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Latitude 10° - 19°
Declination SAME name as Latitude

Sight-Reduction Tables for Latitude 10° - 19°

Declination SAME name as Latitude

Revision V1.2 - Apr2017

Warning and Terms of Usage:

The following pages have been generated by a computer program. Complex computer programs usually have bugs and may produce wrong data. The data in these Tables is believed to be accurate but no warranty is given for its correctness.

Use these Tables only for training and exercising!

Compiled by Erik De Man (mail2erik@siranah.de) on Tue Apr 11 09:20:27 2017

Purpose and Scope

The following tables are designed to determine Altitude and Azimuth of a celestial object, given the position of the observer (Latitude - Longitude) and the coordinates of the celestial object (Declination - GHA). Using the Altitude-Intercept Method, the calculated Altitude H_c and Azimuth Z_c may be used to refine the observer's position by comparing the calculated Altitude H_c with the observed Altitude H_o obtained by means of a sextant measurement.

The tables on the following pages were calculated according to:

$$H_c = \text{asin} (\sin(\text{Latitude}) * \sin(\text{Declination}) + \cos(\text{Latitude}) * \cos(\text{Declination}) * \cos(\text{LHA}))$$
$$Z = \text{atan} (\frac{\cos(\text{Declination}) * \sin(\text{LHA})}{\cos(\text{Latitude}) * \sin(\text{Declination}) - \sin(\text{Latitude}) * \cos(\text{Declination}) * \cos(\text{LHA})})$$

The Local Hour Angle (LHA) is the angle measured westward from the observer's Meridian to the Hour Circle of the observed celestial object: $LHA = GHA + Longitude$.

The tables are organized with the Latitude value as primary parameter. The Latitude value is printed on the first line of each page. The particular values for Declination (Dec) and LHA are read from the vertical and horizontal labels of the tables respectively. Notice that each table entry is valid for two different values of LHA related by $LHA_1 = 360^\circ - LHA_2$ (conjugate LHA angles).

The covered range of the Declination values is limited from 0° to 29° , which applies to the Declination of the Sun, the Moon and the planets used for celestial navigation. The LHA range is such that the resulting Altitude is positive (object above the local horizon).

For practical Sight Reduction this manual is used as follows:

1. select the correct part of the manual (Declination "SAME as" / "CONTRARY to" Latitude),
2. select the correct Latitude page,
3. select the correct LHA column from one of the sub-tables,
4. read the H , dH and Z values from the correct Declination (integral value) line.

Further steps include interpolation for the specific (fractional) value of Declination and determination of the true Azimuth value Z_c according to the following rules:

Latitude NORTH	LHA > 180°: $Z_c = Z$
	LHA < 180°: $Z_c = 360^\circ - Z$
Latitude SOUTH	LHA > 180°: $Z_c = 180^\circ - Z$
	LHA < 180°: $Z_c = 180^\circ + Z$

Declination SAME name as Latitude

Latitude 10°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	80 00.0 +60.0 180.0	79 57.0 +59.7 174.3	79 48.2 +58.8 168.6	79 33.8 +57.3 163.2	79 14.2 +55.4 158.1
1°	81 00.0 +60.0 180.0	80 56.7 +59.6 173.6	80 47.0 +58.4 167.4	80 31.1 +56.7 161.5	80 09.6 +54.4 155.9
2°	82 00.0 +60.0 180.0	81 56.3 +59.5 172.9	81 45.4 +58.0 165.9	81 27.8 +55.8 159.4	81 04.0 +53.1 153.3
3°	83 00.0 +60.0 180.0	82 55.8 +59.3 171.9	82 43.4 +57.4 164.0	82 23.6 +54.5 156.7	81 57.1 +51.3 150.2
4°	84 00.0 +60.0 180.0	83 55.1 +59.1 170.5	83 40.8 +56.5 161.6	83 18.1 +52.9 153.4	82 48.4 +48.7 146.2
5°	85 00.0 +60.0 180.0	84 54.2 +58.6 168.7	84 37.3 +54.9 158.2	84 11.0 +50.1 149.0	83 37.1 +45.2 141.3
6°	86 00.0 +60.0 180.0	85 52.8 +57.7 166.0	85 32.2 +52.2 153.5	85 01.1 +45.8 143.2	84 22.3 +39.8 135.0
7°	87 00.0 +60.0 180.0	86 50.5 +55.7 161.7	86 24.4 +46.9 146.4	85 46.9 +38.6 135.1	85 02.1 +32.2 126.9
8°	88 00.0 +60.0 180.0	87 46.2 +49.5 153.6	87 11.3 +36.0 135.2	86 25.5 +27.1 123.8	85 34.3 +21.5 116.5
9°	89 00.0 +60.0 180.0	88 35.7 +25.2 135.3	87 47.3 +14.5 116.7	86 52.6 +10.1 108.4	85 55.8 +07.8 103.9
10°	90 00.0 -60.0 0.0	89 00.9 -25.0 89.9	88 01.8 -14.2 89.8	87 02.7 -09.6 89.7	86 03.6 -07.1 89.7
11°	89 00.0 -60.0 0.0	88 35.9 -49.6 44.4	87 47.6 -35.7 62.9	86 53.1 -26.7 71.0	85 56.5 -20.9 75.4
12°	88 00.0 -60.0 0.0	87 46.3 -55.7 26.0	87 11.9 -46.9 44.3	86 26.4 -38.4 55.5	85 35.6 -31.7 62.6
13°	87 00.0 -60.0 0.0	86 50.6 -57.7 18.0	86 25.0 -52.2 33.0	85 48.0 -45.6 44.1	85 03.9 -39.6 52.2
14°	86 00.0 -60.0 0.0	85 52.9 -58.6 13.6	85 32.8 -54.8 25.9	85 02.4 -50.0 36.0	84 24.3 -44.9 44.0
15°	85 00.0 -60.0 0.0	84 54.3 -59.0 10.9	84 38.0 -56.5 21.1	84 12.4 -52.8 30.0	83 39.4 -48.6 37.6
16°	84 00.0 -60.0 0.0	83 55.3 -59.3 9.1	83 41.5 -57.4 17.8	83 19.6 -54.6 25.7	82 50.8 -51.2 32.6
17°	83 00.0 -60.0 0.0	82 56.0 -59.5 7.8	82 44.1 -58.0 15.3	82 25.0 -55.7 22.3	81 59.6 -53.0 28.6
18°	82 00.0 -60.0 0.0	81 56.5 -59.6 6.8	81 46.1 -58.4 13.4	81 29.3 -56.7 19.6	81 06.6 -54.4 25.4
19°	81 00.0 -60.0 0.0	80 56.9 -59.7 6.0	80 47.7 -58.8 11.9	80 32.6 -57.2 17.5	80 12.2 -55.3 22.8
20°	80 00.0 -60.0 0.0	79 57.2 -59.7 5.4	79 48.9 -58.9 10.7	79 35.4 -57.7 15.8	79 16.9 -56.1 20.6
21°	79 00.0 -60.0 0.0	78 57.5 -59.8 4.9	78 50.0 -59.1 9.7	78 37.7 -58.1 14.3	78 20.8 -56.7 18.8
22°	78 00.0 -60.0 0.0	77 57.7 -59.8 4.4	77 50.9 -59.3 8.8	77 39.6 -58.4 13.1	77 24.1 -57.2 17.2
23°	77 00.0 -60.0 0.0	76 57.9 -59.8 4.1	76 51.6 -59.4 8.1	76 41.2 -58.5 12.1	76 26.9 -57.5 15.9
24°	76 00.0 -60.0 0.0	75 58.1 -59.9 3.8	75 52.2 -59.4 7.5	75 42.7 -58.8 11.2	75 29.4 -57.8 14.7
25°	75 00.0 -60.0 0.0	74 58.2 -59.9 3.5	74 52.8 -59.5 7.0	74 43.9 -58.9 10.4	74 31.6 -58.1 13.7
26°	74 00.0 -60.0 0.0	73 58.3 -59.9 3.3	73 53.3 -59.6 6.5	73 45.0 -59.0 9.7	73 33.5 -58.3 12.8
27°	73 00.0 -60.0 0.0	72 58.4 -59.9 3.0	72 53.7 -59.6 6.1	72 46.0 -59.2 9.1	72 35.2 -58.5 12.0
28°	72 00.0 -60.0 0.0	71 58.5 -59.9 2.9	71 54.1 -59.6 5.7	71 46.8 -59.2 8.5	71 36.7 -58.7 11.3
29°	71 00.0 -60.0 0.0	70 58.6 -59.9 2.7	70 54.5 -59.7 5.4	70 47.6 -59.3 8.0	70 38.0 -58.7 10.6

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	78 49.9 +53.2 153.3	78 21.2 +50.9 148.8	77 48.8 +48.6 144.7	77 13.2 +46.1 141.0	76 34.6 +43.9 137.6
1°	79 43.1 +51.9 150.8	79 12.1 +49.3 146.1	78 37.4 +46.5 141.9	77 59.3 +44.0 138.0	77 18.5 +41.6 134.6
2°	80 35.0 +50.1 147.8	80 01.4 +47.1 142.9	79 23.9 +44.2 138.5	78 43.3 +41.4 134.7	78 00.1 +38.8 131.2
3°	81 25.1 +47.8 144.3	80 48.5 +44.4 139.2	80 08.1 +41.3 134.7	79 24.7 +38.3 130.9	78 38.9 +35.7 127.5
4°	82 12.9 +44.7 140.1	81 32.9 +40.9 134.8	80 49.4 +37.5 130.3	80 03.0 +34.6 126.5	79 14.6 +31.9 123.3
5°	82 57.6 +40.5 134.9	82 13.8 +36.5 129.6	81 26.9 +33.0 125.3	80 37.6 +30.0 121.7	79 46.5 +27.5 118.6
6°	83 38.1 +34.9 128.6	82 50.3 +30.8 123.5	81 59.9 +27.4 119.5	81 07.6 +24.8 116.2	80 14.0 +22.5 113.5
7°	84 13.0 +27.3 120.9	83 21.1 +23.7 116.4	82 27.3 +20.9 112.9	81 32.4 +18.6 110.1	80 36.5 +16.9 107.9
8°	84 40.3 +17.8 111.6	83 44.8 +15.1 108.2	82 48.2 +13.2 105.6	81 51.0 +11.8 103.6	80 53.4 +10.7 101.9
9°	84 58.1 +06.5 101.0	83 59.9 +05.6 99.1	83 01.4 +05.0 97.7	82 02.8 +04.5 96.6	81 04.1 +04.1 95.7
10°	85 04.6 -05.6 89.6	84 05.5 -04.5 89.5	83 06.4 -03.7 89.4	82 07.3 -03.0 89.3	81 08.2 -02.5 89.2
11°	84 59.0 -17.0 78.1	84 01.0 -14.2 79.8	83 02.7 -12.1 81.1	82 04.3 -10.5 82.0	81 05.7 -09.1 82.7
12°	84 42.0 -26.7 67.4	83 46.8 -22.8 70.7	82 50.6 -19.8 73.1	81 53.8 -17.4 75.0	80 56.6 -15.5 76.4
13°	84 15.3 -34.3 58.0	83 24.0 -30.1 62.4	82 30.8 -26.5 65.7	81 36.4 -23.6 68.3	80 41.1 -21.1 70.4
14°	83 41.0 -40.2 50.2	82 53.9 -35.9 55.1	82 04.3 -32.2 59.0	81 12.8 -29.1 62.1	80 20.0 -26.4 64.7
15°	83 00.8 -44.4 43.8	82 18.0 -40.5 48.9	81 32.1 -37.0 53.1	80 43.7 -33.7 56.6	79 53.6 -30.9 59.4
16°	82 16.4 -47.6 38.5	81 37.5 -44.1 43.6	80 55.1 -40.7 47.9	80 10.0 -37.6 51.6	79 22.7 -34.8 54.7
17°	81 28.8 -50.0 34.2	80 53.4 -46.8 39.2	80 14.4 -43.8 43.4	79 32.4 -40.9 47.1	78 47.9 -38.1 50.4
18°	80 38.8 -51.8 30.7	80 06.6 -49.1 35.4	79 30.6 -46.3 39.5	78 51.5 -43.5 43.2	78 09.8 -40.9 46.5
19°	79 47.0 -53.1 27.7	79 17.5 -50.7 32.1	78 44.3 -48.2 36.2	78 08.0 -45.8 39.8	77 28.9 -43.4 43.0
20°	78 53.9 -54.2 25.2	78 26.8 -52.1 29.4	77 56.1 -49.9 33.2	77 22.2 -47.6 36.7	76 45.5 -45.3 39.9
21°	77 59.7 -55.1 23.0	77 34.7 -53.2 27.0	77 06.2 -51.2 30.6	76 34.6 -49.2 34.0	76 00.2 -47.1 37.1
22°	77 04.6 -55.7 21.2	76 41.5 -54.1 24.9	76 15.0 -52.3 28.4	75 45.4 -50.4 31.6	75 13.1 -48.5 34.6
23°	76 08.9 -56.2 19.6	75 47.4 -54.8 23.1	75 22.7 -53.2 26.4	74 55.0 -51.5 29.5	74 24.6 -49.8 32.4
24°	75 12.7 -56.8 18.2	74 52.6 -55.4 21.5	74 29.5 -54.0 24.6	74 03.5 -52.4 27.6	73 34.8 -50.8 30.4
25°	74 15.9 -57.1 16.9	73 57.2 -55.9 20.0	73 35.5 -54.6 23.0	73 11.1 -53.3 25.8	72 44.0 -51.7 28.5
26°	73 18.8 -57.4 15.8	73 01.3 -56.4 18.8	72 40.9 -55.2 21.6	72 17.8 -53.8 24.3	71 52.3 -52.5 26.9
27°	72 21.4 -57.6 14.8	72 04.9 -56.7 17.6	71 45.7 -55.6 20.3	71 24.0 -54.5 22.9	70 59.8 -53.2 25.3
28°	71 23.8 -57.9 14.0	71 08.2 -56.0 16.6	70 50.1 -56.1 19.1	70 29.5 -54.9 21.6	70 06.6 -53.7 24.0
29°	70 25.9 -58.1 13.2	70 11.2 -57.3 15.6	69 54.0 -56.3 18.1	69 34.6 -55.4 20.4	69 12.9 -54.3 22.7

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Latitude 10°

Declination SAME name as Latitude

Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	75 53.6 +41.7 134.6	75 10.5 +39.6 131.8	74 25.6 +37.7 129.2	73 39.1 +35.9 126.9	72 51.2 +34.2 124.9
1°	76 35.3 +39.3 131.5	75 50.1 +37.2 128.8	75 03.3 +35.2 126.3	74 15.0 +33.3 124.0	73 25.4 +31.8 122.0
2°	77 14.6 +36.5 128.2	76 27.3 +34.3 125.5	75 38.5 +32.4 123.1	74 48.3 +30.7 120.9	73 57.2 +29.0 119.0
3°	77 51.1 +33.3 124.5	77 01.6 +31.2 121.9	76 10.9 +29.2 119.6	75 19.0 +27.6 117.6	74 26.2 +26.1 115.8
4°	78 24.4 +29.6 120.5	77 32.8 +27.6 118.0	76 40.1 +25.8 115.9	75 46.6 +24.2 114.0	74 52.3 +22.8 112.4
5°	78 54.0 +25.3 116.0	78 00.4 +23.5 113.8	77 05.9 +22.0 111.9	76 10.8 +20.6 110.3	75 15.1 +19.4 108.8
6°	79 19.3 +20.7 111.2	78 23.9 +19.1 109.3	77 27.9 +17.7 107.7	76 31.4 +16.6 106.3	75 34.5 +15.6 105.0
7°	79 40.0 +15.4 106.1	78 43.0 +14.2 104.6	77 45.6 +13.3 103.2	76 48.0 +12.4 102.1	75 50.1 +11.7 101.1
8°	79 55.4 +09.8 100.6	78 57.2 +09.1 99.5	77 58.9 +08.5 98.6	77 00.4 +08.0 97.8	76 01.8 +07.6 97.1
9°	80 05.2 +03.9 94.9	79 06.3 +03.8 94.3	78 07.4 +03.6 93.8	77 08.4 +03.5 93.4	76 09.4 +03.4 93.0
10°	80 09.1 -02.1 89.1	79 10.1 -01.8 89.0	78 11.0 -01.4 89.0	77 11.9 -01.1 88.9	76 12.8 -00.8 88.8
11°	80 07.0 -08.0 83.3	79 08.3 -07.1 83.7	78 09.6 -06.4 84.1	77 10.8 -05.7 84.4	76 12.0 -05.1 84.6
12°	79 59.0 -13.8 77.6	79 01.2 -12.4 78.5	78 03.2 -11.2 79.2	77 05.1 -10.2 79.9	76 06.9 -09.3 80.4
13°	79 45.2 -19.1 72.0	78 48.8 -17.4 73.4	77 52.0 -15.8 74.5	76 54.9 -14.5 75.5	75 57.6 -13.3 76.3
14°	79 26.1 -24.0 66.8	78 31.4 -21.9 68.5	77 36.2 -20.2 70.0	76 40.4 -18.5 71.3	75 44.3 -17.2 72.3
15°	79 02.1 -28.4 61.9	78 09.5 -26.2 63.9	77 16.0 -24.1 65.7	76 21.9 -22.4 67.2	75 27.1 -20.8 68.5
16°	78 33.7 -32.2 57.3	77 43.3 -29.8 59.6	76 51.9 -27.8 61.6	75 59.5 -25.9 63.3	75 06.3 -24.1 64.8
17°	78 01.5 -35.6 53.2	77 13.5 -33.3 55.6	76 24.1 -31.1 57.7	75 33.6 -29.1 59.6	74 42.2 -27.3 61.3
18°	77 25.9 -38.5 49.4	76 40.2 -36.1 51.9	75 53.0 -34.0 54.2	75 04.5 -32.0 56.2	74 14.9 -30.2 57.9
19°	76 47.4 -40.9 45.9	76 04.1 -38.8 48.5	75 19.0 -36.6 50.9	74 32.5 -34.6 52.9	73 44.7 -32.7 54.8
20°	76 06.5 -43.2 42.8	75 25.3 -41.0 45.4	74 42.4 -39.0 47.8	73 57.9 -37.0 49.9	73 12.0 -35.1 51.9
21°	75 23.3 -45.0 40.0	74 44.3 -42.9 42.6	74 03.4 -40.9 45.0	73 20.9 -39.1 47.1	72 36.9 -37.3 49.1
22°	74 38.3 -46.5 37.4	74 01.4 -44.7 40.0	73 22.5 -42.8 42.4	72 41.8 -40.9 44.5	71 59.6 -39.1 46.5
23°	73 51.8 -48.0 35.1	73 16.7 -46.1 37.6	72 39.7 -44.4 40.0	72 00.9 -42.6 42.1	71 20.5 -40.9 44.1
24°	73 03.8 -49.1 33.0	72 30.6 -47.5 35.4	71 55.3 -45.7 37.7	71 18.3 -44.1 39.9	70 39.6 -42.4 41.9
25°	72 14.7 -50.2 31.1	71 43.1 -48.6 33.5	71 09.6 -47.0 35.7	70 34.2 -45.4 37.8	69 57.2 -43.8 39.8
26°	71 24.5 -51.1 29.3	70 54.5 -49.6 31.6	70 22.6 -48.1 33.8	69 48.8 -46.5 35.9	69 13.4 -45.1 37.8
27°	70 33.4 -51.8 27.7	70 04.9 -50.4 29.9	69 34.5 -49.1 32.1	69 02.3 -47.7 34.1	68 28.3 -46.1 36.0
28°	69 41.6 -52.6 26.2	69 14.5 -51.3 28.4	68 45.4 -49.9 30.4	68 14.6 -48.5 32.4	67 42.2 -47.2 34.3
29°	68 49.0 -53.1 24.9	68 23.2 -51.9 26.9	67 55.5 -50.6 28.9	67 26.1 -49.4 30.8	66 55.0 -48.1 32.7

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	72 02.2 +32.6 122.9	71 12.1 +31.2 121.2	70 21.1 +29.9 119.6	69 29.4 +28.6 118.1	68 36.9 +27.5 116.8
1°	72 34.8 +30.2 120.2	71 43.3 +28.8 118.5	70 51.0 +27.6 117.0	69 58.0 +26.4 115.6	69 04.4 +25.4 114.3
2°	73 05.0 +27.6 117.3	72 12.1 +26.3 115.7	71 18.6 +25.0 114.2	70 24.4 +24.0 112.9	69 29.8 +22.9 111.7
3°	73 32.6 +24.7 114.2	72 38.4 +23.5 112.7	71 43.6 +22.4 111.4	70 48.4 +21.4 110.2	69 52.7 +20.5 109.1
4°	73 57.3 +21.6 110.9	73 01.9 +20.5 109.6	72 06.0 +19.6 108.4	71 09.8 +18.6 107.3	70 13.2 +17.9 106.3
5°	74 18.9 +18.3 107.5	73 22.4 +17.4 106.3	72 25.6 +16.5 105.3	71 28.4 +15.8 104.3	70 31.1 +15.1 103.5
6°	74 37.2 +14.8 103.9	73 39.8 +14.0 103.0	72 42.1 +13.4 102.1	71 44.2 +12.8 101.3	70 46.2 +12.3 100.6
7°	74 52.0 +11.1 100.3	73 53.8 +10.6 99.5	72 55.5 +10.1 98.8	71 57.0 +09.7 98.1	70 58.5 +09.3 97.6
8°	75 03.1 +07.3 96.5	74 04.4 +07.0 95.9	73 05.6 +06.7 95.4	72 06.7 +06.6 94.9	71 07.8 +06.4 94.5
9°	75 10.4 +03.3 92.6	74 11.4 +03.3 92.3	73 12.3 +03.3 92.0	72 13.3 +03.2 91.7	71 14.2 +03.3 91.4
10°	75 13.7 -00.6 88.7	74 14.7 -00.4 88.6	73 15.6 -00.2 88.5	72 16.5 +00.1 88.4	71 17.5 +00.2 88.3
11°	75 13.1 -04.5 84.8	74 14.3 -04.1 84.9	73 15.4 -03.6 85.0	72 16.6 -03.3 85.1	71 17.7 -02.9 85.2
12°	75 08.6 -08.5 80.9	74 10.2 -07.8 81.3	73 11.8 -07.1 81.6	72 13.3 -06.5 81.9	71 14.8 -06.0 82.1
13°	75 00.1 -12.3 77.0	74 02.4 -11.3 77.6	73 04.7 -10.5 78.2	72 06.8 -09.7 78.6	71 08.8 -09.0 79.0
14°	74 47.8 -15.9 73.3	73 51.1 -14.7 74.1	72 54.2 -13.7 74.8	71 57.1 -12.8 75.4	70 59.8 -11.9 76.0
15°	74 31.9 -19.3 69.6	73 36.4 -18.1 70.6	72 40.5 -16.9 71.5	71 44.3 -15.8 72.3	70 47.9 -14.8 73.0
16°	74 12.6 -22.6 66.1	73 18.3 -21.1 67.3	72 23.6 -19.8 68.3	71 28.5 -18.6 69.2	70 33.1 -17.5 70.0
17°	73 50.0 -25.6 62.7	72 57.2 -24.1 64.0	72 03.8 -22.7 65.2	71 09.9 -21.4 66.3	70 15.6 -20.1 67.2
18°	73 24.4 -28.4 59.5	72 33.1 -26.8 61.0	71 41.1 -25.3 62.2	70 48.5 -23.9 63.4	69 55.5 -22.7 64.4
19°	72 56.0 -31.0 56.5	72 06.3 -29.4 58.0	71 15.8 -27.9 59.4	70 24.6 -26.4 60.6	69 32.8 -25.0 61.8
20°	72 25.0 -33.4 53.6	71 36.9 -31.7 55.2	70 47.9 -30.1 56.7	69 58.2 -28.6 58.0	69 07.8 -27.3 59.2
21°	71 51.6 -35.5 50.9	71 05.2 -33.8 52.6	70 17.8 -32.2 54.1	69 29.6 -30.8 55.4	68 40.5 -29.3 56.7
22°	71 16.1 -37.4 48.4	70 31.4 -35.8 50.0	69 45.6 -34.2 51.6	68 58.8 -32.7 53.0	68 11.2 -31.3 54.3
23°	70 38.7 -39.2 46.0	69 55.6 -37.6 47.7	69 11.4 -36.1 49.2	68 26.1 -34.5 50.7	67 39.9 -33.1 52.1
24°	69 59.5 -40.8 43.7	69 18.0 -39.2 45.4	68 35.3 -37.7 47.0	67 51.6 -36.2 48.5	67 06.8 -34.7 49.9
25°	69 18.7 -42.3 41.6	68 38.8 -40.7 43.3	67 57.6 -39.2 44.9	67 15.4 -37.8 46.4	66 32.1 -36.4 47.8
26°	68 36.4 -43.5 39.6	67 58.1 -42.1 41.3	67 18.4 -40.6 42.9	66 37.6 -39.2 44.4	65 55.7 -37.8 45.8
27°	67 52.9 -44.8 37.8	67 16.0 -43.3 39.5	66 37.8 -41.9 41.1	65 58.4 -40.5 42.6	65 17.9 -39.1 44.0
28°	67 08.1 -45.8 36.0	66 32.7 -44.4 37.7	65 55.9 -43.0 39.3	65 17.9 -41.7 40.8	64 38.8 -40.4 42.2
29°	66 22.3 -46.7 34.4	65 48.3 -45.5 36.0	65 12.9 -44.2 37.6	64 36.2 -42.8 39.1	63 58.4 -41.5 40.5

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Latitude 10°

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	67 43.9 +26.4 115.5	66 50.3 +25.5 114.3	65 56.2 +24.6 113.3	65 01.7 +23.8 112.2	64 06.9 +22.9 111.3
1°	68 10.3 +24.4 113.1	67 15.8 +23.4 112.0	66 20.8 +22.6 111.0	65 25.5 +21.7 110.1	64 29.8 +21.0 109.2
2°	68 34.7 +22.0 110.6	67 39.2 +21.2 109.6	66 43.4 +20.4 108.7	65 47.2 +19.8 107.8	64 50.8 +19.1 107.0
3°	68 56.7 +19.7 108.1	68 00.4 +18.9 107.1	67 03.8 +18.2 106.3	66 07.0 +17.5 105.5	65 09.9 +17.0 104.7
4°	69 16.4 +17.1 105.4	68 19.3 +16.5 104.6	67 22.0 +15.9 103.8	66 24.5 +15.4 103.1	65 26.9 +14.9 102.4
5°	69 33.5 +14.6 102.7	68 35.8 +14.0 102.0	67 37.9 +13.5 101.3	66 39.9 +13.1 100.7	65 41.8 +12.7 100.1
6°	69 48.1 +11.8 99.9	68 49.8 +11.4 99.3	67 51.4 +11.1 98.7	66 53.0 +10.7 98.2	65 54.5 +10.4 97.7
7°	69 59.9 +09.0 97.0	69 01.2 +08.8 96.6	68 02.5 +08.5 96.1	67 03.7 +08.3 95.7	66 04.9 +08.1 95.3
8°	70 08.9 +06.2 94.1	69 10.0 +06.0 93.8	68 11.0 +06.0 93.5	67 12.0 +05.9 93.1	66 13.0 +05.8 92.8
9°	70 15.1 +03.3 91.2	69 16.0 +03.4 91.0	68 17.0 +03.3 90.8	67 17.9 +03.3 90.6	66 18.8 +03.4 90.4
10°	70 18.4 +00.4 88.2	69 19.4 +00.5 88.2	68 20.3 +00.7 88.1	67 21.2 +00.9 88.0	66 22.2 +01.0 87.9
11°	70 18.8 -02.6 85.3	69 19.9 -02.2 85.3	68 21.0 -01.9 85.4	67 22.1 -01.6 85.4	66 23.2 -01.4 85.4
12°	70 16.2 -05.4 82.3	69 17.7 -05.0 82.5	68 19.1 -04.6 82.6	67 20.5 -04.2 82.8	66 21.8 -03.7 82.9
13°	70 10.8 -08.3 79.4	69 12.7 -07.7 79.7	68 14.5 -07.1 80.0	67 16.3 -06.6 80.2	66 18.1 -06.2 80.4
14°	70 02.5 -11.2 76.5	69 05.0 -10.4 76.9	68 07.4 -09.7 77.3	67 09.7 -09.1 77.6	66 11.9 -08.4 77.9
15°	69 51.3 -13.8 73.6	68 54.6 -13.0 74.1	67 57.7 -12.3 74.6	67 00.6 -11.4 75.1	66 03.5 -10.8 75.5
16°	69 37.5 -16.5 70.8	68 41.6 -15.6 71.4	67 45.4 -14.6 72.0	66 49.2 -13.9 72.6	65 52.7 -13.0 73.1
17°	69 21.0 -19.0 68.0	68 26.0 -17.9 68.8	67 30.8 -17.0 69.5	66 35.3 -16.0 70.1	65 39.7 -15.2 70.7
18°	69 02.0 -21.5 65.4	68 08.1 -20.4 66.2	67 13.8 -19.2 67.0	66 19.3 -18.3 67.7	65 24.5 -17.3 68.4
19°	68 40.5 -23.7 62.8	67 47.7 -22.5 63.7	66 54.6 -21.5 64.6	66 01.0 -20.3 65.4	65 07.2 -19.4 66.1
20°	68 16.8 -26.0 60.3	67 25.2 -24.7 61.3	66 33.1 -23.5 62.2	65 40.7 -22.4 63.1	64 47.8 -21.3 63.8
21°	67 50.8 -28.0 57.9	67 00.5 -26.7 58.9	66 09.6 -25.5 59.9	65 18.3 -24.4 60.8	64 26.5 -23.3 61.7
22°	67 22.8 -29.9 55.5	66 33.8 -28.6 56.7	65 44.1 -27.3 57.7	64 53.9 -26.1 58.6	64 03.2 -25.0 59.5
23°	66 52.9 -31.7 53.3	66 05.2 -30.4 54.5	65 16.8 -29.1 55.5	64 27.8 -27.9 56.5	63 38.2 -26.7 57.5
24°	66 21.2 -33.4 51.2	65 34.8 -32.1 52.4	64 47.7 -30.8 53.5	63 59.9 -29.6 54.5	63 11.5 -28.4 55.5
25°	65 47.8 -34.9 49.1	65 02.7 -33.6 50.3	64 16.9 -32.4 51.5	63 30.3 -31.1 52.5	62 43.1 -29.9 53.5
26°	65 12.9 -36.5 47.2	64 29.1 -35.1 48.4	63 44.5 -33.8 49.6	62 59.2 -32.6 50.6	62 13.2 -31.4 51.7
27°	64 36.4 -37.8 45.3	63 54.0 -36.5 46.5	63 10.7 -35.3 47.7	62 26.6 -34.0 48.8	61 41.8 -32.8 49.8
28°	63 58.6 -39.1 43.5	63 17.5 -37.8 44.7	62 35.4 -36.5 45.9	61 52.6 -35.3 47.0	61 09.0 -34.1 48.1
29°	63 19.5 -40.2 41.8	62 39.7 -39.0 43.0	61 58.9 -37.7 44.2	61 17.3 -36.5 45.3	60 34.9 -35.4 46.4

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	63 11.6 +22.3 110.4	62 16.1 +21.5 109.6	61 20.3 +20.9 108.8	60 24.3 +20.2 108.1	59 28.0 +19.7 107.4
1°	63 33.9 +20.3 108.4	62 37.6 +19.8 107.6	61 41.2 +19.2 106.9	60 44.5 +18.7 106.2	59 47.7 +18.1 105.5
2°	63 54.2 +18.5 106.2	62 57.4 +17.9 105.5	62 00.4 +17.3 104.8	61 03.2 +16.8 104.2	60 05.8 +16.4 103.6
3°	64 12.7 +16.4 104.1	63 15.3 +15.9 103.4	62 17.7 +15.5 102.8	61 20.0 +15.1 102.2	60 22.2 +14.7 101.7
4°	64 29.1 +14.5 101.8	63 31.2 +14.1 101.3	62 33.2 +13.7 100.7	61 35.1 +13.3 100.2	60 36.9 +13.0 99.7
5°	64 43.6 +12.3 99.6	63 45.3 +11.9 99.1	62 46.9 +11.6 98.6	61 48.4 +11.4 98.1	60 49.9 +11.1 97.7
6°	64 55.9 +10.1 97.3	63 57.2 +10.0 96.8	62 58.5 +09.7 96.4	61 59.8 +09.5 96.1	61 01.0 +09.3 95.7
7°	65 06.0 +08.0 94.9	64 07.2 +07.8 94.6	63 08.2 +07.7 94.3	62 09.3 +07.6 93.9	61 10.3 +07.5 93.7
8°	65 14.0 +05.7 92.6	64 15.0 +05.6 92.3	63 15.9 +05.6 92.1	62 16.9 +05.5 91.8	61 17.8 +05.5 91.6
9°	65 19.7 +03.4 90.2	64 20.6 +03.5 90.0	63 21.5 +03.6 89.8	62 22.4 +03.6 89.7	61 23.3 +03.7 89.5
10°	65 23.1 +01.2 87.8	64 24.1 +01.3 87.7	63 25.1 +01.4 87.6	62 26.0 +01.6 87.5	61 27.0 +01.7 87.4
11°	65 24.3 -01.1 85.4	64 25.4 -00.9 85.4	63 26.5 -00.6 85.4	62 27.6 -00.4 85.4	61 28.7 -00.2 85.3
12°	65 23.2 -03.4 83.0	64 24.5 -03.0 83.1	63 25.9 -02.8 83.1	62 27.2 -02.4 83.2	61 28.5 -02.1 83.2
13°	65 19.8 -05.7 80.6	64 21.5 -05.2 80.8	63 23.1 -04.8 80.9	62 24.8 -04.4 81.0	61 26.4 -04.0 81.2
14°	65 14.1 -07.9 78.2	64 16.3 -07.4 78.5	63 18.3 -06.8 78.7	62 20.4 -06.4 78.9	61 22.4 -06.0 79.1
15°	65 06.2 -10.1 75.9	64 08.9 -09.5 76.2	63 11.5 -09.0 76.5	62 14.0 -08.4 76.7	61 16.4 -07.8 77.0
16°	64 56.1 -12.3 73.5	63 59.4 -11.6 73.9	63 02.5 -10.9 74.3	62 05.6 -10.3 74.6	61 08.6 -09.7 74.9
17°	64 43.8 -14.4 71.2	63 47.8 -13.6 71.7	62 51.6 -12.8 72.1	61 55.3 -12.2 72.5	60 58.9 -11.5 72.9
18°	64 29.4 -16.4 69.0	63 34.2 -15.6 69.5	62 38.8 -14.8 70.0	61 43.1 -14.0 70.5	60 47.4 -13.3 70.9
19°	64 13.0 -18.4 66.7	63 18.6 -17.5 67.3	62 24.0 -16.7 67.9	61 29.1 -15.8 68.4	60 34.1 -15.1 68.9
20°	63 54.6 -20.3 64.6	63 01.1 -19.4 65.2	62 07.3 -18.5 65.8	61 13.3 -17.6 66.4	60 19.0 -16.7 66.9
21°	63 34.3 -22.2 62.4	62 41.7 -21.2 63.1	61 48.8 -20.2 63.8	60 55.7 -19.3 64.4	60 02.3 -18.5 65.0
22°	63 12.1 -24.0 60.4	62 20.5 -22.9 61.1	61 28.6 -21.9 61.8	60 36.4 -21.0 62.5	59 43.8 -20.0 63.1
23°	62 48.1 -25.6 58.3	61 57.6 -24.5 59.1	61 06.7 -23.5 59.9	60 15.4 -22.5 60.6	59 23.8 -21.6 61.2
24°	62 22.5 -27.2 56.4	61 33.1 -26.2 57.2	60 43.2 -25.1 58.0	59 52.9 -24.1 58.7	59 02.2 -23.1 59.4
25°	61 55.3 -28.8 54.5	61 06.9 -27.6 55.3	60 18.1 -26.6 56.1	59 28.8 -25.5 56.9	58 39.1 -24.6 57.6
26°	61 26.5 -30.2 52.6	60 39.3 -29.1 53.5	59 51.5 -28.0 54.4	59 03.3 -27.0 55.1	58 14.5 -25.9 55.9
27°	60 56.3 -31.7 50.8	60 10.2 -30.5 51.7	59 23.5 -29.4 52.6	58 36.3 -28.3 53.4	57 48.6 -27.3 54.2
28°	60 24.6 -32.9 49.1	59 39.7 -31.8 50.0	58 54.1 -30.7 50.9	58 08.0 -29.6 51.7	57 21.3 -28.5 52.5
29°	59 51.7 -34.1 47.4	59 07.9 -33.0 48.4	58 23.4 -31.9 49.3	57 38.4 -30.9 50.1	56 52.8 -29.8 50.9

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Latitude 10°

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Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	58 31.5 +19.2 106.7	57 34.8 +18.7 106.1	56 38.0 +18.2 105.5	55 41.0 +17.7 105.0	54 43.8 +17.4 104.4
1°	58 50.7 +17.6 104.9	57 53.5 +17.2 104.3	56 56.2 +16.7 103.8	55 58.7 +16.4 103.3	55 01.2 +16.0 102.8
2°	59 08.3 +16.0 103.1	58 10.7 +15.6 102.5	57 12.9 +15.3 102.0	56 15.1 +14.9 101.5	55 17.2 +14.5 101.1
3°	59 24.3 +14.4 101.2	58 26.3 +14.0 100.7	57 28.2 +13.7 100.2	56 30.0 +13.4 99.8	55 31.7 +13.2 99.4
4°	59 38.7 +12.6 99.3	58 40.3 +12.4 98.8	57 41.9 +12.1 98.4	56 43.4 +11.9 98.0	55 44.9 +11.6 97.6
5°	59 51.3 +10.9 97.3	58 52.7 +10.7 96.9	57 54.0 +10.5 96.6	56 55.3 +10.3 96.2	55 56.5 +10.2 95.9
6°	60 02.2 +09.2 95.4	59 03.4 +09.0 95.0	58 04.5 +08.9 94.7	57 05.6 +08.7 94.4	56 06.7 +08.6 94.1
7°	60 11.4 +07.3 93.4	59 12.4 +07.2 93.1	58 13.4 +07.2 92.8	57 14.3 +07.2 92.6	56 15.3 +07.1 92.4
8°	60 18.7 +05.6 91.4	59 19.6 +05.6 91.2	58 20.6 +05.5 91.0	57 21.5 +05.5 90.8	56 22.4 +05.5 90.6
9°	60 24.3 +03.7 89.4	59 25.2 +03.8 89.2	58 26.1 +03.8 89.1	57 27.0 +03.9 88.9	56 27.9 +04.0 88.8
10°	60 28.0 +01.8 87.3	59 29.0 +01.9 87.2	58 29.9 +02.2 87.1	57 30.9 +02.3 87.1	56 31.9 +02.4 87.0
11°	60 29.8 +00.1 85.3	59 30.9 +00.3 85.3	58 32.1 +00.4 85.2	57 33.2 +00.6 85.2	56 34.3 +00.8 85.1
12°	60 29.9 -01.9 83.3	59 31.2 -01.6 83.3	58 32.5 -01.3 83.3	57 33.8 -01.0 83.3	56 35.1 -00.8 83.3
13°	60 28.0 -03.7 81.2	59 29.6 -03.3 81.3	58 31.2 -03.0 81.4	57 32.8 -02.7 81.5	56 34.3 -02.3 81.5
14°	60 24.3 -05.5 79.2	59 26.3 -05.1 79.4	58 28.2 -04.7 79.5	57 30.1 -04.3 79.6	56 32.0 -04.0 79.7
15°	60 18.8 -07.3 77.2	59 21.2 -06.9 77.4	58 23.5 -06.4 77.6	57 25.8 -06.0 77.8	56 28.0 -05.5 77.9
16°	60 11.5 -09.1 75.2	59 14.3 -08.5 75.5	58 17.1 -08.0 75.7	57 19.8 -07.5 75.9	56 22.5 -07.1 76.1
17°	60 02.4 -10.9 73.2	59 05.8 -10.3 73.5	58 09.1 -09.7 73.8	57 12.3 -09.2 74.1	56 15.4 -08.6 74.3
18°	59 51.5 -12.6 71.3	58 55.5 -12.0 71.6	57 59.4 -11.4 71.9	57 03.1 -10.7 72.2	56 06.8 -10.1 72.5
19°	59 38.9 -14.3 69.3	58 43.5 -13.6 69.7	57 48.0 -12.9 70.1	56 52.4 -12.3 70.4	55 56.7 -11.7 70.8
20°	59 24.6 -16.0 67.4	58 29.9 -15.2 67.9	57 35.1 -14.5 68.3	56 40.1 -13.7 68.7	55 45.0 -13.1 69.0
21°	59 08.6 -17.6 65.5	58 14.7 -16.8 66.0	57 20.6 -16.0 66.5	56 26.4 -15.3 66.9	55 31.9 -14.5 67.3
22°	58 51.0 -19.2 63.7	57 57.9 -18.3 64.2	57 04.6 -17.5 64.7	56 11.1 -16.7 65.1	55 17.4 -16.0 65.6
23°	58 31.8 -20.6 61.8	57 39.6 -19.8 62.4	56 47.1 -18.9 62.9	55 54.4 -18.2 63.4	55 01.4 -17.3 63.9
24°	58 11.2 -22.2 60.1	57 19.8 -21.2 60.6	56 28.2 -20.4 61.2	55 36.2 -19.5 61.7	54 44.1 -18.7 62.2
25°	57 49.0 -23.6 58.3	56 58.6 -22.7 58.9	56 07.8 -21.7 59.5	55 16.7 -20.8 60.1	54 25.4 -20.0 60.6
26°	57 25.4 -24.9 56.6	56 35.9 -24.0 57.2	55 46.1 -23.1 57.9	54 55.9 -22.2 58.4	54 05.4 -21.3 59.0
27°	57 00.5 -26.3 54.9	56 11.9 -25.3 55.6	55 23.0 -24.3 56.2	54 33.7 -23.4 56.8	53 44.1 -22.5 57.4
28°	56 34.2 -27.5 53.3	55 46.6 -26.5 54.0	54 58.7 -25.6 54.6	54 10.3 -24.6 55.2	53 21.6 -23.7 55.8
29°	56 06.7 -28.8 51.7	55 20.1 -27.7 52.4	54 33.1 -26.8 53.0	53 45.7 -25.8 53.7	52 57.9 -24.9 54.3

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	53 46.5 +17.0 103.9	52 49.1 +16.6 103.4	51 51.6 +16.2 103.0	50 54.0 +15.9 102.5	49 56.2 +15.6 102.1
1°	54 03.5 +15.6 102.3	53 05.7 +15.3 101.8	52 07.8 +15.0 101.4	51 09.9 +14.7 101.0	50 11.8 +14.5 100.6
2°	54 19.1 +14.3 100.6	53 21.0 +14.0 100.2	52 22.8 +13.8 99.8	51 24.6 +13.4 99.4	50 26.3 +13.2 99.1
3°	54 33.4 +12.9 99.0	53 35.0 +12.6 98.6	52 36.6 +12.4 98.2	51 38.0 +12.3 97.9	50 39.5 +12.0 97.5
4°	54 46.3 +11.4 97.3	53 47.6 +11.3 96.9	52 49.0 +11.0 96.6	51 50.3 +10.9 96.3	50 51.5 +10.8 96.0
5°	54 57.7 +10.0 95.6	53 58.9 +09.9 95.3	53 00.0 +09.8 95.0	52 01.2 +09.6 94.7	51 02.3 +09.5 94.4
6°	55 07.7 +08.6 93.9	54 08.8 +08.4 93.6	53 09.8 +08.4 93.3	52 10.8 +08.3 93.1	51 11.8 +08.2 92.9
7°	55 16.3 +07.0 92.1	54 17.2 +07.0 91.9	53 18.2 +06.9 91.7	52 19.1 +07.0 91.5	51 20.0 +07.0 91.3
8°	55 23.3 +05.6 90.4	54 24.2 +05.6 90.2	53 25.1 +05.6 90.0	52 26.1 +05.6 89.9	51 27.0 +05.6 89.7
9°	55 28.9 +04.0 88.6	54 29.8 +04.1 88.5	53 30.7 +04.2 88.4	52 31.7 +04.2 88.2	51 32.6 +04.4 88.1
10°	55 32.9 +02.5 86.9	54 33.9 +02.7 86.8	53 34.9 +02.8 86.7	52 35.9 +02.9 86.6	51 37.0 +03.0 86.5
11°	55 35.4 +01.0 85.1	54 36.6 +01.1 85.0	53 37.7 +01.3 85.0	52 38.8 +01.6 84.9	51 40.0 +01.7 84.9
12°	55 36.4 -00.5 83.3	54 37.7 -00.3 83.3	53 39.0 +00.0 83.3	52 40.4 +00.1 83.3	51 41.7 +00.4 83.3
13°	55 35.9 -02.1 81.6	54 37.4 -01.7 81.6	53 39.0 -01.5 81.6	52 40.5 -01.2 81.6	51 42.1 -01.0 81.6
14°	55 33.8 -03.6 79.8	54 35.7 -03.3 79.9	53 37.5 -02.9 79.9	52 39.3 -02.6 80.0	51 41.1 -02.3 80.0
15°	55 30.2 -05.1 78.0	54 32.4 -04.7 78.1	53 34.6 -04.4 78.2	52 36.7 -03.9 78.3	51 38.8 -03.6 78.4
16°	55 25.1 -06.6 76.3	54 27.7 -06.2 76.4	53 30.2 -05.7 76.6	52 32.8 -05.4 76.7	51 35.2 -04.9 76.8
17°	55 18.5 -08.1 74.5	54 21.5 -07.6 74.7	53 24.5 -07.1 74.9	52 27.4 -06.6 75.1	51 30.3 -06.2 75.2
18°	55 10.4 -09.6 72.8	54 13.9 -09.0 73.0	53 17.4 -08.5 73.2	52 20.8 -08.0 73.4	51 24.1 -07.5 73.6
19°	55 00.8 -11.0 71.1	54 04.9 -10.4 71.3	53 08.9 -09.9 71.6	52 12.8 -09.3 71.8	51 16.6 -08.8 72.0
20°	54 49.8 -12.4 69.3	53 54.5 -11.9 69.7	52 59.0 -11.2 69.9	52 03.5 -10.7 70.2	51 07.8 -10.0 70.4
21°	54 37.4 -13.9 67.7	53 42.6 -13.2 68.0	52 47.8 -12.5 68.3	51 52.8 -11.9 68.6	50 57.8 -11.3 68.9
22°	54 23.5 -15.2 66.0	53 29.4 -14.5 66.4	52 35.3 -13.9 66.7	51 40.9 -13.2 67.0	50 46.5 -12.6 67.3
23°	54 08.3 -16.6 64.3	53 14.9 -15.8 64.7	52 21.4 -15.1 65.1	51 27.7 -14.4 65.5	50 33.9 -13.7 65.8
24°	53 51.7 -17.9 62.7	52 59.1 -17.1 63.1	52 06.3 -16.4 63.5	51 13.3 -15.6 63.9	50 20.2 -15.0 64.3
25°	53 33.8 -19.2 61.1	52 42.0 -18.4 61.5	51 49.9 -17.6 62.0	50 57.7 -16.9 62.4	50 05.2 -16.1 62.7
26°	53 14.6 -20.4 59.5	52 23.6 -19.6 60.0	51 32.3 -18.8 60.4	50 40.8 -18.0 60.8	49 49.1 -17.2 61.2
27°	52 54.2 -21.7 57.9	52 04.0 -20.8 58.4	51 13.5 -20.0 58.9	50 22.8 -19.2 59.3	49 31.9 -18.4 59.8
28°	52 32.5 -22.8 56.4	51 43.2 -22.0 56.9	50 53.5 -21.1 57.4	50 03.6 -20.2 57.9	49 13.5 -19.5 58.3
29°	52 09.7 -23.9 54.9	51 21.2 -23.0 55.4	50 32.4 -22.2 55.9	49 43.4 -21.4 56.4	48 54.0 -20.5 56.9

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Declination SAME name as Latitude

Latitude 10°

Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	48 58.4 +15.3 101.7	48 00.5 +15.0 101.3	47 02.5 +14.8 100.9	46 04.5 +14.5 100.5	45 06.3 +14.3 100.2
1°	49 13.7 +14.2 100.2	48 15.5 +14.0 99.8	47 17.3 +13.7 99.5	46 19.0 +13.4 99.1	45 20.6 +13.3 98.8
2°	49 27.9 +13.0 98.7	48 29.5 +12.8 98.4	47 31.0 +12.6 98.1	46 32.4 +12.5 97.7	45 33.9 +12.2 97.4
3°	49 40.9 +11.8 97.2	48 42.3 +11.6 96.9	47 43.6 +11.5 96.6	46 44.9 +11.3 96.3	45 46.1 +11.2 96.0
4°	49 52.7 +10.6 95.7	48 53.9 +10.5 95.4	47 55.1 +10.3 95.1	46 56.2 +10.3 94.9	45 57.3 +10.2 94.6
5°	50 03.3 +09.5 94.2	49 04.4 +09.3 93.9	48 05.4 +09.3 93.7	47 06.5 +09.1 93.4	46 07.5 +09.1 93.2
6°	50 12.8 +08.1 92.6	49 13.7 +08.2 92.4	48 14.7 +08.1 92.2	47 15.6 +08.1 92.0	46 16.6 +08.0 91.8
7°	50 20.9 +07.0 91.1	49 21.9 +06.9 90.9	48 22.8 +06.9 90.7	47 23.7 +06.9 90.5	46 24.6 +06.9 90.3
8°	50 27.9 +05.7 89.5	49 28.8 +05.7 89.4	48 29.7 +05.8 89.2	47 30.6 +05.8 89.0	46 31.5 +05.9 88.9
9°	50 33.6 +04.4 88.0	49 34.5 +04.5 87.8	48 35.5 +04.6 87.7	47 36.4 +04.7 87.6	46 37.4 +04.8 87.4
10°	50 38.0 +03.1 86.4	49 39.0 +03.3 86.3	48 40.1 +03.3 86.2	47 41.1 +03.5 86.1	46 42.2 +03.6 86.0
11°	50 41.1 +01.9 84.8	49 42.3 +02.0 84.7	48 43.4 +02.3 84.7	47 44.6 +02.4 84.6	46 45.8 +02.5 84.5
12°	50 43.0 +00.6 83.2	49 44.3 +00.8 83.2	48 45.7 +01.0 83.2	47 47.0 +01.2 83.1	46 48.3 +01.5 83.1
13°	50 43.6 -00.7 81.7	49 45.1 -00.4 81.6	48 46.7 -00.2 81.6	47 48.2 +00.1 81.6	46 49.8 +00.3 81.6
14°	50 42.9 -02.0 80.1	49 44.7 -01.7 80.1	48 46.5 -01.4 80.1	47 48.3 -01.1 80.1	46 50.1 -00.9 80.1
15°	50 40.9 -03.2 78.5	49 43.0 -02.9 78.6	48 45.1 -02.6 78.6	47 47.2 -02.3 78.7	46 49.2 -01.9 78.7
16°	50 37.7 -04.5 76.9	49 40.1 -04.1 77.0	48 42.5 -03.7 77.1	47 44.9 -03.4 77.2	46 47.3 -03.0 77.2
17°	50 33.2 -05.8 75.3	49 36.0 -05.4 75.5	48 38.8 -05.0 75.6	47 41.5 -04.5 75.7	46 44.3 -04.2 75.8
18°	50 27.4 -07.0 73.8	49 30.6 -06.5 73.9	48 33.8 -06.1 74.1	47 37.0 -05.7 74.2	46 40.1 -05.2 74.3
19°	50 20.4 -08.3 72.2	49 24.1 -07.8 72.4	48 27.7 -07.3 72.6	47 31.3 -06.8 72.7	46 34.9 -06.4 72.9
20°	50 12.1 -09.5 70.7	49 16.3 -09.0 70.9	48 20.4 -08.4 71.1	47 24.5 -07.9 71.3	46 28.5 -07.4 71.4
21°	50 02.6 -10.7 69.1	49 07.3 -10.1 69.4	48 12.0 -09.6 69.6	47 16.6 -09.1 69.8	46 21.1 -08.5 70.0
22°	49 51.9 -11.9 67.6	48 57.2 -11.3 67.9	48 02.4 -10.7 68.1	47 07.5 -10.1 68.3	46 12.6 -09.6 68.5
23°	49 40.0 -13.1 66.1	48 45.9 -12.5 66.4	47 51.7 -11.8 66.6	46 57.4 -11.2 66.9	46 03.0 -10.6 67.1
24°	49 26.9 -14.3 64.6	48 33.4 -13.6 64.9	47 39.9 -13.0 65.2	46 46.2 -12.3 65.5	45 52.4 -11.7 65.7
25°	49 12.6 -15.4 63.1	48 19.8 -14.7 63.4	47 26.9 -14.0 63.7	46 33.9 -13.4 64.0	45 40.7 -12.7 64.3
26°	48 57.2 -16.5 61.6	48 05.1 -15.7 62.0	47 12.9 -15.1 62.3	46 20.5 -14.4 62.6	45 28.0 -13.7 62.9
27°	48 40.7 -17.6 60.2	47 49.4 -16.9 60.5	46 57.8 -16.1 60.9	46 06.1 -15.4 61.2	45 14.3 -14.8 61.5
28°	48 23.1 -18.7 58.7	47 32.5 -17.9 59.1	46 41.7 -17.2 59.5	45 50.7 -16.4 59.8	44 59.5 -15.7 60.1
29°	48 04.4 -19.7 57.3	47 14.6 -18.9 57.7	46 24.5 -18.1 58.1	45 34.3 -17.4 58.4	44 43.8 -16.6 58.8

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	44 08.2 +14.0 99.9	43 09.9 +13.8 99.5	42 11.6 +13.6 99.2	41 13.3 +13.4 98.9	40 14.9 +13.2 98.6
1°	44 22.2 +13.1 98.5	43 23.7 +12.9 98.2	42 25.2 +12.7 97.9	41 26.7 +12.5 97.6	40 28.1 +12.4 97.3
2°	44 35.3 +12.0 97.1	43 36.6 +11.9 96.8	42 37.9 +11.8 96.6	41 39.2 +11.6 96.3	40 40.5 +11.5 96.0
3°	44 47.3 +11.1 95.7	43 48.5 +11.0 95.5	42 49.7 +10.8 95.2	41 50.8 +10.8 95.0	40 52.0 +10.6 94.7
4°	44 58.4 +10.1 94.4	43 59.5 +10.0 94.1	43 00.5 +09.9 93.9	42 01.6 +09.8 93.6	41 02.6 +09.8 93.4
5°	45 08.5 +09.0 93.0	44 09.5 +08.9 92.7	43 10.4 +09.0 92.5	42 11.4 +08.9 92.3	41 12.4 +08.8 92.1
6°	45 17.5 +08.0 91.6	44 18.4 +08.0 91.4	43 19.4 +07.9 91.2	42 20.3 +08.0 91.0	41 21.2 +08.0 90.8
7°	45 25.5 +07.0 90.2	44 26.4 +07.0 90.0	43 27.3 +07.0 89.8	42 28.3 +07.0 89.6	41 29.2 +07.0 89.5
8°	45 32.5 +05.9 88.7	44 33.4 +06.0 88.6	43 34.3 +06.0 88.4	42 35.3 +06.0 88.3	41 36.2 +06.1 88.1
9°	45 38.4 +04.8 87.3	44 39.4 +04.9 87.2	43 40.3 +05.1 87.1	42 41.3 +05.1 86.9	41 42.3 +05.2 86.8
10°	45 43.2 +03.8 85.9	44 44.3 +03.9 85.8	43 45.4 +04.0 85.7	42 46.4 +04.2 85.6	41 47.5 +04.3 85.5
11°	45 47.0 +02.7 84.5	44 48.2 +02.8 84.4	43 49.4 +03.0 84.3	42 50.6 +03.2 84.2	41 51.8 +03.3 84.1
12°	45 49.7 +01.6 83.0	44 51.0 +01.8 83.0	43 52.4 +02.0 82.9	42 53.8 +02.2 82.9	41 55.1 +02.4 82.8
13°	45 51.3 +00.5 81.6	44 52.8 +00.8 81.6	43 54.4 +01.0 81.5	42 56.0 +01.2 81.5	41 57.5 +01.5 81.5
14°	45 51.8 -00.5 80.2	44 53.6 -00.2 80.1	43 55.4 +00.0 80.1	42 57.2 +00.2 80.1	41 59.0 +00.5 80.1
15°	45 51.3 -01.6 78.7	44 53.4 -01.4 78.7	43 55.4 -01.0 78.8	42 57.4 -00.7 78.8	41 59.5 -00.4 78.8
16°	45 49.7 -02.7 77.3	44 52.0 -02.3 77.3	43 54.4 -02.0 77.4	42 56.7 -01.7 77.4	41 59.1 -01.4 77.4
17°	45 47.0 -03.8 75.8	44 49.7 -03.4 75.9	43 52.4 -03.1 76.0	42 55.0 -02.6 76.0	41 57.7 -02.3 76.1
18°	45 43.2 -04.8 74.4	44 46.3 -04.4 74.5	43 49.3 -04.0 74.6	42 52.4 -03.7 74.7	41 55.4 -03.3 74.7
19°	45 38.4 -05.9 73.0	44 41.9 -05.5 73.1	43 45.3 -05.0 73.2	42 48.7 -04.6 73.3	41 52.1 -04.2 73.4
20°	45 32.5 -07.0 71.6	44 36.4 -06.5 71.7	43 40.3 -06.0 71.8	42 44.1 -05.5 71.9	41 47.9 -05.1 72.0
21°	45 25.5 -07.9 70.2	44 29.9 -07.5 70.3	43 34.3 -07.0 70.5	42 38.6 -06.5 70.6	41 42.8 -06.0 70.7
22°	45 17.6 -09.1 68.7	44 22.4 -08.4 68.9	43 27.3 -08.0 69.1	42 32.1 -07.5 69.2	41 36.8 -07.0 69.4
23°	45 08.5 -10.0 67.3	44 14.0 -09.5 67.5	43 19.3 -08.9 67.7	42 24.6 -08.4 67.9	41 29.8 -07.9 68.1
24°	44 58.5 -11.1 65.9	44 04.5 -10.5 66.2	43 10.4 -09.9 66.4	42 16.2 -09.3 66.6	41 21.9 -08.7 66.7
25°	44 47.4 -12.1 64.6	43 54.0 -11.5 64.8	43 00.5 -10.9 65.0	42 06.9 -10.3 65.2	41 13.2 -09.7 65.4
26°	44 35.3 -13.0 63.2	43 42.5 -12.4 63.4	42 49.6 -11.8 63.7	41 56.6 -11.2 63.9	41 03.5 -10.6 64.1
27°	44 22.3 -14.1 61.8	43 30.1 -13.4 62.1	42 37.8 -12.7 62.3	41 45.4 -12.0 62.6	41 02.9 -11.4 62.8
28°	44 08.2 -15.0 60.5	43 16.7 -14.3 60.7	42 25.1 -13.6 61.0	41 33.4 -13.0 61.3	40 41.5 -12.3 61.5
29°	43 53.2 -15.9 59.1	43 02.4 -15.2 59.4	42 11.5 -14.5 59.7	41 20.4 -13.8 60.0	40 29.2 -13.2 60.2

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Latitude 10°

Declination SAME name as Latitude

Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	39 16.4 +13.1 98.3	38 17.9 +12.9 98.0	37 19.4 +12.7 97.7	36 20.8 +12.6 97.5	35 22.2 +12.4 97.2
1°	39 29.5 +12.2 97.0	38 30.8 +12.1 96.8	37 32.1 +12.0 96.5	36 33.4 +11.8 96.2	35 34.6 +11.7 96.0
2°	39 41.7 +11.4 95.8	38 42.9 +11.3 95.5	37 44.1 +11.1 95.3	36 45.2 +11.1 95.0	35 46.3 +11.0 94.8
3°	39 53.1 +10.5 94.5	38 54.2 +10.4 94.2	37 55.2 +10.4 94.0	36 56.3 +10.3 93.8	35 57.3 +10.2 93.6
4°	40 03.6 +09.7 93.2	39 04.6 +09.6 93.0	38 05.6 +09.6 92.8	37 06.6 +09.5 92.6	36 07.5 +09.5 92.4
5°	40 13.3 +08.8 91.9	39 14.2 +08.8 91.7	38 15.2 +08.8 91.5	37 16.1 +08.8 91.3	36 17.0 +08.8 91.1
6°	40 22.1 +08.0 90.6	39 23.0 +08.0 90.4	38 24.0 +07.9 90.2	37 24.9 +07.9 90.1	36 25.8 +08.0 89.9
7°	40 30.1 +07.1 89.3	39 31.0 +07.1 89.1	38 31.9 +07.2 89.0	37 32.8 +07.2 88.8	36 33.8 +07.2 88.7
8°	40 37.2 +06.1 88.0	39 38.1 +06.3 87.9	38 39.1 +06.3 87.7	37 40.0 +06.4 87.6	36 41.0 +06.4 87.4
9°	40 43.3 +05.3 86.7	39 44.4 +05.3 86.6	38 45.4 +05.5 86.4	37 46.4 +05.6 86.3	36 47.4 +05.7 86.2
10°	40 48.6 +04.4 85.4	39 49.7 +04.6 85.3	38 50.9 +04.6 85.2	37 52.0 +04.8 85.1	36 53.1 +04.9 84.9
11°	40 53.0 +03.5 84.1	39 54.3 +03.6 84.0	38 55.5 +03.8 83.9	37 56.8 +03.9 83.8	36 58.0 +04.1 83.7
12°	40 56.5 +02.6 82.7	39 57.9 +02.8 82.7	38 59.3 +03.0 82.6	38 00.7 +03.2 82.5	37 02.1 +03.4 82.4
13°	40 59.1 +01.7 81.4	40 00.7 +01.9 81.4	39 02.3 +02.1 81.3	38 03.9 +02.3 81.3	37 05.5 +02.5 81.2
14°	41 00.8 +00.7 80.1	40 02.6 +01.0 80.1	39 04.4 +01.2 80.0	38 06.2 +01.5 80.0	37 08.0 +01.7 79.9
15°	41 01.5 -00.1 78.8	40 03.6 +00.1 78.7	39 05.6 +00.4 78.7	38 07.7 +00.7 78.7	37 09.7 +01.0 78.7
16°	41 01.4 -01.1 77.4	40 03.7 -00.7 77.4	39 06.0 -00.4 77.4	38 08.4 -00.2 77.4	37 10.7 +00.1 77.4
17°	41 00.3 -01.9 76.1	40 03.0 -01.7 76.1	39 05.6 -01.3 76.2	38 08.2 -00.9 76.2	37 10.8 -00.6 76.2
18°	40 58.4 -02.9 74.8	40 01.3 -02.5 74.8	39 04.3 -02.1 74.9	38 07.3 -01.8 74.9	37 10.2 -01.4 74.9
19°	40 55.5 -03.8 73.5	39 58.8 -03.3 73.5	39 02.2 -03.0 73.6	38 05.5 -02.6 73.6	37 08.8 -02.2 73.7
20°	40 51.7 -04.7 72.1	39 55.5 -04.3 72.2	38 59.2 -03.9 72.3	38 02.9 -03.4 72.4	37 06.6 -03.1 72.4
21°	40 47.0 -05.5 70.8	39 51.2 -05.1 70.9	38 55.3 -04.6 71.0	37 59.5 -04.3 71.1	37 03.5 -03.8 71.2
22°	40 41.5 -06.5 69.5	39 46.1 -06.0 69.6	38 50.7 -05.5 69.7	37 55.2 -05.0 69.8	36 59.7 -04.5 69.9
23°	40 35.0 -07.4 68.2	39 40.1 -06.8 68.3	38 45.2 -06.4 68.5	37 50.2 -05.9 68.6	36 55.2 -05.4 68.7
24°	40 27.6 -08.2 66.9	39 33.3 -07.7 67.0	38 38.8 -07.2 67.2	37 44.3 -06.6 67.3	36 49.8 -06.2 67.4
25°	40 19.4 -09.1 65.6	39 25.6 -08.6 65.8	38 31.6 -07.9 65.9	37 37.7 -07.5 66.1	36 43.6 -06.9 66.2
26°	40 10.3 -10.0 64.3	39 17.0 -09.4 64.5	38 23.7 -08.9 64.6	37 30.2 -08.2 64.8	36 36.7 -07.7 64.9
27°	40 00.3 -10.8 63.0	39 07.6 -10.2 63.2	38 14.8 -09.6 63.4	37 22.0 -09.0 63.6	36 29.0 -08.4 63.7
28°	39 49.5 -11.6 61.7	38 57.4 -11.0 61.9	38 05.2 -10.4 62.1	37 13.0 -09.8 62.3	36 20.6 -09.2 62.5
29°	39 37.9 -12.5 60.5	38 46.4 -11.8 60.7	37 54.8 -11.2 60.9	37 03.2 -10.6 61.1	36 11.4 -09.9 61.3

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	34 23.6 +12.2 96.9	33 24.9 +12.1 96.7	32 26.2 +12.0 96.4	31 27.5 +11.9 96.2	30 28.7 +11.8 96.0
1°	34 35.8 +11.6 95.7	33 37.0 +11.5 95.5	32 38.2 +11.4 95.3	31 39.4 +11.3 95.0	30 40.5 +11.2 94.8
2°	34 47.4 +10.9 94.6	33 48.5 +10.8 94.3	32 49.6 +10.7 94.1	31 50.7 +10.6 93.9	30 51.7 +10.6 93.7
3°	34 58.3 +10.2 93.4	33 59.3 +10.1 93.1	33 00.3 +10.1 92.9	32 01.3 +10.0 92.7	31 02.3 +10.0 92.5
4°	35 08.5 +09.5 92.1	34 09.4 +09.5 92.0	33 10.4 +09.4 91.8	32 11.3 +09.4 91.6	31 12.3 +09.3 91.4
5°	35 18.0 +08.7 90.9	34 18.9 +08.7 90.8	33 19.8 +08.7 90.6	32 20.7 +08.7 90.4	31 21.6 +08.8 90.2
6°	35 26.7 +08.0 89.7	34 27.6 +08.0 89.6	33 28.5 +08.1 89.4	32 29.4 +08.1 89.2	31 30.4 +08.1 89.1
7°	35 34.7 +07.3 88.5	34 35.6 +07.3 88.4	33 36.6 +07.3 88.2	32 37.5 +07.4 88.0	31 38.5 +07.4 87.9
8°	35 42.0 +06.5 87.3	34 42.9 +06.6 87.1	33 43.9 +06.7 87.0	32 44.9 +06.8 86.9	31 45.9 +06.9 86.7
9°	35 48.5 +05.8 86.1	34 49.5 +05.9 85.9	33 50.6 +06.0 85.8	32 51.7 +06.1 85.7	31 52.8 +06.2 85.6
10°	35 54.3 +05.0 84.8	34 55.4 +05.2 84.7	33 56.6 +05.3 84.6	32 57.8 +05.4 84.5	31 59.0 +05.5 84.4
11°	35 59.3 +04.3 83.6	35 00.6 +04.4 83.5	34 01.9 +04.5 83.4	33 03.2 +04.7 83.3	32 04.5 +04.9 83.2
12°	36 03.6 +03.5 82.4	35 05.0 +03.7 82.3	34 06.4 +03.9 82.2	33 07.9 +04.1 82.1	32 09.4 +04.2 82.0
13°	36 07.1 +02.7 81.1	35 08.7 +02.9 81.1	34 10.3 +03.2 81.0	33 12.0 +03.3 80.9	32 13.6 +03.6 80.9
14°	36 09.8 +02.0 79.9	35 11.6 +02.3 79.8	34 13.5 +02.4 79.8	33 15.3 +02.7 79.7	32 17.2 +02.9 79.7
15°	36 11.8 +01.2 78.7	35 13.9 +01.5 78.6	34 15.9 +01.8 78.6	33 18.0 +02.0 78.5	32 20.1 +02.3 78.5
16°	36 13.0 +00.5 77.4	35 15.4 +00.7 77.4	34 17.7 +01.0 77.4	33 20.0 +01.3 77.3	32 22.4 +01.6 77.3
17°	36 13.5 -00.3 76.2	35 16.1 +00.0 76.2	34 18.7 +00.3 76.2	33 21.3 +00.7 76.2	32 24.0 +00.9 76.1
18°	36 13.2 -01.1 74.9	35 16.1 -00.7 75.0	34 19.0 -00.4 75.0	33 22.0 -00.1 75.0	32 24.9 +00.3 74.9
19°	36 12.1 -01.9 73.7	35 15.4 -01.5 73.7	34 18.6 -01.1 73.7	33 21.9 -00.8 73.8	32 25.2 -00.4 73.8
20°	36 10.2 -02.6 72.5	35 13.9 -02.2 72.5	34 17.5 -01.8 72.5	33 21.1 -01.4 72.6	32 24.8 -01.1 72.6
21°	36 07.6 -03.4 71.2	35 11.7 -03.0 71.3	34 15.7 -02.6 71.3	33 19.7 -02.1 71.4	32 23.7 -01.7 71.4
22°	36 04.2 -04.1 70.0	35 08.7 -03.7 70.1	34 13.1 -03.2 70.1	33 17.6 -02.9 70.2	32 22.0 -02.4 70.2
23°	36 00.1 -04.9 68.8	35 05.0 -04.4 68.8	34 09.9 -04.0 68.9	33 14.7 -03.5 69.0	32 19.6 -03.1 69.0
24°	35 55.2 -05.6 67.5	35 00.6 -05.2 67.6	34 05.9 -04.6 67.7	33 11.2 -04.1 67.8	32 16.5 -03.7 67.8
25°	35 49.6 -06.4 66.3	34 55.4 -05.8 66.4	34 01.3 -05.4 66.5	33 07.1 -04.9 66.6	32 12.8 -04.3 66.7
26°	35 43.2 -07.2 65.1	34 49.6 -06.6 65.2	33 55.9 -06.1 65.3	33 02.2 -05.5 65.4	32 08.5 -05.1 65.5
27°	35 36.0 -07.8 63.9	34 43.0 -07.4 64.0	33 49.8 -06.7 64.1	32 56.7 -06.3 64.2	32 03.4 -05.6 64.3
28°	35 28.2 -08.6 62.6	34 35.6 -08.0 62.8	33 43.1 -07.5 62.9	32 50.4 -06.8 63.0	31 57.8 -06.4 63.1
29°	35 19.6 -09.4 61.4	34 27.6 -08.7 61.6	33 35.6 -08.1 61.7	32 43.6 -07.6 61.8	31 51.4 -06.9 62.0

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Declination SAME name as Latitude

Latitude 10°

Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	29 29.9 +11.7 95.7	28 31.1 +11.6 95.5	27 32.3 +11.5 95.3	26 33.4 +11.4 95.1	25 34.6 +11.3 94.8
1°	29 41.6 +11.1 94.6	28 42.7 +11.0 94.4	27 43.8 +10.9 94.2	26 44.8 +10.9 94.0	25 45.9 +10.8 93.8
2°	29 52.7 +10.5 93.5	28 53.7 +10.5 93.3	27 54.7 +10.4 93.1	26 55.7 +10.4 92.9	25 56.7 +10.3 92.7
3°	30 03.2 +10.0 92.3	29 04.2 +09.9 92.1	28 05.1 +09.9 91.9	27 06.1 +09.8 91.8	26 07.0 +09.9 91.6
4°	30 13.2 +09.3 91.2	29 14.1 +09.3 91.0	28 15.0 +09.4 90.8	27 15.9 +09.4 90.6	26 16.9 +09.3 90.5
5°	30 22.5 +08.8 90.0	29 23.4 +08.8 89.9	28 24.4 +08.7 89.7	27 25.3 +08.8 89.5	26 26.2 +08.8 89.4
6°	30 31.3 +08.1 88.9	29 32.2 +08.2 88.7	28 33.1 +08.2 88.6	27 34.1 +08.2 88.4	26 35.0 +08.3 88.3
7°	30 39.4 +07.5 87.7	29 40.4 +07.6 87.6	28 41.3 +07.7 87.4	27 42.3 +07.7 87.3	26 43.3 +07.8 87.1
8°	30 46.9 +07.0 86.6	29 48.0 +07.0 86.5	28 49.0 +07.1 86.3	27 50.0 +07.2 86.2	26 51.1 +07.2 86.0
9°	30 53.9 +06.3 85.4	29 55.0 +06.4 85.3	28 56.1 +06.5 85.2	27 57.2 +06.6 85.1	26 58.3 +06.8 84.9
10°	31 00.2 +05.6 84.3	30 01.4 +05.8 84.2	29 02.6 +05.9 84.0	28 03.8 +06.1 83.9	27 05.1 +06.2 83.8
11°	31 05.8 +05.1 83.1	30 07.2 +05.2 83.0	29 08.5 +05.4 82.9	28 09.9 +05.5 82.8	27 11.3 +05.7 82.7
12°	31 10.9 +04.4 81.9	30 12.4 +04.6 81.9	29 13.9 +04.8 81.8	28 15.4 +05.0 81.7	27 17.0 +05.1 81.6
13°	31 15.3 +03.8 80.8	30 17.0 +04.0 80.7	29 18.7 +04.2 80.6	28 20.4 +04.4 80.5	27 22.1 +04.6 80.4
14°	31 19.1 +03.1 79.6	30 21.0 +03.3 79.5	29 22.9 +03.6 79.5	28 24.8 +03.8 79.4	27 26.7 +04.1 79.3
15°	31 22.2 +02.5 78.4	30 24.3 +02.8 78.4	29 26.5 +03.0 78.3	28 28.6 +03.3 78.3	27 30.8 +03.5 78.2
16°	31 24.7 +01.9 77.3	30 27.1 +02.2 77.2	29 29.5 +02.4 77.2	28 31.9 +02.7 77.1	27 34.3 +02.9 77.1
17°	31 26.6 +01.2 76.1	30 29.3 +01.5 76.1	29 31.9 +01.8 76.0	28 34.6 +02.1 76.0	27 37.2 +02.5 75.9
18°	31 27.8 +00.6 74.9	30 30.8 +00.9 74.9	29 33.7 +01.3 74.9	28 36.7 +01.6 74.9	27 39.7 +01.8 74.8
19°	31 28.4 +00.0 73.8	30 31.7 +00.3 73.8	29 35.0 +00.6 73.7	28 38.3 +00.9 73.7	27 41.5 +01.4 73.7
20°	31 28.4 -00.7 72.6	30 32.0 -00.3 72.6	29 35.6 +00.1 72.6	28 39.2 +00.5 72.6	27 42.9 +00.8 72.6
21°	31 27.7 -01.3 71.4	30 31.7 -00.9 71.4	29 35.7 -00.6 71.4	28 39.7 -00.2 71.4	27 43.7 +00.2 71.4
22°	31 26.4 -02.0 70.2	30 30.8 -01.6 70.3	29 35.1 -01.1 70.3	28 39.5 -00.7 70.3	27 43.9 -00.3 70.3
23°	31 24.4 -02.6 69.1	30 29.2 -02.2 69.1	29 34.0 -01.7 69.1	28 38.8 -01.3 69.2	27 43.6 -00.9 69.2
24°	31 21.8 -03.2 67.9	30 27.0 -02.7 67.9	29 32.3 -02.4 68.0	28 37.5 -01.9 68.0	27 42.7 -01.4 68.0
25°	31 18.6 -03.9 66.7	30 24.3 -03.4 66.8	29 29.9 -02.9 66.8	28 35.6 -02.4 66.9	27 41.3 -02.0 66.9
26°	31 14.7 -04.5 65.6	30 20.9 -04.0 65.6	29 27.0 -03.5 65.7	28 33.2 -03.0 65.7	27 39.3 -02.5 65.8
27°	31 10.2 -05.2 64.4	30 16.9 -04.7 64.5	29 23.5 -04.1 64.5	28 30.2 -03.6 64.6	27 36.8 -03.1 64.7
28°	31 05.0 -05.7 63.2	30 12.2 -05.2 63.3	29 19.4 -04.7 63.4	28 26.6 -04.2 63.5	27 33.7 -03.6 63.5
29°	30 59.3 -06.4 62.1	30 07.0 -05.8 62.2	29 14.7 -05.2 62.3	28 22.4 -04.7 62.3	27 30.1 -04.2 62.4

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	24 35.7 +11.2 94.6	23 36.8 +11.1 94.4	22 37.9 +11.0 94.2	21 38.9 +11.0 94.0	20 40.0 +10.9 93.8
1°	24 46.9 +10.8 93.5	23 47.9 +10.7 93.3	22 48.9 +10.7 93.2	21 49.9 +10.6 93.0	20 50.9 +10.6 92.8
2°	24 57.7 +10.3 92.5	23 58.6 +10.3 92.3	22 59.6 +10.2 92.1	22 00.5 +10.2 91.9	21 01.5 +10.1 91.7
3°	25 08.0 +09.8 91.4	24 08.9 +09.8 91.2	23 09.8 +09.8 91.0	22 10.7 +09.8 90.8	21 11.6 +09.8 90.7
4°	25 17.8 +09.3 90.3	24 18.7 +09.3 90.1	23 19.6 +09.3 89.9	22 20.5 +09.4 89.8	21 21.4 +09.4 89.6
5°	25 27.1 +08.8 89.2	24 28.0 +08.9 89.0	23 28.9 +08.9 88.9	22 29.9 +08.9 88.7	21 30.8 +09.0 88.5
6°	25 35.9 +08.4 88.1	24 36.9 +08.4 87.9	23 37.8 +08.5 87.8	22 38.8 +08.5 87.6	21 39.8 +08.5 87.5
7°	25 44.3 +07.8 87.0	24 45.3 +07.9 86.8	23 46.3 +08.0 86.7	22 47.3 +08.1 86.6	21 48.3 +08.2 86.4
8°	25 52.1 +07.4 85.9	24 53.2 +07.5 85.8	23 54.3 +07.5 85.6	22 55.4 +07.6 85.5	21 56.5 +07.7 85.3
9°	25 59.5 +06.8 84.8	25 00.7 +06.9 84.7	24 01.8 +07.1 84.5	23 03.0 +07.2 84.4	22 04.2 +07.3 84.3
10°	26 06.3 +06.4 83.7	25 07.6 +06.5 83.6	24 08.9 +06.6 83.4	23 10.2 +06.8 83.3	22 11.5 +06.9 83.2
11°	26 12.7 +05.8 82.6	25 14.1 +06.0 82.5	24 15.5 +06.2 82.4	23 17.0 +06.3 82.2	22 18.4 +06.5 82.1
12°	26 18.5 +05.3 81.5	25 20.1 +05.5 81.4	24 21.7 +05.7 81.3	23 23.3 +05.9 81.2	22 24.9 +06.1 81.0
13°	26 23.8 +04.8 80.4	25 25.6 +05.0 80.3	24 27.4 +05.2 80.2	23 29.2 +05.4 80.1	22 31.0 +05.6 80.0
14°	26 28.6 +04.3 79.2	25 30.6 +04.5 79.2	24 32.6 +04.7 79.1	23 34.6 +04.9 79.0	22 36.6 +05.2 78.9
15°	26 32.9 +03.8 78.1	25 35.1 +04.0 78.1	24 37.3 +04.3 78.0	23 39.5 +04.5 77.9	22 41.8 +04.7 77.8
16°	26 36.7 +03.2 77.0	25 39.1 +03.5 76.9	24 41.6 +03.7 76.9	23 44.0 +04.1 76.8	22 46.5 +04.3 76.7
17°	26 39.9 +02.7 75.9	25 42.6 +03.0 75.8	24 45.3 +03.3 75.8	23 48.1 +03.6 75.7	22 50.8 +03.9 75.6
18°	26 42.6 +02.2 74.8	25 45.6 +02.5 74.7	24 48.6 +02.9 74.7	23 51.7 +03.1 74.6	22 54.7 +03.4 74.6
19°	26 44.8 +01.7 73.7	25 48.1 +02.0 73.6	24 51.5 +02.3 73.6	23 54.8 +02.6 73.5	22 58.1 +03.0 73.5
20°	26 46.5 +01.1 72.5	25 50.1 +01.5 72.5	24 53.8 +01.8 72.5	23 57.4 +02.2 72.4	23 01.1 +02.6 72.4
21°	26 47.6 +00.6 71.4	25 51.6 +01.0 71.4	24 55.6 +01.4 71.4	23 59.6 +01.8 71.3	23 03.7 +02.1 71.3
22°	26 48.2 +00.1 70.3	25 52.6 +00.5 70.3	24 57.0 +00.9 70.3	24 01.4 +01.2 70.3	23 05.8 +01.6 70.2
23°	26 48.3 -00.4 69.2	25 53.1 +00.0 69.2	24 57.9 +00.3 69.2	24 02.6 +00.8 69.2	23 07.4 +01.2 69.1
24°	26 47.9 -01.0 68.1	25 53.1 -00.6 68.1	24 58.2 -00.1 68.1	24 03.4 +00.4 68.1	23 08.6 +00.8 68.1
25°	26 46.9 -01.5 66.9	25 52.5 -01.0 67.0	24 58.1 -00.5 67.0	24 03.8 -00.2 67.0	23 09.4 +00.3 67.0
26°	26 45.4 -02.1 65.8	25 51.5 -01.6 65.8	24 57.6 -01.1 65.9	24 03.6 -00.6 65.9	23 09.7 -00.1 65.9
27°	26 43.3 -02.5 64.7	25 49.9 -02.0 64.7	24 56.5 -01.6 64.8	24 03.0 -01.0 64.8	23 09.6 -00.6 64.8
28°	26 40.8 -03.1 63.6	25 47.9 -02.6 63.6	24 54.9 -02.0 63.7	24 02.0 -01.6 63.7	23 09.0 -01.0 63.7
29°	26 37.7 -03.6 62.5	25 45.3 -03.1 62.5	24 52.9 -02.6 62.6	24 00.4 -02.0 62.6	23 08.0 -01.5 62.6

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Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	19 41.0 +10.9 93.6	18 42.0 +10.9 93.4	17 43.0 +10.8 93.2	16 44.0 +10.8 93.0	15 45.0 +10.7 92.9
1°	19 51.9 +10.5 92.6	18 52.9 +10.4 92.4	17 53.8 +10.5 92.2	16 54.8 +10.4 92.0	15 55.7 +10.4 91.8
2°	20 02.4 +10.2 91.5	19 03.3 +10.2 91.3	18 04.3 +10.1 91.2	17 05.2 +10.1 91.0	16 06.1 +10.1 90.8
3°	20 12.6 +09.7 90.5	19 13.5 +09.7 90.3	18 14.4 +09.8 90.1	17 15.3 +09.8 89.9	16 16.2 +09.8 89.8
4°	20 22.3 +09.4 89.4	19 23.2 +09.5 89.3	18 24.2 +09.4 89.1	17 25.1 +09.5 88.9	16 26.0 +09.5 88.7
5°	20 31.7 +09.0 88.4	19 32.7 +09.0 88.2	18 33.6 +09.1 88.0	17 34.6 +09.1 87.9	16 35.5 +09.2 87.7
6°	20 40.7 +08.7 87.3	19 41.7 +08.7 87.2	18 42.7 +08.8 87.0	17 43.7 +08.8 86.8	16 44.7 +08.9 86.7
7°	20 49.4 +08.2 86.3	19 50.4 +08.3 86.1	18 51.5 +08.4 86.0	17 52.5 +08.5 85.8	16 53.6 +08.6 85.7
8°	20 57.6 +07.8 85.2	19 58.7 +08.0 85.1	18 59.9 +08.0 84.9	18 01.0 +08.2 84.8	17 02.2 +08.2 84.6
9°	21 05.4 +07.5 84.1	20 06.7 +07.5 84.0	19 07.9 +07.7 83.9	18 09.2 +07.8 83.7	17 10.4 +08.0 83.6
10°	21 12.9 +07.0 83.1	20 14.2 +07.2 82.9	19 15.6 +07.3 82.8	18 17.0 +07.5 82.7	17 18.4 +07.6 82.5
11°	21 19.9 +06.6 82.0	20 21.4 +06.8 81.9	19 22.9 +07.0 81.8	18 24.5 +07.1 81.6	17 26.0 +07.3 81.5
12°	21 26.5 +06.3 80.9	20 28.2 +06.4 80.8	19 29.9 +06.6 80.7	18 31.6 +06.8 80.6	17 33.3 +07.0 80.5
13°	21 32.8 +05.8 79.9	20 34.6 +06.1 79.8	19 36.5 +06.2 79.6	18 38.4 +06.4 79.5	17 40.3 +06.6 79.4
14°	21 38.6 +05.4 78.8	20 40.7 +05.6 78.7	19 42.7 +05.9 78.6	18 44.8 +06.1 78.5	17 46.9 +06.3 78.4
15°	21 44.0 +05.0 77.7	20 46.3 +05.2 77.6	19 48.6 +05.5 77.5	18 50.9 +05.7 77.4	17 53.2 +06.0 77.3
16°	21 49.0 +04.6 76.7	20 51.5 +04.9 76.6	19 54.1 +05.1 76.5	18 56.6 +05.4 76.4	17 59.2 +05.7 76.3
17°	21 53.6 +04.1 75.6	20 56.4 +04.4 75.5	19 59.2 +04.7 75.4	19 02.0 +05.0 75.3	18 04.9 +05.3 75.2
18°	21 57.7 +03.8 74.5	21 00.8 +04.1 74.4	20 03.9 +04.4 74.4	19 07.0 +04.7 74.3	18 10.2 +04.9 74.2
19°	22 01.5 +03.3 73.4	21 04.9 +03.6 73.4	20 08.3 +03.9 73.3	19 11.7 +04.3 73.2	18 15.1 +04.6 73.1
20°	22 04.8 +02.9 72.3	21 08.5 +03.2 72.3	20 12.2 +03.6 72.2	19 16.0 +03.9 72.2	18 19.7 +04.3 72.1
21°	22 07.7 +02.5 71.3	21 11.7 +02.9 71.2	20 15.8 +03.2 71.2	19 19.9 +03.6 71.1	18 24.0 +03.9 71.0
22°	22 10.2 +02.0 70.2	21 14.6 +02.4 70.1	20 19.0 +02.8 70.1	19 23.5 +03.2 70.1	18 27.9 +03.6 70.0
23°	22 12.2 +01.6 69.1	21 17.0 +02.0 69.1	20 21.8 +02.5 69.0	19 26.7 +02.8 69.0	18 31.5 +03.2 68.9
24°	22 13.8 +01.2 68.0	21 19.0 +01.6 68.0	20 24.3 +02.0 68.0	19 29.5 +02.4 67.9	18 34.7 +02.9 67.9
25°	22 15.0 +00.8 67.0	21 20.6 +01.3 66.9	20 26.3 +01.6 66.9	19 31.9 +02.1 66.9	18 37.6 +02.5 66.8
26°	22 15.8 +00.3 65.9	21 21.9 +00.7 65.9	20 27.9 +01.3 65.8	19 34.0 +01.7 65.8	18 40.1 +02.2 65.8
27°	22 16.1 -00.1 64.8	21 22.6 +00.4 64.8	20 29.2 +00.9 64.8	19 35.7 +01.4 64.8	18 42.3 +01.8 64.7
28°	22 16.0 -00.5 63.7	21 23.0 +00.0 63.7	20 30.1 +00.4 63.7	19 37.1 +01.0 63.7	18 44.1 +01.5 63.7
29°	22 15.5 -01.0 62.6	21 23.0 -00.4 62.6	20 30.5 +00.1 62.6	19 38.1 +00.6 62.6	18 45.6 +01.1 62.6

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 46.0 +10.7 92.7	13 47.0 +10.6 92.5	12 47.9 +10.6 92.3	11 48.9 +10.5 92.1	10 49.9 +10.5 91.9
1°	14 56.7 +10.3 91.6	13 57.6 +10.3 91.5	12 58.5 +10.4 91.3	11 59.4 +10.4 91.1	11 00.4 +10.3 90.9
2°	15 07.0 +10.1 90.6	14 07.9 +10.1 90.4	13 08.9 +10.0 90.3	12 09.8 +10.1 90.1	11 10.7 +10.1 89.9
3°	15 17.1 +09.8 89.6	14 18.0 +09.9 89.4	13 18.9 +09.9 89.3	12 19.9 +09.8 89.1	11 20.8 +09.9 88.9
4°	15 26.9 +09.6 88.6	14 27.9 +09.5 88.4	13 28.8 +09.6 88.2	12 29.7 +09.7 88.1	11 30.7 +09.7 87.9
5°	15 36.5 +09.2 87.6	14 37.4 +09.3 87.4	13 38.4 +09.4 87.2	12 39.4 +09.4 87.1	11 40.4 +09.5 86.9
6°	15 45.7 +09.0 86.5	14 46.7 +09.1 86.4	13 47.8 +09.1 86.2	12 48.8 +09.2 86.1	11 49.9 +09.3 85.9
7°	15 54.7 +08.6 85.5	14 55.8 +08.7 85.4	13 56.9 +08.9 85.2	12 58.0 +09.0 85.0	11 59.2 +09.0 84.9
8°	16 03.3 +08.4 84.5	15 04.5 +08.5 84.3	14 05.8 +08.6 84.2	13 07.0 +08.7 84.0	12 08.2 +08.9 83.9
9°	16 11.7 +08.1 83.4	15 13.0 +08.2 83.3	14 14.4 +08.3 83.2	13 15.7 +08.5 83.0	12 17.1 +08.6 82.9
10°	16 19.8 +07.8 82.4	15 21.2 +08.0 82.3	14 22.7 +08.1 82.1	13 24.2 +08.2 82.0	12 25.7 +08.4 81.9
11°	16 27.6 +07.4 81.4	15 29.2 +07.6 81.2	14 30.8 +07.8 81.1	13 32.4 +08.0 81.0	12 34.1 +08.1 80.8
12°	16 35.0 +07.2 80.3	15 36.8 +07.4 80.2	14 38.6 +07.5 80.1	13 40.4 +07.7 80.0	12 42.2 +07.9 79.8
13°	16 42.2 +06.9 79.3	15 44.2 +07.0 79.2	14 46.1 +07.3 79.1	13 48.1 +07.5 78.9	12 50.1 +07.7 78.8
14°	16 49.1 +06.5 78.3	15 51.2 +06.8 78.2	14 53.4 +07.0 78.0	13 55.6 +07.2 77.9	12 57.8 +07.5 77.8
15°	16 55.6 +06.2 77.2	15 58.0 +06.4 77.1	15 00.4 +06.7 77.0	14 02.8 +07.0 76.9	13 05.3 +07.2 76.8
16°	17 01.8 +05.9 76.2	16 04.4 +06.2 76.1	15 07.1 +06.4 76.0	14 09.8 +06.7 75.9	13 12.5 +07.0 75.8
17°	17 07.7 +05.6 75.1	16 10.6 +05.9 75.1	15 13.5 +06.2 74.9	14 16.5 +06.4 74.8	13 19.5 +06.7 74.7
18°	17 13.3 +05.3 74.1	16 16.5 +05.6 74.0	15 19.7 +05.9 73.9	14 22.9 +06.2 73.8	13 26.2 +06.5 73.7
19°	17 18.6 +04.9 73.1	16 22.1 +05.2 73.0	15 25.6 +05.6 72.9	14 29.1 +05.9 72.8	13 32.7 +06.2 72.7
20°	17 23.5 +04.6 72.0	16 27.3 +05.0 71.9	15 31.2 +05.3 71.9	14 35.0 +05.7 71.8	13 38.9 +06.0 71.7
21°	17 28.1 +04.3 71.0	16 32.3 +04.6 70.9	15 36.5 +05.0 70.8	14 40.7 +05.3 70.7	13 44.9 +05.7 70.6
22°	17 32.4 +04.0 69.9	16 36.9 +04.4 69.9	15 41.5 +04.7 69.8	14 46.0 +05.1 69.7	13 50.6 +05.5 69.6
23°	17 36.4 +03.6 68.9	16 41.3 +04.0 68.8	15 46.2 +04.4 68.7	14 51.1 +04.8 68.7	13 56.1 +05.2 68.6
24°	17 40.0 +03.3 67.8	16 45.3 +03.7 67.8	15 50.6 +04.1 67.7	14 55.9 +04.6 67.6	14 01.3 +05.0 67.6
25°	17 43.3 +03.0 66.8	16 49.0 +03.4 66.7	15 54.7 +03.9 66.7	15 00.5 +04.2 66.6	14 06.3 +04.7 66.5
26°	17 46.3 +02.6 65.7	16 52.4 +03.1 65.7	15 58.6 +03.5 65.6	15 04.7 +04.0 65.6	14 11.0 +04.4 65.5
27°	17 48.9 +02.3 64.7	16 55.5 +02.7 64.6	16 02.1 +03.2 64.6	15 08.7 +03.7 64.5	14 15.4 +04.2 64.5
28°	17 51.2 +01.9 63.6	16 58.2 +02.5 63.6	16 05.3 +03.0 63.6	15 12.4 +03.4 63.5	14 19.6 +03.9 63.4
29°	17 53.1 +01.6 62.6	17 00.7 +02.1 62.6	16 08.3 +02.6 62.5	15 15.8 +03.2 62.5	14 23.5 +03.6 62.4

Declination SAME name as Latitude

Latitude 10°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 50.8 +10.5 91.8	8 51.7 +10.5 91.6	7 52.7 +10.4 91.4	6 53.6 +10.4 91.2	5 54.5 +10.4 91.0
1°	10 01.3 +10.3 90.8	9 02.2 +10.3 90.6	8 03.1 +10.3 90.4	7 04.0 +10.3 90.2	6 04.9 +10.3 90.1
2°	10 11.6 +10.1 89.8	9 12.5 +10.1 89.6	8 13.4 +10.2 89.4	7 14.3 +10.2 89.2	6 15.2 +10.2 89.1
3°	10 21.7 +09.9 88.8	9 22.6 +10.0 88.6	8 23.6 +10.0 88.4	7 24.5 +10.1 88.2	6 25.4 +10.1 88.1
4°	10 31.6 +09.8 87.7	9 32.6 +09.8 87.6	8 33.6 +09.8 87.4	7 34.6 +09.9 87.2	6 35.5 +10.0 87.1
5°	10 41.4 +09.6 86.7	9 42.4 +09.6 86.6	8 43.4 +09.7 86.4	7 44.5 +09.7 86.3	6 45.5 +09.9 86.1
6°	10 51.0 +09.3 85.7	9 52.0 +09.5 85.6	8 53.1 +09.6 85.4	7 54.2 +09.7 85.3	6 55.4 +09.7 85.1
7°	11 00.3 +09.2 84.7	10 01.5 +09.2 84.6	9 02.7 +09.3 84.4	8 03.9 +09.4 84.3	7 05.1 +09.6 84.1
8°	11 09.5 +08.9 83.7	10 10.7 +09.1 83.6	9 12.0 +09.2 83.4	8 13.3 +09.4 83.3	7 14.7 +09.4 83.1
9°	11 18.4 +08.8 82.7	10 19.8 +08.9 82.6	9 21.2 +09.1 82.4	8 22.7 +09.2 82.3	7 24.1 +09.4 82.1
10°	11 27.2 +08.5 81.7	10 28.7 +08.7 81.6	9 30.3 +08.9 81.4	8 31.9 +09.0 81.3	7 33.5 +09.2 81.1
11°	11 35.7 +08.4 80.7	10 37.4 +08.5 80.6	9 39.2 +08.7 80.4	8 40.9 +08.9 80.3	7 42.7 +09.0 80.1
12°	11 44.1 +08.1 79.7	10 45.9 +08.4 79.6	9 47.9 +08.5 79.4	8 49.8 +08.7 79.3	7 51.7 +09.0 79.1
13°	11 52.2 +07.9 78.7	10 54.3 +08.1 78.5	9 56.4 +08.3 78.4	8 58.5 +08.6 78.3	8 00.7 +08.7 78.1
14°	12 00.1 +07.7 77.7	11 02.4 +07.9 77.5	10 04.7 +08.2 77.4	9 07.1 +08.4 77.3	8 09.4 +08.7 77.1
15°	12 07.8 +07.5 76.6	11 10.3 +07.7 76.5	10 12.9 +07.9 76.4	9 15.5 +08.2 76.3	8 18.1 +08.4 76.1
16°	12 15.3 +07.2 75.6	11 18.0 +07.5 75.5	10 20.8 +07.8 75.4	9 23.7 +08.0 75.3	8 26.5 +08.4 75.1
17°	12 22.5 +07.0 74.6	11 25.5 +07.3 74.5	10 28.6 +07.6 74.4	9 31.7 +07.9 74.3	8 34.9 +08.1 74.1
18°	12 29.5 +06.8 73.6	11 32.8 +07.1 73.5	10 36.2 +07.4 73.4	9 39.6 +07.7 73.2	8 43.0 +08.1 73.1
19°	12 36.3 +06.6 72.6	11 39.9 +06.9 72.5	10 43.6 +07.2 72.4	9 47.3 +07.5 72.2	8 51.1 +07.8 72.1
20°	12 42.9 +06.3 71.6	11 46.8 +06.7 71.5	10 50.8 +07.0 71.3	9 54.8 +07.4 71.2	8 58.9 +07.7 71.1
21°	12 49.2 +06.1 70.5	11 53.5 +06.4 70.4	10 57.8 +06.8 70.3	10 02.2 +07.2 70.2	9 06.6 +07.5 70.1
22°	12 55.3 +05.8 69.5	11 59.9 +06.2 69.4	11 04.6 +06.6 69.3	10 09.4 +06.9 69.2	9 14.1 +07.4 69.1
23°	13 01.1 +05.6 68.5	12 06.1 +06.1 68.4	11 11.2 +06.4 68.3	10 16.3 +06.8 68.2	9 21.5 +07.2 68.1
24°	13 06.7 +05.4 67.5	12 12.2 +05.7 67.4	11 17.6 +06.2 67.3	10 23.1 +06.6 67.2	9 28.7 +07.0 67.1
25°	13 12.1 +05.1 66.5	12 17.9 +05.6 66.4	11 23.8 +06.0 66.3	10 29.7 +06.4 66.2	9 35.7 +06.8 66.1
26°	13 17.2 +04.9 65.4	12 23.5 +05.3 65.4	11 29.8 +05.8 65.3	10 36.1 +06.3 65.2	9 42.5 +06.7 65.1
27°	13 22.1 +04.6 64.4	12 28.8 +05.1 64.3	11 35.6 +05.5 64.3	10 42.4 +06.0 64.2	9 49.2 +06.5 64.1
28°	13 26.7 +04.4 63.4	12 33.9 +04.9 63.3	11 41.1 +05.4 63.2	10 48.4 +05.8 63.1	9 55.7 +06.3 63.1
29°	13 31.1 +04.1 62.4	12 38.8 +04.6 62.3	11 46.5 +05.1 62.2	10 54.2 +05.6 62.1	10 02.0 +06.1 62.0

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 55.4 +10.4 90.9	3 56.3 +10.5 90.7	2 57.3 +10.4 90.5	1 58.2 +10.4 90.3	0 59.1 +10.4 90.2
1°	5 05.8 +10.4 89.9	4 06.8 +10.3 89.7	3 07.7 +10.3 89.5	2 08.6 +10.4 89.4	1 09.5 +10.4 89.2
2°	5 16.2 +10.2 88.9	4 17.1 +10.3 88.7	3 18.0 +10.3 88.5	2 19.0 +10.3 88.4	1 19.9 +10.4 88.2
3°	5 26.4 +10.1 87.9	4 27.4 +10.1 87.7	3 28.3 +10.2 87.6	2 29.3 +10.3 87.4	1 30.3 +10.3 87.2
4°	5 36.5 +10.1 86.9	4 37.5 +10.1 86.7	3 38.5 +10.2 86.6	2 39.6 +10.2 86.4	1 40.6 +10.3 86.2
5°	5 46.6 +09.9 85.9	4 47.6 +10.0 85.8	3 48.7 +10.1 85.6	2 49.8 +10.2 85.4	1 50.9 +10.3 85.2
6°	5 56.5 +09.8 84.9	4 57.6 +10.0 84.8	3 58.8 +10.0 84.6	3 00.0 +10.1 84.4	2 01.2 +10.2 84.3
7°	6 06.3 +09.7 83.9	5 07.6 +09.8 83.8	4 08.8 +10.0 83.6	3 10.1 +10.1 83.4	2 11.4 +10.2 83.3
8°	6 16.0 +09.6 82.9	5 17.4 +09.7 82.8	4 18.8 +09.9 82.6	3 20.2 +10.0 82.5	2 21.6 +10.2 82.3
9°	6 25.6 +09.5 82.0	5 27.1 +09.7 81.8	4 28.7 +09.8 81.6	3 30.2 +10.0 81.5	2 31.8 +10.1 81.3
10°	6 35.1 +09.4 81.0	5 36.8 +09.5 80.8	4 38.5 +09.7 80.6	3 40.2 +09.9 80.5	2 41.9 +10.1 80.3
11°	6 44.5 +09.2 80.0	5 46.3 +09.5 79.8	4 48.2 +09.6 79.7	3 50.1 +09.8 79.5	2 52.0 +10.0 79.3
12°	6 53.7 +09.2 79.0	5 55.8 +09.3 78.8	4 57.8 +09.5 78.7	3 59.9 +09.7 78.5	3 02.0 +10.0 78.3
13°	7 02.9 +09.0 78.0	6 05.1 +09.2 77.8	5 07.3 +09.5 77.7	4 09.6 +09.7 77.5	3 12.0 +09.9 77.4
14°	7 11.9 +08.8 77.0	6 14.3 +09.1 76.8	5 16.8 +09.3 76.7	4 19.3 +09.6 76.5	3 21.9 +09.8 76.4
15°	7 20.7 +08.8 76.0	6 23.4 +09.0 75.8	5 26.1 +09.3 75.7	4 28.9 +09.5 75.5	3 31.7 +09.8 75.4
16°	7 29.5 +08.6 75.0	6 32.4 +08.9 74.8	5 35.4 +09.2 74.7	4 38.4 +09.5 74.5	3 41.5 +09.7 74.4
17°	7 38.1 +08.4 74.0	6 41.3 +08.7 73.8	5 44.6 +09.0 73.7	4 47.9 +09.3 73.6	3 51.2 +09.7 73.4
18°	7 46.5 +08.4 73.0	6 50.0 +08.7 72.8	5 53.6 +09.0 72.7	4 57.2 +09.3 72.6	4 00.9 +09.5 72.4
19°	7 54.9 +08.1 72.0	6 58.7 +08.5 71.9	6 02.6 +08.8 71.7	5 06.5 +09.1 71.6	4 10.4 +09.5 71.4
20°	8 03.0 +08.1 71.0	7 07.2 +08.4 70.9	6 11.4 +08.7 70.7	5 15.6 +09.1 70.6	4 19.9 +09.5 70.4
21°	8 11.1 +07.9 70.0	7 15.6 +08.2 69.9	6 20.1 +08.6 69.7	5 24.7 +09.0 69.6	4 29.4 +09.3 69.4
22°	8 19.0 +07.7 69.0	7 23.8 +08.1 68.9	6 28.7 +08.5 68.7	5 33.7 +08.9 68.6	4 38.7 +09.3 68.5
23°	8 26.7 +07.6 68.0	7 31.9 +08.0 67.9	6 37.2 +08.4 67.7	5 42.6 +08.8 67.6	4 48.0 +09.2 67.5
24°	8 34.3 +07.4 67.0	7 39.9 +07.9 66.9	6 45.6 +08.3 66.7	5 51.4 +08.6 66.6	4 57.2 +09.0 66.5
25°	8 41.7 +07.3 66.0	7 47.8 +07.7 65.9	6 53.9 +08.1 65.7	6 00.0 +08.6 65.6	5 06.2 +09.0 65.5
26°	8 49.0 +07.1 65.0	7 55.5 +07.5 64.9	7 02.0 +08.0 64.7	6 08.6 +08.4 64.6	5 15.2 +08.9 64.5
27°	8 56.1 +06.9 64.0	8 03.0 +07.4 63.9	7 10.0 +07.9 63.7	6 17.0 +08.4 63.6	5 24.1 +08.8 63.5
28°	9 03.0 +06.8 63.0	8 10.4 +07.3 62.9	7 17.9 +07.7 62.7	6 25.4 +08.2 62.6	5 32.9 +08.8 62.5
29°	9 09.8 +06.6 62.0	8 17.7 +07.1 61.8	7 25.6 +07.6 61.7	6 33.6 +08.1 61.6	5 41.7 +08.6 61.5

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Latitude 10°

Declination SAME name as Latitude

Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +10.4 90.0	-0 59.1 +10.4	-1 58.2 +10.5	-2 57.3 +10.5	-3 56.3 +10.4
1°	0 10.4 +10.4 89.0	-0 48.7 +10.5	-1 47.7 +10.4	-2 46.8 +10.5	-3 45.9 +10.6
2°	0 20.8 +10.4 88.0	-0 38.2 +10.4	-1 37.3 +10.5	-2 36.3 +10.6	-3 35.3 +10.6
3°	0 31.2 +10.4 87.0	-0 27.8 +10.5	-1 26.8 +10.6	-2 25.7 +10.6	-3 24.7 +10.7
4°	0 41.6 +10.4 86.1	-0 17.3 +10.5	-1 16.2 +10.5	-2 15.1 +10.6	-3 14.0 +10.7
5°	0 52.0 +10.4 85.1	-0 06.8 +10.4	-1 05.7 +10.6	-2 04.5 +10.7	-3 03.3 +10.8
6°	1 02.4 +10.4 84.1	0 03.6 +10.5 83.9	-0 55.1 +10.6	-1 53.8 +10.7	-2 52.5 +10.8
7°	1 12.8 +10.3 83.1	0 14.1 +10.5 82.9	-0 44.5 +10.6	-1 43.1 +10.7	-2 41.7 +10.9
8°	1 23.1 +10.3 82.1	0 24.6 +10.4 81.9	-0 33.9 +10.6	-1 32.4 +10.8	-2 30.8 +10.9
9°	1 33.4 +10.3 81.1	0 35.0 +10.5 81.0	-0 23.3 +10.6	-1 21.6 +10.8	-2 19.9 +11.0
10°	1 43.7 +10.2 80.1	0 45.5 +10.4 80.0	-0 12.7 +10.6	-1 10.8 +10.8	-2 08.9 +11.0
11°	1 53.9 +10.2 79.2	0 55.9 +10.4 79.0	-0 02.1 +10.6	-1 00.0 +10.8	-1 57.9 +11.0
12°	2 04.1 +10.2 78.2	1 06.3 +10.4 78.0	0 08.5 +10.7 77.8	-0 49.2 +10.8	-1 46.9 +11.1
13°	2 14.3 +10.2 77.2	1 16.7 +10.4 77.0	0 19.2 +10.6 76.9	-0 38.4 +10.9	-1 35.8 +11.1
14°	2 24.5 +10.1 76.2	1 27.1 +10.3 76.0	0 29.8 +10.6 75.9	-0 27.5 +10.9	-1 24.7 +11.1
15°	2 34.6 +10.0 75.2	1 37.4 +10.4 75.1	0 40.4 +10.6 74.9	-0 16.6 +10.8	-1 13.6 +11.1
16°	2 44.6 +10.0 74.2	1 47.8 +10.3 74.1	0 51.0 +10.5 73.9	-0 05.8 +10.9	-1 02.5 +11.2
17°	2 54.6 +10.0 73.2	1 58.1 +10.2 73.1	1 01.5 +10.6 72.9	0 05.1 +10.9 72.7	-0 51.3 +11.2
18°	3 04.6 +09.9 72.3	2 08.3 +10.2 72.1	1 12.1 +10.5 71.9	0 16.0 +10.8 71.8	-0 40.1 +11.2
19°	3 14.5 +09.8 71.3	2 18.5 +10.2 71.1	1 22.6 +10.6 70.9	0 26.8 +10.9 70.8	-0 28.9 +11.2
20°	3 24.3 +09.8 70.3	2 28.7 +10.1 70.1	1 33.2 +10.4 70.0	0 37.7 +10.8 69.8	-0 17.7 +11.2
21°	3 34.1 +09.7 69.3	2 38.8 +10.1 69.1	1 43.6 +10.5 69.0	0 48.5 +10.8 68.8	-0 06.5 +11.2
22°	3 43.8 +09.6 68.3	2 48.9 +10.0 68.2	1 54.1 +10.4 68.0	0 59.3 +10.9 67.8	0 04.7 +11.2 67.7
23°	3 53.4 +09.6 67.3	2 58.9 +10.0 67.2	2 04.5 +10.4 67.0	1 10.2 +10.7 66.8	0 15.9 +11.2 66.7
24°	4 03.0 +09.5 66.3	3 08.9 +09.9 66.2	2 14.9 +10.3 66.0	1 20.9 +10.8 65.9	0 27.1 +11.2 65.7
25°	4 12.5 +09.4 65.3	3 18.8 +09.9 65.2	2 25.2 +10.3 65.0	1 31.7 +10.8 64.9	0 38.3 +11.1 64.7
26°	4 21.9 +09.4 64.3	3 28.7 +09.8 64.2	2 35.5 +10.3 64.0	1 42.5 +10.7 63.9	0 49.4 +11.2 63.7
27°	4 31.3 +09.3 63.4	3 38.5 +09.8 63.2	2 45.8 +10.2 63.1	1 53.2 +10.6 62.9	1 00.6 +11.1 62.7
28°	4 40.6 +09.2 62.4	3 48.3 +09.6 62.2	2 56.0 +10.2 62.1	2 03.8 +10.7 61.9	1 11.7 +11.2 61.8
29°	4 49.8 +09.1 61.4	3 57.9 +09.6 61.2	3 06.2 +10.1 61.1	2 14.5 +10.6 60.9	1 22.9 +11.1 60.8

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 55.4 +10.5	-5 54.5 +10.5			
1°	-4 44.9 +10.6	-5 44.0 +10.6			
2°	-4 34.3 +10.6	-5 33.4 +10.8			
3°	-4 23.7 +10.8	-5 22.6 +10.8			
4°	-4 12.9 +10.8	-5 11.8 +10.9			
5°	-4 02.1 +10.9	-5 00.9 +11.0			
6°	-3 51.2 +10.9	-4 49.9 +11.1			
7°	-3 40.3 +11.1	-4 38.8 +11.2			
8°	-3 29.2 +11.0	-4 27.6 +11.2			
9°	-3 18.2 +11.2	-4 16.4 +11.3			
10°	-3 07.0 +11.2	-4 05.1 +11.4			
11°	-2 55.8 +11.2	-3 53.7 +11.5			
12°	-2 44.6 +11.3	-3 42.2 +11.5			
13°	-2 33.3 +11.4	-3 30.7 +11.6			
14°	-2 21.9 +11.4	-3 19.1 +11.7			
15°	-2 10.5 +11.4	-3 07.4 +11.7			
16°	-1 59.1 +11.4	-2 55.7 +11.8			
17°	-1 47.7 +11.5	-2 43.9 +11.8			
18°	-1 36.2 +11.6	-2 32.1 +11.8			
19°	-1 24.6 +11.5	-2 20.3 +11.9			
20°	-1 13.1 +11.6	-2 08.4 +11.9			
21°	-1 01.5 +11.5	-1 56.5 +12.0			
22°	-0 50.0 +11.6	-1 44.5 +12.0			
23°	-0 38.4 +11.6	-1 32.5 +12.0			
24°	-0 26.8 +11.7	-1 20.5 +12.1			
25°	-0 15.1 +11.6	-1 08.4 +12.0			
26°	-0 03.5 +11.6	-0 56.4 +12.1			
27°	0 08.1 +11.6 62.6	-0 44.3 +12.1			
28°	0 19.7 +11.6 61.6	-0 32.2 +12.1			
29°	0 31.3 +11.6 60.6	-0 20.1 +12.1			

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Latitude 11°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	79 00.0 +60.0 180.0	78 57.3 +59.7 174.8	78 49.3 +59.0 169.6	78 36.2 +57.7 164.6	78 18.2 +56.2 159.9
1°	80 00.0 +60.0 180.0	79 57.0 +59.7 174.3	79 48.3 +58.7 168.6	79 33.9 +57.3 163.2	79 14.4 +55.4 158.1
2°	81 00.0 +60.0 180.0	80 56.7 +59.6 173.6	80 47.0 +58.5 167.4	80 31.2 +56.7 161.5	80 09.8 +54.4 155.9
3°	82 00.0 +60.0 180.0	81 56.3 +59.5 172.9	81 45.5 +58.0 165.9	81 27.9 +55.8 159.4	81 04.2 +53.2 153.3
4°	83 00.0 +60.0 180.0	82 55.8 +59.3 171.9	82 43.5 +57.4 164.0	82 23.7 +54.6 156.8	81 57.4 +51.3 150.2
5°	84 00.0 +60.0 180.0	83 55.1 +59.1 170.6	83 40.9 +56.5 161.6	83 18.3 +52.9 153.4	82 48.7 +48.8 146.3
6°	85 00.0 +60.0 180.0	84 54.2 +58.6 168.7	84 37.4 +54.9 158.3	84 11.2 +50.1 149.1	83 37.5 +45.2 141.3
7°	86 00.0 +60.0 180.0	85 52.8 +57.7 166.0	85 32.3 +52.3 153.6	85 01.3 +45.9 143.2	84 22.7 +40.0 135.0
8°	87 00.0 +60.0 180.0	86 50.5 +55.7 161.7	86 24.6 +47.0 146.5	85 47.2 +38.7 135.1	85 02.7 +32.2 126.9
9°	88 00.0 +60.0 180.0	87 46.2 +49.7 153.7	87 11.6 +36.0 135.3	86 25.9 +27.2 123.8	85 34.9 +21.6 116.6
10°	89 00.0 +60.0 180.0	88 35.9 +25.2 135.4	87 47.6 +14.6 116.8	86 53.1 +10.2 108.4	85 56.5 +07.9 103.9
11°	90 00.0 -60.0 0.0	89 01.1 -25.1 89.9	88 02.2 -14.2 89.8	87 03.3 -09.6 89.7	86 04.4 -07.1 89.6
12°	89 00.0 -60.0 0.0	88 36.0 -49.6 44.3	87 48.0 -35.9 62.8	86 53.7 -26.8 70.9	85 57.3 -20.9 75.3
13°	88 00.0 -60.0 0.0	87 46.4 -55.7 26.0	87 12.1 -46.9 44.2	86 26.9 -38.4 55.4	85 36.4 -31.8 62.5
14°	87 00.0 -60.0 0.0	86 50.7 -57.7 17.9	86 25.2 -52.2 32.8	85 48.5 -45.7 44.0	85 04.6 -39.6 52.0
15°	86 00.0 -60.0 0.0	85 53.0 -58.6 13.6	85 33.0 -54.9 25.8	85 02.8 -50.1 35.8	84 25.0 -45.0 43.8
16°	85 00.0 -60.0 0.0	84 54.4 -59.1 10.9	84 38.1 -56.4 21.0	84 12.7 -52.8 29.9	83 40.0 -48.7 37.4
17°	84 00.0 -60.0 0.0	83 55.3 -59.3 9.1	83 41.7 -57.4 17.7	83 19.9 -54.6 25.5	82 51.3 -51.2 32.4
18°	83 00.0 -60.0 0.0	82 56.0 -59.5 7.8	82 44.3 -58.1 15.2	82 25.3 -55.8 22.2	82 00.1 -53.0 28.5
19°	82 00.0 -60.0 0.0	81 56.5 -59.6 6.8	81 46.2 -58.4 13.3	81 29.5 -56.6 19.5	81 07.1 -54.4 25.3
20°	81 00.0 -60.0 0.0	80 56.9 -59.7 6.0	80 47.8 -58.8 11.8	80 32.9 -57.3 17.4	80 12.7 -55.4 22.7
21°	80 00.0 -60.0 0.0	79 57.2 -59.7 5.4	79 49.0 -58.9 10.6	79 35.6 -57.7 15.7	79 17.3 -56.1 20.5
22°	79 00.0 -60.0 0.0	78 57.5 -59.8 4.8	78 50.1 -59.1 9.6	78 37.9 -58.1 14.3	78 21.2 -56.7 18.7
23°	78 00.0 -60.0 0.0	77 57.7 -59.8 4.4	77 51.0 -59.3 8.8	77 39.8 -58.4 13.0	77 24.5 -57.2 17.1
24°	77 00.0 -60.0 0.0	76 57.9 -59.8 4.1	76 51.7 -59.4 8.1	76 41.4 -58.6 12.0	76 27.3 -57.6 15.8
25°	76 00.0 -60.0 0.0	75 58.1 -59.9 3.7	75 52.3 -59.4 7.4	75 42.8 -58.7 11.1	75 29.7 -57.8 14.6
26°	75 00.0 -60.0 0.0	74 58.2 -59.9 3.5	74 52.9 -59.5 6.9	74 44.1 -58.9 10.3	74 31.9 -58.1 13.6
27°	74 00.0 -60.0 0.0	73 58.3 -59.9 3.2	73 53.4 -59.6 6.4	73 45.2 -59.1 9.6	73 33.8 -58.3 12.7
28°	73 00.0 -60.0 0.0	72 58.4 -59.9 3.0	72 53.8 -59.6 6.0	72 46.1 -59.1 9.0	72 35.5 -58.5 11.9
29°	72 00.0 -60.0 0.0	71 58.5 -59.9 2.8	71 54.2 -59.7 5.6	71 47.0 -59.2 8.4	71 37.0 -58.7 11.2

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	77 55.8 +54.3 155.4	77 29.3 +52.2 151.2	76 59.1 +50.1 147.2	76 25.7 +48.0 143.6	75 49.4 +45.8 140.3
1°	78 50.1 +53.3 153.3	78 21.5 +51.0 148.8	77 49.2 +48.6 144.7	77 13.7 +46.2 141.0	76 35.2 +44.0 137.6
2°	79 43.4 +51.9 150.8	79 12.5 +49.3 146.1	78 37.8 +46.7 141.8	77 59.9 +44.1 138.0	77 19.2 +41.7 134.6
3°	80 35.3 +50.2 147.8	80 01.8 +47.2 142.9	79 24.5 +44.3 138.5	78 44.0 +41.5 134.7	78 00.9 +38.9 131.2
4°	81 25.5 +47.8 144.3	80 49.0 +44.5 139.2	80 08.8 +41.3 134.7	79 25.5 +38.4 130.8	78 39.8 +35.8 127.4
5°	82 13.3 +44.8 140.1	81 33.5 +41.0 134.8	80 50.1 +37.6 130.3	80 03.9 +34.7 126.5	79 15.6 +32.0 123.3
6°	82 58.1 +40.6 134.9	82 14.5 +36.6 129.6	81 27.7 +33.1 125.3	80 38.6 +30.1 121.6	79 47.6 +27.7 118.6
7°	83 38.7 +35.0 128.6	82 51.1 +30.9 123.5	82 00.8 +27.6 119.5	81 08.7 +24.9 116.2	80 15.3 +22.6 113.5
8°	84 13.7 +27.4 120.9	83 22.0 +23.7 116.4	82 28.4 +21.0 112.9	81 33.6 +18.7 110.1	80 37.9 +17.0 107.9
9°	84 41.1 +17.9 111.7	83 45.7 +15.3 108.2	82 49.4 +13.3 105.6	81 52.3 +12.0 103.5	80 54.9 +10.8 101.9
10°	84 59.0 +06.5 101.0	84 01.0 +05.6 99.1	83 02.7 +05.0 97.6	82 04.3 +04.5 96.5	81 05.7 +04.2 95.6
11°	85 05.5 -05.5 89.5	84 06.6 -04.4 89.4	83 07.7 -03.6 89.3	82 08.8 -03.0 89.2	81 09.9 -02.4 89.1
12°	85 00.0 -17.0 78.0	84 02.2 -14.2 79.8	83 04.1 -12.1 81.0	82 05.8 -10.4 81.9	81 07.5 -09.1 82.6
13°	84 43.0 -26.7 67.3	83 48.0 -22.8 70.6	82 52.0 -19.8 73.0	81 55.4 -17.3 74.9	80 58.4 -15.4 76.3
14°	84 16.3 -34.5 57.9	83 25.2 -30.1 62.3	82 32.2 -26.5 65.6	81 38.1 -23.7 68.2	80 43.0 -21.2 70.2
15°	83 41.8 -40.2 50.1	82 55.1 -36.0 55.0	82 05.7 -32.3 58.9	81 14.4 -29.1 62.0	80 21.8 -26.3 64.5
16°	83 01.6 -44.5 43.6	82 19.1 -40.6 48.7	81 33.4 -37.0 52.9	80 45.3 -33.7 56.4	79 55.5 -31.0 59.3
17°	82 17.1 -47.6 38.4	81 38.5 -44.1 43.4	80 56.4 -40.8 47.7	80 11.6 -37.7 51.4	79 24.5 -34.8 54.5
18°	81 29.5 -50.0 34.1	80 54.4 -46.9 39.0	80 15.6 -43.8 43.2	79 33.9 -40.9 47.0	78 49.7 -38.1 50.2
19°	80 39.5 -51.8 30.5	80 07.5 -49.1 35.2	79 31.8 -46.3 39.4	78 53.0 -43.6 43.0	78 11.6 -41.0 46.3
20°	79 47.7 -53.2 27.5	79 18.4 -50.8 32.0	78 45.5 -48.3 36.0	78 09.4 -45.8 39.6	77 30.6 -43.4 42.8
21°	78 54.5 -54.2 25.0	78 27.6 -52.1 29.2	77 57.2 -49.9 33.0	77 23.6 -47.7 36.5	76 47.2 -45.4 39.7
22°	78 00.3 -55.1 22.9	77 35.5 -53.2 26.8	77 07.3 -51.3 30.5	76 35.9 -49.2 33.8	76 01.8 -47.1 36.9
23°	77 05.2 -55.7 21.0	76 42.3 -54.1 24.7	76 16.0 -52.3 28.2	75 46.7 -50.5 31.4	75 14.7 -48.6 34.4
24°	76 09.5 -56.3 19.4	75 48.2 -54.9 22.9	75 23.7 -53.3 26.2	74 56.2 -51.5 29.3	74 26.1 -49.8 32.2
25°	75 13.2 -56.8 18.0	74 53.3 -55.4 21.3	74 30.4 -54.0 24.4	74 04.7 -52.5 27.4	73 36.3 -50.8 30.2
26°	74 16.4 -57.1 16.8	73 57.9 -56.0 19.9	73 36.4 -54.6 22.8	73 12.2 -53.2 25.7	72 45.5 -51.7 28.3
27°	73 19.3 -57.4 15.7	73 01.9 -56.3 18.6	72 41.8 -55.2 21.4	72 19.0 -53.9 24.1	71 53.8 -52.6 26.7
28°	72 21.9 -57.7 14.7	72 05.6 -56.8 17.5	71 46.6 -55.7 20.1	71 25.1 -54.5 22.7	71 01.2 -53.2 25.1
29°	71 24.2 -57.9 13.8	71 08.8 -57.0 16.4	70 50.9 -56.0 19.0	70 30.6 -55.0 21.4	70 08.0 -53.8 23.7

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Latitude 11°

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Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	75 10.5 +43.9 137.3	74 29.5 +41.9 134.5	73 46.6 +39.9 131.9	73 01.9 +38.2 129.6	72 15.8 +36.6 127.4
1°	75 54.4 +41.7 134.5	75 11.4 +39.7 131.7	74 26.5 +37.8 129.2	73 40.1 +36.0 126.9	72 52.4 +34.3 124.8
2°	76 36.1 +39.4 131.5	75 51.1 +37.2 128.7	75 04.3 +35.3 126.2	74 16.1 +33.6 124.0	73 26.7 +31.9 121.9
3°	77 15.5 +36.6 128.2	76 28.3 +34.5 125.5	75 39.6 +32.6 123.0	74 49.7 +30.8 120.9	73 58.6 +29.2 118.9
4°	77 52.1 +33.4 124.5	77 02.8 +31.3 121.9	76 12.2 +29.4 119.6	75 20.5 +27.7 117.5	74 27.8 +26.2 115.7
5°	78 25.5 +29.8 120.4	77 34.1 +27.7 118.0	76 41.6 +25.9 115.9	75 48.2 +24.4 114.0	74 54.0 +23.0 112.3
6°	78 55.3 +25.5 116.0	78 01.8 +23.7 113.8	77 07.5 +22.1 111.9	76 12.6 +20.7 110.2	75 17.0 +19.5 108.7
7°	79 20.8 +20.7 111.2	78 25.5 +19.2 109.3	77 29.6 +17.9 107.6	76 33.3 +16.8 106.2	75 36.5 +15.8 105.0
8°	79 41.5 +15.6 106.0	78 44.7 +14.4 104.5	77 47.5 +13.4 103.2	76 50.1 +12.5 102.0	75 52.3 +11.9 101.0
9°	79 57.1 +09.9 100.6	78 59.1 +09.2 99.5	78 00.9 +08.7 98.5	77 02.6 +08.2 97.7	76 04.2 +07.8 97.0
10°	80 07.0 +04.1 94.9	79 08.3 +03.9 94.3	78 09.6 +03.7 93.7	77 10.8 +03.6 93.3	76 12.0 +03.5 92.9
11°	80 11.1 -02.1 89.0	79 12.2 -01.7 88.9	78 13.3 -01.3 88.9	77 14.4 -01.0 88.8	76 15.5 -00.7 88.7
12°	80 09.0 -08.0 83.2	79 10.5 -07.1 83.6	78 12.0 -06.3 84.0	77 13.4 -05.6 84.2	76 14.8 -05.0 84.4
13°	80 01.0 -13.7 77.4	79 03.4 -12.3 78.4	78 05.7 -11.2 79.1	77 07.8 -10.1 79.7	76 09.8 -09.2 80.3
14°	79 47.3 -19.1 71.9	78 51.1 -17.3 73.2	77 54.5 -15.7 74.4	76 57.7 -14.5 75.3	76 00.6 -13.2 76.2
15°	79 28.2 -24.0 66.6	78 33.8 -22.0 68.4	77 38.8 -20.2 69.8	76 43.2 -18.5 71.1	75 47.4 -17.2 72.2
16°	79 04.2 -28.4 61.7	78 11.8 -26.1 63.7	77 18.6 -24.1 65.5	76 24.7 -22.3 67.0	75 30.2 -20.7 68.3
17°	78 35.8 -32.2 57.1	77 45.7 -29.9 59.4	76 54.5 -27.8 61.4	76 02.4 -25.9 63.1	75 09.5 -24.1 64.6
18°	78 03.6 -35.6 53.0	77 15.8 -33.3 55.4	76 26.7 -31.1 57.5	75 36.5 -29.1 59.4	74 45.4 -27.3 61.1
19°	77 28.0 -38.6 49.2	76 42.5 -36.2 51.7	75 55.6 -34.0 53.9	75 07.4 -32.0 55.9	74 18.1 -30.2 57.7
20°	76 49.4 -41.0 45.7	76 06.3 -38.7 48.3	75 21.6 -36.7 50.6	74 35.4 -34.7 52.7	73 47.9 -32.7 54.6
21°	76 08.4 -43.2 42.6	75 27.6 -41.1 45.2	74 44.9 -38.9 47.6	74 00.7 -37.0 49.7	73 15.2 -35.2 51.6
22°	75 25.2 -45.0 39.8	74 46.5 -42.9 42.4	74 06.0 -41.0 44.7	73 23.7 -39.1 46.9	72 40.0 -37.2 48.8
23°	74 40.2 -46.6 37.2	74 03.6 -44.7 39.8	73 25.0 -42.9 42.1	72 44.6 -40.9 44.3	72 02.8 -39.2 46.3
24°	73 53.6 -48.0 34.9	73 18.9 -46.2 37.4	72 42.1 -44.3 39.7	72 03.7 -42.7 41.9	71 23.6 -40.9 43.8
25°	73 05.6 -49.2 32.8	72 32.7 -47.5 35.2	71 57.8 -45.8 37.5	71 21.0 -44.1 39.6	70 42.7 -42.4 41.6
26°	72 16.4 -50.2 30.8	71 45.2 -48.6 33.2	71 12.0 -47.1 35.4	70 36.9 -45.4 37.5	70 00.3 -43.9 39.5
27°	71 26.2 -51.1 29.1	70 56.6 -49.7 31.4	70 24.9 -48.1 33.6	69 51.5 -46.6 35.6	69 16.4 -45.1 37.5
28°	70 35.1 -51.9 27.5	70 06.9 -50.5 29.7	69 36.8 -49.1 31.8	69 04.9 -47.6 33.8	68 31.3 -46.2 35.7
29°	69 43.2 -52.5 26.0	69 16.4 -51.2 28.1	68 47.7 -49.9 30.2	68 17.3 -48.6 32.1	67 45.1 -47.2 34.0

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	71 28.4 +35.0 125.5	70 39.9 +33.6 123.6	69 50.4 +32.2 122.0	69 00.0 +31.0 120.4	68 08.9 +29.7 119.0
1°	72 03.4 +32.8 122.9	71 13.5 +31.3 121.1	70 22.6 +30.1 119.5	69 31.0 +28.8 118.0	68 38.6 +27.7 116.6
2°	72 36.2 +30.4 120.1	71 44.8 +29.0 118.4	70 52.7 +27.7 116.9	69 59.8 +26.6 115.5	69 06.3 +25.6 114.2
3°	73 06.6 +27.8 117.2	72 13.8 +26.5 115.6	71 20.4 +25.2 114.1	70 26.4 +24.1 112.8	69 31.9 +23.1 111.6
4°	73 34.4 +24.8 114.1	72 40.3 +23.6 112.6	71 45.6 +22.6 111.3	70 50.5 +21.6 110.1	69 55.0 +20.7 108.9
5°	73 59.2 +21.8 110.8	73 03.9 +20.7 109.5	72 08.2 +19.7 108.3	71 12.1 +18.9 107.2	70 15.7 +18.1 106.2
6°	74 21.0 +18.5 107.4	73 24.6 +17.6 106.2	72 27.9 +16.8 105.2	71 31.0 +16.0 104.2	70 33.8 +15.3 103.3
7°	74 39.5 +15.0 103.8	73 42.2 +14.2 102.9	72 44.7 +13.5 102.0	71 47.0 +13.0 101.2	70 49.1 +12.5 100.4
8°	74 54.5 +11.2 100.2	73 56.4 +10.7 99.4	72 58.2 +10.3 98.7	72 00.0 +09.9 98.0	71 01.6 +09.5 97.4
9°	75 05.7 +07.4 96.4	74 07.1 +07.2 95.8	73 08.5 +06.9 95.3	72 09.9 +06.7 94.8	71 11.1 +06.6 94.4
10°	75 13.1 +03.5 92.5	74 14.3 +03.5 92.1	73 15.4 +03.5 91.8	72 16.6 +03.4 91.6	71 17.7 +03.4 91.3
11°	75 16.6 -00.5 88.6	74 17.8 -00.3 88.5	73 18.9 -00.1 88.4	72 20.0 +00.2 88.3	71 21.1 +00.4 88.2
12°	75 16.1 -04.4 84.6	74 17.5 -04.0 84.8	73 18.8 -03.5 84.9	72 20.2 -03.1 85.0	71 21.5 -02.7 85.0
13°	75 11.7 -08.4 80.7	74 13.5 -07.6 81.1	73 15.3 -07.0 81.4	72 17.1 -06.4 81.7	71 18.8 -05.9 81.9
14°	75 03.3 -12.2 76.9	74 05.9 -11.2 77.5	73 08.3 -10.3 78.0	72 10.7 -09.6 78.4	71 12.9 -08.8 78.8
15°	74 51.1 -15.8 73.1	73 54.7 -14.7 73.9	72 58.0 -13.7 74.6	72 01.1 -12.7 75.2	71 04.1 -11.8 75.8
16°	74 35.3 -19.3 69.4	73 40.0 -18.0 70.4	72 44.3 -16.7 71.3	71 48.4 -15.7 72.1	70 52.3 -14.7 72.8
17°	74 16.0 -22.5 65.9	73 22.0 -21.1 67.1	72 27.6 -19.8 68.1	71 32.7 -18.5 69.0	70 37.6 -17.4 69.8
18°	73 53.5 -25.6 62.5	73 00.9 -24.1 63.8	72 07.8 -22.7 65.0	71 14.2 -21.3 66.0	70 20.2 -20.1 66.9
19°	73 27.9 -28.5 59.3	72 36.8 -26.8 60.7	71 45.1 -25.3 62.0	70 52.9 -23.9 63.1	70 00.1 -22.6 64.2
20°	72 59.4 -31.0 56.2	72 10.0 -29.3 57.8	71 19.8 -27.7 59.1	70 29.0 -26.4 60.4	69 37.5 -25.0 61.5
21°	72 28.4 -33.3 53.4	71 40.7 -31.7 54.9	70 52.1 -30.1 56.4	70 02.6 -28.6 57.7	69 12.5 -27.2 58.9
22°	71 55.1 -35.5 50.6	71 09.0 -33.8 52.3	70 22.0 -32.3 53.8	69 34.0 -30.7 55.2	68 45.3 -29.3 56.4
23°	71 19.6 -37.5 48.1	70 35.2 -35.8 49.8	69 49.7 -34.2 51.3	69 03.3 -32.7 52.7	68 16.0 -31.2 54.0
24°	70 42.1 -39.2 45.7	69 59.4 -37.6 47.4	69 15.5 -36.0 49.0	68 30.6 -34.5 50.4	67 44.8 -33.1 51.8
25°	70 02.9 -40.8 43.4	69 21.8 -39.3 45.1	68 39.5 -37.8 46.7	67 56.1 -36.3 48.2	67 11.7 -34.8 49.6
26°	69 22.1 -42.3 41.3	68 42.5 -40.7 43.0	68 01.7 -39.2 44.6	67 19.8 -37.7 46.1	66 36.9 -36.4 47.5
27°	68 39.8 -43.6 39.3	68 01.8 -42.1 41.0	67 22.5 -40.6 42.6	66 42.1 -39.2 44.1	66 00.5 -37.8 45.5
28°	67 56.2 -44.7 37.5	67 19.7 -43.3 39.2	66 41.9 -41.9 40.7	66 02.9 -40.6 42.2	65 22.7 -39.1 43.6
29°	67 11.5 -45.9 35.7	66 36.4 -44.5 37.4	66 00.0 -43.1 39.0	65 22.3 -41.7 40.4	64 43.6 -40.4 41.8

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Declination SAME name as Latitude

Latitude 11°

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	67 17.0 +28.7 117.7	66 24.6 +27.6 116.4	65 31.6 +26.7 115.3	64 38.1 +25.8 114.2	63 44.1 +25.0 113.2
1°	67 45.7 +26.7 115.4	66 52.2 +25.7 114.2	65 58.3 +24.8 113.1	65 03.9 +23.9 112.1	64 09.1 +23.2 111.1
2°	68 12.4 +24.5 113.0	67 17.9 +23.6 111.9	66 23.1 +22.7 110.8	65 27.8 +22.0 109.9	64 32.3 +21.3 109.0
3°	68 36.9 +22.2 110.5	67 41.5 +21.5 109.5	66 45.8 +20.7 108.5	65 49.8 +20.0 107.6	64 53.6 +19.3 106.8
4°	68 59.1 +19.9 107.9	68 03.0 +19.1 107.0	67 06.5 +18.4 106.1	66 09.8 +17.8 105.3	65 12.9 +17.2 104.6
5°	69 19.0 +17.4 105.3	68 22.1 +16.7 104.4	67 24.9 +16.2 103.7	66 27.6 +15.6 102.9	65 30.1 +15.2 102.3
6°	69 36.4 +14.7 102.5	68 38.8 +14.2 101.8	67 41.1 +13.7 101.1	66 43.2 +13.3 100.5	65 45.3 +12.9 99.9
7°	69 51.1 +12.1 99.8	68 53.0 +11.7 99.1	67 54.8 +11.3 98.6	66 56.5 +11.0 98.0	65 58.2 +10.6 97.5
8°	70 03.2 +09.2 96.9	69 04.7 +08.9 96.4	68 06.1 +08.7 95.9	67 07.5 +08.5 95.5	66 08.8 +08.4 95.1
9°	70 12.4 +06.4 94.0	69 13.6 +06.3 93.6	68 14.8 +06.2 93.3	67 16.0 +06.1 93.0	66 17.2 +06.0 92.7
10°	70 18.8 +03.5 91.0	69 19.9 +03.5 90.8	68 21.0 +03.5 90.6	67 22.1 +03.6 90.4	66 23.2 +03.6 90.2
11°	70 22.3 +00.5 88.1	69 23.4 +00.7 88.0	68 24.5 +00.9 87.9	67 25.7 +01.1 87.8	66 26.8 +01.3 87.7
12°	70 22.8 -02.4 85.1	69 24.1 -02.0 85.1	68 25.4 -01.7 85.2	67 26.8 -01.5 85.2	66 28.1 -01.2 85.2
13°	70 20.4 -05.3 82.1	69 22.1 -04.8 82.3	68 23.7 -04.4 82.4	67 25.3 -04.0 82.6	66 26.9 -03.6 82.7
14°	70 15.1 -08.2 79.2	69 17.3 -07.6 79.5	68 19.3 -07.0 79.7	67 21.3 -06.4 80.0	66 23.3 -05.9 80.2
15°	70 06.9 -11.0 76.2	69 09.7 -10.3 76.7	68 12.3 -09.5 77.1	67 14.9 -08.9 77.4	66 17.4 -08.3 77.7
16°	69 55.9 -13.7 73.4	68 59.4 -12.8 73.9	68 02.8 -12.1 74.4	67 06.0 -11.3 74.8	66 09.1 -10.6 75.2
17°	69 42.2 -16.4 70.5	68 46.6 -15.5 71.2	67 50.7 -14.5 71.8	66 54.7 -13.7 72.3	65 58.5 -12.9 72.8
18°	69 25.8 -18.9 67.8	68 31.1 -17.8 68.5	67 36.2 -16.9 69.2	66 41.0 -16.0 69.9	65 45.6 -15.1 70.4
19°	69 06.9 -21.4 65.1	68 13.3 -20.3 66.0	67 19.3 -19.2 66.7	66 25.0 -18.1 67.4	65 30.5 -17.2 68.1
20°	68 45.5 -23.7 62.5	67 53.0 -22.5 63.4	67 00.1 -21.3 64.3	66 06.9 -20.3 65.1	65 13.3 -19.2 65.8
21°	68 21.8 -25.9 60.0	67 30.5 -24.6 61.0	66 38.8 -23.4 61.9	65 46.6 -22.3 62.8	64 54.1 -21.3 63.5
22°	67 55.9 -27.9 57.6	67 05.9 -26.6 58.6	66 15.4 -25.5 59.6	65 24.3 -24.2 60.5	64 32.8 -23.1 61.3
23°	67 28.0 -29.9 55.2	66 39.3 -28.6 56.4	65 49.9 -27.3 57.4	65 00.1 -26.1 58.3	64 09.7 -24.9 59.2
24°	66 58.1 -31.7 53.0	66 10.7 -30.4 54.2	65 22.6 -29.0 55.2	64 34.0 -27.9 56.2	63 44.8 -26.7 57.1
25°	66 26.4 -33.4 50.9	65 40.3 -32.0 52.0	64 53.6 -30.8 53.1	64 06.1 -29.5 54.2	63 18.1 -28.4 55.1
26°	65 53.0 -34.9 48.8	65 08.3 -33.6 50.0	64 22.8 -32.3 51.1	63 36.6 -31.1 52.2	62 49.7 -29.8 53.2
27°	65 18.1 -36.5 46.8	64 34.7 -35.1 48.1	63 50.5 -33.9 49.2	63 05.5 -32.6 50.3	62 19.9 -31.4 51.3
28°	64 41.6 -37.8 44.9	63 59.6 -36.5 46.2	63 16.6 -35.2 47.4	62 32.9 -33.9 48.4	61 48.5 -32.8 49.5
29°	64 03.8 -39.1 43.2	63 23.1 -37.8 44.4	62 41.4 -36.5 45.6	61 59.0 -35.3 46.7	61 15.7 -34.0 47.7

