
The Nautical Almanac 2023



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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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2023

January

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

February

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

March

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

April

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

May

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

June

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

July

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

August

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

September

wk	Su	M	Tu	W	Th	F	Sa
35						1	2
36	3	4	5	6	7	8	9
37	10	11	12	13	14	15	16
38	17	18	19	20	21	22	23
39	24	25	26	27	28	29	30

October

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

November

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

December

wk	Su	M	Tu	W	Th	F	Sa
48						1	2
49	3	4	5	6	7	8	9
50	10	11	12	13	14	15	16
51	17	18	19	20	21	22	23
52	24	25	26	27	28	29	30
31							

2023

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	Sun	1	364	1
2	Mon	2	363	
3	Tue	3	362	
4	Wed	4	361	
5	Thu	5	360	
6	Fri	6	359	
7	Sat	7	358	
8	Sun	8	357	2
9	Mon	9	356	
10	Tue	10	355	
11	Wed	11	354	
12	Thu	12	353	
13	Fri	13	352	
14	Sat	14	351	
15	Sun	15	350	3
16	Mon	16	349	
17	Tue	17	348	
18	Wed	18	347	
19	Thu	19	346	
20	Fri	20	345	
21	Sat	21	344	
22	Sun	22	343	4
23	Mon	23	342	
24	Tue	24	341	
25	Wed	25	340	
26	Thu	26	339	
27	Fri	27	338	
28	Sat	28	337	
29	Sun	29	336	5
30	Mon	30	335	
31	Tue	31	334	

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

Day of Month	3		Days remaining	Week number
	March			
	Day of Week	Day of Year		
1	Wed	60	305	9
2	Thu	61	304	
3	Fri	62	303	
4	Sat	63	302	
5	Sun	64	301	10
6	Mon	65	300	
7	Tue	66	299	
8	Wed	67	298	
9	Thu	68	297	
10	Fri	69	296	
11	Sat	70	295	
12	Sun	71	294	11
13	Mon	72	293	
14	Tue	73	292	
15	Wed	74	291	
16	Thu	75	290	
17	Fri	76	289	
18	Sat	77	288	
19	Sun	78	287	12
20	Mon	79	286	
21	Tue	80	285	
22	Wed	81	284	
23	Thu	82	283	
24	Fri	83	282	
25	Sat	84	281	
26	Sun	85	280	13
27	Mon	86	279	
28	Tue	87	278	
29	Wed	88	277	
30	Thu	89	276	
31	Fri	90	275	

Day of Month	4		Days remaining	Week number
	April			
	Day of Week	Day of Year		
1	Sat	91	274	13
2	Sun	92	273	14
3	Mon	93	272	
4	Tue	94	271	
5	Wed	95	270	
6	Thu	96	269	
7	Fri	97	268	
8	Sat	98	267	
9	Sun	99	266	15
10	Mon	100	265	
11	Tue	101	264	
12	Wed	102	263	
13	Thu	103	262	
14	Fri	104	261	
15	Sat	105	260	
16	Sun	106	259	16
17	Mon	107	258	
18	Tue	108	257	
19	Wed	109	256	
20	Thu	110	255	
21	Fri	111	254	
22	Sat	112	253	
23	Sun	113	252	17
24	Mon	114	251	
25	Tue	115	250	
26	Wed	116	249	
27	Thu	117	248	
28	Fri	118	247	
29	Sat	119	246	
30	Sun	120	245	18

Day of Month	5		Days remaining	Week number
	May			
	Day of Week	Day of Year		
1	Mon	121	244	18
2	Tue	122	243	
3	Wed	123	242	
4	Thu	124	241	
5	Fri	125	240	
6	Sat	126	239	
7	Sun	127	238	19
8	Mon	128	237	
9	Tue	129	236	
10	Wed	130	235	
11	Thu	131	234	
12	Fri	132	233	
13	Sat	133	232	
14	Sun	134	231	20
15	Mon	135	230	
16	Tue	136	229	
17	Wed	137	228	
18	Thu	138	227	
19	Fri	139	226	
20	Sat	140	225	
21	Sun	141	224	21
22	Mon	142	223	
23	Tue	143	222	
24	Wed	144	221	
25	Thu	145	220	
26	Fri	146	219	
27	Sat	147	218	
28	Sun	148	217	22
29	Mon	149	216	
30	Tue	150	215	
31	Wed	151	214	

Day of Month	6		Days remaining	Week number
	June			
	Day of Week	Day of Year		
1	Thu	152	213	22
2	Fri	153	212	
3	Sat	154	211	
4	Sun	155	210	23
5	Mon	156	209	
6	Tue	157	208	
7	Wed	158	207	
8	Thu	159	206	
9	Fri	160	205	
10	Sat	161	204	
11	Sun	162	203	24
12	Mon	163	202	
13	Tue	164	201	
14	Wed	165	200	
15	Thu	166	199	
16	Fri	167	198	
17	Sat	168	197	
18	Sun	169	196	25
19	Mon	170	195	
20	Tue	171	194	
21	Wed	172	193	
22	Thu	173	192	
23	Fri	174	191	
24	Sat	175	190	
25	Sun	176	189	26
26	Mon	177	188	
27	Tue	178	187	
28	Wed	179	186	
29	Thu	180	185	
30	Fri	181	184	

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

Day of Month	8		Days remaining	Week number
	August			
	Day of Week	Day of Year		
1	Tue	213	152	31
2	Wed	214	151	
3	Thu	215	150	
4	Fri	216	149	
5	Sat	217	148	
6	Sun	218	147	32
7	Mon	219	146	
8	Tue	220	145	
9	Wed	221	144	
10	Thu	222	143	
11	Fri	223	142	
12	Sat	224	141	
13	Sun	225	140	33
14	Mon	226	139	
15	Tue	227	138	
16	Wed	228	137	
17	Thu	229	136	
18	Fri	230	135	
19	Sat	231	134	
20	Sun	232	133	34
21	Mon	233	132	
22	Tue	234	131	
23	Wed	235	130	
24	Thu	236	129	
25	Fri	237	128	
26	Sat	238	127	
27	Sun	239	126	35
28	Mon	240	125	
29	Tue	241	124	
30	Wed	242	123	
31	Thu	243	122	

Day of Month	9		Days remaining	Week number
	September			
	Day of Week	Day of Year		
1	Fri	244	121	35
2	Sat	245	120	
3	Sun	246	119	36
4	Mon	247	118	
5	Tue	248	117	
6	Wed	249	116	
7	Thu	250	115	
8	Fri	251	114	
9	Sat	252	113	
10	Sun	253	112	37
11	Mon	254	111	
12	Tue	255	110	
13	Wed	256	109	
14	Thu	257	108	
15	Fri	258	107	
16	Sat	259	106	
17	Sun	260	105	38
18	Mon	261	104	
19	Tue	262	103	
20	Wed	263	102	
21	Thu	264	101	
22	Fri	265	100	
23	Sat	266	99	
24	Sun	267	98	39
25	Mon	268	97	
26	Tue	269	96	
27	Wed	270	95	
28	Thu	271	94	
29	Fri	272	93	
30	Sat	273	92	

Day of Month	10		Days remaining	Week number
	October			
	Day of Week	Day of Year		
1	Sun	274	91	40
2	Mon	275	90	
3	Tue	276	89	
4	Wed	277	88	
5	Thu	278	87	
6	Fri	279	86	
7	Sat	280	85	
8	Sun	281	84	41
9	Mon	282	83	
10	Tue	283	82	
11	Wed	284	81	
12	Thu	285	80	
13	Fri	286		

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						
Wed	GHA	Dec	GHA	v	Dec	d	HP	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	█

18

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			

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 Sun, Aries, Venus, Mars, Jupiter, Saturn and rows for dates 0-23. Includes GHA, Dec, and other astronomical data.

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

Table with columns for Tue, GHA, Dec and rows for dates 0-23. Includes 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 Stars, SHA, Dec and rows for various star names like Denebola, Genah, Acrux, etc.

Table with columns for Stars, SHA, Dec and rows for various star names like Jan 01 Sun, Jan 02 Mon, Jan 03 Tue, etc.

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

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

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

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for various latitudes and times.

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

Table with columns for Day, Eqn. of Time, Mer. Pass, Moon, Age and rows for various days and times.

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 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 days 0-23.

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

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

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

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

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

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

Table for Stars with columns for SHA, Mer. pass, and Horizontal parallax for days 0-23.

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

Table for day length and moon phase with columns for Day, Sun (Eqn. of Time, Pass), Mer. Pass, Moon (Upper, Lower), and Age (12-14, 92-99%) for days 04-06.

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, and Dec.

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

Table for Stars with columns for Star name, SHA, and Dec.

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

Table for Moonrise and moonset with columns for Lat., Moonrise (Sun, Mon), Moonset (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 with columns for Star name, SHA, Mer. pass, and Dec.

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

Table for Day with columns for Day, Sun (Eqn. of Time, 00h, 12h, mm:ss), Mer. Pass (hh:mm), Moon (Mer. Pass, Upper, Lower, hh:mm), and Age (15-17, 100-96%).

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 various stars like Alpheratz, Schedar, Achernar, Hamal, Polaris, etc.

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

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

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

Table for Stars (SHA, Dec) listing stars like Denebola, Genah, Acrux, Gacrux, Alioth, Spica, etc.

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

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

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 (SHA, Mer. pass) listing stars like Jan 10 Tue, Jan 11 Wed, Jan 12 Thu, and Horizontal parallax.

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

Table for Moonset (Day, Eqn. of Time, Mer. Pass, Moon, Age) for days 10-12.

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 SHA and Dec, listing various star names and their coordinates.

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

Table for Twilight and Sunrise/Sunset 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 each day (Sat, Sun).

Table for Stars with columns for SHA and Dec, listing various star names and their coordinates.

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

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

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

Table for Stars with columns for SHA and Dec, listing various star names and their coordinates.

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

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

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

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

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

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, Genah, Acrux, Gacrux, Alloth, Spica, Alkaid, etc.

Table for Stars (SHA, Dec) listing stars like Jan 16 Mon, Jan 17 Tue, Jan 18 Wed, and Horizontal parallax.

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

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

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

Table for Twilight (Lat., Twilight, Sunrise, Sunset, Twilight) for various latitudes (N 72°, N 70°, N 68°, etc.).

Table for Moonset (Lat., Moonrise, Moonset) for various latitudes (N 72°, N 70°, N 68°, etc.).

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for days 16-18.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and sub-columns for GHA, Dec, and Mer. pass. for each planet.

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).

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

Table with columns for planets (Fri, GHA, Dec) and sub-columns for GHA, Dec, and Mer. pass. for each planet.

Table for Stars with columns for SHA and Dec, listing stars like Dubhe, Denebola, Genah, etc.

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

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

Table with columns for planets (Sat, GHA, Dec) and sub-columns for GHA, Dec, and Mer. pass. for each planet.

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

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

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

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

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

Table with columns for Tue, 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 Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

Table for Jan 22 Sun with columns for SHA, Mer.pass and rows for Venus, Mars, Jupiter, Saturn.

Table for Jan 23 Mon with columns for SHA, Mer.pass and rows for Venus, Mars, Jupiter, Saturn.

Table for Jan 24 Tue with columns for SHA, Mer.pass and rows for Venus, Mars, Jupiter, Saturn.

Table for Horizontal parallax with columns for Venus, Mer. and rows for Venus.

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

Table with columns for Mon, GHA, Dec, GHA, ν, Dec, d, HP and rows for dates 0-23. Includes SD = 16.2', d = 0.6'.

Table with columns for Tue, GHA, Dec, GHA, ν, Dec, d, HP and rows for dates 0-23. Includes SD = 16.2', d = 0.6'.

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 and rows for dates 22-24.

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, and Dec.

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

Table for Twilight with columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut. for days 0-23.

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

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

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

Table for Moonset with columns for Lat., Wed, Moonrise, Fri, Wed, Moonset, Thu, Fri for days 0-23.

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

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

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

Table for Moon with columns for Day, Eqn. of Time, Sun (12h, Mer. Pass), Moon (Upper, Lower Mer. Pass), Age for days 25-27.

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, d, HP) for each day (0-23).

Table for Twilight (Lat, Naat, Civil, Sunrise, Sunset, Civil, Naat) for various latitudes (N 72° to S 60°).

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

Table for Stars (SHA, Dec) listing stars like Denebola, Geniah, Acrux, Gacrux, Alrioth, Spica, Alkaid, etc.

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

Table for Moonrise and Moonset (Lat, Sat, Sun, Mon, Sat, Sun, Mon) for various latitudes (N 72° to S 60°).

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 stars like Jan 28 Sat, Jan 29 Sun, Jan 30 Mon, and Horizontal parallax.

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for days 28, 29, 30.

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, d, HP) for days 0-23. Includes SD and d values at the bottom.

Table for Twilight (Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.) for days 0-23. Includes Moonset data at the bottom.

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

Table for Stars (SHA, Dec) listing stars like Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, etc.

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

Table for Moonset (Lat., Tue, Wed, Thu) for days 0-23. Includes Moonset data at the bottom.

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 (SHA, Dec, Mer. pass) listing stars like Jan 31 Tue, Feb 01 Wed, Feb 02 Thu.

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Moon) for days 01-02. Includes Moonset data at the bottom.

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

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

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

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 Venus, Mars, Jupiter, Saturn for specific dates.

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

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

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

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

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for days 03-05.

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 (Tue, GHA, Dec) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

Table with columns for planets (Wed, GHA, Dec) 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, Mirafak, Aldebaran, Rigel, Capella, Bellatrix, El Nath, Alnilam, Betelgeuse, Canopus, Sirius, Adhara, Procyon, Pollux, Avior, Suhail, Miaplacidus, Alghard, Regulus, Dubhe, Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkhar, Arcturus, Rigel Kent., Atria, Kouchab, Zubayr 'ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aus., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

Table for Stars (SHA, Dec) listing stars like Feb 06 Mon, Feb 07 Tue, Feb 08 Wed, and Horizontal parallax for Venus and Mars.

Table for Stars (SHA, Dec) listing stars like Feb 06 Mon, Feb 07 Tue, Feb 08 Wed, and Horizontal parallax for Venus and Mars.

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

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

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

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

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

Table for Day (Day, Sun, Mer. Pass, Moon, Age) with columns for Day, Eqn. of Time, Mer. Pass, Upper, Lower, Age for days 06-08.

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 and Dec, listing stars like Alpheratz, Ankaa, Schedar, etc.

Table for Sun and Moon with columns for GHA, Dec, and HP, including SD and d values.

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

Table with columns for Fri and Dec, listing GHA, Dec, and Mer. pass. data for various celestial objects.

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

Table for Sun and Moon with columns for GHA, Dec, and HP, including SD and d values.

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

Table with columns for Sat and Dec, listing GHA, Dec, and Mer. pass. data for various celestial objects.

Table for Stars with columns for SHA and Mer. pass, listing stars like Feb 09 Thu, Feb 10 Fri, Feb 11 Sat.

Table for Sun and Moon with columns for GHA, Dec, and HP, including SD and d values.

