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# The Nautical Almanac 2024 For the Sun

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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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*freely ye received, freely give*

## 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

<b>WWV</b> (Fort Collins, Colorado)	2.5, 5, 10, 15, 20 MHz (male voice)
<b>WWVH</b> (Kauai, Hawaii)	2.5, 5, 10, 15 MHz (female voice)
<b>CHU</b> (Ottawa, Canada)	3330, 7850, and 14,670 kHz (USB)

**Bowditch**    2019- *The American Practical Navigator*

[https://TheNauticalAlmanac.com/2019\\_Bowditch-American\\_Practical\\_Navigator.html](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](https://www.thenauticalalmanac.com/Pub_No_249_Epoch_2020.html)

*Epoch 2025*    [https://www.thenauticalalmanac.com/Pub\\_No\\_249\\_Epoch\\_2025.html](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-  $\text{Sin}^{-1}$  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° 25.2'     $\alpha\lambda$ = W 55° 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° 01.2'     $\alpha\lambda$ = E 9° 10.1' (ignore the 10.1')

**Step 1-** *get GHA degree difference;*    59° - 58° 01.2' = 0° 58.8'

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

**Step 3-** *get LHA;*    58° 01.2 + 9° 58.8' = 68° (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-  $\text{Cos}^{-1}$  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  $180^\circ$ , it is treated as a negative quantity. If the azimuth angle as calculated is negative, add  $180^\circ$  to obtain the desired value.

### **To obtain Zn apply the following rules**

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

**Determine Refraction**  $0.96 \div \text{Tan of } (H_a)$

Gives good results down to about  $8^\circ$  from the horizon but not less.

**Refraction** (good overall formula from  $90^\circ$  to below  $8^\circ$  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



*fair winds...clear skies and following seas*  
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# Equation of Time *for the Sun*

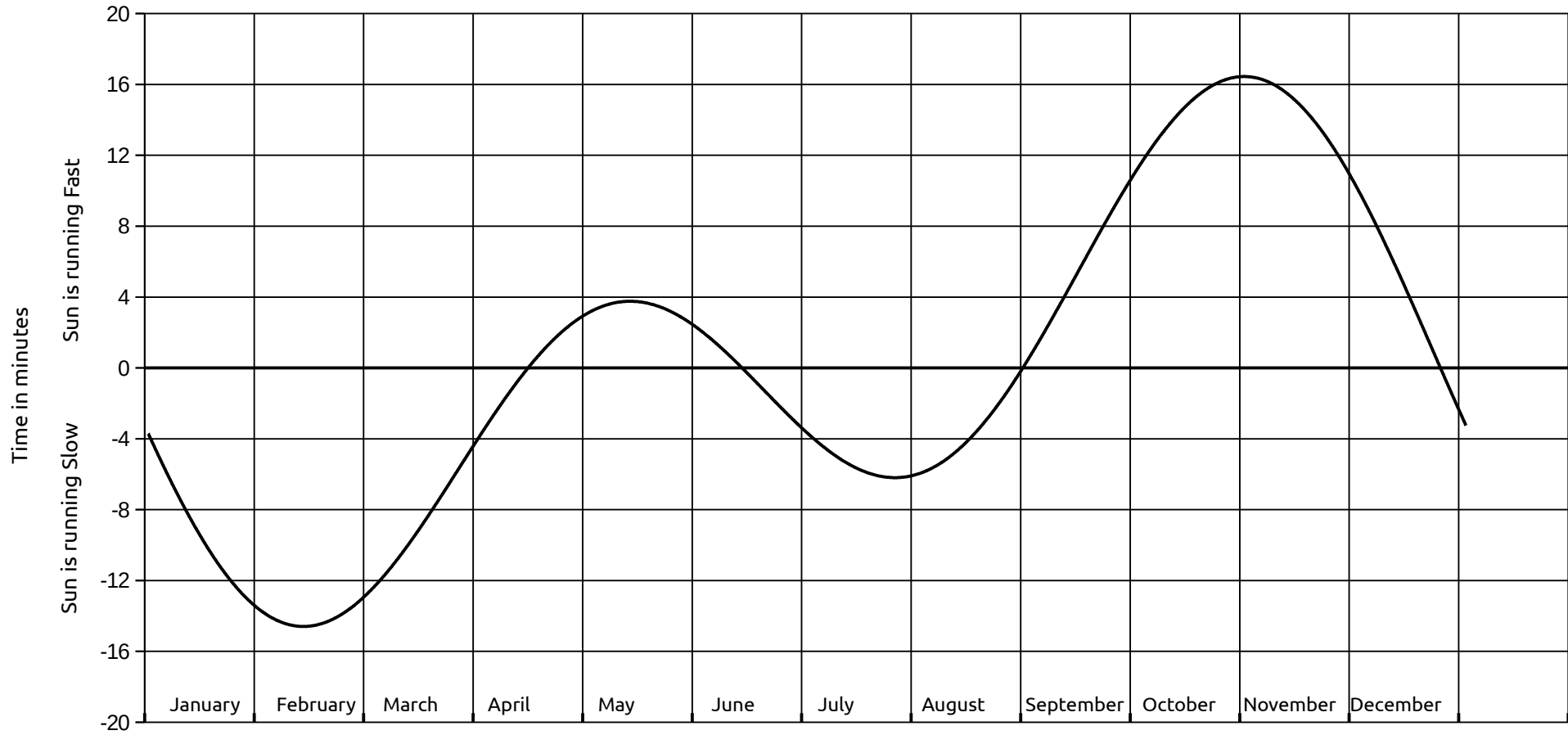




Table with columns 01-13 and 04-13, rows 0-23. Each row contains GHA and Dec values for specific days. Summary rows at the bottom show SD and d values for different day groups.

Table with columns 02-14 and 05-14, rows 0-23. Each row contains GHA and Dec values for specific days. Summary rows at the bottom show SD and d values for different day groups.

Table with columns 03-15 and 06-15, rows 0-23. Each row contains GHA and Dec values for specific days. Summary rows at the bottom show SD and d values for different day groups.



Table with 12 columns (01-12) and 24 rows. Each column contains GHA and Dec values. Summary rows at the bottom show SD=16.2' and d values.

Table with 10 columns (01-10) and 24 rows. Each column contains GHA and Dec values. Summary rows at the bottom show SD=16.2' and d values.

Table with 10 columns (02-14) and 24 rows. Each column contains GHA and Dec values. Summary rows at the bottom show SD=16.2' and d values.









Table with 12 columns (15-23) and 24 rows (0-23). Each row contains GHA and Dec values for two different astronomical objects. Summary rows at the bottom show SD and d values.

Table with 12 columns (16-23) and 24 rows (0-23). Each row contains GHA and Dec values for two different astronomical objects. Summary rows at the bottom show SD and d values.

Table with 12 columns (17-23) and 24 rows (0-23). Each row contains GHA and Dec values for two different astronomical objects. Summary rows at the bottom show SD and d values.





Table with 12 columns (15, 18, 21, 24, 27) and 2 rows per column (GHA, Dec). Rows 0-23 show astronomical data for days 0-23. Summary row: SD=15.8' d=0.6'.

Table with 12 columns (16, 19, 22, 25, 28) and 2 rows per column (GHA, Dec). Rows 0-23 show astronomical data for days 0-23. Summary row: SD=15.8' d=0.6'.

Table with 12 columns (17, 20, 23, 26, 29) and 2 rows per column (GHA, Dec). Rows 0-23 show astronomical data for days 0-23. Summary row: SD=15.8' d=0.6'.







Table with 12 columns (14-26) and 24 rows (0-23). Each row contains GHA and Dec values for two different astronomical objects. Summary rows at the bottom show SD and d values.

Table with 12 columns (15-27) and 24 rows (0-23). Each row contains GHA and Dec values for two different astronomical objects. Summary rows at the bottom show SD and d values.

Table with 12 columns (16-28) and 24 rows (0-23). Each row contains GHA and Dec values for two different astronomical objects. Summary rows at the bottom show SD and d values.



Table with 12 columns (13-25) and 24 rows (0-23). Each row contains GHA and Dec values for a specific day. Summary rows at the bottom show SD=15.8' and d=-0.8'.

Table with 10 columns (14-26) and 24 rows (0-23). Each row contains GHA and Dec values for a specific day. Summary rows at the bottom show SD=15.8' and d=-0.8'.

Table with 10 columns (15-27) and 24 rows (0-23). Each row contains GHA and Dec values for a specific day. Summary rows at the bottom show SD=15.8' and d=-0.8'.





Table with columns 12, 15, 18, 21, 24. Each column contains two sub-columns: GHA and Dec. Rows 0-23 show astronomical data with values for GHA and Dec in degrees and minutes/seconds, and some rows include right ascension values.

Table with columns 13, 16, 19, 22, 25. Each column contains two sub-columns: GHA and Dec. Rows 0-23 show astronomical data with values for GHA and Dec in degrees and minutes/seconds, and some rows include right ascension values.

Table with columns 14, 17, 20, 23, 26. Each column contains two sub-columns: GHA and Dec. Rows 0-23 show astronomical data with values for GHA and Dec in degrees and minutes/seconds, and some rows include right ascension values.















DUT1 = UT1-UTC = +0.1834 sec  $\Delta T = TT-UT1 = +69.0006$  sec

2024 December 26 to Dec. 31 UT

26	GHA	Dec	29	GHA	Dec
0	179°52.1	S23°21.3	0	179°30.0	S23°12.7
1	194°51.8	21.2	1	194°29.7	12.5
2	209°51.5	21.1	2	209°29.4	12.4
3	224°51.2	· · 21.0	3	224°29.1	· · 12.2
4	239°50.9	20.9	4	239°28.8	12.1
5	254°50.6	20.8	5	254°28.5	11.9
6	269°50.3	S23°20.8	6	269°28.2	S23°11.8
7	284°49.9	20.7	7	284°27.9	11.6
8	299°49.6	20.6	8	299°27.6	11.5
9	314°49.3	· · 20.5	9	314°27.3	· · 11.3
10	329°49.0	20.4	10	329°27.0	11.2
11	344°48.7	20.3	11	344°26.7	11.0
12	359°48.4	S23°20.2	12	359°26.4	S23°10.9
13	14°48.1	20.1	13	14°26.0	10.7
14	29°47.8	20.0	14	29°25.7	10.5
15	44°47.5	· · 19.9	15	44°25.4	· · 10.4
16	59°47.2	19.8	16	59°25.1	10.2
17	74°46.9	19.7	17	74°24.8	10.0
18	89°46.5	S23°19.6	18	89°24.5	S23°09.9
19	104°46.2	19.4	19	104°24.2	09.7
20	119°45.9	19.3	20	119°23.9	09.6
21	134°45.6	· · 19.2	21	134°23.6	· · 09.4
22	149°45.3	19.1	22	149°23.3	09.2
23	164°45.0	19.0	23	164°23.0	09.1
SD=16.3'		d = -0.1'	SD=16.3'		d = -0.1'

27	GHA	Dec	30	GHA	Dec
0	179°44.7	S23°18.9	0	179°22.7	S23°08.9
1	194°44.4	18.8	1	194°22.4	08.7
2	209°44.1	18.7	2	209°22.1	08.6
3	224°43.8	· · 18.6	3	224°21.8	· · 08.4
4	239°43.5	18.5	4	239°21.5	08.2
5	254°43.2	18.3	5	254°21.2	08.0
6	269°42.9	S23°18.2	6	269°20.9	S23°07.9
7	284°42.5	18.1	7	284°20.6	07.7
8	299°42.2	18.0	8	299°20.3	07.5
9	314°41.9	· · 17.9	9	314°20.0	· · 07.3
10	329°41.6	17.8	10	329°19.7	07.2
11	344°41.3	17.6	11	344°19.4	07.0
12	359°41.0	S23°17.5	12	359°19.1	S23°06.8
13	14°40.7	17.4	13	14°18.8	06.6
14	29°40.4	17.3	14	29°18.5	06.5
15	44°40.1	· · 17.2	15	44°18.2	· · 06.3
16	59°39.8	17.0	16	59°17.9	06.1
17	74°39.5	16.9	17	74°17.6	05.9
18	89°39.2	S23°16.8	18	89°17.3	S23°05.7
19	104°38.9	16.7	19	104°17.0	05.5
20	119°38.6	16.5	20	119°16.7	05.4
21	134°38.2	· · 16.4	21	134°16.4	· · 05.2
22	149°37.9	16.3	22	149°16.1	05.0
23	164°37.6	16.2	23	164°15.8	04.8
SD=16.3'		d = -0.1'	SD=16.3'		d = -0.2'

28	GHA	Dec	31	GHA	Dec
0	179°37.3	S23°16.0	0	179°15.5	S23°04.6
1	194°37.0	15.9	1	194°15.2	04.4
2	209°36.7	15.8	2	209°14.9	04.2
3	224°36.4	· · 15.6	3	224°14.6	· · 04.1
4	239°36.1	15.5	4	239°14.3	03.9
5	254°35.8	15.4	5	254°14.0	03.7
6	269°35.5	S23°15.2	6	269°13.7	S23°03.5
7	284°35.2	15.1	7	284°13.4	03.3
8	299°34.9	15.0	8	299°13.1	03.1
9	314°34.6	· · 14.8	9	314°12.8	· · 02.9
10	329°34.3	14.7	10	329°12.5	02.7
11	344°34.0	14.6	11	344°12.2	02.5
12	359°33.7	S23°14.4	12	359°11.9	S23°02.3
13	14°33.3	14.3	13	14°11.6	02.1
14	29°33.0	14.1	14	29°11.3	01.9
15	44°32.7	· · 14.0	15	44°11.0	· · 01.7
16	59°32.4	13.9	16	59°10.7	01.5
17	74°32.1	13.7	17	74°10.4	01.3
18	89°31.8	S23°13.6	18	89°10.1	S23°01.1
19	104°31.5	13.4	19	104°09.9	00.9
20	119°31.2	13.3	20	119°09.6	00.7
21	134°30.9	· · 13.1	21	134°09.3	· · 00.5
22	149°30.6	13.0	22	149°09.0	00.3
23	164°30.3	12.8	23	164°08.7	00.1
SD=16.3'		d = -0.1'	SD=16.3'		d = -0.2'

