
The Nautical Almanac 2024



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The Nautical Almanac

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fair winds, clear skies & following seas

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Acknowledgment and Credits

Dr. Enno Rodegerdts

The Nautical Almanac *Daily Pages* and Sun Almanacs found on our site were originally created from PyAlmanac written by the great Norwegian sailor Enno Rodegerdts. PyAlmanac used PyEphem to generate the almanacs and LaTeX provided the final formatting. Visit Dr. Rodegerdts site and learn of his voyages at <https://sv-inua.net/>

Without his work TheNauticalAlmanac.com wouldn't exist.

Andrew Bauer

Mr. Bauer has taken the initial work of Dr. Rodegerdts and improved it to the excellence found in the following Daily Pages. Attending foremost to the accuracy of data and then formatting Mr. Bauer created SkyAlmanac which draws from Brandon Rhodes work *Ephem* and *Skyfield* and provides a clear arrangement of figures required for celestial navigation. To that end his work was determined, tireless and efficient. In our mutual writing across many lines of longitude he has always been pleasant, friendly and most affable.

As he has said, *"The art of celestial navigation should be promoted, not discouraged, even in the modern day"*.

To both of these men we all owe a large debt of gratitude and thanks

Disclaimer and Warning

Prior to use verify the accuracy of The Nautical Almanac or data you download from our site. They SHOULD NOT and MUST NOT be relied upon for celestial navigation work of any sorts or any purpose whatsoever. You use them at your own risk or peril.

Errors & Corrections

Contact us if you find any significant errors and describe the correction that should be made.



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2024

January

wk	Su	M	Tu	W	Th	F	Sa
1		1	2	3	4	5	6
2	7	8	9	10	11	12	13
3	14	15	16	17	18	19	20
4	21	22	23	24	25	26	27
5	28	29	30	31			

February

wk	Su	M	Tu	W	Th	F	Sa
5					1	2	3
6	4	5	6	7	8	9	10
7	11	12	13	14	15	16	17
8	18	19	20	21	22	23	24
9	25	26	27	28	29		

March

wk	Su	M	Tu	W	Th	F	Sa
9						1	2
10	3	4	5	6	7	8	9
11	10	11	12	13	14	15	16
12	17	18	19	20	21	22	23
13	24	25	26	27	28	29	30
14	31						

April

wk	Su	M	Tu	W	Th	F	Sa
14		1	2	3	4	5	6
15	7	8	9	10	11	12	13
16	14	15	16	17	18	19	20
17	21	22	23	24	25	26	27
18	28	29	30				

May

wk	Su	M	Tu	W	Th	F	Sa
18				1	2	3	4
19	5	6	7	8	9	10	11
20	12	13	14	15	16	17	18
21	19	20	21	22	23	24	25
22	26	27	28	29	30	31	

June

wk	Su	M	Tu	W	Th	F	Sa
22							1
23	2	3	4	5	6	7	8
24	9	10	11	12	13	14	15
25	16	17	18	19	20	21	22
26	23	24	25	26	27	28	29
27	30						

July

wk	Su	M	Tu	W	Th	F	Sa
27		1	2	3	4	5	6
28	7	8	9	10	11	12	13
29	14	15	16	17	18	19	20
30	21	22	23	24	25	26	27
31	28	29	30	31			

August

wk	Su	M	Tu	W	Th	F	Sa
31					1	2	3
32	4	5	6	7	8	9	10
33	11	12	13	14	15	16	17
34	18	19	20	21	22	23	24
35	25	26	27	28	29	30	31

September

wk	Su	M	Tu	W	Th	F	Sa
36	1	2	3	4	5	6	7
37	8	9	10	11	12	13	14
38	15	16	17	18	19	20	21
39	22	23	24	25	26	27	28
40	29	30					

October

wk	Su	M	Tu	W	Th	F	Sa
40			1	2	3	4	5
41	6	7	8	9	10	11	12
42	13	14	15	16	17	18	19
43	20	21	22	23	24	25	26
44	27	28	29	30	31		

November

wk	Su	M	Tu	W	Th	F	Sa
44						1	2
45	3	4	5	6	7	8	9
46	10	11	12	13	14	15	16
47	17	18	19	20	21	22	23
48	24	25	26	27	28	29	30

December

wk	Su	M	Tu	W	Th	F	Sa
49	1	2	3	4	5	6	7
50	8	9	10	11	12	13	14
51	15	16	17	18	19	20	21
52	22	23	24	25	26	27	28
1	29	30	31				

2024

Day of Week, Week Number, Day of Year, Remaining Days of Year

Day of Month	1		Days remaining	Week number
	January			
	Day of Week	Day of Year		
1	Mon	1	365	1
2	Tue	2	364	
3	Wed	3	363	
4	Thu	4	362	
5	Fri	5	361	
6	Sat	6	360	
7	Sun	7	359	2
8	Mon	8	358	
9	Tue	9	357	
10	Wed	10	356	
11	Thu	11	355	
12	Fri	12	354	
13	Sat	13	353	
14	Sun	14	352	3
15	Mon	15	351	
16	Tue	16	350	
17	Wed	17	349	
18	Thu	18	348	
19	Fri	19	347	
20	Sat	20	346	
21	Sun	21	345	4
22	Mon	22	344	
23	Tue	23	343	
24	Wed	24	342	
25	Thu	25	341	
26	Fri	26	340	
27	Sat	27	339	
28	Sun	28	338	5
29	Mon	29	337	
30	Tue	30	336	
31	Wed	31	335	

Day of Month	2		Days remaining	Week number
	February			
	Day of Week	Day of Year		
1	Thu	32	334	5
2	Fri	33	333	
3	Sat	34	332	
4	Sun	35	331	6
5	Mon	36	330	
6	Tue	37	329	
7	Wed	38	328	
8	Thu	39	327	
9	Fri	40	326	
10	Sat	41	325	
11	Sun	42	324	7
12	Mon	43	323	
13	Tue	44	322	
14	Wed	45	321	
15	Thu	46	320	
16	Fri	47	319	
17	Sat	48	318	
18	Sun	49	317	8
19	Mon	50	316	
20	Tue	51	315	
21	Wed	52	314	
22	Thu	53	313	
23	Fri	54	312	
24	Sat	55	311	
25	Sun	56	310	9
26	Mon	57	309	
27	Tue	58	308	
28	Wed	59	307	
29	Thu	60	306	

Day of Month	3		Days remaining	Week number
	March			
	Day of Week	Day of Year		
1	Fri	61	305	9
2	Sat	62	304	
3	Sun	63	303	10
4	Mon	64	302	
5	Tue	65	301	
6	Wed	66	300	
7	Thu	67	299	
8	Fri	68	298	
9	Sat	69	297	
10	Sun	70	296	11
11	Mon	71	295	
12	Tue	72	294	
13	Wed	73	293	
14	Thu	74	292	
15	Fri	75	291	
16	Sat	76	290	
17	Sun	77	289	12
18	Mon	78	288	
19	Tue	79	287	
20	Wed	80	286	
21	Thu	81	285	
22	Fri	82	284	
23	Sat	83	283	
24	Sun	84	282	13
25	Mon	85	281	
26	Tue	86	280	
27	Wed	87	279	
28	Thu	88	278	
29	Fri	89	277	
30	Sat	90	276	
31	Sun	91	275	14

Day of Month	4		Days remaining	Week number
	April			
	Day of Week	Day of Year		
1	Mon	92	274	14
2	Tue	93	273	
3	Wed	94	272	
4	Thu	95	271	
5	Fri	96	270	
6	Sat	97	269	
7	Sun	98	268	15
8	Mon	99	267	
9	Tue	100	266	
10	Wed	101	265	
11	Thu	102	264	
12	Fri	103	263	
13	Sat	104	262	
14	Sun	105	261	16
15	Mon	106	260	
16	Tue	107	259	
17	Wed	108	258	
18	Thu	109	257	
19	Fri	110	256	
20	Sat	111	255	
21	Sun	112	254	17
22	Mon	113	253	
23	Tue	114	252	
24	Wed	115	251	
25	Thu	116	250	
26	Fri	117	249	
27	Sat	118	248	
28	Sun	119	247	18
29	Mon	120	246	
30	Tue	121	245	

Day of Month	5		Days remaining	Week number
	May			
	Day of Week	Day of Year		
1	Wed	122	244	18
2	Thu	123	243	
3	Fri	124	242	
4	Sat	125	241	
5	Sun	126	240	19
6	Mon	127	239	
7	Tue	128	238	
8	Wed	129	237	
9	Thu	130	236	
10	Fri	131	235	
11	Sat	132	234	
12	Sun	133	233	20
13	Mon	134	232	
14	Tue	135	231	
15	Wed	136	230	
16	Thu	137	229	
17	Fri	138	228	
18	Sat	139	227	
19	Sun	140	226	21
20	Mon	141	225	
21	Tue	142	224	
22	Wed	143	223	
23	Thu	144	222	
24	Fri	145	221	
25	Sat	146	220	
26	Sun	147	219	22
27	Mon	148	218	
28	Tue	149	217	
29	Wed	150	216	
30	Thu	151	215	
31	Fri	152	214	

Day of Month	6		Days remaining	Week number
	June			
	Day of Week	Day of Year		
1	Sat	153	213	23
2	Sun	154	212	
3	Mon	155	211	
4	Tue	156	210	
5	Wed	157	209	
6	Thu	158	208	
7	Fri	159	207	
8	Sat	160	206	
9	Sun	161	205	24
10	Mon	162	204	
11	Tue	163	203	
12	Wed	164	202	
13	Thu	165	201	
14	Fri	166	200	
15	Sat	167	199	
16	Sun	168	198	25
17	Mon	169	197	
18	Tue	170	196	
19	Wed	171	195	
20	Thu	172	194	
21	Fri	173	193	
22	Sat	174	192	
23	Sun	175	191	26
24	Mon	176	190	
25	Tue	177	189	
26	Wed	178	188	
27	Thu	179	187	
28	Fri	180	186	
29	Sat	181	185	
30	Sun	182	184	27

Day of Week, Week Number, Day of Year, Remaining Days of Year

Day of Month	7		Days remaining	Week number
	July			
	Day of Week	Day of Year		
1	Mon	183	183	27
2	Tue	184	182	
3	Wed	185	181	
4	Thu	186	180	
5	Fri	187	179	
6	Sat	188	178	
7	Sun	189	177	28
8	Mon	190	176	
9	Tue	191	175	
10	Wed	192	174	
11	Thu	193	173	
12	Fri	194	172	
13	Sat	195	171	
14	Sun	196	170	29
15	Mon	197	169	
16	Tue	198	168	
17	Wed	199	167	
18	Thu	200	166	
19	Fri	201	165	
20	Sat	202	164	
21	Sun	203	163	30
22	Mon	204	162	
23	Tue	205	161	
24	Wed	206	160	
25	Thu	207	159	
26	Fri	208	158	
27	Sat	209	157	
28	Sun	210	156	31
29	Mon	211	155	
30	Tue	212	154	
31	Wed	213	153	

Day of Month	8		Days remaining	Week number
	August			
	Day of Week	Day of Year		
1	Thu	214	152	31
2	Fri	215	151	
3	Sat	216	150	
4	Sun	217	149	32
5	Mon	218	148	
6	Tue	219	147	
7	Wed	220	146	
8	Thu	221	145	
9	Fri	222	144	
10	Sat	223	143	
11	Sun	224	142	33
12	Mon	225	141	
13	Tue	226	140	
14	Wed	227	139	
15	Thu	228	138	
16	Fri	229	137	
17	Sat	230	136	
18	Sun	231	135	34
19	Mon	232	134	
20	Tue	233	133	
21	Wed	234	132	
22	Thu	235	131	
23	Fri	236	130	
24	Sat	237	129	
25	Sun	238	128	35
26	Mon	239	127	
27	Tue	240	126	
28	Wed	241	125	
29	Thu	242	124	
30	Fri	243	123	
31	Sat	244	122	

Day of Month	9		Days remaining	Week number
	September			
	Day of Week	Day of Year		
1	Sun	245	121	36
2	Mon	246	120	
3	Tue	247	119	
4	Wed	248	118	
5	Thu	249	117	
6	Fri	250	116	
7	Sat	251	115	
8	Sun	252	114	37
9	Mon	253	113	
10	Tue	254	112	
11	Wed	255	111	
12	Thu	256	110	
13	Fri	257	109	
14	Sat	258	108	
15	Sun	259	107	38
16	Mon	260	106	
17	Tue	261	105	
18	Wed	262	104	
19	Thu	263	103	
20	Fri	264	102	
21	Sat	265	101	
22	Sun	266	100	39
23	Mon	267	99	
24	Tue	268	98	
25	Wed	269	97	
26	Thu	270	96	
27	Fri	271	95	
28	Sat	272	94	
29	Sun	273	93	40
30	Mon	274	92	

Day of Month	10		Days remaining	Week number
	October			
	Day of Week	Day of Year		
1	Tue	275	91	40
2	Wed	276	90	
3	Thu	277	89	
4	Fri	278	88	
5	Sat	279	87	
6	Sun	280	86	41
7	Mon	281	85	
8	Tue	282	84	
9	Wed	283	83	
10	Thu	284	82	
11	Fri	285	81	
12	Sat	286	8	

Useful Information

Time Signals- by telephone

WWV 303-499-7111 **WWVH** 808-335-4363

CHU English: 613-745-1576 (CHU provides only Eastern time announcements)

French: 613-745-9426

Time signals- by Radio

WWV (Fort Collins, Colorado) 2.5, 5, 10, 15, 20 MHz (male voice)

WWVH (Kauai, Hawaii) 2.5, 5, 10, 15 MHz (female voice)

CHU (Ottawa, Canada) 3330, 7850, and 14,670 kHz (USB)

Bowditch 2019- *The American Practical Navigator*

https://TheNauticalAlmanac.com/2019_Bowditch-American_Practical_Navigator.html

Organized in a convenient and useful manner. Download the Chapters, Parts or Tables you want or the entire work.

The Terrestrial Almanac Annual calendar and day planner for the entire year.

<https://TheNauticalAlmanac.com/TerrestrialAlmanac.html>

Pub. No. 249 Download individual Latitudes or Volumes

Epoch 2020 https://www.thenauticalalmanac.com/Pub_No_249_Epoch_2020.html

Epoch 2025 https://www.thenauticalalmanac.com/Pub_No_249_Epoch_2025.html

Pub. No. 229 Download individual Volumes covering a range of Latitudes

<https://TheNauticalAlmanac.com/Pub.No.229.html>

Sight Reduction Forms & Methods

<https://www.TheNauticalAlmanac.com/Methods.html>

Celestial Navigation

useful Formulas

About Calculators

The Casio *fx-300ES Plus* is an inexpensive calculator at about 11 USD. It features *natural input* so you enter a formula just as it would be written on paper. Entering degrees, minutes and seconds is very simple. The Casio *fx-300ES Plus* has 9 memory locations and you can review many of the previous entries you make using a special key on the calculator.

Determine Hc using a calculator

The formula

$$Hc = \text{asin}[\sin(\text{Declination}) * \sin(\text{Latitude}) + \cos(\text{Latitude}) * \cos(\text{Declination}) * \cos(\text{LHA})]$$

As it would be entered into the Casio calculator Note- Sin^{-1} is the arc-sin key

$$\text{Sin}^{-1}(\text{Sin}(\text{Ap Latitude}) \times \text{Sin}(\text{Declination}) + \text{Cos}(\text{Ap Latitude}) \times \text{Cos}(\text{Declination}) \times \text{Cos}(\text{LHA}))$$

Declination is the declination of the Celestial body you're observing. When the heavenly body's declination is *Contrary name* to your Ap Latitude enter a negative sign before it.

Latitude "The AP latitude is chosen to be the nearest whole degree in latitude to the DR latitude." *from Bowditch 2019 Vol. 1 Chapter 19 section 1902 p. 310* Consider this to be where you are, think you are or where you would like to determine Hc for. Typically, you'll be using an *Assumed position Latitude* or *Ap Latitude* as it's called. *See Bowditch 2019 Vol. 1 Chapter 19 section 1902 p. 310*

About LHA determination

Assumed Position longitude ($\alpha \lambda$) "The AP longitude is that nearest the DR longitude resulting in a whole degree of LHA for the observed body." *From Bowditch 2019 Vol. 1 Chapter 19 section 1902 p. 310*

In Western Longitudes *see Bowditch 2019 Vol. 1 Chapter 19 section 1905 p. 313*

LHA is the Local Hour Angle derived by subtracting your Assumed Longitude ($\alpha \lambda$) whole degree value from the whole degree **GHA** (Greenwich Hour Angle) value. If GHA is less than the $\alpha \lambda$ then the add 360° to it then subtract the $\alpha \lambda$. *Ignore the arc minutes of GHA and $\alpha \lambda$.*

Example when GHA is less than $\alpha \lambda$ **GHA** = $43^\circ 25.2'$ $\alpha \lambda$ = W $55^\circ 15.1'$

$$360^\circ + 43^\circ = 403^\circ \quad \text{Then....} 403^\circ - 55^\circ = 348^\circ \text{ (LHA)}$$

In Eastern Longitudes *see Bowditch 2019 Vol. 1 Chapter 19 section 1905 p. 313*

LHA, in Eastern Longitudes, is determined by adding the entire GHA figure (degrees and minutes) to the whole degree figure of the Assumed longitude ($\alpha \lambda$) *plus* the amount of arc minutes required to get to the next degree of the GHA. If the resulting LHA figure is greater than 360° then subtract 360° from the figure to obtain the LHA.

Example- **GHA** = $58^\circ 01.2'$ $\alpha \lambda$ = E $9^\circ 10.1'$ (ignore the 10.1')

Step 1- *get GHA degree difference;* $59^\circ - 58^\circ 01.2' = 0^\circ 58.8'$

Step 2- *add $\alpha \lambda$ degrees to difference found in step 1;* $9^\circ + 0^\circ 58.8' = 9^\circ 58.8'$ $\alpha \lambda$

Step 3- *get LHA;* $58^\circ 01.2' + 9^\circ 58.8' = 68^\circ$ (LHA)

Why would you want to determine Hc using a calculator?

It's faster than looking up in Pub. No. 249 and Pub. No. 229, highly accurate and you don't need a lot of printed out pages of Latitudes from Pub. No. 249 and Pub. No. 229. Pub. No. 249 Vol. 2 & 3 don't cover any declination greater than 29 degrees so you'd have to use Pub. No. 229 which is extremely large.

Celestial Navigation

Determine Z

$$Z = \text{acos}[(\sin(\text{Declination}) - \sin(\text{Ap Latitude}) \times \sin(\text{Hc})) \div (\cos(\text{Ap Latitude}) \times \cos(\text{Hc}))]$$

As it would be entered into the Casio calculator... Note- Cos^{-1} is the arc-cosine key

$$\text{Cos}^{-1}((\sin(\text{Declination}) - \sin(\text{AP Latitude}) \times \sin(\text{Hc})) \div (\cos(\text{AP Latitude}) \times \cos(\text{Hc}))$$

If the heavenly body's declination is *Contrary name* to the Ap Latitude enter a negative sign before it.

To obtain Zn see the rules below for Northern and Southern latitudes.

Determine Z independent of Hc

$$Z = \tan^{-1}\left(\frac{\sin \text{LHA}}{(\cos L \tan d) - (\sin L \cos \text{LHA})}\right)$$

"L" is latitude and "d" is declination. When the heavenly body's declination is *Contrary name* to your Ap Latitude enter a negative sign before it.

As it would be entered into the Casio calculator... Note- \tan^{-1} is the arc-tangent key

$$Z = \tan^{-1} ((\sin (\text{LHA}) \div (\cos(\text{AP latitude}) \times \tan(\text{declination}) - (\sin(\text{AP latitude}) \times \cos(\text{LHA})))$$

The sign convention used in the calculation of this azimuth formula is as follows:

from Bowditch Chapter 22 CALCULATIONS AND CONVERSIONS, page 331

- 1) If latitude and declination are of contrary name, declination is treated as a negative quantity;
- 2) If the local hour angle is greater than 180° , it is treated as a negative quantity. If the azimuth angle as calculated is negative, add 180° to obtain the desired value.

To obtain Zn apply the following rules

<u>In Northern Latitudes</u>	<u>In Southern Latitudes</u>
LHA greater than 180°Zn=Z	LHA greater than 180°Zn= $180^\circ - Z$
LHA less than 180°Zn= $360^\circ - Z$	LHA less than 180°Zn= $180^\circ + Z$

Determine Refraction $0.96 \div \tan$ of (Ha)

Gives good results down to about 8° from the horizon but not less.

Refraction (good overall formula from 90° to below 8° from the horizon)

$$R_0 = \cot \left(H_a + \frac{7.31}{H_a + 4.4} \right)$$

As it would be entered into the Casio calculator...

$$1 \div \tan((H_a + (7.31 \div (H_a + 4.4)))$$

Both refraction formulas use the standard pressure and temperature of;

1010 mb 10° C
29.83 in 53° F

Determine Dip using feet

0.97 x (Square Root of H_e (Height of Eye) in feet)

Determine Dip using meters

1.76 x (Square Root of H_e (Height of eye) in meters)

Rules to Calculate Latitude using the Sun- Noon-Sight

1- Latitude and declination *Same name* but latitude is greater than declination:

$$\text{Latitude} = (90^\circ - H_o) + \text{declination}$$

2- Latitude and declination *Same name* but declination greater than latitude:

$$\text{Latitude} = \text{Declination} - (90^\circ - H_o)$$

3- Latitude and declination *Contrary name*:

$$\text{Latitude} = (90^\circ - H_o) - \text{Declination}$$

To get AP longitude (needed for plotting the LOP)

In Western longitudes

Combine the DR Longitude figure with only the minutes (of arc) of the total GHA figure. The $A_p \lambda$ figure will be used when plotting the LOP on the UPS.

In Eastern longitudes

In Eastern longitudes the $A_p \lambda$ is determined as follows;

DR longitude + (0°60' *minus* GHA minutes of arc)

Example- E 075° + (0°60' - 0° 02') = 75° 58' A_p longitude



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Explanation of The Nautical Almanac Daily Pages

1	Date and Time based on GMT/UT								
2	Mer. pass- meridian passage of Aries at the Prime Meridian- Greenwich- 0°. Time figure is GMT/UT.								
3	<p>Planet or Moon GHA v value and planet or Moon declination d value.</p> <p>v- "The change in hour angle arising from v of the body at the time of the sight observation is accounted for with the <i>v correction</i>." <i>Source- Bowditch 2017, Chapter 19- Sight Reduction p. 313.</i> The planet's v is positive unless preceded by a minus sign which is sometimes the case with Venus. The sign of the Moon's v is positive.</p> <p>d- "The change in declination of the body at the time of the sight observation is accounted for with the <i>d correction</i>." <i>Source- Bowditch 2017, Chapter 19- Sight Reduction p. 313.</i> The sign of the Moon or planet's d correction is determined by the declination trend- positive if successive declination values increase and negative if they decrease.</p> <p>Corrections for both v and d are found in the Increments and Corrections pages of The Nautical Almanac.</p> <p>To find the correction for either v or d enter the Increments and Corrections pages for the minutes in time of the observation and find the value in the v and d corr. columns Find the v, or d, value in the left side of one of the three columns. To the right of that value is the v, or d, correction. Be sure to add or subtract the values depending upon the <i>sign</i> of the value as mentioned above.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 35%;">Example for v & d correction-</td> <td style="width: 20%;">June 10, 2020</td> <td style="width: 20%;">GMT- 21:19:10</td> <td style="width: 25%;">Body- Moon</td> </tr> <tr> <td style="padding: 5px;"> GHA= 247° 20.6' v = 12.1' GHA increment 4° 34.4' v- correction for 12.1' + 0° 03.9' GHA= 251° 58.9' </td> <td style="padding: 5px;"> Dec= S 17° 43.8' d= 8.9' d- correction for 8.9' - 0° 02.9' dec= S 17° 40.9' </td> <td colspan="2" style="padding: 5px; text-align: center;"><i>declination trend is decreasing so the sign of d correction is negative</i></td> </tr> </table>	Example for v & d correction-	June 10, 2020	GMT- 21:19:10	Body- Moon	GHA= 247° 20.6' v = 12.1' GHA increment 4° 34.4' v- correction for 12.1' + 0° 03.9' GHA= 251° 58.9'	Dec= S 17° 43.8' d = 8.9' d- correction for 8.9' - 0° 02.9' dec= S 17° 40.9'	<i>declination trend is decreasing so the sign of d correction is negative</i>	
Example for v & d correction-	June 10, 2020	GMT- 21:19:10	Body- Moon						
GHA= 247° 20.6' v = 12.1' GHA increment 4° 34.4' v- correction for 12.1' + 0° 03.9' GHA= 251° 58.9'	Dec= S 17° 43.8' d = 8.9' d- correction for 8.9' - 0° 02.9' dec= S 17° 40.9'	<i>declination trend is decreasing so the sign of d correction is negative</i>							
4	<p>m- is the <i>magnitude</i> or brightness of the planet.</p> <p>A bright planet will have a <i>minus</i> sign beside the figure. A fainter planet will have no sign beside its magnitude figure.</p>								
5	<p>Stars- SHA, Sidereal Hour Angle, and Declination. 59 stars are listed.</p> <p>Typically, only 57 stars are used for navigational purposes in both Northern and Southern Hemispheres. Here you'll also find Polaris and Scheat. In the Northern Hemisphere Polaris is often used for determination of latitude.</p>								
6	Mer. pass- planet meridian passage time at the Prime Meridian- Greenwich- 0°. Time figure is GMT/UT.								
7	<p>SHA- planet SHA.</p> <p>Planet SHA is calculated by subtracting Aries GHA from planet GHA. If planet GHA figure is less than Aries GHA, add 360° to planet GHA and then subtract Aries GHA.</p>								
8	<p>Horizontal parallax- for Venus and Mars.</p> <p>Horizontal parallax is the angle subtended by half the Earth's diameter as viewed from the planet in minutes of arc.</p>								
9	<p>SD- Semi-diameter of the Sun in minutes of arc.</p> <p>One half of the angular width of the Sun as observed on earth.</p>								
10	d- the daily average change, per hour, in the Sun's declination in minutes of arc.								

11	SD- Semi-diameter of the Moon in minutes of arc. Semi-diameter is one half of the angular width of the Moon, as observed on earth.
12	HP- the angle between two lines, one from the center of the Moon to the center of the Earth, the other from the center of the Moon to the edge of the Earth. This angle is about 56', but it changes slightly from day to day as the distance to the Moon changes along its elliptical path around the Earth. <i>Source- starpath.com</i>
13	Sun- Eqn. of Time- Basically the Equation of Time (EoT) is the difference between clock time and time seen on a sundial. This is comparing "clock time", as a mechanical measurement of time, and the sundial being time determined by the position of the Sun at any given moment. The figures listed are for 00 ^h and 12 ^h . Using the EoT you can get fairly accurate determination of when Meridian Passage (Local Apparent Noon) occurs at your position. Unshaded EoT values are subtracted from 12:00 to get Meridian Passage. Shaded EoT values are added to 12:00 to get Meridian Passage. An Equation of Time chart (as a curve) is provided in each almanac on TheNauticalAlmanac.com Example- Meridian Passage on May 30, 2020 equals 12:00 – EoT of 2 minutes 21 seconds MP= 11:57:39 <i>Local Apparent Noon</i> Example- Meridian Passage on August 25, 2020 equals 12:00 + EoT of 1 minute 59 seconds MP= 12:01:59 <i>Local Apparent Noon</i>
14	Sun- Mer. Pass just to the right of the Eqn. of Time is the approximate GMT/UT when the Sun crosses The Prime Meridian (at Greenwich) for that specific date.
15	Moon- Mer. Pass- is the approximate GMT/UT when the Moon crosses The Prime Meridian (at Greenwich) or the 180° line of longitude. Upper means the GMT/UT when the Moon crosses The Prime Meridian (Greenwich). Lower means the GMT/UT when the Moon crosses the 180° line of longitude.
16	Moon- Age- this is the number of days past a new Moon. Typically, there are 29 days in a lunar month. Moon- %- the amount of the Moon's illumination. 100% would be a full moon. 49% would be about ½ of the Moon is illuminated. A 3 day range percentage is provided but only one graphic for the phase.
17* see notes at bottom	(morning) Twilight- Naut.- the approximate GMT/UT when morning Nautical Twilight begins. Nautical twilight is the time when the center of the sun is 12° below the horizon and the horizon is visible enough to be used for marine sextant observations. First locate your approximate Latitude in the Lat. column and then follow across horizontally to the right to find the time.
17* see notes at bottom	(morning) Twilight- Civil- the approximate GMT/UT of morning civil twilight starts when the geometric center of the sun is 6° below the horizon. First locate your approximate Latitude in the Lat. column and then follow across horizontally to the right to find the time.
17* see notes at bottom	Sunrise- the approximate GMT/UT when the Sun is 0° 50' (semi-diameter plus refraction) below the horizon. First locate your approximate Latitude in the Lat. column and then follow across horizontally to the right to find the time.

17* see notes at bottom	Sunset- the approximate GMT/UT when the Sun is 0° 50' (semi-diameter plus refraction) below the horizon. First locate your approximate Latitude in the Lat. column and then follow across horizontally to the right to find the time.
17* see notes at bottom	(evening) Twilight- Civil- the approximate GMT/UT of evening civil twilight that ends when the geometric center of the sun is 6° below the horizon. First locate your approximate Latitude in the Lat. column and then follow across horizontally to the right to find the time.
17* see notes at bottom	(evening) Twilight- Naut.- the approximate GMT/UT of when evening Nautical Twilight ends. Nautical twilight is the time when the center of the sun is 12° below the horizon and the horizon is no longer visible enough to be used for sextant observations. First locate your approximate Latitude in the Lat. column and then follow across horizontally to the right to find the time.
18* see notes at bottom	Moonrise- the approximate GMT/UT when the Moon is about 0° 05' to 0° 10' below the horizon. First locate your approximate Latitude in the Lat. column and then follow across horizontally to the right to find the time under the specific day.
18* see notes at bottom	Moonset- the approximate GMT/UT when the Moon is about 0° 05' to 0° 10' below the horizon. First locate your approximate Latitude in the Lat. column and then follow across horizontally to the right to find the time under the specific day.

* Note-

☐ means the Sun or Moon remains continuously above the horizon on that day.

–:– can also mean twilight lasts all night

■ means the Sun or Moon remains continuously below the horizon on that day.

–:– means Moon does not rise or set on that day but may have risen or set the previous day or following day.

* **Note-** Time of Sunrise, Sunset, Moonrise, Moonset and twilight is based on GMT/UT of the event at 0° (Greenwich) and can be considered as approximate LMT (Local Mean Time) with a tolerance of +/- 30 minutes depending on where you are within a time zone.

Wednesday, February 24, 2021

Explanation_of_The_Nautical_Almanac_Daily_Pages.odt

January 01, 02 ,03 (Fri., Sat., Sun.)

	Aries			Venus			Mars			Jupiter			Saturn		
Fri	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec		
0	100°32.5	181°58.1	S23°38.5	318°04.0	N18°45.1	131°37.2	S13°36.5	275°29.9	N00°18.5						
1	115°35.0	196°57.1	38.4	333°06.8	45.4	146°39.2	36.4	290°32.3	18.5						
2	130°37.4	211°56.1	38.3	348°09.6	45.6	161°41.2	36.2	305°34.7	18.5						
3	145°39.9	226°55.1	· · 38.2	3°12.4	· · 45.8	176°43.2	· · 36.0	320°37.1	· · 18.5						
4	160°42.4	241°54.2	38.1	18°15.2	46.0	191°45.1	35.8	335°39.5	18.5						
5	175°44.8	256°53.2	38.0	33°18.1	46.2	206°47.1	35.7	350°41.9	18.5						
6	190°47.3	271°52.2	S23°37.9	48°20.9	N18°46.5	221°49.1	S13°35.5	5°44.3	N00°18.5						
7	205°49.8	286°51.3	37.8	63°23.7	46.7	236°51.1	35.3	20°46.7	18.5						
8	220°52.2	301°50.3	37.7	78°26.5	46.9	251°53.0	35.1	35°49.2	18.5						
9	235°54.7	316°49.3	· · 37.6	93°29.4	· · 47.1	266°55.0	· · 35.0	50°51.6	· · 18.4						
10	250°57.2	331°48.4	37.5	108°32.2	47.3	281°57.0	34.8	65°54.0	18.4						
11	265°59.6	346°47.4	37.4	123°35.0	47.6	296°59.0	34.6	80°56.4	18.4						
12	281°02.1	1°46.4	S23°37.3	138°37.9	N18°47.8	312°00.9	S13°34.4	95°58.8	N00°18.4						
13	296°04.5	16°45.5	37.2	153°40.7	48.0	327°02.9	34.3	111°01.2	18.4						
14	311°07.0	31°44.5	37.1	168°43.5	48.2	342°04.9	34.1	126°03.6	18.4						
15	326°09.5	46°43.5	· · 37.0	183°46.4	· · 48.5	357°06.8	· · 33.9	141°06.0	· · 18.4						
16	341°11.9	61°42.6	36.9	198°49.2	48.7	12°08.8	33.7	156°08.4	18.4						
17	356°14.4	76°41.6	36.8	213°52.0	48.9	27°10.8	33.6	171°10.8	18.4						
18	11°16.9	91°40.6	S23°36.7	228°54.9	N18°49.1	42°12.8	S13°33.4	186°13.2	N00°18.3						
19	26°19.3	106°39.6	36.5	243°57.7	49.4	57°14.7	33.2	201°15.7	18.3						
20	41°21.8	121°38.7	36.4	259°00.6	49.6	72°16.7	33.0	216°18.1	18.3						
21	56°24.3	136°37.7	· · 36.3	274°03.4	· · 49.8	87°18.7	· · 32.9	231°20.5	· · 18.3						
22	71°26.7	151°36.7	36.2	289°06.3	50.0	102°20.7	32.7	246°22.9	18.3						
23	86°29.2	166°35.8	36.1	304°09.1	50.3	117°22.6	32.5	261°25.3	18.3						
Mer.pass.:17:14	v-1.0 d0.1 m-3.8			v2.8 d0.2 m-0.7			v2.0 d0.2 m-2.0			v2.4 d-0.0 m0.9					

Sat	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec			
0	101°31.7	181°34.8	S23°36.0	319°12.0	N18°50.5	132°24.6	S13°32.3	276°27.7	N00°18.3			
1	116°34.1	196°33.8	35.8	334°14.8	50.7	147°26.6	32.2	291°30.1	18.3			
2	131°36.6	211°32.9	35.7	349°17.7	51.0	162°28.6	32.0	306°32.5	18.3			
3	146°39.0	226°31.9	· · 35.6	4°20.5	· · 51.2	177°30.5	· · 31.8	321°34.9	· · 18.3			
4	161°41.5	241°30.9	35.5	19°23.4	51.4	192°32.5	31.6	336°37.3	18.2			
5	176°44.0	256°30.0	35.3	34°26.2	51.6	207°34.5	31.5	351°39.8	18.2			
6	191°46.4	271°29.0	S23°35.2	49°29.1	N18°51.9	222°36.4	S13°31.3	6°42.2	N00°18.2			
7	206°48.9	286°28.0	35.1	64°31.9	52.1	237°38.4	31.1	21°44.6	18.2			
8	221°51.4	301°27.1	34.9	79°34.8	52.3	252°40.4	30.9	36°47.0	18.2			
9	236°53.8	316°26.1	· · 34.8	94°37.7	· · 52.6	267°42.4	· · 30.8	51°49.4	· · 18.2			
10	251°56.3	331°25.1	34.7	109°40.5	52.8	282°44.3	30.6	66°51.8	18.2			
11	266°58.8	346°24.2	34.5	124°43.4	53.0	297°46.3	30.4	81°54.2	18.2			
12	282°01.2	1°23.2	S23°34.4	139°46.3	N18°53.3	312°48.3	S13°30.2	96°56.6	N00°18.2			
13	297°03.7	16°22.2	34.3	154°49.1	53.5	327°50.2	30.1	111°59.1	18.2			
14	312°06.1	31°21.3	34.1	169°52.0	53.7	342°52.2	· · 29.9	127°01.5	18.2			
15	327°08.6	46°20.3	· · 34.0	184°54.9	· · 54.0	357°54.2	· · 29.7	142°03.9	· · 18.1			
16	342°11.1	61°19.3	33.8	199°57.7	54.2	12°56.2	29.5	157°06.3	18.1			
17	357°13.5	76°18.4	33.7	215°00.6	54.4	27°58.1	29.3	172°08.7	18.1			
18	12°16.0	91°17.4	S23°33.6	230°03.5	N18°54.7	43°00.1	S13°29.2	187°11.1	N00°18.1			
19	27°18.5	106°16.5	33.4	245°06.4	54.9	58°02.1	29.0	202°13.5	18.1			
20	42°20.9	121°15.5	33.3	260°09.3	55.1	73°04.0	· · 28.8	217°16.0	18.1			
21	57°23.4	136°14.5	· · 33.1	275°12.1	· · 55.4	88°06.0	· · 28.6	232°18.4	· · 18.1			
22	72°25.9	151°13.6	33.0	290°15.0	55.6	103°08.0	28.5	247°20.8	18.1			
23	87°28.3	166°12.6	32.8	305°17.9	55.9	118°09.9	28.3	262°23.2	18.1			
Mer.pass.:17:11	v-1.0 d0.1 m-3.8			v2.9 d0.2 m-0.8			v2.0 d0.2 m-1.9			v2.4 d-0.0 m0.9		

Sun	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec			
0	102°30.8	181°11.6	S23°32.7	320°20.8	N18°56.1	133°11.9	S13°28.1	277°25.6	N00°18.1			
1	117°33.3	196°10.7	32.5	335°23.7	56.3	148°13.9	27.9	292°28.0	18.1			
2	132°35.7	211°09.7	32.4	350°26.6	56.6	163°15.9	27.8	307°30.4	18.1			
3	147°38.2	226°08.7	· · 32.2	5°29.4	· · 56.8	178°17.8	· · 27.6	322°32.9	· · 18.0			
4	162°40.6	241°07.8	32.0	20°32.3	57.0	193°19.8	27.4	337°35.3	18.0			
5	177°43.1	256°06.8	31.9	35°35.2	57.3	208°21.8	27.2	352°37.7	18.0			
6	192°45.6	271°05.8	S23°31.7	50°38.1	N18°57.5	223°23.7	S13°27.0	7°40.1	N00°18.0			
7	207°48.0	286°04.9	31.6	65°41.0	57.8	238°25.7	26.9	22°42.5	18.0			
8	222°50.5	301°03.9	31.4	80°43.9	58.0	253°27.7	26.7	37°44.9	18.0			
9	237°53.0	316°03.0	· · 31.2	95°46.8	· · 58.2	268°29.6	· · 26.5	52°47.4	· · 18.0			
10	252°55.4	331°02.0	31.1	110°49.7	58.5	283°31.6	26.3	67°49.8	18.0			
11	267°57.9	346°01.0	30.9	125°52.6	58.7	298°33.6	26.2	82°52.2	18.0			
12	283°00.4	1°00.1	S23°30.7	140°55.5	N18°59.0	313°35.5	S13°26.0	97°54.6	N00°18.0			
13	298°02.8	15°59.1	30.6	155°58.4	59.2	328°37.5	25.8	112°57.0	18.0			
14	313°05.3	30°58.1	30.4	171°01.3	59.5	343°39.5	25.6	127°59.4	18.0			
15	328°07.8	45°57.2	· · 30.2	186°04.2	· · 59.7	358°41.4	· · 25.4	143°01.9	· · 18.0			
16	343°10.2	60°56.2	30.1	201°07.1	18°59.9	13°43.4	25.3	158°04.3	17.9			
17	358°12.7	75°55.3	29.9	216°10.0	19°00.2	28°45.4	25.1	173°06.7	17.9			
18	13°15.1	90°54.3	S23°29.7	231°13.0	N19°00.4	43°47.3	S13°24.9	188°09.9	N00°17.9			
19	28°17.6	105°53.3	29.5	246°15.9	00.7	58°49.3	24.7	203°11.5	17.9			
20	43°20.1	120°52.4	29.4	261°18.8	00.9	73°51.3	24.6	218°13.9	17.9			
21	58°22.5	135°51.4	· · 29.2	276°21.7	· · 01.2	88°53.3	· · 24.4	233°16.4	· · 17.9			
22	73°25.0	150°50.4	29.0	291°24.6	01.4	103°55.2	24.2	248°18.8	17.9			
23	88°27.5	165°49.5	28.8	306°27.5	01.7	118°57.2	24.0	263°21.2	17.9			
Mer.pass.:17:07	v-1.0 d0.2 m-3.8			v2.9 d0.2 m-0.8			v2.0 d0.2 m-1.9			v2.4 d-0.0 m0.9		

	SHA	Dec
Alpheratz	357°46.2	29°09.0
Ankaa	353°18.1	-42°15.2
Schedar	349°43.6	56°35.9
Diphda	348°58.3	-17°55.9
Achernar	335°28.3	-57°11.3
Hamal	328°03.5	23°30.8
Polaris	318°47.1	89°18.8
Akamar	315°19.9	-40°16.0
Menkar	314°17.5	4°07.8
Mirfak	308°43.7	49°54.0
Aldebaran	290°52.0	16°31.9
Rigel	281°14.1	-8°11.4
Capella	280°37.8	46°00.6
Bellatrix	278°34.4	6°21.5
Elnath	278°15.5	28°37.0
Anilam	275°48.6	-1°11.7
Betelgeuse	271°03.7	7°24.5
Canopus	263°56.7	-52°42.1
Sirius	258°35.5	-16°43.6
Adara	255°14.1	-28°59.2
Procyon	245°01.9	5°12.0
Pollux	243°30.3	28°00.0
Avior	234°18.6	-59°32.4
Suhail	222°54.0	-43°28.3
Miaplacidus	221°39.7	-69°45.4
Alphard	217°58.3	-8°42.2
Regulus	207°45.9	11°54.9
Dubhe	193°54.2	61°41.4
Denebola	182°36.0	14°30.8
Gienah	175°54.9	-17°35.9
Acrux	173°12.3	-63°09.1
Gacrux	172°03.9	-57°10.0
Altho	166°22.8	55°53.9
Spica	158°34.0	-11°12.9
Alcaid	153°00.9	49°15.4
Hadar	148°51.9	-60°25.1
Menkent	148°10.8	-36°25.1
Arcturus	145°58.0	19°07.9
Rigel Kent.	139°55.6	-60°52.4
Zubenelg.	137°08.4	-16°05.0
Kochab	137°20.2	74°06.5
Alphecca	126°13.4	26°40.7
Antares	112°29.7	-26°27.2
Atria	107°34.4	-69°02.6
Sabik	102°15.8	-15°44.3
Shaula	96°25.8	-37°06.6
Rasalhague	96°09.1	12°33.1
Eltanin	90°47.8	51°29.2
Kaus Aust.	83°47.5	-34°22.8
Vega	80°41.1	38°47.5
Nunki	76°01.8	-26°17.1
Altair	62°11.1	8°53.7
Peacock	53°23.6	-56°42.2
Deneb	49°33.7	45°19.1
Enif	33°49.9	9°55.4
Alnair	27°47.1	-46°54.8
Fomalhaut	15°26.9	-29°34.2
Scheat	13°56.1	28°08.4
Markab	13°41.0	15°15.7

Jan 01 Fri	SHA	Mer.pass
Venus	81°25.5	11:53
Mars	217°31.4	02:47
Jupiter	31°04.7	15:12
Saturn	174°57.4	05:37

Jan 02 Sat	SHA	Mer.pass
Venus	80°03.2	11:54
Mars	217°40.3	02:43
Jupiter	30°53.0	15:08
Saturn	174°56.1	05:33

Jan 03 Sun	SHA	Mer.pass
Venus	78°40.8	11:56

17

1

2020 January 01 to Jan. 03

1

Sun				Moon			
h	GHA	Dec	GHA	v	Dec	d	HP
0	179° 13.7	S23° 03.5	110° 56.9	15.3'	S09° 58.5	10.7'	54.3'
1	194° 13.4	03.3	125° 31.3	15.4'	09° 47.8	10.7'	54.3'
2	209° 13.1	03.1	140° 05.7	15.4'	09° 37.1	10.7'	54.3'
3	224° 12.8	03.0	154° 40.1	15.5'	09° 26.3	10.8'	54.3'
4	239° 12.5	02.8	169° 14.6	15.5'	09° 15.5	10.8'	54.3'
5	254° 12.2	02.6	183° 49.1	15.5'	09° 04.7	10.8'	54.2'
6	269° 11.9	S23° 02.4	198° 23.6	15.6'	S08° 53.8	10.9'	54.2'
7	284° 11.6	02.2	212° 58.2	15.6'	08° 42.9	10.9'	54.2'
8	299° 11.3	02.0	227° 32.8	15.6'	08° 32.0	10.9'	54.2'
9	314° 11.0	01.8	242° 07.5	15.7'	08° 21.0	11.0'	54.2'
10	329° 10.7	01.6	256° 42.2	15.7'	08° 10.0	11.0'	54.2'
11	344° 10.4	01.4	271° 16.9	15.7'	07° 59.0	11.0'	54.2'
12	359° 10.1	S23° 01.2	285° 51.7	15.8'	S07° 48.0	11.1'	54.2'
13	14° 09.8	01.0	300° 26.4	15.8'	07° 36.9	11.1'	54.2'
14	29° 09.5	00.8	315° 01.2	15.8'	07° 25.8	11.1'	54.2'
15	44° 09.2	00.6	329° 36.1	15.9'	07° 14.7	11.1'	54.2'
16	59° 08.9	00.4	344° 10.9	15.9'	07° 03.5	11.2'	54.2'
17	74° 08.6	00.2	358° 45.8	15.9'	06° 52.3	11.2'	54.2'
18	89° 08.3	S23° 00.0	13° 20.7	15.9'	S06° 41.1	11.2'	54.2'
19	104° 08.0	22° 59.7	27° 55.7	16.0'	06° 29.9	11.2'	54.2'
20	119° 07.7	59.5	42° 30.7	16.0'	06° 18.7	11.3'	54.2'
21	134° 07.5	59.3	57° 05.6	16.0'	06° 07.4	11.3'	54.2'
22	149° 07.2	59.1	71° 40.6	16.0'	05° 56.1	11.3'	54.2'
23	164° 06.9	58.9	86° 15.7	16.0'	05° 44.8	11.3'	54.2'

SD.=16.3 d=0.2

S.D.=14.8

Thu	GHA	Dec	GHA	v	Dec	d	HP
0	179° 06.6	S22° 58.7	100° 50.7	16.1'	S05° 33.4	11.3'	54.2'
1	194° 06.3	58.5	115° 25.8	16.1'	05° 22.1	11.4'	54.2'
2	209° 06.0	58.3	130° 00.9	16.1'	05° 10.7	11.4'	54.2'
3	224° 05.7	58.1	144° 36.0	16.1'	04° 59.3	11.4'	54.2'
4	239° 05.4	57.9	159° 11.1	16.1'	04° 47.9	11.4'	54.2'
5	254° 05.1	57.6	173° 46.3	16.1'	04° 36.5	11.4'	54.2'
6	269° 04.8	S22° 57.4	188° 21.4	16.2'	S04° 25.0	11.5'	54.2'
7	284° 04.5	57.2	202° 56.6	16.2'	04° 13.5	11.5'	54.2'
8	299° 04.2	57.0	217° 31.7	16.2'	04° 02.1	11.5'	54.2'
9	314° 03.9	56.8	232° 06.9	16.2'	03° 50.6	11.5'	54.2'
10	329° 03.6	56.6	246° 42.1	16.2'	03° 39.0	11.5'	54.2'
11	344° 03.3	56.3	261° 17.3	16.2'	03° 27.5	11.5'	54.2'
12	359° 03.0	S22° 56.1	275° 52.6	16.2'	S03° 16.0	11.5'	54.2'
13	14° 02.8	55.9	290° 27.8	16.2'	03° 04.4	11.6'	54.2'
14	29° 02.5	55.7	305° 03.0	16.2'	02° 52.8	11.6'	54.2'
15	44° 02.2	55.5	319° 38.3	16.2'	02° 41.3	11.6'	54.2'
16	59° 01.9	55.2	334° 13.5	16.2'	02° 29.7	11.6'	54.2'
17	74° 01.6	55.0	348° 48.8	16.3'	02° 18.1	11.6'	54.2'
18	89° 01.3	S22° 54.8	3° 24.0	16.3'	S02° 06.5	11.6'	54.2'
19	104° 01.0	54.6	17° 59.3	16.3'	01° 54.8	11.6'	54.2'
20	119° 00.7	54.3	32° 34.5	16.3'	01° 43.2	11.6'	54.2'
21	134° 00.4	54.1	47° 09.8	16.3'	01° 31.6	11.6'	54.2'
22	149° 00.1	53.9	61° 45.0	16.3'	01° 19.9	11.7'	54.2'
23	163° 59.8	53.7	76° 20.3	16.3'	01° 08.2	11.7'	54.3'

SD.=16.3 d=0.2

S.D.=14.8

Fri	GHA	Dec	GHA	v	Dec	d	HP
0	178° 59.5	S22° 53.4	90° 55.5	16.2'	S00° 56.6	11.7'	54.3'
1	193° 59.3	53.2	105° 30.8	16.2'	00° 44.9	11.7'	54.3'
2	208° 59.0	53.0	120° 06.0	16.2'	00° 33.2	11.7'	54.3'
3	223° 58.7	52.7	134° 41.3	16.2'	00° 21.5	11.7'	54.3'
4	238° 58.4	52.5	149° 16.5	16.2'	S00° 09.9	11.7'	54.3'
5	253° 58.1	52.3	163° 51.7	16.2'	N00° 01.8	11.7'	54.3'
6	268° 57.8	S22° 52.0	178° 26.9	16.2'	N00° 13.5	11.7'	54.3'
7	283° 57.5	51.8	193° 02.1	16.2'	00° 25.2	11.7'	54.3'
8	298° 57.2	51.6	207° 37.3	16.2'	00° 36.9	11.7'	54.3'
9	313° 56.9	51.3	222° 12.5	16.2'	00° 48.6	11.7'	54.3'
10	328° 56.6	51.1	236° 47.7	16.2'	01° 00.3	11.7'	54.3'
11	343° 56.4	50.8	251° 22.8	16.1'	01° 12.0	11.7'	54.4'
12	358° 56.1	S22° 50.6	265° 58.0	16.1'	N01° 23.7	11.7'	54.4'
13	13° 55.8	50.4	280° 33.1	16.1'	01° 35.4	11.7'	54.4'
14	28° 55.5	50.1	295° 08.2	16.1'	01° 47.1	11.7'	54.4'
15	43° 55.2	49.9	309° 43.3	16.1'	01° 58.8	11.7'	54.4'
16	58° 54.9	49.6	324° 18.4	16.1'	02° 10.5	11.7'	54.4'
17	73° 54.6	49.4	338° 53.4	16.0'	02° 22.2	11.7'	54.4'
18	88° 54.3	S22° 49.2	353° 28.4	16.0'	N02° 33.9	11.7'	54.4'
19	103° 54.0	48.9	8° 03.5	16.0'	02° 45.6	11.7'	54.4'
20	118° 53.8	48.7	22° 38.4	16.0'	02° 57.3	11.7'	54.5'
21	133° 53.5	48.4	37° 13.4	16.0'	03° 09.0	11.7'	54.5'
22	148° 53.2	48.2	51° 48.4	15.9'	03° 20.6	11.7'	54.5'
23	163° 52.9	47.9	66° 23.3	15.9'	03° 32.3	11.7'	54.5'

SD.=16.3 d=0.2

S.D.=14.8

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

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

Day	Sun		Mer. Pass	Moon		Age 6-8 34-53%
	Eqn. of Time 00 ^h mm:ss	12 ^h mm:ss		Upper Mer. Pass. hh:mm	Lower Mer. Pass. hh:mm	
01	03:05	03:20	12:03	17:05	04:44	
02	03:34	03:48	12:04	17:46	05:26	
03	04:02	04:16	12:04	18:27	06:06	

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Information in the data page footers

Information pertaining to the IERS EOP data has been added to the odd data page footers if using MiKTeX or TeX Live (2020 or later). The International Earth Rotation Service (IERS) provides accurate data (updated weekly) on the Earth Orientation Parameters (EOP).

Earth's speed of rotation is not constant, i.e. the day length fluctuates.¹ This is due to *internal torques* caused by relative movements and mass redistribution of Earth's core, mantle, oceans, atmosphere, and cryosphere. This has an immediate impact on the GHA values of all celestial objects.

The IERS monitors and measures several parameters taking the actual speed of Earth's rotation into account. Their measured data begins on 2nd January 1973. Predictive data begins following the last day of (obtained) data and extends about 360 days into the future. (The IERS results are published with a delay of about 18-hours between the date of publication and the last available date with measured EOP.²) These Nautical Almanac daily pages take the (measured or predicted) UT1-UTC values into account providing highly accurate navigational data especially if the predictions are fairly recent.

As long as either measured or predicted data is available the footer will show:

[IERS Earth Orientation data as of dd-mmm-yyyy](#)

This indicates that IERS EOP data is in use - older dates are measured; newer dates are predictions.

If the final date of IERS prediction data is on the current data page, the footer shows:

[IERS Earth Orientation predictions end dd-mmm-yyyy](#)

Pages with dates beyond the final date of IERS prediction data have the following footer:

No IERS EOP prediction data available

Skyfield then defaults to using the ΔT and leap second files that ship with Skyfield internally.

The footers mentioned are only displayed as long as `'uselERS = True'` is set in `config.py` to enable use of IERS EOP data.

Brief historical overview

The story begins with the XEphem astronomical library, which is declared 'end of life' by its author, Elwood Charles Downey, as no further updates are planned. He generously gave permission for use of XEphem code in Ephem (also known as Pyephem), an astronomical library authored by Brandon Rhodes. Enno Rodegerdts (<https://sv-inua.net/>) created the original Nautical Almanac 'daily pages' in Pyalmanac using Python 2 and LaTeX. After contacting him I obtained permission for its future enhancement and maintenance. Pyalmanac uses Ephem.

Meanwhile Brandon Rhodes was working on a far more sophisticated astronomical library, Skyfield. This was 'state of the art' and clearly surpassed the 'Jean Meeus'-based Pyephem/Ephem. Skyfield uses NASA's NAIF (Navigation and Ancillary Information Facility) SPICE algorithms. The results agree with those from the HORIZONS System (*operated by NASA JPL (Jet Propulsion Laboratory) SSD (Solar System Dynamics) group, not by NAIF*). This in turn implies that celestial positions calculated by Skyfield agree with those generated by the United States Naval Observatory and their *Astronomical Almanac* to within 0.0005 arcseconds (half a milliarcsecond).

Pyephem was then in 'maintenance mode'. Clearly Pyalmanac needed adaptation to use Skyfield, and thus SFalmanac was born. However its performance was poor regarding the calculation of 'events' such as: sunrise, sunset, moonrise, moonset, civil twilight start/end and nautical twilight start/end. An interim (faster) solution was required.

A hybrid application, originally named Skyalmanac, was developed using Ephem to calculate 'events' and Skyfield for the rest. This was indeed much faster at the cost of poorer 'event time' data. It took a while to find a better solution: multiprocessing, which was built into SFalmanac. This now could compare to the execution times in Pyalmanac but with improved data.

New functionality was added to SFalmanac, e.g. lunar phase as a graphic; Lunar Distance tables and charts. The original Skyalmanac is deprecated and has now been replaced with the latest SFalmanac code, so Skyalmanac and SFalmanac are now identical apart from the name. Since April 2019 <http://thenauticalalmanac.com> has been publishing Celestial Navigation related material with software provided here.

¹https://en.wikipedia.org/wiki/Day_length_fluctuations

²<https://hpiers.obspm.fr/eoppc/bul/bul/explanatory.html>

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec for each planet.

Table with columns for Stars and rows for dates 0-23. Columns include SHA, Dec for various stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP for both celestial bodies.

Table with columns for twilight and sunrise/sunset times and rows for dates 0-23. Columns include Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec for dates 0-23.

Table with columns for Stars and rows for dates 0-23. Columns include SHA, Dec for various stars like Dubhe, Denebola, Genah, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP for both celestial bodies.

Table with columns for Moonrise and Moonset times and rows for dates 0-23. Columns include Lat., Mon, Tue, Wed, Mon, Tue, Wed.

Table with columns for Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec for dates 0-23.

Table with columns for Stars and rows for dates 0-23. Columns include SHA, Mer-pass for various stars like Jan 01 Mon, Jan 02 Tue, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP for both celestial bodies.

Table with columns for Moonrise and Moonset times and rows for dates 0-23. Columns include Day, Sun Eqn of Time, Mer. Pass, Moonrise, Moonset, Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer.pass. for various celestial bodies.

Table for Stars with columns for SHA and Dec, listing stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon with columns for h, GHA, Dec, GHA, v, Dec, d, HP.

Table for twilight and sunrise/sunset with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.).

Table with columns for Fri, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table for Stars with columns for SHA and Dec, listing stars like Denebola, Gienah, Acruy, etc.

Table for Sun and Moon with columns for Fri, GHA, Dec, GHA, v, Dec, d, HP.

Table for Moonset with columns for Lat., Moonrise, Moonset.

Table with columns for Sat, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table for Stars with columns for SHA, Mer-pass, and Horizontal parallax.

Table for Sun and Moon with columns for Sat, GHA, Dec, GHA, v, Dec, d, HP.

Table for Moonset with columns for Day, Eqn.of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Stars (SHA, Dec) and rows for stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Miraf, Aldebaran, Rigel, Capella, Bellatrix, Elmath, Alnilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alpherat, Regulus, Dubhe, Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel Kent., Kochab, Zuben'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aua, Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun and Moon (GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.) and rows for latitudes N 72° to S 60°.

Table with columns for Mon, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Stars (SHA, Dec, Mer-pass) and rows for stars like Jan 07 Sun, Jan 08 Mon, Jan 09 Tue.

Table with columns for Mon and Moon (GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Lat., Moonrise (Sun, Moon, Tue), Moonset (Sun, Moon, Tue) and rows for latitudes N 72° to S 60°.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Stars (SHA, Mer-pass) and rows for stars like Jan 07 Sun, Jan 08 Mon, Jan 09 Tue.

Table with columns for Tue and Moon (GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Age) and rows for dates 07-09.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars with columns for Star Name, SHA, and Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for days 0-23. Includes SD and d values.

Table for Twilight and Sunrise/Sunset with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.) for various latitudes.

Table with columns for planets (Thu, GHA, Dec) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars with columns for Star Name, SHA, and Dec. Lists stars like Dubhe, Denebola, Geniah, etc.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for days 0-23. Includes SD and d values.

Table for Moonrise and Moonset with columns for Lat., Moonrise (Wed, Thu, Fri), Moonset (Wed, Thu, Fri) for various latitudes.

Table with columns for planets (Fri, GHA, Dec) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars with columns for Star Name, SHA, Mer. pass. Lists stars like Jan 10 Wed, Jan 11 Thu, Jan 12 Fri.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for days 0-23. Includes SD and d values.

Table for Sun and Moon with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Lower, Age) for days 10-12.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, SHA, Dec for each planet.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc. Includes SHA and Dec.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for twilight and sunrise/sunset and rows for latitudes N 72°, N 70°, N 58°, N 56°, N 54°, N 52°, N 50°, N 48°, N 46°, N 44°, N 42°, N 40°, N 38°, N 36°, N 34°, N 32°, N 30°, S 10°, S 20°, S 30°, S 40°, S 50°.

Table with columns for Sun and rows for dates 0-23. Includes GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Dubhe, Denebola, Genah, Acru, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Moonrise and Moonset and rows for latitudes N 72°, N 70°, N 68°, N 66°, N 64°, N 62°, N 60°, N 58°, N 56°, N 54°, N 52°, N 50°, N 48°, N 46°, N 44°, N 42°, N 40°, N 38°, N 36°, N 34°, N 32°, N 30°, S 10°, S 20°, S 30°, S 40°, S 50°.

Table with columns for Mon and rows for dates 0-23. Includes GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Jan 13 Sat, Jan 14 Sun, Jan 15 Mon and rows for Venus, Mars, Jupiter, Saturn. Includes SHA, Mer-pass, Mer-pass.

Table with columns for Mon and rows for dates 0-23. Includes GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Day, Sun, Moon and rows for dates 13, 14, 15. Includes Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for days 0-23.

Table for Stars with columns for Star Name, SHA, Dec, and Mer-pass.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for days 0-23.

Table for twilight and sunrise/sunset with columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut. for days 0-23.

Table with columns for planets (Wed, GHA, Dec) and their positions (GHA, Dec) for days 0-23.

Table for Stars with columns for Star Name, SHA, Dec, and Mer-pass.

Table for Sun and Moon with columns for Wed, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for days 0-23.

Table for Moonrise and moonset with columns for Lat., Tue, Moonrise (Wed, Thu), Moonset (Wed, Thu) for days 0-23.

Table with columns for planets (Thu, GHA, Dec) and their positions (GHA, Dec) for days 0-23.

Table for Stars with columns for Star Name, SHA, Mer-pass, and Horizontal parallax.

Table for Sun and Moon with columns for Thu, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for days 0-23.

Table for Moonrise and moonset with columns for Day, Sun (Eqn. of Time, 00h, 12h, mm:ss), Mer. Pass (hh:mm), Moon (Mer. Pass, Lower, Upper, Age, 5-7, 26-48%) for days 16-18.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer.pass. values.

Table with columns for Sun, GHA, Dec and rows for dates 0-23. Includes Mer.pass. values.

Table with columns for Sun, GHA, Dec and rows for dates 0-23. Includes Mer.pass. values.

Table with columns for Stars, SHA, Dec and rows for stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars, SHA, Dec and rows for stars like Denebola, Gienah, Acruh, etc.

Table with columns for Stars, SHA, Mer-pass and rows for dates Jan 19, 20, 21. Includes horizontal parallax.

Table with columns for Sun, Moon, GHA, Dec, d, HP and rows for dates 0-23. Includes SD values.

Table with columns for Sun, Moon, GHA, Dec, d, HP and rows for dates 0-23. Includes SD values.

Table with columns for Sun, Moon, GHA, Dec, d, HP and rows for dates 0-23. Includes SD values.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for latitudes N 72° to S 60°.

Table with columns for Lat., Moonrise, Moonset and rows for latitudes N 72° to S 60°.

Table with columns for Day, Eqn. of Time, Mer. Pass, Moon and rows for days 19, 20, 21.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for days 0-23. Includes SD and d values.

Table for twilight and sunrise/sunset (Lat., Naat., Civil, Sunrise, Sunset, Civil, Naat.) for days 0-23.

Table with columns for planets (Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars (SHA, Dec) listing stars like Dubhe, Denebola, Genah, Acru, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkhar, Arcturus, Rigel, Kochab, Zuben'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus, Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for days 0-23. Includes SD and d values.

Table for Moonrise and Moonset (Lat., Mon, Tue, Wed, Mon, Tue, Wed) for days 0-23. Includes phase indicators.

Table with columns for planets (Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars (SHA, Mer. pass) listing stars like Jan 22 Mon, Jan 23 Tue, Jan 24 Wed, and Horizontal parallax.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for days 0-23. Includes SD and d values.

Table for Day (Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for days 22-24.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer.pass. values.

Table for Stars with columns for SHA and Dec, listing stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), and Moon (GHA, ν, Dec, d, HP) for dates 0-23.

Table for twilight and sunrise/sunset with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.) for various latitudes.

Table with columns for Fri, GHA, Dec, and rows for dates 0-23. Includes Mer.pass. values.

Table for Stars with columns for SHA and Dec, listing stars like Denebola, Gienah, Acru, etc.

Table for Sun and Moon with columns for Fri, Sun (GHA, Dec), and Moon (GHA, ν, Dec, d, HP) for dates 0-23.

Table for Moonset with columns for Lat., Moonset (Thu, Fri, Sat) and Moonrise (Thu, Fri, Sat) for various latitudes.

Table with columns for Sat, GHA, Dec, and rows for dates 0-23. Includes Mer.pass. values.

Table for Stars with columns for SHA, Mer-pass, and rows for dates Jan 25 Thu, Jan 26 Fri, Jan 27 Sat.

Table for Sun and Moon with columns for Sat, Sun (GHA, Dec), and Moon (GHA, ν, Dec, d, HP) for dates 0-23.

Table for Day with columns for Day, Eqn. of Time, Sun (00h, 12h, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass), and Moon (Age, 14-16, 99-98%) for dates 25-27.

Table with columns for Sun, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, ν, Dec, d, HP. Rows 0-23 showing Sun and Moon positions.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight. Rows 0-23 showing twilight and sunrise/sunset times.

Table with columns for Mon and sub-columns for GHA, Dec. Rows 0-23 showing Moon coordinates.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Denebola, Gienah, Acrux, etc.

Table with columns for Mon and sub-columns for GHA, Dec, ν, Dec, d, HP. Rows 0-23 showing Moon coordinates.

Table with columns for Lat., Moonrise, Moonset and sub-columns for Sun, Moon. Rows 0-23 showing moonrise and moonset times.

Table with columns for Tue and sub-columns for GHA, Dec. Rows 0-23 showing Moon coordinates.

Table with columns for Jan 28 Sun, Jan 29 Mon, Jan 30 Tue and sub-columns for SHA, Mer-pass. Lists stars and transit times.

Table with columns for Tue and sub-columns for GHA, Dec, ν, Dec, d, HP. Rows 0-23 showing Moon coordinates.

Table with columns for Day, Sun, Mer. Pass, Moon, Age and sub-columns for Eqn. of Time, 12h, Mer. Pass, Upper, Lower, Age. Rows 28-30 showing detailed twilight and moon data.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Wed, Thu, Fri.

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for Wed, Thu, Fri.

Table for twilight and sunrise/sunset times (Lat., Naat., Civil, Sunrise, Sunset, Civil, Naat.) for various latitudes.

Table with columns for planets (GHA, Dec) for Thu, Fri, and Mer. pass. times.

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acru, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for Thu, Fri, and Mer. pass. times.

Table for Moonrise and Moonset times (Lat., Wed, Thu, Fri, Wed, Thu, Fri) for various latitudes.

Table with columns for planets (GHA, Dec) for Fri, and Mer. pass. times.

Table for Stars (SHA, Dec) listing stars like Jan 31 Wed, Feb 01 Thu, Feb 02 Fri.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for Fri, and Mer. pass. times.

Table for Moonrise and Moonset times (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for various days.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (0-23).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, ν, Dec, d, HP) for each day (0-23).

Table for twilight and sunrise/sunset times (Lat., Naat., Civil, Sunrise, Sunset, Civil, Naat.) for various latitudes.

Table with columns for planets (Sun, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table for Stars (SHA, Dec) listing various stars like Denebola, Gienah, Acru, etc.

Table for Sun and Moon (GHA, Dec, ν, Dec, d, HP) for each day (0-23).

Table for Moonrise and Moonset times (Lat., Sat, Sun, Mon, Sat, Sun, Mon) for various latitudes.

Table with columns for planets (Mon, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table for Stars (SHA, Mer-pass) listing various stars like Feb 03 Sat, Feb 04 Sun, Feb 05 Mon, and Horizontal parallax.

Table for Sun and Moon (GHA, Dec, ν, Dec, d, HP) for each day (0-23).

Table for Day, Sun, and Moon (Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for various days.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (0-23).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) showing their positions and parameters.

Table for Twilight and Sunrise/Sunset (Lat., Naup., Civil, Sunrise, Sunset, Civil, Twilight) for various latitudes.

Table with columns for planets (GHA, Dec) and their positions for each day (0-23).

Table for Stars (SHA, Dec) listing various stars like Denebola, Gienah, Acruus, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) showing their positions and parameters.

Table for Moonset (Lat., Tue, Moonrise, Wed, Thu, Moonset, Thu) showing moon phases and times.

Table with columns for planets (GHA, Dec) and their positions for each day (0-23).

Table for Stars (SHA, Mer-pass) listing stars like Feb 06 Tue, Venus, Mars, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) showing their positions and parameters.

Table for Sun and Moon (Day, Eqn.of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) showing solar and lunar data.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, and Mer. pass. Includes data for Fri, Sat, Sun.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, and Mer. pass. Includes data for Sat, Sun.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, and Mer. pass. Includes data for Sun.

Table with columns for Stars: SHA, Dec, Mer. pass. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table for Feb 09 Fri: SHA, Mer. pass. Lists Venus, Mars, Jupiter, Saturn.

Table for Feb 10 Sat: SHA, Mer. pass. Lists Venus, Mars, Jupiter, Saturn.

Table for Feb 11 Sun: SHA, Mer. pass. Lists Venus, Mars, Jupiter, Saturn.

Table for Horizontal parallax: Lists Venus and Mars.

Table with columns for Sun and Moon: h, GHA, Dec, GHA, ν, Dec, d, HP. Includes data for Fri, Sat, Sun.

Table with columns for Sun and Moon: Sat, GHA, Dec, GHA, ν, Dec, d, HP. Includes data for Sat, Sun.

Table with columns for Sun and Moon: Sun, GHA, Dec, GHA, ν, Dec, d, HP. Includes data for Sun.

Table with columns for twilight and sunrise/sunset: Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut. Includes data for various latitudes.

Table with columns for moonrise/moonset: Lat., Fri, Moonrise, Sat, Sun, Fri, Moonset, Sun. Includes data for various latitudes.

Table with columns for day and moon: Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age. Includes data for days 09, 10, 11.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Mon, Tue, Wed).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) showing their positions and parameters.

Table for twilight and sunrise/sunset times (Lat, Naut., Civil, Sunrise, Sunset, Civil, Naut.) for various latitudes.

Table with columns for planets (GHA, Dec) for each day (Tue, Wed, Thu, Fri, Sat, Sun, Mon, Tue, Wed).

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acrux, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) showing their positions and parameters.

Table for twilight and sunrise/sunset times (Lat, Moonrise, Moonset) for various latitudes.

Table with columns for planets (GHA, Dec) for each day (Wed, Thu, Fri, Sat, Sun, Mon, Tue, Wed).

Table for Stars (SHA, Dec, Mer-pass) listing stars like Feb 12 Mon, Feb 13 Tue, Feb 14 Wed.

Table for Sun and Moon (GHA, Dec, ν, d, HP) showing their positions and parameters.

Table for twilight and sunrise/sunset times (Day, Eqn. of Time, Mer. Pass, Moon) for various latitudes.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (0-23).

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table for Sun and Moon (GHA, Dec, HP) listing positions for each day (0-23).

Table for twilight and sunrise/sunset (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes.

Table with columns for planets (Fri, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigil Kent, Kochab, Zuben ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table for Sun and Moon (GHA, Dec, HP) listing positions for each day (0-23).

Table for Moonrise and Moonset (Lat., Moonrise, Moonset) for various latitudes.

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table for Stars (SHA, Mer-pass) listing stars like Venus, Mars, Jupiter, Saturn for Feb 15 Thu, Feb 16 Fri, and Feb 17 Sat.

Table for Sun and Moon (GHA, Dec, HP) listing positions for each day (0-23).

Table for Moonrise and Moonset (Day, Sun, Moon) listing times for each day (15-17).

Table with columns for Sun, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Includes rows for each day and a Mer.pass. row.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.). Includes rows for various latitudes and twilight times.

Table with columns for Mon and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer.pass. row.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Denebola, Gienah, Acru, etc.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values.

Table with columns for Lat., Moonrise, Moonset. Includes rows for various latitudes and moon phase times.

Table with columns for Tue and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer.pass. row.

Table with columns for Stars and sub-columns for SHA, Mer-pass. Includes sections for Feb 18 Sun, Feb 19 Mon, Feb 20 Tue, and Horizontal parallax.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values.

Table with columns for Day, Eqn.of Time, Mer. Pass, Moon (Upper, Lower), Age. Includes rows for days 18, 19, 20.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for days 0-23. Includes SD and d values at the bottom.

Table for twilight and sunrise/sunset times (Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for days 0-23.

Table with columns for planets (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acruus, Gaeruus, Alioth, Spica, Alkaid, Hadar, Menkath, Arcturus, Rigil Kent, Kochab, Zubay'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltamin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for days 0-23. Includes SD and d values at the bottom.

Table for Moonset times (Lat., Wed, Moonrise, Fri, Wed, Moonset, Thu, Fri) for days 0-23.

Table with columns for planets (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars (SHA, Mer. pass) for Feb 21 Wed, Feb 22 Thu, and Feb 23 Fri. Includes Horizontal parallax for Venus and Mars.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for days 0-23. Includes SD and d values at the bottom.

Table for Moon phases (Day, Eqn. of Time, Sun, Mer. Pass, Moon, Age) for days 0-23.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (SHA, Dec) for each day (0-23).

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, etc.

Table for Sun and Moon (GHA, Dec, SHA, Dec, d, HP) for each day (0-23).

Table for twilight and sunrise/sunset times (Lat., Naat., Civil, Sunrise, Sunset, Civil, Naat.) for various latitudes.

Table with columns for planets (Sun, GHA, Dec, SHA, Dec, GHA, Dec, GHA, Dec) for each day (0-23).

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acrux, etc.

Table for Sun and Moon (GHA, Dec, SHA, Dec, d, HP) for each day (0-23).

Table for Moonrise and Moonset times (Lat., Sat, Moonrise, Mon, Sat, Moonset, Mon) for various latitudes.

Table with columns for planets (Mon, GHA, Dec, SHA, Dec, GHA, Dec, GHA, Dec) for each day (0-23).

Table for Stars (SHA, Mer-pass) listing stars like Feb 24 Sat, Venus, Mars, etc.

Table for Sun and Moon (GHA, Dec, SHA, Dec, d, HP) for each day (0-23).

Table for Moonrise and Moonset times (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for various latitudes.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. info at the bottom.

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for days 0-23. Includes SD and d values at the bottom.

Table for Moon phases (Lat., Twilght, Sunrise, Sunset, Twilght) for days 0-23. Includes Moonset info at the bottom.

Table with columns for planets (GHA, Dec) for days 0-23. Includes Mer. pass. info at the bottom.

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acruus, Gacrux, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for days 0-23. Includes SD and d values at the bottom.

Table for Moon phases (Lat., Moonrise, Moonset) for days 0-23. Includes Moonset info at the bottom.

Table with columns for planets (GHA, Dec) for days 0-23. Includes Mer. pass. info at the bottom.

Table for Stars (SHA, Mer. pass) listing stars like Feb 27 Tue, Venus, Mars, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for days 0-23. Includes SD and d values at the bottom.

Table for Moon phases (Day, Eqn. of Time, Mer. Pass, Moon) for days 27-29. Includes Moonset info at the bottom.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer.pass data.

Table with columns for Sat and rows for dates 0-23. Includes GHA, Dec, and Mer.pass data.

Table with columns for Sun and rows for dates 0-23. Includes GHA, Dec, and Mer.pass data.

Table with columns for Stars (SHA, Dec) and rows for various star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars (SHA, Dec) and rows for various star names like Denebola, Gienah, Acrux, etc.

Table with columns for Stars (SHA, Dec) and rows for various star names like Mar 01 Fri, Mar 02 Sat, Mar 03 Sun.

Table with columns for Sun and Moon (h, GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23.

Table with columns for Sun and Moon (h, GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23.

Table with columns for Sun and Moon (h, GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23.

Table with columns for Lat., Twilight (Civil, Sunrise, Sunset, Civil, Twilight, Naut.), and rows for dates 0-23.

Table with columns for Lat., Moonrise (Sat, Sun), Moonset (Sat, Sun), and rows for dates 0-23.

Table with columns for Day, Sun (Eqn.of Time, Pass), Moon (Mer.Pass, Lower, Age), and rows for dates 01-03.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec for each planet.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec for each planet.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec for each planet.

Table with columns for Stars and rows for various star names like Alpheratz, Ankaa, Schedar, etc. Columns include SHA and Dec.

Table with columns for Stars and rows for various star names like Denebola, Gienah, Acrux, etc. Columns include SHA and Dec.

Table with columns for Stars and rows for various star names like Mar 04 Mon, Mar 05 Tue, Mar 06 Wed. Columns include SHA, Mer-pass, Mer-pass.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, d, HP.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, d, HP.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, d, HP.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for various latitudes from 72°N to 60°S.

Table with columns for Lat., Moonrise, Moonset and rows for various latitudes from 72°N to 60°S.

Table with columns for Day, Sun, Moon and rows for dates 04, 05, 06. Columns include Eqn. of Time, Mer. Pass, Moon Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Fri and sub-columns for GHA, Dec, SHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Sat and sub-columns for GHA, Dec, SHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Denebola, Gienah, Acrux, etc.

Table with columns for Stars and sub-columns for SHA, Mer-pass. Lists stars like Mar 07 Thu, Mar 08 Fri, Mar 09 Sat.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, SHA, Dec, d, HP. Rows 0-23 showing positions.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, SHA, Dec, d, HP. Rows 0-23 showing positions.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, SHA, Dec, d, HP. Rows 0-23 showing positions.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight. Rows 72°N to 60°S showing times.

Table with columns for Lat., Moonrise, Moonset. Rows 72°N to 60°S showing times.

Table with columns for Day, Eqn. of Time, Mer. Pass, Moon, Age. Rows 07-09 showing times and moon phase.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Mon, GHA, Dec, Mer. pass. and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Tue, GHA, Dec, Mer. pass. and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Stars, SHA, Dec, Mer. pass. and rows for stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars, SHA, Dec, Mer. pass. and rows for stars like Denebola, Gienah, Acrux, etc.

Table with columns for Stars, SHA, Mer. pass. and rows for stars like Mar 10 Sun, Mar 11 Mon, Mar 12 Tue.

Table with columns for Sun, Moon, GHA, Dec, HP and rows for dates 0-23. Includes GHA, Dec, HP, and SD data.

Table with columns for Mon, GHA, Dec, HP and rows for dates 0-23. Includes GHA, Dec, HP, and SD data.