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

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

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

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

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

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

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

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

Table for Moonrise and Moonset with columns for Lat., Moonrise (Sun, Tue), and Moonset (Sun, Tue).

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

Table for Stars with columns for SHA and Dec, listing stars like Feb 12 Sun, Feb 13 Mon, Feb 14 Tue, and Horizontal parallax.

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

Table for Moonrise and Moonset with columns for Day, Sun (Eqn. of Time, 00h, 12h), Mer. Pass (hh:mm), Moon (Mer. Pass. Upper, Lower), and Age (22-24, 67-66%).

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, Dec, HP) for days 0-23.

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

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, Dec, and Mer.pass.

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

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

Table with columns for planets (Fri, 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 h, Sun (GHA, Dec), Moon (GHA, Dec, HP) for days 0-23.

Table for Day with columns for Day, Eqn.of Time (00h, 12h), Mer. Pass (hh:mm), Mer. Pass. (Upper, Lower), and Age (25-27, 36-16%).

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, d, HP) for days 0-23.

Table for Twilight (Naut., Civil) and Sunrise/Sunset (Sunrise, Sunset, Civil) for days 0-23.

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

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

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

Table for Moonrise/Moonset (Moonrise, Moonset) and Moon phase (Lat., Sat, Sun, Mon) for days 0-23.

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

Table for Stars (SHA, Mer-pass) listing stars like Feb 18 Sat, Venus, Mars, etc.

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

Table for Moonrise/Moonset (Moonrise, Moonset) and Moon phase (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age-28, 8-0%) for days 0-23.

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 (Wed, GHA, Dec) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

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 (SHA, Dec) and Sun (h, Sun) and Moon (Moon) positions (GHA, Dec, d, HP) for days 0-23. Includes horizontal parallax data at the bottom.

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

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

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

Table for Twilight (Lat., Naat., Civil, Sunrise, Sunset, Civil, Naat.) for days 0-23. Includes S and N latitude data.

Table for Moonset (Lat., Tue, Moonrise, Thu, Tue, Moonset, Thu) for days 0-23. Includes N and S latitude data.

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for days 21-23. Includes a moon phase icon.

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

Table with columns for planets (Sat, GHA, Dec) and their GHA, Dec, and magnitude. Includes Mer. pass. data at the bottom.

Table with columns for Sun, GHA, Dec, and their GHA, Dec, and magnitude. Includes Mer. pass. data at the bottom.

Table for Stars with columns for SHA, Dec, and Mer. pass. Includes a section for Horizontal parallax.

Table for Sun and Moon with columns for h, Sun (GHA, Dec), and Moon (GHA, Dec, d, HP). Includes SD and d values at the bottom.

Table for Sun and Moon with columns for Sun (GHA, Dec) and Moon (GHA, Dec, d, HP). Includes SD and d values at the bottom.

Table for Sun and Moon with columns for Sun (GHA, Dec) and Moon (GHA, Dec, d, HP). Includes SD and d values at the bottom.

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

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

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

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

Table with columns for Tue, GHA, Dec, Mer. pass. values for various celestial bodies.

Table with columns for Wed, GHA, Dec, Mer. pass. values for various celestial bodies.

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

Table with columns for Stars, SHA, Dec, Mer. pass. values for stars like Dubhe, Denebola, Geniah, etc.

Table with columns for Stars, SHA, Mer. pass. values for stars like Feb 27 Mon, Feb 28 Sat, Mar 01 Wed.

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

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

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

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, Age and rows for days 27, 28, 01.

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 SHA and Dec, listing various stars like Alpheratz, Ankaa, Schedar, etc.

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

Table for Twilight and Sunrise/Sunset with columns for Lat., Naup., Civil, Sunrise, Sunset, Civil, Twilight, Naup. for days 0-23.

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

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

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

Table for Moonrise and Moonset with columns for Lat., Thu, Moonrise, Fri, Sat, Thu, Moonset, Fri, Sat for days 0-23.

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

Table for Stars with columns for SHA and Mer-pass, listing stars like Mar 02 Thu, Mar 03 Fri, Mar 04 Sat.

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

Table for Day with columns for Day, Eqn.of Time, Mer. Pass, Upper Mer.Pass, Lower Mer.Pass, Age for days 02-04.

Table with columns for Sun, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Includes Mer. pass. data at the bottom.

Table with columns for Mon and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

Table with columns for Tue and sub-columns for GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Includes Mer. pass. data at the bottom.

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 Dubhe, Denebola, Geniah, etc.

Table with columns for Stars and sub-columns for SHA, Mer. pass. Includes sections for Mar 05 Sun, Mar 06 Mon, Mar 07 Tue, and Horizontal parallax.

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

Table with columns for Mon and sub-columns for GHA, Dec, GHA, Dec, d, HP. Includes SD values at the bottom.

Table with columns for Tue and sub-columns for GHA, Dec, GHA, Dec, d, HP. Includes SD values at the bottom.

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

Table with columns for Lat., Moonrise, Moonset and sub-columns for Sun, Moonrise, Sun, Moonset.

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

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

Table with columns for Thu and sub-columns for GHA, Dec, SHA, Dec. Rows 0-23.

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

Mer. pass. 12:56 ν -0.3° d 1.3' m -3.95 ...

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 Dubhe, Denebola, Gienah, etc.

Table with columns for Mar 08 Wed, Mar 09 Thu, Mar 10 Fri and sub-columns for SHA, Mer. pass. Lists planetary positions.

Horizontal parallax Venus: 0.1 Mars: 0.1

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

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

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

SD = 16.1' d = 1.0' SD = 15.0' SD = 16.1' d = 1.0' SD = 15.1'

Table with columns for Twilight, Sunrise, Sunset, Twilight and sub-columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut. Rows 0-23.

Table with columns for Moonset and sub-columns for Lat., Wed, Thu, Fri, Wed, Moonset, Thu, Fri. Rows 0-23.

Table with columns for Day, Sun, Moon and sub-columns for Eqn. of Time, Mer. Pass, Upper, Lower, Age. Rows 08-10.

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 and sunrise/sunset times and rows for latitudes from 0 to 60 degrees.

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

Table with columns for Stars and rows for names like Dubhe, Denebola, Genah, Acrux, Gacrux, 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 Moonrise and Moonset times and rows for latitudes from 0 to 60 degrees.

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

Table with columns for Stars and rows for names like Mar 11 Sat, Mar 12 Sun, Mar 13 Mon, and Horizontal parallax.

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

Table with columns for Moonrise and Moonset times and rows for latitudes from 0 to 60 degrees.

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 stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

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

Table for Twilight (Lat, Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for various latitudes.

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

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

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

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

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

Table for Stars (SHA, Mer-pass) listing stars like Mar 14 Tue, Mar 15 Wed, Mar 16 Thu.

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

Table for Day (Day, Eqn of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for days 14-16.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Table for Day 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 (0-23).

Table with columns for planets (Fri, GHA, Dec) 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 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 (Lat, Naat, Civil, Sunrise, Sunset, Civil, Naat) listing times for various latitudes (N 72°, N 60°, N 58°, N 40°, N 30°, S 10°, S 60°).

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

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

Table with columns for Tue, GHA, Dec 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, etc.

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

Table with columns for Stars, SHA, Mer. pass and rows for Sun, Venus, Mars, Jupiter, Saturn on specific dates.

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

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

Table with columns for Tue, GHA, Dec, GHA, v, Dec, 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., Sun, Moon, Moonset and rows for various latitudes (N 72°, N 70°, etc.).

Table with columns for Day, Eqn. of Time, Mer. Pass, Moon, Age and rows for days 26, 27, 28.

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 (Thu) and their positions (GHA, Dec) for each day (0-23).

Table with columns for planets (Fri) 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 Stars (SHA, Dec) listing various stars like Dubhe, Denebola, Geniah, etc.

Table for Stars (SHA, Dec) listing various stars like Mar 29 Wed, Mar 30 Thu, Mar 31 Fri, and Horizontal parallax.

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

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

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

Table for Twilight (Lat., Naút., Civil, Sunrise, Sunset, Civil, Twilight) for various latitudes (N 72° to S 60°).

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age 8-10 49-68%) for days 29, 30, 31.

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, etc.

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

Table for Twilight (Naut., Civil, Sunrise, Sunset, Civil, Naut.) for each day (0-23).

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

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

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

Table for Moonrise and Moonset (Sat, Sun, Moon, Sat, Moonset, Moon) for each day (0-23).

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

Table for Stars (SHA, Dec, Mer.pass) listing stars like Apr 01 Sat, Apr 01 Sun, Apr 03 Mon.

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

Table for Moonrise and Moonset (Day, Sun, Mer., Moon, Age) for each day (0-23).

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, d, HP) showing positions for each day (0-23).

Table for Twilight (Lat., Naup., Civil, Sunrise, Sunset, Civil, Naup.) for various latitudes (N 72° to S 60°).

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

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

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

Table for Moonrise (Lat., Tue, Moonrise, Thu, Tue, Moonset, Thu) for various latitudes (N 72° to S 60°).

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

Table for Stars (SHA, Mer.pass) listing stars like Apr 04 Tue, Venus, Mars, Jupiter, Saturn, etc.

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

Table for Moonrise (Day, Sun Eqn. of Time, Mer. Pass, Moon Mer. Pass, Age) for various days (04-06).

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

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

Table with columns for planets (Sun) and their GHA, Dec, and Mer. pass. values.

Table for Stars (SHA, Dec, Mer. pass.) and Horizontal parallax (Venus, Mars).

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

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

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

Table for Twilight (Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.) and Moonrise (Lat., Moonrise, Moonset) values.

Table for Moonrise (Lat., Moonrise, Moonset) values.

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper, Lower, Age) values.

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 (Tue, GHA, Dec) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

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

Table for Stars (SHA, Dec) and Horizontal parallax (Venus, Mars) for days Apr 10 Mon, Apr 11 Tue, and Apr 12 Wed.

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

Table for Twilight (Naut., Civil, Sunrise, Sunset, Civil, Twilight) for days 0-23. Includes SD and d values at the bottom.

Table for Moonrise (Mon, Tue, Wed) and Moonset (Mon, Tue, Wed) for days 0-23. Includes SD and d values at the bottom.

Table for Day (Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for days 10-12. Includes a moon phase icon.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their coordinates (GHA, Dec) for days 0-23. Includes a summary row for meridian passage times.

Table with columns for planets (Fri, GHA, Dec) and their coordinates for days 0-23. Includes a summary row for meridian passage times.

Table with columns for planets (Sat, GHA, Dec) and their coordinates for days 0-23. Includes a summary row for meridian passage times.

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

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

Table for Stars with columns for star name, SHA, and Dec. Lists stars like Apr 13 Thu, Apr 14 Fri, Apr 15 Sat, and Horizontal parallax.

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

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

Table for Sun and Moon with columns for Sat, Sun (GHA, Dec), and Moon (GHA, 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 days 0-23.

Table for Moonrise and Moonset with columns for Lat., Moonrise (Thu, Fri, Sat), and Moonset (Thu, Fri, Sat) for days 0-23.

Table for Day with columns for Day, Eqn. of Time, Mer. Pass, Moon (Upper, Lower), and Age (23-25%, 54-32%) for days 13-15.

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 for Apr 16 Sun with columns for SHA, Mer. pass. and rows for Venus, Mars, Jupiter, Saturn.

Table for Apr 17 Mon with columns for SHA, Mer. pass. and rows for Venus, Mars, Jupiter, Saturn.

Table for Apr 18 Tue with columns for SHA, Mer. pass. and rows for Venus, Mars, Jupiter, Saturn.

Table for Horizontal parallax with columns for Venus, Mars and rows for values.

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

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

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

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

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

Table with columns for Day, Sun, Mer. Pass, Moon, Age and rows for dates 16-18. Includes Sun, Mer. Pass, Moon, Age data.

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

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

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

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

Table for Stars (SHA, Dec) listing stars like Denebel, Genah, Acrux, Gacrux, Alioth, Spica, Alkaid, etc.

Table for Stars (SHA, Dec) listing stars like Al Na'ir, Fomalhaut, Scheat, Markab, and a section for Horizontal parallaxes.

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

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

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

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

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

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

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, ν, d, HP) for each day (0-23).

Table for Twilight (Lat., Naut., Civil, Sunrise, Sunset, Civil, Naut.) for various latitudes (N 70°, N 70°, N 70°, etc.).

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

Table for Stars (SHA, Dec) listing stars like Denebola, Geniah, Acrux, Gacrux, Alioth, Spica, Alkaid, etc.

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

Table for Moonrise and Moonset (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 (0-23).

Table for Stars (SHA, Dec, Mer. pass) listing stars like Apr 22 Sat, Apr 23 Sun, Apr 24 Mon, and Horizontal parallax.

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age 2-4 1-16%) 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 stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

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

Table for Twilight (Naut., Civil, Sunrise, Sunset, Civil, Naut.) and Moonrise/Moonset for each day (0-23).

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

Table for Stars (SHA, Dec) listing stars like Denebola, Geniah, Acrux, Gacrux, Alioth, Spica, Alkaid, etc.

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

Table for Moonrise/Moonset (Tue, Wed, Thu) and Twilight (Tue, Wed, Thu) for each day (0-23).

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

Table for Stars (SHA, Dec, Mer.pass) listing stars like Apr 25 Tue, Apr 26 Wed, Apr 27 Thu, and Horizontal parallax.

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

Table for Day (Eqn.of Time, Mer. Pass, Moonrise/Moonset, Mer.Pass, Lower, Age) for each day (25-27).

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 with columns for stars (SHA, Dec) and their positions (SHA, Dec) for each day (Sat, Sun).

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

Table with columns for stars (SHA, Dec) and their positions (SHA, Dec) for each day (Sun).

Table with columns for Sun and Moon (GHA, Dec, HP) and their positions (GHA, Dec, d, HP) for each day (Fri, Sat, Sun).

Table with columns for Sun and Moon (GHA, Dec, HP) and their positions (GHA, Dec, d, HP) for each day (Sat, Sun).

Table with columns for Sun and Moon (GHA, Dec, HP) and their positions (GHA, Dec, d, HP) for each day (Sun).

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

Table with columns for moonrise and moonset times (Lat., Moonrise, Moonset) for various latitudes.

Table with columns for day, sun, and moon data (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 days 0-23.

Table with columns for planets (Tue, GHA, Dec) 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 stars (SHA, Dec) and horizontal parallax for various stars like Alpheratz, Ankaa, Schedar, etc.

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

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

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

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

Table with columns for moonrise and moonset (Lat., Mon, Tue, Wed, Mon, Tue, Wed) for various latitudes.

Table with columns for day length and moon phase (Day, Eqn. of Time, Mer. Pass, Mer. Pass, Age) for various days.

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

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

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

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

Table with columns for Fri and coordinates (GHA, Dec) for days 0-23.

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

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

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

Table with columns for Sat and coordinates (GHA, Dec) for days 0-23.

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

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

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

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn. Columns include GHA, Dec, and Mer. pass. times.