## Increments and Corrections

m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
0	Plan.						1	Plan.					2	Plan.						
0	0°00.0	0°00.0	0°00.0	0.0 - 0.0	6.0 - 0.1	12.0 - 0.1	0	0°15.0	0°15.0	0°14.3	0.0 - 0.0	6.0 - 0.2	12.0 - 0.3	0	0°30.0	0°30.1	0°28.6	0.0 - 0.0	6.0 - 0.3	12.0 - 0.5
1	0°00.3	0°00.3	0°00.2	0.1 - 0.0	6.1 - 0.1	12.1 - 0.1	1	0°15.3	0°15.3	0°14.6	0.1 - 0.0	6.1 - 0.2	12.1 - 0.3	1	0°30.3	0°30.3	0°28.9	0.1 - 0.0	6.1 - 0.3	12.1 - 0.5
2	0°00.5	0°00.5	0°00.5	0.2 - 0.0	6.2 - 0.1	12.2 - 0.1	2	0°15.5	0°15.5	0°14.8	0.2 - 0.0	6.2 - 0.2	12.2 - 0.3	2	0°30.5	0°30.6	0°29.1	0.2 - 0.0	6.2 - 0.3	12.2 - 0.5
3	0°00.8	0°00.8	0°00.7	0.3 - 0.0	6.3 - 0.1	12.3 - 0.1	3	0°15.8	0°15.8	0°15.0	0.3 - 0.0	6.3 - 0.2	12.3 - 0.3	3	0°30.7	0°30.8	0°29.3	0.3 - 0.0	6.3 - 0.3	12.3 - 0.5
4	0°01.0	0°01.0	0°01.0	0.4 - 0.0	6.4 - 0.1	12.4 - 0.1	4	0°16.0	0°16.0	0°15.3	0.4 - 0.0	6.4 - 0.2	12.4 - 0.3	4	0°31.0	0°31.1	0°29.6	0.4 - 0.0	6.4 - 0.3	12.4 - 0.5
5	0°01.3	0°01.3	0°01.2	0.5 - 0.0	6.5 - 0.1	12.5 - 0.1	5	0°16.3	0°16.3	0°15.5	0.5 - 0.0	6.5 - 0.2	12.5 - 0.3	5	0°31.3	0°31.3	0°29.8	0.5 - 0.0	6.5 - 0.3	12.5 - 0.5
6	0°01.5	0°01.5	0°01.4	0.6 - 0.0	6.6 - 0.1	12.6 - 0.1	6	0°16.5	0°16.5	0°15.7	0.6 - 0.0	6.6 - 0.2	12.6 - 0.3	6	0°31.5	0°31.6	0°30.1	0.6 - 0.0	6.6 - 0.3	12.6 - 0.5
7	0°01.8	0°01.8	0°01.7	0.7 - 0.0	6.7 - 0.1	12.7 - 0.1	7	0°16.8	0°16.8	0°16.0	0.7 - 0.0	6.7 - 0.2	12.7 - 0.3	7	0°31.8	0°31.8	0°30.3	0.7 - 0.0	6.7 - 0.3	12.7 - 0.5
8	0°02.0	0°02.0	0°01.9	0.8 - 0.0	6.8 - 0.1	12.8 - 0.1	8	0°17.0	0°17.0	0°16.2	0.8 - 0.0	6.8 - 0.2	12.8 - 0.3	8	0°32.0	0°32.1	0°30.5	0.8 - 0.0	6.8 - 0.3	12.8 - 0.5
9	0°02.3	0°02.3	0°02.1	0.9 - 0.0	6.9 - 0.1	12.9 - 0.1	9	0°17.3	0°17.3	0°16.5	0.9 - 0.0	6.9 - 0.2	12.9 - 0.3	9	0°32.3	0°32.3	0°30.8	0.9 - 0.0	6.9 - 0.3	12.9 - 0.5
10	0°02.5	0°02.5	0°02.4	1.0 - 0.0	7.0 - 0.1	13.0 - 0.1	10	0°17.5	0°17.5	0°16.7	1.0 - 0.0	7.0 - 0.2	13.0 - 0.3	10	0°32.5	0°32.6	0°31.0	1.0 - 0.0	7.0 - 0.3	13.0 - 0.5
11	0°02.8	0°02.8	0°02.6	1.1 - 0.0	7.1 - 0.1	13.1 - 0.1	11	0°17.8	0°17.8	0°16.9	1.1 - 0.0	7.1 - 0.2	13.1 - 0.3	11	0°32.8	0°32.8	0°31.3	1.1 - 0.0	7.1 - 0.3	13.1 - 0.5
12	0°03.0	0°03.0	0°02.9	1.2 - 0.0	7.2 - 0.1	13.2 - 0.1	12	0°18.0	0°18.0	0°17.2	1.2 - 0.0	7.2 - 0.2	13.2 - 0.3	12	0°33.0	0°33.1	0°31.5	1.2 - 0.1	7.2 - 0.3	13.2 - 0.5
13	0°03.3	0°03.3	0°03.1	1.3 - 0.0	7.3 - 0.1	13.3 - 0.1	13	0°18.3	0°18.3	0°17.4	1.3 - 0.0	7.3 - 0.2	13.3 - 0.3	13	0°33.3	0°33.3	0°31.7	1.3 - 0.1	7.3 - 0.3	13.3 - 0.6
14	0°03.5	0°03.5	0°03.3	1.4 - 0.0	7.4 - 0.1	13.4 - 0.1	14	0°18.5	0°18.6	0°17.7	1.4 - 0.0	7.4 - 0.2	13.4 - 0.3	14	0°33.5	0°33.6	0°32.0	1.4 - 0.1	7.4 - 0.3	13.4 - 0.6
15	0°03.8	0°03.8	0°03.6	1.5 - 0.0	7.5 - 0.1	13.5 - 0.1	15	0°18.8	0°18.8	0°17.9	1.5 - 0.0	7.5 - 0.2	13.5 - 0.3	15	0°33.8	0°33.8	0°32.2	1.5 - 0.1	7.5 - 0.3	13.5 - 0.6
16	0°04.0	0°04.0	0°03.8	1.6 - 0.0	7.6 - 0.1	13.6 - 0.1	16	0°19.0	0°19.1	0°18.1	1.6 - 0.0	7.6 - 0.2	13.6 - 0.3	16	0°34.0	0°34.1	0°32.5	1.6 - 0.1	7.6 - 0.3	13.6 - 0.6
17	0°04.3	0°04.3	0°04.1	1.7 - 0.0	7.7 - 0.1	13.7 - 0.1	17	0°19.3	0°19.3	0°18.4	1.7 - 0.0	7.7 - 0.2	13.7 - 0.3	17	0°34.3	0°34.3	0°32.7	1.7 - 0.1	7.7 - 0.3	13.7 - 0.6
18	0°04.5	0°04.5	0°04.3	1.8 - 0.0	7.8 - 0.1	13.8 - 0.1	18	0°19.5	0°19.6	0°18.6	1.8 - 0.0	7.8 - 0.2	13.8 - 0.3	18	0°34.5	0°34.6	0°32.9	1.8 - 0.1	7.8 - 0.3	13.8 - 0.6
19	0°04.8	0°04.8	0°04.5	1.9 - 0.0	7.9 - 0.1	13.9 - 0.1	19	0°19.8	0°19.8	0°18.9	1.9 - 0.0	7.9 - 0.2	13.9 - 0.3	19	0°34.8	0°34.8	0°33.2	1.9 - 0.1	7.9 - 0.3	13.9 - 0.6
20	0°05.0	0°05.0	0°04.8	2.0 - 0.0	8.0 - 0.1	14.0 - 0.1	20	0°20.0	0°20.1	0°19.1	2.0 - 0.1	8.0 - 0.2	14.0 - 0.4	20	0°35.0	0°35.1	0°33.4	2.0 - 0.1	8.0 - 0.3	14.0 - 0.6
21	0°05.3	0°05.3	0°05.0	2.1 - 0.0	8.1 - 0.1	14.1 - 0.1	21	0°20.3	0°20.3	0°19.3	2.1 - 0.1	8.1 - 0.2	14.1 - 0.4	21	0°35.3	0°35.3	0°33.6	2.1 - 0.1	8.1 - 0.3	14.1 - 0.6
22	0°05.5	0°05.5	0°05.2	2.2 - 0.0	8.2 - 0.1	14.2 - 0.1	22	0°20.5	0°20.6	0°19.6	2.2 - 0.1	8.2 - 0.2	14.2 - 0.4	22	0°35.5	0°35.6	0°33.9	2.2 - 0.1	8.2 - 0.3	14.2 - 0.6
23	0°05.8	0°05.8	0°05.5	2.3 - 0.0	8.3 - 0.1	14.3 - 0.1	23	0°20.8	0°20.8	0°19.8	2.3 - 0.1	8.3 - 0.2	14.3 - 0.4	23	0°35.8	0°35.8	0°34.1	2.3 - 0.1	8.3 - 0.3	14.3 - 0.6
24	0°06.0	0°06.0	0°05.7	2.4 - 0.0	8.4 - 0.1	14.4 - 0.1	24	0°21.0	0°21.1	0°20.0	2.4 - 0.1	8.4 - 0.2	14.4 - 0.4	24	0°36.0	0°36.1	0°34.4	2.4 - 0.1	8.4 - 0.3	14.4 - 0.6
25	0°06.3	0°06.3	0°06.0	2.5 - 0.0	8.5 - 0.1	14.5 - 0.1	25	0°21.3	0°21.3	0°20.3	2.5 - 0.1	8.5 - 0.2	14.5 - 0.4	25	0°36.3	0°36.3	0°34.6	2.5 - 0.1	8.5 - 0.4	14.5 - 0.6
26	0°06.5	0°06.5	0°06.2	2.6 - 0.0	8.6 - 0.1	14.6 - 0.1	26	0°21.5	0°21.6	0°20.5	2.6 - 0.1	8.6 - 0.2	14.6 - 0.4	26	0°36.5	0°36.6	0°34.8	2.6 - 0.1	8.6 - 0.4	14.6 - 0.6
27	0°06.8	0°06.8	0°06.4	2.7 - 0.0	8.7 - 0.1	14.7 - 0.1	27	0°21.8	0°21.8	0°20.8	2.7 - 0.1	8.7 - 0.2	14.7 - 0.4	27	0°36.8	0°36.9	0°35.1	2.7 - 0.1	8.7 - 0.4	14.7 - 0.6
28	0°07.0	0°07.0	0°06.7	2.8 - 0.0	8.8 - 0.1	14.8 - 0.1	28	0°22.0	0°22.1	0°21.0	2.8 - 0.1	8.8 - 0.2	14.8 - 0.4	28	0°37.0	0°37.1	0°35.3	2.8 - 0.1	8.8 - 0.4	14.8 - 0.6
29	0°07.3	0°07.3	0°06.9	2.9 - 0.0	8.9 - 0.1	14.9 - 0.1	29	0°22.3	0°22.3	0°21.2	2.9 - 0.1	8.9 - 0.2	14.9 - 0.4	29	0°37.3	0°37.4	0°35.6	2.9 - 0.1	8.9 - 0.4	14.9 - 0.6
30	0°07.5	0°07.5	0°07.2	3.0 - 0.0	9.0 - 0.1	15.0 - 0.1	30	0°22.5	0°22.6	0°21.5	3.0 - 0.1	9.0 - 0.2	15.0 - 0.4	30	0°37.5	0°37.6	0°35.8	3.0 - 0.1	9.0 - 0.4	15.0 - 0.6
31	0°07.8	0°07.8	0°07.4	3.1 - 0.0	9.1 - 0.1	15.1 - 0.1	31	0°22.8	0°22.8	0°21.7	3.1 - 0.1	9.1 - 0.2	15.1 - 0.4	31	0°37.8	0°37.9	0°36.0	3.1 - 0.1	9.1 - 0.4	15.1 - 0.6
32	0°08.0	0°08.0	0°07.6	3.2 - 0.0	9.2 - 0.1	15.2 - 0.1	32	0°23.0	0°23.1	0°22.0	3.2 - 0.1	9.2 - 0.2	15.2 - 0.4	32	0°38.0	0°38.1	0°36.3	3.2 - 0.1	9.2 - 0.4	15.2 - 0.6
33	0°08.3	0°08.3	0°07.9	3.3 - 0.0	9.3 - 0.1	15.3 - 0.1	33	0°23.3	0°23.3	0°22.2	3.3 - 0.1	9.3 - 0.2	15.3 - 0.4	33	0°38.3	0°38.4	0°36.5	3.3 - 0.1	9.3 - 0.4	15.3 - 0.6
34	0°08.5	0°08.5	0°08.1	3.4 - 0.0	9.4 - 0.1	15.4 - 0.1	34	0°23.5	0°23.6	0°22.4	3.4 - 0.1	9.4 - 0.2	15.4 - 0.4	34	0°38.5	0°38.6	0°36.7	3.4 - 0.1	9.4 - 0.4	15.4 - 0.6
35	0°08.8	0°08.8	0°08.4	3.5 - 0.0	9.5 - 0.1	15.5 - 0.1	35	0°23.8	0°23.8	0°22.7	3.5 - 0.1	9.5 - 0.2	15.5 - 0.4	35	0°38.8	0°38.9	0°37.0	3.5 - 0.1	9.5 - 0.4	15.5 - 0.6
36	0°09.0	0°09.0	0°08.6	3.6 - 0.0	9.6 - 0.1	15.6 - 0.1	36	0°24.0	0°24.1	0°22.9	3.6 - 0.1	9.6 - 0.2	15.6 - 0.4	36	0°39.0	0°39.1	0°37.2	3.6 - 0.1	9.6 - 0.4	15.6 - 0.6
37	0°09.3	0°09.3	0°08.8	3.7 - 0.0	9.7 - 0.1	15.7 - 0.1	37	0°24.3	0°24.3	0°23.1	3.7 - 0.1	9.7 - 0.2	15.7 - 0.4	37	0°39.3	0°39.4	0°37.5	3.7 - 0.2	9.7 - 0.4	15.7 - 0.7
38	0°09.5	0°09.5	0°09.1	3.8 - 0.0	9.8 - 0.1	15.8 - 0.1	38	0°24.5	0°24.6	0°23.4	3.8 - 0.1	9.8 - 0.2	15.8 - 0.4	38	0°39.5	0°39.6	0°37.7	3.8 - 0.2	9.8 - 0.4	15.8 - 0.7
39	0°09.8	0°09.8	0°09.3	3.9 - 0.0	9.9 - 0.1	15.9 - 0.1	39	0°24.8	0°24.8	0°23.6	3.9 - 0.1	9.9 - 0.2	15.9 - 0.4	39	0°39.8	0°39.9	0°37.9	3.9 - 0.2	9.9 - 0.4	15.9 - 0.7
40	0°10.0	0°10.0	0°09.5	4.0 - 0.0	10.0 - 0.1	16.0 - 0.1	40	0°25.0	0°25.1	0°23.9	4.0 - 0.1	10.0 - 0.3	16.0 - 0.4	40	0°40.0	0°40.1	0°38.2	4.0 - 0.2	10.0 - 0.4	16.0 - 0.7
41	0°10.3	0°10.3	0°09.8	4.1 - 0.0	10.1 - 0.1	16.1 - 0.1	41	0°25.3	0°25.3	0°24.1	4.1 - 0.1	10.1 - 0.3	16.1 - 0.4	41	0°40.3	0°40.4	0°38.4	4.1 - 0.2	10.1 - 0.4	16.1 - 0.7
42	0°10.5	0°10.5	0°10.0	4.2 - 0.0	10.2 - 0.1	16.2 - 0.1	42	0°25.5	0°25.6	0°24.3	4.2 - 0.1	10.2 - 0.3	16.2 - 0.4	42	0°40.5	0°40.6	0°38.7	4.2 - 0.2	10.2 - 0.4	16.2 - 0.7
43	0°10.8	0°10.8	0°10.3	4.3 - 0.0	10.3 - 0.1	16.3 - 0.1	43	0°25.8	0°25.8	0°24.6	4.3 - 0.1	10.3 - 0.3	16.3 - 0.4	43	0°40.8	0°40.9	0°38.9	4.3 - 0.2	10.3 - 0.4	16.3 - 0.7
44	0°11.0	0°11.0	0°10.5	4.4 - 0.0	10.4 - 0.1	16.4 - 0.1	44	0°26.0	0°26.1	0°24.8	4.4 - 0.1	10.4 - 0.3	16.4 - 0.4	44	0°41.0	0°41.1	0°39.1	4.4 - 0.2	10.4 - 0.4	16.4 - 0.7
45	0°11.3	0°11.3	0°10.7	4.5 - 0.0	10.5 - 0.1	16.5 - 0.1	45	0°26.3	0°26.3	0°25.1	4.5 - 0.1	10.5 - 0.3	16.5 - 0.4	45	0°41.3	0°41.4	0°39.4	4.5 - 0.2	10.5 - 0.4	16.5 - 0.7
46	0°11.5	0°11.5	0°11.0	4.6 - 0.0	10.6 - 0.1	16.6 - 0.1	46	0°26.5	0°26.6	0°25.3	4.6 - 0.1	10.6 - 0.3	16.6 - 0.4	46	0°41.5	0°41.6	0°39.6	4.6 - 0.2	10.6 - 0.4	16.6 - 0.7
47	0°11.8	0°11.8	0°11.2	4.7 - 0.0	10.7 - 0.1	16.7 - 0.1	47	0°26.8	0°26.8	0°25.5	4.7 - 0.1	10.7 - 0.3	16.7 - 0.4	47	0°41.8	0°41.9	0°39.8	4.7 - 0.2	10.7 - 0.4	16.7 - 0.7
48	0°12.0	0°12.0	0°11.5	4.8 - 0.0	10.8 - 0.1	16.8 - 0.1	48	0°27.0	0°27.1	0°25.8	4.8 - 0.1	10.8 - 0.3	16.8 - 0.4	48	0°42.0	0°42.1	0°40.1	4.8 - 0.2	10.8 - 0.5	16.8 - 0.7
49	0°12.3	0°12.3	0°11.7	4.9 - 0.0	10.															

