	9'.4	47'.1	12'.7	
22	62° 23'.9	9'.4	34'.4	12'.8	
23	76° 52'.3	9'.4	21'.6	12'.8	
24	91° 20'.7	9'.5	08'.8	12'.9	
25	105° 49'.2	9'.6	9° 55'.9 N	12'.9	
26	120° 17'.8	9'.6	9° 43'.0 N	13'.0	59'.6
27	134° 46'.4	9'.6	30'.0	13'.0	
28	149° 15'.0	9'.7	17'.0	13'.1	
29	163° 43'.7	9'.8	03'.9	13'.1	
30	178° 12'.5	9'.8	8° 50'.8 N	13'.2	59'.5
31	192° 41'.3	9'.8	37'.6	13'.2	
32	207° 10'.1	9'.9	24'.4	13'.2	
33	221° 39'.0	10'.0	11'.2	13'.4	
34	236° 08'.0	9'.9	7° 57'.8 N	13'.3	
35	250° 36'.9	10'.1	44'.5	13'.4	
36	265° 06'.0	10'.0	31'.1	13'.4	
37	279° 35'.0	10'.1	17'.7	13'.5	
38	294° 04'.1	10'.2	7° 04'.2 N	13'.5	59'.5
39	308° 33'.3	10'.2	6° 50'.7 N	13'.5	
40	323° 02'.5	10'.2	37'.2	13'.6	
41	337° 31'.7	10'.3	23'.6	13'.6	
42	352° 01'.0	10'.3	10'.0	13'.6	
43	6° 30'.3	10'.3	5° 56'.4 N	13'.7	
44	20° 59'.6	10'.4	42'.7	13'.7	
45	35° 29'.0	10'.4	29'.0	13'.7	
46	49° 58'.4	10'.5	15'.3	13'.7	
47	64° 27'.9	10'.4	01'.6	13'.8	59'.4
48	78° 57'.3	10'.6	4° 47'.8 N	13'.8	
49	93° 26'.9	10'.5	34'.0	13'.8	
50	107° 56'.4	10'.6	4° 20'.2 N	13'.8	59'.4
51	122° 26'.0	10'.6	06'.4	13'.9	
52	136° 55'.6	10'.6	3° 52'.5 N	13'.8	
53	151° 25'.2	10'.7	38'.7	13'.9	
54	165° 54'.9	10'.6	24'.8	13'.9	
55	180° 24'.5	10'.7	10'.9	13'.9	
56	194° 54'.2	10'.8	2° 57'.0 N	13'.9	
57	209° 24'.0	10'.7	43'.1	13'.9	
58	223° 53'.7	10'.8	29'.2	13'.9	
59	238° 23'.5	10'.8	15'.3	14'.0	59'.3
60	252° 53'.3	10'.8	01'.3	13'.9	
61	267° 23'.1	10'.9	1° 47'.4 N	14'.0	
62	281° 53'.0	10'.9	1° 33'.4 N	13'.9	59'.3
63	296° 22'.9	10'.8	19'.5	14'.0	
64	310° 52'.7	10'.9	05'.5	13'.9	
65	325° 22'.6	10'.9	0° 51'.6 N	14'.0	
66	339° 52'.5	11'.0	37'.6	14'.0	
67	354° 22'.5	10'.9	23'.6	13'.9	
68	8° 52'.4	11'.0	09'.7	14'.0	
69	23° 22'.4	10'.9	0° 04'.3 S	13'.9	59'.2
70	37° 52'.3	11'.0	18'.2	13'.9	
71	52° 22'.3	11'.0	32'.1	14'.0	
72	66° 52'.3	11'.0	46'.1	13'.9	
73	81° 22'.3	11'.0	00'.0	13'.9	
74	95° 52'.3	11'.0	1° 13'.9 S	13'.9	59'.2
75	110° 22'.3	11'.0	27'.8	13'.9	
76	124° 52'.3	11'.1	41'.7	13'.8	
77	139° 22'.4	11'.0	55'.5	13'.9	
78	153° 52'.4	11'.0	2° 09'.4 S	13'.8	59'.1
79	168° 22'.4	11'.1	23'.2	13'.8	
80	182° 52'.5	11'.0	37'.0	13'.8	
81	197° 22'.5	11'.0	50'.8	13'.8	
82	211° 52'.5	11'.1	3° 04'.6 S	13'.7	
83	226° 22'.6	11'.0	18'.3	13'.8	
84	240° 52'.6	11'.0	32'.1	13'.7	
85	255° 22'.6	11'.0	45'.8	13'.7	
SD	16'.2		16'.2	16'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
14	5 25	5 10	11:55	03:41	16:07	20d 75%
15	4 56	4 42	11:55	04:33	16:58	21d 65%
16	4 27	4 12	11:56	05:23	17:48	22d 54%

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1992 December 17, 18, 19 (Thur, Fri, Sat)

GMT	ARIES	VENUS -4.2		MARS -1.2		JUPITER -1.9		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
17 Thursday 00	85° 52'.4	133° 11'.7	19° 56'.1 S	327° 53'.1	24° 18'.9 N	254° 24'.9	3° 34'.2 S	128° 13'.7	17° 20'.6 S
01	100° 54'.8	148° 11'.2	55'.2	342° 56'.2	19'.1	269° 27'.1	34'.3	143° 15'.9	20'.6
02	115° 57'.3	163° 10'.7	54'.4	357° 59'.3	19'.4	284° 29'.2	34'.5	158° 18'.1	20'.5
03	130° 59'.8	178° 10'.3	53'.5	13° 02'.5	19'.6	299° 31'.4	34'.6	173° 20'.4	20'.4
04	146° 02'.2	193° 09'.8	52'.7	28° 05'.6	19'.8	314° 33'.6	34'.7	188° 22'.6	20'.4
05	161° 04'.7	208° 09'.3	51'.8	43° 08'.7	20'.0	329° 35'.8	34'.8	203° 24'.8	20'.3
06	176° 07'.1	223° 08'.8	51'.0	58° 11'.8	20'.3	344° 38'.0	34'.9	218° 27'.1	20'.2
07	191° 09'.6	238° 08'.4	50'.1	73° 14'.9	20'.5	359° 40'.1	35'.0	233° 29'.3	20'.2
08	206° 12'.1	253° 07'.9	49'.3	88° 18'.1	20'.7	14° 42'.3	35'.1	248° 31'.5	20'.1
09	221° 14'.5	268° 07'.4	48'.4	103° 21'.2	20'.9	29° 44'.5	35'.2	263° 33'.8	20'.0
10	236° 17'.0	283° 07'.0	47'.6	118° 24'.3	21'.2	44° 46'.7	35'.3	278° 36'.0	19'.9
11	251° 19'.5	298° 06'.5	46'.7	133° 27'.4	21'.4	59° 48'.9	35'.4	293° 38'.2	19'.9
12	266° 21'.9	313° 06'.0	19° 45'.9 S	148° 30'.6	24° 21'.6 N	74° 51'.1	3° 35'.6 S	308° 40'.5	17° 19'.8 S
13	281° 24'.4	328° 05'.5	45'.0	163° 33'.7	21'.9	89° 53'.2	35'.7	323° 42'.7	19'.7
14	296° 26'.9	343° 05'.1	44'.2	178° 36'.8	22'.1	104° 55'.4	35'.8	338° 44'.9	19'.7
15	311° 29'.3	358° 04'.6	43'.3	193° 40'.0	22'.3	119° 57'.6	35'.9	353° 47'.2	19'.6
16	326° 31'.8	13° 04'.1	42'.5	208° 43'.1	22'.5	134° 59'.8	36'.0	8° 49'.4	19'.5
17	341° 34'.3	28° 03'.7	41'.6	223° 46'.2	22'.8	150° 02'.0	36'.1	23° 51'.6	19'.5
18	356° 36'.7	43° 03'.2	40'.8	238° 49'.4	23'.0	165° 04'.1	36'.2	38° 53'.9	19'.4
19	11° 39'.2	58° 02'.8	39'.9	253° 52'.5	23'.2	180° 06'.3	36'.3	53° 56'.1	19'.3
20	26° 41'.6	73° 02'.3	39'.1	268° 55'.6	23'.5	195° 08'.5	36'.4	68° 58'.3	19'.3
21	41° 44'.1	88° 01'.8	38'.2	283° 58'.8	23'.7	210° 10'.7	36'.5	84° 00'.6	19'.2
22	56° 46'.6	103° 01'.4	37'.3	299° 01'.9	23'.9	225° 12'.9	36'.6	99° 02'.8	19'.1
23	71° 49'.0	118° 00'.9	36'.5	314° 05'.1	24'.2	240° 15'.1	36'.7	114° 05'.0	19'.1
18 Friday 00	86° 51'.5	133° 00'.5	19° 35'.6 S	329° 08'.2	24° 24'.4 N	255° 17'.2	3° 36'.9 S	129° 07'.3	17° 19'.0 S
01	101° 54'.0	148° 00'.0	34'.7	344° 11'.4	24'.6	270° 19'.4	37'.0	144° 09'.5	18'.9
02	116° 56'.4	162° 59'.5	33'.9	359° 14'.5	24'.8	285° 21'.6	37'.1	159° 11'.7	18'.9
03	131° 58'.9	177° 59'.1	33'.0	14° 17'.7	25'.1	300° 23'.8	37'.2	174° 14'.0	18'.8
04	147° 01'.4	192° 58'.6	32'.2	29° 20'.8	25'.3	315° 26'.0	37'.3	189° 16'.2	18'.7
05	162° 03'.8	207° 58'.2	31'.3	44° 24'.0	25'.5	330° 28'.2	37'.4	204° 18'.4	18'.7
06	177° 06'.3	222° 57'.7	30'.4	59° 27'.1	25'.8	345° 30'.4	37'.5	219° 20'.7	18'.6
07	192° 08'.7	237° 57'.3	29'.6	74° 30'.3	26'.0	0° 32'.5	37'.6	234° 22'.9	18'.5
08	207° 11'.2	252° 56'.8	28'.7	89° 33'.4	26'.2	15° 34'.7	37'.7	249° 25'.1	18'.4
09	222° 13'.7	267° 56'.4	27'.8	104° 36'.6	26'.5	30° 36'.9	37'.8	264° 27'.4	18'.4
10	237° 16'.1	282° 55'.9	26'.9	119° 39'.8	26'.7	45° 39'.1	37'.9	279° 29'.6	18'.3
11	252° 18'.6	297° 55'.5	26'.1	134° 42'.9	26'.9	60° 41'.3	38'.0	294° 31'.8	18'.2
12	267° 21'.1	312° 55'.0	19° 25'.2 S	149° 46'.1	24° 27'.2 N	75° 43'.5	3° 38'.1 S	309° 34'.1	17° 18'.2 S
13	282° 23'.5	327° 54'.6	24'.3	164° 49'.3	27'.4	90° 45'.7	38'.2	324° 36'.3	18'.1
14	297° 26'.0	342° 54'.1	23'.5	179° 52'.4	27'.6	105° 47'.9	38'.4	339° 38'.5	18'.0
15	312° 28'.5	357° 53'.7	22'.6	194° 55'.6	27'.9	120° 50'.0	38'.5	354° 40'.7	18'.0
16	327° 30'.9	12° 53'.2	21'.7	209° 58'.8	28'.1	135° 52'.2	38'.6	9° 43'.0	17'.9
17	342° 33'.4	27° 52'.8	20'.8	225° 01'.9	28'.3	150° 54'.4	38'.7	24° 45'.2	17'.8
18	357° 35'.9	42° 52'.3	20'.0	240° 05'.1	28'.5	165° 56'.6	38'.8	39° 47'.4	17'.8
19	12° 38'.3	57° 51'.9	19'.1	255° 08'.3	28'.8	180° 58'.8	38'.9	54° 49'.7	17'.7
20	27° 40'.8	72° 51'.4	18'.2	270° 11'.5	29'.0	196° 01'.0	39'.0	69° 51'.9	17'.6
21	42° 43'.2	87° 51'.0	17'.3	285° 14'.6	29'.2	211° 03'.2	39'.1	84° 54'.1	17'.6
22	57° 45'.7	102° 50'.6	16'.4	300° 17'.8	29'.5	226° 05'.4	39'.2	99° 56'.4	17'.5
23	72° 48'.2	117° 50'.1	15'.6	315° 21'.0	29'.7	241° 07'.6	39'.3	114° 58'.6	17'.4
19 Saturday 00	87° 50'.6	132° 49'.7	19° 14'.7 S	330° 24'.2	24° 29'.9 N	256° 09'.7	3° 39'.4 S	130° 00'.8	17° 17'.3 S
01	102° 53'.1	147° 49'.2	13'.8	345° 27'.4	30'.2	271° 11'.9	39'.5	145° 03'.0	17'.3
02	117° 55'.6	162° 48'.8	12'.9	0° 30'.5	30'.4	286° 14'.1	39'.6	160° 05'.3	17'.2
03	132° 58'.0	177° 48'.4	12'.0	15° 33'.7	30'.6	301° 16'.3	39'.7	175° 07'.5	17'.1
04	148° 00'.5	192° 47'.9	11'.1	30° 36'.9	30'.9	316° 18'.5	39'.8	190° 09'.7	17'.1
05	163° 03'.0	207° 47'.5	10'.3	45° 40'.1	31'.1	331° 20'.7	39'.9	205° 12'.0	17'.0
06	178° 05'.4	222° 47'.1	09'.4	60° 43'.3	31'.3	346° 22'.9	40'.0	220° 14'.2	16'.9
07	193° 07'.9	237° 46'.6	08'.5	75° 46'.5	31'.6	1° 25'.1	40'.2	235° 16'.4	16'.9
08	208° 10'.4	252° 46'.2	07'.6	90° 49'.7	31'.8	16° 27'.3	40'.3	250° 18'.7	16'.8
09	223° 12'.8	267° 45'.8	06'.7	105° 52'.9	32'.0	31° 29'.5	40'.4	265° 20'.9	16'.7
10	238° 15'.3	282° 45'.3	05'.8	120° 56'.1	32'.3	46° 31'.7	40'.5	280° 23'.1	16'.7
11	253° 17'.7	297° 44'.9	04'.9	135° 59'.3	32'.5	61° 33'.8	40'.6	295° 25'.3	16'.6
12	268° 20'.2	312° 44'.5	19° 04'.0 S	151° 02'.5	24° 32'.7 N	76° 36'.0	3° 40'.7 S	310° 27'.6	17° 16'.5 S
13	283° 22'.7	327° 44'.0	03'.1	166° 05'.7	33'.0	91° 38'.2	40'.8	325° 29'.8	16'.4
14	298° 25'.1	342° 43'.6	02'.2	181° 08'.9	33'.2	106° 40'.4	40'.9	340° 32'.0	16'.4
15	313° 27'.6	357° 43'.2	01'.3	196° 12'.1	33'.5	121° 42'.6	41'.0	355° 34'.3	16'.3
16	328° 30'.1	12° 42'.8	00'.5	211° 15'.3	33'.7	136° 44'.8	41'.1	10° 36'.5	16'.2
17	343° 32'.5	27° 42'.3	18° 59'.6 S	226° 18'.5	33'.9	151° 47'.0	41'.2	25° 38'.7	16'.2
18	358° 35'.0	42° 41'.9	58'.7	241° 21'.7	34'.2	166° 49'.2	41'.3	40° 40'.9	16'.1
19	13° 37'.5	57° 41'.5	57'.8	256° 24'.9	34'.4	181° 51'.4	41'.4	55° 43'.2	16'.0
20	28° 39'.9	72° 41'.1	56'.9	271° 28'.1	34'.6	196° 53'.6	41'.5	70° 45'.4	16'.0
21	43° 42'.4	87° 40'.6	56'.0	286° 31'.3	34'.9	211° 55'.8	41'.6	85° 47'.6	15'.9
22	58° 44'.8	102° 40'.2	55'.1	301° 34'.5	35'.1	226° 58'.0	41'.7	100° 49'.9	15'.8
23	73° 47'.3	117° 39'.8	54'.2	316° 37'.7	35'.3	242° 00'.2	41'.8	115° 52'.1	15'.7
	M.P. 18:10	v -0'.4	d 0'.9	v 3'.2	d 0'.2	v 2'.2	d 0'.1	v 2'.2	d 0'.1

STARS	SHA	Dec
Acamar	315° 29'.6	40° 20'.0 S
Achernar	335° 37'.8	57° 16'.5 S
Acrux	173° 26'.7	63° 03'.4 S
Adhara	255° 24'.2	28° 57'.7 S
Aldebaran	291° 06'.6	16° 29'.8 N
Alioth	166° 34'.2	55° 59'.5 N
Alkaid	153° 11'.1	49° 20'.6 N
Alnair	28° 03'.1	46° 59'.8 S
Alnilam	276° 01'.6	1° 12'.4 S
Alphard	218° 10'.9	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.2 N
Alpheratz	357° 59'.4	29° 03'.4 N
Altair	62° 23'.5	8° 51'.1 N
Ankaa	353° 30'.6	42° 20'.8 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.0 N
Atria	108° 01'.6	69° 00'.9 S
Avior	234° 23'.8	59° 29'.1 S
Bellatrix	278° 48'.1	6° 20'.6 N
Betelgeuse	271° 17'.5	7° 24'.3 N
Canopus	264° 02'.4	52° 41'.5 S
Capella	280° 56'.6	45° 59'.5 N
Deneb	49° 42'.3	45° 15'.6 N
Denebola	182° 49'.2	14° 36'.5 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.1	61° 46'.9 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.4 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.9	29° 39'.6 S
Gacrux	172° 18'.2	57° 04'.2 S
Gienah	176° 08'.1	17° 30'.2 S
Hadar	149° 10'.2	60° 20'.2 S
Hamal	328° 17'.9	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.2	74° 10'.8 N
Markab	13° 53'.7	15° 10'.2 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 25'.9	36° 20'.0 S
Miaplacidus	221° 42'.4	69° 41'.1 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.6 S
Polaris	323° 33'.0	89° 14'.3 N
Pollux	243° 46'.1	28° 02'.5 N
Procyon	245° 15'.4	5° 14'.5 N
Rasalhague	96° 21'.0	12° 33'.9 N
Regulus	207° 59'.6	11° 59'.9 N
Rigel	281° 26'.4	8° 12'.6 S
Rigil Kent	140° 13'.2	60° 48'.1 S
Sabik	102° 30'.5	15° 43'.0 S
Schedar	349° 58'.0	56° 30'.3 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 46'.8	16° 42'.4 S
Spica	158° 47'.6	11° 07'.5 S
Suhail	223° 03'.4	43° 24'.2 S
Vega	80° 49'.8	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	46° 09'.0	15:08
Mars	242° 16'.7	02:03
Jupiter	168° 25'.7	06:58
Saturn	42° 15'.8	15:21

