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Latitude 0° - 9°
Declination SAME name as Latitude

Sight-Reduction Tables for Latitude 0° - 9°

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!

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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°: $Z_c = 180^\circ + Z$

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°	90 00.0 -60.0 0.0	89 00.0 -24.9 90.0	88 00.0 -14.2 90.0	87 00.0 -09.7 90.0	86 00.0 -07.4 90.0
1°	89 00.0 -60.0 0.0	88 35.1 -49.3 45.0	87 45.8 -35.5 63.4	86 50.3 -26.6 71.6	85 52.6 -20.9 76.0
2°	88 00.0 -60.0 0.0	87 45.8 -55.5 26.6	87 10.3 -46.6 45.0	86 23.7 -38.2 56.3	85 31.7 -31.6 63.4
3°	87 00.0 -60.0 0.0	86 50.3 -57.7 18.4	86 23.7 -52.0 33.7	85 45.5 -45.4 45.0	85 00.1 -39.4 53.1
4°	86 00.0 -60.0 0.0	85 52.6 -58.5 14.0	85 31.7 -54.8 26.5	85 00.1 -49.8 36.8	84 20.7 -44.7 44.9
5°	85 00.0 -60.0 0.0	84 54.1 -59.0 11.3	84 36.9 -56.3 21.7	84 10.3 -52.6 30.9	83 36.0 -48.4 38.6
6°	84 00.0 -60.0 0.0	83 55.1 -59.3 9.4	83 40.6 -57.3 18.4	83 17.7 -54.5 26.5	82 47.6 -51.0 33.6
7°	83 00.0 -60.0 0.0	82 55.8 -59.5 8.1	82 43.3 -58.0 15.9	82 23.2 -55.6 23.1	81 56.6 -52.9 29.6
8°	82 00.0 -60.0 0.0	81 56.3 -59.6 7.1	81 45.3 -58.4 13.9	81 27.6 -56.6 20.4	81 03.7 -54.2 26.4
9°	81 00.0 -60.0 0.0	80 56.7 -59.7 6.3	80 46.9 -58.7 12.4	80 31.0 -57.2 18.3	80 09.5 -55.3 23.8
10°	80 00.0 -60.0 0.0	79 57.0 -59.7 5.7	79 48.2 -58.9 11.2	79 33.8 -57.6 16.5	79 14.2 -56.0 21.6
11°	79 00.0 -60.0 0.0	78 57.3 -59.8 5.1	78 49.3 -59.1 10.2	78 36.2 -58.0 15.1	78 18.2 -56.6 19.7
12°	78 00.0 -60.0 0.0	77 57.5 -59.8 4.7	77 50.2 -59.2 9.3	77 38.2 -58.4 13.8	77 21.6 -57.1 18.2
13°	77 00.0 -60.0 0.0	76 57.7 -59.8 4.3	76 51.0 -59.4 8.6	76 39.8 -58.5 12.8	76 24.5 -57.5 16.8
14°	76 00.0 -60.0 0.0	75 57.9 -59.9 4.0	75 51.6 -59.4 8.0	75 41.3 -58.7 11.9	75 27.0 -57.7 15.6
15°	75 00.0 -60.0 0.0	74 58.0 -59.8 3.7	74 52.2 -59.5 7.4	74 42.6 -58.9 11.1	74 29.3 -58.1 14.6
16°	74 00.0 -60.0 0.0	73 58.2 -59.9 3.5	73 52.7 -59.5 6.9	73 43.7 -59.0 10.3	73 31.2 -58.2 13.7
17°	73 00.0 -60.0 0.0	72 58.3 -59.9 3.3	72 53.2 -59.6 6.5	72 44.7 -59.1 9.7	72 33.0 -58.5 12.9
18°	72 00.0 -60.0 0.0	71 58.4 -59.9 3.1	71 53.6 -59.7 6.1	71 45.6 -59.2 9.2	71 34.5 -58.6 12.1
19°	71 00.0 -60.0 0.0	70 58.5 -59.9 2.9	70 53.9 -59.6 5.8	70 46.4 -59.3 8.6	70 35.9 -58.7 11.5
20°	70 00.0 -60.0 0.0	69 58.6 -60.0 2.7	69 54.3 -59.7 5.5	69 47.1 -59.3 8.2	69 37.2 -58.8 10.8
21°	69 00.0 -60.0 0.0	68 58.6 -59.9 2.6	68 54.6 -59.8 5.2	68 47.8 -59.4 7.8	68 38.4 -59.0 10.3
22°	68 00.0 -60.0 0.0	67 58.7 -59.9 2.5	67 54.8 -59.7 4.9	67 48.4 -59.5 7.4	67 39.4 -59.0 9.8
23°	67 00.0 -60.0 0.0	66 58.8 -60.0 2.4	66 55.1 -59.8 4.7	66 48.9 -59.4 7.0	66 40.4 -59.1 9.3
24°	66 00.0 -60.0 0.0	65 58.8 -59.9 2.2	65 55.3 -59.8 4.5	65 49.5 -59.6 6.7	65 41.3 -59.2 8.9
25°	65 00.0 -60.0 0.0	64 58.9 -60.0 2.1	64 55.5 -59.8 4.3	64 49.9 -59.5 6.4	64 42.1 -59.2 8.5
26°	64 00.0 -60.0 0.0	63 58.9 -59.9 2.0	63 55.7 -59.8 4.1	63 50.4 -59.6 6.1	63 42.9 -59.3 8.1
27°	63 00.0 -60.0 0.0	62 59.0 -60.0 2.0	62 55.9 -59.8 3.9	62 50.8 -59.6 5.9	62 43.6 -59.3 7.8
28°	62 00.0 -60.0 0.0	61 59.0 -59.9 1.9	61 56.1 -59.9 3.8	61 51.2 -59.7 5.6	61 44.3 -59.3 7.5
29°	61 00.0 -60.0 0.0	60 59.1 -60.0 1.8	60 56.2 -59.8 3.6	60 51.5 -59.6 5.4	60 45.0 -59.5 7.2

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°	85 00.0 -05.9 90.0	84 00.0 -04.9 90.0	83 00.0 -04.2 90.0	82 00.0 -03.7 90.0	81 00.0 -03.3 90.0
1°	84 54.1 -17.2 78.7	83 55.1 -14.5 80.5	82 55.8 -12.5 81.8	81 56.3 -11.0 82.9	80 56.7 -09.8 83.6
2°	84 36.9 -26.6 68.2	83 40.6 -22.9 71.5	82 43.3 -20.1 74.0	81 45.3 -17.7 75.9	80 46.9 -15.9 77.4
3°	84 10.3 -34.3 59.0	83 17.7 -30.1 63.4	82 23.2 -26.6 66.7	81 27.6 -23.9 69.4	80 31.0 -21.5 71.5
4°	83 36.0 -40.0 51.3	82 47.6 -35.9 56.2	81 56.6 -32.3 60.2	81 03.7 -29.2 63.3	80 09.5 -26.6 65.9
5°	82 56.0 -44.3 44.9	82 11.7 -40.4 50.1	81 24.3 -36.9 54.3	80 34.5 -33.8 57.8	79 42.9 -31.1 60.8
6°	82 11.7 -47.4 39.7	81 31.3 -43.9 44.8	80 47.4 -40.6 49.2	80 00.7 -37.6 52.9	79 11.8 -34.8 56.1
7°	81 24.3 -49.8 35.4	80 47.4 -46.7 40.4	80 06.8 -43.7 44.8	79 23.1 -40.8 48.6	78 37.0 -38.2 51.9
8°	80 34.5 -51.6 31.8	80 00.7 -48.9 36.6	79 23.1 -46.1 40.9	78 42.3 -43.5 44.7	77 58.8 -40.9 48.1
9°	79 42.9 -53.0 28.8	79 11.8 -50.6 33.4	78 37.0 -48.2 37.6	77 58.8 -45.6 41.3	77 17.9 -43.3 44.6
10°	78 49.9 -54.1 26.3	78 21.2 -51.9 30.7	77 48.8 -49.7 34.7	77 13.2 -47.5 38.3	76 34.6 -45.2 41.6
11°	77 55.8 -55.0 24.2	77 29.3 -53.1 28.3	76 59.1 -51.1 32.1	76 25.7 -49.1 35.6	75 49.4 -47.0 38.8
12°	77 00.8 -55.6 22.3	76 36.2 -54.0 26.2	76 08.0 -52.2 29.8	75 36.6 -50.3 33.2	75 02.4 -48.4 36.4
13°	76 05.2 -56.2 20.7	75 42.2 -54.7 24.4	75 15.8 -53.1 27.8	74 46.3 -51.4 31.1	74 14.0 -49.7 34.1
14°	75 09.0 -56.6 19.3	74 47.5 -55.3 22.7	74 22.7 -53.8 26.0	73 54.9 -52.3 29.2	73 24.3 -50.7 32.1
15°	74 12.4 -57.0 18.0	73 52.2 -55.8 21.3	73 28.9 -54.6 24.5	73 02.6 -53.1 27.4	72 33.6 -51.6 30.3
16°	73 15.4 -57.4 16.9	72 56.4 -56.3 20.0	72 34.3 -55.0 23.0	72 09.5 -53.8 25.9	71 42.0 -52.4 28.6
17°	72 18.0 -57.6 15.9	72 00.1 -56.6 18.9	71 39.3 -55.6 21.7	71 15.7 -54.3 24.5	70 49.6 -53.1 27.1
18°	71 20.4 -57.8 15.0	71 03.5 -57.0 17.8	70 43.7 -55.9 20.6	70 21.4 -54.9 23.2	69 56.5 -53.6 25.7
19°	70 22.6 -58.0 14.2	70 06.5 -57.2 16.9	69 47.8 -56.3 19.5	69 26.5 -55.3 22.0	69 02.9 -54.3 24.4
20°	69 24.6 -58.3 13.5	69 09.3 -57.5 16.0	68 51.5 -56.6 18.5	68 31.2 -55.7 20.9	68 08.6 -54.6 23.3
21°	68 26.3 -58.3 12.8	68 11.8 -57.7 15.2	67 54.9 -56.9 17.6	67 35.5 -56.0 19.9	67 14.0 -55.1 22.2
22°	67 28.0 -58.5 12.2	67 14.1 -57.8 14.5	66 58.0 -57.2 16.8	66 39.5 -56.3 19.0	66 18.9 -55.4 21.2
23°	66 29.5 -58.6 11.6	66 16.3 -58.0 13.8	66 00.8 -57.3 16.0	65 43.2 -56.6 18.2	65 23.5 -55.8 20.2
24°	65 30.9 -58.7 11.1	65 18.3 -58.2 13.2	65 03.5 -57.5 15.3	64 46.6 -56.8 17.4	64 27.7 -56.0 19.4
25°	64 32.2 -58.8 10.6	64 20.1 -58.3 12.6	64 06.0 -57.7 14.6	63 49.8 -57.1 16.6	63 31.7 -56.3 18.5
26°	63 33.4 -58.9 10.1	63 21.8 -58.4 12.1	63 08.3 -57.9 14.0	62 52.7 -57.2 15.9	62 35.4 -56.6 17.8
27°	62 34.5 -58.9 9.7	62 23.4 -58.5 11.6	62 10.4 -58.0 13.5	61 55.5 -57.4 15.3	61 38.8 -56.7 17.1
28°	61 35.6 -59.1 9.3	61 24.9 -58.6 11.1	61 12.4 -58.1 12.9	60 58.1 -57.5 14.7	60 42.1 -57.0 16.4
29°	60 36.5 -59.0 8.9	60 26.3 -58.7 10.7	60 14.3 -58.2 12.4	60 00.6 -57.7 14.1	59 45.1 -57.1 15.8

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°	80 00.0 -03.0 90.0	79 00.0 -02.7 90.0	78 00.0 -02.5 90.0	77 00.0 -02.3 90.0	76 00.0 -02.1 90.0
1°	79 57.0 -08.8 84.3	78 57.3 -08.0 84.8	77 57.5 -07.3 85.2	76 57.7 -06.7 85.6	75 57.9 -06.3 85.9
2°	79 48.2 -14.4 78.6	78 49.3 -13.1 79.6	77 50.2 -12.0 80.5	76 51.0 -11.2 81.2	75 51.6 -10.3 81.8
3°	79 33.8 -19.6 73.2	78 36.2 -18.0 74.6	77 38.2 -16.6 75.9	76 39.8 -15.3 76.9	75 41.3 -14.3 77.8
4°	79 14.2 -24.3 68.1	78 18.2 -22.4 69.9	77 21.6 -20.8 71.4	76 24.5 -19.3 72.7	75 27.0 -18.0 73.9
5°	78 49.9 -28.7 63.3	77 55.8 -26.5 65.4	77 00.8 -24.6 67.2	76 05.2 -23.0 68.7	75 09.0 -21.5 70.1
6°	78 21.2 -32.4 58.8	77 29.3 -30.2 61.2	76 36.2 -28.2 63.2	75 42.2 -26.4 65.0	74 47.5 -24.8 66.5
7°	77 48.8 -35.6 54.7	76 59.1 -33.4 57.2	76 08.0 -31.4 59.4	75 15.8 -29.5 61.4	74 22.7 -27.8 63.1
8°	77 13.2 -38.6 51.0	76 25.7 -36.3 53.6	75 36.6 -34.2 55.9	74 46.3 -32.3 58.0	73 54.9 -30.6 59.8
9°	76 34.6 -41.0 47.6	75 49.4 -38.9 50.3	75 02.4 -36.8 52.7	74 14.0 -34.9 54.9	73 24.3 -33.1 56.8
10°	75 53.6 -43.1 44.6	75 10.5 -41.0 47.3	74 25.6 -39.0 49.7	73 39.1 -37.2 51.9	72 51.2 -35.4 53.9
11°	75 10.5 -44.9 41.8	74 29.5 -42.9 44.5	73 46.6 -41.1 46.9	73 01.9 -39.2 49.2	72 15.8 -37.4 51.2
12°	74 25.6 -46.5 39.2	73 46.6 -44.7 41.9	73 05.5 -42.8 44.4	72 22.7 -41.0 46.6	71 38.4 -39.4 48.7
13°	73 39.1 -47.9 36.9	73 01.9 -46.1 39.6	72 22.7 -44.3 42.0	71 41.7 -42.7 44.3	70 59.0 -41.0 46.3
14°	72 51.2 -49.0 34.9	72 15.8 -47.4 37.4	71 38.4 -45.8 39.8	70 59.0 -44.1 42.1	70 18.0 -42.5 44.1
15°	72 02.2 -50.1 32.9	71 28.4 -48.5 35.5	70 52.6 -46.9 37.8	70 14.9 -45.4 40.0	69 35.5 -43.8 42.1
16°	71 12.1 -51.0 31.2	70 39.9 -49.5 33.6	70 05.7 -48.1 35.9	69 29.5 -46.5 38.1	68 51.7 -45.1 40.2
17°	70 21.1 -51.7 29.6	69 50.4 -50.4 32.0	69 17.6 -48.9 34.2	68 43.0 -47.6 36.3	68 06.6 -46.2 38.4
18°	69 29.4 -52.5 28.1	69 00.0 -51.1 30.4	68 28.7 -49.9 32.6	67 55.4 -48.5 34.7	67 20.4 -47.2 36.7
19°	68 36.9 -53.0 26.8	68 08.9 -51.9 29.0	67 38.8 -50.6 31.1	67 06.9 -49.4 33.2	66 33.2 -48.1 35.1
20°	67 43.9 -53.6 25.5	67 17.0 -52.4 27.7	66 48.2 -51.3 29.7	66 17.5 -50.1 31.7	65 45.1 -48.8 33.6
21°	66 50.3 -54.1 24.3	66 24.6 -53.0 26.4	65 56.9 -51.9 28.4	65 27.4 -50.7 30.4	64 56.3 -49.6 32.2
22°	65 56.2 -54.5 23.3	65 31.6 -53.5 25.3	65 05.0 -52.4 27.2	64 36.7 -51.4 29.1	64 06.7 -50.3 30.9
23°	65 01.7 -54.8 22.2	64 38.1 -54.0 24.2	64 12.6 -53.0 26.1	63 45.3 -51.9 27.9	63 16.4 -50.9 29.7
24°	64 06.9 -55.3 21.3	63 44.1 -54.3 23.2	63 19.6 -53.4 25.0	62 53.4 -52.4 26.8	62 25.5 -51.4 28.5
25°	63 11.6 -55.5 20.4	62 49.8 -54.7 22.3	62 26.2 -53.8 24.0	62 01.0 -52.9 25.8	61 34.1 -51.9 27.4
26°	62 16.1 -55.8 19.6	61 55.1 -55.0 21.4	61 32.4 -54.1 23.1	61 08.1 -53.3 24.8	60 42.2 -52.4 26.4
27°	61 20.3 -56.0 18.8	61 00.1 -55.3 20.5	60 38.3 -54.5 22.2	60 14.8 -53.7 23.8	59 49.8 -52.8 25.4
28°	60 24.3 -56.3 18.1	60 04.8 -55.5 19.7	59 43.8 -54.9 21.4	59 21.1 -54.0 22.9	58 57.0 -53.2 24.5
29°	59 28.0 -56.5 17.4	59 09.3 -55.9 19.0	58 48.9 -55.0 20.6	58 27.1 -54.3 22.1	58 03.8 -53.5 23.6

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°	75 00.0 -02.0 90.0	74 00.0 -01.8 90.0	73 00.0 -01.7 90.0	72 00.0 -01.6 90.0	71 00.0 -01.5 90.0
1°	74 58.0 -05.8 86.1	73 58.2 -05.5 86.4	72 58.3 -05.1 86.6	71 58.4 -04.8 86.8	70 58.5 -04.6 86.9
2°	74 52.2 -09.6 82.3	73 52.7 -09.0 82.8	72 53.2 -08.5 83.2	71 53.6 -08.0 83.6	70 53.9 -07.5 83.9
3°	74 42.6 -13.3 78.6	73 43.7 -12.5 79.2	72 44.7 -11.7 79.8	71 45.6 -11.1 80.4	70 46.4 -10.5 80.9
4°	74 29.3 -16.9 74.9	73 31.2 -15.8 75.8	72 33.0 -15.0 76.5	71 34.5 -14.1 77.2	70 35.9 -13.3 77.9
5°	74 12.4 -20.2 71.3	73 15.4 -19.0 72.4	72 18.0 -17.9 73.3	71 20.4 -16.9 74.2	70 22.6 -16.1 75.0
6°	73 52.2 -23.3 67.9	72 56.4 -22.1 69.1	72 00.1 -20.8 70.2	71 03.5 -19.8 71.2	70 06.5 -18.7 72.1
7°	73 28.9 -26.3 64.6	72 34.3 -24.8 66.0	71 39.3 -23.6 67.2	70 43.7 -22.3 68.3	69 47.8 -21.3 69.3
8°	73 02.6 -29.0 61.5	72 09.5 -27.5 63.0	71 15.7 -26.1 64.3	70 21.4 -24.9 65.5	69 26.5 -23.6 66.7
9°	72 33.6 -31.4 58.5	71 42.0 -29.9 60.1	70 49.6 -28.5 61.6	69 56.5 -27.1 62.9	69 02.9 -26.0 64.1
10°	72 02.2 -33.8 55.7	71 12.1 -32.2 57.4	70 21.1 -30.7 58.9	69 29.4 -29.4 60.3	68 36.9 -28.0 61.6
11°	71 28.4 -35.8 53.1	70 39.9 -34.2 54.8	69 50.4 -32.8 56.4	69 00.0 -31.3 57.8	68 08.9 -30.1 59.2
12°	70 52.6 -37.7 50.6	70 05.7 -36.2 52.4	69 17.6 -34.6 54.0	68 28.7 -33.3 55.5	67 38.8 -31.9 56.9
13°	70 14.9 -39.4 48.3	69 29.5 -37.8 50.1	68 43.0 -36.4 51.7	67 55.4 -35.0 53.2	67 06.9 -33.7 54.7
14°	69 35.5 -40.9 46.1	68 51.7 -39.5 47.9	68 06.6 -38.0 49.5	67 20.4 -36.6 51.1	66 33.2 -35.3 52.6
15°	68 54.6 -42.4 44.0	68 12.2 -40.9 45.8	67 28.6 -39.5 47.5	66 43.8 -38.1 49.1	65 57.9 -36.7 50.5
16°	68 12.2 -43.6 42.1	67 31.3 -42.2 43.9	66 49.1 -40.9 45.6	66 05.7 -39.5 47.1	65 21.2 -38.2 48.6
17°	67 28.6 -44.8 40.2	66 49.1 -43.4 42.0	66 08.2 -42.0 43.7	65 26.2 -40.8 45.3	64 43.0 -39.5 46.8
18°	66 43.8 -45.9 38.5	66 05.7 -44.5 40.3	65 26.2 -43.2 42.0	64 45.4 -41.9 43.6	64 03.5 -40.6 45.1
19°	65 57.9 -46.8 36.9	65 21.2 -45.6 38.7	64 43.0 -44.3 40.3	64 03.5 -43.0 41.9	63 22.9 -41.8 43.4
20°	65 11.1 -47.6 35.4	64 35.6 -46.4 37.1	63 58.7 -45.2 38.8	63 20.5 -44.0 40.3	62 41.1 -42.8 41.8
21°	64 23.5 -48.4 34.0	63 49.2 -47.2 35.7	63 13.5 -46.0 37.3	62 36.5 -44.9 38.8	61 58.3 -43.7 40.3
22°	63 35.1 -49.2 32.6	63 02.0 -48.0 34.3	62 27.5 -46.9 35.9	61 51.6 -45.7 37.4	61 14.6 -44.6 38.9
23°	62 45.9 -49.8 31.4	62 14.0 -48.8 33.0	61 40.6 -47.6 34.6	61 05.9 -46.5 36.1	60 30.0 -45.4 37.5
24°	61 56.1 -50.4 30.2	61 25.2 -49.3 31.8	60 53.0 -48.3 33.3	60 19.4 -47.2 34.8	59 44.6 -46.2 36.2
25°	61 05.7 -50.9 29.0	60 35.9 -49.9 30.6	60 04.7 -48.9 32.1	59 32.2 -47.9 33.5	58 58.4 -46.8 34.9
26°	60 14.8 -51.4 28.0	59 46.0 -50.5 29.5	59 15.8 -49.5 30.9	58 44.3 -48.5 32.4	58 11.6 -47.5 33.7
27°	59 23.4 -51.9 26.9	58 55.5 -51.0 28.4	58 26.3 -50.0 29.8	57 55.8 -49.1 31.2	57 24.1 -48.1 32.6
28°	58 31.5 -52.4 26.0	58 04.5 -51.4 27.4	57 36.3 -50.6 28.8	57 06.7 -49.6 30.2	56 36.0 -48.7 31.5
29°	57 39.1 -52.7 25.0	57 13.1 -51.9 26.4	56 45.7 -50.9 27.8	56 17.1 -50.1 29.1	55 47.3 -49.2 30.4

Declination SAME name as Latitude

Latitude 0°

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°	70 00.0 -01.4 90.0	69 00.0 -01.4 90.0	68 00.0 -01.3 90.0	67 00.0 -01.2 90.0	66 00.0 -01.2 90.0
1°	69 58.6 -04.3 87.1	68 58.6 -04.0 87.2	67 58.7 -03.9 87.3	66 58.8 -03.7 87.4	65 58.8 -03.5 87.5
2°	69 54.3 -07.2 84.2	68 54.6 -06.8 84.4	67 54.8 -06.4 84.7	66 55.1 -06.2 84.9	65 55.3 -05.8 85.1
3°	69 47.1 -09.9 81.3	68 47.8 -09.4 81.7	67 48.4 -09.0 82.0	66 48.9 -08.5 82.4	65 49.5 -08.2 82.7
4°	69 37.2 -12.6 78.4	68 38.4 -12.1 79.0	67 39.4 -11.4 79.4	66 40.4 -10.9 79.9	65 41.3 -10.4 80.2
5°	69 24.6 -15.3 75.7	68 26.3 -14.5 76.3	67 28.0 -13.9 76.9	66 29.5 -13.2 77.4	65 30.9 -12.6 77.9
6°	69 09.3 -17.8 72.9	68 11.8 -16.9 73.7	67 14.1 -16.1 74.3	66 16.3 -15.5 74.9	65 18.3 -14.8 75.5
7°	68 51.5 -20.3 70.3	67 54.9 -19.4 71.1	66 58.0 -18.5 71.9	66 00.8 -17.6 72.6	65 03.5 -16.9 73.2
8°	68 31.2 -22.6 67.7	67 35.5 -21.5 68.6	66 39.5 -20.6 69.4	65 43.2 -19.7 70.2	64 46.6 -18.9 70.9
9°	68 08.6 -24.7 65.2	67 14.0 -23.7 66.2	66 18.9 -22.7 67.1	65 23.5 -21.8 67.9	64 27.7 -20.8 68.7
10°	67 43.9 -26.9 62.7	66 50.3 -25.7 63.8	65 56.2 -24.6 64.8	65 01.7 -23.6 65.7	64 06.9 -22.8 66.6
11°	67 17.0 -28.8 60.4	66 24.6 -27.7 61.5	65 31.6 -26.6 62.6	64 38.1 -25.5 63.6	63 44.1 -24.5 64.5
12°	66 48.2 -30.7 58.1	65 56.9 -29.5 59.3	65 05.0 -28.3 60.4	64 12.6 -27.3 61.5	63 19.6 -26.2 62.4
13°	66 17.5 -32.4 56.0	65 27.4 -31.1 57.2	64 36.7 -30.0 58.4	63 45.3 -28.9 59.4	62 53.4 -27.9 60.4
14°	65 45.1 -34.0 53.9	64 56.3 -32.8 55.2	64 06.7 -31.6 56.4	63 16.4 -30.5 57.5	62 25.5 -29.4 58.5
15°	65 11.1 -35.5 51.9	64 23.5 -34.3 53.2	63 35.1 -33.1 54.4	62 45.9 -31.9 55.6	61 56.1 -30.9 56.6
16°	64 35.6 -36.9 50.0	63 49.2 -35.7 51.3	63 02.0 -34.5 52.6	62 14.0 -33.4 53.7	61 25.2 -32.2 54.8
17°	63 58.7 -38.2 48.2	63 13.5 -37.0 49.5	62 27.5 -35.9 50.8	61 40.6 -34.7 52.0	60 53.0 -33.6 53.1
18°	63 20.5 -39.4 46.5	62 36.5 -38.2 47.8	61 51.6 -37.0 49.1	61 05.9 -35.9 50.3	60 19.4 -34.8 51.4
19°	62 41.1 -40.6 44.8	61 58.3 -39.4 46.1	61 14.6 -38.2 47.4	60 30.0 -37.1 48.6	59 44.6 -36.0 49.8
20°	62 00.5 -41.6 43.2	61 18.9 -40.4 44.6	60 36.4 -39.3 45.8	59 52.9 -38.2 47.0	59 08.6 -37.1 48.2
21°	61 18.9 -42.5 41.7	60 38.5 -41.4 43.0	59 57.1 -40.3 44.3	59 14.7 -39.2 45.5	58 31.5 -38.1 46.7
22°	60 36.4 -43.5 40.2	59 57.1 -42.4 41.6	59 16.8 -41.3 42.8	58 35.5 -40.2 44.0	57 53.4 -39.1 45.2
23°	59 52.9 -44.3 38.9	59 14.7 -43.2 40.2	58 35.5 -42.1 41.4	57 55.3 -41.0 42.6	57 14.3 -40.1 43.8
24°	59 08.6 -45.1 37.5	58 31.5 -44.0 38.8	57 53.4 -43.0 40.1	57 14.3 -42.0 41.3	56 34.2 -40.9 42.4
25°	58 23.5 -45.8 36.3	57 47.5 -44.8 37.5	57 10.4 -43.8 38.8	56 32.3 -42.7 40.0	55 53.3 -41.7 41.1
26°	57 37.7 -46.5 35.0	57 02.7 -45.5 36.3	56 26.6 -44.4 37.5	55 49.6 -43.5 38.7	55 11.6 -42.4 39.8
27°	56 51.2 -47.1 33.9	56 17.2 -46.1 35.1	55 42.2 -45.2 36.3	55 06.1 -44.1 37.5	54 29.2 -43.2 38.6
28°	56 04.1 -47.7 32.8	55 31.1 -46.8 34.0	54 57.0 -45.8 35.2	54 22.0 -44.9 36.3	53 46.0 -43.9 37.4
29°	55 16.4 -48.3 31.7	54 44.3 -47.3 32.9	54 11.2 -46.4 34.1	53 37.1 -45.4 35.2	53 02.1 -44.5 36.3

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°	65 00.0 -01.1 90.0	64 00.0 -01.1 90.0	63 00.0 -01.0 90.0	62 00.0 -01.0 90.0	61 00.0 -00.9 90.0
1°	64 58.9 -03.4 87.6	63 58.9 -03.2 87.7	62 59.0 -03.1 87.8	61 59.0 -02.9 87.9	60 59.1 -02.9 87.9
2°	64 55.5 -05.6 85.3	63 55.7 -05.3 85.4	62 55.9 -05.1 85.6	61 56.1 -04.9 85.7	60 56.2 -04.7 85.9
3°	64 49.9 -07.8 82.9	63 50.4 -07.5 83.2	62 50.8 -07.2 83.4	61 51.2 -06.9 83.6	60 51.5 -06.5 83.8
4°	64 42.1 -09.9 80.6	63 42.9 -09.5 80.9	62 43.6 -09.1 81.2	61 44.3 -08.7 81.5	60 45.0 -08.5 81.8
5°	64 32.2 -12.1 78.3	63 33.4 -11.6 78.7	62 34.5 -11.1 79.1	61 35.6 -10.7 79.4	60 36.5 -10.2 79.8
6°	64 20.1 -14.1 76.0	63 21.8 -13.5 76.5	62 23.4 -13.0 77.0	61 24.9 -12.5 77.4	60 26.3 -12.0 77.8
7°	64 06.0 -16.2 73.8	63 08.3 -15.6 74.4	62 10.4 -14.9 74.9	61 12.4 -14.3 75.3	60 14.3 -13.7 75.8
8°	63 49.8 -18.1 71.6	62 52.7 -17.3 72.2	61 55.5 -16.7 72.8	60 58.1 -16.0 73.3	60 00.6 -15.5 73.8
9°	63 31.7 -20.1 69.5	62 35.4 -19.3 70.1	61 38.8 -18.5 70.8	60 42.1 -17.8 71.4	59 45.1 -17.1 71.9
10°	63 11.6 -21.8 67.4	62 16.1 -21.0 68.1	61 20.3 -20.2 68.8	60 24.3 -19.5 69.4	59 28.0 -18.7 70.0
11°	62 49.8 -23.6 65.3	61 55.1 -22.7 66.1	61 00.1 -21.8 66.8	60 04.8 -21.0 67.5	59 09.3 -20.4 68.2
12°	62 26.2 -25.2 63.3	61 32.4 -24.3 64.1	60 38.3 -23.5 64.9	59 43.8 -22.7 65.6	58 48.9 -21.8 66.3
13°	62 01.0 -26.9 61.4	61 08.1 -25.9 62.2	60 14.8 -25.0 63.0	59 21.1 -24.1 63.8	58 27.1 -23.3 64.5
14°	61 34.1 -28.4 59.5	60 42.2 -27.4 60.4	59 49.8 -26.4 61.2	58 57.0 -25.5 62.0	58 03.8 -24.7 62.8
15°	61 05.7 -29.8 57.6	60 14.8 -28.8 58.6	59 23.4 -27.9 59.5	58 31.5 -27.0 60.3	57 39.1 -26.0 61.1
16°	60 35.9 -31.2 55.8	59 46.0 -30.2 56.8	58 55.5 -29.2 57.7	58 04.5 -28.2 58.6	57 13.1 -27.4 59.4
17°	60 04.7 -32.5 54.1	59 15.8 -31.5 55.1	58 26.3 -30.5 56.0	57 36.3 -29.6 56.9	56 45.7 -28.6 57.8
18°	59 32.2 -33.8 52.4	58 44.3 -32.7 53.5	57 55.8 -31.7 54.4	57 06.7 -30.7 55.3	56 17.1 -29.8 56.2
19°	58 58.4 -34.9 50.8	58 11.6 -33.9 51.9	57 24.1 -32.9 52.8	56 36.0 -31.9 53.7	55 47.3 -30.9 54.6
20°	58 23.5 -36.0 49.3	57 37.7 -35.0 50.3	56 51.2 -34.0 51.3	56 04.1 -33.0 52.2	55 16.4 -32.1 53.1
21°	57 47.5 -37.1 47.8	57 02.7 -36.1 48.8	56 17.2 -35.0 49.8	55 31.1 -34.1 50.7	54 44.3 -33.1 51.6
22°	57 10.4 -38.1 46.3	56 26.6 -37.0 47.3	55 42.2 -36.1 48.3	54 57.0 -35.0 49.3	54 11.2 -34.1 50.2
23°	56 32.3 -39.0 44.9	55 49.6 -38.0 45.9	55 06.1 -36.9 46.9	54 22.0 -36.0 47.9	53 37.1 -35.0 48.8
24°	55 53.3 -39.8 43.5	55 11.6 -38.8 44.6	54 29.2 -37.9 45.6	53 46.0 -36.9 46.5	53 02.1 -35.9 47.4
25°	55 13.5 -40.7 42.2	54 32.8 -39.7 43.2	53 51.3 -38.7 44.2	53 09.1 -37.8 45.2	52 26.2 -36.8 46.1
26°	54 32.8 -41.5 40.9	53 53.1 -40.5 41.9	53 12.6 -39.6 42.9	52 31.3 -38.5 43.9	51 49.4 -37.7 44.8
27°	53 51.3 -42.2 39.7	53 12.6 -41.3 40.7	52 33.0 -40.2 41.7	51 52.8 -39.4 42.7	51 11.7 -38.4 43.6
28°	53 09.1 -42.9 38.5	52 31.3 -41.9 39.5	51 52.8 -41.1 40.5	51 13.4 -40.1 41.4	50 33.3 -39.1 42.4
29°	52 26.2 -43.6 37.3	51 49.4 -42.7 38.3	51 11.7 -41.6 39.3	50 33.3 -40.7 40.3	49 54.2 -39.8 41.2

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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°	60 00.0 -00.9 90.0	59 00.0 -00.9 90.0	58 00.0 -00.8 90.0	57 00.0 -00.8 90.0	56 00.0 -00.8 90.0
1°	59 59.1 -02.7 88.0	58 59.1 -02.6 88.1	57 59.2 -02.5 88.1	56 59.2 -02.4 88.2	55 59.2 -02.3 88.2
2°	59 56.4 -04.5 86.0	58 56.5 -04.3 86.1	57 56.7 -04.2 86.2	56 56.8 -04.0 86.3	55 56.9 -03.9 86.4
3°	59 51.9 -06.4 84.0	58 52.2 -06.1 84.2	57 52.5 -05.9 84.4	56 52.8 -05.7 84.5	55 53.0 -05.4 84.6
4°	59 45.5 -08.0 82.0	58 46.1 -07.8 82.3	57 46.6 -07.4 82.5	56 47.1 -07.2 82.7	55 47.6 -06.9 82.9
5°	59 37.5 -09.9 80.1	58 38.3 -09.4 80.4	57 39.2 -09.1 80.6	56 39.9 -08.7 80.9	55 40.7 -08.5 81.1
6°	59 27.6 -11.5 78.1	58 28.9 -11.1 78.5	57 30.1 -10.7 78.8	56 31.2 -10.3 79.1	55 32.2 -09.9 79.4
7°	59 16.1 -13.2 76.2	58 17.8 -12.8 76.6	57 19.4 -12.3 77.0	56 20.9 -11.8 77.3	55 22.3 -11.4 77.6
8°	59 02.9 -14.9 74.3	58 05.0 -14.3 74.7	57 07.1 -13.8 75.1	56 09.1 -13.4 75.5	55 10.9 -12.8 75.9
9°	58 48.0 -16.5 72.4	57 50.7 -15.9 72.9	56 53.3 -15.3 73.4	55 55.7 -14.7 73.8	54 58.1 -14.3 74.2
10°	58 31.5 -18.1 70.6	57 34.8 -17.4 71.1	56 38.0 -16.8 71.6	55 41.0 -16.2 72.1	54 43.8 -15.6 72.5
11°	58 13.4 -19.5 68.8	57 17.4 -18.9 69.3	56 21.2 -18.3 69.9	55 24.8 -17.6 70.4	54 28.2 -17.0 70.8
12°	57 53.9 -21.1 67.0	56 58.5 -20.3 67.6	56 02.9 -19.6 68.1	55 07.2 -19.0 68.7	54 11.2 -18.4 69.2
13°	57 32.8 -22.5 65.2	56 38.2 -21.7 65.9	55 43.3 -21.0 66.5	54 48.2 -20.3 67.0	53 52.8 -19.6 67.6
14°	57 10.3 -23.9 63.5	56 16.5 -23.1 64.2	55 22.3 -22.3 64.8	54 27.9 -21.6 65.4	53 33.2 -20.9 66.0
15°	56 46.4 -25.2 61.8	55 53.4 -24.4 62.5	55 00.0 -23.6 63.2	54 06.3 -22.8 63.8	53 12.3 -22.1 64.4
16°	56 21.2 -26.4 60.2	55 29.0 -25.6 60.9	54 36.4 -24.8 61.6	53 43.5 -24.1 62.2	52 50.2 -23.3 62.9
17°	55 54.8 -27.8 58.6	55 03.4 -26.9 59.3	54 11.6 -26.0 60.0	53 19.4 -25.2 60.7	52 26.9 -24.4 61.3
18°	55 27.0 -28.9 57.0	54 36.5 -28.0 57.8	53 45.6 -27.2 58.5	52 54.2 -26.3 59.2	52 02.5 -25.5 59.8
19°	54 58.1 -30.0 55.4	54 08.5 -29.1 56.2	53 18.4 -28.3 57.0	52 27.9 -27.4 57.7	51 37.0 -26.6 58.4
20°	54 28.1 -31.1 53.9	53 39.4 -30.2 54.8	52 50.1 -29.3 55.5	52 00.5 -28.5 56.2	51 10.4 -27.7 56.9
21°	53 57.0 -32.2 52.5	53 09.2 -31.3 53.3	52 20.8 -30.4 54.1	51 32.0 -29.5 54.8	50 42.7 -28.6 55.5
22°	53 24.8 -33.1 51.1	52 37.9 -32.2 51.9	51 50.4 -31.3 52.7	51 02.5 -30.5 53.4	50 14.1 -29.6 54.2
23°	52 51.7 -34.1 49.7	52 05.7 -33.2 50.5	51 19.1 -32.3 51.3	50 32.0 -31.4 52.1	49 44.5 -30.6 52.8
24°	52 17.6 -35.0 48.3	51 32.5 -34.1 49.2	50 46.8 -33.1 50.0	50 00.6 -32.3 50.7	49 13.9 -31.4 51.5
25°	51 42.6 -35.9 47.0	50 58.4 -34.9 47.8	50 13.7 -34.1 48.7	49 28.3 -33.1 49.4	48 42.5 -32.3 50.2
26°	51 06.7 -36.6 45.7	50 23.5 -35.8 46.6	49 39.6 -34.8 47.4	48 55.2 -34.0 48.2	48 10.2 -33.1 48.9
27°	50 30.1 -37.5 44.5	49 47.7 -36.5 45.3	49 04.8 -35.7 46.1	48 21.2 -34.7 46.9	47 37.1 -33.9 47.7
28°	49 52.6 -38.2 43.2	49 11.2 -37.4 44.1	48 29.1 -36.4 44.9	47 46.5 -35.6 45.7	47 03.2 -34.6 46.4
29°	49 14.4 -39.0 42.1	48 33.8 -38.0 42.9	47 52.7 -37.1 43.7	47 10.9 -36.2 44.5	46 28.6 -35.4 45.3

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°	55 00.0 -00.7 90.0	54 00.0 -00.7 90.0	53 00.0 -00.7 90.0	52 00.0 -00.7 90.0	51 00.0 -00.6 90.0
1°	54 59.3 -02.3 88.3	53 59.3 -02.2 88.3	52 59.3 -02.1 88.3	51 59.3 -02.0 88.4	50 59.4 -02.0 88.4
2°	54 57.0 -03.7 86.5	53 57.1 -03.6 86.6	52 57.2 -03.4 86.7	51 57.3 -03.3 86.8	50 57.4 -03.2 86.8
3°	54 53.3 -05.2 84.8	53 53.5 -05.0 84.9	52 53.8 -04.9 85.0	51 54.0 -04.7 85.1	50 54.2 -04.5 85.2
4°	54 48.1 -06.7 83.0	53 48.5 -06.4 83.2	52 48.9 -06.2 83.4	51 49.3 -06.0 83.5	50 49.7 -05.8 83.7
5°	54 41.4 -08.1 81.3	53 42.1 -07.9 81.5	52 42.7 -07.6 81.7	51 43.3 -07.3 81.9	50 43.9 -07.1 82.1
6°	54 33.3 -09.6 79.6	53 34.2 -09.2 79.9	52 35.1 -08.9 80.1	51 36.0 -08.6 80.3	50 36.8 -08.3 80.5
7°	54 23.7 -11.0 77.9	53 25.0 -10.6 78.2	52 26.2 -10.2 78.5	51 27.4 -09.9 78.7	50 28.5 -09.5 79.0
8°	54 12.7 -12.4 76.2	53 14.4 -12.0 76.6	52 16.0 -11.6 76.9	51 17.5 -11.1 77.1	50 19.0 -10.8 77.4
9°	54 00.3 -13.8 74.6	53 02.4 -13.3 74.9	52 04.4 -12.8 75.3	51 06.4 -12.4 75.6	50 08.2 -12.0 75.9
10°	53 46.5 -15.1 72.9	52 49.1 -14.6 73.3	51 51.6 -14.1 73.7	50 54.0 -13.7 74.0	49 56.2 -13.1 74.3
11°	53 31.4 -16.4 71.3	52 34.5 -15.9 71.7	51 37.5 -15.4 72.1	50 40.3 -14.8 72.5	49 43.1 -14.4 72.8
12°	53 15.0 -17.7 69.7	52 18.6 -17.1 70.1	51 22.1 -16.5 70.5	50 25.5 -16.0 71.0	49 28.7 -15.5 71.3
13°	52 57.3 -19.0 68.1	52 01.5 -18.3 68.6	51 05.6 -17.8 69.0	50 09.5 -17.2 69.4	49 13.2 -16.6 69.9
14°	52 38.3 -20.2 66.5	51 43.2 -19.6 67.0	50 47.8 -18.9 67.5	49 52.3 -18.3 68.0	48 56.6 -17.7 68.4
15°	52 18.1 -21.4 65.0	51 23.6 -20.7 65.5	50 28.9 -20.0 66.0	49 34.0 -19.4 66.5	48 38.9 -18.8 66.9
16°	51 56.7 -22.6 63.4	51 02.9 -21.8 64.0	50 08.9 -21.2 64.5	49 14.6 -20.5 65.0	48 20.1 -19.9 65.5
17°	51 34.1 -23.6 61.9	50 41.1 -23.0 62.5	49 47.7 -22.2 63.1	48 54.1 -21.6 63.6	48 00.2 -20.9 64.1
18°	51 10.5 -24.8 60.5	50 18.1 -24.0 61.1	49 25.5 -23.3 61.6	48 32.5 -22.5 62.2	47 39.3 -21.9 62.7
19°	50 45.7 -25.8 59.0	49 54.1 -25.0 59.6	49 02.2 -24.3 60.2	48 10.0 -23.6 60.8	47 17.4 -22.8 61.3
20°	50 19.9 -26.8 57.6	49 29.1 -26.1 58.2	48 37.9 -25.3 58.8	47 46.4 -24.6 59.4	46 54.6 -23.8 60.0
21°	49 53.1 -27.9 56.2	49 03.0 -27.0 56.9	48 12.6 -26.3 57.5	47 21.8 -25.4 58.1	46 30.8 -24.8 58.6
22°	49 25.2 -28.7 54.8	48 36.0 -28.0 55.5	47 46.3 -27.1 56.1	46 56.4 -26.4 56.7	46 06.0 -25.6 57.3
23°	48 56.5 -29.7 53.5	48 08.0 -28.8 54.2	47 19.2 -28.1 54.8	46 30.0 -27.3 55.4	45 40.4 -26.5 56.0
24°	48 26.8 -30.6 52.2	47 39.2 -29.8 52.9	46 51.1 -28.9 53.5	46 02.7 -28.1 54.1	45 13.9 -27.4 54.7
25°	47 56.2 -31.4 50.9	47 09.4 -30.6 51.6	46 22.2 -29.8 52.2	45 34.6 -29.0 52.9	44 46.5 -28.1 53.5
26°	47 24.8 -32.3 49.6	46 38.8 -31.4 50.3	45 52.4 -30.5 51.0	45 05.6 -29.7 51.6	44 18.4 -29.0 52.2
27°	46 52.5 -33.0 48.4	46 07.4 -32.2 49.1	45 21.9 -31.4 49.7	44 35.9 -30.6 50.4	43 49.4 -29.7 51.0
28°	46 19.5 -33.8 47.2	45 35.2 -32.9 47.9	44 50.5 -32.1 48.5	44 05.3 -31.2 49.2	43 19.7 -30.5 49.8
29°	45 45.7 -34.5 46.0	45 02.3 -33.6 46.7	44 18.4 -32.8 47.4	43 34.1 -32.0 48.0	42 49.2 -31.1 48.6

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°	50 00.0 -00.6 90.0	49 00.0 -00.6 90.0	48 00.0 -00.6 90.0	47 00.0 -00.6 90.0	46 00.0 -00.5 90.0
1°	49 59.4 -01.9 88.4	48 59.4 -01.8 88.5	47 59.4 -01.7 88.5	46 59.4 -01.6 88.5	45 59.5 -01.7 88.6
2°	49 57.5 -03.1 86.9	48 57.6 -03.0 87.0	47 57.7 -02.9 87.0	46 57.8 -02.8 87.1	45 57.8 -02.7 87.1
3°	49 54.4 -04.4 85.3	48 54.6 -04.2 85.4	47 54.8 -04.1 85.5	46 55.0 -04.0 85.6	45 55.1 -03.8 85.7
4°	49 50.0 -05.5 83.8	48 50.4 -05.4 83.9	47 50.7 -05.2 84.0	46 51.0 -05.0 84.1	45 51.3 -04.8 84.3
5°	49 44.5 -06.9 82.2	48 45.0 -06.6 82.4	47 45.5 -06.3 82.6	46 46.0 -06.1 82.7	45 46.5 -05.9 82.8
6°	49 37.6 -08.0 80.7	48 38.4 -07.7 80.9	47 39.2 -07.5 81.1	46 39.9 -07.3 81.2	45 40.6 -07.0 81.4
7°	49 29.6 -09.2 79.2	48 30.7 -08.9 79.4	47 31.7 -08.6 79.6	46 32.6 -08.3 79.8	45 33.6 -08.1 80.0
8°	49 20.4 -10.4 77.7	48 21.8 -10.1 77.9	47 23.1 -09.8 78.1	46 24.3 -09.4 78.4	45 25.5 -09.0 78.6
9°	49 10.0 -11.6 76.2	48 11.7 -11.2 76.4	47 13.3 -10.8 76.7	46 14.9 -10.4 76.9	45 16.5 -10.2 77.2
10°	48 58.4 -12.7 74.7	48 00.5 -12.3 75.0	47 02.5 -11.9 75.2	46 04.5 -11.5 75.5	45 06.3 -11.1 75.8
11°	48 45.7 -13.9 73.2	47 48.2 -13.4 73.5	46 50.6 -12.9 73.8	45 53.0 -12.6 74.1	44 55.2 -12.1 74.4
12°	48 31.8 -15.0 71.7	47 34.8 -14.5 72.0	46 37.7 -14.1 72.4	45 40.4 -13.5 72.7	44 43.1 -13.1 73.0
13°	48 16.8 -16.1 70.2	47 20.3 -15.6 70.6	46 23.6 -15.0 71.0	45 26.9 -14.6 71.3	44 30.0 -14.1 71.6
14°	48 00.7 -17.1 68.8	47 04.7 -16.6 69.2	46 08.6 -16.1 69.6	45 12.3 -15.6 69.9	44 15.9 -15.1 70.3
15°	47 43.6 -18.2 67.4	46 48.1 -17.6 67.8	45 52.5 -17.1 68.2	44 56.7 -16.5 68.6	44 00.8 -16.0 68.9
16°	47 25.4 -19.3 66.0	46 30.5 -18.6 66.4	45 35.4 -18.0 66.8	44 40.2 -17.5 67.2	43 44.8 -16.9 67.6
17°	47 06.1 -20.2 64.6	46 11.9 -19.7 65.0	45 17.4 -19.0 65.4	44 22.7 -18.4 65.9	43 27.9 -17.9 66.2
18°	46 45.9 -21.2 63.2	45 52.2 -20.5 63.7	44 58.4 -20.0 64.1	44 04.3 -19.3 64.5	43 10.0 -18.7 64.9
19°	46 24.7 -22.2 61.8	45 31.7 -21.5 62.3	44 38.4 -20.8 62.8	43 45.0 -20.2 63.2	42 51.3 -19.6 63.6
20°	46 02.5 -23.1 60.5	45 10.2 -22.5 61.0	44 17.6 -21.8 61.5	43 24.8 -21.1 61.9	42 31.7 -20.4 62.3
21°	45 39.4 -24.0 59.2	44 47.7 -23.3 59.7	43 55.8 -22.6 60.2	43 03.7 -22.0 60.6	42 11.3 -21.3 61.1
22°	45 15.4 -24.9 57.8	44 24.4 -24.1 58.4	43 33.2 -23.5 58.9	42 41.7 -22.8 59.4	41 50.0 -22.1 59.8
23°	44 50.5 -25.8 56.6	44 00.3 -25.1 57.1	43 09.7 -24.3 57.6	42 18.9 -23.5 58.1	41 27.9 -22.9 58.6
24°	44 24.7 -26.5 55.3	43 35.2 -25.8 55.8	42 45.4 -25.1 56.4	41 55.4 -24.4 56.9	41 05.0 -23.7 57.3
25°	43 58.2 -27.4 54.0	43 09.4 -26.6 54.6	42 20.3 -25.8 55.1	41 31.0 -25.2 55.6	40 41.3 -24.4 56.1
26°	43 30.8 -28.2 52.8	42 42.8 -27.4 53.4	41 54.5 -26.7 53.9	41 05.8 -25.9 54.4	40 16.9 -25.2 54.9
27°	43 02.6 -28.9 51.6	42 15.4 -28.2 52.2	41 27.8 -27.3 52.7	40 39.9 -26.6 53.2	39 51.7 -25.9 53.7
28°	42 33.7 -29.7 50.4	41 47.2 -28.8 51.0	41 00.5 -28.1 51.5	40 13.3 -27.3 52.1	39 25.8 -26.6 52.6
29°	42 04.0 -30.4 49.2	41 18.4 -29.6 49.8	40 32.4 -28.8 50.4	39 46.0 -28.0 50.9	38 59.2 -27.2 51.4

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°	45 00.0 -00.5 90.0	44 00.0 -00.5 90.0	43 00.0 -00.5 90.0	42 00.0 -00.5 90.0	41 00.0 -00.5 90.0
1°	44 59.5 -01.6 88.6	43 59.5 -01.5 88.6	42 59.5 -01.5 88.6	41 59.5 -01.4 88.7	40 59.5 -01.3 88.7
2°	44 57.9 -02.6 87.2	43 58.0 -02.5 87.2	42 58.0 -02.4 87.3	41 58.1 -02.3 87.3	40 58.2 -02.3 87.4
3°	44 55.3 -03.7 85.8	43 55.5 -03.6 85.8	42 55.6 -03.4 85.9	41 55.8 -03.3 86.0	40 55.9 -03.2 86.0
4°	44 51.6 -04.7 84.4	43 51.9 -04.5 84.4	42 52.2 -04.4 84.5	41 52.5 -04.3 84.6	40 52.7 -04.1 84.7
5°	44 46.9 -05.7 82.9	43 47.4 -05.5 83.1	42 47.8 -05.3 83.2	41 48.2 -05.1 83.3	40 48.6 -04.9 83.4
6°	44 41.2 -06.7 81.5	43 41.9 -06.6 81.7	42 42.5 -06.3 81.8	41 43.1 -06.1 81.9	40 43.7 -05.9 82.1
7°	44 34.5 -07.8 80.1	43 35.3 -07.5 80.3	42 36.2 -07.3 80.5	41 37.0 -07.0 80.6	40 37.8 -06.8 80.8
8°	44 26.7 -08.8 78.8	43 27.8 -08.4 78.9	42 28.9 -08.2 79.1	41 30.0 -07.9 79.3	40 31.0 -07.6 79.5
9°	44 17.9 -09.7 77.4	43 19.4 -09.5 77.6	42 20.7 -09.1 77.8	41 22.1 -08.8 78.0	40 23.4 -08.5 78.1
10°	44 08.2 -10.8 76.0	43 09.9 -10.4 76.2	42 11.6 -10.0 76.4	41 13.3 -09.8 76.7	40 14.9 -09.4 76.8
11°	43 57.4 -11.7 74.6	42 59.5 -11.3 74.9	42 01.6 -11.0 75.1	41 03.5 -10.6 75.3	40 05.5 -10.3 75.6
12°	43 45.7 -12.7 73.3	42 48.2 -12.3 73.5	41 50.6 -11.9 73.8	40 52.9 -11.4 74.0	39 55.2 -11.1 74.3
13°	43 33.0 -13.7 71.9	42 35.9 -13.2 72.2	41 38.7 -12.7 72.5	40 41.5 -12.4 72.7	39 44.1 -11.9 73.0
14°	43 19.3 -14.5 70.6	42 22.7 -14.1 70.9	41 26.0 -13.7 71.2	40 29.1 -13.2 71.5	39 32.2 -12.8 71.7
15°	43 04.8 -15.5 69.2	42 08.6 -15.0 69.6	41 12.3 -14.5 69.9	40 15.9 -14.0 70.2	39 19.4 -13.5 70.5
16°	42 49.3 -16.4 67.9	41 53.6 -15.9 68.3	40 57.8 -15.3 68.6	40 01.9 -14.9 68.9	39 05.9 -14.4 69.2
17°	42 32.9 -17.3 66.6	41 37.7 -16.7 67.0	40 42.5 -16.2 67.3	39 47.0 -15.7 67.6	38 51.5 -15.2 67.9
18°	42 15.6 -18.1 65.3	41 21.0 -17.6 65.7	40 26.3 -17.1 66.0	39 31.3 -16.4 66.4	38 36.3 -15.9 66.7
19°	41 57.5 -19.0 64.0	41 03.4 -18.4 64.4	40 09.2 -17.8 64.8	39 14.9 -17.3 65.1	38 20.4 -16.8 65.5
20°	41 38.5 -19.9 62.8	40 45.0 -19.2 63.2	39 51.4 -18.6 63.5	38 57.6 -18.0 63.9	38 03.6 -17.4 64.3
21°	41 18.6 -20.6 61.5	40 25.8 -20.0 61.9	39 32.8 -19.4 62.3	38 39.6 -18.8 62.7	37 46.2 -18.3 63.0
22°	40 58.0 -21.5 60.3	40 05.8 -20.8 60.7	39 13.4 -20.2 61.1	38 20.8 -19.6 61.5	37 27.9 -18.9 61.8
23°	40 36.5 -22.2 59.0	39 45.0 -21.6 59.5	38 53.2 -20.9 59.9	38 01.2 -20.3 60.3	37 09.0 -19.6 60.6
24°	40 14.3 -23.0 57.8	39 23.4 -22.3 58.2	38 32.3 -21.6 58.7	37 40.9 -21.0 59.1	36 49.4 -20.4 59.5
25°	39 51.3 -23.7 56.6	39 01.1 -23.0 57.0	38 10.7 -22.4 57.5	37 19.9 -21.6 57.9	36 29.0 -21.0 58.3
26°	39 27.6 -24.4 55.4	38 38.1 -23.8 55.9	37 48.3 -23.0 56.3	36 58.3 -22.4 56.7	36 08.0 -21.7 57.1
27°	39 03.2 -25.2 54.2	38 14.3 -24.4 54.7	37 25.3 -23.8 55.1	36 35.9 -23.0 55.6	35 46.3 -22.4 56.0
28°	38 38.0 -25.8 53.1	37 49.9 -25.1 53.5	37 01.5 -24.4 54.0	36 12.9 -23.7 54.4	35 23.9 -23.0 54.8
29°	38 12.2 -26.5 51.9	37 24.8 -25.8 52.4	36 37.1 -25.0 52.8	35 49.2 -24.3 53.3	35 00.9 -23.6 53.7

Latitude 0°

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°	40 00.0 -00.4 90.0	39 00.0 -00.4 90.0	38 00.0 -00.4 90.0	37 00.0 -00.4 90.0	36 00.0 -00.4 90.0
1°	39 59.6 -01.4 88.7	38 59.6 -01.3 88.7	37 59.6 -01.2 88.7	36 59.6 -01.2 88.7	35 59.6 -01.1 88.8
2°	39 58.2 -02.2 87.4	38 58.3 -02.1 87.4	37 58.4 -02.1 87.5	36 58.4 -01.9 87.5	35 58.5 -01.9 87.5
3°	39 56.0 -03.0 86.1	38 56.2 -03.0 86.1	37 56.3 -02.8 86.2	36 56.5 -02.8 86.2	35 56.6 -02.7 86.3
4°	39 53.0 -04.0 84.8	38 53.2 -03.8 84.9	37 53.5 -03.7 84.9	36 53.7 -03.5 85.0	35 53.9 -03.4 85.1
5°	39 49.0 -04.8 83.5	38 49.4 -04.6 83.6	37 49.8 -04.5 83.7	36 50.2 -04.4 83.7	35 50.5 -04.2 83.8
6°	39 44.2 -05.6 82.2	38 44.8 -05.5 82.3	37 45.3 -05.3 82.4	36 45.8 -05.1 82.5	35 46.3 -04.9 82.6
7°	39 38.6 -06.6 80.9	38 39.3 -06.3 81.0	37 40.0 -06.1 81.1	36 40.7 -05.8 81.3	35 41.4 -05.6 81.4
8°	39 32.0 -07.4 79.6	38 33.0 -07.1 79.7	37 33.9 -06.8 79.9	36 34.9 -06.7 80.0	35 35.8 -06.5 80.1
9°	39 24.6 -08.2 78.3	38 25.9 -08.0 78.5	37 27.1 -07.7 78.6	36 28.2 -07.4 78.8	35 29.3 -07.1 78.9
10°	39 16.4 -09.1 77.0	38 17.9 -08.7 77.2	37 19.4 -08.5 77.4	36 20.8 -08.2 77.5	35 22.2 -07.9 77.7
11°	39 07.3 -09.9 75.8	38 09.2 -09.6 76.0	37 10.9 -09.2 76.1	36 12.6 -08.9 76.3	35 14.3 -08.6 76.5
12°	38 57.4 -10.7 74.5	37 59.6 -10.4 74.7	37 01.7 -10.0 74.9	36 03.7 -09.6 75.1	35 05.7 -09.3 75.3
13°	38 46.7 -11.5 73.2	37 49.2 -11.1 73.5	36 51.7 -10.8 73.7	35 54.1 -10.4 73.9	34 56.4 -10.0 74.1
14°	38 35.2 -12.4 72.0	37 38.1 -11.9 72.2	36 40.9 -11.5 72.4	35 43.7 -11.1 72.7	34 46.4 -10.8 72.9
15°	38 22.8 -13.1 70.7	37 26.2 -12.7 71.0	36 29.4 -12.3 71.2	35 32.6 -11.9 71.5	34 35.6 -11.4 71.7
16°	38 09.7 -13.9 69.5	37 13.5 -13.5 69.7	36 17.1 -13.0 70.0	35 20.7 -12.5 70.2	34 24.2 -12.1 70.5
17°	37 55.8 -14.7 68.2	37 00.0 -14.2 68.5	36 04.1 -13.7 68.8	35 08.2 -13.3 69.1	34 12.1 -12.8 69.3
18°	37 41.1 -15.4 67.0	36 45.8 -14.9 67.3	35 50.4 -14.4 67.6	34 54.9 -14.0 67.9	33 59.3 -13.5 68.1
19°	37 25.7 -16.2 65.8	36 30.9 -15.7 66.1	35 36.0 -15.2 66.4	34 40.9 -14.6 66.7	33 45.8 -14.1 66.9
20°	37 09.5 -16.9 64.6	36 15.2 -16.3 64.9	35 20.8 -15.8 65.2	34 26.3 -15.3 65.5	33 31.7 -14.8 65.8
21°	36 52.6 -17.6 63.4	35 58.9 -17.1 63.7	35 05.0 -16.5 64.0	34 11.0 -16.0 64.3	33 16.9 -15.5 64.6
22°	36 35.0 -18.4 62.2	35 41.8 -17.8 62.5	34 48.5 -17.2 62.9	33 55.0 -16.6 63.2	33 01.4 -16.1 63.5
23°	36 16.6 -19.0 61.0	35 24.0 -18.4 61.4	34 31.3 -17.8 61.7	33 38.4 -17.3 62.0	32 45.3 -16.6 62.3
24°	35 57.6 -19.7 59.8	35 05.6 -19.1 60.2	34 13.5 -18.5 60.5	33 21.1 -17.9 60.9	32 28.7 -17.4 61.2
25°	35 37.9 -20.4 58.7	34 46.5 -19.7 59.0	33 55.0 -19.2 59.4	33 03.2 -18.5 59.7	32 11.3 -17.9 60.0
26°	35 17.5 -21.1 57.5	34 26.8 -20.4 57.9	33 35.8 -19.7 58.2	32 44.7 -19.1 58.6	31 53.4 -18.5 58.9
27°	34 56.4 -21.6 56.4	34 06.4 -21.0 56.7	33 16.1 -20.4 57.1	32 25.6 -19.7 57.5	31 34.9 -19.1 57.8
28°	34 34.8 -22.3 55.2	33 45.4 -21.7 55.6	32 55.7 -20.9 56.0	32 05.9 -20.3 56.3	31 15.8 -19.6 56.7
29°	34 12.5 -22.9 54.1	33 23.7 -22.2 54.5	32 34.8 -21.6 54.9	31 45.6 -20.9 55.2	30 56.2 -20.2 55.6

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°	35 00.0 -00.4 90.0	34 00.0 -00.4 90.0	33 00.0 -00.3 90.0	32 00.0 -00.3 90.0	31 00.0 -00.3 90.0
1°	34 59.6 -01.1 88.8	33 59.6 -01.0 88.8	32 59.7 -01.1 88.8	31 59.7 -01.0 88.8	30 59.7 -01.0 88.8
2°	34 58.5 -01.8 87.6	33 58.6 -01.8 87.6	32 58.6 -01.7 87.6	31 58.7 -01.6 87.6	30 58.7 -01.5 87.7
3°	34 56.7 -02.6 86.3	33 56.8 -02.4 86.4	32 56.9 -02.3 86.4	31 57.1 -02.3 86.5	30 57.2 -02.2 86.5
4°	34 54.1 -03.3 85.1	33 54.4 -03.2 85.2	32 54.6 -03.1 85.2	31 54.8 -03.0 85.3	30 55.0 -02.9 85.3
5°	34 50.8 -04.0 83.9	33 51.2 -03.9 84.0	32 51.5 -03.7 84.0	31 51.8 -03.6 84.1	30 52.1 -03.4 84.2
6°	34 46.8 -04.7 82.7	33 47.3 -04.6 82.8	32 47.8 -04.4 82.9	31 48.2 -04.2 82.9	30 48.7 -04.1 83.0
7°	34 42.1 -05.5 81.5	33 42.7 -05.2 81.6	32 43.4 -05.1 81.7	31 44.0 -04.9 81.8	30 44.6 -04.7 81.8
8°	34 36.6 -06.1 80.3	33 37.5 -06.0 80.4	32 38.3 -05.7 80.5	31 39.1 -05.5 80.6	30 39.9 -05.3 80.7
9°	34 30.5 -06.9 79.1	33 31.5 -06.6 79.2	32 32.6 -06.4 79.3	31 33.6 -06.1 79.4	30 34.6 -05.9 79.5
10°	34 23.6 -07.6 77.9	33 24.9 -07.3 78.0	32 26.2 -07.1 78.1	31 27.5 -06.8 78.3	30 28.7 -06.5 78.4
11°	34 16.0 -08.3 76.7	33 17.6 -08.0 76.8	32 19.1 -07.7 77.0	31 20.7 -07.4 77.1	30 22.2 -07.2 77.2
12°	34 07.7 -09.0 75.5	33 09.6 -08.7 75.6	32 11.4 -08.3 75.8	31 13.3 -08.1 75.9	30 15.0 -07.7 76.1
13°	33 58.7 -09.7 74.3	33 00.9 -09.3 74.4	32 03.1 -09.0 74.6	31 05.2 -08.6 74.8	30 07.3 -08.3 74.9
14°	33 49.0 -10.4 73.1	32 51.6 -10.0 73.3	31 54.1 -09.6 73.4	30 56.6 -09.3 73.6	29 59.0 -09.0 73.8
15°	33 38.6 -11.0 71.9	32 41.6 -10.7 72.1	31 44.5 -10.3 72.3	30 47.3 -09.9 72.5	29 50.0 -09.5 72.6
16°	33 27.6 -11.7 70.7	32 30.9 -11.2 70.9	31 34.2 -10.9 71.1	30 37.4 -10.5 71.3	29 40.5 -10.1 71.5
17°	33 15.9 -12.4 69.5	32 19.7 -12.0 69.8	31 23.3 -11.5 70.0	30 26.9 -11.1 70.2	29 30.4 -10.6 70.4
18°	33 03.5 -13.0 68.4	32 07.7 -12.5 68.6	31 11.8 -12.1 68.8	30 15.8 -11.6 69.0	29 19.8 -11.3 69.2
19°	32 50.5 -13.6 67.2	31 55.2 -13.2 67.4	30 59.7 -12.7 67.7	30 04.2 -12.3 67.9	29 08.5 -11.8 68.1
20°	32 36.9 -14.3 66.0	31 42.0 -13.8 66.3	30 47.0 -13.3 66.5	29 51.9 -12.8 66.8	28 56.7 -12.3 67.0
21°	32 22.6 -14.9 64.9	31 28.2 -14.4 65.2	30 33.7 -13.9 65.4	29 39.1 -13.4 65.6	28 44.4 -12.9 65.9
22°	32 07.7 -15.6 63.7	31 13.8 -15.0 64.0	30 19.8 -14.5 64.3	29 25.7 -14.0 64.5	28 31.5 -13.5 64.8
23°	31 52.1 -16.1 62.6	30 58.8 -15.6 62.9	30 05.3 -15.0 63.2	29 11.7 -14.5 63.4	28 18.0 -14.0 63.7
24°	31 36.0 -16.7 61.5	30 43.2 -16.1 61.8	29 50.3 -15.6 62.0	28 57.2 -15.0 62.3	28 04.0 -14.5 62.6
25°	31 19.3 -17.3 60.3	30 27.1 -16.8 60.6	29 34.7 -16.2 60.9	28 42.2 -15.6 61.2	27 49.5 -15.0 61.5
26°	31 02.0 -17.9 59.2	30 10.3 -17.3 59.5	29 18.5 -16.7 59.8	28 26.6 -16.1 60.1	27 34.5 -15.5 60.4
27°	30 44.1 -18.5 58.1	29 53.0 -17.8 58.4	29 01.8 -17.2 58.7	28 10.5 -16.7 59.0	27 19.0 -16.1 59.3
28°	30 25.6 -19.0 57.0	29 35.2 -18.4 57.3	28 44.6 -17.8 57.6	27 53.8 -17.1 57.9	27 02.9 -16.5 58.2
29°	30 06.6 -19.6 55.9	29 16.8 -18.9 56.2	28 26.8 -18.2 56.5	27 36.7 -17.6 56.8	26 46.4 -17.0 57.1

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Declination SAME name as Latitude

Latitude 0°

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°	30 00.0 -00.3 90.0	29 00.0 -00.3 90.0	28 00.0 -00.3 90.0	27 00.0 -00.3 90.0	26 00.0 -00.3 90.0
1°	29 59.7 -00.9 88.8	28 59.7 -00.9 88.9	27 59.7 -00.8 88.9	26 59.7 -00.8 88.9	25 59.7 -00.7 88.9
2°	29 58.8 -01.5 87.7	28 58.8 -01.4 87.7	27 58.9 -01.4 87.7	26 58.9 -01.3 87.8	25 59.0 -01.3 87.8
3°	29 57.3 -02.1 86.5	28 57.4 -02.0 86.6	27 57.5 -02.0 86.6	26 57.6 -01.9 86.6	25 57.7 -01.8 86.7
4°	29 55.2 -02.7 85.4	28 55.4 -02.6 85.4	27 55.5 -02.5 85.5	26 55.7 -02.4 85.5	25 55.9 -02.3 85.6
5°	29 52.5 -03.4 84.2	28 52.8 -03.2 84.3	27 53.0 -03.0 84.3	26 53.3 -02.9 84.4	25 53.6 -02.8 84.4
6°	29 49.1 -03.9 83.1	28 49.6 -03.8 83.1	27 50.0 -03.6 83.2	26 50.4 -03.4 83.3	25 50.8 -03.3 83.3
7°	29 45.2 -04.5 81.9	28 45.8 -04.3 82.0	27 46.4 -04.2 82.1	26 47.0 -04.0 82.2	25 47.5 -03.8 82.2
8°	29 40.7 -05.1 80.8	28 41.5 -04.9 80.9	27 42.2 -04.7 81.0	26 43.0 -04.5 81.0	25 43.7 -04.3 81.1
9°	29 35.6 -05.7 79.6	28 36.6 -05.5 79.7	27 37.5 -05.2 79.8	26 38.5 -05.1 79.9	25 39.4 -04.8 80.0
10°	29 29.9 -06.3 78.5	28 31.1 -06.0 78.6	27 32.3 -05.8 78.7	26 33.4 -05.5 78.8	25 34.6 -05.3 78.9
11°	29 23.6 -06.8 77.3	28 25.1 -06.6 77.5	27 26.5 -06.3 77.6	26 27.9 -06.1 77.7	25 29.3 -05.8 77.8
12°	29 16.8 -07.5 76.2	28 18.5 -07.2 76.3	27 20.2 -06.9 76.5	26 21.8 -06.5 76.6	25 23.5 -06.3 76.7
13°	29 09.3 -08.0 75.1	28 11.3 -07.7 75.2	27 13.3 -07.4 75.3	26 15.3 -07.1 75.5	25 17.2 -06.8 75.6
14°	29 01.3 -08.6 73.9	28 03.6 -08.2 74.1	27 05.9 -07.9 74.2	26 08.2 -07.6 74.4	25 10.4 -07.3 74.5
15°	28 52.7 -09.1 72.8	27 55.4 -08.8 73.0	26 58.0 -08.4 73.1	26 00.6 -08.1 73.3	25 03.1 -07.8 73.4
16°	28 43.6 -09.7 71.7	27 46.6 -09.3 71.8	26 49.6 -09.0 72.0	25 52.5 -08.6 72.2	24 55.3 -08.2 72.3
17°	28 33.9 -10.3 70.6	27 37.3 -09.9 70.7	26 40.6 -09.5 70.9	25 43.9 -09.1 71.1	24 47.1 -08.7 71.2
18°	28 23.6 -10.8 69.4	27 27.4 -10.4 69.6	26 31.1 -09.9 69.8	25 34.8 -09.6 70.0	24 38.4 -09.2 70.1
19°	28 12.8 -11.3 68.3	27 17.0 -10.9 68.5	26 21.2 -10.5 68.7	25 25.2 -10.0 68.9	24 29.2 -09.6 69.0
20°	28 01.5 -11.9 67.2	27 06.1 -11.4 67.4	26 10.7 -11.0 67.6	25 15.2 -10.6 67.8	24 19.6 -10.1 68.0
21°	27 49.6 -12.5 66.1	26 54.7 -12.0 66.3	25 59.7 -11.5 66.5	25 04.6 -11.0 66.7	24 09.5 -10.6 66.9
22°	27 37.1 -12.9 65.0	26 42.7 -12.4 65.2	25 48.2 -12.0 65.4	24 53.6 -11.5 65.6	23 58.9 -11.0 65.8
23°	27 24.2 -13.5 63.9	26 30.3 -13.0 64.1	25 36.2 -12.4 64.3	24 42.1 -11.9 64.5	23 47.9 -11.4 64.7
24°	27 10.7 -13.9 62.8	26 17.3 -13.4 63.0	25 23.8 -12.9 63.2	24 30.2 -12.4 63.4	23 36.5 -11.9 63.6
25°	26 56.8 -14.5 61.7	26 03.9 -13.9 61.9	25 10.9 -13.4 62.2	24 17.8 -12.9 62.4	23 24.6 -12.4 62.6
26°	26 42.3 -15.0 60.6	25 50.0 -14.4 60.9	24 57.5 -13.9 61.1	24 04.9 -13.3 61.3	23 12.2 -12.7 61.5
27°	26 27.3 -15.4 59.5	25 35.6 -14.9 59.8	24 43.6 -14.3 60.0	23 51.6 -13.7 60.2	22 59.5 -13.2 60.5
28°	26 11.9 -16.0 58.5	25 20.7 -15.4 58.7	24 29.3 -14.7 58.9	23 37.9 -14.2 59.2	22 46.3 -13.6 59.4
29°	25 55.9 -16.4 57.4	25 05.3 -15.8 57.6	24 14.6 -15.2 57.9	23 23.7 -14.6 58.1	22 32.7 -14.0 58.3

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°	25 00.0 -00.2 90.0	24 00.0 -00.2 90.0	23 00.0 -00.2 90.0	22 00.0 -00.2 90.0	21 00.0 -00.2 90.0
1°	24 59.8 -00.8 88.9	23 59.8 -00.7 88.9	22 59.8 -00.7 88.9	21 59.8 -00.6 88.9	20 59.8 -00.6 88.9
2°	24 59.0 -01.2 87.8	23 59.1 -01.2 87.8	22 59.1 -01.1 87.8	21 59.2 -01.1 87.8	20 59.2 -01.0 87.9
3°	24 57.8 -01.7 86.7	23 57.9 -01.6 86.7	22 58.0 -01.6 86.7	21 58.1 -01.5 86.8	20 58.2 -01.4 86.8
4°	24 56.1 -02.2 85.6	23 56.3 -02.1 85.6	22 56.4 -02.0 85.7	21 56.6 -01.9 85.7	20 56.8 -01.8 85.7
5°	24 53.9 -02.7 84.5	23 54.2 -02.6 84.5	22 54.4 -02.4 84.6	21 54.7 -02.3 84.6	20 55.0 -02.2 84.6
6°	24 51.2 -03.1 83.4	23 51.6 -03.0 83.4	22 52.0 -02.9 83.5	21 52.4 -02.7 83.5	20 52.8 -02.6 83.6
7°	24 48.1 -03.7 82.3	23 48.6 -03.5 82.3	22 49.1 -03.3 82.4	21 49.7 -03.2 82.5	20 50.2 -03.0 82.5
8°	24 44.4 -04.1 81.2	23 45.1 -03.9 81.3	22 45.8 -03.7 81.3	21 46.5 -03.6 81.4	20 47.2 -03.4 81.4
9°	24 40.3 -04.6 80.1	23 41.2 -04.4 80.2	22 42.1 -04.2 80.2	21 42.9 -04.0 80.3	20 43.8 -03.8 80.4
10°	24 35.7 -05.1 79.0	23 36.8 -04.9 79.1	22 37.9 -04.7 79.2	21 38.9 -04.4 79.2	20 40.0 -04.2 79.3
11°	24 30.6 -05.5 77.9	23 31.9 -05.3 78.0	22 33.2 -05.0 78.1	21 34.5 -04.8 78.2	20 35.8 -04.6 78.2
12°	24 25.1 -06.1 76.8	23 26.6 -05.7 76.9	22 28.2 -05.5 77.0	21 29.7 -05.2 77.1	20 31.2 -05.0 77.2
13°	24 19.0 -06.5 75.7	23 20.9 -06.2 75.8	22 22.7 -05.9 75.9	21 24.5 -05.7 76.0	20 26.2 -05.3 76.1
14°	24 12.5 -06.9 74.6	23 14.7 -06.7 74.7	22 16.8 -06.4 74.8	21 18.8 -06.0 74.9	20 20.9 -05.8 75.0
15°	24 05.6 -07.4 73.5	23 08.0 -07.1 73.7	22 10.4 -06.7 73.8	21 12.8 -06.4 73.9	20 15.1 -06.1 74.0
16°	23 58.2 -07.9 72.4	23 00.9 -07.5 72.6	22 03.7 -07.2 72.7	21 06.4 -06.9 72.8	20 09.0 -06.5 72.9
17°	23 50.3 -08.4 71.4	22 53.4 -08.0 71.5	21 56.5 -07.6 71.6	20 59.5 -07.2 71.8	20 02.5 -06.9 71.9
18°	23 41.9 -08.7 70.3	22 45.4 -08.4 70.4	21 48.9 -08.0 70.6	20 52.3 -07.6 70.7	19 55.6 -07.2 70.8
19°	23 33.2 -09.3 69.2	22 37.0 -08.8 69.3	21 40.9 -08.4 69.5	20 44.7 -08.1 69.6	19 48.4 -07.6 69.8
20°	23 23.9 -09.6 68.1	22 28.2 -09.2 68.3	21 32.5 -08.9 68.4	20 36.6 -08.4 68.6	19 40.8 -08.0 68.7
21°	23 14.3 -10.1 67.0	22 19.0 -09.7 67.2	21 23.6 -09.2 67.4	20 28.2 -08.8 67.5	19 32.8 -08.4 67.6
22°	23 04.2 -10.6 66.0	22 09.3 -10.1 66.1	21 14.4 -09.6 66.3	20 19.4 -09.1 66.5	19 24.4 -08.7 66.6
23°	22 53.6 -10.9 64.9	21 59.2 -10.4 65.1	21 04.8 -10.0 65.2	20 10.3 -09.6 65.4	19 15.7 -09.1 65.5
24°	22 42.7 -11.4 63.8	21 48.8 -10.9 64.0	20 54.8 -10.4 64.2	20 00.7 -09.9 64.3	19 06.6 -09.4 64.5
25°	22 31.3 -11.8 62.8	21 37.9 -11.3 63.0	20 44.4 -10.8 63.1	19 50.8 -10.3 63.3	18 57.2 -09.8 63.5
26°	22 19.5 -12.3 61.7	21 26.6 -11.7 61.9	20 33.6 -11.2 62.1	19 40.5 -10.6 62.3	18 47.4 -10.1 62.4
27°	22 07.2 -12.6 60.7	21 14.9 -12.1 60.8	20 22.4 -11.5 61.0	19 29.9 -11.0 61.2	18 37.3 -10.5 61.4
28°	21 54.6 -13.0 59.6	21 02.8 -12.5 59.8	20 10.9 -11.9 60.0	19 18.9 -11.4 60.2	18 26.8 -10.8 60.3
29°	21 41.6 -13.5 58.5	20 50.3 -12.8 58.8	19 59.0 -12.3 58.9	19 07.5 -11.7 59.1	18 16.0 -11.2 59.3

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°	20 00.0 -00.2 90.0	19 00.0 -00.2 90.0	18 00.0 -00.2 90.0	17 00.0 -00.2 90.0	16 00.0 -00.2 90.0
1°	19 59.8 -00.6 88.9	18 59.8 -00.5 88.9	17 59.8 -00.5 88.9	16 59.8 -00.4 89.0	15 59.8 -00.4 89.0
2°	19 59.2 -00.9 87.9	18 59.3 -00.9 87.9	17 59.3 -00.8 87.9	16 59.4 -00.8 87.9	15 59.4 -00.8 87.9
3°	19 58.3 -01.3 86.8	18 58.4 -01.3 86.8	17 58.5 -01.2 86.8	16 58.6 -01.2 86.9	15 58.6 -01.0 86.9
4°	19 57.0 -01.8 85.7	18 57.1 -01.6 85.8	17 57.3 -01.5 85.8	16 57.4 -01.4 85.8	15 57.6 -01.4 85.8
5°	19 55.2 -02.1 84.7	18 55.5 -02.0 84.7	17 55.8 -01.9 84.7	16 56.0 -01.8 84.8	15 56.2 -01.6 84.8
6°	19 53.1 -02.4 83.6	18 53.5 -02.3 83.7	17 53.9 -02.2 83.7	16 54.2 -02.0 83.7	15 54.6 -01.9 83.8
7°	19 50.7 -02.9 82.6	18 51.2 -02.7 82.6	17 51.7 -02.6 82.6	16 52.2 -02.4 82.7	15 52.7 -02.3 82.7
8°	19 47.8 -03.2 81.5	18 48.5 -03.1 81.5	17 49.1 -02.8 81.6	16 49.8 -02.7 81.6	15 50.4 -02.5 81.7
9°	19 44.6 -03.6 80.4	18 45.4 -03.4 80.5	17 46.3 -03.3 80.5	16 47.1 -03.1 80.6	15 47.9 -02.9 80.6
10°	19 41.0 -04.0 79.4	18 42.0 -03.7 79.4	17 43.0 -03.5 79.5	16 44.0 -03.3 79.6	15 45.0 -03.1 79.6
11°	19 37.0 -04.3 78.3	18 38.3 -04.1 78.4	17 39.5 -03.9 78.4	16 40.7 -03.6 78.5	15 41.9 -03.4 78.6
12°	19 32.7 -04.7 77.3	18 34.2 -04.5 77.3	17 35.6 -04.2 77.4	16 37.1 -04.0 77.5	15 38.5 -03.7 77.5
13°	19 28.0 -05.1 76.2	18 29.7 -04.8 76.3	17 31.4 -04.5 76.4	16 33.1 -04.3 76.4	15 34.8 -04.0 76.5
14°	19 22.9 -05.4 75.1	18 24.9 -05.2 75.2	17 26.9 -04.9 75.3	16 28.8 -04.6 75.4	15 30.8 -04.3 75.5
15°	19 17.5 -05.8 74.1	18 19.7 -05.5 74.2	17 22.0 -05.2 74.3	16 24.2 -04.8 74.3	15 26.5 -04.6 74.4
16°	19 11.7 -06.2 73.0	18 14.2 -05.8 73.1	17 16.8 -05.5 73.2	16 19.4 -05.2 73.3	15 21.9 -04.9 73.4
17°	19 05.5 -06.5 72.0	18 08.4 -06.2 72.1	17 11.3 -05.8 72.2	16 14.2 -05.5 72.3	15 17.0 -05.2 72.4
18°	18 59.0 -06.9 70.9	18 02.2 -06.5 71.0	17 05.5 -06.2 71.1	16 08.7 -05.8 71.2	15 11.8 -05.4 71.3
19°	18 52.1 -07.3 69.9	17 55.7 -06.8 70.0	16 59.3 -06.5 70.1	16 02.9 -06.1 70.2	15 06.4 -05.7 70.3
20°	18 44.8 -07.6 68.8	17 48.9 -07.2 68.9	16 52.8 -06.7 69.1	15 56.8 -06.4 69.2	15 00.7 -06.0 69.3
21°	18 37.2 -07.9 67.8	17 41.7 -07.5 67.9	16 46.1 -07.1 68.0	15 50.4 -06.7 68.1	14 54.7 -06.3 68.2
22°	18 29.3 -08.3 66.7	17 34.2 -07.9 66.9	16 39.0 -07.4 67.0	15 43.7 -07.0 67.1	14 48.4 -06.5 67.2
23°	18 21.0 -08.6 65.7	17 26.3 -08.1 65.8	16 31.6 -07.7 65.9	15 36.7 -07.2 66.1	14 41.9 -06.8 66.2
24°	18 12.4 -08.9 64.6	17 18.2 -08.5 64.8	16 23.9 -08.1 64.9	15 29.5 -07.6 65.0	14 35.1 -07.1 65.1
25°	18 03.5 -09.3 63.6	17 09.7 -08.8 63.7	16 15.8 -08.3 63.9	15 21.9 -07.8 64.0	14 28.0 -07.4 64.1
26°	17 54.2 -09.6 62.6	17 00.9 -09.1 62.7	16 07.5 -08.6 62.8	15 14.1 -08.1 63.0	14 20.6 -07.6 63.1
27°	17 44.6 -10.0 61.5	16 51.8 -09.4 61.7	15 58.9 -08.9 61.8	15 06.0 -08.4 62.0	14 13.0 -07.9 62.1
28°	17 34.6 -10.3 60.5	16 42.4 -09.8 60.6	15 50.0 -09.2 60.8	14 57.6 -08.6 60.9	14 05.1 -08.1 61.1
29°	17 24.3 -10.5 59.5	16 32.6 -10.0 59.6	15 40.8 -09.5 59.8	14 49.0 -09.0 59.9	13 57.0 -08.4 60.0

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°	15 00.0 -00.1 90.0	14 00.0 -00.1 90.0	13 00.0 -00.1 90.0	12 00.0 -00.1 90.0	11 00.0 -00.1 90.0
1°	14 59.9 -00.5 89.0	13 59.9 -00.4 89.0	12 59.9 -00.4 89.0	11 59.9 -00.3 89.0	10 59.9 -00.3 89.0
2°	14 59.4 -00.7 87.9	13 59.5 -00.7 87.9	12 59.5 -00.6 87.9	11 59.6 -00.6 88.0	10 59.6 -00.5 88.0
3°	14 58.7 -00.9 86.9	13 58.8 -00.9 86.9	12 58.9 -00.8 86.9	11 59.0 -00.8 86.9	10 59.1 -00.7 86.9
4°	14 57.8 -01.3 85.9	13 57.9 -01.2 85.9	12 58.1 -01.1 85.9	11 58.2 -01.0 85.9	10 58.4 -00.9 85.9
5°	14 56.5 -01.5 84.8	13 56.7 -01.4 84.8	12 57.0 -01.3 84.9	11 57.2 -01.2 84.9	10 57.5 -01.2 84.9
6°	14 55.0 -01.9 83.8	13 55.3 -01.7 83.8	12 55.7 -01.6 83.8	11 56.0 -01.4 83.9	10 56.3 -01.3 83.9
7°	14 53.1 -02.1 82.8	13 53.6 -01.9 82.8	12 54.1 -01.8 82.8	11 54.6 -01.7 82.8	10 55.0 -01.5 82.9
8°	14 51.0 -02.3 81.7	13 51.7 -02.2 81.8	12 52.3 -02.1 81.8	11 52.9 -01.9 81.8	10 53.5 -01.7 81.9
9°	14 48.7 -02.7 80.7	13 49.5 -02.5 80.7	12 50.2 -02.3 80.8	11 51.0 -02.1 80.8	10 51.8 -01.9 80.8
10°	14 46.0 -02.9 79.7	13 47.0 -02.7 79.7	12 47.9 -02.5 79.7	11 48.9 -02.3 79.8	10 49.9 -02.2 79.8
11°	14 43.1 -03.2 78.6	13 44.3 -03.0 78.7	12 45.4 -02.7 78.7	11 46.6 -02.6 78.8	10 47.7 -02.3 78.8
12°	14 39.9 -03.5 77.6	13 41.3 -03.3 77.6	12 42.7 -03.0 77.7	11 44.0 -02.7 77.7	10 45.4 -02.5 77.8
13°	14 36.4 -03.7 76.6	13 38.0 -03.4 76.6	12 39.7 -03.3 76.7	11 41.3 -03.0 76.7	10 42.9 -02.7 76.8
14°	14 32.7 -04.0 75.5	13 34.6 -03.8 75.6	12 36.4 -03.4 75.6	11 38.3 -03.2 75.7	10 40.2 -03.0 75.7
15°	14 28.7 -04.3 74.5	13 30.8 -04.0 74.6	12 33.0 -03.7 74.6	11 35.1 -03.4 74.7	10 37.2 -03.1 74.7
16°	14 24.4 -04.6 73.5	13 26.8 -04.2 73.5	12 29.3 -03.9 73.6	11 31.7 -03.6 73.7	10 34.1 -03.3 73.7
17°	14 19.8 -04.8 72.4	13 22.6 -04.5 72.5	12 25.4 -04.2 72.6	11 28.1 -03.8 72.6	10 30.8 -03.5 72.7
18°	14 15.0 -05.1 71.4	13 18.1 -04.7 71.5	12 21.2 -04.4 71.6	11 24.3 -04.1 71.6	10 27.3 -03.7 71.7
19°	14 09.9 -05.3 70.4	13 13.4 -05.0 70.5	12 16.8 -04.6 70.5	11 20.2 -04.2 70.6	10 23.6 -03.9 70.7
20°	14 04.6 -05.6 69.4	13 08.4 -05.2 69.4	12 12.2 -04.8 69.5	11 16.0 -04.5 69.6	10 19.7 -04.0 69.7
21°	13 59.0 -05.9 68.3	13 03.2 -05.5 68.4	12 07.4 -05.1 68.5	11 11.5 -04.6 68.6	10 15.7 -04.3 68.6
22°	13 53.1 -06.1 67.3	12 57.7 -05.7 67.4	12 02.3 -05.3 67.5	11 06.9 -04.9 67.6	10 11.4 -04.4 67.6
23°	13 47.0 -06.4 66.3	12 52.0 -05.9 66.4	11 57.0 -05.5 66.5	11 02.0 -05.1 66.5	10 07.0 -04.7 66.6
24°	13 40.6 -06.6 65.3	12 46.1 -06.2 65.4	11 51.5 -05.7 65.4	10 56.9 -05.2 65.5	10 02.3 -04.8 65.6
25°	13 34.0 -06.9 64.2	12 39.9 -06.4 64.3	11 45.8 -05.9 64.4	10 51.7 -05.5 64.5	9 57.5 -05.0 64.6
26°	13 27.1 -07.1 63.2	12 33.5 -06.6 63.3	11 39.9 -06.2 63.4	10 46.2 -05.7 63.5	9 52.5 -05.2 63.6
27°	13 20.0 -07.4 62.2	12 26.9 -06.9 62.3	11 33.7 -06.3 62.4	10 40.5 -05.8 62.5	9 47.3 -05.4 62.6
28°	13 12.6 -07.6 61.2	12 20.0 -07.1 61.3	11 27.4 -06.6 61.4	10 34.7 -06.1 61.5	9 41.9 -05.5 61.6
29°	13 05.0 -07.8 60.2	12 12.9 -07.3 60.3	11 20.8 -06.8 60.4	10 28.6 -06.2 60.5	9 36.4 -05.7 60.5

Declination SAME name as Latitude

Latitude 0°

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°	10 00.0 -00.1 90.0	9 00.0 -00.1 90.0	8 00.0 -00.1 90.0	7 00.0 -00.1 90.0	6 00.0 -00.1 90.0
1°	9 59.9 -00.3 89.0	8 59.9 -00.2 89.0	7 59.9 -00.2 89.0	6 59.9 -00.2 89.0	5 59.9 -00.1 89.0
2°	9 59.6 -00.4 88.0	8 59.7 -00.4 88.0	7 59.7 -00.4 88.0	6 59.7 -00.3 88.0	5 59.8 -00.3 88.0
3°	9 59.2 -00.7 87.0	8 59.3 -00.6 87.0	7 59.3 -00.5 87.0	6 59.4 -00.4 87.0	5 59.5 -00.4 87.0
4°	9 58.5 -00.8 85.9	8 58.7 -00.8 86.0	7 58.8 -00.6 86.0	6 59.0 -00.6 86.0	5 59.1 -00.5 86.0
5°	9 57.7 -01.0 84.9	8 57.9 -00.9 84.9	7 58.2 -00.8 85.0	6 58.4 -00.7 85.0	5 58.6 -00.6 85.0
6°	9 56.7 -01.2 83.9	8 57.0 -01.1 83.9	7 57.4 -01.0 83.9	6 57.7 -00.8 84.0	5 58.0 -00.7 84.0
7°	9 55.5 -01.4 82.9	8 55.9 -01.2 82.9	7 56.4 -01.1 82.9	6 56.9 -01.0 82.9	5 57.3 -00.8 83.0
8°	9 54.1 -01.6 81.9	8 54.7 -01.4 81.9	7 55.3 -01.2 81.9	6 55.9 -01.1 81.9	5 56.5 -00.9 82.0
9°	9 52.5 -01.7 80.9	8 53.3 -01.6 80.9	7 54.1 -01.4 80.9	6 54.8 -01.2 80.9	5 55.6 -01.1 81.0
10°	9 50.8 -01.9 79.8	8 51.7 -01.7 79.9	7 52.7 -01.6 79.9	6 53.6 -01.4 79.9	5 54.5 -01.1 79.9
11°	9 48.9 -02.1 78.8	8 50.0 -01.9 78.9	7 51.1 -01.7 78.9	6 52.2 -01.4 78.9	5 53.4 -01.3 78.9
12°	9 46.8 -02.3 77.8	8 48.1 -02.1 77.9	7 49.4 -01.8 77.9	6 50.8 -01.6 77.9	5 52.1 -01.4 77.9
13°	9 44.5 -02.5 76.8	8 46.0 -02.2 76.8	7 47.6 -01.9 76.9	6 49.2 -01.7 76.9	5 50.7 -01.4 76.9
14°	9 42.0 -02.6 75.8	8 43.8 -02.3 75.8	7 45.7 -02.2 75.9	6 47.5 -01.9 75.9	5 49.3 -01.6 75.9
15°	9 39.4 -02.9 74.8	8 41.5 -02.6 74.8	7 43.5 -02.2 74.9	6 45.6 -01.9 74.9	5 47.7 -01.7 74.9
16°	9 36.5 -03.0 73.8	8 38.9 -02.7 73.8	7 41.3 -02.4 73.9	6 43.7 -02.1 73.9	5 46.0 -01.8 73.9
17°	9 33.5 -03.1 72.8	8 36.2 -02.8 72.8	7 38.9 -02.5 72.8	6 41.6 -02.3 72.9	5 44.2 -01.9 72.9
18°	9 30.4 -03.4 71.7	8 33.4 -03.0 71.8	7 36.4 -02.7 71.8	6 39.3 -02.3 71.9	5 42.3 -02.0 71.9
19°	9 27.0 -03.5 70.7	8 30.4 -03.2 70.8	7 33.7 -02.8 70.8	6 37.0 -02.4 70.9	5 40.3 -02.1 70.9
20°	9 23.5 -03.7 69.7	8 27.2 -03.3 69.8	7 30.9 -03.0 69.8	6 34.6 -02.6 69.9	5 38.2 -02.2 69.9
21°	9 19.8 -03.9 68.7	8 23.9 -03.5 68.8	7 27.9 -03.1 68.8	6 32.0 -02.7 68.9	5 36.0 -02.3 68.9
22°	9 15.9 -04.0 67.7	8 20.4 -03.6 67.8	7 24.8 -03.2 67.8	6 29.3 -02.8 67.9	5 33.7 -02.4 67.9
23°	9 11.9 -04.2 66.7	8 16.8 -03.8 66.7	7 21.6 -03.3 66.8	6 26.5 -03.0 66.8	5 31.3 -02.5 66.9
24°	9 07.7 -04.4 65.7	8 13.0 -04.0 65.7	7 18.3 -03.5 65.8	6 23.5 -03.0 65.8	5 28.8 -02.6 65.9
25°	9 03.3 -04.6 64.7	8 09.0 -04.0 64.7	7 14.8 -03.6 64.8	6 20.5 -03.2 64.8	5 26.2 -02.7 64.9
26°	8 58.7 -04.7 63.7	8 05.0 -04.3 63.7	7 11.2 -03.8 63.8	6 17.3 -03.3 63.8	5 23.5 -02.9 63.9
27°	8 54.0 -04.8 62.6	8 00.7 -04.3 62.7	7 07.4 -03.9 62.8	6 14.0 -03.4 62.8	5 20.6 -02.9 62.9
28°	8 49.2 -05.1 61.6	7 56.4 -04.6 61.7	7 03.5 -04.0 61.8	6 10.6 -03.5 61.8	5 17.7 -03.0 61.9
29°	8 44.1 -05.2 60.6	7 51.8 -04.6 60.7	6 59.5 -04.1 60.8	6 07.1 -03.6 60.8	5 14.7 -03.1 60.9