Table with columns for Tue, GHA, Dec, HP and rows for dates 0-23. Includes GHA, Dec, HP, and SD data.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for latitudes N 72° to S 60°.

Table with columns for Lat., Moonrise, Moonset and rows for latitudes N 72° to S 60°.

Table with columns for Day, Sun, Mer. Pass, Moon, Age and rows for dates 10-12.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Thu and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Fri and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Stars and rows for various star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars and rows for various star names like Denebola, Gienah, Acrux, etc.

Table with columns for Stars and rows for various star names like Mar 13 Wed, Mar 14 Thu, Mar 15 Fri.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, d, HP.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, d, HP.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, d, HP.

Table with columns for Lat., Twilight, Sunrise, Sunset, and rows for various astronomical events.

Table with columns for Lat., Moonrise, Moonset, and rows for various astronomical events.

Table with columns for Day, Sun, Mer. Pass, Moon, and rows for specific dates.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes SHA and Dec values for each planet.

Table with columns for Stars and rows for various star names like Alpheratz, Ankaa, Schedar, etc. Includes SHA and Dec values.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, and HP values.

Table with columns for Lat., Twilight, Sunrise, Sunset, and rows for various latitudes. Includes Naut., Civil, and Civil Naut. sub-columns.

Table with columns for Sun and Dec and rows for dates 0-23. Includes GHA, Dec, and HP values.

Table with columns for Stars and rows for various star names like Dubhe, Denebola, Gienah, etc. Includes SHA and Dec values.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, and HP values.

Table with columns for Lat., Moonrise, Moonset, and rows for various latitudes. Includes Sun, Moon, and Moonset sub-columns.

Table with columns for Mon, GHA, Dec and rows for dates 0-23. Includes GHA, Dec, and HP values.

Table with columns for Stars and rows for Mar 16 Sat, Mar 17 Sun, Mar 18 Mon. Includes SHA, Mer-pass, and Mer-pass values.

Table with columns for Mon, GHA, Dec and rows for dates 0-23. Includes GHA, Dec, and HP values.

Table with columns for Day, Sun, Mer., Moon, and rows for dates 16-18. Includes Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, and Age.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for days 0-23.

Table with columns for planets (Wed, GHA, Dec) and their positions (GHA, Dec) for days 0-23.

Table with columns for planets (Thu, GHA, Dec) and their positions (GHA, Dec) for days 0-23.

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, etc.

Table for Stars (SHA, Dec) listing stars like Dubhe, Denebola, Gienah, etc.

Table for Stars (SHA, Mer-pass) listing stars like Mar 19 Tue, Mar 20 Wed, Mar 21 Thu.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for days 0-23.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for days 0-23.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for days 0-23.

Table for Twilight (Lat, Naat, Civil, Sunrise, Sunset, Civil, Naat) for days 0-23.

Table for Moonset (Lat, Tue, Moonrise, Thu, Tue, Moonset, Thu) for days 0-23.

Table for Sun and Moon (Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for days 19-21.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and Mer. pass. times.

Table with columns for Stars (SHA, Dec) and rows for stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Mirfak, Aldebaran, Rigel, Capella, Bellatrix, Elnath, Alnilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alphard, Regulus, Dubhe, Denebola, Giennah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigil Kent, Kochab, Zuben ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun and Moon (h, GHA, Dec, GHA, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Twilight (Lat, Naut., Civil, Sunrise, Sunset, Civil, Naut.) and rows for dates 0-23. Includes twilight times for various latitudes.

Table with columns for Sun and Moon (Sat, GHA, Dec, GHA, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Stars (SHA, Dec) and rows for stars like Mar 22 Fri, Venus, Mars, Jupiter, Saturn, Mar 23 Sat, Venus, Mars, Jupiter, Saturn, Mar 24 Sun, Venus, Mars, Jupiter, Saturn, and Horizontal parallax.

Table with columns for Sun and Moon (Sat, GHA, Dec, GHA, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Moonrise (Lat, Fri, Sat, Sun, Fri, Sat, Sun) and Moonset (Lat, Fri, Sat, Sun) and rows for dates 0-23.

Table with columns for Sun and Moon (Sun, GHA, Dec, GHA, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Stars (SHA, Dec) and rows for stars like Venus, Mars, Jupiter, Saturn, and Horizontal parallax.

Table with columns for Sun and Moon (Sun, GHA, Dec, GHA, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Day, Eqn. of Time, Mer. Pass, Moon (Mer. Pass, Lower, Age), and rows for dates 22-24.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes sub-headers for GHA, Dec, SHA, Dec.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes sub-headers for GHA, Dec.

Table with columns for Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes sub-headers for GHA, Dec.

Table for Stars with columns for SHA, Dec, Mer.pass. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table for Mar 25 Moon with columns for SHA, Mer.pass. Lists Moon, Mars, Jupiter, Saturn.

Table for Mar 26 Tue with columns for SHA, Mer.pass. Lists Venus, Mars, Jupiter, Saturn.

Table for Mar 27 Wed with columns for SHA, Mer.pass. Lists Venus, Mars, Jupiter, Saturn.

Table for Horizontal parallax with columns for Venus, Mars.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP). Includes sub-headers for GHA, Dec.

Table for Sun and Moon with columns for Tue, GHA, Dec, GHA, ν, Dec, d, HP. Includes sub-headers for GHA, Dec.

Table for Sun and Moon with columns for Wed, GHA, Dec, GHA, ν, Dec, d, HP. Includes sub-headers for GHA, Dec.

Table for Twilight with columns for Lat., Naat., Civil, Sunrise, Sunset, Civil, Twilight, Naat. Includes sub-headers for Sunrise, Sunset.

Table for Moonset with columns for Lat., Moonrise, Moonset, Moonrise, Moonset. Includes sub-headers for Moonrise, Moonset.

Table for Day with columns for Day, Eqn. of Time, Sun (00h, 12h), Mer. Pass, Moon (Upper, Lower), Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 with planetary data.

Table with columns for Fri and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 with planetary data.

Table with columns for Sat and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 with planetary data.

Table with columns for Stars (SHA, Dec) and Mer-pass. Lists stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table with columns for Stars (SHA, Mer-pass) for Mar 28 Thu, Mar 29 Fri, and Mar 30 Sat.

Table with columns for Horizontal parallax (Venus, Mars) and Mer-pass.

Table with columns for Sun (GHA, Dec) and Moon (GHA, ν, Dec, d, HP). Rows 0-23 with solar and lunar data.

Table with columns for Fri and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 with planetary data.

Table with columns for Sat and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 with planetary data.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.). Rows 70°N to 60°S.

Table with columns for Lat., Moonrise (Thu, Fri, Sat), and Moonset (Thu, Fri, Sat). Rows 70°N to 60°S.

Table with columns for Day, Eqn. of Time (00h, 12h), Mer. Pass (hh:mm), Upper Mer. Pass (hh:mm), Lower Mer. Pass (hh:mm), and Age (18-20, 93-80%).

Table with columns for Sun, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, v, Dec, d, HP. Rows 0-23 showing coordinates.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Civil, Twilight (Naut.). Rows 0-23 showing twilight times.

Table with columns for Mon and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing coordinates.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Denebola, Gienah, Acruus, etc.

Table with columns for Mon and sub-columns for GHA, Dec, GHA, v, Dec, d, HP. Rows 0-23 showing coordinates.

Table with columns for Lat., Moonrise, Moonset and sub-columns for Sun, Tue, Sun, Tue. Rows 0-23 showing moon phases.

Table with columns for Tue and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing coordinates.

Table with columns for Mar 31 Sun, Apr 01 Mon, Apr 02 Tue and sub-columns for SHA, Mer-pass, SHA, Mer-pass, SHA, Mer-pass. Lists stars like Venus, Mars, Jupiter, Saturn.

Table with columns for Tue and sub-columns for GHA, Dec, GHA, v, Dec, d, HP. Rows 0-23 showing coordinates.

Table with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Lower, Upper) and Age. Includes a moon phase icon.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Wed, Thu, Fri.

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for Wed, Thu, Fri.

Table for twilight and sunrise/sunset times (Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for various latitudes.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Thu, Fri, Sat.

Table for Stars (SHA, Dec) listing various stars like Denebola, Gienah, Acrux, etc.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for Thu, Fri, Sat.

Table for twilight and sunrise/sunset times (Lat., Wed, Moonrise, Fri, Wed, Moonset, Fri) for various latitudes.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Fri, Sat, Sun.

Table for Stars (SHA, Dec) listing various stars like Al Na'ir, Fomalhaut, Scheat, etc.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for Fri, Sat, Sun.

Table for twilight and sunrise/sunset times (Day, Sun Eqn.of Time, Mer. Pass, Moon Mer. Pass, Age) for various days.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (SHA, Dec) for each day (Sat, Sun, Mon).

Table with columns for stars (SHA, Dec) for each day (Sat, Sun, Mon).

Table with columns for Sun and Moon (GHA, Dec, SHA, ν, Dec, d, HP) for each day (Sat, Sun, Mon).

Table with columns for twilight and sunrise/sunset times (Lat, Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for each day (Sat, Sun, Mon).

Table with columns for planets (Sun, GHA, Dec) and their positions (SHA, Dec) for each day (Sat, Sun, Mon).

Table with columns for stars (SHA, Dec) for each day (Sat, Sun, Mon).

Table with columns for Sun and Moon (GHA, Dec, SHA, ν, Dec, d, HP) for each day (Sat, Sun, Mon).

Table with columns for moonrise and moonset times (Lat, Sat, Moonrise, Moonset) for each day (Sat, Sun, Mon).

Table with columns for planets (Mon, GHA, Dec) and their positions (SHA, Dec) for each day (Sat, Sun, Mon).

Table with columns for stars (SHA, Dec) for each day (Sat, Sun, Mon).

Table with columns for Sun and Moon (GHA, Dec, SHA, ν, Dec, d, HP) for each day (Sat, Sun, Mon).

Table with columns for day, equation of time, meridian passage, moon phase, and age (Day, Eqn. of Time, Mer. Pass, Moon, Age).

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for twilight and sunrise/sunset times and rows for dates 0-23. Columns include Lat., Twilight, Sunrise, Sunset, Twilight.

Table with columns for Wed and Dec and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Moonrise and Moonset times and rows for dates 0-23. Columns include Lat., Moonrise, Moonset.

Table with columns for Thu and Dec and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Al Na'ir, Fomalhaut, Scheat, Markab, Apr 09 Tue, Apr 10 Wed, Apr 11 Thu, Horizontal parallax.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Moonrise and Moonset times and rows for dates 0-23. Columns include Day, Sun, Moon, Age.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Fri, Sat, Sun.

Table for Stars with columns for SHA and Dec, listing stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), and Moon (GHA, Dec, d, HP) for Fri, Sat, Sun.

Table for twilight and sunrise/sunset times with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.).

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for Sat, Sun, Mon.

Table for Stars with columns for SHA and Dec, listing stars like Denebola, Gienah, Acrux, etc.

Table for Sun and Moon with columns for Sat, Sun, and Moon (GHA, Dec, d, HP) for Sat, Sun, Mon.

Table for Moonrise and moonset times with columns for Lat., Moonrise (Fri, Sat, Sun), and Moonset (Fri, Sat, Sun).

Table with columns for planets (Sun, GHA, Dec) and their positions (GHA, Dec) for Sun, Mon, Tue.

Table for Stars with columns for SHA and Dec, listing stars like Apr 12 Fri, Apr 13 Sat, Apr 14 Sun.

Table for Sun and Moon with columns for Sun, Mon, and Moon (GHA, Dec, d, HP) for Sun, Mon, Tue.

Table for Day, Sun (Eqn. of Time, Mer. Pass), and Moon (Mer. Pass, Lower Mer. Pass, Age) for Sun, Mon, Tue.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for days 0-23.

Table for Stars with columns for Star Name, SHA, Dec, and Mer-pass.

Table for Sun and Moon with columns for h, Mon, GHA, Dec, GHA, v, Dec, d, HP.

Table for twilight and sunrise/sunset with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.).

Table with columns for planets (Tue, GHA, Dec) and their positions (GHA, Dec) for days 0-23.

Table for Stars with columns for Star Name, SHA, Dec, and Mer-pass.

Table for Sun and Moon with columns for Tue, GHA, Dec, GHA, v, Dec, d, HP.

Table for moonrise and moonset with columns for Lat., Moonrise (Mon, Tue, Wed), Moonset (Mon, Tue, Wed).

Table with columns for planets (Wed, GHA, Dec) and their positions (GHA, Dec) for days 0-23.

Table for Stars with columns for Star Name, SHA, Mer-pass, and Horizontal parallax.

Table for Sun and Moon with columns for Wed, GHA, Dec, GHA, v, Dec, d, HP.

Table for day length and moon phase with columns for Day, Eqn. of Time, Mer. Pass, Mer. Pass., Lower, Age.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their GHA, Dec, and Mer. pass. data.

Table for Stars with columns for SHA, Dec, and Mer. pass. data.

Table for Sun and Moon with columns for GHA, Dec, ν, Dec, d, HP.

Table for twilight and sunrise/sunset data with columns for Lat., Naat., Civil, Sunrise, Sunset, Civil, Naat.

Table with columns for planets (Fri, GHA, Dec) and their GHA, Dec, and Mer. pass. data.

Table for Stars with columns for SHA, Dec, and Mer. pass. data.

Table for Sun and Moon with columns for GHA, Dec, ν, Dec, d, HP.

Table for Moonset data with columns for Lat., Thu, Moonrise, Fri, Sat, Thu, Moonset, Fri, Sat.

Table with columns for planets (Sat, GHA, Dec) and their GHA, Dec, and Mer. pass. data.

Table for Stars with columns for SHA, Mer. pass. data.

Table for Sun and Moon with columns for GHA, Dec, ν, Dec, d, HP.

Table for Moonset data with columns for Day, Eqn. of Time, Sun, Mer. Pass, Moon, Age.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Contains planetary data for days 0-23.

Table with columns for Stars, SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table with columns for Sun, Moon, h, Sun, Moon and sub-columns for GHA, Dec, GHA, v, Dec, d, HP. Contains data for Sun and Moon positions.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and sub-columns for Naut., Civil, Sunris, Sunset, Civil, Naut. Contains twilight and sunrise/sunset data.

Table with columns for Mon, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Contains planetary data for days 0-23.

Table with columns for Stars, SHA, Dec. Lists stars like Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, etc.

Table with columns for Mon, GHA, Dec, GHA, v, Dec, d, HP. Contains data for Moon positions.

Table with columns for Lat., Sun, Moonrise, Moonset and sub-columns for Sun, Moonrise, Moonset, Sun, Moonset, Tue. Contains moonrise/moonset data.

Table with columns for Tue, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Contains planetary data for days 0-23.

Table with columns for Stars, SHA, Mer-pass. Lists stars like Apr 21 Sun, Apr 22 Mon, Apr 23 Tue and their meridian passages.

Table with columns for Tue, GHA, Dec, GHA, v, Dec, d, HP. Contains data for Moon positions.

Table with columns for Day, Sun, Mer., Moon, Age and sub-columns for Eqn. of Time, 12h, Mer. Pass, Upper, Lower, Age. Contains moon phase and age data.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Wed, Thu, Fri.

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, d, HP) for Wed, Thu, Fri.

Table for twilight and sunrise/sunset times (Lat., Naught, Civil, Sunrise, Sunset, Civil, Naught).

Table with columns for planets (GHA, Dec) for Thu, Fri, and Mer. pass. times.

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acrux, etc.

Table for Sun and Moon (GHA, Dec, d, HP) for Thu, Fri, and Mer. pass. times.

Table for Moonrise and moonset times (Lat., Wed, Thu, Fri, Moonset, Moonrise).

Table with columns for planets (GHA, Dec) for Fri, and Mer. pass. times.

Table for Stars (SHA, Mer. pass) listing stars like Venus, Mars, Jupiter, Saturn.

Table for Sun and Moon (GHA, Dec, d, HP) for Fri, and Mer. pass. times.

Table for Moonrise and moonset times (Day, Eqn. of Time, Mer. Pass, Upper, Lower, Age).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (SHA, Dec) for each day (Sat, Sun, Mon).

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Mirfak, Aldebaran, Rigel, Capella, Bellatrix, Elnath, Alnilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alphard, Regulus, Dubhe, Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menken, Arcturus, Rigel Kent, Kochab, Zubayr, Alphecca, Antares, Atria, Shabik, Sshaula, Rasalhague, Eitanin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table for Sun and Moon (GHA, Dec, SHA, Dec, GHA, Dec, d, HP) for each day (Sat, Sun, Mon).

Table for twilight and sunrise/sunset times (Lat., Naught, Civil, Sunrise, Sunset, Civil, Twilight, Naught) for various latitudes.

Table with columns for planets (Sun, GHA, Dec) and their positions (GHA, Dec) for each day (Sat, Sun, Mon).

Table for Stars (SHA, Dec) listing stars like Dubhe, Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menken, Arcturus, Rigel Kent, Kochab, Zubayr, Alphecca, Antares, Atria, Shabik, Sshaula, Rasalhague, Eitanin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table for Sun and Moon (GHA, Dec, GHA, Dec, d, HP) for each day (Sat, Sun, Mon).

Table for Moonrise and Moonset times (Lat., Sat, Moonrise, Mon, Sat, Moonset, Mon) for various latitudes.

Table with columns for planets (Mon, GHA, Dec) and their positions (GHA, Dec) for each day (Sat, Sun, Mon).

Table for Stars (SHA, Mer-pass) listing stars like Venus, Mars, Jupiter, Saturn for specific dates (Apr 27 Sat, Apr 28 Sun, Apr 29 Mon).

Table for Sun and Moon (GHA, Dec, GHA, Dec, d, HP) for each day (Mon, Sat, Sun, Mon).

Table for Moonrise and Moonset times (Day, Eqn.of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age 19-21 91-76%) for various days.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Stars and rows for various star names like Alpheratz, Ankaa, Schedar, etc. Columns include SHA and Dec.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, Dec, d, HP.

Table with columns for twilight and sunrise/sunset times and rows for dates 0-23. Columns include Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.

Table with columns for Wed and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for various star names like Dubhe, Denebola, Genah, etc. Columns include SHA and Dec.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, Dec, d, HP.

Table with columns for Moonset and rows for dates 0-23. Columns include Lat., Tue, Moonrise, Wed, Thu, Moonset, Wed, Thu.

Table with columns for Thu and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Apr 30 Tue, May 01 Wed, May 02 Thu and rows for Venus, Mars, Jupiter, Saturn. Columns include SHA, Mer-pass, SHA, Mer-pass, SHA, Mer-pass.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, Dec, d, HP.

Table with columns for Day, Sun, and Moon and rows for dates 0-23. Columns include Day, Eqn. of Time, 12h, Mer. Pass, Upper, Lower, Age, 22-24%.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Sun, GHA, Dec and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Sun, GHA, Dec and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Stars, SHA, Dec and rows for various star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars, SHA, Dec and rows for various star names like Denebola, Gienah, Acrux, etc.

Table with columns for Stars, SHA, Mer. pass. and rows for dates May 03, 04, 05. Includes horizontal parallax data.

Table with columns for Sun, Moon, h, GHA, Dec, ν, d, HP and rows for dates 0-23. Includes SD and d values.

Table with columns for Sun, Moon, h, GHA, Dec, ν, d, HP and rows for dates 0-23. Includes SD and d values.

Table with columns for Sun, Moon, h, GHA, Dec, ν, d, HP and rows for dates 0-23. Includes SD and d values.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for various latitudes (N 72, N 70, etc.).

Table with columns for Lat., Moonrise, Moonset and rows for various latitudes (N 72, N 70, etc.).

Table with columns for Day, Eqn. of Time, Mer. Pass, Moon Mer. Pass, Age and rows for dates 03, 04, 05.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Includes rows for various celestial objects and a Mer. pass. row.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values.

Table with columns for Twilight, Sunrise, Sunset, Twilight and sub-columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut. Includes a moon phase icon.

Table with columns for Tue and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. row.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Deneb, Gienah, Acrux, etc.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values.

Table with columns for Moonset and sub-columns for Lat., Mon, Tue, Wed, Mon, Tue, Wed. Includes moon phase icons.

Table with columns for Wed and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. row.

Table with columns for Stars and sub-columns for SHA, Mer. pass. Lists stars like May 06 Mon, May 07 Tue, May 08 Wed.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values.

Table with columns for Sun and Moon and sub-columns for Eqn. of Time, Mer. Pass, Mer. Pass, Age. Includes moon phase icon.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer. pass. data.

Table with columns for Stars and rows for SHA and Dec data.

Table with columns for Sun and Moon and rows for GHA, Dec, ν, d, HP data.

Table with columns for twilight and sunrise/sunset data.

Table with columns for Fri and rows for GHA, Dec, ν, d, HP data.

Table with columns for Stars and rows for SHA and Dec data.

Table with columns for Sun and Moon and rows for GHA, Dec, ν, d, HP data.

Table with columns for Moonset and rows for GHA, Dec, ν, d, HP data.

Table with columns for Sat and rows for GHA, Dec, ν, d, HP data.

Table with columns for Stars and rows for SHA and Dec data.

Table with columns for Sun and Moon and rows for GHA, Dec, ν, d, HP data.

Table with columns for Moonset and rows for GHA, Dec, ν, d, HP data.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Includes rows for celestial objects and Mer. pass. data.

Table with columns for Mon, GHA, Dec, SHA, Dec, GHA, Dec, GHA, Dec. Includes rows for celestial objects and Mer. pass. data.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes rows for celestial objects and Mer. pass. data.

Table with columns for Stars, SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars, SHA, Dec. Lists stars like Deneb, Gienah, Acrux, etc.

Table with columns for Stars, SHA, Mer. pass. Lists stars like Venus, Mars, Jupiter, Saturn for specific dates.

Table with columns for Sun, Moon, GHA, Dec, GHA, ν, Dec, d, HP. Includes rows for Sun and Moon data.

Table with columns for Mon, GHA, Dec, GHA, ν, Dec, d, HP. Includes rows for Moon data.

Table with columns for Tue, GHA, Dec, GHA, ν, Dec, d, HP. Includes rows for Moon data.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Includes rows for various latitudes.

Table with columns for Lat., Sun, Moonrise, Tue, Sun, Moonset, Tue. Includes rows for various latitudes.

Table with columns for Day, Eqn. of Time, 12h, Mer. Pass., Upper, Lower, Age. Includes rows for specific days.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Wed, Thu, Fri.

Table for Stars with columns for Star Name, SHA, Dec, and Mer-pass.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for Wed, Thu, Fri.

Table for Twilight with columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Thu, Fri, Sat.

Table for Stars with columns for Star Name, SHA, Dec, and Mer-pass.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for Thu, Fri, Sat.

Table for Moonset with columns for Lat., Wed, Moonrise, Fri, Wed, Moonset, Thu, Fri.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Fri, Sat, Sun.

Table for Stars with columns for Star Name, SHA, Mer-pass.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for Fri, Sat, Sun.

Table for Moonset with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Lower, Upper, Age).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Sat, Sun, Mon).

Table for Stars with columns for Star Name, SHA, Dec, and Mer. pass.

Table for Sun and Moon with columns for Sun/Moon Name, GHA, Dec, SHA, ν, Dec, d, HP.

Table for Twilight and Sunrise/Sunset with columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.

Table with columns for planets (Sun, GHA, Dec) and their positions (GHA, Dec) for each day (Sun, Mon, Tue).

Table for Stars with columns for Star Name, SHA, Dec, and Mer. pass.

Table for Sun and Moon with columns for Sun/Moon Name, GHA, Dec, SHA, ν, Dec, d, HP.

Table for Twilight and Sunrise/Sunset with columns for Lat., Sat, Moonrise, Moonset, Sun, Mon.

Table with columns for planets (Mon, GHA, Dec) and their positions (GHA, Dec) for each day (Mon, Tue, Wed).

Table for Stars with columns for Star Name, SHA, Mer. pass, and Horizontal parallax.

Table for Sun and Moon with columns for Sun/Moon Name, GHA, Dec, SHA, ν, Dec, d, HP.

Table for Twilight and Sunrise/Sunset with columns for Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Wed, GHA, Dec and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Thu, GHA, Dec and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Stars, SHA, Dec and rows for stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars, SHA, Dec and rows for stars like Denebola, Genah, Acru, etc.

Table with columns for Stars, SHA, Mer. pass and rows for dates May 21, 22, 23. Includes SHA, Mer. pass, and Horizontal parallax data.

Table with columns for Sun, Moon, GHA, Dec, ν, d, HP and rows for dates 0-23. Includes GHA, Dec, ν, d, HP, and SD data.

Table with columns for Sun, Moon, GHA, Dec, ν, d, HP and rows for dates 0-23. Includes GHA, Dec, ν, d, HP, and SD data.

Table with columns for Sun, Moon, GHA, Dec, ν, d, HP and rows for dates 0-23. Includes GHA, Dec, ν, d, HP, and SD data.

Table with columns for Lat., Twilight, Sunrise, Sunset, and rows for latitudes N 72° to S 60°.

Table with columns for Lat., Moonrise, Moonset, and rows for latitudes N 72° to S 60°.

Table with columns for Day, Sun, Moon, and rows for dates 21-23. Includes Sun, Moon, and Age data.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (0-23).

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table with columns for Sun, GHA, Dec, and their positions (GHA, Dec) for each day (0-23).

Table with columns for Stars (SHA, Dec) and their positions (SHA, Dec) for each day (0-23).

Table with columns for Stars (SHA, Dec) and their positions (SHA, Dec) for each day (0-23).

Table with columns for Stars (SHA, Dec) and their positions (SHA, Dec) for each day (0-23).

Table with columns for Sun and Moon (GHA, Dec, GHA, Dec, d, HP) for each day (0-23).

Table with columns for Sun and Moon (GHA, Dec, GHA, Dec, d, HP) for each day (0-23).

Table with columns for Sun and Moon (GHA, Dec, GHA, Dec, d, HP) for each day (0-23).

Table with columns for Twilight (Naut., Civil, Sunrise, Sunset, Civil, Twilight) for various latitudes (N 72° to S 60°).

Table with columns for Moonrise (Fri, Sat, Sun) and Moonset (Fri, Sat, Sun) for various latitudes (N 72° to S 60°).

Table with columns for Sun (Eqn. of Time, Mer. Pass) and Moon (Upper/Lower Mer. Pass, Age) for various days (24-26).

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Tue and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Wed and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, etc. Includes SHA and Dec.

Table with columns for Stars and rows for names like Denebola, Gienah, Acrux, etc. Includes SHA and Dec.

Table with columns for Stars and rows for dates May 27, 28, 29. Includes SHA, Mer. pass, and Horizontal parallax.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, SHA, ν, Dec, d, HP.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, SHA, ν, Dec, d, HP.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, SHA, ν, Dec, d, HP.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for dates 0-23. Includes Naut., Civil, and Naut. data.

Table with columns for Lat., Moonrise, Moonset and rows for dates 0-23. Includes Mon, Tue, Wed, and Moonset data.

Table with columns for Day, Sun, Mer. Pass, Moon and rows for dates 27-29. Includes Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, and Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer. pass. data.

Table with columns for Stars and rows for SHA, Dec, and Mer. pass. data.

Table with columns for Sun and Moon and rows for GHA, Dec, ν, Dec, d, HP and SD data.

Table with columns for Twilight, Sunrise, Sunset, and Twilight and rows for Lat., Naup., Civil, Sunrise, Sunset, Civil, Naup. data.

Table with columns for Fri and rows for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec, Mer. pass. data.

Table with columns for Stars and rows for SHA, Dec, and Mer. pass. data.

Table with columns for Sun and Moon and rows for GHA, Dec, ν, Dec, d, HP and SD data.

Table with columns for Moonrise and Moonset and rows for Lat., Thu, Moonrise, Sat, Thu, Moonset, Sat data.

Table with columns for Sat and rows for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec, Mer. pass. data.

Table with columns for Stars and rows for SHA, Mer. pass. data.

Table with columns for Sun and Moon and rows for GHA, Dec, ν, Dec, d, HP and SD data.

Table with columns for Sun and Moon and rows for Day, Eqn. of Time, Mer. Pass, Upper, Lower, Age data.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Sun, Mon, Tue).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, GHA, ν, Dec, d, HP) showing positions for each day.

Table for twilight and sunrise/sunset times (Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.) for various latitudes.

Table with columns for planets (Mercury, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Mon, Tue).

Table for Stars (SHA, Dec) listing stars like Dubhe, Denebola, Genah, etc.

Table for Sun and Moon (GHA, Dec, GHA, ν, Dec, d, HP) showing positions for each day.

Table for twilight and sunrise/sunset times (Lat., Sun, Moonrise, Tue, Sun, Moonset, Tue) for various latitudes.

Table with columns for planets (Mercury, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Tue, Wed, Thu, Fri, Sat, Sun).

Table for Stars (SHA, Dec) listing stars like Jun 02 Sun, Jun 03 Mon, Jun 04 Tue, and Horizontal parallax.

Table for Sun and Moon (GHA, Dec, GHA, ν, Dec, d, HP) showing positions for each day.

Table for twilight and sunrise/sunset times (Day, Eqn. of Time, Mer. Pass, Mer. Pass, Age) for various latitudes.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Wed, Thu, Fri.

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, GHA, ν, Dec, d, HP) for Wed, Thu, Fri.

Table for twilight and sunrise/sunset times (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Thu, Fri, Sat.

Table for Stars (SHA, Dec) listing stars like Dubhe, Denebola, Genah, etc.

Table for Sun and Moon (GHA, Dec, GHA, ν, Dec, d, HP) for Thu, Fri, Sat.

Table for twilight and sunrise/sunset times (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Fri, Sat, Sun.

Table for Stars (SHA, Dec) listing stars like Jun 05 Wed, Jun 05 Thu, Jun 07 Fri, etc.

Table for Sun and Moon (GHA, Dec, GHA, ν, Dec, d, HP) for Fri, Sat, Sun.

Table for twilight and sunrise/sunset times (Day, Eqn. of Time, Mer. Pass, Mer. Pass, Age) for various days.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (SHA, Dec) for each day (Sat, Sun, Mon).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, SHA, Dec, d, HP) showing their positions and distances.

Table for twilight and sunrise/sunset times (Lat, Naut., Civil, Sunrise, Sunset, Civil, Naut.) for various latitudes.

Table with columns for planets (Sun, GHA, Dec) and their positions (SHA, Dec) for each day (Sat, Sun, Mon).

Table for Stars (SHA, Dec) listing stars like Dubhe, Denebola, Geniah, etc.

Table for Sun and Moon (GHA, Dec, SHA, Dec, d, HP) showing their positions and distances.

Table for twilight and sunrise/sunset times (Lat, Sat, Moonrise, Moonset) for various latitudes.

Table with columns for planets (Mon, GHA, Dec) and their positions (SHA, Dec) for each day (Mon, Tue, Wed, Thu, Fri, Sat, Sun, Mon).

Table for Stars (SHA, Dec) listing stars like Jun 08 Sat, Jun 09 Sun, Jun 10 Mon.

Table for Sun and Moon (GHA, Dec, SHA, Dec, d, HP) showing their positions and distances.

Table for twilight and sunrise/sunset times (Day, Sun, Moon) for various latitudes.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for days 0-23.

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for days 0-23.

Table for twilight and sunrise/sunset times (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes.

Table with columns for planets (Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec) for days 0-23.

Table for Stars (SHA, Dec) listing stars like Dubhe, Denebola, Genah, etc.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for days 0-23.

Table for Moonrise and Moonset times (Lat., Tue, Moonrise, Thu, Tue, Moonset, Thu) for various latitudes.

Table with columns for planets (Thu, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec) for days 0-23.

Table for Stars (SHA, Dec, Mer-pass) listing stars like Jun 11 Tue, Jun 12 Wed, Jun 13 Thu.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for days 0-23.

Table for Moonrise and Moonset times (Day, Eqn. of Time, Mer. Pass, Mer. Pass, Lower, Age) for various days.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Stars (SHA, Dec) and rows for stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars (SHA, Dec) and rows for stars like Deneb, Gienah, Acrux, etc.

Table with columns for Stars (SHA, Dec) and rows for stars like Venus, Mars, Jupiter, Saturn, and horizontal parallax.

Table with columns for Sun and Moon (GHA, Dec, ν, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Sun and Moon (GHA, Dec, ν, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Sun and Moon (GHA, Dec, ν, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.) and rows for latitudes N 72° to S 60°.

Table with columns for Lat., Moonrise (Fri, Sat, Sun), Moonset (Fri, Sat, Sun) and rows for latitudes N 72° to S 60°.

Table with columns for Day, Sun (Eqn of Time, Mer. Pass), Moon (Mer. Pass, Age 8-10) and rows for days 14, 15, 16.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer.pass. data.

Table with columns for Stars and rows for SHA, Dec, and Mer.pass. data.

Table with columns for Sun and Moon and rows for GHA, Dec, ν, Dec, d, HP and SD data.

Table with columns for twilight and sunrise/sunset data, including Lat., Naut., Civil, Sunrise, Sunset, Civil, and Naut.

Table with columns for Tue and rows for GHA, Dec, Mer.pass. data.

Table with columns for Stars and rows for SHA, Dec, and Mer.pass. data.

Table with columns for Sun and Moon and rows for GHA, Dec, ν, Dec, d, HP and SD data.

Table with columns for Moonrise and Moonset data, including Lat., Mon, Tue, Wed, Mon, Tue, Wed.

Table with columns for Wed and rows for GHA, Dec, Mer.pass. data.

Table with columns for Stars and rows for SHA, Mer.pass, and Horizontal parallax data.

Table with columns for Sun and Moon and rows for GHA, Dec, ν, Dec, d, HP and SD data.

Table with columns for Day, Sun, and Moon data, including Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, and Age.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table with columns for planets (Fri) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table with columns for planets (Sat) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Mirfak, Aldebaran, Rigel, Capella, Bellatrix, Elmath, Alnilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alpherat, Regulus, Dubhe, Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkhar, Arcturus, Rigel Kent, Kochab, Zubeh ubi, Alphecca, Antares, Attra, Sabik, Shaula, Rasalhague, Eitanin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table for Stars (SHA, Dec) listing stars like Jun 20 Thu, Jun 21 Fri, Jun 22 Sat, and Horizontal parallax for Venus and Mars.

Table for Sun and Moon (h, Sun, Moon) with columns for GHA, Dec, ν, Dec, d, HP for days 0-23. Includes SD and d values at the bottom.

Table for Sun and Moon (Fri) with columns for GHA, Dec, ν, Dec, d, HP for days 0-23. Includes SD and d values at the bottom.

Table for Sun and Moon (Sat) with columns for GHA, Dec, ν, Dec, d, HP for days 0-23. Includes SD and d values at the bottom.

Table for twilight and sunrise/sunset data (Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for various latitudes (N 72° to S 60°).

Table for Moonrise and Moonset data (Lat., Thu, Moonrise, Fri, Sat, Thu, Moonset, Fri, Sat) for various latitudes (N 72° to S 60°).

Table for Sun and Moon (Day) with columns for Sun (Eqn. of Time, Mer. Pass) and Moon (Mer. Pass, Age) for days 20-22.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer. pass. values.

Table with columns for Stars, SHA, Dec, and Mer. pass. values for various stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun, Moon, GHA, Dec, and HP values for the Sun and Moon.

Table with columns for Lat., Twilight, Sunrise, Sunset, and Twilight values for various latitudes.

Table with columns for Mon, GHA, Dec, and Mer. pass. values for the Moon.

Table with columns for Stars, SHA, Dec, and Mer. pass. values for stars like Denebola, Gienah, Acrux, etc.

Table with columns for Mon, GHA, Dec, and HP values for the Moon.

Table with columns for Lat., Moonrise, Moonset, and Twilight values for various latitudes.

Table with columns for Tue, GHA, Dec, and Mer. pass. values for the Moon.

Table with columns for Stars, SHA, Mer. pass. values for stars like Jun 23 Sun, Jun 24 Mon, Jun 25 Tue.

Table with columns for Tue, GHA, Dec, and HP values for the Moon.

Table with columns for Day, Sun, Mer., Moon, and Age values for the day.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Wed, Thu, Fri.

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for Wed, Thu, Fri.

Table for twilight and sunrise/sunset times (Lat, Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for various latitudes.

Table with columns for planets (GHA, Dec) for Thu, Fri, and Mer. pass. times.

Table for Stars (SHA, Dec) listing stars like Deneb, Geniah, Acrux, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for Thu, Fri, and Mer. pass. times.

Table for twilight and sunrise/sunset times (Lat, Wed, Moonrise, Fri, Wed, Moonset, Thu, Fri) for various latitudes.

Table with columns for planets (GHA, Dec) for Fri, and Mer. pass. times.

Table for Stars (SHA, Mer. pass) listing stars like Jun 26 Ven, Jun 27 Thu, Jun 28 Fri, and Horizontal parallax.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for Fri, and Mer. pass. times.

Table for twilight and sunrise/sunset times (Day, Sun Eqn. of Time, Mer. Pass, Moon Upper/Lower, Age) for various days.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for dates 0-23.

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for dates 0-23.

Table for twilight and sunrise/sunset times (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes.

Table with columns for planets (Sun, GHA, Dec) and their positions (GHA, Dec) for dates 0-23.

Table for Stars (SHA, Dec) listing stars like Dubhe, Denebola, Gienah, Acrux, Gacrux, etc.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for dates 0-23.

Table for moonrise and moonset times (Lat., Moonrise, Moonset) for various latitudes.

Table with columns for planets (Mon, GHA, Dec) and their positions (GHA, Dec) for dates 0-23.

Table for Stars (SHA, Dec, Mer-pass) listing stars like Jun 29 Sat, Jun 30 Sun, Jul 01 Mon, and Horizontal parallax.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for dates 0-23.

Table for sun and moon times (Day, Sun, Mer. Pass, Moon, Age) for dates 29-01.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Tue, Wed, Thu).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Wed, Thu, Fri).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Thu, Fri, Sat).

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table for Stars (SHA, Dec) listing stars like Alpherat, Regulat, Dubhe, Denebola, Gienah, Acru, etc.

Table for Stars (SHA, Dec) listing stars like Jul 02 Tue, Venus, Mars, Jupiter, Saturn, Jul 03 Wed, Venus, Mars, Jupiter, Saturn, etc.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for each day (Tue, Wed, Thu).

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for each day (Wed, Thu, Fri).

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for each day (Thu, Fri, Sat).

Table for Twilight and Sunrise/Sunset (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes.

Table for Moonrise and Moonset (Lat., Moonrise, Moonset) for various latitudes.

Table for Day, Sun, and Moon (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for each day.

Aries			Venus			Mars			Jupiter			Saturn		
Fri	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec		
0	283°28.9	169°45.5	N22°42.1	236°50.8	N16°32.9	215°59.5	N21°07.4	292°25.9	S06°02.0					
1	298°31.4	184°44.7	41.6	251°51.5	33.4	231°01.4	07.5	307°28.4	02.0					
2	313°33.9	199°43.9	41.2	266°52.1	33.9	246°03.3	07.6	322°30.0	02.0					
3	328°36.3	214°43.0	40.8	281°52.8	34.4	261°05.2	07.7	337°33.4	02.0					
4	343°38.8	229°42.2	40.4	296°53.5	34.9	276°07.1	07.8	352°35.8	02.1					
5	358°41.3	244°41.4	39.9	311°54.2	35.4	291°09.0	07.8	7°38.3	02.1					
6	13°43.7	259°40.5	N22°39.5	326°54.8	N16°35.9	306°10.9	N21°07.9	22°40.8	S06°02.2					
7	28°46.2	274°39.7	39.1	341°55.5	36.4	321°12.8	08.0	37°43.3	02.1					
8	43°48.7	289°38.9	38.7	356°56.2	36.9	336°14.7	08.1	52°45.8	02.1					
9	58°51.1	304°38.0	38.2	11°56.9	37.5	351°16.6	08.2	67°48.2	02.1					
10	73°53.6	319°37.2	37.8	26°57.6	38.0	366°18.5	08.3	82°50.7	02.2					
11	88°56.0	334°36.4	37.4	41°58.2	38.5	21°20.4	08.3	97°53.2	02.2					
12	103°58.5	349°35.5	N22°36.9	56°58.9	N16°39.0	36°22.3	N21°08.4	112°55.7	S06°02.2					
13	119°01.0	4°34.7	36.5	71°59.6	39.5	51°24.2	08.5	127°58.2	02.2					
14	134°03.4	19°33.9	36.1	87°00.3	40.0	66°26.1	08.6	143°00.6	02.2					
15	149°05.9	34°33.0	35.6	102°00.9	40.5	81°28.0	08.7	158°03.1	02.3					
16	164°08.4	49°32.2	35.2	117°01.6	41.0	96°29.9	08.7	173°05.6	02.3					
17	179°10.8	64°31.4	34.7	132°02.3	41.5	111°31.8	08.8	188°08.1	02.3					
18	194°13.3	79°30.5	N22°34.3	147°03.0	N16°42.0	126°33.7	N21°08.9	203°10.6	S06°02.3					
19	209°15.8	94°29.7	33.9	162°03.7	42.5	141°35.6	09.0	218°13.1	02.3					
20	224°18.2	109°28.9	33.4	177°04.3	43.0	156°37.5	09.1	233°15.5	02.4					
21	239°20.7	124°28.1	33.0	192°05.0	43.6	171°39.4	09.1	248°18.0	02.4					
22	254°23.2	139°27.2	32.5	207°05.7	44.1	186°41.3	09.2	263°20.5	02.4					
23	269°25.6	154°26.4	32.1	222°06.4	44.6	201°43.2	09.3	278°23.0	02.4					
Mer.pass: 05:05 ν -0.8' d-0.4' m-3.90 ν 0.7' d 0.5' m 0.96 ν 1.9' d 0.1' m-2.04 ν 2.5' d -0.0' m 0.89														

Sat	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	
0	284°28.1	169°25.6	N22°31.6	237°07.0	N16°45.1	216°45.1	N21°09.4	293°25.5	S06°02.4
1	299°30.0	184°24.8	31.2	252°07.7	45.6	231°47.0	09.5	308°28.0	02.5
2	314°33.5	199°23.9	30.7	267°08.4	46.1	246°48.9	09.6	323°30.4	02.5
3	329°35.5	214°23.1	30.3	282°09.1	46.6	261°50.8	09.6	338°32.9	02.5
4	344°37.9	229°22.3	29.8	297°09.8	47.1	276°52.7	09.7	353°35.4	02.5
5	359°40.4	244°21.4	29.4	312°10.4	47.6	291°54.6	09.8	8°37.9	02.5
6	14°42.9	259°20.6	N22°28.9	327°11.1	N16°48.1	306°56.5	N21°09.9	23°40.4	S06°02.6
7	29°45.3	274°19.8	28.5	342°11.8	48.6	321°58.4	10.0	38°42.9	02.6
8	44°47.8	289°19.0	28.0	357°12.5	49.1	337°00.3	10.0	53°45.4	02.6
9	59°50.3	304°18.2	27.6	12°13.1	49.6	352°02.2	10.1	68°47.8	02.6
10	74°52.7	319°17.3	27.1	27°13.8	50.1	7°04.1	10.2	83°50.3	02.6
11	89°55.2	334°16.5	26.6	42°14.5	50.6	22°06.0	10.3	98°52.8	02.7
12	104°57.7	349°15.7	N22°26.2	57°15.2	N16°51.1	37°07.9	N21°10.4	113°55.3	S06°02.7
13	120°00.1	4°14.9	25.7	72°15.8	51.6	52°09.8	10.4	128°58.8	02.7
14	135°02.6	19°14.0	25.2	87°16.5	52.1	67°11.7	10.5	144°00.3	02.7
15	150°05.0	34°13.2	24.8	102°17.2	52.6	82°13.6	10.6	159°02.8	02.7
16	165°07.5	49°12.4	24.3	117°17.9	53.1	97°15.5	10.7	174°05.2	02.8
17	180°10.0	64°11.6	23.9	132°18.6	53.6	112°17.4	10.8	189°07.7	02.8
18	195°12.4	79°10.8	N22°23.4	147°19.2	N16°54.1	127°19.3	N21°10.8	204°10.2	S06°02.8
19	210°14.9	94°09.9	22.9	162°19.9	54.6	142°21.2	10.9	219°12.7	02.8
20	225°17.4	109°09.1	22.4	177°20.6	55.1	157°23.2	11.0	234°15.2	02.8
21	240°19.8	124°08.3	22.0	192°21.3	55.6	172°25.1	11.1	249°17.7	02.9
22	255°22.3	139°07.5	21.5	207°21.9	56.1	187°27.0	11.2	264°20.2	02.9
23	270°24.8	154°06.7	21.0	222°22.6	56.6	202°28.9	11.2	279°22.7	02.9
Mer.pass: 05:01 ν -0.8' d-0.4' m-3.90 ν 0.7' d 0.5' m 0.95 ν 1.9' d 0.1' m-2.04 ν 2.5' d -0.0' m 0.88									

Sun	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	
0	285°27.2	169°05.8	N22°20.6	237°23.3	N16°57.1	217°30.8	N21°11.3	294°25.1	S06°02.9
1	300°29.7	184°05.0	20.1	252°24.0	57.6	232°32.7	11.4	309°27.6	02.9
2	315°32.2	199°04.2	19.6	267°24.7	58.1	247°34.6	11.5	324°30.1	03.0
3	330°34.6	214°03.4	19.1	282°25.3	58.6	262°36.5	11.6	339°32.6	03.0
4	345°37.1	229°02.6	18.6	297°26.0	59.1	277°38.4	11.6	354°35.1	03.0
5	360°39.5	244°01.8	18.2	312°26.7	59.6	292°40.3	11.7	9°37.6	03.0
6	15°42.0	259°00.9	N22°17.7	327°27.4	N17°00.1	307°42.2	N21°11.8	24°40.1	S06°03.1
7	30°44.5	274°00.1	17.2	342°28.0	00.6	322°44.1	11.9	39°42.6	03.1
8	45°46.9	289°58.3	16.7	357°28.7	01.1	337°46.0	11.9	54°45.0	03.1
9	60°49.4	305°58.5	16.2	12°29.4	01.6	352°47.9	12.0	69°47.5	03.1
10	75°51.9	318°57.7	15.7	27°30.1	02.1	7°49.8	12.1	84°50.0	03.1
11	90°54.3	333°56.9	15.3	42°30.7	02.6	22°51.7	12.2	99°52.5	03.2
12	105°56.8	348°56.1	N22°14.8	57°31.4	N17°03.1	37°53.6	N21°12.3	114°55.0	S06°03.2
13	120°59.3	3°55.2	14.3	72°32.1	03.6	52°55.5	12.3	129°56.3	03.2
14	136°01.7	18°54.4	13.8	87°32.8	04.1	67°57.4	12.4	145°00.0	03.2
15	151°04.2	33°53.6	13.3	102°33.5	04.6	82°59.4	12.5	160°02.5	03.3
16	166°06.7	48°52.8	12.8	117°34.1	05.1	98°01.3	12.6	175°05.0	03.3
17	181°09.1	63°52.0	12.3	132°34.8	05.5	113°03.2	12.7	190°07.5	03.3
18	196°11.6	78°51.2	N22°11.8	147°35.5	N17°06.0	128°05.1	N21°12.7	205°09.9	S06°03.3
19	211°14.0	93°50.4	11.3	162°36.2	06.5	143°07.0	12.8	220°12.4	03.3
20	226°16.5	108°49.6	10.8	177°36.8	07.0	158°08.9	12.9	235°14.9	03.4
21	241°19.0	123°48.8	10.3	192°37.5	07.5	173°10.8	13.0	250°17.4	03.4
22	256°21.4	138°47.9	09.8	207°38.2	08.0	188°12.7	13.1	265°19.9	03.4
23	271°23.9	153°47.1	09.3	222°38.9	08.5	203°14.6	13.1	280°22.4	03.4
Mer.pass: 04:57 ν -0.8' d-0.5' m-3.90 ν 0.7' d 0.5' m 0.95 ν 1.9' d 0.1' m-2.04 ν 2.5' d -0.0' m 0.88									

Stars	SHA	Dec
Alpheratz	357°35.1	29°13.4
Ankaa	353°07.5	-42°10.1
Schedar	349°31.5	56°40.0
Diphda	348°47.7	-17°51.0
Achernar	345°20.6	-57°06.4
Hamal	327°51.8	23°34.6
Polaris	314°30.5	89°21.8
Acamar	315°12.3	-40°12.2
Menkar	314°06.8	4°11.2
Mirfak	308°29.2	49°56.7
Aldebaran	290°40.4	16°35.5
Rigel	281°04.6	-8°10.3
Capella	280°23.0	46°01.3
Bellatrix	278°23.6	6°22.3
Elnath	278°02.8	28°37.7
Anilnial	275°38.5	-1°11.1
Betegeuse	270°52.9	7°24.7
Canopus	265°53.1	-52°42.4
Sirius	258°27.0	-16°44.9
Adhara	255°06.6	-29°02.0
Procyon	244°51.6	5°09.8
Pollux	243°18.2	27°58.1
Avior	234°15.5	-59°35.3
Suhail	222°47.0	-43°31.9
Miaplacidus	221°39.2	-69°49.2
Alphard	217°48.4	-8°45.9
Regulus	207°35.1	11°51.0
Dubhe	193°41.8	61°37.4
Denebola	182°25.5	14°26.2
Gienah	175°44.1	-17°40.7
Acrux	173°00.7	-63°14.4
Gacrux	171°52.2	-57°15.3
Alloth	166°13.3	55°49.9
Spica	158°22.7	-11°17.4
Alkaid	152°52.2	49°11.7
Hadar	148°36.4	-60°29.7
Menkent	147°48.0	-36°29.6
Arcturus	145°48.2	19°03.4
Rigel Kent.	139°40.6	-60°56.4
Kochab	137°19.2	74°03.5
Zuben'ubi	136°56.3	-16°08.7
Alphecca	126°03.9	26°29.2
Antares	112°16.0	-26°29.2
Atria	107°10.1	69°04.4
Sabik	102°02.9	-15°45.3
Shaula	96°10.5	37°07.3
Rasalhague	95°58.6	12°32.6
Eltanin	90°41.9	51°29.2
Kaus Aust.	83°32.7	34°22.4
Vega	80°33.1	38°48.4
Nunki	75°47.9	-26°15.9
Altair	62°00.0	8°56.0
Peacock	53°05.8	-56°39.2
Deneb	49°25.7	45°21.9
Enif	33°39.0	9°59.2
Al Na'ir	27°33.1	-46°50.3
Fomalhaut	15°14.8	-29°29.4
Scheat	13°45.4	28°12.8
Markab	13°30.2	15°20.2

Jul 05 Fri	SHA	Mer.pass
Venus	246°16.6	12:42
Mars	313°21.8	08:12
Jupiter	292°30.5	09:35
Saturn	8°57.0	04:30

Jul 06 Sat	SHA	Mer.pass
Venus	244°57.5	12:43
Mars	312°39.0	08:11
Jupiter	292°17.0	09:32
Saturn	8°57.4	04:26

Jul 07 Sun	SHA	Mer.pass
Venus	243°38.6	12:44
Mars	311°56.1	08:10
Jupiter	292°03.5	09:29
Saturn	8°57.9	04:22

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Table with columns for Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Table with columns for Stars, SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars, SHA, Dec. Lists stars like Dubhe, Denebola, Gienah, etc.

Table with columns for Stars, SHA, Mer. pass. Lists stars like Jul 08 Mon, Jul 09 Tue, Jul 10 Wed.

Table with columns for Sun, Moon, h, GHA, Dec, GHA, Dec, d, HP. Includes SD and d values.

Table with columns for Sun, Moon, Tue, GHA, Dec, GHA, Dec, d, HP. Includes SD and d values.

Table with columns for Sun, Moon, Wed, GHA, Dec, GHA, Dec, d, HP. Includes SD and d values.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight. Includes N 72°, N 70°, S 10°, S 60°.

Table with columns for Lat., Moonrise, Moonset. Includes N 72°, N 70°, 68°, 66°, 64°, 62°, 60°, 58°, 56°, 54°, 52°.

Table with columns for Day, Eqn. of Time, Mer. Pass, Mer. Pass., Age. Includes a moon phase icon.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Thu, Fri, Sat).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, ν, Dec, d, HP) for each day (Thu, Fri, Sat).

Table for twilight and sunrise/sunset times (Lat, Naup, Civil, Sunrise, Sunset, Civil, Naup) for various latitudes.

Table with columns for planets (Fri, GHA, Dec) and their positions (GHA, Dec) for each day (Fri, Sat).

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acruus, etc.

Table for Sun and Moon (GHA, Dec, ν, Dec, d, HP) for each day (Fri, Sat).

Table for Moonset times (Lat, Moonrise, Moonset) for various latitudes.

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (Sat).

Table for Stars (SHA, Dec) listing stars like Al Na'ir, Fomalhaut, Scheat, etc.

Table for Sun and Moon (GHA, Dec, ν, Dec, d, HP) for each day (Sat).

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper, Lower, Age) for various days.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

Table with columns for Stars, SHA, Dec. Rows 0-23 listing stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun, Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Rows 0-23.

Table with columns for Mon, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

Table with columns for Stars, SHA, Dec. Rows 0-23 listing stars like Dubhe, Denebola, Gienah, etc.

Table with columns for Moon, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns for Lat., Moonrise, Moonset, Sun, Moon. Rows 0-23.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

Table with columns for Stars, SHA, Mer-pass. Rows 0-23 listing stars like Venus, Mars, Jupiter, Saturn.

Table with columns for Sun, Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns for Day, Sun (Eqn. of Time, 00h, 12h, mm:ss), Mer. Pass (hh:mm), Moon (Upper, Lower, hh:mm), Age (9-11, 50-69%). Rows 0-23.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their GHA, Dec, and Mer. pass. data.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their GHA, Dec, and Mer. pass. data.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their GHA, Dec, and Mer. pass. data.

Table with columns for stars (SHA, Dec) and names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for stars (SHA, Dec) and names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for stars (SHA, Dec) and names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon (GHA, Dec, GHA, ν, Dec, d, HP) and SD values.

Table with columns for Sun and Moon (GHA, Dec, GHA, ν, Dec, d, HP) and SD values.

Table with columns for Sun and Moon (GHA, Dec, GHA, ν, Dec, d, HP) and SD values.

Table with columns for twilight and sunrise/sunset data (Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.).

Table with columns for moon phase data (Lat., Wed, Moonrise, Thu, Fri, Moonset, Thu, Fri).

Table with columns for day, sun, and moon data (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Sat, Sun, Mon).

Table with columns for planets (Sun, GHA, Dec) and their positions (GHA, Dec) for each day (Sat, Sun, Mon).

Table with columns for planets (Mon, GHA, Dec) and their positions (GHA, Dec) for each day (Sat, Sun, Mon).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Stars (SHA, Dec) listing various stars like Dubhe, Denebola, Gienah, etc.

Table for Stars (SHA, Dec) listing various stars like Jul 20 Sat, Jul 21 Sun, Jul 22 Mon, and Horizontal parallax.

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for each day (Sat, Sun, Mon).

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for each day (Sat, Sun, Mon).

Table for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) for each day (Sat, Sun, Mon).

Table for Twilight (Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for various latitudes.

Table for Moonrise (Lat., Sat, Moonrise, Mon, Sat, Moonset, Mon) for various latitudes.

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for various days.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer. pass. data.

Table with columns for Stars and rows for SHA, Dec, and Mer. pass. data.

Table with columns for Sun and Moon and rows for GHA, Dec, GHA, v, Dec, d, HP.

Table with columns for Twilight, Sunrise, Sunset, and Twilight and rows for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.

Table with columns for Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for SHA, Dec, and Mer. pass. data.

Table with columns for Sun and Moon and rows for GHA, Dec, GHA, v, Dec, d, HP.

Table with columns for Moonset and rows for Lat., Tue, Moonset, Thu, Tue, Moonset, Thu.

Table with columns for Thu, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for SHA, Mer. pass, and Horizontal parallax.

Table with columns for Sun and Moon and rows for GHA, Dec, GHA, v, Dec, d, HP.

Table with columns for Moonset and rows for Day, Sun, Mer., Moon, Age.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Fri, Sat, Sun).

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (Sat, Sun).

Table with columns for planets (Sun, GHA, Dec) and their positions (GHA, Dec) for each day (Sun).

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acruus, Gacrux, Alioth, Spica, Alkaid, Hadar, Menken, Arcturus, Rigel, Kochab, Zuben'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus, Vega, Nunki, Altair, Peacock, Deneb, Enif, Al'Na'ir, Fomalhaut, Scheat, Markab.

Table for Stars (SHA, Dec) listing stars like Al'Na'ir, Fomalhaut, Scheat, Markab, and other stars with their positions.

Table for Sun and Moon (h, Sun, Moon) showing positions (GHA, Dec) and other parameters (ν, d, HP) for each day (Fri, Sat, Sun).

Table for Sun and Moon (h, Sun, Moon) showing positions (GHA, Dec) and other parameters (ν, d, HP) for each day (Sat, Sun).

Table for Sun and Moon (h, Sun, Moon) showing positions (GHA, Dec) and other parameters (ν, d, HP) for each day (Sun).

Table for Twilight and Sunrise/Sunset (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes (N 72°, N 70°, 66°, 64°, 62°, 60°, N 58°, 56°, 54°, 52°, N 40°, N 30°, N 10°, S 10°, 20°, 30°, 35°, 40°, 45°, S 50°, 52°, 54°, 56°, 58°, S 60°).

Table for Moonset (Lat., Moonset) for various latitudes (N 72°, 68°, 66°, 64°, 62°, N 58°, 56°, 54°, 52°, N 40°, 30°, 20°, N 10°, S 10°, 20°, 30°, S 40°, 45°, S 50°, 52°, 54°, S 60°).

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for various days (26, 27, 28).

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Table with columns for Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Table for Stars with columns for SHA, Dec, SHA, Dec, SHA, Dec, SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table for Stars with columns for SHA, Dec, SHA, Dec, SHA, Dec, SHA, Dec. Lists stars like Dubhe, Denebola, Gienah, etc.

Table for Moon with columns for SHA, Mer. pass, Venus, Mars, Jupiter, Saturn. Includes dates Jul 29, 30, 31.

Table for Horizontal parallax with columns for Venus, Mars.

Table for Sun and Moon with columns for h, Sun (GHA, Dec, GHA, ν, Dec, d, HP), Moon (GHA, ν, Dec, d, HP). Includes SD and d values.

Table for Sun and Moon with columns for Tue, GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values.

Table for Sun and Moon with columns for Wed, GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values.

Table for Twilight and Sunrise/Sunset with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.).

Table for Moonset with columns for Lat., Moon (Mon, Tue, Wed), Moonset (Mon, Tue, Wed).

Table for Day with columns for Day, Eqn. of Time (00h, 12h), Mer. Pass (hh:mm), Upper/Lower Mer. Pass (hh:mm), Age (19:10, 24:26, 40:20%).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their GHA, Dec, and Mer. pass. values.

Table for Stars with columns for Star name, SHA, Dec, and Mer. pass.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP), and SD values.

Table for twilight and sunrise/sunset with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.).

Table with columns for Fri and planets (GHA, Dec) and Mer. pass. values.

Table for Stars with columns for Star name, SHA, Dec, and Mer. pass.

Table for Sun and Moon with columns for Fri, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP), and SD values.

Table for twilight and sunrise/sunset with columns for Lat., Moonrise, Moonset, and Moonset (Fri, Sat).

Table with columns for Sat and planets (GHA, Dec) and Mer. pass. values.

Table for Stars with columns for Star name, SHA, Mer. pass, and Horizontal parallax.

Table for Sun and Moon with columns for Sat, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP), and SD values.

Table for twilight and sunrise/sunset with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Lower), and Age.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA and Dec. Rows 0-23 showing celestial coordinates.

Table for Stars with columns: SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon with columns: h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP). Rows 0-23.

Table for twilight and sunrise/sunset with columns: Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Rows 0-23.

Table with columns: Mon, GHA, Dec. Rows 0-23 showing celestial coordinates for Monday.

Table for Stars with columns: SHA, Dec. Lists stars like Denebola, Genah, Acrux, etc.

Table for Sun and Moon with columns: Mon, GHA, Dec, Moon (GHA, ν, Dec, d, HP). Rows 0-23.

Table for twilight and sunrise/sunset with columns: Lat., Sun, Moonrise, Moonset, Sunrise, Sunset. Rows 0-23.

Table with columns: Tue, GHA, Dec. Rows 0-23 showing celestial coordinates for Tuesday.

Table for Stars with columns: SHA, Mer-pass. Lists stars like Aug 04 Sun, Aug 05 Mon, Aug 06 Tue.

Table for Sun and Moon with columns: Tue, GHA, Dec, Moon (GHA, ν, Dec, d, HP). Rows 0-23.

Table for twilight and sunrise/sunset with columns: Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Age). Rows 0-23.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Wed, Thu, Fri).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Thu, Fri, Sat).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Fri, Sat, Sun).

Table for Stars with columns for Star Name, SHA, Dec, and magnitude.

Table for Stars with columns for Star Name, SHA, Dec, and magnitude.

Table for Stars with columns for Star Name, SHA, Dec, and magnitude.

Table for Sun and Moon with columns for GHA, Dec, GHA, v, Dec, d, HP.

Table for Sun and Moon with columns for GHA, Dec, GHA, v, Dec, d, HP.

Table for Sun and Moon with columns for GHA, Dec, GHA, v, Dec, d, HP.

Table for Twilight and Sunrise/Sunset with columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.

Table for Moonset with columns for Lat., Wed, Moonrise, Fri, Wed, Moonset, Thu, Fri.

Table for Day with columns for Day, Sun (Eqn. of Time, 00°, 12°, mm:ss), Mer. Pass (hh:mm), Moon (Mer. Pass, Upper, Lower, Age 3-5, 6-18%).

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, and other astronomical data.

Table for Stars with columns: SHA, Dec, and other astronomical data.

Table for Sun and Moon with columns: h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP).

Table for twilight and sunrise/sunset with columns: Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.

Table with columns for planets: Sun, GHA, Dec, and other astronomical data.

Table for Stars with columns: SHA, Dec, and other astronomical data.

Table for Sun and Moon with columns: Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP).

Table for twilight and sunrise/sunset with columns: Lat., Sat, Moonrise, Mon, Sat, Moonset, Mon.

Table with columns for planets: Mon, GHA, Dec, and other astronomical data.

Table for Stars with columns: SHA, Mer. pass, and other astronomical data.

Table for Sun and Moon with columns: Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP).

Table for twilight and sunrise/sunset with columns: Day, Eqn. of Time, Sun (00h, 12h), Mer. Pass, Moon (Upper, Lower), Age (6-8, 26-44%).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Tue, Wed, Thu).

Table for Stars with columns for Star Name, SHA, Dec, and magnitude.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP).

Table for twilight and sunrise/sunset times with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Wed, Thu, Fri).

Table for Stars with columns for Star Name, SHA, Dec, and magnitude.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP).

Table for Moonrise and moonset times with columns for Lat., Moonrise (Tue, Wed, Thu), Moonset (Tue, Wed, Thu).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Thu, Fri, Sat).

Table for Stars with columns for Star Name, SHA, Mer. pass, and magnitude.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP).

Table for Day with columns for Day, Eqn.of Time (00h, 12h), Mer. Pass (hh:mm), Upper Mer. Pass (hh:mm), Lower Mer. Pass (hh:mm), and Age (9-11, 54-73%).

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, d, HP.

Table with columns for Twilight, Sunrise, Sunset, and Twilight. Rows include dates and times for various locations.

Table with columns for GHA, Dec and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Stars and rows for names like Dubhe, Denebola, Genah, Acru, Gacrux, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Moonrise, Moonset and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Sun, GHA, Dec and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Stars and rows for names like Aug 16 Fri, Aug 17 Sat, Aug 18 Sun, and Horizontal parallax.

Table with columns for Sun and Moon and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Day, Sun, Mer. Pass, Moon, and Age. Rows include dates and times.

Planetary data table for Aries, Venus, Mars, Jupiter, Saturn. Columns include Mon, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Planetary data table for Aries, Venus, Mars, Jupiter, Saturn. Columns include Tue, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Planetary data table for Aries, Venus, Mars, Jupiter, Saturn. Columns include Wed, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Stars table with columns: Name, SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Stars table with columns: Name, SHA, Mer. pass. Lists stars like Denebola, Genah, Acru, etc.

Stars table with columns: Name, SHA, Mer. pass. Lists stars like Aug 19 Mon, Aug 20 Tue, Aug 21 Wed, and Horizontal parallax.

Sun and Moon data table with columns: h, Mon, GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values at the bottom.

Sun and Moon data table with columns: Tue, GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values at the bottom.

Sun and Moon data table with columns: Wed, GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values at the bottom.

Twilight and Sunrise/Sunset data table with columns: Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut. Includes N 72°, N 60°, N 58°, N 40°, N 10°, S 10°, S 60°.

Moonrise and Moonset data table with columns: Lat., Mon, Moonrise, Tue, Wed, Mon, Moonset, Tue, Wed. Includes N 72°, N 70°, N 68°, N 66°, N 64°, N 62°, N 58°, N 56°, N 54°, N 52°, N 50°, N 40°, N 30°, N 10°, S 10°, S 60°.

Day, Sun, and Moon data table with columns: Day, Eqn. of Time, Sun 00h, 12h, Mer. Pass, Mer. Pass, Upper, Lower, Age. Includes data for days 19, 20, 21.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Thu, Fri, Sat).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, ν, Dec, d, HP) for each day (Thu, Fri, Sat).

Table for twilight and sunrise/sunset times (Lat., Naught, Civil, Sunrise, Sunset, Civil, Naught).

Table with columns for planets (Fri, GHA, Dec) and their positions (GHA, Dec) for each day (Fri, Sat).

Table for Stars (SHA, Dec) listing stars like Dubhe, Denebola, Geniah, etc.

Table for Sun and Moon (GHA, Dec, ν, Dec, d, HP) for each day (Fri, Sat).

Table for Moonset times (Lat., Moonrise, Moonset) for each day (Fri, Sat).

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (Sat).

Table for Stars (SHA, Dec, Mer-pass) listing stars like Aug 22 Thu, Aug 23 Fri, Aug 24 Sat.

Table for Sun and Moon (GHA, Dec, ν, Dec, d, HP) for each day (Sat).

Table for Moonset times (Day, Sun Eqn of Time, Mer. Pass, Moon Mer. Pass, Age) for each day (Sat).

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA and Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Stars: SHA, Dec. Rows listing star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon: GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing positions of the Sun and Moon.

Table with columns for twilight and sunrise/sunset: Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Rows 0-45 showing twilight data for various latitudes.

Table with columns for planets: GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Stars: SHA, Dec. Rows listing star names like Denebola, Genah, Acrux, etc.

Table with columns for Sun and Moon: GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing positions of the Sun and Moon.

Table with columns for Moonrise and Moonset: Lat., Moonrise (Sun, Mon, Tue), Moonset (Sun, Mon, Tue). Rows 0-45 showing moonrise and moonset data.

Table with columns for planets: GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Stars: SHA, Mer-pass. Rows listing star names like Aug 25 Sun, Venus, Mars, etc.

Table with columns for Sun and Moon: GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing positions of the Sun and Moon.

Table with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Age). Rows 25-27 showing specific day data.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, and magnitude. Rows 0-23.

Table for Stars with columns: SHA, Dec, magnitude. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon with columns: h, Sun (GHA, Dec, magnitude), Moon (GHA, ν, Dec, d, HP). Rows 0-23.

Table for twilight and sunrise/sunset with columns: Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Rows 0-23.

Table with columns: Thu, GHA, Dec, magnitude. Rows 0-23.

Table for Stars with columns: SHA, Dec, magnitude. Lists stars like Denebola, Geniah, Acrux, etc.

Table for Sun and Moon with columns: Thu, Sun (GHA, Dec, magnitude), Moon (GHA, ν, Dec, d, HP). Rows 0-23.

Table for twilight and sunrise/sunset with columns: Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Rows 0-23.

Table with columns: Fri, GHA, Dec, magnitude. Rows 0-23.

Table for Stars with columns: SHA, Mer.pass, magnitude. Lists stars like Aug 28 Wed, Aug 29 Thu, Aug 30 Fri.

Table for Sun and Moon with columns: Fri, Sun (GHA, Dec, magnitude), Moon (GHA, ν, Dec, d, HP). Rows 0-23.

Table for twilight and sunrise/sunset with columns: Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Age). Rows 0-23.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, SHA, Dec. Rows 0-23.

Table with columns: Stars, SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns: Sun, Moon. Sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns: Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Rows 0-23.

Table with columns: Sun, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

Table with columns: Stars, SHA, Dec. Lists stars like Denebola, Gienah, Acrux, etc.

Table with columns: Sun, Moon. Sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns: Lat., Moonrise (Sun, Mon), Moonset (Sat, Sun, Mon). Includes checkboxes for visibility.

Table with columns: Mon, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

Table with columns: Aug 31 Sat, Sep 01 Sun, Sep 02 Mon. Sub-columns for SHA, Mer.pass, SHA, Mer.pass, SHA, Mer.pass.

Table with columns: Mon, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns: Day, Sun (Eqn. of Time, 12h, Mer. Pass), Moon (Mer. Pass, Upper, Lower, Age 9-1%).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Tue, Wed, Thu).

Table for Stars with columns for Star Name, SHA, Dec, and Mer. pass.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d), and HP.

Table for Twilight and Sunrise/Sunset with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.).

Table with columns for planets (Wed, GHA, Dec) and their positions (GHA, Dec) for each day (Wed, Thu, Fri).

Table for Stars with columns for Star Name, SHA, Dec, and Mer. pass.

Table for Sun and Moon with columns for Wed, Sun (GHA, Dec), Moon (GHA, ν, Dec, d), and HP.

Table for Twilight and Sunrise/Sunset with columns for Lat., Moonrise, Moonset, and Twilight.

Table with columns for planets (Thu, GHA, Dec) and their positions (GHA, Dec) for each day (Thu, Fri, Sat).

Table for Stars with columns for Star Name, SHA, Mer. pass, and Horizontal parallax.

Table for Sun and Moon with columns for Thu, Sun (GHA, Dec), Moon (GHA, ν, Dec, d), and HP.

Table for Twilight and Sunrise/Sunset with columns for Day, Sun (Eqn. of Time, Mer. Pass), and Moon (Mer. Pass, Age).

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Fri, Sat, Sun).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for each day (Fri, Sat, Sun).

Table for twilight and sunrise/sunset times (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes.

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (Sat, Sun).

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acrux, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for each day (Sat, Sun).

Table for Moon phases (Lat., Moonrise, Moonset) for various latitudes.

Table with columns for planets (Sun, GHA, Dec) and their positions (GHA, Dec) for each day (Sun).

Table for Stars (SHA, Dec, Mer-pass) listing stars like Sep 06 Fri, Sep 07 Sat, Sep 08 Sun.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for each day (Sun).

Table for Day (Day, Eqn.of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for each day.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (0-23).

Table for Stars with columns for Star Name, SHA, Dec, and magnitude.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for each day.

Table for twilight and sunrise/sunset with columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.

Table with columns for planets (Tue, GHA, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table for Stars with columns for Star Name, SHA, Dec, and magnitude.

Table for Sun and Moon with columns for Tue, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for each day.

Table for Moonrise and Moonset with columns for Lat., Moonrise (Mon, Tue, Wed), Moonset (Mon, Tue, Wed).

Table with columns for planets (Wed, GHA, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table for Stars with columns for Star Name, SHA, Mer.pass, and magnitude.

Table for Sun and Moon with columns for Wed, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP) for each day.

Table for Day with columns for Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age 6-8, 28-47%.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, and Mer. pass. Data rows for each planet.

Table with columns for planets: Fri, GHA, Dec, Mer. pass. Data rows for each planet.

Table with columns for planets: Sat, GHA, Dec, Mer. pass. Data rows for each planet.

Table with columns for Stars: SHA, Dec, Mer. pass. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon: h, GHA, Dec, GHA, Dec, d, HP. Data for Sun and Moon positions.

Table with columns for Sun and Moon: Fri, GHA, Dec, GHA, Dec, d, HP. Data for Sun and Moon positions.

Table with columns for Sun and Moon: Sat, GHA, Dec, GHA, Dec, d, HP. Data for Sun and Moon positions.

Table with columns for twilight: Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut. Data for various latitudes.

Table with columns for Moonrise: Lat., Thu, Fri, Sat, Thu, Fri, Sat. Data for moonrise times.

Table with columns for Day: Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age. Data for day-specific astronomical events.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, SHA, Dec, and Mer.pass. values.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc. Includes SHA and Dec values.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, GHA, v, Dec, d, HP values.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for dates 0-23. Includes Naut., Civil, Sunrise, Sunset, Civil, Naut. values.

Table with columns for Mon, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer.pass. values.

Table with columns for Stars and rows for names like Denebola, Genah, Acrux, Gacrux, Alioth, Spica, Alkaid, etc. Includes SHA and Dec values.

Table with columns for Moon and rows for dates 0-23. Includes GHA, Dec, GHA, v, Dec, d, HP values.

Table with columns for Lat., Moonrise, Moonset and rows for dates 0-23. Includes Sun, Moonrise, Tue, Sun, Moonset, Tue values.

Table with columns for Tue, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer.pass. values.

Table with columns for Stars and rows for names like Sep 15 Sun, Sep 16 Mon, Sep 17 Tue and rows for names like Venus, Mars, Jupiter, Saturn. Includes SHA, Mer.pass. values.

Table with columns for Moon and rows for dates 0-23. Includes GHA, Dec, GHA, v, Dec, d, HP values.

Table with columns for Day, Sun, Mer., Moon, Age and rows for dates 15, 16, 17. Includes Eqn. of Time, Pass, Upper, Lower, Age values.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, and Mer. pass. Data rows for days 0-23.

Table for Stars with columns: SHA, Dec, Mer. pass. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon with columns: h, GHA, Dec, GHA, ν, Dec, d, HP. Data rows for days 0-23.

Table for twilight and sunrise/sunset with columns: Lat., Naat., Civil, Sunrise, Sunset, Civil, Twilight, Naat. Data rows for days 0-23.

Table with columns: Thu, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Data rows for days 0-23.

Table for Stars with columns: SHA, Dec, Mer. pass. Lists stars like Denebola, Geniah, Acrux, etc.

Table for Sun and Moon with columns: Thu, GHA, Dec, GHA, ν, Dec, d, HP. Data rows for days 0-23.

Table for twilight and sunrise/sunset with columns: Lat., Wed, Moonrise, Fri, Wed, Moonset, Fri. Data rows for days 0-23.

Table with columns: Fri, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Data rows for days 0-23.

Table for Stars with columns: SHA, Mer. pass. Lists stars like Sep 18 Ven, Sep 19 Thu, Sep 20 Fri.

Table for Sun and Moon with columns: Fri, GHA, Dec, GHA, ν, Dec, d, HP. Data rows for days 0-23.

Table for twilight and sunrise/sunset with columns: Day, Sun Eqn. of Time, Mer. Pass, Moon Mer. Pass, Age. Data rows for days 18-20.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Stars, SHA, Dec, Mer.pass. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun, Moon, h, GHA, Dec, GHA, v, Dec, d, HP. Rows 0-23 showing Sun and Moon positions.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Rows 0-45 showing twilight times for various latitudes.

Table with columns for Sun, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing Sun coordinates.

Table with columns for Stars, SHA, Dec, Mer.pass. Lists stars like Denebola, Gienah, Acrux, etc.

Table with columns for Sun, Moon, h, GHA, Dec, GHA, v, Dec, d, HP. Rows 0-23 showing Sun and Moon positions.

Table with columns for Lat., Moonrise, Moonset, Moon Sun, Moon Mon. Rows 0-60 showing moon phases and times.

Table with columns for Mon, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing Moon coordinates.

Table with columns for Stars, SHA, Mer.pass. Lists stars like Sep 21 Sat, Venus, Mars, etc.

Table with columns for Mon, GHA, Dec, GHA, v, Dec, d, HP. Rows 0-23 showing Moon coordinates.

Table with columns for Day, Eqn.of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age. Rows 21-23 showing time and age data.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data for Venus, Mars, Jupiter, Saturn.

Table with columns for Thu, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data for Venus, Mars, Jupiter, Saturn.

Table with columns for Stars, SHA, Dec, Mer. pass. Lists stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table with columns for Stars, SHA, Dec, Mer. pass. Lists stars like Al Na'ir, Fomalhaut, Scheat, Markab, and includes Horizontal parallax data.

Table with columns for Sun, Moon, GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values for Sun and Moon.

Table with columns for Wed, GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values for Sun and Moon.

Table with columns for Thu, GHA, Dec, GHA, ν, Dec, d, HP. Includes SD and d values for Sun and Moon.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Includes twilight times for various latitudes.

Table with columns for Lat., Moonrise, Moonset, Moonrise, Moonset. Includes moon phase indicators and times for various latitudes.

Table with columns for Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age. Includes a moon phase icon.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (Fri, Sat, Sun).

Table for Stars (SHA, Dec) listing various stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Mirfak, Aldebaran, Rigel, Capella, Bellatrix, El Nath, Alnilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alphan, Regul, Dubhe, Denebola, Genah, Acru, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigil Kent, Kochab, Zuben ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table for Sun and Moon (h, Sun, Moon) with columns for GHA, Dec, GHA, ν, Dec, d, HP.

Table for twilight and sunrise/sunset times (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes.

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (Sat, Sun).

Table for Stars (SHA, Dec) listing stars like Denebola, Genah, Acru, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigil Kent, Kochab, Zuben ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table for Sun and Moon (Sat, Sun, Moon) with columns for GHA, Dec, GHA, ν, Dec, d, HP.

Table for moonrise and moonset times (Lat., Moonrise, Moonset) for various latitudes.

Table with columns for planets (Sun, GHA, Dec) and their positions (GHA, Dec) for each day (Sun).