SUN	GHA	Dec
17	180° 59'.3	23° 21'.4 S
18	195° 59'.0	21'.5
19	210° 58'.7	21'.6
20	225° 58'.4	21'.7
21	240° 58'.1	21'.7
22	255° 57'.8	21'.8
23	270° 57'.5	21'.9
24	285° 57'.2	22'.0
25	300° 56'.9	22'.1
26	315° 56'.5	22'.2
27	330° 56'.2	22'.3
28	345° 55'.9	22'.3
29	0° 55'.6	23° 22'.4 S
30	15° 55'.3	22'.5
31	30° 55'.0	22'.6
32	45° 54'.7	22'.7
33	60° 54'.4	22'.7
34	75° 54'.1	22'.8
35	90° 53'.8	22'.9
36	105° 53'.5	23'.0
37	120° 53'.2	23'.0
38	135° 52'.9	23'.1
39	150° 52'.6	23'.2
40	165° 52'.2	23'.2
41	180° 51'.9	23° 23'.3 S
42	195° 51'.6	23'.4
43	210° 51'.3	23'.5
44	225° 51'.0	23'.5
45	240° 50'.7	23'.6
46	255° 50'.4	23'.7
47	270° 50'.1	23'.7
48	285° 49'.8	23'.8
49	300° 49'.5	23'.9
50	315° 49'.2	23'.9
51	330° 48'.9	24'.0
52	345° 48'.6	24'.0
53	0° 48'.2	23° 24'.1 S
54	15° 47'.9	24'.2
55	30° 47'.6	24'.2
56	45° 47'.3	24'.3
57	60° 47'.0	24'.3
58	75° 46'.7	24'.4
59	90° 46'.4	24'.5
60	105° 46'.1	24'.5
61	120° 45'.8	24'.6
62	135° 45'.5	24'.6
63	150° 45'.2	24'.7
64	165° 44'.8	24'.7
65	180° 44'.5	23° 24'.8 S
66	195° 44'.2	24'.8
67	210° 43'.9	24'.9
68	225° 43'.6	24'.9
69	240° 43'.3	25'.0
70	255° 43'.0	25'.0
71	270° 42'.7	25'.1
72	285° 42'.4	25'.1
73	300° 42'.1	25'.2
74	315° 41'.7	25'.2
75	330° 41'.4	25'.3
76	345° 41'.1	25'.3
77	0° 40'.8	23° 25'.3 S
78	15° 40'.5	25'.4
79	30° 40'.2	25'.4
80	45° 39'.9	25'.5
81	60° 39'.6	25'.5
82	75° 39'.3	25'.5
83	90° 39'.0	25'.6
84	105° 38'.6	25'.6
85	120° 38'.3	25'.6
86	135° 38'.0	25'.7
87	150° 37'.7	25'.7
88	165° 37'.4	25'.7
SD	16'.3	d 0'.1

MOON	GHA	v	Dec	d	HP
17	269° 52'.6	11'.1	3° 59'.5 S	13'.6	59'.0
18	284° 22'.7	11'.0	4° 13'.1 S	13'.6	
19	298° 52'.7	11'.0	26'.7	13'.6	
20	313° 22'.7	11'.0	40'.3	13'.6	
21	327° 52'.7	11'.0	53'.9	13'.5	
22	342° 22'.7	11'.0	5° 07'.4 S	13'.5	
23	356° 52'.7	11'.0	20'.9	13'.5	
24	11° 22'.7	10'.9	34'.4	13'.4	
25	25° 52'.6	11'.0	47'.8	13'.4	58'.9
26	40° 22'.6	10'.9	6° 01'.2 S	13'.4	
27	54° 52'.5	10'.9	14'.6	13'.3	
28	69° 22'.4	11'.0	27'.9	13'.2	
29	83° 52'.4	10'.9	6° 41'.1 S	13'.3	58'.9
30	98° 22'.3	10'.8	54'.4	13'.2	
31	112° 52'.1	10'.9	7° 07'.6 S	13'.1	
32	127° 22'.0	10'.9	20'.7	13'.1	58'.8
33	141° 51'.9	10'.8	33'.8	13'.1	
34	156° 21'.7	10'.8	46'.9	13'.0	
35	170° 51'.5	10'.8	59'.9	12'.9	
36	185° 21'.3	10'.8	8° 12'.8 S	12'.9	
37	199° 51'.1	10'.7	25'.7	12'.9	
38	214° 20'.8	10'.7	38'.6	12'.8	
39	228° 50'.5	10'.7	51'.4	12'.8	58'.7
40	243° 20'.2	10'.7	9° 04'.2 S	12'.7	
41	257° 49'.9	10'.7	9° 16'.9 S	12'.6	58'.7
42	272° 19'.6	10'.6	29'.5	12'.6	
43	286° 49'.2	10'.6	42'.1	12'.5	
44	301° 18'.8	10'.6	54'.6	12'.5	
45	315° 48'.4	10'.5	10° 07'.1 S	12'.4	
46	330° 17'.9	10'.6	19'.5	12'.4	58'.6
47	344° 47'.5	10'.5	31'.9	12'.2	
48	359° 17'.0	10'.4	44'.1	12'.3	
49	13° 46'.4	10'.4	56'.4	12'.1	
50	28° 15'.8	10'.5	11° 08'.5 S	12'.1	
51	42° 45'.3	10'.3	20'.6	12'.0	
52	57° 14'.6	10'.4	32'.6	12'.0	
53	71° 44'.0	10'.3	11° 44'.6 S	11'.9	58'.5
54	86° 13'.3	10'.3	56'.5	11'.8	
55	100° 42'.6	10'.2	12° 08'.3 S	11'.7	
56	115° 11'.8	10'.2	20'.0	11'.7	
57	129° 41'.0	10'.2	31'.7	11'.6	
58	144° 10'.2	10'.1	43'.3	11'.5	
59	158° 39'.3	10'.1	54'.8	11'.5	58'.4
60	173° 08'.4	10'.1	13° 06'.3 S	11'.4	
61	187° 37'.5	10'.0	17'.7	11'.2	
62	202° 06'.5	10'.0	28'.9	11'.3	
63	216° 35'.5	10'.0	40'.2	11'.1	
64	231° 04'.5	9'.9	51'.3	11'.0	
65	245° 33'.4	9'.9	14° 02'.3 S	11'.0	58'.3
66	260° 02'.3	9'.9	13'.3	10'.9	
67	274° 31'.2	9'.8	24'.2	10'.8	
68	289° 00'.0	9'.7	35'.0	10'.7	
69	303° 28'.7	9'.8	45'.7	10'.6	
70	317° 57'.5	9'.7	56'.3	10'.6	
71	332° 26'.2	9'.6	15° 06'.9 S	10'.4	
72	346° 54'.8	9'.7	17'.3	10'.4	58'.2
73	1° 23'.5	9'.5	27'.7	10'.3	
74	15° 52'.0	9'.6	38'.0	10'.2	
75	30° 20'.6	9'.5	48'.2	10'.0	
76	44° 49'.1	9'.4	58'.2	10'.0	
77	59° 17'.5	9'.5	16° 08'.2 S	9'.9	58'.1
78	73° 46'.0	9'.3	18'.1	9'.8	
79	88° 14'.3	9'.4	27'.9	9'.7	
80	102° 42'.7	9'.3	37'.6	9'.6	
81	117° 11'.0	9'.2	47'.2	9'.6	
82	131° 39'.2	9'.3	56'.8	9'.4	
83	146° 07'.5	9'.1	17° 06'.2 S	9'.3	58'.0
84	160° 35'.6	9'.2	15'.5	9'.2	
85	175° 03'.8	9'.1	24'.7	9'.1	
86	189° 31'.9	9'.1	33'.8	9'.0	
87	204° 00'.0	9'.0	42'.8	8'.9	
88	218° 28'.0	9'.0	51'.7	8'.8	
SD	16'.0		16'.0		15'.8

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
17	3 58	3 43	11:56	06:13	18:38	23d 42%
18	3 28	3 14	11:57	07:03	19:28	24d 31%
19	2 59	2 44	11:57	07:54	20:20	25d 22%

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1992 December 20, 21, 22 (Sun, Mon, Tue)

GMT	ARIES	VENUS -4.2		MARS -1.2		JUPITER -1.9		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
20 Sunday 00	88° 49'.8	132° 39'.4	18° 53'.3 S	331° 41'.0	24° 35'.6 N	257° 02'.4	3° 41'.9 S	130° 54'.3	17° 15'.7 S
01	103° 52'.2	147° 38'.9	52'.4	346° 44'.2	35'.8	272° 04'.6	42'.0	145° 56'.5	15'.6
02	118° 54'.7	162° 38'.5	51'.5	1° 47'.4	36'.0	287° 06'.8	42'.1	160° 58'.8	15'.5
03	133° 57'.2	177° 38'.1	50'.6	16° 50'.6	36'.3	302° 09'.0	42'.2	176° 01'.0	15'.5
04	148° 59'.6	192° 37'.7	49'.7	31° 53'.8	36'.5	317° 11'.1	42'.3	191° 03'.2	15'.4
05	164° 02'.1	207° 37'.3	48'.7	46° 57'.0	36'.7	332° 13'.3	42'.4	206° 05'.4	15'.3
06	179° 04'.6	222° 36'.9	47'.8	62° 00'.3	37'.0	347° 15'.5	42'.5	221° 07'.7	15'.3
07	194° 07'.0	237° 36'.4	46'.9	77° 03'.5	37'.2	2° 17'.7	42'.6	236° 09'.9	15'.2
08	209° 09'.5	252° 36'.0	46'.0	92° 06'.7	37'.5	17° 19'.9	42'.7	251° 12'.1	15'.1
09	224° 12'.0	267° 35'.6	45'.1	107° 10'.0	37'.7	32° 22'.1	42'.8	266° 14'.4	15'.0
10	239° 14'.4	282° 35'.2	44'.2	122° 13'.2	37'.9	47° 24'.3	43'.0	281° 16'.6	15'.0
11	254° 16'.9	297° 34'.8	43'.3	137° 16'.4	38'.2	62° 26'.5	43'.1	296° 18'.8	14'.9
12	269° 19'.3	312° 34'.4	18° 42'.4 S	152° 19'.6	24° 38'.4 N	77° 28'.7	3° 43'.2 S	311° 21'.0	17° 14'.8 S
13	284° 21'.8	327° 34'.0	41'.5	167° 22'.9	38'.6	92° 30'.9	43'.3	326° 23'.3	14'.8
14	299° 24'.3	342° 33'.6	40'.6	182° 26'.1	38'.9	107° 33'.1	43'.4	341° 25'.5	14'.7
15	314° 26'.7	357° 33'.2	39'.7	197° 29'.3	39'.1	122° 35'.3	43'.5	356° 27'.7	14'.6
16	329° 29'.2	12° 32'.7	38'.7	212° 32'.6	39'.3	137° 37'.5	43'.6	11° 29'.9	14'.6
17	344° 31'.7	27° 32'.3	37'.8	227° 35'.8	39'.6	152° 39'.7	43'.7	26° 32'.2	14'.5
18	359° 34'.1	42° 31'.9	36'.9	242° 39'.1	39'.8	167° 41'.9	43'.8	41° 34'.4	14'.4
19	14° 36'.6	57° 31'.5	36'.0	257° 42'.3	40'.1	182° 44'.1	43'.9	56° 36'.6	14'.3
20	29° 39'.1	72° 31'.1	35'.1	272° 45'.6	40'.3	197° 46'.3	44'.0	71° 38'.8	14'.3
21	44° 41'.5	87° 30'.7	34'.2	287° 48'.8	40'.5	212° 48'.5	44'.1	86° 41'.1	14'.2
22	59° 44'.0	102° 30'.3	33'.2	302° 52'.0	40'.8	227° 50'.7	44'.2	101° 43'.3	14'.1
23	74° 46'.5	117° 29'.9	32'.3	317° 55'.3	41'.0	242° 52'.9	44'.3	116° 45'.5	14'.1
21 Monday 00	89° 48'.9	132° 29'.5	18° 31'.4 S	332° 58'.5	24° 41'.2 N	257° 55'.1	3° 44'.4 S	131° 47'.7	17° 14'.0 S
01	104° 51'.4	147° 29'.1	30'.5	348° 01'.8	41'.5	272° 57'.3	44'.5	146° 50'.0	13'.9
02	119° 53'.8	162° 28'.7	29'.6	3° 05'.0	41'.7	287° 59'.5	44'.6	161° 52'.2	13'.8
03	134° 56'.3	177° 28'.3	28'.6	18° 08'.3	42'.0	303° 01'.7	44'.7	176° 54'.4	13'.8
04	149° 58'.8	192° 27'.9	27'.7	33° 11'.5	42'.2	318° 03'.9	44'.8	191° 56'.6	13'.7
05	165° 01'.2	207° 27'.5	26'.8	48° 14'.8	42'.4	333° 06'.1	44'.9	206° 58'.9	13'.6
06	180° 03'.7	222° 27'.1	25'.9	63° 18'.1	42'.7	348° 08'.3	45'.0	222° 01'.1	13'.6
07	195° 06'.2	237° 26'.7	24'.9	78° 21'.3	42'.9	3° 10'.5	45'.1	237° 03'.3	13'.5
08	210° 08'.6	252° 26'.3	24'.0	93° 24'.6	43'.1	18° 12'.7	45'.2	252° 05'.5	13'.4
09	225° 11'.1	267° 25'.9	23'.1	108° 27'.8	43'.4	33° 14'.9	45'.3	267° 07'.8	13'.4
10	240° 13'.6	282° 25'.5	22'.2	123° 31'.1	43'.6	48° 17'.1	45'.4	282° 10'.0	13'.3
11	255° 16'.0	297° 25'.2	21'.2	138° 34'.4	43'.9	63° 19'.3	45'.5	297° 12'.2	13'.2
12	270° 18'.5	312° 24'.8	18° 20'.3 S	153° 37'.6	24° 44'.1 N	78° 21'.5	3° 45'.6 S	312° 14'.4	17° 13'.1 S
13	285° 21'.0	327° 24'.4	19'.4	168° 40'.9	44'.3	93° 23'.7	45'.7	327° 16'.7	13'.1
14	300° 23'.4	342° 24'.0	18'.4	183° 44'.2	44'.6	108° 26'.0	45'.8	342° 18'.9	13'.0
15	315° 25'.9	357° 23'.6	17'.5	198° 47'.4	44'.8	123° 28'.2	45'.9	357° 21'.1	12'.9
16	330° 28'.3	12° 23'.2	16'.6	213° 50'.7	45'.1	138° 30'.4	46'.0	12° 23'.3	12'.9
17	345° 30'.8	27° 22'.8	15'.6	228° 54'.0	45'.3	153° 32'.6	46'.1	27° 25'.6	12'.8
18	0° 33'.3	42° 22'.4	14'.7	243° 57'.2	45'.5	168° 34'.8	46'.2	42° 27'.8	12'.7
19	15° 35'.7	57° 22'.0	13'.8	259° 00'.5	45'.8	183° 37'.0	46'.3	57° 30'.0	12'.6
20	30° 38'.2	72° 21'.7	12'.8	274° 03'.8	46'.0	198° 39'.2	46'.4	72° 32'.2	12'.6
21	45° 40'.7	87° 21'.3	11'.9	289° 07'.1	46'.2	213° 41'.4	46'.5	87° 34'.5	12'.5
22	60° 43'.1	102° 20'.9	11'.0	304° 10'.3	46'.5	228° 43'.6	46'.6	102° 36'.7	12'.4
23	75° 45'.6	117° 20'.5	10'.0	319° 13'.6	46'.7	243° 45'.8	46'.7	117° 38'.9	12'.4
22 Tuesday 00	90° 48'.1	132° 20'.1	18° 09'.1 S	334° 16'.9	24° 47'.0 N	258° 48'.0	3° 46'.8 S	132° 41'.1	17° 12'.3 S
01	105° 50'.5	147° 19'.8	08'.2	349° 20'.2	47'.2	273° 50'.2	46'.9	147° 43'.3	12'.2
02	120° 53'.0	162° 19'.4	07'.2	4° 23'.5	47'.4	288° 52'.4	47'.0	162° 45'.6	12'.1
03	135° 55'.5	177° 19'.0	06'.3	19° 26'.8	47'.7	303° 54'.6	47'.1	177° 47'.8	12'.1
04	150° 57'.9	192° 18'.6	05'.3	34° 30'.0	47'.9	318° 56'.8	47'.2	192° 50'.0	12'.0
05	166° 00'.4	207° 18'.2	04'.4	49° 33'.3	48'.2	333° 59'.0	47'.3	207° 52'.2	11'.9
06	181° 02'.8	222° 17'.9	03'.4	64° 36'.6	48'.4	349° 01'.2	47'.3	222° 54'.5	11'.9
07	196° 05'.3	237° 17'.5	02'.5	79° 39'.9	48'.6	4° 03'.5	47'.4	237° 56'.7	11'.8
08	211° 07'.8	252° 17'.1	01'.6	94° 43'.2	48'.9	19° 05'.7	47'.5	252° 58'.9	11'.7
09	226° 10'.2	267° 16'.7	00'.6	109° 46'.5	49'.1	34° 07'.9	47'.6	268° 01'.1	11'.6
10	241° 12'.7	282° 16'.4	17° 59'.7 S	124° 49'.8	49'.3	49° 10'.1	47'.7	283° 03'.3	11'.6
11	256° 15'.2	297° 16'.0	58'.7	139° 53'.1	49'.6	64° 12'.3	47'.8	298° 05'.6	11'.5
12	271° 17'.6	312° 15'.6	17° 57'.8 S	154° 56'.4	24° 49'.8 N	79° 14'.5	3° 47'.9 S	313° 07'.8	17° 11'.4 S
13	286° 20'.1	327° 15'.2	56'.8	169° 59'.7	50'.1	94° 16'.7	48'.0	328° 10'.0	11'.3
14	301° 22'.6	342° 14'.9	55'.9	185° 03'.0	50'.3	109° 18'.9	48'.1	343° 12'.2	11'.3
15	316° 25'.0	357° 14'.5	54'.9	200° 06'.3	50'.5	124° 21'.1	48'.2	358° 14'.5	11'.2
16	331° 27'.5	12° 14'.1	54'.0	215° 09'.6	50'.8	139° 23'.3	48'.3	13° 16'.7	11'.1
17	346° 29'.9	27° 13'.8	53'.0	230° 12'.9	51'.0	154° 25'.5	48'.4	28° 18'.9	11'.1
18	1° 32'.4	42° 13'.4	52'.1	245° 16'.2	51'.3	169° 27'.8	48'.5	43° 21'.1	11'.0
19	16° 34'.9	57° 13'.0	51'.1	260° 19'.5	51'.5	184° 30'.0	48'.6	58° 23'.3	10'.9
20	31° 37'.3	72° 12'.7	50'.2	275° 22'.8	51'.7	199° 32'.2	48'.7	73° 25'.6	10'.8
21	46° 39'.8	87° 12'.3	49'.2	290° 26'.1	52'.0	214° 34'.4	48'.8	88° 27'.8	10'.8
22	61° 42'.3	102° 11'.9	48'.3	305° 29'.4	52'.2	229° 36'.6	48'.9	103° 30'.0	10'.7
23	76° 44'.7	117° 11'.6	47'.3	320° 32'.7	52'.5	244° 38'.8	49'.0	118° 32'.2	10'.6
	M.P. 17:58	v -0'.4	d 0'.9	v 3'.3	d 0'.2	v 2'.2	d 0'.1	v 2'.2	d 0'.1

STARS	SHA	Dec
Acamar	315° 29'.6	40° 20'.1 S
Achernar	335° 37'.8	57° 16'.5 S
Acrux	173° 26'.7	63° 03'.4 S
Adhara	255° 24'.2	28° 57'.8 S
Aldebaran	291° 06'.6	16° 29'.8 N
Alioth	166° 34'.2	55° 59'.5 N
Alkaid	153° 11'.1	49° 20'.6 N
Alnair	28° 03'.1	46° 59'.8 S
Alnilam	276° 01'.5	1° 12'.4 S
Alphard	218° 10'.9	8° 37'.7 S
Alphecca	126° 24'.3	26° 44'.2 N
Alpheratz	357° 59'.4	29° 03'.4 N
Altair	62° 23'.5	8° 51'.1 N
Ankaa	353° 30'.7	42° 20'.8 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.9	19° 13'.0 N
Atria	108° 01'.6	69° 00'.8 S
Avior	234° 23'.8	59° 29'.1 S
Bellatrix	278° 48'.1	6° 20'.6 N
Betelgeuse	271° 17'.5	7° 24'.3 N
Canopus	264° 02'.4	52° 41'.5 S
Capella	280° 56'.6	45° 59'.5 N
Deneb	49° 42'.3	45° 15'.6 N
Denebola	182° 49'.2	14° 36'.5 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.1	61° 46'.9 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.4 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.9	29° 39'.6 S
Gacrux	172° 18'.2	57° 04'.3 S
Gienah	176° 08'.1	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.2 S
Hamal	328° 17'.9	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.2	74° 10'.7 N
Markab	13° 53'.7	15° 10'.2 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 25'.9	36° 20'.0 S
Miaplacidus	221° 42'.3	69° 41'.2 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.6 S
Polaris	323° 33'.7	89° 14'.3 N
Pollux	243° 46'.0	28° 02'.5 N
Procyon	245° 15'.4	5° 14'.5 N
Rasalhague	96° 21'.0	12° 33'.9 N
Regulus	207° 59'.6	11° 59'.9 N
Rigel	281° 26'.4	8° 12'.6 S
Rigil Kent	140° 13'.1	60° 48'.1 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 58'.0	56° 30'.3 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 46'.8	16° 42'.4 S
Spica	158° 47'.5	11° 07'.5 S
Suhail	223° 03'.4	43° 24'.2 S
Vega	80° 49'.8	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	42° 40'.6	15:10
Mars	243° 09'.6	01:48
Jupiter	168° 06'.2	06:47
Saturn	41° 58'.8	15:11