Table with columns for Mon, GHA, Dec. Columns include GHA, Dec, and Mer. pass. times.

Table with columns for Tue, GHA, Dec. Columns include GHA, Dec, and Mer. pass. times.

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

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

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

Table with columns for Sun, Moon, GHA, Dec, HP. Columns include GHA, Dec, HP, SD, d.

Table with columns for Mon, GHA, Dec, HP. Columns include GHA, Dec, HP, SD, d.

Table with columns for Tue, GHA, Dec, HP. Columns include GHA, Dec, HP, SD, d.

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

Table with columns for Lat., Moonrise, Moonset, Sunrise, Sunset, Moonset. Columns include Sun, Moonrise, Tue, Sun, Moonset, Tue.

Table with columns for Day, Sun, Mer. Pass, Moon, Age. Columns include Eqn. of Time, Mer. Pass, Upper, Lower, Age.

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

Mer.pass. 08:48 v -0.6' d -0.0' m -4.17 v 1.0' d -0.3' m 1.43 v 1.9' d 0.2' m -2.07 v 2.3' d 0.0' m 0.92

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

Mer.pass. 08:44 v -0.6' d -0.0' m -4.17 v 1.0' d -0.3' m 1.43 v 1.9' d 0.2' m -2.07 v 2.3' d 0.0' m 0.91

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

Mer.pass. 08:41 v -0.5' d -0.1' m -4.18 v 1.0' d -0.3' m 1.44 v 1.9' d 0.2' m -2.07 v 2.3' d 0.0' m 0.91

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

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

Table with columns for Stars: SHA, Dec, Mer.pass. Lists stars like May 10 Wed, Venus, Mars, etc.

Table with columns for Stars: SHA, Dec, Mer.pass. Lists stars like May 11 Thu, Venus, Mars, etc.

Table with columns for Stars: SHA, Dec, Mer.pass. Lists stars like May 12 Fri, Venus, Mars, etc.

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

SD = 15.8' d = 0.7' SD = 16.2'

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

SD = 15.8' d = 0.6' SD = 16.2'

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

SD = 15.8' d = 0.6' SD = 16.2'

Table with columns for twilight: Lat., Naat., Civil, Sunrise, Sunset, Civil, Twilight, Naat. Rows 0-23 showing times.

Table with columns for Moonrise: Lat., Wed, Thu, Fri, Wed, Thu, Fri. Rows 0-23 showing moon phases.

Table with columns for Day: Eqn of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age. Rows 10-12 showing times.

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their positions in GHA, Dec, and other parameters.

Table with columns for planets (Sun, GHA, Dec) and their positions in GHA, Dec, and other parameters.

Table with columns for planets (Mon, GHA, Dec) and their positions in GHA, Dec, and other parameters.

Table with columns for Stars (SHA, Dec) and their positions in SHA, Dec, and other parameters.

Table with columns for Stars (SHA, Dec, Mer.pass) and their positions in SHA, Dec, and other parameters.

Table with columns for Stars (SHA, Mer.pass) and their positions in SHA, Mer.pass, and other parameters.

Table with columns for Sun and Moon (GHA, Dec, SHA, Dec, d, HP) and their positions in GHA, Dec, SHA, Dec, d, HP, and other parameters.

Table with columns for Sun and Moon (GHA, Dec, SHA, Dec, d, HP) and their positions in GHA, Dec, SHA, Dec, d, HP, and other parameters.

Table with columns for Sun and Moon (GHA, Dec, SHA, Dec, d, HP) and their positions in GHA, Dec, SHA, Dec, d, HP, and other parameters.

Table with columns for twilight and sunrise/sunset (Lat, Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) and their positions in Lat, Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut., and other parameters.

Table with columns for twilight and sunrise/sunset (Lat, Sat, Moonrise, Moonset, Sunrise, Sunset, Moon) and their positions in Lat, Sat, Moonrise, Moonset, Sunrise, Sunset, Moon, and other parameters.

Table with columns for twilight and sunrise/sunset (Day, Eqn. of Time, Mer. Pass, Mer. Pass, Upper, Lower, Age) and their positions in Day, Eqn. of Time, Mer. Pass, Mer. Pass, Upper, Lower, Age, and other parameters.

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 of Stars (SHA, Dec) including Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, Acamar, Menkar, Mirfak, Aldebaran, Rigel, Capella, Bellatrix, Elmath, 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 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, d, HP) for days 0-23.

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

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

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

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

Table for Day (Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for days 16-18.

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 with columns for Stars (SHA, Dec) and their positions (SHA, Dec) for each day (May 19 Fri, May 20 Sat, May 21 Sun).

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

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

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 planets: Aries, Venus, Mars, Jupiter, Saturn. Sub-columns for GHA and Dec. Rows 0-23 showing celestial coordinates.

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 Stars with columns: SHA, Dec. Lists stars like Denebola, Gienah, Acrux, etc.

Table for Stars with columns: SHA, Dec. Lists stars like May 22 Mon, May 23 Tue, May 24 Wed, and Horizontal parallax.

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

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

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

Table for Twilight and Sunrise/Sunset with columns: Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.). Rows 0-45.

Table for Moonset with columns: Lat., Moonrise (Mon, Tue, Wed), Moonset (Mon, Tue, Wed). Rows 0-45.

Table for Day with columns: Day, Eqn. of Time (00h, 12h), Mer. Pass (hh:mm), Mer. Pass. (Upper, Lower), Age (3-5, 6-18%). Rows 22-24.

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, and Dec.

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

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 (Fri, GHA, GHA, Dec, GHA, Dec, GHA, Dec) for each day (Fri, Sat).

Table for Stars with columns for Star name, SHA, and Dec.

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

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

Table with columns for planets (Sat, GHA, GHA, Dec, GHA, Dec, GHA, Dec) for each day (Sat).

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

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

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

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

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

Table with columns for Tue, GHA, Dec, SHA, Dec, GHA, Dec, 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 May 28 Sun, SHA, Mer.pass. Lists stars like Venus, Mars, Jupiter, Saturn.

Table with columns for May 30 Tue, SHA, Mer.pass. Lists stars like Venus, Mars, Jupiter, Saturn.

Table with columns for Horizontal parallax, Venus, Mars. Lists values for Venus (0.2) and Mars (0.1).

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

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

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

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

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

Table with columns for Day, Sun (Eqn. of Time, 12h, Mer. Pass), Moon (Mer. Pass, Lower, Age). Rows 28-30 showing moon phase and time.

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

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

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

Table with columns for Stars (SHA, Dec) listing various star names and their coordinates.

Table with columns for Stars (SHA, Dec) listing various star names and their coordinates.

Table with columns for Stars (SHA, Dec) listing various star names and their coordinates.

Table with columns for Sun and Moon (GHA, Dec, d, HP) listing their positions and distances.

Table with columns for Sun and Moon (GHA, Dec, d, HP) listing their positions and distances.

Table with columns for Sun and Moon (GHA, Dec, d, HP) listing their positions and distances.

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

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

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

Table with columns for planets (Aries, Venus, Mars, Jupiter, Saturn) and their coordinates (SHA, Dec) for dates June 03, 04, 05.

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

Table with columns for Sun and Moon (Sun, Moon) and their coordinates (GHA, Dec, SHA, Dec, d, HP) for dates June 03, 04, 05.

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

Table with columns for planets (Sun, GHA, Dec) and their coordinates (GHA, Dec) for dates June 03, 04, 05.

Table with columns for stars (Denebola, Gienah, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkar, Arcturus, Rigel Kent., Kochab, Zuben ubi, Alphecca, Antares, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aug., Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab) and their coordinates (SHA, Dec, Mer-pass).

Table with columns for Sun and Moon (Sun, Moon) and their coordinates (GHA, Dec, SHA, Dec, d, HP) for dates June 03, 04, 05.

Table with columns for moonrise and moonset times (Lat., Moonrise, Moonset) for various latitudes.

Table with columns for planets (Mercury, Venus, Mars, Jupiter, Saturn) and their coordinates (GHA, Dec) for dates June 03, 04, 05.

Table with columns for stars (Mercury, Venus, Mars, Jupiter, Saturn) and their coordinates (SHA, Dec, Mer-pass).

Table with columns for Sun and Moon (Sun, Moon) and their coordinates (GHA, Dec, SHA, Dec, d, HP) for dates June 03, 04, 05.

Table with columns for day and time (Day, Eqn of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for dates June 03, 04, 05.

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

Table for Stars with columns for Star name, SHA, and Dec.

Table for Sun and Moon with columns for Sun/Moon name, GHA, Dec, and 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 (Wed, GHA, Dec) and their positions (SHA, Dec) for each day (Wed, Thu, Fri).

Table for Stars with columns for Star name, SHA, and Dec.

Table for Sun and Moon with columns for Sun/Moon name, GHA, Dec, and HP.

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

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

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

Table for Sun and Moon with columns for Sun/Moon name, GHA, Dec, and HP.

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

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

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

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

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

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

Table for Stars (SHA, Dec) listing stars like Jun 09 Fri, Jun 10 Sat, Jun 11 Sun, and Horizontal parallax.

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

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

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

Table for Twilight and Sunrise/Sunset (Lat., Twilight, Sunrise, Sunset, Twilight) with checkboxes for Civil, Naut., and Sun.

Table for Moonrise and Moonset (Lat., Moonrise, Moonset) with checkboxes for Sat, Sun, Fri, Sat, Sun.

Table for Day, Sun, and Moon (Day, Sun, Moon) with columns for 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. Includes Mer. pass. data at the bottom.

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

Table with columns for planets (Wed, GHA, Dec) 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, Schkarak, and others with their coordinates and magnitudes.

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

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

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

Table for Twilight (Naut., Civil, Sunrise, Sunset, Civil, Naut.) for various latitudes (N 72°, N 70°, N 68°, N 66°, N 58°, N 56°, N 40°, S 50°, S 60°).

Table for Moonrise (Mon, Tue, Wed, Mon, Tue, Wed) for various latitudes (N 72°, N 70°, 68°, 66°, 64°, 62°, 60°, N 58°, 56°, 54°, 52°, N 40°, 35°, 30°).

Table for Day (Sun Eqn. of Time, Mer. Pass, Moon Mer. Pass, Age) for days 12, 13, 14.

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

Table for Stars with columns for SHA and Dec, listing various star names and their coordinates.

Table for Sun and Moon with columns for GHA, Dec, and other astronomical data.

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

Table with columns for Fri and Dec, listing astronomical data for Friday and December.

Table for Stars with columns for SHA and Dec, listing various star names and their coordinates.

Table for Sun and Moon with columns for GHA, Dec, and other astronomical data.

Table for Twilight and Sunrise/Sunset with columns for Lat., Thu, Moonrise, Sat, Moonset, Fri, Sat.

Table with columns for Sat and Dec, listing astronomical data for Saturday and December.

Table for Stars with columns for SHA and Dec, listing various star names and their coordinates.

Table for Sun and Moon with columns for GHA, Dec, and other astronomical data.

Table for Twilight and Sunrise/Sunset 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 Moon 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 and rows for names like Alpheratz, Schkar, Diphda, etc. Includes SHA and Dec.

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

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

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

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

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

Table with columns for Twilight, Sunrise, Sunset, and Twilight. Includes Lat., Naut., Civil, and Sun. data.

Table with columns for Moonrise and Moonset. Includes Lat., Sun, Moon, Tue, and Sun, Moon, Tue data.

Table with columns for Day, Sun, and Moon. Includes Eqn. of Time, Mer. Pass, and Mer. Pass. data.

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

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

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

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

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

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

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

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

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

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

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

Table for Sun (Eqn. of Time, Mer. Pass) and Moon (Mer. Pass, Age) for days 21-23.

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

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

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

Table for Twilight and Sunrise/Sunset with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.) for each day (0-23).

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

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

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

Table for Moonset and Moonrise with columns for Lat., Moonset (Sat, Sun, Mon), Moonrise (Sat, Sun, Mon) for each day (0-23).

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

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

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

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

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 magnitude.

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

Table for twilight and sunrise/sunset times with columns for Lat., Nautil., Civil, Sunrise, Sunset, Civil, Nautil.

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 magnitude.

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

Table for twilight and sunrise/sunset times with columns for Lat., Tue, Moonrise, Thu, Tue, Moonset, Thu.

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 magnitude.

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

Table for twilight and sunrise/sunset times with columns for Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age.

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

Table with columns for planets (Sat, GHA, Dec) and their GHA, Dec, and other astronomical data.

Table with columns for Sun, GHA, Dec, and their GHA, Dec, and other astronomical data.

Table with columns for Stars (SHA, Dec) and their SHA, Dec, and other astronomical data.

Table with columns for Stars (SHA, Dec) and their SHA, Dec, and other astronomical data.

Table with columns for Stars (SHA, Dec) and their SHA, Dec, and other astronomical data.

Table with columns for Sun and Moon (GHA, Dec, HP) and their GHA, Dec, HP, and other astronomical data.

Table with columns for Sun and Moon (GHA, Dec, HP) and their GHA, Dec, HP, and other astronomical data.

Table with columns for Sun and Moon (GHA, Dec, HP) and their GHA, Dec, HP, and other astronomical data.

Table with columns for twilight and sunrise/sunset data (Lat., Twilight, Sunrise, Sunset, Twilight) and their corresponding times.

Table with columns for moonrise and moonset data (Lat., Moonrise, Moonset) and their corresponding times.

Table with columns for day and moon data (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) and their corresponding values.

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

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

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

Table for Sun and Moon with columns for Sun (GHA, Dec) and Moon (GHA, Dec, d, HP) for days 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 for Moonset with columns for Lat., Moonset (Mon, Tue, Wed) for various latitudes.

Table for Day with columns for Day, Sun (Eqn. of Time, Mer. Pass), and Moon (Mer. Pass, Age) for days 03-04.

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

Table with columns for planets (Fri, GHA, Dec) and their GHA, Dec, and other astronomical data.

Table with columns for planets (Sat, GHA, Dec) and their GHA, Dec, and other astronomical data.

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

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

Table for Stars with columns for SHA and Dec, listing stars like Jul 06 Thu, Jul 07 Fri, Jul 08 Sat, and Horizontal parallax.

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

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

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

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., Moonrise (Thu, Fri, Sat), Moonset (Thu, Fri, Sat).

Table for Day with columns for Day, Eqn. of Time (00', 12'), Mer. Pass (hh:mm), Upper Mer. Pass (hh:mm), Lower Mer. Pass (hh:mm), Age (18-20, 91-73%).

Table with columns for Sun, Venus, Mars, Jupiter, Saturn and rows for GHA, Dec, and Mer. pass. data for various celestial objects.

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

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

Table with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.) data.

Table with columns for Mon, GHA, Dec, and Mer. pass. data for various celestial objects.

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

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

Table with columns for Lat., Sun, Moonrise, Moonset, and Moonset (Sun, Tue) data.

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

Table with columns for Stars, SHA, Mer. pass., and Horizontal parallax data for stars like Jul 09 Sun, Jul 10 Mon, etc.

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

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

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).