Table for Stars (SHA, Dec) listing stars like Sep 27 Fri, Sep 28 Sat, Sep 29 Sun, and Horizontal parallax for Venus and Mars.

Table for Sun and Moon (Sun, Moon) with columns for GHA, Dec, GHA, ν, Dec, d, HP.

Table for Day (Day, Eqn. of Time, Mer. Pass, Moon) with columns for Day, Eqn. of Time, Mer. Pass, Moon, Age.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, and other astronomical data.

Table for Stars with columns: SHA, Dec, and names of stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon with columns: h, Sun (GHA, Dec), Moon (GHA, ν, Dec, d, HP).

Table for twilight and sunrise/sunset with columns: Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.).

Table with columns: Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Multiple columns for astronomical data.

Table for Stars with columns: SHA, Dec, and names of stars like Denebola, Gienah, Acrux, etc.

Table for Sun and Moon with columns: Tue, GHA, Dec, GHA, ν, Dec, d, HP.

Table for twilight and sunrise/sunset with columns: Lat., Moonrise, Moonset, and other astronomical data.

Table with columns: Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Multiple columns for astronomical data.

Table for Stars with columns: SHA, Mer.pass, and names of stars like Sep 30 Mon, Venus, Mars, etc.

Table for Sun and Moon with columns: Wed, GHA, Dec, GHA, ν, Dec, d, HP.

Table for twilight and sunrise/sunset with columns: Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Age, 7-1%), and other astronomical data.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and Mer.pass.

Table with columns for Stars (SHA, Dec) and rows for stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table with columns for Sun and Moon (h, GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for twilight (Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.) and rows for various latitudes from 72°N to 60°S.

Table with columns for Fri (GHA, Dec) and rows for dates 0-23. Includes Mer.pass.

Table with columns for Stars (SHA, Dec) and rows for stars like Alpheratz, Denebola, Gienah, Acru, Gacrux, etc.

Table with columns for Moon (GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Moonrise (Lat., Thu, Moonrise, Fri, Sat, Thu, Moonset, Fri, Sat) and rows for various latitudes from 72°N to 60°S.

Table with columns for Sat (GHA, Dec) and rows for dates 0-23. Includes Mer.pass.

Table with columns for Stars (SHA, Dec, Mer-pass) and rows for stars like Oct 04 Thu, Venus, Mars, Jupiter, Saturn, Oct 04 Fri, Venus, Mars, Jupiter, Saturn, Oct 05 Sat, Venus, Mars, Jupiter, Saturn, and Horizontal parallax.

Table with columns for Moon (GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Day (Day, Eqn.of Time, Mer. Pass, Upper Mer.Pass., Lower Mer.Pass., Age) and rows for dates 03, 04, 05.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Rows 0-23.

Table with columns for Mon, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

Table with columns for Stars, SHA, Dec, Mer.pass. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun, Moon, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns for Mon, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns for Tue, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight. Rows 72°N to 60°S.

Table with columns for Lat., Moonrise, Moonset. Rows 72°N to 60°S.

Table with columns for Day, Sun, Mer. Pass, Moon, Age. Rows 06-08.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for Wed, Thu, Fri.

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for Wed, Thu, Fri.

Table for twilight and sunrise/sunset times (Lat, Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for various latitudes.

Table with columns for planets (GHA, Dec) for Thu, Fri, and Mer. pass times.

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, etc.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for Thu, Fri, and Mer. pass times.

Table for Moonrise and Moonset times (Lat, Wed, Moonrise, Fri, Wed, Moonset, Fri) for various latitudes.

Table with columns for planets (GHA, Dec) for Fri, and Mer. pass times.

Table for Stars (SHA, Dec, Mer. pass) listing stars like Oct 09 Ven, Oct 10 Thu, Oct 11 Fri, and Horizontal parallax.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for Fri, and Mer. pass times.

Table for Day, Sun (Eqn. of Time, Mer. Pass, Upper, Lower), and Moon (Age, 7-9, 32-52%) for various days.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Stars and rows for stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Mirfak, Aldebaran, Rigel, Capella, Bellatrix, Elnath, Anilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alpherat, Regulus, Dubhe, Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel Kent, Kochab, Zuben ul, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eitannin, Kaus Aest, Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for twilight and sunrise/sunset and rows for dates 0-23. Columns include Lat., Naat., Civil, Sunrise, Sunset, Civil, Naat., and a moon phase icon.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Stars and rows for stars like Alpherat, Regulus, Dubhe, Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel Kent, Kochab, Zuben ul, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eitannin, Kaus Aest, Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for twilight and sunrise/sunset and rows for dates 0-23. Columns include Lat., Sat, Moonrise, Mon, Sat, Moonset, Mon.

Table with columns for Mon and Dec and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Oct 12 Sat, Oct 13 Sun, Oct 13 Sun, Oct 14 Mon and rows for stars like Venus, Mars, Jupiter, Saturn.

Table with columns for Mon and Dec and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age and rows for dates 12-14.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Stars (SHA, Dec) and rows for various star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon (GHA, Dec, ν, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Twilight (Naut., Civil, Sunrise, Sunset, Civil, Naut.) and rows for dates 0-23. Includes latitude and time data.

Table with columns for Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Stars (SHA, Dec) and rows for various star names like Dubhe, Denebola, Gienah, etc.

Table with columns for Sun and Moon (GHA, Dec, ν, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Moonset (Lat., Tue, Moonrise, Thu, Tue, Moonset, Thu) and rows for dates 0-23. Includes latitude and time data.

Table with columns for Thu, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer. pass. data.

Table with columns for Stars (SHA, Mer. pass) and rows for dates Oct 15, 16, 17. Includes star names like Venus, Mars, Jupiter, Saturn.

Table with columns for Sun and Moon (GHA, Dec, ν, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Age) and rows for dates 15-17. Includes time and age data.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (0-23).

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table with columns for Sun, GHA, Dec and their positions (GHA, Dec) for each day (0-23).

Table for Stars (SHA, Dec) listing stars like Alpheratz, Ankaa, Schedar, etc.

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, AcruX, etc.

Table for Stars (SHA, Dec) listing stars like Oct 18 Fri, Oct 19 Sat, Oct 20 Sun, and Horizontal parallax.

Table for Sun and Moon (GHA, Dec, ν, d, HP) for each day (0-23).

Table for Sun and Moon (GHA, Dec, ν, d, HP) for each day (0-23).

Table for Sun and Moon (GHA, Dec, ν, d, HP) for each day (0-23).

Table for Twilight (Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for various latitudes.

Table for Moonrise and Moonset (Lat., Fri, Sunrise, Sun, Fri, Moonset, Sun) for various latitudes.

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for various days.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer. pass. data.

Table with columns for Tue, GHA, Dec, Mer. pass. data.

Table with columns for Wed, GHA, Dec, Mer. pass. data.

Table with columns for Stars, SHA, Dec, Mer. pass. data.

Table with columns for Stars, SHA, Dec, Mer. pass. data.

Table with columns for Stars, SHA, Dec, Mer. pass. data.

Table with columns for Sun, Moon, GHA, Dec, HP data.

Table with columns for Sun, Moon, GHA, Dec, HP data.

Table with columns for Sun, Moon, GHA, Dec, HP data.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for various latitudes.

Table with columns for Lat., Moonrise, Moonset and rows for various latitudes.

Table with columns for Day, Sun, Mer., Moon, Age and rows for various days.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer. pass. values for various celestial objects.

Table with columns for Stars, SHA, Dec, and Mer. pass. values for stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun, Moon, GHA, Dec, ν, Dec, d, HP and rows for Sun and Moon data.

Table with columns for Lat., Twilight, Sunrise, Sunset, and rows for twilight and sunrise/sunset times for various latitudes.

Table with columns for Fri, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for Friday's celestial data.

Table with columns for Stars, SHA, Dec, and Mer. pass. values for stars like Denebola, Gienah, Acru, etc.

Table with columns for Sun, Moon, GHA, Dec, ν, Dec, d, HP and rows for Sun and Moon data for Friday.

Table with columns for Lat., Moonrise, Moonset and rows for moonrise and moonset times for various latitudes.

Table with columns for Sat, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for Saturday's celestial data.

Table with columns for Stars, SHA, Mer. pass. and rows for Saturday's star data.

Table with columns for Sun, Moon, GHA, Dec, ν, Dec, d, HP and rows for Sun and Moon data for Saturday.

Table with columns for Day, Sun, Mer. Pass, Moon, and Age and rows for daily solar and lunar data.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Mon, GHA, Dec and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Tue, GHA, Dec and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Stars, SHA, Dec, and Mer. pass. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Oct 27 Sun, Venus, Mars, Jupiter, Saturn, SHA, Mer. pass.

Table with columns for Oct 28 Mon, Venus, Mars, Jupiter, Saturn, SHA, Mer. pass.

Table with columns for Oct 29 Tue, Venus, Mars, Jupiter, Saturn, SHA, Mer. pass.

Table with columns for Horizontal parallax, Venus, Mars.

Table with columns for Sun, Moon, GHA, Dec, SHA, Dec, d, HP and rows for dates 0-23.

Table with columns for Mon, GHA, Dec, GHA, Dec, d, HP and rows for dates 0-23.

Table with columns for Tue, GHA, Dec, GHA, Dec, d, HP and rows for dates 0-23.

Table with columns for Sun, Moon, GHA, Dec, SHA, Dec, d, HP and rows for dates 0-23.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for dates 0-23.

Table with columns for Lat., Moonrise, Moonset and rows for dates 0-23.

Table with columns for Day, Sun, Mer. Pass, Moon, Age and rows for dates 27-29.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, etc. Columns include SHA and Dec.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, Dec, d, HP.

Table with columns for twilight and sunrise/sunset data and rows for latitudes from N 72° to S 60°.

Table with columns for Thu and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, etc. Columns include SHA and Dec.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, Dec, d, HP.

Table with columns for Moonrise and Moonset data and rows for latitudes from N 72° to S 60°.

Table with columns for Fri and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Oct 30 Wed, Oct 31 Thu, Nov 01 Fri. Columns include SHA, Mer.pass, SHA, Mer.pass.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, Dec, d, HP.

Table with columns for Day, Sun, and Moon data and rows for dates 30, 31, 01. Columns include Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing positions.

Table with columns for Twilight and Sunrise/Sunset and sub-columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut. Rows 70°N to 60°S.

Table with columns for Sun and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing positions.

Table with columns for Stars and sub-columns for SHA, Dec. Lists stars like Denebola, Genah, Acru, etc.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing positions.

Table with columns for Moonrise and Moonset and sub-columns for Lat., Sat, Sun, Mon, Sat, Sun, Mon. Rows 70°N to 60°S.

Table with columns for Mon and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing positions.

Table with columns for Nov 02 Sat, Nov 03 Sun, Nov 04 Mon and sub-columns for SHA, Mer-pass, SHA, Mer-pass, SHA, Mer-pass. Lists planetary events.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing positions.

Table with columns for Day, Sun, Moon and sub-columns for Eqn. of Time, Mer. Pass, Mer. Pass, Age. Includes a moon phase icon.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions (GHA, Dec) for each day (0-23).

Table for Stars with columns for Star Name, SHA, Dec, and Mer. Pass.

Table for Sun and Moon with columns for h, GHA, Dec, GHA, v, Dec, d, HP.

Table for twilight and sunrise/sunset with columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.

Table with columns for Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table for Stars with columns for Star Name, SHA, Dec, and Mer. Pass.

Table for Sun and Moon with columns for Wed, GHA, Dec, GHA, v, Dec, d, HP.

Table for Moonrise and Moonset with columns for Lat., Tue, Moonrise, Wed, Thu, Moonset, Thu.

Table with columns for Thu, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table for Stars with columns for Star Name, SHA, Mer. Pass, and Horizontal Parallax.

Table for Sun and Moon with columns for Thu, GHA, Dec, GHA, v, Dec, d, HP.

Table for Moonrise and Moonset with columns for Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and Mer.pass.

Table with columns for Sat and rows for dates 0-23. Columns include GHA, Dec, and Mer.pass.

Table with columns for Sun and rows for dates 0-23. Columns include GHA, Dec, and Mer.pass.

Table with columns for Stars (SHA, Dec) and rows for various star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Nov 08 Fri (SHA, Mer-pass) and rows for Venus, Mars, Jupiter, Saturn.

Table with columns for Nov 09 Sat (SHA, Mer-pass) and rows for Venus, Mars, Jupiter, Saturn.

Table with columns for Nov 10 Sun (SHA, Mer-pass) and rows for Venus, Mars, Jupiter, Saturn.

Table with columns for Horizontal parallax (Venus, Mars) and values.

Table with columns for Sun and Moon (GHA, Dec, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Sun and Moon (GHA, Dec, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Sun and Moon (GHA, Dec, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.) and rows for various latitudes.

Table with columns for Lat., Moonset (Fri, Sat, Sun), and Moonset (Fri, Sat, Sun) and rows for various latitudes.

Table with columns for Day, Eqn.of Time, Mer. Pass, Upper Mer.Pass, Lower Mer.Pass, and Age 7-9 37-58% and rows for dates 08-10.

Table with columns for planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA, Dec, SHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns: Tue, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns: Wed, GHA, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns: Stars, SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns: Stars, SHA, Dec. Lists stars like Denebola, Genah, Acrux, etc.

Table with columns: Stars, SHA, Mer. pass. Lists stars like Nov 11 Mon, Nov 12 Tue, Nov 13 Wed.

Table with columns: Sun, Moon, h, Mon, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing Sun and Moon positions.

Table with columns: Sun, Moon, Tue, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing Sun and Moon positions.

Table with columns: Sun, Moon, Wed, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing Sun and Moon positions.

Table with columns: Lat., Twilight, Sunrise, Sunset, Twilight. Rows 0-23 showing twilight and sunrise/sunset times.

Table with columns: Lat., Moonrise, Moonset. Rows 0-23 showing moonrise and moonset times.

Table with columns: Day, Sun, Mer. Pass, Moon, Age. Rows 11-13 showing Sun and Moon data.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer. pass. data for various celestial objects.

Table with columns for Fri and rows for GHA, Dec, and Mer. pass. data for various celestial objects.

Table with columns for Sat and rows for GHA, Dec, and Mer. pass. data for various celestial objects.

Table with columns for Stars and rows for SHA, Dec, and Mer. pass. data for various stars.

Table with columns for Nov 14 Thu, Nov 15 Fri, and Nov 16 Sat, and rows for SHA, Mer. pass, and Mer. pass data for various stars.

Table with columns for Horizontal parallax and rows for Venus and Mars data.

Table with columns for Sun and Moon and rows for h, GHA, Dec, GHA, ν, Dec, d, HP data for various celestial objects.

Table with columns for Fri and rows for GHA, Dec, GHA, ν, Dec, d, HP data for various celestial objects.

Table with columns for Sat and rows for GHA, Dec, GHA, ν, Dec, d, HP data for various celestial objects.

Table with columns for Lat., Twilight, Sunrise, Sunset, and rows for various celestial objects and times.

Table with columns for Lat., Moonrise, Moonset, and rows for various celestial objects and times.

Table with columns for Day, Eqn.of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, and Age 13-15 95-100%.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer.pass. data.

Table with columns for Stars, SHA, Dec and rows for stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Miraf, Aldebaran, Rigel, Capella, Bellatrix, Elmath, Alnilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alpherat, Regulat, Dubhe, Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel Kent., Kochab, Zuben'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aua, Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun, Moon, h, Sun, Moon and rows for dates 0-23. Includes GHA, Dec, SHA, ν, Dec, d, HP data.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for latitudes N 72° to S 60°.

Table with columns for Mon, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer.pass. data.

Table with columns for Stars, SHA, Dec, Mer-pass and rows for stars like Nov 17 Sun, Venus, Mars, Jupiter, Saturn, Nov 18 Mon, Venus, Mars, Jupiter, Saturn, Nov 19 Tue, Venus, Mars, Jupiter, Saturn, Horizontal parallax.

Table with columns for Mon, GHA, Dec, GHA, ν, Dec, d, HP and rows for dates 0-23. Includes Mer-pass data.

Table with columns for Lat., Sun, Moonrise, Moonset, Sun, Moonset, Tue and rows for latitudes N 72° to S 60°.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer.pass. data.

Table with columns for Stars, SHA, Dec, Mer-pass and rows for stars like Nov 17 Sun, Venus, Mars, Jupiter, Saturn, Nov 18 Mon, Venus, Mars, Jupiter, Saturn, Nov 19 Tue, Venus, Mars, Jupiter, Saturn, Horizontal parallax.

Table with columns for Tue, GHA, Dec, GHA, ν, Dec, d, HP and rows for dates 0-23. Includes Mer-pass data.

Table with columns for Day, Sun, Mer., Moon, Age and rows for dates 17-19. Includes Mer. Pass, Upper, Lower, Age data.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and Mer.pass. values.

Table with columns for Stars (SHA, Dec) and rows for various star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun (GHA, Dec) and Moon (GHA, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for twilight and sunrise/sunset times (Naut., Civil, Sunrise, Sunset, Civil, Naut.) and rows for dates 0-23.

Table with columns for Thu, GHA, Dec and rows for dates 0-23. Includes Mer.pass. values.

Table with columns for Stars (SHA, Dec) and rows for various star names like Dubhe, Denebola, Gienah, etc.

Table with columns for Sun (GHA, Dec) and Moon (GHA, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Moonset times (Wed, Thu, Fri) and rows for dates 0-23.

Table with columns for Fri, GHA, Dec and rows for dates 0-23. Includes Mer.pass. values.

Table with columns for Nov 20 Wed, Nov 21 Thu, Nov 22 Fri (SHA, Mer.pass) and Horizontal parallax (Venus, Mars).

Table with columns for Sun (GHA, Dec) and Moon (GHA, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Moonset times (Wed, Thu, Fri) and rows for dates 0-23.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, etc. Columns include SHA and Dec.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, Dec, d, HP.

Table with columns for twilight and sunrise/sunset data and rows for dates 0-23. Columns include Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.

Table with columns for Sun and Dec and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Dubhe, Denebola, Geniah, etc. Columns include SHA and Dec.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Moonrise and Moonset data and rows for dates 0-23. Columns include Lat., Sat, Moonrise, Mon, Sat, Moonset, Mon.

Table with columns for Mon and Dec and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Nov 23 Sat, Nov 24 Sun, Nov 25 Mon. Columns include SHA, Mer. pass.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Moonrise and Moonset data and rows for dates 0-23. Columns include Day, Sun, Mer. Pass, Moon, Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for twilight and sunrise/sunset data and rows for dates 0-23. Includes Lat., Naat., Civil, Sunrise, Sunset, Civil, Naat.

Table with columns for Wed and Dec and rows for dates 0-23. Includes GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Dubhe, Denebola, Gienah, Acrux, Gacrux, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Moonset and rows for dates 0-23. Includes Lat., Tue, Moonrise, Wed, Thu, Moonset, Wed, Thu.

Table with columns for Thu and Dec and rows for dates 0-23. Includes GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Nov 26 Tue, Nov 27 Wed, Nov 28 Thu, and Horizontal parallax.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, GHA, ν, Dec, d, HP.

Table with columns for Day, Sun, and Moon and rows for dates 26-28. Includes Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer.pass. values.

Table with columns for Stars (SHA, Dec) and rows for stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Mirfak, Aldebaran, Rigel, Capella, Bellatrix, Elnath, Alnilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alphard, Regulus, Dubhe, Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigil Kent, Kochab, Zuben ubi, Alphecca, Antares, Atria, Shaula, Rasalhague, Eltanin, Kaus Aust, Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) and rows for dates 0-23. Includes SD = 16.2' d = -0.4' and SD = 14.8'.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.) and rows for dates 0-23. Includes various twilight and sunrise/sunset times.

Table with columns for Sat (GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec) and rows for dates 0-23. Includes Mer.pass. values.

Table with columns for Stars (SHA, Dec) and rows for stars like Nov 29 Fri, Nov 30 Sat, Dec 01 Sun, and Horizontal parallax for Venus and Mars.

Table with columns for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) and rows for dates 0-23. Includes SD = 16.2' d = -0.4' and SD = 14.9'.

Table with columns for Lat., Moonset (Sat, Sun), and Moonset (Sat, Sun) and rows for dates 0-23. Includes moonset times.

Table with columns for Sun (GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec) and rows for dates 0-23. Includes Mer.pass. values.

Table with columns for Stars (SHA, Dec) and rows for stars like Nov 29 Fri, Nov 30 Sat, Dec 01 Sun, and Horizontal parallax for Venus and Mars.

Table with columns for Sun and Moon (GHA, Dec, GHA, v, Dec, d, HP) and rows for dates 0-23. Includes SD = 16.2' d = -0.4' and SD = 15.0'.

Table with columns for Day, Eqn.of Time (h, mm:ss), Mer. Pass (hh:mm), Mer. Pass. (Upper, Lower), and Age (28-0, 5-0%) and rows for dates 29, 30, 01. Includes a moon phase icon.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Mirfak, Aldebaran, Rigel, Capella, Bellatrix, Elmath, Alnilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alphard, Regulus, Dubhe, Denebola, Gienah, Acrux, Gacrux, Althoth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel Kent., Kochab, Zuben'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eitanian, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, ν, d, HP data.

Table with columns for twilight and sunrise/sunset data. Includes Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut. data.

Table with columns for Tue and rows for dates 0-23. Includes GHA, Dec, ν, d, HP data.

Table with columns for Stars and rows for names like Denebola, Gienah, Acrux, Gacrux, Althoth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel Kent., Kochab, Zuben'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eitanian, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, ν, d, HP data.

Table with columns for Moonrise and Moonset data. Includes Lat., Mon, Moonrise, Wed, Mon, Moonset, Wed data.

Table with columns for Wed and rows for dates 0-23. Includes GHA, Dec, ν, d, HP data.

Table with columns for Stars and rows for Dec 02 Mon, Dec 03 Tue, Dec 04 Wed, and Horizontal parallax data.

Table with columns for Sun and Moon and rows for dates 0-23. Includes GHA, Dec, ν, d, HP data.

Table with columns for Day, Sun, and Moon data. Includes Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age data.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and Mer. pass.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec, Mer. pass.

Table with columns for twilight and sunrise/sunset times and rows for dates 0-45.

Table with columns for Fri and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec, Mer. pass.

Table with columns for Stars and rows for names like Denebola, Gienah, Acruus, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigil Kent, Kochab, Zuben'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec, Mer. pass.

Table with columns for Moonset and rows for dates 0-45. Columns include Moonset times and rows for dates.

Table with columns for Sat and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec, Mer. pass.

Table with columns for Stars and rows for Dec 05 Thu, Dec 06 Fri, Dec 07 Sat, and Horizontal parallax.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, SHA, Dec, Mer. pass.

Table with columns for Moonset and rows for dates 0-45. Columns include Moonset times and rows for dates.

Table with columns for Sun, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec. Rows 0-23 showing celestial coordinates.

Table with columns for Stars, SHA, Dec. Lists stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table with columns for Sun, Moon, h, Sun, Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing Sun and Moon positions.

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Rows 0-23 showing twilight times for various latitudes.

Table with columns for Mon, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing coordinates for Monday.

Table with columns for Stars, SHA, Dec. Lists stars like Denebola, Gienah, Acrux, Gacrux, Althoth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel, etc.

Table with columns for Mon, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing Sun and Moon positions for Monday.

Table with columns for Lat., Moonrise, Moonset, Sun, Moon, Sun, Moon. Rows 0-23 showing moonrise and moonset times.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing coordinates for Tuesday.

Table with columns for Dec 08 Sun, Dec 09 Mon, Dec 10 Tue, SHA, Mer-pass. Lists stars and their meridian passages.

Table with columns for Tue, GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23 showing Sun and Moon positions for Tuesday.

Table with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Upper Mer. Pass, Lower Mer. Pass), Age. Rows 0-23 showing detailed twilight and moon data.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and other astronomical data.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, etc. Columns include SHA and Dec.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, ν, Dec, d, HP.

Table with columns for twilight and sunrise/sunset times and rows for dates 0-23. Columns include Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.

Table with columns for dates and rows for GHA, Dec, and other astronomical data.

Table with columns for dates and rows for SHA, Dec, and other astronomical data.

Table with columns for dates and rows for GHA, Dec, ν, Dec, d, HP.

Table with columns for dates and rows for twilight and sunrise/sunset times.

Table with columns for dates and rows for GHA, Dec, and other astronomical data.

Table with columns for dates and rows for SHA, Mer-pass, and other astronomical data.

Table with columns for dates and rows for GHA, Dec, ν, Dec, d, HP.

Table with columns for dates and rows for twilight and sunrise/sunset times.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and Mer.pass. values.

Table with columns for Stars and rows for names like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc. Columns include SHA and Dec.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, v, Dec, d, HP.

Table with columns for twilight and sunrise/sunset times and rows for latitudes 72, 70, 68, 66, 64, 62, 60, 58, 56, 54, 52, 50, 48, 46, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100.

Table with columns for Sun and Dec and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for names like Dubhe, Denebola, Gienah, Acrux, Gacrux, Althio, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel, Kochab, Zuben'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eitanin, Kaus Aust., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, v, Dec, d, HP.

Table with columns for Moonrise and Moonset times and rows for latitudes 72, 70, 68, 66, 64, 62, 60, 58, 56, 54, 52, 50, 48, 46, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100.

Table with columns for Mon and Dec and rows for dates 0-23. Columns include GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for Dec 14 Sat, Dec 15 Sun, Dec 16 Mon, and Horizontal parallax.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, GHA, v, Dec, d, HP.

Table with columns for Sun and Moon and rows for dates 14, 15, 16. Columns include Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer.pass. data.

Table with columns for Stars (SHA, Dec) and rows for various star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon (h, GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for twilight and sunrise/sunset times (Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.) and rows for dates 0-23.

Table with columns for Wed, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer.pass. data.

Table with columns for Stars (SHA, Dec) and rows for various star names like Dubhe, Denebola, Gienah, etc.

Table with columns for Sun and Moon (h, GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Moonset times (Lat., Tue, Moonrise, Thu, Tue, Moonset, Thu) and rows for dates 0-23.

Table with columns for Thu, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec and rows for dates 0-23. Includes Mer.pass. data.

Table with columns for Stars (SHA, Mer-pass) and rows for Dec 17 Tue, Dec 18 Wed, Dec 19 Thu, and Horizontal parallax.

Table with columns for Sun and Moon (Thu, GHA, Dec, ν, Dec, d, HP) and rows for dates 0-23. Includes SD and d values.

Table with columns for Moonset times (Day, Egn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) and rows for dates 17-19.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Columns include GHA, Dec, and Mer.pass.

Table with columns for Sat and rows for dates 0-23. Columns include GHA, Dec, and Mer.pass.

Table with columns for Sun and rows for dates 0-23. Columns include GHA, Dec, and Mer.pass.

Table with columns for Stars and rows for various star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars and rows for various star names like Denebola, Gienah, Acrux, etc.

Table with columns for Stars and rows for Dec 20 Fri, Dec 21 Sat, Dec 22 Sun, and Horizontal parallax.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, and HP.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, and HP.

Table with columns for Sun and Moon and rows for dates 0-23. Columns include GHA, Dec, and HP.

Table with columns for Lat., Twilight, Sunrise, Sunset, and Twilight. Rows for various latitudes from N 72° to S 60°.

Table with columns for Lat., Moonrise, Moonset, and Moon. Rows for various latitudes from N 72° to S 60°.

Table with columns for Day, Eqn. of Time, Mer. Pass, and Moon. Rows for dates 20, 21, 22.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Rows 0-23.

Table with columns for Stars and sub-columns for SHA, Dec. Rows 0-23.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns for twilight and sunrise/sunset times. Rows 0-23.

Table with columns for Tue and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

Table with columns for Stars and sub-columns for SHA, Dec, Mer-pass. Rows 0-23.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns for Moonrise and Moonset times. Rows 0-23.

Table with columns for Wed and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

Table with columns for Stars and sub-columns for SHA, Dec, Mer-pass. Rows 0-23.

Table with columns for Sun and Moon and sub-columns for GHA, Dec, GHA, ν, Dec, d, HP. Rows 0-23.

Table with columns for Day, Eqn. of Time, Mer. Pass, Moon, and Age. Rows 0-23.

Table with columns for Aries, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer. pass. for various celestial bodies.

Table with columns for Stars and rows for SHA, Dec, and Mer. pass. for stars like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Sun and Moon and rows for h, GHA, Dec, GHA, v, Dec, d, HP.

Table with columns for Twilight and Sunrise/Sunset and rows for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.

Table with columns for Fri and rows for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for SHA, Dec, Mer. pass. for stars like Denebola, Gienah, Acrux, etc.

Table with columns for Sun and Moon and rows for Fri, GHA, Dec, GHA, v, Dec, d, HP.

Table with columns for Moonrise/Moonset and rows for Lat., Moonrise, Moonset.

Table with columns for Sat and rows for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec.

Table with columns for Stars and rows for SHA, Mer. pass. for stars like Dec 26 Thu, Dec 27 Fri, Dec 28 Sat.

Table with columns for Sun and Moon and rows for Sat, GHA, Dec, GHA, v, Dec, d, HP.

Table with columns for Day, Sun, Mer. Pass, Moon and rows for Day, Eqn. of Time, Mer. Pass, Moon, Age.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Mon, GHA, Dec and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Tue, GHA, Dec and rows for dates 0-23. Includes GHA, Dec, and Mer. pass. data.

Table with columns for Stars, SHA, Dec and rows for various star names like Alpheratz, Ankaa, Schedar, etc.

Table with columns for Stars, SHA, Dec and rows for various star names like Denebola, Gienah, Acrux, etc.

Table with columns for Stars, SHA, Mer. pass and rows for Dec 29 Sun, Dec 30 Mon, Dec 31 Tue.

Table with columns for Sun, Moon, GHA, Dec, HP and rows for dates 0-23. Includes GHA, Dec, HP, and SD data.

Table with columns for Mon, GHA, Dec, HP and rows for dates 0-23. Includes GHA, Dec, HP, and SD data.

Table with columns for Tue, GHA, Dec, HP and rows for dates 0-23. Includes GHA, Dec, HP, and SD data.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for various latitudes.

Table with columns for Lat., Moonrise, Moonset and rows for various latitudes.

Table with columns for Day, Sun, Moon, Mer. Pass, Upper, Lower, Age and rows for dates 29-31.

Conversion of Arc to Time

0° - 59°			60° - 119°			120° - 179°			180° - 239°			240° - 299°			300° - 360°			0' - 59'			0" - 59"	
°	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°	h	m	'	m	s	"	s
0	0	00	60	4	00	120	8	00	180	12	00	240	16	00	300	20	00	0	0	00	0	0.00
1	0	04	61	4	04	121	8	04	181	12	04	241	16	04	301	20	04	1	0	04	1	0.07
2	0	08	62	4	08	122	8	08	182	12	08	242	16	08	302	20	08	2	0	08	2	0.13
3	0	12	63	4	12	123	8	12	183	12	12	243	16	12	303	20	12	3	0	12	3	0.20
4	0	16	64	4	16	124	8	16	184	12	16	244	16	16	304	20	16	4	0	16	4	0.27
5	0	20	65	4	20	125	8	20	185	12	20	245	16	20	305	20	20	5	0	20	5	0.33
6	0	24	66	4	24	126	8	24	186	12	24	246	16	24	306	20	24	6	0	24	6	0.40
7	0	28	67	4	28	127	8	28	187	12	28	247	16	28	307	20	28	7	0	28	7	0.47
8	0	32	68	4	32	128	8	32	188	12	32	248	16	32	308	20	32	8	0	32	8	0.53
9	0	36	69	4	36	129	8	36	189	12	36	249	16	36	309	20	36	9	0	36	9	0.60
10	0	40	70	4	40	130	8	40	190	12	40	250	16	40	310	20	40	10	0	40	10	0.67
11	0	44	71	4	44	131	8	44	191	12	44	251	16	44	311	20	44	11	0	44	11	0.73
12	0	48	72	4	48	132	8	48	192	12	48	252	16	48	312	20	48	12	0	48	12	0.80
13	0	52	73	4	52	133	8	52	193	12	52	253	16	52	313	20	52	13	0	52	13	0.87
14	0	56	74	4	56	134	8	56	194	12	56	254	16	56	314	20	56	14	0	56	14	0.93
15	1	00	75	5	00	135	9	00	195	13	00	255	17	00	315	21	00	15	1	00	15	1.00
16	1	04	76	5	04	136	9	04	196	13	04	256	17	04	316	21	04	16	1	04	16	1.07
17	1	08	77	5	08	137	9	08	197	13	08	257	17	08	317	21	08	17	1	08	17	1.13
18	1	12	78	5	12	138	9	12	198	13	12	258	17	12	318	21	12	18	1	12	18	1.20
19	1	16	79	5	16	139	9	16	199	13	16	259	17	16	319	21	16	19	1	16	19	1.27
20	1	20	80	5	20	140	9	20	200	13	20	260	17	20	320	21	20	20	1	20	20	1.33
21	1	24	81	5	24	141	9	24	201	13	24	261	17	24	321	21	24	21	1	24	21	1.40
22	1	28	82	5	28	142	9	28	202	13	28	262	17	28	322	21	28	22	1	28	22	1.47
23	1	32	83	5	32	143	9	32	203	13	32	263	17	32	323	21	32	23	1	32	23	1.53
24	1	36	84	5	36	144	9	36	204	13	36	264	17	36	324	21	36	24	1	36	24	1.60
25	1	40	85	5	40	145	9	40	205	13	40	265	17	40	325	21	40	25	1	40	25	1.67
26	1	44	86	5	44	146	9	44	206	13	44	266	17	44	326	21	44	26	1	44	26	1.73
27	1	48	87	5	48	147	9	48	207	13	48	267	17	48	327	21	48	27	1	48	27	1.80
28	1	52	88	5	52	148	9	52	208	13	52	268	17	52	328	21	52	28	1	52	28	1.87
29	1	56	89	5	56	149	9	56	209	13	56	269	17	56	329	21	56	29	1	56	29	1.93
30	2	00	90	6	00	150	10	00	210	14	00	270	18	00	330	22	00	30	2	00	30	2.00
31	2	04	91	6	04	151	10	04	211	14	04	271	18	04	331	22	04	31	2	04	31	2.07
32	2	08	92	6	08	152	10	08	212	14	08	272	18	08	332	22	08	32	2	08	32	2.13
33	2	12	93	6	12	153	10	12	213	14	12	273	18	12	333	22	12	33	2	12	33	2.20
34	2	16	94	6	16	154	10	16	214	14	16	274	18	16	334	22	16	34	2	16	34	2.27
35	2	20	95	6	20	155	10	20	215	14	20	275	18	20	335	22	20	35	2	20	35	2.33
36	2	24	96	6	24	156	10	24	216	14	24	276	18	24	336	22	24	36	2	24	36	2.40
37	2	28	97	6	28	157	10	28	217	14	28	277	18	28	337	22	28	37	2	28	37	2.47
38	2	32	98	6	32	158	10	32	218	14	32	278	18	32	338	22	32	38	2	32	38	2.53
39	2	36	99	6	36	159	10	36	219	14	36	279	18	36	339	22	36	39	2	36	39	2.60
40	2	40	100	6	40	160	10	40	220	14	40	280	18	40	340	22	40	40	2	40	40	2.67
41	2	44	101	6	44	161	10	44	221	14	44	281	18	44	341	22	44	41	2	44	41	2.73
42	2	48	102	6	48	162	10	48	222	14	48	282	18	48	342	22	48	42	2	48	42	2.80
43	2	52	103	6	52	163	10	52	223	14	52	283	18	52	343	22	52	43	2	52	43	2.87
44	2	56	104	6	56	164	10	56	224	14	56	284	18	56	344	22	56	44	2	56	44	2.93
45	3	00	105	7	00	165	11	00	225	15	00	285	19	00	345	23	00	45	3	00	45	3.00
46	3	04	106	7	04	166	11	04	226	15	04	286	19	04	346	23	04	46	3	04	46	3.07
47	3	08	107	7	08	167	11	08	227	15	08	287	19	08	347	23	08	47	3	08	47	3.13
48	3	12	108	7	12	168	11	12	228	15	12	288	19	12	348	23	12	48	3	12	48	3.20
49	3	16	109	7	16	169	11	16	229	15	16	289	19	16	349	23	16	49	3	16	49	3.27
50	3	20	110	7	20	170	11	20	230	15	20	290	19	20	350	23	20	50	3	20	50	3.33
51	3	24	111	7	24	171	11	24	231	15	24	291	19	24	351	23	24	51	3	24	51	3.40
52	3	28	112	7	28	172	11	28	232	15	28	292	19	28	352	23	28	52	3	28	52	3.47
53	3	32	113	7	32	173	11	32	233	15	32	293	19	32	353	23	32	53	3	32	53	3.53
54	3	36	114	7	36	174	11	36	234	15	36	294	19	36	354	23	36	54	3	36	54	3.60
55	3	40	115	7	40	175	11	40	235	15	40	295	19	40	355	23	40	55	3	40	55	3.67
56	3	44	116	7	44	176	11	44	236	15	44	296	19	44	356	23	44	56	3	44	56	3.73
57	3	48	117	7	48	177	11	48	237	15	48	297	19	48	357	23	48	57	3	48	57	3.80
58	3	52	118	7	52	178	11	52	238	15	52	298	19	52	358	23	52	58	3	52	58	3.87
59	3	56	119	7	56	179	11	56	239	15	56	299	19	56	359	23	56	59	3	56	59	3.93
60	4	00	120	8	00	180	12	00	240	16	00	300	20	00	360	24	00	60	4	00	60	4.00

h= hours of time m= minutes of time s = seconds of time ' = minutes of arc " = seconds of arc

Increments and Corrections

m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
0	Plan.						1	Plan.					2	Plan.						
0	0°00.0	0°00.0	0°00.0	0.0 - 0.0	6.0 - 0.1	12.0 - 0.1	0	0°15.0	0°15.0	0°14.3	0.0 - 0.0	6.0 - 0.2	12.0 - 0.3	0	0°30.0	0°30.1	0°28.6	0.0 - 0.0	6.0 - 0.3	12.0 - 0.5
1	0°00.3	0°00.3	0°00.2	0.1 - 0.0	6.1 - 0.1	12.1 - 0.1	1	0°15.3	0°15.3	0°14.6	0.1 - 0.0	6.1 - 0.2	12.1 - 0.3	1	0°30.3	0°30.3	0°28.9	0.1 - 0.0	6.1 - 0.3	12.1 - 0.5
2	0°00.5	0°00.5	0°00.5	0.2 - 0.0	6.2 - 0.1	12.2 - 0.1	2	0°15.5	0°15.5	0°14.8	0.2 - 0.0	6.2 - 0.2	12.2 - 0.3	2	0°30.5	0°30.6	0°29.1	0.2 - 0.0	6.2 - 0.3	12.2 - 0.5
3	0°00.8	0°00.8	0°00.7	0.3 - 0.0	6.3 - 0.1	12.3 - 0.1	3	0°15.8	0°15.8	0°15.0	0.3 - 0.0	6.3 - 0.2	12.3 - 0.3	3	0°30.7	0°30.8	0°29.3	0.3 - 0.0	6.3 - 0.3	12.3 - 0.5
4	0°01.0	0°01.0	0°01.0	0.4 - 0.0	6.4 - 0.1	12.4 - 0.1	4	0°16.0	0°16.0	0°15.3	0.4 - 0.0	6.4 - 0.2	12.4 - 0.3	4	0°31.0	0°31.1	0°29.6	0.4 - 0.0	6.4 - 0.3	12.4 - 0.5
5	0°01.3	0°01.3	0°01.2	0.5 - 0.0	6.5 - 0.1	12.5 - 0.1	5	0°16.3	0°16.3	0°15.5	0.5 - 0.0	6.5 - 0.2	12.5 - 0.3	5	0°31.3	0°31.3	0°29.8	0.5 - 0.0	6.5 - 0.3	12.5 - 0.5
6	0°01.5	0°01.5	0°01.4	0.6 - 0.0	6.6 - 0.1	12.6 - 0.1	6	0°16.5	0°16.5	0°15.7	0.6 - 0.0	6.6 - 0.2	12.6 - 0.3	6	0°31.5	0°31.6	0°30.1	0.6 - 0.0	6.6 - 0.3	12.6 - 0.5
7	0°01.8	0°01.8	0°01.7	0.7 - 0.0	6.7 - 0.1	12.7 - 0.1	7	0°16.8	0°16.8	0°16.0	0.7 - 0.0	6.7 - 0.2	12.7 - 0.3	7	0°31.8	0°31.8	0°30.3	0.7 - 0.0	6.7 - 0.3	12.7 - 0.5
8	0°02.0	0°02.0	0°01.9	0.8 - 0.0	6.8 - 0.1	12.8 - 0.1	8	0°17.0	0°17.0	0°16.2	0.8 - 0.0	6.8 - 0.2	12.8 - 0.3	8	0°32.0	0°32.1	0°30.5	0.8 - 0.0	6.8 - 0.3	12.8 - 0.5
9	0°02.3	0°02.3	0°02.1	0.9 - 0.0	6.9 - 0.1	12.9 - 0.1	9	0°17.3	0°17.3	0°16.5	0.9 - 0.0	6.9 - 0.2	12.9 - 0.3	9	0°32.3	0°32.3	0°30.8	0.9 - 0.0	6.9 - 0.3	12.9 - 0.5
10	0°02.5	0°02.5	0°02.4	1.0 - 0.0	7.0 - 0.1	13.0 - 0.1	10	0°17.5	0°17.5	0°16.7	1.0 - 0.0	7.0 - 0.2	13.0 - 0.3	10	0°32.5	0°32.6	0°31.0	1.0 - 0.0	7.0 - 0.3	13.0 - 0.5
11	0°02.8	0°02.8	0°02.6	1.1 - 0.0	7.1 - 0.1	13.1 - 0.1	11	0°17.8	0°17.8	0°16.9	1.1 - 0.0	7.1 - 0.2	13.1 - 0.3	11	0°32.8	0°32.8	0°31.3	1.1 - 0.0	7.1 - 0.3	13.1 - 0.5
12	0°03.0	0°03.0	0°02.9	1.2 - 0.0	7.2 - 0.1	13.2 - 0.1	12	0°18.0	0°18.0	0°17.2	1.2 - 0.0	7.2 - 0.2	13.2 - 0.3	12	0°33.0	0°33.1	0°31.5	1.2 - 0.1	7.2 - 0.3	13.2 - 0.5
13	0°03.3	0°03.3	0°03.1	1.3 - 0.0	7.3 - 0.1	13.3 - 0.1	13	0°18.3	0°18.3	0°17.4	1.3 - 0.0	7.3 - 0.2	13.3 - 0.3	13	0°33.3	0°33.3	0°31.7	1.3 - 0.1	7.3 - 0.3	13.3 - 0.6
14	0°03.5	0°03.5	0°03.3	1.4 - 0.0	7.4 - 0.1	13.4 - 0.1	14	0°18.5	0°18.6	0°17.7	1.4 - 0.0	7.4 - 0.2	13.4 - 0.3	14	0°33.5	0°33.6	0°32.0	1.4 - 0.1	7.4 - 0.3	13.4 - 0.6
15	0°03.8	0°03.8	0°03.6	1.5 - 0.0	7.5 - 0.1	13.5 - 0.1	15	0°18.8	0°18.8	0°17.9	1.5 - 0.0	7.5 - 0.2	13.5 - 0.3	15	0°33.8	0°33.8	0°32.2	1.5 - 0.1	7.5 - 0.3	13.5 - 0.6
16	0°04.0	0°04.0	0°03.8	1.6 - 0.0	7.6 - 0.1	13.6 - 0.1	16	0°19.0	0°19.1	0°18.1	1.6 - 0.0	7.6 - 0.2	13.6 - 0.3	16	0°34.0	0°34.1	0°32.5	1.6 - 0.1	7.6 - 0.3	13.6 - 0.6
17	0°04.3	0°04.3	0°04.1	1.7 - 0.0	7.7 - 0.1	13.7 - 0.1	17	0°19.3	0°19.3	0°18.4	1.7 - 0.0	7.7 - 0.2	13.7 - 0.3	17	0°34.3	0°34.3	0°32.7	1.7 - 0.1	7.7 - 0.3	13.7 - 0.6
18	0°04.5	0°04.5	0°04.3	1.8 - 0.0	7.8 - 0.1	13.8 - 0.1	18	0°19.5	0°19.6	0°18.6	1.8 - 0.0	7.8 - 0.2	13.8 - 0.3	18	0°34.5	0°34.6	0°32.9	1.8 - 0.1	7.8 - 0.3	13.8 - 0.6
19	0°04.8	0°04.8	0°04.5	1.9 - 0.0	7.9 - 0.1	13.9 - 0.1	19	0°19.8	0°19.8	0°18.9	1.9 - 0.0	7.9 - 0.2	13.9 - 0.3	19	0°34.8	0°34.8	0°33.2	1.9 - 0.1	7.9 - 0.3	13.9 - 0.6
20	0°05.0	0°05.0	0°04.8	2.0 - 0.0	8.0 - 0.1	14.0 - 0.1	20	0°20.0	0°20.1	0°19.1	2.0 - 0.1	8.0 - 0.2	14.0 - 0.4	20	0°35.0	0°35.1	0°33.4	2.0 - 0.1	8.0 - 0.3	14.0 - 0.6
21	0°05.3	0°05.3	0°05.0	2.1 - 0.0	8.1 - 0.1	14.1 - 0.1	21	0°20.3	0°20.3	0°19.3	2.1 - 0.1	8.1 - 0.2	14.1 - 0.4	21	0°35.3	0°35.3	0°33.6	2.1 - 0.1	8.1 - 0.3	14.1 - 0.6
22	0°05.5	0°05.5	0°05.2	2.2 - 0.0	8.2 - 0.1	14.2 - 0.1	22	0°20.5	0°20.6	0°19.6	2.2 - 0.1	8.2 - 0.2	14.2 - 0.4	22	0°35.5	0°35.6	0°33.9	2.2 - 0.1	8.2 - 0.3	14.2 - 0.6
23	0°05.8	0°05.8	0°05.5	2.3 - 0.0	8.3 - 0.1	14.3 - 0.1	23	0°20.8	0°20.8	0°19.8	2.3 - 0.1	8.3 - 0.2	14.3 - 0.4	23	0°35.8	0°35.8	0°34.1	2.3 - 0.1	8.3 - 0.3	14.3 - 0.6
24	0°06.0	0°06.0	0°05.7	2.4 - 0.0	8.4 - 0.1	14.4 - 0.1	24	0°21.0	0°21.1	0°20.0	2.4 - 0.1	8.4 - 0.2	14.4 - 0.4	24	0°36.0	0°36.1	0°34.4	2.4 - 0.1	8.4 - 0.3	14.4 - 0.6
25	0°06.3	0°06.3	0°06.0	2.5 - 0.0	8.5 - 0.1	14.5 - 0.1	25	0°21.3	0°21.3	0°20.3	2.5 - 0.1	8.5 - 0.2	14.5 - 0.4	25	0°36.3	0°36.3	0°34.6	2.5 - 0.1	8.5 - 0.4	14.5 - 0.6
26	0°06.5	0°06.5	0°06.2	2.6 - 0.0	8.6 - 0.1	14.6 - 0.1	26	0°21.5	0°21.6	0°20.5	2.6 - 0.1	8.6 - 0.2	14.6 - 0.4	26	0°36.5	0°36.6	0°34.8	2.6 - 0.1	8.6 - 0.4	14.6 - 0.6
27	0°06.8	0°06.8	0°06.4	2.7 - 0.0	8.7 - 0.1	14.7 - 0.1	27	0°21.8	0°21.8	0°20.8	2.7 - 0.1	8.7 - 0.2	14.7 - 0.4	27	0°36.8	0°36.9	0°35.1	2.7 - 0.1	8.7 - 0.4	14.7 - 0.6
28	0°07.0	0°07.0	0°06.7	2.8 - 0.0	8.8 - 0.1	14.8 - 0.1	28	0°22.0	0°22.1	0°21.0	2.8 - 0.1	8.8 - 0.2	14.8 - 0.4	28	0°37.0	0°37.1	0°35.3	2.8 - 0.1	8.8 - 0.4	14.8 - 0.6
29	0°07.3	0°07.3	0°06.9	2.9 - 0.0	8.9 - 0.1	14.9 - 0.1	29	0°22.3	0°22.3	0°21.2	2.9 - 0.1	8.9 - 0.2	14.9 - 0.4	29	0°37.3	0°37.4	0°35.6	2.9 - 0.1	8.9 - 0.4	14.9 - 0.6
30	0°07.5	0°07.5	0°07.2	3.0 - 0.0	9.0 - 0.1	15.0 - 0.1	30	0°22.5	0°22.6	0°21.5	3.0 - 0.1	9.0 - 0.2	15.0 - 0.4	30	0°37.5	0°37.6	0°35.8	3.0 - 0.1	9.0 - 0.4	15.0 - 0.6
31	0°07.8	0°07.8	0°07.4	3.1 - 0.0	9.1 - 0.1	15.1 - 0.1	31	0°22.8	0°22.8	0°21.7	3.1 - 0.1	9.1 - 0.2	15.1 - 0.4	31	0°37.8	0°37.9	0°36.0	3.1 - 0.1	9.1 - 0.4	15.1 - 0.6
32	0°08.0	0°08.0	0°07.6	3.2 - 0.0	9.2 - 0.1	15.2 - 0.1	32	0°23.0	0°23.1	0°22.0	3.2 - 0.1	9.2 - 0.2	15.2 - 0.4	32	0°38.0	0°38.1	0°36.3	3.2 - 0.1	9.2 - 0.4	15.2 - 0.6
33	0°08.3	0°08.3	0°07.9	3.3 - 0.0	9.3 - 0.1	15.3 - 0.1	33	0°23.3	0°23.3	0°22.2	3.3 - 0.1	9.3 - 0.2	15.3 - 0.4	33	0°38.3	0°38.4	0°36.5	3.3 - 0.1	9.3 - 0.4	15.3 - 0.6
34	0°08.5	0°08.5	0°08.1	3.4 - 0.0	9.4 - 0.1	15.4 - 0.1	34	0°23.5	0°23.6	0°22.4	3.4 - 0.1	9.4 - 0.2	15.4 - 0.4	34	0°38.5	0°38.6	0°36.7	3.4 - 0.1	9.4 - 0.4	15.4 - 0.6
35	0°08.8	0°08.8	0°08.4	3.5 - 0.0	9.5 - 0.1	15.5 - 0.1	35	0°23.8	0°23.8	0°22.7	3.5 - 0.1	9.5 - 0.2	15.5 - 0.4	35	0°38.8	0°38.9	0°37.0	3.5 - 0.1	9.5 - 0.4	15.5 - 0.6
36	0°09.0	0°09.0	0°08.6	3.6 - 0.0	9.6 - 0.1	15.6 - 0.1	36	0°24.0	0°24.1	0°22.9	3.6 - 0.1	9.6 - 0.2	15.6 - 0.4	36	0°39.0	0°39.1	0°37.2	3.6 - 0.1	9.6 - 0.4	15.6 - 0.6
37	0°09.3	0°09.3	0°08.8	3.7 - 0.0	9.7 - 0.1	15.7 - 0.1	37	0°24.3	0°24.3	0°23.1	3.7 - 0.1	9.7 - 0.2	15.7 - 0.4	37	0°39.3	0°39.4	0°37.5	3.7 - 0.2	9.7 - 0.4	15.7 - 0.7
38	0°09.5	0°09.5	0°09.1	3.8 - 0.0	9.8 - 0.1	15.8 - 0.1	38	0°24.5	0°24.6	0°23.4	3.8 - 0.1	9.8 - 0.2	15.8 - 0.4	38	0°39.5	0°39.6	0°37.7	3.8 - 0.2	9.8 - 0.4	15.8 - 0.7
39	0°09.8	0°09.8	0°09.3	3.9 - 0.0	9.9 - 0.1	15.9 - 0.1	39	0°24.8	0°24.8	0°23.6	3.9 - 0.1	9.9 - 0.2	15.9 - 0.4	39	0°39.8	0°39.9	0°37.9	3.9 - 0.2	9.9 - 0.4	15.9 - 0.7
40	0°10.0	0°10.0	0°09.5	4.0 - 0.0	10.0 - 0.1	16.0 - 0.1	40	0°25.0	0°25.1	0°23.9	4.0 - 0.1	10.0 - 0.3	16.0 - 0.4	40	0°40.0	0°40.1	0°38.2	4.0 - 0.2	10.0 - 0.4	16.0 - 0.7
41	0°10.3	0°10.3	0°09.8	4.1 - 0.0	10.1 - 0.1	16.1 - 0.1	41	0°25.3	0°25.3	0°24.1	4.1 - 0.1	10.1 - 0.3	16.1 - 0.4	41	0°40.3	0°40.4	0°38.4	4.1 - 0.2	10.1 - 0.4	16.1 - 0.7
42	0°10.5	0°10.5	0°10.0	4.2 - 0.0	10.2 - 0.1	16.2 - 0.1	42	0°25.5	0°25.6	0°24.3	4.2 - 0.1	10.2 - 0.3	16.2 - 0.4	42	0°40.5	0°40.6	0°38.7	4.2 - 0.2	10.2 - 0.4	16.2 - 0.7
43	0°10.8	0°10.8	0°10.3	4.3 - 0.0	10.3 - 0.1	16.3 - 0.1	43	0°25.8	0°25.8	0°24.6	4.3 - 0.1	10.3 - 0.3	16.3 - 0.4	43	0°40.8	0°40.9	0°38.9	4.3 - 0.2	10.3 - 0.4	16.3 - 0.7
44	0°11.0	0°11.0	0°10.5	4.4 - 0.0	10.4 - 0.1	16.4 - 0.1	44	0°26.0	0°26.1	0°24.8	4.4 - 0.1	10.4 - 0.3	16.4 - 0.4	44	0°41.0	0°41.1	0°39.1	4.4 - 0.2	10.4 - 0.4	16.4 - 0.7
45	0°11.3	0°11.3	0°10.7	4.5 - 0.0	10.5 - 0.1	16.5 - 0.1	45	0°26.3	0°26.3	0°25.1	4.5 - 0.1	10.5 - 0.3	16.5 - 0.4	45	0°41.3	0°41.4	0°39.4	4.5 - 0.2	10.5 - 0.4	16.5 - 0.7
46	0°11.5	0°11.5	0°11.0	4.6 - 0.0	10.6 - 0.1	16.6 - 0.1	46	0°26.5	0°26.6	0°25.3	4.6 - 0.1	10.6 - 0.3	16.6 - 0.4	46	0°41.5	0°41.6	0°39.6	4.6 - 0.2	10.6 - 0.4	16.6 - 0.7
47	0°11.8	0°11.8	0°11.2	4.7 - 0.0	10.7 - 0.1	16.7 - 0.1	47	0°26.8	0°26.8	0°25.5	4.7 - 0.1	10.7 - 0.3	16.7 - 0.4	47	0°41.8	0°41.9	0°39.8	4.7 - 0.2	10.7 - 0.4	16.7 - 0.7
48	0°12.0	0°12.0	0°11.5	4.8 - 0.0	10.8 - 0.1	16.8 - 0.1	48	0°27.0	0°27.1	0°25.8	4.8 - 0.1	10.8 - 0.3	16.8 - 0.4	48	0°42.0	0°42.1	0°40.1	4.8 - 0.2	10.8 - 0.5	16.8 - 0.7
49	0°12.3	0°12.3	0°11.7	4.9 - 0.0	10.															

Increments and Corrections

m 3	Sun Plan.	Aries	Moon	v and d corr			m 4	Sun Plan.	Aries	Moon	v and d corr			m 5	Sun Plan.	Aries	Moon	v and d corr		
0	0°45.0	0°45.1	0°43.0	0.0 - 0.0	6.0 - 0.3	12.0 - 0.7	0	1°00.0	1°00.2	0°57.3	0.0 - 0.0	6.0 - 0.4	12.0 - 0.9	0	1°15.0	1°15.2	1°11.6	0.0 - 0.0	6.0 - 0.5	12.0 - 1.1
1	0°45.3	0°45.4	0°43.2	0.1 - 0.0	6.1 - 0.4	12.1 - 0.7	1	1°00.2	1°00.4	0°57.5	0.1 - 0.0	6.1 - 0.5	12.1 - 0.9	1	1°15.3	1°15.5	1°11.8	0.1 - 0.0	6.1 - 0.6	12.1 - 1.1
2	0°45.5	0°45.6	0°43.4	0.2 - 0.0	6.2 - 0.4	12.2 - 0.7	2	1°00.5	1°00.7	0°57.7	0.2 - 0.0	6.2 - 0.5	12.2 - 0.9	2	1°15.5	1°15.7	1°12.1	0.2 - 0.0	6.2 - 0.6	12.2 - 1.1
3	0°45.8	0°45.9	0°43.7	0.3 - 0.0	6.3 - 0.4	12.3 - 0.7	3	1°00.7	1°00.9	0°58.0	0.3 - 0.0	6.3 - 0.5	12.3 - 0.9	3	1°15.7	1°16.0	1°12.3	0.3 - 0.0	6.3 - 0.6	12.3 - 1.1
4	0°46.0	0°46.1	0°43.9	0.4 - 0.0	6.4 - 0.4	12.4 - 0.7	4	1°01.0	1°01.2	0°58.2	0.4 - 0.0	6.4 - 0.5	12.4 - 0.9	4	1°16.0	1°16.2	1°12.5	0.4 - 0.0	6.4 - 0.6	12.4 - 1.1
5	0°46.3	0°46.4	0°44.1	0.5 - 0.0	6.5 - 0.4	12.5 - 0.7	5	1°01.2	1°01.4	0°58.5	0.5 - 0.0	6.5 - 0.5	12.5 - 0.9	5	1°16.2	1°16.5	1°12.8	0.5 - 0.0	6.5 - 0.6	12.5 - 1.1
6	0°46.5	0°46.6	0°44.4	0.6 - 0.0	6.6 - 0.4	12.6 - 0.7	6	1°01.5	1°01.7	0°58.7	0.6 - 0.0	6.6 - 0.5	12.6 - 0.9	6	1°16.5	1°16.7	1°13.0	0.6 - 0.1	6.6 - 0.6	12.6 - 1.2
7	0°46.8	0°46.9	0°44.6	0.7 - 0.0	6.7 - 0.4	12.7 - 0.7	7	1°01.7	1°01.9	0°58.9	0.7 - 0.1	6.7 - 0.5	12.7 - 1.0	7	1°16.7	1°17.0	1°13.3	0.7 - 0.1	6.7 - 0.6	12.7 - 1.2
8	0°47.0	0°47.1	0°44.9	0.8 - 0.0	6.8 - 0.4	12.8 - 0.7	8	1°02.0	1°02.2	0°59.2	0.8 - 0.1	6.8 - 0.5	12.8 - 1.0	8	1°17.0	1°17.2	1°13.5	0.8 - 0.1	6.8 - 0.6	12.8 - 1.2
9	0°47.3	0°47.4	0°45.1	0.9 - 0.1	6.9 - 0.4	12.9 - 0.8	9	1°02.3	1°02.4	0°59.4	0.9 - 0.1	6.9 - 0.5	12.9 - 1.0	9	1°17.3	1°17.5	1°13.7	0.9 - 0.1	6.9 - 0.6	12.9 - 1.2
10	0°47.5	0°47.6	0°45.3	1.0 - 0.1	7.0 - 0.4	13.0 - 0.8	10	1°02.5	1°02.7	0°59.7	1.0 - 0.1	7.0 - 0.5	13.0 - 1.0	10	1°17.5	1°17.7	1°14.0	1.0 - 0.1	7.0 - 0.6	13.0 - 1.2
11	0°47.8	0°47.9	0°45.6	1.1 - 0.1	7.1 - 0.4	13.1 - 0.8	11	1°02.8	1°02.9	0°59.9	1.1 - 0.1	7.1 - 0.5	13.1 - 1.0	11	1°17.8	1°18.0	1°14.2	1.1 - 0.1	7.1 - 0.7	13.1 - 1.2
12	0°48.0	0°48.1	0°45.8	1.2 - 0.1	7.2 - 0.4	13.2 - 0.8	12	1°03.0	1°03.2	1°00.1	1.2 - 0.1	7.2 - 0.5	13.2 - 1.0	12	1°18.0	1°18.2	1°14.4	1.2 - 0.1	7.2 - 0.7	13.2 - 1.2
13	0°48.3	0°48.4	0°46.1	1.3 - 0.1	7.3 - 0.4	13.3 - 0.8	13	1°03.3	1°03.4	1°00.4	1.3 - 0.1	7.3 - 0.5	13.3 - 1.0	13	1°18.3	1°18.5	1°14.7	1.3 - 0.1	7.3 - 0.7	13.3 - 1.2
14	0°48.5	0°48.6	0°46.3	1.4 - 0.1	7.4 - 0.4	13.4 - 0.8	14	1°03.5	1°03.7	1°00.6	1.4 - 0.1	7.4 - 0.6	13.4 - 1.0	14	1°18.5	1°18.7	1°14.9	1.4 - 0.1	7.4 - 0.7	13.4 - 1.2
15	0°48.8	0°48.9	0°46.5	1.5 - 0.1	7.5 - 0.4	13.5 - 0.8	15	1°03.8	1°03.9	1°00.8	1.5 - 0.1	7.5 - 0.6	13.5 - 1.0	15	1°18.8	1°19.0	1°15.2	1.5 - 0.1	7.5 - 0.7	13.5 - 1.2
16	0°49.0	0°49.1	0°46.8	1.6 - 0.1	7.6 - 0.4	13.6 - 0.8	16	1°04.0	1°04.2	1°01.1	1.6 - 0.1	7.6 - 0.6	13.6 - 1.0	16	1°19.0	1°19.2	1°15.4	1.6 - 0.1	7.6 - 0.7	13.6 - 1.2
17	0°49.3	0°49.4	0°47.0	1.7 - 0.1	7.7 - 0.4	13.7 - 0.8	17	1°04.2	1°04.4	1°01.3	1.7 - 0.1	7.7 - 0.6	13.7 - 1.0	17	1°19.3	1°19.5	1°15.6	1.7 - 0.2	7.7 - 0.7	13.7 - 1.3
18	0°49.5	0°49.6	0°47.2	1.8 - 0.1	7.8 - 0.5	13.8 - 0.8	18	1°04.5	1°04.7	1°01.6	1.8 - 0.1	7.8 - 0.6	13.8 - 1.0	18	1°19.5	1°19.7	1°15.9	1.8 - 0.2	7.8 - 0.7	13.8 - 1.3
19	0°49.8	0°49.9	0°47.5	1.9 - 0.1	7.9 - 0.5	13.9 - 0.8	19	1°04.7	1°04.9	1°01.8	1.9 - 0.1	7.9 - 0.6	13.9 - 1.0	19	1°19.7	1°20.0	1°16.1	1.9 - 0.2	7.9 - 0.7	13.9 - 1.3
20	0°50.0	0°50.1	0°47.7	2.0 - 0.1	8.0 - 0.5	14.0 - 0.8	20	1°05.0	1°05.2	1°02.0	2.0 - 0.1	8.0 - 0.6	14.0 - 1.1	20	1°20.0	1°20.2	1°16.4	2.0 - 0.2	8.0 - 0.7	14.0 - 1.3
21	0°50.3	0°50.4	0°48.0	2.1 - 0.1	8.1 - 0.5	14.1 - 0.8	21	1°05.2	1°05.4	1°02.3	2.1 - 0.2	8.1 - 0.6	14.1 - 1.1	21	1°20.2	1°20.5	1°16.6	2.1 - 0.2	8.1 - 0.7	14.1 - 1.3
22	0°50.5	0°50.6	0°48.2	2.2 - 0.1	8.2 - 0.5	14.2 - 0.8	22	1°05.5	1°05.7	1°02.5	2.2 - 0.2	8.2 - 0.6	14.2 - 1.1	22	1°20.5	1°20.7	1°16.8	2.2 - 0.2	8.2 - 0.8	14.2 - 1.3
23	0°50.8	0°50.9	0°48.4	2.3 - 0.1	8.3 - 0.5	14.3 - 0.8	23	1°05.8	1°05.9	1°02.8	2.3 - 0.2	8.3 - 0.6	14.3 - 1.1	23	1°20.8	1°21.0	1°17.1	2.3 - 0.2	8.3 - 0.8	14.3 - 1.3
24	0°51.0	0°51.1	0°48.7	2.4 - 0.1	8.4 - 0.5	14.4 - 0.8	24	1°06.0	1°06.2	1°03.0	2.4 - 0.2	8.4 - 0.6	14.4 - 1.1	24	1°21.0	1°21.2	1°17.3	2.4 - 0.2	8.4 - 0.8	14.4 - 1.3
25	0°51.3	0°51.4	0°48.9	2.5 - 0.1	8.5 - 0.5	14.5 - 0.8	25	1°06.3	1°06.4	1°03.2	2.5 - 0.2	8.5 - 0.6	14.5 - 1.1	25	1°21.3	1°21.5	1°17.5	2.5 - 0.2	8.5 - 0.8	14.5 - 1.3
26	0°51.5	0°51.6	0°49.2	2.6 - 0.2	8.6 - 0.5	14.6 - 0.9	26	1°06.5	1°06.7	1°03.5	2.6 - 0.2	8.6 - 0.6	14.6 - 1.1	26	1°21.5	1°21.7	1°17.8	2.6 - 0.2	8.6 - 0.8	14.6 - 1.3
27	0°51.8	0°51.9	0°49.4	2.7 - 0.2	8.7 - 0.5	14.7 - 0.9	27	1°06.8	1°06.9	1°03.7	2.7 - 0.2	8.7 - 0.7	14.7 - 1.1	27	1°21.8	1°22.0	1°18.0	2.7 - 0.2	8.7 - 0.8	14.7 - 1.3
28	0°52.0	0°52.1	0°49.6	2.8 - 0.2	8.8 - 0.5	14.8 - 0.9	28	1°07.0	1°07.2	1°03.9	2.8 - 0.2	8.8 - 0.7	14.8 - 1.1	28	1°22.0	1°22.2	1°18.3	2.8 - 0.3	8.8 - 0.8	14.8 - 1.4
29	0°52.3	0°52.4	0°49.9	2.9 - 0.2	8.9 - 0.5	14.9 - 0.9	29	1°07.3	1°07.4	1°04.2	2.9 - 0.2	8.9 - 0.7	14.9 - 1.1	29	1°22.3	1°22.5	1°18.5	2.9 - 0.3	8.9 - 0.8	14.9 - 1.4
30	0°52.5	0°52.6	0°50.1	3.0 - 0.2	9.0 - 0.5	15.0 - 0.9	30	1°07.5	1°07.7	1°04.4	3.0 - 0.2	9.0 - 0.7	15.0 - 1.1	30	1°22.5	1°22.7	1°18.7	3.0 - 0.3	9.0 - 0.8	15.0 - 1.4
31	0°52.8	0°52.9	0°50.3	3.1 - 0.2	9.1 - 0.5	15.1 - 0.9	31	1°07.7	1°07.9	1°04.7	3.1 - 0.2	9.1 - 0.7	15.1 - 1.1	31	1°22.8	1°23.0	1°19.0	3.1 - 0.3	9.1 - 0.8	15.1 - 1.4
32	0°53.0	0°53.1	0°50.6	3.2 - 0.2	9.2 - 0.5	15.2 - 0.9	32	1°08.0	1°08.2	1°04.9	3.2 - 0.2	9.2 - 0.7	15.2 - 1.1	32	1°23.0	1°23.2	1°19.2	3.2 - 0.3	9.2 - 0.8	15.2 - 1.4
33	0°53.3	0°53.4	0°50.8	3.3 - 0.2	9.3 - 0.5	15.3 - 0.9	33	1°08.2	1°08.4	1°05.1	3.3 - 0.2	9.3 - 0.7	15.3 - 1.1	33	1°23.2	1°23.5	1°19.5	3.3 - 0.3	9.3 - 0.9	15.3 - 1.4
34	0°53.5	0°53.6	0°51.1	3.4 - 0.2	9.4 - 0.5	15.4 - 0.9	34	1°08.5	1°08.7	1°05.4	3.4 - 0.3	9.4 - 0.7	15.4 - 1.2	34	1°23.5	1°23.7	1°19.7	3.4 - 0.3	9.4 - 0.9	15.4 - 1.4
35	0°53.8	0°53.9	0°51.3	3.5 - 0.2	9.5 - 0.6	15.5 - 0.9	35	1°08.7	1°08.9	1°05.6	3.5 - 0.3	9.5 - 0.7	15.5 - 1.2	35	1°23.7	1°24.0	1°19.9	3.5 - 0.3	9.5 - 0.9	15.5 - 1.4
36	0°54.0	0°54.1	0°51.5	3.6 - 0.2	9.6 - 0.6	15.6 - 0.9	36	1°09.0	1°09.2	1°05.9	3.6 - 0.3	9.6 - 0.7	15.6 - 1.2	36	1°24.0	1°24.2	1°20.2	3.6 - 0.3	9.6 - 0.9	15.6 - 1.4
37	0°54.3	0°54.4	0°51.8	3.7 - 0.2	9.7 - 0.6	15.7 - 0.9	37	1°09.3	1°09.4	1°06.1	3.7 - 0.3	9.7 - 0.7	15.7 - 1.2	37	1°24.3	1°24.5	1°20.4	3.7 - 0.3	9.7 - 0.9	15.7 - 1.4
38	0°54.5	0°54.6	0°52.0	3.8 - 0.2	9.8 - 0.6	15.8 - 0.9	38	1°09.5	1°09.7	1°06.3	3.8 - 0.3	9.8 - 0.7	15.8 - 1.2	38	1°24.5	1°24.7	1°20.7	3.8 - 0.3	9.8 - 0.9	15.8 - 1.4
39	0°54.8	0°54.9	0°52.3	3.9 - 0.2	9.9 - 0.6	15.9 - 0.9	39	1°09.8	1°09.9	1°06.6	3.9 - 0.3	9.9 - 0.7	15.9 - 1.2	39	1°24.8	1°25.0	1°20.9	3.9 - 0.4	9.9 - 0.9	15.9 - 1.5
40	0°55.0	0°55.2	0°52.5	4.0 - 0.2	10.0 - 0.6	16.0 - 0.9	40	1°10.0	1°10.2	1°06.8	4.0 - 0.3	10.0 - 0.8	16.0 - 1.2	40	1°25.0	1°25.2	1°21.1	4.0 - 0.4	10.0 - 0.9	16.0 - 1.5
41	0°55.3	0°55.4	0°52.7	4.1 - 0.2	10.1 - 0.6	16.1 - 0.9	41	1°10.3	1°10.4	1°07.0	4.1 - 0.3	10.1 - 0.8	16.1 - 1.2	41	1°25.3	1°25.5	1°21.4	4.1 - 0.4	10.1 - 0.9	16.1 - 1.5
42	0°55.5	0°55.7	0°53.0	4.2 - 0.2	10.2 - 0.6	16.2 - 0.9	42	1°10.5	1°10.7	1°07.3	4.2 - 0.3	10.2 - 0.8	16.2 - 1.2	42	1°25.5	1°25.7	1°21.6	4.2 - 0.4	10.2 - 0.9	16.2 - 1.5
43	0°55.8	0°55.9	0°53.2	4.3 - 0.3	10.3 - 0.6	16.3 - 1.0	43	1°10.8	1°10.9	1°07.5	4.3 - 0.3	10.3 - 0.8	16.3 - 1.2	43	1°25.8	1°26.0	1°21.8	4.3 - 0.4	10.3 - 0.9	16.3 - 1.5
44	0°56.0	0°56.2	0°53.4	4.4 - 0.3	10.4 - 0.6	16.4 - 1.0	44	1°11.0	1°11.2	1°07.8	4.4 - 0.3	10.4 - 0.8	16.4 - 1.2	44	1°26.0	1°26.2	1°22.1	4.4 - 0.4	10.4 - 1.0	16.4 - 1.5
45	0°56.3	0°56.4	0°53.7	4.5 - 0.3	10.5 - 0.6	16.5 - 1.0	45	1°11.3	1°11.4	1°08.0	4.5 - 0.3	10.5 - 0.8	16.5 - 1.2	45	1°26.3	1°26.5	1°22.3	4.5 - 0.4	10.5 - 1.0	16.5 - 1.5
46	0°56.5	0°56.7	0°53.9	4.6 - 0.3	10.6 - 0.6	16.6 - 1.0	46	1°11.5	1°11.7	1°08.2	4.6 - 0.3	10.6 - 0.8	16.6 - 1.2	46	1°26.5	1°26.7	1°22.6	4.6 - 0.4	10.6 - 1.0	16.6 - 1.5
47	0°56.8	0°56.9	0°54.2	4.7 - 0.3	10.7 - 0.6	16.7 - 1.0	47	1°11.7	1°11.9	1°08.5	4.7 - 0.4	10.7 - 0.8	16.7 - 1.3	47	1°26.8	1°27.0	1°22.8	4.7 - 0.4	10.7 - 1.0	16.7 - 1.5
48	0°57.0	0°57.2	0°54.4	4.8 - 0.3	10.8 - 0.6	16.8 - 1.0	48	1°12.0	1°12.2	1°08.7	4.8 - 0.4	10.8 - 0.8	16.8 - 1.3	48	1°27.0	1°27.2	1°23.0	4.8 - 0.4	10.8 - 1.0	16.8 - 1.5
49	0°57.3	0°57.4																		