SUN		MOON				
GHA	Dec	GHA	v	Dec	d	HP
180° 37'.1	23° 25'.8 S	232° 56'.0	8'.9	18° 00'.5 S	8'.7	57'.9
195° 36'.8	25'.8	247° 23'.9	8'.9	09'.2	8'.5	
210° 36'.5	25'.8	261° 51'.8	8'.9	17'.7	8'.5	
225° 36'.2	25'.9	276° 19'.7	8'.8	26'.2	8'.4	
240° 35'.9	25'.9	290° 47'.5	8'.8	34'.6	8'.2	
255° 35'.5	25'.9	305° 15'.3	8'.8	42'.8	8'.1	
270° 35'.2	26'.0	319° 43'.1	8'.7	50'.9	8'.1	57'.8
285° 34'.9	26'.0	334° 10'.8	8'.7	59'.0	7'.9	
300° 34'.6	26'.0	348° 38'.5	8'.6	19° 06'.9 S	7'.8	
315° 34'.3	26'.0	3° 06'.1	8'.7	14'.7	7'.7	
330° 34'.0	26'.1	17° 33'.8	8'.5	22'.4	7'.5	
345° 33'.7	26'.1	32° 01'.3	8'.6	29'.9	7'.5	57'.7
0° 33'.4	23° 26'.1 S	46° 28'.9	8'.5	19° 37'.4 S	7'.3	57'.7
15° 33'.1	26'.1	60° 56'.4	8'.5	44'.7	7'.3	
30° 32'.7	26'.1	75° 23'.9	8'.4	52'.0	7'.1	
45° 32'.4	26'.2	89° 51'.3	8'.4	59'.1	7'.0	
60° 32'.1	26'.2	104° 18'.7	8'.4	20° 06'.1 S	6'.8	
75° 31'.8	26'.2	118° 46'.1	8'.3	12'.9	6'.8	57'.6
90° 31'.5	26'.2	133° 13'.4	8'.4	19'.7	6'.6	
105° 31'.2	26'.2	147° 40'.8	8'.2	26'.3	6'.5	
120° 30'.9	26'.2	162° 08'.0	8'.3	32'.8	6'.4	
135° 30'.6	26'.3	176° 35'.3	8'.2	39'.2	6'.3	
150° 30'.2	26'.3	191° 02'.5	8'.2	45'.5	6'.1	57'.5
165° 29'.9	26'.3	205° 29'.7	8'.2	51'.6	6'.0	
180° 29'.6	23° 26'.3 S	219° 56'.9	8'.1	20° 57'.6 S	5'.9	57'.5
195° 29'.3	26'.3	234° 24'.0	8'.2	21° 03'.5 S	5'.8	
210° 29'.0	26'.3	248° 51'.2	8'.1	09'.3	5'.6	
225° 28'.7	26'.3	263° 18'.3	8'.0	14'.9	5'.5	57'.4
240° 28'.4	26'.3	277° 45'.3	8'.1	20'.4	5'.4	
255° 28'.1	26'.3	292° 12'.4	8'.0	25'.8	5'.2	
270° 27'.8	26'.4	306° 39'.4	8'.0	31'.0	5'.2	
285° 27'.4	26'.4	321° 06'.4	8'.0	36'.2	5'.0	
300° 27'.1	26'.4	335° 33'.4	8'.0	41'.2	4'.9	57'.3
315° 26'.8	26'.4	350° 00'.4	7'.9	46'.1	4'.7	
330° 26'.5	26'.4	4° 27'.3	8'.0	50'.8	4'.6	
345° 26'.2	26'.4	18° 54'.3	7'.9	55'.4	4'.5	
0° 25'.9	23° 26'.4 S	33° 21'.2	7'.9	21° 59'.9 S	4'.3	57'.3
15° 25'.6	26'.4	47° 48'.1	7'.9	22° 04'.2 S	4'.3	57'.2
30° 25'.3	26'.4	62° 15'.0	7'.8	08'.5	4'.1	
45° 24'.9	26'.4	76° 41'.8	7'.9	12'.6	3'.9	
60° 24'.6	26'.4	91° 08'.7	7'.9	16'.5	3'.9	
75° 24'.3	26'.4	105° 35'.6	7'.8	20'.4	3'.7	
90° 24'.0	26'.4	120° 02'.4	7'.8	24'.1	3'.5	57'.1
105° 23'.7	26'.4	134° 29'.2	7'.9	27'.6	3'.4	
120° 23'.4	26'.4	148° 56'.1	7'.8	31'.0	3'.3	
135° 23'.1	26'.4	163° 22'.9	7'.8	34'.3	3'.2	
150° 22'.8	26'.4	177° 49'.7	7'.8	37'.5	3'.0	
165° 22'.5	26'.4	192° 16'.5	7'.8	40'.5	2'.9	57'.0
180° 22'.1	23° 26'.3 S	206° 43'.3	7'.8	22° 43'.4 S	2'.8	57'.0
195° 21'.8	26'.3	221° 10'.1	7'.8	46'.2	2'.6	
210° 21'.5	26'.3	235° 36'.9	7'.8	48'.8	2'.5	
225° 21'.2	26'.3	250° 03'.7	7'.9	51'.3	2'.4	
240° 20'.9	26'.3	264° 30'.6	7'.8	53'.7	2'.2	56'.9
255° 20'.6	26'.3	278° 57'.4	7'.8	55'.9	2'.1	
270° 20'.3	26'.3	293° 24'.2	7'.8	58'.0	2'.0	
285° 20'.0	26'.3	307° 51'.0	7'.8	23° 00'.0 S	1'.8	
300° 19'.6	26'.3	322° 17'.8	7'.9	01'.8	1'.7	
315° 19'.3	26'.2	336° 44'.7	7'.8	03'.5	1'.6	56'.8
330° 19'.0	26'.2	351° 11'.5	7'.9	05'.1	1'.4	
345° 18'.7	26'.2	5° 38'.4	7'.9	06'.5	1'.3	
0° 18'.4	23° 26'.2 S	20° 05'.3	7'.9	23° 07'.8 S	1'.2	56'.8
15° 18'.1	26'.2	34° 32'.2	7'.9	09'.0	1'.0	
30° 17'.8	26'.2	48° 59'.1	7'.9	10'.0	0'.9	56'.7
45° 17'.5	26'.1	63° 26'.0	7'.9	10'.9	0'.7	
60° 17'.1	26'.1	77° 52'.9	8'.0	11'.6	0'.7	
75° 16'.8	26'.1	92° 19'.9	7'.9	12'.3	0'.5	
90° 16'.5	26'.1	106° 46'.8	8'.0	12'.8	0'.3	
105° 16'.2	26'.1	121° 13'.8	8'.0	13'.1	0'.2	56'.6
120° 15'.9	26'.0	135° 40'.8	8'.1	13'.3	0'.1	
135° 15'.6	26'.0	150° 07'.9	8'.0	13'.4	0'.0	
150° 15'.3	26'.0	164° 34'.9	8'.1	13'.4	0'.2	
165° 15'.0	26'.0	179° 02'.0	8'.1	13'.2	0'.3	
SD 16'.3	d 0'.0	SD	15'.7	15'.6	15'.5	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
20	2 29	2 14	11:58	08:47	21:14	26d 13%
21	1 59	1 44	11:58	09:41	22:09	27d 7%
22	1 29	1 14	11:59	10:37	23:04	28d 3%

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1992 December 23, 24, 25 (Wed, Thur, Fri)

GMT	ARIES	VENUS -4.2		MARS -1.3		JUPITER -2.0		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
23 Wednesday 00	91° 47'.2	132° 11'.2	17° 46'.3 S	335° 36'.0	24° 52'.7 N	259° 41'.0	3° 49'.1 S	133° 34'.4	17° 10'.6 S
01	106° 49'.7	147° 10'.9	45'.4	350° 39'.3	52'.9	274° 43'.2	49'.2	148° 36'.7	10'.5
02	121° 52'.1	162° 10'.5	44'.4	5° 42'.6	53'.2	289° 45'.4	49'.3	163° 38'.9	10'.4
03	136° 54'.6	177° 10'.1	43'.5	20° 46'.0	53'.4	304° 47'.7	49'.4	178° 41'.1	10'.3
04	151° 57'.1	192° 09'.8	42'.5	35° 49'.3	53'.7	319° 49'.9	49'.5	193° 43'.3	10'.3
05	166° 59'.5	207° 09'.4	41'.6	50° 52'.6	53'.9	334° 52'.1	49'.6	208° 45'.5	10'.2
06	182° 02'.0	222° 09'.1	40'.6	65° 55'.9	54'.1	349° 54'.3	49'.7	223° 47'.8	10'.1
07	197° 04'.4	237° 08'.7	39'.6	80° 59'.2	54'.4	4° 56'.5	49'.8	238° 50'.0	10'.0
08	212° 06'.9	252° 08'.4	38'.7	96° 02'.6	54'.6	19° 58'.7	49'.9	253° 52'.2	10'.0
09	227° 09'.4	267° 08'.0	37'.7	111° 05'.9	54'.9	35° 00'.9	49'.9	268° 54'.4	09'.9
10	242° 11'.8	282° 07'.6	36'.7	126° 09'.2	55'.1	50° 03'.2	50'.0	283° 56'.6	09'.8
11	257° 14'.3	297° 07'.3	35'.8	141° 12'.5	55'.3	65° 05'.4	50'.1	298° 58'.9	09'.8
12	272° 16'.8	312° 06'.9	17° 34'.8 S	156° 15'.8	24° 55'.6 N	80° 07'.6	3° 50'.2 S	314° 01'.1	17° 09'.7 S
13	287° 19'.2	327° 06'.6	33'.9	171° 19'.2	55'.8	95° 09'.8	50'.3	329° 03'.3	09'.6
14	302° 21'.7	342° 06'.2	32'.9	186° 22'.5	56'.1	110° 12'.0	50'.4	344° 05'.5	09'.5
15	317° 24'.2	357° 05'.9	31'.9	201° 25'.8	56'.3	125° 14'.2	50'.5	359° 07'.7	09'.5
16	332° 26'.6	12° 05'.5	31'.0	216° 29'.2	56'.5	140° 16'.4	50'.6	14° 10'.0	09'.4
17	347° 29'.1	27° 05'.2	30'.0	231° 32'.5	56'.8	155° 18'.7	50'.7	29° 12'.2	09'.3
18	2° 31'.6	42° 04'.8	29'.0	246° 35'.8	57'.0	170° 20'.9	50'.8	44° 14'.4	09'.2
19	17° 34'.0	57° 04'.5	28'.0	261° 39'.2	57'.3	185° 23'.1	50'.9	59° 16'.6	09'.2
20	32° 36'.5	72° 04'.1	27'.1	276° 42'.5	57'.5	200° 25'.3	51'.0	74° 18'.8	09'.1
21	47° 38'.9	87° 03'.8	26'.1	291° 45'.8	57'.7	215° 27'.5	51'.1	89° 21'.0	09'.0
22	62° 41'.4	102° 03'.5	25'.1	306° 49'.2	58'.0	230° 29'.7	51'.2	104° 23'.3	09'.0
23	77° 43'.9	117° 03'.1	24'.2	321° 52'.5	58'.2	245° 32'.0	51'.3	119° 25'.5	08'.9
24 Thursday 00	92° 46'.3	132° 02'.8	17° 23'.2 S	336° 55'.9	24° 58'.4 N	260° 34'.2	3° 51'.4 S	134° 27'.7	17° 08'.8 S
01	107° 48'.8	147° 02'.4	22'.2	351° 59'.2	58'.7	275° 36'.4	51'.5	149° 29'.9	08'.7
02	122° 51'.3	162° 02'.1	21'.2	7° 02'.5	58'.9	290° 38'.6	51'.5	164° 32'.1	08'.7
03	137° 53'.7	177° 01'.8	20'.3	22° 05'.9	59'.2	305° 40'.8	51'.6	179° 34'.4	08'.6
04	152° 56'.2	192° 01'.4	19'.3	37° 09'.2	59'.4	320° 43'.0	51'.7	194° 36'.6	08'.5
05	167° 58'.7	207° 01'.1	18'.3	52° 12'.6	59'.6	335° 45'.3	51'.8	209° 38'.8	08'.4
06	183° 01'.1	222° 00'.7	17'.3	67° 15'.9	59'.9	350° 47'.5	51'.9	224° 41'.0	08'.4
07	198° 03'.6	237° 00'.4	16'.4	82° 19'.3	25° 00'.1 N	5° 49'.7	52'.0	239° 43'.2	08'.3
08	213° 06'.1	252° 00'.1	15'.4	97° 22'.6	00'.4	20° 51'.9	52'.1	254° 45'.4	08'.2
09	228° 08'.5	266° 59'.7	14'.4	112° 26'.0	00'.6	35° 54'.1	52'.2	269° 47'.7	08'.2
10	243° 11'.0	281° 59'.4	13'.4	127° 29'.3	00'.8	50° 56'.4	52'.3	284° 49'.9	08'.1
11	258° 13'.4	296° 59'.1	12'.4	142° 32'.7	01'.1	65° 58'.6	52'.4	299° 52'.1	08'.0
12	273° 15'.9	311° 58'.7	17° 11'.5 S	157° 36'.0	25° 01'.3 N	81° 00'.8	3° 52'.5 S	314° 54'.3	17° 07'.9 S
13	288° 18'.4	326° 58'.4	10'.5	172° 39'.4	01'.6	96° 03'.0	52'.6	329° 56'.5	07'.9
14	303° 20'.8	341° 58'.1	09'.5	187° 42'.7	01'.8	111° 05'.2	52'.7	344° 58'.7	07'.8
15	318° 23'.3	356° 57'.7	08'.5	202° 46'.1	02'.0	126° 07'.5	52'.7	0° 01'.0	07'.7
16	333° 25'.8	11° 57'.4	07'.5	217° 49'.5	02'.3	141° 09'.7	52'.8	15° 03'.2	07'.6
17	348° 28'.2	26° 57'.1	06'.5	232° 52'.8	02'.5	156° 11'.9	52'.9	30° 05'.4	07'.6
18	3° 30'.7	41° 56'.8	05'.6	247° 56'.2	02'.8	171° 14'.1	53'.0	45° 07'.6	07'.5
19	18° 33'.2	56° 56'.4	04'.6	262° 59'.5	03'.0	186° 16'.4	53'.1	60° 09'.8	07'.4
20	33° 35'.6	71° 56'.1	03'.6	278° 02'.9	03'.2	201° 18'.6	53'.2	75° 12'.0	07'.3
21	48° 38'.1	86° 55'.8	02'.6	293° 06'.3	03'.5	216° 20'.8	53'.3	90° 14'.3	07'.3
22	63° 40'.6	101° 55'.5	01'.6	308° 09'.6	03'.7	231° 23'.0	53'.4	105° 16'.5	07'.2
23	78° 43'.0	116° 55'.1	00'.6	323° 13'.0	04'.0	246° 25'.2	53'.5	120° 18'.7	07'.1
25 Friday 00	93° 45'.5	131° 54'.8	16° 59'.6 S	338° 16'.4	25° 04'.2 N	261° 27'.5	3° 53'.6 S	135° 20'.9	17° 07'.0 S
01	108° 47'.9	146° 54'.5	58'.6	353° 19'.7	04'.4	276° 29'.7	53'.7	150° 23'.1	07'.0
02	123° 50'.4	161° 54'.2	57'.6	8° 23'.1	04'.7	291° 31'.9	53'.7	165° 25'.3	06'.9
03	138° 52'.9	176° 53'.8	56'.7	23° 26'.5	04'.9	306° 34'.1	53'.8	180° 27'.6	06'.8
04	153° 55'.3	191° 53'.5	55'.7	38° 29'.9	05'.2	321° 36'.4	53'.9	195° 29'.8	06'.8
05	168° 57'.8	206° 53'.2	54'.7	53° 33'.2	05'.4	336° 38'.6	54'.0	210° 32'.0	06'.7
06	184° 00'.3	221° 52'.9	53'.7	68° 36'.6	05'.6	351° 40'.8	54'.1	225° 34'.2	06'.6
07	199° 02'.7	236° 52'.6	52'.7	83° 40'.0	05'.9	6° 43'.0	54'.2	240° 36'.4	06'.5
08	214° 05'.2	251° 52'.3	51'.7	98° 43'.4	06'.1	21° 45'.3	54'.3	255° 38'.6	06'.5
09	229° 07'.7	266° 51'.9	50'.7	113° 46'.7	06'.3	36° 47'.5	54'.4	270° 40'.9	06'.4
10	244° 10'.1	281° 51'.6	49'.7	128° 50'.1	06'.6	51° 49'.7	54'.5	285° 43'.1	06'.3
11	259° 12'.6	296° 51'.3	48'.7	143° 53'.5	06'.8	66° 51'.9	54'.6	300° 45'.3	06'.2
12	274° 15'.1	311° 51'.0	16° 47'.7 S	158° 56'.9	25° 07'.1 N	81° 54'.2	3° 54'.6 S	315° 47'.5	17° 06'.2 S
13	289° 17'.5	326° 50'.7	46'.7	174° 00'.3	07'.3	96° 56'.4	54'.7	330° 49'.7	06'.1
14	304° 20'.0	341° 50'.4	45'.7	189° 03'.6	07'.5	111° 58'.6	54'.8	345° 51'.9	06'.0
15	319° 22'.4	356° 50'.1	44'.7	204° 07'.0	07'.8	127° 00'.8	54'.9	0° 54'.1	05'.9
16	334° 24'.9	11° 49'.8	43'.7	219° 10'.4	08'.0	142° 03'.1	55'.0	15° 56'.4	05'.9
17	349° 27'.4	26° 49'.5	42'.7	234° 13'.8	08'.3	157° 05'.3	55'.1	30° 58'.6	05'.8
18	4° 29'.8	41° 49'.1	41'.7	249° 17'.2	08'.5	172° 07'.5	55'.2	46° 00'.8	05'.7
19	19° 32'.3	56° 48'.8	40'.7	264° 20'.6	08'.7	187° 09'.8	55'.3	61° 03'.0	05'.6
20	34° 34'.8	71° 48'.5	39'.7	279° 24'.0	09'.0	202° 12'.0	55'.4	76° 05'.2	05'.6
21	49° 37'.2	86° 48'.2	38'.7	294° 27'.4	09'.2	217° 14'.2	55'.4	91° 07'.4	05'.5
22	64° 39'.7	101° 47'.9	37'.7	309° 30'.8	09'.4	232° 16'.4	55'.5	106° 09'.6	05'.4
23	79° 42'.2	116° 47'.6	36'.7	324° 34'.1	09'.7	247° 18'.7	55'.6	121° 11'.9	05'.3
	M.P. 17:46	v -0'.3	d 1'.0	v 3'.4	d 0'.2	v 2'.2	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 29'.6	40° 20'.1 S
Achernar	335° 37'.8	57° 16'.5 S
Acrux	173° 26'.6	63° 03'.4 S
Adhara	255° 24'.2	28° 57'.8 S
Aldebaran	291° 06'.6	16° 29'.8 N
Alioth	166° 34'.1	55° 59'.5 N
Alkaid	153° 11'.1	49° 20'.6 N
Alnair	28° 03'.1	46° 59'.8 S
Alnilam	276° 01'.5	1° 12'.4 S
Alphard	218° 10'.9	8° 37'.8 S
Alphecca	126° 24'.2	26° 44'.1 N
Alpheratz	357° 59'.4	29° 03'.4 N
Altair	62° 23'.5	8° 51'.1 N
Ankaa	353° 30'.7	42° 20'.8 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.8	19° 12'.9 N
Atria	108° 01'.6	69° 00'.8 S
Avior	234° 23'.7	59° 29'.1 S
Bellatrix	278° 48'.1	6° 20'.6 N
Betelgeuse	271° 17'.5	7° 24'.3 N
Canopus	264° 02'.4	52° 41'.5 S
Capella	280° 56'.6	45° 59'.5 N
Deneb	49° 42'.3	45° 15'.5 N
Denebola	182° 49'.2	14° 36'.5 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.0	61° 46'.9 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.4 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.9	29° 39'.6 S
Gacrux	172° 18'.1	57° 04'.3 S
Gienah	176° 08'.1	17° 30'.2 S
Hadar	149° 10'.1	60° 20'.2 S
Hamal	328° 17'.9	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.1	74° 10'.7 N
Markab	13° 53'.7	15° 10'.2 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 25'.9	36° 20'.0 S
Miaplacidus	221° 42'.3	69° 41'.2 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.6 S
Polaris	323° 34'.4	89° 14'.3 N
Pollux	243° 46'.0	28° 02'.5 N
Procyon	245° 15'.4	5° 14'.5 N
Rasalhague	96° 21'.0	12° 33'.9 N
Regulus	207° 59'.6	11° 59'.9 N
Rigel	281° 26'.4	8° 12'.6 S
Rigil Kent	140° 13'.1	60° 48'.1 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 58'.0	56° 30'.3 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 46'.8	16° 42'.4 S
Spica	158° 47'.5	11° 07'.5 S
Suhail	223° 03'.4	43° 24'.2 S
Vega	80° 49'.7	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	39° 16'.4	15:12
Mars	244° 09'.5	01:32
Jupiter	167° 47'.8	06:37
Saturn	41° 41'.4	39:00