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°	5 00.0 +00.0 90.0	4 00.0 +00.0 90.0	3 00.0 +00.0 90.0	2 00.0 +00.0 90.0	1 00.0 +00.0 90.0
1°	5 00.0 -00.2 89.0	4 00.0 -00.1 89.0	3 00.0 -00.1 89.0	2 00.0 -00.1 89.0	1 00.0 +00.0 89.0
2°	4 59.8 -00.2 88.0	3 59.9 -00.2 88.0	2 59.9 -00.1 88.0	1 59.9 -00.1 88.0	1 00.0 -00.1 88.0
3°	4 59.6 -00.3 87.0	3 59.7 -00.3 87.0	2 59.8 -00.2 87.0	1 59.8 -00.1 87.0	0 59.9 +00.0 87.0
4°	4 59.3 -00.4 86.0	3 59.4 -00.3 86.0	2 59.6 -00.3 86.0	1 59.7 -00.2 86.0	0 59.9 -00.1 86.0
5°	4 58.9 -00.5 85.0	3 59.1 -00.4 85.0	2 59.3 -00.3 85.0	1 59.5 -00.2 85.0	0 59.8 -00.1 85.0
6°	4 58.4 -00.6 84.0	3 58.7 -00.5 84.0	2 59.0 -00.3 84.0	1 59.3 -00.2 84.0	0 59.7 -00.1 84.0
7°	4 57.8 -00.7 83.0	3 58.2 -00.5 83.0	2 58.7 -00.5 83.0	1 59.1 -00.3 83.0	0 59.6 -00.2 83.0
8°	4 57.1 -00.8 82.0	3 57.7 -00.7 82.0	2 58.2 -00.4 82.0	1 58.8 -00.3 82.0	0 59.4 -00.1 82.0
9°	4 56.3 -00.9 81.0	3 57.0 -00.7 81.0	2 57.8 -00.5 81.0	1 58.5 -00.3 81.0	0 59.3 -00.2 81.0
10°	4 55.4 -00.9 80.0	3 56.3 -00.7 80.0	2 57.3 -00.6 80.0	1 58.2 -00.4 80.0	0 59.1 -00.2 80.0
11°	4 54.5 -01.1 79.0	3 55.6 -00.9 79.0	2 56.7 -00.6 79.0	1 57.8 -00.4 79.0	0 58.9 -00.2 79.0
12°	4 53.4 -01.1 78.0	3 54.7 -00.9 78.0	2 56.1 -00.7 78.0	1 57.4 -00.5 78.0	0 58.7 -00.2 78.0
13°	4 52.3 -01.2 77.0	3 53.8 -00.9 77.0	2 55.4 -00.8 77.0	1 56.9 -00.5 77.0	0 58.5 -00.3 77.0
14°	4 51.1 -01.3 75.9	3 52.9 -01.1 76.0	2 54.6 -00.7 76.0	1 56.4 -00.5 76.0	0 58.2 -00.2 76.0
15°	4 49.8 -01.4 74.9	3 51.8 -01.1 75.0	2 53.9 -00.9 75.0	1 55.9 -00.6 75.0	0 58.0 -00.3 75.0
16°	4 48.4 -01.5 73.9	3 50.7 -01.2 74.0	2 53.0 -00.9 74.0	1 55.3 -00.5 74.0	0 57.7 -00.3 74.0
17°	4 46.9 -01.6 72.9	3 49.5 -01.3 73.0	2 52.1 -00.9 73.0	1 54.8 -00.7 73.0	0 57.4 -00.3 73.0
18°	4 45.3 -01.7 71.9	3 48.2 -01.3 72.0	2 51.2 -01.0 72.0	1 54.1 -00.6 72.0	0 57.1 -00.4 72.0
19°	4 43.6 -01.7 70.9	3 46.9 -01.4 71.0	2 50.2 -01.1 71.0	1 53.5 -00.7 71.0	0 56.7 -00.3 71.0
20°	4 41.9 -01.9 69.9	3 45.5 -01.5 70.0	2 49.1 -01.1 70.0	1 52.8 -00.8 70.0	0 56.4 -00.4 70.0
21°	4 40.0 -01.9 68.9	3 44.0 -01.5 69.0	2 48.0 -01.1 69.0	1 52.0 -00.7 69.0	0 56.0 -00.4 69.0
22°	4 38.1 -02.0 67.9	3 42.5 -01.6 68.0	2 46.9 -01.2 68.0	1 51.3 -00.8 68.0	0 55.6 -00.4 68.0
23°	4 36.1 -02.1 66.9	3 40.9 -01.7 66.9	2 45.7 -01.3 67.0	1 50.5 -00.9 67.0	0 55.2 -00.4 67.0
24°	4 34.0 -02.2 65.9	3 39.2 -01.7 65.9	2 44.4 -01.3 66.0	1 49.6 -00.8 66.0	0 54.8 -00.4 66.0
25°	4 31.8 -02.2 64.9	3 37.5 -01.8 64.9	2 43.1 -01.3 65.0	1 48.8 -00.9 65.0	0 54.4 -00.5 65.0
26°	4 29.6 -02.4 63.9	3 35.7 -01.9 63.9	2 41.8 -01.4 64.0	1 47.9 -01.0 64.0	0 53.9 -00.4 64.0
27°	4 27.2 -02.4 62.9	3 33.8 -01.9 62.9	2 40.4 -01.5 63.0	1 46.9 -01.0 63.0	0 53.5 -00.5 63.0
28°	4 24.8 -02.5 61.9	3 31.9 -02.0 61.9	2 38.9 -01.5 62.0	1 45.9 -01.0 62.0	0 53.0 -00.5 62.0
29°	4 22.3 -02.6 60.9	3 29.9 -02.1 60.9	2 37.4 -01.5 61.0	1 44.9 -01.0 61.0	0 52.5 -00.5 61.0

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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 +00.0 90.0	-1 00.0 +00.0			
1°	0 00.0 +00.0 89.0	-1 00.0 +00.0			
2°	0 00.0 +00.0 88.0	-1 00.0 +00.1			
3°	0 00.0 +00.0 87.0	-0 59.9 +00.0			
4°	0 00.0 +00.0 86.0	-0 59.9 +00.1			
5°	0 00.0 +00.0 85.0	-0 59.8 +00.1			
6°	0 00.0 +00.0 84.0	-0 59.7 +00.1			
7°	0 00.0 +00.0 83.0	-0 59.6 +00.2			
8°	0 00.0 +00.0 82.0	-0 59.4 +00.1			
9°	0 00.0 +00.0 81.0	-0 59.3 +00.2			
10°	0 00.0 +00.0 80.0	-0 59.1 +00.2			
11°	0 00.0 +00.0 79.0	-0 58.9 +00.2			
12°	0 00.0 +00.0 78.0	-0 58.7 +00.2			
13°	0 00.0 +00.0 77.0	-0 58.5 +00.3			
14°	0 00.0 +00.0 76.0	-0 58.2 +00.2			
15°	0 00.0 +00.0 75.0	-0 58.0 +00.3			
16°	0 00.0 +00.0 74.0	-0 57.7 +00.3			
17°	0 00.0 +00.0 73.0	-0 57.4 +00.3			
18°	0 00.0 +00.0 72.0	-0 57.1 +00.4			
19°	0 00.0 +00.0 71.0	-0 56.7 +00.3			
20°	0 00.0 +00.0 70.0	-0 56.4 +00.4			
21°	0 00.0 +00.0 69.0	-0 56.0 +00.4			
22°	0 00.0 +00.0 68.0	-0 55.6 +00.4			
23°	0 00.0 +00.0 67.0	-0 55.2 +00.4			
24°	0 00.0 +00.0 66.0	-0 54.8 +00.4			
25°	0 00.0 +00.0 65.0	-0 54.4 +00.5			
26°	0 00.0 +00.0 64.0	-0 53.9 +00.4			
27°	0 00.0 +00.0 63.0	-0 53.5 +00.5			
28°	0 00.0 +00.0 62.0	-0 53.0 +00.5			
29°	0 00.0 +00.0 61.0	-0 52.5 +00.5			

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°					
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 1°

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°	89 00.0 +60.0 180.0	88 35.1 +24.9 135.0	87 45.8 +14.2 116.6	86 50.3 +09.7 108.4	85 52.6 +07.4 104.0
1°	90 00.0 -60.0 0.0	89 00.0 -24.8 90.0	88 00.0 -14.1 90.0	87 00.0 -09.7 90.0	86 00.0 -07.3 90.0
2°	89 00.0 -60.0 0.0	88 35.2 -49.3 45.0	87 45.9 -35.5 63.4	86 50.3 -26.5 71.5	85 52.7 -20.9 75.9
3°	88 00.0 -60.0 0.0	87 45.9 -55.6 26.5	87 10.4 -46.7 45.0	86 23.8 -38.2 56.2	85 31.8 -31.6 63.4
4°	87 00.0 -60.0 0.0	86 50.3 -57.7 18.4	86 23.7 -51.9 33.6	85 45.6 -45.4 44.9	85 00.2 -39.3 53.0
5°	86 00.0 -60.0 0.0	85 52.6 -58.5 14.0	85 31.8 -54.8 26.5	85 00.2 -49.9 36.8	84 20.9 -44.8 44.9
6°	85 00.0 -60.0 0.0	84 54.1 -59.0 11.3	84 37.0 -56.4 21.7	84 10.3 -52.6 30.8	83 36.1 -48.4 38.5
7°	84 00.0 -60.0 0.0	83 55.1 -59.3 9.4	83 40.6 -57.3 18.3	83 17.7 -54.4 26.4	82 47.7 -51.0 33.5
8°	83 00.0 -60.0 0.0	82 55.8 -59.5 8.1	82 43.3 -57.9 15.8	82 23.3 -55.6 23.0	81 56.7 -52.9 29.5
9°	82 00.0 -60.0 0.0	81 56.3 -59.6 7.1	81 45.4 -58.4 13.9	81 27.7 -56.6 20.4	81 03.8 -54.2 26.3
10°	81 00.0 -60.0 0.0	80 56.7 -59.7 6.3	80 47.0 -58.7 12.4	80 31.1 -57.2 18.2	80 09.6 -55.2 23.7
11°	80 00.0 -60.0 0.0	79 57.0 -59.7 5.6	79 48.3 -58.9 11.2	79 33.9 -57.6 16.5	79 14.4 -56.0 21.5
12°	79 00.0 -60.0 0.0	78 57.3 -59.7 5.1	78 49.4 -59.1 10.1	78 36.3 -58.1 15.0	78 18.4 -56.6 19.7
13°	78 00.0 -60.0 0.0	77 57.6 -59.9 4.7	77 50.3 -59.3 9.3	77 38.2 -58.3 13.8	77 21.8 -57.1 18.1
14°	77 00.0 -60.0 0.0	76 57.7 -59.8 4.3	76 51.0 -59.3 8.6	76 39.9 -58.5 12.7	76 24.7 -57.5 16.7
15°	76 00.0 -60.0 0.0	75 57.9 -59.8 4.0	75 51.7 -59.4 7.9	75 41.4 -58.7 11.8	75 27.2 -57.8 15.6
16°	75 00.0 -60.0 0.0	74 58.1 -59.9 3.7	74 52.3 -59.5 7.4	74 42.7 -58.9 11.0	74 29.4 -58.0 14.5
17°	74 00.0 -60.0 0.0	73 58.2 -59.9 3.5	73 52.8 -59.6 6.9	73 43.8 -59.0 10.3	73 31.4 -58.3 13.6
18°	73 00.0 -60.0 0.0	72 58.3 -59.9 3.2	72 53.2 -59.6 6.5	72 44.8 -59.1 9.7	72 33.1 -58.4 12.8
19°	72 00.0 -60.0 0.0	71 58.4 -59.9 3.1	71 53.6 -59.6 6.1	71 45.7 -59.2 9.1	71 34.7 -58.6 12.0
20°	71 00.0 -60.0 0.0	70 58.5 -59.9 2.9	70 54.0 -59.7 5.8	70 46.5 -59.3 8.6	70 36.1 -58.7 11.4
21°	70 00.0 -60.0 0.0	69 58.6 -60.0 2.7	69 54.3 -59.7 5.4	69 47.2 -59.3 8.1	69 37.4 -58.9 10.8
22°	69 00.0 -60.0 0.0	68 58.6 -59.9 2.6	68 54.6 -59.7 5.2	68 47.9 -59.4 7.7	68 38.5 -58.9 10.2
23°	68 00.0 -60.0 0.0	67 58.7 -59.9 2.5	67 54.9 -59.8 4.9	67 48.5 -59.5 7.3	67 39.6 -59.0 9.7
24°	67 00.0 -60.0 0.0	66 58.8 -60.0 2.3	66 55.1 -59.8 4.7	66 49.0 -59.5 7.0	66 40.6 -59.1 9.3
25°	66 00.0 -60.0 0.0	65 58.8 -59.9 2.2	65 55.3 -59.7 4.4	65 49.5 -59.5 6.7	65 41.5 -59.2 8.8
26°	65 00.0 -60.0 0.0	64 58.9 -60.0 2.1	64 55.6 -59.9 4.2	64 50.0 -59.5 6.4	64 42.3 -59.2 8.4
27°	64 00.0 -60.0 0.0	63 58.9 -59.9 2.0	63 55.7 -59.8 4.1	63 50.5 -59.6 6.1	63 43.1 -59.3 8.1
28°	63 00.0 -60.0 0.0	62 59.0 -60.0 1.9	62 55.9 -59.8 3.9	62 50.9 -59.7 5.8	62 43.8 -59.3 7.7
29°	62 00.0 -60.0 0.0	61 59.0 -59.9 1.9	61 56.1 -59.8 3.7	61 51.2 -59.6 5.6	61 44.5 -59.4 7.4

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°	84 54.1 +05.9 101.3	83 55.1 +05.0 99.4	82 55.8 +04.3 98.1	81 56.3 +03.8 97.1	80 56.7 +03.4 96.3
1°	85 00.0 -05.8 90.0	84 00.1 -04.9 89.9	83 00.1 -04.2 89.9	82 00.1 -03.7 89.9	81 00.1 -03.2 89.9
2°	84 54.2 -17.1 78.6	83 55.2 -14.4 80.5	82 55.9 -12.4 81.8	81 56.4 -10.9 82.8	80 56.9 -09.7 83.6
3°	84 37.1 -26.7 68.1	83 40.8 -22.9 71.5	82 43.5 -20.0 73.9	81 45.5 -17.7 75.8	80 47.2 -15.9 77.3
4°	84 10.4 -34.2 58.9	83 17.9 -30.1 63.3	82 23.5 -26.7 66.7	81 27.8 -23.8 69.3	80 31.3 -21.5 71.4
5°	83 36.2 -40.0 51.2	82 47.8 -35.8 56.1	81 56.8 -32.2 60.1	81 04.0 -29.1 63.2	80 09.8 -26.5 65.8
6°	82 56.2 -44.3 44.8	82 12.0 -40.4 50.0	81 24.6 -36.8 54.2	80 34.9 -33.8 57.8	79 43.3 -31.0 60.7
7°	82 11.9 -47.4 39.6	81 31.6 -43.9 44.8	80 47.8 -40.7 49.1	80 01.1 -37.6 52.8	79 12.3 -34.8 56.0
8°	81 24.5 -49.8 35.3	80 47.7 -46.7 40.3	80 07.1 -43.6 44.7	79 23.5 -40.7 48.5	78 37.5 -38.1 51.8
9°	80 34.7 -51.6 31.7	80 01.0 -48.9 36.6	79 23.5 -46.1 40.8	78 42.8 -43.5 44.6	77 59.4 -40.9 47.9
10°	79 43.1 -53.0 28.7	79 12.1 -50.6 33.3	78 37.4 -48.2 37.5	77 59.3 -45.6 41.2	77 18.5 -43.3 44.5
11°	78 50.1 -54.1 26.2	78 21.5 -51.9 30.6	77 49.2 -49.7 34.5	77 13.7 -47.5 38.2	76 35.2 -45.2 41.5
12°	77 56.0 -54.9 24.1	77 29.6 -53.1 28.2	76 59.5 -51.1 32.0	76 26.2 -49.0 35.5	75 50.0 -47.0 38.7
13°	77 01.1 -55.6 22.2	76 36.5 -53.9 26.1	76 08.4 -52.1 29.7	75 37.2 -50.4 33.1	75 03.0 -48.4 36.2
14°	76 05.5 -56.2 20.6	75 42.6 -54.7 24.3	75 16.3 -53.1 27.7	74 46.8 -51.3 31.0	74 14.6 -49.6 34.0
15°	75 09.3 -56.7 19.2	74 47.9 -55.4 22.6	74 23.2 -53.9 25.9	73 55.5 -52.3 29.0	73 25.0 -50.7 32.0
16°	74 12.6 -57.0 17.9	73 52.5 -55.8 21.2	73 29.3 -54.5 24.3	73 03.2 -53.1 27.3	72 34.3 -51.6 30.1
17°	73 15.6 -57.3 16.8	72 56.7 -56.3 19.9	72 34.8 -55.1 22.9	72 10.1 -53.8 25.8	71 42.7 -52.4 28.5
18°	72 18.3 -57.6 15.8	72 00.4 -56.6 18.8	71 39.7 -55.5 21.6	71 16.3 -54.4 24.3	70 50.3 -53.1 27.0
19°	71 20.7 -57.9 14.9	71 03.8 -57.0 17.7	70 44.2 -56.0 20.4	70 21.9 -54.8 23.1	69 57.2 -53.6 25.6
20°	70 22.8 -58.0 14.1	70 06.8 -57.2 16.8	69 48.2 -56.3 19.4	69 27.1 -55.3 21.9	69 03.6 -54.2 24.3
21°	69 24.8 -58.2 13.4	69 09.6 -57.5 15.9	68 51.9 -56.6 18.4	68 31.8 -55.7 20.8	68 09.4 -54.7 23.1
22°	68 26.6 -58.4 12.7	68 12.1 -57.6 15.1	67 55.3 -56.9 17.5	67 36.1 -56.0 19.8	67 14.7 -55.1 22.0
23°	67 28.2 -58.5 12.1	67 14.5 -57.9 14.4	66 58.4 -57.1 16.7	66 40.1 -56.3 18.9	66 19.6 -55.4 21.0
24°	66 29.7 -58.6 11.5	66 16.6 -58.0 13.7	66 01.3 -57.4 15.9	65 43.8 -56.6 18.0	65 24.2 -55.8 20.1
25°	65 31.1 -58.7 11.0	65 18.6 -58.2 13.1	65 03.9 -57.5 15.2	64 47.2 -56.8 17.2	64 28.4 -56.0 19.2
26°	64 32.4 -58.8 10.5	64 20.4 -58.2 12.5	64 06.4 -57.7 14.5	63 50.4 -57.1 16.5	63 32.4 -56.3 18.4
27°	63 33.6 -58.9 10.0	63 22.2 -58.4 12.0	63 08.7 -57.8 13.9	62 53.3 -57.2 15.8	62 36.1 -56.6 17.6
28°	62 34.7 -58.9 9.6	62 23.8 -58.5 11.5	62 10.9 -58.0 13.3	61 56.1 -57.4 15.1	61 39.5 -56.7 16.9
29°	61 35.8 -59.0 9.2	61 25.3 -58.6 11.0	61 12.9 -58.1 12.8	60 58.7 -57.5 14.5	60 42.8 -57.0 16.2

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Latitude 1°

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°	79 57.0 +03.1 95.7	78 57.3 +02.8 95.1	77 57.5 +02.6 94.7	76 57.7 +02.4 94.3	75 57.9 +02.2 94.0
1°	80 00.1 -02.9 89.9	79 00.1 -02.6 89.9	78 00.1 -02.3 89.9	77 00.1 -02.1 89.9	76 00.1 -01.9 89.9
2°	79 57.2 -08.7 84.2	78 57.5 -07.9 84.7	77 57.8 -07.3 85.1	76 58.0 -06.7 85.4	75 58.2 -06.2 85.7
3°	79 48.5 -14.3 78.5	78 49.6 -13.0 79.5	77 50.5 -11.9 80.4	76 51.3 -11.0 81.1	75 52.0 -10.2 81.7
4°	79 34.2 -19.5 73.1	78 36.6 -17.9 74.5	77 38.6 -16.5 75.7	76 40.3 -15.2 76.8	75 41.8 -14.1 77.6
5°	79 14.7 -24.3 68.0	78 18.7 -22.4 69.8	77 22.1 -20.6 71.3	76 25.1 -19.2 72.6	75 27.7 -17.9 73.7
6°	78 50.4 -28.6 63.2	77 56.3 -26.4 65.3	77 01.5 -24.6 67.1	76 05.9 -22.9 68.6	75 09.8 -21.4 70.0
7°	78 21.8 -32.4 58.7	77 29.9 -30.1 61.0	76 36.9 -28.1 63.1	75 43.0 -26.3 64.8	74 48.4 -24.7 66.4
8°	77 49.4 -35.6 54.6	76 59.8 -33.4 57.1	76 08.8 -31.3 59.3	75 16.7 -29.5 61.2	74 23.7 -27.8 62.9
9°	77 13.8 -38.5 50.9	76 26.4 -36.3 53.5	75 37.5 -34.2 55.8	74 47.2 -32.2 57.9	73 55.9 -30.5 59.7
10°	76 35.3 -40.9 47.5	75 50.1 -38.7 50.2	75 03.3 -36.8 52.6	74 15.0 -34.9 54.7	73 25.4 -33.0 56.6
11°	75 54.4 -43.1 44.4	75 11.4 -41.0 47.1	74 26.5 -39.0 49.5	73 40.1 -37.1 51.7	72 52.4 -35.4 53.7
12°	75 11.3 -44.9 41.6	74 30.4 -43.0 44.3	73 47.5 -41.0 46.8	73 03.0 -39.1 49.0	72 17.0 -37.4 51.0
13°	74 26.4 -46.5 39.1	73 47.4 -44.6 41.8	73 06.5 -42.7 44.2	72 23.9 -41.0 46.5	71 39.6 -39.2 48.5
14°	73 39.9 -47.9 36.8	73 02.8 -46.0 39.4	72 23.8 -44.4 41.8	71 42.9 -42.6 44.1	71 00.4 -41.0 46.2
15°	72 52.0 -49.0 34.7	72 16.8 -47.4 37.3	71 39.4 -45.7 39.7	71 00.3 -44.1 41.9	70 19.4 -42.5 43.9
16°	72 03.0 -50.1 32.8	71 29.4 -48.5 35.3	70 53.7 -46.9 37.6	70 16.2 -45.4 39.8	69 36.9 -43.8 41.9
17°	71 12.9 -50.9 31.0	70 40.9 -49.5 33.5	70 06.8 -48.0 35.8	69 30.8 -46.5 37.9	68 53.1 -45.0 40.0
18°	70 22.0 -51.8 29.4	69 51.4 -50.4 31.8	69 18.8 -49.0 34.0	68 44.3 -47.6 36.2	68 08.1 -46.2 38.2
19°	69 30.2 -52.4 28.0	69 01.0 -51.1 30.3	68 29.8 -49.8 32.4	67 56.7 -48.5 34.5	67 21.9 -47.2 36.5
20°	68 37.8 -53.1 26.6	68 09.9 -51.9 28.8	67 40.0 -50.6 30.9	67 08.2 -49.3 33.0	66 34.7 -48.0 34.9
21°	67 44.7 -53.5 25.3	67 18.0 -52.4 27.5	66 49.4 -51.3 29.6	66 18.9 -50.1 31.5	65 46.7 -48.9 33.4
22°	66 51.2 -54.1 24.2	66 25.6 -53.0 26.3	65 58.1 -51.9 28.3	65 28.8 -50.7 30.2	64 57.8 -49.5 32.0
23°	65 57.1 -54.5 23.1	65 32.6 -53.5 25.1	65 06.2 -52.4 27.0	64 38.1 -51.4 28.9	64 08.3 -50.3 30.7
24°	65 02.6 -54.9 22.1	64 39.1 -53.9 24.0	64 13.8 -53.0 25.9	63 46.7 -51.9 27.7	63 18.0 -50.8 29.5
25°	64 07.7 -55.2 21.1	63 45.2 -54.3 23.0	63 20.8 -53.3 24.8	62 54.8 -52.4 26.6	62 27.2 -51.5 28.3
26°	63 12.5 -55.5 20.3	62 50.9 -54.7 22.1	62 27.5 -53.8 23.8	62 02.4 -52.9 25.5	61 35.7 -51.9 27.2
27°	62 17.0 -55.8 19.4	61 56.2 -55.0 21.2	61 33.7 -54.2 22.9	61 09.5 -53.2 24.6	60 43.8 -52.3 26.2
28°	61 21.2 -56.0 18.7	61 01.2 -55.3 20.3	60 39.5 -54.5 22.0	60 16.3 -53.7 23.6	59 51.5 -52.8 25.2
29°	60 25.2 -56.3 17.9	60 05.9 -55.6 19.6	59 45.0 -54.8 21.2	59 22.6 -54.0 22.7	58 58.7 -53.2 24.2

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°	74 58.0 +02.1 93.7	73 58.2 +01.9 93.5	72 58.3 +01.9 93.3	71 58.4 +01.8 93.1	70 58.5 +01.7 92.9
1°	75 00.1 -01.8 89.9	74 00.1 -01.6 89.9	73 00.2 -01.6 89.9	72 00.2 -01.5 89.8	71 00.2 -01.4 89.8
2°	74 58.3 -05.7 86.0	73 58.5 -05.3 86.2	72 58.6 -05.0 86.4	71 58.7 -04.6 86.6	70 58.8 -04.3 86.8
3°	74 52.6 -09.5 82.2	73 53.2 -08.9 82.6	72 53.6 -08.3 83.0	71 54.1 -07.9 83.4	70 54.5 -07.4 83.7
4°	74 43.1 -13.2 78.4	73 44.3 -12.4 79.1	72 45.3 -11.6 79.7	71 46.2 -10.9 80.2	70 47.1 -10.3 80.7
5°	74 29.9 -16.7 74.7	73 31.9 -15.7 75.6	72 33.7 -14.8 76.4	71 35.3 -13.9 77.1	70 36.8 -13.2 77.7
6°	74 13.2 -20.1 71.2	73 16.2 -18.9 72.2	72 18.9 -17.8 73.2	71 21.4 -16.8 74.0	70 23.6 -15.9 74.8
7°	73 53.1 -23.2 67.7	72 57.3 -21.9 69.0	72 01.1 -20.7 70.1	71 04.6 -19.6 71.0	70 07.7 -18.6 71.9
8°	73 29.9 -26.2 64.5	72 35.4 -24.7 65.8	71 40.4 -23.4 67.0	70 45.0 -22.3 68.1	69 49.1 -21.1 69.1
9°	73 03.7 -28.9 61.3	72 10.7 -27.4 62.8	71 17.0 -26.0 64.1	70 22.7 -24.7 65.4	69 28.0 -23.6 66.5
10°	72 34.8 -31.4 58.4	71 43.3 -29.8 59.9	70 51.0 -28.4 61.4	69 58.0 -27.0 62.7	69 04.4 -25.8 63.9
11°	72 03.4 -33.6 55.6	71 13.5 -32.1 57.2	70 22.6 -30.6 58.7	69 31.0 -29.3 60.1	68 38.6 -27.9 61.4
12°	71 29.8 -35.8 52.9	70 41.4 -34.2 54.6	69 52.0 -32.7 56.2	69 01.7 -31.2 57.6	68 10.7 -30.0 58.9
13°	70 54.0 -37.6 50.4	70 07.2 -36.1 52.2	69 19.3 -34.6 53.8	68 30.5 -33.2 55.3	67 40.7 -31.8 56.6
14°	70 16.4 -39.4 48.1	69 31.1 -37.8 49.9	68 44.7 -36.3 51.5	67 57.3 -34.9 53.0	67 08.9 -33.6 54.4
15°	69 37.0 -40.9 45.9	68 53.3 -39.4 47.7	68 08.4 -37.9 49.3	67 22.4 -36.6 50.9	66 35.3 -35.2 52.3
16°	68 56.1 -42.3 43.8	68 13.9 -40.8 45.6	67 30.5 -39.5 47.3	66 45.8 -38.0 48.8	66 00.1 -36.7 50.3
17°	68 13.8 -43.6 41.9	67 33.1 -42.2 43.7	66 51.0 -40.7 45.3	66 07.8 -39.4 46.9	65 23.4 -38.1 48.4
18°	67 30.2 -44.7 40.0	66 50.9 -43.4 41.8	66 10.3 -42.1 43.5	65 28.4 -40.7 45.1	64 45.3 -39.4 46.6
19°	66 45.5 -45.8 38.3	66 07.5 -44.4 40.1	65 28.2 -43.1 41.7	64 47.7 -41.9 43.3	64 05.9 -40.5 44.8
20°	65 59.7 -46.8 36.7	65 23.1 -45.5 38.5	64 45.1 -44.2 40.1	64 05.8 -42.9 41.7	63 25.4 -41.7 43.1
21°	65 12.9 -47.6 35.2	64 37.6 -46.4 36.9	64 00.9 -45.2 38.5	63 22.9 -44.0 40.1	62 43.7 -42.8 41.6
22°	64 25.3 -48.4 33.8	63 51.2 -47.2 35.4	63 15.7 -46.0 37.1	62 38.9 -44.8 38.6	62 00.9 -43.7 40.0
23°	63 36.9 -49.2 32.4	63 04.0 -48.0 34.1	62 29.7 -46.9 35.6	61 54.1 -45.7 37.2	61 17.2 -44.5 38.6
24°	62 47.7 -49.7 31.1	62 16.0 -48.7 32.8	61 42.8 -47.5 34.3	61 08.4 -46.5 35.8	60 32.7 -45.4 37.2
25°	61 58.0 -50.4 29.9	61 27.3 -49.3 31.5	60 55.3 -48.3 33.0	60 21.9 -47.2 34.5	59 47.3 -46.1 35.9
26°	61 07.6 -50.9 28.8	60 38.0 -49.9 30.3	60 07.0 -48.9 31.8	59 34.7 -47.8 33.3	59 01.2 -46.8 34.6
27°	60 16.7 -51.5 27.7	59 48.1 -50.5 29.2	59 18.1 -49.5 30.7	58 46.9 -48.5 32.1	58 14.4 -47.5 33.4
28°	59 25.2 -51.8 26.7	58 57.6 -51.0 28.2	58 28.6 -50.0 29.6	57 58.4 -49.1 31.0	57 26.9 -48.0 32.3
29°	58 33.4 -52.3 25.7	58 06.6 -51.4 27.2	57 38.6 -50.5 28.5	57 09.3 -49.5 29.9	56 38.9 -48.7 31.2

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Latitude 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°	69 58.6 +01.6 92.7	68 58.6 +01.6 92.6	67 58.7 +01.5 92.5	66 58.8 +01.4 92.4	65 58.8 +01.4 92.2
1°	70 00.2 -01.3 89.8	69 00.2 -01.2 89.8	68 00.2 -01.1 89.8	67 00.2 -01.0 89.8	66 00.2 -00.9 89.8
2°	69 58.9 -04.1 86.9	68 59.0 -03.9 87.0	67 59.1 -03.7 87.1	66 59.2 -03.5 87.2	65 59.3 -03.3 87.3
3°	69 54.8 -06.9 84.0	68 55.1 -06.5 84.2	67 55.4 -06.2 84.5	66 55.7 -05.9 84.7	65 56.0 -05.7 84.9
4°	69 47.9 -09.8 81.1	68 48.6 -09.3 81.5	67 49.2 -08.8 81.8	66 49.8 -08.3 82.2	65 50.3 -07.9 82.4
5°	69 38.1 -12.5 78.3	68 39.3 -11.8 78.8	67 40.4 -11.2 79.2	66 41.5 -10.7 79.6	65 42.4 -10.2 80.0
6°	69 25.6 -15.1 75.5	68 27.5 -14.4 76.1	67 29.2 -13.7 76.6	66 30.8 -13.1 77.2	65 32.2 -12.4 77.6
7°	69 10.5 -17.6 72.7	68 13.1 -16.8 73.5	67 15.5 -16.0 74.1	66 17.7 -15.2 74.7	65 19.8 -14.6 75.3
8°	68 52.9 -20.1 70.1	67 56.3 -19.1 70.9	66 59.5 -18.3 71.6	66 02.5 -17.5 72.3	65 05.2 -16.7 73.0
9°	68 32.8 -22.5 67.5	67 37.2 -21.4 68.4	66 41.2 -20.4 69.2	65 45.0 -19.5 70.0	64 48.5 -18.7 70.7
10°	68 10.3 -24.6 64.9	67 15.8 -23.6 65.9	66 20.8 -22.5 66.9	65 25.5 -21.6 67.7	64 29.8 -20.7 68.5
11°	67 45.7 -26.7 62.5	66 52.2 -25.6 63.6	65 58.3 -24.5 64.6	65 03.9 -23.5 65.5	64 09.1 -22.5 66.3
12°	67 19.0 -28.7 60.2	66 26.6 -27.5 61.3	65 33.8 -26.5 62.3	64 40.4 -25.4 63.3	63 46.6 -24.4 64.2
13°	66 50.3 -30.6 57.9	65 59.1 -29.3 59.1	65 07.3 -28.2 60.2	64 15.0 -27.1 61.2	63 22.2 -26.1 62.2
14°	66 19.7 -32.3 55.7	65 29.8 -31.1 57.0	64 39.1 -29.8 58.1	63 47.9 -28.8 59.2	62 56.1 -27.7 60.2
15°	65 47.4 -33.9 53.7	64 58.7 -32.7 54.9	64 09.3 -31.5 56.1	63 19.1 -30.3 57.2	62 28.4 -29.2 58.2
16°	65 13.5 -35.4 51.7	64 26.0 -34.1 53.0	63 37.8 -33.0 54.2	62 48.8 -31.8 55.3	61 59.2 -30.8 56.3
17°	64 38.1 -36.8 49.8	63 51.9 -35.6 51.1	63 04.8 -34.4 52.3	62 17.0 -33.3 53.5	61 28.4 -32.1 54.5
18°	64 01.3 -38.2 48.0	63 16.3 -36.9 49.3	62 30.4 -35.7 50.5	61 43.7 -34.6 51.7	60 56.3 -33.5 52.8
19°	63 23.1 -39.3 46.2	62 39.4 -38.2 47.5	61 54.7 -37.0 48.8	61 09.1 -35.8 50.0	60 22.8 -34.7 51.1
20°	62 43.8 -40.5 44.5	62 01.2 -39.3 45.9	61 17.7 -38.1 47.1	60 33.3 -37.0 48.3	59 48.1 -35.9 49.5
21°	62 03.3 -41.5 43.0	61 21.9 -40.3 44.3	60 39.6 -39.2 45.5	59 56.3 -38.1 46.7	59 12.2 -37.0 47.9
22°	61 21.8 -42.5 41.4	60 41.6 -41.4 42.8	60 00.4 -40.3 44.0	59 18.2 -39.1 45.2	58 35.2 -38.0 46.3
23°	60 39.3 -43.5 40.0	60 00.2 -42.3 41.3	59 20.1 -41.2 42.5	58 39.1 -40.1 43.7	57 57.2 -39.0 44.9
24°	59 55.8 -44.2 38.6	59 17.9 -43.2 39.9	58 38.9 -42.1 41.1	57 59.0 -41.0 42.3	57 18.2 -40.0 43.5
25°	59 11.6 -45.1 37.2	58 34.7 -43.9 38.5	57 56.8 -42.9 39.8	57 18.0 -41.9 41.0	56 38.2 -40.8 42.1
26°	58 26.5 -45.7 36.0	57 50.8 -44.8 37.2	57 13.9 -43.7 38.5	56 36.1 -42.6 39.6	55 57.4 -41.6 40.8
27°	57 40.8 -46.5 34.7	57 06.0 -45.4 36.0	56 30.2 -44.4 37.2	55 53.5 -43.4 38.4	55 15.8 -42.4 39.5
28°	56 54.3 -47.1 33.6	56 20.6 -46.1 34.8	55 45.8 -45.1 36.0	55 10.1 -44.2 37.2	54 33.4 -43.2 38.3
29°	56 07.2 -47.7 32.5	55 34.5 -46.7 33.7	55 00.7 -45.7 34.8	54 25.9 -44.7 36.0	53 50.2 -43.8 37.1

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°	64 58.9 +01.3 92.1	63 58.9 +01.3 92.0	62 59.0 +01.3 92.0	61 59.0 +01.3 91.9	60 59.1 +01.2 91.8
1°	65 00.2 -00.9 89.8	64 00.2 -00.8 89.8	63 00.3 -00.8 89.8	62 00.3 -00.8 89.8	61 00.3 -00.7 89.7
2°	64 59.3 -03.1 87.4	63 59.4 -03.0 87.5	62 59.5 -02.9 87.6	61 59.5 -02.7 87.6	60 59.6 -02.6 87.7
3°	64 56.2 -05.3 85.1	63 56.4 -05.1 85.2	62 56.6 -04.8 85.4	61 56.8 -04.6 85.5	60 57.0 -04.4 85.6
4°	64 50.9 -07.6 82.7	63 51.3 -07.2 82.9	62 51.8 -06.9 83.2	61 52.2 -06.6 83.4	60 52.6 -06.3 83.6
5°	64 43.3 -09.7 80.4	63 44.1 -09.3 80.7	62 44.9 -08.9 81.0	61 45.6 -08.5 81.3	60 46.3 -08.2 81.5
6°	64 33.6 -11.9 78.1	63 34.8 -11.3 78.5	62 36.0 -10.9 78.8	61 37.1 -10.4 79.2	60 38.1 -09.9 79.5
7°	64 21.7 -14.0 75.8	63 23.5 -13.4 76.3	62 25.1 -12.7 76.7	61 26.7 -12.2 77.1	60 28.2 -11.8 77.5
8°	64 07.7 -15.9 73.6	63 10.1 -15.3 74.1	62 12.4 -14.7 74.6	61 14.5 -14.1 75.1	60 16.4 -13.5 75.5
9°	63 51.8 -17.9 71.4	62 54.8 -17.2 72.0	61 57.7 -16.5 72.5	61 00.4 -15.9 73.1	60 02.9 -15.2 73.6
10°	63 33.9 -19.9 69.2	62 37.6 -19.0 69.9	61 41.2 -18.3 70.5	60 44.5 -17.5 71.1	59 47.7 -16.9 71.6
11°	63 14.0 -21.6 67.1	62 18.6 -20.8 67.8	61 22.9 -20.0 68.5	60 27.0 -19.3 69.1	59 30.8 -18.5 69.7
12°	62 52.4 -23.4 65.0	61 57.8 -22.5 65.8	61 02.9 -21.6 66.5	60 07.7 -20.8 67.2	59 12.3 -20.1 67.9
13°	62 29.0 -25.1 63.0	61 35.3 -24.2 63.9	60 41.3 -23.3 64.6	59 46.9 -22.4 65.4	58 52.2 -21.6 66.0
14°	62 03.9 -26.7 61.1	61 11.1 -25.7 61.9	60 18.0 -24.8 62.8	59 24.5 -24.0 63.5	58 30.6 -23.1 64.2
15°	61 37.2 -28.3 59.2	60 45.4 -27.2 60.1	59 53.2 -26.3 60.9	59 00.5 -25.3 61.7	58 07.5 -24.5 62.5
16°	61 08.9 -29.7 57.3	60 18.2 -28.7 58.3	59 26.9 -27.7 59.2	58 35.2 -26.8 60.0	57 43.0 -25.8 60.8
17°	60 39.2 -31.0 55.6	59 49.5 -30.1 56.5	58 59.2 -29.1 57.4	58 08.4 -28.1 58.3	57 17.2 -27.2 59.1
18°	60 08.2 -32.4 53.8	59 19.4 -31.3 54.8	58 30.1 -30.3 55.7	57 40.3 -29.4 56.6	56 50.0 -28.5 57.4
19°	59 35.8 -33.6 52.1	58 48.1 -32.6 53.1	57 59.8 -31.6 54.1	57 10.9 -30.6 55.0	56 21.5 -29.6 55.8
20°	59 02.2 -34.9 50.5	58 15.5 -33.7 51.5	57 28.2 -32.7 52.5	56 40.3 -31.7 53.4	55 51.9 -30.8 54.3
21°	58 27.3 -35.9 49.0	57 41.8 -34.9 50.0	56 55.5 -33.9 51.0	56 08.6 -32.9 51.9	55 21.1 -31.9 52.8
22°	57 51.4 -36.9 47.4	57 06.9 -36.0 48.5	56 21.6 -34.9 49.5	55 35.7 -33.9 50.4	54 49.2 -32.9 51.3
23°	57 14.5 -38.0 46.0	56 30.9 -36.9 47.0	55 46.7 -35.9 48.0	55 01.8 -34.9 48.9	54 16.3 -34.0 49.8
24°	56 36.5 -38.9 44.5	55 54.0 -37.9 45.6	55 10.8 -36.9 46.6	54 26.9 -35.9 47.5	53 42.3 -34.9 48.4
25°	55 57.6 -39.8 43.2	55 16.1 -38.7 44.2	54 33.9 -37.7 45.2	53 51.0 -36.8 46.2	53 07.4 -35.8 47.1
26°	55 17.8 -40.6 41.9	54 37.4 -39.6 42.9	53 56.2 -38.7 43.9	53 14.2 -37.6 44.8	52 31.6 -36.7 45.7
27°	54 37.2 -41.4 40.6	53 57.8 -40.5 41.6	53 17.5 -39.4 42.6	52 36.6 -38.5 43.5	51 54.9 -37.5 44.5
28°	53 55.8 -42.2 39.3	53 17.3 -41.1 40.4	52 38.1 -40.2 41.3	51 58.1 -39.2 42.3	51 17.4 -38.3 43.2
29°	53 13.6 -42.8 38.1	52 36.2 -41.9 39.1	51 57.9 -40.9 40.1	51 18.9 -40.0 41.1	50 39.1 -39.1 42.0

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°	59 59.1 +01.2 91.7	58 59.1 +01.2 91.7	57 59.2 +01.1 91.6	56 59.2 +01.1 91.5	55 59.2 +01.1 91.5
1°	60 00.3 -00.6 89.7	59 00.3 -00.6 89.7	58 00.3 -00.5 89.7	57 00.3 -00.5 89.7	56 00.3 -00.4 89.7
2°	59 59.7 -02.5 87.7	58 59.7 -02.3 87.8	57 59.8 -02.2 87.8	56 59.8 -02.1 87.9	55 59.9 -02.0 87.9
3°	59 57.2 -04.2 85.7	58 57.4 -04.1 85.8	57 57.6 -03.9 85.9	56 57.7 -03.7 86.0	55 57.9 -03.6 86.1
4°	59 53.0 -06.1 83.7	58 53.3 -05.7 83.9	57 53.7 -05.6 84.1	56 54.0 -05.3 84.2	55 54.3 -05.1 84.3
5°	59 46.9 -07.8 81.8	58 47.6 -07.5 82.0	57 48.1 -07.2 82.2	56 48.7 -06.9 82.4	55 49.2 -06.6 82.6
6°	59 39.1 -09.5 79.8	58 40.1 -09.2 80.1	57 40.9 -08.8 80.3	56 41.8 -08.5 80.6	55 42.6 -08.1 80.8
7°	59 29.6 -11.3 77.8	58 30.9 -10.8 78.2	57 32.1 -10.4 78.5	56 33.3 -10.0 78.8	55 34.5 -09.7 79.0
8°	59 18.3 -13.0 75.9	58 20.1 -12.5 76.3	57 21.7 -12.0 76.7	56 23.3 -11.5 77.0	55 24.8 -11.1 77.3
9°	59 05.3 -14.6 74.0	58 07.6 -14.1 74.4	57 09.7 -13.5 74.8	56 11.8 -13.1 75.2	55 13.7 -12.5 75.6
10°	58 50.7 -16.3 72.1	57 53.5 -15.6 72.6	56 56.2 -15.1 73.1	55 58.7 -14.5 73.5	55 01.2 -14.0 73.9
11°	58 34.4 -17.8 70.3	57 37.9 -17.2 70.8	56 41.1 -16.5 71.3	55 44.2 -15.9 71.7	54 47.2 -15.4 72.2
12°	58 16.6 -19.3 68.5	57 20.7 -18.6 69.0	56 24.6 -18.0 69.5	55 28.3 -17.3 70.0	54 31.8 -16.7 70.5
13°	57 57.3 -20.9 66.7	57 02.1 -20.1 67.3	56 06.6 -19.4 67.8	55 11.0 -18.8 68.3	54 15.1 -18.1 68.8
14°	57 36.4 -22.2 64.9	56 42.0 -21.5 65.5	55 47.2 -20.7 66.1	54 52.2 -20.0 66.7	53 57.0 -19.3 67.2
15°	57 14.2 -23.7 63.2	56 20.5 -22.9 63.8	55 26.5 -22.1 64.5	54 32.2 -21.3 65.1	53 37.7 -20.6 65.6
16°	56 50.5 -25.0 61.5	55 57.6 -24.2 62.2	55 04.4 -23.4 62.8	54 10.9 -22.6 63.5	53 17.1 -21.9 64.0
17°	56 25.5 -26.3 59.8	55 33.4 -25.4 60.6	54 41.0 -24.6 61.2	53 48.3 -23.9 61.9	52 55.2 -23.0 62.5
18°	55 59.2 -27.5 58.2	55 08.0 -26.7 59.0	54 16.4 -25.8 59.7	53 24.4 -24.9 60.3	52 32.2 -24.2 61.0
19°	55 31.7 -28.8 56.6	54 41.3 -27.8 57.4	53 50.6 -27.0 58.1	52 59.5 -26.2 58.8	52 08.0 -25.4 59.5
20°	55 02.9 -29.8 55.1	54 13.5 -29.0 55.9	53 23.6 -28.1 56.6	52 33.3 -27.2 57.3	51 42.6 -26.4 58.0
21°	54 33.1 -31.0 53.6	53 44.5 -30.0 54.4	52 55.5 -29.1 55.1	52 06.1 -28.3 55.9	51 16.2 -27.4 56.6
22°	54 02.1 -32.0 52.1	53 14.5 -31.1 52.9	52 26.4 -30.2 53.7	51 37.8 -29.3 54.4	50 48.8 -28.4 55.1
23°	53 30.1 -33.0 50.7	52 43.4 -32.0 51.5	51 56.2 -31.1 52.3	51 08.5 -30.3 53.0	50 20.4 -29.5 53.8
24°	52 57.1 -33.9 49.3	52 11.4 -33.1 50.1	51 25.1 -32.2 50.9	50 38.2 -31.2 51.7	49 50.9 -30.3 52.4
25°	52 23.2 -34.9 47.9	51 38.3 -33.9 48.8	50 52.9 -33.0 49.6	50 07.0 -32.1 50.3	49 20.6 -31.3 51.1
26°	51 48.3 -35.7 46.6	51 04.4 -34.8 47.5	50 19.9 -33.9 48.3	49 34.9 -33.0 49.0	48 49.3 -32.1 49.8
27°	51 12.6 -36.6 45.3	50 29.6 -35.7 46.2	49 46.0 -34.7 47.0	49 01.9 -33.8 47.7	48 17.2 -32.9 48.5
28°	50 36.0 -37.4 44.1	49 53.9 -36.4 44.9	49 11.3 -35.5 45.7	48 28.1 -34.7 46.5	47 44.3 -33.7 47.2
29°	49 58.6 -38.1 42.8	49 17.5 -37.2 43.7	48 35.8 -36.3 44.5	47 53.4 -35.3 45.3	47 10.6 -34.6 46.0

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°	54 59.3 +01.0 91.4	53 59.3 +01.0 91.4	52 59.3 +01.1 91.3	51 59.3 +01.1 91.3	50 59.4 +01.0 91.2
1°	55 00.3 -00.4 89.7	54 00.3 -00.3 89.7	53 00.4 -00.4 89.7	52 00.4 -00.3 89.7	51 00.4 -00.3 89.6
2°	54 59.9 -01.9 87.9	54 00.0 -01.9 88.0	53 00.0 -01.7 88.0	52 00.1 -01.7 88.0	51 00.1 -01.6 88.1
3°	54 58.0 -03.4 86.2	53 58.1 -03.2 86.3	52 58.3 -03.1 86.3	51 58.4 -03.0 86.4	50 58.5 -02.8 86.5
4°	54 54.6 -04.9 84.5	53 54.9 -04.7 84.6	52 55.2 -04.5 84.7	51 55.4 -04.3 84.8	50 55.7 -04.2 84.9
5°	54 49.7 -06.3 82.7	53 50.2 -06.1 82.9	52 50.7 -05.9 83.0	51 51.1 -05.6 83.2	50 51.5 -05.4 83.3
6°	54 43.4 -07.9 81.0	53 44.1 -07.5 81.2	52 44.8 -07.2 81.4	51 45.5 -07.0 81.6	50 46.1 -06.7 81.7
7°	54 35.5 -09.2 79.3	53 36.6 -08.9 79.5	52 37.6 -08.6 79.7	51 38.5 -08.3 80.0	50 39.4 -07.9 80.2
8°	54 26.3 -10.7 77.6	53 27.7 -10.3 77.9	52 29.0 -09.9 78.1	51 30.2 -09.5 78.4	50 31.5 -09.2 78.6
9°	54 15.6 -12.1 75.9	53 17.4 -11.7 76.2	52 19.1 -11.3 76.5	51 20.7 -10.8 76.8	50 22.3 -10.5 77.0
10°	54 03.5 -13.5 74.2	53 05.7 -13.0 74.6	52 07.8 -12.5 74.9	51 09.9 -12.1 75.2	50 11.8 -11.6 75.5
11°	53 50.0 -14.8 72.6	52 52.7 -14.3 73.0	51 55.3 -13.8 73.3	50 57.8 -13.3 73.7	50 00.2 -12.8 74.0
12°	53 35.2 -16.1 70.9	52 38.4 -15.5 71.3	51 41.5 -15.0 71.7	50 44.5 -14.5 72.1	49 47.4 -14.1 72.5
13°	53 19.1 -17.5 69.3	52 22.9 -16.9 69.8	51 26.5 -16.3 70.2	50 30.0 -15.7 70.6	49 33.3 -15.1 71.0
14°	53 01.6 -18.7 67.7	52 06.0 -18.0 68.2	51 10.2 -17.4 68.6	50 14.3 -16.9 69.1	49 18.2 -16.3 69.5
15°	52 42.9 -19.9 66.1	51 48.0 -19.3 66.6	50 52.8 -18.7 67.1	49 57.4 -18.0 67.6	49 01.9 -17.4 68.0
16°	52 23.0 -21.1 64.6	51 28.7 -20.5 65.1	50 34.1 -19.7 65.6	49 39.4 -19.1 66.1	48 44.5 -18.5 66.5
17°	52 01.9 -22.4 63.1	51 08.2 -21.5 63.6	50 14.4 -20.9 64.1	49 20.3 -20.2 64.6	48 26.0 -19.6 65.1
18°	51 39.5 -23.4 61.6	50 46.7 -22.7 62.1	49 53.5 -22.0 62.7	49 00.1 -21.3 63.2	48 06.4 -20.6 63.7
19°	51 16.1 -24.5 60.1	50 24.0 -23.8 60.7	49 31.5 -23.0 61.2	48 38.8 -22.3 61.8	47 45.8 -21.6 62.3
20°	50 51.6 -25.6 58.6	50 00.2 -24.8 59.2	49 08.5 -24.1 59.8	48 16.5 -23.3 60.4	47 24.2 -22.6 60.9
21°	50 26.0 -26.6 57.2	49 35.4 -25.8 57.8	48 44.4 -25.0 58.4	47 53.2 -24.3 59.0	47 01.6 -23.5 59.5
22°	49 59.4 -27.6 55.8	49 09.6 -26.8 56.4	48 19.4 -26.0 57.1	47 28.9 -25.3 57.6	46 38.1 -24.5 58.2
23°	49 31.8 -28.6 54.4	48 42.8 -27.8 55.1	47 53.4 -27.0 55.7	47 03.6 -26.1 56.3	46 13.6 -25.4 56.9
24°	49 03.2 -29.5 53.1	48 15.0 -28.6 53.7	47 26.4 -27.8 54.4	46 37.5 -27.1 55.0	45 48.2 -26.3 55.6
25°	48 33.7 -30.4 51.8	47 46.4 -29.6 52.4	46 58.6 -28.7 53.1	46 10.4 -27.9 53.7	45 21.9 -27.1 54.3
26°	48 03.3 -31.2 50.5	47 16.8 -30.4 51.1	46 29.9 -29.6 51.8	45 42.5 -28.7 52.4	44 54.8 -27.9 53.0
27°	47 32.1 -32.1 49.2	46 46.4 -31.2 49.9	46 00.3 -30.4 50.5	45 13.8 -29.6 51.2	44 26.9 -28.8 51.8
28°	47 00.0 -32.9 48.0	46 15.2 -32.0 48.6	45 29.9 -31.1 49.3	44 44.2 -30.3 49.9	43 58.1 -29.5 50.5
29°	46 27.1 -33.6 46.7	45 43.2 -32.8 47.4	44 58.8 -31.9 48.1	44 13.9 -31.1 48.7	43 28.6 -30.2 49.3

Declination SAME name as Latitude

Latitude 1°

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°	49 59.4 +01.0 91.2	48 59.4 +01.0 91.2	47 59.4 +01.0 91.1	46 59.4 +01.0 91.1	45 59.5 +00.9 91.0
1°	50 00.4 -00.3 89.6	49 00.4 -00.2 89.6	48 00.4 -00.2 89.6	47 00.4 -00.1 89.6	46 00.4 -00.1 89.6
2°	50 00.1 -01.5 88.1	49 00.2 -01.4 88.1	48 00.2 -01.3 88.1	47 00.3 -01.3 88.1	46 00.3 -01.2 88.2
3°	49 58.6 -02.7 86.5	48 58.8 -02.7 86.6	47 58.9 -02.5 86.6	46 59.0 -02.4 86.7	45 59.1 -02.3 86.7
4°	49 55.9 -04.0 85.0	48 56.1 -03.8 85.1	47 56.4 -03.7 85.1	46 56.6 -03.5 85.2	45 56.8 -03.4 85.3
5°	49 51.9 -05.2 83.4	48 52.3 -05.0 83.5	47 52.7 -04.8 83.6	46 53.1 -04.6 83.7	45 53.4 -04.4 83.8
6°	49 46.7 -06.4 81.9	48 47.3 -06.2 82.0	47 47.9 -06.0 82.2	46 48.5 -05.8 82.3	45 49.0 -05.5 82.4
7°	49 40.3 -07.7 80.3	48 41.1 -07.3 80.5	47 41.9 -07.1 80.7	46 42.7 -06.8 80.8	45 43.5 -06.6 81.0
8°	49 32.6 -08.8 78.8	48 33.8 -08.6 79.0	47 34.8 -08.2 79.2	46 35.9 -07.9 79.4	45 36.9 -07.6 79.6
9°	49 23.8 -10.1 77.3	48 25.2 -09.7 77.5	47 26.6 -09.3 77.7	46 28.0 -09.0 77.9	45 29.3 -08.7 78.1
10°	49 13.7 -11.2 75.8	48 15.5 -10.8 76.0	47 17.3 -10.5 76.3	46 19.0 -10.1 76.5	45 20.6 -09.7 76.7
11°	49 02.5 -12.4 74.3	48 04.7 -11.9 74.6	47 06.8 -11.5 74.8	46 08.9 -11.1 75.1	45 10.9 -10.7 75.3
12°	48 50.1 -13.5 72.8	47 52.8 -13.1 73.1	46 55.3 -12.6 73.4	45 57.8 -12.2 73.7	45 00.2 -11.8 73.9
13°	48 36.6 -14.7 71.3	47 39.7 -14.2 71.6	46 42.7 -13.7 72.0	45 45.6 -13.2 72.3	44 48.4 -12.7 72.6
14°	48 21.9 -15.7 69.8	47 25.5 -15.2 70.2	46 29.0 -14.7 70.5	45 32.4 -14.2 70.9	44 35.7 -13.7 71.2
15°	48 06.2 -16.9 68.4	47 10.3 -16.2 68.8	46 14.3 -15.7 69.1	45 18.2 -15.2 69.5	44 22.0 -14.7 69.8
16°	47 49.3 -17.8 67.0	46 54.1 -17.3 67.4	45 58.6 -16.7 67.8	45 03.0 -16.2 68.1	44 07.3 -15.7 68.5
17°	47 31.5 -19.0 65.5	46 36.8 -18.4 66.0	45 41.9 -17.7 66.4	44 46.8 -17.1 66.8	43 51.6 -16.5 67.1
18°	47 12.5 -19.9 64.1	46 18.4 -19.3 64.6	45 24.2 -18.7 65.0	44 29.7 -18.1 65.4	43 35.1 -17.5 65.8
19°	46 52.6 -20.9 62.8	45 59.1 -20.2 63.2	45 05.5 -19.6 63.7	44 11.6 -19.0 64.1	43 17.6 -18.4 64.5
20°	46 31.7 -21.9 61.4	45 38.9 -21.2 61.9	44 45.9 -20.6 62.3	43 52.6 -19.9 62.8	42 59.2 -19.3 63.2
21°	46 09.8 -22.9 60.0	45 17.7 -22.2 60.5	44 25.3 -21.4 61.0	43 32.7 -20.8 61.5	42 39.9 -20.1 61.9
22°	45 46.9 -23.7 58.7	44 55.5 -23.0 59.2	44 03.9 -22.4 59.7	43 11.9 -21.6 60.2	42 19.8 -21.0 60.6
23°	45 23.2 -24.7 57.4	44 32.5 -23.9 57.9	43 41.5 -23.2 58.4	42 50.3 -22.5 58.9	41 58.8 -21.8 59.3
24°	44 58.5 -25.4 56.1	44 08.6 -24.8 56.6	43 18.3 -24.0 57.1	42 27.8 -23.3 57.6	41 37.0 -22.6 58.1
25°	44 33.1 -26.4 54.8	43 43.8 -25.5 55.4	42 54.3 -24.8 55.9	42 04.5 -24.1 56.4	41 14.4 -23.4 56.9
26°	44 06.7 -27.1 53.6	43 18.3 -26.4 54.1	42 29.5 -25.6 54.6	41 40.4 -24.9 55.1	40 51.0 -24.1 55.6
27°	43 39.6 -28.0 52.3	42 51.9 -27.2 52.9	42 03.9 -26.4 53.4	41 15.5 -25.6 53.9	40 26.9 -24.9 54.4
28°	43 11.6 -28.7 51.1	42 24.7 -27.9 51.7	41 37.5 -27.1 52.2	40 49.9 -26.4 52.7	40 02.0 -25.6 53.2
29°	42 42.9 -29.4 49.9	41 56.8 -28.6 50.5	41 10.4 -27.9 51.0	40 23.5 -27.0 51.6	39 36.4 -26.3 52.1

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 59.5 +00.9 91.0	43 59.5 +00.9 91.0	42 59.5 +01.0 90.9	41 59.5 +01.0 90.9	40 59.5 +01.0 90.9
1°	45 00.4 -00.1 89.6	44 00.4 +00.0 89.6	43 00.5 -00.1 89.6	42 00.5 +00.0 89.6	41 00.5 +00.0 89.5
2°	45 00.3 -01.1 88.2	44 00.4 -01.1 88.2	43 00.4 -01.0 88.2	42 00.5 -01.0 88.2	41 00.5 -00.9 88.2
3°	44 59.2 -02.2 86.8	43 59.3 -02.1 86.8	42 59.4 -02.0 86.8	41 59.5 -01.9 86.9	40 59.6 -01.8 86.9
4°	44 57.0 -03.2 85.3	43 57.2 -03.1 85.4	42 57.4 -02.9 85.5	41 57.6 -02.8 85.5	40 57.8 -02.7 85.6
5°	44 53.8 -04.3 83.9	43 54.1 -04.1 84.0	42 54.5 -04.0 84.1	41 54.8 -03.8 84.2	40 55.1 -03.6 84.2
6°	44 49.5 -05.3 82.5	43 50.0 -05.1 82.6	42 50.5 -04.9 82.7	41 51.0 -04.7 82.8	40 51.5 -04.5 82.9
7°	44 44.2 -06.3 81.1	43 44.9 -06.0 81.3	42 45.6 -05.8 81.4	41 46.3 -05.6 81.5	40 47.0 -05.4 81.6
8°	44 37.9 -07.3 79.7	43 38.9 -07.1 79.9	42 39.8 -06.8 80.0	41 40.7 -06.6 80.2	40 41.6 -06.3 80.3
9°	44 30.6 -08.4 78.3	43 31.8 -08.1 78.5	42 33.0 -07.8 78.7	41 34.1 -07.4 78.8	40 35.3 -07.2 79.0
10°	44 22.2 -09.4 76.9	43 23.7 -09.0 77.1	42 25.2 -08.7 77.3	41 26.7 -08.4 77.5	40 28.1 -08.1 77.7
11°	44 12.8 -10.3 75.6	43 14.7 -10.0 75.8	42 16.5 -09.6 76.0	41 18.3 -09.3 76.2	40 20.0 -08.9 76.4
12°	44 02.5 -11.3 74.2	43 04.7 -10.9 74.4	42 06.9 -10.5 74.7	41 09.0 -10.1 74.9	40 11.1 -09.8 75.1
13°	43 51.2 -12.3 72.8	42 53.8 -11.9 73.1	41 56.4 -11.5 73.3	40 58.9 -11.1 73.6	40 01.3 -10.7 73.8
14°	43 38.9 -13.3 71.5	42 41.9 -12.8 71.8	41 44.9 -12.3 72.0	40 47.8 -11.9 72.3	39 50.6 -11.5 72.5
15°	43 25.6 -14.2 70.1	42 29.1 -13.7 70.4	41 32.6 -13.3 70.7	40 35.9 -12.8 71.0	39 39.1 -12.3 71.2
16°	43 11.4 -15.1 68.8	42 15.4 -14.6 69.1	41 19.3 -14.1 69.4	40 23.1 -13.6 69.7	39 26.8 -13.2 70.0
17°	42 56.3 -16.0 67.5	42 00.8 -15.5 67.8	41 05.2 -15.0 68.1	40 09.5 -14.5 68.4	39 13.6 -13.9 68.7
18°	42 40.3 -17.0 66.2	41 45.3 -16.3 66.5	40 50.2 -15.8 66.8	39 55.0 -15.3 67.1	38 59.7 -14.8 67.4
19°	42 23.3 -17.7 64.9	41 29.0 -17.2 65.2	40 34.4 -16.6 65.6	39 39.7 -16.1 65.9	38 44.9 -15.5 66.2
20°	42 05.6 -18.7 63.6	41 11.8 -18.1 63.9	40 17.8 -17.5 64.3	39 23.6 -16.8 64.6	38 29.4 -16.4 65.0
21°	41 46.9 -19.5 62.3	40 53.7 -18.9 62.7	40 00.3 -18.2 63.0	39 06.8 -17.7 63.4	38 13.0 -17.1 63.7
22°	41 27.4 -20.3 61.0	40 34.8 -19.6 61.4	39 42.1 -19.1 61.8	38 49.1 -18.4 62.2	37 55.9 -17.8 62.5
23°	41 07.1 -21.1 59.8	40 15.2 -20.5 60.2	39 23.0 -19.8 60.6	38 30.7 -19.2 61.0	37 38.1 -18.6 61.3
24°	40 46.0 -21.9 58.5	39 54.7 -21.2 59.0	39 03.2 -20.6 59.4	38 11.5 -20.0 59.7	37 19.5 -19.2 60.1
25°	40 24.1 -22.7 57.3	39 33.5 -22.0 57.7	38 42.6 -21.3 58.2	37 51.5 -20.6 58.5	37 00.3 -20.0 58.9
26°	40 01.4 -23.4 56.1	39 11.5 -22.7 56.5	38 21.3 -22.0 57.0	37 30.9 -21.3 57.4	36 40.3 -20.7 57.7
27°	39 38.0 -24.2 54.9	38 48.8 -23.5 55.3	37 59.3 -22.8 55.8	37 09.6 -22.1 56.2	36 19.6 -21.4 56.6
28°	39 13.8 -24.9 53.7	38 25.3 -24.1 54.2	37 36.5 -23.4 54.6	36 47.5 -22.7 55.0	35 58.2 -22.0 55.4
29°	38 48.9 -25.5 52.5	38 01.2 -24.8 53.0	37 13.1 -24.1 53.4	36 24.8 -23.4 53.9	35 36.2 -22.6 54.3

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Latitude 1°

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 59.6 +00.9 90.8	38 59.6 +00.9 90.8	37 59.6 +00.9 90.8	36 59.6 +00.9 90.8	35 59.6 +00.9 90.7
1°	40 00.5 +00.0 89.5	39 00.5 +00.1 89.5	38 00.5 +00.1 89.5	37 00.5 +00.1 89.5	36 00.5 +00.2 89.5
2°	40 00.5 -00.8 88.2	39 00.6 -00.8 88.2	38 00.6 -00.7 88.2	37 00.6 -00.6 88.2	36 00.7 -00.6 88.3
3°	39 59.7 -01.7 86.9	38 59.8 -01.6 86.9	37 59.9 -01.5 87.0	37 00.0 -01.5 87.0	36 00.1 -01.4 87.0
4°	39 58.0 -02.6 85.6	38 58.2 -02.5 85.7	37 58.4 -02.4 85.7	36 58.5 -02.2 85.7	35 58.7 -02.1 85.8
5°	39 55.4 -03.4 84.3	38 55.7 -03.3 84.4	37 56.0 -03.2 84.4	36 56.3 -03.0 84.5	35 56.6 -02.9 84.5
6°	39 52.0 -04.4 83.0	38 52.4 -04.1 83.1	37 52.8 -03.9 83.2	36 53.3 -03.8 83.2	35 53.7 -03.6 83.3
7°	39 47.6 -05.2 81.7	38 48.3 -05.0 81.8	37 48.9 -04.8 81.9	36 49.5 -04.6 82.0	35 50.1 -04.4 82.1
8°	39 42.4 -06.0 80.4	38 43.3 -05.9 80.5	37 44.1 -05.6 80.6	36 44.9 -05.4 80.8	35 45.7 -05.2 80.9
9°	39 36.4 -06.9 79.1	38 37.4 -06.6 79.3	37 38.5 -06.4 79.4	36 39.5 -06.1 79.5	35 40.5 -05.9 79.6
10°	39 29.5 -07.8 77.8	38 30.8 -07.5 78.0	37 32.1 -07.2 78.1	36 33.4 -06.9 78.3	35 34.6 -06.6 78.4
11°	39 21.7 -08.6 76.6	38 23.3 -08.3 76.7	37 24.9 -08.0 76.9	36 26.5 -07.7 77.0	35 28.0 -07.4 77.2
12°	39 13.1 -09.5 75.3	38 15.0 -09.1 75.5	37 16.9 -08.7 75.6	36 18.8 -08.4 75.8	35 20.6 -08.1 76.0
13°	39 03.6 -10.2 74.0	38 05.9 -09.8 74.2	37 08.2 -09.5 74.4	36 10.4 -09.2 74.6	35 12.5 -08.8 74.7
14°	38 53.4 -11.1 72.7	37 56.1 -10.7 73.0	36 58.7 -10.3 73.2	36 01.2 -09.9 73.4	35 03.7 -09.5 73.5
15°	38 42.3 -11.9 71.5	37 45.4 -11.5 71.7	36 48.4 -11.1 71.9	35 51.3 -10.6 72.1	34 54.2 -10.3 72.3
16°	38 30.4 -12.7 70.2	37 33.9 -12.2 70.5	36 37.3 -11.8 70.7	35 40.7 -11.4 70.9	34 43.9 -10.9 71.1
17°	38 17.7 -13.5 69.0	37 21.7 -13.1 69.2	36 25.5 -12.5 69.5	35 29.3 -12.1 69.7	34 33.0 -11.7 69.9
18°	38 04.2 -14.2 67.7	37 08.6 -13.7 68.0	36 13.0 -13.3 68.3	35 17.2 -12.8 68.5	34 21.3 -12.3 68.7
19°	37 50.0 -15.1 66.5	36 54.9 -14.5 66.8	35 59.7 -14.0 67.1	35 04.4 -13.5 67.3	34 09.0 -13.0 67.6
20°	37 34.9 -15.7 65.3	36 40.4 -15.3 65.6	35 45.7 -14.7 65.9	34 50.9 -14.2 66.1	33 56.0 -13.7 66.4
21°	37 19.2 -16.6 64.1	36 25.1 -15.9 64.4	35 31.0 -15.4 64.7	34 36.7 -14.9 64.9	33 42.3 -14.3 65.2
22°	37 02.6 -17.2 62.9	36 09.2 -16.7 63.2	35 15.6 -16.1 63.5	34 21.8 -15.5 63.8	33 28.0 -15.0 64.1
23°	36 45.4 -18.0 61.7	35 52.5 -17.3 62.0	34 59.5 -16.8 62.3	34 06.3 -16.2 62.6	33 13.0 -15.7 62.9
24°	36 27.4 -18.6 60.5	35 35.2 -18.1 60.8	34 42.7 -17.4 61.1	33 50.1 -16.9 61.4	32 57.3 -16.2 61.7
25°	36 08.8 -19.4 59.3	35 17.1 -18.7 59.6	34 25.3 -18.1 60.0	33 33.2 -17.4 60.3	32 41.1 -16.9 60.6
26°	35 49.4 -20.0 58.1	34 58.4 -19.4 58.5	34 07.2 -18.8 58.8	33 15.8 -18.2 59.1	32 24.2 -17.5 59.5
27°	35 29.4 -20.7 57.0	34 39.0 -20.0 57.3	33 48.4 -19.3 57.7	32 57.6 -18.7 58.0	32 06.7 -18.1 58.3
28°	35 08.7 -21.3 55.8	34 19.0 -20.7 56.2	33 29.1 -20.0 56.5	32 38.9 -19.3 56.9	31 48.6 -18.7 57.2
29°	34 47.4 -22.0 54.7	33 58.3 -21.2 55.0	33 09.1 -20.6 55.4	32 19.6 -19.9 55.8	31 29.9 -19.3 56.1

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°	34 59.6 +00.9 90.7	33 59.6 +01.0 90.7	32 59.7 +00.9 90.6	31 59.7 +00.9 90.6	30 59.7 +00.9 90.6
1°	35 00.5 +00.2 89.5	34 00.6 +00.2 89.5	33 00.6 +00.2 89.5	32 00.6 +00.2 89.4	31 00.6 +00.3 89.4
2°	35 00.7 -00.5 88.3	34 00.8 -00.5 88.3	33 00.8 -00.5 88.3	32 00.8 -00.4 88.3	31 00.9 -00.4 88.3
3°	35 00.2 -01.3 87.0	34 00.3 -01.3 87.1	33 00.3 -01.1 87.1	32 00.4 -01.0 87.1	31 00.5 -01.0 87.1
4°	34 58.9 -02.0 85.8	33 59.0 -01.9 85.8	32 59.2 -01.8 85.9	31 59.4 -01.7 85.9	30 59.5 -01.6 85.9
5°	34 56.9 -02.8 84.6	33 57.1 -02.6 84.6	32 57.4 -02.5 84.7	31 57.7 -02.4 84.7	30 57.9 -02.2 84.8
6°	34 54.1 -03.5 83.4	33 54.5 -03.3 83.4	32 54.9 -03.2 83.5	31 55.3 -03.0 83.6	30 55.7 -02.9 83.6
7°	34 50.6 -04.2 82.2	33 51.2 -04.0 82.2	32 51.7 -03.8 82.3	31 52.3 -03.7 82.4	30 52.8 -03.5 82.4
8°	34 46.4 -04.9 80.9	33 47.2 -04.7 81.0	32 47.9 -04.5 81.1	31 48.6 -04.3 81.2	30 49.3 -04.1 81.3
9°	34 41.5 -05.7 79.7	33 42.5 -05.5 79.8	32 43.4 -05.2 79.9	31 44.3 -04.9 80.0	30 45.2 -04.7 80.1
10°	34 35.8 -06.3 78.5	33 37.0 -06.1 78.6	32 38.2 -05.8 78.8	31 39.4 -05.6 78.9	30 40.5 -05.4 79.0
11°	34 29.5 -07.1 77.3	33 30.9 -06.7 77.4	32 32.4 -06.5 77.6	31 33.8 -06.3 77.7	30 35.1 -05.9 77.8
12°	34 22.4 -07.8 76.1	33 24.2 -07.5 76.3	32 25.9 -07.2 76.4	31 27.5 -06.8 76.5	30 29.2 -06.6 76.6
13°	34 14.6 -08.4 74.9	33 16.7 -08.2 75.1	32 18.7 -07.8 75.2	31 20.7 -07.5 75.4	30 22.6 -07.2 75.5
14°	34 06.2 -09.2 73.7	33 08.5 -08.8 73.9	32 10.9 -08.5 74.0	31 13.2 -08.1 74.2	30 15.4 -07.7 74.3
15°	33 57.0 -09.9 72.5	32 59.7 -09.4 72.7	32 02.4 -09.1 72.9	31 05.1 -08.8 73.0	30 07.7 -08.4 73.2
16°	33 47.1 -10.5 71.3	32 50.3 -10.2 71.5	31 53.3 -09.7 71.7	30 56.3 -09.3 71.9	29 59.3 -09.0 72.0
17°	33 36.6 -11.2 70.2	32 40.1 -10.8 70.4	31 43.6 -10.4 70.5	30 47.0 -10.0 70.7	29 50.3 -09.5 70.9
18°	33 25.4 -11.9 69.0	32 29.3 -11.4 69.2	31 33.2 -11.0 69.4	30 37.0 -10.5 69.6	29 40.8 -10.2 69.8
19°	33 13.5 -12.5 67.8	32 17.9 -12.1 68.0	31 22.2 -11.6 68.2	30 26.5 -11.2 68.4	29 30.6 -10.7 68.6
20°	33 01.0 -13.2 66.6	32 05.8 -12.7 66.9	31 10.6 -12.2 67.1	30 15.3 -11.7 67.3	29 19.9 -11.2 67.5
21°	32 47.8 -13.9 65.5	31 53.1 -13.3 65.7	30 58.4 -12.8 65.9	30 03.6 -12.3 66.2	29 08.7 -11.9 66.4
22°	32 33.9 -14.4 64.3	31 39.8 -13.9 64.6	30 45.6 -13.4 64.8	29 51.3 -12.9 65.0	28 56.8 -12.4 65.3
23°	32 19.5 -15.1 63.2	31 25.9 -14.5 63.4	30 32.2 -14.0 63.7	29 38.4 -13.5 63.9	28 44.4 -12.9 64.1
24°	32 04.4 -15.7 62.0	31 11.4 -15.2 62.3	30 18.2 -14.6 62.5	29 24.9 -14.0 62.8	28 31.5 -13.5 63.0
25°	31 48.7 -16.3 60.9	30 56.2 -15.7 61.2	30 03.6 -15.1 61.4	29 10.9 -14.6 61.7	28 18.0 -14.0 61.9
26°	31 32.4 -16.9 59.8	30 40.5 -16.3 60.0	29 48.5 -15.7 60.3	28 56.3 -15.1 60.6	28 04.0 -14.6 60.8
27°	31 15.5 -17.4 58.6	30 24.2 -16.8 58.9	29 32.8 -16.3 59.2	28 41.2 -15.7 59.5	27 49.4 -15.0 59.7
28°	30 58.1 -18.1 57.5	30 07.4 -17.4 57.8	29 16.5 -16.8 58.1	28 25.5 -16.2 58.4	27 34.4 -15.6 58.6
29°	30 40.0 -18.6 56.4	29 50.0 -18.0 56.7	28 59.7 -17.3 57.0	28 09.3 -16.7 57.3	27 18.8 -16.1 57.5

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Latitude 1°

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 59.7 +00.9 90.6	28 59.7 +00.9 90.6	27 59.7 +00.9 90.5	26 59.7 +00.9 90.5	25 59.7 +01.0 90.5
1°	30 00.6 +00.3 89.4	29 00.6 +00.3 89.4	28 00.6 +00.4 89.4	27 00.6 +00.4 89.4	26 00.7 +00.4 89.4
2°	30 00.9 -00.3 88.3	29 00.9 -00.2 88.3	28 01.0 -00.2 88.3	27 01.0 -00.1 88.3	26 01.1 -00.2 88.3
3°	30 00.6 -00.9 87.1	29 00.7 -00.8 87.1	28 00.8 -00.8 87.1	27 00.9 -00.7 87.1	26 00.9 -00.6 87.1
4°	29 59.7 -01.5 86.0	28 59.9 -01.5 86.0	28 00.0 -01.3 86.0	27 00.2 -01.3 86.0	26 00.3 -01.1 86.0
5°	29 58.2 -02.1 84.8	28 58.4 -02.0 84.8	27 58.7 -01.9 84.9	26 58.9 -01.7 84.9	25 59.2 -01.7 84.9
6°	29 56.1 -02.7 83.7	28 56.4 -02.5 83.7	27 56.8 -02.4 83.7	26 57.2 -02.3 83.8	25 57.5 -02.1 83.8
7°	29 53.4 -03.4 82.5	28 53.9 -03.2 82.6	27 54.4 -03.0 82.6	26 54.9 -02.8 82.7	25 55.4 -02.7 82.7
8°	29 50.0 -03.9 81.3	28 50.7 -03.7 81.4	27 51.4 -03.5 81.5	26 52.1 -03.4 81.5	25 52.7 -03.1 81.6
9°	29 46.1 -04.5 80.2	28 47.0 -04.3 80.3	27 47.9 -04.1 80.3	26 48.7 -03.9 80.4	25 49.6 -03.7 80.5
10°	29 41.6 -05.1 79.0	28 42.7 -04.9 79.1	27 43.8 -04.7 79.2	26 44.8 -04.4 79.3	25 45.9 -04.2 79.4
11°	29 36.5 -05.7 77.9	28 37.8 -05.4 78.0	27 39.1 -05.1 78.1	26 40.4 -04.9 78.2	25 41.7 -04.7 78.3
12°	29 30.8 -06.3 76.8	28 32.4 -06.0 76.9	27 34.0 -05.8 77.0	26 35.5 -05.4 77.1	25 37.0 -05.2 77.2
13°	29 24.5 -06.8 75.6	28 26.4 -06.6 75.7	27 28.2 -06.2 75.8	26 30.1 -06.0 76.0	25 31.8 -05.6 76.1
14°	29 17.7 -07.5 74.5	28 19.8 -07.1 74.6	27 22.0 -06.8 74.7	26 24.1 -06.5 74.8	25 26.2 -06.2 75.0
15°	29 10.2 -08.0 73.3	28 12.7 -07.6 73.5	27 15.2 -07.3 73.6	26 17.6 -07.0 73.7	25 20.0 -06.6 73.9
16°	29 02.2 -08.6 72.2	28 05.1 -08.3 72.4	27 07.9 -07.9 72.5	26 10.6 -07.5 72.6	25 13.4 -07.2 72.8
17°	28 53.6 -09.1 71.1	27 56.8 -08.7 71.2	27 00.0 -08.4 71.4	26 03.1 -08.0 71.5	25 06.2 -07.6 71.7
18°	28 44.5 -09.8 69.9	27 48.1 -09.3 70.1	26 51.6 -08.9 70.3	25 55.1 -08.5 70.4	24 58.6 -08.1 70.6
19°	28 34.7 -10.2 68.8	27 38.8 -09.9 69.0	26 42.7 -09.4 69.2	25 46.6 -09.0 69.3	24 50.5 -08.6 69.5
20°	28 24.5 -10.9 67.7	27 28.9 -10.3 67.9	26 33.3 -09.9 68.1	25 37.6 -09.4 68.2	24 41.9 -09.1 68.4
21°	28 13.6 -11.3 66.6	27 18.6 -10.9 66.8	26 23.4 -10.4 67.0	25 28.2 -10.0 67.1	24 32.8 -09.5 67.3
22°	28 02.3 -11.9 65.5	27 07.7 -11.4 65.7	26 13.0 -11.0 65.9	25 18.2 -10.5 66.0	24 23.3 -10.0 66.2
23°	27 50.4 -12.4 64.4	26 56.3 -12.0 64.6	26 02.0 -11.4 64.8	25 07.7 -10.9 64.9	24 13.3 -10.4 65.1
24°	27 38.0 -13.0 63.3	26 44.3 -12.4 63.5	25 50.6 -11.9 63.7	24 56.8 -11.4 63.9	24 02.9 -10.9 64.0
25°	27 25.0 -13.5 62.2	26 31.9 -12.9 62.4	25 38.7 -12.4 62.6	24 45.4 -11.9 62.8	23 52.0 -11.3 63.0
26°	27 11.5 -13.9 61.1	26 19.0 -13.4 61.3	25 26.3 -12.8 61.5	24 33.5 -12.3 61.7	23 40.7 -11.8 61.9
27°	26 57.6 -14.5 60.0	26 05.6 -13.9 60.2	25 13.5 -13.4 60.4	24 21.2 -12.7 60.6	23 28.9 -12.2 60.8
28°	26 43.1 -15.0 58.9	25 51.7 -14.4 59.1	25 00.1 -13.8 59.3	24 08.5 -13.3 59.6	23 16.7 -12.7 59.8
29°	26 28.1 -15.5 57.8	25 37.3 -14.9 58.0	24 46.3 -14.2 58.3	23 55.2 -13.6 58.5	23 04.0 -13.0 58.7

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 59.8 +00.9 90.5	23 59.8 +00.9 90.4	22 59.8 +00.9 90.4	21 59.8 +00.9 90.4	20 59.8 +00.9 90.4
1°	25 00.7 +00.4 89.4	24 00.7 +00.4 89.4	23 00.7 +00.5 89.3	22 00.7 +00.5 89.3	21 00.7 +00.5 89.3
2°	25 01.1 -00.1 88.3	24 01.1 +00.0 88.3	23 01.2 +00.0 88.3	22 01.2 +00.1 88.2	21 01.2 +00.2 88.2
3°	25 01.0 -00.5 87.2	24 01.1 -00.5 87.2	23 01.2 -00.4 87.2	22 01.3 -00.4 87.2	21 01.4 -00.3 87.2
4°	25 00.5 -01.1 86.1	24 00.6 -00.9 86.1	23 00.8 -00.9 86.1	22 00.9 -00.8 86.1	21 01.1 -00.7 86.1
5°	24 59.4 -01.5 84.9	23 59.7 -01.5 85.0	22 59.9 -01.3 85.0	22 00.1 -01.2 85.0	21 00.4 -01.1 85.0
6°	24 57.9 -02.0 83.8	23 58.2 -01.8 83.9	22 58.6 -01.8 83.9	21 58.9 -01.6 83.9	20 59.3 -01.5 84.0
7°	24 55.9 -02.5 82.7	23 56.4 -02.4 82.8	22 56.8 -02.1 82.8	21 57.3 -02.0 82.9	20 57.8 -01.9 82.9
8°	24 53.4 -03.0 81.6	23 54.0 -02.8 81.7	22 54.7 -02.7 81.7	21 55.3 -02.5 81.8	20 55.9 -02.3 81.8
9°	24 50.4 -03.5 80.5	23 51.2 -03.3 80.6	22 52.0 -03.1 80.7	21 52.8 -02.9 80.7	20 53.6 -02.7 80.7
10°	24 46.9 -03.9 79.4	23 47.9 -03.7 79.5	22 48.9 -03.5 79.6	21 49.9 -03.3 79.6	20 50.9 -03.1 79.7
11°	24 43.0 -04.5 78.3	23 44.2 -04.2 78.4	22 45.4 -03.9 78.5	21 46.6 -03.7 78.5	20 47.8 -03.5 78.6
12°	24 38.5 -04.9 77.2	23 40.0 -04.6 77.3	22 41.5 -04.4 77.4	21 42.9 -04.1 77.5	20 44.3 -03.8 77.5
13°	24 33.6 -05.4 76.1	23 35.4 -05.1 76.2	22 37.1 -04.8 76.3	21 38.8 -04.6 76.4	20 40.5 -04.3 76.5
14°	24 28.2 -05.8 75.1	23 30.3 -05.6 75.2	22 32.3 -05.3 75.2	21 34.2 -04.9 75.3	20 36.2 -04.7 75.4
15°	24 22.4 -06.4 74.0	23 24.7 -06.0 74.1	22 27.0 -05.7 74.2	21 29.3 -05.4 74.3	20 31.5 -05.0 74.3
16°	24 16.0 -06.8 72.9	23 18.7 -06.5 73.0	22 21.3 -06.1 73.1	21 23.9 -05.8 73.2	20 26.5 -05.5 73.3
17°	24 09.2 -07.2 71.8	23 12.2 -06.8 71.9	22 15.2 -06.5 72.0	21 18.1 -06.2 72.1	20 21.0 -05.8 72.2
18°	24 02.0 -07.7 70.7	23 05.4 -07.4 70.8	22 08.7 -07.0 70.9	21 11.9 -06.5 71.1	20 15.2 -06.2 71.2
19°	23 54.3 -08.2 69.6	22 58.0 -07.8 69.7	22 01.7 -07.4 69.9	21 05.4 -07.0 70.0	20 09.0 -06.6 70.1
20°	23 46.1 -08.6 68.5	22 50.2 -08.2 68.7	21 54.3 -07.7 68.8	20 58.4 -07.4 68.9	20 02.4 -07.0 69.0
21°	23 37.5 -09.1 67.4	22 42.0 -08.6 67.6	21 46.6 -08.2 67.7	20 51.0 -07.8 67.9	19 55.4 -07.3 68.0
22°	23 28.4 -09.5 66.4	22 33.4 -09.0 66.5	21 38.4 -08.6 66.7	20 43.2 -08.1 66.8	19 48.1 -07.7 66.9
23°	23 18.9 -10.0 65.3	22 24.4 -09.5 65.4	21 29.8 -09.1 65.6	20 35.1 -08.6 65.7	19 40.4 -08.1 65.9
24°	23 08.9 -10.4 64.2	22 14.9 -09.9 64.4	21 20.7 -09.4 64.5	20 26.5 -08.9 64.7	19 32.3 -08.5 64.8
25°	22 58.5 -10.8 63.1	22 05.0 -10.3 63.3	21 11.3 -09.8 63.5	20 17.6 -09.3 63.6	19 23.8 -08.8 63.8
26°	22 47.7 -11.2 62.1	21 54.7 -10.8 62.3	21 01.5 -10.2 62.4	20 08.3 -09.7 62.6	19 15.0 -09.1 62.7
27°	22 36.5 -11.7 61.0	21 43.9 -11.1 61.2	20 51.3 -10.5 61.4	19 58.6 -10.0 61.5	19 05.9 -09.5 61.7
28°	22 24.8 -12.1 60.0	21 32.8 -11.5 60.1	20 40.8 -11.0 60.3	19 48.6 -10.4 60.5	18 56.4 -09.9 60.6
29°	22 12.7 -12.5 58.9	21 21.3 -11.9 59.1	20 29.8 -11.4 59.3	19 38.2 -10.8 59.4	18 46.5 -10.2 59.6

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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 59.8 +00.9 90.4	18 59.8 +00.9 90.3	17 59.8 +01.0 90.3	16 59.8 +01.0 90.3	15 59.8 +01.0 90.3
1°	20 00.7 +00.6 89.3	19 00.7 +00.6 89.3	18 00.8 +00.6 89.3	17 00.8 +00.6 89.3	16 00.8 +00.6 89.2
2°	20 01.3 +00.1 88.2	19 01.3 +00.2 88.2	18 01.4 +00.2 88.2	17 01.4 +00.3 88.2	16 01.4 +00.4 88.2
3°	20 01.4 -00.2 87.2	19 01.5 -00.1 87.2	18 01.6 -00.1 87.2	17 01.7 +00.0 87.2	16 01.8 +00.0 87.2
4°	20 01.2 -00.6 86.1	19 01.4 -00.6 86.1	18 01.5 -00.4 86.1	17 01.7 -00.4 86.1	16 01.8 -00.3 86.1
5°	20 00.6 -01.0 85.0	19 00.8 -00.8 85.1	18 01.1 -00.8 85.1	17 01.3 -00.7 85.1	16 01.5 -00.5 85.1
6°	19 59.6 -01.3 84.0	19 00.0 -01.3 84.0	18 00.3 -01.1 84.0	17 00.6 -00.9 84.0	16 01.0 -00.9 84.0
7°	19 58.3 -01.8 82.9	18 58.7 -01.6 82.9	17 59.2 -01.5 83.0	16 59.7 -01.4 83.0	16 00.1 -01.2 83.0
8°	19 56.5 -02.1 81.9	18 57.1 -01.9 81.9	17 57.7 -01.8 81.9	16 58.3 -01.6 81.9	15 58.9 -01.4 82.0
9°	19 54.4 -02.5 80.8	18 55.2 -02.3 80.8	17 55.9 -02.1 80.9	16 56.7 -01.9 80.9	15 57.5 -01.8 80.9
10°	19 51.9 -02.9 79.7	18 52.9 -02.7 79.8	17 53.8 -02.4 79.8	16 54.8 -02.3 79.9	15 55.7 -02.0 79.9
11°	19 49.0 -03.2 78.7	18 50.2 -03.0 78.7	17 51.4 -02.9 78.8	16 52.5 -02.6 78.8	15 53.7 -02.4 78.8
12°	19 45.8 -03.7 77.6	18 47.2 -03.4 77.7	17 48.5 -03.1 77.7	16 49.9 -02.9 77.8	15 51.3 -02.7 77.8
13°	19 42.1 -04.0 76.5	18 43.8 -03.8 76.6	17 45.4 -03.5 76.7	16 47.0 -03.2 76.7	15 48.6 -02.9 76.8
14°	19 38.1 -04.4 75.5	18 40.0 -04.1 75.6	17 41.9 -03.8 75.6	16 43.8 -03.5 75.7	15 45.7 -03.3 75.7
15°	19 33.7 -04.7 74.4	18 35.9 -04.4 74.5	17 38.1 -04.1 74.6	16 40.3 -03.9 74.6	15 42.4 -03.5 74.7
16°	19 29.0 -05.1 73.4	18 31.5 -04.8 73.4	17 34.0 -04.5 73.5	16 36.4 -04.1 73.6	15 38.9 -03.8 73.7
17°	19 23.9 -05.5 72.3	18 26.7 -05.1 72.4	17 29.5 -04.8 72.5	16 32.3 -04.5 72.6	15 35.1 -04.2 72.6
18°	19 18.4 -05.8 71.3	18 21.6 -05.5 71.3	17 24.7 -05.1 71.4	16 27.8 -04.7 71.5	15 30.9 -04.4 71.6
19°	19 12.6 -06.3 70.2	18 16.1 -05.8 70.3	17 19.6 -05.4 70.4	16 23.1 -05.1 70.5	15 26.5 -04.7 70.5
20°	19 06.3 -06.5 69.1	18 10.3 -06.2 69.2	17 14.2 -05.8 69.3	16 18.0 -05.4 69.4	15 21.8 -05.0 69.5
21°	18 59.8 -06.9 68.1	18 04.1 -06.5 68.2	17 08.4 -06.1 68.3	16 12.6 -05.7 68.4	15 16.8 -05.2 68.5
22°	18 52.9 -07.3 67.0	17 57.6 -06.8 67.2	17 02.3 -06.4 67.3	16 06.9 -05.9 67.4	15 11.6 -05.6 67.4
23°	18 45.6 -07.6 66.0	17 50.8 -07.2 66.1	16 55.9 -06.7 66.2	16 01.0 -06.3 66.3	15 06.0 -05.8 66.4
24°	18 38.0 -08.0 64.9	17 43.6 -07.5 65.1	16 49.2 -07.1 65.2	15 54.7 -06.6 65.3	15 00.2 -06.1 65.4
25°	18 30.0 -08.3 63.9	17 36.1 -07.8 64.0	16 42.1 -07.3 64.1	15 48.1 -06.8 64.3	14 54.1 -06.4 64.4
26°	18 21.7 -08.7 62.9	17 28.3 -08.2 63.0	16 34.8 -07.7 63.1	15 41.3 -07.2 63.2	14 47.7 -06.7 63.3
27°	18 13.0 -09.0 61.8	17 20.1 -08.5 62.0	16 27.1 -07.9 62.1	15 34.1 -07.4 62.2	14 41.0 -06.9 62.3
28°	18 04.0 -09.3 60.8	17 11.6 -08.7 60.9	16 19.2 -08.3 61.0	15 26.7 -07.8 61.2	14 34.1 -07.2 61.3
29°	17 54.7 -09.6 59.7	17 02.9 -09.1 59.9	16 10.9 -08.5 60.0	15 18.9 -08.0 60.1	14 26.9 -07.5 60.2

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 59.9 +00.9 90.3	13 59.9 +00.9 90.2	12 59.9 +00.9 90.2	11 59.9 +00.9 90.2	10 59.9 +01.0 90.2
1°	15 00.8 +00.7 89.2	14 00.8 +00.7 89.2	13 00.8 +00.7 89.2	12 00.8 +00.8 89.2	11 00.9 +00.7 89.2
2°	15 01.5 +00.3 88.2	14 01.5 +00.4 88.2	13 01.5 +00.5 88.2	12 01.6 +00.5 88.2	11 01.6 +00.6 88.2
3°	15 01.8 +00.1 87.2	14 01.9 +00.2 87.2	13 02.0 +00.2 87.2	12 02.1 +00.3 87.1	11 02.2 +00.3 87.1
4°	15 01.9 -00.1 86.1	14 02.1 -00.1 86.1	13 02.2 +00.0 86.1	12 02.4 +00.1 86.1	11 02.5 +00.2 86.1
5°	15 01.8 -00.5 85.1	14 02.0 -00.4 85.1	13 02.2 -00.2 85.1	12 02.5 -00.2 85.1	11 02.7 -00.1 85.1
6°	15 01.3 -00.7 84.1	14 01.6 -00.6 84.1	13 02.0 -00.5 84.1	12 02.3 -00.4 84.1	11 02.6 -00.2 84.1
7°	15 00.6 -01.1 83.0	14 01.0 -00.9 83.0	13 01.5 -00.8 83.0	12 01.9 -00.6 83.1	11 02.4 -00.5 83.1
8°	14 59.5 -01.3 82.0	14 00.1 -01.1 82.0	13 00.7 -01.0 82.0	12 01.3 -00.8 82.0	11 01.9 -00.7 82.0
9°	14 58.2 -01.5 81.0	13 59.0 -01.4 81.0	12 59.7 -01.2 81.0	12 00.5 -01.1 81.0	11 01.2 -00.8 81.0
10°	14 56.7 -01.9 79.9	13 57.6 -01.7 79.9	12 58.5 -01.5 80.0	11 59.4 -01.2 80.0	11 00.4 -01.1 80.0
11°	14 54.8 -02.2 78.9	13 55.9 -01.9 78.9	12 57.0 -01.7 78.9	11 58.2 -01.5 79.0	10 59.3 -01.3 79.0
12°	14 52.6 -02.4 77.8	13 54.0 -02.2 77.9	12 55.3 -01.9 77.9	11 56.7 -01.7 77.9	10 58.0 -01.5 78.0
13°	14 50.2 -02.7 76.8	13 51.8 -02.4 76.9	12 53.4 -02.2 76.9	11 55.0 -02.0 76.9	10 56.5 -01.7 77.0
14°	14 47.5 -02.9 75.8	13 49.4 -02.7 75.8	12 51.2 -02.4 75.9	11 53.0 -02.1 75.9	10 54.8 -01.8 75.9
15°	14 44.6 -03.3 74.7	13 46.7 -03.0 74.8	12 48.8 -02.7 74.8	11 50.9 -02.4 74.9	10 53.0 -02.1 74.9
16°	14 41.3 -03.5 73.7	13 43.7 -03.2 73.8	12 46.1 -02.9 73.8	11 48.5 -02.6 73.9	10 50.9 -02.3 73.9
17°	14 37.8 -03.8 72.7	13 40.5 -03.4 72.7	12 43.2 -03.1 72.8	11 45.9 -02.8 72.8	10 48.6 -02.5 72.9
18°	14 34.0 -04.1 71.7	13 37.1 -03.8 71.7	12 40.1 -03.4 71.8	11 43.1 -03.0 71.8	10 46.1 -02.7 71.9
19°	14 29.9 -04.3 70.6	13 33.3 -03.9 70.7	12 36.7 -03.6 70.7	11 40.1 -03.3 70.8	10 43.4 -02.9 70.8
20°	14 25.6 -04.6 69.6	13 29.4 -04.2 69.7	12 33.1 -03.8 69.7	11 36.8 -03.4 69.8	10 40.5 -03.1 69.8
21°	14 21.0 -04.9 68.6	13 25.2 -04.5 68.6	12 29.3 -04.1 68.7	11 33.4 -03.7 68.8	10 37.4 -03.2 68.8
22°	14 16.1 -05.1 67.5	13 20.7 -04.7 67.6	12 25.2 -04.3 67.7	11 29.7 -03.9 67.7	10 34.2 -03.5 67.8
23°	14 11.0 -05.4 66.5	13 16.0 -05.0 66.6	12 20.9 -04.5 66.7	11 25.8 -04.1 66.7	10 30.7 -03.7 66.8
24°	14 05.6 -05.6 65.5	13 11.0 -05.2 65.6	12 16.4 -04.8 65.6	11 21.7 -04.3 65.7	10 27.0 -03.8 65.8
25°	14 00.0 -06.0 64.5	13 05.8 -05.4 64.5	12 11.6 -04.9 64.6	11 17.4 -04.5 64.7	10 23.2 -04.1 64.8
26°	13 54.0 -06.1 63.4	13 00.4 -05.7 63.5	12 06.7 -05.2 63.6	11 12.9 -04.7 63.7	10 19.1 -04.2 63.7
27°	13 47.9 -06.5 62.4	12 54.7 -05.9 62.5	12 01.5 -05.5 62.6	11 08.2 -04.9 62.7	10 14.9 -04.4 62.7
28°	13 41.4 -06.6 61.4	12 48.8 -06.2 61.5	11 56.0 -05.6 61.6	11 03.3 -05.2 61.6	10 10.5 -04.7 61.7
29°	13 34.8 -07.0 60.4	12 42.6 -06.4 60.5	11 50.4 -05.9 60.5	10 58.1 -05.3 60.6	10 05.8 -04.8 60.7