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

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

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

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, Dec, d, HP).

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

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

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., Moonrise (Wed, Thu, Fri), Moonset (Wed, Thu, Fri).

Table for Day 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 (0-23).

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

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

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

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

Table for Moonset and Moonrise with columns for Lat., Moonset (Sun, Mon), Moonrise (Sun, Mon).

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

Table for Day with columns for Day, Eqn. of Time, Sun (12h, Mer. Pass), Moon (Upper, Lower Mer. Pass), and Age (7-1%).

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

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

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

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

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

Table for Day with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Age) for days 18-20.

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 (Fri, Sat, Sun).

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

Table with columns for Stars (SHA, Dec) and their positions (SHA, Dec) for each day (Fri, Sat, Sun).

Table with columns for Stars (SHA, Dec) and their positions (SHA, Dec) for each day (Fri, Sat, Sun).

Table with columns for Stars (SHA, Dec) and their positions (SHA, Dec) for each day (Fri, Sat, Sun).

Table with columns for Sun and Moon (GHA, Dec, HP) and their positions (GHA, Dec, d, HP) for each day (Fri, Sat, Sun).

Table with columns for Sun and Moon (GHA, Dec, HP) and their positions (GHA, Dec, d, HP) for each day (Fri, Sat, Sun).

Table with columns for Sun and Moon (GHA, Dec, HP) and their positions (GHA, Dec, d, HP) for each day (Fri, Sat, Sun).

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

Table with columns for moonrise and moonset times (Lat., Moonrise, Moonset) for various latitudes.

Table with columns for day, sun, and moon data (Day, Sun, Moon) including equation of time and meridian passage.

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 for various celestial bodies.

Table with columns for Wed, GHA, Dec, Mer. pass. data for various celestial bodies.

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

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

Table with columns for Stars, SHA, Mer. pass. data for stars like Jul 24 Mon, Venus, Mars, etc.

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

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

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

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight data for various latitudes.

Table with columns for Lat., Moonrise, Moonset data for various latitudes.

Table with columns for Day, Sun, Mer. Pass, Moon, Age data for specific days.

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 SHA and Dec, listing stars like Alpheratz, Ankaa, Schedar, etc.

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

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

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 SHA and Dec, listing stars like Denebola, Gienah, Acrux, etc.

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

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

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

Table for Stars with columns for SHA, Mer. pass, and Horizontal parallax (Ven., Mars).

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

Table for Moonset data with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (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 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 stars like Alpheratz, Ankaa, Schedar, etc.

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

Table with columns for Stars, SHA, Dec and rows for stars like Jul 30 Sun, Venus, Mars, etc.

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

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

Table with columns for Tue, GHA, Dec, GHA, Dec, 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 dates 0-23. Includes N 72°, N 70°, N 58°, etc.

Table with columns for Lat., Moonrise, Moonset and rows for dates 0-23. Includes N 72°, N 70°, N 68°, etc.

Table with columns for Day, Sun, Mer., Moon, Age and rows for dates 30, 31, 01. Includes Eqn.of Time, Mer. Pass, etc.

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 (Thu) 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 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, Acrux, Gacrux, Alioth, Spica, Alkaid, Hadar, Menkent, Arcturus, Rigel Kent., etc.

Table for Stars (SHA, Dec) listing stars like Aug 02 Wed, Aug 03 Thu, Aug 04 Fri, and Horizontal parallax data.

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

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

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

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

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for days 02-04.

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

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

Table with columns for planets (Mon, GHA, Dec) and their positions (SHA, 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 Deneb, Gienah, Acrux, etc.

Table for Stars (SHA, Dec) listing stars like Aug 05 Sat, Aug 06 Sun, Aug 07 Mon, and Horizontal parallax.

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

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

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

Table for Twilight (Naut., Civil, Sunrise, Sunset, Civil, Naut.) for each day (0-23).

Table for Moonrise and Moonset (Sat, Moonrise, Mon, Sat, Moonset, Mon) for each day (0-23).

Table for Day (Eqn. of Time, Mer. Pass, Mer. Pass, Upper, Lower, Age) for each day (05-07).

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 stars like Alpheratz, Ankaa, Schedar, etc.

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

Table for Twilight (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 (SHA, Dec) listing stars like Deneb, Gienah, Acrux, etc.

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

Table for Moonset (Moonrise, Moonset) 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, Mer. pass) listing stars like Aug 08 Tue, Aug 09 Wed, Aug 10 Thu.

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

Table for Day (Eqn. of Time, Mer. Pass, Moon, Age) for days 08-10.

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 (Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for various latitudes.

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (Fri, 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 Moonrise and Moonset (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 Aug 11 Fri, Aug 12 Sat, Aug 13 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 various days.

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

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

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

Table for Twilight and Sunrise/Sunset with columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut. Rows 0-23.

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

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

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

Table for Moonrise and Moonset with columns for Lat., Mon, Tue, Wed, Mon, Tue, Wed. Rows 0-23.

Table with columns for Wed, GHA, Dec, SHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23 showing coordinates.

Table for Stars with columns for SHA, Mer-pass, SHA, Mer-pass. Lists stars like Aug 14 Mon, Aug 15 Tue, Aug 16 Wed.

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

Table for Sun and Moon with columns for Day, Sun Eqn of Time, Mer. Pass, Moon Mer. Pass, Age. Rows 14-16.

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

Table for Stars with columns for SHA and Dec, listing various star names and their coordinates.

Table for Sun and Moon with columns for GHA, Dec, ν, and HP, providing data for both celestial bodies.

Table for Twilight with columns for Lat., Naught, Civil, Sunrise, Sunset, and Twilight, showing times for different latitudes.

Table for Fri with columns for GHA, Dec, ν, and HP, listing astronomical data for Friday.

Table for Stars with columns for SHA and Dec, listing star names and coordinates.

Table for Sun and Moon with columns for GHA, Dec, ν, and HP, providing data for Friday.

Table for Moonset with columns for Lat., Moonrise, Moonset, and Moonset, showing times for different latitudes.

Table for Sat with columns for GHA, Dec, ν, and HP, listing astronomical data for Saturday.

Table for Stars with columns for SHA and Dec, listing star names and coordinates.

Table for Sun and Moon with columns for GHA, Dec, ν, and HP, providing data for Saturday.

Table for Moonset with columns for Day, Sun, Mer. Pass, Moon, and Age, showing times and moon phase for different days.

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, Genah, Acrux, etc.

Table with columns for Stars, SHA, Dec, Mer. pass. and rows for stars like Aug 20 Sun, Aug 21 Mon, Aug 22 Tue, and Horizontal parallax.

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

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

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

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

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

Table with columns for Day, Sun, Mer. Pass, Moon, Age and rows for dates 20-22. Includes Sun, Mer. Pass, Moon, Age data.

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 Mer. pass.

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

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, Dec, d, HP) for each day.

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

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

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

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

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

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

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

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

Table with columns for stars (SHA, Dec) and their names (Alpheratz, Ankaa, Schedar, etc.).

Table with columns for stars (SHA, Dec) and their names (Denebola, Genah, Acrux, etc.).

Table with columns for stars (SHA, Dec) and their names (Aug 26 Sat, Aug 27 Sun, Aug 28 Mon, Horizontal parallax).

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

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

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

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

Table with columns for moon phases (Lat., Moonrise, Moonset) for each day (0-23).

Table with columns for day observations (Day, Sun Eqn of Time, Mer. Pass, Moon Mer. Pass, Age) for each day (26-28).

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) showing positions for each day (0-23).

Table for Twilight (Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for various latitudes.

Table with columns for planets (Wed, 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, Antares, Rigel Kent, Kochab, Zubeh'nun, Alphecca, Arcturus, Atria, Sabik, Shaula, Rasalhague, Eltanin, Kaus Aest, Vega, Nunki, Altair, Peacock, Deneb, Enif, Al Na'ir, Fomalhaut, Scheat, Markab.

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

Table for Moonset (Lat., Tue, Wed, Thu, Tue, Wed, Thu) showing moonset times for various latitudes.

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

Table for Stars (SHA, Mer-pass) listing stars like Aug 29 Tue, Aug 30 Wed, Aug 31 Thu, and Horizontal parallax.

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

Table for Day (Day, Sun, Moon) showing equatorial time, meridian passage, and moon phases.

Table with columns for Venus, Mars, Jupiter, Saturn, and Mer. pass. Data includes GHA, Dec, and magnitude for various celestial bodies.

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

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

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

Table with columns for Sat, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Data for Saturn and other planets.

Table for Stars with columns for SHA and Dec. Lists 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 with columns for GHA, Dec, GHA, ν, Dec, d, HP. Includes data for the Sun and Moon over the period.

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

Table with columns for Sun, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Data for the Sun and other planets.

Table for Stars with columns for SHA, Mer-pass, and Horizontal parallax. Lists stars like Sep 01 Fri, Sep 02 Sat, Sep 03 Sun, and Venus/Mars parallax.

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

Table for Day with columns for Day, Eqn. of Time (00h, 12h), Mer. Pass (hh:mm), Moon (Upper, Lower), Age (99-88%).

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 (Tue, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table with columns for planets (Wed, GHA, Dec) 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 Stars with columns for Star Name, SHA, Dec, and Mer.pass.

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

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

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

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

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

Table for Moonrise and Moonset with columns for Lat., Moonrise (Mon, Tue, Wed), and Moonset (Mon, Tue, Wed) for each day (0-23).

Table for Day with columns for Day, Eqn. of Time, Sun (GHA, Dec), Mer. Pass, Moon (Mer. Pass, Lower, Upper), and Age for each day (04-06).

Table with columns for Venus, Mars, Jupiter, Saturn, and Mer. pass. Rows show GHA, Dec, and other astronomical data for each planet.

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

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

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

Table with columns for Fri, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows show astronomical data for Friday.

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

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

Table for Moonrise and Moonset with columns for Lat., Moonrise, Moonset. Includes a moon phase icon.

Table with columns for Sat, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows show astronomical data for Saturday.

Table for Stars with columns for SHA, Mer. pass. Lists stars like Sep 07 Thu, Sep 08 Fri, Sep 09 Sat.

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

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

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

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

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

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

Table with columns for Horizontal parallax, Venus, Mars and rows for Venus, Mars.

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

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

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

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for dates 0-23. Columns include Lat., Twilight, Sunrise, Sunset, Twilight.

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

Table with columns for Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age and rows for dates 10-12. Columns include Day, 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 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).

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

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

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

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

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

Table for Sun and Moon with columns for Sun (GHA, Dec) and Moon (GHA, Dec, d, HP) for each day (Thu, Fri).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 Sun/Moon Name, GHA, Dec, and distance.

Table for Sun and Moon with columns for Sun/Moon Name, GHA, Dec, and distance.

Table for Sun and Moon with columns for Sun/Moon Name, GHA, Dec, and distance.

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

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

Table for Day with columns for Day, Eqn. of Time, Sun, Mer. Pass, 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 stars (Sat, GHA, Dec) and their positions (GHA, Dec) for each day (Sat, Sun).

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

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

Table with columns for Sun and Moon (h, Sun, Moon) and their positions (GHA, Dec, HP) for each day (Fri, Sat, Sun).

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

Table with columns for Sun and Moon (Sun, Moon) and their positions (GHA, Dec, HP) for each day (Sun).

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

Table with columns for moonrise/moonset (Lat., Moonrise, Moonset) for various latitudes.

Table with columns for day length and moon phase (Day, Eqn. of Time, Mer. Pass, Moon, 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 with columns for planets (Tue, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table with columns for planets (Wed, 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, Genah, Acrux, etc.

Table for Stars (SHA, Dec) listing stars like Sep 25 Ven, Sep 26 Tue, Sep 27 Wed, and Horizontal parallax.

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

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

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

Table for Twilight (Lat., Naup., Civil, Sunrise, Sunset, Civil, Naup.) listing twilight times for various latitudes (N 72° to S 60°).

Table for Moonrise (Lat., Mon, Tue, Wed, Mon, Tue, Wed) listing moonrise and moonset times for various latitudes (N 72° to S 60°).

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) listing day data for days 25, 26, and 27.

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, d, HP) showing positions for each day (0-23).

Table for twilight and sunrise/sunset times (Lat., Sunrise, Sunset, Twilight) for various latitudes (N 70° to S 60°).

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, etc.

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

Table for Moonrise and Moonset times (Lat., Moonrise, Moonset) for various latitudes (N 70° to S 60°).

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

Table for Stars (SHA, Dec, Mer-pass) listing stars like Sep 28 Thu, Sep 29 Fri, Sep 30 Sat.

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

Table for Day, Sun, and Moon (Eqn. of Time, Mer. Pass, Moon) for days 28, 29, and 30.

Table with columns for Sun, Aries, Venus, Mars, Jupiter, Saturn. Columns include GHA, Dec, and other astronomical data.

Table with columns for Mon, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Columns include GHA, Dec, and other astronomical data.

Table with columns for Tue, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Columns include GHA, Dec, and other astronomical data.

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

Table with columns for Stars, SHA, Dec, Mer.pass. Lists stars like Denebola, Geniah, Acrux, etc.

Table with columns for Stars, SHA, Mer.pass, Horizontal parallax. Lists stars like Oct 01 Sun, Venus, Mars, etc.

Table with columns for Sun, Moon, GHA, Dec, GHA, Dec, d, HP. Columns include GHA, Dec, d, HP.

Table with columns for Mon, GHA, Dec, GHA, Dec, d, HP. Columns include GHA, Dec, d, HP.

Table with columns for Tue, GHA, Dec, GHA, Dec, d, HP. Columns include GHA, Dec, d, HP.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight. Columns include Lat., Twilight, Sunrise, Sunset, Twilight.

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

Table with columns for Day, Eqn. of Time, Mer. Pass, Mer. Pass., Age. Columns include Day, Eqn. of Time, Mer. Pass., Mer. Pass., Age.

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

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

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

Table for Stars (SHA, Dec) listing various star names and their coordinates.

Table for Stars (SHA, Dec) listing various star names and their coordinates.

Table for Stars (SHA, Dec) listing various star names and their coordinates.

Table for Sun and Moon (GHA, Dec, HP) listing their positions and parameters for each day.

Table for Sun and Moon (GHA, Dec, HP) listing their positions and parameters for each day.

Table for Sun and Moon (GHA, Dec, HP) listing their positions and parameters for each day.

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

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) and a moon phase icon.

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

Table for Stars with columns for Star name, SHA, and Dec.

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

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

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

Table for Stars with columns for Star name, SHA, and Dec.

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

Table for Moonrise and Moonset with columns for Lat., Sat, Moonrise (Sun, Mon), Moonset (Sun, Mon) for each day (0-23).

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

Table for Stars with columns for Star name, SHA, Mer.pass, SHA, Mer.pass for Oct 07, 08, 09.

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

Table for Moonrise and Moonset with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Lower, Age) for each day (0-23).

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

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

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

Table for Stars (SHA, Dec) and Horizontal parallax (Venus, Mars) for dates Oct 10-12. Includes Mer. pass. data.