## Increments and Corrections

m 3	Sun Plan.	Aries	Moon	v and d corr			m 4	Sun Plan.	Aries	Moon	v and d corr			m 5	Sun Plan.	Aries	Moon	v and d corr		
0	0°45.0	0°45.1	0°43.0	0.0 - 0.0	6.0 - 0.3	12.0 - 0.7	0	1°00.0	1°00.2	0°57.3	0.0 - 0.0	6.0 - 0.4	12.0 - 0.9	0	1°15.0	1°15.2	1°11.6	0.0 - 0.0	6.0 - 0.5	12.0 - 1.1
1	0°45.3	0°45.4	0°43.2	0.1 - 0.0	6.1 - 0.4	12.1 - 0.7	1	1°00.2	1°00.4	0°57.5	0.1 - 0.0	6.1 - 0.5	12.1 - 0.9	1	1°15.3	1°15.5	1°11.8	0.1 - 0.0	6.1 - 0.6	12.1 - 1.1
2	0°45.5	0°45.6	0°43.4	0.2 - 0.0	6.2 - 0.4	12.2 - 0.7	2	1°00.5	1°00.7	0°57.7	0.2 - 0.0	6.2 - 0.5	12.2 - 0.9	2	1°15.5	1°15.7	1°12.1	0.2 - 0.0	6.2 - 0.6	12.2 - 1.1
3	0°45.8	0°45.9	0°43.7	0.3 - 0.0	6.3 - 0.4	12.3 - 0.7	3	1°00.7	1°00.9	0°58.0	0.3 - 0.0	6.3 - 0.5	12.3 - 0.9	3	1°15.7	1°16.0	1°12.3	0.3 - 0.0	6.3 - 0.6	12.3 - 1.1
4	0°46.0	0°46.1	0°43.9	0.4 - 0.0	6.4 - 0.4	12.4 - 0.7	4	1°01.0	1°01.2	0°58.2	0.4 - 0.0	6.4 - 0.5	12.4 - 0.9	4	1°16.0	1°16.2	1°12.5	0.4 - 0.0	6.4 - 0.6	12.4 - 1.1
5	0°46.3	0°46.4	0°44.1	0.5 - 0.0	6.5 - 0.4	12.5 - 0.7	5	1°01.2	1°01.4	0°58.5	0.5 - 0.0	6.5 - 0.5	12.5 - 0.9	5	1°16.2	1°16.5	1°12.8	0.5 - 0.0	6.5 - 0.6	12.5 - 1.1
6	0°46.5	0°46.6	0°44.4	0.6 - 0.0	6.6 - 0.4	12.6 - 0.7	6	1°01.5	1°01.7	0°58.7	0.6 - 0.0	6.6 - 0.5	12.6 - 0.9	6	1°16.5	1°16.7	1°13.0	0.6 - 0.1	6.6 - 0.6	12.6 - 1.2
7	0°46.8	0°46.9	0°44.6	0.7 - 0.0	6.7 - 0.4	12.7 - 0.7	7	1°01.7	1°01.9	0°58.9	0.7 - 0.1	6.7 - 0.5	12.7 - 1.0	7	1°16.7	1°17.0	1°13.3	0.7 - 0.1	6.7 - 0.6	12.7 - 1.2
8	0°47.0	0°47.1	0°44.9	0.8 - 0.0	6.8 - 0.4	12.8 - 0.7	8	1°02.0	1°02.2	0°59.2	0.8 - 0.1	6.8 - 0.5	12.8 - 1.0	8	1°17.0	1°17.2	1°13.5	0.8 - 0.1	6.8 - 0.6	12.8 - 1.2
9	0°47.3	0°47.4	0°45.1	0.9 - 0.1	6.9 - 0.4	12.9 - 0.8	9	1°02.3	1°02.4	0°59.4	0.9 - 0.1	6.9 - 0.5	12.9 - 1.0	9	1°17.3	1°17.5	1°13.7	0.9 - 0.1	6.9 - 0.6	12.9 - 1.2
10	0°47.5	0°47.6	0°45.3	1.0 - 0.1	7.0 - 0.4	13.0 - 0.8	10	1°02.5	1°02.7	0°59.7	1.0 - 0.1	7.0 - 0.5	13.0 - 1.0	10	1°17.5	1°17.7	1°14.0	1.0 - 0.1	7.0 - 0.6	13.0 - 1.2
11	0°47.8	0°47.9	0°45.6	1.1 - 0.1	7.1 - 0.4	13.1 - 0.8	11	1°02.8	1°02.9	0°59.9	1.1 - 0.1	7.1 - 0.5	13.1 - 1.0	11	1°17.8	1°18.0	1°14.2	1.1 - 0.1	7.1 - 0.7	13.1 - 1.2
12	0°48.0	0°48.1	0°45.8	1.2 - 0.1	7.2 - 0.4	13.2 - 0.8	12	1°03.0	1°03.2	1°00.1	1.2 - 0.1	7.2 - 0.5	13.2 - 1.0	12	1°18.0	1°18.2	1°14.4	1.2 - 0.1	7.2 - 0.7	13.2 - 1.2
13	0°48.3	0°48.4	0°46.1	1.3 - 0.1	7.3 - 0.4	13.3 - 0.8	13	1°03.3	1°03.4	1°00.4	1.3 - 0.1	7.3 - 0.5	13.3 - 1.0	13	1°18.3	1°18.5	1°14.7	1.3 - 0.1	7.3 - 0.7	13.3 - 1.2
14	0°48.5	0°48.6	0°46.3	1.4 - 0.1	7.4 - 0.4	13.4 - 0.8	14	1°03.5	1°03.7	1°00.6	1.4 - 0.1	7.4 - 0.6	13.4 - 1.0	14	1°18.5	1°18.7	1°14.9	1.4 - 0.1	7.4 - 0.7	13.4 - 1.2
15	0°48.8	0°48.9	0°46.5	1.5 - 0.1	7.5 - 0.4	13.5 - 0.8	15	1°03.8	1°03.9	1°00.8	1.5 - 0.1	7.5 - 0.6	13.5 - 1.0	15	1°18.8	1°19.0	1°15.2	1.5 - 0.1	7.5 - 0.7	13.5 - 1.2
16	0°49.0	0°49.1	0°46.8	1.6 - 0.1	7.6 - 0.4	13.6 - 0.8	16	1°04.0	1°04.2	1°01.1	1.6 - 0.1	7.6 - 0.6	13.6 - 1.0	16	1°19.0	1°19.2	1°15.4	1.6 - 0.1	7.6 - 0.7	13.6 - 1.2
17	0°49.3	0°49.4	0°47.0	1.7 - 0.1	7.7 - 0.4	13.7 - 0.8	17	1°04.2	1°04.4	1°01.3	1.7 - 0.1	7.7 - 0.6	13.7 - 1.0	17	1°19.3	1°19.5	1°15.6	1.7 - 0.2	7.7 - 0.7	13.7 - 1.3
18	0°49.5	0°49.6	0°47.2	1.8 - 0.1	7.8 - 0.5	13.8 - 0.8	18	1°04.5	1°04.7	1°01.6	1.8 - 0.1	7.8 - 0.6	13.8 - 1.0	18	1°19.5	1°19.7	1°15.9	1.8 - 0.2	7.8 - 0.7	13.8 - 1.3
19	0°49.8	0°49.9	0°47.5	1.9 - 0.1	7.9 - 0.5	13.9 - 0.8	19	1°04.7	1°04.9	1°01.8	1.9 - 0.1	7.9 - 0.6	13.9 - 1.0	19	1°19.7	1°20.0	1°16.1	1.9 - 0.2	7.9 - 0.7	13.9 - 1.3
20	0°50.0	0°50.1	0°47.7	2.0 - 0.1	8.0 - 0.5	14.0 - 0.8	20	1°05.0	1°05.2	1°02.0	2.0 - 0.1	8.0 - 0.6	14.0 - 1.1	20	1°20.0	1°20.2	1°16.4	2.0 - 0.2	8.0 - 0.7	14.0 - 1.3
21	0°50.3	0°50.4	0°48.0	2.1 - 0.1	8.1 - 0.5	14.1 - 0.8	21	1°05.2	1°05.4	1°02.3	2.1 - 0.2	8.1 - 0.6	14.1 - 1.1	21	1°20.2	1°20.5	1°16.6	2.1 - 0.2	8.1 - 0.7	14.1 - 1.3
22	0°50.5	0°50.6	0°48.2	2.2 - 0.1	8.2 - 0.5	14.2 - 0.8	22	1°05.5	1°05.7	1°02.5	2.2 - 0.2	8.2 - 0.6	14.2 - 1.1	22	1°20.5	1°20.7	1°16.8	2.2 - 0.2	8.2 - 0.8	14.2 - 1.3
23	0°50.8	0°50.9	0°48.4	2.3 - 0.1	8.3 - 0.5	14.3 - 0.8	23	1°05.8	1°05.9	1°02.8	2.3 - 0.2	8.3 - 0.6	14.3 - 1.1	23	1°20.8	1°21.0	1°17.1	2.3 - 0.2	8.3 - 0.8	14.3 - 1.3