GMT	SUN GHA	SUN Dec	MOON GHA	v	MOON Dec	d	HP
23 00	180° 14'.6	23° 25'.9 S	193° 29'.1	8'.2	23° 12'.9 S	0'.4	56'.5
01	195° 14'.3	25'.9	207° 56'.3	8'.2	12'.5	0'.6	
02	210° 14'.0	25'.9	222° 23'.5	8'.2	11'.9	0'.7	
03	225° 13'.7	25'.8	236° 50'.7	8'.2	11'.2	0'.8	
04	240° 13'.4	25'.8	251° 17'.9	8'.3	10'.4	0'.9	56'.4
05	255° 13'.1	25'.8	265° 45'.2	8'.3	09'.5	1'.1	
06	270° 12'.8	25'.7	280° 12'.5	8'.3	08'.4	1'.2	
07	285° 12'.5	25'.7	294° 39'.8	8'.4	07'.2	1'.4	
08	300° 12'.2	25'.7	309° 07'.2	8'.4	05'.8	1'.4	
09	315° 11'.8	25'.6	323° 34'.6	8'.4	04'.4	1'.6	56'.3
10	330° 11'.5	25'.6	338° 02'.0	8'.5	02'.8	1'.8	
11	345° 11'.2	25'.6	352° 29'.5	8'.6	01'.0	1'.8	
12	0° 10'.9	23° 25'.5 S	6° 57'.1	8'.5	22° 59'.2 S	2'.0	56'.3
13	15° 10'.6	25'.5	21° 24'.6	8'.7	57'.2	2'.1	
14	30° 10'.3	25'.5	35° 52'.3	8'.6	55'.1	2'.2	56'.2
15	45° 10'.0	25'.4	50° 19'.9	8'.7	52'.9	2'.4	
16	60° 09'.7	25'.4	64° 47'.6	8'.8	50'.5	2'.4	
17	75° 09'.3	25'.3	79° 15'.4	8'.8	48'.1	2'.6	
18	90° 09'.0	25'.3	93° 43'.2	8'.8	45'.5	2'.8	56'.1
19	105° 08'.7	25'.3	108° 11'.0	8'.9	42'.7	2'.8	
20	120° 08'.4	25'.2	122° 38'.9	9'.0	39'.9	3'.0	
21	135° 08'.1	25'.2	137° 06'.9	9'.0	36'.9	3'.0	
22	150° 07'.8	25'.1	151° 34'.9	9'.0	33'.9	3'.2	
23	165° 07'.5	25'.1	166° 02'.9	9'.2	30'.7	3'.4	56'.0
24 00	180° 07'.2	23° 25'.0 S	180° 31'.1	9'.1	22° 27'.3 S	3'.4	56'.0
01	195° 06'.8	25'.0	194° 59'.2	9'.2	23'.9	3'.6	
02	210° 06'.5	24'.9	209° 27'.4	9'.3	20'.3	3'.6	
03	225° 06'.2	24'.9	223° 55'.7	9'.3	16'.7	3'.8	
04	240° 05'.9	24'.8	238° 24'.0	9'.4	12'.9	3'.9	55'.9
05	255° 05'.6	24'.8	252° 52'.4	9'.4	09'.0	4'.0	
06	270° 05'.3	24'.7	267° 20'.8	9'.5	05'.0	4'.2	
07	285° 05'.0	24'.7	281° 49'.3	9'.6	00'.8	4'.2	
08	300° 04'.7	24'.6	296° 17'.9	9'.6	21° 56'.6 S	4'.4	
09	315° 04'.4	24'.6	310° 46'.5	9'.7	52'.2	4'.5	55'.8
10	330° 04'.0	24'.5	325° 15'.2	9'.7	47'.7	4'.5	
11	345° 03'.7	24'.5	339° 43'.9	9'.9	43'.2	4'.7	
12	0° 03'.4	23° 24'.4 S	354° 12'.8	9'.8	21° 38'.5 S	4'.8	55'.8
13	15° 03'.1	24'.4	8° 41'.6	9'.9	33'.7	4'.9	55'.7
14	30° 02'.8	24'.3	23° 10'.5	10'.0	28'.8	5'.1	
15	45° 02'.5	24'.2	37° 39'.5	10'.1	23'.7	5'.1	
16	60° 02'.2	24'.2	52° 08'.6	10'.1	18'.6	5'.2	
17	75° 01'.9	24'.1	66° 37'.7	10'.2	13'.4	5'.3	
18	90° 01'.6	24'.1	81° 06'.9	10'.3	08'.1	5'.5	55'.6
19	105° 01'.2	24'.0	95° 36'.2	10'.3	02'.6	5'.5	
20	120° 00'.9	23'.9	110° 05'.5	10'.4	20° 57'.1 S	5'.7	
21	135° 00'.6	23'.9	124° 34'.9	10'.4	51'.4	5'.7	
22	150° 00'.3	23'.8	139° 04'.3	10'.5	45'.7	5'.9	
23	165° 00'.0	23'.7	153° 33'.8	10'.6	39'.8	5'.9	55'.5
25 00	179° 59'.7	23° 23'.7 S	168° 03'.4	10'.7	20° 33'.9 S	6'.0	55'.5
01	194° 59'.4	23'.6	182° 33'.1	10'.7	27'.9	6'.2	
02	209° 59'.1	23'.5	197° 02'.8	10'.8	21'.7	6'.2	
03	224° 58'.7	23'.5	211° 32'.6	10'.9	15'.5	6'.3	
04	239° 58'.4	23'.4	226° 02'.5	10'.9	09'.2	6'.5	55'.4
05	254° 58'.1	23'.3	240° 32'.4	11'.0	02'.7	6'.5	
06	269° 57'.8	23'.3	255° 02'.4	11'.1	19° 56'.2 S	6'.6	
07	284° 57'.5	23'.2	269° 32'.5	11'.1	49'.6	6'.7	
08	299° 57'.2	23'.1	284° 02'.6	11'.2	42'.9	6'.8	
09	314° 56'.9	23'.0	298° 32'.8	11'.3	36'.1	6'.9	55'.3
10	329° 56'.6	23'.0	313° 03'.1	11'.3	29'.2	7'.0	
11	344° 56'.3	22'.9	327° 33'.4	11'.5	22'.2	7'.0	
12	359° 56'.0	23° 22'.8 S	342° 03'.9	11'.5	19° 15'.2 S	7'.2	55'.3
13	14° 55'.6	22'.7	356° 34'.4	11'.5	08'.0	7'.2	
14	29° 55'.3	22'.7	11° 04'.9	11'.6	00'.8	7'.3	55'.2
15	44° 55'.0	22'.6	25° 35'.5	11'.7	18° 53'.5 S	7'.5	
16	59° 54'.7	22'.5	40° 06'.2	11'.8	46'.0	7'.4	
17	74° 54'.4	22'.4	54° 37'.0	11'.9	38'.6	7'.6	
18	89° 54'.1	22'.3	69° 07'.9	11'.9	31'.0	7'.7	
19	104° 53'.8	22'.3	83° 38'.8	12'.0	23'.3	7'.7	55'.1
20	119° 53'.5	22'.2	98° 09'.8	12'.0	15'.6	7'.8	
21	134° 53'.2	22'.1	112° 40'.8	12'.1	07'.8	7'.9	
22	149° 52'.8	22'.0	127° 11'.9	12'.2	17° 59'.9 S	8'.0	
23	164° 52'.5	21'.9	141° 43'.1	12'.3	51'.9	8'.0	
	SD 16'.3	d 0'.1	SD 15'.3		15'.2	15'.1	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
23	0 59	0 44	11:59	11:31	23:58	29d 0%
24	0 29	0 14	12:00	12:24	24:49	0d 0%
25	0 01	0 16	12:00	13:14	00:49	1d 2%

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1992 December 26, 27, 28 (Sat, Sun, Mon)

GMT	ARIES	VENUS -4.3		MARS -1.3		JUPITER -2.0		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
26 Saturday 00	94° 44'.6	131° 47'.3	16° 35'.7 S	339° 37'.5	25° 09'.9 N	262° 20'.9	3° 55'.7 S	136° 14'.1	17° 05'.3 S
01	109° 47'.1	146° 47'.0	34'.7	354° 40'.9	10'.2	277° 23'.1	55'.8	151° 16'.3	05'.2
02	124° 49'.5	161° 46'.7	33'.7	9° 44'.3	10'.4	292° 25'.4	55'.9	166° 18'.5	05'.1
03	139° 52'.0	176° 46'.4	32'.6	24° 47'.7	10'.6	307° 27'.6	56'.0	181° 20'.7	05'.0
04	154° 54'.5	191° 46'.1	31'.6	39° 51'.1	10'.9	322° 29'.8	56'.1	196° 22'.9	05'.0
05	169° 56'.9	206° 45'.8	30'.6	54° 54'.5	11'.1	337° 32'.1	56'.1	211° 25'.1	04'.9
06	184° 59'.4	221° 45'.5	29'.6	69° 57'.9	11'.3	352° 34'.3	56'.2	226° 27'.3	04'.8
07	200° 01'.9	236° 45'.2	28'.6	85° 01'.3	11'.6	7° 36'.5	56'.3	241° 29'.6	04'.7
08	215° 04'.3	251° 44'.9	27'.6	100° 04'.7	11'.8	22° 38'.7	56'.4	256° 31'.8	04'.7
09	230° 06'.8	266° 44'.6	26'.6	115° 08'.1	12'.1	37° 41'.0	56'.5	271° 34'.0	04'.6
10	245° 09'.3	281° 44'.3	25'.6	130° 11'.5	12'.3	52° 43'.2	56'.6	286° 36'.2	04'.5
11	260° 11'.7	296° 44'.0	24'.6	145° 15'.0	12'.5	67° 45'.4	56'.7	301° 38'.4	04'.4
12	275° 14'.2	311° 43'.8	16° 23'.6 S	160° 18'.4	25° 12'.8 N	82° 47'.7	3° 56'.8 S	316° 40'.6	17° 04'.4 S
13	290° 16'.7	326° 43'.5	22'.5	175° 21'.8	13'.0	97° 49'.9	56'.8	331° 42'.8	04'.3
14	305° 19'.1	341° 43'.2	21'.5	190° 25'.2	13'.2	112° 52'.1	56'.9	346° 45'.1	04'.2
15	320° 21'.6	356° 42'.9	20'.5	205° 28'.6	13'.5	127° 54'.4	57'.0	1° 47'.3	04'.1
16	335° 24'.0	11° 42'.6	19'.5	220° 32'.0	13'.7	142° 56'.6	57'.1	16° 49'.5	04'.1
17	350° 26'.5	26° 42'.3	18'.5	235° 35'.4	14'.0	157° 58'.8	57'.2	31° 51'.7	04'.0
18	5° 29'.0	41° 42'.0	17'.5	250° 38'.8	14'.2	173° 01'.1	57'.3	46° 53'.9	03'.9
19	20° 31'.4	56° 41'.7	16'.4	265° 42'.2	14'.4	188° 03'.3	57'.4	61° 56'.1	03'.8
20	35° 33'.9	71° 41'.4	15'.4	280° 45'.6	14'.7	203° 05'.5	57'.5	76° 58'.3	03'.8
21	50° 36'.4	86° 41'.2	14'.4	295° 49'.1	14'.9	218° 07'.8	57'.5	92° 00'.5	03'.7
22	65° 38'.8	101° 40'.9	13'.4	310° 52'.5	15'.1	233° 10'.0	57'.6	107° 02'.7	03'.6
23	80° 41'.3	116° 40'.6	12'.4	325° 55'.9	15'.4	248° 12'.2	57'.7	122° 05'.0	03'.5
27 Sunday 00	95° 43'.8	131° 40'.3	16° 11'.3 S	340° 59'.3	25° 15'.6 N	263° 14'.5	3° 57'.8 S	137° 07'.2	17° 03'.5 S
01	110° 46'.2	146° 40'.0	10'.3	356° 02'.7	15'.9	278° 16'.7	57'.9	152° 09'.4	03'.4
02	125° 48'.7	161° 39'.7	09'.3	11° 06'.2	16'.1	293° 18'.9	58'.0	167° 11'.6	03'.3
03	140° 51'.2	176° 39'.5	08'.3	26° 09'.6	16'.3	308° 21'.2	58'.0	182° 13'.8	03'.2
04	155° 53'.6	191° 39'.2	07'.2	41° 13'.0	16'.6	323° 23'.4	58'.1	197° 16'.0	03'.2
05	170° 56'.1	206° 38'.9	06'.2	56° 16'.4	16'.8	338° 25'.7	58'.2	212° 18'.2	03'.1
06	185° 58'.5	221° 38'.6	05'.2	71° 19'.9	17'.0	353° 27'.9	58'.3	227° 20'.4	03'.0
07	201° 01'.0	236° 38'.4	04'.2	86° 23'.3	17'.3	8° 30'.1	58'.4	242° 22'.7	02'.9
08	216° 03'.5	251° 38'.1	03'.1	101° 26'.7	17'.5	23° 32'.4	58'.5	257° 24'.9	02'.9
09	231° 05'.9	266° 37'.8	02'.1	116° 30'.1	17'.7	38° 34'.6	58'.6	272° 27'.1	02'.8
10	246° 08'.4	281° 37'.5	01'.1	131° 33'.6	18'.0	53° 36'.8	58'.6	287° 29'.3	02'.7
11	261° 10'.9	296° 37'.3	00'.1	146° 37'.0	18'.2	68° 39'.1	58'.7	302° 31'.5	02'.6
12	276° 13'.3	311° 37'.0	15° 59'.0 S	161° 40'.4	25° 18'.4 N	83° 41'.3	3° 58'.8 S	317° 33'.7	17° 02'.6 S
13	291° 15'.8	326° 36'.7	58'.0	176° 43'.9	18'.7	98° 43'.6	58'.9	332° 35'.9	02'.5
14	306° 18'.3	341° 36'.4	57'.0	191° 47'.3	18'.9	113° 45'.8	59'.0	347° 38'.1	02'.4
15	321° 20'.7	356° 36'.2	55'.9	206° 50'.7	19'.2	128° 48'.0	59'.1	2° 40'.3	02'.3
16	336° 23'.2	11° 35'.9	54'.9	221° 54'.2	19'.4	143° 50'.3	59'.1	17° 42'.5	02'.3
17	351° 25'.7	26° 35'.6	53'.9	236° 57'.6	19'.6	158° 52'.5	59'.2	32° 44'.8	02'.2
18	6° 28'.1	41° 35'.4	52'.9	252° 01'.0	19'.9	173° 54'.7	59'.3	47° 47'.0	02'.1
19	21° 30'.6	56° 35'.1	51'.8	267° 04'.5	20'.1	188° 57'.0	59'.4	62° 49'.2	02'.0
20	36° 33'.0	71° 34'.8	50'.8	282° 07'.9	20'.3	203° 59'.2	59'.5	77° 51'.4	02'.0
21	51° 35'.5	86° 34'.6	49'.8	297° 11'.3	20'.6	219° 01'.5	59'.6	92° 53'.6	01'.9
22	66° 38'.0	101° 34'.3	48'.7	312° 14'.8	20'.8	234° 03'.7	59'.6	107° 55'.8	01'.8
23	81° 40'.4	116° 34'.0	47'.7	327° 18'.2	21'.0	249° 05'.9	59'.7	122° 58'.0	01'.7
28 Monday 00	96° 42'.9	131° 33'.8	15° 46'.6 S	342° 21'.7	25° 21'.3 N	264° 08'.2	3° 59'.8 S	138° 00'.2	17° 01'.7 S
01	111° 45'.4	146° 33'.5	45'.6	357° 25'.1	21'.5	279° 10'.4	59'.9	153° 02'.4	01'.6
02	126° 47'.8	161° 33'.3	44'.6	12° 28'.5	21'.7	294° 12'.7	4° 00'.0 S	168° 04'.6	01'.5
03	141° 50'.3	176° 33'.0	43'.5	27° 32'.0	22'.0	309° 14'.9	00'.1	183° 06'.9	01'.4
04	156° 52'.8	191° 32'.7	42'.5	42° 35'.4	22'.2	324° 17'.2	00'.1	198° 09'.1	01'.3
05	171° 55'.2	206° 32'.5	41'.5	57° 38'.9	22'.4	339° 19'.4	00'.2	213° 11'.3	01'.3
06	186° 57'.7	221° 32'.2	40'.4	72° 42'.3	22'.7	354° 21'.6	00'.3	228° 13'.5	01'.2
07	202° 00'.1	236° 32'.0	39'.4	87° 45'.8	22'.9	9° 23'.9	00'.4	243° 15'.7	01'.1
08	217° 02'.6	251° 31'.7	38'.3	102° 49'.2	23'.1	24° 26'.1	00'.5	258° 17'.9	01'.0
09	232° 05'.1	266° 31'.5	37'.3	117° 52'.7	23'.4	39° 28'.4	00'.6	273° 20'.1	01'.0
10	247° 07'.5	281° 31'.2	36'.3	132° 56'.1	23'.6	54° 30'.6	00'.6	288° 22'.3	00'.9
11	262° 10'.0	296° 30'.9	35'.2	147° 59'.6	23'.8	69° 32'.9	00'.7	303° 24'.5	00'.8
12	277° 12'.5	311° 30'.7	15° 34'.2 S	163° 03'.0	25° 24'.1 N	84° 35'.1	4° 00'.8 S	318° 26'.7	17° 00'.7 S
13	292° 14'.9	326° 30'.4	33'.1	178° 06'.5	24'.3	99° 37'.3	00'.9	333° 28'.9	00'.7
14	307° 17'.4	341° 30'.2	32'.1	193° 09'.9	24'.5	114° 39'.6	01'.0	348° 31'.2	00'.6
15	322° 19'.9	356° 29'.9	31'.0	208° 13'.4	24'.8	129° 41'.8	01'.0	3° 33'.4	00'.5
16	337° 22'.3	11° 29'.7	30'.0	223° 16'.9	25'.0	144° 44'.1	01'.1	18° 35'.6	00'.4
17	352° 24'.8	26° 29'.4	28'.9	238° 20'.3	25'.2	159° 46'.3	01'.2	33° 37'.8	00'.4
18	7° 27'.3	41° 29'.2	27'.9	253° 23'.8	25'.5	174° 48'.6	01'.3	48° 40'.0	00'.3
19	22° 29'.7	56° 29'.0	26'.9	268° 27'.2	25'.7	189° 50'.8	01'.4	63° 42'.2	00'.2
20	37° 32'.2	71° 28'.7	25'.8	283° 30'.7	25'.9	204° 53'.1	01'.4	78° 44'.4	00'.1
21	52° 34'.6	86° 28'.5	24'.8	298° 34'.1	26'.2	219° 55'.3	01'.5	93° 46'.6	00'.1
22	67° 37'.1	101° 28'.2	23'.7	313° 37'.6	26'.4	234° 57'.6	01'.6	108° 48'.8	00'.0
23	82° 39'.6	116° 28'.0	22'.7	328° 41'.1	26'.6	249° 59'.8	01'.7	123° 51'.0	16° 59'.9 S
	M.P. 17:34	v -0'.3	d 1'.0	v 3'.4	d 0'.2	v 2'.2	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 29'.6	40° 20'.1 S
Achernar	335° 37'.8	57° 16'.5 S
Acrux	173° 26'.6	63° 03'.4 S
Adhara	255° 24'.1	28° 57'.8 S
Aldebaran	291° 06'.6	16° 29'.8 N
Alioth	166° 34'.1	55° 59'.5 N
Alkaid	153° 11'.0	49° 20'.5 N
Alnair	28° 03'.1	46° 59'.8 S
Alnilam	276° 01'.5	1° 12'.4 S
Alphard	218° 10'.9	8° 37'.8 S
Alphecca	126° 24'.2	26° 44'.1 N
Alpheratz	357° 59'.4	29° 03'.4 N
Altair	62° 23'.5	8° 51'.1 N
Ankaa	353° 30'.7	42° 20'.8 S
Antares	112° 45'.4	26° 25'.0 S
Arcturus	146° 09'.8	19° 12'.9 N
Atria	108° 01'.5	69° 00'.8 S
Avior	234° 23'.7	59° 29'.2 S
Bellatrix	278° 48'.1	6° 20'.6 N
Betelgeuse	271° 17'.5	7° 24'.3 N
Canopus	264° 02'.4	52° 41'.6 S
Capella	280° 56'.6	45° 59'.5 N
Deneb	49° 42'.3	45° 15'.5 N
Denebola	182° 49'.2	14° 36'.5 N
Diphda	349° 11'.1	18° 01'.5 S
Dubhe	194° 10'.0	61° 46'.9 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.4 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.9	29° 39'.6 S
Gacrux	172° 18'.1	57° 04'.3 S
Gienah	176° 08'.0	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.2 S
Hamal	328° 17'.9	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.1	74° 10'.7 N
Markab	13° 53'.7	15° 10'.2 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 25'.8	36° 20'.1 S
Miaplacidus	221° 42'.3	69° 41'.2 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.5 S
Polaris	323° 35'.4	89° 14'.4 N
Pollux	243° 46'.0	28° 02'.5 N
Procyon	245° 15'.4	5° 14'.5 N
Rasalhague	96° 21'.0	12° 33'.9 N
Regulus	207° 59'.5	11° 59'.9 N
Rigel	281° 26'.4	8° 12'.6 S
Rigil Kent	140° 13'.0	60° 48'.1 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 58'.0	56° 30'.3 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 46'.8	16° 42'.4 S
Spica	158° 47'.5	11° 07'.5 S
Suhail	223° 03'.4	43° 24'.2 S
Vega	80° 49'.7	38° 46'.7 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	35° 56'.5	15:14
Mars	245° 15'.6	01:16
Jupiter	167° 30'.7	06:26
Saturn	41° 23'.4	14:49