Declination SAME name as Latitude

Latitude 1°

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 59.9 +01.0 90.2	8 59.9 +01.0 90.2	7 59.9 +01.0 90.1	6 59.9 +01.0 90.1	5 59.9 +01.0 90.1
1°	10 00.9 +00.8 89.2	9 00.9 +00.8 89.1	8 00.9 +00.8 89.1	7 00.9 +00.9 89.1	6 00.9 +00.9 89.1
2°	10 01.7 +00.6 88.1	9 01.7 +00.7 88.1	8 01.7 +00.7 88.1	7 01.8 +00.7 88.1	6 01.8 +00.8 88.1
3°	10 02.3 +00.4 87.1	9 02.4 +00.4 87.1	8 02.4 +00.6 87.1	7 02.5 +00.6 87.1	6 02.6 +00.7 87.1
4°	10 02.7 +00.2 86.1	9 02.8 +00.3 86.1	8 03.0 +00.4 86.1	7 03.1 +00.5 86.1	6 03.3 +00.5 86.1
5°	10 02.9 +00.1 85.1	9 03.1 +00.2 85.1	8 03.4 +00.2 85.1	7 03.6 +00.3 85.1	6 03.8 +00.5 85.1
6°	10 03.0 -00.2 84.1	9 03.3 +00.0 84.1	8 03.6 +00.1 84.1	7 03.9 +00.3 84.1	6 04.3 +00.3 84.1
7°	10 02.8 -00.3 83.1	9 03.3 -00.2 83.1	8 03.7 +00.0 83.1	7 04.2 +00.0 83.1	6 04.6 +00.2 83.1
8°	10 02.5 -00.5 82.1	9 03.1 -00.4 82.1	8 03.7 -00.2 82.1	7 04.2 +00.0 82.1	6 04.8 +00.1 82.1
9°	10 02.0 -00.7 81.0	9 02.7 -00.5 81.0	8 03.5 -00.4 81.1	7 04.2 -00.2 81.1	6 04.9 +00.0 81.1
10°	10 01.3 -00.9 80.0	9 02.2 -00.7 80.0	8 03.1 -00.5 80.0	7 04.0 -00.3 80.0	6 04.9 -00.1 80.0
11°	10 00.4 -01.1 79.0	9 01.5 -00.8 79.0	8 02.6 -00.6 79.0	7 03.7 -00.4 79.0	6 04.8 -00.2 79.0
12°	9 59.3 -01.2 78.0	9 00.7 -01.1 78.0	8 02.0 -00.8 78.0	7 03.3 -00.6 78.0	6 04.6 -00.3 78.0
13°	9 58.1 -01.5 77.0	8 59.6 -01.2 77.0	8 01.2 -01.0 77.0	7 02.7 -00.7 77.0	6 04.3 -00.5 77.0
14°	9 56.6 -01.6 76.0	8 58.4 -01.3 76.0	8 00.2 -01.1 76.0	7 02.0 -00.8 76.0	6 03.8 -00.6 76.0
15°	9 55.0 -01.8 74.9	8 57.1 -01.5 75.0	7 59.1 -01.2 75.0	7 01.2 -01.0 75.0	6 03.2 -00.6 75.0
16°	9 53.2 -02.0 73.9	8 55.6 -01.7 74.0	7 57.9 -01.4 74.0	7 00.2 -01.0 74.0	6 02.6 -00.8 74.0
17°	9 51.2 -02.1 72.9	8 53.9 -01.9 72.9	7 56.5 -01.5 73.0	6 59.2 -01.2 73.0	6 01.8 -00.9 73.0
18°	9 49.1 -02.4 71.9	8 52.0 -02.0 71.9	7 55.0 -01.7 72.0	6 58.0 -01.4 72.0	6 00.9 -01.0 72.0
19°	9 46.7 -02.5 70.9	8 50.0 -02.1 70.9	7 53.3 -01.8 71.0	6 56.6 -01.4 71.0	5 59.9 -01.1 71.0
20°	9 44.2 -02.7 69.9	8 47.9 -02.4 69.9	7 51.5 -01.9 69.9	6 55.2 -01.6 70.0	5 58.8 -01.2 70.0
21°	9 41.5 -02.9 68.9	8 45.5 -02.5 68.9	7 49.6 -02.1 68.9	6 53.6 -01.8 69.0	5 57.6 -01.4 69.0
22°	9 38.6 -03.1 67.8	8 43.0 -02.6 67.9	7 47.5 -02.3 67.9	6 51.8 -01.8 68.0	5 56.2 -01.4 68.0
23°	9 35.5 -03.2 66.8	8 40.4 -02.8 66.9	7 45.2 -02.4 66.9	6 50.0 -02.0 67.0	5 54.8 -01.6 67.0
24°	9 32.3 -03.4 65.8	8 37.6 -03.0 65.9	7 42.8 -02.5 65.9	6 48.0 -02.1 65.9	5 53.2 -01.6 66.0
25°	9 28.9 -03.6 64.8	8 34.6 -03.1 64.9	7 40.3 -02.7 64.9	6 45.9 -02.2 64.9	5 51.6 -01.8 65.0
26°	9 25.3 -03.8 63.8	8 31.5 -03.3 63.9	7 37.6 -02.8 63.9	6 43.7 -02.3 63.9	5 49.8 -01.8 64.0
27°	9 21.5 -03.9 62.8	8 28.2 -03.5 62.8	7 34.8 -03.0 62.9	6 41.4 -02.5 62.9	5 48.0 -02.0 63.0
28°	9 17.6 -04.1 61.8	8 24.7 -03.6 61.8	7 31.8 -03.0 61.9	6 38.9 -02.6 61.9	5 46.4 -02.1 62.0
29°	9 13.5 -04.3 60.8	8 21.1 -03.7 60.8	7 28.8 -03.3 60.9	6 36.3 -02.7 60.9	5 43.9 -02.2 61.0

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°	5 00.0 +01.0 90.1	4 00.0 +01.0 90.1	3 00.0 +01.0 90.1	2 00.0 +01.0 90.0	1 00.0 +01.0 90.0
1°	5 01.0 +00.9 89.1	4 01.0 +00.9 89.1	3 01.0 +01.0 89.1	2 01.0 +01.0 89.0	1 01.0 +01.0 89.0
2°	5 01.9 +00.8 88.1	4 01.9 +00.9 88.1	3 02.0 +00.9 88.0	2 02.0 +01.0 88.0	1 02.0 +01.0 88.0
3°	5 02.7 +00.7 87.1	4 02.8 +00.8 87.1	3 02.9 +00.8 87.0	2 03.0 +00.9 87.0	1 03.0 +01.0 87.0
4°	5 03.4 +00.7 86.1	4 03.6 +00.7 86.1	3 03.7 +00.8 86.0	2 03.9 +00.9 86.0	1 04.0 +01.0 86.0
5°	5 04.1 +00.5 85.1	4 04.3 +00.6 85.1	3 04.5 +00.8 85.0	2 04.8 +00.8 85.0	1 05.0 +00.9 85.0
6°	5 04.6 +00.5 84.1	4 04.9 +00.6 84.1	3 05.3 +00.7 84.0	2 05.6 +00.8 84.0	1 05.9 +01.0 84.0
7°	5 05.1 +00.3 83.1	4 05.5 +00.5 83.1	3 06.0 +00.6 83.0	2 06.4 +00.8 83.0	1 06.9 +00.9 83.0
8°	5 05.4 +00.3 82.1	4 06.0 +00.4 82.1	3 06.6 +00.6 82.0	2 07.2 +00.7 82.0	1 07.8 +00.8 82.0
9°	5 05.7 +00.1 81.1	4 06.4 +00.4 81.0	3 07.2 +00.5 81.0	2 07.9 +00.7 81.0	1 08.6 +00.9 81.0
10°	5 05.8 +00.1 80.0	4 06.8 +00.2 80.0	3 07.7 +00.4 80.0	2 08.6 +00.6 80.0	1 09.5 +00.8 80.0
11°	5 05.9 +00.0 79.0	4 07.0 +00.2 79.0	3 08.1 +00.4 79.0	2 09.2 +00.6 79.0	1 10.3 +00.9 79.0
12°	5 05.9 -00.1 78.0	4 07.2 +00.1 78.0	3 08.5 +00.4 78.0	2 09.8 +00.6 78.0	1 11.2 +00.8 78.0
13°	5 05.8 -00.2 77.0	4 07.3 +00.1 77.0	3 08.9 +00.3 77.0	2 10.4 +00.5 77.0	1 12.0 +00.7 77.0
14°	5 05.6 -00.3 76.0	4 07.4 -00.1 76.0	3 09.2 +00.2 76.0	2 10.9 +00.5 76.0	1 12.7 +00.8 76.0
15°	5 05.3 -00.4 75.0	4 07.3 -00.1 75.0	3 09.4 +00.2 75.0	2 11.4 +00.5 75.0	1 13.5 +00.7 75.0
16°	5 04.9 -00.5 74.0	4 07.2 -00.2 74.0	3 09.6 +00.1 74.0	2 11.9 +00.4 74.0	1 14.2 +00.7 74.0
17°	5 04.4 -00.6 73.0	4 07.0 -00.2 73.0	3 09.7 +00.0 73.0	2 12.3 +00.4 73.0	1 14.9 +00.7 73.0
18°	5 03.8 -00.6 72.0	4 06.8 -00.4 72.0	3 09.7 +00.0 72.0	2 12.7 +00.3 72.0	1 15.6 +00.7 72.0
19°	5 03.2 -00.8 71.0	4 06.4 -00.4 71.0	3 09.7 +00.0 71.0	2 13.0 +00.3 71.0	1 16.3 +00.6 71.0
20°	5 02.4 -00.8 70.0	4 06.0 -00.4 70.0	3 09.7 -00.2 70.0	2 13.3 +00.2 70.0	1 16.9 +00.6 70.0
21°	5 01.6 -01.0 69.0	4 05.6 -00.6 69.0	3 09.5 -00.1 69.0	2 13.5 +00.2 69.0	1 17.5 +00.6 69.0
22°	5 00.6 -01.0 68.0	4 05.0 -00.6 68.0	3 09.4 -00.3 68.0	2 13.7 +00.2 68.0	1 18.1 +00.6 68.0
23°	4 59.6 -01.1 67.0	4 04.4 -00.8 67.0	3 09.1 -00.3 67.0	2 13.9 +00.1 67.0	1 18.7 +00.5 67.0
24°	4 58.5 -01.3 66.0	4 03.6 -00.7 66.0	3 08.8 -00.3 66.0	2 14.0 +00.1 66.0	1 19.2 +00.5 66.0
25°	4 57.2 -01.3 65.0	4 02.9 -00.9 65.0	3 08.5 -00.4 65.0	2 14.1 +00.1 65.0	1 19.7 +00.5 65.0
26°	4 55.9 -01.4 64.0	4 02.0 -00.9 64.0	3 08.1 -00.5 64.0	2 14.2 +00.0 64.0	1 20.2 +00.5 64.0
27°	4 54.5 -01.5 63.0	4 01.1 -01.0 63.0	3 07.6 -00.5 63.0	2 14.2 -00.1 63.0	1 20.7 +00.4 63.0
28°	4 53.0 -01.6 62.0	4 00.1 -01.1 62.0	3 07.1 -00.6 62.0	2 14.1 -00.1 62.0	1 21.1 +00.5 62.0
29°	4 51.4 -01.6 61.0	3 59.0 -01.2 61.0	3 06.5 -00.6 61.0	2 14.0 -00.1 61.0	1 21.6 +00.4 61.0

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Latitude 1°

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 +01.0 90.0	-1 00.0 +01.1			
1°	0 01.0 +01.1 89.0	-0 58.9 +01.0			
2°	0 02.1 +01.0 88.0	-0 57.9 +01.1			
3°	0 03.1 +01.1 87.0	-0 56.8 +01.1			
4°	0 04.2 +01.0 86.0	-0 55.7 +01.2			
5°	0 05.2 +01.1 85.0	-0 54.5 +01.1			
6°	0 06.3 +01.0 84.0	-0 53.4 +01.2			
7°	0 07.3 +01.0 83.0	-0 52.2 +01.1			
8°	0 08.3 +01.1 82.0	-0 51.1 +01.2			
9°	0 09.4 +01.0 81.0	-0 49.9 +01.2			
10°	0 10.4 +01.0 80.0	-0 48.7 +01.3			
11°	0 11.4 +01.1 79.0	-0 47.4 +01.2			
12°	0 12.5 +01.0 78.0	-0 46.2 +01.2			
13°	0 13.5 +01.0 77.0	-0 45.0 +01.3			
14°	0 14.5 +01.0 76.0	-0 43.7 +01.3			
15°	0 15.5 +01.0 75.0	-0 42.4 +01.3			
16°	0 16.5 +01.0 74.0	-0 41.1 +01.3			
17°	0 17.5 +01.0 73.0	-0 39.8 +01.3			
18°	0 18.5 +01.0 72.0	-0 38.5 +01.3			
19°	0 19.5 +01.0 71.0	-0 37.2 +01.3			
20°	0 20.5 +01.0 70.0	-0 35.9 +01.4			
21°	0 21.5 +01.0 69.0	-0 34.5 +01.4			
22°	0 22.5 +00.9 68.0	-0 33.1 +01.3			
23°	0 23.4 +01.0 67.0	-0 31.8 +01.4			
24°	0 24.4 +01.0 66.0	-0 30.4 +01.4			
25°	0 25.4 +00.9 65.0	-0 29.0 +01.4			
26°	0 26.3 +00.9 64.0	-0 27.6 +01.4			
27°	0 27.2 +01.0 63.0	-0 26.2 +01.4			
28°	0 28.2 +00.9 62.0	-0 24.8 +01.4			
29°	0 29.1 +00.9 61.0	-0 23.4 +01.4			

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°					
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°					

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Declination SAME name as Latitude

Latitude 2°

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°	88 00.0 +60.0 180.0	87 45.8 +49.4 153.4	87 10.3 +35.6 135.0	86 23.7 +26.6 123.7	85 31.7 +21.0 116.5
1°	89 00.0 +60.0 180.0	88 35.2 +24.8 135.0	87 45.9 +14.2 116.5	86 50.3 +09.8 108.4	85 52.7 +07.4 104.0
2°	90 00.0 -60.0 0.0	89 00.0 -24.8 90.0	88 00.1 -14.2 90.0	87 00.1 -09.7 89.9	86 00.1 -07.3 89.9
3°	89 00.0 -60.0 0.0	88 35.2 -49.3 45.0	87 45.9 -35.5 63.4	86 50.4 -26.5 71.5	85 52.8 -20.8 75.9
4°	88 00.0 -60.0 0.0	87 45.9 -55.6 26.5	87 10.4 -46.6 44.9	86 23.9 -38.2 56.2	85 32.0 -31.6 63.3
5°	87 00.0 -60.0 0.0	86 50.3 -57.6 18.4	86 23.8 -52.0 33.6	85 45.7 -45.4 44.9	85 00.4 -39.4 53.0
6°	86 00.0 -60.0 0.0	85 52.7 -58.6 14.0	85 31.8 -54.8 26.4	85 00.3 -49.8 36.7	84 21.0 -44.7 44.8
7°	85 00.0 -60.0 0.0	84 54.1 -59.0 11.2	84 37.0 -56.3 21.7	84 10.5 -52.6 30.8	83 36.3 -48.4 38.4
8°	84 00.0 -60.0 0.0	83 55.1 -59.3 9.4	83 40.7 -57.3 18.3	83 17.9 -54.5 26.4	82 47.9 -51.0 33.4
9°	83 00.0 -60.0 0.0	82 55.8 -59.5 8.1	82 43.4 -58.0 15.8	82 23.4 -55.6 23.0	81 56.9 -52.9 29.5
10°	82 00.0 -60.0 0.0	81 56.3 -59.6 7.0	81 45.4 -58.4 13.9	81 27.8 -56.6 20.3	81 04.0 -54.2 26.3
11°	81 00.0 -60.0 0.0	80 56.7 -59.6 6.2	80 47.0 -58.7 12.4	80 31.2 -57.2 18.2	80 09.8 -55.2 23.6
12°	80 00.0 -60.0 0.0	79 57.1 -59.8 5.6	79 48.3 -58.9 11.1	79 34.0 -57.6 16.4	79 14.6 -56.1 21.4
13°	79 00.0 -60.0 0.0	78 57.3 -59.7 5.1	78 49.4 -59.1 10.1	78 36.4 -58.1 15.0	78 18.5 -56.6 19.6
14°	78 00.0 -60.0 0.0	77 57.6 -59.8 4.7	77 50.3 -59.2 9.2	77 38.3 -58.3 13.7	77 21.9 -57.1 18.0
15°	77 00.0 -60.0 0.0	76 57.8 -59.9 4.3	76 51.1 -59.4 8.5	76 40.0 -58.5 12.7	76 24.8 -57.4 16.7
16°	76 00.0 -60.0 0.0	75 57.9 -59.8 4.0	75 51.7 -59.4 7.9	75 41.5 -58.7 11.7	75 27.4 -57.8 15.5
17°	75 00.0 -60.0 0.0	74 58.1 -59.9 3.7	74 52.3 -59.5 7.3	74 42.8 -58.9 10.9	74 29.6 -58.1 14.4
18°	74 00.0 -60.0 0.0	73 58.2 -59.9 3.4	73 52.8 -59.5 6.9	73 43.9 -59.0 10.2	73 31.5 -58.2 13.5
19°	73 00.0 -60.0 0.0	72 58.3 -59.9 3.2	72 53.3 -59.6 6.4	72 44.9 -59.1 9.6	72 33.3 -58.5 12.7
20°	72 00.0 -60.0 0.0	71 58.4 -59.9 3.0	71 53.7 -59.7 6.1	71 45.8 -59.2 9.0	71 34.8 -58.6 12.0
21°	71 00.0 -60.0 0.0	70 58.5 -59.9 2.9	70 54.0 -59.7 5.7	70 46.6 -59.3 8.5	70 36.2 -58.7 11.3
22°	70 00.0 -60.0 0.0	69 58.6 -59.9 2.7	69 54.3 -59.7 5.4	69 47.3 -59.3 8.1	69 37.5 -58.8 10.7
23°	69 00.0 -60.0 0.0	68 58.7 -60.0 2.6	68 54.6 -59.7 5.1	68 48.0 -59.4 7.7	68 38.7 -59.0 10.2
24°	68 00.0 -60.0 0.0	67 58.7 -59.9 2.4	67 54.9 -59.7 4.9	67 48.6 -59.5 7.3	67 39.7 -59.0 9.7
25°	67 00.0 -60.0 0.0	66 58.8 -60.0 2.3	66 55.2 -59.8 4.6	66 49.1 -59.5 6.9	66 40.7 -59.1 9.2
26°	66 00.0 -60.0 0.0	65 58.8 -59.9 2.2	65 55.4 -59.8 4.4	65 49.6 -59.5 6.6	65 41.6 -59.1 8.8
27°	65 00.0 -60.0 0.0	64 58.9 -60.0 2.1	64 55.6 -59.8 4.2	64 50.1 -59.6 6.3	64 42.5 -59.3 8.4
28°	64 00.0 -60.0 0.0	63 58.9 -59.9 2.0	63 55.8 -59.8 4.0	63 50.5 -59.5 6.0	63 43.2 -59.2 8.0
29°	63 00.0 -60.0 0.0	62 59.0 -60.0 1.9	62 56.0 -59.9 3.8	62 51.0 -59.7 5.8	62 44.0 -59.4 7.7

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°	84 36.9 +17.3 111.7	83 40.6 +14.6 108.4	82 43.3 +12.6 105.9	81 45.3 +11.1 103.9	80 46.9 +10.0 102.4
1°	84 54.2 +06.0 101.2	83 55.2 +05.0 99.4	82 55.9 +04.4 98.0	81 56.4 +03.9 97.0	80 56.9 +03.4 96.2
2°	85 00.2 -05.9 89.9	84 00.2 -04.8 89.9	83 00.3 -04.2 89.9	82 00.3 -03.6 89.9	81 00.3 -03.1 89.8
3°	84 54.3 -17.0 78.6	83 55.4 -14.4 80.4	82 56.1 -12.3 81.7	81 56.7 -10.8 82.7	80 57.2 -09.6 83.5
4°	84 37.3 -26.6 68.1	83 41.0 -22.9 71.4	82 43.8 -20.0 73.9	81 45.9 -17.6 75.8	80 47.6 -15.8 77.2
5°	84 10.7 -34.3 58.9	83 18.1 -30.0 63.2	82 23.8 -26.6 66.6	81 28.3 -23.8 69.2	80 31.8 -21.4 71.3
6°	83 36.4 -39.9 51.1	82 48.1 -35.8 56.1	81 57.2 -32.2 60.0	81 04.5 -29.2 63.1	80 10.4 -26.5 65.7
7°	82 56.5 -44.3 44.7	82 12.3 -40.3 49.9	81 25.0 -36.8 54.1	80 35.3 -33.7 57.7	79 43.9 -31.0 60.6
8°	82 12.2 -47.4 39.5	81 32.0 -43.9 44.7	80 48.2 -40.6 49.0	80 01.6 -37.5 52.7	79 12.9 -34.8 55.9
9°	81 24.8 -49.8 35.2	80 48.1 -46.7 40.2	80 07.6 -43.7 44.6	79 24.1 -40.8 48.4	78 38.1 -38.0 51.6
10°	80 35.0 -51.6 31.6	80 01.4 -48.9 36.5	79 23.9 -46.1 40.7	78 43.3 -43.4 44.5	78 00.1 -40.9 47.8
11°	79 43.4 -53.0 28.7	79 12.5 -50.6 33.2	78 37.8 -48.1 37.4	77 59.9 -45.6 41.1	77 19.2 -43.3 44.4
12°	78 50.4 -54.1 26.1	78 21.9 -52.0 30.5	77 49.7 -49.7 34.4	77 14.3 -47.5 38.0	76 35.9 -45.2 41.3
13°	77 56.3 -55.0 24.0	77 29.9 -53.0 28.1	77 00.0 -51.1 31.9	76 26.8 -49.0 35.4	75 50.7 -46.9 38.6
14°	77 01.3 -55.6 22.1	76 36.9 -54.0 26.0	76 08.9 -52.2 29.6	75 37.8 -50.3 33.0	75 03.8 -48.4 36.1
15°	76 05.7 -56.2 20.5	75 42.9 -54.7 24.2	75 16.7 -53.1 27.6	74 47.5 -51.4 30.8	74 15.4 -49.6 33.8
16°	75 09.5 -56.6 19.1	74 48.2 -55.3 22.5	74 23.6 -53.8 25.8	73 56.1 -52.3 28.9	73 25.8 -50.7 31.8
17°	74 12.9 -57.0 17.8	73 52.9 -55.8 21.1	73 29.8 -54.5 24.2	73 03.8 -53.1 27.2	72 35.1 -51.6 30.0
18°	73 15.9 -57.4 16.7	72 57.1 -56.3 19.8	72 35.3 -55.1 22.8	72 10.7 -53.8 25.6	71 43.5 -52.4 28.3
19°	72 18.5 -57.6 15.7	72 00.8 -56.6 18.7	71 40.2 -55.5 21.5	71 16.9 -54.3 24.2	70 51.1 -53.1 26.8
20°	71 20.9 -57.8 14.8	71 04.2 -57.0 17.6	70 44.7 -56.0 20.3	70 22.6 -54.9 22.9	69 58.0 -53.7 25.4
21°	70 23.1 -58.1 14.0	70 07.2 -57.2 16.7	69 48.7 -56.3 19.2	69 27.7 -55.3 21.7	69 04.3 -54.2 24.1
22°	69 25.0 -58.2 13.3	69 10.0 -57.5 15.8	68 52.4 -56.6 18.3	68 32.4 -55.7 20.7	68 10.1 -54.6 23.0
23°	68 26.8 -58.3 12.6	68 12.5 -57.7 15.0	67 55.8 -56.9 17.4	67 36.7 -56.0 19.7	67 15.5 -55.1 21.9
24°	67 28.5 -58.5 12.0	67 14.8 -57.8 14.3	66 58.9 -57.1 16.5	66 40.7 -56.3 18.7	66 20.4 -55.4 20.9
25°	66 30.0 -58.6 11.4	66 17.0 -58.0 13.6	66 01.8 -57.4 15.8	65 44.4 -56.6 17.9	65 25.0 -55.8 19.9
26°	65 31.4 -58.7 10.9	65 19.0 -58.2 13.0	65 04.4 -57.5 15.1	64 47.8 -56.8 17.1	64 29.2 -56.0 19.1
27°	64 32.7 -58.8 10.4	64 20.8 -58.3 12.4	64 06.9 -57.7 14.4	63 51.0 -57.0 16.3	63 33.2 -56.3 18.2
28°	63 33.9 -58.9 10.0	63 22.5 -58.4 11.9	63 09.2 -57.9 13.8	62 54.0 -57.3 15.6	62 36.9 -56.6 17.5
29°	62 35.0 -59.0 9.5	62 24.1 -58.5 11.4	62 11.3 -57.9 13.2	61 56.7 -57.4 15.0	61 40.3 -56.7 16.8

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Latitude 2°

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°	79 48.2 +09.0 101.2	78 49.3 +08.2 100.2	77 50.2 +07.6 99.3	76 51.0 +07.0 98.6	75 51.6 +06.6 98.0
1°	79 57.2 +03.2 95.6	78 57.5 +02.9 95.0	77 57.8 +02.6 94.6	76 58.0 +02.5 94.2	75 58.2 +02.3 93.9
2°	80 00.4 -02.8 89.8	79 00.4 -02.5 89.8	78 00.4 -02.2 89.8	77 00.5 -02.1 89.8	76 00.5 -01.8 89.8
3°	79 57.6 -08.6 84.1	78 57.9 -07.8 84.6	77 58.2 -07.1 85.0	76 58.4 -06.5 85.3	75 58.7 -06.0 85.6
4°	79 49.0 -14.3 78.4	78 50.1 -12.9 79.4	77 51.1 -11.9 80.2	76 51.9 -10.9 80.9	75 52.7 -10.1 81.5
5°	79 34.7 -19.4 73.0	78 37.2 -17.8 74.4	77 39.2 -16.3 75.6	76 41.0 -15.1 76.6	75 42.6 -14.1 77.5
6°	79 15.3 -24.3 67.9	78 19.4 -22.3 69.6	77 22.9 -20.6 71.2	76 25.9 -19.1 72.5	75 28.5 -17.8 73.6
7°	78 51.0 -28.5 63.0	77 57.1 -26.4 65.1	77 02.3 -24.5 66.9	76 06.8 -22.8 68.5	75 10.7 -21.3 69.8
8°	78 22.5 -32.3 58.6	77 30.7 -30.1 60.9	76 37.8 -28.1 62.9	75 44.0 -26.3 64.7	74 49.4 -24.6 66.2
9°	77 50.2 -35.6 54.5	77 00.6 -33.3 57.0	76 09.7 -31.2 59.2	75 17.7 -29.4 61.1	74 24.8 -27.6 62.8
10°	77 14.6 -38.5 50.8	76 27.3 -36.2 53.4	75 38.5 -34.2 55.7	74 48.3 -32.2 57.7	73 57.2 -30.5 59.5
11°	76 36.1 -40.9 47.4	75 51.1 -38.8 50.0	75 04.3 -36.7 52.4	74 16.1 -34.7 54.5	73 26.7 -33.0 56.5
12°	75 55.2 -43.1 44.3	75 12.3 -40.9 47.0	74 27.6 -38.9 49.4	73 41.4 -37.1 51.6	72 53.7 -35.2 53.6
13°	75 12.1 -44.9 41.5	74 31.4 -42.9 44.2	73 48.7 -41.0 46.6	73 04.3 -39.1 48.8	72 18.5 -37.4 50.9
14°	74 27.2 -46.4 39.0	73 48.5 -44.6 41.6	73 07.7 -42.7 44.0	72 25.2 -41.0 46.3	71 41.1 -39.2 48.3
15°	73 40.8 -47.9 36.6	73 03.9 -46.1 39.3	72 25.0 -44.3 41.7	71 44.2 -42.6 43.9	71 01.9 -40.9 46.0
16°	72 52.9 -49.0 34.5	72 17.8 -47.3 37.1	71 40.7 -45.7 39.5	71 01.6 -44.0 41.7	70 21.0 -42.5 43.8
17°	72 03.9 -50.1 32.6	71 30.5 -48.5 35.1	70 55.0 -46.9 37.5	70 17.6 -45.4 39.6	69 38.5 -43.8 41.7
18°	71 13.8 -50.9 30.9	70 42.0 -49.5 33.3	70 08.1 -48.0 35.6	69 32.2 -46.5 37.7	68 54.7 -45.0 39.8
19°	70 22.9 -51.8 29.3	69 52.5 -50.4 31.6	69 20.1 -49.0 33.9	68 45.7 -47.5 36.0	68 09.7 -46.1 37.9
20°	69 31.1 -52.4 27.8	69 02.1 -51.1 30.1	68 31.1 -49.8 32.2	67 58.2 -48.5 34.3	67 23.6 -47.2 36.3
21°	68 38.7 -53.0 26.4	68 11.0 -51.8 28.6	67 41.3 -50.6 30.7	67 09.7 -49.3 32.8	66 36.4 -48.0 34.7
22°	67 45.7 -53.6 25.2	67 19.2 -52.5 27.3	66 50.7 -51.3 29.4	66 20.4 -50.1 31.3	65 48.4 -48.8 33.2
23°	66 52.1 -54.1 24.0	66 26.7 -53.0 26.1	66 59.4 -51.9 28.1	65 30.3 -50.7 30.0	64 59.6 -49.6 31.8
24°	65 58.0 -54.4 22.9	65 33.7 -53.5 24.9	65 07.5 -52.4 26.8	64 39.6 -51.4 28.7	64 10.0 -50.2 30.5
25°	65 03.6 -54.9 21.9	64 40.2 -53.9 23.8	64 15.1 -52.9 25.7	63 48.2 -51.9 27.5	63 19.8 -50.9 29.2
26°	64 08.7 -55.2 21.0	63 46.3 -54.3 22.8	63 22.2 -53.4 24.6	62 56.3 -52.4 26.4	62 28.9 -51.4 28.1
27°	63 13.5 -55.5 20.1	62 52.0 -54.7 21.9	62 28.8 -53.8 23.6	62 03.9 -52.8 25.3	61 37.5 -51.9 27.0
28°	62 18.0 -55.8 19.3	61 57.3 -55.0 21.0	61 35.0 -54.1 22.7	61 11.1 -53.3 24.3	60 45.6 -52.3 25.9
29°	61 22.2 -56.1 18.5	61 02.3 -55.3 20.2	60 40.9 -54.5 21.8	60 17.8 -53.6 23.4	59 53.3 -52.8 24.9

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°	74 52.2 +06.1 97.4	73 52.7 +05.8 96.9	72 53.2 +05.4 96.5	71 53.6 +05.1 96.1	70 53.9 +04.9 95.8
1°	74 58.3 +02.3 93.6	73 58.5 +02.1 93.3	72 58.6 +02.0 93.1	71 58.7 +02.0 92.9	70 58.8 +01.9 92.7
2°	75 00.6 -01.7 89.7	74 00.6 -01.5 89.7	73 00.6 -01.4 89.7	72 00.7 -01.3 89.7	71 00.7 -01.2 89.7
3°	74 58.9 -05.6 85.9	73 59.1 -05.2 86.1	72 59.2 -04.8 86.3	71 59.4 -04.5 86.4	70 59.5 -04.2 86.6
4°	74 53.3 -09.4 82.0	73 53.9 -08.7 82.5	72 54.4 -08.2 82.9	71 54.9 -07.7 83.2	70 55.3 -07.2 83.5
5°	74 43.9 -13.0 78.3	73 45.2 -12.3 78.9	72 46.2 -11.4 79.5	71 47.2 -10.7 80.0	70 48.1 -10.1 80.5
6°	74 30.9 -16.7 74.6	73 32.9 -15.5 75.5	72 34.8 -14.6 76.2	71 36.5 -13.8 76.9	70 38.0 -13.0 77.5
7°	74 14.2 -19.9 71.0	73 17.4 -18.8 72.1	72 20.2 -17.7 73.0	71 22.7 -16.7 73.8	70 25.0 -15.8 74.6
8°	73 54.3 -23.2 67.6	72 58.6 -21.8 68.8	72 02.5 -20.6 69.9	71 06.0 -19.5 70.9	70 09.2 -18.5 71.7
9°	73 31.1 -26.1 64.3	72 36.8 -24.7 65.7	71 41.9 -23.3 66.9	70 46.5 -22.1 68.0	69 50.7 -20.9 69.0
10°	73 05.0 -28.8 61.2	72 12.1 -27.3 62.6	71 18.6 -25.9 64.0	70 24.4 -24.6 65.2	69 29.8 -23.5 66.3
11°	72 36.2 -31.3 58.2	71 44.8 -29.7 59.8	70 52.7 -28.3 61.2	69 59.8 -26.9 62.5	69 06.3 -25.6 63.6
12°	72 04.9 -33.6 55.4	71 15.1 -32.0 57.0	70 24.4 -30.6 58.5	69 32.9 -29.2 59.9	68 40.7 -27.9 61.1
13°	71 31.3 -35.7 52.7	70 43.1 -34.1 54.4	69 53.8 -32.6 56.0	69 03.7 -31.2 57.4	68 12.8 -29.8 58.7
14°	70 55.6 -37.5 50.2	70 09.0 -36.0 52.0	69 21.2 -34.5 53.6	68 32.5 -33.1 55.0	67 43.0 -31.8 56.4
15°	70 18.1 -39.3 47.9	69 33.0 -37.8 49.6	68 46.7 -36.2 51.3	67 59.4 -34.8 52.8	67 11.2 -33.4 54.2
16°	69 38.8 -40.9 45.7	68 55.2 -39.3 47.4	68 10.5 -37.9 49.1	67 24.6 -36.5 50.6	66 37.8 -35.2 52.1
17°	68 57.9 -42.3 43.6	68 15.9 -40.8 45.4	67 32.6 -39.4 47.0	66 48.1 -38.0 48.6	66 02.6 -36.6 50.1
18°	68 15.6 -43.6 41.6	67 35.1 -42.2 43.4	66 53.2 -40.7 45.1	66 10.1 -39.3 46.7	65 26.0 -38.0 48.1
19°	67 32.0 -44.7 39.8	66 52.9 -43.3 41.6	66 12.5 -42.0 43.3	65 30.8 -40.7 44.8	64 48.0 -39.4 46.3
20°	66 47.3 -45.8 38.1	66 09.6 -44.5 39.9	65 30.5 -43.1 41.5	64 50.1 -41.8 43.1	64 08.6 -40.5 44.5
21°	66 01.5 -46.7 36.5	65 25.1 -45.4 38.2	64 47.4 -44.2 39.9	64 08.3 -42.9 41.4	63 28.1 -41.7 42.9
22°	65 14.8 -47.6 35.0	64 39.7 -46.4 36.7	64 03.2 -45.1 38.3	63 25.4 -43.9 39.8	62 46.4 -42.6 41.3
23°	64 27.2 -48.4 33.5	63 53.3 -47.2 35.2	63 18.1 -46.0 36.8	62 41.5 -44.8 38.3	62 03.8 -43.7 39.8
24°	63 38.8 -49.1 32.2	63 06.1 -47.9 33.8	62 32.1 -46.8 35.4	61 56.7 -45.6 36.9	61 20.1 -44.5 38.3
25°	62 49.7 -49.8 30.9	62 18.2 -48.7 32.5	61 45.3 -47.6 34.0	61 11.1 -46.5 35.5	60 35.6 -45.3 36.9
26°	61 59.9 -50.3 29.7	61 29.5 -49.3 31.3	60 57.7 -48.2 32.8	60 24.6 -47.2 34.2	59 50.3 -46.1 35.6
27°	61 09.6 -50.9 28.6	60 40.2 -49.9 30.1	60 09.5 -48.9 31.6	59 37.4 -47.8 33.0	59 04.2 -46.8 34.4
28°	60 18.7 -51.5 27.5	59 50.3 -50.4 29.0	59 20.6 -49.5 30.4	58 49.6 -48.4 31.8	58 17.4 -47.4 33.2
29°	59 27.2 -51.8 26.4	58 59.9 -51.0 27.9	58 31.1 -50.0 29.3	58 01.2 -49.1 30.7	57 30.0 -48.1 32.0

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Latitude 2°

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°	69 54.3 +04.6 95.5	68 54.6 +04.4 95.2	67 54.8 +04.3 94.9	66 55.1 +04.1 94.7	65 55.3 +04.0 94.5
1°	69 58.9 +01.8 92.6	68 59.0 +01.8 92.4	67 59.1 +01.7 92.3	66 59.2 +01.7 92.2	65 59.3 +01.6 92.0
2°	70 00.7 -01.0 89.6	69 00.8 -01.0 89.6	68 00.8 -00.9 89.6	67 00.9 -00.9 89.6	66 00.9 -00.7 89.6
3°	69 59.7 -04.0 86.7	68 59.8 -03.7 86.8	67 59.9 -03.5 86.9	67 00.0 -03.2 87.0	66 00.2 -03.1 87.1
4°	69 55.7 -06.8 83.8	68 56.1 -06.4 84.1	67 56.4 -06.0 84.3	66 56.8 -05.7 84.5	65 57.1 -05.4 84.7
5°	69 48.9 -09.5 80.9	68 49.7 -09.0 81.3	67 50.4 -08.6 81.6	66 51.1 -08.2 81.9	65 51.7 -07.8 82.2
6°	69 39.4 -12.3 78.1	68 40.7 -11.7 78.6	67 41.8 -11.0 79.0	66 42.9 -10.5 79.4	65 43.9 -10.0 79.8
7°	69 27.1 -15.0 75.3	68 29.0 -14.2 75.9	67 30.8 -13.5 76.4	66 32.4 -12.8 76.9	65 33.9 -12.2 77.4
8°	69 12.1 -17.5 72.5	68 14.8 -16.6 73.2	67 17.3 -15.8 73.9	66 19.6 -15.1 74.5	65 21.7 -14.4 75.1
9°	68 54.6 -19.9 69.9	67 58.2 -19.0 70.7	67 01.5 -18.1 71.4	66 04.5 -17.3 72.1	65 07.3 -16.5 72.7
10°	68 34.7 -22.3 67.2	67 39.2 -21.3 68.2	66 43.4 -20.3 69.0	65 47.2 -19.4 69.8	64 50.8 -18.5 70.5
11°	68 12.4 -24.5 64.7	67 17.9 -23.4 65.7	66 23.1 -22.4 66.6	65 27.8 -21.4 67.5	64 32.3 -20.5 68.2
12°	67 47.9 -26.7 62.3	66 54.5 -25.5 63.4	66 00.7 -24.4 64.3	65 06.4 -23.3 65.2	64 11.8 -22.4 66.1
13°	67 21.2 -28.6 59.9	66 29.0 -27.4 61.1	65 36.3 -26.3 62.1	64 43.1 -25.2 63.1	63 49.4 -24.2 63.9
14°	66 52.6 -30.4 57.7	66 01.6 -29.2 58.9	65 10.0 -28.0 59.9	64 17.9 -27.0 60.9	63 25.2 -25.9 61.9
15°	66 22.2 -32.2 55.5	65 32.4 -30.9 56.7	64 42.0 -29.8 57.9	63 50.9 -28.6 58.9	62 59.3 -27.6 59.9
16°	65 50.0 -33.8 53.4	65 01.5 -32.6 54.7	64 12.2 -31.4 55.8	63 22.3 -30.3 56.9	62 31.7 -29.1 57.9
17°	65 16.2 -35.3 51.4	64 28.9 -34.1 52.7	63 40.8 -32.9 53.9	62 52.0 -31.7 55.0	62 02.6 -30.6 56.1
18°	64 40.9 -36.8 49.5	63 54.8 -35.5 50.8	63 07.9 -34.3 52.0	62 20.3 -33.2 53.2	61 32.0 -32.1 54.2
19°	64 04.1 -38.1 47.7	63 19.3 -36.8 49.0	62 33.6 -35.6 50.2	61 47.1 -34.4 51.4	60 59.9 -33.3 52.5
20°	63 26.0 -39.2 45.9	62 42.5 -38.1 47.3	61 58.0 -36.9 48.5	61 12.7 -35.8 49.7	60 26.6 -34.6 50.8
21°	62 46.8 -40.5 44.3	62 04.4 -39.2 45.6	61 21.1 -38.0 46.8	60 36.9 -36.9 48.0	59 52.0 -35.8 49.1
22°	62 06.3 -41.5 42.7	61 25.2 -40.3 44.0	60 43.1 -39.2 45.2	60 00.0 -38.0 46.4	59 16.2 -36.9 47.6
23°	61 24.8 -42.4 41.1	60 44.9 -41.3 42.5	60 03.9 -40.2 43.7	59 22.0 -39.0 44.9	58 39.3 -38.0 46.0
24°	60 42.4 -43.4 39.7	60 03.6 -42.3 41.0	59 23.7 -41.1 42.2	58 43.0 -40.1 43.4	58 01.3 -38.9 44.6
25°	59 59.0 -44.2 38.3	59 21.3 -43.1 39.6	58 42.6 -42.0 40.8	58 02.9 -40.9 42.0	57 22.4 -39.9 43.1
26°	59 14.8 -45.0 37.0	58 38.2 -43.9 38.2	58 00.6 -42.9 39.5	57 22.0 -41.8 40.6	56 42.5 -40.7 41.8
27°	58 29.8 -45.8 35.7	57 54.3 -44.7 36.9	57 17.7 -43.6 38.2	56 40.2 -42.6 39.3	56 01.8 -41.6 40.4
28°	57 44.0 -46.4 34.4	57 09.6 -45.4 35.7	56 34.1 -44.4 36.9	55 57.6 -43.4 38.0	55 20.2 -42.4 39.2
29°	56 57.6 -47.0 33.3	56 24.2 -46.1 34.5	55 49.7 -45.1 35.7	55 14.2 -44.0 36.8	54 37.8 -43.0 37.9

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°	64 55.5 +03.8 94.3	63 55.7 +03.7 94.1	62 55.9 +03.6 93.9	61 56.1 +03.4 93.8	60 56.2 +03.4 93.6
1°	64 59.3 +01.6 91.9	63 59.4 +01.6 91.8	62 59.5 +01.5 91.7	61 59.5 +01.5 91.6	60 59.6 +01.5 91.5
2°	65 00.9 -00.6 89.6	64 01.0 -00.6 89.5	63 01.0 -00.5 89.5	62 01.0 -00.4 89.5	61 01.1 -00.4 89.5
3°	65 00.3 -02.9 87.2	64 00.4 -02.8 87.3	63 00.5 -02.6 87.3	62 00.6 -02.5 87.4	61 00.7 -02.3 87.4
4°	64 57.4 -05.2 84.8	63 57.6 -04.8 85.0	62 57.9 -04.6 85.1	61 58.1 -04.3 85.2	60 58.4 -04.2 85.4
5°	64 52.2 -07.3 82.5	63 52.8 -07.0 82.7	62 53.3 -06.7 82.9	61 53.8 -06.4 83.1	60 54.2 -06.0 83.3
6°	64 44.9 -09.5 80.1	63 45.8 -09.1 80.5	62 46.6 -08.6 80.7	61 47.4 -08.2 81.0	60 48.2 -07.9 81.3
7°	64 35.4 -11.7 77.8	63 36.7 -11.1 78.2	62 38.0 -10.6 78.6	61 39.2 -10.2 78.9	60 40.3 -09.7 79.2
8°	64 23.7 -13.7 75.6	63 25.6 -13.1 76.0	62 27.4 -12.6 76.5	61 29.0 -12.0 76.9	60 30.6 -11.5 77.2
9°	64 10.0 -15.8 73.3	63 12.5 -15.1 73.9	62 14.8 -14.4 74.3	61 17.0 -13.8 74.8	60 19.1 -13.3 75.2
10°	63 54.2 -17.7 71.1	62 57.4 -17.0 71.7	62 00.4 -16.3 72.3	61 03.2 -15.7 72.8	60 05.8 -15.0 73.3
11°	63 36.5 -19.7 69.0	62 40.4 -18.8 69.6	61 44.1 -18.1 70.2	60 47.5 -17.3 70.8	59 50.8 -16.6 71.3
12°	63 16.8 -21.4 66.8	62 21.6 -20.7 67.6	61 26.0 -19.8 68.2	60 30.2 -19.0 68.9	59 34.2 -18.3 69.4
13°	62 55.4 -23.3 64.8	62 00.9 -22.3 65.5	61 06.2 -21.5 66.3	60 11.2 -20.7 66.9	59 15.9 -19.9 67.6
14°	62 32.1 -24.9 62.8	61 38.6 -24.0 63.6	60 44.7 -23.1 64.3	59 50.5 -22.2 65.1	58 56.0 -21.4 65.7
15°	62 07.2 -26.6 60.8	61 14.6 -25.6 61.7	60 21.6 -24.6 62.5	59 28.3 -23.8 63.2	58 34.6 -22.9 63.9
16°	61 40.6 -28.1 58.9	60 49.0 -27.0 59.8	59 57.0 -26.1 60.6	59 04.5 -25.2 61.4	58 11.7 -24.3 62.2
17°	61 12.5 -29.5 57.1	60 22.0 -28.6 58.0	59 30.9 -27.6 58.8	58 39.3 -26.6 59.7	57 47.4 -25.7 60.4
18°	60 43.0 -31.0 55.3	59 53.4 -29.9 56.2	59 03.3 -28.9 57.1	58 12.7 -27.9 58.0	57 21.7 -27.0 58.7
19°	60 12.0 -32.2 53.5	59 23.5 -31.2 54.5	58 34.4 -30.2 55.4	57 44.8 -29.2 56.3	56 54.7 -28.3 57.1
20°	59 39.8 -33.5 51.8	58 52.3 -32.5 52.8	58 04.2 -31.4 53.8	57 15.6 -30.5 54.7	56 26.4 -29.5 55.5
21°	59 06.3 -34.8 50.2	58 19.8 -33.6 51.2	57 32.8 -32.6 52.2	56 45.1 -31.6 53.1	55 56.9 -30.6 53.9
22°	58 31.5 -35.8 48.6	57 46.2 -34.8 49.7	57 00.2 -33.8 50.6	56 13.5 -32.7 51.5	55 26.3 -31.8 52.4
23°	57 55.7 -36.9 47.1	57 11.4 -35.8 48.1	56 26.4 -34.8 49.1	55 40.8 -33.8 50.0	54 54.5 -32.8 50.9
24°	57 18.8 -37.8 45.6	56 35.6 -36.8 46.7	55 51.6 -35.8 47.6	55 07.0 -34.8 48.6	54 21.7 -33.8 49.5
25°	56 41.0 -38.9 44.2	55 58.8 -37.8 45.2	55 15.8 -36.7 46.2	54 32.2 -35.8 47.2	53 47.9 -34.8 48.1
26°	56 02.1 -39.7 42.8	55 21.0 -38.7 43.9	54 39.1 -37.7 44.9	53 56.4 -36.7 45.8	53 13.1 -35.7 46.7
27°	55 22.4 -40.5 41.5	54 42.3 -39.5 42.5	54 01.4 -38.6 43.5	53 19.7 -37.5 44.5	52 37.4 -36.6 45.4
28°	54 41.9 -41.3 40.2	54 02.8 -40.4 41.2	53 22.8 -39.3 42.2	52 42.2 -38.4 43.2	52 00.8 -37.4 44.1
29°	54 00.6 -42.1 39.0	53 22.4 -41.1 40.0	52 43.5 -40.1 41.0	52 03.8 -39.1 41.9	51 23.4 -38.2 42.8

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Latitude 2°

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°	59 56.4 +03.3 93.5	58 56.5 +03.2 93.3	57 56.7 +03.1 93.2	56 56.8 +03.0 93.1	55 56.9 +03.0 93.0
1°	59 59.7 +01.4 91.5	58 59.7 +01.5 91.4	57 59.8 +01.4 91.3	56 59.8 +01.4 91.2	55 59.9 +01.4 91.2
2°	60 01.1 -00.3 89.5	59 01.2 -00.3 89.4	58 01.2 -00.2 89.4	57 01.2 -00.1 89.4	56 01.3 -00.2 89.4
3°	60 00.8 -02.2 87.5	59 00.9 -02.1 87.5	58 01.0 -02.0 87.5	57 01.1 -01.8 87.6	56 01.1 -01.6 87.6
4°	59 58.6 -04.0 85.5	58 58.8 -03.7 85.6	57 59.0 -03.5 85.7	56 59.3 -03.5 85.7	55 59.5 -03.3 85.8
5°	59 54.6 -05.7 83.5	58 55.1 -05.5 83.6	57 55.5 -05.3 83.8	56 55.8 -05.0 83.9	55 56.2 -04.8 84.0
6°	59 48.9 -07.6 81.5	58 49.6 -07.2 81.7	57 50.2 -06.9 81.9	56 50.8 -06.6 82.1	55 51.4 -06.3 82.2
7°	59 41.3 -09.2 79.5	58 42.4 -08.9 79.8	57 43.3 -08.5 80.0	56 44.2 -08.1 80.3	55 45.1 -07.8 80.5
8°	59 32.1 -11.1 77.6	58 33.5 -10.6 77.9	57 34.8 -10.1 78.2	56 36.1 -09.7 78.5	55 37.3 -09.3 78.7
9°	59 21.0 -12.7 75.6	58 22.9 -12.2 76.0	57 24.7 -11.8 76.3	56 26.4 -11.3 76.7	55 28.0 -10.8 77.0
10°	59 08.3 -14.4 73.7	58 10.7 -13.8 74.1	57 12.9 -13.2 74.5	56 15.1 -12.8 74.9	55 17.2 -12.3 75.2
11°	58 53.9 -16.0 71.8	57 56.9 -15.4 72.3	56 59.7 -14.8 72.7	56 02.3 -14.2 73.1	55 04.9 -13.7 73.5
12°	58 37.9 -17.6 70.0	57 41.5 -16.9 70.5	56 44.9 -16.3 71.0	55 48.1 -15.7 71.4	54 51.2 -15.1 71.8
13°	58 20.3 -19.1 68.1	57 24.6 -18.5 68.7	56 28.6 -17.7 69.2	55 32.4 -17.0 69.7	54 36.1 -16.4 70.2
14°	58 01.2 -20.6 66.4	57 06.1 -19.8 66.9	56 10.9 -19.2 67.5	55 15.4 -18.5 68.0	54 19.7 -17.8 68.5
15°	57 40.6 -22.1 64.6	56 46.3 -21.3 65.2	55 51.7 -20.5 65.8	54 56.9 -19.8 66.3	54 01.9 -19.2 66.9
16°	57 18.5 -23.5 62.9	56 25.0 -22.7 63.5	55 31.2 -21.9 64.1	54 37.1 -21.1 64.7	53 42.7 -20.3 65.3
17°	56 55.0 -24.8 61.2	56 02.3 -23.9 61.8	55 09.3 -23.1 62.5	54 16.0 -22.4 63.1	53 22.4 -21.7 63.7
18°	56 30.2 -26.1 59.5	55 38.4 -25.3 60.2	54 46.2 -24.5 60.9	53 53.6 -23.6 61.5	53 00.7 -22.8 62.1
19°	56 04.1 -27.3 57.9	55 13.1 -26.4 58.6	54 21.7 -25.6 59.3	53 30.0 -24.8 60.0	52 37.9 -24.0 60.6
20°	55 36.8 -28.6 56.3	54 46.7 -27.7 57.0	53 56.1 -26.7 57.8	53 05.2 -25.9 58.4	52 13.9 -25.1 59.1
21°	55 08.2 -29.7 54.7	54 19.0 -28.8 55.5	53 29.4 -27.9 56.3	52 39.3 -27.0 57.0	51 48.8 -26.1 57.6
22°	54 38.5 -30.8 53.2	53 50.2 -29.9 54.0	53 01.5 -29.0 54.8	52 12.3 -28.1 55.5	51 22.7 -27.3 56.2
23°	54 07.7 -31.9 51.8	53 20.3 -30.9 52.6	52 32.5 -30.0 53.3	51 44.2 -29.2 54.1	50 55.4 -28.2 54.7
24°	53 35.8 -32.8 50.3	52 49.4 -31.9 51.1	52 02.5 -31.0 51.9	51 15.0 -30.1 52.6	50 27.2 -29.3 53.4
25°	53 03.0 -33.8 48.9	52 17.5 -32.9 49.7	51 31.5 -32.0 50.5	50 44.9 -31.0 51.3	49 57.9 -30.2 52.0
26°	52 29.2 -34.8 47.6	51 44.6 -33.8 48.4	50 59.5 -32.9 49.2	50 13.9 -32.0 49.9	49 27.7 -31.0 50.7
27°	51 54.4 -35.6 46.2	51 10.8 -34.7 47.1	50 26.6 -33.7 47.9	49 41.9 -32.8 48.6	48 56.7 -32.0 49.3
28°	51 18.8 -36.5 44.9	50 36.1 -35.5 45.8	49 52.9 -34.6 46.6	49 09.1 -33.7 47.3	48 24.7 -32.8 48.1
29°	50 42.3 -37.2 43.7	50 00.6 -36.3 44.5	49 18.3 -35.4 45.3	48 35.4 -34.5 46.1	47 51.9 -33.6 46.8

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°	54 57.0 +02.9 92.9	53 57.1 +02.9 92.8	52 57.2 +02.8 92.7	51 57.3 +02.8 92.6	50 57.4 +02.7 92.5
1°	54 59.9 +01.4 91.1	54 00.0 +01.4 91.1	53 00.0 +01.4 91.0	52 00.1 +01.3 90.9	51 00.1 +01.4 90.9
2°	55 01.3 -00.1 89.4	54 01.4 -00.1 89.4	53 01.4 +00.0 89.3	52 01.4 +00.1 89.3	51 01.5 +00.1 89.3
3°	55 01.2 -01.6 87.6	54 01.3 -01.5 87.6	53 01.4 -01.4 87.7	52 01.5 -01.3 87.7	51 01.6 -01.2 87.7
4°	54 59.6 -03.0 85.9	53 59.8 -02.9 85.9	53 00.0 -02.8 86.0	52 00.2 -02.6 86.1	51 00.4 -02.5 86.1
5°	54 56.6 -04.6 84.1	53 56.9 -04.3 84.2	52 57.2 -04.1 84.3	51 57.6 -04.0 84.4	50 57.9 -03.8 84.5
6°	54 52.0 -06.0 82.4	53 52.6 -05.8 82.6	52 53.1 -05.5 82.7	51 53.6 -05.3 82.8	50 54.1 -05.1 82.9
7°	54 46.0 -07.5 80.7	53 46.8 -07.2 80.9	52 47.6 -06.9 81.0	51 48.3 -06.6 81.2	50 49.0 -06.3 81.4
8°	54 38.5 -09.0 79.0	53 39.6 -08.6 79.2	52 40.7 -08.3 79.4	51 41.7 -07.9 79.6	50 42.7 -07.6 79.8
9°	54 29.5 -10.4 77.3	53 31.0 -10.0 77.5	52 32.4 -09.6 77.8	51 33.8 -09.2 78.0	50 35.1 -08.8 78.2
10°	54 19.1 -11.8 75.6	53 21.0 -11.3 75.9	52 22.8 -10.9 76.2	51 24.6 -10.5 76.4	50 26.3 -10.1 76.7
11°	54 07.3 -13.1 73.9	53 09.7 -12.7 74.2	52 11.9 -12.2 74.5	51 14.1 -11.7 74.8	50 16.2 -11.3 75.1
12°	53 54.2 -14.6 72.2	52 57.0 -14.0 72.6	51 59.7 -13.4 73.0	51 02.4 -13.0 73.3	50 04.9 -12.5 73.6
13°	53 39.6 -15.8 70.6	52 43.0 -15.3 71.0	51 46.3 -14.8 71.4	50 49.4 -14.2 71.7	49 52.4 -13.7 72.1
14°	53 23.8 -17.2 69.0	52 27.7 -16.5 69.4	51 31.5 -15.9 69.8	50 35.2 -15.4 70.2	49 38.7 -14.9 70.6
15°	53 06.6 -18.4 67.4	52 11.2 -17.8 67.8	51 15.6 -17.2 68.3	50 19.8 -16.6 68.7	49 23.8 -16.0 69.1
16°	52 48.2 -19.7 65.8	51 53.4 -19.0 66.3	50 58.4 -18.4 66.7	50 03.2 -17.7 67.2	49 07.8 -17.1 67.6
17°	52 28.5 -20.9 64.2	51 34.4 -20.2 64.7	50 40.0 -19.5 65.2	49 45.5 -18.9 65.7	48 50.7 -18.2 66.1
18°	52 07.6 -22.1 62.7	51 14.2 -21.3 63.2	50 20.5 -20.6 63.7	49 26.6 -19.9 64.2	48 32.5 -19.2 64.7
19°	51 45.5 -23.2 61.2	50 52.9 -22.5 61.7	49 59.9 -21.7 62.3	49 06.7 -21.0 62.8	48 13.3 -20.4 63.3
20°	51 22.3 -24.3 59.7	50 30.4 -23.5 60.3	49 38.2 -22.8 60.8	48 45.7 -22.1 61.4	47 52.9 -21.3 61.9
21°	50 58.0 -25.3 58.2	50 06.9 -24.6 58.8	49 15.4 -23.8 59.4	48 23.6 -23.0 60.0	47 31.6 -22.3 60.5
22°	50 32.7 -26.5 56.8	49 42.3 -25.6 57.4	48 51.6 -24.8 58.0	48 00.6 -24.1 58.6	47 09.3 -23.3 59.1
23°	50 06.2 -27.4 55.4	49 16.7 -26.6 56.0	48 26.8 -25.8 56.6	47 36.5 -25.0 57.2	46 46.0 -24.2 57.7
24°	49 38.8 -28.3 54.0	48 50.1 -27.5 54.7	48 01.0 -26.7 55.3	47 11.5 -25.9 55.9	46 21.8 -25.2 56.4
25°	49 10.5 -29.4 52.7	48 22.6 -28.5 53.3	47 34.3 -27.7 53.9	46 45.6 -26.8 54.5	45 56.6 -26.0 55.1
26°	48 41.1 -30.2 51.3	47 54.1 -29.4 52.0	47 06.6 -28.5 52.6	46 18.8 -27.7 53.2	45 30.6 -26.9 53.8
27°	48 10.9 -31.0 50.0	47 24.7 -30.2 50.7	46 38.1 -29.3 51.3	45 51.1 -28.5 52.0	45 03.7 -27.7 52.5
28°	47 39.9 -31.9 48.8	46 54.5 -31.0 49.4	46 08.8 -30.2 50.1	45 22.6 -29.4 50.7	44 36.0 -28.6 51.3
29°	47 08.0 -32.8 47.5	46 23.5 -31.8 48.2	45 38.6 -31.0 48.8	44 53.2 -30.1 49.5	44 07.4 -29.3 50.1

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Latitude 2°

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°	49 57.5 +02.6 92.4	48 57.6 +02.6 92.3	47 57.7 +02.5 92.2	46 57.8 +02.5 92.1	45 57.8 +02.5 92.1
1°	50 00.1 +01.4 90.8	49 00.2 +01.4 90.8	48 00.2 +01.4 90.7	47 00.3 +01.3 90.7	46 00.3 +01.4 90.6
2°	50 01.5 +00.2 89.3	49 01.6 +00.1 89.3	48 01.6 +00.2 89.2	47 01.6 +00.3 89.2	46 01.7 +00.3 89.2
3°	50 01.7 -01.1 87.7	49 01.7 -01.0 87.7	48 01.8 -00.9 87.7	47 01.9 -00.8 87.7	46 02.0 -00.8 87.8
4°	50 00.6 -02.4 86.2	49 00.7 -02.2 86.2	48 00.9 -02.1 86.2	47 01.1 -02.0 86.3	46 01.2 -01.9 86.3
5°	49 58.2 -03.6 84.6	48 58.5 -03.4 84.7	47 58.8 -03.3 84.7	46 59.1 -03.1 84.8	45 59.3 -02.9 84.9
6°	49 54.6 -04.9 83.1	48 55.1 -04.7 83.2	47 55.5 -04.4 83.3	46 56.0 -04.3 83.3	45 56.4 -04.0 83.4
7°	49 49.7 -06.0 81.5	48 50.4 -05.8 81.6	47 51.1 -05.6 81.8	46 51.7 -05.3 81.9	45 52.4 -05.1 82.0
8°	49 43.7 -07.3 80.0	48 44.6 -07.0 80.1	47 45.5 -06.7 80.3	46 46.4 -06.4 80.4	45 47.3 -06.2 80.6
9°	49 36.4 -08.5 78.4	48 37.6 -08.1 78.6	47 38.8 -07.8 78.8	46 40.0 -07.6 79.0	45 41.1 -07.2 79.1
10°	49 27.9 -09.7 76.9	48 29.5 -09.4 77.1	47 31.0 -09.0 77.3	46 32.4 -08.6 77.5	45 33.9 -08.3 77.7
11°	49 18.2 -10.9 75.4	48 20.1 -10.4 75.6	47 22.0 -10.1 75.9	46 23.8 -09.7 76.1	45 25.6 -09.3 76.3
12°	49 07.3 -12.0 73.9	48 09.7 -11.6 74.2	47 11.9 -11.1 74.4	46 14.1 -10.7 74.7	45 16.3 -10.4 74.9
13°	48 55.3 -13.2 72.4	47 58.1 -12.7 72.7	47 00.8 -12.3 73.0	46 03.4 -11.8 73.3	45 05.9 -11.3 73.5
14°	48 42.1 -14.3 70.9	47 45.4 -13.8 71.2	46 48.5 -13.3 71.5	45 51.6 -12.8 71.8	44 54.6 -12.4 72.1
15°	48 27.8 -15.5 69.4	47 31.6 -14.9 69.8	46 35.2 -14.3 70.1	45 38.8 -13.9 70.4	44 42.2 -13.3 70.7
16°	48 12.3 -16.5 68.0	47 16.7 -16.0 68.4	46 20.9 -15.4 68.7	45 24.9 -14.8 69.1	44 28.9 -14.4 69.4
17°	47 55.8 -17.6 66.6	47 00.7 -17.0 66.9	46 05.5 -16.4 67.3	45 10.1 -15.9 67.7	44 14.5 -15.3 68.0
18°	47 38.2 -18.6 65.1	46 43.7 -18.0 65.5	45 49.1 -17.4 65.9	44 54.2 -16.8 66.3	43 59.2 -16.2 66.7
19°	47 19.6 -19.6 63.7	46 25.7 -19.0 64.2	45 31.7 -18.4 64.6	44 37.4 -17.7 65.0	43 43.0 -17.1 65.3
20°	47 00.0 -20.7 62.3	46 06.7 -19.9 62.8	45 13.3 -19.3 63.2	44 19.7 -18.7 63.6	43 25.9 -18.1 64.0
21°	46 39.3 -21.6 61.0	45 46.8 -21.0 61.4	44 54.0 -20.3 61.9	44 01.0 -19.6 62.3	43 07.8 -18.9 62.7
22°	46 17.7 -22.6 59.6	45 25.8 -21.8 60.1	44 33.7 -21.1 60.5	43 41.4 -20.5 61.0	42 48.9 -19.8 61.4
23°	45 55.1 -23.5 58.3	45 04.0 -22.8 58.8	44 12.6 -22.1 59.2	43 20.9 -21.3 59.7	42 29.1 -20.7 60.1
24°	45 31.6 -24.3 57.0	44 41.2 -23.6 57.5	43 50.5 -22.9 57.9	42 59.6 -22.2 58.4	42 08.4 -21.5 58.9
25°	45 07.3 -25.3 55.7	44 17.6 -24.5 56.2	43 27.6 -23.7 56.7	42 37.4 -23.0 57.1	41 46.9 -22.3 57.6
26°	44 42.0 -26.1 54.4	43 53.1 -25.3 54.9	43 03.9 -24.6 55.4	42 14.4 -23.8 55.9	41 24.6 -23.1 56.4
27°	44 15.9 -26.9 53.1	43 27.8 -26.2 53.6	42 39.3 -25.3 54.2	41 50.6 -24.6 54.7	41 01.5 -23.9 55.1
28°	43 49.0 -27.7 51.9	43 01.6 -26.9 52.4	42 14.0 -26.2 52.9	41 26.0 -25.4 53.4	40 37.6 -25.6 53.9
29°	43 21.3 -28.5 50.6	42 34.7 -27.7 51.2	41 47.8 -26.9 51.7	41 00.6 -26.1 52.2	40 13.0 -25.3 52.7

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 57.9 +02.4 92.0	43 58.0 +02.4 91.9	42 58.0 +02.4 91.9	41 58.1 +02.4 91.8	40 58.2 +02.3 91.7
1°	45 00.3 +01.4 90.6	44 00.4 +01.4 90.5	43 00.4 +01.4 90.5	42 00.5 +01.4 90.5	41 00.5 +01.4 90.4
2°	45 01.7 +00.4 89.2	44 01.8 +00.4 89.2	43 01.8 +00.4 89.1	42 01.9 +00.4 89.1	41 01.9 +00.5 89.1
3°	45 02.1 -00.7 87.8	44 02.2 -00.7 87.8	43 02.2 -00.5 87.8	42 02.3 -00.5 87.8	41 02.4 -00.4 87.8
4°	45 01.4 -01.8 86.3	44 01.5 -01.6 86.4	43 01.7 -01.5 86.4	42 01.8 -01.4 86.4	41 02.0 -01.3 86.4
5°	44 59.6 -02.8 84.9	43 59.9 -02.7 85.0	43 00.2 -02.6 85.0	42 00.4 -02.4 85.1	41 00.7 -02.3 85.1
6°	44 56.8 -03.8 83.5	43 57.2 -03.6 83.6	42 57.6 -03.4 83.7	41 58.0 -03.3 83.7	40 58.4 -03.1 83.8
7°	44 53.0 -04.9 82.1	43 53.6 -04.7 82.2	42 54.2 -04.5 82.3	41 54.7 -04.2 82.4	40 55.3 -04.1 82.5
8°	44 48.1 -05.9 80.7	43 48.9 -05.6 80.8	42 49.7 -05.4 80.9	41 50.5 -05.2 81.0	40 51.2 -04.9 81.1
9°	44 42.2 -06.9 79.3	43 43.3 -06.7 79.4	42 44.3 -06.4 79.6	41 45.3 -06.1 79.7	40 46.3 -05.8 79.8
10°	44 35.3 -08.0 77.9	43 36.6 -07.6 78.1	42 37.9 -07.3 78.2	41 39.2 -07.0 78.4	40 40.5 -06.8 78.5
11°	44 27.3 -08.9 76.5	43 29.0 -08.6 76.7	42 30.6 -08.3 76.9	41 32.2 -08.0 77.0	40 33.7 -07.6 77.2
12°	44 18.4 -10.0 75.1	43 20.4 -09.6 75.3	42 22.3 -09.2 75.5	41 24.2 -08.8 75.7	40 26.1 -08.5 75.9
13°	44 08.4 -10.9 73.8	43 10.8 -10.5 74.0	42 13.1 -10.1 74.2	41 15.4 -09.7 74.4	40 17.6 -09.3 74.6
14°	43 57.5 -11.9 72.4	43 00.3 -11.5 72.6	42 03.0 -11.0 72.9	41 05.7 -10.7 73.1	40 08.3 -10.3 73.3
15°	43 45.6 -12.9 71.0	42 48.8 -12.4 71.3	41 52.0 -12.0 71.6	40 55.0 -11.5 71.8	39 58.0 -11.0 72.0
16°	43 32.7 -13.8 69.7	42 36.4 -13.3 70.0	41 40.0 -12.8 70.2	40 43.5 -12.3 70.5	39 47.0 -11.9 70.7
17°	43 18.9 -14.8 68.3	42 23.1 -14.3 68.6	41 27.2 -13.7 68.9	40 31.2 -13.3 69.2	39 35.1 -12.8 69.5
18°	43 04.1 -15.6 67.0	42 08.8 -15.1 67.3	41 13.5 -14.6 67.6	40 17.9 -14.0 67.9	39 22.3 -13.5 68.2
19°	42 48.5 -16.6 65.7	41 53.7 -16.0 66.0	40 58.9 -15.5 66.3	40 03.9 -14.9 66.7	39 08.8 -14.4 66.9
20°	42 31.9 -17.5 64.4	41 37.7 -16.8 64.7	40 43.4 -16.2 65.1	39 49.0 -15.7 65.4	38 54.4 -15.2 65.7
21°	42 14.4 -18.3 63.1	41 20.9 -17.7 63.5	40 27.2 -17.1 63.8	39 33.3 -16.5 64.1	38 39.3 -15.9 64.5
22°	41 56.1 -19.1 61.8	41 03.2 -18.5 62.2	40 10.1 -18.0 62.5	39 16.8 -17.3 62.9	38 23.3 -16.7 63.2
23°	41 37.0 -20.0 60.5	40 44.7 -19.4 60.9	39 52.1 -18.7 61.3	38 59.5 -18.1 61.7	38 06.6 -17.5 62.0
24°	41 17.0 -20.8 59.3	40 25.3 -20.1 59.7	39 33.4 -19.4 60.1	38 41.4 -18.8 60.4	37 49.1 -18.2 60.8
25°	40 56.2 -21.6 58.0	40 05.2 -20.9 58.4	39 14.0 -20.3 58.8	38 22.6 -19.6 59.2	37 30.9 -18.9 59.6
26°	40 34.6 -22.4 56.8	39 44.3 -21.7 57.2	38 53.7 -21.0 57.6	38 03.0 -20.3 58.0	37 12.0 -19.6 58.4
27°	40 12.2 -23.2 55.6	39 22.6 -22.4 56.0	38 32.7 -21.7 56.4	37 42.7 -21.1 56.8	36 52.4 -20.4 57.2
28°	39 49.0 -23.8 54.4	39 00.2 -23.2 54.8	38 11.0 -22.4 55.2	37 21.6 -21.7 55.6	36 32.0 -21.0 56.0
29°	39 25.2 -24.6 53.2	38 37.0 -23.8 53.6	37 48.6 -23.1 54.1	36 59.9 -22.4 54.5	36 11.0 -21.7 54.9

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Latitude 2°

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 58.2 +02.3 91.7	38 58.3 +02.3 91.6	37 58.4 +02.2 91.6	36 58.4 +02.2 91.5	35 58.5 +02.2 91.5
1°	40 00.5 +01.5 90.4	39 00.6 +01.4 90.3	38 00.6 +01.4 90.3	37 00.6 +01.5 90.3	36 00.7 +01.4 90.2
2°	40 02.0 +00.5 89.1	39 02.0 +00.6 89.0	38 02.0 +00.7 89.0	37 02.1 +00.6 89.0	36 02.1 +00.7 89.0
3°	40 02.5 -00.4 87.8	39 02.6 -00.3 87.8	38 02.7 -00.3 87.8	37 02.7 -00.1 87.8	36 02.8 -00.1 87.7
4°	40 02.1 -01.2 86.5	39 02.3 -01.1 86.5	38 02.4 -01.0 86.5	37 02.6 -00.9 86.5	36 02.7 -00.8 86.5
5°	40 00.9 -02.1 85.1	39 01.2 -02.0 85.2	38 01.4 -01.8 85.2	37 01.7 -01.8 85.2	36 01.9 -01.6 85.3
6°	39 58.8 -03.0 83.8	38 59.2 -02.8 83.9	37 59.6 -02.7 83.9	36 59.9 -02.5 84.0	36 00.3 -02.4 84.0
7°	39 55.8 -03.8 82.5	38 56.4 -03.7 82.6	37 56.9 -03.5 82.7	36 57.4 -03.3 82.7	35 57.9 -03.1 82.8
8°	39 52.0 -04.7 81.2	38 52.7 -04.5 81.3	37 53.4 -04.3 81.4	36 54.1 -04.0 81.5	35 54.8 -03.8 81.6
9°	39 47.3 -05.6 79.9	38 48.2 -05.3 80.1	37 49.1 -05.0 80.2	36 50.1 -04.9 80.2	35 51.0 -04.7 80.3
10°	39 41.7 -06.5 78.6	38 42.9 -06.2 78.8	37 44.1 -05.9 78.9	36 45.2 -05.6 79.0	35 46.3 -05.3 79.1
11°	39 35.2 -07.3 77.4	38 36.7 -07.0 77.5	37 38.2 -06.7 77.6	36 39.6 -06.4 77.8	35 41.0 -06.2 77.9
12°	39 27.9 -08.1 76.1	38 29.7 -07.8 76.2	37 31.5 -07.5 76.4	36 33.2 -07.2 76.5	35 34.8 -06.8 76.7
13°	39 19.8 -09.0 74.8	38 21.9 -08.6 75.0	37 24.0 -08.3 75.1	36 26.0 -07.9 75.3	35 28.0 -07.6 75.4
14°	39 10.8 -09.8 73.5	38 13.3 -09.5 73.7	37 15.7 -09.1 73.9	36 18.1 -08.7 74.1	35 20.4 -08.4 74.2
15°	39 01.0 -10.7 72.2	38 03.8 -10.2 72.4	37 06.6 -09.8 72.6	36 09.4 -09.5 72.8	35 12.0 -09.0 73.0
16°	38 50.3 -11.4 71.0	37 53.6 -11.0 71.2	36 56.8 -10.6 71.4	35 59.9 -10.1 71.6	35 03.0 -09.8 71.8
17°	38 38.9 -12.3 69.7	37 42.6 -11.8 70.0	36 46.2 -11.3 70.2	35 49.8 -11.0 70.4	34 53.2 -10.4 70.6
18°	38 26.6 -13.1 68.5	37 30.8 -12.6 68.7	36 34.9 -12.1 69.0	35 38.8 -11.6 69.2	34 42.8 -11.2 69.4
19°	38 13.5 -13.8 67.2	37 18.2 -13.3 67.5	36 22.8 -12.9 67.7	35 27.2 -12.3 68.0	34 31.6 -11.9 68.2
20°	37 59.7 -14.6 66.0	37 04.9 -14.1 66.3	36 09.9 -13.5 66.5	35 14.9 -13.1 66.8	34 19.7 -12.5 67.0
21°	37 45.1 -15.4 64.8	36 50.8 -14.8 65.0	35 56.4 -14.3 65.3	35 01.8 -13.7 65.6	34 07.2 -13.3 65.8
22°	37 29.7 -16.1 63.5	36 36.0 -15.6 63.8	35 42.1 -15.0 64.1	34 48.1 -14.5 64.4	33 53.9 -13.9 64.7
23°	37 13.6 -16.9 62.3	36 20.4 -16.3 62.6	35 27.1 -15.7 62.9	34 33.6 -15.1 63.2	33 40.0 -14.5 63.5
24°	36 56.7 -17.6 61.1	36 04.1 -16.9 61.4	35 11.4 -16.4 61.7	34 18.5 -15.8 62.0	33 25.5 -15.2 62.3
25°	36 39.1 -18.3 59.9	35 47.2 -17.7 60.3	34 55.0 -17.0 60.6	34 02.7 -16.4 60.9	33 10.3 -15.9 61.2
26°	36 20.8 -18.9 58.7	35 29.5 -18.3 59.1	34 38.0 -17.7 59.4	33 46.3 -17.1 59.7	32 54.4 -16.5 60.0
27°	36 01.9 -19.7 57.6	35 11.2 -19.1 57.9	34 20.3 -18.4 58.2	33 29.2 -17.7 58.6	32 37.9 -17.1 58.9
28°	35 42.2 -20.3 56.4	34 52.1 -19.6 56.8	34 01.9 -19.0 57.1	33 11.5 -18.4 57.4	32 20.8 -17.7 57.7
29°	35 21.9 -21.0 55.2	34 32.5 -20.3 55.6	33 42.9 -19.6 56.0	32 53.1 -18.9 56.3	32 03.1 -18.3 56.6

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 58.5 +02.2 91.4	33 58.6 +02.2 91.3	32 58.6 +02.2 91.3	31 58.7 +02.1 91.2	30 58.7 +02.2 91.2
1°	35 00.7 +01.5 90.2	34 00.8 +01.4 90.1	33 00.8 +01.5 90.1	32 00.8 +01.5 90.1	31 00.9 +01.5 90.0
2°	35 02.2 +00.7 89.0	34 02.2 +00.8 88.9	33 02.3 +00.8 88.9	32 02.3 +00.9 88.9	31 02.4 +00.8 88.9
3°	35 02.9 +00.0 87.7	34 03.0 +00.0 87.7	33 03.1 +00.1 87.7	32 03.2 +00.1 87.7	31 03.2 +00.3 87.7
4°	35 02.9 -00.8 86.5	34 03.0 -00.6 86.5	33 03.2 -00.6 86.5	32 03.3 -00.4 86.5	31 03.5 -00.4 86.5
5°	35 02.1 -01.4 85.3	34 02.4 -01.4 85.3	33 02.6 -01.2 85.3	32 02.9 -01.2 85.4	31 03.1 -01.0 85.4
6°	35 00.7 -02.2 84.1	34 01.0 -02.0 84.1	33 01.4 -02.0 84.1	32 01.7 -01.8 84.2	31 02.1 -01.7 84.2
7°	34 58.5 -03.0 82.9	33 59.0 -02.8 82.9	32 59.4 -02.6 83.0	31 59.9 -02.4 83.0	31 00.4 -02.3 83.0
8°	34 55.5 -03.7 81.6	33 56.2 -03.5 81.7	32 56.8 -03.2 81.8	31 57.5 -03.1 81.8	30 58.1 -02.9 81.9
9°	34 51.8 -04.4 80.4	33 52.7 -04.2 80.5	32 53.6 -04.0 80.6	31 54.4 -03.7 80.6	30 55.2 -03.5 80.7
10°	34 47.4 -05.1 79.2	33 48.5 -04.8 79.3	32 49.6 -04.6 79.4	31 50.7 -04.4 79.5	30 51.7 -04.2 79.5
11°	34 42.3 -05.8 78.0	33 43.7 -05.6 78.1	32 45.0 -05.3 78.2	31 46.3 -05.1 78.3	30 47.5 -04.7 78.4
12°	34 36.5 -06.6 76.8	33 38.1 -06.3 76.9	32 39.7 -06.0 77.0	31 41.2 -05.7 77.1	30 42.8 -05.4 77.2
13°	34 29.9 -07.3 75.6	33 31.8 -06.9 75.7	32 33.7 -06.6 75.8	31 35.5 -06.3 75.9	30 37.4 -06.0 76.1
14°	34 22.6 -07.9 74.4	33 24.9 -07.6 74.5	32 27.1 -07.3 74.7	31 29.2 -06.9 74.8	30 31.4 -06.7 74.9
15°	34 14.7 -08.7 73.2	33 17.3 -08.3 73.3	32 19.8 -07.9 73.5	31 22.3 -07.6 73.6	30 24.7 -07.2 73.8
16°	34 06.0 -09.4 72.0	33 09.0 -09.0 72.1	32 11.9 -08.6 72.3	31 14.7 -08.2 72.5	30 17.5 -07.8 72.6
17°	33 56.6 -10.0 70.8	33 00.0 -09.6 71.0	32 03.3 -09.2 71.1	31 06.5 -08.8 71.3	30 09.7 -08.4 71.5
18°	33 46.6 -10.7 69.6	32 50.4 -10.3 69.8	31 54.1 -09.9 70.0	30 57.7 -09.4 70.1	30 01.3 -09.1 70.3
19°	33 35.9 -11.4 68.4	32 40.1 -11.0 68.6	31 44.2 -10.5 68.8	30 48.3 -10.1 69.0	29 52.2 -09.6 69.2
20°	33 24.5 -12.1 67.2	32 29.1 -11.6 67.5	31 33.7 -11.1 67.7	30 38.2 -10.6 67.8	29 42.6 -10.2 68.0
21°	33 12.4 -12.7 66.1	32 17.5 -12.2 66.3	31 22.6 -11.7 66.5	30 27.6 -11.3 66.7	29 32.4 -10.7 66.9
22°	32 59.7 -13.4 64.9	32 05.3 -12.8 65.1	31 10.9 -12.4 65.4	30 16.3 -11.8 65.6	29 21.7 -11.3 65.8
23°	32 46.3 -14.0 63.7	31 52.5 -13.5 64.0	30 58.5 -12.9 64.2	30 04.5 -12.4 64.4	29 10.4 -11.9 64.6
24°	32 32.3 -14.6 62.6	31 39.0 -14.1 62.8	30 45.6 -13.5 63.1	29 52.1 -13.0 63.3	28 58.5 -12.5 63.5
25°	32 17.7 -15.3 61.4	31 24.9 -14.6 61.7	30 32.1 -14.1 61.9	29 39.1 -13.5 62.2	28 46.0 -13.0 62.4
26°	32 02.4 -15.9 60.3	31 10.3 -15.3 60.6	30 18.0 -14.7 60.8	29 25.6 -14.2 61.1	28 33.0 -13.5 61.3
27°	31 46.5 -16.4 59.2	30 55.0 -15.9 59.4	30 03.3 -15.3 59.7	29 11.4 -14.6 59.9	28 19.5 -14.1 60.2
28°	31 30.1 -17.1 58.0	30 39.1 -16.4 58.3	29 48.0 -15.8 58.6	28 56.8 -15.2 58.8	28 05.4 -14.6 59.1
29°	31 13.0 -17.6 56.9	30 22.7 -17.0 57.2	29 32.2 -16.4 57.5	28 41.6 -15.8 57.7	27 50.8 -15.1 58.0

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Declination SAME name as Latitude

Latitude 2°

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 58.8 +02.1 91.2	28 58.8 +02.1 91.1	27 58.9 +02.1 91.1	26 58.9 +02.1 91.0	25 59.0 +02.1 91.0
1°	30 00.9 +01.5 90.0	29 00.9 +01.6 90.0	28 01.0 +01.5 89.9	27 01.0 +01.6 89.9	26 01.1 +01.5 89.9
2°	30 02.4 +00.9 88.8	29 02.5 +00.9 88.8	28 02.5 +01.0 88.8	27 02.6 +01.0 88.8	26 02.6 +01.1 88.8
3°	30 03.3 +00.3 87.7	29 03.4 +00.4 87.7	28 03.5 +00.4 87.7	27 03.6 +00.5 87.7	26 03.7 +00.5 87.6
4°	30 03.6 -00.3 86.5	29 03.8 -00.3 86.5	28 03.9 -00.1 86.5	27 04.1 -00.1 86.5	26 04.2 +00.0 86.5
5°	30 03.3 -00.9 85.4	29 03.5 -00.8 85.4	28 03.8 -00.7 85.4	27 04.0 -00.6 85.4	26 04.2 -00.4 85.4
6°	30 02.4 -01.5 84.2	29 02.7 -01.3 84.2	28 03.1 -01.3 84.3	27 03.4 -01.1 84.3	26 03.8 -01.0 84.3
7°	30 00.9 -02.1 83.1	29 01.4 -02.0 83.1	28 01.8 -01.8 83.1	27 02.3 -01.7 83.2	26 02.8 -01.6 83.2
8°	29 58.8 -02.8 81.9	28 59.4 -02.5 82.0	28 00.0 -02.3 82.0	27 00.6 -02.2 82.0	26 01.2 -02.0 82.1
9°	29 56.0 -03.3 80.8	28 56.9 -03.2 80.8	27 57.7 -03.0 80.9	26 58.4 -02.7 80.9	25 59.2 -02.5 81.0
10°	29 52.7 -03.9 79.6	28 53.7 -03.7 79.7	27 54.7 -03.4 79.7	26 55.7 -03.2 79.8	25 56.7 -03.0 79.8
11°	29 48.8 -04.5 78.5	28 50.0 -04.2 78.5	27 51.3 -04.1 78.6	26 52.5 -03.8 78.7	25 53.7 -03.6 78.7
12°	29 44.3 -05.1 77.3	28 45.8 -04.9 77.4	27 47.2 -04.5 77.5	26 48.7 -04.3 77.6	25 50.1 -04.0 77.6
13°	29 39.2 -05.8 76.2	28 40.9 -05.4 76.3	27 42.7 -05.2 76.4	26 44.4 -04.9 76.4	25 46.1 -04.6 76.5
14°	29 33.4 -06.3 75.0	28 35.5 -06.0 75.1	27 37.5 -05.6 75.2	26 39.5 -05.3 75.3	25 41.5 -05.0 75.4
15°	29 27.1 -06.8 73.9	28 29.5 -06.5 74.0	27 31.9 -06.2 74.1	26 34.2 -05.9 74.2	25 36.5 -05.6 74.3
16°	29 20.3 -07.5 72.7	28 23.0 -07.1 72.9	27 25.7 -06.8 73.0	26 28.3 -06.4 73.1	25 30.9 -06.0 73.2
17°	29 12.8 -08.0 71.6	28 15.9 -07.7 71.7	27 18.9 -07.3 71.9	26 21.9 -06.9 72.0	25 24.9 -06.6 72.1
18°	29 04.8 -08.6 70.5	28 08.2 -08.2 70.6	27 11.6 -07.8 70.8	26 15.0 -07.4 70.9	25 18.3 -07.0 71.0
19°	28 56.2 -09.2 69.3	28 00.0 -08.7 69.5	27 03.8 -08.3 69.6	26 07.6 -07.9 69.8	25 11.3 -07.5 69.9
20°	28 47.0 -09.7 68.2	27 51.3 -09.3 68.4	26 55.5 -08.8 68.5	25 59.7 -08.4 68.7	25 03.8 -08.0 68.8
21°	28 37.3 -10.3 67.1	27 42.0 -09.8 67.3	26 46.7 -09.4 67.4	25 51.3 -09.0 67.6	24 55.8 -08.5 67.7
22°	28 27.0 -10.9 66.0	27 32.2 -10.4 66.1	26 37.3 -09.9 66.3	25 42.3 -09.4 66.5	24 47.3 -08.9 66.6
23°	28 16.1 -11.4 64.8	27 21.8 -10.9 65.0	26 27.4 -10.4 65.2	25 32.9 -09.9 65.4	24 38.4 -09.4 65.5
24°	28 04.7 -11.9 63.7	27 10.9 -11.4 63.9	26 17.0 -10.9 64.1	25 23.0 -10.3 64.3	24 29.0 -09.9 64.5
25°	27 52.8 -12.4 62.6	26 59.5 -11.9 62.8	26 06.1 -11.3 63.0	25 12.7 -10.9 63.2	24 19.1 -10.3 63.4
26°	27 40.4 -13.0 61.5	26 47.6 -12.4 61.7	25 54.8 -11.9 61.9	25 01.8 -11.3 62.1	24 08.8 -10.8 62.3
27°	27 27.4 -13.5 60.4	26 35.2 -12.9 60.6	25 42.9 -12.4 60.8	24 50.5 -11.8 61.0	23 58.0 -11.3 61.2
28°	27 13.9 -14.0 59.3	26 22.3 -13.4 59.5	25 30.5 -12.8 59.7	24 38.7 -12.3 59.9	23 46.7 -11.7 60.1
29°	26 59.9 -14.5 58.2	26 08.9 -13.9 58.4	25 17.7 -13.3 58.7	24 26.4 -12.7 58.9	23 35.0 -12.1 59.1

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 59.0 +02.1 90.9	23 59.1 +02.0 90.9	22 59.1 +02.1 90.8	21 59.2 +02.0 90.8	20 59.2 +02.0 90.8
1°	25 01.1 +01.6 89.8	24 01.1 +01.6 89.8	23 01.2 +01.6 89.8	22 01.2 +01.6 89.7	21 01.2 +01.7 89.7
2°	25 02.7 +01.1 88.7	24 02.7 +01.1 88.7	23 02.8 +01.1 88.7	22 02.8 +01.2 88.7	21 02.9 +01.2 88.6
3°	25 03.8 +00.6 87.6	24 03.8 +00.7 87.6	23 03.9 +00.8 87.6	22 04.0 +00.8 87.6	21 04.1 +00.8 87.6
4°	25 04.4 +00.1 86.5	24 04.5 +00.2 86.5	23 04.7 +00.2 86.5	22 04.8 +00.4 86.5	21 04.9 +00.5 86.5
5°	25 04.5 -00.4 85.4	24 04.7 -00.3 85.4	23 04.9 -00.2 85.4	22 05.2 -00.1 85.4	21 05.4 +00.0 85.4
6°	25 04.1 -00.9 84.3	24 04.4 -00.7 84.3	23 04.7 -00.6 84.3	22 05.1 -00.5 84.3	21 05.4 -00.4 84.3
7°	25 03.2 -01.3 83.2	24 03.7 -01.2 83.2	23 04.1 -01.0 83.2	22 04.6 -00.9 83.3	21 05.0 -00.8 83.3
8°	25 01.9 -01.9 82.1	24 02.5 -01.7 82.1	23 03.1 -01.6 82.2	22 03.7 -01.4 82.2	21 04.2 -01.1 82.2
9°	25 00.0 -02.3 81.0	24 00.8 -02.2 81.0	23 01.5 -01.9 81.1	22 02.3 -01.8 81.1	21 03.1 -01.6 81.1
10°	24 57.7 -02.9 79.9	23 58.6 -02.6 79.9	22 59.6 -02.4 80.0	22 00.5 -02.2 80.0	21 01.5 -02.0 80.1
11°	24 54.8 -03.3 78.8	23 56.0 -03.1 78.8	22 57.2 -02.9 78.9	21 58.3 -02.6 78.9	20 59.5 -02.4 79.0
12°	24 51.5 -03.7 77.7	23 52.9 -03.5 77.8	22 54.3 -03.2 77.8	21 55.7 -03.0 77.9	20 57.1 -02.8 77.9
13°	24 47.8 -04.3 76.6	23 49.4 -04.0 76.7	22 51.1 -03.8 76.7	21 52.7 -03.5 76.8	20 54.3 -03.2 76.8
14°	24 43.5 -04.8 75.5	23 45.4 -04.4 75.6	22 47.3 -04.1 75.6	21 49.2 -03.8 75.7	20 51.1 -03.6 75.8
15°	24 38.7 -05.2 74.4	23 41.0 -05.0 74.5	22 43.2 -04.6 74.6	21 45.4 -04.3 74.6	20 47.5 -04.0 74.7
16°	24 33.5 -05.7 73.3	23 36.0 -05.3 73.4	22 38.6 -05.1 73.5	21 41.1 -04.7 73.6	20 43.5 -04.3 73.6
17°	24 27.8 -06.2 72.2	23 30.7 -05.8 72.3	22 33.5 -05.4 72.4	21 36.4 -05.1 72.5	20 39.2 -04.8 72.6
18°	24 21.6 -06.6 71.1	23 24.9 -06.3 71.2	22 28.1 -05.9 71.3	21 31.3 -05.6 71.4	20 34.4 -05.2 71.5
19°	24 15.0 -07.1 70.0	23 18.6 -06.7 70.1	22 22.2 -06.3 70.3	21 25.7 -05.9 70.4	20 29.2 -05.5 70.4
20°	24 07.9 -07.6 68.9	23 11.9 -07.2 69.1	22 15.9 -06.8 69.2	21 19.8 -06.3 69.3	20 23.7 -05.9 69.4
21°	24 00.3 -08.0 67.9	23 04.7 -07.6 68.0	22 09.1 -07.1 68.1	21 13.5 -06.8 68.2	20 17.8 -06.4 68.3
22°	23 52.3 -08.5 66.8	22 57.1 -08.0 66.9	22 02.0 -07.6 67.0	21 06.7 -07.1 67.1	20 11.4 -06.7 67.3
23°	23 43.8 -09.0 65.7	22 49.1 -08.5 65.8	21 54.4 -08.0 66.0	20 59.6 -07.6 66.1	20 04.7 -07.0 66.2
24°	23 34.8 -09.3 64.6	22 40.6 -08.9 64.8	21 46.4 -08.4 64.9	20 52.0 -07.9 65.0	19 57.7 -07.5 65.1
25°	23 25.5 -09.9 63.5	22 31.7 -09.3 63.7	21 38.0 -08.8 63.8	20 44.1 -08.3 64.0	19 50.2 -07.8 64.1
26°	23 15.6 -10.2 62.5	22 22.4 -09.7 62.6	21 29.2 -09.3 62.8	20 35.8 -08.7 62.9	19 42.4 -08.2 63.0
27°	23 05.4 -10.7 61.4	22 12.7 -10.2 61.5	21 19.9 -09.6 61.7	20 27.1 -09.1 61.8	19 34.2 -08.6 62.0
28°	22 54.7 -11.1 60.3	22 02.5 -10.5 60.5	21 10.3 -10.0 60.6	20 18.0 -09.4 60.8	19 25.6 -08.9 60.9
29°	22 43.6 -11.6 59.2	21 52.0 -11.0 59.4	21 00.3 -10.4 59.6	20 08.6 -09.9 59.7	19 16.7 -09.3 59.9