24	0°51.0	0°51.1	0°48.7	2.4 - 0.1	8.4 - 0.5	14.4 - 0.8	24	1°06.0	1°06.2	1°03.0	2.4 - 0.2	8.4 - 0.6	14.4 - 1.1	24	1°21.0	1°21.2	1°17.3	2.4 - 0.2	8.4 - 0.8	14.4 - 1.3
25	0°51.3	0°51.4	0°48.9	2.5 - 0.1	8.5 - 0.5	14.5 - 0.8	25	1°06.3	1°06.4	1°03.2	2.5 - 0.2	8.5 - 0.6	14.5 - 1.1	25	1°21.3	1°21.5	1°17.5	2.5 - 0.2	8.5 - 0.8	14.5 - 1.3
26	0°51.5	0°51.6	0°49.2	2.6 - 0.2	8.6 - 0.5	14.6 - 0.9	26	1°06.5	1°06.7	1°03.5	2.6 - 0.2	8.6 - 0.6	14.6 - 1.1	26	1°21.5	1°21.7	1°17.8	2.6 - 0.2	8.6 - 0.8	14.6 - 1.3
27	0°51.8	0°51.9	0°49.4	2.7 - 0.2	8.7 - 0.5	14.7 - 0.9	27	1°06.8	1°06.9	1°03.7	2.7 - 0.2	8.7 - 0.7	14.7 - 1.1	27	1°21.8	1°22.0	1°18.0	2.7 - 0.2	8.7 - 0.8	14.7 - 1.3
28	0°52.0	0°52.1	0°49.6	2.8 - 0.2	8.8 - 0.5	14.8 - 0.9	28	1°07.0	1°07.2	1°03.9	2.8 - 0.2	8.8 - 0.7	14.8 - 1.1	28	1°22.0	1°22.2	1°18.3	2.8 - 0.3	8.8 - 0.8	14.8 - 1.4
29	0°52.3	0°52.4	0°49.9	2.9 - 0.2	8.9 - 0.5	14.9 - 0.9	29	1°07.3	1°07.4	1°04.2	2.9 - 0.2	8.9 - 0.7	14.9 - 1.1	29	1°22.3	1°22.5	1°18.5	2.9 - 0.3	8.9 - 0.8	14.9 - 1.4
30	0°52.5	0°52.6	0°50.1	3.0 - 0.2	9.0 - 0.5	15.0 - 0.9	30	1°07.5	1°07.7	1°04.4	3.0 - 0.2	9.0 - 0.7	15.0 - 1.1	30	1°22.5	1°22.7	1°18.7	3.0 - 0.3	9.0 - 0.8	15.0 - 1.4
31	0°52.8	0°52.9	0°50.3	3.1 - 0.2	9.1 - 0.5	15.1 - 0.9	31	1°07.7	1°07.9	1°04.7	3.1 - 0.2	9.1 - 0.7	15.1 - 1.1	31	1°22.8	1°23.0	1°19.0	3.1 - 0.3	9.1 - 0.8	15.1 - 1.4
32	0°53.0	0°53.1	0°50.6	3.2 - 0.2	9.2 - 0.5	15.2 - 0.9	32	1°08.0	1°08.2	1°04.9	3.2 - 0.2	9.2 - 0.7	15.2 - 1.1	32	1°23.0	1°23.2	1°19.2	3.2 - 0.3	9.2 - 0.8	15.2 - 1.4
33	0°53.3	0°53.4	0°50.8	3.3 - 0.2	9.3 - 0.5	15.3 - 0.9	33	1°08.2	1°08.4	1°05.1	3.3 - 0.2	9.3 - 0.7	15.3 - 1.1	33	1°23.2	1°23.5	1°19.5	3.3 - 0.3	9.3 - 0.9	15.3 - 1.4
34	0°53.5	0°53.6	0°51.1	3.4 - 0.2	9.4 - 0.5	15.4 - 0.9	34	1°08.5	1°08.7	1°05.4	3.4 - 0.3	9.4 - 0.7	15.4 - 1.2	34	1°23.5	1°23.7	1°19.7	3.4 - 0.3	9.4 - 0.9	15.4 - 1.4
35	0°53.8	0°53.9	0°51.3	3.5 - 0.2	9.5 - 0.6	15.5 - 0.9	35	1°08.7	1°08.9	1°05.6	3.5 - 0.3	9.5 - 0.7	15.5 - 1.2	35	1°23.7	1°24.0	1°19.9	3.5 - 0.3	9.5 - 0.9	15.5 - 1.4
36	0°54.0	0°54.1	0°51.5	3.6 - 0.2	9.6 - 0.6	15.6 - 0.9	36	1°09.0	1°09.2	1°05.9	3.6 - 0.3	9.6 - 0.7	15.6 - 1.2	36	1°24.0	1°24.2	1°20.2	3.6 - 0.3	9.6 - 0.9	15.6 - 1.4
37	0°54.3	0°54.4	0°51.8	3.7 - 0.2	9.7 - 0.6	15.7 - 0.9	37	1°09.3	1°09.4	1°06.1	3.7 - 0.3	9.7 - 0.7	15.7 - 1.2	37	1°24.3	1°24.5	1°20.4	3.7 - 0.3	9.7 - 0.9	15.7 - 1.4
38	0°54.5	0°54.6	0°52.0	3.8 - 0.2	9.8 - 0.6	15.8 - 0.9	38	1°09.5	1°09.7	1°06.3	3.8 - 0.3	9.8 - 0.7	15.8 - 1.2	38	1°24.5	1°24.7	1°20.7	3.8 - 0.3	9.8 - 0.9	15.8 - 1.4
39	0°54.8	0°54.9	0°52.3	3.9 - 0.2	9.9 - 0.6	15.9 - 0.9	39	1°09.8	1°09.9	1°06.6	3.9 - 0.3	9.9 - 0.7	15.9 - 1.2	39	1°24.8	1°25.0	1°20.9	3.9 - 0.4	9.9 - 0.9	15.9 - 1.5
40	0°55.0	0°55.2	0°52.5	4.0 - 0.2	10.0 - 0.6	16.0 - 0.9	40	1°10.0	1°10.2	1°06.8	4.0 - 0.3	10.0 - 0.8	16.0 - 1.2	40	1°25.0	1°25.2	1°21.1	4.0 - 0.4	10.0 - 0.9	16.0 - 1.5
41	0°55.3	0°55.4	0°52.7	4.1 - 0.2	10.1 - 0.6	16.1 - 0.9	41	1°10.3	1°10.4	1°07.0	4.1 - 0.3	10.1 - 0.8	16.1 - 1.2	41	1°25.3	1°25.5	1°21.4	4.1 - 0.4	10.1 - 0.9	16.1 - 1.5
42	0°55.5	0°55.7	0°53.0	4.2 - 0.2	10.2 - 0.6	16.2 - 0.9	42	1°10.5	1°10.7	1°07.3	4.2 - 0.3	10.2 - 0.8	16.2 - 1.2	42	1°25.5	1°25.7	1°21.6	4.2 - 0.4	10.2 - 0.9	16.2 - 1.5
43	0°55.8	0°55.9	0°53.2	4.3 - 0.3	10.3 - 0.6	16.3 - 1.0	43	1°10.8	1°10.9	1°07.5	4.3 - 0.3	10.3 - 0.8	16.3 - 1.2	43	1°25.8	1°26.0	1°21.8	4.3 - 0.4	10.3 - 0.9	16.3 - 1.5
44	0°56.0	0°56.2	0°53.4	4.4 - 0.3	10.4 - 0.6	16.4 - 1.0	44	1°11.0	1°11.2	1°07.8	4.4 - 0.3	10.4 - 0.8	16.4 - 1.2	44	1°26.0	1°26.2	1°22.1	4.4 - 0.4	10.4 - 1.0	16.4 - 1.5
45	0°56.3	0°56.4	0°53.7	4.5 - 0.3	10.5 - 0.6	16.5 - 1.0	45	1°11.3	1°11.4	1°08.0	4.5 - 0.3	10.5 - 0.8	16.5 - 1.2	45	1°26.3	1°26.5	1°22.3	4.5 - 0.4	10.5 - 1.0	16.5 - 1.5
46	0°56.5	0°56.7	0°53.9	4.6 - 0.3	10.6 - 0.6	16.6 - 1.0	46	1°11.5	1°11.7	1°08.2	4.6 - 0.3	10.6 - 0.8	16.6 - 1.2	46	1°26.5	1°26.7	1°22.6	4.6 - 0.4	10.6 - 1.0	16.6 - 1.5
47	0°56.8	0°56.9	0°54.2	4.7 - 0.3	10.7 - 0.6	16.7 - 1.0	47	1°11.7	1°11.9	1°08.5	4.7 - 0.4	10.7 - 0.8	16.7 - 1.3	47	1°26.8	1°27.0	1°22.8	4.7 - 0.4	10.7 - 1.0	16.7 - 1.5
48	0°57.0	0°57.2	0°54.4	4.8 - 0.3	10.8 - 0.6	16.8 - 1.0	48	1°12.0	1°12.2	1°08.7	4.8 - 0.4	10.8 - 0.8	16.8 - 1.3	48	1°27.0	1°27.2	1°23.0	4.8 - 0.4	10.8 - 1.0	16.8 - 1.5
49	0°57.3	0°57.4	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 -									