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	62 49.8 +24.2 112.3	61 55.1 +23.5 111.4	61 00.1 +22.8 110.5	60 04.8 +22.2 109.7	59 09.3 +21.5 109.0
1°	63 14.0 +22.5 110.2	62 18.6 +21.8 109.4	61 22.9 +21.2 108.6	60 27.0 +20.5 107.9	59 30.8 +20.0 107.2
2°	63 36.5 +20.6 108.2	62 40.4 +20.0 107.4	61 44.1 +19.4 106.6	60 47.5 +18.9 106.0	59 50.8 +18.4 105.3
3°	63 57.1 +18.7 106.0	63 00.4 +18.1 105.3	62 03.5 +17.6 104.6	61 06.4 +17.2 104.0	60 09.2 +16.7 103.4
4°	64 15.8 +16.7 103.9	63 18.5 +16.3 103.2	62 21.1 +15.8 102.6	61 23.6 +15.4 102.0	60 25.9 +15.0 101.5
5°	64 32.5 +14.7 101.6	63 34.8 +14.2 101.1	62 36.9 +13.9 100.5	61 39.0 +13.5 100.0	60 40.9 +13.2 99.5
6°	64 47.2 +12.6 99.4	63 49.0 +12.3 98.9	62 50.8 +12.0 98.4	61 52.5 +11.7 97.9	60 54.1 +11.5 97.5
7°	64 59.8 +10.4 97.1	64 01.3 +10.2 96.6	63 02.8 +09.9 96.2	62 04.2 +09.8 95.8	61 05.6 +09.6 95.5
8°	65 10.2 +08.2 94.7	64 11.5 +08.0 94.4	63 12.7 +07.9 94.0	62 14.0 +07.8 93.7	61 15.2 +07.7 93.4
9°	65 18.4 +05.9 92.4	64 19.5 +05.9 92.1	63 20.6 +05.9 91.8	62 21.8 +05.8 91.6	61 22.9 +05.8 91.3
10°	65 24.3 +03.7 90.0	64 25.4 +03.7 89.8	63 26.5 +03.8 89.6	62 27.6 +03.9 89.4	61 28.7 +03.9 89.3
11°	65 28.0 +01.4 87.6	64 29.1 +01.6 87.5	63 30.3 +01.7 87.4	62 31.5 +01.8 87.3	61 32.6 +02.0 87.2
12°	65 29.4 -00.9 85.2	64 30.7 -00.7 85.2	63 32.0 -00.4 85.1	62 33.3 -00.1 85.1	61 34.6 +00.1 85.1
13°	65 28.5 -03.2 82.8	64 30.0 -02.8 82.8	63 31.6 -02.5 82.9	62 33.2 -02.2 82.9	61 34.7 -01.9 83.0
14°	65 25.3 -05.5 80.4	64 27.2 -05.0 80.5	63 29.1 -04.6 80.7	62 31.0 -04.2 80.8	61 32.8 -03.8 80.9
15°	65 19.8 -07.7 78.0	64 22.2 -07.2 78.2	63 24.5 -06.7 78.4	62 26.8 -06.2 78.6	61 29.0 -05.7 78.8
16°	65 12.1 -10.0 75.6	64 15.0 -09.3 75.9	63 17.8 -08.7 76.2	62 20.6 -08.2 76.5	61 23.3 -07.6 76.7
17°	65 02.1 -12.1 73.3	64 05.7 -11.4 73.6	63 09.1 -10.7 74.0	62 12.4 -10.1 74.3	61 15.7 -09.5 74.6
18°	64 50.0 -14.2 70.9	63 54.3 -13.5 71.4	62 58.4 -12.7 71.8	62 02.3 -12.0 72.2	61 06.2 -11.3 72.6
19°	64 35.8 -16.3 68.7	63 40.8 -15.4 69.2	62 45.7 -14.7 69.7	61 50.3 -13.8 70.1	60 54.9 -13.1 70.6
20°	64 19.5 -18.3 66.4	63 25.4 -17.4 67.0	62 31.0 -16.5 67.6	61 36.5 -15.7 68.1	60 41.8 -14.9 68.6
21°	64 01.2 -20.2 64.2	63 08.0 -19.3 64.9	62 14.5 -18.3 65.5	61 20.8 -17.4 66.1	60 26.9 -16.6 66.6
22°	63 41.0 -22.1 62.1	62 48.7 -21.0 62.8	61 56.2 -20.1 63.5	61 03.4 -19.2 64.1	60 10.3 -18.3 64.6
23°	63 18.9 -23.9 60.0	62 27.7 -22.8 60.8	61 36.1 -21.8 61.5	60 44.2 -20.8 62.1	59 52.0 -19.9 62.7
24°	62 55.0 -25.5 58.0	62 04.9 -24.5 58.8	61 14.3 -23.4 59.5	60 23.4 -22.5 60.2	59 32.1 -21.5 60.9
25°	62 29.5 -27.2 56.0	61 40.4 -26.1 56.9	60 50.9 -25.0 57.6	60 00.9 -24.0 58.4	59 10.6 -23.0 59.0
26°	62 02.3 -28.7 54.1	61 14.3 -27.6 55.0	60 25.9 -26.5 55.8	59 36.9 -25.4 56.5	58 47.6 -24.4 57.2
27°	61 33.6 -30.2 52.2	60 46.7 -29.0 53.1	59 59.4 -28.0 54.0	59 11.5 -26.9 54.8	58 23.2 -25.9 55.5
28°	61 03.4 -31.6 50.4	60 17.7 -30.4 51.4	59 31.4 -29.3 52.2	58 44.6 -28.2 53.0	57 57.3 -27.2 53.8
29°	60 31.8 -32.9 48.7	59 47.3 -31.8 49.6	59 02.1 -30.6 50.5	58 16.4 -29.6 51.3	57 30.1 -28.5 52.1

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Latitude 11°

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Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	58 13.4 +21.0 108.3	57 17.4 +20.5 107.6	56 21.2 +19.9 107.0	55 24.8 +19.4 106.4	54 28.2 +19.0 105.8
1°	58 34.4 +19.5 106.5	57 37.9 +19.0 105.9	56 41.1 +18.6 105.3	55 44.2 +18.1 104.7	54 47.2 +17.7 104.2
2°	58 53.9 +17.9 104.7	57 56.9 +17.4 104.1	56 59.7 +17.0 103.5	56 02.3 +16.7 103.0	55 04.9 +16.3 102.5
3°	59 11.8 +16.3 102.8	58 14.3 +16.0 102.3	57 16.7 +15.6 101.8	56 19.0 +15.2 101.3	55 21.2 +14.9 100.8
4°	59 28.1 +14.7 100.9	58 30.3 +14.3 100.4	57 32.3 +14.0 100.0	56 34.2 +13.8 99.5	55 36.1 +13.5 99.1
5°	59 42.8 +12.9 99.0	58 44.6 +12.6 98.6	57 46.3 +12.4 98.2	56 48.0 +12.2 97.8	55 49.6 +12.0 97.4
6°	59 55.7 +11.2 97.1	58 57.2 +11.0 96.7	57 58.7 +10.8 96.3	57 00.2 +10.6 96.0	56 01.6 +10.5 95.6
7°	60 06.9 +09.5 95.1	59 08.2 +09.4 94.8	58 09.5 +09.2 94.5	57 10.8 +09.1 94.1	56 12.1 +08.9 93.9
8°	60 16.4 +07.6 93.1	59 17.6 +07.5 92.8	58 18.7 +07.5 92.6	57 19.9 +07.4 92.3	56 21.0 +07.4 92.1
9°	60 24.0 +05.8 91.1	59 25.1 +05.8 90.9	58 26.2 +05.9 90.7	57 27.3 +05.9 90.5	56 28.4 +05.9 90.3
10°	60 29.8 +04.0 89.1	59 30.9 +04.1 88.9	58 32.1 +04.1 88.8	57 33.2 +04.2 88.6	56 34.3 +04.3 88.5
11°	60 33.8 +02.2 87.1	59 35.0 +02.3 87.0	58 36.2 +02.4 86.9	57 37.4 +02.5 86.8	56 38.6 +02.7 86.7
12°	60 36.0 +00.2 85.0	59 37.3 +00.5 85.0	58 38.6 +00.7 84.9	57 39.9 +01.0 84.9	56 41.3 +01.1 84.8
13°	60 36.2 -01.5 83.0	59 37.8 -01.3 83.0	58 39.3 -01.0 83.0	57 40.9 -00.8 83.0	56 42.4 -00.5 83.0
14°	60 34.7 -03.5 81.0	59 36.5 -03.1 81.0	58 38.3 -02.7 81.1	57 40.1 -02.4 81.2	56 41.9 -02.1 81.2
15°	60 31.2 -05.2 78.9	59 33.4 -04.8 79.1	58 35.6 -04.5 79.2	57 37.7 -04.0 79.3	56 39.8 -03.6 79.4
16°	60 26.0 -07.1 76.9	59 28.6 -06.6 77.1	58 31.1 -06.1 77.3	57 33.7 -05.7 77.4	56 36.2 -05.3 77.6
17°	60 18.9 -08.9 74.9	59 22.0 -08.4 75.2	58 25.0 -07.8 75.4	57 28.0 -07.3 75.6	56 30.9 -06.8 75.8
18°	60 10.0 -10.7 72.9	59 13.6 -10.1 73.2	58 17.2 -09.5 73.5	57 20.7 -08.9 73.7	56 24.1 -08.4 74.0
19°	59 59.3 -12.5 70.9	59 03.5 -11.7 71.3	58 07.7 -11.1 71.6	57 11.8 -10.5 71.9	56 15.7 -09.9 72.2
20°	59 46.8 -14.1 69.0	58 51.8 -13.4 69.4	57 56.6 -12.7 69.8	57 01.3 -12.1 70.1	56 05.8 -11.4 70.4
21°	59 32.7 -15.8 67.1	58 38.4 -15.0 67.5	57 43.9 -14.3 67.9	56 49.2 -13.5 68.3	55 54.4 -12.8 68.6
22°	59 16.9 -17.4 65.2	58 23.4 -16.7 65.7	57 29.6 -15.8 66.1	56 35.7 -15.1 66.5	55 41.6 -14.4 66.9
23°	58 59.5 -19.0 63.3	58 06.7 -18.1 63.8	57 13.8 -17.4 64.3	56 20.6 -16.5 64.8	55 27.2 -15.8 65.2
24°	58 40.5 -20.6 61.5	57 48.6 -19.7 62.0	56 56.4 -18.8 62.6	56 04.1 -18.0 63.0	55 11.4 -17.1 63.5
25°	58 19.9 -22.0 59.7	57 28.9 -21.1 60.3	56 37.6 -20.2 60.8	55 46.1 -19.4 61.3	54 54.3 -18.5 61.8
26°	57 57.9 -23.5 57.9	57 07.8 -22.5 58.5	56 17.4 -21.6 59.1	55 26.7 -20.7 59.7	54 35.8 -19.9 60.2
27°	57 34.4 -24.8 56.2	56 45.3 -23.9 56.8	55 55.8 -22.9 57.4	55 06.0 -22.0 58.0	54 15.9 -21.1 58.6
28°	57 09.6 -26.2 54.5	56 21.4 -25.1 55.2	55 32.9 -24.2 55.8	54 44.0 -23.3 56.4	53 54.8 -22.4 57.0
29°	56 43.4 -27.4 52.8	55 56.3 -26.5 53.5	55 08.7 -25.5 54.2	54 20.7 -24.5 54.8	53 32.4 -23.6 55.4

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	53 31.4 +18.6 105.2	52 34.5 +18.2 104.7	51 37.5 +17.8 104.2	50 40.3 +17.5 103.7	49 43.1 +17.1 103.3
1°	53 50.0 +17.3 103.6	52 52.7 +17.0 103.1	51 55.3 +16.6 102.7	50 57.8 +16.3 102.2	50 00.2 +16.0 101.8
2°	54 07.3 +16.0 102.0	53 09.7 +15.6 101.5	52 11.9 +15.4 101.1	51 14.1 +15.1 100.7	50 16.2 +14.8 100.3
3°	54 23.3 +14.6 100.4	53 25.3 +14.4 99.9	52 27.3 +14.1 99.5	51 29.2 +13.8 99.1	50 31.0 +13.6 98.7
4°	54 37.9 +13.2 98.7	53 39.7 +13.0 98.3	52 41.4 +12.7 97.9	51 43.0 +12.6 97.6	50 44.6 +12.4 97.2
5°	54 51.1 +11.8 97.0	53 52.7 +11.6 96.6	52 54.1 +11.5 96.3	51 55.6 +11.3 96.0	50 57.0 +11.1 95.7
6°	55 02.9 +10.4 95.3	54 04.3 +10.2 95.0	53 05.6 +10.1 94.7	52 06.9 +10.0 94.4	51 08.1 +09.9 94.1
7°	55 13.3 +08.9 93.6	54 14.5 +08.8 93.3	53 15.7 +08.7 93.0	52 16.9 +08.6 92.8	51 18.0 +08.6 92.5
8°	55 22.2 +07.3 91.8	54 23.3 +07.3 91.6	53 24.4 +07.3 91.4	52 25.5 +07.4 91.2	51 26.6 +07.4 90.9
9°	55 29.5 +05.9 90.1	54 30.6 +06.0 89.9	53 31.7 +06.0 89.7	52 32.9 +05.9 89.5	51 34.0 +06.0 89.3
10°	55 35.4 +04.4 88.3	54 36.6 +04.4 88.2	53 37.7 +04.5 88.0	52 38.8 +04.6 87.9	51 40.0 +04.7 87.7
11°	55 39.8 +02.8 86.6	54 41.0 +03.0 86.5	53 42.2 +03.1 86.3	52 43.4 +03.3 86.2	51 44.7 +03.4 86.1
12°	55 42.6 +01.3 84.8	54 44.0 +01.5 84.7	53 45.3 +01.7 84.7	52 46.7 +01.9 84.6	51 48.1 +02.0 84.5
13°	55 43.9 -00.2 83.0	54 45.5 +00.0 83.0	53 47.0 +00.3 83.0	52 48.6 +00.5 82.9	51 50.1 +00.7 82.9
14°	55 43.7 -01.8 81.2	54 45.5 -01.5 81.3	53 47.3 -01.2 81.3	52 49.1 -00.9 81.3	51 50.8 -00.6 81.3
15°	55 41.9 -03.3 79.5	54 44.0 -02.9 79.5	53 46.1 -02.6 79.6	52 48.2 -02.3 79.6	51 50.2 -01.9 79.7
16°	55 38.6 -04.8 77.7	54 41.1 -04.4 77.8	53 43.5 -04.0 77.9	52 45.9 -03.6 78.0	51 48.3 -03.3 78.1
17°	55 33.8 -06.3 75.9	54 36.7 -05.9 76.1	53 39.5 -05.5 76.2	52 42.3 -05.0 76.3	51 45.0 -04.6 76.4
18°	55 27.5 -07.9 74.2	54 30.8 -07.3 74.4	53 34.0 -06.8 74.5	52 37.3 -06.4 74.7	51 40.4 -05.9 74.8
19°	55 19.6 -09.3 72.4	54 23.5 -08.8 72.7	53 27.2 -08.2 72.9	52 30.9 -07.7 73.0	51 34.5 -07.2 73.2
20°	55 10.3 -10.8 70.7	54 14.7 -10.2 71.0	53 19.0 -09.6 71.2	52 23.2 -09.1 71.4	51 27.3 -08.5 71.6
21°	54 59.5 -12.2 69.0	54 04.5 -11.6 69.3	53 09.4 -11.0 69.5	52 14.1 -10.3 69.8	51 18.8 -09.8 70.0
22°	54 47.3 -13.6 67.3	53 52.9 -12.9 67.6	52 58.4 -12.3 67.9	52 03.8 -11.7 68.2	51 09.0 -11.0 68.5
23°	54 33.7 -15.1 65.6	53 40.0 -14.3 66.0	52 46.1 -13.6 66.3	51 52.1 -12.9 66.6	50 58.0 -12.3 66.9
24°	54 18.6 -16.3 63.9	53 25.7 -15.7 64.3	52 32.5 -14.9 64.7	51 39.2 -14.2 65.0	50 45.7 -13.5 65.4
25°	54 02.3 -17.8 62.3	53 10.0 -16.9 62.7	52 17.6 -16.2 63.1	51 25.0 -15.4 63.5	50 32.2 -14.7 63.8
26°	53 44.5 -19.0 60.7	52 53.1 -18.2 61.1	52 01.4 -17.4 61.5	51 09.6 -16.7 61.9	50 17.5 -15.9 62.3
27°	53 25.5 -20.2 59.1	52 34.9 -19.4 59.5	51 44.0 -18.6 60.0	50 52.9 -17.8 60.4	50 01.6 -17.0 60.8
28°	53 05.3 -21.5 57.5	52 15.5 -20.6 58.0	51 25.4 -19.8 58.4	50 35.1 -19.0 58.9	49 44.6 -18.2 59.3
29°	52 43.8 -22.7 55.9	51 54.9 -21.8 56.5	51 05.6 -20.9 56.9	50 16.1 -20.1 57.4	49 26.4 -19.3 57.8

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Latitude 11°

Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	48 45.7 +16.8 102.8	47 48.2 +16.5 102.4	46 50.6 +16.2 102.0	45 53.0 +15.9 101.6	44 55.2 +15.7 101.2
1°	49 02.5 +15.7 101.4	48 04.7 +15.4 100.9	47 06.8 +15.2 100.6	46 08.9 +14.9 100.2	45 10.9 +14.7 99.8
2°	49 18.2 +14.6 99.9	48 20.1 +14.4 99.5	47 22.0 +14.1 99.1	46 23.8 +13.9 98.8	45 25.6 +13.7 98.4
3°	49 32.8 +13.3 98.4	48 34.5 +13.2 98.0	47 36.1 +13.0 97.7	46 37.7 +12.9 97.4	45 39.3 +12.7 97.0
4°	49 46.1 +12.3 96.9	48 47.7 +12.0 96.6	47 49.1 +11.9 96.2	46 50.6 +11.7 95.9	45 52.0 +11.6 95.6
5°	49 58.4 +11.0 95.4	48 59.7 +10.9 95.1	48 01.0 +10.8 94.8	47 02.3 +10.7 94.5	46 03.6 +10.6 94.2
6°	50 09.4 +09.8 93.8	49 10.6 +09.7 93.6	48 11.8 +09.7 93.3	47 13.0 +09.6 93.1	46 14.2 +09.5 92.8
7°	50 19.2 +08.5 92.3	49 20.3 +08.6 92.0	48 21.5 +08.5 91.8	47 22.6 +08.5 91.6	46 23.7 +08.5 91.4
8°	50 27.7 +07.4 90.7	49 28.9 +07.3 90.5	48 30.0 +07.3 90.3	47 31.1 +07.3 90.1	46 32.2 +07.3 89.9
9°	50 35.1 +06.0 89.2	49 36.2 +06.1 89.0	48 37.3 +06.1 88.8	47 38.4 +06.2 88.7	46 39.5 +06.3 88.5
10°	50 41.1 +04.8 87.6	49 42.3 +04.9 87.5	48 43.4 +05.0 87.3	47 44.6 +05.1 87.2	46 45.8 +05.2 87.0
11°	50 45.9 +03.5 86.0	49 47.2 +03.6 85.9	48 48.4 +03.8 85.8	47 49.7 +03.9 85.7	46 51.0 +04.0 85.6
12°	50 49.4 +02.3 84.4	49 50.8 +02.4 84.4	48 52.2 +02.6 84.3	47 53.6 +02.8 84.2	46 55.0 +03.0 84.1
13°	50 51.7 +00.9 82.9	49 53.2 +01.2 82.8	48 54.8 +01.4 82.8	47 56.4 +01.6 82.7	46 58.0 +01.8 82.7
14°	50 52.6 -00.3 81.3	49 54.4 -00.1 81.3	48 56.2 +00.2 81.3	47 58.0 +00.4 81.2	46 59.8 +00.7 81.2
15°	50 52.3 -01.6 79.7	49 54.3 -01.3 79.7	48 56.4 -01.0 79.7	47 58.4 -00.7 79.7	47 00.5 -00.5 79.7
16°	50 50.7 -02.9 78.1	49 53.0 -02.5 78.2	48 55.4 -02.2 78.2	47 57.7 -01.9 78.2	47 00.0 -01.5 78.3
17°	50 47.8 -04.2 76.5	49 50.5 -03.8 76.6	48 53.2 -03.4 76.7	47 55.8 -03.0 76.8	46 58.5 -02.7 76.8
18°	50 43.6 -05.5 75.0	49 46.7 -05.0 75.1	48 49.8 -04.6 75.2	47 52.8 -04.2 75.3	46 55.8 -03.8 75.3
19°	50 38.1 -06.7 73.4	49 41.7 -06.3 73.5	48 45.2 -05.8 73.7	47 48.6 -05.3 73.8	46 52.0 -04.8 73.9
20°	50 31.4 -08.0 71.8	49 35.4 -07.5 72.0	48 39.4 -07.0 72.1	47 43.3 -06.5 72.3	46 47.2 -06.1 72.4
21°	50 23.4 -09.2 70.3	49 27.9 -08.6 70.5	48 32.4 -08.1 70.6	47 36.8 -07.6 70.8	46 41.1 -07.1 71.0
22°	50 14.2 -10.4 68.7	49 19.3 -09.9 68.9	48 24.3 -09.3 69.2	47 29.2 -08.7 69.3	46 34.0 -08.1 69.5
23°	50 03.8 -11.7 67.2	49 09.4 -11.0 67.4	48 15.0 -10.4 67.7	47 20.5 -09.9 67.9	46 25.9 -09.3 68.1
24°	49 52.1 -12.8 65.7	48 58.4 -12.2 65.9	48 04.6 -11.6 66.2	47 10.6 -10.9 66.4	46 16.6 -10.3 66.7
25°	49 39.3 -14.0 64.1	48 46.2 -13.3 64.4	47 53.0 -12.7 64.7	46 59.7 -12.0 65.0	46 06.3 -11.4 65.2
26°	49 25.3 -15.2 62.6	48 32.9 -14.5 63.0	47 40.3 -13.7 63.3	46 47.7 -13.1 63.6	45 54.9 -12.4 63.8
27°	49 10.1 -16.3 61.2	48 18.4 -15.5 61.5	47 26.6 -14.8 61.8	46 34.6 -14.1 62.1	45 42.5 -13.5 62.4
28°	48 53.8 -17.4 59.7	48 02.9 -16.7 60.1	47 11.8 -15.9 60.4	46 20.5 -15.2 60.7	45 29.0 -14.4 61.0
29°	48 36.4 -18.4 58.2	47 46.2 -17.6 58.6	46 55.9 -17.0 59.0	46 05.3 -16.2 59.3	45 14.6 -15.5 59.6

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	43 57.4 +15.4 100.8	42 59.5 +15.2 100.4	42 01.6 +14.9 100.1	41 03.5 +14.8 99.7	40 05.5 +14.5 99.4
1°	44 12.8 +14.5 99.5	43 14.7 +14.3 99.1	42 16.5 +14.1 98.8	41 18.3 +13.9 98.5	40 20.0 +13.7 98.1
2°	44 27.3 +13.5 98.1	43 29.0 +13.3 97.8	42 30.6 +13.2 97.5	41 32.2 +13.0 97.2	40 33.7 +12.9 96.9
3°	44 40.8 +12.5 96.7	43 42.3 +12.4 96.4	42 43.8 +12.2 96.1	41 45.2 +12.1 95.9	40 46.6 +12.0 95.6
4°	44 53.3 +11.6 95.4	43 54.7 +11.4 95.1	42 56.0 +11.3 94.8	41 57.3 +11.2 94.5	40 58.6 +11.1 94.3
5°	45 04.9 +10.5 94.0	44 06.1 +10.4 93.7	43 07.3 +10.4 93.5	42 08.5 +10.3 93.2	41 09.7 +10.2 93.0
6°	45 15.4 +09.4 92.6	44 16.5 +09.4 92.3	43 17.7 +09.3 92.1	42 18.8 +09.4 91.9	41 19.9 +09.4 91.7
7°	45 24.8 +08.5 91.2	44 25.9 +08.5 91.0	43 27.0 +08.5 90.8	42 28.2 +08.4 90.6	41 29.3 +08.4 90.4
8°	45 33.3 +07.4 89.8	44 34.4 +07.4 89.6	43 35.5 +07.4 89.4	42 36.6 +07.5 89.2	41 37.7 +07.5 89.0
9°	45 40.7 +06.3 88.3	44 41.8 +06.4 88.2	43 42.9 +06.5 88.0	42 44.1 +06.5 87.9	41 45.2 +06.6 87.7
10°	45 47.0 +05.2 86.9	44 48.2 +05.3 86.8	43 49.4 +05.4 86.6	42 50.6 +05.5 86.5	41 51.8 +05.7 86.4
11°	45 52.2 +04.2 85.5	44 53.5 +04.4 85.4	43 54.8 +04.5 85.3	42 56.1 +04.6 85.1	41 57.5 +04.7 85.0
12°	45 56.4 +03.1 84.0	44 57.9 +03.2 84.0	43 59.3 +03.4 83.9	43 00.7 +03.7 83.8	42 02.2 +03.8 83.7
13°	45 59.5 +02.1 82.6	45 01.1 +02.3 82.5	44 02.7 +02.5 82.5	43 04.4 +02.6 82.4	42 06.0 +02.8 82.3
14°	46 01.6 +00.9 81.2	45 03.4 +01.2 81.1	44 05.2 +01.4 81.1	43 07.0 +01.7 81.0	42 08.8 +01.9 81.0
15°	46 02.5 -00.1 79.7	45 04.6 +00.1 79.7	44 06.6 +00.4 79.7	43 08.7 +00.7 79.7	42 10.7 +01.0 79.6
16°	46 02.4 -01.2 78.3	45 04.7 -00.9 78.3	44 07.0 -00.6 78.3	43 09.4 -00.3 78.3	42 11.7 +00.0 78.3
17°	46 01.2 -02.4 76.9	45 03.8 -02.0 76.9	44 06.4 -01.6 76.9	43 09.1 -01.3 76.9	42 11.7 -01.0 77.0
18°	45 58.8 -03.3 75.4	45 01.8 -03.0 75.5	44 04.8 -02.6 75.5	43 07.8 -02.3 75.6	42 10.7 -01.9 75.6
19°	45 55.5 -04.5 74.0	44 58.8 -04.0 74.1	44 02.2 -03.7 74.1	43 05.5 -03.2 74.2	42 08.8 -02.8 74.3
20°	45 51.0 -05.6 72.5	44 54.8 -05.1 72.7	43 58.5 -04.6 72.7	43 02.3 -04.2 72.8	42 06.0 -03.8 72.9
21°	45 45.4 -06.6 71.1	44 49.7 -06.1 71.2	43 53.9 -05.6 71.4	42 58.1 -05.2 71.5	42 02.2 -04.7 71.6
22°	45 38.8 -07.6 69.7	44 43.6 -07.2 69.8	43 48.3 -06.7 70.0	42 52.9 -06.1 70.1	41 57.5 -05.7 70.2
23°	45 31.2 -08.7 68.3	44 36.4 -08.1 68.4	43 41.6 -07.6 68.6	42 46.8 -07.1 68.7	41 51.8 -06.5 68.9
24°	45 22.5 -09.8 66.9	44 28.3 -09.2 67.1	43 34.0 -08.6 67.2	42 39.7 -08.1 67.4	41 45.3 -07.6 67.5
25°	45 12.7 -10.7 65.5	44 19.1 -10.1 65.7	43 25.4 -09.6 65.9	42 31.6 -09.0 66.1	41 37.7 -08.4 66.2
26°	45 02.0 -11.8 64.1	44 09.0 -11.2 64.3	43 15.8 -10.5 64.5	42 22.6 -09.9 64.7	41 29.3 -09.3 64.9
27°	44 50.2 -12.8 62.7	43 57.8 -12.1 62.9	43 05.3 -11.5 63.2	42 12.7 -10.8 63.4	41 20.0 -10.2 63.6
28°	44 37.4 -13.7 61.3	43 45.7 -13.1 61.6	42 53.8 -12.4 61.8	42 01.9 -11.8 62.1	41 09.8 -11.1 62.3
29°	44 23.7 -14.8 59.9	43 32.6 -14.0 60.2	42 41.4 -13.3 60.5	41 50.1 -12.6 60.7	40 58.7 -12.0 61.0

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Latitude 11°

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Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	39 07.3 +14.4 99.1	38 09.2 +14.1 98.8	37 10.9 +14.0 98.5	36 12.6 +13.9 98.2	35 14.3 +13.7 97.9
1°	39 21.7 +13.5 97.8	38 23.3 +13.4 97.5	37 24.9 +13.3 97.3	36 26.5 +13.1 97.0	35 28.0 +13.0 96.7
2°	39 35.2 +12.8 96.6	38 36.7 +12.6 96.3	37 38.2 +12.4 96.0	36 39.6 +12.3 95.8	35 41.0 +12.2 95.5
3°	39 48.0 +11.8 95.3	38 49.3 +11.8 95.0	37 50.6 +11.7 94.8	36 51.9 +11.6 94.5	35 53.2 +11.5 94.3
4°	39 59.8 +11.1 94.0	39 01.1 +10.9 93.8	38 02.3 +10.9 93.5	37 03.5 +10.8 93.3	36 04.7 +10.8 93.1
5°	40 10.9 +10.2 92.7	39 12.0 +10.2 92.5	38 13.2 +10.1 92.3	37 14.3 +10.1 92.1	36 15.5 +10.0 91.9
6°	40 21.1 +09.3 91.5	39 22.2 +09.3 91.2	38 23.3 +09.3 91.0	37 24.4 +09.3 90.8	36 25.5 +09.3 90.6
7°	40 30.4 +08.4 90.2	39 31.5 +08.4 90.0	38 32.6 +08.4 89.8	37 33.7 +08.5 89.6	36 34.8 +08.5 89.4
8°	40 38.8 +07.6 88.9	39 39.9 +07.6 88.7	38 41.0 +07.7 88.5	37 42.2 +07.7 88.3	36 43.3 +07.7 88.2
9°	40 46.4 +06.6 87.5	39 47.5 +06.8 87.4	38 48.7 +06.8 87.2	37 49.9 +06.9 87.1	36 51.0 +07.0 86.9
10°	40 53.0 +05.8 86.2	39 54.3 +05.8 86.1	38 55.5 +06.0 86.0	37 56.8 +06.0 85.8	36 58.0 +06.2 85.7
11°	40 58.8 +04.9 84.9	40 00.1 +05.0 84.8	39 01.5 +05.1 84.7	38 02.8 +05.3 84.6	37 04.2 +05.4 84.4
12°	41 03.7 +03.9 83.6	40 05.1 +04.2 83.5	39 06.6 +04.3 83.4	38 08.1 +04.5 83.3	37 09.6 +04.7 83.2
13°	41 07.6 +03.1 82.3	40 09.3 +03.2 82.2	39 10.9 +03.5 82.1	38 12.6 +03.6 82.0	37 14.3 +03.8 81.9
14°	41 10.7 +02.1 80.9	40 12.5 +02.4 80.9	39 14.4 +02.5 80.8	38 16.2 +02.8 80.8	37 18.1 +03.0 80.7
15°	41 12.8 +01.2 79.6	40 14.9 +01.4 79.6	39 16.9 +01.8 79.5	38 19.0 +02.0 79.5	37 21.1 +02.3 79.4
16°	41 14.0 +00.3 78.3	40 16.3 +00.6 78.3	39 18.7 +00.9 78.2	38 21.0 +01.2 78.2	37 23.4 +01.4 78.2
17°	41 14.3 -00.6 77.0	40 16.9 -00.3 77.0	39 19.6 +00.0 77.0	38 22.2 +00.3 76.9	37 24.8 +00.6 76.9
18°	41 13.7 -01.5 75.6	40 16.6 -01.2 75.6	39 19.6 -00.9 75.7	38 22.5 -00.5 75.7	37 25.4 -00.1 75.7
19°	41 12.2 -02.5 74.3	40 15.4 -02.0 74.3	39 18.7 -01.7 74.4	38 22.0 -01.3 74.4	37 25.3 -01.0 74.4
20°	41 09.7 -03.4 73.0	40 13.4 -03.0 73.0	39 17.0 -02.5 73.1	38 20.7 -02.2 73.1	37 24.3 -01.7 73.1
21°	41 06.3 -04.2 71.6	40 10.4 -03.8 71.7	39 14.5 -03.4 71.8	38 18.5 -03.0 71.8	37 22.6 -02.6 71.9
22°	41 02.1 -05.2 70.3	40 06.6 -04.7 70.4	39 11.1 -04.3 70.5	38 15.5 -03.8 70.6	37 20.0 -03.4 70.6
23°	40 56.9 -06.1 69.0	40 01.9 -05.6 69.1	39 06.8 -05.1 69.2	38 11.7 -04.6 69.3	37 16.6 -04.1 69.4
24°	40 50.8 -07.0 67.7	39 56.3 -06.5 67.8	39 01.7 -05.9 67.9	38 07.1 -05.4 68.0	37 12.5 -05.0 68.1
25°	40 43.8 -07.8 66.4	39 49.8 -07.3 66.5	38 55.8 -06.8 66.6	38 01.7 -06.3 66.8	37 07.5 -05.7 66.9
26°	40 36.0 -08.8 65.1	39 42.5 -08.2 65.2	38 49.0 -07.6 65.4	37 55.4 -07.0 65.5	37 01.8 -06.5 65.6
27°	40 27.2 -09.6 63.8	39 34.3 -09.0 63.9	38 41.4 -08.4 64.1	37 48.4 -07.9 64.2	36 55.3 -07.3 64.4
28°	40 17.6 -10.5 62.5	39 25.3 -09.8 62.7	38 33.0 -09.3 62.8	37 40.5 -08.6 63.0	36 48.0 -08.0 63.1
29°	40 07.1 -11.3 61.2	39 15.5 -10.7 61.4	38 23.7 -10.0 61.6	37 31.9 -09.5 61.7	36 40.0 -08.9 61.9

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	34 16.0 +13.5 97.6	33 17.6 +13.3 97.3	32 19.1 +13.3 97.1	31 20.7 +13.1 96.8	30 22.2 +12.9 96.5
1°	34 29.5 +12.8 96.4	33 30.9 +12.8 96.2	32 32.4 +12.6 95.9	31 33.8 +12.5 95.7	30 35.1 +12.4 95.4
2°	34 42.3 +12.1 95.2	33 43.7 +12.0 95.0	32 45.0 +11.9 94.7	31 46.3 +11.8 94.5	30 47.5 +11.8 94.3
3°	34 54.4 +11.5 94.0	33 55.7 +11.4 93.8	32 56.9 +11.3 93.6	31 58.1 +11.3 93.4	30 59.3 +11.2 93.1
4°	35 05.9 +10.7 92.9	34 07.1 +10.6 92.6	33 08.2 +10.6 92.4	32 09.4 +10.6 92.2	31 10.5 +10.6 92.0
5°	35 16.6 +10.0 91.6	34 17.7 +10.0 91.4	33 18.8 +10.0 91.2	32 20.0 +09.9 91.0	31 21.1 +09.9 90.8
6°	35 26.6 +09.3 90.4	34 27.7 +09.3 90.2	33 28.8 +09.3 90.1	32 29.9 +09.3 89.9	31 31.0 +09.3 89.7
7°	35 35.9 +08.5 89.2	34 37.0 +08.6 89.0	33 38.1 +08.6 88.9	32 39.2 +08.7 88.7	31 40.3 +08.7 88.5
8°	35 44.4 +07.8 88.0	34 45.6 +07.8 87.8	33 46.7 +07.9 87.7	32 47.9 +08.0 87.5	31 49.0 +08.1 87.3
9°	35 52.2 +07.1 86.8	34 53.4 +07.2 86.6	33 54.6 +07.3 86.5	32 55.9 +07.3 86.3	31 57.1 +07.4 86.2
10°	35 59.3 +06.3 85.6	35 00.6 +06.4 85.4	34 01.9 +06.5 85.3	33 03.2 +06.6 85.1	32 04.5 +06.8 85.0
11°	36 05.6 +05.5 84.3	35 07.0 +05.7 84.2	34 08.4 +05.8 84.1	33 09.8 +06.0 84.0	32 11.3 +06.1 83.8
12°	36 11.1 +04.8 83.1	35 12.7 +04.9 83.0	34 14.2 +05.2 82.9	33 15.8 +05.3 82.8	32 17.4 +05.4 82.7
13°	36 15.9 +04.1 81.9	35 17.6 +04.3 81.8	34 19.4 +04.4 81.7	33 21.1 +04.6 81.6	32 22.8 +04.8 81.5
14°	36 20.0 +03.2 80.6	35 21.9 +03.4 80.5	34 23.8 +03.7 80.5	33 25.7 +03.9 80.4	32 27.6 +04.2 80.3
15°	36 23.2 +02.5 79.4	35 25.3 +02.8 79.3	34 27.5 +03.0 79.3	33 29.6 +03.2 79.2	32 31.8 +03.4 79.1
16°	36 25.7 +01.7 78.1	35 28.1 +02.0 78.1	34 30.5 +02.2 78.0	33 32.8 +02.6 78.0	32 35.2 +02.8 77.9
17°	36 27.4 +01.0 76.9	35 30.1 +01.2 76.9	34 32.7 +01.6 76.8	33 35.4 +01.8 76.8	32 38.0 +02.2 76.7
18°	36 28.4 +00.2 75.7	35 31.3 +00.5 75.6	34 34.3 +00.8 75.6	33 37.2 +01.2 75.6	32 40.2 +01.4 75.6
19°	36 28.6 -00.6 74.4	35 31.8 -00.2 74.4	34 35.1 +00.1 74.4	33 38.4 +00.4 74.4	32 41.6 +00.8 74.4
20°	36 28.0 -01.4 73.2	35 31.6 -01.0 73.2	34 35.2 -00.6 73.2	33 38.8 -00.2 73.2	32 42.4 +00.2 73.2
21°	36 26.6 -02.2 71.9	35 30.6 -01.8 72.0	34 34.6 -01.4 72.0	33 38.6 -01.0 72.0	32 42.6 -00.6 72.0
22°	36 24.4 -02.9 70.7	35 28.8 -02.5 70.7	34 33.2 -02.0 70.8	33 37.6 -01.6 70.8	32 42.0 -01.2 70.8
23°	36 21.5 -03.7 69.4	35 26.3 -03.2 69.5	34 31.2 -02.8 69.5	33 36.0 -02.4 69.6	32 40.8 -01.9 69.6
24°	36 17.8 -04.4 68.2	35 23.1 -04.0 68.3	34 28.4 -03.5 68.3	33 33.6 -03.0 68.4	32 38.9 -02.6 68.4
25°	36 13.4 -05.3 67.0	35 19.1 -04.7 67.1	34 24.9 -04.2 67.1	33 30.6 -03.7 67.2	32 36.3 -03.2 67.2
26°	36 08.1 -05.9 65.7	35 14.4 -05.4 65.8	34 20.7 -04.9 65.9	33 26.9 -04.4 66.0	32 33.1 -03.9 66.1
27°	36 02.2 -06.8 64.5	35 09.0 -06.2 64.6	34 15.8 -05.7 64.7	33 22.5 -05.1 64.8	32 29.2 -04.6 64.9
28°	35 55.4 -07.4 63.3	35 02.8 -06.9 63.4	34 10.1 -06.3 63.5	33 17.4 -05.8 63.6	32 24.6 -05.2 63.7
29°	35 48.0 -08.2 62.0	34 55.9 -07.6 62.2	34 03.8 -07.0 62.3	33 11.6 -06.4 62.4	32 19.4 -05.9 62.5

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Declination SAME name as Latitude

Latitude 11°

Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	29 23.6 +12.9 96.3	28 25.1 +12.7 96.0	27 26.5 +12.6 95.8	26 27.9 +12.5 95.6	25 29.3 +12.4 95.3
1°	29 36.5 +12.3 95.2	28 37.8 +12.2 94.9	27 39.1 +12.2 94.7	26 40.4 +12.1 94.5	25 41.7 +12.0 94.2
2°	29 48.8 +11.7 94.0	28 50.0 +11.7 93.8	27 51.3 +11.5 93.6	26 52.5 +11.5 93.4	25 53.7 +11.4 93.1
3°	30 00.5 +11.1 92.9	29 01.7 +11.1 92.7	28 02.8 +11.1 92.5	27 04.0 +11.0 92.3	26 05.1 +11.0 92.1
4°	30 11.6 +10.6 91.8	29 12.8 +10.5 91.6	28 13.9 +10.5 91.4	27 15.0 +10.5 91.2	26 16.1 +10.5 91.0
5°	30 22.2 +09.9 90.6	29 23.3 +09.9 90.4	28 24.4 +09.9 90.2	27 25.5 +09.9 90.0	26 26.6 +10.0 89.9
6°	30 32.1 +09.4 89.5	29 33.2 +09.4 89.3	28 34.3 +09.4 89.1	27 35.4 +09.5 88.9	26 36.6 +09.4 88.8
7°	30 41.5 +08.7 88.3	29 42.6 +08.8 88.2	28 43.7 +08.9 88.0	27 44.9 +08.9 87.8	26 46.0 +09.0 87.7
8°	30 50.2 +08.1 87.2	29 51.4 +08.2 87.0	28 52.6 +08.2 86.9	27 53.8 +08.3 86.7	26 55.0 +08.4 86.5
9°	30 58.3 +07.5 86.0	29 59.6 +07.6 85.9	29 00.8 +07.7 85.7	28 02.1 +07.8 85.6	27 03.4 +07.9 85.4
10°	31 05.8 +06.9 84.9	30 07.2 +07.0 84.7	29 08.5 +07.2 84.6	28 09.9 +07.2 84.5	27 11.3 +07.4 84.3
11°	31 12.7 +06.3 83.7	30 14.2 +06.4 83.6	29 15.7 +06.5 83.5	28 17.1 +06.7 83.3	27 18.7 +06.8 83.2
12°	31 19.0 +05.6 82.5	30 20.6 +05.8 82.4	29 22.2 +06.0 82.3	28 23.8 +06.2 82.2	27 25.5 +06.3 82.1
13°	31 24.6 +05.0 81.4	30 26.4 +05.2 81.3	29 28.2 +05.3 81.2	28 30.0 +05.5 81.1	27 31.8 +05.8 81.0
14°	31 29.6 +04.3 80.2	30 31.6 +04.5 80.1	29 33.5 +04.8 80.0	28 35.5 +05.0 79.9	27 37.6 +05.2 79.8
15°	31 33.9 +03.7 79.0	30 36.1 +04.0 79.0	29 38.3 +04.2 78.9	28 40.5 +04.5 78.8	27 42.8 +04.6 78.7
16°	31 37.6 +03.1 77.9	30 40.1 +03.3 77.8	29 42.5 +03.6 77.7	28 45.0 +03.8 77.7	27 47.4 +04.2 77.6
17°	31 40.7 +02.4 76.7	30 43.4 +02.7 76.6	29 46.1 +03.0 76.6	28 48.8 +03.3 76.5	27 51.6 +03.5 76.5
18°	31 43.1 +01.8 75.5	30 46.1 +02.1 75.5	29 49.1 +02.4 75.4	28 52.1 +02.7 75.4	27 55.1 +03.0 75.3
19°	31 44.9 +01.2 74.4	30 48.2 +01.5 74.3	29 51.5 +01.8 74.3	28 54.8 +02.2 74.2	27 58.1 +02.5 74.2
20°	31 46.1 +00.4 73.2	30 49.7 +00.8 73.2	29 53.3 +01.2 73.1	28 57.0 +01.5 73.1	28 00.6 +01.9 73.1
21°	31 46.5 -00.1 72.0	30 50.5 +00.2 72.0	29 54.5 +00.6 72.0	28 58.5 +01.0 72.0	28 02.5 +01.4 71.9
22°	31 46.4 -00.8 70.8	30 50.7 -00.4 70.8	29 55.1 +00.0 70.8	28 59.5 +00.4 70.8	28 03.9 +00.7 70.8
23°	31 45.6 -01.5 69.6	30 50.3 -01.0 69.7	29 55.1 -00.6 69.7	28 59.9 -00.2 69.7	28 04.6 +00.3 69.7
24°	31 44.1 -02.1 68.5	30 49.3 -01.7 68.5	29 54.5 -01.2 68.5	28 59.7 -00.8 68.5	28 04.9 -00.4 68.5
25°	31 42.0 -02.8 67.3	30 47.6 -02.2 67.3	29 53.3 -01.8 67.4	28 58.9 -01.3 67.4	28 04.5 -00.8 67.4
26°	31 39.2 -03.4 66.1	30 45.4 -02.9 66.2	29 51.5 -02.4 66.2	28 57.6 -02.0 66.2	28 03.7 -01.5 66.3
27°	31 35.8 -04.0 64.9	30 42.5 -03.6 65.0	29 49.1 -03.0 65.1	28 55.6 -02.5 65.1	28 02.2 -02.0 65.1
28°	31 31.8 -04.7 63.8	30 38.9 -04.1 63.8	29 46.1 -03.7 63.9	28 53.1 -03.0 64.0	28 00.2 -02.5 64.0
29°	31 27.1 -05.3 62.6	30 34.8 -04.8 62.7	29 42.4 -04.2 62.8	28 50.1 -03.7 62.8	27 57.7 -03.2 62.9

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	24 30.6 +12.4 95.1	23 31.9 +12.3 94.9	22 33.2 +12.2 94.6	21 34.5 +12.1 94.4	20 35.8 +12.0 94.2
1°	24 43.0 +11.8 94.0	23 44.2 +11.8 93.8	22 45.4 +11.8 93.6	21 46.6 +11.7 93.4	20 47.8 +11.7 93.1
2°	24 54.8 +11.5 92.9	23 56.0 +11.4 92.7	22 57.2 +11.3 92.5	21 58.3 +11.3 92.3	20 59.5 +11.3 92.1
3°	25 06.3 +10.9 91.8	24 07.4 +10.9 91.6	23 08.5 +10.9 91.4	22 09.6 +10.9 91.2	21 10.8 +10.8 91.0
4°	25 17.2 +10.5 90.8	24 18.3 +10.5 90.6	23 19.4 +10.5 90.4	22 20.5 +10.5 90.2	21 21.6 +10.5 90.0
5°	25 27.7 +10.0 89.7	24 28.8 +10.0 89.5	23 29.9 +10.0 89.3	22 31.0 +10.1 89.1	21 32.1 +10.1 88.9
6°	25 37.7 +09.5 88.6	24 38.8 +09.5 88.4	23 39.9 +09.6 88.2	22 41.1 +09.6 88.0	21 42.2 +09.7 87.9
7°	25 47.2 +09.0 87.5	24 48.3 +09.1 87.3	23 49.5 +09.1 87.1	22 50.7 +09.2 87.0	21 51.9 +09.2 86.8
8°	25 56.2 +08.5 86.4	24 57.4 +08.6 86.2	23 58.6 +08.7 86.1	22 59.9 +08.7 85.9	22 01.1 +08.9 85.7
9°	26 04.7 +08.0 85.3	25 06.0 +08.1 85.1	24 07.3 +08.2 85.0	23 08.6 +08.4 84.8	22 10.0 +08.4 84.7
10°	26 12.7 +07.5 84.2	25 14.1 +07.6 84.0	24 15.5 +07.8 83.9	23 17.0 +07.9 83.7	22 18.4 +08.0 83.6
11°	26 20.2 +07.0 83.1	25 21.7 +07.2 82.9	24 23.3 +07.3 82.8	23 24.9 +07.4 82.7	22 26.4 +07.6 82.5
12°	26 27.2 +06.4 82.0	25 28.9 +06.6 81.8	24 30.6 +06.8 81.7	23 32.3 +07.0 81.6	22 34.0 +07.2 81.5
13°	26 33.6 +06.0 80.8	25 35.5 +06.1 80.7	24 37.4 +06.3 80.6	23 39.3 +06.5 80.5	22 41.2 +06.7 80.4
14°	26 39.6 +05.4 79.7	25 41.6 +05.7 79.6	24 43.7 +05.9 79.5	23 45.8 +06.1 79.4	22 47.9 +06.3 79.3
15°	26 45.0 +04.9 78.6	25 47.3 +05.1 78.5	24 49.6 +05.4 78.4	23 51.9 +05.6 78.3	22 54.2 +05.9 78.2
16°	26 49.9 +04.4 77.5	25 52.4 +04.7 77.4	24 55.0 +04.9 77.3	23 57.5 +05.2 77.2	23 00.1 +05.4 77.1
17°	26 54.3 +03.9 76.4	25 57.1 +04.1 76.3	24 59.9 +04.4 76.2	24 02.7 +04.7 76.1	23 05.5 +05.0 76.1
18°	26 58.2 +03.3 75.3	26 01.2 +03.6 75.2	25 04.3 +03.9 75.1	24 07.4 +04.2 75.1	23 10.5 +04.5 75.0
19°	27 01.5 +02.8 74.1	26 04.8 +03.1 74.1	25 08.2 +03.4 74.0	24 11.6 +03.7 74.0	23 15.0 +04.1 73.9
20°	27 04.3 +02.2 73.0	26 07.9 +02.6 73.0	25 11.6 +03.0 72.9	24 15.3 +03.3 72.9	23 19.1 +03.6 72.8
21°	27 06.5 +01.7 71.9	26 10.5 +02.1 71.9	25 14.6 +02.4 71.8	24 18.6 +02.8 71.8	23 22.7 +03.2 71.7
22°	27 08.2 +01.2 70.8	26 12.6 +01.6 70.8	25 17.0 +02.0 70.7	24 21.4 +02.4 70.7	23 25.9 +02.7 70.6
23°	27 09.4 +00.7 69.7	26 14.2 +01.1 69.6	25 19.0 +01.4 69.6	24 23.8 +01.9 69.6	23 28.6 +02.3 69.5
24°	27 10.1 +00.1 68.5	26 15.3 +00.5 68.5	25 20.4 +01.0 68.5	24 25.7 +01.3 68.5	23 30.9 +01.8 68.5
25°	27 10.2 -00.5 67.4	26 15.8 +00.0 67.4	25 21.4 +00.5 67.4	24 27.0 +01.0 67.4	23 32.7 +01.3 67.4
26°	27 09.7 -00.9 66.3	26 15.8 -00.5 66.3	25 21.9 +00.0 66.3	24 28.0 +00.4 66.3	23 34.0 +00.9 66.3
27°	27 08.8 -01.5 65.2	26 15.3 -01.0 65.2	25 21.9 -00.6 65.2	24 28.4 +00.0 65.2	23 34.9 +00.5 65.2
28°	27 07.3 -02.1 64.0	26 14.3 -01.5 64.1	25 21.3 -01.0 64.1	24 28.4 -00.5 64.1	23 35.4 +00.0 64.1
29°	27 05.2 -02.5 62.9	26 12.8 -02.1 62.9	25 20.3 -01.5 63.0	24 27.9 -01.0 63.0	23 35.4 -00.5 63.0

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Latitude 11°

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Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	19 37.0 +12.0 94.0	18 38.3 +11.9 93.8	17 39.5 +11.9 93.5	16 40.7 +11.8 93.3	15 41.9 +11.8 93.1
1°	19 49.0 +11.6 92.9	18 50.2 +11.6 92.7	17 51.4 +11.5 92.5	16 52.5 +11.5 92.3	15 53.7 +11.4 92.1
2°	20 00.6 +11.3 91.9	19 01.8 +11.2 91.7	18 02.9 +11.2 91.5	17 04.0 +11.2 91.3	16 05.1 +11.2 91.1
3°	20 11.9 +10.8 90.8	19 13.0 +10.8 90.6	18 14.1 +10.8 90.5	17 15.2 +10.9 90.3	16 16.3 +10.9 90.1
4°	20 22.7 +10.5 89.8	19 23.8 +10.6 89.6	18 24.9 +10.6 89.4	17 26.1 +10.5 89.2	16 27.2 +10.5 89.0
5°	20 33.2 +10.1 88.7	19 34.4 +10.1 88.6	18 35.5 +10.2 88.4	17 36.6 +10.2 88.2	16 37.7 +10.3 88.0
6°	20 43.3 +09.8 87.7	19 44.5 +09.8 87.5	18 45.7 +09.8 87.3	17 46.8 +09.9 87.2	16 48.0 +10.0 87.0
7°	20 53.1 +09.3 86.6	19 54.3 +09.4 86.5	18 55.5 +09.5 86.3	17 56.7 +09.6 86.1	16 58.0 +09.6 86.0
8°	21 02.4 +09.0 85.6	20 03.7 +09.0 85.4	19 05.0 +09.1 85.3	18 06.3 +09.2 85.1	17 07.6 +09.4 84.9
9°	21 11.4 +08.5 84.5	20 12.7 +08.7 84.4	19 14.1 +08.8 84.2	18 15.5 +09.0 84.0	17 17.0 +09.0 83.9
10°	21 19.9 +08.2 83.5	20 21.4 +08.3 83.3	19 22.9 +08.4 83.2	18 24.5 +08.5 83.0	17 26.0 +08.7 82.9
11°	21 28.1 +07.7 82.4	20 29.7 +07.9 82.2	19 31.3 +08.1 82.1	18 33.0 +08.2 82.0	17 34.7 +08.4 81.8
12°	21 35.8 +07.3 81.3	20 37.6 +07.5 81.2	19 39.4 +07.7 81.1	18 41.2 +07.9 80.9	17 43.1 +08.0 80.8
13°	21 43.1 +07.0 80.3	20 45.1 +07.1 80.1	19 47.1 +07.3 80.0	18 49.1 +07.5 79.9	17 51.1 +07.7 79.7
14°	21 50.1 +06.5 79.2	20 52.2 +06.7 79.1	19 54.4 +06.9 78.9	18 56.6 +07.2 78.8	17 58.8 +07.4 78.7
15°	21 56.6 +06.1 78.1	20 58.9 +06.4 78.0	20 01.3 +06.6 77.9	19 03.8 +06.8 77.8	18 06.2 +07.1 77.7
16°	22 02.7 +05.6 77.0	21 05.3 +05.9 76.9	20 07.9 +06.2 76.8	19 10.6 +06.4 76.7	18 13.3 +06.7 76.6
17°	22 08.3 +05.3 76.0	21 11.2 +05.5 75.9	20 14.1 +05.8 75.8	19 17.0 +06.1 75.7	18 20.0 +06.3 75.6
18°	22 13.6 +04.8 74.9	21 16.7 +05.2 74.8	20 19.9 +05.4 74.7	19 23.1 +05.7 74.6	18 26.3 +06.1 74.5
19°	22 18.4 +04.4 73.8	21 21.9 +04.7 73.7	20 25.3 +05.1 73.6	19 28.8 +05.4 73.6	18 32.4 +05.6 73.5
20°	22 22.8 +04.0 72.7	21 26.6 +04.3 72.7	20 30.4 +04.6 72.6	19 34.2 +05.0 72.5	18 38.0 +05.3 72.4
21°	22 26.8 +03.5 71.7	21 30.9 +03.9 71.6	20 35.0 +04.3 71.5	19 39.2 +04.6 71.4	18 43.3 +05.0 71.4
22°	22 30.3 +03.1 70.6	21 34.8 +03.5 70.5	20 39.3 +03.8 70.5	19 43.8 +04.2 70.4	18 48.3 +04.6 70.3
23°	22 33.4 +02.7 69.5	21 38.3 +03.0 69.4	20 43.1 +03.5 69.4	19 48.0 +03.9 69.3	18 52.9 +04.3 69.3
24°	22 36.1 +02.2 68.4	21 41.3 +02.7 68.4	20 46.6 +03.1 68.3	19 51.9 +03.5 68.3	18 57.2 +03.9 68.2
25°	22 38.3 +01.8 67.3	21 44.0 +02.2 67.3	20 49.7 +02.6 67.3	19 55.4 +03.1 67.2	19 01.1 +03.5 67.1
26°	22 40.1 +01.4 66.2	21 46.2 +01.8 66.2	20 52.3 +02.3 66.2	19 58.5 +02.7 66.1	19 04.6 +03.2 66.1
27°	22 41.5 +00.9 65.2	21 48.0 +01.4 65.1	20 54.6 +01.9 65.1	20 01.2 +02.3 65.1	19 07.8 +02.8 65.0
28°	22 42.4 +00.5 64.1	21 49.4 +01.0 64.1	20 56.5 +01.5 64.0	20 03.5 +02.0 64.0	19 10.6 +02.4 64.0
29°	22 42.9 +00.0 63.0	21 50.4 +00.6 63.0	20 58.0 +01.0 63.0	20 05.5 +01.6 62.9	19 13.0 +02.1 62.9

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 43.1 +11.7 92.9	13 44.3 +11.6 92.7	12 45.4 +11.6 92.5	11 46.6 +11.6 92.3	10 47.7 +11.6 92.1
1°	14 54.8 +11.4 91.9	13 55.9 +11.4 91.7	12 57.0 +11.4 91.5	11 58.2 +11.3 91.3	10 59.3 +11.3 91.1
2°	15 06.2 +11.2 90.9	14 07.3 +11.2 90.7	13 08.4 +11.2 90.5	12 09.5 +11.2 90.3	11 10.6 +11.2 90.1
3°	15 17.4 +10.9 89.9	14 18.5 +10.9 89.7	13 19.6 +10.9 89.5	12 20.7 +10.9 89.3	11 21.8 +11.0 89.1
4°	15 28.3 +10.6 88.9	14 29.4 +10.6 88.7	13 30.5 +10.7 88.5	12 31.6 +10.7 88.3	11 32.8 +10.7 88.1
5°	15 38.9 +10.3 87.8	14 40.0 +10.4 87.7	13 41.2 +10.4 87.5	12 42.3 +10.5 87.3	11 43.5 +10.6 87.1
6°	15 49.2 +10.0 86.8	14 50.4 +10.1 86.6	13 51.6 +10.2 86.5	12 52.8 +10.3 86.3	11 54.1 +10.3 86.1
7°	15 59.2 +09.8 85.8	15 00.5 +09.8 85.6	14 01.8 +09.9 85.4	13 03.1 +10.0 85.3	12 04.4 +10.1 85.1
8°	16 09.0 +09.4 84.8	15 10.3 +09.6 84.6	14 11.7 +09.7 84.4	13 13.1 +09.8 84.3	12 14.5 +09.9 84.1
9°	16 18.4 +09.2 83.7	15 19.9 +09.3 83.6	14 21.4 +09.4 83.4	13 22.9 +09.5 83.2	12 24.4 +09.7 83.1
10°	16 27.6 +08.8 82.7	15 29.2 +08.9 82.5	14 30.8 +09.1 82.4	13 32.4 +09.3 82.2	12 34.1 +09.4 82.1
11°	16 36.4 +08.6 81.7	15 38.1 +08.8 81.5	14 39.9 +08.9 81.4	13 41.7 +09.0 81.2	12 43.5 +09.2 81.1
12°	16 45.0 +08.2 80.6	15 46.9 +08.4 80.5	14 48.8 +08.6 80.3	13 50.7 +08.8 80.2	12 52.7 +09.0 80.0
13°	16 53.2 +07.9 79.6	15 55.3 +08.1 79.5	14 57.4 +08.3 79.3	13 59.5 +08.5 79.2	13 01.7 +08.7 79.0
14°	17 01.1 +07.6 78.6	16 03.4 +07.8 78.4	15 05.7 +08.0 78.3	14 08.0 +08.3 78.2	13 10.4 +08.5 78.0
15°	17 08.7 +07.3 77.5	16 11.2 +07.5 77.4	15 13.7 +07.8 77.3	14 16.3 +08.0 77.1	13 18.9 +08.3 77.0
16°	17 16.0 +07.0 76.5	16 18.7 +07.3 76.4	15 21.5 +07.5 76.2	14 24.3 +07.8 76.1	13 27.2 +08.0 76.0
17°	17 23.0 +06.6 75.4	16 26.0 +06.9 75.3	15 29.0 +07.2 75.2	14 32.1 +07.4 75.1	13 35.2 +07.7 75.0
18°	17 29.6 +06.3 74.4	16 32.9 +06.6 74.3	15 36.2 +06.9 74.2	14 39.5 +07.2 74.1	13 42.9 +07.5 73.9
19°	17 35.9 +06.0 73.4	16 39.5 +06.3 73.3	15 43.1 +06.6 73.2	14 46.7 +07.0 73.0	13 50.4 +07.3 72.9
20°	17 41.9 +05.6 72.3	16 45.8 +06.0 72.2	15 49.7 +06.3 72.1	14 53.7 +06.6 72.0	13 57.7 +07.0 71.9
21°	17 47.5 +05.4 71.3	16 51.8 +05.7 71.2	15 56.0 +06.1 71.1	15 00.3 +06.4 71.0	14 04.7 +06.7 70.9
22°	17 52.9 +04.9 70.2	16 57.5 +05.3 70.1	16 02.1 +05.7 70.0	15 06.7 +06.1 70.0	14 11.4 +06.5 69.9
23°	17 57.8 +04.7 69.2	17 02.8 +05.1 69.1	16 07.8 +05.4 69.0	15 12.8 +05.9 68.9	14 17.9 +06.2 68.8
24°	18 02.5 +04.3 68.1	17 07.9 +04.7 68.1	16 13.2 +05.2 68.0	15 18.7 +05.5 67.9	14 24.1 +05.9 67.8
25°	18 06.8 +04.0 67.1	17 12.6 +04.4 67.0	16 18.4 +04.8 66.9	15 24.2 +05.2 66.9	14 30.0 +05.7 66.8
26°	18 10.8 +03.6 66.0	17 17.0 +04.0 66.0	16 23.2 +04.5 65.9	15 29.4 +05.0 65.8	14 35.7 +05.4 65.7
27°	18 14.4 +03.3 65.0	17 21.0 +03.8 64.9	16 27.7 +04.2 64.9	15 34.4 +04.7 64.8	14 41.1 +05.2 64.7
28°	18 17.7 +02.9 63.9	17 24.8 +03.4 63.9	16 31.9 +03.9 63.8	15 39.1 +04.4 63.8	14 46.3 +04.8 63.7
29°	18 20.6 +02.6 62.9	17 28.2 +03.1 62.8	16 35.8 +03.6 62.8	15 43.5 +04.0 62.7	14 51.1 +04.6 62.7

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Latitude 11°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 48.9 +11.5 91.9	8 50.0 +11.5 91.7	7 51.1 +11.5 91.5	6 52.2 +11.5 91.3	5 53.4 +11.4 91.1
1°	10 00.4 +11.3 90.9	9 01.5 +11.4 90.7	8 02.6 +11.4 90.5	7 03.7 +11.4 90.4	6 04.8 +11.4 90.2
2°	10 11.7 +11.2 89.9	9 12.9 +11.1 89.7	8 14.0 +11.2 89.6	7 15.1 +11.2 89.4	6 16.2 +11.2 89.2
3°	10 22.9 +11.0 88.9	9 24.0 +11.1 88.7	8 25.2 +11.0 88.6	7 26.3 +11.1 88.4	6 27.4 +11.1 88.2
4°	10 33.9 +10.8 87.9	9 35.1 +10.8 87.8	8 36.2 +10.9 87.6	7 37.4 +10.9 87.4	6 38.5 +11.0 87.2
5°	10 44.7 +10.6 86.9	9 45.9 +10.7 86.8	8 47.1 +10.7 86.6	7 48.3 +10.8 86.4	6 49.5 +10.9 86.2
6°	10 55.3 +10.4 85.9	9 56.6 +10.5 85.8	8 57.8 +10.6 85.6	7 59.1 +10.7 85.4	7 00.4 +10.8 85.2
7°	11 05.7 +10.2 84.9	10 07.1 +10.3 84.8	9 08.4 +10.4 84.6	8 09.8 +10.5 84.4	7 11.2 +10.6 84.2
8°	11 15.9 +10.0 83.9	10 17.4 +10.1 83.8	9 18.8 +10.3 83.6	8 20.3 +10.4 83.4	7 21.8 +10.5 83.2
9°	11 25.9 +09.8 82.9	10 27.5 +09.9 82.8	9 29.1 +10.1 82.6	8 30.7 +10.2 82.4	7 32.3 +10.4 82.2
10°	11 35.7 +09.6 81.9	10 37.4 +09.8 81.7	9 39.2 +09.9 81.6	8 40.9 +10.1 81.4	7 42.7 +10.2 81.2
11°	11 45.3 +09.4 80.9	10 47.2 +09.5 80.7	9 49.1 +09.7 80.6	8 51.0 +09.9 80.4	7 52.9 +10.1 80.3
12°	11 54.7 +09.2 79.9	10 56.7 +09.4 79.7	9 58.8 +09.5 79.6	9 00.9 +09.7 79.4	8 03.0 +09.9 79.3
13°	12 03.9 +08.9 78.9	11 06.1 +09.1 78.7	10 08.3 +09.4 78.6	9 10.6 +09.6 78.4	8 12.9 +09.8 78.3
14°	12 12.8 +08.7 77.9	11 15.2 +09.0 77.7	10 17.7 +09.2 77.6	9 20.2 +09.4 77.4	8 22.7 +09.7 77.3
15°	12 21.5 +08.5 76.9	11 24.2 +08.7 76.7	10 26.9 +09.0 76.6	9 29.6 +09.3 76.4	8 32.4 +09.5 76.3
16°	12 30.0 +08.3 75.8	11 32.9 +08.6 75.7	10 35.9 +08.8 75.6	9 38.9 +09.0 75.4	8 41.9 +09.3 75.3
17°	12 38.3 +08.0 74.8	11 41.5 +08.3 74.7	10 44.7 +08.6 74.6	9 47.9 +08.9 74.4	8 51.2 +09.2 74.3
18°	12 46.3 +07.8 73.8	11 49.8 +08.1 73.7	10 53.3 +08.4 73.5	9 56.8 +08.7 73.4	9 00.4 +09.0 73.3
19°	12 54.1 +07.6 72.8	11 57.9 +07.9 72.7	11 01.7 +08.2 72.5	10 05.5 +08.6 72.4	9 09.4 +08.9 72.3
20°	13 01.7 +07.4 71.8	12 05.8 +07.7 71.7	11 09.9 +08.0 71.5	10 14.1 +08.3 71.4	9 18.3 +08.7 71.3
21°	13 09.1 +07.0 70.8	12 13.5 +07.4 70.6	11 17.9 +07.8 70.5	10 22.4 +08.2 70.4	9 27.0 +08.5 70.3
22°	13 16.1 +06.9 69.7	12 20.9 +07.2 69.6	11 25.7 +07.6 69.5	10 30.6 +07.9 69.4	9 35.5 +08.3 69.3
23°	13 23.0 +06.6 68.7	12 28.1 +07.0 68.6	11 33.3 +07.4 68.5	10 38.5 +07.8 68.4	9 43.8 +08.2 68.3
24°	13 29.6 +06.3 67.7	12 35.1 +06.8 67.6	11 40.7 +07.2 67.5	10 46.3 +07.6 67.4	9 52.0 +07.9 67.2
25°	13 35.9 +06.1 66.7	12 41.9 +06.5 66.6	11 47.9 +06.9 66.5	10 53.9 +07.4 66.4	9 59.9 +07.9 66.2
26°	13 42.0 +05.9 65.7	12 48.4 +06.3 65.6	11 54.8 +06.7 65.5	11 01.3 +07.1 65.3	10 07.8 +07.6 65.2
27°	13 47.9 +05.6 64.6	12 54.7 +06.1 64.5	12 01.5 +06.6 64.4	11 08.4 +07.0 64.3	10 15.4 +07.4 64.2
28°	13 53.5 +05.3 63.6	13 00.8 +05.8 63.5	12 08.1 +06.3 63.4	11 15.4 +06.8 63.3	10 22.8 +07.2 63.2
29°	13 58.8 +05.1 62.6	13 06.6 +05.5 62.5	12 14.4 +06.0 62.4	11 22.2 +06.5 62.3	10 30.0 +07.1 62.2

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 54.5 +11.4 91.0	3 55.6 +11.4 90.8	2 56.7 +11.4 90.6	1 57.8 +11.4 90.4	0 58.9 +11.4 90.2
1°	5 05.9 +11.4 90.0	4 07.0 +11.4 89.8	3 08.1 +11.4 89.6	2 09.2 +11.4 89.4	1 10.3 +11.5 89.2
2°	5 17.3 +11.2 89.0	4 18.4 +11.3 88.8	3 19.5 +11.3 88.6	2 20.6 +11.4 88.4	1 21.8 +11.4 88.2
3°	5 28.5 +11.2 88.0	4 29.7 +11.2 87.8	3 30.8 +11.3 87.6	2 32.0 +11.3 87.4	1 33.2 +11.3 87.2
4°	5 39.7 +11.1 87.0	4 40.9 +11.1 86.8	3 42.1 +11.2 86.6	2 43.3 +11.3 86.5	1 44.5 +11.4 86.3
5°	5 50.8 +10.9 86.0	4 52.0 +11.1 85.8	3 53.3 +11.1 85.7	2 54.6 +11.2 85.5	1 55.9 +11.3 85.3
6°	6 01.7 +10.9 85.0	5 03.1 +10.9 84.9	4 04.4 +11.1 84.7	3 05.8 +11.1 84.5	2 07.2 +11.2 84.3
7°	6 12.6 +10.7 84.0	5 14.0 +10.9 83.9	4 15.5 +11.0 83.7	3 16.9 +11.1 83.5	2 18.4 +11.3 83.3
8°	6 23.3 +10.7 83.1	5 24.9 +10.7 82.9	4 26.5 +10.9 82.7	3 28.0 +11.1 82.5	2 29.7 +11.1 82.3
9°	6 34.0 +10.5 82.1	5 35.6 +10.7 81.9	4 37.4 +10.8 81.7	3 39.1 +11.0 81.5	2 40.8 +11.2 81.3
10°	6 44.5 +10.4 81.1	5 46.3 +10.6 80.9	4 48.2 +10.7 80.7	3 50.1 +10.9 80.5	2 52.0 +11.1 80.4
11°	6 54.9 +10.3 80.1	5 56.9 +10.4 79.9	4 58.9 +10.7 79.7	4 01.0 +10.8 79.6	3 03.1 +11.0 79.4
12°	7 05.2 +10.1 79.1	6 07.3 +10.4 78.9	5 09.6 +10.5 78.7	4 11.8 +10.8 78.6	3 14.1 +11.0 78.4
13°	7 15.3 +10.0 78.1	6 17.7 +10.2 77.9	5 20.1 +10.5 77.8	4 22.6 +10.7 77.6	3 25.1 +10.9 77.4
14°	7 25.3 +09.9 77.1	6 27.9 +10.1 76.9	5 30.6 +10.3 76.8	4 33.3 +10.6 76.6	3 36.0 +10.8 76.4
15°	7 35.2 +09.7 76.1	6 38.0 +10.0 75.9	5 40.9 +10.3 75.8	4 43.9 +10.5 75.6	3 46.8 +10.8 75.4
16°	7 44.9 +09.7 75.1	6 48.0 +09.9 75.0	5 51.2 +10.1 74.8	4 54.4 +10.4 74.6	3 57.6 +10.7 74.5
17°	7 54.6 +09.4 74.1	6 57.9 +09.8 74.0	6 01.3 +10.1 73.8	5 04.8 +10.3 73.6	4 08.3 +10.7 73.5
18°	8 04.0 +09.3 73.1	7 07.7 +09.6 73.0	6 11.4 +09.9 72.8	5 15.1 +10.3 72.6	4 19.0 +10.5 72.5
19°	8 13.3 +09.2 72.1	7 17.3 +09.5 72.0	6 21.3 +09.9 71.8	5 25.4 +10.2 71.7	4 29.5 +10.5 71.5
20°	8 22.5 +09.0 71.1	7 26.8 +09.4 71.0	6 31.2 +09.7 70.8	5 35.6 +10.0 70.7	4 40.0 +10.4 70.5
21°	8 31.5 +08.9 70.1	7 36.2 +09.2 70.0	6 40.9 +09.6 69.8	5 45.6 +10.0 69.7	4 50.4 +10.3 69.5
22°	8 40.4 +08.7 69.1	7 45.4 +09.1 69.0	6 50.5 +09.4 68.8	5 55.6 +09.8 68.7	5 00.7 +10.2 68.5
23°	8 49.1 +08.6 68.1	7 54.5 +08.9 68.0	6 59.9 +09.4 67.8	6 05.4 +09.7 67.7	5 10.9 +10.2 67.5
24°	8 57.7 +08.4 67.1	8 03.4 +08.8 67.0	7 09.3 +09.2 66.8	6 15.1 +09.7 66.7	5 21.1 +10.0 66.5
25°	9 06.1 +08.2 66.1	8 12.2 +08.7 66.0	7 18.5 +09.1 65.9	6 24.8 +09.5 65.7	5 31.1 +09.9 65.6
26°	9 14.3 +08.1 65.1	8 20.9 +08.5 65.0	7 27.6 +08.9 64.9	6 34.3 +09.4 64.7	5 41.0 +09.9 64.6
27°	9 22.4 +07.9 64.1	8 29.4 +08.4 64.0	7 36.5 +08.8 63.9	6 43.7 +09.2 63.7	5 50.9 +09.7 63.6
28°	9 30.3 +07.7 63.1	8 37.8 +08.1 63.0	7 45.3 +08.7 62.9	6 52.9 +09.2 62.7	6 00.6 +09.6 62.6
29°	9 38.0 +07.5 62.1	8 45.9 +08.1 62.0	7 54.0 +08.5 61.9	7 02.1 +09.0 61.7	6 10.2 +09.6 61.6

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Latitude 11°

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Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +11.4 90.0	-0 58.9 +11.5	-1 57.8 +11.5	-2 56.7 +11.5	-3 55.6 +11.5
1°	0 11.4 +11.5 89.0	-0 47.4 +11.4	-1 46.3 +11.5	-2 45.2 +11.5	-3 44.1 +11.6
2°	0 22.9 +11.4 88.0	-0 36.0 +11.5	-1 34.8 +11.5	-2 33.7 +11.6	-3 32.5 +11.6
3°	0 34.3 +11.5 87.1	-0 24.5 +11.5	-1 23.3 +11.6	-2 22.1 +11.6	-3 20.9 +11.7
4°	0 45.8 +11.4 86.1	-0 13.0 +11.5	-1 11.7 +11.5	-2 10.5 +11.7	-3 09.2 +11.8
5°	0 57.2 +11.4 85.1	-0 01.5 +11.5	-1 00.2 +11.6	-1 58.8 +11.7	-2 57.4 +11.8
6°	1 08.6 +11.3 84.1	0 10.0 +11.5 83.9	-0 48.6 +11.6	-1 47.1 +11.7	-2 45.6 +11.8
7°	1 19.9 +11.4 83.1	0 21.5 +11.5 82.9	-0 37.0 +11.7	-1 35.4 +11.8	-2 33.8 +11.9
8°	1 31.3 +11.3 82.1	0 33.0 +11.4 82.0	-0 25.3 +11.6	-1 23.6 +11.8	-2 21.9 +12.0
9°	1 42.6 +11.3 81.2	0 44.4 +11.5 81.0	-0 13.7 +11.6	-1 11.8 +11.8	-2 09.9 +12.0
10°	1 53.9 +11.3 80.2	0 55.9 +11.5 80.0	-0 02.1 +11.7	-1 00.0 +11.8	-1 57.9 +12.0
11°	2 05.2 +11.2 79.2	1 07.4 +11.4 79.0	0 09.6 +11.6 78.8	-0 48.2 +11.8	-1 45.9 +12.0
12°	2 16.4 +11.2 78.2	1 18.8 +11.4 78.0	0 21.2 +11.6 77.8	-0 36.4 +11.9	-1 33.9 +12.1
13°	2 27.6 +11.1 77.2	1 30.2 +11.4 77.0	0 32.8 +11.6 76.9	-0 24.5 +11.8	-1 21.8 +12.1
14°	2 38.7 +11.1 76.2	1 41.6 +11.3 76.1	0 44.4 +11.6 75.9	-0 12.7 +11.9	-1 09.7 +12.1
15°	2 49.8 +11.1 75.3	1 52.9 +11.3 75.1	0 56.0 +11.6 74.9	-0 00.8 +11.8	-0 57.6 +12.1
16°	3 00.9 +11.0 74.3	2 04.2 +11.3 74.1	1 07.6 +11.6 73.9	0 11.0 +11.9 73.7	-0 45.5 +12.2
17°	3 11.9 +10.9 73.3	2 15.5 +11.2 73.1	1 19.2 +11.5 72.9	0 22.9 +11.8 72.7	-0 33.3 +12.1
18°	3 22.8 +10.9 72.3	2 26.7 +11.2 72.1	1 30.7 +11.5 72.0	0 34.7 +11.9 71.8	-0 21.2 +12.2
19°	3 33.7 +10.8 71.3	2 37.9 +11.2 71.2	1 42.2 +11.5 71.0	0 46.6 +11.8 70.8	-0 09.0 +12.1
20°	3 44.5 +10.8 70.3	2 49.1 +11.1 70.2	1 53.7 +11.5 70.0	0 58.4 +11.8 69.8	0 03.1 +12.2 69.6
21°	3 55.3 +10.6 69.4	3 00.2 +11.0 69.2	2 05.2 +11.4 69.0	1 10.2 +11.8 68.8	0 15.3 +12.2 68.6
22°	4 05.9 +10.6 68.4	3 11.2 +11.0 68.2	2 16.6 +11.3 68.0	1 22.0 +11.7 67.8	0 27.5 +12.1 67.7
23°	4 16.5 +10.6 67.4	3 22.2 +10.9 67.2	2 27.9 +11.4 67.0	1 33.7 +11.8 66.9	0 39.6 +12.2 66.7
24°	4 27.1 +10.4 66.4	3 33.1 +10.9 66.2	2 39.3 +11.3 66.1	1 45.5 +11.7 65.9	0 51.8 +12.1 65.7
25°	4 37.5 +10.4 65.4	3 44.0 +10.8 65.2	2 50.6 +11.2 65.1	1 57.2 +11.6 64.9	1 03.9 +12.1 64.7
26°	4 47.9 +10.3 64.4	3 54.8 +10.7 64.3	3 01.8 +11.2 64.1	2 08.8 +11.7 63.9	1 16.0 +12.1 63.7
27°	4 58.2 +10.2 63.4	4 05.5 +10.7 63.3	3 13.0 +11.1 63.1	2 20.5 +11.6 62.9	1 28.1 +12.0 62.8
28°	5 08.4 +10.1 62.4	4 16.2 +10.6 62.3	3 24.1 +11.0 62.1	2 32.1 +11.5 62.0	1 40.1 +12.0 61.8
29°	5 18.5 +10.0 61.4	4 26.8 +10.5 61.3	3 35.1 +11.0 61.1	2 43.6 +11.5 61.0	1 52.1 +12.0 60.8

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 54.5 +11.6	-5 53.4 +11.6	-6 52.2 +11.5		
1°	-4 42.9 +11.6	-5 41.8 +11.7	-6 40.7 +11.8		
2°	-4 31.3 +11.7	-5 30.1 +11.7	-6 28.9 +11.8		
3°	-4 19.6 +11.7	-5 18.4 +11.9	-6 17.1 +11.9		
4°	-4 07.9 +11.9	-5 06.5 +11.9	-6 05.2 +12.1		
5°	-3 56.0 +11.9	-4 54.6 +12.0	-5 53.1 +12.1		
6°	-3 44.1 +12.0	-4 42.6 +12.2	-5 41.0 +12.2		
7°	-3 32.1 +12.0	-4 30.4 +12.1	-5 28.8 +12.4		
8°	-3 20.1 +12.1	-4 18.3 +12.3	-5 16.4 +12.4		
9°	-3 08.0 +12.2	-4 06.0 +12.3	-5 04.0 +12.5		
10°	-2 55.8 +12.2	-3 53.7 +12.4	-4 51.5 +12.7		
11°	-2 43.6 +12.2	-3 41.3 +12.5	-4 38.8 +12.6		
12°	-2 31.4 +12.3	-3 28.8 +12.6	-4 26.2 +12.8		
13°	-2 19.1 +12.4	-3 16.2 +12.5	-4 13.4 +12.9		
14°	-2 06.7 +12.4	-3 03.7 +12.7	-4 00.5 +12.9		
15°	-1 54.3 +12.4	-2 51.0 +12.7	-3 47.6 +12.9		
16°	-1 41.9 +12.4	-2 38.3 +12.7	-3 34.7 +13.1		
17°	-1 29.5 +12.5	-2 25.6 +12.8	-3 21.6 +13.1		
18°	-1 17.0 +12.5	-2 12.8 +12.8	-3 08.5 +13.1		
19°	-1 04.5 +12.5	-2 00.0 +12.9	-2 55.4 +13.2		
20°	-0 52.0 +12.5	-1 47.1 +12.8	-2 42.2 +13.3		
21°	-0 39.5 +12.5	-1 34.3 +13.0	-2 28.9 +13.3		
22°	-0 27.0 +12.6	-1 21.3 +12.9	-2 15.6 +13.3		
23°	-0 14.4 +12.5	-1 08.4 +13.0	-2 02.3 +13.4		
24°	-0 01.9 +12.6	-0 55.4 +12.9	-1 48.9 +13.4		
25°	0 10.7 +12.5 64.5	-0 42.5 +13.0	-1 35.5 +13.4		
26°	0 23.2 +12.5 63.6	-0 29.5 +13.0	-1 22.1 +13.5		
27°	0 35.7 +12.6 62.6	-0 16.5 +13.0	-1 08.6 +13.4		
28°	0 48.3 +12.5 61.6	-0 03.5 +13.0	-0 55.2 +13.5		
29°	1 00.8 +12.5 60.6	0 09.5 +13.0 60.4	-0 41.7 +13.5		

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Declination SAME name as Latitude

Latitude 12°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	78 00.0 +60.0 180.0	77 57.5 +59.8 175.2	77 50.2 +59.2 170.5	77 38.2 +58.1 165.9	77 21.6 +56.8 161.4
1°	79 00.0 +60.0 180.0	78 57.3 +59.8 174.8	78 49.4 +58.9 169.6	78 36.3 +57.7 164.6	78 18.4 +56.2 159.9
2°	80 00.0 +60.0 180.0	79 57.1 +59.6 174.3	79 48.3 +58.8 168.6	79 34.0 +57.3 163.2	79 14.6 +55.4 158.1
3°	81 00.0 +60.0 180.0	80 56.7 +59.6 173.6	80 47.1 +58.4 167.4	80 31.3 +56.7 161.5	80 10.0 +54.5 155.9
4°	82 00.0 +60.0 180.0	81 56.3 +59.5 172.9	81 45.5 +58.1 165.9	81 28.0 +55.9 159.4	81 04.5 +53.1 153.4
5°	83 00.0 +60.0 180.0	82 55.8 +59.4 171.9	82 43.6 +57.4 164.1	82 23.9 +54.6 156.8	81 57.6 +51.4 150.2
6°	84 00.0 +60.0 180.0	83 55.2 +59.0 170.6	83 41.0 +56.5 161.6	83 18.5 +52.9 153.5	82 49.0 +48.9 146.3
7°	85 00.0 +60.0 180.0	84 54.2 +58.6 168.8	84 37.5 +55.0 158.3	84 11.4 +50.3 149.1	83 37.9 +45.3 141.4
8°	86 00.0 +60.0 180.0	85 52.8 +57.8 166.1	85 32.5 +52.3 153.6	85 01.7 +45.9 143.3	84 23.2 +40.0 135.1
9°	87 00.0 +60.0 180.0	86 50.6 +55.7 161.8	86 24.8 +47.1 146.6	85 47.6 +38.8 135.2	85 03.2 +32.4 127.0
10°	88 00.0 +60.0 180.0	87 46.3 +49.7 153.8	87 11.9 +36.1 135.3	86 26.4 +27.3 123.9	85 35.6 +21.7 116.6
11°	89 00.0 +60.0 180.0	88 36.0 +25.3 135.5	87 48.0 +14.6 116.8	86 53.7 +10.2 108.5	85 57.3 +07.9 103.9
12°	90 00.0 -60.0 0.0	89 01.3 -25.2 89.9	88 02.6 -14.2 89.8	87 03.9 -09.6 89.7	86 05.2 -07.1 89.6
13°	89 00.0 -60.0 0.0	88 36.1 -49.6 44.2	87 48.4 -35.9 62.7	86 54.3 -26.8 70.8	85 58.1 -20.9 75.2
14°	88 00.0 -60.0 0.0	87 46.5 -55.7 25.9	87 12.5 -47.0 44.0	86 27.5 -38.5 55.3	85 37.2 -31.9 62.4
15°	87 00.0 -60.0 0.0	86 50.8 -57.8 17.8	86 25.5 -52.2 32.7	85 49.0 -45.8 43.9	85 05.3 -39.7 51.9
16°	86 00.0 -60.0 0.0	85 53.0 -58.6 13.5	85 33.3 -55.0 25.6	85 03.2 -50.1 35.7	84 25.6 -45.0 43.7
17°	85 00.0 -60.0 0.0	84 54.4 -59.0 10.8	84 38.3 -56.5 20.9	84 13.1 -52.8 29.8	83 40.6 -48.7 37.3
18°	84 00.0 -60.0 0.0	83 55.4 -59.4 9.0	83 41.8 -57.4 17.6	83 20.3 -54.7 25.4	82 51.9 -51.3 32.3
19°	83 00.0 -60.0 0.0	82 56.0 -59.4 7.7	82 44.4 -58.0 15.1	82 25.6 -55.8 22.1	82 00.6 -53.1 28.3
20°	82 00.0 -60.0 0.0	81 56.6 -59.6 6.7	81 46.4 -58.5 13.2	81 29.8 -56.6 19.4	81 07.5 -54.4 25.1
21°	81 00.0 -60.0 0.0	80 57.0 -59.7 5.9	80 47.9 -58.7 11.8	80 33.2 -57.3 17.3	80 13.1 -55.4 22.5
22°	80 00.0 -60.0 0.0	79 57.3 -59.8 5.3	79 49.2 -59.0 10.5	79 35.9 -57.8 15.6	79 17.7 -56.1 20.4
23°	79 00.0 -60.0 0.0	78 57.5 -59.7 4.8	78 50.2 -59.1 9.6	78 38.1 -58.1 14.2	78 21.6 -56.7 18.6
24°	78 00.0 -60.0 0.0	77 57.8 -59.9 4.4	77 51.1 -59.3 8.7	77 40.0 -58.4 12.9	77 24.9 -57.2 17.0
25°	77 00.0 -60.0 0.0	76 57.9 -59.8 4.0	76 51.8 -59.4 8.0	76 41.6 -58.6 11.9	76 27.7 -57.6 15.7
26°	76 00.0 -60.0 0.0	75 58.1 -59.9 3.7	75 52.4 -59.4 7.4	75 43.0 -58.7 11.0	75 30.1 -57.9 14.5
27°	75 00.0 -60.0 0.0	74 58.2 -59.8 3.4	74 53.0 -59.5 6.8	74 44.3 -59.0 10.2	74 32.2 -58.1 13.5
28°	74 00.0 -60.0 0.0	73 58.4 -59.9 3.2	73 53.5 -59.6 6.4	73 45.3 -59.0 9.5	73 34.1 -58.3 12.6
29°	73 00.0 -60.0 0.0	72 58.5 -59.9 3.0	72 53.9 -59.6 6.0	72 46.3 -59.1 8.9	72 35.8 -58.5 11.8

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	77 00.8 +55.2 157.2	76 36.2 +53.4 153.2	76 08.0 +51.5 149.4	75 36.6 +49.6 145.9	75 02.4 +47.6 142.7
1°	77 56.0 +54.4 155.4	77 29.6 +52.3 151.1	76 59.5 +50.2 147.2	76 26.2 +48.1 143.6	75 50.0 +45.9 140.3
2°	78 50.4 +53.3 153.3	78 21.9 +51.0 148.8	77 49.7 +48.7 144.7	77 14.3 +46.3 141.0	76 35.9 +44.1 137.6
3°	79 43.7 +51.9 150.8	79 12.9 +49.4 146.1	78 38.4 +46.7 141.8	78 00.6 +44.2 138.0	77 20.0 +41.8 134.6
4°	80 35.6 +50.3 147.9	80 02.3 +47.2 142.9	79 25.1 +44.4 138.5	78 44.8 +41.6 134.7	78 01.8 +39.1 131.2
5°	81 25.9 +47.9 144.4	80 49.5 +44.6 139.2	80 09.5 +41.4 134.7	79 26.4 +38.5 130.8	78 40.9 +35.9 127.4
6°	82 13.8 +44.9 140.1	81 34.1 +41.2 134.8	80 50.9 +37.8 130.4	80 04.9 +34.8 126.5	79 16.8 +32.1 123.2
7°	82 58.7 +40.7 135.0	82 15.3 +36.6 129.7	81 28.7 +33.2 125.3	80 39.7 +30.3 121.6	79 48.9 +27.8 118.6
8°	83 39.4 +35.1 128.6	82 51.9 +31.0 123.5	82 01.9 +27.7 119.5	81 10.0 +24.9 116.2	80 16.7 +22.7 113.5
9°	84 14.5 +27.5 120.9	83 22.9 +23.9 116.4	82 29.6 +21.0 112.9	81 34.9 +18.9 110.1	80 39.4 +17.2 107.9
10°	84 42.0 +18.0 111.7	83 46.8 +15.4 108.2	82 50.6 +13.5 105.5	81 53.8 +12.0 103.5	80 56.6 +10.9 101.9
11°	85 00.0 +06.6 101.0	84 02.2 +05.7 99.0	83 04.1 +05.1 97.6	82 05.8 +04.7 96.5	81 07.5 +04.3 95.6
12°	85 06.6 -05.6 89.5	84 07.9 -04.4 89.4	83 09.2 -03.6 89.3	82 10.5 -02.9 89.2	81 11.8 -02.4 89.1
13°	85 01.0 -17.0 77.9	84 03.5 -14.2 79.7	83 05.6 -12.0 80.9	82 07.6 -10.4 81.8	81 09.4 -09.0 82.5
14°	84 44.0 -26.7 67.1	83 49.3 -22.9 70.5	82 53.6 -19.8 72.9	81 57.2 -17.4 74.7	81 00.4 -15.4 76.2
15°	84 17.3 -34.5 57.8	83 26.4 -30.1 62.1	82 33.8 -26.6 65.4	81 39.8 -23.6 68.0	80 45.0 -21.2 70.1
16°	83 42.8 -40.3 49.9	82 56.3 -36.1 54.8	82 07.2 -32.4 58.7	81 16.2 -29.2 61.8	80 23.8 -26.4 64.3
17°	83 02.5 -44.5 43.5	82 20.2 -40.6 48.6	81 34.8 -37.0 52.7	80 47.0 -33.8 56.2	79 57.4 -30.9 59.1
18°	82 18.0 -47.7 38.2	81 39.6 -44.2 43.3	80 57.8 -40.8 47.6	80 13.2 -37.7 51.2	79 26.5 -34.9 54.3
19°	81 30.3 -50.1 33.9	80 55.4 -46.9 38.8	80 17.0 -43.9 43.1	79 35.5 -41.0 46.8	78 51.6 -38.2 50.0
20°	80 40.2 -51.9 30.3	80 08.5 -49.1 35.0	79 33.1 -46.4 39.2	78 54.5 -43.6 42.8	78 13.4 -41.0 46.1
21°	79 48.3 -53.2 27.4	79 19.4 -50.9 31.8	78 46.7 -48.4 35.8	78 10.9 -45.9 39.4	77 32.4 -43.4 42.6
22°	78 55.1 -54.2 24.9	78 28.5 -52.1 29.0	77 58.3 -49.9 32.8	77 25.0 -47.7 36.3	76 49.0 -45.5 39.5
23°	78 00.9 -55.1 22.7	77 36.4 -53.3 26.6	77 08.4 -51.3 30.3	76 37.3 -49.2 33.6	76 03.5 -47.1 36.7
24°	77 05.8 -55.8 20.9	76 43.1 -54.1 24.6	76 17.1 -52.4 28.0	75 48.1 -50.5 31.2	75 16.4 -48.6 34.2
25°	76 10.0 -56.3 19.3	75 49.0 -54.9 22.7	75 24.7 -53.3 26.0	74 57.6 -51.6 29.1	74 27.8 -49.9 32.0
26°	75 13.7 -56.7 17.9	74 54.1 -55.5 21.1	74 31.4 -54.0 24.2	74 06.0 -52.5 27.2	73 37.9 -50.9 29.9
27°	74 17.0 -57.2 16.7	73 58.6 -55.9 19.7	73 37.4 -54.7 22.7	73 13.5 -53.3 25.4	72 47.0 -51.7 28.1
28°	73 19.8 -57.4 15.6	73 02.7 -56.4 18.4	72 42.7 -55.2 21.2	72 20.2 -53.9 23.9	71 55.3 -52.6 26.4
29°	72 22.4 -57.7 14.6	72 06.3 -56.8 17.3	71 47.5 -55.7 19.9	71 26.3 -54.5 22.5	71 02.7 -53.3 24.9

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Latitude 12°

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Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	74 25.6 +45.7 139.7	73 46.6 +43.8 136.9	73 05.5 +42.0 134.4	72 22.7 +40.3 132.0	71 38.4 +38.6 129.8
1°	75 11.3 +43.9 137.2	74 30.4 +41.9 134.4	73 47.5 +40.1 131.9	73 03.0 +38.4 129.5	72 17.0 +36.7 127.4
2°	75 55.2 +41.9 134.5	75 12.3 +39.9 131.7	74 27.6 +38.0 129.1	73 41.4 +36.1 126.8	72 53.7 +34.5 124.7
3°	76 37.1 +39.5 131.5	75 52.2 +37.4 128.7	75 05.6 +35.4 126.2	74 17.5 +33.7 123.9	73 28.2 +32.1 121.9
4°	77 16.6 +36.7 128.1	76 29.6 +34.6 125.4	75 41.0 +32.7 123.0	74 51.2 +30.9 120.8	74 00.3 +29.3 118.9
5°	77 53.3 +33.6 124.5	77 04.2 +31.4 121.8	76 13.7 +29.6 119.5	75 22.1 +27.9 117.5	74 29.6 +26.4 115.6
6°	78 26.9 +29.8 120.4	77 35.6 +27.9 118.0	76 43.3 +26.1 115.8	75 50.0 +24.6 113.9	74 56.0 +23.2 112.2
7°	78 56.7 +25.7 116.0	78 03.5 +23.8 113.8	77 09.4 +22.2 111.8	76 14.6 +20.8 110.1	75 19.2 +19.7 108.6
8°	79 22.4 +20.9 111.2	78 27.3 +19.4 109.2	77 31.6 +18.1 107.6	76 35.4 +17.0 106.1	75 38.9 +15.9 104.9
9°	79 43.3 +15.7 106.0	78 46.7 +14.5 104.4	77 49.7 +13.5 103.1	76 52.4 +12.7 102.0	75 54.8 +12.1 101.0
10°	79 59.0 +10.0 100.5	79 01.2 +09.3 99.4	78 03.2 +08.8 98.5	77 05.1 +08.3 97.6	76 06.9 +07.9 96.9
11°	80 09.0 +04.1 94.8	79 10.5 +04.0 94.2	78 12.0 +03.8 93.6	77 13.4 +03.7 93.2	76 14.8 +03.6 92.7
12°	80 13.1 -01.9 89.0	79 14.5 -01.6 88.9	78 15.8 -01.2 88.7	77 17.1 -00.9 88.6	76 18.4 -00.6 88.5
13°	80 11.2 -07.9 83.1	79 12.9 -07.0 83.5	78 14.6 -06.2 83.8	77 16.2 -05.5 84.1	76 17.8 -04.9 84.3
14°	80 03.3 -13.7 77.3	79 05.9 -12.3 78.2	78 08.4 -11.1 79.0	77 10.7 -10.0 79.6	76 12.9 -09.1 80.1
15°	79 49.6 -19.1 71.7	78 53.6 -17.3 73.1	77 57.3 -15.8 74.2	77 00.7 -14.4 75.2	76 03.8 -13.1 76.0
16°	79 30.5 -24.0 66.4	78 36.3 -21.9 68.2	77 41.5 -20.1 69.7	76 46.3 -18.5 70.9	75 50.7 -17.1 72.0
17°	79 06.5 -28.4 61.5	78 14.4 -26.2 63.5	77 21.4 -24.1 65.3	76 27.8 -22.3 66.8	75 33.6 -20.7 68.1
18°	78 38.1 -32.3 56.9	77 48.2 -29.9 59.2	76 57.3 -27.8 61.2	76 05.5 -25.9 62.9	75 12.9 -24.1 64.4
19°	78 05.8 -35.7 52.7	77 18.3 -33.3 55.2	76 29.5 -31.1 57.3	75 39.6 -29.1 59.2	74 48.8 -27.3 60.8
20°	77 30.1 -38.5 48.9	76 45.0 -36.2 51.5	75 58.4 -34.1 53.7	75 10.5 -32.1 55.7	74 21.5 -30.2 57.5
21°	76 51.6 -41.1 45.5	76 08.8 -38.8 48.1	75 24.3 -36.7 50.4	74 38.4 -34.6 52.5	73 51.3 -32.8 54.3
22°	76 10.5 -43.2 42.4	75 30.0 -41.1 45.0	74 47.6 -39.0 47.3	74 03.8 -37.1 49.4	73 18.5 -35.1 51.4
23°	75 27.3 -45.1 39.5	74 48.9 -43.0 42.1	74 08.6 -41.0 44.5	73 26.7 -39.1 46.6	72 43.4 -37.3 48.6
24°	74 42.2 -46.7 37.0	74 05.9 -44.8 39.5	73 27.6 -42.9 41.8	72 47.6 -41.0 44.0	72 06.1 -39.2 46.0
25°	73 55.5 -48.0 34.6	73 21.1 -46.2 37.1	72 44.7 -44.4 39.4	72 06.6 -42.7 41.6	71 26.9 -40.9 43.6
26°	73 07.5 -49.2 32.5	72 34.9 -47.5 35.0	72 00.3 -45.8 37.2	71 23.9 -44.1 39.3	70 46.0 -42.5 41.3
27°	72 18.3 -50.3 30.6	71 47.4 -48.7 33.0	71 14.5 -47.1 35.2	70 39.8 -45.5 37.3	70 03.5 -43.9 39.2
28°	71 28.0 -51.1 28.8	70 58.7 -49.7 31.1	70 27.4 -48.2 33.3	69 54.3 -46.6 35.3	69 19.6 -45.1 37.2
29°	70 36.9 -51.9 27.2	70 09.0 -50.5 29.4	69 39.2 -49.1 31.5	69 07.7 -47.7 33.5	68 34.5 -46.3 35.4

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	70 52.6 +37.2 127.8	70 05.7 +35.7 125.9	69 17.6 +34.4 124.2	68 28.7 +33.0 122.6	67 38.8 +31.9 121.1
1°	71 29.8 +35.1 125.4	70 41.4 +33.7 123.5	69 52.0 +32.4 121.9	69 01.7 +31.2 120.3	68 10.7 +30.0 118.9
2°	72 04.9 +33.0 122.8	71 15.1 +31.5 121.0	70 24.4 +30.2 119.4	69 32.9 +29.0 117.9	68 40.7 +27.9 116.5
3°	72 37.9 +30.5 120.0	71 46.6 +29.2 118.3	70 54.6 +27.9 116.8	70 01.9 +26.8 115.4	69 08.6 +25.7 114.1
4°	73 08.4 +28.0 117.1	72 15.8 +26.6 115.5	71 22.5 +25.5 114.0	70 28.7 +24.3 112.7	69 34.3 +23.3 111.5
5°	73 36.4 +25.0 114.0	72 42.4 +23.9 112.5	71 48.0 +22.7 111.2	70 53.0 +21.8 109.9	69 57.6 +20.9 108.8
6°	74 01.4 +22.0 110.7	73 06.3 +20.9 109.4	72 10.7 +19.9 108.2	71 14.8 +19.0 107.1	70 18.5 +18.3 106.1
7°	74 23.4 +18.6 107.3	73 27.2 +17.7 106.1	72 30.6 +16.9 105.1	71 33.8 +16.2 104.1	70 36.8 +15.6 103.2
8°	74 42.0 +15.1 103.8	73 44.9 +14.4 102.8	72 47.5 +13.8 101.9	71 50.0 +13.2 101.0	70 52.4 +12.6 100.3
9°	74 57.1 +11.5 100.1	73 59.3 +10.9 99.3	73 01.3 +10.5 98.5	72 03.2 +10.1 97.9	71 05.0 +09.8 97.3
10°	75 08.6 +07.5 96.3	74 10.2 +07.3 95.7	73 11.8 +07.0 95.2	72 13.3 +06.9 94.7	71 14.8 +06.7 94.2
11°	75 16.1 +03.7 92.4	74 17.5 +03.6 92.0	73 18.8 +03.6 91.7	72 20.2 +03.6 91.4	71 21.5 +03.6 91.1
12°	75 19.8 -00.4 88.4	74 21.1 -00.1 88.3	73 22.4 +00.2 88.2	72 23.8 +00.3 88.1	71 25.1 +00.6 88.0
13°	75 19.4 -04.3 84.5	74 21.0 -03.9 84.6	73 22.6 -03.4 84.7	72 24.1 -03.0 84.8	71 25.7 -02.6 84.9
14°	75 15.1 -08.3 80.6	74 17.1 -07.5 80.9	73 19.2 -06.9 81.2	72 21.1 -06.2 81.5	71 23.1 -05.7 81.7
15°	75 06.8 -12.1 76.7	74 09.6 -11.1 77.3	73 12.3 -10.2 77.8	72 14.9 -09.5 78.2	71 17.4 -08.7 78.6
16°	74 54.7 -15.8 72.9	73 58.5 -14.6 73.7	73 02.1 -13.6 74.4	72 05.4 -12.5 75.0	71 08.7 -11.7 75.5
17°	74 38.9 -19.2 69.2	73 43.9 -17.9 70.2	72 48.5 -16.7 71.1	71 52.9 -15.6 71.8	70 57.0 -14.6 72.5
18°	74 19.7 -22.6 65.7	73 26.0 -21.1 66.8	72 31.8 -19.7 67.9	71 37.3 -18.5 68.8	70 42.4 -17.4 69.6
19°	73 57.1 -25.5 62.3	73 04.9 -24.0 63.6	72 12.1 -22.6 64.7	71 18.8 -21.3 65.8	70 25.0 -20.0 66.7
20°	73 31.6 -28.4 59.1	72 40.9 -26.8 60.5	71 49.5 -25.3 61.7	70 57.5 -23.9 62.9	70 05.0 -22.5 63.9
21°	73 03.2 -31.0 56.0	72 14.1 -29.4 57.5	71 24.2 -27.8 58.9	70 33.6 -26.3 60.1	69 42.5 -25.0 61.2
22°	72 32.2 -33.4 53.1	71 44.7 -31.7 54.7	70 56.4 -30.1 56.1	70 07.3 -28.6 57.4	69 17.5 -27.1 58.6
23°	71 58.8 -35.5 50.4	71 13.0 -33.8 52.0	70 26.3 -32.2 53.5	69 38.7 -30.7 54.9	68 50.4 -29.3 56.1
24°	71 23.3 -37.5 47.8	70 39.2 -35.8 49.5	69 54.1 -34.3 51.0	69 08.0 -32.7 52.4	68 21.1 -31.3 53.7
25°	70 45.8 -39.3 45.4	70 03.4 -37.6 47.1	69 19.8 -36.0 48.7	68 35.3 -34.5 50.1	67 49.8 -33.0 51.4
26°	70 06.5 -40.8 43.1	69 25.8 -39.3 44.8	68 43.8 -37.7 46.4	68 00.8 -36.3 47.9	67 16.8 -34.8 49.3
27°	69 25.7 -42.4 41.0	68 46.5 -40.8 42.7	68 06.1 -39.3 44.3	67 24.5 -37.8 45.8	66 42.0 -36.4 47.2
28°	68 43.3 -43.6 39.0	68 05.7 -42.1 40.7	67 26.8 -40.7 42.3	66 46.7 -39.2 43.8	66 05.6 -37.8 45.2
29°	67 59.7 -44.8 37.2	67 23.6 -43.4 38.8	66 46.1 -41.9 40.4	66 07.5 -40.5 41.9	65 27.8 -39.2 43.3

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Declination SAME name as Latitude

Latitude 12°

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	66 48.2 +30.8 119.7	65 56.9 +29.7 118.4	65 05.0 +28.8 117.2	64 12.6 +27.8 116.1	63 19.6 +27.0 115.0
1°	67 19.0 +28.9 117.5	66 26.6 +27.9 116.3	65 33.8 +26.9 115.1	64 40.4 +26.0 114.0	63 46.6 +25.2 113.0
2°	67 47.9 +26.8 115.2	66 54.5 +25.9 114.1	66 00.7 +25.0 112.9	65 06.4 +24.2 111.9	64 11.8 +23.4 111.0
3°	68 14.7 +24.8 112.8	67 20.4 +23.9 111.7	66 25.7 +23.0 110.7	65 30.6 +22.3 109.7	64 35.2 +21.6 108.8
4°	68 39.5 +22.4 110.4	67 44.3 +21.6 109.3	66 48.7 +20.9 108.4	65 52.9 +20.2 107.5	64 56.8 +19.5 106.6
5°	69 01.9 +20.1 107.8	68 05.9 +19.3 106.8	67 09.6 +18.7 106.0	66 13.1 +18.0 105.2	65 16.3 +17.5 104.4
6°	69 22.0 +17.6 105.1	68 25.2 +17.0 104.3	67 28.3 +16.3 103.5	66 31.1 +15.9 102.8	65 33.8 +15.4 102.1
7°	69 39.6 +14.9 102.4	68 42.2 +14.4 101.7	67 44.6 +14.0 101.0	66 47.0 +13.5 100.3	65 49.2 +13.1 99.7
8°	69 54.5 +12.3 99.6	68 56.6 +11.9 99.0	67 58.6 +11.5 98.4	67 00.5 +11.2 97.9	66 02.3 +10.9 97.4
9°	70 06.8 +09.4 96.7	69 08.5 +09.2 96.2	68 10.1 +09.0 95.8	67 11.7 +08.8 95.3	66 13.2 +08.6 94.9
10°	70 16.2 +06.6 93.8	69 17.7 +06.4 93.5	68 19.1 +06.3 93.1	67 20.5 +06.3 92.8	66 21.8 +06.3 92.5
11°	70 22.8 +03.7 90.9	69 24.1 +03.7 90.6	68 25.4 +03.8 90.4	67 26.8 +03.8 90.2	66 28.1 +03.8 90.0
12°	70 26.5 +00.7 87.9	69 27.8 +00.9 87.8	68 29.2 +01.1 87.7	67 30.6 +01.2 87.6	66 31.9 +01.5 87.5
13°	70 27.2 -02.2 84.9	69 28.7 -01.8 84.9	68 30.3 -01.6 85.0	67 31.8 -01.2 85.0	66 33.4 -01.0 85.0
14°	70 25.0 -05.2 81.9	69 26.9 -04.7 82.1	68 28.7 -04.2 82.2	67 30.6 -03.8 82.3	66 32.4 -03.4 82.4
15°	70 19.8 -08.0 79.0	69 22.2 -07.4 79.3	68 24.5 -06.8 79.5	67 26.8 -06.3 79.7	66 29.0 -05.8 79.9
16°	70 11.8 -10.9 76.0	69 14.8 -10.1 76.4	68 17.7 -09.4 76.8	67 20.5 -08.8 77.2	66 23.2 -08.1 77.5
17°	70 00.9 -13.6 73.1	69 04.7 -12.8 73.7	68 08.3 -12.0 74.2	67 11.7 -11.1 74.6	66 15.1 -10.4 75.0
18°	69 47.3 -16.3 70.3	68 51.9 -15.3 71.0	67 56.3 -14.4 71.5	67 00.6 -13.6 72.1	66 04.7 -12.8 72.5
19°	69 31.0 -18.9 67.5	68 36.6 -17.8 68.3	67 41.9 -16.8 69.0	66 47.0 -15.8 69.6	65 51.9 -14.9 70.1
20°	69 12.1 -21.3 64.8	68 18.8 -20.2 65.7	67 25.1 -19.0 66.5	66 31.2 -18.0 67.2	65 37.0 -17.1 67.8
21°	68 50.8 -23.6 62.2	67 58.6 -22.4 63.2	67 06.1 -21.3 64.0	66 13.2 -20.2 64.8	65 19.9 -19.1 65.5
22°	68 27.2 -25.9 59.7	67 36.2 -24.6 60.7	66 44.8 -23.4 61.6	65 53.0 -22.3 62.5	65 00.8 -21.2 63.2
23°	68 01.3 -27.9 57.3	67 11.6 -26.6 58.3	66 21.4 -25.3 59.3	65 30.7 -24.1 60.2	64 39.6 -23.1 61.0
24°	67 33.4 -29.9 54.9	66 45.0 -28.5 56.0	65 56.1 -27.3 57.1	65 06.6 -26.1 58.0	64 16.5 -24.8 58.9
25°	67 03.5 -31.6 52.7	66 16.5 -30.3 53.8	65 28.8 -29.0 54.9	64 40.5 -27.8 55.9	63 51.7 -26.7 56.8
26°	66 31.9 -33.4 50.5	65 46.2 -32.1 51.7	64 59.8 -30.8 52.8	64 12.7 -29.5 53.8	63 25.0 -28.2 54.8
27°	65 58.5 -35.0 48.5	65 14.1 -33.6 49.7	64 29.0 -32.3 50.8	63 43.2 -31.1 51.8	62 56.8 -29.9 52.8
28°	65 23.5 -36.4 46.5	64 40.5 -35.1 47.7	63 56.7 -33.8 48.9	63 12.1 -32.5 49.9	62 26.9 -31.3 50.9
29°	64 47.1 -37.9 44.6	64 05.4 -36.5 45.8	63 22.9 -35.2 47.0	62 39.6 -34.0 48.1	61 55.6 -32.8 49.1

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	62 26.2 +26.2 114.0	61 32.4 +25.4 113.1	60 38.3 +24.6 112.2	59 43.8 +23.9 111.4	58 48.9 +23.4 110.6
1°	62 52.4 +24.4 112.1	61 57.8 +23.8 111.2	61 02.9 +23.1 110.3	60 07.7 +22.5 109.5	59 12.3 +21.9 108.8
2°	63 16.8 +22.7 110.1	62 21.6 +22.0 109.2	61 26.0 +21.4 108.4	60 30.2 +20.8 107.7	59 34.2 +20.2 106.9
3°	63 39.5 +20.9 108.0	62 43.6 +20.3 107.2	61 47.4 +19.7 106.4	60 51.0 +19.2 105.7	59 54.4 +18.7 105.1
4°	64 00.4 +19.0 105.9	63 03.9 +18.4 105.1	62 07.1 +17.9 104.4	61 10.2 +17.4 103.8	60 13.1 +17.0 103.2
5°	64 19.4 +17.0 103.7	63 22.3 +16.5 103.0	62 25.0 +16.1 102.4	61 27.6 +15.7 101.8	60 30.1 +15.3 101.2
6°	64 36.4 +14.9 101.5	63 38.8 +14.5 100.9	62 41.1 +14.1 100.3	61 43.3 +13.8 99.8	60 45.4 +13.5 99.3
7°	64 51.3 +12.8 99.2	63 53.3 +12.5 98.7	62 55.2 +12.3 98.2	61 57.1 +12.0 97.7	60 58.9 +11.7 97.3
8°	65 04.1 +10.7 96.9	64 05.8 +10.4 96.4	63 07.5 +10.2 96.0	62 09.1 +10.0 95.6	61 10.6 +09.9 95.2
9°	65 14.8 +08.4 94.5	64 16.2 +08.3 94.2	63 17.7 +08.2 93.8	62 19.1 +08.1 93.5	61 20.5 +08.0 93.2
10°	65 23.2 +06.2 92.2	64 24.5 +06.2 91.9	63 25.9 +06.1 91.6	62 27.2 +06.1 91.4	61 28.5 +06.1 91.1
11°	65 29.4 +03.9 89.8	64 30.7 +04.0 89.6	63 32.0 +04.0 89.4	62 33.3 +04.1 89.2	61 34.6 +04.2 89.0
12°	65 33.3 +01.6 87.4	64 34.7 +01.7 87.3	63 36.0 +02.0 87.1	62 37.4 +02.1 87.0	61 38.8 +02.3 86.9
13°	65 34.9 -00.7 84.9	64 36.4 -00.4 84.9	63 38.0 -00.2 84.9	62 39.5 +00.1 84.9	61 41.1 +00.3 84.8
14°	65 34.2 -03.0 82.5	64 36.0 -02.6 82.6	63 37.8 -02.3 82.6	62 39.6 -01.9 82.7	61 41.4 -01.6 82.7
15°	65 31.2 -05.3 80.1	64 33.4 -04.8 80.3	63 35.5 -04.4 80.4	62 37.7 -04.0 80.5	61 39.8 -03.6 80.6
16°	65 25.9 -07.5 77.7	64 28.6 -07.0 77.9	63 31.1 -06.4 78.2	62 33.7 -06.0 78.3	61 36.2 -05.5 78.5
17°	65 18.4 -09.8 75.3	64 21.6 -09.2 75.6	63 24.7 -08.6 75.9	62 27.7 -07.9 76.2	61 30.7 -07.4 76.4
18°	65 08.6 -12.0 73.0	64 12.4 -11.2 73.4	63 16.1 -10.5 73.7	62 19.8 -09.9 74.0	61 23.3 -09.3 74.3
19°	64 56.6 -14.1 70.7	64 01.2 -13.3 71.1	63 05.6 -12.6 71.5	62 09.9 -11.9 71.9	61 14.0 -11.1 72.3
20°	64 42.5 -16.1 68.4	63 47.9 -15.3 68.9	62 53.0 -14.4 69.4	61 58.0 -13.7 69.8	61 02.9 -13.0 70.2
21°	64 26.4 -18.2 66.1	63 32.6 -17.3 66.7	62 38.6 -16.4 67.3	61 44.3 -15.5 67.8	60 49.9 -14.7 68.2
22°	64 08.2 -20.1 63.9	63 15.3 -19.1 64.6	62 22.2 -18.2 65.2	61 28.8 -17.3 65.7	60 35.2 -16.5 66.2
23°	63 48.1 -22.0 61.8	62 56.2 -21.0 62.5	62 04.0 -20.0 63.1	61 11.5 -19.1 63.7	60 18.7 -18.1 64.3
24°	63 26.1 -23.8 59.7	62 35.2 -22.7 60.4	61 44.0 -21.7 61.1	60 52.4 -20.7 61.8	60 00.6 -19.8 62.4
25°	63 02.3 -25.5 57.6	62 12.5 -24.4 58.4	61 22.3 -23.3 59.2	60 31.7 -22.3 59.9	59 40.8 -21.4 60.5
26°	62 36.8 -27.1 55.7	61 48.1 -26.0 56.5	60 59.0 -25.0 57.3	60 09.4 -23.9 58.0	59 19.4 -22.8 58.7
27°	62 09.7 -28.7 53.7	61 22.1 -27.5 54.6	60 34.0 -26.4 55.4	59 45.5 -25.4 56.2	58 56.6 -24.4 56.9
28°	61 41.0 -30.1 51.9	60 54.6 -29.0 52.8	60 07.6 -27.9 53.6	59 20.1 -26.8 54.4	58 32.2 -25.7 55.1
29°	61 10.9 -31.6 50.1	60 25.6 -30.4 51.0	59 39.7 -29.3 51.8	58 53.3 -28.2 52.6	58 06.5 -27.2 53.4

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Latitude 12°

Declination SAME name as Latitude

Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	57 53.9 +22.7 109.8	56 58.5 +22.2 109.1	56 02.9 +21.7 108.4	55 07.2 +21.1 107.8	54 11.2 +20.6 107.1
1°	58 16.6 +21.3 108.1	57 20.7 +20.8 107.4	56 24.6 +20.3 106.7	55 28.3 +19.8 106.1	54 31.8 +19.4 105.5
2°	58 37.9 +19.8 106.3	57 41.5 +19.3 105.6	56 44.9 +18.8 105.0	55 48.1 +18.4 104.4	54 51.2 +18.0 103.9
3°	58 57.7 +18.2 104.4	58 00.8 +17.8 103.8	57 03.7 +17.4 103.3	56 06.5 +17.0 102.7	55 09.2 +16.7 102.2
4°	59 15.9 +16.6 102.6	58 18.6 +16.2 102.0	57 21.1 +15.9 101.5	56 23.5 +15.6 101.0	55 25.9 +15.2 100.5
5°	59 32.5 +14.9 100.7	58 34.8 +14.6 100.2	57 37.0 +14.3 99.7	56 39.1 +14.0 99.3	55 41.1 +13.8 98.8
6°	59 47.4 +13.3 98.8	58 49.4 +13.0 98.3	57 51.3 +12.7 97.9	56 53.1 +12.6 97.5	55 54.9 +12.3 97.1
7°	60 00.7 +11.5 96.8	59 02.4 +11.3 96.4	58 04.0 +11.2 96.1	57 05.7 +10.9 95.7	56 07.2 +10.9 95.3
8°	60 12.2 +09.7 94.9	59 13.7 +09.6 94.5	58 15.2 +09.5 94.2	57 16.6 +09.4 93.9	56 18.1 +09.3 93.6
9°	60 21.9 +08.0 92.9	59 23.3 +07.9 92.6	58 24.7 +07.8 92.3	57 26.0 +07.8 92.0	56 27.4 +07.7 91.8
10°	60 29.9 +06.1 90.9	59 31.2 +06.1 90.6	58 32.5 +06.1 90.4	57 33.8 +06.1 90.2	56 35.1 +06.2 90.0
11°	60 36.0 +04.2 88.8	59 37.3 +04.3 88.7	58 38.6 +04.4 88.5	57 39.9 +04.6 88.3	56 41.3 +04.6 88.2
12°	60 40.2 +02.4 86.8	59 41.6 +02.6 86.7	58 43.0 +02.8 86.6	57 44.5 +02.8 86.5	56 45.9 +03.0 86.4
13°	60 42.6 +00.6 84.8	59 44.2 +00.8 84.7	58 45.8 +00.9 84.7	57 47.3 +01.2 84.6	56 48.9 +01.4 84.5
14°	60 43.2 -01.3 82.7	59 45.0 -01.1 82.7	58 46.7 -00.7 82.7	57 48.5 -00.4 82.7	56 50.3 -00.2 82.7
15°	60 41.9 -03.2 80.7	59 43.9 -02.8 80.8	58 46.0 -02.5 80.8	57 48.1 -02.2 80.9	56 50.1 -01.8 80.9
16°	60 38.7 -05.1 78.6	59 41.1 -04.6 78.8	58 43.5 -04.2 78.9	57 45.9 -03.7 79.0	56 48.3 -03.4 79.1
17°	60 33.6 -06.9 76.6	59 36.5 -06.4 76.8	58 39.3 -05.8 77.0	57 42.2 -05.5 77.1	56 44.9 -04.9 77.2
18°	60 26.7 -08.6 74.6	59 30.1 -08.1 74.8	58 33.5 -07.6 75.0	57 36.7 -07.0 75.2	56 40.0 -06.6 75.4
19°	60 18.1 -10.5 72.6	59 22.0 -09.8 72.9	58 25.9 -09.3 73.2	57 29.7 -08.7 73.4	56 33.4 -08.1 73.6
20°	60 07.6 -12.3 70.6	59 12.2 -11.6 71.0	58 16.6 -10.9 71.3	57 21.0 -10.3 71.6	56 25.3 -09.7 71.8
21°	59 55.3 -13.9 68.7	59 00.6 -13.2 69.0	58 05.7 -12.5 69.4	57 10.7 -11.8 69.7	56 15.6 -11.2 70.0
22°	59 41.4 -15.7 66.7	58 47.4 -14.9 67.2	57 53.2 -14.1 67.6	56 58.9 -13.4 67.9	56 04.4 -12.6 68.3
23°	59 25.7 -17.3 64.8	58 32.5 -16.4 65.3	57 39.1 -15.7 65.7	56 45.5 -14.9 66.1	55 51.8 -14.2 66.5
24°	59 08.4 -18.8 62.9	58 16.1 -18.0 63.5	57 23.4 -17.1 63.9	56 30.6 -16.3 64.4	55 37.6 -15.6 64.8
25°	58 49.6 -20.4 61.1	57 58.1 -19.6 61.6	57 06.3 -18.7 62.2	56 14.3 -17.8 62.6	55 22.0 -17.0 63.1
26°	58 29.2 -22.0 59.3	57 38.5 -20.9 59.9	56 47.6 -20.0 60.4	55 56.5 -19.2 60.9	55 05.0 -18.3 61.4
27°	58 07.2 -23.3 57.5	57 17.6 -22.4 58.1	56 27.6 -21.5 58.7	55 37.3 -20.6 59.3	54 46.7 -19.7 59.8
28°	57 43.9 -24.8 55.8	56 55.2 -23.8 56.4	56 06.1 -22.8 57.0	55 16.7 -21.9 57.6	54 27.0 -21.0 58.1
29°	57 19.1 -26.1 54.1	56 31.4 -25.1 54.8	55 43.3 -24.1 55.4	54 54.8 -23.1 56.0	54 06.0 -22.2 56.5

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	53 15.0 +20.2 106.5	52 18.6 +19.8 106.0	51 22.1 +19.4 105.4	50 25.5 +19.0 104.9	49 28.7 +18.7 104.4
1°	53 35.2 +19.0 105.0	52 38.4 +18.6 104.4	51 41.5 +18.2 103.9	50 44.5 +17.9 103.4	49 47.4 +17.5 102.9
2°	53 54.2 +17.6 103.4	52 57.0 +17.3 102.8	51 59.7 +17.0 102.4	51 02.4 +16.6 101.9	50 04.9 +16.3 101.4
3°	54 11.8 +16.4 101.7	53 14.3 +16.0 101.3	52 16.7 +15.7 100.8	51 19.0 +15.5 100.4	50 21.2 +15.2 99.9
4°	54 28.2 +14.9 100.1	53 30.3 +14.7 99.6	52 32.4 +14.5 99.2	51 34.5 +14.2 98.8	50 36.4 +14.0 98.4
5°	54 43.1 +13.6 98.4	53 45.0 +13.4 98.0	52 46.9 +13.1 97.6	51 48.7 +12.9 97.2	50 50.4 +12.8 96.9
6°	54 56.7 +12.1 96.7	53 58.4 +11.9 96.3	53 00.0 +11.8 96.0	52 01.6 +11.7 95.7	51 03.2 +11.5 95.3
7°	55 08.8 +10.7 95.0	54 10.3 +10.6 94.7	53 11.8 +10.5 94.4	52 13.3 +10.3 94.1	51 14.7 +10.3 93.8
8°	55 19.5 +09.2 93.3	54 20.9 +09.1 93.0	53 22.3 +09.0 92.7	52 23.6 +09.1 92.5	51 25.0 +09.0 92.2
9°	55 28.7 +07.7 91.5	54 30.0 +07.7 91.3	53 31.3 +07.7 91.1	52 32.7 +07.7 90.8	51 34.0 +07.7 90.6
10°	55 36.4 +06.2 89.8	54 37.7 +06.3 89.6	53 39.0 +06.3 89.4	52 40.4 +06.3 89.2	51 41.7 +06.4 89.0
11°	55 42.6 +04.7 88.0	54 44.0 +04.8 87.9	53 45.3 +04.9 87.7	52 46.7 +05.0 87.6	51 48.1 +05.0 87.4
12°	55 47.3 +03.2 86.2	54 48.8 +03.3 86.1	53 50.2 +03.5 86.0	52 51.7 +03.6 85.9	51 53.1 +03.8 85.8
13°	55 50.5 +01.6 84.5	54 52.1 +01.8 84.4	53 53.7 +02.0 84.3	52 55.3 +02.2 84.3	51 56.9 +02.4 84.2
14°	55 52.1 +00.1 82.7	54 53.9 +00.3 82.7	53 55.7 +00.6 82.6	52 57.5 +00.8 82.6	51 59.3 +01.0 82.5
15°	55 52.2 -01.5 80.9	54 54.2 -01.1 80.9	53 56.3 -00.9 80.9	52 58.3 -00.6 80.9	52 00.3 -00.2 80.9
16°	55 50.7 -03.0 79.1	54 53.1 -02.7 79.2	53 55.4 -02.3 79.2	52 57.7 -01.9 79.3	52 00.1 -01.6 79.3
17°	55 47.7 -04.6 77.3	54 50.4 -04.1 77.5	53 53.1 -03.7 77.5	52 55.8 -03.3 77.6	51 58.5 -03.0 77.7
18°	55 43.1 -06.0 75.6	54 46.3 -05.6 75.7	53 49.4 -05.2 75.8	52 52.5 -04.7 76.0	51 55.5 -04.3 76.1
19°	55 37.1 -07.6 73.8	54 40.7 -07.1 74.0	53 44.2 -06.5 74.2	52 47.8 -06.1 74.3	51 51.2 -05.6 74.4
20°	55 29.5 -09.1 72.1	54 33.6 -08.5 72.3	53 37.7 -08.0 72.5	52 41.7 -07.5 72.7	51 45.6 -06.9 72.8
21°	55 20.4 -10.5 70.3	54 25.1 -09.9 70.6	53 29.7 -09.3 70.8	52 34.2 -08.7 71.0	51 38.7 -08.2 71.2
22°	55 09.9 -12.0 68.6	54 15.2 -11.4 68.9	53 20.4 -10.8 69.2	52 25.5 -10.1 69.4	51 30.5 -09.5 69.6
23°	54 57.9 -13.5 66.9	54 03.8 -12.7 67.2	53 09.6 -12.0 67.5	52 15.4 -11.4 67.8	51 21.0 -10.8 68.1
24°	54 44.4 -14.8 65.2	53 51.1 -14.1 65.5	52 57.6 -13.4 65.9	52 04.0 -12.8 66.2	51 10.2 -12.0 66.5
25°	54 29.6 -16.2 63.5	53 37.0 -15.4 63.9	52 44.2 -14.7 64.3	51 51.2 -13.9 64.6	50 58.2 -13.3 64.9
26°	54 13.4 -17.5 61.9	53 21.6 -16.8 62.3	52 29.5 -16.0 62.7	51 37.3 -15.2 63.0	50 44.9 -14.5 63.4
27°	53 55.9 -18.9 60.2	53 04.8 -18.0 60.7	52 13.5 -17.2 61.1	51 22.1 -16.5 61.5	50 30.4 -15.7 61.8
28°	53 37.0 -20.1 58.6	52 46.8 -19.3 59.1	51 56.3 -18.4 59.5	51 05.6 -17.6 59.9	50 14.7 -16.8 60.3
29°	53 16.9 -21.3 57.0	52 27.5 -20.4 57.5	51 37.9 -19.6 58.0	50 48.0 -18.8 58.4	49 57.9 -18.0 58.8

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Declination SAME name as Latitude

Latitude 12°

Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	48 31.8 +18.3 103.9	47 34.8 +18.0 103.5	46 37.7 +17.6 103.0	45 40.4 +17.4 102.6	44 43.1 +17.1 102.2
1°	48 50.1 +17.2 102.5	47 52.8 +16.9 102.0	46 55.3 +16.6 101.6	45 57.8 +16.3 101.2	45 00.2 +16.1 100.8
2°	49 07.3 +16.1 101.0	48 09.7 +15.8 100.6	47 11.9 +15.6 100.2	46 14.1 +15.4 99.8	45 16.3 +15.1 99.4
3°	49 23.4 +15.0 99.5	48 25.5 +14.7 99.1	47 27.5 +14.5 98.8	46 29.5 +14.3 98.4	45 31.4 +14.1 98.1
4°	49 38.4 +13.7 98.0	48 40.2 +13.6 97.7	47 42.0 +13.5 97.3	46 43.8 +13.3 97.0	45 45.5 +13.1 96.7
5°	49 52.1 +12.7 96.5	48 53.8 +12.5 96.2	47 55.5 +12.3 95.9	46 57.1 +12.1 95.6	45 58.6 +12.1 95.3
6°	50 04.8 +11.4 95.0	49 06.3 +11.3 94.7	48 07.8 +11.2 94.4	47 09.2 +11.1 94.1	46 10.7 +11.0 93.9
7°	50 16.2 +10.1 93.5	49 17.6 +10.1 93.2	48 19.0 +10.0 92.9	47 20.3 +10.0 92.7	46 21.7 +10.0 92.4
8°	50 26.3 +09.0 91.9	49 27.7 +08.9 91.7	48 29.0 +08.9 91.5	47 30.3 +08.9 91.2	46 31.7 +08.8 91.0
9°	50 35.3 +07.7 90.4	49 36.6 +07.7 90.2	48 37.9 +07.8 90.0	47 39.2 +07.8 89.8	46 40.5 +07.8 89.6
10°	50 43.0 +06.4 88.8	49 44.3 +06.5 88.6	48 45.7 +06.5 88.5	47 47.0 +06.6 88.3	46 48.3 +06.7 88.1
11°	50 49.4 +05.2 87.3	49 50.8 +05.3 87.1	48 52.2 +05.4 87.0	47 53.6 +05.5 86.8	46 55.0 +05.6 86.7
12°	50 54.6 +03.9 85.7	49 56.1 +04.0 85.6	48 57.6 +04.2 85.4	47 59.1 +04.3 85.3	47 00.6 +04.5 85.2
13°	50 58.5 +02.6 84.1	50 00.1 +02.8 84.0	49 01.8 +02.9 83.9	48 03.4 +03.2 83.8	47 05.1 +03.3 83.7
14°	51 01.1 +01.3 82.5	50 02.9 +01.5 82.4	49 04.7 +01.8 82.4	48 06.6 +02.0 82.3	47 08.4 +02.2 82.3
15°	51 02.4 +00.0 80.9	50 04.4 +00.3 80.9	49 06.5 +00.6 80.9	48 08.6 +00.8 80.8	47 10.6 +01.1 80.8
16°	51 02.4 -01.3 79.3	50 04.7 -00.9 79.3	49 07.1 -00.7 79.3	48 09.4 -00.4 79.3	47 11.7 +00.0 79.3
17°	51 01.1 -02.6 77.7	50 03.8 -02.2 77.8	49 06.4 -01.9 77.8	48 09.0 -01.5 77.8	47 11.7 -01.2 77.9
18°	50 58.5 -03.8 76.1	50 01.6 -03.5 76.2	49 04.5 -03.0 76.3	48 07.5 -02.7 76.3	47 10.5 -02.3 76.4
19°	50 54.7 -05.2 74.6	49 58.1 -04.7 74.7	49 01.5 -04.3 74.8	48 04.8 -03.8 74.8	47 08.2 -03.4 74.9
20°	50 49.5 -06.4 73.0	49 53.4 -05.9 73.1	48 57.2 -05.4 73.2	48 01.0 -05.0 73.4	47 04.8 -04.6 73.4
21°	50 43.1 -07.7 71.4	49 47.5 -07.2 71.6	48 51.8 -06.7 71.7	47 56.0 -06.1 71.9	47 00.2 -05.7 72.0
22°	50 35.4 -08.9 69.8	49 40.3 -08.4 70.0	48 45.1 -07.8 70.2	47 49.9 -07.3 70.4	46 54.5 -06.7 70.5
23°	50 26.5 -10.2 68.3	49 31.9 -09.5 68.5	48 37.3 -09.0 68.7	47 42.6 -08.5 68.9	46 47.8 -07.9 69.1
24°	50 16.3 -11.4 66.7	49 22.4 -10.8 67.0	48 28.3 -10.1 67.2	47 34.1 -09.5 67.4	46 39.9 -09.0 67.6
25°	50 04.9 -12.5 65.2	49 11.6 -11.9 65.5	48 18.2 -11.3 65.7	47 24.6 -10.7 66.0	46 30.9 -10.0 66.2
26°	49 52.4 -13.8 63.7	48 59.7 -13.1 64.0	48 06.9 -12.4 64.3	47 13.9 -11.7 64.5	46 20.9 -11.1 64.8
27°	49 38.6 -14.9 62.2	48 46.6 -14.2 62.5	47 54.5 -13.5 62.8	47 02.2 -12.8 63.1	46 09.8 -12.1 63.3
28°	49 23.7 -16.1 60.7	48 32.4 -15.3 61.0	47 41.0 -14.6 61.3	46 49.4 -13.9 61.6	45 57.7 -13.2 61.9
29°	49 07.6 -17.2 59.2	48 17.1 -16.5 59.6	47 26.4 -15.7 59.9	46 35.5 -14.9 60.2	45 44.5 -14.2 60.5

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	43 45.7 +16.8 101.7	42 48.2 +16.5 101.4	41 50.6 +16.3 101.0	40 52.9 +16.1 100.6	39 55.2 +15.9 100.2
1°	44 02.5 +15.9 100.4	43 04.7 +15.7 100.0	42 06.9 +15.4 99.7	41 09.0 +15.2 99.3	40 11.1 +15.0 99.0
2°	44 18.4 +14.9 99.1	43 20.4 +14.7 98.7	42 22.3 +14.6 98.4	41 24.2 +14.4 98.0	40 26.1 +14.2 97.7
3°	44 33.3 +13.9 97.7	43 35.1 +13.8 97.4	42 36.9 +13.6 97.1	41 38.6 +13.5 96.7	40 40.3 +13.3 96.4
4°	44 47.2 +13.0 96.3	43 48.9 +12.8 96.0	42 50.5 +12.7 95.7	41 52.1 +12.6 95.4	40 53.6 +12.5 95.1
5°	45 00.2 +11.9 95.0	44 01.7 +11.9 94.7	43 03.2 +11.8 94.4	42 04.7 +11.6 94.1	41 06.1 +11.6 93.9
6°	45 12.1 +11.0 93.6	44 13.6 +10.8 93.3	43 15.0 +10.8 93.1	42 16.3 +10.8 92.8	41 17.7 +10.7 92.5
7°	45 23.1 +09.9 92.2	44 24.4 +09.9 91.9	43 25.8 +09.8 91.7	42 27.1 +09.8 91.5	41 28.4 +09.8 91.2
8°	45 33.0 +08.9 90.8	44 34.3 +08.9 90.6	43 35.6 +08.9 90.3	42 36.9 +08.9 90.1	41 38.2 +08.9 89.9
9°	45 41.9 +07.8 89.4	44 43.2 +07.8 89.2	43 44.5 +07.9 89.0	42 45.8 +08.0 88.8	41 47.1 +08.0 88.6
10°	45 49.7 +06.7 87.9	44 51.0 +06.9 87.8	43 52.4 +06.9 87.6	42 53.8 +06.9 87.4	41 55.1 +07.1 87.3
11°	45 56.4 +05.7 86.5	44 57.9 +05.8 86.4	43 59.3 +05.9 86.2	43 00.7 +06.1 86.1	42 02.2 +06.1 85.9
12°	46 02.1 +04.6 85.1	45 03.7 +04.7 85.0	44 05.2 +04.9 84.8	43 06.8 +05.0 84.7	42 08.3 +05.2 84.6
13°	46 06.7 +03.6 83.6	45 08.4 +03.7 83.5	44 10.1 +03.9 83.4	43 11.8 +04.1 83.3	42 13.5 +04.3 83.2
14°	46 10.3 +02.4 82.2	45 12.1 +02.7 82.1	44 14.0 +02.9 82.1	43 15.9 +03.0 82.0	42 17.8 +03.2 81.9
15°	46 12.7 +01.3 80.8	45 14.8 +01.6 80.7	44 16.9 +01.8 80.7	43 18.9 +02.1 80.6	42 21.0 +02.4 80.5
16°	46 14.0 +00.3 79.3	45 16.4 +00.5 79.3	44 18.7 +00.8 79.3	43 21.0 +01.2 79.2	42 23.4 +01.4 79.2
17°	46 14.3 -00.9 77.9	45 16.9 -00.5 77.9	44 19.5 -00.2 77.9	43 22.2 +00.1 77.9	42 24.8 +00.4 77.8
18°	46 13.4 -01.9 76.4	45 16.4 -01.6 76.4	44 19.3 -01.2 76.5	43 22.3 -00.9 76.5	42 25.2 -00.5 76.5
19°	46 11.5 -03.0 75.0	45 14.8 -02.6 75.0	44 18.1 -02.2 75.1	43 21.4 -01.8 75.1	42 24.7 -01.5 75.1
20°	46 08.5 -04.1 73.5	45 12.2 -03.7 73.6	44 15.9 -03.3 73.7	43 19.6 -02.9 73.7	42 23.2 -02.4 73.8
21°	46 04.4 -05.2 72.1	45 08.5 -04.7 72.2	44 12.6 -04.2 72.3	43 16.7 -03.8 72.4	42 20.8 -03.4 72.4
22°	45 59.2 -06.3 70.7	45 03.8 -05.8 70.8	44 08.4 -05.3 70.9	43 12.9 -04.8 71.0	42 17.4 -04.4 71.1
23°	45 52.9 -07.3 69.2	44 58.0 -06.8 69.4	44 03.1 -06.3 69.5	43 08.1 -05.8 69.6	42 13.0 -05.2 69.7
24°	45 45.6 -08.4 67.8	44 51.2 -07.8 68.0	43 56.8 -07.3 68.1	43 02.3 -06.7 68.3	42 07.8 -06.3 68.4
25°	45 37.2 -09.4 66.4	44 43.4 -08.8 66.6	43 49.5 -08.3 66.7	42 55.6 -07.7 66.9	42 01.5 -07.1 67.0
26°	45 27.8 -10.5 65.0	44 34.6 -09.9 65.2	43 41.2 -09.2 65.4	42 47.9 -08.7 65.5	41 54.4 -08.1 65.7
27°	45 17.3 -11.5 63.6	44 24.7 -10.8 63.8	43 32.0 -10.2 64.0	42 39.2 -09.6 64.2	41 46.3 -09.0 64.4
28°	45 05.8 -12.5 62.2	44 13.9 -11.9 62.4	43 21.8 -11.2 62.6	42 29.6 -10.5 62.9	41 37.3 -09.9 63.1
29°	44 53.3 -13.5 60.8	44 02.0 -12.8 61.1	43 10.6 -12.1 61.3	42 19.1 -11.5 61.5	41 27.4 -10.8 61.7

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Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	38 57.4 +15.7 99.9	37 59.6 +15.4 99.6	37 01.7 +15.2 99.2	36 03.7 +15.1 98.9	35 05.7 +14.9 98.6
1°	39 13.1 +14.8 98.7	38 15.0 +14.7 98.3	37 16.9 +14.6 98.0	36 18.8 +14.4 97.7	35 20.6 +14.2 97.4
2°	39 27.9 +14.1 97.4	38 29.7 +13.9 97.1	37 31.5 +13.7 96.8	36 33.2 +13.6 96.5	35 34.8 +13.5 96.2
3°	39 42.0 +13.2 96.1	38 43.6 +13.1 95.8	37 45.2 +13.0 95.6	36 46.8 +12.8 95.3	35 48.3 +12.8 95.0
4°	39 55.2 +12.4 94.9	38 56.7 +12.3 94.6	37 58.2 +12.2 94.3	36 59.6 +12.2 94.1	36 01.1 +12.0 93.8
5°	40 07.6 +11.5 93.6	39 09.0 +11.4 93.3	38 10.4 +11.4 93.1	37 11.8 +11.3 92.8	36 13.1 +11.3 92.6
6°	40 19.1 +10.6 92.3	39 20.4 +10.7 92.1	38 21.8 +10.6 91.8	37 23.1 +10.6 91.6	36 24.4 +10.6 91.4
7°	40 29.7 +09.9 91.0	39 31.1 +09.8 90.8	38 32.4 +09.8 90.6	37 33.7 +09.8 90.4	36 35.0 +09.8 90.1
8°	40 39.6 +08.9 89.7	39 40.9 +08.9 89.5	38 42.2 +09.0 89.3	37 43.5 +09.0 89.1	36 44.8 +09.1 88.9
9°	40 48.5 +08.0 88.4	39 49.8 +08.1 88.2	38 51.2 +08.1 88.0	37 52.5 +08.2 87.9	36 53.9 +08.2 87.7
10°	40 56.5 +07.2 87.1	39 57.9 +07.2 86.9	38 59.3 +07.3 86.8	38 00.7 +07.4 86.6	37 02.1 +07.5 86.4
11°	41 03.7 +06.2 85.8	40 05.1 +06.4 85.6	39 06.6 +06.5 85.5	38 08.1 +06.6 85.3	37 09.6 +06.7 85.2
12°	41 09.9 +05.3 84.5	40 11.5 +05.5 84.3	39 13.1 +05.6 84.2	38 14.7 +05.8 84.1	37 16.3 +06.0 84.0
13°	41 15.2 +04.5 83.1	40 17.0 +04.6 83.0	39 18.7 +04.8 82.9	38 20.5 +04.9 82.8	37 22.3 +05.1 82.7
14°	41 19.7 +03.5 81.8	40 21.6 +03.7 81.7	39 23.5 +03.9 81.6	38 25.4 +04.2 81.5	37 27.4 +04.3 81.4
15°	41 23.2 +02.5 80.5	40 25.3 +02.8 80.4	39 27.4 +03.1 80.3	38 29.6 +03.3 80.3	37 31.7 +03.6 80.2
16°	41 25.7 +01.7 79.1	40 28.1 +01.9 79.1	39 30.5 +02.2 79.0	38 32.9 +02.4 79.0	37 35.3 +02.7 78.9
17°	41 27.4 +00.7 77.8	40 30.0 +01.1 77.8	39 32.7 +01.3 77.8	38 35.3 +01.7 77.7	37 38.0 +01.9 77.7
18°	41 28.1 -00.1 76.5	40 31.1 +00.1 76.5	39 34.0 +00.5 76.5	38 37.0 +00.8 76.4	37 39.9 +01.1 76.4
19°	41 28.0 -01.2 75.1	40 31.2 -00.7 75.2	39 34.5 -00.4 75.2	38 37.8 -00.1 75.2	37 41.0 +00.4 75.1
20°	41 26.8 -02.0 73.8	40 30.5 -01.7 73.8	39 34.1 -01.2 73.9	38 37.7 -00.8 73.9	37 41.4 -00.6 73.9
21°	41 24.8 -02.9 72.5	40 28.8 -02.5 72.5	39 32.9 -02.2 72.6	38 36.9 -01.8 72.6	37 40.8 -01.3 72.6
22°	41 21.9 -03.9 71.1	40 26.3 -03.4 71.2	39 30.7 -03.0 71.3	38 35.1 -02.5 71.3	37 39.5 -02.1 71.4
23°	41 18.0 -04.8 69.8	40 22.9 -04.3 69.9	39 27.7 -03.8 70.0	38 32.6 -03.4 70.0	37 37.4 -02.9 70.1
24°	41 13.2 -05.7 68.5	40 18.6 -05.2 68.6	39 23.9 -04.7 68.7	38 29.2 -04.2 68.8	37 34.5 -03.7 68.8
25°	41 07.5 -06.6 67.2	40 13.4 -06.1 67.3	39 19.2 -05.5 67.4	38 25.0 -05.0 67.5	37 30.8 -04.5 67.6
26°	41 00.9 -07.5 65.9	40 07.3 -07.0 66.0	39 13.7 -06.4 66.1	38 20.0 -05.9 66.2	37 26.3 -05.4 66.3
27°	40 53.4 -08.4 64.5	40 00.3 -07.8 64.7	39 07.3 -07.3 64.8	38 14.1 -06.6 64.9	37 20.9 -06.1 65.1
28°	40 45.0 -09.3 63.2	39 52.5 -08.6 63.4	39 00.0 -08.0 63.5	38 07.5 -07.5 63.7	37 14.8 -06.9 63.8
29°	40 35.7 -10.2 61.9	39 43.9 -09.6 62.1	38 52.0 -08.9 62.3	38 00.0 -08.3 62.4	37 07.9 -07.7 62.6