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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 59.2 +02.1 90.7	18 59.3 +02.0 90.7	17 59.3 +02.1 90.6	16 59.4 +02.0 90.6	15 59.4 +02.0 90.6
1°	20 01.3 +01.6 89.7	19 01.3 +01.7 89.6	18 01.4 +01.6 89.6	17 01.4 +01.7 89.6	16 01.4 +01.8 89.5
2°	20 02.9 +01.3 88.6	19 03.0 +01.3 88.6	18 03.0 +01.4 88.5	17 03.1 +01.4 88.5	16 03.2 +01.4 88.5
3°	20 04.2 +00.9 87.5	19 04.3 +00.9 87.5	18 04.4 +01.0 87.5	17 04.5 +01.1 87.5	16 04.6 +01.1 87.5
4°	20 05.1 +00.5 86.5	19 05.2 +00.6 86.5	18 05.4 +00.7 86.4	17 05.6 +00.7 86.4	16 05.7 +00.8 86.4
5°	20 05.6 +00.1 85.4	19 05.8 +00.3 85.4	18 06.1 +00.3 85.4	17 06.3 +00.4 85.4	16 06.5 +00.6 85.4
6°	20 05.7 -00.2 84.3	19 06.1 -00.2 84.3	18 06.4 +00.0 84.3	17 06.7 +00.1 84.3	16 07.1 +00.2 84.3
7°	20 05.5 -00.7 83.3	19 05.9 -00.5 83.3	18 06.4 -00.4 83.3	17 06.8 -00.2 83.3	16 07.3 -00.1 83.3
8°	20 04.8 -01.0 82.2	19 05.4 -00.8 82.2	18 06.0 -00.7 82.2	17 06.6 -00.5 82.2	16 07.2 -00.4 82.2
9°	20 03.8 -01.4 81.1	19 04.6 -01.3 81.2	18 05.3 -01.0 81.2	17 06.1 -00.9 81.2	16 06.8 -00.7 81.2
10°	20 02.4 -01.8 80.1	19 03.3 -01.5 80.1	18 04.3 -01.4 80.1	17 05.2 -01.2 80.2	16 06.1 -01.0 80.2
11°	20 00.6 -02.1 79.0	19 01.8 -02.0 79.1	18 02.9 -01.7 79.1	17 04.0 -01.5 79.1	16 05.1 -01.3 79.1
12°	19 58.5 -02.6 78.0	18 59.8 -02.3 78.0	18 01.2 -02.1 78.0	17 02.5 -01.8 78.1	16 03.8 -01.6 78.1
13°	19 55.9 -02.9 76.9	18 57.5 -02.7 76.9	17 59.1 -02.4 77.0	17 00.7 -02.2 77.0	16 02.2 -01.9 77.0
14°	19 53.0 -03.3 75.8	18 54.8 -03.0 75.9	17 56.7 -02.8 75.9	16 58.5 -02.5 76.0	16 00.3 -02.2 76.0
15°	19 49.7 -03.7 74.8	18 51.8 -03.4 74.8	17 53.9 -03.0 74.9	16 56.0 -02.7 74.9	15 58.1 -02.5 75.0
16°	19 46.0 -04.1 73.7	18 48.4 -03.7 73.8	17 50.9 -03.5 73.8	16 53.3 -03.2 73.9	15 55.6 -02.8 73.9
17°	19 41.9 -04.4 72.6	18 44.7 -04.1 72.7	17 47.4 -03.7 72.8	16 50.1 -03.4 72.8	15 52.8 -03.0 72.9
18°	19 37.5 -04.8 71.6	18 40.6 -04.4 71.7	17 43.7 -04.1 71.7	16 46.7 -03.7 71.8	15 49.8 -03.4 71.9
19°	19 32.7 -05.2 70.5	18 36.2 -04.8 70.6	17 39.6 -04.4 70.7	16 43.0 -04.1 70.8	15 46.4 -03.7 70.8
20°	19 27.5 -05.5 69.5	18 31.4 -05.2 69.6	17 35.2 -04.8 69.6	16 38.9 -04.3 69.7	15 42.7 -04.0 69.8
21°	19 22.0 -05.9 68.4	18 26.2 -05.5 68.5	17 30.4 -05.1 68.6	16 34.6 -04.7 68.7	15 38.7 -04.3 68.7
22°	19 16.1 -06.3 67.4	18 20.7 -05.8 67.5	17 25.3 -05.4 67.5	16 29.9 -05.0 67.6	15 34.4 -04.5 67.7
23°	19 09.8 -06.6 66.3	18 14.9 -06.2 66.4	17 19.9 -05.7 66.5	16 24.9 -05.3 66.6	15 29.9 -04.9 66.7
24°	19 03.2 -07.0 65.3	18 08.7 -06.5 65.4	17 14.2 -06.0 65.5	16 19.6 -05.5 65.6	15 25.0 -05.1 65.6
25°	18 56.2 -07.3 64.2	18 02.2 -06.8 64.3	17 08.2 -06.4 64.4	16 14.1 -05.9 64.5	15 19.9 -05.4 64.6
26°	18 48.9 -07.7 63.2	17 55.4 -07.2 63.3	17 01.8 -06.7 63.4	16 08.2 -06.2 63.5	15 14.5 -05.7 63.6
27°	18 41.2 -08.0 62.1	17 48.2 -07.5 62.2	16 55.1 -07.0 62.3	16 02.0 -06.5 62.4	15 08.8 -06.0 62.5
28°	18 33.2 -08.4 61.1	17 40.7 -07.9 61.2	16 48.1 -07.3 61.3	15 55.5 -06.8 61.4	15 02.8 -06.2 61.5
29°	18 24.8 -08.7 60.0	17 32.8 -08.1 60.1	16 40.8 -07.6 60.3	15 48.7 -07.1 60.4	14 56.6 -06.6 60.5

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 59.4 +02.1 90.5	13 59.5 +02.0 90.5	12 59.5 +02.0 90.5	11 59.6 +02.0 90.4	10 59.6 +02.0 90.4
1°	15 01.5 +01.7 89.5	14 01.5 +01.8 89.5	13 01.5 +01.8 89.4	12 01.6 +01.8 89.4	11 01.6 +01.9 89.4
2°	15 03.2 +01.5 88.5	14 03.3 +01.5 88.4	13 03.3 +01.6 88.4	12 03.4 +01.6 88.4	11 03.5 +01.6 88.4
3°	15 04.7 +01.2 87.4	14 04.8 +01.2 87.4	13 04.9 +01.3 87.4	12 05.0 +01.3 87.4	11 05.1 +01.4 87.3
4°	15 05.9 +00.9 86.4	14 06.0 +01.0 86.4	13 06.2 +01.0 86.4	12 06.3 +01.2 86.3	11 06.5 +01.2 86.3
5°	15 06.8 +00.6 85.4	14 07.0 +00.7 85.3	13 07.2 +00.8 85.3	12 07.5 +00.9 85.3	11 07.7 +01.0 85.3
6°	15 07.4 +00.3 84.3	14 07.7 +00.5 84.3	13 08.0 +00.6 84.3	12 08.4 +00.7 84.3	11 08.7 +00.8 84.3
7°	15 07.7 +00.1 83.3	14 08.2 +00.2 83.3	13 08.6 +00.3 83.3	12 09.1 +00.4 83.3	11 09.5 +00.6 83.3
8°	15 07.8 -00.3 82.3	14 08.4 -00.1 82.3	13 08.9 +00.1 82.3	12 09.5 +00.3 82.2	11 10.1 +00.4 82.2
9°	15 07.5 -00.5 81.2	14 08.3 -00.4 81.2	13 09.0 -00.1 81.2	12 09.8 +00.0 81.2	11 10.5 +00.2 81.2
10°	15 07.0 -00.8 80.2	14 07.9 -00.6 80.2	13 08.9 -00.5 80.2	12 09.8 -00.3 80.2	11 10.7 -00.1 80.2
11°	15 06.2 -01.1 79.1	14 07.3 -00.8 79.2	13 08.4 -00.6 79.2	12 09.5 -00.4 79.2	11 10.6 -00.2 79.2
12°	15 05.1 -01.3 78.1	14 06.5 -01.2 78.1	13 07.8 -00.9 78.1	12 09.1 -00.7 78.2	11 10.4 -00.4 78.2
13°	15 03.8 -01.7 77.1	14 05.3 -01.4 77.1	13 06.9 -01.2 77.1	12 08.4 -00.9 77.1	11 10.0 -00.7 77.1
14°	15 02.1 -01.9 76.0	14 03.9 -01.6 76.1	13 05.7 -01.3 76.1	12 07.5 -01.1 76.1	11 09.3 -00.8 76.1
15°	15 00.2 -02.2 75.0	14 02.3 -01.9 75.0	13 04.4 -01.7 75.1	12 06.4 -01.3 75.1	11 08.5 -01.1 75.1
16°	14 58.0 -02.5 74.0	14 00.4 -02.2 74.0	13 02.7 -01.8 74.0	12 05.1 -01.6 74.1	11 07.4 -01.3 74.1
17°	14 55.5 -02.7 72.9	13 58.2 -02.4 73.0	13 00.9 -02.2 73.0	12 03.5 -01.8 73.0	11 06.1 -01.4 73.1
18°	14 52.8 -03.1 71.9	13 55.8 -02.7 71.9	12 58.7 -02.3 72.0	12 01.7 -02.0 72.0	11 04.7 -01.7 72.0
19°	14 49.7 -03.3 70.9	13 53.1 -03.0 70.9	12 56.4 -02.6 71.0	11 59.7 -02.2 71.0	11 03.0 -01.9 71.0
20°	14 46.4 -03.6 69.8	13 50.1 -03.2 69.9	12 53.8 -02.8 69.9	11 57.5 -02.5 70.0	11 01.1 -02.1 70.0
21°	14 42.8 -03.8 68.8	13 46.9 -03.5 68.9	12 51.0 -03.1 68.9	11 55.0 -02.7 69.0	10 59.0 -02.3 69.0
22°	14 39.0 -04.2 67.8	13 43.4 -03.7 67.8	12 47.9 -03.3 67.9	11 52.3 -02.9 67.9	10 56.7 -02.4 68.0
23°	14 34.8 -04.4 66.7	13 39.7 -04.0 66.8	12 44.6 -03.6 66.9	11 49.4 -03.1 66.9	10 54.3 -02.7 67.0
24°	14 30.4 -04.7 65.7	13 35.7 -04.2 65.8	12 41.0 -03.7 65.8	11 46.3 -03.3 65.9	10 51.6 -02.9 65.9
25°	14 25.7 -04.9 64.7	13 31.5 -04.5 64.8	12 37.3 -04.1 64.8	11 43.0 -03.6 64.9	10 48.7 -03.1 64.9
26°	14 20.8 -05.2 63.7	13 27.0 -04.7 63.7	12 33.2 -04.2 63.8	11 39.4 -03.7 63.9	10 45.6 -03.3 63.9
27°	14 15.6 -05.5 62.6	13 22.3 -05.0 62.7	12 29.0 -04.5 62.8	11 35.7 -04.0 62.8	10 42.3 -03.5 62.9
28°	14 10.1 -05.7 61.6	13 17.3 -05.2 61.7	12 24.5 -04.7 61.8	11 31.7 -04.2 61.8	10 38.8 -03.7 61.9
29°	14 04.4 -06.0 60.6	13 12.1 -05.5 60.7	12 19.8 -04.9 60.7	11 27.5 -04.4 60.8	10 35.1 -03.8 60.9

Declination SAME name as Latitude

Latitude 2°

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 59.6 +02.1 90.4	8 59.7 +02.0 90.3	7 59.7 +02.0 90.3	6 59.7 +02.1 90.2	5 59.8 +02.0 90.2
1°	10 01.7 +01.8 89.3	9 01.7 +01.9 89.3	8 01.7 +01.9 89.3	7 01.8 +01.9 89.2	6 01.8 +02.0 89.2
2°	10 03.5 +01.7 88.3	9 03.6 +01.7 88.3	8 03.6 +01.8 88.3	7 03.7 +01.8 88.2	6 03.8 +01.8 88.2
3°	10 05.2 +01.5 87.3	9 05.3 +01.5 87.3	8 05.4 +01.6 87.3	7 05.5 +01.6 87.2	6 05.6 +01.7 87.2
4°	10 06.7 +01.2 86.3	9 06.8 +01.4 86.3	8 07.0 +01.4 86.2	7 07.1 +01.6 86.2	6 07.3 +01.6 86.2
5°	10 07.9 +01.1 85.3	9 08.2 +01.2 85.3	8 08.4 +01.3 85.2	7 08.7 +01.4 85.2	6 08.9 +01.5 85.2
6°	10 09.0 +01.0 84.3	9 09.4 +01.0 84.2	8 09.7 +01.2 84.2	7 10.1 +01.2 84.2	6 10.4 +01.4 84.2
7°	10 10.0 +00.7 83.2	9 10.4 +00.9 83.2	8 10.9 +01.0 83.2	7 11.3 +01.2 83.2	6 11.8 +01.3 83.2
8°	10 10.7 +00.5 82.2	9 11.3 +00.7 82.2	8 11.9 +00.8 82.2	7 12.5 +01.0 82.2	6 13.1 +01.1 82.2
9°	10 11.2 +00.4 81.2	9 12.0 +00.5 81.2	8 12.7 +00.7 81.2	7 13.5 +00.8 81.2	6 14.2 +01.0 81.2
10°	10 11.6 +00.1 80.2	9 12.5 +00.4 80.2	8 13.4 +00.6 80.2	7 14.3 +00.8 80.2	6 15.2 +01.0 80.2
11°	10 11.7 +00.0 79.2	9 12.9 +00.1 79.2	8 14.0 +00.3 79.2	7 15.1 +00.6 79.2	6 16.2 +00.8 79.2
12°	10 11.7 -00.2 78.2	9 13.0 +00.1 78.2	8 14.3 +00.3 78.2	7 15.7 +00.4 78.2	6 17.0 +00.7 78.1
13°	10 11.5 -00.4 77.1	9 13.1 -00.2 77.2	8 14.6 +00.1 77.2	7 16.1 +00.4 77.1	6 17.7 +00.5 77.1
14°	10 11.1 -00.6 76.1	9 12.9 -00.3 76.1	8 14.7 -00.1 76.1	7 16.5 +00.2 76.1	6 18.2 +00.5 76.1
15°	10 10.5 -00.8 75.1	9 12.6 -00.5 75.1	8 14.6 -00.2 75.1	7 16.7 +00.0 75.1	6 18.7 +00.3 75.1
16°	10 09.7 -00.9 74.1	9 12.1 -00.7 74.1	8 14.4 -00.4 74.1	7 16.7 +00.0 74.1	6 19.0 +00.3 74.1
17°	10 08.8 -01.2 73.1	9 11.4 -00.8 73.1	8 14.0 -00.5 73.1	7 16.7 -00.2 73.1	6 19.3 +00.3 73.1
18°	10 07.6 -01.3 72.1	9 10.6 -01.0 72.1	8 13.5 -00.7 72.1	7 16.5 -00.4 72.1	6 19.4 +00.0 72.1
19°	10 06.3 -01.5 71.1	9 09.6 -01.2 71.1	8 12.8 -00.8 71.1	7 16.1 -00.5 71.1	6 19.4 -00.1 71.1
20°	10 04.8 -01.7 70.0	9 08.4 -01.3 70.1	8 12.0 -00.9 70.1	7 15.6 -00.6 70.1	6 19.3 -00.3 70.1
21°	10 03.1 -01.9 69.0	9 07.1 -01.6 69.0	8 11.1 -01.2 69.1	7 15.0 -00.7 69.1	6 19.0 -00.3 69.1
22°	10 01.2 -02.1 68.0	9 05.5 -01.6 68.0	8 09.9 -01.2 68.1	7 14.3 -00.9 68.1	6 18.7 -00.5 68.1
23°	9 59.1 -02.3 67.0	9 03.9 -01.9 67.0	8 08.7 -01.5 67.0	7 13.4 -01.0 67.1	6 18.2 -00.6 67.1
24°	9 56.8 -02.4 66.0	9 02.0 -02.0 66.0	8 07.2 -01.5 66.0	7 12.4 -01.1 66.1	6 17.6 -00.7 66.1
25°	9 54.4 -02.7 65.0	9 00.0 -02.2 65.0	8 05.7 -01.8 65.0	7 11.3 -01.3 65.1	6 16.9 -00.8 65.1
26°	9 51.7 -02.8 64.0	8 57.8 -02.3 64.0	8 03.9 -01.8 64.0	7 10.0 -01.4 64.0	6 16.1 -00.9 64.1
27°	9 48.9 -03.0 62.9	8 55.5 -02.5 63.0	8 02.1 -02.0 63.0	7 08.6 -01.5 63.0	6 15.2 -01.0 63.1
28°	9 45.9 -03.2 61.9	8 53.0 -02.7 62.0	8 00.1 -02.2 62.0	7 07.1 -01.6 62.0	6 14.2 -01.2 62.0
29°	9 42.7 -03.3 60.9	8 50.3 -02.8 61.0	7 57.9 -02.3 61.0	7 05.5 -01.8 61.0	6 13.0 -01.3 61.0

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 59.8 +02.1 90.2	3 59.9 +02.0 90.1	2 59.9 +02.1 90.1	1 59.9 +02.1 90.1	1 00.0 +02.0 90.0
1°	5 01.9 +01.9 89.2	4 01.9 +02.0 89.1	3 02.0 +02.0 89.1	2 02.0 +02.0 89.1	1 02.0 +02.1 89.0
2°	5 03.8 +01.9 88.2	4 03.9 +01.9 88.1	3 04.0 +01.9 88.1	2 04.0 +02.0 88.1	1 04.1 +02.1 88.0
3°	5 05.7 +01.8 87.2	4 05.8 +01.9 87.1	3 05.9 +01.9 87.1	2 06.0 +02.0 87.1	1 06.2 +02.0 87.0
4°	5 07.5 +01.7 86.2	4 07.7 +01.7 86.1	3 07.8 +01.9 86.1	2 08.0 +01.9 86.1	1 08.2 +02.0 86.0
5°	5 09.2 +01.6 85.2	4 09.4 +01.7 85.1	3 09.7 +01.8 85.1	2 09.9 +01.9 85.1	1 10.2 +02.0 85.0
6°	5 10.8 +01.5 84.2	4 11.1 +01.6 84.1	3 11.5 +01.7 84.1	2 11.8 +01.9 84.1	1 12.2 +01.9 84.0
7°	5 12.3 +01.4 83.2	4 12.7 +01.6 83.1	3 13.2 +01.7 83.1	2 13.7 +01.8 83.1	1 14.1 +02.0 83.0
8°	5 13.7 +01.3 82.1	4 14.3 +01.4 82.1	3 14.9 +01.6 82.1	2 15.5 +01.7 82.1	1 16.1 +01.9 82.0
9°	5 15.0 +01.2 81.1	4 15.7 +01.4 81.1	3 16.5 +01.5 81.1	2 17.2 +01.8 81.1	1 18.0 +01.9 81.0
10°	5 16.2 +01.1 80.1	4 17.1 +01.3 80.1	3 18.0 +01.5 80.1	2 19.0 +01.6 80.1	1 19.9 +01.9 80.0
11°	5 17.3 +01.0 79.1	4 18.4 +01.2 79.1	3 19.5 +01.4 79.1	2 20.6 +01.7 79.1	1 21.8 +01.8 79.0
12°	5 18.3 +00.9 78.1	4 19.6 +01.2 78.1	3 20.9 +01.4 78.1	2 22.3 +01.6 78.1	1 23.6 +01.8 78.0
13°	5 19.2 +00.8 77.1	4 20.8 +01.0 77.1	3 22.3 +01.3 77.1	2 23.9 +01.5 77.1	1 25.4 +01.8 77.0
14°	5 20.0 +00.8 76.1	4 21.8 +01.0 76.1	3 23.6 +01.3 76.1	2 25.4 +01.5 76.1	1 27.2 +01.8 76.0
15°	5 20.8 +00.6 75.1	4 22.8 +00.9 75.1	3 24.9 +01.1 75.1	2 26.9 +01.5 75.1	1 29.0 +01.7 75.0
16°	5 21.4 +00.5 74.1	4 23.7 +00.8 74.1	3 26.0 +01.2 74.1	2 28.4 +01.4 74.1	1 30.7 +01.7 74.0
17°	5 21.9 +00.4 73.1	4 24.5 +00.8 73.1	3 27.2 +01.0 73.1	2 29.8 +01.4 73.1	1 32.4 +01.7 73.0
18°	5 22.3 +00.4 72.1	4 25.3 +00.6 72.1	3 28.2 +01.0 72.1	2 31.2 +01.3 72.1	1 34.1 +01.7 72.0
19°	5 22.7 +00.2 71.1	4 25.9 +00.6 71.1	3 29.2 +00.9 71.1	2 32.5 +01.3 71.1	1 35.8 +01.6 71.0
20°	5 22.9 +00.1 70.1	4 26.5 +00.5 70.1	3 30.1 +00.9 70.1	2 33.8 +01.2 70.1	1 37.4 +01.6 70.0
21°	5 23.0 +00.1 69.1	4 27.0 +00.4 69.1	3 31.0 +00.8 69.1	2 35.0 +01.2 69.1	1 39.0 +01.6 69.0
22°	5 23.1 -00.1 68.1	4 27.4 +00.4 68.1	3 31.8 +00.7 68.1	2 36.2 +01.1 68.1	1 40.6 +01.5 68.0
23°	5 23.0 -00.2 67.1	4 27.8 +00.2 67.1	3 32.5 +00.7 67.1	2 37.3 +01.1 67.1	1 42.1 +01.5 67.0
24°	5 22.8 -00.2 66.1	4 28.0 +00.2 66.1	3 33.2 +00.6 66.1	2 38.4 +01.0 66.1	1 43.6 +01.5 66.0
25°	5 22.6 -00.4 65.1	4 28.2 +00.1 65.1	3 33.8 +00.5 65.1	2 39.4 +01.0 65.1	1 45.1 +01.4 65.0
26°	5 22.2 -00.5 64.1	4 28.3 +00.0 64.1	3 34.3 +00.5 64.1	2 40.4 +01.0 64.1	1 46.5 +01.4 64.0
27°	5 21.7 -00.5 63.1	4 28.3 -00.1 63.1	3 34.8 +00.4 63.1	2 41.4 +00.9 63.1	1 47.9 +01.4 63.0
28°	5 21.2 -00.7 62.1	4 28.2 -00.2 62.1	3 35.2 +00.4 62.1	2 42.3 +00.8 62.1	1 49.3 +01.3 62.0
29°	5 20.5 -00.7 61.1	4 28.0 -00.2 61.1	3 35.6 +00.2 61.1	2 43.1 +00.8 61.1	1 50.6 +01.3 61.0

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 +02.1 90.0	-1 00.0 +02.1	-1 59.9 +02.1		
1°	0 02.1 +02.1 89.0	-0 57.9 +02.2	-1 57.8 +02.1		
2°	0 04.2 +02.1 88.0	-0 55.7 +02.1	-1 55.7 +02.2		
3°	0 06.3 +02.1 87.0	-0 53.6 +02.2	-1 53.5 +02.2		
4°	0 08.4 +02.1 86.0	-0 51.4 +02.1	-1 51.3 +02.3		
5°	0 10.5 +02.0 85.0	-0 49.3 +02.2	-1 49.0 +02.3		
6°	0 12.5 +02.1 84.0	-0 47.1 +02.2	-1 46.7 +02.3		
7°	0 14.6 +02.1 83.0	-0 44.9 +02.2	-1 44.4 +02.3		
8°	0 16.7 +02.1 82.0	-0 42.7 +02.2	-1 42.1 +02.4		
9°	0 18.8 +02.0 81.0	-0 40.5 +02.3	-1 39.7 +02.4		
10°	0 20.8 +02.1 80.0	-0 38.2 +02.2	-1 37.3 +02.5		
11°	0 22.9 +02.0 79.0	-0 36.0 +02.3	-1 34.8 +02.5		
12°	0 24.9 +02.1 78.0	-0 33.7 +02.3	-1 32.3 +02.4		
13°	0 27.0 +02.0 77.0	-0 31.4 +02.2	-1 29.9 +02.6		
14°	0 29.0 +02.1 76.0	-0 29.2 +02.3	-1 27.3 +02.5		
15°	0 31.1 +02.0 75.0	-0 26.9 +02.3	-1 24.8 +02.6		
16°	0 33.1 +02.0 74.0	-0 24.6 +02.3	-1 22.2 +02.6		
17°	0 35.1 +02.0 73.0	-0 22.3 +02.3	-1 19.6 +02.6		
18°	0 37.1 +02.0 72.0	-0 20.0 +02.4	-1 17.0 +02.7		
19°	0 39.1 +01.9 71.0	-0 17.6 +02.3	-1 14.3 +02.7		
20°	0 41.0 +02.0 70.0	-0 15.3 +02.3	-1 11.6 +02.7		
21°	0 43.0 +01.9 69.0	-0 13.0 +02.3	-1 08.9 +02.7		
22°	0 44.9 +02.0 68.0	-0 10.7 +02.4	-1 06.2 +02.7		
23°	0 46.9 +01.9 67.0	-0 08.3 +02.3	-1 03.5 +02.8		
24°	0 48.8 +01.9 66.0	-0 06.0 +02.4	-1 00.7 +02.7		
25°	0 50.7 +01.9 65.0	-0 03.6 +02.3	-0 58.0 +02.8		
26°	0 52.6 +01.9 64.0	-0 01.3 +02.3	-0 55.2 +02.8		
27°	0 54.5 +01.8 63.0	0 01.0 +02.4 63.0	-0 52.4 +02.9		
28°	0 56.3 +01.9 62.0	0 03.4 +02.3 62.0	-0 49.5 +02.8		
29°	0 58.2 +01.8 61.0	0 05.7 +02.4 61.0	-0 46.7 +02.8		

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°					
1°					
2°					
3°					
4°					
5°					
6°					
7°					
8°					
9°					
10°					
11°					
12°					
13°					
14°					
15°					
16°					
17°					
18°					
19°					
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21°					
22°					
23°					
24°					
25°					
26°					
27°					
28°					
29°					

Declination SAME name as Latitude

Latitude 3°

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°	87 00.0 +60.0 180.0	86 50.3 +55.6 161.6	86 23.7 +46.7 146.3	85 45.5 +38.3 135.0	85 00.1 +31.7 126.8
1°	88 00.0 +60.0 180.0	87 45.9 +49.3 153.4	87 10.4 +35.5 135.0	86 23.8 +26.6 123.6	85 31.8 +21.0 116.5
2°	89 00.0 +60.0 180.0	88 35.2 +24.9 135.0	87 45.9 +14.3 116.5	86 50.4 +09.8 108.4	85 52.8 +07.5 104.0
3°	90 00.0 -60.0 0.0	89 00.1 -24.9 90.0	88 00.2 -14.2 89.9	87 00.2 -09.6 89.9	86 00.3 -07.2 89.9
4°	89 00.0 -60.0 0.0	88 35.2 -49.3 44.9	87 46.0 -35.5 63.3	86 50.6 -26.6 71.4	85 53.1 -20.9 75.8
5°	88 00.0 -60.0 0.0	87 45.9 -55.6 26.5	87 10.5 -46.6 44.9	86 24.0 -38.2 56.1	85 32.2 -31.6 63.2
6°	87 00.0 -60.0 0.0	86 50.3 -57.6 18.3	86 23.9 -52.0 33.5	85 45.8 -45.4 44.8	85 00.6 -39.3 52.9
7°	86 00.0 -60.0 0.0	85 52.7 -58.6 13.9	85 31.9 -54.8 26.4	85 00.4 -49.8 36.6	84 21.3 -44.7 44.7
8°	85 00.0 -60.0 0.0	84 54.1 -59.0 11.2	84 37.1 -56.3 21.6	84 10.6 -52.6 30.7	83 36.6 -48.5 38.4
9°	84 00.0 -60.0 0.0	83 55.1 -59.3 9.4	83 40.8 -57.4 18.2	83 18.0 -54.4 26.3	82 48.1 -51.0 33.4
10°	83 00.0 -60.0 0.0	82 55.8 -59.5 8.0	82 43.4 -57.9 15.7	82 23.6 -55.7 22.9	81 57.1 -52.9 29.4
11°	82 00.0 -60.0 0.0	81 56.3 -59.6 7.0	81 45.5 -58.4 13.8	81 27.9 -56.6 20.3	81 04.2 -54.2 26.2
12°	81 00.0 -60.0 0.0	80 56.7 -59.6 6.2	80 47.1 -58.7 12.3	80 31.3 -57.1 18.1	80 10.0 -55.2 23.5
13°	80 00.0 -60.0 0.0	79 57.1 -59.8 5.6	79 48.4 -59.0 11.1	79 34.2 -57.7 16.4	79 14.8 -56.1 21.4
14°	79 00.0 -60.0 0.0	78 57.3 -59.7 5.1	78 49.4 -59.1 10.1	78 36.5 -58.0 14.9	78 18.7 -56.6 19.5
15°	78 00.0 -60.0 0.0	77 57.6 -59.8 4.6	77 50.3 -59.2 9.2	77 38.5 -58.4 13.7	77 22.1 -57.1 17.9
16°	77 00.0 -60.0 0.0	76 57.8 -59.9 4.3	76 51.1 -59.3 8.5	76 40.1 -58.5 12.6	76 25.0 -57.4 16.6
17°	76 00.0 -60.0 0.0	75 57.9 -59.8 3.9	75 51.8 -59.5 7.9	75 41.6 -58.7 11.7	75 27.6 -57.8 15.4
18°	75 00.0 -60.0 0.0	74 58.1 -59.9 3.7	74 52.3 -59.4 7.3	74 42.9 -58.9 10.9	74 29.8 -58.1 14.4
19°	74 00.0 -60.0 0.0	73 58.2 -59.9 3.4	73 52.9 -59.6 6.8	73 44.0 -59.0 10.2	73 31.7 -58.2 13.5
20°	73 00.0 -60.0 0.0	72 58.3 -59.9 3.2	72 53.3 -59.6 6.4	72 45.0 -59.1 9.5	72 33.5 -58.5 12.6
21°	72 00.0 -60.0 0.0	71 58.4 -59.9 3.0	71 53.7 -59.6 6.0	71 45.9 -59.2 9.0	71 35.0 -58.6 11.9
22°	71 00.0 -60.0 0.0	70 58.5 -59.9 2.8	70 54.1 -59.7 5.7	70 46.7 -59.3 8.5	70 36.4 -58.7 11.2
23°	70 00.0 -60.0 0.0	69 58.6 -59.9 2.7	69 54.4 -59.7 5.4	69 47.4 -59.3 8.0	69 37.7 -58.8 10.6
24°	69 00.0 -60.0 0.0	68 58.7 -60.0 2.5	68 54.7 -59.8 5.1	68 48.1 -59.4 7.6	68 38.9 -59.0 10.1
25°	68 00.0 -60.0 0.0	67 58.7 -59.9 2.4	67 54.9 -59.7 4.8	67 48.7 -59.5 7.2	67 39.9 -59.0 9.6
26°	67 00.0 -60.0 0.0	66 58.8 -59.9 2.3	66 55.2 -59.8 4.6	66 49.2 -59.5 6.9	66 40.9 -59.1 9.1
27°	66 00.0 -60.0 0.0	65 58.9 -60.0 2.2	65 55.4 -59.8 4.4	65 49.7 -59.5 6.5	65 41.8 -59.2 8.7
28°	65 00.0 -60.0 0.0	64 58.9 -59.9 2.1	64 55.6 -59.8 4.2	64 50.2 -59.6 6.2	64 42.4 -59.2 8.3
29°	64 00.0 -60.0 0.0	63 59.0 -60.0 2.0	63 55.8 -59.8 4.0	63 50.6 -59.6 6.0	63 43.4 -59.3 7.9

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°	84 10.3 +26.8 120.9	83 17.7 +23.1 116.5	82 23.2 +20.3 113.1	81 27.6 +17.9 110.4	80 31.0 +16.2 108.3
1°	84 37.1 +17.2 111.7	83 40.8 +14.6 108.3	82 43.5 +12.6 105.8	81 45.5 +11.2 103.9	80 47.2 +10.0 102.4
2°	84 54.3 +06.1 101.2	83 55.4 +05.1 99.3	82 56.1 +04.5 98.0	81 56.7 +04.0 96.9	80 57.2 +03.5 96.1
3°	85 00.4 -05.8 89.9	84 00.5 -04.8 89.8	83 00.6 -04.1 89.8	82 00.7 -03.5 89.8	81 00.7 -03.0 89.8
4°	84 54.6 -17.0 78.5	83 55.7 -14.3 80.3	82 56.5 -12.3 81.7	81 57.2 -10.8 82.6	80 57.7 -09.6 83.4
5°	84 37.6 -26.6 68.0	83 41.4 -22.9 71.3	82 44.2 -19.9 73.8	81 46.4 -17.6 75.7	80 48.1 -15.7 77.2
6°	84 11.0 -34.2 58.8	83 18.5 -30.0 63.2	82 24.3 -26.6 66.5	81 28.8 -23.7 69.1	80 32.4 -21.3 71.2
7°	83 36.8 -40.0 51.0	82 48.5 -35.8 56.0	81 57.7 -32.2 59.9	81 05.1 -29.1 63.0	80 11.1 -26.5 65.6
8°	82 56.8 -44.3 44.7	82 12.7 -40.3 49.8	81 25.5 -36.8 54.0	80 36.0 -33.7 57.5	79 44.6 -30.9 60.5
9°	82 12.5 -47.4 39.4	81 32.4 -43.9 44.6	80 48.7 -40.6 48.9	80 02.3 -37.6 52.6	79 13.7 -34.8 55.8
10°	81 25.1 -49.8 35.1	80 48.5 -46.7 40.1	80 08.1 -43.6 44.5	79 24.7 -40.7 48.2	78 38.9 -38.0 51.5
11°	80 35.3 -51.6 31.5	80 01.8 -48.9 36.3	79 24.5 -46.1 40.6	78 44.0 -43.4 44.4	78 00.9 -40.9 47.7
12°	79 43.7 -53.0 28.6	79 12.9 -50.6 33.1	78 38.4 -48.1 37.2	78 00.6 -45.7 40.9	77 20.0 -43.2 44.3
13°	78 50.7 -54.1 26.0	78 22.3 -51.9 30.4	77 50.3 -49.8 34.3	77 14.9 -47.4 37.9	76 36.8 -45.3 41.2
14°	77 56.6 -55.0 23.9	77 30.4 -53.1 28.0	77 00.5 -51.0 31.7	76 27.5 -49.0 35.2	75 51.5 -46.9 38.4
15°	77 01.6 -55.6 22.0	76 37.3 -54.0 25.9	76 09.5 -52.2 29.5	75 38.5 -50.3 32.8	75 04.6 -48.4 35.9
16°	76 06.0 -56.2 20.4	75 43.3 -54.7 24.0	75 17.3 -53.1 27.5	74 48.2 -51.4 30.7	74 16.2 -49.6 33.7
17°	75 09.8 -56.6 19.0	74 48.6 -55.3 22.4	74 24.2 -53.9 25.7	73 56.8 -52.3 28.8	73 26.6 -50.7 31.7
18°	74 13.2 -57.0 17.7	73 53.3 -55.8 21.0	73 30.3 -54.5 24.1	73 04.5 -53.1 27.0	72 35.9 -51.6 29.8
19°	73 16.2 -57.4 16.6	72 57.5 -56.3 19.7	72 35.8 -55.1 22.7	72 11.4 -53.8 25.5	71 44.3 -52.4 28.2
20°	72 18.8 -57.6 15.6	72 01.2 -56.6 18.6	71 40.7 -55.5 21.4	71 17.6 -54.4 24.1	70 51.9 -53.0 26.6
21°	71 21.2 -57.8 14.7	71 04.6 -57.0 17.5	70 45.2 -56.0 20.2	70 23.2 -54.8 22.8	69 58.9 -53.7 25.3
22°	70 23.4 -58.1 13.9	70 07.6 -57.2 16.6	69 49.2 -56.3 19.1	69 28.4 -55.3 21.6	69 05.2 -54.2 24.0
23°	69 25.3 -58.2 13.2	69 10.4 -57.5 15.7	68 52.9 -56.6 18.1	68 33.1 -55.7 20.5	68 11.0 -54.7 22.8
24°	68 27.1 -58.4 12.5	68 12.9 -57.7 14.9	67 56.3 -56.9 17.2	67 37.4 -56.0 19.5	67 16.3 -55.1 21.7
25°	67 28.7 -58.4 11.9	67 15.2 -57.8 14.2	66 59.4 -57.1 16.4	66 41.4 -56.3 18.6	66 21.2 -55.4 20.7
26°	66 30.3 -58.7 11.3	66 17.4 -58.1 13.5	66 02.3 -57.4 15.6	65 45.1 -56.6 17.7	65 25.8 -55.8 19.8
27°	65 31.6 -58.7 10.8	65 19.3 -58.1 12.9	65 04.9 -57.5 14.9	64 48.5 -56.8 16.9	64 30.0 -56.0 18.9
28°	64 32.9 -58.8 10.3	64 21.2 -58.3 12.3	64 07.4 -57.7 14.3	63 51.7 -57.1 16.2	63 34.0 -56.3 18.1
29°	63 34.1 -58.8 9.9	63 22.9 -58.4 11.8	63 09.7 -57.9 13.7	62 54.6 -57.2 15.5	62 37.7 -56.6 17.3

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Latitude 3°

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°	79 33.8 +14.7 106.5	78 36.2 +13.4 105.1	77 38.2 +12.3 103.8	76 39.8 +11.5 102.8	75 41.3 +10.7 101.9
1°	79 48.5 +09.1 101.1	78 49.6 +08.3 100.1	77 50.5 +07.7 99.2	76 51.3 +07.1 98.5	75 52.0 +06.7 97.8
2°	79 57.6 +03.2 95.5	78 57.9 +03.0 94.9	77 58.2 +02.8 94.5	76 58.4 +02.7 94.1	75 58.7 +02.5 93.8
3°	80 00.8 -02.7 89.7	79 00.9 -02.4 89.7	78 01.0 -02.1 89.7	77 01.1 -01.9 89.7	76 01.2 -01.8 89.6
4°	79 58.1 -08.5 84.0	78 58.5 -07.7 84.5	77 58.9 -07.1 84.9	76 59.2 -06.5 85.2	75 59.4 -05.8 85.5
5°	79 49.6 -14.2 78.3	78 50.8 -12.9 79.3	77 51.8 -11.7 80.1	76 52.7 -10.8 80.8	75 53.6 -10.0 81.4
6°	79 35.4 -19.4 72.9	78 37.9 -17.7 74.3	77 40.1 -16.3 75.5	76 41.9 -15.0 76.5	75 43.6 -14.0 77.4
7°	79 16.0 -24.2 67.7	78 20.2 -22.2 69.5	77 23.8 -20.5 71.0	76 26.9 -19.0 72.3	75 29.6 -17.6 73.5
8°	78 51.8 -28.4 62.9	77 58.0 -26.3 65.0	77 03.3 -24.4 66.8	76 07.9 -22.7 68.3	75 12.0 -21.3 69.7
9°	78 23.4 -32.3 58.4	77 31.7 -30.1 60.8	76 38.9 -28.0 62.8	75 45.2 -26.2 64.5	74 50.7 -24.5 66.1
10°	77 51.1 -35.6 54.4	77 01.6 -33.3 56.8	76 10.9 -31.3 59.0	75 19.0 -29.3 60.9	74 26.2 -27.6 62.6
11°	77 15.5 -38.4 50.6	76 28.3 -31.1 53.2	75 39.6 -34.0 55.5	74 49.7 -32.2 57.5	73 58.6 -30.4 59.4
12°	76 37.1 -40.9 47.2	75 52.2 -38.8 49.9	75 05.6 -36.7 52.2	74 17.5 -34.7 54.4	73 28.2 -32.9 56.3
13°	75 56.2 -43.1 44.1	75 13.4 -40.9 46.8	74 28.9 -38.9 49.2	73 42.8 -37.0 51.4	72 55.3 -35.2 53.4
14°	75 13.1 -44.9 41.3	74 32.5 -42.9 44.0	73 50.0 -41.0 46.4	73 05.8 -39.1 48.6	72 20.1 -37.3 50.7
15°	74 28.2 -46.4 38.8	73 49.6 -44.6 41.4	73 09.0 -42.7 43.9	72 26.7 -41.0 46.1	71 42.8 -39.2 48.1
16°	73 41.8 -47.9 36.5	73 05.0 -46.0 39.1	72 26.3 -44.3 41.5	71 45.7 -42.5 43.7	71 03.6 -40.9 45.8
17°	72 53.9 -49.0 34.4	72 19.0 -47.3 36.9	71 42.0 -45.7 39.3	71 03.2 -44.0 41.5	70 22.7 -42.4 43.5
18°	72 04.9 -50.0 32.5	71 31.7 -48.5 34.9	70 56.3 -46.9 37.3	70 19.2 -45.4 39.4	69 40.3 -43.8 41.5
19°	71 14.9 -51.0 30.7	70 43.2 -49.5 33.1	70 09.4 -47.9 35.4	69 33.8 -46.5 37.5	68 56.5 -45.0 39.5
20°	70 23.9 -51.7 29.1	69 53.7 -50.4 31.4	69 21.5 -49.0 33.7	68 47.3 -47.5 35.7	68 11.5 -46.1 37.7
21°	69 32.2 -52.5 27.6	69 03.3 -51.1 29.9	68 32.5 -49.8 32.0	67 59.8 -48.5 34.1	67 25.4 -47.1 36.0
22°	68 39.7 -53.0 26.3	68 12.2 -51.8 28.5	67 42.7 -50.6 30.5	67 11.3 -49.3 32.5	66 38.3 -48.1 34.4
23°	67 46.7 -53.6 25.0	67 20.4 -52.5 27.1	66 52.1 -51.3 29.2	66 22.0 -50.0 31.1	65 50.2 -48.8 33.0
24°	66 53.1 -54.0 23.8	66 27.9 -53.0 25.9	66 00.8 -51.8 27.9	65 32.0 -50.8 29.7	65 01.4 -49.6 31.6
25°	65 59.1 -54.5 22.7	65 34.9 -53.5 24.7	65 09.0 -52.5 26.6	64 41.2 -51.3 28.5	64 11.8 -50.2 30.2
26°	65 04.6 -54.9 21.7	64 41.4 -53.9 23.7	64 16.5 -52.9 25.5	63 49.9 -51.9 27.3	63 21.6 -50.8 29.0
27°	64 09.7 -55.2 20.8	63 47.5 -54.3 22.6	63 23.6 -53.4 24.4	62 58.0 -52.4 26.2	62 30.8 -51.4 27.8
28°	63 14.5 -55.5 19.9	62 53.2 -54.7 21.7	62 30.2 -53.8 23.4	62 05.6 -52.9 25.1	61 39.4 -51.9 26.7
29°	62 19.0 -55.8 19.1	61 58.5 -55.0 20.8	61 36.4 -54.1 22.5	61 12.7 -53.2 24.1	60 47.5 -52.4 25.7

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°	74 42.6 +10.0 101.1	73 43.7 +09.5 100.3	72 44.7 +08.9 99.7	71 45.6 +08.5 99.2	70 46.4 +08.1 98.6
1°	74 52.6 +06.3 97.3	73 53.2 +05.9 96.8	72 53.6 +05.6 96.4	71 54.1 +05.3 96.0	70 54.5 +05.0 95.6
2°	74 58.9 +02.3 93.5	73 59.1 +02.2 93.2	72 59.2 +02.2 93.0	71 59.4 +02.1 92.8	70 59.5 +02.1 92.6
3°	75 01.2 -01.5 89.6	74 01.3 -01.4 89.6	73 01.4 -01.2 89.6	72 01.5 -01.1 89.5	71 01.6 -01.0 89.5
4°	74 59.7 -05.4 85.7	73 59.9 -05.0 85.9	73 00.2 -04.7 86.1	72 00.4 -04.4 86.3	71 00.6 -04.1 86.4
5°	74 54.3 -09.3 81.9	73 54.9 -08.6 82.3	72 55.5 -08.0 82.7	71 56.0 -07.5 83.1	70 56.5 -07.0 83.4
6°	74 45.0 -12.9 78.1	73 46.3 -12.1 78.8	72 47.5 -11.3 79.4	71 48.5 -10.6 79.9	70 49.5 -10.0 80.3
7°	74 32.1 -16.6 74.4	73 34.2 -15.4 75.3	72 36.2 -14.5 76.1	71 37.9 -13.6 76.7	70 39.5 -12.8 77.3
8°	74 15.5 -19.8 70.9	73 18.8 -18.7 71.9	72 21.7 -17.6 72.8	71 24.3 -16.6 73.7	70 26.7 -15.7 74.4
9°	73 55.7 -23.1 67.4	73 00.1 -21.7 68.6	72 04.1 -20.5 69.7	71 07.7 -19.3 70.7	70 11.0 -18.3 71.5
10°	73 32.6 -26.0 64.1	72 38.4 -24.6 65.5	71 43.6 -23.2 66.7	70 48.4 -22.0 67.8	69 52.7 -20.8 68.8
11°	73 06.6 -28.7 61.0	72 13.8 -27.2 62.4	71 20.4 -25.8 63.8	70 26.4 -24.5 65.0	69 31.9 -23.3 66.0
12°	72 37.9 -31.3 58.0	71 46.6 -29.6 59.6	70 54.6 -28.2 61.0	70 01.9 -26.9 62.3	69 08.6 -25.6 63.4
13°	72 06.6 -33.5 55.2	71 17.0 -32.0 56.8	70 26.4 -30.5 58.3	69 35.0 -29.0 59.7	68 43.0 -27.7 60.9
14°	71 33.1 -35.6 52.5	70 45.0 -34.0 54.2	69 55.9 -32.5 55.8	69 06.0 -31.1 57.2	68 15.3 -29.8 58.5
15°	70 57.5 -37.6 50.0	70 11.0 -36.0 51.8	69 23.4 -34.4 53.3	68 34.9 -33.0 54.8	67 45.5 -31.7 56.2
16°	70 19.9 -39.2 47.7	69 35.0 -37.7 49.4	68 49.0 -36.2 51.1	68 01.9 -34.8 52.6	67 13.8 -33.4 54.0
17°	69 40.7 -40.9 45.5	68 57.3 -39.3 47.2	68 12.8 -37.9 48.9	67 27.1 -36.4 50.4	66 40.4 -35.0 51.8
18°	68 59.8 -42.2 43.4	68 18.0 -40.8 45.2	67 34.9 -39.3 46.8	66 50.7 -37.9 48.4	66 05.4 -36.6 49.8
19°	68 17.6 -43.6 41.4	67 37.2 -42.1 43.2	66 55.6 -40.7 44.9	66 12.8 -39.4 46.4	65 28.8 -38.0 47.9
20°	67 34.0 -44.7 39.6	66 55.1 -43.3 41.4	66 14.9 -41.9 43.0	65 33.4 -40.6 44.6	64 50.8 -39.2 46.0
21°	66 49.3 -45.7 37.9	66 11.8 -44.4 39.6	65 33.0 -43.1 41.3	64 52.8 -41.7 42.8	64 11.6 -40.5 44.3
22°	66 03.6 -46.7 36.3	65 27.4 -45.4 38.0	64 49.9 -44.1 39.6	64 11.1 -42.9 41.1	63 31.1 -41.6 42.6
23°	65 16.9 -47.6 34.7	64 42.0 -46.3 36.4	64 05.8 -45.1 38.0	63 28.2 -43.9 39.6	62 49.5 -42.7 41.0
24°	64 29.3 -48.4 33.3	63 55.7 -47.2 35.0	63 20.7 -46.0 36.5	62 44.3 -44.7 38.0	62 06.8 -43.6 39.5
25°	63 40.9 -49.1 31.9	63 08.5 -48.0 33.6	62 34.7 -46.8 35.1	61 59.6 -45.7 36.6	61 23.2 -44.5 38.0
26°	62 51.8 -49.8 30.7	62 20.5 -48.6 32.3	61 47.7 -47.6 33.8	61 13.9 -46.4 35.2	60 38.7 -45.3 36.7
27°	62 02.0 -50.3 29.5	61 31.9 -49.3 31.0	61 00.3 -48.2 32.5	60 27.5 -47.2 33.9	59 53.4 -46.0 35.3
28°	61 11.7 -50.9 28.3	60 42.6 -49.9 29.8	60 12.1 -48.9 31.3	59 40.3 -47.8 32.7	59 07.4 -46.8 34.1
29°	60 20.8 -51.4 27.2	59 52.7 -50.5 28.7	59 23.2 -49.4 30.1	58 52.5 -48.4 31.5	58 20.6 -47.4 32.9

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Declination SAME name as Latitude

Latitude 3°

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°	69 47.1 +07.7 98.2	68 47.8 +07.3 97.8	67 48.4 +07.0 97.4	66 48.9 +06.8 97.0	65 49.5 +06.5 96.7
1°	69 54.8 +04.9 95.3	68 55.1 +04.7 95.0	67 55.4 +04.5 94.7	66 55.7 +04.3 94.5	65 56.0 +04.2 94.3
2°	69 59.7 +02.0 92.4	68 59.8 +01.9 92.2	67 59.9 +01.9 92.1	67 00.0 +01.9 91.9	66 00.2 +01.8 91.8
3°	70 01.7 -00.9 89.5	69 01.7 -00.7 89.4	68 01.8 -00.7 89.4	67 01.9 -00.6 89.4	66 02.0 -00.5 89.4
4°	70 00.8 -03.8 86.5	69 01.0 -03.5 86.7	68 01.1 -03.2 86.7	67 01.3 -03.0 86.8	66 01.5 -02.9 86.9
5°	69 57.0 -06.6 83.6	68 57.5 -06.3 83.9	67 57.9 -05.9 84.1	66 58.3 -05.6 84.3	65 58.6 -05.2 84.4
6°	69 50.4 -09.4 80.7	68 51.2 -08.8 81.1	67 52.0 -08.4 81.4	66 52.7 -07.9 81.7	65 53.4 -07.5 82.0
7°	69 41.0 -12.1 77.9	68 42.4 -11.5 78.4	67 43.6 -10.8 78.8	66 44.8 -10.3 79.2	65 45.9 -09.8 79.6
8°	69 28.9 -14.8 75.1	68 30.9 -14.0 75.7	67 32.8 -13.3 76.2	66 34.5 -12.6 76.7	65 36.1 -12.0 77.2
9°	69 14.1 -17.4 72.3	68 16.9 -16.5 73.0	67 19.5 -15.7 73.7	66 21.9 -14.9 74.3	65 24.1 -14.2 74.8
10°	68 56.7 -19.8 69.6	68 00.4 -18.9 70.5	67 03.8 -18.0 71.2	66 07.0 -17.2 71.9	65 09.9 -16.3 72.5
11°	68 36.9 -22.2 67.0	67 41.5 -21.1 67.9	66 45.8 -20.1 68.8	65 49.8 -19.2 69.5	64 53.6 -18.4 70.2
12°	68 14.7 -24.4 64.5	67 20.4 -23.3 65.5	66 25.7 -22.2 66.4	65 30.6 -21.2 67.2	64 35.2 -20.3 68.0
13°	67 50.3 -26.5 62.1	66 57.1 -25.3 63.1	66 03.5 -24.3 64.1	65 09.4 -23.2 65.0	64 14.9 -22.2 65.8
14°	67 23.8 -28.5 59.7	66 31.8 -27.3 60.8	65 39.2 -26.1 61.8	64 46.2 -25.1 62.8	63 52.7 -24.1 63.7
15°	66 55.3 -30.3 57.4	66 04.5 -29.1 58.6	65 13.1 -28.0 59.7	64 21.1 -26.9 60.7	63 28.6 -25.8 61.6
16°	66 25.0 -32.1 55.3	65 35.4 -30.9 56.5	64 45.1 -29.6 57.6	63 54.2 -28.5 58.6	63 02.8 -27.4 59.6
17°	65 52.9 -33.7 53.2	65 04.5 -32.4 54.4	64 15.5 -31.3 55.6	63 25.7 -30.1 56.7	62 35.4 -29.0 57.7
18°	65 19.2 -35.3 51.2	64 32.1 -34.0 52.4	63 44.2 -32.8 53.6	62 55.6 -31.6 54.7	62 06.4 -30.5 55.8
19°	64 43.9 -36.7 49.3	63 58.1 -35.5 50.5	63 11.4 -34.2 51.7	62 24.0 -33.1 52.9	61 35.9 -32.0 54.0
20°	64 07.2 -38.0 47.4	63 22.6 -36.7 48.7	62 37.2 -35.6 49.9	61 50.9 -34.4 51.1	61 03.9 -33.2 52.2
21°	63 29.2 -39.2 45.7	62 45.9 -38.0 47.0	62 01.6 -36.8 48.2	61 16.5 -35.6 49.4	60 30.7 -34.5 50.5
22°	62 50.0 -40.4 44.0	62 07.9 -39.2 45.3	61 24.8 -38.0 46.5	60 40.9 -36.8 47.7	59 56.2 -35.7 48.8
23°	62 09.6 -41.4 42.4	61 28.7 -40.2 43.7	60 46.8 -39.0 44.9	60 04.1 -38.0 46.1	59 20.5 -36.8 47.2
24°	61 28.2 -42.5 40.9	60 48.5 -41.3 42.2	60 07.8 -40.2 43.4	59 26.1 -39.0 44.6	58 43.7 -37.9 45.7
25°	60 45.7 -43.3 39.4	60 07.2 -42.2 40.7	59 27.6 -41.0 41.9	58 47.1 -39.9 43.1	58 05.8 -38.9 44.2
26°	60 02.4 -44.2 38.0	59 25.0 -43.1 39.3	58 46.6 -42.0 40.5	58 07.2 -40.9 41.7	57 26.9 -39.8 42.8
27°	59 18.2 -45.0 36.7	58 41.9 -43.9 37.9	58 04.6 -42.8 39.1	57 26.3 -41.8 40.3	56 47.1 -40.7 41.4
28°	58 33.2 -45.7 35.4	57 58.0 -44.6 36.6	57 21.8 -43.6 37.8	56 44.5 -42.5 39.0	56 06.4 -41.5 40.1
29°	57 47.5 -46.4 34.1	57 13.4 -45.4 35.4	56 38.2 -44.4 36.6	56 02.0 -43.3 37.7	55 24.9 -42.3 38.8

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°	64 49.9 +06.3 96.4	63 50.4 +06.0 96.1	62 50.8 +05.8 95.9	61 51.2 +05.6 95.6	60 51.5 +05.5 95.4
1°	64 56.2 +04.1 94.1	63 56.4 +04.0 93.9	62 56.6 +03.9 93.7	61 56.8 +03.8 93.5	60 57.0 +03.7 93.3
2°	65 00.3 +01.8 91.7	64 00.4 +01.8 91.6	63 00.5 +01.8 91.5	62 00.6 +01.7 91.4	61 00.7 +01.7 91.3
3°	65 02.1 -00.4 89.3	64 02.2 -00.4 89.3	63 02.3 -00.3 89.3	62 02.3 -00.2 89.3	61 02.4 -00.1 89.2
4°	65 01.7 -02.7 87.0	64 01.8 -02.5 87.0	63 02.0 -02.3 87.1	62 02.1 -02.1 87.1	61 02.3 -02.0 87.2
5°	64 59.0 -04.9 84.6	63 59.3 -04.6 84.7	62 59.7 -04.4 84.9	62 00.0 -04.2 85.0	61 00.3 -03.9 85.1
6°	64 54.1 -07.1 82.2	63 54.7 -06.8 82.5	62 55.3 -06.4 82.7	61 55.8 -06.1 82.9	60 56.4 -05.8 83.0
7°	64 47.0 -09.3 79.9	63 47.9 -08.8 80.2	62 48.9 -08.5 80.5	61 49.7 -08.0 80.8	60 50.6 -07.6 81.0
8°	64 37.7 -11.5 77.6	63 39.1 -10.9 78.0	62 40.4 -10.3 78.3	61 41.7 -09.9 78.7	60 43.0 -09.5 79.0
9°	64 26.2 -13.5 75.3	63 28.2 -12.9 75.8	62 30.1 -12.4 76.2	61 31.8 -11.8 76.6	60 33.5 -11.3 76.9
10°	64 12.7 -15.6 73.1	63 15.3 -14.9 73.6	62 17.7 -14.2 74.1	61 20.0 -13.6 74.5	60 22.2 -13.0 75.0
11°	63 57.1 -17.6 70.9	63 00.4 -16.8 71.5	62 03.5 -16.1 72.0	61 06.4 -15.4 72.5	60 09.2 -14.8 73.0
12°	63 39.5 -19.4 68.7	62 43.6 -18.7 69.3	61 47.4 -17.9 70.0	60 51.0 -17.1 70.5	59 54.4 -16.4 71.0
13°	63 20.1 -21.3 66.6	62 24.9 -20.4 67.3	61 29.5 -19.6 67.9	60 33.9 -18.8 68.6	59 38.0 -18.1 69.1
14°	62 58.8 -23.1 64.5	62 04.5 -22.2 65.3	61 09.9 -21.3 66.0	60 15.1 -20.5 66.6	59 19.9 -19.6 67.3
15°	62 35.7 -24.8 62.5	61 42.3 -23.8 63.3	60 48.6 -22.9 64.0	59 54.6 -22.0 64.8	59 00.3 -21.3 65.4
16°	62 10.9 -26.4 60.5	61 18.5 -25.4 61.4	60 25.7 -24.4 62.2	59 32.6 -23.6 62.9	58 39.0 -22.7 63.6
17°	61 44.5 -28.0 58.6	60 53.1 -26.9 59.5	60 01.3 -26.0 60.3	59 09.0 -25.0 61.1	58 16.3 -24.1 61.8
18°	61 16.5 -29.4 56.8	60 26.2 -28.4 57.7	59 35.3 -27.4 58.5	58 44.0 -26.5 59.3	57 52.2 -25.5 60.1
19°	60 47.1 -30.8 55.0	59 57.8 -29.8 55.9	59 07.9 -28.8 56.8	58 17.5 -27.8 57.6	57 26.7 -26.8 58.4
20°	60 16.3 -32.2 53.2	59 28.0 -31.1 54.2	58 39.1 -30.0 55.1	57 49.7 -29.0 55.9	56 59.9 -28.2 56.8
21°	59 44.1 -33.4 51.5	58 56.9 -32.4 52.5	58 09.1 -31.4 53.4	57 20.7 -30.4 54.3	56 31.7 -29.3 55.2
22°	59 10.7 -34.6 49.9	58 24.5 -33.5 50.9	57 37.7 -32.5 51.8	56 50.3 -31.4 52.7	56 02.4 -30.5 53.6
23°	58 36.1 -35.7 48.3	57 51.0 -34.7 49.3	57 05.2 -33.6 50.3	56 18.9 -32.7 51.2	55 31.9 -31.6 52.0
24°	58 00.4 -36.8 46.8	57 16.3 -35.7 47.8	56 31.6 -34.7 48.8	55 46.2 -33.6 49.7	55 00.3 -32.7 50.6
25°	57 23.6 -37.8 45.3	56 40.6 -36.7 46.3	55 56.9 -35.7 47.3	55 12.6 -34.7 48.2	54 27.6 -33.7 49.1
26°	56 45.8 -38.8 43.9	56 03.9 -37.7 44.9	55 21.2 -36.7 45.9	54 37.9 -35.7 46.8	53 53.9 -34.7 47.7
27°	56 07.0 -39.6 42.5	55 26.2 -38.6 43.5	54 44.5 -37.5 44.5	54 02.2 -36.6 45.4	53 19.2 -35.6 46.3
28°	55 27.4 -40.5 41.2	54 47.6 -39.5 42.2	54 07.0 -38.5 43.1	53 25.6 -37.4 44.1	52 43.6 -36.5 45.0
29°	54 46.9 -41.3 39.9	54 08.1 -40.3 40.9	53 28.5 -39.3 41.8	52 48.2 -38.3 42.8	52 07.1 -37.3 43.7

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Latitude 3°

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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°	59 51.9 +05.3 95.2	58 52.2 +05.2 95.0	57 52.5 +05.1 94.8	56 52.8 +04.9 94.6	55 53.0 +04.9 94.4
1°	59 57.2 +03.6 93.2	58 57.4 +03.5 93.0	57 57.6 +03.4 92.9	56 57.7 +03.4 92.8	55 57.9 +03.2 92.7
2°	60 00.8 +01.7 91.2	59 00.9 +01.7 91.1	58 01.0 +01.7 91.0	57 01.1 +01.7 90.9	56 01.1 +01.8 90.9
3°	60 02.5 +00.0 89.2	59 02.6 +00.0 89.2	58 02.7 +00.1 89.1	57 02.8 +00.1 89.1	56 02.9 +00.2 89.1
4°	60 02.5 -01.9 87.2	59 02.6 -01.7 87.2	58 02.8 -01.7 87.3	57 02.9 -01.5 87.3	56 03.1 -01.4 87.3
5°	60 00.6 -03.7 85.2	59 00.9 -03.5 85.3	58 01.1 -03.2 85.4	57 01.4 -03.1 85.4	56 01.7 -02.9 85.5
6°	59 56.9 -05.5 83.2	58 57.4 -05.2 83.3	57 57.9 -05.0 83.5	56 58.3 -04.7 83.6	55 58.8 -04.5 83.7
7°	59 51.4 -07.3 81.2	58 52.2 -07.0 81.4	57 52.9 -06.6 81.6	56 53.6 -06.3 81.8	55 54.3 -06.0 81.9
8°	59 44.1 -09.0 79.2	58 45.2 -08.6 79.5	57 46.3 -08.3 79.7	56 47.3 -07.9 80.0	55 48.3 -07.5 80.2
9°	59 35.1 -10.8 77.3	58 36.6 -10.3 77.6	57 38.0 -09.8 77.9	56 39.4 -09.4 78.2	55 40.8 -09.1 78.4
10°	59 24.3 -12.5 75.3	58 26.3 -12.0 75.7	57 28.2 -11.5 76.0	56 30.0 -11.0 76.4	55 31.7 -10.5 76.7
11°	59 11.8 -14.1 73.4	58 14.3 -13.5 73.8	57 16.7 -13.0 74.2	56 19.0 -12.5 74.6	55 21.2 -12.0 74.9
12°	58 57.7 -15.8 71.5	58 00.8 -15.2 72.0	57 03.7 -14.5 72.4	56 06.5 -13.9 72.8	55 09.2 -13.4 73.2
13°	58 41.9 -17.4 69.7	57 45.6 -16.7 70.2	56 49.2 -16.1 70.6	55 52.6 -15.4 71.1	54 55.8 -14.8 71.5
14°	58 24.5 -18.9 67.8	57 28.9 -18.1 68.4	56 33.1 -17.5 68.9	55 37.2 -16.9 69.4	54 41.0 -16.2 69.8
15°	58 05.6 -20.4 66.0	57 10.8 -19.7 66.6	56 15.6 -18.9 67.2	55 20.3 -18.2 67.7	54 24.8 -17.5 68.2
16°	57 45.2 -21.8 64.3	56 51.1 -21.1 64.9	55 56.7 -20.3 65.5	55 02.1 -19.6 66.0	54 07.3 -18.9 66.5
17°	57 23.4 -23.3 62.5	56 30.0 -22.4 63.2	55 36.4 -21.6 63.8	54 42.5 -20.8 64.4	53 48.4 -20.2 64.9
18°	57 00.1 -24.6 60.8	56 07.6 -23.8 61.5	55 14.8 -23.0 62.1	54 21.7 -22.2 62.7	53 28.2 -21.3 63.3
19°	56 35.5 -26.0 59.2	55 43.8 -25.0 59.9	54 51.8 -24.2 60.5	53 59.5 -23.4 61.2	53 06.9 -22.6 61.7
20°	56 09.5 -27.2 57.5	55 18.8 -26.3 58.3	54 27.6 -25.4 58.9	53 36.1 -24.6 59.6	52 44.3 -23.8 60.2
21°	55 42.3 -28.4 55.9	54 52.5 -27.5 56.7	54 02.2 -26.6 57.4	53 11.5 -25.7 58.1	52 20.5 -24.9 58.7
22°	55 13.9 -29.5 54.4	54 25.0 -28.6 55.2	53 35.6 -27.7 55.9	52 45.8 -26.9 56.6	51 55.6 -26.0 57.2
23°	54 44.4 -30.7 52.9	53 56.4 -29.8 53.6	53 07.9 -28.8 54.4	52 18.9 -27.9 55.1	51 29.6 -27.1 55.8
24°	54 13.7 -31.7 51.4	53 26.6 -30.7 52.2	52 39.1 -29.9 52.9	51 51.0 -28.9 53.7	51 02.5 -28.0 54.3
25°	53 42.0 -32.7 49.9	52 55.9 -31.8 50.7	52 09.2 -30.8 51.5	51 22.1 -30.0 52.2	50 34.5 -29.1 52.9
26°	53 09.3 -33.7 48.5	52 24.1 -32.8 49.4	51 38.4 -31.9 50.1	50 52.1 -30.9 50.9	50 05.4 -30.0 51.6
27°	52 35.6 -34.7 47.2	51 51.3 -33.6 48.0	51 06.5 -32.7 48.8	50 21.2 -31.8 49.5	49 35.4 -30.9 50.2
28°	52 00.9 -35.5 45.8	51 17.7 -34.6 46.7	50 33.8 -33.6 47.4	49 49.4 -32.7 48.2	49 04.5 -31.8 48.9
29°	51 25.4 -36.3 44.5	50 43.1 -35.4 45.4	50 00.2 -34.5 46.1	49 16.7 -33.6 46.9	48 32.7 -32.7 47.6

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°	54 53.3 +04.7 94.3	53 53.5 +04.6 94.1	52 53.8 +04.5 94.0	51 54.0 +04.4 93.8	50 54.2 +04.3 93.7
1°	54 58.0 +03.2 92.5	53 58.1 +03.2 92.4	52 58.3 +03.1 92.3	51 58.4 +03.1 92.2	50 58.5 +03.1 92.1
2°	55 01.2 +01.8 90.8	54 01.3 +01.8 90.7	53 01.4 +01.8 90.7	52 01.5 +01.7 90.6	51 01.6 +01.7 90.5
3°	55 03.0 +00.2 89.1	54 03.1 +00.3 89.0	53 03.2 +00.3 89.0	52 03.2 +00.5 89.0	51 03.3 +00.5 88.9
4°	55 03.2 -01.2 87.3	54 03.4 -01.2 87.3	53 03.5 -01.0 87.3	52 03.7 -01.0 87.3	51 03.8 -00.8 87.3
5°	55 02.0 -02.8 85.6	54 02.2 -02.6 85.6	53 02.5 -02.5 85.7	52 02.7 -02.3 85.7	51 03.0 -02.2 85.8
6°	54 59.2 -04.2 83.8	53 59.6 -04.0 83.9	53 00.0 -03.8 84.0	52 00.4 -03.6 84.1	51 00.8 -03.4 84.2
7°	54 55.0 -05.8 82.1	53 55.6 -05.5 82.2	52 56.2 -05.2 82.4	51 56.8 -04.9 82.5	50 57.4 -04.7 82.6
8°	54 49.2 -07.2 80.4	53 50.1 -06.8 80.5	52 51.0 -06.5 80.7	51 51.9 -06.3 80.9	50 52.7 -06.0 81.0
9°	54 42.0 -08.6 78.6	53 43.3 -08.3 78.9	52 44.5 -07.9 79.1	51 45.6 -07.6 79.2	50 46.7 -07.2 79.4
10°	54 33.4 -10.1 76.9	53 35.0 -09.7 77.2	52 36.6 -09.3 77.4	51 38.0 -08.8 77.6	50 39.5 -08.5 77.9
11°	54 23.3 -11.5 75.2	53 25.3 -11.0 75.5	52 27.3 -10.6 75.8	51 29.2 -10.2 76.1	50 31.0 -09.8 76.3
12°	54 11.8 -12.9 73.5	53 14.3 -12.4 73.9	52 16.7 -11.9 74.2	51 19.0 -11.4 74.5	50 21.2 -10.9 74.7
13°	53 58.9 -14.2 71.9	53 01.9 -13.7 72.2	52 04.8 -13.2 72.6	51 07.6 -12.7 72.9	50 10.3 -12.2 73.2
14°	53 44.7 -15.6 70.2	52 48.2 -15.0 70.6	51 51.6 -14.4 71.0	50 54.9 -13.9 71.4	49 58.1 -13.4 71.7
15°	53 29.1 -16.9 68.6	52 33.2 -16.2 69.0	51 37.2 -15.7 69.4	50 41.0 -15.1 69.8	49 44.7 -14.5 70.2
16°	53 12.2 -18.2 67.0	52 17.0 -17.6 67.5	51 21.5 -16.9 67.9	50 25.9 -16.2 68.3	49 30.2 -15.7 68.7
17°	52 54.0 -19.4 65.4	51 59.4 -18.7 65.9	51 04.6 -18.0 66.4	50 09.7 -17.5 66.8	49 14.5 -16.8 67.2
18°	52 34.6 -20.7 63.9	51 40.7 -19.9 64.4	50 46.6 -19.3 64.8	49 52.2 -18.5 65.3	48 57.7 -17.9 65.7
19°	52 13.9 -21.8 62.3	51 20.8 -21.1 62.8	50 27.3 -20.3 63.3	49 33.7 -19.7 63.8	48 39.8 -19.0 64.3
20°	51 52.1 -23.0 60.8	50 59.7 -22.2 61.4	50 07.0 -21.5 61.9	49 14.0 -20.8 62.4	48 20.8 -20.1 62.8
21°	51 29.1 -24.1 59.3	50 37.5 -23.3 59.9	49 45.5 -22.5 60.4	48 53.2 -21.8 60.9	48 00.7 -21.0 61.4
22°	51 05.0 -25.1 57.8	50 14.2 -24.4 58.4	49 23.0 -23.6 59.0	48 31.4 -22.8 59.5	47 39.7 -22.1 60.0
23°	50 39.9 -26.2 56.4	49 49.8 -25.4 57.0	48 59.4 -24.6 57.6	48 08.6 -23.8 58.1	47 17.6 -23.0 58.7
24°	50 13.7 -27.3 55.0	49 24.4 -26.4 55.6	48 34.8 -25.6 56.2	47 44.8 -24.7 56.8	46 54.6 -24.0 57.3
25°	49 46.4 -28.1 53.6	48 58.0 -27.3 54.2	48 09.2 -26.5 54.8	47 20.1 -25.8 55.4	46 30.6 -25.0 56.0
26°	49 18.3 -29.2 52.2	48 30.7 -28.3 52.9	47 42.7 -27.4 53.5	46 54.3 -26.6 54.1	46 05.6 -25.8 54.7
27°	48 49.1 -30.0 50.9	48 02.4 -29.2 51.6	47 15.3 -28.4 52.2	46 27.7 -27.5 52.8	45 39.8 -26.6 53.4
28°	48 19.1 -30.9 49.6	47 33.2 -30.0 50.3	46 46.9 -29.1 50.9	46 00.2 -28.3 51.5	45 13.2 -27.6 52.1
29°	47 48.2 -31.8 48.3	47 03.2 -30.9 49.0	46 17.8 -30.1 49.6	45 31.9 -29.2 50.2	44 45.6 -28.3 50.8

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Declination SAME name as Latitude

Latitude 3°

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°	49 54.4 +04.2 93.6	48 54.6 +04.2 93.4	47 54.8 +04.1 93.3	46 55.0 +04.0 93.2	45 55.1 +04.0 93.1
1°	49 58.6 +03.1 92.0	48 58.8 +02.9 91.9	47 58.9 +02.9 91.8	46 59.0 +02.9 91.8	45 59.1 +02.9 91.7
2°	50 01.7 +01.7 90.5	49 01.7 +01.8 90.4	48 01.8 +01.8 90.3	47 01.9 +01.8 90.3	46 02.0 +01.8 90.2
3°	50 03.4 +00.5 88.9	49 03.5 +00.6 88.9	48 03.6 +00.6 88.8	47 03.7 +00.7 88.8	46 03.8 +00.7 88.8
4°	50 03.9 -00.7 87.4	49 04.1 -00.6 87.4	48 04.2 -00.5 87.4	47 04.4 -00.5 87.4	46 04.5 -00.3 87.3
5°	50 03.2 -02.0 85.8	49 03.5 -01.9 85.8	48 03.7 -01.7 85.9	47 03.9 -01.5 85.9	46 04.2 -01.5 85.9
6°	50 01.2 -03.2 84.2	49 01.6 -03.0 84.3	48 02.0 -02.9 84.4	47 02.4 -02.7 84.4	46 02.7 -02.5 84.5
7°	49 58.0 -04.5 82.7	48 58.6 -04.3 82.8	47 59.1 -04.0 82.9	46 59.7 -03.9 83.0	46 00.2 -03.6 83.0
8°	49 53.5 -05.7 81.1	48 54.3 -05.4 81.3	47 55.1 -05.2 81.4	46 55.8 -04.9 81.5	45 56.6 -04.7 81.6
9°	49 47.8 -06.9 79.6	48 48.9 -06.6 79.7	47 49.9 -06.3 79.9	46 50.9 -06.0 80.0	45 51.9 -05.8 80.2
10°	49 40.9 -08.1 78.1	48 42.3 -07.8 78.2	47 43.6 -07.5 78.4	46 44.9 -07.2 78.6	45 46.1 -06.8 78.7
11°	49 32.8 -09.4 76.5	48 34.5 -09.0 76.7	47 36.1 -08.6 76.9	46 37.7 -08.2 77.1	45 39.3 -07.9 77.3
12°	49 23.4 -10.5 75.0	48 25.5 -10.1 75.2	47 27.5 -09.7 75.5	46 29.5 -09.3 75.7	45 31.4 -08.9 75.9
13°	49 12.9 -11.7 73.5	48 15.4 -11.3 73.8	47 17.8 -10.8 74.0	46 20.2 -10.4 74.3	45 22.5 -10.0 74.5
14°	49 01.2 -12.9 72.0	48 04.1 -12.3 72.3	47 07.0 -11.9 72.6	46 09.8 -11.4 72.8	45 12.5 -11.0 73.1
15°	48 48.3 -14.0 70.5	47 51.8 -13.5 70.8	46 55.1 -12.9 71.1	45 58.4 -12.5 71.4	45 01.5 -12.0 71.7
16°	48 34.3 -15.1 69.0	47 38.3 -14.6 69.4	46 42.2 -14.1 69.7	45 45.9 -13.5 70.0	44 49.5 -13.0 70.3
17°	48 19.2 -16.2 67.6	47 23.7 -15.6 67.9	46 28.1 -15.0 68.3	45 32.4 -14.5 68.6	44 36.5 -13.9 68.9
18°	48 03.0 -17.3 66.1	47 08.1 -16.7 66.5	46 13.1 -16.1 66.9	45 17.9 -15.5 67.2	44 22.6 -15.0 67.6
19°	47 45.7 -18.3 64.7	46 51.4 -17.7 65.1	45 57.0 -17.1 65.5	45 02.4 -16.5 65.9	44 07.6 -15.8 66.2
20°	47 27.4 -19.4 63.3	46 33.7 -18.7 63.7	45 39.9 -18.0 64.1	44 45.9 -17.4 64.5	43 51.8 -16.9 64.9
21°	47 08.0 -20.4 61.9	46 15.0 -19.6 62.3	45 21.9 -19.0 62.8	44 28.5 -18.4 63.2	43 34.9 -17.7 63.5
22°	46 47.6 -21.3 60.5	45 55.4 -20.7 61.0	45 02.9 -20.0 61.4	44 10.1 -19.2 61.8	43 17.2 -18.6 62.2
23°	46 26.3 -22.3 59.2	45 34.7 -21.6 59.6	44 42.9 -20.9 60.1	43 50.9 -20.2 60.5	42 58.6 -19.5 60.9
24°	46 04.0 -23.3 57.8	45 13.1 -22.5 58.3	44 22.0 -21.7 58.8	43 30.7 -21.1 59.2	42 39.1 -20.4 59.6
25°	45 40.7 -24.1 56.5	44 50.6 -23.3 57.0	44 00.3 -22.7 57.5	43 09.6 -21.9 57.9	42 18.7 -21.2 58.4
26°	45 16.6 -25.0 55.2	44 27.3 -24.3 55.7	43 37.6 -23.5 56.2	42 47.7 -22.7 56.7	41 57.5 -22.0 57.1
27°	44 51.6 -25.9 53.9	44 03.0 -25.1 54.4	43 14.1 -24.3 54.9	42 25.0 -23.6 55.4	41 35.5 -22.8 55.9
28°	44 25.7 -26.7 52.6	43 37.9 -25.9 53.2	42 49.8 -25.1 53.7	42 01.4 -24.4 54.2	41 12.7 -23.6 54.6
29°	43 59.0 -27.5 51.4	43 12.0 -26.7 51.9	42 24.7 -25.9 52.4	41 37.0 -25.1 52.9	40 49.1 -24.4 53.4

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°	44 55.3 +03.9 93.0	43 55.5 +03.8 92.9	42 55.6 +03.8 92.8	41 55.8 +03.7 92.7	40 55.9 +03.7 92.6
1°	44 59.2 +02.9 91.6	43 59.3 +02.9 91.5	42 59.4 +02.8 91.4	41 59.5 +02.8 91.4	40 59.6 +02.8 91.3
2°	45 02.1 +01.8 90.2	44 02.2 +01.8 90.1	43 02.2 +01.9 90.1	42 02.3 +01.9 90.0	41 02.4 +01.9 90.0
3°	45 03.9 +00.8 88.8	44 04.0 +00.8 88.7	43 04.1 +00.9 88.7	42 04.2 +00.9 88.7	41 04.3 +01.0 88.6
4°	45 04.7 -00.3 87.3	44 04.8 -00.2 87.3	43 05.0 -00.1 87.3	42 05.1 +00.0 87.3	41 05.3 +00.0 87.3
5°	45 04.4 -01.3 85.9	44 04.6 -01.2 85.9	43 04.9 -01.1 86.0	42 05.1 -01.0 86.0	41 05.3 -00.8 86.0
6°	45 03.1 -02.4 84.5	44 03.4 -02.2 84.6	43 03.8 -02.1 84.6	42 04.1 -01.9 84.6	41 04.5 -01.8 84.7
7°	45 00.7 -03.4 83.1	44 01.2 -03.2 83.2	43 01.7 -03.0 83.2	42 02.2 -02.8 83.3	41 02.7 -02.7 83.3
8°	44 57.3 -04.5 81.7	43 58.0 -04.2 81.8	42 58.7 -04.0 81.9	41 59.4 -03.8 81.9	41 00.0 -03.5 82.0
9°	44 52.8 -05.5 80.3	43 53.8 -05.3 80.4	42 54.7 -05.0 80.5	41 55.6 -04.8 80.6	40 56.5 -04.5 80.7
10°	44 47.3 -06.5 78.9	43 48.5 -06.2 79.0	42 49.7 -05.9 79.1	41 50.8 -05.6 79.3	40 52.0 -05.4 79.4
11°	44 40.8 -07.5 77.5	43 42.3 -07.2 77.6	42 43.8 -06.9 77.8	41 45.2 -06.6 77.9	40 46.6 -06.3 78.0
12°	44 33.3 -08.6 76.1	43 35.1 -08.2 76.3	42 36.9 -07.9 76.4	41 38.6 -07.5 76.6	40 40.3 -07.2 76.7
13°	44 24.7 -09.5 74.7	43 26.9 -09.2 74.9	42 29.0 -08.8 75.1	41 31.1 -08.4 75.3	40 33.1 -08.0 75.4
14°	44 15.2 -10.6 73.3	43 17.7 -10.1 73.5	42 20.2 -09.7 73.7	41 22.7 -09.3 73.9	40 25.1 -08.9 74.1
15°	44 04.6 -11.5 71.9	43 07.6 -11.1 72.2	42 10.5 -10.6 72.4	41 13.4 -10.2 72.6	40 16.2 -09.8 72.8
16°	43 53.1 -12.5 70.6	42 56.5 -12.0 70.8	41 59.9 -11.6 71.1	41 03.2 -11.1 71.3	40 06.4 -10.7 71.5
17°	43 40.6 -13.5 69.2	42 44.5 -12.9 69.5	41 48.3 -12.4 69.8	40 52.1 -12.0 70.0	39 55.7 -11.5 70.2
18°	43 27.1 -14.4 67.9	42 31.6 -13.9 68.2	41 35.9 -13.3 68.5	40 40.1 -12.8 68.7	39 44.2 -12.3 69.0
19°	43 12.7 -15.3 66.5	42 17.7 -14.7 66.9	41 22.6 -14.2 67.2	40 27.3 -13.7 67.4	39 31.9 -13.2 67.7
20°	42 57.4 -16.2 65.2	42 03.0 -15.7 65.5	41 08.4 -15.1 65.9	40 13.6 -14.5 66.2	39 18.7 -13.9 66.4
21°	42 41.2 -17.1 63.9	41 47.3 -16.5 64.2	40 53.3 -15.9 64.6	39 59.1 -15.3 64.9	39 04.8 -14.8 65.2
22°	42 24.1 -18.0 62.6	41 30.8 -17.3 63.0	40 37.4 -16.8 63.3	39 43.8 -16.2 63.6	38 50.0 -15.5 63.9
23°	42 06.1 -18.8 61.3	41 13.5 -18.2 61.7	40 20.6 -17.5 62.0	39 27.6 -16.9 62.4	38 34.5 -16.4 62.7
24°	41 47.3 -19.7 60.0	40 55.3 -19.0 60.4	40 03.1 -18.4 60.8	39 10.7 -17.8 61.1	38 18.1 -17.1 61.5
25°	41 27.6 -20.5 58.8	40 36.3 -19.9 59.2	39 44.7 -19.2 59.5	38 52.9 -18.4 59.9	38 01.0 -17.8 60.3
26°	41 07.1 -21.3 57.5	40 16.4 -20.6 57.9	39 25.5 -19.9 58.3	38 34.5 -19.3 58.7	37 43.2 -18.6 59.0
27°	40 45.8 -22.1 56.3	39 55.8 -21.3 56.7	39 05.6 -20.6 57.1	38 15.2 -20.0 57.5	37 24.6 -19.3 57.8
28°	40 23.7 -22.9 55.1	39 34.5 -22.2 55.5	38 45.0 -21.5 55.9	37 55.2 -20.7 56.3	37 05.3 -20.0 56.7
29°	40 00.8 -23.6 53.9	39 12.3 -22.8 54.3	38 23.5 -22.1 54.7	37 34.5 -21.4 55.1	36 45.3 -20.7 55.5

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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 56.0 +03.7 92.5	38 56.2 +03.6 92.4	37 56.3 +03.6 92.3	36 56.5 +03.5 92.3	35 56.6 +03.5 92.2
1°	39 59.7 +02.8 91.2	38 59.8 +02.8 91.1	37 59.9 +02.8 91.1	37 00.0 +02.7 91.0	36 00.1 +02.7 90.9
2°	40 02.5 +01.9 89.9	39 02.6 +01.9 89.9	38 02.7 +01.9 89.8	37 02.7 +02.0 89.8	36 02.8 +02.0 89.7
3°	40 04.4 +01.0 88.6	39 04.5 +01.1 88.6	38 04.6 +01.1 88.5	37 04.7 +01.2 88.5	36 04.8 +01.2 88.5
4°	40 05.4 +00.2 87.3	39 05.6 +00.2 87.3	38 05.7 +00.3 87.3	37 05.9 +00.3 87.3	36 06.0 +00.5 87.2
5°	40 05.6 -00.8 86.0	39 05.8 -00.6 86.0	38 06.0 -00.5 86.0	37 06.2 -00.4 86.0	36 06.5 -00.3 86.0
6°	40 04.8 -01.6 84.7	39 05.2 -01.5 84.7	38 05.5 -01.3 84.7	37 05.8 -01.2 84.7	36 06.2 -01.1 84.8
7°	40 03.2 -02.5 83.4	39 03.7 -02.3 83.4	38 04.2 -02.2 83.5	37 04.6 -02.0 83.5	36 05.1 -01.8 83.5
8°	40 00.7 -03.4 82.1	39 01.4 -03.2 82.1	38 02.0 -03.0 82.2	37 02.6 -02.8 82.2	36 03.3 -02.6 82.3
9°	39 57.3 -04.2 80.8	38 58.2 -04.0 80.8	37 59.0 -03.8 80.9	36 59.8 -03.5 81.0	36 00.7 -03.4 81.1
10°	39 53.1 -05.1 79.5	38 54.2 -04.9 79.6	37 55.2 -04.6 79.7	36 56.3 -04.4 79.7	35 57.3 -04.1 79.8
11°	39 48.0 -06.0 78.2	38 49.3 -05.7 78.3	37 50.6 -05.4 78.4	36 51.9 -05.1 78.5	35 53.2 -04.9 78.6
12°	39 42.0 -06.9 76.9	38 43.6 -06.5 77.0	37 45.2 -06.2 77.1	36 46.8 -05.9 77.2	35 48.3 -05.6 77.4
13°	39 35.1 -07.7 75.6	38 37.1 -07.4 75.7	37 39.0 -07.0 75.9	36 40.9 -06.7 76.0	35 42.7 -06.4 76.1
14°	39 27.4 -08.5 74.3	38 29.7 -08.1 74.5	37 32.0 -07.8 74.6	36 34.2 -07.5 74.8	35 36.3 -07.1 74.9
15°	39 18.9 -09.4 73.0	38 21.6 -09.0 73.2	37 24.2 -08.6 73.4	36 26.7 -08.2 73.5	35 29.2 -07.8 73.7
16°	39 09.5 -10.2 71.7	38 12.6 -09.8 71.9	37 15.6 -09.4 72.1	36 18.5 -08.9 72.3	35 21.4 -08.6 72.5
17°	38 59.3 -11.0 70.5	38 02.8 -10.6 70.7	37 06.2 -10.1 70.9	36 09.6 -09.8 71.1	35 12.8 -09.2 71.3
18°	38 48.3 -11.9 69.2	37 52.2 -11.4 69.4	36 56.1 -10.9 69.7	35 59.8 -10.4 69.9	35 03.6 -10.0 70.0
19°	38 36.4 -12.6 68.0	37 40.8 -12.1 68.2	36 45.2 -11.7 68.4	35 49.4 -11.2 68.6	34 53.6 -10.8 68.8
20°	38 23.8 -13.5 66.7	37 28.7 -12.9 67.0	36 33.5 -12.4 67.2	35 38.2 -11.9 67.4	34 42.8 -11.4 67.6
21°	38 10.3 -14.2 65.5	37 15.8 -13.7 65.7	36 21.1 -13.2 66.0	35 26.3 -12.6 66.2	34 31.4 -12.1 66.5
22°	37 56.1 -15.0 64.2	37 02.1 -14.4 64.5	36 07.9 -13.8 64.8	35 13.7 -13.3 65.0	34 19.3 -12.8 65.3
23°	37 41.1 -15.7 63.0	36 47.7 -15.2 63.3	35 54.1 -14.6 63.6	35 00.4 -14.1 63.8	34 06.5 -13.4 64.1
24°	37 25.4 -16.5 61.8	36 32.5 -15.9 62.1	35 39.5 -15.3 62.4	34 46.3 -14.7 62.6	33 53.1 -14.2 62.9
25°	37 08.9 -17.2 60.6	36 16.6 -16.6 60.9	35 24.2 -16.0 61.2	34 31.6 -15.3 61.5	33 38.9 -14.8 61.7
26°	36 51.7 -17.9 59.4	36 00.0 -17.2 59.7	35 08.2 -16.6 60.0	34 16.3 -16.1 60.3	33 24.1 -15.4 60.6
27°	36 33.8 -18.7 58.2	35 42.8 -18.0 58.5	34 51.6 -17.4 58.8	34 00.2 -16.7 59.1	33 08.7 -16.1 59.4
28°	36 15.1 -19.3 57.0	35 24.8 -18.7 57.3	34 34.2 -18.0 57.7	33 43.5 -17.3 58.0	32 52.6 -16.7 58.3
29°	35 55.8 -20.0 55.8	35 06.1 -19.3 56.2	34 16.2 -18.6 56.5	33 26.2 -18.0 56.8	32 35.9 -17.3 57.1

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°	34 56.7 +03.5 92.1	33 56.8 +03.5 92.0	32 56.9 +03.4 91.9	31 57.1 +03.3 91.9	30 57.2 +03.3 91.8
1°	35 00.2 +02.7 90.9	34 00.3 +02.7 90.8	33 00.3 +02.8 90.8	32 00.4 +02.8 90.7	31 00.5 +02.7 90.6
2°	35 02.9 +02.0 89.7	34 03.0 +02.0 89.6	33 03.1 +02.0 89.6	32 03.2 +02.0 89.5	31 03.2 +02.1 89.5
3°	35 04.9 +01.3 88.4	34 05.0 +01.3 88.4	33 05.1 +01.4 88.4	32 05.2 +01.4 88.3	31 05.3 +01.5 88.3
4°	35 06.2 +00.5 87.2	34 06.3 +00.6 87.2	33 06.5 +00.7 87.2	32 06.6 +00.8 87.2	31 06.8 +00.8 87.1
5°	35 06.7 -00.2 86.0	34 06.9 -00.1 86.0	33 07.2 +00.0 86.0	32 07.4 +00.1 86.0	31 07.6 +00.2 86.0
6°	35 06.5 -00.9 84.8	34 06.8 -00.8 84.8	33 07.2 -00.7 84.8	32 07.5 -00.6 84.8	31 07.8 -00.4 84.8
7°	35 05.6 -01.7 83.6	34 06.0 -01.5 83.6	33 06.5 -01.4 83.6	32 06.9 -01.2 83.6	31 07.4 -01.1 83.6
8°	35 03.9 -02.4 82.3	34 04.5 -02.2 82.4	33 05.1 -02.0 82.4	32 05.7 -01.9 82.4	31 06.3 -01.7 82.5
9°	35 01.5 -03.2 81.1	34 02.3 -03.0 81.2	33 03.1 -02.8 81.2	32 03.8 -02.5 81.3	31 04.6 -02.3 81.3
10°	34 58.3 -03.9 79.9	33 59.3 -03.6 80.0	33 00.3 -03.4 80.0	32 01.3 -03.2 80.1	31 02.3 -03.0 80.1
11°	34 54.4 -04.6 78.7	33 55.7 -04.4 78.8	32 56.9 -04.1 78.8	31 58.1 -03.8 78.9	30 59.3 -03.6 79.0
12°	34 49.8 -05.3 77.5	33 51.3 -05.0 77.6	32 52.8 -04.7 77.6	31 54.3 -04.5 77.7	30 55.7 -04.2 77.8
13°	34 44.5 -06.0 76.2	33 46.3 -05.7 76.4	32 48.1 -05.5 76.5	31 49.8 -05.1 76.5	30 51.5 -04.8 76.6
14°	34 38.5 -06.8 75.0	33 40.6 -06.4 75.2	32 42.6 -06.1 75.3	31 44.7 -05.8 75.4	30 46.7 -05.5 75.5
15°	34 31.7 -07.4 73.8	33 34.2 -07.2 74.0	32 36.5 -06.7 74.1	31 38.9 -06.4 74.2	30 41.2 -06.0 74.3
16°	34 24.3 -08.2 72.6	33 27.0 -07.7 72.8	32 29.8 -07.4 72.9	31 32.5 -07.0 73.0	30 35.2 -06.7 73.2
17°	34 16.1 -08.9 71.4	33 19.3 -08.5 71.6	32 22.4 -08.1 71.7	31 25.5 -07.7 71.9	30 28.5 -07.3 72.0
18°	34 07.2 -09.6 70.2	33 10.8 -09.1 70.4	32 14.3 -08.7 70.6	31 17.8 -08.3 70.7	30 21.2 -07.9 70.9
19°	33 57.6 -10.2 69.0	33 01.7 -09.8 69.2	32 05.6 -09.4 69.4	31 09.5 -08.9 69.6	30 13.3 -08.5 69.7
20°	33 47.4 -10.9 67.9	32 51.9 -10.5 68.0	31 56.2 -10.0 68.2	31 00.6 -09.6 68.4	30 04.8 -09.1 68.6
21°	33 36.5 -11.6 66.7	32 41.4 -11.1 66.9	31 46.2 -10.6 67.1	30 51.0 -10.1 67.3	29 55.7 -09.6 67.4
22°	33 24.9 -12.3 65.5	32 30.3 -11.8 65.7	31 35.6 -11.2 65.9	30 40.9 -10.8 66.1	29 46.1 -10.3 66.3
23°	33 12.6 -12.9 64.3	32 18.5 -12.4 64.5	31 24.4 -11.9 64.8	30 30.1 -11.3 65.0	29 35.8 -10.8 65.2
24°	32 59.7 -13.6 63.2	32 06.1 -13.0 63.4	31 12.5 -12.4 63.6	30 18.8 -11.9 63.8	29 25.0 -11.4 64.0
25°	32 46.1 -14.2 62.0	31 53.1 -13.6 62.2	31 00.1 -13.1 62.5	30 06.9 -12.5 62.7	29 13.6 -12.0 62.9
26°	32 31.9 -14.8 60.8	31 39.5 -14.2 61.1	30 47.0 -13.7 61.3	29 54.4 -13.1 61.6	29 01.6 -12.5 61.8
27°	32 17.1 -15.5 59.7	31 25.3 -14.9 60.0	30 33.3 -14.2 60.2	29 41.3 -13.7 60.4	28 49.1 -13.1 60.7
28°	32 01.6 -16.1 58.6	31 10.4 -15.4 58.8	30 19.1 -14.8 59.1	29 27.6 -14.2 59.3	28 36.0 -13.6 59.5
29°	31 45.5 -16.6 57.4	30 55.0 -16.1 57.7	30 04.3 -15.4 58.0	29 13.4 -14.8 58.2	28 22.4 -14.1 58.4

Declination SAME name as Latitude

Latitude 3°

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 57.3 +03.3 91.7	28 57.4 +03.3 91.7	27 57.5 +03.3 91.6	26 57.6 +03.3 91.5	25 57.7 +03.2 91.5
1°	30 00.6 +02.7 90.6	29 00.7 +02.7 90.5	28 00.8 +02.7 90.5	27 00.9 +02.7 90.4	26 00.9 +02.8 90.4
2°	30 03.3 +02.1 89.4	29 03.4 +02.1 89.4	28 03.5 +02.2 89.3	27 03.6 +02.2 89.3	26 03.7 +02.2 89.2
3°	30 05.4 +01.5 88.3	29 05.5 +01.6 88.2	28 05.7 +01.6 88.2	27 05.8 +01.6 88.2	26 05.9 +01.7 88.1
4°	30 06.9 +00.9 87.1	29 07.1 +01.0 87.1	28 07.3 +01.0 87.1	27 07.4 +01.1 87.0	26 07.6 +01.2 87.0
5°	30 07.8 +00.3 86.0	29 08.1 +00.4 85.9	28 08.3 +00.5 85.9	27 08.5 +00.6 85.9	26 08.8 +00.7 85.9
6°	30 08.1 -00.3 84.8	29 08.5 -00.2 84.8	28 08.8 -00.1 84.8	27 09.1 +00.1 84.8	26 09.5 +00.1 84.8
7°	30 07.8 -00.9 83.6	29 08.3 -00.8 83.7	28 08.7 -00.6 83.7	27 09.2 -00.5 83.7	26 09.6 -00.3 83.7
8°	30 06.9 -01.5 82.5	29 07.5 -01.4 82.5	28 08.1 -01.2 82.5	27 08.7 -01.0 82.5	26 09.3 -00.9 82.6
9°	30 05.4 -02.2 81.3	29 06.1 -01.9 81.4	28 06.9 -01.8 81.4	27 07.7 -01.6 81.4	26 08.4 -01.4 81.4
10°	30 03.2 -02.7 80.2	29 04.2 -02.5 80.2	28 05.1 -02.3 80.3	27 06.1 -02.1 80.3	26 07.0 -01.9 80.3
11°	30 00.5 -03.3 79.0	29 01.7 -03.1 79.1	28 02.8 -02.8 79.1	27 04.0 -02.6 79.2	26 05.1 -02.4 79.2
12°	29 57.2 -04.0 77.9	28 58.6 -03.7 77.9	28 00.0 -03.5 78.0	27 01.4 -03.2 78.1	26 02.7 -02.9 78.1
13°	29 53.2 -04.5 76.7	28 54.9 -04.3 76.8	27 56.5 -03.9 76.9	26 58.2 -03.7 76.9	25 59.8 -03.4 77.0
14°	29 48.7 -05.2 75.6	28 50.6 -04.8 75.7	27 52.6 -04.6 75.7	26 54.5 -04.2 75.8	25 56.4 -03.9 75.9
15°	29 43.5 -05.7 74.4	28 45.8 -05.4 74.5	27 48.0 -05.0 74.6	26 50.3 -04.8 74.7	25 52.5 -04.5 74.8
16°	29 37.8 -06.3 73.3	28 40.4 -06.0 73.4	27 43.0 -05.6 73.5	26 45.5 -05.3 73.6	25 48.0 -04.9 73.7
17°	29 31.5 -06.9 72.1	28 34.4 -06.5 72.3	27 37.4 -06.2 72.4	26 40.2 -05.8 72.5	25 43.1 -05.5 72.6
18°	29 24.6 -07.5 71.0	28 27.9 -07.1 71.1	27 31.2 -06.7 71.2	26 34.4 -06.3 71.4	25 37.6 -05.9 71.5
19°	29 17.1 -08.1 69.9	28 20.8 -07.6 70.0	27 24.5 -07.3 70.1	26 28.1 -06.8 70.2	25 31.7 -06.4 70.4
20°	29 09.0 -08.6 68.7	28 13.2 -08.2 68.9	27 17.2 -07.7 69.0	26 21.3 -07.4 69.1	25 25.3 -07.0 69.2
21°	29 00.4 -09.2 67.6	28 05.0 -08.8 67.7	27 09.5 -08.3 67.9	26 13.9 -07.8 68.0	25 18.3 -07.4 68.2
22°	28 51.2 -09.8 66.5	27 56.2 -09.3 66.6	27 01.2 -08.8 66.8	26 06.1 -08.4 66.9	25 10.9 -07.9 67.1
23°	28 41.4 -10.3 65.3	27 46.9 -09.8 65.5	26 52.4 -09.4 65.7	25 57.7 -08.8 65.8	25 03.0 -08.3 66.0
24°	28 31.1 -10.9 64.2	27 37.1 -10.4 64.4	26 43.0 -09.8 64.6	25 48.9 -09.4 64.7	24 54.7 -08.9 64.9
25°	28 20.2 -11.4 63.1	27 26.7 -10.9 63.3	26 33.2 -10.4 63.5	25 39.5 -09.8 63.6	24 45.8 -09.3 63.8
26°	28 08.8 -12.0 62.0	27 15.8 -11.4 62.2	26 22.8 -10.9 62.4	25 29.7 -10.3 62.5	24 36.5 -09.8 62.7
27°	27 56.8 -12.5 60.9	27 04.4 -11.9 61.1	26 11.9 -11.3 61.3	25 19.4 -10.9 61.4	24 26.7 -10.3 61.6
28°	27 44.3 -13.0 59.8	26 52.5 -12.4 60.0	26 00.6 -11.9 60.2	25 08.5 -11.2 60.3	24 16.4 -10.7 60.5
29°	27 31.3 -13.5 58.7	26 40.1 -13.0 58.9	25 48.7 -12.3 59.1	24 57.3 -11.8 59.3	24 05.7 -11.1 59.4