## 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°																		

## 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																			



## Increments and Corrections

m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
21	Plan.						22	Plan.					23	Plan.						
0	5°15.0	5°15.9	5°00.6	0.0 - 0.0	6.0 - 2.1	12.0 - 4.3	0	5°30.0	5°30.9	5°15.0	0.0 - 0.0	6.0 - 2.3	12.0 - 4.5	0	5°45.0	5°45.9	5°29.3	0.0 - 0.0	6.0 - 2.4	12.0 - 4.7
1	5°15.2	5°16.1	5°00.9	0.1 - 0.0	6.1 - 2.2	12.1 - 4.3	1	5°30.2	5°31.2	5°15.2	0.1 - 0.0	6.1 - 2.3	12.1 - 4.5	1	5°45.2	5°46.2	5°29.5	0.1 - 0.0	6.1 - 2.4	12.1 - 4.7
2	5°15.5	5°16.4	5°01.1	0.2 - 0.1	6.2 - 2.2	12.2 - 4.4	2	5°30.5	5°31.4	5°15.4	0.2 - 0.1	6.2 - 2.3	12.2 - 4.6	2	5°45.5	5°46.4	5°29.8	0.2 - 0.1	6.2 - 2.4	12.2 - 4.8
3	5°15.8	5°16.6	5°01.4	0.3 - 0.1	6.3 - 2.3	12.3 - 4.4	3	5°30.8	5°31.7	5°15.7	0.3 - 0.1	6.3 - 2.4	12.3 - 4.6	3	5°45.8	5°46.7	5°30.0	0.3 - 0.1	6.3 - 2.5	12.3 - 4.8
4	5°16.0	5°16.9	5°01.6	0.4 - 0.1	6.4 - 2.3	12.4 - 4.4	4	5°31.0	5°31.9	5°15.9	0.4 - 0.2	6.4 - 2.4	12.4 - 4.7	4	5°46.0	5°46.9	5°30.2	0.4 - 0.2	6.4 - 2.5	12.4 - 4.9
5	5°16.2	5°17.1	5°01.8	0.5 - 0.2	6.5 - 2.3	12.5 - 4.5	5	5°31.2	5°32.2	5°16.2	0.5 - 0.2	6.5 - 2.4	12.5 - 4.7	5	5°46.2	5°47.2	5°30.5	0.5 - 0.2	6.5 - 2.5	12.5 - 4.9
6	5°16.5	5°17.4	5°02.1	0.6 - 0.2	6.6 - 2.4	12.6 - 4.5	6	5°31.5	5°32.4	5°16.4	0.6 - 0.2	6.6 - 2.5	12.6 - 4.7	6	5°46.5	5°47.4	5°30.7	0.6 - 0.2	6.6 - 2.6	12.6 - 4.9
7	5°16.8	5°17.6	5°02.3	0.7 - 0.3	6.7 - 2.4	12.7 - 4.6	7	5°31.8	5°32.7	5°16.6	0.7 - 0.3	6.7 - 2.5	12.7 - 4.8	7	5°46.8	5°47.7	5°31.0	0.7 - 0.3	6.7 - 2.6	12.7 - 5.0
8	5°17.0	5°17.9	5°02.6	0.8 - 0.3	6.8 - 2.4	12.8 - 4.6	8	5°32.0	5°32.9	5°16.9	0.8 - 0.3	6.8 - 2.5	12.8 - 4.8	8	5°47.0	5°47.9	5°31.2	0.8 - 0.3	6.8 - 2.7	12.8 - 5.0
9	5°17.2	5°18.1	5°02.8	0.9 - 0.3	6.9 - 2.5	12.9 - 4.6	9	5°32.2	5°33.2	5°17.1	0.9 - 0.3	6.9 - 2.6	12.9 - 4.8	9	5°47.2	5°48.2	5°31.4	0.9 - 0.4	6.9 - 2.7	12.9 - 5.1
10	5°17.5	5°18.4	5°03.0	1.0 - 0.4	7.0 - 2.5	13.0 - 4.7	10	5°32.5	5°33.4	5°17.4	1.0 - 0.4	7.0 - 2.6	13.0 - 4.9	10	5°47.5	5°48.4	5°31.7	1.0 - 0.4	7.0 - 2.7	13.0 - 5.1
11	5°17.8	5°18.6	5°03.3	1.1 - 0.4	7.1 - 2.5	13.1 - 4.7	11	5°32.8	5°33.7	5°17.6	1.1 - 0.4	7.1 - 2.7	13.1 - 4.9	11	5°47.8	5°48.7	5°31.9	1.1 - 0.4	7.1 - 2.8	13.1 - 5.1
12	5°18.0	5°18.9	5°03.5	1.2 - 0.4	7.2 - 2.6	13.2 - 4.7	12	5°33.0	5°33.9	5°17.8	1.2 - 0.5	7.2 - 2.7	13.2 - 4.9	12	5°48.0	5°49.0	5°32.1	1.2 - 0.5	7.2 - 2.8	13.2 - 5.2
13	5°18.2	5°19.1	5°03.8	1.3 - 0.5	7.3 - 2.6	13.3 - 4.8	13	5°33.2	5°34.2	5°18.1	1.3 - 0.5	7.3 - 2.7	13.3 - 5.0	13	5°48.2	5°49.2	5°32.4	1.3 - 0.5	7.3 - 2.9	13.3 - 5.2
14	5°18.5	5°19.4	5°04.0	1.4 - 0.5	7.4 - 2.7	13.4 - 4.8	14	5°33.5	5°34.4	5°18.3	1.4 - 0.5	7.4 - 2.8	13.4 - 5.0	14	5°48.5	5°49.5	5°32.6	1.4 - 0.5	7.4 - 2.9	13.4 - 5.2
15	5°18.8	5°19.6	5°04.2	1.5 - 0.5	7.5 - 2.7	13.5 - 4.8	15	5°33.8	5°34.7	5°18.5	1.5 - 0.6	7.5 - 2.8	13.5 - 5.1	15	5°48.8	5°49.7	5°32.9	1.5 - 0.6	7.5 - 2.9	13.5 - 5.3
16	5°19.0	5°19.9	5°04.5	1.6 - 0.6	7.6 - 2.7	13.6 - 4.9	16	5°34.0	5°34.9	5°18.8	1.6 - 0.6	7.6 - 2.8	13.6 - 5.1	16	5°49.0	5°50.0	5°33.1	1.6 - 0.6	7.6 - 3.0	13.6 - 5.3
17	5°19.3	5°20.1	5°04.7	1.7 - 0.6	7.7 - 2.8	13.7 - 4.9	17	5°34.3	5°35.2	5°19.0	1.7 - 0.6	7.7 - 2.9	13.7 - 5.1	17	5°49.3	5°50.2	5°33.3	1.7 - 0.7	7.7 - 3.0	13.7 - 5.4
18	5°19.5	5°20.4	5°04.9	1.8 - 0.6	7.8 - 2.8	13.8 - 4.9	18	5°34.5	5°35.4	5°19.3	1.8 - 0.7	7.8 - 2.9	13.8 - 5.2	18	5°49.5	5°50.5	5°33.6	1.8 - 0.7	7.8 - 3.1	13.8 - 5.4
19	5°19.7	5°20.6	5°05.2	1.9 - 0.7	7.9 - 2.8	13.9 - 5.0	19	5°34.8	5°35.7	5°19.5	1.9 - 0.7	7.9 - 3.0	13.9 - 5.2	19	5°49.8	5°50.7	5°33.8	1.9 - 0.7	7.9 - 3.1	13.9 - 5.4
20	5°20.0	5°20.9	5°05.4	2.0 - 0.7	8.0 - 2.9	14.0 - 5.0	20	5°35.0	5°35.9	5°19.7	2.0 - 0.8	8.0 - 3.0	14.0 - 5.3	20	5°50.0	5°51.0	5°34.1	2.0 - 0.8	8.0 - 3.1	14.0 - 5.5
21	5°20.3	5°21.1	5°05.7	2.1 - 0.8	8.1 - 2.9	14.1 - 5.1	21	5°35.3	5°36.2	5°20.0	2.1 - 0.8	8.1 - 3.0	14.1 - 5.3	21	5°50.3	5°51.2	5°34.3	2.1 - 0.8	8.1 - 3.2	14.1 - 5.5
22	5°20.5	5°21.4	5°05.9	2.2 - 0.8	8.2 - 2.9	14.2 - 5.1	22	5°35.5	5°36.4	5°20.2	2.2 - 0.8	8.2 - 3.1	14.2 - 5.3	22	5°50.5	5°51.5	5°34.5	2.2 - 0.9	8.2 - 3.2	14.2 - 5.6
23	5°20.7	5°21.6	5°06.1	2.3 - 0.8	8.3 - 3.0	14.3 - 5.1	23	5°35.7	5°36.7	5°20.5	2.3 - 0.9	8.3 - 3.1	14.3 - 5.4	23	5°50.7	5°51.7	5°34.8	2.3 - 0.9	8.3 - 3.3	14.3 - 5.6
24	5°21.0	5°21.9	5°06.4	2.4 - 0.9	8.4 - 3.0	14.4 - 5.2	24	5°36.0	5°36.9	5°20.7	2.4 - 0.9	8.4 - 3.2	14.4 - 5.4	24	5°51.0	5°52.0	5°35.0	2.4 - 0.9	8.4 - 3.3	14.4 - 5.6
25	5°21.3	5°22.1	5°06.6	2.5 - 0.9	8.5 - 3.0	14.5 - 5.2	25	5°36.3	5°37.2	5°20.9	2.5 - 0.9	8.5 - 3.2	14.5 - 5.4	25	5°51.3	5°52.2	5°35.2	2.5 - 1.0	8.5 - 3.3	14.5 - 5.7
26	5°21.5	5°22.4	5°06.9	2.6 - 0.9	8.6 - 3.1	14.6 - 5.2	26	5°36.5	5°37.4	5°21.2	2.6 - 1.0	8.6 - 3.2	14.6 - 5.5	26	5°51.5	5°52.5	5°35.5	2.6 - 1.0	8.6 - 3.4	14.6 - 5.7
27	5°21.7	5°22.6	5°07.1	2.7 - 1.0	8.7 - 3.1	14.7 - 5.3	27	5°36.7	5°37.7	5°21.4	2.7 - 1.0	8.7 - 3.3	14.7 - 5.5	27	5°51.7	5°52.7	5°35.7	2.7 - 1.1	8.7 - 3.4	14.7 - 5.8
28	5°22.0	5°22.9	5°07.3	2.8 - 1.0	8.8 - 3.2	14.8 - 5.3	28	5°37.0	5°37.9	5°21.6	2.8 - 1.1	8.8 - 3.3	14.8 - 5.6	28	5°52.0	5°53.0	5°36.0	2.8 - 1.1	8.8 - 3.4	14.8 - 5.8
29	5°22.3	5°23.1	5°07.6	2.9 - 1.0	8.9 - 3.2	14.9 - 5.3	29	5°37.3	5°38.2	5°21.9	2.9 - 1.1	8.9 - 3.3	14.9 - 5.6	29	5°52.3	5°53.2	5°36.2	2.9 - 1.1	8.9 - 3.5	14.9 - 5.8
30	5°22.5	5°23.4	5°07.8	3.0 - 1.1	9.0 - 3.2	15.0 - 5.4	30	5°37.5	5°38.4	5°22.1	3.0 - 1.1	9.0 - 3.4	15.0 - 5.6	30	5°52.5	5°53.5	5°36.4	3.0 - 1.2	9.0 - 3.5	15.0 - 5.9
31	5°22.7	5°23.6	5°08.0	3.1 - 1.1	9.1 - 3.3	15.1 - 5.4	31	5°37.7	5°38.7	5°22.4	3.1 - 1.2	9.1 - 3.4	15.1 - 5.7	31	5°52.7	5°53.7	5°36.7	3.1 - 1.2	9.1 - 3.6	15.1 - 5.9
32	5°23.0	5°23.9	5°08.3	3.2 - 1.1	9.2 - 3.3	15.2 - 5.4	32	5°38.0	5°38.9	5°22.6	3.2 - 1.2	9.2 - 3.4	15.2 - 5.7	32	5°53.0	5°54.0	5°36.9	3.2 - 1.3	9.2 - 3.6	15.2 - 6.0
33	5°23.3	5°24.1	5°08.5	3.3 - 1.2	9.3 - 3.3	15.3 - 5.5	33	5°38.3	5°39.2	5°22.8	3.3 - 1.2	9.3 - 3.5	15.3 - 5.7	33	5°53.3	5°54.2	5°37.2	3.3 - 1.3	9.3 - 3.6	15.3 - 6.0
34	5°23.5	5°24.4	5°08.8	3.4 - 1.2	9.4 - 3.4	15.4 - 5.5	34	5°38.5	5°39.4	5°23.1	3.4 - 1.3	9.4 - 3.5	15.4 - 5.8	34	5°53.5	5°54.5	5°37.4	3.4 - 1.3	9.4 - 3.7	15.4 - 6.0
35	5°23.7	5°24.6	5°09.0	3.5 - 1.3	9.5 - 3.4	15.5 - 5.6	35	5°38.7	5°39.7	5°23.3	3.5 - 1.3	9.5 - 3.6	15.5 - 5.8	35	5°53.7	5°54.7	5°37.6	3.5 - 1.4	9.5 - 3.7	15.5 - 6.1
36	5°24.0	5°24.9	5°09.2	3.6 - 1.3	9.6 - 3.4	15.6 - 5.6	36	5°39.0	5°39.9	5°23.6	3.6 - 1.4	9.6 - 3.6	15.6 - 5.8	36	5°54.0	5°55.0	5°37.9	3.6 - 1.4	9.6 - 3.8	15.6 - 6.1
37	5°24.3	5°25.1	5°09.5	3.7 - 1.3	9.7 - 3.5	15.7 - 5.6	37	5°39.3	5°40.2	5°23.8	3.7 - 1.4	9.7 - 3.6	15.7 - 5.9	37	5°54.3	5°55.2	5°38.1	3.7 - 1.4	9.7 - 3.8	15.7 - 6.2
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°2																		

## 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°13.3	5°55.3	4.9 - 2.0	10.9 - 4.5	16.9 - 6.9	49	6°27.2	6°28.3	6°09.6	4.9 - 2.1	10								