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	34 07.7 +14.7 98.3	33 09.6 +14.6 98.0	32 11.4 +14.5 97.7	31 13.3 +14.2 97.4	30 15.0 +14.2 97.1
1°	34 22.4 +14.1 97.1	33 24.2 +13.9 96.8	32 25.9 +13.8 96.5	31 27.5 +13.7 96.3	30 29.2 +13.6 96.0
2°	34 36.5 +13.3 95.9	33 38.1 +13.2 95.7	32 39.7 +13.1 95.4	31 41.2 +13.1 95.1	30 42.8 +12.9 94.9
3°	34 49.8 +12.7 94.7	33 51.3 +12.6 94.5	32 52.8 +12.5 94.2	31 54.3 +12.4 94.0	30 55.7 +12.4 93.7
4°	35 02.5 +12.0 93.6	34 03.9 +12.0 93.3	33 05.3 +11.9 93.1	32 06.7 +11.8 92.8	31 08.1 +11.8 92.6
5°	35 14.5 +11.3 92.4	34 15.9 +11.2 92.1	33 17.2 +11.2 91.9	32 18.5 +11.2 91.7	31 19.9 +11.1 91.4
6°	35 25.8 +10.5 91.2	34 27.1 +10.5 90.9	33 28.4 +10.5 90.7	32 29.7 +10.6 90.5	31 31.0 +10.6 90.3
7°	35 36.3 +09.8 89.9	34 37.6 +09.9 89.7	33 38.9 +09.9 89.5	32 40.3 +09.8 89.3	31 41.6 +09.9 89.1
8°	35 46.1 +09.1 88.7	34 47.5 +09.1 88.5	33 48.8 +09.2 88.3	32 50.1 +09.3 88.2	31 51.5 +09.3 88.0
9°	35 55.2 +08.4 87.5	34 56.6 +08.4 87.3	33 58.0 +08.4 87.2	32 59.4 +08.5 87.0	32 00.8 +08.6 86.8
10°	36 03.6 +07.5 86.3	35 05.0 +07.7 86.1	34 06.4 +07.8 86.0	33 07.9 +07.9 85.8	32 09.4 +08.0 85.6
11°	36 11.1 +06.9 85.1	35 12.7 +06.9 84.9	34 14.2 +07.1 84.8	33 15.8 +07.2 84.6	32 17.4 +07.3 84.5
12°	36 18.0 +06.1 83.8	35 19.6 +06.3 83.7	34 21.3 +06.4 83.6	33 23.0 +06.5 83.4	32 24.7 +06.7 83.3
13°	36 24.1 +05.3 82.6	35 25.9 +05.5 82.5	34 27.7 +05.7 82.4	33 29.5 +05.9 82.2	32 31.4 +06.0 82.1
14°	36 29.4 +04.5 81.3	35 31.4 +04.7 81.2	34 33.4 +04.9 81.1	33 35.4 +05.1 81.0	32 37.4 +05.4 80.9
15°	36 33.9 +03.8 80.1	35 36.1 +04.0 80.0	34 38.3 +04.2 79.9	33 40.5 +04.5 79.8	32 42.8 +04.7 79.7
16°	36 37.7 +03.0 78.9	35 40.1 +03.3 78.8	34 42.5 +03.5 78.7	33 45.0 +03.8 78.6	32 47.5 +04.0 78.6
17°	36 40.7 +02.2 77.6	35 43.4 +02.5 77.6	34 46.0 +02.8 77.5	33 48.8 +03.0 77.4	32 51.5 +03.3 77.4
18°	36 42.9 +01.4 76.4	35 45.9 +01.7 76.3	34 48.8 +02.1 76.3	33 51.8 +02.4 76.2	32 54.8 +02.7 76.2
19°	36 44.3 +00.7 75.1	35 47.6 +01.0 75.1	34 50.9 +01.3 75.1	33 54.2 +01.6 75.0	32 57.5 +02.0 75.0
20°	36 45.0 -00.2 73.9	35 48.6 +00.2 73.9	34 52.2 +00.6 73.9	33 55.8 +01.0 73.8	32 59.5 +01.3 73.8
21°	36 44.8 -00.9 72.6	35 48.8 -00.5 72.6	34 52.8 -00.1 72.6	33 56.8 +00.2 72.6	33 00.8 +00.6 72.6
22°	36 43.9 -01.7 71.4	35 48.3 -01.3 71.4	34 52.7 -00.9 71.4	33 57.0 -00.4 71.4	33 01.4 +00.0 71.4
23°	36 42.2 -02.4 70.1	35 47.0 -02.0 70.2	34 51.8 -01.6 70.2	33 56.6 -01.2 70.2	33 01.4 -00.8 70.2
24°	36 39.8 -03.3 68.9	35 45.0 -02.8 68.9	34 50.2 -02.3 69.0	33 55.4 -01.8 69.0	33 00.6 -01.4 69.0
25°	36 36.5 -04.0 67.6	35 42.2 -03.5 67.7	34 47.9 -03.0 67.8	33 53.6 -02.6 67.8	32 59.2 -02.1 67.8
26°	36 32.5 -04.8 66.4	35 38.7 -04.3 66.5	34 44.9 -03.8 66.5	33 51.0 -03.3 66.6	32 57.1 -02.7 66.7
27°	36 27.7 -05.6 65.2	35 34.4 -05.0 65.3	34 41.1 -04.5 65.3	33 47.7 -03.9 65.4	32 54.4 -03.5 65.5
28°	36 22.1 -06.3 63.9	35 29.4 -05.8 64.0	34 36.6 -05.2 64.1	33 43.8 -04.7 64.2	32 50.9 -04.1 64.3
29°	36 15.8 -07.1 62.7	35 23.6 -06.5 62.8	34 31.4 -05.9 62.9	33 39.1 -05.3 63.0	32 46.8 -04.8 63.1

Declination SAME name as Latitude

Latitude 12°

Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	29 16.8 +14.0 96.8	28 18.5 +13.9 96.6	27 20.2 +13.8 96.3	26 21.8 +13.7 96.0	25 23.5 +13.5 95.8
1°	29 30.8 +13.5 95.7	28 32.4 +13.4 95.5	27 34.0 +13.2 95.2	26 35.5 +13.2 95.0	25 37.0 +13.1 94.7
2°	29 44.3 +12.9 94.6	28 45.8 +12.8 94.4	27 47.2 +12.8 94.1	26 48.7 +12.7 93.9	25 50.1 +12.6 93.6
3°	29 57.2 +12.3 93.5	28 58.6 +12.2 93.2	28 00.0 +12.2 93.0	27 01.4 +12.1 92.8	26 02.7 +12.2 92.5
4°	30 09.5 +11.7 92.4	29 10.8 +11.7 92.1	28 12.2 +11.6 91.9	27 13.5 +11.7 91.7	26 14.9 +11.6 91.4
5°	30 21.2 +11.2 91.2	29 22.5 +11.2 91.0	28 23.8 +11.2 90.8	27 25.2 +11.1 90.6	26 26.5 +11.1 90.4
6°	30 32.4 +10.5 90.1	29 33.7 +10.5 89.9	28 35.0 +10.5 89.7	27 36.3 +10.6 89.5	26 37.6 +10.6 89.3
7°	30 42.9 +09.9 88.9	29 44.2 +10.0 88.7	28 45.5 +10.1 88.5	27 46.9 +10.0 88.3	26 48.2 +10.1 88.2
8°	30 52.8 +09.4 87.8	29 54.2 +09.4 87.6	28 55.6 +09.4 87.4	27 56.9 +09.5 87.2	26 58.3 +09.6 87.0
9°	31 02.2 +08.7 86.6	30 03.6 +08.8 86.5	29 05.0 +08.9 86.3	28 06.4 +09.0 86.1	27 07.9 +09.1 85.9
10°	31 10.9 +08.1 85.5	30 12.4 +08.2 85.3	29 13.9 +08.3 85.2	28 15.4 +08.4 85.0	27 17.0 +08.5 84.8
11°	31 19.0 +07.4 84.3	30 20.6 +07.6 84.2	29 22.2 +07.7 84.0	28 23.8 +07.9 83.9	27 25.5 +08.0 83.7
12°	31 26.4 +06.9 83.2	30 28.2 +07.0 83.0	29 29.9 +07.2 82.9	28 31.7 +07.3 82.7	27 33.5 +07.5 82.6
13°	31 33.3 +06.2 82.0	30 35.2 +06.3 81.9	29 37.1 +06.5 81.7	28 39.0 +06.7 81.6	27 41.0 +06.9 81.5
14°	31 39.5 +05.5 80.8	30 41.5 +05.8 80.7	29 43.6 +06.0 80.6	28 45.7 +06.2 80.5	27 47.9 +06.3 80.4
15°	31 45.0 +04.9 79.7	30 47.3 +05.1 79.6	29 49.6 +05.4 79.4	28 51.9 +05.6 79.3	27 54.2 +05.9 79.2
16°	31 49.9 +04.3 78.5	30 52.4 +04.6 78.4	29 55.0 +04.7 78.3	28 57.5 +05.0 78.2	28 00.1 +05.2 78.1
17°	31 54.2 +03.6 77.3	30 57.0 +03.9 77.2	29 59.7 +04.2 77.1	29 02.5 +04.5 77.1	28 05.3 +04.8 77.0
18°	31 57.8 +03.0 76.1	31 00.9 +03.2 76.1	30 03.9 +03.6 76.0	29 07.0 +03.8 75.9	28 10.1 +04.1 75.8
19°	32 00.8 +02.3 75.0	31 04.1 +02.7 74.9	30 07.5 +02.9 74.8	29 10.8 +03.3 74.8	28 14.2 +03.6 74.7
20°	32 03.1 +01.7 73.8	31 06.8 +02.0 73.7	30 10.4 +02.4 73.7	29 14.1 +02.7 73.6	28 17.8 +03.1 73.6
21°	32 04.8 +01.0 72.6	31 08.8 +01.4 72.6	30 12.8 +01.7 72.5	29 16.8 +02.1 72.5	28 20.9 +02.4 72.4
22°	32 05.8 +00.3 71.4	31 10.2 +00.7 71.4	30 14.5 +01.2 71.4	29 18.9 +01.6 71.3	28 23.3 +01.9 71.3
23°	32 06.1 -00.3 70.2	31 10.9 +00.1 70.2	30 15.7 +00.5 70.2	29 20.5 +00.9 70.2	28 25.2 +01.4 70.2
24°	32 05.8 -00.9 69.1	31 11.0 -00.5 69.1	30 16.2 -00.1 69.1	29 21.4 +00.3 69.1	28 26.6 +00.8 69.0
25°	32 04.9 -01.7 67.9	31 10.5 -01.2 67.9	30 16.1 -00.7 67.9	29 21.7 -00.2 67.9	28 27.4 +00.2 67.9
26°	32 03.2 -02.2 66.7	31 09.3 -01.8 66.7	30 15.4 -01.3 66.7	29 21.5 -00.8 66.8	28 27.6 -00.4 66.8
27°	32 01.0 -03.0 65.5	31 07.5 -02.4 65.6	30 14.1 -01.9 65.6	29 20.7 -01.5 65.6	28 27.2 -00.9 65.6
28°	31 58.0 -03.5 64.3	31 05.1 -03.0 64.4	30 12.2 -02.5 64.4	29 19.2 -02.0 64.5	28 26.3 -01.5 64.5
29°	31 54.5 -04.3 63.2	31 02.1 -03.7 63.2	30 09.7 -03.2 63.3	29 17.2 -02.6 63.3	28 24.8 -02.1 63.4

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	24 25.1 +13.4 95.5	23 26.6 +13.4 95.3	22 28.2 +13.3 95.0	21 29.7 +13.2 94.8	20 31.2 +13.1 94.6
1°	24 38.5 +13.0 94.5	23 40.0 +12.9 94.2	22 41.5 +12.8 94.0	21 42.9 +12.8 93.8	20 44.3 +12.8 93.5
2°	24 51.5 +12.6 93.4	23 52.9 +12.6 93.2	22 54.3 +12.5 92.9	21 55.7 +12.4 92.7	20 57.1 +12.4 92.5
3°	25 04.1 +12.1 92.3	24 05.5 +12.0 92.1	23 06.8 +12.0 91.9	22 08.1 +12.0 91.6	21 09.5 +11.9 91.4
4°	25 16.2 +11.6 91.2	24 17.5 +11.6 91.0	23 18.8 +11.6 90.8	22 20.1 +11.6 90.6	21 21.4 +11.6 90.4
5°	25 27.8 +11.1 90.1	24 29.1 +11.1 89.9	23 30.4 +11.2 89.7	22 31.7 +11.2 89.5	21 33.0 +11.2 89.3
6°	25 38.9 +10.7 89.1	24 40.2 +10.7 88.9	23 41.6 +10.7 88.7	22 42.9 +10.7 88.5	21 44.2 +10.8 88.3
7°	25 49.6 +10.1 88.0	24 50.9 +10.2 87.8	23 52.3 +10.2 87.6	22 53.6 +10.4 87.4	21 55.0 +10.4 87.2
8°	25 59.7 +09.7 86.9	25 01.1 +09.7 86.7	24 02.5 +09.8 86.5	23 04.0 +09.8 86.3	22 05.4 +10.0 86.1
9°	26 09.4 +09.1 85.8	25 10.8 +09.3 85.6	24 12.3 +09.4 85.4	23 13.8 +09.5 85.3	22 15.4 +09.5 85.1
10°	26 18.5 +08.7 84.7	25 20.1 +08.8 84.5	24 21.7 +08.9 84.3	23 23.3 +09.0 84.2	22 24.9 +09.1 84.0
11°	26 27.2 +08.1 83.6	25 28.9 +08.2 83.4	24 30.6 +08.4 83.3	23 32.3 +08.5 83.1	22 34.0 +08.7 82.9
12°	26 35.3 +07.6 82.5	25 37.1 +07.8 82.3	24 39.0 +07.9 82.2	23 40.8 +08.2 82.0	22 42.7 +08.3 81.9
13°	26 42.9 +07.1 81.3	25 44.9 +07.3 81.2	24 46.9 +07.5 81.1	23 49.0 +07.6 80.9	22 51.0 +07.8 80.8
14°	26 50.0 +06.6 80.2	25 52.2 +06.8 80.1	24 54.4 +07.0 80.0	23 56.6 +07.2 79.8	22 58.8 +07.4 79.7
15°	26 56.6 +06.1 79.1	25 59.0 +06.3 79.0	25 01.4 +06.5 78.9	24 03.8 +06.7 78.8	23 06.2 +07.0 78.6
16°	27 02.7 +05.5 78.0	26 05.3 +05.7 77.9	25 07.9 +06.0 77.8	24 10.5 +06.3 77.7	23 13.2 +06.5 77.6
17°	27 08.2 +05.0 76.9	26 11.0 +05.3 76.8	25 13.9 +05.5 76.7	24 16.8 +05.8 76.6	23 19.7 +06.1 76.5
18°	27 13.2 +04.4 75.8	26 16.3 +04.7 75.7	25 19.4 +05.1 75.6	24 22.6 +05.3 75.5	23 25.8 +05.6 75.4
19°	27 17.6 +03.9 74.6	26 21.0 +04.3 74.6	25 24.5 +04.5 74.5	24 27.9 +04.9 74.4	23 31.4 +05.2 74.3
20°	27 21.5 +03.4 73.5	26 25.3 +03.7 73.5	25 29.0 +04.1 73.4	24 32.8 +04.4 73.3	23 36.6 +04.7 73.2
21°	27 24.9 +02.8 72.4	26 29.0 +03.2 72.3	25 33.1 +03.5 72.3	24 37.2 +03.9 72.2	23 41.3 +04.3 72.1
22°	27 27.7 +02.3 71.3	26 32.2 +02.6 71.2	25 36.6 +03.1 71.2	24 41.1 +03.4 71.1	23 45.6 +03.8 71.0
23°	27 30.0 +01.8 70.1	26 34.8 +02.2 70.1	25 39.7 +02.5 70.1	24 44.5 +03.0 70.0	23 49.4 +03.3 70.0
24°	27 31.8 +01.2 69.0	26 37.0 +01.6 69.0	25 42.2 +02.1 69.0	24 47.5 +02.4 68.9	23 52.7 +02.9 68.9
25°	27 33.0 +00.6 67.9	26 38.6 +01.1 67.9	25 44.3 +01.5 67.8	24 49.9 +02.0 67.8	23 55.6 +02.4 67.8
26°	27 33.6 +00.2 66.8	26 39.7 +00.6 66.7	25 45.8 +01.0 66.7	24 51.9 +01.5 66.7	23 58.0 +01.9 66.7
27°	27 33.8 -00.5 65.6	26 40.3 +00.0 65.6	25 46.8 +00.6 65.6	24 53.4 +01.0 65.6	23 59.9 +01.5 65.6
28°	27 33.3 -01.0 64.5	26 40.3 -00.4 64.5	25 47.4 +00.0 64.5	24 54.4 +00.5 64.5	24 01.4 +01.0 64.5
29°	27 32.3 -01.5 63.4	26 39.9 -01.0 63.4	25 47.4 -00.5 63.4	24 54.9 +00.0 63.4	24 02.4 +00.6 63.4

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Latitude 12°

Declination SAME name as Latitude

Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	19 32.7 +13.1 94.3	18 34.2 +13.0 94.1	17 35.6 +12.9 93.9	16 37.1 +12.8 93.6	15 38.5 +12.8 93.4
1°	19 45.8 +12.7 93.3	18 47.2 +12.6 93.1	17 48.5 +12.7 92.8	16 49.9 +12.6 92.6	15 51.3 +12.5 92.4
2°	19 58.5 +12.3 92.3	18 59.8 +12.3 92.0	18 01.2 +12.2 91.8	17 02.5 +12.2 91.6	16 03.8 +12.3 91.4
3°	20 10.8 +12.0 91.2	19 12.1 +12.0 91.0	18 13.4 +12.0 90.8	17 14.7 +12.0 90.6	16 16.1 +11.9 90.4
4°	20 22.8 +11.6 90.2	19 24.1 +11.6 90.0	18 25.4 +11.6 89.7	17 26.7 +11.6 89.5	16 28.0 +11.7 89.3
5°	20 34.4 +11.2 89.1	19 35.7 +11.2 88.9	18 37.0 +11.3 88.7	17 38.3 +11.3 88.5	16 39.7 +11.3 88.3
6°	20 45.6 +10.8 88.1	19 46.9 +10.9 87.9	18 48.3 +10.9 87.7	17 49.6 +11.0 87.5	16 51.0 +11.1 87.3
7°	20 56.4 +10.4 87.0	19 57.8 +10.5 86.8	18 59.2 +10.6 86.6	18 00.6 +10.7 86.5	17 02.1 +10.7 86.3
8°	21 06.8 +10.1 86.0	20 08.3 +10.1 85.8	19 09.8 +10.2 85.6	18 11.3 +10.3 85.4	17 12.8 +10.4 85.2
9°	21 16.9 +09.6 84.9	20 18.4 +09.8 84.7	19 20.0 +09.9 84.6	18 21.6 +10.0 84.4	17 23.2 +10.1 84.2
10°	21 26.5 +09.3 83.8	20 28.2 +09.4 83.7	19 29.9 +09.5 83.5	18 31.6 +09.6 83.3	17 33.3 +09.8 83.2
11°	21 35.8 +08.8 82.8	20 37.6 +09.0 82.6	19 39.4 +09.1 82.5	18 41.2 +09.3 82.3	17 43.1 +09.4 82.1
12°	21 44.6 +08.5 81.7	20 46.6 +08.6 81.6	19 48.5 +08.8 81.4	18 50.5 +09.0 81.3	17 52.5 +09.2 81.1
13°	21 53.1 +08.0 80.7	20 55.2 +08.2 80.5	19 57.3 +08.4 80.4	18 59.5 +08.6 80.2	18 01.7 +08.7 80.1
14°	22 01.1 +07.6 79.6	21 03.4 +07.8 79.4	20 05.7 +08.1 79.3	19 08.1 +08.2 79.2	18 10.4 +08.5 79.0
15°	22 08.7 +07.2 78.5	21 11.2 +07.4 78.4	20 13.8 +07.6 78.2	19 16.3 +07.9 78.1	18 18.9 +08.1 78.0
16°	22 15.9 +06.8 77.4	21 18.6 +07.1 77.3	20 21.4 +07.3 77.2	19 24.2 +07.5 77.1	18 27.0 +07.8 76.9
17°	22 22.7 +06.3 76.4	21 25.7 +06.6 76.3	20 28.7 +06.8 76.1	19 31.7 +07.2 76.0	18 34.8 +07.4 75.9
18°	22 29.0 +05.9 75.3	21 32.3 +06.2 75.2	20 35.5 +06.5 75.1	19 38.9 +06.7 75.0	18 42.2 +07.1 74.8
19°	22 34.9 +05.5 74.2	21 38.5 +05.8 74.1	20 42.0 +06.1 74.0	19 45.6 +06.4 73.9	18 49.3 +06.7 73.8
20°	22 40.4 +05.1 73.1	21 44.3 +05.3 73.0	20 48.1 +05.7 72.9	19 52.0 +06.1 72.8	18 56.0 +06.4 72.7
21°	22 45.5 +04.6 72.1	21 49.6 +05.0 72.0	20 53.8 +05.4 71.9	19 58.1 +05.6 71.8	19 02.4 +06.0 71.7
22°	22 50.1 +04.1 71.0	21 54.6 +04.5 70.9	20 59.2 +04.9 70.8	20 03.7 +05.3 70.7	19 08.4 +05.6 70.6
23°	22 54.2 +03.8 69.9	21 59.1 +04.2 69.8	21 04.1 +04.5 69.7	20 09.0 +04.9 69.7	19 14.0 +05.3 69.6
24°	22 58.0 +03.3 68.8	22 03.3 +03.7 68.7	21 08.6 +04.1 68.7	20 13.9 +04.5 68.6	19 19.3 +04.9 68.5
25°	23 01.3 +02.8 67.7	22 07.0 +03.2 67.7	21 12.7 +03.7 67.6	20 18.4 +04.2 67.5	19 24.2 +04.6 67.5
26°	23 04.1 +02.4 66.6	22 10.2 +02.9 66.6	21 16.4 +03.3 66.5	20 22.6 +03.7 66.5	19 28.8 +04.2 66.4
27°	23 06.5 +02.0 65.5	22 13.1 +02.4 65.5	21 19.7 +02.9 65.5	20 26.3 +03.4 65.4	19 33.0 +03.8 65.4
28°	23 08.5 +01.5 64.5	22 15.5 +02.0 64.4	21 22.6 +02.5 64.4	20 29.7 +02.9 64.3	19 36.8 +03.4 64.3
29°	23 10.0 +01.0 63.4	22 17.5 +01.6 63.4	21 25.1 +02.0 63.3	20 32.6 +02.6 63.3	19 40.2 +03.1 63.2

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 39.9 +12.7 93.2	13 41.3 +12.7 93.0	12 42.7 +12.6 92.7	11 44.0 +12.7 92.5	10 45.4 +12.6 92.3
1°	14 52.6 +12.5 92.2	13 54.0 +12.5 92.0	12 55.3 +12.5 91.7	11 56.7 +12.4 91.5	10 58.0 +12.4 91.3
2°	15 05.1 +12.3 91.2	14 06.5 +12.2 91.0	13 07.8 +12.2 90.7	12 09.1 +12.2 90.5	11 10.4 +12.2 90.3
3°	15 17.4 +11.9 90.2	14 18.7 +11.9 89.9	13 20.0 +12.0 89.7	12 21.3 +12.0 89.5	11 22.6 +12.0 89.3
4°	15 29.3 +11.7 89.1	14 30.6 +11.7 88.9	13 32.0 +11.7 88.7	12 33.3 +11.8 88.5	11 34.6 +11.8 88.3
5°	15 41.0 +11.4 88.1	14 42.3 +11.5 87.9	13 43.7 +11.5 87.7	12 45.1 +11.5 87.5	11 46.4 +11.6 87.3
6°	15 52.4 +11.1 87.1	14 53.8 +11.1 86.9	13 55.2 +11.2 86.7	12 56.6 +11.3 86.5	11 58.0 +11.4 86.3
7°	16 03.5 +10.8 86.1	15 04.9 +10.9 85.9	14 06.4 +11.0 85.7	13 07.9 +11.1 85.5	12 09.4 +11.2 85.3
8°	16 14.3 +10.5 85.1	15 15.8 +10.7 84.9	14 17.4 +10.7 84.7	13 19.0 +10.8 84.5	12 20.6 +10.9 84.3
9°	16 24.8 +10.2 84.0	15 26.5 +10.3 83.8	14 28.1 +10.5 83.7	13 29.8 +10.6 83.5	12 31.5 +10.7 83.3
10°	16 35.0 +10.0 83.0	15 36.8 +10.1 82.8	14 38.6 +10.2 82.6	13 40.4 +10.3 82.5	12 42.2 +10.5 82.3
11°	16 45.0 +09.6 82.0	15 46.9 +09.7 81.8	14 48.8 +09.9 81.6	13 50.7 +10.1 81.5	12 52.7 +10.3 81.3
12°	16 54.6 +09.3 80.9	15 56.6 +09.5 80.8	14 58.7 +09.7 80.6	14 00.8 +09.8 80.4	13 03.0 +10.0 80.3
13°	17 03.9 +08.9 79.9	16 06.1 +09.2 79.7	15 08.4 +09.3 79.6	14 10.6 +09.6 79.4	13 13.0 +09.7 79.3
14°	17 12.8 +08.7 78.9	16 15.3 +08.9 78.7	15 17.7 +09.1 78.6	14 20.2 +09.3 78.4	13 22.7 +09.6 78.2
15°	17 21.5 +08.4 77.8	16 24.2 +08.5 77.7	15 26.8 +08.8 77.5	14 29.5 +09.1 77.4	13 32.3 +09.3 77.2
16°	17 29.9 +08.0 76.8	16 32.7 +08.3 76.7	15 35.6 +08.6 76.5	14 38.6 +08.8 76.4	13 41.6 +09.0 76.2
17°	17 37.9 +07.7 75.8	16 41.0 +08.0 75.6	15 44.2 +08.2 75.5	14 47.4 +08.5 75.3	13 50.6 +08.8 75.2
18°	17 45.6 +07.3 74.7	16 49.0 +07.6 74.6	15 52.4 +08.0 74.5	14 55.9 +08.2 74.3	13 59.4 +08.5 74.2
19°	17 52.9 +07.1 73.7	16 56.6 +07.4 73.5	16 00.4 +07.6 73.4	15 04.1 +08.0 73.3	14 07.9 +08.3 73.2
20°	18 00.0 +06.7 72.6	17 04.0 +07.0 72.5	16 08.0 +07.4 72.4	15 12.1 +07.7 72.3	14 16.2 +08.0 72.1
21°	18 06.7 +06.3 71.6	17 11.0 +06.7 71.5	16 15.4 +07.0 71.4	15 19.8 +07.4 71.2	14 24.2 +07.8 71.1
22°	18 13.0 +06.0 70.5	17 17.7 +06.4 70.4	16 22.4 +06.8 70.3	15 27.2 +07.1 70.2	14 32.0 +07.4 70.1
23°	18 19.0 +05.7 69.5	17 24.1 +06.0 69.4	16 29.2 +06.4 69.3	15 34.3 +06.8 69.2	14 39.4 +07.3 69.1
24°	18 24.7 +05.3 68.4	17 30.1 +05.8 68.3	16 35.6 +06.1 68.3	15 41.1 +06.5 68.1	14 46.7 +06.9 68.0
25°	18 30.0 +05.0 67.4	17 35.9 +05.4 67.3	16 41.7 +05.9 67.2	15 47.6 +06.3 67.1	14 53.6 +06.7 67.0
26°	18 35.0 +04.6 66.3	17 41.3 +05.0 66.3	16 47.6 +05.5 66.2	15 53.9 +05.9 66.1	15 00.3 +06.3 66.0
27°	18 39.6 +04.3 65.3	17 46.3 +04.8 65.2	16 53.1 +05.2 65.1	15 59.8 +05.7 65.0	15 06.6 +06.2 65.0
28°	18 43.9 +03.9 64.2	17 51.1 +04.4 64.2	16 58.3 +04.8 64.1	16 05.5 +05.3 64.0	15 12.8 +05.8 63.9
29°	18 47.8 +03.6 63.2	17 55.5 +04.0 63.1	17 03.1 +04.6 63.0	16 10.8 +05.1 63.0	15 18.6 +05.5 62.9

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Latitude 12°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 46.8 +12.5 92.1	8 48.1 +12.6 91.9	7 49.4 +12.6 91.7	6 50.8 +12.5 91.5	5 52.1 +12.5 91.3
1°	9 59.3 +12.4 91.1	9 00.7 +12.3 90.9	8 02.0 +12.3 90.7	7 03.3 +12.4 90.5	6 04.6 +12.4 90.3
2°	10 11.7 +12.2 90.1	9 13.0 +12.3 89.9	8 14.3 +12.3 89.7	7 15.7 +12.2 89.5	6 17.0 +12.2 89.3
3°	10 23.9 +12.1 89.1	9 25.3 +12.0 88.9	8 26.6 +12.1 88.7	7 27.9 +12.1 88.5	6 29.2 +12.2 88.3
4°	10 36.0 +11.8 88.1	9 37.3 +11.9 87.9	8 38.7 +11.9 87.7	7 40.0 +12.0 87.5	6 41.4 +12.0 87.3
5°	10 47.8 +11.7 87.1	9 49.2 +11.7 86.9	8 50.6 +11.8 86.7	7 52.0 +11.9 86.5	6 53.4 +12.0 86.3
6°	10 59.5 +11.4 86.1	10 00.9 +11.5 85.9	9 02.4 +11.6 85.7	8 03.9 +11.7 85.5	7 05.4 +11.8 85.3
7°	11 10.9 +11.3 85.1	10 12.4 +11.4 84.9	9 14.0 +11.5 84.7	8 15.6 +11.5 84.5	7 17.2 +11.6 84.4
8°	11 22.2 +11.0 84.1	10 23.8 +11.2 83.9	9 25.5 +11.2 83.7	8 27.1 +11.4 83.6	7 28.8 +11.5 83.4
9°	11 33.2 +10.9 83.1	10 35.0 +10.9 82.9	9 36.7 +11.2 82.7	8 38.5 +11.3 82.6	7 40.3 +11.4 82.4
10°	11 44.1 +10.6 82.1	10 45.9 +10.8 81.9	9 47.9 +10.9 81.8	8 49.8 +11.1 81.6	7 51.7 +11.3 81.4
11°	11 54.7 +10.4 81.1	10 56.7 +10.6 80.9	9 58.8 +10.8 80.8	9 00.9 +10.9 80.6	8 03.0 +11.1 80.4
12°	12 05.1 +10.2 80.1	11 07.3 +10.4 79.9	10 09.6 +10.5 79.8	9 11.8 +10.8 79.6	8 14.1 +11.0 79.4
13°	12 15.3 +10.0 79.1	11 17.7 +10.2 78.9	10 20.1 +10.4 78.8	9 22.6 +10.6 78.6	8 25.1 +10.8 78.4
14°	12 25.3 +09.8 78.1	11 27.9 +10.0 77.9	10 30.5 +10.2 77.8	9 33.2 +10.4 77.6	8 35.9 +10.7 77.4
15°	12 35.1 +09.5 77.1	11 37.9 +09.8 76.9	10 40.7 +10.0 76.8	9 43.6 +10.3 76.6	8 46.6 +10.5 76.4
16°	12 44.6 +09.3 76.1	11 47.7 +09.5 75.9	10 50.7 +09.9 75.7	9 53.9 +10.1 75.6	8 57.1 +10.3 75.4
17°	12 53.9 +09.1 75.1	11 57.2 +09.4 74.9	11 00.6 +09.6 74.7	10 04.0 +09.9 74.6	9 07.4 +10.2 74.4
18°	13 03.0 +08.8 74.0	12 06.6 +09.1 73.9	11 10.2 +09.4 73.7	10 13.9 +09.7 73.6	9 17.6 +10.0 73.4
19°	13 11.8 +08.6 73.0	12 15.7 +08.9 72.9	11 19.6 +09.2 72.7	10 23.6 +09.5 72.6	9 27.6 +09.9 72.4
20°	13 20.4 +08.3 72.0	12 24.6 +08.6 71.9	11 28.8 +09.0 71.7	10 33.1 +09.4 71.6	9 37.5 +09.6 71.4
21°	13 28.7 +08.1 71.0	12 33.2 +08.5 70.9	11 37.8 +08.8 70.7	10 42.5 +09.1 70.6	9 47.1 +09.5 70.4
22°	13 36.8 +07.9 70.0	12 41.7 +08.2 69.8	11 46.6 +08.6 69.7	10 51.6 +09.0 69.6	9 56.6 +09.4 69.4
23°	13 44.7 +07.6 68.9	12 49.9 +08.0 68.8	11 55.2 +08.4 68.7	11 00.6 +08.7 68.6	10 06.0 +09.1 68.4
24°	13 52.3 +07.3 67.9	12 57.9 +07.7 67.8	12 03.6 +08.1 67.7	11 09.3 +08.6 67.5	10 15.1 +08.9 67.4
25°	13 59.6 +07.1 66.9	13 05.6 +07.5 66.8	12 11.7 +07.9 66.7	11 17.9 +08.3 66.5	10 24.0 +08.8 66.4
26°	14 06.7 +06.8 65.9	13 13.1 +07.3 65.8	12 19.6 +07.7 65.7	11 26.2 +08.1 65.5	10 32.8 +08.6 65.4
27°	14 13.5 +06.6 64.9	13 20.4 +07.0 64.7	12 27.3 +07.5 64.6	11 34.3 +08.0 64.5	10 41.4 +08.4 64.4
28°	14 20.1 +06.3 63.8	13 27.4 +06.8 63.7	12 34.8 +07.3 63.6	11 42.3 +07.7 63.5	10 49.8 +08.1 63.4
29°	14 26.4 +06.0 62.8	13 34.2 +06.5 62.7	12 42.1 +07.0 62.6	11 50.0 +07.5 62.5	10 57.9 +08.0 62.4

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 53.4 +12.5 91.0	3 54.7 +12.5 90.8	2 56.1 +12.4 90.6	1 57.4 +12.4 90.4	0 58.7 +12.5 90.2
1°	5 05.9 +12.4 90.1	4 07.2 +12.4 89.9	3 08.5 +12.4 89.6	2 09.8 +12.5 89.4	1 11.2 +12.4 89.2
2°	5 18.3 +12.3 89.1	4 19.6 +12.3 88.9	3 20.9 +12.4 88.7	2 22.3 +12.4 88.5	1 23.6 +12.4 88.3
3°	5 30.6 +12.2 88.1	4 31.9 +12.3 87.9	3 33.3 +12.3 87.7	2 34.7 +12.3 87.5	1 36.0 +12.4 87.3
4°	5 42.8 +12.1 87.1	4 44.2 +12.1 86.9	3 45.6 +12.2 86.7	2 47.0 +12.3 86.5	1 48.4 +12.4 86.3
5°	5 54.9 +12.0 86.1	4 56.3 +12.1 85.9	3 57.8 +12.2 85.7	2 59.3 +12.2 85.5	2 00.8 +12.3 85.3
6°	6 06.9 +11.9 85.1	5 08.4 +12.0 84.9	4 10.0 +12.0 84.7	3 11.5 +12.2 84.5	2 13.1 +12.3 84.3
7°	6 18.8 +11.7 84.2	5 20.4 +11.9 84.0	4 22.0 +12.0 83.8	3 23.7 +12.1 83.6	2 25.4 +12.2 83.4
8°	6 30.5 +11.7 83.2	5 32.3 +11.8 83.0	4 34.0 +12.0 82.8	3 35.8 +12.1 82.6	2 37.6 +12.2 82.4
9°	6 42.2 +11.5 82.2	5 44.1 +11.7 82.0	4 46.0 +11.8 81.8	3 47.9 +12.0 81.6	2 49.8 +12.2 81.4
10°	6 53.7 +11.5 81.2	5 55.8 +11.5 81.0	4 57.8 +11.8 80.8	3 59.9 +11.9 80.6	3 02.0 +12.1 80.4
11°	7 05.2 +11.2 80.2	6 07.3 +11.5 80.0	5 09.6 +11.6 79.8	4 11.8 +11.9 79.6	3 14.1 +12.0 79.4
12°	7 16.4 +11.2 79.2	6 18.8 +11.4 79.0	5 21.2 +11.6 78.8	4 23.7 +11.7 78.6	3 26.1 +12.0 78.5
13°	7 27.6 +11.0 78.2	6 30.2 +11.2 78.0	5 32.8 +11.4 77.9	4 35.4 +11.7 77.7	3 38.1 +11.9 77.5
14°	7 38.6 +10.9 77.2	6 41.4 +11.2 77.1	5 44.2 +11.4 76.9	4 47.1 +11.6 76.7	3 50.0 +11.9 76.5
15°	7 49.5 +10.8 76.2	6 52.6 +11.0 76.1	5 55.6 +11.3 75.9	4 58.7 +11.5 75.7	4 01.9 +11.8 75.5
16°	8 00.3 +10.6 75.2	7 03.6 +10.8 75.1	6 06.9 +11.1 74.9	5 10.2 +11.5 74.7	4 13.7 +11.7 74.5
17°	8 10.9 +10.5 74.3	7 14.4 +10.8 74.1	6 18.0 +11.1 73.9	5 21.7 +11.3 73.7	4 25.4 +11.6 73.5
18°	8 21.4 +10.3 73.3	7 25.2 +10.6 73.1	6 29.1 +10.9 72.9	5 33.0 +11.2 72.7	4 37.0 +11.5 72.6
19°	8 31.7 +10.2 72.3	7 35.8 +10.5 72.1	6 40.0 +10.8 71.9	5 44.2 +11.2 71.8	4 48.5 +11.5 71.6
20°	8 41.9 +10.0 71.3	7 46.3 +10.4 71.1	6 50.8 +10.7 70.9	5 55.4 +11.0 70.8	5 00.0 +11.4 70.6
21°	8 51.9 +09.8 70.3	7 56.7 +10.2 70.1	7 01.5 +10.6 69.9	6 06.4 +10.9 69.8	5 11.4 +11.2 69.6
22°	9 01.7 +09.7 69.3	8 06.9 +10.0 69.1	7 12.1 +10.4 69.0	6 17.3 +10.8 68.8	5 22.6 +11.2 68.6
23°	9 11.4 +09.5 68.3	8 16.9 +09.9 68.1	7 22.5 +10.3 68.0	6 28.1 +10.7 67.8	5 33.8 +11.1 67.6
24°	9 20.9 +09.4 67.3	8 26.8 +09.8 67.1	7 32.8 +10.2 67.0	6 38.8 +10.6 66.8	5 44.9 +11.0 66.6
25°	9 30.3 +09.2 66.3	8 36.6 +09.6 66.1	7 43.0 +10.0 66.0	6 49.4 +10.4 65.8	5 55.9 +10.9 65.7
26°	9 39.5 +09.0 65.3	8 46.2 +09.5 65.1	7 53.0 +09.9 65.0	6 59.8 +10.4 64.8	6 06.8 +10.7 64.7
27°	9 48.5 +08.8 64.3	8 55.7 +09.2 64.1	8 02.9 +09.7 64.0	7 10.2 +10.2 63.8	6 17.5 +10.7 63.7
28°	9 57.3 +08.7 63.3	9 04.9 +09.2 63.1	8 12.6 +09.6 63.0	7 20.4 +10.0 62.8	6 28.2 +10.5 62.7
29°	10 06.0 +08.4 62.3	9 14.1 +08.9 62.1	8 22.2 +09.5 62.0	7 30.4 +10.0 61.8	6 38.7 +10.5 61.7

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Latitude 12°

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Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +12.5 90.0	-0 58.7 +12.5	-1 57.4 +12.5	-2 56.1 +12.6	-3 54.7 +12.5
1°	0 12.5 +12.4 89.0	-0 46.2 +12.5	-1 44.9 +12.6	-2 43.5 +12.5	-3 42.2 +12.6
2°	0 24.9 +12.5 88.0	-0 33.7 +12.5	-1 32.3 +12.5	-2 31.0 +12.6	-3 29.6 +12.7
3°	0 37.4 +12.5 87.1	-0 21.2 +12.5	-1 19.8 +12.6	-2 18.4 +12.7	-3 16.9 +12.7
4°	0 49.9 +12.4 86.1	-0 08.7 +12.5	-1 07.2 +12.6	-2 05.7 +12.7	-3 04.2 +12.8
5°	1 02.3 +12.4 85.1	0 03.8 +12.5 84.9	-0 54.6 +12.6	-1 53.0 +12.7	-2 51.4 +12.8
6°	1 14.7 +12.4 84.1	0 16.3 +12.6 83.9	-0 42.0 +12.6	-1 40.3 +12.7	-2 38.6 +12.8
7°	1 27.1 +12.4 83.2	0 28.9 +12.5 82.9	-0 29.4 +12.7	-1 27.6 +12.8	-2 25.8 +13.0
8°	1 39.5 +12.3 82.2	0 41.4 +12.5 82.0	-0 16.7 +12.6	-1 14.8 +12.8	-2 12.8 +12.9
9°	1 51.8 +12.3 81.2	0 53.9 +12.4 81.0	-0 04.1 +12.6	-1 02.0 +12.8	-1 59.9 +13.0
10°	2 04.1 +12.3 80.2	1 06.3 +12.5 80.0	0 08.5 +12.7 79.8	-0 49.2 +12.8	-1 46.9 +13.0
11°	2 16.4 +12.3 79.2	1 18.8 +12.4 79.0	0 21.2 +12.6 78.8	-0 36.4 +12.9	-1 33.9 +13.1
12°	2 28.7 +12.1 78.3	1 31.2 +12.4 78.1	0 33.8 +12.6 77.8	-0 23.5 +12.8	-1 20.8 +13.0
13°	2 40.8 +12.2 77.3	1 43.6 +12.4 77.1	0 46.4 +12.6 76.9	-0 10.7 +12.9	-1 07.8 +13.1
14°	2 53.0 +12.1 76.3	1 56.0 +12.3 76.1	0 59.0 +12.6 75.9	0 02.2 +12.8 75.7	-0 54.7 +13.1
15°	3 05.1 +12.0 75.3	2 08.3 +12.3 75.1	1 11.6 +12.6 74.9	0 15.0 +12.8 74.7	-0 41.6 +13.1
16°	3 17.1 +12.0 74.3	2 20.6 +12.3 74.1	1 24.2 +12.6 73.9	0 27.8 +12.9 73.7	-0 28.5 +13.2
17°	3 29.1 +11.9 73.4	2 32.9 +12.2 73.2	1 36.8 +12.5 73.0	0 40.7 +12.8 72.8	-0 15.3 +13.1
18°	3 41.0 +11.9 72.4	2 45.1 +12.2 72.2	1 49.3 +12.5 72.0	0 53.5 +12.8 71.8	-0 02.2 +13.1
19°	3 52.9 +11.8 71.4	2 57.3 +12.1 71.2	2 01.8 +12.4 71.0	1 06.3 +12.8 70.8	0 10.9 +13.1 70.6
20°	4 04.7 +11.7 70.4	3 09.4 +12.1 70.2	2 14.2 +12.4 70.0	1 19.1 +12.8 69.8	0 24.0 +13.2 69.6
21°	4 16.4 +11.6 69.4	3 21.5 +12.0 69.2	2 26.6 +12.4 69.0	1 31.9 +12.7 68.8	0 37.2 +13.1 68.6
22°	4 28.0 +11.6 68.4	3 33.5 +11.9 68.3	2 39.0 +12.3 68.1	1 44.6 +12.7 67.9	0 50.3 +13.1 67.7
23°	4 39.6 +11.5 67.5	3 45.4 +11.9 67.3	2 51.3 +12.3 67.1	1 57.3 +12.7 66.9	1 03.4 +13.0 66.7
24°	4 51.1 +11.4 66.5	3 57.3 +11.8 66.3	3 03.6 +12.2 66.1	2 10.0 +12.6 65.9	1 16.4 +13.1 65.7
25°	5 02.5 +11.3 65.5	4 09.1 +11.7 65.3	3 15.8 +12.2 65.1	2 22.6 +12.6 64.9	1 29.5 +13.0 64.7
26°	5 13.8 +11.2 64.5	4 20.8 +11.7 64.3	3 28.0 +12.1 64.1	2 35.2 +12.6 64.0	1 42.5 +13.0 63.8
27°	5 25.0 +11.1 63.5	4 32.5 +11.6 63.3	3 40.1 +12.0 63.2	2 47.8 +12.4 63.0	1 55.5 +13.0 62.8
28°	5 36.1 +11.0 62.5	4 44.1 +11.5 62.4	3 52.1 +12.0 62.2	3 00.2 +12.5 62.0	2 08.5 +12.9 61.8
29°	5 47.1 +10.9 61.5	4 55.6 +11.4 61.4	4 04.1 +11.9 61.2	3 12.7 +12.4 61.0	2 21.4 +12.9 60.8

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 53.4 +12.5	-5 52.1 +12.6	-6 50.8 +12.6		
1°	-4 40.9 +12.7	-5 39.5 +12.7	-6 38.2 +12.8		
2°	-4 28.2 +12.7	-5 26.8 +12.8	-6 25.4 +12.8		
3°	-4 15.5 +12.8	-5 14.0 +12.8	-6 12.6 +13.0		
4°	-4 02.7 +12.9	-5 01.2 +13.0	-5 59.6 +13.1		
5°	-3 49.8 +12.9	-4 48.2 +13.1	-5 46.5 +13.1		
6°	-3 36.9 +13.0	-4 35.1 +13.1	-5 33.4 +13.3		
7°	-3 23.9 +13.1	-4 22.0 +13.2	-5 20.1 +13.4		
8°	-3 10.8 +13.1	-4 08.8 +13.3	-5 06.7 +13.4		
9°	-2 57.7 +13.1	-3 55.5 +13.3	-4 53.3 +13.5		
10°	-2 44.6 +13.2	-3 42.2 +13.4	-4 39.8 +13.6		
11°	-2 31.4 +13.3	-3 28.8 +13.5	-4 26.2 +13.7		
12°	-2 18.1 +13.3	-3 15.3 +13.5	-4 12.5 +13.8		
13°	-2 04.8 +13.3	-3 01.8 +13.6	-3 58.7 +13.8		
14°	-1 51.5 +13.4	-2 48.2 +13.6	-3 44.9 +13.9		
15°	-1 38.1 +13.4	-2 34.6 +13.7	-3 31.0 +14.0		
16°	-1 24.7 +13.4	-2 20.9 +13.7	-3 17.0 +14.0		
17°	-1 11.3 +13.4	-2 07.2 +13.8	-3 03.0 +14.1		
18°	-0 57.9 +13.5	-1 53.4 +13.7	-2 48.9 +14.1		
19°	-0 44.4 +13.5	-1 39.7 +13.9	-2 34.8 +14.1		
20°	-0 30.9 +13.4	-1 25.8 +13.8	-2 20.7 +14.2		
21°	-0 17.5 +13.5	-1 12.0 +13.9	-2 06.5 +14.3		
22°	-0 04.0 +13.5	-0 58.1 +13.8	-1 52.2 +14.2		
23°	0 09.5 +13.5 66.5	-0 44.3 +13.9	-1 38.0 +14.3		
24°	0 23.0 +13.5 65.5	-0 30.4 +13.9	-1 23.7 +14.4		
25°	0 36.5 +13.4 64.5	-0 16.5 +13.9	-1 09.3 +14.3		
26°	0 49.9 +13.5 63.6	-0 02.6 +13.9	-0 55.0 +14.4		
27°	1 03.4 +13.4 62.6	0 11.3 +13.9 62.4	-0 40.6 +14.3		
28°	1 16.8 +13.4 61.6	0 25.2 +13.9 61.4	-0 26.3 +14.4		
29°	1 30.2 +13.4 60.6	0 39.1 +13.9 60.4	-0 11.9 +14.4		

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Declination SAME name as Latitude

Latitude 13°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	77 00.0 +60.0 180.0	76 57.7 +59.9 175.6	76 51.0 +59.3 171.2	76 39.8 +58.4 166.9	76 24.5 +57.3 162.7
1°	78 00.0 +60.0 180.0	77 57.6 +59.7 175.2	77 50.3 +59.1 170.5	77 38.2 +58.2 165.9	77 21.8 +56.7 161.4
2°	79 00.0 +60.0 180.0	78 57.3 +59.8 174.8	78 49.4 +59.0 169.6	78 36.4 +57.8 164.6	78 18.5 +56.3 159.9
3°	80 00.0 +60.0 180.0	79 57.1 +59.7 174.3	79 48.4 +58.7 168.6	79 34.2 +57.3 163.2	79 14.8 +55.4 158.1
4°	81 00.0 +60.0 180.0	80 56.8 +59.6 173.6	80 47.1 +58.5 167.4	80 31.5 +56.7 161.5	80 10.2 +54.6 155.9
5°	82 00.0 +60.0 180.0	81 56.4 +59.5 172.9	81 45.6 +58.1 166.0	81 28.2 +55.9 159.4	81 04.8 +53.2 153.4
6°	83 00.0 +60.0 180.0	82 55.9 +59.3 171.9	82 43.7 +57.4 164.1	82 24.1 +54.7 156.8	81 58.0 +51.4 150.2
7°	84 00.0 +60.0 180.0	83 55.2 +59.1 170.6	83 41.1 +56.5 161.6	83 18.8 +52.9 153.5	82 49.4 +49.0 146.3
8°	85 00.0 +60.0 180.0	84 54.3 +58.6 168.8	84 37.6 +55.1 158.3	84 11.7 +50.3 149.2	83 38.4 +45.3 141.4
9°	86 00.0 +60.0 180.0	85 52.9 +57.7 166.1	85 32.7 +52.3 153.7	85 02.0 +46.0 143.3	84 23.7 +40.2 135.1
10°	87 00.0 +60.0 180.0	86 50.6 +55.8 161.8	86 25.0 +47.1 146.6	85 48.0 +38.9 135.3	85 03.9 +32.5 127.0
11°	88 00.0 +60.0 180.0	87 46.4 +49.7 153.8	87 12.1 +36.3 135.4	86 26.9 +27.4 124.0	85 36.4 +21.7 116.6
12°	89 00.0 +60.0 180.0	88 36.1 +25.4 135.6	87 48.4 +14.7 116.9	86 54.3 +10.3 108.5	85 58.1 +08.1 103.9
13°	90 00.0 -60.0 0.0	89 01.5 -25.2 89.9	88 03.1 -14.3 89.8	87 04.6 -09.6 89.7	86 06.2 -07.2 89.5
14°	89 00.0 -60.0 0.0	88 36.3 -49.7 44.1	87 48.8 -36.0 62.6	86 55.0 -26.9 70.7	85 59.0 -21.0 75.1
15°	88 00.0 -60.0 0.0	87 46.6 -55.7 25.8	87 12.8 -47.0 43.9	86 28.1 -38.6 55.2	85 38.0 -31.9 62.3
16°	87 00.0 -60.0 0.0	86 50.9 -57.8 17.8	86 25.8 -52.3 32.6	85 49.5 -45.8 43.7	85 06.1 -39.7 51.7
17°	86 00.0 -60.0 0.0	85 53.1 -58.6 13.4	85 33.5 -55.0 25.5	85 03.7 -50.2 35.5	84 26.4 -45.1 43.5
18°	85 00.0 -60.0 0.0	84 54.5 -59.1 10.8	84 38.5 -56.5 20.8	84 13.5 -52.9 29.6	83 41.3 -48.8 37.1
19°	84 00.0 -60.0 0.0	83 55.4 -59.3 9.0	83 42.0 -57.5 17.5	83 20.6 -54.6 25.3	82 52.5 -51.3 32.1
20°	83 00.0 -60.0 0.0	82 56.1 -59.5 7.7	82 44.5 -58.0 15.0	82 26.0 -55.9 21.9	82 01.2 -53.1 28.2
21°	82 00.0 -60.0 0.0	81 56.6 -59.6 6.7	81 46.5 -58.5 13.2	81 30.1 -56.7 19.3	81 08.1 -54.5 25.0
22°	81 00.0 -60.0 0.0	80 57.0 -59.7 5.9	80 48.0 -58.7 11.7	80 33.4 -57.3 17.2	80 13.6 -55.4 22.4
23°	80 00.0 -60.0 0.0	79 57.3 -59.7 5.3	79 49.3 -59.0 10.5	79 36.1 -57.7 15.5	79 18.2 -56.2 20.2
24°	79 00.0 -60.0 0.0	78 57.6 -59.8 4.8	78 50.3 -59.1 9.5	78 38.4 -58.1 14.0	78 22.0 -56.7 18.4
25°	78 00.0 -60.0 0.0	77 57.8 -59.8 4.3	77 51.2 -59.3 8.6	77 40.3 -58.4 12.8	77 25.3 -57.3 16.9
26°	77 00.0 -60.0 0.0	76 58.0 -59.9 4.0	76 51.9 -59.4 7.9	76 41.9 -58.6 11.8	76 28.0 -57.5 15.5
27°	76 00.0 -60.0 0.0	75 58.1 -59.8 3.7	75 52.5 -59.4 7.3	75 43.3 -58.8 10.9	75 30.5 -57.9 14.4
28°	75 00.0 -60.0 0.0	74 58.3 -59.9 3.4	74 53.1 -59.6 6.8	74 44.5 -59.0 10.1	74 32.6 -58.2 13.4
29°	74 00.0 -60.0 0.0	73 58.4 -59.9 3.2	73 53.5 -59.5 6.3	73 45.5 -59.0 9.4	73 34.4 -58.3 12.5

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	76 05.2 +55.9 158.7	75 42.2 +54.3 155.0	75 15.8 +52.6 151.4	74 46.3 +50.9 148.0	74 14.0 +49.0 144.9
1°	77 01.1 +55.2 157.2	76 36.5 +53.4 153.2	76 08.4 +51.6 149.4	75 37.2 +49.6 145.9	75 03.0 +47.7 142.7
2°	77 56.3 +54.4 155.4	77 29.9 +52.4 151.1	77 00.0 +50.3 147.2	76 26.8 +48.1 143.6	75 50.7 +46.1 140.3
3°	78 50.7 +53.3 153.3	78 22.3 +51.1 148.8	77 50.3 +48.7 144.7	77 14.9 +46.4 141.0	76 36.8 +44.1 137.6
4°	79 44.0 +52.0 150.8	79 13.4 +49.4 146.1	78 39.0 +46.8 141.8	78 01.3 +44.3 138.0	77 20.9 +41.9 134.6
5°	80 36.0 +50.4 147.9	80 02.8 +47.4 143.0	79 25.8 +44.5 138.6	78 45.6 +41.8 134.7	78 02.8 +39.2 131.2
6°	81 26.4 +48.0 144.4	80 50.2 +44.7 139.2	80 10.3 +41.5 134.8	79 27.4 +38.6 130.9	78 42.0 +36.0 127.4
7°	82 14.4 +44.9 140.2	81 34.9 +41.2 134.9	80 51.8 +37.9 130.4	80 06.0 +34.9 126.5	79 18.0 +32.3 123.2
8°	82 59.3 +40.9 135.0	82 16.1 +36.8 129.7	81 29.7 +33.3 125.3	80 40.9 +30.4 121.7	79 50.3 +27.9 118.6
9°	83 40.2 +35.1 128.7	82 52.9 +31.1 123.6	82 03.0 +27.8 119.5	81 11.3 +25.1 116.2	80 18.2 +22.9 113.4
10°	84 15.3 +27.7 121.0	83 24.0 +24.0 116.4	82 30.8 +21.2 112.9	81 36.4 +19.0 110.1	80 41.1 +17.3 107.8
11°	84 43.0 +18.0 111.7	83 48.0 +15.5 108.2	82 52.0 +13.6 105.5	81 55.4 +12.2 103.5	80 58.4 +11.0 101.8
12°	85 01.0 +06.7 101.0	84 03.5 +05.7 99.0	83 05.6 +05.2 97.6	82 07.6 +04.7 96.4	81 09.4 +04.5 95.5
13°	85 07.7 -05.5 89.4	84 09.2 -04.3 89.3	83 10.8 -03.6 89.2	82 12.3 -02.9 89.1	81 13.9 -02.4 89.0
14°	85 02.2 -17.0 77.8	84 04.9 -14.2 79.6	83 07.2 -12.0 80.8	82 09.4 -10.3 81.8	81 11.5 -09.0 82.4
15°	84 45.2 -26.9 67.0	83 50.7 -22.9 70.3	82 55.2 -19.8 72.8	81 59.1 -17.4 74.6	81 02.5 -15.3 76.0
16°	84 18.3 -34.5 57.6	83 27.8 -30.2 62.0	82 35.4 -26.7 65.3	81 41.7 -23.7 67.9	80 47.2 -21.2 69.9
17°	83 43.8 -40.3 49.7	82 57.6 -36.1 54.6	82 08.7 -32.3 58.5	81 18.0 -29.1 61.6	80 26.0 -26.4 64.2
18°	83 03.5 -44.7 43.3	82 21.5 -40.7 48.4	81 36.4 -37.1 52.6	80 48.9 -33.9 56.0	79 59.6 -31.0 58.9
19°	82 18.8 -47.7 38.0	81 40.8 -44.3 43.1	80 59.3 -40.9 47.4	80 15.0 -37.8 51.0	79 28.6 -34.9 54.1
20°	81 31.1 -50.1 33.7	80 56.5 -47.0 38.6	80 18.4 -44.0 42.9	79 37.2 -41.0 46.5	78 53.7 -38.3 49.7
21°	80 41.0 -51.9 30.2	80 09.5 -49.2 34.8	79 34.4 -46.4 39.0	78 56.2 -43.7 42.6	78 15.4 -41.1 45.9
22°	79 49.1 -53.3 27.2	79 20.3 -50.8 31.6	78 48.0 -48.4 35.6	78 12.5 -45.9 39.2	77 34.3 -43.5 42.4
23°	78 55.8 -54.3 24.7	78 29.5 -52.2 28.8	77 59.6 -50.0 32.6	77 26.6 -47.8 36.1	76 50.8 -45.5 39.3
24°	78 01.5 -55.1 22.6	77 37.3 -53.3 26.5	77 09.6 -51.4 30.1	76 38.8 -49.3 33.4	76 05.3 -47.2 36.5
25°	77 06.4 -55.8 20.7	76 44.0 -54.2 24.4	76 18.2 -52.4 27.8	75 49.5 -50.5 31.0	75 18.1 -48.6 34.0
26°	76 10.6 -56.3 19.1	75 49.8 -54.9 22.6	75 25.8 -53.3 25.8	74 59.0 -51.7 28.9	74 29.5 -49.9 31.7
27°	75 14.3 -56.8 17.7	74 54.9 -55.5 21.0	74 32.5 -54.1 24.0	74 07.3 -52.5 27.0	73 39.6 -51.0 29.7
28°	74 17.5 -57.1 16.5	73 59.4 -56.0 19.5	73 38.4 -54.7 22.5	73 14.8 -53.3 25.2	72 48.6 -51.8 27.9
29°	73 20.4 -57.5 15.4	73 03.4 -56.4 18.3	72 43.7 -55.2 21.0	72 21.5 -54.0 23.7	71 56.8 -52.6 26.2

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Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	73 39.1 +47.3 141.9	73 01.9 +45.5 139.2	72 22.7 +43.8 136.6	71 41.7 +42.2 134.3	70 59.0 +40.6 132.1
1°	74 26.4 +45.7 139.7	73 47.4 +44.0 136.9	73 06.5 +42.2 134.3	72 23.9 +40.4 131.9	71 39.6 +38.9 129.8
2°	75 12.1 +44.1 137.2	74 31.4 +42.0 134.4	73 48.7 +40.2 131.8	73 04.3 +38.5 129.5	72 18.5 +36.8 127.3
3°	75 56.2 +42.0 134.5	75 13.4 +40.0 131.7	74 28.9 +38.1 129.1	73 42.8 +36.3 126.8	72 55.3 +34.7 124.7
4°	76 38.2 +39.6 131.5	75 53.4 +37.5 128.7	75 07.0 +35.6 126.2	74 19.1 +33.8 123.9	73 30.0 +32.2 121.8
5°	77 17.8 +36.9 128.1	76 30.9 +34.8 125.4	75 42.6 +32.8 123.0	74 52.9 +31.1 120.8	74 02.2 +29.5 118.8
6°	77 54.7 +33.7 124.5	77 05.7 +31.6 121.8	76 15.4 +29.7 119.5	75 24.0 +28.1 117.4	74 31.7 +26.6 115.6
7°	78 28.4 +30.0 120.4	77 37.3 +28.0 117.9	76 45.1 +26.3 115.8	75 52.1 +24.7 113.9	74 58.3 +23.3 112.2
8°	78 58.4 +25.8 116.0	78 05.3 +24.0 113.7	77 11.4 +22.4 111.8	76 16.8 +21.0 110.1	75 21.6 +19.9 108.6
9°	79 24.2 +21.0 111.2	78 29.3 +19.5 109.2	77 33.8 +18.2 107.5	76 37.8 +17.1 106.1	75 41.5 +16.1 104.8
10°	79 45.2 +15.8 106.0	78 48.8 +14.6 104.4	77 52.0 +13.7 103.1	76 54.9 +12.9 101.9	75 57.6 +12.2 100.9
11°	80 01.0 +10.2 100.5	79 03.4 +09.5 99.4	78 05.7 +08.9 98.4	77 07.8 +08.4 97.5	76 09.8 +08.0 96.8
12°	80 11.2 +04.2 94.7	79 12.9 +04.1 94.1	78 14.6 +03.9 93.6	77 16.2 +03.9 93.1	76 17.8 +03.8 92.6
13°	80 15.4 -01.9 88.9	79 17.0 -01.5 88.8	78 18.5 -01.1 88.6	77 20.1 -00.8 88.5	76 21.6 -00.5 88.4
14°	80 13.5 -07.8 83.0	79 15.5 -06.9 83.4	78 17.4 -06.1 83.7	77 19.3 -05.4 84.0	76 21.1 -04.8 84.2
15°	80 05.7 -13.7 77.2	79 08.6 -12.3 78.1	78 11.3 -11.1 78.8	77 13.9 -10.0 79.4	76 16.3 -09.0 80.0
16°	79 52.0 -19.1 71.6	78 56.3 -17.3 72.9	78 00.2 -15.7 74.1	77 03.9 -14.3 75.0	76 07.3 -13.1 75.8
17°	79 32.9 -24.0 66.3	78 39.0 -21.9 68.0	77 44.5 -20.1 69.5	76 49.6 -18.5 70.7	75 54.2 -17.0 71.8
18°	79 08.9 -28.5 61.3	78 17.1 -26.2 63.3	77 24.4 -24.1 65.1	76 31.1 -22.3 66.6	75 37.2 -20.7 67.9
19°	78 40.4 -32.3 56.7	77 50.9 -29.9 59.0	77 00.3 -27.8 61.0	76 08.8 -25.9 62.7	75 16.5 -24.1 64.1
20°	78 08.1 -35.7 52.5	77 21.0 -33.4 55.0	76 32.5 -31.2 57.1	75 42.9 -29.1 58.9	74 52.4 -27.3 60.6
21°	77 32.4 -38.6 48.7	76 47.6 -36.2 51.2	76 01.3 -34.1 53.5	75 13.8 -32.1 55.5	74 25.1 -30.2 57.2
22°	76 53.8 -41.1 45.3	76 11.4 -38.9 47.8	75 27.2 -36.7 50.1	74 41.7 -34.7 52.2	73 54.9 -32.8 54.1
23°	76 12.7 -43.3 42.1	75 32.5 -41.1 44.7	74 50.5 -39.0 47.0	74 07.0 -37.1 49.2	73 22.1 -35.2 51.1
24°	75 29.4 -45.1 39.3	74 51.4 -43.1 41.9	74 11.5 -41.1 44.2	73 29.9 -39.2 46.3	72 46.9 -37.3 48.3
25°	74 44.3 -46.7 36.7	74 08.3 -44.8 39.3	73 30.4 -42.9 41.6	72 50.7 -41.0 43.7	72 09.6 -39.2 45.7
26°	73 57.6 -48.1 34.4	73 23.5 -46.3 36.9	72 47.5 -44.5 39.2	72 09.7 -42.7 41.3	71 30.4 -41.0 43.3
27°	73 09.5 -49.3 32.3	72 37.2 -47.6 34.7	72 03.0 -45.9 36.9	71 27.0 -44.2 39.1	70 49.4 -42.6 41.0
28°	72 20.2 -50.3 30.4	71 49.6 -48.7 32.7	71 17.1 -47.1 34.9	70 42.8 -45.5 37.0	70 06.8 -43.9 38.9
29°	71 29.9 -51.2 28.6	71 00.9 -49.7 30.9	70 30.0 -48.2 33.0	69 57.3 -46.7 35.0	69 22.9 -45.2 36.9

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	70 14.9 +39.1 130.0	69 29.5 +37.7 128.1	68 43.0 +36.3 126.3	67 55.4 +35.1 124.7	67 06.9 +33.8 123.2
1°	70 54.0 +37.3 127.7	70 07.2 +35.9 125.9	69 19.3 +34.5 124.1	68 30.5 +33.2 122.5	67 40.7 +32.1 121.0
2°	71 31.3 +35.3 125.3	70 43.1 +33.9 123.5	69 53.8 +32.6 121.8	69 03.7 +31.3 120.2	68 12.8 +30.2 118.8
3°	72 06.6 +33.2 122.7	71 17.0 +31.7 120.9	70 26.4 +30.4 119.3	69 35.0 +29.3 117.8	68 43.0 +28.1 116.4
4°	72 39.8 +30.7 120.0	71 48.7 +29.4 118.2	70 56.8 +28.1 116.7	70 04.3 +26.9 115.3	69 11.1 +25.9 113.9
5°	73 10.5 +28.1 117.0	72 18.1 +26.8 115.4	71 24.9 +25.7 114.0	70 31.2 +24.6 112.6	69 37.0 +23.6 111.4
6°	73 38.6 +25.2 113.9	72 44.9 +24.0 112.4	71 50.6 +22.9 111.1	70 55.8 +22.0 109.8	70 00.6 +21.1 108.7
7°	74 03.8 +22.2 110.7	73 08.9 +21.1 109.3	72 13.5 +20.1 108.1	71 17.8 +19.2 107.0	70 21.7 +18.5 106.0
8°	74 26.0 +18.8 107.2	73 30.0 +17.9 106.0	72 33.6 +17.1 105.0	71 37.0 +16.4 104.0	70 40.2 +15.7 103.1
9°	74 44.8 +15.3 103.7	73 47.9 +14.5 102.7	72 50.7 +14.0 101.7	71 53.4 +13.4 100.9	70 55.9 +12.9 100.2
10°	75 00.1 +11.6 100.0	74 02.4 +11.1 99.2	73 04.7 +10.6 98.4	72 06.8 +10.3 97.8	71 08.8 +10.0 97.2
11°	75 11.7 +07.7 96.1	74 13.5 +07.5 95.6	73 15.3 +07.3 95.0	72 17.1 +07.0 94.5	71 18.8 +06.9 94.1
12°	75 19.4 +03.8 92.3	74 21.0 +03.8 91.9	73 22.6 +03.7 91.6	72 24.1 +03.8 91.3	71 25.7 +03.8 91.0
13°	75 23.2 -00.2 88.3	74 24.8 +00.0 88.2	73 26.3 +00.3 88.1	72 27.9 +00.5 88.0	71 29.5 +00.7 87.8
14°	75 23.0 -04.3 84.3	74 24.8 -03.7 84.5	73 26.6 -00.3 84.6	72 28.4 -02.9 84.6	71 30.2 -02.5 84.7
15°	75 18.7 -08.2 80.4	74 21.1 -07.5 80.8	73 23.3 -06.7 81.1	72 25.5 -06.1 81.3	71 27.7 -05.5 81.5
16°	75 10.5 -12.0 76.5	74 13.6 -11.0 77.1	73 16.6 -10.2 77.6	72 19.4 -09.3 78.0	71 22.2 -08.6 78.4
17°	74 58.5 -15.7 72.7	74 02.6 -14.6 73.5	73 06.4 -13.5 74.2	72 10.1 -12.5 74.8	71 13.6 -11.6 75.3
18°	74 42.8 -19.2 69.0	73 48.0 -17.8 70.0	72 52.9 -16.6 70.9	71 57.6 -15.5 71.6	71 02.0 -14.5 72.3
19°	74 23.6 -22.5 65.5	73 30.2 -21.1 66.6	72 36.3 -19.7 67.6	71 42.1 -18.5 68.5	70 47.5 -17.3 69.3
20°	74 01.1 -25.6 62.0	73 09.1 -24.0 63.3	72 16.6 -22.5 64.5	71 23.6 -21.2 65.5	70 30.2 -19.9 66.4
21°	73 35.5 -28.4 58.8	72 45.1 -26.8 60.2	71 54.1 -25.3 61.5	71 02.4 -23.8 62.6	70 10.3 -22.5 63.6
22°	73 07.1 -31.0 55.7	72 18.3 -29.3 57.2	71 28.8 -27.8 58.6	70 38.6 -26.3 59.8	69 47.8 -24.9 60.9
23°	72 36.1 -33.4 52.8	71 49.0 -31.7 54.4	71 01.0 -30.1 55.8	70 12.3 -28.6 57.1	69 22.9 -27.2 58.3
24°	72 02.7 -35.6 50.1	71 17.3 -33.9 51.7	70 30.9 -32.2 53.2	69 43.7 -30.7 54.6	68 55.7 -29.3 55.8
25°	71 27.1 -37.5 47.5	70 43.4 -35.8 49.2	69 58.7 -34.3 50.7	69 13.0 -32.7 52.1	68 26.4 -31.2 53.4
26°	70 49.6 -39.3 45.1	70 07.6 -37.7 46.8	69 24.4 -36.0 48.3	68 40.3 -34.6 49.8	67 55.2 -33.1 51.1
27°	70 10.3 -40.9 42.8	69 29.9 -39.3 44.5	68 48.4 -37.8 46.1	68 05.7 -36.2 47.6	67 22.1 -34.8 48.9
28°	69 29.4 -42.4 40.7	68 50.6 -40.8 42.4	68 10.6 -39.3 44.0	67 29.5 -37.9 45.5	66 47.3 -36.4 46.8
29°	68 47.0 -43.6 38.7	68 09.8 -42.2 40.4	67 31.3 -40.7 42.0	66 51.6 -39.2 43.5	66 10.9 -37.8 44.8

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	66 17.5 +32.8 121.7	65 27.4 +31.7 120.4	64 36.7 +30.6 119.1	63 45.3 +29.7 117.9	62 53.4 +28.8 116.8
1°	66 50.3 +30.9 119.6	65 59.1 +29.9 118.3	65 07.3 +29.0 117.1	64 15.0 +28.1 115.9	63 22.2 +27.2 114.9
2°	67 21.2 +29.1 117.4	66 29.0 +28.1 116.2	65 36.3 +27.2 115.0	64 43.1 +26.3 113.9	63 49.4 +25.5 112.9
3°	67 50.3 +27.1 115.1	66 57.1 +26.2 113.9	66 03.5 +25.2 112.8	65 09.4 +24.4 111.8	64 14.9 +23.7 110.8
4°	68 17.4 +25.0 112.7	67 23.3 +24.0 111.6	66 28.7 +23.3 110.6	65 33.8 +22.5 109.6	64 38.6 +21.7 108.7
5°	68 42.4 +22.7 110.2	67 47.3 +21.9 109.2	66 52.0 +21.1 108.2	65 56.3 +20.4 107.3	65 00.3 +19.8 106.5
6°	69 05.1 +20.3 107.7	68 09.2 +19.6 106.7	67 13.1 +18.9 105.8	66 16.7 +18.3 105.0	65 20.1 +17.8 104.2
7°	69 25.4 +17.7 105.0	68 28.8 +17.1 104.2	67 32.0 +16.6 103.4	66 35.0 +16.1 102.6	65 37.9 +15.6 101.9
8°	69 43.1 +15.2 102.3	68 45.9 +14.7 101.5	67 48.6 +14.2 100.8	66 51.1 +13.8 100.2	65 53.5 +13.4 99.6
9°	69 58.3 +12.5 99.5	69 00.6 +12.1 98.8	68 02.8 +11.7 98.2	67 04.9 +11.4 97.7	66 06.9 +11.2 97.2
10°	70 10.8 +09.6 96.6	69 12.7 +09.4 96.1	68 14.5 +09.2 95.6	67 16.3 +09.0 95.2	66 18.1 +08.8 94.7
11°	70 20.4 +06.8 93.7	69 22.1 +06.6 93.3	68 23.7 +06.6 92.9	67 25.3 +06.5 92.6	66 26.9 +06.5 92.3
12°	70 27.2 +03.9 90.7	69 28.7 +03.9 90.5	68 30.3 +03.9 90.2	67 31.8 +04.0 90.0	66 33.4 +04.0 89.8
13°	70 31.1 +00.9 87.7	69 32.6 +01.1 87.6	68 34.2 +01.3 87.5	67 35.8 +01.5 87.4	66 37.4 +01.7 87.3
14°	70 32.0 -02.1 84.7	69 33.7 -01.7 84.8	68 35.5 -01.4 84.8	67 37.3 -01.1 84.8	66 39.1 -00.8 84.7
15°	70 29.9 -05.0 81.7	69 32.0 -04.5 81.9	68 34.1 -04.0 82.0	67 36.2 -03.6 82.1	66 38.3 -03.2 82.2
16°	70 24.9 -07.9 78.8	69 27.5 -07.3 79.0	68 30.1 -06.7 79.3	67 32.6 -06.1 79.5	66 35.1 -05.6 79.7
17°	70 17.0 -10.8 75.8	69 20.2 -09.9 76.2	68 23.4 -09.3 76.6	67 26.5 -08.6 76.9	66 29.5 -07.9 77.2
18°	70 06.2 -13.5 72.9	69 10.3 -12.7 73.4	68 14.1 -11.8 73.9	67 17.9 -11.0 74.3	66 21.6 -10.3 74.7
19°	69 52.7 -16.2 70.1	68 57.6 -15.2 70.7	68 02.3 -14.3 71.3	67 06.9 -13.4 71.8	66 11.3 -12.6 72.3
20°	69 36.5 -18.8 67.3	68 42.4 -17.7 68.0	67 48.0 -16.6 68.7	66 53.5 -15.8 69.3	65 58.7 -14.9 69.9
21°	69 17.7 -21.3 64.6	68 24.7 -20.1 65.4	67 31.4 -19.0 66.2	66 37.7 -17.9 66.9	65 43.8 -16.9 67.5
22°	68 56.4 -23.6 61.9	68 04.6 -22.4 62.9	67 12.4 -21.2 63.7	66 19.8 -20.1 64.5	65 26.9 -19.1 65.2
23°	68 32.8 -25.8 59.4	67 42.2 -24.5 60.4	66 51.2 -23.3 61.3	65 59.7 -22.2 62.1	65 07.8 -21.1 62.9
24°	68 07.0 -27.9 57.0	67 17.7 -26.6 58.0	66 27.9 -25.4 59.0	65 37.5 -24.1 59.9	64 46.7 -22.9 60.7
25°	67 39.1 -29.8 54.6	66 51.1 -28.5 55.7	66 02.5 -27.2 56.7	65 13.4 -26.0 57.7	64 23.8 -24.9 58.5
26°	67 09.3 -31.7 52.4	66 22.6 -30.3 53.5	65 35.3 -29.0 54.6	64 47.4 -27.8 55.5	63 58.9 -26.6 56.4
27°	66 37.6 -33.4 50.2	65 52.3 -32.0 51.4	65 06.3 -30.7 52.5	64 19.6 -29.4 53.5	63 32.3 -28.2 54.4
28°	66 04.2 -35.0 48.1	65 20.3 -33.7 49.3	64 35.6 -32.4 50.4	63 50.2 -31.1 51.5	63 04.1 -29.8 52.5
29°	65 29.2 -36.4 46.1	64 46.6 -35.1 47.4	64 03.2 -33.8 48.5	63 19.1 -32.5 49.6	62 34.3 -31.3 50.6

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	62 01.0 +28.0 115.8	61 08.1 +27.2 114.8	60 14.8 +26.5 113.8	59 21.1 +25.8 112.9	58 27.1 +25.1 112.1
1°	62 29.0 +26.4 113.9	61 35.3 +25.6 112.9	60 41.3 +24.9 112.0	59 46.9 +24.3 111.1	58 52.2 +23.7 110.3
2°	62 55.4 +24.7 111.9	62 00.9 +24.0 111.0	61 06.2 +23.3 110.1	60 11.2 +22.7 109.3	59 15.9 +22.1 108.6
3°	63 20.1 +22.9 109.9	62 24.9 +22.3 109.0	61 29.5 +21.7 108.2	60 33.9 +21.1 107.4	59 38.0 +20.6 106.7
4°	63 43.0 +21.2 107.8	62 47.2 +20.6 107.0	61 51.2 +20.0 106.2	60 55.0 +19.4 105.5	59 58.6 +18.9 104.9
5°	64 04.2 +19.2 105.7	63 07.8 +18.7 104.9	62 11.2 +18.2 104.2	61 14.4 +17.8 103.6	60 17.5 +17.3 103.0
6°	64 23.4 +17.2 103.5	63 26.5 +16.7 102.8	62 29.4 +16.3 102.2	61 32.2 +15.9 101.6	60 34.8 +15.6 101.0
7°	64 40.6 +15.2 101.3	63 43.2 +14.8 100.7	62 45.7 +14.5 100.1	61 48.1 +14.1 99.5	60 50.4 +13.8 99.0
8°	64 55.8 +13.1 99.0	63 58.0 +12.8 98.5	63 00.2 +12.5 98.0	62 02.2 +12.3 97.5	61 04.2 +12.0 97.0
9°	65 08.9 +10.9 96.7	64 10.8 +10.7 96.2	63 12.7 +10.4 95.8	62 14.5 +10.3 95.4	61 16.2 +10.2 95.0
10°	65 19.8 +08.7 94.3	64 21.5 +08.5 94.0	63 23.1 +08.5 93.6	62 24.8 +08.4 93.3	61 26.4 +08.3 92.9
11°	65 28.5 +06.4 92.0	64 30.0 +06.4 91.7	63 31.6 +06.4 91.4	62 33.2 +06.3 91.1	61 34.7 +06.4 90.9
12°	65 34.9 +04.1 89.6	64 36.4 +04.3 89.4	63 38.0 +04.3 89.2	62 39.5 +04.4 89.0	61 41.1 +04.4 88.8
13°	65 39.0 +01.9 87.1	64 40.7 +02.0 87.0	63 42.3 +02.2 86.9	62 43.9 +02.3 86.8	61 45.5 +02.5 86.7
14°	65 40.9 -00.5 84.7	64 42.7 -00.2 84.7	63 44.5 +00.0 84.7	62 46.2 +00.4 84.6	61 48.0 +00.6 84.6
15°	65 40.4 -02.8 82.3	64 42.5 -02.5 82.3	63 44.5 -02.1 82.4	62 46.6 -01.8 82.4	61 48.6 -01.4 82.4
16°	65 37.6 -05.1 79.9	64 40.0 -04.6 80.0	63 42.4 -04.1 80.1	62 44.8 -03.7 80.2	61 47.2 -03.3 80.3
17°	65 32.5 -07.4 77.5	64 35.4 -06.8 77.7	63 38.3 -06.3 77.9	62 41.1 -05.8 78.1	61 43.9 -05.3 78.2
18°	65 25.1 -09.6 75.1	64 28.6 -09.0 75.4	63 32.0 -08.4 75.6	62 35.3 -07.7 75.9	61 38.6 -07.2 76.1
19°	65 15.5 -11.8 72.7	64 19.6 -11.1 73.1	63 23.6 -10.3 73.4	62 27.6 -09.8 73.7	61 31.4 -09.1 74.0
20°	65 03.7 -14.0 70.4	64 08.5 -13.1 70.8	63 13.3 -12.4 71.2	62 17.8 -11.6 71.6	61 22.3 -11.0 72.0
21°	64 49.7 -16.0 68.1	63 55.4 -15.2 68.6	63 00.9 -14.4 69.1	62 06.2 -13.6 69.5	61 11.3 -12.7 69.9
22°	64 33.7 -18.1 65.8	63 40.2 -17.1 66.4	62 46.5 -16.2 66.9	61 52.6 -15.3 67.4	60 58.6 -14.6 67.9
23°	64 15.6 -20.0 63.6	63 23.1 -19.1 64.3	62 30.3 -18.1 64.8	61 37.3 -17.2 65.4	60 44.0 -16.3 65.9
24°	63 55.6 -21.9 61.4	63 04.0 -20.8 62.1	62 12.2 -19.9 62.8	61 20.1 -19.0 63.4	60 27.7 -18.0 63.9
25°	63 33.7 -23.7 59.3	62 43.2 -22.7 60.1	61 52.3 -21.6 60.8	61 01.1 -20.6 61.4	60 09.7 -19.7 62.0
26°	63 10.0 -25.5 57.3	62 20.5 -24.3 58.1	61 30.7 -23.2 58.8	60 40.5 -22.2 59.5	59 50.0 -21.3 60.1
27°	62 44.5 -27.0 55.3	61 56.2 -25.9 56.1	61 07.5 -24.9 56.9	60 18.3 -23.8 57.6	59 28.7 -22.7 58.3
28°	62 17.5 -28.7 53.4	61 30.3 -27.5 54.2	60 42.6 -26.4 55.0	59 54.5 -25.3 55.8	59 06.0 -24.3 56.5
29°	61 48.8 -30.1 51.5	61 02.8 -29.0 52.4	60 16.2 -27.8 53.2	59 29.2 -26.8 54.0	58 41.7 -25.7 54.7

Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	57 32.8 +24.5 111.3	56 38.2 +23.9 110.5	55 43.3 +23.3 109.8	54 48.2 +22.8 109.1	53 52.8 +22.3 108.4
1°	57 57.3 +23.0 109.6	57 02.1 +22.5 108.8	56 06.6 +22.0 108.2	55 11.0 +21.4 107.5	54 15.1 +21.0 106.9
2°	58 20.3 +21.6 107.8	57 24.6 +21.0 107.1	56 28.6 +20.6 106.5	55 32.4 +20.2 105.9	54 36.1 +19.7 105.3
3°	58 41.9 +20.1 106.0	57 45.6 +19.6 105.4	56 49.2 +19.2 104.8	55 52.6 +18.7 104.2	54 55.8 +18.4 103.6
4°	59 02.0 +18.5 104.2	58 05.2 +18.1 103.6	57 08.4 +17.7 103.0	56 11.3 +17.4 102.5	55 14.2 +17.0 102.0
5°	59 20.5 +16.9 102.4	58 23.3 +16.6 101.8	57 26.1 +16.1 101.3	56 28.7 +15.8 100.8	55 31.2 +15.6 100.3
6°	59 37.4 +15.2 100.5	58 39.9 +14.9 100.0	57 42.2 +14.7 99.5	56 44.5 +14.4 99.0	55 46.8 +14.1 98.6
7°	59 52.6 +13.6 98.6	58 54.8 +13.3 98.1	57 56.9 +13.0 97.6	56 58.9 +12.9 97.2	56 00.9 +12.6 96.8
8°	60 06.2 +11.8 96.6	59 08.1 +11.6 96.2	58 09.9 +11.5 95.8	57 11.8 +11.3 95.4	56 13.5 +11.2 95.1
9°	60 18.0 +10.0 94.6	59 19.7 +09.9 94.3	58 21.4 +09.8 93.9	57 23.1 +09.7 93.6	56 24.7 +09.6 93.3
10°	60 28.0 +08.2 92.6	59 29.6 +08.2 92.3	58 31.2 +08.1 92.0	57 32.8 +08.1 91.8	56 34.3 +08.1 91.5
11°	60 36.2 +06.4 90.6	59 37.8 +06.4 90.4	58 39.3 +06.5 90.1	57 40.9 +06.4 89.9	56 42.4 +06.5 89.7
12°	60 42.6 +04.6 88.6	59 44.2 +04.6 88.4	58 45.8 +04.7 88.2	57 47.3 +04.8 88.1	56 48.9 +04.9 87.9
13°	60 47.2 +02.6 86.6	59 48.8 +02.9 86.4	58 50.5 +03.0 86.3	57 52.1 +03.2 86.2	56 53.8 +03.3 86.1
14°	60 49.8 +00.9 84.5	59 51.7 +01.0 84.4	58 53.5 +01.2 84.4	57 55.3 +01.5 84.3	56 57.1 +01.7 84.2
15°	60 50.7 -01.1 82.5	59 52.7 -00.8 82.5	58 54.7 -00.4 82.4	57 56.8 -00.2 82.4	56 58.8 +00.1 82.4
16°	60 49.6 -03.0 80.4	59 51.9 -02.5 80.5	58 54.3 -02.2 80.5	57 56.6 -01.8 80.5	56 58.9 -01.5 80.6
17°	60 46.6 -04.8 78.4	59 49.4 -04.4 78.5	58 52.1 -04.0 78.6	57 54.8 -03.6 78.7	56 57.4 -03.1 78.7
18°	60 41.8 -06.6 76.3	59 45.0 -06.2 76.5	58 48.1 -05.6 76.6	57 51.2 -05.1 76.8	56 54.3 -04.7 76.9
19°	60 35.2 -08.5 74.3	59 38.8 -07.9 74.5	58 42.5 -07.4 74.7	57 46.1 -06.9 74.9	56 49.6 -06.3 75.1
20°	60 26.7 -10.3 72.3	59 30.9 -09.6 72.6	58 35.1 -09.0 72.8	57 39.2 -08.4 73.1	56 43.3 -07.9 73.3
21°	60 16.4 -12.1 70.3	59 21.3 -11.4 70.6	58 26.1 -10.7 70.9	57 30.8 -10.1 71.2	56 35.4 -09.4 71.5
22°	60 04.3 -13.8 68.3	59 09.9 -13.0 68.7	58 15.4 -12.3 69.0	57 20.7 -11.6 69.4	56 26.0 -11.0 69.7
23°	59 50.5 -15.5 66.4	58 56.9 -14.7 66.8	58 03.1 -14.0 67.2	57 09.1 -13.2 67.6	56 15.0 -12.5 67.9
24°	59 35.0 -17.1 64.5	58 42.2 -16.3 64.9	57 49.1 -15.4 65.4	56 55.9 -14.7 65.8	56 02.5 -13.9 66.1
25°	59 17.9 -18.7 62.6	58 25.9 -17.9 63.1	57 33.7 -17.1 63.6	56 41.2 -16.2 64.0	55 48.6 -15.4 64.4
26°	58 59.2 -20.3 60.7	58 08.0 -19.4 61.3	57 16.6 -18.5 61.8	56 25.0 -17.6 62.2	55 33.2 -16.8 62.7
27°	58 38.9 -21.9 58.9	57 48.6 -20.8 59.5	56 58.1 -19.9 60.0	56 07.4 -19.1 60.5	55 16.4 -18.2 61.0
28°	58 17.0 -23.2 57.1	57 27.8 -22.3 57.7	56 38.2 -21.4 58.3	55 48.3 -20.4 58.8	54 58.2 -19.6 59.3
29°	57 53.8 -24.7 55.4	57 05.5 -23.7 56.0	56 16.8 -22.7 56.6	55 27.9 -21.8 57.2	54 38.6 -20.8 57.7

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	52 57.3 +21.8 107.8	52 01.5 +21.4 107.2	51 05.6 +20.9 106.6	50 09.5 +20.5 106.1	49 13.2 +20.1 105.5
1°	53 19.1 +20.5 106.3	52 22.9 +20.1 105.7	51 26.5 +19.8 105.1	50 30.0 +19.4 104.6	49 33.3 +19.1 104.1
2°	53 39.6 +19.3 104.7	52 43.0 +18.9 104.1	51 46.3 +18.5 103.6	50 49.4 +18.2 103.1	49 52.4 +17.9 102.6
3°	53 58.9 +18.0 103.1	53 01.9 +17.7 102.6	52 04.8 +17.4 102.1	51 07.6 +17.0 101.6	50 10.3 +16.7 101.1
4°	54 16.9 +16.7 101.4	53 19.6 +16.4 101.0	52 22.2 +16.0 100.5	51 24.6 +15.9 100.1	50 27.0 +15.6 99.6
5°	54 33.6 +15.3 99.8	53 36.0 +15.0 99.3	52 38.2 +14.9 98.9	51 40.5 +14.5 98.5	50 42.6 +14.4 98.1
6°	54 48.9 +13.9 98.1	53 51.0 +13.7 97.7	52 53.1 +13.5 97.3	51 55.0 +13.4 96.9	50 57.0 +13.1 96.6
7°	55 02.8 +12.5 96.4	54 04.7 +12.3 96.1	53 06.6 +12.1 95.7	52 08.4 +12.0 95.3	51 10.1 +11.9 95.0
8°	55 15.3 +11.0 94.7	54 17.0 +10.9 94.4	53 18.7 +10.8 94.1	52 20.4 +10.7 93.7	51 22.0 +10.7 93.4
9°	55 26.3 +09.6 93.0	54 27.9 +09.5 92.7	53 29.5 +09.5 92.4	52 31.1 +09.4 92.1	51 32.7 +09.4 91.9
10°	55 35.9 +08.0 91.2	54 37.4 +08.1 91.0	53 39.0 +08.0 90.7	52 40.5 +08.1 90.5	51 42.1 +08.0 90.3
11°	55 43.9 +06.6 89.5	54 45.5 +06.6 89.3	53 47.0 +06.7 89.1	52 48.6 +06.7 88.9	51 50.1 +06.8 88.7
12°	55 50.5 +05.0 87.7	54 52.1 +05.1 87.6	53 53.7 +05.2 87.4	52 55.3 +05.3 87.2	51 56.9 +05.4 87.1
13°	55 55.5 +03.5 85.9	54 57.2 +03.6 85.8	53 58.9 +03.8 85.7	53 00.6 +03.9 85.6	52 02.3 +04.1 85.4
14°	55 59.0 +01.9 84.2	55 00.8 +02.1 84.1	54 02.7 +02.3 84.0	53 04.5 +02.6 83.9	52 06.4 +02.8 83.8
15°	56 00.9 +00.4 82.4	55 02.9 +00.7 82.3	54 05.0 +00.9 82.3	53 07.1 +01.1 82.2	52 09.2 +01.4 82.2
16°	56 01.3 -01.2 80.6	55 03.6 -00.9 80.6	54 05.9 -00.5 80.6	53 08.2 -00.2 80.6	52 10.6 +00.0 80.6
17°	56 00.1 -02.7 78.8	55 02.7 -02.3 78.8	54 05.4 -02.0 78.9	53 08.0 -01.6 78.9	52 10.6 -01.3 78.9
18°	55 57.4 -04.3 77.0	55 00.4 -03.9 77.1	54 03.4 -03.5 77.2	53 06.4 -03.1 77.2	52 09.3 -02.6 77.3
19°	55 53.1 -05.8 75.2	54 56.5 -05.3 75.4	53 59.9 -04.8 75.5	53 03.3 -04.4 75.6	52 06.7 -04.0 75.7
20°	55 47.3 -07.4 73.5	54 51.2 -06.8 73.6	53 55.1 -06.3 73.8	52 58.9 -05.8 73.9	52 02.7 -05.3 74.1
21°	55 39.9 -08.8 71.7	54 44.4 -08.3 71.9	53 48.8 -07.7 72.1	52 53.1 -07.1 72.3	51 57.4 -06.6 72.4
22°	55 31.1 -10.3 69.9	54 36.1 -09.7 70.2	53 41.1 -09.1 70.4	52 46.0 -08.5 70.6	51 50.8 -08.0 70.8
23°	55 20.8 -11.8 68.2	54 26.4 -11.1 68.5	53 32.0 -10.5 68.8	52 37.5 -09.9 69.0	51 42.8 -09.2 69.2
24°	55 09.0 -13.2 66.5	54 15.3 -12.5 66.8	53 21.5 -11.8 67.1	52 27.6 -11.2 67.4	51 33.6 -10.5 67.6
25°	54 55.8 -14.7 64.8	54 02.8 -13.9 65.1	53 09.7 -13.2 65.5	52 16.4 -12.4 65.8	51 23.1 -11.8 66.0
26°	54 41.1 -16.0 63.1	53 48.9 -15.2 63.5	52 56.5 -14.5 63.8	52 04.0 -13.8 64.2	51 11.3 -13.1 64.5
27°	54 25.1 -17.4 61.4	53 33.7 -16.6 61.9	52 42.0 -15.8 62.2	51 50.2 -15.0 62.6	50 58.2 -14.2 62.9
28°	54 07.7 -18.6 59.8	53 17.1 -17.8 60.2	52 26.2 -17.0 60.6	51 35.2 -16.2 61.0	50 44.0 -15.5 61.4
29°	53 49.1 -20.0 58.2	52 59.3 -19.1 58.6	52 09.2 -18.2 59.1	51 19.0 -17.5 59.5	50 28.5 -16.7 59.9

Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	48 16.8 +19.8 105.0	47 20.3 +19.4 104.5	46 23.6 +19.1 104.0	45 26.9 +18.7 103.6	44 30.0 +18.4 103.1
1°	48 36.6 +18.7 103.6	47 39.7 +18.4 103.1	46 42.7 +18.1 102.6	45 45.6 +17.8 102.2	44 48.4 +17.5 101.8
2°	48 55.3 +17.6 102.1	47 58.1 +17.3 101.7	47 00.8 +17.0 101.3	46 03.4 +16.8 100.8	45 05.9 +16.6 100.4
3°	49 12.9 +16.5 100.7	48 15.4 +16.2 100.3	47 17.8 +16.0 99.8	46 20.2 +15.8 99.4	45 22.5 +15.5 99.1
4°	49 29.4 +15.3 99.2	48 31.6 +15.1 98.8	47 33.8 +14.9 98.4	46 36.0 +14.7 98.0	45 38.0 +14.6 97.7
5°	49 44.7 +14.2 97.7	48 46.7 +14.0 97.3	47 48.7 +13.9 97.0	46 50.7 +13.7 96.6	45 52.6 +13.5 96.3
6°	49 58.9 +13.0 96.2	49 00.7 +12.9 95.9	48 02.6 +12.7 95.5	47 04.4 +12.6 95.2	46 06.1 +12.5 94.9
7°	50 11.9 +11.8 94.7	49 13.6 +11.7 94.4	48 15.3 +11.6 94.1	47 17.0 +11.5 93.8	46 18.6 +11.5 93.5
8°	50 23.7 +10.6 93.2	49 25.3 +10.5 92.9	48 26.9 +10.5 92.6	47 28.5 +10.4 92.3	46 30.1 +10.4 92.1
9°	50 34.3 +09.3 91.6	49 35.8 +09.3 91.3	48 37.4 +09.3 91.1	47 38.9 +09.3 90.9	46 40.5 +09.3 90.6
10°	50 43.6 +08.1 90.0	49 45.1 +08.1 89.8	48 46.7 +08.1 89.6	47 48.2 +08.2 89.4	46 49.8 +08.2 89.2
11°	50 51.7 +06.8 88.5	49 53.2 +06.9 88.3	48 54.8 +07.0 88.1	47 56.4 +07.0 87.9	46 58.0 +07.1 87.7
12°	50 58.5 +05.5 86.9	50 00.1 +05.7 86.7	49 01.8 +05.7 86.6	48 03.4 +05.9 86.4	47 05.1 +05.9 86.3
13°	51 04.0 +04.3 85.3	50 05.8 +04.4 85.2	49 07.5 +04.6 85.1	48 09.3 +04.7 84.9	47 11.0 +04.9 84.8
14°	51 08.3 +02.9 83.7	50 10.2 +03.1 83.6	49 12.1 +03.3 83.5	48 14.0 +03.5 83.4	47 15.9 +03.8 83.3
15°	51 11.2 +01.7 82.1	50 13.3 +01.9 82.1	49 15.4 +02.2 82.0	48 17.5 +02.4 81.9	47 19.7 +02.6 81.9
16°	51 12.9 +00.3 80.5	50 15.2 +00.7 80.5	49 17.6 +00.9 80.5	48 19.9 +01.2 80.4	47 22.3 +01.4 80.4
17°	51 13.2 -00.9 78.9	50 15.9 -00.6 78.9	49 18.5 -00.3 78.9	48 21.1 +00.0 78.9	47 23.7 +00.4 78.9
18°	51 12.3 -02.3 77.3	50 15.3 -01.9 77.4	49 18.2 -01.5 77.4	48 21.1 -01.1 77.4	47 24.1 -00.8 77.4
19°	51 10.0 -03.5 75.8	50 13.4 -03.2 75.8	49 16.7 -02.7 75.9	48 20.0 -02.3 75.9	47 23.3 -02.0 76.0
20°	51 06.5 -04.8 74.2	50 10.2 -04.3 74.3	49 14.0 -04.0 74.3	48 17.7 -03.5 74.4	47 21.3 -03.0 74.5
21°	51 01.7 -06.2 72.6	50 05.9 -05.7 72.7	49 10.0 -05.1 72.8	48 14.2 -04.7 72.9	47 18.3 -04.3 73.0
22°	50 55.5 -07.4 71.0	50 00.2 -06.8 71.2	49 04.9 -06.4 71.3	48 09.5 -05.8 71.4	47 14.0 -05.3 71.5
23°	50 48.1 -08.6 69.4	49 53.4 -08.1 69.6	48 58.5 -07.5 69.8	48 03.7 -07.0 69.9	47 08.7 -06.4 70.1
24°	50 39.5 -09.9 67.9	49 45.3 -09.3 68.1	48 51.0 -08.7 68.3	47 56.7 -08.2 68.5	47 02.3 -07.6 68.6
25°	50 29.6 -11.2 66.3	49 36.0 -10.5 66.5	48 42.3 -09.9 66.8	47 48.5 -09.2 67.0	46 54.7 -08.7 67.2
26°	50 18.4 -12.3 64.8	49 25.5 -11.7 65.0	48 32.4 -11.0 65.3	47 39.3 -10.4 65.5	46 46.0 -09.7 65.7
27°	50 06.1 -13.5 63.2	49 13.8 -12.8 63.5	48 21.4 -12.1 63.8	47 28.9 -11.5 64.0	46 36.3 -10.8 64.3
28°	49 52.6 -14.8 61.7	49 01.0 -14.0 62.0	48 09.3 -13.3 62.3	47 17.4 -12.5 62.6	46 25.5 -11.9 62.8
29°	49 37.8 -15.8 60.2	48 47.0 -15.1 60.6	47 56.0 -14.3 60.9	47 04.9 -13.7 61.2	46 13.6 -12.9 61.4

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	43 33.0 +18.2 102.7	42 35.9 +17.9 102.3	41 38.7 +17.7 101.8	40 41.5 +17.4 101.5	39 44.1 +17.2 101.1
1°	43 51.2 +17.2 101.4	42 53.8 +17.0 101.0	41 56.4 +16.7 100.6	40 58.9 +16.5 100.2	40 01.3 +16.3 99.8
2°	44 08.4 +16.3 100.0	43 10.8 +16.1 99.6	42 13.1 +15.9 99.3	41 15.4 +15.7 98.9	40 17.6 +15.5 98.6
3°	44 24.7 +15.4 98.7	43 26.9 +15.2 98.3	42 29.0 +15.0 98.0	41 31.1 +14.8 97.6	40 33.1 +14.7 97.3
4°	44 40.1 +14.4 97.3	43 42.1 +14.2 97.0	42 44.0 +14.1 96.7	41 45.9 +14.0 96.3	40 47.8 +13.8 96.0
5°	44 54.5 +13.4 96.0	43 56.3 +13.3 95.6	42 58.1 +13.2 95.3	41 59.9 +13.0 95.0	41 01.6 +13.0 94.7
6°	45 07.9 +12.4 94.6	44 09.6 +12.3 94.3	43 11.3 +12.2 94.0	42 12.9 +12.2 93.7	41 14.6 +12.1 93.4
7°	45 20.3 +11.3 93.2	44 21.9 +11.3 92.9	43 23.5 +11.3 92.6	42 25.1 +11.2 92.4	41 26.7 +11.2 92.1
8°	45 31.6 +10.4 91.8	44 33.2 +10.3 91.5	43 34.8 +10.3 91.3	42 36.3 +10.3 91.0	41 37.9 +10.2 90.8
9°	45 42.0 +09.3 90.4	44 43.5 +09.3 90.2	43 45.1 +09.3 89.9	42 46.6 +09.4 89.7	41 48.1 +09.4 89.5
10°	45 51.3 +08.2 89.0	44 52.8 +08.3 88.8	43 54.4 +08.3 88.6	42 56.0 +08.4 88.4	41 57.5 +08.5 88.2
11°	45 59.5 +07.2 87.5	45 01.1 +07.3 87.4	44 02.7 +07.4 87.2	43 04.4 +07.4 87.0	42 06.0 +07.5 86.8
12°	46 06.7 +06.1 86.1	45 08.4 +06.2 86.0	44 10.1 +06.3 85.8	43 11.8 +06.5 85.6	42 13.5 +06.6 85.5
13°	46 12.8 +05.1 84.7	45 14.6 +05.2 84.5	44 16.4 +05.4 84.4	43 18.3 +05.5 84.3	42 20.1 +05.6 84.1
14°	46 17.9 +03.9 83.2	45 19.8 +04.1 83.1	44 21.8 +04.3 83.0	43 23.8 +04.5 82.9	42 25.7 +04.7 82.8
15°	46 21.8 +02.8 81.8	45 23.9 +03.1 81.7	44 26.1 +03.3 81.6	43 28.3 +03.5 81.5	42 30.4 +03.8 81.4
16°	46 24.6 +01.8 80.3	45 27.0 +02.0 80.3	44 29.4 +02.3 80.2	43 31.8 +02.5 80.2	42 34.2 +02.8 80.1
17°	46 26.4 +00.6 78.9	45 29.0 +01.0 78.9	44 31.7 +01.2 78.8	43 34.3 +01.5 78.8	42 37.0 +01.8 78.7
18°	46 27.0 -00.4 77.4	45 30.0 -00.2 77.4	44 32.9 +00.2 77.4	43 35.8 +00.6 77.4	42 38.8 +00.8 77.4
19°	46 26.6 -01.6 76.0	45 29.8 -01.2 76.0	44 33.1 -00.8 76.0	43 36.4 -00.5 76.0	42 39.6 -00.1 76.0
20°	46 25.0 -02.7 74.5	45 28.6 -02.2 74.6	44 32.3 -01.9 74.6	43 35.9 -01.5 74.6	42 39.5 -01.0 74.7
21°	46 22.3 -03.7 73.1	45 26.4 -03.3 73.2	44 30.4 -02.9 73.2	43 34.4 -02.4 73.3	42 38.5 -02.1 73.3
22°	46 18.6 -04.9 71.6	45 23.1 -04.4 71.7	44 27.5 -03.9 71.8	43 32.0 -03.5 71.9	42 36.4 -03.0 71.9
23°	46 13.7 -05.9 70.2	45 18.7 -05.4 70.3	44 23.6 -04.9 70.4	43 28.5 -04.4 70.5	42 33.4 -03.9 70.6
24°	46 07.8 -07.0 68.8	45 13.3 -06.5 68.9	44 18.7 -05.9 69.0	43 24.1 -05.4 69.1	42 29.5 -05.0 69.2
25°	46 00.8 -08.1 67.3	45 06.8 -07.5 67.5	44 12.8 -07.0 67.6	43 18.7 -06.4 67.8	42 24.5 -05.8 67.9
26°	45 52.7 -09.1 65.9	44 59.3 -08.5 66.1	44 05.8 -07.9 66.2	43 12.3 -07.4 66.4	42 18.7 -06.8 66.5
27°	45 43.6 -10.2 64.5	44 50.8 -09.6 64.7	43 57.9 -08.9 64.9	43 04.9 -08.3 65.0	42 11.9 -07.7 65.2
28°	45 33.4 -11.2 63.1	44 41.2 -10.5 63.3	43 49.0 -10.0 63.5	42 56.6 -09.3 63.7	42 04.2 -08.7 63.9
29°	45 22.2 -12.2 61.7	44 30.7 -11.6 61.9	43 39.0 -10.8 62.1	42 47.3 -10.2 62.3	41 55.5 -09.6 62.5

Latitude 13°

Declination SAME name as Latitude

Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	38 46.7 +16.9 100.7	37 49.2 +16.7 100.3	36 51.7 +16.5 100.0	35 54.1 +16.3 99.6	34 56.4 +16.1 99.3
1°	39 03.6 +16.2 99.5	38 05.9 +16.0 99.1	37 08.2 +15.8 98.8	36 10.4 +15.6 98.4	35 12.5 +15.5 98.1
2°	39 19.8 +15.3 98.2	38 21.9 +15.2 97.9	37 24.0 +15.0 97.6	36 26.0 +14.9 97.2	35 28.0 +14.7 96.9
3°	39 35.1 +14.6 97.0	38 37.1 +14.4 96.6	37 39.0 +14.2 96.3	36 40.9 +14.1 96.0	35 42.7 +14.0 95.7
4°	39 49.7 +13.7 95.7	38 51.5 +13.6 95.4	37 53.2 +13.5 95.1	36 55.0 +13.4 94.8	35 56.7 +13.3 94.5
5°	40 03.4 +12.8 94.4	39 05.1 +12.7 94.1	38 06.7 +12.7 93.9	37 08.4 +12.6 93.6	36 10.0 +12.6 93.3
6°	40 16.2 +12.0 93.2	39 17.8 +12.0 92.9	38 19.4 +12.0 92.6	37 21.0 +11.9 92.4	36 22.6 +11.9 92.1
7°	40 28.2 +11.2 91.9	39 29.8 +11.1 91.6	38 31.4 +11.1 91.4	37 32.9 +11.1 91.1	36 34.5 +11.1 90.9
8°	40 39.4 +10.3 90.6	39 40.9 +10.3 90.3	38 42.5 +10.3 90.1	37 44.0 +10.3 89.9	36 45.6 +10.3 89.7
9°	40 49.7 +09.4 89.3	39 51.2 +09.5 89.1	38 52.8 +09.5 88.8	37 54.3 +09.6 88.6	36 55.9 +09.6 88.4
10°	40 59.1 +08.5 88.0	40 00.7 +08.6 87.8	39 02.3 +08.6 87.6	38 03.9 +08.7 87.4	37 05.5 +08.8 87.2
11°	41 07.6 +07.6 86.7	40 09.3 +07.7 86.5	39 10.9 +07.8 86.3	38 12.6 +07.9 86.1	37 14.3 +08.0 86.0
12°	41 15.2 +06.7 85.3	40 17.0 +06.8 85.2	39 18.7 +07.0 85.0	38 20.5 +07.1 84.9	37 22.3 +07.2 84.7
13°	41 21.9 +05.8 84.0	40 23.8 +06.0 83.9	39 25.7 +06.1 83.7	38 27.6 +06.3 83.6	37 29.5 +06.4 83.5
14°	41 27.7 +04.9 82.7	40 29.8 +05.0 82.6	39 31.8 +05.3 82.4	38 33.9 +05.4 82.3	37 35.9 +05.7 82.2
15°	41 32.6 +04.0 81.4	40 34.8 +04.2 81.3	39 37.1 +04.4 81.2	38 39.3 +04.6 81.1	37 41.6 +04.8 81.0
16°	41 36.6 +03.0 80.0	40 39.0 +03.3 79.9	39 41.5 +03.5 79.9	38 43.9 +03.8 79.8	37 46.4 +04.0 79.7
17°	41 39.6 +02.1 78.7	40 42.3 +02.4 78.6	39 45.0 +02.7 78.6	38 47.7 +02.9 78.5	37 50.4 +03.2 78.4
18°	41 41.7 +01.2 77.3	40 44.7 +01.5 77.3	39 47.7 +01.8 77.3	38 50.6 +02.2 77.2	37 53.6 +02.4 77.2
19°	41 42.9 +00.2 76.0	40 46.2 +00.6 76.0	39 49.5 +00.9 76.0	38 52.8 +01.2 75.9	37 56.0 +01.6 75.9
20°	41 43.1 -00.6 74.7	40 46.8 -00.4 74.7	39 50.4 +00.0 74.7	38 54.0 +00.4 74.6	37 57.6 +00.8 74.6
21°	41 42.5 -01.7 73.3	40 46.4 -01.2 73.3	39 50.4 -00.8 73.4	38 54.4 -00.4 73.4	37 58.4 +00.0 73.4
22°	41 40.8 -02.5 72.0	40 45.2 -02.1 72.0	39 49.6 -01.7 72.1	38 54.0 -01.3 72.1	37 58.4 -00.9 72.1
23°	41 38.3 -03.5 70.7	40 43.1 -03.0 70.7	39 47.9 -02.6 70.8	38 52.7 -02.1 70.8	37 57.5 -01.7 70.8
24°	41 34.8 -04.4 69.3	40 40.1 -03.9 69.4	39 45.3 -03.4 69.5	38 50.6 -03.0 69.5	37 55.8 -02.5 69.6
25°	41 30.4 -05.4 68.0	40 36.2 -04.9 68.1	39 41.9 -04.3 68.2	38 47.6 -03.8 68.2	37 53.3 -03.3 68.3
26°	41 25.0 -06.2 66.7	40 31.3 -05.7 66.8	39 37.6 -05.2 66.9	38 43.8 -04.6 66.9	37 50.0 -04.1 67.0
27°	41 18.8 -07.2 65.3	40 25.6 -06.5 65.5	39 32.4 -06.0 65.6	38 39.2 -05.5 65.7	37 45.9 -04.9 65.8
28°	41 11.6 -08.0 64.0	40 19.1 -07.5 64.2	39 26.4 -06.9 64.3	38 33.7 -06.3 64.4	37 41.0 -05.8 64.5
29°	41 03.6 -09.0 62.7	40 11.6 -08.3 62.9	39 19.5 -07.7 63.0	38 27.4 -07.1 63.1	37 35.2 -06.5 63.2

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	33 58.7 +15.9 99.0	33 00.9 +15.8 98.6	32 03.1 +15.6 98.3	31 05.2 +15.5 98.0	30 07.3 +15.3 97.7
1°	34 14.6 +15.3 97.8	33 16.7 +15.1 97.5	32 18.7 +15.0 97.2	31 20.7 +14.8 96.9	30 22.6 +14.8 96.6
2°	34 29.9 +14.6 96.6	33 31.8 +14.5 96.3	32 33.7 +14.4 96.0	31 35.5 +14.3 95.7	30 37.4 +14.1 95.5
3°	34 44.5 +13.9 95.4	33 46.3 +13.8 95.2	32 48.1 +13.7 94.9	31 49.8 +13.7 94.6	30 51.5 +13.6 94.3
4°	34 58.4 +13.3 94.3	34 00.1 +13.2 94.0	33 01.8 +13.1 93.7	32 03.5 +13.0 93.4	31 05.1 +13.0 93.2
5°	35 11.7 +12.5 93.1	34 13.3 +12.5 92.8	33 14.9 +12.4 92.5	32 16.5 +12.4 92.3	31 18.1 +12.3 92.0
6°	35 24.2 +11.8 91.9	34 25.8 +11.7 91.6	33 27.3 +11.8 91.4	32 28.9 +11.7 91.1	31 30.4 +11.8 90.9
7°	35 36.0 +11.1 90.7	34 37.5 +11.1 90.4	33 39.1 +11.1 90.2	32 40.6 +11.1 90.0	31 42.2 +11.1 89.7
8°	35 47.1 +10.4 89.4	34 48.6 +10.4 89.2	33 50.2 +10.4 89.0	32 51.7 +10.5 88.8	31 53.3 +10.5 88.6
9°	35 57.5 +09.6 88.2	34 59.0 +09.7 88.0	34 00.6 +09.7 87.8	33 02.2 +09.8 87.6	32 03.8 +09.8 87.4
10°	36 07.1 +08.8 87.0	35 08.7 +08.9 86.8	34 10.3 +09.1 86.6	33 12.0 +09.1 86.5	32 13.6 +09.2 86.3
11°	36 15.9 +08.2 85.8	35 17.6 +08.3 85.6	34 19.4 +08.3 85.4	33 21.1 +08.4 85.3	32 22.8 +08.6 85.1
12°	36 24.1 +07.3 84.6	35 25.9 +07.5 84.4	34 27.7 +07.6 84.2	33 29.5 +07.8 84.1	32 31.4 +07.9 83.9
13°	36 31.4 +06.6 83.3	35 33.4 +06.7 83.2	34 35.3 +06.9 83.0	33 37.3 +07.1 82.9	32 39.3 +07.2 82.7
14°	36 38.0 +05.8 82.1	35 40.1 +06.0 82.0	34 42.2 +06.2 81.8	33 44.4 +06.4 81.7	32 46.5 +06.6 81.6
15°	36 43.8 +05.1 80.8	35 46.1 +05.3 80.7	34 48.4 +05.5 80.6	33 50.8 +05.7 80.5	32 53.1 +05.9 80.4
16°	36 48.9 +04.3 79.6	35 51.4 +04.5 79.5	34 53.9 +04.8 79.4	33 56.5 +05.0 79.3	32 59.0 +05.3 79.2
17°	36 53.2 +03.4 78.4	35 55.9 +03.8 78.3	34 58.7 +04.0 78.2	34 01.5 +04.3 78.1	33 04.3 +04.5 78.0
18°	36 56.6 +02.8 77.1	35 59.7 +03.0 77.0	35 02.7 +03.3 77.0	34 05.8 +03.5 76.9	33 08.8 +03.9 76.8
19°	36 59.4 +01.9 75.9	36 02.7 +02.2 75.8	35 06.0 +02.6 75.8	34 09.3 +02.9 75.7	33 12.7 +03.2 75.6
20°	37 01.3 +01.1 74.6	36 04.9 +01.5 74.6	35 08.6 +01.8 74.5	34 12.2 +02.2 74.5	33 15.9 +02.5 74.4
21°	37 02.4 +00.3 73.3	36 06.4 +00.7 73.3	35 10.4 +01.1 73.3	34 14.4 +01.4 73.3	33 18.4 +01.8 73.2
22°	37 02.7 -00.4 72.1	36 07.1 -00.1 72.1	35 11.5 +00.3 72.1	34 15.8 +00.8 72.1	33 20.2 +01.2 72.0
23°	37 02.3 -01.3 70.8	36 07.0 -00.8 70.9	35 11.8 -00.4 70.9	34 16.6 +00.0 70.9	33 21.4 +00.4 70.8
24°	37 01.0 -02.0 69.6	36 06.2 -01.5 69.6	35 11.4 -01.1 69.6	34 16.6 -00.7 69.6	33 21.8 -00.2 69.6
25°	36 59.0 -02.8 68.3	36 04.7 -02.4 68.4	35 10.3 -01.9 68.4	34 15.9 -01.4 68.4	33 21.6 -01.0 68.5
26°	36 56.2 -03.6 67.1	36 02.3 -03.1 67.1	35 08.4 -02.6 67.2	34 14.5 -02.1 67.2	33 20.6 -01.6 67.3
27°	36 52.6 -04.4 65.8	35 59.2 -03.8 65.9	35 05.8 -03.3 66.0	34 12.4 -02.8 66.0	33 19.0 -02.3 66.1
28°	36 48.2 -05.2 64.6	35 55.4 -04.7 64.7	35 02.5 -04.1 64.7	34 09.6 -03.5 64.8	33 16.7 -03.0 64.9
29°	36 43.0 -05.9 63.4	35 50.7 -05.3 63.4	34 58.4 -04.8 63.5	34 06.1 -04.3 63.6	33 13.7 -03.7 63.7

Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	29 09.3 +15.2 97.4	28 11.3 +15.1 97.1	27 13.3 +14.9 96.8	26 15.3 +14.8 96.5	25 17.2 +14.6 96.3
1°	29 24.5 +14.7 96.3	28 26.4 +14.5 96.0	27 28.2 +14.5 95.7	26 30.1 +14.3 95.5	25 31.8 +14.3 95.2
2°	29 39.2 +14.0 95.2	28 40.9 +14.0 94.9	27 42.7 +13.8 94.6	26 44.4 +13.8 94.4	25 46.1 +13.7 94.1
3°	29 53.2 +13.5 94.1	28 54.9 +13.4 94.8	27 56.5 +13.4 93.5	26 58.2 +13.3 93.3	25 59.8 +13.3 93.0
4°	30 06.7 +12.9 92.9	29 08.3 +12.9 92.7	28 09.9 +12.8 92.4	27 11.5 +12.8 92.2	26 13.1 +12.7 91.9
5°	30 19.6 +12.4 91.8	29 21.2 +12.3 91.6	28 22.7 +12.3 91.3	27 24.3 +12.3 91.1	26 25.8 +12.3 90.9
6°	30 32.0 +11.7 90.7	29 33.5 +11.7 90.4	28 35.0 +11.8 90.2	27 36.6 +11.7 90.0	26 38.1 +11.8 89.8
7°	30 43.7 +11.1 89.5	29 45.2 +11.2 89.3	28 46.8 +11.2 89.1	27 48.3 +11.3 88.9	26 49.9 +11.2 88.7
8°	30 54.8 +10.6 88.4	29 56.4 +10.6 88.2	28 58.0 +10.6 88.0	27 59.6 +10.6 87.8	27 01.1 +10.8 87.6
9°	31 05.4 +09.9 87.2	30 07.0 +10.0 87.0	29 08.6 +10.1 86.8	28 10.2 +10.2 86.6	27 11.9 +10.2 86.5
10°	31 15.3 +09.3 86.1	30 17.0 +09.4 85.9	29 18.7 +09.5 85.7	28 20.4 +09.6 85.5	27 22.1 +09.7 85.3
11°	31 24.6 +08.7 84.9	30 26.4 +08.8 84.8	29 28.2 +08.9 84.6	28 30.0 +09.0 84.4	27 31.8 +09.2 84.2
12°	31 33.3 +08.0 83.8	30 35.2 +08.1 83.6	29 37.1 +08.3 83.4	28 39.0 +08.5 83.3	27 41.0 +08.6 83.1
13°	31 41.3 +07.4 82.6	30 43.3 +07.6 82.5	29 45.4 +07.7 82.3	28 47.5 +07.9 82.2	27 49.6 +08.1 82.0
14°	31 48.7 +06.8 81.4	30 50.9 +07.0 81.3	29 53.1 +07.2 81.2	28 55.4 +07.3 81.0	27 57.7 +07.5 80.9
15°	31 55.5 +06.1 80.3	30 57.9 +06.3 80.1	30 00.3 +06.5 80.0	29 02.7 +06.8 79.9	28 05.2 +07.0 79.8
16°	32 01.6 +05.5 79.1	31 04.2 +05.7 79.0	30 06.8 +06.0 78.9	29 09.5 +06.2 78.7	28 12.2 +06.4 78.6
17°	32 07.1 +04.8 77.9	31 09.9 +05.1 77.8	30 12.8 +05.3 77.7	29 15.7 +05.6 77.6	28 18.6 +05.9 77.5
18°	32 11.9 +04.2 76.7	31 15.0 +04.5 76.7	30 18.1 +04.8 76.6	29 21.3 +05.0 76.5	28 24.5 +05.3 76.4
19°	32 16.1 +03.5 75.6	31 19.5 +03.8 75.5	30 22.9 +04.1 75.4	29 26.3 +04.5 75.3	28 29.8 +04.7 75.2
20°	32 19.6 +02.8 74.4	31 23.3 +03.2 74.3	30 27.0 +03.5 74.2	29 30.8 +03.8 74.2	28 34.5 +04.2 74.1
21°	32 22.4 +02.2 73.2	31 26.5 +02.5 73.1	30 30.5 +02.9 73.1	29 34.6 +03.3 73.0	28 38.7 +03.6 73.0
22°	32 24.6 +01.5 72.0	31 29.0 +01.9 72.0	30 33.4 +02.3 71.9	29 37.9 +02.6 71.9	28 42.3 +03.0 71.8
23°	32 26.1 +00.9 70.8	31 30.9 +01.3 70.8	30 35.7 +01.7 70.8	29 40.5 +02.1 70.7	28 45.3 +02.5 70.7
24°	32 27.0 +00.2 69.6	31 32.2 +00.6 69.6	30 37.4 +01.0 69.6	29 42.6 +01.5 69.6	28 47.8 +01.9 69.5
25°	32 27.2 -00.5 68.5	31 32.8 +00.0 68.5	30 38.4 +00.5 68.4	29 44.1 +00.8 68.4	28 49.7 +01.3 68.4
26°	32 26.7 -01.1 67.3	31 32.8 -00.7 67.3	30 38.9 -00.2 67.3	29 44.9 +00.3 67.3	28 51.0 +00.7 67.3
27°	32 25.6 -01.8 66.1	31 32.1 -01.3 66.1	30 38.7 -00.9 66.1	29 45.2 -00.3 66.1	28 51.7 +00.2 66.1
28°	32 23.8 -02.5 64.9	31 30.8 -01.9 64.9	30 37.8 -01.4 65.0	29 44.9 -01.0 65.0	28 51.9 -00.4 65.0
29°	32 21.3 -03.1 63.7	31 28.9 -02.6 63.8	30 36.4 -02.0 63.8	29 43.9 -01.5 63.8	28 51.5 -01.0 63.8

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	24 19.0 +14.6 96.0	23 20.9 +14.5 95.7	22 22.7 +14.4 95.5	21 24.5 +14.3 95.2	20 26.2 +14.3 94.9
1°	24 33.6 +14.2 94.9	23 35.4 +14.0 94.7	22 37.1 +14.0 94.4	21 38.8 +13.9 94.1	20 40.5 +13.8 93.9
2°	24 47.8 +13.6 93.9	23 49.4 +13.6 93.6	22 51.1 +13.5 93.3	21 52.7 +13.5 93.1	20 54.3 +13.5 92.9
3°	25 01.4 +13.2 92.8	24 03.0 +13.2 92.5	23 04.6 +13.2 92.3	22 06.2 +13.1 92.1	21 07.8 +13.1 91.8
4°	25 14.6 +12.8 91.7	24 16.2 +12.7 91.5	23 17.8 +12.7 91.2	22 19.3 +12.7 91.0	21 20.9 +12.6 90.8
5°	25 27.4 +12.3 90.6	24 28.9 +12.3 90.4	23 30.5 +12.2 90.2	22 32.0 +12.3 89.9	21 33.5 +12.3 89.7
6°	25 39.7 +11.7 89.5	24 41.2 +11.8 89.3	23 42.7 +11.9 89.1	22 44.3 +11.8 88.9	21 45.8 +11.9 88.7
7°	25 51.4 +11.3 88.4	24 53.0 +11.3 88.2	23 54.6 +11.4 88.0	22 56.1 +11.5 87.8	21 57.7 +11.5 87.6
8°	26 02.7 +10.8 87.4	25 04.3 +10.9 87.2	24 06.0 +10.9 87.0	23 07.6 +11.0 86.7	22 09.2 +11.1 86.5
9°	26 13.5 +10.3 86.3	25 15.2 +10.4 86.1	24 16.9 +10.5 85.9	23 18.6 +10.6 85.7	22 20.3 +10.7 85.5
10°	26 23.8 +09.8 85.2	25 25.6 +09.9 85.0	24 27.4 +10.0 84.8	23 29.2 +10.1 84.6	22 31.0 +10.2 84.4
11°	26 33.6 +09.3 84.1	25 35.5 +09.4 83.9	24 37.4 +09.5 83.7	23 39.3 +09.7 83.5	22 41.2 +09.8 83.4
12°	26 42.9 +08.8 83.0	25 44.9 +08.9 82.8	24 46.9 +09.1 82.6	23 49.0 +09.2 82.5	22 51.0 +09.4 82.3
13°	26 51.7 +08.2 81.8	25 53.8 +08.5 81.7	24 56.0 +08.6 81.5	23 58.2 +08.8 81.4	23 00.4 +08.9 81.2
14°	26 59.9 +07.8 80.7	26 02.3 +07.9 80.6	25 04.6 +08.1 80.4	24 07.0 +08.3 80.3	23 09.3 +08.6 80.1
15°	27 07.7 +07.2 79.6	26 10.2 +07.4 79.5	25 12.7 +07.6 79.3	24 15.3 +07.8 79.2	23 17.9 +08.0 79.1
16°	27 14.9 +06.6 78.5	26 17.6 +06.9 78.4	25 20.3 +07.2 78.2	24 23.1 +07.4 78.1	23 25.9 +07.6 78.0
17°	27 21.5 +06.2 77.4	26 24.5 +06.4 77.3	25 27.5 +06.6 77.1	24 30.5 +06.9 77.0	23 33.5 +07.2 76.9
18°	27 27.7 +05.6 76.3	26 30.9 +05.9 76.2	25 34.1 +06.2 76.0	24 37.4 +06.5 75.9	23 40.7 +06.7 75.8
19°	27 33.3 +05.0 75.1	26 36.8 +05.3 75.0	25 40.3 +05.7 74.9	24 43.9 +05.9 74.8	23 47.4 +06.3 74.7
20°	27 38.3 +04.5 74.0	26 42.1 +04.8 73.9	25 46.0 +05.1 73.8	24 49.8 +05.5 73.7	23 53.7 +05.8 73.6
21°	27 42.8 +04.0 72.9	26 46.9 +04.4 72.8	25 51.1 +04.7 72.7	24 55.3 +05.0 72.6	23 59.5 +05.3 72.6
22°	27 46.8 +03.4 71.8	26 51.3 +03.7 71.7	25 55.8 +04.1 71.6	25 00.3 +04.5 71.5	24 04.8 +04.9 71.5
23°	27 50.2 +02.8 70.6	26 55.0 +03.3 70.6	25 59.9 +03.6 70.5	25 04.8 +04.0 70.4	24 09.7 +04.4 70.4
24°	27 53.0 +02.3 69.5	26 58.3 +02.7 69.5	26 03.5 +03.2 69.4	25 08.8 +03.6 69.3	24 14.1 +04.0 69.3
25°	27 55.3 +01.8 68.4	27 01.0 +02.2 68.3	26 06.7 +02.6 68.3	25 12.4 +03.0 68.2	24 18.1 +03.5 68.2
26°	27 57.1 +01.2 67.2	27 03.2 +01.6 67.2	26 09.3 +02.1 67.2	25 15.4 +02.6 67.1	24 21.6 +02.9 67.1
27°	27 58.3 +00.6 66.1	27 04.8 +01.1 66.1	26 11.4 +01.6 66.1	25 18.0 +02.0 66.0	24 24.5 +02.6 66.0
28°	27 58.9 +00.1 65.0	27 05.9 +00.6 65.0	26 13.0 +01.0 65.0	25 20.0 +01.6 64.9	24 27.1 +02.0 64.9
29°	27 59.0 -00.5 63.8	27 06.5 +00.1 63.8	26 14.0 +00.6 63.8	25 21.6 +01.0 63.8	24 29.1 +01.6 63.8

Latitude 13°

Declination SAME name as Latitude

Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	19 28.0 +14.1 94.7	18 29.7 +14.1 94.4	17 31.4 +14.0 94.2	16 33.1 +13.9 93.9	15 34.8 +13.8 93.7
1°	19 42.1 +13.8 93.6	18 43.8 +13.7 93.4	17 45.4 +13.7 93.2	16 47.0 +13.7 92.9	15 48.6 +13.6 92.7
2°	19 55.9 +13.4 92.6	18 57.5 +13.4 92.4	17 59.1 +13.3 92.1	17 00.7 +13.3 91.9	16 02.2 +13.3 91.7
3°	20 09.3 +13.1 91.6	19 10.9 +13.0 91.3	18 12.4 +13.1 91.1	17 14.0 +13.0 90.9	16 15.5 +13.0 90.7
4°	20 22.4 +12.7 90.5	19 23.9 +12.7 90.3	18 25.5 +12.7 90.1	17 27.0 +12.7 89.9	16 28.5 +12.8 89.6
5°	20 35.1 +12.3 89.5	19 36.6 +12.4 89.3	18 38.2 +12.3 89.1	17 39.7 +12.4 88.8	16 41.3 +12.4 88.6
6°	20 47.4 +11.9 88.4	19 49.0 +11.9 88.2	18 50.5 +12.0 88.0	17 52.1 +12.1 87.8	16 53.7 +12.1 87.6
7°	20 59.3 +11.6 87.4	20 00.9 +11.6 87.2	19 02.5 +11.7 87.0	18 04.2 +11.7 86.8	17 05.8 +11.8 86.6
8°	21 10.9 +11.1 86.3	20 12.5 +11.3 86.1	19 14.2 +11.3 85.9	18 15.9 +11.4 85.7	17 17.6 +11.5 85.5
9°	21 22.0 +10.8 85.3	20 23.8 +10.8 85.1	19 25.5 +11.0 84.9	18 27.3 +11.1 84.7	17 29.1 +11.2 84.5
10°	21 32.8 +10.3 84.2	20 34.6 +10.5 84.0	19 36.5 +10.6 83.9	18 38.4 +10.7 83.7	17 40.3 +10.8 83.5
11°	21 43.1 +10.0 83.2	20 45.1 +10.1 83.0	19 47.1 +10.2 82.8	18 49.1 +10.4 82.6	17 51.1 +10.6 82.5
12°	21 53.1 +09.5 82.1	20 55.2 +09.7 81.9	19 57.3 +09.9 81.8	18 59.5 +10.0 81.6	18 01.7 +10.1 81.4
13°	22 02.6 +09.2 81.0	21 04.9 +09.3 80.9	20 07.2 +09.5 80.7	19 09.5 +09.7 80.5	18 11.8 +09.9 80.4
14°	22 11.8 +08.7 80.0	21 14.2 +08.9 79.8	20 16.7 +09.1 79.7	19 19.2 +09.3 79.5	18 21.7 +09.5 79.3
15°	22 20.5 +08.3 78.9	21 23.1 +08.5 78.8	20 25.8 +08.7 78.6	19 28.5 +08.9 78.5	18 31.2 +09.2 78.3
16°	22 28.8 +07.8 77.8	21 31.6 +08.1 77.7	20 34.5 +08.4 77.6	19 37.4 +08.6 77.4	18 40.4 +08.8 77.3
17°	22 36.6 +07.5 76.8	21 39.7 +07.7 76.6	20 42.9 +07.9 76.5	19 46.0 +08.3 76.4	18 49.2 +08.5 76.2
18°	22 44.1 +07.0 75.7	21 47.4 +07.3 75.6	20 50.8 +07.6 75.4	19 54.3 +07.8 75.3	18 57.7 +08.2 75.2
19°	22 51.1 +06.5 74.6	21 54.7 +06.9 74.5	20 58.4 +07.2 74.4	20 02.1 +07.5 74.2	19 05.9 +07.7 74.1
20°	22 57.6 +06.1 73.5	22 01.6 +06.4 73.4	21 05.6 +06.7 73.3	20 09.6 +07.1 73.2	19 13.6 +07.4 73.1
21°	23 03.7 +05.7 72.5	22 08.0 +06.1 72.4	21 12.3 +06.4 72.2	20 16.7 +06.7 72.1	19 21.0 +07.1 72.0
22°	23 09.4 +05.3 71.4	22 14.1 +05.6 71.3	21 18.7 +06.0 71.2	20 23.4 +06.3 71.1	19 28.1 +06.7 71.0
23°	23 14.7 +04.8 70.3	22 19.7 +05.1 70.2	21 24.7 +05.5 70.1	20 29.7 +05.9 70.0	19 34.8 +06.3 69.9
24°	23 19.5 +04.3 69.2	22 24.8 +04.8 69.1	21 30.2 +05.2 69.0	20 35.6 +05.6 69.0	19 41.1 +06.0 68.9
25°	23 23.8 +03.9 68.1	22 29.6 +04.3 68.0	21 35.4 +04.7 68.0	20 41.2 +05.2 67.9	19 47.1 +05.5 67.8
26°	23 27.7 +03.5 67.0	22 33.9 +03.9 67.0	21 40.1 +04.3 66.9	20 46.4 +04.7 66.8	19 52.6 +05.2 66.7
27°	23 31.2 +02.9 65.9	22 37.8 +03.4 65.9	21 44.4 +03.9 65.8	20 51.1 +04.4 65.8	19 57.8 +04.8 65.7
28°	23 34.1 +02.6 64.9	22 41.2 +03.0 64.8	21 48.3 +03.5 64.7	20 55.5 +03.9 64.7	20 02.6 +04.5 64.6
29°	23 36.7 +02.1 63.8	22 44.2 +02.6 63.7	21 51.8 +03.1 63.7	20 59.4 +03.6 63.6	20 07.1 +04.1 63.6

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 36.4 +13.8 93.4	13 38.0 +13.8 93.2	12 39.7 +13.7 93.0	11 41.3 +13.7 92.7	10 42.9 +13.6 92.5
1°	14 50.2 +13.6 92.4	13 51.8 +13.5 92.2	12 53.4 +13.5 92.0	11 55.0 +13.4 91.7	10 56.5 +13.5 91.5
2°	15 03.8 +13.3 91.4	14 05.3 +13.3 91.2	13 06.9 +13.2 91.0	12 08.4 +13.3 90.7	11 10.0 +13.2 90.5
3°	15 17.1 +13.0 90.4	14 18.6 +13.0 90.2	13 20.1 +13.1 90.0	12 21.7 +13.0 89.7	11 23.2 +13.1 89.5
4°	15 30.1 +12.7 89.4	14 31.6 +12.8 89.2	13 33.2 +12.8 89.0	12 34.7 +12.8 88.7	11 36.3 +12.8 88.5
5°	15 42.8 +12.5 88.4	14 44.4 +12.5 88.2	13 46.0 +12.5 88.0	12 47.5 +12.6 87.7	11 49.1 +12.7 87.5
6°	15 55.3 +12.2 87.4	14 56.9 +12.2 87.2	13 58.5 +12.3 87.0	13 00.1 +12.4 86.7	12 01.8 +12.4 86.5
7°	16 07.5 +11.8 86.4	15 09.1 +12.0 86.2	14 10.8 +12.0 85.9	13 12.5 +12.1 85.7	12 14.2 +12.2 85.5
8°	16 19.3 +11.6 85.3	15 21.1 +11.7 85.1	14 22.8 +11.8 84.9	13 24.6 +11.9 84.7	12 26.4 +12.0 84.5
9°	16 30.9 +11.3 84.3	15 32.8 +11.4 84.1	14 34.6 +11.5 83.9	13 36.5 +11.6 83.7	12 38.4 +11.7 83.5
10°	16 42.2 +11.0 83.3	15 44.2 +11.1 83.1	14 46.1 +11.3 82.9	13 48.1 +11.4 82.7	12 50.1 +11.6 82.5
11°	16 53.2 +10.7 82.3	15 55.3 +10.8 82.1	14 57.4 +11.0 81.9	13 59.5 +11.1 81.7	13 01.7 +11.3 81.5
12°	17 03.9 +10.3 81.2	16 06.1 +10.5 81.1	15 08.4 +10.7 80.9	14 10.6 +10.9 80.7	13 13.0 +11.0 80.5
13°	17 14.2 +10.1 80.2	16 16.6 +10.3 80.0	15 19.1 +10.4 79.9	14 21.5 +10.7 79.7	13 24.0 +10.8 79.5
14°	17 24.3 +09.7 79.2	16 26.9 +09.9 79.0	15 29.5 +10.1 78.8	14 32.2 +10.3 78.7	13 34.8 +10.6 78.5
15°	17 34.0 +09.4 78.1	16 36.8 +09.6 78.0	15 39.6 +09.9 77.8	14 42.5 +10.1 77.6	13 45.4 +10.3 77.5
16°	17 43.4 +09.1 77.1	16 46.4 +09.4 76.9	15 49.5 +09.6 76.8	14 52.6 +09.8 76.6	13 55.7 +10.1 76.5
17°	17 52.5 +08.7 76.1	16 55.8 +09.0 75.9	15 59.1 +09.3 75.8	15 02.4 +09.6 75.6	14 05.8 +09.8 75.4
18°	18 01.2 +08.4 75.0	17 04.8 +08.7 74.9	16 08.4 +08.9 74.7	15 12.0 +09.2 74.6	14 15.6 +09.6 74.4
19°	18 09.6 +08.1 74.0	17 13.5 +08.3 73.8	16 17.3 +08.7 73.7	15 21.2 +09.0 73.6	14 25.2 +09.3 73.4
20°	18 17.7 +07.8 72.9	17 21.8 +08.1 72.8	16 26.0 +08.4 72.7	15 30.2 +08.7 72.5	14 34.5 +09.0 72.4
21°	18 25.5 +07.3 71.9	17 29.9 +07.7 71.8	16 34.4 +08.1 71.6	15 38.9 +08.5 71.5	14 43.5 +08.8 71.4
22°	18 32.8 +07.1 70.8	17 37.6 +07.4 70.7	16 42.5 +07.7 70.6	15 47.4 +08.1 70.5	14 52.3 +08.5 70.3
23°	18 39.9 +06.7 69.8	17 45.0 +07.1 69.7	16 50.2 +07.5 69.6	15 55.5 +07.8 69.4	15 00.8 +08.2 69.3
24°	18 46.6 +06.3 68.8	17 52.1 +06.8 68.6	16 57.7 +07.1 68.5	16 03.3 +07.6 68.4	15 09.0 +07.9 68.3
25°	18 52.9 +06.0 67.7	17 58.9 +06.4 67.6	17 04.8 +06.9 67.5	16 10.9 +07.2 67.4	15 16.9 +07.7 67.3
26°	18 58.9 +05.7 66.6	18 05.3 +06.0 66.6	17 11.7 +06.5 66.5	16 18.1 +06.9 66.3	15 24.6 +07.3 66.2
27°	19 04.6 +05.2 65.6	18 11.3 +05.8 65.5	17 18.2 +06.1 65.4	16 25.0 +06.7 65.3	15 31.9 +07.1 65.2
28°	19 09.8 +05.0 64.5	18 17.1 +05.4 64.5	17 24.3 +05.9 64.4	16 31.7 +06.3 64.3	15 39.0 +06.8 64.2
29°	19 14.8 +04.5 63.5	18 22.5 +05.0 63.4	17 30.2 +05.5 63.3	16 38.0 +06.0 63.2	15 45.8 +06.5 63.1