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
26 00	179° 52'.2	23° 21'.8 S	156° 14'.4	12'.3	17° 43'.9 S	8'.2	55'.1
01	194° 51'.9	21'.8	170° 45'.7	12'.4	35'.7	8'.2	55'.0
02	209° 51'.6	21'.7	185° 17'.1	12'.5	27'.5	8'.2	
03	224° 51'.3	21'.6	199° 48'.6	12'.5	19'.3	8'.4	
04	239° 51'.0	21'.5	214° 20'.1	12'.6	10'.9	8'.4	
05	254° 50'.7	21'.4	228° 51'.7	12'.7	02'.5	8'.5	
06	269° 50'.4	21'.3	243° 23'.4	12'.8	16° 54'.0 S	8'.6	54'.9
07	284° 50'.1	21'.2	257° 55'.2	12'.8	45'.4	8'.6	
08	299° 49'.7	21'.1	272° 27'.0	12'.9	36'.8	8'.7	
09	314° 49'.4	21'.0	286° 58'.9	12'.9	28'.1	8'.8	
10	329° 49'.1	20'.9	301° 30'.8	13'.0	19'.3	8'.8	
11	344° 48'.8	20'.8	316° 02'.8	13'.1	10'.5	8'.9	
12	359° 48'.5	23° 20'.8 S	330° 34'.9	13'.1	16° 01'.6 S	9'.0	54'.8
13	14° 48'.2	20'.7	345° 07'.0	13'.2	15° 52'.6 S	9'.0	
14	29° 47'.9	20'.6	359° 39'.2	13'.3	43'.6	9'.1	
15	44° 47'.6	20'.5	14° 11'.5	13'.4	34'.5	9'.1	
16	59° 47'.3	20'.4	28° 43'.9	13'.4	25'.4	9'.3	
17	74° 47'.0	20'.3	43° 16'.3	13'.4	16'.1	9'.2	
18	89° 46'.7	20'.2	57° 48'.7	13'.6	06'.9	9'.4	54'.7
19	104° 46'.3	20'.1	72° 21'.3	13'.6	14° 57'.5 S	9'.4	
20	119° 46'.0	20'.0	86° 53'.9	13'.6	48'.1	9'.4	
21	134° 45'.7	19'.9	101° 26'.5	13'.8	38'.7	9'.5	
22	149° 45'.4	19'.8	115° 59'.3	13'.7	29'.2	9'.6	
23	164° 45'.1	19'.6	130° 32'.0	13'.9	19'.6	9'.6	
27 00	179° 44'.8	23° 19'.5 S	145° 04'.9	13'.9	14° 10'.0 S	9'.7	54'.7
01	194° 44'.5	19'.4	159° 37'.8	14'.0	00'.3	9'.7	54'.6
02	209° 44'.2	19'.3	174° 10'.8	14'.0	13° 50'.6 S	9'.8	
03	224° 43'.9	19'.2	188° 43'.8	14'.1	40'.8	9'.8	
04	239° 43'.6	19'.1	203° 16'.9	14'.1	31'.0	9'.9	
05	254° 43'.3	19'.0	217° 50'.0	14'.2	21'.1	9'.9	
06	269° 43'.0	18'.9	232° 23'.2	14'.3	11'.2	10'.0	
07	284° 42'.6	18'.8	246° 56'.5	14'.3	01'.2	10'.0	
08	299° 42'.3	18'.7	261° 29'.8	14'.3	12° 51'.2 S	10'.1	54'.5
09	314° 42'.0	18'.6	276° 03'.1	14'.5	41'.1	10'.1	
10	329° 41'.7	18'.4	290° 36'.6	14'.4	31'.0	10'.2	
11	344° 41'.4	18'.3	305° 10'.0	14'.6	20'.8	10'.2	
12	359° 41'.1	23° 18'.2 S	319° 43'.6	14'.6	12° 10'.6 S	10'.3	54'.5
13	14° 40'.8	18'.1	334° 17'.2	14'.6	00'.3	10'.3	
14	29° 40'.5	18'.0	348° 50'.8	14'.7	11° 50'.0 S	10'.3	
15	44° 40'.2	17'.9	3° 24'.5	14'.7	39'.7	10'.4	
16	59° 39'.9	17'.7	17° 58'.2	14'.8	29'.3	10'.5	54'.4
17	74° 39'.6	17'.6	32° 32'.0	14'.9	18'.8	10'.4	
18	89° 39'.3	17'.5	47° 05'.9	14'.8	08'.4	10'.5	
19	104° 39'.0	17'.4	61° 39'.7	15'.0	10° 57'.9 S	10'.6	
20	119° 38'.6	17'.3	76° 13'.7	15'.0	47'.3	10'.6	
21	134° 38'.3	17'.1	90° 47'.7	15'.0	36'.7	10'.6	
22	149° 38'.0	17'.0	105° 21'.7	15'.1	26'.1	10'.6	
23	164° 37'.7	16'.9	119° 55'.8	15'.1	15'.5	10'.7	
28 00	179° 37'.4	23° 16'.8 S	134° 29'.9	15'.2	10° 04'.8 S	10'.8	54'.4
01	194° 37'.1	16'.6	149° 04'.1	15'.2	9° 54'.0 S	10'.7	54'.3
02	209° 36'.8	16'.5	163° 38'.3	15'.3	43'.3	10'.8	
03	224° 36'.5	16'.4	178° 12'.6	15'.3	32'.5	10'.9	
04	239° 36'.2	16'.3	192° 46'.9	15'.3	21'.6	10'.8	
05	254° 35'.9	16'.1	207° 21'.2	15'.4	10'.8	10'.9	
06	269° 35'.6	16'.0	221° 55'.6	15'.4	8° 59'.9 S	10'.9	
07	284° 35'.3	15'.9	236° 30'.0	15'.5	49'.0	11'.0	
08	299° 35'.0	15'.7	251° 04'.5	15'.5	38'.0	11'.0	
09	314° 34'.7	15'.6	265° 39'.0	15'.5	27'.0	11'.0	
10	329° 34'.4	15'.5	280° 13'.5	15'.6	16'.0	11'.0	
11	344° 34'.1	15'.3	294° 48'.1	15'.6	05'.0	11'.1	
12	359° 33'.7	23° 15'.2 S	309° 22'.7	15'.6	7° 53'.9 S	11'.1	54'.2
13	14° 33'.4	15'.1	323° 57'.3	15'.7	42'.8	11'.1	
14	29° 33'.1	14'.9	338° 32'.0	15'.7	31'.7	11'.2	
15	44° 32'.8	14'.8	353° 06'.7	15'.8	20'.5	11'.1	
16	59° 32'.5	14'.7	7° 41'.5	15'.7	09'.4	11'.2	
17	74° 32'.2	14'.5	22° 16'.2	15'.8	6° 58'.2 S	11'.3	
18	89° 31'.9	14'.4	36° 51'.0	15'.9	46'.9	11'.2	
19	104° 31'.6	14'.2	51° 25'.9	15'.9	35'.7	11'.3	
20	119° 31'.3	14'.1	66° 00'.8	15'.8	24'.4	11'.2	
21	134° 31'.0	14'.0	80° 35'.6	16'.0	13'.2	11'.3	
22	149° 30'.7	13'.8	95° 10'.6	15'.9	01'.9	11'.4	
23	164° 30'.4	13'.7	109° 45'.5	16'.0	5° 50'.5 S	11'.3	
	SD 16'.3	d 0'.1	SD 14'.9		14'.8		14'.8

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
26	0 30	0 45	12:01	14:01	01:38	2d 6%
27	1 00	1 15	12:01	14:46	02:24	3d 11%
28	1 30	1 44	12:02	15:28	03:07	4d 18%

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1992 December 29, 30, 31 (Tue, Wed, Thur)

GMT	ARIES	VENUS -4.3		MARS -1.4		JUPITER -2.0		SATURN +0.8	
	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
29 Tuesday 00	97° 42'.0	131° 27'.7	15° 21'.6 S	343° 44'.5	25° 26'.8 N	265° 02'.1	4° 01'.8 S	138° 53'.2	16° 59'.8 S
01	112° 44'.5	146° 27'.5	20'.6	358° 48'.0	27'.1	280° 04'.3	01'.8	153° 55'.4	59'.7
02	127° 47'.0	161° 27'.3	19'.5	13° 51'.5	27'.3	295° 06'.5	01'.9	168° 57'.6	59'.7
03	142° 49'.4	176° 27'.0	18'.5	28° 54'.9	27'.5	310° 08'.8	02'.0	183° 59'.9	59'.6
04	157° 51'.9	191° 26'.8	17'.4	43° 58'.4	27'.8	325° 11'.0	02'.1	199° 02'.1	59'.5
05	172° 54'.4	206° 26'.5	16'.4	59° 01'.9	28'.0	340° 13'.3	02'.2	214° 04'.3	59'.4
06	187° 56'.8	221° 26'.3	15'.3	74° 05'.3	28'.2	355° 15'.5	02'.2	229° 06'.5	59'.4
07	202° 59'.3	236° 26'.1	14'.2	89° 08'.8	28'.5	10° 17'.8	02'.3	244° 08'.7	59'.3
08	218° 01'.8	251° 25'.8	13'.2	104° 12'.3	28'.7	25° 20'.0	02'.4	259° 10'.9	59'.2
09	233° 04'.2	266° 25'.6	12'.1	119° 15'.7	28'.9	40° 22'.3	02'.5	274° 13'.1	59'.1
10	248° 06'.7	281° 25'.4	11'.1	134° 19'.2	29'.2	55° 24'.5	02'.6	289° 15'.3	59'.1
11	263° 09'.1	296° 25'.1	10'.0	149° 22'.7	29'.4	70° 26'.8	02'.6	304° 17'.5	59'.0
12	278° 11'.6	311° 24'.9	15° 09'.0 S	164° 26'.1	25° 29'.6 N	85° 29'.0	4° 02'.7 S	319° 19'.7	16° 58'.9 S
13	293° 14'.1	326° 24'.7	07'.9	179° 29'.6	29'.8	100° 31'.3	02'.8	334° 21'.9	58'.8
14	308° 16'.5	341° 24'.4	06'.8	194° 33'.1	30'.1	115° 33'.5	02'.9	349° 24'.1	58'.7
15	323° 19'.0	356° 24'.2	05'.8	209° 36'.6	30'.3	130° 35'.8	03'.0	4° 26'.3	58'.7
16	338° 21'.5	11° 24'.0	04'.7	224° 40'.0	30'.5	145° 38'.0	03'.0	19° 28'.5	58'.6
17	353° 23'.9	26° 23'.7	03'.7	239° 43'.5	30'.8	160° 40'.3	03'.1	34° 30'.7	58'.5
18	8° 26'.4	41° 23'.5	02'.6	254° 47'.0	31'.0	175° 42'.5	03'.2	49° 33'.0	58'.4
19	23° 28'.9	56° 23'.3	01'.5	269° 50'.5	31'.2	190° 44'.8	03'.3	64° 35'.2	58'.4
20	38° 31'.3	71° 23'.1	00'.5	284° 54'.0	31'.4	205° 47'.0	03'.4	79° 37'.4	58'.3
21	53° 33'.8	86° 22'.8	14° 59'.4 S	299° 57'.4	31'.7	220° 49'.3	03'.4	94° 39'.6	58'.2
22	68° 36'.2	101° 22'.6	58'.4	315° 00'.9	31'.9	235° 51'.6	03'.5	109° 41'.8	58'.1
23	83° 38'.7	116° 22'.4	57'.3	330° 04'.4	32'.1	250° 53'.8	03'.6	124° 44'.0	58'.1
30 Wednesday 00	98° 41'.2	131° 22'.2	14° 56'.2 S	345° 07'.9	25° 32'.4 N	265° 56'.1	4° 03'.7 S	139° 46'.2	16° 58'.0 S
01	113° 43'.6	146° 22'.0	55'.2	0° 11'.4	32'.6	280° 58'.3	03'.7	154° 48'.4	57'.9
02	128° 46'.1	161° 21'.7	54'.1	15° 14'.8	32'.8	296° 00'.6	03'.8	169° 50'.6	57'.8
03	143° 48'.6	176° 21'.5	53'.0	30° 18'.3	33'.0	311° 02'.8	03'.9	184° 52'.8	57'.7
04	158° 51'.0	191° 21'.3	52'.0	45° 21'.8	33'.3	326° 05'.1	04'.0	199° 55'.0	57'.7
05	173° 53'.5	206° 21'.1	50'.9	60° 25'.3	33'.5	341° 07'.3	04'.0	214° 57'.2	57'.6
06	188° 56'.0	221° 20'.9	49'.8	75° 28'.8	33'.7	356° 09'.6	04'.1	229° 59'.4	57'.5
07	203° 58'.4	236° 20'.6	48'.8	90° 32'.3	33'.9	11° 11'.8	04'.2	245° 01'.6	57'.4
08	219° 00'.9	251° 20'.4	47'.7	105° 35'.8	34'.2	26° 14'.1	04'.3	260° 03'.8	57'.4
09	234° 03'.4	266° 20'.2	46'.6	120° 39'.2	34'.4	41° 16'.3	04'.4	275° 06'.0	57'.3
10	249° 05'.8	281° 20'.0	45'.6	135° 42'.7	34'.6	56° 18'.6	04'.4	290° 08'.2	57'.2
11	264° 08'.3	296° 19'.8	44'.5	150° 46'.2	34'.8	71° 20'.9	04'.5	305° 10'.4	57'.1
12	279° 10'.7	311° 19'.6	14° 43'.4 S	165° 49'.7	25° 35'.1 N	86° 23'.1	4° 04'.6 S	320° 12'.7	16° 57'.0 S
13	294° 13'.2	326° 19'.4	42'.4	180° 53'.2	35'.3	101° 25'.4	04'.7	335° 14'.9	57'.0
14	309° 15'.7	341° 19'.2	41'.3	195° 56'.7	35'.5	116° 27'.6	04'.7	350° 17'.1	56'.9
15	324° 18'.1	356° 18'.9	40'.2	211° 00'.2	35'.7	131° 29'.9	04'.8	5° 19'.3	56'.8
16	339° 20'.6	11° 18'.7	39'.1	226° 03'.7	36'.0	146° 32'.1	04'.9	20° 21'.5	56'.7
17	354° 23'.1	26° 18'.5	38'.1	241° 07'.2	36'.2	161° 34'.4	05'.0	35° 23'.7	56'.7
18	9° 25'.5	41° 18'.3	37'.0	256° 10'.7	36'.4	176° 36'.7	05'.0	50° 25'.9	56'.6
19	24° 28'.0	56° 18'.1	35'.9	271° 14'.2	36'.6	191° 38'.9	05'.1	65° 28'.1	56'.5
20	39° 30'.5	71° 17'.9	34'.8	286° 17'.7	36'.9	206° 41'.2	05'.2	80° 30'.3	56'.4
21	54° 32'.9	86° 17'.7	33'.8	301° 21'.2	37'.1	221° 43'.4	05'.3	95° 32'.5	56'.3
22	69° 35'.4	101° 17'.5	32'.7	316° 24'.6	37'.3	236° 45'.7	05'.3	110° 34'.7	56'.3
23	84° 37'.9	116° 17'.3	31'.6	331° 28'.1	37'.5	251° 47'.9	05'.4	125° 36'.9	56'.2
31 Thursday 00	99° 40'.3	131° 17'.1	14° 30'.5 S	346° 31'.6	25° 37'.8 N	266° 50'.2	4° 05'.5 S	140° 39'.1	16° 56'.1 S
01	114° 42'.8	146° 16'.9	29'.5	1° 35'.1	38'.0	281° 52'.5	05'.6	155° 41'.3	56'.0
02	129° 45'.2	161° 16'.7	28'.4	16° 38'.6	38'.2	296° 54'.7	05'.6	170° 43'.5	56'.0
03	144° 47'.7	176° 16'.5	27'.3	31° 42'.1	38'.4	311° 57'.0	05'.7	185° 45'.7	55'.9
04	159° 50'.2	191° 16'.3	26'.2	46° 45'.6	38'.7	326° 59'.2	05'.8	200° 47'.9	55'.8
05	174° 52'.6	206° 16'.1	25'.2	61° 49'.1	38'.9	342° 01'.5	05'.9	215° 50'.1	55'.7
06	189° 55'.1	221° 15'.9	24'.1	76° 52'.6	39'.1	357° 03'.8	05'.9	230° 52'.3	55'.6
07	204° 57'.6	236° 15'.7	23'.0	91° 56'.2	39'.3	12° 06'.0	06'.0	245° 54'.5	55'.6
08	220° 00'.0	251° 15'.5	21'.9	106° 59'.7	39'.6	27° 08'.3	06'.1	260° 56'.7	55'.5
09	235° 02'.5	266° 15'.3	20'.8	122° 03'.2	39'.8	42° 10'.6	06'.2	275° 58'.9	55'.4
10	250° 05'.0	281° 15'.1	19'.7	137° 06'.7	40'.0	57° 12'.8	06'.2	291° 01'.1	55'.3
11	265° 07'.4	296° 14'.9	18'.7	152° 10'.2	40'.2	72° 15'.1	06'.3	306° 03'.3	55'.2
12	280° 09'.9	311° 14'.8	14° 17'.6 S	167° 13'.7	25° 40'.4 N	87° 17'.3	4° 06'.4 S	321° 05'.5	16° 55'.2 S
13	295° 12'.3	326° 14'.6	16'.5	182° 17'.2	40'.7	102° 19'.6	06'.5	336° 07'.7	55'.1
14	310° 14'.8	341° 14'.4	15'.4	197° 20'.7	40'.9	117° 21'.9	06'.5	351° 09'.9	55'.0
15	325° 17'.3	356° 14'.2	14'.3	212° 24'.2	41'.1	132° 24'.1	06'.6	6° 12'.1	54'.9
16	340° 19'.7	11° 14'.0	13'.2	227° 27'.7	41'.3	147° 26'.4	06'.7	21° 14'.3	54'.9
17	355° 22'.2	26° 13'.8	12'.2	242° 31'.2	41'.5	162° 28'.7	06'.7	36° 16'.6	54'.8
18	10° 24'.7	41° 13'.6	11'.1	257° 34'.7	41'.8	177° 30'.9	06'.8	51° 18'.8	54'.7
19	25° 27'.1	56° 13'.4	10'.0	272° 38'.2	42'.0	192° 33'.2	06'.9	66° 21'.0	54'.6
20	40° 29'.6	71° 13'.3	08'.9	287° 41'.7	42'.2	207° 35'.5	07'.0	81° 23'.2	54'.5
21	55° 32'.1	86° 13'.1	07'.8	302° 45'.3	42'.4	222° 37'.7	07'.0	96° 25'.4	54'.5
22	70° 34'.5	101° 12'.9	06'.7	317° 48'.8	42'.6	237° 40'.0	07'.1	111° 27'.6	54'.4
23	85° 37'.0	116° 12'.7	05'.6	332° 52'.3	42'.9	252° 42'.2	07'.2	126° 29'.8	54'.3
	M.P. 17:22	v -0'.2	d 1'.1	v 3'.5	d 0'.2	v 2'.3	d 0'.1	v 2'.2	d 0'.1