Increments and Corrections

m 6	Sun Plan.	Aries	Moon	v and d corr			m 7	Sun Plan.	Aries	Moon	v and d corr			m 8	Sun Plan.	Aries	Moon	v and d corr		
0	1°30.0	1°30.2	1°25.9	0.0 - 0.0	6.0 - 0.7	12.0 - 1.3	0	1°45.0	1°45.3	1°40.2	0.0 - 0.0	6.0 - 0.8	12.0 - 1.5	0	2°00.0	2°00.3	1°54.5	0.0 - 0.0	6.0 - 0.8	12.0 - 1.7
1	1°30.3	1°30.5	1°26.1	0.1 - 0.0	6.1 - 0.7	12.1 - 1.3	1	1°45.3	1°45.5	1°40.5	0.1 - 0.0	6.1 - 0.8	12.1 - 1.5	1	2°00.3	2°00.6	1°54.8	0.1 - 0.0	6.1 - 0.9	12.1 - 1.7
2	1°30.5	1°30.7	1°26.4	0.2 - 0.0	6.2 - 0.7	12.2 - 1.3	2	1°45.5	1°45.8	1°40.7	0.2 - 0.0	6.2 - 0.8	12.2 - 1.5	2	2°00.5	2°00.8	1°55.0	0.2 - 0.0	6.2 - 0.9	12.2 - 1.7
3	1°30.7	1°31.0	1°26.6	0.3 - 0.0	6.3 - 0.7	12.3 - 1.3	3	1°45.8	1°46.0	1°40.9	0.3 - 0.0	6.3 - 0.8	12.3 - 1.5	3	2°00.8	2°01.1	1°55.2	0.3 - 0.0	6.3 - 0.9	12.3 - 1.7
4	1°31.0	1°31.2	1°26.9	0.4 - 0.0	6.4 - 0.7	12.4 - 1.3	4	1°46.0	1°46.3	1°41.2	0.4 - 0.1	6.4 - 0.8	12.4 - 1.6	4	2°01.0	2°01.3	1°55.5	0.4 - 0.1	6.4 - 0.9	12.4 - 1.8
5	1°31.2	1°31.5	1°27.1	0.5 - 0.1	6.5 - 0.7	12.5 - 1.4	5	1°46.2	1°46.5	1°41.4	0.5 - 0.1	6.5 - 0.8	12.5 - 1.6	5	2°01.3	2°01.6	1°55.7	0.5 - 0.1	6.5 - 0.9	12.5 - 1.8
6	1°31.5	1°31.8	1°27.3	0.6 - 0.1	6.6 - 0.7	12.6 - 1.4	6	1°46.5	1°46.8	1°41.6	0.6 - 0.1	6.6 - 0.8	12.6 - 1.6	6	2°01.5	2°01.8	1°56.0	0.6 - 0.1	6.6 - 0.9	12.6 - 1.8
7	1°31.7	1°32.0	1°27.6	0.7 - 0.1	6.7 - 0.7	12.7 - 1.4	7	1°46.7	1°47.0	1°41.9	0.7 - 0.1	6.7 - 0.8	12.7 - 1.6	7	2°01.8	2°02.1	1°56.2	0.7 - 0.1	6.7 - 0.9	12.7 - 1.8
8	1°32.0	1°32.3	1°27.8	0.8 - 0.1	6.8 - 0.7	12.8 - 1.4	8	1°47.0	1°47.3	1°42.1	0.8 - 0.1	6.8 - 0.8	12.8 - 1.6	8	2°02.0	2°02.3	1°56.4	0.8 - 0.1	6.8 - 1.0	12.8 - 1.8
9	1°32.3	1°32.5	1°28.0	0.9 - 0.1	6.9 - 0.7	12.9 - 1.4	9	1°47.3	1°47.5	1°42.4	0.9 - 0.1	6.9 - 0.9	12.9 - 1.6	9	2°02.3	2°02.6	1°56.7	0.9 - 0.1	6.9 - 1.0	12.9 - 1.8
10	1°32.5	1°32.8	1°28.3	1.0 - 0.1	7.0 - 0.8	13.0 - 1.4	10	1°47.5	1°47.8	1°42.6	1.0 - 0.1	7.0 - 0.9	13.0 - 1.6	10	2°02.5	2°02.8	1°56.9	1.0 - 0.1	7.0 - 1.0	13.0 - 1.8
11	1°32.8	1°33.0	1°28.5	1.1 - 0.1	7.1 - 0.8	13.1 - 1.4	11	1°47.8	1°48.0	1°42.8	1.1 - 0.1	7.1 - 0.9	13.1 - 1.6	11	2°02.8	2°03.1	1°57.2	1.1 - 0.2	7.1 - 1.0	13.1 - 1.9
12	1°33.0	1°33.3	1°28.8	1.2 - 0.1	7.2 - 0.8	13.2 - 1.4	12	1°48.0	1°48.3	1°43.1	1.2 - 0.2	7.2 - 0.9	13.2 - 1.6	12	2°03.0	2°03.3	1°57.4	1.2 - 0.2	7.2 - 1.0	13.2 - 1.9
13	1°33.3	1°33.5	1°29.0	1.3 - 0.1	7.3 - 0.8	13.3 - 1.4	13	1°48.3	1°48.5	1°43.3	1.3 - 0.2	7.3 - 0.9	13.3 - 1.7	13	2°03.3	2°03.6	1°57.6	1.3 - 0.2	7.3 - 1.0	13.3 - 1.9
14	1°33.5	1°33.8	1°29.2	1.4 - 0.2	7.4 - 0.8	13.4 - 1.5	14	1°48.5	1°48.8	1°43.6	1.4 - 0.2	7.4 - 0.9	13.4 - 1.7	14	2°03.5	2°03.8	1°57.9	1.4 - 0.2	7.4 - 1.0	13.4 - 1.9
15	1°33.8	1°34.0	1°29.5	1.5 - 0.2	7.5 - 0.8	13.5 - 1.5	15	1°48.8	1°49.0	1°43.8	1.5 - 0.2	7.5 - 0.9	13.5 - 1.7	15	2°03.8	2°04.1	1°58.1	1.5 - 0.2	7.5 - 1.1	13.5 - 1.9
16	1°34.0	1°34.3	1°29.7	1.6 - 0.2	7.6 - 0.8	13.6 - 1.5	16	1°49.0	1°49.3	1°44.0	1.6 - 0.2	7.6 - 0.9	13.6 - 1.7	16	2°04.0	2°04.3	1°58.4	1.6 - 0.2	7.6 - 1.1	13.6 - 1.9
17	1°34.3	1°34.5	1°30.0	1.7 - 0.2	7.7 - 0.8	13.7 - 1.5	17	1°49.3	1°49.5	1°44.3	1.7 - 0.2	7.7 - 1.0	13.7 - 1.7	17	2°04.2	2°04.6	1°58.6	1.7 - 0.2	7.7 - 1.1	13.7 - 1.9
18	1°34.5	1°34.8	1°30.2	1.8 - 0.2	7.8 - 0.8	13.8 - 1.5	18	1°49.5	1°49.8	1°44.5	1.8 - 0.2	7.8 - 1.0	13.8 - 1.7	18	2°04.5	2°04.8	1°58.8	1.8 - 0.3	7.8 - 1.1	13.8 - 2.0
19	1°34.8	1°35.0	1°30.4	1.9 - 0.2	7.9 - 0.9	13.9 - 1.5	19	1°49.8	1°50.0	1°44.8	1.9 - 0.2	7.9 - 1.0	13.9 - 1.7	19	2°04.7	2°05.1	1°59.1	1.9 - 0.3	7.9 - 1.1	13.9 - 2.0
20	1°35.0	1°35.3	1°30.7	2.0 - 0.2	8.0 - 0.9	14.0 - 1.5	20	1°50.0	1°50.3	1°45.0	2.0 - 0.3	8.0 - 1.0	14.0 - 1.8	20	2°05.0	2°05.3	1°59.3	2.0 - 0.3	8.0 - 1.1	14.0 - 2.0
21	1°35.2	1°35.5	1°30.9	2.1 - 0.2	8.1 - 0.9	14.1 - 1.5	21	1°50.2	1°50.6	1°45.2	2.1 - 0.3	8.1 - 1.0	14.1 - 1.8	21	2°05.2	2°05.6	1°59.5	2.1 - 0.3	8.1 - 1.1	14.1 - 2.0
22	1°35.5	1°35.8	1°31.1	2.2 - 0.2	8.2 - 0.9	14.2 - 1.5	22	1°50.5	1°50.8	1°45.5	2.2 - 0.3	8.2 - 1.0	14.2 - 1.8	22	2°05.5	2°05.8	1°59.8	2.2 - 0.3	8.2 - 1.2	14.2 - 2.0
23	1°35.8	1°36.0	1°31.4	2.3 - 0.2	8.3 - 0.9	14.3 - 1.5	23	1°50.8	1°51.1	1°45.7	2.3 - 0.3	8.3 - 1.0	14.3 - 1.8	23	2°05.7	2°06.1	2°00.0	2.3 - 0.3	8.3 - 1.2	14.3 - 2.0
24	1°36.0	1°36.3	1°31.6	2.4 - 0.3	8.4 - 0.9	14.4 - 1.6	24	1°51.0	1°51.3	1°45.9	2.4 - 0.3	8.4 - 1.1	14.4 - 1.8	24	2°06.0	2°06.3	2°00.3	2.4 - 0.3	8.4 - 1.2	14.4 - 2.0
25	1°36.3	1°36.5	1°31.9	2.5 - 0.3	8.5 - 0.9	14.5 - 1.6	25	1°51.3	1°51.6	1°46.2	2.5 - 0.3	8.5 - 1.1	14.5 - 1.8	25	2°06.2	2°06.6	2°00.5	2.5 - 0.4	8.5 - 1.2	14.5 - 2.1
26	1°36.5	1°36.8	1°32.1	2.6 - 0.3	8.6 - 0.9	14.6 - 1.6	26	1°51.5	1°51.8	1°46.4	2.6 - 0.3	8.6 - 1.1	14.6 - 1.8	26	2°06.5	2°06.8	2°00.7	2.6 - 0.4	8.6 - 1.2	14.6 - 2.1
27	1°36.8	1°37.0	1°32.3	2.7 - 0.3	8.7 - 0.9	14.7 - 1.6	27	1°51.8	1°52.1	1°46.7	2.7 - 0.3	8.7 - 1.1	14.7 - 1.8	27	2°06.7	2°07.1	2°01.0	2.7 - 0.4	8.7 - 1.2	14.7 - 2.1
28	1°37.0	1°37.3	1°32.6	2.8 - 0.3	8.8 - 1.0	14.8 - 1.6	28	1°52.0	1°52.3	1°46.9	2.8 - 0.4	8.8 - 1.1	14.8 - 1.9	28	2°07.0	2°07.3	2°01.2	2.8 - 0.4	8.8 - 1.2	14.8 - 2.1
29	1°37.3	1°37.5	1°32.8	2.9 - 0.3	8.9 - 1.0	14.9 - 1.6	29	1°52.3	1°52.6	1°47.1	2.9 - 0.4	8.9 - 1.1	14.9 - 1.9	29	2°07.2	2°07.6	2°01.5	2.9 - 0.4	8.9 - 1.3	14.9 - 2.1
30	1°37.5	1°37.8	1°33.1	3.0 - 0.3	9.0 - 1.0	15.0 - 1.6	30	1°52.5	1°52.8	1°47.4	3.0 - 0.4	9.0 - 1.1	15.0 - 1.9	30	2°07.5	2°07.8	2°01.7	3.0 - 0.4	9.0 - 1.3	15.0 - 2.1
31	1°37.8	1°38.0	1°33.3	3.1 - 0.3	9.1 - 1.0	15.1 - 1.6	31	1°52.7	1°53.1	1°47.6	3.1 - 0.4	9.1 - 1.1	15.1 - 1.9	31	2°07.8	2°08.1	2°01.9	3.1 - 0.4	9.1 - 1.3	15.1 - 2.1
32	1°38.0	1°38.3	1°33.5	3.2 - 0.3	9.2 - 1.0	15.2 - 1.6	32	1°53.0	1°53.3	1°47.9	3.2 - 0.4	9.2 - 1.1	15.2 - 1.9	32	2°08.0	2°08.3	2°02.2	3.2 - 0.5	9.2 - 1.3	15.2 - 2.2
33	1°38.3	1°38.5	1°33.8	3.3 - 0.4	9.3 - 1.0	15.3 - 1.7	33	1°53.3	1°53.6	1°48.1	3.3 - 0.4	9.3 - 1.2	15.3 - 1.9	33	2°08.3	2°08.6	2°02.4	3.3 - 0.5	9.3 - 1.3	15.3 - 2.2
34	1°38.5	1°38.8	1°34.0	3.4 - 0.4	9.4 - 1.0	15.4 - 1.7	34	1°53.5	1°53.8	1°48.3	3.4 - 0.4	9.4 - 1.2	15.4 - 1.9	34	2°08.5	2°08.9	2°02.6	3.4 - 0.5	9.4 - 1.3	15.4 - 2.2
35	1°38.7	1°39.0	1°34.3	3.5 - 0.4	9.5 - 1.0	15.5 - 1.7	35	1°53.7	1°54.1	1°48.6	3.5 - 0.4	9.5 - 1.2	15.5 - 1.9	35	2°08.8	2°09.1	2°02.9	3.5 - 0.5	9.5 - 1.3	15.5 - 2.2
36	1°39.0	1°39.3	1°34.5	3.6 - 0.4	9.6 - 1.0	15.6 - 1.7	36	1°54.0	1°54.3	1°48.8	3.6 - 0.5	9.6 - 1.2	15.6 - 1.9	36	2°09.0	2°09.4	2°03.1	3.6 - 0.5	9.6 - 1.4	15.6 - 2.2
37	1°39.3	1°39.5	1°34.7	3.7 - 0.4	9.7 - 1.1	15.7 - 1.7	37	1°54.2	1°54.6	1°49.0	3.7 - 0.5	9.7 - 1.2	15.7 - 2.0	37	2°09.3	2°09.6	2°03.4	3.7 - 0.5	9.7 - 1.4	15.7 - 2.2
38	1°39.5	1°39.8	1°35.0	3.8 - 0.4	9.8 - 1.1	15.8 - 1.7	38	1°54.5	1°54.8	1°49.3	3.8 - 0.5	9.8 - 1.2	15.8 - 2.0	38	2°09.5	2°09.9	2°03.6	3.8 - 0.5	9.8 - 1.4	15.8 - 2.2
39	1°39.8	1°40.0	1°35.2	3.9 - 0.4	9.9 - 1.1	15.9 - 1.7	39	1°54.8	1°55.1	1°49.5	3.9 - 0.5	9.9 - 1.2	15.9 - 2.0	39	2°09.8	2°10.1	2°03.8	3.9 - 0.6	9.9 - 1.4	15.9 - 2.3
40	1°40.0	1°40.3	1°35.4	4.0 - 0.4	10.0 - 1.1	16.0 - 1.7	40	1°55.0	1°55.3	1°49.8	4.0 - 0.5	10.0 - 1.3	16.0 - 2.0	40	2°10.0	2°10.4	2°04.1	4.0 - 0.6	10.0 - 1.4	16.0 - 2.3
41	1°40.3	1°40.5	1°35.7	4.1 - 0.4	10.1 - 1.1	16.1 - 1.7	41	1°55.3	1°55.6	1°50.0	4.1 - 0.5	10.1 - 1.3	16.1 - 2.0	41	2°10.3	2°10.6	2°04.3	4.1 - 0.6	10.1 - 1.4	16.1 - 2.3
42	1°40.5	1°40.8	1°35.9	4.2 - 0.5	10.2 - 1.1	16.2 - 1.8	42	1°55.5	1°55.8	1°50.2	4.2 - 0.5	10.2 - 1.3	16.2 - 2.0	42	2°10.5	2°10.9	2°04.6	4.2 - 0.6	10.2 - 1.4	16.2 - 2.3
43	1°40.8	1°41.0	1°36.2	4.3 - 0.5	10.3 - 1.1	16.3 - 1.8	43	1°55.8	1°56.1	1°50.5	4.3 - 0.5	10.3 - 1.3	16.3 - 2.0	43	2°10.8	2°11.1	2°04.8	4.3 - 0.6	10.3 - 1.5	16.3 - 2.3
44	1°41.0	1°41.3	1°36.4	4.4 - 0.5	10.4 - 1.1	16.4 - 1.8	44	1°56.0	1°56.3	1°50.7	4.4 - 0.6	10.4 - 1.3	16.4 - 2.0	44	2°11.0	2°11.4	2°05.0	4.4 - 0.6	10.4 - 1.5	16.4 - 2.3
45	1°41.3	1°41.5	1°36.6	4.5 - 0.5	10.5 - 1.1	16.5 - 1.8	45	1°56.3	1°56.6	1°51.0	4.5 - 0.6	10.5 - 1.3	16.5 - 2.1	45	2°11.3	2°11.6	2°05.3	4.5 - 0.6	10.5 - 1.5	16.5 - 2.3
46	1°41.5	1°41.8	1°36.9	4.6 - 0.5	10.6 - 1.1	16.6 - 1.8	46	1°56.5	1°56.8	1°51.2	4.6 - 0.6	10.6 - 1.3	16.6 - 2.1	46	2°11.5	2°11.9	2°05.5	4.6 - 0.7	10.6 - 1.5	16.6 - 2.4
47	1°41.8	1°42.0	1°37.1	4.7 - 0.5	10.7 - 1.2	16.7 - 1.8	47	1°56.7	1°57.1	1°51.4	4.7 - 0.6	10.7 - 1.3	16.7 - 2.1	47	2°11.7	2°12.1	2°05.7	4.7 - 0.7	10.7 - 1.5	16.7 - 2.4
48	1°42.0	1°42.3	1°37.4	4.8 - 0.5	10.8 - 1.2	16.8 - 1.8	48	1°57.0	1°57.3	1°51.7	4.8 - 0.6	10.8 - 1.4	16.8 - 2.1	48	2°12.0	2°12.4	2°06.0	4.8 - 0.7	10.8 - 1.5	16.8 - 2.4
49	1°42.3	1°42.5																		

Increments and Corrections

m 9	Sun Plan.	Aries	Moon	v and d corr			m 10	Sun Plan.	Aries	Moon	v and d corr			m 11	Sun Plan.	Aries	Moon	v and d corr		
0	2°15.0	2°15.4	2°08.8	0.0 - 0.0	6.0 - 0.9	12.0 - 1.9	0	2°30.0	2°30.4	2°23.2	0.0 - 0.0	6.0 - 1.0	12.0 - 2.1	0	2°45.0	2°45.5	2°37.5	0.0 - 0.0	6.0 - 1.2	12.0 - 2.3
1	2°15.3	2°15.6	2°09.1	0.1 - 0.0	6.1 - 1.0	12.1 - 1.9	1	2°30.3	2°30.7	2°23.4	0.1 - 0.0	6.1 - 1.1	12.1 - 2.1	1	2°45.3	2°45.7	2°37.7	0.1 - 0.0	6.1 - 1.2	12.1 - 2.3
2	2°15.5	2°15.9	2°09.3	0.2 - 0.0	6.2 - 1.0	12.2 - 1.9	2	2°30.5	2°30.9	2°23.6	0.2 - 0.0	6.2 - 1.1	12.2 - 2.1	2	2°45.5	2°46.0	2°38.0	0.2 - 0.0	6.2 - 1.2	12.2 - 2.3
3	2°15.8	2°16.1	2°09.6	0.3 - 0.0	6.3 - 1.0	12.3 - 1.9	3	2°30.8	2°31.2	2°23.9	0.3 - 0.1	6.3 - 1.1	12.3 - 2.2	3	2°45.8	2°46.2	2°38.2	0.3 - 0.1	6.3 - 1.2	12.3 - 2.4
4	2°16.0	2°16.4	2°09.8	0.4 - 0.1	6.4 - 1.0	12.4 - 2.0	4	2°31.0	2°31.4	2°24.1	0.4 - 0.1	6.4 - 1.1	12.4 - 2.2	4	2°46.0	2°46.5	2°38.4	0.4 - 0.1	6.4 - 1.2	12.4 - 2.4
5	2°16.3	2°16.6	2°10.0	0.5 - 0.1	6.5 - 1.0	12.5 - 2.0	5	2°31.3	2°31.7	2°24.4	0.5 - 0.1	6.5 - 1.1	12.5 - 2.2	5	2°46.3	2°46.7	2°38.7	0.5 - 0.1	6.5 - 1.2	12.5 - 2.4
6	2°16.5	2°16.9	2°10.3	0.6 - 0.1	6.6 - 1.0	12.6 - 2.0	6	2°31.5	2°31.9	2°24.6	0.6 - 0.1	6.6 - 1.2	12.6 - 2.2	6	2°46.5	2°47.0	2°38.9	0.6 - 0.1	6.6 - 1.3	12.6 - 2.4
7	2°16.8	2°17.1	2°10.5	0.7 - 0.1	6.7 - 1.1	12.7 - 2.0	7	2°31.8	2°32.2	2°24.8	0.7 - 0.1	6.7 - 1.2	12.7 - 2.2	7	2°46.8	2°47.2	2°39.2	0.7 - 0.1	6.7 - 1.3	12.7 - 2.4
8	2°17.0	2°17.4	2°10.8	0.8 - 0.1	6.8 - 1.1	12.8 - 2.0	8	2°32.0	2°32.4	2°25.1	0.8 - 0.1	6.8 - 1.2	12.8 - 2.2	8	2°47.0	2°47.5	2°39.4	0.8 - 0.2	6.8 - 1.3	12.8 - 2.5
9	2°17.3	2°17.6	2°11.0	0.9 - 0.1	6.9 - 1.1	12.9 - 2.0	9	2°32.3	2°32.7	2°25.3	0.9 - 0.2	6.9 - 1.2	12.9 - 2.3	9	2°47.3	2°47.7	2°39.6	0.9 - 0.2	6.9 - 1.3	12.9 - 2.5
10	2°17.5	2°17.9	2°11.2	1.0 - 0.2	7.0 - 1.1	13.0 - 2.1	10	2°32.5	2°32.9	2°25.6	1.0 - 0.2	7.0 - 1.2	13.0 - 2.3	10	2°47.5	2°48.0	2°39.9	1.0 - 0.2	7.0 - 1.3	13.0 - 2.5
11	2°17.8	2°18.1	2°11.5	1.1 - 0.2	7.1 - 1.1	13.1 - 2.1	11	2°32.8	2°33.2	2°25.8	1.1 - 0.2	7.1 - 1.2	13.1 - 2.3	11	2°47.8	2°48.2	2°40.1	1.1 - 0.2	7.1 - 1.4	13.1 - 2.5
12	2°18.0	2°18.4	2°11.7	1.2 - 0.2	7.2 - 1.1	13.2 - 2.1	12	2°33.0	2°33.4	2°26.0	1.2 - 0.2	7.2 - 1.3	13.2 - 2.3	12	2°48.0	2°48.5	2°40.3	1.2 - 0.2	7.2 - 1.4	13.2 - 2.5
13	2°18.3	2°18.6	2°12.0	1.3 - 0.2	7.3 - 1.2	13.3 - 2.1	13	2°33.3	2°33.7	2°26.3	1.3 - 0.2	7.3 - 1.3	13.3 - 2.3	13	2°48.3	2°48.7	2°40.6	1.3 - 0.2	7.3 - 1.4	13.3 - 2.5
14	2°18.5	2°18.9	2°12.2	1.4 - 0.2	7.4 - 1.2	13.4 - 2.1	14	2°33.5	2°33.9	2°26.5	1.4 - 0.2	7.4 - 1.3	13.4 - 2.3	14	2°48.5	2°49.0	2°40.8	1.4 - 0.3	7.4 - 1.4	13.4 - 2.6
15	2°18.8	2°19.1	2°12.4	1.5 - 0.2	7.5 - 1.2	13.5 - 2.1	15	2°33.8	2°34.2	2°26.7	1.5 - 0.3	7.5 - 1.3	13.5 - 2.4	15	2°48.8	2°49.2	2°41.1	1.5 - 0.3	7.5 - 1.4	13.5 - 2.6
16	2°19.0	2°19.4	2°12.7	1.6 - 0.3	7.6 - 1.2	13.6 - 2.2	16	2°34.0	2°34.4	2°27.0	1.6 - 0.3	7.6 - 1.3	13.6 - 2.4	16	2°49.0	2°49.5	2°41.3	1.6 - 0.3	7.6 - 1.5	13.6 - 2.6
17	2°19.3	2°19.6	2°12.9	1.7 - 0.3	7.7 - 1.2	13.7 - 2.2	17	2°34.3	2°34.7	2°27.2	1.7 - 0.3	7.7 - 1.3	13.7 - 2.4	17	2°49.3	2°49.7	2°41.5	1.7 - 0.3	7.7 - 1.5	13.7 - 2.6
18	2°19.5	2°19.9	2°13.1	1.8 - 0.3	7.8 - 1.2	13.8 - 2.2	18	2°34.5	2°34.9	2°27.5	1.8 - 0.3	7.8 - 1.4	13.8 - 2.4	18	2°49.5	2°50.0	2°41.8	1.8 - 0.3	7.8 - 1.5	13.8 - 2.6
19	2°19.7	2°20.1	2°13.4	1.9 - 0.3	7.9 - 1.3	13.9 - 2.2	19	2°34.8	2°35.2	2°27.7	1.9 - 0.3	7.9 - 1.4	13.9 - 2.4	19	2°49.8	2°50.2	2°42.0	1.9 - 0.4	7.9 - 1.5	13.9 - 2.7
20	2°20.0	2°20.4	2°13.6	2.0 - 0.3	8.0 - 1.3	14.0 - 2.2	20	2°35.0	2°35.4	2°27.9	2.0 - 0.3	8.0 - 1.4	14.0 - 2.4	20	2°50.0	2°50.5	2°42.3	2.0 - 0.4	8.0 - 1.5	14.0 - 2.7
21	2°20.2	2°20.6	2°13.9	2.1 - 0.3	8.1 - 1.3	14.1 - 2.2	21	2°35.2	2°35.6	2°28.2	2.1 - 0.4	8.1 - 1.4	14.1 - 2.5	21	2°50.2	2°50.7	2°42.5	2.1 - 0.4	8.1 - 1.6	14.1 - 2.7
22	2°20.5	2°20.9	2°14.1	2.2 - 0.3	8.2 - 1.3	14.2 - 2.2	22	2°35.5	2°35.9	2°28.4	2.2 - 0.4	8.2 - 1.4	14.2 - 2.5	22	2°50.5	2°51.0	2°42.7	2.2 - 0.4	8.2 - 1.6	14.2 - 2.7
23	2°20.7	2°21.1	2°14.3	2.3 - 0.4	8.3 - 1.3	14.3 - 2.3	23	2°35.7	2°36.2	2°28.7	2.3 - 0.4	8.3 - 1.5	14.3 - 2.5	23	2°50.7	2°51.2	2°43.0	2.3 - 0.4	8.3 - 1.6	14.3 - 2.7
24	2°21.0	2°21.4	2°14.6	2.4 - 0.4	8.4 - 1.3	14.4 - 2.3	24	2°36.0	2°36.4	2°28.9	2.4 - 0.4	8.4 - 1.5	14.4 - 2.5	24	2°51.0	2°51.5	2°43.2	2.4 - 0.5	8.4 - 1.6	14.4 - 2.8
25	2°21.2	2°21.6	2°14.8	2.5 - 0.4	8.5 - 1.3	14.5 - 2.3	25	2°36.2	2°36.7	2°29.1	2.5 - 0.4	8.5 - 1.5	14.5 - 2.5	25	2°51.2	2°51.7	2°43.4	2.5 - 0.5	8.5 - 1.6	14.5 - 2.8
26	2°21.5	2°21.9	2°15.1	2.6 - 0.4	8.6 - 1.4	14.6 - 2.3	26	2°36.5	2°36.9	2°29.4	2.6 - 0.5	8.6 - 1.5	14.6 - 2.6	26	2°51.5	2°52.0	2°43.7	2.6 - 0.5	8.6 - 1.6	14.6 - 2.8
27	2°21.7	2°22.1	2°15.3	2.7 - 0.4	8.7 - 1.4	14.7 - 2.3	27	2°36.7	2°37.2	2°29.6	2.7 - 0.5	8.7 - 1.5	14.7 - 2.6	27	2°51.7	2°52.2	2°43.9	2.7 - 0.5	8.7 - 1.7	14.7 - 2.8
28	2°22.0	2°22.4	2°15.5	2.8 - 0.4	8.8 - 1.4	14.8 - 2.3	28	2°37.0	2°37.4	2°29.8	2.8 - 0.5	8.8 - 1.5	14.8 - 2.6	28	2°52.0	2°52.5	2°44.2	2.8 - 0.5	8.8 - 1.7	14.8 - 2.8
29	2°22.2	2°22.6	2°15.8	2.9 - 0.5	8.9 - 1.4	14.9 - 2.4	29	2°37.2	2°37.7	2°30.1	2.9 - 0.5	8.9 - 1.6	14.9 - 2.6	29	2°52.2	2°52.7	2°44.4	2.9 - 0.6	8.9 - 1.7	14.9 - 2.9
30	2°22.5	2°22.9	2°16.0	3.0 - 0.5	9.0 - 1.4	15.0 - 2.4	30	2°37.5	2°37.9	2°30.3	3.0 - 0.5	9.0 - 1.6	15.0 - 2.6	30	2°52.5	2°53.0	2°44.6	3.0 - 0.6	9.0 - 1.7	15.0 - 2.9
31	2°22.8	2°23.1	2°16.2	3.1 - 0.5	9.1 - 1.4	15.1 - 2.4	31	2°37.8	2°38.2	2°30.6	3.1 - 0.5	9.1 - 1.6	15.1 - 2.6	31	2°52.8	2°53.2	2°44.9	3.1 - 0.6	9.1 - 1.7	15.1 - 2.9
32	2°23.0	2°23.4	2°16.5	3.2 - 0.5	9.2 - 1.5	15.2 - 2.4	32	2°38.0	2°38.4	2°30.8	3.2 - 0.6	9.2 - 1.6	15.2 - 2.7	32	2°53.0	2°53.5	2°45.1	3.2 - 0.6	9.2 - 1.8	15.2 - 2.9
33	2°23.3	2°23.6	2°16.7	3.3 - 0.5	9.3 - 1.5	15.3 - 2.4	33	2°38.3	2°38.7	2°31.0	3.3 - 0.6	9.3 - 1.6	15.3 - 2.7	33	2°53.3	2°53.7	2°45.4	3.3 - 0.6	9.3 - 1.8	15.3 - 2.9
34	2°23.5	2°23.9	2°17.0	3.4 - 0.5	9.4 - 1.5	15.4 - 2.4	34	2°38.5	2°38.9	2°31.3	3.4 - 0.6	9.4 - 1.6	15.4 - 2.7	34	2°53.5	2°54.0	2°45.6	3.4 - 0.7	9.4 - 1.8	15.4 - 3.0
35	2°23.8	2°24.1	2°17.2	3.5 - 0.6	9.5 - 1.5	15.5 - 2.5	35	2°38.8	2°39.2	2°31.5	3.5 - 0.6	9.5 - 1.7	15.5 - 2.7	35	2°53.8	2°54.2	2°45.8	3.5 - 0.7	9.5 - 1.8	15.5 - 3.0
36	2°24.0	2°24.4	2°17.4	3.6 - 0.6	9.6 - 1.5	15.6 - 2.5	36	2°39.0	2°39.4	2°31.8	3.6 - 0.6	9.6 - 1.7	15.6 - 2.7	36	2°54.0	2°54.5	2°46.1	3.6 - 0.7	9.6 - 1.8	15.6 - 3.0
37	2°24.3	2°24.6	2°17.7	3.7 - 0.6	9.7 - 1.5	15.7 - 2.5	37	2°39.3	2°39.7	2°32.0	3.7 - 0.6	9.7 - 1.7	15.7 - 2.7	37	2°54.3	2°54.7	2°46.3	3.7 - 0.7	9.7 - 1.9	15.7 - 3.0
38	2°24.5	2°24.9	2°17.9	3.8 - 0.6	9.8 - 1.6	15.8 - 2.5	38	2°39.5	2°39.9	2°32.2	3.8 - 0.7	9.8 - 1.7	15.8 - 2.8	38	2°54.5	2°55.0	2°46.6	3.8 - 0.7	9.8 - 1.9	15.8 - 3.0
39	2°24.8	2°25.1	2°18.2	3.9 - 0.6	9.9 - 1.6	15.9 - 2.5	39	2°39.8	2°40.2	2°32.5	3.9 - 0.7	9.9 - 1.7	15.9 - 2.8	39	2°54.8	2°55.2	2°46.8	3.9 - 0.7	9.9 - 1.9	15.9 - 3.0
40	2°25.0	2°25.4	2°18.4	4.0 - 0.6	10.0 - 1.6	16.0 - 2.5	40	2°40.0	2°40.4	2°32.7	4.0 - 0.7	10.0 - 1.8	16.0 - 2.8	40	2°55.0	2°55.5	2°47.0	4.0 - 0.8	10.0 - 1.9	16.0 - 3.1
41	2°25.3	2°25.6	2°18.6	4.1 - 0.6	10.1 - 1.6	16.1 - 2.5	41	2°40.3	2°40.7	2°32.9	4.1 - 0.7	10.1 - 1.8	16.1 - 2.8	41	2°55.3	2°55.7	2°47.3	4.1 - 0.8	10.1 - 1.9	16.1 - 3.1
42	2°25.5	2°25.9	2°18.9	4.2 - 0.7	10.2 - 1.6	16.2 - 2.6	42	2°40.5	2°40.9	2°33.2	4.2 - 0.7	10.2 - 1.8	16.2 - 2.8	42	2°55.5	2°56.0	2°47.5	4.2 - 0.8	10.2 - 2.0	16.2 - 3.1
43	2°25.8	2°26.1	2°19.1	4.3 - 0.7	10.3 - 1.6	16.3 - 2.6	43	2°40.8	2°41.2	2°33.4	4.3 - 0.8	10.3 - 1.8	16.3 - 2.9	43	2°55.8	2°56.2	2°47.7	4.3 - 0.8	10.3 - 2.0	16.3 - 3.1
44	2°26.0	2°26.4	2°19.3	4.4 - 0.7	10.4 - 1.6	16.4 - 2.6	44	2°41.0	2°41.4	2°33.7	4.4 - 0.8	10.4 - 1.8	16.4 - 2.9	44	2°56.0	2°56.5	2°48.0	4.4 - 0.8	10.4 - 2.0	16.4 - 3.1
45	2°26.3	2°26.6	2°19.6	4.5 - 0.7	10.5 - 1.7	16.5 - 2.6	45	2°41.3	2°41.7	2°33.9	4.5 - 0.8	10.5 - 1.8	16.5 - 2.9	45	2°56.3	2°56.7	2°48.2	4.5 - 0.9	10.5 - 2.0	16.5 - 3.2
46	2°26.5	2°26.9	2°19.8	4.6 - 0.7	10.6 - 1.7	16.6 - 2.6	46	2°41.5	2°41.9	2°34.1	4.6 - 0.8	10.6 - 1.9	16.6 - 2.9	46	2°56.5	2°57.0	2°48.5	4.6 - 0.9	10.6 - 2.0	16.6 - 3.2
47	2°26.8	2°27.2	2°20.1	4.7 - 0.7	10.7 - 1.7	16.7 - 2.6	47	2°41.8	2°42.2	2°34.4	4.7 - 0.8	10.7 - 1.9	16.7 - 2.9	47	2°56.8	2°57.2	2°48.7	4.7 - 0.9	10.7 - 2.1	16.7 - 3.2
48	2°27.0	2°27.4	2°20.3	4.8 - 0.8	10.8 - 1.7	16.8 - 2.7	48	2°42.0	2°42.4	2°34.6	4.8 - 0.8	10.8 - 1.9	16.8 - 2.9	48	2°57.0	2°57.5	2°48.9	4.8 - 0.9	10.8 - 2.1	16.8 - 3.2
49																				

Increments and Corrections

m 12	Sun Plan.	Aries	Moon	v and d corr			m 13	Sun Plan.	Aries	Moon	v and d corr			m 14	Sun Plan.	Aries	Moon	v and d corr		
0	3°00.0	3°00.5	2°51.8	0.0 - 0.0	6.0 - 1.3	12.0 - 2.5	0	3°15.0	3°15.5	3°06.1	0.0 - 0.0	6.0 - 1.4	12.0 - 2.7	0	3°30.0	3°30.6	3°20.4	0.0 - 0.0	6.0 - 1.4	12.0 - 2.9
1	3°00.3	3°00.7	2°52.0	0.1 - 0.0	6.1 - 1.3	12.1 - 2.5	1	3°15.3	3°15.8	3°06.4	0.1 - 0.0	6.1 - 1.4	12.1 - 2.7	1	3°30.3	3°30.8	3°20.7	0.1 - 0.0	6.1 - 1.5	12.1 - 2.9
2	3°00.5	3°01.0	2°52.3	0.2 - 0.0	6.2 - 1.3	12.2 - 2.5	2	3°15.5	3°16.0	3°06.6	0.2 - 0.0	6.2 - 1.4	12.2 - 2.7	2	3°30.5	3°31.1	3°20.9	0.2 - 0.0	6.2 - 1.5	12.2 - 2.9
3	3°00.8	3°01.2	2°52.5	0.3 - 0.1	6.3 - 1.3	12.3 - 2.6	3	3°15.8	3°16.3	3°06.8	0.3 - 0.1	6.3 - 1.4	12.3 - 2.8	3	3°30.8	3°31.3	3°21.1	0.3 - 0.1	6.3 - 1.5	12.3 - 3.0
4	3°01.0	3°01.5	2°52.8	0.4 - 0.1	6.4 - 1.3	12.4 - 2.6	4	3°16.0	3°16.5	3°07.1	0.4 - 0.1	6.4 - 1.4	12.4 - 2.8	4	3°31.0	3°31.6	3°21.4	0.4 - 0.1	6.4 - 1.5	12.4 - 3.0
5	3°01.3	3°01.7	2°53.0	0.5 - 0.1	6.5 - 1.4	12.5 - 2.6	5	3°16.3	3°16.8	3°07.3	0.5 - 0.1	6.5 - 1.5	12.5 - 2.8	5	3°31.3	3°31.8	3°21.6	0.5 - 0.1	6.5 - 1.6	12.5 - 3.0
6	3°01.5	3°02.0	2°53.2	0.6 - 0.1	6.6 - 1.4	12.6 - 2.6	6	3°16.5	3°17.0	3°07.5	0.6 - 0.1	6.6 - 1.5	12.6 - 2.8	6	3°31.5	3°32.1	3°21.9	0.6 - 0.1	6.6 - 1.6	12.6 - 3.0
7	3°01.8	3°02.2	2°53.5	0.7 - 0.1	6.7 - 1.4	12.7 - 2.6	7	3°16.8	3°17.3	3°07.8	0.7 - 0.2	6.7 - 1.5	12.7 - 2.9	7	3°31.8	3°32.3	3°22.1	0.7 - 0.2	6.7 - 1.6	12.7 - 3.1
8	3°02.0	3°02.5	2°53.7	0.8 - 0.2	6.8 - 1.4	12.8 - 2.7	8	3°17.0	3°17.5	3°08.0	0.8 - 0.2	6.8 - 1.5	12.8 - 2.9	8	3°32.0	3°32.6	3°22.3	0.8 - 0.2	6.8 - 1.6	12.8 - 3.1
9	3°02.3	3°02.7	2°53.9	0.9 - 0.2	6.9 - 1.4	12.9 - 2.7	9	3°17.3	3°17.8	3°08.3	0.9 - 0.2	6.9 - 1.6	12.9 - 2.9	9	3°32.3	3°32.8	3°22.6	0.9 - 0.2	6.9 - 1.7	12.9 - 3.1
10	3°02.5	3°03.0	2°54.2	1.0 - 0.2	7.0 - 1.5	13.0 - 2.7	10	3°17.5	3°18.0	3°08.5	1.0 - 0.2	7.0 - 1.6	13.0 - 2.9	10	3°32.5	3°33.1	3°22.8	1.0 - 0.2	7.0 - 1.7	13.0 - 3.1
11	3°02.8	3°03.2	2°54.4	1.1 - 0.2	7.1 - 1.5	13.1 - 2.7	11	3°17.8	3°18.3	3°08.7	1.1 - 0.2	7.1 - 1.6	13.1 - 2.9	11	3°32.8	3°33.3	3°23.1	1.1 - 0.3	7.1 - 1.7	13.1 - 3.2
12	3°03.0	3°03.5	2°54.7	1.2 - 0.3	7.2 - 1.5	13.2 - 2.8	12	3°18.0	3°18.5	3°09.0	1.2 - 0.3	7.2 - 1.6	13.2 - 3.0	12	3°33.0	3°33.6	3°23.3	1.2 - 0.3	7.2 - 1.7	13.2 - 3.2
13	3°03.3	3°03.8	2°54.9	1.3 - 0.3	7.3 - 1.5	13.3 - 2.8	13	3°18.3	3°18.8	3°09.2	1.3 - 0.3	7.3 - 1.6	13.3 - 3.0	13	3°33.3	3°33.8	3°23.5	1.3 - 0.3	7.3 - 1.8	13.3 - 3.2
14	3°03.5	3°04.0	2°55.1	1.4 - 0.3	7.4 - 1.5	13.4 - 2.8	14	3°18.5	3°19.0	3°09.5	1.4 - 0.3	7.4 - 1.7	13.4 - 3.0	14	3°33.5	3°34.1	3°23.8	1.4 - 0.3	7.4 - 1.8	13.4 - 3.2
15	3°03.8	3°04.3	2°55.4	1.5 - 0.3	7.5 - 1.6	13.5 - 2.8	15	3°18.8	3°19.3	3°09.7	1.5 - 0.3	7.5 - 1.7	13.5 - 3.0	15	3°33.8	3°34.3	3°24.0	1.5 - 0.4	7.5 - 1.8	13.5 - 3.3
16	3°04.0	3°04.5	2°55.6	1.6 - 0.3	7.6 - 1.6	13.6 - 2.8	16	3°19.0	3°19.5	3°09.9	1.6 - 0.4	7.6 - 1.7	13.6 - 3.1	16	3°34.0	3°34.6	3°24.3	1.6 - 0.4	7.6 - 1.8	13.6 - 3.3
17	3°04.2	3°04.8	2°55.9	1.7 - 0.4	7.7 - 1.6	13.7 - 2.9	17	3°19.3	3°19.8	3°10.2	1.7 - 0.4	7.7 - 1.7	13.7 - 3.1	17	3°34.3	3°34.8	3°24.5	1.7 - 0.4	7.7 - 1.9	13.7 - 3.3
18	3°04.5	3°05.0	2°56.1	1.8 - 0.4	7.8 - 1.6	13.8 - 2.9	18	3°19.5	3°20.0	3°10.4	1.8 - 0.4	7.8 - 1.8	13.8 - 3.1	18	3°34.5	3°35.1	3°24.7	1.8 - 0.4	7.8 - 1.9	13.8 - 3.3
19	3°04.7	3°05.3	2°56.3	1.9 - 0.4	7.9 - 1.6	13.9 - 2.9	19	3°19.7	3°20.3	3°10.7	1.9 - 0.4	7.9 - 1.8	13.9 - 3.1	19	3°34.8	3°35.3	3°25.0	1.9 - 0.5	7.9 - 1.9	13.9 - 3.4
20	3°05.0	3°05.5	2°56.6	2.0 - 0.4	8.0 - 1.7	14.0 - 2.9	20	3°20.0	3°20.5	3°10.9	2.0 - 0.5	8.0 - 1.8	14.0 - 3.1	20	3°35.0	3°35.6	3°25.2	2.0 - 0.5	8.0 - 1.9	14.0 - 3.4
21	3°05.2	3°05.8	2°56.8	2.1 - 0.4	8.1 - 1.7	14.1 - 2.9	21	3°20.2	3°20.8	3°11.1	2.1 - 0.5	8.1 - 1.8	14.1 - 3.2	21	3°35.2	3°35.8	3°25.4	2.1 - 0.5	8.1 - 2.0	14.1 - 3.4
22	3°05.5	3°06.0	2°57.0	2.2 - 0.5	8.2 - 1.7	14.2 - 3.0	22	3°20.5	3°21.0	3°11.4	2.2 - 0.5	8.2 - 1.8	14.2 - 3.2	22	3°35.5	3°36.1	3°25.7	2.2 - 0.5	8.2 - 2.0	14.2 - 3.4
23	3°05.7	3°06.3	2°57.3	2.3 - 0.5	8.3 - 1.7	14.3 - 3.0	23	3°20.7	3°21.3	3°11.6	2.3 - 0.5	8.3 - 1.9	14.3 - 3.2	23	3°35.7	3°36.3	3°25.9	2.3 - 0.6	8.3 - 2.0	14.3 - 3.5
24	3°06.0	3°06.5	2°57.5	2.4 - 0.5	8.4 - 1.8	14.4 - 3.0	24	3°21.0	3°21.5	3°11.8	2.4 - 0.5	8.4 - 1.9	14.4 - 3.2	24	3°36.0	3°36.6	3°26.2	2.4 - 0.6	8.4 - 2.0	14.4 - 3.5
25	3°06.2	3°06.8	2°57.8	2.5 - 0.5	8.5 - 1.8	14.5 - 3.0	25	3°21.2	3°21.8	3°12.1	2.5 - 0.6	8.5 - 1.9	14.5 - 3.3	25	3°36.2	3°36.8	3°26.4	2.5 - 0.6	8.5 - 2.1	14.5 - 3.5
26	3°06.5	3°07.0	2°58.0	2.6 - 0.5	8.6 - 1.8	14.6 - 3.0	26	3°21.5	3°22.1	3°12.3	2.6 - 0.6	8.6 - 1.9	14.6 - 3.3	26	3°36.5	3°37.1	3°26.6	2.6 - 0.6	8.6 - 2.1	14.6 - 3.5
27	3°06.7	3°07.3	2°58.2	2.7 - 0.6	8.7 - 1.8	14.7 - 3.1	27	3°21.7	3°22.3	3°12.6	2.7 - 0.6	8.7 - 2.0	14.7 - 3.3	27	3°36.7	3°37.3	3°26.9	2.7 - 0.7	8.7 - 2.1	14.7 - 3.6
28	3°07.0	3°07.5	2°58.5	2.8 - 0.6	8.8 - 1.8	14.8 - 3.1	28	3°22.0	3°22.6	3°12.8	2.8 - 0.6	8.8 - 2.0	14.8 - 3.3	28	3°37.0	3°37.6	3°27.1	2.8 - 0.7	8.8 - 2.1	14.8 - 3.6
29	3°07.2	3°07.8	2°58.7	2.9 - 0.6	8.9 - 1.9	14.9 - 3.1	29	3°22.2	3°22.8	3°13.0	2.9 - 0.7	8.9 - 2.0	14.9 - 3.4	29	3°37.2	3°37.8	3°27.4	2.9 - 0.7	8.9 - 2.2	14.9 - 3.6
30	3°07.5	3°08.0	2°59.0	3.0 - 0.6	9.0 - 1.9	15.0 - 3.1	30	3°22.5	3°23.1	3°13.3	3.0 - 0.7	9.0 - 2.0	15.0 - 3.4	30	3°37.5	3°38.1	3°27.6	3.0 - 0.7	9.0 - 2.2	15.0 - 3.6
31	3°07.8	3°08.3	2°59.2	3.1 - 0.6	9.1 - 1.9	15.1 - 3.1	31	3°22.8	3°23.3	3°13.5	3.1 - 0.7	9.1 - 2.0	15.1 - 3.4	31	3°37.8	3°38.3	3°27.8	3.1 - 0.7	9.1 - 2.2	15.1 - 3.6
32	3°08.0	3°08.5	2°59.4	3.2 - 0.7	9.2 - 1.9	15.2 - 3.2	32	3°23.0	3°23.6	3°13.8	3.2 - 0.7	9.2 - 2.1	15.2 - 3.4	32	3°38.0	3°38.6	3°28.1	3.2 - 0.8	9.2 - 2.2	15.2 - 3.7
33	3°08.3	3°08.8	2°59.7	3.3 - 0.7	9.3 - 1.9	15.3 - 3.2	33	3°23.3	3°23.8	3°14.0	3.3 - 0.7	9.3 - 2.1	15.3 - 3.4	33	3°38.3	3°38.8	3°28.3	3.3 - 0.8	9.3 - 2.2	15.3 - 3.7
34	3°08.5	3°09.0	2°59.9	3.4 - 0.7	9.4 - 2.0	15.4 - 3.2	34	3°23.5	3°24.1	3°14.2	3.4 - 0.8	9.4 - 2.1	15.4 - 3.5	34	3°38.5	3°39.1	3°28.5	3.4 - 0.8	9.4 - 2.3	15.4 - 3.7
35	3°08.8	3°09.3	3°00.2	3.5 - 0.7	9.5 - 2.0	15.5 - 3.2	35	3°23.8	3°24.3	3°14.5	3.5 - 0.8	9.5 - 2.1	15.5 - 3.5	35	3°38.8	3°39.3	3°28.8	3.5 - 0.8	9.5 - 2.3	15.5 - 3.7
36	3°09.0	3°09.5	3°00.4	3.6 - 0.8	9.6 - 2.0	15.6 - 3.3	36	3°24.0	3°24.6	3°14.7	3.6 - 0.8	9.6 - 2.2	15.6 - 3.5	36	3°39.0	3°39.6	3°29.0	3.6 - 0.9	9.6 - 2.3	15.6 - 3.8
37	3°09.3	3°09.8	3°00.6	3.7 - 0.8	9.7 - 2.0	15.7 - 3.3	37	3°24.3	3°24.8	3°14.9	3.7 - 0.8	9.7 - 2.2	15.7 - 3.5	37	3°39.3	3°39.8	3°29.3	3.7 - 0.9	9.7 - 2.3	15.7 - 3.8
38	3°09.5	3°10.0	3°00.9	3.8 - 0.8	9.8 - 2.0	15.8 - 3.3	38	3°24.5	3°25.1	3°15.2	3.8 - 0.9	9.8 - 2.2	15.8 - 3.6	38	3°39.5	3°40.1	3°29.5	3.8 - 0.9	9.8 - 2.4	15.8 - 3.8
39	3°09.8	3°10.3	3°01.1	3.9 - 0.8	9.9 - 2.1	15.9 - 3.3	39	3°24.8	3°25.3	3°15.4	3.9 - 0.9	9.9 - 2.2	15.9 - 3.6	39	3°39.8	3°40.4	3°29.7	3.9 - 0.9	9.9 - 2.4	15.9 - 3.8
40	3°10.0	3°10.5	3°01.3	4.0 - 0.8	10.0 - 2.1	16.0 - 3.3	40	3°25.0	3°25.6	3°15.7	4.0 - 0.9	10.0 - 2.3	16.0 - 3.6	40	3°40.0	3°40.6	3°30.0	4.0 - 1.0	10.0 - 2.4	16.0 - 3.9
41	3°10.3	3°10.8	3°01.6	4.1 - 0.9	10.1 - 2.1	16.1 - 3.4	41	3°25.3	3°25.8	3°15.9	4.1 - 0.9	10.1 - 2.3	16.1 - 3.6	41	3°40.3	3°40.9	3°30.2	4.1 - 1.0	10.1 - 2.4	16.1 - 3.9
42	3°10.5	3°11.0	3°01.8	4.2 - 0.9	10.2 - 2.1	16.2 - 3.4	42	3°25.5	3°26.1	3°16.1	4.2 - 0.9	10.2 - 2.3	16.2 - 3.6	42	3°40.5	3°41.1	3°30.5	4.2 - 1.0	10.2 - 2.5	16.2 - 3.9
43	3°10.8	3°11.3	3°02.1	4.3 - 0.9	10.3 - 2.1	16.3 - 3.4	43	3°25.8	3°26.3	3°16.4	4.3 - 1.0	10.3 - 2.3	16.3 - 3.7	43	3°40.8	3°41.4	3°30.7	4.3 - 1.0	10.3 - 2.5	16.3 - 3.9
44	3°11.0	3°11.5	3°02.3	4.4 - 0.9	10.4 - 2.2	16.4 - 3.4	44	3°26.0	3°26.6	3°16.6	4.4 - 1.0	10.4 - 2.3	16.4 - 3.7	44	3°41.0	3°41.6	3°30.9	4.4 - 1.1	10.4 - 2.5	16.4 - 4.0
45	3°11.3	3°11.8	3°02.5	4.5 - 0.9	10.5 - 2.2	16.5 - 3.4	45	3°26.3	3°26.8	3°16.9	4.5 - 1.0	10.5 - 2.4	16.5 - 3.7	45	3°41.3	3°41.9	3°31.2	4.5 - 1.1	10.5 - 2.5	16.5 - 4.0
46	3°11.5	3°12.0	3°02.8	4.6 - 1.0	10.6 - 2.2	16.6 - 3.5	46	3°26.5	3°27.1	3°17.1	4.6 - 1.0	10.6 - 2.4	16.6 - 3.7	46	3°41.5	3°42.1	3°31.4	4.6 - 1.1	10.6 - 2.6	16.6 - 4.0
47	3°11.7	3°12.3	3°03.0	4.7 - 1.0	10.7 - 2.2	16.7 - 3.5	47	3°26.8	3°27.3	3°17.3	4.7 - 1.1	10.7 - 2.4	16.7 - 3.8	47	3°41.8	3°42.4	3°31.6	4.7 - 1.1	10.7 - 2.6	16.7 - 4.0
48	3°12.0	3°12.5	3°03.3	4.8 - 1.0	10.8 - 2.3	16.8 - 3.5	48	3°27.0	3°27.6	3°17.6	4.8 - 1.1	10.8 - 2.4	16.8 - 3.8	48	3°42.0	3°42.6	3°31.9	4.8 - 1.2	10.8 - 2.6	16.8 - 4.1
49	3°12.2	3°12.																		

Increments and Corrections

m 15	Sun Plan.	Aries	Moon	v and d corr			m 16	Sun Plan.	Aries	Moon	v and d corr			m 17	Sun Plan.	Aries	Moon	v and d corr		
0	3°45.0	3°45.6	3°34.8	0.0 - 0.0	6.0 - 1.6	12.0 - 3.1	0	4°00.0	4°00.7	3°49.1	0.0 - 0.0	6.0 - 1.7	12.0 - 3.3	0	4°15.0	4°15.7	4°03.4	0.0 - 0.0	6.0 - 1.8	12.0 - 3.5
1	3°45.2	3°45.9	3°35.0	0.1 - 0.0	6.1 - 1.6	12.1 - 3.1	1	4°00.2	4°00.9	3°49.3	0.1 - 0.0	6.1 - 1.7	12.1 - 3.3	1	4°15.2	4°15.9	4°03.6	0.1 - 0.0	6.1 - 1.8	12.1 - 3.5
2	3°45.5	3°46.1	3°35.2	0.2 - 0.1	6.2 - 1.6	12.2 - 3.2	2	4°00.5	4°01.2	3°49.5	0.2 - 0.1	6.2 - 1.7	12.2 - 3.4	2	4°15.5	4°16.2	4°03.9	0.2 - 0.1	6.2 - 1.8	12.2 - 3.6
3	3°45.8	3°46.4	3°35.5	0.3 - 0.1	6.3 - 1.6	12.3 - 3.2	3	4°00.8	4°01.4	3°49.8	0.3 - 0.1	6.3 - 1.7	12.3 - 3.4	3	4°15.8	4°16.4	4°04.1	0.3 - 0.1	6.3 - 1.8	12.3 - 3.6
4	3°46.0	3°46.6	3°35.7	0.4 - 0.1	6.4 - 1.7	12.4 - 3.2	4	4°01.0	4°01.7	3°50.0	0.4 - 0.1	6.4 - 1.8	12.4 - 3.4	4	4°16.0	4°16.7	4°04.3	0.4 - 0.1	6.4 - 1.9	12.4 - 3.6
5	3°46.2	3°46.9	3°35.9	0.5 - 0.1	6.5 - 1.7	12.5 - 3.2	5	4°01.2	4°01.9	3°50.3	0.5 - 0.1	6.5 - 1.8	12.5 - 3.4	5	4°16.2	4°17.0	4°04.6	0.5 - 0.1	6.5 - 1.9	12.5 - 3.6
6	3°46.5	3°47.1	3°36.2	0.6 - 0.2	6.6 - 1.7	12.6 - 3.3	6	4°01.5	4°02.2	3°50.5	0.6 - 0.2	6.6 - 1.8	12.6 - 3.5	6	4°16.5	4°17.2	4°04.8	0.6 - 0.2	6.6 - 1.9	12.6 - 3.7
7	3°46.8	3°47.4	3°36.4	0.7 - 0.2	6.7 - 1.7	12.7 - 3.3	7	4°01.8	4°02.4	3°50.7	0.7 - 0.2	6.7 - 1.8	12.7 - 3.5	7	4°16.8	4°17.5	4°05.1	0.7 - 0.2	6.7 - 2.0	12.7 - 3.7
8	3°47.0	3°47.6	3°36.7	0.8 - 0.2	6.8 - 1.8	12.8 - 3.3	8	4°02.0	4°02.7	3°51.0	0.8 - 0.2	6.8 - 1.9	12.8 - 3.5	8	4°17.0	4°17.7	4°05.3	0.8 - 0.2	6.8 - 2.0	12.8 - 3.7
9	3°47.3	3°47.9	3°36.9	0.9 - 0.2	6.9 - 1.8	12.9 - 3.3	9	4°02.2	4°02.9	3°51.2	0.9 - 0.2	6.9 - 1.9	12.9 - 3.5	9	4°17.2	4°18.0	4°05.5	0.9 - 0.3	6.9 - 2.0	12.9 - 3.8
10	3°47.5	3°48.1	3°37.1	1.0 - 0.3	7.0 - 1.8	13.0 - 3.4	10	4°02.5	4°03.2	3°51.5	1.0 - 0.3	7.0 - 1.9	13.0 - 3.6	10	4°17.5	4°18.2	4°05.8	1.0 - 0.3	7.0 - 2.0	13.0 - 3.8
11	3°47.7	3°48.4	3°37.4	1.1 - 0.3	7.1 - 1.8	13.1 - 3.4	11	4°02.8	4°03.4	3°51.7	1.1 - 0.3	7.1 - 2.0	13.1 - 3.6	11	4°17.8	4°18.5	4°06.0	1.1 - 0.3	7.1 - 2.1	13.1 - 3.8
12	3°48.0	3°48.6	3°37.6	1.2 - 0.3	7.2 - 1.9	13.2 - 3.4	12	4°03.0	4°03.7	3°51.9	1.2 - 0.3	7.2 - 2.0	13.2 - 3.6	12	4°18.0	4°18.7	4°06.2	1.2 - 0.4	7.2 - 2.1	13.2 - 3.9
13	3°48.3	3°48.9	3°37.9	1.3 - 0.3	7.3 - 1.9	13.3 - 3.4	13	4°03.2	4°03.9	3°52.2	1.3 - 0.4	7.3 - 2.0	13.3 - 3.7	13	4°18.2	4°19.0	4°06.5	1.3 - 0.4	7.3 - 2.1	13.3 - 3.9
14	3°48.5	3°49.1	3°38.1	1.4 - 0.4	7.4 - 1.9	13.4 - 3.5	14	4°03.5	4°04.2	3°52.4	1.4 - 0.4	7.4 - 2.0	13.4 - 3.7	14	4°18.5	4°19.2	4°06.7	1.4 - 0.4	7.4 - 2.2	13.4 - 3.9
15	3°48.8	3°49.4	3°38.3	1.5 - 0.4	7.5 - 1.9	13.5 - 3.5	15	4°03.8	4°04.4	3°52.6	1.5 - 0.4	7.5 - 2.1	13.5 - 3.7	15	4°18.8	4°19.5	4°07.0	1.5 - 0.4	7.5 - 2.2	13.5 - 3.9
16	3°49.0	3°49.6	3°38.6	1.6 - 0.4	7.6 - 2.0	13.6 - 3.5	16	4°04.0	4°04.7	3°52.9	1.6 - 0.4	7.6 - 2.1	13.6 - 3.7	16	4°19.0	4°19.7	4°07.2	1.6 - 0.5	7.6 - 2.2	13.6 - 4.0
17	3°49.3	3°49.9	3°38.8	1.7 - 0.4	7.7 - 2.0	13.7 - 3.5	17	4°04.3	4°04.9	3°53.1	1.7 - 0.5	7.7 - 2.1	13.7 - 3.8	17	4°19.3	4°20.0	4°07.4	1.7 - 0.5	7.7 - 2.2	13.7 - 4.0
18	3°49.5	3°50.1	3°39.0	1.8 - 0.5	7.8 - 2.0	13.8 - 3.6	18	4°04.5	4°05.2	3°53.4	1.8 - 0.5	7.8 - 2.1	13.8 - 3.8	18	4°19.5	4°20.2	4°07.7	1.8 - 0.5	7.8 - 2.3	13.8 - 4.0
19	3°49.8	3°50.4	3°39.3	1.9 - 0.5	7.9 - 2.0	13.9 - 3.6	19	4°04.7	4°05.4	3°53.6	1.9 - 0.5	7.9 - 2.2	13.9 - 3.8	19	4°19.7	4°20.5	4°07.9	1.9 - 0.6	7.9 - 2.3	13.9 - 4.1
20	3°50.0	3°50.6	3°39.5	2.0 - 0.5	8.0 - 2.1	14.0 - 3.6	20	4°05.0	4°05.7	3°53.8	2.0 - 0.6	8.0 - 2.2	14.0 - 3.9	20	4°20.0	4°20.7	4°08.2	2.0 - 0.6	8.0 - 2.3	14.0 - 4.1
21	3°50.2	3°50.9	3°39.8	2.1 - 0.5	8.1 - 2.1	14.1 - 3.6	21	4°05.3	4°05.9	3°54.1	2.1 - 0.6	8.1 - 2.2	14.1 - 3.9	21	4°20.3	4°21.0	4°08.4	2.1 - 0.6	8.1 - 2.4	14.1 - 4.1
22	3°50.5	3°51.1	3°40.0	2.2 - 0.6	8.2 - 2.1	14.2 - 3.7	22	4°05.5	4°06.2	3°54.3	2.2 - 0.6	8.2 - 2.2	14.2 - 3.9	22	4°20.5	4°21.2	4°08.6	2.2 - 0.6	8.2 - 2.4	14.2 - 4.1
23	3°50.7	3°51.4	3°40.2	2.3 - 0.6	8.3 - 2.1	14.3 - 3.7	23	4°05.7	4°06.4	3°54.6	2.3 - 0.6	8.3 - 2.3	14.3 - 3.9	23	4°20.7	4°21.5	4°08.9	2.3 - 0.7	8.3 - 2.4	14.3 - 4.2
24	3°51.0	3°51.6	3°40.5	2.4 - 0.6	8.4 - 2.2	14.4 - 3.7	24	4°06.0	4°06.7	3°54.8	2.4 - 0.7	8.4 - 2.3	14.4 - 4.0	24	4°21.0	4°21.7	4°09.1	2.4 - 0.7	8.4 - 2.5	14.4 - 4.2
25	3°51.2	3°51.9	3°40.7	2.5 - 0.6	8.5 - 2.2	14.5 - 3.7	25	4°06.3	4°06.9	3°55.0	2.5 - 0.7	8.5 - 2.3	14.5 - 4.0	25	4°21.3	4°22.0	4°09.3	2.5 - 0.7	8.5 - 2.5	14.5 - 4.2
26	3°51.5	3°52.1	3°41.0	2.6 - 0.7	8.6 - 2.2	14.6 - 3.8	26	4°06.5	4°07.2	3°55.3	2.6 - 0.7	8.6 - 2.4	14.6 - 4.0	26	4°21.5	4°22.2	4°09.6	2.6 - 0.8	8.6 - 2.5	14.6 - 4.3
27	3°51.8	3°52.4	3°41.2	2.7 - 0.7	8.7 - 2.2	14.7 - 3.8	27	4°06.7	4°07.4	3°55.5	2.7 - 0.7	8.7 - 2.4	14.7 - 4.0	27	4°21.7	4°22.5	4°09.8	2.7 - 0.8	8.7 - 2.5	14.7 - 4.3
28	3°52.0	3°52.6	3°41.4	2.8 - 0.7	8.8 - 2.3	14.8 - 3.8	28	4°07.0	4°07.7	3°55.7	2.8 - 0.8	8.8 - 2.4	14.8 - 4.1	28	4°22.0	4°22.7	4°10.1	2.8 - 0.8	8.8 - 2.6	14.8 - 4.3
29	3°52.2	3°52.9	3°41.7	2.9 - 0.7	8.9 - 2.3	14.9 - 3.8	29	4°07.3	4°07.9	3°56.0	2.9 - 0.8	8.9 - 2.4	14.9 - 4.1	29	4°22.3	4°23.0	4°10.3	2.9 - 0.8	8.9 - 2.6	14.9 - 4.3
30	3°52.5	3°53.1	3°41.9	3.0 - 0.8	9.0 - 2.3	15.0 - 3.9	30	4°07.5	4°08.2	3°56.2	3.0 - 0.8	9.0 - 2.5	15.0 - 4.1	30	4°22.5	4°23.2	4°10.5	3.0 - 0.9	9.0 - 2.6	15.0 - 4.4
31	3°52.8	3°53.4	3°42.1	3.1 - 0.8	9.1 - 2.4	15.1 - 3.9	31	4°07.7	4°08.4	3°56.5	3.1 - 0.9	9.1 - 2.5	15.1 - 4.2	31	4°22.7	4°23.5	4°10.8	3.1 - 0.9	9.1 - 2.7	15.1 - 4.4
32	3°53.0	3°53.6	3°42.4	3.2 - 0.8	9.2 - 2.4	15.2 - 3.9	32	4°08.0	4°08.7	3°56.7	3.2 - 0.9	9.2 - 2.5	15.2 - 4.2	32	4°23.0	4°23.7	4°11.0	3.2 - 0.9	9.2 - 2.7	15.2 - 4.4
33	3°53.2	3°53.9	3°42.6	3.3 - 0.9	9.3 - 2.4	15.3 - 4.0	33	4°08.3	4°08.9	3°56.9	3.3 - 0.9	9.3 - 2.6	15.3 - 4.2	33	4°23.3	4°24.0	4°11.3	3.3 - 1.0	9.3 - 2.7	15.3 - 4.5
34	3°53.5	3°54.1	3°42.9	3.4 - 0.9	9.4 - 2.4	15.4 - 4.0	34	4°08.5	4°09.2	3°57.2	3.4 - 0.9	9.4 - 2.6	15.4 - 4.2	34	4°23.5	4°24.2	4°11.5	3.4 - 1.0	9.4 - 2.7	15.4 - 4.5
35	3°53.8	3°54.4	3°43.1	3.5 - 0.9	9.5 - 2.5	15.5 - 4.0	35	4°08.7	4°09.4	3°57.4	3.5 - 1.0	9.5 - 2.6	15.5 - 4.3	35	4°23.7	4°24.5	4°11.7	3.5 - 1.0	9.5 - 2.8	15.5 - 4.5
36	3°54.0	3°54.6	3°43.3	3.6 - 0.9	9.6 - 2.5	15.6 - 4.0	36	4°09.0	4°09.7	3°57.7	3.6 - 1.0	9.6 - 2.6	15.6 - 4.3	36	4°24.0	4°24.7	4°12.0	3.6 - 1.1	9.6 - 2.8	15.6 - 4.5
37	3°54.3	3°54.9	3°43.6	3.7 - 1.0	9.7 - 2.5	15.7 - 4.1	37	4°09.3	4°09.9	3°57.9	3.7 - 1.0	9.7 - 2.7	15.7 - 4.3	37	4°24.3	4°25.0	4°12.2	3.7 - 1.1	9.7 - 2.8	15.7 - 4.6
38	3°54.5	3°55.1	3°43.8	3.8 - 1.0	9.8 - 2.5	15.8 - 4.1	38	4°09.5	4°10.2	3°58.1	3.8 - 1.0	9.8 - 2.7	15.8 - 4.3	38	4°24.5	4°25.2	4°12.5	3.8 - 1.1	9.8 - 2.9	15.8 - 4.6
39	3°54.8	3°55.4	3°44.1	3.9 - 1.0	9.9 - 2.6	15.9 - 4.1	39	4°09.7	4°10.4	3°58.4	3.9 - 1.1	9.9 - 2.7	15.9 - 4.4	39	4°24.7	4°25.5	4°12.7	3.9 - 1.1	9.9 - 2.9	15.9 - 4.6
40	3°55.0	3°55.6	3°44.3	4.0 - 1.0	10.0 - 2.6	16.0 - 4.1	40	4°10.0	4°10.7	3°58.6	4.0 - 1.1	10.0 - 2.8	16.0 - 4.4	40	4°25.0	4°25.7	4°12.9	4.0 - 1.2	10.0 - 2.9	16.0 - 4.7
41	3°55.3	3°55.9	3°44.5	4.1 - 1.1	10.1 - 2.6	16.1 - 4.2	41	4°10.3	4°10.9	3°58.8	4.1 - 1.1	10.1 - 2.8	16.1 - 4.4	41	4°25.3	4°26.0	4°13.2	4.1 - 1.2	10.1 - 2.9	16.1 - 4.7
42	3°55.5	3°56.1	3°44.8	4.2 - 1.1	10.2 - 2.6	16.2 - 4.2	42	4°10.5	4°11.2	3°59.1	4.2 - 1.2	10.2 - 2.8	16.2 - 4.5	42	4°25.5	4°26.2	4°13.4	4.2 - 1.2	10.2 - 3.0	16.2 - 4.7
43	3°55.7	3°56.4	3°45.0	4.3 - 1.1	10.3 - 2.7	16.3 - 4.2	43	4°10.7	4°11.4	3°59.3	4.3 - 1.2	10.3 - 2.8	16.3 - 4.5	43	4°25.7	4°26.5	4°13.6	4.3 - 1.3	10.3 - 3.0	16.3 - 4.8
44	3°56.0	3°56.6	3°45.2	4.4 - 1.1	10.4 - 2.7	16.4 - 4.2	44	4°11.0	4°11.7	3°59.6	4.4 - 1.2	10.4 - 2.9	16.4 - 4.5	44	4°26.0	4°26.7	4°13.9	4.4 - 1.3	10.4 - 3.0	16.4 - 4.8
45	3°56.3	3°56.9	3°45.5	4.5 - 1.2	10.5 - 2.7	16.5 - 4.3	45	4°11.3	4°11.9	3°59.8	4.5 - 1.2	10.5 - 2.9	16.5 - 4.5	45	4°26.3	4°27.0	4°14.1	4.5 - 1.3	10.5 - 3.1	16.5 - 4.8
46	3°56.5	3°57.1	3°45.7	4.6 - 1.2	10.6 - 2.7	16.6 - 4.3	46	4°11.5	4°12.2	4°00.0	4.6 - 1.3	10.6 - 2.9	16.6 - 4.6	46	4°26.5	4°27.2	4°14.4	4.6 - 1.3	10.6 - 3.1	16.6 - 4.8
47	3°56.8	3°57.4	3°46.0	4.7 - 1.2	10.7 - 2.8	16.7 - 4.3	47	4°11.8	4°12.4	4°00.3	4.7 - 1.3	10.7 - 2.9	16.7 - 4.6	47	4°26.8	4°27.5	4°14.6	4.7 - 1.4	10.7 - 3.1	16.7 - 4.9
48	3°57.0	3°57.6	3°46.2	4.8 - 1.2	10.8 - 2.8	16.8 - 4.3	48	4°12.0	4°12.7	4°00.5	4.8 - 1.3	10.8 - 3.0	16.8 - 4.6	48	4°27.0	4°27.7	4°14.8	4.8 - 1.4	10.8 - 3.2	16.8 - 4.9
49	3°57.3	3°57.																		

Increments and Corrections

m 18	Sun Plan.	Aries	Moon	v and d corr			m 19	Sun Plan.	Aries	Moon	v and d corr			m 20	Sun Plan.	Aries	Moon	v and d corr		
0	4°30.0	4°30.7	4°17.7	0.0 - 0.0	6.0 - 1.9	12.0 - 3.7	0	4°45.0	4°45.8	4°32.0	0.0 - 0.0	6.0 - 2.0	12.0 - 3.9	0	5°00.0	5°00.8	4°46.3	0.0 - 0.0	6.0 - 2.0	12.0 - 4.1
1	4°30.2	4°31.0	4°17.9	0.1 - 0.0	6.1 - 1.9	12.1 - 3.7	1	4°45.2	4°46.0	4°32.3	0.1 - 0.0	6.1 - 2.0	12.1 - 3.9	1	5°00.2	5°01.1	4°46.6	0.1 - 0.0	6.1 - 2.1	12.1 - 4.1
2	4°30.5	4°31.2	4°18.2	0.2 - 0.1	6.2 - 1.9	12.2 - 3.8	2	4°45.5	4°46.3	4°32.5	0.2 - 0.1	6.2 - 2.0	12.2 - 4.0	2	5°00.5	5°01.3	4°46.8	0.2 - 0.1	6.2 - 2.1	12.2 - 4.2
3	4°30.8	4°31.5	4°18.4	0.3 - 0.1	6.3 - 1.9	12.3 - 3.8	3	4°45.8	4°46.5	4°32.7	0.3 - 0.1	6.3 - 2.0	12.3 - 4.0	3	5°00.8	5°01.6	4°47.0	0.3 - 0.1	6.3 - 2.2	12.3 - 4.2
4	4°31.0	4°31.7	4°18.7	0.4 - 0.1	6.4 - 2.0	12.4 - 3.8	4	4°46.0	4°46.8	4°33.0	0.4 - 0.1	6.4 - 2.1	12.4 - 4.0	4	5°01.0	5°01.8	4°47.3	0.4 - 0.1	6.4 - 2.2	12.4 - 4.2
5	4°31.2	4°32.0	4°18.9	0.5 - 0.2	6.5 - 2.0	12.5 - 3.9	5	4°46.2	4°47.0	4°33.2	0.5 - 0.2	6.5 - 2.1	12.5 - 4.1	5	5°01.2	5°02.1	4°47.5	0.5 - 0.2	6.5 - 2.2	12.5 - 4.3
6	4°31.5	4°32.2	4°19.1	0.6 - 0.2	6.6 - 2.0	12.6 - 3.9	6	4°46.5	4°47.3	4°33.4	0.6 - 0.2	6.6 - 2.1	12.6 - 4.1	6	5°01.5	5°02.3	4°47.8	0.6 - 0.2	6.6 - 2.3	12.6 - 4.3
7	4°31.8	4°32.5	4°19.4	0.7 - 0.2	6.7 - 2.1	12.7 - 3.9	7	4°46.8	4°47.5	4°33.7	0.7 - 0.2	6.7 - 2.2	12.7 - 4.1	7	5°01.8	5°02.6	4°48.0	0.7 - 0.2	6.7 - 2.3	12.7 - 4.3
8	4°32.0	4°32.7	4°19.6	0.8 - 0.2	6.8 - 2.1	12.8 - 3.9	8	4°47.0	4°47.8	4°33.9	0.8 - 0.3	6.8 - 2.2	12.8 - 4.2	8	5°02.0	5°02.8	4°48.2	0.8 - 0.3	6.8 - 2.3	12.8 - 4.4
9	4°32.2	4°33.0	4°19.8	0.9 - 0.3	6.9 - 2.1	12.9 - 4.0	9	4°47.2	4°48.0	4°34.2	0.9 - 0.3	6.9 - 2.2	12.9 - 4.2	9	5°02.2	5°03.1	4°48.5	0.9 - 0.3	6.9 - 2.4	12.9 - 4.4
10	4°32.5	4°33.2	4°20.1	1.0 - 0.3	7.0 - 2.2	13.0 - 4.0	10	4°47.5	4°48.3	4°34.4	1.0 - 0.3	7.0 - 2.3	13.0 - 4.2	10	5°02.5	5°03.3	4°48.7	1.0 - 0.3	7.0 - 2.4	13.0 - 4.4
11	4°32.8	4°33.5	4°20.3	1.1 - 0.3	7.1 - 2.2	13.1 - 4.0	11	4°47.8	4°48.5	4°34.6	1.1 - 0.4	7.1 - 2.3	13.1 - 4.3	11	5°02.8	5°03.6	4°49.0	1.1 - 0.4	7.1 - 2.4	13.1 - 4.5
12	4°33.0	4°33.7	4°20.6	1.2 - 0.4	7.2 - 2.2	13.2 - 4.1	12	4°48.0	4°48.8	4°34.9	1.2 - 0.4	7.2 - 2.3	13.2 - 4.3	12	5°03.0	5°03.8	4°49.2	1.2 - 0.4	7.2 - 2.5	13.2 - 4.5
13	4°33.2	4°34.0	4°20.8	1.3 - 0.4	7.3 - 2.3	13.3 - 4.1	13	4°48.2	4°49.0	4°35.1	1.3 - 0.4	7.3 - 2.4	13.3 - 4.3	13	5°03.2	5°04.1	4°49.4	1.3 - 0.4	7.3 - 2.5	13.3 - 4.5
14	4°33.5	4°34.2	4°21.0	1.4 - 0.4	7.4 - 2.3	13.4 - 4.1	14	4°48.5	4°49.3	4°35.4	1.4 - 0.5	7.4 - 2.4	13.4 - 4.4	14	5°03.5	5°04.3	4°49.7	1.4 - 0.5	7.4 - 2.5	13.4 - 4.6
15	4°33.8	4°34.5	4°21.3	1.5 - 0.5	7.5 - 2.3	13.5 - 4.2	15	4°48.8	4°49.5	4°35.6	1.5 - 0.5	7.5 - 2.4	13.5 - 4.4	15	5°03.8	5°04.6	4°49.9	1.5 - 0.5	7.5 - 2.6	13.5 - 4.6
16	4°34.0	4°34.7	4°21.5	1.6 - 0.5	7.6 - 2.3	13.6 - 4.2	16	4°49.0	4°49.8	4°35.8	1.6 - 0.5	7.6 - 2.5	13.6 - 4.4	16	5°04.0	5°04.8	4°50.2	1.6 - 0.5	7.6 - 2.6	13.6 - 4.6
17	4°34.3	4°35.0	4°21.8	1.7 - 0.5	7.7 - 2.4	13.7 - 4.2	17	4°49.3	4°50.0	4°36.1	1.7 - 0.6	7.7 - 2.5	13.7 - 4.5	17	5°04.3	5°05.1	4°50.4	1.7 - 0.6	7.7 - 2.6	13.7 - 4.7
18	4°34.5	4°35.3	4°22.0	1.8 - 0.6	7.8 - 2.4	13.8 - 4.3	18	4°49.5	4°50.3	4°36.3	1.8 - 0.6	7.8 - 2.5	13.8 - 4.5	18	5°04.5	5°05.3	4°50.6	1.8 - 0.6	7.8 - 2.7	13.8 - 4.7
19	4°34.8	4°35.5	4°22.2	1.9 - 0.6	7.9 - 2.4	13.9 - 4.3	19	4°49.8	4°50.5	4°36.6	1.9 - 0.6	7.9 - 2.6	13.9 - 4.5	19	5°04.7	5°05.6	4°50.9	1.9 - 0.6	7.9 - 2.7	13.9 - 4.7
20	4°35.0	4°35.8	4°22.5	2.0 - 0.6	8.0 - 2.5	14.0 - 4.3	20	4°50.0	4°50.8	4°36.8	2.0 - 0.7	8.0 - 2.6	14.0 - 4.5	20	5°05.0	5°05.8	4°51.1	2.0 - 0.7	8.0 - 2.7	14.0 - 4.8
21	4°35.3	4°36.0	4°22.7	2.1 - 0.6	8.1 - 2.5	14.1 - 4.3	21	4°50.3	4°51.0	4°37.0	2.1 - 0.7	8.1 - 2.6	14.1 - 4.6	21	5°05.3	5°06.1	4°51.3	2.1 - 0.7	8.1 - 2.8	14.1 - 4.8
22	4°35.5	4°36.3	4°22.9	2.2 - 0.7	8.2 - 2.5	14.2 - 4.4	22	4°50.5	4°51.3	4°37.3	2.2 - 0.7	8.2 - 2.7	14.2 - 4.6	22	5°05.5	5°06.3	4°51.6	2.2 - 0.8	8.2 - 2.8	14.2 - 4.9
23	4°35.7	4°36.5	4°23.2	2.3 - 0.7	8.3 - 2.6	14.3 - 4.4	23	4°50.7	4°51.5	4°37.5	2.3 - 0.7	8.3 - 2.7	14.3 - 4.6	23	5°05.7	5°06.6	4°51.8	2.3 - 0.8	8.3 - 2.8	14.3 - 4.9
24	4°36.0	4°36.8	4°23.4	2.4 - 0.7	8.4 - 2.6	14.4 - 4.4	24	4°51.0	4°51.8	4°37.7	2.4 - 0.8	8.4 - 2.7	14.4 - 4.7	24	5°06.0	5°06.8	4°52.1	2.4 - 0.8	8.4 - 2.9	14.4 - 4.9
25	4°36.3	4°37.0	4°23.7	2.5 - 0.8	8.5 - 2.6	14.5 - 4.5	25	4°51.3	4°52.0	4°38.0	2.5 - 0.8	8.5 - 2.8	14.5 - 4.7	25	5°06.3	5°07.1	4°52.3	2.5 - 0.9	8.5 - 2.9	14.5 - 5.0
26	4°36.5	4°37.3	4°23.9	2.6 - 0.8	8.6 - 2.7	14.6 - 4.5	26	4°51.5	4°52.3	4°38.2	2.6 - 0.8	8.6 - 2.8	14.6 - 4.7	26	5°06.5	5°07.3	4°52.5	2.6 - 0.9	8.6 - 2.9	14.6 - 5.0
27	4°36.7	4°37.5	4°24.1	2.7 - 0.8	8.7 - 2.7	14.7 - 4.5	27	4°51.7	4°52.5	4°38.5	2.7 - 0.9	8.7 - 2.8	14.7 - 4.8	27	5°06.7	5°07.6	4°52.8	2.7 - 0.9	8.7 - 3.0	14.7 - 5.0
28	4°37.0	4°37.8	4°24.4	2.8 - 0.9	8.8 - 2.7	14.8 - 4.6	28	4°52.0	4°52.8	4°38.7	2.8 - 0.9	8.8 - 2.9	14.8 - 4.8	28	5°07.0	5°07.8	4°53.0	2.8 - 1.0	8.8 - 3.0	14.8 - 5.1
29	4°37.3	4°38.0	4°24.6	2.9 - 0.9	8.9 - 2.7	14.9 - 4.6	29	4°52.3	4°53.0	4°38.9	2.9 - 0.9	8.9 - 2.9	14.9 - 4.8	29	5°07.3	5°08.1	4°53.3	2.9 - 1.0	8.9 - 3.0	14.9 - 5.1
30	4°37.5	4°38.3	4°24.9	3.0 - 0.9	9.0 - 2.8	15.0 - 4.6	30	4°52.5	4°53.3	4°39.2	3.0 - 1.0	9.0 - 2.9	15.0 - 4.9	30	5°07.5	5°08.3	4°53.5	3.0 - 1.0	9.0 - 3.1	15.0 - 5.1
31	4°37.7	4°38.5	4°25.1	3.1 - 1.0	9.1 - 2.8	15.1 - 4.7	31	4°52.7	4°53.6	4°39.4	3.1 - 1.0	9.1 - 3.0	15.1 - 4.9	31	5°07.7	5°08.6	4°53.7	3.1 - 1.1	9.1 - 3.1	15.1 - 5.2
32	4°38.0	4°38.8	4°25.3	3.2 - 1.0	9.2 - 2.8	15.2 - 4.7	32	4°53.0	4°53.8	4°39.7	3.2 - 1.0	9.2 - 3.0	15.2 - 4.9	32	5°08.0	5°08.8	4°54.0	3.2 - 1.1	9.2 - 3.1	15.2 - 5.2
33	4°38.3	4°39.0	4°25.6	3.3 - 1.0	9.3 - 2.9	15.3 - 4.7	33	4°53.3	4°54.1	4°39.9	3.3 - 1.1	9.3 - 3.0	15.3 - 5.0	33	5°08.3	5°09.1	4°54.2	3.3 - 1.1	9.3 - 3.2	15.3 - 5.2
34	4°38.5	4°39.3	4°25.8	3.4 - 1.0	9.4 - 2.9	15.4 - 4.7	34	4°53.5	4°54.3	4°40.1	3.4 - 1.1	9.4 - 3.1	15.4 - 5.0	34	5°08.5	5°09.3	4°54.4	3.4 - 1.2	9.4 - 3.2	15.4 - 5.3
35	4°38.7	4°39.5	4°26.1	3.5 - 1.1	9.5 - 2.9	15.5 - 4.8	35	4°53.7	4°54.6	4°40.4	3.5 - 1.1	9.5 - 3.1	15.5 - 5.0	35	5°08.7	5°09.6	4°54.7	3.5 - 1.2	9.5 - 3.2	15.5 - 5.3
36	4°39.0	4°39.8	4°26.3	3.6 - 1.1	9.6 - 3.0	15.6 - 4.8	36	4°54.0	4°54.8	4°40.6	3.6 - 1.2	9.6 - 3.1	15.6 - 5.1	36	5°09.0	5°09.8	4°54.9	3.6 - 1.2	9.6 - 3.3	15.6 - 5.3
37	4°39.3	4°40.0	4°26.5	3.7 - 1.1	9.7 - 3.0	15.7 - 4.8	37	4°54.3	4°55.1	4°40.8	3.7 - 1.2	9.7 - 3.2	15.7 - 5.1	37	5°09.3	5°10.1	4°55.2	3.7 - 1.3	9.7 - 3.3	15.7 - 5.4
38	4°39.5	4°40.3	4°26.8	3.8 - 1.2	9.8 - 3.0	15.8 - 4.9	38	4°54.5	4°55.3	4°41.1	3.8 - 1.2	9.8 - 3.2	15.8 - 5.1	38	5°09.5	5°10.3	4°55.4	3.8 - 1.3	9.8 - 3.3	15.8 - 5.4
39	4°39.7	4°40.5	4°27.0	3.9 - 1.2	9.9 - 3.1	15.9 - 4.9	39	4°54.7	4°55.6	4°41.3	3.9 - 1.3	9.9 - 3.2	15.9 - 5.2	39	5°09.7	5°10.6	4°55.6	3.9 - 1.3	9.9 - 3.4	15.9 - 5.4
40	4°40.0	4°40.8	4°27.2	4.0 - 1.2	10.0 - 3.1	16.0 - 4.9	40	4°55.0	4°55.8	4°41.6	4.0 - 1.3	10.0 - 3.3	16.0 - 5.2	40	5°10.0	5°10.8	4°55.9	4.0 - 1.4	10.0 - 3.4	16.0 - 5.5
41	4°40.3	4°41.0	4°27.5	4.1 - 1.3	10.1 - 3.1	16.1 - 5.0	41	4°55.3	4°56.1	4°41.8	4.1 - 1.3	10.1 - 3.3	16.1 - 5.2	41	5°10.3	5°11.1	4°56.1	4.1 - 1.4	10.1 - 3.5	16.1 - 5.5
42	4°40.5	4°41.3	4°27.7	4.2 - 1.3	10.2 - 3.1	16.2 - 5.0	42	4°55.5	4°56.3	4°42.0	4.2 - 1.4	10.2 - 3.3	16.2 - 5.3	42	5°10.5	5°11.3	4°56.4	4.2 - 1.4	10.2 - 3.5	16.2 - 5.5
43	4°40.7	4°41.5	4°28.0	4.3 - 1.3	10.3 - 3.2	16.3 - 5.0	43	4°55.7	4°56.6	4°42.3	4.3 - 1.4	10.3 - 3.3	16.3 - 5.3	43	5°10.7	5°11.6	4°56.6	4.3 - 1.5	10.3 - 3.5	16.3 - 5.6
44	4°41.0	4°41.8	4°28.2	4.4 - 1.4	10.4 - 3.2	16.4 - 5.1	44	4°56.0	4°56.8	4°42.5	4.4 - 1.4	10.4 - 3.4	16.4 - 5.3	44	5°11.0	5°11.9	4°56.8	4.4 - 1.5	10.4 - 3.6	16.4 - 5.6
45	4°41.3	4°42.0	4°28.4	4.5 - 1.4	10.5 - 3.2	16.5 - 5.1	45	4°56.3	4°57.1	4°42.8	4.5 - 1.5	10.5 - 3.4	16.5 - 5.4	45	5°11.3	5°12.1	4°57.1	4.5 - 1.5	10.5 - 3.6	16.5 - 5.6
46	4°41.5	4°42.3	4°28.7	4.6 - 1.4	10.6 - 3.3	16.6 - 5.1	46	4°56.5	4°57.3	4°43.0	4.6 - 1.5	10.6 - 3.4	16.6 - 5.4	46	5°11.5	5°12.4	4°57.3	4.6 - 1.6	10.6 - 3.6	16.6 - 5.7
47	4°41.8	4°42.5	4°28.9	4.7 - 1.4	10.7 - 3.3	16.7 - 5.1	47	4°56.8	4°57.6	4°43.2	4.7 - 1.5	10.7 - 3.5	16.7 - 5.4	47	5°11.8	5°12.6	4°57.5	4.7 - 1.6	10.7 - 3.7	16.7 - 5.7
48	4°42.0	4°42.8	4°29.2	4.8 - 1.5	10.8 - 3.3	16.8 - 5.2	48	4°57.0	4°57.8	4°43.5	4.8 - 1.6	10.8 - 3.5	16.8 - 5.5	48	5°12.0	5°12.9	4°57.8	4.8 - 1.6	10.8 - 3.7	16.8 - 5.7
49	4°42.3	4°43.																		