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Declination SAME name as Latitude

Latitude 13°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 44.5 +13.6 92.3	8 46.0 +13.6 92.0	7 47.6 +13.6 91.8	6 49.2 +13.5 91.6	5 50.7 +13.6 91.4
1°	9 58.1 +13.4 91.3	8 59.6 +13.5 91.1	8 01.2 +13.4 90.8	7 02.7 +13.4 90.6	6 04.3 +13.4 90.4
2°	10 11.5 +13.3 90.3	9 13.1 +13.2 90.1	8 14.6 +13.3 89.8	7 16.1 +13.3 89.6	6 17.7 +13.3 89.4
3°	10 24.8 +13.0 89.3	9 26.3 +13.1 89.1	8 27.9 +13.1 88.9	7 29.4 +13.2 88.6	6 31.0 +13.2 88.4
4°	10 37.8 +12.9 88.3	9 39.4 +12.9 88.1	8 41.0 +12.9 87.9	7 42.6 +13.0 87.7	6 44.2 +13.0 87.4
5°	10 50.7 +12.7 87.3	9 52.3 +12.8 87.1	8 53.9 +12.9 86.9	7 55.6 +12.9 86.7	6 57.2 +13.0 86.4
6°	11 03.4 +12.5 86.3	10 05.1 +12.6 86.1	9 06.8 +12.6 85.9	8 08.5 +12.7 85.7	7 10.2 +12.8 85.5
7°	11 15.9 +12.3 85.3	10 17.7 +12.3 85.1	9 19.4 +12.5 84.9	8 21.2 +12.6 84.7	7 23.0 +12.7 84.5
8°	11 28.2 +12.1 84.3	10 30.0 +12.3 84.1	9 31.9 +12.3 83.9	8 33.8 +12.4 83.7	7 35.7 +12.5 83.5
9°	11 40.3 +11.9 83.3	10 42.3 +12.0 83.1	9 44.2 +12.2 82.9	8 46.2 +12.3 82.7	7 48.2 +12.5 82.5
10°	11 52.2 +11.7 82.3	10 54.3 +11.8 82.1	9 56.4 +11.9 81.9	8 58.5 +12.1 81.7	8 00.7 +12.2 81.5
11°	12 03.9 +11.4 81.3	11 06.1 +11.6 81.1	10 08.3 +11.8 80.9	9 10.6 +12.0 80.7	8 12.9 +12.2 80.5
12°	12 15.3 +11.3 80.3	11 17.7 +11.4 80.1	10 20.1 +11.6 79.9	9 22.6 +11.8 79.7	8 25.1 +12.0 79.5
13°	12 26.6 +11.0 79.3	11 29.1 +11.3 79.1	10 31.7 +11.5 78.9	9 34.4 +11.6 78.7	8 37.1 +11.8 78.5
14°	12 37.6 +10.8 78.3	11 40.4 +11.0 78.1	10 43.2 +11.2 77.9	9 46.0 +11.5 77.7	8 48.9 +11.7 77.6
15°	12 48.4 +10.5 77.3	11 51.4 +10.8 77.1	10 54.4 +11.0 76.9	9 57.5 +11.2 76.8	9 00.6 +11.5 76.6
16°	12 58.9 +10.4 76.3	12 02.2 +10.5 76.1	11 05.4 +10.9 75.9	10 08.7 +11.1 75.8	9 12.1 +11.4 75.6
17°	13 09.3 +10.0 75.3	12 12.7 +10.4 75.1	11 16.3 +10.6 74.9	10 19.8 +10.9 74.8	9 23.5 +11.1 74.6
18°	13 19.3 +09.9 74.3	12 23.1 +10.1 74.1	11 26.9 +10.4 73.9	10 30.7 +10.8 73.8	9 34.6 +11.1 73.6
19°	13 29.2 +09.6 73.2	12 33.2 +09.9 73.1	11 37.3 +10.2 72.9	10 41.5 +10.5 72.8	9 45.7 +10.8 72.6
20°	13 38.8 +09.3 72.2	12 43.1 +09.7 72.1	11 47.5 +10.0 71.9	10 52.0 +10.3 71.8	9 56.5 +10.7 71.6
21°	13 48.1 +09.1 71.2	12 52.8 +09.5 71.1	11 57.5 +09.8 70.9	11 02.3 +10.2 70.8	10 07.2 +10.4 70.6
22°	13 57.2 +08.9 70.2	13 02.3 +09.2 70.1	12 07.3 +09.6 69.9	11 12.5 +09.9 69.7	10 17.6 +10.3 69.6
23°	14 06.1 +08.6 69.2	13 11.5 +08.9 69.0	12 16.9 +09.4 68.9	11 22.4 +09.7 68.7	10 27.9 +10.2 68.6
24°	14 14.7 +08.3 68.2	13 20.4 +08.8 68.0	12 26.3 +09.1 67.9	11 32.1 +09.6 67.7	10 38.1 +09.9 67.6
25°	14 23.0 +08.1 67.1	13 29.2 +08.5 67.0	12 35.4 +08.9 66.9	11 41.7 +09.3 66.7	10 48.0 +09.7 66.6
26°	14 31.1 +07.8 66.1	13 37.7 +08.2 66.0	12 44.3 +08.6 65.9	11 51.0 +09.1 65.7	10 57.7 +09.5 65.6
27°	14 38.9 +07.5 65.1	13 45.9 +08.0 65.0	12 52.9 +08.5 64.8	12 00.1 +08.8 64.7	11 07.2 +09.4 64.6
28°	14 46.4 +07.3 64.1	13 53.9 +07.7 63.9	13 01.4 +08.2 63.8	12 08.9 +08.7 63.7	11 16.6 +09.1 63.6
29°	14 53.7 +07.0 63.0	14 01.6 +07.5 62.9	13 09.6 +07.9 62.8	12 17.6 +08.4 62.7	11 25.7 +08.9 62.6

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 52.3 +13.5 91.1	3 53.8 +13.5 90.9	2 55.4 +13.5 90.7	1 56.9 +13.5 90.5	0 58.5 +13.5 90.2
1°	5 05.8 +13.4 90.1	4 07.3 +13.5 89.9	3 08.9 +13.4 89.7	2 10.4 +13.5 89.5	1 12.0 +13.4 89.3
2°	5 19.2 +13.3 89.2	4 20.8 +13.3 88.9	3 22.3 +13.4 88.7	2 23.9 +13.4 88.5	1 25.4 +13.5 88.3
3°	5 32.5 +13.3 88.2	4 34.1 +13.3 88.0	3 35.7 +13.3 87.7	2 37.3 +13.3 87.5	1 38.9 +13.4 87.3
4°	5 45.8 +13.1 87.2	4 47.4 +13.2 87.0	3 49.0 +13.2 86.8	2 50.6 +13.3 86.5	1 52.3 +13.4 86.3
5°	5 58.9 +13.0 86.2	5 00.6 +13.0 86.0	4 02.2 +13.2 85.8	3 03.9 +13.3 85.6	2 05.7 +13.3 85.4
6°	6 11.9 +12.9 85.2	5 13.6 +13.1 85.0	4 15.4 +13.1 84.8	3 17.2 +13.2 84.6	2 19.0 +13.3 84.4
7°	6 24.8 +12.8 84.3	5 26.7 +12.9 84.1	4 28.5 +13.0 83.8	3 30.4 +13.1 83.6	2 32.3 +13.3 83.4
8°	6 37.6 +12.7 83.3	5 39.6 +12.8 83.1	4 41.5 +13.0 82.9	3 43.5 +13.1 82.6	2 45.6 +13.2 82.4
9°	6 50.3 +12.6 82.3	5 52.4 +12.7 82.1	4 54.5 +12.8 81.9	3 56.6 +13.0 81.7	2 58.8 +13.2 81.4
10°	7 02.9 +12.4 81.3	6 05.1 +12.6 81.1	5 07.3 +12.8 80.9	4 09.6 +13.0 80.7	3 12.0 +13.1 80.5
11°	7 15.3 +12.3 80.3	6 17.7 +12.5 80.1	5 20.1 +12.7 79.9	4 22.6 +12.8 79.7	3 25.1 +13.0 79.5
12°	7 27.6 +12.2 79.3	6 30.2 +12.3 79.1	5 32.8 +12.6 78.9	4 35.4 +12.8 78.7	3 38.1 +13.0 78.5
13°	7 39.8 +12.0 78.4	6 42.5 +12.3 78.2	5 45.4 +12.4 77.9	4 48.2 +12.7 77.7	3 51.1 +12.9 77.5
14°	7 51.8 +11.9 77.4	6 54.8 +12.1 77.2	5 57.8 +12.4 77.0	5 00.9 +12.6 76.8	4 04.0 +12.9 76.6
15°	8 03.7 +11.8 76.4	7 06.9 +12.1 76.2	6 10.2 +12.3 76.0	5 13.5 +12.5 75.8	4 16.9 +12.7 75.6
16°	8 15.5 +11.6 75.4	7 19.0 +11.8 75.2	6 22.5 +12.1 75.0	5 26.0 +12.4 74.8	4 29.6 +12.7 74.6
17°	8 27.1 +11.5 74.4	7 30.8 +11.8 74.2	6 34.6 +12.0 74.0	5 38.4 +12.4 73.8	4 42.3 +12.6 73.6
18°	8 38.6 +11.3 73.4	7 42.6 +11.6 73.2	6 46.6 +12.0 73.0	5 50.8 +12.2 72.8	4 54.9 +12.6 72.6
19°	8 49.9 +11.2 72.4	7 54.2 +11.5 72.2	6 58.6 +11.7 72.0	6 03.0 +12.1 71.8	5 07.5 +12.4 71.7
20°	9 01.1 +11.0 71.4	8 05.7 +11.3 71.2	7 10.3 +11.7 71.1	6 15.1 +12.0 70.9	5 19.9 +12.3 70.7
21°	9 12.1 +10.8 70.4	8 17.0 +11.2 70.2	7 22.0 +11.5 70.1	6 27.1 +11.9 69.9	5 32.2 +12.3 69.7
22°	9 22.9 +10.7 69.4	8 28.2 +11.0 69.2	7 33.5 +11.4 69.1	6 39.0 +11.7 68.9	5 44.5 +12.1 68.7
23°	9 33.6 +10.4 68.4	8 39.2 +10.9 68.3	7 44.9 +11.3 68.1	6 50.7 +11.7 67.9	5 56.6 +12.1 67.7
24°	9 44.0 +10.4 67.4	8 50.1 +10.7 67.3	7 56.2 +11.1 67.1	7 02.4 +11.5 66.9	6 08.7 +11.9 66.7
25°	9 54.4 +10.1 66.4	9 00.8 +10.6 66.3	8 07.3 +11.0 66.1	7 13.9 +11.4 65.9	6 20.6 +11.8 65.7
26°	10 04.5 +10.0 65.4	9 11.4 +10.4 65.3	8 18.3 +10.8 65.1	7 25.3 +11.3 64.9	6 32.4 +11.7 64.8
27°	10 14.5 +09.7 64.4	9 21.8 +10.2 64.3	8 29.1 +10.7 64.1	7 36.6 +11.1 63.9	6 44.1 +11.6 63.8
28°	10 24.2 +09.6 63.4	9 32.0 +10.1 63.3	8 39.8 +10.5 63.1	7 47.7 +11.0 63.0	6 55.7 +11.4 62.8
29°	10 33.8 +09.4 62.4	9 42.1 +09.8 62.3	8 50.3 +10.4 62.1	7 58.7 +10.9 62.0	7 07.1 +11.4 61.8

Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +13.5 90.0	-0 58.5 +13.5	-1 56.9 +13.5	-2 55.4 +13.6	-3 53.8 +13.5
1°	0 13.5 +13.5 89.0	-0 45.0 +13.6	-1 43.4 +13.5	-2 41.8 +13.5	-3 40.3 +13.6
2°	0 27.0 +13.5 88.1	-0 31.4 +13.5	-1 29.9 +13.6	-2 28.3 +13.7	-3 26.7 +13.7
3°	0 40.5 +13.4 87.1	-0 17.9 +13.5	-1 16.3 +13.6	-2 14.6 +13.6	-3 13.0 +13.8
4°	0 53.9 +13.5 86.1	-0 04.4 +13.6	-1 02.7 +13.6	-2 01.0 +13.7	-2 59.2 +13.8
5°	1 07.4 +13.4 85.1	0 09.2 +13.5 84.9	-0 49.1 +13.7	-1 47.3 +13.8	-2 45.4 +13.8
6°	1 20.8 +13.5 84.2	0 22.7 +13.5 83.9	-0 35.4 +13.6	-1 33.5 +13.7	-2 31.6 +13.9
7°	1 34.3 +13.3 83.2	0 36.2 +13.5 83.0	-0 21.8 +13.7	-1 19.8 +13.8	-2 17.7 +13.9
8°	1 47.6 +13.4 82.2	0 49.7 +13.5 82.0	-0 08.1 +13.6	-1 06.0 +13.8	-2 03.8 +14.0
9°	2 01.0 +13.3 81.2	1 03.2 +13.5 81.0	0 05.5 +13.7 80.8	-0 52.2 +13.8	-1 49.8 +14.0
10°	2 14.3 +13.3 80.3	1 16.7 +13.5 80.0	0 19.2 +13.6 79.8	-0 38.4 +13.9	-1 35.8 +14.0
11°	2 27.6 +13.2 79.3	1 30.2 +13.4 79.1	0 32.8 +13.6 78.8	-0 24.5 +13.8	-1 21.8 +14.0
12°	2 40.8 +13.2 78.3	1 43.6 +13.4 78.1	0 46.4 +13.7 77.9	-0 10.7 +13.8	-1 07.8 +14.1
13°	2 54.0 +13.2 77.3	1 57.0 +13.4 77.1	1 00.1 +13.6 76.9	0 03.1 +13.9 76.7	-0 53.7 +14.1
14°	3 07.2 +13.1 76.3	2 10.4 +13.3 76.1	1 13.7 +13.5 75.9	0 17.0 +13.8 75.7	-0 39.6 +14.1
15°	3 20.3 +13.0 75.4	2 23.7 +13.3 75.2	1 27.2 +13.6 74.9	0 30.8 +13.8 74.7	-0 25.5 +14.0
16°	3 33.3 +13.0 74.4	2 37.0 +13.3 74.2	1 40.8 +13.5 74.0	0 44.6 +13.9 73.7	-0 11.5 +14.1
17°	3 46.3 +12.9 73.4	2 50.3 +13.2 73.2	1 54.3 +13.5 73.0	0 58.5 +13.7 72.8	0 02.6 +14.1 72.5
18°	3 59.2 +12.8 72.4	3 03.5 +13.1 72.2	2 07.8 +13.5 72.0	1 12.2 +13.8 71.8	0 16.7 +14.1 71.6
19°	4 12.0 +12.8 71.5	3 16.6 +13.1 71.2	2 21.3 +13.4 71.0	1 26.0 +13.8 70.8	0 30.8 +14.1 70.6
20°	4 24.8 +12.6 70.5	3 29.7 +13.0 70.3	2 34.7 +13.4 70.1	1 39.8 +13.7 69.9	0 44.9 +14.1 69.6
21°	4 37.4 +12.6 69.5	3 42.7 +13.0 69.3	2 48.1 +13.3 69.1	1 53.5 +13.7 68.9	0 59.0 +14.1 68.7
22°	4 50.0 +12.6 68.5	3 55.7 +12.9 68.3	3 01.4 +13.3 68.1	2 07.2 +13.6 67.9	1 13.1 +14.0 67.7
23°	5 02.6 +12.4 67.5	4 08.6 +12.8 67.3	3 14.7 +13.2 67.1	2 20.8 +13.6 66.9	1 27.1 +14.0 66.7
24°	5 15.0 +12.3 66.5	4 21.4 +12.7 66.4	3 27.9 +13.1 66.2	2 34.4 +13.6 66.0	1 41.1 +14.0 65.7
25°	5 27.3 +12.3 65.6	4 34.1 +12.7 65.4	3 41.0 +13.1 65.2	2 48.0 +13.5 65.0	1 55.1 +13.9 64.8
26°	5 39.6 +12.1 64.6	4 46.8 +12.6 64.4	3 54.1 +13.0 64.2	3 01.5 +13.5 64.0	2 09.0 +13.9 63.8
27°	5 51.7 +12.0 63.6	4 59.4 +12.5 63.4	4 07.1 +13.0 63.2	3 15.0 +13.4 63.0	2 22.9 +13.9 62.8
28°	6 03.7 +12.0 62.6	5 11.9 +12.4 62.4	4 20.1 +12.9 62.2	3 28.4 +13.3 62.1	2 36.8 +13.8 61.8
29°	6 15.7 +11.8 61.6	5 24.3 +12.3 61.4	4 33.0 +12.8 61.3	3 41.7 +13.3 61.1	2 50.6 +13.8 60.9

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 52.3 +13.6	-5 50.7 +13.6	-6 49.2 +13.7	-7 47.6 +13.7	
1°	-4 38.7 +13.7	-5 37.1 +13.7	-6 35.5 +13.7	-7 33.9 +13.8	
2°	-4 25.0 +13.7	-5 23.4 +13.8	-6 21.8 +13.9	-7 20.1 +13.9	
3°	-4 11.3 +13.8	-5 09.6 +13.9	-6 07.9 +14.0	-7 06.2 +14.1	
4°	-3 57.5 +13.9	-4 55.7 +14.0	-5 53.9 +14.1	-6 52.1 +14.2	
5°	-3 43.6 +14.0	-4 41.7 +14.0	-5 39.8 +14.2	-6 37.9 +14.3	
6°	-3 29.6 +14.0	-4 27.7 +14.2	-5 25.6 +14.2	-6 23.6 +14.4	
7°	-3 15.6 +14.0	-4 13.5 +14.2	-5 11.4 +14.4	-6 09.2 +14.6	
8°	-3 01.6 +14.2	-3 59.3 +14.3	-4 57.0 +14.5	-5 54.6 +14.6	
9°	-2 47.4 +14.1	-3 45.0 +14.3	-4 42.5 +14.5	-5 40.0 +14.7	
10°	-2 33.3 +14.2	-3 30.7 +14.5	-4 28.0 +14.6	-5 25.3 +14.8	
11°	-2 19.1 +14.3	-3 16.2 +14.4	-4 13.4 +14.7	-5 10.5 +14.9	
12°	-2 04.8 +14.3	-3 01.8 +14.5	-3 58.7 +14.7	-4 55.6 +15.0	
13°	-1 50.5 +14.3	-2 47.3 +14.6	-3 44.0 +14.9	-4 40.6 +15.1	
14°	-1 36.2 +14.4	-2 32.7 +14.6	-3 29.1 +14.8	-4 25.5 +15.1	
15°	-1 21.8 +14.3	-2 18.1 +14.7	-3 14.3 +15.0	-4 10.4 +15.3	
16°	-1 07.5 +14.4	-2 03.4 +14.6	-2 59.3 +15.0	-3 55.1 +15.2	
17°	-0 53.1 +14.4	-1 48.8 +14.8	-2 44.3 +15.0	-3 39.9 +15.4	
18°	-0 38.7 +14.4	-1 34.0 +14.7	-2 29.3 +15.1	-3 24.5 +15.4	
19°	-0 24.3 +14.5	-1 19.3 +14.8	-2 14.2 +15.1	-3 09.1 +15.5	
20°	-0 09.8 +14.4	-1 04.5 +14.8	-1 59.1 +15.1	-2 53.6 +15.5	
21°	0 04.6 +14.4 68.4	-0 49.7 +14.8	-1 44.0 +15.2	-2 38.1 +15.5	
22°	0 19.0 +14.4 67.5	-0 34.9 +14.8	-1 28.8 +15.2	-2 22.6 +15.6	
23°	0 33.4 +14.4 66.5	-0 20.1 +14.8	-1 13.6 +15.2	-2 07.0 +15.6	
24°	0 47.8 +14.4 65.5	-0 05.3 +14.8	-0 58.4 +15.2	-1 51.4 +15.7	
25°	1 02.2 +14.4 64.6	0 09.5 +14.8 64.3	-0 43.2 +15.3	-1 35.7 +15.7	
26°	1 16.6 +14.4 63.6	0 24.3 +14.8 63.4	-0 27.9 +15.3	-1 20.0 +15.7	
27°	1 31.0 +14.3 62.6	0 39.1 +14.8 62.4	-0 12.6 +15.2	-1 04.3 +15.7	
28°	1 45.3 +14.3 61.6	0 53.9 +14.8 61.4	0 02.6 +15.3 61.2	-0 48.6 +15.8	
29°	1 59.6 +14.3 60.7	1 08.7 +14.7 60.5	0 17.9 +15.2 60.2	-0 32.8 +15.7	

Declination SAME name as Latitude

Latitude 14°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	76 00.0 +60.0 180.0	75 57.9 +59.8 175.9	75 51.6 +59.4 171.8	75 41.3 +58.6 167.8	75 27.0 +57.7 163.9
1°	77 00.0 +60.0 180.0	76 57.7 +59.9 175.6	76 51.0 +59.3 171.2	76 39.9 +58.4 166.9	76 24.7 +57.2 162.7
2°	78 00.0 +60.0 180.0	77 57.6 +59.7 175.2	77 50.3 +59.1 170.5	77 38.3 +58.2 165.9	77 21.9 +56.8 161.4
3°	79 00.0 +60.0 180.0	78 57.3 +59.8 174.8	78 49.4 +59.0 169.6	78 36.5 +57.8 164.7	78 18.7 +56.3 159.9
4°	80 00.0 +60.0 180.0	79 57.1 +59.7 174.3	79 48.4 +58.8 168.7	79 34.3 +57.3 163.2	79 15.0 +55.5 158.1
5°	81 00.0 +60.0 180.0	80 56.8 +59.6 173.7	80 47.2 +58.5 167.5	80 31.6 +56.8 161.5	80 10.5 +54.6 156.0
6°	82 00.0 +60.0 180.0	81 56.4 +59.5 172.9	81 45.7 +58.1 166.0	81 28.4 +55.9 159.5	81 05.1 +53.2 153.4
7°	83 00.0 +60.0 180.0	82 55.9 +59.3 171.9	82 43.8 +57.4 164.1	82 24.3 +54.7 156.9	81 58.3 +51.5 150.3
8°	84 00.0 +60.0 180.0	83 55.2 +59.1 170.6	83 41.2 +56.6 161.7	83 19.0 +53.0 153.6	82 49.8 +49.1 146.4
9°	85 00.0 +60.0 180.0	84 54.3 +58.6 168.8	84 37.8 +55.0 158.4	84 12.0 +50.4 149.2	83 38.9 +45.4 141.5
10°	86 00.0 +60.0 180.0	85 52.9 +57.8 166.2	85 32.8 +52.4 153.7	85 02.4 +46.1 143.4	84 24.3 +40.3 135.2
11°	87 00.0 +60.0 180.0	86 50.7 +55.8 161.9	86 25.2 +47.3 146.7	85 48.5 +39.0 135.4	85 04.6 +32.6 127.1
12°	88 00.0 +60.0 180.0	87 46.5 +49.8 153.9	87 12.5 +36.3 135.5	86 27.5 +27.5 124.0	85 37.2 +21.8 116.7
13°	89 00.0 +60.0 180.0	88 36.3 +25.5 135.7	87 48.8 +14.8 117.0	86 55.0 +10.3 108.6	85 59.0 +08.1 103.9
14°	90 00.0 -60.0 0.0	89 01.8 -25.3 89.9	88 03.6 -14.4 89.8	87 05.3 -09.6 89.6	86 07.1 -07.1 89.5
15°	89 00.0 -60.0 0.0	88 36.5 -49.8 43.9	87 49.2 -36.0 62.4	86 55.7 -26.9 70.6	86 00.0 -21.0 75.0
16°	88 00.0 -60.0 0.0	87 46.7 -55.8 25.7	87 13.2 -47.1 43.8	86 28.8 -38.8 55.0	85 39.0 -32.0 62.1
17°	87 00.0 -60.0 0.0	86 50.9 -57.7 17.7	86 26.1 -52.4 32.5	85 50.0 -45.8 43.5	85 07.0 -39.9 51.6
18°	86 00.0 -60.0 0.0	85 53.2 -58.7 13.4	85 33.7 -55.0 25.4	85 04.2 -50.3 35.4	84 27.1 -45.1 43.3
19°	85 00.0 -60.0 0.0	84 54.5 -59.0 10.7	84 38.7 -56.5 20.7	84 13.9 -52.9 29.5	83 42.0 -48.9 36.9
20°	84 00.0 -60.0 0.0	83 55.5 -59.4 8.9	83 42.2 -57.5 17.4	83 21.0 -54.7 25.1	82 53.1 -51.3 32.0
21°	83 00.0 -60.0 0.0	82 56.1 -59.5 7.6	82 44.7 -58.1 15.0	82 26.3 -55.9 21.8	82 01.8 -53.2 28.0
22°	82 00.0 -60.0 0.0	81 56.6 -59.6 6.6	81 46.6 -58.4 13.1	81 30.4 -56.7 19.2	81 08.6 -54.5 24.8
23°	81 00.0 -60.0 0.0	80 57.0 -59.7 5.9	80 48.2 -58.8 11.6	80 33.7 -57.3 17.1	80 14.1 -55.4 22.2
24°	80 00.0 -60.0 0.0	79 57.3 -59.7 5.2	79 49.4 -59.0 10.4	79 36.4 -57.8 15.4	79 18.7 -56.2 20.1
25°	79 00.0 -60.0 0.0	78 57.6 -59.8 4.7	78 50.4 -59.1 9.4	78 38.6 -58.1 13.9	78 22.5 -56.8 18.3
26°	78 00.0 -60.0 0.0	77 57.8 -59.8 4.3	77 51.3 -59.3 8.6	77 40.5 -58.4 12.7	77 25.7 -57.3 16.7
27°	77 00.0 -60.0 0.0	76 58.0 -59.9 4.0	76 52.0 -59.4 7.9	76 42.1 -58.6 11.7	76 28.4 -57.6 15.4
28°	76 00.0 -60.0 0.0	75 58.1 -59.8 3.6	75 52.6 -59.4 7.3	75 43.5 -58.8 10.8	75 30.8 -57.9 14.3
29°	75 00.0 -60.0 0.0	74 58.3 -59.9 3.4	74 53.2 -59.6 6.7	74 44.7 -59.0 10.0	74 32.9 -58.1 13.2

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	75 09.0 +56.5 160.1	74 47.5 +55.1 156.5	74 22.7 +53.6 153.1	73 54.9 +51.9 149.8	73 24.3 +50.3 146.8
1°	76 05.5 +55.8 158.7	75 42.6 +54.3 155.0	75 16.3 +52.6 151.4	74 46.8 +51.0 148.0	74 14.6 +49.2 144.8
2°	77 01.3 +55.3 157.2	76 36.9 +53.5 153.2	76 08.9 +51.6 149.4	75 37.8 +49.7 145.9	75 03.8 +47.7 142.7
3°	77 56.6 +54.4 155.4	77 30.4 +52.4 151.2	77 00.5 +50.4 147.2	76 27.5 +48.2 143.6	75 51.5 +46.2 140.3
4°	78 51.0 +53.4 153.3	78 22.8 +51.1 148.8	77 50.9 +48.8 144.7	77 15.7 +46.5 141.0	76 37.7 +44.3 137.6
5°	79 44.4 +52.1 150.8	79 13.9 +49.6 146.1	78 39.7 +46.9 141.9	78 02.2 +44.4 138.0	77 22.0 +42.0 134.6
6°	80 36.5 +50.4 147.9	80 03.5 +47.4 143.0	79 26.6 +44.6 138.6	78 46.6 +41.9 134.7	78 04.0 +39.3 131.2
7°	81 26.9 +48.1 144.4	80 50.9 +44.8 139.3	80 11.2 +41.6 134.8	79 28.5 +38.7 130.9	78 43.3 +36.2 127.4
8°	82 15.0 +45.0 140.2	81 35.7 +41.3 134.9	80 52.8 +38.0 130.4	80 07.2 +35.1 126.6	79 19.5 +32.4 123.3
9°	83 00.0 +41.0 135.1	82 17.0 +36.9 129.7	81 30.8 +33.5 125.3	80 42.3 +30.5 121.7	79 51.9 +28.1 118.6
10°	83 41.0 +35.3 128.7	82 53.9 +31.3 123.6	82 04.3 +27.9 119.5	81 12.8 +25.3 116.2	80 20.0 +23.0 113.4
11°	84 16.3 +27.7 121.0	83 25.2 +24.1 116.4	82 32.2 +21.4 112.9	81 38.1 +19.1 110.1	80 43.0 +17.4 107.8
12°	84 44.0 +18.2 111.7	83 49.3 +15.6 108.2	82 53.6 +13.6 105.5	81 57.2 +12.2 103.5	81 00.4 +11.1 101.8
13°	85 02.2 +06.7 101.0	84 04.9 +05.8 99.0	83 07.2 +05.3 97.5	82 09.4 +04.9 96.4	81 11.5 +04.6 95.5
14°	85 08.9 -05.5 89.4	84 10.7 -04.3 89.3	83 12.5 -03.5 89.2	82 14.3 -02.8 89.0	81 16.1 -02.3 88.9
15°	85 03.4 -17.0 77.7	84 06.4 -14.2 79.5	83 09.0 -12.0 80.7	82 11.5 -10.4 81.7	81 13.8 -09.0 82.3
16°	84 46.4 -26.9 66.9	83 52.2 -23.0 70.2	82 57.0 -19.9 72.6	82 01.1 -17.3 74.5	81 04.8 -15.3 75.9
17°	84 19.5 -34.6 57.4	83 29.2 -30.3 61.8	82 37.1 -26.7 65.1	81 43.8 -23.8 67.7	80 49.5 -21.2 69.8
18°	83 44.9 -40.4 49.6	82 58.9 -36.1 54.5	82 10.4 -32.4 58.3	81 20.0 -29.2 61.5	80 28.3 -26.5 64.0
19°	83 04.5 -44.7 43.1	82 22.8 -40.8 48.2	81 38.0 -37.2 52.4	80 50.8 -33.9 55.8	80 01.8 -31.0 58.7
20°	82 19.8 -47.9 37.9	81 42.0 -44.3 42.9	81 00.8 -40.9 47.2	80 16.9 -37.9 50.8	79 30.8 -35.0 53.9
21°	81 31.9 -50.1 33.5	80 57.7 -47.1 38.4	80 19.9 -44.1 42.6	79 39.0 -41.1 46.3	78 55.8 -38.3 49.5
22°	80 41.8 -52.0 30.0	80 10.6 -49.2 34.6	79 35.8 -46.5 38.7	78 57.9 -43.7 42.4	78 17.5 -41.2 45.6
23°	79 49.8 -53.3 27.0	79 21.4 -50.9 31.4	78 49.3 -48.4 35.4	78 14.2 -46.0 38.9	77 36.3 -43.5 42.1
24°	78 56.5 -54.3 24.5	78 30.5 -52.3 28.6	78 00.9 -50.1 32.4	77 28.2 -47.8 35.9	76 52.8 -45.6 39.0
25°	78 02.2 -55.2 22.4	77 38.2 -53.3 26.3	77 10.8 -51.4 29.9	76 40.4 -49.4 33.2	76 07.2 -47.3 36.2
26°	77 07.0 -55.8 20.6	76 44.9 -54.3 24.2	76 19.4 -52.4 27.6	75 51.0 -50.6 30.8	75 19.9 -48.7 33.7
27°	76 11.2 -56.3 19.0	75 50.6 -54.9 22.4	75 27.0 -53.4 25.6	75 00.4 -51.7 28.6	74 31.2 -49.9 31.5
28°	75 14.9 -56.8 17.6	74 55.7 -55.5 20.8	74 33.6 -54.1 23.8	74 08.7 -52.6 26.7	73 41.3 -51.0 29.5
29°	74 18.1 -57.2 16.4	74 00.2 -56.0 19.4	73 39.5 -54.8 22.3	73 16.1 -53.3 25.0	72 50.3 -51.9 27.6

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Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	72 51.2 +48.7 143.9	72 15.8 +47.0 141.2	71 38.4 +45.4 138.7	70 59.0 +43.9 136.3	70 18.0 +42.4 134.1
1°	73 39.9 +47.3 141.9	73 02.8 +45.7 139.1	72 23.8 +43.9 136.6	71 42.9 +42.3 134.2	71 00.4 +40.7 132.0
2°	74 27.2 +45.9 139.6	73 48.5 +44.0 136.9	73 07.7 +42.3 134.3	72 25.2 +40.6 131.9	71 41.1 +39.0 129.7
3°	75 13.1 +44.2 137.2	74 32.5 +42.2 134.4	73 50.0 +40.3 131.8	73 05.8 +38.6 129.4	72 20.1 +37.0 127.2
4°	75 57.3 +42.1 134.5	75 14.7 +40.1 131.6	74 30.3 +38.2 129.1	73 44.4 +36.4 126.7	72 57.1 +34.8 124.6
5°	76 39.4 +39.7 131.4	75 54.8 +37.7 128.6	75 08.5 +35.8 126.1	74 20.8 +34.0 123.8	73 31.9 +32.4 121.8
6°	77 19.1 +37.1 128.1	76 32.5 +34.9 125.4	75 44.3 +33.0 122.9	74 54.8 +31.3 120.7	74 04.3 +29.7 118.8
7°	77 56.2 +33.8 124.4	77 07.4 +31.7 121.8	76 17.3 +29.9 119.5	75 26.1 +28.2 117.4	74 34.0 +26.7 115.5
8°	78 30.0 +30.1 120.4	77 39.1 +28.2 117.9	76 47.2 +26.4 115.7	75 54.3 +24.9 113.8	75 00.7 +23.6 112.1
9°	79 00.1 +26.0 116.0	78 07.3 +24.1 113.7	77 13.6 +22.6 111.8	76 19.2 +21.2 110.0	75 24.3 +20.0 108.5
10°	79 26.1 +21.2 111.1	78 31.4 +19.7 109.2	77 36.2 +18.3 107.5	76 40.4 +17.3 106.0	75 44.3 +16.3 104.7
11°	79 47.3 +16.0 106.0	78 51.1 +14.8 104.4	77 54.5 +13.9 103.0	76 57.7 +13.0 101.8	76 00.6 +12.3 100.8
12°	80 03.3 +10.2 100.4	79 05.9 +09.6 99.3	78 08.4 +09.0 98.3	77 10.7 +08.6 97.5	76 12.9 +08.2 96.7
13°	80 13.5 +04.4 94.7	79 15.5 +04.2 94.0	78 17.4 +04.1 93.5	77 19.3 +04.0 93.0	76 21.1 +04.0 92.5
14°	80 17.9 -01.8 88.8	79 19.7 -01.4 88.7	78 21.5 -01.1 88.5	77 23.3 -00.7 88.4	76 25.1 -00.4 88.3
15°	80 16.1 -07.9 82.9	79 18.3 -06.9 83.3	78 20.4 -06.0 83.6	77 22.6 -05.4 83.8	76 24.7 -04.7 84.0
16°	80 08.2 -13.6 77.0	79 11.4 -12.2 77.9	78 14.4 -11.0 78.7	77 17.2 -09.9 79.3	76 20.0 -09.0 79.8
17°	79 54.6 -19.1 71.4	78 59.2 -17.3 72.8	78 03.4 -15.7 73.9	77 07.3 -14.3 74.8	76 11.0 -13.0 75.6
18°	79 35.5 -24.1 66.1	78 41.9 -21.9 67.8	77 47.7 -20.1 69.3	76 53.0 -18.4 70.5	75 58.0 -17.0 71.6
19°	79 11.4 -28.4 61.1	78 20.0 -26.2 63.1	77 27.6 -24.1 64.9	76 34.6 -22.3 66.4	75 41.0 -20.7 67.7
20°	78 43.0 -32.4 56.5	77 53.8 -30.0 58.8	77 03.5 -27.9 60.7	76 12.3 -25.9 62.4	75 20.3 -24.1 63.9
21°	78 10.6 -35.7 52.3	77 23.8 -33.4 54.7	76 35.6 -31.1 56.8	75 46.4 -29.2 58.7	74 56.2 -27.3 60.3
22°	77 34.9 -38.7 48.5	76 50.4 -36.3 51.0	76 04.5 -34.2 53.2	75 17.2 -32.1 55.2	74 28.9 -30.2 57.0
23°	76 56.2 -41.2 45.0	76 14.1 -38.9 47.6	75 30.3 -36.8 49.9	74 45.1 -34.7 51.9	73 58.7 -32.8 53.8
24°	76 15.0 -43.4 41.9	75 35.2 -41.2 44.4	74 53.5 -39.1 46.8	74 10.4 -37.1 48.9	73 25.9 -35.3 50.8
25°	75 31.6 -45.1 39.0	74 54.0 -43.2 41.6	74 14.4 -41.1 43.9	73 33.3 -39.3 46.1	72 50.6 -37.3 48.0
26°	74 46.5 -46.8 36.5	74 10.8 -44.8 39.0	73 33.3 -43.0 41.3	72 54.0 -41.1 43.4	72 13.3 -39.3 45.4
27°	73 59.7 -48.2 34.1	73 26.0 -46.4 36.6	72 50.3 -44.5 38.9	72 12.9 -42.7 41.0	71 34.0 -41.1 43.0
28°	73 11.5 -49.3 32.0	72 39.6 -47.6 34.4	72 05.8 -46.0 36.7	71 30.2 -44.3 38.8	70 52.9 -42.6 40.7
29°	72 22.2 -50.3 30.1	71 52.0 -48.8 32.4	71 19.8 -47.1 34.6	70 45.9 -45.6 36.7	70 10.3 -43.9 38.6

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	69 35.5 +40.9 132.1	68 51.7 +39.4 130.2	68 06.6 +38.1 128.4	67 20.4 +36.9 126.7	66 33.2 +35.7 125.1
1°	70 16.4 +39.2 129.9	69 31.1 +37.9 128.0	68 44.7 +36.5 126.3	67 57.3 +35.2 124.6	67 08.9 +34.1 123.0
2°	70 55.6 +37.5 127.7	70 09.0 +36.0 125.8	69 21.2 +34.7 124.0	68 32.5 +33.5 122.4	67 43.0 +32.3 120.9
3°	71 33.1 +35.5 125.2	70 45.0 +34.1 123.4	69 55.9 +32.8 121.7	69 06.0 +31.5 120.1	68 15.3 +30.3 118.7
4°	72 08.6 +33.3 122.6	71 19.1 +31.9 120.9	70 28.7 +30.6 119.2	69 37.5 +29.4 117.7	68 45.6 +28.3 116.3
5°	72 41.9 +30.9 119.9	71 51.0 +29.5 118.2	70 59.3 +28.3 116.6	70 06.9 +27.2 115.2	69 13.9 +26.2 113.8
6°	73 12.8 +28.3 117.0	72 20.5 +27.0 115.3	71 27.6 +25.8 113.9	70 34.1 +24.8 112.5	69 40.1 +23.8 111.3
7°	73 41.1 +25.4 113.9	72 47.5 +24.3 112.4	71 53.4 +23.2 111.0	70 58.9 +22.2 109.7	70 03.9 +21.3 108.6
8°	74 06.5 +22.3 110.6	73 11.8 +21.2 109.2	72 16.6 +20.3 108.0	71 21.1 +19.4 106.9	70 25.2 +18.7 105.8
9°	74 28.8 +19.0 107.2	73 33.0 +18.1 106.0	72 36.9 +17.3 104.9	71 40.5 +16.6 103.9	70 43.9 +15.9 103.0
10°	74 47.8 +15.5 103.6	73 51.1 +14.8 102.6	72 54.2 +14.1 101.6	71 57.1 +13.6 100.8	70 59.8 +13.1 100.0
11°	75 03.3 +11.8 99.9	74 05.9 +11.2 99.1	73 08.3 +10.9 98.3	72 10.7 +10.4 97.6	71 12.9 +10.2 97.0
12°	75 15.1 +07.9 96.1	74 17.1 +07.7 95.5	73 19.2 +07.4 94.9	72 21.1 +07.3 94.4	71 23.1 +07.1 94.0
13°	75 23.0 +03.9 92.1	74 24.8 +03.9 91.8	73 26.6 +03.9 91.4	72 28.4 +03.9 91.1	71 30.2 +04.0 90.8
14°	75 26.9 -00.1 88.2	74 28.7 +00.1 88.1	73 30.5 +00.4 87.9	72 32.3 +00.7 87.8	71 34.2 +00.8 87.7
15°	75 26.8 -04.2 84.2	74 28.8 -03.6 84.3	73 30.9 -03.1 84.4	72 33.0 -02.7 84.5	71 35.0 -02.3 84.5
16°	75 22.6 -08.1 80.2	74 25.2 -07.3 80.6	73 27.8 -06.7 80.9	72 30.3 -06.0 81.1	71 32.7 -05.4 81.4
17°	75 14.5 -11.9 76.3	74 17.9 -11.0 76.9	73 21.1 -10.0 77.4	72 24.3 -09.3 77.8	71 27.3 -08.5 78.2
18°	75 02.6 -15.7 72.5	74 06.9 -14.4 73.3	73 11.1 -13.4 74.0	72 15.0 -12.4 74.6	71 18.8 -11.5 75.1
19°	74 46.9 -19.2 68.8	73 52.5 -17.9 69.8	72 57.7 -16.6 70.6	72 02.6 -15.4 71.4	71 07.3 -14.4 72.1
20°	74 27.7 -22.5 65.2	73 34.6 -21.0 66.4	72 41.1 -19.7 67.4	71 47.2 -18.4 68.3	70 52.9 -17.2 69.1
21°	74 05.2 -25.5 61.8	73 13.6 -24.0 63.1	72 21.4 -22.5 64.2	71 28.8 -21.2 65.3	70 35.7 -19.9 66.2
22°	73 39.7 -28.5 58.5	72 49.6 -26.8 59.9	71 58.9 -25.2 61.2	71 07.6 -23.8 62.3	70 15.8 -22.5 63.4
23°	73 11.2 -31.0 55.5	72 22.8 -29.3 57.0	71 33.7 -27.8 58.3	70 43.8 -26.3 59.5	69 53.3 -24.8 60.6
24°	72 40.2 -33.4 52.5	71 53.5 -31.7 54.1	71 05.9 -30.1 55.5	70 17.5 -28.6 56.8	69 28.5 -27.2 58.0
25°	72 06.8 -35.6 49.8	71 21.8 -33.9 51.4	70 35.8 -32.3 52.9	69 48.9 -30.7 54.3	69 01.3 -29.3 55.5
26°	71 31.2 -37.6 47.2	70 47.9 -35.9 48.9	70 03.5 -34.3 50.4	69 18.2 -32.7 51.8	68 32.0 -31.2 53.1
27°	70 53.6 -39.3 44.8	70 12.0 -37.7 46.5	69 29.2 -36.1 48.0	68 45.5 -34.6 49.5	68 00.8 -33.1 50.8
28°	70 14.3 -41.0 42.5	69 34.3 -39.4 44.2	68 53.1 -37.8 45.8	68 10.9 -36.3 47.2	67 27.7 -34.8 48.6
29°	69 33.3 -42.4 40.4	68 54.9 -40.8 42.1	68 15.3 -39.3 43.6	67 34.6 -37.9 45.1	66 52.9 -36.5 46.5

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	65 45.1 +34.6 123.6	64 56.3 +33.5 122.2	64 06.7 +32.4 120.9	63 16.4 +31.5 119.7	62 25.5 +30.6 118.5
1°	66 19.7 +32.9 121.6	65 29.8 +31.8 120.2	64 39.1 +30.9 119.0	63 47.9 +30.0 117.8	62 56.1 +29.1 116.6
2°	66 52.6 +31.2 119.5	66 01.6 +30.2 118.2	65 10.0 +29.2 116.9	64 17.9 +28.3 115.8	63 25.2 +27.5 114.7
3°	67 23.8 +29.3 117.3	66 31.8 +28.3 116.0	65 39.2 +27.4 114.8	64 46.2 +26.5 113.7	63 52.7 +25.7 112.7
4°	67 53.1 +27.3 115.0	67 00.1 +26.4 113.8	66 06.6 +25.5 112.7	65 12.7 +24.7 111.6	64 18.4 +23.9 110.6
5°	68 20.4 +25.2 112.6	67 26.5 +24.3 111.5	66 32.1 +23.5 110.4	65 37.4 +22.7 109.4	64 42.3 +22.0 108.5
6°	68 45.6 +22.9 110.1	67 50.8 +22.1 109.1	66 55.6 +21.3 108.1	66 00.1 +20.7 107.2	65 04.3 +20.1 106.3
7°	69 08.5 +20.6 107.6	68 12.9 +19.8 106.6	67 16.9 +19.2 105.7	66 20.8 +18.5 104.8	65 24.4 +18.0 104.1
8°	69 29.1 +18.0 104.9	68 32.7 +17.4 104.0	67 36.1 +16.8 103.2	66 39.3 +16.4 102.5	65 42.4 +15.9 101.8
9°	69 47.1 +15.4 102.2	68 50.1 +14.9 101.4	67 52.9 +14.5 100.7	66 55.7 +14.0 100.0	65 58.3 +13.6 99.4
10°	70 02.5 +12.6 99.3	69 05.0 +12.3 98.7	68 07.4 +11.9 98.1	67 09.7 +11.6 97.5	66 11.9 +11.4 97.0
11°	70 15.1 +09.9 96.5	69 17.3 +09.6 95.9	68 19.3 +09.4 95.4	67 21.3 +09.3 95.0	66 23.3 +09.1 94.6
12°	70 25.0 +07.0 93.5	69 26.9 +06.8 93.1	68 28.7 +06.8 92.8	67 30.6 +06.7 92.4	66 32.4 +06.7 92.1
13°	70 32.0 +04.0 90.6	69 33.7 +04.1 90.3	68 35.5 +04.2 90.0	67 37.3 +04.2 89.8	66 39.1 +04.3 89.6
14°	70 36.0 +01.1 87.6	69 37.8 +01.3 87.4	68 39.7 +01.5 87.3	67 41.5 +01.7 87.2	66 43.4 +01.8 87.1
15°	70 37.1 -01.9 84.5	69 39.1 -01.5 84.6	68 41.2 -01.2 84.6	67 43.2 -00.9 84.5	66 45.2 -00.5 84.5
16°	70 35.2 -04.9 81.5	69 37.6 -04.4 81.7	68 40.0 -03.9 81.8	67 42.3 -03.4 81.9	66 44.7 -03.0 82.0
17°	70 30.3 -07.8 78.5	69 33.2 -07.1 78.8	68 36.1 -06.6 79.1	67 38.9 -06.0 79.3	66 41.7 -05.5 79.5
18°	70 22.5 -10.6 75.6	69 26.1 -09.9 76.0	68 29.5 -09.1 76.4	67 32.9 -08.4 76.7	66 36.2 -07.8 77.0
19°	70 11.9 -13.5 72.7	69 16.2 -12.5 73.2	68 20.4 -11.7 73.7	67 24.5 -10.9 74.1	66 28.4 -10.1 74.5
20°	69 58.4 -16.1 69.8	69 03.7 -15.2 70.4	68 08.7 -14.2 71.0	67 13.6 -13.3 71.5	66 18.3 -12.5 72.0
21°	69 42.3 -18.8 67.0	68 48.5 -17.6 67.8	67 54.5 -16.6 68.4	67 00.3 -15.7 69.0	66 05.8 -14.7 69.6
22°	69 23.5 -21.2 64.3	68 30.9 -20.0 65.1	67 37.9 -18.9 65.9	66 44.6 -17.8 66.6	65 51.1 -16.9 67.2
23°	69 02.3 -23.5 61.7	68 10.9 -22.3 62.6	67 19.0 -21.1 63.4	66 26.8 -20.0 64.2	65 34.2 -18.9 64.9
24°	68 38.8 -25.8 59.1	67 48.6 -24.5 60.1	66 57.9 -23.3 61.0	66 06.8 -22.2 61.8	65 15.3 -21.0 62.6
25°	68 13.0 -27.9 56.6	67 24.1 -26.6 57.7	66 34.6 -25.3 58.7	65 44.6 -24.0 59.5	64 54.3 -23.0 60.4
26°	67 45.1 -29.8 54.3	66 57.5 -28.5 55.4	66 09.3 -27.2 56.4	65 20.6 -26.0 57.3	64 31.3 -24.8 58.2
27°	67 15.3 -31.7 52.0	66 29.0 -30.3 53.2	65 42.1 -29.0 54.2	64 54.6 -27.7 55.2	64 06.5 -26.5 56.1
28°	66 43.6 -33.4 49.8	65 58.7 -32.0 51.0	65 13.1 -30.7 52.1	64 26.9 -29.5 53.1	63 40.0 -28.2 54.1
29°	66 10.2 -35.0 47.8	65 26.7 -33.7 49.0	64 42.4 -32.3 50.1	63 57.4 -31.0 51.1	63 11.8 -29.8 52.1

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	61 34.1 +29.8 117.4	60 42.2 +28.9 116.4	59 49.8 +28.2 115.4	58 57.0 +27.5 114.5	58 03.8 +26.8 113.6
1°	62 03.9 +28.2 115.6	61 11.1 +27.5 114.6	60 18.0 +26.7 113.6	59 24.5 +26.0 112.7	58 30.6 +25.4 111.9
2°	62 32.1 +26.7 113.7	61 38.6 +25.9 112.7	60 44.7 +25.2 111.8	59 50.5 +24.6 110.9	58 56.0 +23.9 110.1
3°	62 58.8 +24.9 111.7	62 04.5 +24.3 110.8	61 09.9 +23.7 109.9	60 15.1 +23.0 109.1	59 19.9 +22.5 108.3
4°	63 23.7 +23.3 109.7	62 28.8 +22.6 108.8	61 33.6 +21.9 108.0	60 38.1 +21.4 107.2	59 42.4 +20.8 106.5
5°	63 47.0 +21.4 107.6	62 51.4 +20.8 106.8	61 55.5 +20.3 106.1	60 59.5 +19.7 105.3	60 03.2 +19.3 104.6
6°	64 08.4 +19.4 105.5	63 12.2 +18.9 104.8	62 15.8 +18.4 104.0	61 19.2 +18.0 103.4	60 22.5 +17.6 102.7
7°	64 27.8 +17.5 103.3	63 31.1 +17.1 102.6	62 34.2 +16.7 102.0	61 37.2 +16.3 101.4	60 40.1 +15.9 100.8
8°	64 45.3 +15.5 101.1	63 48.2 +15.0 100.5	62 50.9 +14.7 99.9	61 53.5 +14.4 99.3	60 56.0 +14.1 98.8
9°	65 00.8 +13.3 98.8	64 03.2 +13.1 98.3	63 05.6 +12.7 97.8	62 07.9 +12.5 97.3	61 10.1 +12.3 96.8
10°	65 14.1 +11.2 96.5	64 16.3 +10.9 96.0	63 18.3 +10.8 95.6	62 20.4 +10.6 95.2	61 22.4 +10.4 94.8
11°	65 25.3 +08.9 94.1	64 27.2 +08.8 93.8	63 29.1 +08.7 93.4	62 31.0 +08.6 93.0	61 32.8 +08.6 92.7
12°	65 34.2 +06.7 91.8	64 36.0 +06.7 91.5	63 37.8 +06.7 91.2	62 39.6 +06.6 90.9	61 41.4 +06.6 90.6
13°	65 40.9 +04.3 89.4	64 42.7 +04.4 89.1	63 44.5 +04.5 88.9	62 46.2 +04.7 88.7	61 48.0 +04.8 88.5
14°	65 45.2 +02.1 86.9	64 47.1 +02.2 86.8	63 49.0 +02.4 86.7	62 50.9 +02.6 86.5	61 52.8 +02.7 86.4
15°	65 47.3 -00.3 84.5	64 49.3 +00.1 84.5	63 51.4 +00.3 84.4	62 53.5 +00.5 84.4	61 55.5 +00.8 84.3
16°	65 47.0 -02.6 82.1	64 49.4 -02.3 82.1	63 51.7 -01.9 82.1	62 54.0 -01.5 82.2	61 56.3 -01.1 82.2
17°	65 44.4 -04.9 79.6	64 47.1 -04.4 79.8	63 49.8 -03.9 79.9	62 52.5 -03.5 80.0	61 55.2 -03.1 80.0
18°	65 39.5 -07.2 77.2	64 42.7 -06.6 77.4	63 45.9 -06.1 77.6	62 49.0 -05.6 77.8	61 52.1 -05.1 77.9
19°	65 32.3 -09.5 74.8	64 36.1 -08.8 75.1	63 39.8 -08.2 75.4	62 43.4 -07.5 75.6	61 47.0 -07.0 75.8
20°	65 22.8 -11.6 72.4	64 27.3 -10.9 72.8	63 31.6 -10.2 73.1	62 35.9 -09.6 73.4	61 40.0 -08.9 73.7
21°	65 11.2 -13.9 70.1	64 16.4 -13.1 70.5	63 21.4 -12.2 70.9	62 26.3 -11.5 71.3	61 31.1 -10.8 71.6
22°	64 57.3 -15.9 67.8	64 03.3 -15.0 68.3	63 09.2 -14.2 68.8	62 14.8 -13.4 69.2	61 20.3 -12.6 69.6
23°	64 41.4 -18.0 65.5	63 48.3 -17.0 66.1	62 55.0 -16.2 66.6	62 01.4 -15.2 67.1	61 07.7 -14.4 67.6
24°	64 23.4 -19.9 63.3	63 31.3 -19.0 63.9	62 38.8 -17.9 64.5	61 46.2 -17.1 65.1	60 53.3 -16.2 65.6
25°	64 03.5 -21.9 61.1	63 12.3 -20.8 61.8	62 20.9 -19.8 62.4	61 29.1 -18.8 63.0	60 37.1 -17.9 63.6
26°	63 41.6 -23.6 59.0	62 51.5 -22.5 59.7	62 01.1 -21.5 60.4	61 10.3 -20.5 61.1	60 19.2 -19.6 61.6
27°	63 18.0 -25.4 56.9	62 29.0 -24.3 57.7	61 39.6 -23.2 58.4	60 49.8 -22.2 59.1	59 59.6 -21.1 59.7
28°	62 52.6 -27.0 54.9	62 04.7 -25.9 55.7	61 16.4 -24.8 56.5	60 27.6 -23.7 57.2	59 38.5 -22.7 57.9
29°	62 25.6 -28.6 53.0	61 38.8 -27.4 53.8	60 51.6 -26.4 54.6	60 03.9 -25.3 55.4	59 15.8 -24.2 56.1

Latitude 14°

Declination SAME name as Latitude

Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	57 10.3 +26.1 112.7	56 16.5 +25.5 111.9	55 22.3 +24.9 111.2	54 27.9 +24.3 110.4	53 33.2 +23.8 109.7
1°	57 36.4 +24.8 111.1	56 42.0 +24.1 110.3	55 47.2 +23.7 109.6	54 52.2 +23.2 108.9	53 57.0 +22.7 108.2
2°	58 01.2 +23.3 109.4	57 06.1 +22.8 108.6	56 10.9 +22.2 107.9	55 15.4 +21.8 107.2	54 19.7 +21.3 106.6
3°	58 24.5 +21.9 107.6	57 28.9 +21.4 106.9	56 33.1 +21.0 106.2	55 37.2 +20.4 105.6	54 41.0 +20.1 105.0
4°	58 46.4 +20.4 105.8	57 50.3 +20.0 105.2	56 54.1 +19.5 104.5	55 57.6 +19.1 103.9	55 01.1 +18.7 103.4
5°	59 06.8 +18.8 104.0	58 10.3 +18.4 103.4	57 13.6 +18.0 102.8	56 16.7 +17.7 102.2	55 19.8 +17.3 101.7
6°	59 25.6 +17.2 102.1	58 28.7 +16.8 101.6	57 31.6 +16.5 101.0	56 34.4 +16.2 100.5	55 37.1 +15.9 100.0
7°	59 42.8 +15.6 100.2	58 45.5 +15.3 99.7	57 48.1 +15.0 99.2	56 50.6 +14.7 98.7	55 53.0 +14.5 98.3
8°	59 58.4 +13.8 98.3	59 00.8 +13.6 97.8	58 03.1 +13.3 97.4	57 05.3 +13.2 97.0	56 07.5 +13.0 96.5
9°	60 12.2 +12.1 96.4	59 14.4 +11.9 96.0	58 16.4 +11.8 95.5	57 18.5 +11.6 95.2	56 20.5 +11.5 94.8
10°	60 24.3 +10.4 94.4	59 26.3 +10.2 94.0	58 28.2 +10.1 93.7	57 30.1 +10.0 93.3	56 32.0 +09.9 93.0
11°	60 34.7 +08.5 92.4	59 36.5 +08.5 92.1	58 38.3 +08.4 91.8	57 40.1 +08.4 91.5	56 41.9 +08.4 91.2
12°	60 43.2 +06.6 90.4	59 45.0 +06.7 90.1	58 46.7 +06.8 89.9	57 48.5 +06.8 89.6	56 50.3 +06.8 89.4
13°	60 49.8 +04.9 88.3	59 51.7 +04.9 88.1	58 53.5 +05.0 88.0	57 55.3 +05.1 87.8	56 57.1 +05.3 87.6
14°	60 54.7 +02.9 86.3	59 56.6 +03.1 86.2	58 58.5 +03.3 86.0	58 00.4 +03.5 85.9	57 02.4 +03.6 85.8
15°	60 57.6 +01.1 84.2	59 59.7 +01.3 84.2	59 01.8 +01.5 84.1	58 03.9 +01.7 84.0	57 06.0 +02.0 83.9
16°	60 58.7 -00.9 82.2	60 01.0 -00.5 82.2	59 03.3 -00.2 82.1	58 05.6 +00.1 82.1	57 08.0 +00.4 82.1
17°	60 57.8 -02.7 80.1	60 00.5 -02.3 80.2	59 03.1 -01.9 80.2	58 05.7 -01.5 80.2	57 08.4 -01.3 80.3
18°	60 55.1 -04.6 78.1	59 58.2 -04.2 78.2	59 01.2 -03.7 78.3	58 04.2 -03.3 78.3	57 07.1 -02.8 78.4
19°	60 50.5 -06.4 76.0	59 54.0 -05.9 76.2	58 57.5 -05.4 76.3	58 00.9 -04.9 76.5	57 04.3 -04.5 76.6
20°	60 44.1 -08.3 74.0	59 48.1 -07.7 74.2	58 52.1 -07.2 74.4	57 56.0 -06.6 74.6	56 59.8 -06.0 74.7
21°	60 35.8 -10.1 71.9	59 40.4 -09.4 72.2	58 44.9 -08.8 72.5	57 49.4 -08.3 72.7	56 53.8 -07.7 72.9
22°	60 25.7 -11.9 69.9	59 31.0 -11.2 70.3	58 36.1 -10.5 70.6	57 41.1 -09.8 70.8	56 46.1 -09.2 71.1
23°	60 13.8 -13.6 68.0	59 19.8 -12.9 68.3	58 25.6 -12.1 68.7	57 31.3 -11.4 69.0	56 36.9 -10.8 69.3
24°	60 00.2 -15.4 66.0	59 06.9 -14.5 66.4	58 13.5 -13.8 66.8	57 19.9 -13.0 67.2	56 26.1 -12.2 67.5
25°	59 44.8 -17.0 64.1	58 52.4 -16.2 64.6	57 59.7 -15.3 65.0	57 06.9 -14.6 65.4	56 13.9 -13.8 65.8
26°	59 27.8 -18.6 62.2	58 36.2 -17.7 62.7	57 44.4 -16.9 63.2	56 52.3 -16.0 63.6	56 00.1 -15.2 64.0
27°	59 09.2 -20.2 60.3	58 18.5 -19.3 60.9	57 27.5 -18.4 61.4	56 36.3 -17.5 61.8	55 44.9 -16.7 62.3
28°	58 49.0 -21.7 58.5	57 59.2 -20.7 59.1	57 09.1 -19.8 59.6	56 18.8 -18.9 60.1	55 28.2 -18.1 60.6
29°	58 27.3 -23.2 56.7	57 38.5 -22.2 57.3	56 49.3 -21.2 57.9	55 59.9 -20.4 58.4	55 10.1 -19.4 58.9

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	52 38.3 +23.3 109.1	51 43.2 +22.8 108.4	50 47.8 +22.4 107.8	49 52.3 +22.0 107.2	48 56.6 +21.6 106.6
1°	53 01.6 +22.2 107.5	52 06.0 +21.7 106.9	51 10.2 +21.3 106.3	50 14.3 +20.9 105.8	49 18.2 +20.5 105.2
2°	53 23.8 +20.9 106.0	52 27.7 +20.5 105.4	51 31.5 +20.1 104.8	50 35.2 +19.7 104.3	49 38.7 +19.4 103.8
3°	53 44.7 +19.6 104.4	52 48.2 +19.3 103.8	51 51.6 +19.0 103.3	50 54.9 +18.6 102.8	49 58.1 +18.3 102.3
4°	54 04.3 +18.4 102.8	53 07.5 +18.0 102.3	52 10.6 +17.7 101.8	51 13.5 +17.4 101.3	50 16.4 +17.1 100.8
5°	54 22.7 +17.0 101.2	53 25.5 +16.8 100.7	52 28.3 +16.4 100.2	51 30.9 +16.2 99.7	50 33.5 +16.0 99.3
6°	54 39.7 +15.7 99.5	53 42.3 +15.4 99.1	52 44.7 +15.2 98.6	51 47.1 +15.0 98.2	50 49.5 +14.8 97.8
7°	54 55.4 +14.2 97.8	53 57.7 +14.0 97.4	52 59.9 +13.9 97.0	52 02.1 +13.7 96.6	51 04.3 +13.5 96.2
8°	55 09.6 +12.8 96.2	54 11.7 +12.7 95.8	53 13.8 +12.5 95.4	52 15.8 +12.4 95.0	51 17.8 +12.3 94.7
9°	55 22.4 +11.4 94.4	54 24.4 +11.3 94.1	53 26.3 +11.2 93.8	52 28.2 +11.1 93.4	51 30.1 +11.0 93.1
10°	55 33.8 +09.9 92.7	54 35.7 +09.8 92.4	53 37.5 +09.8 92.1	52 39.3 +09.8 91.8	51 41.1 +09.7 91.5
11°	55 43.7 +08.4 91.0	54 45.5 +08.4 90.7	53 47.3 +08.4 90.4	52 49.1 +08.4 90.2	51 50.8 +08.5 89.9
12°	55 52.1 +06.9 89.2	54 53.9 +06.9 89.0	53 55.7 +07.0 88.8	52 57.5 +07.0 88.5	51 59.3 +07.1 88.3
13°	55 59.0 +05.3 87.4	55 00.8 +05.5 87.2	54 02.7 +05.5 87.1	53 04.5 +05.7 86.9	52 06.4 +05.8 86.7
14°	56 04.3 +03.8 85.6	55 06.3 +03.9 85.5	54 08.2 +04.1 85.4	53 10.2 +04.3 85.2	52 12.2 +04.4 85.1
15°	56 08.1 +02.2 83.8	55 10.2 +02.5 83.8	54 12.3 +02.7 83.7	53 14.5 +02.9 83.6	52 16.6 +03.1 83.5
16°	56 10.3 +00.7 82.1	55 12.7 +00.9 82.0	54 15.0 +01.2 82.0	53 17.4 +01.5 81.9	52 19.7 +01.8 81.8
17°	56 11.0 -00.9 80.3	55 13.6 -00.5 80.3	54 16.2 -00.2 80.2	53 18.9 +00.0 80.2	52 21.5 +00.4 80.2
18°	56 10.1 -02.5 78.5	55 13.1 -02.1 78.5	54 16.0 -01.7 78.5	53 18.9 -01.3 78.6	52 21.9 -01.0 78.6
19°	56 07.6 -04.0 76.7	55 11.0 -03.6 76.8	54 14.3 -03.1 76.8	53 17.6 -02.7 76.9	52 20.9 -02.3 76.9
20°	56 03.6 -05.5 74.9	55 07.4 -05.0 75.0	54 11.2 -04.6 75.1	53 14.9 -04.1 75.2	52 18.6 -03.7 75.3
21°	55 58.1 -07.1 73.1	55 02.4 -06.6 73.3	54 06.6 -06.0 73.4	53 10.8 -05.6 73.5	52 14.9 -05.0 73.7
22°	55 51.0 -08.6 71.3	54 55.8 -08.0 71.5	54 00.6 -07.5 71.7	53 05.2 -06.8 71.9	52 09.9 -06.4 72.0
23°	55 42.4 -10.1 69.6	54 47.8 -09.5 69.8	53 53.1 -08.8 70.0	52 58.4 -08.3 70.2	52 03.5 -07.6 70.4
24°	55 32.3 -11.6 67.8	54 38.3 -10.9 68.1	53 44.3 -10.3 68.4	52 50.1 -09.6 68.6	51 55.9 -09.0 68.8
25°	55 20.7 -13.0 66.1	54 27.4 -12.3 66.4	53 34.0 -11.6 66.7	52 40.5 -11.0 67.0	51 46.9 -10.3 67.2
26°	55 07.7 -14.5 64.4	54 15.1 -13.7 64.7	53 22.4 -13.0 65.0	52 29.5 -12.2 65.3	51 36.6 -11.6 65.6
27°	54 53.2 -15.8 62.7	54 01.4 -15.1 63.1	53 09.4 -14.3 63.4	52 17.3 -13.6 63.7	51 25.0 -12.8 64.0
28°	54 37.4 -17.2 61.0	53 46.3 -16.3 61.4	52 55.1 -15.6 61.8	52 03.7 -14.8 62.2	51 12.2 -14.1 62.5
29°	54 20.2 -18.6 59.4	53 30.0 -17.7 59.8	52 39.5 -16.8 60.2	51 48.9 -16.0 60.6	50 58.1 -15.2 60.9

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Declination SAME name as Latitude

Latitude 14°

Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	48 00.7 +21.2 106.1	47 04.7 +20.8 105.6	46 08.6 +20.4 105.0	45 12.3 +20.1 104.5	44 15.9 +19.8 104.1
1°	48 21.9 +20.2 104.7	47 25.5 +19.9 104.2	46 29.0 +19.5 103.7	45 32.4 +19.2 103.2	44 35.7 +18.9 102.7
2°	48 42.1 +19.1 103.3	47 45.4 +18.7 102.8	46 48.5 +18.5 102.3	45 51.6 +18.2 101.8	44 54.6 +17.9 101.4
3°	49 01.2 +18.0 101.8	48 04.1 +17.8 101.4	47 07.0 +17.5 100.9	46 09.8 +17.2 100.5	45 12.5 +17.0 100.1
4°	49 19.2 +16.8 100.4	48 21.9 +16.6 99.9	47 24.5 +16.4 99.5	46 27.0 +16.2 99.1	45 29.5 +16.0 98.7
5°	49 36.0 +15.8 98.9	48 38.5 +15.5 98.5	47 40.9 +15.3 98.1	46 43.2 +15.2 97.7	45 45.5 +15.0 97.3
6°	49 51.8 +14.6 97.4	48 54.0 +14.4 97.0	47 56.2 +14.3 96.6	46 58.4 +14.1 96.3	46 00.5 +13.9 95.9
7°	50 06.4 +13.4 95.9	49 08.4 +13.3 95.5	48 10.5 +13.1 95.2	47 12.5 +13.0 94.8	46 14.4 +13.0 94.5
8°	50 19.8 +12.1 94.4	49 21.7 +12.1 94.0	48 23.6 +12.0 93.7	47 25.5 +11.9 93.4	46 27.4 +11.9 93.1
9°	50 31.9 +11.0 92.8	49 33.8 +10.9 92.5	48 35.6 +10.9 92.2	47 37.4 +10.9 92.0	46 39.3 +10.8 91.7
10°	50 42.9 +09.7 91.3	49 44.7 +09.7 91.0	48 46.5 +09.7 90.7	47 48.3 +09.7 90.5	46 50.1 +09.7 90.2
11°	50 52.6 +08.5 89.7	49 54.4 +08.5 89.5	48 56.2 +08.5 89.2	47 58.0 +08.6 89.0	46 59.8 +08.6 88.8
12°	51 01.1 +07.2 88.1	50 02.9 +07.3 87.9	49 04.7 +07.4 87.7	48 06.6 +07.4 87.5	47 08.4 +07.5 87.3
13°	51 08.3 +05.9 86.6	50 10.2 +06.0 86.4	49 12.1 +06.1 86.2	48 14.0 +06.3 86.1	47 15.9 +06.4 85.9
14°	51 14.2 +04.6 85.0	50 16.2 +04.8 84.8	49 18.2 +05.0 84.7	48 20.3 +05.1 84.6	47 22.3 +05.3 84.4
15°	51 18.8 +03.3 83.4	50 21.0 +03.5 83.3	49 23.2 +03.7 83.2	48 25.4 +03.9 83.1	47 27.6 +04.1 82.9
16°	51 22.1 +02.0 81.8	50 24.5 +02.3 81.7	49 26.9 +02.5 81.6	48 29.3 +02.8 81.6	47 31.7 +03.0 81.5
17°	51 24.1 +00.7 80.2	50 26.8 +01.0 80.1	49 29.4 +01.3 80.1	48 32.1 +01.5 80.0	47 34.7 +01.9 80.0
18°	51 24.8 -00.6 78.6	50 27.8 -00.3 78.6	49 30.7 +00.0 78.6	48 33.6 +00.4 78.5	47 36.6 +00.7 78.5
19°	51 24.2 -01.9 77.0	50 27.5 -01.6 77.0	49 30.7 -01.1 77.0	48 34.0 -00.8 77.0	47 37.3 -00.5 77.0
20°	51 22.3 -03.3 75.4	50 25.9 -02.8 75.4	49 29.6 -02.4 75.5	48 33.2 -02.0 75.5	47 36.8 -01.5 75.5
21°	51 19.0 -04.5 73.8	50 23.1 -04.1 73.9	49 27.2 -03.6 73.9	48 31.2 -03.1 74.0	47 35.3 -02.8 74.1
22°	51 14.5 -05.8 72.2	50 19.0 -05.3 72.3	49 23.6 -04.9 72.4	48 28.1 -04.4 72.5	47 32.5 -03.8 72.6
23°	51 08.7 -07.2 70.6	50 13.7 -06.5 70.7	49 18.7 -06.0 70.9	48 23.7 -05.5 71.0	47 28.7 -05.1 71.1
24°	51 01.5 -08.4 69.0	50 07.2 -07.9 69.2	49 12.7 -07.2 69.3	48 18.2 -06.7 69.5	47 23.6 -06.1 69.6
25°	50 53.1 -09.6 67.4	49 59.3 -09.0 67.6	49 05.5 -08.5 67.8	48 11.5 -07.8 68.0	47 17.5 -07.2 68.2
26°	50 43.5 -10.9 65.9	49 50.3 -10.2 66.1	48 57.0 -09.6 66.3	48 03.7 -09.0 66.5	47 10.3 -08.4 66.7
27°	50 32.6 -12.1 64.3	49 40.1 -11.5 64.6	48 47.4 -10.7 64.8	47 54.7 -10.1 65.0	47 01.9 -09.5 65.2
28°	50 20.5 -13.3 62.8	49 28.6 -12.6 63.1	48 36.7 -11.9 63.3	47 44.6 -11.2 63.6	46 52.4 -10.5 63.8
29°	50 07.2 -14.5 61.3	49 16.0 -13.7 61.6	48 24.8 -13.1 61.8	47 33.4 -12.3 62.1	46 41.9 -11.7 62.4

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	43 19.3 +19.6 103.6	42 22.7 +19.2 103.1	41 26.0 +18.9 102.7	40 29.1 +18.7 102.3	39 32.2 +18.4 101.9
1°	43 38.9 +18.6 102.3	42 41.9 +18.4 101.9	41 44.9 +18.1 101.4	40 47.8 +17.9 101.0	39 50.6 +17.7 100.6
2°	43 57.5 +17.7 101.0	43 00.3 +17.4 100.6	42 03.0 +17.2 100.2	41 05.7 +17.0 99.8	40 08.3 +16.8 99.4
3°	44 15.2 +16.7 99.6	43 17.7 +16.6 99.3	42 20.2 +16.4 98.9	41 22.7 +16.2 98.5	40 25.1 +16.0 98.1
4°	44 31.9 +15.8 98.3	43 34.3 +15.6 97.9	42 36.6 +15.5 97.6	41 38.9 +15.3 97.2	40 41.1 +15.1 96.9
5°	44 47.7 +14.9 96.9	43 49.9 +14.7 96.6	42 52.1 +14.5 96.3	41 54.2 +14.4 95.9	40 56.2 +14.3 95.6
6°	45 02.6 +13.8 95.6	44 04.6 +13.7 95.2	43 06.6 +13.6 94.9	42 08.6 +13.5 94.6	41 10.5 +13.5 94.3
7°	45 16.4 +12.8 94.2	44 18.3 +12.8 93.9	43 20.2 +12.7 93.6	42 22.1 +12.6 93.3	41 24.0 +12.5 93.0
8°	45 29.2 +11.9 92.8	44 31.1 +11.8 92.5	43 32.9 +11.7 92.2	42 34.7 +11.7 92.0	41 36.5 +11.7 91.7
9°	45 41.1 +10.7 91.4	44 42.9 +10.7 91.1	43 44.6 +10.8 90.9	42 46.4 +10.8 90.6	41 48.2 +10.8 90.4
10°	45 51.8 +09.8 90.0	44 53.6 +09.8 89.8	43 55.4 +09.8 89.5	42 57.2 +09.8 89.3	41 59.0 +09.8 89.1
11°	46 01.6 +08.7 88.6	45 03.4 +08.7 88.4	44 05.2 +08.8 88.2	43 07.0 +08.9 87.9	42 08.8 +09.0 87.7
12°	46 10.3 +07.6 87.2	45 12.1 +07.7 87.0	44 14.0 +07.8 86.8	43 15.9 +07.9 86.6	42 17.8 +07.9 86.4
13°	46 17.9 +06.5 85.7	45 19.8 +06.7 85.6	44 21.8 +06.8 85.4	43 23.8 +06.9 85.2	42 25.7 +07.1 85.1
14°	46 24.4 +05.4 84.3	45 26.5 +05.6 84.1	44 28.6 +05.7 84.0	43 30.7 +05.9 83.9	42 32.8 +06.1 83.7
15°	46 29.8 +04.4 82.8	45 32.1 +04.5 82.7	44 34.3 +04.8 82.6	43 36.6 +04.9 82.5	42 38.9 +05.1 82.4
16°	46 34.2 +03.2 81.4	45 36.6 +03.5 81.3	44 39.1 +03.7 81.2	43 41.5 +04.0 81.1	42 44.0 +04.2 81.0
17°	46 37.4 +02.1 79.9	45 40.1 +02.4 79.9	44 42.8 +02.7 79.8	43 45.5 +02.9 79.7	42 48.2 +03.2 79.6
18°	46 39.5 +01.1 78.5	45 42.5 +01.3 78.4	44 45.5 +01.6 78.4	43 48.4 +02.0 78.3	42 51.4 +02.3 78.3
19°	46 40.6 -00.1 77.0	45 43.8 +00.3 77.0	44 47.1 +00.6 77.0	43 50.4 +00.9 77.0	42 53.7 +01.3 76.9
20°	46 40.5 -01.2 75.6	45 44.1 -00.8 75.6	44 47.7 -00.4 75.6	43 51.3 +00.0 75.6	42 55.0 +00.3 75.6
21°	46 39.3 -02.3 74.1	45 43.3 -01.9 74.1	44 47.3 -01.5 74.2	43 51.3 -01.1 74.2	42 55.3 -00.7 74.2
22°	46 37.0 -03.4 72.6	45 41.4 -03.0 72.7	44 45.8 -02.5 72.8	43 50.2 -02.1 72.8	42 54.6 -01.7 72.8
23°	46 33.6 -04.5 71.2	45 38.4 -04.0 71.3	44 43.3 -03.6 71.3	43 48.1 -03.1 71.4	42 52.9 -02.6 71.5
24°	46 29.1 -05.7 69.7	45 34.4 -05.1 69.9	44 39.7 -04.5 69.9	43 45.0 -04.0 70.0	42 50.3 -03.6 70.1
25°	46 23.4 -06.6 68.3	45 29.3 -06.1 68.4	44 35.2 -05.6 68.5	43 41.0 -05.1 68.6	42 46.7 -04.5 68.7
26°	46 16.8 -07.8 66.9	45 23.2 -07.2 67.0	44 29.6 -06.7 67.1	43 35.9 -06.1 67.3	42 42.2 -05.5 67.4
27°	46 09.0 -08.9 65.4	45 16.0 -08.2 65.6	44 22.9 -07.6 65.8	43 29.8 -07.0 65.9	42 36.7 -06.5 66.0
28°	46 00.1 -09.9 64.0	45 07.8 -09.3 64.2	44 15.3 -08.6 64.4	43 22.8 -08.0 64.5	42 30.2 -07.4 64.7
29°	45 50.2 -10.9 62.6	44 58.5 -10.3 62.8	44 06.7 -09.6 63.0	43 14.8 -09.0 63.2	42 22.8 -08.4 63.3

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Latitude 14°

Declination SAME name as Latitude

Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	38 35.2 +18.2 101.5	37 38.1 +18.0 101.1	36 40.9 +17.8 100.7	35 43.7 +17.5 100.3	34 46.4 +17.3 100.0
1°	38 53.4 +17.4 100.3	37 56.1 +17.2 99.9	36 58.7 +17.0 99.5	36 01.2 +16.9 99.2	35 03.7 +16.7 98.8
2°	39 10.8 +16.6 99.0	38 13.3 +16.4 98.7	37 15.7 +16.3 98.3	36 18.1 +16.1 98.0	35 20.4 +15.9 97.6
3°	39 27.4 +15.9 97.8	38 29.7 +15.7 97.4	37 32.0 +15.5 97.1	36 34.2 +15.4 96.8	35 36.3 +15.3 96.4
4°	39 43.3 +15.0 96.5	38 45.4 +14.9 96.2	37 47.5 +14.8 95.9	36 49.6 +14.6 95.6	35 51.6 +14.6 95.3
5°	39 58.3 +14.2 95.3	39 00.3 +14.1 95.0	38 02.3 +14.0 94.6	37 04.2 +14.0 94.3	36 06.2 +13.8 94.1
6°	40 12.5 +13.3 94.0	39 14.4 +13.3 93.7	38 16.3 +13.2 93.4	37 18.2 +13.1 93.1	36 20.0 +13.1 92.8
7°	40 25.8 +12.6 92.7	39 27.7 +12.4 92.4	38 29.5 +12.4 92.2	37 31.3 +12.4 91.9	36 33.1 +12.4 91.6
8°	40 38.4 +11.6 91.4	39 40.1 +11.7 91.2	38 41.9 +11.7 90.9	37 43.7 +11.6 90.7	36 45.5 +11.6 90.4
9°	40 50.0 +10.8 90.1	39 51.8 +10.8 89.9	38 53.6 +10.8 89.7	37 55.3 +10.9 89.4	36 57.1 +10.9 89.2
10°	41 00.8 +09.9 88.8	40 02.6 +09.9 88.6	39 04.4 +10.0 88.4	38 06.2 +10.0 88.2	37 08.0 +10.1 88.0
11°	41 10.7 +09.0 87.5	40 12.5 +09.1 87.3	39 14.4 +09.1 87.1	38 16.2 +09.2 86.9	37 18.1 +09.3 86.7
12°	41 19.7 +08.0 86.2	40 21.6 +08.2 86.0	39 23.5 +08.3 85.8	38 25.4 +08.5 85.7	37 27.4 +08.5 85.5
13°	41 27.7 +07.2 84.9	40 29.8 +07.3 84.7	39 31.8 +07.5 84.6	38 33.9 +07.6 84.4	37 35.9 +07.8 84.2
14°	41 34.9 +06.3 83.6	40 37.1 +06.4 83.4	39 39.3 +06.6 83.3	38 41.5 +06.7 83.1	37 43.7 +06.9 83.0
15°	41 41.2 +05.3 82.2	40 43.5 +05.6 82.1	39 45.9 +05.7 82.0	38 48.2 +06.0 81.8	37 50.6 +06.1 81.7
16°	41 46.5 +04.5 80.9	40 49.1 +04.6 80.8	39 51.6 +04.9 80.7	38 54.2 +05.1 80.6	37 56.7 +05.4 80.5
17°	41 51.0 +03.4 79.6	40 53.7 +03.7 79.5	39 56.5 +04.0 79.4	38 59.3 +04.2 79.3	38 02.1 +04.5 79.2
18°	41 54.4 +02.6 78.2	40 57.4 +02.9 78.2	40 00.5 +03.1 78.1	39 03.5 +03.4 78.0	38 06.6 +03.7 77.9
19°	41 57.0 +01.6 76.9	41 00.3 +01.9 76.8	40 03.6 +02.2 76.8	39 06.9 +02.6 76.7	38 10.3 +02.9 76.7
20°	41 58.6 +00.6 75.5	41 02.2 +01.0 75.5	40 05.8 +01.4 75.5	39 09.5 +01.7 75.4	38 13.2 +02.0 75.4
21°	41 59.2 -00.2 74.2	41 03.2 +00.1 74.2	40 07.2 +00.5 74.2	39 11.2 +00.9 74.1	38 15.2 +01.2 74.1
22°	41 59.0 -01.3 72.8	41 03.3 -00.8 72.9	40 07.7 -00.4 72.9	39 12.1 +00.0 72.9	38 16.4 +00.4 72.8
23°	41 57.7 -02.1 71.5	41 02.5 -01.7 71.5	40 07.3 -01.3 71.5	39 12.1 -00.9 71.6	38 16.8 -00.4 71.6
24°	41 55.6 -03.1 70.2	41 00.8 -02.6 70.2	40 06.0 -02.2 70.2	39 11.2 -01.7 70.3	38 16.4 -01.2 70.3
25°	41 52.5 -04.1 68.8	40 58.2 -03.6 68.9	40 03.8 -03.0 68.9	39 09.5 -02.5 69.0	38 15.2 -02.1 69.0
26°	41 48.4 -04.9 67.5	40 54.6 -04.4 67.6	40 00.8 -03.9 67.6	39 07.0 -03.4 67.7	38 13.1 -02.9 67.7
27°	41 43.5 -05.9 66.1	40 50.2 -05.3 66.2	39 56.9 -04.8 66.3	39 03.6 -04.3 66.4	38 10.2 -03.7 66.5
28°	41 37.6 -06.9 64.8	40 44.9 -06.3 64.9	39 52.1 -05.7 65.0	38 59.3 -05.1 65.1	38 06.5 -04.6 65.2
29°	41 30.7 -07.7 63.5	40 38.6 -07.1 63.6	39 46.4 -06.5 63.7	38 54.2 -05.9 63.8	38 01.9 -05.3 63.9

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	33 49.0 +17.2 99.6	32 51.6 +16.9 99.3	31 54.1 +16.8 98.9	30 56.6 +16.6 98.6	29 59.0 +16.4 98.3
1°	34 06.2 +16.4 98.5	33 08.5 +16.4 98.1	32 10.9 +16.2 97.8	31 13.2 +16.0 97.5	30 15.4 +16.0 97.2
2°	34 22.6 +15.9 97.3	33 24.9 +15.7 97.0	32 27.1 +15.5 96.7	31 29.2 +15.5 96.3	30 31.4 +15.3 96.0
3°	34 38.5 +15.1 96.1	33 40.6 +15.0 95.8	32 42.6 +15.0 95.5	31 44.7 +14.8 95.2	30 46.7 +14.7 94.9
4°	34 53.6 +14.5 94.9	33 55.6 +14.4 94.7	32 57.6 +14.3 94.4	31 59.5 +14.2 94.1	31 01.4 +14.2 93.8
5°	35 08.1 +13.8 93.8	34 10.0 +13.7 93.5	33 11.9 +13.6 93.2	32 13.7 +13.7 92.9	31 15.6 +13.6 92.7
6°	35 21.9 +13.0 92.6	34 23.7 +13.0 92.3	33 25.5 +13.0 92.0	32 27.4 +12.9 91.8	31 29.2 +12.9 91.5
7°	35 34.9 +12.4 91.4	34 36.7 +12.4 91.1	33 38.5 +12.4 90.9	32 40.3 +12.3 90.6	31 42.1 +12.3 90.4
8°	35 47.3 +11.6 90.2	34 49.1 +11.6 89.9	33 50.9 +11.6 89.7	32 52.6 +11.7 89.4	31 54.4 +11.7 89.2
9°	35 58.9 +10.9 89.0	35 00.7 +10.9 88.7	34 02.5 +11.0 88.5	33 04.3 +11.0 88.3	32 06.1 +11.1 88.1
10°	36 09.8 +10.2 87.7	35 11.6 +10.3 87.5	34 13.5 +10.3 87.3	33 15.3 +10.4 87.1	32 17.2 +10.4 86.9
11°	36 20.0 +09.4 86.5	35 21.9 +09.5 86.3	34 23.8 +09.6 86.1	33 25.7 +09.7 85.9	32 27.6 +09.8 85.7
12°	36 29.4 +08.6 85.3	35 31.4 +08.7 85.1	34 33.4 +08.8 84.9	33 35.4 +09.0 84.7	32 37.4 +09.1 84.6
13°	36 38.0 +07.9 84.1	35 40.1 +08.0 83.9	34 42.2 +08.2 83.7	33 44.4 +08.3 83.6	32 46.5 +08.5 83.4
14°	36 45.9 +07.1 82.8	35 48.1 +07.3 82.7	34 50.4 +07.5 82.5	33 52.7 +07.6 82.4	32 55.0 +07.8 82.2
15°	36 53.0 +06.3 81.6	35 55.4 +06.6 81.4	34 57.9 +06.7 81.3	34 00.3 +07.0 81.2	33 02.8 +07.1 81.0
16°	36 59.3 +05.6 80.3	36 02.0 +05.7 80.2	35 04.6 +06.0 80.1	34 07.3 +06.2 80.0	33 09.9 +06.5 79.8
17°	37 04.9 +04.8 79.1	36 07.7 +05.1 79.0	35 10.6 +05.3 78.9	34 13.5 +05.5 78.8	33 16.4 +05.8 78.7
18°	37 09.7 +03.9 77.8	36 12.8 +04.2 77.8	35 15.9 +04.5 77.7	34 19.0 +04.8 77.6	33 22.2 +05.1 77.5
19°	37 13.6 +03.2 76.6	36 17.0 +03.5 76.5	35 20.4 +03.8 76.4	34 23.8 +04.1 76.4	33 27.3 +04.4 76.3
20°	37 16.8 +02.4 75.3	36 20.5 +02.7 75.3	35 24.2 +03.1 75.2	34 27.9 +03.4 75.1	33 31.7 +03.7 75.1
21°	37 19.2 +01.6 74.1	36 23.2 +02.0 74.0	35 27.3 +02.3 74.0	34 31.3 +02.7 73.9	33 35.4 +03.0 73.9
22°	37 20.8 +00.8 72.8	36 25.2 +01.2 72.8	35 29.6 +01.6 72.8	34 34.0 +01.9 72.7	33 38.4 +02.3 72.7
23°	37 21.6 +00.0 71.6	36 26.4 +00.4 71.6	35 31.2 +00.8 71.5	34 35.9 +01.3 71.5	33 40.7 +01.7 71.5
24°	37 21.6 -00.8 70.3	36 26.8 -00.4 70.3	35 32.0 +00.1 70.3	34 37.2 +00.5 70.3	33 42.4 +00.9 70.3
25°	37 20.8 -01.6 69.0	36 26.4 -01.1 69.1	35 32.1 -00.7 69.1	34 37.7 -00.2 69.1	33 43.3 +00.2 69.1
26°	37 19.2 -02.4 67.8	36 25.3 -01.9 67.8	35 31.4 -01.4 67.8	34 37.5 -01.0 67.9	33 43.5 -00.4 67.9
27°	37 16.8 -03.2 66.5	36 23.4 -02.7 66.6	35 30.0 -02.2 66.6	34 36.5 -01.7 66.6	33 43.1 -01.2 66.7
28°	37 13.6 -04.0 65.3	36 20.7 -03.4 65.3	35 27.8 -02.9 65.4	34 34.8 -02.3 65.4	33 41.9 -01.9 65.5
29°	37 09.6 -04.8 64.0	36 17.3 -04.3 64.1	35 24.9 -03.7 64.2	34 32.5 -03.1 64.2	33 40.0 -02.5 64.3

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Declination SAME name as Latitude

Latitude 14°

Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	29 01.3 +16.4 98.0	28 03.6 +16.2 97.6	27 05.9 +16.1 97.3	26 08.2 +15.9 97.0	25 10.4 +15.8 96.7
1°	29 17.7 +15.7 96.8	28 19.8 +15.7 96.5	27 22.0 +15.5 96.2	26 24.1 +15.4 96.0	25 26.2 +15.3 95.7
2°	29 33.4 +15.3 95.7	28 35.5 +15.1 95.4	27 37.5 +15.1 95.2	26 39.5 +15.0 94.9	25 41.5 +14.9 94.6
3°	29 48.7 +14.6 94.6	28 50.6 +14.6 94.3	27 52.6 +14.5 94.1	26 54.5 +14.4 93.8	25 56.4 +14.4 93.5
4°	30 03.3 +14.1 93.5	29 05.2 +14.1 93.2	28 07.1 +14.0 93.0	27 08.9 +14.0 92.7	26 10.8 +13.9 92.4
5°	30 17.4 +13.6 92.4	29 19.3 +13.4 92.1	28 21.1 +13.4 91.9	27 22.9 +13.4 91.6	26 24.7 +13.4 91.3
6°	30 31.0 +12.9 91.3	29 32.7 +13.0 91.0	28 34.5 +13.0 90.8	27 36.3 +12.9 90.5	26 38.1 +12.9 90.3
7°	30 43.9 +12.3 90.1	29 45.7 +12.3 89.9	28 47.5 +12.3 89.6	27 49.2 +12.4 89.4	26 51.0 +12.4 89.2
8°	30 56.2 +11.8 89.0	29 58.0 +11.8 88.8	28 59.8 +11.8 88.5	28 01.6 +11.9 88.3	27 03.4 +11.9 88.1
9°	31 08.0 +11.1 87.8	30 09.8 +11.2 87.6	29 11.6 +11.3 87.4	28 13.5 +11.3 87.2	27 15.3 +11.4 87.0
10°	31 19.1 +10.5 86.7	30 21.0 +10.6 86.5	29 22.9 +10.6 86.3	28 24.8 +10.7 86.1	27 26.7 +10.9 85.9
11°	31 29.6 +09.9 85.5	30 31.6 +09.9 85.3	29 33.5 +10.1 85.1	28 35.5 +10.2 84.9	27 37.6 +10.3 84.8
12°	31 39.5 +09.2 84.4	30 41.5 +09.4 84.2	29 43.6 +09.5 84.0	28 45.7 +09.7 83.8	27 47.9 +09.8 83.6
13°	31 48.7 +08.6 83.2	30 50.9 +08.8 83.0	29 53.1 +09.0 82.9	28 55.4 +09.1 82.7	27 57.7 +09.2 82.5
14°	31 57.3 +08.0 82.0	30 59.7 +08.1 81.9	30 02.1 +08.3 81.7	29 04.5 +08.5 81.6	28 06.9 +08.7 81.4
15°	32 05.3 +07.4 80.9	31 07.8 +07.6 80.7	30 10.4 +07.7 80.6	29 13.0 +07.9 80.4	28 15.6 +08.1 80.3
16°	32 12.7 +06.6 79.7	31 15.4 +06.9 79.6	30 18.1 +07.2 79.4	29 20.9 +07.4 79.3	28 23.7 +07.6 79.2
17°	32 19.3 +06.1 78.5	31 22.3 +06.3 78.4	30 25.3 +06.5 78.3	29 28.3 +06.8 78.2	28 31.3 +07.0 78.0
18°	32 25.4 +05.3 77.4	31 28.6 +05.6 77.2	30 31.8 +05.9 77.1	29 35.1 +06.1 77.0	28 38.3 +06.5 76.9
19°	32 30.7 +04.7 76.2	31 34.2 +05.0 76.1	30 37.7 +05.3 76.0	29 41.2 +05.6 75.9	28 44.8 +05.9 75.8
20°	32 35.4 +04.1 75.0	31 39.2 +04.4 74.9	30 43.0 +04.7 74.8	29 46.8 +05.0 74.7	28 50.7 +05.3 74.6
21°	32 39.5 +03.3 73.8	31 43.6 +03.7 73.7	30 47.7 +04.1 73.7	29 51.8 +04.4 73.6	28 56.0 +04.8 73.5
22°	32 42.8 +02.7 72.6	31 47.3 +03.1 72.6	30 51.8 +03.4 72.5	29 56.2 +03.9 72.4	29 00.8 +04.1 72.4
23°	32 45.5 +02.1 71.4	31 50.4 +02.4 71.4	30 55.2 +02.8 71.3	30 00.1 +03.2 71.3	29 04.9 +03.6 71.2
24°	32 47.6 +01.3 70.2	31 52.8 +01.8 70.2	30 58.0 +02.2 70.2	30 03.3 +02.6 70.1	29 08.5 +03.0 70.1
25°	32 48.9 +00.7 69.1	31 54.6 +01.1 69.0	31 00.2 +01.6 69.0	30 05.9 +01.9 69.0	29 11.5 +02.4 68.9
26°	32 49.6 +00.0 67.9	31 55.7 +00.4 67.9	31 01.8 +00.9 67.8	30 07.8 +01.4 67.8	29 13.9 +01.9 67.8
27°	32 49.6 -00.7 66.7	31 56.1 -00.1 66.7	31 02.7 +00.3 66.7	30 09.2 +00.8 66.7	29 15.8 +01.2 66.6
28°	32 48.9 -01.3 65.5	31 56.0 -00.9 65.5	31 03.0 -00.4 65.5	30 10.0 +00.2 65.5	29 17.0 +00.7 65.5
29°	32 47.6 -02.0 64.3	31 55.1 -01.5 64.3	31 02.6 -00.9 64.3	30 10.2 -00.5 64.3	29 17.7 +00.1 64.3

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	24 12.5 +15.7 96.4	23 14.7 +15.6 96.1	22 16.8 +15.5 95.9	21 18.8 +15.4 95.6	20 20.9 +15.3 95.3
1°	24 28.2 +15.3 95.4	23 30.3 +15.1 95.1	22 32.3 +15.0 94.8	21 34.2 +15.0 94.5	20 36.2 +14.9 94.3
2°	24 43.5 +14.8 94.3	23 45.4 +14.7 94.0	22 47.3 +14.7 93.8	21 49.2 +14.6 93.5	20 51.1 +14.6 93.2
3°	24 58.3 +14.3 93.2	24 00.1 +14.3 93.0	23 02.0 +14.2 92.7	22 03.8 +14.2 92.5	21 05.7 +14.1 92.2
4°	25 12.6 +13.9 92.2	24 14.4 +13.9 91.9	23 16.2 +13.9 91.7	22 18.0 +13.9 91.4	21 19.8 +13.8 91.2
5°	25 26.5 +13.4 91.1	24 28.3 +13.4 90.8	23 30.1 +13.4 90.6	22 31.9 +13.3 90.4	21 33.6 +13.4 90.1
6°	25 39.9 +12.9 90.0	24 41.7 +12.9 89.8	23 43.5 +12.9 89.5	22 45.2 +13.0 89.3	21 47.0 +13.0 89.1
7°	25 52.8 +12.4 88.9	24 54.6 +12.5 88.7	23 56.4 +12.5 88.5	22 58.2 +12.6 88.2	22 00.0 +12.6 88.0
8°	26 05.2 +12.0 87.8	25 07.1 +12.0 87.6	24 08.9 +12.1 87.4	23 10.8 +12.1 87.2	22 12.6 +12.2 87.0
9°	26 17.2 +11.4 86.8	25 19.1 +11.5 86.5	24 21.0 +11.6 86.3	23 22.9 +11.7 86.1	22 24.8 +11.8 85.9
10°	26 28.6 +11.0 85.7	25 30.6 +11.0 85.5	24 32.6 +11.1 85.2	23 34.6 +11.2 85.0	22 36.6 +11.3 84.8
11°	26 39.6 +10.4 84.6	25 41.6 +10.6 84.4	24 43.7 +10.7 84.2	23 45.8 +10.8 84.0	22 47.9 +10.9 83.8
12°	26 50.0 +09.9 83.5	25 52.2 +10.1 83.3	24 54.4 +10.2 83.1	23 56.6 +10.4 82.9	22 58.8 +10.5 82.7
13°	26 59.9 +09.4 82.3	26 02.3 +09.5 82.2	25 04.6 +09.7 82.0	24 07.0 +09.8 81.8	23 09.3 +10.1 81.6
14°	27 09.3 +08.9 81.2	26 11.8 +09.1 81.1	25 14.3 +09.3 80.9	24 16.8 +09.5 80.7	23 19.4 +09.6 80.6
15°	27 18.2 +08.4 80.1	26 20.9 +08.5 80.0	25 23.6 +08.7 79.8	24 26.3 +08.9 79.6	23 29.0 +09.2 79.5
16°	27 26.6 +07.8 79.0	26 29.4 +08.1 78.9	25 32.3 +08.3 78.7	24 35.2 +08.5 78.6	23 38.2 +08.7 78.4
17°	27 34.4 +07.3 77.9	26 37.5 +07.5 77.8	25 40.6 +07.8 77.6	24 43.7 +08.1 77.5	23 46.9 +08.3 77.3
18°	27 41.7 +06.7 76.8	26 45.0 +07.0 76.6	25 48.4 +07.2 76.5	24 51.8 +07.5 76.4	23 55.2 +07.8 76.2
19°	27 48.4 +06.2 75.6	26 52.0 +06.5 75.5	25 55.6 +06.8 75.4	24 59.3 +07.1 75.3	24 03.0 +07.4 75.2
20°	27 54.6 +05.6 74.5	26 58.5 +05.9 74.4	26 02.4 +06.3 74.3	25 06.4 +06.6 74.2	24 10.4 +06.9 74.1
21°	28 00.2 +05.1 73.4	27 04.4 +05.5 73.3	26 08.7 +05.7 73.2	25 13.0 +06.1 73.1	24 17.3 +06.4 73.0
22°	28 05.3 +04.5 72.3	27 09.9 +04.8 72.2	26 14.4 +05.3 72.1	25 19.1 +05.6 72.0	24 23.7 +06.0 71.9
23°	28 09.8 +04.0 71.1	27 14.7 +04.4 71.1	26 19.7 +04.7 71.0	25 24.7 +05.1 70.9	24 29.7 +05.5 70.8
24°	28 13.8 +03.4 70.0	27 19.1 +03.8 69.9	26 24.4 +04.2 69.9	25 29.8 +04.6 69.8	24 35.2 +05.0 69.7
25°	28 17.2 +02.9 68.9	27 22.9 +03.3 68.8	26 28.6 +03.7 68.8	25 34.4 +04.1 68.7	24 40.2 +04.5 68.6
26°	28 20.1 +02.2 67.7	27 26.2 +02.7 67.7	26 32.3 +03.2 67.6	25 38.5 +03.6 67.6	24 44.7 +04.1 67.5
27°	28 22.3 +01.8 66.6	27 28.9 +02.2 66.6	26 35.5 +02.7 66.5	25 42.1 +03.1 66.5	24 48.8 +03.5 66.4
28°	28 24.1 +01.1 65.5	27 31.1 +01.7 65.4	26 38.2 +02.1 65.4	25 45.2 +02.7 65.4	24 52.3 +03.1 65.3
29°	28 25.2 +00.6 64.3	27 32.8 +01.1 64.3	26 40.3 +01.6 64.3	25 47.9 +02.1 64.3	24 55.4 +02.6 64.2

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Latitude 14°

Declination SAME name as Latitude

Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	19 22.9 +15.2 95.0	18 24.9 +15.1 94.8	17 26.9 +15.0 94.5	16 28.8 +15.0 94.2	15 30.8 +14.9 94.0
1°	19 38.1 +14.9 94.0	18 40.0 +14.8 93.7	17 41.9 +14.8 93.5	16 43.8 +14.7 93.2	15 45.7 +14.6 93.0
2°	19 53.0 +14.5 93.0	18 54.8 +14.5 92.7	17 56.7 +14.4 92.5	16 58.5 +14.4 92.2	16 00.3 +14.4 92.0
3°	20 07.5 +14.1 91.9	19 09.3 +14.1 91.7	18 11.1 +14.1 91.4	17 12.9 +14.1 91.2	16 14.7 +14.1 90.9
4°	20 21.6 +13.8 90.9	19 23.4 +13.8 90.7	18 25.2 +13.8 90.4	17 27.0 +13.8 90.2	16 28.8 +13.8 89.9
5°	20 35.4 +13.4 89.9	19 37.2 +13.4 89.6	18 39.0 +13.4 89.4	17 40.8 +13.4 89.2	16 42.6 +13.4 88.9
6°	20 48.8 +13.0 88.8	19 50.6 +13.1 88.6	18 52.4 +13.1 88.4	17 54.2 +13.2 88.1	16 56.0 +13.2 87.9
7°	21 01.8 +12.7 87.8	20 03.7 +12.7 87.6	19 05.5 +12.8 87.3	18 07.4 +12.8 87.1	17 09.2 +12.9 86.9
8°	21 14.5 +12.2 86.7	20 16.4 +12.3 86.5	19 18.3 +12.4 86.3	18 20.2 +12.5 86.1	17 22.1 +12.6 85.9
9°	21 26.7 +11.9 85.7	20 28.7 +12.0 85.5	19 30.7 +12.0 85.3	18 32.7 +12.1 85.0	17 34.7 +12.2 84.8
10°	21 38.6 +11.5 84.6	20 40.7 +11.5 84.4	19 42.7 +11.7 84.2	18 44.8 +11.8 84.0	17 46.9 +11.9 83.8
11°	21 50.1 +11.0 83.6	20 52.2 +11.2 83.4	19 54.4 +11.3 83.2	18 56.6 +11.5 83.0	17 58.8 +11.6 82.8
12°	22 01.1 +10.7 82.5	21 03.4 +10.8 82.3	20 05.7 +11.0 82.1	19 08.1 +11.1 81.9	18 10.4 +11.3 81.7
13°	22 11.8 +10.2 81.5	21 14.2 +10.4 81.3	20 16.7 +10.5 81.1	19 19.2 +10.7 80.9	18 21.7 +10.9 80.7
14°	22 22.0 +09.8 80.4	21 24.6 +10.0 80.2	20 27.2 +10.2 80.0	19 29.9 +10.4 79.9	18 32.6 +10.6 79.7
15°	22 31.8 +09.4 79.3	21 34.6 +09.6 79.1	20 37.4 +09.9 79.0	19 40.3 +10.0 78.8	18 43.2 +10.3 78.6
16°	22 41.2 +08.9 78.2	21 44.2 +09.2 78.1	20 47.3 +09.4 77.9	19 50.3 +09.7 77.8	18 53.5 +09.9 77.6
17°	22 50.1 +08.6 77.2	21 53.4 +08.8 77.0	20 56.7 +09.0 76.9	20 00.0 +09.3 76.7	19 03.4 +09.5 76.5
18°	22 58.7 +08.1 76.1	22 02.2 +08.3 76.0	21 05.7 +08.7 75.8	20 09.3 +08.9 75.7	19 12.9 +09.2 75.5
19°	23 06.8 +07.6 75.0	22 10.5 +08.0 74.9	21 14.4 +08.2 74.7	20 18.2 +08.5 74.6	19 22.1 +08.8 74.5
20°	23 14.4 +07.2 73.9	22 18.5 +07.5 73.8	21 22.6 +07.8 73.7	20 26.7 +08.2 73.5	19 30.9 +08.5 73.4
21°	23 21.6 +06.8 72.9	22 26.0 +07.1 72.7	21 30.4 +07.5 72.6	20 34.9 +07.8 72.5	19 39.4 +08.1 72.4
22°	23 28.4 +06.3 71.8	22 33.1 +06.7 71.7	21 37.9 +07.0 71.6	20 42.7 +07.3 71.4	19 47.5 +07.7 71.3
23°	23 34.7 +05.9 70.7	22 39.8 +06.2 70.6	21 44.9 +06.6 70.5	20 50.0 +07.0 70.4	19 55.2 +07.4 70.2
24°	23 40.6 +05.4 69.6	22 46.0 +05.8 69.5	21 51.5 +06.2 69.4	20 57.0 +06.6 69.3	20 02.6 +07.0 69.2
25°	23 46.0 +04.9 68.5	22 51.8 +05.4 68.4	21 57.7 +05.8 68.3	21 03.6 +06.2 68.2	20 09.6 +06.6 68.1
26°	23 50.9 +04.5 67.4	22 57.2 +04.9 67.4	22 03.5 +05.3 67.3	21 09.8 +05.8 67.2	20 16.2 +06.2 67.1
27°	23 55.4 +04.1 66.3	23 02.1 +04.5 66.3	22 08.8 +05.0 66.2	21 15.6 +05.4 66.1	20 22.4 +05.8 66.0
28°	23 59.5 +03.5 65.3	23 06.6 +04.0 65.2	22 13.8 +04.5 65.1	21 21.0 +04.9 65.0	20 28.2 +05.5 65.0
29°	24 03.0 +03.1 64.2	23 10.6 +03.6 64.1	22 18.3 +04.1 64.0	21 25.9 +04.6 64.0	20 33.7 +05.0 63.9

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 32.7 +14.8 93.7	13 34.6 +14.8 93.5	12 36.4 +14.8 93.2	11 38.3 +14.7 92.9	10 40.2 +14.6 92.7
1°	14 47.5 +14.6 92.7	13 49.4 +14.5 92.5	12 51.2 +14.5 92.2	11 53.0 +14.5 92.0	10 54.8 +14.5 91.7
2°	15 02.1 +14.4 91.7	14 03.9 +14.4 91.5	13 05.7 +14.4 91.2	12 07.5 +14.3 91.0	11 09.3 +14.3 90.7
3°	15 16.5 +14.1 90.7	14 18.3 +14.0 90.5	13 20.1 +14.0 90.2	12 21.8 +14.1 90.0	11 23.6 +14.1 89.7
4°	15 30.6 +13.8 89.7	14 32.3 +13.9 89.4	13 34.1 +13.9 89.2	12 35.9 +13.9 89.0	11 37.7 +13.9 88.7
5°	15 44.4 +13.5 88.7	14 46.2 +13.5 88.4	13 48.0 +13.6 88.2	12 49.8 +13.6 88.0	11 51.6 +13.7 87.7
6°	15 57.9 +13.2 87.7	14 59.7 +13.3 87.4	14 01.6 +13.3 87.2	13 03.4 +13.4 87.0	12 05.3 +13.5 86.7
7°	16 11.1 +13.0 86.7	15 13.0 +13.0 86.4	14 14.9 +13.1 86.2	13 16.8 +13.2 86.0	12 18.8 +13.2 85.7
8°	16 24.1 +12.6 85.6	15 26.0 +12.8 85.4	14 28.0 +12.8 85.2	13 30.0 +12.9 85.0	12 32.0 +13.0 85.4
9°	16 36.7 +12.4 84.6	15 38.8 +12.4 84.4	14 40.8 +12.6 84.2	13 42.9 +12.7 84.0	12 45.0 +12.8 83.7
10°	16 49.1 +12.0 83.6	15 51.2 +12.2 83.4	14 53.4 +12.3 83.2	13 55.6 +12.4 83.0	12 57.8 +12.6 82.7
11°	17 01.1 +11.7 82.6	16 03.4 +11.9 82.4	15 05.7 +12.0 82.2	14 08.0 +12.2 82.0	13 10.4 +12.3 81.7
12°	17 12.8 +11.5 81.5	16 15.3 +11.6 81.3	15 17.7 +11.8 81.1	14 20.2 +12.0 80.9	13 22.7 +12.1 80.7
13°	17 24.3 +11.1 80.5	16 26.9 +11.3 80.3	15 29.5 +11.5 80.1	14 32.2 +11.6 79.9	13 34.8 +11.9 79.7
14°	17 35.4 +10.8 79.5	16 38.2 +10.9 79.3	15 41.0 +11.2 79.1	14 43.8 +11.4 78.9	13 46.7 +11.6 78.7
15°	17 46.2 +10.4 78.5	16 49.1 +10.7 78.3	15 52.2 +10.9 78.1	14 55.2 +11.2 77.9	13 58.3 +11.4 77.7
16°	17 56.6 +10.2 77.4	16 59.8 +10.4 77.2	16 03.1 +10.6 77.1	15 06.4 +10.8 76.9	14 09.7 +11.1 76.7
17°	18 06.8 +09.8 76.4	17 10.2 +10.1 76.2	16 13.7 +10.3 76.0	15 17.2 +10.6 75.9	14 20.8 +10.8 75.7
18°	18 16.6 +09.4 75.3	17 20.3 +09.7 75.2	16 24.0 +10.0 75.0	15 27.8 +10.3 74.8	14 31.6 +10.6 74.7
19°	18 26.0 +09.2 74.3	17 30.0 +09.4 74.1	16 34.0 +09.7 74.0	15 38.1 +10.0 73.8	14 42.2 +10.3 73.7
20°	18 35.2 +08.7 73.3	17 39.4 +09.1 73.1	16 43.7 +09.5 73.0	15 48.1 +09.7 72.8	14 52.5 +10.1 72.6
21°	18 43.9 +08.5 72.2	17 48.5 +08.8 72.1	16 53.2 +09.1 71.9	15 57.8 +09.5 71.8	15 02.6 +09.7 71.6
22°	18 52.4 +08.1 71.2	17 57.3 +08.4 71.0	17 02.3 +08.8 70.9	16 07.3 +09.1 70.7	15 12.3 +09.5 70.6
23°	19 00.5 +07.7 70.1	18 05.7 +08.1 70.0	17 11.1 +08.4 69.9	16 16.4 +08.9 69.7	15 21.8 +09.3 69.6
24°	19 08.2 +07.4 69.1	18 13.8 +07.8 68.9	17 19.5 +08.2 68.8	16 25.3 +08.5 68.7	15 31.1 +08.9 68.5
25°	19 15.6 +07.0 68.0	18 21.6 +07.4 67.9	17 27.7 +07.8 67.8	16 33.8 +08.2 67.7	15 40.0 +08.6 67.5
26°	19 22.6 +06.6 67.0	18 29.0 +07.1 66.9	17 35.5 +07.5 66.7	16 42.0 +08.0 66.6	15 48.6 +08.4 66.5
27°	19 29.2 +06.3 65.9	18 36.1 +06.7 65.8	17 43.0 +07.2 65.7	16 50.0 +07.6 65.6	15 57.0 +08.0 65.5
28°	19 35.5 +05.9 64.9	18 42.8 +06.4 64.8	17 50.2 +06.8 64.7	16 57.6 +07.3 64.5	16 05.0 +07.8 64.4
29°	19 41.4 +05.5 63.8	18 49.2 +06.0 63.7	17 57.0 +06.5 63.6	17 04.9 +07.0 63.5	16 12.8 +07.5 63.4

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Latitude 14°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 42.0 +14.6 92.4	8 43.8 +14.6 92.2	7 45.7 +14.5 91.9	6 47.5 +14.5 91.7	5 49.3 +14.5 91.5
1°	9 56.6 +14.5 91.5	8 58.4 +14.5 91.2	8 00.2 +14.5 91.0	7 02.0 +14.5 90.7	6 03.8 +14.4 90.5
2°	10 11.1 +14.3 90.5	9 12.9 +14.3 90.2	8 14.7 +14.3 90.0	7 16.5 +14.3 89.7	6 18.2 +14.4 89.5
3°	10 25.4 +14.1 89.5	9 27.2 +14.1 89.2	8 29.0 +14.1 89.0	7 30.8 +14.2 88.8	6 32.6 +14.2 88.5
4°	10 39.5 +13.9 88.5	9 41.3 +14.0 88.3	8 43.1 +14.0 88.0	7 45.0 +14.0 87.8	6 46.8 +14.1 87.5
5°	10 53.4 +13.8 87.5	9 55.3 +13.8 87.3	8 57.1 +13.9 87.0	7 59.0 +13.9 86.8	7 00.9 +13.9 86.6
6°	11 07.2 +13.5 86.5	10 09.1 +13.6 86.3	9 11.0 +13.7 86.1	8 12.9 +13.8 85.8	7 14.8 +13.9 85.6
7°	11 20.7 +13.3 85.5	10 22.7 +13.4 85.3	9 24.7 +13.5 85.1	8 26.7 +13.6 84.8	7 28.7 +13.7 84.6
8°	11 34.0 +13.2 84.5	10 36.1 +13.2 84.3	9 38.2 +13.3 84.1	8 40.3 +13.4 83.9	7 42.4 +13.6 83.6
9°	11 47.2 +12.9 83.5	10 49.3 +13.1 83.3	9 51.5 +13.2 83.1	8 53.7 +13.4 82.9	7 56.0 +13.4 82.6
10°	12 00.1 +12.7 82.5	11 02.4 +12.8 82.3	10 04.7 +13.0 82.1	9 07.1 +13.1 81.9	8 09.4 +13.3 81.7
11°	12 12.8 +12.5 81.5	11 15.2 +12.7 81.3	10 17.7 +12.8 81.1	9 20.2 +13.0 80.9	8 22.7 +13.2 80.7
12°	12 25.3 +12.3 80.5	11 27.9 +12.5 80.3	10 30.5 +12.7 80.1	9 33.2 +12.8 79.9	8 35.9 +13.0 79.7
13°	12 37.6 +12.0 79.5	11 40.4 +12.2 79.3	10 43.2 +12.4 79.1	9 46.0 +12.7 78.9	8 48.9 +12.8 78.7
14°	12 49.6 +11.9 78.5	11 52.6 +12.0 78.3	10 55.6 +12.3 78.1	9 58.7 +12.4 77.9	9 01.7 +12.7 77.7
15°	13 01.5 +11.5 77.5	12 04.6 +11.9 77.3	11 07.9 +12.0 77.1	10 11.1 +12.3 76.9	9 14.4 +12.6 76.7
16°	13 13.0 +11.4 76.5	12 16.5 +11.6 76.3	11 19.9 +11.9 76.1	10 23.4 +12.1 75.9	9 27.0 +12.3 75.7
17°	13 24.4 +11.1 75.5	12 28.1 +11.3 75.3	11 31.8 +11.6 75.1	10 35.5 +11.9 74.9	9 39.3 +12.2 74.7
18°	13 35.5 +10.9 74.5	12 39.4 +11.2 74.3	11 43.4 +11.4 74.1	10 47.4 +11.8 73.9	9 51.5 +12.0 73.7
19°	13 46.4 +10.6 73.5	12 50.6 +10.9 73.3	11 54.8 +11.3 73.1	10 59.2 +11.5 72.9	10 03.5 +11.9 72.7
20°	13 57.0 +10.4 72.5	13 01.5 +10.7 72.3	12 06.1 +11.0 72.1	11 10.7 +11.3 71.9	10 15.4 +11.6 71.8
21°	14 07.4 +10.1 71.5	13 12.2 +10.4 71.3	12 17.1 +10.8 71.1	11 22.0 +11.1 70.9	10 27.0 +11.5 70.8
22°	14 17.5 +09.8 70.4	13 22.6 +10.2 70.3	12 27.9 +10.5 70.1	11 33.1 +11.0 69.9	10 38.5 +11.3 69.8
23°	14 27.3 +09.6 69.4	13 32.8 +10.0 69.3	12 38.4 +10.4 69.1	11 44.1 +10.7 68.9	10 49.8 +11.1 68.8
24°	14 36.9 +09.3 68.4	13 42.8 +09.7 68.2	12 48.8 +10.1 68.1	11 54.8 +10.5 67.9	11 00.9 +10.8 67.8
25°	14 46.2 +09.1 67.4	13 52.5 +09.5 67.2	12 58.9 +09.8 67.1	12 05.3 +10.2 66.9	11 11.7 +10.7 66.8
26°	14 55.3 +08.7 66.4	14 02.0 +09.2 66.2	13 08.7 +09.7 66.1	12 15.5 +10.1 65.9	11 22.4 +10.5 65.8
27°	15 04.0 +08.5 65.3	14 11.2 +08.9 65.2	13 18.4 +09.3 65.0	12 25.6 +09.8 64.9	11 32.9 +10.3 64.7
28°	15 12.5 +08.3 64.3	14 20.1 +08.7 64.2	13 27.7 +09.2 64.0	12 35.4 +09.6 63.9	11 43.2 +10.1 63.7
29°	15 20.8 +07.9 63.3	14 28.8 +08.4 63.2	13 36.9 +08.9 63.0	12 45.0 +09.4 62.9	11 53.3 +09.8 62.7

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 51.1 +14.5 91.2	3 52.9 +14.5 91.0	2 54.6 +14.6 90.7	1 56.4 +14.5 90.5	0 58.2 +14.5 90.2
1°	5 05.6 +14.4 90.2	4 07.4 +14.4 90.0	3 09.2 +14.4 89.8	2 10.9 +14.5 89.5	1 12.7 +14.5 89.3
2°	5 20.0 +14.4 89.3	4 21.8 +14.4 89.0	3 23.6 +14.4 88.8	2 25.4 +14.4 88.5	1 27.2 +14.5 88.3
3°	5 34.4 +14.2 88.3	4 36.2 +14.3 88.0	3 38.0 +14.3 87.8	2 39.8 +14.4 87.6	1 41.7 +14.4 87.3
4°	5 48.6 +14.2 87.3	4 50.5 +14.2 87.1	3 52.3 +14.3 86.8	2 54.2 +14.3 86.6	1 56.1 +14.4 86.4
5°	6 02.8 +14.0 86.3	5 04.7 +14.1 86.1	4 06.6 +14.2 85.9	3 08.5 +14.3 85.6	2 10.5 +14.4 85.4
6°	6 16.8 +13.9 85.4	5 18.8 +14.0 85.1	4 20.8 +14.1 84.9	3 22.8 +14.2 84.7	2 24.9 +14.3 84.4
7°	6 30.7 +13.9 84.4	5 32.8 +14.0 84.1	4 34.9 +14.1 83.9	3 37.0 +14.2 83.7	2 39.2 +14.3 83.4
8°	6 44.6 +13.7 83.4	5 46.8 +13.8 83.2	4 49.0 +13.9 82.9	3 51.2 +14.1 82.7	2 53.5 +14.2 82.5
9°	6 58.3 +13.6 82.4	6 00.6 +13.7 82.2	5 02.9 +13.9 82.0	4 05.3 +14.0 81.7	3 07.7 +14.2 81.5
10°	7 11.9 +13.4 81.4	6 14.3 +13.6 81.2	5 16.8 +13.8 81.0	4 19.3 +14.0 80.8	3 21.9 +14.1 80.5
11°	7 25.3 +13.3 80.5	6 27.9 +13.5 80.2	5 30.6 +13.6 80.0	4 33.3 +13.8 79.8	3 36.0 +14.0 79.6
12°	7 38.6 +13.2 79.5	6 41.4 +13.4 79.3	5 44.2 +13.6 79.0	4 47.1 +13.8 78.8	3 50.0 +14.0 78.6
13°	7 51.8 +13.1 78.5	6 54.8 +13.3 78.3	5 57.8 +13.5 78.1	5 00.9 +13.7 77.8	4 04.0 +13.9 77.6
14°	8 04.9 +12.9 77.5	7 08.1 +13.1 77.3	6 11.3 +13.4 77.1	5 14.6 +13.6 76.9	4 17.9 +13.9 76.6
15°	8 17.8 +12.8 76.5	7 21.2 +13.0 76.3	6 24.7 +13.2 76.1	5 28.2 +13.5 75.9	4 31.8 +13.7 75.7
16°	8 30.6 +12.6 75.5	7 34.2 +12.9 75.3	6 37.9 +13.2 75.1	5 41.7 +13.4 74.9	4 45.5 +13.7 74.7
17°	8 43.2 +12.5 74.5	7 47.1 +12.7 74.3	6 51.1 +13.0 74.1	5 55.1 +13.3 73.9	4 59.2 +13.6 73.7
18°	8 55.7 +12.3 73.5	7 59.8 +12.7 73.3	7 04.1 +12.9 73.1	6 08.4 +13.2 72.9	5 12.8 +13.5 72.7
19°	9 08.0 +12.1 72.6	8 12.5 +12.4 72.4	7 17.0 +12.8 72.2	6 21.6 +13.1 72.0	5 26.3 +13.4 71.7
20°	9 20.1 +12.0 71.6	8 24.9 +12.3 71.4	7 29.8 +12.6 71.2	6 34.7 +13.0 71.0	5 39.7 +13.3 70.8
21°	9 32.1 +11.8 70.6	8 37.2 +12.2 70.4	7 42.4 +12.5 70.2	6 47.7 +12.8 70.0	5 53.0 +13.2 69.8
22°	9 43.9 +11.6 69.6	8 49.4 +12.0 69.4	7 54.9 +12.4 69.2	7 00.5 +12.8 69.0	6 06.2 +13.1 68.8
23°	9 55.5 +11.5 68.6	9 01.4 +11.8 68.4	8 07.3 +12.2 68.2	7 13.3 +12.6 68.0	6 19.3 +13.0 67.8
24°	10 07.0 +11.3 67.6	9 13.2 +11.7 67.4	8 19.5 +12.1 67.2	7 25.9 +12.4 67.0	6 32.3 +12.9 66.8
25°	10 18.3 +11.1 66.6	9 24.9 +11.5 66.4	8 31.6 +11.9 66.2	7 38.3 +12.4 66.0	6 45.2 +12.7 65.9
26°	10 29.4 +10.9 65.6	9 36.4 +11.3 65.4	8 43.5 +11.8 65.2	7 50.7 +12.2 65.1	6 57.9 +12.7 64.9
27°	10 40.3 +10.7 64.6	9 47.7 +11.2 64.4	8 55.3 +11.6 64.2	8 02.9 +12.0 64.1	7 10.6 +12.5 63.9
28°	10 51.0 +10.5 63.6	9 58.9 +11.0 63.4	9 06.9 +11.4 63.3	8 14.9 +12.0 63.1	7 23.1 +12.3 62.9
29°	11 01.5 +10.4 62.6	10 09.9 +10.8 62.4	9 18.3 +11.3 62.3	8 26.9 +11.7 62.1	7 35.4 +12.3 61.9

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Latitude 14°

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Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +14.5 90.0	-0 58.2 +14.5	-1 56.4 +14.5	-2 54.6 +14.5	-3 52.9 +14.6
1°	0 14.5 +14.5 89.0	-0 43.7 +14.5	-1 41.9 +14.6	-2 40.1 +14.6	-3 38.3 +14.7
2°	0 29.0 +14.5 88.1	-0 29.2 +14.6	-1 27.3 +14.6	-2 25.5 +14.7	-3 23.6 +14.7
3°	0 43.5 +14.5 87.1	-0 14.6 +14.5	-1 12.7 +14.6	-2 10.8 +14.6	-3 08.9 +14.7
4°	0 58.0 +14.5 86.1	-0 00.1 +14.6	-0 58.1 +14.6	-1 56.2 +14.8	-2 54.2 +14.8
5°	1 12.5 +14.4 85.1	0 14.5 +14.5 84.9	-0 43.5 +14.7	-1 41.4 +14.7	-2 39.4 +14.9
6°	1 26.9 +14.5 84.2	0 29.0 +14.6 83.9	-0 28.8 +14.6	-1 26.7 +14.8	-2 24.5 +14.9
7°	1 41.4 +14.4 83.2	0 43.6 +14.5 83.0	-0 14.2 +14.7	-1 11.9 +14.8	-2 09.6 +14.9
8°	1 55.8 +14.3 82.2	0 58.1 +14.5 82.0	0 00.5 +14.6 81.8	-0 57.1 +14.8	-1 54.7 +15.0
9°	2 10.1 +14.4 81.3	1 12.6 +14.5 81.0	0 15.1 +14.7 80.8	-0 42.3 +14.8	-1 39.7 +15.0
10°	2 24.5 +14.2 80.3	1 27.1 +14.5 80.1	0 29.8 +14.6 79.8	-0 27.5 +14.8	-1 24.7 +15.0
11°	2 38.7 +14.3 79.3	1 41.6 +14.4 79.1	0 44.4 +14.6 78.8	-0 12.7 +14.9	-1 09.7 +15.0
12°	2 53.0 +14.2 78.3	1 56.0 +14.4 78.1	0 59.0 +14.7 77.9	0 02.2 +14.8 77.6	-0 54.7 +15.1
13°	3 07.2 +14.1 77.4	2 10.4 +14.4 77.1	1 13.7 +14.6 76.9	0 17.0 +14.8 76.7	-0 39.6 +15.0
14°	3 21.3 +14.1 76.4	2 24.8 +14.3 76.2	1 28.3 +14.5 75.9	0 31.8 +14.8 75.7	-0 24.6 +15.1
15°	3 35.4 +14.0 75.4	2 39.1 +14.3 75.2	1 42.8 +14.6 75.0	0 46.6 +14.8 74.7	-0 09.5 +15.1
16°	3 49.4 +14.0 74.5	2 53.4 +14.2 74.2	1 57.4 +14.5 74.0	1 01.4 +14.8 73.8	0 05.6 +15.0 73.5
17°	4 03.4 +13.8 73.5	3 07.6 +14.1 73.3	2 11.9 +14.4 73.0	1 16.2 +14.8 72.8	0 20.6 +15.1 72.6
18°	4 17.2 +13.8 72.5	3 21.7 +14.2 72.3	2 26.3 +14.5 72.1	1 31.0 +14.7 71.8	0 35.7 +15.1 71.6
19°	4 31.0 +13.8 71.5	3 35.9 +14.0 71.3	2 40.8 +14.3 71.1	1 45.7 +14.7 70.9	0 50.8 +15.0 70.6
20°	4 44.8 +13.6 70.5	3 49.9 +14.0 70.3	2 55.1 +14.4 70.1	2 00.4 +14.7 69.9	1 05.8 +15.0 69.6
21°	4 58.4 +13.6 69.6	4 03.9 +13.9 69.4	3 09.5 +14.2 69.1	2 15.1 +14.6 68.9	1 20.8 +15.0 68.7
22°	5 12.0 +13.4 68.6	4 17.8 +13.9 68.4	3 23.7 +14.2 68.2	2 29.7 +14.6 67.9	1 35.8 +15.0 67.7
23°	5 25.4 +13.4 67.6	4 31.7 +13.7 67.4	3 37.9 +14.2 67.2	2 44.3 +14.6 67.0	1 50.8 +14.9 66.7
24°	5 38.8 +13.3 66.6	4 45.4 +13.7 66.4	3 52.1 +14.1 66.2	2 58.9 +14.5 66.0	2 05.7 +14.9 65.8
25°	5 52.1 +13.2 65.7	4 59.1 +13.6 65.5	4 06.2 +14.0 65.2	3 13.4 +14.4 65.0	2 20.6 +14.9 64.8
26°	6 05.3 +13.0 64.7	5 12.7 +13.5 64.5	4 20.2 +13.9 64.3	3 27.8 +14.4 64.1	2 35.5 +14.8 63.8
27°	6 18.3 +13.0 63.7	5 26.2 +13.4 63.5	4 34.1 +13.9 63.3	3 42.2 +14.3 63.1	2 50.3 +14.8 62.9
28°	6 31.3 +12.8 62.7	5 39.6 +13.3 62.5	4 48.0 +13.8 62.3	3 56.5 +14.2 62.1	3 05.1 +14.7 61.9
29°	6 44.1 +12.8 61.7	5 52.9 +13.2 61.5	5 01.8 +13.7 61.3	4 10.7 +14.2 61.1	3 19.8 +14.7 60.9

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 51.1 +14.6	-5 49.3 +14.7	-6 47.5 +14.7	-7 45.7 +14.8	
1°	-4 36.5 +14.7	-5 34.6 +14.7	-6 32.8 +14.8	-7 30.9 +14.8	
2°	-4 21.8 +14.8	-5 19.9 +14.8	-6 18.0 +14.9	-7 16.1 +15.0	
3°	-4 07.0 +14.8	-5 05.1 +15.0	-6 03.1 +15.0	-7 01.1 +15.1	
4°	-3 52.2 +14.9	-4 50.1 +14.9	-5 48.1 +15.1	-6 46.0 +15.2	
5°	-3 37.3 +15.0	-4 35.2 +15.1	-5 33.0 +15.2	-6 30.8 +15.3	
6°	-3 22.3 +15.0	-4 20.1 +15.2	-5 17.8 +15.3	-6 15.5 +15.4	
7°	-3 07.3 +15.1	-4 04.9 +15.2	-5 02.5 +15.4	-6 00.1 +15.6	
8°	-2 52.2 +15.1	-3 49.7 +15.3	-4 47.1 +15.4	-5 44.5 +15.6	
9°	-2 37.1 +15.2	-3 34.4 +15.3	-4 31.7 +15.5	-5 28.9 +15.7	
10°	-2 21.9 +15.2	-3 19.1 +15.4	-4 16.2 +15.7	-5 13.2 +15.8	
11°	-2 06.7 +15.2	-3 03.7 +15.5	-4 00.5 +15.6	-4 57.4 +15.9	
12°	-1 51.5 +15.3	-2 48.2 +15.5	-3 44.9 +15.8	-4 41.5 +16.0	
13°	-1 36.2 +15.3	-2 32.7 +15.6	-3 29.1 +15.8	-4 25.5 +16.0	
14°	-1 20.9 +15.3	-2 17.1 +15.5	-3 13.3 +15.8	-4 09.5 +16.2	
15°	-1 05.6 +15.4	-2 01.6 +15.7	-2 57.5 +15.9	-3 53.3 +16.1	
16°	-0 50.2 +15.3	-1 45.9 +15.6	-2 41.6 +16.0	-3 37.2 +16.3	
17°	-0 34.9 +15.4	-1 30.3 +15.7	-2 25.6 +16.0	-3 20.9 +16.3	
18°	-0 19.5 +15.4	-1 14.6 +15.7	-2 09.6 +16.0	-3 04.6 +16.4	
19°	-0 04.1 +15.4	-0 58.9 +15.7	-1 53.6 +16.0	-2 48.2 +16.4	
20°	0 11.3 +15.3 69.4	-0 43.2 +15.7	-1 37.6 +16.1	-2 31.8 +16.4	
21°	0 26.6 +15.4 68.4	-0 27.5 +15.8	-1 21.5 +16.1	-2 15.4 +16.5	
22°	0 42.0 +15.4 67.5	-0 11.7 +15.7	-1 05.4 +16.2	-1 58.9 +16.5	
23°	0 57.4 +15.3 66.5	0 04.0 +15.7 66.3	-0 49.2 +16.1	-1 42.4 +16.6	
24°	1 12.7 +15.3 65.5	0 19.7 +15.8 65.3	-0 33.1 +16.2	-1 25.8 +16.5	
25°	1 28.0 +15.3 64.6	0 35.5 +15.7 64.3	-0 16.9 +16.1	-1 09.3 +16.6	
26°	1 43.3 +15.3 63.6	0 51.2 +15.7 63.4	-0 00.8 +16.2	-0 52.7 +16.6	
27°	1 58.6 +15.2 62.6	1 06.9 +15.7 62.4	0 15.4 +16.1 62.2	-0 36.1 +16.7	
28°	2 13.8 +15.2 61.7	1 22.6 +15.7 61.4	0 31.5 +16.2 61.2	-0 19.4 +16.6	
29°	2 29.0 +15.1 60.7	1 38.3 +15.6 60.5	0 47.7 +16.1 60.2	-0 02.8 +16.6	

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Latitude 15°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	75 00.0 +60.0 180.0	74 58.0 +59.9 176.1	74 52.2 +59.5 172.3	74 42.6 +58.8 168.6	74 29.3 +57.9 164.9
1°	76 00.0 +60.0 180.0	75 57.9 +59.9 175.9	75 51.7 +59.4 171.8	75 41.4 +58.6 167.8	75 27.2 +57.6 163.9
2°	77 00.0 +60.0 180.0	76 57.8 +59.8 175.6	76 51.1 +59.2 171.2	76 40.0 +58.5 166.9	76 24.8 +57.3 162.7
3°	78 00.0 +60.0 180.0	77 57.6 +59.8 175.2	77 50.3 +59.2 170.5	77 38.5 +58.1 165.9	77 22.1 +56.9 161.4
4°	79 00.0 +60.0 180.0	78 57.4 +59.7 174.8	78 49.5 +59.0 169.7	78 36.6 +57.8 164.7	78 19.0 +56.2 159.9
5°	80 00.0 +60.0 180.0	79 57.1 +59.7 174.3	79 48.5 +58.8 168.7	79 34.4 +57.4 163.3	79 15.2 +55.6 158.1
6°	81 00.0 +60.0 180.0	80 56.8 +59.6 173.7	80 47.3 +58.5 167.5	80 31.8 +56.8 161.6	80 10.8 +54.6 156.0
7°	82 00.0 +60.0 180.0	81 56.4 +59.5 172.9	81 45.8 +58.1 166.0	81 28.6 +55.9 159.5	81 05.4 +53.3 153.4
8°	83 00.0 +60.0 180.0	82 55.9 +59.4 171.9	82 43.9 +57.5 164.1	82 24.5 +54.8 156.9	81 58.7 +51.6 150.3
9°	84 00.0 +60.0 180.0	83 55.3 +59.0 170.6	83 41.4 +56.6 161.7	83 19.3 +53.1 153.6	82 50.3 +49.1 146.5
10°	85 00.0 +60.0 180.0	84 54.3 +58.7 168.8	84 38.0 +55.0 158.4	84 12.4 +50.4 149.3	83 39.4 +45.6 141.6
11°	86 00.0 +60.0 180.0	85 53.0 +57.8 166.2	85 33.0 +52.5 153.8	85 02.8 +46.2 143.5	84 25.0 +40.3 135.3
12°	87 00.0 +60.0 180.0	86 50.8 +55.8 161.9	86 25.5 +47.3 146.8	85 49.0 +39.1 135.4	85 05.3 +32.7 127.2
13°	88 00.0 +60.0 180.0	87 46.6 +49.9 154.0	87 12.8 +36.4 135.6	86 28.1 +27.6 124.1	85 38.0 +22.0 116.8
14°	89 00.0 +60.0 180.0	88 36.5 +25.5 135.8	87 49.2 +14.9 117.1	86 55.7 +10.4 108.6	86 00.0 +08.2 104.0
15°	90 00.0 -60.0 0.0	89 02.0 -25.3 89.9	88 04.1 -14.4 89.7	87 06.1 -09.6 89.6	86 08.2 -07.1 89.5
16°	89 00.0 -60.0 0.0	88 36.7 -49.8 43.8	87 49.7 -36.1 62.3	86 56.5 -27.1 70.5	86 01.1 -21.1 74.9
17°	88 00.0 -60.0 0.0	87 46.9 -55.9 25.5	87 13.6 -47.2 43.6	86 29.4 -38.8 54.9	85 40.0 -32.1 62.0
18°	87 00.0 -60.0 0.0	86 51.0 -57.8 17.6	86 26.4 -52.4 32.3	85 50.6 -45.9 43.4	85 07.9 -39.9 51.4
19°	86 00.0 -60.0 0.0	85 53.2 -58.6 13.3	85 34.0 -55.1 25.3	85 04.7 -50.3 35.2	84 28.0 -45.3 43.2
20°	85 00.0 -60.0 0.0	84 54.6 -59.1 10.7	84 38.9 -56.5 20.6	84 14.4 -53.0 29.3	83 42.7 -48.9 36.8
21°	84 00.0 -60.0 0.0	83 55.5 -59.3 8.9	83 42.4 -57.5 17.3	83 21.4 -54.7 25.0	82 53.8 -51.4 31.8
22°	83 00.0 -60.0 0.0	82 56.2 -59.5 7.6	82 44.9 -58.1 14.9	82 26.7 -55.9 21.7	82 02.4 -53.2 27.8
23°	82 00.0 -60.0 0.0	81 56.7 -59.6 6.6	81 46.8 -58.5 13.0	81 30.8 -56.8 19.1	81 09.2 -54.5 24.7
24°	81 00.0 -60.0 0.0	80 57.1 -59.7 5.8	80 48.3 -58.8 11.5	80 34.0 -57.3 17.0	80 14.7 -55.5 22.1
25°	80 00.0 -60.0 0.0	79 57.4 -59.8 5.2	79 49.5 -59.0 10.3	79 36.7 -57.8 15.3	79 19.2 -56.3 19.9
26°	79 00.0 -60.0 0.0	78 57.6 -59.8 4.7	78 50.5 -59.1 9.3	78 38.9 -58.1 13.8	78 22.9 -56.8 18.1
27°	78 00.0 -60.0 0.0	77 57.8 -59.8 4.3	77 51.4 -59.3 8.5	77 40.8 -58.5 12.6	77 26.1 -57.2 16.6
28°	77 00.0 -60.0 0.0	76 58.0 -59.8 3.9	76 52.1 -59.4 7.8	76 42.3 -58.6 11.6	76 28.9 -57.7 15.3
29°	76 00.0 -60.0 0.0	75 58.2 -59.9 3.6	75 52.7 -59.4 7.2	75 43.7 -58.8 10.7	75 31.2 -57.9 14.1

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	74 12.4 +56.9 161.3	73 52.2 +55.7 157.9	73 28.9 +54.3 154.6	73 02.6 +52.9 151.5	72 33.6 +51.4 148.5
1°	75 09.3 +56.4 160.1	74 47.9 +55.0 156.5	74 23.2 +53.5 153.1	73 55.5 +52.0 149.8	73 25.0 +50.4 146.8
2°	76 05.7 +55.9 158.7	75 42.9 +54.4 155.0	75 16.7 +52.8 151.4	74 47.5 +51.0 148.0	74 15.4 +49.2 144.8
3°	77 01.6 +55.3 157.2	76 37.3 +53.5 153.2	76 09.5 +51.6 149.4	75 38.5 +49.7 145.9	75 04.6 +47.9 142.7
4°	77 56.9 +54.5 155.4	77 30.8 +52.5 151.2	77 01.1 +50.5 147.2	76 28.2 +48.4 143.6	75 52.5 +46.2 140.2
5°	78 51.4 +53.4 153.3	78 23.3 +51.2 148.8	77 51.6 +48.9 144.7	77 16.6 +46.6 141.0	76 38.7 +44.4 137.6
6°	79 44.8 +52.2 150.9	79 14.5 +49.6 146.2	78 40.5 +47.0 141.9	78 03.2 +44.5 138.0	77 23.1 +42.2 134.6
7°	80 37.0 +50.5 148.0	80 04.1 +47.6 143.0	79 27.5 +44.7 138.6	78 47.7 +42.0 134.7	78 05.3 +39.4 131.2
8°	81 27.5 +48.2 144.5	80 51.7 +44.8 139.3	80 12.2 +41.7 134.8	79 29.7 +38.9 130.9	78 44.7 +36.3 127.5
9°	82 15.7 +45.1 140.3	81 36.5 +41.5 135.0	80 53.9 +38.2 130.4	80 08.6 +35.1 126.6	79 21.0 +32.6 123.3
10°	83 00.8 +41.0 135.1	82 18.0 +37.1 129.8	81 32.1 +33.6 125.4	80 43.7 +30.7 121.7	79 53.6 +28.2 118.6
11°	83 41.8 +35.5 128.8	82 55.1 +31.3 123.7	82 05.7 +28.1 119.6	81 14.4 +25.4 116.2	80 21.8 +23.2 113.5
12°	84 17.3 +27.9 121.1	83 26.4 +24.3 116.5	82 33.8 +21.4 112.9	81 39.8 +19.3 110.1	80 45.0 +17.5 107.8
13°	84 45.2 +18.2 111.8	83 50.7 +15.7 108.2	82 55.2 +13.8 105.5	81 59.1 +12.4 103.5	81 02.5 +11.3 101.8
14°	85 03.4 +06.8 101.0	84 06.4 +05.9 99.0	83 09.0 +05.3 97.5	82 11.5 +04.9 96.3	81 13.8 +04.6 95.4
15°	85 10.2 -05.4 89.4	84 12.3 -04.3 89.2	83 14.3 -03.4 89.1	82 16.4 -02.8 89.0	81 18.4 -02.2 88.8
16°	85 04.8 -17.1 77.6	84 08.0 -14.2 79.4	83 10.9 -12.0 80.6	82 13.6 -10.3 81.6	81 16.2 -08.9 82.2
17°	84 47.7 -27.0 66.7	83 53.8 -23.0 70.1	82 58.9 -19.9 72.5	82 03.3 -17.4 74.3	81 07.3 -15.3 75.8
18°	84 20.7 -34.7 57.3	83 30.8 -30.4 61.6	82 39.0 -26.8 64.9	81 45.9 -23.7 67.5	80 52.0 -21.3 69.6
19°	83 46.0 -40.5 49.4	83 00.4 -36.2 54.3	82 12.2 -32.5 58.2	81 22.2 -29.3 61.3	80 30.7 -26.5 63.8
20°	83 05.5 -44.7 42.9	82 24.2 -40.9 48.0	81 39.7 -37.2 52.2	80 52.9 -34.0 55.6	80 04.2 -31.1 58.5
21°	82 20.8 -47.9 37.7	81 43.3 -44.4 42.7	81 02.5 -41.1 46.9	80 18.9 -38.0 50.6	79 33.1 -35.0 53.6
22°	81 32.9 -50.3 33.4	80 58.9 -47.1 38.2	80 21.4 -44.1 42.4	79 40.9 -41.1 46.1	78 58.1 -38.4 49.3
23°	80 42.6 -52.0 29.8	80 11.8 -49.3 34.4	79 37.3 -46.5 38.5	78 59.8 -43.9 42.2	78 19.7 -41.3 45.4
24°	79 50.6 -53.3 26.8	79 22.5 -51.0 31.2	78 50.8 -48.6 35.1	78 15.9 -46.0 38.7	77 38.4 -43.6 41.9
25°	78 57.3 -54.4 24.3	78 31.5 -52.3 28.4	78 02.2 -50.1 32.2	77 29.9 -47.9 35.6	76 54.8 -45.6 38.8
26°	78 02.9 -55.2 22.2	77 39.2 -53.4 26.1	77 12.1 -51.4 29.6	76 42.0 -49.4 32.9	76 09.2 -47.3 36.0
27°	77 07.7 -55.8 20.4	76 45.8 -54.3 24.0	76 20.7 -52.5 27.4	75 52.6 -50.7 30.5	75 21.9 -48.8 33.5
28°	76 11.9 -56.4 18.8	75 51.5 -54.9 22.2	75 28.2 -53.5 25.4	75 01.9 -51.7 28.4	74 33.1 -50.0 31.2
29°	75 15.5 -56.9 17.4	74 56.6 -55.6 20.6	74 34.7 -54.1 23.6	74 10.2 -52.6 26.5	73 43.1 -51.0 29.2