Name	SHA	Dec
Acamar	315° 29'.6	40° 20'.1 S
Achernar	335° 37'.9	57° 16'.5 S
Acrux	173° 26'.6	63° 03'.4 S
Adhara	255° 24'.1	28° 57'.8 S
Aldebaran	291° 06'.6	16° 29'.8 N
Alioth	166° 34'.0	55° 59'.5 N
Alkaid	153° 11'.0	49° 20'.5 N
Alnair	28° 03'.1	46° 59'.8 S
Alnilam	276° 01'.5	1° 12'.4 S
Alphard	218° 10'.8	8° 37'.8 S
Alphecca	126° 24'.2	26° 44'.1 N
Alpheratz	357° 59'.4	29° 03'.4 N
Altair	62° 23'.5	8° 51'.0 N
Ankaa	353° 30'.7	42° 20'.8 S
Antares	112° 45'.3	26° 25'.0 S
Arcturus	146° 09'.8	19° 12'.9 N
Atria	108° 01'.5	69° 00'.8 S
Avior	234° 23'.7	59° 29'.2 S
Bellatrix	278° 48'.1	6° 20'.6 N
Betelgeuse	271° 17'.5	7° 24'.3 N
Canopus	264° 02'.4	52° 41'.6 S
Capella	280° 56'.6	45° 59'.5 N
Deneb	49° 42'.3	45° 15'.5 N
Denebola	182° 49'.1	14° 36'.4 N
Diphda	349° 11'.2	18° 01'.5 S
Dubhe	194° 10'.0	61° 46'.9 N
Elnath	278° 31'.6	28° 36'.1 N
Eltanin	90° 53'.8	51° 29'.3 N
Enif	34° 02'.3	9° 50'.7 N
Fomalhaut	15° 40'.9	29° 39'.6 S
Gacrux	172° 18'.0	57° 04'.3 S
Gienah	176° 08'.0	17° 30'.2 S
Hadar	149° 10'.0	60° 20'.2 S
Hamal	328° 17'.9	23° 26'.0 N
Kaus Aust.	84° 04'.5	34° 23'.3 S
Kochab	137° 20'.0	74° 10'.7 N
Markab	13° 53'.7	15° 10'.2 N
Menkar	314° 30'.8	4° 03'.8 N
Menkent	148° 25'.8	36° 20'.1 S
Miaplacidus	221° 42'.2	69° 41'.2 S
Mirfak	309° 01'.9	49° 50'.4 N
Nunki	76° 17'.6	26° 18'.3 S
Peacock	53° 43'.7	56° 45'.5 S
Polaris	323° 36'.4	89° 14'.4 N
Pollux	243° 46'.0	28° 02'.5 N
Procyon	245° 15'.4	5° 14'.5 N
Rasalhague	96° 21'.0	12° 33'.9 N
Regulus	207° 59'.5	11° 59'.9 N
Rigel	281° 26'.4	8° 12'.6 S
Rigil Kent	140° 13'.0	60° 48'.1 S
Sabik	102° 30'.4	15° 43'.0 S
Schedar	349° 58'.0	56° 30'.3 N
Shaula	96° 43'.1	37° 05'.9 S
Sirius	258° 46'.8	16° 42'.4 S
Spica	158° 47'.4	11° 07'.5 S
Suhail	223° 03'.3	43° 24'.2 S
Vega	80° 49'.7	38° 46'.6 N
Zuben'ubi	137° 22'.6	16° 00'.8 S

	SHA	Mer.Pass.
Venus	32° 41'.0	15:15
Mars	246° 26'.7	00:59
Jupiter	167° 14'.9	06:15
Saturn	41° 05'.0	14:39

GMT	SUN GHA	SUN Dec	MOON GHA	MOON v	MOON Dec	MOON d	MOON HP
29 Tuesday 00	179° 30'.1	23° 13'.5 S	124° 20'.5	16'.0	5° 39'.2 S	11'.4	54'.2
01	194° 29'.8	13'.4	138° 55'.5	16'.0	27'.8	11'.3	
02	209° 29'.5	13'.2	153° 30'.5	16'.1	16'.5	11'.4	
03	224° 29'.2	13'.1	168° 05'.6	16'.0	05'.1	11'.4	
04	239° 28'.9	13'.0	182° 40'.6	16'.1	4° 53'.7 S	11'.5	
05	254° 28'.6	12'.8	197° 15'.7	16'.2	42'.2	11'.4	
06	269° 28'.3	12'.7	211° 50'.9	16'.1	30'.8	11'.5	54'.1
07	284° 28'.0	12'.5	226° 26'.0	16'.1	19'.3	11'.5	
08	299° 27'.7	12'.4	241° 01'.1	16'.2	07'.8	11'.4	
09	314° 27'.3	12'.2	255° 36'.3	16'.2	3° 56'.4 S	11'.5	
10	329° 27'.0	12'.1	270° 11'.5	16'.2	44'.9	11'.5	
11	344° 26'.7	11'.9	284° 46'.7	16'.2	33'.4	11'.6	
12	359° 26'.4	23° 11'.7 S	299° 21'.9	16'.2	3° 21'.8 S	11'.5	54'.1
13	14° 26'.1	11'.6	313° 57'.1	16'.3	10'.3	11'.5	
14	29° 25'.8	11'.4	328° 32'.4	16'.2	2° 58'.8 S	11'.6	
15	44° 25'.5	11'.3	343° 07'.6	16'.3	47'.2	11'.6	
16	59° 25'.2	11'.1	357° 42'.9	16'.3	35'.6	11'.5	
17	74° 24'.9	11'.0	12° 18'.2	16'.3	24'.1	11'.6	
18	89° 24'.6	10'.8	26° 53'.5	16'.3	12'.5	11'.6	
19	104° 24'.3	10'.6	41° 28'.8	16'.3	00'.9	11'.6	
20	119° 24'.0	10'.5	56° 04'.1	16'.3	1° 49'.3 S	11'.6	
21	134° 23'.7	10'.3	70° 39'.4	16'.3	37'.7	11'.6	
22	149° 23'.4	10'.2	85° 14'.7	16'.4	26'.1	11'.6	
23	164° 23'.1	10'.0	99° 50'.1	16'.3	14'.5	11'.6	
30 Wednesday 00	179° 22'.8	23° 09'.8 S	114° 25'.4	16'.3	1° 02'.9 S	11'.7	54'.1
01	194° 22'.5	09'.7	129° 00'.7	16'.3	0° 51'.2 S	11'.6	
02	209° 22'.2	09'.5	143° 36'.0	16'.4	39'.6	11'.6	
03	224° 21'.9	09'.3	158° 11'.4	16'.3	28'.0	11'.6	
04	239° 21'.6	09'.2	172° 46'.7	16'.4	16'.4	11'.7	
05	254° 21'.3	09'.0	187° 22'.1	16'.3	04'.7	11'.6	54'.2
06	269° 21'.0	08'.8	201° 57'.4	16'.3	0° 06'.9 N	11'.6	
07	284° 20'.7	08'.7	216° 32'.7	16'.3	18'.5	11'.6	
08	299° 20'.4	08'.5	231° 08'.0	16'.4	30'.1	11'.7	
09	314° 20'.1	08'.3	245° 43'.4	16'.3	41'.8	11'.6	
10	329° 19'.8	08'.2	260° 18'.7	16'.3	53'.4	11'.6	
11	344° 19'.5	08'.0	274° 54'.0	16'.3	1° 05'.0 N	11'.7	
12	359° 19'.2	23° 07'.8 S	289° 29'.3	16'.3	1° 16'.7 N	11'.6	54'.2
13	14° 18'.9	07'.6	304° 04'.6	16'.3	28'.3	11'.6	
14	29° 18'.6	07'.5	318° 39'.9	16'.3	39'.9	11'.6	
15	44° 18'.3	07'.3	333° 15'.2	16'.2	51'.5	11'.6	
16	59° 18'.0	07'.1	347° 50'.4	16'.3	2° 03'.1 N	11'.6	
17	74° 17'.7	06'.9	2° 25'.7	16'.2	14'.7	11'.6	
18	89° 17'.4	06'.8	17° 00'.9	16'.3	26'.3	11'.6	
19	104° 17'.1	06'.6	31° 36'.2	16'.2	37'.9	11'.6	
20	119° 16'.8	06'.4	46° 11'.4	16'.2	49'.5	11'.6	
21	134° 16'.5	06'.2	60° 46'.6	16'.2	3° 01'.1 N	11'.5	
22	149° 16'.2	06'.0	75° 21'.8	16'.1	12'.6	11'.6	54'.3
23	164° 15'.9	05'.9	89° 56'.9	16'.2	24'.2	11'.5	
31 Thursday 00	179° 15'.6	23° 05'.7 S	104° 32'.1	16'.1	3° 35'.7 N	11'.6	54'.3
01	194° 15'.3	05'.5	119° 07'.2	16'.1	47'.3	11'.5	
02	209° 15'.0	05'.3	133° 42'.3	16'.1	58'.8	11'.5	
03	224° 14'.7	05'.1	148° 17'.4	16'.0	4° 10'.3 N	11'.5	
04	239° 14'.4	04'.9	162° 52'.4	16'.1	21'.8	11'.5	
05	254° 14'.1	04'.7	177° 27'.5	16'.0	33'.3	11'.5	
06	269° 13'.8	04'.6	192° 02'.5	16'.0	44'.8	11'.4	
07	284° 13'.5	04'.4	206° 37'.5	15'.9	56'.2	11'.5	
08	299° 13'.2	04'.2	221° 12'.4	16'.0	5° 07'.7 N	11'.4	54'.4
09	314° 12'.9	04'.0	235° 47'.4	15'.9	19'.1	11'.4	
10	329° 12'.6	03'.8	250° 22'.3	15'.9	30'.5	11'.4	
11	344° 12'.3	03'.6	264° 57'.2	15'.8	41'.9	11'.4	
12	359° 12'.0	23° 03'.4 S	279° 32'.0	15'.8	5° 53'.3 N	11'.4	54'.4
13	14° 11'.7	03'.2	294° 06'.8	15'.8	6° 04'.7 N	11'.4	
14	29° 11'.4	03'.0	308° 41'.6	15'.8	16'.1	11'.3	
15	44° 11'.1	02'.8	323° 16'.4	15'.7	27'.4	11'.3	
16	59° 10'.8	02'.6	337° 51'.1	15'.7	38'.7	11'.3	54'.5
17	74° 10'.5	02'.4	352° 25'.8	15'.6	50'.0	11'.3	
18	89° 10'.2	02'.2	7° 00'.4	15'.6	7° 01'.3 N	11'.2	
19	104° 09'.9	02'.0	21° 35'.0	15'.6	12'.5	11'.2	
20	119° 09'.6	01'.8	36° 09'.6	15'.5	23'.7	11'.2	
21	134° 09'.4	01'.6	50° 44'.1	15'.5	34'.9	11'.2	
22	149° 09'.1	01'.4	65° 18'.6	15'.4	46'.1	11'.2	
23	164° 08'.8	01'.2	79° 53'.0	15'.4	57'.3	11'.1	54'.6
	SD 16'.3	d 0'.2	SD 14'.8		14'.8	14'.8	

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

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

Day	SUN Eqn. of Time 00h	SUN Eqn. of Time 12h	SUN Mer. Pass.	MOON Mer. Pass. Upper	MOON Mer. Pass. Lower	MOON Age/ Vis
29	1 59	2 14	12:02	16:09	03:49	5d 26%
30	2 28	2 43	12:03	16:50	04:30	6d 35%
31	2 57	3 11	12:03	17:31	05:10	7d 44%