Increments and Corrections

m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
21	Plan.						22	Plan.					23	Plan.						
0	5°15.0	5°15.9	5°00.6	0.0 - 0.0	6.0 - 2.1	12.0 - 4.3	0	5°30.0	5°30.9	5°15.0	0.0 - 0.0	6.0 - 2.3	12.0 - 4.5	0	5°45.0	5°45.9	5°29.3	0.0 - 0.0	6.0 - 2.4	12.0 - 4.7
1	5°15.2	5°16.1	5°00.9	0.1 - 0.0	6.1 - 2.2	12.1 - 4.3	1	5°30.2	5°31.2	5°15.2	0.1 - 0.0	6.1 - 2.3	12.1 - 4.5	1	5°45.2	5°46.2	5°29.5	0.1 - 0.0	6.1 - 2.4	12.1 - 4.7
2	5°15.5	5°16.4	5°01.1	0.2 - 0.1	6.2 - 2.2	12.2 - 4.4	2	5°30.5	5°31.4	5°15.4	0.2 - 0.1	6.2 - 2.3	12.2 - 4.6	2	5°45.5	5°46.4	5°29.8	0.2 - 0.1	6.2 - 2.4	12.2 - 4.8
3	5°15.8	5°16.6	5°01.4	0.3 - 0.1	6.3 - 2.3	12.3 - 4.4	3	5°30.8	5°31.7	5°15.7	0.3 - 0.1	6.3 - 2.4	12.3 - 4.6	3	5°45.8	5°46.7	5°30.0	0.3 - 0.1	6.3 - 2.5	12.3 - 4.8
4	5°16.0	5°16.9	5°01.6	0.4 - 0.1	6.4 - 2.3	12.4 - 4.4	4	5°31.0	5°31.9	5°15.9	0.4 - 0.2	6.4 - 2.4	12.4 - 4.7	4	5°46.0	5°46.9	5°30.2	0.4 - 0.2	6.4 - 2.5	12.4 - 4.9
5	5°16.2	5°17.1	5°01.8	0.5 - 0.2	6.5 - 2.3	12.5 - 4.5	5	5°31.2	5°32.2	5°16.2	0.5 - 0.2	6.5 - 2.4	12.5 - 4.7	5	5°46.2	5°47.2	5°30.5	0.5 - 0.2	6.5 - 2.5	12.5 - 4.9
6	5°16.5	5°17.4	5°02.1	0.6 - 0.2	6.6 - 2.4	12.6 - 4.5	6	5°31.5	5°32.4	5°16.4	0.6 - 0.2	6.6 - 2.5	12.6 - 4.7	6	5°46.5	5°47.4	5°30.7	0.6 - 0.2	6.6 - 2.6	12.6 - 4.9
7	5°16.8	5°17.6	5°02.3	0.7 - 0.3	6.7 - 2.4	12.7 - 4.6	7	5°31.8	5°32.7	5°16.6	0.7 - 0.3	6.7 - 2.5	12.7 - 4.8	7	5°46.8	5°47.7	5°31.0	0.7 - 0.3	6.7 - 2.6	12.7 - 5.0
8	5°17.0	5°17.9	5°02.6	0.8 - 0.3	6.8 - 2.4	12.8 - 4.6	8	5°32.0	5°32.9	5°16.9	0.8 - 0.3	6.8 - 2.5	12.8 - 4.8	8	5°47.0	5°47.9	5°31.2	0.8 - 0.3	6.8 - 2.7	12.8 - 5.0
9	5°17.2	5°18.1	5°02.8	0.9 - 0.3	6.9 - 2.5	12.9 - 4.6	9	5°32.2	5°33.2	5°17.1	0.9 - 0.3	6.9 - 2.6	12.9 - 4.8	9	5°47.2	5°48.2	5°31.4	0.9 - 0.4	6.9 - 2.7	12.9 - 5.1
10	5°17.5	5°18.4	5°03.0	1.0 - 0.4	7.0 - 2.5	13.0 - 4.7	10	5°32.5	5°33.4	5°17.4	1.0 - 0.4	7.0 - 2.6	13.0 - 4.9	10	5°47.5	5°48.4	5°31.7	1.0 - 0.4	7.0 - 2.7	13.0 - 5.1
11	5°17.8	5°18.6	5°03.3	1.1 - 0.4	7.1 - 2.5	13.1 - 4.7	11	5°32.8	5°33.7	5°17.6	1.1 - 0.4	7.1 - 2.7	13.1 - 4.9	11	5°47.8	5°48.7	5°31.9	1.1 - 0.4	7.1 - 2.8	13.1 - 5.1
12	5°18.0	5°18.9	5°03.5	1.2 - 0.4	7.2 - 2.6	13.2 - 4.7	12	5°33.0	5°33.9	5°17.8	1.2 - 0.5	7.2 - 2.7	13.2 - 4.9	12	5°48.0	5°49.0	5°32.1	1.2 - 0.5	7.2 - 2.8	13.2 - 5.2
13	5°18.2	5°19.1	5°03.8	1.3 - 0.5	7.3 - 2.6	13.3 - 4.8	13	5°33.2	5°34.2	5°18.1	1.3 - 0.5	7.3 - 2.7	13.3 - 5.0	13	5°48.2	5°49.2	5°32.4	1.3 - 0.5	7.3 - 2.9	13.3 - 5.2
14	5°18.5	5°19.4	5°04.0	1.4 - 0.5	7.4 - 2.7	13.4 - 4.8	14	5°33.5	5°34.4	5°18.3	1.4 - 0.5	7.4 - 2.8	13.4 - 5.0	14	5°48.5	5°49.5	5°32.6	1.4 - 0.5	7.4 - 2.9	13.4 - 5.2
15	5°18.8	5°19.6	5°04.2	1.5 - 0.5	7.5 - 2.7	13.5 - 4.8	15	5°33.8	5°34.7	5°18.5	1.5 - 0.6	7.5 - 2.8	13.5 - 5.1	15	5°48.8	5°49.7	5°32.9	1.5 - 0.6	7.5 - 2.9	13.5 - 5.3
16	5°19.0	5°19.9	5°04.5	1.6 - 0.6	7.6 - 2.7	13.6 - 4.9	16	5°34.0	5°34.9	5°18.8	1.6 - 0.6	7.6 - 2.8	13.6 - 5.1	16	5°49.0	5°50.0	5°33.1	1.6 - 0.6	7.6 - 3.0	13.6 - 5.3
17	5°19.3	5°20.1	5°04.7	1.7 - 0.6	7.7 - 2.8	13.7 - 4.9	17	5°34.3	5°35.2	5°19.0	1.7 - 0.6	7.7 - 2.9	13.7 - 5.1	17	5°49.3	5°50.2	5°33.3	1.7 - 0.7	7.7 - 3.0	13.7 - 5.4
18	5°19.5	5°20.4	5°04.9	1.8 - 0.6	7.8 - 2.8	13.8 - 4.9	18	5°34.5	5°35.4	5°19.3	1.8 - 0.7	7.8 - 2.9	13.8 - 5.2	18	5°49.5	5°50.5	5°33.6	1.8 - 0.7	7.8 - 3.1	13.8 - 5.4
19	5°19.7	5°20.6	5°05.2	1.9 - 0.7	7.9 - 2.8	13.9 - 5.0	19	5°34.8	5°35.7	5°19.5	1.9 - 0.7	7.9 - 3.0	13.9 - 5.2	19	5°49.8	5°50.7	5°33.8	1.9 - 0.7	7.9 - 3.1	13.9 - 5.4
20	5°20.0	5°20.9	5°05.4	2.0 - 0.7	8.0 - 2.9	14.0 - 5.0	20	5°35.0	5°35.9	5°19.7	2.0 - 0.8	8.0 - 3.0	14.0 - 5.3	20	5°50.0	5°51.0	5°34.1	2.0 - 0.8	8.0 - 3.1	14.0 - 5.5
21	5°20.3	5°21.1	5°05.7	2.1 - 0.8	8.1 - 2.9	14.1 - 5.1	21	5°35.3	5°36.2	5°20.0	2.1 - 0.8	8.1 - 3.0	14.1 - 5.3	21	5°50.3	5°51.2	5°34.3	2.1 - 0.8	8.1 - 3.2	14.1 - 5.5
22	5°20.5	5°21.4	5°05.9	2.2 - 0.8	8.2 - 2.9	14.2 - 5.1	22	5°35.5	5°36.4	5°20.2	2.2 - 0.8	8.2 - 3.1	14.2 - 5.3	22	5°50.5	5°51.5	5°34.5	2.2 - 0.9	8.2 - 3.2	14.2 - 5.6
23	5°20.7	5°21.6	5°06.1	2.3 - 0.8	8.3 - 3.0	14.3 - 5.1	23	5°35.7	5°36.7	5°20.5	2.3 - 0.9	8.3 - 3.1	14.3 - 5.4	23	5°50.7	5°51.7	5°34.8	2.3 - 0.9	8.3 - 3.3	14.3 - 5.6
24	5°21.0	5°21.9	5°06.4	2.4 - 0.9	8.4 - 3.0	14.4 - 5.2	24	5°36.0	5°36.9	5°20.7	2.4 - 0.9	8.4 - 3.2	14.4 - 5.4	24	5°51.0	5°52.0	5°35.0	2.4 - 0.9	8.4 - 3.3	14.4 - 5.6
25	5°21.3	5°22.1	5°06.6	2.5 - 0.9	8.5 - 3.0	14.5 - 5.2	25	5°36.3	5°37.2	5°20.9	2.5 - 0.9	8.5 - 3.2	14.5 - 5.4	25	5°51.3	5°52.2	5°35.2	2.5 - 1.0	8.5 - 3.3	14.5 - 5.7
26	5°21.5	5°22.4	5°06.9	2.6 - 0.9	8.6 - 3.1	14.6 - 5.2	26	5°36.5	5°37.4	5°21.2	2.6 - 1.0	8.6 - 3.2	14.6 - 5.5	26	5°51.5	5°52.5	5°35.5	2.6 - 1.0	8.6 - 3.4	14.6 - 5.7
27	5°21.7	5°22.6	5°07.1	2.7 - 1.0	8.7 - 3.1	14.7 - 5.3	27	5°36.7	5°37.7	5°21.4	2.7 - 1.0	8.7 - 3.3	14.7 - 5.5	27	5°51.7	5°52.7	5°35.7	2.7 - 1.1	8.7 - 3.4	14.7 - 5.8
28	5°22.0	5°22.9	5°07.3	2.8 - 1.0	8.8 - 3.2	14.8 - 5.3	28	5°37.0	5°37.9	5°21.6	2.8 - 1.1	8.8 - 3.3	14.8 - 5.6	28	5°52.0	5°53.0	5°36.0	2.8 - 1.1	8.8 - 3.4	14.8 - 5.8
29	5°22.3	5°23.1	5°07.6	2.9 - 1.0	8.9 - 3.2	14.9 - 5.3	29	5°37.3	5°38.2	5°21.9	2.9 - 1.1	8.9 - 3.3	14.9 - 5.6	29	5°52.3	5°53.2	5°36.2	2.9 - 1.1	8.9 - 3.5	14.9 - 5.8
30	5°22.5	5°23.4	5°07.8	3.0 - 1.1	9.0 - 3.2	15.0 - 5.4	30	5°37.5	5°38.4	5°22.1	3.0 - 1.1	9.0 - 3.4	15.0 - 5.6	30	5°52.5	5°53.5	5°36.4	3.0 - 1.2	9.0 - 3.5	15.0 - 5.9
31	5°22.7	5°23.6	5°08.0	3.1 - 1.1	9.1 - 3.3	15.1 - 5.4	31	5°37.7	5°38.7	5°22.4	3.1 - 1.2	9.1 - 3.4	15.1 - 5.7	31	5°52.7	5°53.7	5°36.7	3.1 - 1.2	9.1 - 3.6	15.1 - 5.9
32	5°23.0	5°23.9	5°08.3	3.2 - 1.1	9.2 - 3.3	15.2 - 5.4	32	5°38.0	5°38.9	5°22.6	3.2 - 1.2	9.2 - 3.4	15.2 - 5.7	32	5°53.0	5°54.0	5°36.9	3.2 - 1.3	9.2 - 3.6	15.2 - 6.0
33	5°23.3	5°24.1	5°08.5	3.3 - 1.2	9.3 - 3.3	15.3 - 5.5	33	5°38.3	5°39.2	5°22.8	3.3 - 1.2	9.3 - 3.5	15.3 - 5.7	33	5°53.3	5°54.2	5°37.2	3.3 - 1.3	9.3 - 3.6	15.3 - 6.0
34	5°23.5	5°24.4	5°08.8	3.4 - 1.2	9.4 - 3.4	15.4 - 5.5	34	5°38.5	5°39.4	5°23.1	3.4 - 1.3	9.4 - 3.5	15.4 - 5.8	34	5°53.5	5°54.5	5°37.4	3.4 - 1.3	9.4 - 3.7	15.4 - 6.0
35	5°23.7	5°24.6	5°09.0	3.5 - 1.3	9.5 - 3.4	15.5 - 5.6	35	5°38.7	5°39.7	5°23.3	3.5 - 1.3	9.5 - 3.6	15.5 - 5.8	35	5°53.7	5°54.7	5°37.6	3.5 - 1.4	9.5 - 3.7	15.5 - 6.1
36	5°24.0	5°24.9	5°09.2	3.6 - 1.3	9.6 - 3.4	15.6 - 5.6	36	5°39.0	5°39.9	5°23.6	3.6 - 1.4	9.6 - 3.6	15.6 - 5.8	36	5°54.0	5°55.0	5°37.9	3.6 - 1.4	9.6 - 3.8	15.6 - 6.1
37	5°24.3	5°25.1	5°09.5	3.7 - 1.3	9.7 - 3.5	15.7 - 5.6	37	5°39.3	5°40.2	5°23.8	3.7 - 1.4	9.7 - 3.6	15.7 - 5.9	37	5°54.3	5°55.2	5°38.1	3.7 - 1.4	9.7 - 3.8	15.7 - 6.1
38	5°24.5	5°25.4	5°09.7	3.8 - 1.4	9.8 - 3.5	15.8 - 5.7	38	5°39.5	5°40.4	5°24.0	3.8 - 1.4	9.8 - 3.7	15.8 - 5.9	38	5°54.5	5°55.5	5°38.4	3.8 - 1.5	9.8 - 3.8	15.8 - 6.2
39	5°24.7	5°25.6	5°10.0	3.9 - 1.4	9.9 - 3.5	15.9 - 5.7	39	5°39.7	5°40.7	5°24.3	3.9 - 1.5	9.9 - 3.7	15.9 - 6.0	39	5°54.7	5°55.7	5°38.6	3.9 - 1.5	9.9 - 3.9	15.9 - 6.2
40	5°25.0	5°25.9	5°10.2	4.0 - 1.4	10.0 - 3.6	16.0 - 5.7	40	5°40.0	5°40.9	5°24.5	4.0 - 1.5	10.0 - 3.8	16.0 - 6.0	40	5°55.0	5°56.0	5°38.8	4.0 - 1.6	10.0 - 3.9	16.0 - 6.3
41	5°25.3	5°26.1	5°10.4	4.1 - 1.5	10.1 - 3.6	16.1 - 5.8	41	5°40.3	5°41.2	5°24.7	4.1 - 1.5	10.1 - 3.8	16.1 - 6.0	41	5°55.3	5°56.2	5°39.1	4.1 - 1.6	10.1 - 4.0	16.1 - 6.3
42	5°25.5	5°26.4	5°10.7	4.2 - 1.5	10.2 - 3.7	16.2 - 5.8	42	5°40.5	5°41.4	5°25.0	4.2 - 1.6	10.2 - 3.8	16.2 - 6.1	42	5°55.5	5°56.5	5°39.3	4.2 - 1.6	10.2 - 4.0	16.2 - 6.3
43	5°25.7	5°26.6	5°10.9	4.3 - 1.5	10.3 - 3.7	16.3 - 5.8	43	5°40.7	5°41.7	5°25.2	4.3 - 1.6	10.3 - 3.9	16.3 - 6.1	43	5°55.7	5°56.7	5°39.5	4.3 - 1.7	10.3 - 4.0	16.3 - 6.4
44	5°26.0	5°26.9	5°11.1	4.4 - 1.6	10.4 - 3.7	16.4 - 5.9	44	5°41.0	5°41.9	5°25.5	4.4 - 1.7	10.4 - 3.9	16.4 - 6.1	44	5°56.0	5°57.0	5°39.8	4.4 - 1.7	10.4 - 4.1	16.4 - 6.4
45	5°26.3	5°27.1	5°11.4	4.5 - 1.6	10.5 - 3.8	16.5 - 5.9	45	5°41.3	5°42.2	5°25.7	4.5 - 1.7	10.5 - 3.9	16.5 - 6.2	45	5°56.3	5°57.2	5°40.0	4.5 - 1.8	10.5 - 4.1	16.5 - 6.5
46	5°26.5	5°27.4	5°11.6	4.6 - 1.6	10.6 - 3.8	16.6 - 5.9	46	5°41.5	5°42.4	5°25.9	4.6 - 1.7	10.6 - 4.0	16.6 - 6.2	46	5°56.5	5°57.5	5°40.3	4.6 - 1.8	10.6 - 4.2	16.6 - 6.5
47	5°26.8	5°27.6	5°11.9	4.7 - 1.7	10.7 - 3.8	16.7 - 6.0	47	5°41.8	5°42.7	5°26.2	4.7 - 1.8	10.7 - 4.0	16.7 - 6.3	47	5°56.8	5°57.7	5°40.5	4.7 - 1.8	10.7 - 4.2	16.7 - 6.5
48	5°27.0	5°27.9	5°12.1	4.8 - 1.7	10.8 - 3.9	16.8 - 6.0	48	5°42.0	5°42.9	5°26.4	4.8 - 1.8	10.8 - 4.1	16.8 - 6.3	48	5°57.0	5°58.0	5°40.7	4.8 - 1.9	10.8 - 4.2	16.8 - 6.6
49	5°27.2	5°28.1	5°12.3																	

Increments and Corrections

m 24	Sun Plan.	Aries	Moon	v and d corr			m 25	Sun Plan.	Aries	Moon	v and d corr			m 26	Sun Plan.	Aries	Moon	v and d corr		
0	6°00.0	6°01.0	5°43.6	0.0 - 0.0	6.0 - 2.5	12.0 - 4.9	0	6°15.0	6°16.0	5°57.9	0.0 - 0.0	6.0 - 2.5	12.0 - 5.1	0	6°30.0	6°31.1	6°12.2	0.0 - 0.0	6.0 - 2.6	12.0 - 5.3
1	6°00.2	6°01.2	5°43.8	0.1 - 0.0	6.1 - 2.5	12.1 - 4.9	1	6°15.2	6°16.3	5°58.2	0.1 - 0.0	6.1 - 2.6	12.1 - 5.1	1	6°30.2	6°31.3	6°12.5	0.1 - 0.0	6.1 - 2.7	12.1 - 5.3
2	6°00.5	6°01.5	5°44.1	0.2 - 0.1	6.2 - 2.5	12.2 - 5.0	2	6°15.5	6°16.5	5°58.4	0.2 - 0.1	6.2 - 2.6	12.2 - 5.2	2	6°30.5	6°31.6	6°12.7	0.2 - 0.1	6.2 - 2.7	12.2 - 5.4
3	6°00.8	6°01.7	5°44.3	0.3 - 0.1	6.3 - 2.6	12.3 - 5.0	3	6°15.8	6°16.8	5°58.6	0.3 - 0.1	6.3 - 2.7	12.3 - 5.2	3	6°30.8	6°31.8	6°12.9	0.3 - 0.1	6.3 - 2.8	12.3 - 5.4
4	6°01.0	6°02.0	5°44.6	0.4 - 0.2	6.4 - 2.6	12.4 - 5.1	4	6°16.0	6°17.0	5°58.9	0.4 - 0.2	6.4 - 2.7	12.4 - 5.3	4	6°31.0	6°32.1	6°13.2	0.4 - 0.2	6.4 - 2.8	12.4 - 5.5
5	6°01.2	6°02.2	5°44.8	0.5 - 0.2	6.5 - 2.7	12.5 - 5.1	5	6°16.2	6°17.3	5°59.1	0.5 - 0.2	6.5 - 2.8	12.5 - 5.3	5	6°31.2	6°32.3	6°13.4	0.5 - 0.2	6.5 - 2.9	12.5 - 5.5
6	6°01.5	6°02.5	5°45.0	0.6 - 0.2	6.6 - 2.7	12.6 - 5.1	6	6°16.5	6°17.5	5°59.3	0.6 - 0.3	6.6 - 2.8	12.6 - 5.4	6	6°31.5	6°32.6	6°13.7	0.6 - 0.3	6.6 - 2.9	12.6 - 5.6
7	6°01.8	6°02.7	5°45.3	0.7 - 0.3	6.7 - 2.7	12.7 - 5.2	7	6°16.8	6°17.8	5°59.6	0.7 - 0.3	6.7 - 2.8	12.7 - 5.4	7	6°31.8	6°32.8	6°13.9	0.7 - 0.3	6.7 - 3.0	12.7 - 5.6
8	6°02.0	6°03.0	5°45.5	0.8 - 0.3	6.8 - 2.8	12.8 - 5.2	8	6°17.0	6°18.0	5°59.8	0.8 - 0.3	6.8 - 2.9	12.8 - 5.4	8	6°32.0	6°33.1	6°14.1	0.8 - 0.4	6.8 - 3.0	12.8 - 5.7
9	6°02.2	6°03.2	5°45.7	0.9 - 0.4	6.9 - 2.8	12.9 - 5.3	9	6°17.2	6°18.3	6°00.1	0.9 - 0.4	6.9 - 2.9	12.9 - 5.5	9	6°32.2	6°33.3	6°14.4	0.9 - 0.4	6.9 - 3.0	12.9 - 5.7
10	6°02.5	6°03.5	5°46.0	1.0 - 0.4	7.0 - 2.9	13.0 - 5.3	10	6°17.5	6°18.5	6°00.3	1.0 - 0.4	7.0 - 3.0	13.0 - 5.5	10	6°32.5	6°33.6	6°14.6	1.0 - 0.4	7.0 - 3.1	13.0 - 5.7
11	6°02.8	6°03.7	5°46.2	1.1 - 0.4	7.1 - 2.9	13.1 - 5.3	11	6°17.8	6°18.8	6°00.5	1.1 - 0.5	7.1 - 3.0	13.1 - 5.6	11	6°32.8	6°33.8	6°14.9	1.1 - 0.5	7.1 - 3.1	13.1 - 5.8
12	6°03.0	6°04.0	5°46.5	1.2 - 0.5	7.2 - 2.9	13.2 - 5.4	12	6°18.0	6°19.0	6°00.8	1.2 - 0.5	7.2 - 3.1	13.2 - 5.6	12	6°33.0	6°34.1	6°15.1	1.2 - 0.5	7.2 - 3.2	13.2 - 5.8
13	6°03.2	6°04.2	5°46.7	1.3 - 0.5	7.3 - 3.0	13.3 - 5.4	13	6°18.2	6°19.3	6°01.0	1.3 - 0.6	7.3 - 3.1	13.3 - 5.7	13	6°33.2	6°34.3	6°15.3	1.3 - 0.6	7.3 - 3.2	13.3 - 5.9
14	6°03.5	6°04.5	5°46.9	1.4 - 0.6	7.4 - 3.0	13.4 - 5.5	14	6°18.5	6°19.5	6°01.3	1.4 - 0.6	7.4 - 3.1	13.4 - 5.7	14	6°33.5	6°34.6	6°15.6	1.4 - 0.6	7.4 - 3.3	13.4 - 5.9
15	6°03.8	6°04.7	5°47.2	1.5 - 0.6	7.5 - 3.1	13.5 - 5.5	15	6°18.8	6°19.8	6°01.5	1.5 - 0.6	7.5 - 3.2	13.5 - 5.7	15	6°33.8	6°34.8	6°15.8	1.5 - 0.7	7.5 - 3.3	13.5 - 6.0
16	6°04.0	6°05.0	5°47.4	1.6 - 0.7	7.6 - 3.1	13.6 - 5.6	16	6°19.0	6°20.0	6°01.7	1.6 - 0.7	7.6 - 3.2	13.6 - 5.8	16	6°34.0	6°35.1	6°16.1	1.6 - 0.7	7.6 - 3.4	13.6 - 6.0
17	6°04.3	6°05.2	5°47.7	1.7 - 0.7	7.7 - 3.1	13.7 - 5.6	17	6°19.3	6°20.3	6°02.0	1.7 - 0.7	7.7 - 3.3	13.7 - 5.8	17	6°34.3	6°35.3	6°16.3	1.7 - 0.8	7.7 - 3.4	13.7 - 6.1
18	6°04.5	6°05.5	5°47.9	1.8 - 0.7	7.8 - 3.2	13.8 - 5.6	18	6°19.5	6°20.5	6°02.2	1.8 - 0.8	7.8 - 3.3	13.8 - 5.9	18	6°34.5	6°35.6	6°16.5	1.8 - 0.8	7.8 - 3.4	13.8 - 6.1
19	6°04.7	6°05.7	5°48.1	1.9 - 0.8	7.9 - 3.2	13.9 - 5.7	19	6°19.7	6°20.8	6°02.5	1.9 - 0.8	7.9 - 3.4	13.9 - 5.9	19	6°34.8	6°35.8	6°16.8	1.9 - 0.8	7.9 - 3.5	13.9 - 6.1
20	6°05.0	6°06.0	5°48.4	2.0 - 0.8	8.0 - 3.3	14.0 - 5.7	20	6°20.0	6°21.0	6°02.7	2.0 - 0.8	8.0 - 3.4	14.0 - 6.0	20	6°35.0	6°36.1	6°17.0	2.0 - 0.9	8.0 - 3.5	14.0 - 6.2
21	6°05.3	6°06.2	5°48.6	2.1 - 0.9	8.1 - 3.3	14.1 - 5.8	21	6°20.3	6°21.3	6°02.9	2.1 - 0.9	8.1 - 3.4	14.1 - 6.0	21	6°35.3	6°36.3	6°17.2	2.1 - 0.9	8.1 - 3.6	14.1 - 6.2
22	6°05.5	6°06.5	5°48.8	2.2 - 0.9	8.2 - 3.3	14.2 - 5.8	22	6°20.5	6°21.5	6°03.2	2.2 - 0.9	8.2 - 3.5	14.2 - 6.0	22	6°35.5	6°36.6	6°17.5	2.2 - 1.0	8.2 - 3.6	14.2 - 6.3
23	6°05.7	6°06.7	5°49.1	2.3 - 0.9	8.3 - 3.4	14.3 - 5.8	23	6°20.7	6°21.8	6°03.4	2.3 - 1.0	8.3 - 3.5	14.3 - 6.1	23	6°35.7	6°36.8	6°17.7	2.3 - 1.0	8.3 - 3.7	14.3 - 6.3
24	6°06.0	6°07.0	5°49.3	2.4 - 1.0	8.4 - 3.4	14.4 - 5.9	24	6°21.0	6°22.0	6°03.6	2.4 - 1.0	8.4 - 3.6	14.4 - 6.1	24	6°36.0	6°37.1	6°18.0	2.4 - 1.1	8.4 - 3.7	14.4 - 6.4
25	6°06.3	6°07.3	5°49.6	2.5 - 1.0	8.5 - 3.5	14.5 - 5.9	25	6°21.3	6°22.3	6°03.9	2.5 - 1.1	8.5 - 3.6	14.5 - 6.2	25	6°36.3	6°37.3	6°18.2	2.5 - 1.1	8.5 - 3.8	14.5 - 6.4
26	6°06.5	6°07.5	5°49.8	2.6 - 1.1	8.6 - 3.5	14.6 - 6.0	26	6°21.5	6°22.5	6°04.1	2.6 - 1.1	8.6 - 3.7	14.6 - 6.2	26	6°36.5	6°37.6	6°18.4	2.6 - 1.1	8.6 - 3.8	14.6 - 6.4
27	6°06.7	6°07.8	5°50.0	2.7 - 1.1	8.7 - 3.6	14.7 - 6.0	27	6°21.7	6°22.8	6°04.4	2.7 - 1.1	8.7 - 3.7	14.7 - 6.2	27	6°36.7	6°37.8	6°18.7	2.7 - 1.2	8.7 - 3.8	14.7 - 6.5
28	6°07.0	6°08.0	5°50.3	2.8 - 1.1	8.8 - 3.6	14.8 - 6.0	28	6°22.0	6°23.0	6°04.6	2.8 - 1.2	8.8 - 3.7	14.8 - 6.3	28	6°37.0	6°38.1	6°18.9	2.8 - 1.2	8.8 - 3.9	14.8 - 6.5
29	6°07.3	6°08.3	5°50.5	2.9 - 1.2	8.9 - 3.6	14.9 - 6.1	29	6°22.3	6°23.3	6°04.8	2.9 - 1.2	8.9 - 3.8	14.9 - 6.3	29	6°37.3	6°38.3	6°19.2	2.9 - 1.3	8.9 - 3.9	14.9 - 6.6
30	6°07.5	6°08.5	5°50.8	3.0 - 1.2	9.0 - 3.7	15.0 - 6.1	30	6°22.5	6°23.5	6°05.1	3.0 - 1.3	9.0 - 3.8	15.0 - 6.4	30	6°37.5	6°38.6	6°19.4	3.0 - 1.3	9.0 - 4.0	15.0 - 6.6
31	6°07.7	6°08.8	5°51.0	3.1 - 1.3	9.1 - 3.7	15.1 - 6.2	31	6°22.7	6°23.8	6°05.3	3.1 - 1.3	9.1 - 3.9	15.1 - 6.4	31	6°37.7	6°38.8	6°19.6	3.1 - 1.4	9.1 - 4.0	15.1 - 6.7
32	6°08.0	6°09.0	5°51.2	3.2 - 1.3	9.2 - 3.8	15.2 - 6.2	32	6°23.0	6°24.0	6°05.6	3.2 - 1.4	9.2 - 3.9	15.2 - 6.5	32	6°38.0	6°39.1	6°19.9	3.2 - 1.4	9.2 - 4.1	15.2 - 6.7
33	6°08.3	6°09.3	5°51.5	3.3 - 1.3	9.3 - 3.8	15.3 - 6.2	33	6°23.3	6°24.3	6°05.8	3.3 - 1.4	9.3 - 4.0	15.3 - 6.5	33	6°38.3	6°39.3	6°20.1	3.3 - 1.5	9.3 - 4.1	15.3 - 6.8
34	6°08.5	6°09.5	5°51.7	3.4 - 1.4	9.4 - 3.8	15.4 - 6.3	34	6°23.5	6°24.5	6°06.0	3.4 - 1.4	9.4 - 4.0	15.4 - 6.5	34	6°38.5	6°39.6	6°20.3	3.4 - 1.5	9.4 - 4.2	15.4 - 6.8
35	6°08.7	6°09.8	5°52.0	3.5 - 1.4	9.5 - 3.9	15.5 - 6.3	35	6°23.7	6°24.8	6°06.3	3.5 - 1.5	9.5 - 4.0	15.5 - 6.6	35	6°38.7	6°39.8	6°20.6	3.5 - 1.5	9.5 - 4.2	15.5 - 6.8
36	6°09.0	6°10.0	5°52.2	3.6 - 1.5	9.6 - 3.9	15.6 - 6.4	36	6°24.0	6°25.0	6°06.5	3.6 - 1.5	9.6 - 4.1	15.6 - 6.6	36	6°39.0	6°40.1	6°20.8	3.6 - 1.6	9.6 - 4.2	15.6 - 6.9
37	6°09.3	6°10.3	5°52.4	3.7 - 1.5	9.7 - 4.0	15.7 - 6.4	37	6°24.3	6°25.3	6°06.7	3.7 - 1.6	9.7 - 4.1	15.7 - 6.7	37	6°39.3	6°40.3	6°21.1	3.7 - 1.6	9.7 - 4.3	15.7 - 6.9
38	6°09.5	6°10.5	5°52.7	3.8 - 1.6	9.8 - 4.0	15.8 - 6.5	38	6°24.5	6°25.6	6°07.0	3.8 - 1.6	9.8 - 4.2	15.8 - 6.7	38	6°39.5	6°40.6	6°21.3	3.8 - 1.7	9.8 - 4.3	15.8 - 7.0
39	6°09.7	6°10.8	5°52.9	3.9 - 1.6	9.9 - 4.0	15.9 - 6.5	39	6°24.7	6°25.8	6°07.2	3.9 - 1.7	9.9 - 4.2	15.9 - 6.8	39	6°39.7	6°40.8	6°21.5	3.9 - 1.7	9.9 - 4.4	15.9 - 7.0
40	6°10.0	6°11.0	5°53.1	4.0 - 1.6	10.0 - 4.1	16.0 - 6.5	40	6°25.0	6°26.1	6°07.5	4.0 - 1.7	10.0 - 4.3	16.0 - 6.8	40	6°40.0	6°41.1	6°21.8	4.0 - 1.8	10.0 - 4.4	16.0 - 7.1
41	6°10.3	6°11.3	5°53.4	4.1 - 1.7	10.1 - 4.1	16.1 - 6.6	41	6°25.3	6°26.3	6°07.7	4.1 - 1.7	10.1 - 4.3	16.1 - 6.8	41	6°40.3	6°41.3	6°22.0	4.1 - 1.8	10.1 - 4.5	16.1 - 7.1
42	6°10.5	6°11.5	5°53.6	4.2 - 1.7	10.2 - 4.2	16.2 - 6.6	42	6°25.5	6°26.6	6°07.9	4.2 - 1.8	10.2 - 4.3	16.2 - 6.9	42	6°40.5	6°41.6	6°22.3	4.2 - 1.9	10.2 - 4.5	16.2 - 7.2
43	6°10.7	6°11.8	5°53.9	4.3 - 1.8	10.3 - 4.2	16.3 - 6.7	43	6°25.7	6°26.8	6°08.2	4.3 - 1.8	10.3 - 4.4	16.3 - 6.9	43	6°40.7	6°41.8	6°22.5	4.3 - 1.9	10.3 - 4.5	16.3 - 7.2
44	6°11.0	6°12.0	5°54.1	4.4 - 1.8	10.4 - 4.2	16.4 - 6.7	44	6°26.0	6°27.1	6°08.4	4.4 - 1.9	10.4 - 4.4	16.4 - 7.0	44	6°41.0	6°42.1	6°22.7	4.4 - 1.9	10.4 - 4.6	16.4 - 7.2
45	6°11.3	6°12.3	5°54.3	4.5 - 1.8	10.5 - 4.3	16.5 - 6.7	45	6°26.3	6°27.3	6°08.7	4.5 - 1.9	10.5 - 4.5	16.5 - 7.0	45	6°41.3	6°42.3	6°23.0	4.5 - 2.0	10.5 - 4.6	16.5 - 7.3
46	6°11.5	6°12.5	5°54.6	4.6 - 1.9	10.6 - 4.3	16.6 - 6.8	46	6°26.5	6°27.6	6°08.9	4.6 - 2.0	10.6 - 4.5	16.6 - 7.1	46	6°41.5	6°42.6	6°23.2	4.6 - 2.0	10.6 - 4.7	16.6 - 7.3
47	6°11.8	6°12.8	5°54.8	4.7 - 1.9	10.7 - 4.4	16.7 - 6.8	47	6°26.8	6°27.8	6°09.1	4.7 - 2.0	10.7 - 4.5	16.7 - 7.1	47	6°41.8	6°42.8	6°23.4	4.7 - 2.1	10.7 - 4.7	16.7 - 7.4
48	6°12.0	6°13.0	5°55.1	4.8 - 2.0	10.8 - 4.4	16.8 - 6.9	48	6°27.0	6°28.1	6°09.4	4.8 - 2.0	10.8 - 4.6	16.8 - 7.1	48	6°42.0	6°43.1	6°23.7	4.8 - 2.1	10.8 - 4.8	16.8 - 7.4
49	6°12.2	6°13.																		

Increments and Corrections

m	Sun Plan.	Aries	Moon	v and d corr			m	Sun Plan.	Aries	Moon	v and d corr			m	Sun Plan.	Aries	Moon	v and d corr		
27							28							29						
0	6°45.0	6°46.1	6°26.5	0.0 - 0.0	6.0 - 2.8	12.0 - 5.5	0	7°00.0	7°01.1	6°40.9	0.0 - 0.0	6.0 - 2.8	12.0 - 5.7	0	7°15.0	7°16.2	6°55.2	0.0 - 0.0	6.0 - 2.9	12.0 - 5.9
1	6°45.2	6°46.4	6°26.8	0.1 - 0.0	6.1 - 2.8	12.1 - 5.5	1	7°00.2	7°01.4	6°41.1	0.1 - 0.0	6.1 - 2.9	12.1 - 5.7	1	7°15.2	7°16.4	6°55.4	0.1 - 0.0	6.1 - 3.0	12.1 - 5.9
2	6°45.5	6°46.6	6°27.0	0.2 - 0.1	6.2 - 2.8	12.2 - 5.6	2	7°00.5	7°01.6	6°41.3	0.2 - 0.1	6.2 - 2.9	12.2 - 5.8	2	7°15.5	7°16.7	6°55.7	0.2 - 0.1	6.2 - 3.0	12.2 - 6.0
3	6°45.8	6°46.9	6°27.3	0.3 - 0.1	6.3 - 2.9	12.3 - 5.6	3	7°00.8	7°01.9	6°41.6	0.3 - 0.1	6.3 - 3.0	12.3 - 5.8	3	7°15.8	7°16.9	6°55.9	0.3 - 0.1	6.3 - 3.1	12.3 - 6.0
4	6°46.0	6°47.1	6°27.5	0.4 - 0.2	6.4 - 2.9	12.4 - 5.7	4	7°01.0	7°02.2	6°41.8	0.4 - 0.2	6.4 - 3.0	12.4 - 5.9	4	7°16.0	7°17.2	6°56.1	0.4 - 0.2	6.4 - 3.1	12.4 - 6.1
5	6°46.2	6°47.4	6°27.7	0.5 - 0.2	6.5 - 3.0	12.5 - 5.7	5	7°01.2	7°02.4	6°42.1	0.5 - 0.2	6.5 - 3.1	12.5 - 5.9	5	7°16.2	7°17.4	6°56.4	0.5 - 0.2	6.5 - 3.2	12.5 - 6.1
6	6°46.5	6°47.6	6°28.0	0.6 - 0.3	6.6 - 3.0	12.6 - 5.8	6	7°01.5	7°02.7	6°42.3	0.6 - 0.3	6.6 - 3.1	12.6 - 6.0	6	7°16.5	7°17.7	6°56.6	0.6 - 0.3	6.6 - 3.2	12.6 - 6.2
7	6°46.8	6°47.9	6°28.2	0.7 - 0.3	6.7 - 3.1	12.7 - 5.8	7	7°01.8	7°02.9	6°42.5	0.7 - 0.3	6.7 - 3.2	12.7 - 6.0	7	7°16.8	7°17.9	6°56.9	0.7 - 0.3	6.7 - 3.3	12.7 - 6.2
8	6°47.0	6°48.1	6°28.5	0.8 - 0.4	6.8 - 3.1	12.8 - 5.9	8	7°02.0	7°03.2	6°42.8	0.8 - 0.4	6.8 - 3.2	12.8 - 6.1	8	7°17.0	7°18.2	6°57.1	0.8 - 0.4	6.8 - 3.3	12.8 - 6.3
9	6°47.2	6°48.4	6°28.7	0.9 - 0.4	6.9 - 3.2	12.9 - 5.9	9	7°02.2	7°03.4	6°43.0	0.9 - 0.4	6.9 - 3.3	12.9 - 6.1	9	7°17.2	7°18.4	6°57.3	0.9 - 0.4	6.9 - 3.4	12.9 - 6.3
10	6°47.5	6°48.6	6°28.9	1.0 - 0.5	7.0 - 3.2	13.0 - 6.0	10	7°02.5	7°03.7	6°43.3	1.0 - 0.5	7.0 - 3.3	13.0 - 6.2	10	7°17.5	7°18.7	6°57.6	1.0 - 0.5	7.0 - 3.4	13.0 - 6.4
11	6°47.8	6°48.9	6°29.2	1.1 - 0.5	7.1 - 3.3	13.1 - 6.0	11	7°02.8	7°03.9	6°43.5	1.1 - 0.5	7.1 - 3.4	13.1 - 6.2	11	7°17.8	7°18.9	6°57.8	1.1 - 0.5	7.1 - 3.5	13.1 - 6.4
12	6°48.0	6°49.1	6°29.4	1.2 - 0.6	7.2 - 3.3	13.2 - 6.0	12	7°03.0	7°04.2	6°43.7	1.2 - 0.6	7.2 - 3.4	13.2 - 6.3	12	7°18.0	7°19.2	6°58.0	1.2 - 0.6	7.2 - 3.5	13.2 - 6.5
13	6°48.2	6°49.4	6°29.7	1.3 - 0.6	7.3 - 3.3	13.3 - 6.1	13	7°03.2	7°04.4	6°44.0	1.3 - 0.6	7.3 - 3.5	13.3 - 6.3	13	7°18.2	7°19.4	6°58.3	1.3 - 0.6	7.3 - 3.6	13.3 - 6.5
14	6°48.5	6°49.6	6°29.9	1.4 - 0.6	7.4 - 3.4	13.4 - 6.1	14	7°03.5	7°04.7	6°44.2	1.4 - 0.7	7.4 - 3.5	13.4 - 6.4	14	7°18.5	7°19.7	6°58.5	1.4 - 0.7	7.4 - 3.6	13.4 - 6.6
15	6°48.8	6°49.9	6°30.1	1.5 - 0.7	7.5 - 3.4	13.5 - 6.2	15	7°03.8	7°04.9	6°44.4	1.5 - 0.7	7.5 - 3.6	13.5 - 6.4	15	7°18.8	7°19.9	6°58.8	1.5 - 0.7	7.5 - 3.7	13.5 - 6.6
16	6°49.0	6°50.1	6°30.4	1.6 - 0.7	7.6 - 3.5	13.6 - 6.2	16	7°04.0	7°05.2	6°44.7	1.6 - 0.8	7.6 - 3.6	13.6 - 6.5	16	7°19.0	7°20.2	6°59.0	1.6 - 0.8	7.6 - 3.7	13.6 - 6.7
17	6°49.3	6°50.4	6°30.6	1.7 - 0.8	7.7 - 3.5	13.7 - 6.3	17	7°04.3	7°05.4	6°44.9	1.7 - 0.8	7.7 - 3.7	13.7 - 6.5	17	7°19.3	7°20.5	6°59.2	1.7 - 0.8	7.7 - 3.8	13.7 - 6.7
18	6°49.5	6°50.6	6°30.8	1.8 - 0.8	7.8 - 3.6	13.8 - 6.3	18	7°04.5	7°05.7	6°45.2	1.8 - 0.9	7.8 - 3.7	13.8 - 6.6	18	7°19.5	7°20.7	6°59.5	1.8 - 0.9	7.8 - 3.8	13.8 - 6.8
19	6°49.8	6°50.9	6°31.1	1.9 - 0.9	7.9 - 3.6	13.9 - 6.4	19	7°04.7	7°05.9	6°45.4	1.9 - 0.9	7.9 - 3.8	13.9 - 6.6	19	7°19.7	7°21.0	6°59.7	1.9 - 0.9	7.9 - 3.9	13.9 - 6.8
20	6°50.0	6°51.1	6°31.3	2.0 - 0.9	8.0 - 3.7	14.0 - 6.4	20	7°05.0	7°06.2	6°45.6	2.0 - 0.9	8.0 - 3.8	14.0 - 6.6	20	7°20.0	7°21.2	7°00.0	2.0 - 1.0	8.0 - 3.9	14.0 - 6.9
21	6°50.3	6°51.4	6°31.6	2.1 - 1.0	8.1 - 3.7	14.1 - 6.5	21	7°05.3	7°06.4	6°45.9	2.1 - 1.0	8.1 - 3.8	14.1 - 6.7	21	7°20.3	7°21.5	7°00.2	2.1 - 1.0	8.1 - 4.0	14.1 - 6.9
22	6°50.5	6°51.6	6°31.8	2.2 - 1.0	8.2 - 3.8	14.2 - 6.5	22	7°05.5	7°06.7	6°46.1	2.2 - 1.0	8.2 - 3.9	14.2 - 6.7	22	7°20.5	7°21.7	7°00.4	2.2 - 1.1	8.2 - 4.0	14.2 - 7.0
23	6°50.7	6°51.9	6°32.0	2.3 - 1.1	8.3 - 3.8	14.3 - 6.6	23	7°05.7	7°06.9	6°46.4	2.3 - 1.1	8.3 - 3.9	14.3 - 6.8	23	7°20.7	7°22.0	7°00.7	2.3 - 1.1	8.3 - 4.1	14.3 - 7.0
24	6°51.0	6°52.1	6°32.3	2.4 - 1.1	8.4 - 3.9	14.4 - 6.6	24	7°06.0	7°07.2	6°46.6	2.4 - 1.1	8.4 - 4.0	14.4 - 6.8	24	7°21.0	7°22.2	7°00.9	2.4 - 1.2	8.4 - 4.1	14.4 - 7.1
25	6°51.3	6°52.4	6°32.5	2.5 - 1.1	8.5 - 3.9	14.5 - 6.6	25	7°06.3	7°07.4	6°46.8	2.5 - 1.2	8.5 - 4.0	14.5 - 6.9	25	7°21.3	7°22.5	7°01.1	2.5 - 1.2	8.5 - 4.2	14.5 - 7.1
26	6°51.5	6°52.6	6°32.8	2.6 - 1.2	8.6 - 3.9	14.6 - 6.7	26	7°06.5	7°07.7	6°47.1	2.6 - 1.2	8.6 - 4.1	14.6 - 6.9	26	7°21.5	7°22.7	7°01.4	2.6 - 1.3	8.6 - 4.2	14.6 - 7.2
27	6°51.7	6°52.9	6°33.0	2.7 - 1.2	8.7 - 4.0	14.7 - 6.7	27	7°06.7	7°07.9	6°47.3	2.7 - 1.3	8.7 - 4.1	14.7 - 7.0	27	7°21.7	7°23.0	7°01.6	2.7 - 1.3	8.7 - 4.3	14.7 - 7.2
28	6°52.0	6°53.1	6°33.2	2.8 - 1.3	8.8 - 4.0	14.8 - 6.8	28	7°07.0	7°08.2	6°47.5	2.8 - 1.3	8.8 - 4.2	14.8 - 7.0	28	7°22.0	7°23.2	7°01.9	2.8 - 1.4	8.8 - 4.3	14.8 - 7.3
29	6°52.3	6°53.4	6°33.5	2.9 - 1.3	8.9 - 4.1	14.9 - 6.8	29	7°07.3	7°08.4	6°47.8	2.9 - 1.4	8.9 - 4.2	14.9 - 7.1	29	7°22.3	7°23.5	7°02.1	2.9 - 1.4	8.9 - 4.4	14.9 - 7.3
30	6°52.5	6°53.6	6°33.7	3.0 - 1.4	9.0 - 4.1	15.0 - 6.9	30	7°07.5	7°08.7	6°48.0	3.0 - 1.4	9.0 - 4.3	15.0 - 7.1	30	7°22.5	7°23.7	7°02.3	3.0 - 1.5	9.0 - 4.4	15.0 - 7.4
31	6°52.7	6°53.9	6°33.9	3.1 - 1.4	9.1 - 4.2	15.1 - 6.9	31	7°07.7	7°08.9	6°48.3	3.1 - 1.5	9.1 - 4.3	15.1 - 7.2	31	7°22.7	7°24.0	7°02.6	3.1 - 1.5	9.1 - 4.5	15.1 - 7.4
32	6°53.0	6°54.1	6°34.2	3.2 - 1.5	9.2 - 4.2	15.2 - 7.0	32	7°08.0	7°09.2	6°48.5	3.2 - 1.5	9.2 - 4.4	15.2 - 7.2	32	7°23.0	7°24.2	7°02.8	3.2 - 1.6	9.2 - 4.5	15.2 - 7.5
33	6°53.3	6°54.4	6°34.4	3.3 - 1.5	9.3 - 4.3	15.3 - 7.0	33	7°08.3	7°09.4	6°48.7	3.3 - 1.6	9.3 - 4.4	15.3 - 7.3	33	7°23.3	7°24.5	7°03.1	3.3 - 1.6	9.3 - 4.6	15.3 - 7.5
34	6°53.5	6°54.6	6°34.7	3.4 - 1.6	9.4 - 4.3	15.4 - 7.1	34	7°08.5	7°09.7	6°49.0	3.4 - 1.6	9.4 - 4.5	15.4 - 7.3	34	7°23.5	7°24.7	7°03.3	3.4 - 1.7	9.4 - 4.6	15.4 - 7.6
35	6°53.7	6°54.9	6°34.9	3.5 - 1.6	9.5 - 4.4	15.5 - 7.1	35	7°08.7	7°09.9	6°49.2	3.5 - 1.7	9.5 - 4.5	15.5 - 7.4	35	7°23.7	7°25.0	7°03.5	3.5 - 1.7	9.5 - 4.7	15.5 - 7.6
36	6°54.0	6°55.1	6°35.1	3.6 - 1.6	9.6 - 4.4	15.6 - 7.1	36	7°09.0	7°10.2	6°49.5	3.6 - 1.7	9.6 - 4.6	15.6 - 7.4	36	7°24.0	7°25.2	7°03.8	3.6 - 1.8	9.6 - 4.7	15.6 - 7.7
37	6°54.3	6°55.4	6°35.4	3.7 - 1.7	9.7 - 4.4	15.7 - 7.2	37	7°09.3	7°10.4	6°49.7	3.7 - 1.8	9.7 - 4.6	15.7 - 7.5	37	7°24.3	7°25.5	7°04.0	3.7 - 1.8	9.7 - 4.8	15.7 - 7.7
38	6°54.5	6°55.6	6°35.6	3.8 - 1.7	9.8 - 4.5	15.8 - 7.2	38	7°09.5	7°10.7	6°49.9	3.8 - 1.8	9.8 - 4.7	15.8 - 7.5	38	7°24.5	7°25.7	7°04.3	3.8 - 1.9	9.8 - 4.8	15.8 - 7.8
39	6°54.7	6°55.9	6°35.9	3.9 - 1.8	9.9 - 4.5	15.9 - 7.3	39	7°09.7	7°10.9	6°50.2	3.9 - 1.9	9.9 - 4.7	15.9 - 7.6	39	7°24.7	7°26.0	7°04.5	3.9 - 1.9	9.9 - 4.9	15.9 - 7.9
40	6°55.0	6°56.1	6°36.1	4.0 - 1.8	10.0 - 4.6	16.0 - 7.3	40	7°10.0	7°11.2	6°50.4	4.0 - 1.9	10.0 - 4.8	16.0 - 7.6	40	7°25.0	7°26.2	7°04.7	4.0 - 2.0	10.0 - 4.9	16.0 - 7.8
41	6°55.3	6°56.4	6°36.3	4.1 - 1.9	10.1 - 4.6	16.1 - 7.4	41	7°10.3	7°11.4	6°50.6	4.1 - 1.9	10.1 - 4.8	16.1 - 7.6	41	7°25.3	7°26.5	7°05.0	4.1 - 2.0	10.1 - 5.0	16.1 - 7.9
42	6°55.5	6°56.6	6°36.6	4.2 - 1.9	10.2 - 4.7	16.2 - 7.4	42	7°10.5	7°11.7	6°50.9	4.2 - 2.0	10.2 - 4.8	16.2 - 7.7	42	7°25.5	7°26.7	7°05.2	4.2 - 2.1	10.2 - 5.0	16.2 - 8.0
43	6°55.7	6°56.9	6°36.8	4.3 - 2.0	10.3 - 4.7	16.3 - 7.5	43	7°10.7	7°11.9	6°51.1	4.3 - 2.0	10.3 - 4.9	16.3 - 7.7	43	7°25.7	7°27.0	7°05.4	4.3 - 2.1	10.3 - 5.1	16.3 - 8.0
44	6°56.0	6°57.1	6°37.0	4.4 - 2.0	10.4 - 4.8	16.4 - 7.5	44	7°11.0	7°12.2	6°51.4	4.4 - 2.1	10.4 - 4.9	16.4 - 7.8	44	7°26.0	7°27.2	7°05.7	4.4 - 2.2	10.4 - 5.1	16.4 - 8.1
45	6°56.3	6°57.4	6°37.3	4.5 - 2.1	10.5 - 4.8	16.5 - 7.6	45	7°11.3	7°12.4	6°51.6	4.5 - 2.1	10.5 - 5.0	16.5 - 7.8	45	7°26.3	7°27.5	7°05.9	4.5 - 2.2	10.5 - 5.2	16.5 - 8.1
46	6°56.5	6°57.6	6°37.5	4.6 - 2.1	10.6 - 4.9	16.6 - 7.6	46	7°11.5	7°12.7	6°51.8	4.6 - 2.2	10.6 - 5.0	16.6 - 7.9	46	7°26.5	7°27.7	7°06.2	4.6 - 2.3	10.6 - 5.2	16.6 - 8.2
47	6°56.8	6°57.9	6°37.8	4.7 - 2.2	10.7 - 4.9	16.7 - 7.7	47	7°11.8	7°12.9	6°52.1	4.7 - 2.2	10.7 - 5.1	16.7 - 7.9	47	7°26.8	7°28.0	7°06.4	4.7 - 2.3	10.7 - 5.3	16.7 - 8.2
48	6°57.0	6°58.1	6°38.0	4.8 - 2.2	10.8 - 5.0	16.8 - 7.7	48	7°12.0	7°13.2	6°52.3	4.8 - 2.3	10.8 - 5.1	16.8 - 8.0	48	7°27.					

Increments and Corrections

m	Sun Plan.	Aries	Moon	v and d corr			m	Sun Plan.	Aries	Moon	v and d corr			m	Sun Plan.	Aries	Moon	v and d corr		
0	7°30.0	7°31.2	7°09.5	0.0 - 0.0	6.0 - 3.0	12.0 - 6.1	0	7°45.0	7°46.3	7°23.8	0.0 - 0.0	6.0 - 3.2	12.0 - 6.3	0	8°00.0	8°01.3	7°38.1	0.0 - 0.0	6.0 - 3.3	12.0 - 6.5
1	7°30.2	7°31.5	7°09.7	0.1 - 0.1	6.1 - 3.1	12.1 - 6.2	1	7°45.2	7°46.5	7°24.1	0.1 - 0.1	6.1 - 3.2	12.1 - 6.4	1	8°00.2	8°01.6	7°38.4	0.1 - 0.1	6.1 - 3.3	12.1 - 6.6
2	7°30.5	7°31.7	7°10.0	0.2 - 0.1	6.2 - 3.2	12.2 - 6.2	2	7°45.5	7°46.8	7°24.3	0.2 - 0.1	6.2 - 3.3	12.2 - 6.4	2	8°00.5	8°01.8	7°38.6	0.2 - 0.1	6.2 - 3.4	12.2 - 6.6
3	7°30.8	7°32.0	7°10.2	0.3 - 0.2	6.3 - 3.2	12.3 - 6.3	3	7°45.7	7°47.0	7°24.5	0.3 - 0.2	6.3 - 3.3	12.3 - 6.5	3	8°00.7	8°02.1	7°38.8	0.3 - 0.2	6.3 - 3.4	12.3 - 6.7
4	7°31.0	7°32.2	7°10.5	0.4 - 0.2	6.4 - 3.3	12.4 - 6.3	4	7°46.0	7°47.3	7°24.8	0.4 - 0.2	6.4 - 3.4	12.4 - 6.5	4	8°01.0	8°02.3	7°39.1	0.4 - 0.2	6.4 - 3.5	12.4 - 6.7
5	7°31.2	7°32.5	7°10.7	0.5 - 0.3	6.5 - 3.3	12.5 - 6.4	5	7°46.2	7°47.5	7°25.0	0.5 - 0.3	6.5 - 3.4	12.5 - 6.6	5	8°01.3	8°02.6	7°39.3	0.5 - 0.3	6.5 - 3.5	12.5 - 6.8
6	7°31.5	7°32.7	7°10.9	0.6 - 0.3	6.6 - 3.4	12.6 - 6.4	6	7°46.5	7°47.8	7°25.2	0.6 - 0.3	6.6 - 3.5	12.6 - 6.6	6	8°01.5	8°02.8	7°39.6	0.6 - 0.3	6.6 - 3.6	12.6 - 6.8
7	7°31.7	7°33.0	7°11.2	0.7 - 0.4	6.7 - 3.4	12.7 - 6.5	7	7°46.8	7°48.0	7°25.5	0.7 - 0.4	6.7 - 3.5	12.7 - 6.7	7	8°01.8	8°03.1	7°39.8	0.7 - 0.4	6.7 - 3.6	12.7 - 6.9
8	7°32.0	7°33.2	7°11.4	0.8 - 0.4	6.8 - 3.5	12.8 - 6.5	8	7°47.0	7°48.3	7°25.7	0.8 - 0.4	6.8 - 3.6	12.8 - 6.7	8	8°02.0	8°03.3	7°40.0	0.8 - 0.4	6.8 - 3.7	12.8 - 6.9
9	7°32.2	7°33.5	7°11.6	0.9 - 0.5	6.9 - 3.5	12.9 - 6.6	9	7°47.2	7°48.5	7°26.0	0.9 - 0.5	6.9 - 3.6	12.9 - 6.8	9	8°02.2	8°03.6	7°40.3	0.9 - 0.5	6.9 - 3.7	12.9 - 7.0
10	7°32.5	7°33.7	7°11.9	1.0 - 0.5	7.0 - 3.6	13.0 - 6.6	10	7°47.5	7°48.8	7°26.2	1.0 - 0.5	7.0 - 3.7	13.0 - 6.8	10	8°02.5	8°03.8	7°40.5	1.0 - 0.5	7.0 - 3.8	13.0 - 7.0
11	7°32.8	7°34.0	7°12.1	1.1 - 0.6	7.1 - 3.6	13.1 - 6.7	11	7°47.7	7°49.0	7°26.4	1.1 - 0.6	7.1 - 3.7	13.1 - 6.9	11	8°02.7	8°04.1	7°40.8	1.1 - 0.6	7.1 - 3.8	13.1 - 7.1
12	7°33.0	7°34.2	7°12.4	1.2 - 0.6	7.2 - 3.7	13.2 - 6.7	12	7°48.0	7°49.3	7°26.7	1.2 - 0.6	7.2 - 3.8	13.2 - 6.9	12	8°03.0	8°04.3	7°41.0	1.2 - 0.7	7.2 - 3.9	13.2 - 7.1
13	7°33.3	7°34.5	7°12.6	1.3 - 0.7	7.3 - 3.7	13.3 - 6.8	13	7°48.2	7°49.5	7°26.9	1.3 - 0.7	7.3 - 3.8	13.3 - 7.0	13	8°03.3	8°04.6	7°41.2	1.3 - 0.7	7.3 - 4.0	13.3 - 7.2
14	7°33.5	7°34.7	7°12.8	1.4 - 0.7	7.4 - 3.8	13.4 - 6.8	14	7°48.5	7°49.8	7°27.2	1.4 - 0.7	7.4 - 3.9	13.4 - 7.0	14	8°03.5	8°04.8	7°41.5	1.4 - 0.8	7.4 - 4.0	13.4 - 7.3
15	7°33.8	7°35.0	7°13.1	1.5 - 0.8	7.5 - 3.8	13.5 - 6.9	15	7°48.8	7°50.0	7°27.4	1.5 - 0.8	7.5 - 3.9	13.5 - 7.1	15	8°03.8	8°05.1	7°41.7	1.5 - 0.8	7.5 - 4.1	13.5 - 7.3
16	7°34.0	7°35.2	7°13.3	1.6 - 0.8	7.6 - 3.9	13.6 - 6.9	16	7°49.0	7°50.3	7°27.6	1.6 - 0.8	7.6 - 4.0	13.6 - 7.1	16	8°04.0	8°05.3	7°42.0	1.6 - 0.9	7.6 - 4.1	13.6 - 7.4
17	7°34.3	7°35.5	7°13.6	1.7 - 0.9	7.7 - 3.9	13.7 - 7.0	17	7°49.3	7°50.5	7°27.9	1.7 - 0.9	7.7 - 4.0	13.7 - 7.2	17	8°04.2	8°05.6	7°42.2	1.7 - 0.9	7.7 - 4.2	13.7 - 7.4
18	7°34.5	7°35.7	7°13.8	1.8 - 0.9	7.8 - 4.0	13.8 - 7.0	18	7°49.5	7°50.8	7°28.1	1.8 - 0.9	7.8 - 4.1	13.8 - 7.2	18	8°04.5	8°05.8	7°42.4	1.8 - 1.0	7.8 - 4.2	13.8 - 7.5
19	7°34.8	7°36.0	7°14.0	1.9 - 1.0	7.9 - 4.0	13.9 - 7.1	19	7°49.8	7°51.0	7°28.4	1.9 - 1.0	7.9 - 4.1	13.9 - 7.3	19	8°04.8	8°06.1	7°42.7	1.9 - 1.0	7.9 - 4.3	13.9 - 7.5
20	7°35.0	7°36.2	7°14.3	2.0 - 1.0	8.0 - 4.1	14.0 - 7.1	20	7°50.0	7°51.3	7°28.6	2.0 - 1.1	8.0 - 4.2	14.0 - 7.4	20	8°05.0	8°06.3	7°42.9	2.0 - 1.1	8.0 - 4.3	14.0 - 7.6
21	7°35.3	7°36.5	7°14.5	2.1 - 1.1	8.1 - 4.1	14.1 - 7.2	21	7°50.3	7°51.5	7°28.8	2.1 - 1.1	8.1 - 4.3	14.1 - 7.4	21	8°05.3	8°06.6	7°43.1	2.1 - 1.1	8.1 - 4.4	14.1 - 7.6
22	7°35.5	7°36.7	7°14.7	2.2 - 1.1	8.2 - 4.2	14.2 - 7.2	22	7°50.5	7°51.8	7°29.1	2.2 - 1.2	8.2 - 4.3	14.2 - 7.5	22	8°05.5	8°06.8	7°43.4	2.2 - 1.2	8.2 - 4.4	14.2 - 7.7
23	7°35.7	7°37.0	7°15.0	2.3 - 1.2	8.3 - 4.2	14.3 - 7.3	23	7°50.7	7°52.0	7°29.3	2.3 - 1.2	8.3 - 4.4	14.3 - 7.5	23	8°05.7	8°07.1	7°43.6	2.3 - 1.2	8.3 - 4.5	14.3 - 7.7
24	7°36.0	7°37.2	7°15.2	2.4 - 1.2	8.4 - 4.3	14.4 - 7.3	24	7°51.0	7°52.3	7°29.5	2.4 - 1.3	8.4 - 4.4	14.4 - 7.6	24	8°06.0	8°07.3	7°43.9	2.4 - 1.3	8.4 - 4.5	14.4 - 7.8
25	7°36.2	7°37.5	7°15.5	2.5 - 1.3	8.5 - 4.3	14.5 - 7.4	25	7°51.3	7°52.5	7°29.8	2.5 - 1.3	8.5 - 4.5	14.5 - 7.6	25	8°06.2	8°07.6	7°44.1	2.5 - 1.4	8.5 - 4.6	14.5 - 7.9
26	7°36.5	7°37.7	7°15.7	2.6 - 1.3	8.6 - 4.4	14.6 - 7.4	26	7°51.5	7°52.8	7°30.0	2.6 - 1.4	8.6 - 4.5	14.6 - 7.7	26	8°06.5	8°07.8	7°44.3	2.6 - 1.4	8.6 - 4.7	14.6 - 7.9
27	7°36.7	7°38.0	7°15.9	2.7 - 1.4	8.7 - 4.4	14.7 - 7.5	27	7°51.7	7°53.0	7°30.3	2.7 - 1.4	8.7 - 4.6	14.7 - 7.7	27	8°06.8	8°08.1	7°44.6	2.7 - 1.5	8.7 - 4.7	14.7 - 8.0
28	7°37.0	7°38.2	7°16.2	2.8 - 1.4	8.8 - 4.5	14.8 - 7.5	28	7°52.0	7°53.3	7°30.5	2.8 - 1.5	8.8 - 4.6	14.8 - 7.8	28	8°07.0	8°08.3	7°44.8	2.8 - 1.5	8.8 - 4.8	14.8 - 8.0
29	7°37.3	7°38.5	7°16.4	2.9 - 1.5	8.9 - 4.5	14.9 - 7.6	29	7°52.2	7°53.5	7°30.7	2.9 - 1.5	8.9 - 4.7	14.9 - 7.8	29	8°07.3	8°08.6	7°45.1	2.9 - 1.6	8.9 - 4.8	14.9 - 8.1
30	7°37.5	7°38.8	7°16.7	3.0 - 1.5	9.0 - 4.6	15.0 - 7.6	30	7°52.5	7°53.8	7°31.0	3.0 - 1.6	9.0 - 4.7	15.0 - 7.9	30	8°07.5	8°08.8	7°45.3	3.0 - 1.6	9.0 - 4.9	15.0 - 8.1
31	7°37.7	7°39.0	7°16.9	3.1 - 1.6	9.1 - 4.6	15.1 - 7.7	31	7°52.7	7°54.0	7°31.2	3.1 - 1.6	9.1 - 4.8	15.1 - 7.9	31	8°07.7	8°09.1	7°45.5	3.1 - 1.7	9.1 - 4.9	15.1 - 8.2
32	7°38.0	7°39.3	7°17.1	3.2 - 1.6	9.2 - 4.7	15.2 - 7.7	32	7°53.0	7°54.3	7°31.5	3.2 - 1.7	9.2 - 4.8	15.2 - 8.0	32	8°08.0	8°09.3	7°45.8	3.2 - 1.7	9.2 - 5.0	15.2 - 8.2
33	7°38.3	7°39.5	7°17.4	3.3 - 1.7	9.3 - 4.7	15.3 - 7.8	33	7°53.3	7°54.5	7°31.7	3.3 - 1.7	9.3 - 4.9	15.3 - 8.0	33	8°08.2	8°09.6	7°46.0	3.3 - 1.8	9.3 - 5.0	15.3 - 8.3
34	7°38.5	7°39.8	7°17.6	3.4 - 1.7	9.4 - 4.8	15.4 - 7.8	34	7°53.5	7°54.8	7°31.9	3.4 - 1.8	9.4 - 4.9	15.4 - 8.1	34	8°08.5	8°09.8	7°46.2	3.4 - 1.8	9.4 - 5.1	15.4 - 8.3
35	7°38.7	7°40.0	7°17.9	3.5 - 1.8	9.5 - 4.8	15.5 - 7.9	35	7°53.8	7°55.0	7°32.2	3.5 - 1.8	9.5 - 5.0	15.5 - 8.1	35	8°08.8	8°10.1	7°46.5	3.5 - 1.9	9.5 - 5.1	15.5 - 8.4
36	7°39.0	7°40.3	7°18.1	3.6 - 1.8	9.6 - 4.9	15.6 - 7.9	36	7°54.0	7°55.3	7°32.4	3.6 - 1.9	9.6 - 5.0	15.6 - 8.2	36	8°09.0	8°10.3	7°46.7	3.6 - 1.9	9.6 - 5.2	15.6 - 8.4
37	7°39.3	7°40.5	7°18.3	3.7 - 1.9	9.7 - 4.9	15.7 - 8.0	37	7°54.3	7°55.5	7°32.6	3.7 - 1.9	9.7 - 5.1	15.7 - 8.2	37	8°09.3	8°10.6	7°47.0	3.7 - 2.0	9.7 - 5.3	15.7 - 8.5
38	7°39.5	7°40.8	7°18.6	3.8 - 1.9	9.8 - 5.0	15.8 - 8.0	38	7°54.5	7°55.8	7°32.9	3.8 - 2.0	9.8 - 5.1	15.8 - 8.3	38	8°09.5	8°10.8	7°47.2	3.8 - 2.1	9.8 - 5.3	15.8 - 8.6
39	7°39.8	7°41.0	7°18.8	3.9 - 2.0	9.9 - 5.0	15.9 - 8.1	39	7°54.7	7°56.0	7°33.1	3.9 - 2.0	9.9 - 5.2	15.9 - 8.3	39	8°09.7	8°11.1	7°47.4	3.9 - 2.1	9.9 - 5.4	15.9 - 8.6
40	7°40.0	7°41.3	7°19.0	4.0 - 2.0	10.0 - 5.1	16.0 - 8.1	40	7°55.0	7°56.3	7°33.4	4.0 - 2.1	10.0 - 5.3	16.0 - 8.4	40	8°10.0	8°11.3	7°47.7	4.0 - 2.2	10.0 - 5.4	16.0 - 8.7
41	7°40.3	7°41.5	7°19.3	4.1 - 2.1	10.1 - 5.1	16.1 - 8.2	41	7°55.3	7°56.5	7°33.6	4.1 - 2.2	10.1 - 5.3	16.1 - 8.5	41	8°10.2	8°11.6	7°47.9	4.1 - 2.2	10.1 - 5.5	16.1 - 8.7
42	7°40.5	7°41.8	7°19.5	4.2 - 2.1	10.2 - 5.2	16.2 - 8.2	42	7°55.5	7°56.8	7°33.8	4.2 - 2.2	10.2 - 5.4	16.2 - 8.5	42	8°10.5	8°11.8	7°48.2	4.2 - 2.3	10.2 - 5.5	16.2 - 8.8
43	7°40.7	7°42.0	7°19.8	4.3 - 2.2	10.3 - 5.2	16.3 - 8.3	43	7°55.7	7°57.1	7°34.1	4.3 - 2.3	10.3 - 5.4	16.3 - 8.6	43	8°10.8	8°12.1	7°48.4	4.3 - 2.3	10.3 - 5.6	16.3 - 8.8
44	7°41.0	7°42.3	7°20.0	4.4 - 2.2	10.4 - 5.3	16.4 - 8.3	44	7°56.0	7°57.3	7°34.3	4.4 - 2.3	10.4 - 5.5	16.4 - 8.6	44	8°11.0	8°12.3	7°48.6	4.4 - 2.4	10.4 - 5.6	16.4 - 8.9
45	7°41.2	7°42.5	7°20.2	4.5 - 2.3	10.5 - 5.3	16.5 - 8.4	45	7°56.3	7°57.6	7°34.6	4.5 - 2.4	10.5 - 5.5	16.5 - 8.7	45	8°11.3	8°12.6	7°48.9	4.5 - 2.4	10.5 - 5.7	16.5 - 8.9
46	7°41.5	7°42.8	7°20.5	4.6 - 2.3	10.6 - 5.4	16.6 - 8.4	46	7°56.5	7°57.8	7°34.8	4.6 - 2.4	10.6 - 5.6	16.6 - 8.7	46	8°11.5	8°12.8	7°49.1	4.6 - 2.5	10.6 - 5.7	16.6 - 9.0
47	7°41.8	7°43.0	7°20.7	4.7 - 2.4	10.7 - 5.4	16.7 - 8.5	47	7°56.7	7°58.1	7°35.0	4.7 - 2.5	10.7 - 5.6	16.7 - 8.8	47	8°11.7	8°13.1	7°49.3	4.7 - 2.5	10.7 - 5.8	16.7 - 9.0
48	7°42.0	7°43.3	7°21.0	4.8 - 2.4	10.8 - 5.5	16.8 - 8.5	48	7°57.0	7°58.3	7°35.3	4.8 - 2.5	10.8 - 5.7	16.8 - 8.8	48	8°12.0	8°13.3	7°49.6	4.8 - 2.6	10.8 - 5.8	16.8 - 9.1
49	7°42.3	7°43.5																		