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

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

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

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

Table for Moonset (Moonrise, Moonset) for various latitudes (N 72° to S 60°).

Table for Day (Eqn. of Time, Mer. Pass, Moon) for various latitudes (N 10° to S 60°).

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 planets (Sun, GHA, Dec) 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 Stars with columns for Star Name, SHA, Dec, and Mer-pass.

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

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

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

Table for Sun and Moon with columns for Sun (GHA, Dec) and Moon (GHA, Dec, d, HP) for each day (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 for Moonset with columns for Lat., Moonrise (Sat, Sun), and Moonset (Fri, Sat, Sun) for various latitudes.

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

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 (Tue, GHA, Dec) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. data at the bottom.

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

Table for Stars (SHA, Dec) and Horizontal parallax (Venus, Mars) for days 0-23.

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

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

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

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

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper/Lower Mer. Pass, Age) for days 16-18.

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

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

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

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

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

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

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

Table for Twilight and Sunrise/Sunset with columns for Lat., Moonrise, Moonset, and Moonset (Fri, Sat).

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

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

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

Table for Twilight and Sunrise/Sunset with columns for Day, Sun (Eqn. of Time, Mer. Pass), Moon (Mer. Pass, Lower, Upper), and Age (18-37%).

Table with columns for Sun, Venus, Mars, Jupiter, Saturn and sub-columns for GHA, Dec, SHA, Dec. Includes Mer. pass. data at the bottom.

Table with columns for Moon and sub-columns for GHA, Dec, SHA, Dec. Includes Mer. pass. data at the bottom.

Table with columns for Tue and sub-columns for GHA, Dec, SHA, Dec. Includes Mer. pass. data at the bottom.

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

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

Table for Stars with columns for SHA, Mer. pass, and Horizontal parallax. Lists stars like Oct 22 Sun, Oct 23 Mon, Oct 24 Tue.

Table for Sun and Moon with columns for GHA, Dec, SHA, Dec, d, HP. Includes SD and d values at the bottom.

Table for Sun and Moon with columns for GHA, Dec, SHA, Dec, d, HP. Includes SD and d values at the bottom.

Table for Sun and Moon with columns for GHA, Dec, SHA, Dec, d, HP. Includes SD and d values at the bottom.

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., Sun, Moonrise (Sun, Tue), Moonset (Sun, Tue).

Table for Day with columns for Day, Eqn. of Time (00h, 12h), Mer. Pass (hh:mm), Moon (Upper Pass, Lower Pass), Age (8-10, 48-71%).

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 (SHA, Dec) and Mer.pass for various stars like Alpheratz, Ankaa, Schedar, etc.

Table for Stars (SHA, Dec, Mer.pass) for Oct 25, Oct 26, and Oct 27.

Table for Horizontal parallax (Venus, Mars) with values 0.2 and 0.1.

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

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

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

Table for Twilight (Lat, Naat, Civil, Sunrise, Sunset, Civil, Naat) for various latitudes.

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age) for days 25, 26, 27.

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, and Dec.

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

Table for Twilight and Sunrise/Sunset with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, and Twilight (Civil, Naut.) for each day (0-23).

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

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

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

Table for Moonrise and Moonset with columns for Lat., Moonrise (Sat, Sun, Mon), Moonset (Sat, Sun, Mon) for each day (0-23).

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

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

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

Table for Day with columns for Day, Sun (Eqn. of Time, 12h, Mer. Pass), Moon (Mer. Pass, Lower, Age), and HP for each day (28-30).

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

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

Table with columns for Thu, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

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

Table with columns for Oct 31 Tue, SHA, Mer-pass, Venus, Mars, Jupiter, Saturn. Lists planetary positions.

Table with columns for Nov 01 Wed, SHA, Mer-pass, Venus, Mars, Jupiter, Saturn. Lists planetary positions.

Table with columns for Horizontal parallax, Venus, Mars. Lists parallax values.

Table with columns for Sun, Moon, GHA, Dec, HP. Lists solar and lunar data.

Table with columns for Wed, GHA, Dec, GHA, Dec, HP. Lists planetary data for Wednesday.

Table with columns for Thu, GHA, Dec, GHA, Dec, HP. Lists planetary data for Thursday.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight. Lists twilight and sunrise/sunset times.

Table with columns for Lat., Tue, Moonrise, Thu, Tue, Moonset, Thu. Lists moonrise and moonset times.

Table with columns for Day, Sun, Mer., Moon, Age. Lists sun and moon data.

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, and Dec.

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

Table for Twilight and Sunrise/Sunset 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 each day (0-23).

Table for Stars with columns for Star name, SHA, and Dec.

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

Table for Moonrise and Moonset 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 each day (0-23).

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

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

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

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

Table with columns for TUE, GHA, Dec, SHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

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

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

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

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, Dec, d, HP. Rows 0-23.

Table with columns for Sun, Moon, GHA, Dec, GHA, Dec, d, HP. Rows 0-23.

Table with columns for Sun, Moon, GHA, Dec, GHA, Dec, d, HP. Rows 0-23.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight. Rows 0-23.

Table with columns for Lat., Moonrise, Moonset. Rows 0-23.

Table with columns for Day, Sun, Mer., Moon, Age. Rows 06-08.

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

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

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

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

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

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

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

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

Table for Moonset with columns for Lat., Moonrise (Thu, Fri, Sat), and Moonset (Thu, Fri, Sat) for days 0-23.

Table for Day with columns for Day, Eqn. of Time (00h, 12h), Mer. Pass (hh:mm), Moon (Upper, Lower), and Age (18-6%) for days 09-11.

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 Moon, GHA, Dec, and Mer. pass. data for dates 0-23.

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

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

Table with columns for Stars, SHA, Dec, and Mer. pass. data for stars like Dubhe, Denebola, Genah, etc.

Table with columns for Stars, SHA, Dec, and Mer. pass. data for stars like Nov 12 Sun, Nov 13 Mon, Nov 14 Tue, and Horizontal parallax.

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

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

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

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

Table with columns for Lat., Moonrise, Moonset and rows for dates 0-23. Includes Sun and Moon times.

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

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

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

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

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

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

Table for Stars (SHA, Dec) listing stars like Nov 15 Wed, Nov 16 Thu, Nov 17 Fri, and Horizontal parallax.

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, Naut., Civil, Sunrise, Sunset, Civil, Twilight, Naut.) for days 0-23.

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Mer. Pass., Age) for days 15-17.

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

Table with columns for planets (Mon, 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 Dubhe, Denebola, Genah, etc.

Table for Stars (SHA, Dec) listing stars like Nov 18 Sat, Nov 19 Sun, Nov 20 Mon, and Horizontal parallax.

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

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

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

Table for Twilight (Lat, Naut, Civil, Sunrise, Sunset, Civil, Naut) for each day (0-23).

Table for Moonset (Lat, Sat, Moonrise, Mon, Sat, Moonset, Mon) for each day (0-23).

Table for Day (Day, Eqn. of Time, Mer. Pass, Upper Mer. Pass, Lower Mer. Pass, Age 5-7, 24-45%) for each day (0-23).

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

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

Table with columns for Thu, GHA, Dec, GHA, Dec, GHA, Dec, GHA, Dec. Rows 0-23.

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, Geniah, etc.

Table with columns for Stars, SHA, Mer-pass, SHA, Mer-pass. Lists stars like Nov 21 Tue, Nov 22 Wed, Nov 23 Thu.

Table with columns for Sun, Moon, GHA, Dec, GHA, Dec, GHA, Dec, HP. Rows 0-23.

Table with columns for Sun, Moon, GHA, Dec, GHA, Dec, GHA, Dec, HP. Rows 0-23.

Table with columns for Sun, Moon, GHA, Dec, GHA, Dec, GHA, Dec, HP. Rows 0-23.

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight. Rows 0-23.

Table with columns for Lat., Moonrise, Moonset. Rows 0-23.

Table with columns for Day, Sun, Mer., Moon, Age. Rows 21-23.

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

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

Table with columns for planets (Sun, 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 Stars (SHA, Dec) listing stars like Denebola, Genah, Acruz, etc.

Table for Stars (SHA, Dec) listing stars like Nov 24 Fri, Nov 25 Sat, Nov 26 Sun, and Horizontal parallax.

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

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

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

Table for Twilight (Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight) for various latitudes.

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

Table for Day (Day, Eqn. of Time, Mer. Pass, Moon, 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 with columns for planets (Tue, GHA, Dec) and their positions (GHA, Dec) for each day (0-23).

Table with columns for planets (Wed, 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 (h, Sun, Moon) and their positions (GHA, Dec, ν, d, HP) for each day (0-23).

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

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

Table with columns for twilight (Lat., Twilight, Sunrise, Sunset, Twilight) and their positions (Naut., Civil, Sunrise, Sunset, Civil, Naut.) for each day (0-23).

Table with columns for moonrise (Lat., Moonrise, Moonset) and their positions (Mon, Tue, Wed, Mon, Tue, Wed) for each day (0-23).

Table with columns for day (Day, Egn. of Time, Mer. Pass, Moon, Age) and their positions (00h, 12h, mm:ss, hh:mm, hh:mm, hh:mm, 100-97%) for each day (27-29).

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

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

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

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

Table for Stars with columns for SHA and Dec, listing stars like Nov 30 Thu, Dec 01 Fri, Dec 02 Sat, and Horizontal parallax.

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

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

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

Table for Day with columns for Day, Eqn. of Time (00h, 12h), Mer. Pass (hh:mm), Mer. Pass. (Upper, Lower), and Age (17-19, 92-79%) for days 30, 01, 02.

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 Mer. pass. data.

Table with columns for Tue, GHA, Dec and rows for dates 0-23. Includes 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 Dubhe, Denebola, Genah, etc.

Table with columns for Stars, SHA, Mer. pass and rows for Dec 03 Sun, Dec 04 Mon, Dec 05 Tue.

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

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

Table with columns for Tue, GHA, Dec, GHA, Dec, 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 dates 0-23. Includes Naut. and Civil times.

Table with columns for Lat., Moonrise, Moonset and rows for dates 0-23. Includes Sun and Moon times.

Table with columns for Day, Sun, Mer. Pass, Moon, Age and rows for dates 03-05. Includes Eqn. of Time and Mer. Pass. 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 Thursday (Thu) and rows for dates 0-23. Columns include GHA, Dec, and Mer. pass.

Table with columns for Friday (Fri) and rows for dates 0-23. Columns include GHA, Dec, and Mer. pass.

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

Table for Stars with columns for Dec 06 Wed, Dec 07 Thu, Dec 08 Fri, listing stars like Venus, Mars, Jupiter, Saturn.

Table for Stars with columns for Horizontal parallax, listing Venus and Mars.

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

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

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

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

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

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

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 Sun, GHA, Dec, Mer. pass and rows for dates 0-23. Columns include GHA, Dec, and Mer. pass.

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

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 Dubhe, Denebola, Genah, etc.

Table with columns for Stars, SHA, Dec, Mer. pass and rows for stars like Dec 09 Sat, Dec 10 Sun, Dec 11 Mon, and Horizontal parallax.

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

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

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

Table with columns for Lat., Twilight, Sunrise, Sunset, Twilight and rows for dates 0-23. Columns include Lat., Twilight, Sunrise, Sunset, Twilight.

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

Table with columns for Day, Sun, Moon, Age 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 each day (0-23).

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

Table with columns for planets (Thu, GHA, Dec) 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 Stars with columns for Star Name, SHA, Dec, and Mer-pass.

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

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

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

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

Table for Twilight with columns for Lat., Naut., Civil, Sunrise, Sunset, Civil, Twilight for each day (0-23).

Table for Moonrise and Moonset with columns for Lat., Tue, Moonrise, Thu, Tue, Moonset, Thu for each day (0-23).

Table for Day with columns for Day, Eqn. of Time, Mer. Pass, Moon Mer. Pass, Age for each day (12-14).

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

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

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

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

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

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, Dec, HP) for Fri, Sat, Sun.

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

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

Table for Twilight with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.) for Fri, Sat, Sun.

Table for Twilight with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.) for Fri, Sat, Sun.

Table for Twilight with columns for Lat., Twilight (Naut., Civil), Sunrise, Sunset, Twilight (Civil, Naut.) for Fri, Sat, Sun.

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 stars like Alpheratz, Ankaa, Schedar, Diphda, Achernar, Hamal, Polaris, etc.

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

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

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

Table for Stars (SHA, Dec, Mer-pass) listing stars like Dubhe, Denebola, Genah, Acrux, Gacrux, etc.

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

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

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

Table for Stars (SHA, Dec, Mer-pass) listing stars like Dec 18 Mon, Dec 19 Tue, Dec 20 Wed.

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

Table for Moonrise and Moonset (Sun, Moon) for days 0-23.

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

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

Table with columns for planets (Sat, GHA, Dec) and their positions (GHA, Dec) for days 0-23. Includes Mer. pass. times.

Table for Stars (SHA, Dec) and Horizontal parallax (Venus, Mars) for days 0-23.

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

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

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

Table for twilight and sunrise/sunset times (Lat., Twilight, Sunrise, Sunset, Twilight) for days 0-45.

Table for moonrise and moonset times (Lat., Moonrise, Moonset) for days 0-45.

Table for day length and moon phase (Day, Eqn. of Time, Mer. Pass, Moon, Age) for days 21-23.

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

Table with columns for Mon, GHA, Dec, SHA, Dec, Mer.pass. values for dates 0-23.

Table with columns for Tue, GHA, Dec, SHA, Dec, Mer.pass. values for dates 0-23.

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

Table with columns for Stars, SHA, Dec, Mer.pass. values for stars like Deneb, Enif, Al Na'ir, etc.

Table with columns for Stars, SHA, Dec, Mer.pass. values for stars like Dec 24 Sun, Dec 25 Mon, Dec 26 Tue, and Horizontal parallax.

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

Table with columns for Mon, GHA, Dec, SHA, Dec, HP values for dates 0-23.

Table with columns for Tue, GHA, Dec, SHA, Dec, HP values 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., Moon and rows for dates 24-26.

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 (Thu) 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 for Stars (SHA, Dec) listing 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, Geniah, Acrux, Gacrux, Alioth, Spica, Alkaid, Henkar, Meratim, Rigil 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 for Stars (SHA, Dec) listing stars like Dec 27 Wed, Dec 28 Thu, Dec 29 Fri, and Horizontal parallax for Venus and Mars.

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

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

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

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

Table for Moonrise (Lat., Wed, Thu, Fri, Wed, Thu, Fri) for days 0-23. Includes moon phase indicators.

Table for Day (Day, Eqn. of Time, Mer. Pass, Mer. Pass., Age) for days 27-29. Includes moon phase indicators.

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

Table for Stars with columns for Star name, SHA, and Dec.

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

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

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

Table for Stars with columns for Star name, SHA, and Dec.

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

Table for Twilight with columns for Lat., Moonrise, Moonset, and Moon (Sat, Sun, Mon) for various latitudes.