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 57.8 +03.2 91.4	23 57.9 +03.2 91.3	22 58.0 +03.2 91.3	21 58.1 +03.2 91.2	20 58.2 +03.2 91.2
1°	25 01.0 +02.8 90.3	24 01.1 +02.7 90.2	23 01.2 +02.7 90.2	22 01.3 +02.7 90.1	21 01.4 +02.7 90.1
2°	25 03.8 +02.2 89.2	24 03.8 +02.3 89.1	23 03.9 +02.3 89.1	22 04.0 +02.4 89.1	21 04.1 +02.4 89.0
3°	25 06.0 +01.8 88.1	24 06.1 +01.8 88.1	23 06.2 +01.9 88.0	22 06.4 +01.9 88.0	21 06.5 +01.9 87.9
4°	25 07.8 +01.2 87.0	24 07.9 +01.4 87.0	23 08.1 +01.4 86.9	22 08.3 +01.4 86.9	21 08.4 +01.6 86.9
5°	25 09.0 +00.8 85.9	24 09.3 +00.8 85.9	23 09.5 +01.0 85.8	22 09.7 +01.1 85.8	21 10.0 +01.1 85.8
6°	25 09.8 +00.3 84.8	24 10.1 +00.4 84.8	23 10.5 +00.5 84.8	22 10.8 +00.6 84.7	21 11.1 +00.8 84.7
7°	25 10.1 -00.2 83.7	24 10.5 -00.1 83.7	23 11.0 +00.0 83.7	22 11.4 +00.2 83.7	21 11.9 +00.3 83.7
8°	25 09.9 -00.7 82.6	24 10.4 -00.5 82.6	23 11.0 -00.4 82.6	22 11.6 -00.2 82.6	21 12.2 -00.1 82.6
9°	25 09.2 -01.2 81.5	24 09.9 -01.0 81.5	23 10.6 -00.8 81.5	22 11.4 -00.7 81.5	21 12.1 -00.5 81.5
10°	25 08.0 -01.7 80.4	24 08.9 -01.5 80.4	23 09.8 -01.3 80.4	22 10.7 -01.1 80.4	21 11.6 -00.8 80.4
11°	25 06.3 -02.2 79.3	24 07.4 -01.9 79.3	23 08.5 -01.7 79.3	22 09.6 -01.5 79.3	21 10.8 -01.3 79.4
12°	25 04.1 -02.7 78.2	24 05.5 -02.5 78.2	23 06.8 -02.2 78.2	22 08.1 -01.9 78.3	21 09.5 -01.7 78.3
13°	25 01.4 -03.1 77.0	24 03.0 -02.9 77.1	23 04.6 -02.6 77.1	22 06.2 -02.4 77.2	21 07.8 -02.1 77.2
14°	24 58.3 -03.7 75.9	24 00.1 -03.3 76.0	23 02.0 -03.1 76.1	22 03.8 -02.7 76.1	21 05.7 -02.5 76.1
15°	24 54.6 -04.1 74.8	23 56.8 -03.8 74.9	22 58.9 -03.5 75.0	22 01.1 -03.2 75.0	21 03.2 -02.9 75.1
16°	24 50.5 -04.6 73.7	23 53.0 -04.3 73.8	22 55.4 -03.9 73.9	21 57.9 -03.7 73.9	21 00.3 -03.3 74.0
17°	24 45.9 -05.1 72.6	23 48.7 -04.7 72.7	22 51.5 -04.4 72.8	21 54.2 -04.0 72.9	20 57.0 -03.8 72.9
18°	24 40.8 -05.5 71.6	23 44.0 -05.2 71.6	22 47.1 -04.8 71.7	21 50.2 -04.5 71.8	20 53.2 -04.1 71.9
19°	24 35.3 -06.1 70.5	23 38.8 -05.7 70.6	22 42.3 -05.3 70.6	21 45.7 -04.9 70.7	20 49.1 -04.5 70.8
20°	24 29.2 -06.5 69.4	23 33.1 -06.1 69.5	22 37.0 -05.7 69.6	21 40.8 -05.3 69.7	20 44.6 -04.9 69.7
21°	24 22.7 -07.0 68.3	23 27.0 -06.5 68.4	22 31.3 -06.1 68.5	21 35.5 -05.7 68.6	20 39.7 -05.2 68.7
22°	24 15.7 -07.4 67.2	23 20.5 -07.0 67.3	22 25.2 -06.6 67.4	21 29.8 -06.1 67.5	20 34.5 -05.7 67.6
23°	24 08.3 -07.9 66.1	23 13.5 -07.5 66.2	22 18.6 -06.9 66.3	21 23.7 -06.5 66.4	20 28.8 -06.1 66.5
24°	24 00.4 -08.4 65.0	23 06.0 -07.8 65.1	22 11.7 -07.4 65.3	21 17.2 -06.9 65.4	20 22.7 -06.4 65.5
25°	23 52.0 -08.8 63.9	22 58.2 -08.3 64.1	22 04.3 -07.9 64.2	21 10.3 -07.3 64.3	20 16.3 -06.9 64.4
26°	23 43.2 -09.3 62.8	22 49.9 -08.8 63.0	21 56.4 -08.2 63.1	21 03.0 -07.7 63.2	20 09.4 -07.2 63.4
27°	23 33.9 -09.7 61.8	22 41.1 -09.2 61.9	21 48.2 -08.6 62.1	20 55.3 -08.2 62.2	20 02.2 -07.6 62.3
28°	23 24.2 -10.1 60.7	22 31.9 -09.6 60.8	21 39.6 -09.1 61.0	20 47.1 -08.5 61.1	19 54.6 -07.9 61.2
29°	23 14.1 -10.6 59.6	22 22.3 -10.0 59.8	21 30.5 -09.4 59.9	20 38.6 -08.8 60.1	19 46.7 -08.3 60.2

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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 58.3 +03.1 91.1	18 58.4 +03.1 91.0	17 58.5 +03.1 91.0	16 58.6 +03.1 90.9	15 58.6 +03.2 90.9
1°	20 01.4 +02.8 90.0	19 01.5 +02.8 90.0	18 01.6 +02.8 89.9	17 01.7 +02.8 89.9	16 01.8 +02.8 89.8
2°	20 04.2 +02.4 89.0	19 04.3 +02.4 88.9	18 04.4 +02.4 88.9	17 04.5 +02.5 88.8	16 04.6 +02.5 88.8
3°	20 06.6 +02.0 87.9	19 06.7 +02.1 87.9	18 06.8 +02.2 87.8	17 07.0 +02.1 87.8	16 07.1 +02.2 87.7
4°	20 08.6 +01.6 86.8	19 08.8 +01.7 86.8	18 09.0 +01.7 86.8	17 09.1 +01.9 86.7	16 09.3 +01.9 86.7
5°	20 10.2 +01.3 85.8	19 10.5 +01.3 85.7	18 10.7 +01.4 85.7	17 11.0 +01.5 85.7	16 11.2 +01.6 85.7
6°	20 11.5 +00.8 84.7	19 11.8 +01.0 84.7	18 12.1 +01.1 84.7	17 12.5 +01.2 84.6	16 12.8 +01.3 84.6
7°	20 12.3 +00.5 83.6	19 12.8 +00.6 83.6	18 13.2 +00.8 83.6	17 13.7 +00.8 83.6	16 14.1 +01.0 83.6
8°	20 12.8 +00.1 82.6	19 13.4 +00.2 82.6	18 14.0 +00.3 82.6	17 14.5 +00.6 82.6	16 15.1 +00.7 82.5
9°	20 12.9 -00.3 81.5	19 13.6 -00.1 81.5	18 14.3 +00.1 81.5	17 15.1 +00.2 81.5	16 15.8 +00.4 81.5
10°	20 12.6 -00.7 80.4	19 13.5 -00.5 80.5	18 14.4 -00.3 80.5	17 15.3 -00.1 80.5	16 16.2 +00.1 80.5
11°	20 11.9 -01.1 79.4	19 13.0 -00.9 79.4	18 14.1 -00.7 79.4	17 15.2 -00.5 79.4	16 16.3 -00.2 79.4
12°	20 10.8 -01.5 78.3	19 12.1 -01.2 78.3	18 13.4 -01.0 78.3	17 14.7 -00.7 78.4	16 16.1 -00.6 78.4
13°	20 09.3 -01.8 77.2	19 10.9 -01.6 77.3	18 12.4 -01.3 77.3	17 14.0 -01.1 77.3	16 15.5 -00.8 77.3
14°	20 07.5 -02.2 76.2	19 09.3 -01.9 76.2	18 11.1 -01.7 76.2	17 12.9 -01.4 76.3	16 14.7 -01.1 76.3
15°	20 05.3 -02.6 75.1	19 07.4 -02.4 75.2	18 09.4 -02.0 75.2	17 11.5 -01.7 75.2	16 13.6 -01.5 75.2
16°	20 02.7 -03.0 74.1	19 05.0 -02.6 74.1	18 07.4 -02.4 74.1	17 09.8 -02.1 74.2	16 12.1 -01.7 74.2
17°	19 59.7 -03.4 73.0	19 02.4 -03.1 73.0	18 05.0 -02.7 73.1	17 07.7 -02.4 73.1	16 10.4 -02.1 73.2
18°	19 56.3 -03.8 71.9	18 59.3 -03.4 72.0	18 02.3 -03.0 72.0	17 05.3 -02.7 72.1	16 08.3 -02.3 72.1
19°	19 52.5 -04.1 70.9	18 55.9 -03.7 70.9	17 59.3 -03.4 71.0	17 02.6 -03.0 71.0	16 06.0 -02.7 71.1
20°	19 48.4 -04.5 69.8	18 52.2 -04.1 69.9	17 55.9 -03.7 69.9	16 59.6 -03.3 70.0	16 03.3 -03.0 70.0
21°	19 43.9 -04.9 68.7	18 48.1 -04.5 68.8	17 52.2 -04.1 68.9	16 56.3 -03.7 69.0	16 00.3 -03.2 69.0
22°	19 39.0 -05.2 67.7	18 43.6 -04.8 67.8	17 48.1 -04.4 67.8	16 52.6 -04.0 67.9	15 57.1 -03.6 68.0
23°	19 33.8 -05.6 66.6	18 38.8 -05.2 66.7	17 43.7 -04.7 66.8	16 48.6 -04.2 66.9	15 53.5 -03.8 66.9
24°	19 28.2 -06.0 65.6	18 33.6 -05.5 65.7	17 39.0 -05.1 65.7	16 44.4 -04.6 65.8	15 49.7 -04.2 65.9
25°	19 22.2 -06.3 64.5	18 28.1 -05.9 64.6	17 33.9 -05.3 64.7	16 39.8 -05.0 64.8	15 45.5 -04.4 64.9
26°	19 15.9 -06.7 63.5	18 22.2 -06.2 63.6	17 28.6 -05.8 63.7	16 34.8 -05.2 63.7	15 41.1 -04.7 63.8
27°	19 09.2 -07.1 62.4	18 16.0 -06.5 62.5	17 22.8 -06.0 62.6	16 29.6 -05.5 62.7	15 36.4 -05.1 62.8
28°	19 02.1 -07.4 61.4	18 09.5 -06.9 61.5	17 16.8 -06.4 61.6	16 24.1 -05.8 61.7	15 31.3 -05.3 61.7
29°	18 54.7 -07.8 60.3	18 02.6 -07.2 60.4	17 10.4 -06.6 60.5	16 18.3 -06.2 60.6	15 26.0 -05.6 60.7

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 58.7 +03.1 90.8	13 58.8 +03.1 90.7	12 58.9 +03.1 90.7	11 59.0 +03.1 90.6	10 59.1 +03.1 90.6
1°	15 01.8 +02.9 89.8	14 01.9 +02.9 89.7	13 02.0 +02.9 89.7	12 02.1 +02.9 89.6	11 02.2 +02.9 89.6
2°	15 04.7 +02.5 88.7	14 04.8 +02.6 88.7	13 04.9 +02.6 88.6	12 05.0 +02.6 88.6	11 05.1 +02.7 88.5
3°	15 07.2 +02.3 87.7	14 07.4 +02.3 87.7	13 07.5 +02.4 87.6	12 07.6 +02.5 87.6	11 07.8 +02.4 87.5
4°	15 09.5 +02.0 86.7	14 09.7 +02.0 86.6	13 09.9 +02.1 86.6	12 10.1 +02.2 86.6	11 10.2 +02.3 86.5
5°	15 11.5 +01.7 85.6	14 11.7 +01.8 85.6	13 12.0 +01.9 85.6	12 12.3 +01.9 85.5	11 12.5 +02.1 85.5
6°	15 13.2 +01.4 84.6	14 13.5 +01.6 84.6	13 13.9 +01.6 84.5	12 14.2 +01.8 84.5	11 14.6 +01.9 84.5
7°	15 14.6 +01.1 83.6	14 15.1 +01.2 83.5	13 15.5 +01.4 83.5	12 16.0 +01.5 83.5	11 16.5 +01.6 83.5
8°	15 15.7 +00.9 82.5	14 16.3 +01.0 82.5	13 16.9 +01.2 82.5	12 17.5 +01.3 82.5	11 18.1 +01.5 82.4
9°	15 16.6 +00.5 81.5	14 17.3 +00.7 81.5	13 18.1 +00.8 81.5	12 18.8 +01.1 81.4	11 19.6 +01.2 81.4
10°	15 17.1 +00.3 80.4	14 18.0 +00.5 80.4	13 18.9 +00.7 80.4	12 19.9 +00.8 80.4	11 20.8 +01.0 80.4
11°	15 17.4 +00.0 79.4	14 18.5 +00.2 79.4	13 19.6 +00.4 79.4	12 20.7 +00.6 79.4	11 21.8 +00.8 79.4
12°	15 17.4 -00.3 78.4	14 18.7 -00.1 78.4	13 20.0 +00.1 78.4	12 21.3 +00.4 78.4	11 22.6 +00.6 78.4
13°	15 17.1 -00.6 77.3	14 18.6 -00.3 77.3	13 20.1 +00.0 77.3	12 21.7 +00.1 77.3	11 23.2 +00.4 77.3
14°	15 16.5 -00.9 76.3	14 18.3 -00.6 76.3	13 20.1 -00.4 76.3	12 21.8 +00.0 76.3	11 23.6 +00.2 76.3
15°	15 15.6 -01.1 75.3	14 17.7 -00.9 75.3	13 19.7 -00.6 75.3	12 21.8 -00.4 75.3	11 23.8 +00.0 75.3
16°	15 14.5 -01.5 74.2	14 16.8 -01.2 74.2	13 19.1 -00.8 74.3	12 21.4 -00.5 74.3	11 23.8 -00.3 74.3
17°	15 13.0 -01.7 73.2	14 15.6 -01.4 73.2	13 18.3 -01.1 73.2	12 20.9 -00.8 73.2	11 23.5 -00.4 73.3
18°	15 11.3 -02.0 72.2	14 14.2 -01.6 72.2	13 17.2 -01.3 72.2	12 20.1 -01.0 72.2	11 23.1 -00.7 72.2
19°	15 09.3 -02.3 71.1	14 12.6 -02.0 71.2	13 15.9 -01.6 71.2	12 19.1 -01.2 71.2	11 22.4 -00.9 71.2
20°	15 07.0 -02.6 70.1	14 10.6 -02.2 70.1	13 14.3 -01.9 70.2	12 17.9 -01.4 70.2	11 21.5 -01.0 70.2
21°	15 04.4 -02.9 69.1	14 08.4 -02.4 69.1	13 12.4 -02.0 69.1	12 16.5 -01.7 69.2	11 20.5 -01.3 69.2
22°	15 01.5 -03.1 68.0	14 06.0 -02.8 68.1	13 10.4 -02.3 68.1	12 14.8 -01.9 68.1	11 19.2 -01.5 68.2
23°	14 58.4 -03.4 67.0	14 03.2 -03.0 67.0	13 08.1 -02.6 67.1	12 12.9 -02.2 67.1	11 17.7 -01.8 67.1
24°	14 55.0 -03.7 65.9	14 00.2 -03.2 66.0	13 05.5 -02.8 66.0	12 10.7 -02.3 66.1	11 15.9 -01.9 66.1
25°	14 51.3 -04.0 64.9	13 57.0 -03.5 65.0	13 02.7 -03.1 65.0	12 08.4 -02.6 65.1	11 14.0 -02.1 65.1
26°	14 47.3 -04.2 63.9	13 53.5 -03.8 63.9	12 59.6 -03.2 64.0	12 05.8 -02.8 64.0	11 11.9 -02.3 64.1
27°	14 43.1 -04.6 62.9	13 49.7 -04.0 62.9	12 56.4 -03.6 63.0	12 03.0 -03.1 63.0	11 09.6 -02.6 63.1
28°	14 38.5 -04.8 61.8	13 45.7 -04.3 61.9	12 52.8 -03.7 61.9	11 59.9 -03.2 62.0	11 07.0 -02.7 62.0
29°	14 33.7 -05.0 60.8	13 41.4 -04.5 60.9	12 49.1 -04.0 60.9	11 56.7 -03.5 61.0	11 04.3 -03.0 61.0

Declination SAME name as Latitude

Latitude 3°

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 59.2 +03.1 90.5	8 59.3 +03.1 90.5	7 59.3 +03.1 90.4	6 59.4 +03.1 90.4	5 59.5 +03.1 90.3
1°	10 02.3 +02.9 89.5	9 02.4 +02.9 89.5	8 02.4 +03.0 89.4	7 02.5 +03.0 89.4	6 02.6 +03.0 89.3
2°	10 05.2 +02.7 88.5	9 05.3 +02.7 88.5	8 05.4 +02.8 88.4	7 05.5 +02.8 88.4	6 05.6 +02.9 88.3
3°	10 07.9 +02.5 87.5	9 08.0 +02.6 87.4	8 08.2 +02.6 87.4	7 08.3 +02.7 87.3	6 08.5 +02.7 87.3
4°	10 10.4 +02.4 86.5	9 10.6 +02.5 86.4	8 10.8 +02.5 86.4	7 11.0 +02.6 86.3	6 11.2 +02.7 86.3
5°	10 12.8 +02.2 85.5	9 13.1 +02.2 85.4	8 13.3 +02.4 85.4	7 13.6 +02.5 85.3	6 13.9 +02.5 85.3
6°	10 15.0 +01.9 84.4	9 15.3 +02.1 84.4	8 15.7 +02.2 84.4	7 16.1 +02.3 84.3	6 16.4 +02.5 84.3
7°	10 16.9 +01.8 83.4	9 17.4 +01.9 83.4	8 17.9 +02.0 83.4	7 18.4 +02.2 83.3	6 18.9 +02.3 83.3
8°	10 18.7 +01.6 82.4	9 19.3 +01.8 82.4	8 19.9 +01.9 82.3	7 20.6 +02.0 82.3	6 21.2 +02.2 82.3
9°	10 20.3 +01.4 81.4	9 21.1 +01.5 81.4	8 21.8 +01.8 81.3	7 22.6 +01.9 81.3	6 23.4 +02.0 81.3
10°	10 21.7 +01.2 80.4	9 22.6 +01.4 80.4	8 23.6 +01.6 80.3	7 24.5 +01.8 80.3	6 25.4 +02.0 80.3
11°	10 22.9 +01.0 79.4	9 24.0 +01.3 79.3	8 25.2 +01.4 79.3	7 26.3 +01.6 79.3	6 27.4 +01.8 79.3
12°	10 23.9 +00.9 78.3	9 25.3 +01.0 78.3	8 26.6 +01.3 78.3	7 27.9 +01.5 78.3	6 29.2 +01.8 78.3
13°	10 24.8 +00.6 77.3	9 26.3 +00.9 77.3	8 27.9 +01.1 77.3	7 29.4 +01.4 77.3	6 31.0 +01.6 77.2
14°	10 25.4 +00.4 76.3	9 27.2 +00.7 76.3	8 29.0 +00.9 76.3	7 30.8 +01.2 76.3	6 32.6 +01.5 76.2
15°	10 25.8 +00.3 75.3	9 27.9 +00.5 75.3	8 29.9 +00.8 75.3	7 32.0 +01.1 75.3	6 34.1 +01.3 75.2
16°	10 26.1 +00.1 74.3	9 28.4 +00.4 74.3	8 30.7 +00.7 74.3	7 33.1 +00.9 74.2	6 35.4 +01.3 74.2
17°	10 26.2 -00.2 73.3	9 28.8 +00.2 73.3	8 31.4 +00.5 73.3	7 34.0 +00.8 73.2	6 36.7 +01.1 73.2
18°	10 26.0 -00.3 72.2	9 29.0 +00.0 72.2	8 31.9 +00.3 72.2	7 34.8 +00.7 72.2	6 37.8 +01.0 72.2
19°	10 25.7 -00.5 71.2	9 29.0 -00.2 71.2	8 32.2 +00.2 71.2	7 35.5 +00.5 71.2	6 38.8 +00.8 71.2
20°	10 25.2 -00.7 70.2	9 28.8 -00.4 70.2	8 32.4 +00.0 70.2	7 36.0 +00.4 70.2	6 39.6 +00.8 70.2
21°	10 24.5 -01.0 69.2	9 28.4 -00.5 69.2	8 32.4 -00.1 69.2	7 36.4 +00.3 69.2	6 40.4 +00.6 69.2
22°	10 23.5 -01.1 68.2	9 27.9 -00.7 68.2	8 32.3 -00.3 68.2	7 36.7 +00.1 68.2	6 41.0 +00.5 68.2
23°	10 22.4 -01.2 67.2	9 27.2 -00.8 67.2	8 32.0 -00.5 67.2	7 36.8 -00.1 67.2	6 41.5 +00.4 67.2
24°	10 21.2 -01.5 66.1	9 26.4 -01.1 66.2	8 31.5 -00.6 66.2	7 36.7 -00.1 66.2	6 41.9 +00.3 66.2
25°	10 19.7 -01.7 65.1	9 25.3 -01.2 65.1	8 30.9 -00.7 65.2	7 36.6 -00.4 65.2	6 42.2 +00.1 65.2
26°	10 18.0 -01.9 64.1	9 24.1 -01.4 64.1	8 30.2 -00.9 64.2	7 36.2 -00.4 64.2	6 42.3 +00.0 64.2
27°	10 16.1 -02.0 63.1	9 22.7 -01.6 63.1	8 29.3 -01.1 63.1	7 35.8 -00.6 63.2	6 42.3 -00.1 63.2
28°	10 14.1 -02.3 62.1	9 21.1 -01.7 62.1	8 28.2 -01.3 62.1	7 35.2 -00.7 62.1	6 42.2 -00.2 62.1
29°	10 11.8 -02.4 61.1	9 19.4 -01.9 61.1	8 26.9 -01.3 61.1	7 34.5 -00.9 61.1	6 42.0 -00.4 61.1

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 59.6 +03.1 90.3	3 59.7 +03.1 90.2	2 59.8 +03.1 90.2	1 59.8 +03.2 90.1	0 59.9 +03.1 90.1
1°	5 02.7 +03.0 89.3	4 02.8 +03.0 89.2	3 02.9 +03.0 89.2	2 03.0 +03.0 89.1	1 03.0 +03.2 89.1
2°	5 05.7 +02.9 88.3	4 05.8 +03.0 88.2	3 05.9 +03.0 88.2	2 06.0 +03.1 88.1	1 06.2 +03.1 88.1
3°	5 08.6 +02.9 87.3	4 08.8 +02.9 87.2	3 08.9 +03.0 87.2	2 09.1 +03.0 87.1	1 09.3 +03.0 87.1
4°	5 11.5 +02.7 86.3	4 11.7 +02.8 86.2	3 11.9 +02.9 86.2	2 12.1 +03.0 86.1	1 12.3 +03.1 86.1
5°	5 14.2 +02.6 85.2	4 14.5 +02.7 85.2	3 14.8 +02.8 85.2	2 15.1 +02.9 85.1	1 15.4 +03.0 85.1
6°	5 16.8 +02.6 84.2	4 17.2 +02.7 84.2	3 17.6 +02.8 84.2	2 18.0 +02.9 84.1	1 18.4 +03.0 84.1
7°	5 19.4 +02.4 83.2	4 19.9 +02.5 83.2	3 20.4 +02.7 83.2	2 20.9 +02.8 83.1	1 21.4 +03.0 83.1
8°	5 21.8 +02.4 82.2	4 22.4 +02.5 82.2	3 23.1 +02.6 82.2	2 23.7 +02.8 82.1	1 24.4 +02.9 82.1
9°	5 24.2 +02.2 81.2	4 24.9 +02.5 81.2	3 25.7 +02.6 81.2	2 26.5 +02.8 81.1	1 27.3 +03.0 81.1
10°	5 26.4 +02.1 80.2	4 27.4 +02.3 80.2	3 28.3 +02.5 80.2	2 29.3 +02.7 80.1	1 30.3 +02.9 80.1
11°	5 28.5 +02.1 79.2	4 29.7 +02.2 79.2	3 30.8 +02.5 79.2	2 32.0 +02.7 79.1	1 33.2 +02.8 79.1
12°	5 30.6 +01.9 78.2	4 31.9 +02.2 78.2	3 33.3 +02.4 78.2	2 34.7 +02.6 78.1	1 36.0 +02.9 78.1
13°	5 32.5 +01.9 77.2	4 34.1 +02.1 77.2	3 35.7 +02.3 77.1	2 37.3 +02.5 77.1	1 38.9 +02.8 77.1
14°	5 34.4 +01.7 76.2	4 36.2 +02.0 76.2	3 38.0 +02.3 76.1	2 39.8 +02.6 76.1	1 41.7 +02.8 76.1
15°	5 36.1 +01.7 75.2	4 38.2 +01.9 75.2	3 40.3 +02.2 75.1	2 42.4 +02.4 75.1	1 44.5 +02.7 75.1
16°	5 37.8 +01.5 74.2	4 40.1 +01.8 74.2	3 42.5 +02.1 74.1	2 44.8 +02.4 74.1	1 47.2 +02.7 74.1
17°	5 39.3 +01.4 73.2	4 41.9 +01.8 73.2	3 44.6 +02.0 73.1	2 47.2 +02.4 73.1	1 49.9 +02.7 73.1
18°	5 40.7 +01.3 72.2	4 43.7 +01.6 72.2	3 46.6 +02.0 72.1	2 49.6 +02.3 72.1	1 52.6 +02.6 72.1
19°	5 42.0 +01.3 71.2	4 45.3 +01.6 71.2	3 48.6 +01.9 71.1	2 51.9 +02.3 71.1	1 55.2 +02.7 71.1
20°	5 43.3 +01.1 70.2	4 46.9 +01.5 70.2	3 50.5 +01.9 70.1	2 54.2 +02.2 70.1	1 57.9 +02.5 70.1
21°	5 44.4 +01.0 69.2	4 48.4 +01.4 69.2	3 52.4 +01.8 69.1	2 56.4 +02.2 69.1	2 00.4 +02.6 69.1
22°	5 45.4 +00.9 68.2	4 49.8 +01.3 68.2	3 54.2 +01.7 68.1	2 58.6 +02.1 68.1	2 03.0 +02.5 68.1
23°	5 46.3 +00.8 67.2	4 51.1 +01.2 67.2	3 55.9 +01.6 67.1	3 00.7 +02.0 67.1	2 05.5 +02.4 67.1
24°	5 47.1 +00.7 66.2	4 52.3 +01.1 66.2	3 57.5 +01.6 66.1	3 02.7 +02.0 66.1	2 07.9 +02.5 66.1
25°	5 47.8 +00.6 65.2	4 53.4 +01.1 65.1	3 59.1 +01.5 65.1	3 04.7 +01.9 65.1	2 10.4 +02.4 65.1
26°	5 48.4 +00.5 64.2	4 54.5 +00.9 64.1	4 00.6 +01.4 64.1	3 06.6 +01.9 64.1	2 12.8 +02.3 64.1
27°	5 48.9 +00.4 63.2	4 55.4 +00.9 63.1	4 02.0 +01.3 63.1	3 08.5 +01.9 63.1	2 15.1 +02.3 63.1
28°	5 49.3 +00.2 62.1	4 56.3 +00.7 62.1	4 03.3 +01.3 62.1	3 10.4 +01.7 62.1	2 17.4 +02.3 62.1
29°	5 49.5 +00.2 61.1	4 57.0 +00.7 61.1	4 04.6 +01.2 61.1	3 12.1 +01.7 61.1	2 19.7 +02.2 61.1

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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 +03.1 90.0	-0 59.9 +03.1	-1 59.8 +03.1		
1°	0 03.1 +03.2 89.0	-0 56.8 +03.2	-1 56.7 +03.2		
2°	0 06.3 +03.1 88.0	-0 53.6 +03.2	-1 53.5 +03.3		
3°	0 09.4 +03.2 87.0	-0 50.4 +03.2	-1 50.2 +03.2		
4°	0 12.6 +03.1 86.0	-0 47.2 +03.2	-1 47.0 +03.3		
5°	0 15.7 +03.1 85.0	-0 44.0 +03.2	-1 43.7 +03.3		
6°	0 18.8 +03.1 84.0	-0 40.8 +03.3	-1 40.4 +03.4		
7°	0 21.9 +03.1 83.0	-0 37.5 +03.2	-1 37.0 +03.4		
8°	0 25.0 +03.1 82.0	-0 34.3 +03.3	-1 33.6 +03.4		
9°	0 28.1 +03.1 81.0	-0 31.0 +03.2	-1 30.2 +03.4		
10°	0 31.2 +03.1 80.0	-0 27.8 +03.3	-1 26.8 +03.5		
11°	0 34.3 +03.1 79.0	-0 24.5 +03.3	-1 23.3 +03.5		
12°	0 37.4 +03.1 78.0	-0 21.2 +03.3	-1 19.8 +03.5		
13°	0 40.5 +03.0 77.0	-0 17.9 +03.3	-1 16.3 +03.6		
14°	0 43.5 +03.1 76.0	-0 14.6 +03.3	-1 12.7 +03.5		
15°	0 46.6 +03.0 75.0	-0 11.3 +03.3	-1 09.2 +03.6		
16°	0 49.6 +03.0 74.0	-0 08.0 +03.3	-1 05.6 +03.6		
17°	0 52.6 +03.0 73.0	-0 04.7 +03.3	-1 02.0 +03.6		
18°	0 55.6 +03.0 72.0	-0 01.4 +03.3	-0 58.4 +03.7		
19°	0 58.6 +02.9 71.0	0 01.9 +03.3 71.0	-0 54.7 +03.6		
20°	1 01.5 +03.0 70.0	0 05.2 +03.3 70.0	-0 51.1 +03.7		
21°	1 04.5 +02.9 69.0	0 08.5 +03.3 69.0	-0 47.4 +03.7		
22°	1 07.4 +02.9 68.0	0 11.8 +03.3 68.0	-0 43.7 +03.7		
23°	1 10.3 +02.9 67.0	0 15.1 +03.3 67.0	-0 40.0 +03.7		
24°	1 13.2 +02.8 66.0	0 18.4 +03.3 66.0	-0 36.3 +03.8		
25°	1 16.0 +02.9 65.0	0 21.7 +03.3 65.0	-0 32.5 +03.7		
26°	1 18.9 +02.8 64.0	0 25.0 +03.3 64.0	-0 28.8 +03.7		
27°	1 21.7 +02.8 63.0	0 28.3 +03.3 63.0	-0 25.1 +03.8		
28°	1 24.5 +02.7 62.0	0 31.6 +03.2 62.0	-0 21.3 +03.7		
29°	1 27.2 +02.8 61.0	0 34.8 +03.3 61.0	-0 17.6 +03.8		

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°					
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°					

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°	86 00.0 +60.0 180.0	85 52.6 +57.7 166.0	85 31.7 +52.0 153.4	85 00.1 +45.5 143.1	84 20.7 +39.5 134.9
1°	87 00.0 +60.0 180.0	86 50.3 +55.6 161.6	86 23.7 +46.7 146.3	85 45.6 +38.3 135.0	85 00.2 +31.8 126.8
2°	88 00.0 +60.0 180.0	87 45.9 +49.3 153.4	87 10.4 +35.6 135.0	86 23.9 +26.7 123.6	85 32.0 +21.1 116.5
3°	89 00.0 +60.0 180.0	88 35.2 +24.9 135.0	87 46.0 +14.3 116.5	86 50.6 +09.8 108.4	85 53.1 +07.5 103.9
4°	90 00.0 -60.0 0.0	89 00.1 -24.8 90.0	88 00.3 -14.1 89.9	87 00.4 -09.6 89.9	86 00.6 -07.3 89.9
5°	89 00.0 -60.0 0.0	88 35.3 -49.4 44.9	87 46.2 -35.6 63.3	86 50.8 -26.6 71.4	85 53.3 -20.8 75.8
6°	88 00.0 -60.0 0.0	87 45.9 -55.5 26.4	87 10.6 -46.6 44.8	86 24.2 -38.2 56.1	85 32.5 -31.6 63.2
7°	87 00.0 -60.0 0.0	86 50.4 -57.7 18.3	86 24.0 -52.0 33.5	85 46.0 -45.4 44.7	85 00.9 -39.3 52.8
8°	86 00.0 -60.0 0.0	85 52.7 -58.6 13.9	85 32.0 -54.8 26.3	85 00.6 -49.8 36.6	84 21.6 -44.8 44.7
9°	85 00.0 -60.0 0.0	84 54.1 -59.0 11.2	84 37.2 -56.4 21.6	84 10.8 -52.7 30.6	83 36.8 -48.4 38.3
10°	84 00.0 -60.0 0.0	83 55.1 -59.3 9.3	83 40.8 -57.3 18.2	83 18.1 -54.4 26.2	82 48.4 -51.0 33.3
11°	83 00.0 -60.0 0.0	82 55.8 -59.5 8.0	82 43.5 -58.0 15.7	82 23.7 -55.7 22.8	81 57.4 -52.9 29.3
12°	82 00.0 -60.0 0.0	81 56.3 -59.5 7.0	81 45.5 -58.4 13.8	81 28.0 -56.5 20.2	81 04.5 -54.3 26.1
13°	81 00.0 -60.0 0.0	80 56.8 -59.7 6.2	80 47.1 -58.7 12.3	80 31.5 -57.2 18.0	80 10.2 -55.2 23.5
14°	80 00.0 -60.0 0.0	79 57.1 -59.7 5.6	79 48.4 -58.9 11.0	79 34.3 -57.7 16.3	79 15.0 -56.0 21.3
15°	79 00.0 -60.0 0.0	78 57.4 -59.8 5.0	78 49.5 -59.1 10.0	78 36.6 -58.0 14.8	78 19.0 -56.7 19.4
16°	78 00.0 -60.0 0.0	77 57.6 -59.8 4.6	77 50.4 -59.2 9.2	77 38.6 -58.3 13.6	77 22.3 -57.1 17.9
17°	77 00.0 -60.0 0.0	76 57.8 -59.9 4.2	76 51.2 -59.4 8.4	76 40.3 -58.6 12.5	76 25.2 -57.4 16.5
18°	76 00.0 -60.0 0.0	75 57.9 -59.8 3.9	75 51.8 -59.4 7.8	75 41.7 -58.7 11.6	75 27.8 -57.8 15.3
19°	75 00.0 -60.0 0.0	74 58.1 -59.9 3.6	74 52.4 -59.5 7.3	74 43.0 -58.9 10.8	74 30.0 -58.1 14.3
20°	74 00.0 -60.0 0.0	73 58.2 -59.9 3.4	73 52.9 -59.5 6.8	73 44.1 -59.0 10.1	73 31.9 -58.2 13.4
21°	73 00.0 -60.0 0.0	72 58.3 -59.9 3.2	72 53.4 -59.7 6.4	72 45.1 -59.1 9.5	72 33.7 -58.5 12.6
22°	72 00.0 -60.0 0.0	71 58.4 -59.9 3.0	71 53.7 -59.6 6.0	71 46.0 -59.2 8.9	71 35.2 -58.6 11.8
23°	71 00.0 -60.0 0.0	70 58.5 -59.9 2.8	70 54.1 -59.7 5.6	70 46.8 -59.3 8.4	70 36.6 -58.7 11.2
24°	70 00.0 -60.0 0.0	69 58.6 -59.9 2.7	69 54.4 -59.7 5.3	69 47.5 -59.3 8.0	69 37.9 -58.9 10.5
25°	69 00.0 -60.0 0.0	68 58.7 -60.0 2.5	68 54.7 -59.7 5.0	68 48.2 -59.4 7.5	68 39.0 -58.9 10.0
26°	68 00.0 -60.0 0.0	67 58.7 -59.9 2.4	67 55.0 -59.8 4.8	67 48.8 -59.5 7.2	67 40.1 -59.0 9.5
27°	67 00.0 -60.0 0.0	66 58.8 -59.9 2.3	66 55.2 -59.7 4.5	66 49.3 -59.5 6.8	66 41.1 -59.1 9.0
28°	66 00.0 -60.0 0.0	65 58.9 -60.0 2.2	65 55.5 -59.8 4.3	65 49.8 -59.5 6.5	65 42.0 -59.2 8.6
29°	65 00.0 -60.0 0.0	64 58.9 -59.9 2.1	64 55.7 -59.8 4.1	64 50.3 -59.6 6.2	64 42.8 -59.2 8.2

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°	83 36.0 +34.4 128.6	82 47.6 +30.3 123.6	81 56.6 +26.9 119.6	81 03.7 +24.1 116.4	80 09.5 +21.8 113.8
1°	84 10.4 +26.9 120.9	83 17.9 +23.1 116.4	82 23.5 +20.3 113.0	81 27.8 +18.1 110.4	80 31.3 +16.3 108.2
2°	84 37.3 +17.3 111.7	83 41.0 +14.7 108.3	82 43.8 +12.7 105.8	81 45.9 +11.3 103.8	80 47.6 +10.1 102.3
3°	84 54.6 +06.1 101.2	83 55.7 +05.2 99.3	82 56.5 +04.5 97.9	81 57.2 +04.0 96.9	80 57.7 +03.6 96.1
4°	85 00.7 -05.7 89.8	84 00.9 -04.8 89.8	83 01.0 -04.0 89.8	82 01.2 -03.5 89.7	81 01.3 -03.0 89.7
5°	84 55.0 -17.0 78.5	83 56.1 -14.3 80.3	82 57.0 -12.2 81.6	81 57.7 -10.7 82.6	80 58.3 -09.4 83.3
6°	84 38.0 -26.6 67.9	83 41.8 -22.8 71.3	82 44.8 -19.9 73.7	81 47.0 -17.5 75.6	80 48.9 -15.7 77.1
7°	84 11.4 -34.3 58.7	83 19.0 -30.0 63.1	82 24.9 -26.6 66.4	81 29.5 -23.7 69.0	80 33.2 -21.3 71.1
8°	83 37.1 -39.9 50.9	82 49.0 -35.7 55.9	81 58.3 -32.1 59.8	81 05.8 -29.1 62.9	80 11.9 -26.4 65.5
9°	82 57.2 -44.3 44.6	82 13.3 -40.4 49.7	81 26.2 -36.8 53.9	80 36.7 -33.7 57.4	79 45.5 -30.9 60.3
10°	82 12.9 -47.4 39.3	81 32.9 -43.9 44.5	80 49.4 -40.6 48.8	80 03.0 -37.5 52.5	79 14.6 -34.8 55.6
11°	81 25.5 -49.9 35.0	80 49.0 -46.7 40.0	80 08.8 -43.7 44.3	79 25.5 -40.7 48.1	78 39.8 -38.0 51.4
12°	80 35.6 -51.6 31.4	80 02.3 -48.9 36.2	79 25.1 -46.1 40.5	78 44.8 -43.5 44.2	78 01.8 -40.9 47.5
13°	79 44.0 -53.0 28.5	79 13.4 -50.6 33.0	78 39.0 -48.1 37.1	78 01.3 -45.6 40.8	77 20.9 -43.2 44.1
14°	78 51.0 -54.1 25.9	78 22.8 -52.0 30.2	77 50.9 -49.8 34.2	77 15.7 -47.5 37.8	76 37.7 -45.2 41.0
15°	77 56.9 -54.9 23.8	77 30.8 -53.0 27.8	77 01.1 -51.0 31.6	76 28.2 -49.0 35.1	75 52.5 -47.0 38.3
16°	77 02.0 -55.7 21.9	76 37.8 -54.0 25.8	76 10.1 -52.2 29.3	75 39.2 -50.3 32.7	75 05.5 -48.3 35.8
17°	76 06.3 -56.2 20.3	75 43.8 -54.7 23.9	75 17.9 -53.1 27.3	74 48.9 -51.4 30.5	74 17.2 -49.7 33.5
18°	75 10.1 -56.6 18.9	74 49.1 -55.4 22.3	74 24.8 -53.9 25.6	73 57.5 -52.3 28.6	73 27.5 -50.7 31.5
19°	74 13.5 -57.0 17.6	73 53.7 -55.8 20.9	73 30.9 -54.5 24.0	73 05.2 -53.1 26.9	72 36.8 -51.6 29.7
20°	73 16.5 -57.4 16.5	72 57.9 -56.3 19.6	72 36.4 -55.1 22.5	72 12.1 -53.8 25.3	71 45.2 -52.4 28.0
21°	72 19.1 -57.6 15.5	72 01.6 -56.6 18.4	71 41.3 -55.5 21.2	71 18.3 -54.3 23.9	70 52.8 -53.0 26.5
22°	71 21.5 -57.8 14.6	71 05.0 -57.0 17.4	70 45.8 -56.0 20.1	70 24.0 -54.9 22.6	69 59.8 -53.7 25.1
23°	70 23.7 -58.1 13.8	70 08.0 -57.2 16.4	69 49.8 -56.3 19.0	69 29.1 -55.3 21.4	69 06.1 -54.2 23.8
24°	69 25.6 -58.2 13.1	69 10.8 -57.5 15.6	68 53.5 -56.6 18.0	68 33.8 -55.7 20.4	68 11.9 -54.7 22.6
25°	68 27.4 -58.4 12.4	68 13.3 -57.7 14.8	67 56.9 -56.9 17.1	67 38.1 -56.0 19.4	67 17.2 -55.1 21.5
26°	67 29.0 -58.5 11.8	67 15.6 -57.8 14.1	67 00.0 -57.2 16.3	66 42.1 -56.3 18.4	66 22.1 -55.4 20.5
27°	66 30.5 -58.6 11.2	66 17.8 -58.1 13.4	66 02.8 -57.3 15.5	65 45.8 -56.6 17.6	65 26.7 -55.8 19.6
28°	65 31.9 -58.7 10.7	65 19.7 -58.1 12.8	65 05.5 -57.6 14.8	64 49.2 -56.8 16.8	64 30.9 -56.0 18.7
29°	64 33.2 -58.8 10.2	64 21.6 -58.3 12.2	64 07.9 -57.7 14.1	63 52.4 -57.1 16.0	63 34.9 -56.3 17.9

Latitude 4°

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°	79 14.2 +20.0 111.6	78 18.2 +18.4 109.7	77 21.6 +17.0 108.2	76 24.5 +15.8 106.8	75 27.0 +14.8 105.6
1°	79 34.2 +14.8 106.5	78 36.6 +13.5 105.0	77 38.6 +12.5 103.7	76 40.3 +11.6 102.7	75 41.8 +10.9 101.7
2°	79 49.0 +09.1 101.0	78 50.1 +08.4 100.0	77 51.1 +07.8 99.1	76 51.9 +07.3 98.4	75 52.7 +06.7 97.7
3°	79 58.1 +03.4 95.4	78 58.5 +03.1 94.9	77 58.9 +02.9 94.4	76 59.2 +02.7 94.0	75 59.4 +02.7 93.6
4°	80 01.5 -02.6 89.7	79 01.6 -02.3 89.6	78 01.8 -02.1 89.6	77 01.9 -01.8 89.5	76 02.1 -01.6 89.5
5°	79 58.9 -08.5 83.9	78 59.3 -07.6 84.4	77 59.7 -06.9 84.8	77 00.1 -06.3 85.1	76 00.5 -05.8 85.4
6°	79 50.4 -14.1 78.2	78 51.7 -12.8 79.2	77 52.8 -11.7 80.0	76 53.8 -10.7 80.7	75 54.7 -09.9 81.3
7°	79 36.3 -19.3 72.8	78 38.9 -17.6 74.2	77 41.1 -16.1 75.4	76 43.1 -14.9 76.4	75 44.8 -13.8 77.2
8°	79 17.0 -24.2 67.6	78 21.3 -22.2 69.4	77 25.0 -20.5 70.9	76 28.2 -19.0 72.2	75 31.0 -17.6 73.3
9°	78 52.8 -28.4 62.8	77 59.1 -26.3 64.9	77 04.5 -24.4 66.6	76 09.2 -22.6 68.2	75 13.4 -21.1 69.5
10°	78 24.4 -32.3 58.3	77 32.8 -30.0 60.6	76 40.1 -27.9 62.6	75 46.6 -26.1 64.4	74 52.3 -24.5 65.9
11°	77 52.1 -35.5 54.2	77 02.8 -33.2 56.7	76 12.2 -31.2 58.8	75 20.5 -29.3 60.8	74 27.8 -27.5 62.4
12°	77 16.6 -38.4 50.5	76 29.6 -36.2 53.0	75 41.0 -34.0 55.3	74 51.2 -32.1 57.4	74 00.3 -30.3 59.2
13°	76 38.2 -40.9 47.1	75 53.4 -38.7 49.7	75 07.0 -36.7 52.1	74 19.1 -34.7 54.2	73 30.0 -32.9 56.1
14°	75 57.3 -43.1 44.0	75 14.7 -40.9 46.6	74 30.3 -38.9 49.0	73 44.4 -37.0 51.2	72 57.1 -35.2 53.2
15°	75 14.2 -44.9 41.2	74 33.8 -42.9 43.8	73 51.4 -40.9 46.2	73 07.4 -39.1 48.5	72 21.9 -37.3 50.5
16°	74 29.3 -46.4 38.6	73 50.9 -44.6 41.3	73 10.5 -42.7 43.7	72 28.3 -40.9 45.9	71 44.6 -39.2 47.9
17°	73 42.9 -47.9 36.3	73 06.3 -46.0 38.9	72 27.8 -44.3 41.3	71 47.4 -42.5 43.5	71 05.4 -40.8 45.6
18°	72 55.0 -49.0 34.2	72 20.3 -47.3 36.7	71 43.5 -45.7 39.1	71 04.9 -44.0 41.3	70 24.6 -42.4 43.3
19°	72 06.0 -50.0 32.3	71 33.0 -48.5 34.8	70 57.8 -46.9 37.1	70 20.9 -45.4 39.2	69 42.2 -43.8 41.3
20°	71 16.0 -51.0 30.5	70 44.5 -49.5 32.9	70 10.9 -47.9 35.2	69 35.5 -46.4 37.3	68 58.4 -45.0 39.3
21°	70 25.0 -51.7 28.9	69 55.0 -50.4 31.2	69 23.0 -49.0 33.5	68 49.1 -47.6 35.5	68 13.4 -46.1 37.5
22°	69 33.3 -52.5 27.4	69 04.6 -51.1 29.7	68 34.0 -49.8 31.8	68 01.5 -48.4 33.9	67 27.3 -47.1 35.8
23°	68 40.8 -53.0 26.1	68 13.5 -51.8 28.3	67 44.2 -50.6 30.3	67 13.1 -49.3 32.3	66 40.2 -48.0 34.2
24°	67 47.8 -53.6 24.8	67 21.7 -52.5 26.9	66 53.6 -51.2 28.9	66 23.8 -50.1 30.9	65 52.2 -48.8 32.7
25°	66 54.2 -54.1 23.7	66 29.2 -53.0 25.7	66 02.4 -51.9 27.6	65 33.7 -50.7 29.5	65 03.4 -49.6 31.3
26°	66 00.1 -54.4 22.6	65 36.2 -53.5 24.5	65 10.5 -52.5 26.4	64 43.0 -51.4 28.3	64 13.8 -50.2 30.0
27°	65 05.7 -54.9 21.6	64 42.7 -53.9 23.5	64 18.0 -52.9 25.3	63 51.6 -51.9 27.1	63 23.6 -50.8 28.8
28°	64 10.8 -55.2 20.6	63 48.8 -54.3 22.4	63 25.1 -53.4 24.2	62 59.7 -52.4 25.9	62 32.8 -51.4 27.6
29°	63 15.6 -55.6 19.7	62 54.5 -54.7 21.5	62 31.7 -53.8 23.2	62 07.3 -52.8 24.9	61 41.4 -51.9 26.5

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°	74 29.3 +13.8 104.6	73 31.2 +13.1 103.7	72 33.0 +12.3 102.9	71 34.5 +11.7 102.1	70 35.9 +11.2 101.5
1°	74 43.1 +10.2 100.9	73 44.3 +09.6 100.2	72 45.3 +09.1 99.6	71 46.2 +08.7 99.0	70 47.1 +08.2 98.5
2°	74 53.3 +06.4 97.2	73 53.9 +06.0 96.7	72 54.4 +05.8 96.2	71 54.9 +05.5 95.8	70 55.3 +05.3 95.5
3°	74 59.7 +02.5 93.3	73 59.9 +02.5 93.1	73 00.2 +02.3 92.8	72 00.4 +02.3 92.6	71 00.6 +02.2 92.4
4°	75 02.2 -01.4 89.5	74 02.4 -01.3 89.4	73 02.5 -01.1 89.4	72 02.7 -01.0 89.4	71 02.8 -00.8 89.3
5°	75 00.8 -05.3 85.6	74 01.1 -04.9 85.8	73 01.4 -04.5 86.0	72 01.7 -04.2 86.1	71 02.0 -03.9 86.3
6°	74 55.5 -09.1 81.8	73 56.2 -08.4 82.2	72 56.9 -07.9 82.6	71 57.5 -07.3 82.9	70 58.1 -06.9 83.2
7°	74 46.4 -12.9 78.0	73 47.8 -12.0 78.6	72 49.0 -11.2 79.2	71 50.2 -10.5 79.7	70 51.2 -09.8 80.1
8°	74 33.5 -16.4 74.3	73 35.8 -15.4 75.1	72 37.8 -14.3 75.9	71 39.7 -13.5 76.6	70 41.4 -12.7 77.2
9°	74 17.1 -19.8 70.7	73 20.4 -18.5 71.7	72 23.5 -17.5 72.7	71 26.2 -16.4 73.5	70 28.7 -15.5 74.2
10°	73 57.3 -22.9 67.3	73 01.9 -21.6 68.5	72 06.0 -20.4 69.5	71 09.8 -19.3 70.5	70 13.2 -18.2 71.3
11°	73 34.4 -26.0 63.9	72 40.3 -24.5 65.3	71 45.6 -23.1 66.5	70 50.5 -21.8 67.6	69 55.0 -20.7 68.5
12°	73 08.4 -28.6 60.8	72 15.8 -27.1 62.3	71 22.5 -25.7 63.6	70 28.7 -24.4 64.8	69 34.3 -23.2 65.8
13°	72 39.8 -31.2 57.8	71 48.7 -29.6 59.4	70 56.8 -28.1 60.8	70 04.3 -26.8 62.0	69 11.1 -25.5 63.2
14°	72 08.6 -33.5 55.0	71 19.1 -31.9 56.6	70 28.7 -30.4 58.1	69 37.5 -29.0 59.5	68 45.6 -27.6 60.7
15°	71 35.1 -35.6 52.3	70 47.2 -34.0 54.0	69 58.3 -32.5 55.5	69 08.5 -31.0 57.0	68 18.0 -29.7 58.3
16°	70 59.5 -37.5 49.8	70 13.2 -35.9 51.5	69 25.8 -34.4 53.1	68 37.5 -32.9 54.6	67 48.3 -31.6 55.9
17°	70 22.0 -39.2 47.4	69 37.3 -37.7 49.2	68 51.4 -36.1 50.8	68 04.6 -34.8 52.3	67 16.7 -33.3 53.7
18°	69 42.8 -40.8 45.2	68 59.6 -39.2 47.0	68 15.3 -37.8 48.6	67 29.8 -36.3 50.2	66 43.4 -35.0 51.6
19°	69 02.0 -42.3 43.1	68 20.4 -40.8 44.9	67 37.5 -39.3 46.6	66 53.5 -37.9 48.1	66 08.4 -36.5 49.6
20°	68 19.7 -43.5 41.2	67 39.6 -42.0 43.0	66 58.2 -40.6 44.6	66 15.6 -39.3 46.2	65 31.9 -37.9 47.6
21°	67 36.2 -44.7 39.4	66 57.6 -43.3 41.1	66 17.6 -41.9 42.8	65 36.3 -40.5 44.3	64 54.0 -39.3 45.8
22°	66 51.5 -45.7 37.6	66 14.3 -44.4 39.4	65 35.7 -43.1 41.0	64 55.8 -41.8 42.5	64 14.7 -40.4 44.0
23°	66 05.8 -46.7 36.0	65 29.9 -45.4 37.7	64 52.6 -44.1 39.3	64 14.0 -42.8 40.9	63 34.3 -41.6 42.3
24°	65 19.1 -47.6 34.5	64 44.5 -46.4 36.2	64 08.5 -45.1 37.8	63 31.2 -43.8 39.3	62 52.7 -42.6 40.7
25°	64 31.5 -48.4 33.0	63 58.1 -47.1 34.7	63 23.4 -46.0 36.3	62 47.4 -44.8 37.8	62 10.1 -43.6 39.2
26°	63 43.1 -49.1 31.7	63 11.0 -48.0 33.3	62 37.4 -46.8 34.9	62 02.6 -45.6 36.3	61 26.5 -44.4 37.7
27°	62 54.0 -49.7 30.4	62 23.0 -48.6 32.0	61 50.6 -47.5 33.5	61 17.0 -46.4 35.0	60 42.1 -45.3 36.4
28°	62 04.3 -50.4 29.2	61 34.4 -49.3 30.7	61 03.1 -48.2 32.2	60 30.6 -47.2 33.7	59 56.8 -46.1 35.0
29°	61 13.9 -50.9 28.1	60 45.1 -49.9 29.6	60 14.9 -48.9 31.0	59 43.4 -47.8 32.4	59 10.7 -46.7 33.8

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Declination SAME name as Latitude

Latitude 4°

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°	69 37.2 +10.7 100.8	68 38.4 +10.2 100.3	67 39.4 +09.8 99.8	66 40.4 +09.4 99.3	65 41.3 +09.0 98.9
1°	69 47.9 +07.8 98.0	68 48.6 +07.5 97.6	67 49.2 +07.2 97.2	66 49.8 +07.0 96.8	65 50.3 +06.8 96.5
2°	69 55.7 +05.1 95.1	68 56.1 +04.9 94.8	67 56.4 +04.7 94.6	66 56.8 +04.5 94.3	65 57.1 +04.4 94.1
3°	70 00.8 +02.2 92.2	69 01.0 +02.1 92.1	68 01.1 +02.2 91.9	67 01.3 +02.1 91.7	66 01.5 +02.1 91.6
4°	70 03.0 -00.8 89.3	69 03.1 -00.6 89.3	68 03.3 -00.5 89.2	67 03.4 -00.4 89.2	66 03.6 -00.3 89.2
5°	70 02.2 -03.5 86.4	69 02.5 -03.3 86.5	68 02.8 -03.1 86.5	67 03.0 -02.8 86.6	66 03.3 -02.7 86.7
6°	69 58.7 -06.5 83.4	68 59.2 -06.0 83.7	67 59.7 -05.7 83.9	67 00.2 -05.3 84.1	66 00.6 -05.0 84.2
7°	69 52.2 -09.2 80.5	68 53.2 -08.7 80.9	67 54.0 -08.2 81.2	66 54.9 -07.8 81.5	65 55.6 -07.3 81.8
8°	69 43.0 -12.0 77.7	68 44.5 -11.4 78.2	67 45.8 -10.7 78.6	66 47.1 -10.1 79.0	65 48.3 -09.6 79.4
9°	69 31.0 -14.6 74.9	68 33.1 -13.8 75.5	67 35.1 -13.1 76.0	66 37.0 -12.5 76.5	65 38.7 -11.8 77.0
10°	69 16.4 -17.3 72.1	68 19.3 -16.3 72.8	67 22.0 -15.5 73.5	66 24.5 -14.7 74.0	65 26.9 -14.0 74.6
11°	68 59.1 -19.6 69.4	68 03.0 -18.7 70.2	67 06.5 -17.8 71.0	66 09.8 -16.9 71.6	65 12.9 -16.1 72.3
12°	68 39.5 -22.1 66.8	67 44.3 -21.0 67.7	66 48.7 -20.0 68.5	65 52.9 -19.1 69.3	64 56.8 -18.2 70.0
13°	68 17.4 -24.3 64.3	67 23.3 -23.2 65.3	66 28.7 -22.1 66.1	65 33.8 -21.1 67.0	64 38.6 -20.2 67.7
14°	67 53.1 -26.4 61.8	67 00.1 -25.2 62.9	66 06.6 -24.1 63.8	65 12.7 -23.1 64.7	64 18.4 -22.1 65.5
15°	67 26.7 -28.3 59.5	66 34.9 -27.2 60.6	65 42.5 -26.0 61.6	64 49.6 -24.9 62.5	63 56.3 -23.9 63.4
16°	66 58.4 -30.3 57.2	66 07.7 -29.0 58.3	65 16.5 -27.9 59.4	64 24.7 -26.7 60.4	63 32.4 -25.7 61.3
17°	66 28.1 -32.0 55.0	65 38.7 -30.8 56.2	64 48.6 -29.5 57.3	63 58.0 -28.5 58.4	63 06.7 -27.3 59.3
18°	65 56.1 -33.7 52.9	65 07.9 -32.4 54.1	64 19.1 -31.2 55.3	63 29.5 -30.0 56.4	62 39.4 -28.9 57.4
19°	65 22.4 -35.2 50.9	64 35.5 -33.9 52.2	63 47.9 -32.7 53.3	62 59.5 -31.5 54.4	62 10.5 -30.4 55.5
20°	64 47.2 -36.6 49.0	64 01.6 -35.3 50.3	63 15.2 -34.1 51.5	62 28.0 -33.0 52.6	61 40.1 -31.8 53.6
21°	64 10.6 -38.0 47.1	63 26.3 -36.7 48.4	62 41.1 -35.5 49.7	61 55.0 -34.3 50.8	61 08.3 -33.1 51.9
22°	63 32.6 -39.1 45.4	62 49.6 -38.0 46.7	62 05.6 -36.8 47.9	61 20.7 -35.5 49.1	60 35.2 -34.5 50.2
23°	62 53.5 -40.4 43.7	62 11.6 -39.1 45.0	61 28.8 -37.9 46.2	60 45.2 -36.8 47.4	60 00.7 -35.6 48.5
24°	62 13.1 -41.4 42.1	61 32.5 -40.2 43.4	60 50.9 -39.0 44.6	60 08.4 -37.9 45.8	59 25.1 -36.8 46.9
25°	61 31.7 -42.4 40.6	60 52.3 -41.2 41.9	60 11.9 -40.1 43.1	59 30.5 -38.9 44.3	58 48.3 -37.8 45.4
26°	60 49.3 -43.3 39.1	60 11.1 -42.2 40.4	59 31.8 -41.0 41.6	58 51.6 -39.9 42.8	58 10.5 -38.8 43.9
27°	60 06.0 -44.1 37.7	59 28.9 -43.0 39.0	58 50.8 -42.0 40.2	58 11.7 -40.8 41.3	57 31.7 -39.7 42.5
28°	59 21.9 -45.0 36.3	58 45.9 -43.9 37.6	58 08.8 -42.7 38.8	57 30.9 -41.7 40.0	56 52.0 -40.7 41.1
29°	58 36.9 -45.7 35.1	58 02.0 -44.6 36.3	57 26.1 -43.6 37.5	56 49.2 -42.6 38.6	56 11.3 -41.4 39.7

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°	64 42.1 +08.8 98.5	63 42.9 +08.4 98.1	62 43.6 +08.2 97.8	61 44.3 +07.9 97.5	60 45.0 +07.6 97.2
1°	64 50.9 +06.5 96.2	63 51.3 +06.3 95.9	62 51.8 +06.1 95.6	61 52.2 +05.9 95.4	60 52.6 +05.8 95.1
2°	64 57.4 +04.3 93.8	63 57.6 +04.2 93.6	62 57.9 +04.1 93.4	61 58.1 +04.0 93.3	60 58.4 +03.9 93.1
3°	65 01.7 +02.0 91.5	64 01.8 +02.1 91.4	63 02.0 +02.0 91.2	62 02.1 +02.1 91.1	61 02.3 +02.0 91.0
4°	65 03.7 -00.2 89.1	64 03.9 -00.1 89.1	63 04.0 +00.0 89.0	62 04.2 +00.0 89.0	61 04.3 +00.2 89.0
5°	65 03.5 -02.4 86.7	64 03.8 -02.3 86.8	63 04.0 -02.1 86.8	62 04.2 -01.9 86.9	61 04.5 -01.8 86.9
6°	65 01.1 -04.7 84.4	64 01.5 -04.4 84.5	63 01.9 -04.1 84.6	62 02.3 -03.9 84.7	61 02.7 -03.6 84.8
7°	64 56.4 -06.9 82.0	63 57.1 -06.5 82.2	62 57.8 -06.2 82.4	61 58.4 -05.8 82.6	60 59.1 -05.6 82.8
8°	64 49.5 -09.1 79.7	63 50.6 -08.7 80.0	62 51.6 -08.2 80.2	61 52.6 -07.8 80.5	60 53.5 -07.3 80.7
9°	64 40.4 -11.3 77.4	63 41.9 -10.7 77.7	62 43.4 -10.2 78.1	61 44.8 -09.7 78.4	60 46.2 -09.3 78.7
10°	64 29.1 -13.3 75.1	63 31.2 -12.7 75.5	62 33.2 -12.1 75.9	61 35.1 -11.5 76.3	60 36.9 -11.0 76.7
11°	64 15.8 -15.4 72.8	63 18.5 -14.6 73.3	62 21.1 -14.0 73.8	61 23.6 -13.4 74.3	60 25.9 -12.8 74.7
12°	64 00.4 -17.4 70.6	63 03.9 -16.7 71.2	62 07.1 -15.9 71.7	61 10.2 -15.2 72.2	60 13.1 -14.5 72.7
13°	63 43.0 -19.3 68.4	62 47.2 -18.4 69.1	61 51.2 -17.6 69.7	60 55.0 -16.9 70.2	59 58.6 -16.2 70.8
14°	63 23.7 -21.1 66.3	62 28.8 -20.3 67.0	61 33.6 -19.5 67.7	60 38.1 -18.7 68.3	59 42.4 -17.9 68.8
15°	63 02.6 -22.9 64.2	62 08.5 -22.0 65.0	61 14.1 -21.1 65.7	60 19.4 -20.2 66.3	59 24.5 -19.5 67.0
16°	62 39.7 -24.7 62.2	61 46.5 -23.7 63.0	60 53.0 -22.7 63.7	59 59.2 -21.9 64.4	59 05.0 -21.0 65.1
17°	62 15.0 -26.3 60.2	61 22.8 -25.2 61.1	60 30.3 -24.4 61.9	59 37.3 -23.4 62.6	58 44.0 -22.5 63.3
18°	61 48.7 -27.8 58.3	60 57.6 -26.8 59.2	60 05.9 -25.8 60.0	59 13.9 -24.9 60.8	58 21.5 -24.0 61.5
19°	61 20.9 -29.3 56.4	60 30.8 -28.3 57.4	59 40.1 -27.2 58.2	58 49.0 -26.3 59.0	57 57.5 -25.3 59.8
20°	60 51.6 -30.7 54.6	60 02.5 -29.6 55.6	59 12.9 -28.7 56.5	58 22.7 -27.6 57.3	57 32.2 -26.7 58.1
21°	60 20.9 -32.1 52.9	59 32.9 -31.0 53.9	58 44.2 -29.9 54.8	57 55.1 -28.9 55.6	57 05.5 -28.0 56.4
22°	59 48.8 -33.3 51.2	59 01.9 -32.3 52.2	58 14.3 -31.2 53.1	57 26.2 -30.2 54.0	56 37.5 -29.2 54.8
23°	59 15.5 -34.5 49.6	58 29.6 -33.4 50.5	57 43.1 -32.4 51.5	56 56.0 -31.4 52.4	56 08.3 -30.4 53.2
24°	58 41.0 -35.6 48.0	57 56.2 -34.6 49.0	57 10.7 -33.5 49.9	56 24.6 -32.5 50.8	55 37.9 -31.5 51.7
25°	58 05.4 -36.8 46.4	57 21.6 -35.6 47.4	56 37.2 -34.6 48.4	55 52.1 -33.6 49.3	55 06.4 -32.5 50.2
26°	57 28.6 -37.7 45.0	56 46.0 -36.7 46.0	56 02.6 -35.6 46.9	55 18.5 -34.6 47.8	54 33.9 -33.6 48.7
27°	56 50.9 -38.7 43.5	56 09.3 -37.6 44.5	55 27.0 -36.6 45.5	54 43.9 -35.5 46.4	54 00.3 -34.6 47.3
28°	56 12.2 -39.6 42.1	55 31.7 -38.6 43.1	54 50.4 -37.5 44.1	54 08.4 -36.5 45.0	53 25.7 -35.5 45.9
29°	55 32.6 -40.4 40.8	54 53.1 -39.4 41.8	54 12.9 -38.4 42.8	53 31.9 -37.4 43.7	52 50.2 -36.4 44.6

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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°	59 45.5 +07.5 96.9	58 46.1 +07.2 96.6	57 46.6 +07.1 96.4	56 47.1 +06.9 96.1	55 47.6 +06.7 95.9
1°	59 53.0 +05.6 94.9	58 53.3 +05.5 94.7	57 53.7 +05.3 94.5	56 54.0 +05.3 94.3	55 54.3 +05.2 94.1
2°	59 58.6 +03.9 92.9	58 58.8 +03.8 92.8	57 59.0 +03.8 92.6	56 59.3 +03.6 92.5	55 59.5 +03.6 92.4
3°	60 02.5 +02.0 90.9	59 02.6 +02.0 90.8	58 02.8 +02.0 90.7	57 02.9 +02.1 90.7	56 03.1 +02.0 90.6
4°	60 04.5 +00.2 88.9	59 04.6 +00.3 88.9	58 04.8 +00.4 88.9	57 05.0 +00.4 88.8	56 05.1 +00.5 88.8
5°	60 04.7 -01.6 86.9	59 04.9 -01.4 86.9	58 05.2 -01.4 87.0	57 05.4 -01.2 87.0	56 05.6 -01.0 87.0
6°	60 03.1 -03.4 84.9	59 03.5 -03.2 85.0	58 03.8 -03.0 85.1	57 04.2 -02.8 85.1	56 04.6 -02.6 85.2
7°	59 59.7 -05.3 82.9	59 00.3 -05.0 83.1	58 00.8 -04.6 83.2	57 01.4 -04.4 83.3	56 02.0 -04.2 83.4
8°	59 54.4 -07.0 80.9	58 55.3 -06.6 81.1	57 56.2 -06.4 81.3	56 57.0 -06.0 81.5	55 57.8 -05.7 81.6
9°	59 47.4 -08.7 79.0	58 48.7 -08.4 79.2	57 49.8 -07.9 79.4	56 51.0 -07.6 79.6	55 52.1 -07.2 79.8
10°	59 38.7 -10.6 77.0	58 40.3 -10.0 77.3	57 41.9 -09.6 77.6	56 43.4 -09.2 77.8	55 44.9 -08.8 78.1
11°	59 28.1 -12.2 75.1	58 30.3 -11.7 75.4	57 32.3 -11.2 75.7	56 34.2 -10.7 76.0	55 36.1 -10.2 76.3
12°	59 15.9 -13.9 73.1	58 18.6 -13.4 73.5	57 21.1 -12.7 73.9	56 23.5 -12.2 74.3	55 25.9 -11.7 74.6
13°	59 02.0 -15.6 71.2	58 05.2 -14.9 71.7	57 08.4 -14.3 72.1	56 11.3 -13.7 72.5	55 14.2 -13.1 72.9
14°	58 46.4 -17.1 69.4	57 50.3 -16.4 69.9	56 54.1 -15.8 70.3	55 57.6 -15.1 70.7	55 01.1 -14.6 71.2
15°	58 29.3 -18.7 67.5	57 33.9 -18.0 68.1	56 38.3 -17.3 68.6	55 42.5 -16.6 69.0	54 46.5 -16.0 69.5
16°	58 10.6 -20.2 65.7	57 15.9 -19.4 66.3	56 21.0 -18.7 66.8	55 25.9 -18.0 67.3	54 30.5 -17.3 67.8
17°	57 50.4 -21.7 63.9	56 56.5 -20.9 64.5	56 02.3 -20.1 65.1	55 07.9 -19.4 65.7	54 13.2 -18.6 66.2
18°	57 28.7 -23.1 62.2	56 35.6 -22.2 62.8	55 42.2 -21.4 63.4	54 48.5 -20.6 64.0	53 54.6 -19.9 64.5
19°	57 05.6 -24.4 60.5	56 13.4 -23.6 61.2	55 20.8 -22.8 61.8	54 27.9 -22.0 62.4	53 34.7 -21.2 62.9
20°	56 41.2 -25.8 58.8	55 49.8 -24.9 59.5	54 58.0 -24.0 60.2	54 05.9 -23.1 60.8	53 13.5 -22.3 61.4
21°	56 15.4 -27.0 57.2	55 24.9 -26.1 57.9	54 34.0 -25.2 58.6	53 42.8 -24.4 59.2	52 51.2 -23.6 59.8
22°	55 48.4 -28.3 55.6	54 58.8 -27.3 56.3	54 08.8 -26.5 57.0	53 18.4 -25.6 57.7	52 27.6 -24.7 58.3
23°	55 20.1 -29.4 54.0	54 31.5 -28.5 54.8	53 42.3 -27.5 55.5	52 52.8 -26.7 56.2	52 02.9 -25.8 56.8
24°	54 50.7 -30.5 52.5	54 03.0 -29.6 53.3	53 14.8 -28.7 54.0	52 26.1 -27.7 54.7	51 37.1 -26.9 55.4
25°	54 20.2 -31.6 51.0	53 33.4 -30.6 51.8	52 46.1 -29.7 52.5	51 58.4 -28.8 53.3	51 10.2 -27.9 53.9
26°	53 48.6 -32.6 49.6	53 02.8 -31.7 50.4	52 16.4 -30.7 51.1	51 29.6 -29.8 51.8	50 42.3 -28.9 52.5
27°	53 16.0 -33.6 48.1	52 31.1 -32.6 49.0	51 45.7 -31.7 49.7	50 59.8 -30.8 50.4	50 13.4 -29.8 51.1
28°	52 42.4 -34.5 46.8	51 58.5 -33.6 47.6	51 14.0 -32.6 48.4	50 29.0 -31.6 49.1	49 43.6 -30.8 49.8
29°	52 07.9 -35.5 45.4	51 24.9 -34.4 46.2	50 41.4 -33.5 47.0	49 57.4 -32.6 47.8	49 12.8 -31.7 48.5

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°	54 48.1 +06.5 95.7	53 48.5 +06.4 95.5	52 48.9 +06.3 95.3	51 49.3 +06.1 95.1	50 49.7 +06.0 94.9
1°	54 54.6 +05.0 94.0	53 54.9 +04.9 93.8	52 55.2 +04.8 93.6	51 55.4 +04.8 93.5	50 55.7 +04.7 93.3
2°	54 59.6 +03.6 92.2	53 59.8 +03.6 92.1	53 00.0 +03.5 92.0	52 00.2 +03.5 91.9	51 00.4 +03.4 91.8
3°	55 03.2 +02.1 90.5	54 03.4 +02.0 90.4	53 03.5 +02.1 90.3	52 03.7 +02.1 90.3	51 03.8 +02.1 90.2
4°	55 05.3 +00.5 88.7	54 05.4 +00.7 88.7	53 05.6 +00.7 88.7	52 05.8 +00.7 88.6	51 05.9 +00.9 88.6
5°	55 05.8 -00.9 87.0	54 06.1 -00.8 87.0	53 06.3 -00.7 87.0	52 06.5 -00.5 87.0	51 06.8 -00.5 87.0
6°	55 04.9 -02.4 85.2	54 05.3 -02.3 85.3	53 05.6 -02.1 85.3	52 06.0 -02.0 85.4	51 06.3 -01.8 85.4
7°	55 02.5 -03.9 83.5	54 03.0 -03.7 83.6	53 03.5 -03.4 83.7	52 04.0 -03.2 83.7	51 04.5 -03.0 83.8
8°	54 58.6 -05.4 81.8	53 59.3 -05.1 81.9	53 00.1 -04.9 82.0	52 00.8 -04.6 82.1	51 01.5 -04.4 82.2
9°	54 53.2 -06.9 80.0	53 54.2 -06.6 80.2	52 55.2 -06.2 80.4	51 56.2 -05.9 80.5	50 57.1 -05.6 80.6
10°	54 46.3 -08.4 78.3	53 47.6 -07.9 78.5	52 49.0 -07.6 78.7	51 50.3 -07.3 78.9	50 51.5 -06.9 79.1
11°	54 37.9 -09.7 76.6	53 39.7 -09.4 76.8	52 41.4 -09.0 77.1	51 43.0 -08.5 77.3	50 44.6 -08.2 77.5
12°	54 28.2 -11.3 74.9	53 30.3 -10.7 75.2	52 32.4 -10.2 75.4	51 34.5 -09.9 75.7	50 36.4 -09.4 75.9
13°	54 16.9 -12.6 73.2	53 19.6 -12.1 73.5	52 22.2 -11.6 73.8	51 24.6 -11.1 74.1	50 27.0 -10.6 74.4
14°	54 04.3 -13.9 71.5	53 07.5 -13.4 71.9	52 10.6 -12.9 72.2	51 13.5 -12.3 72.5	50 16.4 -11.9 72.8
15°	53 50.4 -15.4 69.9	52 54.1 -14.7 70.3	51 57.7 -14.2 70.6	51 01.2 -13.6 71.0	50 04.5 -13.0 71.3
16°	53 35.0 -16.6 68.2	52 39.4 -16.0 68.7	51 43.5 -15.3 69.1	50 47.6 -14.8 69.4	49 51.5 -14.3 69.8
17°	53 18.4 -17.9 66.6	52 23.4 -17.3 67.1	51 28.2 -16.7 67.5	50 32.8 -16.0 67.9	49 37.2 -15.3 68.3
18°	53 00.5 -19.2 65.0	52 06.1 -18.5 65.5	51 11.5 -17.8 66.0	50 16.8 -17.2 66.4	49 21.9 -16.6 66.8
19°	52 41.3 -20.4 63.5	51 47.6 -19.7 64.0	50 53.7 -19.0 64.4	49 59.6 -18.3 64.9	49 05.3 -17.6 65.3
20°	52 20.9 -21.6 61.9	51 27.9 -20.8 62.4	50 34.7 -20.1 62.9	49 41.3 -19.4 63.4	48 47.7 -18.7 63.9
21°	51 59.3 -22.8 60.4	51 07.1 -22.0 60.9	50 14.6 -21.2 61.5	49 21.9 -20.5 62.0	48 29.0 -19.8 62.4
22°	51 36.5 -23.9 58.9	50 45.1 -23.1 59.5	49 53.4 -22.3 60.0	49 01.4 -21.5 60.5	48 09.2 -20.8 61.0
23°	51 12.6 -24.9 57.4	50 22.0 -24.1 58.0	49 31.1 -23.4 58.6	48 39.9 -22.6 59.1	47 48.4 -21.8 59.6
24°	50 47.7 -26.1 56.0	49 57.9 -25.2 56.6	49 07.7 -24.3 57.2	48 17.3 -23.6 57.7	47 26.6 -22.8 58.2
25°	50 21.6 -27.0 54.6	49 32.7 -26.2 55.2	48 43.4 -25.4 55.8	47 53.7 -24.5 56.3	47 03.8 -23.8 56.9
26°	49 54.6 -28.0 53.2	49 06.5 -27.2 53.8	48 18.0 -26.3 54.4	47 29.2 -25.5 55.0	46 40.0 -24.7 55.5
27°	49 26.6 -29.0 51.8	48 39.3 -28.1 52.4	47 51.7 -27.3 53.1	47 03.7 -26.4 53.6	46 15.3 -25.6 54.2
28°	48 57.6 -29.9 50.5	48 11.2 -29.0 51.1	47 24.4 -28.1 51.7	46 37.3 -27.3 52.3	45 49.7 -26.5 52.9
29°	48 27.7 -30.7 49.2	47 42.2 -29.8 49.8	46 56.3 -29.0 50.4	46 10.0 -28.2 51.0	45 23.2 -27.3 51.6

Declination SAME name as Latitude

Latitude 4°

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°	49 50.0 +05.9 94.8	48 50.4 +05.7 94.6	47 50.7 +05.7 94.4	46 51.0 +05.6 94.3	45 51.3 +05.5 94.1
1°	49 55.9 +04.7 93.2	48 56.1 +04.6 93.1	47 56.4 +04.5 92.9	46 56.6 +04.5 92.8	45 56.8 +04.4 92.7
2°	50 00.6 +03.3 91.7	49 00.7 +03.4 91.6	48 00.9 +03.3 91.5	47 01.1 +03.3 91.4	46 01.2 +03.3 91.3
3°	50 03.9 +02.2 90.1	49 04.1 +02.2 90.0	48 04.2 +02.2 90.0	47 04.4 +02.2 89.9	46 04.5 +02.3 89.8
4°	50 06.1 +00.9 88.5	49 06.3 +00.9 88.5	48 06.4 +01.1 88.5	47 06.6 +01.1 88.4	46 06.8 +01.1 88.4
5°	50 07.0 -00.4 87.0	49 07.2 -00.2 87.0	48 07.5 -00.2 87.0	47 07.7 -00.1 87.0	46 07.9 +00.1 86.9
6°	50 06.6 -01.6 85.4	49 07.0 -01.5 85.5	48 07.3 -01.3 85.5	47 07.6 -01.1 85.5	46 08.0 -01.1 85.5
7°	50 05.0 -02.8 83.9	49 05.5 -02.7 83.9	48 06.0 -02.5 84.0	47 06.5 -02.3 84.0	46 06.9 -02.1 84.1
8°	50 02.2 -04.1 82.3	49 02.8 -03.8 82.4	48 03.5 -03.6 82.5	47 04.2 -03.5 82.5	46 04.8 -03.2 82.6
9°	49 58.1 -05.4 80.8	48 59.0 -05.1 80.9	47 59.9 -04.8 81.0	47 00.7 -04.5 81.1	46 01.6 -04.3 81.2
10°	49 52.7 -06.6 79.2	48 53.9 -06.2 79.4	47 55.1 -06.0 79.5	46 56.2 -05.6 79.6	45 57.3 -05.3 79.7
11°	49 46.1 -07.7 77.7	48 47.7 -07.5 77.8	47 49.1 -07.1 78.0	46 50.6 -06.8 78.2	45 52.0 -06.5 78.3
12°	49 38.4 -09.0 76.1	48 40.2 -08.6 76.3	47 42.0 -08.2 76.5	46 43.8 -07.8 76.7	45 45.5 -07.5 76.9
13°	49 29.4 -10.2 74.6	48 31.6 -09.7 74.8	47 33.8 -09.3 75.1	46 36.0 -09.0 75.3	45 38.0 -08.5 75.5
14°	49 19.2 -11.4 73.1	48 21.9 -11.0 73.4	47 24.5 -10.5 73.6	46 27.0 -10.0 73.8	45 29.5 -09.6 74.0
15°	49 07.8 -12.5 71.6	48 10.9 -12.0 71.9	47 14.0 -11.5 72.2	46 17.0 -11.1 72.4	45 19.9 -10.6 72.6
16°	48 55.3 -13.7 70.1	47 58.9 -13.1 70.4	47 02.5 -12.7 70.7	46 05.9 -12.1 71.0	45 09.3 -11.6 71.2
17°	48 41.6 -14.8 68.6	47 45.8 -14.3 69.0	46 49.8 -13.6 69.3	45 53.8 -13.1 69.6	44 57.7 -12.7 69.9
18°	48 26.8 -15.9 67.2	47 31.5 -15.3 67.5	46 36.2 -14.8 67.9	45 40.7 -14.2 68.2	44 45.0 -13.6 68.5
19°	48 10.9 -17.0 65.7	47 16.2 -16.3 66.1	46 21.4 -15.7 66.4	45 26.5 -15.2 66.8	44 31.4 -14.6 67.1
20°	47 53.9 -18.1 64.3	46 59.9 -17.4 64.7	46 05.7 -16.8 65.1	45 11.3 -16.1 65.4	44 16.8 -15.5 65.8
21°	47 35.8 -19.1 62.9	46 42.5 -18.5 63.3	45 48.9 -17.8 63.7	44 55.2 -17.1 64.0	44 01.3 -16.5 64.4
22°	47 16.7 -20.1 61.5	46 24.0 -19.4 61.9	45 31.1 -18.7 62.3	44 38.1 -18.1 62.7	43 44.8 -17.4 63.1
23°	46 56.6 -21.1 60.1	46 04.6 -20.3 60.5	45 12.4 -19.6 61.0	44 20.0 -19.0 61.4	43 27.4 -18.3 61.7
24°	46 35.5 -22.0 58.7	45 44.3 -21.3 59.2	44 52.8 -20.6 59.6	44 01.0 -19.9 60.0	43 09.1 -19.3 60.4
25°	46 13.5 -23.0 57.4	45 23.0 -22.3 57.8	44 32.2 -21.5 58.3	43 41.1 -20.8 58.7	42 49.8 -20.0 59.1
26°	45 50.5 -23.9 56.0	45 00.7 -23.1 56.5	44 10.7 -22.4 57.0	43 20.3 -21.6 57.4	42 29.8 -20.9 57.9
27°	45 26.6 -24.8 54.7	44 37.6 -24.0 55.2	43 48.3 -23.3 55.7	42 58.7 -22.5 56.2	42 08.9 -21.8 56.6
28°	45 01.8 -25.7 53.4	44 13.6 -24.9 53.9	43 25.0 -24.0 54.4	42 36.2 -23.3 54.9	41 47.1 -22.5 55.3
29°	44 36.1 -26.4 52.1	43 48.7 -25.7 52.7	43 01.0 -24.9 53.2	42 12.9 -24.1 53.6	41 24.6 -23.4 54.1

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 51.6 +05.4 94.0	43 51.9 +05.3 93.9	42 52.2 +05.2 93.7	41 52.5 +05.1 93.6	40 52.7 +05.1 93.5
1°	44 57.0 +04.4 92.6	43 57.2 +04.3 92.5	42 57.4 +04.3 92.4	41 57.6 +04.2 92.3	40 57.8 +04.2 92.2
2°	45 01.4 +03.3 91.2	44 01.5 +03.3 91.1	43 01.7 +03.3 91.0	42 01.8 +03.3 90.9	41 02.0 +03.3 90.8
3°	45 04.7 +02.2 89.8	44 04.8 +02.3 89.7	43 05.0 +02.3 89.6	42 05.1 +02.4 89.6	41 05.3 +02.3 89.5
4°	45 06.9 +01.2 88.3	44 07.1 +01.3 88.3	43 07.3 +01.3 88.3	42 07.5 +01.3 88.2	41 07.6 +01.5 88.2
5°	45 08.1 +00.2 86.9	44 08.4 +00.2 86.9	43 08.6 +00.4 86.9	42 08.8 +00.5 86.9	41 09.1 +00.5 86.9
6°	45 08.3 -00.9 85.5	44 08.6 -00.7 85.5	43 09.0 -00.7 85.5	42 09.3 -00.5 85.5	41 09.6 -00.4 85.5
7°	45 07.4 -01.9 84.1	44 07.9 -01.8 84.1	43 08.3 -01.6 84.2	42 08.8 -01.5 84.2	41 09.2 -01.3 84.2
8°	45 05.5 -03.0 82.7	44 06.1 -02.8 82.7	43 06.7 -02.6 82.8	42 07.3 -02.4 82.8	41 07.9 -02.2 82.9
9°	45 02.5 -04.1 81.3	44 03.3 -03.8 81.3	43 04.1 -03.6 81.4	42 04.9 -03.3 81.5	41 05.7 -03.1 81.5
10°	44 58.4 -05.1 79.9	43 59.5 -04.8 80.0	43 00.5 -04.5 80.0	42 01.6 -04.3 80.1	41 02.6 -04.0 80.2
11°	44 53.3 -06.1 78.4	43 54.7 -05.8 78.6	42 56.0 -05.5 78.7	41 57.3 -05.2 78.8	40 58.6 -05.0 78.9
12°	44 47.2 -07.1 77.0	43 48.9 -06.8 77.2	42 50.5 -06.5 77.3	41 52.1 -06.2 77.5	40 53.6 -05.8 77.6
13°	44 40.1 -08.2 75.6	43 42.1 -07.8 75.8	42 44.0 -07.4 76.0	41 45.9 -07.0 76.1	40 47.8 -06.7 76.3
14°	44 31.9 -09.2 74.3	43 34.3 -08.8 74.4	42 36.6 -08.4 74.6	41 38.9 -08.0 74.8	40 41.1 -07.6 74.9
15°	44 22.7 -10.1 72.9	43 25.5 -09.7 73.1	42 28.2 -09.3 73.3	41 30.9 -08.9 73.5	40 33.5 -08.5 73.6
16°	44 12.6 -11.2 71.5	43 15.8 -10.7 71.7	42 18.9 -10.2 71.9	41 22.0 -09.8 72.1	40 25.0 -09.4 72.3
17°	44 01.4 -12.1 70.1	43 05.1 -11.6 70.4	42 08.7 -11.2 70.6	41 12.2 -10.7 70.8	40 15.6 -10.2 71.0
18°	43 49.3 -13.1 68.8	42 53.5 -12.6 69.0	41 57.5 -12.0 69.3	41 01.5 -11.6 69.5	40 05.4 -11.1 69.8
19°	43 36.2 -14.0 67.4	42 40.9 -13.5 67.7	41 45.5 -13.0 68.0	40 49.9 -12.4 68.2	39 54.3 -11.9 68.5
20°	43 22.2 -15.0 66.1	42 27.4 -14.4 66.4	41 32.5 -13.8 66.7	40 37.5 -13.3 66.9	39 42.4 -12.8 67.2
21°	43 07.2 -15.9 64.7	42 13.0 -15.3 65.1	41 18.7 -14.7 65.4	40 24.2 -14.1 65.7	39 29.6 -13.6 65.9
22°	42 51.3 -16.7 63.4	41 57.7 -16.1 63.8	41 04.0 -15.6 64.1	40 10.1 -15.0 64.4	39 16.0 -14.4 64.7
23°	42 34.6 -17.7 62.1	41 41.6 -17.1 62.5	40 48.4 -16.4 62.8	39 55.1 -15.8 63.1	39 01.6 -15.2 63.4
24°	42 16.9 -18.5 60.8	41 24.5 -17.8 61.2	40 32.0 -17.2 61.5	39 39.3 -16.6 61.9	38 46.4 -15.9 62.2
25°	41 58.4 -19.4 59.5	41 06.7 -18.7 59.9	40 14.8 -18.1 60.3	39 22.7 -17.4 60.6	38 30.5 -16.8 60.9
26°	41 39.0 -20.2 58.3	40 48.0 -19.5 58.7	39 56.7 -18.8 59.0	39 05.3 -18.1 59.4	38 13.7 -17.5 59.7
27°	41 18.8 -21.0 57.0	40 28.5 -20.4 57.4	39 37.9 -19.6 57.8	38 47.2 -18.9 58.2	37 56.2 -18.2 58.5
28°	40 57.8 -21.9 55.8	40 08.1 -21.0 56.2	39 18.3 -20.4 56.6	38 28.3 -19.7 56.9	37 38.0 -19.0 57.3
29°	40 35.9 -22.5 54.5	39 47.1 -21.9 55.0	38 57.9 -21.1 55.4	38 08.6 -20.4 55.7	37 19.0 -19.7 56.1

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Latitude 4°

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 53.0 +05.0 93.3	38 53.2 +05.0 93.2	37 53.5 +04.9 93.1	36 53.7 +04.8 93.0	35 53.9 +04.8 92.9
1°	39 58.0 +04.1 92.1	38 58.2 +04.1 92.0	37 58.4 +04.0 91.9	36 58.5 +04.1 91.8	35 58.7 +04.0 91.7
2°	40 02.1 +03.3 90.7	39 02.3 +03.3 90.7	38 02.4 +03.3 90.6	37 02.6 +03.3 90.5	36 02.7 +03.3 90.4
3°	40 05.4 +02.4 89.4	39 05.6 +02.4 89.4	38 05.7 +02.5 89.3	37 05.9 +02.4 89.3	36 06.0 +02.5 89.2
4°	40 07.8 +01.5 88.1	39 08.0 +01.6 88.1	38 08.2 +01.6 88.1	37 08.3 +01.7 88.0	36 08.5 +01.8 88.0
5°	40 09.3 +00.6 86.8	39 09.6 +00.7 86.8	38 09.8 +00.8 86.8	37 10.0 +00.9 86.8	36 10.3 +01.0 86.7
6°	40 09.9 -00.2 85.5	39 10.3 -00.2 85.5	38 10.6 +00.0 85.5	37 10.9 +00.1 85.5	36 11.3 +00.2 85.5
7°	40 09.7 -01.2 84.2	39 10.1 -01.0 84.2	38 10.6 -00.9 84.2	37 11.0 -00.7 84.2	36 11.5 -00.6 84.2
8°	40 08.5 -02.0 82.9	39 09.1 -01.8 82.9	38 09.7 -01.6 83.0	37 10.3 -01.4 83.0	36 10.9 -01.3 83.0
9°	40 06.5 -02.9 81.6	39 07.3 -02.7 81.6	38 08.1 -02.5 81.7	37 08.9 -02.3 81.7	36 09.6 -02.1 81.8
10°	40 03.6 -03.8 80.3	39 04.6 -03.5 80.4	38 05.6 -03.3 80.4	37 06.6 -03.1 80.5	36 07.5 -02.8 80.5
11°	39 59.8 -04.6 79.0	39 01.1 -04.4 79.1	38 02.3 -04.1 79.2	37 03.5 -03.9 79.2	36 04.7 -03.6 79.3
12°	39 55.2 -05.5 77.7	38 56.7 -05.2 77.8	37 58.2 -05.0 77.9	36 59.6 -04.6 78.0	36 01.1 -04.4 78.1
13°	39 49.7 -06.4 76.4	38 51.5 -06.1 76.5	37 53.2 -05.7 76.6	36 55.0 -05.4 76.7	35 56.7 -05.1 76.8
14°	39 43.3 -07.3 75.1	38 45.4 -06.9 75.2	37 47.5 -06.5 75.4	36 49.6 -06.2 75.5	35 51.6 -05.8 75.6
15°	39 36.0 -08.1 73.8	38 38.5 -07.7 74.0	37 41.0 -07.4 74.1	36 43.4 -07.0 74.2	35 45.8 -06.7 74.4
16°	39 27.9 -08.9 72.5	38 30.8 -08.5 72.7	37 33.6 -08.1 72.9	36 36.4 -07.7 73.0	35 39.1 -07.3 73.1
17°	39 19.0 -09.8 71.2	38 22.3 -09.4 71.4	37 25.5 -08.9 71.6	36 28.7 -08.5 71.8	35 31.8 -08.1 71.9
18°	39 09.2 -10.6 70.0	38 12.9 -10.1 70.2	37 16.6 -09.7 70.4	36 20.2 -09.3 70.5	35 23.7 -08.8 70.7
19°	38 58.6 -11.5 68.7	38 02.8 -11.0 68.9	37 06.9 -10.5 69.1	36 10.9 -10.0 69.3	35 14.9 -09.6 69.5
20°	38 47.1 -12.2 67.4	37 51.8 -11.7 67.7	36 56.4 -11.2 67.9	36 00.9 -10.7 68.1	35 05.3 -10.2 68.3
21°	38 34.9 -13.0 66.2	37 40.1 -12.5 66.4	36 45.2 -12.0 66.7	35 50.2 -11.5 66.9	34 55.1 -11.0 67.1
22°	38 21.9 -13.9 64.9	37 27.6 -13.3 65.2	36 33.2 -12.7 65.4	35 38.7 -12.2 65.7	34 44.1 -11.6 65.9
23°	38 08.0 -14.6 63.7	37 14.3 -14.0 64.0	36 20.5 -13.5 64.2	35 26.5 -12.9 64.5	34 32.5 -12.4 64.7
24°	37 53.4 -15.3 62.5	37 00.3 -14.8 62.8	36 07.0 -14.2 63.0	35 13.6 -13.6 63.3	34 20.1 -13.0 63.5
25°	37 38.1 -16.1 61.2	36 45.5 -15.5 61.5	35 52.8 -14.8 61.8	35 00.0 -14.3 62.1	34 07.1 -13.7 62.3
26°	37 22.0 -16.9 60.0	36 30.0 -16.2 60.3	35 38.0 -15.6 60.6	34 45.7 -15.0 60.9	33 53.4 -14.4 61.2
27°	37 05.1 -17.6 58.8	36 13.8 -16.9 59.1	35 22.4 -16.3 59.4	34 30.7 -15.6 59.7	33 39.0 -15.1 60.0
28°	36 47.5 -18.3 57.6	35 56.9 -17.6 58.0	35 06.1 -17.0 58.3	34 15.1 -16.3 58.6	33 23.9 -15.6 58.8
29°	36 29.2 -19.0 56.4	35 39.3 -18.3 56.8	34 49.1 -17.6 57.1	33 58.8 -17.0 57.4	33 08.3 -16.3 57.7