## Increments and Corrections

m	Sun Plan.	Aries	Moon	v and d corr			m	Sun Plan.	Aries	Moon	v and d corr			m	Sun Plan.	Aries	Moon	v and d corr		
0	7°30.0	7°31.2	7°09.5	0.0 - 0.0	6.0 - 3.0	12.0 - 6.1	0	7°45.0	7°46.3	7°23.8	0.0 - 0.0	6.0 - 3.2	12.0 - 6.3	0	8°00.0	8°01.3	7°38.1	0.0 - 0.0	6.0 - 3.3	12.0 - 6.5
1	7°30.2	7°31.5	7°09.7	0.1 - 0.1	6.1 - 3.1	12.1 - 6.2	1	7°45.2	7°46.5	7°24.1	0.1 - 0.1	6.1 - 3.2	12.1 - 6.4	1	8°00.2	8°01.6	7°38.4	0.1 - 0.1	6.1 - 3.3	12.1 - 6.6
2	7°30.5	7°31.7	7°10.0	0.2 - 0.1	6.2 - 3.2	12.2 - 6.2	2	7°45.5	7°46.8	7°24.3	0.2 - 0.1	6.2 - 3.3	12.2 - 6.4	2	8°00.5	8°01.8	7°38.6	0.2 - 0.1	6.2 - 3.4	12.2 - 6.6
3	7°30.8	7°32.0	7°10.2	0.3 - 0.2	6.3 - 3.2	12.3 - 6.3	3	7°45.7	7°47.0	7°24.5	0.3 - 0.2	6.3 - 3.3	12.3 - 6.5	3	8°00.7	8°02.1	7°38.8	0.3 - 0.2	6.3 - 3.4	12.3 - 6.7
4	7°31.0	7°32.2	7°10.5	0.4 - 0.2	6.4 - 3.3	12.4 - 6.3	4	7°46.0	7°47.3	7°24.8	0.4 - 0.2	6.4 - 3.4	12.4 - 6.5	4	8°01.0	8°02.3	7°39.1	0.4 - 0.2	6.4 - 3.5	12.4 - 6.7
5	7°31.2	7°32.5	7°10.7	0.5 - 0.3	6.5 - 3.3	12.5 - 6.4	5	7°46.2	7°47.5	7°25.0	0.5 - 0.3	6.5 - 3.4	12.5 - 6.6	5	8°01.3	8°02.6	7°39.3	0.5 - 0.3	6.5 - 3.5	12.5 - 6.8
6	7°31.5	7°32.7	7°10.9	0.6 - 0.3	6.6 - 3.4	12.6 - 6.4	6	7°46.5	7°47.8	7°25.2	0.6 - 0.3	6.6 - 3.5	12.6 - 6.6	6	8°01.5	8°02.8	7°39.6	0.6 - 0.3	6.6 - 3.6	12.6 - 6.8
7	7°31.7	7°33.0	7°11.2	0.7 - 0.4	6.7 - 3.4	12.7 - 6.5	7	7°46.8	7°48.0	7°25.5	0.7 - 0.4	6.7 - 3.5	12.7 - 6.7	7	8°01.8	8°03.1	7°39.8	0.7 - 0.4	6.7 - 3.6	12.7 - 6.9
8	7°32.0	7°33.2	7°11.4	0.8 - 0.4	6.8 - 3.5	12.8 - 6.5	8	7°47.0	7°48.3	7°25.7	0.8 - 0.4	6.8 - 3.6	12.8 - 6.7	8	8°02.0	8°03.3	7°40.0	0.8 - 0.4	6.8 - 3.7	12.8 - 6.9
9	7°32.2	7°33.5	7°11.6	0.9 - 0.5	6.9 - 3.5	12.9 - 6.6	9	7°47.2	7°48.5	7°26.0	0.9 - 0.5	6.9 - 3.6	12.9 - 6.8	9	8°02.2	8°03.6	7°40.3	0.9 - 0.5	6.9 - 3.7	12.9 - 7.0
10	7°32.5	7°33.7	7°11.9	1.0 - 0.5	7.0 - 3.6	13.0 - 6.6	10	7°47.5	7°48.8	7°26.2	1.0 - 0.5	7.0 - 3.7	13.0 - 6.8	10	8°02.5	8°03.8	7°40.5	1.0 - 0.5	7.0 - 3.8	13.0 - 7.0
11	7°32.8	7°34.0	7°12.1	1.1 - 0.6	7.1 - 3.6	13.1 - 6.7	11	7°47.7	7°49.0	7°26.4	1.1 - 0.6	7.1 - 3.7	13.1 - 6.9	11	8°02.7	8°04.1	7°40.8	1.1 - 0.6	7.1 - 3.8	13.1 - 7.1
12	7°33.0	7°34.2	7°12.4	1.2 - 0.6	7.2 - 3.7	13.2 - 6.7	12	7°48.0	7°49.3	7°26.7	1.2 - 0.6	7.2 - 3.8	13.2 - 6.9	12	8°03.0	8°04.3	7°41.0	1.2 - 0.7	7.2 - 3.9	13.2 - 7.1
13	7°33.3	7°34.5	7°12.6	1.3 - 0.7	7.3 - 3.7	13.3 - 6.8	13	7°48.2	7°49.5	7°26.9	1.3 - 0.7	7.3 - 3.8	13.3 - 7.0	13	8°03.3	8°04.6	7°41.2	1.3 - 0.7	7.3 - 4.0	13.3 - 7.2
14	7°33.5	7°34.7	7°12.8	1.4 - 0.7	7.4 - 3.8	13.4 - 6.8	14	7°48.5	7°49.8	7°27.2	1.4 - 0.7	7.4 - 3.9	13.4 - 7.0	14	8°03.5	8°04.8	7°41.5	1.4 - 0.8	7.4 - 4.0	13.4 - 7.3
15	7°33.8	7°35.0	7°13.1	1.5 - 0.8	7.5 - 3.8	13.5 - 6.9	15	7°48.8	7°50.0	7°27.4	1.5 - 0.8	7.5 - 3.9	13.5 - 7.1	15	8°03.8	8°05.1	7°41.7	1.5 - 0.8	7.5 - 4.1	13.5 - 7.3
16	7°34.0	7°35.2	7°13.3	1.6 - 0.8	7.6 - 3.9	13.6 - 6.9	16	7°49.0	7°50.3	7°27.6	1.6 - 0.8	7.6 - 4.0	13.6 - 7.1	16	8°04.0	8°05.3	7°42.0	1.6 - 0.9	7.6 - 4.1	13.6 - 7.4
17	7°34.3	7°35.5	7°13.6	1.7 - 0.9	7.7 - 3.9	13.7 - 7.0	17	7°49.3	7°50.5	7°27.9	1.7 - 0.9	7.7 - 4.0	13.7 - 7.2	17	8°04.2	8°05.6	7°42.2	1.7 - 0.9	7.7 - 4.2	13.7 - 7.4
18	7°34.5	7°35.7	7°13.8	1.8 - 0.9	7.8 - 4.0	13.8 - 7.0	18	7°49.5	7°50.8	7°28.1	1.8 - 0.9	7.8 - 4.1	13.8 - 7.2	18	8°04.5	8°05.8	7°42.4	1.8 - 1.0	7.8 - 4.2	13.8 - 7.5
19	7°34.8	7°36.0	7°14.0	1.9 - 1.0	7.9 - 4.0	13.9 - 7.1	19	7°49.8	7°51.0	7°28.4	1.9 - 1.0	7.9 - 4.1	13.9 - 7.3	19	8°04.8	8°06.1	7°42.7	1.9 - 1.0	7.9 - 4.3	13.9 - 7.5
20	7°35.0	7°36.2	7°14.3	2.0 - 1.0	8.0 - 4.1	14.0 - 7.1	20	7°50.0	7°51.3	7°28.6	2.0 - 1.1	8.0 - 4.2	14.0 - 7.4	20	8°05.0	8°06.3	7°42.9	2.0 - 1.1	8.0 - 4.3	14.0 - 7.6
21	7°35.3	7°36.5	7°14.5	2.1 - 1.1	8.1 - 4.1	14.1 - 7.2	21	7°50.3	7°51.5	7°28.8	2.1 - 1.1	8.1 - 4.3	14.1 - 7.4	21	8°05.3	8°06.6	7°43.1	2.1 - 1.1	8.1 - 4.4	14.1 - 7.6
22	7°35.5	7°36.7	7°14.7	2.2 - 1.1	8.2 - 4.2	14.2 - 7.2	22	7°50.5	7°51.8	7°29.1	2.2 - 1.2	8.2 - 4.3	14.2 - 7.5	22	8°05.5	8°06.8	7°43.4	2.2 - 1.2	8.2 - 4.4	14.2 - 7.7
23	7°35.7	7°37.0	7°15.0	2.3 - 1.2	8.3 - 4.2	14.3 - 7.3	23	7°50.7	7°52.0	7°29.3	2.3 - 1.2	8.3 - 4.4	14.3 - 7.5	23	8°05.7	8°07.1	7°43.6	2.3 - 1.2	8.3 - 4.5	14.3 - 7.7
24	7°36.0	7°37.2	7°15.2	2.4 - 1.2	8.4 - 4.3	14.4 - 7.3	24	7°51.0	7°52.3	7°29.5	2.4 - 1.3	8.4 - 4.4	14.4 - 7.6	24	8°06.0	8°07.3	7°43.9	2.4 - 1.3	8.4 - 4.5	14.4 - 7.8
25	7°36.2	7°37.5	7°15.5	2.5 - 1.3	8.5 - 4.3	14.5 - 7.4	25	7°51.3	7°52.5	7°29.8	2.5 - 1.3	8.5 - 4.5	14.5 - 7.6	25	8°06.2	8°07.6	7°44.1	2.5 - 1.4	8.5 - 4.6	14.5 - 7.9
26	7°36.5	7°37.7	7°15.7	2.6 - 1.3	8.6 - 4.4	14.6 - 7.4	26	7°51.5	7°52.8	7°30.0	2.6 - 1.4	8.6 - 4.5	14.6 - 7.7	26	8°06.5	8°07.8	7°44.3	2.6 - 1.4	8.6 - 4.7	14.6 - 7.9
27	7°36.7	7°38.0	7°15.9	2.7 - 1.4	8.7 - 4.4	14.7 - 7.5	27	7°51.7	7°53.0	7°30.3	2.7 - 1.4	8.7 - 4.6	14.7 - 7.7	27	8°06.8	8°08.1	7°44.6	2.7 - 1.5	8.7 - 4.7	14.7 - 8.0
28	7°37.0	7°38.2	7°16.2	2.8 - 1.4	8.8 - 4.5	14.8 - 7.5	28	7°52.0	7°53.3	7°30.5	2.8 - 1.5	8.8 - 4.6	14.8 - 7.8	28	8°07.0	8°08.3	7°44.8	2.8 - 1.5	8.8 - 4.8	14.8 - 8.0
29	7°37.3	7°38.5	7°16.4	2.9 - 1.5	8.9 - 4.5	14.9 - 7.6	29	7°52.2	7°53.5	7°30.7	2.9 - 1.5	8.9 - 4.7	14.9 - 7.8	29	8°07.3	8°08.6	7°45.1	2.9 - 1.6	8.9 - 4.8	14.9 - 8.1
30	7°37.5	7°38.8	7°16.7	3.0 - 1.5	9.0 - 4.6	15.0 - 7.6	30	7°52.5	7°53.8	7°31.0	3.0 - 1.6	9.0 - 4.7	15.0 - 7.9	30	8°07.5	8°08.8	7°45.3	3.0 - 1.6	9.0 - 4.9	15.0 - 8.1
31	7°37.7	7°39.0	7°16.9	3.1 - 1.6	9.1 - 4.6	15.1 - 7.7	31	7°52.7	7°54.0	7°31.2	3.1 - 1.6	9.1 - 4.8	15.1 - 7.9	31	8°07.7	8°09.1	7°45.5	3.1 - 1.7	9.1 - 4.9	15.1 - 8.2
32	7°38.0	7°39.3	7°17.1	3.2 - 1.6	9.2 - 4.7	15.2 - 7.7	32	7°53.0	7°54.3	7°31.5	3.2 - 1.7	9.2 - 4.8	15.2 - 8.0	32	8°08.0	8°09.3	7°45.8	3.2 - 1.7	9.2 - 5.0	15.2 - 8.2
33	7°38.3	7°39.5	7°17.4	3.3 - 1.7	9.3 - 4.7	15.3 - 7.8	33	7°53.3	7°54.5	7°31.7	3.3 - 1.7	9.3 - 4.9	15.3 - 8.0	33	8°08.2	8°09.6	7°46.0	3.3 - 1.8	9.3 - 5.0	15.3 - 8.3
34	7°38.5	7°39.8	7°17.6	3.4 - 1.7	9.4 - 4.8	15.4 - 7.8	34	7°53.5	7°54.8	7°31.9	3.4 - 1.8	9.4 - 4.9	15.4 - 8.1	34	8°08.5	8°09.8	7°46.2	3.4 - 1.8	9.4 - 5.1	15.4 - 8.3
35	7°38.7	7°40.0	7°17.9	3.5 - 1.8	9.5 - 4.8	15.5 - 7.9	35	7°53.8	7°55.0	7°32.2	3.5 - 1.8	9.5 - 5.0	15.5 - 8.1	35	8°08.8	8°10.1	7°46.5	3.5 - 1.9	9.5 - 5.1	15.5 - 8.4
36	7°39.0	7°40.3	7°18.1	3.6 - 1.8	9.6 - 4.9	15.6 - 7.9	36	7°54.0	7°55.3	7°32.4	3.6 - 1.9	9.6 - 5.0	15.6 - 8.2	36	8°09.0	8°10.3	7°46.7	3.6 - 1.9	9.6 - 5.2	15.6 - 8.4
37	7°39.3	7°40.5	7°18.3	3.7 - 1.9	9.7 - 4.9	15.7 - 8.0	37	7°54.3	7°55.5	7°32.6	3.7 - 1.9	9.7 - 5.1	15.7 - 8.2	37	8°09.3	8°10.6	7°47.0	3.7 - 2.0	9.7 - 5.3	15.7 - 8.5
38	7°39.5	7°40.8	7°18.6	3.8 - 1.9	9.8 - 5.0	15.8 - 8.0	38	7°54.5	7°55.8	7°32.9	3.8 - 2.0	9.8 - 5.1	15.8 - 8.3	38	8°09.5	8°10.8	7°47.2	3.8 - 2.1	9.8 - 5.3	15.8 - 8.6
39	7°39.8	7°41.0	7°18.8	3.9 - 2.0	9.9 - 5.0	15.9 - 8.1	39	7°54.7	7°56.0	7°33.1	3.9 - 2.0	9.9 - 5.2	15.9 - 8.3	39	8°09.7	8°11.1	7°47.4	3.9 - 2.1	9.9 - 5.4	15.9 - 8.6
40	7°40.0	7°41.3	7°19.0	4.0 - 2.0	10.0 - 5.1	16.0 - 8.1	40	7°55.0	7°56.3	7°33.4	4.0 - 2.1	10.0 - 5.3	16.0 - 8.4	40	8°10.0	8°11.3	7°47.7	4.0 - 2.2	10.0 - 5.4	16.0 - 8.7
41	7°40.3	7°41.5	7°19.3	4.1 - 2.1	10.1 - 5.1	16.1 - 8.2	41	7°55.3	7°56.5	7°33.6	4.1 - 2.2	10.1 - 5.3	16.1 - 8.5	41	8°10.2	8°11.6	7°47.9	4.1 - 2.2	10.1 - 5.5	16.1 - 8.7
42	7°40.5	7°41.8	7°19.5	4.2 - 2.1	10.2 - 5.2	16.2 - 8.2	42	7°55.5	7°56.8	7°33.8	4.2 - 2.2	10.2 - 5.4	16.2 - 8.5	42	8°10.5	8°11.8	7°48.2	4.2 - 2.3	10.2 - 5.5	16.2 - 8.8
43	7°40.7	7°42.0	7°19.8	4.3 - 2.2	10.3 - 5.2	16.3 - 8.3	43	7°55.7	7°57.1	7°34.1	4.3 - 2.3	10.3 - 5.4	16.3 - 8.6	43	8°10.8	8°12.1	7°48.4	4.3 - 2.3	10.3 - 5.6	16.3 - 8.8
44	7°41.0	7°42.3	7°20.0	4.4 - 2.2	10.4 - 5.3	16.4 - 8.3	44	7°56.0	7°57.3	7°34.3	4.4 - 2.3	10.4 - 5.5	16.4 - 8.6	44	8°11.0	8°12.3	7°48.6	4.4 - 2.4	10.4 - 5.6	16.4 - 8.9
45	7°41.2	7°42.5	7°20.2	4.5 - 2.3	10.5 - 5.3	16.5 - 8.4	45	7°56.3	7°57.6	7°34.6	4.5 - 2.4	10.5 - 5.5	16.5 - 8.7	45	8°11.3	8°12.6	7°48.9	4.5 - 2.4	10.5 - 5.7	16.5 - 8.9
46	7°41.5	7°42.8	7°20.5	4.6 - 2.3	10.6 - 5.4	16.6 - 8.4	46	7°56.5	7°57.8	7°34.8	4.6 - 2.4	10.6 - 5.6	16.6 - 8.7	46	8°11.5	8°12.8	7°49.1	4.6 - 2.5	10.6 - 5.7	16.6 - 9.0
47	7°41.8	7°43.0	7°20.7	4.7 - 2.4	10.7 - 5.4	16.7 - 8.5	47	7°56.7	7°58.1	7°35.0	4.7 - 2.5	10.7 - 5.6	16.7 - 8.8	47	8°11.7	8°13.1	7°49.3	4.7 - 2.5	10.7 - 5.8	16.7 - 9.0
48	7°42.0	7°43.3	7°21.0	4.8 - 2.4	10.8 - 5.5	16.8 - 8.5	48	7°57.0	7°58.3	7°35.3	4.8 - 2.5	10.8 - 5.7	16.8 - 8.8	48	8°12.0	8°13.3	7°49.6	4.8 - 2.6	10.8 - 5.8	16.8 - 9.1
49	7°42.3	7°43.5																		