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Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	72 02.2 +49.8 145.7	71 28.4 +48.4 143.1	70 52.6 +46.8 140.6	70 14.9 +45.4 138.3	69 35.5 +43.9 136.1
1°	72 52.0 +48.8 143.9	72 16.8 +47.1 141.2	71 39.4 +45.6 138.7	71 00.3 +43.9 136.3	70 19.4 +42.5 134.1
2°	73 40.8 +47.4 141.9	73 03.9 +45.7 139.1	72 25.0 +44.0 136.5	71 44.2 +42.5 134.2	71 01.9 +40.9 131.9
3°	74 28.2 +46.0 139.6	73 49.6 +44.2 136.8	73 09.0 +42.4 134.3	72 26.7 +40.7 131.9	71 42.8 +39.1 129.7
4°	75 14.2 +44.3 137.2	74 33.8 +42.3 134.3	73 51.4 +40.5 131.8	73 07.4 +38.8 129.4	72 21.9 +37.2 127.2
5°	75 58.5 +42.2 134.5	75 16.1 +40.3 131.6	74 31.9 +38.4 129.0	73 46.2 +36.6 126.7	72 59.1 +34.9 124.6
6°	76 40.7 +39.9 131.5	75 56.4 +37.8 128.6	75 10.3 +35.9 126.1	74 22.8 +34.2 123.8	73 34.0 +32.6 121.7
7°	77 20.6 +37.2 128.1	76 34.2 +35.1 125.4	75 46.2 +33.2 122.9	74 57.0 +31.4 120.7	74 06.6 +29.9 118.7
8°	77 57.8 +34.0 124.5	77 09.3 +31.9 121.8	76 19.4 +30.0 119.5	75 28.4 +28.4 117.4	74 36.5 +26.9 115.5
9°	78 31.8 +30.3 120.4	77 41.2 +28.3 117.9	76 49.4 +26.6 115.7	75 56.8 +25.1 113.8	75 03.4 +23.7 112.1
10°	79 02.1 +26.1 116.0	78 09.5 +24.3 113.7	77 16.0 +22.8 111.7	76 21.9 +21.3 110.0	75 27.1 +20.3 108.5
11°	79 28.2 +21.4 111.1	78 33.8 +19.8 109.2	77 38.8 +18.5 107.5	76 43.2 +17.5 106.0	75 47.4 +16.4 104.7
12°	79 49.6 +16.1 105.9	78 53.6 +15.0 104.3	77 57.3 +14.0 103.0	77 00.7 +13.2 101.8	76 03.8 +12.5 100.7
13°	80 05.7 +10.4 100.4	79 08.6 +09.7 99.2	78 11.3 +09.1 98.3	77 13.9 +08.7 97.4	76 16.3 +08.4 96.6
14°	80 16.1 +04.4 94.6	79 18.3 +04.3 94.0	78 20.4 +04.2 93.4	77 22.6 +04.1 92.9	76 24.7 +04.1 92.4
15°	80 20.5 -01.7 88.7	79 22.6 -01.3 88.6	78 24.6 -00.9 88.4	77 26.7 -00.6 88.3	76 28.8 -00.3 88.2
16°	80 18.8 -07.8 82.8	79 21.3 -06.9 83.2	78 23.7 -06.0 83.5	77 26.1 -05.3 83.7	76 28.5 -04.6 83.9
17°	80 11.0 -13.7 76.9	79 14.4 -12.2 77.8	78 17.7 -10.9 78.5	77 20.8 -09.8 79.1	76 23.9 -08.9 79.7
18°	79 57.3 -19.1 71.2	79 02.2 -17.2 72.6	78 06.8 -15.7 73.7	77 11.0 -14.3 74.7	76 15.0 -13.0 75.5
19°	79 38.2 -24.0 65.9	78 45.0 -22.0 67.6	77 51.1 -20.1 69.1	76 56.7 -18.4 70.3	76 02.0 -17.0 71.4
20°	79 14.2 -28.6 60.9	78 23.0 -26.2 62.9	77 31.0 -24.2 64.7	76 38.3 -22.3 66.2	75 45.0 -20.6 67.5
21°	78 45.6 -32.4 56.3	77 56.8 -30.0 58.5	77 06.8 -27.8 60.5	76 16.0 -25.9 62.2	75 24.4 -24.2 63.7
22°	78 13.2 -35.8 52.1	77 26.8 -33.5 54.5	76 39.0 -31.3 56.6	75 50.1 -29.2 58.5	75 00.2 -27.3 60.1
23°	77 37.4 -38.7 48.2	76 53.3 -36.4 50.7	76 07.7 -34.2 53.0	75 20.9 -32.2 54.9	74 32.9 -30.2 56.7
24°	76 58.7 -41.3 44.7	76 16.9 -39.0 47.3	75 33.5 -36.8 49.6	74 48.7 -34.8 51.7	74 02.7 -32.9 53.5
25°	76 17.4 -43.4 41.6	75 37.9 -41.2 44.2	74 56.7 -39.2 46.5	74 13.9 -37.1 48.6	73 29.8 -35.3 50.5
26°	75 34.0 -45.3 38.8	74 56.7 -43.2 41.3	74 17.5 -41.2 43.6	73 36.8 -39.3 45.8	72 54.5 -37.4 47.7
27°	74 48.7 -46.8 36.2	74 13.5 -44.9 38.7	73 36.3 -43.0 41.0	72 57.5 -41.2 43.1	72 17.1 -39.4 45.1
28°	74 01.9 -48.2 33.9	73 28.6 -46.4 36.3	72 53.3 -44.6 38.6	72 16.3 -42.8 40.7	71 37.7 -41.0 42.7
29°	73 13.7 -49.4 31.8	72 42.2 -47.7 34.1	72 08.7 -46.0 36.4	71 33.5 -44.4 38.5	70 56.7 -42.7 40.4

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	68 54.6 +42.4 134.0	68 12.2 +41.1 132.1	67 28.6 +39.8 130.2	66 43.8 +38.6 128.5	65 57.9 +37.4 126.9
1°	69 37.0 +41.1 132.0	68 53.3 +39.7 130.1	68 08.4 +38.3 128.3	67 22.4 +37.0 126.6	66 35.3 +35.9 125.0
2°	70 18.1 +39.4 129.9	69 33.0 +38.0 128.0	68 46.7 +36.7 126.2	67 59.4 +35.5 124.5	67 11.2 +34.3 122.9
3°	70 57.5 +37.6 127.6	70 11.0 +36.2 125.7	69 23.4 +34.9 124.0	68 34.9 +33.6 122.3	67 45.5 +32.5 120.8
4°	71 35.1 +35.7 125.2	70 47.2 +34.3 123.3	69 58.3 +32.9 121.6	69 08.5 +31.7 120.0	68 18.0 +30.6 118.6
5°	72 10.8 +33.5 122.6	71 21.5 +32.0 120.8	70 31.2 +30.9 119.1	69 40.2 +29.7 117.6	68 48.6 +28.5 116.2
6°	72 44.3 +31.0 119.8	71 53.5 +29.8 118.1	71 02.1 +28.5 116.5	70 09.9 +27.4 115.1	69 17.1 +26.4 113.7
7°	73 15.3 +28.5 116.9	72 23.3 +27.2 115.3	71 30.6 +26.0 113.8	70 37.3 +24.9 112.4	69 43.5 +24.0 111.2
8°	73 43.8 +25.6 113.8	72 50.5 +24.4 112.3	71 56.6 +23.4 110.9	71 02.2 +22.4 109.7	70 07.5 +21.5 108.5
9°	74 09.4 +22.5 110.5	73 14.9 +21.5 109.2	72 20.0 +20.5 107.9	71 24.6 +19.7 106.8	70 29.0 +18.9 105.7
10°	74 31.9 +19.2 107.1	73 36.4 +18.3 105.9	72 40.5 +17.5 104.8	71 44.3 +16.8 103.8	70 47.9 +16.2 102.9
11°	74 51.1 +15.7 103.5	73 54.7 +14.9 102.5	72 58.0 +14.3 101.6	72 01.1 +13.8 100.7	71 04.1 +13.3 99.9
12°	75 06.8 +11.9 99.8	74 09.6 +11.5 99.0	73 12.3 +11.0 98.2	72 14.9 +10.6 97.5	71 17.4 +10.3 96.9
13°	75 18.7 +08.1 96.0	74 21.1 +07.7 95.3	73 23.3 +07.6 94.8	72 25.5 +07.5 94.3	71 27.7 +07.3 93.8
14°	75 26.8 +04.0 92.0	74 28.8 +04.1 91.7	73 30.9 +04.1 91.3	72 33.0 +04.1 91.0	71 35.0 +04.2 90.7
15°	75 30.8 +00.1 88.0	74 32.9 +00.3 87.9	73 35.0 +00.5 87.8	72 37.1 +00.8 87.7	71 39.2 +01.0 87.5
16°	75 30.9 -04.1 84.0	74 33.2 -03.5 84.2	73 35.5 -03.0 84.2	72 37.9 -02.6 84.3	71 40.2 -02.1 84.3
17°	75 26.8 -08.0 80.1	74 29.7 -07.2 80.4	73 32.5 -06.5 80.7	72 35.3 -05.9 81.0	71 38.1 -05.3 81.2
18°	75 18.8 -11.9 76.1	74 22.5 -10.9 76.7	73 26.0 -10.0 77.2	72 29.4 -09.1 77.6	71 32.8 -08.4 78.0
19°	75 06.9 -15.6 72.3	74 11.6 -14.4 73.1	73 16.0 -13.3 73.8	72 20.3 -12.3 74.4	71 24.4 -11.4 74.9
20°	74 51.3 -19.2 68.6	73 57.2 -17.8 69.6	73 02.7 -16.6 70.4	72 08.0 -15.4 71.2	71 13.0 -14.3 71.8
21°	74 32.1 -22.5 65.0	73 39.4 -21.0 66.1	72 46.1 -19.6 67.1	71 52.6 -18.4 68.0	70 58.7 -17.2 68.8
22°	74 09.6 -25.6 61.5	73 18.4 -24.0 62.8	72 26.5 -22.5 64.0	71 34.2 -21.1 65.0	70 41.5 -19.9 65.9
23°	73 44.0 -28.4 58.3	72 54.4 -26.8 59.7	72 04.0 -25.2 60.9	71 13.1 -23.8 62.1	70 21.6 -22.4 63.1
24°	73 15.6 -31.1 55.2	72 27.6 -29.4 56.7	71 38.8 -27.8 58.0	70 49.3 -26.3 59.2	69 59.2 -24.9 60.3
25°	72 44.5 -33.4 52.2	71 58.2 -31.7 53.8	71 11.0 -30.1 55.2	70 23.0 -28.6 56.5	69 34.3 -27.1 57.7
26°	72 11.1 -35.7 49.5	71 26.5 -34.0 51.1	70 40.9 -32.3 52.6	69 54.4 -30.7 53.9	69 07.2 -29.3 55.2
27°	71 35.4 -37.6 46.9	70 52.5 -35.9 48.6	70 08.6 -34.4 50.1	69 23.7 -32.8 51.5	68 37.9 -31.3 52.8
28°	70 57.8 -39.4 44.5	70 16.6 -37.8 46.1	69 34.2 -36.1 47.7	68 50.9 -34.6 49.1	68 06.6 -33.1 50.4
29°	70 18.4 -41.0 42.2	69 38.8 -39.4 43.9	68 58.1 -37.9 45.4	68 16.3 -36.3 46.9	67 33.5 -34.9 48.2

Declination SAME name as Latitude

Latitude 15°

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	65 11.1 +36.3 125.4	64 23.5 +35.2 124.0	63 35.1 +34.2 122.6	62 45.9 +33.2 121.4	61 56.1 +32.3 120.2
1°	65 47.4 +34.8 123.5	64 58.7 +33.7 122.1	64 09.3 +32.7 120.8	63 19.1 +31.8 119.5	62 28.4 +30.9 118.4
2°	66 22.2 +33.1 121.5	65 32.4 +32.1 120.1	64 42.0 +31.1 118.8	63 50.9 +30.2 117.6	62 59.3 +29.3 116.5
3°	66 55.3 +31.4 119.4	66 04.5 +30.4 118.1	65 13.1 +29.4 116.8	64 21.1 +28.5 115.6	63 28.6 +27.7 114.6
4°	67 26.7 +29.6 117.2	66 34.9 +28.5 115.9	65 42.5 +27.6 114.7	64 49.6 +26.8 113.6	63 56.3 +26.0 112.6
5°	67 56.3 +27.5 114.9	67 03.4 +26.6 113.7	66 10.1 +25.8 112.5	65 16.4 +24.9 111.5	64 22.3 +24.2 110.5
6°	68 23.8 +25.4 112.5	67 30.0 +24.6 111.4	66 35.9 +23.7 110.3	65 41.3 +23.0 109.3	64 46.5 +22.3 108.4
7°	68 49.2 +23.1 110.0	67 54.6 +22.3 108.9	66 59.6 +21.6 108.0	66 04.3 +20.9 107.0	65 08.8 +20.3 106.2
8°	69 12.3 +20.8 107.4	68 16.9 +20.0 106.5	67 21.2 +19.4 105.5	66 25.2 +18.8 104.7	65 29.1 +18.2 103.9
9°	69 33.1 +18.2 104.8	68 36.9 +17.7 103.9	67 40.6 +17.1 103.1	66 44.0 +16.6 102.3	65 47.3 +16.2 101.6
10°	69 51.3 +15.6 102.0	68 54.6 +15.1 101.3	67 57.7 +14.6 100.5	67 00.6 +14.3 99.9	66 03.5 +13.9 99.2
11°	70 06.9 +12.9 99.2	69 09.7 +12.5 98.5	68 12.3 +12.2 97.9	67 14.9 +11.9 97.4	66 17.4 +11.6 96.8
12°	70 19.8 +10.1 96.3	69 22.2 +09.8 95.8	68 24.5 +09.6 95.3	67 26.8 +09.4 94.8	66 29.0 +09.3 94.4
13°	70 29.9 +07.2 93.4	69 32.0 +07.1 93.0	68 34.1 +07.1 92.6	67 36.2 +07.0 92.2	66 38.3 +06.9 91.9
14°	70 37.1 +04.2 90.4	69 39.1 +04.3 90.1	68 41.2 +04.3 89.9	67 43.2 +04.4 89.6	66 45.2 +04.6 89.4
15°	70 41.3 +01.2 87.4	69 43.4 +01.5 87.3	68 45.5 +01.7 87.1	67 47.6 +01.9 87.0	66 49.8 +02.0 86.9
16°	70 42.5 -01.7 84.4	69 44.9 -01.4 84.4	68 47.2 -01.0 84.4	67 49.5 -00.7 84.3	66 51.8 -00.3 84.3
17°	70 40.8 -04.7 81.3	69 43.5 -04.2 81.5	68 46.2 -03.8 81.6	67 48.8 -03.2 81.7	66 51.5 -02.9 81.8
18°	70 36.1 -07.7 78.3	69 39.3 -07.0 78.6	68 42.4 -06.4 78.8	67 45.6 -05.9 79.0	66 48.6 -05.2 79.2
19°	70 28.4 -10.6 75.4	69 32.3 -09.8 75.8	68 36.0 -09.0 76.1	67 39.7 -08.3 76.4	66 43.4 -07.7 76.7
20°	70 17.8 -13.3 72.4	69 22.5 -12.4 72.9	68 27.0 -11.5 73.4	67 31.4 -10.7 73.8	66 35.7 -10.0 74.2
21°	70 04.5 -16.1 69.5	69 10.1 -15.1 70.2	68 15.5 -14.1 70.8	67 20.7 -13.2 71.3	66 25.7 -12.3 71.7
22°	69 48.4 -18.7 66.7	68 55.0 -17.5 67.5	68 01.4 -16.5 68.1	67 07.5 -15.6 68.7	66 13.4 -14.6 69.3
23°	69 29.7 -21.1 64.0	68 37.5 -20.0 64.8	67 44.9 -18.9 65.6	66 51.9 -17.8 66.3	65 58.8 -16.8 66.9
24°	69 08.6 -23.6 61.4	68 17.5 -22.3 62.3	67 26.0 -21.1 63.1	66 34.1 -19.9 63.9	65 42.0 -18.9 64.5
25°	68 45.0 -25.7 58.8	67 55.2 -24.4 59.8	67 04.9 -23.2 60.7	66 14.2 -22.1 61.5	65 23.1 -21.0 62.3
26°	68 19.3 -27.9 56.3	67 30.8 -26.6 57.4	66 41.7 -25.3 58.3	65 52.1 -24.0 59.2	65 02.1 -22.8 60.0
27°	67 51.4 -29.8 53.9	67 04.2 -28.5 55.0	66 16.4 -27.2 56.1	65 28.1 -26.0 57.0	64 39.3 -24.8 57.8
28°	67 21.6 -31.8 51.7	66 35.7 -30.3 52.8	65 49.2 -29.0 53.9	65 02.1 -27.7 54.8	64 14.5 -26.5 55.7
29°	66 49.8 -33.4 49.5	66 05.4 -32.1 50.7	65 20.2 -30.7 51.7	64 34.4 -29.4 52.7	63 48.0 -28.2 53.7

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	61 05.7 +31.5 119.0	60 14.8 +30.6 118.0	59 23.4 +29.8 116.9	58 31.5 +29.0 116.0	57 39.1 +28.4 115.0
1°	61 37.2 +30.0 117.3	60 45.4 +29.2 116.2	59 53.2 +28.4 115.2	59 00.5 +27.8 114.3	58 07.5 +27.1 113.4
2°	62 07.2 +28.5 115.4	61 14.6 +27.7 114.4	60 21.6 +27.0 113.4	59 28.3 +26.3 112.5	58 34.6 +25.7 111.7
3°	62 35.7 +26.9 113.5	61 42.3 +26.2 112.5	60 48.6 +25.5 111.6	59 54.6 +24.8 110.8	59 00.3 +24.2 109.9
4°	63 02.6 +25.2 111.6	62 08.5 +24.6 110.6	61 14.1 +23.9 109.8	60 19.4 +23.3 108.9	59 24.5 +22.7 108.1
5°	63 27.8 +23.5 109.5	62 33.1 +22.8 108.7	61 38.0 +22.3 107.8	60 42.7 +21.7 107.1	59 47.2 +21.2 106.3
6°	63 51.3 +21.7 107.5	62 55.9 +21.1 106.7	62 00.3 +20.5 105.9	61 04.4 +20.1 105.1	60 08.4 +19.6 104.4
7°	64 13.0 +19.7 105.3	63 17.0 +19.2 104.6	62 20.8 +18.8 103.9	61 24.5 +18.3 103.2	60 28.0 +17.8 102.5
8°	64 32.7 +17.8 103.2	63 36.2 +17.3 102.5	62 39.6 +16.9 101.8	61 42.8 +16.5 101.2	60 45.8 +16.2 100.6
9°	64 50.5 +15.7 100.9	63 53.5 +15.4 100.3	62 56.5 +15.0 99.7	61 59.3 +14.7 99.1	61 02.0 +14.4 98.6
10°	65 06.2 +13.6 98.6	64 08.9 +13.3 98.1	63 11.5 +13.0 97.6	62 14.0 +12.8 97.1	61 16.4 +12.6 96.6
11°	65 19.8 +11.4 96.3	64 22.2 +11.2 95.8	63 24.5 +11.0 95.4	62 26.8 +10.9 95.0	61 29.0 +10.8 94.6
12°	65 31.2 +09.2 94.0	64 33.4 +09.1 93.6	63 35.5 +09.0 93.2	62 37.7 +08.9 92.8	61 39.8 +08.8 92.5
13°	65 40.4 +06.9 91.6	64 42.5 +06.8 91.3	63 44.5 +06.9 91.0	62 46.6 +06.9 90.7	61 48.5 +06.9 90.4
14°	65 47.3 +04.6 89.2	64 49.3 +04.7 88.9	63 51.4 +04.8 88.7	62 53.5 +04.9 88.5	61 55.6 +05.0 88.3
15°	65 51.9 +02.3 86.7	64 54.0 +02.5 86.6	63 56.2 +02.6 86.4	62 58.4 +02.8 86.3	62 00.5 +03.0 86.2
16°	65 54.2 -00.1 84.3	64 56.5 +00.2 84.2	63 58.8 +00.6 84.2	63 01.2 +00.8 84.1	62 03.5 +01.1 84.0
17°	65 54.1 -02.4 81.8	64 56.7 -02.0 81.9	63 59.4 -01.7 81.9	63 02.0 -01.3 81.9	62 04.6 -00.9 81.9
18°	65 51.7 -04.7 79.4	64 54.7 -04.2 79.5	63 57.7 -03.8 79.6	63 00.7 -03.3 79.7	62 03.7 -02.9 79.8
19°	65 47.0 -07.1 76.9	64 50.5 -06.5 77.2	63 53.9 -05.9 77.3	62 57.4 -05.4 77.5	62 00.8 -04.9 77.6
20°	65 39.9 -09.3 74.5	64 44.0 -08.6 74.8	63 48.0 -08.0 75.1	62 52.0 -07.4 75.3	61 55.9 -06.8 75.5
21°	65 30.6 -11.5 72.1	64 35.4 -10.8 72.5	63 40.0 -10.0 72.8	62 44.6 -09.3 73.1	61 49.1 -08.7 73.4
22°	65 19.1 -13.8 69.8	64 24.6 -12.9 70.2	63 30.0 -12.1 70.6	62 35.3 -11.4 71.0	61 40.4 -10.6 71.3
23°	65 05.3 -15.8 67.5	64 11.7 -14.9 68.0	63 17.9 -14.1 68.4	62 23.9 -13.2 68.9	61 29.8 -12.5 69.3
24°	64 49.5 -17.9 65.2	63 56.8 -16.9 65.8	63 03.8 -16.0 66.3	62 10.7 -15.2 66.8	61 17.3 -14.3 67.2
25°	64 31.6 -19.9 62.9	63 39.9 -18.9 63.6	62 47.8 -17.9 64.2	61 55.5 -16.9 64.7	61 03.0 -16.0 65.2
26°	64 11.7 -21.7 60.8	63 21.0 -20.7 61.5	62 29.9 -19.7 62.1	61 38.6 -18.7 62.7	60 47.0 -17.8 63.2
27°	63 50.0 -23.6 58.6	63 00.3 -22.5 59.4	62 10.2 -21.4 60.1	61 19.9 -20.5 60.7	60 29.2 -19.5 61.3
28°	63 26.4 -25.4 56.6	62 37.8 -24.2 57.3	61 48.8 -23.1 58.1	60 59.4 -22.0 58.7	60 09.7 -21.0 59.4
29°	63 01.0 -27.0 54.6	62 13.6 -25.9 55.4	61 25.7 -24.8 56.1	60 37.4 -23.7 56.8	59 48.7 -22.7 57.5

Latitude 15°

Declination SAME name as Latitude

Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	56 46.4 +27.8 114.1	55 53.4 +27.1 113.3	55 00.0 +26.5 112.5	54 06.3 +25.9 111.7	53 12.3 +25.4 111.0
1°	57 14.2 +26.4 112.5	56 20.5 +25.8 111.7	55 26.5 +25.2 110.9	54 32.2 +24.7 110.2	53 37.7 +24.2 109.5
2°	57 40.6 +25.0 110.8	56 46.3 +24.5 110.1	55 51.7 +23.9 109.3	54 56.9 +23.4 108.6	54 01.9 +22.9 107.9
3°	58 05.6 +23.7 109.1	57 10.8 +23.1 108.4	56 15.6 +22.7 107.7	55 20.3 +22.2 107.0	54 24.8 +21.7 106.3
4°	58 29.3 +22.2 107.4	57 33.9 +21.7 106.7	56 38.3 +21.2 106.0	55 42.5 +20.8 105.4	54 46.5 +20.4 104.7
5°	58 51.5 +20.7 105.6	57 55.6 +20.2 104.9	56 59.5 +19.8 104.3	56 03.3 +19.4 103.7	55 06.9 +19.0 103.1
6°	59 12.2 +19.1 103.8	58 15.8 +18.7 103.2	57 19.3 +18.4 102.6	56 22.7 +18.0 102.0	55 25.9 +17.7 101.4
7°	59 31.3 +17.5 101.9	58 34.5 +17.2 101.3	57 37.7 +16.8 100.8	56 40.7 +16.5 100.2	55 43.6 +16.3 99.7
8°	59 48.8 +15.9 100.0	58 51.7 +15.6 99.5	57 54.5 +15.3 99.0	56 57.2 +15.1 98.5	55 59.9 +14.8 98.0
9°	60 04.7 +14.1 98.1	59 07.3 +13.9 97.6	58 09.8 +13.7 97.2	57 12.3 +13.5 96.7	56 14.7 +13.3 96.3
10°	60 18.8 +12.4 96.1	59 21.2 +12.2 95.7	58 23.5 +12.1 95.3	57 25.8 +11.9 94.9	56 28.0 +11.8 94.5
11°	60 31.2 +10.7 94.2	59 33.4 +10.5 93.8	58 35.6 +10.4 93.4	57 37.7 +10.4 93.1	56 39.8 +10.3 92.7
12°	60 41.9 +08.8 92.2	59 43.9 +08.8 91.8	58 46.0 +08.7 91.5	57 48.1 +08.7 91.2	56 50.1 +08.7 90.9
13°	60 50.7 +06.9 90.1	59 52.7 +07.0 89.9	58 54.7 +07.1 89.6	57 56.8 +07.1 89.4	56 58.8 +07.2 89.1
14°	60 57.6 +05.1 88.1	59 59.7 +05.2 87.9	59 01.8 +05.3 87.7	58 03.9 +05.4 87.5	57 06.0 +05.5 87.3
15°	61 02.7 +03.2 86.0	60 04.9 +03.4 85.9	59 07.1 +03.6 85.8	58 09.3 +03.7 85.6	57 11.5 +03.9 85.5
16°	61 05.9 +01.3 84.0	60 08.3 +01.5 83.9	59 10.7 +01.8 83.8	58 13.0 +02.1 83.7	57 15.4 +02.3 83.6
17°	61 07.2 -00.6 81.9	60 09.8 -00.2 81.9	59 12.5 +00.0 81.9	58 15.1 +00.4 81.8	57 17.7 +00.7 81.8
18°	61 06.6 -02.4 79.8	60 09.6 -02.1 79.9	59 12.5 -01.7 79.9	58 15.5 -01.4 79.9	57 18.4 -01.0 79.9
19°	61 04.2 -04.4 77.8	60 07.5 -03.9 77.9	59 10.8 -03.4 78.0	58 14.1 -03.0 78.0	57 17.4 -02.5 78.1
20°	60 59.8 -06.3 75.7	60 03.6 -05.7 75.9	59 07.4 -05.2 76.0	58 11.1 -04.7 76.1	57 14.9 -04.3 76.2
21°	60 53.5 -08.1 73.7	59 57.9 -07.5 73.9	59 02.2 -06.9 74.1	58 06.4 -06.3 74.2	57 10.6 -05.8 74.4
22°	60 45.4 -09.9 71.6	59 50.4 -09.3 71.9	58 55.3 -08.6 72.1	58 00.1 -08.0 72.4	57 04.8 -07.4 72.6
23°	60 35.5 -11.7 69.6	59 41.1 -11.0 69.9	58 46.7 -10.4 70.2	57 52.1 -09.7 70.5	56 57.4 -09.0 70.7
24°	60 23.8 -13.5 67.6	59 30.1 -12.7 68.0	58 36.3 -11.9 68.3	57 42.4 -11.2 68.6	56 48.4 -10.6 68.9
25°	60 10.3 -15.2 65.7	59 17.4 -14.3 66.1	58 24.4 -13.6 66.5	57 31.2 -12.8 66.8	56 37.8 -12.0 67.1
26°	59 55.1 -16.9 63.7	59 03.1 -16.1 64.2	58 10.8 -15.2 64.6	57 18.4 -14.4 65.0	56 25.8 -13.6 65.4
27°	59 38.2 -18.5 61.8	58 47.0 -17.6 62.3	57 55.6 -16.7 62.8	57 04.0 -15.9 63.2	56 12.2 -15.1 63.6
28°	59 19.7 -20.1 59.9	58 29.4 -19.1 60.5	57 38.9 -18.3 61.0	56 48.1 -17.4 61.4	55 57.1 -16.5 61.9
29°	58 59.6 -21.6 58.1	58 10.3 -20.7 58.7	57 20.6 -19.7 59.2	56 30.7 -18.8 59.7	55 40.6 -18.0 60.2

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	52 18.1 +24.8 110.3	51 23.6 +24.4 109.6	50 28.9 +23.9 109.0	49 34.0 +23.4 108.3	48 38.9 +23.0 107.7
1°	52 42.9 +23.7 108.8	51 48.0 +23.2 108.1	50 52.8 +22.8 107.5	49 57.4 +22.4 106.9	49 01.9 +21.9 106.3
2°	53 06.6 +22.5 107.3	52 11.2 +22.0 106.6	51 15.6 +21.6 106.0	50 19.8 +21.2 105.5	49 23.8 +20.9 104.9
3°	53 29.1 +21.3 105.7	52 33.2 +20.9 105.1	51 37.2 +20.5 104.5	50 41.0 +20.2 104.0	49 44.7 +19.8 103.5
4°	53 50.4 +20.0 104.1	52 54.1 +19.6 103.6	51 57.7 +19.3 103.0	51 01.2 +18.9 102.5	50 04.5 +18.7 102.0
5°	54 10.4 +18.7 102.5	53 13.7 +18.4 102.0	52 17.0 +18.1 101.5	51 20.1 +17.8 101.0	50 23.2 +17.5 100.5
6°	54 29.1 +17.3 100.9	53 32.1 +17.1 100.4	52 35.1 +16.8 99.9	51 37.9 +16.6 99.4	50 40.7 +16.4 99.0
7°	54 46.4 +16.0 99.2	53 49.2 +15.8 98.8	52 51.9 +15.5 98.3	51 54.5 +15.4 97.9	50 57.1 +15.1 97.5
8°	55 02.4 +14.7 97.6	54 05.0 +14.4 97.1	53 07.4 +14.3 96.7	52 09.9 +14.0 96.3	51 12.2 +14.0 95.9
9°	55 17.1 +13.1 95.9	54 19.4 +13.0 95.5	53 21.7 +12.9 95.1	52 23.9 +12.8 94.7	51 26.2 +12.6 94.4
10°	55 30.2 +11.7 94.2	54 32.4 +11.6 93.8	53 34.6 +11.5 93.5	52 36.7 +11.5 93.1	51 38.8 +11.4 92.8
11°	55 41.9 +10.3 92.4	54 44.0 +10.2 92.1	53 46.1 +10.2 91.8	52 48.2 +10.1 91.5	51 50.2 +10.1 91.2
12°	55 52.2 +08.7 90.7	54 54.2 +08.7 90.4	53 56.3 +08.7 90.1	52 58.3 +08.8 89.9	52 00.3 +08.9 89.6
13°	56 00.9 +07.2 88.9	55 02.9 +07.3 88.7	54 05.0 +07.3 88.4	53 07.1 +07.4 88.2	52 09.2 +07.4 88.0
14°	56 08.1 +05.6 87.1	55 10.2 +05.8 86.9	54 12.3 +05.9 86.8	53 14.5 +06.0 86.6	52 16.6 +06.2 86.4
15°	56 13.7 +04.1 85.3	55 16.0 +04.3 85.2	54 18.2 +04.5 85.1	53 20.5 +04.6 84.9	52 22.8 +04.8 84.8
16°	56 17.8 +02.6 83.5	55 20.3 +02.7 83.4	54 22.7 +03.0 83.3	53 25.1 +03.3 83.2	52 27.6 +03.4 83.1
17°	56 20.4 +00.9 81.7	55 23.0 +01.3 81.7	54 25.7 +01.5 81.6	53 28.4 +01.8 81.6	52 31.0 +02.1 81.5
18°	56 21.3 -00.6 79.9	55 24.3 -00.3 79.9	54 27.2 +00.1 79.9	53 30.2 +00.4 79.9	52 33.1 +00.7 79.8
19°	56 20.7 -02.1 78.1	55 24.0 -01.8 78.2	54 27.3 -01.4 78.2	53 30.6 -01.1 78.2	52 33.8 -00.6 78.2
20°	56 18.6 -03.8 76.3	55 22.2 -03.3 76.4	54 25.9 -02.9 76.5	53 29.5 -02.4 76.5	52 33.2 -02.0 76.6
21°	56 14.8 -05.3 74.5	55 18.9 -04.8 74.6	54 23.0 -04.3 74.7	53 27.1 -03.8 74.8	52 31.2 -03.4 74.9
22°	56 09.5 -06.8 72.7	55 14.1 -06.3 72.9	54 18.7 -05.7 73.0	53 23.3 -05.3 73.2	52 27.8 -04.8 73.3
23°	56 02.7 -08.4 71.0	55 07.8 -07.7 71.2	54 13.0 -07.2 71.3	53 18.0 -06.6 71.5	52 23.0 -06.0 71.6
24°	55 54.3 -09.9 69.2	55 00.1 -09.3 69.4	54 05.8 -08.7 69.6	53 11.4 -08.0 69.8	52 17.0 -07.5 70.0
25°	55 44.4 -11.4 67.4	54 50.8 -10.7 67.7	53 57.1 -10.0 68.0	53 03.4 -09.4 68.2	52 09.5 -08.7 68.4
26°	55 33.0 -12.8 65.7	54 40.1 -12.1 66.0	53 47.1 -11.4 66.3	52 54.0 -10.7 66.5	52 00.8 -10.1 66.8
27°	55 20.2 -14.3 64.0	54 28.0 -13.5 64.3	53 35.7 -12.8 64.6	52 43.3 -12.1 64.9	51 50.7 -11.3 65.2
28°	55 05.9 -15.7 62.3	54 14.5 -14.9 62.6	53 22.9 -14.1 63.0	52 31.2 -13.3 63.3	51 39.4 -12.6 63.6
29°	54 50.2 -17.1 60.6	53 59.6 -16.2 61.0	53 08.8 -15.4 61.4	52 17.9 -14.6 61.7	51 26.8 -13.9 62.0

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Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	47 43.6 +22.6 107.1	46 48.1 +22.2 106.6	45 52.5 +21.8 106.0	44 56.7 +21.5 105.5	44 00.8 +21.2 105.0
1°	48 06.2 +21.6 105.8	47 10.3 +21.3 105.2	46 14.3 +20.9 104.7	45 18.2 +20.6 104.2	44 22.0 +20.2 103.7
2°	48 27.8 +20.5 104.4	47 31.6 +20.2 103.8	46 35.2 +19.9 103.3	45 38.8 +19.6 102.8	44 42.2 +19.3 102.4
3°	48 48.3 +19.5 102.9	47 51.8 +19.1 102.4	46 55.1 +18.9 102.0	45 58.4 +18.6 101.5	45 01.5 +18.4 101.0
4°	49 07.8 +18.4 101.5	48 10.9 +18.2 101.0	47 14.0 +17.9 100.6	46 17.0 +17.6 100.1	45 19.9 +17.4 99.7
5°	49 26.2 +17.3 100.0	48 29.1 +17.0 99.6	47 31.9 +16.8 99.2	46 34.6 +16.7 98.7	45 37.3 +16.5 98.3
6°	49 43.5 +16.1 98.6	48 46.1 +16.0 98.1	47 48.7 +15.8 97.7	46 51.3 +15.5 97.3	45 53.8 +15.4 96.9
7°	49 59.6 +15.0 97.1	49 02.1 +14.8 96.7	48 04.5 +14.6 96.3	47 06.8 +14.6 95.9	46 09.2 +14.4 95.6
8°	50 14.6 +13.8 95.6	49 16.9 +13.6 95.2	48 19.1 +13.6 94.8	47 21.4 +13.4 94.5	46 23.6 +13.3 94.2
9°	50 28.4 +12.5 94.0	49 30.5 +12.5 93.7	48 32.7 +12.4 93.4	47 34.8 +12.4 93.0	46 36.9 +12.3 92.7
10°	50 40.9 +11.4 92.5	49 43.0 +11.3 92.2	48 45.1 +11.3 91.9	47 47.2 +11.2 91.6	46 49.2 +11.3 91.3
11°	50 52.3 +10.1 90.9	49 54.3 +10.1 90.7	48 56.4 +10.1 90.4	47 58.4 +10.2 90.1	47 00.5 +10.1 89.9
12°	51 02.4 +08.8 89.4	50 04.4 +08.9 89.1	49 06.5 +08.9 88.9	48 08.6 +08.9 88.7	47 10.6 +09.1 88.4
13°	51 11.2 +07.6 87.8	50 13.3 +07.7 87.6	49 15.4 +07.8 87.4	48 17.5 +07.9 87.2	47 19.7 +07.9 87.0
14°	51 18.8 +06.3 86.2	50 21.0 +06.4 86.0	49 23.2 +06.5 85.9	48 25.4 +06.6 85.7	47 27.6 +06.8 85.5
15°	51 25.1 +05.0 84.6	50 27.4 +05.1 84.5	49 29.7 +05.3 84.3	48 32.0 +05.5 84.2	47 34.4 +05.7 84.0
16°	51 30.1 +03.6 83.0	50 32.5 +03.9 82.9	49 35.0 +04.1 82.8	48 37.5 +04.4 82.7	47 40.1 +04.5 82.6
17°	51 33.7 +02.4 81.4	50 36.4 +02.6 81.3	49 39.1 +02.9 81.3	48 41.9 +03.1 81.2	47 44.6 +03.4 81.1
18°	51 36.1 +01.0 79.8	50 39.0 +01.4 79.8	49 42.0 +01.6 79.7	48 45.0 +01.9 79.6	47 48.0 +02.2 79.6
19°	51 37.1 -00.3 78.2	50 40.4 +00.0 78.2	49 43.6 +00.5 78.2	48 46.9 +00.8 78.1	47 50.2 +01.1 78.1
20°	51 36.8 -01.6 76.6	50 40.4 -01.2 76.6	49 44.1 -00.9 76.6	48 47.7 -00.5 76.6	47 51.3 -00.1 76.6
21°	51 35.2 -02.9 75.0	50 39.2 -02.5 75.0	49 43.2 -02.0 75.1	48 47.2 -01.6 75.1	47 51.2 -01.2 75.1
22°	51 32.3 -04.3 73.4	50 36.7 -03.7 73.5	49 41.2 -03.3 73.5	48 45.6 -02.9 73.6	47 50.0 -02.4 73.6
23°	51 28.0 -05.5 71.8	50 33.0 -05.1 71.9	49 37.9 -04.6 72.0	48 42.7 -04.0 72.1	47 47.6 -03.6 72.1
24°	51 22.5 -06.9 70.2	50 27.9 -06.3 70.3	49 33.3 -05.7 70.4	48 38.7 -05.2 70.6	47 44.0 -04.7 70.7
25°	51 15.6 -08.1 68.6	50 21.6 -07.5 68.8	49 27.6 -07.0 68.9	48 33.5 -06.4 69.0	47 39.3 -05.8 69.2
26°	51 07.5 -09.4 67.0	50 14.1 -08.8 67.2	49 20.6 -08.1 67.4	48 27.1 -07.5 67.5	47 33.5 -07.0 67.7
27°	50 58.1 -10.7 65.4	50 05.3 -10.0 65.7	49 12.5 -09.4 65.9	48 19.6 -08.8 66.1	47 26.5 -08.0 66.2
28°	50 47.4 -11.9 63.9	49 55.3 -11.2 64.1	49 03.1 -10.5 64.4	48 10.8 -09.8 64.6	47 18.5 -09.2 64.8
29°	50 35.5 -13.1 62.3	49 44.1 -12.4 62.6	48 52.6 -11.7 62.9	48 01.0 -11.0 63.1	47 09.3 -10.3 63.3

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	43 04.8 +20.8 104.5	42 08.6 +20.5 104.0	41 12.3 +20.3 103.6	40 15.9 +20.0 103.1	39 19.4 +19.7 102.7
1°	43 25.6 +20.0 103.2	42 29.1 +19.7 102.8	41 32.6 +19.4 102.3	40 35.9 +19.1 101.9	39 39.1 +18.9 101.5
2°	43 45.6 +19.0 101.9	42 48.8 +18.8 101.5	41 52.0 +18.5 101.0	40 55.0 +18.4 100.6	39 58.0 +18.2 100.2
3°	44 04.6 +18.1 100.6	43 07.6 +17.9 100.2	42 10.5 +17.7 99.8	41 13.4 +17.5 99.4	40 16.2 +17.3 99.0
4°	44 22.7 +17.3 99.3	43 25.5 +17.0 98.9	42 28.2 +16.8 98.5	41 30.9 +16.6 98.1	40 33.5 +16.5 97.7
5°	44 40.0 +16.2 97.9	43 42.5 +16.1 97.5	42 45.0 +16.0 97.2	41 47.5 +15.8 96.8	40 50.0 +15.6 96.4
6°	44 56.2 +15.3 96.6	43 58.6 +15.1 96.2	43 01.0 +15.0 95.9	42 03.3 +14.9 95.5	41 05.6 +14.8 95.2
7°	45 11.5 +14.3 95.2	44 13.7 +14.2 94.9	43 16.0 +14.1 94.5	42 18.2 +14.0 94.2	41 20.4 +13.9 93.9
8°	45 25.8 +13.2 93.8	44 27.9 +13.2 93.5	43 30.1 +13.1 93.2	42 32.2 +13.1 92.9	41 34.3 +13.0 92.6
9°	45 39.0 +12.3 92.4	44 41.1 +12.3 92.1	43 43.2 +12.2 91.8	42 45.3 +12.1 91.6	41 47.3 +12.2 91.3
10°	45 51.3 +11.2 91.0	44 53.4 +11.2 90.8	43 55.4 +11.2 90.5	42 57.4 +11.3 90.2	41 59.5 +11.2 90.0
11°	46 02.5 +10.2 89.6	45 04.6 +10.2 89.4	44 06.6 +10.3 89.1	43 08.7 +10.2 88.9	42 10.7 +10.3 88.6
12°	46 12.7 +09.1 88.2	45 14.8 +09.1 88.0	44 16.9 +09.2 87.7	43 18.9 +09.4 87.5	42 21.0 +09.4 87.3
13°	46 21.8 +08.0 86.8	45 23.9 +08.2 86.6	44 26.1 +08.2 86.4	43 28.3 +08.3 86.2	42 30.4 +08.5 86.0
14°	46 29.8 +07.0 85.3	45 32.1 +07.0 85.1	44 34.3 +07.2 85.0	43 36.6 +07.4 84.8	42 38.9 +07.5 84.6
15°	46 36.8 +05.8 83.9	45 39.1 +06.1 83.7	44 41.5 +06.2 83.6	43 44.0 +06.3 83.4	42 46.4 +06.5 83.3
16°	46 42.6 +04.8 82.4	45 45.2 +04.9 82.3	44 47.7 +05.2 82.2	43 50.3 +05.4 82.0	42 52.9 +05.6 81.9
17°	46 47.4 +03.6 81.0	45 50.1 +03.9 80.9	44 52.9 +04.1 80.8	43 55.7 +04.4 80.7	42 58.5 +04.6 80.6
18°	46 51.0 +02.5 79.5	45 54.0 +02.8 79.4	44 57.0 +03.1 79.4	44 00.1 +03.4 79.3	43 03.1 +03.7 79.2
19°	46 53.5 +01.4 78.1	45 56.8 +01.7 78.0	45 00.1 +02.1 78.0	44 03.5 +02.3 77.9	43 06.8 +02.7 77.8
20°	46 54.9 +00.3 76.6	45 58.5 +00.7 76.6	45 02.2 +01.0 76.5	44 05.8 +01.4 76.5	43 09.5 +01.6 76.5
21°	46 55.2 -00.8 75.1	45 59.2 -00.5 75.1	45 03.2 -00.1 75.1	44 07.2 +00.3 75.1	43 11.1 +00.8 75.1
22°	46 54.4 -02.0 73.7	45 58.7 -01.5 73.7	45 03.1 -01.1 73.7	44 07.5 -00.7 73.7	43 11.9 -00.3 73.7
23°	46 52.4 -03.1 72.2	45 57.2 -02.6 72.3	45 02.0 -02.1 72.3	44 06.8 -01.7 72.3	43 11.6 -01.3 72.3
24°	46 49.3 -04.1 70.7	45 54.6 -03.7 70.8	44 59.9 -03.2 70.9	44 05.1 -02.7 70.9	43 10.3 -02.2 71.0
25°	46 45.2 -05.3 69.3	45 50.9 -04.7 69.4	44 56.7 -04.3 69.5	44 02.4 -03.7 69.5	43 08.1 -03.3 69.6
26°	46 39.9 -06.4 67.8	45 46.2 -05.9 68.0	44 52.4 -05.2 68.1	43 58.7 -04.8 68.2	43 04.8 -04.2 68.2
27°	46 33.5 -07.5 66.4	45 40.3 -06.8 66.5	44 47.2 -06.3 66.7	43 53.9 -05.7 66.8	43 00.6 -05.1 66.9
28°	46 26.0 -08.6 64.9	45 33.5 -08.0 65.1	44 40.9 -07.4 65.3	43 48.2 -06.7 65.4	42 55.5 -06.2 65.5
29°	46 17.4 -09.6 63.5	45 25.5 -09.0 63.7	44 33.5 -08.3 63.9	43 41.5 -07.7 64.0	42 49.3 -07.0 64.2

Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	38 22.8 +19.5 102.3	37 26.2 +19.2 101.8	36 29.4 +19.0 101.4	35 32.6 +18.7 101.0	34 35.6 +18.6 100.6
1°	38 42.3 +18.7 101.0	37 45.4 +18.4 100.6	36 48.4 +18.2 100.2	35 51.3 +18.1 99.9	34 54.2 +17.8 99.5
2°	39 01.0 +17.9 99.8	38 03.8 +17.8 99.4	37 06.6 +17.6 99.1	36 09.4 +17.3 98.7	35 12.0 +17.2 98.3
3°	39 18.9 +17.1 98.6	38 21.6 +16.9 98.2	37 24.2 +16.8 97.9	36 26.7 +16.7 97.5	35 29.2 +16.6 97.2
4°	39 36.0 +16.3 97.4	38 38.5 +16.2 97.0	37 41.0 +16.0 96.6	36 43.4 +15.9 96.3	35 45.8 +15.8 96.0
5°	39 52.3 +15.6 96.1	38 54.7 +15.4 95.8	37 57.0 +15.3 95.4	36 59.3 +15.2 95.1	36 01.6 +15.1 94.8
6°	40 07.9 +14.7 94.8	39 10.1 +14.6 94.5	38 12.3 +14.5 94.2	37 14.5 +14.4 93.9	36 16.7 +14.3 93.6
7°	40 22.6 +13.8 93.6	39 24.7 +13.8 93.3	38 26.8 +13.8 93.0	37 28.9 +13.7 92.7	36 31.0 +13.7 92.4
8°	40 36.4 +13.0 92.3	39 38.5 +13.0 92.0	38 40.6 +12.9 91.7	37 42.6 +12.9 91.4	36 44.7 +12.9 91.2
9°	40 49.4 +12.1 91.0	39 51.5 +12.1 90.7	38 53.5 +12.1 90.5	37 55.5 +12.2 90.2	36 57.6 +12.1 89.9
10°	41 01.5 +11.3 89.7	40 03.6 +11.3 89.5	39 05.6 +11.3 89.2	38 07.7 +11.3 89.0	37 09.7 +11.4 88.7
11°	41 12.8 +10.4 88.4	40 14.9 +10.4 88.2	39 16.9 +10.5 87.9	38 19.0 +10.6 87.7	37 21.1 +10.6 87.5
12°	41 23.2 +09.4 87.1	40 25.3 +09.5 86.9	39 27.4 +09.7 86.7	38 29.6 +09.7 86.4	37 31.7 +09.9 86.2
13°	41 32.6 +08.6 85.8	40 34.8 +08.7 85.6	39 37.1 +08.8 85.4	38 39.3 +08.9 85.2	37 41.6 +09.0 85.0
14°	41 41.2 +07.6 84.4	40 43.5 +07.8 84.3	39 45.9 +07.9 84.1	38 48.2 +08.1 83.9	37 50.6 +08.3 83.7
15°	41 48.8 +06.8 83.1	40 51.3 +06.9 83.0	39 53.8 +07.1 82.8	38 56.3 +07.3 82.6	37 58.9 +07.4 82.5
16°	41 55.6 +05.8 81.8	40 58.2 +06.0 81.6	40 00.9 +06.2 81.5	39 03.6 +06.4 81.4	38 06.3 +06.6 81.2
17°	42 01.4 +04.8 80.4	41 04.2 +05.1 80.3	40 07.1 +05.3 80.2	39 10.0 +05.6 80.1	38 12.9 +05.8 80.0
18°	42 06.2 +03.9 79.1	41 09.3 +04.2 79.0	40 12.4 +04.5 78.9	39 15.6 +04.7 78.8	38 18.7 +05.0 78.7
19°	42 10.1 +03.0 77.8	41 13.5 +03.3 77.7	40 16.9 +03.6 77.6	39 20.3 +03.9 77.5	38 23.7 +04.2 77.4
20°	42 13.1 +02.0 76.4	41 16.8 +02.4 76.4	40 20.5 +02.7 76.3	39 24.2 +03.0 76.2	38 27.9 +03.4 76.2
21°	42 15.1 +01.1 75.1	41 19.2 +01.4 75.0	40 23.2 +01.8 75.0	39 27.2 +02.2 74.9	38 31.3 +02.5 74.9
22°	42 16.2 +00.1 73.7	41 20.6 +00.5 73.7	40 25.0 +00.9 73.7	39 29.4 +01.3 73.6	38 33.8 +01.6 73.6
23°	42 16.3 -00.8 72.4	41 21.1 -00.4 72.4	40 25.9 +00.0 72.4	39 30.7 +00.4 72.3	38 35.4 +00.9 72.3
24°	42 15.5 -01.8 71.0	41 20.7 -01.3 71.0	40 25.9 -00.9 71.0	39 31.1 -00.4 71.0	38 36.3 +00.0 71.0
25°	42 13.7 -02.7 69.7	41 19.4 -02.3 69.7	40 25.0 -01.7 69.7	39 30.7 -01.3 69.7	38 36.3 -00.8 69.8
26°	42 11.0 -03.7 68.3	41 17.1 -03.1 68.4	40 23.3 -02.7 68.4	39 29.4 -02.2 68.5	38 35.5 -01.7 68.5
27°	42 07.3 -04.6 67.0	41 14.0 -04.1 67.0	40 20.6 -03.5 67.1	39 27.2 -03.0 67.2	38 33.8 -02.5 67.2
28°	42 02.7 -05.5 65.6	41 09.9 -05.0 65.7	40 17.1 -04.5 65.8	39 24.2 -03.9 65.9	38 31.3 -03.3 65.9
29°	41 57.2 -06.5 64.3	41 04.9 -05.9 64.4	40 12.6 -05.3 64.5	39 20.3 -04.7 64.6	38 28.0 -04.2 64.6

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	33 38.6 +18.4 100.3	32 41.6 +18.1 99.9	31 44.5 +17.9 99.5	30 47.3 +17.8 99.2	29 50.0 +17.7 98.8
1°	33 57.0 +17.7 99.1	32 59.7 +17.6 98.8	32 02.4 +17.4 98.4	31 05.1 +17.2 98.1	30 07.7 +17.0 97.7
2°	34 14.7 +17.0 98.0	33 17.3 +16.9 97.6	32 19.8 +16.7 97.3	31 22.3 +16.6 97.0	30 24.7 +16.5 96.6
3°	34 31.7 +16.4 96.8	33 34.2 +16.2 96.5	32 36.5 +16.2 96.1	31 38.9 +16.0 95.8	30 41.2 +16.0 95.5
4°	34 48.1 +15.7 95.6	33 50.4 +15.6 95.3	32 52.7 +15.5 95.0	31 54.9 +15.5 94.7	30 57.2 +15.3 94.4
5°	35 03.8 +15.0 94.5	34 06.0 +14.9 94.2	33 08.2 +14.9 93.9	32 10.4 +14.8 93.6	31 12.5 +14.8 93.3
6°	35 18.8 +14.3 93.3	34 20.9 +14.3 93.0	33 23.1 +14.2 92.7	32 25.2 +14.1 92.4	31 27.3 +14.1 92.1
7°	35 33.1 +13.6 92.1	34 35.2 +13.6 91.8	33 37.3 +13.5 91.5	32 39.3 +13.6 91.3	31 41.4 +13.5 91.0
8°	35 46.7 +12.9 90.9	34 48.8 +12.9 90.6	33 50.8 +12.9 90.4	32 52.9 +12.9 90.1	31 54.9 +12.9 89.8
9°	35 59.6 +12.2 89.7	35 01.7 +12.2 89.4	34 03.7 +12.2 89.2	33 05.8 +12.2 88.9	32 07.8 +12.3 88.7
10°	36 11.8 +11.4 88.5	35 13.9 +11.4 88.2	34 15.9 +11.6 88.0	33 18.0 +11.6 87.8	32 20.1 +11.7 87.5
11°	36 23.2 +10.7 87.3	35 25.3 +10.8 87.0	34 27.5 +10.8 86.8	33 29.6 +10.9 86.6	32 31.8 +11.0 86.4
12°	36 33.9 +09.9 86.0	35 36.1 +10.0 85.8	34 38.3 +10.1 85.6	33 40.5 +10.3 85.4	32 42.8 +10.3 85.2
13°	36 43.8 +09.2 84.8	35 46.1 +09.3 84.6	34 48.4 +09.5 84.4	33 50.8 +09.5 84.2	32 53.1 +09.7 84.0
14°	36 53.0 +08.4 83.6	35 55.4 +08.6 83.4	34 57.9 +08.7 83.2	34 00.3 +08.9 83.0	33 02.8 +09.0 82.8
15°	37 01.4 +07.6 82.3	36 04.0 +07.8 82.2	35 06.6 +08.0 82.0	34 09.2 +08.2 81.8	33 11.8 +08.4 81.7
16°	37 09.0 +06.9 81.1	36 11.8 +07.0 80.9	35 14.6 +07.2 80.8	34 17.4 +07.4 80.6	33 20.2 +07.7 80.5
17°	37 15.9 +06.0 79.8	36 18.8 +06.3 79.7	35 21.8 +06.6 79.6	34 24.8 +06.8 79.4	33 27.9 +07.0 79.3
18°	37 21.9 +05.3 78.6	36 25.1 +05.5 78.5	35 28.4 +05.7 78.4	34 31.6 +06.1 78.2	33 34.9 +06.3 78.1
19°	37 27.2 +04.4 77.3	36 30.6 +04.8 77.2	35 34.1 +05.1 77.1	34 37.7 +05.3 77.0	33 41.2 +05.6 76.9
20°	37 31.6 +03.7 76.1	36 35.4 +04.0 76.0	35 39.2 +04.3 75.9	34 43.0 +04.6 75.8	33 46.8 +04.9 75.7
21°	37 35.3 +02.9 74.8	36 39.4 +03.2 74.7	35 43.5 +03.5 74.7	34 47.6 +03.9 74.6	33 51.7 +04.3 74.5
22°	37 38.2 +02.0 73.6	36 42.6 +02.4 73.5	35 47.0 +02.8 73.4	34 51.5 +03.1 73.4	33 56.0 +03.5 73.3
23°	37 40.2 +01.3 72.3	36 45.0 +01.7 72.3	35 49.8 +02.1 72.2	34 54.6 +02.5 72.2	33 59.5 +02.8 72.1
24°	37 41.5 +00.4 71.0	36 46.7 +00.8 71.0	35 51.9 +01.3 71.0	34 57.1 +01.7 70.9	34 02.3 +02.1 70.9
25°	37 41.9 -00.4 69.8	36 47.5 +00.1 69.8	35 53.2 +00.5 69.7	34 58.8 +01.0 69.7	34 04.4 +01.4 69.7
26°	37 41.5 -01.1 68.5	36 47.6 -00.7 68.5	35 53.7 -00.2 68.5	34 59.8 +00.2 68.5	34 05.8 +00.7 68.5
27°	37 40.4 -02.0 67.2	36 46.9 -01.5 67.3	35 53.5 -01.0 67.3	35 00.0 -00.5 67.3	34 06.5 +00.0 67.3
28°	37 38.4 -02.8 66.0	36 45.4 -02.2 66.0	35 52.5 -01.8 66.0	34 59.5 -01.2 66.1	34 06.5 -00.7 66.1
29°	37 35.6 -03.6 64.7	36 43.2 -03.1 64.8	35 50.7 -02.5 64.8	34 58.3 -02.0 64.8	34 05.8 -01.4 64.9

Declination SAME name as Latitude

Latitude 15°

Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	28 52.7 +17.5 98.5	27 55.4 +17.3 98.2	26 58.0 +17.2 97.8	26 00.6 +17.0 97.5	25 03.1 +16.9 97.2
1°	29 10.2 +16.9 97.4	28 12.7 +16.8 97.1	27 15.2 +16.7 96.8	26 17.6 +16.6 96.4	25 20.0 +16.5 96.1
2°	29 27.1 +16.4 96.3	28 29.5 +16.3 96.0	27 31.9 +16.1 95.7	26 34.2 +16.1 95.4	25 36.5 +16.0 95.1
3°	29 43.5 +15.9 95.2	28 45.8 +15.7 94.9	27 48.0 +15.7 94.6	26 50.3 +15.6 94.3	25 52.5 +15.5 94.0
4°	29 59.4 +15.2 94.1	29 01.5 +15.3 93.8	28 03.7 +15.2 93.5	27 05.9 +15.0 93.2	26 08.0 +15.0 92.9
5°	30 14.6 +14.7 93.0	29 16.8 +14.6 92.7	28 18.9 +14.6 92.4	27 20.9 +14.6 92.1	26 23.0 +14.6 91.8
6°	30 29.3 +14.1 91.8	29 31.4 +14.1 91.6	28 33.5 +14.0 91.3	27 35.5 +14.1 91.0	26 37.6 +14.0 90.8
7°	30 43.4 +13.6 90.7	29 45.5 +13.5 90.5	28 47.5 +13.6 90.2	27 49.6 +13.5 89.9	26 51.6 +13.6 89.7
8°	30 57.0 +12.9 89.6	29 59.0 +13.0 89.3	29 01.1 +12.9 89.1	28 03.1 +13.0 88.8	27 05.2 +13.0 88.6
9°	31 09.9 +12.3 88.4	30 12.0 +12.3 88.2	29 14.0 +12.5 88.0	28 16.1 +12.5 87.7	27 18.2 +12.6 87.5
10°	31 22.2 +11.7 87.3	30 24.3 +11.8 87.1	29 26.5 +11.8 86.8	28 28.6 +11.9 86.6	27 30.8 +12.0 86.4
11°	31 33.9 +11.1 86.1	30 36.1 +11.2 85.9	29 38.3 +11.3 85.7	28 40.5 +11.4 85.5	27 42.8 +11.4 85.3
12°	31 45.0 +10.5 85.0	30 47.3 +10.6 84.8	29 49.6 +10.7 84.6	28 51.9 +10.8 84.4	27 54.2 +11.0 84.2
13°	31 55.5 +09.8 83.8	30 57.9 +09.9 83.6	30 00.3 +10.1 83.4	29 02.7 +10.3 83.2	28 05.2 +10.4 83.1
14°	32 05.3 +09.2 82.7	31 07.8 +09.4 82.5	30 10.4 +09.5 82.3	29 13.0 +09.7 82.1	28 15.6 +09.8 81.9
15°	32 14.5 +08.6 81.5	31 17.2 +08.7 81.3	30 19.9 +08.9 81.2	29 22.7 +09.1 81.0	28 25.4 +09.3 80.8
16°	32 23.1 +07.8 80.3	31 25.9 +08.1 80.2	30 28.8 +08.4 80.0	29 31.8 +08.5 79.9	28 34.7 +08.8 79.7
17°	32 30.9 +07.3 79.2	31 34.0 +07.5 79.0	30 37.2 +07.7 78.9	29 40.3 +08.0 78.7	28 43.5 +08.2 78.6
18°	32 38.2 +06.6 78.0	31 41.5 +06.8 77.8	30 44.9 +07.1 77.7	29 48.3 +07.3 77.6	28 51.7 +07.6 77.4
19°	32 44.8 +05.9 76.8	31 48.3 +06.2 76.7	30 52.0 +06.4 76.6	29 55.6 +06.8 76.4	28 59.3 +07.0 76.3
20°	32 50.7 +05.2 75.6	31 54.5 +05.6 75.5	30 58.4 +05.9 75.4	30 02.4 +06.1 75.3	29 06.3 +06.5 75.2
21°	32 55.9 +04.6 74.4	32 00.1 +04.9 74.3	31 04.3 +05.2 74.2	30 08.5 +05.6 74.1	29 12.8 +05.9 74.0
22°	33 00.5 +03.8 73.2	32 05.0 +04.2 73.2	31 09.5 +04.6 73.1	30 14.1 +04.9 73.0	29 18.7 +05.3 72.9
23°	33 04.3 +03.3 72.0	32 09.2 +03.6 72.0	31 14.1 +04.0 71.9	30 19.0 +04.4 71.8	29 24.0 +04.7 71.7
24°	33 07.6 +02.5 70.9	32 12.8 +02.9 70.8	31 18.1 +03.3 70.7	30 23.4 +03.7 70.7	29 28.7 +04.1 70.6
25°	33 10.1 +01.8 69.7	32 15.7 +02.3 69.6	31 21.4 +02.7 69.6	30 27.1 +03.1 69.5	29 32.8 +03.6 69.4
26°	33 11.9 +01.2 68.5	32 18.0 +01.6 68.4	31 24.1 +02.1 68.4	30 30.2 +02.5 68.4	29 36.4 +02.9 68.3
27°	33 13.1 +00.4 67.3	32 19.6 +01.0 67.3	31 26.2 +01.4 67.2	30 32.7 +01.9 67.2	29 39.3 +02.4 67.2
28°	33 13.5 -00.2 66.1	32 20.6 +00.3 66.1	31 27.6 +00.8 66.1	30 34.6 +01.3 66.0	29 41.7 +01.7 66.0
29°	33 13.3 -00.9 64.9	32 20.9 -00.4 64.9	31 28.4 +00.1 64.9	30 35.9 +00.7 64.9	29 43.4 +01.2 64.9

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	24 05.6 +16.8 96.9	23 08.0 +16.7 96.6	22 10.4 +16.6 96.3	21 12.8 +16.5 96.0	20 15.1 +16.4 95.7
1°	24 22.4 +16.3 95.8	23 24.7 +16.3 95.5	22 27.0 +16.2 95.2	21 29.3 +16.1 94.9	20 31.5 +16.0 94.6
2°	24 38.7 +15.9 94.8	23 41.0 +15.8 94.5	22 43.2 +15.7 94.2	21 45.4 +15.7 93.9	20 47.5 +15.7 93.6
3°	24 54.6 +15.5 93.7	23 56.8 +15.4 93.4	22 58.9 +15.4 93.1	22 01.1 +15.3 92.9	21 03.2 +15.2 92.6
4°	25 10.1 +15.0 92.6	24 12.2 +15.0 92.4	23 14.3 +14.9 92.1	22 16.4 +14.9 91.8	21 18.4 +14.9 91.5
5°	25 25.1 +14.5 91.6	24 27.2 +14.5 91.3	23 29.2 +14.5 91.0	22 31.3 +14.5 90.8	21 33.3 +14.5 90.5
6°	25 39.6 +14.1 90.5	24 41.7 +14.0 90.2	23 43.7 +14.1 90.0	22 45.8 +14.0 89.7	21 47.8 +14.1 89.5
7°	25 53.7 +13.6 89.4	24 55.7 +13.6 89.2	23 57.8 +13.6 88.9	22 59.8 +13.7 88.7	22 01.9 +13.7 88.4
8°	26 07.3 +13.0 88.3	25 09.3 +13.2 88.1	24 11.4 +13.2 87.8	23 13.5 +13.2 87.6	22 15.6 +13.3 87.4
9°	26 20.3 +12.6 87.2	25 22.5 +12.6 87.0	24 24.6 +12.7 86.8	23 26.7 +12.8 86.5	22 28.9 +12.9 86.3
10°	26 32.9 +12.1 86.2	25 35.1 +12.2 85.9	24 37.3 +12.3 85.7	23 39.5 +12.4 85.5	22 41.8 +12.4 85.3
11°	26 45.0 +11.6 85.1	25 47.3 +11.7 84.8	24 49.6 +11.8 84.6	23 51.9 +11.9 84.4	22 54.2 +12.0 84.2
12°	26 56.6 +11.1 84.0	25 59.0 +11.2 83.8	25 01.4 +11.3 83.5	24 03.8 +11.5 83.3	23 06.2 +11.7 83.1
13°	27 07.7 +10.5 82.9	26 10.2 +10.7 82.7	25 12.7 +10.9 82.5	24 15.3 +11.0 82.3	23 17.9 +11.1 82.1
14°	27 18.2 +10.0 81.7	26 20.9 +10.2 81.6	25 23.6 +10.3 81.4	24 26.3 +10.5 81.2	23 29.0 +10.8 81.0
15°	27 28.2 +09.5 80.6	26 31.1 +09.7 80.5	25 33.9 +09.9 80.3	24 36.8 +10.1 80.1	23 39.8 +10.2 79.9
16°	27 37.7 +09.0 79.5	26 40.8 +09.1 79.4	25 43.8 +09.4 79.2	24 46.9 +09.6 79.0	23 50.0 +09.9 78.8
17°	27 46.7 +08.4 78.4	26 49.9 +08.7 78.2	25 53.2 +08.9 78.1	24 56.5 +09.2 77.9	23 59.9 +09.4 77.8
18°	27 55.1 +07.9 77.3	26 58.6 +08.1 77.1	26 02.1 +08.4 77.0	25 05.7 +08.6 76.8	24 09.3 +08.9 76.7
19°	28 03.0 +07.3 76.2	27 06.7 +07.6 76.0	26 10.5 +07.9 75.9	25 14.3 +08.2 75.7	24 18.2 +08.4 75.6
20°	28 10.3 +06.8 75.0	27 14.3 +07.1 74.9	26 18.4 +07.4 74.8	25 22.5 +07.7 74.6	24 26.6 +08.0 74.5
21°	28 17.1 +06.2 73.9	27 21.4 +06.6 73.8	26 25.8 +06.9 73.7	25 30.2 +07.2 73.5	24 34.6 +07.5 73.4
22°	28 23.3 +05.7 72.8	27 28.0 +06.0 72.7	26 32.7 +06.3 72.6	25 37.4 +06.7 72.4	24 42.1 +07.1 72.3
23°	28 29.0 +05.1 71.6	27 34.0 +05.4 71.6	26 39.0 +05.8 71.5	25 44.1 +06.2 71.3	24 49.2 +06.6 71.2
24°	28 34.1 +04.5 70.5	27 39.4 +05.0 70.4	26 44.8 +05.4 70.3	25 50.3 +05.7 70.2	24 55.8 +06.1 70.1
25°	28 38.6 +03.9 69.4	27 44.4 +04.3 69.3	26 50.2 +04.7 69.2	25 56.0 +05.2 69.1	25 01.9 +05.6 69.0
26°	28 42.5 +03.4 68.2	27 48.7 +03.9 68.2	26 54.9 +04.3 68.1	26 01.2 +04.7 68.0	25 07.5 +05.1 67.9
27°	28 45.9 +02.8 67.1	27 52.6 +03.2 67.0	26 59.2 +03.7 67.0	26 05.9 +04.1 66.9	25 12.6 +04.6 66.8
28°	28 48.7 +02.3 66.0	27 55.8 +02.7 65.9	27 02.9 +03.2 65.9	26 10.0 +03.7 65.8	25 17.2 +04.1 65.7
29°	28 51.0 +01.6 64.8	27 58.5 +02.2 64.8	27 06.1 +02.7 64.7	26 13.7 +03.2 64.7	25 21.3 +03.7 64.6

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Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	19 17.5 +16.2 95.4	18 19.7 +16.2 95.1	17 22.0 +16.1 94.8	16 24.2 +16.1 94.5	15 26.5 +15.9 94.2
1°	19 33.7 +16.0 94.4	18 35.9 +15.9 94.1	17 38.1 +15.8 93.8	16 40.3 +15.7 93.5	15 42.4 +15.7 93.2
2°	19 49.7 +15.6 93.3	18 51.8 +15.6 93.1	17 53.9 +15.5 92.8	16 56.0 +15.5 92.5	15 58.1 +15.5 92.2
3°	20 05.3 +15.2 92.3	19 07.4 +15.1 92.0	18 09.4 +15.2 91.8	17 11.5 +15.1 91.5	16 13.6 +15.1 91.2
4°	20 20.5 +14.9 91.3	19 22.5 +14.9 91.0	18 24.6 +14.8 90.7	17 26.6 +14.9 90.5	16 28.7 +14.8 90.2
5°	20 35.4 +14.5 90.2	19 37.4 +14.5 90.0	18 39.4 +14.6 89.7	17 41.5 +14.5 89.5	16 43.5 +14.6 89.2
6°	20 49.9 +14.1 89.2	19 51.9 +14.1 89.0	18 54.0 +14.1 88.7	17 56.0 +14.2 88.5	16 58.1 +14.2 88.2
7°	21 04.0 +13.7 88.2	20 06.0 +13.8 87.9	19 08.1 +13.9 87.7	18 10.2 +13.9 87.4	17 12.3 +14.0 87.2
8°	21 17.7 +13.4 87.1	20 19.8 +13.4 86.9	19 22.0 +13.4 86.6	18 24.1 +13.6 86.4	17 26.3 +13.6 86.2
9°	21 31.1 +12.9 86.1	20 33.2 +13.1 85.8	19 35.4 +13.2 85.6	18 37.7 +13.2 85.4	17 39.9 +13.3 85.1
10°	21 44.0 +12.6 85.0	20 46.3 +12.6 84.8	19 48.6 +12.7 84.6	18 50.9 +12.9 84.3	17 53.2 +13.0 84.1
11°	21 56.6 +12.1 84.0	20 58.9 +12.3 83.8	20 01.3 +12.5 83.5	19 03.8 +12.5 83.3	18 06.2 +12.7 83.1
12°	22 08.7 +11.8 82.9	21 11.2 +11.9 82.7	20 13.8 +12.0 82.5	19 16.3 +12.2 82.3	18 18.9 +12.3 82.1
13°	22 20.5 +11.3 81.9	21 23.1 +11.5 81.7	20 25.8 +11.6 81.4	19 28.5 +11.8 81.2	18 31.2 +12.0 81.0
14°	22 31.8 +10.9 80.8	21 34.6 +11.1 80.6	20 37.4 +11.3 80.4	19 40.3 +11.5 80.2	18 43.2 +11.7 80.0
15°	22 42.7 +10.5 79.7	21 45.7 +10.7 79.5	20 48.7 +10.9 79.4	19 51.8 +11.1 79.2	18 54.9 +11.3 79.0
16°	22 53.2 +10.1 78.7	21 56.4 +10.3 78.5	20 59.6 +10.5 78.3	20 02.9 +10.7 78.1	19 06.2 +11.0 77.9
17°	23 03.3 +09.6 77.6	22 06.7 +09.8 77.4	21 10.1 +10.1 77.2	20 13.6 +10.4 77.1	19 17.2 +10.6 76.9
18°	23 12.9 +09.2 76.5	22 16.5 +09.5 76.4	21 20.2 +09.8 76.2	20 24.0 +10.0 76.0	19 27.8 +10.2 75.8
19°	23 22.1 +08.7 75.4	22 26.0 +09.0 75.3	21 30.0 +09.3 75.1	20 34.0 +09.6 75.0	19 38.0 +09.9 74.8
20°	23 30.8 +08.3 74.4	22 35.0 +08.6 74.2	21 39.3 +08.9 74.1	20 43.6 +09.2 73.9	19 47.9 +09.5 73.7
21°	23 39.1 +07.8 73.3	22 43.6 +08.2 73.1	21 48.2 +08.5 73.0	20 52.8 +08.8 72.8	19 57.4 +09.2 72.7
22°	23 46.9 +07.4 72.2	22 51.8 +07.7 72.1	21 56.7 +08.1 71.9	21 01.6 +08.4 71.8	20 06.6 +08.7 71.6
23°	23 54.3 +07.0 71.1	22 59.5 +07.3 71.0	22 04.8 +07.6 70.9	21 10.0 +08.1 70.7	20 15.3 +08.4 70.6
24°	24 01.3 +06.4 70.0	23 06.8 +06.9 69.9	22 12.4 +07.3 69.8	21 18.1 +07.6 69.7	20 23.7 +08.0 69.5
25°	24 07.7 +06.1 68.9	23 13.7 +06.4 68.8	22 19.7 +06.8 68.7	21 25.7 +07.2 68.6	20 31.7 +07.7 68.5
26°	24 13.8 +05.5 67.8	23 20.1 +06.0 67.7	22 26.5 +06.4 67.6	21 32.9 +06.8 67.5	20 39.4 +07.2 67.4
27°	24 19.3 +05.1 66.8	23 26.1 +05.5 66.7	22 32.9 +05.9 66.6	21 39.7 +06.4 66.5	20 46.6 +06.9 66.4
28°	24 24.4 +04.6 65.7	23 31.6 +05.1 65.6	22 38.8 +05.6 65.5	21 46.1 +06.0 65.4	20 53.5 +06.4 65.3
29°	24 29.0 +04.1 64.6	23 36.7 +04.6 64.5	22 44.4 +05.1 64.4	21 52.1 +05.6 64.3	20 59.9 +06.1 64.2

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 28.7 +15.9 94.0	13 30.8 +15.9 93.7	12 33.0 +15.8 93.4	11 35.1 +15.8 93.1	10 37.2 +15.8 92.9
1°	14 44.6 +15.6 93.0	13 46.7 +15.6 92.7	12 48.8 +15.6 92.4	11 50.9 +15.5 92.2	10 53.0 +15.5 91.9
2°	15 00.2 +15.4 92.0	14 02.3 +15.4 91.7	13 04.4 +15.3 91.4	12 06.4 +15.4 91.2	11 08.5 +15.3 90.9
3°	15 15.6 +15.1 91.0	14 17.7 +15.1 90.7	13 19.7 +15.1 90.4	12 21.8 +15.1 90.2	11 23.8 +15.1 89.9
4°	15 30.7 +14.9 90.0	14 32.8 +14.8 89.7	13 34.8 +14.9 89.5	12 36.9 +14.9 89.2	11 38.9 +15.0 88.9
5°	15 45.6 +14.6 89.0	14 47.6 +14.7 88.7	13 49.7 +14.7 88.5	12 51.8 +14.7 88.2	11 53.9 +14.7 88.0
6°	16 00.2 +14.3 88.0	15 02.3 +14.3 87.7	14 04.4 +14.3 87.5	13 06.5 +14.4 87.2	12 08.6 +14.5 87.0
7°	16 14.5 +14.0 86.9	15 16.6 +14.1 86.7	14 18.7 +14.2 86.5	13 20.9 +14.2 86.2	12 23.1 +14.3 86.0
8°	16 28.5 +13.7 85.9	15 30.7 +13.8 85.7	14 32.9 +13.9 85.5	13 35.1 +14.0 85.2	12 37.4 +14.0 85.0
9°	16 42.2 +13.4 84.9	15 44.5 +13.5 84.7	14 46.8 +13.6 84.4	13 49.1 +13.7 84.2	12 51.4 +13.9 84.0
10°	16 55.6 +13.1 83.9	15 58.0 +13.2 83.7	15 00.4 +13.3 83.4	14 02.8 +13.5 83.2	13 05.3 +13.6 83.0
11°	17 08.7 +12.8 82.9	16 11.2 +13.0 82.7	15 13.7 +13.1 82.4	14 16.3 +13.2 82.2	13 18.9 +13.4 82.0
12°	17 21.5 +12.5 81.9	16 24.2 +12.6 81.6	15 26.8 +12.8 81.4	14 29.5 +13.0 81.2	13 32.3 +13.1 81.0
13°	17 34.0 +12.2 80.8	16 36.8 +12.3 80.6	15 39.6 +12.6 80.4	14 42.5 +12.7 80.2	13 45.4 +12.9 80.0
14°	17 46.2 +11.8 79.8	16 49.1 +12.1 79.6	15 52.2 +12.2 79.4	14 55.2 +12.5 79.2	13 58.3 +12.7 79.0
15°	17 58.0 +11.5 78.8	17 01.2 +11.7 78.6	16 04.4 +12.0 78.4	15 07.7 +12.1 78.2	14 11.0 +12.4 78.0
16°	18 09.5 +11.2 77.7	17 12.9 +11.5 77.5	16 16.4 +11.6 77.3	15 19.8 +11.9 77.1	14 23.4 +12.1 76.9
17°	18 20.7 +10.9 76.7	17 24.4 +11.1 76.5	16 28.0 +11.4 76.3	15 31.7 +11.6 76.1	14 35.5 +11.9 75.9
18°	18 31.6 +10.5 75.7	17 35.5 +10.8 75.5	16 39.4 +11.0 75.3	15 43.3 +11.4 75.1	14 47.4 +11.6 74.9
19°	18 42.1 +10.2 74.6	17 46.3 +10.4 74.5	16 50.4 +10.8 74.3	15 54.7 +11.0 74.1	14 59.0 +11.3 73.9
20°	18 52.3 +09.8 73.6	17 56.7 +10.1 73.4	17 01.2 +10.4 73.2	16 05.7 +10.8 73.1	15 10.3 +11.1 72.9
21°	19 02.1 +09.5 72.5	18 06.8 +09.8 72.4	17 11.6 +10.2 72.2	16 16.5 +10.4 72.0	15 21.4 +10.8 71.9
22°	19 11.6 +09.1 71.5	18 16.6 +09.5 71.3	17 21.8 +09.8 71.2	16 26.9 +10.2 71.0	15 32.2 +10.5 70.9
23°	19 20.7 +08.8 70.4	18 26.1 +09.1 70.3	17 31.6 +09.5 70.1	16 37.1 +09.8 70.0	15 42.7 +10.2 69.8
24°	19 29.5 +08.4 69.4	18 35.2 +08.8 69.3	17 41.1 +09.1 69.1	16 46.9 +09.6 69.0	15 52.9 +09.9 68.8
25°	19 37.9 +08.0 68.3	18 44.0 +08.4 68.2	17 50.2 +08.9 68.1	16 56.5 +09.2 67.9	16 02.8 +09.6 67.8
26°	19 45.9 +07.6 67.3	18 52.4 +08.1 67.2	17 59.1 +08.4 67.0	17 05.7 +08.9 66.9	16 12.4 +09.4 66.8
27°	19 53.5 +07.3 66.2	19 00.5 +07.7 66.1	18 07.5 +08.2 66.0	17 14.6 +08.6 65.9	16 21.8 +09.0 65.7
28°	20 00.8 +06.9 65.2	19 08.2 +07.4 65.1	18 15.7 +07.8 65.0	17 23.2 +08.3 64.8	16 30.8 +08.7 64.7
29°	20 07.7 +06.6 64.1	19 15.6 +07.0 64.0	18 23.5 +07.5 63.9	17 31.5 +08.0 63.8	16 39.5 +08.5 63.7

Declination SAME name as Latitude

Latitude 15°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 39.4 +15.6 92.6	8 41.5 +15.6 92.3	7 43.5 +15.6 92.1	6 45.6 +15.6 91.8	5 47.7 +15.5 91.6
1°	9 55.0 +15.5 91.6	8 57.1 +15.5 91.4	7 59.1 +15.5 91.1	7 01.2 +15.5 90.8	6 03.2 +15.5 90.6
2°	10 10.5 +15.3 90.7	9 12.6 +15.3 90.4	8 14.6 +15.3 90.1	7 16.7 +15.3 89.9	6 18.7 +15.4 89.6
3°	10 25.8 +15.2 89.7	9 27.9 +15.1 89.4	8 29.9 +15.2 89.2	7 32.0 +15.2 88.9	6 34.1 +15.2 88.6
4°	10 41.0 +14.9 88.7	9 43.0 +15.0 88.4	8 45.1 +15.0 88.2	7 47.2 +15.1 87.9	6 49.3 +15.1 87.7
5°	10 55.9 +14.8 87.7	9 58.0 +14.9 87.4	9 00.1 +14.9 87.2	8 02.3 +14.9 86.9	7 04.4 +15.0 86.7
6°	11 10.7 +14.6 86.7	10 12.9 +14.6 86.5	9 15.0 +14.7 86.2	8 17.2 +14.8 86.0	7 19.4 +14.9 85.7
7°	11 25.3 +14.4 85.7	10 27.5 +14.5 85.5	9 29.7 +14.6 85.2	8 32.0 +14.6 85.0	7 34.3 +14.7 84.7
8°	11 39.7 +14.1 84.7	10 42.0 +14.2 84.5	9 44.3 +14.4 84.2	8 46.6 +14.5 84.0	7 49.0 +14.6 83.8
9°	11 53.8 +14.0 83.7	10 56.2 +14.1 83.5	9 58.7 +14.2 83.3	9 01.1 +14.4 83.0	8 03.6 +14.5 82.8
10°	12 07.8 +13.7 82.7	11 10.3 +13.9 82.5	10 12.9 +14.0 82.3	9 15.5 +14.1 82.0	8 18.1 +14.3 81.8
11°	12 21.5 +13.6 81.7	11 24.2 +13.7 81.5	10 26.9 +13.8 81.3	9 29.6 +14.0 81.1	8 32.4 +14.2 80.8
12°	12 35.1 +13.3 80.8	11 37.9 +13.5 80.5	10 40.7 +13.7 80.3	9 43.6 +13.9 80.1	8 46.6 +14.0 79.8
13°	12 48.4 +13.1 79.8	11 51.4 +13.2 79.5	10 54.4 +13.5 79.3	9 57.5 +13.6 79.1	9 00.6 +13.8 78.9
14°	13 01.5 +12.8 78.8	12 04.6 +13.1 78.5	11 07.9 +13.2 78.3	10 11.1 +13.5 78.1	9 14.4 +13.7 77.9
15°	13 14.3 +12.6 77.7	12 17.7 +12.8 77.5	11 21.1 +13.1 77.3	10 24.6 +13.3 77.1	9 28.1 +13.6 76.9
16°	13 26.9 +12.4 76.7	12 30.5 +12.7 76.5	11 34.2 +12.9 76.3	10 37.9 +13.1 76.1	9 41.7 +13.3 75.9
17°	13 39.3 +12.1 75.7	12 43.2 +12.3 75.5	11 47.1 +12.6 75.3	10 51.0 +12.9 75.1	9 55.0 +13.2 74.9
18°	13 51.4 +11.9 74.7	12 55.5 +12.2 74.5	11 59.7 +12.5 74.3	11 03.9 +12.8 74.1	10 08.2 +13.0 73.9
19°	14 03.3 +11.6 73.7	13 07.7 +11.9 73.5	12 12.2 +12.2 73.3	11 16.7 +12.5 73.1	10 21.2 +12.9 72.9
20°	14 14.9 +11.4 72.7	13 19.6 +11.7 72.5	12 24.4 +12.0 72.3	11 29.2 +12.3 72.1	10 34.1 +12.6 71.9
21°	14 26.3 +11.1 71.7	13 31.3 +11.5 71.5	12 36.4 +11.8 71.3	11 41.5 +12.1 71.1	10 46.7 +12.5 70.9
22°	14 37.4 +10.9 70.7	13 42.8 +11.2 70.5	12 48.2 +11.5 70.3	11 53.6 +11.9 70.1	10 59.2 +12.2 69.9
23°	14 48.3 +10.6 69.7	13 54.0 +10.9 69.5	12 59.7 +11.3 69.3	12 05.5 +11.7 69.1	11 11.4 +12.1 68.9
24°	14 58.9 +10.3 68.6	14 04.9 +10.7 68.5	13 11.0 +11.1 68.3	12 17.2 +11.5 68.1	11 23.5 +11.8 67.9
25°	15 09.2 +10.0 67.6	14 15.6 +10.5 67.5	13 22.1 +10.9 67.3	12 28.7 +11.2 67.1	11 35.3 +11.7 66.9
26°	15 19.2 +09.8 66.6	14 26.1 +10.1 66.4	13 33.0 +10.6 66.3	12 39.9 +11.1 66.1	11 47.0 +11.4 65.9
27°	15 29.0 +09.4 65.6	14 36.2 +09.9 65.4	13 43.6 +10.3 65.3	12 51.0 +10.7 65.1	11 58.4 +11.2 64.9
28°	15 38.4 +09.2 64.6	14 46.1 +09.7 64.4	13 53.9 +10.1 64.3	13 01.7 +10.6 64.1	12 09.6 +11.1 63.9
29°	15 47.6 +08.9 63.5	14 55.8 +09.4 63.4	14 04.0 +09.9 63.2	13 12.3 +10.3 63.1	12 20.7 +10.7 62.9

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 49.8 +15.5 91.3	3 51.8 +15.5 91.0	2 53.9 +15.5 90.8	1 55.9 +15.5 90.5	0 58.0 +15.5 90.3
1°	5 05.3 +15.5 90.3	4 07.3 +15.5 90.1	3 09.4 +15.5 89.8	2 11.4 +15.5 89.6	1 13.5 +15.5 89.3
2°	5 20.8 +15.3 89.4	4 22.8 +15.4 89.4	3 24.9 +15.4 88.8	2 26.9 +15.5 88.6	1 29.0 +15.5 88.3
3°	5 36.1 +15.3 88.4	4 38.2 +15.3 88.1	3 40.3 +15.3 87.9	2 42.4 +15.4 87.6	1 44.5 +15.4 87.4
4°	5 51.4 +15.2 87.4	4 53.5 +15.2 87.2	3 55.6 +15.3 86.9	2 57.8 +15.3 86.6	1 59.9 +15.4 86.4
5°	6 06.6 +15.0 86.4	5 08.7 +15.1 86.2	4 10.9 +15.2 85.9	3 13.1 +15.3 85.7	2 15.3 +15.4 85.4
6°	6 21.6 +15.0 85.5	5 23.8 +15.1 85.2	4 26.1 +15.1 85.0	3 28.4 +15.2 84.7	2 30.7 +15.3 84.5
7°	6 36.6 +14.8 84.5	5 38.9 +14.9 84.2	4 41.2 +15.1 84.0	3 43.6 +15.2 83.7	2 46.0 +15.3 83.5
8°	6 51.4 +14.7 83.5	5 53.8 +14.9 83.3	4 56.3 +15.0 83.0	3 58.8 +15.1 82.8	3 01.3 +15.2 82.5
9°	7 06.1 +14.6 82.5	6 08.7 +14.7 82.3	5 11.3 +14.8 82.1	4 13.9 +15.0 81.8	3 16.5 +15.2 81.6
10°	7 20.7 +14.5 81.6	6 23.4 +14.6 81.3	5 26.1 +14.8 81.1	4 28.9 +15.0 80.8	3 31.7 +15.1 80.6
11°	7 35.2 +14.3 80.6	6 38.0 +14.6 80.3	5 40.9 +14.7 80.1	4 43.9 +14.8 79.9	3 46.8 +15.1 79.6
12°	7 49.5 +14.2 79.6	6 52.6 +14.3 79.4	5 55.6 +14.6 79.1	4 58.7 +14.8 78.9	4 01.9 +15.0 78.6
13°	8 03.7 +14.1 78.6	7 06.9 +14.3 78.4	6 10.2 +14.5 78.2	5 13.5 +14.7 77.9	4 16.9 +14.9 77.7
14°	8 17.8 +13.9 77.6	7 21.2 +14.2 77.4	6 24.7 +14.3 77.2	5 28.2 +14.6 76.9	4 31.8 +14.8 76.7
15°	8 31.7 +13.8 76.7	7 35.4 +14.0 76.4	6 39.0 +14.3 76.2	5 42.8 +14.5 76.0	4 46.6 +14.7 75.7
16°	8 45.5 +13.6 75.7	7 49.4 +13.8 75.4	6 53.3 +14.1 75.2	5 57.3 +14.4 75.0	5 01.3 +14.7 74.8
17°	8 59.1 +13.5 74.7	8 03.2 +13.8 74.5	7 07.4 +14.0 74.2	6 11.7 +14.3 74.0	5 16.0 +14.6 73.8
18°	9 12.6 +13.3 73.7	8 17.0 +13.6 73.5	7 21.4 +13.9 73.3	6 26.0 +14.2 73.0	5 30.6 +14.5 72.8
19°	9 25.9 +13.1 72.7	8 30.6 +13.4 72.5	7 35.3 +13.8 72.3	6 40.2 +14.0 72.1	5 45.1 +14.3 71.8
20°	9 39.0 +13.0 71.7	8 44.0 +13.3 71.5	7 49.1 +13.6 71.3	6 54.2 +14.0 71.1	5 59.4 +14.3 70.9
21°	9 52.0 +12.8 70.7	8 57.3 +13.1 70.5	8 02.7 +13.5 70.3	7 08.2 +13.8 70.1	6 13.7 +14.2 69.9
22°	10 04.8 +12.6 69.7	9 10.4 +13.0 69.5	8 16.2 +13.3 69.3	7 22.0 +13.7 69.1	6 27.9 +14.0 68.9
23°	10 17.4 +12.4 68.7	9 23.4 +12.8 68.5	8 29.5 +13.2 68.3	7 35.7 +13.5 68.1	6 41.9 +14.0 67.9
24°	10 29.8 +12.2 67.8	9 36.2 +12.6 67.6	8 42.7 +13.0 67.4	7 49.2 +13.4 67.2	6 55.9 +13.8 66.9
25°	10 42.0 +12.1 66.8	9 48.8 +12.5 66.6	8 55.7 +12.9 66.4	8 02.6 +13.3 66.2	7 09.7 +13.7 66.0
26°	10 54.1 +11.9 65.8	10 01.3 +12.3 65.6	9 08.6 +12.7 65.4	8 15.9 +13.2 65.2	7 23.4 +13.5 65.0
27°	11 06.0 +11.6 64.8	10 13.6 +12.1 64.6	9 21.3 +12.5 64.4	8 29.1 +12.9 64.2	7 36.9 +13.4 64.0
28°	11 17.6 +11.5 63.8	10 25.7 +11.9 63.6	9 33.8 +12.4 63.4	8 42.0 +12.9 63.2	7 50.3 +13.3 63.0
29°	11 29.1 +11.2 62.8	10 37.6 +11.7 62.6	9 46.2 +12.2 62.4	8 54.9 +12.7 62.2	8 03.6 +13.2 62.0

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Latitude 15°

Declination SAME name as Latitude

Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +15.5 90.0	-0 58.0 +15.6	-1 55.9 +15.5	-2 53.9 +15.6	-3 51.8 +15.6
1°	0 15.5 +15.6 89.0	-0 42.4 +15.5	-1 40.4 +15.6	-2 38.3 +15.6	-3 36.2 +15.6
2°	0 31.1 +15.5 88.1	-0 26.9 +15.6	-1 24.8 +15.6	-2 22.7 +15.7	-3 20.6 +15.8
3°	0 46.6 +15.5 87.1	-0 11.3 +15.6	-1 09.2 +15.7	-2 07.0 +15.7	-3 04.8 +15.7
4°	1 02.1 +15.5 86.1	0 04.3 +15.5 85.9	-0 53.5 +15.6	-1 51.3 +15.7	-2 49.1 +15.8
5°	1 17.6 +15.4 85.2	0 19.8 +15.6 84.9	-0 37.9 +15.7	-1 35.6 +15.8	-2 33.3 +15.9
6°	1 33.0 +15.5 84.2	0 35.4 +15.5 83.9	-0 22.2 +15.6	-1 19.8 +15.7	-2 17.4 +15.9
7°	1 48.5 +15.4 83.2	0 50.9 +15.5 83.0	-0 06.6 +15.7	-1 04.1 +15.8	-2 01.5 +15.9
8°	2 03.9 +15.3 82.3	1 06.4 +15.6 82.0	0 09.1 +15.6 81.8	-0 48.3 +15.8	-1 45.6 +16.0
9°	2 19.2 +15.4 81.3	1 22.0 +15.4 81.0	0 24.7 +15.7 80.8	-0 32.5 +15.9	-1 29.6 +16.0
10°	2 34.6 +15.2 80.3	1 37.4 +15.5 80.1	0 40.4 +15.6 79.8	-0 16.6 +15.8	-1 13.6 +16.0
11°	2 49.8 +15.3 79.4	1 52.9 +15.4 79.1	0 56.0 +15.6 78.9	-0 00.8 +15.8	-0 57.6 +16.0
12°	3 05.1 +15.2 78.4	2 08.3 +15.4 78.1	1 11.6 +15.6 77.9	0 15.0 +15.8 77.6	-0 41.6 +16.1
13°	3 20.3 +15.1 77.4	2 23.7 +15.4 77.2	1 27.2 +15.6 76.9	0 30.8 +15.8 76.7	-0 25.5 +16.0
14°	3 35.4 +15.1 76.5	2 39.1 +15.3 76.2	1 42.8 +15.6 76.0	0 46.6 +15.8 75.7	-0 09.5 +16.0
15°	3 50.5 +15.0 75.5	2 54.4 +15.2 75.2	1 58.4 +15.5 75.0	1 02.4 +15.8 74.7	0 06.5 +16.1 74.5
16°	4 05.5 +14.9 74.5	3 09.6 +15.2 74.3	2 13.9 +15.5 74.0	1 18.2 +15.8 73.8	0 22.6 +16.0 73.5
17°	4 20.4 +14.8 73.5	3 24.8 +15.2 73.3	2 29.4 +15.4 73.1	1 34.0 +15.7 72.8	0 38.6 +16.1 72.6
18°	4 35.2 +14.8 72.6	3 40.0 +15.1 72.3	2 44.8 +15.4 72.1	1 49.7 +15.7 71.8	0 54.7 +16.0 71.6
19°	4 50.0 +14.7 71.6	3 55.1 +15.0 71.4	3 00.2 +15.3 71.1	2 05.4 +15.6 70.9	1 10.7 +16.0 70.6
20°	5 04.7 +14.6 70.6	4 10.1 +14.9 70.4	3 15.5 +15.3 70.2	2 21.0 +15.7 69.9	1 26.7 +15.9 69.7
21°	5 19.3 +14.5 69.7	4 25.0 +14.9 69.4	3 30.8 +15.2 69.2	2 36.7 +15.5 69.0	1 42.6 +16.0 68.7
22°	5 33.8 +14.5 68.7	4 39.9 +14.8 68.5	3 46.0 +15.2 68.2	2 52.2 +15.6 68.0	1 58.6 +15.9 67.7
23°	5 48.3 +14.3 67.7	4 54.7 +14.7 67.5	4 01.2 +15.1 67.3	3 07.8 +15.5 67.0	2 14.5 +15.8 66.8
24°	6 02.6 +14.2 66.7	5 09.4 +14.6 66.5	4 16.3 +15.0 66.3	3 23.3 +15.4 66.0	2 30.3 +15.9 65.8
25°	6 16.8 +14.1 65.8	5 24.0 +14.5 65.5	4 31.3 +14.9 65.3	3 38.7 +15.3 65.1	2 46.2 +15.7 64.8
26°	6 30.9 +14.0 64.8	5 38.5 +14.4 64.6	4 46.2 +14.9 64.3	3 54.0 +15.3 64.1	3 01.9 +15.8 63.9
27°	6 44.9 +13.8 63.8	5 52.9 +14.3 63.6	5 01.1 +14.7 63.4	4 09.3 +15.2 63.1	3 17.7 +15.6 62.9
28°	6 58.7 +13.8 62.8	6 07.2 +14.3 62.6	5 15.8 +14.7 62.4	4 24.5 +15.2 62.2	3 33.3 +15.6 61.9
29°	7 12.5 +13.6 61.8	6 21.5 +14.1 61.6	5 30.5 +14.6 61.4	4 39.7 +15.0 61.2	3 48.9 +15.6 61.0

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 49.8 +15.7	-5 47.7 +15.7	-6 45.6 +15.7	-7 43.5 +15.7	-8 41.5 +15.8
1°	-4 34.1 +15.7	-5 32.0 +15.7	-6 29.9 +15.8	-7 27.8 +15.9	-8 25.7 +16.0
2°	-4 18.4 +15.8	-5 16.3 +15.9	-6 14.1 +15.9	-7 11.9 +15.9	-8 09.7 +16.0
3°	-4 02.6 +15.8	-5 00.4 +15.9	-5 58.2 +16.0	-6 56.0 +16.2	-7 53.7 +16.2
4°	-3 46.8 +15.9	-4 44.5 +16.0	-5 42.2 +16.1	-6 39.8 +16.2	-7 37.5 +16.4
5°	-3 30.9 +16.0	-4 28.5 +16.1	-5 26.1 +16.2	-6 23.6 +16.3	-7 21.1 +16.4
6°	-3 14.9 +16.0	-4 12.4 +16.1	-5 09.9 +16.3	-6 07.3 +16.4	-7 04.7 +16.6
7°	-2 58.9 +16.1	-3 56.3 +16.3	-4 53.6 +16.4	-5 50.9 +16.6	-6 48.1 +16.7
8°	-2 42.8 +16.1	-3 40.0 +16.2	-4 37.2 +16.4	-5 34.3 +16.6	-6 31.4 +16.8
9°	-2 26.7 +16.2	-3 23.8 +16.4	-4 20.8 +16.6	-5 17.7 +16.7	-6 14.6 +16.9
10°	-2 10.5 +16.2	-3 07.4 +16.4	-4 04.2 +16.6	-5 01.0 +16.8	-5 57.7 +17.0
11°	-1 54.3 +16.2	-2 51.0 +16.4	-3 47.6 +16.6	-4 44.2 +16.9	-5 40.7 +17.1
12°	-1 38.1 +16.3	-2 34.6 +16.5	-3 31.0 +16.7	-4 27.3 +16.9	-5 23.6 +17.2
13°	-1 21.8 +16.2	-2 18.1 +16.5	-3 14.3 +16.8	-4 10.4 +17.1	-5 06.4 +17.3
14°	-1 05.6 +16.3	-2 01.6 +16.6	-2 57.5 +16.8	-3 53.3 +17.1	-4 49.1 +17.3
15°	-0 49.3 +16.4	-1 45.0 +16.6	-2 40.7 +16.9	-3 36.2 +17.1	-4 31.8 +17.5
16°	-0 32.9 +16.3	-1 28.4 +16.6	-2 23.8 +16.9	-3 19.1 +17.2	-4 14.3 +17.5
17°	-0 16.6 +16.3	-1 11.8 +16.6	-2 06.9 +17.0	-3 01.9 +17.3	-3 56.8 +17.6
18°	-0 00.3 +16.3	-0 55.2 +16.7	-1 49.9 +16.9	-2 44.6 +17.3	-3 39.2 +17.6
19°	0 16.0 +16.4 70.4	-0 38.5 +16.6	-1 33.0 +17.0	-2 27.3 +17.3	-3 21.6 +17.7
20°	0 32.4 +16.3 69.4	-0 21.9 +16.7	-1 16.0 +17.1	-2 10.0 +17.4	-3 03.9 +17.7
21°	0 48.7 +16.3 68.5	-0 05.2 +16.7	-0 58.9 +17.0	-1 52.6 +17.4	-2 46.2 +17.8
22°	1 05.0 +16.3 67.5	0 11.5 +16.6 67.2	-0 41.9 +17.0	-1 35.2 +17.4	-2 28.4 +17.9
23°	1 21.3 +16.2 66.5	0 28.1 +16.7 66.3	-0 24.9 +17.1	-1 17.8 +17.5	-2 10.5 +17.8
24°	1 37.5 +16.3 65.6	0 44.8 +16.7 65.3	-0 07.8 +17.1	-1 00.3 +17.5	-1 52.7 +17.9
25°	1 53.8 +16.2 64.6	1 01.5 +16.6 64.4	0 09.3 +17.0 64.1	-0 42.8 +17.5	-1 34.8 +18.0
26°	2 10.0 +16.1 63.6	1 18.1 +16.6 63.4	0 26.3 +17.1 63.1	-0 25.3 +17.5	-1 16.8 +17.9
27°	2 26.1 +16.1 62.7	1 34.7 +16.6 62.4	0 43.4 +17.0 62.2	-0 07.8 +17.5	-0 58.9 +18.0
28°	2 42.2 +16.1 61.7	1 51.3 +16.5 61.5	1 00.4 +17.0 61.2	0 09.7 +17.5 61.0	-0 40.9 +17.9
29°	2 58.3 +16.0 60.7	2 07.8 +16.5 60.5	1 17.4 +17.0 60.3	0 27.2 +17.5 60.0	-0 23.0 +18.0

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Latitude 16°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	74 00.0 +60.0 180.0	73 58.2 +59.9 176.4	73 52.7 +59.6 172.8	73 43.7 +59.0 169.2	73 31.2 +58.2 165.8
1°	75 00.0 +60.0 180.0	74 58.1 +59.8 176.1	74 52.3 +59.4 172.3	74 42.7 +58.8 168.6	74 29.4 +58.0 164.9
2°	76 00.0 +60.0 180.0	75 57.9 +59.9 175.9	75 51.7 +59.4 171.8	75 41.5 +58.6 167.8	75 27.4 +57.6 163.9
3°	77 00.0 +60.0 180.0	76 57.8 +59.8 175.6	76 51.1 +59.3 171.2	76 40.1 +58.5 166.9	76 25.0 +57.3 162.7
4°	78 00.0 +60.0 180.0	77 57.6 +59.8 175.2	77 50.4 +59.2 170.5	77 38.6 +58.2 165.9	77 22.3 +56.9 161.4
5°	79 00.0 +60.0 180.0	78 57.4 +59.7 174.8	78 49.6 +59.0 169.7	78 36.8 +57.8 164.7	78 19.2 +56.3 159.9
6°	80 00.0 +60.0 180.0	79 57.1 +59.7 174.3	79 48.6 +58.8 168.7	79 34.6 +57.4 163.3	79 15.5 +55.6 158.1
7°	81 00.0 +60.0 180.0	80 56.8 +59.6 173.7	80 47.4 +58.5 167.5	80 32.0 +56.8 161.6	80 11.1 +54.7 156.0
8°	82 00.0 +60.0 180.0	81 56.4 +59.5 172.9	81 45.9 +58.1 166.0	81 28.8 +56.0 159.5	81 05.8 +53.3 153.5
9°	83 00.0 +60.0 180.0	82 55.9 +59.4 171.9	82 44.0 +57.5 164.2	82 24.8 +54.8 157.0	81 59.1 +51.7 150.4
10°	84 00.0 +60.0 180.0	83 55.3 +59.1 170.7	83 41.5 +56.6 161.8	83 19.6 +53.1 153.7	82 50.8 +49.2 146.5
11°	85 00.0 +60.0 180.0	84 54.4 +58.6 168.9	84 38.1 +55.2 158.5	84 12.7 +50.5 149.4	83 40.0 +45.6 141.6
12°	86 00.0 +60.0 180.0	85 53.0 +57.9 166.2	85 33.3 +52.5 153.9	85 03.2 +46.3 143.6	84 25.6 +40.5 135.4
13°	87 00.0 +60.0 180.0	86 50.9 +55.8 162.0	86 25.8 +47.4 146.9	85 49.5 +39.3 135.5	85 06.1 +32.9 127.2
14°	88 00.0 +60.0 180.0	87 46.7 +50.0 154.1	87 13.2 +36.5 135.7	86 28.8 +27.7 124.2	85 39.0 +22.1 116.8
15°	89 00.0 +60.0 180.0	88 36.7 +25.6 135.9	87 49.7 +14.9 117.2	86 56.5 +10.5 108.7	86 01.1 +08.2 104.0
16°	90 00.0 -60.0 0.0	89 02.3 -25.4 89.9	88 04.6 -14.4 89.7	87 07.0 -09.7 89.6	86 09.3 -07.1 89.4
17°	89 00.0 -60.0 0.0	88 36.9 -49.9 43.7	87 50.2 -36.2 62.2	86 57.3 -27.1 70.4	86 02.2 -21.2 74.8
18°	88 00.0 -60.0 0.0	87 47.0 -55.9 25.4	87 14.0 -47.3 43.4	86 30.2 -38.9 54.7	85 41.0 -32.2 61.8
19°	87 00.0 -60.0 0.0	86 51.1 -57.8 17.5	86 26.7 -52.4 32.2	85 51.3 -46.1 43.2	85 08.8 -40.0 51.2
20°	86 00.0 -60.0 0.0	85 53.3 -58.6 13.2	85 34.3 -55.1 25.1	85 05.2 -50.3 35.0	84 28.8 -45.3 43.0
21°	85 00.0 -60.0 0.0	84 54.7 -59.1 10.6	84 39.2 -56.6 20.5	84 14.9 -53.1 29.2	83 43.5 -49.0 36.6
22°	84 00.0 -60.0 0.0	83 55.6 -59.4 8.8	83 42.6 -57.5 17.2	83 21.8 -54.7 24.8	82 54.5 -51.5 31.6
23°	83 00.0 -60.0 0.0	82 56.2 -59.5 7.5	82 45.1 -58.1 14.7	82 27.1 -56.0 21.5	82 03.0 -53.2 27.7
24°	82 00.0 -60.0 0.0	81 56.7 -59.6 6.5	81 47.0 -58.5 12.9	81 31.1 -56.7 18.9	81 09.8 -54.6 24.5
25°	81 00.0 -60.0 0.0	80 57.1 -59.7 5.8	80 48.5 -58.8 11.4	80 34.4 -57.4 16.8	80 15.2 -55.5 21.9
26°	80 00.0 -60.0 0.0	79 57.4 -59.7 5.2	79 49.7 -59.0 10.2	79 37.0 -57.8 15.1	79 19.7 -56.3 19.8
27°	79 00.0 -60.0 0.0	78 57.7 -59.8 4.7	78 50.7 -59.2 9.2	78 39.2 -58.2 13.7	78 23.4 -56.8 18.0
28°	78 00.0 -60.0 0.0	77 57.9 -59.9 4.2	77 51.5 -59.3 8.4	77 41.0 -58.4 12.5	77 26.6 -57.3 16.5
29°	77 00.0 -60.0 0.0	76 58.0 -59.8 3.9	76 52.2 -59.4 7.7	76 42.6 -58.7 11.5	76 29.3 -57.6 15.1

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	73 15.4 +57.2 162.4	72 56.4 +56.1 159.1	72 34.3 +55.0 156.0	72 09.5 +53.7 153.0	71 42.0 +52.3 150.1
1°	74 12.6 +56.9 161.3	73 52.5 +55.7 157.9	73 29.3 +54.3 154.6	73 03.2 +52.9 151.5	72 34.3 +51.5 148.5
2°	75 09.5 +56.5 160.1	74 48.2 +55.1 156.5	74 23.6 +53.7 153.1	73 56.1 +52.1 149.8	73 25.8 +50.4 146.8
3°	76 06.0 +56.0 158.8	75 43.3 +54.5 155.0	75 17.3 +52.8 151.4	74 48.2 +51.0 148.0	74 16.2 +49.3 144.8
4°	77 02.0 +55.3 157.2	76 37.8 +53.6 153.2	76 10.1 +51.7 149.4	75 39.2 +49.9 145.9	75 05.5 +48.0 142.7
5°	77 57.3 +54.5 155.4	77 31.4 +52.5 151.2	77 01.8 +50.5 147.3	76 29.1 +48.4 143.6	75 53.5 +46.4 140.3
6°	78 51.8 +53.5 153.3	78 23.9 +51.3 148.9	77 52.3 +49.0 144.8	77 17.5 +46.7 141.0	76 39.9 +44.5 137.6
7°	79 45.3 +52.3 150.9	79 15.2 +49.7 146.2	78 41.3 +47.2 141.9	78 04.2 +44.7 138.1	77 24.4 +42.3 134.6
8°	80 37.6 +50.5 148.0	80 04.9 +47.6 143.1	79 28.5 +44.7 138.7	78 48.9 +42.1 134.7	78 06.7 +39.6 131.2
9°	81 28.1 +48.3 144.5	80 52.5 +45.0 139.4	80 13.2 +41.9 134.9	79 31.0 +39.0 130.9	78 46.3 +36.4 127.5
10°	82 16.4 +45.2 140.3	81 37.5 +41.6 135.0	80 55.1 +38.3 130.5	80 10.0 +35.3 126.6	79 22.7 +32.8 123.3
11°	83 01.6 +41.2 135.2	82 19.1 +37.2 129.9	81 33.4 +33.8 125.4	80 45.3 +30.9 121.7	79 55.5 +28.3 118.6
12°	83 42.8 +35.5 128.9	82 56.3 +31.5 123.7	82 07.2 +28.2 119.6	81 16.2 +25.5 116.2	80 23.8 +23.4 113.5
13°	84 18.3 +28.1 121.1	83 27.8 +24.4 116.5	82 35.4 +21.6 113.0	81 41.7 +19.4 110.1	80 47.2 +17.6 107.8
14°	84 46.4 +18.4 111.8	83 52.2 +15.8 108.2	82 57.0 +13.9 105.6	82 01.1 +12.5 103.5	81 04.8 +11.4 101.8
15°	85 04.8 +06.8 101.0	84 08.0 +06.0 99.0	83 10.9 +05.4 97.5	82 13.6 +05.0 96.3	81 16.2 +04.8 95.4
16°	85 11.6 -05.4 89.3	84 14.0 -04.3 89.2	83 16.3 -03.4 89.0	82 18.6 -02.7 88.9	81 21.0 -02.2 88.8
17°	85 06.2 -17.2 77.5	84 09.7 -14.3 79.3	83 12.9 -12.0 80.5	82 15.9 -10.3 81.4	81 18.8 -08.9 82.1
18°	84 49.0 -27.0 66.6	83 55.4 -23.0 69.9	83 00.9 -20.0 72.4	82 05.6 -17.4 74.2	81 09.9 -15.3 75.6
19°	84 22.0 -34.8 57.1	83 32.4 -30.4 61.5	82 40.9 -26.8 64.8	81 48.2 -23.8 67.4	80 54.6 -21.3 69.4
20°	83 47.2 -40.6 49.2	83 02.0 -36.4 54.1	82 14.1 -32.6 58.0	81 24.4 -29.4 61.1	80 33.3 -26.6 63.6
21°	83 06.6 -44.8 42.7	82 25.6 -40.9 47.8	81 41.5 -37.3 51.9	80 55.0 -34.0 55.4	80 06.7 -31.1 58.3
22°	82 21.8 -48.0 37.5	81 44.7 -44.5 42.5	81 04.2 -41.1 46.7	80 21.0 -38.0 50.3	79 35.6 -35.1 53.4
23°	81 33.8 -50.3 33.1	81 00.2 -47.2 38.0	80 23.1 -44.2 42.2	79 43.0 -41.3 45.9	79 00.5 -38.5 49.0
24°	80 43.5 -52.0 29.6	80 13.0 -49.4 34.2	79 38.9 -46.6 38.3	79 01.7 -43.9 41.9	78 22.0 -41.3 45.1
25°	79 51.5 -53.4 26.7	79 23.6 -51.0 31.0	78 52.3 -48.6 34.9	78 17.8 -46.2 38.4	77 40.7 -43.7 41.6
26°	78 58.1 -54.4 24.2	78 32.6 -52.4 28.2	78 03.7 -50.2 32.0	77 31.6 -47.9 35.4	76 57.0 -45.7 38.5
27°	78 03.7 -55.3 22.0	77 40.2 -53.4 25.9	77 13.5 -51.5 29.4	76 43.7 -49.5 32.7	76 11.3 -47.5 35.7
28°	77 08.4 -55.9 20.2	76 46.8 -54.3 23.8	76 22.0 -52.6 27.2	75 54.2 -50.7 30.3	75 23.8 -48.8 33.2
29°	76 12.5 -56.4 18.6	75 52.5 -55.0 22.0	75 29.4 -53.5 25.2	75 03.5 -51.8 28.2	74 35.0 -50.0 31.0

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Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	71 12.1 +50.9 147.4	70 39.9 +49.5 144.8	70 05.7 +48.0 142.4	69 29.5 +46.7 140.1	68 51.7 +45.2 137.9
1°	72 03.0 +49.9 145.7	71 29.4 +48.4 143.1	70 53.7 +47.0 140.6	70 16.2 +45.4 138.2	69 36.9 +44.1 136.0
2°	72 52.9 +48.9 143.9	72 17.8 +47.2 141.2	71 40.7 +45.6 138.6	71 01.6 +44.1 136.3	70 21.0 +42.6 134.0
3°	73 41.8 +47.5 141.9	73 05.0 +45.9 139.1	72 26.3 +44.2 136.5	71 45.7 +42.6 134.1	71 03.6 +41.0 131.9
4°	74 29.3 +46.1 139.6	73 50.9 +44.3 136.8	73 10.5 +42.5 134.2	72 28.3 +40.9 131.8	71 44.6 +39.3 129.6
5°	75 15.4 +44.4 137.2	74 35.2 +42.5 134.3	73 53.0 +40.7 131.7	73 09.2 +38.9 129.4	72 23.9 +37.3 127.2
6°	75 59.8 +42.4 134.5	75 17.7 +40.4 131.6	74 33.7 +38.5 129.0	73 48.1 +36.8 126.7	73 01.2 +35.2 124.5
7°	76 42.2 +40.1 131.5	75 58.1 +37.9 128.6	75 12.2 +36.1 126.1	74 24.9 +34.4 123.8	73 36.4 +32.8 121.7
8°	77 22.3 +37.3 128.1	76 36.0 +35.3 125.4	75 48.3 +33.3 122.9	74 59.3 +31.6 120.7	74 09.2 +30.0 118.7
9°	77 59.6 +34.1 124.5	77 11.3 +32.0 121.8	76 21.6 +30.3 119.4	75 30.9 +28.6 117.3	74 39.2 +27.1 115.5
10°	78 33.7 +30.5 120.4	77 43.3 +28.5 117.9	76 51.9 +26.7 115.7	75 59.5 +25.2 113.8	75 06.3 +23.9 112.0
11°	79 04.2 +26.3 116.0	78 11.8 +24.5 113.7	77 18.6 +22.9 111.7	76 24.7 +21.6 110.0	75 30.2 +20.5 108.4
12°	79 30.5 +21.5 111.1	78 36.3 +20.0 109.1	77 41.5 +18.7 107.4	76 46.3 +17.6 105.9	75 50.7 +16.6 104.6
13°	79 52.0 +16.2 105.9	78 56.3 +15.1 104.3	78 00.2 +14.2 102.9	77 03.9 +13.3 101.7	76 07.3 +12.7 100.7
14°	80 08.2 +10.6 100.4	79 11.4 +09.9 99.2	78 14.4 +09.3 98.2	77 17.2 +08.9 97.3	76 20.0 +08.5 96.6
15°	80 18.8 +04.5 94.6	79 21.3 +04.3 93.9	78 23.7 +04.3 93.3	77 26.1 +04.2 92.8	76 28.5 +04.2 92.3
16°	80 23.3 -01.6 88.6	79 25.6 -01.2 88.5	78 28.0 -00.8 88.3	77 30.3 -00.4 88.2	76 32.7 -00.2 88.1
17°	80 21.7 -07.8 82.6	79 24.4 -06.7 83.0	78 27.2 -06.0 83.3	77 29.9 -05.2 83.6	76 32.5 -04.5 83.8
18°	80 13.9 -13.6 76.8	79 17.7 -12.2 77.7	78 21.2 -10.9 78.4	77 24.7 -09.8 79.0	76 28.0 -08.8 79.5
19°	80 00.3 -19.1 71.1	79 05.5 -17.3 72.4	78 10.3 -15.6 73.6	77 14.9 -14.2 74.5	76 19.2 -13.0 75.3
20°	79 41.2 -24.2 65.7	78 48.2 -21.9 67.4	77 54.7 -20.1 68.9	77 00.7 -18.5 70.1	76 06.2 -16.9 71.2
21°	79 17.0 -28.5 60.7	78 26.3 -26.3 62.7	77 34.6 -24.2 64.5	76 42.2 -22.3 65.9	75 49.3 -20.7 67.2
22°	78 48.5 -32.5 56.0	78 00.0 -30.1 58.3	77 10.4 -27.9 60.3	76 19.9 -26.0 62.0	75 28.6 -24.1 63.4
23°	78 16.0 -35.9 51.8	77 29.9 -33.5 54.2	76 42.5 -31.3 56.3	75 53.9 -29.2 58.2	75 04.5 -27.4 59.8
24°	77 40.1 -38.8 48.0	76 56.4 -36.5 50.5	76 11.2 -34.3 52.7	75 24.7 -32.2 54.7	74 37.1 -30.2 56.4
25°	77 01.3 -41.4 44.5	76 19.9 -39.0 47.0	75 36.9 -36.9 49.3	74 52.5 -34.9 51.4	74 06.9 -33.0 53.2
26°	76 19.9 -43.5 41.3	75 40.9 -41.4 43.9	75 00.0 -39.2 46.2	74 17.6 -37.2 48.3	73 33.9 -35.3 50.2
27°	75 36.4 -45.3 38.5	74 59.5 -43.3 41.0	74 20.8 -41.3 43.4	73 40.4 -39.3 45.5	72 58.6 -37.5 47.4
28°	74 51.1 -46.9 35.9	74 16.2 -44.9 38.4	73 39.5 -43.1 40.7	73 01.1 -41.3 42.8	72 21.1 -39.4 44.8
29°	74 04.2 -48.3 33.6	73 31.3 -46.5 36.0	72 56.4 -44.7 38.3	72 19.8 -42.9 40.4	71 41.7 -41.2 42.4

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	68 12.2 +43.9 135.8	67 31.3 +42.6 133.9	66 49.1 +41.4 132.0	66 05.7 +40.1 130.3	65 21.2 +38.9 128.7
1°	68 56.1 +42.7 133.9	68 13.9 +41.3 132.0	67 30.5 +40.0 130.2	66 45.8 +38.8 128.5	66 00.1 +37.7 126.8
2°	69 38.8 +41.1 132.0	68 55.2 +39.8 130.0	68 10.5 +38.5 128.2	67 24.6 +37.3 126.5	66 37.8 +36.0 124.9
3°	70 19.9 +39.6 129.8	69 35.0 +38.2 127.9	68 49.0 +36.8 126.1	68 01.9 +35.6 124.4	67 13.8 +34.5 122.9
4°	70 59.5 +37.8 127.6	70 13.2 +36.4 125.7	69 25.8 +35.1 123.9	68 37.5 +33.9 122.2	67 48.3 +32.7 120.7
5°	71 37.3 +35.9 125.1	70 49.6 +34.5 123.3	70 00.9 +33.2 121.5	69 11.4 +31.9 119.9	68 21.0 +30.8 118.5
6°	72 13.2 +33.6 122.6	71 24.1 +32.3 120.7	70 34.1 +31.0 119.1	69 43.3 +29.8 117.5	68 51.8 +28.8 116.1
7°	72 46.8 +31.3 119.8	71 56.4 +29.9 118.1	71 05.1 +28.7 116.5	70 13.1 +27.6 115.0	69 20.6 +26.5 113.7
8°	73 18.1 +28.7 116.9	72 26.3 +27.4 115.2	71 33.8 +26.2 113.7	70 40.7 +25.2 112.3	69 47.1 +24.3 111.1
9°	73 46.8 +25.8 113.8	72 53.7 +24.6 112.2	72 00.0 +23.6 110.8	71 05.9 +22.6 109.6	70 11.4 +21.7 108.4
10°	74 12.6 +22.7 110.5	73 18.3 +21.7 109.1	72 23.6 +20.7 107.8	71 28.5 +19.9 106.7	70 33.1 +19.2 105.6
11°	74 35.3 +19.4 107.1	73 40.0 +18.5 105.8	72 44.3 +17.8 104.7	71 48.4 +17.0 103.7	70 52.3 +16.4 102.8
12°	74 54.7 +15.8 103.5	73 58.5 +15.1 102.4	73 02.1 +14.5 101.5	72 05.4 +14.0 100.6	71 08.7 +13.5 99.8
13°	75 10.5 +12.1 99.7	74 13.6 +11.6 98.9	73 16.6 +11.2 98.1	72 19.4 +10.9 97.4	71 22.2 +10.5 96.8
14°	75 22.6 +08.3 95.9	74 25.2 +08.0 95.2	73 27.8 +07.7 94.7	72 30.3 +07.6 94.2	71 32.7 +07.5 93.7
15°	75 30.9 +04.2 91.9	74 33.2 +04.2 91.5	73 35.5 +04.3 91.2	72 37.9 +04.3 90.8	71 40.2 +04.3 90.5
16°	75 35.1 +00.1 87.9	74 37.4 +00.4 87.8	73 39.8 +00.7 87.6	72 42.2 +00.9 87.5	71 44.5 +01.2 87.4
17°	75 35.2 -03.9 83.9	74 37.8 -03.3 84.0	73 40.5 -02.9 84.1	72 43.1 -02.4 84.1	71 45.7 -02.0 84.2
18°	75 31.3 -08.0 79.9	74 34.5 -07.2 80.2	73 37.6 -06.4 80.5	72 40.7 -05.8 80.8	71 43.7 -05.1 81.0
19°	75 23.3 -11.8 76.0	74 27.3 -10.8 76.5	73 31.2 -09.9 77.0	72 34.9 -09.0 77.4	71 38.6 -08.3 77.8
20°	75 11.5 -15.6 72.1	74 16.5 -14.4 72.9	73 21.3 -13.3 73.6	72 25.9 -12.3 74.2	71 30.3 -11.3 74.7
21°	74 55.9 -19.2 68.3	74 02.1 -17.8 69.3	73 08.0 -16.5 70.2	72 13.6 -15.3 70.9	71 19.0 -14.3 71.6
22°	74 36.7 -22.5 64.7	73 44.3 -20.9 65.9	72 51.5 -19.6 66.9	71 58.3 -18.3 67.8	71 04.7 -17.1 68.6
23°	74 14.2 -25.6 61.3	73 23.4 -24.0 62.6	72 31.9 -22.5 63.7	71 40.0 -21.2 64.7	70 47.6 -19.8 65.6
24°	73 48.6 -28.4 58.0	72 59.4 -26.9 59.4	72 09.4 -25.3 60.7	71 18.8 -23.7 61.8	70 27.8 -22.4 62.8
25°	73 20.2 -31.2 54.9	72 32.5 -29.4 56.4	71 44.1 -27.8 57.7	70 55.1 -26.3 58.9	70 05.4 -24.9 60.0
26°	72 49.0 -33.5 51.9	72 03.1 -31.7 53.5	71 16.3 -30.1 54.9	70 28.8 -28.6 56.2	69 40.5 -27.2 57.4
27°	72 15.5 -35.7 49.2	71 31.4 -34.0 50.8	70 46.2 -32.4 52.3	70 00.2 -30.8 53.6	69 13.3 -29.3 54.9
28°	71 39.8 -37.6 46.6	70 57.4 -36.0 48.2	70 13.8 -34.3 49.7	69 29.4 -32.8 51.1	68 44.0 -31.3 52.4
29°	71 02.2 -39.5 44.2	70 21.4 -37.8 45.8	69 39.5 -36.2 47.4	68 56.6 -34.7 48.8	68 12.7 -33.1 50.1

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	64 35.6 +37.9 127.1	63 49.2 +36.8 125.7	63 02.0 +35.8 124.3	62 14.0 +34.8 123.0	61 25.2 +34.0 121.8
1°	65 13.5 +36.5 125.3	64 26.0 +35.5 123.9	63 37.8 +34.4 122.5	62 48.8 +33.5 121.2	61 59.2 +32.5 120.0
2°	65 50.0 +35.0 123.4	65 01.5 +33.9 122.0	64 12.2 +32.9 120.7	63 22.3 +31.9 119.4	62 31.7 +31.1 118.2
3°	66 25.0 +33.4 121.4	65 35.4 +32.3 120.0	64 45.1 +31.4 118.7	63 54.2 +30.5 117.5	63 02.8 +29.6 116.3
4°	66 58.4 +31.6 119.3	66 07.7 +30.6 117.9	65 16.5 +29.6 116.7	64 24.7 +28.8 115.5	63 32.4 +27.9 114.4
5°	67 30.0 +29.7 117.1	66 38.3 +28.8 115.8	65 46.1 +27.9 114.6	64 53.5 +27.0 113.5	64 00.3 +26.3 112.4
6°	67 59.7 +27.8 114.8	67 07.1 +26.8 113.6	66 14.0 +26.0 112.4	65 20.5 +25.2 111.3	64 26.6 +24.4 110.3
7°	68 27.5 +25.6 112.4	67 33.9 +24.8 111.2	66 40.0 +24.0 110.2	65 45.7 +23.2 109.2	64 51.0 +22.6 108.2
8°	68 53.1 +23.4 109.9	67 58.7 +22.6 108.8	67 04.0 +21.8 107.8	66 08.9 +21.2 106.9	65 13.6 +20.6 106.0
9°	69 16.5 +21.0 107.3	68 21.3 +20.3 106.3	67 25.8 +19.6 105.4	66 30.1 +19.1 104.6	65 34.2 +18.5 103.8
10°	69 37.5 +18.4 104.7	68 41.6 +17.8 103.8	67 45.4 +17.4 102.9	66 49.2 +16.8 102.2	65 52.7 +16.4 101.4
11°	69 55.9 +15.9 101.9	68 59.4 +15.4 101.1	68 02.8 +14.9 100.4	67 06.0 +14.5 99.7	66 09.1 +14.1 99.1
12°	70 11.8 +13.1 99.1	69 14.8 +12.7 98.4	68 17.7 +12.4 97.8	67 20.5 +12.1 97.2	66 23.2 +11.9 96.7
13°	70 24.9 +10.3 96.2	69 27.5 +10.1 95.6	68 30.1 +9.9 95.1	67 32.6 +9.7 94.7	66 35.1 +9.6 94.2
14°	70 35.2 +07.3 93.2	69 37.6 +07.3 92.8	68 40.0 +07.2 92.4	67 42.3 +07.2 92.1	66 44.7 +07.1 91.7
15°	70 42.5 +04.4 90.2	69 44.9 +04.4 90.0	68 47.2 +04.5 89.7	67 49.5 +04.6 89.4	66 51.8 +04.8 89.2
16°	70 46.9 +01.4 87.2	69 49.3 +01.7 87.1	68 51.7 +01.9 86.9	67 54.1 +02.1 86.8	66 56.6 +02.2 86.6
17°	70 48.3 -01.5 84.2	69 51.0 -01.2 84.2	68 53.6 -00.9 84.2	67 56.2 -00.5 84.1	66 58.8 -00.1 84.1
18°	70 46.8 -04.6 81.1	69 49.8 -04.1 81.3	68 52.7 -03.5 81.4	67 55.7 -03.1 81.5	66 58.7 -02.7 81.5
19°	70 42.2 -07.6 78.1	69 45.7 -06.9 78.4	68 49.2 -06.3 78.6	67 52.6 -05.6 78.8	66 56.0 -05.1 79.0
20°	70 34.6 -10.4 75.1	69 38.8 -09.6 75.5	68 42.9 -08.9 75.9	67 47.0 -08.2 76.2	66 50.9 -07.5 76.4
21°	70 24.2 -13.3 72.2	69 29.2 -12.4 72.7	68 34.0 -11.4 73.2	67 38.8 -10.7 73.6	66 43.4 -09.9 73.9
22°	70 10.9 -16.0 69.3	69 16.8 -14.9 69.9	68 22.6 -14.0 70.5	67 28.1 -13.1 71.0	66 33.5 -12.2 71.4
23°	69 54.9 -18.6 66.5	69 01.9 -17.5 67.2	68 08.6 -16.5 67.9	67 15.0 -15.4 68.5	66 21.3 -14.5 69.0
24°	69 36.3 -21.2 63.7	68 44.4 -20.0 64.5	67 52.1 -18.8 65.3	66 59.6 -17.7 66.0	66 06.8 -16.7 66.6
25°	69 15.1 -23.5 61.0	68 24.4 -22.2 62.0	67 33.3 -21.0 62.8	66 41.9 -19.9 63.5	65 50.1 -18.8 64.2
26°	68 51.6 -25.7 58.5	68 02.2 -24.5 59.5	67 12.3 -23.2 60.3	66 22.0 -22.0 61.2	65 31.3 -20.9 61.9
27°	68 25.9 -27.9 56.0	67 37.7 -26.5 57.0	66 49.1 -25.2 58.0	66 00.0 -24.1 58.9	65 10.4 -22.9 59.7
28°	67 58.0 -29.9 53.6	67 11.2 -28.5 54.7	66 23.9 -27.2 55.7	65 35.9 -25.9 56.6	64 47.5 -24.7 57.5
29°	67 28.1 -31.7 51.3	66 42.7 -30.3 52.4	65 56.7 -29.0 53.5	65 10.0 -27.7 54.5	64 22.8 -26.5 55.4

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	60 35.9 +33.0 120.6	59 46.0 +32.2 119.5	58 55.5 +31.4 118.4	58 04.5 +30.7 117.4	57 13.1 +29.9 116.4
1°	61 08.9 +31.7 118.9	60 18.2 +30.8 117.8	59 26.9 +30.1 116.7	58 35.2 +29.3 115.8	57 43.0 +28.7 114.8
2°	61 40.6 +30.3 117.1	60 49.0 +29.5 116.0	59 57.0 +28.7 115.0	59 04.5 +28.1 114.1	58 11.7 +27.3 113.2
3°	62 10.9 +28.8 115.3	61 18.5 +28.0 114.2	60 25.7 +27.3 113.3	59 32.6 +26.6 112.3	58 39.0 +26.0 111.5
4°	62 39.7 +27.1 113.4	61 46.5 +26.5 112.4	60 53.0 +25.8 111.5	59 59.2 +25.1 110.6	59 05.0 +24.5 109.7
5°	63 06.8 +25.5 111.4	62 13.0 +24.8 110.5	61 18.8 +24.2 109.6	60 24.3 +23.6 108.7	59 29.5 +23.1 107.9
6°	63 32.3 +23.8 109.4	62 37.8 +23.1 108.5	61 43.0 +22.5 107.7	60 47.9 +22.0 106.9	59 52.6 +21.5 106.1
7°	63 56.1 +21.9 107.3	63 00.9 +21.4 106.5	62 05.5 +20.8 105.7	61 09.9 +20.3 104.9	60 14.1 +19.8 104.2
8°	64 18.0 +20.1 105.2	63 22.3 +19.5 104.4	62 26.3 +19.1 103.7	61 30.2 +18.6 103.0	60 33.9 +18.2 102.3
9°	64 38.1 +18.0 103.0	63 41.8 +17.6 102.3	62 45.4 +17.1 101.6	61 48.8 +16.8 101.0	60 52.1 +16.5 100.4
10°	64 56.1 +16.0 100.8	63 59.4 +15.6 100.1	63 02.5 +15.3 99.5	62 05.6 +15.0 98.9	61 08.6 +14.7 98.4
11°	65 12.1 +13.8 98.5	64 15.0 +13.6 97.9	63 17.8 +13.3 97.4	62 20.6 +13.1 96.9	61 23.3 +12.9 96.4
12°	65 25.9 +11.7 96.1	64 28.6 +11.4 95.7	63 31.1 +11.3 95.2	62 33.7 +11.1 94.8	61 36.2 +11.0 94.3
13°	65 37.6 +09.4 93.8	64 40.0 +09.4 93.4	63 42.4 +09.3 93.0	62 44.8 +09.2 92.6	61 47.2 +09.1 92.3
14°	65 47.0 +07.2 91.4	64 49.4 +07.1 91.1	63 51.7 +07.1 90.7	62 54.0 +07.2 90.5	61 56.3 +07.2 90.2
15°	65 54.2 +04.8 88.9	64 56.5 +04.9 88.7	63 58.8 +05.1 88.5	63 01.2 +05.1 88.3	62 03.5 +05.3 88.1
16°	65 59.0 +02.5 86.5	65 01.4 +02.7 86.4	64 03.9 +02.9 86.2	63 06.3 +03.1 86.1	62 08.8 +03.3 85.9
17°	66 01.5 +00.1 84.0	65 04.1 +00.5 84.0	64 06.8 +00.7 83.9	63 09.4 +01.0 83.9	62 12.1 +01.3 83.8
18°	66 01.6 -02.2 81.6	65 04.6 -01.9 81.6	64 07.5 -01.4 81.6	63 10.4 -01.0 81.6	62 13.4 -00.7 81.6
19°	65 59.4 -04.6 79.1	65 02.7 -04.0 79.2	64 06.1 -03.6 79.3	63 09.4 -03.1 79.4	62 12.7 -02.7 79.5
20°	65 54.8 -06.9 76.7	64 58.7 -06.3 76.9	64 02.5 -05.7 77.1	63 06.3 -05.2 77.2	62 10.0 -04.7 77.4
21°	65 47.9 -09.1 74.3	64 52.4 -08.5 74.5	63 56.8 -07.9 74.8	63 01.1 -07.2 75.0	62 05.3 -06.6 75.2
22°	65 38.8 -11.4 71.8	64 43.9 -10.6 72.2	63 48.9 -09.9 72.5	62 53.9 -09.2 72.8	61 58.7 -08.5 73.1
23°	65 27.4 -13.6 69.5	64 33.3 -12.8 69.9	63 39.0 -11.9 70.3	62 44.7 -11.2 70.7	61 50.2 -10.5 71.0
24°	65 13.8 -15.8 67.1	64 20.5 -14.8 67.6	63 27.1 -14.0 68.1	62 33.5 -13.1 68.5	61 39.7 -12.3 68.9
25°	64 58.0 -17.8 64.8	64 05.7 -16.8 65.4	63 13.1 -15.9 65.9	62 20.4 -15.0 66.4	61 27.4 -14.1 66.9
26°	64 40.2 -19.8 62.6	63 48.9 -18.8 63.2	62 57.2 -17.8 63.8	62 05.4 -16.9 64.3	61 13.3 -16.0 64.8
27°	64 20.4 -21.7 60.4	63 30.1 -20.7 61.1	62 39.4 -19.6 61.7	61 48.5 -18.6 62.3	60 57.3 -17.7 62.8
28°	63 58.7 -23.6 58.3	63 09.4 -22.4 59.0	62 19.8 -21.4 59.7	61 29.9 -20.4 60.3	60 39.6 -19.3 60.9
29°	63 35.1 -25.3 56.2	62 47.0 -24.2 57.0	61 58.4 -23.0 57.7	61 09.5 -22.0 58.3	60 20.3 -21.0 59.0

Latitude 16°

Declination SAME name as Latitude

Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	56 21.2 +29.3 115.5	55 29.0 +28.6 114.6	54 36.4 +28.0 113.8	53 43.5 +27.4 113.0	52 50.2 +26.9 112.2
1°	56 50.5 +28.0 113.9	55 57.6 +27.4 113.1	55 04.4 +26.8 112.3	54 10.9 +26.2 111.5	53 17.1 +25.6 110.7
2°	57 18.5 +26.7 112.3	56 25.0 +26.1 111.5	55 31.2 +25.5 110.7	54 37.1 +25.0 109.9	53 42.7 +24.6 109.2
3°	57 45.2 +25.4 110.6	56 51.1 +24.8 109.8	55 56.7 +24.3 109.1	55 02.1 +23.8 108.4	54 07.3 +23.2 107.7
4°	58 10.6 +24.0 108.9	57 15.9 +23.5 108.2	56 21.0 +22.9 107.4	55 25.9 +22.4 106.8	54 30.5 +22.1 106.1
5°	58 34.6 +22.5 107.2	57 39.4 +22.0 106.5	56 43.9 +21.6 105.8	55 48.3 +21.2 105.1	54 52.6 +20.7 104.5
6°	58 57.1 +21.0 105.4	58 01.4 +20.5 104.7	57 05.5 +20.2 104.1	56 09.5 +19.7 103.4	55 13.3 +19.4 102.8
7°	59 18.1 +19.4 103.6	58 21.9 +19.1 102.9	57 25.7 +18.6 102.3	56 29.2 +18.4 101.7	55 32.7 +18.0 101.2
8°	59 37.5 +17.8 101.7	58 41.0 +17.5 101.1	57 44.3 +17.2 100.5	56 47.6 +16.9 100.0	55 50.7 +16.6 99.5
9°	59 55.3 +16.2 99.8	58 58.5 +15.8 99.3	58 01.5 +15.6 98.7	57 04.5 +15.3 98.2	56 07.3 +15.2 97.8
10°	60 11.5 +14.5 97.9	59 14.3 +14.3 97.4	58 17.1 +14.0 96.9	57 19.8 +13.9 96.5	56 22.5 +13.7 96.0
11°	60 26.0 +12.7 95.9	59 28.6 +12.5 95.5	58 31.1 +12.4 95.1	57 33.7 +12.2 94.7	56 36.2 +12.1 94.3
12°	60 38.7 +10.9 93.9	59 41.1 +10.8 93.5	58 43.5 +10.8 93.2	57 45.9 +10.7 92.8	56 48.3 +10.6 92.5
13°	60 49.6 +09.1 91.9	59 51.9 +09.1 91.6	58 54.3 +09.0 91.3	57 56.6 +09.0 91.0	56 58.9 +09.1 90.7
14°	60 58.7 +07.2 89.9	60 01.0 +07.3 89.6	59 03.3 +07.4 89.4	58 05.6 +07.4 89.1	57 08.0 +07.4 88.9
15°	61 05.9 +05.4 87.8	60 08.3 +05.5 87.6	59 10.7 +05.6 87.4	58 13.0 +05.8 87.2	57 15.4 +05.9 87.0
16°	61 11.3 +03.4 85.8	60 13.8 +03.6 85.6	59 16.3 +03.8 85.5	58 18.8 +04.0 85.3	57 21.3 +04.2 85.2
17°	61 14.7 +01.6 83.7	60 17.4 +01.8 83.6	59 20.1 +02.1 83.5	58 22.8 +02.3 83.4	57 25.5 +02.6 83.3
18°	61 16.3 -00.3 81.6	60 19.2 +00.0 81.6	59 22.2 +00.3 81.6	58 25.1 +00.7 81.5	57 28.1 +01.0 81.5
19°	61 16.0 -02.3 79.5	60 19.2 -01.8 79.6	59 22.5 -01.4 79.6	58 25.8 -01.1 79.6	57 29.1 -00.7 79.6
20°	61 13.7 -04.1 77.5	60 17.4 -03.7 77.6	59 21.1 -03.2 77.6	58 24.7 -02.7 77.7	57 28.4 -02.4 77.8
21°	61 09.6 -06.1 75.4	60 13.7 -05.5 75.5	59 17.9 -05.0 75.7	58 22.0 -04.5 75.8	57 26.0 -03.9 75.9
22°	61 03.5 -07.9 73.3	60 08.2 -07.3 73.5	59 12.9 -06.7 73.7	58 17.5 -06.1 73.9	57 22.1 -05.6 74.0
23°	60 55.6 -09.7 71.3	60 00.9 -09.0 71.6	59 06.2 -08.4 71.8	58 11.4 -07.8 72.0	57 16.5 -07.2 72.2
24°	60 45.9 -11.6 69.3	59 51.9 -10.9 69.6	58 57.8 -10.2 69.9	58 03.6 -09.5 70.1	57 09.3 -08.8 70.4
25°	60 34.3 -13.3 67.3	59 41.0 -12.5 67.6	58 47.6 -11.8 68.0	57 54.1 -11.1 68.3	57 00.5 -10.4 68.5
26°	60 21.0 -15.1 65.3	59 28.5 -14.3 65.7	58 35.8 -13.4 66.1	57 43.0 -12.6 66.4	56 50.1 -11.9 66.7
27°	60 05.9 -16.8 63.3	59 14.2 -15.9 63.8	58 22.4 -15.0 64.2	57 30.4 -14.2 64.6	56 38.2 -13.4 65.0
28°	59 49.1 -18.4 61.4	58 58.3 -17.4 61.9	58 07.4 -16.7 62.4	57 16.2 -15.8 62.8	56 24.8 -15.0 63.2
29°	59 30.7 -20.0 59.5	58 40.9 -19.1 60.1	57 50.7 -18.1 60.6	57 00.4 -17.2 61.0	56 09.8 -16.3 61.4