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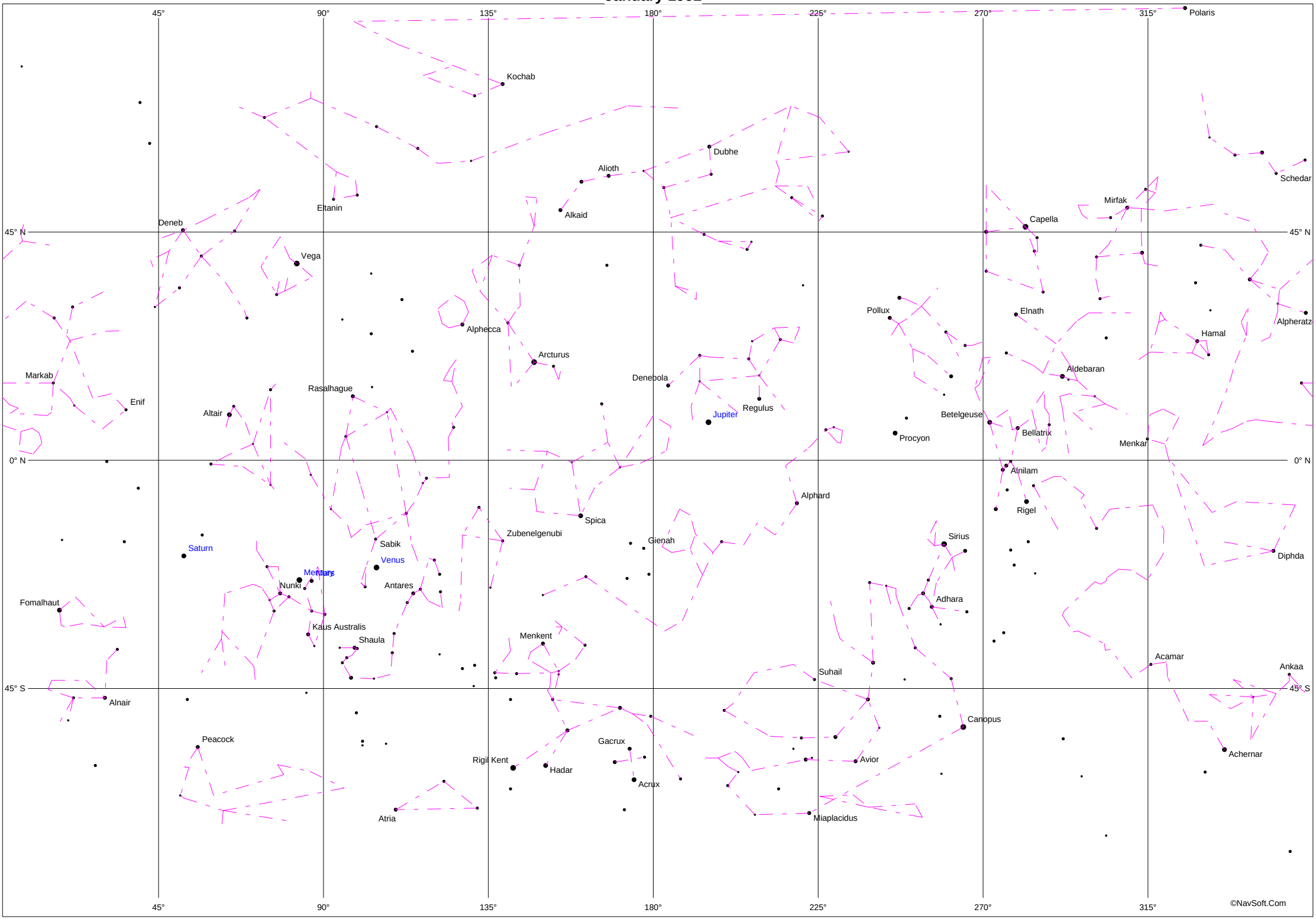
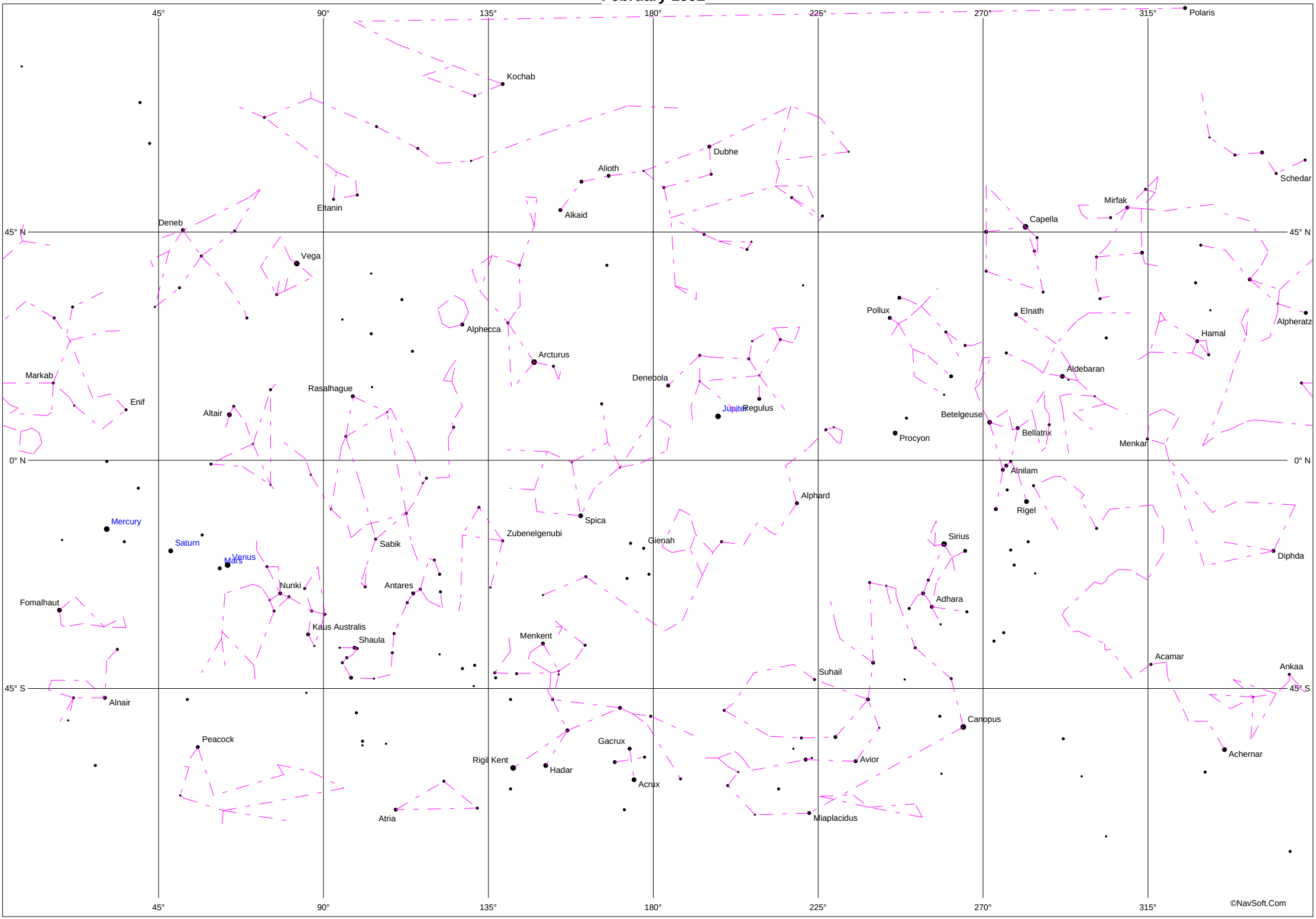
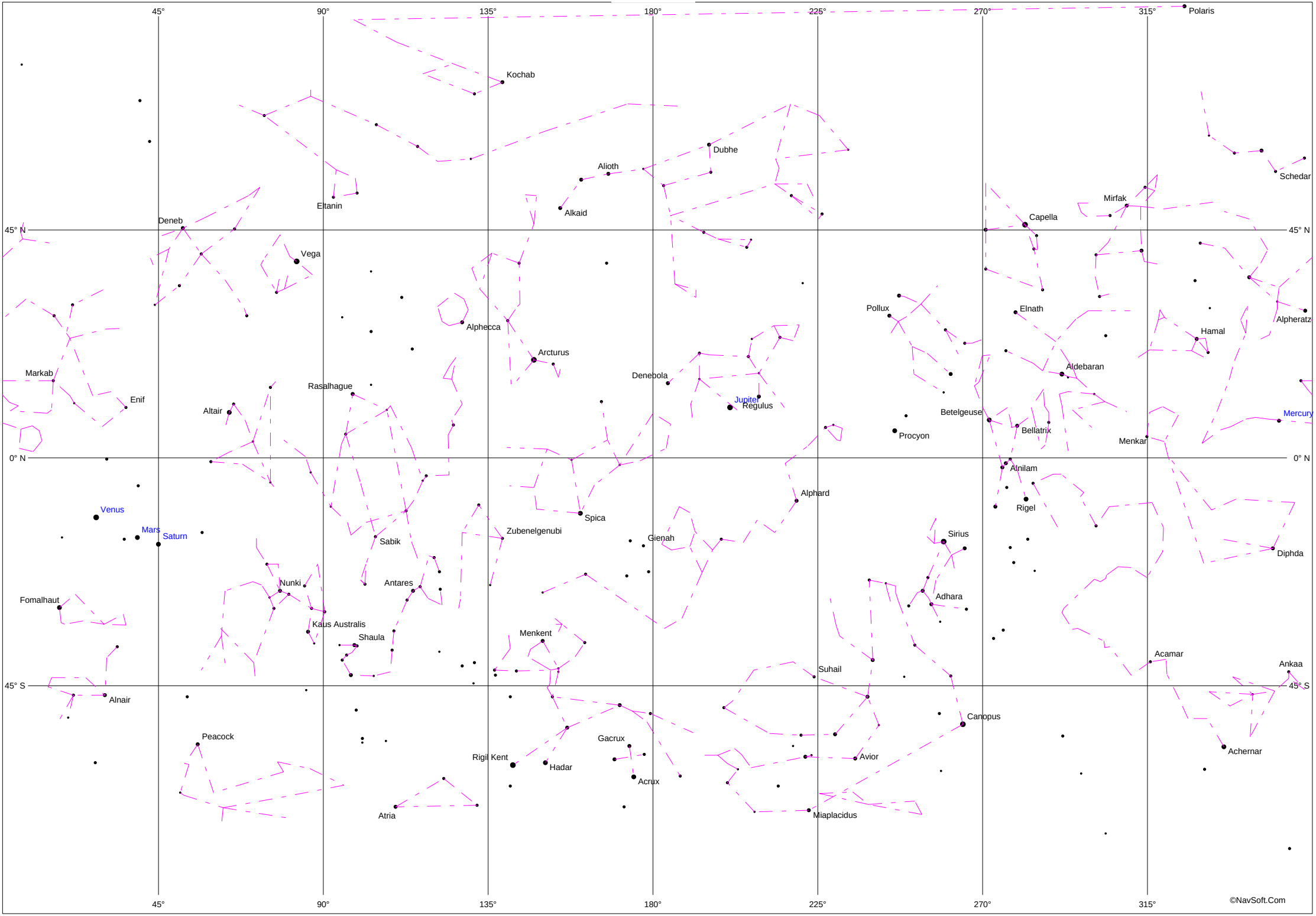
January 1992



February 1992



March 1992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Betelgeuse
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Miaplacidus
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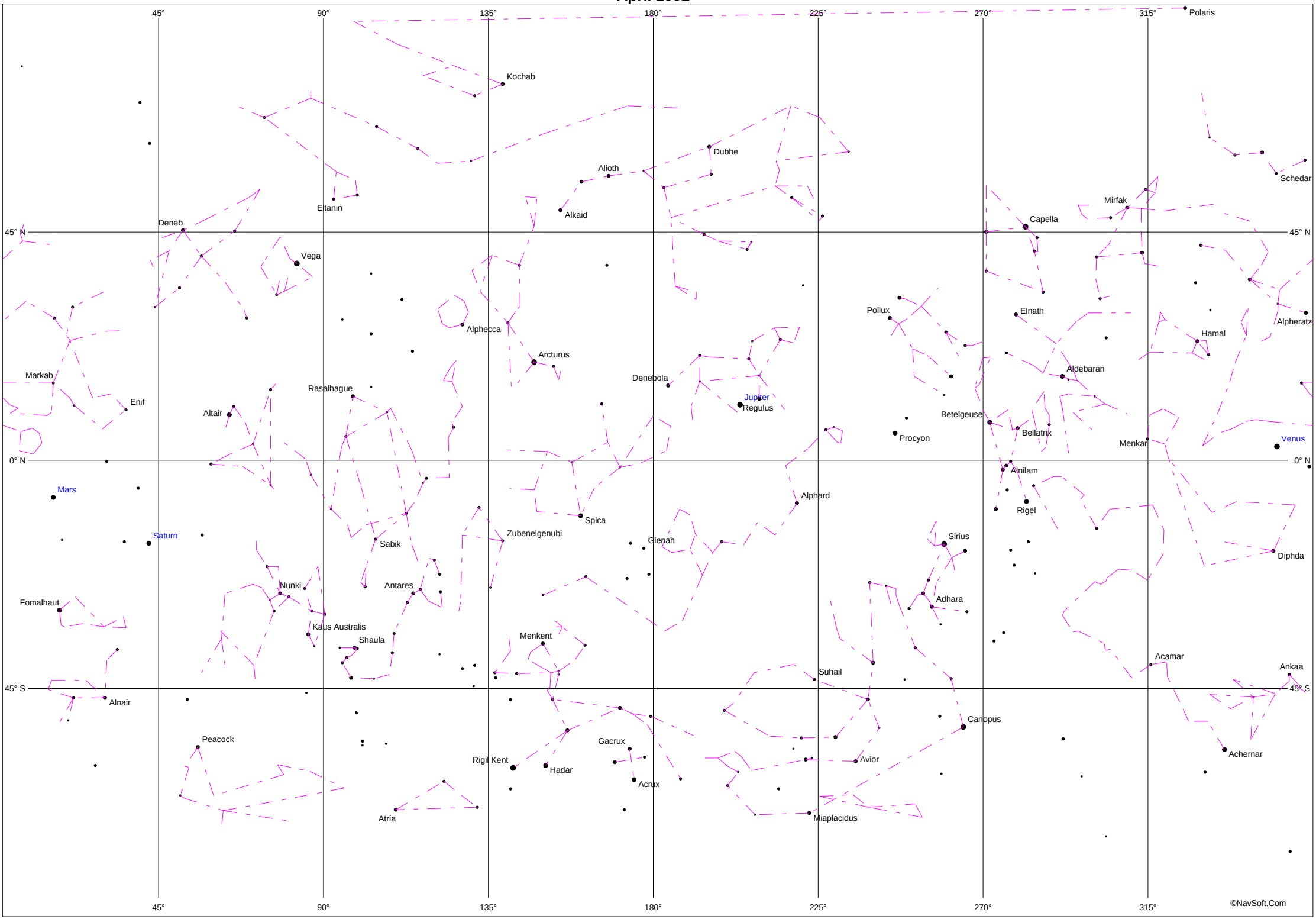
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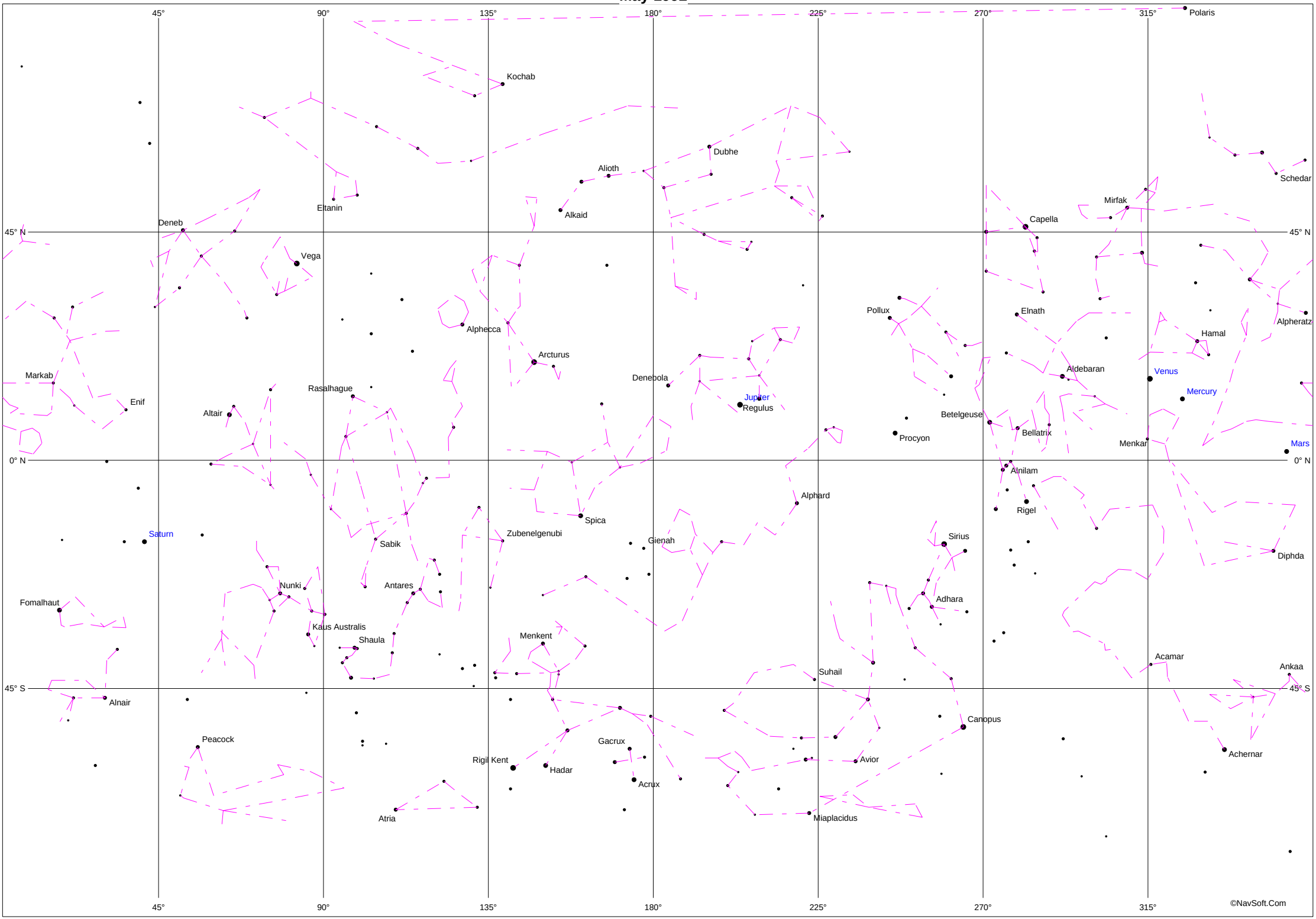
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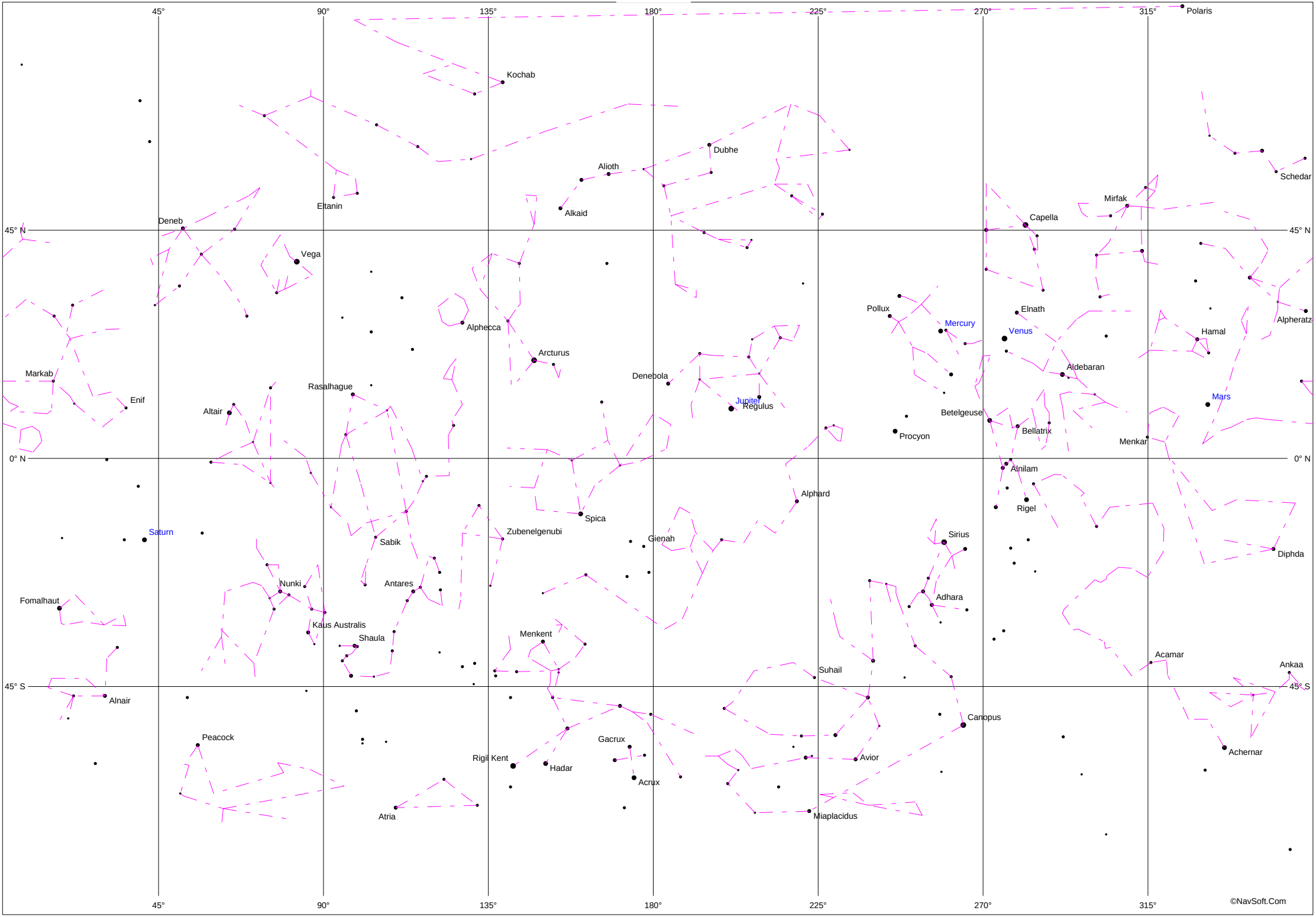
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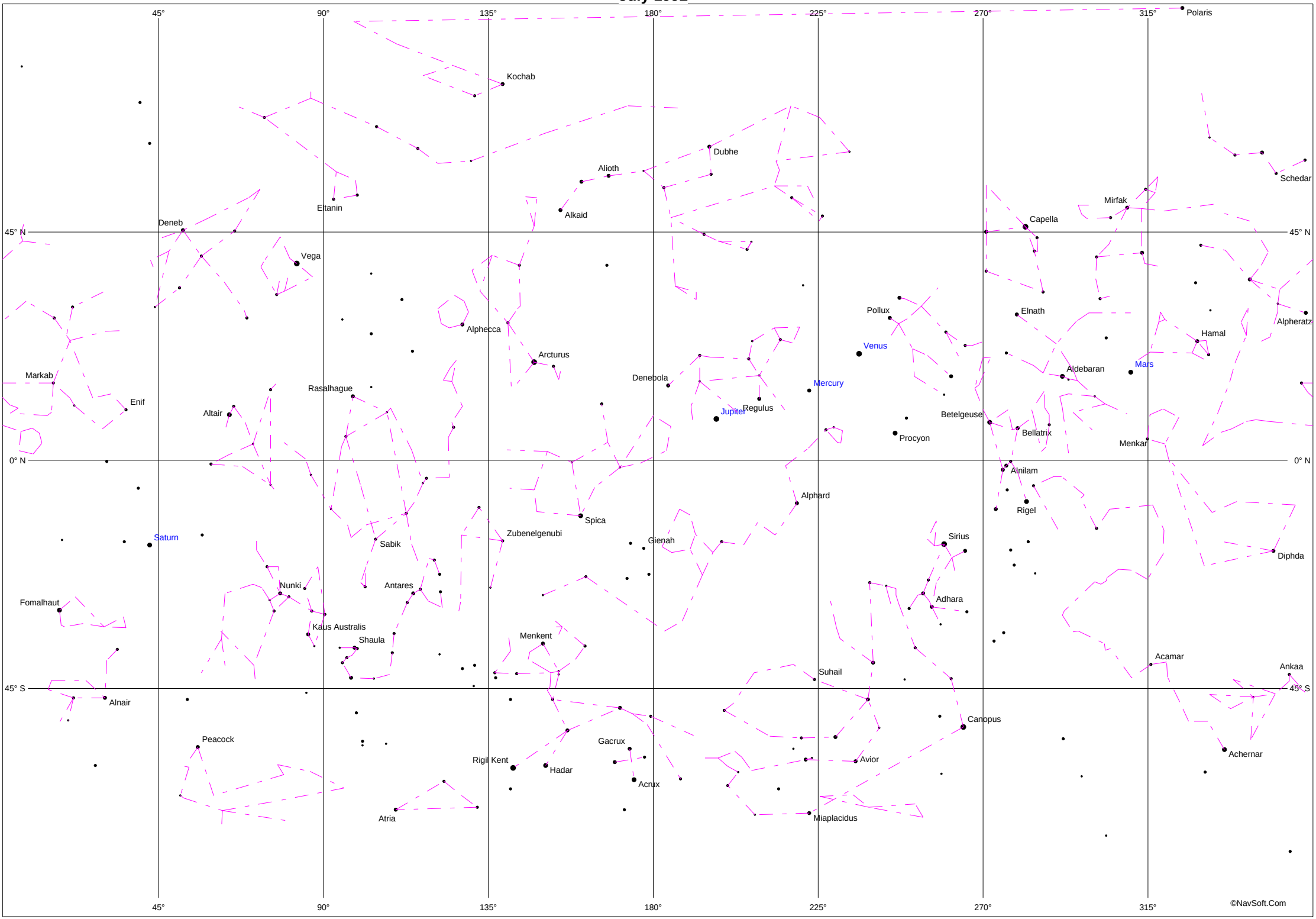
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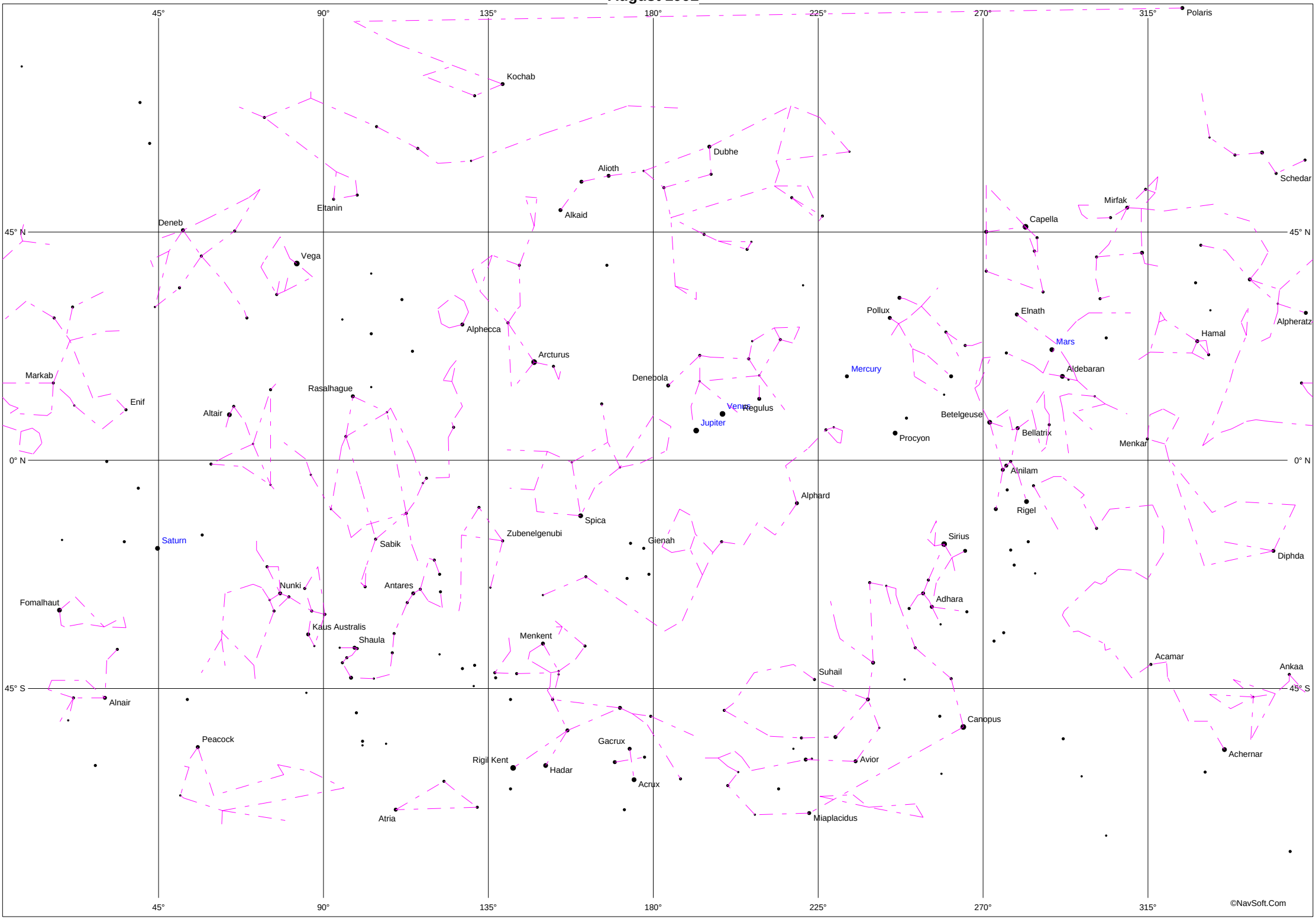
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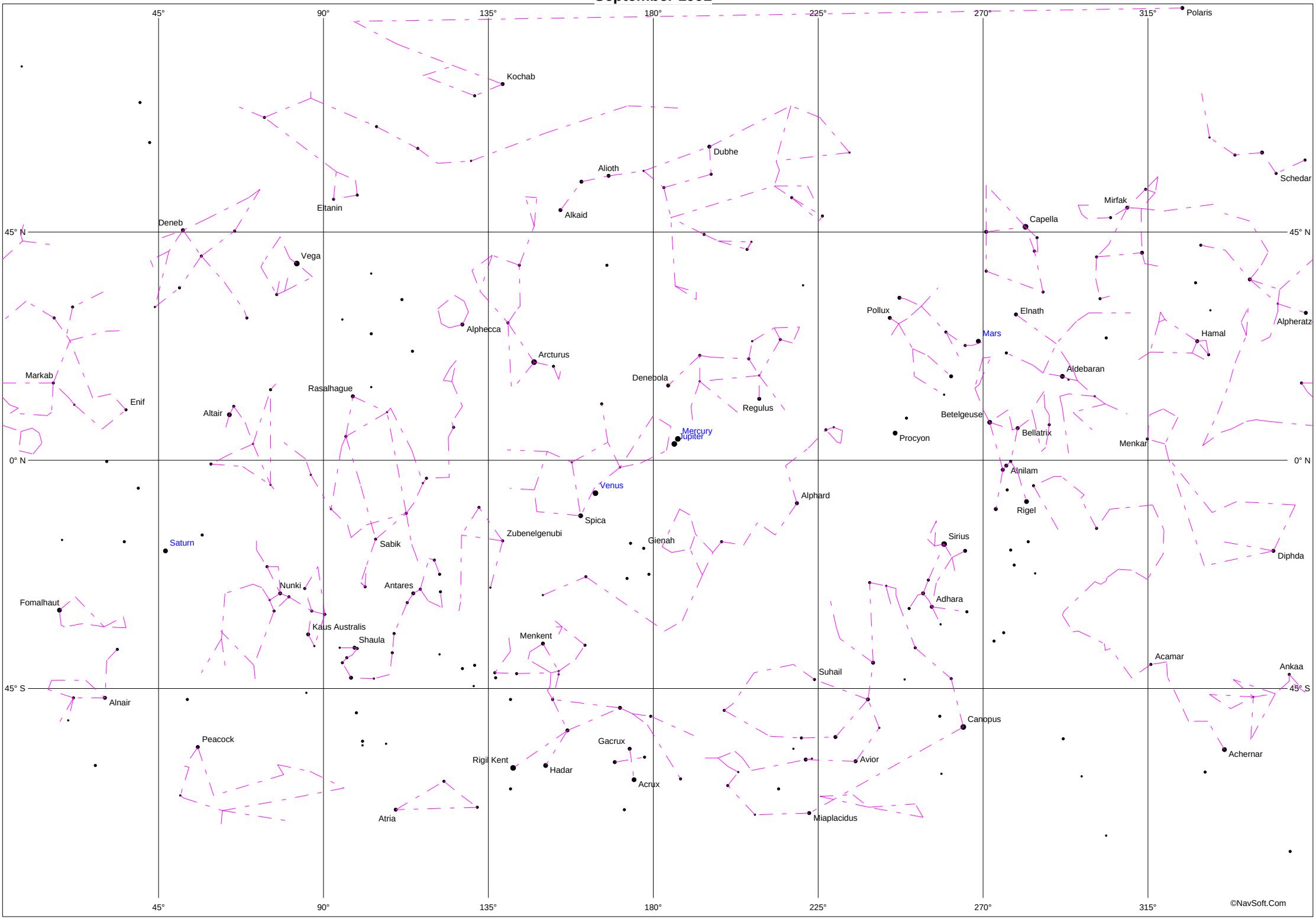