## Increments and Corrections

m 33	Sun Plan.	Aries	Moon	v and d corr			m 34	Sun Plan.	Aries	Moon	v and d corr			m 35	Sun Plan.	Aries	Moon	v and d corr		
0	8°15.0	8°16.4	7°52.5	0.0 - 0.0	6.0 - 3.4	12.0 - 6.7	0	8°30.0	8°31.4	8°06.8	0.0 - 0.0	6.0 - 3.4	12.0 - 6.9	0	8°45.0	8°46.4	8°21.1	0.0 - 0.0	6.0 - 3.5	12.0 - 7.1
1	8°15.2	8°16.6	7°52.7	0.1 - 0.1	6.1 - 3.4	12.1 - 6.8	1	8°30.2	8°31.6	8°07.0	0.1 - 0.1	6.1 - 3.5	12.1 - 7.0	1	8°45.2	8°46.7	8°21.3	0.1 - 0.1	6.1 - 3.6	12.1 - 7.2
2	8°15.5	8°16.9	7°52.9	0.2 - 0.1	6.2 - 3.5	12.2 - 6.8	2	8°30.5	8°31.9	8°07.2	0.2 - 0.1	6.2 - 3.6	12.2 - 7.0	2	8°45.5	8°46.9	8°21.6	0.2 - 0.1	6.2 - 3.7	12.2 - 7.2
3	8°15.7	8°17.1	7°53.2	0.3 - 0.2	6.3 - 3.5	12.3 - 6.9	3	8°30.7	8°32.1	8°07.5	0.3 - 0.2	6.3 - 3.6	12.3 - 7.1	3	8°45.7	8°47.2	8°21.8	0.3 - 0.2	6.3 - 3.7	12.3 - 7.3
4	8°16.0	8°17.4	7°53.4	0.4 - 0.2	6.4 - 3.6	12.4 - 6.9	4	8°31.0	8°32.4	8°07.7	0.4 - 0.2	6.4 - 3.7	12.4 - 7.1	4	8°46.0	8°47.4	8°22.0	0.4 - 0.2	6.4 - 3.8	12.4 - 7.3
5	8°16.3	8°17.6	7°53.6	0.5 - 0.3	6.5 - 3.6	12.5 - 7.0	5	8°31.3	8°32.6	8°08.0	0.5 - 0.3	6.5 - 3.7	12.5 - 7.2	5	8°46.3	8°47.7	8°22.3	0.5 - 0.3	6.5 - 3.8	12.5 - 7.4
6	8°16.5	8°17.9	7°53.9	0.6 - 0.3	6.6 - 3.7	12.6 - 7.0	6	8°31.5	8°32.9	8°08.2	0.6 - 0.3	6.6 - 3.8	12.6 - 7.2	6	8°46.5	8°47.9	8°22.5	0.6 - 0.4	6.6 - 3.9	12.6 - 7.5
7	8°16.8	8°18.1	7°54.1	0.7 - 0.4	6.7 - 3.7	12.7 - 7.1	7	8°31.8	8°33.1	8°08.4	0.7 - 0.4	6.7 - 3.9	12.7 - 7.3	7	8°46.8	8°48.2	8°22.8	0.7 - 0.4	6.7 - 4.0	12.7 - 7.5
8	8°17.0	8°18.4	7°54.4	0.8 - 0.4	6.8 - 3.8	12.8 - 7.1	8	8°32.0	8°33.4	8°08.7	0.8 - 0.5	6.8 - 3.9	12.8 - 7.4	8	8°47.0	8°48.4	8°23.0	0.8 - 0.5	6.8 - 4.0	12.8 - 7.6
9	8°17.2	8°18.6	7°54.6	0.9 - 0.5	6.9 - 3.9	12.9 - 7.2	9	8°32.2	8°33.7	8°08.9	0.9 - 0.5	6.9 - 4.0	12.9 - 7.4	9	8°47.2	8°48.7	8°23.2	0.9 - 0.5	6.9 - 4.1	12.9 - 7.6
10	8°17.5	8°18.9	7°54.8	1.0 - 0.6	7.0 - 3.9	13.0 - 7.3	10	8°32.5	8°33.9	8°09.2	1.0 - 0.6	7.0 - 4.0	13.0 - 7.5	10	8°47.5	8°48.9	8°23.5	1.0 - 0.6	7.0 - 4.1	13.0 - 7.7
11	8°17.7	8°19.1	7°55.1	1.1 - 0.6	7.1 - 4.0	13.1 - 7.3	11	8°32.7	8°34.2	8°09.4	1.1 - 0.6	7.1 - 4.1	13.1 - 7.5	11	8°47.7	8°49.2	8°23.7	1.1 - 0.7	7.1 - 4.2	13.1 - 7.8
12	8°18.0	8°19.4	7°55.3	1.2 - 0.7	7.2 - 4.0	13.2 - 7.4	12	8°33.0	8°34.4	8°09.6	1.2 - 0.7	7.2 - 4.1	13.2 - 7.6	12	8°48.0	8°49.4	8°23.9	1.2 - 0.7	7.2 - 4.3	13.2 - 7.8
13	8°18.3	8°19.6	7°55.6	1.3 - 0.7	7.3 - 4.1	13.3 - 7.4	13	8°33.3	8°34.7	8°09.9	1.3 - 0.7	7.3 - 4.2	13.3 - 7.6	13	8°48.3	8°49.7	8°24.2	1.3 - 0.8	7.3 - 4.3	13.3 - 7.9
14	8°18.5	8°19.9	7°55.8	1.4 - 0.8	7.4 - 4.1	13.4 - 7.5	14	8°33.5	8°34.9	8°10.1	1.4 - 0.8	7.4 - 4.3	13.4 - 7.7	14	8°48.5	8°49.9	8°24.4	1.4 - 0.8	7.4 - 4.4	13.4 - 7.9
15	8°18.8	8°20.1	7°56.0	1.5 - 0.8	7.5 - 4.2	13.5 - 7.5	15	8°33.8	8°35.2	8°10.3	1.5 - 0.9	7.5 - 4.3	13.5 - 7.8	15	8°48.8	8°50.2	8°24.7	1.5 - 0.9	7.5 - 4.4	13.5 - 8.0
16	8°19.0	8°20.4	7°56.3	1.6 - 0.9	7.6 - 4.2	13.6 - 7.6	16	8°34.0	8°35.4	8°10.6	1.6 - 0.9	7.6 - 4.4	13.6 - 7.8	16	8°49.0	8°50.4	8°24.9	1.6 - 0.9	7.6 - 4.5	13.6 - 8.0
17	8°19.2	8°20.6	7°56.5	1.7 - 0.9	7.7 - 4.3	13.7 - 7.6	17	8°34.2	8°35.7	8°10.8	1.7 - 1.0	7.7 - 4.4	13.7 - 7.9	17	8°49.2	8°50.7	8°25.1	1.7 - 1.0	7.7 - 4.6	13.7 - 8.1
18	8°19.5	8°20.9	7°56.7	1.8 - 1.0	7.8 - 4.4	13.8 - 7.7	18	8°34.5	8°35.9	8°11.1	1.8 - 1.0	7.8 - 4.5	13.8 - 7.9	18	8°49.5	8°50.9	8°25.4	1.8 - 1.1	7.8 - 4.6	13.8 - 8.2
19	8°19.8	8°21.1	7°57.0	1.9 - 1.1	7.9 - 4.4	13.9 - 7.8	19	8°34.8	8°36.2	8°11.3	1.9 - 1.1	7.9 - 4.5	13.9 - 8.0	19	8°49.8	8°51.2	8°25.6	1.9 - 1.1	7.9 - 4.7	13.9 - 8.2
20	8°20.0	8°21.4	7°57.2	2.0 - 1.1	8.0 - 4.5	14.0 - 7.8	20	8°35.0	8°36.4	8°11.5	2.0 - 1.1	8.0 - 4.6	14.0 - 8.0	20	8°50.0	8°51.4	8°25.9	2.0 - 1.2	8.0 - 4.7	14.0 - 8.3
21	8°20.3	8°21.6	7°57.5	2.1 - 1.2	8.1 - 4.5	14.1 - 7.9	21	8°35.3	8°36.7	8°11.8	2.1 - 1.2	8.1 - 4.7	14.1 - 8.1	21	8°50.3	8°51.7	8°26.1	2.1 - 1.2	8.1 - 4.8	14.1 - 8.3
22	8°20.5	8°21.9	7°57.7	2.2 - 1.2	8.2 - 4.6	14.2 - 7.9	22	8°35.5	8°36.9	8°12.0	2.2 - 1.3	8.2 - 4.7	14.2 - 8.2	22	8°50.5	8°52.0	8°26.3	2.2 - 1.3	8.2 - 4.9	14.2 - 8.4
23	8°20.7	8°22.1	7°57.9	2.3 - 1.3	8.3 - 4.6	14.3 - 8.0	23	8°35.7	8°37.2	8°12.3	2.3 - 1.3	8.3 - 4.8	14.3 - 8.2	23	8°50.7	8°52.2	8°26.6	2.3 - 1.4	8.3 - 4.9	14.3 - 8.5
24	8°21.0	8°22.4	7°58.2	2.4 - 1.3	8.4 - 4.7	14.4 - 8.0	24	8°36.0	8°37.4	8°12.5	2.4 - 1.4	8.4 - 4.8	14.4 - 8.3	24	8°51.0	8°52.5	8°26.8	2.4 - 1.4	8.4 - 5.0	14.4 - 8.5
25	8°21.2	8°22.6	7°58.4	2.5 - 1.4	8.5 - 4.7	14.5 - 8.1	25	8°36.2	8°37.7	8°12.7	2.5 - 1.4	8.5 - 4.9	14.5 - 8.3	25	8°51.2	8°52.7	8°27.0	2.5 - 1.5	8.5 - 5.0	14.5 - 8.6
26	8°21.5	8°22.9	7°58.7	2.6 - 1.5	8.6 - 4.8	14.6 - 8.2	26	8°36.5	8°37.9	8°13.0	2.6 - 1.5	8.6 - 4.9	14.6 - 8.4	26	8°51.5	8°53.0	8°27.3	2.6 - 1.5	8.6 - 5.1	14.6 - 8.6
27	8°21.8	8°23.1	7°58.9	2.7 - 1.5	8.7 - 4.9	14.7 - 8.2	27	8°36.8	8°38.2	8°13.2	2.7 - 1.6	8.7 - 5.0	14.7 - 8.5	27	8°51.8	8°53.2	8°27.5	2.7 - 1.6	8.7 - 5.1	14.7 - 8.7
28	8°22.0	8°23.4	7°59.1	2.8 - 1.6	8.8 - 4.9	14.8 - 8.3	28	8°37.0	8°38.4	8°13.4	2.8 - 1.6	8.8 - 5.1	14.8 - 8.5	28	8°52.0	8°53.5	8°27.8	2.8 - 1.7	8.8 - 5.2	14.8 - 8.8
29	8°22.3	8°23.6	7°59.4	2.9 - 1.6	8.9 - 5.0	14.9 - 8.3	29	8°37.3	8°38.7	8°13.7	2.9 - 1.7	8.9 - 5.1	14.9 - 8.6	29	8°52.3	8°53.7	8°28.0	2.9 - 1.7	8.9 - 5.3	14.9 - 8.8
30	8°22.5	8°23.9	7°59.6	3.0 - 1.7	9.0 - 5.0	15.0 - 8.4	30	8°37.5	8°38.9	8°13.9	3.0 - 1.7	9.0 - 5.2	15.0 - 8.6	30	8°52.5	8°54.0	8°28.2	3.0 - 1.8	9.0 - 5.3	15.0 - 8.9
31	8°22.7	8°24.1	7°59.8	3.1 - 1.7	9.1 - 5.1	15.1 - 8.4	31	8°37.7	8°39.2	8°14.2	3.1 - 1.8	9.1 - 5.2	15.1 - 8.7	31	8°52.7	8°54.2	8°28.5	3.1 - 1.8	9.1 - 5.4	15.1 - 8.9
32	8°23.0	8°24.4	8°00.1	3.2 - 1.8	9.2 - 5.1	15.2 - 8.5	32	8°38.0	8°39.4	8°14.4	3.2 - 1.8	9.2 - 5.3	15.2 - 8.7	32	8°53.0	8°54.5	8°28.7	3.2 - 1.9	9.2 - 5.4	15.2 - 9.0
33	8°23.2	8°24.6	8°00.3	3.3 - 1.8	9.3 - 5.2	15.3 - 8.5	33	8°38.2	8°39.7	8°14.6	3.3 - 1.9	9.3 - 5.3	15.3 - 8.8	33	8°53.2	8°54.7	8°29.0	3.3 - 2.0	9.3 - 5.5	15.3 - 9.1
34	8°23.5	8°24.9	8°00.6	3.4 - 1.9	9.4 - 5.2	15.4 - 8.6	34	8°38.5	8°39.9	8°14.9	3.4 - 2.0	9.4 - 5.4	15.4 - 8.9	34	8°53.5	8°55.0	8°29.2	3.4 - 2.0	9.4 - 5.6	15.4 - 9.1
35	8°23.8	8°25.1	8°00.8	3.5 - 2.0	9.5 - 5.3	15.5 - 8.7	35	8°38.8	8°40.2	8°15.1	3.5 - 2.0	9.5 - 5.5	15.5 - 8.9	35	8°53.8	8°55.2	8°29.4	3.5 - 2.1	9.5 - 5.6	15.5 - 9.2
36	8°24.0	8°25.4	8°01.0	3.6 - 2.0	9.6 - 5.4	15.6 - 8.7	36	8°39.0	8°40.4	8°15.4	3.6 - 2.1	9.6 - 5.5	15.6 - 9.0	36	8°54.0	8°55.5	8°29.7	3.6 - 2.1	9.6 - 5.7	15.6 - 9.2
37	8°24.3	8°25.6	8°01.3	3.7 - 2.1	9.7 - 5.4	15.7 - 8.8	37	8°39.3	8°40.7	8°15.6	3.7 - 2.1	9.7 - 5.6	15.7 - 9.0	37	8°54.3	8°55.7	8°29.9	3.7 - 2.2	9.7 - 5.7	15.7 - 9.3
38	8°24.5	8°25.9	8°01.5	3.8 - 2.1	9.8 - 5.5	15.8 - 8.8	38	8°39.5	8°40.9	8°15.8	3.8 - 2.2	9.8 - 5.6	15.8 - 9.1	38	8°54.5	8°56.0	8°30.2	3.8 - 2.2	9.8 - 5.8	15.8 - 9.3
39	8°24.7	8°26.1	8°01.8	3.9 - 2.2	9.9 - 5.5	15.9 - 8.9	39	8°39.7	8°41.2	8°16.1	3.9 - 2.2	9.9 - 5.7	15.9 - 9.1	39	8°54.7	8°56.2	8°30.4	3.9 - 2.3	9.9 - 5.9	15.9 - 9.4
40	8°25.0	8°26.4	8°02.0	4.0 - 2.2	10.0 - 5.6	16.0 - 8.9	40	8°40.0	8°41.4	8°16.3	4.0 - 2.3	10.0 - 5.8	16.0 - 9.2	40	8°55.0	8°56.5	8°30.6	4.0 - 2.4	10.0 - 5.9	16.0 - 9.5
41	8°25.2	8°26.6	8°02.2	4.1 - 2.3	10.1 - 5.6	16.1 - 9.0	41	8°40.2	8°41.7	8°16.5	4.1 - 2.4	10.1 - 5.8	16.1 - 9.3	41	8°55.2	8°56.7	8°30.9	4.1 - 2.4	10.1 - 6.0	16.1 - 9.5
42	8°25.5	8°26.9	8°02.5	4.2 - 2.3	10.2 - 5.7	16.2 - 9.0	42	8°40.5	8°41.9	8°16.8	4.2 - 2.4	10.2 - 5.9	16.2 - 9.3	42	8°55.5	8°57.0	8°31.1	4.2 - 2.5	10.2 - 6.0	16.2 - 9.6
43	8°25.8	8°27.1	8°02.7	4.3 - 2.4	10.3 - 5.8	16.3 - 9.1	43	8°40.8	8°42.2	8°17.0	4.3 - 2.5	10.3 - 5.9	16.3 - 9.4	43	8°55.8	8°57.2	8°31.3	4.3 - 2.5	10.3 - 6.1	16.3 - 9.6
44	8°26.0	8°27.4	8°02.9	4.4 - 2.5	10.4 - 5.8	16.4 - 9.2	44	8°41.0	8°42.4	8°17.3	4.4 - 2.5	10.4 - 6.0	16.4 - 9.4	44	8°56.0	8°57.5	8°31.6	4.4 - 2.6	10.4 - 6.2	16.4 - 9.7
45	8°26.3	8°27.6	8°03.2	4.5 - 2.5	10.5 - 5.9	16.5 - 9.2	45	8°41.3	8°42.7	8°17.5	4.5 - 2.6	10.5 - 6.0	16.5 - 9.5	45	8°56.3	8°57.7	8°31.8	4.5 - 2.7	10.5 - 6.2	16.5 - 9.8
46	8°26.5	8°27.9	8°03.4	4.6 - 2.6	10.6 - 5.9	16.6 - 9.3	46	8°41.5	8°42.9	8°17.7	4.6 - 2.6	10.6 - 6.1	16.6 - 9.5	46	8°56.5	8°58.0	8°32.1	4.6 - 2.7	10.6 - 6.3	16.6 - 9.8
47	8°26.7	8°28.1	8°03.7	4.7 - 2.6	10.7 - 6.0	16.7 - 9.3	47	8°41.7	8°43.2	8°18.0	4.7 - 2.7	10.7 - 6.2	16.7 - 9.6	47	8°56.7	8°58.2	8°32.3	4.7 - 2.8	10.7 - 6.3	16.7 - 9.9
48	8°27.0	8°28.4	8°03.9	4.8 - 2.7	10.8 - 6.0	16.8 - 9.4	48	8°42.0	8°43.4	8°18.2	4.8 - 2.8	10.8 - 6.2	16.8 - 9.7	48	8°57.0	8°58.5	8°32.5	4.8 - 2.8	10.8 - 6.4	16.8 - 9.9
49	8°27.3	8°28.																		