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	51 56.7 +26.3 111.5	51 02.9 +25.8 110.8	50 08.9 +25.2 110.1	49 14.6 +24.8 109.4	48 20.1 +24.4 108.8
1°	52 23.0 +25.2 110.0	51 28.7 +24.7 109.3	50 34.1 +24.3 108.7	49 39.4 +23.8 108.0	48 44.5 +23.3 107.4
2°	52 48.2 +24.0 108.5	51 53.4 +23.6 107.9	50 58.4 +23.1 107.2	50 03.2 +22.7 106.6	49 07.8 +22.4 106.0
3°	53 12.2 +22.8 107.0	52 17.0 +22.4 106.4	51 21.5 +22.0 105.8	50 25.9 +21.7 105.2	49 30.2 +21.3 104.6
4°	53 35.0 +21.7 105.5	52 39.4 +21.2 104.8	51 43.5 +20.9 104.3	50 47.6 +20.5 103.7	49 51.5 +20.2 103.1
5°	53 56.7 +20.3 103.9	53 00.6 +20.0 103.3	52 04.4 +19.7 102.7	51 08.1 +19.4 102.2	50 11.7 +19.0 101.7
6°	54 17.0 +19.1 102.3	53 20.6 +18.8 101.7	52 24.1 +18.4 101.2	51 27.5 +18.1 100.7	50 30.7 +18.0 100.2
7°	54 36.1 +17.7 100.6	53 39.4 +17.4 100.1	52 42.5 +17.2 99.6	51 45.6 +17.0 99.2	50 48.7 +16.7 98.7
8°	54 53.8 +16.4 99.0	53 56.8 +16.1 98.5	52 59.7 +15.9 98.0	52 02.6 +15.7 97.6	51 05.4 +15.5 97.2
9°	55 10.2 +14.9 97.3	54 12.9 +14.8 96.9	53 15.6 +14.6 96.4	52 18.3 +14.5 96.0	51 20.9 +14.3 95.6
10°	55 25.1 +13.5 95.6	54 27.7 +13.4 95.2	53 30.2 +13.3 94.8	52 32.8 +13.1 94.4	51 35.2 +13.1 94.1
11°	55 38.6 +12.1 93.9	54 41.1 +12.0 93.5	53 43.5 +11.9 93.2	52 45.9 +11.8 92.8	51 48.3 +11.8 92.5
12°	55 50.7 +10.6 92.1	54 53.1 +10.5 91.8	53 55.4 +10.5 91.5	52 57.7 +10.5 91.2	52 00.1 +10.5 90.9
13°	56 01.3 +09.0 90.4	55 03.6 +09.1 90.1	54 05.9 +09.1 89.8	53 08.2 +09.2 89.6	52 10.6 +09.1 89.3
14°	56 10.3 +07.5 88.6	55 12.7 +07.6 88.4	54 15.0 +07.7 88.1	53 17.4 +07.7 87.9	52 19.7 +07.9 87.7
15°	56 17.8 +06.0 86.8	55 20.3 +06.1 86.6	54 22.7 +06.2 86.4	53 25.1 +06.4 86.2	52 27.6 +06.5 86.1
16°	56 23.8 +04.4 85.0	55 26.4 +04.6 84.9	54 28.9 +04.8 84.7	53 31.5 +05.0 84.6	52 34.1 +05.1 84.4
17°	56 28.2 +02.9 83.2	55 31.0 +03.0 83.1	54 33.7 +03.3 83.0	53 36.5 +03.5 82.9	52 39.2 +03.8 82.8
18°	56 31.1 +01.2 81.4	55 34.0 +01.6 81.4	54 37.0 +01.9 81.3	53 40.0 +02.2 81.2	52 43.0 +02.4 81.1
19°	56 32.3 -00.3 79.6	55 35.6 +00.0 79.6	54 38.9 +00.3 79.6	53 42.2 +00.7 79.5	52 45.4 +01.1 79.5
20°	56 32.0 -01.9 77.8	55 35.6 -01.5 77.8	54 39.2 -01.1 77.8	53 42.9 -00.8 77.8	52 46.5 -00.4 77.8
21°	56 30.1 -03.5 76.0	55 34.1 -03.0 76.1	54 38.1 -02.5 76.1	53 42.1 -02.1 76.2	52 46.1 -01.7 76.2
22°	56 26.6 -05.1 74.2	55 31.1 -04.6 74.3	54 35.6 -04.1 74.4	53 40.0 -03.6 74.5	52 44.4 -03.1 74.5
23°	56 21.5 -06.6 72.4	55 26.5 -06.0 72.5	54 31.5 -05.5 72.7	53 36.4 -04.9 72.8	52 41.3 -04.4 72.9
24°	56 14.9 -08.2 70.6	55 20.5 -07.6 70.8	54 26.0 -07.0 70.9	53 31.5 -06.4 71.1	52 36.9 -05.9 71.2
25°	56 06.7 -09.6 68.8	55 12.9 -09.0 69.0	54 19.0 -08.4 69.2	53 25.1 -07.8 69.4	52 31.0 -07.1 69.6
26°	55 57.1 -11.2 67.0	55 03.9 -10.5 67.3	54 10.6 -09.8 67.5	53 17.3 -09.1 67.8	52 23.9 -08.5 68.0
27°	55 45.9 -12.7 65.3	54 53.4 -11.9 65.6	54 00.8 -11.2 65.9	53 08.2 -10.6 66.1	52 15.4 -09.9 66.4
28°	55 33.2 -14.1 63.6	54 41.5 -13.3 63.9	53 49.6 -12.5 64.2	52 57.6 -11.8 64.5	52 05.5 -11.1 64.7
29°	55 19.1 -15.5 61.8	54 28.2 -14.8 62.2	53 37.1 -14.0 62.5	52 45.8 -13.2 62.9	51 54.4 -12.4 63.1

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Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	47 25.4 +23.9 108.2	46 30.5 +23.6 107.6	45 35.4 +23.2 107.0	44 40.2 +22.8 106.5	43 44.8 +22.5 105.9
1°	47 49.3 +23.0 106.8	46 54.1 +22.6 106.3	45 58.6 +22.3 105.7	45 03.0 +21.9 105.2	44 07.3 +21.6 104.6
2°	48 12.3 +22.0 105.4	47 16.7 +21.6 104.9	46 20.9 +21.3 104.4	45 24.9 +21.0 103.8	44 28.9 +20.6 103.3
3°	48 34.3 +21.0 104.0	47 38.3 +20.6 103.5	46 42.2 +20.3 103.0	45 45.9 +20.0 102.5	44 49.5 +19.8 102.0
4°	48 55.3 +19.8 102.6	47 58.9 +19.6 102.1	47 02.5 +19.3 101.6	46 05.9 +19.1 101.1	45 09.3 +18.8 100.7
5°	49 15.1 +18.8 101.2	48 18.5 +18.5 100.7	47 21.8 +18.3 100.2	46 25.0 +18.1 99.8	45 28.1 +17.9 99.3
6°	49 33.9 +17.7 99.7	48 37.0 +17.5 99.3	47 40.1 +17.2 98.8	46 43.1 +17.0 98.4	45 46.0 +16.8 98.0
7°	49 51.6 +16.5 98.2	48 54.5 +16.3 97.8	47 57.3 +16.2 97.4	47 00.1 +16.0 97.0	46 02.8 +15.9 96.6
8°	50 08.1 +15.4 96.7	49 10.8 +15.3 96.3	48 13.5 +15.1 96.0	47 16.1 +15.0 95.6	46 18.7 +14.8 95.2
9°	50 23.5 +14.2 95.2	49 26.1 +14.0 94.9	48 28.6 +13.9 94.5	47 31.1 +13.8 94.1	46 33.5 +13.8 93.8
10°	50 37.7 +13.0 93.7	49 40.1 +12.9 93.4	48 42.5 +12.9 93.0	47 44.9 +12.8 92.7	46 47.3 +12.7 92.4
11°	50 50.7 +11.7 92.2	49 53.0 +11.7 91.8	48 55.4 +11.7 91.5	47 57.7 +11.7 91.2	47 00.0 +11.7 90.9
12°	51 02.4 +10.5 90.6	50 04.7 +10.5 90.3	49 07.1 +10.5 90.0	48 09.4 +10.5 89.8	47 11.7 +10.6 89.5
13°	51 12.9 +09.2 89.0	50 15.2 +09.3 88.8	49 17.6 +09.3 88.5	48 19.9 +09.4 88.3	47 22.3 +09.4 88.1
14°	51 22.1 +08.0 87.5	50 24.5 +08.0 87.2	49 26.9 +08.1 87.0	48 29.3 +08.2 86.8	47 31.7 +08.4 86.6
15°	51 30.1 +06.6 85.9	50 32.5 +06.8 85.7	49 35.0 +07.0 85.5	48 37.5 +07.1 85.3	47 40.1 +07.2 85.1
16°	51 36.7 +05.3 84.3	50 39.3 +05.5 84.1	49 42.0 +05.7 84.0	48 44.6 +05.9 83.8	47 47.3 +06.0 83.6
17°	51 42.0 +04.0 82.7	50 44.8 +04.3 82.5	49 47.7 +04.4 82.4	48 50.5 +04.7 82.3	47 53.3 +05.0 82.2
18°	51 46.0 +02.7 81.1	50 49.1 +02.9 81.0	49 52.1 +03.3 80.9	48 55.2 +03.5 80.8	47 58.3 +03.7 80.7
19°	51 48.7 +01.4 79.4	50 52.0 +01.7 79.4	49 55.4 +02.0 79.3	48 58.7 +02.3 79.3	48 02.0 +02.6 79.2
20°	51 50.1 +00.0 77.8	50 53.7 +00.4 77.8	49 57.4 +00.7 77.8	49 01.0 +01.1 77.7	48 04.6 +01.5 77.7
21°	51 50.1 -01.3 76.2	50 54.1 -00.9 76.2	49 58.1 -00.5 76.2	49 02.1 -00.1 76.2	48 06.1 +00.2 76.2
22°	51 48.8 -02.6 74.6	50 53.2 -02.2 74.6	49 57.6 -01.7 74.7	49 02.0 -01.3 74.7	48 06.3 -00.8 74.7
23°	51 46.2 -04.0 73.0	50 51.0 -03.4 73.0	49 55.9 -03.0 73.1	49 00.7 -02.6 73.2	48 05.5 -02.1 73.2
24°	51 42.2 -05.2 71.4	50 47.6 -04.8 71.5	49 52.9 -04.3 71.6	48 58.1 -03.7 71.6	48 03.4 -03.2 71.7
25°	51 37.0 -06.6 69.8	50 42.8 -06.0 69.9	49 48.6 -05.4 70.0	48 54.4 -04.9 70.1	48 00.2 -04.4 70.2
26°	51 30.4 -07.9 68.2	50 36.8 -07.3 68.3	49 43.2 -06.7 68.5	48 49.5 -06.1 68.6	47 55.8 -05.5 68.7
27°	51 22.5 -09.2 66.6	50 29.5 -08.5 66.8	49 36.5 -07.9 66.9	48 43.4 -07.3 67.1	47 50.3 -06.7 67.2
28°	51 13.3 -10.4 65.0	50 21.0 -09.7 65.2	49 28.6 -09.1 65.4	48 36.1 -08.4 65.6	47 43.6 -07.8 65.8
29°	51 02.9 -11.7 63.4	50 11.3 -11.0 63.7	49 19.5 -10.3 63.9	48 27.7 -09.6 64.1	47 35.8 -09.0 64.3

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	42 49.3 +22.1 105.4	41 53.6 +21.8 104.9	40 57.8 +21.5 104.4	40 01.9 +21.2 103.9	39 05.9 +20.9 103.5
1°	43 11.4 +21.3 104.1	42 15.4 +21.0 103.7	41 19.3 +20.7 103.2	40 23.1 +20.4 102.7	39 26.8 +20.2 102.3
2°	43 32.7 +20.4 102.9	42 36.4 +20.1 102.4	41 40.0 +19.9 101.9	40 43.5 +19.7 101.5	39 47.0 +19.4 101.0
3°	43 53.1 +19.5 101.6	42 56.5 +19.3 101.1	41 59.9 +19.0 100.7	41 03.2 +18.8 100.2	40 06.4 +18.6 99.8
4°	44 12.6 +18.6 100.2	43 15.8 +18.4 99.8	42 18.9 +18.2 99.4	41 22.0 +18.0 99.0	40 25.0 +17.8 98.6
5°	44 31.2 +17.6 98.9	43 34.2 +17.4 98.5	42 37.1 +17.3 98.1	41 40.0 +17.1 97.7	40 42.8 +16.9 97.3
6°	44 48.8 +16.7 97.6	43 51.6 +16.6 97.2	42 54.4 +16.4 96.8	41 57.1 +16.2 96.4	40 59.7 +16.2 96.0
7°	45 05.5 +15.7 96.2	44 08.2 +15.5 95.8	43 10.8 +15.4 95.5	42 13.3 +15.4 95.1	41 15.9 +15.2 94.8
8°	45 21.2 +14.8 94.8	44 23.7 +14.7 94.5	43 26.2 +14.6 94.1	42 28.7 +14.5 93.8	41 31.1 +14.4 93.5
9°	45 36.0 +13.7 93.5	44 38.4 +13.6 93.1	43 40.8 +13.6 92.8	42 43.2 +13.5 92.5	41 45.5 +13.6 92.2
10°	45 49.7 +12.7 92.1	44 52.0 +12.7 91.7	43 54.4 +12.6 91.4	42 56.7 +12.7 91.2	41 59.1 +12.6 90.9
11°	46 02.4 +11.6 90.7	45 04.7 +11.7 90.4	44 07.0 +11.7 90.1	43 09.4 +11.6 89.8	42 11.7 +11.7 89.5
12°	46 14.0 +10.6 89.2	45 16.4 +10.6 89.0	44 18.7 +10.7 88.7	43 21.0 +10.8 88.5	42 23.4 +10.8 88.2
13°	46 24.6 +09.6 87.8	45 27.0 +09.6 87.6	44 29.4 +09.7 87.3	43 31.8 +09.7 87.1	42 34.2 +09.8 86.9
14°	46 34.2 +08.4 86.4	45 36.6 +08.6 86.2	44 39.1 +08.6 86.0	43 41.5 +08.8 85.7	42 44.0 +08.9 85.5
15°	46 42.6 +07.4 84.9	45 45.2 +07.5 84.8	44 47.7 +07.7 84.6	43 50.3 +07.8 84.4	42 52.9 +08.0 84.2
16°	46 50.0 +06.2 83.5	45 52.7 +06.4 83.3	44 55.4 +06.6 83.2	43 58.1 +06.8 83.0	43 00.9 +07.0 82.8
17°	46 56.2 +05.2 82.0	45 59.1 +05.4 81.9	45 02.0 +05.6 81.8	44 04.9 +05.9 81.6	43 07.9 +06.0 81.5
18°	47 01.4 +04.0 80.6	46 04.5 +04.3 80.5	45 07.6 +04.5 80.4	44 10.8 +04.8 80.2	43 13.9 +05.1 80.1
19°	47 05.4 +02.9 79.1	46 08.8 +03.2 79.0	45 12.1 +03.5 78.9	44 15.6 +03.7 78.8	43 19.0 +04.0 78.7
20°	47 08.3 +01.8 77.6	46 12.0 +02.1 77.6	45 15.6 +02.5 77.5	44 19.3 +02.8 77.4	43 23.0 +03.1 77.4
21°	47 10.1 +00.6 76.2	46 14.1 +01.0 76.1	45 18.1 +01.4 76.1	44 22.1 +01.7 76.1	43 26.1 +02.1 76.0
22°	47 10.7 -00.5 74.7	46 15.1 -00.1 74.7	45 19.5 +00.3 74.7	44 23.8 +00.8 74.7	43 28.2 +01.1 74.6
23°	47 10.2 -01.6 73.2	46 15.0 -01.2 73.2	45 19.8 -00.8 73.3	44 24.6 -00.4 73.3	43 29.3 +00.1 73.2
24°	47 08.6 -02.7 71.8	46 13.8 -02.2 71.8	45 19.0 -01.8 71.8	44 24.2 -01.3 71.9	43 29.4 -00.9 71.9
25°	47 05.9 -03.9 70.3	46 11.6 -03.4 70.4	45 17.2 -02.8 70.4	44 22.9 -02.4 70.5	43 28.5 -01.8 70.5
26°	47 02.0 -05.0 68.8	46 08.2 -04.4 68.9	45 14.4 -03.9 69.0	44 20.5 -03.3 69.1	43 26.7 -02.9 69.1
27°	46 57.0 -06.0 67.4	46 03.8 -05.5 67.5	45 10.5 -05.0 67.6	44 17.2 -04.4 67.7	43 23.8 -03.9 67.7
28°	46 51.0 -07.2 65.9	45 58.3 -06.6 66.0	45 05.5 -06.0 66.2	44 12.8 -05.4 66.3	43 19.9 -04.8 66.4
29°	46 43.8 -08.3 64.5	45 51.7 -07.7 64.6	44 59.5 -07.0 64.8	44 07.4 -06.5 64.9	43 15.1 -05.8 65.0

Latitude 16°

Declination SAME name as Latitude

Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	38 09.7 +20.7 103.0	37 13.5 +20.4 102.6	36 17.1 +20.2 102.2	35 20.7 +20.0 101.7	34 24.2 +19.7 101.3
1°	38 30.4 +19.9 101.8	37 33.9 +19.7 101.4	36 37.3 +19.5 101.0	35 40.7 +19.2 100.6	34 43.9 +19.1 100.2
2°	38 50.3 +19.2 100.6	37 53.6 +19.0 100.2	36 56.8 +18.8 99.8	35 59.9 +18.6 99.4	35 03.0 +18.4 99.0
3°	39 09.5 +18.4 99.4	38 12.6 +18.2 99.0	37 15.6 +18.0 98.6	36 18.5 +17.9 98.2	35 21.4 +17.7 97.9
4°	39 27.9 +17.6 98.2	38 30.8 +17.5 97.8	37 33.6 +17.3 97.4	36 36.4 +17.2 97.0	35 39.1 +17.1 96.7
5°	39 45.5 +16.9 96.9	38 48.3 +16.7 96.6	37 50.9 +16.6 96.2	36 53.6 +16.4 95.8	35 56.2 +16.3 95.5
6°	40 02.4 +16.0 95.7	39 05.0 +15.9 95.3	38 07.5 +15.8 95.0	37 10.0 +15.8 94.6	36 12.5 +15.7 94.3
7°	40 18.4 +15.2 94.4	39 20.9 +15.1 94.1	38 23.3 +15.0 93.8	37 25.8 +14.9 93.4	36 28.2 +14.9 93.1
8°	40 33.6 +14.3 93.1	39 36.0 +14.3 92.8	38 38.3 +14.3 92.5	37 40.7 +14.2 92.2	36 43.1 +14.2 91.9
9°	40 47.9 +13.5 91.9	39 50.3 +13.4 91.6	38 52.6 +13.4 91.3	37 54.9 +13.5 91.0	36 57.3 +13.4 90.7
10°	41 01.4 +12.6 90.6	40 03.7 +12.6 90.3	39 06.0 +12.7 90.0	38 08.4 +12.6 89.7	37 10.7 +12.7 89.5
11°	41 14.0 +11.7 89.3	40 16.3 +11.8 89.0	39 18.7 +11.8 88.8	38 21.0 +11.9 88.5	37 23.4 +11.9 88.2
12°	41 25.7 +10.9 88.0	40 28.1 +10.9 87.7	39 30.5 +11.0 87.5	38 32.9 +11.0 87.2	37 35.3 +11.1 87.0
13°	41 36.6 +09.9 86.7	40 39.0 +10.1 86.4	39 41.5 +10.1 86.2	38 43.9 +10.3 86.0	37 46.4 +10.3 85.8
14°	41 46.5 +09.1 85.3	40 49.1 +09.1 85.1	39 51.6 +09.3 84.9	38 54.2 +09.4 84.7	37 56.7 +09.6 84.5
15°	41 55.6 +08.1 84.0	40 58.2 +08.3 83.8	40 00.9 +08.4 83.6	39 03.6 +08.6 83.5	38 06.3 +08.7 83.3
16°	42 03.7 +07.2 82.7	41 06.5 +07.4 82.5	40 09.3 +07.6 82.3	39 12.2 +07.7 82.2	38 15.0 +08.0 82.0
17°	42 10.9 +06.2 81.3	41 13.9 +06.4 81.2	40 16.9 +06.7 81.0	39 19.9 +06.9 80.9	38 23.0 +07.1 80.7
18°	42 17.1 +05.3 80.0	41 20.3 +05.6 79.9	40 23.6 +05.8 79.7	39 26.8 +06.1 79.6	38 30.1 +06.3 79.5
19°	42 22.4 +04.4 78.6	41 25.9 +04.6 78.5	40 29.4 +04.9 78.4	39 32.9 +05.2 78.3	38 36.4 +05.5 78.2
20°	42 26.8 +03.4 77.3	41 30.5 +03.7 77.2	40 34.3 +04.0 77.1	39 38.1 +04.3 77.0	38 41.9 +04.6 76.9
21°	42 30.2 +02.4 75.9	41 34.2 +02.8 75.9	40 38.3 +03.1 75.8	39 42.4 +03.5 75.7	38 46.5 +03.8 75.6
22°	42 32.6 +01.5 74.6	41 37.0 +01.9 74.5	40 41.4 +02.3 74.5	39 45.9 +02.6 74.4	38 50.3 +03.0 74.4
23°	42 34.1 +00.5 73.2	41 38.9 +00.9 73.2	40 43.7 +01.3 73.2	39 48.5 +01.7 73.1	38 53.3 +02.1 73.1
24°	42 34.6 -00.4 71.9	41 39.8 +00.0 71.9	40 45.0 +00.4 71.9	39 50.2 +00.8 71.8	38 55.4 +01.3 71.8
25°	42 34.2 -01.4 70.5	41 39.8 -00.9 70.5	40 45.4 -00.5 70.5	39 51.0 +00.0 70.5	38 56.7 +00.4 70.5
26°	42 32.8 -02.4 69.2	41 38.9 -01.9 69.2	40 44.9 -01.3 69.2	39 51.0 -00.9 69.2	38 57.1 -00.4 69.2
27°	42 30.4 -03.3 67.8	41 37.0 -02.8 67.9	40 43.6 -02.3 67.9	39 50.1 -01.7 67.9	38 56.7 -01.3 67.9
28°	42 27.1 -04.3 66.4	41 34.2 -03.7 66.5	40 41.3 -03.2 66.6	39 48.4 -02.7 66.6	38 55.4 -02.1 66.7
29°	42 22.8 -05.2 65.1	41 30.5 -04.7 65.2	40 38.1 -04.1 65.3	39 45.7 -03.5 65.3	38 53.3 -03.0 65.4

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	33 27.6 +19.5 100.9	32 30.9 +19.4 100.5	31 34.2 +19.1 100.1	30 37.4 +18.9 99.8	29 40.5 +18.8 99.4
1°	33 47.1 +18.9 99.8	32 50.3 +18.7 99.4	31 53.3 +18.6 99.0	30 56.3 +18.4 98.7	29 59.3 +18.2 98.3
2°	34 06.0 +18.3 98.6	33 09.0 +18.0 98.3	32 11.9 +17.9 97.9	31 14.7 +17.8 97.6	30 17.5 +17.7 97.2
3°	34 24.3 +17.5 97.5	33 27.0 +17.5 97.1	32 29.8 +17.3 96.8	31 32.5 +17.2 96.4	30 35.2 +17.1 96.1
4°	34 41.8 +17.0 96.3	33 44.5 +16.8 96.0	32 47.1 +16.7 95.6	31 49.7 +16.6 95.3	30 52.3 +16.5 95.0
5°	34 58.8 +16.2 95.2	34 01.3 +16.2 94.8	33 03.8 +16.1 94.5	32 06.3 +16.0 94.2	31 08.8 +15.9 93.9
6°	35 15.0 +15.6 94.0	34 17.5 +15.5 93.7	33 19.9 +15.4 93.3	32 22.3 +15.4 93.0	31 24.7 +15.3 92.7
7°	35 30.6 +14.8 92.8	34 33.0 +14.8 92.5	33 35.3 +14.8 92.2	32 37.7 +14.7 91.9	31 40.0 +14.8 91.6
8°	35 45.4 +14.2 91.6	34 47.8 +14.1 91.3	33 50.1 +14.1 91.0	32 52.4 +14.2 90.7	31 54.8 +14.1 90.5
9°	35 59.6 +13.4 90.4	35 01.9 +13.5 90.1	34 04.2 +13.5 89.9	33 06.6 +13.4 89.6	32 08.9 +13.5 89.3
10°	36 13.0 +12.7 89.2	35 15.4 +12.7 88.9	34 17.7 +12.8 88.7	33 20.0 +12.8 88.4	32 22.4 +12.8 88.2
11°	36 25.7 +12.0 88.0	35 28.1 +12.0 87.7	34 30.5 +12.0 87.5	33 32.8 +12.2 87.2	32 35.2 +12.3 87.0
12°	36 37.7 +11.2 86.8	35 40.1 +11.3 86.5	34 42.5 +11.4 86.3	33 45.0 +11.5 86.1	32 47.5 +11.5 85.8
13°	36 48.9 +10.4 85.5	35 51.4 +10.6 85.3	34 53.9 +10.7 85.1	33 56.5 +10.8 84.9	32 59.0 +10.9 84.7
14°	36 59.3 +09.7 84.3	36 02.0 +09.8 84.1	35 04.6 +10.0 83.9	34 07.3 +10.1 83.7	33 09.9 +10.3 83.5
15°	37 09.0 +08.9 83.1	36 11.8 +09.1 82.9	35 14.6 +09.2 82.7	34 17.4 +09.4 82.5	33 20.2 +09.6 82.3
16°	37 17.9 +08.2 81.8	36 20.9 +08.3 81.7	35 23.8 +08.5 81.5	34 26.8 +08.7 81.3	33 29.8 +08.9 81.1
17°	37 26.1 +07.3 80.6	36 29.2 +07.5 80.4	35 32.3 +07.8 80.3	34 35.5 +08.0 80.1	33 38.7 +08.2 79.9
18°	37 33.4 +06.6 79.3	36 36.7 +06.8 79.2	35 40.1 +07.0 79.1	34 43.5 +07.3 78.9	33 46.9 +07.5 78.8
19°	37 40.0 +05.7 78.1	36 43.5 +06.1 78.0	35 47.1 +06.3 77.8	34 50.8 +06.5 77.7	33 54.4 +06.9 77.6
20°	37 45.7 +04.9 76.8	36 49.6 +05.2 76.7	35 53.4 +05.6 76.6	34 57.3 +05.9 76.5	34 01.3 +06.1 76.4
21°	37 50.6 +04.2 75.6	36 54.8 +04.5 75.5	35 59.0 +04.8 75.4	35 03.2 +05.1 75.3	34 07.4 +05.5 75.2
22°	37 54.8 +03.3 74.3	36 59.3 +03.6 74.2	36 03.8 +04.0 74.1	35 08.3 +04.4 74.1	34 12.9 +04.7 74.0
23°	37 58.1 +02.5 73.0	37 02.9 +02.9 73.0	36 07.8 +03.3 72.9	35 12.7 +03.6 72.8	34 17.6 +04.0 72.8
24°	38 00.6 +01.7 71.8	37 05.8 +02.1 71.7	36 11.1 +02.5 71.7	35 16.3 +03.0 71.6	34 21.6 +03.3 71.5
25°	38 02.3 +00.9 70.5	37 07.9 +01.3 70.5	36 13.6 +01.7 70.4	35 19.3 +02.1 70.4	34 24.9 +02.6 70.3
26°	38 03.2 +00.0 69.2	37 09.2 +00.6 69.2	36 15.3 +01.0 69.2	35 21.4 +01.4 69.2	34 27.5 +01.9 69.1
27°	38 03.2 -00.7 68.0	37 09.8 -00.3 68.0	36 16.3 +00.2 68.0	35 22.8 +00.7 67.9	34 29.4 +01.2 67.9
28°	38 02.5 -01.6 66.7	37 09.5 -01.1 66.7	36 16.5 -00.6 66.7	35 23.5 +00.0 66.7	34 30.6 +00.4 66.7
29°	38 00.9 -02.4 65.4	37 08.4 -01.9 65.4	36 15.9 -01.3 65.5	35 23.5 -00.8 65.5	34 31.0 -00.3 65.5

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Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	28 43.6 +18.6 99.0	27 46.6 +18.5 98.7	26 49.6 +18.3 98.3	25 52.5 +18.1 98.0	24 55.3 +18.1 97.7
1°	29 02.2 +18.1 98.0	28 05.1 +17.9 97.6	27 07.9 +17.8 97.3	26 10.6 +17.7 96.9	25 13.4 +17.5 96.6
2°	29 20.3 +17.5 96.9	28 23.0 +17.4 96.5	27 25.7 +17.3 96.2	26 28.3 +17.2 95.9	25 30.9 +17.1 95.5
3°	29 37.8 +17.0 95.8	28 40.4 +16.9 95.4	27 43.0 +16.8 95.1	26 45.5 +16.7 94.8	25 48.0 +16.7 94.5
4°	29 54.8 +16.4 94.7	28 57.3 +16.4 94.3	27 59.8 +16.3 94.0	27 02.2 +16.3 93.7	26 04.7 +16.1 93.4
5°	30 11.2 +15.9 93.5	29 13.7 +15.8 93.2	28 16.1 +15.7 92.9	27 18.5 +15.7 92.6	26 20.8 +15.7 92.3
6°	30 27.1 +15.3 92.4	29 29.5 +15.2 92.1	28 31.8 +15.3 91.8	27 34.2 +15.2 91.5	26 36.5 +15.2 91.3
7°	30 42.4 +14.7 91.3	29 44.7 +14.7 91.0	28 47.1 +14.6 90.7	27 49.4 +14.7 90.5	26 51.7 +14.7 90.2
8°	30 57.1 +14.1 90.2	29 59.4 +14.2 89.9	29 01.7 +14.2 89.6	28 04.1 +14.1 89.4	27 06.4 +14.2 89.1
9°	31 11.2 +13.5 89.0	30 13.6 +13.5 88.8	29 15.9 +13.6 88.5	28 18.2 +13.7 88.3	27 20.6 +13.7 88.0
10°	31 24.7 +12.9 87.9	30 27.1 +13.0 87.7	29 29.5 +13.0 87.4	28 31.9 +13.1 87.1	27 34.3 +13.1 86.9
11°	31 37.6 +12.3 86.8	30 40.1 +12.3 86.5	29 42.5 +12.5 86.3	28 45.0 +12.5 86.0	27 47.4 +12.7 85.8
12°	31 49.9 +11.7 85.6	30 52.4 +11.8 85.4	29 55.0 +11.8 85.2	28 57.5 +12.0 84.9	28 00.1 +12.1 84.7
13°	32 01.6 +11.1 84.5	31 04.2 +11.2 84.2	30 06.8 +11.3 84.0	29 09.5 +11.4 83.8	28 12.2 +11.5 83.6
14°	32 12.7 +10.4 83.3	31 15.4 +10.5 83.1	30 18.1 +10.7 82.9	29 20.9 +10.9 82.7	28 23.7 +11.0 82.5
15°	32 23.1 +09.7 82.1	31 25.9 +10.0 81.9	30 28.8 +10.1 81.7	29 31.8 +10.3 81.5	28 34.7 +10.5 81.3
16°	32 32.8 +09.1 81.0	31 35.9 +09.3 80.8	30 38.9 +09.5 80.6	29 42.1 +09.7 80.4	28 45.2 +09.9 80.2
17°	32 41.9 +08.5 79.8	31 45.2 +08.6 79.6	30 48.4 +08.9 79.4	29 51.8 +09.1 79.3	28 55.1 +09.4 79.1
18°	32 50.4 +07.7 78.6	31 53.8 +08.1 78.5	30 57.3 +08.3 78.3	30 00.9 +08.5 78.1	29 04.5 +08.7 78.0
19°	32 58.1 +07.1 77.4	32 01.9 +07.3 77.3	31 05.6 +07.7 77.1	30 09.4 +07.9 77.0	29 13.2 +08.2 76.8
20°	33 05.2 +06.5 76.2	32 09.2 +06.8 76.1	31 13.3 +07.0 76.0	30 17.3 +07.4 75.8	29 21.4 +07.6 75.7
21°	33 11.7 +05.7 75.1	32 16.0 +06.1 74.9	31 20.3 +06.4 74.8	30 24.7 +06.7 74.7	29 29.0 +07.1 74.6
22°	33 17.4 +05.1 73.9	32 22.1 +05.4 73.8	31 26.7 +05.8 73.7	30 31.4 +06.1 73.5	29 36.1 +06.4 73.4
23°	33 22.5 +04.4 72.7	32 27.5 +04.7 72.6	31 32.5 +05.1 72.5	30 37.5 +05.5 72.4	29 42.5 +05.9 72.3
24°	33 26.9 +03.7 71.5	32 32.2 +04.1 71.4	31 37.6 +04.5 71.3	30 43.0 +04.9 71.2	29 48.4 +05.2 71.1
25°	33 30.6 +03.0 70.3	32 36.3 +03.5 70.2	31 42.1 +03.8 70.1	30 47.9 +04.2 70.1	29 53.6 +04.7 70.0
26°	33 33.6 +02.4 69.1	32 39.8 +02.7 69.0	31 45.9 +03.2 69.0	30 52.1 +03.6 68.9	29 58.3 +04.1 68.8
27°	33 36.0 +01.6 67.9	32 42.5 +02.1 67.8	31 49.1 +02.6 67.8	30 55.7 +03.0 67.7	30 02.4 +03.4 67.7
28°	33 37.6 +00.9 66.7	32 44.6 +01.4 66.7	31 51.7 +01.9 66.6	30 58.7 +02.4 66.6	30 05.8 +02.9 66.5
29°	33 38.5 +00.2 65.5	32 46.0 +00.8 65.5	31 53.6 +01.2 65.4	31 01.1 +01.8 65.4	30 08.7 +02.2 65.4

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	23 58.2 +17.8 97.3	23 00.9 +17.8 97.0	22 03.7 +17.6 96.7	21 06.4 +17.5 96.4	20 09.0 +17.5 96.0
1°	24 16.0 +17.5 96.3	23 18.7 +17.3 96.0	22 21.3 +17.3 95.6	21 23.9 +17.2 95.3	20 26.5 +17.0 95.0
2°	24 33.5 +17.0 95.2	23 36.0 +17.0 94.9	22 38.6 +16.8 94.6	21 41.1 +16.8 94.3	20 43.5 +16.8 94.0
3°	24 50.5 +16.6 94.2	23 53.0 +16.5 93.9	22 55.4 +16.5 93.6	21 57.9 +16.3 93.3	21 00.3 +16.3 93.0
4°	25 07.1 +16.1 93.1	24 09.5 +16.1 92.8	23 11.9 +16.0 92.5	22 14.2 +16.0 92.2	21 16.6 +16.0 91.9
5°	25 23.2 +15.6 92.0	24 25.6 +15.6 91.8	23 27.9 +15.6 91.5	22 30.2 +15.6 91.2	21 32.6 +15.6 90.9
6°	25 38.8 +15.2 91.0	24 41.2 +15.2 90.7	23 43.5 +15.2 90.4	22 45.8 +15.2 90.1	21 48.2 +15.1 89.9
7°	25 54.0 +14.7 89.9	24 56.4 +14.7 89.6	23 58.7 +14.7 89.4	23 01.0 +14.8 89.1	22 03.3 +14.8 88.8
8°	26 08.7 +14.3 88.8	25 11.1 +14.2 88.6	24 13.4 +14.3 88.3	23 15.8 +14.3 88.0	22 18.1 +14.4 87.8
9°	26 23.0 +13.7 87.7	25 25.3 +13.8 87.5	24 27.7 +13.9 87.2	23 30.1 +13.9 87.0	22 32.5 +14.0 86.7
10°	26 36.7 +13.2 86.7	25 39.1 +13.3 86.4	24 41.6 +13.4 86.2	23 44.0 +13.5 85.9	22 46.5 +13.6 85.7
11°	26 49.9 +12.8 85.6	25 52.4 +12.9 85.3	24 55.0 +12.9 85.1	23 57.5 +13.0 84.8	23 00.1 +13.1 84.6
12°	27 02.7 +12.2 84.5	26 05.3 +12.3 84.2	25 07.9 +12.4 84.0	24 10.5 +12.6 83.8	23 13.2 +12.7 83.5
13°	27 14.9 +11.7 83.4	26 17.6 +11.8 83.1	25 20.3 +12.0 82.9	24 23.1 +12.1 82.7	23 25.9 +12.3 82.5
14°	27 26.6 +11.1 82.3	26 29.4 +11.4 82.1	25 32.3 +11.5 81.8	24 35.2 +11.7 81.6	23 38.2 +11.8 81.4
15°	27 37.7 +10.7 81.2	26 40.8 +10.8 81.0	25 43.8 +11.0 80.8	24 46.9 +11.2 80.6	23 50.0 +11.4 80.3
16°	27 48.4 +10.1 80.0	26 51.6 +10.3 79.9	25 54.8 +10.6 79.7	24 58.1 +10.7 79.5	24 01.4 +11.0 79.3
17°	27 58.5 +09.6 78.9	27 01.9 +09.8 78.7	26 05.4 +10.0 78.6	25 08.8 +10.3 78.4	24 12.4 +10.5 78.2
18°	28 08.1 +09.0 77.8	27 11.7 +09.3 77.6	26 15.4 +09.5 77.5	25 19.1 +09.8 77.3	24 22.9 +10.0 77.1
19°	28 17.1 +08.4 76.7	27 21.0 +08.7 76.5	26 24.9 +09.0 76.4	25 28.9 +09.3 76.2	24 32.9 +09.5 76.0
20°	28 25.5 +08.0 75.6	27 29.7 +08.2 75.4	26 33.9 +08.5 75.3	25 38.2 +08.8 75.1	24 42.4 +09.1 74.9
21°	28 33.5 +07.3 74.4	27 37.9 +07.7 74.3	26 42.4 +08.0 74.2	25 47.0 +08.3 74.0	24 51.5 +08.6 73.9
22°	28 40.8 +06.8 73.3	27 45.6 +07.1 73.2	26 50.4 +07.5 73.0	25 55.3 +07.8 72.9	25 00.1 +08.2 72.8
23°	28 47.6 +06.2 72.2	27 52.7 +06.6 72.1	26 57.9 +06.9 71.9	26 03.1 +07.2 71.8	25 08.3 +07.6 71.7
24°	28 53.8 +05.7 71.0	27 59.3 +06.0 70.9	27 04.8 +06.4 70.8	26 10.3 +06.8 70.7	25 15.9 +07.2 70.6
25°	28 59.5 +05.0 69.9	28 05.3 +05.5 69.8	27 11.2 +05.9 69.7	26 17.1 +06.3 69.6	25 23.1 +06.7 69.5
26°	29 04.5 +04.5 68.8	28 10.8 +04.9 68.7	27 17.1 +05.3 68.6	26 23.4 +05.8 68.5	25 29.8 +06.2 68.4
27°	29 09.0 +04.5 67.6	28 15.7 +04.4 67.5	27 22.4 +04.8 67.5	26 29.2 +05.2 67.4	25 36.0 +05.6 67.3
28°	29 12.9 +03.4 66.5	28 20.1 +03.8 66.4	27 27.2 +04.3 66.3	26 34.4 +04.7 66.3	25 41.6 +05.2 66.2
29°	29 16.3 +02.7 65.3	28 23.9 +03.2 65.3	27 31.5 +03.7 65.2	26 39.1 +04.3 65.1	25 46.8 +04.7 65.1

Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	19 11.7 +17.3 95.7	18 14.2 +17.3 95.4	17 16.8 +17.2 95.1	16 19.4 +17.0 94.8	15 21.9 +17.0 94.5
1°	19 29.0 +17.0 94.7	18 31.5 +16.9 94.4	17 34.0 +16.9 94.1	16 36.4 +16.9 93.8	15 38.9 +16.7 93.5
2°	19 46.0 +16.7 93.7	18 48.4 +16.6 93.4	17 50.9 +16.5 93.1	16 53.3 +16.5 92.8	15 55.6 +16.5 92.5
3°	20 02.7 +16.3 92.7	19 05.0 +16.3 92.4	18 07.4 +16.2 92.1	17 09.8 +16.2 91.8	16 12.1 +16.2 91.5
4°	20 19.0 +15.9 91.6	19 21.3 +15.9 91.4	18 23.6 +16.0 91.1	17 26.0 +15.9 90.8	16 28.3 +15.9 90.5
5°	20 34.9 +15.6 90.6	19 37.2 +15.6 90.3	18 39.6 +15.5 90.1	17 41.9 +15.6 89.8	16 44.2 +15.6 89.5
6°	20 50.5 +15.2 89.6	19 52.8 +15.2 89.3	18 55.1 +15.3 89.0	17 57.5 +15.3 88.8	16 59.8 +15.3 88.5
7°	21 05.7 +14.8 88.6	20 08.0 +14.9 88.3	19 10.4 +14.9 88.0	18 12.8 +14.9 87.8	17 15.1 +15.0 87.5
8°	21 20.5 +14.5 87.5	20 22.9 +14.5 87.3	19 25.3 +14.6 87.0	18 27.7 +14.6 86.7	17 30.1 +14.7 86.5
9°	21 35.0 +14.0 86.5	20 37.4 +14.1 86.2	19 39.9 +14.2 86.0	18 42.3 +14.3 85.7	17 44.8 +14.4 85.5
10°	21 49.0 +13.7 85.4	20 51.5 +13.8 85.2	19 54.1 +13.8 84.9	18 56.6 +14.0 84.7	17 59.2 +14.1 84.4
11°	22 02.7 +13.2 84.4	21 05.3 +13.3 84.1	20 07.9 +13.5 83.9	19 10.6 +13.6 83.7	18 13.3 +13.7 83.4
12°	22 15.9 +12.9 83.3	21 18.6 +13.0 83.1	20 21.4 +13.1 82.9	19 24.2 +13.2 82.6	18 27.0 +13.4 82.4
13°	22 28.8 +12.4 82.3	21 31.6 +12.6 82.0	20 34.5 +12.8 81.8	19 37.4 +12.9 81.6	18 40.4 +13.1 81.4
14°	22 41.2 +12.0 81.2	21 44.2 +12.2 81.0	20 47.3 +12.3 80.8	19 50.3 +12.6 80.6	18 53.5 +12.7 80.3
15°	22 53.2 +11.6 80.1	21 56.4 +11.8 79.9	20 59.6 +12.0 79.7	20 02.9 +12.2 79.5	19 06.2 +12.4 79.3
16°	23 04.8 +11.1 79.1	22 08.2 +11.3 78.9	21 11.6 +11.6 78.7	20 15.1 +11.8 78.5	19 18.6 +12.0 78.3
17°	23 15.9 +10.8 78.0	22 19.5 +11.0 77.8	21 23.2 +11.2 77.6	20 26.9 +11.4 77.4	19 30.6 +11.7 77.2
18°	23 26.7 +10.2 76.9	22 30.5 +10.5 76.8	21 34.4 +10.8 76.6	20 38.3 +11.0 76.4	19 42.3 +11.3 76.2
19°	23 36.9 +09.9 75.9	22 41.0 +10.1 75.7	21 45.2 +10.3 75.5	20 49.3 +10.7 75.3	19 53.6 +10.9 75.1
20°	23 46.8 +09.4 74.8	22 51.1 +09.7 74.6	21 55.5 +10.0 74.4	21 00.0 +10.3 74.3	20 04.5 +10.6 74.1
21°	23 56.2 +08.9 73.7	23 00.8 +09.3 73.5	22 05.5 +09.6 73.4	21 10.3 +09.9 73.2	20 15.1 +10.2 73.0
22°	24 05.1 +08.5 72.6	23 10.1 +08.8 72.5	22 15.1 +09.1 72.3	21 20.2 +09.4 72.2	20 25.3 +09.8 72.0
23°	24 13.6 +08.0 71.5	23 18.9 +08.3 71.4	22 24.2 +08.8 71.2	21 29.6 +09.1 71.1	20 35.1 +09.4 70.9
24°	24 21.6 +07.5 70.4	23 27.2 +08.0 70.3	22 33.0 +08.2 70.2	21 38.7 +08.7 70.0	20 44.5 +09.1 69.9
25°	24 29.1 +07.1 69.4	23 35.2 +07.4 69.2	22 41.2 +07.9 69.1	21 47.4 +08.3 69.0	20 53.6 +08.6 68.8
26°	24 36.2 +06.6 68.3	23 42.6 +07.0 68.2	22 49.1 +07.4 68.0	21 55.7 +07.8 67.9	21 02.2 +08.3 67.8
27°	24 42.8 +06.1 67.2	23 49.6 +06.6 67.1	22 56.5 +07.0 67.0	22 03.5 +07.4 66.8	21 10.5 +07.9 66.7
28°	24 48.9 +05.7 66.1	23 56.2 +06.1 66.0	23 03.5 +06.6 65.9	22 10.9 +07.0 65.8	21 18.4 +07.4 65.6
29°	24 54.6 +05.1 65.0	24 02.3 +05.6 64.9	23 10.1 +06.1 64.8	22 17.9 +06.6 64.7	21 25.8 +07.1 64.6

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 24.4 +16.9 94.2	13 26.8 +16.9 93.9	12 29.3 +16.8 93.6	11 31.7 +16.8 93.4	10 34.1 +16.8 93.1
1°	14 41.3 +16.7 93.2	13 43.7 +16.7 92.9	12 46.1 +16.6 92.7	11 48.5 +16.6 92.4	10 50.9 +16.5 92.1
2°	14 58.0 +16.5 92.2	14 00.4 +16.4 92.0	13 02.7 +16.4 91.7	12 05.1 +16.3 91.4	11 07.4 +16.4 91.1
3°	15 14.5 +16.1 91.2	14 16.8 +16.2 91.0	13 19.1 +16.2 90.7	12 21.4 +16.2 90.4	11 23.8 +16.1 90.1
4°	15 30.6 +15.9 90.2	14 33.0 +15.9 90.0	13 35.3 +15.9 89.7	12 37.6 +15.9 89.4	11 39.9 +16.0 89.1
5°	15 46.5 +15.7 89.2	14 48.9 +15.6 89.0	13 51.2 +15.7 88.7	12 53.5 +15.8 88.4	11 55.9 +15.7 88.2
6°	16 02.2 +15.3 88.2	15 04.5 +15.4 88.0	14 06.9 +15.4 87.7	13 09.3 +15.4 87.4	12 11.6 +15.6 87.2
7°	16 17.5 +15.1 87.2	15 19.9 +15.1 87.0	14 22.3 +15.2 86.7	13 24.7 +15.3 86.4	12 27.2 +15.3 86.2
8°	16 32.6 +14.7 86.2	15 35.0 +14.9 86.0	14 37.5 +14.9 85.7	13 40.0 +15.0 85.5	12 42.5 +15.1 85.2
9°	16 47.3 +14.5 85.2	15 49.9 +14.5 85.0	14 52.4 +14.7 84.7	13 55.0 +14.8 84.5	12 57.6 +14.9 84.2
10°	17 01.8 +14.2 84.2	16 04.4 +14.3 84.0	15 07.1 +14.4 83.7	14 09.8 +14.5 83.5	13 12.5 +14.7 83.2
11°	17 16.0 +13.9 83.2	16 18.7 +14.0 82.9	15 21.5 +14.1 82.7	14 24.3 +14.3 82.5	13 27.2 +14.4 82.2
12°	17 29.9 +13.5 82.2	16 32.7 +13.7 81.9	15 35.6 +13.9 81.7	14 38.6 +14.0 81.5	13 41.6 +14.1 81.2
13°	17 43.4 +13.2 81.1	16 46.4 +13.4 80.9	15 49.5 +13.6 80.7	14 52.6 +13.8 80.4	13 55.7 +14.0 80.2
14°	17 56.6 +12.9 80.1	16 59.8 +13.1 79.9	16 03.1 +13.3 79.7	15 06.4 +13.4 79.4	14 09.7 +13.7 79.2
15°	18 09.5 +12.6 79.1	17 12.9 +12.8 78.9	16 16.4 +13.0 78.7	15 19.8 +13.2 78.4	14 23.4 +13.4 78.2
16°	18 22.1 +12.3 78.1	17 25.7 +12.5 77.8	16 29.4 +12.7 77.6	15 33.0 +13.0 77.4	14 36.8 +13.1 77.2
17°	18 34.4 +11.9 77.0	17 38.2 +12.1 76.8	16 42.1 +12.4 76.6	15 46.0 +12.6 76.4	14 49.9 +12.9 76.2
18°	18 46.3 +11.6 76.0	17 50.3 +11.9 75.8	16 54.5 +12.1 75.6	15 58.6 +12.4 75.4	15 02.8 +12.7 75.2
19°	18 57.9 +11.2 75.0	18 02.2 +11.5 74.8	17 06.6 +11.7 74.6	16 11.0 +12.1 74.4	15 15.5 +12.3 74.2
20°	19 09.1 +10.8 73.9	18 13.7 +11.2 73.7	17 18.3 +11.5 73.5	16 23.1 +11.7 73.3	15 27.8 +12.1 73.2
21°	19 19.9 +10.6 72.9	18 24.9 +10.8 72.7	17 29.8 +11.2 72.5	16 34.8 +11.5 72.3	15 39.9 +11.8 72.1
22°	19 30.5 +10.1 71.8	18 35.7 +10.5 71.7	17 41.0 +10.8 71.5	16 46.3 +11.2 71.3	15 51.7 +11.5 71.1
23°	19 40.6 +09.8 70.8	18 46.2 +10.1 70.6	17 51.8 +10.5 70.4	16 57.5 +10.8 70.3	16 03.2 +11.2 70.1
24°	19 50.4 +09.4 69.7	18 56.3 +09.8 69.6	18 02.3 +10.2 69.4	17 08.3 +10.6 69.2	16 14.4 +11.0 69.1
25°	19 59.8 +09.1 68.7	19 06.1 +09.5 68.5	18 12.5 +09.8 68.4	17 18.9 +10.2 68.2	16 25.4 +10.6 68.0
26°	20 08.9 +08.6 67.6	19 15.6 +09.1 67.5	18 22.3 +09.5 67.3	17 29.1 +09.9 67.2	16 36.0 +10.3 67.0
27°	20 17.5 +08.3 66.6	19 24.7 +08.7 66.4	18 31.8 +09.2 66.3	17 39.0 +09.6 66.1	16 46.3 +10.0 66.0
28°	20 25.8 +08.0 65.5	19 33.4 +08.3 65.4	18 41.0 +08.8 65.3	17 48.6 +09.3 65.1	16 56.3 +09.7 65.0
29°	20 33.8 +07.5 64.5	19 41.7 +08.0 64.3	18 49.8 +08.4 64.2	17 57.9 +08.9 64.1	17 06.0 +09.4 63.9

Declination SAME name as Latitude

Latitude 16°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 36.5 +16.7 92.8	8 38.9 +16.7 92.5	7 41.3 +16.6 92.2	6 43.7 +16.5 91.9	5 46.0 +16.6 91.7
1°	9 53.2 +16.5 91.8	8 55.6 +16.5 91.5	7 57.9 +16.5 91.2	7 00.2 +16.5 91.0	6 02.6 +16.4 90.7
2°	10 09.7 +16.4 90.8	9 12.1 +16.3 90.6	8 14.4 +16.3 90.3	7 16.7 +16.4 90.0	6 19.0 +16.4 89.7
3°	10 26.1 +16.2 89.9	9 28.4 +16.2 89.6	8 30.7 +16.2 89.3	7 33.1 +16.2 89.0	6 35.4 +16.3 88.8
4°	10 42.3 +16.0 88.9	9 44.6 +16.0 88.6	8 46.9 +16.1 88.3	7 49.3 +16.1 88.1	6 51.7 +16.1 87.8
5°	10 58.3 +15.7 87.9	10 00.6 +15.9 87.6	9 03.0 +15.9 87.4	8 05.4 +15.9 87.1	7 07.8 +16.0 86.8
6°	11 14.0 +15.7 86.9	10 16.5 +15.6 86.6	9 18.9 +15.7 86.4	8 21.3 +15.9 86.1	7 23.8 +15.9 85.8
7°	11 29.7 +15.4 85.9	10 32.1 +15.5 85.7	9 34.6 +15.6 85.4	8 37.2 +15.6 85.1	7 39.7 +15.8 84.9
8°	11 45.1 +15.2 84.9	10 47.6 +15.3 84.7	9 50.2 +15.4 84.4	8 52.8 +15.5 84.2	7 55.5 +15.6 83.9
9°	12 00.3 +15.0 83.9	11 02.9 +15.1 83.7	10 05.6 +15.2 83.4	9 08.3 +15.4 83.2	8 11.1 +15.4 82.9
10°	12 15.3 +14.7 83.0	11 18.0 +14.9 82.7	10 20.8 +15.1 82.5	9 23.7 +15.2 82.2	8 26.5 +15.4 81.9
11°	12 30.0 +14.6 82.0	11 32.9 +14.8 81.7	10 35.9 +14.8 81.5	9 38.9 +15.0 81.2	8 41.9 +15.2 81.0
12°	12 44.6 +14.3 81.0	11 47.7 +14.5 80.7	10 50.7 +14.7 80.5	9 53.9 +14.8 80.2	8 57.1 +15.0 80.0
13°	12 58.9 +14.1 80.0	12 02.2 +14.3 79.7	11 05.4 +14.5 79.5	10 08.7 +14.7 79.3	9 12.1 +14.9 79.0
14°	13 13.0 +13.9 79.0	12 16.5 +14.0 78.7	11 19.9 +14.3 78.5	10 23.4 +14.5 78.3	9 27.0 +14.7 78.0
15°	13 26.9 +13.7 78.0	12 30.5 +13.9 77.7	11 34.2 +14.1 77.5	10 37.9 +14.3 77.3	9 41.7 +14.5 77.0
16°	13 40.6 +13.4 77.0	12 44.4 +13.6 76.8	11 48.3 +13.9 76.5	10 52.2 +14.1 76.3	9 56.2 +14.4 76.1
17°	13 54.0 +13.1 76.0	12 58.0 +13.4 75.8	12 02.2 +13.6 75.5	11 06.3 +14.0 75.3	10 10.6 +14.2 75.1
18°	14 07.1 +12.9 75.0	13 11.4 +13.2 74.8	12 15.8 +13.5 74.5	11 20.3 +13.7 74.3	10 24.8 +14.0 74.1
19°	14 20.0 +12.7 74.0	13 24.6 +12.9 73.8	12 29.3 +13.2 73.5	11 34.0 +13.5 73.3	10 38.8 +13.8 73.1
20°	14 32.7 +12.3 73.0	13 37.5 +12.7 72.7	12 42.5 +13.0 72.5	11 47.5 +13.3 72.3	10 52.6 +13.6 72.1
21°	14 45.0 +12.2 71.9	13 50.2 +12.5 71.7	12 55.5 +12.8 71.5	12 00.8 +13.1 71.3	11 06.2 +13.5 71.1
22°	14 57.2 +11.8 70.9	14 02.7 +12.2 70.7	13 08.3 +12.5 70.5	12 13.9 +12.9 70.3	11 19.7 +13.2 70.1
23°	15 09.0 +11.6 69.9	14 14.9 +11.9 69.7	13 20.8 +12.3 69.5	12 26.8 +12.7 69.3	11 32.9 +13.0 69.1
24°	15 20.6 +11.3 68.9	14 26.8 +11.7 68.7	13 33.1 +12.1 68.5	12 39.5 +12.4 68.3	11 45.9 +12.8 68.1
25°	15 31.9 +11.0 67.9	14 38.5 +11.4 67.7	13 45.2 +11.8 67.5	12 51.9 +12.2 67.3	11 58.7 +12.7 67.1
26°	15 42.9 +10.8 66.9	14 49.9 +11.2 66.7	13 57.0 +11.6 66.5	13 04.1 +12.0 66.3	12 11.4 +12.4 66.1
27°	15 53.7 +10.4 65.8	15 01.1 +10.9 65.7	14 08.6 +11.3 65.5	13 16.1 +11.8 65.3	12 23.8 +12.1 65.1
28°	16 04.1 +10.2 64.8	15 12.0 +10.6 64.6	14 19.9 +11.0 64.5	13 27.9 +11.5 64.3	12 35.9 +12.0 64.1
29°	16 14.3 +09.8 63.8	15 22.6 +10.3 63.6	14 30.9 +10.8 63.5	13 39.4 +11.2 63.3	12 47.9 +11.7 63.1

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 48.4 +16.5 91.4	3 50.7 +16.5 91.1	2 53.0 +16.6 90.8	1 55.3 +16.6 90.6	0 57.7 +16.5 90.3
1°	5 04.9 +16.5 90.4	4 07.2 +16.5 90.1	3 09.6 +16.4 89.9	2 11.9 +16.5 89.6	1 14.2 +16.5 89.3
2°	5 21.4 +16.4 89.5	4 23.7 +16.4 89.2	3 26.0 +16.5 88.9	2 28.4 +16.4 88.6	1 30.7 +16.5 88.4
3°	5 37.8 +16.2 88.5	4 40.1 +16.3 88.2	3 42.5 +16.3 87.9	2 44.8 +16.4 87.7	1 47.2 +16.5 87.4
4°	5 54.0 +16.2 87.5	4 56.4 +16.3 87.2	3 58.8 +16.3 87.0	3 01.2 +16.4 86.7	2 03.7 +16.4 86.4
5°	6 10.2 +16.1 86.5	5 12.7 +16.1 86.3	4 15.1 +16.2 86.0	3 17.6 +16.3 85.7	2 20.1 +16.4 85.5
6°	6 26.3 +16.0 85.6	5 28.8 +16.1 85.3	4 31.3 +16.2 85.0	3 33.9 +16.2 84.8	2 36.5 +16.3 84.5
7°	6 42.3 +15.8 84.6	5 44.9 +15.9 84.3	4 47.5 +16.0 84.1	3 50.1 +16.2 83.8	2 52.8 +16.3 83.5
8°	6 58.1 +15.8 83.6	6 00.8 +15.9 83.4	5 03.5 +16.0 83.1	4 06.3 +16.1 82.8	3 09.1 +16.2 82.6
9°	7 13.9 +15.6 82.7	6 16.7 +15.7 82.4	5 19.5 +15.9 82.1	4 22.4 +16.0 81.9	3 25.3 +16.2 81.6
10°	7 29.5 +15.4 81.7	6 32.4 +15.6 81.4	5 35.4 +15.8 81.2	4 38.4 +16.0 80.9	3 41.5 +16.1 80.6
11°	7 44.9 +15.4 80.7	6 48.0 +15.6 80.5	5 51.2 +15.7 80.2	4 54.4 +15.8 79.9	3 57.6 +16.1 79.7
12°	8 00.3 +15.2 79.7	7 03.6 +15.4 79.5	6 06.9 +15.6 79.2	5 10.2 +15.8 79.0	4 13.7 +15.9 78.7
13°	8 15.5 +15.1 78.8	7 19.0 +15.2 78.5	6 22.5 +15.4 78.3	5 26.0 +15.7 78.0	4 29.6 +15.9 77.7
14°	8 30.6 +14.9 77.8	7 34.2 +15.2 77.5	6 37.9 +15.4 77.3	5 41.7 +15.6 77.0	4 45.5 +15.8 76.8
15°	8 45.5 +14.8 76.8	7 49.4 +15.0 76.6	6 53.3 +15.2 76.3	5 57.3 +15.5 76.1	5 01.3 +15.8 75.8
16°	9 00.3 +14.6 75.8	8 04.4 +14.8 75.6	7 08.5 +15.2 75.3	6 12.8 +15.4 75.1	5 17.1 +15.6 74.8
17°	9 14.9 +14.4 74.8	8 19.2 +14.8 74.6	7 23.7 +15.0 74.4	6 28.2 +15.2 74.1	5 32.7 +15.6 73.9
18°	9 29.3 +14.3 73.9	8 34.0 +14.5 73.6	7 38.7 +14.8 73.4	6 43.4 +15.2 73.1	5 48.3 +15.4 72.9
19°	9 43.6 +14.1 72.9	8 48.5 +14.5 72.6	7 53.5 +14.7 72.4	6 58.6 +15.0 72.2	6 03.7 +15.4 71.9
20°	9 57.7 +14.0 71.9	9 03.0 +14.2 71.7	8 08.2 +14.6 71.4	7 13.6 +14.9 71.2	6 19.1 +15.2 71.0
21°	10 11.7 +13.8 70.9	9 17.2 +14.1 70.7	8 22.8 +14.5 70.5	7 28.5 +14.8 70.2	6 34.3 +15.1 70.0
22°	10 25.5 +13.5 69.9	9 31.3 +14.0 69.7	8 37.3 +14.3 69.5	7 43.3 +14.6 69.2	6 49.4 +15.0 69.0
23°	10 39.0 +13.4 68.9	9 45.3 +13.7 68.7	8 51.6 +14.1 68.5	7 57.9 +14.6 68.3	7 04.4 +14.9 68.0
24°	10 52.4 +13.2 67.9	9 59.0 +13.6 67.7	9 05.7 +14.0 67.5	8 12.5 +14.3 67.3	7 19.3 +14.7 67.1
25°	11 05.6 +13.1 66.9	10 12.6 +13.4 66.7	9 19.7 +13.8 66.5	8 26.8 +14.2 66.3	7 34.0 +14.7 66.1
26°	11 18.7 +12.8 65.9	10 26.0 +13.3 65.7	9 33.5 +13.6 65.5	8 41.0 +14.1 65.3	7 48.7 +14.5 65.1
27°	11 31.5 +12.6 64.9	10 39.3 +13.0 64.7	9 47.1 +13.5 64.5	8 55.1 +13.9 64.3	8 03.2 +14.3 64.1
28°	11 44.1 +12.4 63.9	10 52.3 +12.8 63.8	10 00.6 +13.3 63.6	9 09.0 +13.8 63.4	8 17.5 +14.2 63.1
29°	11 56.5 +12.2 62.9	11 05.1 +12.7 62.8	10 13.9 +13.1 62.6	9 22.8 +13.6 62.4	8 31.7 +14.1 62.2

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Latitude 16°

Declination SAME name as Latitude

Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +16.5 90.0	-0 57.7 +16.6	-1 55.3 +16.5	-2 53.0 +16.6	-3 50.7 +16.6
1°	0 16.5 +16.6 89.0	-0 41.1 +16.5	-1 38.8 +16.6	-2 36.4 +16.6	-3 34.1 +16.7
2°	0 33.1 +16.5 88.1	-0 24.6 +16.6	-1 22.2 +16.6	-2 19.8 +16.7	-3 17.4 +16.7
3°	0 49.6 +16.5 87.1	-0 08.0 +16.6	-1 05.6 +16.7	-2 03.1 +16.7	-3 00.7 +16.8
4°	1 06.1 +16.5 86.2	0 08.6 +16.5 85.9	-0 48.9 +16.6	-1 46.4 +16.7	-2 43.9 +16.8
5°	1 22.6 +16.5 85.2	0 25.1 +16.6 84.9	-0 32.3 +16.7	-1 29.7 +16.7	-2 27.1 +16.9
6°	1 39.1 +16.4 84.2	0 41.7 +16.5 84.0	-0 15.6 +16.6	-1 13.0 +16.8	-2 10.2 +16.9
7°	1 55.5 +16.4 83.3	0 58.2 +16.6 83.0	0 01.0 +16.7 82.7	-0 56.2 +16.8	-1 53.3 +16.9
8°	2 11.9 +16.4 82.3	1 14.8 +16.5 82.0	0 17.7 +16.6 81.8	-0 39.4 +16.8	-1 36.4 +16.9
9°	2 28.3 +16.3 81.3	1 31.3 +16.5 81.1	0 34.3 +16.7 80.8	-0 22.6 +16.8	-1 19.5 +17.0
10°	2 44.6 +16.3 80.4	1 47.8 +16.4 80.1	0 51.0 +16.6 79.8	-0 05.8 +16.8	-1 02.5 +17.0
11°	3 00.9 +16.2 79.4	2 04.2 +16.4 79.1	1 07.6 +16.6 78.9	0 11.0 +16.8 78.6	-0 45.5 +17.0
12°	3 17.1 +16.2 78.5	2 20.6 +16.4 78.2	1 24.2 +16.6 77.9	0 27.8 +16.8 77.6	-0 28.5 +17.0
13°	3 33.3 +16.1 77.5	2 37.0 +16.4 77.2	1 40.8 +16.6 77.0	0 44.6 +16.8 76.7	-0 11.5 +17.1
14°	3 49.4 +16.1 76.5	2 53.4 +16.2 76.3	1 57.4 +16.5 76.0	1 01.4 +16.8 75.7	0 05.6 +17.0 75.5
15°	4 05.5 +15.9 75.6	3 09.6 +16.3 75.3	2 13.9 +16.5 75.0	1 18.2 +16.7 74.8	0 22.6 +17.0 74.5
16°	4 21.4 +15.9 74.6	3 25.9 +16.1 74.3	2 30.4 +16.4 74.1	1 34.9 +16.8 73.8	0 39.6 +17.0 73.5
17°	4 37.3 +15.9 73.6	3 42.0 +16.2 73.4	2 46.8 +16.4 73.1	1 51.7 +16.7 72.8	0 56.6 +17.0 72.6
18°	4 53.2 +15.7 72.7	3 58.2 +16.0 72.4	3 03.2 +16.4 72.1	2 08.4 +16.6 71.9	1 13.6 +17.0 71.6
19°	5 08.9 +15.7 71.7	4 14.2 +16.0 71.4	3 19.6 +16.3 71.2	2 25.0 +16.6 70.9	1 30.6 +16.9 70.7
20°	5 24.6 +15.5 70.7	4 30.2 +15.9 70.5	3 35.9 +16.2 70.2	2 41.6 +16.6 70.0	1 47.5 +16.9 69.7
21°	5 40.1 +15.5 69.7	4 46.1 +15.8 69.5	3 52.1 +16.2 69.3	2 58.2 +16.5 69.0	2 04.4 +16.9 68.7
22°	5 55.6 +15.4 68.8	5 01.9 +15.7 68.5	4 08.3 +16.0 68.3	3 14.7 +16.5 68.0	2 21.3 +16.8 67.8
23°	6 11.0 +15.2 67.8	5 17.6 +15.6 67.6	4 24.3 +16.1 67.3	3 31.2 +16.4 67.1	2 38.1 +16.8 66.8
24°	6 26.2 +15.2 66.8	5 33.2 +15.6 66.6	4 40.4 +15.9 66.4	3 47.6 +16.3 66.1	2 54.9 +16.7 65.9
25°	6 41.4 +15.0 65.9	5 48.8 +15.4 65.6	4 56.3 +15.9 65.4	4 03.9 +16.3 65.1	3 11.6 +16.7 64.9
26°	6 56.4 +14.9 64.9	6 04.2 +15.4 64.7	5 12.2 +15.7 64.4	4 20.2 +16.2 64.2	3 28.3 +16.7 63.9
27°	7 11.3 +14.8 63.9	6 19.6 +15.2 63.7	5 27.9 +15.7 63.4	4 36.4 +16.1 63.2	3 45.0 +16.5 63.0
28°	7 26.1 +14.7 62.9	6 34.8 +15.1 62.7	5 43.6 +15.6 62.5	4 52.5 +16.0 62.2	4 01.5 +16.5 62.0
29°	7 40.8 +14.5 61.9	6 49.9 +15.0 61.7	5 59.2 +15.4 61.5	5 08.5 +16.0 61.3	4 18.0 +16.4 61.0

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 48.4 +16.7	-5 46.0 +16.7	-6 43.7 +16.8	-7 41.3 +16.8	-8 38.9 +16.8
1°	-4 31.7 +16.7	-5 29.3 +16.7	-6 26.9 +16.8	-7 24.5 +16.8	-8 22.1 +16.9
2°	-4 15.0 +16.8	-5 12.6 +16.9	-6 10.1 +16.9	-7 07.7 +17.0	-8 05.2 +17.1
3°	-3 58.2 +16.8	-4 55.7 +16.9	-5 53.2 +17.0	-6 50.7 +17.2	-7 48.1 +17.2
4°	-3 41.4 +16.9	-4 38.8 +17.0	-5 36.2 +17.1	-6 33.5 +17.2	-7 30.9 +17.4
5°	-3 24.5 +17.0	-4 21.8 +17.1	-5 19.1 +17.2	-6 16.3 +17.3	-7 13.5 +17.4
6°	-3 07.5 +17.0	-4 04.7 +17.2	-5 01.9 +17.3	-5 59.0 +17.4	-6 56.1 +17.6
7°	-2 50.5 +17.1	-3 47.5 +17.2	-4 44.6 +17.4	-5 41.6 +17.6	-6 38.5 +17.7
8°	-2 33.4 +17.1	-3 30.3 +17.3	-4 27.2 +17.4	-5 24.0 +17.6	-6 20.8 +17.8
9°	-2 16.3 +17.2	-3 13.0 +17.3	-4 09.8 +17.6	-5 06.4 +17.7	-6 03.0 +17.9
10°	-1 59.1 +17.2	-2 55.7 +17.4	-3 52.2 +17.5	-4 48.7 +17.8	-5 45.1 +18.0
11°	-1 41.9 +17.2	-2 38.3 +17.4	-3 34.7 +17.7	-4 30.9 +17.8	-5 27.1 +18.0
12°	-1 24.7 +17.2	-2 20.9 +17.5	-3 17.0 +17.7	-4 13.1 +18.0	-5 09.1 +18.2
13°	-1 07.5 +17.3	-2 03.4 +17.5	-2 59.3 +17.7	-3 55.1 +17.9	-4 50.9 +18.3
14°	-0 50.2 +17.3	-1 45.9 +17.5	-2 41.6 +17.8	-3 37.2 +18.1	-4 32.6 +18.3
15°	-0 32.9 +17.2	-1 28.4 +17.5	-2 23.8 +17.8	-3 19.1 +18.1	-4 14.3 +18.4
16°	-0 15.7 +17.3	-1 10.9 +17.6	-2 06.0 +17.9	-3 01.0 +18.2	-3 55.9 +18.4
17°	0 01.6 +17.3 72.3	-0 53.3 +17.6	-1 48.1 +17.9	-2 42.8 +18.2	-3 37.5 +18.6
18°	0 18.9 +17.3 71.3	-0 35.7 +17.6	-1 30.2 +17.9	-2 24.6 +18.2	-3 18.9 +18.5
19°	0 36.2 +17.2 70.4	-0 18.1 +17.6	-1 12.3 +17.9	-2 06.4 +18.3	-3 00.4 +18.7
20°	0 53.4 +17.3 69.4	-0 00.5 +17.6	-0 54.4 +18.0	-1 48.1 +18.3	-2 41.7 +18.6
21°	1 10.7 +17.2 68.5	0 17.1 +17.6 68.2	-0 36.4 +18.0	-1 29.8 +18.3	-2 23.1 +18.7
22°	1 27.9 +17.2 67.5	0 34.7 +17.6 67.2	-0 18.4 +17.9	-1 11.5 +18.4	-2 04.4 +18.8
23°	1 45.1 +17.2 66.6	0 52.3 +17.6 66.3	-0 00.5 +18.0	-0 53.1 +18.4	-1 45.6 +18.7
24°	2 02.3 +17.2 65.6	1 09.9 +17.5 65.3	0 17.5 +18.0 65.1	-0 34.7 +18.3	-1 26.9 +18.8
25°	2 19.5 +17.1 64.6	1 27.4 +17.5 64.4	0 35.5 +17.9 64.1	-0 16.4 +18.4	-1 08.1 +18.9
26°	2 36.6 +17.0 63.7	1 44.9 +17.5 63.4	0 53.4 +18.0 63.2	0 02.0 +18.4 62.9	-0 49.2 +18.8
27°	2 53.6 +17.1 62.7	2 02.4 +17.5 62.5	1 11.4 +17.9 62.2	0 20.4 +18.4 61.9	-0 30.4 +18.8
28°	3 10.7 +16.9 61.8	2 19.9 +17.4 61.5	1 29.3 +17.9 61.2	0 38.8 +18.3 61.0	-0 11.6 +18.9
29°	3 27.6 +16.9 60.8	2 37.3 +17.4 60.5	1 47.2 +17.8 60.3	0 57.1 +18.4 60.0	0 07.3 +18.8 59.8

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Dec	LHA 100° / 260°	LHA 101° / 259°	LHA 102° / 258°	LHA 103° / 257°	LHA 104° / 256°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-9 36.5 +16.8				
1°	-9 19.7 +17.0				
2°	-9 02.7 +17.2				
3°	-8 45.5 +17.3				
4°	-8 28.2 +17.5				
5°	-8 10.7 +17.6				
6°	-7 53.1 +17.7				
7°	-7 35.4 +17.8				
8°	-7 17.6 +18.0				
9°	-6 59.6 +18.1				
10°	-6 41.5 +18.2				
11°	-6 23.3 +18.3				
12°	-6 05.0 +18.4				
13°	-5 46.6 +18.6				
14°	-5 28.0 +18.6				
15°	-5 09.4 +18.6				
16°	-4 50.8 +18.8				
17°	-4 32.0 +18.8				
18°	-4 13.2 +18.9				
19°	-3 54.3 +19.0				
20°	-3 35.3 +19.1				
21°	-3 16.2 +19.0				
22°	-2 57.2 +19.2				
23°	-2 38.0 +19.2				
24°	-2 18.8 +19.2				
25°	-1 59.6 +19.2				
26°	-1 40.4 +19.3				
27°	-1 21.1 +19.3				
28°	-1 01.8 +19.3				
29°	-0 42.5 +19.3				

Dec	LHA 105° / 255°	LHA 106° / 254°	LHA 107° / 253°	LHA 108° / 252°	LHA 109° / 251°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°					
1°					
2°					
3°					
4°					
5°					
6°					
7°					
8°					
9°					
10°					
11°					
12°					
13°					
14°					
15°					
16°					
17°					
18°					
19°					
20°					
21°					
22°					
23°					
24°					
25°					
26°					
27°					
28°					
29°					

Declination SAME name as Latitude

Latitude 17°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	73 00.0 +60.0 180.0	72 58.3 +59.9 176.6	72 53.2 +59.6 173.2	72 44.7 +59.1 169.8	72 33.0 +58.4 166.5
1°	74 00.0 +60.0 180.0	73 58.2 +59.9 176.4	73 52.8 +59.5 172.8	73 43.8 +59.0 169.2	73 31.4 +58.2 165.8
2°	75 00.0 +60.0 180.0	74 58.1 +59.8 176.1	74 52.3 +59.5 172.3	74 42.8 +58.8 168.6	74 29.6 +58.0 164.9
3°	76 00.0 +60.0 180.0	75 57.9 +59.9 175.9	75 51.8 +59.4 171.8	75 41.6 +58.7 167.8	75 27.6 +57.6 163.9
4°	77 00.0 +60.0 180.0	76 57.8 +59.8 175.6	76 51.2 +59.3 171.2	76 40.3 +58.4 166.9	76 25.2 +57.4 162.8
5°	78 00.0 +60.0 180.0	77 57.6 +59.8 175.2	77 50.5 +59.1 170.5	77 38.7 +58.2 165.9	77 22.6 +56.9 161.5
6°	79 00.0 +60.0 180.0	78 57.4 +59.7 174.8	78 49.6 +59.1 169.7	78 36.9 +57.9 164.7	78 19.5 +56.3 160.0
7°	80 00.0 +60.0 180.0	79 57.1 +59.7 174.3	79 48.7 +58.8 168.7	79 34.8 +57.4 163.3	79 15.8 +55.7 158.2
8°	81 00.0 +60.0 180.0	80 56.8 +59.7 173.7	80 47.5 +58.5 167.5	80 32.2 +56.8 161.6	80 11.5 +54.7 156.1
9°	82 00.0 +60.0 180.0	81 56.5 +59.5 172.9	81 46.0 +58.1 166.1	81 29.0 +56.0 159.6	81 06.2 +53.4 153.5
10°	83 00.0 +60.0 180.0	82 56.0 +59.3 172.0	82 44.1 +57.6 164.2	82 25.0 +54.9 157.0	81 59.6 +51.7 150.4
11°	84 00.0 +60.0 180.0	83 55.3 +59.1 170.7	83 41.7 +56.6 161.8	83 19.9 +53.2 153.7	82 51.3 +49.3 146.6
12°	85 00.0 +60.0 180.0	84 54.4 +58.7 168.9	84 38.3 +55.2 158.6	84 13.1 +50.6 149.5	83 40.6 +45.8 141.7
13°	86 00.0 +60.0 180.0	85 53.1 +57.8 166.3	85 33.5 +52.6 154.0	85 03.7 +46.3 143.7	84 26.4 +40.6 135.5
14°	87 00.0 +60.0 180.0	86 50.9 +56.0 162.1	86 26.1 +47.5 147.0	85 50.0 +39.4 135.7	85 07.0 +33.0 127.3
15°	88 00.0 +60.0 180.0	87 46.9 +50.0 154.2	87 13.6 +36.6 135.9	86 29.4 +27.9 124.3	85 40.0 +22.2 116.9
16°	89 00.0 +60.0 180.0	88 36.9 +25.7 136.1	87 50.2 +15.0 117.3	86 57.3 +10.6 108.7	86 02.2 +08.3 104.0
17°	90 00.0 -60.0 0.0	89 02.6 -25.5 89.9	88 05.2 -14.4 89.7	87 07.9 -09.7 89.6	86 10.5 -07.1 89.4
18°	89 00.0 -60.0 0.0	88 37.1 -50.0 43.5	87 50.8 -36.4 62.0	86 58.2 -27.2 70.3	86 03.4 -21.3 74.7
19°	88 00.0 -60.0 0.0	87 47.1 -55.9 25.3	87 14.4 -47.3 43.3	86 31.0 -39.0 54.5	85 42.1 -32.2 61.7
20°	87 00.0 -60.0 0.0	86 51.2 -57.8 17.4	86 27.1 -52.6 32.0	85 52.0 -46.2 43.0	85 09.9 -40.1 51.0
21°	86 00.0 -60.0 0.0	85 53.4 -58.7 13.1	85 34.5 -55.1 25.0	85 05.8 -50.4 34.9	84 29.8 -45.5 42.8
22°	85 00.0 -60.0 0.0	84 54.7 -59.1 10.5	84 39.4 -56.6 20.3	84 15.4 -53.1 29.0	83 44.3 -49.0 36.4
23°	84 00.0 -60.0 0.0	83 55.6 -59.3 8.7	83 42.8 -57.6 17.1	83 22.3 -54.8 24.7	82 55.3 -51.6 31.4
24°	83 00.0 -60.0 0.0	82 56.3 -59.5 7.5	82 45.2 -58.1 14.6	82 27.5 -56.0 21.4	82 03.7 -53.3 27.5
25°	82 00.0 -60.0 0.0	81 56.8 -59.7 6.5	81 47.1 -58.5 12.8	81 31.5 -56.8 18.8	81 10.4 -54.6 24.3
26°	81 00.0 -60.0 0.0	80 57.1 -59.7 5.7	80 48.6 -58.8 11.3	80 34.7 -57.4 16.7	80 15.8 -55.6 21.8
27°	80 00.0 -60.0 0.0	79 57.4 -59.7 5.1	79 49.8 -59.0 10.1	79 37.3 -57.8 15.0	79 20.2 -56.3 19.6
28°	79 00.0 -60.0 0.0	78 57.7 -59.8 4.6	78 50.8 -59.2 9.2	78 39.5 -58.2 13.6	78 23.9 -56.8 17.8
29°	78 00.0 -60.0 0.0	77 57.9 -59.8 4.2	77 51.6 -59.3 8.3	77 41.3 -58.5 12.4	77 27.1 -57.4 16.3

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	72 18.0 +57.6 163.3	72 00.1 +56.6 160.2	71 39.3 +55.5 157.2	71 15.7 +54.4 154.3	70 49.6 +53.1 151.6
1°	73 15.6 +57.3 162.4	72 56.7 +56.2 159.1	72 34.8 +55.0 156.0	72 10.1 +53.7 153.0	71 42.7 +52.4 150.1
2°	74 12.9 +56.9 161.3	73 52.9 +55.7 157.9	73 29.8 +54.4 154.6	73 03.8 +53.0 151.5	72 35.1 +51.5 148.5
3°	75 09.8 +56.5 160.1	74 48.6 +55.2 156.5	74 24.2 +53.7 153.1	73 56.8 +52.1 149.8	73 26.6 +50.6 146.8
4°	76 06.3 +56.0 158.8	75 43.8 +54.5 155.0	75 17.9 +52.8 151.4	74 48.9 +51.2 148.0	74 17.2 +49.4 144.8
5°	77 02.3 +55.4 157.2	76 38.3 +53.6 153.2	76 10.7 +51.9 149.5	75 40.1 +49.9 145.9	75 06.6 +48.0 142.7
6°	77 57.7 +54.6 155.4	77 31.9 +52.7 151.2	77 02.6 +50.6 147.3	76 30.0 +48.6 143.6	75 54.6 +46.5 140.3
7°	78 52.3 +53.6 153.4	78 24.6 +51.3 148.9	77 53.2 +49.1 144.8	77 18.6 +46.8 141.0	76 41.1 +44.7 137.6
8°	79 45.9 +52.2 150.9	79 15.9 +49.8 146.2	78 42.3 +47.2 142.0	78 05.4 +44.7 138.1	77 25.8 +42.4 134.6
9°	80 38.1 +50.7 148.1	80 05.7 +47.7 143.1	79 29.5 +44.9 138.7	78 50.1 +42.3 134.8	78 08.2 +39.7 131.3
10°	81 28.8 +48.3 144.6	80 53.4 +45.1 139.4	80 14.4 +42.0 134.9	79 32.4 +39.2 131.0	78 47.9 +36.6 127.5
11°	82 17.1 +45.4 140.4	81 38.5 +41.7 135.1	80 56.4 +38.4 130.6	80 11.6 +35.4 126.7	79 24.5 +32.9 123.3
12°	83 02.5 +41.3 135.3	82 20.2 +37.4 129.9	81 34.8 +33.9 125.5	80 47.0 +31.0 121.8	79 57.4 +28.6 118.7
13°	83 43.8 +35.7 129.0	82 57.6 +31.6 123.8	82 08.7 +28.4 119.7	81 18.0 +25.8 116.3	80 26.0 +23.5 113.5
14°	84 19.5 +28.2 121.2	83 29.2 +24.6 116.6	82 37.1 +21.8 113.0	81 43.8 +19.5 110.2	80 49.5 +17.8 107.8
15°	84 47.7 +18.5 111.9	83 53.8 +15.9 108.3	82 58.9 +14.0 105.6	82 03.3 +12.6 103.5	81 07.3 +11.5 101.7
16°	85 06.2 +06.9 101.1	84 09.7 +06.0 99.0	83 12.9 +05.5 97.5	82 15.9 +05.1 96.3	81 18.8 +04.8 95.3
17°	85 13.1 -05.4 89.3	84 15.7 -04.2 89.1	83 18.4 -03.4 89.0	82 21.0 -02.7 88.8	81 23.6 -02.0 88.7
18°	85 07.7 -17.2 77.4	84 11.5 -14.3 79.2	83 15.0 -12.0 80.4	82 18.3 -10.3 81.3	81 21.6 -08.9 82.0
19°	84 50.5 -27.1 66.4	83 57.2 -23.1 69.8	83 03.0 -20.0 72.2	82 08.0 -17.4 74.1	81 12.7 -15.4 75.5
20°	84 23.4 -34.9 56.9	83 34.1 -30.5 61.3	82 43.0 -26.9 64.6	81 50.6 -23.9 67.2	80 57.3 -21.3 69.2
21°	83 48.5 -40.7 49.0	83 03.6 -36.4 53.9	82 16.1 -32.7 57.7	81 26.7 -29.4 60.9	80 36.0 -26.6 63.4
22°	83 07.8 -44.9 42.5	82 27.2 -41.0 47.6	81 43.4 -37.4 51.7	80 57.3 -34.1 55.2	80 09.4 -31.3 58.0
23°	82 22.9 -48.1 37.2	81 46.2 -44.6 42.2	81 06.0 -41.2 46.5	80 23.2 -38.1 50.1	79 38.1 -35.2 53.2
24°	81 34.8 -50.4 32.9	81 01.6 -47.3 37.7	80 24.8 -44.3 42.0	79 45.1 -41.4 45.6	79 02.9 -38.5 48.8
25°	80 44.4 -52.1 29.4	80 14.3 -49.5 34.0	79 40.5 -46.7 38.0	79 03.7 -44.0 41.7	78 24.4 -41.4 44.9
26°	79 52.3 -53.4 26.5	79 24.8 -51.1 30.8	78 53.8 -48.7 34.7	78 19.7 -46.2 38.2	77 43.0 -43.8 41.4
27°	78 58.9 -54.5 24.0	78 33.7 -52.4 28.0	78 05.1 -50.2 31.7	77 33.5 -48.0 35.1	76 59.2 -45.8 38.2
28°	78 04.4 -55.3 21.9	77 41.3 -53.5 25.6	77 14.9 -51.6 29.2	76 45.5 -49.6 32.4	76 13.4 -47.5 35.5
29°	77 09.1 -55.9 20.0	76 47.8 -54.3 23.6	76 23.3 -52.6 26.9	75 55.9 -50.8 30.1	75 25.9 -48.9 33.0

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Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	70 21.1 +51.8 148.9	69 50.4 +50.5 146.4	69 17.6 +49.2 144.0	68 43.0 +47.8 141.7	68 06.6 +46.5 139.5
1°	71 12.9 +51.0 147.4	70 40.9 +49.6 144.8	70 06.8 +48.2 142.3	69 30.8 +46.8 140.0	68 53.1 +45.4 137.8
2°	72 03.9 +50.0 145.7	71 30.5 +48.5 143.0	70 55.0 +47.0 140.5	70 17.6 +45.6 138.2	69 38.5 +44.2 136.0
3°	72 53.9 +49.0 143.9	72 19.0 +47.3 141.1	71 42.0 +45.8 138.6	71 03.2 +44.2 136.2	70 22.7 +42.7 134.0
4°	73 42.9 +47.7 141.8	73 06.3 +46.0 139.1	72 27.8 +44.3 136.5	71 47.4 +42.8 134.1	71 05.4 +41.3 131.9
5°	74 30.6 +46.2 139.6	73 52.3 +44.5 136.8	73 12.1 +42.7 134.2	72 30.2 +41.0 131.8	71 46.7 +39.4 129.6
6°	75 16.8 +44.5 137.2	74 36.8 +42.6 134.3	73 54.8 +40.8 131.7	73 11.2 +39.1 129.3	72 26.1 +37.5 127.1
7°	76 01.3 +42.5 134.5	75 19.4 +40.5 131.6	74 35.6 +38.7 129.0	73 50.3 +37.0 126.7	73 03.6 +35.4 124.5
8°	76 43.8 +40.2 131.5	75 59.9 +38.2 128.7	75 14.3 +36.3 126.1	74 27.3 +34.5 123.8	73 39.0 +32.9 121.7
9°	77 24.0 +37.5 128.2	76 38.1 +35.4 125.4	75 50.6 +33.5 122.9	75 01.8 +31.8 120.7	74 11.9 +30.3 118.7
10°	78 01.5 +34.3 124.5	77 13.5 +32.2 121.8	76 24.1 +30.4 119.4	75 33.6 +28.8 117.3	74 42.2 +27.3 115.4
11°	78 35.8 +30.7 120.4	77 45.7 +28.7 117.9	76 54.5 +26.9 115.7	76 02.4 +25.4 113.8	75 09.5 +24.1 112.0
12°	79 06.5 +26.4 116.0	78 14.4 +24.6 113.7	77 21.4 +23.1 111.7	76 27.8 +21.8 109.9	75 33.6 +20.6 108.4
13°	79 32.9 +21.7 111.1	78 39.0 +20.2 109.1	77 44.5 +18.9 107.4	76 49.6 +17.7 105.9	75 54.2 +16.8 104.6
14°	79 54.6 +16.4 105.9	78 59.2 +15.2 104.3	78 03.4 +14.3 102.9	77 07.3 +13.5 101.7	76 11.0 +12.9 100.6
15°	80 11.0 +10.7 100.3	79 14.4 +10.0 99.2	78 17.7 +9.5 98.1	77 20.8 +9.1 97.3	76 23.9 +8.6 96.5
16°	80 21.7 +04.6 94.5	79 24.4 +04.5 93.8	78 27.2 +04.4 93.2	77 29.9 +04.3 92.7	76 32.5 +04.1 92.2
17°	80 26.3 -01.6 88.5	79 28.9 -01.1 88.4	78 31.6 -00.8 88.2	77 34.2 -00.4 88.1	76 36.9 -00.1 87.9
18°	80 24.7 -07.7 82.5	79 27.8 -06.7 82.9	78 30.8 -05.8 83.2	77 33.8 -05.1 83.4	76 36.8 -04.4 83.6
19°	80 17.0 -13.6 76.6	79 21.1 -12.2 77.5	78 25.0 -10.9 78.2	77 28.7 -09.7 78.8	76 32.4 -08.8 79.3
20°	80 03.4 -19.2 70.9	79 08.9 -17.2 72.3	78 14.1 -15.6 73.4	77 19.0 -14.2 74.3	76 23.6 -12.9 75.1
21°	79 44.2 -24.1 65.5	78 51.7 -22.1 67.2	77 58.5 -20.2 68.7	77 04.8 -18.4 69.9	76 10.7 -16.9 71.0
22°	79 20.1 -28.7 60.5	78 29.6 -26.3 62.5	77 38.3 -24.2 64.2	76 46.4 -22.4 65.7	75 53.8 -20.7 67.0
23°	78 51.4 -32.5 55.8	78 03.3 -30.1 58.1	77 14.1 -28.0 60.0	76 24.0 -26.0 61.7	75 33.1 -24.2 63.2
24°	78 18.9 -36.0 51.6	77 33.2 -33.6 54.0	76 46.1 -31.3 56.1	75 58.0 -29.3 57.9	75 08.9 -27.3 59.6
25°	77 42.9 -38.9 47.7	76 59.6 -36.5 50.2	76 14.8 -34.3 52.4	75 28.7 -32.2 54.4	74 41.6 -30.4 56.2
26°	77 04.0 -41.4 44.2	76 23.1 -39.2 46.8	75 40.5 -37.0 49.0	74 56.5 -35.0 51.1	74 11.2 -33.0 52.9
27°	76 22.6 -43.6 41.1	75 43.9 -41.4 43.6	75 03.5 -39.3 45.9	74 21.5 -37.3 48.0	73 38.2 -35.4 49.9
28°	75 39.0 -45.4 38.2	75 02.5 -43.4 40.7	74 24.2 -41.4 43.1	73 44.2 -39.4 45.2	73 02.8 -37.5 47.1
29°	74 53.6 -47.0 35.6	74 19.1 -45.0 38.1	73 42.8 -43.2 40.4	73 04.8 -41.3 42.5	72 25.3 -39.5 44.5

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	67 28.6 +45.2 137.5	66 49.1 +44.0 135.6	66 08.2 +42.8 133.7	65 26.2 +41.6 132.0	64 43.0 +40.4 130.3
1°	68 13.8 +44.1 135.8	67 33.1 +42.8 133.8	66 51.0 +41.6 132.0	66 07.8 +40.3 130.2	65 23.4 +39.2 128.6
2°	68 57.9 +42.8 133.9	68 15.9 +41.4 131.9	67 32.6 +40.2 130.1	66 48.1 +39.0 128.4	66 02.6 +37.8 126.7
3°	69 40.7 +41.3 131.9	68 57.3 +40.0 130.0	68 12.8 +38.6 128.1	67 27.1 +37.5 126.4	66 40.4 +36.3 124.8
4°	70 22.0 +39.8 129.8	69 37.3 +38.4 127.8	68 51.4 +37.1 126.0	68 04.6 +35.8 124.3	67 16.7 +34.7 122.8
5°	71 01.8 +38.0 127.5	70 15.7 +36.6 125.6	69 28.5 +35.3 123.8	68 40.4 +34.1 122.2	67 51.4 +32.9 120.6
6°	71 39.8 +36.0 125.1	70 52.3 +34.6 123.2	70 03.8 +33.3 121.5	69 14.5 +32.1 119.9	68 24.3 +31.1 118.4
7°	72 15.8 +33.8 122.5	71 26.9 +32.5 120.7	70 37.1 +31.3 119.0	69 46.6 +30.1 117.5	68 55.4 +28.9 116.0
8°	72 49.6 +31.5 119.8	71 59.4 +30.2 118.0	71 08.4 +28.9 116.4	70 16.7 +27.8 114.9	69 24.3 +26.8 113.6
9°	73 21.1 +28.9 116.8	72 29.6 +27.6 115.2	71 37.3 +26.5 113.7	70 44.5 +25.4 112.3	69 51.1 +24.5 111.0
10°	73 50.0 +26.0 113.7	72 57.2 +24.8 112.2	72 03.8 +23.8 110.8	71 09.9 +22.8 109.5	70 15.6 +22.0 108.3
11°	74 16.0 +22.9 110.5	73 22.0 +21.9 109.0	72 27.6 +20.9 107.8	71 32.7 +20.2 106.6	70 37.6 +19.4 105.5
12°	74 38.9 +19.6 107.0	73 43.9 +18.7 105.8	72 48.5 +17.9 104.6	71 52.9 +17.2 103.6	70 57.0 +16.6 102.7
13°	74 58.5 +16.0 103.4	74 02.6 +15.3 102.3	73 06.4 +14.7 101.4	72 10.1 +14.2 100.5	71 13.6 +13.7 99.7
14°	75 14.5 +12.3 99.6	74 17.9 +11.8 98.8	73 21.1 +11.4 98.0	72 24.3 +11.0 97.3	71 27.3 +10.8 96.7
15°	75 26.8 +08.4 95.8	74 29.7 +08.1 95.1	73 32.5 +08.0 94.6	72 35.3 +07.8 94.0	71 38.1 +07.6 93.6
16°	75 35.2 +04.3 91.8	74 37.8 +04.4 91.4	73 40.5 +04.4 91.1	72 43.1 +04.5 90.7	71 45.7 +04.5 90.4
17°	75 39.5 +00.3 87.8	74 42.2 +00.6 87.6	73 44.9 +00.8 87.5	72 47.6 +01.0 87.3	71 50.2 +01.4 87.2
18°	75 39.8 -03.8 83.8	74 42.8 -03.3 83.9	73 45.7 -02.8 83.9	72 48.6 -02.3 84.0	71 51.6 -01.9 84.0
19°	75 36.0 -07.9 79.7	74 39.5 -07.1 80.1	73 42.9 -06.3 80.4	72 46.3 -05.6 80.6	71 49.7 -05.0 80.8
20°	75 28.1 -11.8 75.8	74 32.4 -10.7 76.3	73 36.6 -09.8 76.8	72 40.7 -09.0 77.2	71 44.7 -08.2 77.6
21°	75 16.3 -15.6 71.9	74 21.7 -14.4 72.7	73 26.8 -13.2 73.3	72 31.7 -12.2 73.9	71 36.5 -11.2 74.4
22°	75 00.7 -19.1 68.1	74 07.3 -17.7 69.1	73 13.6 -16.5 69.9	72 19.5 -15.3 70.7	71 25.3 -14.2 71.3
23°	74 41.6 -22.5 64.5	73 49.6 -21.0 65.6	72 57.1 -19.6 66.6	72 04.2 -18.2 67.5	71 11.1 -17.1 68.3
24°	74 19.1 -25.6 61.0	73 28.6 -24.0 62.3	72 37.5 -22.5 63.4	71 46.0 -21.1 64.5	70 54.0 -19.8 65.4
25°	73 53.5 -28.6 57.7	73 04.6 -26.9 59.1	72 15.0 -25.2 60.4	71 24.9 -23.8 61.5	70 34.2 -22.4 62.5
26°	73 24.9 -31.1 54.6	72 37.7 -29.4 56.1	71 49.8 -27.9 57.4	71 01.1 -26.3 58.6	70 11.8 -24.9 59.7
27°	72 53.8 -33.6 51.6	72 08.3 -31.8 53.2	71 21.9 -30.2 54.6	70 34.8 -28.7 55.9	69 46.9 -27.1 57.1
28°	72 20.2 -35.8 48.9	71 36.5 -34.1 50.5	70 51.7 -32.4 51.9	70 06.1 -30.8 53.3	69 19.8 -29.4 54.5
29°	71 44.4 -37.7 46.3	71 02.4 -36.0 47.9	70 19.3 -34.4 49.4	69 35.3 -32.8 50.8	68 50.4 -31.3 52.1

Declination SAME name as Latitude

Latitude 17°

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	63 58.7 +39.4 128.8	63 13.5 +38.4 127.3	62 27.5 +37.3 125.9	61 40.6 +36.4 124.6	60 53.0 +35.4 123.3
1°	64 38.1 +38.1 127.0	63 51.9 +37.0 125.6	63 04.8 +36.0 124.2	62 17.0 +35.0 122.9	61 28.4 +34.2 121.6
2°	65 16.2 +36.7 125.2	64 28.9 +35.6 123.8	63 40.8 +34.7 122.4	62 52.0 +33.7 121.1	62 02.6 +32.8 119.9
3°	65 52.9 +35.2 123.3	65 04.5 +34.2 121.9	64 15.5 +33.1 120.5	63 25.7 +32.3 119.3	62 35.4 +31.3 118.1
4°	66 28.1 +33.6 121.3	65 38.7 +32.6 119.9	64 48.6 +31.6 118.6	63 58.0 +30.6 117.4	63 06.7 +29.9 116.2
5°	67 01.7 +31.8 119.2	66 11.3 +30.8 117.8	65 20.2 +29.9 116.6	64 28.6 +29.1 115.4	63 36.6 +28.2 114.3
6°	67 33.5 +30.0 117.0	66 42.1 +29.0 115.7	65 50.1 +28.2 114.5	64 57.7 +27.3 113.3	64 04.8 +26.5 112.3
7°	68 03.5 +28.0 114.7	67 11.1 +27.1 113.5	66 18.3 +26.2 112.3	65 25.0 +25.4 111.2	64 31.3 +24.7 110.2
8°	68 31.5 +25.9 112.3	67 38.2 +25.0 111.1	66 44.5 +24.2 110.0	65 50.4 +23.5 109.0	64 56.0 +22.8 108.1
9°	68 57.4 +23.6 109.8	68 03.2 +22.8 108.7	67 08.7 +22.1 107.7	66 13.9 +21.4 106.8	65 18.8 +20.9 105.9
10°	69 21.0 +21.2 107.2	68 26.0 +20.6 106.2	67 30.8 +19.9 105.3	66 35.3 +19.4 104.4	65 39.7 +18.8 103.6
11°	69 42.2 +18.7 104.6	68 46.6 +18.1 103.7	67 50.7 +17.6 102.8	66 54.7 +17.0 102.0	65 58.5 +16.6 101.3
12°	70 00.9 +16.1 101.8	69 04.7 +15.5 101.0	68 08.3 +15.1 100.3	67 11.7 +14.8 99.6	66 15.1 +14.4 98.9
13°	70 17.0 +13.3 99.0	69 20.2 +13.0 98.3	68 23.4 +12.7 97.6	67 26.5 +12.4 97.1	66 29.5 +12.2 96.5
14°	70 30.3 +10.5 96.1	69 33.2 +10.3 95.5	68 36.1 +10.1 95.0	67 38.9 +09.9 94.5	66 41.7 +09.8 94.0
15°	70 40.8 +07.5 93.1	69 43.5 +07.5 92.7	68 46.2 +07.4 92.3	67 48.8 +07.4 91.9	66 51.5 +07.3 91.5
16°	70 48.3 +04.6 90.1	69 51.0 +04.6 89.8	68 53.6 +04.7 89.5	67 56.2 +04.9 89.3	66 58.8 +05.0 89.0
17°	70 52.9 +01.6 87.0	69 55.6 +01.9 86.9	68 58.3 +02.1 86.7	68 01.1 +02.2 86.6	67 03.8 +02.5 86.4
18°	70 54.5 -01.4 84.0	69 57.5 -01.1 84.0	69 00.4 -00.7 84.0	68 03.3 -00.3 83.9	67 06.3 +00.0 83.9
19°	70 53.1 -04.5 80.9	69 56.4 -03.9 81.1	68 59.7 -03.4 81.2	68 03.0 -02.9 81.2	67 06.3 -02.5 81.3
20°	70 48.6 -07.4 77.9	69 52.5 -06.8 78.2	68 56.3 -06.1 78.4	68 00.1 -05.5 78.6	67 03.8 -04.9 78.7
21°	70 41.2 -10.4 74.9	69 45.7 -09.5 75.3	68 50.2 -08.8 75.6	67 54.6 -08.1 75.9	66 58.9 -07.4 76.2
22°	70 30.8 -13.2 71.9	69 36.2 -12.3 72.4	68 41.4 -11.3 72.9	67 46.5 -10.5 73.3	66 51.5 -09.8 73.7
23°	70 17.6 -15.9 69.0	69 23.9 -14.9 69.6	68 30.1 -14.0 70.2	67 36.0 -13.0 70.7	66 41.7 -12.1 71.2
24°	70 01.7 -18.6 66.2	69 09.0 -17.4 66.9	68 16.1 -16.3 67.6	67 23.0 -15.4 68.2	66 29.6 -14.4 68.7
25°	69 43.1 -21.1 63.4	68 51.6 -19.9 64.2	67 59.8 -18.8 65.0	67 07.6 -17.6 65.7	66 15.2 -16.6 66.3
26°	69 22.0 -23.5 60.7	68 31.7 -22.2 61.6	67 41.0 -21.0 62.5	66 50.0 -19.9 63.2	65 58.6 -18.8 63.9
27°	68 58.5 -25.8 58.1	68 09.5 -24.5 59.1	67 20.0 -23.2 60.0	66 30.1 -22.0 60.8	65 39.8 -20.8 61.6
28°	68 32.7 -27.9 55.7	67 45.0 -26.5 56.7	66 56.8 -25.2 57.6	66 08.1 -24.0 58.5	65 19.0 -22.8 59.3
29°	68 04.8 -29.9 53.3	67 18.5 -28.5 54.3	66 31.6 -27.2 55.3	65 44.1 -25.9 56.3	64 56.2 -24.7 57.1

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	60 04.7 +34.5 122.1	59 15.8 +33.7 120.9	58 26.3 +32.9 119.8	57 36.3 +32.1 118.8	56 45.7 +31.5 117.8
1°	60 39.2 +33.3 120.4	59 49.5 +32.5 119.3	58 59.2 +31.7 118.2	58 08.4 +30.9 117.2	57 17.2 +30.2 116.2
2°	61 12.5 +32.0 118.7	60 22.0 +31.1 117.6	59 30.9 +30.4 116.6	58 39.3 +29.7 115.6	57 47.4 +28.9 114.6
3°	61 44.5 +30.5 116.9	60 53.1 +29.7 115.9	60 01.3 +29.0 114.9	59 09.0 +28.3 113.9	58 16.3 +27.7 113.0
4°	62 15.0 +29.0 115.1	61 22.8 +28.3 114.1	60 30.3 +27.5 113.1	59 37.3 +26.9 112.2	58 44.0 +26.3 111.3
5°	62 44.0 +27.5 113.2	61 51.1 +26.8 112.2	60 57.8 +26.1 111.3	60 04.2 +25.4 110.4	59 10.3 +24.8 109.5
6°	63 11.5 +25.8 111.3	62 17.9 +25.1 110.3	61 23.9 +24.5 109.4	60 29.6 +23.9 108.6	59 35.1 +23.3 107.8
7°	63 37.3 +24.0 109.2	62 43.0 +23.4 108.3	61 48.4 +22.8 107.5	60 53.5 +22.3 106.7	59 58.4 +21.8 105.9
8°	64 01.3 +22.2 107.2	63 06.4 +21.6 106.3	62 11.2 +21.1 105.5	61 15.8 +20.6 104.8	60 20.2 +20.2 104.0
9°	64 23.5 +20.3 105.0	63 28.0 +19.8 104.2	62 32.3 +19.3 103.5	61 36.4 +18.9 102.8	60 40.4 +18.5 102.1
10°	64 43.8 +18.3 102.8	63 47.8 +17.9 102.1	62 51.6 +17.5 101.4	61 55.3 +17.1 100.8	60 58.9 +16.8 100.2
11°	65 02.1 +16.3 100.6	64 05.7 +15.9 99.9	63 09.1 +15.6 99.3	62 12.4 +15.3 98.8	61 15.7 +15.0 98.2
12°	65 18.4 +14.1 98.3	64 21.6 +13.8 97.7	63 24.7 +13.6 97.2	62 27.7 +13.4 96.7	61 30.7 +13.2 96.2
13°	65 32.5 +11.9 96.0	64 35.4 +11.7 95.5	63 38.3 +11.5 95.0	62 41.1 +11.4 94.6	61 43.9 +11.3 94.1
14°	65 44.4 +09.7 93.6	64 47.1 +09.6 93.2	63 49.8 +09.6 92.8	62 52.5 +09.5 92.4	61 55.2 +09.4 92.0
15°	65 54.1 +07.4 91.2	64 56.7 +07.4 90.9	63 59.4 +07.4 90.5	63 02.0 +07.4 90.2	62 04.6 +07.5 89.9
16°	66 01.5 +05.0 88.7	65 04.1 +05.2 88.5	64 06.8 +05.2 88.3	63 09.4 +05.4 88.0	62 12.1 +05.5 87.8
17°	66 06.5 +02.7 86.3	65 09.3 +02.9 86.1	64 12.0 +03.2 86.0	63 14.8 +03.3 85.8	62 17.6 +03.5 85.7
18°	66 09.2 +00.4 83.8	65 12.2 +00.6 83.8	64 15.2 +00.9 83.7	63 18.1 +01.3 83.6	62 21.1 +01.5 83.5
19°	66 09.6 -02.1 81.3	65 12.8 -01.6 81.4	64 16.1 -01.2 81.4	63 19.4 -00.9 81.4	62 22.6 -00.4 81.4
20°	66 07.5 -04.4 78.9	65 11.2 -03.9 79.0	64 14.9 -03.4 79.1	63 18.5 -02.9 79.2	62 22.2 -02.5 79.2
21°	66 03.1 -06.7 76.4	65 07.3 -06.1 76.6	64 11.5 -05.5 76.8	63 15.6 -05.0 76.9	62 19.7 -04.4 77.1
22°	65 56.4 -09.0 74.0	65 01.2 -08.3 74.3	64 06.0 -07.7 74.5	63 10.6 -07.0 74.7	62 15.3 -06.5 74.9
23°	65 47.4 -11.3 71.6	64 52.9 -10.5 71.9	63 58.3 -09.8 72.2	63 03.6 -09.0 72.5	62 08.8 -08.3 72.8
24°	65 36.1 -13.5 69.2	64 42.4 -12.7 69.6	63 48.5 -11.8 70.0	62 54.6 -11.1 70.4	62 00.5 -10.3 70.7
25°	65 22.6 -15.7 66.8	64 29.7 -14.7 67.3	63 36.7 -13.8 67.8	62 43.5 -13.0 68.2	61 50.2 -12.2 68.6
26°	65 06.9 -17.7 64.5	64 15.0 -16.7 65.1	63 22.9 -15.8 65.6	62 30.5 -14.9 66.1	61 38.0 -14.1 66.5
27°	64 49.2 -19.7 62.3	63 58.3 -18.7 62.9	63 07.1 -17.7 63.5	62 15.6 -16.7 64.0	61 23.9 -15.8 64.5
28°	64 29.5 -21.7 60.1	63 39.6 -20.6 60.7	62 49.4 -19.6 61.4	61 58.9 -18.6 61.9	61 08.1 -17.6 62.5
29°	64 07.8 -23.6 57.9	63 19.0 -22.4 58.6	62 29.8 -21.3 59.3	61 40.3 -20.3 59.9	60 50.5 -19.3 60.5

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Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	55 54.8 +30.7 116.9	55 03.4 +30.0 115.9	54 11.6 +29.4 115.1	53 19.4 +28.9 114.2	52 26.9 +28.3 113.4
1°	56 25.5 +29.5 115.3	55 33.4 +28.9 114.4	54 41.0 +28.3 113.6	53 48.3 +27.7 112.8	52 55.2 +27.2 112.0
2°	56 55.0 +28.4 113.7	56 02.3 +27.7 112.9	55 09.3 +27.1 112.0	54 16.0 +26.5 111.3	53 22.4 +26.0 110.5
3°	57 23.4 +27.0 112.1	56 30.0 +26.5 111.3	55 36.4 +25.9 110.5	54 42.5 +25.4 109.7	53 48.4 +24.8 109.0
4°	57 50.4 +25.7 110.4	56 56.5 +25.1 109.6	56 02.3 +24.6 108.9	55 07.9 +24.1 108.1	54 13.2 +23.7 107.4
5°	58 16.1 +24.2 108.7	57 21.6 +23.8 108.0	56 26.9 +23.3 107.2	55 32.0 +22.8 106.5	54 36.9 +22.4 105.8
6°	58 40.3 +22.9 107.0	57 45.4 +22.3 106.2	56 50.2 +21.9 105.5	55 54.8 +21.5 104.9	54 59.3 +21.1 104.2
7°	59 03.2 +21.3 105.2	58 07.7 +20.9 104.5	57 12.1 +20.5 103.8	56 16.3 +20.1 103.2	55 20.4 +19.7 102.6
8°	59 24.5 +19.7 103.4	58 28.6 +19.4 102.7	57 32.6 +19.0 102.1	56 36.4 +18.7 101.5	55 40.1 +18.4 100.9
9°	59 44.2 +18.2 101.5	58 48.0 +17.8 100.9	57 51.6 +17.5 100.3	56 55.1 +17.2 99.8	55 58.5 +16.9 99.2
10°	60 02.4 +16.5 99.6	59 05.8 +16.2 99.0	58 09.1 +15.9 98.5	57 12.3 +15.7 98.0	56 15.4 +15.5 97.5
11°	60 18.9 +14.7 97.7	59 22.0 +14.5 97.2	58 25.0 +14.3 96.7	57 28.0 +14.2 96.2	56 30.9 +14.0 95.8
12°	60 33.6 +13.0 95.7	59 36.5 +12.9 95.3	58 39.3 +12.8 94.8	57 42.2 +12.6 94.4	56 44.9 +12.5 94.0
13°	60 46.6 +11.2 93.7	59 49.4 +11.1 93.3	58 52.1 +11.0 92.9	57 54.8 +10.9 92.6	56 57.4 +11.0 92.2
14°	60 57.8 +09.4 91.7	60 00.5 +09.3 91.4	59 03.1 +09.4 91.0	58 05.7 +09.4 90.7	57 08.4 +09.3 90.4
15°	61 07.2 +07.5 89.7	60 09.8 +07.6 89.4	59 12.5 +07.6 89.1	58 15.1 +07.7 88.8	57 17.7 +07.8 88.6
16°	61 14.7 +05.7 87.6	60 17.4 +05.8 87.4	59 20.1 +05.9 87.2	58 22.8 +06.0 87.0	57 25.5 +06.2 86.7
17°	61 20.4 +03.7 85.5	60 23.2 +03.9 85.4	59 26.0 +04.1 85.2	58 28.8 +04.4 85.1	57 31.7 +04.5 84.9
18°	61 24.1 +01.8 83.4	60 27.1 +02.1 83.3	59 30.1 +02.4 83.2	58 33.2 +02.6 83.1	57 36.2 +02.9 83.0
19°	61 25.9 -00.1 81.3	60 29.2 +00.2 81.3	59 32.5 +00.6 81.3	58 35.8 +00.9 81.2	57 39.1 +01.2 81.2
20°	61 25.8 -02.0 79.3	60 29.4 -01.6 79.3	59 33.1 -01.2 79.3	58 36.7 -00.8 79.3	57 40.3 -00.4 79.3
21°	61 23.8 -04.0 77.2	60 27.8 -03.4 77.3	59 31.9 -03.0 77.3	58 35.9 -02.6 77.4	57 39.9 -02.1 77.4
22°	61 19.8 -05.8 75.1	60 24.4 -05.3 75.2	59 28.9 -04.8 75.4	58 33.3 -04.2 75.5	57 37.8 -03.7 75.6
23°	61 14.0 -07.7 73.0	60 19.1 -07.1 73.2	59 24.1 -06.5 73.4	58 29.1 -05.9 73.6	57 34.1 -05.4 73.7
24°	61 06.3 -09.6 71.0	60 12.0 -08.9 71.2	59 17.6 -08.2 71.4	58 23.2 -07.6 71.7	57 28.7 -07.0 71.8
25°	60 56.7 -11.4 68.9	60 03.1 -10.7 69.2	59 09.4 -10.0 69.5	58 15.6 -09.3 69.8	57 21.7 -08.6 70.0
26°	60 45.3 -13.2 66.9	59 52.4 -12.4 67.3	58 59.4 -11.6 67.6	58 06.3 -10.9 67.9	57 13.1 -10.2 68.2
27°	60 32.1 -15.0 64.9	59 40.0 -14.1 65.3	58 47.8 -13.3 65.7	57 55.4 -12.5 66.0	57 02.9 -11.7 66.4
28°	60 17.1 -16.6 63.0	59 25.9 -15.8 63.4	58 34.5 -14.9 63.8	57 42.9 -14.1 64.2	56 51.2 -13.3 64.6
29°	60 00.5 -18.4 61.0	59 10.1 -17.4 61.5	58 19.6 -16.5 62.0	57 28.8 -15.6 62.4	56 37.9 -14.8 62.8

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	51 34.1 +27.8 112.7	50 41.1 +27.1 111.9	49 47.7 +26.7 111.2	48 54.1 +26.2 110.5	48 00.2 +25.8 109.9
1°	52 01.9 +26.6 111.2	51 08.2 +26.2 110.5	50 14.4 +25.6 109.8	49 20.3 +25.2 109.1	48 26.0 +24.7 108.5
2°	52 28.5 +25.5 109.8	51 34.4 +25.0 109.1	50 40.0 +24.6 108.4	49 45.5 +24.2 107.7	48 50.7 +23.8 107.1
3°	52 54.0 +24.4 108.3	51 59.4 +24.0 107.6	51 04.6 +23.6 106.9	50 09.7 +23.1 106.3	49 14.5 +22.7 105.7
4°	53 18.4 +23.2 106.7	52 23.4 +22.8 106.1	51 28.2 +22.3 105.5	50 32.8 +22.0 104.9	49 37.2 +21.7 104.3
5°	53 41.6 +22.0 105.2	52 46.2 +21.5 104.6	51 50.5 +21.3 104.0	50 54.8 +20.9 103.4	49 58.9 +20.6 102.8
6°	54 03.6 +20.7 103.6	53 07.7 +20.4 103.0	52 11.8 +20.0 102.5	51 15.7 +19.7 101.9	50 19.5 +19.5 101.4
7°	54 24.3 +19.4 102.0	53 28.1 +19.1 101.5	52 31.8 +18.9 100.9	51 35.4 +18.6 100.4	50 39.0 +18.3 99.9
8°	54 43.7 +18.1 100.4	53 47.2 +17.8 99.9	52 50.7 +17.5 99.4	51 54.0 +17.3 98.9	50 57.3 +17.1 98.4
9°	55 01.8 +16.7 98.7	54 05.0 +16.5 98.2	53 08.2 +16.3 97.8	52 11.3 +16.1 97.3	51 14.4 +15.9 96.9
10°	55 18.5 +15.3 97.0	54 21.5 +15.2 96.6	53 24.5 +15.0 96.2	52 27.4 +14.9 95.7	51 30.3 +14.7 95.3
11°	55 33.8 +13.9 95.3	54 36.7 +13.7 94.9	53 39.5 +13.6 94.5	52 42.3 +13.5 94.1	51 45.0 +13.5 93.8
12°	55 47.7 +12.4 93.6	54 50.4 +12.3 93.2	53 53.1 +12.3 92.9	52 55.8 +12.2 92.5	51 58.5 +12.1 92.2
13°	56 00.1 +10.9 91.9	55 02.7 +10.9 91.5	54 05.4 +10.8 91.2	53 08.0 +10.9 90.9	52 10.6 +10.9 90.6
14°	56 11.0 +09.4 90.1	55 13.6 +09.4 89.8	54 16.2 +09.5 89.5	53 18.9 +09.5 89.3	52 21.5 +09.5 89.0
15°	56 20.4 +07.8 88.3	55 23.0 +08.0 88.1	54 25.7 +08.0 87.8	53 28.4 +08.1 87.6	52 31.0 +08.2 87.4
16°	56 28.2 +06.3 86.5	55 31.0 +06.4 86.3	54 33.7 +06.6 86.1	53 36.5 +06.7 85.9	52 39.2 +06.9 85.7
17°	56 34.5 +04.7 84.7	55 37.4 +04.9 84.6	54 40.3 +05.1 84.4	53 43.2 +05.3 84.3	52 46.1 +05.5 84.1
18°	56 39.2 +03.2 82.9	55 42.3 +03.4 82.8	54 45.4 +03.6 82.7	53 48.5 +03.9 82.6	52 51.6 +04.1 82.4
19°	56 42.4 +01.5 81.1	55 45.7 +01.8 81.0	54 49.0 +02.2 81.0	53 52.4 +02.4 80.9	52 55.7 +02.8 80.8
20°	56 43.9 +00.0 79.3	55 47.5 +00.4 79.3	54 51.2 +00.6 79.2	53 54.8 +01.0 79.2	52 58.5 +01.3 79.1
21°	56 43.9 -01.7 77.5	55 47.9 -01.3 77.5	54 51.8 -00.8 77.5	53 55.8 -00.4 77.5	52 59.8 +00.0 77.5
22°	56 42.2 -03.2 75.6	55 46.6 -02.7 75.7	54 51.0 -02.3 75.7	53 55.4 -01.9 75.8	52 59.8 -01.4 75.8
23°	56 39.0 -04.8 73.8	55 43.9 -04.3 73.9	54 48.7 -03.8 74.0	53 53.5 -03.3 74.1	52 58.4 -02.9 74.1
24°	56 34.2 -06.4 72.0	55 39.6 -05.9 72.2	54 44.9 -05.2 72.3	53 50.2 -04.7 72.4	52 55.5 -04.1 72.5
25°	56 27.8 -08.0 70.2	55 33.7 -07.3 70.4	54 39.7 -06.8 70.6	53 45.5 -06.1 70.7	52 51.4 -05.6 70.8
26°	56 19.8 -09.5 68.4	55 26.4 -08.8 68.6	54 32.9 -08.1 68.8	53 39.4 -07.5 69.0	52 45.8 -06.9 69.2
27°	56 10.3 -11.0 66.6	55 17.6 -10.3 66.9	54 24.8 -09.6 67.1	53 31.9 -09.0 67.4	52 38.9 -08.3 67.5
28°	55 59.3 -12.5 64.9	55 07.3 -11.8 65.2	54 15.2 -11.1 65.4	53 22.9 -10.3 65.7	52 30.6 -09.6 65.9
29°	55 46.8 -14.0 63.1	54 55.5 -13.1 63.5	54 04.1 -12.4 63.8	53 12.6 -11.6 64.0	52 21.0 -11.0 64.3

Declination SAME name as Latitude

Latitude 17°

Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	47 06.1 +25.4 109.2	46 11.9 +24.9 108.6	45 17.4 +24.5 108.0	44 22.7 +24.1 107.4	43 27.9 +23.7 106.8
1°	47 31.5 +24.3 107.9	46 36.8 +23.9 107.3	45 41.9 +23.6 106.7	44 46.8 +23.3 106.1	43 51.6 +22.9 105.6
2°	47 55.8 +23.4 106.5	47 00.7 +23.0 105.9	46 05.5 +22.6 105.4	45 10.1 +22.3 104.8	44 14.5 +22.0 104.3
3°	48 19.2 +22.4 105.1	47 23.7 +22.1 104.6	46 28.1 +21.7 104.0	45 32.4 +21.4 103.5	44 36.5 +21.2 103.0
4°	48 41.6 +21.3 103.7	47 45.8 +21.0 103.2	46 49.8 +20.8 102.7	45 53.8 +20.5 102.2	44 57.7 +20.2 101.7
5°	49 02.9 +20.3 102.3	48 06.8 +20.0 101.8	47 10.6 +19.7 101.3	46 14.3 +19.5 100.8	45 17.9 +19.2 100.3
6°	49 23.2 +19.2 100.9	48 26.8 +19.0 100.4	47 30.3 +18.7 99.9	46 33.8 +18.5 99.4	45 37.1 +18.3 99.0
7°	49 42.4 +18.1 99.4	48 45.8 +17.8 98.9	47 49.0 +17.7 98.5	46 52.3 +17.4 98.0	45 55.4 +17.3 97.6
8°	50 00.5 +16.9 97.9	49 03.6 +16.8 97.5	48 06.7 +16.6 97.1	47 09.7 +16.5 96.6	46 12.7 +16.3 96.2
9°	50 17.4 +15.8 96.4	49 20.4 +15.6 96.0	48 23.3 +15.5 95.6	47 26.2 +15.3 95.2	46 29.0 +15.3 94.8
10°	50 33.2 +14.6 94.9	49 36.0 +14.5 94.5	48 38.8 +14.4 94.2	47 41.5 +14.3 93.8	46 44.3 +14.2 93.4
11°	50 47.8 +13.3 93.4	49 50.5 +13.3 93.0	48 53.2 +13.2 92.7	47 55.8 +13.2 92.3	46 58.5 +13.2 92.0
12°	51 01.1 +12.1 91.8	50 03.8 +12.1 91.5	49 06.4 +12.1 91.2	48 09.0 +12.1 90.9	47 11.7 +12.0 90.6
13°	51 13.2 +10.9 90.3	50 15.9 +10.9 90.0	49 18.5 +10.9 89.7	48 21.1 +11.0 89.4	47 23.7 +11.0 89.1
14°	51 24.1 +09.6 88.7	50 26.8 +09.6 88.4	49 29.4 +09.7 88.2	48 32.1 +09.8 87.9	47 34.7 +09.9 87.7
15°	51 33.7 +08.3 87.1	50 36.4 +08.4 86.9	49 39.1 +08.6 86.7	48 41.9 +08.6 86.4	47 44.6 +08.7 86.2
16°	51 42.0 +07.0 85.5	50 44.8 +07.2 85.3	49 47.7 +07.3 85.1	48 50.5 +07.4 84.9	47 53.3 +07.7 84.7
17°	51 49.0 +05.7 83.9	50 52.0 +05.9 83.8	49 55.0 +06.0 83.6	48 57.9 +06.3 83.4	48 01.0 +06.4 83.3
18°	51 54.7 +04.4 82.3	50 57.9 +04.6 82.2	50 01.0 +04.9 82.0	49 04.2 +05.1 81.9	48 07.4 +05.3 81.8
19°	51 59.1 +03.0 80.7	51 02.5 +03.3 80.6	50 05.9 +03.6 80.5	49 09.3 +03.9 80.4	48 12.7 +04.2 80.3
20°	52 02.1 +01.7 79.1	51 05.8 +02.0 79.0	50 09.5 +02.3 78.9	49 13.2 +02.6 78.9	48 16.9 +02.9 78.8
21°	52 03.8 +00.3 77.4	51 07.8 +00.7 77.4	50 11.8 +01.1 77.4	49 15.8 +01.5 77.3	48 19.8 +01.8 77.3
22°	52 04.1 -00.9 75.8	51 08.5 -00.6 75.8	50 12.9 -00.2 75.8	49 17.3 +00.2 75.8	48 21.6 +00.7 75.8
23°	52 03.2 -02.4 74.2	51 07.9 -01.8 74.2	50 12.7 -01.4 74.3	49 17.5 -01.0 74.3	48 22.3 -00.6 74.3
24°	52 00.8 -03.7 72.6	51 06.1 -03.2 72.6	50 11.3 -02.7 72.7	49 16.5 -02.2 72.7	48 21.7 -01.7 72.8
25°	51 57.1 -05.0 70.9	51 02.9 -04.5 71.0	50 08.6 -03.9 71.1	49 14.3 -03.4 71.2	48 20.0 -02.9 71.3
26°	51 52.1 -06.3 69.3	50 58.4 -05.7 69.5	50 04.7 -05.2 69.6	49 10.9 -04.6 69.7	48 17.1 -04.1 69.8
27°	51 45.8 -07.6 67.7	50 52.7 -07.1 67.9	49 59.5 -06.4 68.0	49 06.3 -05.9 68.2	48 13.0 -05.3 68.3
28°	51 38.2 -09.0 66.1	50 45.6 -08.2 66.3	49 53.1 -07.7 66.5	49 00.4 -07.0 66.6	48 07.7 -06.4 66.8
29°	51 29.2 -10.2 64.5	50 37.4 -09.6 64.7	49 45.4 -08.8 64.9	48 53.4 -08.2 65.1	48 01.3 -07.5 65.3

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	42 32.9 +23.4 106.3	41 37.7 +23.1 105.8	40 42.5 +22.7 105.3	39 47.0 +22.5 104.7	38 51.5 +22.1 104.3
1°	42 56.3 +22.6 105.0	42 00.8 +22.3 104.5	41 05.2 +22.0 104.0	40 09.5 +21.7 103.5	39 13.6 +21.5 103.1
2°	43 18.9 +21.7 103.8	42 23.1 +21.4 103.3	41 27.2 +21.1 102.8	40 31.2 +20.9 102.3	39 35.1 +20.6 101.9
3°	43 40.6 +20.8 102.5	42 44.5 +20.6 102.0	41 48.3 +20.4 101.5	40 52.1 +20.1 101.1	39 55.7 +19.9 100.6
4°	44 01.4 +20.0 101.2	43 05.1 +19.7 100.7	42 08.7 +19.5 100.3	41 12.2 +19.3 99.8	40 15.6 +19.1 99.4
5°	44 21.4 +19.0 99.9	43 24.8 +18.8 99.4	42 28.2 +18.6 99.0	41 31.5 +18.4 98.6	40 34.7 +18.3 98.2
6°	44 40.4 +18.1 98.5	43 43.6 +18.0 98.1	42 46.8 +17.8 97.7	41 49.9 +17.6 97.3	40 53.0 +17.4 96.9
7°	44 58.5 +17.2 97.2	44 01.6 +17.0 96.8	43 04.6 +16.8 96.4	42 07.5 +16.7 96.0	41 10.4 +16.6 95.6
8°	45 15.7 +16.1 95.8	44 18.6 +16.0 95.5	43 21.4 +16.0 95.1	42 24.2 +15.9 94.7	41 27.0 +15.8 94.4
9°	45 31.8 +15.2 94.5	44 34.6 +15.1 94.1	43 37.4 +15.0 93.7	42 40.1 +14.9 93.4	41 42.8 +14.9 93.1
10°	45 47.0 +14.2 93.1	44 49.7 +14.1 92.7	43 52.4 +14.0 92.4	42 55.0 +14.1 92.1	41 57.7 +14.0 91.8
11°	46 01.2 +13.1 91.7	45 03.8 +13.1 91.4	44 06.4 +13.1 91.1	43 09.1 +13.1 90.8	42 11.7 +13.1 90.4
12°	46 14.3 +12.1 90.3	45 16.9 +12.1 90.0	44 19.5 +12.2 89.7	43 22.2 +12.1 89.4	42 24.8 +12.2 89.1
13°	46 26.4 +11.0 88.9	45 29.0 +11.1 88.6	44 31.7 +11.1 88.3	43 34.3 +11.2 88.1	42 37.0 +11.2 87.8
14°	46 37.4 +10.0 87.4	45 40.1 +10.0 87.2	44 42.8 +10.1 86.9	43 45.5 +10.2 86.7	42 48.2 +10.3 86.5
15°	46 47.4 +08.8 86.0	45 50.1 +09.0 85.8	44 52.9 +09.1 85.6	43 55.7 +09.2 85.3	42 58.5 +09.4 85.1
16°	46 56.2 +07.8 84.5	45 59.1 +07.9 84.4	45 02.0 +08.1 84.2	44 04.9 +08.3 84.0	43 07.9 +08.4 83.8
17°	47 04.0 +06.6 83.1	46 07.0 +06.9 82.9	45 10.1 +07.0 82.8	44 13.2 +07.2 82.6	43 16.3 +07.4 82.4
18°	47 10.6 +05.6 81.6	46 13.9 +05.8 81.5	45 17.1 +06.1 81.3	44 20.4 +06.3 81.2	43 23.7 +06.5 81.0
19°	47 16.2 +04.4 80.2	46 19.7 +04.6 80.1	45 23.2 +04.9 79.9	44 26.7 +05.2 79.8	43 30.2 +05.5 79.7
20°	47 20.6 +03.3 78.7	46 24.3 +03.6 78.6	45 28.1 +03.9 78.5	44 31.9 +04.2 78.4	43 35.7 +04.5 78.3
21°	47 23.9 +02.1 77.2	46 27.9 +02.5 77.2	45 32.0 +02.8 77.1	44 36.1 +03.1 77.0	43 40.2 +03.5 76.9
22°	47 26.0 +01.0 75.7	46 30.4 +01.4 75.7	45 34.8 +01.8 75.7	44 39.2 +02.2 75.6	43 43.7 +02.5 75.5
23°	47 27.0 -00.1 74.3	46 31.8 +00.3 74.3	45 36.6 +00.7 74.2	44 41.4 +01.1 74.2	43 46.2 +01.5 74.2
24°	47 26.9 -01.3 72.8	46 32.1 -00.8 72.8	45 37.3 -00.4 72.8	44 42.5 +00.0 72.8	43 47.7 +00.4 72.8
25°	47 25.6 -02.4 71.3	46 31.3 -02.0 71.3	45 36.9 -01.5 71.4	44 42.5 -01.0 71.4	43 48.1 -00.5 71.4
26°	47 23.2 -03.5 69.8	46 29.3 -03.0 69.9	45 35.4 -02.5 69.9	44 41.5 -02.0 70.0	43 47.6 -01.5 70.0
27°	47 19.7 -04.7 68.4	46 26.3 -04.1 68.4	45 32.9 -03.6 68.5	44 39.5 -03.0 68.6	43 46.1 -02.5 68.6
28°	47 15.0 -05.8 66.9	46 22.2 -05.2 67.0	45 29.3 -04.6 67.1	44 36.5 -04.1 67.2	43 43.6 -03.5 67.2
29°	47 09.2 -06.9 65.4	46 17.0 -06.3 65.6	45 24.7 -05.7 65.7	44 32.4 -05.1 65.8	43 40.1 -04.6 65.9

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Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	37 55.8 +21.9 103.8	37 00.0 +21.7 103.3	36 04.1 +21.4 102.9	35 08.2 +21.1 102.4	34 12.1 +20.9 102.0
1°	38 17.7 +21.2 102.6	37 21.7 +20.9 102.1	36 25.5 +20.7 101.7	35 29.3 +20.5 101.3	34 33.0 +20.2 100.9
2°	38 38.9 +20.4 101.4	37 42.6 +20.2 101.0	36 46.2 +20.0 100.5	35 49.8 +19.8 100.1	34 53.2 +19.6 99.7
3°	38 59.3 +19.7 100.2	38 02.8 +19.5 99.8	37 06.2 +19.3 99.4	36 09.6 +19.1 99.0	35 12.8 +19.0 98.6
4°	39 19.0 +18.9 99.0	38 22.3 +18.7 98.6	37 25.5 +18.6 98.2	36 28.7 +18.4 97.8	35 31.8 +18.3 97.4
5°	39 37.9 +18.1 97.8	38 41.0 +18.0 97.4	37 44.1 +17.8 97.0	36 47.1 +17.7 96.6	35 50.1 +17.5 96.2
6°	39 56.0 +17.3 96.5	38 59.0 +17.2 96.1	38 01.9 +17.1 95.8	37 04.8 +17.0 95.4	36 07.6 +16.9 95.0
7°	40 13.3 +16.5 95.3	39 16.2 +16.4 94.9	38 19.0 +16.3 94.5	37 21.8 +16.2 94.2	36 24.5 +16.2 93.8
8°	40 29.8 +15.7 94.0	39 32.6 +15.6 93.7	38 35.3 +15.5 93.3	37 38.0 +15.5 93.0	36 40.7 +15.4 92.7
9°	40 45.5 +14.8 92.7	39 48.2 +14.8 92.4	38 50.8 +14.8 92.1	37 53.5 +14.7 91.8	36 56.1 +14.7 91.4
10°	41 00.3 +14.0 91.4	40 03.0 +13.9 91.1	39 05.6 +14.0 90.8	38 08.2 +14.0 90.5	37 10.8 +14.0 90.2
11°	41 14.3 +13.1 90.2	40 16.9 +13.1 89.9	39 19.6 +13.1 89.6	38 22.2 +13.1 89.3	37 24.8 +13.2 89.0
12°	41 27.4 +12.2 88.9	40 30.0 +12.3 88.6	39 32.7 +12.3 88.3	38 35.3 +12.4 88.0	37 38.0 +12.4 87.8
13°	41 39.6 +11.4 87.5	40 42.3 +11.4 87.3	39 45.0 +11.5 87.0	38 47.7 +11.6 86.8	37 50.4 +11.7 86.5
14°	41 51.0 +10.4 86.2	40 53.7 +10.5 86.0	39 56.5 +10.6 85.8	38 59.3 +10.7 85.5	38 02.1 +10.8 85.3
15°	42 01.4 +09.5 84.9	41 04.2 +09.7 84.7	40 07.1 +09.8 84.5	39 10.0 +09.9 84.3	38 12.9 +10.1 84.0
16°	42 10.9 +08.5 83.6	41 13.9 +08.7 83.4	40 16.9 +08.9 83.2	39 19.9 +09.1 83.0	38 23.0 +09.2 82.8
17°	42 19.4 +07.7 82.2	41 22.6 +07.8 82.1	40 25.8 +08.0 81.9	39 29.0 +08.2 81.7	38 32.2 +08.5 81.5
18°	42 27.1 +06.7 80.9	41 30.4 +07.0 80.7	40 33.8 +07.2 80.6	39 37.2 +07.4 80.4	38 40.7 +07.6 80.3
19°	42 33.8 +05.7 79.5	41 37.4 +06.0 79.4	40 41.0 +06.2 79.3	39 44.6 +06.5 79.1	38 48.3 +06.7 79.0
20°	42 39.5 +04.8 78.2	41 43.4 +05.0 78.1	40 47.2 +05.4 78.0	39 51.1 +05.7 77.8	38 55.0 +06.0 77.7
21°	42 44.3 +03.8 76.8	41 48.4 +04.2 76.7	40 52.6 +04.5 76.6	39 56.8 +04.8 76.5	39 01.0 +05.1 76.4
22°	42 48.1 +02.9 75.5	41 52.6 +03.2 75.4	40 57.1 +03.5 75.3	40 01.6 +03.9 75.2	39 06.1 +04.2 75.1
23°	42 51.0 +01.8 74.1	41 55.8 +02.3 74.1	41 00.6 +02.7 74.0	40 05.5 +03.0 73.9	39 10.3 +03.5 73.9
24°	42 52.8 +01.0 72.8	41 58.1 +01.3 72.7	41 03.3 +01.7 72.7	40 08.5 +02.2 72.6	39 13.8 +02.5 72.6
25°	42 53.8 -00.1 71.4	41 59.4 +00.4 71.4	41 05.0 +00.8 71.4	40 10.7 +01.2 71.3	39 16.3 +01.7 71.3
26°	42 53.7 -01.0 70.0	41 59.8 -00.6 70.0	41 05.8 +00.0 70.0	40 11.9 +00.4 70.0	39 18.0 +00.8 70.0
27°	42 52.7 -02.0 68.7	41 59.2 -01.5 68.7	41 05.8 -01.0 68.7	40 12.3 -00.5 68.7	39 18.8 +00.0 68.7
28°	42 50.7 -03.0 67.3	41 57.7 -02.4 67.3	41 04.8 -01.9 67.4	40 11.8 -01.4 67.4	39 18.8 -00.8 67.4
29°	42 47.7 -04.0 65.9	41 55.3 -03.4 66.0	41 02.9 -02.9 66.0	40 10.4 -02.3 66.1	39 18.0 -01.8 66.1