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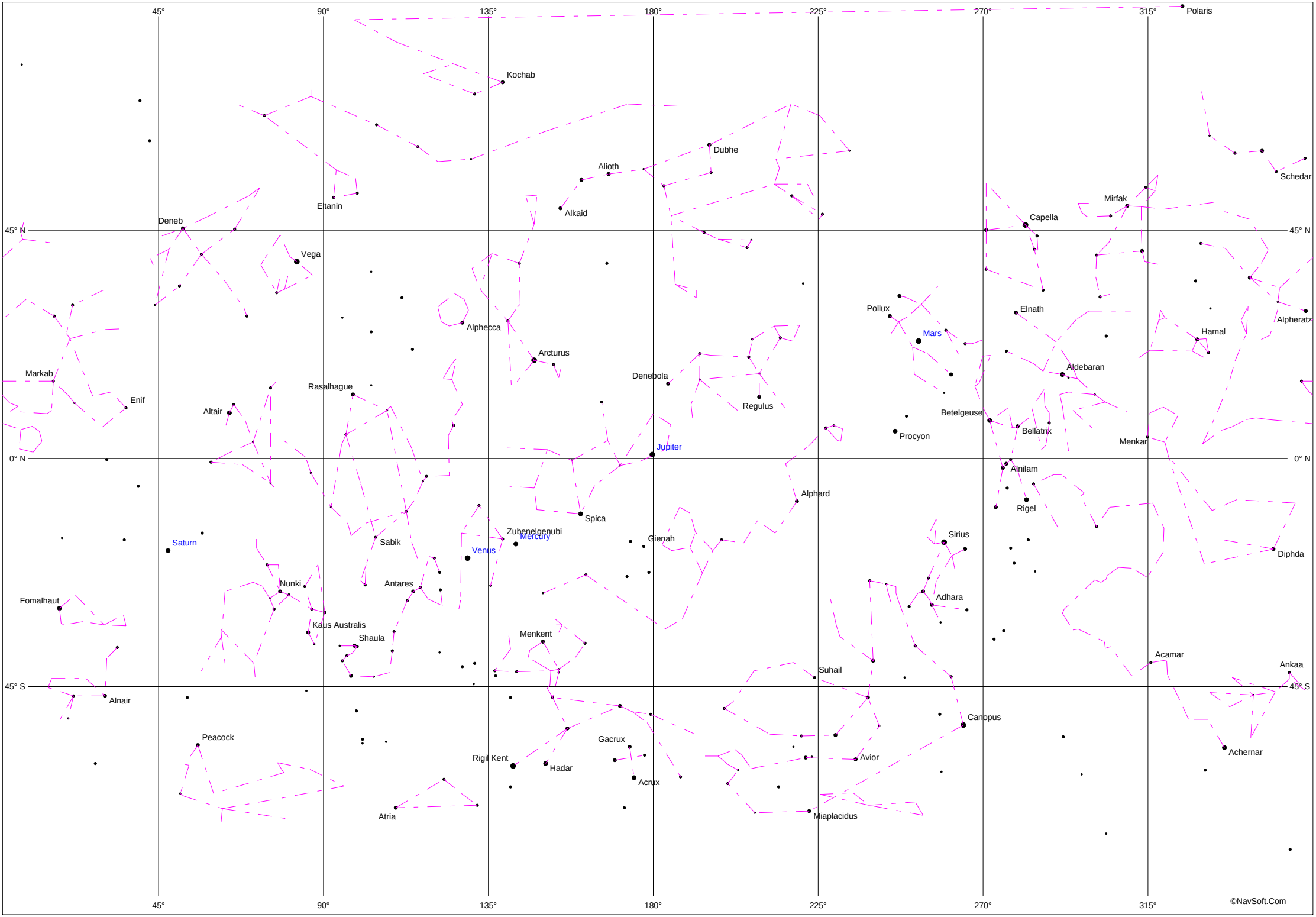

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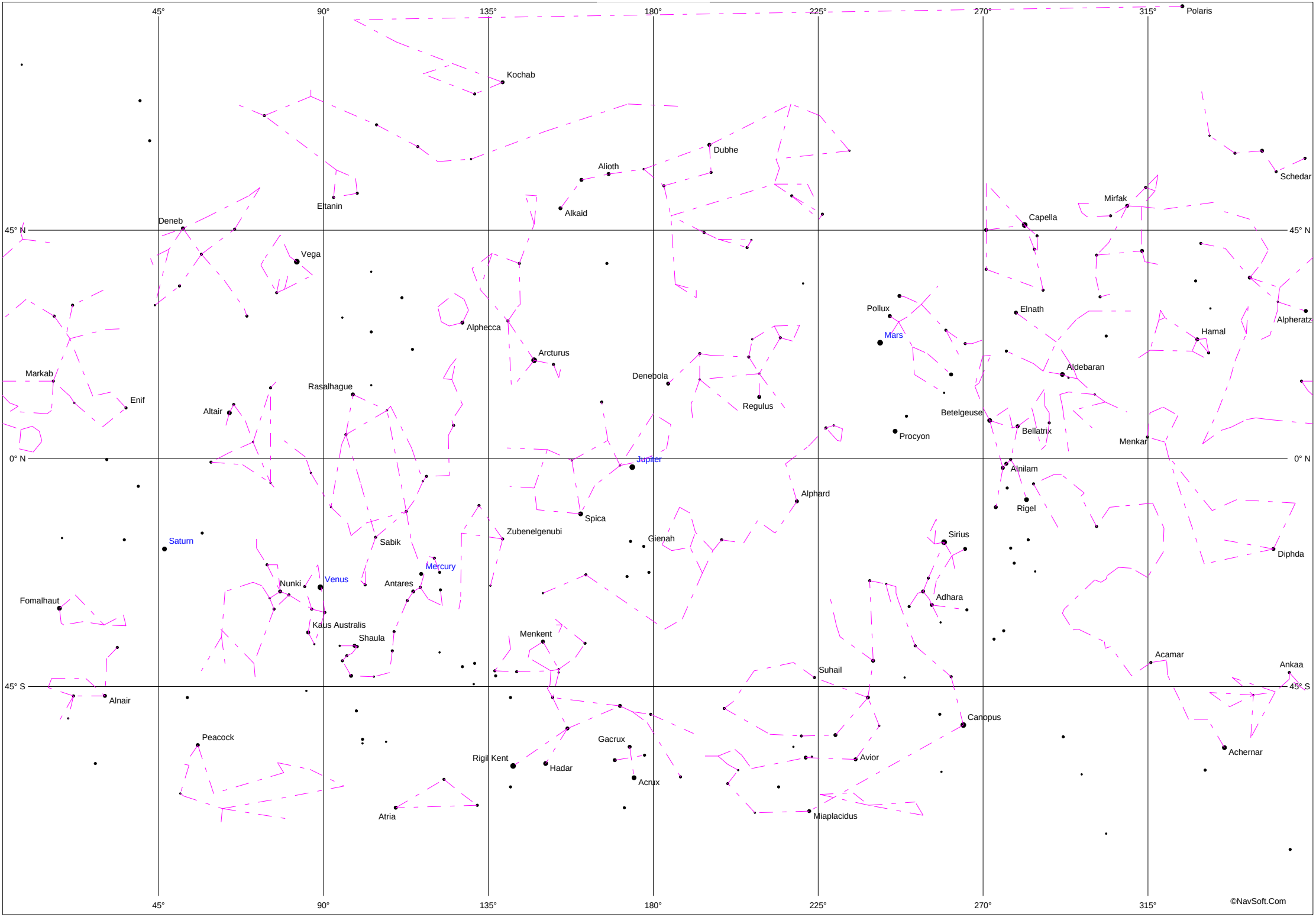
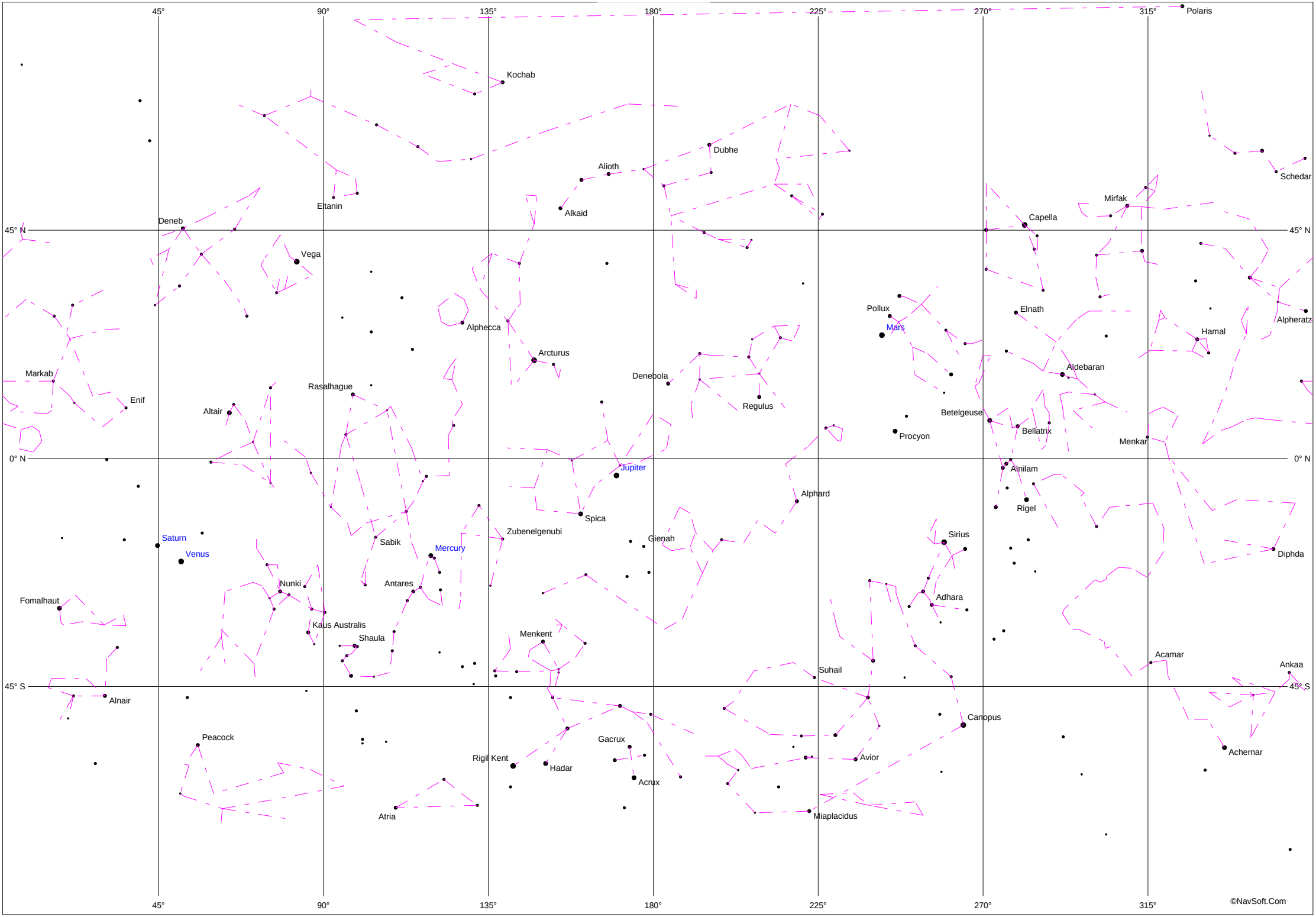
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