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 54.1 +04.8 92.8	33 54.4 +04.6 92.7	32 54.6 +04.6 92.6	31 54.8 +04.6 92.5	30 55.0 +04.5 92.4
1°	34 58.9 +04.0 91.6	33 59.0 +04.0 91.5	32 59.2 +04.0 91.4	31 59.4 +03.9 91.3	30 59.5 +04.0 91.2
2°	35 02.9 +03.3 90.4	34 03.0 +03.3 90.3	33 03.2 +03.3 90.2	32 03.3 +03.3 90.1	31 03.5 +03.3 90.1
3°	35 06.2 +02.5 89.1	34 06.3 +02.6 89.1	33 06.5 +02.6 89.0	32 06.6 +02.7 89.0	31 06.8 +02.7 88.9
4°	35 08.7 +01.8 87.9	34 08.9 +01.9 87.9	33 09.1 +01.9 87.8	32 09.3 +02.0 87.8	31 09.5 +02.0 87.7
5°	35 10.5 +01.1 86.7	34 10.8 +01.1 86.7	33 11.0 +01.3 86.6	32 11.3 +01.3 86.6	31 11.5 +01.4 86.6
6°	35 11.6 +00.3 85.5	34 11.9 +00.5 85.5	33 12.3 +00.5 85.4	32 12.6 +00.7 85.4	31 12.9 +00.8 85.4
7°	35 11.9 -00.4 84.3	34 12.4 -00.3 84.3	33 12.8 -00.1 84.2	32 13.3 +00.0 84.2	31 13.7 +00.2 84.2
8°	35 11.5 -01.1 83.0	34 12.1 -01.0 83.0	33 12.7 -00.8 83.1	32 13.3 -00.7 83.1	31 13.9 -00.5 83.1
9°	35 10.4 -01.9 81.8	34 11.1 -01.7 81.8	33 11.9 -01.5 81.9	32 12.6 -01.3 81.9	31 13.4 -01.1 81.9
10°	35 08.5 -02.6 80.6	34 09.4 -02.3 80.6	33 10.4 -02.2 80.7	32 11.3 -01.9 80.7	31 12.3 -01.8 80.7
11°	35 05.9 -03.4 79.4	34 07.1 -03.2 79.4	33 08.2 -02.9 79.5	32 09.4 -02.7 79.5	31 10.5 -02.4 79.6
12°	35 02.5 -04.1 78.1	34 03.9 -03.8 78.2	33 05.3 -03.5 78.3	32 06.7 -03.2 78.3	31 08.1 -03.0 78.4
13°	34 58.4 -04.8 76.9	34 00.1 -04.5 77.0	33 01.8 -04.2 77.1	32 03.5 -04.0 77.2	31 05.1 -03.7 77.2
14°	34 53.6 -05.5 75.7	33 55.6 -05.2 75.8	32 57.6 -04.9 75.9	31 59.5 -04.6 76.0	31 01.4 -04.2 76.1
15°	34 48.1 -06.3 74.5	33 50.4 -05.9 74.6	32 52.7 -05.6 74.7	31 54.9 -05.2 74.8	30 57.2 -04.9 74.9
16°	34 41.8 -06.9 73.3	33 44.5 -06.6 73.4	32 47.1 -06.2 73.5	31 49.7 -05.9 73.6	30 52.3 -05.6 73.7
17°	34 34.9 -07.7 72.1	33 37.9 -07.3 72.2	32 40.9 -06.9 72.3	31 43.8 -06.5 72.5	30 46.7 -06.1 72.6
18°	34 27.2 -08.4 70.9	33 30.6 -08.0 71.0	32 34.0 -07.6 71.2	31 37.3 -07.1 71.3	30 40.6 -06.8 71.4
19°	34 18.8 -09.1 69.7	33 22.6 -08.6 69.8	32 26.4 -08.2 70.0	31 30.2 -07.8 70.1	30 33.8 -07.3 70.3
20°	34 09.7 -09.8 68.5	33 14.0 -09.3 68.6	32 18.2 -08.8 68.8	31 22.4 -08.4 69.0	30 26.5 -08.0 69.1
21°	33 59.9 -10.4 67.3	33 04.7 -10.0 67.5	32 09.4 -09.6 67.6	31 14.0 -09.1 67.8	30 18.5 -08.6 68.0
22°	33 49.5 -11.2 66.1	32 54.7 -10.7 66.3	31 59.8 -10.1 66.5	31 04.9 -09.6 66.7	30 09.9 -09.1 66.8
23°	33 38.3 -11.8 64.9	32 44.0 -11.2 65.1	31 49.7 -10.8 65.3	30 55.3 -10.3 65.5	30 00.8 -09.8 65.7
24°	33 26.5 -12.5 63.7	32 32.8 -12.0 64.0	31 38.9 -11.4 64.2	30 45.0 -10.8 64.4	29 51.0 -10.3 64.5
25°	33 14.0 -13.1 62.6	32 20.8 -12.5 62.8	31 27.5 -12.0 63.0	30 34.2 -11.5 63.2	29 40.7 -10.9 63.4
26°	33 00.9 -13.8 61.4	32 08.3 -13.2 61.6	31 15.5 -12.6 61.9	30 22.7 -12.1 62.1	29 29.8 -11.5 62.3
27°	32 47.1 -14.4 60.2	31 55.1 -13.9 60.5	31 02.9 -13.2 60.7	30 10.6 -12.6 60.9	29 18.3 -12.1 61.1
28°	32 32.7 -15.1 59.1	31 41.2 -14.4 59.3	30 49.7 -13.8 59.6	29 58.0 -13.2 59.8	29 06.2 -12.6 60.0
29°	32 17.6 -15.7 57.9	31 26.8 -15.0 58.2	30 35.9 -14.4 58.4	29 44.8 -13.8 58.7	28 53.6 -13.2 58.9

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Declination SAME name as Latitude

Latitude 4°

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 55.2 +04.5 92.3	28 55.4 +04.5 92.2	27 55.5 +04.5 92.1	26 55.7 +04.5 92.0	25 55.9 +04.4 91.9
1°	29 59.7 +03.9 91.2	28 59.9 +03.9 91.1	28 00.0 +03.9 91.0	27 00.2 +03.9 90.9	26 00.3 +03.9 90.8
2°	30 03.6 +03.3 90.0	29 03.8 +03.3 89.9	28 03.9 +03.4 89.9	27 04.1 +03.3 89.8	26 04.2 +03.4 89.7
3°	30 06.9 +02.8 88.8	29 07.1 +02.8 88.8	28 07.3 +02.8 88.7	27 07.4 +02.9 88.7	26 07.6 +02.9 88.6
4°	30 09.7 +02.1 87.7	29 09.9 +02.1 87.6	28 10.1 +02.2 87.6	27 10.3 +02.3 87.6	26 10.5 +02.3 87.5
5°	30 11.8 +01.5 86.5	29 12.0 +01.6 86.5	28 12.3 +01.7 86.5	27 12.6 +01.7 86.4	26 12.8 +01.9 86.4
6°	30 13.3 +00.9 85.4	29 13.6 +01.0 85.4	28 14.0 +01.1 85.3	27 14.3 +01.2 85.3	26 14.7 +01.3 85.3
7°	30 14.2 +00.3 84.2	29 14.6 +00.4 84.2	28 15.1 +00.5 84.2	27 15.5 +00.7 84.2	26 16.0 +00.8 84.2
8°	30 14.5 -00.4 83.1	29 15.0 -00.1 83.1	28 15.6 +00.0 83.1	27 16.2 +00.1 83.1	26 16.8 +00.3 83.0
9°	30 14.1 -00.9 81.9	29 14.9 -00.8 81.9	28 15.6 -00.6 81.9	27 16.3 -00.4 81.9	26 17.1 -00.2 81.9
10°	30 13.2 -01.6 80.8	29 14.1 -01.3 80.8	28 15.0 -01.1 80.8	27 15.9 -00.9 80.8	26 16.9 -00.8 80.8
11°	30 11.6 -02.1 79.6	29 12.8 -02.0 79.6	28 13.9 -01.7 79.7	27 15.0 -01.5 79.7	26 16.1 -01.2 79.7
12°	30 09.5 -02.8 78.4	29 10.8 -02.5 78.5	28 12.2 -02.3 78.5	27 13.5 -02.0 78.6	26 14.9 -01.8 78.6
13°	30 06.7 -03.4 77.3	29 08.3 -03.1 77.3	28 09.9 -02.8 77.4	27 11.5 -02.6 77.4	26 13.1 -02.3 77.5
14°	30 03.3 -03.9 76.1	29 05.2 -03.7 76.2	28 07.1 -03.4 76.3	27 08.9 -03.0 76.3	26 10.8 -02.8 76.4
15°	29 59.4 -04.6 75.0	29 01.5 -04.2 75.1	28 03.7 -03.9 75.1	27 05.9 -03.7 75.2	26 08.0 -03.3 75.2
16°	29 54.8 -05.2 73.8	28 57.3 -04.8 73.9	27 59.8 -04.5 74.0	27 02.2 -04.1 74.1	26 04.7 -03.9 74.1
17°	29 49.6 -05.8 72.7	28 52.5 -05.4 72.8	27 55.3 -05.1 72.9	26 58.1 -04.7 72.9	26 00.8 -04.3 73.0
18°	29 43.8 -06.3 71.5	28 47.1 -06.0 71.6	27 50.2 -05.6 71.7	26 53.4 -05.2 71.8	25 56.5 -04.8 71.9
19°	29 37.5 -07.0 70.4	28 41.1 -06.6 70.5	27 44.6 -06.1 70.6	26 48.2 -05.8 70.7	25 51.7 -05.4 70.8
20°	29 30.5 -07.5 69.2	28 34.5 -07.1 69.4	27 38.5 -06.7 69.5	26 42.4 -06.2 69.6	25 46.3 -05.8 69.7
21°	29 23.0 -08.1 68.1	28 27.4 -07.6 68.2	27 31.8 -07.2 68.4	26 36.2 -06.8 68.5	25 40.5 -06.4 68.6
22°	29 14.9 -08.7 67.0	28 19.8 -08.2 67.1	27 24.6 -07.7 67.2	26 29.4 -07.3 67.4	25 34.1 -06.8 67.5
23°	29 06.2 -09.3 65.8	28 11.6 -08.8 66.0	27 16.9 -08.3 66.1	26 22.1 -07.8 66.3	25 27.3 -07.4 66.4
24°	28 56.9 -09.8 64.7	28 02.8 -09.3 64.9	27 08.6 -08.8 65.0	26 14.3 -08.3 65.2	25 19.9 -07.8 65.3
25°	28 47.1 -10.4 63.6	27 53.5 -09.9 63.7	26 59.8 -09.4 63.9	26 06.0 -08.8 64.1	25 12.1 -08.3 64.2
26°	28 36.7 -10.9 62.5	27 43.6 -10.4 62.6	26 50.4 -09.8 62.8	25 57.2 -09.3 63.0	25 03.8 -08.8 63.1
27°	28 25.8 -11.5 61.3	27 33.2 -10.9 61.5	26 40.6 -10.4 61.7	25 47.9 -09.9 61.9	24 55.0 -09.2 62.0
28°	28 14.3 -12.0 60.2	27 22.3 -11.4 60.4	26 30.2 -10.8 60.6	25 38.0 -10.2 60.8	24 45.8 -09.8 60.9
29°	28 02.3 -12.6 59.1	27 10.9 -12.0 59.3	26 19.4 -11.4 59.5	25 27.8 -10.8 59.7	24 36.0 -10.2 59.8

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 56.1 +04.4 91.9	23 56.3 +04.3 91.8	22 56.4 +04.4 91.7	21 56.6 +04.3 91.6	20 56.8 +04.3 91.5
1°	25 00.5 +03.9 90.8	24 00.6 +03.9 90.7	23 00.8 +03.9 90.6	22 00.9 +03.9 90.5	21 01.1 +03.8 90.5
2°	25 04.4 +03.4 89.7	24 04.5 +03.4 89.6	23 04.7 +03.4 89.5	22 04.8 +03.5 89.5	21 04.9 +03.5 89.4
3°	25 07.8 +02.9 88.6	24 07.9 +03.0 88.5	23 08.1 +03.0 88.4	22 08.3 +03.0 88.4	21 08.4 +03.1 88.3
4°	25 10.7 +02.4 87.5	24 10.9 +02.5 87.4	23 11.1 +02.5 87.4	22 11.3 +02.6 87.3	21 11.5 +02.7 87.3
5°	25 13.1 +01.9 86.4	24 13.4 +02.0 86.3	23 13.6 +02.1 86.3	22 13.9 +02.2 86.2	21 14.2 +02.2 86.2
6°	25 15.0 +01.4 85.2	24 15.4 +01.5 85.2	23 15.7 +01.7 85.2	22 16.1 +01.7 85.1	21 16.4 +01.9 85.1
7°	25 16.4 +01.0 84.1	24 16.9 +01.1 84.1	23 17.4 +01.2 84.1	22 17.8 +01.3 84.1	21 18.3 +01.4 84.0
8°	25 17.4 +00.4 83.0	24 18.0 +00.6 83.0	23 18.6 +00.7 83.0	22 19.1 +00.9 83.0	21 19.7 +01.1 83.0
9°	25 17.8 +00.0 81.9	24 18.6 +00.1 81.9	23 19.3 +00.3 81.9	22 20.0 +00.5 81.9	21 20.8 +00.6 81.9
10°	25 17.8 -00.6 80.8	24 18.7 -00.4 80.8	23 19.6 -00.2 80.8	22 20.5 +00.0 80.8	21 21.4 +00.2 80.8
11°	25 17.2 -01.0 79.7	24 18.3 -00.8 79.7	23 19.4 -00.6 79.7	22 20.5 -00.4 79.7	21 21.6 -00.2 79.7
12°	25 16.2 -01.6 78.6	24 17.5 -01.3 78.6	23 18.8 -01.0 78.6	22 20.1 -00.8 78.7	21 21.4 -00.5 78.7
13°	25 14.6 -02.0 77.5	24 16.2 -01.8 77.5	23 17.8 -01.6 77.6	22 19.3 -01.3 77.6	21 20.9 -01.1 77.6
14°	25 12.6 -02.5 76.4	24 14.4 -02.2 76.4	23 16.2 -01.9 76.5	22 18.0 -01.6 76.5	21 19.8 -01.4 76.5
15°	25 10.1 -03.0 75.3	24 12.2 -02.7 75.3	23 14.3 -02.4 75.4	22 16.4 -02.2 75.4	21 18.4 -01.8 75.5
16°	25 07.1 -03.5 74.2	24 09.5 -03.2 74.2	23 11.9 -02.9 74.3	22 14.2 -02.5 74.3	21 16.6 -02.2 74.4
17°	25 03.6 -04.0 73.1	24 06.3 -03.6 73.2	23 09.0 -03.3 73.2	22 11.7 -03.0 73.3	21 14.4 -02.7 73.3
18°	24 59.6 -04.5 72.0	24 02.7 -04.2 72.1	23 05.7 -03.7 72.1	22 08.7 -03.4 72.2	21 11.7 -03.0 72.2
19°	24 55.1 -04.9 70.9	23 58.5 -04.5 71.0	23 02.0 -04.2 71.0	22 05.3 -03.8 71.1	21 08.7 -03.4 71.2
20°	24 50.2 -05.5 69.8	23 54.0 -05.1 69.9	22 57.8 -04.7 70.0	22 01.5 -04.2 70.0	21 05.3 -03.9 70.1
21°	24 44.7 -05.9 68.7	23 48.9 -05.5 68.8	22 53.1 -05.1 68.9	21 57.3 -04.7 69.0	21 01.4 -04.2 69.0
22°	24 38.8 -06.4 67.6	23 43.4 -05.9 67.7	22 48.0 -05.5 67.8	21 52.6 -05.1 67.9	20 57.2 -04.7 68.0
23°	24 32.4 -06.9 66.5	23 37.5 -06.4 66.6	22 42.5 -05.9 66.7	21 47.5 -05.5 66.8	20 52.5 -05.0 66.9
24°	24 25.5 -07.3 65.4	23 31.1 -06.9 65.5	22 36.6 -06.4 65.6	21 42.0 -05.9 65.7	20 47.5 -05.5 65.8
25°	24 18.2 -07.8 64.3	23 24.2 -07.3 64.4	22 30.2 -06.8 64.6	21 36.1 -06.3 64.7	20 42.0 -05.8 64.8
26°	24 10.4 -08.3 63.2	23 16.9 -07.7 63.4	22 23.4 -07.2 63.5	21 29.8 -06.7 63.6	20 36.2 -06.2 63.7
27°	24 02.1 -08.7 62.2	23 09.2 -08.2 62.3	22 16.2 -07.7 62.4	21 23.1 -07.1 62.5	20 30.0 -06.6 62.6
28°	23 53.4 -09.1 61.1	23 01.0 -08.6 61.2	22 08.5 -08.1 61.3	21 16.0 -07.6 61.5	20 23.4 -07.0 61.6
29°	23 44.3 -09.7 60.0	22 52.4 -09.1 60.1	22 00.4 -08.4 60.3	21 08.4 -07.9 60.4	20 16.4 -07.4 60.5

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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 57.0 +04.2 91.5	18 57.1 +04.3 91.4	17 57.3 +04.2 91.3	16 57.4 +04.3 91.2	15 57.6 +04.2 91.1
1°	20 01.2 +03.9 90.4	19 01.4 +03.8 90.3	18 01.5 +03.9 90.2	17 01.7 +03.9 90.2	16 01.8 +03.9 90.1
2°	20 05.1 +03.5 89.3	19 05.2 +03.6 89.3	18 05.4 +03.6 89.2	17 05.6 +03.5 89.1	16 05.7 +03.6 89.1
3°	20 08.6 +03.1 88.3	19 08.8 +03.1 88.2	18 09.0 +03.2 88.1	17 09.1 +03.3 88.1	16 09.3 +03.3 88.0
4°	20 11.7 +02.8 87.2	19 11.9 +02.8 87.2	18 12.2 +02.8 87.1	17 12.4 +02.9 87.0	16 12.6 +03.0 87.0
5°	20 14.5 +02.3 86.1	19 14.7 +02.5 86.1	18 15.0 +02.5 86.0	17 15.3 +02.6 86.0	16 15.6 +02.7 86.0
6°	20 16.8 +02.0 85.1	19 17.2 +02.0 85.0	18 17.5 +02.2 85.0	17 17.9 +02.3 85.0	16 18.3 +02.4 84.9
7°	20 18.8 +01.5 84.0	19 19.2 +01.7 84.0	18 19.7 +01.8 83.9	17 20.2 +02.0 83.9	16 20.7 +02.1 83.9
8°	20 20.3 +01.2 82.9	19 20.9 +01.4 82.9	18 21.5 +01.5 82.9	17 22.2 +01.6 82.9	16 22.8 +01.7 82.8
9°	20 21.5 +00.8 81.9	19 22.3 +00.9 81.9	18 23.0 +01.2 81.8	17 23.8 +01.3 81.8	16 24.5 +01.5 81.8
10°	20 22.3 +00.4 80.8	19 23.2 +00.6 80.8	18 24.2 +00.7 80.8	17 25.1 +01.0 80.8	16 26.0 +01.2 80.7
11°	20 22.7 +00.1 79.7	19 23.8 +00.3 79.7	18 24.9 +00.5 79.7	17 26.1 +00.6 79.7	16 27.2 +00.8 79.7
12°	20 22.8 -00.4 78.7	19 24.1 -00.2 78.7	18 25.4 +00.1 78.7	17 26.7 +00.3 78.7	16 28.0 +00.5 78.7
13°	20 22.4 -00.8 77.6	19 23.9 -00.5 77.6	18 25.5 -00.3 77.6	17 27.0 +00.0 77.6	16 28.5 +00.3 77.6
14°	20 21.6 -01.1 76.5	19 23.4 -00.9 76.6	18 25.2 -00.6 76.6	17 27.0 -00.4 76.6	16 28.8 -00.1 76.6
15°	20 20.5 -01.5 75.5	19 22.5 -01.2 75.5	18 24.6 -01.0 75.5	17 26.6 -00.6 75.5	16 28.7 -00.4 75.5
16°	20 19.0 -02.0 74.4	19 21.3 -01.6 74.4	18 23.6 -01.3 74.5	17 26.0 -01.0 74.5	16 28.3 -00.7 74.5
17°	20 17.0 -02.3 73.3	19 19.7 -02.0 73.4	18 22.3 -01.6 73.4	17 25.0 -01.4 73.4	16 27.6 -01.0 73.4
18°	20 14.7 -02.7 72.3	19 17.7 -02.3 72.3	18 20.7 -02.0 72.4	17 23.6 -01.6 72.4	16 26.6 -01.3 72.4
19°	20 12.0 -03.0 71.2	19 15.4 -02.7 71.3	18 18.7 -02.4 71.3	17 22.0 -02.0 71.3	16 25.3 -01.7 71.4
20°	20 09.0 -03.5 70.2	19 12.7 -03.1 70.2	18 16.3 -02.7 70.2	17 20.0 -02.3 70.3	16 23.6 -01.9 70.3
21°	20 05.5 -03.8 69.1	19 09.6 -03.5 69.1	18 13.6 -03.0 69.2	17 17.7 -02.7 69.2	16 21.7 -02.2 69.3
22°	20 01.7 -04.3 68.0	19 06.1 -03.8 68.1	18 10.6 -03.4 68.1	17 15.0 -02.9 68.2	16 19.5 -02.6 68.2
23°	19 57.4 -04.6 67.0	19 02.3 -04.1 67.0	18 07.2 -03.7 67.1	17 12.1 -03.3 67.1	16 16.9 -02.8 67.2
24°	19 52.8 -04.9 65.9	18 58.2 -04.5 66.0	18 03.5 -04.1 66.0	17 08.8 -03.6 66.1	16 14.1 -03.2 66.2
25°	19 47.9 -05.4 64.8	18 53.7 -04.9 64.9	17 59.4 -04.4 65.0	17 05.2 -03.9 65.1	16 10.9 -03.5 65.1
26°	19 42.5 -05.7 63.8	18 48.8 -05.2 63.9	17 55.0 -04.7 63.9	17 01.3 -04.3 64.0	16 07.4 -03.7 64.1
27°	19 36.8 -06.1 62.7	18 43.6 -05.6 62.8	17 50.3 -05.1 62.9	16 57.0 -04.6 63.0	16 03.7 -04.1 63.0
28°	19 30.7 -06.5 61.7	18 38.0 -05.9 61.8	17 45.2 -05.4 61.9	16 52.4 -04.8 61.9	15 59.6 -04.3 62.0
29°	19 24.2 -06.8 60.6	18 32.1 -06.3 60.7	17 39.8 -05.7 60.8	16 47.6 -05.2 60.9	15 55.3 -04.7 61.0

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 57.8 +04.1 91.1	13 57.9 +04.2 91.0	12 58.1 +04.1 90.9	11 58.2 +04.2 90.8	10 58.4 +04.1 90.8
1°	15 01.9 +04.0 90.0	14 02.1 +03.9 90.0	13 02.2 +04.0 89.9	12 02.4 +03.9 89.8	11 02.5 +04.0 89.8
2°	15 05.9 +03.6 89.0	14 06.0 +03.7 88.9	13 06.2 +03.7 88.9	12 06.3 +03.8 88.8	11 06.5 +03.7 88.7
3°	15 09.5 +03.3 88.0	14 09.7 +03.4 87.9	13 09.9 +03.4 87.8	12 10.1 +03.5 87.8	11 10.2 +03.6 87.7
4°	15 12.8 +03.1 86.9	14 13.1 +03.1 86.9	13 13.3 +03.2 86.8	12 13.6 +03.2 86.8	11 13.8 +03.3 86.7
5°	15 15.9 +02.8 85.9	14 16.2 +02.9 85.9	13 16.5 +03.0 85.8	12 16.8 +03.1 85.7	11 17.1 +03.2 85.7
6°	15 18.7 +02.5 84.9	14 19.1 +02.6 84.8	13 19.5 +02.7 84.8	12 19.9 +02.8 84.7	11 20.3 +02.9 84.7
7°	15 21.2 +02.2 83.8	14 21.7 +02.3 83.8	13 22.2 +02.4 83.7	12 22.7 +02.6 83.7	11 23.2 +02.7 83.7
8°	15 23.4 +01.9 82.8	14 24.0 +02.1 82.8	13 24.6 +02.2 82.7	12 25.3 +02.3 82.7	11 25.9 +02.5 82.6
9°	15 25.3 +01.6 81.8	14 26.1 +01.8 81.7	13 26.8 +02.0 81.7	12 27.6 +02.1 81.7	11 28.4 +02.3 81.6
10°	15 26.9 +01.4 80.7	14 27.9 +01.5 80.7	13 28.8 +01.7 80.7	12 29.7 +01.9 80.6	11 30.7 +02.1 80.6
11°	15 28.3 +01.0 79.7	14 29.4 +01.2 79.7	13 30.5 +01.5 79.6	12 31.6 +01.7 79.6	11 32.8 +01.8 79.6
12°	15 29.3 +00.8 78.6	14 30.6 +01.0 78.6	13 32.0 +01.2 78.6	12 33.3 +01.4 78.6	11 34.6 +01.7 78.6
13°	15 30.1 +00.5 77.6	14 31.6 +00.7 77.6	13 33.2 +00.9 77.6	12 34.7 +01.2 77.6	11 36.3 +01.4 77.5
14°	15 30.6 +00.1 76.6	14 32.3 +00.5 76.6	13 34.1 +00.7 76.5	12 35.9 +01.0 76.5	11 37.7 +01.2 76.5
15°	15 30.7 -00.1 75.5	14 32.8 +00.2 75.5	13 34.8 +00.5 75.5	12 36.9 +00.7 75.5	11 38.9 +01.0 75.5
16°	15 30.6 -00.4 74.5	14 33.0 -00.2 74.5	13 35.3 +00.2 74.5	12 37.6 +00.5 74.5	11 39.9 +00.8 74.5
17°	15 30.2 -00.7 73.5	14 32.8 -00.3 73.5	13 35.5 -00.1 73.5	12 38.1 +00.2 73.5	11 40.7 +00.6 73.5
18°	15 29.5 -00.9 72.4	14 32.5 -00.7 72.4	13 35.4 -00.3 72.4	12 38.3 +00.1 72.4	11 41.3 +00.3 72.4
19°	15 28.6 -01.3 71.4	14 31.8 -00.9 71.4	13 35.1 -00.6 71.4	12 38.4 -00.2 71.4	11 41.6 +00.2 71.4
20°	15 27.3 -01.6 70.3	14 30.9 -01.2 70.4	13 34.5 -00.8 70.4	12 38.2 -00.5 70.4	11 41.8 -00.1 70.4
21°	15 25.7 -01.8 69.3	14 29.7 -01.4 69.3	13 33.7 -01.1 69.3	12 37.7 -00.7 69.4	11 41.7 -00.3 69.4
22°	15 23.9 -02.2 68.3	14 28.3 -01.8 68.3	13 32.6 -01.3 68.3	12 37.0 -00.9 68.3	11 41.4 -00.5 68.3
23°	15 21.7 -02.4 67.2	14 26.5 -02.0 67.3	13 31.3 -01.5 67.3	12 36.1 -01.1 67.3	11 40.9 -00.7 67.3
24°	15 19.3 -02.7 66.2	14 24.5 -02.2 66.2	13 29.8 -01.9 66.3	12 35.0 -01.4 66.3	11 40.2 -01.0 66.3
25°	15 16.6 -03.0 65.2	14 22.3 -02.6 65.2	13 27.9 -02.0 65.2	12 33.6 -01.6 65.3	11 39.2 -01.2 65.3
26°	15 13.6 -03.3 64.1	14 19.7 -02.8 64.2	13 25.9 -02.4 64.2	12 32.0 -01.9 64.2	11 38.0 -01.3 64.3
27°	15 10.3 -03.5 63.1	14 16.9 -03.0 63.1	13 23.5 -02.5 63.2	12 30.1 -02.1 63.2	11 36.7 -01.6 63.2
28°	15 06.8 -03.9 62.1	14 13.9 -03.4 62.1	13 21.0 -02.9 62.2	12 28.0 -02.3 62.2	11 35.1 -01.8 62.2
29°	15 02.9 -04.1 61.0	14 10.5 -03.6 61.1	13 18.1 -03.0 61.1	12 25.7 -02.5 61.2	11 33.3 -02.1 61.2

Declination SAME name as Latitude

Latitude 4°

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 58.5 +04.2 90.7	8 58.7 +04.1 90.6	7 58.8 +04.2 90.6	6 59.0 +04.1 90.5	5 59.1 +04.2 90.4
1°	10 02.7 +04.0 89.7	9 02.8 +04.0 89.6	8 03.0 +04.0 89.6	7 03.1 +04.0 89.5	6 03.3 +04.0 89.4
2°	10 06.7 +03.7 88.7	9 06.8 +03.8 88.6	8 07.0 +03.8 88.5	7 07.1 +03.9 88.5	6 07.3 +03.9 88.4
3°	10 10.4 +03.6 87.7	9 10.6 +03.7 87.6	8 10.8 +03.7 87.5	7 11.0 +03.8 87.5	6 11.2 +03.9 87.4
4°	10 14.0 +03.5 86.7	9 14.3 +03.5 86.6	8 14.5 +03.6 86.5	7 14.8 +03.6 86.5	6 15.1 +03.7 86.4
5°	10 17.5 +03.2 85.6	9 17.8 +03.3 85.6	8 18.1 +03.4 85.5	7 18.4 +03.5 85.5	6 18.8 +03.6 85.4
6°	10 20.7 +03.0 84.6	9 21.1 +03.1 84.6	8 21.5 +03.3 84.5	7 21.9 +03.4 84.5	6 22.4 +03.4 84.4
7°	10 23.7 +02.8 83.6	9 24.2 +03.0 83.6	8 24.8 +03.1 83.5	7 25.3 +03.2 83.4	6 25.8 +03.4 83.4
8°	10 26.5 +02.7 82.6	9 27.2 +02.8 82.5	8 27.9 +02.9 82.5	7 28.5 +03.1 82.4	6 29.2 +03.2 82.4
9°	10 29.2 +02.4 81.6	9 30.0 +02.6 81.5	8 30.8 +02.8 81.5	7 31.6 +03.0 81.4	6 32.4 +03.1 81.4
10°	10 31.6 +02.3 80.6	9 32.6 +02.5 80.5	8 33.6 +02.6 80.5	7 34.6 +02.8 80.4	6 35.5 +03.0 80.4
11°	10 33.9 +02.1 79.5	9 35.1 +02.2 79.5	8 36.2 +02.5 79.5	7 37.4 +02.6 79.4	6 38.5 +02.9 79.4
12°	10 36.0 +01.8 78.5	9 37.3 +02.1 78.5	8 38.7 +02.3 78.5	7 40.0 +02.6 78.4	6 41.4 +02.8 78.4
13°	10 37.8 +01.7 77.5	9 39.4 +01.9 77.5	8 41.0 +02.1 77.4	7 42.6 +02.4 77.4	6 44.2 +02.6 77.4
14°	10 39.5 +01.5 76.5	9 41.3 +01.7 76.5	8 43.1 +02.0 76.4	7 45.0 +02.2 76.4	6 46.8 +02.5 76.4
15°	10 41.0 +01.3 75.5	9 43.0 +01.6 75.4	8 45.1 +01.8 75.4	7 47.2 +02.1 75.4	6 49.3 +02.4 75.3
16°	10 42.3 +01.0 74.5	9 44.6 +01.4 74.4	8 46.9 +01.7 74.4	7 49.3 +02.0 74.4	6 51.7 +02.2 74.3
17°	10 43.3 +00.9 73.4	9 46.0 +01.2 73.4	8 48.6 +01.5 73.4	7 51.3 +01.8 73.4	6 53.9 +02.1 73.3
18°	10 44.2 +00.7 72.4	9 47.2 +01.0 72.4	8 50.1 +01.4 72.4	7 53.1 +01.6 72.4	6 56.0 +02.0 72.3
19°	10 44.9 +00.5 71.4	9 48.2 +00.8 71.4	8 51.5 +01.1 71.4	7 54.7 +01.6 71.4	6 58.0 +01.9 71.3
20°	10 45.4 +00.3 70.4	9 49.0 +00.7 70.4	8 52.6 +01.1 70.4	7 56.3 +01.4 70.3	6 59.9 +01.8 70.3
21°	10 45.7 +00.1 69.4	9 49.7 +00.4 69.4	8 53.7 +00.8 69.3	7 57.7 +01.2 69.3	7 01.7 +01.6 69.3
22°	10 45.8 -00.1 68.3	9 50.1 +00.3 68.3	8 54.5 +00.7 68.3	7 58.9 +01.1 68.3	7 03.3 +01.4 68.3
23°	10 45.7 -00.4 67.3	9 50.4 +00.1 67.3	8 55.2 +00.5 67.3	8 00.0 +00.9 67.3	7 04.7 +01.4 67.3
24°	10 45.3 -00.5 66.3	9 50.5 +00.0 66.3	8 55.7 +00.4 66.3	8 00.9 +00.8 66.3	7 06.1 +01.2 66.3
25°	10 44.8 -00.7 65.3	9 50.5 -00.3 65.3	8 56.1 +00.2 65.3	8 01.7 +00.6 65.3	7 07.3 +01.1 65.3
26°	10 44.1 -00.9 64.3	9 50.2 -00.4 64.3	8 56.3 +00.0 64.3	8 02.3 +00.5 64.3	7 08.4 +01.0 64.3
27°	10 43.2 -01.1 63.3	9 49.8 -00.7 63.3	8 56.3 -00.1 63.3	8 02.8 +00.4 63.3	7 09.4 +00.8 63.3
28°	10 42.1 -01.3 62.2	9 49.1 -00.8 62.3	8 56.2 -00.3 62.3	8 03.2 +00.2 62.3	7 10.2 +00.7 62.3
29°	10 40.8 -01.5 61.2	9 48.3 -00.9 61.2	8 55.9 -00.5 61.3	8 03.4 +00.0 61.3	7 10.9 +00.6 61.2

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 59.3 +04.1 90.3	3 59.4 +04.2 90.3	2 59.6 +04.1 90.2	1 59.7 +04.2 90.1	0 59.9 +04.1 90.1
1°	5 03.4 +04.1 89.3	4 03.6 +04.1 89.3	3 03.7 +04.1 89.2	2 03.9 +04.1 89.1	1 04.0 +04.2 89.1
2°	5 07.5 +04.0 88.3	4 07.7 +04.0 88.3	3 07.8 +04.1 88.2	2 08.0 +04.1 88.1	1 08.2 +04.1 88.1
3°	5 11.5 +03.8 87.3	4 11.7 +03.9 87.3	3 11.9 +04.0 87.2	2 12.1 +04.1 87.1	1 12.3 +04.1 87.1
4°	5 15.3 +03.8 86.3	4 15.6 +03.9 86.3	3 15.9 +03.9 86.2	2 16.2 +04.0 86.1	1 16.4 +04.1 86.1
5°	5 19.1 +03.7 85.3	4 19.5 +03.7 85.3	3 19.8 +03.9 85.2	2 20.2 +03.9 85.1	1 20.5 +04.1 85.1
6°	5 22.8 +03.6 84.3	4 23.2 +03.7 84.3	3 23.7 +03.8 84.2	2 24.1 +04.0 84.1	1 24.6 +04.0 84.1
7°	5 26.4 +03.5 83.3	4 26.9 +03.6 83.3	3 27.5 +03.7 83.2	2 28.1 +03.8 83.2	1 28.6 +04.1 83.1
8°	5 29.9 +03.3 82.3	4 30.5 +03.6 82.3	3 31.2 +03.7 82.2	2 31.9 +03.9 82.2	1 32.7 +03.9 82.1
9°	5 33.2 +03.3 81.3	4 34.1 +03.4 81.3	3 34.9 +03.6 81.2	2 35.8 +03.8 81.2	1 36.6 +04.0 81.1
10°	5 36.5 +03.2 80.3	4 37.5 +03.4 80.3	3 38.5 +03.6 80.2	2 39.6 +03.7 80.2	1 40.6 +03.9 80.1
11°	5 39.7 +03.1 79.3	4 40.9 +03.3 79.3	3 42.1 +03.5 79.2	2 43.3 +03.7 79.2	1 44.5 +03.9 79.1
12°	5 42.8 +03.0 78.3	4 44.2 +03.2 78.3	3 45.6 +03.4 78.2	2 47.0 +03.6 78.2	1 48.4 +03.9 78.1
13°	5 45.8 +02.8 77.3	4 47.4 +03.1 77.3	3 49.0 +03.3 77.2	2 50.6 +03.6 77.2	1 52.3 +03.8 77.1
14°	5 48.6 +02.8 76.3	4 50.5 +03.0 76.3	3 52.3 +03.3 76.2	2 54.2 +03.6 76.2	1 56.1 +03.8 76.1
15°	5 51.4 +02.6 75.3	4 53.5 +02.9 75.3	3 55.6 +03.2 75.2	2 57.8 +03.4 75.2	1 59.9 +03.8 75.1
16°	5 54.0 +02.6 74.3	4 56.4 +02.9 74.3	3 58.8 +03.1 74.2	3 01.2 +03.5 74.2	2 03.7 +03.7 74.1
17°	5 56.6 +02.4 73.3	4 59.3 +02.7 73.3	4 01.9 +03.1 73.2	3 04.7 +03.3 73.2	2 07.4 +03.7 73.1
18°	5 59.0 +02.3 72.3	5 02.0 +02.7 72.3	4 05.0 +03.0 72.2	3 08.0 +03.3 72.2	2 11.1 +03.6 72.1
19°	6 01.3 +02.3 71.3	5 04.7 +02.5 71.3	4 08.0 +02.9 71.2	3 11.3 +03.3 71.2	2 14.7 +03.6 71.1
20°	6 03.6 +02.1 70.3	5 07.2 +02.5 70.2	4 10.9 +02.8 70.2	3 14.6 +03.2 70.2	2 18.3 +03.6 70.1
21°	6 05.7 +02.0 69.3	5 09.7 +02.4 69.2	4 13.7 +02.8 69.2	3 17.8 +03.1 69.2	2 21.9 +03.5 69.1
22°	6 07.7 +01.8 68.3	5 12.1 +02.2 68.2	4 16.5 +02.7 68.2	3 20.9 +03.1 68.2	2 25.4 +03.4 68.1
23°	6 09.5 +01.8 67.3	5 14.3 +02.2 67.2	4 19.2 +02.6 67.2	3 24.0 +03.0 67.2	2 28.8 +03.5 67.1
24°	6 11.3 +01.7 66.3	5 16.5 +02.1 66.2	4 21.8 +02.5 66.2	3 27.0 +02.9 66.2	2 32.3 +03.3 66.1
25°	6 13.0 +01.5 65.3	5 18.6 +02.0 65.2	4 24.3 +02.4 65.2	3 29.9 +02.9 65.2	2 35.6 +03.4 65.1
26°	6 14.5 +01.4 64.3	5 20.6 +01.9 64.2	4 26.7 +02.4 64.2	3 32.8 +02.8 64.2	2 39.0 +03.3 64.1
27°	6 15.9 +01.3 63.3	5 22.5 +01.8 63.2	4 29.1 +02.2 63.2	3 35.6 +02.8 63.2	2 42.3 +03.2 63.1
28°	6 17.2 +01.2 62.2	5 24.3 +01.7 62.2	4 31.3 +02.2 62.2	3 38.4 +02.7 62.2	2 45.5 +03.2 62.1
29°	6 18.4 +01.1 61.2	5 26.0 +01.6 61.2	4 33.5 +02.1 61.2	3 41.1 +02.6 61.2	2 48.7 +03.1 61.1

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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 +04.2 90.0	-0 59.9 +04.2	-1 59.7 +04.2	-2 59.6 +04.3	
1°	0 04.2 +04.2 89.0	-0 55.7 +04.3	-1 55.5 +04.2	-2 55.3 +04.2	
2°	0 08.4 +04.2 88.0	-0 51.4 +04.2	-1 51.3 +04.3	-2 51.1 +04.4	
3°	0 12.6 +04.1 87.0	-0 47.2 +04.2	-1 47.0 +04.3	-2 46.7 +04.3	
4°	0 16.7 +04.2 86.0	-0 43.0 +04.3	-1 42.7 +04.4	-2 42.4 +04.4	
5°	0 20.9 +04.2 85.0	-0 38.7 +04.2	-1 38.3 +04.3	-2 38.0 +04.5	
6°	0 25.1 +04.1 84.0	-0 34.5 +04.3	-1 34.0 +04.4	-2 33.5 +04.5	
7°	0 29.2 +04.2 83.0	-0 30.2 +04.3	-1 29.6 +04.4	-2 29.0 +04.6	
8°	0 33.4 +04.1 82.0	-0 25.9 +04.3	-1 25.2 +04.5	-2 24.4 +04.6	
9°	0 37.5 +04.1 81.0	-0 21.6 +04.3	-1 20.7 +04.5	-2 19.8 +04.7	
10°	0 41.6 +04.2 80.0	-0 17.3 +04.3	-1 16.2 +04.5	-2 15.1 +04.6	
11°	0 45.8 +04.1 79.0	-0 13.0 +04.3	-1 11.7 +04.5	-2 10.5 +04.8	
12°	0 49.9 +04.0 78.0	-0 08.7 +04.3	-1 07.2 +04.5	-2 05.7 +04.7	
13°	0 53.9 +04.1 77.0	-0 04.4 +04.3	-1 02.7 +04.6	-2 01.0 +04.8	
14°	0 58.0 +04.1 76.0	-0 00.1 +04.4	-0 58.1 +04.6	-1 56.2 +04.9	
15°	1 02.1 +04.0 75.0	0 04.3 +04.3 75.0	-0 53.5 +04.6	-1 51.3 +04.9	
16°	1 06.1 +04.0 74.0	0 08.6 +04.3 74.0	-0 48.9 +04.6	-1 46.4 +04.9	
17°	1 10.1 +04.0 73.0	0 12.9 +04.3 73.0	-0 44.3 +04.6	-1 41.5 +04.9	
18°	1 14.1 +04.0 72.0	0 17.2 +04.3 72.0	-0 39.7 +04.6	-1 36.6 +05.0	
19°	1 18.1 +03.9 71.0	0 21.5 +04.3 71.0	-0 35.1 +04.7	-1 31.6 +05.0	
20°	1 22.0 +03.9 70.0	0 25.8 +04.3 70.0	-0 30.4 +04.6	-1 26.6 +05.0	
21°	1 25.9 +03.9 69.0	0 30.1 +04.2 69.0	-0 25.8 +04.7	-1 21.6 +05.0	
22°	1 29.8 +03.9 68.0	0 34.3 +04.3 68.0	-0 21.1 +04.6	-1 16.6 +05.1	
23°	1 33.7 +03.9 67.1	0 38.6 +04.3 67.0	-0 16.5 +04.7	-1 11.5 +05.1	
24°	1 37.6 +03.8 66.1	0 42.9 +04.2 66.0	-0 11.8 +04.7	-1 06.4 +05.1	
25°	1 41.4 +03.7 65.1	0 47.1 +04.2 65.0	-0 07.1 +04.7	-1 01.3 +05.1	
26°	1 45.1 +03.8 64.1	0 51.3 +04.2 64.0	-0 02.4 +04.6	-0 56.2 +05.1	
27°	1 48.9 +03.7 63.1	0 55.5 +04.2 63.0	0 02.2 +04.7 62.9	-0 51.1 +05.2	
28°	1 52.6 +03.7 62.1	0 59.7 +04.2 62.0	0 06.9 +04.7 61.9	-0 45.9 +05.2	
29°	1 56.3 +03.6 61.1	1 03.9 +04.2 61.0	0 11.6 +04.7 60.9	-0 40.7 +05.2	

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°					
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 5°

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°	85 00.0 +60.0 180.0	84 54.1 +58.5 168.7	84 36.9 +54.9 158.2	84 10.3 +49.9 149.0	83 36.0 +44.9 141.3
1°	86 00.0 +60.0 180.0	85 52.6 +57.7 166.0	85 31.8 +52.0 153.4	85 00.2 +45.5 143.1	84 20.9 +39.5 134.9
2°	87 00.0 +60.0 180.0	86 50.3 +55.6 161.6	86 23.8 +46.7 146.3	85 45.7 +38.3 135.0	85 00.4 +31.8 126.8
3°	88 00.0 +60.0 180.0	87 45.9 +49.4 153.5	87 10.5 +35.7 135.0	86 24.0 +26.8 123.6	85 32.2 +21.1 116.5
4°	89 00.0 +60.0 180.0	88 35.3 +24.9 135.0	87 46.2 +14.3 116.6	86 50.8 +09.9 108.4	85 53.3 +07.6 103.9
5°	90 00.0 -60.0 0.0	89 00.2 -24.9 90.0	88 00.5 -14.2 89.9	87 00.7 -09.6 89.9	86 00.9 -07.2 89.8
6°	89 00.0 -60.0 0.0	88 35.3 -49.3 44.8	87 46.3 -35.5 63.2	86 51.1 -26.6 71.3	85 53.7 -20.8 75.7
7°	88 00.0 -60.0 0.0	87 46.0 -55.6 26.4	87 10.8 -46.7 44.7	86 24.5 -38.2 56.0	85 32.9 -31.6 63.1
8°	87 00.0 -60.0 0.0	86 50.4 -57.7 18.3	86 24.1 -52.0 33.4	85 46.3 -45.5 44.7	85 01.3 -39.4 52.7
9°	86 00.0 -60.0 0.0	85 52.7 -58.5 13.9	85 32.1 -54.8 26.3	85 00.8 -49.8 36.5	84 21.9 -44.8 44.6
10°	85 00.0 -60.0 0.0	84 54.2 -59.1 11.2	84 37.3 -56.4 21.5	84 11.0 -52.7 30.6	83 37.1 -48.4 38.2
11°	84 00.0 -60.0 0.0	83 55.1 -59.3 9.3	83 40.9 -57.3 18.1	83 18.3 -54.4 26.1	82 48.7 -51.1 33.2
12°	83 00.0 -60.0 0.0	82 55.8 -59.4 8.0	82 43.6 -58.0 15.6	82 23.9 -55.7 22.8	81 57.6 -52.8 29.2
13°	82 00.0 -60.0 0.0	81 56.4 -59.6 7.0	81 45.6 -58.4 13.7	81 28.2 -56.6 20.1	81 04.8 -54.3 26.0
14°	81 00.0 -60.0 0.0	80 56.8 -59.7 6.2	80 47.2 -58.7 12.2	80 31.6 -57.2 18.0	80 10.5 -55.3 23.4
15°	80 00.0 -60.0 0.0	79 57.1 -59.7 5.5	79 48.5 -58.9 11.0	79 34.4 -57.6 16.2	79 15.2 -56.0 21.2
16°	79 00.0 -60.0 0.0	78 57.4 -59.8 5.0	78 49.6 -59.1 10.0	78 36.8 -58.1 14.8	78 19.2 -56.6 19.3
17°	78 00.0 -60.0 0.0	77 57.6 -59.8 4.6	77 50.5 -59.3 9.1	77 38.7 -58.3 13.5	77 22.6 -57.1 17.8
18°	77 00.0 -60.0 0.0	76 57.8 -59.8 4.2	76 51.2 -59.3 8.4	76 40.4 -58.6 12.5	76 25.5 -57.5 16.4
19°	76 00.0 -60.0 0.0	75 58.0 -59.9 3.9	75 51.9 -59.4 7.8	75 41.8 -58.7 11.6	75 28.0 -57.8 15.2
20°	75 00.0 -60.0 0.0	74 58.1 -59.9 3.6	74 52.5 -59.5 7.2	74 43.1 -58.9 10.8	74 30.2 -58.1 14.2
21°	74 00.0 -60.0 0.0	73 58.2 -59.9 3.4	73 53.0 -59.6 6.7	73 44.2 -59.0 10.0	73 32.1 -58.2 13.3
22°	73 00.0 -60.0 0.0	72 58.3 -59.9 3.2	72 53.4 -59.6 6.3	72 45.2 -59.1 9.4	72 33.9 -58.5 12.5
23°	72 00.0 -60.0 0.0	71 58.4 -59.9 3.0	71 53.8 -59.6 5.9	71 46.1 -59.2 8.9	71 35.4 -58.6 11.7
24°	71 00.0 -60.0 0.0	70 58.5 -59.9 2.8	70 54.2 -59.7 5.6	70 46.9 -59.3 8.4	70 36.8 -58.7 11.1
25°	70 00.0 -60.0 0.0	69 58.6 -59.9 2.6	69 54.5 -59.7 5.3	69 47.6 -59.3 7.9	69 38.1 -58.9 10.5
26°	69 00.0 -60.0 0.0	68 58.7 -59.9 2.5	68 54.8 -59.8 5.0	68 48.3 -59.4 7.5	68 39.2 -58.9 9.9
27°	68 00.0 -60.0 0.0	67 58.8 -60.0 2.4	67 55.0 -59.7 4.7	67 48.9 -59.5 7.1	67 40.3 -59.0 9.4
28°	67 00.0 -60.0 0.0	66 58.8 -59.9 2.3	66 55.3 -59.8 4.5	66 49.4 -59.5 6.7	66 41.3 -59.1 9.0
29°	66 00.0 -60.0 0.0	65 58.9 -60.0 2.1	65 55.5 -59.8 4.3	65 49.9 -59.5 6.4	65 42.2 -59.2 8.5

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°	82 56.0 +40.2 134.9	82 11.7 +36.1 129.7	81 24.3 +32.5 125.4	80 34.5 +29.5 121.8	79 42.9 +26.9 118.8
1°	83 36.2 +34.5 128.5	82 47.8 +30.3 123.5	81 56.8 +27.0 119.6	81 04.0 +24.3 116.3	80 09.8 +22.0 113.7
2°	84 10.7 +26.9 120.8	83 18.1 +23.3 116.4	82 23.8 +20.4 113.0	81 28.3 +18.1 110.3	80 31.8 +16.3 108.2
3°	84 37.6 +17.4 111.7	83 41.4 +14.7 108.3	82 44.2 +12.8 105.7	81 46.4 +11.3 103.8	80 48.1 +10.2 102.2
4°	84 55.0 +06.1 101.1	83 56.1 +05.3 99.2	82 57.0 +04.6 97.9	81 57.7 +04.1 96.8	80 58.3 +03.8 96.0
5°	85 01.1 -05.7 89.8	84 01.4 -04.7 89.7	83 01.6 -03.9 89.7	82 01.8 -03.3 89.7	81 02.1 -02.9 89.6
6°	84 55.4 -17.0 78.4	83 56.7 -14.3 80.2	82 57.7 -12.3 81.5	81 58.5 -10.7 82.5	80 59.2 -09.5 83.2
7°	84 38.4 -26.6 67.8	83 42.4 -22.8 71.2	82 45.4 -19.8 73.6	81 47.8 -17.5 75.5	80 49.7 -15.6 77.0
8°	84 11.8 -34.2 58.6	83 19.6 -30.0 63.0	82 25.6 -26.5 66.3	81 30.3 -23.7 68.9	80 34.1 -21.2 71.0
9°	83 37.6 -40.0 50.8	82 49.6 -35.8 55.8	81 59.1 -32.2 59.7	81 06.6 -29.0 62.8	80 12.9 -26.4 65.4
10°	82 57.6 -44.3 44.5	82 13.8 -40.3 49.6	81 26.9 -36.8 53.8	80 37.6 -33.7 57.3	79 46.5 -30.9 60.2
11°	82 13.3 -47.4 39.2	81 33.5 -44.0 44.3	80 50.1 -40.6 48.7	80 03.9 -37.5 52.4	79 15.6 -34.7 55.5
12°	81 25.9 -49.9 34.9	80 49.5 -46.7 39.9	80 09.5 -43.7 44.2	79 26.4 -40.8 48.0	78 40.9 -38.1 51.2
13°	80 36.0 -51.6 31.3	80 02.8 -48.9 36.1	79 25.8 -46.1 40.3	78 45.6 -43.4 44.1	78 02.8 -40.8 47.4
14°	79 44.4 -53.0 28.3	79 13.9 -50.6 32.9	78 39.7 -48.1 37.0	78 02.2 -45.6 40.7	77 22.0 -43.3 43.9
15°	78 51.4 -54.1 25.8	78 23.3 -51.9 30.1	77 51.6 -49.8 34.0	77 16.6 -47.5 37.6	76 38.7 -45.2 40.9
16°	77 57.3 -55.0 23.7	77 31.4 -53.1 27.7	77 01.8 -51.1 31.5	76 29.1 -49.0 34.9	75 53.5 -46.9 38.1
17°	77 02.3 -55.6 21.8	76 38.3 -54.0 25.6	76 10.7 -52.2 29.2	75 40.1 -50.4 32.5	75 06.6 -48.4 35.6
18°	76 06.7 -56.2 20.2	75 44.3 -54.7 23.8	75 18.5 -53.1 27.2	74 49.7 -51.4 30.4	74 18.2 -49.7 33.4
19°	75 10.5 -56.7 18.8	74 49.6 -55.4 22.2	74 25.4 -53.8 25.4	73 58.3 -52.3 28.5	73 28.5 -50.7 31.3
20°	74 13.8 -57.0 17.5	73 54.2 -55.8 20.7	73 31.6 -54.6 23.8	73 06.0 -53.1 26.7	72 37.8 -51.6 29.5
21°	73 16.8 -57.3 16.4	72 58.4 -56.3 19.5	72 37.0 -55.1 22.4	72 12.9 -53.8 25.2	71 46.2 -52.4 27.8
22°	72 19.5 -57.7 15.4	72 02.1 -56.7 18.3	71 41.9 -55.5 21.1	71 19.1 -54.3 23.8	70 53.8 -53.1 26.3
23°	71 21.8 -57.8 14.5	71 05.4 -56.9 17.3	70 46.4 -56.0 19.9	70 24.8 -54.9 22.5	70 00.7 -53.6 24.9
24°	70 24.0 -58.1 13.7	70 08.5 -57.3 16.3	69 50.4 -56.3 18.8	69 29.9 -55.3 21.3	69 07.1 -54.3 23.6
25°	69 25.9 -58.2 13.0	69 11.2 -57.4 15.5	68 54.1 -56.6 17.9	68 34.6 -55.7 20.2	68 12.8 -54.6 22.5
26°	68 27.7 -58.4 12.3	68 13.8 -57.7 14.7	67 57.5 -56.9 17.0	67 38.9 -56.0 19.2	67 18.2 -55.1 21.4
27°	67 29.3 -58.5 11.7	67 16.1 -57.9 13.9	67 00.6 -57.2 16.1	66 42.9 -56.4 18.3	66 23.1 -55.5 20.4
28°	66 30.8 -58.6 11.1	66 18.2 -58.0 13.3	66 03.4 -57.3 15.4	65 46.5 -56.6 17.4	65 27.6 -55.7 19.4
29°	65 32.2 -58.7 10.6	65 20.2 -58.2 12.7	65 06.1 -57.6 14.7	64 49.9 -56.8 16.6	64 31.9 -56.1 18.6

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Latitude 5°

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°	78 49.9 +24.8 116.3	77 55.8 +22.9 114.2	77 00.8 +21.3 112.3	76 05.2 +19.9 110.7	75 09.0 +18.7 109.3
1°	79 14.7 +20.0 111.5	78 18.7 +18.5 109.7	77 22.1 +17.1 108.1	76 25.1 +15.9 106.7	75 27.7 +14.9 105.5
2°	79 34.7 +14.9 106.4	78 37.2 +13.6 104.9	77 39.2 +12.6 103.6	76 41.0 +11.7 102.6	75 42.6 +11.0 101.6
3°	79 49.6 +09.3 101.0	78 50.8 +08.5 99.9	77 51.8 +07.9 99.0	76 52.7 +07.4 98.3	75 53.6 +06.9 97.6
4°	79 58.9 +03.4 95.3	78 59.3 +03.2 94.8	77 59.7 +03.0 94.3	77 00.1 +02.9 93.9	76 00.5 +02.7 93.5
5°	80 02.3 -02.5 89.6	79 02.5 -02.2 89.5	78 02.7 -01.9 89.5	77 03.0 -01.7 89.4	76 03.2 -01.5 89.4
6°	79 59.8 -08.4 83.8	79 00.3 -07.5 84.3	78 00.8 -06.8 84.7	77 01.3 -06.2 85.0	76 01.7 -05.6 85.2
7°	79 51.4 -14.0 78.1	78 52.8 -12.7 79.1	77 54.0 -11.6 79.9	76 55.1 -10.6 80.6	75 56.1 -09.8 81.1
8°	79 37.4 -19.3 72.7	78 40.1 -17.6 74.1	77 42.4 -16.1 75.2	76 44.5 -14.9 76.2	75 46.3 -13.7 77.1
9°	79 18.1 -24.1 67.5	78 22.5 -22.1 69.3	77 26.3 -20.4 70.8	76 29.6 -18.8 72.1	75 32.6 -17.5 73.2
10°	78 54.0 -28.5 62.6	78 00.4 -26.3 64.7	77 05.9 -24.3 66.5	76 10.8 -22.6 68.0	75 15.1 -21.1 69.4
11°	78 25.5 -32.2 58.2	77 34.1 -29.9 60.5	76 41.6 -27.9 62.5	75 48.2 -26.1 64.2	74 54.0 -24.4 65.7
12°	77 53.3 -35.5 54.1	77 04.2 -33.3 56.5	76 13.7 -31.1 58.7	75 22.1 -29.2 60.6	74 29.6 -27.4 62.3
13°	77 17.8 -38.4 50.3	76 30.9 -36.1 52.9	75 42.6 -34.1 55.2	74 52.9 -32.1 57.2	74 02.2 -30.3 59.0
14°	76 39.4 -40.9 46.9	75 54.8 -38.7 49.5	75 08.5 -36.6 51.9	74 20.8 -34.6 54.0	73 31.9 -32.8 55.9
15°	75 58.5 -43.1 43.8	75 16.1 -40.9 46.5	74 31.9 -38.9 48.9	73 46.2 -37.0 51.0	72 59.1 -35.2 53.0
16°	75 15.4 -44.8 41.0	74 35.2 -42.9 43.6	73 53.0 -40.9 46.1	73 09.2 -39.0 48.3	72 23.9 -37.2 50.3
17°	74 30.6 -46.5 38.4	73 52.3 -44.5 41.1	73 12.1 -42.7 43.5	72 30.2 -40.9 45.7	71 46.7 -39.2 47.7
18°	73 44.1 -47.8 36.1	73 07.8 -46.1 38.7	72 29.4 -44.3 41.1	71 49.3 -42.6 43.3	71 07.5 -40.8 45.3
19°	72 56.3 -49.1 34.0	72 21.7 -47.3 36.5	71 45.1 -45.6 38.9	71 06.7 -44.0 41.1	70 26.7 -42.4 43.1
20°	72 07.2 -50.0 32.1	71 34.4 -48.5 34.6	70 59.5 -46.9 36.9	70 22.7 -45.3 39.0	69 44.3 -43.8 41.0
21°	71 17.2 -51.0 30.3	70 45.9 -49.5 32.7	70 12.6 -48.0 35.0	69 37.4 -46.5 37.1	69 00.5 -45.0 39.1
22°	70 26.2 -51.7 28.7	69 56.4 -50.4 31.0	69 24.6 -49.0 33.2	68 50.9 -47.5 35.3	68 15.5 -46.1 37.3
23°	69 34.5 -52.5 27.3	69 06.0 -51.1 29.5	68 35.6 -49.8 31.6	68 03.4 -48.5 33.7	67 29.4 -47.1 35.6
24°	68 42.0 -53.0 25.9	68 14.9 -51.8 28.1	67 45.8 -50.6 30.1	67 14.9 -49.3 32.1	66 42.3 -48.0 34.0
25°	67 49.0 -53.6 24.6	67 23.1 -52.5 26.7	66 55.2 -51.2 28.7	66 25.6 -50.0 30.7	65 54.3 -48.8 32.5
26°	66 55.4 -54.1 23.5	66 30.6 -53.0 25.5	66 04.0 -51.9 27.4	65 35.6 -50.8 29.3	65 05.5 -49.6 31.1
27°	66 01.3 -54.5 22.4	65 37.6 -53.5 24.3	65 12.1 -52.5 26.2	64 44.8 -51.3 28.0	64 15.9 -50.2 29.8
28°	65 06.8 -54.9 21.4	64 44.1 -53.9 23.2	64 19.6 -52.9 25.1	63 53.5 -51.9 26.8	63 25.7 -50.8 28.5
29°	64 11.9 -55.2 20.4	63 50.2 -54.4 22.2	63 26.7 -53.4 24.0	63 01.6 -52.4 25.7	62 34.9 -51.4 27.4

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°	74 12.4 +17.5 108.0	73 15.4 +16.5 106.9	72 18.0 +15.7 105.9	71 20.4 +14.9 105.0	70 22.6 +14.2 104.2
1°	74 29.9 +14.0 104.5	73 31.9 +13.3 103.5	72 33.7 +12.5 102.7	71 35.3 +11.9 102.0	70 36.8 +11.3 101.3
2°	74 43.9 +10.4 100.8	73 45.2 +09.7 100.1	72 46.2 +09.3 99.4	71 47.2 +08.8 98.8	70 48.1 +08.4 98.3
3°	74 54.3 +06.5 97.0	73 54.9 +06.2 96.5	72 55.5 +05.9 96.1	71 56.0 +05.7 95.7	70 56.5 +05.5 95.3
4°	75 00.8 +02.6 93.2	74 01.1 +02.6 92.9	73 01.4 +02.5 92.7	72 01.7 +02.4 92.5	71 02.0 +02.4 92.2
5°	75 03.4 -01.2 89.3	74 03.7 -01.1 89.3	73 03.9 -00.9 89.3	72 04.1 -00.7 89.2	71 04.4 -00.7 89.2
6°	75 02.2 -05.2 85.5	74 02.6 -04.8 85.7	73 03.0 -04.4 85.8	72 03.4 -04.1 86.0	71 03.7 -03.7 86.1
7°	74 57.0 -09.0 81.6	73 57.8 -08.3 82.0	72 58.6 -07.7 82.4	71 59.3 -07.2 82.7	71 00.0 -06.7 83.0
8°	74 48.0 -12.7 77.8	73 49.5 -11.9 78.5	72 50.9 -11.1 79.0	71 52.1 -10.3 79.5	70 53.3 -09.7 80.0
9°	74 35.3 -16.4 74.1	73 37.6 -15.2 75.0	72 39.8 -14.2 75.7	71 41.8 -13.4 76.4	70 43.6 -12.5 77.0
10°	74 18.9 -19.7 70.5	73 22.4 -18.5 71.6	72 25.6 -17.4 72.5	71 28.4 -16.3 73.3	70 31.1 -15.4 74.0
11°	73 59.2 -22.8 67.1	73 03.9 -21.5 68.3	72 08.2 -20.2 69.3	71 12.1 -19.1 70.3	70 15.7 -18.1 71.1
12°	73 36.4 -25.9 63.8	72 42.4 -24.3 65.1	71 48.0 -23.1 66.3	70 53.0 -21.8 67.4	69 57.6 -20.6 68.3
13°	73 10.5 -28.6 60.6	72 18.1 -27.1 62.1	71 24.9 -25.6 63.4	70 31.2 -24.3 64.5	69 37.0 -23.1 65.6
14°	72 41.9 -31.1 57.6	71 51.0 -29.5 59.2	70 59.3 -28.1 60.6	70 06.9 -26.7 61.8	69 13.9 -25.3 63.0
15°	72 10.8 -33.5 54.8	71 21.5 -31.9 56.4	70 31.2 -30.3 57.9	69 40.2 -28.8 59.2	68 48.6 -27.6 60.5
16°	71 37.3 -35.5 52.1	70 49.6 -33.9 53.8	70 00.9 -32.4 55.3	69 11.4 -31.0 56.7	68 21.0 -29.6 58.0
17°	71 01.8 -37.5 49.6	70 15.7 -35.9 51.3	69 28.5 -34.3 52.9	68 40.4 -32.9 54.3	67 51.4 -31.5 55.7
18°	70 24.3 -39.2 47.2	69 39.8 -37.6 49.0	68 54.2 -36.1 50.6	68 07.5 -34.7 52.1	67 19.9 -33.3 53.5
19°	69 45.1 -40.8 45.0	69 02.2 -39.3 46.8	68 18.1 -37.8 48.4	67 32.8 -36.3 49.9	66 46.6 -34.9 51.3
20°	69 04.3 -42.2 42.9	68 22.9 -40.7 44.7	67 40.3 -39.3 46.3	66 56.5 -37.8 47.9	66 11.7 -36.5 49.3
21°	68 22.1 -43.5 41.0	67 42.2 -42.0 42.7	67 01.0 -40.6 44.4	66 18.7 -39.2 45.9	65 35.2 -37.8 47.3
22°	67 38.6 -44.7 39.1	67 00.2 -43.3 40.9	66 20.4 -41.9 42.5	65 39.5 -40.6 44.0	64 57.4 -39.2 45.5
23°	66 53.9 -45.7 37.4	66 16.9 -44.4 39.1	65 38.5 -43.0 40.7	64 58.9 -41.7 42.3	64 18.2 -40.5 43.7
24°	66 08.2 -46.7 35.8	65 32.5 -45.4 37.5	64 55.5 -44.1 39.1	64 17.2 -42.8 40.6	63 37.7 -41.5 42.0
25°	65 21.5 -47.6 34.2	64 47.1 -46.3 35.9	64 11.4 -45.1 37.5	63 34.4 -43.8 39.0	62 56.2 -42.6 40.4
26°	64 33.9 -48.4 32.8	64 00.8 -47.2 34.4	63 26.3 -45.9 36.0	62 50.6 -44.8 37.5	62 13.6 -43.5 38.9
27°	63 45.5 -49.1 31.4	63 13.6 -47.9 33.0	62 40.4 -46.8 34.6	62 05.8 -45.6 36.0	61 30.1 -44.5 37.4
28°	62 56.4 -49.7 30.2	62 25.7 -48.7 31.7	61 53.6 -47.5 33.2	61 20.2 -46.4 34.7	60 45.6 -45.3 36.1
29°	62 06.7 -50.4 28.9	61 37.0 -49.2 30.5	61 06.1 -48.2 31.9	60 33.8 -47.1 33.4	60 00.3 -46.0 34.7

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Latitude 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°	69 24.6 +13.5 103.5	68 26.3 +13.0 102.8	67 28.0 +12.4 102.2	66 29.5 +12.0 101.6	65 30.9 +11.5 101.1
1°	69 38.1 +10.8 100.7	68 39.3 +10.4 100.1	67 40.4 +10.0 99.6	66 41.5 +09.6 99.1	65 42.4 +09.3 98.7
2°	69 48.9 +08.1 97.8	68 49.7 +07.8 97.4	67 50.4 +07.5 97.0	66 51.1 +07.2 96.6	65 51.7 +06.9 96.3
3°	69 57.0 +05.2 95.0	68 57.5 +05.0 94.7	67 57.9 +04.9 94.4	66 58.3 +04.7 94.1	65 58.6 +04.7 93.9
4°	70 02.2 +02.4 92.0	69 02.5 +02.3 91.9	68 02.8 +02.3 91.7	67 03.0 +02.3 91.5	66 03.3 +02.3 91.4
5°	70 04.6 -00.5 89.1	69 04.8 -00.4 89.1	68 05.1 -00.3 89.0	67 05.3 -00.2 89.0	66 05.6 -00.1 88.9
6°	70 04.1 -03.4 86.2	69 04.4 -03.1 86.3	68 04.8 -02.9 86.4	67 05.1 -02.6 86.4	66 05.5 -02.4 86.5
7°	70 00.7 -06.3 83.3	69 01.3 -05.8 83.5	68 01.9 -05.5 83.7	67 02.5 -05.1 83.9	66 03.1 -04.8 84.0
8°	69 54.4 -09.1 80.4	68 55.5 -08.6 80.7	67 56.4 -08.0 81.0	66 57.4 -07.6 81.3	65 58.3 -07.1 81.6
9°	69 45.3 -11.8 77.5	68 46.9 -11.1 78.0	67 48.4 -10.5 78.4	66 49.8 -09.9 78.8	65 51.2 -09.4 79.1
10°	69 33.5 -14.5 74.7	68 35.8 -13.7 75.3	67 37.9 -13.0 75.8	66 39.9 -12.3 76.3	65 41.8 -11.7 76.7
11°	69 19.0 -17.1 71.9	68 22.1 -16.2 72.6	67 24.9 -15.3 73.2	66 27.6 -14.5 73.8	65 30.1 -13.8 74.3
12°	69 01.9 -19.5 69.2	68 05.9 -18.6 70.0	67 09.6 -17.6 70.7	66 13.1 -16.8 71.4	65 16.3 -16.0 72.0
13°	68 42.4 -22.0 66.6	67 47.3 -20.8 67.5	66 52.0 -19.9 68.3	65 56.3 -18.9 69.0	65 00.3 -18.0 69.7
14°	68 20.4 -24.1 64.0	67 26.5 -23.1 65.0	66 32.1 -22.0 65.9	65 37.4 -21.0 66.7	64 42.3 -20.0 67.5
15°	67 56.3 -26.3 61.6	67 03.4 -25.1 62.6	66 10.1 -24.0 63.6	65 16.4 -22.9 64.5	64 22.3 -22.0 65.3
16°	67 30.0 -28.3 59.2	66 38.3 -27.0 60.3	65 46.1 -25.9 61.3	64 53.5 -24.9 62.3	64 00.3 -23.7 63.1
17°	67 01.7 -30.2 56.9	66 11.3 -29.0 58.1	65 20.2 -27.7 59.1	64 28.6 -26.6 60.1	63 36.6 -25.6 61.1
18°	66 31.5 -32.0 54.7	65 42.3 -30.7 55.9	64 52.5 -29.5 57.0	64 02.0 -28.3 58.1	63 11.0 -27.2 59.0
19°	65 59.5 -33.6 52.6	65 11.6 -32.3 53.9	64 23.0 -31.1 55.0	63 33.7 -29.9 56.1	62 43.8 -28.8 57.1
20°	65 25.9 -35.1 50.6	64 39.3 -33.8 51.9	63 51.9 -32.6 53.0	63 03.8 -31.4 54.1	62 15.0 -30.2 55.2
21°	64 50.8 -36.6 48.7	64 05.5 -35.3 50.0	63 19.3 -34.1 51.2	62 32.4 -32.9 52.3	61 44.8 -31.8 53.3
22°	64 14.2 -37.9 46.9	63 30.2 -36.7 48.1	62 45.2 -35.4 49.3	61 59.5 -34.2 50.5	61 13.0 -33.0 51.6
23°	63 36.3 -39.1 45.1	62 53.5 -37.9 46.4	62 09.8 -36.7 47.6	61 25.3 -35.5 48.8	60 40.0 -34.4 49.8
24°	62 57.2 -40.3 43.4	62 15.6 -39.0 44.7	61 33.1 -37.8 45.9	60 49.8 -36.7 47.1	60 05.6 -35.6 48.2
25°	62 16.9 -41.4 41.8	61 36.6 -40.2 43.1	60 55.3 -39.0 44.3	60 13.1 -37.9 45.5	59 30.0 -36.6 46.6
26°	61 35.5 -42.3 40.3	60 56.4 -41.2 41.5	60 16.3 -40.0 42.8	59 35.2 -38.8 43.9	58 53.4 -37.8 45.0
27°	60 53.2 -43.3 38.8	60 15.2 -42.1 40.1	59 36.3 -41.0 41.3	58 56.4 -39.9 42.4	58 15.6 -38.7 43.5
28°	60 09.9 -44.2 37.4	59 33.1 -43.0 38.6	58 55.3 -41.9 39.8	58 16.5 -40.8 41.0	57 36.9 -39.8 42.1
29°	59 25.7 -44.9 36.0	58 50.1 -43.9 37.3	58 13.4 -42.8 38.5	57 35.7 -41.7 39.6	56 57.1 -40.5 40.7

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°	64 32.2 +11.1 100.6	63 33.4 +10.7 100.1	62 34.5 +10.4 99.7	61 35.6 +10.0 99.3	60 36.5 +09.8 98.9
1°	64 43.3 +08.9 98.3	63 44.1 +08.7 97.9	62 44.9 +08.4 97.6	61 45.6 +08.2 97.2	60 46.3 +07.9 96.9
2°	64 52.2 +06.8 96.0	63 52.8 +06.5 95.7	62 53.3 +06.4 95.4	61 53.8 +06.2 95.1	60 54.2 +06.1 94.9
3°	64 59.0 +04.5 93.6	63 59.3 +04.5 93.4	62 59.7 +04.3 93.2	62 00.0 +04.2 93.0	61 00.3 +04.2 92.8
4°	65 03.5 +02.3 91.3	64 03.8 +02.2 91.1	63 04.0 +02.3 91.0	62 04.2 +02.3 90.9	61 04.5 +02.3 90.8
5°	65 05.8 +00.0 88.9	64 06.0 +00.2 88.8	63 06.3 +00.2 88.8	62 06.5 +00.3 88.8	61 06.8 +00.4 88.7
6°	65 05.8 -02.2 86.5	64 06.2 -02.1 86.6	63 06.5 -01.8 86.6	62 06.8 -01.6 86.6	61 07.2 -01.5 86.6
7°	65 03.6 -04.5 84.1	64 04.1 -04.1 84.3	63 04.7 -03.9 84.4	62 05.2 -03.7 84.5	61 05.7 -03.4 84.6
8°	64 59.1 -06.6 81.8	64 00.0 -06.3 82.0	63 00.8 -06.0 82.2	62 01.5 -05.6 82.4	61 02.3 -05.3 82.5
9°	64 52.5 -08.9 79.4	63 53.7 -08.4 79.7	62 54.8 -07.9 80.0	61 55.9 -07.5 80.2	60 57.0 -07.1 80.5
10°	64 43.6 -11.1 77.1	63 45.3 -10.5 77.5	62 46.9 -10.0 77.8	61 48.4 -09.4 78.1	60 49.9 -09.0 78.4
11°	64 32.5 -13.1 74.8	63 34.8 -12.5 75.3	62 36.9 -11.9 75.7	61 39.0 -11.4 76.0	60 40.9 -10.8 76.4
12°	64 19.4 -15.2 72.6	63 22.3 -14.5 73.1	62 25.0 -13.8 73.5	61 27.6 -13.2 74.0	60 30.1 -12.6 74.4
13°	64 04.2 -17.2 70.3	63 07.8 -16.4 70.9	62 11.2 -15.7 71.5	61 14.4 -14.9 71.9	60 17.5 -14.3 72.4
14°	63 47.0 -19.2 68.2	62 51.4 -18.3 68.8	61 55.5 -17.5 69.4	60 59.5 -16.8 69.9	60 03.2 -16.0 70.5
15°	63 27.8 -21.0 66.0	62 33.1 -20.1 66.7	61 38.0 -19.2 67.4	60 42.7 -18.4 68.0	59 47.2 -17.7 68.5
16°	63 06.8 -22.8 63.9	62 13.0 -21.9 64.7	61 18.8 -21.0 65.4	60 24.3 -20.1 66.0	59 29.5 -19.2 66.6
17°	62 44.0 -24.5 61.9	61 51.1 -23.5 62.7	60 57.8 -22.6 63.4	60 04.2 -21.7 64.1	59 10.3 -20.9 64.8
18°	62 19.5 -26.1 59.9	61 27.6 -25.1 60.8	60 35.2 -24.1 61.5	59 42.5 -23.2 62.3	58 49.4 -22.3 63.0
19°	61 53.4 -27.7 58.0	61 02.5 -26.7 58.9	60 11.1 -25.7 59.7	59 19.3 -24.7 60.5	58 27.1 -23.8 61.2
20°	61 25.7 -29.2 56.1	60 35.8 -28.1 57.0	59 45.4 -27.1 57.9	58 54.6 -26.2 58.7	58 03.3 -25.2 59.4
21°	60 56.5 -30.6 54.3	60 07.7 -29.6 55.3	59 18.3 -28.5 56.1	58 28.4 -27.5 57.0	57 38.1 -26.5 57.7
22°	60 25.9 -32.0 52.6	59 38.1 -30.9 53.5	58 49.8 -29.8 54.4	58 00.9 -28.8 55.3	57 11.6 -27.9 56.1
23°	59 53.9 -33.2 50.9	59 07.2 -32.1 51.8	58 20.0 -31.1 52.8	57 32.1 -30.1 53.6	56 43.7 -29.0 54.4
24°	59 20.7 -34.4 49.2	58 35.1 -33.3 50.2	57 48.9 -32.3 51.1	57 02.0 -31.2 52.0	56 14.7 -30.3 52.9
25°	58 46.3 -35.6 47.6	58 01.8 -34.5 48.6	57 16.6 -33.5 49.6	56 30.8 -32.4 50.5	55 44.4 -31.4 51.3
26°	58 10.7 -36.7 46.1	57 27.3 -35.6 47.1	56 43.1 -34.5 48.0	55 58.4 -33.5 48.9	55 13.0 -32.4 49.8
27°	57 34.0 -37.6 44.6	56 51.7 -36.6 45.6	56 08.6 -35.5 46.6	55 24.9 -34.5 47.5	54 40.6 -33.5 48.3
28°	56 56.4 -38.7 43.2	56 15.1 -37.6 44.2	55 33.1 -36.5 45.1	54 50.4 -35.5 46.0	54 07.1 -34.5 46.9
29°	56 17.7 -39.5 41.8	55 37.5 -38.4 42.8	54 56.6 -37.5 43.7	54 14.9 -36.4 44.6	53 32.6 -35.4 45.5

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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°	59 37.5 +09.4 98.6	58 38.3 +09.3 98.3	57 39.2 +08.9 97.9	56 39.9 +08.8 97.6	55 40.7 +08.5 97.4
1°	59 46.9 +07.7 96.6	58 47.6 +07.5 96.4	57 48.1 +07.4 96.1	56 48.7 +07.1 95.8	55 49.2 +07.0 95.6
2°	59 54.6 +06.0 94.7	58 55.1 +05.8 94.4	57 55.5 +05.6 94.2	56 55.8 +05.6 94.0	55 56.2 +05.5 93.8
3°	60 00.6 +04.1 92.7	59 00.9 +04.0 92.5	58 01.1 +04.1 92.3	57 01.4 +04.0 92.2	56 01.7 +03.9 92.1
4°	60 04.7 +02.3 90.7	59 04.9 +02.4 90.6	58 05.2 +02.3 90.5	57 05.4 +02.3 90.4	56 05.6 +02.4 90.3
5°	60 07.0 +00.5 88.7	59 07.3 +00.5 88.6	58 07.5 +00.7 88.6	57 07.7 +00.8 88.5	56 08.0 +00.8 88.5
6°	60 07.5 -01.3 86.7	59 07.8 -01.1 86.7	58 08.2 -01.1 86.7	57 08.5 -00.9 86.7	56 08.8 -00.7 86.7
7°	60 06.2 -03.2 84.6	59 06.7 -03.0 84.7	58 07.1 -02.7 84.8	57 07.6 -02.5 84.8	56 08.1 -02.3 84.9
8°	60 03.0 -04.9 82.6	59 03.7 -04.6 82.8	58 04.4 -04.4 82.9	57 05.1 -04.1 83.0	56 05.8 -03.9 83.1
9°	59 58.1 -06.8 80.7	58 59.1 -06.4 80.8	58 00.0 -06.0 81.0	57 01.0 -05.7 81.2	56 01.9 -05.4 81.3
10°	59 51.3 -08.5 78.7	58 52.7 -08.1 78.9	57 54.0 -07.7 79.1	56 55.3 -07.3 79.3	55 56.5 -06.9 79.5
11°	59 42.8 -10.3 76.7	58 44.6 -09.8 77.0	57 46.3 -09.3 77.3	56 48.0 -08.9 77.5	55 49.6 -08.5 77.8
12°	59 32.5 -12.0 74.8	58 34.8 -11.5 75.1	57 37.0 -10.9 75.4	56 39.1 -10.4 75.7	55 41.1 -09.9 76.0
13°	59 20.5 -13.7 72.8	58 23.3 -13.0 73.2	57 26.1 -12.5 73.6	56 28.7 -12.0 73.9	55 31.2 -11.4 74.2
14°	59 06.8 -15.3 70.9	58 10.3 -14.7 71.4	57 13.6 -14.1 71.8	56 16.7 -13.4 72.2	55 19.8 -12.9 72.5
15°	58 51.5 -16.9 69.0	57 55.6 -16.2 69.5	56 59.5 -15.6 70.0	56 03.3 -15.0 70.4	55 06.9 -14.3 70.8
16°	58 34.6 -18.5 67.2	57 39.4 -17.8 67.7	56 43.9 -17.0 68.2	55 48.3 -16.3 68.7	54 52.6 -15.7 69.1
17°	58 16.1 -20.1 65.4	57 21.6 -19.2 65.9	56 26.9 -18.5 66.5	55 32.0 -17.8 67.0	54 36.9 -17.1 67.4
18°	57 56.0 -21.4 63.6	57 02.4 -20.7 64.2	56 08.4 -19.9 64.8	55 14.2 -19.1 65.3	54 19.8 -18.4 65.8
19°	57 34.6 -23.0 61.8	56 41.7 -22.1 62.5	55 48.5 -21.2 63.1	54 55.1 -20.4 63.6	54 01.4 -19.7 64.2
20°	57 11.6 -24.2 60.1	56 19.6 -23.4 60.8	55 27.3 -22.6 61.4	54 34.7 -21.8 62.0	53 41.7 -20.9 62.6
21°	56 47.4 -25.7 58.5	55 56.2 -24.7 59.1	55 04.7 -23.8 59.8	54 12.9 -23.0 60.4	53 20.8 -22.2 61.0
22°	56 21.7 -26.8 56.8	55 31.5 -25.9 57.5	54 40.9 -25.1 58.2	53 49.9 -24.2 58.8	52 58.6 -23.3 59.4
23°	55 54.9 -28.1 55.2	55 05.6 -27.2 55.9	54 15.8 -26.2 56.6	53 25.7 -25.3 57.3	52 35.3 -24.6 57.9
24°	55 26.8 -29.3 53.6	54 38.4 -28.3 54.4	53 49.6 -27.4 55.1	53 00.4 -26.5 55.8	52 10.7 -25.6 56.4
25°	54 57.5 -30.4 52.1	54 10.1 -29.5 52.9	53 22.2 -28.5 53.6	52 33.9 -27.6 54.3	51 45.1 -26.7 55.0
26°	54 27.1 -31.5 50.6	53 40.6 -30.5 51.4	52 53.7 -29.6 52.1	52 06.3 -28.7 52.8	51 18.4 -27.7 53.5
27°	53 55.6 -32.5 49.2	53 10.1 -31.5 50.0	52 24.1 -30.6 50.7	51 37.6 -29.6 51.4	50 50.7 -28.8 52.1
28°	53 23.1 -33.5 47.7	52 38.6 -32.5 48.5	51 53.5 -31.5 49.3	51 08.0 -30.7 50.0	50 21.9 -29.7 50.7
29°	52 49.6 -34.4 46.4	52 06.1 -33.5 47.2	51 22.0 -32.5 47.9	50 37.3 -31.5 48.7	49 52.2 -30.6 49.4

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°	54 41.4 +08.3 97.1	53 42.1 +08.1 96.8	52 42.7 +08.0 96.6	51 43.3 +07.8 96.4	50 43.9 +07.6 96.1
1°	54 49.7 +06.9 95.4	53 50.2 +06.7 95.2	52 50.7 +06.5 95.0	51 51.1 +06.5 94.8	50 51.5 +06.4 94.6
2°	54 56.6 +05.4 93.7	53 56.9 +05.3 93.5	52 57.2 +05.3 93.3	51 57.6 +05.1 93.2	50 57.9 +05.1 93.0
3°	55 02.0 +03.8 91.9	54 02.2 +03.9 91.8	53 02.5 +03.8 91.7	52 02.7 +03.8 91.5	51 03.0 +03.8 91.4
4°	55 05.8 +02.4 90.2	54 06.1 +02.4 90.1	53 06.3 +02.5 90.0	52 06.5 +02.5 89.9	51 06.8 +02.5 89.8
5°	55 08.2 +00.9 88.4	54 08.5 +01.0 88.4	53 08.8 +01.0 88.3	52 09.0 +01.1 88.3	51 09.3 +01.2 88.2
6°	55 09.1 -00.6 86.7	54 09.5 -00.5 86.7	53 09.8 -00.3 86.7	52 10.1 -00.2 86.7	51 10.5 -00.1 86.6
7°	55 08.5 -02.1 84.9	54 09.0 -01.9 85.0	53 09.5 -01.8 85.0	52 09.9 -01.6 85.0	51 10.4 -01.4 85.0
8°	55 06.4 -03.6 83.2	54 07.1 -03.4 83.3	53 07.7 -03.1 83.3	52 08.3 -02.9 83.4	51 09.0 -02.7 83.4
9°	55 02.8 -05.1 81.4	54 03.7 -04.8 81.6	53 04.6 -04.6 81.7	52 05.4 -04.2 81.8	51 06.3 -04.0 81.9
10°	54 57.7 -06.6 79.7	53 58.9 -06.2 79.9	53 00.0 -05.9 80.0	52 01.2 -05.6 80.1	51 02.3 -05.3 80.3
11°	54 51.1 -08.0 78.0	53 52.7 -07.7 78.2	52 54.1 -07.2 78.4	51 55.6 -06.9 78.5	50 57.0 -06.6 78.7
12°	54 43.1 -09.5 76.2	53 45.0 -09.0 76.5	52 46.9 -08.7 76.7	51 48.7 -08.2 76.9	50 50.4 -07.8 77.1
13°	54 33.6 -10.9 74.5	53 36.0 -10.5 74.8	52 38.2 -09.9 75.1	51 40.5 -09.6 75.3	50 42.6 -09.1 75.5
14°	54 22.7 -12.3 72.9	53 25.5 -11.8 73.2	52 28.3 -11.3 73.5	51 30.9 -10.8 73.7	50 33.5 -10.3 74.0
15°	54 10.4 -13.7 71.2	53 13.7 -13.1 71.5	52 17.0 -12.6 71.8	51 20.1 -12.0 72.2	50 23.2 -11.5 72.4
16°	53 56.7 -15.1 69.5	53 00.6 -14.4 69.9	52 04.4 -13.9 70.3	51 08.1 -13.3 70.6	50 11.7 -12.8 70.9
17°	53 41.6 -16.4 67.9	52 46.2 -15.8 68.3	51 50.5 -15.1 68.7	50 54.8 -14.5 69.0	49 58.9 -13.9 69.4
18°	53 25.2 -17.7 66.3	52 30.4 -17.0 66.7	51 35.4 -16.3 67.1	50 40.3 -15.7 67.5	49 45.0 -15.1 67.9
19°	53 07.5 -18.9 64.7	52 13.4 -18.2 65.1	51 19.1 -17.6 65.6	50 24.6 -16.9 66.0	49 29.9 -16.3 66.4
20°	52 48.6 -20.2 63.1	51 55.2 -19.5 63.6	51 01.5 -18.7 64.0	50 07.7 -18.0 64.5	49 13.6 -17.3 64.9
21°	52 28.4 -21.4 61.5	51 35.7 -20.6 62.0	50 42.8 -19.9 62.5	49 49.7 -19.2 63.0	48 56.3 -18.5 63.4
22°	52 07.0 -22.5 60.0	51 15.1 -21.8 60.5	50 22.9 -21.0 61.1	49 30.5 -20.3 61.5	48 37.8 -19.5 62.0
23°	51 44.5 -23.7 58.5	50 53.3 -22.8 59.1	50 01.9 -22.1 59.6	49 10.2 -21.3 60.1	48 18.3 -20.6 60.6
24°	51 20.8 -24.8 57.0	50 30.5 -24.0 57.6	49 39.8 -23.1 58.1	48 48.9 -22.3 58.7	47 57.7 -21.5 59.2
25°	50 56.0 -25.8 55.6	50 06.5 -25.0 56.2	49 16.7 -24.2 56.7	48 26.6 -23.4 57.3	47 36.2 -22.6 57.8
26°	50 30.2 -26.9 54.1	49 41.5 -26.0 54.8	48 52.5 -25.1 55.3	48 03.2 -24.3 55.9	47 13.6 -23.6 56.4
27°	50 03.3 -27.9 52.7	49 15.5 -27.0 53.4	48 27.4 -26.2 54.0	47 38.9 -25.3 54.5	46 50.0 -24.4 55.0
28°	49 35.4 -28.8 51.4	48 48.5 -27.9 52.0	48 01.2 -27.0 52.6	47 13.6 -26.2 53.2	46 25.6 -25.4 53.7
29°	49 06.6 -29.7 50.0	48 20.6 -28.8 50.7	47 34.2 -28.0 51.3	46 47.4 -27.2 51.9	46 00.2 -26.3 52.4

Declination SAME name as Latitude

Latitude 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°	49 44.5 +07.4 95.9	48 45.0 +07.3 95.7	47 45.5 +07.2 95.5	46 46.0 +07.1 95.3	45 46.5 +06.9 95.2
1°	49 51.9 +06.3 94.4	48 52.3 +06.2 94.2	47 52.7 +06.1 94.1	46 53.1 +06.0 93.9	45 53.4 +05.9 93.7
2°	49 58.2 +05.0 92.8	48 58.5 +05.0 92.7	47 58.8 +04.9 92.6	46 59.1 +04.8 92.4	45 59.3 +04.9 92.3
3°	50 03.2 +03.8 91.3	49 03.5 +03.7 91.2	48 03.7 +03.8 91.1	47 03.9 +03.8 91.0	46 04.2 +03.7 90.9
4°	50 07.0 +02.5 89.7	49 07.2 +02.6 89.7	48 07.5 +02.5 89.6	47 07.7 +02.6 89.5	46 07.9 +02.7 89.4
5°	50 09.5 +01.3 88.2	49 09.8 +01.3 88.1	48 10.0 +01.5 88.1	47 10.3 +01.5 88.0	46 10.6 +01.5 88.0
6°	50 10.8 +00.0 86.6	49 11.1 +00.2 86.6	48 11.5 +00.2 86.6	47 11.8 +00.4 86.6	46 12.1 +00.5 86.5
7°	50 10.8 -01.2 85.1	49 11.3 -01.1 85.1	48 11.7 -00.9 85.1	47 12.2 -00.8 85.1	46 12.6 -00.6 85.1
8°	50 09.6 -02.5 83.5	49 10.2 -02.3 83.5	48 10.8 -02.1 83.6	47 11.4 -01.9 83.6	46 12.0 -01.7 83.6
9°	50 07.1 -03.8 81.9	49 07.9 -03.5 82.0	48 08.7 -03.3 82.1	47 09.5 -03.0 82.1	46 10.3 -02.8 82.2
10°	50 03.3 -04.9 80.4	49 04.4 -04.7 80.5	48 05.4 -04.4 80.6	47 06.5 -04.2 80.7	46 07.5 -03.9 80.8
11°	49 58.4 -06.3 78.8	48 59.7 -05.9 79.0	48 01.0 -05.5 79.1	47 02.3 -05.2 79.2	46 03.6 -05.0 79.3
12°	49 52.1 -07.4 77.3	48 53.8 -07.1 77.5	47 55.5 -06.8 77.6	46 57.1 -06.4 77.8	45 58.6 -06.0 77.9
13°	49 44.7 -08.7 75.8	48 46.7 -08.2 75.9	47 48.7 -07.8 76.1	46 50.7 -07.5 76.3	45 52.6 -07.1 76.5
14°	49 36.0 -09.8 74.2	48 38.5 -09.4 74.4	47 40.9 -09.0 74.7	46 43.2 -08.6 74.9	45 45.5 -08.2 75.0
15°	49 26.2 -11.1 72.7	48 29.1 -10.6 73.0	47 31.9 -10.1 73.2	46 34.6 -09.6 73.4	45 37.3 -09.2 73.6
16°	49 15.1 -12.2 71.2	48 18.5 -11.7 71.5	47 21.8 -11.2 71.7	46 25.0 -10.7 72.0	45 28.1 -10.2 72.2
17°	49 02.9 -13.4 69.7	48 06.8 -12.8 70.0	47 10.6 -12.3 70.3	46 14.3 -11.8 70.6	45 17.9 -11.3 70.8
18°	48 49.5 -14.5 68.2	47 54.0 -13.9 68.5	46 58.3 -13.4 68.8	46 02.5 -12.8 69.1	45 06.6 -12.3 69.4
19°	48 35.0 -15.6 66.7	47 40.1 -15.0 67.1	46 44.9 -14.4 67.4	45 49.7 -13.9 67.7	44 54.3 -13.3 68.0
20°	48 19.4 -16.7 65.3	47 25.1 -16.1 65.7	46 30.5 -15.4 66.0	45 35.8 -14.8 66.3	44 41.0 -14.2 66.6
21°	48 02.7 -17.7 63.8	47 09.0 -17.1 64.2	46 15.1 -16.5 64.6	45 21.0 -15.8 65.0	44 26.8 -15.2 65.3
22°	47 45.0 -18.9 62.4	46 51.9 -18.2 62.8	45 58.6 -17.5 63.2	45 05.2 -16.8 63.6	44 11.6 -16.2 63.9
23°	47 26.1 -19.8 61.0	46 33.7 -19.1 61.4	45 41.1 -18.4 61.8	44 48.4 -17.8 62.2	43 55.4 -17.1 62.6
24°	47 06.3 -20.8 59.6	46 14.6 -20.1 60.1	45 22.7 -19.4 60.5	44 30.6 -18.7 60.9	43 38.3 -18.0 61.3
25°	46 45.5 -21.8 58.3	45 54.5 -21.0 58.7	45 03.3 -20.3 59.1	44 11.9 -19.6 59.6	43 20.3 -19.0 60.0
26°	46 23.7 -22.8 56.9	45 33.5 -22.0 57.4	44 43.0 -21.3 57.8	43 52.3 -20.5 58.2	43 01.3 -19.7 58.7
27°	46 00.9 -23.7 55.6	45 11.5 -22.9 56.0	44 21.7 -22.1 56.5	43 31.8 -21.4 56.9	42 41.6 -20.7 57.4
28°	45 37.2 -24.6 54.2	44 48.6 -23.8 54.7	43 59.6 -23.0 55.2	43 10.4 -22.2 55.7	42 20.9 -21.5 56.1
29°	45 12.6 -25.4 52.9	44 24.8 -24.7 53.4	43 36.6 -23.8 53.9	42 48.2 -23.1 54.4	41 59.4 -22.3 54.8

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 46.9 +06.9 95.0	43 47.4 +06.7 94.8	42 47.8 +06.7 94.6	41 48.2 +06.6 94.5	40 48.6 +06.5 94.3
1°	44 53.8 +05.8 93.6	43 54.1 +05.8 93.4	42 54.5 +05.7 93.3	41 54.8 +05.6 93.2	40 55.1 +05.6 93.0
2°	44 59.6 +04.8 92.2	43 59.9 +04.7 92.1	43 00.2 +04.7 91.9	42 00.4 +04.7 91.8	41 00.7 +04.6 91.7
3°	45 04.4 +03.7 90.8	44 04.6 +03.8 90.7	43 04.9 +03.7 90.6	42 05.1 +03.7 90.5	41 05.3 +03.8 90.4
4°	45 08.1 +02.7 89.3	44 08.4 +02.7 89.3	43 08.6 +02.8 89.2	42 08.8 +02.8 89.1	41 09.1 +02.8 89.1
5°	45 10.8 +01.7 87.9	44 11.1 +01.7 87.9	43 11.4 +01.8 87.8	42 11.6 +01.9 87.8	41 11.9 +01.9 87.7
6°	45 12.5 +00.6 86.5	44 12.8 +00.7 86.5	43 13.2 +00.8 86.5	42 13.5 +00.9 86.4	41 13.8 +01.0 86.4
7°	45 13.1 -00.5 85.1	44 13.5 -00.3 85.1	43 14.0 -00.2 85.1	42 14.4 +00.0 85.1	41 14.8 +00.1 85.1
8°	45 12.6 -01.5 83.7	44 13.2 -01.4 83.7	43 13.8 -01.2 83.7	42 14.4 -01.0 83.7	41 14.9 -00.8 83.7
9°	45 11.1 -02.6 82.3	44 11.8 -02.3 82.3	43 12.6 -02.2 82.3	42 13.4 -02.0 82.4	41 14.1 -01.7 82.4
10°	45 08.5 -03.6 80.8	44 09.5 -03.4 80.9	43 10.4 -03.1 81.0	42 11.4 -02.9 81.0	41 12.4 -02.7 81.1
11°	45 04.9 -04.7 79.4	44 06.1 -04.4 79.5	43 07.3 -04.1 79.6	42 08.5 -03.8 79.7	41 09.7 -03.6 79.8
12°	45 00.2 -05.7 78.0	44 01.7 -05.4 78.1	43 03.2 -05.1 78.2	42 04.7 -04.8 78.3	41 06.1 -04.5 78.4
13°	44 54.5 -06.8 76.6	43 56.3 -06.4 76.7	42 58.1 -06.0 76.9	41 59.9 -05.7 77.0	41 01.6 -05.4 77.1
14°	44 47.7 -07.7 75.2	43 49.9 -07.4 75.4	42 52.1 -07.1 75.5	41 54.2 -06.7 75.7	40 56.2 -06.2 75.8
15°	44 40.0 -08.8 73.8	43 42.5 -08.3 74.0	42 45.0 -07.9 74.2	41 47.5 -07.5 74.3	40 50.0 -07.2 74.5
16°	44 31.2 -09.8 72.4	43 34.2 -09.4 72.6	42 37.1 -08.9 72.8	41 40.0 -08.5 73.0	40 42.8 -08.1 73.2
17°	44 21.4 -10.8 71.0	43 24.8 -10.3 71.3	42 28.2 -09.9 71.5	41 31.5 -09.4 71.7	40 34.7 -08.9 71.9
18°	44 10.6 -11.8 69.7	43 14.5 -11.3 69.9	42 18.3 -10.7 70.1	41 22.1 -10.3 70.3	40 25.8 -09.9 70.6
19°	43 58.8 -12.7 68.3	43 03.2 -12.2 68.6	42 07.6 -11.7 68.8	41 11.8 -11.2 69.0	40 15.9 -10.6 69.3
20°	43 46.1 -13.7 66.9	42 51.0 -13.1 67.2	41 55.9 -12.6 67.5	41 00.6 -12.0 67.7	40 05.3 -11.6 68.0
21°	43 32.4 -14.6 65.6	42 37.9 -14.0 65.9	41 43.3 -13.5 66.2	40 48.6 -13.0 66.4	39 53.7 -12.4 66.7
22°	43 17.8 -15.6 64.3	42 23.9 -15.0 64.6	41 29.8 -14.3 64.9	40 35.6 -13.7 65.1	39 41.3 -13.2 65.4
23°	43 02.2 -16.4 62.9	42 08.9 -15.8 63.3	41 15.5 -15.2 63.6	40 21.9 -14.6 63.9	39 28.1 -14.0 64.1
24°	42 45.8 -17.4 61.6	41 53.1 -16.7 62.0	41 00.3 -16.1 62.3	40 07.3 -15.5 62.6	39 14.1 -14.8 62.9
25°	42 28.4 -18.2 60.3	41 36.4 -17.6 60.7	40 44.2 -16.9 61.0	39 51.8 -16.2 61.3	38 59.3 -15.6 61.6
26°	42 10.2 -19.1 59.0	41 18.8 -18.4 59.4	40 27.3 -17.7 59.8	39 35.6 -17.1 60.1	38 43.7 -16.4 60.4
27°	41 51.1 -19.9 57.8	41 00.4 -19.2 58.1	40 09.6 -18.5 58.5	39 18.5 -17.8 58.8	38 27.3 -17.2 59.2
28°	41 31.2 -20.8 56.5	40 41.2 -20.0 56.9	39 51.1 -19.3 57.3	39 00.7 -18.6 57.6	38 10.1 -17.9 58.0
29°	41 10.4 -21.5 55.2	40 21.2 -20.8 55.6	39 31.8 -20.1 56.0	38 42.1 -19.4 56.4	37 52.2 -18.7 56.7