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	33 15.9 +20.7 101.6	32 19.7 +20.4 101.2	31 23.3 +20.3 100.8	30 26.9 +20.1 100.4	29 30.4 +19.9 100.0
1°	33 36.6 +20.0 100.4	32 40.1 +19.9 100.0	31 43.6 +19.7 99.6	30 47.0 +19.5 99.3	29 50.3 +19.4 98.9
2°	33 56.6 +19.5 99.3	33 00.0 +19.3 98.9	32 03.3 +19.1 98.5	31 06.5 +19.0 98.2	30 09.7 +18.8 97.8
3°	34 16.1 +18.8 98.2	33 19.3 +18.6 97.8	32 22.4 +18.5 97.4	31 25.5 +18.3 97.0	30 28.5 +18.2 96.7
4°	34 34.9 +18.1 97.0	33 37.9 +18.0 96.6	32 40.9 +17.9 96.3	31 43.8 +17.8 95.9	30 46.7 +17.7 95.6
5°	34 53.0 +17.5 95.9	33 55.9 +17.4 95.5	32 58.8 +17.3 95.1	32 01.6 +17.2 94.8	31 04.4 +17.1 94.5
6°	35 10.5 +16.8 94.7	34 13.3 +16.7 94.3	33 16.1 +16.6 94.0	32 18.8 +16.6 93.7	31 21.5 +16.5 93.3
7°	35 27.3 +16.1 93.5	34 30.0 +16.0 93.2	33 32.7 +16.0 92.9	32 35.4 +15.9 92.5	31 38.0 +16.0 92.2
8°	35 43.4 +15.4 92.3	34 46.0 +15.4 92.0	33 48.7 +15.3 91.7	32 51.3 +15.4 91.4	31 54.0 +15.3 91.1
9°	35 58.8 +14.7 91.1	35 01.4 +14.7 90.8	34 04.0 +14.7 90.5	33 06.7 +14.6 90.2	32 09.3 +14.7 89.9
10°	36 13.5 +13.9 89.9	35 16.1 +14.0 89.6	34 18.7 +14.0 89.4	33 21.3 +14.1 89.1	32 24.0 +14.0 88.8
11°	36 27.4 +13.3 88.7	35 30.1 +13.3 88.5	34 32.7 +13.3 88.2	33 35.4 +13.4 87.9	32 38.0 +13.5 87.6
12°	36 40.7 +12.5 87.5	35 43.4 +12.5 87.3	34 46.0 +12.7 87.0	33 48.8 +12.7 86.7	32 51.5 +12.8 86.5
13°	36 53.2 +11.7 86.3	35 55.9 +11.8 86.0	34 58.7 +11.9 85.8	34 01.5 +12.0 85.6	33 04.3 +12.1 85.3
14°	37 04.9 +11.0 85.1	36 07.7 +11.1 84.8	35 10.6 +11.2 84.6	34 13.5 +11.3 84.4	33 16.4 +11.5 84.1
15°	37 15.9 +10.2 83.8	36 18.8 +10.4 83.6	35 21.8 +10.5 83.4	34 24.8 +10.7 83.2	33 27.9 +10.8 83.0
16°	37 26.1 +09.4 82.6	36 29.2 +09.6 82.4	35 32.3 +09.8 82.2	34 35.5 +09.9 82.0	33 38.7 +10.1 81.8
17°	37 35.5 +08.6 81.3	36 38.8 +08.8 81.2	35 42.1 +09.0 81.0	34 45.4 +09.3 80.8	33 48.8 +09.5 80.6
18°	37 44.1 +07.9 80.1	36 47.6 +08.1 79.9	35 51.1 +08.3 79.8	34 54.7 +08.5 79.6	33 58.3 +08.7 79.4
19°	37 52.0 +07.0 78.8	36 55.7 +07.3 78.7	35 59.4 +07.6 78.5	35 03.2 +07.8 78.4	34 07.0 +08.1 78.2
20°	37 59.0 +06.2 77.6	37 03.0 +06.5 77.4	36 07.0 +06.8 77.3	35 11.0 +07.1 77.2	34 15.1 +07.4 77.0
21°	38 05.2 +05.4 76.3	37 09.5 +05.7 76.2	36 13.8 +06.0 76.1	35 18.1 +06.4 76.0	34 22.5 +06.6 75.8
22°	38 10.6 +04.6 75.1	37 15.2 +05.0 75.0	36 19.8 +05.3 74.8	35 24.5 +05.6 74.7	34 29.1 +06.0 74.6
23°	38 15.2 +03.8 73.8	37 20.2 +04.1 73.7	36 25.1 +04.5 73.6	35 30.1 +04.8 73.5	34 35.1 +05.2 73.4
24°	38 19.0 +03.0 72.5	37 24.3 +03.3 72.4	36 29.6 +03.7 72.4	35 34.9 +04.2 72.3	34 40.3 +04.5 72.2
25°	38 22.0 +02.1 71.2	37 27.6 +02.6 71.2	36 33.3 +03.0 71.1	35 39.1 +03.3 71.1	34 44.8 +03.8 71.0
26°	38 24.1 +01.3 70.0	37 30.2 +01.7 69.9	36 36.3 +02.2 69.9	35 42.4 +02.7 69.8	34 48.6 +03.0 69.8
27°	38 25.4 +00.4 68.7	37 31.9 +01.0 68.7	36 38.5 +01.4 68.6	35 45.1 +01.8 68.6	34 51.6 +02.4 68.6
28°	38 25.8 -00.3 67.4	37 32.9 +00.1 67.4	36 39.9 +00.6 67.4	35 46.9 +01.2 67.4	34 54.0 +01.6 67.3
29°	38 25.5 -01.2 66.1	37 33.0 -00.7 66.1	36 40.5 -00.1 66.1	35 48.1 +00.3 66.1	34 55.6 +00.9 66.1

Declination SAME name as Latitude

Latitude 17°

Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	28 33.9 +19.7 99.6	27 37.3 +19.5 99.2	26 40.6 +19.4 98.8	25 43.9 +19.2 98.5	24 47.1 +19.1 98.1
1°	28 53.6 +19.2 98.5	27 56.8 +19.1 98.1	27 00.0 +18.9 97.8	26 03.1 +18.8 97.4	25 06.2 +18.7 97.1
2°	29 12.8 +18.7 97.4	28 15.9 +18.5 97.1	27 18.9 +18.5 96.7	26 21.9 +18.3 96.4	25 24.9 +18.2 96.0
3°	29 31.5 +18.1 96.3	28 34.4 +18.1 96.0	27 37.4 +17.9 95.6	26 40.2 +17.9 95.3	25 43.1 +17.7 95.0
4°	29 49.6 +17.6 95.2	28 52.5 +17.5 94.9	27 55.3 +17.4 94.6	26 58.1 +17.3 94.2	26 00.8 +17.3 93.9
5°	30 07.2 +17.0 94.1	29 10.0 +16.9 93.8	28 12.7 +16.9 93.5	27 15.4 +16.9 93.2	26 18.1 +16.8 92.8
6°	30 24.2 +16.5 93.0	29 26.9 +16.5 92.7	28 29.6 +16.4 92.4	27 32.3 +16.3 92.1	26 34.9 +16.4 91.8
7°	30 40.7 +15.9 91.9	29 43.4 +15.8 91.6	28 46.0 +15.8 91.3	27 48.6 +15.9 91.0	26 51.3 +15.8 90.7
8°	30 56.6 +15.3 90.8	29 59.2 +15.3 90.5	29 01.8 +15.4 90.2	28 04.5 +15.3 89.9	27 07.1 +15.3 89.6
9°	31 11.9 +14.7 89.7	30 14.5 +14.8 89.4	29 17.2 +14.7 89.1	28 19.8 +14.8 88.8	27 22.4 +14.8 88.5
10°	31 26.6 +14.1 88.5	30 29.3 +14.1 88.2	29 31.9 +14.2 88.0	28 34.6 +14.2 87.7	27 37.2 +14.4 87.4
11°	31 40.7 +13.5 87.4	30 43.4 +13.6 87.1	29 46.1 +13.6 86.8	28 48.8 +13.7 86.6	27 51.6 +13.7 86.3
12°	31 54.2 +12.9 86.2	30 57.0 +12.9 86.0	29 59.7 +13.1 85.7	29 02.5 +13.2 85.5	28 05.3 +13.3 85.2
13°	32 07.1 +12.2 85.1	31 09.9 +12.4 84.8	30 12.8 +12.5 84.6	29 15.7 +12.6 84.4	28 18.6 +12.7 84.1
14°	32 19.3 +11.6 83.9	31 22.3 +11.7 83.7	30 25.3 +11.9 83.5	29 28.3 +12.0 83.2	28 31.3 +12.2 83.0
15°	32 30.9 +11.0 82.8	31 34.0 +11.2 82.5	30 37.2 +11.2 82.3	29 40.3 +11.5 82.1	28 43.5 +11.6 81.9
16°	32 41.9 +10.3 81.6	31 45.2 +10.5 81.4	30 48.4 +10.7 81.2	29 51.8 +10.8 81.0	28 55.1 +11.1 80.8
17°	32 52.2 +09.7 80.4	31 55.7 +09.8 80.2	30 59.1 +10.1 80.0	30 02.6 +10.3 79.8	29 06.2 +10.5 79.6
18°	33 01.9 +09.0 79.2	32 05.5 +09.3 79.1	31 09.2 +09.5 78.9	30 12.9 +09.7 78.7	29 16.7 +09.9 78.5
19°	33 10.9 +08.3 78.1	32 14.8 +08.5 77.9	31 18.7 +08.8 77.7	30 22.6 +09.1 77.6	29 26.6 +09.4 77.4
20°	33 19.2 +07.6 76.9	32 23.3 +08.0 76.7	31 27.5 +08.2 76.6	30 31.7 +08.5 76.4	29 36.0 +08.7 76.3
21°	33 26.8 +07.0 75.7	32 31.3 +07.2 75.6	31 35.7 +07.6 75.4	30 40.2 +07.9 75.3	29 44.7 +08.2 75.1
22°	33 33.8 +06.3 74.5	32 38.5 +06.6 74.4	31 43.3 +06.9 74.2	30 48.1 +07.3 74.1	29 52.9 +07.6 74.0
23°	33 40.1 +05.6 73.3	32 45.1 +06.0 73.2	31 50.2 +06.3 73.1	30 55.4 +06.6 73.0	30 00.5 +07.0 72.8
24°	33 45.7 +04.9 72.1	32 51.1 +05.3 72.0	31 56.5 +05.7 71.9	31 02.0 +06.0 71.8	30 07.5 +06.4 71.7
25°	33 50.6 +04.2 70.9	32 56.4 +04.6 70.8	32 02.2 +05.0 70.7	31 08.0 +05.4 70.6	30 13.9 +05.8 70.5
26°	33 54.8 +03.5 69.7	33 01.0 +03.9 69.6	32 07.2 +04.3 69.6	31 13.4 +04.8 69.5	30 19.7 +05.2 69.4
27°	33 58.3 +02.7 68.5	33 04.9 +03.2 68.4	32 11.5 +03.7 68.4	31 18.2 +04.1 68.3	30 24.9 +04.6 68.2
28°	34 01.0 +02.1 67.3	33 08.1 +02.6 67.3	32 15.2 +03.0 67.2	31 22.3 +03.5 67.1	30 29.5 +03.9 67.1
29°	34 03.1 +01.4 66.1	33 10.7 +01.9 66.1	32 18.2 +02.4 66.0	31 25.8 +02.9 66.0	30 33.4 +03.4 65.9

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	23 50.3 +18.9 97.8	22 53.4 +18.8 97.4	21 56.5 +18.7 97.1	20 59.5 +18.6 96.7	20 02.5 +18.5 96.4
1°	24 09.2 +18.6 96.7	23 12.2 +18.5 96.4	22 15.2 +18.3 96.0	21 18.1 +18.3 95.7	20 21.0 +18.2 95.4
2°	24 27.8 +18.1 95.7	23 30.7 +18.0 95.3	22 33.5 +18.0 95.0	21 36.4 +17.8 94.7	20 39.2 +17.8 94.4
3°	24 45.9 +17.7 94.6	23 48.7 +17.6 94.3	22 51.5 +17.5 94.0	21 54.2 +17.5 93.7	20 57.0 +17.4 93.4
4°	25 03.6 +17.2 93.6	24 06.3 +17.2 93.3	23 09.0 +17.1 92.9	22 11.7 +17.1 92.6	21 14.4 +17.0 92.3
5°	25 20.8 +16.8 92.5	24 23.5 +16.7 92.2	23 26.1 +16.7 91.9	22 28.8 +16.7 91.6	21 31.4 +16.7 91.3
6°	25 37.6 +16.3 91.5	24 40.2 +16.3 91.2	23 42.8 +16.3 90.9	22 45.5 +16.2 90.6	21 48.1 +16.3 90.3
7°	25 53.9 +15.8 90.4	24 56.5 +15.8 90.1	23 59.1 +15.9 89.8	23 01.7 +15.9 89.5	22 04.4 +15.9 89.2
8°	26 09.7 +15.4 89.3	25 12.3 +15.4 89.0	24 15.0 +15.4 88.7	23 17.6 +15.5 88.5	22 20.3 +15.4 88.2
9°	26 25.1 +14.8 88.2	25 27.7 +14.9 88.0	24 30.4 +14.9 87.7	23 33.1 +15.0 87.4	22 35.7 +15.1 87.1
10°	26 39.9 +14.4 87.2	25 42.6 +14.5 86.9	24 45.3 +14.6 86.6	23 48.1 +14.6 86.4	22 50.8 +14.7 86.1
11°	26 54.3 +13.9 86.1	25 57.1 +13.9 85.8	24 59.9 +14.0 85.5	24 02.7 +14.1 85.3	23 05.5 +14.2 85.0
12°	27 08.2 +13.3 85.0	26 11.0 +13.5 84.7	25 13.9 +13.6 84.5	24 16.8 +13.7 84.2	23 19.7 +13.8 84.0
13°	27 21.5 +12.9 83.9	26 24.5 +13.0 83.6	25 27.5 +13.1 83.4	24 30.5 +13.2 83.2	23 33.5 +13.4 82.9
14°	27 34.4 +12.3 82.8	26 37.5 +12.4 82.5	25 40.6 +12.6 82.3	24 43.7 +12.8 82.1	23 46.9 +13.0 81.9
15°	27 46.7 +11.8 81.7	26 49.9 +12.0 81.5	25 53.2 +12.2 81.2	24 56.5 +12.3 81.0	23 59.9 +12.5 80.8
16°	27 58.5 +11.2 80.6	27 01.9 +11.5 80.4	26 05.4 +11.6 80.1	25 08.8 +11.9 79.9	24 12.4 +12.0 79.7
17°	28 09.7 +10.8 79.4	27 13.4 +10.9 79.2	26 17.0 +11.2 79.0	25 20.7 +11.4 78.8	24 24.4 +11.6 78.6
18°	28 20.5 +10.1 78.3	27 24.3 +10.4 78.1	26 28.2 +10.6 78.0	25 32.1 +10.8 77.8	24 36.0 +11.1 77.6
19°	28 30.6 +09.6 77.2	27 34.7 +09.9 77.0	26 38.8 +10.1 76.9	25 42.9 +10.4 76.7	24 47.1 +10.7 76.5
20°	28 40.2 +09.1 76.1	27 44.6 +09.3 75.9	26 48.9 +09.7 75.7	25 53.3 +10.0 75.6	24 57.8 +10.2 75.4
21°	28 49.3 +08.5 75.0	27 53.9 +08.8 74.8	26 58.6 +09.1 74.6	26 03.3 +09.4 74.5	25 08.0 +09.7 74.3
22°	28 57.8 +07.9 73.8	28 02.7 +08.3 73.7	27 07.7 +08.5 73.5	26 12.7 +08.9 73.4	25 17.7 +09.2 73.2
23°	29 05.7 +07.4 72.7	28 11.0 +07.7 72.6	27 16.2 +08.1 72.4	26 21.6 +08.4 72.3	25 26.9 +08.8 72.1
24°	29 13.1 +06.7 71.6	28 18.7 +07.1 71.4	27 24.3 +07.5 71.3	26 30.0 +07.8 71.2	25 35.7 +08.2 71.0
25°	29 19.8 +06.2 70.4	28 25.8 +06.6 70.3	27 31.8 +07.0 70.2	26 37.8 +07.4 70.1	25 43.9 +07.8 69.9
26°	29 26.0 +05.6 69.3	28 32.4 +06.0 69.2	27 38.8 +06.4 69.1	26 45.2 +06.8 68.9	25 51.7 +07.2 68.8
27°	29 31.6 +05.0 68.1	28 38.4 +05.4 68.0	27 45.2 +05.9 67.9	26 52.0 +06.4 67.8	25 58.9 +06.8 67.7
28°	29 36.6 +04.5 67.0	28 43.8 +04.9 66.9	27 51.1 +05.3 66.8	26 58.4 +05.8 66.7	26 05.7 +06.2 66.6
29°	29 41.1 +03.8 65.8	28 48.7 +04.3 65.8	27 56.4 +04.8 65.7	27 04.2 +05.2 65.6	26 11.9 +05.8 65.5

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Latitude 17°

Declination SAME name as Latitude

Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	19 05.5 +18.4 96.1	18 08.4 +18.3 95.7	17 11.3 +18.2 95.4	16 14.2 +18.1 95.1	15 17.0 +18.1 94.8
1°	19 23.9 +18.0 95.1	18 26.7 +18.0 94.7	17 29.5 +17.9 94.4	16 32.3 +17.8 94.1	15 35.1 +17.7 93.8
2°	19 41.9 +17.8 94.1	18 44.7 +17.7 93.7	17 47.4 +17.6 93.4	16 50.1 +17.6 93.1	15 52.8 +17.6 92.8
3°	19 59.7 +17.3 93.0	19 02.4 +17.3 92.7	18 05.0 +17.3 92.4	17 07.7 +17.3 92.1	16 10.4 +17.2 91.8
4°	20 17.0 +17.1 92.0	19 19.7 +17.0 91.7	18 22.3 +17.0 91.4	17 25.0 +16.9 91.1	16 27.6 +17.0 90.8
5°	20 34.1 +16.6 91.0	19 36.7 +16.6 90.7	18 39.3 +16.7 90.4	17 41.9 +16.7 90.1	16 44.6 +16.6 89.8
6°	20 50.7 +16.3 90.0	19 53.3 +16.3 89.7	18 56.0 +16.3 89.4	17 58.6 +16.3 89.1	17 01.2 +16.4 88.8
7°	21 07.0 +15.9 88.9	20 09.6 +16.0 88.7	19 12.3 +16.0 88.4	18 14.9 +16.0 88.1	17 17.6 +16.1 87.8
8°	21 22.9 +15.5 87.9	20 25.6 +15.6 87.6	19 28.3 +15.6 87.3	18 30.9 +15.7 87.1	17 33.7 +15.7 86.8
9°	21 38.4 +15.2 86.9	20 41.2 +15.2 86.6	19 43.9 +15.3 86.3	18 46.6 +15.4 86.1	17 49.4 +15.5 85.8
10°	21 53.6 +14.7 85.8	20 56.4 +14.8 85.6	19 59.2 +14.9 85.3	19 02.0 +15.0 85.0	18 04.9 +15.1 84.8
11°	22 08.3 +14.4 84.8	21 11.2 +14.5 84.5	20 14.1 +14.6 84.3	19 17.0 +14.7 84.0	18 20.0 +14.8 83.7
12°	22 22.7 +13.9 83.7	21 25.7 +14.0 83.5	20 28.7 +14.2 83.2	19 31.7 +14.3 83.0	18 34.8 +14.4 82.7
13°	22 36.6 +13.5 82.7	21 39.7 +13.7 82.4	20 42.9 +13.8 82.2	19 46.0 +14.0 81.9	18 49.2 +14.2 81.7
14°	22 50.1 +13.2 81.6	21 53.4 +13.3 81.4	20 56.7 +13.4 81.1	20 00.0 +13.6 80.9	19 03.4 +13.8 80.7
15°	23 03.3 +12.6 80.6	22 06.7 +12.8 80.3	21 10.1 +13.1 80.1	20 13.6 +13.3 79.9	19 17.2 +13.4 79.6
16°	23 15.9 +12.3 79.5	22 19.5 +12.5 79.3	21 23.2 +12.6 79.1	20 26.9 +12.8 78.8	19 30.6 +13.1 78.6
17°	23 28.2 +11.8 78.4	22 32.0 +12.0 78.2	21 35.8 +12.3 78.0	20 39.7 +12.5 77.8	19 43.7 +12.7 77.6
18°	23 40.0 +11.4 77.4	22 44.0 +11.7 77.2	21 48.1 +11.9 77.0	20 52.2 +12.2 76.7	19 56.4 +12.4 76.5
19°	23 51.4 +10.9 76.3	22 55.7 +11.1 76.1	22 00.0 +11.4 75.9	21 04.4 +11.7 75.7	20 08.8 +12.0 75.5
20°	24 02.3 +10.5 75.2	23 06.8 +10.8 75.0	22 11.4 +11.1 74.8	21 16.1 +11.3 74.6	20 20.8 +11.6 74.5
21°	24 12.8 +10.0 74.1	23 17.6 +10.3 74.0	22 22.5 +10.6 73.8	21 27.4 +11.0 73.6	20 32.4 +11.3 73.4
22°	24 22.8 +09.5 73.1	23 27.9 +09.9 72.9	22 33.1 +10.2 72.7	21 38.4 +10.5 72.5	20 43.7 +10.8 72.4
23°	24 32.3 +09.1 72.0	23 37.8 +09.4 71.8	22 43.3 +09.8 71.6	21 48.9 +10.1 71.5	20 54.5 +10.5 71.3
24°	24 41.4 +08.6 70.9	23 47.2 +09.0 70.7	22 53.1 +09.4 70.6	21 59.0 +09.7 70.4	21 05.0 +10.1 70.2
25°	24 50.0 +08.2 69.8	23 56.2 +08.6 69.6	23 02.5 +08.9 69.5	22 08.7 +09.3 69.3	21 15.1 +09.7 69.2
26°	24 58.2 +07.7 68.7	24 04.8 +08.0 68.6	23 11.4 +08.4 68.4	22 18.0 +08.9 68.3	21 24.8 +09.3 68.1
27°	25 05.9 +07.1 67.6	24 12.8 +07.6 67.5	23 19.8 +08.1 67.3	22 26.9 +08.5 67.2	21 34.1 +08.8 67.1
28°	25 13.0 +06.7 66.5	24 20.4 +07.2 66.4	23 27.9 +07.6 66.3	22 35.4 +08.0 66.1	21 42.9 +08.5 66.0
29°	25 19.7 +06.2 65.4	24 27.6 +06.6 65.3	23 35.5 +07.1 65.2	22 43.4 +07.6 65.1	21 51.4 +08.1 64.9

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 19.8 +18.0 94.5	13 22.6 +17.9 94.2	12 25.4 +17.8 93.9	11 28.1 +17.8 93.6	10 30.8 +17.8 93.3
1°	14 37.8 +17.7 93.5	13 40.5 +17.7 93.2	12 43.2 +17.7 92.9	11 45.9 +17.6 92.6	10 48.6 +17.5 92.3
2°	14 55.5 +17.5 92.5	13 58.2 +17.4 92.2	13 00.9 +17.4 91.9	12 03.5 +17.4 91.6	11 06.1 +17.4 91.3
3°	15 13.0 +17.2 91.5	14 15.6 +17.2 91.2	13 18.3 +17.2 90.9	12 20.9 +17.2 90.6	11 23.5 +17.2 90.3
4°	15 30.2 +17.0 90.5	14 32.8 +17.0 90.2	13 35.5 +16.9 89.9	12 38.1 +17.0 89.6	11 40.7 +17.0 89.4
5°	15 47.2 +16.7 89.5	14 49.8 +16.7 89.2	13 52.4 +16.8 88.9	12 55.1 +16.7 88.7	11 57.7 +16.8 88.4
6°	16 03.9 +16.4 88.5	15 06.5 +16.4 88.2	14 09.2 +16.4 88.0	13 11.8 +16.5 87.7	12 14.5 +16.6 87.4
7°	16 20.3 +16.1 87.5	15 22.9 +16.2 87.2	14 25.6 +16.3 87.0	13 28.3 +16.3 86.7	12 31.1 +16.3 86.4
8°	16 36.4 +15.8 86.5	15 39.1 +15.9 86.2	14 41.9 +15.9 86.0	13 44.6 +16.1 85.7	12 47.4 +16.2 85.4
9°	16 52.2 +15.5 85.5	15 55.0 +15.6 85.2	14 57.8 +15.7 85.0	14 00.7 +15.8 84.7	13 03.6 +15.9 84.4
10°	17 07.7 +15.3 84.5	16 10.6 +15.4 84.2	15 13.5 +15.5 84.0	14 16.5 +15.6 83.7	13 19.5 +15.7 83.4
11°	17 23.0 +14.9 83.5	16 26.0 +15.0 83.2	15 29.0 +15.2 83.0	14 32.1 +15.3 82.7	13 35.2 +15.4 82.5
12°	17 37.9 +14.6 82.5	16 41.0 +14.8 82.2	15 44.2 +14.9 82.0	14 47.4 +15.0 81.7	13 50.6 +15.2 81.5
13°	17 52.5 +14.3 81.5	16 55.8 +14.4 81.2	15 59.1 +14.6 81.0	15 02.4 +14.8 80.7	14 05.8 +15.0 80.5
14°	18 06.8 +13.9 80.4	17 10.2 +14.2 80.2	16 13.7 +14.3 80.0	15 17.2 +14.5 79.7	14 20.8 +14.7 79.5
15°	18 20.7 +13.7 79.4	17 24.4 +13.8 79.2	16 28.0 +14.1 78.9	15 31.7 +14.3 78.7	14 35.5 +14.4 78.5
16°	18 34.4 +13.3 78.4	17 38.2 +13.5 78.2	16 42.1 +13.7 77.9	15 46.0 +13.9 77.7	14 49.9 +14.2 77.5
17°	18 47.7 +12.9 77.4	17 51.7 +13.2 77.1	16 55.8 +13.4 76.9	15 59.9 +13.7 76.7	15 04.1 +14.0 76.4
18°	19 00.6 +12.7 76.3	18 04.9 +12.9 76.1	17 09.2 +13.2 75.9	16 13.6 +13.4 75.7	15 18.1 +13.6 75.4
19°	19 13.3 +12.2 75.3	18 17.8 +12.5 75.1	17 22.4 +12.8 74.9	16 27.0 +13.1 74.7	15 31.7 +13.4 74.4
20°	19 25.5 +11.9 74.3	18 30.3 +12.2 74.0	17 35.2 +12.5 73.8	16 40.1 +12.8 73.6	15 45.1 +13.1 73.4
21°	19 37.4 +11.6 73.2	18 42.5 +11.9 73.0	17 47.7 +12.2 72.8	16 52.9 +12.5 72.6	15 58.2 +12.8 72.4
22°	19 49.0 +11.2 72.2	18 54.4 +11.5 72.0	17 59.9 +11.8 71.8	17 05.4 +12.2 71.6	16 11.0 +12.5 71.4
23°	20 00.2 +10.8 71.1	19 05.9 +11.2 70.9	18 11.7 +11.5 70.8	17 17.6 +11.9 70.6	16 23.5 +12.2 70.4
24°	20 11.0 +10.5 70.1	19 17.1 +10.8 69.9	18 23.2 +11.2 69.7	17 29.5 +11.5 69.5	16 35.7 +12.0 69.3
25°	20 21.5 +10.0 69.0	19 27.9 +10.5 68.9	18 34.4 +10.9 68.7	17 41.0 +11.2 68.5	16 47.7 +11.6 68.3
26°	20 31.5 +09.7 68.0	19 38.4 +10.1 67.8	18 45.3 +10.5 67.6	17 52.2 +11.0 67.5	16 59.3 +11.3 67.3
27°	20 41.2 +09.3 66.9	19 48.5 +09.7 66.8	18 55.8 +10.1 66.6	18 03.2 +10.5 66.4	17 10.6 +11.0 66.3
28°	20 50.5 +09.0 65.9	19 58.2 +09.4 65.7	19 05.9 +09.8 65.6	18 13.7 +10.3 65.4	17 21.6 +10.7 65.2
29°	20 59.5 +08.5 64.8	20 07.6 +09.0 64.7	19 15.7 +09.5 64.5	18 24.0 +09.9 64.4	17 32.3 +10.3 64.2

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Declination SAME name as Latitude

Latitude 17°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 33.5 +17.7 93.0	8 36.2 +17.7 92.7	7 38.9 +17.6 92.4	6 41.6 +17.6 92.1	5 44.2 +17.6 91.8
1°	9 51.2 +17.6 92.0	8 53.9 +17.5 91.7	7 56.5 +17.5 91.4	6 59.2 +17.5 91.1	6 01.8 +17.5 90.8
2°	10 08.8 +17.4 91.0	9 11.4 +17.4 90.7	8 14.0 +17.4 90.4	7 16.7 +17.3 90.1	6 19.3 +17.4 89.8
3°	10 26.2 +17.1 90.0	9 28.8 +17.2 89.7	8 31.4 +17.2 89.5	7 34.0 +17.3 89.2	6 36.7 +17.2 88.9
4°	10 43.3 +17.1 89.1	9 46.0 +17.0 88.8	8 48.6 +17.1 88.5	7 51.3 +17.1 88.2	6 53.9 +17.2 87.9
5°	11 00.4 +16.8 88.1	10 03.0 +16.9 87.8	9 05.7 +16.9 87.5	8 08.4 +16.9 87.2	7 11.1 +17.0 86.9
6°	11 17.2 +16.6 87.1	10 19.9 +16.7 86.8	9 22.6 +16.8 86.5	8 25.3 +16.9 86.3	7 28.1 +16.9 86.0
7°	11 33.8 +16.4 86.1	10 36.6 +16.5 85.8	9 39.4 +16.5 85.6	8 42.2 +16.6 85.3	7 45.0 +16.8 85.0
8°	11 50.2 +16.3 85.1	10 53.1 +16.3 84.9	9 55.9 +16.5 84.6	8 58.8 +16.6 84.3	8 01.8 +16.6 84.0
9°	12 06.5 +16.0 84.2	11 09.4 +16.1 83.9	10 12.4 +16.2 83.6	9 15.4 +16.3 83.3	8 18.4 +16.5 83.1
10°	12 22.5 +15.8 83.2	11 25.5 +16.0 82.9	10 28.6 +16.1 82.6	9 31.7 +16.2 82.4	8 34.9 +16.3 82.1
11°	12 38.3 +15.6 82.2	11 41.5 +15.7 81.9	10 44.7 +15.9 81.7	9 47.9 +16.1 81.4	8 51.2 +16.2 81.1
12°	12 53.9 +15.4 81.2	11 57.2 +15.5 80.9	11 00.6 +15.7 80.7	10 04.0 +15.8 80.4	9 07.4 +16.1 80.1
13°	13 09.3 +15.1 80.2	12 12.7 +15.4 80.0	11 16.3 +15.5 79.7	10 19.8 +15.7 79.4	9 23.5 +15.8 79.2
14°	13 24.4 +14.9 79.2	12 28.1 +15.1 79.0	11 31.8 +15.3 78.7	10 35.5 +15.5 78.5	9 39.3 +15.7 78.2
15°	13 39.3 +14.7 78.2	12 43.2 +14.8 78.0	11 47.1 +15.1 77.7	10 51.0 +15.3 77.5	9 55.0 +15.6 77.2
16°	13 54.0 +14.4 77.2	12 58.0 +14.7 77.0	12 02.2 +14.8 76.7	11 06.3 +15.2 76.5	10 10.6 +15.3 76.2
17°	14 08.4 +14.1 76.2	13 12.7 +14.4 76.0	12 17.0 +14.7 75.7	11 21.5 +14.9 75.5	10 25.9 +15.2 75.3
18°	14 22.5 +14.0 75.2	13 27.1 +14.2 75.0	12 31.7 +14.5 74.7	11 36.4 +14.7 74.5	10 41.1 +15.0 74.3
19°	14 36.5 +13.6 74.2	13 41.3 +13.9 74.0	12 46.2 +14.2 73.8	11 51.1 +14.5 73.5	10 56.1 +14.8 73.3
20°	14 50.1 +13.4 73.2	13 55.2 +13.7 73.0	13 00.4 +14.0 72.8	12 05.6 +14.3 72.5	11 10.9 +14.6 72.3
21°	15 03.5 +13.1 72.2	14 08.9 +13.5 72.0	13 14.4 +13.8 71.8	12 19.9 +14.1 71.5	11 25.5 +14.5 71.3
22°	15 16.6 +12.9 71.2	14 22.4 +13.2 71.0	13 28.2 +13.5 70.8	12 34.0 +13.9 70.5	11 40.0 +14.2 70.3
23°	15 29.5 +12.6 70.2	14 35.6 +12.9 70.0	13 41.7 +13.3 69.8	12 47.9 +13.6 69.5	11 54.2 +14.0 69.3
24°	15 42.1 +12.3 69.2	14 48.5 +12.7 69.0	13 55.0 +13.0 68.8	13 01.5 +13.5 68.5	12 08.2 +13.8 68.3
25°	15 54.4 +12.0 68.1	15 01.2 +12.4 67.9	14 08.0 +12.8 67.7	13 15.0 +13.1 67.5	12 22.0 +13.5 67.3
26°	16 06.4 +11.7 67.1	15 13.6 +12.1 66.9	14 20.8 +12.5 66.7	13 28.1 +13.0 66.5	12 35.5 +13.4 66.3
27°	16 18.1 +11.4 66.1	15 25.7 +11.8 65.9	14 33.3 +12.3 65.7	13 41.1 +12.7 65.5	12 48.9 +13.1 65.3
28°	16 29.5 +11.2 65.1	15 37.5 +11.6 64.9	14 45.6 +12.0 64.7	13 53.8 +12.4 64.5	13 02.0 +12.9 64.3
29°	16 40.7 +10.8 64.0	15 49.1 +11.3 63.9	14 57.6 +11.8 63.7	14 06.2 +12.2 63.5	13 14.9 +12.7 63.3

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 46.9 +17.5 91.5	3 49.5 +17.5 91.2	2 52.1 +17.6 90.9	1 54.8 +17.5 90.6	0 57.4 +17.5 90.3
1°	5 04.4 +17.5 90.5	4 07.0 +17.5 90.2	3 09.7 +17.5 89.9	2 12.3 +17.5 89.6	1 14.9 +17.5 89.3
2°	5 21.9 +17.4 89.5	4 24.5 +17.4 89.3	3 27.2 +17.4 89.0	2 29.8 +17.4 88.7	1 32.4 +17.5 88.4
3°	5 39.3 +17.3 88.6	4 41.9 +17.4 88.3	3 44.6 +17.3 88.0	2 47.2 +17.5 87.7	1 49.9 +17.5 87.4
4°	5 56.6 +17.2 87.6	4 59.3 +17.2 87.3	4 01.9 +17.3 87.0	3 04.7 +17.3 86.8	2 07.4 +17.4 86.5
5°	6 13.8 +17.1 86.7	5 16.5 +17.2 86.4	4 19.2 +17.3 86.1	3 22.0 +17.3 85.8	2 24.8 +17.4 85.5
6°	6 30.9 +16.9 85.7	5 33.7 +17.0 85.4	4 36.5 +17.1 85.1	3 39.3 +17.3 84.8	2 42.2 +17.3 84.5
7°	6 47.8 +16.9 84.7	5 50.7 +17.0 84.4	4 53.6 +17.1 84.2	3 56.6 +17.1 83.9	2 59.5 +17.3 83.6
8°	7 04.7 +16.7 83.8	6 07.7 +16.8 83.5	5 10.7 +17.0 83.2	4 13.7 +17.1 82.9	3 16.8 +17.2 82.6
9°	7 21.4 +16.7 82.8	6 24.5 +16.8 82.5	5 27.7 +16.9 82.2	4 30.8 +17.1 82.0	3 34.0 +17.2 81.7
10°	7 38.1 +16.5 81.8	6 41.3 +16.6 81.5	5 44.6 +16.7 81.3	4 47.9 +16.9 81.0	3 51.2 +17.1 80.7
11°	7 54.6 +16.3 80.9	6 57.9 +16.5 80.6	6 01.3 +16.7 80.3	5 04.8 +16.9 80.0	4 08.3 +17.1 79.8
12°	8 10.9 +16.2 79.9	7 14.4 +16.4 79.6	6 18.0 +16.6 79.3	5 21.7 +16.7 79.1	4 25.4 +16.9 78.8
13°	8 27.1 +16.1 78.9	7 30.8 +16.3 78.6	6 34.6 +16.5 78.4	5 38.4 +16.7 78.1	4 42.3 +16.9 77.8
14°	8 43.2 +15.9 77.9	7 47.1 +16.1 77.7	6 51.1 +16.3 77.4	5 55.1 +16.6 77.1	4 59.2 +16.8 76.9
15°	8 59.1 +15.8 77.0	8 03.2 +16.0 76.7	7 07.4 +16.3 76.4	6 11.7 +16.5 76.2	5 16.0 +16.7 75.9
16°	9 14.9 +15.6 76.0	8 19.2 +15.9 75.7	7 23.7 +16.1 75.5	6 28.2 +16.3 75.2	5 32.7 +16.6 74.9
17°	9 30.5 +15.4 75.0	8 35.1 +15.7 74.7	7 39.8 +15.9 74.5	6 44.5 +16.3 74.2	5 49.3 +16.6 74.0
18°	9 45.9 +15.3 74.0	8 50.8 +15.6 73.8	7 55.7 +15.9 73.5	7 00.8 +16.1 73.3	6 05.9 +16.4 73.0
19°	10 01.2 +15.1 73.0	9 06.4 +15.4 72.8	8 11.6 +15.7 72.5	7 16.9 +16.0 72.3	6 22.3 +16.3 72.0
20°	10 16.3 +14.9 72.1	9 21.8 +15.2 71.8	8 27.3 +15.5 71.6	7 32.9 +15.9 71.3	6 38.6 +16.2 71.1
21°	10 31.2 +14.8 71.1	9 37.0 +15.1 70.8	8 42.8 +15.4 70.6	7 48.8 +15.7 70.3	6 54.8 +16.0 70.1
22°	10 46.0 +14.5 70.1	9 52.1 +14.9 69.9	8 58.2 +15.3 69.6	8 04.5 +15.6 69.4	7 10.8 +16.0 69.1
23°	11 00.5 +14.4 69.1	10 07.0 +14.7 68.9	9 13.5 +15.1 68.6	8 20.1 +15.5 68.4	7 26.8 +15.8 68.2
24°	11 14.9 +14.2 68.1	10 21.7 +14.5 67.9	9 28.6 +14.9 67.7	8 35.6 +15.3 67.4	7 42.6 +15.7 67.2
25°	11 29.1 +13.9 67.1	10 36.2 +14.4 66.9	9 43.5 +14.8 66.7	8 50.9 +15.1 66.4	7 58.3 +15.6 66.2
26°	11 43.0 +13.8 66.1	10 50.6 +14.2 65.9	9 58.3 +14.5 65.7	9 06.0 +15.0 65.5	8 13.9 +15.4 65.2
27°	11 56.8 +13.5 65.1	11 04.8 +14.0 64.9	10 12.8 +14.5 64.7	9 21.0 +14.9 64.5	8 29.3 +15.3 64.3
28°	12 10.3 +13.4 64.1	11 18.8 +13.7 63.9	10 27.3 +14.2 63.7	9 35.9 +14.6 63.5	8 44.6 +15.1 63.3
29°	12 23.7 +13.1 63.1	11 32.5 +13.6 62.9	10 41.5 +14.0 62.7	9 50.5 +14.5 62.5	8 59.7 +14.9 62.3

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Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +17.5 90.0	-0 57.4 +17.6	-1 54.8 +17.6	-2 52.1 +17.6	-3 49.5 +17.6
1°	0 17.5 +17.6 89.0	-0 39.8 +17.5	-1 37.2 +17.6	-2 34.5 +17.6	-3 31.9 +17.7
2°	0 35.1 +17.5 88.1	-0 22.3 +17.6	-1 19.6 +17.6	-2 16.9 +17.7	-3 14.2 +17.7
3°	0 52.6 +17.5 87.1	-0 04.7 +17.6	-1 02.0 +17.7	-1 59.2 +17.7	-2 56.5 +17.8
4°	1 10.1 +17.5 86.2	0 12.9 +17.5 85.9	-0 44.3 +17.6	-1 41.5 +17.7	-2 38.7 +17.8
5°	1 27.6 +17.5 85.2	0 30.4 +17.6 84.9	-0 26.7 +17.7	-1 23.8 +17.7	-2 20.9 +17.9
6°	1 45.1 +17.4 84.3	0 48.0 +17.5 84.0	-0 09.0 +17.6	-1 06.1 +17.8	-2 03.0 +17.9
7°	2 02.5 +17.4 83.3	1 05.5 +17.6 83.0	0 08.6 +17.7 82.7	-0 48.3 +17.8	-1 45.1 +17.9
8°	2 19.9 +17.4 82.3	1 23.1 +17.5 82.1	0 26.3 +17.6 81.8	-0 30.5 +17.8	-1 27.2 +17.9
9°	2 37.3 +17.3 81.4	1 40.6 +17.5 81.1	0 43.9 +17.6 80.8	-0 12.7 +17.8	-1 09.3 +18.0
10°	2 54.6 +17.3 80.4	1 58.1 +17.4 80.1	1 01.5 +17.7 79.9	0 05.1 +17.8 79.6	-0 51.3 +18.0
11°	3 11.9 +17.2 79.5	2 15.5 +17.4 79.2	1 19.2 +17.6 78.9	0 22.9 +17.8 78.6	-0 33.3 +18.0
12°	3 29.1 +17.2 78.5	2 32.9 +17.4 78.2	1 36.8 +17.5 77.9	0 40.7 +17.8 77.7	-0 15.3 +17.9
13°	3 46.3 +17.1 77.5	2 50.3 +17.3 77.3	1 54.3 +17.6 77.0	0 58.5 +17.7 76.7	0 02.6 +18.0 76.4
14°	4 03.4 +17.0 76.6	3 07.6 +17.2 76.3	2 11.9 +17.5 76.0	1 16.2 +17.8 75.7	0 20.6 +18.0 75.5
15°	4 20.4 +16.9 75.6	3 24.8 +17.2 75.4	2 29.4 +17.4 75.1	1 34.0 +17.7 74.8	0 38.6 +18.0 74.5
16°	4 37.3 +16.9 74.7	3 42.0 +17.2 74.4	2 46.8 +17.4 74.1	1 51.7 +17.7 73.8	0 56.6 +18.0 73.5
17°	4 54.2 +16.8 73.7	3 59.2 +17.1 73.4	3 04.2 +17.4 73.2	2 09.4 +17.6 72.9	1 14.6 +17.9 72.6
18°	5 11.0 +16.7 72.7	4 16.3 +17.0 72.5	3 21.6 +17.3 72.2	2 27.0 +17.6 71.9	1 32.5 +17.9 71.6
19°	5 27.7 +16.6 71.8	4 33.3 +16.9 71.5	3 38.9 +17.2 71.2	2 44.6 +17.6 71.0	1 50.4 +17.9 70.7
20°	5 44.3 +16.6 70.8	4 50.2 +16.8 70.5	3 56.1 +17.2 70.3	3 02.2 +17.5 70.0	2 08.3 +17.8 69.7
21°	6 00.9 +16.4 69.8	5 07.0 +16.8 69.6	4 13.3 +17.1 69.3	3 19.7 +17.4 69.0	2 26.1 +17.9 68.8
22°	6 17.3 +16.3 68.9	5 23.8 +16.7 68.6	4 30.4 +17.0 68.4	3 37.1 +17.4 68.1	2 44.0 +17.7 67.8
23°	6 33.6 +16.2 67.9	5 40.5 +16.5 67.7	4 47.4 +17.0 67.4	3 54.5 +17.4 67.1	3 01.7 +17.7 66.9
24°	6 49.8 +16.1 66.9	5 57.0 +16.5 66.7	5 04.4 +16.9 66.4	4 11.9 +17.2 66.2	3 19.4 +17.7 65.9
25°	7 05.9 +15.9 66.0	6 13.5 +16.4 65.7	5 21.3 +16.7 65.5	4 29.1 +17.2 65.2	3 37.1 +17.6 64.9
26°	7 21.8 +15.9 65.0	6 29.9 +16.2 64.8	5 38.0 +16.7 64.5	4 46.3 +17.1 64.2	3 54.7 +17.5 64.0
27°	7 37.7 +15.7 64.0	6 46.1 +16.2 63.8	5 54.7 +16.6 63.5	5 03.4 +17.0 63.3	4 12.2 +17.5 63.0
28°	7 53.4 +15.5 63.0	7 02.3 +16.0 62.8	6 11.3 +16.5 62.6	5 20.4 +16.9 62.3	4 29.7 +17.3 62.1
29°	8 08.9 +15.5 62.1	7 18.3 +15.9 61.8	6 27.8 +16.3 61.6	5 37.3 +16.9 61.4	4 47.0 +17.3 61.1

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 46.9 +17.7	-5 44.2 +17.7	-6 41.6 +17.8	-7 38.9 +17.8	-8 36.2 +17.8
1°	-4 29.2 +17.7	-5 26.5 +17.7	-6 23.8 +17.8	-7 21.1 +17.9	-8 18.4 +17.9
2°	-4 11.5 +17.8	-5 08.8 +17.9	-6 06.0 +17.9	-7 03.2 +18.0	-8 00.5 +18.1
3°	-3 53.7 +17.8	-4 50.9 +17.9	-5 48.1 +18.0	-6 45.2 +18.1	-7 42.4 +18.2
4°	-3 35.9 +18.0	-4 33.0 +18.0	-5 30.1 +18.1	-6 27.1 +18.2	-7 24.2 +18.4
5°	-3 17.9 +17.9	-4 15.0 +18.1	-5 12.0 +18.2	-6 08.9 +18.3	-7 05.8 +18.4
6°	-3 00.0 +18.0	-3 56.9 +18.2	-4 53.8 +18.3	-5 50.6 +18.4	-6 47.4 +18.6
7°	-2 42.0 +18.1	-3 38.7 +18.2	-4 35.5 +18.4	-5 32.2 +18.6	-6 28.8 +18.7
8°	-2 23.9 +18.1	-3 20.5 +18.2	-4 17.1 +18.4	-5 13.6 +18.6	-6 10.1 +18.8
9°	-2 05.8 +18.1	-3 02.3 +18.4	-3 58.7 +18.5	-4 55.0 +18.7	-5 51.3 +18.8
10°	-1 47.7 +18.2	-2 43.9 +18.3	-3 40.2 +18.6	-4 36.3 +18.7	-5 32.5 +19.0
11°	-1 29.5 +18.2	-2 25.6 +18.4	-3 21.6 +18.6	-4 17.6 +18.8	-5 13.5 +19.1
12°	-1 11.3 +18.2	-2 07.2 +18.4	-3 03.0 +18.7	-3 58.8 +18.9	-4 54.4 +19.1
13°	-0 53.1 +18.2	-1 48.8 +18.5	-2 44.3 +18.7	-3 39.9 +19.0	-4 35.3 +19.2
14°	-0 34.9 +18.3	-1 30.3 +18.5	-2 25.6 +18.7	-3 20.9 +19.0	-4 16.1 +19.3
15°	-0 16.6 +18.2	-1 11.8 +18.5	-2 06.9 +18.8	-3 01.9 +19.1	-3 56.8 +19.3
16°	0 01.6 +18.3 73.3	-0 53.3 +18.5	-1 48.1 +18.8	-2 42.8 +19.1	-3 37.5 +19.4
17°	0 19.9 +18.2 72.3	-0 34.8 +18.6	-1 29.3 +18.8	-2 23.7 +19.1	-3 18.1 +19.5
18°	0 38.1 +18.2 71.4	-0 16.2 +18.5	-1 10.5 +18.9	-2 04.6 +19.2	-2 58.6 +19.5
19°	0 56.3 +18.2 70.4	0 02.3 +18.5 70.1	-0 51.6 +18.9	-1 45.4 +19.2	-2 39.1 +19.6
20°	1 14.5 +18.2 69.4	0 20.8 +18.6 69.2	-0 32.7 +18.9	-1 26.2 +19.2	-2 19.5 +19.5
21°	1 32.7 +18.2 68.5	0 39.4 +18.5 68.2	-0 13.8 +18.8	-1 07.0 +19.3	-2 00.0 +19.7
22°	1 50.9 +18.1 67.5	0 57.9 +18.5 67.3	0 05.0 +18.9 67.0	-0 47.7 +19.3	-1 40.3 +19.6
23°	2 09.0 +18.1 66.6	1 16.4 +18.5 66.3	0 23.9 +18.9 66.0	-0 28.4 +19.2	-1 20.7 +19.7
24°	2 27.1 +18.1 65.6	1 34.9 +18.4 65.4	0 42.8 +18.9 65.1	-0 09.2 +19.3	-1 01.0 +19.7
25°	2 45.2 +18.0 64.7	1 53.3 +18.5 64.4	1 01.7 +18.8 64.1	0 10.1 +19.3 63.8	-0 41.3 +19.7
26°	3 03.2 +17.9 63.7	2 11.8 +18.4 63.4	1 20.5 +18.8 63.2	0 29.4 +19.2 62.9	-0 21.6 +19.7
27°	3 21.1 +17.9 62.8	2 30.2 +18.3 62.5	1 39.3 +18.8 62.2	0 48.6 +19.3 61.9	-0 01.9 +19.7
28°	3 39.0 +17.9 61.8	2 48.5 +18.3 61.5	1 58.1 +18.8 61.3	1 07.9 +19.2 61.0	0 17.8 +19.7 60.7
29°	3 56.9 +17.7 60.9	3 06.8 +18.3 60.6	2 16.9 +18.7 60.3	1 27.1 +19.2 60.0	0 37.5 +19.7 59.8

Dec	LHA 100° / 260°	LHA 101° / 259°	LHA 102° / 258°	LHA 103° / 257°	LHA 104° / 256°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-9 33.5 +17.8				
1°	-9 15.7 +18.1				
2°	-8 57.6 +18.1				
3°	-8 39.5 +18.4				
4°	-8 21.1 +18.4				
5°	-8 02.7 +18.6				
6°	-7 44.1 +18.7				
7°	-7 25.4 +18.9				
8°	-7 06.5 +18.9				
9°	-6 47.6 +19.1				
10°	-6 28.5 +19.2				
11°	-6 09.3 +19.3				
12°	-5 50.0 +19.3				
13°	-5 30.7 +19.5				
14°	-5 11.2 +19.6				
15°	-4 51.6 +19.6				
16°	-4 32.0 +19.7				
17°	-4 12.3 +19.8				
18°	-3 52.5 +19.8				
19°	-3 32.7 +19.9				
20°	-3 12.8 +20.0				
21°	-2 52.8 +20.0				
22°	-2 32.8 +20.0				
23°	-2 12.8 +20.1				
24°	-1 52.7 +20.1				
25°	-1 32.6 +20.1				
26°	-1 12.5 +20.2				
27°	-0 52.3 +20.1				
28°	-0 32.2 +20.2				
29°	-0 12.0 +20.2				

Dec	LHA 105° / 255°	LHA 106° / 254°	LHA 107° / 253°	LHA 108° / 252°	LHA 109° / 251°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°					
1°					
2°					
3°					
4°					
5°					
6°					
7°					
8°					
9°					
10°					
11°					
12°					
13°					
14°					
15°					
16°					
17°					
18°					
19°					
20°					
21°					
22°					
23°					
24°					
25°					
26°					
27°					
28°					
29°					

Declination SAME name as Latitude

Latitude 18°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	72 00.0 +60.0 180.0	71 58.4 +59.9 176.8	71 53.6 +59.6 173.6	71 45.6 +59.2 170.4	71 34.5 +58.6 167.2
1°	73 00.0 +60.0 180.0	72 58.3 +59.9 176.6	72 53.2 +59.6 173.2	72 44.8 +59.1 169.8	72 33.1 +58.4 166.5
2°	74 00.0 +60.0 180.0	73 58.2 +59.9 176.4	73 52.8 +59.5 172.8	73 43.9 +59.0 169.2	73 31.5 +58.3 165.8
3°	75 00.0 +60.0 180.0	74 58.1 +59.8 176.1	74 52.3 +59.5 172.3	74 42.9 +58.8 168.6	74 29.8 +58.0 164.9
4°	76 00.0 +60.0 180.0	75 57.9 +59.9 175.9	75 51.8 +59.4 171.8	75 41.7 +58.7 167.8	75 27.8 +57.7 163.9
5°	77 00.0 +60.0 180.0	76 57.8 +59.8 175.6	76 51.2 +59.3 171.2	76 40.4 +58.5 166.9	76 25.5 +57.3 162.8
6°	78 00.0 +60.0 180.0	77 57.6 +59.8 175.2	77 50.5 +59.2 170.5	77 38.9 +58.2 165.9	77 22.8 +57.0 161.5
7°	79 00.0 +60.0 180.0	78 57.4 +59.8 174.8	78 49.7 +59.0 169.7	78 37.1 +57.9 164.7	78 19.8 +56.4 160.0
8°	80 00.0 +60.0 180.0	79 57.2 +59.7 174.3	79 48.7 +58.9 168.7	79 35.0 +57.4 163.3	79 16.2 +55.6 158.2
9°	81 00.0 +60.0 180.0	80 56.9 +59.6 173.7	80 47.6 +58.5 167.6	80 32.4 +56.9 161.7	80 11.8 +54.8 156.1
10°	82 00.0 +60.0 180.0	81 56.5 +59.5 173.0	81 46.1 +58.2 166.1	81 29.3 +56.0 159.6	81 06.6 +53.5 153.6
11°	83 00.0 +60.0 180.0	82 56.0 +59.4 172.0	82 44.3 +57.5 164.3	82 25.3 +55.0 157.1	82 00.1 +51.8 150.5
12°	84 00.0 +60.0 180.0	83 55.4 +59.1 170.7	83 41.8 +56.7 161.9	83 20.3 +53.2 153.8	82 51.9 +49.4 146.7
13°	85 00.0 +60.0 180.0	84 54.5 +58.7 169.0	84 38.5 +55.2 158.6	84 13.5 +50.7 149.5	83 41.3 +45.8 141.8
14°	86 00.0 +60.0 180.0	85 53.2 +57.8 166.3	85 33.7 +52.7 154.0	85 04.2 +46.4 143.8	84 27.1 +40.8 135.6
15°	87 00.0 +60.0 180.0	86 51.0 +56.0 162.1	86 26.4 +47.6 147.1	85 50.6 +39.6 135.8	85 07.9 +33.1 127.5
16°	88 00.0 +60.0 180.0	87 47.0 +50.1 154.3	87 14.0 +36.8 136.0	86 30.2 +28.0 124.4	85 41.0 +22.4 117.0
17°	89 00.0 +60.0 180.0	88 37.1 +25.8 136.2	88 3.8 +15.1 117.4	86 58.2 +10.6 108.8	86 03.4 +9.4 104.1
18°	90 00.0 -60.0 0.0	89 02.9 -25.6 89.8	88 05.9 -14.5 89.7	87 08.8 -09.7 89.5	86 11.8 -07.2 89.4
19°	89 00.0 -60.0 0.0	88 37.3 -50.0 43.3	87 51.4 -36.5 61.9	86 59.1 -27.3 70.2	86 04.6 -21.3 74.6
20°	88 00.0 -60.0 0.0	87 47.3 -56.0 25.1	87 14.9 -47.5 43.1	86 31.8 -39.1 54.3	85 43.3 -32.4 61.5
21°	87 00.0 -60.0 0.0	86 51.3 -57.8 17.3	86 27.4 -52.6 31.8	85 52.7 -46.3 42.8	85 10.9 -40.2 50.8
22°	86 00.0 -60.0 0.0	85 53.5 -58.7 13.1	85 34.8 -55.1 24.8	85 06.4 -50.5 34.7	84 30.7 -45.5 42.6
23°	85 00.0 -60.0 0.0	84 54.8 -59.1 10.4	84 39.7 -56.7 20.2	84 15.9 -53.1 28.8	83 45.2 -49.2 36.2
24°	84 00.0 -60.0 0.0	83 55.7 -59.4 8.7	83 43.0 -57.6 16.9	83 22.8 -54.9 24.5	82 56.0 -51.6 31.2
25°	83 00.0 -60.0 0.0	82 56.3 -59.5 7.4	82 45.4 -58.1 14.5	82 27.9 -56.0 21.2	82 04.4 -53.4 27.3
26°	82 00.0 -60.0 0.0	81 56.8 -59.6 6.4	81 47.3 -58.5 12.7	81 31.9 -56.8 18.6	81 11.0 -54.6 24.1
27°	81 00.0 -60.0 0.0	80 57.2 -59.7 5.7	80 48.8 -58.8 11.2	80 35.1 -57.5 16.6	80 16.4 -55.6 21.6
28°	80 00.0 -60.0 0.0	79 57.5 -59.8 5.1	79 50.0 -59.1 10.1	79 37.6 -57.8 14.9	79 20.8 -56.4 19.5
29°	79 00.0 -60.0 0.0	78 57.7 -59.8 4.6	78 50.9 -59.1 9.1	78 39.8 -58.2 13.5	78 24.4 -56.9 17.7

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	71 20.4 +57.9 164.2	71 03.5 +56.9 161.2	70 43.7 +56.0 158.3	70 21.4 +54.9 155.5	69 56.5 +53.8 152.9
1°	72 18.3 +57.6 163.3	72 00.4 +56.7 160.2	71 39.7 +55.6 157.2	71 16.3 +54.4 154.3	70 50.3 +53.2 151.5
2°	73 15.9 +57.3 162.4	72 57.1 +56.2 159.1	72 35.3 +55.0 156.0	72 10.7 +53.8 153.0	71 43.5 +52.4 150.1
3°	74 13.2 +56.9 161.3	73 53.3 +55.8 157.9	73 30.3 +54.5 154.6	73 04.5 +53.0 151.5	72 35.9 +51.6 148.5
4°	75 10.1 +56.6 160.1	74 49.1 +55.2 156.5	74 24.8 +53.7 153.1	73 57.5 +52.2 149.8	73 27.5 +50.7 146.8
5°	76 06.7 +56.0 158.8	75 44.3 +54.5 155.0	75 18.5 +53.0 151.4	74 49.7 +51.3 148.0	74 18.2 +49.5 144.8
6°	77 02.7 +55.4 157.3	76 38.8 +53.7 153.2	76 11.5 +51.9 149.5	75 41.0 +50.0 146.0	75 07.7 +48.2 142.7
7°	77 58.1 +54.7 155.5	77 32.5 +52.8 151.3	77 03.4 +50.7 147.3	76 31.0 +48.7 143.7	75 55.9 +46.6 140.3
8°	78 52.8 +53.6 153.4	78 25.3 +51.4 149.0	77 54.1 +49.2 144.8	77 19.7 +46.9 141.1	76 42.5 +44.8 137.6
9°	79 46.4 +52.4 151.0	79 16.7 +49.9 146.3	78 43.3 +47.3 142.0	78 06.6 +44.9 138.1	77 27.3 +42.5 134.7
10°	80 38.8 +50.7 148.1	80 06.6 +47.8 143.2	79 30.6 +45.0 138.8	78 51.5 +42.4 134.8	78 09.8 +39.9 131.3
11°	81 29.5 +48.5 144.7	80 54.4 +45.2 139.5	80 15.6 +42.2 135.0	79 33.9 +39.3 131.0	78 49.7 +36.8 127.6
12°	82 18.0 +45.5 140.5	81 39.6 +41.9 135.2	80 57.8 +38.6 130.6	80 13.2 +35.7 126.7	79 26.5 +33.1 123.4
13°	83 03.5 +41.4 135.4	82 21.5 +37.4 130.0	81 36.4 +34.0 125.6	80 48.9 +31.1 121.8	79 59.6 +28.7 118.7
14°	83 44.9 +35.8 129.1	82 58.9 +31.9 123.9	82 10.4 +28.6 119.7	81 20.0 +25.9 116.3	80 28.3 +23.7 113.5
15°	84 20.7 +28.3 121.3	83 30.8 +24.6 116.7	82 39.0 +21.9 113.1	81 45.9 +19.7 110.2	80 52.0 +17.9 107.9
16°	84 49.0 +18.7 112.0	83 55.4 +16.1 108.3	83 00.9 +14.1 105.6	82 05.6 +12.7 103.5	81 09.9 +11.7 101.7
17°	85 07.7 +07.0 101.1	84 11.5 +06.1 99.0	83 15.0 +05.6 97.5	82 18.3 +05.2 96.3	81 21.6 +04.9 95.3
18°	85 14.7 -05.4 89.2	84 17.6 -04.2 89.1	83 20.6 -03.4 88.9	82 23.5 -02.6 88.8	81 26.5 -02.0 88.6
19°	85 09.3 -17.3 77.3	84 13.4 -14.3 79.1	83 17.2 -12.0 80.3	82 20.9 -10.3 81.2	81 24.5 -08.9 81.9
20°	84 52.0 -27.2 66.3	83 59.1 -23.2 69.6	83 05.2 -20.0 72.1	82 10.6 -17.5 73.9	81 15.6 -15.4 75.3
21°	84 24.8 -35.0 56.7	83 35.9 -30.6 61.1	82 45.2 -27.0 64.4	81 53.1 -23.9 67.0	81 00.2 -21.3 69.1
22°	83 49.8 -40.8 48.8	83 05.3 -36.5 53.6	82 18.2 -32.8 57.5	81 29.2 -29.5 60.7	80 38.9 -26.7 63.2
23°	83 09.0 -45.0 42.3	82 28.8 -41.1 47.3	81 45.4 -37.5 51.5	80 59.7 -34.2 54.9	80 12.2 -31.4 57.8
24°	82 24.0 -48.1 37.0	81 47.7 -44.7 42.0	81 07.9 -41.3 46.2	80 25.5 -38.2 49.8	79 40.8 -35.2 52.9
25°	81 35.9 -50.5 32.7	81 03.0 -47.4 37.5	80 26.6 -44.4 41.7	79 47.3 -41.5 45.4	79 05.6 -38.7 48.5
26°	80 45.4 -52.2 29.2	80 15.6 -49.5 33.7	79 42.2 -46.8 37.8	79 05.8 -44.1 41.4	78 26.9 -41.5 44.6
27°	79 53.2 -53.5 26.2	79 26.1 -51.2 30.5	78 55.4 -48.7 34.4	78 21.7 -46.3 37.9	77 45.4 -43.9 41.1
28°	78 59.7 -54.5 23.8	78 34.9 -51.5 27.8	78 06.7 -50.4 31.5	77 35.4 -48.1 34.9	77 01.5 -45.9 38.0
29°	78 05.2 -55.3 21.7	77 42.4 -53.5 25.4	77 16.3 -51.6 28.9	76 47.3 -49.6 32.2	76 15.6 -47.5 35.2

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Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	69 29.4 +52.6 150.3	69 00.0 +51.4 147.8	68 28.7 +50.1 145.5	67 55.4 +48.9 143.2	67 20.4 +47.7 141.1
1°	70 22.0 +51.8 148.9	69 51.4 +50.6 146.4	69 18.8 +49.3 144.0	68 44.3 +47.9 141.7	68 08.1 +46.6 139.5
2°	71 13.8 +51.1 147.4	70 42.0 +49.7 144.8	70 08.1 +48.2 142.3	69 32.2 +47.0 140.0	68 54.7 +45.6 137.8
3°	72 04.9 +50.1 145.7	71 31.7 +48.6 143.0	70 56.3 +47.2 140.5	70 19.2 +45.7 138.2	69 40.3 +44.3 135.9
4°	72 55.0 +49.1 143.9	72 20.3 +47.5 141.1	71 43.5 +45.9 138.6	71 04.9 +44.4 136.2	70 24.6 +42.9 134.0
5°	73 44.1 +47.8 141.9	73 07.8 +46.1 139.1	72 29.4 +44.5 136.5	71 49.3 +42.9 134.1	71 07.5 +41.4 131.8
6°	74 31.9 +46.3 139.6	73 53.9 +44.5 136.8	73 13.9 +42.8 134.2	72 32.2 +41.2 131.8	71 48.9 +39.6 129.6
7°	75 18.2 +44.7 137.2	74 38.4 +42.8 134.4	73 56.7 +41.0 131.7	73 13.4 +39.2 129.3	72 28.5 +37.7 127.1
8°	76 02.9 +42.7 134.5	75 21.2 +40.7 131.6	74 37.7 +38.9 129.0	73 52.6 +37.2 126.7	73 06.2 +35.6 124.5
9°	76 45.6 +40.3 131.5	76 01.9 +38.3 128.7	75 16.6 +36.4 126.1	74 29.8 +34.7 123.8	73 41.8 +33.1 121.7
10°	77 25.9 +37.7 128.2	76 40.2 +35.6 125.4	75 53.0 +33.7 122.9	75 04.5 +32.0 120.7	74 14.9 +30.5 118.6
11°	78 03.6 +34.5 124.5	77 15.8 +32.4 121.8	76 26.7 +30.6 119.5	75 36.5 +29.0 117.3	74 45.4 +27.5 115.4
12°	78 38.1 +30.8 120.5	77 48.2 +28.9 117.9	76 57.3 +27.1 115.7	76 05.5 +25.6 113.7	75 12.9 +24.3 112.0
13°	79 08.9 +26.6 116.0	78 17.1 +24.8 113.7	77 24.4 +23.3 111.7	76 31.1 +21.9 109.9	75 37.2 +20.8 108.4
14°	79 35.5 +21.8 111.2	78 41.9 +20.3 109.1	77 47.7 +19.1 107.4	76 53.0 +18.0 105.9	75 58.0 +17.0 104.5
15°	79 57.3 +16.6 105.9	79 02.2 +15.5 104.3	78 06.8 +14.4 102.9	77 11.0 +13.7 101.6	76 15.0 +13.0 100.5
16°	80 13.9 +10.8 100.3	79 17.7 +10.1 99.1	78 21.2 +09.6 98.1	77 24.7 +09.1 97.2	76 28.0 +08.8 96.4
17°	80 24.7 +04.7 94.5	79 27.8 +04.6 93.8	78 30.8 +04.6 93.2	77 33.8 +04.5 92.6	76 36.8 +04.5 92.1
18°	80 29.4 -01.5 88.5	79 32.4 -01.1 88.3	78 35.4 -00.7 88.1	77 38.3 -00.2 88.0	76 41.3 +00.1 87.8
19°	80 27.9 -07.7 82.4	79 31.3 -06.6 82.8	78 34.7 -05.8 83.1	77 38.1 -05.1 83.3	76 41.4 -04.4 83.5
20°	80 20.2 -13.6 76.5	79 24.7 -12.2 77.4	78 28.9 -10.8 78.1	77 33.0 -09.7 78.7	76 37.0 -08.7 79.2
21°	80 06.6 -19.1 70.7	79 12.5 -17.2 72.1	78 18.1 -15.7 73.2	77 23.3 -14.2 74.1	76 28.3 -12.9 74.9
22°	79 47.5 -24.3 65.3	78 55.3 -22.1 67.0	78 02.4 -20.1 68.5	77 09.1 -18.4 69.7	76 15.4 -16.9 70.8
23°	79 23.2 -28.7 60.2	78 33.2 -26.4 62.3	77 42.3 -24.3 64.0	76 50.7 -22.4 65.5	75 58.5 -20.7 66.8
24°	78 54.5 -32.6 55.6	78 06.8 -30.2 57.8	77 18.0 -28.0 59.8	76 28.3 -26.0 61.5	75 37.8 -24.2 62.9
25°	78 21.9 -36.1 51.3	77 36.6 -33.6 53.7	76 50.0 -31.4 55.8	76 02.3 -29.4 57.7	75 13.6 -27.4 59.3
26°	77 45.8 -39.0 47.4	77 03.0 -36.7 49.9	76 18.6 -34.4 52.1	75 32.9 -32.3 54.1	74 46.2 -30.4 55.9
27°	77 06.8 -41.5 43.9	76 26.3 -39.2 46.5	75 44.2 -37.1 48.8	75 00.6 -35.0 50.8	74 15.8 -33.1 52.6
28°	76 25.3 -43.7 40.8	75 47.1 -41.5 43.3	75 07.1 -39.4 45.6	74 25.6 -37.4 47.7	73 42.7 -35.5 49.6
29°	75 41.6 -45.5 37.9	75 05.6 -43.5 40.4	74 27.7 -41.5 42.8	73 48.2 -39.5 44.9	73 07.2 -37.6 46.8

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	66 43.8 +46.4 139.1	66 05.7 +45.2 137.1	65 26.2 +44.1 135.3	64 45.4 +43.0 133.6	64 03.5 +41.8 131.9
1°	67 30.2 +45.4 137.4	66 50.9 +44.2 135.5	66 10.3 +42.9 133.7	65 28.4 +41.7 131.9	64 45.3 +40.7 130.2
2°	68 15.6 +44.2 135.7	67 35.1 +42.9 133.7	66 53.2 +41.7 131.9	66 10.1 +40.6 130.2	65 26.0 +39.4 128.5
3°	68 59.8 +43.0 133.9	68 18.0 +41.6 131.9	67 34.9 +40.4 130.0	66 50.7 +39.1 128.3	66 05.4 +38.0 126.7
4°	69 42.8 +41.5 131.9	68 59.6 +40.2 129.9	68 15.3 +38.9 128.1	67 29.8 +37.7 126.3	66 43.4 +36.5 124.7
5°	70 24.3 +39.9 129.8	69 39.8 +38.6 127.8	68 54.2 +37.2 126.0	68 07.5 +36.0 124.3	67 19.9 +34.9 122.7
6°	71 04.2 +38.2 127.5	70 18.4 +36.8 125.6	69 31.4 +35.5 123.8	68 43.5 +34.3 122.1	67 54.8 +33.1 120.6
7°	71 42.4 +36.2 125.1	70 55.2 +34.8 123.2	70 06.9 +33.6 121.4	69 17.8 +32.4 119.8	68 27.9 +31.3 118.3
8°	72 18.6 +34.1 122.5	71 30.0 +32.7 120.7	70 40.5 +31.4 119.0	69 50.2 +30.3 117.4	68 59.2 +29.2 116.0
9°	72 52.7 +31.7 119.7	72 02.7 +30.4 118.0	71 11.9 +29.2 116.4	70 20.5 +28.0 114.9	69 28.4 +27.1 113.5
10°	73 24.4 +29.1 116.8	72 33.1 +27.8 115.1	71 41.1 +26.7 113.6	70 48.5 +25.7 112.2	69 55.5 +24.7 110.9
11°	73 53.5 +26.2 113.7	73 00.9 +25.1 112.1	72 07.8 +24.0 110.7	71 14.2 +23.1 109.4	70 20.2 +22.2 108.2
12°	74 19.7 +23.1 110.4	73 26.0 +22.0 109.0	72 31.8 +21.1 107.7	71 37.3 +20.3 106.5	70 42.4 +19.6 105.5
13°	74 42.8 +19.8 107.0	73 48.0 +18.9 105.7	72 52.9 +18.2 104.6	71 57.6 +17.4 103.5	71 02.0 +16.8 102.6
14°	75 02.6 +16.2 103.3	74 06.9 +15.6 102.3	73 11.1 +14.9 101.3	72 15.0 +14.4 100.4	71 18.8 +14.0 99.6
15°	75 18.8 +12.5 99.6	74 22.5 +12.0 98.7	73 26.0 +11.6 97.9	72 29.4 +11.3 97.2	71 32.8 +10.9 96.5
16°	75 31.3 +08.5 95.7	74 34.5 +08.3 95.0	73 37.6 +08.1 94.5	72 40.7 +07.9 93.9	71 43.7 +07.9 93.4
17°	75 39.8 +04.5 91.7	74 42.8 +04.5 91.3	73 45.7 +04.6 90.9	72 48.6 +04.7 90.6	71 51.6 +04.7 90.2
18°	75 44.3 +00.4 87.7	74 47.3 +00.6 87.5	73 50.3 +00.9 87.4	72 53.3 +01.2 87.2	71 56.3 +01.5 87.0
19°	75 44.7 -03.8 83.6	74 47.9 -03.1 83.7	73 51.2 -02.6 83.8	72 54.5 -02.2 83.8	71 57.8 -01.8 83.8
20°	75 40.9 -07.8 79.6	74 44.8 -07.0 79.9	73 48.6 -06.3 80.2	72 52.3 -05.5 80.4	71 56.0 -04.9 80.6
21°	75 33.1 -11.7 75.6	74 37.8 -10.7 76.1	73 42.3 -09.7 76.6	72 46.8 -08.9 77.0	71 51.1 -08.0 77.4
22°	75 21.4 -15.6 71.7	74 27.1 -14.3 72.4	73 32.6 -13.2 73.1	72 37.9 -12.1 73.7	71 43.1 -11.2 74.2
23°	75 05.8 -19.1 67.9	74 12.8 -17.7 68.8	73 19.4 -16.4 69.7	72 25.8 -15.3 70.4	71 31.9 -14.2 71.1
24°	74 46.7 -22.5 64.2	73 55.1 -21.0 65.4	73 03.0 -19.6 66.4	72 10.5 -18.2 67.3	71 17.7 -17.0 68.0
25°	74 24.2 -25.7 60.7	73 34.1 -24.1 62.0	72 43.4 -22.5 63.2	71 52.3 -21.1 64.2	71 00.7 -19.8 65.1
26°	73 58.5 -28.6 57.4	73 10.0 -26.8 58.8	72 20.9 -25.3 60.1	71 31.2 -23.8 61.2	70 40.9 -22.4 62.2
27°	73 29.9 -31.2 54.3	72 43.2 -29.5 55.8	71 55.6 -27.9 57.1	71 07.4 -26.4 58.3	70 18.5 -24.9 59.4
28°	72 58.7 -33.6 51.3	72 13.7 -31.9 52.9	71 27.7 -30.2 54.3	70 41.0 -28.6 55.6	69 53.6 -27.2 56.7
29°	72 25.1 -35.9 48.5	71 41.8 -34.1 50.1	70 57.5 -32.5 51.6	70 12.4 -30.9 52.9	69 26.4 -29.3 54.2

Declination SAME name as Latitude

Latitude 18°

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	63 20.5 +40.8 130.3	62 36.5 +39.8 128.8	61 51.6 +38.8 127.4	61 05.9 +37.8 126.1	60 19.4 +36.9 124.8
1°	64 01.3 +39.6 128.7	63 16.3 +38.5 127.2	62 30.4 +37.5 125.8	61 43.7 +36.6 124.4	60 56.3 +35.7 123.2
2°	64 40.9 +38.3 126.9	63 54.8 +37.3 125.5	63 07.9 +36.3 124.1	62 20.3 +35.3 122.7	61 32.0 +34.4 121.5
3°	65 19.2 +36.9 125.1	64 32.1 +35.8 123.7	63 44.2 +34.9 122.3	62 55.6 +33.9 121.0	62 06.4 +33.0 119.7
4°	65 56.1 +35.4 123.2	65 07.9 +34.4 121.8	64 19.1 +33.4 120.4	63 29.5 +32.5 119.2	62 39.4 +31.6 117.9
5°	66 31.5 +33.8 121.2	65 42.3 +32.8 119.8	64 52.5 +31.8 118.5	64 02.0 +31.0 117.3	63 11.0 +30.1 116.1
6°	67 05.3 +32.1 119.1	66 15.1 +31.1 117.7	65 24.3 +30.2 116.5	64 33.0 +29.3 115.3	63 41.1 +28.5 114.1
7°	67 37.4 +30.2 116.9	66 46.2 +29.3 115.6	65 54.5 +28.4 114.4	65 02.3 +27.5 113.2	64 09.6 +26.8 112.1
8°	68 07.6 +28.2 114.6	67 15.5 +27.3 113.4	66 22.9 +26.4 112.2	65 29.8 +25.7 111.1	64 36.4 +25.0 110.1
9°	68 35.8 +26.2 112.2	67 42.8 +25.3 111.0	66 49.3 +24.5 109.9	65 55.5 +23.8 108.9	65 01.4 +23.1 107.9
10°	69 02.0 +23.8 109.7	68 08.1 +23.0 108.6	67 13.8 +22.4 107.6	66 19.3 +21.7 106.6	65 24.5 +21.1 105.7
11°	69 25.8 +21.5 107.1	68 31.1 +20.8 106.1	67 36.2 +20.1 105.2	66 41.0 +19.6 104.3	65 45.6 +19.1 103.5
12°	69 47.3 +18.9 104.5	68 51.9 +18.4 103.5	67 56.3 +17.8 102.7	67 00.6 +17.3 101.9	66 04.7 +16.9 101.1
13°	70 06.2 +16.3 101.7	69 10.3 +15.8 100.9	68 14.1 +15.4 100.1	67 17.9 +15.0 99.4	66 21.6 +14.6 98.8
14°	70 22.5 +13.6 98.9	69 26.1 +13.2 98.2	68 29.5 +12.9 97.5	67 32.9 +12.7 96.9	66 36.2 +12.4 96.3
15°	70 36.1 +10.7 95.9	69 39.3 +10.5 95.4	68 42.4 +10.3 94.8	67 45.6 +10.1 94.3	66 48.6 +10.1 93.9
16°	70 46.8 +07.7 93.0	69 49.8 +07.7 92.5	68 52.7 +07.7 92.1	67 55.7 +07.6 91.7	66 58.7 +07.6 91.4
17°	70 54.5 +04.8 89.9	69 57.5 +04.8 89.6	69 00.4 +05.0 89.3	68 03.3 +05.1 89.1	67 06.3 +05.1 88.8
18°	70 59.3 +01.7 86.9	70 02.3 +02.0 86.7	69 05.4 +02.2 86.6	68 08.4 +02.5 86.4	67 11.4 +02.7 86.2
19°	71 01.0 -01.3 83.8	70 04.3 -00.9 83.8	69 07.6 -00.5 83.8	68 10.9 -00.2 83.7	67 14.1 +00.2 83.7
20°	70 59.7 -04.3 80.7	70 03.4 -03.8 80.9	69 07.1 -03.3 81.0	68 10.7 -02.8 81.0	67 14.3 -02.3 81.1
21°	70 55.4 -07.3 77.7	69 59.6 -06.6 77.9	69 03.8 -06.0 78.2	68 07.9 -05.3 78.3	67 12.0 -04.7 78.5
22°	70 48.1 -10.3 74.7	69 53.0 -09.4 75.0	68 57.8 -08.6 75.4	68 02.6 -07.9 75.7	67 07.3 -07.3 75.9
23°	70 37.8 -13.1 71.7	69 43.6 -12.2 72.2	68 49.2 -11.3 72.6	67 54.7 -10.5 73.0	67 00.0 -09.6 73.4
24°	70 24.7 -15.9 68.7	69 31.4 -14.8 69.4	68 37.9 -13.8 69.9	67 44.2 -12.9 70.4	66 50.4 -12.0 70.9
25°	70 08.8 -18.6 65.9	69 16.6 -17.4 66.6	68 24.1 -16.4 67.3	67 31.3 -15.3 67.9	66 38.4 -14.4 68.4
26°	69 50.2 -21.1 63.1	68 59.2 -19.9 63.9	68 07.7 -18.7 64.7	67 16.0 -17.6 65.3	66 24.0 -16.5 65.9
27°	69 29.1 -23.5 60.4	68 39.3 -22.2 61.3	67 49.0 -21.0 62.1	66 58.4 -19.8 62.9	66 07.5 -18.8 63.6
28°	69 05.6 -25.8 57.8	68 17.1 -24.5 58.8	67 28.0 -23.1 59.7	66 38.6 -22.0 60.5	65 48.7 -20.8 61.2
29°	68 39.8 -27.9 55.3	67 52.6 -26.5 56.3	67 04.9 -25.3 57.3	66 16.6 -24.0 58.2	65 27.9 -22.7 58.9

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	59 32.2 +36.0 123.5	58 44.3 +35.1 122.4	57 55.8 +34.3 121.2	57 06.7 +33.6 120.2	56 17.1 +32.9 119.1
1°	60 08.2 +34.8 121.9	59 19.4 +34.0 120.8	58 30.1 +33.2 119.7	57 40.3 +32.4 118.6	56 50.0 +31.7 117.6
2°	60 43.0 +33.5 120.3	59 53.4 +32.8 119.2	59 03.3 +32.0 118.1	58 12.7 +31.3 117.0	57 21.7 +30.5 116.1
3°	61 16.5 +32.2 118.6	60 26.2 +31.4 117.5	59 35.3 +30.6 116.4	58 44.0 +29.9 115.4	57 52.2 +29.3 114.4
4°	61 48.7 +30.8 116.8	60 57.6 +30.0 115.7	60 05.9 +29.3 114.7	59 13.9 +28.6 113.7	58 21.5 +27.9 112.8
5°	62 19.5 +29.3 115.0	61 27.6 +28.6 113.9	60 35.2 +27.9 112.9	59 42.5 +27.2 112.0	58 49.4 +26.6 111.1
6°	62 48.8 +27.8 113.1	61 56.2 +27.0 112.1	61 03.1 +26.4 111.1	60 09.7 +25.7 110.2	59 16.0 +25.2 109.4
7°	63 16.6 +26.0 111.1	62 23.2 +25.4 110.2	61 29.5 +24.7 109.3	60 35.4 +24.2 108.4	59 41.2 +23.6 107.6
8°	63 42.6 +24.4 109.1	62 48.6 +23.7 108.2	61 54.2 +23.1 107.3	60 59.6 +22.6 106.5	60 04.8 +22.1 105.7
9°	64 07.0 +22.4 107.0	63 12.3 +21.9 106.2	62 17.3 +21.5 105.4	61 22.2 +20.9 104.6	60 26.9 +20.5 103.9
10°	64 29.4 +20.6 104.9	63 34.2 +20.1 104.1	62 38.8 +19.6 103.3	61 43.1 +19.2 102.6	60 47.4 +18.8 101.9
11°	64 50.0 +18.6 102.7	63 54.3 +18.1 102.0	62 58.4 +17.7 101.3	62 02.3 +17.5 100.6	61 06.2 +17.1 100.0
12°	65 08.6 +16.5 100.4	64 12.4 +16.2 99.8	63 16.1 +15.9 99.2	62 19.8 +15.5 98.6	61 23.3 +15.3 98.0
13°	65 25.1 +14.4 98.1	64 28.6 +14.1 97.6	63 32.0 +13.9 97.0	62 35.3 +13.7 96.5	61 38.6 +13.5 96.0
14°	65 39.5 +12.2 95.8	64 42.7 +12.0 95.3	63 45.9 +11.8 94.8	62 49.0 +11.7 94.4	61 52.1 +11.6 93.9
15°	65 51.7 +09.9 93.4	64 54.7 +09.9 93.0	63 57.7 +09.8 92.6	63 00.7 +09.7 92.2	62 03.7 +09.7 91.8
16°	66 01.6 +07.6 91.0	65 04.6 +07.6 90.7	64 07.5 +07.7 90.3	63 10.4 +07.7 90.0	62 13.4 +07.7 89.7
17°	66 09.2 +05.3 88.5	65 12.2 +05.4 88.3	64 15.2 +05.5 88.1	63 18.1 +05.7 87.8	62 21.1 +05.8 87.6
18°	66 14.5 +02.9 86.1	65 17.6 +03.1 85.9	64 20.7 +03.3 85.8	63 23.8 +03.5 85.6	62 26.9 +03.8 85.4
19°	66 17.4 +00.6 83.6	65 20.7 +00.9 83.5	64 24.0 +01.2 83.4	63 27.3 +01.5 83.4	62 30.7 +01.7 83.3
20°	66 18.0 -01.9 81.1	65 21.6 -01.4 81.1	64 25.2 -01.0 81.1	63 28.8 -00.6 81.1	62 32.4 -00.2 81.1
21°	66 16.1 -04.2 78.6	65 20.2 -03.7 78.7	64 24.2 -03.2 78.8	63 28.2 -02.7 78.9	62 32.2 -02.3 78.9
22°	66 11.9 -06.6 76.2	65 16.5 -06.0 76.3	64 21.0 -05.4 76.5	63 25.5 -04.8 76.7	62 29.9 -04.2 76.8
23°	66 05.3 -08.9 73.7	65 10.5 -08.2 74.0	64 15.6 -07.5 74.2	63 20.7 -06.9 74.4	62 25.7 -06.3 74.6
24°	65 56.4 -11.2 71.3	65 02.3 -10.4 71.6	64 08.1 -09.6 71.9	63 13.8 -08.9 72.2	62 19.4 -08.2 72.5
25°	65 45.2 -13.4 68.9	64 51.9 -12.5 69.3	63 58.5 -11.7 69.7	63 04.9 -10.9 70.0	62 11.2 -10.1 70.3
26°	65 31.8 -15.6 66.5	64 39.4 -14.7 67.0	63 46.8 -13.8 67.4	62 54.0 -12.9 67.9	62 01.1 -12.1 68.2
27°	65 16.2 -17.6 64.2	64 24.7 -16.6 64.7	63 33.0 -15.7 65.3	62 41.1 -14.8 65.7	61 49.0 -13.9 66.2
28°	64 58.6 -19.7 61.9	64 08.1 -18.7 62.5	63 17.3 -17.6 63.1	62 26.3 -16.7 63.6	61 35.1 -15.8 64.1
29°	64 38.9 -21.7 59.7	63 49.4 -20.5 60.4	62 59.7 -19.5 61.0	62 09.6 -18.4 61.6	61 19.3 -17.5 62.1

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Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	55 27.0 +32.2 118.2	54 36.5 +31.5 117.2	53 45.6 +30.8 116.3	52 54.2 +30.2 115.4	52 02.5 +29.7 114.6
1°	55 59.2 +31.0 116.7	55 08.0 +30.4 115.7	54 16.4 +29.8 114.9	53 24.4 +29.2 114.0	52 32.2 +28.5 113.2
2°	56 30.2 +29.9 115.1	55 38.4 +29.2 114.2	54 46.2 +28.6 113.4	53 53.6 +28.1 112.5	53 00.7 +27.5 111.7
3°	57 00.1 +28.6 113.5	56 07.6 +28.0 112.7	55 14.8 +27.4 111.8	54 21.7 +26.8 111.0	53 28.2 +26.4 110.3
4°	57 28.7 +27.3 111.9	56 35.6 +26.8 111.1	55 42.2 +26.2 110.3	54 48.5 +25.7 109.5	53 54.6 +25.2 108.7
5°	57 56.0 +26.0 110.2	57 02.4 +25.4 109.4	56 08.4 +25.0 108.7	55 14.2 +24.5 107.9	54 19.8 +24.0 107.2
6°	58 22.0 +24.6 108.5	57 27.8 +24.1 107.8	56 33.4 +23.6 107.0	55 38.7 +23.1 106.3	54 43.8 +22.8 105.6
7°	58 46.6 +23.2 106.8	57 51.9 +22.7 106.0	56 57.0 +22.2 105.3	56 01.8 +21.9 104.7	55 06.6 +21.4 104.0
8°	59 09.8 +21.6 105.0	58 14.6 +21.2 104.3	57 19.2 +20.8 103.6	56 23.7 +20.4 103.0	55 28.0 +20.1 102.4
9°	59 31.4 +20.1 103.2	58 35.8 +19.7 102.5	57 40.0 +19.4 101.9	56 44.1 +19.0 101.3	55 48.1 +18.7 100.7
10°	59 51.5 +18.5 101.3	58 55.5 +18.1 100.7	57 59.4 +17.8 100.1	57 03.1 +17.6 99.5	56 06.8 +17.3 99.0
11°	60 10.0 +16.7 99.4	59 13.6 +16.5 98.8	58 17.2 +16.3 98.3	57 20.7 +16.0 97.8	56 24.1 +15.9 97.3
12°	60 26.7 +15.1 97.5	59 30.1 +14.9 96.9	58 33.5 +14.6 96.4	57 36.7 +14.5 96.0	56 40.0 +14.3 95.5
13°	60 41.8 +13.3 95.5	59 45.0 +13.2 95.0	58 48.1 +13.1 94.6	57 51.2 +13.0 94.2	56 54.3 +12.8 93.7
14°	60 55.1 +11.5 93.5	59 58.2 +11.4 93.1	59 01.2 +11.3 92.7	58 04.2 +11.3 92.3	57 07.1 +11.3 92.0
15°	61 06.6 +09.7 91.5	60 09.6 +09.6 91.1	59 12.5 +09.7 90.8	58 15.5 +09.6 90.5	57 18.4 +09.7 90.1
16°	61 16.3 +07.8 89.4	60 19.2 +07.9 89.1	59 22.2 +07.9 88.8	58 25.1 +08.1 88.6	57 28.1 +08.1 88.3
17°	61 24.1 +05.9 87.3	60 27.1 +06.1 87.1	59 30.1 +06.2 86.9	58 33.2 +06.3 86.7	57 36.2 +06.5 86.5
18°	61 30.0 +04.0 85.3	60 33.2 +04.2 85.1	59 36.3 +04.4 84.9	58 39.5 +04.6 84.8	57 42.7 +04.8 84.6
19°	61 34.0 +02.1 83.2	60 37.4 +02.3 83.1	59 40.7 +02.6 83.0	58 44.1 +02.9 82.9	57 47.5 +03.1 82.7
20°	61 36.1 +00.1 81.1	60 39.7 +00.5 81.0	59 43.3 +00.9 81.0	58 47.0 +01.2 80.9	57 50.6 +01.5 80.9
21°	61 36.2 -01.8 79.0	60 40.2 -01.4 79.0	59 44.2 -01.0 79.0	58 48.2 -00.6 79.0	57 52.1 -00.1 79.0
22°	61 34.4 -03.8 76.9	60 38.8 -03.2 77.0	59 43.2 -02.7 77.0	58 47.6 -02.3 77.1	57 52.0 -01.9 77.1
23°	61 30.6 -05.6 74.8	60 35.6 -05.1 74.9	59 40.5 -04.6 75.0	58 45.3 -04.0 75.1	57 50.1 -03.4 75.2
24°	61 25.0 -07.6 72.7	60 30.5 -06.9 72.9	59 35.9 -06.3 73.1	58 41.3 -05.7 73.2	57 46.7 -05.2 73.3
25°	61 17.4 -09.4 70.6	60 23.6 -08.8 70.9	59 29.6 -08.1 71.1	58 35.6 -07.4 71.3	57 41.5 -06.8 71.5
26°	61 08.0 -11.3 68.6	60 14.8 -10.5 68.9	59 21.5 -09.7 69.2	58 28.2 -09.1 69.4	57 34.7 -08.4 69.6
27°	60 56.7 -13.0 66.5	60 04.3 -12.3 66.9	59 11.8 -11.5 67.2	58 19.1 -10.7 67.5	57 26.3 -10.0 67.8
28°	60 43.7 -14.9 64.5	59 52.0 -13.9 64.9	59 00.3 -13.2 65.3	58 08.4 -12.4 65.6	57 16.3 -11.6 66.0
29°	60 28.8 -16.6 62.6	59 38.1 -15.7 63.0	58 47.1 -14.8 63.4	57 56.0 -13.9 63.8	57 04.7 -13.1 64.1

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	51 10.5 +29.0 113.8	50 18.1 +28.6 113.0	49 25.5 +28.0 112.3	48 32.5 +27.6 111.6	47 39.3 +27.1 110.9
1°	51 39.5 +28.1 112.4	50 46.7 +27.5 111.7	49 53.5 +27.0 110.9	49 00.1 +26.5 110.2	48 06.4 +26.1 109.6
2°	52 07.6 +27.0 111.0	51 14.2 +26.5 110.2	50 20.5 +26.1 109.5	49 26.6 +25.6 108.9	48 32.5 +25.2 108.2
3°	52 34.6 +25.9 109.5	51 40.7 +25.4 108.8	50 46.6 +24.9 108.1	49 52.2 +24.6 107.5	48 57.7 +24.2 106.8
4°	53 00.5 +24.7 108.0	52 06.1 +24.3 107.3	51 11.5 +23.9 106.7	50 16.8 +23.5 106.0	49 21.9 +23.1 105.4
5°	53 25.2 +23.6 106.5	52 30.4 +23.2 105.8	51 35.4 +22.8 105.2	50 40.3 +22.4 104.6	49 45.0 +22.1 104.0
6°	53 48.8 +22.3 105.0	52 53.6 +21.9 104.3	51 58.2 +21.6 103.7	51 02.7 +21.3 103.1	50 07.1 +20.9 102.6
7°	54 11.1 +21.1 103.4	53 15.5 +20.8 102.8	52 19.8 +20.4 102.2	51 24.0 +20.1 101.6	50 28.0 +19.9 101.1
8°	54 32.2 +19.8 101.8	53 36.3 +19.4 101.2	52 40.2 +19.2 100.6	51 44.1 +19.0 100.1	50 47.9 +18.7 99.6
9°	54 52.0 +18.4 100.1	53 55.7 +18.2 99.6	52 59.4 +18.0 99.1	52 03.1 +17.7 98.6	51 06.6 +17.5 98.1
10°	55 10.4 +17.1 98.5	54 13.9 +16.9 98.0	53 17.4 +16.6 97.5	52 20.8 +16.5 97.0	51 24.1 +16.3 96.6
11°	55 27.5 +15.6 96.8	54 30.8 +15.5 96.3	53 34.0 +15.4 95.9	52 37.3 +15.2 95.4	51 40.4 +15.1 95.0
12°	55 43.1 +14.3 95.1	54 46.3 +14.1 94.7	53 49.4 +14.0 94.2	52 52.5 +13.9 93.8	51 55.5 +13.8 93.5
13°	55 57.4 +12.7 93.3	55 00.4 +12.7 93.0	54 03.4 +12.6 92.6	53 06.4 +12.5 92.2	52 09.3 +12.6 91.9
14°	56 10.1 +11.2 91.6	55 13.1 +11.2 91.3	54 16.0 +11.2 90.9	53 18.9 +11.3 90.6	52 21.9 +11.2 90.3
15°	56 21.3 +09.8 89.8	55 24.3 +09.7 89.5	54 27.2 +09.8 89.2	53 30.2 +09.8 88.9	52 33.1 +09.9 88.7
16°	56 31.1 +08.1 88.0	55 34.0 +08.3 87.8	54 37.0 +08.4 87.5	53 40.0 +08.5 87.3	52 43.0 +08.6 87.0
17°	56 39.2 +06.6 86.2	55 42.3 +06.8 86.0	54 45.4 +06.9 85.8	53 48.5 +07.0 85.6	52 51.6 +07.2 85.4
18°	56 45.8 +05.1 84.4	55 49.1 +05.2 84.3	54 52.3 +05.4 84.1	53 55.5 +05.7 83.9	52 58.8 +05.8 83.8
19°	56 50.9 +03.4 82.6	55 54.3 +03.7 82.5	54 57.7 +04.0 82.4	54 01.2 +04.2 82.2	53 04.6 +04.5 82.1
20°	56 54.3 +01.8 80.8	55 58.0 +02.1 80.7	55 01.7 +02.4 80.6	54 05.4 +02.7 80.5	53 09.1 +03.1 80.4
21°	56 56.1 +00.2 79.0	56 00.1 +00.6 78.9	55 04.1 +01.0 78.9	54 08.1 +01.4 78.8	53 12.2 +01.6 78.8
22°	56 56.3 -01.3 77.1	56 00.7 -00.9 77.1	55 05.1 -00.6 77.1	54 09.5 -00.2 77.1	53 13.8 +00.3 77.1
23°	56 55.0 -03.0 75.3	55 59.8 -02.6 75.3	55 04.5 -02.0 75.4	54 09.3 -01.6 75.4	53 14.1 -01.1 75.4
24°	56 52.0 -04.6 73.5	55 57.2 -04.0 73.6	55 02.5 -03.5 73.6	54 07.7 -03.0 73.7	53 13.0 -02.6 73.8
25°	56 47.4 -06.2 71.6	55 53.2 -05.6 71.8	54 59.0 -05.1 71.9	54 04.7 -04.5 72.0	53 10.4 -03.9 72.1
26°	56 41.2 -07.8 69.8	55 47.6 -07.1 70.0	54 53.9 -06.5 70.2	54 00.2 -05.9 70.3	53 06.5 -05.3 70.4
27°	56 33.4 -09.3 68.0	55 40.5 -08.6 68.2	54 47.4 -07.9 68.4	53 54.3 -07.3 68.6	53 01.2 -06.7 68.8
28°	56 24.1 -10.8 66.2	55 31.9 -10.1 66.5	54 39.5 -09.4 66.7	53 47.0 -08.7 66.9	52 54.5 -08.1 67.1
29°	56 13.3 -12.3 64.5	55 21.8 -11.6 64.8	54 30.1 -10.8 65.0	53 38.3 -10.1 65.3	52 46.4 -09.4 65.5

Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	46 45.9 +26.6 110.2	45 52.2 +26.2 109.6	44 58.4 +25.8 108.9	44 04.3 +25.4 108.3	43 10.0 +25.1 107.7
1°	47 12.5 +25.7 108.9	46 18.4 +25.3 108.3	45 24.2 +24.9 107.7	44 29.7 +24.5 107.1	43 35.1 +24.1 106.5
2°	47 38.2 +24.8 107.6	46 43.7 +24.4 107.0	45 49.1 +24.0 106.4	44 54.2 +23.7 105.8	43 59.2 +23.4 105.2
3°	48 03.0 +23.8 106.2	47 08.1 +23.5 105.6	46 13.1 +23.1 105.0	45 17.9 +22.8 104.5	44 22.6 +22.4 103.9
4°	48 26.8 +22.7 104.8	47 31.5 +22.5 104.3	46 36.2 +22.1 103.7	45 40.7 +21.8 103.2	44 45.0 +21.6 102.6
5°	48 49.5 +21.8 103.4	47 54.0 +21.4 102.9	46 58.3 +21.2 102.3	46 02.5 +20.9 101.8	45 06.6 +20.6 101.3
6°	49 11.3 +20.7 102.0	48 15.4 +20.4 101.5	47 19.5 +20.1 101.0	46 23.4 +19.9 100.5	45 27.2 +19.7 100.0
7°	49 32.0 +19.6 100.6	48 35.8 +19.4 100.1	47 39.6 +19.1 99.6	46 43.3 +18.9 99.1	45 46.9 +18.8 98.6
8°	49 51.6 +18.5 99.1	48 55.2 +18.3 98.6	47 58.7 +18.1 98.2	47 02.2 +17.9 97.7	46 05.7 +17.7 97.3
9°	50 10.1 +17.3 97.6	49 13.5 +17.1 97.2	48 16.8 +17.0 96.7	47 20.1 +16.9 96.3	46 23.4 +16.7 95.9
10°	50 27.4 +16.2 96.1	49 30.6 +16.1 95.7	48 33.8 +16.0 95.3	47 37.0 +15.8 94.9	46 40.1 +15.7 94.5
11°	50 43.6 +14.9 94.6	49 46.7 +14.9 94.2	48 49.8 +14.7 93.8	47 52.8 +14.7 93.5	46 55.8 +14.7 93.1
12°	50 58.5 +13.8 93.1	50 01.6 +13.7 92.7	49 04.5 +13.7 92.4	48 07.5 +13.6 92.0	47 10.5 +13.6 91.7
13°	51 12.3 +12.5 91.5	50 15.3 +12.5 91.2	49 18.2 +12.5 90.9	48 21.1 +12.5 90.5	47 24.1 +12.5 90.2
14°	51 24.8 +11.3 90.0	50 27.8 +11.2 89.7	49 30.7 +11.3 89.4	48 33.6 +11.4 89.1	47 36.6 +11.4 88.8
15°	51 36.1 +09.9 88.4	50 39.0 +10.1 88.1	49 42.0 +10.1 87.8	48 45.0 +10.2 87.6	47 48.0 +10.3 87.3
16°	51 46.0 +08.7 86.8	50 49.1 +08.8 86.6	49 52.1 +08.9 86.3	48 55.2 +09.0 86.1	47 58.3 +09.1 85.8
17°	51 54.7 +07.4 85.2	50 57.9 +07.5 85.0	50 01.0 +07.7 84.8	49 04.2 +07.9 84.6	48 07.4 +08.0 84.4
18°	52 02.1 +06.0 83.6	51 05.4 +06.2 83.4	50 08.7 +06.5 83.2	49 12.1 +06.6 83.1	48 15.4 +06.9 82.9
19°	52 08.1 +04.7 82.0	51 11.6 +05.0 81.8	50 15.2 +05.2 81.7	49 18.7 +05.5 81.5	48 22.3 +05.7 81.4
20°	52 12.8 +03.4 80.3	51 16.6 +03.6 80.2	50 20.4 +03.9 80.1	49 24.2 +04.2 80.0	48 28.0 +04.5 79.9
21°	52 16.2 +02.0 78.7	51 20.2 +02.4 78.6	50 24.3 +02.7 78.6	49 28.4 +03.0 78.5	48 32.5 +03.3 78.4
22°	52 18.2 +00.7 77.1	51 22.6 +01.0 77.0	50 27.0 +01.4 77.0	49 31.4 +01.8 76.9	48 35.8 +02.2 76.9
23°	52 18.9 -00.7 75.4	51 23.6 -00.2 75.4	50 28.4 +00.2 75.4	49 33.2 +00.5 75.4	48 38.0 +00.9 75.4
24°	52 18.2 -02.1 73.8	51 23.4 -01.6 73.8	50 28.6 -01.2 73.8	49 33.7 -00.6 73.9	48 38.9 -00.2 73.9
25°	52 16.1 -03.4 72.2	51 21.8 -02.9 72.2	50 27.4 -02.4 72.3	49 33.1 -01.9 72.3	48 38.7 -01.4 72.3
26°	52 12.7 -04.7 70.5	51 18.9 -04.2 70.6	50 25.0 -03.6 70.7	49 31.2 -03.1 70.8	48 37.3 -02.6 70.8
27°	52 08.0 -06.1 68.9	51 14.7 -05.5 69.0	50 21.4 -04.9 69.1	49 28.1 -04.4 69.2	48 34.7 -03.8 69.3
28°	52 01.9 -07.4 67.3	51 09.2 -06.8 67.4	50 16.5 -06.2 67.6	49 23.7 -05.5 67.7	48 30.9 -05.0 67.8
29°	51 54.5 -08.7 65.7	51 02.4 -08.0 65.9	50 10.3 -07.4 66.0	49 18.2 -06.8 66.2	48 25.9 -06.1 66.3

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	42 15.6 +24.7 107.2	41 21.0 +24.3 106.6	40 26.3 +23.9 106.1	39 31.3 +23.7 105.5	38 36.3 +23.4 105.0
1°	42 40.3 +23.8 105.9	41 45.3 +23.5 105.4	40 50.2 +23.3 104.9	39 55.0 +22.9 104.4	38 59.7 +22.6 103.9
2°	43 04.1 +23.0 104.7	42 08.8 +22.8 104.2	41 13.5 +22.4 103.6	40 17.9 +22.2 103.1	39 22.3 +21.9 102.7
3°	43 27.1 +22.2 103.4	42 31.6 +21.9 102.9	41 35.9 +21.6 102.4	40 40.1 +21.4 101.9	39 44.2 +21.2 101.5
4°	43 49.3 +21.3 102.1	42 53.5 +21.0 101.6	41 57.5 +20.8 101.2	41 01.5 +20.6 100.7	40 05.4 +20.4 100.2
5°	44 10.6 +20.4 100.8	43 14.5 +20.2 100.4	42 18.3 +20.0 99.9	41 22.1 +19.7 99.4	40 25.8 +19.5 99.0
6°	44 31.0 +19.5 99.5	43 34.7 +19.3 99.1	42 38.3 +19.1 98.6	41 41.8 +19.0 98.2	40 45.3 +18.8 97.8
7°	44 50.5 +18.5 98.2	43 54.0 +18.3 97.7	42 57.4 +18.2 97.3	42 00.8 +18.0 96.9	41 04.1 +17.9 96.5
8°	45 09.0 +17.6 96.8	44 12.3 +17.5 96.4	43 15.6 +17.3 96.0	42 18.8 +17.3 95.6	41 22.0 +17.1 95.2
9°	45 26.6 +16.6 95.5	44 29.8 +16.5 95.1	43 32.9 +16.4 94.7	42 36.1 +16.3 94.3	41 39.1 +16.3 93.9
10°	45 43.2 +15.6 94.1	44 46.3 +15.5 93.7	43 49.3 +15.5 93.4	42 52.4 +15.4 93.0	41 55.4 +15.3 92.7
11°	45 58.8 +14.6 92.7	45 01.8 +14.6 92.4	44 04.8 +14.5 92.0	43 07.8 +14.5 91.7	42 10.7 +14.5 91.4
12°	46 13.4 +13.6 91.3	45 16.4 +13.6 91.0	44 19.3 +13.6 90.7	43 22.3 +13.5 90.4	42 25.2 +13.6 90.0
13°	46 27.0 +12.5 89.9	45 30.0 +12.5 89.6	44 32.9 +12.6 89.3	43 35.8 +12.6 89.0	42 38.8 +12.6 88.7
14°	46 39.5 +11.5 88.5	45 42.5 +11.5 88.2	44 45.5 +11.5 87.9	43 48.4 +11.7 87.7	42 51.4 +11.7 87.4
15°	46 51.0 +10.4 87.1	45 54.0 +10.5 86.8	44 57.0 +10.6 86.6	44 00.1 +10.7 86.3	43 03.1 +10.8 86.1
16°	47 01.4 +09.2 85.6	46 04.5 +09.4 85.4	45 07.6 +09.5 85.2	44 10.8 +09.6 84.9	43 13.9 +09.8 84.7
17°	47 10.6 +08.2 84.2	46 13.9 +08.3 84.0	45 17.1 +08.6 83.8	44 20.4 +08.7 83.6	43 23.7 +08.9 83.3
18°	47 18.8 +07.1 82.7	46 22.2 +07.3 82.5	45 25.7 +07.4 82.3	44 29.1 +07.7 82.2	43 32.6 +07.9 82.0
19°	47 25.9 +05.9 81.2	46 29.5 +06.2 81.1	45 33.1 +06.4 80.9	44 36.8 +06.6 80.8	43 40.5 +06.9 80.6
20°	47 31.8 +04.8 79.8	46 35.7 +05.0 79.6	45 39.5 +05.4 79.5	44 43.4 +05.7 79.4	43 47.4 +05.9 79.2
21°	47 36.6 +03.7 78.3	46 40.7 +04.0 78.2	45 44.9 +04.3 78.1	44 49.1 +04.6 78.0	43 53.3 +04.9 77.9
22°	47 40.3 +02.5 76.8	46 44.7 +02.9 76.7	45 49.2 +03.2 76.7	44 53.7 +03.5 76.6	43 58.2 +03.9 76.5
23°	47 42.8 +01.3 75.3	46 47.6 +01.7 75.3	45 52.4 +02.1 75.2	44 57.2 +02.5 75.2	44 02.1 +02.9 75.1
24°	47 44.1 +00.2 73.8	46 49.3 +00.7 73.8	45 54.5 +01.1 73.8	44 59.7 +01.5 73.7	44 05.0 +01.8 73.7
25°	47 44.3 -00.9 72.4	46 50.0 -00.5 72.4	45 55.6 -00.1 72.3	45 01.2 +00.4 72.3	44 06.8 +00.9 72.3
26°	47 43.4 -02.1 70.9	46 49.5 -01.6 70.9	45 55.5 -01.1 70.9	45 01.6 -00.6 70.9	44 07.7 -00.2 70.9
27°	47 41.3 -03.3 69.4	46 47.9 -02.7 69.4	45 54.4 -02.2 69.5	45 01.0 -01.7 69.5	44 07.5 -01.1 69.5
28°	47 38.0 -04.3 67.9	46 45.2 -03.9 68.0	45 52.2 -03.2 68.0	44 59.3 -02.7 68.1	44 06.4 -02.2 68.1
29°	47 33.7 -05.6 66.4	46 41.3 -04.9 66.5	45 49.0 -04.4 66.6	44 56.6 -03.8 66.7	44 04.2 -03.2 66.7

Latitude 18°

Declination SAME name as Latitude

Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	37 41.1 +23.1 104.5	36 45.8 +22.8 104.0	35 50.4 +22.6 103.6	34 54.9 +22.3 103.1	33 59.3 +22.0 102.7
1°	38 04.2 +22.4 103.4	37 08.6 +22.2 102.9	36 13.0 +21.9 102.4	35 17.2 +21.6 102.0	34 21.3 +21.5 101.5
2°	38 26.6 +21.7 102.2	37 30.8 +21.4 101.7	36 34.9 +21.2 101.3	35 38.8 +21.0 100.8	34 42.8 +20.8 100.4
3°	38 48.3 +20.9 101.0	37 52.2 +20.7 100.5	36 56.1 +20.5 100.1	35 59.8 +20.4 99.7	35 03.6 +20.1 99.3
4°	39 09.2 +20.2 99.8	38 12.9 +20.0 99.4	37 16.6 +19.8 98.9	36 20.2 +19.6 98.5	35 23.7 +19.5 98.1
5°	39 29.4 +19.4 98.6	38 32.9 +19.2 98.1	37 36.4 +19.1 97.7	36 39.8 +19.0 97.3	35 43.2 +18.8 96.9
6°	39 48.8 +18.6 97.3	38 52.1 +18.5 96.9	37 55.5 +18.3 96.5	36 58.8 +18.2 96.1	36 02.0 +18.1 95.8
7°	40 07.4 +17.8 96.1	39 10.6 +17.7 95.7	38 13.8 +17.6 95.3	37 17.0 +17.5 95.0	36 20.1 +17.4 94.6
8°	40 25.2 +17.0 94.8	39 28.3 +16.9 94.5	38 31.4 +16.9 94.1	37 34.5 +16.8 93.7	36 37.5 +16.7 93.4
9°	40 42.2 +16.2 93.6	39 45.2 +16.1 93.2	38 48.3 +16.0 92.9	37 51.3 +16.0 92.5	36 54.2 +16.0 92.2
10°	40 58.4 +15.3 92.3	40 01.3 +15.3 92.0	39 04.3 +15.3 91.6	38 07.3 +15.2 91.3	37 10.2 +15.2 91.0
11°	41 13.7 +14.4 91.0	40 16.6 +14.5 90.7	39 19.6 +14.4 90.4	38 22.5 +14.5 90.1	37 25.4 +14.5 89.8
12°	41 28.1 +13.6 89.7	40 31.1 +13.6 89.4	39 34.0 +13.7 89.1	38 37.0 +13.6 88.8	37 39.9 +13.7 88.5
13°	41 41.7 +12.7 88.4	40 44.7 +12.7 88.2	39 47.7 +12.8 87.9	38 50.6 +12.9 87.6	37 53.6 +13.0 87.3
14°	41 54.4 +11.8 87.1	40 57.4 +11.9 86.9	40 00.5 +11.9 86.6	39 03.5 +12.1 86.3	38 06.6 +12.1 86.1
15°	42 06.2 +10.9 85.8	41 09.3 +11.0 85.6	40 12.4 +11.2 85.3	39 15.6 +11.2 85.1	38 18.7 +11.4 84.8
16°	42 17.1 +10.0 84.5	41 20.3 +10.1 84.3	40 23.6 +10.2 84.0	39 26.8 +10.4 83.8	38 30.1 +10.6 83.6
17°	42 27.1 +09.0 83.1	41 30.4 +09.2 82.9	40 33.8 +09.4 82.7	39 37.2 +09.6 82.5	38 40.7 +09.7 82.3
18°	42 36.1 +08.1 81.8	41 39.6 +08.3 81.6	40 43.2 +08.5 81.4	39 46.8 +08.7 81.2	38 50.4 +08.9 81.1
19°	42 44.2 +07.1 80.5	41 47.9 +07.4 80.3	40 51.7 +07.6 80.1	39 55.5 +07.8 80.0	38 59.3 +08.1 79.8
20°	42 51.3 +06.2 79.1	41 55.3 +06.4 79.0	40 59.3 +06.7 78.8	40 03.3 +07.0 78.7	39 07.4 +07.3 78.5
21°	42 57.5 +05.2 77.7	42 01.7 +05.6 77.6	41 06.0 +05.8 77.5	40 10.3 +06.1 77.4	39 14.7 +06.4 77.2
22°	43 02.7 +04.2 76.4	42 07.3 +04.5 76.3	41 11.8 +04.9 76.2	40 16.4 +05.3 76.1	39 21.1 +05.5 75.9
23°	43 06.9 +03.3 75.0	42 11.8 +03.6 74.9	41 16.7 +04.0 74.8	40 21.7 +04.3 74.8	39 26.6 +04.7 74.7
24°	43 10.2 +02.3 73.6	42 15.4 +02.7 73.6	41 20.7 +03.1 73.5	40 26.0 +03.5 73.4	39 31.3 +03.9 73.4
25°	43 12.5 +01.3 72.3	42 18.1 +01.7 72.2	41 23.8 +02.1 72.2	40 29.5 +02.5 72.1	39 35.2 +02.9 72.1
26°	43 13.8 +00.3 70.9	42 19.8 +00.8 70.9	41 25.9 +01.3 70.9	40 32.0 +01.7 70.8	39 38.1 +02.2 70.8
27°	43 14.1 -00.7 69.5	42 20.6 -00.2 69.5	41 27.2 +00.3 69.5	40 33.7 +00.8 69.5	39 40.3 +01.2 69.5
28°	43 13.4 -01.7 68.2	42 20.4 -01.1 68.2	41 27.5 -00.7 68.2	40 34.5 -00.1 68.2	39 41.5 +00.4 68.2
29°	43 11.7 -02.6 66.8	42 19.3 -02.1 66.8	41 26.8 -01.5 66.8	40 34.4 -01.1 66.9	39 41.9 -00.5 66.9

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	33 03.5 +21.9 102.2	32 07.7 +21.6 101.8	31 11.8 +21.4 101.3	30 15.8 +21.2 100.9	29 19.8 +21.0 100.5
1°	33 25.4 +21.2 101.1	32 29.3 +21.1 100.7	31 33.2 +20.9 100.3	30 37.0 +20.7 99.8	29 40.8 +20.5 99.4
2°	33 46.6 +20.6 100.0	32 50.4 +20.4 99.6	31 54.1 +20.2 99.2	30 57.7 +20.1 98.8	30 01.3 +19.9 98.4
3°	34 07.2 +20.0 98.8	33 10.8 +19.8 98.4	32 14.3 +19.7 98.0	31 17.8 +19.5 97.7	30 21.2 +19.4 97.3
4°	34 27.2 +19.3 97.7	33 30.6 +19.2 97.3	32 34.0 +19.1 96.9	31 37.3 +19.0 96.5	30 40.6 +18.8 96.2
5°	34 46.5 +18.7 96.5	33 49.8 +18.6 96.2	32 53.1 +18.4 95.8	31 56.3 +18.3 95.4	30 59.4 +18.3 95.1
6°	35 05.2 +18.0 95.4	34 08.4 +17.9 95.0	33 11.5 +17.9 94.7	32 14.6 +17.8 94.3	31 17.7 +17.7 94.0
7°	35 23.2 +17.4 94.2	34 26.3 +17.3 93.9	33 29.4 +17.2 93.5	32 32.4 +17.1 93.2	31 35.4 +17.1 92.8
8°	35 40.6 +16.6 93.0	34 43.6 +16.6 92.7	33 46.6 +16.5 92.4	32 49.5 +16.6 92.0	31 52.5 +16.5 91.7
9°	35 57.2 +16.0 91.9	35 00.2 +15.9 91.5	34 03.1 +15.9 91.2	33 06.1 +15.9 90.9	32 09.0 +15.9 90.6
10°	36 13.2 +15.2 90.7	35 16.1 +15.2 90.4	34 19.0 +15.3 90.0	33 22.0 +15.2 89.7	32 24.9 +15.3 89.4
11°	36 28.4 +14.5 89.5	35 31.3 +14.6 89.2	34 34.3 +14.5 88.9	33 37.2 +14.6 88.6	32 40.2 +14.6 88.3
12°	36 42.9 +13.7 88.3	35 45.9 +13.8 88.0	34 48.8 +13.9 87.7	33 51.8 +14.0 87.4	32 54.8 +14.0 87.1
13°	36 56.6 +13.1 87.0	35 59.7 +13.1 86.8	35 02.7 +13.2 86.5	34 05.8 +13.2 86.2	33 08.8 +13.4 86.0
14°	37 09.7 +12.2 85.8	36 12.8 +12.3 85.6	35 15.9 +12.5 85.3	34 19.0 +12.6 85.1	33 22.2 +12.7 84.8
15°	37 21.9 +11.5 84.6	36 25.1 +11.6 84.3	35 28.4 +11.7 84.1	34 31.6 +11.9 83.9	33 34.9 +12.0 83.6
16°	37 33.4 +10.7 83.4	36 36.7 +10.9 83.1	35 40.1 +11.0 82.9	34 43.5 +11.2 82.7	33 46.9 +11.4 82.5
17°	37 44.1 +09.9 82.1	36 47.6 +10.1 81.9	35 51.1 +10.3 81.7	34 54.7 +10.5 81.5	33 58.3 +10.6 81.3
18°	37 54.0 +09.2 80.9	36 57.7 +09.4 80.7	36 01.4 +09.6 80.5	35 05.2 +09.7 80.3	34 08.9 +10.0 80.1
19°	38 03.2 +08.3 79.6	37 07.1 +08.5 79.4	36 11.0 +08.8 79.3	35 14.9 +09.1 79.1	34 18.9 +09.3 78.9
20°	38 11.5 +07.5 78.3	37 15.6 +07.8 78.2	36 19.8 +08.1 78.0	35 24.0 +08.3 77.9	34 28.2 +08.6 77.7
21°	38 19.0 +06.7 77.1	37 23.4 +07.0 76.9	36 27.9 +07.2 76.8	35 32.3 +07.6 76.6	34 36.8 +07.9 76.5
22°	38 25.7 +05.9 75.8	37 30.4 +06.2 75.7	36 35.1 +06.6 75.6	35 39.9 +06.8 75.4	34 44.7 +07.2 75.3
23°	38 31.6 +05.1 74.5	37 36.6 +05.4 74.4	36 41.7 +05.7 74.3	35 46.7 +06.1 74.2	34 51.9 +06.4 74.1
24°	38 36.7 +04.2 73.3	37 42.0 +04.6 73.2	36 47.4 +05.0 73.1	35 52.8 +05.4 73.0	34 58.3 +05.7 72.9
25°	38 40.9 +03.4 72.0	37 46.6 +03.8 71.9	36 52.4 +04.2 71.8	35 58.2 +04.6 71.7	35 04.0 +05.0 71.6
26°	38 44.3 +02.5 70.7	37 50.4 +03.0 70.7	36 56.6 +03.4 70.6	36 02.8 +03.8 70.5	35 09.0 +04.3 70.4
27°	38 46.8 +01.7 69.4	37 53.4 +02.2 69.4	37 00.0 +02.6 69.3	36 06.6 +03.1 69.3	35 13.3 +03.5 69.2
28°	38 48.5 +00.9 68.2	37 55.6 +01.3 68.1	37 02.6 +01.9 68.1	36 09.7 +02.3 68.0	35 16.8 +02.8 68.0
29°	38 49.4 +00.0 66.9	37 56.9 +00.6 66.9	37 04.5 +01.0 66.8	36 12.0 +01.6 66.8	35 19.6 +02.0 66.8

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Declination SAME name as Latitude

Latitude 18°

Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	28 23.6 +20.9 100.1	27 27.4 +20.7 99.7	26 31.1 +20.5 99.3	25 34.8 +20.3 98.9	24 38.4 +20.2 98.6
1°	28 44.5 +20.3 99.0	27 48.1 +20.1 98.7	26 51.6 +20.0 98.3	25 55.1 +19.9 97.9	24 58.6 +19.7 97.5
2°	29 04.8 +19.8 98.0	28 08.2 +19.7 97.6	27 11.6 +19.6 97.2	26 15.0 +19.4 96.9	25 18.3 +19.3 96.5
3°	29 24.6 +19.2 96.9	28 27.9 +19.2 96.5	27 31.2 +19.0 96.2	26 34.4 +19.0 95.8	25 37.6 +18.9 95.4
4°	29 43.8 +18.8 95.8	28 47.1 +18.6 95.4	27 50.2 +18.6 95.1	26 53.4 +18.5 94.7	25 56.5 +18.4 94.4
5°	30 02.6 +18.2 94.7	29 05.7 +18.1 94.4	28 08.8 +18.0 94.0	27 11.9 +17.9 93.7	26 14.9 +17.9 93.3
6°	30 20.8 +17.6 93.6	29 23.8 +17.6 93.3	28 26.8 +17.6 92.9	27 29.8 +17.5 92.6	26 32.8 +17.5 92.3
7°	30 38.4 +17.1 92.5	29 41.4 +17.0 92.2	28 44.4 +17.0 91.8	27 47.3 +17.0 91.5	26 50.3 +16.9 91.2
8°	30 55.5 +16.5 91.4	29 58.4 +16.5 91.1	29 01.4 +16.4 90.7	28 04.3 +16.5 90.4	27 07.2 +16.5 90.1
9°	31 12.0 +15.8 90.3	30 14.9 +15.9 89.9	29 17.8 +15.9 89.6	28 20.8 +15.9 89.3	27 23.7 +16.0 89.0
10°	31 27.8 +15.3 89.1	30 30.8 +15.3 88.8	29 33.7 +15.4 88.5	28 36.7 +15.4 88.2	27 39.7 +15.4 87.9
11°	31 43.1 +14.7 88.0	30 46.1 +14.8 87.7	29 49.1 +14.8 87.4	28 52.1 +14.9 87.1	27 55.1 +15.0 86.9
12°	31 57.8 +14.1 86.9	31 00.9 +14.1 86.6	30 03.9 +14.2 86.3	29 07.0 +14.3 86.0	28 10.1 +14.4 85.8
13°	32 11.9 +13.5 85.7	31 15.0 +13.6 85.4	30 18.1 +13.7 85.2	29 21.3 +13.8 84.9	28 24.5 +13.8 84.7
14°	32 25.4 +12.8 84.6	31 28.6 +12.9 84.3	30 31.8 +13.1 84.0	29 35.1 +13.2 83.8	28 38.3 +13.4 83.5
15°	32 38.2 +12.2 83.4	31 41.5 +12.3 83.2	30 44.9 +12.4 82.9	29 48.3 +12.6 82.7	28 51.7 +12.8 82.4
16°	32 50.4 +11.5 82.2	31 53.8 +11.7 82.0	30 57.3 +11.9 81.8	30 00.9 +12.0 81.5	29 04.5 +12.2 81.3
17°	33 01.9 +10.8 81.1	32 05.5 +11.1 80.8	31 09.2 +11.3 80.6	30 12.9 +11.5 80.4	29 16.7 +11.6 80.2
18°	33 12.7 +10.3 79.9	32 16.6 +10.4 79.7	31 20.5 +10.6 79.5	30 24.4 +10.8 79.3	29 28.3 +11.1 79.1
19°	33 23.0 +09.5 78.7	32 27.0 +09.8 78.5	31 31.1 +10.0 78.3	30 35.2 +10.3 78.1	29 39.4 +10.5 77.9
20°	33 32.5 +08.8 77.5	32 36.8 +09.1 77.3	31 41.1 +09.4 77.2	30 45.5 +09.7 77.0	29 49.9 +10.0 76.8
21°	33 41.3 +08.2 76.3	32 45.9 +08.5 76.2	31 50.5 +08.8 76.0	30 55.2 +09.0 75.8	29 59.9 +09.3 75.7
22°	33 49.5 +07.5 75.1	32 54.4 +07.8 75.0	31 59.3 +08.1 74.8	31 04.2 +08.5 74.7	30 09.2 +08.8 74.5
23°	33 57.0 +06.8 73.9	33 02.2 +07.1 73.8	32 07.4 +07.5 73.7	31 12.7 +07.8 73.5	30 18.0 +08.1 73.4
24°	34 03.8 +06.1 72.7	33 09.3 +06.5 72.6	32 14.9 +06.8 72.5	31 20.5 +07.1 72.4	30 26.1 +07.5 72.2
25°	34 09.9 +05.4 71.5	33 15.8 +05.7 71.4	32 21.7 +06.1 71.3	31 27.6 +06.6 71.2	30 33.6 +07.0 71.1
26°	34 15.3 +04.6 70.3	33 21.5 +05.1 70.2	32 27.8 +05.5 70.1	31 34.2 +05.9 70.0	30 40.6 +06.3 69.9
27°	34 19.9 +04.0 69.1	33 26.6 +04.4 69.1	32 33.3 +04.9 69.0	31 40.1 +05.3 68.9	30 46.9 +05.7 68.8
28°	34 23.9 +03.2 67.9	33 31.0 +03.7 67.9	32 38.2 +04.2 67.8	31 45.4 +04.6 67.7	30 52.6 +05.1 67.6
29°	34 27.1 +02.6 66.7	33 34.7 +03.1 66.7	32 42.4 +03.5 66.6	31 50.0 +04.0 66.5	30 57.7 +04.4 66.5

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	23 41.9 +20.1 98.2	22 45.4 +20.0 97.8	21 48.9 +19.8 97.5	20 52.3 +19.6 97.1	19 55.6 +19.6 96.8
1°	24 02.0 +19.6 97.2	23 05.4 +19.5 96.8	22 08.7 +19.4 96.5	21 11.9 +19.4 96.1	20 15.2 +19.2 95.8
2°	24 21.6 +19.2 96.1	23 24.9 +19.1 95.8	22 28.1 +19.0 95.4	21 31.3 +18.9 95.1	20 34.4 +18.8 94.7
3°	24 40.8 +18.8 95.1	23 44.0 +18.7 94.7	22 47.1 +18.6 94.4	21 50.2 +18.5 94.1	20 53.2 +18.5 93.7
4°	24 59.6 +18.3 94.0	24 02.7 +18.2 93.7	23 05.7 +18.2 93.4	22 08.7 +18.2 93.0	21 11.7 +18.2 92.7
5°	25 17.9 +17.9 93.0	24 20.9 +17.9 92.7	23 23.9 +17.8 92.3	22 26.9 +17.8 92.0	21 29.9 +17.7 91.7
6°	25 35.8 +17.4 91.9	24 38.8 +17.4 91.6	23 41.7 +17.4 91.3	22 44.7 +17.3 91.0	21 47.6 +17.4 90.7
7°	25 53.2 +17.0 90.9	24 56.2 +16.9 90.6	23 59.1 +17.0 90.2	23 02.0 +17.0 89.9	22 05.0 +16.9 89.6
8°	26 10.2 +16.5 89.8	25 13.1 +16.5 89.5	24 16.1 +16.5 89.2	23 19.0 +16.5 88.9	22 21.9 +16.6 88.6
9°	26 26.7 +15.9 88.7	25 29.6 +16.0 88.4	24 32.6 +16.0 88.1	23 35.5 +16.2 87.8	22 38.5 +16.2 87.6
10°	26 42.6 +15.6 87.7	25 45.6 +15.6 87.4	24 48.6 +15.7 87.1	23 51.7 +15.7 86.8	22 54.7 +15.8 86.5
11°	26 58.2 +15.0 86.6	26 01.2 +15.1 86.3	25 04.3 +15.1 86.0	24 07.4 +15.2 85.7	23 10.5 +15.3 85.5
12°	27 13.2 +14.5 85.5	26 16.3 +14.6 85.2	25 19.4 +14.7 84.9	24 22.6 +14.8 84.7	23 25.8 +14.9 84.4
13°	27 27.7 +14.0 84.4	26 30.9 +14.1 84.1	25 34.1 +14.3 83.9	24 37.4 +14.4 83.6	23 40.7 +14.5 83.4
14°	27 41.7 +13.4 83.3	26 45.0 +13.6 83.0	25 48.4 +13.7 82.8	24 51.8 +13.9 82.5	23 55.2 +14.1 82.3
15°	27 55.1 +13.0 82.2	26 58.6 +13.1 82.0	26 02.1 +13.3 81.7	25 05.7 +13.4 81.5	24 09.3 +13.6 81.2
16°	28 08.1 +12.4 81.1	27 11.7 +12.6 80.9	26 15.4 +12.8 80.6	25 19.1 +13.0 80.4	24 22.9 +13.1 80.2
17°	28 20.5 +11.8 80.0	27 24.3 +12.1 79.8	26 28.2 +12.2 79.5	25 32.1 +12.4 79.3	24 36.0 +12.7 79.1
18°	28 32.3 +11.3 78.9	27 36.4 +11.5 78.7	26 40.4 +11.8 78.4	25 44.5 +12.0 78.2	24 48.7 +12.2 78.0
19°	28 43.6 +10.8 77.7	27 47.9 +11.0 77.5	26 52.2 +11.3 77.3	25 56.5 +11.6 77.1	25 00.9 +11.8 76.9
20°	28 54.4 +10.2 76.6	27 58.9 +10.5 76.4	27 03.5 +10.7 76.2	26 08.1 +11.0 76.0	25 12.7 +11.3 75.8
21°	29 04.6 +09.6 75.5	28 09.4 +09.9 75.3	27 14.2 +10.2 75.1	26 19.1 +10.5 74.9	25 24.0 +10.8 74.8
22°	29 14.2 +09.1 74.4	28 19.3 +09.4 74.2	27 24.4 +09.7 74.0	26 29.6 +10.0 73.9	25 34.8 +10.3 73.7
23°	29 23.3 +08.5 73.2	28 28.7 +08.8 73.1	27 34.1 +09.2 72.9	26 39.6 +09.5 72.7	25 45.1 +09.9 72.6
24°	29 31.8 +07.9 72.1	28 37.5 +08.3 71.9	27 43.3 +08.6 71.8	26 49.1 +09.0 71.6	25 55.0 +09.3 71.5
25°	29 39.7 +07.3 71.0	28 45.8 +07.7 70.8	27 51.9 +08.1 70.7	26 58.1 +08.4 70.5	26 04.3 +08.8 70.4
26°	29 47.0 +06.7 69.8	28 53.5 +07.1 69.7	28 00.0 +07.5 69.6	27 06.5 +07.9 69.4	26 13.1 +08.4 69.3
27°	29 53.7 +06.1 68.7	29 00.6 +06.5 68.6	28 07.5 +07.0 68.4	27 14.4 +07.4 68.3	26 21.5 +07.8 68.2
28°	29 59.8 +05.6 67.5	29 07.1 +06.0 67.4	28 14.5 +06.4 67.3	27 21.8 +06.9 67.2	26 29.3 +07.3 67.1
29°	30 05.4 +04.9 66.4	29 13.1 +05.4 66.3	28 20.9 +05.9 66.2	27 28.7 +06.3 66.1	26 36.6 +06.8 66.0

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Latitude 18°

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Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	18 59.0 +19.4 96.4	18 02.2 +19.4 96.1	17 05.5 +19.2 95.7	16 08.7 +19.1 95.4	15 11.8 +19.1 95.1
1°	19 18.4 +19.1 95.4	18 21.6 +19.0 95.1	17 24.7 +19.0 94.7	16 27.8 +18.9 94.4	15 30.9 +18.9 94.1
2°	19 37.5 +18.8 94.4	18 40.6 +18.7 94.1	17 43.7 +18.6 93.7	16 46.7 +18.6 93.4	15 49.8 +18.5 93.1
3°	19 56.3 +18.4 93.4	18 59.3 +18.4 93.1	18 02.3 +18.4 92.7	17 05.3 +18.3 92.4	16 08.3 +18.3 92.1
4°	20 14.7 +18.1 92.4	19 17.7 +18.1 92.1	18 20.7 +18.0 91.7	17 23.6 +18.1 91.4	16 26.6 +18.0 91.1
5°	20 32.8 +17.7 91.4	19 35.8 +17.7 91.1	18 38.7 +17.7 90.7	17 41.7 +17.7 90.4	16 44.6 +17.7 90.1
6°	20 50.5 +17.4 90.3	19 53.5 +17.4 90.0	18 56.4 +17.4 89.7	17 59.4 +17.4 89.4	17 02.3 +17.4 89.1
7°	21 07.9 +17.0 89.3	20 10.9 +17.0 89.0	19 13.8 +17.0 88.7	18 16.8 +17.0 88.4	17 19.7 +17.1 88.1
8°	21 24.9 +16.6 88.3	20 27.9 +16.6 88.0	19 30.8 +16.8 87.7	18 33.8 +16.8 87.4	17 36.8 +16.9 87.1
9°	21 41.5 +16.2 87.3	20 44.5 +16.3 87.0	19 47.6 +16.3 86.7	18 50.6 +16.4 86.4	17 53.7 +16.5 86.1
10°	21 57.7 +15.9 86.2	21 00.8 +15.9 85.9	20 03.9 +16.0 85.7	19 07.0 +16.1 85.4	18 10.2 +16.1 85.1
11°	22 13.6 +15.4 85.2	21 16.7 +15.6 84.9	20 19.9 +15.6 84.6	19 23.1 +15.8 84.4	18 26.3 +15.9 84.1
12°	22 29.0 +15.1 84.1	21 32.3 +15.1 83.9	20 35.5 +15.3 83.6	19 38.9 +15.4 83.3	18 42.2 +15.5 83.1
13°	22 44.1 +14.6 83.1	21 47.4 +14.8 82.8	20 50.8 +14.9 82.6	19 54.3 +15.0 82.3	18 57.7 +15.2 82.0
14°	22 58.7 +14.2 82.0	22 02.2 +14.3 81.8	21 05.7 +14.5 81.5	20 09.3 +14.7 81.3	19 12.9 +14.9 81.0
15°	23 12.9 +13.8 81.0	22 16.5 +14.0 80.7	21 20.2 +14.2 80.5	20 24.0 +14.3 80.2	19 27.8 +14.5 80.0
16°	23 26.7 +13.3 79.9	22 30.5 +13.5 79.7	21 34.4 +13.7 79.4	20 38.3 +13.9 79.2	19 42.3 +14.1 79.0
17°	23 40.0 +12.9 78.9	22 44.0 +13.2 78.6	21 48.1 +13.4 78.4	20 52.2 +13.6 78.2	19 56.4 +13.8 77.9
18°	23 52.9 +12.5 77.8	22 57.2 +12.7 77.6	22 01.5 +12.9 77.3	21 05.8 +13.2 77.1	20 10.2 +13.4 76.9
19°	24 05.4 +12.0 76.7	23 09.9 +12.2 76.5	22 14.4 +12.5 76.3	21 19.0 +12.8 76.1	20 23.6 +13.1 75.9
20°	24 17.4 +11.6 75.6	23 22.1 +11.9 75.4	22 26.9 +12.1 75.2	21 31.8 +12.4 75.0	20 36.7 +12.7 74.8
21°	24 29.0 +11.1 74.6	23 34.0 +11.4 74.4	22 39.0 +11.7 74.2	21 44.2 +12.0 74.0	20 49.4 +12.3 73.8
22°	24 40.1 +10.6 73.5	23 45.4 +10.9 73.3	22 50.7 +11.3 73.1	21 56.2 +11.6 72.9	21 01.7 +11.9 72.7
23°	24 50.7 +10.2 72.4	23 56.3 +10.5 72.2	23 02.0 +10.9 72.0	22 07.8 +11.1 71.9	21 13.6 +11.5 71.7
24°	25 00.9 +09.7 71.3	24 06.8 +10.1 71.1	23 12.9 +10.4 71.0	22 18.9 +10.8 70.8	21 25.1 +11.1 70.6
25°	25 10.6 +09.2 70.2	24 16.9 +09.6 70.1	23 23.3 +09.9 69.9	22 29.7 +10.4 69.7	21 36.2 +10.7 69.6
26°	25 19.8 +08.7 69.1	24 26.5 +09.1 69.0	23 33.2 +09.6 68.8	22 40.1 +09.9 68.7	21 46.9 +10.4 68.5
27°	25 28.5 +08.2 68.0	24 35.6 +08.7 67.9	23 42.8 +09.0 67.7	22 50.0 +09.5 67.6	21 57.3 +09.9 67.4
28°	25 36.7 +07.8 66.9	24 44.3 +08.1 66.8	23 51.8 +08.7 66.7	22 59.5 +09.0 66.5	22 07.2 +09.5 66.4
29°	25 44.5 +07.2 65.8	24 52.4 +07.8 65.7	24 00.5 +08.1 65.6	23 08.5 +08.6 65.4	22 16.7 +09.0 65.3

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 15.0 +19.0 94.7	13 18.1 +19.0 94.4	12 21.2 +18.9 94.1	11 24.3 +18.8 93.8	10 27.3 +18.8 93.4
1°	14 34.0 +18.8 93.8	13 37.1 +18.7 93.4	12 40.1 +18.6 93.1	11 43.1 +18.6 92.8	10 46.1 +18.6 92.5
2°	14 52.8 +18.5 92.8	13 55.8 +18.4 92.5	12 58.7 +18.5 92.1	12 01.7 +18.4 91.8	11 04.7 +18.4 91.5
3°	15 11.3 +18.2 91.8	14 14.2 +18.3 91.5	13 17.2 +18.2 91.2	12 20.1 +18.2 90.8	11 23.1 +18.2 90.5
4°	15 29.5 +18.0 90.8	14 32.5 +18.0 90.5	13 35.4 +18.0 90.2	12 38.3 +18.0 89.9	11 41.3 +18.0 89.6
5°	15 47.5 +17.7 89.8	14 50.5 +17.7 89.5	13 53.4 +17.8 89.2	12 56.3 +17.8 88.9	11 59.3 +17.8 88.6
6°	16 05.2 +17.5 88.8	15 08.2 +17.5 88.5	14 11.2 +17.5 88.2	13 14.1 +17.6 87.9	12 17.1 +17.6 87.6
7°	16 22.7 +17.2 87.8	15 25.7 +17.2 87.5	14 28.7 +17.2 87.2	13 31.7 +17.3 86.9	12 34.7 +17.4 86.6
8°	16 39.9 +16.8 86.8	15 42.9 +16.9 86.5	14 45.9 +17.1 86.2	13 49.0 +17.1 85.9	12 52.1 +17.2 85.6
9°	16 56.7 +16.6 85.8	15 59.8 +16.7 85.5	15 03.0 +16.7 85.2	14 06.1 +16.8 85.0	13 09.3 +16.9 84.7
10°	17 13.3 +16.3 84.8	16 16.5 +16.4 84.5	15 19.7 +16.5 84.2	14 22.9 +16.6 84.0	13 26.2 +16.7 83.7
11°	17 29.6 +16.0 83.8	16 32.9 +16.1 83.5	15 36.2 +16.2 83.2	14 39.5 +16.4 83.0	13 42.9 +16.5 82.7
12°	17 45.6 +15.6 82.8	16 49.0 +15.8 82.5	15 52.4 +16.0 82.2	14 55.9 +16.1 82.0	13 59.4 +16.2 81.7
13°	18 01.2 +15.4 81.8	17 04.8 +15.5 81.5	16 08.4 +15.6 81.2	15 12.0 +15.8 81.0	14 15.6 +16.0 80.7
14°	18 16.6 +15.0 80.8	17 20.3 +15.2 80.5	16 24.0 +15.4 80.2	15 27.8 +15.5 80.0	14 31.6 +15.8 79.7
15°	18 31.6 +14.7 79.7	17 35.5 +14.8 79.5	16 39.4 +15.1 79.2	15 43.3 +15.3 79.0	14 47.4 +15.4 78.7
16°	18 46.3 +14.3 78.7	17 50.3 +14.6 78.5	16 54.5 +14.7 78.2	15 58.6 +15.0 78.0	15 02.8 +15.3 77.7
17°	19 00.6 +14.1 77.7	18 04.9 +14.3 77.4	17 09.2 +14.5 77.2	16 13.6 +14.7 77.0	15 18.1 +14.9 76.7
18°	19 14.7 +13.6 76.7	18 19.2 +13.9 76.4	17 23.7 +14.2 76.2	16 28.3 +14.4 76.0	15 33.0 +14.7 75.7
19°	19 28.3 +13.3 75.6	18 33.1 +13.6 75.4	17 37.9 +13.8 75.2	16 42.7 +14.2 74.9	15 47.7 +14.4 74.7
20°	19 41.6 +13.0 74.6	18 46.7 +13.2 74.4	17 51.7 +13.6 74.1	16 56.9 +13.8 73.9	16 02.1 +14.1 73.7
21°	19 54.6 +12.6 73.6	18 59.9 +12.9 73.3	18 05.3 +13.2 73.1	17 10.7 +13.5 72.9	16 16.2 +13.8 72.7
22°	20 07.2 +12.2 72.5	19 12.8 +12.6 72.3	18 18.5 +12.8 72.1	17 24.2 +13.2 71.9	16 30.0 +13.5 71.7
23°	20 19.4 +11.9 71.5	19 25.4 +12.2 71.3	18 31.3 +12.6 71.1	17 37.4 +12.9 70.9	16 43.5 +13.3 70.6
24°	20 31.3 +11.5 70.4	19 37.6 +11.8 70.2	18 43.9 +12.2 70.0	17 50.3 +12.6 69.8	16 56.8 +12.9 69.6
25°	20 42.8 +11.1 69.4	19 49.4 +11.5 69.2	18 56.1 +11.8 69.0	18 02.9 +12.2 68.8	17 09.7 +12.6 68.6
26°	20 53.9 +10.7 68.3	20 00.9 +11.1 68.1	19 07.9 +11.6 68.0	18 15.1 +11.9 67.8	17 22.3 +12.3 67.6
27°	21 04.6 +10.3 67.3	20 12.0 +10.7 67.1	19 19.5 +11.1 66.9	18 27.0 +11.6 66.7	17 34.6 +12.0 66.6
28°	21 14.9 +09.9 66.2	20 22.7 +10.4 66.1	19 30.6 +10.8 65.9	18 38.6 +11.2 65.7	17 46.6 +11.6 65.5
29°	21 24.8 +09.6 65.2	20 33.1 +10.0 65.0	19 41.4 +10.4 64.8	18 49.8 +10.9 64.7	17 58.2 +11.4 64.5

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Declination SAME name as Latitude