Increments and Corrections

m 33	Sun Plan.	Aries	Moon	v and d corr			m 34	Sun Plan.	Aries	Moon	v and d corr			m 35	Sun Plan.	Aries	Moon	v and d corr		
0	8°15.0	8°16.4	7°52.5	0.0 - 0.0	6.0 - 3.4	12.0 - 6.7	0	8°30.0	8°31.4	8°06.8	0.0 - 0.0	6.0 - 3.4	12.0 - 6.9	0	8°45.0	8°46.4	8°21.1	0.0 - 0.0	6.0 - 3.5	12.0 - 7.1
1	8°15.2	8°16.6	7°52.7	0.1 - 0.1	6.1 - 3.4	12.1 - 6.8	1	8°30.2	8°31.6	8°07.0	0.1 - 0.1	6.1 - 3.5	12.1 - 7.0	1	8°45.2	8°46.7	8°21.3	0.1 - 0.1	6.1 - 3.6	12.1 - 7.2
2	8°15.5	8°16.9	7°52.9	0.2 - 0.1	6.2 - 3.5	12.2 - 6.8	2	8°30.5	8°31.9	8°07.2	0.2 - 0.1	6.2 - 3.6	12.2 - 7.0	2	8°45.5	8°46.9	8°21.6	0.2 - 0.1	6.2 - 3.7	12.2 - 7.2
3	8°15.7	8°17.1	7°53.2	0.3 - 0.2	6.3 - 3.5	12.3 - 6.9	3	8°30.7	8°32.1	8°07.5	0.3 - 0.2	6.3 - 3.6	12.3 - 7.1	3	8°45.7	8°47.2	8°21.8	0.3 - 0.2	6.3 - 3.7	12.3 - 7.3
4	8°16.0	8°17.4	7°53.4	0.4 - 0.2	6.4 - 3.6	12.4 - 6.9	4	8°31.0	8°32.4	8°07.7	0.4 - 0.2	6.4 - 3.7	12.4 - 7.1	4	8°46.0	8°47.4	8°22.0	0.4 - 0.2	6.4 - 3.8	12.4 - 7.3
5	8°16.3	8°17.6	7°53.6	0.5 - 0.3	6.5 - 3.6	12.5 - 7.0	5	8°31.3	8°32.6	8°08.0	0.5 - 0.3	6.5 - 3.7	12.5 - 7.2	5	8°46.3	8°47.7	8°22.3	0.5 - 0.3	6.5 - 3.8	12.5 - 7.4
6	8°16.5	8°17.9	7°53.9	0.6 - 0.3	6.6 - 3.7	12.6 - 7.0	6	8°31.5	8°32.9	8°08.2	0.6 - 0.3	6.6 - 3.8	12.6 - 7.2	6	8°46.5	8°47.9	8°22.5	0.6 - 0.4	6.6 - 3.9	12.6 - 7.5
7	8°16.8	8°18.1	7°54.1	0.7 - 0.4	6.7 - 3.7	12.7 - 7.1	7	8°31.8	8°33.1	8°08.4	0.7 - 0.4	6.7 - 3.9	12.7 - 7.3	7	8°46.8	8°48.2	8°22.8	0.7 - 0.4	6.7 - 4.0	12.7 - 7.5
8	8°17.0	8°18.4	7°54.4	0.8 - 0.4	6.8 - 3.8	12.8 - 7.1	8	8°32.0	8°33.4	8°08.7	0.8 - 0.5	6.8 - 3.9	12.8 - 7.4	8	8°47.0	8°48.4	8°23.0	0.8 - 0.5	6.8 - 4.0	12.8 - 7.6
9	8°17.2	8°18.6	7°54.6	0.9 - 0.5	6.9 - 3.9	12.9 - 7.2	9	8°32.2	8°33.7	8°08.9	0.9 - 0.5	6.9 - 4.0	12.9 - 7.4	9	8°47.2	8°48.7	8°23.2	0.9 - 0.5	6.9 - 4.1	12.9 - 7.6
10	8°17.5	8°18.9	7°54.8	1.0 - 0.6	7.0 - 3.9	13.0 - 7.3	10	8°32.5	8°33.9	8°09.2	1.0 - 0.6	7.0 - 4.0	13.0 - 7.5	10	8°47.5	8°48.9	8°23.5	1.0 - 0.6	7.0 - 4.1	13.0 - 7.7
11	8°17.7	8°19.1	7°55.1	1.1 - 0.6	7.1 - 4.0	13.1 - 7.3	11	8°32.7	8°34.2	8°09.4	1.1 - 0.6	7.1 - 4.1	13.1 - 7.5	11	8°47.7	8°49.2	8°23.7	1.1 - 0.7	7.1 - 4.2	13.1 - 7.8
12	8°18.0	8°19.4	7°55.3	1.2 - 0.7	7.2 - 4.0	13.2 - 7.4	12	8°33.0	8°34.4	8°09.6	1.2 - 0.7	7.2 - 4.1	13.2 - 7.6	12	8°48.0	8°49.4	8°23.9	1.2 - 0.7	7.2 - 4.3	13.2 - 7.8
13	8°18.3	8°19.6	7°55.6	1.3 - 0.7	7.3 - 4.1	13.3 - 7.4	13	8°33.3	8°34.7	8°09.9	1.3 - 0.7	7.3 - 4.2	13.3 - 7.6	13	8°48.3	8°49.7	8°24.2	1.3 - 0.8	7.3 - 4.3	13.3 - 7.9
14	8°18.5	8°19.9	7°55.8	1.4 - 0.8	7.4 - 4.1	13.4 - 7.5	14	8°33.5	8°34.9	8°10.1	1.4 - 0.8	7.4 - 4.3	13.4 - 7.7	14	8°48.5	8°49.9	8°24.4	1.4 - 0.8	7.4 - 4.4	13.4 - 7.9
15	8°18.8	8°20.1	7°56.0	1.5 - 0.8	7.5 - 4.2	13.5 - 7.5	15	8°33.8	8°35.2	8°10.3	1.5 - 0.9	7.5 - 4.3	13.5 - 7.8	15	8°48.8	8°50.2	8°24.7	1.5 - 0.9	7.5 - 4.4	13.5 - 8.0
16	8°19.0	8°20.4	7°56.3	1.6 - 0.9	7.6 - 4.2	13.6 - 7.6	16	8°34.0	8°35.4	8°10.6	1.6 - 0.9	7.6 - 4.4	13.6 - 7.8	16	8°49.0	8°50.4	8°24.9	1.6 - 0.9	7.6 - 4.5	13.6 - 8.0
17	8°19.2	8°20.6	7°56.5	1.7 - 0.9	7.7 - 4.3	13.7 - 7.6	17	8°34.2	8°35.7	8°10.8	1.7 - 1.0	7.7 - 4.4	13.7 - 7.9	17	8°49.2	8°50.7	8°25.1	1.7 - 1.0	7.7 - 4.6	13.7 - 8.1
18	8°19.5	8°20.9	7°56.7	1.8 - 1.0	7.8 - 4.4	13.8 - 7.7	18	8°34.5	8°35.9	8°11.1	1.8 - 1.0	7.8 - 4.5	13.8 - 7.9	18	8°49.5	8°50.9	8°25.4	1.8 - 1.1	7.8 - 4.6	13.8 - 8.2
19	8°19.8	8°21.1	7°57.0	1.9 - 1.1	7.9 - 4.4	13.9 - 7.8	19	8°34.8	8°36.2	8°11.3	1.9 - 1.1	7.9 - 4.5	13.9 - 8.0	19	8°49.8	8°51.2	8°25.6	1.9 - 1.1	7.9 - 4.7	13.9 - 8.2
20	8°20.0	8°21.4	7°57.2	2.0 - 1.1	8.0 - 4.5	14.0 - 7.8	20	8°35.0	8°36.4	8°11.5	2.0 - 1.1	8.0 - 4.6	14.0 - 8.0	20	8°50.0	8°51.4	8°25.9	2.0 - 1.2	8.0 - 4.7	14.0 - 8.3
21	8°20.3	8°21.6	7°57.5	2.1 - 1.2	8.1 - 4.5	14.1 - 7.9	21	8°35.3	8°36.7	8°11.8	2.1 - 1.2	8.1 - 4.7	14.1 - 8.1	21	8°50.3	8°51.7	8°26.1	2.1 - 1.2	8.1 - 4.8	14.1 - 8.3
22	8°20.5	8°21.9	7°57.7	2.2 - 1.2	8.2 - 4.6	14.2 - 7.9	22	8°35.5	8°36.9	8°12.0	2.2 - 1.3	8.2 - 4.7	14.2 - 8.2	22	8°50.5	8°52.0	8°26.3	2.2 - 1.3	8.2 - 4.9	14.2 - 8.4
23	8°20.7	8°22.1	7°57.9	2.3 - 1.3	8.3 - 4.6	14.3 - 8.0	23	8°35.7	8°37.2	8°12.3	2.3 - 1.3	8.3 - 4.8	14.3 - 8.2	23	8°50.7	8°52.2	8°26.6	2.3 - 1.4	8.3 - 4.9	14.3 - 8.5
24	8°21.0	8°22.4	7°58.2	2.4 - 1.3	8.4 - 4.7	14.4 - 8.0	24	8°36.0	8°37.4	8°12.5	2.4 - 1.4	8.4 - 4.8	14.4 - 8.3	24	8°51.0	8°52.5	8°26.8	2.4 - 1.4	8.4 - 5.0	14.4 - 8.5
25	8°21.2	8°22.6	7°58.4	2.5 - 1.4	8.5 - 4.7	14.5 - 8.1	25	8°36.2	8°37.7	8°12.7	2.5 - 1.4	8.5 - 4.9	14.5 - 8.3	25	8°51.2	8°52.7	8°27.0	2.5 - 1.5	8.5 - 5.0	14.5 - 8.6
26	8°21.5	8°22.9	7°58.7	2.6 - 1.5	8.6 - 4.8	14.6 - 8.2	26	8°36.5	8°37.9	8°13.0	2.6 - 1.5	8.6 - 4.9	14.6 - 8.4	26	8°51.5	8°53.0	8°27.3	2.6 - 1.5	8.6 - 5.1	14.6 - 8.6
27	8°21.8	8°23.1	7°58.9	2.7 - 1.5	8.7 - 4.9	14.7 - 8.2	27	8°36.8	8°38.2	8°13.2	2.7 - 1.6	8.7 - 5.0	14.7 - 8.5	27	8°51.8	8°53.2	8°27.5	2.7 - 1.6	8.7 - 5.1	14.7 - 8.7
28	8°22.0	8°23.4	7°59.1	2.8 - 1.6	8.8 - 4.9	14.8 - 8.3	28	8°37.0	8°38.4	8°13.4	2.8 - 1.6	8.8 - 5.1	14.8 - 8.5	28	8°52.0	8°53.5	8°27.8	2.8 - 1.7	8.8 - 5.2	14.8 - 8.8
29	8°22.3	8°23.6	7°59.4	2.9 - 1.6	8.9 - 5.0	14.9 - 8.3	29	8°37.3	8°38.7	8°13.7	2.9 - 1.7	8.9 - 5.1	14.9 - 8.6	29	8°52.3	8°53.7	8°28.0	2.9 - 1.7	8.9 - 5.3	14.9 - 8.8
30	8°22.5	8°23.9	7°59.6	3.0 - 1.7	9.0 - 5.0	15.0 - 8.4	30	8°37.5	8°38.9	8°13.9	3.0 - 1.7	9.0 - 5.2	15.0 - 8.6	30	8°52.5	8°54.0	8°28.2	3.0 - 1.8	9.0 - 5.3	15.0 - 8.9
31	8°22.7	8°24.1	7°59.8	3.1 - 1.7	9.1 - 5.1	15.1 - 8.4	31	8°37.7	8°39.2	8°14.2	3.1 - 1.8	9.1 - 5.2	15.1 - 8.7	31	8°52.7	8°54.2	8°28.5	3.1 - 1.8	9.1 - 5.4	15.1 - 8.9
32	8°23.0	8°24.4	8°00.1	3.2 - 1.8	9.2 - 5.1	15.2 - 8.5	32	8°38.0	8°39.4	8°14.4	3.2 - 1.8	9.2 - 5.3	15.2 - 8.7	32	8°53.0	8°54.5	8°28.7	3.2 - 1.9	9.2 - 5.4	15.2 - 9.0
33	8°23.2	8°24.6	8°00.3	3.3 - 1.8	9.3 - 5.2	15.3 - 8.5	33	8°38.2	8°39.7	8°14.6	3.3 - 1.9	9.3 - 5.3	15.3 - 8.8	33	8°53.2	8°54.7	8°29.0	3.3 - 2.0	9.3 - 5.5	15.3 - 9.1
34	8°23.5	8°24.9	8°00.6	3.4 - 1.9	9.4 - 5.2	15.4 - 8.6	34	8°38.5	8°39.9	8°14.9	3.4 - 2.0	9.4 - 5.4	15.4 - 8.9	34	8°53.5	8°55.0	8°29.2	3.4 - 2.0	9.4 - 5.6	15.4 - 9.1
35	8°23.8	8°25.1	8°00.8	3.5 - 2.0	9.5 - 5.3	15.5 - 8.7	35	8°38.8	8°40.2	8°15.1	3.5 - 2.0	9.5 - 5.5	15.5 - 8.9	35	8°53.8	8°55.2	8°29.4	3.5 - 2.1	9.5 - 5.6	15.5 - 9.2
36	8°24.0	8°25.4	8°01.0	3.6 - 2.0	9.6 - 5.4	15.6 - 8.7	36	8°39.0	8°40.4	8°15.4	3.6 - 2.1	9.6 - 5.5	15.6 - 9.0	36	8°54.0	8°55.5	8°29.7	3.6 - 2.1	9.6 - 5.7	15.6 - 9.2
37	8°24.3	8°25.6	8°01.3	3.7 - 2.1	9.7 - 5.4	15.7 - 8.8	37	8°39.3	8°40.7	8°15.6	3.7 - 2.1	9.7 - 5.6	15.7 - 9.0	37	8°54.3	8°55.7	8°29.9	3.7 - 2.2	9.7 - 5.7	15.7 - 9.3
38	8°24.5	8°25.9	8°01.5	3.8 - 2.1	9.8 - 5.5	15.8 - 8.8	38	8°39.5	8°40.9	8°15.8	3.8 - 2.2	9.8 - 5.6	15.8 - 9.1	38	8°54.5	8°56.0	8°30.2	3.8 - 2.2	9.8 - 5.8	15.8 - 9.3
39	8°24.7	8°26.1	8°01.8	3.9 - 2.2	9.9 - 5.5	15.9 - 8.9	39	8°39.7	8°41.2	8°16.1	3.9 - 2.2	9.9 - 5.7	15.9 - 9.1	39	8°54.7	8°56.2	8°30.4	3.9 - 2.3	9.9 - 5.9	15.9 - 9.4
40	8°25.0	8°26.4	8°02.0	4.0 - 2.2	10.0 - 5.6	16.0 - 8.9	40	8°40.0	8°41.4	8°16.3	4.0 - 2.3	10.0 - 5.8	16.0 - 9.2	40	8°55.0	8°56.5	8°30.6	4.0 - 2.4	10.0 - 5.9	16.0 - 9.5
41	8°25.2	8°26.6	8°02.2	4.1 - 2.3	10.1 - 5.6	16.1 - 9.0	41	8°40.2	8°41.7	8°16.5	4.1 - 2.4	10.1 - 5.8	16.1 - 9.3	41	8°55.2	8°56.7	8°30.9	4.1 - 2.4	10.1 - 6.0	16.1 - 9.5
42	8°25.5	8°26.9	8°02.5	4.2 - 2.3	10.2 - 5.7	16.2 - 9.0	42	8°40.5	8°41.9	8°16.8	4.2 - 2.4	10.2 - 5.9	16.2 - 9.3	42	8°55.5	8°57.0	8°31.1	4.2 - 2.5	10.2 - 6.0	16.2 - 9.6
43	8°25.8	8°27.1	8°02.7	4.3 - 2.4	10.3 - 5.8	16.3 - 9.1	43	8°40.8	8°42.2	8°17.0	4.3 - 2.5	10.3 - 5.9	16.3 - 9.4	43	8°55.8	8°57.2	8°31.3	4.3 - 2.5	10.3 - 6.1	16.3 - 9.6
44	8°26.0	8°27.4	8°02.9	4.4 - 2.5	10.4 - 5.8	16.4 - 9.2	44	8°41.0	8°42.4	8°17.3	4.4 - 2.5	10.4 - 6.0	16.4 - 9.4	44	8°56.0	8°57.5	8°31.6	4.4 - 2.6	10.4 - 6.2	16.4 - 9.7
45	8°26.3	8°27.6	8°03.2	4.5 - 2.5	10.5 - 5.9	16.5 - 9.2	45	8°41.3	8°42.7	8°17.5	4.5 - 2.6	10.5 - 6.0	16.5 - 9.5	45	8°56.3	8°57.7	8°31.8	4.5 - 2.7	10.5 - 6.2	16.5 - 9.8
46	8°26.5	8°27.9	8°03.4	4.6 - 2.6	10.6 - 5.9	16.6 - 9.3	46	8°41.5	8°42.9	8°17.7	4.6 - 2.6	10.6 - 6.1	16.6 - 9.5	46	8°56.5	8°58.0	8°32.1	4.6 - 2.7	10.6 - 6.3	16.6 - 9.8
47	8°26.7	8°28.1	8°03.7	4.7 - 2.6	10.7 - 6.0	16.7 - 9.3	47	8°41.7	8°43.2	8°18.0	4.7 - 2.7	10.7 - 6.2	16.7 - 9.6	47	8°56.7	8°58.2	8°32.3	4.7 - 2.8	10.7 - 6.3	16.7 - 9.9
48	8°27.0	8°28.4	8°03.9	4.8 - 2.7	10.8 - 6.0	16.8 - 9.4	48	8°42.0	8°43.4	8°18.2	4.8 - 2.8	10.8 - 6.2	16.8 - 9.7	48	8°57.0	8°58.5	8°32.5	4.8 - 2.8	10.8 - 6.4	16.8 - 9.9
49	8°27.3	8°28.																		

Increments and Corrections

m 36	Sun Plan.	Aries	Moon	v and d corr			m 37	Sun Plan.	Aries	Moon	v and d corr			m 38	Sun Plan.	Aries	Moon	v and d corr		
0	9°00.0	9°01.5	8°35.4	0.0 - 0.0	6.0 - 3.6	12.0 - 7.3	0	9°15.0	9°16.5	8°49.7	0.0 - 0.0	6.0 - 3.8	12.0 - 7.5	0	9°30.0	9°31.6	9°04.0	0.0 - 0.0	6.0 - 3.9	12.0 - 7.7
1	9°00.2	9°01.7	8°35.6	0.1 - 0.1	6.1 - 3.7	12.1 - 7.4	1	9°15.2	9°16.8	8°50.0	0.1 - 0.1	6.1 - 3.8	12.1 - 7.6	1	9°30.2	9°31.8	9°04.3	0.1 - 0.1	6.1 - 3.9	12.1 - 7.8
2	9°00.5	9°02.0	8°35.9	0.2 - 0.1	6.2 - 3.8	12.2 - 7.4	2	9°15.5	9°17.0	8°50.2	0.2 - 0.1	6.2 - 3.9	12.2 - 7.6	2	9°30.5	9°32.1	9°04.5	0.2 - 0.1	6.2 - 4.0	12.2 - 7.8
3	9°00.7	9°02.2	8°36.1	0.3 - 0.2	6.3 - 3.8	12.3 - 7.5	3	9°15.7	9°17.3	8°50.4	0.3 - 0.2	6.3 - 3.9	12.3 - 7.7	3	9°30.7	9°32.3	9°04.7	0.3 - 0.2	6.3 - 4.0	12.3 - 7.9
4	9°01.0	9°02.5	8°36.4	0.4 - 0.2	6.4 - 3.9	12.4 - 7.5	4	9°16.0	9°17.5	8°50.7	0.4 - 0.3	6.4 - 4.0	12.4 - 7.8	4	9°31.0	9°32.6	9°05.0	0.4 - 0.3	6.4 - 4.1	12.4 - 8.0
5	9°01.3	9°02.7	8°36.6	0.5 - 0.3	6.5 - 4.0	12.5 - 7.6	5	9°16.3	9°17.8	8°50.9	0.5 - 0.3	6.5 - 4.1	12.5 - 7.8	5	9°31.3	9°32.8	9°05.2	0.5 - 0.3	6.5 - 4.2	12.5 - 8.0
6	9°01.5	9°03.0	8°36.8	0.6 - 0.4	6.6 - 4.0	12.6 - 7.7	6	9°16.5	9°18.0	8°51.1	0.6 - 0.4	6.6 - 4.1	12.6 - 7.9	6	9°31.5	9°33.1	9°05.5	0.6 - 0.4	6.6 - 4.2	12.6 - 8.1
7	9°01.8	9°03.2	8°37.1	0.7 - 0.4	6.7 - 4.1	12.7 - 7.7	7	9°16.8	9°18.3	8°51.4	0.7 - 0.4	6.7 - 4.2	12.7 - 7.9	7	9°31.8	9°33.3	9°05.7	0.7 - 0.4	6.7 - 4.3	12.7 - 8.1
8	9°02.0	9°03.5	8°37.3	0.8 - 0.5	6.8 - 4.1	12.8 - 7.8	8	9°17.0	9°18.5	8°51.6	0.8 - 0.5	6.8 - 4.3	12.8 - 8.0	8	9°32.0	9°33.6	9°05.9	0.8 - 0.5	6.8 - 4.4	12.8 - 8.2
9	9°02.2	9°03.7	8°37.5	0.9 - 0.5	6.9 - 4.2	12.9 - 7.8	9	9°17.2	9°18.8	8°51.9	0.9 - 0.6	6.9 - 4.3	12.9 - 8.1	9	9°32.2	9°33.8	9°06.2	0.9 - 0.6	6.9 - 4.4	12.9 - 8.3
10	9°02.5	9°04.0	8°37.8	1.0 - 0.6	7.0 - 4.3	13.0 - 7.9	10	9°17.5	9°19.0	8°52.1	1.0 - 0.6	7.0 - 4.4	13.0 - 8.1	10	9°32.5	9°34.1	9°06.4	1.0 - 0.6	7.0 - 4.5	13.0 - 8.3
11	9°02.7	9°04.2	8°38.0	1.1 - 0.7	7.1 - 4.3	13.1 - 8.0	11	9°17.7	9°19.3	8°52.3	1.1 - 0.7	7.1 - 4.4	13.1 - 8.2	11	9°32.7	9°34.3	9°06.7	1.1 - 0.7	7.1 - 4.6	13.1 - 8.4
12	9°03.0	9°04.5	8°38.3	1.2 - 0.7	7.2 - 4.4	13.2 - 8.0	12	9°18.0	9°19.5	8°52.6	1.2 - 0.8	7.2 - 4.5	13.2 - 8.3	12	9°33.0	9°34.6	9°06.9	1.2 - 0.8	7.2 - 4.6	13.2 - 8.5
13	9°03.3	9°04.7	8°38.5	1.3 - 0.8	7.3 - 4.4	13.3 - 8.1	13	9°18.3	9°19.8	8°52.8	1.3 - 0.8	7.3 - 4.6	13.3 - 8.3	13	9°33.3	9°34.8	9°07.1	1.3 - 0.8	7.3 - 4.7	13.3 - 8.5
14	9°03.5	9°05.0	8°38.7	1.4 - 0.9	7.4 - 4.5	13.4 - 8.2	14	9°18.5	9°20.0	8°53.1	1.4 - 0.9	7.4 - 4.6	13.4 - 8.4	14	9°33.5	9°35.1	9°07.4	1.4 - 0.9	7.4 - 4.7	13.4 - 8.6
15	9°03.8	9°05.2	8°39.0	1.5 - 0.9	7.5 - 4.6	13.5 - 8.2	15	9°18.8	9°20.3	8°53.3	1.5 - 0.9	7.5 - 4.7	13.5 - 8.4	15	9°33.8	9°35.3	9°07.6	1.5 - 1.0	7.5 - 4.8	13.5 - 8.7
16	9°04.0	9°05.5	8°39.2	1.6 - 1.0	7.6 - 4.6	13.6 - 8.3	16	9°19.0	9°20.5	8°53.5	1.6 - 1.0	7.6 - 4.8	13.6 - 8.5	16	9°34.0	9°35.6	9°07.9	1.6 - 1.0	7.6 - 4.9	13.6 - 8.7
17	9°04.2	9°05.7	8°39.5	1.7 - 1.0	7.7 - 4.7	13.7 - 8.3	17	9°19.2	9°20.8	8°53.8	1.7 - 1.1	7.7 - 4.8	13.7 - 8.6	17	9°34.2	9°35.8	9°08.1	1.7 - 1.1	7.7 - 4.9	13.7 - 8.8
18	9°04.5	9°06.0	8°39.7	1.8 - 1.1	7.8 - 4.7	13.8 - 8.4	18	9°19.5	9°21.0	8°54.0	1.8 - 1.1	7.8 - 4.9	13.8 - 8.6	18	9°34.5	9°36.1	9°08.3	1.8 - 1.2	7.8 - 5.0	13.8 - 8.9
19	9°04.8	9°06.2	8°39.9	1.9 - 1.2	7.9 - 4.8	13.9 - 8.5	19	9°19.8	9°21.3	8°54.3	1.9 - 1.2	7.9 - 4.9	13.9 - 8.7	19	9°34.8	9°36.3	9°08.6	1.9 - 1.2	7.9 - 5.1	13.9 - 8.9
20	9°05.0	9°06.5	8°40.2	2.0 - 1.2	8.0 - 4.9	14.0 - 8.5	20	9°20.0	9°21.5	8°54.5	2.0 - 1.3	8.0 - 5.0	14.0 - 8.8	20	9°35.0	9°36.6	9°08.8	2.0 - 1.3	8.0 - 5.1	14.0 - 9.0
21	9°05.3	9°06.7	8°40.4	2.1 - 1.3	8.1 - 4.9	14.1 - 8.6	21	9°20.3	9°21.8	8°54.7	2.1 - 1.3	8.1 - 5.1	14.1 - 8.8	21	9°35.3	9°36.8	9°09.0	2.1 - 1.3	8.1 - 5.2	14.1 - 9.1
22	9°05.5	9°07.0	8°40.6	2.2 - 1.3	8.2 - 5.0	14.2 - 8.6	22	9°20.5	9°22.0	8°55.0	2.2 - 1.4	8.2 - 5.1	14.2 - 8.9	22	9°35.5	9°37.1	9°09.3	2.2 - 1.4	8.2 - 5.3	14.2 - 9.0
23	9°05.7	9°07.2	8°40.9	2.3 - 1.4	8.3 - 5.0	14.3 - 8.7	23	9°20.7	9°22.3	8°55.2	2.3 - 1.4	8.3 - 5.2	14.3 - 8.9	23	9°35.7	9°37.3	9°09.5	2.3 - 1.5	8.3 - 5.3	14.3 - 9.2
24	9°06.0	9°07.5	8°41.1	2.4 - 1.5	8.4 - 5.1	14.4 - 8.8	24	9°21.0	9°22.5	8°55.4	2.4 - 1.5	8.4 - 5.3	14.4 - 9.0	24	9°36.0	9°37.6	9°09.8	2.4 - 1.5	8.4 - 5.4	14.4 - 9.2
25	9°06.2	9°07.7	8°41.4	2.5 - 1.5	8.5 - 5.2	14.5 - 8.8	25	9°21.2	9°22.8	8°55.7	2.5 - 1.6	8.5 - 5.3	14.5 - 9.1	25	9°36.2	9°37.8	9°10.0	2.5 - 1.6	8.5 - 5.5	14.5 - 9.3
26	9°06.5	9°08.0	8°41.6	2.6 - 1.6	8.6 - 5.2	14.6 - 8.9	26	9°21.5	9°23.0	8°55.9	2.6 - 1.6	8.6 - 5.4	14.6 - 9.1	26	9°36.5	9°38.1	9°10.2	2.6 - 1.7	8.6 - 5.5	14.6 - 9.4
27	9°06.8	9°08.2	8°41.8	2.7 - 1.6	8.7 - 5.3	14.7 - 8.9	27	9°21.8	9°23.3	8°56.2	2.7 - 1.7	8.7 - 5.4	14.7 - 9.2	27	9°36.8	9°38.3	9°10.5	2.7 - 1.7	8.7 - 5.6	14.7 - 9.4
28	9°07.0	9°08.5	8°42.1	2.8 - 1.7	8.8 - 5.4	14.8 - 9.0	28	9°22.0	9°23.5	8°56.4	2.8 - 1.8	8.8 - 5.5	14.8 - 9.3	28	9°37.0	9°38.6	9°10.7	2.8 - 1.8	8.8 - 5.6	14.8 - 9.5
29	9°07.3	9°08.7	8°42.3	2.9 - 1.8	8.9 - 5.4	14.9 - 9.1	29	9°22.3	9°23.8	8°56.6	2.9 - 1.8	8.9 - 5.6	14.9 - 9.3	29	9°37.3	9°38.8	9°11.0	2.9 - 1.9	8.9 - 5.7	14.9 - 9.6
30	9°07.5	9°09.0	8°42.6	3.0 - 1.8	9.0 - 5.5	15.0 - 9.1	30	9°22.5	9°24.0	8°56.9	3.0 - 1.9	9.0 - 5.6	15.0 - 9.4	30	9°37.5	9°39.1	9°11.2	3.0 - 1.9	9.0 - 5.8	15.0 - 9.6
31	9°07.7	9°09.2	8°42.8	3.1 - 1.9	9.1 - 5.5	15.1 - 9.2	31	9°22.7	9°24.3	8°57.1	3.1 - 1.9	9.1 - 5.7	15.1 - 9.4	31	9°37.7	9°39.3	9°11.4	3.1 - 2.0	9.1 - 5.8	15.1 - 9.7
32	9°08.0	9°09.5	8°43.0	3.2 - 1.9	9.2 - 5.6	15.2 - 9.2	32	9°23.0	9°24.5	8°57.4	3.2 - 2.0	9.2 - 5.8	15.2 - 9.5	32	9°38.0	9°39.6	9°11.7	3.2 - 2.1	9.2 - 5.9	15.2 - 9.8
33	9°08.2	9°09.7	8°43.3	3.3 - 2.0	9.3 - 5.7	15.3 - 9.3	33	9°23.2	9°24.8	8°57.6	3.3 - 2.1	9.3 - 5.8	15.3 - 9.6	33	9°38.2	9°39.8	9°11.9	3.3 - 2.1	9.3 - 6.0	15.3 - 9.8
34	9°08.5	9°10.0	8°43.5	3.4 - 2.1	9.4 - 5.7	15.4 - 9.4	34	9°23.5	9°25.0	8°57.8	3.4 - 2.1	9.4 - 5.9	15.4 - 9.6	34	9°38.5	9°40.1	9°12.1	3.4 - 2.2	9.4 - 6.0	15.4 - 9.9
35	9°08.8	9°10.2	8°43.8	3.5 - 2.1	9.5 - 5.8	15.5 - 9.4	35	9°23.8	9°25.3	8°58.1	3.5 - 2.2	9.5 - 5.9	15.5 - 9.7	35	9°38.8	9°40.3	9°12.4	3.5 - 2.2	9.5 - 6.1	15.5 - 9.9
36	9°09.0	9°10.5	8°44.0	3.6 - 2.2	9.6 - 5.8	15.6 - 9.5	36	9°24.0	9°25.5	8°58.3	3.6 - 2.3	9.6 - 6.0	15.6 - 9.8	36	9°39.0	9°40.6	9°12.6	3.6 - 2.3	9.6 - 6.2	15.6 - 10.0
37	9°09.3	9°10.8	8°44.2	3.7 - 2.3	9.7 - 5.9	15.7 - 9.6	37	9°24.3	9°25.8	8°58.5	3.7 - 2.3	9.7 - 6.1	15.7 - 9.8	37	9°39.3	9°40.8	9°12.9	3.7 - 2.4	9.7 - 6.2	15.7 - 10.1
38	9°09.5	9°11.0	8°44.5	3.8 - 2.3	9.8 - 6.0	15.8 - 9.6	38	9°24.5	9°26.0	8°58.8	3.8 - 2.4	9.8 - 6.1	15.8 - 9.9	38	9°39.5	9°41.1	9°13.1	3.8 - 2.4	9.8 - 6.3	15.8 - 10.1
39	9°09.7	9°11.3	8°44.7	3.9 - 2.4	9.9 - 6.0	15.9 - 9.7	39	9°24.7	9°26.3	8°59.0	3.9 - 2.4	9.9 - 6.2	15.9 - 9.9	39	9°39.7	9°41.3	9°13.3	3.9 - 2.5	9.9 - 6.4	15.9 - 10.2
40	9°10.0	9°11.5	8°44.9	4.0 - 2.4	10.0 - 6.1	16.0 - 9.7	40	9°25.0	9°26.5	8°59.3	4.0 - 2.5	10.0 - 6.3	16.0 - 10.0	40	9°40.0	9°41.6	9°13.6	4.0 - 2.6	10.0 - 6.4	16.0 - 10.3
41	9°10.2	9°11.8	8°45.2	4.1 - 2.5	10.1 - 6.1	16.1 - 9.8	41	9°25.2	9°26.8	8°59.5	4.1 - 2.6	10.1 - 6.3	16.1 - 10.1	41	9°40.2	9°41.8	9°13.8	4.1 - 2.6	10.1 - 6.5	16.1 - 10.3
42	9°10.5	9°12.0	8°45.4	4.2 - 2.6	10.2 - 6.2	16.2 - 9.9	42	9°25.5	9°27.0	8°59.7	4.2 - 2.6	10.2 - 6.4	16.2 - 10.1	42	9°40.5	9°42.1	9°14.1	4.2 - 2.7	10.2 - 6.5	16.2 - 10.4
43	9°10.8	9°12.3	8°45.7	4.3 - 2.6	10.3 - 6.3	16.3 - 9.9	43	9°25.8	9°27.3	9°00.0	4.3 - 2.7	10.3 - 6.4	16.3 - 10.2	43	9°40.8	9°42.3	9°14.3	4.3 - 2.8	10.3 - 6.6	16.3 - 10.5
44	9°11.0	9°12.5	8°45.9	4.4 - 2.7	10.4 - 6.3	16.4 - 10.0	44	9°26.0	9°27.5	9°00.2	4.4 - 2.8	10.4 - 6.5	16.4 - 10.3	44	9°41.0	9°42.6	9°14.5	4.4 - 2.8	10.4 - 6.7	16.4 - 10.5
45	9°11.3	9°12.8	8°46.1	4.5 - 2.7	10.5 - 6.4	16.5 - 10.0	45	9°26.3	9°27.8	9°00.5	4.5 - 2.8	10.5 - 6.6	16.5 - 10.3	45	9°41.3	9°42.8	9°14.8	4.5 - 2.9	10.5 - 6.7	16.5 - 10.6
46	9°11.5	9°13.0	8°46.4	4.6 - 2.8	10.6 - 6.4	16.6 - 10.1	46	9°26.5	9°28.0	9°00.7	4.6 - 2.9	10.6 - 6.6	16.6 - 10.4	46	9°41.5	9°43.1	9°15.0	4.6 - 3.0	10.6 - 6.8	16.6 - 10.7
47	9°11.7	9°13.3	8°46.6	4.7 - 2.9	10.7 - 6.5	16.7 - 10.2	47	9°26.7	9°28.3	9°00.9	4.7 - 2.9	10.7 - 6.7	16.7 - 10.4	47	9°41.7	9°43.3	9°15.2	4.7 - 3.0	10.7 - 6.9	16.7 - 10.7
48	9°12.0	9°13.5	8°46.9	4.8 - 2.9	10.8 - 6.6	16.8 - 10.2	48	9°27.0	9°28.5	9°01.2	4.8 - 3.0	10.8 - 6.8	16.8 - 10.5	48	9°42.0	9°43.6	9°15.5	4.8 - 3.1	10.8 - 6.9	16.8 - 10.8

Increments and Corrections

m 39	Sun Plan.	Aries	Moon	v and d corr			m 40	Sun Plan.	Aries	Moon	v and d corr			m 41	Sun Plan.	Aries	Moon	v and d corr		
0	9°45.0	9°46.6	9°18.4	0.0 - 0.0	6.0 - 4.0	12.0 - 7.9	0	10°00.0	10°01.6	9°32.7	0.0 - 0.0	6.0 - 4.1	12.0 - 8.1	0	10°15.0	10°16.7	9°47.0	0.0 - 0.0	6.0 - 4.2	12.0 - 8.3
1	9°45.2	9°46.8	9°18.6	0.1 - 0.1	6.1 - 4.0	12.1 - 8.0	1	10°00.2	10°01.9	9°32.9	0.1 - 0.1	6.1 - 4.1	12.1 - 8.2	1	10°15.2	10°16.9	9°47.2	0.1 - 0.1	6.1 - 4.2	12.1 - 8.4
2	9°45.5	9°47.1	9°18.8	0.2 - 0.1	6.2 - 4.1	12.2 - 8.0	2	10°00.5	10°02.1	9°33.1	0.2 - 0.1	6.2 - 4.2	12.2 - 8.2	2	10°15.5	10°17.2	9°47.5	0.2 - 0.1	6.2 - 4.3	12.2 - 8.4
3	9°45.7	9°47.4	9°19.1	0.3 - 0.2	6.3 - 4.1	12.3 - 8.1	3	10°00.7	10°02.4	9°33.4	0.3 - 0.2	6.3 - 4.3	12.3 - 8.3	3	10°15.7	10°17.4	9°47.7	0.3 - 0.2	6.3 - 4.4	12.3 - 8.5
4	9°46.0	9°47.6	9°19.3	0.4 - 0.3	6.4 - 4.2	12.4 - 8.2	4	10°01.0	10°02.6	9°33.6	0.4 - 0.3	6.4 - 4.3	12.4 - 8.4	4	10°16.0	10°17.7	9°47.9	0.4 - 0.3	6.4 - 4.4	12.4 - 8.6
5	9°46.3	9°47.9	9°19.5	0.5 - 0.3	6.5 - 4.3	12.5 - 8.2	5	10°01.3	10°02.9	9°33.9	0.5 - 0.3	6.5 - 4.4	12.5 - 8.4	5	10°16.3	10°17.9	9°48.2	0.5 - 0.3	6.5 - 4.5	12.5 - 8.6
6	9°46.5	9°48.1	9°19.8	0.6 - 0.4	6.6 - 4.3	12.6 - 8.3	6	10°01.5	10°03.1	9°34.1	0.6 - 0.4	6.6 - 4.5	12.6 - 8.5	6	10°16.5	10°18.2	9°48.4	0.6 - 0.4	6.6 - 4.6	12.6 - 8.7
7	9°46.8	9°48.4	9°20.0	0.7 - 0.5	6.7 - 4.4	12.7 - 8.4	7	10°01.8	10°03.4	9°34.3	0.7 - 0.5	6.7 - 4.5	12.7 - 8.6	7	10°16.8	10°18.4	9°48.7	0.7 - 0.5	6.7 - 4.6	12.7 - 8.8
8	9°47.0	9°48.6	9°20.3	0.8 - 0.5	6.8 - 4.5	12.8 - 8.4	8	10°02.0	10°03.6	9°34.6	0.8 - 0.5	6.8 - 4.6	12.8 - 8.6	8	10°17.0	10°18.7	9°48.9	0.8 - 0.6	6.8 - 4.7	12.8 - 8.9
9	9°47.2	9°48.9	9°20.5	0.9 - 0.6	6.9 - 4.5	12.9 - 8.5	9	10°02.2	10°03.9	9°34.8	0.9 - 0.6	6.9 - 4.7	12.9 - 8.7	9	10°17.2	10°18.9	9°49.1	0.9 - 0.6	6.9 - 4.8	12.9 - 8.9
10	9°47.5	9°49.1	9°20.7	1.0 - 0.7	7.0 - 4.6	13.0 - 8.6	10	10°02.5	10°04.1	9°35.1	1.0 - 0.7	7.0 - 4.7	13.0 - 8.8	10	10°17.5	10°19.2	9°49.4	1.0 - 0.7	7.0 - 4.8	13.0 - 9.0
11	9°47.7	9°49.4	9°21.0	1.1 - 0.7	7.1 - 4.7	13.1 - 8.6	11	10°02.7	10°04.4	9°35.3	1.1 - 0.7	7.1 - 4.8	13.1 - 8.8	11	10°17.7	10°19.4	9°49.6	1.1 - 0.8	7.1 - 4.9	13.1 - 9.1
12	9°48.0	9°49.6	9°21.2	1.2 - 0.8	7.2 - 4.7	13.2 - 8.7	12	10°03.0	10°04.6	9°35.5	1.2 - 0.8	7.2 - 4.9	13.2 - 8.9	12	10°18.0	10°19.7	9°49.8	1.2 - 0.8	7.2 - 5.0	13.2 - 9.1
13	9°48.3	9°49.9	9°21.5	1.3 - 0.9	7.3 - 4.8	13.3 - 8.8	13	10°03.3	10°04.9	9°35.8	1.3 - 0.9	7.3 - 4.9	13.3 - 9.0	13	10°18.3	10°19.9	9°50.1	1.3 - 0.9	7.3 - 5.0	13.3 - 9.2
14	9°48.5	9°50.1	9°21.7	1.4 - 0.9	7.4 - 4.9	13.4 - 8.8	14	10°03.5	10°05.1	9°36.0	1.4 - 0.9	7.4 - 5.0	13.4 - 9.0	14	10°18.5	10°20.2	9°50.3	1.4 - 1.0	7.4 - 5.1	13.4 - 9.3
15	9°48.8	9°50.4	9°21.9	1.5 - 1.0	7.5 - 4.9	13.5 - 8.9	15	10°03.8	10°05.4	9°36.2	1.5 - 1.0	7.5 - 5.1	13.5 - 9.1	15	10°18.8	10°20.4	9°50.6	1.5 - 1.0	7.5 - 5.2	13.5 - 9.3
16	9°49.0	9°50.6	9°22.2	1.6 - 1.1	7.6 - 5.0	13.6 - 9.0	16	10°04.0	10°05.7	9°36.5	1.6 - 1.1	7.6 - 5.1	13.6 - 9.2	16	10°19.0	10°20.7	9°50.8	1.6 - 1.1	7.6 - 5.3	13.6 - 9.4
17	9°49.2	9°50.9	9°22.4	1.7 - 1.1	7.7 - 5.1	13.7 - 9.0	17	10°04.2	10°05.9	9°36.7	1.7 - 1.1	7.7 - 5.2	13.7 - 9.2	17	10°19.2	10°20.9	9°51.0	1.7 - 1.2	7.7 - 5.3	13.7 - 9.5
18	9°49.5	9°51.1	9°22.6	1.8 - 1.2	7.8 - 5.1	13.8 - 9.1	18	10°04.5	10°06.2	9°37.0	1.8 - 1.2	7.8 - 5.3	13.8 - 9.3	18	10°19.5	10°21.2	9°51.3	1.8 - 1.2	7.8 - 5.4	13.8 - 9.5
19	9°49.8	9°51.4	9°22.9	1.9 - 1.3	7.9 - 5.2	13.9 - 9.2	19	10°04.8	10°06.4	9°37.2	1.9 - 1.3	7.9 - 5.3	13.9 - 9.4	19	10°19.8	10°21.4	9°51.5	1.9 - 1.3	7.9 - 5.5	13.9 - 9.6
20	9°50.0	9°51.6	9°23.1	2.0 - 1.3	8.0 - 5.3	14.0 - 9.2	20	10°05.0	10°06.7	9°37.4	2.0 - 1.4	8.0 - 5.4	14.0 - 9.5	20	10°20.0	10°21.7	9°51.8	2.0 - 1.4	8.0 - 5.5	14.0 - 9.7
21	9°50.3	9°51.9	9°23.4	2.1 - 1.4	8.1 - 5.3	14.1 - 9.3	21	10°05.3	10°06.9	9°37.7	2.1 - 1.4	8.1 - 5.5	14.1 - 9.5	21	10°20.3	10°21.9	9°52.0	2.1 - 1.5	8.1 - 5.6	14.1 - 9.8
22	9°50.5	9°52.1	9°23.6	2.2 - 1.4	8.2 - 5.4	14.2 - 9.3	22	10°05.5	10°07.2	9°37.9	2.2 - 1.5	8.2 - 5.5	14.2 - 9.6	22	10°20.5	10°22.2	9°52.2	2.2 - 1.5	8.2 - 5.7	14.2 - 9.8
23	9°50.7	9°52.4	9°23.8	2.3 - 1.5	8.3 - 5.5	14.3 - 9.4	23	10°05.7	10°07.4	9°38.2	2.3 - 1.6	8.3 - 5.6	14.3 - 9.7	23	10°20.7	10°22.4	9°52.5	2.3 - 1.6	8.3 - 5.7	14.3 - 9.9
24	9°51.0	9°52.6	9°24.1	2.4 - 1.6	8.4 - 5.5	14.4 - 9.5	24	10°06.0	10°07.7	9°38.4	2.4 - 1.6	8.4 - 5.7	14.4 - 9.7	24	10°21.0	10°22.7	9°52.7	2.4 - 1.7	8.4 - 5.8	14.4 - 10.0
25	9°51.2	9°52.9	9°24.3	2.5 - 1.6	8.5 - 5.6	14.5 - 9.5	25	10°06.2	10°07.9	9°38.6	2.5 - 1.7	8.5 - 5.7	14.5 - 9.8	25	10°21.2	10°22.9	9°52.9	2.5 - 1.7	8.5 - 5.9	14.5 - 10.0
26	9°51.5	9°53.1	9°24.6	2.6 - 1.7	8.6 - 5.7	14.6 - 9.6	26	10°06.5	10°08.2	9°38.9	2.6 - 1.8	8.6 - 5.8	14.6 - 9.9	26	10°21.5	10°23.2	9°53.2	2.6 - 1.8	8.6 - 5.9	14.6 - 10.1
27	9°51.8	9°53.4	9°24.8	2.7 - 1.8	8.7 - 5.7	14.7 - 9.7	27	10°06.8	10°08.4	9°39.1	2.7 - 1.8	8.7 - 5.9	14.7 - 9.9	27	10°21.8	10°23.4	9°53.4	2.7 - 1.9	8.7 - 6.0	14.7 - 10.2
28	9°52.0	9°53.6	9°25.0	2.8 - 1.8	8.8 - 5.8	14.8 - 9.7	28	10°07.0	10°08.7	9°39.3	2.8 - 1.9	8.8 - 5.9	14.8 - 10.0	28	10°22.0	10°23.7	9°53.7	2.8 - 1.9	8.8 - 6.1	14.8 - 10.2
29	9°52.3	9°53.9	9°25.3	2.9 - 1.9	8.9 - 5.9	14.9 - 9.8	29	10°07.3	10°08.9	9°39.6	2.9 - 2.0	8.9 - 6.0	14.9 - 10.1	29	10°22.3	10°24.0	9°53.9	2.9 - 2.0	8.9 - 6.2	14.9 - 10.3
30	9°52.5	9°54.1	9°25.5	3.0 - 2.0	9.0 - 5.9	15.0 - 9.9	30	10°07.5	10°09.2	9°39.8	3.0 - 2.0	9.0 - 6.1	15.0 - 10.1	30	10°22.5	10°24.2	9°54.1	3.0 - 2.1	9.0 - 6.2	15.0 - 10.4
31	9°52.7	9°54.4	9°25.7	3.1 - 2.0	9.1 - 6.0	15.1 - 9.9	31	10°07.7	10°09.4	9°40.1	3.1 - 2.1	9.1 - 6.1	15.1 - 10.2	31	10°22.7	10°24.5	9°54.4	3.1 - 2.1	9.1 - 6.3	15.1 - 10.4
32	9°53.0	9°54.6	9°26.0	3.2 - 2.1	9.2 - 6.1	15.2 - 10.0	32	10°08.0	10°09.7	9°40.3	3.2 - 2.2	9.2 - 6.2	15.2 - 10.3	32	10°23.0	10°24.7	9°54.6	3.2 - 2.2	9.2 - 6.4	15.2 - 10.5
33	9°53.2	9°54.9	9°26.2	3.3 - 2.2	9.3 - 6.1	15.3 - 10.1	33	10°08.2	10°09.9	9°40.5	3.3 - 2.2	9.3 - 6.3	15.3 - 10.3	33	10°23.2	10°25.0	9°54.9	3.3 - 2.3	9.3 - 6.4	15.3 - 10.6
34	9°53.5	9°55.1	9°26.5	3.4 - 2.2	9.4 - 6.2	15.4 - 10.1	34	10°08.5	10°10.2	9°40.8	3.4 - 2.3	9.4 - 6.3	15.4 - 10.4	34	10°23.5	10°25.2	9°55.1	3.4 - 2.4	9.4 - 6.5	15.4 - 10.7
35	9°53.8	9°55.4	9°26.7	3.5 - 2.3	9.5 - 6.3	15.5 - 10.2	35	10°08.8	10°10.4	9°41.0	3.5 - 2.4	9.5 - 6.4	15.5 - 10.5	35	10°23.8	10°25.5	9°55.3	3.5 - 2.4	9.5 - 6.6	15.5 - 10.7
36	9°54.0	9°55.6	9°26.9	3.6 - 2.4	9.6 - 6.3	15.6 - 10.3	36	10°09.0	10°10.7	9°41.3	3.6 - 2.4	9.6 - 6.5	15.6 - 10.5	36	10°24.0	10°25.7	9°55.6	3.6 - 2.5	9.6 - 6.6	15.6 - 10.8
37	9°54.3	9°55.9	9°27.2	3.7 - 2.4	9.7 - 6.4	15.7 - 10.3	37	10°09.3	10°10.9	9°41.5	3.7 - 2.5	9.7 - 6.5	15.7 - 10.6	37	10°24.3	10°26.0	9°55.8	3.7 - 2.6	9.7 - 6.7	15.7 - 10.9
38	9°54.5	9°56.1	9°27.4	3.8 - 2.5	9.8 - 6.5	15.8 - 10.4	38	10°09.5	10°11.2	9°41.7	3.8 - 2.6	9.8 - 6.6	15.8 - 10.7	38	10°24.5	10°26.2	9°56.1	3.8 - 2.6	9.8 - 6.8	15.8 - 10.9
39	9°54.7	9°56.4	9°27.7	3.9 - 2.6	9.9 - 6.5	15.9 - 10.5	39	10°09.7	10°11.4	9°42.0	3.9 - 2.6	9.9 - 6.7	15.9 - 10.7	39	10°24.7	10°26.5	9°56.3	3.9 - 2.7	9.9 - 6.8	15.9 - 11.0
40	9°55.0	9°56.6	9°27.9	4.0 - 2.6	10.0 - 6.6	16.0 - 10.5	40	10°10.0	10°11.7	9°42.2	4.0 - 2.7	10.0 - 6.8	16.0 - 10.8	40	10°25.0	10°26.7	9°56.5	4.0 - 2.8	10.0 - 6.9	16.0 - 11.1
41	9°55.2	9°56.9	9°28.1	4.1 - 2.7	10.1 - 6.6	16.1 - 10.6	41	10°10.2	10°11.9	9°42.4	4.1 - 2.8	10.1 - 6.8	16.1 - 10.9	41	10°25.2	10°27.0	9°56.8	4.1 - 2.8	10.1 - 7.0	16.1 - 11.1
42	9°55.5	9°57.1	9°28.4	4.2 - 2.8	10.2 - 6.7	16.2 - 10.7	42	10°10.5	10°12.2	9°42.7	4.2 - 2.8	10.2 - 6.9	16.2 - 10.9	42	10°25.5	10°27.2	9°57.0	4.2 - 2.9	10.2 - 7.1	16.2 - 11.2
43	9°55.8	9°57.4	9°28.6	4.3 - 2.8	10.3 - 6.8	16.3 - 10.7	43	10°10.8	10°12.4	9°42.9	4.3 - 2.9	10.3 - 7.0	16.3 - 11.0	43	10°25.8	10°27.5	9°57.2	4.3 - 3.0	10.3 - 7.1	16.3 - 11.3
44	9°56.0	9°57.6	9°28.8	4.4 - 2.9	10.4 - 6.8	16.4 - 10.8	44	10°11.0	10°12.7	9°43.2	4.4 - 3.0	10.4 - 7.0	16.4 - 11.1	44	10°26.0	10°27.7	9°57.5	4.4 - 3.0	10.4 - 7.2	16.4 - 11.3
45	9°56.3	9°57.9	9°29.1	4.5 - 3.0	10.5 - 6.9	16.5 - 10.9	45	10°11.3	10°12.9	9°43.4	4.5 - 3.0	10.5 - 7.1	16.5 - 11.1	45	10°26.3	10°28.0	9°57.7	4.5 - 3.1	10.5 - 7.3	16.5 - 11.4
46	9°56.5	9°58.1	9°29.3	4.6 - 3.0	10.6 - 7.0	16.6 - 10.9	46	10°11.5	10°13.2	9°43.6	4.6 - 3.1	10.6 - 7.2	16.6 - 11.2	46	10°26.5	10°28.2	9°58.0	4.6 - 3.2	10.6 - 7.3	16.6 - 11.5
47	9°56.7	9°58.4	9°29.6	4.7 - 3.1	10.7 - 7.0	16.7 - 11.0	47	10°11.7	10°13.4	9°43.9	4.7 - 3.2	10.7 - 7.2	16.7 - 11.3	47	10°26.7	10°28.5	9°58.2	4.7 - 3.3	10.7 - 7.4	16.7 - 11.6
48	9°57.0	9																		

Increments and Corrections

m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
42	Plan.						43	Plan.						44	Plan.					
0	10°30.0	10°31.7	10°01.3	0.0 - 0.0	6.0 - 4.3	12.0 - 8.5	0	10°45.0	10°46.8	10°15.6	0.0 - 0.0	6.0 - 4.3	12.0 - 8.7	0	11°00.0	11°01.8	10°29.9	0.0 - 0.0	6.0 - 4.5	12.0 - 8.9
1	10°30.2	10°32.0	10°01.5	0.1 - 0.1	6.1 - 4.3	12.1 - 8.6	1	10°45.2	10°47.0	10°15.9	0.1 - 0.1	6.1 - 4.4	12.1 - 8.8	1	11°00.2	11°02.1	10°30.2	0.1 - 0.1	6.1 - 4.5	12.1 - 9.0
2	10°30.5	10°32.2	10°01.8	0.2 - 0.1	6.2 - 4.4	12.2 - 8.6	2	10°45.5	10°47.3	10°16.1	0.2 - 0.1	6.2 - 4.5	12.2 - 8.8	2	11°00.5	11°02.3	10°30.4	0.2 - 0.1	6.2 - 4.6	12.2 - 9.0
3	10°30.7	10°32.5	10°02.0	0.3 - 0.2	6.3 - 4.5	12.3 - 8.7	3	10°45.7	10°47.5	10°16.3	0.3 - 0.2	6.3 - 4.6	12.3 - 8.9	3	11°00.7	11°02.6	10°30.6	0.3 - 0.2	6.3 - 4.7	12.3 - 9.1
4	10°31.0	10°32.7	10°02.3	0.4 - 0.3	6.4 - 4.5	12.4 - 8.8	4	10°46.0	10°47.8	10°16.6	0.4 - 0.3	6.4 - 4.6	12.4 - 9.0	4	11°01.0	11°02.8	10°30.9	0.4 - 0.3	6.4 - 4.7	12.4 - 9.2
5	10°31.3	10°33.0	10°02.5	0.5 - 0.4	6.5 - 4.6	12.5 - 8.9	5	10°46.3	10°48.0	10°16.8	0.5 - 0.4	6.5 - 4.7	12.5 - 9.1	5	11°01.3	11°03.1	10°31.1	0.5 - 0.4	6.5 - 4.8	12.5 - 9.3
6	10°31.5	10°33.2	10°02.7	0.6 - 0.4	6.6 - 4.7	12.6 - 8.9	6	10°46.5	10°48.3	10°17.0	0.6 - 0.4	6.6 - 4.8	12.6 - 9.1	6	11°01.5	11°03.3	10°31.4	0.6 - 0.4	6.6 - 4.9	12.6 - 9.3
7	10°31.8	10°33.5	10°03.0	0.7 - 0.5	6.7 - 4.7	12.7 - 9.0	7	10°46.8	10°48.5	10°17.3	0.7 - 0.5	6.7 - 4.9	12.7 - 9.2	7	11°01.8	11°03.6	10°31.6	0.7 - 0.5	6.7 - 5.0	12.7 - 9.4
8	10°32.0	10°33.7	10°03.2	0.8 - 0.6	6.8 - 4.8	12.8 - 9.1	8	10°47.0	10°48.8	10°17.5	0.8 - 0.6	6.8 - 4.9	12.8 - 9.3	8	11°02.0	11°03.8	10°31.8	0.8 - 0.6	6.8 - 5.0	12.8 - 9.5
9	10°32.2	10°34.0	10°03.4	0.9 - 0.6	6.9 - 4.9	12.9 - 9.1	9	10°47.2	10°49.0	10°17.8	0.9 - 0.7	6.9 - 5.0	12.9 - 9.4	9	11°02.2	11°04.1	10°32.1	0.9 - 0.7	6.9 - 5.1	12.9 - 9.6
10	10°32.5	10°34.2	10°03.7	1.0 - 0.7	7.0 - 5.0	13.0 - 9.2	10	10°47.5	10°49.3	10°18.0	1.0 - 0.7	7.0 - 5.1	13.0 - 9.4	10	11°02.5	11°04.3	10°32.3	1.0 - 0.7	7.0 - 5.2	13.0 - 9.6
11	10°32.7	10°34.5	10°03.9	1.1 - 0.8	7.1 - 5.0	13.1 - 9.3	11	10°47.7	10°49.5	10°18.2	1.1 - 0.8	7.1 - 5.1	13.1 - 9.5	11	11°02.7	11°04.6	10°32.6	1.1 - 0.8	7.1 - 5.3	13.1 - 9.7
12	10°33.0	10°34.7	10°04.2	1.2 - 0.9	7.2 - 5.1	13.2 - 9.3	12	10°48.0	10°49.8	10°18.5	1.2 - 0.9	7.2 - 5.2	13.2 - 9.6	12	11°03.0	11°04.8	10°32.8	1.2 - 0.9	7.2 - 5.3	13.2 - 9.8
13	10°33.3	10°35.0	10°04.4	1.3 - 0.9	7.3 - 5.2	13.3 - 9.4	13	10°48.3	10°50.0	10°18.7	1.3 - 0.9	7.3 - 5.3	13.3 - 9.6	13	11°03.3	11°05.1	10°33.0	1.3 - 1.0	7.3 - 5.4	13.3 - 9.9
14	10°33.5	10°35.2	10°04.6	1.4 - 1.0	7.4 - 5.2	13.4 - 9.5	14	10°48.5	10°50.3	10°19.0	1.4 - 1.0	7.4 - 5.4	13.4 - 9.7	14	11°03.5	11°05.3	10°33.3	1.4 - 1.0	7.4 - 5.5	13.4 - 9.9
15	10°33.8	10°35.5	10°04.9	1.5 - 1.1	7.5 - 5.3	13.5 - 9.6	15	10°48.8	10°50.5	10°19.2	1.5 - 1.1	7.5 - 5.4	13.5 - 9.8	15	11°03.8	11°05.6	10°33.5	1.5 - 1.1	7.5 - 5.6	13.5 - 10.0
16	10°34.0	10°35.7	10°05.1	1.6 - 1.1	7.6 - 5.4	13.6 - 9.6	16	10°49.0	10°50.8	10°19.4	1.6 - 1.2	7.6 - 5.5	13.6 - 9.9	16	11°04.0	11°05.8	10°33.8	1.6 - 1.2	7.6 - 5.6	13.6 - 10.1
17	10°34.2	10°36.0	10°05.4	1.7 - 1.2	7.7 - 5.5	13.7 - 9.7	17	10°49.2	10°51.0	10°19.7	1.7 - 1.2	7.7 - 5.6	13.7 - 9.9	17	11°04.2	11°06.1	10°34.0	1.7 - 1.3	7.7 - 5.7	13.7 - 10.2
18	10°34.5	10°36.2	10°05.6	1.8 - 1.3	7.8 - 5.5	13.8 - 9.8	18	10°49.5	10°51.3	10°19.9	1.8 - 1.3	7.8 - 5.7	13.8 - 10.0	18	11°04.5	11°06.3	10°34.2	1.8 - 1.3	7.8 - 5.8	13.8 - 10.2
19	10°34.8	10°36.5	10°05.8	1.9 - 1.3	7.9 - 5.6	13.9 - 9.8	19	10°49.8	10°51.5	10°20.2	1.9 - 1.4	7.9 - 5.7	13.9 - 10.1	19	11°04.8	11°06.6	10°34.5	1.9 - 1.4	7.9 - 5.9	13.9 - 10.3
20	10°35.0	10°36.7	10°06.1	2.0 - 1.4	8.0 - 5.7	14.0 - 9.9	20	10°50.0	10°51.8	10°20.4	2.0 - 1.4	8.0 - 5.8	14.0 - 10.2	20	11°05.0	11°06.8	10°34.7	2.0 - 1.5	8.0 - 5.9	14.0 - 10.4
21	10°35.3	10°37.0	10°06.3	2.1 - 1.5	8.1 - 5.7	14.1 - 10.0	21	10°50.3	10°52.0	10°20.6	2.1 - 1.5	8.1 - 5.9	14.1 - 10.2	21	11°05.3	11°07.1	10°34.9	2.1 - 1.6	8.1 - 6.0	14.1 - 10.5
22	10°35.5	10°37.2	10°06.5	2.2 - 1.6	8.2 - 5.8	14.2 - 10.1	22	10°50.5	10°52.3	10°20.9	2.2 - 1.6	8.2 - 5.9	14.2 - 10.3	22	11°05.5	11°07.3	10°35.2	2.2 - 1.6	8.2 - 6.1	14.2 - 10.5
23	10°35.7	10°37.5	10°06.8	2.3 - 1.6	8.3 - 5.9	14.3 - 10.1	23	10°50.7	10°52.5	10°21.1	2.3 - 1.7	8.3 - 6.0	14.3 - 10.4	23	11°05.7	11°07.6	10°35.4	2.3 - 1.7	8.3 - 6.2	14.3 - 10.6
24	10°36.0	10°37.7	10°07.0	2.4 - 1.7	8.4 - 6.0	14.4 - 10.2	24	10°51.0	10°52.8	10°21.3	2.4 - 1.7	8.4 - 6.1	14.4 - 10.4	24	11°06.0	11°07.8	10°35.7	2.4 - 1.8	8.4 - 6.2	14.4 - 10.7
25	10°36.2	10°38.0	10°07.3	2.5 - 1.8	8.5 - 6.0	14.5 - 10.3	25	10°51.2	10°53.0	10°21.6	2.5 - 1.8	8.5 - 6.2	14.5 - 10.5	25	11°06.2	11°08.1	10°35.9	2.5 - 1.9	8.5 - 6.3	14.5 - 10.8
26	10°36.5	10°38.2	10°07.5	2.6 - 1.8	8.6 - 6.1	14.6 - 10.3	26	10°51.5	10°53.3	10°21.8	2.6 - 1.9	8.6 - 6.2	14.6 - 10.6	26	11°06.5	11°08.3	10°36.1	2.6 - 1.9	8.6 - 6.4	14.6 - 10.8
27	10°36.8	10°38.5	10°07.7	2.7 - 1.9	8.7 - 6.2	14.7 - 10.4	27	10°51.8	10°53.5	10°22.1	2.7 - 2.0	8.7 - 6.3	14.7 - 10.7	27	11°06.8	11°08.6	10°36.4	2.7 - 2.0	8.7 - 6.5	14.7 - 10.9
28	10°37.0	10°38.7	10°08.0	2.8 - 2.0	8.8 - 6.2	14.8 - 10.5	28	10°52.0	10°53.8	10°22.3	2.8 - 2.0	8.8 - 6.4	14.8 - 10.7	28	11°07.0	11°08.8	10°36.6	2.8 - 2.1	8.8 - 6.5	14.8 - 11.0
29	10°37.3	10°39.0	10°08.2	2.9 - 2.1	8.9 - 6.3	14.9 - 10.6	29	10°52.3	10°54.0	10°22.5	2.9 - 2.1	8.9 - 6.5	14.9 - 10.8	29	11°07.3	11°09.1	10°36.9	2.9 - 2.2	8.9 - 6.6	14.9 - 11.1
30	10°37.5	10°39.2	10°08.5	3.0 - 2.1	9.0 - 6.4	15.0 - 10.6	30	10°52.5	10°54.3	10°22.8	3.0 - 2.2	9.0 - 6.5	15.0 - 10.9	30	11°07.5	11°09.3	10°37.1	3.0 - 2.2	9.0 - 6.7	15.0 - 11.1
31	10°37.7	10°39.5	10°08.7	3.1 - 2.2	9.1 - 6.4	15.1 - 10.7	31	10°52.7	10°54.5	10°23.0	3.1 - 2.2	9.1 - 6.6	15.1 - 10.9	31	11°07.7	11°09.6	10°37.3	3.1 - 2.3	9.1 - 6.7	15.1 - 11.2
32	10°38.0	10°39.7	10°08.9	3.2 - 2.3	9.2 - 6.5	15.2 - 10.8	32	10°53.0	10°54.8	10°23.3	3.2 - 2.3	9.2 - 6.7	15.2 - 11.0	32	11°08.0	11°09.8	10°37.6	3.2 - 2.4	9.2 - 6.8	15.2 - 11.3
33	10°38.2	10°40.0	10°09.2	3.3 - 2.3	9.3 - 6.6	15.3 - 10.8	33	10°53.2	10°55.0	10°23.5	3.3 - 2.4	9.3 - 6.7	15.3 - 11.1	33	11°08.2	11°10.1	10°37.8	3.3 - 2.4	9.3 - 6.9	15.3 - 11.3
34	10°38.5	10°40.2	10°09.4	3.4 - 2.4	9.4 - 6.7	15.4 - 10.9	34	10°53.5	10°55.3	10°23.7	3.4 - 2.5	9.4 - 6.8	15.4 - 11.2	34	11°08.5	11°10.3	10°38.0	3.4 - 2.5	9.4 - 7.0	15.4 - 11.4
35	10°38.8	10°40.5	10°09.7	3.5 - 2.5	9.5 - 6.7	15.5 - 11.0	35	10°53.8	10°55.5	10°24.0	3.5 - 2.5	9.5 - 6.9	15.5 - 11.2	35	11°08.8	11°10.6	10°38.3	3.5 - 2.6	9.5 - 7.0	15.5 - 11.5
36	10°39.0	10°40.7	10°09.9	3.6 - 2.6	9.6 - 6.8	15.6 - 11.1	36	10°54.0	10°55.8	10°24.2	3.6 - 2.6	9.6 - 7.0	15.6 - 11.3	36	11°09.0	11°10.8	10°38.5	3.6 - 2.7	9.6 - 7.1	15.6 - 11.6
37	10°39.3	10°41.0	10°10.1	3.7 - 2.6	9.7 - 6.9	15.7 - 11.1	37	10°54.3	10°56.0	10°24.4	3.7 - 2.7	9.7 - 7.0	15.7 - 11.4	37	11°09.3	11°11.1	10°38.8	3.7 - 2.7	9.7 - 7.2	15.7 - 11.6
38	10°39.5	10°41.2	10°10.4	3.8 - 2.7	9.8 - 6.9	15.8 - 11.2	38	10°54.5	10°56.3	10°24.7	3.8 - 2.8	9.8 - 7.1	15.8 - 11.5	38	11°09.5	11°11.3	10°39.0	3.8 - 2.8	9.8 - 7.3	15.8 - 11.7
39	10°39.7	10°41.5	10°10.6	3.9 - 2.8	9.9 - 7.0	15.9 - 11.3	39	10°54.7	10°56.5	10°24.9	3.9 - 2.8	9.9 - 7.2	15.9 - 11.5	39	11°09.7	11°11.6	10°39.2	3.9 - 2.9	9.9 - 7.3	15.9 - 11.8
40	10°40.0	10°41.7	10°10.8	4.0 - 2.8	10.0 - 7.1	16.0 - 11.3	40	10°55.0	10°56.8	10°25.2	4.0 - 2.9	10.0 - 7.3	16.0 - 11.6	40	11°10.0	11°11.8	10°39.5	4.0 - 3.0	10.0 - 7.4	16.0 - 11.9
41	10°40.2	10°42.0	10°11.1	4.1 - 2.9	10.1 - 7.2	16.1 - 11.4	41	10°55.2	10°57.0	10°25.4	4.1 - 3.0	10.1 - 7.3	16.1 - 11.7	41	11°10.2	11°12.1	10°39.7	4.1 - 3.0	10.1 - 7.5	16.1 - 11.9
42	10°40.5	10°42.3	10°11.3	4.2 - 3.0	10.2 - 7.2	16.2 - 11.5	42	10°55.5	10°57.3	10°25.6	4.2 - 3.0	10.2 - 7.4	16.2 - 11.7	42	11°10.5	11°12.3	10°40.0	4.2 - 3.1	10.2 - 7.6	16.2 - 12.0
43	10°40.8	10°42.5	10°11.6	4.3 - 3.0	10.3 - 7.3	16.3 - 11.5	43	10°55.8	10°57.5	10°25.9	4.3 - 3.1	10.3 - 7.5	16.3 - 11.8	43	11°10.8	11°12.6	10°40.2	4.3 - 3.2	10.3 - 7.6	16.3 - 12.1
44	10°41.0	10°42.8	10°11.8	4.4 - 3.1	10.4 - 7.4	16.4 - 11.6	44	10°56.0	10°57.8	10°26.1	4.4 - 3.2	10.4 - 7.5	16.4 - 11.9	44	11°11.0	11°12.8	10°40.4	4.4 - 3.3	10.4 - 7.7	16.4 - 12.2
45	10°41.3	10°43.0	10°12.0	4.5 - 3.2	10.5 - 7.4	16.5 - 11.7	45	10°56.3	10°58.0	10°26.4	4.5 - 3.3	10.5 - 7.6	16.5 - 12.0	45	11°11.3	11°13.1	10°40.7	4.5 - 3.3	10.5 - 7.8	16.5 - 12.2
46	10°41.5	10°43.3	10°12.3	4.6 - 3.3	10.6 - 7.5	16.6 - 11.8	46	10°56.5	10°58.3	10°26.6	4.6 - 3.3	10.6 - 7.7	16.6 - 12.0	46	11°11.5	11°13.3	10°40.9	4.6 - 3.4	10.6 - 7.9	16.6 - 12.3
47	10°41.7	10°43.5	10°12.5	4.7 - 3.3																