## Increments and Corrections

m	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																		

## Increments and Corrections

m	Sun Plan.	Aries	Moon	v and d corr			m	Sun Plan.	Aries	Moon	v and d corr			m	Sun Plan.	Aries	Moon	v and d corr		
39							40						41							
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.				

## 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	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
45	Plan.						46	Plan.					47	Plan.						
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	16.6 - 13.1
47	11°26.7	11°28.6	10°55.5	4.7 - 3.6	10.7 - 8.1	16.7 - 12.7	47	11												

## Increments and Corrections

m 48	Sun		Aries		Moon		v and d corr			m 49	Sun		Aries		Moon		v and d corr			m 50	Sun		Aries		Moon		v and d corr																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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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
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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

## Increments and Corrections

m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr		
51							52						53							
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	4.6 - 4.1	10.6 - 9.5	16.6 - 14.8</

# 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	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			m	Sun	Aries	Moon	v and d corr			
<b>57</b>	<b>Plan.</b>						<b>58</b>	<b>Plan.</b>						<b>59</b>	<b>Plan.</b>						
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 -															

## 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

Altitude Correction Tables for 10° to 90° — Sun, Stars, Planets

<b>SUN</b>		
<b>October – March</b>		
App. Alt.	Lower Limb	Upper Limb
9 33	+10.8	-21.5
9 45	+10.9	-21.4
9 56	+11.0	-21.3
10 08	+11.1	-21.2
10 20	+11.2	-21.1
10 33	+11.3	-21.0
10 46	+11.4	-20.9
11 00	+11.5	-20.8
11 15	+11.6	-20.7
11 30	+11.7	-20.6
11 45	+11.8	-20.5
12 01	+11.9	-20.4
12 18	+12.0	-20.3
12 36	+12.1	-20.2
12 54	+12.2	-20.1
13 14	+12.3	-20.0
13 34	+12.4	-19.9
13 55	+12.5	-19.8
14 17	+12.6	-19.7
14 41	+12.7	-19.6
15 05	+12.8	-19.5
15 31	+12.9	-19.4
15 59	+13.0	-19.3
16 27	+13.1	-19.2
16 58	+13.2	-19.1
17 30	+13.3	-19.0
18 05	+13.4	-18.9
18 41	+13.5	-18.8
19 20	+13.6	-18.7
20 02	+13.7	-18.6
20 46	+13.8	-18.5
21 34	+13.9	-18.4
22 25	+14.0	-18.3
23 20	+14.1	-18.2
24 20	+14.2	-18.1
25 24	+14.3	-18.0
26 34	+14.4	-17.9
27 50	+14.5	-17.8
29 13	+14.6	-17.7
30 44	+14.7	-17.6
32 24	+14.8	-17.5
34 15	+14.9	-17.4
36 17	+15.0	-17.3
38 34	+15.1	-17.2
41 06	+15.2	-17.1
43 56	+15.3	-17.0
47 07	+15.4	-16.9
50 43	+15.5	-16.8
54 46	+15.6	-16.7
59 21	+15.7	-16.6
64 28	+15.8	-16.5
70 10	+15.9	-16.4
76 24	+16.0	-16.3
83 05	+16.1	-16.2
90 00		

<b>SUN</b>		
<b>April – September</b>		
App. Alt.	Lower Limb	Upper Limb
9 39	+10.6	-21.2
9 50	+10.7	-21.1
10 02	+10.8	-21.0
10 14	+10.9	-20.9
10 27	+11.0	-20.8
10 40	+11.1	-20.7
10 53	+11.2	-20.6
11 07	+11.3	-20.5
11 22	+11.4	-20.4
11 37	+11.5	-20.3
11 53	+11.6	-20.2
12 10	+11.7	-20.1
12 27	+11.8	-20.0
14 45	+11.9	-19.9
13 04	+12.0	-19.8
13 24	+12.1	-19.7
13 44	+12.2	-19.6
14 06	+12.3	-19.5
14 29	+12.4	-19.4
14 53	+12.5	-19.3
15 18	+12.6	-19.2
15 45	+12.7	-19.1
16 13	+12.8	-19.0
16 43	+12.9	-18.9
17 14	+13.0	-18.8
17 47	+13.1	-18.7
18 23	+13.2	-18.6
19 00	+13.3	-18.5
19 41	+13.4	-18.4
20 24	+13.5	-18.3
21 10	+13.6	-18.2
21 59	+13.7	-18.1
22 52	+13.8	-18.0
23 49	+13.9	-17.9
24 51	+14.0	-17.8
25 58	+14.1	-17.7
27 11	+14.2	-17.6
28 31	+14.3	-17.5
29 58	+14.4	-17.4
31 33	+14.5	-17.3
33 18	+14.6	-17.2
35 15	+14.7	-17.1
37 24	+14.8	-17.0
39 48	+14.9	-16.9
42 28	+15.0	-16.8
45 29	+15.1	-16.7
48 52	+15.2	-16.6
51 41	+15.3	-16.5
56 59	+15.4	-16.4
61 50	+15.5	-16.3
67 15	+15.6	-16.2
73 14	+15.7	-16.1
79 42	+15.8	-16.0
86 21	+15.9	-15.9
90 00		

<b>Stars &amp; Planets</b>	
App. Alt.	Corr
9 55	-5.3
10 07	-5.2
10 20	-5.1
10 32	-5.0
10 46	-4.9
10 59	-4.8
11 14	-4.7
11 29	-4.6
11 44	-4.5
12 00	-4.4
12 17	-4.3
12 35	-4.2
12 53	-4.1
13 12	-4.0
13 32	-3.9
13 53	-3.8
14 16	-3.7
14 39	-3.6
15 03	-3.5
15 29	-3.4
15 56	-3.3
16 25	-3.2
16 55	-3.1
17 27	-3.0
18 01	-2.9
18 37	-2.8
19 16	-2.7
19 56	-2.6
20 40	-2.5
21 27	-2.4
22 17	-2.3
23 11	-2.2
24 09	-2.1
25 12	-2.0
26 20	-1.9
27 34	-1.8
28 54	-1.7
30 22	-1.6
31 58	-1.5
33 43	-1.4
35 38	-1.3
37 45	-1.2
40 06	-1.1
42 42	-1.0
45 34	-0.9
48 45	-0.8
52 16	-0.7
56 09	-0.6
60 26	-0.5
65 06	-0.4
70 09	-0.3
75 32	-0.2
81 12	-0.1
87 03	0.0
90 00	

**Additional Altitude Correction for Mars & Venus**

A small additional altitude correction for Mars & Venus can be obtained in the Daily Pages of The Nautical Almanac for the day of the observation.

Find the correction in the block labeled **Horizontal parallax**.

The figure will cover the range of 3 days found on that Daily Page.

The correction is to be added to Apparent Altitude.

<b>Refraction</b>	
App. Alt.	Corr
5.5	-9.1
6.0	-8.5
6.5	-7.9
7.0	-7.5
7.5	-7.0
8.0	-6.6
8.5	-6.3
9.0	-5.9
9.5	-5.7
10.0	-5.4
10.5	-5.1
11.0	-4.9
11.5	-4.7
12.0	-4.5
12.5	-4.4
13.0	-4.2
13.5	-4.0
14.0	-3.9
14.5	-3.8
15.0	-3.6
15.5	-3.5
16.0	-3.4
16.5	-3.3
17.0	-3.2
17.5	-3.1
18.0	-3.0
18.5	-2.9
19.0	-2.9
19.5	-2.8
20.0	-2.7
21.0	-2.6
22.0	-2.4
23.0	-2.3
24.0	-2.2
25.0	-2.1
26.0	-2.0
27.0	-1.9
28.0	-1.9
29.0	-1.8
30.0	-1.7
31.0	-1.7
32.0	-1.6
33.0	-1.5
34.0	-1.5
35.0	-1.4
36.0	-1.4
37.0	-1.3
38.0	-1.3
39.0	-1.2
40.0	-1.2
45.0	-1.0
50.0	-0.8
55.0	-0.7
60.0	-0.6
65.0	-0.5
70.0	-0.4
75.0	-0.3
80.0	-0.2
85.0	-0.1
21.4	70.5

<b>DIP</b>				
<i>always subtracted from Hs</i>				
Ht. of Eye	Corr	Ht. of Eye	Ht. of Eye	Corr
<b>meters</b>		<b>feet</b>	<b>meters</b>	<b>feet</b>
2.4	-2.8	8.0	1.0	-1.8
2.6	-2.9	8.6	1.5	-2.2
2.8	-3.0	9.2	2.0	-2.5
3.0	-3.1	9.8	2.5	-2.8
3.2	-3.1	10.5	3.0	-3.0
3.4	-3.2	11.2		
3.6	-3.3	11.9		
3.8	-3.4	12.6		
4.0	-3.5	13.3		
4.3	-3.6	14.1		
4.5	-3.7	14.9		
4.7	-3.8	15.7		
5.0	-3.9	16.5		
5.2	-4.0	17.4		
5.5	-4.1	18.3		
5.8	-4.2	19.1		
6.1	-4.3	20.1		
6.3	-4.4	21.0		
6.6	-4.5	22.0		
6.9	-4.6	22.9		
7.2	-4.8	23.9		
7.5	-4.9	24.9		
7.9	-5.0	26.0		
8.2	-5.1	27.1		
8.5	-5.2	28.1		
8.8	-5.3	29.2		
9.2	-5.4	30.4		
9.5	-5.5	31.5		
9.9	-5.6	32.7		
10.3	-5.7	33.9		
10.6	-5.8	35.1		
11.0	-5.8	36.3		
11.4	-5.9	37.6		
11.8	-6.0	38.9		
12.2	-6.1	40.1		
12.6	-6.2	41.5		
13.0	-6.3	42.8		
13.4	-6.4	44.2		
13.8	-6.5	45.5		
14.2	-6.6	46.9		
14.7	-6.7	48.4		
15.1	-6.8	49.8		
15.5	-6.9	51.3		
16.0	-7.0	52.8		
16.5	-7.1	54.3		
16.9	-7.2	55.8		
17.4	-7.3	57.4		
17.9	-7.4	58.9		
18.4	-7.5	60.5		
18.8	-7.6	62.1		
19.3	-7.7	63.8		
19.8	-7.8	65.4		
20.4	-7.9	67.1		
20.9	-8.0	68.8		
21.4	-8.1	70.5		

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.



# NAVIGATIONAL STAR CHART

U.S. Naval Observatory / Astronomical Applications Dept.