Latitude 18°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 30.4 +18.7 93.1	8 33.4 +18.6 92.8	7 36.4 +18.6 92.5	6 39.3 +18.7 92.2	5 42.3 +18.6 91.9
1°	9 49.1 +18.5 92.2	8 52.0 +18.6 91.8	7 55.0 +18.5 91.5	6 58.0 +18.5 91.2	6 00.9 +18.5 90.9
2°	10 07.6 +18.4 91.2	9 10.6 +18.4 90.9	8 13.5 +18.4 90.6	7 16.5 +18.3 90.3	6 19.4 +18.4 89.9
3°	10 26.0 +18.2 90.2	9 29.0 +18.2 89.9	8 31.9 +18.2 89.6	7 34.8 +18.3 89.3	6 37.8 +18.2 89.0
4°	10 44.2 +18.1 89.3	9 47.2 +18.0 88.9	8 50.1 +18.1 88.6	7 53.1 +18.1 88.3	6 56.0 +18.2 88.0
5°	11 02.3 +17.8 88.3	10 05.2 +17.9 88.0	9 08.2 +17.9 87.7	8 11.2 +18.0 87.4	7 14.2 +18.0 87.1
6°	11 20.1 +17.7 87.3	10 23.1 +17.7 87.0	9 26.1 +17.8 86.7	8 29.2 +17.8 86.4	7 32.2 +17.9 86.1
7°	11 37.8 +17.4 86.3	10 40.8 +17.5 86.0	9 43.9 +17.6 85.7	8 47.0 +17.7 85.4	7 50.1 +17.8 85.1
8°	11 55.2 +17.3 85.4	10 58.3 +17.4 85.1	10 01.5 +17.4 84.8	9 04.7 +17.5 84.5	8 07.9 +17.7 84.2
9°	12 12.5 +17.0 84.4	11 15.7 +17.1 84.1	10 18.9 +17.3 83.8	9 22.2 +17.4 83.5	8 25.6 +17.4 83.2
10°	12 29.5 +16.8 83.4	11 32.8 +17.0 83.1	10 36.2 +17.1 82.8	9 39.6 +17.2 82.5	8 43.0 +17.4 82.2
11°	12 46.3 +16.7 82.4	11 49.8 +16.8 82.1	10 53.3 +16.9 81.8	9 56.8 +17.1 81.6	9 00.4 +17.2 81.3
12°	13 03.0 +16.3 81.4	12 06.6 +16.5 81.1	11 10.2 +16.7 80.9	10 13.9 +16.8 80.6	9 17.6 +17.0 80.3
13°	13 19.3 +16.2 80.4	12 23.1 +16.3 80.2	11 26.9 +16.5 79.9	10 30.7 +16.7 79.6	9 34.6 +16.9 79.3
14°	13 35.5 +15.9 79.4	12 39.4 +16.1 79.2	11 43.4 +16.3 78.9	10 47.4 +16.5 78.6	9 51.5 +16.7 78.4
15°	13 51.4 +15.7 78.5	12 55.5 +15.9 78.2	11 59.7 +16.1 77.9	11 03.9 +16.4 77.7	10 08.2 +16.6 77.4
16°	14 07.1 +15.4 77.5	13 11.4 +15.7 77.2	12 15.8 +15.9 76.9	11 20.3 +16.1 76.7	10 24.8 +16.3 76.4
17°	14 22.5 +15.2 76.5	13 27.1 +15.4 76.2	12 31.7 +15.7 76.0	11 36.4 +15.9 75.7	10 41.1 +16.2 75.4
18°	14 37.7 +15.0 75.5	13 42.5 +15.2 75.2	12 47.4 +15.4 75.0	11 52.3 +15.7 74.7	10 57.3 +16.0 74.5
19°	14 52.7 +14.6 74.5	13 57.7 +15.0 74.2	13 02.8 +15.3 74.0	12 08.0 +15.5 73.7	11 13.3 +15.8 73.5
20°	15 07.3 +14.4 73.5	14 12.7 +14.7 73.2	13 18.1 +15.0 73.0	12 23.5 +15.3 72.7	11 29.1 +15.6 72.5
21°	15 21.7 +14.2 72.5	14 27.4 +14.4 72.2	13 33.1 +14.7 72.0	12 38.8 +15.1 71.7	11 44.7 +15.4 71.5
22°	15 35.9 +13.8 71.4	14 41.8 +14.2 71.2	13 47.8 +14.5 71.0	12 53.9 +14.9 70.8	12 00.1 +15.2 70.5
23°	15 49.7 +13.6 70.4	14 56.0 +13.9 70.2	14 02.3 +14.3 70.0	13 08.8 +14.6 69.8	12 15.3 +14.9 69.5
24°	16 03.3 +13.3 69.4	15 09.9 +13.7 69.2	14 16.6 +14.0 69.0	13 23.4 +14.4 68.8	12 30.2 +14.8 68.5
25°	16 16.6 +13.0 68.4	15 23.6 +13.3 68.2	14 30.6 +13.8 68.0	13 37.8 +14.1 67.8	12 45.0 +14.5 67.5
26°	16 29.6 +12.7 67.4	15 36.9 +13.1 67.2	14 44.4 +13.5 67.0	13 51.9 +13.9 66.8	12 59.5 +14.3 66.5
27°	16 42.3 +12.4 66.4	15 50.0 +12.9 66.2	14 57.9 +13.2 66.0	14 05.8 +13.7 65.8	13 13.8 +14.1 65.5
28°	16 54.7 +12.1 65.3	16 02.9 +12.5 65.2	15 11.1 +13.0 65.0	14 19.5 +13.4 64.8	13 27.9 +13.8 64.5
29°	17 06.8 +11.8 64.3	16 15.4 +12.2 64.1	15 24.1 +12.7 63.9	14 32.9 +13.1 63.7	13 41.7 +13.6 63.5

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 45.3 +18.5 91.5	3 48.2 +18.6 91.2	2 51.2 +18.5 90.9	1 54.1 +18.6 90.6	0 57.1 +18.5 90.3
1°	5 03.8 +18.5 90.6	4 06.8 +18.5 90.3	3 09.7 +18.5 90.0	2 12.7 +18.5 89.7	1 15.6 +18.5 89.4
2°	5 22.3 +18.4 89.6	4 25.3 +18.4 89.3	3 28.2 +18.4 89.0	2 31.2 +18.4 88.7	1 34.1 +18.5 88.4
3°	5 40.7 +18.3 88.7	4 43.7 +18.3 88.4	3 46.6 +18.4 88.1	2 49.6 +18.4 87.8	1 52.6 +18.5 87.5
4°	5 59.0 +18.2 87.7	5 02.0 +18.3 87.4	4 05.0 +18.3 87.1	3 08.0 +18.4 86.8	2 11.1 +18.4 86.5
5°	6 17.2 +18.1 86.8	5 20.3 +18.1 86.5	4 23.3 +18.2 86.2	3 26.4 +18.3 85.9	2 29.5 +18.4 85.5
6°	6 35.3 +18.0 85.8	5 38.4 +18.1 85.5	4 41.5 +18.2 85.2	3 44.7 +18.2 84.9	2 47.9 +18.3 84.6
7°	6 53.3 +17.9 84.8	5 56.5 +17.9 84.5	4 59.7 +18.0 84.2	4 02.9 +18.2 83.9	3 06.2 +18.3 83.6
8°	7 11.2 +17.7 83.9	6 14.4 +17.9 83.6	5 17.7 +18.0 83.3	4 21.1 +18.1 83.0	3 24.5 +18.2 82.7
9°	7 28.9 +17.6 82.9	6 32.3 +17.7 82.6	5 35.7 +17.9 82.3	4 39.2 +18.0 82.0	3 42.7 +18.2 81.7
10°	7 46.5 +17.5 82.0	6 50.0 +17.7 81.7	5 53.6 +17.8 81.4	4 57.2 +17.9 81.1	4 00.9 +18.1 80.8
11°	8 04.0 +17.4 81.0	7 07.7 +17.5 80.7	6 11.4 +17.7 80.4	5 15.1 +17.9 80.1	4 19.0 +18.0 79.8
12°	8 21.4 +17.2 80.0	7 25.2 +17.4 79.7	6 29.1 +17.5 79.5	5 33.0 +17.8 79.2	4 37.0 +17.9 78.9
13°	8 38.6 +17.1 79.1	7 42.6 +17.2 78.8	6 46.6 +17.5 78.5	5 50.8 +17.6 78.2	4 54.9 +17.9 77.9
14°	8 55.7 +16.9 78.1	7 59.8 +17.2 77.8	7 04.1 +17.3 77.5	6 08.4 +17.6 77.2	5 12.8 +17.8 77.0
15°	9 12.6 +16.7 77.1	8 17.0 +17.0 76.8	7 21.4 +17.3 76.6	6 26.0 +17.4 76.3	5 30.6 +17.7 76.0
16°	9 29.3 +16.6 76.1	8 34.0 +16.8 75.9	7 38.7 +17.0 75.6	6 43.4 +17.4 75.3	5 48.3 +17.6 75.0
17°	9 45.9 +16.5 75.2	8 50.8 +16.7 74.9	7 55.7 +17.0 74.6	7 00.8 +17.2 74.3	6 05.9 +17.4 74.1
18°	10 02.4 +16.2 74.2	9 07.5 +16.5 73.9	8 12.7 +16.8 73.7	7 18.0 +17.1 73.4	6 23.3 +17.4 73.1
19°	10 18.6 +16.1 73.2	9 24.0 +16.4 73.0	8 29.5 +16.7 72.7	7 35.1 +16.9 72.4	6 40.7 +17.3 72.1
20°	10 34.7 +15.9 72.2	9 40.4 +16.2 72.0	8 46.2 +16.5 71.7	7 52.0 +16.9 71.4	6 58.0 +17.1 71.2
21°	10 50.6 +15.7 71.3	9 56.6 +16.1 71.0	9 02.7 +16.4 70.7	8 08.9 +16.7 70.5	7 15.1 +17.1 70.2
22°	11 06.3 +15.5 70.3	10 12.7 +15.8 70.0	9 19.1 +16.2 69.8	8 25.6 +16.5 69.5	7 32.2 +16.9 69.2
23°	11 21.8 +15.4 69.3	10 28.5 +15.7 69.0	9 35.3 +16.0 68.8	8 42.1 +16.4 68.5	7 49.1 +16.7 68.3
24°	11 37.2 +15.1 68.3	10 44.2 +15.5 68.1	9 51.3 +15.9 67.8	8 58.5 +16.3 67.6	8 05.8 +16.7 67.3
25°	11 52.3 +14.9 67.3	10 59.7 +15.3 67.1	10 07.2 +15.7 66.8	9 14.8 +16.1 66.6	8 22.5 +16.4 66.3
26°	12 07.2 +14.7 66.3	11 15.0 +15.1 66.1	10 22.9 +15.5 65.9	9 30.9 +15.9 65.6	8 38.9 +16.4 65.4
27°	12 21.9 +14.5 65.3	11 30.1 +14.9 65.1	10 38.4 +15.3 64.9	9 46.8 +15.8 64.6	8 55.3 +16.2 64.4
28°	12 36.4 +14.3 64.3	11 45.0 +14.7 64.1	10 53.7 +15.2 63.9	10 02.6 +15.5 63.7	9 11.5 +16.0 63.4
29°	12 50.7 +14.0 63.3	11 59.7 +14.5 63.1	11 08.9 +14.9 62.9	10 18.1 +15.5 62.7	9 27.5 +15.9 62.4

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Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +18.5 90.0	-0 57.1 +18.6	-1 54.1 +18.5	-2 51.2 +18.6	-3 48.2 +18.6
1°	0 18.5 +18.6 89.0	-0 38.5 +18.5	-1 35.6 +18.6	-2 32.6 +18.6	-3 29.6 +18.6
2°	0 37.1 +18.5 88.1	-0 20.0 +18.6	-1 17.0 +18.6	-2 14.0 +18.7	-3 11.0 +18.8
3°	0 55.6 +18.5 87.1	-0 01.4 +18.6	-0 58.4 +18.7	-1 55.3 +18.7	-2 52.2 +18.7
4°	1 14.1 +18.5 86.2	0 17.2 +18.5 85.9	-0 39.7 +18.6	-1 36.6 +18.7	-2 33.5 +18.9
5°	1 32.6 +18.5 85.2	0 35.7 +18.6 84.9	-0 21.1 +18.7	-1 17.9 +18.8	-2 14.6 +18.8
6°	1 51.1 +18.4 84.3	0 54.3 +18.5 84.0	-0 02.4 +18.6	-0 59.1 +18.7	-1 55.8 +18.9
7°	2 09.5 +18.4 83.3	1 12.8 +18.6 83.0	0 16.2 +18.7 82.7	-0 40.4 +18.8	-1 36.9 +18.9
8°	2 27.9 +18.3 82.4	1 31.4 +18.4 82.1	0 34.9 +18.6 81.8	-0 21.6 +18.8	-1 18.0 +18.9
9°	2 46.2 +18.4 81.4	1 49.8 +18.5 81.1	0 53.5 +18.6 80.8	-0 02.8 +18.8	-0 59.1 +19.0
10°	3 04.6 +18.2 80.5	2 08.3 +18.4 80.2	1 12.1 +18.6 79.9	0 16.0 +18.7 79.6	-0 40.1 +18.9
11°	3 22.8 +18.2 79.5	2 26.7 +18.4 79.2	1 30.7 +18.6 78.9	0 34.7 +18.8 78.6	-0 21.2 +19.0
12°	3 41.0 +18.2 78.6	2 45.1 +18.4 78.3	1 49.3 +18.5 78.0	0 53.5 +18.7 77.7	-0 02.2 +18.9
13°	3 59.2 +18.0 77.6	3 03.5 +18.2 77.3	2 07.8 +18.5 77.0	1 12.2 +18.8 76.7	0 16.7 +19.0 76.4
14°	4 17.2 +18.0 76.7	3 21.7 +18.3 76.4	2 26.3 +18.5 76.1	1 31.0 +18.7 75.8	0 35.7 +19.0 75.5
15°	4 35.2 +18.0 75.7	3 40.0 +18.2 75.4	2 44.8 +18.4 75.1	1 49.7 +18.7 74.8	0 54.7 +18.9 74.5
16°	4 53.2 +17.8 74.7	3 58.2 +18.1 74.5	3 03.2 +18.4 74.2	2 08.4 +18.6 73.9	1 13.6 +18.9 73.6
17°	5 11.0 +17.8 73.8	4 16.3 +18.0 73.5	3 21.6 +18.3 73.2	2 27.0 +18.6 72.9	1 32.5 +18.9 72.6
18°	5 28.8 +17.6 72.8	4 34.3 +18.0 72.5	3 39.9 +18.3 72.3	2 45.6 +18.6 72.0	1 51.4 +18.8 71.7
19°	5 46.4 +17.6 71.9	4 52.3 +17.8 71.6	3 58.2 +18.2 71.3	3 04.2 +18.5 71.0	2 10.2 +18.9 70.7
20°	6 04.0 +17.5 70.9	5 10.1 +17.8 70.6	4 16.4 +18.1 70.3	3 22.7 +18.4 70.1	2 29.1 +18.7 69.8
21°	6 21.5 +17.3 69.9	5 27.9 +17.7 69.7	4 34.5 +18.0 69.4	3 41.1 +18.4 69.1	2 47.8 +18.8 68.8
22°	6 38.8 +17.3 69.0	5 45.6 +17.6 68.7	4 52.5 +18.0 68.4	3 59.5 +18.3 68.2	3 06.6 +18.7 67.9
23°	6 56.1 +17.1 68.0	6 03.2 +17.5 67.7	5 10.5 +17.8 67.5	4 17.8 +18.3 67.2	3 25.3 +18.6 66.9
24°	7 13.2 +17.0 67.1	6 20.7 +17.4 66.8	5 28.3 +17.8 66.5	4 36.1 +18.1 66.2	3 43.9 +18.6 66.0
25°	7 30.2 +16.9 66.1	6 38.1 +17.3 65.8	5 46.1 +17.7 65.6	4 54.2 +18.1 65.3	4 02.5 +18.5 65.0
26°	7 47.1 +16.8 65.1	6 55.4 +17.2 64.9	6 03.8 +17.6 64.6	5 12.3 +18.0 64.3	4 21.0 +18.4 64.1
27°	8 03.9 +16.6 64.1	7 12.6 +17.0 63.9	6 21.4 +17.5 63.6	5 30.3 +17.9 63.4	4 39.4 +18.3 63.1
28°	8 20.5 +16.5 63.2	7 29.6 +16.9 62.9	6 38.9 +17.3 62.7	5 48.2 +17.9 62.4	4 57.7 +18.3 62.1
29°	8 37.0 +16.3 62.2	7 46.5 +16.8 62.0	6 56.2 +17.3 61.7	6 06.1 +17.7 61.4	5 16.0 +18.2 61.2

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 45.3 +18.7	-5 42.3 +18.7	-6 39.3 +18.7	-7 36.4 +18.8	-8 33.4 +18.9
1°	-4 26.6 +18.7	-5 23.6 +18.7	-6 20.6 +18.8	-7 17.6 +18.9	-8 14.5 +18.9
2°	-4 07.9 +18.8	-5 04.9 +18.9	-6 01.8 +18.9	-6 58.7 +19.0	-7 55.6 +19.1
3°	-3 49.1 +18.8	-4 46.0 +18.9	-5 42.9 +19.0	-6 39.7 +19.1	-7 36.5 +19.2
4°	-3 30.3 +18.9	-4 27.1 +19.0	-5 23.9 +19.2	-6 20.6 +19.2	-7 17.3 +19.3
5°	-3 11.4 +19.0	-4 08.1 +19.1	-5 04.7 +19.1	-6 01.4 +19.3	-6 58.0 +19.5
6°	-2 52.4 +19.0	-3 49.0 +19.1	-4 45.6 +19.3	-5 42.1 +19.5	-6 38.5 +19.5
7°	-2 33.4 +19.0	-3 29.9 +19.2	-4 26.3 +19.4	-5 22.6 +19.5	-6 19.0 +19.7
8°	-2 14.4 +19.1	-3 10.7 +19.3	-4 06.9 +19.4	-5 03.1 +19.5	-5 59.3 +19.8
9°	-1 55.3 +19.1	-2 51.4 +19.3	-3 47.5 +19.4	-4 43.6 +19.7	-5 39.5 +19.8
10°	-1 36.2 +19.2	-2 32.1 +19.3	-3 28.1 +19.6	-4 23.9 +19.7	-5 19.7 +20.0
11°	-1 17.0 +19.1	-2 12.8 +19.4	-3 08.5 +19.6	-4 04.2 +19.8	-4 59.7 +20.0
12°	-0 57.9 +19.2	-1 53.4 +19.4	-2 48.9 +19.6	-3 44.4 +19.9	-4 39.7 +20.1
13°	-0 38.7 +19.2	-1 34.0 +19.4	-2 29.3 +19.7	-3 24.5 +19.9	-4 19.6 +20.1
14°	-0 19.5 +19.2	-1 14.6 +19.4	-2 09.6 +19.7	-3 04.6 +20.0	-3 59.5 +20.3
15°	-0 00.3 +19.2	-0 55.2 +19.5	-1 49.9 +19.7	-2 44.6 +20.0	-3 39.2 +20.3
16°	0 18.9 +19.2 73.3	-0 35.7 +19.5	-1 30.2 +19.7	-2 24.6 +20.0	-3 18.9 +20.3
17°	0 38.1 +19.2 72.3	-0 16.2 +19.4	-1 10.5 +19.8	-2 04.6 +20.1	-2 58.6 +20.4
18°	0 57.3 +19.1 71.4	0 03.2 +19.5 71.1	-0 50.7 +19.8	-1 44.5 +20.1	-2 38.2 +20.4
19°	1 16.4 +19.2 70.4	0 22.7 +19.5 70.1	-0 30.9 +19.8	-1 24.4 +20.1	-2 17.8 +20.5
20°	1 35.6 +19.1 69.5	0 42.2 +19.4 69.2	-0 11.1 +19.8	-1 04.3 +20.2	-1 57.3 +20.5
21°	1 54.7 +19.1 68.5	1 01.6 +19.5 68.2	0 08.7 +19.8 67.9	-0 44.1 +20.2	-1 36.8 +20.5
22°	2 13.8 +19.0 67.6	1 21.1 +19.4 67.3	0 28.5 +19.8 67.0	-0 23.9 +20.1	-1 16.3 +20.6
23°	2 32.8 +19.0 66.6	1 40.5 +19.4 66.3	0 48.3 +19.8 66.0	-0 03.8 +20.2	-0 55.7 +20.5
24°	2 51.8 +19.0 65.7	1 59.9 +19.4 65.4	1 08.1 +19.7 65.1	0 16.4 +20.2 64.8	-0 35.2 +20.6
25°	3 10.8 +18.9 64.7	2 19.3 +19.3 64.4	1 27.8 +19.8 64.1	0 36.6 +20.1 63.8	-0 14.6 +20.6
26°	3 29.7 +18.9 63.8	2 38.6 +19.3 63.5	1 47.6 +19.7 63.2	0 56.7 +20.2 62.9	0 06.0 +20.6 62.6
27°	3 48.6 +18.7 62.8	2 57.9 +19.2 62.5	2 07.3 +19.7 62.2	1 16.9 +20.1 62.0	0 26.6 +20.5 61.6
28°	4 07.3 +18.8 61.9	3 17.1 +19.2 61.6	2 27.0 +19.6 61.3	1 37.0 +20.1 61.0	0 47.1 +20.6 60.7
29°	4 26.1 +18.6 60.9	3 36.3 +19.1 60.6	2 46.6 +19.6 60.4	1 57.1 +20.0 60.1	1 07.7 +20.5 59.8

Dec	LHA 100° / 260°	LHA 101° / 259°	LHA 102° / 258°	LHA 103° / 257°	LHA 104° / 256°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-9 30.4 +18.9				
1°	-9 11.5 +19.1				
2°	-8 52.4 +19.1	-9 49.3 +19.3			
3°	-8 33.3 +19.3	-9 30.0 +19.4			
4°	-8 14.0 +19.5	-9 10.6 +19.6			
5°	-7 54.5 +19.6	-8 51.0 +19.7			
6°	-7 34.9 +19.7	-8 31.3 +19.9			
7°	-7 15.2 +19.8	-8 11.4 +20.0			
8°	-6 55.4 +20.0	-7 51.4 +20.1			
9°	-6 35.4 +20.0	-7 31.3 +20.3			
10°	-6 15.4 +20.2	-7 11.0 +20.3			
11°	-5 55.2 +20.2	-6 50.7 +20.5			
12°	-5 35.0 +20.3	-6 30.2 +20.6			
13°	-5 14.7 +20.5	-6 09.6 +20.7			
14°	-4 54.2 +20.5	-5 48.9 +20.8			
15°	-4 33.7 +20.5	-5 28.1 +20.8			
16°	-4 13.2 +20.7	-5 07.3 +21.0			
17°	-3 52.5 +20.7	-4 46.3 +21.0			
18°	-3 31.8 +20.8	-4 25.3 +21.1			
19°	-3 11.0 +20.8	-4 04.2 +21.2			
20°	-2 50.2 +20.8	-3 43.0 +21.2			
21°	-2 29.4 +20.9	-3 21.8 +21.2			
22°	-2 08.5 +21.0	-3 00.6 +21.4			
23°	-1 47.5 +20.9	-2 39.2 +21.3			
24°	-1 26.6 +21.0	-2 17.9 +21.4			
25°	-1 05.6 +21.0	-1 56.5 +21.5			
26°	-0 44.6 +21.0	-1 35.0 +21.4			
27°	-0 23.6 +21.0	-1 13.6 +21.5			
28°	-0 02.6 +21.1	-0 52.1 +21.5			
29°	0 18.5 +21.0 59.5	-0 30.6 +21.5			

Dec	LHA 105° / 255°	LHA 106° / 254°	LHA 107° / 253°	LHA 108° / 252°	LHA 109° / 251°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°					
1°					
2°					
3°					
4°					
5°					
6°					
7°					
8°					
9°					
10°					
11°					
12°					
13°					
14°					
15°					
16°					
17°					
18°					
19°					
20°					
21°					
22°					
23°					
24°					
25°					
26°					
27°					
28°					
29°					

Declination SAME name as Latitude

Latitude 19°

Dec	LHA 000° / 360°	LHA 001° / 359°	LHA 002° / 358°	LHA 003° / 357°	LHA 004° / 356°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	71 00.0 +60.0 180.0	70 58.5 +59.9 176.9	70 53.9 +59.7 173.9	70 46.4 +59.3 170.9	70 35.9 +58.8 167.9
1°	72 00.0 +60.0 180.0	71 58.4 +59.9 176.8	71 53.6 +59.7 173.6	71 45.7 +59.2 170.4	71 34.7 +58.6 167.2
2°	73 00.0 +60.0 180.0	72 58.3 +59.9 176.6	72 53.3 +59.6 173.2	72 44.9 +59.1 169.8	72 33.3 +58.4 166.6
3°	74 00.0 +60.0 180.0	73 58.2 +59.9 176.4	73 52.9 +59.5 172.8	73 44.0 +59.0 169.2	73 31.7 +58.3 165.8
4°	75 00.0 +60.0 180.0	74 58.1 +59.9 176.2	74 52.4 +59.5 172.3	74 43.0 +58.8 168.6	74 30.0 +58.0 164.9
5°	76 00.0 +60.0 180.0	75 58.0 +59.8 175.9	75 51.9 +59.4 171.8	75 41.8 +58.7 167.8	75 28.0 +57.7 163.9
6°	77 00.0 +60.0 180.0	76 57.8 +59.8 175.6	76 51.3 +59.3 171.2	76 40.5 +58.5 166.9	76 25.7 +57.4 162.8
7°	78 00.0 +60.0 180.0	77 57.6 +59.8 175.2	77 50.6 +59.2 170.5	77 39.0 +58.3 165.9	77 23.1 +57.0 161.5
8°	79 00.0 +60.0 180.0	78 57.4 +59.8 174.8	78 49.8 +59.0 169.7	78 37.3 +57.9 164.8	78 20.1 +56.4 160.0
9°	80 00.0 +60.0 180.0	79 57.2 +59.7 174.3	79 48.8 +58.9 168.8	79 35.2 +57.4 163.4	79 16.5 +55.7 158.3
10°	81 00.0 +60.0 180.0	80 56.9 +59.6 173.7	80 47.7 +58.5 167.6	80 32.6 +56.9 161.7	80 12.2 +54.9 156.2
11°	82 00.0 +60.0 180.0	81 56.5 +59.5 173.0	81 46.2 +58.2 166.2	81 29.5 +56.1 159.7	81 07.1 +53.5 153.7
12°	83 00.0 +60.0 180.0	82 56.0 +59.4 172.0	82 44.4 +57.6 164.3	82 25.6 +55.0 157.1	82 00.6 +51.9 150.6
13°	84 00.0 +60.0 180.0	83 55.4 +59.1 170.8	83 42.0 +56.7 161.9	83 20.6 +53.3 153.9	82 52.5 +49.5 146.8
14°	85 00.0 +60.0 180.0	84 54.5 +58.7 169.0	84 38.7 +55.3 158.7	84 13.9 +50.8 149.6	83 42.0 +46.0 141.9
15°	86 00.0 +60.0 180.0	85 53.2 +57.9 166.4	85 34.0 +52.7 154.1	85 04.7 +46.6 143.9	84 28.0 +40.8 135.7
16°	87 00.0 +60.0 180.0	86 51.1 +56.0 162.2	86 26.7 +47.7 147.2	85 51.3 +39.7 135.9	85 08.8 +33.3 127.6
17°	88 00.0 +60.0 180.0	87 47.1 +50.2 154.4	87 14.4 +37.0 136.1	86 31.0 +28.1 124.6	85 42.1 +22.5 117.1
18°	89 00.0 +60.0 180.0	88 37.3 +26.0 136.4	87 51.4 +15.1 117.5	86 59.1 +10.7 108.9	86 04.6 +08.5 104.1
19°	90 00.0 -60.0 0.0	89 03.3 -25.8 89.8	88 06.5 -14.5 89.7	87 09.8 -09.8 89.5	86 13.1 -07.1 89.3
20°	89 00.0 -60.0 0.0	88 37.5 -50.1 43.1	87 52.0 -36.7 61.7	87 00.0 -27.4 70.0	86 06.0 -21.4 74.5
21°	88 00.0 -60.0 0.0	87 47.4 -56.0 25.0	87 15.3 -47.5 42.9	86 32.6 -39.2 54.1	85 44.6 -32.6 61.3
22°	87 00.0 -60.0 0.0	86 51.4 -57.8 17.2	86 27.8 -52.6 31.6	85 53.4 -46.4 42.6	85 12.0 -40.3 50.6
23°	86 00.0 -60.0 0.0	85 53.6 -58.7 13.0	85 35.2 -55.3 24.7	85 07.0 -50.5 34.5	84 31.7 -45.6 42.3
24°	85 00.0 -60.0 0.0	84 54.9 -59.2 10.4	84 39.9 -56.7 20.1	84 16.5 -53.3 28.6	83 46.1 -49.2 35.9
25°	84 00.0 -60.0 0.0	83 55.7 -59.3 8.6	83 43.2 -57.6 16.8	83 23.2 -54.9 24.3	82 56.9 -51.7 31.0
26°	83 00.0 -60.0 0.0	82 56.4 -59.6 7.3	82 45.6 -58.1 14.4	82 28.3 -56.0 21.0	82 05.2 -53.5 27.1
27°	82 00.0 -60.0 0.0	81 56.8 -59.6 6.4	81 47.5 -58.6 12.6	81 32.3 -56.9 18.5	81 11.7 -54.7 24.0
28°	81 00.0 -60.0 0.0	80 57.2 -59.7 5.6	80 48.9 -58.8 11.1	80 35.4 -57.4 16.4	80 17.0 -55.6 21.4
29°	80 00.0 -60.0 0.0	79 57.5 -59.7 5.0	79 50.1 -59.0 10.0	79 38.0 -57.9 14.7	79 21.4 -56.4 19.3

Dec	LHA 005° / 355°	LHA 006° / 354°	LHA 007° / 353°	LHA 008° / 352°	LHA 009° / 351°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	70 22.6 +58.1 165.0	70 06.5 +57.3 162.1	69 47.8 +56.4 159.3	69 26.5 +55.4 156.7	69 02.9 +54.3 154.1
1°	71 20.7 +57.8 164.2	71 03.8 +57.0 161.2	70 44.2 +56.0 158.3	70 21.9 +55.0 155.5	69 57.2 +53.9 152.9
2°	72 18.5 +57.7 163.3	72 00.8 +56.7 160.2	71 40.2 +55.6 157.2	71 16.9 +54.5 154.3	70 51.1 +53.2 151.5
3°	73 16.2 +57.3 162.4	72 57.5 +56.2 159.1	72 35.8 +55.1 156.0	72 11.4 +53.8 153.0	71 44.3 +52.5 150.1
4°	74 13.5 +57.0 161.3	73 53.7 +55.9 157.9	73 30.9 +54.5 154.6	73 05.2 +53.1 151.5	72 36.8 +51.7 148.5
5°	75 10.5 +56.6 160.2	74 49.6 +55.2 156.6	74 25.4 +53.9 153.1	73 58.3 +52.4 149.9	73 28.5 +50.8 146.8
6°	76 07.1 +56.1 158.8	75 44.8 +54.6 155.0	75 19.3 +53.0 151.4	74 50.7 +51.3 148.0	74 19.3 +49.6 144.9
7°	77 03.2 +55.4 157.3	76 39.4 +53.8 153.3	76 12.3 +52.0 149.5	75 42.0 +50.1 146.0	75 08.9 +48.3 142.7
8°	77 58.6 +54.7 155.5	77 33.2 +52.8 151.3	77 04.3 +50.7 147.4	76 32.1 +48.8 143.7	75 57.2 +46.8 140.3
9°	78 53.3 +53.7 153.5	78 26.0 +51.5 149.0	77 55.0 +49.3 144.9	77 20.9 +47.1 141.1	76 44.0 +44.9 137.7
10°	79 47.0 +52.5 151.1	79 17.5 +50.0 146.4	78 44.3 +47.5 142.1	78 08.0 +45.0 138.2	77 28.9 +42.7 134.7
11°	80 39.5 +50.8 148.2	80 07.5 +47.9 143.3	79 31.8 +45.2 138.8	78 53.0 +42.5 134.9	78 11.6 +40.0 131.4
12°	81 30.3 +48.5 144.8	80 55.4 +45.4 139.6	80 17.0 +42.3 135.1	79 35.5 +39.5 131.1	78 51.6 +37.0 127.6
13°	82 18.8 +45.7 140.6	81 40.8 +42.0 135.3	80 59.3 +38.7 130.7	80 15.0 +35.8 126.8	79 28.6 +33.2 123.4
14°	83 04.5 +41.5 135.5	82 22.8 +37.6 130.1	81 38.0 +34.2 125.6	80 50.8 +31.4 121.9	80 01.8 +28.9 118.7
15°	83 46.0 +36.0 129.2	83 00.4 +32.0 124.0	82 12.2 +28.7 119.8	81 22.2 +26.0 116.4	80 30.7 +23.9 113.6
16°	84 22.0 +28.5 121.4	83 32.4 +24.8 116.7	82 40.9 +22.1 113.1	81 48.2 +19.8 110.2	80 54.6 +18.1 107.9
17°	84 50.5 +18.8 112.0	83 57.2 +16.2 108.4	83 03.0 +14.2 105.6	82 08.0 +12.9 103.5	81 12.7 +11.8 101.7
18°	85 09.3 +07.1 101.1	84 13.4 +06.2 99.0	83 17.2 +05.7 97.4	82 20.9 +05.3 96.2	81 24.5 +05.0 95.2
19°	85 16.4 -05.5 89.2	84 19.6 -04.2 89.0	83 22.9 -03.3 88.9	82 26.2 -02.6 88.7	81 29.5 -02.0 88.5
20°	85 10.9 -17.3 77.2	84 15.4 -14.3 79.0	83 19.6 -12.1 80.2	82 23.6 -10.3 81.1	81 27.5 -08.8 81.8
21°	84 53.6 -27.3 66.1	84 01.1 -23.3 69.5	83 07.5 -20.0 71.9	82 13.3 -17.5 73.8	81 18.7 -15.4 75.2
22°	84 26.3 -35.1 56.5	83 37.8 -30.7 60.9	82 47.5 -27.1 64.2	81 55.8 -24.0 66.8	81 03.3 -21.5 68.9
23°	83 51.2 -40.9 48.5	83 07.1 -36.6 53.4	82 20.4 -32.9 57.3	81 31.8 -29.6 60.4	80 41.8 -26.7 63.0
24°	83 10.3 -45.1 42.0	82 30.5 -41.3 47.1	81 47.5 -37.6 51.2	81 02.2 -34.3 54.7	80 15.1 -31.4 57.6
25°	82 25.2 -48.3 36.8	81 49.2 -44.7 41.7	81 09.9 -41.4 46.0	80 27.9 -38.3 49.6	79 43.7 -35.4 52.7
26°	81 36.9 -50.5 32.5	81 04.5 -47.5 37.3	80 28.5 -44.5 41.4	79 49.6 -41.6 45.1	79 08.3 -38.8 48.3
27°	80 46.4 -52.2 29.0	80 17.0 -49.6 33.0	79 44.0 -46.9 37.5	79 08.0 -44.2 41.1	78 29.5 -41.6 44.3
28°	79 54.2 -53.6 26.0	79 27.4 -51.3 30.3	78 57.1 -48.9 34.2	78 23.8 -46.4 37.7	77 47.9 -44.0 40.8
29°	79 00.6 -54.6 23.6	78 36.1 -52.6 27.6	78 08.2 -50.4 31.2	77 37.4 -48.2 34.6	77 03.9 -45.9 37.7

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Dec	LHA 010° / 350°	LHA 011° / 349°	LHA 012° / 348°	LHA 013° / 347°	LHA 014° / 346°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	68 36.9 +53.3 151.6	68 08.9 +52.1 149.2	67 38.8 +51.0 146.9	67 06.9 +49.8 144.7	66 33.2 +48.7 142.6
1°	69 30.2 +52.7 150.3	69 01.0 +51.5 147.8	68 29.8 +50.3 145.5	67 56.7 +49.0 143.2	67 21.9 +47.8 141.1
2°	70 22.9 +52.0 148.9	69 52.5 +50.7 146.3	69 20.1 +49.3 143.9	68 45.7 +48.1 141.6	68 09.7 +46.8 139.5
3°	71 14.9 +51.1 147.4	70 43.2 +49.8 144.8	70 09.4 +48.4 142.3	69 33.8 +47.1 140.0	68 56.5 +45.7 137.8
4°	72 06.0 +50.3 145.7	71 33.0 +48.7 143.0	70 57.8 +47.3 140.5	70 20.9 +45.8 138.1	69 42.2 +44.5 135.9
5°	72 56.3 +49.1 143.9	72 21.7 +47.6 141.1	71 45.1 +46.1 138.6	71 06.7 +44.6 136.2	70 26.7 +43.0 133.9
6°	73 45.4 +47.9 141.9	73 09.3 +46.3 139.1	72 31.2 +44.6 136.5	71 51.3 +43.0 134.1	71 09.7 +41.6 131.8
7°	74 33.3 +46.5 139.7	73 55.6 +44.7 136.8	73 15.8 +43.0 134.2	72 34.3 +41.4 131.8	71 51.3 +39.8 129.6
8°	75 19.8 +44.8 137.2	74 40.3 +42.9 134.4	73 58.8 +41.2 131.8	73 15.7 +39.5 129.3	72 31.1 +37.9 127.1
9°	76 04.6 +42.8 134.5	75 23.2 +40.9 131.7	74 40.0 +39.0 129.1	73 55.2 +37.3 126.7	73 09.0 +35.7 124.5
10°	76 47.4 +40.6 131.6	76 04.1 +38.4 128.7	75 19.0 +36.6 126.1	74 32.5 +34.9 123.8	73 44.7 +33.4 121.7
11°	77 28.0 +37.8 128.2	76 42.5 +35.8 125.4	75 55.6 +33.9 122.9	75 07.4 +32.2 120.7	74 18.1 +30.7 118.6
12°	78 05.8 +34.6 124.6	77 18.3 +32.6 121.9	76 29.5 +30.8 119.5	75 39.6 +29.2 117.3	74 48.8 +27.7 115.4
13°	78 40.4 +31.0 120.5	77 50.9 +29.1 118.0	77 00.3 +27.3 115.7	76 08.8 +25.8 113.7	75 16.5 +24.5 112.0
14°	79 11.4 +26.8 116.0	78 20.0 +25.0 113.7	77 27.6 +23.5 111.7	76 34.6 +22.1 109.9	75 41.0 +21.0 108.3
15°	79 38.2 +22.1 111.2	78 45.0 +20.5 109.1	77 51.1 +19.2 107.4	76 56.7 +18.2 105.9	76 02.0 +17.2 104.5
16°	80 00.3 +16.7 105.9	79 05.5 +15.6 104.3	78 10.3 +14.7 102.8	77 14.9 +13.8 101.6	76 19.2 +13.2 100.5
17°	80 17.0 +10.9 100.3	79 21.1 +10.2 99.1	78 25.0 +9.7 98.0	77 28.7 +9.4 97.1	76 32.4 +9.0 96.3
18°	80 27.9 +04.9 94.4	79 31.3 +04.8 93.7	78 34.7 +04.7 93.1	77 38.1 +04.6 92.5	76 41.4 +04.6 92.1
19°	80 32.8 -01.5 88.4	79 36.1 -01.0 88.2	78 39.4 -00.6 88.0	77 42.7 -00.2 87.9	76 46.0 +00.1 87.7
20°	80 31.3 -07.6 82.3	79 35.1 -06.6 82.7	78 38.8 -05.7 83.0	77 42.5 -05.0 83.2	76 46.1 -04.2 83.3
21°	80 23.7 -13.7 76.3	79 28.5 -12.2 77.2	78 33.1 -10.9 77.9	77 37.5 -09.6 78.5	76 41.9 -08.7 79.0
22°	80 10.0 -19.2 70.5	79 16.3 -17.3 71.9	78 22.2 -15.6 73.0	77 27.9 -14.2 73.9	76 33.2 -12.8 74.7
23°	79 50.8 -24.2 65.1	78 59.0 -22.1 66.8	78 06.6 -20.2 68.3	77 13.7 -18.5 69.5	76 20.4 -17.0 70.5
24°	79 26.6 -28.8 60.0	78 36.9 -26.4 62.0	77 46.4 -24.3 63.8	76 55.2 -22.4 65.2	76 03.4 -20.7 66.5
25°	78 57.8 -32.8 55.3	78 10.5 -30.3 57.6	77 22.1 -28.1 59.5	76 32.8 -26.1 61.2	75 42.7 -24.2 62.7
26°	78 25.0 -36.1 51.0	77 40.2 -33.8 53.4	76 54.0 -31.5 55.5	76 06.7 -29.4 57.4	75 18.5 -27.5 59.0
27°	77 48.9 -39.1 47.1	77 06.4 -36.7 49.6	76 22.5 -34.5 51.9	75 37.3 -32.4 53.8	74 51.0 -30.5 55.6
28°	77 09.8 -41.6 43.6	76 29.7 -39.3 46.2	75 48.0 -37.2 48.4	75 04.9 -35.1 50.5	74 20.5 -33.1 52.3
29°	76 28.2 -43.8 40.5	75 50.4 -41.6 43.0	75 10.8 -39.5 45.3	74 29.8 -37.5 47.4	73 47.4 -35.6 49.3

Dec	LHA 015° / 345°	LHA 016° / 344°	LHA 017° / 343°	LHA 018° / 342°	LHA 019° / 341°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	65 57.9 +47.6 140.5	65 21.2 +46.3 138.6	64 43.0 +45.2 136.8	64 03.5 +44.2 135.1	63 22.9 +43.0 133.4
1°	66 45.5 +46.5 139.0	66 07.5 +45.4 137.1	65 28.2 +44.3 135.2	64 47.7 +43.1 133.5	64 05.9 +42.1 131.8
2°	67 32.0 +45.6 137.4	66 52.9 +44.3 135.4	66 12.5 +43.1 133.6	65 30.8 +42.0 131.8	64 48.0 +40.8 130.2
3°	68 17.6 +44.4 135.7	67 37.2 +43.2 133.7	66 55.6 +41.9 131.8	66 12.8 +40.7 130.1	65 28.8 +39.6 128.4
4°	69 02.0 +43.1 133.8	68 20.4 +41.8 131.8	67 37.5 +40.6 130.0	66 53.5 +39.3 128.2	66 08.4 +38.2 126.6
5°	69 45.1 +41.7 131.8	69 02.2 +40.3 129.9	68 18.1 +39.0 128.0	67 32.8 +37.9 126.3	66 46.6 +36.8 124.7
6°	70 26.8 +40.1 129.7	69 42.5 +38.8 127.8	68 57.1 +37.5 125.9	68 10.7 +36.3 124.2	67 23.4 +35.1 122.6
7°	71 06.9 +38.4 127.5	70 21.3 +37.0 125.5	69 34.6 +35.7 123.7	68 47.0 +34.5 122.1	67 58.5 +33.4 120.5
8°	71 45.3 +36.4 125.1	70 58.3 +35.0 123.2	70 10.3 +33.8 121.4	69 21.5 +32.6 119.8	68 31.9 +31.4 118.3
9°	72 21.7 +34.3 122.5	71 33.3 +33.0 120.6	70 44.1 +31.7 118.9	69 54.1 +30.5 117.4	69 03.3 +29.5 115.9
10°	72 56.0 +31.9 119.7	72 06.3 +30.5 117.9	71 15.8 +29.3 116.3	70 24.6 +28.3 114.8	69 32.8 +27.3 113.4
11°	73 27.9 +29.2 116.8	72 36.8 +28.1 115.1	71 45.1 +27.0 113.6	70 52.9 +25.9 112.2	70 00.1 +24.9 110.9
12°	73 57.1 +26.5 113.7	73 04.9 +25.3 112.1	72 12.1 +24.2 110.7	71 18.8 +23.3 109.4	70 25.0 +22.5 108.2
13°	74 23.6 +23.3 110.4	73 30.2 +22.3 109.0	72 36.3 +21.4 107.7	71 42.1 +20.5 106.5	70 47.5 +19.8 105.4
14°	74 46.9 +20.0 106.9	74 52.5 +19.1 105.6	72 57.7 +17.3 104.5	72 02.6 +17.7 103.4	71 07.3 +17.1 102.5
15°	75 06.9 +16.4 103.3	74 11.6 +15.7 102.2	73 16.0 +15.2 101.2	72 20.3 +14.6 100.3	71 24.4 +14.2 99.5
16°	75 23.3 +12.7 99.5	74 27.3 +12.2 98.6	73 31.2 +11.7 97.8	72 34.9 +11.4 97.1	71 38.6 +11.1 96.4
17°	75 36.0 +08.7 95.6	74 39.5 +08.4 95.0	73 42.9 +08.3 94.4	72 46.3 +08.2 93.8	71 49.7 +08.1 93.3
18°	75 44.7 +04.6 91.6	74 47.9 +04.7 91.2	73 51.2 +04.7 90.8	72 54.5 +04.8 90.4	71 57.8 +04.8 90.1
19°	75 49.3 +00.5 87.5	74 52.6 +00.8 87.4	73 55.9 +01.1 87.2	72 59.3 +01.4 87.0	72 02.6 +01.7 86.9
20°	75 49.8 -03.7 83.5	74 53.4 -03.0 83.5	73 57.0 -02.5 83.6	73 00.7 -02.1 83.6	72 04.3 -01.6 83.6
21°	75 46.1 -07.7 79.4	74 50.4 -06.9 79.7	73 54.5 -06.1 80.0	72 58.6 -05.4 80.2	72 02.7 -04.8 80.4
22°	75 38.4 -11.7 75.4	74 43.5 -10.7 75.9	73 48.4 -09.7 76.4	72 53.2 -08.8 76.8	71 57.9 -08.0 77.2
23°	75 26.7 -15.5 71.4	74 32.8 -14.3 72.2	73 38.7 -13.1 72.9	72 44.4 -12.1 73.5	71 49.9 -11.1 74.0
24°	75 11.2 -19.2 67.6	74 18.5 -17.7 68.6	73 25.6 -16.5 69.4	72 32.3 -15.2 70.2	71 38.8 -14.1 70.8
25°	74 52.0 -22.5 64.0	74 00.8 -21.0 65.1	73 09.1 -19.5 66.1	72 17.1 -18.3 67.0	71 24.7 -17.0 67.8
26°	74 29.5 -25.7 60.5	73 39.8 -24.1 61.7	72 49.6 -22.6 62.9	71 58.8 -21.1 63.9	71 07.7 -19.8 64.8
27°	74 03.8 -28.7 57.1	73 15.7 -26.9 58.5	72 27.0 -25.3 59.8	71 37.7 -23.8 60.9	70 47.9 -22.4 61.9
28°	73 35.1 -31.3 54.0	72 48.8 -29.5 55.5	72 01.7 -27.9 56.8	71 13.9 -26.4 58.0	70 25.5 -24.9 59.1
29°	73 03.8 -33.7 51.0	72 19.3 -32.0 52.5	71 33.8 -30.3 54.0	70 47.5 -28.7 55.2	70 00.6 -27.2 56.4

Declination SAME name as Latitude

Latitude 19°

Dec	LHA 020° / 340°	LHA 021° / 339°	LHA 022° / 338°	LHA 023° / 337°	LHA 024° / 336°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	62 41.1 +42.0 131.8	61 58.3 +41.1 130.3	61 14.6 +40.1 128.9	60 30.0 +39.1 127.5	59 44.6 +38.2 126.2
1°	63 23.1 +41.0 130.2	62 39.4 +39.9 128.7	61 54.7 +38.9 127.3	61 09.1 +38.0 125.9	60 22.8 +37.1 124.6
2°	64 04.1 +39.8 128.6	63 19.3 +38.8 127.1	62 33.6 +37.8 125.7	61 47.1 +36.9 124.3	60 59.9 +36.0 123.0
3°	64 43.9 +38.5 126.9	63 58.1 +37.4 125.4	63 11.4 +36.5 124.0	62 24.0 +35.5 122.6	61 35.9 +34.6 121.4
4°	65 22.4 +37.1 125.0	64 35.5 +36.1 123.6	63 47.9 +35.1 122.2	62 59.5 +34.2 120.9	62 10.5 +33.3 119.6
5°	65 59.5 +35.7 123.1	65 11.6 +34.7 121.7	64 23.0 +33.7 120.3	63 33.7 +32.8 119.0	62 43.8 +31.9 117.8
6°	66 35.2 +34.0 121.1	65 46.3 +33.0 119.7	64 56.7 +32.1 118.4	64 06.5 +31.2 117.1	63 15.7 +30.4 116.0
7°	67 09.2 +32.4 119.0	66 19.3 +31.3 117.7	65 28.8 +30.4 116.4	64 37.7 +29.5 115.2	63 46.1 +28.7 114.0
8°	67 41.6 +30.4 116.8	66 50.6 +29.6 115.5	65 59.2 +28.6 114.3	65 07.2 +27.8 113.1	64 14.8 +27.1 112.0
9°	68 12.0 +28.5 114.5	67 20.2 +27.5 113.3	66 27.8 +26.8 112.1	65 35.0 +26.0 111.0	64 41.9 +25.3 110.0
10°	68 40.5 +26.4 112.1	67 47.7 +25.6 111.0	66 54.6 +24.7 109.8	66 01.0 +24.0 108.8	65 07.2 +23.3 107.8
11°	69 06.9 +24.1 109.7	68 13.3 +23.3 108.5	67 19.3 +22.6 107.5	66 25.0 +22.0 106.5	65 30.5 +21.4 105.6
12°	69 31.0 +21.7 107.1	68 36.6 +21.0 106.0	67 41.9 +20.4 105.1	66 47.0 +19.9 104.2	65 51.9 +19.4 103.3
13°	69 52.7 +19.2 104.4	68 57.6 +18.6 103.4	68 02.3 +18.1 102.6	67 06.9 +17.6 101.8	66 11.3 +17.1 101.0
14°	70 11.9 +16.5 101.6	69 16.2 +16.1 100.8	68 20.4 +15.6 100.0	67 24.5 +15.2 99.3	66 28.4 +15.0 98.6
15°	70 28.4 +13.8 98.7	69 32.3 +13.4 98.0	68 36.0 +13.2 97.4	67 39.7 +12.9 96.8	66 43.4 +12.6 96.2
16°	70 42.2 +10.9 95.8	69 45.7 +10.7 95.2	68 49.2 +10.5 94.7	67 52.6 +10.4 94.2	66 56.0 +10.3 93.7
17°	70 53.1 +07.9 92.8	69 56.4 +07.9 92.4	68 59.7 +07.9 92.0	68 03.0 +07.9 91.6	67 06.3 +07.8 91.2
18°	71 01.0 +05.0 89.8	70 04.3 +05.1 89.5	69 07.6 +05.1 89.2	68 10.9 +05.2 88.9	67 14.1 +05.4 88.6
19°	71 06.0 +01.9 86.7	70 09.4 +02.1 86.5	69 12.7 +02.5 86.4	68 16.1 +02.7 86.2	67 19.5 +02.9 86.0
20°	71 07.9 -01.1 83.6	70 11.5 -00.7 83.6	69 15.2 -00.4 83.6	68 18.8 +00.0 83.5	67 22.4 +00.4 83.4
21°	71 06.8 -04.2 80.5	70 10.8 -03.7 80.6	69 14.8 -03.1 80.7	68 18.8 -02.6 80.8	67 22.8 -02.1 80.8
22°	71 02.6 -07.3 77.5	70 07.1 -06.5 77.7	69 11.7 -05.9 77.9	68 16.2 -05.2 78.1	67 20.7 -04.7 78.3
23°	70 55.3 -10.2 74.4	70 00.6 -09.3 74.8	69 05.8 -08.5 75.1	68 11.0 -07.8 75.4	67 16.0 -07.1 75.7
24°	70 45.1 -13.0 71.4	69 51.3 -12.1 71.9	68 57.3 -11.2 72.4	68 03.2 -10.4 72.8	67 08.9 -09.5 73.1
25°	70 32.1 -15.9 68.5	69 39.2 -14.8 69.1	68 46.1 -13.8 69.6	67 52.8 -12.8 70.1	66 59.4 -11.9 70.6
26°	70 16.2 -18.5 65.6	69 24.4 -17.4 66.3	68 32.3 -16.2 67.0	67 40.0 -15.2 67.5	66 47.5 -14.3 68.1
27°	69 57.7 -21.1 62.8	69 07.0 -19.8 63.6	68 16.1 -18.7 64.3	67 24.8 -17.6 65.0	66 33.2 -16.5 65.6
28°	69 36.6 -23.5 60.1	68 47.2 -22.2 61.0	67 57.4 -21.0 61.8	67 07.2 -19.8 62.5	66 16.7 -18.7 63.2
29°	69 13.1 -25.8 57.5	68 25.0 -24.5 58.4	67 36.4 -23.2 59.3	66 47.4 -21.9 60.1	65 58.0 -20.7 60.9

Dec	LHA 025° / 335°	LHA 026° / 334°	LHA 027° / 333°	LHA 028° / 332°	LHA 029° / 331°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	58 58.4 +37.4 124.9	58 11.6 +36.5 123.7	57 24.1 +35.7 122.6	56 36.0 +34.9 121.5	55 47.3 +34.2 120.4
1°	59 35.8 +36.2 123.4	58 48.1 +35.4 122.2	57 59.8 +34.6 121.1	57 10.9 +33.9 120.0	56 21.5 +33.2 119.0
2°	60 12.0 +35.1 121.8	59 23.5 +34.3 120.6	58 34.4 +33.5 119.5	57 44.8 +32.7 118.5	56 54.7 +32.0 117.4
3°	60 47.1 +33.8 120.2	59 57.8 +33.0 119.0	59 07.9 +32.2 117.9	58 17.5 +31.5 116.9	57 26.7 +30.8 115.9
4°	61 20.9 +32.5 118.4	60 30.8 +31.7 117.3	59 40.1 +31.0 116.3	58 49.0 +30.3 115.2	57 57.5 +29.6 114.3
5°	61 53.4 +31.1 116.7	61 02.5 +30.3 115.6	60 11.1 +29.6 114.5	59 19.3 +28.9 113.6	58 27.1 +28.3 112.6
6°	62 24.5 +29.6 114.8	61 32.8 +28.8 113.8	60 40.7 +28.1 112.8	59 48.2 +27.5 111.8	58 55.4 +26.8 110.9
7°	62 54.1 +28.0 113.0	62 01.6 +27.3 111.9	61 08.8 +26.7 111.0	60 15.7 +26.0 110.1	59 22.2 +25.5 109.2
8°	63 22.1 +26.3 111.0	62 28.9 +25.7 110.0	61 35.5 +25.0 109.1	60 41.7 +24.5 108.2	59 47.7 +24.0 107.4
9°	63 48.4 +24.6 109.0	62 54.6 +24.0 108.1	62 00.5 +23.5 107.2	61 06.2 +22.9 106.3	60 11.7 +22.4 105.6
10°	64 13.0 +22.8 106.9	63 18.6 +22.2 106.0	62 24.0 +21.7 105.2	61 29.1 +21.2 104.4	60 34.1 +20.8 103.7
11°	64 35.8 +20.8 104.8	63 40.8 +20.4 103.9	62 45.7 +19.9 103.2	61 50.3 +19.6 102.5	60 54.9 +19.1 101.8
12°	64 56.6 +18.9 102.6	64 01.2 +18.4 101.8	63 05.6 +18.0 101.1	62 09.9 +17.7 100.4	61 14.0 +17.4 99.8
13°	65 15.5 +16.8 100.3	64 19.6 +16.5 99.6	63 23.6 +16.2 99.0	62 27.6 +15.8 98.4	61 31.4 +15.6 97.8
14°	65 32.3 +14.7 98.0	64 36.1 +14.4 97.4	63 39.8 +14.1 96.8	62 43.4 +14.0 96.3	61 47.0 +13.8 95.8
15°	65 47.0 +12.4 95.6	64 50.5 +12.2 95.1	63 53.9 +12.2 94.6	62 57.4 +12.0 94.2	62 00.8 +11.9 93.7
16°	65 59.4 +10.2 93.2	65 02.7 +10.1 92.8	64 06.1 +10.0 92.4	63 09.4 +10.0 92.0	62 12.7 +09.9 91.6
17°	66 09.6 +07.8 90.8	65 12.8 +07.9 90.5	64 16.1 +07.9 90.1	63 19.4 +07.9 89.8	62 22.6 +08.1 89.5
18°	66 17.4 +05.5 88.4	65 20.7 +05.7 88.1	64 24.0 +05.8 87.8	63 27.3 +05.9 87.6	62 30.7 +06.0 87.3
19°	66 22.9 +03.2 85.9	65 26.4 +03.3 85.7	64 29.8 +03.6 85.5	63 33.2 +03.8 85.4	62 36.7 +04.0 85.2
20°	66 26.1 +00.7 83.4	65 29.7 +01.1 83.3	64 33.4 +01.4 83.2	63 37.0 +01.7 83.1	62 40.7 +02.0 83.0
21°	66 26.8 -01.7 80.9	65 30.8 -01.3 80.9	64 34.8 -00.9 80.9	63 38.7 -00.4 80.9	62 42.7 +00.0 80.8
22°	66 25.1 -04.1 78.4	65 29.5 -03.5 78.5	64 33.9 -03.0 78.6	63 38.3 -02.5 78.6	62 42.7 -02.0 78.7
23°	66 21.0 -06.4 75.9	65 26.0 -05.8 76.1	64 30.9 -05.2 76.2	63 35.8 -04.6 76.4	62 40.7 -04.1 76.5
24°	66 14.6 -08.8 73.4	65 20.2 -08.1 73.7	64 25.7 -07.3 73.9	63 31.2 -06.7 74.1	62 36.6 -06.1 74.3
25°	66 05.8 -11.0 71.0	65 12.1 -10.2 71.3	64 18.4 -09.5 71.6	63 24.5 -08.8 71.9	62 30.5 -08.0 72.1
26°	65 54.8 -13.4 68.5	65 01.9 -12.5 69.0	64 08.9 -11.6 69.4	63 15.7 -10.8 69.7	62 22.5 -10.1 70.0
27°	65 41.4 -15.5 66.2	64 49.4 -14.5 66.7	63 57.3 -13.7 67.1	63 04.9 -12.7 67.5	62 12.4 -11.9 67.9
28°	65 25.9 -17.6 63.8	64 34.9 -16.6 64.4	63 43.6 -15.6 64.9	62 52.2 -14.8 65.4	62 00.5 -13.8 65.8
29°	65 08.3 -19.6 61.5	64 18.3 -18.6 62.2	63 28.0 -17.6 62.7	62 37.4 -16.5 63.2	61 46.7 -15.7 63.7

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Dec	LHA 030° / 330°	LHA 031° / 329°	LHA 032° / 328°	LHA 033° / 327°	LHA 034° / 326°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	54 58.1 +33.6 119.4	54 08.5 +32.8 118.5	53 18.4 +32.2 117.5	52 27.9 +31.6 116.6	51 37.0 +31.0 115.8
1°	55 31.7 +32.4 118.0	54 41.3 +31.8 117.0	53 50.6 +31.1 116.1	52 59.5 +30.5 115.2	52 08.0 +29.9 114.4
2°	56 04.1 +31.4 116.5	55 13.1 +30.7 115.5	54 21.7 +30.1 114.6	53 30.0 +29.5 113.8	52 37.9 +29.0 113.0
3°	56 35.5 +30.1 114.9	55 43.8 +29.6 114.0	54 51.8 +29.0 113.1	53 59.5 +28.4 112.3	53 06.9 +27.8 111.5
4°	57 05.6 +29.0 113.3	56 13.4 +28.3 112.5	55 20.8 +27.7 111.6	54 27.9 +27.2 110.8	53 34.7 +26.7 110.0
5°	57 34.6 +27.6 111.7	56 41.7 +27.1 110.9	55 48.5 +26.6 110.0	54 55.1 +26.1 109.3	54 01.4 +25.6 108.5
6°	58 02.2 +26.3 110.1	57 08.8 +25.8 109.2	56 15.1 +25.3 108.4	55 21.2 +24.7 107.7	54 27.0 +24.3 107.0
7°	58 28.5 +25.0 108.4	57 34.6 +24.4 107.6	56 40.4 +23.9 106.8	55 45.9 +23.6 106.1	54 51.3 +23.1 105.4
8°	58 53.5 +23.4 106.6	57 59.0 +23.0 105.8	57 04.3 +22.6 105.1	56 09.5 +22.1 104.4	55 14.4 +21.8 103.8
9°	59 16.9 +22.0 104.8	58 22.0 +21.5 104.1	57 26.9 +21.1 103.4	56 31.6 +20.8 102.8	55 36.2 +20.5 102.1
10°	59 38.9 +20.4 103.0	58 43.5 +20.0 102.3	57 48.0 +19.7 101.7	56 52.4 +19.4 101.0	55 56.7 +19.0 100.5
11°	59 59.3 +18.8 101.1	59 03.5 +18.5 100.5	58 07.7 +18.2 99.9	57 11.8 +17.9 99.3	56 15.7 +17.7 98.8
12°	60 18.1 +17.1 99.2	59 22.0 +16.8 98.6	58 25.9 +16.6 98.1	57 29.7 +16.4 97.5	56 33.4 +16.2 97.0
13°	60 35.2 +15.3 97.3	59 38.8 +15.2 96.7	58 42.5 +15.0 96.2	57 46.1 +14.8 95.7	56 49.6 +14.7 95.3
14°	60 50.5 +13.7 95.3	59 54.0 +13.5 94.8	58 57.5 +13.3 94.4	58 00.9 +13.2 93.9	57 04.3 +13.1 93.5
15°	61 04.2 +11.8 93.3	60 07.5 +11.7 92.9	59 10.8 +11.7 92.5	58 14.1 +11.7 92.1	57 17.4 +11.7 91.7
16°	61 16.0 +09.9 91.2	60 19.2 +10.0 90.9	59 22.5 +10.0 90.5	58 25.8 +10.0 90.2	57 29.1 +10.0 88.9
17°	61 25.9 +08.1 89.2	60 29.2 +08.2 88.9	59 32.5 +08.2 88.6	58 35.8 +08.3 88.3	57 39.1 +08.4 88.0
18°	61 34.0 +06.2 87.1	60 37.4 +06.3 86.9	59 40.7 +06.5 86.6	58 44.1 +06.6 86.4	57 47.5 +06.7 86.2
19°	61 40.2 +04.2 85.0	60 43.7 +04.4 84.8	59 47.2 +04.7 84.7	58 50.7 +04.9 84.5	57 54.2 +05.2 84.3
20°	61 44.4 +02.3 82.9	60 48.1 +02.6 82.8	59 51.9 +02.8 82.7	58 55.6 +03.2 82.6	57 59.4 +03.4 82.4
21°	61 46.7 +00.4 80.8	60 50.7 +00.8 80.7	59 54.7 +01.1 80.7	58 58.8 +01.4 80.6	58 02.8 +01.8 80.6
22°	61 47.1 -01.6 78.7	60 51.5 -01.2 78.7	59 55.8 -00.7 78.7	59 00.2 -00.3 78.7	58 04.6 +00.1 78.7
23°	61 45.5 -03.5 76.6	60 50.3 -03.0 76.6	59 55.1 -02.5 76.7	58 59.9 -02.1 76.7	58 04.7 -01.6 76.8
24°	61 42.0 -05.5 74.5	60 47.3 -04.9 74.6	59 52.6 -04.4 74.7	58 57.8 -03.8 74.8	58 03.1 -03.3 74.9
25°	61 36.5 -07.4 72.4	60 42.4 -06.8 72.6	59 48.2 -06.1 72.7	58 54.0 -05.5 72.9	57 59.8 -04.9 73.0
26°	61 29.1 -09.3 70.3	60 35.6 -08.5 70.5	59 42.1 -07.9 70.7	58 48.5 -07.2 70.9	57 54.9 -06.6 71.1
27°	61 19.8 -11.1 68.2	60 27.1 -10.4 68.5	59 34.2 -09.6 68.8	58 41.3 -08.9 69.0	57 48.3 -08.2 69.3
28°	61 08.7 -13.0 66.2	60 16.7 -12.1 66.5	59 24.6 -11.3 66.8	58 32.4 -10.6 67.1	57 40.1 -09.9 67.4
29°	60 55.7 -14.7 64.2	60 04.6 -13.9 64.6	59 13.3 -13.1 64.9	58 21.8 -12.2 65.3	57 30.2 -11.4 65.6

Dec	LHA 035° / 325°	LHA 036° / 324°	LHA 037° / 323°	LHA 038° / 322°	LHA 039° / 321°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	50 45.7 +30.4 114.9	49 54.1 +29.9 114.1	49 02.2 +29.3 113.4	48 10.0 +28.8 112.6	47 17.4 +28.4 111.9
1°	51 16.1 +29.4 113.6	50 24.0 +28.9 112.8	49 31.5 +28.4 112.0	48 38.8 +27.9 111.3	47 45.8 +27.5 110.6
2°	51 45.5 +28.4 112.2	50 52.9 +27.9 111.4	49 59.9 +27.4 110.7	49 06.7 +27.0 110.0	48 13.3 +26.5 109.3
3°	52 13.9 +27.4 110.7	51 20.8 +26.8 110.0	50 27.3 +26.4 109.3	49 33.7 +25.9 108.6	48 39.8 +25.5 107.9
4°	52 41.3 +26.2 109.3	51 47.6 +25.8 108.6	50 53.7 +25.4 107.9	49 59.6 +25.0 107.2	49 05.3 +24.6 106.5
5°	53 07.5 +25.1 107.8	52 13.4 +24.7 107.1	51 19.1 +24.2 106.4	50 24.6 +23.9 105.8	49 29.9 +23.5 105.1
6°	53 32.6 +24.0 106.3	52 38.1 +23.5 105.6	51 43.3 +23.2 104.9	50 48.5 +22.8 104.3	49 53.4 +22.5 103.7
7°	53 56.6 +22.7 104.7	53 01.6 +22.3 104.1	52 06.5 +22.0 103.4	51 11.3 +21.6 102.9	50 15.9 +21.4 102.3
8°	54 19.3 +21.4 103.1	53 23.9 +21.1 102.5	52 28.5 +20.8 101.9	51 32.9 +20.5 101.4	50 37.3 +20.2 100.8
9°	54 40.7 +20.1 101.5	53 45.0 +19.9 100.9	52 49.3 +19.6 100.4	51 53.4 +19.4 99.8	50 57.5 +19.1 99.3
10°	55 00.8 +18.8 99.9	54 04.9 +18.6 99.3	53 08.9 +18.3 98.8	52 12.8 +18.1 98.3	51 16.6 +17.9 97.8
11°	55 19.6 +17.5 98.2	54 23.5 +17.2 97.7	53 27.2 +17.0 97.2	52 30.9 +16.9 96.7	51 34.5 +16.7 96.3
12°	55 37.1 +16.0 96.5	54 40.7 +15.8 96.1	53 44.2 +15.7 95.6	52 47.8 +15.5 95.2	51 51.2 +15.5 94.7
13°	55 53.1 +14.5 94.8	54 56.5 +14.5 94.4	53 59.9 +14.4 94.0	53 03.3 +14.3 93.6	52 06.7 +14.2 93.2
14°	56 07.6 +13.1 93.1	55 11.0 +13.0 92.7	54 14.3 +13.0 92.3	53 17.6 +13.0 91.9	52 20.9 +12.9 91.6
15°	56 20.7 +11.6 91.3	55 24.0 +11.6 91.0	54 27.3 +11.6 90.6	53 30.6 +11.6 90.3	52 33.8 +11.6 90.0
16°	56 32.3 +10.1 89.6	55 35.6 +10.1 89.2	54 38.9 +10.1 88.9	53 42.2 +10.2 88.6	52 45.4 +10.3 88.4
17°	56 42.4 +08.5 87.8	55 45.7 +08.6 87.5	54 49.0 +08.7 87.2	53 52.4 +08.8 87.0	52 55.7 +08.9 86.7
18°	56 50.9 +06.9 86.0	55 54.3 +07.1 85.7	54 57.7 +07.3 85.5	54 01.2 +07.4 85.3	53 04.6 +07.6 85.1
19°	56 57.8 +05.3 84.1	56 01.4 +05.5 84.0	55 05.0 +05.7 83.8	54 08.6 +05.9 83.6	53 12.2 +06.2 83.4
20°	57 03.1 +03.7 82.3	56 06.9 +04.0 82.2	55 10.7 +04.3 82.0	54 14.5 +04.6 81.9	53 18.4 +04.8 81.8
21°	57 06.8 +02.1 80.5	56 10.9 +02.4 80.4	55 15.0 +02.7 80.3	54 19.1 +03.0 80.2	53 23.2 +03.4 80.1
22°	57 08.9 +00.5 78.6	56 13.3 +00.9 78.6	55 17.7 +01.3 78.5	54 22.1 +01.6 78.5	53 26.6 +01.9 78.4
23°	57 09.4 -01.1 76.8	56 14.2 -00.7 76.8	55 19.0 -00.3 76.8	54 23.7 +00.2 76.8	53 28.5 +00.6 76.7
24°	57 08.3 -02.8 74.9	56 13.5 -02.3 75.0	55 18.7 -01.8 75.0	54 23.9 -01.3 75.0	53 29.1 -00.9 75.1
25°	57 05.5 -04.3 73.1	56 11.2 -03.8 73.2	55 16.9 -03.3 73.3	54 22.6 -02.8 73.3	53 28.2 -02.2 73.4
26°	57 01.2 -06.0 71.3	56 07.4 -05.3 71.4	55 13.6 -04.8 71.5	54 19.8 -04.2 71.6	53 26.0 -03.7 71.7
27°	56 55.2 -07.5 69.4	56 02.1 -07.0 69.6	55 08.8 -06.2 69.8	54 15.6 -05.7 69.9	53 22.3 -05.1 70.0
28°	56 47.7 -09.2 67.6	55 55.1 -08.4 67.8	55 02.6 -07.8 68.0	54 09.9 -07.1 68.2	53 17.2 -06.4 68.4
29°	56 38.5 -10.6 65.8	55 46.7 -09.9 66.1	54 54.8 -09.2 66.3	54 02.8 -08.5 66.5	53 10.8 -07.9 66.7

Declination SAME name as Latitude

Latitude 19°

Dec	LHA 040° / 320°	LHA 041° / 319°	LHA 042° / 318°	LHA 043° / 317°	LHA 044° / 316°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	46 24.7 +27.9 111.2	45 31.7 +27.4 110.5	44 38.4 +27.1 109.9	43 45.0 +26.6 109.2	42 51.3 +26.3 108.6
1°	46 52.6 +27.0 109.9	45 59.1 +26.6 109.3	45 05.5 +26.2 108.6	44 11.6 +25.8 108.0	43 17.6 +25.4 107.4
2°	47 19.6 +26.1 108.6	46 25.7 +25.7 108.0	45 31.7 +25.3 107.3	44 37.4 +25.0 106.7	43 43.0 +24.6 106.2
3°	47 45.7 +25.2 107.3	46 51.4 +24.8 106.6	45 57.0 +24.4 106.0	45 02.4 +24.1 105.5	44 07.6 +23.8 104.9
4°	48 10.9 +24.1 105.9	47 16.2 +23.9 105.3	46 21.4 +23.5 104.7	45 26.5 +23.2 104.2	44 31.4 +22.9 103.6
5°	48 35.0 +23.2 104.5	47 40.1 +22.8 104.0	46 44.9 +22.6 103.4	45 49.7 +22.3 102.8	44 54.3 +22.0 102.3
6°	48 58.2 +22.2 103.1	48 02.9 +21.9 102.6	47 07.5 +21.6 102.0	46 12.0 +21.3 101.5	45 16.3 +21.1 101.0
7°	49 20.4 +21.1 101.7	48 24.8 +20.8 101.2	47 29.1 +20.6 100.7	46 33.3 +20.3 100.1	45 37.4 +20.1 99.6
8°	49 41.5 +20.0 100.3	48 45.6 +19.8 99.8	47 49.7 +19.5 99.3	46 53.6 +19.4 98.8	45 57.5 +19.2 98.3
9°	50 01.5 +18.9 98.8	49 05.4 +18.7 98.3	48 09.2 +18.5 97.8	47 13.0 +18.3 97.4	46 16.7 +18.2 96.9
10°	50 20.4 +17.7 97.3	49 24.1 +17.6 96.9	48 27.7 +17.5 96.4	47 31.3 +17.3 96.0	46 34.9 +17.1 95.5
11°	50 38.1 +16.6 95.8	49 41.7 +16.4 95.4	48 45.2 +16.3 95.0	47 48.6 +16.2 94.6	46 52.0 +16.2 94.2
12°	50 54.7 +15.3 94.3	49 58.1 +15.3 93.9	49 01.5 +15.2 93.5	48 04.8 +15.2 93.1	47 08.2 +15.1 92.7
13°	51 10.0 +14.2 92.8	50 13.4 +14.1 92.4	49 16.7 +14.0 92.0	48 20.0 +14.0 91.7	47 23.3 +14.0 91.3
14°	51 24.2 +12.9 91.2	50 27.5 +12.9 90.9	49 30.7 +12.9 90.5	48 34.0 +12.9 90.2	47 37.3 +12.9 89.9
15°	51 37.1 +11.6 89.6	50 40.4 +11.6 89.3	49 43.6 +11.8 89.0	48 46.9 +11.8 88.7	47 50.2 +11.8 88.4
16°	51 48.7 +10.4 88.1	50 52.0 +10.5 87.8	49 55.4 +10.5 87.5	48 58.7 +10.6 87.2	48 02.0 +10.7 87.0
17°	51 59.1 +09.0 86.5	51 02.5 +09.1 86.2	50 05.9 +09.3 86.0	49 09.3 +09.4 85.7	48 12.7 +09.6 85.5
18°	52 08.1 +07.8 84.9	51 11.6 +07.9 84.6	50 15.2 +08.0 84.4	49 18.7 +08.2 84.2	48 22.3 +08.4 84.0
19°	52 15.9 +06.3 83.2	51 19.5 +06.6 83.1	50 23.2 +06.8 82.9	49 26.9 +07.1 82.7	48 30.7 +07.2 82.5
20°	52 22.2 +05.1 81.6	51 26.1 +05.3 81.5	50 30.0 +05.6 81.3	49 34.0 +05.8 81.2	48 37.9 +06.1 81.0
21°	52 27.3 +03.7 80.0	51 31.4 +04.0 79.9	50 35.6 +04.3 79.7	49 39.8 +04.6 79.6	48 44.0 +04.9 79.5
22°	52 31.0 +02.3 78.3	51 35.4 +02.7 78.3	50 39.9 +03.0 78.2	49 44.4 +03.3 78.1	48 48.9 +03.7 78.0
23°	52 33.3 +01.0 76.7	51 38.1 +01.4 76.7	50 42.9 +01.8 76.6	49 47.7 +02.2 76.5	48 52.6 +02.5 76.5
24°	52 34.3 -00.4 75.1	51 39.5 +00.0 75.0	50 44.7 +00.4 75.0	49 49.9 +00.8 75.0	48 55.1 +01.3 75.0
25°	52 33.9 -01.8 73.4	51 39.5 -01.3 73.4	50 45.1 -00.8 73.4	49 50.7 -00.3 73.4	48 56.4 +00.1 73.4
26°	52 32.1 -03.1 71.8	51 38.2 -02.6 71.8	50 44.3 -02.1 71.9	49 50.4 -01.6 71.9	48 56.5 -01.1 71.9
27°	52 29.0 -04.5 70.1	51 35.6 -03.9 70.2	50 42.2 -03.4 70.3	49 48.8 -02.9 70.3	48 55.4 -02.4 70.4
28°	52 24.5 -05.9 68.5	51 31.7 -05.3 68.6	50 38.8 -04.6 68.7	49 45.9 -04.0 68.8	48 53.0 -03.5 68.9
29°	52 18.6 -07.2 66.9	51 26.4 -06.5 67.0	50 34.2 -05.9 67.1	49 41.9 -05.3 67.2	48 49.5 -04.7 67.3

Dec	LHA 045° / 315°	LHA 046° / 314°	LHA 047° / 313°	LHA 048° / 312°	LHA 049° / 311°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	41 57.5 +25.8 108.0	41 03.4 +25.6 107.5	40 09.2 +25.2 106.9	39 14.9 +24.8 106.3	38 20.4 +24.5 105.8
1°	42 23.3 +25.2 106.8	41 29.0 +24.7 106.2	40 34.4 +24.5 105.7	39 39.7 +24.2 105.2	38 44.9 +23.9 104.6
2°	42 48.5 +24.2 105.6	41 53.7 +24.0 105.0	40 58.9 +23.7 104.5	40 03.9 +23.4 104.0	39 08.8 +23.1 103.5
3°	43 12.7 +23.5 104.3	42 17.7 +23.2 103.8	41 22.6 +22.9 103.3	40 27.3 +22.6 102.8	39 31.9 +22.4 102.3
4°	43 36.2 +22.6 103.1	42 40.9 +22.3 102.5	41 45.5 +22.1 102.0	40 49.9 +21.9 101.5	39 54.3 +21.6 101.1
5°	43 58.8 +21.8 101.8	43 03.2 +21.5 101.3	42 07.6 +21.2 100.8	41 11.8 +21.0 100.3	40 15.9 +20.9 99.8
6°	44 20.6 +20.8 100.5	43 24.7 +20.7 100.0	42 28.8 +20.5 99.5	41 32.8 +20.3 99.1	40 36.8 +20.1 98.6
7°	44 41.4 +20.0 99.2	43 45.4 +19.7 98.7	42 49.3 +19.5 98.2	41 53.1 +19.4 97.8	40 56.9 +19.2 97.4
8°	45 01.4 +19.0 97.8	44 05.1 +18.9 97.4	43 08.8 +18.7 97.0	42 12.5 +18.6 96.5	41 16.1 +18.4 96.1
9°	45 20.4 +18.0 96.5	44 24.0 +17.9 96.1	43 27.5 +17.8 95.6	42 31.1 +17.6 95.2	41 34.5 +17.6 94.8
10°	45 38.4 +17.1 95.1	44 41.9 +16.9 94.7	43 45.3 +16.9 94.3	42 48.7 +16.8 93.9	41 52.1 +16.7 93.6
11°	45 55.5 +16.0 93.8	44 58.8 +16.0 93.4	44 02.2 +15.9 93.0	43 05.5 +15.9 92.6	42 08.8 +15.9 92.3
12°	46 11.5 +15.1 92.4	45 14.8 +15.0 92.0	44 18.1 +15.0 91.6	43 21.4 +15.0 91.3	42 24.7 +14.9 91.0
13°	46 26.6 +14.0 91.0	45 29.8 +14.0 90.6	44 33.1 +14.0 90.3	43 36.4 +14.0 90.0	42 39.6 +14.1 89.6
14°	46 40.6 +12.9 89.6	45 43.8 +13.0 89.2	44 47.1 +13.0 88.9	43 50.4 +13.1 88.6	42 53.7 +13.1 88.3
15°	46 53.5 +11.9 88.1	45 56.8 +12.0 87.8	45 00.1 +12.0 87.5	44 03.5 +12.1 87.3	43 06.8 +12.2 87.0
16°	47 05.4 +10.8 86.7	46 08.8 +10.9 86.4	45 12.1 +11.1 86.2	44 15.6 +11.1 85.9	43 19.0 +11.2 85.6
17°	47 16.2 +09.7 85.2	46 19.7 +09.8 85.0	45 23.2 +09.9 84.8	44 26.7 +10.1 84.5	43 30.2 +10.3 84.3
18°	47 25.9 +08.6 83.8	46 29.5 +08.7 83.6	45 33.1 +09.0 83.4	44 36.8 +09.1 83.1	43 40.5 +09.3 82.9
19°	47 34.5 +07.4 82.3	46 38.2 +07.7 82.1	45 42.1 +07.8 81.9	44 45.9 +08.1 81.8	43 49.8 +08.3 81.6
20°	47 41.9 +06.3 80.8	46 45.9 +06.6 80.7	45 49.9 +06.9 80.5	44 54.0 +07.1 80.4	43 58.1 +07.3 80.2
21°	47 48.2 +05.2 79.4	46 52.5 +05.4 79.2	45 56.8 +05.7 79.1	45 01.1 +06.0 79.0	44 05.4 +06.3 78.8
22°	47 53.4 +04.0 77.9	46 57.9 +04.4 77.8	46 02.5 +04.7 77.7	45 07.1 +05.0 77.5	44 11.7 +05.3 77.4
23°	47 57.4 +02.9 76.4	47 02.3 +03.2 76.3	46 07.2 +03.6 76.2	45 12.1 +03.9 76.1	44 17.0 +04.3 76.0
24°	48 00.3 +01.7 74.9	47 05.5 +02.1 74.8	46 10.8 +02.5 74.8	45 16.0 +02.9 74.7	44 21.3 +03.3 74.6
25°	48 02.0 +00.5 73.4	47 07.6 +01.0 73.4	46 13.3 +01.4 73.3	45 18.9 +01.9 73.3	44 24.6 +02.3 73.2
26°	48 02.5 -00.6 71.9	47 08.6 -00.1 71.9	46 14.7 +00.3 71.9	45 20.8 +00.7 71.9	44 26.9 +01.2 71.8
27°	48 01.9 -01.8 70.4	47 08.5 -01.3 70.4	46 15.0 -00.8 70.4	45 21.5 -00.2 70.4	44 28.1 +00.2 70.4
28°	48 00.1 -02.9 68.9	47 07.2 -02.4 69.0	46 14.2 -01.9 69.0	45 21.3 -01.4 69.0	44 28.3 -00.9 69.0
29°	47 57.2 -04.1 67.4	47 04.8 -03.6 67.5	46 12.3 -02.9 67.6	45 19.9 -02.4 67.6	44 27.4 -01.8 67.6

Latitude 19°

Declination SAME name as Latitude

Dec	LHA 050° / 310°	LHA 051° / 309°	LHA 052° / 308°	LHA 053° / 307°	LHA 054° / 306°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	37 25.7 +24.3 105.3	36 30.9 +24.0 104.8	35 36.0 +23.7 104.3	34 40.9 +23.5 103.8	33 45.8 +23.2 103.3
1°	37 50.0 +23.5 104.1	36 54.9 +23.3 103.6	35 59.7 +23.1 103.1	35 04.4 +22.8 102.7	34 09.0 +22.6 102.2
2°	38 13.5 +22.9 103.0	37 18.2 +22.6 102.5	36 22.8 +22.4 102.0	35 27.2 +22.2 101.5	34 31.6 +22.0 101.1
3°	38 36.4 +22.2 101.8	37 40.8 +22.0 101.3	36 45.2 +21.7 100.8	35 49.4 +21.5 100.4	34 53.6 +21.3 99.9
4°	38 58.6 +21.4 100.6	38 02.8 +21.2 100.1	37 06.9 +21.0 99.7	36 10.9 +20.9 99.2	35 14.9 +20.7 98.8
5°	39 20.0 +20.7 99.4	38 24.0 +20.5 98.9	37 27.9 +20.3 98.5	36 31.8 +20.1 98.1	35 35.6 +20.0 97.6
6°	39 40.7 +19.9 98.2	38 44.5 +19.7 97.7	37 48.2 +19.6 97.3	36 51.9 +19.5 96.9	35 55.6 +19.3 96.5
7°	40 00.6 +19.1 96.9	39 04.2 +19.0 96.5	38 07.8 +18.9 96.1	37 11.4 +18.8 95.7	36 14.9 +18.7 95.3
8°	40 19.7 +18.3 95.7	39 23.2 +18.2 95.3	38 26.7 +18.1 94.9	37 30.2 +18.0 94.5	36 33.6 +17.9 94.1
9°	40 38.0 +17.5 94.4	39 41.4 +17.4 94.1	38 44.8 +17.4 93.7	37 48.2 +17.3 93.3	36 51.5 +17.3 92.9
10°	40 55.5 +16.7 93.2	39 58.8 +16.6 92.8	39 02.2 +16.5 92.5	38 05.5 +16.5 92.1	37 08.8 +16.5 91.7
11°	41 12.2 +15.8 91.9	40 15.4 +15.8 91.6	39 18.7 +15.8 91.2	38 22.0 +15.8 90.9	37 25.3 +15.7 90.5
12°	41 28.0 +14.9 90.6	40 31.2 +15.0 90.3	39 34.5 +15.0 90.0	38 37.8 +15.0 89.6	37 41.0 +15.0 89.3
13°	41 42.9 +14.1 89.3	40 46.2 +14.1 89.0	39 49.5 +14.1 88.7	38 52.8 +14.1 88.4	37 56.0 +14.3 88.1
14°	41 57.0 +13.1 88.0	41 00.3 +13.2 87.7	40 03.6 +13.3 87.4	39 06.9 +13.4 87.1	38 10.3 +13.4 86.9
15°	42 10.1 +12.3 86.7	41 13.5 +12.4 86.4	40 16.9 +12.5 86.2	39 20.3 +12.6 85.9	38 23.7 +12.7 85.6
16°	42 22.4 +11.4 85.4	41 25.9 +11.5 85.1	40 29.4 +11.6 84.9	39 32.9 +11.7 84.6	38 36.4 +11.9 84.4
17°	42 33.8 +10.4 84.1	41 37.4 +10.5 83.8	40 41.0 +10.7 83.6	39 44.6 +10.9 83.3	38 48.3 +11.0 83.1
18°	42 44.2 +09.5 82.7	41 47.9 +09.7 82.5	40 51.7 +09.9 82.3	39 55.5 +10.0 82.1	38 59.3 +10.3 81.9
19°	42 53.7 +08.5 81.4	41 57.6 +08.7 81.2	41 01.6 +08.9 81.0	40 05.5 +09.2 80.8	39 09.6 +09.4 80.6
20°	43 02.2 +07.6 80.0	42 06.3 +07.9 79.8	41 10.5 +08.1 79.7	40 14.7 +08.3 79.5	39 19.0 +08.5 79.3
21°	43 09.8 +06.6 78.7	42 14.2 +06.8 78.5	41 18.6 +07.1 78.3	40 23.0 +07.5 78.2	39 27.5 +07.7 78.0
22°	43 16.4 +05.6 77.3	42 21.0 +06.0 77.2	41 25.7 +06.3 77.0	40 30.5 +06.5 76.9	39 35.2 +06.9 76.7
23°	43 22.0 +04.6 75.9	42 27.0 +05.0 75.8	41 32.0 +05.3 75.7	40 37.0 +05.7 75.6	39 42.1 +06.0 75.4
24°	43 26.6 +03.7 74.6	42 32.0 +04.0 74.5	41 37.3 +04.4 74.4	40 42.7 +04.8 74.3	39 48.1 +05.2 74.2
25°	43 30.3 +02.7 73.2	42 36.0 +03.1 73.1	41 41.7 +03.5 73.0	40 47.5 +03.9 72.9	39 53.3 +04.2 72.9
26°	43 33.0 +01.6 71.8	42 39.1 +02.1 71.7	41 45.2 +02.5 71.7	40 51.4 +02.9 71.6	39 57.5 +03.4 71.6
27°	43 34.6 +00.7 70.4	42 41.2 +01.1 70.4	41 47.7 +01.7 70.4	40 54.3 +02.1 70.3	40 00.9 +02.5 70.3
28°	43 35.3 -00.3 69.0	42 42.3 +00.2 69.0	41 49.4 +00.6 69.0	40 56.4 +01.2 69.0	40 03.4 +01.7 68.9
29°	43 35.0 -01.3 67.7	42 42.5 -00.8 67.7	41 50.0 -00.2 67.7	40 57.6 +00.2 67.7	40 05.1 +00.7 67.6

Dec	LHA 055° / 305°	LHA 056° / 304°	LHA 057° / 303°	LHA 058° / 302°	LHA 059° / 301°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	32 50.5 +23.0 102.8	31 55.2 +22.7 102.4	30 59.7 +22.5 101.9	30 04.2 +22.3 101.5	29 08.5 +22.1 101.1
1°	33 13.5 +22.4 101.7	32 17.9 +22.2 101.3	31 22.2 +22.0 100.9	30 26.5 +21.8 100.4	29 30.6 +21.6 100.0
2°	33 35.9 +21.7 100.6	32 40.1 +21.6 100.2	31 44.2 +21.4 99.8	30 48.3 +21.2 99.3	29 52.2 +21.1 98.9
3°	33 57.6 +21.2 99.5	33 01.7 +20.9 99.1	32 05.6 +20.8 98.7	31 09.5 +20.7 98.3	30 13.3 +20.5 97.8
4°	34 18.8 +20.5 98.4	33 22.6 +20.4 98.0	32 26.4 +20.3 97.6	31 30.2 +20.1 97.2	30 33.8 +20.0 96.8
5°	34 39.3 +19.9 97.2	33 43.0 +19.8 96.8	32 46.7 +19.6 96.4	31 50.3 +19.5 96.0	30 53.8 +19.5 95.7
6°	34 59.2 +19.2 96.1	34 02.8 +19.1 95.7	33 06.3 +19.0 95.3	32 09.8 +18.9 94.9	31 13.3 +18.8 94.6
7°	35 18.4 +18.6 94.9	34 21.9 +18.5 94.5	33 25.3 +18.4 94.2	32 28.7 +18.4 93.8	31 32.1 +18.3 93.4
8°	35 37.0 +17.9 93.8	34 40.4 +17.8 93.4	33 43.7 +17.8 93.0	32 47.1 +17.7 92.7	31 50.4 +17.7 92.3
9°	35 54.9 +17.2 92.6	34 58.2 +17.2 92.2	34 01.5 +17.1 91.9	33 04.8 +17.1 91.5	32 08.1 +17.1 91.2
10°	36 12.1 +16.5 91.4	35 15.4 +16.4 91.1	34 18.6 +16.5 90.7	33 21.9 +16.5 90.4	32 25.2 +16.4 90.1
11°	36 28.6 +15.7 90.2	35 31.8 +15.8 89.9	34 35.1 +15.8 89.6	33 38.4 +15.8 89.2	32 41.6 +15.9 88.9
12°	36 44.3 +15.1 89.0	35 47.6 +15.1 88.7	34 50.9 +15.1 88.4	33 54.2 +15.1 88.1	32 57.5 +15.2 87.8
13°	36 59.4 +14.2 87.8	36 02.7 +14.3 87.5	35 06.0 +14.4 87.2	34 09.3 +14.5 86.9	33 12.7 +14.6 86.6
14°	37 13.6 +13.6 86.6	36 17.0 +13.6 86.3	35 20.4 +13.7 86.0	34 23.8 +13.9 85.7	33 27.3 +13.9 85.5
15°	37 27.2 +12.8 85.4	36 30.6 +12.9 85.1	35 34.1 +13.0 84.8	34 37.7 +13.1 84.6	33 41.2 +13.2 84.3
16°	37 40.0 +12.0 84.1	36 43.5 +12.2 83.9	35 47.1 +12.3 83.6	34 50.8 +12.4 83.4	33 54.4 +12.6 83.1
17°	37 52.0 +11.2 82.9	36 55.7 +11.4 82.6	35 59.4 +11.6 82.4	35 03.2 +11.7 82.2	34 07.0 +11.9 81.9
18°	38 03.2 +10.4 81.6	37 07.1 +10.6 81.4	36 11.0 +10.8 81.2	35 14.9 +11.1 81.0	34 18.9 +11.2 80.8
19°	38 13.6 +09.6 80.4	37 17.7 +09.8 80.2	36 21.8 +10.1 80.0	35 26.0 +10.3 79.8	34 30.1 +10.6 79.6
20°	38 23.2 +08.8 79.1	37 27.5 +09.1 78.9	36 31.9 +09.3 78.7	35 36.3 +09.5 78.6	34 40.7 +09.8 78.4
21°	38 32.0 +08.0 77.9	37 36.6 +08.3 77.7	36 41.2 +08.5 77.5	35 45.8 +08.8 77.3	34 50.5 +09.1 77.2
22°	38 40.0 +07.2 76.6	37 44.9 +07.4 76.4	36 49.7 +07.8 76.3	35 54.6 +08.1 76.1	34 59.6 +08.4 76.0
23°	38 47.2 +06.3 75.3	37 52.3 +06.7 75.2	36 57.5 +07.0 75.0	36 02.7 +07.4 74.9	35 08.0 +07.6 74.8
24°	38 53.5 +05.6 74.0	37 59.0 +05.9 73.9	37 04.5 +06.2 73.8	36 10.1 +06.5 73.7	35 15.6 +07.0 73.5
25°	38 59.1 +04.6 72.8	38 04.9 +05.0 72.7	37 10.7 +05.5 72.6	36 16.6 +05.9 72.4	35 22.6 +06.2 72.3
26°	39 03.7 +03.8 71.5	38 09.9 +04.3 71.4	37 16.2 +04.6 71.3	36 22.5 +05.0 71.2	35 28.8 +05.4 71.1
27°	39 07.5 +03.0 70.2	38 14.2 +03.4 70.1	37 20.8 +03.9 70.0	36 27.5 +04.3 70.0	35 34.2 +04.8 69.9
28°	39 10.5 +02.1 68.9	38 17.6 +02.6 68.9	37 24.7 +03.0 68.8	36 31.8 +03.5 68.7	35 39.0 +03.9 68.6
29°	39 12.6 +01.3 67.6	38 20.2 +01.7 67.6	37 27.7 +02.3 67.5	36 35.3 +02.8 67.5	35 42.9 +03.2 67.4

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Latitude 19°

Dec	LHA 060° / 300°	LHA 061° / 299°	LHA 062° / 298°	LHA 063° / 297°	LHA 064° / 296°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	28 12.8 +21.9 100.6	27 17.0 +21.8 100.2	26 21.2 +21.5 99.8	25 25.2 +21.4 99.4	24 29.2 +21.3 99.0
1°	28 34.7 +21.5 99.6	27 38.8 +21.2 99.2	26 42.7 +21.1 98.8	25 46.6 +21.0 98.4	24 50.5 +20.8 98.0
2°	28 56.2 +20.9 98.5	28 00.0 +20.8 98.1	27 03.8 +20.7 97.7	26 07.6 +20.5 97.3	25 11.3 +20.4 97.0
3°	29 17.1 +20.4 97.4	28 20.8 +20.3 97.1	27 24.5 +20.1 96.7	26 28.1 +20.1 96.3	25 31.7 +20.0 95.9
4°	29 37.5 +19.9 96.4	28 41.1 +19.8 96.0	27 44.6 +19.7 95.6	26 48.2 +19.6 95.2	25 51.7 +19.5 94.9
5°	29 57.4 +19.3 95.3	29 00.9 +19.2 94.9	28 04.3 +19.2 94.5	27 07.8 +19.1 94.2	26 11.2 +19.0 93.8
6°	30 16.7 +18.8 94.2	29 20.1 +18.7 93.8	28 23.5 +18.7 93.5	27 26.9 +18.6 93.1	26 30.2 +18.6 92.8
7°	30 35.5 +18.2 93.1	29 38.8 +18.2 92.7	28 42.2 +18.1 92.4	27 45.5 +18.1 92.0	26 48.8 +18.0 91.7
8°	30 53.7 +17.7 92.0	29 57.0 +17.6 91.6	29 00.3 +17.6 91.3	28 03.6 +17.6 91.0	27 06.8 +17.6 90.6
9°	31 11.4 +17.0 90.9	30 14.6 +17.1 90.5	29 17.9 +17.1 90.2	28 21.2 +17.1 89.9	27 24.4 +17.1 89.6
10°	31 28.4 +16.5 89.7	30 31.7 +16.5 89.4	29 35.0 +16.5 89.1	28 38.3 +16.5 88.8	27 41.5 +16.6 88.5
11°	31 44.9 +15.9 88.6	30 48.2 +15.9 88.3	29 51.5 +16.0 88.0	28 54.8 +16.0 87.7	27 58.1 +16.1 87.4
12°	32 00.8 +15.3 87.5	31 04.1 +15.4 87.2	30 07.5 +15.4 86.9	29 10.8 +15.5 86.6	28 14.2 +15.6 86.3
13°	32 16.1 +14.6 86.3	31 19.5 +14.7 86.0	30 22.9 +14.8 85.8	29 26.3 +14.9 85.5	28 29.8 +15.0 85.2
14°	32 30.7 +14.1 85.2	31 34.2 +14.1 84.9	30 37.7 +14.3 84.6	29 41.2 +14.4 84.4	28 44.8 +14.5 84.1
15°	32 44.8 +13.3 84.0	31 48.3 +13.6 83.8	30 52.0 +13.6 83.5	29 55.6 +13.8 83.2	28 59.3 +13.9 83.0
16°	32 58.1 +12.8 82.9	32 01.9 +12.9 82.6	31 05.6 +13.1 82.4	30 09.4 +13.2 82.1	29 13.2 +13.4 81.9
17°	33 10.9 +12.1 81.7	32 14.8 +12.2 81.5	31 18.7 +12.4 81.2	30 22.6 +12.6 81.0	29 26.6 +12.8 80.8
18°	33 23.0 +11.4 80.5	32 27.0 +11.6 80.3	31 31.1 +11.8 80.1	30 35.2 +12.1 79.9	29 39.4 +12.3 79.6
19°	33 34.4 +10.7 79.4	32 38.6 +11.0 79.1	31 42.9 +11.2 78.9	30 47.3 +11.4 78.7	29 51.7 +11.6 78.5
20°	33 45.1 +10.1 78.2	32 49.6 +10.3 78.0	31 54.1 +10.6 77.8	30 58.7 +10.9 77.6	30 03.3 +11.1 77.4
21°	33 55.2 +09.4 77.0	32 59.9 +09.7 76.8	32 04.7 +10.0 76.6	31 09.6 +10.2 76.4	30 14.4 +10.5 76.2
22°	34 04.6 +08.7 75.8	33 09.6 +09.0 75.6	32 14.7 +09.3 75.4	31 19.8 +09.6 75.3	30 24.9 +09.9 75.1
23°	34 13.3 +08.0 74.6	33 18.6 +08.3 74.4	32 24.0 +08.6 74.3	31 29.4 +08.9 74.1	30 34.8 +09.3 73.9
24°	34 21.3 +07.2 73.4	33 26.9 +07.6 73.3	32 32.6 +08.0 73.1	31 38.3 +08.4 73.0	30 44.1 +08.7 72.8
25°	34 28.5 +06.6 72.2	33 34.5 +07.0 72.1	32 40.6 +07.3 71.9	31 46.7 +07.7 71.8	30 52.8 +08.1 71.6
26°	34 35.1 +05.9 71.0	33 41.5 +06.3 70.9	32 47.9 +06.7 70.8	31 54.4 +07.0 70.6	31 00.9 +07.4 70.5
27°	34 41.0 +05.1 69.8	33 47.8 +05.5 69.7	32 54.6 +06.0 69.6	32 01.4 +06.5 69.5	31 08.3 +06.9 69.3
28°	34 46.1 +04.5 68.6	33 53.3 +04.9 68.5	33 00.6 +05.3 68.4	32 07.9 +05.7 68.3	31 15.2 +06.2 68.2
29°	34 50.6 +03.7 67.4	33 58.2 +04.2 67.3	33 05.9 +04.6 67.2	32 13.6 +05.1 67.1	31 21.4 +05.5 67.0

Dec	LHA 065° / 295°	LHA 066° / 294°	LHA 067° / 293°	LHA 068° / 292°	LHA 069° / 291°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	23 33.2 +21.1 98.6	22 37.0 +21.0 98.2	21 40.9 +20.8 97.9	20 44.7 +20.7 97.5	19 48.4 +20.6 97.1
1°	23 54.3 +20.7 97.6	22 58.0 +20.6 97.2	22 01.7 +20.5 96.9	21 05.4 +20.3 96.5	20 09.0 +20.2 96.1
2°	24 15.0 +20.3 96.6	23 18.6 +20.2 96.2	22 22.2 +20.1 95.8	21 25.7 +20.0 95.5	20 29.2 +19.9 95.1
3°	24 35.3 +19.8 95.5	23 38.8 +19.7 95.2	22 42.3 +19.7 94.8	21 45.7 +19.6 94.5	20 49.1 +19.6 94.1
4°	24 55.1 +19.4 94.5	23 58.5 +19.4 94.2	23 02.0 +19.2 93.8	22 05.3 +19.3 93.4	21 08.7 +19.2 93.1
5°	25 14.5 +19.0 93.5	24 17.9 +18.9 93.1	23 21.2 +18.9 92.8	22 24.6 +18.8 92.4	21 27.9 +18.8 92.1
6°	25 33.5 +18.6 92.4	24 36.8 +18.5 92.1	23 40.1 +18.5 91.7	22 43.4 +18.5 91.4	21 46.7 +18.4 91.1
7°	25 52.1 +18.0 91.4	24 55.3 +18.1 91.0	23 58.6 +18.1 90.7	23 01.9 +18.0 90.4	22 05.1 +18.1 90.0
8°	26 10.1 +17.6 90.3	25 13.4 +17.6 90.0	24 16.7 +17.6 89.6	23 19.9 +17.7 89.3	22 23.2 +17.7 89.0
9°	26 27.7 +17.1 89.2	25 31.0 +17.1 88.9	24 34.3 +17.2 88.6	23 37.6 +17.2 88.3	22 40.9 +17.2 88.0
10°	26 44.8 +16.7 88.2	25 48.1 +16.7 87.8	24 51.5 +16.7 87.5	23 54.8 +16.8 87.2	22 58.1 +16.9 86.9
11°	27 01.5 +16.1 87.1	26 04.8 +16.2 86.8	25 08.2 +16.3 86.5	24 11.6 +16.3 86.2	23 15.0 +16.4 85.9
12°	27 17.6 +15.7 86.0	26 21.0 +15.8 85.7	25 24.5 +15.8 85.4	24 27.9 +16.0 85.1	23 31.4 +16.0 84.8
13°	27 33.3 +15.1 84.9	26 36.8 +15.2 84.6	25 40.3 +15.3 84.3	24 43.9 +15.4 84.1	23 47.4 +15.6 83.8
14°	27 48.4 +14.6 83.8	26 52.0 +14.7 83.5	25 55.6 +14.9 83.3	24 59.3 +15.0 83.0	24 03.0 +15.2 82.7
15°	28 03.0 +14.1 82.7	27 06.7 +14.3 82.5	26 10.5 +14.4 82.2	25 14.3 +14.6 81.9	24 18.2 +14.7 81.7
16°	28 17.1 +13.5 81.6	27 21.0 +13.7 81.4	26 24.9 +13.9 81.1	25 28.9 +14.0 80.9	24 32.9 +14.2 80.6
17°	28 30.6 +13.0 80.5	27 34.7 +13.2 80.3	26 38.8 +13.4 80.0	25 42.9 +13.6 79.8	24 47.1 +13.8 79.5
18°	28 43.6 +12.5 79.4	27 47.9 +12.7 79.2	26 52.2 +12.9 78.9	25 56.5 +13.2 78.7	25 00.9 +13.4 78.5
19°	28 56.1 +11.9 78.3	28 00.6 +12.1 78.1	27 05.1 +12.4 77.8	26 09.7 +12.6 77.6	25 14.3 +12.8 77.4
20°	29 08.0 +11.4 77.2	28 12.7 +11.6 77.0	27 17.5 +11.8 76.7	26 22.3 +12.1 76.5	25 27.1 +12.4 76.3
21°	29 19.4 +10.7 76.0	28 24.3 +11.1 75.8	27 29.3 +11.4 75.6	26 34.4 +11.6 75.4	25 39.5 +11.9 75.2
22°	29 30.1 +10.2 74.9	28 35.4 +10.5 74.7	27 40.7 +10.8 74.5	26 46.0 +11.1 74.3	25 51.4 +11.5 74.1
23°	29 40.3 +09.7 73.8	28 45.9 +09.9 73.6	27 51.5 +10.3 73.4	26 57.1 +10.6 73.2	26 02.9 +10.9 73.0
24°	29 50.0 +09.0 72.6	28 55.8 +09.4 72.5	28 01.8 +09.7 72.3	27 07.7 +10.1 72.1	26 13.8 +10.4 71.9
25°	29 59.0 +08.4 71.5	29 05.2 +08.8 71.3	28 11.5 +09.2 71.2	27 17.8 +09.6 71.0	26 24.2 +09.9 70.8
26°	30 07.4 +07.9 70.4	29 14.0 +08.3 70.2	28 20.7 +08.6 70.1	27 27.4 +09.0 69.9	26 34.1 +09.4 69.7
27°	30 15.3 +07.2 69.2	29 22.3 +07.6 69.1	28 29.3 +08.1 68.9	27 36.4 +08.5 68.8	26 43.5 +08.9 68.6
28°	30 22.5 +06.7 68.1	29 29.9 +07.1 67.9	28 37.4 +07.5 67.8	27 44.9 +07.9 67.7	26 52.4 +08.4 67.5
29°	30 29.2 +06.0 66.9	29 37.0 +06.5 66.8	28 44.9 +06.9 66.7	27 52.8 +07.4 66.6	27 00.8 +07.9 66.4

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Latitude 19°

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Dec	LHA 070° / 290°	LHA 071° / 289°	LHA 072° / 288°	LHA 073° / 287°	LHA 074° / 286°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	18 52.1 +20.5 96.8	17 55.7 +20.4 96.4	16 59.3 +20.3 96.0	16 02.9 +20.2 95.7	15 06.4 +20.1 95.3
1°	19 12.6 +20.1 95.8	18 16.1 +20.1 95.4	17 19.6 +20.0 95.1	16 23.1 +19.9 94.7	15 26.5 +19.9 94.4
2°	19 32.7 +19.8 94.8	18 36.2 +19.7 94.4	17 39.6 +19.7 94.1	16 43.0 +19.6 93.7	15 46.4 +19.6 93.4
3°	19 52.5 +19.5 93.8	18 55.9 +19.5 93.4	17 59.3 +19.4 93.1	17 02.6 +19.4 92.7	16 06.0 +19.3 92.4
4°	20 12.0 +19.2 92.8	19 15.4 +19.1 92.4	18 18.7 +19.1 92.1	17 22.0 +19.0 91.7	16 25.3 +19.0 91.4
5°	20 31.2 +18.8 91.7	19 34.5 +18.8 91.4	18 37.8 +18.7 91.1	17 41.0 +18.8 90.7	16 44.3 +18.8 90.4
6°	20 50.0 +18.4 90.7	19 53.3 +18.4 90.4	18 56.5 +18.5 90.1	17 59.8 +18.4 89.7	17 03.1 +18.4 89.4
7°	21 08.4 +18.1 89.7	20 11.7 +18.1 89.4	19 15.0 +18.1 89.1	18 18.2 +18.2 88.7	17 21.5 +18.2 88.4
8°	21 26.5 +17.7 88.7	20 29.8 +17.7 88.4	19 33.1 +17.7 88.1	18 36.4 +17.8 87.7	17 39.7 +17.9 87.4
9°	21 44.2 +17.3 87.7	20 47.5 +17.4 87.4	19 50.8 +17.5 87.0	18 54.2 +17.5 86.7	17 57.6 +17.5 86.4
10°	22 01.5 +16.9 86.6	21 04.9 +17.0 86.3	20 08.3 +17.0 86.0	19 11.7 +17.1 85.7	18 15.1 +17.3 85.4
11°	22 18.4 +16.5 85.6	21 21.9 +16.6 85.3	20 25.3 +16.7 85.0	19 28.8 +16.8 84.7	18 32.4 +16.9 84.4
12°	22 34.9 +16.2 84.6	21 38.5 +16.2 84.3	20 42.0 +16.4 84.0	19 45.6 +16.5 83.7	18 49.3 +16.6 83.4
13°	22 51.1 +15.7 83.5	21 54.7 +15.8 83.2	20 58.4 +16.0 82.9	20 02.1 +16.1 82.7	19 05.9 +16.2 82.4
14°	23 06.8 +15.3 82.5	22 10.5 +15.5 82.2	21 14.4 +15.6 81.9	20 18.2 +15.8 81.6	19 22.1 +15.9 81.4
15°	23 22.1 +14.8 81.4	22 26.0 +15.0 81.1	21 30.0 +15.2 80.9	20 34.0 +15.3 80.6	19 38.0 +15.6 80.3
16°	23 36.9 +14.5 80.4	22 41.0 +14.7 80.1	21 45.2 +14.8 79.8	20 49.3 +15.1 79.6	19 53.6 +15.2 79.3
17°	23 51.4 +14.0 79.3	22 55.7 +14.2 79.0	22 00.0 +14.4 78.8	21 04.4 +14.6 78.5	20 08.8 +14.8 78.3
18°	24 05.4 +13.5 78.2	23 09.9 +13.7 78.0	22 14.4 +14.0 77.7	21 19.0 +14.2 77.5	20 23.6 +14.5 77.3
19°	24 18.9 +13.1 77.2	23 23.6 +13.4 76.9	22 28.4 +13.6 76.7	21 33.2 +13.9 76.5	20 38.1 +14.1 76.2
20°	24 32.0 +12.7 76.1	23 37.0 +12.9 75.9	22 42.0 +13.2 75.6	21 47.1 +13.4 75.4	20 52.2 +13.7 75.2
21°	24 44.7 +12.2 75.0	23 49.9 +12.5 74.8	22 55.2 +12.8 74.6	22 00.5 +13.1 74.4	21 05.9 +13.4 74.1
22°	24 56.9 +11.7 73.9	24 02.4 +12.0 73.7	23 08.0 +12.3 73.5	22 13.6 +12.7 73.3	21 19.3 +13.0 73.1
23°	25 08.6 +11.3 72.8	24 14.4 +11.6 72.7	23 20.3 +11.9 72.5	22 26.3 +12.2 72.2	21 32.3 +12.5 72.0
24°	25 19.9 +10.7 71.8	24 26.0 +11.1 71.6	23 32.2 +11.5 71.4	22 38.5 +11.8 71.2	21 44.8 +12.2 71.0
25°	25 30.6 +10.3 70.7	24 37.1 +10.7 70.5	23 43.7 +11.0 70.3	22 50.3 +11.4 70.1	21 57.0 +11.7 69.9
26°	25 40.9 +09.8 69.6	24 47.8 +10.2 69.4	23 54.7 +10.6 69.2	23 01.7 +11.0 69.1	22 08.7 +11.4 68.9
27°	25 50.7 +09.3 68.5	24 58.0 +09.7 68.3	24 05.3 +10.1 68.2	23 12.7 +10.5 68.0	22 20.1 +10.9 67.8
28°	26 00.0 +08.8 67.4	25 07.7 +09.2 67.2	24 15.4 +09.7 67.1	23 23.2 +10.1 66.9	22 31.0 +10.5 66.7
29°	26 08.8 +08.3 66.3	25 16.9 +08.8 66.1	24 25.1 +09.2 66.0	23 33.3 +09.6 65.8	22 41.5 +10.1 65.7

Dec	LHA 075° / 285°	LHA 076° / 284°	LHA 077° / 283°	LHA 078° / 282°	LHA 079° / 281°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	14 09.9 +20.0 95.0	13 13.4 +19.9 94.6	12 16.8 +19.9 94.3	11 20.2 +19.9 94.0	10 23.6 +19.8 93.6
1°	14 29.9 +19.8 94.0	13 33.3 +19.8 93.7	12 36.7 +19.7 93.3	11 40.1 +19.6 93.0	10 43.4 +19.6 92.7
2°	14 49.7 +19.6 93.0	13 53.1 +19.5 92.7	12 56.4 +19.5 92.4	11 59.7 +19.4 92.0	11 03.0 +19.4 91.7
3°	15 09.3 +19.3 92.1	14 12.6 +19.2 91.7	13 15.9 +19.2 91.4	12 19.1 +19.3 91.1	11 22.4 +19.2 90.7
4°	15 28.6 +19.0 91.1	14 31.8 +19.0 90.7	13 35.1 +19.0 90.4	12 38.4 +19.0 90.1	11 41.6 +19.1 89.8
5°	15 47.6 +18.7 90.1	14 50.8 +18.8 89.8	13 54.1 +18.8 89.4	12 57.4 +18.8 89.1	12 00.7 +18.8 88.8
6°	16 06.3 +18.5 89.1	15 09.6 +18.5 88.8	14 12.9 +18.5 88.5	13 16.2 +18.6 88.1	12 19.5 +18.6 87.8
7°	16 24.8 +18.2 88.1	15 28.1 +18.3 87.8	14 31.4 +18.3 87.5	13 34.8 +18.3 87.2	12 38.1 +18.4 86.9
8°	16 43.0 +17.9 87.1	15 46.4 +18.0 86.8	14 49.7 +18.1 86.5	13 53.1 +18.1 86.2	12 56.5 +18.2 85.9
9°	17 00.9 +17.7 86.1	16 04.4 +17.7 85.8	15 07.8 +17.8 85.5	14 11.2 +17.9 85.2	13 14.7 +18.0 84.9
10°	17 18.6 +17.3 85.1	16 22.1 +17.4 84.8	15 25.6 +17.5 84.5	14 29.1 +17.6 84.2	13 32.7 +17.7 83.9
11°	17 35.9 +17.0 84.1	16 39.5 +17.1 83.8	15 43.1 +17.3 83.5	14 46.7 +17.4 83.2	13 50.4 +17.5 82.9
12°	17 52.9 +16.7 83.1	16 56.6 +16.9 82.8	16 00.4 +16.9 82.5	15 04.1 +17.1 82.2	14 07.9 +17.3 81.9
13°	18 09.6 +16.4 82.1	17 13.5 +16.5 81.8	16 17.3 +16.7 81.5	15 21.2 +16.9 81.2	14 25.2 +17.0 81.0
14°	18 26.0 +16.1 81.1	17 30.0 +16.3 80.8	16 34.0 +16.4 80.5	15 38.1 +16.6 80.3	14 42.2 +16.8 80.0
15°	18 42.1 +15.8 80.1	17 46.3 +15.9 79.8	16 50.4 +16.2 79.5	15 54.7 +16.3 79.3	14 59.0 +16.5 79.0
16°	18 57.9 +15.4 79.1	18 02.2 +15.6 78.8	17 06.6 +15.8 78.5	16 11.0 +16.0 78.3	15 15.5 +16.2 78.0
17°	19 13.3 +15.0 78.0	18 17.8 +15.3 77.8	17 22.4 +15.5 77.5	16 27.0 +15.7 77.2	15 31.7 +16.0 77.0
18°	19 28.3 +14.7 77.0	18 33.1 +14.9 76.8	17 37.9 +15.2 76.5	16 42.7 +15.5 76.2	15 47.7 +15.7 76.0
19°	19 43.0 +14.4 76.0	18 48.0 +14.7 75.7	17 53.1 +14.9 75.5	16 58.2 +15.1 75.2	16 03.4 +15.4 75.0
20°	19 57.4 +14.0 74.9	19 02.7 +14.2 74.7	18 08.0 +14.5 74.5	17 13.3 +14.9 74.2	16 18.8 +15.1 74.0
21°	20 11.4 +13.7 73.9	19 16.9 +14.0 73.7	18 22.5 +14.3 73.4	17 28.2 +14.5 73.2	16 33.9 +14.8 73.0
22°	20 25.1 +13.2 72.9	19 30.9 +13.6 72.6	18 36.8 +13.9 72.4	17 42.7 +14.2 72.2	16 48.7 +14.6 72.0
23°	20 38.3 +12.9 71.8	19 44.5 +13.2 71.6	18 50.7 +13.5 71.4	17 56.9 +13.9 71.2	17 03.3 +14.2 70.9
24°	20 51.2 +12.5 70.8	19 57.7 +12.8 70.6	19 04.2 +13.2 70.4	18 10.8 +13.6 70.1	17 17.5 +13.9 69.9
25°	21 03.7 +12.2 69.7	20 10.5 +12.5 69.5	19 17.4 +12.9 69.3	18 24.4 +13.2 69.1	17 31.4 +13.6 68.9
26°	21 15.9 +11.7 68.7	20 23.0 +12.2 68.5	19 30.3 +12.5 68.3	18 37.6 +12.9 68.1	17 45.0 +13.3 67.9
27°	21 27.6 +11.3 67.6	20 35.2 +11.7 67.4	19 42.8 +12.2 67.3	18 50.5 +12.6 67.1	17 58.3 +13.0 66.9
28°	21 38.9 +11.0 66.6	20 46.9 +11.4 66.4	19 55.0 +11.8 66.2	19 03.1 +12.2 66.0	18 11.3 +12.6 65.8
29°	21 49.9 +10.5 65.5	20 58.3 +11.0 65.3	20 06.8 +11.4 65.2	19 15.3 +11.9 65.0	18 23.9 +12.3 64.8

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Latitude 19°

Dec	LHA 080° / 280°	LHA 081° / 279°	LHA 082° / 278°	LHA 083° / 277°	LHA 084° / 276°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	9 27.0 +19.7 93.3	8 30.4 +19.6 93.0	7 33.7 +19.6 92.6	6 37.0 +19.6 92.3	5 40.3 +19.6 92.0
1°	9 46.7 +19.6 92.3	8 50.0 +19.6 92.0	7 53.3 +19.5 91.7	6 56.6 +19.5 91.3	5 59.9 +19.5 91.0
2°	10 06.3 +19.4 91.4	9 09.6 +19.4 91.0	8 12.8 +19.4 90.7	7 16.1 +19.4 90.4	6 19.4 +19.4 90.1
3°	10 25.7 +19.2 90.4	9 29.0 +19.2 90.1	8 32.2 +19.3 89.8	7 35.5 +19.2 89.4	6 38.8 +19.2 89.1
4°	10 44.9 +19.1 89.4	9 48.2 +19.0 89.1	8 51.5 +19.1 88.8	7 54.7 +19.2 88.5	6 58.0 +19.2 88.2
5°	11 04.0 +18.8 88.5	10 07.2 +18.9 88.2	9 10.6 +18.9 87.8	8 13.9 +19.0 87.5	7 17.2 +19.0 87.2
6°	11 22.8 +18.7 87.5	10 26.1 +18.8 87.2	9 29.5 +18.8 86.9	8 32.9 +18.8 86.6	7 36.2 +18.9 86.2
7°	11 41.5 +18.5 86.5	10 44.9 +18.5 86.2	9 48.3 +18.6 85.9	8 51.7 +18.7 85.6	7 55.1 +18.8 85.3
8°	12 00.0 +18.2 85.6	11 03.4 +18.4 85.3	10 06.9 +18.4 84.9	9 10.4 +18.5 84.6	8 13.9 +18.7 84.3
9°	12 18.2 +18.1 84.6	11 21.8 +18.1 84.3	10 25.3 +18.3 84.0	9 28.9 +18.4 83.7	8 32.6 +18.5 83.4
10°	12 36.3 +17.8 83.6	11 39.9 +18.0 83.3	10 43.6 +18.1 83.0	9 47.3 +18.2 82.7	8 51.1 +18.3 82.4
11°	12 54.1 +17.7 82.6	11 57.9 +17.8 82.3	11 01.7 +17.9 82.0	10 05.5 +18.1 81.7	9 09.4 +18.2 81.4
12°	13 11.8 +17.4 81.7	12 15.7 +17.5 81.4	11 19.6 +17.7 81.1	10 23.6 +17.9 80.8	9 27.6 +18.1 80.5
13°	13 29.2 +17.2 80.7	12 33.2 +17.4 80.4	11 37.3 +17.5 80.1	10 41.5 +17.7 79.8	9 45.7 +17.8 79.5
14°	13 46.4 +16.9 79.7	12 50.6 +17.1 79.4	11 54.8 +17.4 79.1	10 59.2 +17.5 78.8	10 03.5 +17.7 78.5
15°	14 03.3 +16.7 78.7	13 07.7 +16.9 78.4	12 12.2 +17.1 78.1	11 16.7 +17.3 77.9	10 21.2 +17.6 77.6
16°	14 20.0 +16.5 77.7	13 24.6 +16.7 77.4	12 29.3 +16.9 77.2	11 34.0 +17.1 76.9	10 38.8 +17.3 76.6
17°	14 36.5 +16.2 76.7	13 41.3 +16.4 76.4	12 46.2 +16.6 76.2	11 51.1 +16.9 75.9	10 56.1 +17.2 75.6
18°	14 52.7 +15.9 75.7	13 57.7 +16.2 75.5	13 02.8 +16.5 75.2	12 08.0 +16.7 74.9	11 13.3 +17.0 74.6
19°	15 08.6 +15.7 74.7	14 13.9 +16.0 74.5	13 19.3 +16.2 74.2	12 24.7 +16.5 73.9	11 30.3 +16.7 73.7
20°	15 24.3 +15.4 73.7	14 29.9 +15.7 73.5	13 35.5 +16.0 73.2	12 41.2 +16.3 72.9	11 47.0 +16.6 72.7
21°	15 39.7 +15.1 72.7	14 45.6 +15.4 72.5	13 51.5 +15.8 72.2	12 57.5 +16.1 72.0	12 03.6 +16.4 71.7
22°	15 54.8 +14.9 71.7	15 01.0 +15.2 71.5	14 07.3 +15.5 71.2	13 13.6 +15.8 71.0	12 20.0 +16.2 70.7
23°	16 09.7 +14.6 70.7	15 16.2 +14.9 70.5	14 22.8 +15.2 70.2	13 29.4 +15.6 70.0	12 36.2 +15.9 69.7
24°	16 24.3 +14.2 69.7	15 31.1 +14.6 69.5	14 38.0 +15.0 69.2	13 45.0 +15.4 69.0	12 52.1 +15.7 68.7
25°	16 38.5 +14.0 68.7	15 45.7 +14.4 68.5	14 53.0 +14.7 68.2	14 00.4 +15.1 68.0	13 07.8 +15.5 67.7
26°	16 52.5 +13.7 67.7	16 00.1 +14.1 67.4	15 07.7 +14.5 67.2	14 15.5 +14.8 67.0	13 23.3 +15.3 66.8
27°	17 06.2 +13.4 66.6	16 14.2 +13.7 66.4	15 22.2 +14.2 66.2	14 30.3 +14.6 66.0	13 38.6 +15.0 65.8
28°	17 19.6 +13.0 65.6	16 27.9 +13.5 65.4	15 36.4 +13.9 65.2	14 44.9 +14.4 65.0	13 53.6 +14.8 64.8
29°	17 32.6 +12.8 64.6	16 41.4 +13.2 64.4	15 50.3 +13.7 64.2	14 59.3 +14.1 64.0	14 08.4 +14.5 63.8

Dec	LHA 085° / 275°	LHA 086° / 274°	LHA 087° / 273°	LHA 088° / 272°	LHA 089° / 271°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	4 43.6 +19.6 91.6	3 46.9 +19.5 91.3	2 50.2 +19.5 91.0	1 53.5 +19.5 90.7	0 56.7 +19.6 90.3
1°	5 03.2 +19.5 90.7	4 06.4 +19.5 90.4	3 09.7 +19.5 90.0	2 13.0 +19.5 89.7	1 16.3 +19.5 89.4
2°	5 22.7 +19.3 89.7	4 25.9 +19.4 89.4	3 29.2 +19.4 89.1	2 32.5 +19.4 88.8	1 35.8 +19.4 88.4
3°	5 42.0 +19.3 88.8	4 45.3 +19.4 88.5	3 48.6 +19.4 88.1	2 51.9 +19.4 87.8	1 55.2 +19.5 87.5
4°	6 01.3 +19.2 87.8	5 04.7 +19.2 87.5	4 08.0 +19.3 87.2	3 11.3 +19.4 86.9	2 14.7 +19.4 86.5
5°	6 20.5 +19.1 86.9	5 23.9 +19.2 86.6	4 27.3 +19.2 86.2	3 30.7 +19.3 85.9	2 34.1 +19.4 85.6
6°	6 39.6 +19.0 85.9	5 43.1 +19.0 85.6	4 46.5 +19.1 85.3	3 50.0 +19.2 85.0	2 53.5 +19.3 84.6
7°	6 58.6 +18.9 85.0	6 02.1 +19.0 84.7	5 05.6 +19.1 84.3	4 09.2 +19.2 84.0	3 12.8 +19.3 83.7
8°	7 17.5 +18.7 84.0	6 21.1 +18.8 83.7	5 24.7 +19.0 83.4	4 28.4 +19.1 83.1	3 32.1 +19.2 82.7
9°	7 36.2 +18.7 83.1	6 39.9 +18.8 82.7	5 43.7 +18.9 82.4	4 47.5 +19.0 82.1	3 51.3 +19.1 81.8
10°	7 54.9 +18.4 82.1	6 58.7 +18.6 81.8	6 02.6 +18.7 81.5	5 06.5 +18.9 81.2	4 10.4 +19.1 80.9
11°	8 13.3 +18.4 81.1	7 17.3 +18.5 80.8	6 21.3 +18.7 80.5	5 25.4 +18.8 80.2	4 29.5 +19.0 79.9
12°	8 31.7 +18.2 80.2	7 35.8 +18.4 79.9	6 40.0 +18.6 79.6	5 44.2 +18.8 79.3	4 48.5 +19.0 78.9
13°	8 49.9 +18.1 79.2	7 54.2 +18.3 78.9	6 58.6 +18.4 78.6	6 03.0 +18.6 78.3	5 07.5 +18.8 78.0
14°	9 08.0 +17.9 78.2	8 12.5 +18.1 77.9	7 17.0 +18.3 77.6	6 21.6 +18.6 77.3	5 26.3 +18.8 77.0
15°	9 25.9 +17.7 77.3	8 30.6 +17.9 77.0	7 35.3 +18.2 76.7	6 40.2 +18.4 76.4	5 45.1 +18.6 76.1
16°	9 43.6 +17.6 76.3	8 48.5 +17.9 76.0	7 53.5 +18.1 75.7	6 58.6 +18.3 75.4	6 03.7 +18.6 75.1
17°	10 01.2 +17.4 75.3	9 06.4 +17.6 75.1	8 11.6 +17.9 74.8	7 16.9 +18.2 74.5	6 22.3 +18.4 74.2
18°	10 18.6 +17.3 74.4	9 24.0 +17.5 74.1	8 29.5 +17.8 73.8	7 35.1 +18.0 73.5	6 40.7 +18.4 73.2
19°	10 35.9 +17.0 73.4	9 41.5 +17.4 73.1	8 47.3 +17.6 72.8	7 53.1 +18.0 72.5	6 59.1 +18.2 72.3
20°	10 52.9 +16.9 72.4	9 58.9 +17.2 72.1	9 04.9 +17.5 71.9	8 11.1 +17.8 71.6	7 17.3 +18.1 71.3
21°	11 09.8 +16.7 71.4	10 16.1 +17.0 71.2	9 22.4 +17.3 70.9	8 28.9 +17.6 70.6	7 35.4 +18.0 70.3
22°	11 26.5 +16.5 70.5	10 33.1 +16.8 70.2	9 39.7 +17.2 69.9	8 46.5 +17.5 69.7	7 53.4 +17.8 69.4
23°	11 43.0 +16.3 69.5	10 49.9 +16.6 69.2	9 56.9 +17.0 69.0	9 04.0 +17.4 68.7	8 11.2 +17.7 68.4
24°	11 59.3 +16.1 68.5	11 06.5 +16.5 68.2	10 13.9 +16.8 68.0	9 21.4 +17.1 67.7	8 28.9 +17.6 67.4
25°	12 15.4 +15.8 67.5	11 23.0 +16.2 67.3	10 30.7 +16.7 67.0	9 38.5 +17.1 66.7	8 46.5 +17.4 66.5
26°	12 31.2 +15.7 66.5	11 39.2 +16.1 66.3	10 47.4 +16.6 66.0	9 55.6 +16.8 65.8	9 03.9 +17.2 65.5
27°	12 46.9 +15.4 65.5	11 55.3 +15.8 65.3	11 03.8 +16.3 65.0	10 12.4 +16.7 64.8	9 21.1 +17.2 64.5
28°	13 02.3 +15.2 64.5	12 11.1 +15.7 64.3	11 20.1 +16.0 64.1	10 29.1 +16.5 63.8	9 38.3 +16.9 63.6
29°	13 17.5 +15.0 63.5	12 26.8 +15.4 63.3	11 36.1 +15.9 63.1	10 45.6 +16.3 62.8	9 55.2 +16.8 62.6

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Latitude 19°

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Dec	LHA 090° / 270°	LHA 091° / 269°	LHA 092° / 268°	LHA 093° / 267°	LHA 094° / 266°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	0 00.0 +19.5 90.0	-0 56.7 +19.5	-1 53.5 +19.6	-2 50.2 +19.6	-3 46.9 +19.6
1°	0 19.5 +19.6 89.1	-0 37.2 +19.6	-1 33.9 +19.6	-2 30.6 +19.6	-3 27.3 +19.7
2°	0 39.1 +19.5 88.1	-0 17.6 +19.5	-1 14.3 +19.6	-2 11.0 +19.7	-3 07.6 +19.7
3°	0 58.6 +19.5 87.2	0 01.9 +19.6 86.8	-0 54.7 +19.6	-1 51.3 +19.7	-2 47.9 +19.7
4°	1 18.1 +19.5 86.2	0 21.5 +19.5 85.9	-0 35.1 +19.6	-1 31.6 +19.7	-2 28.2 +19.8
5°	1 37.6 +19.4 85.3	0 41.0 +19.6 84.9	-0 15.5 +19.7	-1 11.9 +19.7	-2 08.4 +19.9
6°	1 57.0 +19.4 84.3	1 00.6 +19.5 84.0	0 04.2 +19.6 83.7	-0 52.2 +19.8	-1 48.5 +19.8
7°	2 16.4 +19.4 83.4	1 20.1 +19.5 83.1	0 23.8 +19.6 82.7	-0 32.4 +19.7	-1 28.7 +19.9
8°	2 35.8 +19.4 82.4	1 39.6 +19.5 82.1	0 43.4 +19.6 81.8	-0 12.7 +19.8	-1 08.8 +19.9
9°	2 55.2 +19.3 81.5	1 59.1 +19.4 81.2	1 03.0 +19.6 80.8	0 07.1 +19.7 80.5	-0 48.9 +20.0
10°	3 14.5 +19.2 80.5	2 18.5 +19.4 80.2	1 22.6 +19.6 79.9	0 26.8 +19.8 79.6	-0 28.9 +19.9
11°	3 33.7 +19.2 79.6	2 37.9 +19.4 79.3	1 42.2 +19.6 79.0	0 46.6 +19.7 78.6	-0 09.0 +19.9
12°	3 52.9 +19.1 78.6	2 57.3 +19.3 78.3	2 01.8 +19.5 78.0	1 06.3 +19.7 77.7	0 10.9 +19.9 77.4
13°	4 12.0 +19.0 77.7	3 16.6 +19.3 77.4	2 21.3 +19.5 77.1	1 26.0 +19.7 76.7	0 30.8 +20.0 76.4
14°	4 31.0 +19.0 76.7	3 35.9 +19.2 76.4	2 40.8 +19.4 76.1	1 45.7 +19.7 75.8	0 50.8 +19.9 75.5
15°	4 50.0 +18.9 75.8	3 55.1 +19.1 75.5	3 00.2 +19.4 75.2	2 05.4 +19.6 74.8	1 10.7 +19.9 74.5
16°	5 08.9 +18.8 74.8	4 14.2 +19.1 74.5	3 19.6 +19.3 74.2	2 25.0 +19.6 73.9	1 30.6 +19.8 73.6
17°	5 27.7 +18.7 73.9	4 33.3 +19.0 73.6	3 38.9 +19.3 73.3	2 44.6 +19.6 73.0	1 50.4 +19.8 72.6
18°	5 46.4 +18.7 72.9	4 52.3 +18.9 72.6	3 58.2 +19.2 72.3	3 04.2 +19.5 72.0	2 10.2 +19.8 71.7
19°	6 05.1 +18.5 72.0	5 11.2 +18.8 71.7	4 17.4 +19.1 71.4	3 23.7 +19.4 71.1	2 30.0 +19.8 70.8
20°	6 23.6 +18.4 71.0	5 30.0 +18.7 70.7	4 36.5 +19.1 70.4	3 43.1 +19.4 70.1	2 49.8 +19.7 69.8
21°	6 42.0 +18.3 70.1	5 48.7 +18.7 69.8	4 55.6 +18.9 69.5	4 02.5 +19.3 69.2	3 09.5 +19.7 68.9
22°	7 00.3 +18.2 69.1	6 07.4 +18.5 68.8	5 14.5 +18.9 68.5	4 21.8 +19.2 68.2	3 29.2 +19.6 67.9
23°	7 18.5 +18.1 68.1	6 25.9 +18.4 67.8	5 33.4 +18.8 67.6	4 41.0 +19.2 67.3	3 48.8 +19.5 67.0
24°	7 36.6 +17.9 67.2	6 44.3 +18.4 66.9	5 52.2 +18.7 66.6	5 00.2 +19.1 66.3	4 08.3 +19.5 66.0
25°	7 54.5 +17.8 66.2	7 02.7 +18.2 65.9	6 10.9 +18.6 65.7	5 19.3 +19.0 65.4	4 27.8 +19.4 65.1
26°	8 12.3 +17.7 65.2	7 20.9 +18.0 65.0	6 29.5 +18.5 64.7	5 38.3 +18.9 64.4	4 47.2 +19.3 64.1
27°	8 30.0 +17.5 64.3	7 38.9 +18.0 64.0	6 48.0 +18.4 63.7	5 57.2 +18.8 63.5	5 06.5 +19.2 63.2
28°	8 47.5 +17.4 63.3	7 56.9 +17.8 63.0	7 06.4 +18.2 62.8	6 16.0 +18.7 62.5	5 25.7 +19.2 62.2
29°	9 04.9 +17.2 62.3	8 14.7 +17.7 62.1	7 24.6 +18.2 61.8	6 34.7 +18.6 61.5	5 44.9 +19.0 61.3

Dec	LHA 095° / 265°	LHA 096° / 264°	LHA 097° / 263°	LHA 098° / 262°	LHA 099° / 261°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-4 43.6 +19.6	-5 40.3 +19.7	-6 37.0 +19.7	-7 33.7 +19.8	-8 30.4 +19.9
1°	-4 24.0 +19.7	-5 20.6 +19.7	-6 17.3 +19.8	-7 13.9 +19.9	-8 10.5 +19.9
2°	-4 04.3 +19.8	-5 00.9 +19.9	-5 57.5 +19.9	-6 54.0 +20.0	-7 50.6 +20.1
3°	-3 44.5 +19.8	-4 41.0 +19.9	-5 37.6 +20.1	-6 34.0 +20.1	-7 30.5 +20.2
4°	-3 24.7 +19.9	-4 21.1 +20.0	-5 17.5 +20.1	-6 13.9 +20.2	-7 10.3 +20.3
5°	-3 04.8 +20.0	-4 01.1 +20.0	-4 57.4 +20.1	-5 53.7 +20.3	-6 50.0 +20.5
6°	-2 44.8 +20.0	-3 41.1 +20.2	-4 37.3 +20.3	-5 33.4 +20.4	-6 29.5 +20.5
7°	-2 24.8 +20.0	-3 20.9 +20.1	-4 17.0 +20.3	-5 13.0 +20.4	-6 09.0 +20.6
8°	-2 04.8 +20.1	-3 00.8 +20.2	-3 56.7 +20.4	-4 52.6 +20.6	-5 48.4 +20.8
9°	-1 44.7 +20.1	-2 40.6 +20.3	-3 36.3 +20.4	-4 32.0 +20.6	-5 27.6 +20.8
10°	-1 24.6 +20.1	-2 20.3 +20.3	-3 15.9 +20.5	-4 11.4 +20.7	-5 06.8 +20.9
11°	-1 04.5 +20.1	-2 00.0 +20.3	-2 55.4 +20.6	-3 50.7 +20.8	-4 45.9 +21.0
12°	-0 44.4 +20.1	-1 39.7 +20.4	-2 34.8 +20.6	-3 29.9 +20.8	-4 24.9 +21.0
13°	-0 24.3 +20.2	-1 19.3 +20.4	-2 14.2 +20.6	-3 09.1 +20.9	-4 03.9 +21.1
14°	-0 04.1 +20.1	-0 58.9 +20.4	-1 53.6 +20.6	-2 48.2 +20.9	-3 42.8 +21.2
15°	0 16.0 +20.2 74.2	-0 38.5 +20.4	-1 33.0 +20.7	-2 27.3 +20.9	-3 21.6 +21.2
16°	0 36.2 +20.1 73.3	-0 18.1 +20.4	-1 12.3 +20.7	-2 06.4 +21.0	-3 00.4 +21.3
17°	0 56.3 +20.1 72.3	0 02.3 +20.4 72.0	-0 51.6 +20.7	-1 45.4 +21.0	-2 39.1 +21.3
18°	1 16.4 +20.1 71.4	0 22.7 +20.4 71.1	-0 30.9 +20.7	-1 24.4 +21.0	-2 17.8 +21.4
19°	1 36.5 +20.1 70.4	0 43.1 +20.4 70.1	-0 10.2 +20.8	-1 03.4 +21.1	-1 56.4 +21.4
20°	1 56.6 +20.0 69.5	1 03.5 +20.4 69.2	0 10.6 +20.7 68.9	-0 42.3 +21.1	-1 35.0 +21.4
21°	2 16.6 +20.1 68.6	1 23.9 +20.4 68.2	0 31.3 +20.7 67.9	-0 21.2 +21.0	-1 13.6 +21.4
22°	2 36.7 +19.9 67.6	1 44.3 +20.3 67.3	0 52.0 +20.7 67.0	-0 00.2 +21.1	-0 52.2 +21.5
23°	2 56.6 +19.9 66.7	2 04.6 +20.3 66.4	1 12.7 +20.7 66.0	0 20.9 +21.1 65.7	-0 30.7 +21.4
24°	3 16.5 +19.9 65.7	2 24.9 +20.2 65.4	1 33.4 +20.6 65.1	0 42.0 +21.0 64.8	-0 09.3 +21.5
25°	3 36.4 +19.8 64.8	2 45.1 +20.2 64.5	1 54.0 +20.6 64.2	1 03.0 +21.0 63.8	0 12.2 +21.4 63.5
26°	3 56.2 +19.7 63.8	3 05.3 +20.2 63.5	2 14.6 +20.6 63.2	1 24.0 +21.1 62.9	0 33.6 +21.5 62.6
27°	4 15.9 +19.7 62.9	3 25.5 +20.1 62.6	2 35.2 +20.6 62.3	1 45.1 +20.9 62.0	0 55.1 +21.4 61.7
28°	4 35.6 +19.6 61.9	3 45.6 +20.1 61.6	2 55.8 +20.5 61.3	2 06.0 +21.0 61.0	1 16.5 +21.4 60.7
29°	4 55.2 +19.5 61.0	4 05.7 +19.9 60.7	3 16.3 +20.4 60.4	2 27.0 +20.9 60.1	1 37.9 +21.4 59.8

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Dec	LHA 100° / 260°	LHA 101° / 259°	LHA 102° / 258°	LHA 103° / 257°	LHA 104° / 256°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°	-9 27.0 +19.9				
1°	-9 07.1 +20.0				
2°	-8 47.1 +20.2	-9 43.6 +20.3			
3°	-8 26.9 +20.3	-9 23.3 +20.4			
4°	-8 06.6 +20.4	-9 02.9 +20.6	-9 59.1 +20.7		
5°	-7 46.2 +20.6	-8 42.3 +20.7	-9 38.4 +20.8		
6°	-7 25.6 +20.7	-8 21.6 +20.8	-9 17.6 +21.1		
7°	-7 04.9 +20.8	-8 00.8 +21.0	-8 56.5 +21.1		
8°	-6 44.1 +20.9	-7 39.8 +21.1	-8 35.4 +21.3		
9°	-6 23.2 +21.0	-7 18.7 +21.2	-8 14.1 +21.4		
10°	-6 02.2 +21.1	-6 57.5 +21.4	-7 52.7 +21.6		
11°	-5 41.1 +21.2	-6 36.1 +21.4	-7 31.1 +21.6		
12°	-5 19.9 +21.3	-6 14.7 +21.5	-7 09.5 +21.8		
13°	-4 58.6 +21.4	-5 53.2 +21.7	-6 47.7 +21.9		
14°	-4 37.2 +21.4	-5 31.5 +21.7	-6 25.8 +22.0		
15°	-4 15.8 +21.5	-5 09.8 +21.8	-6 03.8 +22.1		
16°	-3 54.3 +21.6	-4 48.0 +21.8	-5 41.7 +22.2		
17°	-3 32.7 +21.7	-4 26.2 +22.0	-5 19.5 +22.3		
18°	-3 11.0 +21.6	-4 04.2 +22.0	-4 57.2 +22.3		
19°	-2 49.4 +21.8	-3 42.2 +22.1	-4 34.9 +22.4		
20°	-2 27.6 +21.7	-3 20.1 +22.1	-4 12.5 +22.5		
21°	-2 05.9 +21.8	-2 58.0 +22.2	-3 50.0 +22.5		
22°	-1 44.1 +21.8	-2 35.8 +22.2	-3 27.5 +22.6		
23°	-1 22.3 +21.9	-2 13.6 +22.2	-3 04.9 +22.7		
24°	-1 00.4 +21.9	-1 51.4 +22.3	-2 42.2 +22.7		
25°	-0 38.5 +21.8	-1 29.1 +22.3	-2 19.5 +22.7		
26°	-0 16.7 +21.9	-1 06.8 +22.3	-1 56.8 +22.8		
27°	0 05.2 +21.9 61.3	-0 44.5 +22.3	-1 34.0 +22.7		
28°	0 27.1 +21.8 60.4	-0 22.2 +22.4	-1 11.3 +22.8		
29°	0 48.9 +21.9 59.5	0 00.2 +22.3 59.2	-0 48.5 +22.8		

Dec	LHA 105° / 255°	LHA 106° / 254°	LHA 107° / 253°	LHA 108° / 252°	LHA 109° / 251°
	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °	H ° ' dH ' Z °
0°					
1°					
2°					
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4°					
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