Increments and Corrections

m 45	Sun Plan.	Aries	Moon	v and d corr			m 46	Sun Plan.	Aries	Moon	v and d corr			m 47	Sun Plan.	Aries	Moon	v and d corr		
0	11°15.0	11°16.8	10°44.3	0.0 - 0.0	6.0 - 4.5	12.0 - 9.1	0	11°30.0	11°31.9	10°58.6	0.0 - 0.0	6.0 - 4.7	12.0 - 9.3	0	11°45.0	11°46.9	11°12.9	0.0 - 0.0	6.0 - 4.8	12.0 - 9.5
1	11°15.2	11°17.1	10°44.5	0.1 - 0.1	6.1 - 4.6	12.1 - 9.2	1	11°30.2	11°32.1	10°58.8	0.1 - 0.1	6.1 - 4.7	12.1 - 9.4	1	11°45.2	11°47.2	11°13.1	0.1 - 0.1	6.1 - 4.8	12.1 - 9.6
2	11°15.5	11°17.3	10°44.7	0.2 - 0.2	6.2 - 4.7	12.2 - 9.3	2	11°30.5	11°32.4	10°59.0	0.2 - 0.2	6.2 - 4.8	12.2 - 9.5	2	11°45.5	11°47.4	11°13.4	0.2 - 0.2	6.2 - 4.9	12.2 - 9.7
3	11°15.7	11°17.6	10°45.0	0.3 - 0.2	6.3 - 4.8	12.3 - 9.3	3	11°30.7	11°32.6	10°59.3	0.3 - 0.2	6.3 - 4.9	12.3 - 9.5	3	11°45.7	11°47.7	11°13.6	0.3 - 0.2	6.3 - 5.0	12.3 - 9.7
4	11°16.0	11°17.8	10°45.2	0.4 - 0.3	6.4 - 4.9	12.4 - 9.4	4	11°31.0	11°32.9	10°59.5	0.4 - 0.3	6.4 - 5.0	12.4 - 9.6	4	11°46.0	11°47.9	11°13.8	0.4 - 0.3	6.4 - 5.1	12.4 - 9.8
5	11°16.3	11°18.1	10°45.4	0.5 - 0.4	6.5 - 4.9	12.5 - 9.5	5	11°31.3	11°33.1	10°59.8	0.5 - 0.4	6.5 - 5.0	12.5 - 9.7	5	11°46.3	11°48.2	11°14.1	0.5 - 0.4	6.5 - 5.1	12.5 - 9.9
6	11°16.5	11°18.3	10°45.7	0.6 - 0.5	6.6 - 5.0	12.6 - 9.6	6	11°31.5	11°33.4	11°00.0	0.6 - 0.5	6.6 - 5.1	12.6 - 9.8	6	11°46.5	11°48.4	11°14.3	0.6 - 0.5	6.6 - 5.2	12.6 - 10.0
7	11°16.8	11°18.6	10°45.9	0.7 - 0.5	6.7 - 5.1	12.7 - 9.6	7	11°31.8	11°33.6	11°00.2	0.7 - 0.5	6.7 - 5.2	12.7 - 9.8	7	11°46.8	11°48.7	11°14.6	0.7 - 0.6	6.7 - 5.3	12.7 - 10.1
8	11°17.0	11°18.9	10°46.2	0.8 - 0.6	6.8 - 5.2	12.8 - 9.7	8	11°32.0	11°33.9	11°00.5	0.8 - 0.6	6.8 - 5.3	12.8 - 9.9	8	11°47.0	11°48.9	11°14.8	0.8 - 0.6	6.8 - 5.4	12.8 - 10.1
9	11°17.2	11°19.1	10°46.4	0.9 - 0.7	6.9 - 5.2	12.9 - 9.8	9	11°32.2	11°34.1	11°00.7	0.9 - 0.7	6.9 - 5.3	12.9 - 10.0	9	11°47.2	11°49.2	11°15.0	0.9 - 0.7	6.9 - 5.5	12.9 - 10.2
10	11°17.5	11°19.4	10°46.6	1.0 - 0.8	7.0 - 5.3	13.0 - 9.9	10	11°32.5	11°34.4	11°01.0	1.0 - 0.8	7.0 - 5.4	13.0 - 10.1	10	11°47.5	11°49.4	11°15.3	1.0 - 0.8	7.0 - 5.5	13.0 - 10.3
11	11°17.7	11°19.6	10°46.9	1.1 - 0.8	7.1 - 5.4	13.1 - 9.9	11	11°32.7	11°34.6	11°01.2	1.1 - 0.9	7.1 - 5.5	13.1 - 10.2	11	11°47.7	11°49.7	11°15.5	1.1 - 0.9	7.1 - 5.6	13.1 - 10.4
12	11°18.0	11°19.9	10°47.1	1.2 - 0.9	7.2 - 5.5	13.2 - 10.0	12	11°33.0	11°34.9	11°01.4	1.2 - 0.9	7.2 - 5.6	13.2 - 10.2	12	11°48.0	11°49.9	11°15.7	1.2 - 1.0	7.2 - 5.7	13.2 - 10.4
13	11°18.3	11°20.1	10°47.4	1.3 - 1.0	7.3 - 5.5	13.3 - 10.1	13	11°33.3	11°35.1	11°01.7	1.3 - 1.0	7.3 - 5.7	13.3 - 10.3	13	11°48.3	11°50.2	11°16.0	1.3 - 1.0	7.3 - 5.8	13.3 - 10.5
14	11°18.5	11°20.4	10°47.6	1.4 - 1.1	7.4 - 5.6	13.4 - 10.2	14	11°33.5	11°35.4	11°01.9	1.4 - 1.1	7.4 - 5.7	13.4 - 10.4	14	11°48.5	11°50.4	11°16.2	1.4 - 1.1	7.4 - 5.9	13.4 - 10.6
15	11°18.8	11°20.6	10°47.8	1.5 - 1.1	7.5 - 5.7	13.5 - 10.2	15	11°33.8	11°35.6	11°02.1	1.5 - 1.2	7.5 - 5.8	13.5 - 10.5	15	11°48.8	11°50.7	11°16.5	1.5 - 1.2	7.5 - 5.9	13.5 - 10.7
16	11°19.0	11°20.9	10°48.1	1.6 - 1.2	7.6 - 5.8	13.6 - 10.3	16	11°34.0	11°35.9	11°02.4	1.6 - 1.2	7.6 - 5.9	13.6 - 10.5	16	11°49.0	11°50.9	11°16.7	1.6 - 1.3	7.6 - 6.0	13.6 - 10.8
17	11°19.2	11°21.1	10°48.3	1.7 - 1.3	7.7 - 5.8	13.7 - 10.4	17	11°34.2	11°36.1	11°02.6	1.7 - 1.3	7.7 - 6.0	13.7 - 10.6	17	11°49.2	11°51.2	11°16.9	1.7 - 1.3	7.7 - 6.1	13.7 - 10.8
18	11°19.5	11°21.4	10°48.5	1.8 - 1.4	7.8 - 5.9	13.8 - 10.5	18	11°34.5	11°36.4	11°02.9	1.8 - 1.4	7.8 - 6.0	13.8 - 10.7	18	11°49.5	11°51.4	11°17.2	1.8 - 1.4	7.8 - 6.2	13.8 - 10.9
19	11°19.8	11°21.6	10°48.8	1.9 - 1.4	7.9 - 6.0	13.9 - 10.5	19	11°34.8	11°36.6	11°03.1	1.9 - 1.5	7.9 - 6.1	13.9 - 10.8	19	11°49.8	11°51.7	11°17.4	1.9 - 1.5	7.9 - 6.3	13.9 - 11.0
20	11°20.0	11°21.9	10°49.0	2.0 - 1.5	8.0 - 6.1	14.0 - 10.6	20	11°35.0	11°36.9	11°03.3	2.0 - 1.6	8.0 - 6.2	14.0 - 10.8	20	11°50.0	11°51.9	11°17.7	2.0 - 1.6	8.0 - 6.3	14.0 - 11.1
21	11°20.3	11°22.1	10°49.3	2.1 - 1.6	8.1 - 6.1	14.1 - 10.7	21	11°35.3	11°37.2	11°03.6	2.1 - 1.6	8.1 - 6.3	14.1 - 10.9	21	11°50.3	11°52.2	11°17.9	2.1 - 1.7	8.1 - 6.4	14.1 - 11.2
22	11°20.5	11°22.4	10°49.5	2.2 - 1.7	8.2 - 6.2	14.2 - 10.8	22	11°35.5	11°37.4	11°03.8	2.2 - 1.7	8.2 - 6.4	14.2 - 11.0	22	11°50.5	11°52.4	11°18.1	2.2 - 1.7	8.2 - 6.5	14.2 - 11.2
23	11°20.7	11°22.6	10°49.7	2.3 - 1.7	8.3 - 6.3	14.3 - 10.8	23	11°35.7	11°37.7	11°04.1	2.3 - 1.8	8.3 - 6.4	14.3 - 11.1	23	11°50.7	11°52.7	11°18.4	2.3 - 1.8	8.3 - 6.6	14.3 - 11.3
24	11°21.0	11°22.9	10°50.0	2.4 - 1.8	8.4 - 6.4	14.4 - 10.9	24	11°36.0	11°37.9	11°04.3	2.4 - 1.9	8.4 - 6.5	14.4 - 11.2	24	11°51.0	11°52.9	11°18.6	2.4 - 1.9	8.4 - 6.7	14.4 - 11.4
25	11°21.2	11°23.1	10°50.2	2.5 - 1.9	8.5 - 6.4	14.5 - 11.0	25	11°36.2	11°38.2	11°04.5	2.5 - 1.9	8.5 - 6.6	14.5 - 11.2	25	11°51.2	11°53.2	11°18.8	2.5 - 2.0	8.5 - 6.7	14.5 - 11.5
26	11°21.5	11°23.4	10°50.5	2.6 - 2.0	8.6 - 6.5	14.6 - 11.1	26	11°36.5	11°38.4	11°04.8	2.6 - 2.0	8.6 - 6.7	14.6 - 11.3	26	11°51.5	11°53.4	11°19.1	2.6 - 2.1	8.6 - 6.8	14.6 - 11.6
27	11°21.8	11°23.6	10°50.7	2.7 - 2.0	8.7 - 6.6	14.7 - 11.1	27	11°36.8	11°38.7	11°05.0	2.7 - 2.1	8.7 - 6.7	14.7 - 11.4	27	11°51.8	11°53.7	11°19.3	2.7 - 2.1	8.7 - 6.9	14.7 - 11.6
28	11°22.0	11°23.9	10°50.9	2.8 - 2.1	8.8 - 6.7	14.8 - 11.2	28	11°37.0	11°38.9	11°05.2	2.8 - 2.2	8.8 - 6.8	14.8 - 11.5	28	11°52.0	11°53.9	11°19.6	2.8 - 2.2	8.8 - 7.0	14.8 - 11.7
29	11°22.3	11°24.1	10°51.2	2.9 - 2.2	8.9 - 6.7	14.9 - 11.3	29	11°37.3	11°39.2	11°05.5	2.9 - 2.2	8.9 - 6.9	14.9 - 11.5	29	11°52.3	11°54.2	11°19.8	2.9 - 2.3	8.9 - 7.0	14.9 - 11.8
30	11°22.5	11°24.4	10°51.4	3.0 - 2.3	9.0 - 6.8	15.0 - 11.4	30	11°37.5	11°39.4	11°05.7	3.0 - 2.3	9.0 - 7.0	15.0 - 11.6	30	11°52.5	11°54.4	11°20.0	3.0 - 2.4	9.0 - 7.1	15.0 - 11.9
31	11°22.7	11°24.6	10°51.6	3.1 - 2.4	9.1 - 6.9	15.1 - 11.5	31	11°37.7	11°39.7	11°06.0	3.1 - 2.4	9.1 - 7.1	15.1 - 11.7	31	11°52.7	11°54.7	11°20.3	3.1 - 2.5	9.1 - 7.2	15.1 - 12.0
32	11°23.0	11°24.9	10°51.9	3.2 - 2.4	9.2 - 7.0	15.2 - 11.5	32	11°38.0	11°39.9	11°06.2	3.2 - 2.5	9.2 - 7.1	15.2 - 11.8	32	11°53.0	11°54.9	11°20.5	3.2 - 2.5	9.2 - 7.3	15.2 - 12.0
33	11°23.2	11°25.1	10°52.1	3.3 - 2.5	9.3 - 7.1	15.3 - 11.6	33	11°38.2	11°40.2	11°06.4	3.3 - 2.6	9.3 - 7.2	15.3 - 11.9	33	11°53.2	11°55.2	11°20.8	3.3 - 2.6	9.3 - 7.4	15.3 - 12.1
34	11°23.5	11°25.4	10°52.4	3.4 - 2.6	9.4 - 7.1	15.4 - 11.7	34	11°38.5	11°40.4	11°06.7	3.4 - 2.6	9.4 - 7.3	15.4 - 11.9	34	11°53.5	11°55.5	11°21.0	3.4 - 2.7	9.4 - 7.4	15.4 - 12.2
35	11°23.8	11°25.6	10°52.6	3.5 - 2.7	9.5 - 7.2	15.5 - 11.8	35	11°38.8	11°40.7	11°06.9	3.5 - 2.7	9.5 - 7.4	15.5 - 12.0	35	11°53.8	11°55.7	11°21.2	3.5 - 2.8	9.5 - 7.5	15.5 - 12.3
36	11°24.0	11°25.9	10°52.8	3.6 - 2.7	9.6 - 7.3	15.6 - 11.8	36	11°39.0	11°40.9	11°07.2	3.6 - 2.8	9.6 - 7.4	15.6 - 12.1	36	11°54.0	11°56.0	11°21.5	3.6 - 2.9	9.6 - 7.6	15.6 - 12.3
37	11°24.3	11°26.1	10°53.1	3.7 - 2.8	9.7 - 7.4	15.7 - 11.9	37	11°39.3	11°41.2	11°07.4	3.7 - 2.9	9.7 - 7.5	15.7 - 12.2	37	11°54.3	11°56.2	11°21.7	3.7 - 2.9	9.7 - 7.7	15.7 - 12.4
38	11°24.5	11°26.4	10°53.3	3.8 - 2.9	9.8 - 7.4	15.8 - 12.0	38	11°39.5	11°41.4	11°07.6	3.8 - 2.9	9.8 - 7.6	15.8 - 12.2	38	11°54.5	11°56.5	11°22.0	3.8 - 3.0	9.8 - 7.8	15.8 - 12.5
39	11°24.7	11°26.6	10°53.6	3.9 - 3.0	9.9 - 7.5	15.9 - 12.1	39	11°39.7	11°41.7	11°07.9	3.9 - 3.0	9.9 - 7.7	15.9 - 12.3	39	11°54.7	11°56.7	11°22.2	3.9 - 3.1	9.9 - 7.8	15.9 - 12.6
40	11°25.0	11°26.9	10°53.8	4.0 - 3.0	10.0 - 7.6	16.0 - 12.1	40	11°40.0	11°41.9	11°08.1	4.0 - 3.1	10.0 - 7.8	16.0 - 12.4	40	11°55.0	11°57.0	11°22.4	4.0 - 3.2	10.0 - 7.9	16.0 - 12.7
41	11°25.2	11°27.1	10°54.0	4.1 - 3.1	10.1 - 7.7	16.1 - 12.2	41	11°40.2	11°42.2	11°08.3	4.1 - 3.2	10.1 - 7.8	16.1 - 12.5	41	11°55.2	11°57.2	11°22.7	4.1 - 3.2	10.1 - 8.0	16.1 - 12.7
42	11°25.5	11°27.4	10°54.3	4.2 - 3.2	10.2 - 7.7	16.2 - 12.3	42	11°40.5	11°42.4	11°08.6	4.2 - 3.3	10.2 - 7.9	16.2 - 12.6	42	11°55.5	11°57.5	11°22.9	4.2 - 3.3	10.2 - 8.1	16.2 - 12.8
43	11°25.8	11°27.6	10°54.5	4.3 - 3.3	10.3 - 7.8	16.3 - 12.4	43	11°40.8	11°42.7	11°08.8	4.3 - 3.3	10.3 - 8.0	16.3 - 12.6	43	11°55.8	11°57.7	11°23.1	4.3 - 3.4	10.3 - 8.2	16.3 - 12.9
44	11°26.0	11°27.9	10°54.7	4.4 - 3.3	10.4 - 7.9	16.4 - 12.4	44	11°41.0	11°42.9	11°09.1	4.4 - 3.4	10.4 - 8.1	16.4 - 12.7	44	11°56.0	11°58.0	11°23.4	4.4 - 3.5	10.4 - 8.2	16.4 - 13.0
45	11°26.3	11°28.1	10°55.0	4.5 - 3.4	10.5 - 8.0	16.5 - 12.5	45	11°41.3	11°43.2	11°09.3	4.5 - 3.5	10.5 - 8.1	16.5 - 12.8	45	11°56.3	11°58.2	11°23.6	4.5 - 3.6	10.5 - 8.3	16.5 - 13.1
46	11°26.5	11°28.4	10°55.2	4.6 - 3.5	10.6 - 8.0	16.6 - 12.6	46	11°41.5	11°43.4	11°09.5	4.6 - 3.6	10.6 - 8.2	16.6 - 12.9	46	11°56.5	11°58.5	11°23.9	4.6 - 3.6	10.6 - 8.4	16

Increments and Corrections

m 48	Sun Plan.	Aries	Moon	v and d corr			m 49	Sun Plan.	Aries	Moon	v and d corr			m 50	Sun Plan.	Aries	Moon	v and d corr		
0	12°00.0	12°02.0	11°27.2	0.0 - 0.0	6.0 - 4.8	12.0 - 9.7	0	12°15.0	12°17.0	11°41.5	0.0 - 0.0	6.0 - 4.9	12.0 - 9.9	0	12°30.0	12°32.1	11°55.8	0.0 - 0.0	6.0 - 5.0	12.0 - 10.1
1	12°00.2	12°02.2	11°27.4	0.1 - 0.1	6.1 - 4.9	12.1 - 9.8	1	12°15.2	12°17.3	11°41.8	0.1 - 0.1	6.1 - 5.0	12.1 - 10.0	1	12°30.2	12°32.3	11°56.1	0.1 - 0.1	6.1 - 5.1	12.1 - 10.2
2	12°00.5	12°02.5	11°27.7	0.2 - 0.2	6.2 - 5.0	12.2 - 9.9	2	12°15.5	12°17.5	11°42.0	0.2 - 0.2	6.2 - 5.1	12.2 - 10.1	2	12°30.5	12°32.6	11°56.3	0.2 - 0.2	6.2 - 5.2	12.2 - 10.3
3	12°00.7	12°02.7	11°27.9	0.3 - 0.2	6.3 - 5.1	12.3 - 9.9	3	12°15.7	12°17.8	11°42.2	0.3 - 0.2	6.3 - 5.2	12.3 - 10.1	3	12°30.7	12°32.8	11°56.5	0.3 - 0.3	6.3 - 5.3	12.3 - 10.4
4	12°01.0	12°03.0	11°28.2	0.4 - 0.3	6.4 - 5.2	12.4 - 10.0	4	12°16.0	12°18.0	11°42.5	0.4 - 0.3	6.4 - 5.3	12.4 - 10.2	4	12°31.0	12°33.1	11°56.8	0.4 - 0.3	6.4 - 5.4	12.4 - 10.4
5	12°01.3	12°03.2	11°28.4	0.5 - 0.4	6.5 - 5.3	12.5 - 10.1	5	12°16.3	12°18.3	11°42.7	0.5 - 0.4	6.5 - 5.4	12.5 - 10.3	5	12°31.3	12°33.3	11°57.0	0.5 - 0.4	6.5 - 5.5	12.5 - 10.5
6	12°01.5	12°03.5	11°28.6	0.6 - 0.5	6.6 - 5.3	12.6 - 10.2	6	12°16.5	12°18.5	11°42.9	0.6 - 0.5	6.6 - 5.4	12.6 - 10.4	6	12°31.5	12°33.6	11°57.3	0.6 - 0.5	6.6 - 5.6	12.6 - 10.6
7	12°01.8	12°03.7	11°28.9	0.7 - 0.6	6.7 - 5.4	12.7 - 10.3	7	12°16.8	12°18.8	11°43.2	0.7 - 0.6	6.7 - 5.5	12.7 - 10.5	7	12°31.8	12°33.8	11°57.5	0.7 - 0.6	6.7 - 5.6	12.7 - 10.7
8	12°02.0	12°04.0	11°29.1	0.8 - 0.6	6.8 - 5.5	12.8 - 10.3	8	12°17.0	12°19.0	11°43.4	0.8 - 0.7	6.8 - 5.6	12.8 - 10.6	8	12°32.0	12°34.1	11°57.7	0.8 - 0.7	6.8 - 5.7	12.8 - 10.8
9	12°02.2	12°04.2	11°29.3	0.9 - 0.7	6.9 - 5.6	12.9 - 10.4	9	12°17.2	12°19.3	11°43.7	0.9 - 0.7	6.9 - 5.7	12.9 - 10.6	9	12°32.2	12°34.3	11°58.0	0.9 - 0.8	6.9 - 5.8	12.9 - 10.9
10	12°02.5	12°04.5	11°29.6	1.0 - 0.8	7.0 - 5.7	13.0 - 10.5	10	12°17.5	12°19.5	11°43.9	1.0 - 0.8	7.0 - 5.8	13.0 - 10.7	10	12°32.5	12°34.6	11°58.2	1.0 - 0.8	7.0 - 5.9	13.0 - 10.9
11	12°02.7	12°04.7	11°29.8	1.1 - 0.9	7.1 - 5.7	13.1 - 10.6	11	12°17.7	12°19.8	11°44.1	1.1 - 0.9	7.1 - 5.9	13.1 - 10.8	11	12°32.7	12°34.8	11°58.5	1.1 - 0.9	7.1 - 6.0	13.1 - 11.0
12	12°03.0	12°05.0	11°30.1	1.2 - 1.0	7.2 - 5.8	13.2 - 10.7	12	12°18.0	12°20.0	11°44.4	1.2 - 1.0	7.2 - 5.9	13.2 - 10.9	12	12°33.0	12°35.1	11°58.7	1.2 - 1.0	7.2 - 6.1	13.2 - 11.1
13	12°03.3	12°05.2	11°30.3	1.3 - 1.1	7.3 - 5.9	13.3 - 10.8	13	12°18.3	12°20.3	11°44.6	1.3 - 1.1	7.3 - 6.0	13.3 - 11.0	13	12°33.3	12°35.3	11°58.9	1.3 - 1.1	7.3 - 6.1	13.3 - 11.2
14	12°03.5	12°05.5	11°30.5	1.4 - 1.1	7.4 - 6.0	13.4 - 10.8	14	12°18.5	12°20.5	11°44.9	1.4 - 1.2	7.4 - 6.1	13.4 - 11.1	14	12°33.5	12°35.6	11°59.2	1.4 - 1.2	7.4 - 6.2	13.4 - 11.3
15	12°03.8	12°05.7	11°30.8	1.5 - 1.2	7.5 - 6.1	13.5 - 10.9	15	12°18.8	12°20.8	11°45.1	1.5 - 1.2	7.5 - 6.2	13.5 - 11.1	15	12°33.8	12°35.8	11°59.4	1.5 - 1.3	7.5 - 6.3	13.5 - 11.4
16	12°04.0	12°06.0	11°31.0	1.6 - 1.3	7.6 - 6.1	13.6 - 11.0	16	12°19.0	12°21.0	11°45.3	1.6 - 1.3	7.6 - 6.3	13.6 - 11.2	16	12°34.0	12°36.1	11°59.7	1.6 - 1.3	7.6 - 6.4	13.6 - 11.4
17	12°04.2	12°06.2	11°31.3	1.7 - 1.4	7.7 - 6.2	13.7 - 11.1	17	12°19.2	12°21.3	11°45.6	1.7 - 1.4	7.7 - 6.4	13.7 - 11.3	17	12°34.2	12°36.3	11°59.9	1.7 - 1.4	7.7 - 6.5	13.7 - 11.5
18	12°04.5	12°06.5	11°31.5	1.8 - 1.5	7.8 - 6.3	13.8 - 11.2	18	12°19.5	12°21.5	11°45.8	1.8 - 1.5	7.8 - 6.4	13.8 - 11.4	18	12°34.5	12°36.6	12°00.1	1.8 - 1.5	7.8 - 6.6	13.8 - 11.6
19	12°04.8	12°06.7	11°31.7	1.9 - 1.5	7.9 - 6.4	13.9 - 11.2	19	12°19.8	12°21.8	11°46.1	1.9 - 1.6	7.9 - 6.5	13.9 - 11.5	19	12°34.8	12°36.8	12°00.4	1.9 - 1.6	7.9 - 6.6	13.9 - 11.7
20	12°05.0	12°07.0	11°32.0	2.0 - 1.6	8.0 - 6.5	14.0 - 11.3	20	12°20.0	12°22.0	11°46.3	2.0 - 1.6	8.0 - 6.6	14.0 - 11.5	20	12°35.0	12°37.1	12°00.6	2.0 - 1.7	8.0 - 6.7	14.0 - 11.8
21	12°05.3	12°07.2	11°32.2	2.1 - 1.7	8.1 - 6.5	14.1 - 11.4	21	12°20.3	12°22.3	11°46.5	2.1 - 1.7	8.1 - 6.7	14.1 - 11.6	21	12°35.3	12°37.3	12°00.8	2.1 - 1.8	8.1 - 6.8	14.1 - 11.9
22	12°05.5	12°07.5	11°32.4	2.2 - 1.8	8.2 - 6.6	14.2 - 11.5	22	12°20.5	12°22.5	11°46.8	2.2 - 1.8	8.2 - 6.8	14.2 - 11.7	22	12°35.5	12°37.6	12°01.1	2.2 - 1.9	8.2 - 6.9	14.2 - 12.0
23	12°05.7	12°07.7	11°32.7	2.3 - 1.9	8.3 - 6.7	14.3 - 11.6	23	12°20.7	12°22.8	11°47.0	2.3 - 1.9	8.3 - 6.8	14.3 - 11.8	23	12°35.7	12°37.8	12°01.3	2.3 - 1.9	8.3 - 7.0	14.3 - 12.0
24	12°06.0	12°08.0	11°32.9	2.4 - 1.9	8.4 - 6.8	14.4 - 11.6	24	12°21.0	12°23.0	11°47.2	2.4 - 2.0	8.4 - 6.9	14.4 - 11.9	24	12°36.0	12°38.1	12°01.6	2.4 - 2.0	8.4 - 7.1	14.4 - 12.1
25	12°06.2	12°08.2	11°33.2	2.5 - 2.0	8.5 - 6.9	14.5 - 11.7	25	12°21.2	12°23.3	11°47.5	2.5 - 2.1	8.5 - 7.0	14.5 - 12.0	25	12°36.2	12°38.3	12°01.8	2.5 - 2.1	8.5 - 7.2	14.5 - 12.2
26	12°06.5	12°08.5	11°33.4	2.6 - 2.1	8.6 - 7.0	14.6 - 11.8	26	12°21.5	12°23.5	11°47.7	2.6 - 2.1	8.6 - 7.1	14.6 - 12.0	26	12°36.5	12°38.6	12°02.0	2.6 - 2.2	8.6 - 7.2	14.6 - 12.3
27	12°06.8	12°08.7	11°33.6	2.7 - 2.2	8.7 - 7.0	14.7 - 11.9	27	12°21.8	12°23.8	11°48.0	2.7 - 2.2	8.7 - 7.2	14.7 - 12.1	27	12°36.8	12°38.8	12°02.3	2.7 - 2.3	8.7 - 7.3	14.7 - 12.4
28	12°07.0	12°09.0	11°33.9	2.8 - 2.3	8.8 - 7.1	14.8 - 12.0	28	12°22.0	12°24.0	11°48.2	2.8 - 2.3	8.8 - 7.3	14.8 - 12.2	28	12°37.0	12°39.1	12°02.5	2.8 - 2.4	8.8 - 7.4	14.8 - 12.5
29	12°07.3	12°09.2	11°34.1	2.9 - 2.3	8.9 - 7.2	14.9 - 12.0	29	12°22.3	12°24.3	11°48.4	2.9 - 2.4	8.9 - 7.3	14.9 - 12.3	29	12°37.3	12°39.3	12°02.8	2.9 - 2.4	8.9 - 7.5	14.9 - 12.5
30	12°07.5	12°09.5	11°34.4	3.0 - 2.4	9.0 - 7.3	15.0 - 12.1	30	12°22.5	12°24.5	11°48.7	3.0 - 2.5	9.0 - 7.4	15.0 - 12.4	30	12°37.5	12°39.6	12°03.0	3.0 - 2.5	9.0 - 7.6	15.0 - 12.6
31	12°07.7	12°09.7	11°34.6	3.1 - 2.5	9.1 - 7.4	15.1 - 12.2	31	12°22.7	12°24.8	11°48.9	3.1 - 2.6	9.1 - 7.5	15.1 - 12.5	31	12°37.7	12°39.8	12°03.2	3.1 - 2.6	9.1 - 7.7	15.1 - 12.7
32	12°08.0	12°10.0	11°34.8	3.2 - 2.6	9.2 - 7.4	15.2 - 12.3	32	12°23.0	12°25.0	11°49.2	3.2 - 2.6	9.2 - 7.6	15.2 - 12.5	32	12°38.0	12°40.1	12°03.5	3.2 - 2.7	9.2 - 7.7	15.2 - 12.8
33	12°08.2	12°10.2	11°35.1	3.3 - 2.7	9.3 - 7.5	15.3 - 12.4	33	12°23.2	12°25.3	11°49.4	3.3 - 2.7	9.3 - 7.7	15.3 - 12.6	33	12°38.2	12°40.3	12°03.7	3.3 - 2.8	9.3 - 7.8	15.3 - 12.9
34	12°08.5	12°10.5	11°35.3	3.4 - 2.7	9.4 - 7.6	15.4 - 12.4	34	12°23.5	12°25.5	11°49.6	3.4 - 2.8	9.4 - 7.8	15.4 - 12.7	34	12°38.5	12°40.6	12°03.9	3.4 - 2.9	9.4 - 7.9	15.4 - 13.0
35	12°08.8	12°10.7	11°35.6	3.5 - 2.8	9.5 - 7.7	15.5 - 12.5	35	12°23.8	12°25.8	11°49.9	3.5 - 2.9	9.5 - 7.8	15.5 - 12.8	35	12°38.8	12°40.8	12°04.2	3.5 - 2.9	9.5 - 8.0	15.5 - 13.0
36	12°09.0	12°11.0	11°35.8	3.6 - 2.9	9.6 - 7.8	15.6 - 12.6	36	12°24.0	12°26.0	11°50.1	3.6 - 3.0	9.6 - 7.9	15.6 - 12.9	36	12°39.0	12°41.1	12°04.4	3.6 - 3.0	9.6 - 8.1	15.6 - 13.1
37	12°09.3	12°11.2	11°36.0	3.7 - 3.0	9.7 - 7.8	15.7 - 12.7	37	12°24.3	12°26.3	11°50.3	3.7 - 3.1	9.7 - 8.0	15.7 - 13.0	37	12°39.3	12°41.3	12°04.7	3.7 - 3.1	9.7 - 8.2	15.7 - 13.2
38	12°09.5	12°11.5	11°36.3	3.8 - 3.1	9.8 - 7.9	15.8 - 12.8	38	12°24.5	12°26.5	11°50.6	3.8 - 3.1	9.8 - 8.1	15.8 - 13.0	38	12°39.5	12°41.6	12°04.9	3.8 - 3.2	9.8 - 8.2	15.8 - 13.3
39	12°09.7	12°11.7	11°36.5	3.9 - 3.2	9.9 - 8.0	15.9 - 12.9	39	12°24.7	12°26.8	11°50.8	3.9 - 3.2	9.9 - 8.2	15.9 - 13.1	39	12°39.7	12°41.8	12°05.1	3.9 - 3.3	9.9 - 8.3	15.9 - 13.4
40	12°10.0	12°12.0	11°36.7	4.0 - 3.2	10.0 - 8.1	16.0 - 12.9	40	12°25.0	12°27.0	11°51.1	4.0 - 3.3	10.0 - 8.3	16.0 - 13.2	40	12°40.0	12°42.1	12°05.4	4.0 - 3.4	10.0 - 8.4	16.0 - 13.5
41	12°10.2	12°12.2	11°37.0	4.1 - 3.3	10.1 - 8.2	16.1 - 13.0	41	12°25.2	12°27.3	11°51.3	4.1 - 3.4	10.1 - 8.3	16.1 - 13.3	41	12°40.2	12°42.3	12°05.6	4.1 - 3.5	10.1 - 8.5	16.1 - 13.6
42	12°10.5	12°12.5	11°37.2	4.2 - 3.4	10.2 - 8.2	16.2 - 13.1	42	12°25.5	12°27.5	11°51.5	4.2 - 3.5	10.2 - 8.4	16.2 - 13.4	42	12°40.5	12°42.6	12°05.9	4.2 - 3.5	10.2 - 8.6	16.2 - 13.6
43	12°10.8	12°12.7	11°37.5	4.3 - 3.5	10.3 - 8.3	16.3 - 13.2	43	12°25.8	12°27.8	11°51.8	4.3 - 3.5	10.3 - 8.5	16.3 - 13.4	43	12°40.8	12°42.8	12°06.1	4.3 - 3.6	10.3 - 8.7	16.3 - 13.7
44	12°11.0	12°13.0	11°37.7	4.4 - 3.6	10.4 - 8.4	16.4 - 13.3	44	12°26.0	12°28.0	11°52.0	4.4 - 3.6	10.4 - 8.6	16.4 - 13.5	44	12°41.0	12°43.1	12°06.3	4.4 - 3.7	10.4 - 8.8	16.4 - 13.8
45	12°11.3	12°13.2	11°37.9	4.5 - 3.6	10.5 - 8.5	16.5 - 13.3	45	12°26.3	12°28.3	11°52.3	4.5 - 3.7	10.5 - 8.7	16.5 - 13.6	45	12°41.3	12°43.3	12°06.6	4.5 - 3.8	10.5 - 8.8	16.5 - 13.9
46	12°11.5	12°13.5	11°38.2	4.6 - 3.7	10.6 - 8.6	16.6 - 13.4	46	12°26.5	12°28.5	11°52.5	4.6 - 3.8	10.6 - 8.7	16.6 - 13.7	46	12°41.5	12°43.6	12°06.8	4.6 - 3.		

Increments and Corrections

m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
51	Plan.						52	Plan.					53	Plan.						
0	12°45.0	12°47.1	12°10.1	0.0 - 0.0	6.0 - 5.1	12.0 - 10.3	0	13°00.0	13°02.1	12°24.5	0.0 - 0.0	6.0 - 5.3	12.0 - 10.5	0	13°15.0	13°17.2	12°38.8	0.0 - 0.0	6.0 - 5.4	12.0 - 10.7
1	12°45.2	12°47.3	12°10.4	0.1 - 0.1	6.1 - 5.2	12.1 - 10.4	1	13°00.2	13°02.4	12°24.7	0.1 - 0.1	6.1 - 5.3	12.1 - 10.6	1	13°15.2	13°17.4	12°39.0	0.1 - 0.1	6.1 - 5.4	12.1 - 10.8
2	12°45.5	12°47.6	12°10.6	0.2 - 0.2	6.2 - 5.3	12.2 - 10.5	2	13°00.5	13°02.6	12°24.9	0.2 - 0.2	6.2 - 5.4	12.2 - 10.7	2	13°15.5	13°17.7	12°39.3	0.2 - 0.2	6.2 - 5.5	12.2 - 10.9
3	12°45.7	12°47.8	12°10.9	0.3 - 0.3	6.3 - 5.4	12.3 - 10.6	3	13°00.7	13°02.9	12°25.2	0.3 - 0.3	6.3 - 5.5	12.3 - 10.8	3	13°15.7	13°17.9	12°39.5	0.3 - 0.3	6.3 - 5.6	12.3 - 11.0
4	12°46.0	12°48.1	12°11.1	0.4 - 0.3	6.4 - 5.5	12.4 - 10.6	4	13°01.0	13°03.1	12°25.4	0.4 - 0.4	6.4 - 5.6	12.4 - 10.8	4	13°16.0	13°18.2	12°39.7	0.4 - 0.4	6.4 - 5.7	12.4 - 11.1
5	12°46.3	12°48.3	12°11.3	0.5 - 0.4	6.5 - 5.6	12.5 - 10.7	5	13°01.3	13°03.4	12°25.7	0.5 - 0.4	6.5 - 5.7	12.5 - 10.9	5	13°16.3	13°18.4	12°40.0	0.5 - 0.4	6.5 - 5.8	12.5 - 11.1
6	12°46.5	12°48.6	12°11.6	0.6 - 0.5	6.6 - 5.7	12.6 - 10.8	6	13°01.5	13°03.6	12°25.9	0.6 - 0.5	6.6 - 5.8	12.6 - 11.0	6	13°16.5	13°18.7	12°40.2	0.6 - 0.5	6.6 - 5.9	12.6 - 11.2
7	12°46.8	12°48.8	12°11.8	0.7 - 0.6	6.7 - 5.8	12.7 - 10.9	7	13°01.8	13°03.9	12°26.1	0.7 - 0.6	6.7 - 5.9	12.7 - 11.1	7	13°16.8	13°18.9	12°40.5	0.7 - 0.6	6.7 - 6.0	12.7 - 11.3
8	12°47.0	12°49.1	12°12.1	0.8 - 0.7	6.8 - 5.8	12.8 - 11.0	8	13°02.0	13°04.1	12°26.4	0.8 - 0.7	6.8 - 6.0	12.8 - 11.2	8	13°17.0	13°19.2	12°40.7	0.8 - 0.7	6.8 - 6.1	12.8 - 11.4
9	12°47.2	12°49.3	12°12.3	0.9 - 0.8	6.9 - 5.9	12.9 - 11.1	9	13°02.2	13°04.4	12°26.6	0.9 - 0.8	6.9 - 6.0	12.9 - 11.3	9	13°17.2	13°19.4	12°40.9	0.9 - 0.8	6.9 - 6.2	12.9 - 11.5
10	12°47.5	12°49.6	12°12.5	1.0 - 0.9	7.0 - 6.0	13.0 - 11.2	10	13°02.5	13°04.6	12°26.9	1.0 - 0.9	7.0 - 6.1	13.0 - 11.4	10	13°17.5	13°19.7	12°41.2	1.0 - 0.9	7.0 - 6.2	13.0 - 11.6
11	12°47.7	12°49.8	12°12.8	1.1 - 0.9	7.1 - 6.1	13.1 - 11.2	11	13°02.7	13°04.9	12°27.1	1.1 - 1.0	7.1 - 6.2	13.1 - 11.5	11	13°17.7	13°19.9	12°41.4	1.1 - 1.0	7.1 - 6.3	13.1 - 11.7
12	12°48.0	12°50.1	12°13.0	1.2 - 1.0	7.2 - 6.2	13.2 - 11.3	12	13°03.0	13°05.1	12°27.3	1.2 - 1.1	7.2 - 6.3	13.2 - 11.5	12	13°18.0	13°20.2	12°41.6	1.2 - 1.1	7.2 - 6.4	13.2 - 11.8
13	12°48.3	12°50.3	12°13.3	1.3 - 1.1	7.3 - 6.3	13.3 - 11.4	13	13°03.3	13°05.4	12°27.6	1.3 - 1.1	7.3 - 6.4	13.3 - 11.6	13	13°18.3	13°20.4	12°41.9	1.3 - 1.2	7.3 - 6.5	13.3 - 11.9
14	12°48.5	12°50.6	12°13.5	1.4 - 1.2	7.4 - 6.4	13.4 - 11.5	14	13°03.5	13°05.6	12°27.8	1.4 - 1.2	7.4 - 6.5	13.4 - 11.7	14	13°18.5	13°20.7	12°42.1	1.4 - 1.2	7.4 - 6.6	13.4 - 11.9
15	12°48.8	12°50.9	12°13.7	1.5 - 1.3	7.5 - 6.4	13.5 - 11.6	15	13°03.8	13°05.9	12°28.0	1.5 - 1.3	7.5 - 6.6	13.5 - 11.8	15	13°18.8	13°20.9	12°42.4	1.5 - 1.3	7.5 - 6.7	13.5 - 12.0
16	12°49.0	12°51.1	12°14.0	1.6 - 1.4	7.6 - 6.5	13.6 - 11.7	16	13°04.0	13°06.1	12°28.3	1.6 - 1.4	7.6 - 6.6	13.6 - 11.9	16	13°19.0	13°21.2	12°42.6	1.6 - 1.4	7.6 - 6.8	13.6 - 12.1
17	12°49.2	12°51.4	12°14.2	1.7 - 1.5	7.7 - 6.6	13.7 - 11.8	17	13°04.2	13°06.4	12°28.5	1.7 - 1.5	7.7 - 6.7	13.7 - 12.0	17	13°19.2	13°21.4	12°42.8	1.7 - 1.5	7.7 - 6.9	13.7 - 12.2
18	12°49.5	12°51.6	12°14.4	1.8 - 1.5	7.8 - 6.7	13.8 - 11.8	18	13°04.5	13°06.6	12°28.8	1.8 - 1.6	7.8 - 6.8	13.8 - 12.1	18	13°19.5	13°21.7	12°43.1	1.8 - 1.6	7.8 - 7.0	13.8 - 12.3
19	12°49.8	12°51.9	12°14.7	1.9 - 1.6	7.9 - 6.8	13.9 - 11.9	19	13°04.8	13°06.9	12°29.0	1.9 - 1.7	7.9 - 6.9	13.9 - 12.2	19	13°19.8	13°21.9	12°43.3	1.9 - 1.7	7.9 - 7.0	13.9 - 12.4
20	12°50.0	12°52.1	12°14.9	2.0 - 1.7	8.0 - 6.9	14.0 - 12.0	20	13°05.0	13°07.1	12°29.2	2.0 - 1.8	8.0 - 7.0	14.0 - 12.3	20	13°20.0	13°22.2	12°43.6	2.0 - 1.8	8.0 - 7.1	14.0 - 12.5
21	12°50.3	12°52.4	12°15.2	2.1 - 1.8	8.1 - 7.0	14.1 - 12.1	21	13°05.3	13°07.4	12°29.5	2.1 - 1.8	8.1 - 7.1	14.1 - 12.3	21	13°20.3	13°22.4	12°43.8	2.1 - 1.9	8.1 - 7.2	14.1 - 12.6
22	12°50.5	12°52.6	12°15.4	2.2 - 1.9	8.2 - 7.0	14.2 - 12.2	22	13°05.5	13°07.6	12°29.7	2.2 - 1.9	8.2 - 7.2	14.2 - 12.4	22	13°20.5	13°22.7	12°44.0	2.2 - 2.0	8.2 - 7.3	14.2 - 12.7
23	12°50.7	12°52.9	12°15.6	2.3 - 2.0	8.3 - 7.1	14.3 - 12.3	23	13°05.7	13°07.9	12°30.0	2.3 - 2.0	8.3 - 7.3	14.3 - 12.5	23	13°20.7	13°22.9	12°44.3	2.3 - 2.1	8.3 - 7.4	14.3 - 12.8
24	12°51.0	12°53.1	12°15.9	2.4 - 2.1	8.4 - 7.2	14.4 - 12.4	24	13°06.0	13°08.1	12°30.2	2.4 - 2.1	8.4 - 7.4	14.4 - 12.6	24	13°21.0	13°23.2	12°44.5	2.4 - 2.1	8.4 - 7.5	14.4 - 12.8
25	12°51.2	12°53.4	12°16.1	2.5 - 2.1	8.5 - 7.3	14.5 - 12.4	25	13°06.2	13°08.4	12°30.4	2.5 - 2.2	8.5 - 7.4	14.5 - 12.7	25	13°21.2	13°23.4	12°44.7	2.5 - 2.2	8.5 - 7.6	14.5 - 12.9
26	12°51.5	12°53.6	12°16.4	2.6 - 2.2	8.6 - 7.4	14.6 - 12.5	26	13°06.5	13°08.6	12°30.7	2.6 - 2.3	8.6 - 7.5	14.6 - 12.8	26	13°21.5	13°23.7	12°45.0	2.6 - 2.3	8.6 - 7.7	14.6 - 13.0
27	12°51.8	12°53.9	12°16.6	2.7 - 2.3	8.7 - 7.5	14.7 - 12.6	27	13°06.8	13°08.9	12°30.9	2.7 - 2.4	8.7 - 7.6	14.7 - 12.9	27	13°21.8	13°23.9	12°45.2	2.7 - 2.4	8.7 - 7.8	14.7 - 13.1
28	12°52.0	12°54.1	12°16.8	2.8 - 2.4	8.8 - 7.6	14.8 - 12.7	28	13°07.0	13°09.2	12°31.1	2.8 - 2.5	8.8 - 7.7	14.8 - 13.0	28	13°22.0	13°24.2	12°45.5	2.8 - 2.5	8.8 - 7.8	14.8 - 13.2
29	12°52.3	12°54.4	12°17.1	2.9 - 2.5	8.9 - 7.6	14.9 - 12.8	29	13°07.3	13°09.4	12°31.4	2.9 - 2.5	8.9 - 7.8	14.9 - 13.0	29	13°22.3	13°24.4	12°45.7	2.9 - 2.6	8.9 - 7.9	14.9 - 13.3
30	12°52.5	12°54.6	12°17.3	3.0 - 2.6	9.0 - 7.7	15.0 - 12.9	30	13°07.5	13°09.7	12°31.6	3.0 - 2.6	9.0 - 7.9	15.0 - 13.1	30	13°22.5	13°24.7	12°45.9	3.0 - 2.7	9.0 - 8.0	15.0 - 13.4
31	12°52.7	12°54.9	12°17.5	3.1 - 2.7	9.1 - 7.8	15.1 - 13.0	31	13°07.7	13°09.9	12°31.9	3.1 - 2.7	9.1 - 8.0	15.1 - 13.2	31	13°22.7	13°24.9	12°46.2	3.1 - 2.8	9.1 - 8.1	15.1 - 13.5
32	12°53.0	12°55.1	12°17.8	3.2 - 2.7	9.2 - 7.9	15.2 - 13.0	32	13°08.0	13°10.2	12°32.1	3.2 - 2.8	9.2 - 8.0	15.2 - 13.3	32	13°23.0	13°25.2	12°46.4	3.2 - 2.9	9.2 - 8.2	15.2 - 13.6
33	12°53.2	12°55.4	12°18.0	3.3 - 2.8	9.3 - 8.0	15.3 - 13.1	33	13°08.2	13°10.4	12°32.3	3.3 - 2.9	9.3 - 8.1	15.3 - 13.4	33	13°23.2	13°25.4	12°46.7	3.3 - 2.9	9.3 - 8.3	15.3 - 13.7
34	12°53.5	12°55.6	12°18.3	3.4 - 2.9	9.4 - 8.1	15.4 - 13.2	34	13°08.5	13°10.7	12°32.6	3.4 - 3.0	9.4 - 8.2	15.4 - 13.5	34	13°23.5	13°25.7	12°46.9	3.4 - 3.0	9.4 - 8.4	15.4 - 13.7
35	12°53.8	12°55.9	12°18.5	3.5 - 3.0	9.5 - 8.2	15.5 - 13.3	35	13°08.8	13°10.9	12°32.8	3.5 - 3.1	9.5 - 8.3	15.5 - 13.6	35	13°23.8	13°25.9	12°47.1	3.5 - 3.1	9.5 - 8.5	15.5 - 13.8
36	12°54.0	12°56.1	12°18.7	3.6 - 3.1	9.6 - 8.2	15.6 - 13.4	36	13°09.0	13°11.2	12°33.1	3.6 - 3.1	9.6 - 8.4	15.6 - 13.7	36	13°24.0	13°26.2	12°47.4	3.6 - 3.2	9.6 - 8.6	15.6 - 13.9
37	12°54.3	12°56.4	12°19.0	3.7 - 3.2	9.7 - 8.3	15.7 - 13.5	37	13°09.3	13°11.4	12°33.3	3.7 - 3.2	9.7 - 8.5	15.7 - 13.7	37	13°24.3	13°26.4	12°47.6	3.7 - 3.3	9.7 - 8.6	15.7 - 14.0
38	12°54.5	12°56.6	12°19.2	3.8 - 3.3	9.8 - 8.4	15.8 - 13.6	38	13°09.5	13°11.7	12°33.5	3.8 - 3.3	9.8 - 8.6	15.8 - 13.8	38	13°24.5	13°26.7	12°47.9	3.8 - 3.4	9.8 - 8.7	15.8 - 14.1
39	12°54.7	12°56.9	12°19.5	3.9 - 3.3	9.9 - 8.5	15.9 - 13.6	39	13°09.7	13°11.9	12°33.8	3.9 - 3.4	9.9 - 8.7	15.9 - 13.9	39	13°24.7	13°26.9	12°48.1	3.9 - 3.5	9.9 - 8.8	15.9 - 14.2
40	12°55.0	12°57.1	12°19.7	4.0 - 3.4	10.0 - 8.6	16.0 - 13.7	40	13°10.0	13°12.2	12°34.0	4.0 - 3.5	10.0 - 8.8	16.0 - 14.0	40	13°25.0	13°27.2	12°48.3	4.0 - 3.6	10.0 - 8.9	16.0 - 14.3
41	12°55.2	12°57.4	12°19.9	4.1 - 3.5	10.1 - 8.7	16.1 - 13.8	41	13°10.2	13°12.4	12°34.2	4.1 - 3.6	10.1 - 8.8	16.1 - 14.1	41	13°25.2	13°27.5	12°48.6	4.1 - 3.7	10.1 - 9.0	16.1 - 14.4
42	12°55.5	12°57.6	12°20.2	4.2 - 3.6	10.2 - 8.8	16.2 - 13.9	42	13°10.5	13°12.7	12°34.5	4.2 - 3.7	10.2 - 8.9	16.2 - 14.2	42	13°25.5	13°27.7	12°48.8	4.2 - 3.7	10.2 - 9.1	16.2 - 14.4
43	12°55.8	12°57.9	12°20.4	4.3 - 3.7	10.3 - 8.8	16.3 - 14.0	43	13°10.8	13°12.9	12°34.7	4.3 - 3.8	10.3 - 9.0	16.3 - 14.3	43	13°25.8	13°28.0	12°49.0	4.3 - 3.8	10.3 - 9.2	16.3 - 14.5
44	12°56.0	12°58.1	12°20.6	4.4 - 3.8	10.4 - 8.9	16.4 - 14.1	44	13°11.0	13°13.2	12°35.0	4.4 - 3.9	10.4 - 9.1	16.4 - 14.3	44	13°26.0	13°28.2	12°49.3	4.4 - 3.9	10.4 - 9.3	16.4 - 14.6
45	12°56.3	12°58.4	12°20.9	4.5 - 3.9	10.5 - 9.0	16.5 - 14.2	45	13°11.3	13°13.4	12°35.2	4.5 - 3.9	10.5 - 9.2	16.5 - 14.4	45	13°26.3	13°28.5	12°49.5	4.5 - 4.0	10.5 - 9.4	16.5 - 14.7
46	12°56.5	12°58.6	12°21.1	4.6 - 3.9	10.6 - 9.1	16.6 - 14.2	46	13°11.5	13°13.7	12°35.4	4.6 - 4.0	10.6 - 9.3	16.6 - 14.5	46	13°26.5	13°28.7	12°49.8	4.6 - 4.1	10.6 - 9.5	16.6 -

Increments and Corrections

m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
54	Plan.						55	Plan.						56	Plan.					
0	13°30.0	13°32.2	12°53.1	0.0 - 0.0	6.0 - 5.5	12.0 - 10.9	0	13°45.0	13°47.3	13°07.4	0.0 - 0.0	6.0 - 5.6	12.0 - 11.1	0	14°00.0	14°02.3	13°21.7	0.0 - 0.0	6.0 - 5.7	12.0 - 11.3
1	13°30.2	13°32.5	12°53.3	0.1 - 0.1	6.1 - 5.5	12.1 - 11.0	1	13°45.2	13°47.5	13°07.7	0.1 - 0.1	6.1 - 5.6	12.1 - 11.2	1	14°00.2	14°02.5	13°22.0	0.1 - 0.1	6.1 - 5.7	12.1 - 11.4
2	13°30.5	13°32.7	12°53.6	0.2 - 0.2	6.2 - 5.6	12.2 - 11.1	2	13°45.5	13°47.8	13°07.9	0.2 - 0.2	6.2 - 5.7	12.2 - 11.3	2	14°00.5	14°02.8	13°22.2	0.2 - 0.2	6.2 - 5.8	12.2 - 11.5
3	13°30.7	13°33.0	12°53.8	0.3 - 0.3	6.3 - 5.7	12.3 - 11.2	3	13°45.7	13°48.0	13°08.1	0.3 - 0.3	6.3 - 5.8	12.3 - 11.4	3	14°00.7	14°03.0	13°22.4	0.3 - 0.3	6.3 - 5.9	12.3 - 11.6
4	13°31.0	13°33.2	12°54.1	0.4 - 0.4	6.4 - 5.8	12.4 - 11.3	4	13°46.0	13°48.3	13°08.4	0.4 - 0.4	6.4 - 5.9	12.4 - 11.5	4	14°01.0	14°03.3	13°22.7	0.4 - 0.4	6.4 - 6.0	12.4 - 11.7
5	13°31.3	13°33.5	12°54.3	0.5 - 0.5	6.5 - 5.9	12.5 - 11.4	5	13°46.3	13°48.5	13°08.6	0.5 - 0.5	6.5 - 6.0	12.5 - 11.6	5	14°01.3	14°03.5	13°22.9	0.5 - 0.5	6.5 - 6.1	12.5 - 11.8
6	13°31.5	13°33.7	12°54.5	0.6 - 0.5	6.6 - 6.0	12.6 - 11.4	6	13°46.5	13°48.8	13°08.8	0.6 - 0.6	6.6 - 6.1	12.6 - 11.7	6	14°01.5	14°03.8	13°23.2	0.6 - 0.6	6.6 - 6.2	12.6 - 11.9
7	13°31.8	13°34.0	12°54.8	0.7 - 0.6	6.7 - 6.1	12.7 - 11.5	7	13°46.8	13°49.0	13°09.1	0.7 - 0.6	6.7 - 6.2	12.7 - 11.7	7	14°01.8	14°04.1	13°23.4	0.7 - 0.7	6.7 - 6.3	12.7 - 12.0
8	13°32.0	13°34.2	12°55.0	0.8 - 0.7	6.8 - 6.2	12.8 - 11.6	8	13°47.0	13°49.3	13°09.3	0.8 - 0.7	6.8 - 6.3	12.8 - 11.8	8	14°02.0	14°04.3	13°23.6	0.8 - 0.8	6.8 - 6.4	12.8 - 12.1
9	13°32.2	13°34.5	12°55.2	0.9 - 0.8	6.9 - 6.3	12.9 - 11.7	9	13°47.2	13°49.5	13°09.6	0.9 - 0.8	6.9 - 6.4	12.9 - 11.9	9	14°02.2	14°04.6	13°23.9	0.9 - 0.8	6.9 - 6.5	12.9 - 12.1
10	13°32.5	13°34.7	12°55.5	1.0 - 0.9	7.0 - 6.4	13.0 - 11.8	10	13°47.5	13°49.8	13°09.8	1.0 - 0.9	7.0 - 6.5	13.0 - 12.0	10	14°02.5	14°04.8	13°24.1	1.0 - 0.9	7.0 - 6.6	13.0 - 12.2
11	13°32.7	13°35.0	12°55.7	1.1 - 1.0	7.1 - 6.4	13.1 - 11.9	11	13°47.7	13°50.0	13°10.0	1.1 - 1.0	7.1 - 6.6	13.1 - 12.1	11	14°02.7	14°05.1	13°24.4	1.1 - 1.0	7.1 - 6.7	13.1 - 12.3
12	13°33.0	13°35.2	12°56.0	1.2 - 1.1	7.2 - 6.5	13.2 - 12.0	12	13°48.0	13°50.3	13°10.3	1.2 - 1.1	7.2 - 6.7	13.2 - 12.2	12	14°03.0	14°05.3	13°24.6	1.2 - 1.1	7.2 - 6.8	13.2 - 12.4
13	13°33.3	13°35.5	12°56.2	1.3 - 1.2	7.3 - 6.6	13.3 - 12.1	13	13°48.3	13°50.5	13°10.5	1.3 - 1.2	7.3 - 6.8	13.3 - 12.3	13	14°03.3	14°05.6	13°24.8	1.3 - 1.2	7.3 - 6.9	13.3 - 12.5
14	13°33.5	13°35.7	12°56.4	1.4 - 1.3	7.4 - 6.7	13.4 - 12.2	14	13°48.5	13°50.8	13°10.8	1.4 - 1.3	7.4 - 6.8	13.4 - 12.4	14	14°03.5	14°05.8	13°25.1	1.4 - 1.3	7.4 - 7.0	13.4 - 12.6
15	13°33.8	13°36.0	12°56.7	1.5 - 1.4	7.5 - 6.8	13.5 - 12.3	15	13°48.8	13°51.0	13°11.0	1.5 - 1.4	7.5 - 6.9	13.5 - 12.5	15	14°03.8	14°06.1	13°25.3	1.5 - 1.4	7.5 - 7.1	13.5 - 12.7
16	13°34.0	13°36.2	12°56.9	1.6 - 1.5	7.6 - 6.9	13.6 - 12.4	16	13°49.0	13°51.3	13°11.2	1.6 - 1.5	7.6 - 7.0	13.6 - 12.6	16	14°04.0	14°06.3	13°25.6	1.6 - 1.5	7.6 - 7.2	13.6 - 12.8
17	13°34.2	13°36.5	12°57.2	1.7 - 1.5	7.7 - 7.0	13.7 - 12.4	17	13°49.2	13°51.5	13°11.5	1.7 - 1.6	7.7 - 7.1	13.7 - 12.7	17	14°04.2	14°06.6	13°25.8	1.7 - 1.6	7.7 - 7.3	13.7 - 12.9
18	13°34.5	13°36.7	12°57.4	1.8 - 1.6	7.8 - 7.1	13.8 - 12.5	18	13°49.5	13°51.8	13°11.7	1.8 - 1.7	7.8 - 7.2	13.8 - 12.8	18	14°04.5	14°06.8	13°26.0	1.8 - 1.7	7.8 - 7.3	13.8 - 13.0
19	13°34.8	13°37.0	12°57.6	1.9 - 1.7	7.9 - 7.2	13.9 - 12.6	19	13°49.8	13°52.0	13°12.0	1.9 - 1.8	7.9 - 7.3	13.9 - 12.9	19	14°04.8	14°07.1	13°26.3	1.9 - 1.8	7.9 - 7.4	13.9 - 13.1
20	13°35.0	13°37.2	12°57.9	2.0 - 1.8	8.0 - 7.3	14.0 - 12.7	20	13°50.0	13°52.3	13°12.2	2.0 - 1.9	8.0 - 7.4	14.0 - 13.0	20	14°05.0	14°07.3	13°26.5	2.0 - 1.9	8.0 - 7.5	14.0 - 13.2
21	13°35.3	13°37.5	12°58.1	2.1 - 1.9	8.1 - 7.4	14.1 - 12.8	21	13°50.3	13°52.5	13°12.4	2.1 - 1.9	8.1 - 7.5	14.1 - 13.0	21	14°05.3	14°07.6	13°26.7	2.1 - 2.0	8.1 - 7.6	14.1 - 13.3
22	13°35.5	13°37.7	12°58.3	2.2 - 2.0	8.2 - 7.4	14.2 - 12.9	22	13°50.5	13°52.8	13°12.7	2.2 - 2.0	8.2 - 7.6	14.2 - 13.1	22	14°05.5	14°07.8	13°27.0	2.2 - 2.1	8.2 - 7.7	14.2 - 13.4
23	13°35.7	13°38.0	12°58.6	2.3 - 2.1	8.3 - 7.5	14.3 - 13.0	23	13°50.7	13°53.0	13°12.9	2.3 - 2.1	8.3 - 7.7	14.3 - 13.2	23	14°05.7	14°08.1	13°27.2	2.3 - 2.2	8.3 - 7.8	14.3 - 13.5
24	13°36.0	13°38.2	12°58.8	2.4 - 2.2	8.4 - 7.6	14.4 - 13.1	24	13°51.0	13°53.3	13°13.1	2.4 - 2.2	8.4 - 7.8	14.4 - 13.3	24	14°06.0	14°08.3	13°27.5	2.4 - 2.3	8.4 - 7.9	14.4 - 13.6
25	13°36.2	13°38.5	12°59.1	2.5 - 2.3	8.5 - 7.7	14.5 - 13.2	25	13°51.2	13°53.5	13°13.4	2.5 - 2.3	8.5 - 7.9	14.5 - 13.4	25	14°06.2	14°08.6	13°27.7	2.5 - 2.4	8.5 - 8.0	14.5 - 13.7
26	13°36.5	13°38.7	12°59.3	2.6 - 2.4	8.6 - 7.8	14.6 - 13.3	26	13°51.5	13°53.8	13°13.6	2.6 - 2.4	8.6 - 8.0	14.6 - 13.5	26	14°06.5	14°08.8	13°27.9	2.6 - 2.4	8.6 - 8.1	14.6 - 13.7
27	13°36.8	13°39.0	12°59.5	2.7 - 2.5	8.7 - 7.9	14.7 - 13.4	27	13°51.8	13°54.0	13°13.9	2.7 - 2.5	8.7 - 8.0	14.7 - 13.6	27	14°06.8	14°09.1	13°28.2	2.7 - 2.5	8.7 - 8.2	14.7 - 13.8
28	13°37.0	13°39.2	12°59.8	2.8 - 2.5	8.8 - 8.0	14.8 - 13.4	28	13°52.0	13°54.3	13°14.1	2.8 - 2.6	8.8 - 8.1	14.8 - 13.7	28	14°07.0	14°09.3	13°28.4	2.8 - 2.6	8.8 - 8.3	14.8 - 13.9
29	13°37.3	13°39.5	13°00.0	2.9 - 2.6	8.9 - 8.1	14.9 - 13.5	29	13°52.3	13°54.5	13°14.3	2.9 - 2.7	8.9 - 8.2	14.9 - 13.8	29	14°07.3	14°09.6	13°28.7	2.9 - 2.7	8.9 - 8.4	14.9 - 14.0
30	13°37.5	13°39.7	13°00.3	3.0 - 2.7	9.0 - 8.2	15.0 - 13.6	30	13°52.5	13°54.8	13°14.6	3.0 - 2.8	9.0 - 8.3	15.0 - 13.9	30	14°07.5	14°09.8	13°28.9	3.0 - 2.8	9.0 - 8.5	15.0 - 14.1
31	13°37.7	13°40.0	13°00.5	3.1 - 2.8	9.1 - 8.3	15.1 - 13.7	31	13°52.7	13°55.0	13°14.8	3.1 - 2.9	9.1 - 8.4	15.1 - 14.0	31	14°07.7	14°10.1	13°29.1	3.1 - 2.9	9.1 - 8.6	15.1 - 14.2
32	13°38.0	13°40.2	13°00.7	3.2 - 2.9	9.2 - 8.4	15.2 - 13.8	32	13°53.0	13°55.3	13°15.1	3.2 - 3.0	9.2 - 8.5	15.2 - 14.1	32	14°08.0	14°10.3	13°29.4	3.2 - 3.0	9.2 - 8.7	15.2 - 14.3
33	13°38.2	13°40.5	13°01.0	3.3 - 3.0	9.3 - 8.4	15.3 - 13.9	33	13°53.2	13°55.5	13°15.3	3.3 - 3.1	9.3 - 8.6	15.3 - 14.2	33	14°08.2	14°10.6	13°29.6	3.3 - 3.1	9.3 - 8.8	15.3 - 14.4
34	13°38.5	13°40.7	13°01.2	3.4 - 3.1	9.4 - 8.5	15.4 - 14.0	34	13°53.5	13°55.8	13°15.5	3.4 - 3.1	9.4 - 8.7	15.4 - 14.2	34	14°08.5	14°10.8	13°29.8	3.4 - 3.2	9.4 - 8.9	15.4 - 14.5
35	13°38.8	13°41.0	13°01.5	3.5 - 3.2	9.5 - 8.6	15.5 - 14.1	35	13°53.8	13°56.0	13°15.8	3.5 - 3.2	9.5 - 8.8	15.5 - 14.3	35	14°08.8	14°11.1	13°30.1	3.5 - 3.3	9.5 - 8.9	15.5 - 14.6
36	13°39.0	13°41.2	13°01.7	3.6 - 3.3	9.6 - 8.7	15.6 - 14.2	36	13°54.0	13°56.3	13°16.0	3.6 - 3.3	9.6 - 8.9	15.6 - 14.4	36	14°09.0	14°11.3	13°30.3	3.6 - 3.4	9.6 - 9.0	15.6 - 14.7
37	13°39.3	13°41.5	13°01.9	3.7 - 3.4	9.7 - 8.8	15.7 - 14.3	37	13°54.3	13°56.5	13°16.2	3.7 - 3.4	9.7 - 9.0	15.7 - 14.5	37	14°09.3	14°11.6	13°30.6	3.7 - 3.5	9.7 - 9.1	15.7 - 14.8
38	13°39.5	13°41.7	13°02.2	3.8 - 3.5	9.8 - 8.9	15.8 - 14.4	38	13°54.5	13°56.8	13°16.5	3.8 - 3.5	9.8 - 9.1	15.8 - 14.6	38	14°09.5	14°11.8	13°30.8	3.8 - 3.6	9.8 - 9.2	15.8 - 14.9
39	13°39.7	13°42.0	13°02.4	3.9 - 3.5	9.9 - 9.0	15.9 - 14.4	39	13°54.7	13°57.0	13°16.7	3.9 - 3.6	9.9 - 9.2	15.9 - 14.7	39	14°09.7	14°12.1	13°31.0	3.9 - 3.7	9.9 - 9.3	15.9 - 15.0
40	13°40.0	13°42.2	13°02.6	4.0 - 3.6	10.0 - 9.1	16.0 - 14.5	40	13°55.0	13°57.3	13°17.0	4.0 - 3.7	10.0 - 9.3	16.0 - 14.8	40	14°10.0	14°12.3	13°31.3	4.0 - 3.8	10.0 - 9.4	16.0 - 15.1
41	13°40.2	13°42.5	13°02.9	4.1 - 3.7	10.1 - 9.2	16.1 - 14.6	41	13°55.2	13°57.5	13°17.2	4.1 - 3.8	10.1 - 9.3	16.1 - 14.9	41	14°10.2	14°12.6	13°31.5	4.1 - 3.9	10.1 - 9.5	16.1 - 15.2
42	13°40.5	13°42.7	13°03.1	4.2 - 3.8	10.2 - 9.3	16.2 - 14.7	42	13°55.5	13°57.8	13°17.4	4.2 - 3.9	10.2 - 9.4	16.2 - 15.0	42	14°10.5	14°12.8	13°31.8	4.2 - 4.0	10.2 - 9.6	16.2 - 15.3
43	13°40.8	13°43.0	13°03.4	4.3 - 3.9	10.3 - 9.4	16.3 - 14.8	43	13°55.8	13°58.0	13°17.7	4.3 - 4.0	10.3 - 9.5	16.3 - 15.1	43	14°10.8	14°13.1	13°32.0	4.3 - 4.0	10.3 - 9.7	16.3 - 15.3
44	13°41.0	13°43.2	13°03.6	4.4 - 4.0	10.4 - 9.4	16.4 - 14.9	44	13°56.0	13°58.3	13°17.9	4.4 - 4.1	10.4 - 9.6	16.4 - 15.2	44	14°11.0	14°13.3	13°32.2	4.4 - 4.1	10.4 - 9.8	16.4 - 15.4
45	13°41.3	13°43.5	13°03.8	4.5 - 4.1	10.5 - 9.5	16.5 - 15.0	45	13°56.3	13°58.5	13°18.2	4.5 - 4.2	10.5 - 9.7	16.5 - 15.3	45	14°11.3	14°13.6	13°32.5	4.5 - 4.2	10.5 - 9.9	16.5 - 15.5
46	13°41.5	13°43.7	13°04.1	4.6 - 4.2	10.6 - 9.6	16.6 - 15.1	46	13°56.5	13°58.8	13°18.4	4.6 - 4.3	10.6 - 9.8	16.6 - 15.4	46	14°11.5	14°13.8	13°32.7	4.6 - 4.3	10.6 - 10.0	16.6 -

Increments and Corrections

m 57	Sun Plan.	Aries	Moon	v and d corr			m 58	Sun Plan.	Aries	Moon	v and d corr			m 59	Sun Plan.	Aries	Moon	v and d corr		
0	14°15.0	14°17.3	13°36.0	0.0 - 0.0	6.0 - 5.8	12.0 - 11.5	0	14°30.0	14°32.4	13°50.4	0.0 - 0.0	6.0 - 5.8	12.0 - 11.7	0	14°45.0	14°47.4	14°04.7	0.0 - 0.0	6.0 - 6.0	12.0 - 11.9
1	14°15.2	14°17.6	13°36.3	0.1 - 0.1	6.1 - 5.8	12.1 - 11.6	1	14°30.2	14°32.6	13°50.6	0.1 - 0.1	6.1 - 5.9	12.1 - 11.8	1	14°45.2	14°47.7	14°04.9	0.1 - 0.1	6.1 - 6.0	12.1 - 12.0
2	14°15.5	14°17.8	13°36.5	0.2 - 0.2	6.2 - 5.9	12.2 - 11.7	2	14°30.5	14°32.9	13°50.8	0.2 - 0.2	6.2 - 6.0	12.2 - 11.9	2	14°45.5	14°47.9	14°05.2	0.2 - 0.2	6.2 - 6.1	12.2 - 12.1
3	14°15.7	14°18.1	13°36.8	0.3 - 0.3	6.3 - 6.0	12.3 - 11.8	3	14°30.7	14°33.1	13°51.1	0.3 - 0.3	6.3 - 6.1	12.3 - 12.0	3	14°45.7	14°48.2	14°05.4	0.3 - 0.3	6.3 - 6.2	12.3 - 12.2
4	14°16.0	14°18.3	13°37.0	0.4 - 0.4	6.4 - 6.1	12.4 - 11.9	4	14°31.0	14°33.4	13°51.3	0.4 - 0.4	6.4 - 6.2	12.4 - 12.1	4	14°46.0	14°48.4	14°05.6	0.4 - 0.4	6.4 - 6.3	12.4 - 12.3
5	14°16.3	14°18.6	13°37.2	0.5 - 0.5	6.5 - 6.2	12.5 - 12.0	5	14°31.3	14°33.6	13°51.6	0.5 - 0.5	6.5 - 6.3	12.5 - 12.2	5	14°46.3	14°48.7	14°05.9	0.5 - 0.5	6.5 - 6.4	12.5 - 12.4
6	14°16.5	14°18.8	13°37.5	0.6 - 0.6	6.6 - 6.3	12.6 - 12.1	6	14°31.5	14°33.9	13°51.8	0.6 - 0.6	6.6 - 6.4	12.6 - 12.3	6	14°46.5	14°48.9	14°06.1	0.6 - 0.6	6.6 - 6.5	12.6 - 12.5
7	14°16.8	14°19.1	13°37.7	0.7 - 0.7	6.7 - 6.4	12.7 - 12.2	7	14°31.8	14°34.1	13°52.0	0.7 - 0.7	6.7 - 6.5	12.7 - 12.4	7	14°46.8	14°49.2	14°06.4	0.7 - 0.7	6.7 - 6.6	12.7 - 12.6
8	14°17.0	14°19.3	13°38.0	0.8 - 0.8	6.8 - 6.5	12.8 - 12.3	8	14°32.0	14°34.4	13°52.3	0.8 - 0.8	6.8 - 6.6	12.8 - 12.5	8	14°47.0	14°49.4	14°06.6	0.8 - 0.8	6.8 - 6.7	12.8 - 12.7
9	14°17.2	14°19.6	13°38.2	0.9 - 0.9	6.9 - 6.6	12.9 - 12.4	9	14°32.2	14°34.6	13°52.5	0.9 - 0.9	6.9 - 6.7	12.9 - 12.6	9	14°47.2	14°49.7	14°06.8	0.9 - 0.9	6.9 - 6.8	12.9 - 12.8
10	14°17.5	14°19.8	13°38.4	1.0 - 1.0	7.0 - 6.7	13.0 - 12.5	10	14°32.5	14°34.9	13°52.8	1.0 - 1.0	7.0 - 6.8	13.0 - 12.7	10	14°47.5	14°49.9	14°07.1	1.0 - 1.0	7.0 - 6.9	13.0 - 12.9
11	14°17.7	14°20.1	13°38.7	1.1 - 1.1	7.1 - 6.8	13.1 - 12.6	11	14°32.7	14°35.1	13°53.0	1.1 - 1.1	7.1 - 6.9	13.1 - 12.8	11	14°47.7	14°50.2	14°07.3	1.1 - 1.1	7.1 - 7.0	13.1 - 13.0
12	14°18.0	14°20.3	13°38.9	1.2 - 1.2	7.2 - 6.9	13.2 - 12.7	12	14°33.0	14°35.4	13°53.2	1.2 - 1.2	7.2 - 7.0	13.2 - 12.9	12	14°48.0	14°50.4	14°07.5	1.2 - 1.2	7.2 - 7.1	13.2 - 13.1
13	14°18.3	14°20.6	13°39.2	1.3 - 1.2	7.3 - 7.0	13.3 - 12.7	13	14°33.3	14°35.6	13°53.5	1.3 - 1.3	7.3 - 7.1	13.3 - 13.0	13	14°48.3	14°50.7	14°07.8	1.3 - 1.3	7.3 - 7.2	13.3 - 13.2
14	14°18.5	14°20.8	13°39.4	1.4 - 1.3	7.4 - 7.1	13.4 - 12.8	14	14°33.5	14°35.9	13°53.7	1.4 - 1.4	7.4 - 7.2	13.4 - 13.1	14	14°48.5	14°50.9	14°08.0	1.4 - 1.4	7.4 - 7.3	13.4 - 13.3
15	14°18.8	14°21.1	13°39.6	1.5 - 1.4	7.5 - 7.2	13.5 - 12.9	15	14°33.8	14°36.1	13°53.9	1.5 - 1.5	7.5 - 7.3	13.5 - 13.2	15	14°48.8	14°51.2	14°08.3	1.5 - 1.5	7.5 - 7.4	13.5 - 13.4
16	14°19.0	14°21.3	13°39.9	1.6 - 1.5	7.6 - 7.3	13.6 - 13.0	16	14°34.0	14°36.4	13°54.2	1.6 - 1.6	7.6 - 7.4	13.6 - 13.3	16	14°49.0	14°51.4	14°08.5	1.6 - 1.6	7.6 - 7.5	13.6 - 13.5
17	14°19.2	14°21.6	13°40.1	1.7 - 1.6	7.7 - 7.4	13.7 - 13.1	17	14°34.2	14°36.6	13°54.4	1.7 - 1.7	7.7 - 7.5	13.7 - 13.4	17	14°49.2	14°51.7	14°08.7	1.7 - 1.7	7.7 - 7.6	13.7 - 13.6
18	14°19.5	14°21.8	13°40.3	1.8 - 1.7	7.8 - 7.5	13.8 - 13.2	18	14°34.5	14°36.9	13°54.7	1.8 - 1.8	7.8 - 7.6	13.8 - 13.5	18	14°49.5	14°51.9	14°09.0	1.8 - 1.8	7.8 - 7.7	13.8 - 13.7
19	14°19.8	14°22.1	13°40.6	1.9 - 1.8	7.9 - 7.6	13.9 - 13.3	19	14°34.8	14°37.1	13°54.9	1.9 - 1.9	7.9 - 7.7	13.9 - 13.6	19	14°49.8	14°52.2	14°09.2	1.9 - 1.9	7.9 - 7.8	13.9 - 13.8
20	14°20.0	14°22.4	13°40.8	2.0 - 1.9	8.0 - 7.7	14.0 - 13.4	20	14°35.0	14°37.4	13°55.1	2.0 - 1.9	8.0 - 7.8	14.0 - 13.7	20	14°50.0	14°52.4	14°09.5	2.0 - 2.0	8.0 - 7.9	14.0 - 13.9
21	14°20.3	14°22.6	13°41.1	2.1 - 2.0	8.1 - 7.8	14.1 - 13.5	21	14°35.3	14°37.6	13°55.4	2.1 - 2.0	8.1 - 7.9	14.1 - 13.7	21	14°50.3	14°52.7	14°09.7	2.1 - 2.1	8.1 - 8.0	14.1 - 14.0
22	14°20.5	14°22.9	13°41.3	2.2 - 2.1	8.2 - 7.9	14.2 - 13.6	22	14°35.5	14°37.9	13°55.6	2.2 - 2.1	8.2 - 8.0	14.2 - 13.8	22	14°50.5	14°52.9	14°09.9	2.2 - 2.2	8.2 - 8.1	14.2 - 14.1
23	14°20.7	14°23.1	13°41.5	2.3 - 2.2	8.3 - 8.0	14.3 - 13.7	23	14°35.7	14°38.1	13°55.9	2.3 - 2.2	8.3 - 8.1	14.3 - 13.9	23	14°50.7	14°53.2	14°10.2	2.3 - 2.3	8.3 - 8.2	14.3 - 14.2
24	14°21.0	14°23.4	13°41.8	2.4 - 2.3	8.4 - 8.1	14.4 - 13.8	24	14°36.0	14°38.4	13°56.1	2.4 - 2.3	8.4 - 8.2	14.4 - 14.0	24	14°51.0	14°53.4	14°10.4	2.4 - 2.4	8.4 - 8.3	14.4 - 14.3
25	14°21.2	14°23.6	13°42.0	2.5 - 2.4	8.5 - 8.1	14.5 - 13.9	25	14°36.2	14°38.6	13°56.3	2.5 - 2.4	8.5 - 8.3	14.5 - 14.1	25	14°51.2	14°53.7	14°10.6	2.5 - 2.5	8.5 - 8.4	14.5 - 14.4
26	14°21.5	14°23.9	13°42.3	2.6 - 2.5	8.6 - 8.2	14.6 - 14.0	26	14°36.5	14°38.9	13°56.6	2.6 - 2.5	8.6 - 8.4	14.6 - 14.2	26	14°51.5	14°53.9	14°10.9	2.6 - 2.6	8.6 - 8.5	14.6 - 14.5
27	14°21.8	14°24.1	13°42.5	2.7 - 2.6	8.7 - 8.3	14.7 - 14.1	27	14°36.8	14°39.1	13°56.8	2.7 - 2.6	8.7 - 8.5	14.7 - 14.3	27	14°51.8	14°54.2	14°11.1	2.7 - 2.7	8.7 - 8.6	14.7 - 14.6
28	14°22.0	14°24.4	13°42.7	2.8 - 2.7	8.8 - 8.4	14.8 - 14.2	28	14°37.0	14°39.4	13°57.0	2.8 - 2.7	8.8 - 8.6	14.8 - 14.4	28	14°52.0	14°54.4	14°11.4	2.8 - 2.8	8.8 - 8.7	14.8 - 14.7
29	14°22.3	14°24.6	13°43.0	2.9 - 2.8	8.9 - 8.5	14.9 - 14.3	29	14°37.3	14°39.6	13°57.3	2.9 - 2.8	8.9 - 8.7	14.9 - 14.5	29	14°52.3	14°54.7	14°11.6	2.9 - 2.9	8.9 - 8.8	14.9 - 14.8
30	14°22.5	14°24.9	13°43.2	3.0 - 2.9	9.0 - 8.6	15.0 - 14.4	30	14°37.5	14°39.9	13°57.5	3.0 - 2.9	9.0 - 8.8	15.0 - 14.6	30	14°52.5	14°54.9	14°11.8	3.0 - 3.0	9.0 - 8.9	15.0 - 14.9
31	14°22.7	14°25.1	13°43.4	3.1 - 3.0	9.1 - 8.7	15.1 - 14.5	31	14°37.7	14°40.1	13°57.8	3.1 - 3.0	9.1 - 8.9	15.1 - 14.7	31	14°52.7	14°55.2	14°12.1	3.1 - 3.1	9.1 - 9.0	15.1 - 15.0
32	14°23.0	14°25.4	13°43.7	3.2 - 3.1	9.2 - 8.8	15.2 - 14.6	32	14°38.0	14°40.4	13°58.0	3.2 - 3.1	9.2 - 9.0	15.2 - 14.8	32	14°53.0	14°55.4	14°12.3	3.2 - 3.2	9.2 - 9.1	15.2 - 15.1
33	14°23.2	14°25.6	13°43.9	3.3 - 3.2	9.3 - 8.9	15.3 - 14.7	33	14°38.2	14°40.7	13°58.2	3.3 - 3.2	9.3 - 9.1	15.3 - 14.9	33	14°53.2	14°55.7	14°12.6	3.3 - 3.3	9.3 - 9.2	15.3 - 15.2
34	14°23.5	14°25.9	13°44.2	3.4 - 3.3	9.4 - 9.0	15.4 - 14.8	34	14°38.5	14°40.9	13°58.5	3.4 - 3.3	9.4 - 9.2	15.4 - 15.0	34	14°53.5	14°55.9	14°12.8	3.4 - 3.4	9.4 - 9.3	15.4 - 15.3
35	14°23.8	14°26.1	13°44.4	3.5 - 3.4	9.5 - 9.1	15.5 - 14.9	35	14°38.8	14°41.2	13°58.7	3.5 - 3.4	9.5 - 9.3	15.5 - 15.1	35	14°53.8	14°56.2	14°13.0	3.5 - 3.5	9.5 - 9.4	15.5 - 15.4
36	14°24.0	14°26.4	13°44.6	3.6 - 3.5	9.6 - 9.2	15.6 - 15.0	36	14°39.0	14°41.4	13°59.0	3.6 - 3.5	9.6 - 9.4	15.6 - 15.2	36	14°54.0	14°56.4	14°13.3	3.6 - 3.6	9.6 - 9.5	15.6 - 15.5
37	14°24.3	14°26.6	13°44.9	3.7 - 3.5	9.7 - 9.3	15.7 - 15.0	37	14°39.3	14°41.7	13°59.2	3.7 - 3.6	9.7 - 9.5	15.7 - 15.3	37	14°54.3	14°56.7	14°13.5	3.7 - 3.7	9.7 - 9.6	15.7 - 15.6
38	14°24.5	14°26.9	13°45.1	3.8 - 3.6	9.8 - 9.4	15.8 - 15.1	38	14°39.5	14°41.9	13°59.4	3.8 - 3.7	9.8 - 9.6	15.8 - 15.4	38	14°54.5	14°56.9	14°13.8	3.8 - 3.8	9.8 - 9.7	15.8 - 15.7
39	14°24.7	14°27.1	13°45.4	3.9 - 3.7	9.9 - 9.5	15.9 - 15.2	39	14°39.7	14°42.2	13°59.7	3.9 - 3.8	9.9 - 9.7	15.9 - 15.5	39	14°54.7	14°57.2	14°14.0	3.9 - 3.9	9.9 - 9.8	15.9 - 15.8
40	14°25.0	14°27.4	13°45.6	4.0 - 3.8	10.0 - 9.6	16.0 - 15.3	40	14°40.0	14°42.4	13°59.9	4.0 - 3.9	10.0 - 9.8	16.0 - 15.6	40	14°55.0	14°57.4	14°14.2	4.0 - 4.0	10.0 - 9.9	16.0 - 15.9
41	14°25.2	14°27.6	13°45.8	4.1 - 3.9	10.1 - 9.7	16.1 - 15.4	41	14°40.2	14°42.7	14°00.1	4.1 - 4.0	10.1 - 9.8	16.1 - 15.7	41	14°55.2	14°57.7	14°14.5	4.1 - 4.1	10.1 - 10.0	16.1 - 16.0
42	14°25.5	14°27.9	13°46.1	4.2 - 4.0	10.2 - 9.8	16.2 - 15.5	42	14°40.5	14°42.9	14°00.4	4.2 - 4.1	10.2 - 9.9	16.2 - 15.8	42	14°55.5	14°57.9	14°14.7	4.2 - 4.2	10.2 - 10.1	16.2 - 16.1
43	14°25.8	14°28.1	13°46.3	4.3 - 4.1	10.3 - 9.9	16.3 - 15.6	43	14°40.8	14°43.2	14°00.6	4.3 - 4.2	10.3 - 10.0	16.3 - 15.9	43	14°55.8	14°58.2	14°14.9	4.3 - 4.3	10.3 - 10.2	16.3 - 16.2
44	14°26.0	14°28.4	13°46.5	4.4 - 4.2	10.4 - 10.0	16.4 - 15.7	44	14°41.0	14°43.4	14°00.9	4.4 - 4.3	10.4 - 10.1	16.4 - 16.0	44	14°56.0	14°58.4	14°15.2	4.4 - 4.4	10.4 - 10.3	16.4 - 16.3
45	14°26.3	14°28.6	13°46.8	4.5 - 4.3	10.5 - 10.1	16.5 - 15.8	45	14°41.3	14°43.7	14°01.1	4.5 - 4.4	10.5 - 10.2	16.5 - 16.1	45	14°56.3	14°58.7	14°15.4	4.5 - 4.5	10.5 - 10.4	16.5 - 16.4
46	14°26.5	14°28.9	13°47.0	4.6 - 4.4	10.6 - 10.2	16.6 - 15.9	46	14°41.5	14°43.9	14°01.3	4.6 - 4.5	10.6 - 10.3	16.6 - 16.2	46	14°56.5	14°59.0	14			

Altitude Correction Tables for 10° to 90° — Sun, Stars, Planets

SUN October – March			SUN April – September			Stars & Planets		Additional Altitude Correction for Mars & Venus	Refraction		DIP <i>always subtracted from Hs</i>				
App. Alt.	Lower Limb	Upper Limb	App. Alt.	Lower Limb	Upper Limb	App. Alt.	Corr		App. Alt.	Corr	Ht. of Eye	Corr	Ht. of Eye	Ht. of Eye	Corr
9 33	+10.8	- 21.5	9 39	+10.6	- 21.2	9 55	-5.3	5.5	-9.1	2.4		8.0	1.0	-1.8	
9 45	+10.9	-21.4	9 50	+10.7	-21.1	10 07	-5.2	6.0	-8.5	2.6	-2.8	8.6	1.5	-2.2	
9 56	+11.0	-21.3	10 02	+10.8	-21.0	10 20	-5.1	6.5	-7.9	2.8	-2.9	9.2	2.0	-2.5	
10 08	+11.1	-21.2	10 14	+10.9	-20.9	10 32	-5.0	7.0	-7.5	3.0	-3.0	9.8	2.5	-2.8	
10 20	+11.2	-21.1	10 27	+11.0	-20.8	10 46	-4.9	7.5	-7.0	3.2	-3.1	10.5	3.0	-3.0	
10 33	+11.3	-21.0	10 40	+11.1	-20.7	10 59	-4.8	8.0	-6.6	3.4	-3.2	11.2			
10 46	+11.4	-20.9	10 53	+11.2	-20.6	11 14	-4.7	8.5	-6.3	3.6	-3.3	11.9		See table	
11 00	+11.5	-20.8	11 07	+11.3	-20.5	11 29	-4.6	9.0	-5.9	3.8	-3.4	12.6			
11 15	+11.6	-20.7	11 22	+11.4	-20.4	11 44	-4.6	9.5	-5.7	4.0	-3.5	13.3			
11 30	+11.7	-20.6	11 37	+11.5	-20.3	12 00	-4.5	10.0	-5.4	4.3	-3.6	14.1	20	-7.9	
11 45	+11.8	-20.5	11 53	+11.6	-20.2	12 17	-4.4	10.5	-5.1	4.5	-3.7	14.9	22	-8.3	
12 01	+11.9	-20.4	12 10	+11.7	-20.1	12 35	-4.3	11.0	-4.9	4.7	-3.8	15.7	24	-8.6	
12 18	+12.0	-20.3	12 27	+11.8	-20.0	12 53	-4.2	11.5	-4.7	5.0	-3.9	16.5	26	-9.0	
12 36	+12.1	-20.2	14 45	+11.9	-19.9	13 12	-4.1	12.0	-4.5	5.2	-4.0	17.4	28	-9.3	
12 54	+12.2	-20.1	13 04	+12.0	-19.8	13 32	-4.0	12.5	-4.4	5.5	-4.1	18.3			
13 14	+12.3	-20.0	13 24	+12.1	-19.7	13 53	-3.9	13.0	-4.2	5.8	-4.2	19.1	30	-9.6	
13 34	+12.4	-19.9	13 44	+12.2	-19.6	14 16	-3.8	13.5	-4.0	6.1	-4.3	20.1	32	-10.0	
13 55	+12.5	-19.8	14 06	+12.3	-19.5	14 39	-3.7	14.0	-3.9	6.3	-4.4	21.0	34	-10.3	
14 17	+12.6	-19.7	14 29	+12.4	-19.4	15 03	-3.6	14.5	-3.8	6.6	-4.5	22.0	36	-10.6	
14 41	+12.7	-19.6	14 53	+12.5	-19.3	15 29	-3.5	15.0	-3.6	6.9	-4.6	22.9	38	-10.8	
15 05	+12.8	-19.5	15 18	+12.6	-19.2	15 56	-3.4	15.5	-3.5	7.2	-4.7	23.9			
15 31	+12.9	-19.4	15 45	+12.7	-19.1	16 25	-3.3	16.0	-3.4	7.5	-4.8	24.9	40	-11.1	
15 59	+13.0	-19.3	16 13	+12.8	-19.0	16 55	-3.2	16.5	-3.3	7.9	-4.9	26.0	42	-11.4	
16 27	+13.1	-19.2	16 43	+12.9	-18.9	17 27	-3.1	17.0	-3.2	8.2	-5.0	27.1	44	-11.7	
16 58	+13.2	-19.1	17 14	+13.0	-18.8	18 01	-3.0	17.5	-3.1	8.5	-5.1	28.1	46	-11.9	
17 30	+13.3	-19.0	17 47	+13.1	-18.7	18 37	-2.9	18.0	-3.0	8.8	-5.2	29.2	48	-12.2	
18 05	+13.4	-18.9	18 23	+13.2	-18.6	19 16	-2.8	18.5	-2.9	9.2	-5.3	30.4		feet	
18 41	+13.5	-18.8	19 00	+13.3	-18.5	19 56	-2.7	19.0	-2.9	9.5	-5.4	31.5	2	-1.4	
19 20	+13.6	-18.7	19 41	+13.4	-18.4	20 40	-2.6	19.5	-2.8	9.9	-5.5	32.7	4	-1.9	
20 02	+13.7	-18.6	20 24	+13.5	-18.3	21 27	-2.5	20.0	-2.7	10.3	-5.6	33.9	6	-2.4	
20 46	+13.8	-18.5	21 10	+13.6	-18.2	22 17	-2.4	21.0	-2.6	10.6	-5.7	35.1	8	-2.7	
21 34	+13.9	-18.4	21 59	+13.7	-18.1	23 11	-2.3	22.0	-2.4	11.0	-5.8	36.3	10	-3.1	
22 25	+14.0	-18.3	22 52	+13.8	-18.0	24 09	-2.2	23.0	-2.3	11.4	-5.9	37.6		See table	
23 20	+14.1	-18.2	23 49	+13.9	-17.9	25 12	-2.1	24.0	-2.2	11.8	-6.0	38.9			
24 20	+14.2	-18.1	24 51	+14.0	-17.8	26 20	-2.0	25.0	-2.1	12.2	-6.1	40.1		feet	
25 24	+14.3	-18.0	25 58	+14.1	-17.7	27 34	-1.9	26.0	-2.0	12.6	-6.2	41.5	70	-8.1	
26 34	+14.4	-17.9	27 11	+14.2	-17.6	28 54	-1.8	27.0	-1.9	13.0	-6.3	42.8	75	-8.4	
27 50	+14.5	-17.8	28 31	+14.3	-17.5	30 22	-1.7	28.0	-1.9	13.4	-6.4	44.2	80	-8.7	
29 13	+14.6	-17.7	29 58	+14.4	-17.4	31 58	-1.6	29.0	-1.8	13.8	-6.5	45.5	85	-8.9	
30 44	+14.7	-17.6	31 33	+14.5	-17.3	33 43	-1.5	30.0	-1.7	14.2	-6.6	46.9	90	-9.2	
32 24	+14.8	-17.5	33 18	+14.6	-17.2	35 38	-1.4	31.0	-1.7	14.7	-6.7	48.4	95	9.5	
34 15	+14.9	-17.4	35 15	+14.7	-17.1	37 45	-1.3	32.0	-1.6	15.1	-6.8	49.8	100	-9.7	
36 17	+15.0	-17.3	37 24	+14.8	-17.0	40 06	-1.2	33.0	-1.5	15.5	-6.9	51.3	105	-9.9	
38 34	+15.1	-17.2	39 48	+14.9	-16.9	42 42	-1.1	34.0	-1.5	16.0	-7.0	52.8	110	-10.2	
41 06	+15.2	-17.1	42 28	+15.0	-16.8	45 34	-1.0	35.0	-1.4	16.5	-7.1	54.3	115	-10.4	
43 56	+15.3	-17.0	45 29	+15.1	-16.7	48 45	-0.9	36.0	-1.4	16.9	-7.2	55.8	120	-10.6	
47 07	+15.4	-16.9	48 52	+15.2	-16.6	52 16	-0.8	37.0	-1.3	17.4	-7.3	57.4	125	-10.8	
50 43	+15.5	-16.8	51 41	+15.3	-16.5	56 09	-0.7	38.0	-1.3	17.9	-7.4	58.9			
54 46	+15.6	-16.7	56 59	+15.4	-16.4	60 26	-0.6	39.0	-1.2	18.4	-7.5	60.5	130	-11.1	
59 21	+15.7	-16.6	61 50	+15.5	-16.3	65 06	-0.5	40.0	-1.2	18.8	-7.6	62.1	135	-11.3	
64 28	+15.8	-16.5	67 15	+15.6	-16.2	70 09	-0.4	45.0	-1.0	19.3	-7.7	63.8	140	-11.5	
70 10	+15.9	-16.4	73 14	+15.7	-16.1	75 32	-0.3	50.0	-0.8	19.8	-7.8	65.4	145	-11.7	
76 24	+16.0	-16.3	79 42	+15.8	-16.0	81 12	-0.2	55.0	-0.7	20.4	-7.9	67.1	150	-11.9	
83 05	+16.1	-16.2	86 21	+15.9	-15.9	87 03	-0.1	60.0	-0.6	20.9	-8.0	68.8	155	-12.1	
90 00			90 00			90 00	0.0	65.0	-0.5	21.4	-8.1	70.5			
								70.0	-0.4						
								75.0	-0.3						
								80.0	-0.2						
								85.0	-0.1						

App. Alt. = Apparent altitude = Sextant altitude corrected for index error and dip.