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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°	39 49.0 +06.4 94.2	38 49.4 +06.3 94.0	37 49.8 +06.2 93.9	36 50.2 +06.1 93.8	35 50.5 +06.1 93.6
1°	39 55.4 +05.5 92.9	38 55.7 +05.5 92.8	37 56.0 +05.4 92.6	36 56.3 +05.4 92.5	35 56.6 +05.3 92.4
2°	40 00.9 +04.7 91.6	39 01.2 +04.6 91.5	38 01.4 +04.6 91.4	37 01.7 +04.5 91.3	36 01.9 +04.6 91.2
3°	40 05.6 +03.7 90.3	39 05.8 +03.8 90.2	38 06.0 +03.8 90.1	37 06.2 +03.8 90.0	36 06.5 +03.8 89.9
4°	40 09.3 +02.9 89.0	39 09.6 +02.9 88.9	38 09.8 +03.0 88.8	37 10.0 +03.0 88.8	36 10.3 +03.0 88.7
5°	40 12.2 +02.0 87.7	39 12.5 +02.0 87.6	38 12.8 +02.1 87.6	37 13.0 +02.2 87.5	36 13.3 +02.3 87.5
6°	40 14.2 +01.1 86.4	39 14.5 +01.2 86.3	38 14.9 +01.3 86.3	37 15.2 +01.5 86.3	36 15.6 +01.5 86.2
7°	40 15.3 +00.2 85.1	39 15.7 +00.4 85.0	38 16.2 +00.5 85.0	37 16.7 +00.6 85.0	36 17.1 +00.8 85.0
8°	40 15.5 -00.6 83.7	39 16.1 -00.5 83.7	38 16.7 -00.4 83.7	37 17.3 -00.2 83.7	36 17.9 -00.1 83.7
9°	40 14.9 -01.6 82.4	39 15.6 -01.4 82.5	38 16.3 -01.1 82.5	37 17.1 -01.0 82.5	36 17.8 -00.8 82.5
10°	40 13.3 -02.4 81.1	39 14.2 -02.2 81.2	38 15.2 -02.0 81.2	37 16.1 -01.8 81.2	36 17.0 -01.5 81.3
11°	40 10.9 -03.3 79.8	39 12.0 -03.0 79.9	38 13.2 -02.8 79.9	37 14.3 -02.5 80.0	36 15.5 -02.4 80.0
12°	40 07.6 -04.2 78.5	39 09.0 -03.9 78.6	38 10.4 -03.7 78.7	37 11.8 -03.4 78.7	36 13.1 -03.1 78.8
13°	40 03.4 -05.1 77.2	39 05.1 -04.8 77.3	38 06.7 -04.4 77.4	37 08.4 -04.2 77.5	36 10.0 -03.8 77.5
14°	39 58.3 -06.0 75.9	39 00.3 -05.6 76.0	38 02.3 -05.3 76.1	37 04.2 -04.9 76.2	36 06.2 -04.6 76.3
15°	39 52.3 -06.8 74.6	38 54.7 -06.4 74.7	37 57.0 -06.1 74.9	36 59.3 -05.7 75.0	36 01.6 -05.4 75.1
16°	39 45.5 -07.6 73.3	38 48.3 -07.3 73.5	37 50.9 -06.8 73.6	36 53.6 -06.5 73.7	35 56.2 -06.1 73.8
17°	39 37.9 -08.5 72.0	38 41.0 -08.1 72.2	37 44.1 -07.7 72.3	36 47.1 -07.3 72.5	35 50.1 -06.9 72.6
18°	39 29.4 -09.4 70.7	38 32.9 -08.9 70.9	37 36.4 -08.5 71.1	36 39.8 -08.0 71.2	35 43.2 -07.6 71.4
19°	39 20.0 -10.2 69.5	38 24.0 -09.7 69.7	37 27.9 -09.2 69.8	36 31.8 -08.8 70.0	35 35.6 -08.4 70.2
20°	39 09.8 -11.0 68.2	38 14.3 -10.6 68.4	37 18.7 -10.1 68.6	36 23.0 -09.6 68.8	35 27.2 -09.1 69.0
21°	38 58.8 -11.9 66.9	38 03.7 -11.3 67.1	37 08.6 -10.8 67.4	36 13.4 -10.3 67.6	35 18.1 -09.8 67.7
22°	38 46.9 -12.6 65.7	37 52.4 -12.1 65.9	36 57.8 -11.5 66.1	36 03.1 -11.0 66.3	35 08.3 -10.5 66.5
23°	38 34.3 -13.4 64.4	37 40.3 -12.8 64.7	36 46.3 -12.4 64.9	35 52.1 -11.8 65.1	34 57.8 -11.2 65.3
24°	38 20.9 -14.3 63.2	37 27.5 -13.7 63.4	36 33.9 -13.0 63.7	35 40.3 -12.5 63.9	34 46.6 -11.9 64.1
25°	38 06.6 -15.0 61.9	37 13.8 -14.4 62.2	36 20.9 -13.8 62.5	35 27.8 -13.2 62.7	34 34.7 -12.7 62.9
26°	37 51.6 -15.7 60.7	36 59.4 -15.1 61.0	36 07.1 -14.5 61.3	35 14.6 -13.9 61.5	34 22.0 -13.3 61.8
27°	37 35.9 -16.5 59.5	36 44.3 -15.9 59.8	35 52.6 -15.2 60.1	35 00.7 -14.6 60.3	34 08.7 -14.0 60.6
28°	37 19.4 -17.3 58.3	36 28.4 -16.5 58.6	35 37.4 -16.0 58.9	34 46.1 -15.2 59.1	33 54.7 -14.6 59.4
29°	37 02.1 -17.9 57.1	36 11.9 -17.3 57.4	35 21.4 -16.6 57.7	34 30.9 -16.0 58.0	33 40.1 -15.3 58.2

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°	34 50.8 +06.1 93.5	33 51.2 +05.9 93.4	32 51.5 +05.9 93.2	31 51.8 +05.9 93.1	30 52.1 +05.8 93.0
1°	34 56.9 +05.2 92.3	33 57.1 +05.3 92.2	32 57.4 +05.2 92.1	31 57.7 +05.2 91.9	30 57.9 +05.2 91.8
2°	35 02.1 +04.6 91.1	34 02.4 +04.5 91.0	33 02.6 +04.6 90.9	32 02.9 +04.5 90.8	31 03.1 +04.5 90.7
3°	35 06.7 +03.8 89.8	34 06.9 +03.9 89.8	33 07.2 +03.8 89.7	32 07.4 +03.9 89.6	31 07.6 +03.9 89.5
4°	35 10.5 +03.1 88.6	34 10.8 +03.1 88.6	33 11.0 +03.2 88.5	32 11.3 +03.2 88.4	31 11.5 +03.3 88.3
5°	35 13.6 +02.4 87.4	34 13.9 +02.4 87.3	33 14.2 +02.5 87.3	32 14.5 +02.6 87.2	31 14.8 +02.6 87.2
6°	35 16.0 +01.6 86.2	34 16.3 +01.7 86.1	33 16.7 +01.8 86.1	32 17.1 +01.9 86.1	31 17.4 +02.0 86.0
7°	35 17.6 +00.8 85.0	34 18.0 +01.0 84.9	33 18.5 +01.1 84.9	32 19.0 +01.2 84.9	31 19.4 +01.4 84.8
8°	35 18.4 +00.2 83.7	34 19.0 +00.3 83.7	33 19.6 +00.4 83.7	32 20.2 +00.6 83.7	31 20.8 +00.7 83.7
9°	35 18.6 -00.6 82.5	34 19.3 -00.4 82.5	33 20.0 -00.2 82.5	32 20.8 -00.1 82.5	31 21.5 +00.1 82.5
10°	35 18.0 -01.4 81.3	34 18.9 -01.2 81.3	33 19.8 -01.0 81.3	32 20.7 -00.7 81.3	31 21.6 -00.5 81.3
11°	35 16.6 -02.1 80.1	34 17.7 -01.8 80.1	33 18.8 -01.6 80.1	32 20.0 -01.5 80.1	31 21.1 -01.2 80.2
12°	35 14.5 -02.8 78.8	34 15.9 -02.6 78.9	33 17.2 -02.3 78.9	32 18.5 -02.0 79.0	31 19.9 -01.8 79.0
13°	35 11.7 -03.6 77.6	34 13.3 -03.3 77.7	33 14.9 -03.0 77.7	32 16.5 -02.8 77.8	31 18.1 -02.5 77.8
14°	35 08.1 -04.3 76.4	34 10.0 -04.0 76.5	33 11.9 -03.7 76.5	32 13.7 -03.3 76.6	31 15.6 -03.1 76.6
15°	35 03.8 -05.0 75.2	34 06.0 -04.7 75.3	33 08.2 -04.4 75.3	32 10.4 -04.1 75.4	31 12.5 -03.7 75.5
16°	34 58.8 -05.8 73.9	34 01.3 -05.4 74.1	33 03.8 -05.0 74.1	32 06.3 -04.7 74.2	31 08.8 -04.4 74.3
17°	34 53.0 -06.5 72.7	33 55.9 -06.1 72.9	32 58.8 -05.7 73.0	32 01.6 -05.3 73.1	31 04.4 -05.0 73.1
18°	34 46.5 -07.2 71.5	33 49.8 -06.8 71.7	32 53.1 -06.4 71.8	31 56.3 -06.0 71.9	30 59.4 -05.6 72.0
19°	34 39.3 -07.9 70.3	33 43.0 -07.5 70.5	32 46.7 -07.1 70.6	31 50.3 -06.7 70.7	30 53.8 -06.2 70.8
20°	34 31.4 -08.6 69.1	33 35.5 -08.1 69.3	32 39.6 -07.7 69.4	31 43.6 -07.2 69.5	30 47.6 -06.8 69.7
21°	34 22.8 -09.3 67.9	33 27.4 -08.9 68.1	32 31.9 -08.4 68.2	31 36.4 -08.0 68.4	30 40.8 -07.5 68.5
22°	34 13.5 -10.0 66.7	33 18.5 -09.5 66.9	32 23.5 -09.0 67.1	31 28.4 -08.5 67.2	30 33.3 -08.1 67.4
23°	34 03.5 -10.7 65.5	33 09.0 -10.2 65.7	32 14.5 -09.7 65.9	31 19.9 -09.2 66.1	30 25.2 -08.6 66.2
24°	33 52.8 -11.4 64.3	32 58.8 -10.8 64.5	32 04.8 -10.3 64.7	31 10.7 -09.7 64.9	30 16.6 -09.3 65.1
25°	33 41.4 -12.1 63.2	32 48.0 -11.5 63.4	31 54.5 -10.9 63.6	31 01.0 -10.4 63.7	30 07.3 -09.8 63.9
26°	33 29.3 -12.7 62.0	32 36.5 -12.1 62.2	31 43.6 -11.6 62.4	30 50.6 -11.0 62.6	29 57.5 -10.5 62.8
27°	33 16.6 -13.4 60.8	32 24.4 -12.8 61.0	31 32.0 -12.2 61.2	30 39.6 -11.6 61.5	29 47.0 -11.0 61.6
28°	33 03.2 -14.0 59.6	32 11.6 -13.4 59.9	31 19.8 -12.8 60.1	30 28.0 -12.2 60.3	29 36.0 -11.6 60.5
29°	32 49.2 -14.6 58.5	31 58.2 -14.0 58.7	31 07.0 -13.3 59.0	30 15.8 -12.8 59.2	29 24.4 -12.2 59.4

Declination SAME name as Latitude

Latitude 5°

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 52.5 +05.7 92.9	28 52.8 +05.6 92.8	27 53.0 +05.7 92.7	26 53.3 +05.6 92.5	25 53.6 +05.6 92.4
1°	29 58.2 +05.1 91.7	28 58.4 +05.1 91.6	27 58.7 +05.1 91.5	26 58.9 +05.1 91.4	25 59.2 +05.0 91.3
2°	30 03.3 +04.5 90.6	29 03.5 +04.6 90.5	28 03.8 +04.5 90.4	27 04.0 +04.5 90.3	26 04.2 +04.6 90.2
3°	30 07.8 +04.0 89.4	29 08.1 +03.9 89.3	28 08.3 +04.0 89.3	27 08.5 +04.1 89.2	26 08.8 +04.0 89.1
4°	30 11.8 +03.3 88.3	29 12.0 +03.4 88.2	28 12.3 +03.4 88.1	27 12.6 +03.4 88.1	26 12.8 +03.5 88.0
5°	30 15.1 +02.7 87.1	29 15.4 +02.8 87.1	28 15.7 +02.9 87.0	27 16.0 +03.0 86.9	26 16.3 +03.0 86.9
6°	30 17.8 +02.1 86.0	29 18.2 +02.2 85.9	28 18.6 +02.3 85.9	27 19.0 +02.3 85.8	26 19.3 +02.5 85.8
7°	30 19.9 +01.5 84.8	29 20.4 +01.6 84.8	28 20.9 +01.7 84.7	27 21.3 +01.9 84.7	26 21.8 +02.0 84.7
8°	30 21.4 +00.9 83.6	29 22.0 +01.0 83.6	28 22.6 +01.2 83.6	27 23.2 +01.3 83.6	26 23.8 +01.4 83.5
9°	30 22.3 +00.2 82.5	29 23.0 +00.4 82.5	28 23.8 +00.6 82.5	27 24.5 +00.8 82.4	26 25.2 +01.0 82.4
10°	30 22.5 -00.3 81.3	29 23.4 -00.1 81.3	28 24.4 +00.0 81.3	27 25.3 +00.2 81.3	26 26.2 +00.4 81.3
11°	30 22.2 -01.0 80.2	29 23.3 -00.8 80.2	28 24.4 -00.6 80.2	27 25.5 -00.3 80.2	26 26.6 -00.1 80.2
12°	30 21.2 -01.6 79.0	29 22.5 -01.3 79.0	28 23.8 -01.1 79.0	27 25.2 -00.9 79.1	26 26.5 -00.7 79.1
13°	30 19.6 -02.2 77.9	29 21.2 -01.9 77.9	28 22.7 -01.6 77.9	27 24.3 -01.4 77.9	26 25.8 -01.1 78.0
14°	30 17.4 -02.8 76.7	29 19.3 -02.5 76.7	28 21.1 -02.2 76.8	27 22.9 -02.0 76.8	26 24.7 -01.7 76.8
15°	30 14.6 -03.4 75.5	29 16.8 -03.1 75.6	28 18.9 -02.8 75.6	27 20.9 -02.4 75.7	26 23.0 -02.2 75.7
16°	30 11.2 -04.0 74.4	29 13.7 -03.7 74.4	28 16.1 -03.4 74.5	27 18.5 -03.1 74.6	26 20.8 -02.7 74.6
17°	30 07.2 -04.6 73.2	29 10.0 -04.3 73.3	28 12.7 -03.9 73.4	27 15.4 -03.5 73.4	26 18.1 -03.2 73.5
18°	30 02.6 -05.2 72.1	29 05.7 -04.8 72.2	28 08.8 -04.5 72.2	27 11.9 -04.1 72.3	26 14.9 -03.7 72.4
19°	29 57.4 -05.9 70.9	29 00.9 -05.5 71.0	28 04.3 -05.0 71.1	27 07.8 -04.7 71.2	26 11.2 -04.3 71.3
20°	29 51.5 -06.4 69.8	28 55.4 -06.0 69.9	27 59.3 -05.6 70.0	27 03.1 -05.2 70.1	26 06.9 -04.8 70.2
21°	29 45.1 -07.0 68.6	28 49.4 -06.5 68.7	27 53.7 -06.1 68.9	26 57.9 -05.7 69.0	26 02.1 -05.2 69.0
22°	29 38.1 -07.6 67.5	28 42.9 -07.2 67.6	27 47.6 -06.7 67.7	26 52.2 -06.2 67.8	25 56.9 -05.8 67.9
23°	29 30.5 -08.2 66.3	28 35.7 -07.7 66.5	27 40.9 -07.2 66.6	26 46.0 -06.7 66.7	25 51.1 -06.3 66.8
24°	29 22.3 -08.7 65.2	28 28.0 -08.2 65.4	27 33.7 -07.8 65.5	26 39.3 -07.3 65.6	25 44.8 -06.8 65.7
25°	29 13.6 -09.3 64.1	28 19.8 -08.8 64.2	27 25.9 -08.2 64.4	26 32.0 -07.8 64.5	25 38.0 -07.2 64.6
26°	29 04.3 -09.9 62.9	28 11.0 -09.4 63.1	27 17.7 -08.9 63.3	26 24.2 -08.2 63.4	25 30.8 -07.8 63.5
27°	28 54.4 -10.5 61.8	28 01.6 -09.9 62.0	27 08.8 -09.3 62.1	26 16.0 -08.8 62.3	25 23.0 -08.2 62.4
28°	28 43.9 -11.0 60.7	27 51.7 -10.4 60.9	26 59.5 -09.9 61.0	26 07.2 -09.3 61.2	25 14.8 -08.8 61.3
29°	28 32.9 -11.6 59.6	27 41.3 -11.0 59.8	26 49.6 -10.3 59.9	25 57.9 -09.8 60.1	25 06.0 -09.2 60.2

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 53.9 +05.5 92.3	23 54.2 +05.5 92.2	22 54.4 +05.5 92.1	21 54.7 +05.4 92.0	20 55.0 +05.4 91.9
1°	24 59.4 +05.1 91.2	23 59.7 +05.0 91.1	22 59.9 +05.0 91.0	22 00.1 +05.1 90.9	21 00.4 +05.0 90.8
2°	25 04.5 +04.5 90.1	24 04.7 +04.6 90.0	23 04.9 +04.6 90.0	22 05.2 +04.5 89.9	21 05.4 +04.6 89.8
3°	25 09.0 +04.1 89.0	24 09.3 +04.1 88.9	23 09.5 +04.1 88.9	22 09.7 +04.2 88.8	21 10.0 +04.2 88.7
4°	25 13.1 +03.6 87.9	24 13.4 +03.6 87.9	23 13.6 +03.7 87.8	22 13.9 +03.7 87.7	21 14.2 +03.8 87.6
5°	25 16.7 +03.0 86.8	24 17.0 +03.1 86.8	23 17.3 +03.2 86.7	22 17.6 +03.3 86.6	21 18.0 +03.3 86.6
6°	25 19.7 +02.6 85.7	24 20.1 +02.7 85.7	23 20.5 +02.8 85.6	22 20.9 +02.9 85.6	21 21.3 +03.0 85.5
7°	25 22.3 +02.1 84.6	24 22.8 +02.2 84.6	23 23.3 +02.3 84.5	22 23.8 +02.5 84.5	21 24.3 +02.6 84.4
8°	25 24.4 +01.6 83.5	24 25.0 +01.8 83.5	23 25.6 +01.9 83.4	22 26.3 +02.0 83.4	21 26.9 +02.1 83.4
9°	25 26.0 +01.1 82.4	24 26.8 +01.2 82.4	23 27.5 +01.4 82.3	22 28.3 +01.6 82.3	21 29.0 +01.8 82.3
10°	25 27.1 +00.6 81.3	24 28.0 +00.8 81.3	23 28.9 +01.0 81.3	22 29.9 +01.1 81.2	21 30.8 +01.3 81.2
11°	25 27.7 +00.1 80.2	24 28.8 +00.3 80.2	23 29.9 +00.5 80.2	22 31.0 +00.7 80.1	21 32.1 +00.9 80.1
12°	25 27.8 -00.4 79.1	24 29.1 -00.2 79.1	23 30.4 +00.1 79.1	22 31.7 +00.3 79.1	21 33.0 +00.5 79.1
13°	25 27.4 -00.9 78.0	24 28.9 -00.6 78.0	23 30.5 -00.4 78.0	22 32.0 -00.1 78.0	21 33.5 +00.1 78.0
14°	25 26.5 -01.4 76.9	24 28.3 -01.1 76.9	23 30.1 -00.9 76.9	22 31.9 -00.6 76.9	21 33.6 -00.3 76.9
15°	25 25.1 -01.9 75.8	24 27.2 -01.6 75.8	23 29.2 -01.3 75.8	22 31.3 -01.1 75.8	21 33.3 -00.7 75.8
16°	25 23.2 -02.4 74.6	24 25.6 -02.1 74.7	23 27.9 -01.8 74.7	22 30.2 -01.4 74.7	21 32.6 -01.2 74.8
17°	25 20.8 -02.9 73.5	24 23.5 -02.6 73.6	23 26.1 -02.2 73.6	22 28.8 -01.9 73.7	21 31.4 -01.5 73.7
18°	25 17.9 -03.4 72.4	24 20.9 -03.0 72.5	23 23.9 -02.7 72.5	22 26.9 -02.3 72.6	21 29.9 -02.0 72.6
19°	25 14.5 -03.8 71.3	24 17.9 -03.5 71.4	23 21.2 -03.1 71.4	22 24.6 -02.8 71.5	21 27.9 -02.4 71.5
20°	25 10.7 -04.4 70.2	24 14.4 -04.0 70.3	23 18.1 -03.5 70.4	22 21.8 -03.2 70.4	21 25.5 -02.8 70.5
21°	25 06.3 -04.8 69.1	24 10.4 -04.4 69.2	23 14.6 -04.1 69.3	22 18.6 -03.6 69.3	21 22.7 -03.2 69.4
22°	25 01.5 -05.4 68.0	24 06.0 -04.9 68.1	23 10.5 -04.4 68.2	22 15.0 -04.0 68.3	21 19.5 -03.6 68.3
23°	24 56.1 -05.8 66.9	24 01.1 -05.3 67.0	23 06.1 -04.9 67.1	22 11.0 -04.5 67.2	21 15.9 -04.0 67.2
24°	24 50.3 -06.3 65.8	23 55.8 -05.9 65.9	23 01.2 -05.4 66.0	22 06.5 -04.9 66.1	21 11.9 -04.5 66.2
25°	24 44.0 -06.8 64.7	23 49.9 -06.2 64.8	22 55.8 -05.8 64.9	22 01.6 -05.3 65.0	21 07.4 -04.8 65.1
26°	24 37.2 -07.2 63.6	23 43.7 -06.8 63.8	22 50.0 -06.2 63.9	21 56.3 -05.7 63.9	21 02.6 -05.2 64.0
27°	24 30.0 -07.7 62.6	23 36.9 -07.2 62.7	22 43.8 -06.7 62.8	21 50.6 -06.1 62.9	20 57.4 -05.6 63.0
28°	24 22.3 -08.2 61.5	23 29.7 -07.6 61.6	22 37.1 -07.1 61.7	21 44.5 -06.6 61.8	20 51.8 -06.0 61.9
29°	24 14.1 -08.7 60.4	23 22.1 -08.1 60.5	22 30.0 -07.5 60.6	21 37.9 -06.9 60.7	20 45.8 -06.5 60.8

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Latitude 5°

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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 55.2 +05.4 91.8	18 55.5 +05.3 91.7	17 55.8 +05.3 91.6	16 56.0 +05.3 91.5	15 56.2 +05.3 91.4
1°	20 00.6 +05.0 90.8	19 00.8 +05.0 90.7	18 01.1 +05.0 90.6	17 01.3 +05.0 90.5	16 01.5 +05.0 90.4
2°	20 05.6 +04.6 89.7	19 05.8 +04.7 89.6	18 06.1 +04.6 89.5	17 06.3 +04.7 89.4	16 06.5 +04.7 89.4
3°	20 10.2 +04.3 88.6	19 10.5 +04.2 88.6	18 10.7 +04.3 88.5	17 11.0 +04.3 88.4	16 11.2 +04.4 88.3
4°	20 14.5 +03.8 87.6	19 14.7 +03.9 87.5	18 15.0 +04.0 87.4	17 15.3 +04.0 87.4	16 15.6 +04.1 87.3
5°	20 18.3 +03.5 86.5	19 18.6 +03.6 86.4	18 19.0 +03.6 86.4	17 19.3 +03.7 86.3	16 19.7 +03.8 86.2
6°	20 21.8 +03.0 85.4	19 22.2 +03.2 85.4	18 22.6 +03.3 85.3	17 23.0 +03.4 85.3	16 23.5 +03.4 85.2
7°	20 24.8 +02.7 84.4	19 25.4 +02.8 84.3	18 25.9 +02.9 84.3	17 26.4 +03.1 84.2	16 26.9 +03.2 84.2
8°	20 27.5 +02.3 83.3	19 28.2 +02.4 83.3	18 28.8 +02.6 83.2	17 29.5 +02.7 83.2	16 30.1 +02.9 83.1
9°	20 29.8 +01.9 82.2	19 30.6 +02.1 82.2	18 31.4 +02.2 82.2	17 32.2 +02.4 82.1	16 33.0 +02.5 82.1
10°	20 31.7 +01.5 81.2	19 32.7 +01.7 81.1	18 33.6 +01.9 81.1	17 34.6 +02.0 81.1	16 35.5 +02.2 81.0
11°	20 33.2 +01.2 80.1	19 34.4 +01.3 80.1	18 35.5 +01.5 80.1	17 36.6 +01.7 80.0	16 37.7 +02.0 80.0
12°	20 34.4 +00.7 79.0	19 35.7 +00.9 79.0	18 37.0 +01.2 79.0	17 38.3 +01.4 79.0	16 39.7 +01.6 78.9
13°	20 35.1 +00.3 78.0	19 36.6 +00.6 78.0	18 38.2 +00.8 77.9	17 39.7 +01.1 77.9	16 41.3 +01.3 77.9
14°	20 35.4 +00.0 76.9	19 37.2 +00.2 76.9	18 39.0 +00.4 76.9	17 40.8 +00.7 76.9	16 42.6 +00.9 76.9
15°	20 35.4 -00.5 75.8	19 37.4 -00.2 75.8	18 39.4 +00.2 75.8	17 41.5 +00.4 75.8	16 43.5 +00.7 75.8
16°	20 34.9 -00.8 74.8	19 37.2 -00.5 74.8	18 39.6 -00.3 74.8	17 41.9 +00.0 74.8	16 44.2 +00.4 74.8
17°	20 34.1 -01.3 73.7	19 36.7 -00.9 73.7	18 39.3 -00.6 73.7	17 41.9 -00.2 73.7	16 44.6 +00.0 73.7
18°	20 32.8 -01.6 72.6	19 35.8 -01.3 72.7	18 38.7 -00.9 72.7	17 41.7 -00.7 72.7	16 44.6 -00.3 72.7
19°	20 31.2 -02.0 71.6	19 34.5 -01.7 71.6	18 37.8 -01.3 71.6	17 41.0 -00.9 71.6	16 44.3 -00.6 71.6
20°	20 29.2 -02.4 70.5	19 32.8 -02.0 70.5	18 36.5 -01.7 70.6	17 40.1 -01.3 70.6	16 43.7 -00.9 70.6
21°	20 26.8 -02.9 69.4	19 30.8 -02.4 69.5	18 34.8 -02.0 69.5	17 38.8 -01.6 69.5	16 42.8 -01.2 69.6
22°	20 23.9 -03.1 68.4	19 28.4 -02.8 68.4	18 32.8 -02.4 68.5	17 37.2 -02.0 68.5	16 41.6 -01.6 68.5
23°	20 20.8 -03.6 67.3	19 25.6 -03.1 67.4	18 30.4 -02.7 67.4	17 35.2 -02.2 67.4	16 40.0 -01.8 67.5
24°	20 17.2 -04.0 66.2	19 22.5 -03.5 66.3	18 27.7 -03.0 66.3	17 33.0 -02.6 66.4	16 38.2 -02.2 66.4
25°	20 13.2 -04.3 65.2	19 19.0 -03.9 65.2	18 24.7 -03.4 65.3	17 30.4 -03.0 65.3	16 36.0 -02.5 65.4
26°	20 08.9 -04.8 64.1	19 15.1 -04.3 64.2	18 21.3 -03.8 64.2	17 27.4 -03.3 64.3	16 33.5 -02.7 64.3
27°	20 04.1 -05.1 63.0	19 10.8 -04.6 63.1	18 17.5 -04.1 63.2	17 24.1 -03.5 63.2	16 30.8 -03.1 63.3
28°	19 59.0 -05.5 62.0	19 06.2 -04.9 62.1	18 13.4 -04.4 62.1	17 20.6 -04.0 62.2	16 27.7 -03.4 62.3
29°	19 53.5 -05.8 60.9	19 01.3 -05.3 61.0	18 09.0 -04.8 61.1	17 16.6 -04.2 61.2	16 24.3 -03.8 61.2

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 56.5 +05.3 91.3	13 56.7 +05.3 91.2	12 57.0 +05.2 91.2	11 57.2 +05.3 91.1	10 57.5 +05.2 91.0
1°	15 01.8 +05.0 90.3	14 02.0 +05.0 90.2	13 02.2 +05.0 90.1	12 02.5 +05.0 90.0	11 02.7 +05.0 90.0
2°	15 06.8 +04.7 89.3	14 07.0 +04.7 89.2	13 07.2 +04.8 89.1	12 07.5 +04.8 89.0	11 07.7 +04.8 88.9
3°	15 11.5 +04.4 88.2	14 11.7 +04.5 88.2	13 12.0 +04.5 88.1	12 12.3 +04.5 88.0	11 12.5 +04.6 87.9
4°	15 15.9 +04.2 87.2	14 16.2 +04.2 87.1	13 16.5 +04.3 87.1	12 16.8 +04.4 87.0	11 17.1 +04.4 86.9
5°	15 20.1 +03.8 86.2	14 20.4 +04.0 86.1	13 20.8 +04.0 86.0	12 21.2 +04.1 86.0	11 21.5 +04.2 85.9
6°	15 23.9 +03.6 85.1	14 24.4 +03.6 85.1	13 24.8 +03.8 85.0	12 25.3 +03.9 84.9	11 25.7 +04.0 84.9
7°	15 27.5 +03.3 84.1	14 28.0 +03.4 84.0	13 28.6 +03.5 84.0	12 29.2 +03.6 83.9	11 29.7 +03.8 83.9
8°	15 30.8 +03.0 83.1	14 31.4 +03.2 83.0	13 32.1 +03.3 83.0	12 32.8 +03.4 82.9	11 33.5 +03.5 82.8
9°	15 33.8 +02.7 82.0	14 34.6 +02.8 82.0	13 35.4 +03.0 81.9	12 36.2 +03.2 81.9	11 37.0 +03.4 81.8
10°	15 36.5 +02.4 81.0	14 37.4 +02.6 80.9	13 38.4 +02.8 80.9	12 39.4 +02.9 80.9	11 40.4 +03.1 80.8
11°	15 38.9 +02.1 80.0	14 40.0 +02.3 79.9	13 41.2 +02.5 79.9	12 42.3 +02.8 79.8	11 43.5 +02.9 79.8
12°	15 41.0 +01.8 78.9	14 42.3 +02.1 78.9	13 43.7 +02.3 78.8	12 45.1 +02.4 78.8	11 46.4 +02.7 78.8
13°	15 42.8 +01.6 77.9	14 44.4 +01.8 77.8	13 46.0 +02.0 77.8	12 47.5 +02.3 77.8	11 49.1 +02.5 77.7
14°	15 44.4 +01.2 76.8	14 46.2 +01.4 76.8	13 48.0 +01.7 76.8	12 49.8 +02.0 76.8	11 51.6 +02.3 76.7
15°	15 45.6 +00.9 75.8	14 47.6 +01.3 75.8	13 49.7 +01.5 75.8	12 51.8 +01.7 75.7	11 53.9 +02.0 75.7
16°	15 46.5 +00.7 74.8	14 48.9 +00.9 74.7	13 51.2 +01.2 74.7	12 53.5 +01.6 74.7	11 55.9 +01.8 74.7
17°	15 47.2 +00.3 73.7	14 49.8 +00.7 73.7	13 52.4 +01.0 73.7	12 55.1 +01.2 73.7	11 57.7 +01.6 73.7
18°	15 47.5 +00.1 72.7	14 50.5 +00.3 72.7	13 53.4 +00.7 72.7	12 56.3 +01.1 72.7	11 59.3 +01.4 72.6
19°	15 47.6 -00.3 71.6	14 50.8 +00.2 71.6	13 54.1 +00.5 71.6	12 57.4 +00.8 71.6	12 00.7 +01.1 71.6
20°	15 47.3 -00.5 70.6	14 51.0 -00.2 70.6	13 54.6 +00.2 70.6	12 58.2 +00.6 70.6	12 01.8 +00.9 70.6
21°	15 46.8 -00.8 69.6	14 50.8 -00.5 69.6	13 54.8 -00.1 69.6	12 58.8 +00.3 69.6	12 02.7 +00.7 69.6
22°	15 46.0 -01.2 68.5	14 50.3 -00.7 68.5	13 54.7 -00.3 68.5	12 59.1 +00.0 68.5	12 03.4 +00.5 68.5
23°	15 44.8 -01.4 67.5	14 49.6 -01.0 67.5	13 54.4 -00.6 67.5	12 59.1 -00.1 67.5	12 03.9 +00.3 67.5
24°	15 43.4 -01.7 66.5	14 48.6 -01.3 66.5	13 53.8 -00.8 66.5	12 59.0 -00.4 66.5	12 04.2 +00.0 66.5
25°	15 41.7 -02.0 65.4	14 47.3 -01.5 65.4	13 53.0 -01.1 65.5	12 58.6 -00.7 65.5	12 04.2 -00.2 65.5
26°	15 39.7 -02.3 64.4	14 45.8 -01.9 64.4	13 51.9 -01.4 64.4	12 57.9 -00.9 64.4	12 04.0 -00.4 64.5
27°	15 37.4 -02.6 63.3	14 43.9 -02.1 63.4	13 50.5 -01.6 63.4	12 57.0 -01.1 63.4	12 03.6 -00.7 63.4
28°	15 34.8 -02.9 62.3	14 41.8 -02.4 62.3	13 48.9 -01.9 62.4	12 55.9 -01.4 62.4	12 02.9 -00.8 62.4
29°	15 31.9 -03.2 61.3	14 39.4 -02.6 61.3	13 47.0 -02.1 61.3	12 54.5 -01.6 61.4	12 02.1 -01.1 61.4

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Latitude 5°

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 57.7 +05.2 90.9	8 57.9 +05.2 90.8	7 58.2 +05.2 90.7	6 58.4 +05.2 90.6	5 58.6 +05.2 90.5
1°	10 02.9 +05.0 89.9	9 03.1 +05.1 89.8	8 03.4 +05.0 89.7	7 03.6 +05.1 89.6	6 03.8 +05.1 89.5
2°	10 07.9 +04.9 88.9	9 08.2 +04.9 88.8	8 08.4 +04.9 88.7	7 08.7 +04.9 88.6	6 08.9 +05.0 88.5
3°	10 12.8 +04.7 87.8	9 13.1 +04.7 87.8	8 13.3 +04.8 87.7	7 13.6 +04.8 87.6	6 13.9 +04.9 87.5
4°	10 17.5 +04.4 86.8	9 17.8 +04.5 86.8	8 18.1 +04.6 86.7	7 18.4 +04.7 86.6	6 18.8 +04.7 86.5
5°	10 21.9 +04.3 85.8	9 22.3 +04.4 85.7	8 22.7 +04.5 85.7	7 23.1 +04.6 85.6	6 23.5 +04.7 85.5
6°	10 26.2 +04.1 84.8	9 26.7 +04.2 84.7	8 27.2 +04.3 84.7	7 27.7 +04.4 84.6	6 28.2 +04.5 84.5
7°	10 30.3 +03.9 83.8	9 30.9 +04.0 83.7	8 31.5 +04.1 83.7	7 32.1 +04.2 83.6	6 32.7 +04.4 83.5
8°	10 34.2 +03.7 82.8	9 34.9 +03.8 82.7	8 35.6 +04.0 82.6	7 36.3 +04.2 82.6	6 37.1 +04.2 82.5
9°	10 37.9 +03.5 81.8	9 38.7 +03.7 81.7	8 39.6 +03.8 81.6	7 40.5 +04.0 81.6	6 41.3 +04.2 81.5
10°	10 41.4 +03.3 80.7	9 42.4 +03.5 80.7	8 43.4 +03.7 80.6	7 44.5 +03.8 80.6	6 45.5 +04.0 80.5
11°	10 44.7 +03.1 79.7	9 45.9 +03.3 79.7	8 47.1 +03.5 79.6	7 48.3 +03.7 79.6	6 49.5 +03.9 79.5
12°	10 47.8 +02.9 78.7	9 49.2 +03.1 78.7	8 50.6 +03.3 78.6	7 52.0 +03.6 78.5	6 53.4 +03.8 78.5
13°	10 50.7 +02.7 77.7	9 52.3 +03.0 77.6	8 53.9 +03.2 77.6	7 55.6 +03.4 77.5	6 57.2 +03.7 77.5
14°	10 53.4 +02.5 76.7	9 55.3 +02.7 76.6	8 57.1 +03.0 76.6	7 59.0 +03.3 76.5	7 00.9 +03.5 76.5
15°	10 55.9 +02.4 75.7	9 58.0 +02.6 75.6	9 00.1 +02.9 75.6	8 02.3 +03.1 75.5	7 04.4 +03.4 75.5
16°	10 58.3 +02.1 74.6	10 00.6 +02.4 74.6	9 03.0 +02.7 74.6	8 05.4 +03.0 74.5	7 07.8 +03.3 74.5
17°	11 00.4 +01.9 73.6	10 03.0 +02.2 73.6	9 05.7 +02.5 73.5	8 08.4 +02.8 73.5	7 11.1 +03.1 73.5
18°	11 02.3 +01.7 72.6	10 05.2 +02.0 72.6	9 08.2 +02.4 72.5	8 11.2 +02.7 72.5	7 14.2 +03.0 72.4
19°	11 04.0 +01.4 71.6	10 07.2 +01.9 71.6	9 10.6 +02.1 71.5	8 13.9 +02.5 71.5	7 17.2 +02.9 71.4
20°	11 05.4 +01.3 70.6	10 09.1 +01.6 70.5	9 12.7 +02.0 70.5	8 16.4 +02.4 70.5	7 20.1 +02.7 70.4
21°	11 06.7 +01.1 69.5	10 10.7 +01.5 69.5	9 14.7 +01.9 69.5	8 18.8 +02.2 69.5	7 22.8 +02.6 69.4
22°	11 07.8 +00.9 68.5	10 12.2 +01.3 68.5	9 16.6 +01.7 68.5	8 21.0 +02.0 68.5	7 25.4 +02.5 68.4
23°	11 08.7 +00.7 67.5	10 13.5 +01.1 67.5	9 18.3 +01.5 67.5	8 23.0 +02.0 67.4	7 27.9 +02.3 67.4
24°	11 09.4 +00.4 66.5	10 14.6 +00.8 66.5	9 19.8 +01.3 66.5	8 25.0 +01.7 66.4	7 30.2 +02.2 66.4
25°	11 09.8 +00.3 65.5	10 15.4 +00.8 65.5	9 21.1 +01.1 65.4	8 26.7 +01.6 65.4	7 32.4 +02.0 65.4
26°	11 10.1 +00.0 64.5	10 16.2 +00.5 64.4	9 22.2 +01.0 64.4	8 28.3 +01.5 64.4	7 34.4 +01.9 64.4
27°	11 10.1 -00.1 63.4	10 16.7 +00.3 63.4	9 23.2 +00.8 63.4	8 29.8 +01.3 63.4	7 36.3 +01.8 63.4
28°	11 10.0 -00.4 62.4	10 17.0 +00.1 62.4	9 24.0 +00.7 62.4	8 31.1 +01.1 62.4	7 38.1 +01.6 62.4
29°	11 09.6 -00.6 61.4	10 17.1 +00.0 61.4	9 24.7 +00.4 61.4	8 32.2 +01.0 61.4	7 39.7 +01.5 61.4

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 58.9 +05.2 90.4	3 59.1 +05.2 90.3	2 59.3 +05.2 90.3	1 59.5 +05.3 90.2	0 59.8 +05.2 90.1
1°	5 04.1 +05.1 89.4	4 04.3 +05.1 89.4	3 04.5 +05.2 89.3	2 04.8 +05.1 89.2	1 05.0 +05.2 89.1
2°	5 09.2 +05.0 88.4	4 09.4 +05.1 88.4	3 09.7 +05.1 88.3	2 09.9 +05.2 88.2	1 10.2 +05.2 88.1
3°	5 14.2 +04.9 87.4	4 14.5 +05.0 87.4	3 14.8 +05.0 87.3	2 15.1 +05.1 87.2	1 15.4 +05.1 87.1
4°	5 19.1 +04.8 86.4	4 19.5 +04.9 86.4	3 19.8 +05.0 86.3	2 20.2 +05.0 86.2	1 20.5 +05.2 86.1
5°	5 23.9 +04.8 85.4	4 24.4 +04.8 85.4	3 24.8 +04.9 85.3	2 25.2 +05.0 85.2	1 25.7 +05.1 85.1
6°	5 28.7 +04.6 84.4	4 29.2 +04.7 84.4	3 29.7 +04.9 84.3	2 30.2 +05.0 84.2	1 30.8 +05.0 84.1
7°	5 33.3 +04.5 83.4	4 33.9 +04.7 83.4	3 34.6 +04.7 83.3	2 35.2 +04.9 83.2	1 35.8 +05.1 83.1
8°	5 37.8 +04.4 82.4	4 38.6 +04.5 82.4	3 39.3 +04.8 82.3	2 40.1 +04.9 82.2	1 40.9 +05.0 82.1
9°	5 42.2 +04.4 81.4	4 43.1 +04.5 81.4	3 44.1 +04.6 81.3	2 45.0 +04.8 81.2	1 45.9 +05.0 81.1
10°	5 46.6 +04.2 80.4	4 47.6 +04.4 80.4	3 48.7 +04.6 80.3	2 49.8 +04.8 80.2	1 50.9 +05.0 80.1
11°	5 50.8 +04.1 79.4	4 52.0 +04.3 79.4	3 53.3 +04.5 79.3	2 54.6 +04.7 79.2	1 55.9 +04.9 79.1
12°	5 54.9 +04.0 78.4	4 56.3 +04.3 78.4	3 57.8 +04.4 78.3	2 59.3 +04.6 78.2	2 00.8 +04.9 78.1
13°	5 58.9 +03.9 77.4	5 00.6 +04.1 77.3	4 02.2 +04.4 77.3	3 03.9 +04.6 77.2	2 05.7 +04.8 77.1
14°	6 02.8 +03.8 76.4	5 04.7 +04.0 76.3	4 06.6 +04.3 76.3	3 08.5 +04.6 76.2	2 10.5 +04.8 76.1
15°	6 06.6 +03.6 75.4	5 08.7 +04.0 75.3	4 10.9 +04.2 75.3	3 13.1 +04.5 75.2	2 15.3 +04.8 75.1
16°	6 10.2 +03.6 74.4	5 12.7 +03.8 74.3	4 15.1 +04.1 74.3	3 17.6 +04.4 74.2	2 20.1 +04.7 74.1
17°	6 13.8 +03.4 73.4	5 16.5 +03.8 73.3	4 19.2 +04.1 73.3	3 22.0 +04.4 73.2	2 24.8 +04.7 73.1
18°	6 17.2 +03.3 72.4	5 20.3 +03.6 72.3	4 23.3 +04.0 72.3	3 26.4 +04.3 72.2	2 29.5 +04.6 72.1
19°	6 20.5 +03.3 71.4	5 23.9 +03.6 71.3	4 27.3 +03.9 71.3	3 30.7 +04.2 71.2	2 34.1 +04.6 71.1
20°	6 23.8 +03.0 70.4	5 27.5 +03.4 70.3	4 31.2 +03.8 70.3	3 34.9 +04.2 70.2	2 38.7 +04.5 70.1
21°	6 26.8 +03.0 69.4	5 30.9 +03.4 69.3	4 35.0 +03.7 69.3	3 39.1 +04.1 69.2	2 43.2 +04.5 69.1
22°	6 29.8 +02.9 68.4	5 34.3 +03.2 68.3	4 38.7 +03.7 68.3	3 43.2 +04.1 68.2	2 47.7 +04.5 68.1
23°	6 32.7 +02.7 67.4	5 37.5 +03.2 67.3	4 42.4 +03.5 67.3	3 47.3 +03.9 67.2	2 52.2 +04.3 67.1
24°	6 35.4 +02.6 66.4	5 40.7 +03.0 66.3	4 45.9 +03.5 66.3	3 51.2 +03.9 66.2	2 56.5 +04.4 66.2
25°	6 38.0 +02.5 65.4	5 43.7 +02.9 65.3	4 49.4 +03.4 65.3	3 55.1 +03.9 65.2	3 00.9 +04.3 65.2
26°	6 40.5 +02.4 64.4	5 46.6 +02.9 64.3	4 52.8 +03.3 64.3	3 59.0 +03.7 64.2	3 05.2 +04.2 64.2
27°	6 42.9 +02.2 63.3	5 49.5 +02.7 63.3	4 56.1 +03.2 63.3	4 02.7 +03.7 63.2	3 09.4 +04.1 63.2
28°	6 45.1 +02.2 62.3	5 52.2 +02.6 62.3	4 59.3 +03.1 62.3	4 06.4 +03.6 62.2	3 13.5 +04.1 62.2
29°	6 47.3 +02.0 61.3	5 54.8 +02.5 61.3	5 02.4 +03.0 61.3	4 10.0 +03.5 61.2	3 17.6 +04.1 61.2

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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 +05.2 90.0	-0 59.8 +05.3	-1 59.5 +05.2	-2 59.3 +05.2	
1°	0 05.2 +05.3 89.0	-0 54.5 +05.2	-1 54.3 +05.3	-2 54.1 +05.4	
2°	0 10.5 +05.2 88.0	-0 49.3 +05.3	-1 49.0 +05.3	-2 48.7 +05.3	
3°	0 15.7 +05.2 87.0	-0 44.0 +05.3	-1 43.7 +05.4	-2 43.4 +05.4	
4°	0 20.9 +05.2 86.0	-0 38.7 +05.3	-1 38.3 +05.3	-2 38.0 +05.5	
5°	0 26.1 +05.2 85.0	-0 33.4 +05.3	-1 33.0 +05.4	-2 32.5 +05.5	
6°	0 31.3 +05.2 84.0	-0 28.1 +05.3	-1 27.6 +05.5	-2 27.0 +05.6	
7°	0 36.5 +05.2 83.0	-0 22.8 +05.3	-1 22.1 +05.4	-2 21.4 +05.6	
8°	0 41.7 +05.2 82.0	-0 17.5 +05.3	-1 16.7 +05.5	-2 15.8 +05.6	
9°	0 46.9 +05.1 81.0	-0 12.2 +05.4	-1 11.2 +05.5	-2 10.2 +05.7	
10°	0 52.0 +05.2 80.0	-0 06.8 +05.3	-1 05.7 +05.5	-2 04.5 +05.7	
11°	0 57.2 +05.1 79.0	-0 01.5 +05.3	-1 00.2 +05.6	-1 58.8 +05.8	
12°	1 02.3 +05.1 78.0	0 03.8 +05.4 78.0	-0 54.6 +05.5	-1 53.0 +05.7	
13°	1 07.4 +05.1 77.0	0 09.2 +05.3 77.0	-0 49.1 +05.6	-1 47.3 +05.9	
14°	1 12.5 +05.1 76.1	0 14.5 +05.3 76.0	-0 43.5 +05.6	-1 41.4 +05.8	
15°	1 17.6 +05.0 75.1	0 19.8 +05.3 75.0	-0 37.9 +05.6	-1 35.6 +05.9	
16°	1 22.6 +05.0 74.1	0 25.1 +05.3 74.0	-0 32.3 +05.6	-1 29.7 +05.9	
17°	1 27.6 +05.0 73.1	0 30.4 +05.3 73.0	-0 26.7 +05.6	-1 23.8 +05.9	
18°	1 32.6 +05.0 72.1	0 35.7 +05.3 72.0	-0 21.1 +05.6	-1 17.9 +06.0	
19°	1 37.6 +04.9 71.1	0 41.0 +05.3 71.0	-0 15.5 +05.7	-1 11.9 +05.9	
20°	1 42.5 +04.9 70.1	0 46.3 +05.3 70.0	-0 09.8 +05.6	-1 06.0 +06.0	
21°	1 47.4 +04.9 69.1	0 51.6 +05.2 69.0	-0 04.2 +05.6	-1 00.0 +06.1	
22°	1 52.3 +04.8 68.1	0 56.8 +05.3 68.0	0 01.4 +05.7 67.9	-0 53.9 +06.0	
23°	1 57.1 +04.8 67.1	1 02.1 +05.2 67.0	0 07.1 +05.6 66.9	-0 47.9 +06.0	
24°	2 01.9 +04.8 66.1	1 07.3 +05.2 66.0	0 12.7 +05.6 65.9	-0 41.9 +06.1	
25°	2 06.7 +04.7 65.1	1 12.5 +05.1 65.0	0 18.3 +05.6 64.9	-0 35.8 +06.1	
26°	2 11.4 +04.7 64.1	1 17.6 +05.2 64.0	0 23.9 +05.6 63.9	-0 29.7 +06.0	
27°	2 16.1 +04.6 63.1	1 22.8 +05.1 63.0	0 29.5 +05.6 62.9	-0 23.7 +06.1	
28°	2 20.7 +04.6 62.1	1 27.9 +05.1 62.0	0 35.1 +05.6 61.9	-0 17.6 +06.1	
29°	2 25.3 +04.6 61.1	1 33.0 +05.1 61.0	0 40.7 +05.6 60.9	-0 11.5 +06.1	

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°					
1°					
2°					
3°					
4°					
5°					
6°					
7°					
8°					
9°					
10°					
11°					
12°					
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20°					
21°					
22°					
23°					
24°					
25°					
26°					
27°					
28°					
29°					

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°	84 00.0 +60.0 180.0	83 55.1 +59.0 170.5	83 40.6 +56.4 161.5	83 17.7 +52.6 153.4	82 47.6 +48.5 146.2
1°	85 00.0 +60.0 180.0	84 54.1 +58.6 168.7	84 37.0 +54.8 158.2	84 10.3 +50.0 149.0	83 36.1 +44.9 141.2
2°	86 00.0 +60.0 180.0	85 52.7 +57.6 166.0	85 31.8 +52.1 153.4	85 00.3 +45.5 143.1	84 21.0 +39.6 134.9
3°	87 00.0 +60.0 180.0	86 50.3 +55.6 161.6	86 23.9 +46.7 146.3	85 45.8 +38.4 135.0	85 00.6 +31.9 126.8
4°	88 00.0 +60.0 180.0	87 45.9 +49.4 153.5	87 10.6 +35.7 135.0	86 24.2 +26.9 123.7	85 32.5 +21.2 116.5
5°	89 00.0 +60.0 180.0	88 35.3 +25.0 135.1	87 46.3 +14.4 116.6	86 51.1 +09.9 108.4	85 53.7 +07.6 103.9
6°	90 00.0 -60.0 0.0	89 00.3 -24.9 89.9	88 00.7 -14.2 89.9	87 01.0 -09.6 89.8	86 01.3 -07.2 89.8
7°	89 00.0 -60.0 0.0	88 35.4 -49.4 44.8	87 46.5 -35.6 63.2	86 51.4 -26.6 71.3	85 54.1 -20.8 75.7
8°	88 00.0 -60.0 0.0	87 46.0 -55.6 26.3	87 10.9 -46.7 44.7	86 24.8 -38.3 55.9	85 33.3 -31.6 63.0
9°	87 00.0 -60.0 0.0	86 50.4 -57.6 18.2	86 24.2 -52.0 33.3	85 46.5 -45.4 44.6	85 01.7 -39.4 52.6
10°	86 00.0 -60.0 0.0	85 52.8 -58.6 13.8	85 32.2 -54.8 26.2	85 01.1 -49.9 36.4	84 22.3 -44.8 44.5
11°	85 00.0 -60.0 0.0	84 54.2 -59.0 11.1	84 37.4 -56.4 21.4	84 11.2 -52.7 30.5	83 37.5 -48.5 38.1
12°	84 00.0 -60.0 0.0	83 55.2 -59.3 9.3	83 41.0 -57.3 18.1	83 18.5 -54.4 26.1	82 49.0 -51.0 33.1
13°	83 00.0 -60.0 0.0	82 55.9 -59.5 7.9	82 43.7 -58.0 15.6	82 24.1 -55.7 22.7	81 58.0 -52.9 29.1
14°	82 00.0 -60.0 0.0	81 56.4 -59.6 6.9	81 45.7 -58.4 13.7	81 28.4 -56.6 20.0	81 05.1 -54.3 25.9
15°	81 00.0 -60.0 0.0	80 56.8 -59.7 6.1	80 47.3 -58.7 12.2	80 31.8 -57.2 17.9	80 10.8 -55.3 23.3
16°	80 00.0 -60.0 0.0	79 57.1 -59.7 5.5	79 48.6 -59.0 10.9	79 34.6 -57.7 16.1	79 15.5 -56.0 21.1
17°	79 00.0 -60.0 0.0	78 57.4 -59.8 5.0	78 49.6 -59.1 9.9	78 36.9 -58.0 14.7	78 19.5 -56.7 19.2
18°	78 00.0 -60.0 0.0	77 57.6 -59.8 4.6	77 50.5 -59.2 9.1	77 38.9 -58.4 13.5	77 22.8 -57.1 17.7
19°	77 00.0 -60.0 0.0	76 57.8 -59.8 4.2	76 51.3 -59.4 8.3	76 40.5 -58.5 12.4	76 25.7 -57.5 16.3
20°	76 00.0 -60.0 0.0	75 58.0 -59.9 3.9	75 51.9 -59.4 7.7	75 42.0 -58.7 11.5	75 28.2 -57.8 15.1
21°	75 00.0 -60.0 0.0	74 58.1 -59.9 3.6	74 52.5 -59.5 7.2	74 43.3 -58.9 10.7	74 30.4 -58.0 14.1
22°	74 00.0 -60.0 0.0	73 58.2 -59.8 3.4	73 53.0 -59.5 6.7	73 44.4 -59.0 10.0	73 32.4 -58.3 13.2
23°	73 00.0 -60.0 0.0	72 58.4 -59.9 3.1	72 53.5 -59.6 6.3	72 45.4 -59.2 9.4	72 34.1 -58.5 12.4
24°	72 00.0 -60.0 0.0	71 58.5 -59.9 3.0	71 53.9 -59.7 5.9	71 46.2 -59.2 8.8	71 35.6 -58.6 11.6
25°	71 00.0 -60.0 0.0	70 58.6 -60.0 2.8	70 54.2 -59.7 5.5	70 47.0 -59.3 8.3	70 37.0 -58.7 11.0
26°	70 00.0 -60.0 0.0	69 58.6 -59.9 2.6	69 54.5 -59.7 5.2	69 47.7 -59.3 7.8	69 38.3 -58.8 10.4
27°	69 00.0 -60.0 0.0	68 58.7 -59.9 2.5	68 54.8 -59.7 5.0	68 48.4 -59.4 7.4	68 39.5 -59.0 9.8
28°	68 00.0 -60.0 0.0	67 58.8 -60.0 2.4	67 55.1 -59.8 4.7	67 49.0 -59.5 7.0	67 40.5 -59.0 9.3
29°	67 00.0 -60.0 0.0	66 58.8 -59.9 2.2	66 55.3 -59.7 4.5	66 49.5 -59.4 6.7	66 41.5 -59.1 8.9

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°	82 11.7 +44.5 140.1	81 31.3 +40.7 134.8	80 47.4 +37.2 130.4	80 00.7 +34.2 126.6	79 11.8 +31.5 123.4
1°	82 56.2 +40.2 134.9	82 12.0 +36.1 129.6	81 24.6 +32.6 125.3	80 34.9 +29.6 121.8	79 43.3 +27.1 118.8
2°	83 36.4 +34.6 128.5	82 48.1 +30.4 123.5	81 57.2 +27.1 119.5	81 04.5 +24.3 116.3	80 10.4 +22.0 113.7
3°	84 11.0 +27.0 120.8	83 18.5 +23.3 116.4	82 24.3 +20.5 113.0	81 28.8 +18.2 110.3	80 32.4 +16.5 108.1
4°	84 38.0 +17.4 111.6	83 41.8 +14.9 108.2	82 44.8 +12.9 105.7	81 47.0 +11.5 103.7	80 48.9 +10.3 102.2
5°	84 55.4 +06.2 101.1	83 56.7 +05.3 99.2	82 57.7 +04.6 97.8	81 58.5 +04.1 96.8	80 59.2 +03.8 95.9
6°	85 01.6 -05.6 89.7	84 02.0 -04.7 89.7	83 02.3 -03.9 89.6	82 02.6 -03.3 89.6	81 03.0 -02.9 89.5
7°	84 56.0 -17.0 78.3	83 57.3 -14.2 80.1	82 58.4 -12.2 81.4	81 59.3 -10.6 82.4	81 00.1 -09.3 83.1
8°	84 39.0 -26.6 67.8	83 43.1 -22.8 71.1	82 46.2 -19.8 73.5	81 48.7 -17.4 75.4	80 50.8 -15.6 76.9
9°	84 12.4 -34.3 58.5	83 20.3 -30.0 62.9	82 26.4 -26.5 66.2	81 31.3 -23.7 68.8	80 35.2 -21.2 70.9
10°	83 38.1 -40.0 50.7	82 50.3 -35.8 55.7	81 59.9 -32.2 59.6	81 07.6 -29.0 62.7	80 14.0 -26.4 65.2
11°	82 58.1 -44.3 44.3	82 14.5 -40.4 49.5	81 27.7 -36.8 53.7	80 38.6 -33.7 57.2	79 47.6 -30.8 60.1
12°	82 13.8 -47.4 39.1	81 34.1 -43.9 44.2	80 50.9 -40.6 48.5	80 04.9 -37.5 52.2	79 16.8 -34.8 55.3
13°	81 26.4 -49.9 34.8	80 50.2 -46.7 39.8	80 10.3 -43.7 44.1	79 27.4 -40.8 47.8	78 42.0 -38.0 51.1
14°	80 36.5 -51.7 31.2	80 03.5 -49.0 36.0	79 26.6 -46.1 40.2	78 46.6 -43.4 43.9	78 04.0 -40.9 47.2
15°	79 44.8 -53.0 28.2	79 14.5 -50.6 32.7	78 40.5 -48.2 36.8	78 03.2 -45.7 40.5	77 23.1 -43.2 43.8
16°	78 51.8 -54.1 25.7	78 23.9 -52.0 30.0	77 52.3 -49.7 33.9	77 17.5 -47.5 37.5	76 39.9 -45.3 40.7
17°	77 57.7 -55.0 23.6	77 31.9 -53.1 27.6	77 02.6 -51.1 31.3	76 30.0 -49.0 34.8	75 54.6 -46.9 37.9
18°	77 02.7 -55.6 21.7	76 38.8 -54.0 25.5	76 11.5 -52.2 29.1	75 41.0 -50.3 32.4	75 07.7 -48.4 35.4
19°	76 07.1 -56.2 20.1	75 44.8 -54.7 23.7	75 19.3 -53.2 27.0	74 50.7 -51.5 30.2	74 19.3 -49.7 33.2
20°	75 10.9 -56.7 18.7	74 50.1 -55.4 22.1	74 26.1 -53.9 25.3	73 59.2 -52.3 28.3	73 29.6 -50.7 31.2
21°	74 14.2 -57.0 17.4	73 54.7 -55.8 20.6	73 32.2 -54.5 23.7	73 06.9 -53.1 26.6	72 38.9 -51.6 29.3
22°	73 17.2 -57.4 16.3	72 58.9 -56.3 19.3	72 37.7 -55.1 22.2	72 13.8 -53.8 25.0	71 47.3 -52.4 27.7
23°	72 19.8 -57.6 15.3	72 02.6 -56.7 18.2	71 42.6 -55.6 20.9	71 20.0 -54.4 23.6	70 54.9 -53.1 26.1
24°	71 22.2 -57.9 14.4	71 05.9 -56.9 17.1	70 47.0 -55.9 19.8	70 25.6 -54.9 22.3	70 01.8 -53.7 24.7
25°	70 24.3 -58.0 13.6	70 09.0 -57.3 16.2	69 51.1 -56.4 18.7	69 30.7 -55.3 21.1	69 08.1 -54.2 23.5
26°	69 26.3 -58.3 12.9	69 11.7 -57.5 15.3	68 54.7 -56.6 17.7	68 35.4 -55.7 20.0	68 13.9 -54.7 22.3
27°	68 28.0 -58.3 12.2	68 14.2 -57.7 14.5	67 58.1 -56.9 16.8	67 39.7 -56.0 19.0	67 19.2 -55.1 21.2
28°	67 29.7 -58.5 11.6	67 16.5 -57.8 13.8	67 01.2 -57.2 16.0	66 43.7 -56.4 18.1	66 24.1 -55.5 20.2
29°	66 31.2 -58.7 11.0	66 18.7 -58.1 13.2	66 04.0 -57.3 15.2	65 47.3 -56.6 17.3	65 28.6 -55.8 19.2

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°	78 21.2 +29.2 120.7	77 29.3 +27.0 118.3	76 36.2 +25.3 116.2	75 42.2 +23.7 114.4	74 47.5 +22.3 112.7
1°	78 50.4 +24.9 116.2	77 56.3 +23.1 114.1	77 01.5 +21.4 112.2	76 05.9 +20.0 110.6	75 09.8 +18.7 109.2
2°	79 15.3 +20.1 111.4	78 19.4 +18.5 109.6	77 22.9 +17.2 108.0	76 25.9 +16.0 106.6	75 28.5 +15.1 105.4
3°	79 35.4 +15.0 106.3	78 37.9 +13.8 104.8	77 40.1 +12.7 103.6	76 41.9 +11.9 102.5	75 43.6 +11.1 101.5
4°	79 50.4 +09.4 100.9	78 51.7 +08.6 99.8	77 52.8 +08.0 98.9	76 53.8 +07.5 98.2	75 54.7 +07.0 97.5
5°	79 59.8 +03.5 95.2	79 00.3 +03.3 94.7	78 00.8 +03.2 94.2	77 01.3 +03.0 93.8	76 01.7 +02.9 93.4
6°	80 03.3 -02.4 89.5	79 03.6 -02.1 89.4	78 04.0 -01.9 89.4	77 04.3 -01.6 89.3	76 04.6 -01.3 89.3
7°	80 00.9 -08.4 83.7	79 01.5 -07.4 84.2	78 02.1 -06.7 84.5	77 02.7 -06.1 84.9	76 03.3 -05.6 85.1
8°	79 52.5 -13.9 78.0	78 54.1 -12.7 79.0	77 55.4 -11.5 79.8	76 56.6 -10.5 80.4	75 57.7 -09.6 81.0
9°	79 38.6 -19.3 72.6	78 41.4 -17.5 73.9	77 43.9 -16.0 75.1	76 46.1 -14.7 76.1	75 48.1 -13.6 76.9
10°	79 19.3 -24.0 67.4	78 23.9 -22.1 69.1	77 27.9 -20.4 70.6	76 31.4 -18.8 71.9	75 34.5 -17.5 73.0
11°	78 55.3 -28.4 62.5	78 01.8 -26.2 64.6	77 07.5 -24.2 66.3	76 12.6 -22.6 67.9	75 17.0 -21.0 69.2
12°	78 26.9 -32.2 58.0	77 35.6 -29.9 60.3	76 43.3 -27.9 62.3	75 50.0 -26.0 64.0	74 56.0 -24.3 65.6
13°	77 54.7 -35.6 53.9	77 05.7 -33.2 56.4	76 15.4 -31.1 58.5	75 24.0 -29.2 60.4	74 31.7 -27.4 62.1
14°	77 19.1 -38.4 50.1	76 32.5 -36.1 52.7	75 44.3 -34.0 55.0	74 54.8 -32.0 57.0	74 04.3 -30.3 58.8
15°	76 40.7 -40.9 46.7	75 56.4 -38.7 49.3	75 10.3 -36.6 51.7	74 22.8 -34.7 53.8	73 34.0 -32.8 55.7
16°	75 59.8 -43.0 43.6	75 17.7 -40.9 46.3	74 33.7 -38.9 48.7	73 48.1 -36.9 50.8	73 01.2 -35.1 52.8
17°	75 16.8 -44.9 40.8	74 36.8 -42.9 43.4	73 54.8 -40.9 45.9	73 11.2 -39.0 48.0	72 26.1 -37.2 50.1
18°	74 31.9 -46.5 38.3	73 53.9 -44.6 40.9	73 13.9 -42.7 43.3	72 32.2 -40.9 45.5	71 48.9 -39.2 47.5
19°	73 45.4 -47.8 35.9	73 09.3 -46.0 38.5	72 31.2 -44.3 40.9	71 51.3 -42.6 43.1	71 09.7 -40.8 45.1
20°	72 57.6 -49.1 33.8	72 23.3 -47.4 36.3	71 46.9 -45.7 38.7	71 08.7 -44.0 40.9	70 28.9 -42.4 42.9
21°	72 08.5 -50.0 31.9	71 35.9 -48.5 34.4	71 01.2 -46.9 36.6	70 24.7 -45.3 38.8	69 46.5 -43.7 40.8
22°	71 18.5 -51.0 30.2	70 47.4 -49.5 32.5	70 14.3 -48.0 34.8	69 39.4 -46.5 36.9	69 02.8 -45.0 38.8
23°	70 27.5 -51.8 28.5	69 57.9 -50.4 30.8	69 26.3 -48.9 33.0	68 52.9 -47.5 35.1	68 17.8 -46.1 37.0
24°	69 35.7 -52.4 27.1	69 07.5 -51.1 29.3	68 37.4 -49.8 31.4	68 05.4 -48.5 33.4	67 31.7 -47.1 35.3
25°	68 43.3 -53.1 25.7	68 16.4 -51.9 27.8	67 47.6 -50.6 29.9	67 16.9 -49.3 31.9	66 44.6 -48.0 33.7
26°	67 50.2 -53.6 24.4	67 24.5 -52.4 26.5	66 57.0 -51.3 28.5	66 27.6 -50.1 30.4	65 56.6 -48.8 32.2
27°	66 56.6 -54.1 23.3	66 32.1 -53.0 25.3	66 05.7 -51.9 27.2	65 37.5 -50.7 29.1	65 07.8 -49.6 30.8
28°	66 02.5 -54.5 22.2	65 39.1 -53.5 24.1	65 13.8 -52.5 26.0	64 46.8 -51.4 27.8	64 18.2 -50.3 29.5
29°	65 08.0 -54.9 21.2	64 45.6 -54.0 23.0	64 21.3 -52.9 24.8	63 55.4 -51.9 26.6	63 27.9 -50.8 28.3

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°	73 52.2 +21.0 111.3	72 56.4 +19.8 110.0	72 00.1 +18.8 108.9	71 03.5 +17.9 107.8	70 06.5 +17.1 106.9
1°	74 13.2 +17.7 107.9	73 16.2 +16.7 106.8	72 18.9 +15.9 105.8	71 21.4 +15.1 104.9	70 23.6 +14.4 104.0
2°	74 30.9 +14.1 104.4	73 32.9 +13.4 103.4	72 34.8 +12.7 102.6	71 36.5 +12.0 101.8	70 38.0 +11.5 101.1
3°	74 45.0 +10.5 100.7	73 46.3 +09.9 100.0	72 47.5 +09.4 99.3	71 48.5 +09.0 98.7	70 49.5 +08.6 98.2
4°	74 55.5 +06.7 96.9	73 56.2 +06.4 96.4	72 56.9 +06.1 95.9	71 57.5 +05.9 95.5	70 58.1 +05.6 95.1
5°	75 02.2 +02.8 93.1	74 02.6 +02.7 92.8	73 03.0 +02.6 92.5	72 03.4 +02.6 92.3	71 03.7 +02.6 92.1
6°	75 05.0 -01.2 89.2	74 05.3 -01.0 89.2	73 05.6 -00.8 89.1	72 06.0 -00.7 89.1	71 06.3 -00.5 89.0
7°	75 03.8 -05.0 85.3	74 04.3 -04.6 85.5	73 04.8 -04.2 85.7	72 05.3 -03.8 85.8	71 05.8 -03.5 85.9
8°	74 58.8 -08.9 81.5	73 59.7 -08.2 81.9	73 00.6 -07.6 82.2	72 01.5 -07.1 82.6	71 02.3 -06.6 82.8
9°	74 49.9 -12.7 77.7	73 51.5 -11.7 78.3	72 53.0 -10.9 78.9	71 54.4 -10.2 79.4	70 55.7 -09.5 79.8
10°	74 37.2 -16.2 74.0	73 39.8 -15.2 74.8	72 42.1 -14.2 75.5	71 44.2 -13.2 76.2	70 46.2 -12.4 76.8
11°	74 21.0 -19.6 70.4	73 24.6 -18.3 71.4	72 27.9 -17.2 72.3	71 31.0 -16.2 73.1	70 33.8 -15.3 73.8
12°	74 01.4 -22.8 66.9	73 06.3 -21.4 68.1	72 10.7 -20.1 69.1	71 14.8 -19.0 70.1	70 18.5 -17.9 70.9
13°	73 38.6 -25.8 63.6	72 44.9 -24.4 64.9	71 50.6 -23.0 66.1	70 55.8 -21.7 67.2	70 00.6 -20.5 68.1
14°	73 12.8 -28.5 60.4	72 20.5 -27.0 61.9	71 27.6 -25.5 63.2	70 34.1 -24.2 64.3	69 40.1 -23.0 65.4
15°	72 44.3 -31.1 57.4	71 53.5 -29.4 58.9	71 02.1 -28.0 60.3	70 09.9 -26.6 61.6	69 17.1 -25.3 62.8
16°	72 13.2 -33.4 54.6	71 24.1 -31.8 56.2	70 34.1 -30.3 57.6	69 43.3 -28.8 59.0	68 51.8 -27.5 60.2
17°	71 39.8 -35.6 51.9	70 52.3 -33.9 53.6	70 03.8 -32.4 55.1	69 14.5 -31.0 56.5	68 24.3 -29.5 57.8
18°	71 04.2 -37.4 49.4	70 18.4 -35.9 51.1	69 31.4 -34.3 52.6	68 43.5 -32.8 54.1	67 54.8 -31.4 55.4
19°	70 26.8 -39.2 47.0	69 42.5 -37.6 48.7	68 57.1 -36.0 50.3	68 10.7 -34.6 51.8	67 23.4 -33.3 53.2
20°	69 47.6 -40.8 44.8	69 04.9 -39.2 46.5	68 21.1 -37.8 48.1	67 36.1 -36.3 49.6	66 50.1 -34.8 51.1
21°	69 06.8 -42.2 42.7	68 25.7 -40.7 44.4	67 43.3 -39.2 46.1	66 59.8 -37.8 47.6	66 15.3 -36.5 49.0
22°	68 24.6 -43.5 40.7	67 45.0 -42.0 42.4	67 04.1 -40.6 44.1	66 22.0 -39.2 45.6	65 38.8 -37.8 47.1
23°	67 41.1 -44.7 38.9	67 03.0 -43.3 40.6	66 23.5 -41.9 42.2	65 42.8 -40.5 43.8	65 01.0 -39.2 45.2
24°	66 56.4 -45.7 37.1	66 19.7 -44.4 38.8	65 41.6 -43.0 40.5	65 02.3 -41.7 42.0	64 21.8 -40.4 43.4
25°	66 10.7 -46.7 35.5	65 35.3 -45.4 37.2	64 58.6 -44.1 38.8	64 20.6 -42.8 40.3	63 41.4 -41.5 41.7
26°	65 24.0 -47.6 34.0	64 49.9 -46.3 35.6	64 14.5 -45.1 37.2	63 37.8 -43.8 38.7	62 59.9 -42.6 40.1
27°	64 36.4 -48.4 32.5	64 03.6 -47.2 34.2	63 29.4 -45.9 35.7	62 54.0 -44.8 37.2	62 17.3 -43.5 38.6
28°	63 48.0 -49.1 31.2	63 16.4 -47.9 32.8	62 43.5 -46.8 34.3	62 09.2 -45.6 35.7	61 33.8 -44.4 37.1
29°	62 58.9 -49.7 29.9	62 28.5 -48.6 31.4	61 56.7 -47.5 32.9	61 23.6 -46.4 34.4	60 49.4 -45.3 35.7

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°	69 09.3 +16.3 106.0	68 11.8 +15.7 105.2	67 14.1 +15.1 104.5	66 16.3 +14.5 103.8	65 18.3 +13.9 103.2
1°	69 25.6 +13.8 103.3	68 27.5 +13.2 102.6	67 29.2 +12.6 102.0	66 30.8 +12.1 101.4	65 32.2 +11.7 100.9
2°	69 39.4 +11.0 100.5	68 40.7 +10.5 99.9	67 41.8 +10.2 99.4	66 42.9 +09.8 98.9	65 43.9 +09.5 98.5
3°	69 50.4 +08.3 97.7	68 51.2 +08.0 97.2	67 52.0 +07.7 96.8	66 52.7 +07.5 96.4	65 53.4 +07.2 96.1
4°	69 58.7 +05.4 94.8	68 59.2 +05.2 94.5	67 59.7 +05.1 94.2	67 00.2 +04.9 93.9	66 00.6 +04.9 93.7
5°	70 04.1 +02.5 91.9	69 04.4 +02.6 91.7	68 04.8 +02.5 91.5	67 05.1 +02.6 91.4	66 05.5 +02.5 91.2
6°	70 06.6 -00.3 88.9	69 07.0 -00.2 88.9	68 07.3 -00.1 88.8	67 07.7 +00.0 88.8	66 08.0 +00.2 88.7
7°	70 06.3 -03.2 86.0	69 06.8 -03.0 86.1	68 07.2 -02.7 86.2	67 07.7 -02.4 86.2	66 08.2 -02.3 86.3
8°	70 03.1 -06.1 83.1	69 03.8 -05.7 83.3	68 04.5 -05.2 83.5	67 05.3 -05.0 83.6	66 05.9 -04.5 83.8
9°	69 57.0 -08.9 80.2	68 58.1 -08.3 80.5	67 59.3 -07.9 80.8	67 00.3 -07.3 81.1	66 01.4 -06.9 81.3
10°	69 48.1 -11.7 77.3	68 49.8 -11.0 77.8	67 51.4 -10.3 78.2	66 53.0 -09.8 78.5	65 54.5 -09.2 78.9
11°	69 36.4 -14.4 74.5	68 38.8 -13.6 75.0	67 41.1 -12.8 75.6	66 43.2 -12.1 76.0	65 45.3 -11.5 76.5
12°	69 22.0 -16.9 71.7	68 25.2 -16.0 72.4	67 28.3 -15.2 73.0	66 31.1 -14.4 73.6	65 33.8 -13.7 74.1
13°	69 05.1 -19.5 69.0	68 09.2 -18.4 69.8	67 13.1 -17.5 70.5	66 16.7 -16.6 71.2	65 20.1 -15.8 71.8
14°	68 45.6 -21.8 66.4	67 50.8 -20.8 67.2	66 55.6 -19.7 68.0	66 00.1 -18.8 68.8	65 04.3 -17.8 69.5
15°	68 23.8 -24.1 63.8	67 30.0 -22.9 64.8	66 35.9 -21.9 65.6	65 41.3 -20.8 66.5	64 46.5 -19.9 67.2
16°	67 59.7 -26.2 61.3	67 07.1 -25.0 62.4	66 14.0 -23.9 63.3	65 20.5 -22.8 64.2	64 26.6 -21.8 65.0
17°	67 33.5 -28.2 59.0	66 42.1 -27.0 60.1	65 50.1 -25.8 61.1	64 57.7 -24.7 62.0	64 04.8 -23.7 62.9
18°	67 05.3 -30.1 56.7	66 15.1 -28.8 57.8	65 24.3 -27.6 58.9	64 33.0 -26.5 59.9	63 41.1 -25.4 60.8
19°	66 35.2 -31.9 54.5	65 46.3 -30.6 55.7	64 56.7 -29.4 56.8	64 06.5 -28.2 57.8	63 15.7 -27.1 58.7
20°	66 03.3 -33.5 52.4	65 15.7 -32.3 53.6	64 27.3 -31.0 54.7	63 38.3 -29.9 55.8	62 48.6 -28.7 56.8
21°	65 29.8 -35.1 50.3	64 43.4 -33.8 51.6	63 56.3 -32.6 52.8	63 08.4 -31.3 53.8	62 19.9 -30.2 54.9
22°	64 54.7 -36.6 48.4	64 09.6 -35.2 49.7	63 23.7 -34.0 50.9	62 37.1 -32.8 52.0	61 49.7 -31.6 53.0
23°	64 18.1 -37.8 46.6	63 34.4 -36.6 47.8	62 49.7 -35.3 49.0	62 04.3 -34.2 50.2	61 18.1 -33.0 51.2
24°	63 40.3 -39.1 44.8	62 57.8 -37.9 46.1	62 14.4 -36.7 47.3	61 30.1 -35.4 48.4	60 45.1 -34.3 49.5
25°	63 01.2 -40.3 43.1	62 19.9 -39.0 44.4	61 37.7 -37.8 45.6	60 54.7 -36.7 46.8	60 10.8 -35.5 47.8
26°	62 20.9 -41.3 41.5	61 40.9 -40.2 42.8	60 59.9 -39.0 44.0	60 18.0 -37.8 45.1	59 35.3 -36.6 46.2
27°	61 39.6 -42.4 39.9	61 00.7 -41.1 41.2	60 20.9 -39.9 42.4	59 40.2 -38.8 43.6	58 58.7 -37.7 44.7
28°	60 57.2 -43.2 38.5	60 19.6 -42.1 39.7	59 41.0 -41.0 40.9	59 01.4 -39.8 42.1	58 21.0 -38.7 43.2
29°	60 14.0 -44.2 37.1	59 37.5 -43.0 38.3	59 00.0 -41.9 39.5	58 21.6 -40.8 40.7	57 42.3 -39.7 41.7

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°	64 20.1 +13.5 102.6	63 21.8 +13.0 102.1	62 23.4 +12.6 101.6	61 24.9 +12.2 101.1	60 26.3 +11.8 100.7
1°	64 33.6 +11.3 100.4	63 34.8 +11.0 99.9	62 36.0 +10.6 99.5	61 37.1 +10.3 99.1	60 38.1 +10.1 98.7
2°	64 44.9 +09.2 98.1	63 45.8 +08.9 97.7	62 46.6 +08.7 97.3	61 47.4 +08.4 97.0	60 48.2 +08.2 96.7
3°	64 54.1 +07.0 95.8	63 54.7 +06.8 95.5	62 55.3 +06.6 95.2	61 55.8 +06.5 94.9	60 56.4 +06.3 94.6
4°	65 01.1 +04.7 93.4	64 01.5 +04.7 93.2	63 01.9 +04.6 93.0	62 02.3 +04.5 92.8	61 02.7 +04.5 92.6
5°	65 05.8 +02.5 91.0	64 06.2 +02.5 90.9	63 06.5 +02.5 90.8	62 06.8 +02.6 90.6	61 07.2 +02.5 90.5
6°	65 08.3 +00.3 88.7	64 08.7 +00.4 88.6	63 09.0 +00.5 88.6	62 09.4 +00.6 88.5	61 09.7 +00.7 88.5
7°	65 08.6 -02.0 86.3	64 09.1 -01.8 86.3	63 09.5 -01.6 86.3	62 10.0 -01.4 86.4	61 10.4 -01.2 86.4
8°	65 06.6 -04.2 83.9	64 07.3 -04.0 84.0	63 07.9 -03.6 84.1	62 08.6 -03.4 84.2	61 09.2 -03.2 84.3
9°	65 02.4 -06.5 81.6	64 03.3 -06.1 81.7	63 04.3 -05.8 81.9	62 05.2 -05.4 82.1	61 06.0 -05.0 82.2
10°	64 55.9 -08.7 79.2	63 57.2 -08.2 79.5	62 58.5 -07.7 79.7	61 59.8 -07.3 80.0	61 01.0 -06.9 80.2
11°	64 47.2 -10.8 76.9	63 49.0 -10.2 77.2	62 50.8 -09.7 77.6	61 52.5 -09.2 77.9	60 54.1 -08.7 78.1
12°	64 36.4 -13.0 74.6	63 38.8 -12.3 75.0	62 41.1 -11.7 75.4	61 43.3 -11.1 75.8	60 45.4 -10.6 76.1
13°	64 23.4 -15.0 72.3	63 26.5 -14.3 72.8	62 29.4 -13.6 73.3	61 32.2 -13.0 73.7	60 34.8 -12.3 74.1
14°	64 08.4 -17.1 70.1	63 12.2 -16.3 70.6	62 15.8 -15.5 71.2	61 19.2 -14.8 71.7	60 22.5 -14.1 72.1
15°	63 51.3 -19.0 67.9	62 55.9 -18.1 68.5	62 00.3 -17.3 69.1	61 04.4 -16.5 69.6	60 08.4 -15.8 70.1
16°	63 32.3 -20.8 65.7	62 37.8 -19.9 66.4	61 43.0 -19.1 67.1	60 47.9 -18.3 67.7	59 52.6 -17.5 68.2
17°	63 11.5 -22.7 63.7	62 17.9 -21.7 64.4	61 23.9 -20.8 65.1	60 29.6 -19.9 65.7	59 35.1 -19.1 66.3
18°	62 48.8 -24.3 61.6	61 56.2 -23.4 62.4	61 03.1 -22.4 63.1	60 09.7 -21.5 63.8	59 16.0 -20.6 64.5
19°	62 24.5 -26.0 59.6	61 32.8 -25.0 60.5	60 40.7 -24.1 61.2	59 48.2 -23.1 62.0	58 55.4 -22.2 62.6
20°	61 58.5 -27.6 57.7	61 07.8 -26.6 58.6	60 16.6 -25.5 59.4	59 25.1 -24.6 60.1	58 33.2 -23.7 60.8
21°	61 30.9 -29.1 55.8	60 41.2 -28.0 56.7	59 51.1 -27.0 57.6	59 00.5 -26.0 58.3	58 09.5 -25.0 59.1
22°	61 01.8 -30.6 54.0	60 13.2 -29.4 54.9	59 24.1 -28.4 55.8	58 34.5 -27.4 56.6	57 44.5 -26.4 57.4
23°	60 31.2 -31.8 52.2	59 43.8 -30.8 53.2	58 55.7 -29.7 54.1	58 07.1 -28.6 54.9	57 18.1 -27.7 55.7
24°	59 59.4 -33.2 50.5	59 13.0 -32.1 51.5	58 26.0 -31.0 52.4	57 38.5 -30.0 53.3	56 50.4 -29.0 54.1
25°	59 26.2 -34.3 48.9	58 40.9 -33.2 49.8	57 55.0 -32.2 50.8	57 08.5 -31.2 51.6	56 21.4 -30.1 52.5
26°	58 51.9 -35.6 47.3	58 07.7 -34.4 48.3	57 22.8 -33.3 49.2	56 37.3 -32.3 50.1	55 51.3 -31.3 50.9
27°	58 16.3 -36.6 45.7	57 33.3 -35.6 46.7	56 49.5 -34.5 47.7	56 05.0 -33.3 48.6	55 20.0 -32.4 49.4
28°	57 39.7 -37.6 44.2	56 57.7 -36.5 45.2	56 15.0 -35.4 46.2	55 31.7 -34.5 47.1	54 47.6 -33.4 47.9
29°	57 02.1 -38.5 42.8	56 21.2 -37.5 43.8	55 39.6 -36.5 44.7	54 57.2 -35.4 45.6	54 14.2 -34.4 46.5

Latitude 6°

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°	59 27.6 +11.5 100.3	58 28.9 +11.2 99.9	57 30.1 +10.8 99.5	56 31.2 +10.6 99.1	55 32.2 +10.4 98.8
1°	59 39.1 +09.8 98.3	58 40.1 +09.5 98.0	57 40.9 +09.3 97.7	56 41.8 +09.0 97.4	55 42.6 +08.8 97.1
2°	59 48.9 +08.0 96.4	58 49.6 +07.8 96.1	57 50.2 +07.7 95.8	56 50.8 +07.5 95.6	55 51.4 +07.4 95.3
3°	59 56.9 +06.2 94.4	58 57.4 +06.1 94.2	57 57.9 +05.9 93.9	56 58.3 +05.9 93.7	55 58.8 +05.8 93.5
4°	60 03.1 +04.4 92.4	59 03.5 +04.3 92.2	58 03.8 +04.4 92.1	57 04.2 +04.3 91.9	56 04.6 +04.2 91.8
5°	60 07.5 +02.6 90.4	59 07.8 +02.6 90.3	58 08.2 +02.6 90.2	57 08.5 +02.7 90.1	56 08.8 +02.7 90.0
6°	60 10.1 +00.8 88.4	59 10.4 +00.9 88.3	58 10.8 +01.0 88.3	57 11.2 +01.0 88.2	56 11.5 +01.1 88.2
7°	60 10.9 -01.1 86.4	59 11.3 -00.9 86.4	58 11.8 -00.8 86.4	57 12.2 -00.6 86.4	56 12.6 -00.4 86.4
8°	60 09.8 -02.9 84.4	59 10.4 -02.6 84.4	58 11.0 -02.4 84.5	57 11.6 -02.2 84.5	56 12.2 -02.0 84.6
9°	60 06.9 -04.7 82.4	59 07.8 -04.4 82.5	58 08.6 -04.1 82.6	57 09.4 -03.8 82.7	56 10.2 -03.5 82.8
10°	60 02.2 -06.5 80.4	59 03.4 -06.2 80.5	58 04.5 -05.8 80.7	57 05.6 -05.4 80.9	56 06.7 -05.1 81.0
11°	59 55.7 -08.3 78.4	58 57.2 -07.8 78.6	57 58.7 -07.4 78.8	57 00.2 -07.1 79.0	56 01.6 -06.7 79.2
12°	59 47.4 -10.0 76.4	58 49.4 -09.5 76.7	57 51.3 -09.1 77.0	56 53.1 -08.6 77.2	55 54.9 -08.1 77.4
13°	59 37.4 -11.8 74.5	58 39.9 -11.2 74.8	57 42.2 -10.6 75.1	56 44.5 -10.1 75.4	55 46.8 -09.7 75.7
14°	59 25.6 -13.4 72.5	58 28.7 -12.9 72.9	57 31.6 -12.3 73.3	56 34.4 -11.7 73.6	55 37.1 -11.2 73.9
15°	59 12.2 -15.1 70.6	58 15.8 -14.4 71.0	57 19.3 -13.8 71.4	56 22.7 -13.2 71.8	55 25.9 -12.6 72.2
16°	58 57.1 -16.8 68.7	58 01.4 -16.0 69.2	57 05.5 -15.3 69.7	56 09.5 -14.7 70.1	55 13.3 -14.0 70.5
17°	58 40.3 -18.3 66.9	57 45.4 -17.6 67.4	56 50.2 -16.8 67.9	55 54.8 -16.1 68.3	54 59.3 -15.5 68.8
18°	58 22.0 -19.8 65.1	57 27.8 -19.0 65.6	56 33.4 -18.3 66.1	55 38.7 -17.5 66.6	54 43.8 -16.8 67.1
19°	58 02.2 -21.3 63.3	57 08.8 -20.5 63.9	56 15.1 -19.7 64.4	55 21.2 -19.0 64.9	54 27.0 -18.2 65.4
20°	57 40.9 -22.7 61.5	56 48.3 -21.9 62.1	55 55.4 -21.0 62.7	55 02.2 -20.2 63.3	54 08.8 -19.4 63.8
21°	57 18.2 -24.2 59.8	56 26.4 -23.2 60.4	55 34.4 -22.4 61.1	54 42.0 -21.6 61.6	53 49.4 -20.8 62.2
22°	56 54.0 -25.4 58.1	56 03.2 -24.6 58.8	55 12.0 -23.7 59.4	54 20.4 -22.8 60.0	53 28.6 -22.0 60.6
23°	56 28.6 -26.8 56.4	55 38.6 -25.8 57.2	54 48.3 -24.9 57.8	53 57.6 -24.0 58.4	53 06.6 -23.1 59.0
24°	56 01.8 -27.9 54.8	55 12.8 -27.0 55.6	54 23.4 -26.1 56.2	53 33.6 -25.2 56.9	52 43.5 -24.4 57.5
25°	55 33.9 -29.2 53.3	54 45.8 -28.2 54.0	53 57.3 -27.2 54.7	53 08.4 -26.3 55.4	52 19.1 -25.4 56.0
26°	55 04.7 -30.3 51.7	54 17.6 -29.3 52.5	53 30.1 -28.4 53.2	52 42.1 -27.5 53.9	51 53.7 -26.6 54.5
27°	54 34.4 -31.3 50.2	53 48.3 -30.4 51.0	53 01.7 -29.4 51.7	52 14.6 -28.5 52.4	51 27.1 -27.6 53.1
28°	54 03.1 -32.4 48.8	53 17.9 -31.4 49.5	52 32.3 -30.5 50.3	51 46.1 -29.5 51.0	50 59.5 -28.6 51.7
29°	53 30.7 -33.4 47.3	52 46.5 -32.4 48.1	52 01.8 -31.4 48.9	51 16.6 -30.5 49.6	50 30.9 -29.5 50.3

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°	54 33.3 +10.1 98.5	53 34.2 +09.9 98.2	52 35.1 +09.7 97.9	51 36.0 +09.5 97.6	50 36.8 +09.3 97.4
1°	54 43.4 +08.6 96.8	53 44.1 +08.5 96.5	52 44.8 +08.3 96.3	51 45.5 +08.1 96.0	50 46.1 +08.0 95.8
2°	54 52.0 +07.2 95.1	53 52.6 +07.0 94.8	52 53.1 +06.9 94.6	51 53.6 +06.8 94.4	50 54.1 +06.7 94.2
3°	54 59.2 +05.7 93.3	53 59.6 +05.7 93.2	53 00.0 +05.6 93.0	52 00.4 +05.6 92.8	51 00.8 +05.5 92.6
4°	55 04.9 +04.2 91.6	54 05.3 +04.2 91.5	53 05.6 +04.2 91.3	52 06.0 +04.1 91.2	51 06.3 +04.2 91.1
5°	55 09.1 +02.8 89.9	54 09.5 +02.7 89.8	53 09.8 +02.8 89.7	52 10.1 +02.9 89.6	51 10.5 +02.8 89.5
6°	55 11.9 +01.2 88.1	54 12.2 +01.3 88.1	53 12.6 +01.4 88.0	52 13.0 +01.4 87.9	51 13.3 +01.6 87.9
7°	55 13.1 -00.3 86.4	54 13.5 -00.1 86.3	53 14.0 +00.0 86.3	52 14.4 +00.2 86.3	51 14.9 +00.3 86.3
8°	55 12.8 -01.8 84.6	54 13.4 -01.6 84.6	53 14.0 -01.4 84.7	52 14.6 -01.2 84.7	51 15.2 -01.1 84.7
9°	55 11.0 -03.3 82.9	54 11.8 -03.0 82.9	53 12.6 -02.8 83.0	52 13.4 -02.6 83.0	51 14.1 -02.3 83.1
10°	55 07.7 -04.8 81.1	54 08.8 -04.5 81.2	53 09.8 -04.2 81.3	52 10.8 -03.9 81.4	51 11.8 -03.7 81.5
11°	55 02.9 -06.2 79.4	54 04.3 -05.9 79.5	53 05.6 -05.6 79.7	52 06.9 -05.3 79.8	51 08.1 -04.9 79.9
12°	54 56.7 -07.8 77.6	53 58.4 -07.4 77.8	53 00.0 -06.9 78.0	52 01.6 -06.6 78.2	51 03.2 -06.2 78.3
13°	54 48.9 -09.2 75.9	53 51.0 -08.7 76.1	52 53.1 -08.4 76.4	51 55.0 -07.9 76.6	50 57.0 -07.5 76.7
14°	54 39.7 -10.6 74.2	53 42.3 -10.2 74.5	52 44.7 -09.6 74.7	51 47.1 -09.2 74.9	50 49.5 -08.8 75.2
15°	54 29.1 -12.1 72.5	53 32.1 -11.5 72.8	52 35.1 -11.0 73.1	51 37.9 -10.4 73.4	50 40.7 -10.0 73.6
16°	54 17.0 -13.4 70.8	53 20.6 -12.9 71.2	52 24.1 -12.3 71.5	51 27.5 -11.8 71.8	50 30.7 -11.2 72.0
17°	54 03.6 -14.8 69.2	53 07.7 -14.1 69.5	52 11.8 -13.6 69.9	51 15.7 -13.0 70.2	50 19.5 -12.4 70.5
18°	53 48.8 -16.2 67.5	52 53.6 -15.5 67.9	51 58.2 -14.9 68.3	51 02.7 -14.2 68.6	50 07.1 -13.7 69.0
19°	53 32.6 -17.4 65.9	52 38.1 -16.8 66.3	51 43.3 -16.0 66.7	50 48.5 -15.5 67.1	49 53.4 -14.8 67.5
20°	53 15.2 -18.7 64.3	52 21.3 -18.0 64.7	51 27.3 -17.3 65.2	50 33.0 -16.6 65.6	49 38.6 -16.0 66.0
21°	52 56.5 -20.0 62.7	52 03.3 -19.2 63.2	51 10.0 -18.5 63.6	50 16.4 -17.8 64.1	49 22.6 -17.1 64.5
22°	52 36.5 -21.2 61.1	51 44.1 -20.4 61.6	50 51.5 -19.7 62.1	49 58.6 -18.9 62.6	49 05.5 -18.2 63.0
23°	52 15.3 -22.3 59.6	51 23.7 -21.5 60.1	50 31.8 -20.7 60.6	49 39.7 -20.0 61.1	48 47.3 -19.2 61.6
24°	51 53.0 -23.5 58.1	51 02.2 -22.7 58.6	50 11.1 -21.9 59.2	49 19.7 -21.1 59.7	48 28.1 -20.4 60.1
25°	51 29.5 -24.6 56.6	50 39.5 -23.8 57.2	49 49.2 -22.9 57.7	48 58.6 -22.1 58.2	48 07.7 -21.3 58.7
26°	51 04.9 -25.7 55.1	50 15.7 -24.8 55.7	49 26.3 -24.0 56.3	48 36.5 -23.2 56.8	47 46.4 -22.4 57.3
27°	50 39.2 -26.7 53.7	49 50.9 -25.8 54.3	49 02.3 -25.0 54.9	48 13.3 -24.1 55.4	47 24.0 -23.3 55.9
28°	50 12.5 -27.7 52.3	49 25.1 -26.8 52.9	48 37.3 -25.9 53.5	47 49.2 -25.1 54.1	47 00.7 -24.3 54.6
29°	49 44.8 -28.6 50.9	48 58.3 -27.8 51.6	48 11.4 -26.9 52.1	47 24.1 -26.1 52.7	46 36.4 -25.2 53.2