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

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

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

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

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																		

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	0°54.6	4.9 - 0.3	10.9 - 0.6	16.9 - 1.0	49	1°12.2	1°12.4	1°09.0	4.9 - 0.4	10.9 -								

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	2°27.2	2°27.7																		

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°12.8	3°03.5	4.9 - 1.0	10.9 - 2.3	16.9 - 3.5	49	3°27.2	3°27.8	3°17.8	4.9 - 1.1	10								

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 - 2.3	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 21	Sun Plan.	Aries	Moon	v and d corr			m 22	Sun Plan.	Aries	Moon	v and d corr			m 23	Sun Plan.	Aries	Moon	v and d corr		
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.																		

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 27	Sun Plan.	Aries	Moon	v and d corr			m 28	Sun Plan.	Aries	Moon	v and d corr			m 29	Sun Plan.	Aries	Moon	v and d corr		
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 - 7.8
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 - 7.9
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°27.0	7°28.2	7°06.6	4.8 - 2.4	10.8 - 5.3	16.8 - 8.3
49	6°57.3	6°58.																		

Increments and Corrections

m 30	Sun Plan.	Aries	Moon	v and d corr			m 31	Sun Plan.	Aries	Moon	v and d corr			m 32	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.																		

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	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
36	Plan.						37	Plan.					38	Plan.						
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
49	9°12.3	9°13.8	8°47.1	4																

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 51	Sun Plan.	Aries	Moon	v and d corr			m 52	Sun Plan.	Aries	Moon	v and d corr			m 53	Sun Plan.	Aries	Moon	v and d corr		
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 - 13.6
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.		

Increments and Corrections

m 54	Sun Plan.	Aries	Moon	v and d corr			m 55	Sun Plan.	Aries	Moon	v and d corr			m 56	Sun Plan.	Aries	Moon	v and d corr		
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.		

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	-20.4	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	-20.3	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	-20.2	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	-20.1	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	-20.0	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	-19.9	13 32	-4.0	12.5	-4.4	5.5	-4.1	18.3			
13 14	+12.3	-20.0	13 24	+12.1	-19.8	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	-19.7	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	-19.6	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	-19.5	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	-19.4	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	0.0	60.0	-0.6	20.9	-8.0	68.8	155	-12.1	
90 00			90 00			90 00		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		
	0°	34.5	5°	38.2	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
10	56.0		53.1		49.8		46.2		42.3		38.1		33.7		29.1		24.4		19.6		14.6		10
20	55.9		53.0		49.7		46.0		42.1		37.9		33.5		29.0		24.2		19.4		14.5		20
30	55.8		52.9		49.5		45.9		42.0		37.8		33.4		28.8		24.1		19.2		14.3		30
40	55.7		52.8		49.4		45.8		41.9		37.7		33.2		28.7		23.9		19.1		14.2		40
50	55.6		52.6		49.3		45.7		41.7		37.5		33.1		28.5		23.8		18.9		14.0		50
00	55.5		52.5		49.2		45.5		41.6		37.4		32.9		28.3		23.6		18.7		13.8		00
10	55.4		52.4		49.1		45.4		41.4		37.2		32.8		28.2		23.4		18.6		13.7		10
20	55.3		52.3		49.0		45.3		41.3		37.1		32.6		28.0		23.3		18.4		13.5		20
30	55.2		52.2		48.8		45.2		41.2		36.9		32.5		27.9		23.1		18.2		13.3		30
40	55.1		52.1		48.7		45.0		41.0		36.8		32.3		27.7		22.9		18.1		13.2		40
50	55.0		52.0		48.6		44.9		40.9		36.6		32.2		27.6		22.8		17.9		13.0		50
00	55.0		51.9		48.5		44.8		40.8		36.5		32.0		27.4		22.6		17.8		12.8		00
10	54.9		51.8		48.4		44.6		40.6		36.4		31.9		27.2		22.5		17.6		12.7		10
20	54.8		51.7		48.3		44.5		40.5		36.2		31.7		27.1		22.3		17.4		12.5		20
30	54.7		51.6		48.1		44.4		40.3		36.1		31.6		26.9		22.1		17.3		12.3		30
40	54.6		51.5		48.0		44.2		40.2		35.9		31.4		26.8		22.0		17.1		12.2		40
50	54.5		51.4		47.9		44.1		40.1		35.8		31.3		26.6		21.8		16.9		12.0		50
00	54.4		51.2		47.8		44.0		39.9		35.6		31.1		26.5		21.7		16.8		11.8		00
10	54.3		51.1		47.7		43.9		39.8		35.5		31.0		26.3		21.5		16.6		11.7		10
20	54.2		51.0		47.5		43.7		39.6		35.3		30.8		26.1		21.3		16.4		11.5		20
30	54.1		50.9		47.4		43.6		39.5		35.2		30.7		26.0		21.2		16.3		11.4		30
40	54.0		50.8		47.3		43.5		39.4		35.0		30.5		25.8		21.0		16.1		11.2		40
50	53.9		50.7		47.2		43.3		39.2		34.9		30.4		25.7		20.9		16.0		11.0		50
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 2023 May 05

Ecliptic Conjunction = 17:35:12.7 TD (= 17:33:59.2 UT)

Greatest Eclipse = 17:24:05.1 TD (= 17:22:51.7 UT)

Penumbral Magnitude = 0.9636

P. Radius = 1.2375°

Gamma = -1.0349

Umbral Magnitude = -0.0457

U. Radius = 0.7089°

Axis = 0.9947°

Saros Series = 141

Member = 24 of 73

Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 02h49m59.7s

Dec. = +16°19'27.9"

S.D. = 00°15'51.6"

H.P. = 00°00'08.7"

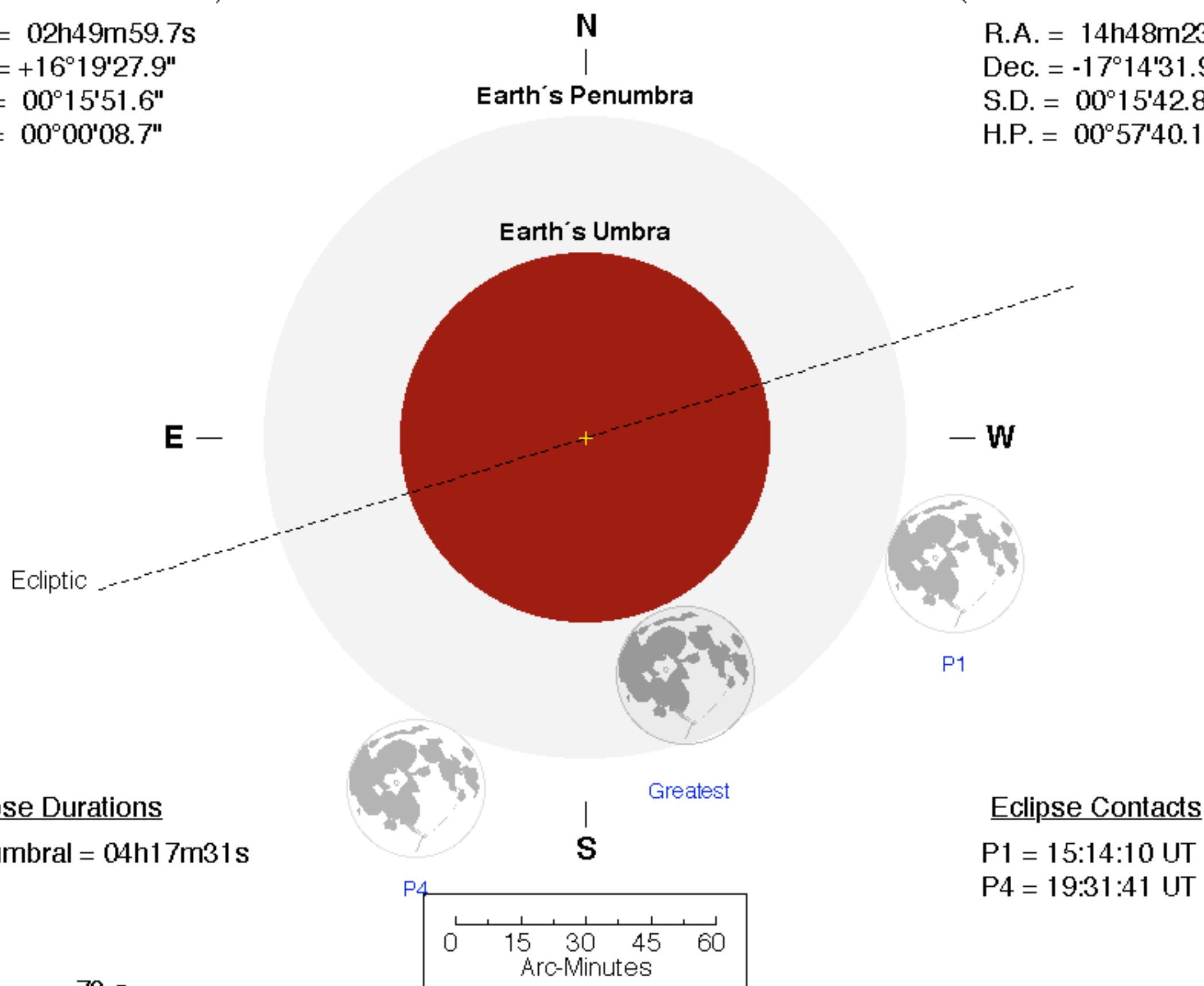
Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 14h48m23.5s

Dec. = -17°14'31.9"

S.D. = 00°15'42.8"

H.P. = 00°57'40.1"



Eclipse Durations

Penumbral = 04h17m31s

Eclipse Contacts

P1 = 15:14:10 UT

P4 = 19:31:41 UT

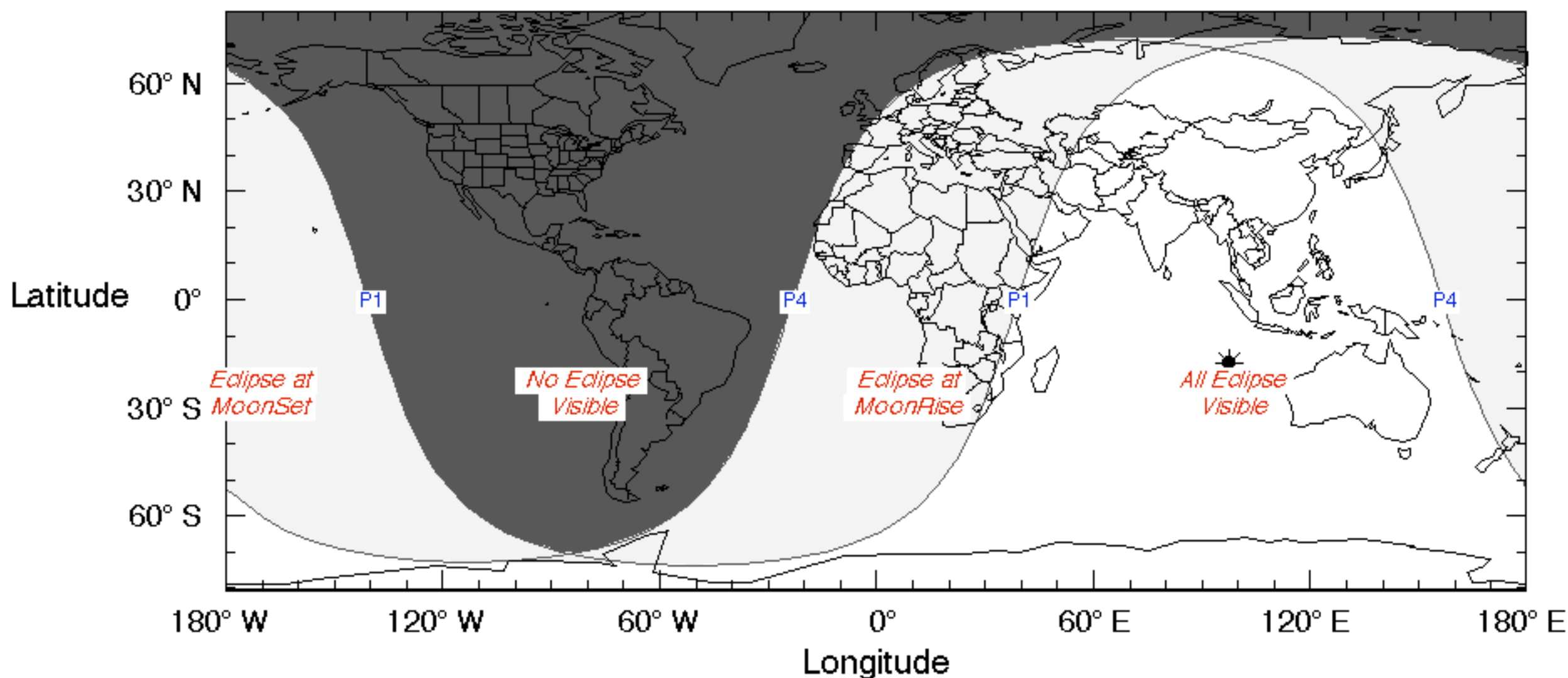
$\Delta T = 73$ s

Rule = CdT (Danjon)

Eph. = VSOP87/ELP2000-85

F. Espenak, NASA's GSFC

eclipse.gsfc.nasa.gov/eclipse.html



Partial Lunar Eclipse of 2023 Oct 28

Ecliptic Conjunction = 20:25:12.2 TD (= 20:23:58.5 UT)

Greatest Eclipse = 20:15:17.6 TD (= 20:14:03.9 UT)

Penumbral Magnitude = 1.1181

P. Radius = 1.2692°

Gamma = 0.9471

Umbral Magnitude = 0.1220

U. Radius = 0.7326°

Axis = 0.9363°

Saros Series = 146

Member = 11 of 72

Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 14h11m25.9s

Dec. = -13°14'10.6"

S.D. = 00°16'05.9"

H.P. = 00°00'08.9"