Altitude Correction Tables for 0° to 10° — Sun, Stars, Planets

App. Alt.	Sun		Sun		Stars & Planets	App. Alt.	Sun		Sun		Stars & Planets
	October - March		April - September				October - March		April - September		
	Lower Limb	Upper Limb	Lower Limb	Upper Limb			Lower Limb	Upper Limb	Lower Limb	Upper Limb	
0 00	-17.5	-49.8	-17.8	-49.6	-33.8	3 30	+ 3.4	-28.9	+ 3.1	-28.7	-12.9
0 03	16.9	49.2	17.2	49.0	33.2	3 35	3.6	28.7	3.3	28.5	12.7
0 06	16.3	48.6	16.6	48.4	32.6	3 40	3.8	28.5	3.6	28.2	12.5
0 09	15.7	48.0	16.0	47.8	32.0	3 45	4.0	28.3	3.8	28.0	12.3
0 12	15.2	47.5	15.4	47.2	31.5	3 50	4.2	28.1	4.0	27.8	12.1
0 15	14.6	46.9	14.8	46.6	30.9	3 55	4.4	27.9	4.1	27.7	11.9
0 18	-14.1	-46.4	-14.3	-46.1	-30.4	4 00	+ 4.6	-27.7	+ 4.3	-27.5	-11.7
0 21	13.5	45.8	13.8	45.6	29.8	4 05	4.8	27.5	4.5	27.3	11.5
0 24	13.0	45.3	13.3	45.1	29.3	4 10	4.9	27.4	4.7	27.1	11.4
0 27	12.5	44.8	12.8	44.6	28.8	4 15	5.1	27.2	4.9	26.9	11.2
0 30	12.0	44.3	12.3	44.1	28.3	4 20	5.3	27.0	5.0	26.8	11.0
0 33	11.6	43.9	11.8	43.6	27.9	4 25	5.4	26.9	5.2	26.6	10.9
0 36	-11.1	-10.0	-11.3	-43.1	-27.4	4 30	+ 5.6	-26.7	+ 5.3	-26.5	-10.7
0 39	10.6	42.9	10.9	42.7	26.9	4 35	5.7	26.6	5.5	26.3	10.6
0 42	10.2	42.5	10.5	42.3	26.5	4 40	5.9	26.4	5.6	26.2	10.4
0 45	9.8	42.1	10.0	41.8	26.1	4 45	6.0	26.3	5.8	26.0	10.3
0 48	9.4	41.7	9.6	41.4	25.7	4 50	6.2	26.1	5.9	25.9	10.1
0 51	9.0	41.3	9.2	41.0	25.3	4 55	6.3	26.0	6.1	25.7	10.0
0 54	-8.6	-40.9	-8.8	-40.6	-24.9	5 00	+ 6.4	-25.9	+ 6.2	-25.6	-9.9
0 57	8.2	40.5	8.4	40.2	24.5	5 05	6.6	25.7	6.3	25.5	9.7
1 00	7.8	40.1	8.0	39.8	24.1	5 10	6.7	25.6	6.5	25.3	9.6
1 03	7.4	39.7	7.7	39.5	23.7	5 15	6.8	25.5	6.6	25.2	9.5
1 06	7.1	39.4	7.3	39.1	23.4	5 20	7.0	25.3	6.7	25.1	9.3
1 09	6.7	39.0	7.0	38.8	23.0	5 25	7.1	25.2	6.8	25.0	9.2
1 12	-6.4	-38.7	-6.6	-38.4	-22.7	5 30	+ 7.2	-25.1	+ 6.9	-24.9	-9.1
1 15	6.0	38.3	6.3	38.1	22.3	5 35	7.3	25.0	7.1	24.7	9.0
1 18	5.7	38.0	6.0	37.8	22.0	5 40	7.4	24.9	7.2	24.6	8.9
1 21	5.4	37.7	5.7	37.5	21.7	5 45	7.5	24.8	7.3	24.5	8.8
1 24	5.1	37.4	5.3	37.1	21.4	5 50	7.6	24.7	7.4	24.4	8.7
1 27	4.8	37.1	5.0	36.8	21.1	5 55	7.7	24.6	7.5	24.3	8.6
1 30	-4.5	-36.8	-4.7	-36.5	-20.8	6 00	+ 7.8	-24.5	+ 7.6	-24.2	-8.5
1 35	4.0	36.3	4.3	36.1	20.3	6 10	8.0	24.3	7.8	24.0	8.3
1 40	3.6	35.9	3.8	35.6	19.9	6 20	8.2	24.1	8.0	23.8	8.1
1 45	3.1	35.4	3.4	35.2	19.4	6 30	8.4	23.9	8.2	23.6	7.9
1 50	2.7	35.0	2.9	34.7	19.0	6 40	8.6	23.7	8.3	23.5	7.7
1 55	2.3	34.6	2.5	34.3	18.6	6 50	8.7	23.6	8.5	23.3	7.6
2 00	-1.9	-34.2	-2.1	-33.9	-18.2	7 00	+ 8.9	-23.4	+ 8.7	-23.1	-7.4
2 05	1.5	33.8	1.7	33.5	17.8	7 10	9.1	23.2	8.8	23.0	7.2
2 10	1.1	33.4	1.4	33.2	17.4	7 20	9.2	23.1	9.0	22.8	7.1
2 15	0.8	33.1	1.0	32.8	17.1	7 30	9.3	23.0	9.1	22.7	6.9
2 20	0.4	32.7	0.7	32.5	16.7	7 40	9.5	22.8	9.2	22.6	6.8
2 25	-0.1	32.4	-0.3	32.1	16.4	7 50	9.6	22.7	9.4	22.4	6.7
2 30	+ 0.2	-32.1	0.0	-31.8	-16.1	8 00	+ 9.7	-22.6	+ 9.5	-22.3	-6.6
2 35	0.5	31.8	+ 0.3	31.5	15.8	8 10	9.9	22.4	9.6	22.2	6.4
2 40	0.8	31.5	0.6	31.2	15.4	8 20	10.0	22.3	9.7	22.1	6.3
2 45	1.1	31.2	0.9	30.9	15.2	8 30	10.1	22.2	9.9	21.9	6.2
2 50	1.4	30.9	1.2	30.6	14.9	8 40	10.2	22.1	10.0	21.8	6.1
2 55	1.7	30.6	1.4	30.4	14.9	8 50	10.3	22.0	10.1	21.7	6.0
3 00	+ 2.0	-30.3	+ 1.7	-30.1	-14.3	9 00	+ 10.4	-21.9	+ 10.2	-21.6	-5.9
3 05	2.2	30.1	2.0	29.8	14.1	9 10	10.5	21.8	10.3	21.5	5.8
3 10	2.5	29.8	2.2	29.6	13.8	9 20	10.6	21.7	10.4	21.4	5.7
3 15	2.7	29.6	2.5	29.3	13.6	9 30	10.7	21.6	10.5	21.3	5.6
3 20	2.9	29.4	2.7	29.1	13.4	9 40	10.8	21.5	10.6	21.2	5.5
3 25	3.2	29.1	2.9	28.9	13.4	9 50	10.9	21.4	10.6	21.2	5.4
3 30	3.4	-28.9	+ 3.1	-28.7	-12.9	10 00	+ 11.0	-21.3	+ 10.7	-21.1	-5.3

For bubble sextant observations- ignore dip and use star corrections for the Sun, planets and stars.

ALTITUDE CORRECTION TABLES 0° – 35° — MOON

App. Alt.	0° – 4°		5° – 9°		10° – 14°		15° – 19°		20° – 24°		25° – 29°		30° – 34°		App. Alt.
	Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		
'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'
00	0°	34.5	5°	58.2	10°	62.1	15°	62.8	20°	62.2	25°	60.8	30°	58.9	00
10		36.5		58.5		62.2		62.8		62.2		60.8		58.8	10
20		38.3		58.7		62.2		62.8		62.1		60.7		58.8	20
30		40.0		58.9		62.3		62.8		62.1		60.7		58.7	30
40		41.5		59.1		62.3		62.8		62.0		60.6		58.6	40
50		42.9		59.3		62.4		62.7		62.0		60.6		58.5	50
00	1°	44.2	6°	59.5	11°	62.4	16°	62.7	21°	62.0	26°	60.5	31°	58.5	00
10		45.4		59.7		62.4		62.7		61.9		60.4		58.4	10
20		46.5		59.9		62.5		62.7		61.9		60.4		58.3	20
30		47.5		60.0		62.5		62.7		61.9		60.3		58.2	30
40		48.4		60.2		62.5		62.7		61.8		60.3		58.2	40
50		49.3		60.3		62.6		62.7		61.8		60.2		58.1	50
00	2°	50.1	7°	60.5	12°	62.6	17°	62.7	22°	61.7	27°	60.1	32°	58.0	00
10		50.8		60.6		62.6		62.6		61.7		60.1		57.9	10
20		51.5		60.7		62.6		62.6		61.6		60.0		57.8	20
30		52.2		60.9		62.7		62.6		61.6		59.9		57.8	30
40		52.8		61.0		62.7		62.6		61.6		59.9		57.7	40
50		53.4		61.1		62.7		62.6		61.5		59.8		57.6	50
00	3°	53.9	8°	61.2	13°	62.7	18°	62.5	23°	61.5	28°	59.7	33°	57.5	00
10		54.4		61.3		62.7		62.5		61.4		59.7		57.4	10
20		54.9		61.4		62.7		62.5		61.4		59.6		57.4	20
30		55.3		61.5		62.8		62.5		61.3		59.5		57.3	30
40		55.7		61.6		62.8		62.4		61.3		59.5		57.2	40
50		56.1		61.6		62.8		62.4		61.2		59.4		57.1	50
00	4°	56.4	9°	61.7	14°	62.8	19°	62.4	24°	61.2	29°	59.3	34°	57.0	00
10		56.8		61.8		62.8		62.4		61.1		59.3		56.9	10
20		57.1		61.9		62.8		62.3		61.1		59.2		56.9	20
30		57.4		61.9		62.8		62.3		61.0		59.1		56.8	30
40		57.7		62.0		62.8		62.3		61.0		59.1		56.7	40
50		58.0		62.1		62.8		62.2		60.9		59.0		56.6	50
HP	L	U	L	U	L	U	L	U	L	U	L	U	L	U	HP
54.0	0.3	0.9	0.3	0.9	0.4	1.0	0.5	1.1	0.6	1.2	0.7	1.3	0.9	1.5	54.0
54.3	0.7	1.1	0.7	1.2	0.8	1.2	0.8	1.3	0.9	1.4	1.1	1.5	1.2	1.7	54.3
54.6	1.1	1.4	1.1	1.4	1.1	1.4	1.2	1.5	1.3	1.6	1.4	1.7	1.5	1.8	54.6
54.9	1.4	1.6	1.4	1.6	1.5	1.6	1.6	1.7	1.6	1.8	1.8	1.9	1.9	2.0	54.9
55.2	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2	55.2
55.5	2.2	2.0	2.2	2.0	2.3	2.1	2.3	2.1	2.4	2.2	2.4	2.3	2.5	2.4	55.5
55.8	2.6	2.2	2.6	2.2	2.6	2.3	2.7	2.3	2.7	2.4	2.8	2.4	2.9	2.5	55.8
56.1	3.0	2.4	3.0	2.5	3.0	2.5	3.0	2.5	3.1	2.6	3.1	2.6	3.2	2.7	56.1
56.4	3.3	2.7	3.3	2.7	3.4	2.7	3.4	2.7	3.4	2.8	3.5	2.8	3.5	2.9	56.4
56.7	3.7	2.9	3.7	2.9	3.8	2.9	3.8	2.9	3.8	3.0	3.8	3.0	3.9	3.0	56.7
57.0	4.1	3.1	4.1	3.1	4.1	3.1	4.1	3.1	4.2	3.2	4.2	3.2	4.2	3.2	57.0
57.3	4.5	3.3	4.5	3.3	4.5	3.3	4.5	3.3	4.5	3.3	4.5	3.4	4.6	3.4	57.3
57.6	4.9	3.5	4.9	3.5	4.9	3.5	4.9	3.5	4.9	3.5	4.9	3.5	4.9	3.6	57.6
57.9	5.3	3.8	5.3	3.8	5.2	3.8	5.2	3.7	5.2	3.7	5.2	3.7	5.2	3.7	57.9
58.2	5.6	4.0	5.6	4.0	5.6	4.0	5.6	4.0	5.6	3.9	5.6	3.9	5.6	3.9	58.2
58.5	6.0	4.2	6.0	4.2	6.0	4.2	6.0	4.2	6.0	4.1	5.9	4.1	5.9	4.1	58.5
58.8	6.4	4.4	6.4	4.4	6.4	4.4	6.3	4.4	6.3	4.3	6.3	4.3	6.2	4.2	58.8
59.1	6.8	4.6	6.8	4.6	6.7	4.6	6.7	4.6	6.7	4.5	6.6	4.5	6.6	4.4	59.1
59.4	7.2	4.8	7.1	4.8	7.1	4.8	7.1	4.8	7.0	4.7	7.0	4.7	6.9	4.6	59.4
59.7	7.5	5.1	7.5	5.0	7.5	5.0	7.5	5.0	7.4	4.9	7.3	4.8	7.2	4.8	59.7
60.0	7.9	5.3	7.9	5.3	7.9	5.2	7.8	5.2	7.8	5.1	7.7	5.0	7.6	4.9	60.0
60.3	8.3	5.5	8.3	5.5	8.2	5.4	8.2	5.4	8.1	5.3	8.0	5.2	7.9	5.1	60.3
60.6	8.7	5.7	8.7	5.7	8.6	5.7	8.6	5.6	8.5	5.5	8.4	5.4	8.2	5.3	60.6
60.9	9.1	5.9	9.0	5.9	9.0	5.9	8.9	5.8	8.8	5.7	8.7	5.6	8.6	5.4	60.9
61.2	9.5	6.2	9.4	6.1	9.4	6.1	9.3	6.0	9.2	5.9	9.1	5.8	8.9	5.6	61.2
61.5	9.8	6.4	9.8	6.3	9.7	6.3	9.7	6.2	9.5	6.1	9.4	5.9	9.2	5.8	61.5

DIP					
Ht. of Eye	Corr ⁿ	Ht. of Eye	Ht. of Eye	Corr ⁿ	Ht. of Eye
m	'	ft	m	'	ft
2.4	-2.8	7.9	9.5	-5.5	31.2
2.6	-2.9	8.5	9.9	-5.6	32.5
2.8	-3.0	9.2	10.3	-5.7	33.8
3.0	-3.1	9.8	10.6	-5.8	34.8
3.2	-3.2	10.5	11.0	-5.9	36.1
3.4	-3.3	11.2	11.4	-6.0	37.4
3.6	-3.4	11.8	11.8	-6.1	38.7
3.8	-3.5	12.5	12.2	-6.2	40.0
4.0	-3.6	13.1	12.6	-6.3	41.3
4.3	-3.7	14.1	13.0	-6.4	42.7
4.5	-3.8	14.8	13.4	-6.5	44.0
4.7	-3.9	15.4	13.8	-6.6	45.3
5.0	-4.0	16.4	14.2	-6.7	46.6
5.2	-4.1	17.1	14.7	-6.8	48.2
5.5	-4.2	18.0	15.1	-6.9	49.5
5.8	-4.3	19.0	15.5	-7.0	50.9
6.1	-4.4	20.0	16.0	-7.1	52.5
6.3	-4.5	20.7	16.5	-7.2	54.1
6.6	-4.6	21.7	16.9	-7.3	55.4
6.9	-4.7	22.6	17.4	-7.4	57.1
7.2	-4.8	23.6	17.9	-7.5	58.7
7.5	-4.9	24.6	18.4	-7.6	60.4
7.9	-5.0	25.9	18.8	-7.7	61.7
8.2	-5.1	26.9	19.3	-7.8	63.3
8.5	-5.2	27.9	19.8	-7.9	65.0
8.8	-5.3	28.9	20.4	-8.0	66.9
9.2	-5.4	30.2	20.9	-8.1	68.6
9.5		31.2	21.4		70.2

MOON CORRECTION TABLE

The correction is in two parts; the first correction is taken from the upper part of the table with argument apparent altitude, and the second from the lower part, with argument HP, in the same column as that from which the first correction was taken. Separate corrections are given in the lower part for lower (L) and upper (U) limbs. All corrections are to be **added** to apparent altitude, *but 30' is to be subtracted from the altitude of the upper limb.*

For corrections for pressure and temperature see page A4.

For bubble sextant observations ignore dip, take the mean of upper and lower limb corrections and subtract 15' from the altitude.

App. Alt. = Apparent altitude = Sextant altitude corrected for index error and dip.

ALTITUDE CORRECTION TABLES 35° – 90° — MOON

App. Alt.	35° – 39°		40° – 44°		45° – 49°		50° – 54°		55° – 59°		60° – 64°		65° – 69°		70° – 74°		75° – 79°		80° – 84°		85° – 89°		App. Alt.
	Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		Corr ⁿ		
'	35°	'	40°	'	45°	'	50°	'	55°	'	60°	'	65°	'	70°	'	75°	'	80°	'	85°	'	
00	56.5		53.7		50.5		46.9		43.1		38.9		34.6		30.0		25.3		20.5		15.6		00
10	56.4		53.6		50.4		46.8		42.9		38.8		34.4		29.9		25.2		20.4		15.5		10
20	56.3		53.5		50.2		46.7		42.8		38.7		34.3		29.7		25.0		20.2		15.3		20
30	56.2		53.4		50.1		46.5		42.7		38.5		34.1		29.6		24.9		20.0		15.1		30
40	56.2		53.3		50.0		46.4		42.5		38.4		34.0		29.4		24.7		19.9		15.0		40
50	56.1		53.2		49.9		46.3		42.4		38.2		33.8		29.3		24.5		19.7		14.8		50
00	36°		41°		46°		51°		56°		61°		66°		71°		76°		81°		86°		00
	56.0		53.1		49.8		46.2		42.3		38.1		33.7		29.1		24.4		19.6		14.6		00
10	55.9		53.0		49.7		46.0		42.1		37.9		33.5		29.0		24.2		19.4		14.5		10
20	55.8		52.9		49.5		45.9		42.0		37.8		33.4		28.8		24.1		19.2		14.3		20
30	55.7		52.8		49.4		45.8		41.9		37.7		33.2		28.7		23.9		19.1		14.2		30
40	55.6		52.6		49.3		45.7		41.7		37.5		33.1		28.5		23.8		18.9		14.0		40
50	55.5		52.5		49.2		45.5		41.6		37.4		32.9		28.3		23.6		18.7		13.8		50
00	37°		42°		47°		52°		57°		62°		67°		72°		77°		82°		87°		00
	55.4		52.4		49.1		45.4		41.4		37.2		32.8		28.2		23.4		18.6		13.7		00
10	55.3		52.3		49.0		45.3		41.3		37.1		32.6		28.0		23.3		18.4		13.5		10
20	55.2		52.2		48.8		45.2		41.2		36.9		32.5		27.9		23.1		18.2		13.3		20
30	55.1		52.1		48.7		45.0		41.0		36.8		32.3		27.7		22.9		18.1		13.2		30
40	55.0		52.0		48.6		44.9		40.9		36.6		32.2		27.6		22.8		17.9		13.0		40
50	55.0		51.9		48.5		44.8		40.8		36.5		32.0		27.4		22.6		17.8		12.8		50
00	38°		43°		48°		53°		58°		63°		68°		73°		78°		83°		88°		00
	54.9		51.8		48.4		44.6		40.6		36.4		31.9		27.2		22.5		17.6		12.7		00
10	54.8		51.7		48.3		44.5		40.5		36.2		31.7		27.1		22.3		17.4		12.5		10
20	54.7		51.6		48.1		44.4		40.3		36.1		31.6		26.9		22.1		17.3		12.3		20
30	54.6		51.5		48.0		44.2		40.2		35.9		31.4		26.8		22.0		17.1		12.2		30
40	54.5		51.4		47.9		44.1		40.1		35.8		31.3		26.6		21.8		16.9		12.0		40
50	54.4		51.2		47.8		44.0		39.9		35.6		31.1		26.5		21.7		16.8		11.8		50
00	39°		44°		49°		54°		59°		64°		69°		74°		79°		84°		89°		00
	54.3		51.1		47.7		43.9		39.8		35.5		31.0		26.3		21.5		16.6		11.7		00
10	54.2		51.0		47.5		43.7		39.6		35.3		30.8		26.1		21.3		16.4		11.5		10
20	54.1		50.9		47.4		43.6		39.5		35.2		30.7		26.0		21.2		16.3		11.4		20
30	54.0		50.8		47.3		43.5		39.4		35.0		30.5		25.8		21.0		16.1		11.2		30
40	53.9		50.7		47.2		43.3		39.2		34.9		30.4		25.7		20.9		16.0		11.0		40
50	53.8		50.6		47.0		43.2		39.1		34.7		30.2		25.5		20.7		15.8		10.9		50
HP	L	U	L	U	L	U	L	U	L	U	L	U	L	U	L	U	L	U	L	U	L	U	HP
54.0	1.1	1.7	1.3	1.9	1.5	2.1	1.7	2.4	2.0	2.6	2.3	2.9	2.6	3.2	2.9	3.5	3.2	3.8	3.5	4.1	3.8	4.5	54.0
54.3	1.4	1.8	1.6	2.0	1.8	2.2	2.0	2.5	2.2	2.7	2.5	3.0	2.8	3.2	3.1	3.5	3.3	3.8	3.6	4.1	3.9	4.4	54.3
54.6	1.7	2.0	1.9	2.2	2.1	2.4	2.3	2.6	2.5	2.8	2.7	3.0	3.0	3.3	3.2	3.5	3.5	3.8	3.8	4.0	4.0	4.3	54.6
54.9	2.0	2.2	2.2	2.3	2.4	2.5	2.5	2.7	2.7	2.9	2.9	3.1	3.2	3.3	3.4	3.5	3.6	3.8	3.9	4.0	4.1	4.3	54.9
55.2	2.3	2.3	2.5	2.4	2.6	2.6	2.8	2.8	3.0	2.9	3.2	3.1	3.4	3.3	3.6	3.5	3.8	3.7	4.0	4.0	4.2	4.2	55.2
55.5	2.7	2.5	2.8	2.6	2.9	2.7	3.1	2.9	3.2	3.0	3.4	3.2	3.6	3.4	3.7	3.5	3.9	3.7	4.1	3.9	4.3	4.1	55.5
55.8	3.0	2.6	3.1	2.7	3.2	2.8	3.3	3.0	3.5	3.1	3.6	3.3	3.8	3.4	3.9	3.6	4.1	3.7	4.2	3.9	4.4	4.0	55.8
56.1	3.3	2.8	3.4	2.9	3.5	3.0	3.6	3.1	3.7	3.2	3.8	3.3	4.0	3.4	4.1	3.6	4.2	3.7	4.4	3.8	4.5	4.0	56.1
56.4	3.6	2.9	3.7	3.0	3.8	3.1	3.9	3.2	3.9	3.3	4.0	3.4	4.1	3.5	4.3	3.6	4.4	3.7	4.5	3.8	4.6	3.9	56.4
56.7	3.9	3.1	4.0	3.1	4.1	3.2	4.1	3.3	4.2	3.3	4.3	3.4	4.3	3.5	4.4	3.6	4.5	3.7	4.6	3.8	4.7	3.8	56.7
57.0	4.3	3.2	4.3	3.3	4.3	3.3	4.4	3.4	4.4	3.4	4.5	3.5	4.5	3.5	4.6	3.6	4.7	3.6	4.7	3.7	4.8	3.8	57.0
57.3	4.6	3.4	4.6	3.4	4.6	3.4	4.6	3.5	4.7	3.5	4.7	3.5	4.7	3.6	4.8	3.6	4.8	3.6	4.8	3.7	4.9	3.7	57.3
57.6	4.9	3.6	4.9	3.6	4.9	3.6	4.9	3.6	4.9	3.6	4.9	3.6	4.9	3.6	4.9	3.6	5.0	3.6	5.0	3.6	5.0	3.6	57.6
57.9	5.2	3.7	5.2	3.7	5.2	3.7	5.2	3.7	5.2	3.7	5.1	3.6	5.1	3.6	5.1	3.6	5.1	3.6	5.1	3.6	5.1	3.6	57.9
58.2	5.5	3.9	5.5	3.8	5.5	3.8	5.4	3.8	5.4	3.7	5.4	3.7	5.3	3.7	5.3	3.6	5.2	3.6	5.2	3.5	5.2	3.5	58.2
58.5	5.9	4.0	5.8	4.0	5.8	3.9	5.7	3.9	5.6	3.8	5.6	3.8	5.5	3.7	5.5	3.6	5.4	3.6	5.3	3.5	5.3	3.4	58.5
58.8	6.2	4.2	6.1	4.1	6.0	4.1	6.0	4.0	5.9	3.9	5.8	3.8	5.7	3.7	5.6	3.6	5.5	3.5	5.4	3.5	5.3	3.4	58.8
59.1	6.5	4.3	6.4	4.3	6.3	4.2	6.2	4.1	6.1	4.0	6.0	3.9	5.9	3.8	5.8	3.6	5.7	3.5	5.6	3.4	5.4	3.3	59.1
59.4	6.8	4.5	6.7	4.4	6.6	4.3	6.5	4.2	6.4	4.1	6.2	3.9	6.1	3.8	6.0	3.7	5.8	3.5	5.7	3.4	5.5	3.2	59.4
59.7	7.1	4.7	7.0	4.5	6.9	4.4	6.8	4.3	6.6	4.1	6.5	4.0	6.3	3.8	6.1	3.7	6.0	3.5	5.8	3.3	5.6	3.2	59.7
60.0	7.5	4.8	7.3	4.7	7.2	4.5	7.0	4.4	6.9	4.2	6.7	4.0	6.5	3.9	6.3	3.7	6.1	3.5	5.9	3.3	5.7	3.1	60.0
60.3	7.8	5.0	7.6	4.8	7.5	4.7	7.3	4.5	7.1	4.3	6.9	4.1	6.7	3.9	6.5	3.7	6.3	3.5	6.0	3.2	5.8	3.0	60.3
60.6	8.1	5.1	7.9	5.0	7.7	4.8	7.6	4.6	7.3	4.4	7.1	4.2	6.9	3.9	6.7	3.7	6.4	3.4	6.2	3.2	5.9	2.9	60.6
60.9	8.4	5.3	8.2	5.1	8.0	4.9	7.8	4.7	7.6	4.5	7.3	4.2	7.1	4.0	6.8	3.7	6.6	3.4	6.3	3.2	6.0	2.9	60.9
61.2	8.7	5.4	8.5	5.2	8.3	5.0	8.1	4.8	7.8	4.5	7.6	4.3	7.3	4.0	7.0	3.7	6.7	3.4	6.4	3.1	6.1	2.8	61.2
61.5	9.1	5.6	8.8	5.4	8.6	5.1	8.3	4.9	8.1	4.6	7.8	4.3	7.5	4.0	7.2	3.7	6.9	3.4	6.5	3.1	6.2	2.7	61.5

Penumbral Lunar Eclipse of 2024 Mar 25

Ecliptic Conjunction = 07:01:28.5 TD (= 07:00:14.6 UT)

Greatest Eclipse = 07:13:59.2 TD (= 07:12:45.2 UT)

Penumbral Magnitude = 0.9557

P. Radius = 1.1803°

Gamma = 1.0609

Umbral Magnitude = -0.1325

U. Radius = 0.6457°

Axis = 0.9564°

Saros Series = 113

Member = 64 of 71

Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 00h18m49.9s

Dec. = +02°02'16.6"

S.D. = 00°16'02.2"

H.P. = 00°00'08.8"

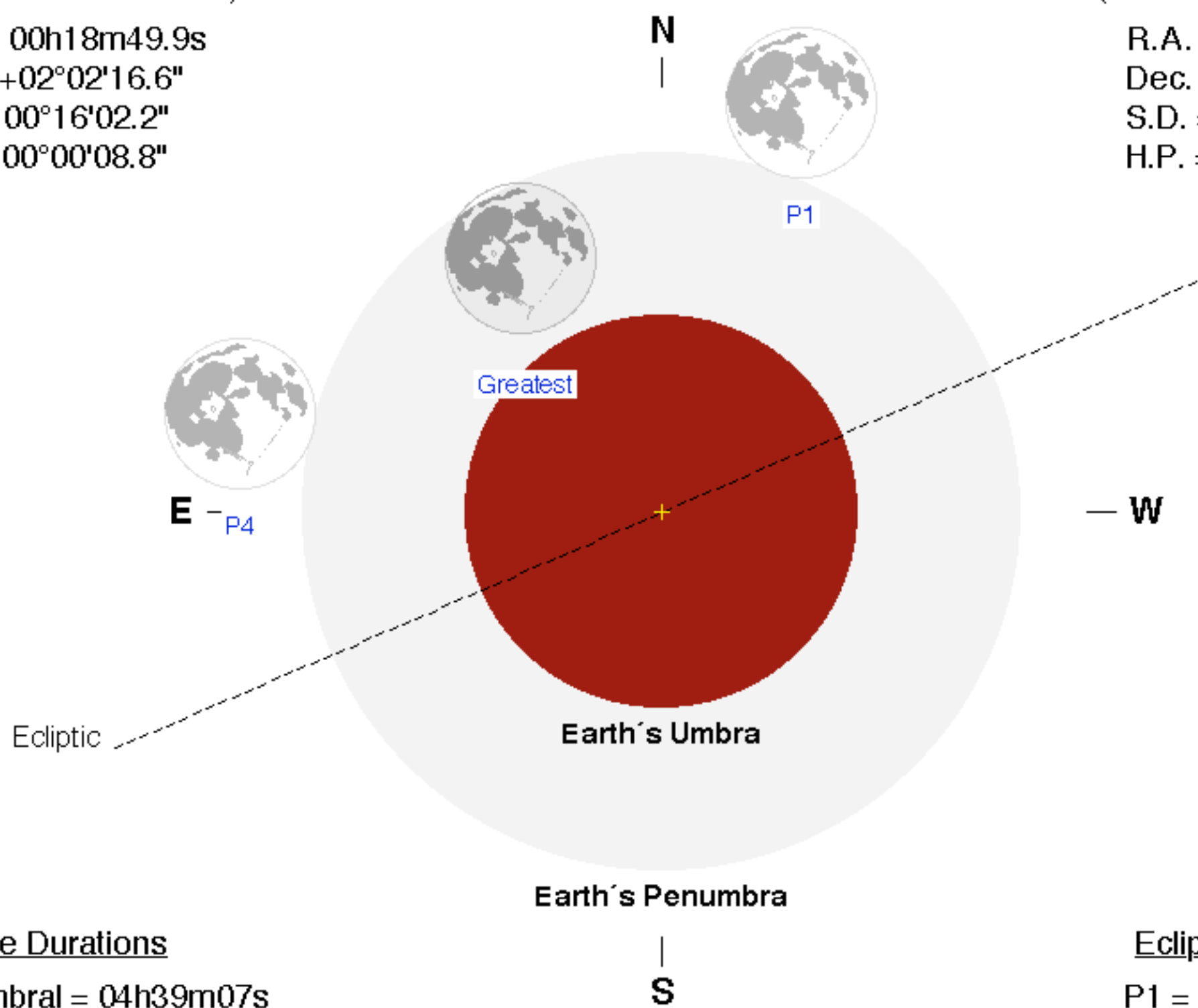
Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 12h20m41.3s

Dec. = -01°12'05.4"

S.D. = 00°14'44.3"

H.P. = 00°54'05.4"



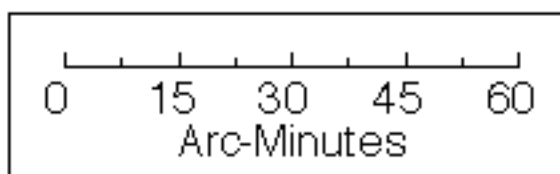
Eclipse Durations

Penumbral = 04h39m07s

Eclipse Contacts

P1 = 04:53:11 UT

P4 = 09:32:18 UT



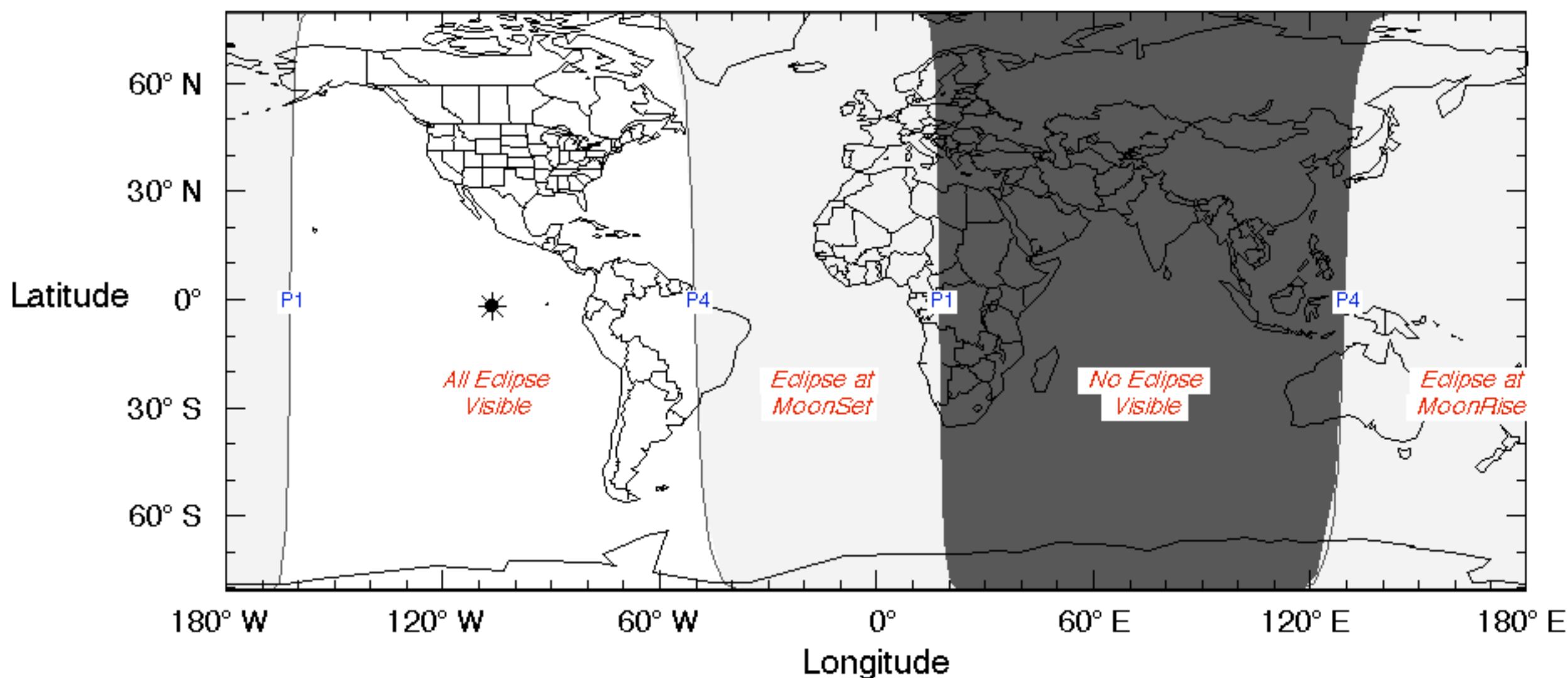
$\Delta T = 74$ s

Rule = CdT (Danjon)

Eph. = VSOP87/ELP2000-85

F. Espenak, NASA's GSFC

eclipse.gsfc.nasa.gov/eclipse.html



Partial Lunar Eclipse of 2024 Sep 18

Ecliptic Conjunction = 02:35:37.1 TD (= 02:34:22.9 UT)

Greatest Eclipse = 02:45:24.7 TD (= 02:44:10.5 UT)

Penumbral Magnitude = 1.0372

P. Radius = 1.3003°

Gamma = -0.9792

Umbral Magnitude = 0.0848

U. Radius = 0.7697°

Axis = 1.0010°

Saros Series = 118 Member = 52 of 74

Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 11h44m09.8s

Dec. = +01°42'52.9"

S.D. = 00°15'55.0"

H.P. = 00°00'08.8"

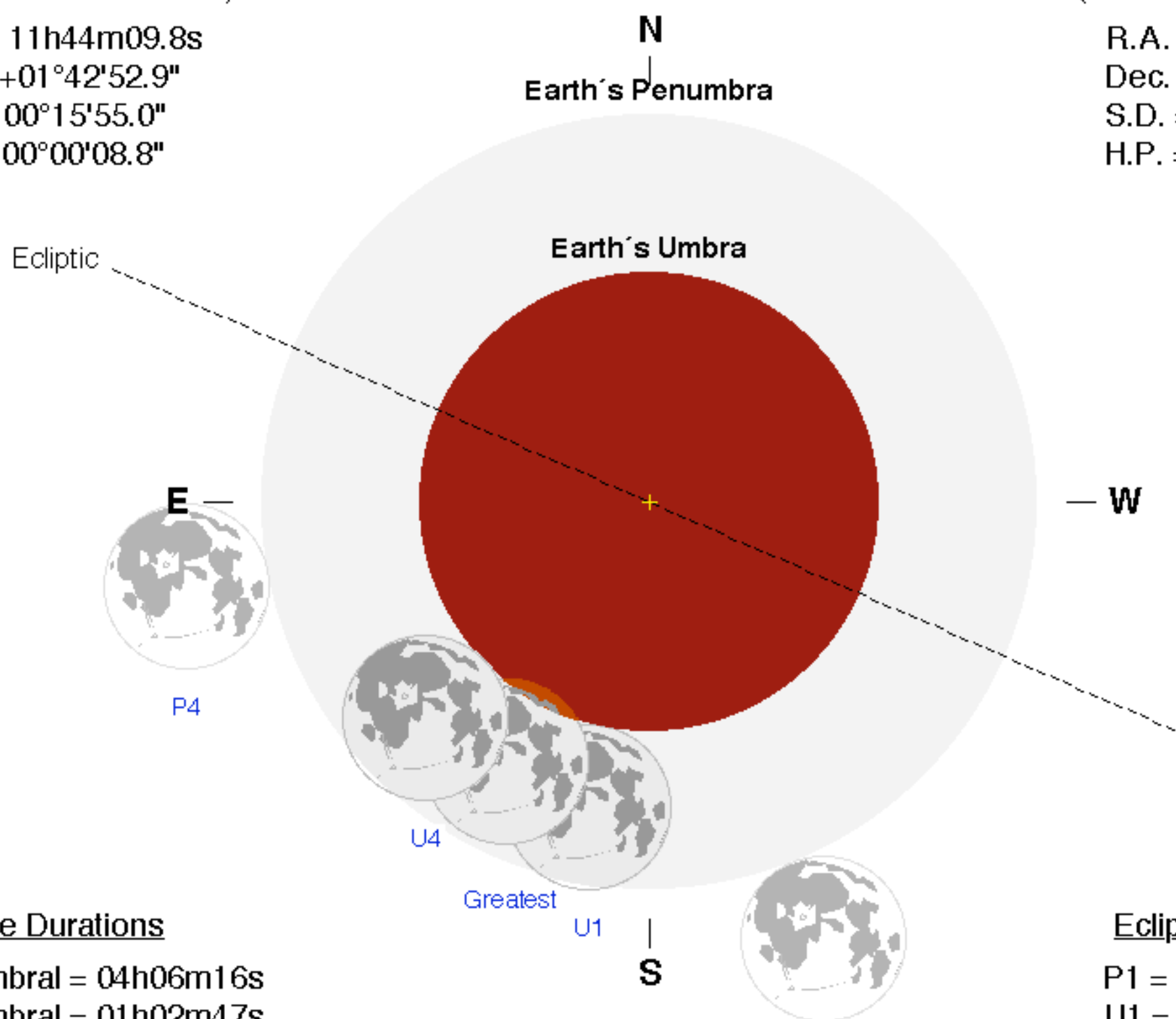
Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 23h46m06.0s

Dec. = -02°35'26.8"

S.D. = 00°16'42.8"

H.P. = 01°01'20.4"



Eclipse Durations

Penumbral = 04h06m16s

Umbral = 01h02m47s

Eclipse Contacts

P1 = 00:41:02 UT

U1 = 02:12:48 UT

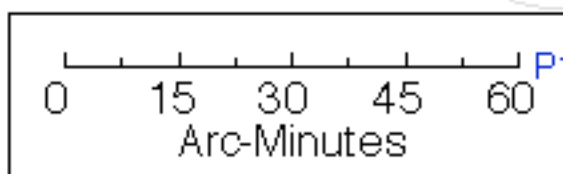
U4 = 03:15:35 UT

P4 = 04:47:18 UT

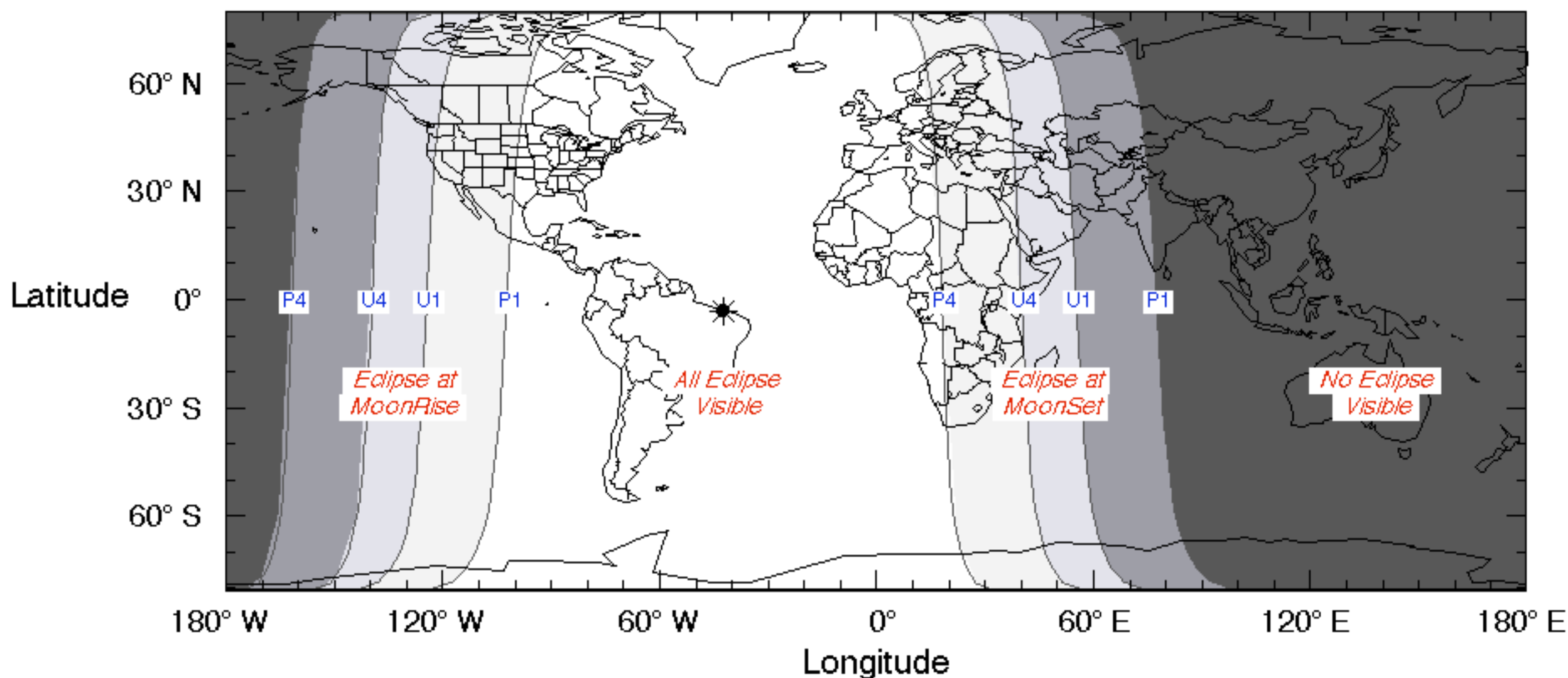
$\Delta T = 74$ s

Rule = CdT (Danjon)

Eph. = VSOP87/ELP2000-85



F. Espenak, NASA's GSFC
eclipse.gsfc.nasa.gov/eclipse.html



Total Solar Eclipse of 2024 Apr 08

Geocentric Conjunction = 18:36:02.5 UT J.D. = 2460409.275029
 Greatest Eclipse = 18:17:13.1 UT J.D. = 2460409.261957

Eclipse Magnitude = 1.0565 Gamma = 0.3432

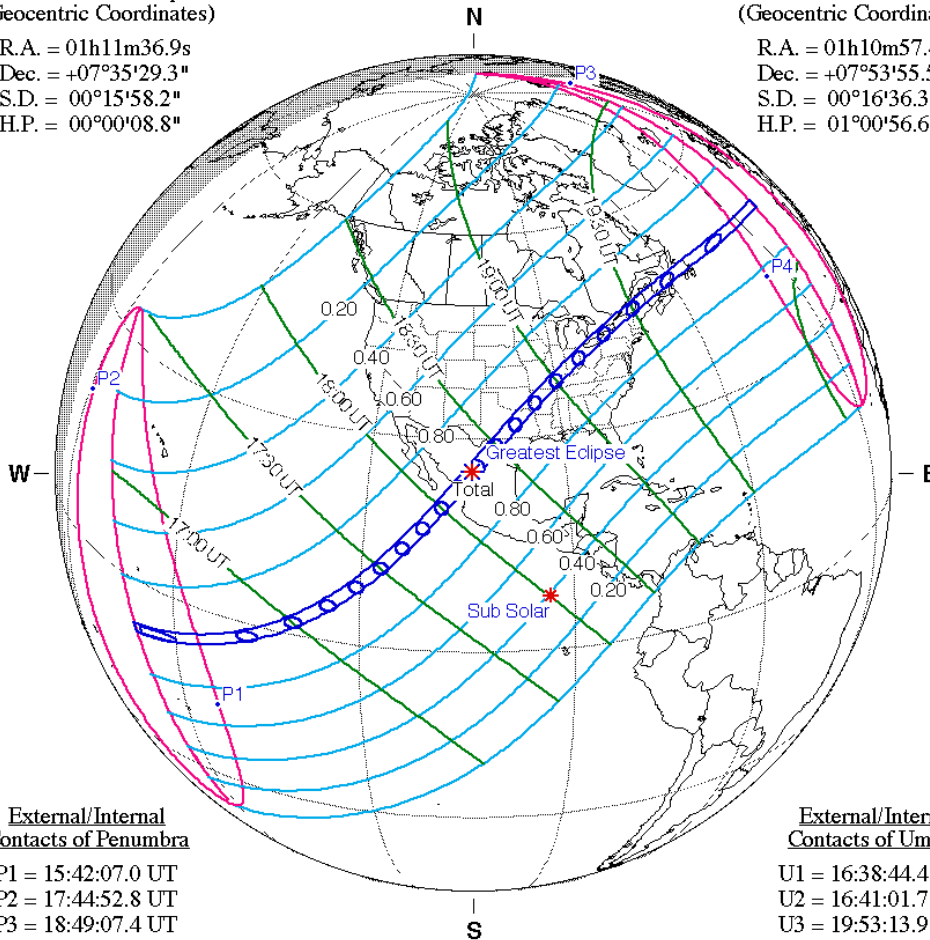
Saros Series = 139 Member = 30 of 71

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 01h11m36.9s
 Dec. = +07°35'29.3"
 S.D. = 00°15'58.2"
 H.P. = 00°00'08.8"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 01h10m57.4s
 Dec. = +07°53'55.5"
 S.D. = 00°16'36.3"
 H.P. = 01°00'56.6"



External/Internal
Contacts of Penumbra

P1 = 15:42:07.0 UT
 P2 = 17:44:52.8 UT
 P3 = 18:49:07.4 UT
 P4 = 20:52:13.8 UT

External/Internal
Contacts of Umbra

U1 = 16:38:44.4 UT
 U2 = 16:41:01.7 UT
 U3 = 19:53:13.9 UT
 U4 = 19:55:29.1 UT

Local Circumstances at Greatest Eclipse

Lat. = 25°17.5'N Sun Alt. = 69.8°
 Long. = 104°07.2'W Sun Azm. = 149.4°
 Path Width = 197.5 km Duration = 04m28.1s

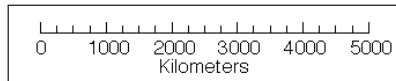
Ephemeris & Constants

Eph. = Newcomb/ILE
 $\Delta T = 81.2$ s
 $k1 = 0.2724880$
 $k2 = 0.2722810$
 $\Delta b = 0.0''$ $\Delta l = 0.0''$

Geocentric Libration
(Optical + Physical)

$l = 2.00^\circ$
 $b = -0.46^\circ$
 $c = -20.75^\circ$

Brown Lun. No. = 1253



F. Espenak, NASA's GSFC - Fri, Jul 2,
sunearth.gsfc.nasa.gov/eclipse/eclipse.html

Annular Solar Eclipse of 2024 Oct 02

Geocentric Conjunction = 19:07:53.1 UT J.D. = 2460586.297142
 Greatest Eclipse = 18:44:51.3 UT J.D. = 2460586.281150

Eclipse Magnitude = 0.9326 Gamma = -0.3510

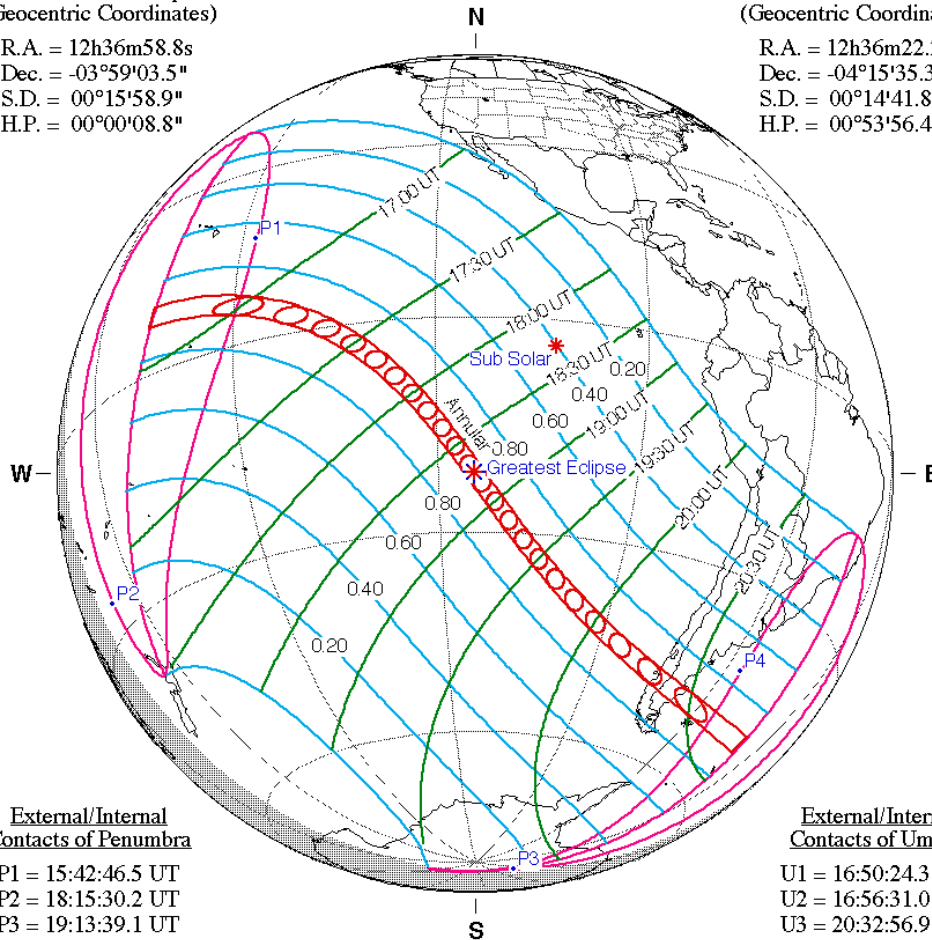
Saros Series = 144 Member = 17 of 70

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 12h36m58.8s
 Dec. = -03°59'03.5"
 S.D. = 00°15'58.9"
 H.P. = 00°00'08.8"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 12h36m22.2s
 Dec. = -04°15'35.3"
 S.D. = 00°14'41.8"
 H.P. = 00°53'56.4"



External/Internal
Contacts of Penumbra

P1 = 15:42:46.5 UT
 P2 = 18:15:30.2 UT
 P3 = 19:13:39.1 UT
 P4 = 21:46:47.1 UT

External/Internal
Contacts of Umbra

U1 = 16:50:24.3 UT
 U2 = 16:56:31.0 UT
 U3 = 20:32:56.9 UT
 U4 = 20:39:04.5 UT

Local Circumstances at Greatest Eclipse

Lat. = 21°57.5'S Sun Alt. = 69.3°
 Long. = 114°28.2'W Sun Azm. = 31.1°
 Path Width = 266.5 km Duration = 07m25.1s

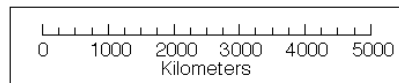
Ephemeris & Constants

Eph. = Newcomb/ILE
 $\Delta T = 81.8$ s
 $k1 = 0.2724880$
 $k2 = 0.2722810$
 $\Delta b = 0.0''$ $\Delta l = 0.0''$

Geocentric Libration
(Optical + Physical)

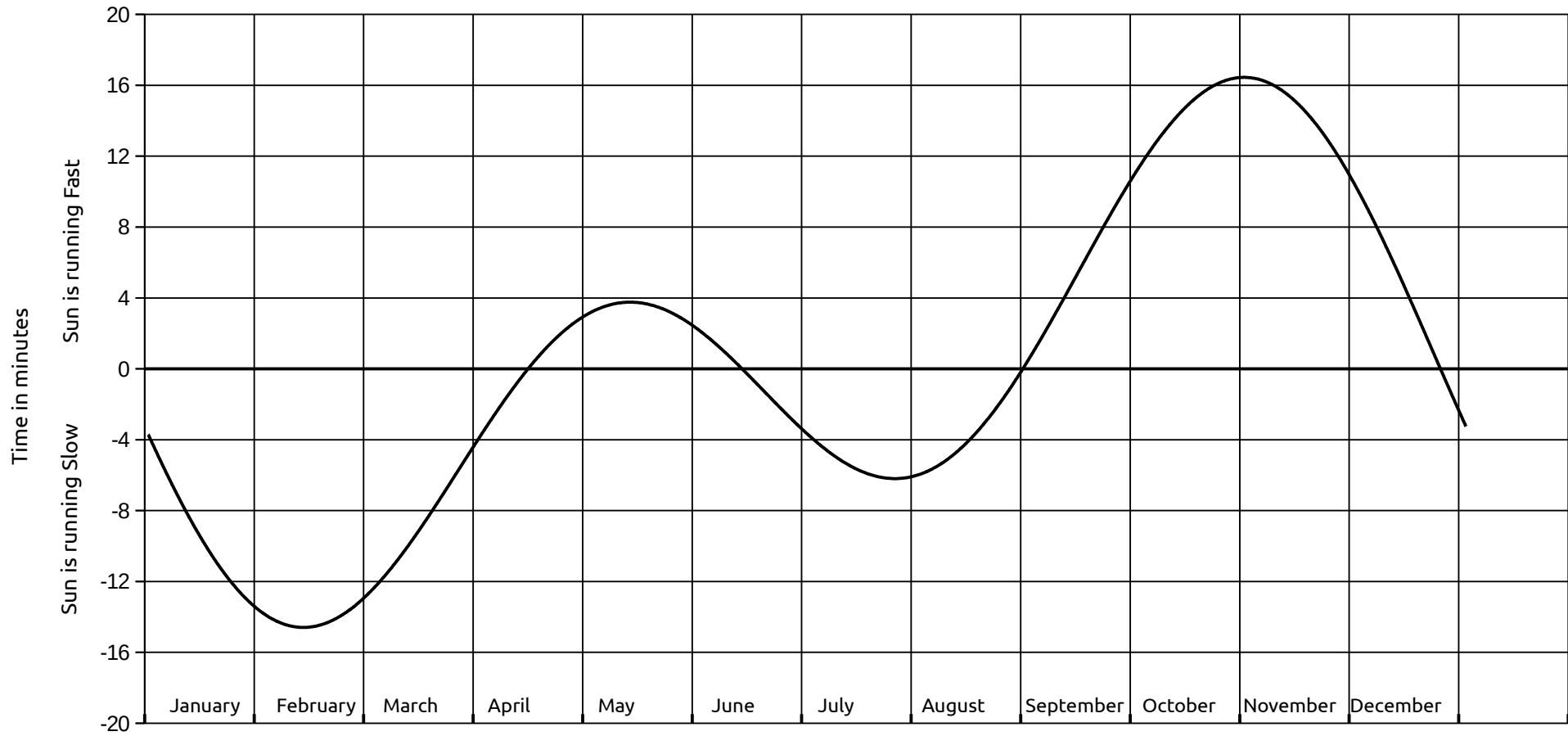
$l = 0.19^\circ$
 $b = 0.42^\circ$
 $c = 21.58^\circ$

Brown Lun. No. = 1259



F. Espenak, NASA's GSFC - Fri, Jul 2,
sunearth.gsfc.nasa.gov/eclipse/eclipse.html

Equation of Time *for the Sun*

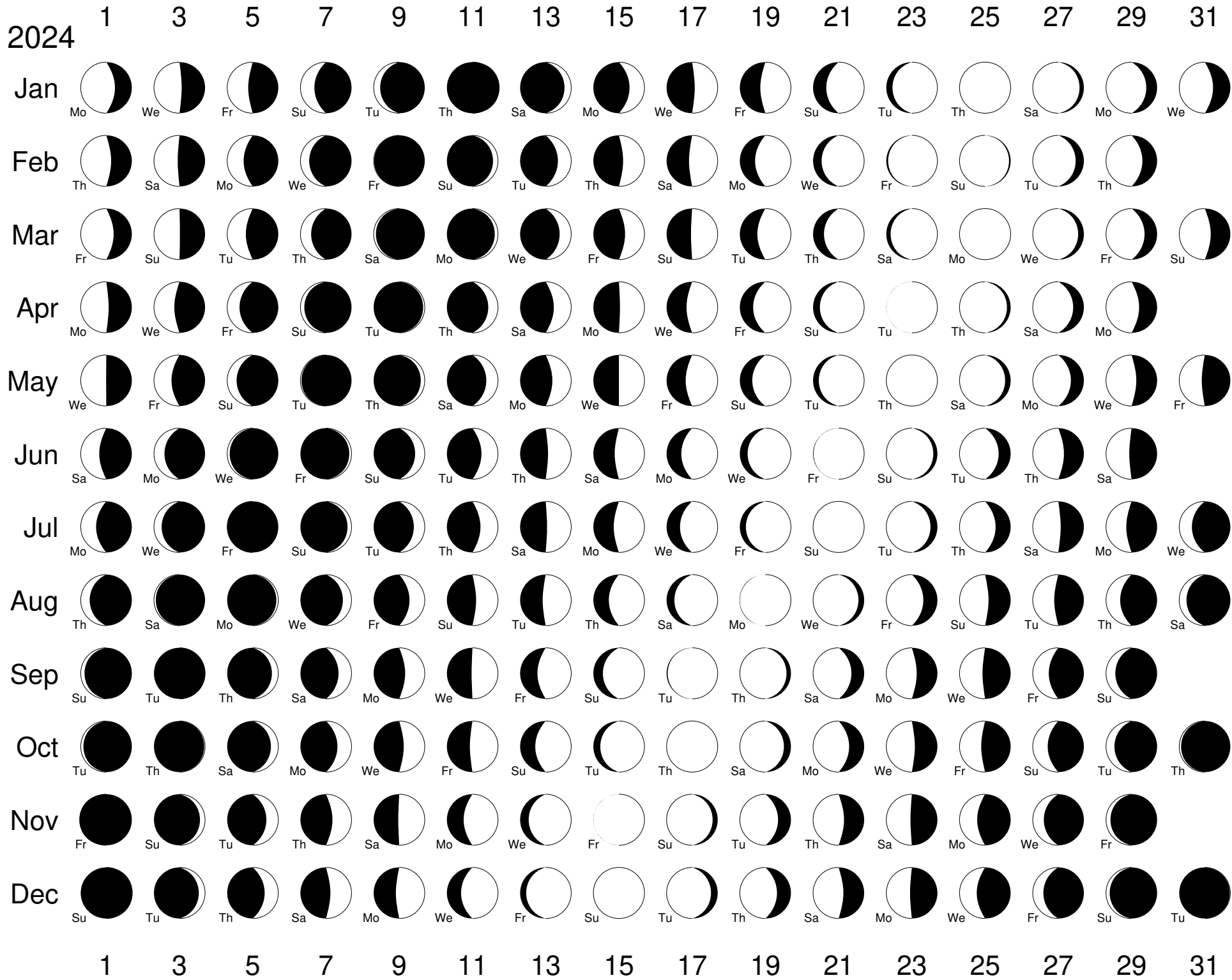


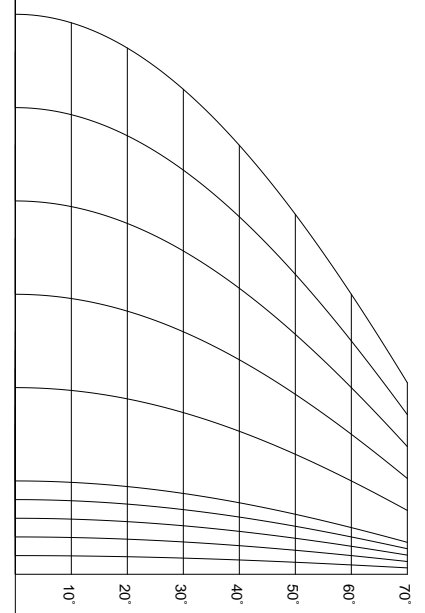
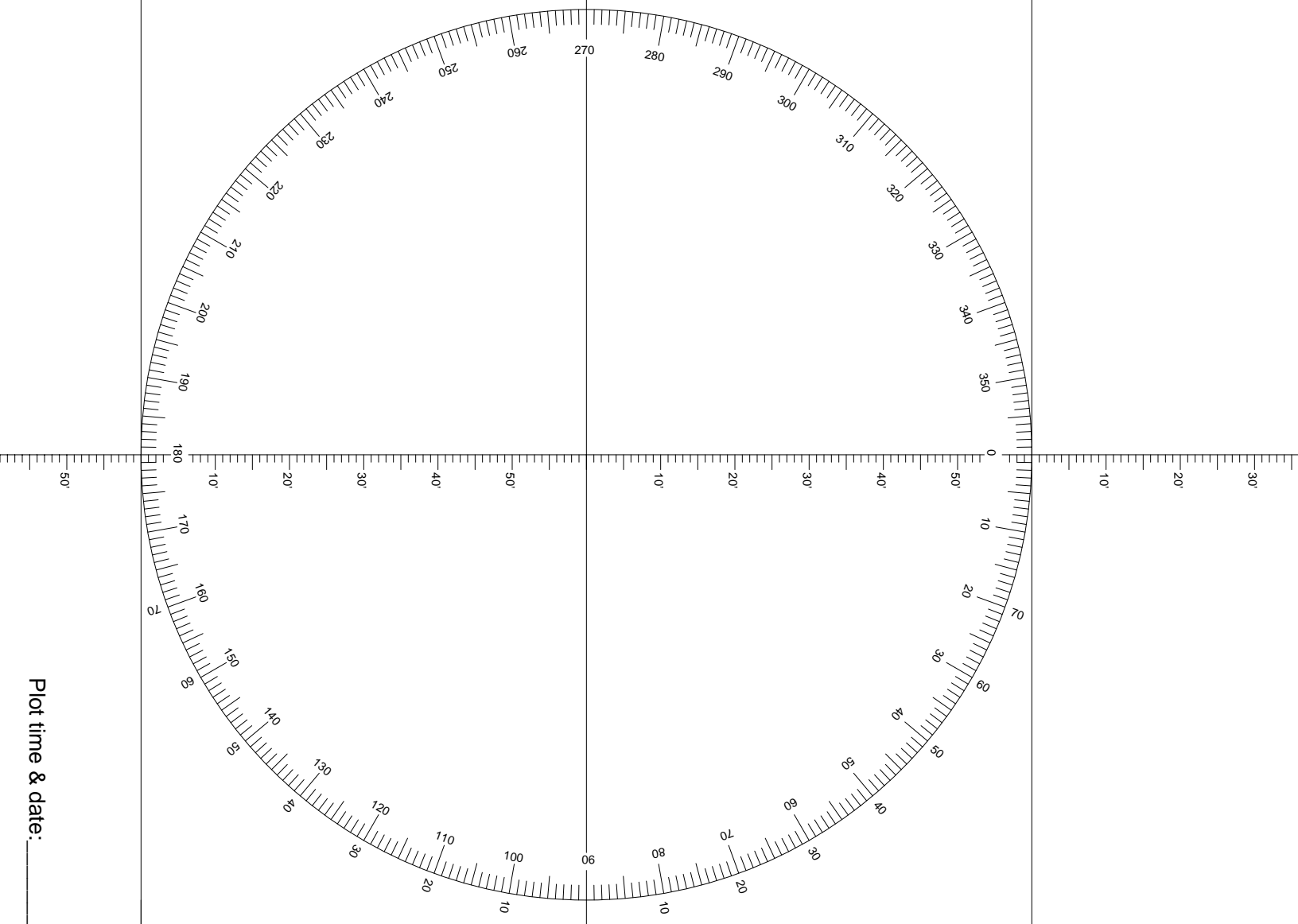
2024 Moon Phases

Date and Time (GMT/Universal Time)

New Moon	First Quarter	Full Moon	Last Quarter
--	--	--	January 04 03:30
January 11 11:57	January 18 03:52	January 25 17:54	February 02 23:18
February 09 22:59	February 16 15:01	February 24 12:30	March 03 15:23
March 10 09:00	March 17 04:11	March 25 07:00	April 02 03:15
April 08 18:21	April 15 19:13	April 23 23:49	May 01 11:27
May 08 03:22	May 15 11:48	May 23 13:53	May 30 17:13
June 06 12:38	June 14 05:18	June 22 01:08	June 28 21:53
July 05 22:57	July 13 22:49	July 21 10:17	July 28 02:51
August 04 11:13	August 12 15:19	August 19 18:26	August 26 09:26
September 03 01:55	September 11 06:05	September 18 02:34	September 24 18:50
October 02 18:49	October 10 18:55	October 17 11:26	October 24 08:03
November 01 12:47	November 09 05:55	November 15 21:28	November 23 01:28
December 01 06:21	December 08 15:26	December 15 09:02	December 22 22:18
December 30 22:27	--	--	--

Add or subtract your time difference from Greenwich to determine local time and date of Moon phase.





Plot time & date: _____

Page: _____