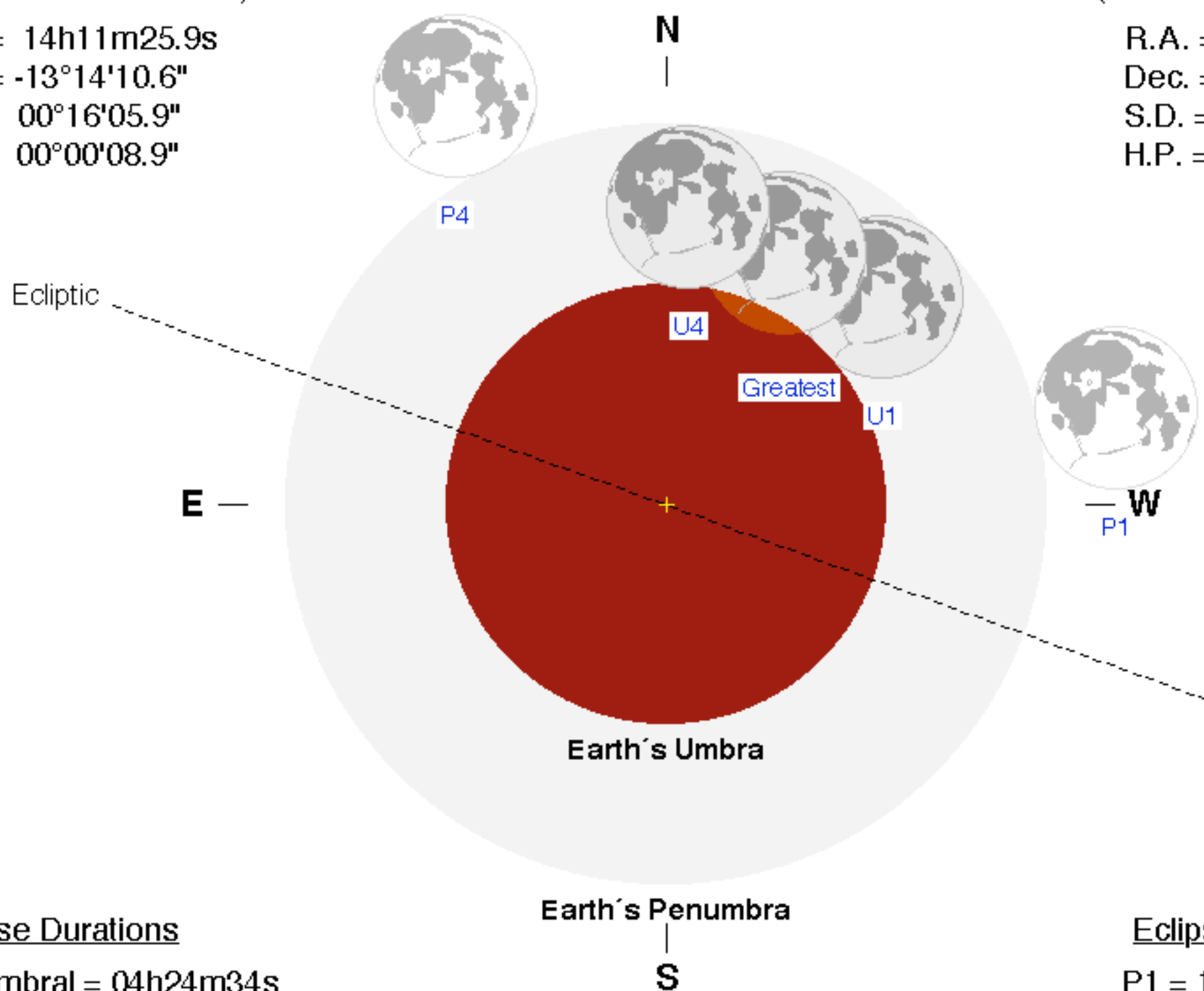
Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 02h09m47.6s

Dec. = +14°05'01.8"

S.D. = 00°16'09.7"

H.P. = 00°59'18.9"



Eclipse Durations

Penumbral = 04h24m34s

Umbral = 01h17m21s

Eclipse Contacts

P1 = 18:01:47 UT

U1 = 19:35:18 UT

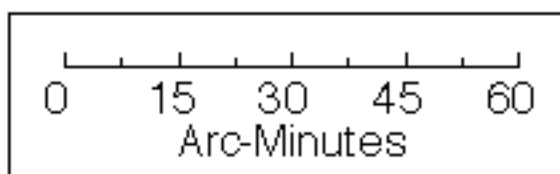
U4 = 20:52:39 UT

P4 = 22:26:20 UT

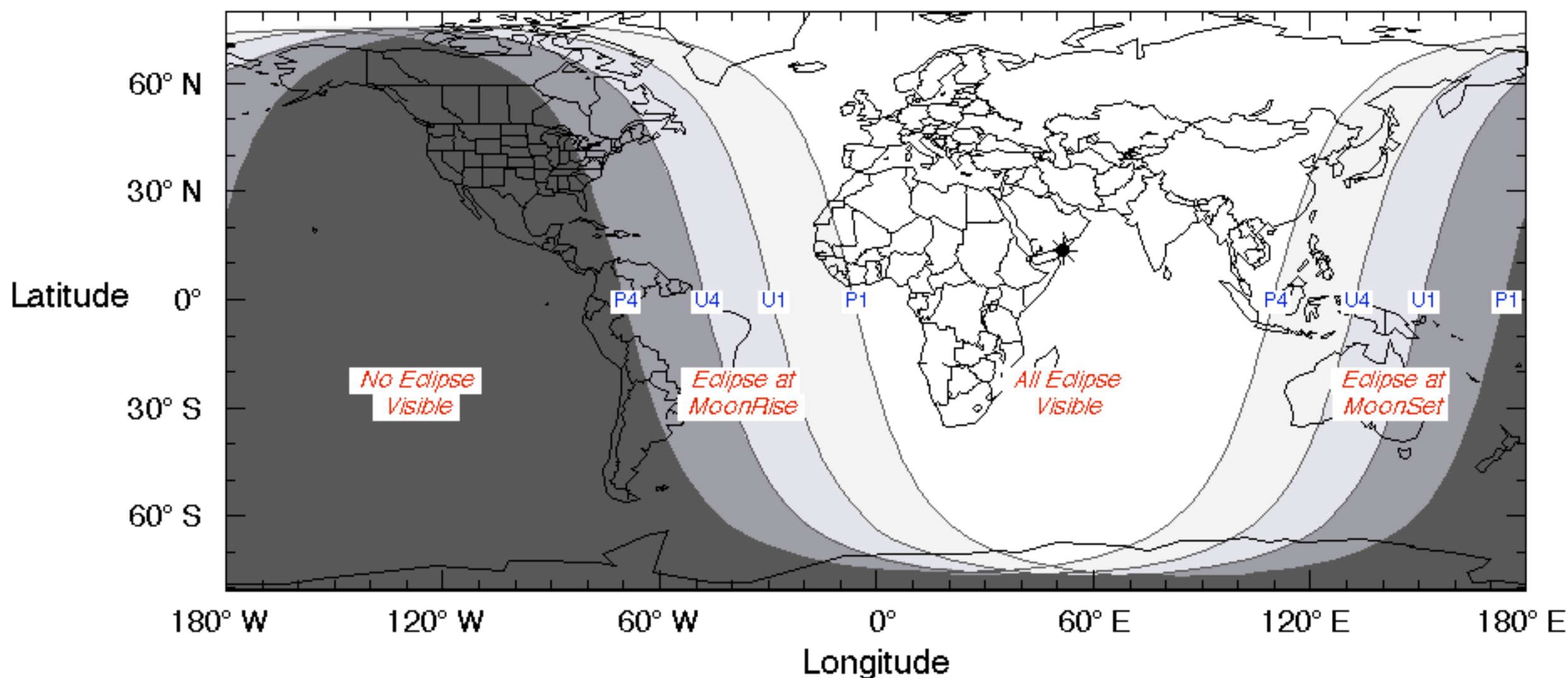
$\Delta T = 74$ s

Rule = CdT (Danjon)

Eph. = VSOP87/ELP2000-85



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eclipse.gsfc.nasa.gov/eclipse.html



Hybrid Solar Eclipse of 2023 Apr 20

Geocentric Conjunction = 03:55:26.5 UT J.D. = 2460054.663502
 Greatest Eclipse = 04:16:37.5 UT J.D. = 2460054.678212

Eclipse Magnitude = 1.0132 Gamma = -0.3951

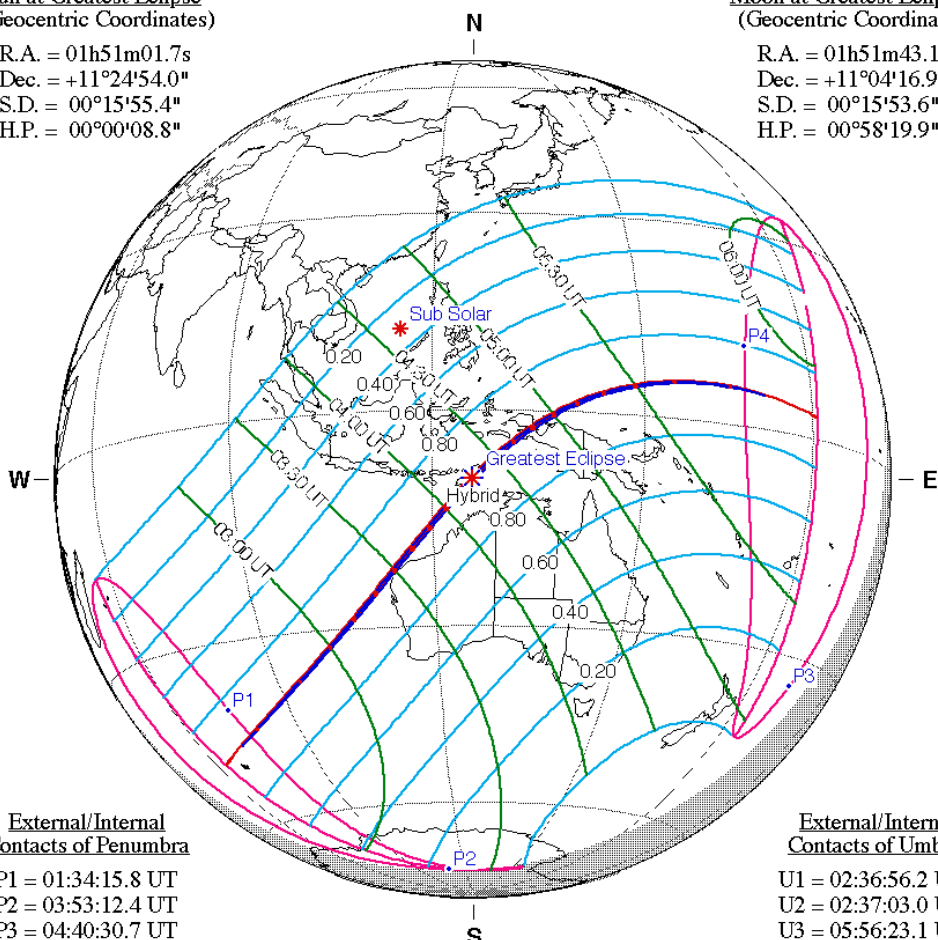
Saros Series = 129 Member = 52 of 80

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 01h51m01.7s
 Dec. = +11°24'54.0"
 S.D. = 00°15'55.4"
 H.P. = 00°00'08.8"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 01h51m43.1s
 Dec. = +11°04'16.9"
 S.D. = 00°15'53.6"
 H.P. = 00°58'19.9"



External/Internal
Contacts of Penumbra

P1 = 01:34:15.8 UT
 P2 = 03:53:12.4 UT
 P3 = 04:40:30.7 UT
 P4 = 06:59:13.5 UT

External/Internal
Contacts of Umbra

U1 = 02:36:56.2 UT
 U2 = 02:37:03.0 UT
 U3 = 05:56:23.1 UT
 U4 = 05:56:35.2 UT

Local Circumstances at Greatest Eclipse

Lat. = 09°35.4'S Sun Alt. = 66.7°
 Long. = 125°48.4'E Sun Azm. = 334.0°
 Path Width = 49.0 km Duration = 01m16.1s

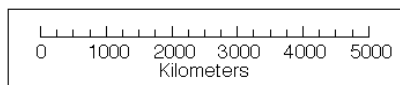
Ephemeris & Constants

Eph. = Newcomb/ILE
 ΔT = 80.2 s
 k1 = 0.2724880
 k2 = 0.2722810
 Δb = 0.0" Δl = 0.0"

Geocentric Libration
(Optical + Physical)

l = 4.67°
 b = 0.46°
 c = -19.05°

Brown Lun. No. = 1241



*F. Espenak, NASA's GSFC - Fri, Jul 2,
sunearth.gsfc.nasa.gov/eclipse/eclipse.html*

Annular Solar Eclipse of 2023 Oct 14

Geocentric Conjunction = 17:36:28.8 UT J.D. = 2460232.233667
 Greatest Eclipse = 17:59:21.0 UT J.D. = 2460232.249549

Eclipse Magnitude = 0.9520 Gamma = 0.3752

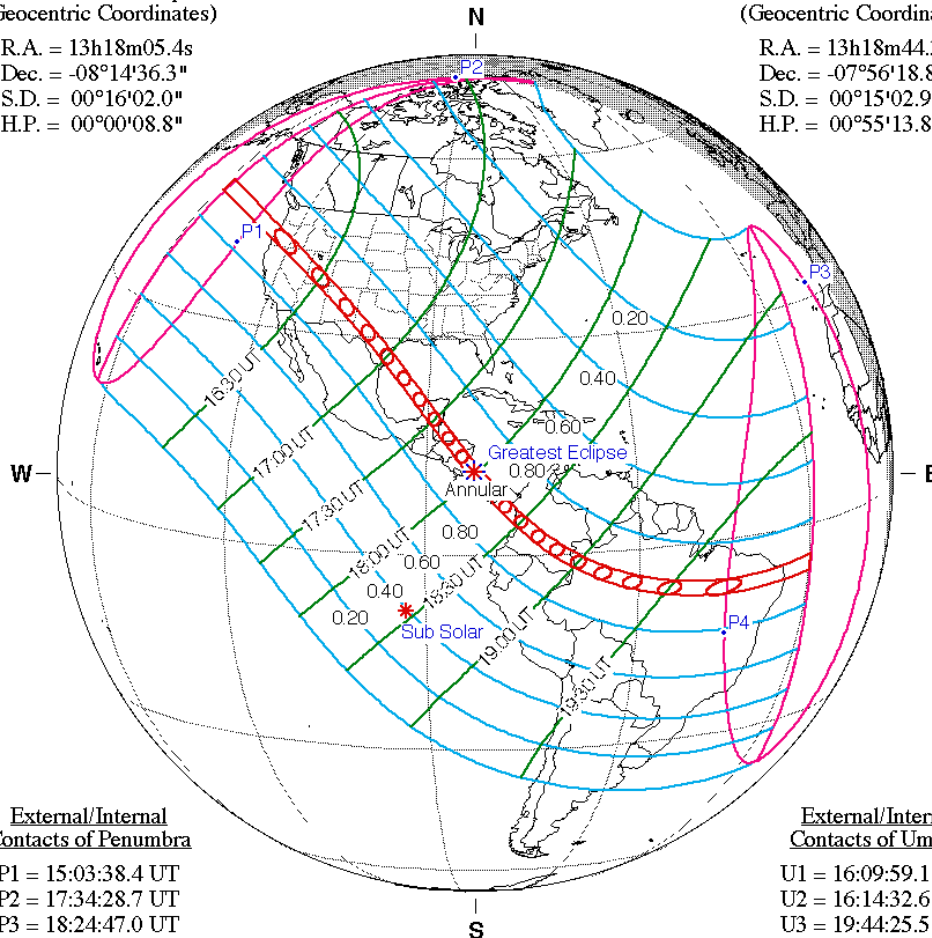
Saros Series = 134 Member = 44 of 71

Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 13h18m05.4s
 Dec. = -08°14'36.3"
 S.D. = 00°16'02.0"
 H.P. = 00°00'08.8"

Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 13h18m44.3s
 Dec. = -07°56'18.8"
 S.D. = 00°15'02.9"
 H.P. = 00°55'13.8"



External/Internal Contacts of Penumbra

P1 = 15:03:38.4 UT
 P2 = 17:34:28.7 UT
 P3 = 18:24:47.0 UT
 P4 = 20:55:06.9 UT

External/Internal Contacts of Umbra

U1 = 16:09:59.1 UT
 U2 = 16:14:32.6 UT
 U3 = 19:44:25.5 UT
 U4 = 19:48:53.5 UT

Local Circumstances at Greatest Eclipse

Lat. = 11°21.7'N Sun Alt. = 67.9°
 Long. = 083°04.3'W Sun Azm. = 208.0°
 Path Width = 187.4 km Duration = 05m17.2s

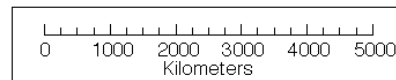
Ephemeris & Constants

Eph. = Newcomb/ILE
 $\Delta T = 80.7$ s
 $k1 = 0.2724880$
 $k2 = 0.2722810$
 $\Delta b = 0.0''$ $\Delta l = 0.0''$

Geocentric Libration (Optical + Physical)

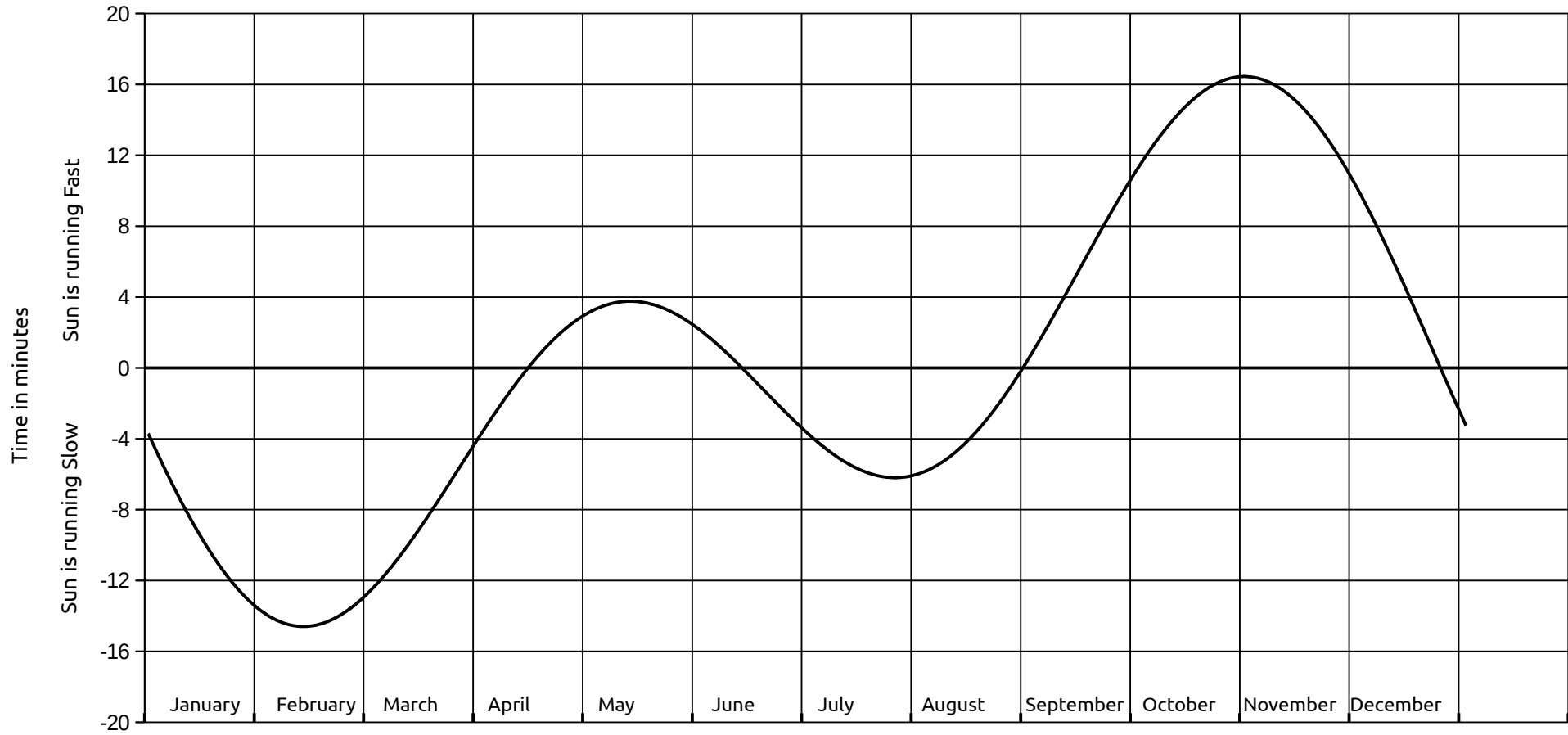
$l = -3.80^\circ$
 $b = -0.48^\circ$
 $c = 20.45^\circ$

Brown Lun. No. = 1247



F. Espenak, NASA's GSFC - Fri, Jul 2,
sunearth.gsfc.nasa.gov/eclipse/eclipse.html

Equation of Time *for the Sun*



2023 Moon Phases

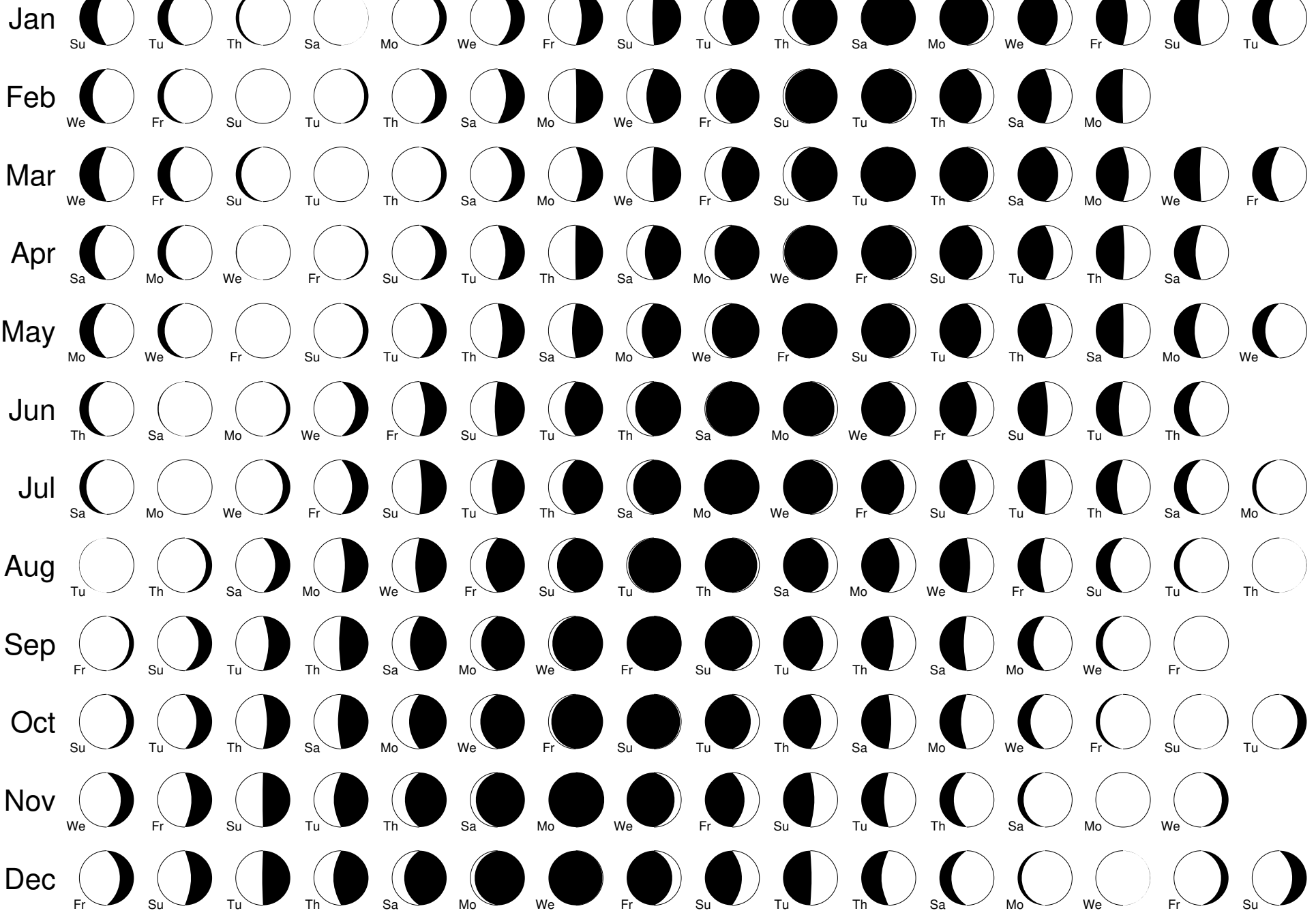
Date and Time (GMT/Universal Time)

New Moon	First Quarter	Full Moon	Last Quarter
--	--	January 06 23:08	January 15 02:10
January 21 20:53	January 28 15:19	February 05 18:28	February 13 16:01
February 20 07:06	February 27 08:06	March 07 12:40	March 15 02:08
March 21 17:23	March 29 02:32	April 06 04:34	April 13 09:11
April 20 04:12	April 27 21:20	May 05 17:34	May 12 14:28
May 19 15:53	May 27 15:22	June 04 03:42	June 10 19:31
June 18 04:37	June 26 07:50	July 03 11:39	July 10 01:48
July 17 18:32	July 25 22:07	August 01 18:32	August 08 10:28
August 16 09:38	August 24 09:57	August 31 01:35	September 06 22:21
September 15 01:40	September 22 19:32	September 29 09:57	October 06 13:48
October 14 17:55	October 22 03:29	October 28 20:24	November 05 08:37
November 13 09:27	November 20 10:50	November 27 09:16	December 05 05:49
December 12 23:32	December 19 18:39	December 27 00:33	

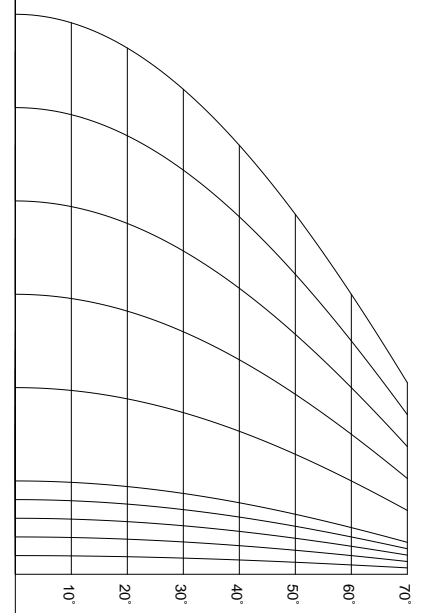
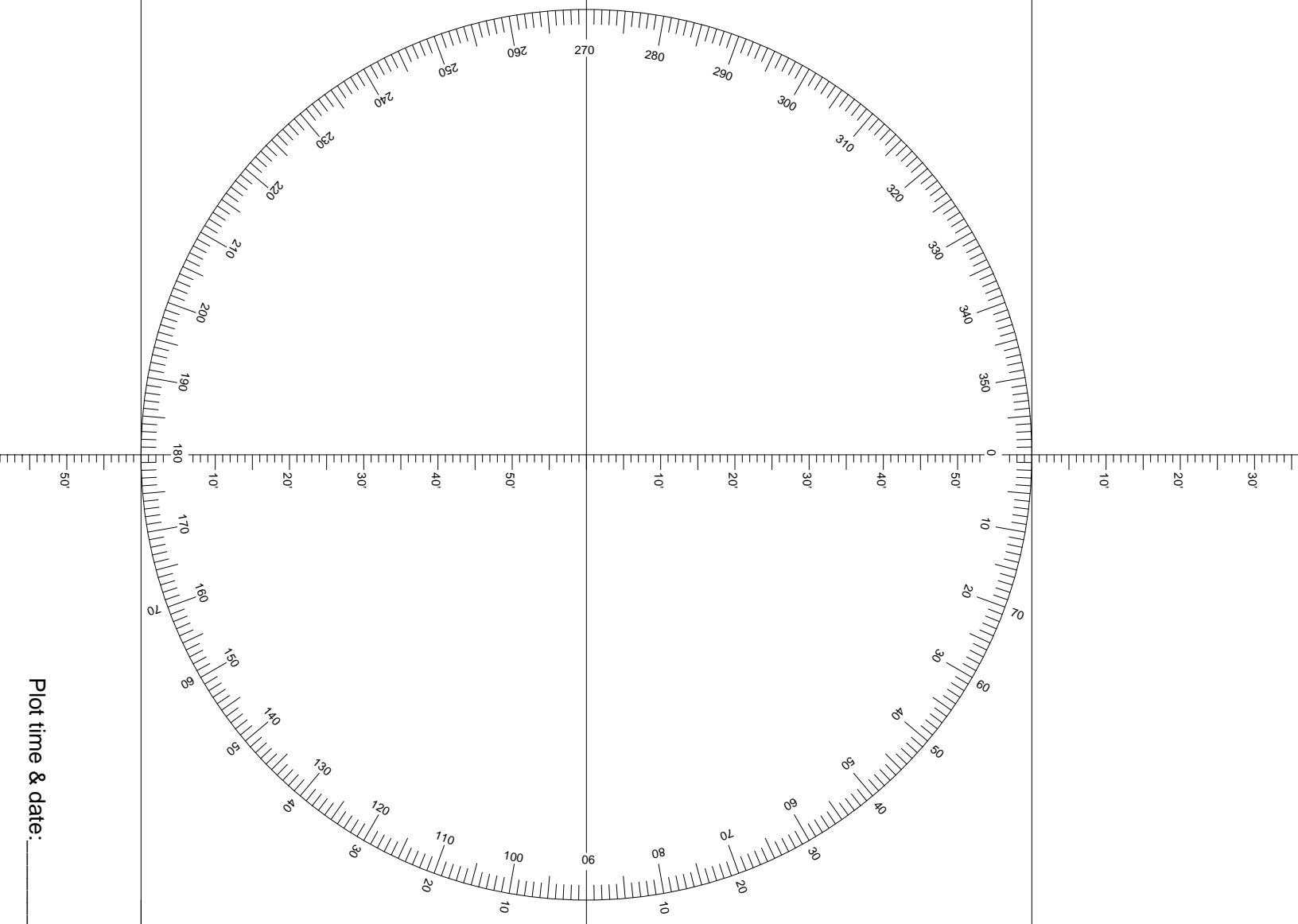
Add or subtract your time difference from Greenwich to determine local time and date of Moon phase.

2023

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31



1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31



Plot time & date: _____

Page: _____

NAVIGATIONAL STAR CHART