Declination SAME name as Latitude

Latitude 6°

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°	49 37.6 +09.1 97.1	48 38.4 +08.9 96.9	47 39.2 +08.7 96.6	46 39.9 +08.6 96.4	45 40.6 +08.4 96.2
1°	49 46.7 +07.9 95.6	48 47.3 +07.8 95.4	47 47.9 +07.6 95.2	46 48.5 +07.5 95.0	45 49.0 +07.4 94.8
2°	49 54.6 +06.6 94.0	48 55.1 +06.5 93.9	47 55.5 +06.5 93.7	46 56.0 +06.4 93.5	45 56.4 +06.3 93.3
3°	50 01.2 +05.4 92.5	49 01.6 +05.4 92.3	48 02.0 +05.3 92.2	47 02.4 +05.2 92.0	46 02.7 +05.1 91.9
4°	50 06.6 +04.2 90.9	49 07.0 +04.1 90.8	48 07.3 +04.2 90.7	47 07.6 +04.2 90.6	46 08.0 +04.1 90.5
5°	50 10.8 +02.9 89.4	49 11.1 +03.0 89.3	48 11.5 +03.0 89.2	47 11.8 +03.0 89.1	46 12.1 +03.1 89.0
6°	50 13.7 +01.7 87.8	49 14.1 +01.7 87.8	48 14.5 +01.8 87.7	47 14.8 +01.9 87.6	46 15.2 +02.0 87.6
7°	50 15.4 +00.3 86.3	49 15.8 +00.5 86.2	48 16.3 +00.6 86.2	47 16.7 +00.8 86.2	46 17.2 +00.9 86.1
8°	50 15.7 -00.8 84.7	49 16.3 -00.7 84.7	48 16.9 -00.5 84.7	47 17.5 -00.4 84.7	46 18.1 -00.2 84.7
9°	50 14.9 -02.1 83.1	49 15.6 -01.9 83.2	48 16.4 -01.7 83.2	47 17.1 -01.5 83.2	46 17.9 -01.3 83.2
10°	50 12.8 -03.4 81.6	49 13.7 -03.1 81.6	48 14.7 -02.9 81.7	47 15.6 -02.6 81.7	46 16.6 -02.4 81.8
11°	50 09.4 -04.6 80.0	49 10.6 -04.3 80.1	48 11.8 -04.0 80.2	47 13.0 -03.8 80.3	46 14.2 -03.5 80.3
12°	50 04.8 -05.9 78.5	49 06.3 -05.6 78.6	48 07.8 -05.2 78.7	47 09.2 -04.8 78.8	46 10.7 -04.6 78.9
13°	49 58.9 -07.1 76.9	49 00.7 -06.7 77.1	48 02.6 -06.4 77.2	47 04.4 -06.0 77.3	46 06.1 -05.6 77.5
14°	49 51.8 -08.3 75.4	48 54.0 -07.9 75.5	47 56.2 -07.5 75.7	46 58.4 -07.1 75.9	46 00.5 -06.7 76.0
15°	49 43.5 -09.6 73.8	48 46.1 -09.1 74.0	47 48.7 -08.6 74.2	46 51.3 -08.2 74.4	45 53.8 -07.8 74.6
16°	49 33.9 -10.7 72.3	48 37.0 -10.2 72.5	47 40.1 -09.8 72.8	46 43.1 -09.3 73.0	45 46.0 -08.9 73.2
17°	49 23.2 -11.9 70.8	48 26.8 -11.4 71.1	47 30.3 -10.8 71.3	46 33.8 -10.4 71.5	45 37.1 -09.9 71.8
18°	49 11.3 -13.1 69.3	48 15.4 -12.5 69.6	47 19.5 -12.0 69.9	46 23.4 -11.4 70.1	45 27.2 -10.9 70.4
19°	48 58.2 -14.2 67.8	48 02.9 -13.6 68.1	47 07.5 -13.0 68.4	46 12.0 -12.5 68.7	45 16.3 -11.9 69.0
20°	48 44.0 -15.3 66.3	47 49.3 -14.7 66.7	46 54.5 -14.1 67.0	45 59.5 -13.5 67.3	45 04.4 -13.0 67.6
21°	48 28.7 -16.4 64.9	47 34.6 -15.8 65.2	46 40.4 -15.2 65.6	45 46.0 -14.6 65.9	44 51.4 -13.9 66.2
22°	48 12.3 -17.5 63.4	47 18.8 -16.8 63.8	46 25.2 -16.2 64.2	45 31.4 -15.5 64.5	44 37.5 -14.9 64.8
23°	47 54.8 -18.6 62.0	47 02.0 -17.9 62.4	46 09.0 -17.1 62.8	45 15.9 -16.5 63.1	44 22.6 -15.9 63.5
24°	47 36.2 -19.6 60.6	46 44.1 -18.8 61.0	45 51.9 -18.2 61.4	44 59.4 -17.5 61.8	44 06.7 -16.8 62.1
25°	47 16.6 -20.6 59.2	46 25.3 -19.9 59.6	45 33.7 -19.1 60.0	44 41.9 -18.4 60.4	43 49.9 -17.7 60.8
26°	46 56.0 -21.5 57.8	46 05.4 -20.8 58.2	45 14.6 -20.1 58.7	44 23.5 -19.4 59.1	43 32.2 -18.6 59.5
27°	46 34.5 -22.6 56.4	45 44.6 -21.7 56.9	44 54.5 -21.0 57.3	44 04.1 -20.2 57.8	43 13.6 -19.5 58.2
28°	46 11.9 -23.4 55.1	45 22.9 -22.7 55.6	44 33.5 -21.9 56.0	43 43.9 -21.1 56.4	42 54.1 -20.4 56.9
29°	45 48.5 -24.4 53.8	45 00.2 -23.6 54.2	44 11.6 -22.8 54.7	43 22.8 -22.0 55.2	42 33.7 -21.2 55.6

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°	44 41.2 +08.3 96.0	43 41.9 +08.1 95.8	42 42.5 +08.0 95.6	41 43.1 +07.9 95.4	40 43.7 +07.8 95.2
1°	44 49.5 +07.3 94.6	43 50.0 +07.2 94.4	42 50.5 +07.1 94.2	41 51.0 +07.0 94.0	40 51.5 +06.9 93.9
2°	44 56.8 +06.3 93.2	43 57.2 +06.2 93.0	42 57.6 +06.2 92.9	41 58.0 +06.1 92.7	40 58.4 +06.1 92.6
3°	45 03.1 +05.2 91.8	44 03.4 +05.2 91.6	43 03.8 +05.2 91.5	42 04.1 +05.2 91.4	41 04.5 +05.1 91.2
4°	45 08.3 +04.2 90.4	44 08.6 +04.2 90.2	43 09.0 +04.2 90.1	42 09.3 +04.2 90.0	41 09.6 +04.2 89.9
5°	45 12.5 +03.1 88.9	44 12.8 +03.2 88.9	43 13.2 +03.2 88.8	42 13.5 +03.3 88.7	41 13.8 +03.4 88.6
6°	45 15.6 +02.1 87.5	44 16.0 +02.1 87.5	43 16.4 +02.2 87.4	42 16.8 +02.3 87.3	41 17.2 +02.4 87.3
7°	45 17.7 +01.0 86.1	44 18.1 +01.2 86.1	43 18.6 +01.2 86.0	42 19.1 +01.3 86.0	41 19.6 +01.4 85.9
8°	45 18.7 -00.1 84.7	44 19.3 +00.1 84.7	43 19.8 +00.3 84.7	42 20.4 +00.4 84.6	41 21.0 +00.6 84.6
9°	45 18.6 -01.1 83.3	44 19.4 -01.0 83.3	43 20.1 -00.7 83.3	42 20.8 -00.5 83.3	41 21.6 -00.4 83.3
10°	45 17.5 -02.1 81.8	44 18.4 -01.9 81.9	43 19.4 -01.7 81.9	42 20.3 -01.5 81.9	41 21.2 -01.3 81.9
11°	45 15.4 -03.3 80.4	44 16.5 -02.9 80.5	43 17.7 -02.7 80.5	42 18.8 -02.5 80.6	41 19.9 -02.2 80.6
12°	45 12.1 -04.2 79.0	44 13.6 -04.0 79.1	43 15.0 -03.7 79.2	42 16.3 -03.4 79.2	41 17.7 -03.1 79.3
13°	45 07.9 -05.3 77.6	44 09.6 -05.0 77.7	43 11.3 -04.7 77.8	42 12.9 -04.3 77.9	41 14.6 -04.1 78.0
14°	45 02.6 -06.4 76.2	44 04.6 -06.0 76.3	43 06.6 -05.6 76.4	42 08.6 -05.3 76.5	41 10.5 -04.9 76.6
15°	44 56.2 -07.4 74.8	43 58.6 -07.0 74.9	43 01.0 -06.6 75.1	42 03.3 -06.2 75.2	41 05.6 -05.9 75.3
16°	44 48.8 -08.4 73.4	43 51.6 -08.0 73.5	42 54.4 -07.6 73.7	41 57.1 -07.2 73.8	40 59.7 -06.7 74.0
17°	44 40.4 -09.4 72.0	43 43.6 -08.9 72.2	42 46.8 -08.5 72.3	41 49.9 -08.1 72.5	40 53.0 -07.7 72.7
18°	44 31.0 -10.4 70.6	43 34.7 -10.0 70.8	42 38.3 -09.5 71.0	41 41.8 -09.0 71.2	40 45.3 -08.5 71.4
19°	44 20.6 -11.4 69.2	43 24.7 -10.8 69.4	42 28.8 -10.4 69.7	41 32.8 -09.8 69.9	40 36.8 -09.4 70.1
20°	44 09.2 -12.4 67.8	43 13.9 -11.9 68.1	42 18.4 -11.3 68.3	41 23.0 -10.8 68.5	40 27.4 -10.3 68.8
21°	43 56.8 -13.4 66.5	43 02.0 -12.8 66.7	42 07.1 -12.2 67.0	41 12.2 -11.7 67.2	40 17.1 -11.2 67.5
22°	43 43.4 -14.3 65.1	42 49.2 -13.7 65.4	41 54.9 -13.1 65.7	41 00.5 -12.6 65.9	40 05.9 -11.9 66.2
23°	43 29.1 -15.2 63.8	42 35.5 -14.6 64.1	41 41.8 -14.0 64.4	40 47.9 -13.4 64.6	39 54.0 -12.9 64.9
24°	43 13.9 -16.1 62.5	42 20.9 -15.5 62.8	41 27.8 -14.9 63.1	40 34.5 -14.2 63.4	39 41.1 -13.6 63.6
25°	42 57.8 -17.1 61.1	42 05.4 -16.4 61.5	41 12.9 -15.7 61.8	40 20.3 -15.1 62.1	39 27.5 -14.5 62.4
26°	42 40.7 -17.9 59.8	41 49.0 -17.2 60.2	40 57.2 -16.6 60.5	40 05.2 -16.0 60.8	39 13.0 -15.3 61.1
27°	42 22.8 -18.8 58.5	41 31.8 -18.1 58.9	40 40.6 -17.4 59.2	39 49.2 -16.7 59.6	38 57.7 -16.0 59.9
28°	42 04.0 -19.7 57.2	41 13.7 -18.9 57.6	40 23.2 -18.2 58.0	39 32.5 -17.5 58.3	38 41.7 -16.9 58.6
29°	41 44.3 -20.4 56.0	40 54.8 -19.8 56.4	40 05.0 -19.0 56.7	39 15.0 -18.3 57.1	38 24.8 -17.6 57.4

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Latitude 6°

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 44.2 +07.8 95.0	38 44.8 +07.6 94.8	37 45.3 +07.5 94.7	36 45.8 +07.5 94.5	35 46.3 +07.4 94.3
1°	39 52.0 +06.8 93.7	38 52.4 +06.8 93.6	37 52.8 +06.8 93.4	36 53.3 +06.6 93.3	35 53.7 +06.6 93.1
2°	39 58.8 +06.0 92.4	38 59.2 +06.0 92.3	37 59.6 +05.9 92.2	36 59.9 +05.9 92.0	36 00.3 +05.9 91.9
3°	40 04.8 +05.1 91.1	39 05.2 +05.1 91.0	38 05.5 +05.1 90.9	37 05.8 +05.1 90.8	36 06.2 +05.1 90.7
4°	40 09.9 +04.3 89.8	39 10.3 +04.2 89.7	38 10.6 +04.3 89.6	37 10.9 +04.3 89.5	36 11.3 +04.3 89.4
5°	40 14.2 +03.4 88.5	39 14.5 +03.5 88.4	38 14.9 +03.5 88.4	37 15.2 +03.6 88.3	36 15.6 +03.6 88.2
6°	40 17.6 +02.4 87.2	39 18.0 +02.5 87.1	38 18.4 +02.6 87.1	37 18.8 +02.7 87.0	36 19.2 +02.8 87.0
7°	40 20.0 +01.6 85.9	39 20.5 +01.7 85.9	38 21.0 +01.8 85.8	37 21.5 +01.9 85.8	36 22.0 +02.0 85.7
8°	40 21.6 +00.7 84.6	39 22.2 +00.9 84.6	38 22.8 +01.0 84.5	37 23.4 +01.1 84.5	36 24.0 +01.3 84.5
9°	40 22.3 -00.2 83.3	39 23.1 -00.1 83.3	38 23.8 +00.2 83.3	37 24.5 +00.4 83.2	36 25.3 +00.5 83.2
10°	40 22.1 -01.0 82.0	39 23.0 -00.8 82.0	38 24.0 -00.7 82.0	37 24.9 -00.5 82.0	36 25.8 -00.3 82.0
11°	40 21.1 -02.0 80.7	39 22.2 -01.8 80.7	38 23.3 -01.5 80.7	37 24.4 -01.3 80.7	36 25.5 -01.1 80.7
12°	40 19.1 -02.9 79.3	39 20.4 -02.6 79.4	38 21.8 -02.4 79.4	37 23.1 -02.1 79.5	36 24.4 -01.8 79.5
13°	40 16.2 -03.7 78.0	39 17.8 -03.4 78.1	38 19.4 -03.1 78.2	37 21.0 -02.8 78.2	36 22.6 -02.6 78.3
14°	40 12.5 -04.6 76.7	39 14.4 -04.3 76.8	38 16.3 -04.0 76.9	37 18.2 -03.7 77.0	36 20.0 -03.3 77.0
15°	40 07.9 -05.5 75.4	39 10.1 -05.1 75.5	38 12.3 -04.8 75.6	37 14.5 -04.5 75.7	36 16.7 -04.2 75.8
16°	40 02.4 -06.4 74.1	39 05.0 -06.0 74.2	38 07.5 -05.6 74.3	37 10.0 -05.2 74.4	36 12.5 -04.9 74.5
17°	39 56.0 -07.2 72.8	38 59.0 -06.9 73.0	38 01.9 -06.4 73.1	37 04.8 -06.0 73.2	36 07.6 -05.6 73.3
18°	39 48.8 -08.1 71.5	38 52.1 -07.6 71.7	37 55.5 -07.3 71.8	36 58.8 -06.9 72.0	36 02.0 -06.4 72.1
19°	39 40.7 -09.0 70.2	38 44.5 -08.5 70.4	37 48.2 -08.0 70.6	36 51.9 -07.5 70.7	35 55.6 -07.2 70.8
20°	39 31.7 -09.8 69.0	38 36.0 -09.3 69.1	37 40.2 -08.8 69.3	36 44.4 -08.4 69.5	35 48.4 -07.9 69.6
21°	39 21.9 -10.6 67.7	38 26.7 -10.1 67.9	37 31.4 -09.6 68.1	36 36.0 -09.1 68.2	35 40.5 -08.6 68.4
22°	39 11.3 -11.4 66.4	38 16.6 -10.9 66.6	37 21.8 -10.4 66.8	36 26.9 -09.9 67.0	35 31.9 -09.3 67.2
23°	38 59.9 -12.3 65.1	38 05.7 -11.7 65.4	37 11.4 -11.2 65.6	36 17.0 -10.6 65.8	35 22.6 -10.1 66.0
24°	38 47.6 -13.1 63.9	37 54.0 -12.5 64.1	37 00.2 -11.9 64.3	36 06.4 -11.4 64.6	35 12.5 -10.8 64.8
25°	38 34.5 -13.8 62.6	37 41.5 -13.3 62.9	36 48.3 -12.6 63.1	35 55.0 -12.0 63.3	35 01.7 -11.6 63.6
26°	38 20.7 -14.7 61.4	37 28.2 -14.0 61.7	36 35.7 -13.5 61.9	35 43.0 -12.8 62.1	34 50.1 -12.2 62.4
27°	38 06.0 -15.4 60.2	37 14.2 -14.8 60.4	36 22.2 -14.1 60.7	35 30.2 -13.6 60.9	34 37.9 -12.9 61.2
28°	37 50.6 -16.1 58.9	36 59.4 -15.5 59.2	36 08.1 -14.8 59.5	35 16.6 -14.2 59.7	34 25.0 -13.6 60.0
29°	37 34.5 -16.9 57.7	36 43.9 -16.2 58.0	35 53.3 -15.6 58.3	35 02.4 -14.9 58.6	34 11.4 -14.2 58.8

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 46.8 +07.3 94.2	33 47.3 +07.2 94.0	32 47.8 +07.1 93.9	31 48.2 +07.1 93.7	30 48.7 +07.0 93.6
1°	34 54.1 +06.6 93.0	33 54.5 +06.5 92.8	32 54.9 +06.5 92.7	31 55.3 +06.4 92.6	30 55.7 +06.4 92.4
2°	35 00.7 +05.8 91.8	34 01.0 +05.8 91.6	33 01.4 +05.8 91.5	32 01.7 +05.8 91.4	31 02.1 +05.7 91.3
3°	35 06.5 +05.1 90.5	34 06.8 +05.1 90.4	33 07.2 +05.1 90.3	32 07.5 +05.1 90.2	31 07.8 +05.1 90.1
4°	35 11.6 +04.4 89.3	34 11.9 +04.4 89.2	33 12.3 +04.4 89.1	32 12.6 +04.5 89.0	31 12.9 +04.5 89.0
5°	35 16.0 +03.6 88.1	34 16.3 +03.7 88.0	33 16.7 +03.7 87.9	32 17.1 +03.8 87.9	31 17.4 +03.9 87.8
6°	35 19.6 +02.9 86.9	34 20.0 +03.0 86.8	33 20.4 +03.1 86.8	32 20.9 +03.1 86.7	31 21.3 +03.2 86.6
7°	35 22.5 +02.1 85.7	34 23.0 +02.2 85.6	33 23.5 +02.4 85.6	32 24.0 +02.5 85.5	31 24.5 +02.6 85.4
8°	35 24.6 +01.4 84.4	34 25.2 +01.6 84.4	33 25.9 +01.6 84.4	32 26.5 +01.8 84.3	31 27.1 +01.9 84.3
9°	35 26.0 +00.7 83.2	34 26.8 +00.8 83.2	33 27.5 +01.0 83.2	32 28.3 +01.1 83.1	31 29.0 +01.4 83.1
10°	35 26.7 -00.1 82.0	34 27.6 +00.1 82.0	33 28.5 +00.3 82.0	32 29.4 +00.5 81.9	31 30.4 +00.6 81.9
11°	35 26.6 -00.8 80.8	34 27.7 -00.6 80.8	33 28.8 -00.4 80.8	32 29.9 -00.2 80.8	31 31.0 +00.0 80.8
12°	35 25.8 -01.6 79.5	34 27.1 -01.3 79.5	33 28.4 -01.1 79.6	32 29.7 -00.8 79.6	31 31.0 -00.6 79.6
13°	35 24.2 -02.3 78.3	34 25.8 -02.1 78.3	33 27.3 -01.8 78.4	32 28.9 -01.5 78.4	31 30.4 -01.2 78.4
14°	35 21.9 -03.1 77.1	34 23.7 -02.8 77.1	33 25.5 -02.4 77.2	32 27.4 -02.2 77.2	31 29.2 -01.9 77.2
15°	35 18.8 -03.8 75.8	34 20.9 -03.4 75.9	33 23.1 -03.2 76.0	32 25.2 -02.9 76.0	31 27.3 -02.6 76.1
16°	35 15.0 -04.5 74.6	34 17.5 -04.2 74.7	33 19.9 -03.8 74.8	32 22.3 -03.5 74.8	31 24.7 -03.2 74.9
17°	35 10.5 -05.3 73.4	34 13.3 -04.9 73.5	33 16.1 -04.6 73.6	32 18.8 -04.2 73.7	31 21.5 -03.8 73.7
18°	35 05.2 -06.0 72.2	34 08.4 -05.6 72.3	33 11.5 -05.2 72.4	32 14.6 -04.8 72.5	31 17.7 -04.4 72.6
19°	34 59.2 -06.7 71.0	34 02.8 -06.3 71.1	33 06.3 -05.9 71.2	32 09.8 -05.5 71.3	31 13.3 -05.1 71.4
20°	34 52.5 -07.5 69.8	33 56.5 -07.0 69.9	33 00.4 -06.5 70.0	32 04.3 -06.1 70.1	31 08.2 -05.7 70.2
21°	34 45.0 -08.1 68.6	33 49.5 -07.7 68.7	32 53.9 -07.3 68.8	31 58.2 -06.8 69.0	31 02.5 -06.4 69.1
22°	34 36.9 -08.9 67.3	33 41.8 -08.4 67.5	32 46.6 -07.9 67.6	31 51.4 -07.4 67.8	30 56.1 -06.9 67.9
23°	34 28.0 -09.6 66.1	33 33.4 -09.1 66.3	32 38.7 -08.5 66.5	31 44.0 -08.1 66.6	30 49.2 -07.6 66.7
24°	34 18.4 -10.2 65.0	33 24.3 -09.7 65.1	32 30.2 -09.2 65.3	31 35.9 -08.7 65.4	30 41.6 -08.2 65.6
25°	34 08.2 -11.0 63.8	33 14.6 -10.4 63.9	32 21.0 -09.9 64.1	31 27.2 -09.3 64.3	30 33.4 -08.7 64.4
26°	33 57.2 -11.6 62.6	33 04.2 -11.0 62.8	32 11.1 -10.5 63.0	31 17.9 -09.9 63.1	30 24.7 -09.4 63.3
27°	33 45.6 -12.3 61.4	32 53.2 -11.7 61.6	32 00.6 -11.1 61.8	31 08.0 -10.6 62.0	30 15.3 -10.0 62.1
28°	33 33.3 -13.0 60.2	32 41.5 -12.4 60.4	31 49.5 -11.8 60.6	30 57.4 -11.1 60.8	30 05.3 -10.6 61.0
29°	33 20.3 -13.6 59.0	32 29.1 -13.0 59.3	31 37.7 -12.3 59.5	30 46.3 -11.8 59.7	29 54.7 -11.1 59.9

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Latitude 6°

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 49.1 +07.0 93.5	28 49.6 +06.8 93.3	27 50.0 +06.8 93.2	26 50.4 +06.8 93.0	25 50.8 +06.7 92.9
1°	29 56.1 +06.3 92.3	28 56.4 +06.3 92.2	27 56.8 +06.3 92.1	26 57.2 +06.2 91.9	25 57.5 +06.3 91.8
2°	30 02.4 +05.7 91.2	29 02.7 +05.8 91.0	28 03.1 +05.7 90.9	27 03.4 +05.7 90.8	26 03.8 +05.7 90.7
3°	30 08.1 +05.2 90.0	29 08.5 +05.1 89.9	28 08.8 +05.2 89.8	27 09.1 +05.2 89.7	26 09.5 +05.2 89.6
4°	30 13.3 +04.5 88.9	29 13.6 +04.6 88.8	28 14.0 +04.6 88.7	27 14.3 +04.7 88.6	26 14.7 +04.6 88.5
5°	30 17.8 +03.9 87.7	29 18.2 +04.0 87.6	28 18.6 +04.0 87.5	27 19.0 +04.1 87.5	26 19.3 +04.2 87.4
6°	30 21.7 +03.3 86.5	29 22.2 +03.4 86.5	28 22.6 +03.5 86.4	27 23.1 +03.5 86.3	26 23.5 +03.7 86.3
7°	30 25.0 +02.7 85.4	29 25.6 +02.8 85.3	28 26.1 +02.9 85.3	27 26.6 +03.0 85.2	26 27.2 +03.1 85.1
8°	30 27.7 +02.1 84.2	29 28.4 +02.2 84.2	28 29.0 +02.3 84.1	27 29.6 +02.5 84.1	26 30.3 +02.6 84.0
9°	30 29.8 +01.5 83.1	29 30.6 +01.6 83.0	28 31.3 +01.8 83.0	27 32.1 +02.0 83.0	26 32.9 +02.1 82.9
10°	30 31.3 +00.8 81.9	29 32.2 +01.0 81.9	28 33.1 +01.2 81.9	27 34.1 +01.3 81.8	26 35.0 +01.6 81.8
11°	30 32.1 +00.3 80.7	29 33.2 +00.5 80.7	28 34.3 +00.7 80.7	27 35.4 +00.9 80.7	26 36.6 +01.0 80.7
12°	30 32.4 -00.4 79.6	29 33.7 -00.2 79.6	28 35.0 +00.0 79.6	27 36.3 +00.3 79.6	26 37.6 +00.5 79.6
13°	30 32.0 -01.0 78.4	29 33.5 -00.8 78.4	28 35.0 -00.5 78.4	27 36.6 -00.3 78.4	26 38.1 +00.0 78.4
14°	30 31.0 -01.7 77.3	29 32.7 -01.3 77.3	28 34.5 -01.0 77.3	27 36.3 -00.8 77.3	26 38.1 -00.5 77.3
15°	30 29.3 -02.2 76.1	29 31.4 -01.9 76.1	28 33.5 -01.7 76.2	27 35.5 -01.3 76.2	26 37.6 -01.1 76.2
16°	30 27.1 -02.9 74.9	29 29.5 -02.6 75.0	28 31.8 -02.2 75.0	27 34.2 -01.9 75.1	26 36.5 -01.6 75.1
17°	30 24.2 -03.4 73.8	29 26.9 -03.1 73.8	28 29.6 -02.8 73.9	27 32.3 -02.5 73.9	26 34.9 -02.1 74.0
18°	30 20.8 -04.1 72.6	29 23.8 -03.7 72.7	28 26.8 -03.3 72.8	27 29.8 -02.9 72.8	26 32.8 -02.6 72.9
19°	30 16.7 -04.7 71.5	29 20.1 -04.3 71.6	28 23.5 -03.9 71.6	27 26.9 -03.6 71.7	26 30.2 -03.2 71.7
20°	30 12.0 -05.3 70.3	29 15.8 -04.9 70.4	28 19.6 -04.5 70.5	27 23.3 -04.0 70.6	26 27.0 -03.6 70.6
21°	30 06.7 -05.9 69.2	29 10.9 -05.4 69.3	28 15.1 -05.0 69.4	27 19.3 -04.6 69.4	26 23.4 -04.2 69.5
22°	30 00.8 -06.5 68.0	29 05.5 -06.1 68.1	28 10.1 -05.6 68.2	27 14.7 -05.2 68.3	26 19.2 -04.7 68.4
23°	29 54.3 -07.0 66.9	28 59.4 -06.6 67.0	28 04.5 -06.1 67.1	27 09.5 -05.7 67.2	26 14.5 -05.2 67.3
24°	29 47.3 -07.7 65.7	28 52.8 -07.1 65.9	27 58.4 -06.7 66.0	27 03.8 -06.2 66.1	26 09.3 -05.8 66.2
25°	29 39.6 -08.3 64.6	28 45.7 -07.8 64.7	27 51.7 -07.3 64.8	26 57.6 -06.7 65.0	26 03.5 -06.2 65.1
26°	29 31.3 -08.8 63.4	28 37.9 -08.3 63.6	27 44.4 -07.7 63.7	26 50.9 -07.3 63.8	25 57.3 -06.7 64.0
27°	29 22.5 -09.4 62.3	28 29.6 -08.9 62.5	27 36.7 -08.4 62.6	26 43.6 -07.7 62.7	25 50.6 -07.3 62.9
28°	29 13.1 -10.0 61.2	28 20.7 -09.4 61.3	27 28.3 -08.8 61.5	26 35.9 -08.3 61.6	25 43.3 -07.7 61.7
29°	29 03.1 -10.6 60.0	28 11.3 -09.9 60.2	27 19.5 -09.4 60.4	26 27.6 -08.8 60.5	25 35.6 -08.2 60.6

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 51.2 +06.7 92.8	23 51.6 +06.6 92.7	22 52.0 +06.6 92.5	21 52.4 +06.5 92.4	20 52.8 +06.5 92.3
1°	24 57.9 +06.2 91.7	23 58.2 +06.2 91.6	22 58.6 +06.1 91.5	21 58.9 +06.2 91.3	20 59.3 +06.1 91.2
2°	25 04.1 +05.7 90.6	24 04.4 +05.7 90.5	22 04.7 +05.8 90.4	22 05.1 +05.7 90.3	21 05.4 +05.7 90.2
3°	25 09.8 +05.2 89.5	24 10.1 +05.3 89.4	23 10.5 +05.2 89.3	22 10.8 +05.3 89.2	21 11.1 +05.3 89.1
4°	25 15.0 +04.7 88.4	24 15.4 +04.7 88.3	23 15.7 +04.8 88.2	22 16.1 +04.8 88.1	21 16.4 +04.9 88.0
5°	25 19.7 +04.3 87.3	24 20.1 +04.3 87.2	23 20.5 +04.4 87.1	22 20.9 +04.5 87.0	21 21.3 +04.6 87.0
6°	25 24.0 +03.7 86.2	24 24.4 +03.9 86.1	23 24.9 +03.9 86.0	22 25.4 +04.0 86.0	21 25.9 +04.0 85.9
7°	25 27.7 +03.2 85.1	24 28.3 +03.3 85.0	23 28.8 +03.5 85.0	22 29.4 +03.6 84.9	21 29.9 +03.7 84.8
8°	25 30.9 +02.8 84.0	24 31.6 +02.9 83.9	23 32.3 +03.0 83.9	22 33.0 +03.1 83.8	21 33.6 +03.3 83.7
9°	25 33.7 +02.2 82.9	24 34.5 +02.4 82.8	23 35.3 +02.5 82.8	22 36.1 +02.7 82.7	21 36.9 +02.9 82.7
10°	25 35.9 +01.8 81.8	24 36.9 +01.9 81.7	23 37.8 +02.1 81.7	22 38.8 +02.3 81.6	21 39.8 +02.4 81.6
11°	25 37.7 +01.2 80.7	24 38.8 +01.4 80.6	23 39.9 +01.7 80.6	22 41.1 +01.8 80.6	21 42.2 +02.0 80.5
12°	25 38.9 +00.8 79.5	24 40.2 +01.0 79.5	23 41.6 +01.1 79.5	22 42.9 +01.4 79.5	21 44.2 +01.6 79.4
13°	25 39.7 +00.2 78.4	24 41.2 +00.5 78.4	23 42.7 +00.8 78.4	22 44.3 +00.9 78.4	21 45.8 +01.2 78.4
14°	25 39.9 -00.3 77.3	24 41.7 +00.0 77.3	23 43.5 +00.2 77.3	22 45.2 +00.6 77.3	21 47.0 +00.8 77.3
15°	25 39.6 -00.8 76.2	24 41.7 -00.5 76.2	23 43.7 -00.2 76.2	22 45.8 +00.0 76.2	21 47.8 +00.4 76.2
16°	25 38.8 -01.2 75.1	24 41.2 -01.0 75.1	23 43.5 -00.7 75.1	22 45.8 -00.3 75.1	21 48.2 -00.1 75.1
17°	25 37.6 -01.8 74.0	24 40.2 -01.4 74.0	23 42.8 -01.1 74.0	22 45.5 -00.8 74.1	21 48.1 -00.5 74.1
18°	25 35.8 -02.3 72.9	24 38.8 -02.0 72.9	23 41.7 -01.6 73.0	22 44.7 -01.3 73.0	21 47.6 -00.9 73.0
19°	25 33.5 -02.8 71.8	24 36.8 -02.4 71.8	23 40.1 -02.0 71.9	22 43.4 -01.7 71.9	21 46.7 -01.3 71.9
20°	25 30.7 -03.2 70.7	24 34.4 -02.9 70.7	23 38.1 -02.5 70.8	22 41.7 -02.1 70.8	21 45.4 -01.8 70.8
21°	25 27.5 -03.8 69.6	24 31.5 -03.3 69.6	23 35.6 -03.0 69.7	22 39.6 -02.5 69.7	21 43.6 -02.1 69.8
22°	25 23.7 -04.3 68.5	24 28.2 -03.9 68.5	23 32.6 -03.4 68.6	22 37.1 -03.0 68.6	21 41.5 -02.6 68.7
23°	25 19.4 -04.7 67.4	24 24.3 -04.3 67.4	23 29.2 -03.8 67.5	22 34.1 -03.4 67.6	21 38.9 -03.0 67.6
24°	25 14.7 -05.3 66.3	24 20.0 -04.8 66.3	23 25.4 -04.4 66.4	22 30.7 -03.9 66.5	21 35.9 -03.4 66.5
25°	25 09.4 -05.7 65.2	24 15.2 -05.2 65.2	23 21.0 -04.7 65.3	22 26.8 -04.3 65.4	21 32.5 -03.8 65.5
26°	25 03.7 -06.2 64.1	24 10.0 -05.7 64.2	23 16.3 -05.2 64.2	22 22.5 -04.7 64.3	21 28.7 -04.2 64.4
27°	24 57.5 -06.7 63.0	24 04.3 -06.2 63.1	23 11.1 -05.7 63.2	22 17.8 -05.1 63.2	21 24.5 -04.6 63.3
28°	24 50.8 -07.2 61.9	23 58.1 -06.6 62.0	23 05.4 -06.1 62.1	22 12.7 -05.6 62.2	21 19.9 -05.1 62.2
29°	24 43.6 -07.7 60.8	23 51.5 -07.1 60.9	22 59.3 -06.5 61.0	22 07.1 -06.0 61.1	21 14.8 -05.4 61.2

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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 53.1 +06.5 92.2	18 53.5 +06.5 92.1	17 53.9 +06.4 91.9	16 54.2 +06.4 91.8	15 54.6 +06.4 91.7
1°	19 59.6 +06.1 91.1	19 00.0 +06.1 91.0	18 00.3 +06.1 90.9	17 00.6 +06.1 90.8	16 01.0 +06.1 90.7
2°	20 05.7 +05.8 90.1	19 06.1 +05.7 90.0	18 06.4 +05.7 89.9	17 06.7 +05.8 89.8	16 07.1 +05.7 89.6
3°	20 11.5 +05.3 89.0	19 11.8 +05.4 88.9	18 12.1 +05.4 88.8	17 12.5 +05.4 88.7	16 12.8 +05.5 88.6
4°	20 16.8 +05.0 87.9	19 17.2 +05.0 87.8	18 17.5 +05.1 87.8	17 17.9 +05.1 87.7	16 18.3 +05.2 87.6
5°	20 21.8 +04.5 86.9	19 22.2 +04.6 86.8	18 22.6 +04.7 86.7	17 23.0 +04.8 86.6	16 23.5 +04.8 86.5
6°	20 26.3 +04.2 85.8	19 26.8 +04.3 85.7	18 27.3 +04.4 85.7	17 27.8 +04.5 85.6	16 28.3 +04.6 85.5
7°	20 30.5 +03.8 84.7	19 31.1 +03.9 84.7	18 31.7 +04.0 84.6	17 32.3 +04.1 84.5	16 32.9 +04.2 84.5
8°	20 34.3 +03.4 83.7	19 35.0 +03.5 83.6	18 35.7 +03.7 83.6	17 36.4 +03.8 83.5	16 37.1 +04.0 83.4
9°	20 37.7 +03.0 82.6	19 38.5 +03.2 82.6	18 39.4 +03.3 82.5	17 40.2 +03.5 82.4	16 41.1 +03.6 82.4
10°	20 40.7 +02.6 81.5	19 41.7 +02.8 81.5	18 42.7 +03.0 81.4	17 43.7 +03.1 81.4	16 44.7 +03.3 81.3
11°	20 43.3 +02.3 80.5	19 44.5 +02.4 80.4	18 45.7 +02.6 80.4	17 46.8 +02.8 80.3	16 48.0 +03.0 80.3
12°	20 45.6 +01.8 79.4	19 46.9 +02.1 79.4	18 48.3 +02.2 79.3	17 49.6 +02.5 79.3	16 51.0 +02.7 79.2
13°	20 47.4 +01.4 78.3	19 49.0 +01.6 78.3	18 50.5 +01.9 78.3	17 52.1 +02.1 78.2	16 53.7 +02.3 78.2
14°	20 48.8 +01.1 77.3	19 50.6 +01.3 77.3	18 52.4 +01.6 77.2	17 54.2 +01.8 77.2	16 56.0 +02.1 77.2
15°	20 49.9 +00.6 76.2	19 51.9 +00.9 76.2	18 54.0 +01.1 76.2	17 56.0 +01.5 76.1	16 58.1 +01.7 76.1
16°	20 50.5 +00.2 75.1	19 52.8 +00.5 75.1	18 55.1 +00.9 75.1	17 57.5 +01.1 75.1	16 59.8 +01.4 75.1
17°	20 50.7 -00.2 74.1	19 53.3 +00.2 74.1	18 56.0 +00.4 74.1	17 58.6 +00.8 74.0	17 01.2 +01.1 74.0
18°	20 50.5 -00.5 73.0	19 53.5 -00.2 73.0	18 56.4 +00.1 73.0	17 59.4 +00.4 73.0	17 02.3 +00.8 73.0
19°	20 50.0 -01.0 71.9	19 53.3 -00.7 71.9	18 56.5 -00.2 71.9	17 59.8 +00.1 71.9	17 03.1 +00.4 71.9
20°	20 49.0 -01.3 70.9	19 52.6 -00.9 70.9	18 56.3 -00.6 70.9	17 59.9 -00.3 70.9	17 03.5 +00.1 70.9
21°	20 47.7 -01.8 69.8	19 51.7 -01.4 69.8	18 55.7 -01.0 69.8	17 59.6 -00.5 69.8	17 03.6 -00.2 69.8
22°	20 45.9 -02.2 68.7	19 50.3 -01.8 68.7	18 54.7 -01.4 68.8	17 59.1 -01.0 68.8	17 03.4 -00.5 68.8
23°	20 43.7 -02.5 67.6	19 48.5 -02.1 67.7	18 53.3 -01.7 67.7	17 58.1 -01.2 67.7	17 02.9 -00.8 67.7
24°	20 41.2 -03.0 66.6	19 46.4 -02.5 66.6	18 51.6 -02.0 66.7	17 56.9 -01.6 66.7	17 02.1 -01.2 66.7
25°	20 38.2 -03.3 65.5	19 43.9 -02.8 65.6	18 49.6 -02.4 65.6	17 55.3 -02.0 65.6	17 00.9 -01.5 65.7
26°	20 34.9 -03.7 64.4	19 41.1 -03.3 64.5	18 47.2 -02.8 64.5	17 53.3 -02.3 64.6	16 59.4 -01.8 64.6
27°	20 31.2 -04.1 63.4	19 37.8 -03.6 63.4	18 44.4 -03.1 63.5	17 51.0 -02.6 63.5	16 57.6 -02.1 63.6
28°	20 27.1 -04.6 62.3	19 34.2 -04.0 62.4	18 41.3 -03.5 62.4	17 48.4 -02.9 62.5	16 55.5 -02.5 62.5
29°	20 22.5 -04.9 61.3	19 30.2 -04.3 61.3	18 37.8 -03.8 61.4	17 45.5 -03.3 61.4	16 53.0 -02.7 61.5

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 55.0 +06.3 91.6	13 55.3 +06.3 91.5	12 55.7 +06.3 91.4	11 56.0 +06.3 91.3	10 56.3 +06.3 91.2
1°	15 01.3 +06.1 90.6	14 01.6 +06.1 90.5	13 02.0 +06.0 90.4	12 02.3 +06.1 90.3	11 02.6 +06.1 90.2
2°	15 07.4 +05.8 89.5	14 07.7 +05.8 89.4	13 08.0 +05.9 89.3	12 08.4 +05.8 89.2	11 08.7 +05.9 89.1
3°	15 13.2 +05.5 88.5	14 13.5 +05.6 88.4	13 13.9 +05.6 88.3	12 14.2 +05.7 88.2	11 14.6 +05.7 88.1
4°	15 18.7 +05.2 87.5	14 19.1 +05.3 87.4	13 19.5 +05.3 87.3	12 19.9 +05.4 87.2	11 20.3 +05.4 87.1
5°	15 23.9 +05.0 86.4	14 24.4 +05.0 86.4	13 24.8 +05.1 86.3	12 25.3 +05.1 86.2	11 25.7 +05.3 86.1
6°	15 28.9 +04.6 85.4	14 29.4 +04.7 85.3	13 29.9 +04.9 85.2	12 30.4 +05.0 85.2	11 31.0 +05.0 85.1
7°	15 33.5 +04.4 84.4	14 34.1 +04.5 84.3	13 34.8 +04.5 84.2	12 35.4 +04.7 84.1	11 36.0 +04.9 84.1
8°	15 37.9 +04.0 83.3	14 38.6 +04.2 83.3	13 39.3 +04.4 83.2	12 40.1 +04.5 83.1	11 40.9 +04.6 83.0
9°	15 41.9 +03.8 82.3	14 42.8 +03.9 82.2	13 43.7 +04.1 82.2	12 44.6 +04.2 82.1	11 45.5 +04.4 82.0
10°	15 45.7 +03.5 81.3	14 46.7 +03.7 81.2	13 47.8 +03.8 81.1	12 48.8 +04.0 81.1	11 49.9 +04.2 81.0
11°	15 49.2 +03.2 80.2	14 50.4 +03.4 80.2	13 51.6 +03.6 80.1	12 52.8 +03.8 80.1	11 54.1 +03.9 80.0
12°	15 52.4 +02.9 79.2	14 53.8 +03.1 79.1	13 55.2 +03.3 79.1	12 56.6 +03.5 79.0	11 58.0 +03.8 79.0
13°	15 55.3 +02.6 78.2	14 56.9 +02.8 78.1	13 58.5 +03.1 78.1	13 00.1 +03.3 78.0	12 01.8 +03.5 77.9
14°	15 57.9 +02.3 77.1	14 59.7 +02.6 77.1	14 01.6 +02.8 77.0	13 03.4 +03.1 77.0	12 05.3 +03.3 77.9
15°	16 00.2 +02.0 76.1	15 02.3 +02.2 76.0	14 04.4 +02.5 76.0	13 06.5 +02.8 76.0	12 08.6 +03.0 75.9
16°	16 02.2 +01.7 75.0	15 04.5 +02.0 75.0	14 06.9 +02.3 75.0	13 09.3 +02.5 74.9	12 11.6 +02.9 74.9
17°	16 03.9 +01.3 74.0	15 06.5 +01.7 74.0	14 09.2 +02.0 73.9	13 11.8 +02.3 73.9	12 14.5 +02.6 73.9
18°	16 05.2 +01.1 73.0	15 08.2 +01.4 72.9	14 11.2 +01.7 72.9	13 14.1 +02.1 72.9	12 17.1 +02.4 72.8
19°	16 06.3 +00.8 71.9	15 09.6 +01.1 71.9	14 12.9 +01.5 71.9	13 16.2 +01.8 71.8	12 19.5 +02.2 71.8
20°	16 07.1 +00.5 70.9	15 10.7 +00.9 70.9	14 14.4 +01.2 70.8	13 18.0 +01.6 70.8	12 21.7 +01.9 70.8
21°	16 07.6 +00.2 69.8	15 11.6 +00.6 69.8	14 15.6 +00.9 69.8	13 19.6 +01.3 69.8	12 23.6 +01.7 69.8
22°	16 07.8 -00.1 68.8	15 12.2 +00.2 68.8	14 16.5 +00.7 68.8	13 20.9 +01.1 68.8	12 25.3 +01.5 68.7
23°	16 07.7 -00.5 67.8	15 12.4 +00.0 67.8	14 17.2 +00.4 67.7	13 22.0 +00.8 67.7	12 26.8 +01.2 67.7
24°	16 07.2 -00.7 66.7	15 12.4 -00.3 66.7	14 17.6 +00.2 66.7	13 22.8 +00.6 66.7	12 28.0 +01.0 66.7
25°	16 06.5 -01.0 65.7	15 12.1 -00.5 65.7	14 17.8 -00.2 65.7	13 23.4 +00.3 65.7	12 29.0 +00.8 65.7
26°	16 05.5 -01.3 64.6	15 11.6 -00.9 64.6	14 17.6 -00.3 64.7	13 23.7 +00.1 64.7	12 29.8 +00.5 64.6
27°	16 04.2 -01.7 63.6	15 10.7 -01.1 63.6	14 17.3 -00.7 63.6	13 23.8 -00.2 63.6	12 30.3 +00.4 63.6
28°	16 02.5 -01.9 62.6	15 09.6 -01.5 62.6	14 16.6 -00.9 62.6	13 23.6 -00.4 62.6	12 30.7 +00.0 62.6
29°	16 00.6 -02.2 61.5	15 08.1 -01.7 61.5	14 15.7 -01.2 61.6	13 23.2 -00.7 61.6	12 30.7 -00.1 61.6

Declination SAME name as Latitude

Latitude 6°

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 56.7 +06.3 91.1	8 57.0 +06.3 90.9	7 57.4 +06.2 90.8	6 57.7 +06.2 90.7	5 58.0 +06.3 90.6
1°	10 03.0 +06.0 90.0	9 03.3 +06.1 89.9	8 03.6 +06.1 89.8	7 03.9 +06.2 89.7	6 04.3 +06.1 89.6
2°	10 09.0 +06.0 89.0	9 09.4 +05.9 88.9	8 09.7 +06.0 88.8	7 10.1 +06.0 88.7	6 10.4 +06.0 88.6
3°	10 15.0 +05.7 88.0	9 15.3 +05.8 87.9	8 15.7 +05.8 87.8	7 16.1 +05.8 87.7	6 16.4 +06.0 87.6
4°	10 20.7 +05.5 87.0	9 21.1 +05.6 86.9	8 21.5 +05.7 86.8	7 21.9 +05.8 86.7	6 22.4 +05.8 86.6
5°	10 26.2 +05.3 86.0	9 26.7 +05.4 85.9	8 27.2 +05.5 85.8	7 27.7 +05.6 85.7	6 28.2 +05.6 85.6
6°	10 31.5 +05.2 85.0	9 32.1 +05.3 84.9	8 32.7 +05.3 84.8	7 33.3 +05.4 84.7	6 33.8 +05.6 84.6
7°	10 36.7 +04.9 84.0	9 37.4 +05.0 83.9	8 38.0 +05.2 83.8	7 38.7 +05.3 83.7	6 39.4 +05.4 83.6
8°	10 41.6 +04.8 83.0	9 42.4 +04.9 82.9	8 43.2 +05.1 82.8	7 44.0 +05.2 82.7	6 44.8 +05.4 82.6
9°	10 46.4 +04.6 81.9	9 47.3 +04.7 81.9	8 48.3 +04.8 81.8	7 49.2 +05.0 81.7	6 50.2 +05.2 81.6
10°	10 51.0 +04.3 80.9	9 52.0 +04.6 80.9	8 53.1 +04.7 80.8	7 54.2 +04.9 80.7	6 55.4 +05.0 80.6
11°	10 55.3 +04.2 79.9	9 56.6 +04.3 79.8	8 57.8 +04.6 79.8	7 59.1 +04.8 79.7	7 00.4 +05.0 79.6
12°	10 59.5 +03.9 78.9	10 00.9 +04.2 78.8	9 02.4 +04.4 78.8	8 03.9 +04.6 78.7	7 05.4 +04.8 78.6
13°	11 03.4 +03.8 77.9	10 05.1 +04.0 77.8	9 06.8 +04.2 77.7	8 08.5 +04.4 77.7	7 10.2 +04.6 77.6
14°	11 07.2 +03.5 76.9	10 09.1 +03.8 76.8	9 11.0 +04.0 76.7	8 12.9 +04.3 76.7	7 14.8 +04.6 76.6
15°	11 10.7 +03.3 75.8	10 12.9 +03.6 75.8	9 15.0 +03.9 75.7	8 17.2 +04.1 75.7	7 19.4 +04.4 75.6
16°	11 14.0 +03.2 74.8	10 16.5 +03.4 74.8	9 18.9 +03.7 74.7	8 21.3 +04.0 74.7	7 23.8 +04.3 74.6
17°	11 17.2 +02.9 73.8	10 19.9 +03.2 73.8	9 22.6 +03.5 73.7	8 25.3 +03.9 73.6	7 28.1 +04.1 73.6
18°	11 20.1 +02.7 72.8	10 23.1 +03.0 72.7	9 26.1 +03.4 72.7	8 29.2 +03.7 72.6	7 32.2 +04.0 72.6
19°	11 22.8 +02.5 71.8	10 26.1 +02.9 71.7	9 29.5 +03.2 71.7	8 32.9 +03.5 71.6	7 36.2 +03.9 71.6
20°	11 25.3 +02.3 70.8	10 29.0 +02.6 70.7	9 32.7 +03.0 70.7	8 36.4 +03.3 70.6	7 40.1 +03.7 70.6
21°	11 27.6 +02.1 69.7	10 31.6 +02.5 69.7	9 35.7 +02.8 69.7	8 39.7 +03.2 69.6	7 43.8 +03.6 69.6
22°	11 29.7 +01.9 68.7	10 34.1 +02.3 68.7	9 38.5 +02.7 68.6	8 42.9 +03.1 68.6	7 47.4 +03.4 68.5
23°	11 31.6 +01.6 67.7	10 36.4 +02.0 67.7	9 41.2 +02.4 67.6	8 46.0 +02.9 67.6	7 50.8 +03.3 67.5
24°	11 33.2 +01.4 66.7	10 38.4 +01.9 66.6	9 43.6 +02.3 66.6	8 48.9 +02.7 66.6	7 54.1 +03.2 66.5
25°	11 34.6 +01.3 65.7	10 40.3 +01.7 65.6	9 45.9 +02.2 65.6	8 51.6 +02.6 65.6	7 57.3 +03.0 65.5
26°	11 35.9 +01.0 64.6	10 42.0 +01.4 64.6	9 48.1 +01.9 64.6	8 54.2 +02.4 64.6	8 00.3 +02.8 64.5
27°	11 36.9 +00.8 63.6	10 43.4 +01.3 63.6	9 50.0 +01.7 63.6	8 56.6 +02.2 63.5	8 03.1 +02.8 63.5
28°	11 37.7 +00.6 62.6	10 44.7 +01.1 62.6	9 51.7 +01.6 62.6	8 58.8 +02.1 62.5	8 05.9 +02.5 62.5
29°	11 38.3 +00.3 61.6	10 45.8 +00.9 61.6	9 53.3 +01.4 61.5	9 00.9 +01.9 61.5	8 08.4 +02.4 61.5

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 58.4 +06.2 90.5	3 58.7 +06.2 90.4	2 59.0 +06.3 90.3	1 59.3 +06.3 90.2	0 59.7 +06.2 90.1
1°	5 04.6 +06.2 89.5	4 04.9 +06.2 89.4	3 05.3 +06.2 89.3	2 05.6 +06.2 89.2	1 05.9 +06.3 89.1
2°	5 10.8 +06.0 88.5	4 11.1 +06.1 88.4	3 11.5 +06.1 88.3	2 11.8 +06.2 88.2	1 12.2 +06.2 88.1
3°	5 16.8 +06.0 87.5	4 17.2 +06.0 87.4	3 17.6 +06.1 87.3	2 18.0 +06.1 87.2	1 18.4 +06.2 87.1
4°	5 22.8 +05.9 86.5	4 23.2 +06.0 86.4	3 23.7 +06.0 86.3	2 24.1 +06.1 86.2	1 24.6 +06.2 86.1
5°	5 28.7 +05.7 85.5	4 29.2 +05.8 85.4	3 29.7 +06.0 85.3	2 30.2 +06.1 85.2	1 30.8 +06.1 85.1
6°	5 34.4 +05.7 84.5	4 35.0 +05.8 84.4	3 35.7 +05.8 84.3	2 36.3 +06.0 84.2	1 36.9 +06.1 84.1
7°	5 40.1 +05.6 83.5	4 40.8 +05.7 83.4	3 41.5 +05.9 83.3	2 42.3 +05.9 83.2	1 43.0 +06.1 83.1
8°	5 45.7 +05.4 82.5	4 46.5 +05.6 82.4	3 47.4 +05.7 82.3	2 48.2 +05.9 82.2	1 49.1 +06.1 82.1
9°	5 51.1 +05.4 81.5	4 52.1 +05.5 81.4	3 53.1 +05.7 81.3	2 54.1 +05.9 81.2	1 55.2 +06.0 81.1
10°	5 56.5 +05.2 80.5	4 57.6 +05.5 80.4	3 58.8 +05.6 80.3	3 00.0 +05.8 80.3	2 01.2 +06.0 80.2
11°	6 01.7 +05.2 79.5	5 03.1 +05.3 79.4	4 04.4 +05.6 79.3	3 05.8 +05.7 79.3	2 07.2 +05.9 79.2
12°	6 06.9 +05.0 78.5	5 08.4 +05.2 78.4	4 10.0 +05.4 78.3	3 11.5 +05.7 78.3	2 13.1 +05.9 78.2
13°	6 11.9 +04.9 77.5	5 13.6 +05.2 77.4	4 15.4 +05.4 77.4	3 17.2 +05.6 77.3	2 19.0 +05.9 77.2
14°	6 16.8 +04.8 76.5	5 18.8 +05.0 76.4	4 20.8 +05.3 76.4	3 22.8 +05.6 76.3	2 24.9 +05.8 76.2
15°	6 21.6 +04.7 75.5	5 23.8 +05.0 75.4	4 26.1 +05.2 75.4	3 28.4 +05.5 75.3	2 30.7 +05.8 75.2
16°	6 26.3 +04.6 74.5	5 28.8 +04.9 74.4	4 31.3 +05.2 74.4	3 33.9 +05.4 74.3	2 36.5 +05.7 74.2
17°	6 30.9 +04.4 73.5	5 33.7 +04.7 73.4	4 36.5 +05.0 73.4	3 39.3 +05.4 73.3	2 42.2 +05.7 73.2
18°	6 35.3 +04.3 72.5	5 38.4 +04.7 72.4	4 41.5 +05.0 72.4	3 44.7 +05.3 72.3	2 47.9 +05.6 72.2
19°	6 39.6 +04.2 71.5	5 43.1 +04.5 71.4	4 46.5 +04.9 71.4	3 50.0 +05.2 71.3	2 53.5 +05.6 71.2
20°	6 43.8 +04.1 70.5	5 47.6 +04.4 70.4	4 51.4 +04.8 70.4	3 55.2 +05.2 70.3	2 59.1 +05.5 70.2
21°	6 47.9 +04.0 69.5	5 52.0 +04.4 69.4	4 56.2 +04.7 69.4	4 00.4 +05.1 69.3	3 04.6 +05.4 69.2
22°	6 51.9 +03.8 68.5	5 56.4 +04.2 68.4	5 00.9 +04.6 68.4	4 05.5 +05.0 68.3	3 10.0 +05.4 68.2
23°	6 55.7 +03.7 67.5	6 00.6 +04.1 67.4	5 05.5 +04.5 67.4	4 10.5 +04.9 67.3	3 15.4 +05.4 67.2
24°	6 59.4 +03.6 66.5	6 04.7 +04.0 66.4	5 10.0 +04.5 66.4	4 15.4 +04.9 66.3	3 20.8 +05.3 66.2
25°	7 03.0 +03.4 65.5	6 08.7 +03.9 65.4	5 14.5 +04.3 65.3	4 20.3 +04.7 65.3	3 26.1 +05.2 65.2
26°	7 06.4 +03.4 64.5	6 12.6 +03.8 64.4	5 18.8 +04.2 64.3	4 25.0 +04.7 64.3	3 31.3 +05.1 64.2
27°	7 09.8 +03.1 63.5	6 16.4 +03.7 63.4	5 23.0 +04.2 63.3	4 29.7 +04.6 63.3	3 36.4 +05.1 63.2
28°	7 12.9 +03.1 62.5	6 20.1 +03.5 62.4	5 27.2 +04.0 62.3	4 34.3 +04.6 62.3	3 41.5 +05.1 62.2
29°	7 16.0 +02.9 61.4	6 23.6 +03.4 61.4	5 31.2 +04.0 61.3	4 38.9 +04.4 61.3	3 46.6 +04.9 61.2

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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 +06.3 90.0	-0 59.7 +06.3	-1 59.3 +06.3	-2 59.0 +06.3	-3 58.7 +06.3
1°	0 06.3 +06.2 89.0	-0 53.4 +06.3	-1 53.0 +06.3	-2 52.7 +06.4	-3 52.4 +06.4
2°	0 12.5 +06.3 88.0	-0 47.1 +06.3	-1 46.7 +06.3	-2 46.3 +06.4	-3 46.0 +06.5
3°	0 18.8 +06.3 87.0	-0 40.8 +06.3	-1 40.4 +06.4	-2 39.9 +06.4	-3 39.5 +06.5
4°	0 25.1 +06.2 86.0	-0 34.5 +06.4	-1 34.0 +06.4	-2 33.5 +06.5	-3 33.0 +06.6
5°	0 31.3 +06.3 85.0	-0 28.1 +06.3	-1 27.6 +06.5	-2 27.0 +06.6	-3 26.4 +06.7
6°	0 37.6 +06.2 84.0	-0 21.8 +06.4	-1 21.1 +06.5	-2 20.4 +06.6	-3 19.7 +06.7
7°	0 43.8 +06.2 83.0	-0 15.4 +06.3	-1 14.6 +06.4	-2 13.8 +06.6	-3 13.0 +06.7
8°	0 50.0 +06.2 82.0	-0 09.1 +06.4	-1 08.2 +06.6	-2 07.2 +06.7	-3 06.3 +06.9
9°	0 56.2 +06.2 81.0	-0 02.7 +06.3	-1 01.6 +06.5	-2 00.5 +06.7	-2 59.4 +06.9
10°	1 02.4 +06.2 80.1	0 03.6 +06.4 80.0	-0 55.1 +06.5	-1 53.8 +06.7	-2 52.5 +06.9
11°	1 08.6 +06.1 79.1	0 10.0 +06.3 79.1	-0 48.6 +06.6	-1 47.1 +06.8	-2 45.6 +07.0
12°	1 14.7 +06.1 78.1	0 16.3 +06.4 78.0	-0 42.0 +06.6	-1 40.3 +06.8	-2 38.6 +07.0
13°	1 20.8 +06.1 77.1	0 22.7 +06.3 77.0	-0 35.4 +06.6	-1 33.5 +06.8	-2 31.6 +07.1
14°	1 26.9 +06.1 76.1	0 29.0 +06.4 76.0	-0 28.8 +06.6	-1 26.7 +06.9	-2 24.5 +07.1
15°	1 33.0 +06.1 75.1	0 35.4 +06.3 75.0	-0 22.2 +06.6	-1 19.8 +06.8	-2 17.4 +07.2
16°	1 39.1 +06.0 74.1	0 41.7 +06.3 74.0	-0 15.6 +06.6	-1 13.0 +06.9	-2 10.2 +07.2
17°	1 45.1 +06.0 73.1	0 48.0 +06.3 73.0	-0 09.0 +06.6	-1 06.1 +07.0	-2 03.0 +07.2
18°	1 51.1 +05.9 72.1	0 54.3 +06.3 72.0	-0 02.4 +06.6	-0 59.1 +06.9	-1 55.8 +07.3
19°	1 57.0 +05.9 71.1	1 00.6 +06.2 71.0	0 04.2 +06.6 70.9	-0 52.2 +07.0	-1 48.5 +07.3
20°	2 02.9 +05.9 70.1	1 06.8 +06.3 70.0	0 10.8 +06.6 69.9	-0 45.2 +06.9	-1 41.2 +07.3
21°	2 08.8 +05.8 69.1	1 13.1 +06.2 69.0	0 17.4 +06.6 68.9	-0 38.3 +07.0	-1 33.9 +07.4
22°	2 14.6 +05.8 68.1	1 19.3 +06.2 68.0	0 24.0 +06.6 67.9	-0 31.3 +07.0	-1 26.5 +07.4
23°	2 20.4 +05.8 67.1	1 25.5 +06.2 67.0	0 30.6 +06.6 66.9	-0 24.3 +07.0	-1 19.1 +07.4
24°	2 26.2 +05.7 66.1	1 31.7 +06.1 66.0	0 37.2 +06.5 65.9	-0 17.3 +07.0	-1 11.7 +07.4
25°	2 31.9 +05.7 65.1	1 37.8 +06.1 65.0	0 43.7 +06.6 64.9	-0 10.3 +07.0	-1 04.3 +07.5
26°	2 37.6 +05.6 64.1	1 43.9 +06.1 64.0	0 50.3 +06.5 63.9	-0 03.3 +07.0	-0 56.8 +07.4
27°	2 43.2 +05.6 63.1	1 50.0 +06.0 63.0	0 56.8 +06.6 62.9	0 03.7 +07.0 62.8	-0 49.4 +07.5
28°	2 48.8 +05.5 62.1	1 56.0 +06.1 62.0	1 03.4 +06.5 62.0	0 10.7 +07.0 61.9	-0 41.9 +07.5
29°	2 54.3 +05.5 61.1	2 02.1 +05.9 61.0	1 09.9 +06.4 61.0	0 17.7 +07.0 60.9	-0 34.4 +07.5

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°					
1°					
2°					
3°					
4°					
5°					
6°					
7°					
8°					
9°					
10°					
11°					
12°					
13°					
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16°					
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20°					
21°					
22°					
23°					
24°					
25°					
26°					
27°					
28°					
29°					

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°	83 00.0 +60.0 180.0	82 55.8 +59.3 171.8	82 43.3 +57.3 164.0	82 23.2 +54.5 156.7	81 56.6 +51.1 150.2
1°	84 00.0 +60.0 180.0	83 55.1 +59.0 170.5	83 40.6 +56.4 161.5	83 17.7 +52.8 153.4	82 47.7 +48.6 146.2
2°	85 00.0 +60.0 180.0	84 54.1 +58.6 168.7	84 37.0 +54.9 158.2	84 10.5 +49.9 149.0	83 36.3 +45.0 141.2
3°	86 00.0 +60.0 180.0	85 52.7 +57.7 166.0	85 31.9 +52.1 153.4	85 00.4 +45.6 143.1	84 21.3 +39.6 134.9
4°	87 00.0 +60.0 180.0	86 50.4 +55.6 161.6	86 24.0 +46.8 146.3	85 46.0 +38.5 135.0	85 00.9 +32.0 126.8
5°	88 00.0 +60.0 180.0	87 46.0 +49.4 153.5	87 10.8 +35.7 135.0	86 24.5 +26.9 123.7	85 32.9 +21.2 116.5
6°	89 00.0 +60.0 180.0	88 35.4 +25.0 135.1	87 46.5 +14.4 116.6	86 51.4 +09.9 108.4	85 54.1 +07.7 103.9
7°	90 00.0 -60.0 0.0	89 00.4 -24.9 89.9	88 00.9 -14.1 89.9	87 01.3 -09.6 89.8	86 01.8 -07.2 89.8
8°	89 00.0 -60.0 0.0	88 35.5 -49.4 44.7	87 46.8 -35.7 63.1	86 51.7 -26.6 71.2	85 54.6 -20.8 75.6
9°	88 00.0 -60.0 0.0	87 46.1 -55.6 26.3	87 11.1 -46.7 44.6	86 25.1 -38.2 55.8	85 33.8 -31.7 62.9
10°	87 00.0 -60.0 0.0	86 50.5 -57.7 18.2	86 24.4 -52.1 33.3	85 46.9 -45.6 44.5	85 02.1 -39.4 52.5
11°	86 00.0 -60.0 0.0	85 52.8 -58.6 13.8	85 32.3 -54.8 26.1	85 01.3 -49.9 36.3	84 22.7 -44.8 44.3
12°	85 00.0 -60.0 0.0	84 54.2 -59.0 11.1	84 37.5 -56.4 21.4	84 11.4 -52.6 30.4	83 37.9 -48.5 38.0
13°	84 00.0 -60.0 0.0	83 55.2 -59.3 9.2	83 41.1 -57.3 18.0	83 18.8 -54.5 26.0	82 49.4 -51.1 33.0
14°	83 00.0 -60.0 0.0	82 55.9 -59.5 7.9	82 43.8 -58.0 15.5	82 24.3 -55.7 22.6	81 58.3 -52.9 29.0
15°	82 00.0 -60.0 0.0	81 56.4 -59.6 6.9	81 45.8 -58.4 13.6	81 28.6 -56.6 19.9	81 05.4 -54.3 25.8
16°	81 00.0 -60.0 0.0	80 56.8 -59.7 6.1	80 47.4 -58.7 12.1	80 32.0 -57.2 17.8	80 11.1 -55.3 23.2
17°	80 00.0 -60.0 0.0	79 57.1 -59.7 5.5	79 48.7 -59.0 10.9	79 34.8 -57.7 16.1	79 15.8 -56.0 21.0
18°	79 00.0 -60.0 0.0	78 57.4 -59.8 5.0	78 49.7 -59.1 9.9	78 37.1 -58.1 14.6	78 19.8 -56.7 19.1
19°	78 00.0 -60.0 0.0	77 57.6 -59.8 4.5	77 50.6 -59.2 9.0	77 39.0 -58.3 13.4	77 23.1 -57.1 17.6
20°	77 00.0 -60.0 0.0	76 57.8 -59.8 4.2	76 51.4 -59.4 8.3	76 40.7 -58.6 12.3	76 26.0 -57.5 16.2
21°	76 00.0 -60.0 0.0	75 58.0 -59.9 3.9	75 52.0 -59.4 7.7	75 42.1 -58.7 11.4	75 28.5 -57.8 15.0
22°	75 00.0 -60.0 0.0	74 58.1 -59.8 3.6	74 52.6 -59.5 7.1	74 43.4 -58.9 10.6	74 30.7 -58.1 14.0
23°	74 00.0 -60.0 0.0	73 58.3 -59.9 3.3	73 53.1 -59.6 6.6	73 44.5 -59.0 9.9	73 32.6 -58.3 13.1
24°	73 00.0 -60.0 0.0	72 58.4 -59.9 3.1	72 53.5 -59.6 6.2	72 45.5 -59.1 9.3	72 34.3 -58.4 12.3
25°	72 00.0 -60.0 0.0	71 58.5 -59.9 2.9	71 53.9 -59.6 5.8	71 46.4 -59.2 8.7	71 35.9 -58.6 11.6
26°	71 00.0 -60.0 0.0	70 58.6 -60.0 2.8	70 54.3 -59.7 5.5	70 47.2 -59.3 8.2	70 37.3 -58.8 10.9
27°	70 00.0 -60.0 0.0	69 58.6 -59.9 2.6	69 54.6 -59.7 5.2	69 47.9 -59.4 7.8	69 38.5 -58.8 10.3
28°	69 00.0 -60.0 0.0	68 58.7 -59.9 2.5	68 54.9 -59.7 4.9	68 48.5 -59.4 7.3	68 39.7 -59.0 9.7
29°	68 00.0 -60.0 0.0	67 58.8 -60.0 2.3	67 55.2 -59.8 4.7	67 49.1 -59.4 7.0	67 40.7 -59.0 9.2

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°	81 24.3 +47.6 144.3	80 47.4 +44.2 139.2	80 06.8 +41.0 134.8	79 23.1 +38.0 130.9	78 37.0 +35.3 127.6
1°	82 11.9 +44.6 140.1	81 31.6 +40.7 134.8	80 47.8 +37.2 130.4	80 01.1 +34.2 126.6	79 12.3 +31.6 123.4
2°	82 56.5 +40.3 134.9	82 12.3 +36.2 129.6	81 25.0 +32.7 125.3	80 35.3 +29.8 121.7	79 43.9 +27.2 118.7
3°	83 36.8 +34.6 128.5	82 48.5 +30.5 123.5	81 57.7 +27.2 119.5	81 05.1 +24.4 116.3	80 11.1 +22.1 113.6
4°	84 11.4 +27.0 120.8	83 19.0 +23.4 116.4	82 24.9 +20.5 112.9	81 29.5 +18.3 110.2	80 33.2 +16.5 108.0
5°	84 38.4 +17.6 111.6	83 42.4 +14.9 108.2	82 45.4 +13.0 105.6	81 47.8 +11.5 103.7	80 49.7 +10.4 102.1
6°	84 56.0 +06.2 101.1	83 57.3 +05.4 99.2	82 58.4 +04.7 97.8	81 59.3 +04.3 96.7	81 00.1 +03.9 95.9
7°	85 02.2 -05.6 89.7	84 02.7 -04.6 89.6	83 03.1 -03.8 89.6	82 03.6 -03.2 89.5	81 04.0 -02.7 89.5
8°	84 56.6 -17.0 78.3	83 58.1 -14.2 80.1	82 59.3 -12.2 81.4	82 00.4 -10.6 82.3	81 01.3 -09.3 83.0
9°	84 39.6 -26.6 67.7	83 43.9 -22.8 71.0	82 47.1 -19.8 73.4	81 49.8 -17.4 75.3	80 52.0 -15.5 76.8
10°	84 13.0 -34.3 58.4	83 21.1 -30.0 62.8	82 27.3 -26.5 66.1	81 32.4 -23.7 68.7	80 36.5 -21.2 70.7
11°	83 38.7 -40.0 50.6	82 51.1 -35.8 55.5	82 00.8 -32.1 59.4	81 08.7 -29.0 62.6	80 15.3 -26.4 65.1
12°	82 58.7 -44.3 44.2	82 15.3 -40.4 49.3	81 28.7 -36.9 53.6	80 39.7 -33.7 57.0	79 48.9 -30.9 59.9
13°	82 14.4 -47.5 39.0	81 34.9 -44.0 44.1	80 51.8 -40.6 48.4	80 06.0 -37.5 52.1	79 18.0 -34.7 55.2
14°	81 26.9 -49.9 34.7	80 50.9 -46.8 39.6	80 11.2 -43.7 43.9	79 28.5 -40.8 47.7	78 43.3 -38.0 50.9
15°	80 37.0 -51.7 31.1	80 04.1 -48.9 35.8	79 27.5 -46.2 40.0	78 47.7 -43.5 43.8	78 05.3 -40.9 47.1
16°	79 45.3 -53.0 28.1	79 15.2 -50.6 32.6	78 41.3 -48.1 36.7	78 04.2 -45.6 40.3	77 24.4 -43.3 43.6
17°	78 52.3 -54.2 25.6	78 24.6 -52.1 29.8	77 53.2 -49.8 33.7	77 18.6 -47.6 37.3	76 41.1 -45.2 40.5
18°	77 58.1 -54.9 23.4	77 32.5 -53.1 27.4	77 03.4 -51.1 31.2	76 31.0 -49.0 34.6	75 55.9 -47.0 37.7
19°	77 03.2 -55.7 21.6	76 39.4 -54.0 25.4	76 12.3 -52.3 28.9	75 42.0 -50.4 32.2	75 08.9 -48.4 35.2
20°	76 07.5 -56.2 20.0	75 45.4 -54.7 23.5	75 20.0 -53.1 26.9	74 51.6 -51.4 30.0	74 20.5 -49.7 33.0
21°	75 11.3 -56.7 18.6	74 50.7 -55.4 21.9	74 26.9 -53.9 25.1	74 00.2 -52.4 28.1	73 30.8 -50.7 31.0
22°	74 14.6 -57.0 17.3	73 55.3 -55.9 20.5	73 33.0 -54.6 23.5	73 07.8 -53.1 26.4	72 40.1 -51.6 29.1
23°	73 17.6 -57.4 16.2	72 59.4 -56.3 19.2	72 38.4 -55.1 22.1	72 14.7 -53.8 24.8	71 48.5 -52.5 27.5
24°	72 20.2 -57.7 15.2	72 03.1 -56.6 18.1	71 43.3 -55.6 20.8	71 20.9 -54.4 23.4	70 56.0 -53.1 25.9
25°	71 22.5 -57.8 14.3	71 06.5 -57.0 17.0	70 47.7 -56.0 19.6	70 26.5 -54.9 22.1	70 02.9 -53.7 24.6
26°	70 24.7 -58.1 13.5	70 09.5 -57.3 16.1	69 51.7 -56.3 18.6	69 31.6 -55.3 21.0	69 09.2 -54.2 23.3
27°	69 26.6 -58.2 12.8	69 12.2 -57.5 15.2	68 55.4 -56.6 17.6	68 36.3 -55.7 19.9	68 15.0 -54.7 22.1
28°	68 28.4 -58.4 12.1	68 14.7 -57.7 14.4	67 58.8 -57.0 16.7	67 40.6 -56.1 18.9	67 20.3 -55.2 21.0
29°	67 30.0 -58.5 11.5	67 17.0 -57.9 13.7	67 01.8 -57.1 15.9	66 44.5 -56.3 18.0	66 25.1 -55.4 20.0

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°	77 48.8 +33.0 124.7	76 59.1 +30.8 122.1	76 08.0 +28.9 119.8	75 15.8 +27.2 117.8	74 22.7 +25.7 116.0
1°	78 21.8 +29.2 120.6	77 29.9 +27.2 118.2	76 36.9 +25.4 116.1	75 43.0 +23.8 114.3	74 48.4 +22.3 112.6
2°	78 51.0 +25.0 116.2	77 57.1 +23.1 114.0	77 02.3 +21.5 112.1	76 06.8 +20.1 110.5	75 10.7 +18.9 109.1
3°	79 16.0 +20.3 111.4	78 20.2 +18.7 109.5	77 23.8 +17.3 107.9	76 26.9 +16.2 106.5	75 29.6 +15.2 105.3
4°	79 36.3 +15.1 106.2	78 38.9 +13.9 104.7	77 41.1 +12.9 103.5	76 43.1 +12.0 102.4	75 44.8 +11.3 101.4
5°	79 51.4 +09.5 100.8	78 52.8 +08.7 99.8	77 54.0 +08.1 98.8	76 55.1 +07.6 98.1	75 56.1 +07.2 97.4
6°	80 00.9 +03.6 95.2	79 01.5 +03.4 94.6	78 02.1 +03.3 94.1	77 02.7 +03.1 93.7	76 03.3 +03.0 93.3
7°	80 04.5 -02.4 89.4	79 04.9 -02.0 89.3	78 05.4 -01.7 89.3	77 05.8 -01.4 89.2	76 06.3 -01.2 89.1
8°	80 02.1 -08.2 83.6	79 02.9 -07.3 84.1	78 03.7 -06.7 84.4	77 04.4 -06.0 84.7	76 05.1 -05.5 85.0
9°	79 53.9 -13.9 77.9	78 55.6 -12.6 78.9	77 57.0 -11.4 79.6	76 58.4 -10.4 80.3	75 59.6 -09.5 80.9
10°	79 40.0 -19.2 72.4	78 43.0 -17.5 73.8	77 45.6 -16.0 75.0	76 48.0 -14.7 76.0	75 50.1 -13.6 76.8
11°	79 20.8 -24.1 67.2	78 25.5 -22.0 69.0	77 29.6 -20.2 70.5	76 33.3 -18.7 71.7	75 36.5 -17.3 72.8
12°	78 56.7 -28.3 62.4	78 03.5 -26.2 64.4	77 09.4 -24.3 66.2	76 14.6 -22.5 67.7	75 19.2 -20.9 69.0
13°	78 28.4 -32.2 57.9	77 37.3 -29.9 60.1	76 45.1 -27.8 62.1	75 52.1 -26.0 63.9	74 58.3 -24.3 65.4
14°	77 56.2 -35.6 53.7	77 07.4 -33.2 56.2	76 17.3 -31.1 58.3	75 26.1 -29.1 60.2	74 34.0 -27.4 61.9
15°	77 20.6 -38.4 50.0	76 34.2 -36.1 52.5	75 46.2 -34.0 54.8	74 57.0 -32.1 56.8	74 06.6 -30.2 58.6
16°	76 42.2 -40.9 46.5	75 58.1 -38.7 49.2	75 12.2 -36.6 51.5	74 24.9 -34.6 53.6	73 36.4 -32.8 55.5
17°	76 01.3 -43.1 43.4	75 19.4 -41.0 46.1	74 35.6 -38.9 48.5	73 50.3 -36.9 50.6	73 03.6 -35.1 52.6
18°	75 18.2 -44.9 40.6	74 38.4 -42.8 43.2	73 56.7 -40.9 45.6	73 13.4 -39.1 47.8	72 28.5 -37.2 49.8
19°	74 33.3 -46.4 38.1	73 55.6 -44.6 40.7	73 15.8 -42.7 43.1	72 34.3 -40.9 45.2	71 51.3 -39.1 47.3
20°	73 46.9 -47.9 35.7	73 11.0 -46.1 38.3	72 33.1 -44.3 40.7	71 53.4 -42.5 42.8	71 12.2 -40.9 44.9
21°	72 59.0 -49.1 33.6	72 24.9 -47.4 36.1	71 48.8 -45.7 38.5	71 10.9 -44.0 40.6	70 31.3 -42.3 42.6
22°	72 09.9 -50.1 31.7	71 37.5 -48.5 34.1	71 03.1 -46.9 36.4	70 26.9 -45.3 38.6	69 49.0 -43.8 40.5
23°	71 19.8 -51.0 30.0	70 49.0 -49.5 32.3	70 16.2 -48.0 34.5	69 41.6 -46.5 36.6	69 05.2 -45.0 38.6
24°	70 28.8 -51.7 28.3	69 59.5 -50.4 30.6	69 28.2 -49.0 32.8	68 55.1 -47.6 34.8	68 20.2 -46.1 36.8
25°	69 37.1 -52.5 26.9	69 09.1 -51.1 29.1	68 39.2 -49.8 31.2	68 07.5 -48.5 33.2	67 34.1 -47.1 35.1
26°	68 44.6 -53.1 25.5	68 18.0 -51.9 27.6	67 49.4 -50.6 29.7	67 19.0 -49.3 31.6	66 47.0 -48.0 33.5
27°	67 51.5 -53.6 24.2	67 26.1 -52.5 26.3	66 58.8 -51.3 28.3	66 29.7 -50.1 30.2	65 59.0 -48.9 32.0
28°	66 57.9 -54.1 23.1	66 33.6 -53.0 25.1	66 07.5 -51.9 27.0	65 39.6 -50.7 28.8	65 10.1 -49.6 30.6
29°	66 03.8 -54.5 22.0	65 40.6 -53.5 23.9	65 15.6 -52.5 25.8	64 48.9 -51.4 27.5	64 20.5 -50.2 29.3

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°	73 28.9 +24.2 114.5	72 34.3 +23.0 113.0	71 39.3 +21.8 111.7	70 43.7 +20.9 110.6	69 47.8 +19.9 109.5
1°	73 53.1 +21.1 111.2	72 57.3 +20.1 109.9	72 01.1 +19.1 108.7	71 04.6 +18.1 107.7	70 07.7 +17.3 106.7
2°	74 14.2 +17.9 107.8	73 17.4 +16.8 106.7	72 20.2 +16.0 105.6	71 22.7 +15.2 104.7	70 25.0 +14.5 103.9
3°	74 32.1 +14.3 104.2	73 34.2 +13.6 103.3	72 36.2 +12.8 102.4	71 37.9 +12.3 101.7	70 39.5 +11.7 101.0
4°	74 46.4 +10.6 100.6	73 47.8 +10.0 99.8	72 49.0 +09.6 99.2	71 50.2 +09.1 98.6	70 51.2 +08.8 98.0
5°	74 57.0 +06.8 96.8	73 57.8 +06.5 96.3	72 58.6 +06.2 95.8	71 59.3 +06.0 95.4	71 00.0 +05.8 95.0
6°	75 03.8 +02.9 93.0	74 04.3 +02.9 92.7	73 04.8 +02.9 92.4	72 05.3 +02.8 92.1	71 05.8 +02.8 91.9
7°	75 06.7 -01.0 89.1	74 07.2 -00.8 89.0	73 07.7 -00.7 89.0	72 08.1 -00.5 88.9	71 08.6 -00.3 88.8
8°	75 05.7 -04.9 85.2	74 06.4 -04.5 85.4	73 07.0 -04.1 85.5	72 07.6 -03.7 85.6	71 08.3 -03.4 85.7
9°	75 00.8 -08.8 81.3	74 01.9 -08.1 81.7	73 02.9 -07.4 82.1	72 03.9 -06.9 82.4	71 04.9 -06.4 82.7
10°	74 52.0 -12.5 77.5	73 53.8 -11.6 78.1	72 55.5 -10.8 78.7	71 57.0 -10.0 79.2	70 58.5 -09.4 79.6
11°	74 39.5 -16.1 73.8	73 42.2 -15.0 74.6	72 44.7 -14.1 75.4	71 47.0 -13.2 76.0	70 49.1 -12.3 76.6
12°	74 23.4 -19.6 70.2	73 27.2 -18.3 71.2	72 30.6 -17.1 72.1	71 33.8 -16.0 72.9	70 36.8 -15.1 73.6
13°	74 03.8 -22.7 66.7	73 08.9 -21.4 67.9	72 13.5 -20.1 68.9	71 17.8 -18.9 69.9	70 21.7 -17.8 70.7
14°	73 41.1 -25.8 63.4	72 47.5 -24.2 64.7	71 53.4 -22.8 65.9	70 58.9 -21.6 66.9	70 03.9 -20.4 67.9
15°	73 15.3 -28.5 60.2	72 23.3 -26.9 61.6	71 30.6 -25.5 62.9	70 37.3 -24.2 64.1	69 43.5 -22.9 65.2
16°	72 46.8 -31.0 57.2	71 56.4 -29.5 58.7	71 05.1 -28.0 60.1	70 13.1 -26.5 61.4	69 20.6 -25.2 62.5
17°	72 15.8 -33.4 54.3	71 26.9 -31.7 55.9	70 37.1 -30.2 57.4	69 46.6 -28.8 58.7	68 55.4 -27.5 60.0
18°	71 42.4 -35.5 51.6	70 55.2 -33.9 53.3	70 06.9 -32.3 54.8	69 17.8 -30.8 56.2	68 27.9 -29.4 57.5
19°	71 06.9 -37.4 49.1	70 21.3 -35.8 50.8	69 34.6 -34.3 52.4	68 47.0 -32.8 53.8	67 58.5 -31.4 55.2
20°	70 29.5 -39.2 46.7	69 45.5 -37.6 48.5	69 00.3 -36.0 50.1	68 14.2 -34.6 51.6	67 27.1 -33.2 52.9
21°	69 50.3 -40.8 44.5	69 07.9 -39.2 46.3	68 24.3 -37.7 47.9	67 39.6 -36.3 49.4	66 53.9 -34.8 50.8
22°	69 09.5 -42.2 42.4	68 28.7 -40.7 44.2	67 46.6 -39.2 45.8	67 03.3 -37.7 47.3	66 19.1 -36.4 48.7
23°	68 27.3 -43.5 40.4	67 48.0 -42.1 42.2	67 07.4 -40.6 43.8	66 25.6 -39.2 45.3	65 42.7 -37.8 46.8
24°	67 43.8 -44.7 38.6	67 05.9 -43.2 40.3	66 26.8 -41.9 41.9	65 46.4 -40.5 43.5	65 04.9 -39.2 44.9
25°	66 59.1 -45.7 36.9	66 22.7 -44.4 38.6	65 44.9 -43.0 40.2	65 05.9 -41.7 41.7	64 25.7 -40.4 43.1
26°	66 13.4 -46.7 35.2	65 38.3 -45.4 36.9	65 01.9 -44.1 38.5	64 24.2 -42.8 40.0	63 45.3 -41.5 41.4
27°	65 26.7 -47.6 33.7	64 52.9 -46.3 35.3	64 17.8 -45.1 36.9	63 41.4 -43.8 38.4	63 03.8 -42.5 39.8
28°	64 39.1 -48.4 32.3	64 06.6 -47.2 33.9	63 32.7 -45.9 35.4	62 57.6 -44.8 36.9	62 21.3 -43.6 38.3
29°	63 50.7 -49.1 30.9	63 19.4 -47.9 32.5	62 46.8 -46.8 34.0	62 12.8 -45.6 35.4	61 37.7 -44.4 36.8

Declination SAME name as Latitude

Latitude 7°

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°	68 51.5 +19.0 108.5	67 54.9 +18.2 107.6	66 58.0 +17.5 106.8	66 00.8 +16.9 106.0	65 03.5 +16.3 105.3
1°	69 10.5 +16.6 105.9	68 13.1 +15.9 105.1	67 15.5 +15.3 104.3	66 17.7 +14.7 103.6	65 19.8 +14.1 103.0
2°	69 27.1 +13.9 103.1	68 29.0 +13.4 102.4	67 30.8 +12.8 101.8	66 32.4 +12.4 101.2	65 33.9 +12.0 100.7
3°	69 41.0 +11.2 100.4	68 42.4 +10.8 99.8	67 43.6 +10.4 99.2	66 44.8 +10.1 98.8	65 45.9 +09.7 98.3
4°	69 52.2 +08.5 97.5	68 53.2 +08.1 97.1	67 54.0 +07.9 96.6	66 54.9 +07.6 96.2	65 55.6 +07.5 95.9
5°	70 00.7 +05.6 94.6	69 01.3 +05.5 94.3	68 01.9 +05.3 94.0	67 02.5 +05.2 93.7	66 03.1 +05.1 93.4
6°	70 06.3 +02.7 91.7	69 06.8 +02.7 91.5	68 07.2 +02.8 91.3	67 07.7 +02.7 91.2	66 08.2 +02.7 91.0
7°	70 09.0 -00.1 88.8	69 09.5 +00.0 88.7	68 10.0 +00.1 88.6	67 10.4 +00.3 88.6	66 10.9 +00.4 88.5
8°	70 08.9 -03.1 85.8	69 09.5 -02.8 85.9	68 10.1 -02.5 86.0	67 10.7 -02.3 86.0	66 11.3 -02.0 86.0
9°	70 05.8 -05.9 82.9	69 06.7 -05.5 83.1	68 07.6 -05.1 83.3	67 08.4 -04.7 83.4	66 09.3 -04.4 83.6
10°	69 59.9 -08.8 80.0	69 01.2 -08.2 80.3	68 02.5 -07.7 80.6	67 03.7 -07.2 80.9	66 04.9 -06.7 81.1
11°	69 51.1 -11.5 77.1	68 53.0 -10.8 77.5	67 54.8 -10.2 78.0	66 56.5 -09.5 78.3	65 58.2 -09.0 78.7
12°	69 39.6 -14.2 74.3	68 42.2 -13.4 74.8	67 44.6 -12.6 75.3	66 47.0 -12.0 75.8	65 49.2 -11.3 76.2
13°	69 25.4 -16.9 71.5	68 28.8 -15.9 72.2	67 32.0 -15.1 72.8	66 35.0 -14.2 73.3	65 37.9 -13.5 73.8
14°	69 08.5 -19.3 68.8	68 12.9 -18.3 69.5	67 16.9 -17.3 70.3	66 20.8 -16.5 70.9	65 24.4 -15.6 71.5
15°	68 49.2 -21.7 66.1	67 54.6 -20.7 67.0	66 59.6 -19.6 67.8	66 04.3 -18.6 68.5	65 08.8 -17.8 69.2
16°	68 27.5 -24.0 63.6	67 33.9 -22.8 64.5	66 40.0 -21.7 65.4	65 45.7 -20.7 66.2	64 51.0 -19.7 66.9
17°	68 03.5 -26.1 61.1	67 11.1 -24.9 62.1	66 18.3 -23.8 63.1	65 25.0 -22.7 63.9	64 31.3 -21.7 64.7
18°	67 37.4 -28.2 58.7	66 46.2 -26.9 59.8	65 54.5 -25.7 60.8	65 02.3 -24.6 61.7	64 09.6 -23.5 62.6
19°	67 09.2 -30.0 56.4	66 19.3 -28.8 57.5	65 28.8 -27.6 58.6	64 37.7 -26.4 59.6	63 46.1 -25.3 60.5
20°	66 39.2 -31.8 54.2	65 50.5 -30.5 55.4	65 01.2 -29.3 56.5	64 11.3 -28.2 57.5	63 20.8 -27.0 58.4
21°	66 07.4 -33.5 52.1	65 20.0 -32.2 53.3	64 31.9 -31.0 54.4	63 43.1 -29.7 55.5	62 53.8 -28.6 56.5
22°	65 33.9 -35.1 50.0	64 47.8 -33.8 51.3	64 00.9 -32.4 52.4	63 13.4 -31.3 53.5	62 25.2 -30.1 54.5
23°	64 58.8 -36.5 48.1	64 14.0 -35.2 49.4	63 28.5 -34.0 50.5	62 42.1 -32.7 51.7	61 55.1 -31.6 52.7
24°	64 22.3 -37.8 46.3	63 38.8 -36.5 47.5	62 54.5 -35.3 48.7	62 09.4 -34.1 49.8	61 23.5 -32.9 50.9
25°	63 44.5 -39.1 44.5	63 02.3 -37.8 45.8	62 19.2 -36.6 47.0	61 35.3 -35.4 48.1	60 50.6 -34.3 49.2
26°	63 05.4 -40.2 42.8	62 24.5 -39.0 44.1	61 42.6 -37.8 45.3	60 59.9 -36.6 46.4	60 16.3 -35.4 47.5
27°	62 25.2 -41.4 41.2	61 45.5 -40.2 42.4	61 04.8 -38.9 43.6	60 23.3 -37.8 44.8	59 40.9 -36.6 45.9
28°	61 43.8 -42.3 39.6	61 05.3 -41.1 40.9	60 25.9 -40.0 42.1	59 45.5 -38.8 43.2	59 04.3 -37.6 44.3
29°	61 01.5 -43.3 38.1	60 24.2 -42.1 39.4	59 45.9 -40.9 40.6	59 06.7 -39.8 41.7	58 26.7 -38.7 42.8

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°	64 06.0 +15.7 104.6	63 08.3 +15.2 104.0	62 10.4 +14.7 103.5	61 12.4 +14.3 102.9	60 14.3 +13.9 102.4
1°	64 21.7 +13.7 102.4	63 23.5 +13.2 101.9	62 25.1 +12.9 101.4	61 26.7 +12.5 100.9	60 28.2 +12.1 100.4
2°	64 35.4 +11.6 100.2	63 36.7 +11.2 99.7	62 38.0 +10.9 99.2	61 39.2 +10.5 98.8	60 40.3 +10.3 98.4
3°	64 47.0 +09.4 97.9	63 47.9 +09.2 97.5	62 48.9 +08.9 97.1	61 49.7 +08.7 96.8	60 50.6 +08.5 96.4
4°	64 56.4 +07.2 95.5	63 57.1 +07.0 95.2	62 57.8 +06.9 94.9	61 58.4 +06.8 94.7	60 59.1 +06.6 94.4
5°	65 03.6 +05.0 93.2	64 04.1 +05.0 93.0	63 04.7 +04.8 92.7	62 05.2 +04.8 92.5	61 05.7 +04.7 92.3
6°	65 08.6 +02.8 90.8	64 09.1 +02.7 90.7	63 09.5 +02.8 90.5	62 10.0 +02.8 90.4	61 10.4 +02.9 90.3
7°	65 11.4 +00.4 88.5	64 11.8 +00.6 88.4	63 12.3 +00.7 88.3	62 12.8 +00.8 88.3	61 13.3 +00.9 88.2
8°	65 11.8 -01.7 86.1	64 12.4 -01.5 86.1	63 13.0 -01.3 86.1	62 13.6 -01.2 86.1	61 14.2 -01.0 86.1
9°	65 10.1 -04.1 83.7	64 10.9 -03.7 83.8	63 11.7 -03.5 83.9	62 12.4 -03.1 84.0	61 13.2 -02.9 84.0
10°	65 06.0 -06.2 81.3	64 07.2 -05.9 81.5	63 08.2 -05.4 81.7	62 09.3 -05.1 81.8	61 10.3 -04.7 82.0
11°	64 59.8 -08.5 79.0	64 01.3 -08.0 79.2	63 02.8 -07.6 79.5	62 04.2 -07.1 79.7	61 05.6 -06.7 79.9
12°	64 51.3 -10.7 76.6	63 53.3 -10.1 77.0	62 55.2 -09.5 77.3	61 57.1 -09.0 77.6	60 58.9 -08.5 77.8
13°	64 40.6 -12.8 74.3	63 43.2 -12.1 74.7	62 45.7 -11.5 75.1	61 48.1 -10.9 75.5	60 50.4 -10.3 75.8
14°	64 27.8 -14.8 72.0	63 31.1 -14.1 72.5	62 34.2 -13.4 73.0	61 37.2 -12.7 73.4	60 40.1 -12.1 73.8
15°	64 13.0 -16.9 69.8	63 17.0 -16.1 70.4	62 20.8 -15.3 70.9	61 24.5 -14.6 71.4	60 28.0 -13.9 71.8
16°	63 56.1 -18.8 67.6	63 00.9 -17.9 68.2	62 05.5 -17.1 68.8	61 09.9 -16.4 69.3	60 14.1 -15.7 69.8
17°	63 37.3 -20.7 65.5	62 43.0 -19.8 66.1	61 48.4 -18.9 66.8	60 53.5 -18.1 67.4	59 58.4 -17.2 67.9
18°	63 16.6 -22.5 63.4	62 23.2 -21.6 64.1	61 29.5 -20.7 64.8	60 35.4 -19.7 65.4	59 41.2 -19.0 66.0
19°	62 54.1 -24.3 61.3	62 01.6 -23.2 62.1	61 08.8 -22.3 62.8	60 15.7 -21.4 63.5	59 22.2 -20.5 64.1
20°	62 29.8 -25.9 59.3	61 38.4 -24.9 60.1	60 46.5 -23.9 60.9	59 54.3 -22.9 61.6	59 01.7 -22.0 62.3
21°	62 03.9 -27.5 57.4	61 13.5 -26.4 58.2	60 22.6 -25.4 59.0	59 31.4 -24.5 59.8	58 39.7 -23.5 60.5
22°	61 36.4 -29.0 55.5	60 47.1 -28.0 56.4	59 57.2 -26.9 57.2	59 06.9 -25.8 58.0	58 16.2 -24.9 58.7
23°	61 07.4 -30.4 53.7	60 19.1 -29.3 54.6	59 30.3 -28.2 55.4	58 41.1 -27.3 56.2	57 51.3 -26.2 57.0
24°	60 37.0 -31.8 51.9	59 49.8 -30.7 52.8	59 02.1 -29.7 53.7	58 13.8 -28.6 54.5	57 25.1 -27.6 55.3
25°	60 05.2 -33.1 50.2	59 19.1 -32.0 51.1	58 32.4 -30.9 52.0	57 45.2 -29.8 52.9	56 57.5 -28.9 53.7
26°	59 32.1 -34.3 48.5	58 47.1 -33.2 49.5	58 01.5 -32.1 50.4	57 15.4 -31.1 51.3	56 28.6 -30.0 52.1
27°	58 57.8 -35.5 46.9	58 13.9 -34.3 47.9	57 29.4 -33.2 48.8	56 44.3 -32.2 49.7	55 58.6 -31.2 50.5
28°	58 22.3 -36.5 45.4	57 39.6 -35.5 46.3	56 56.2 -34.4 47.3	56 12.1 -33.3 48.2	55 27.4 -32.3 49.0
29°	57 45.8 -37.6 43.9	57 04.1 -36.4 44.9	56 21.8 -35.4 45.8	55 38.8 -34.4 46.7	54 55.1 -33.3 47.5

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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°	59 16.1 +13.5 101.9	58 17.8 +13.1 101.5	57 19.4 +12.7 101.0	56 20.9 +12.4 100.6	55 22.3 +12.2 100.2
1°	59 29.6 +11.7 100.0	58 30.9 +11.5 99.6	57 32.1 +11.2 99.2	56 33.3 +10.9 98.9	55 34.5 +10.6 98.5
2°	59 41.3 +10.1 98.1	58 42.4 +09.8 97.7	57 43.3 +09.6 97.4	56 44.2 +09.4 97.1	55 45.1 +09.2 96.8
3°	59 51.4 +08.3 96.1	58 52.2 +08.1 95.8	57 52.9 +07.9 95.5	56 53.6 +07.8 95.3	55 54.3 +07.7 95.0
4°	59 59.7 +06.5 94.1	59 00.3 +06.4 93.9	58 00.8 +06.3 93.7	57 01.4 +06.2 93.4	56 02.0 +06.1 93.2
5°	60 06.2 +04.7 92.1	59 06.7 +04.6 92.0	58 07.1 +04.7 91.8	57 07.6 +04.6 91.6	56 08.1 +04.5 91.5
6°	60 10.9 +02.8 90.1	59 11.3 +02.9 90.0	58 11.8 +02.9 89.9	57 12.2 +03.0 89.8	56 12.6 +03.1 89.7
7°	60 13.7 +01.1 88.1	59 14.2 +01.2 88.1	58 14.7 +01.2 88.0	57 15.2 +01.3 87.9	56 15.7 +01.4 87.9
8°	60 14.8 -00.8 86.1	59 15.4 -00.7 86.1	58 15.9 -00.4 86.1	57 16.5 -00.3 86.1	56 17.1 -00.1 86.1
9°	60 14.0 -02.6 84.1	59 14.7 -02.3 84.2	58 15.5 -02.1 84.2	57 16.2 -01.9 84.2	56 17.0 -01.7 84.3
10°	60 11.4 -04.5 82.1	59 12.4 -04.2 82.2	58 13.4 -03.9 82.3	57 14.3 -03.5 82.4	56 15.3 -03.2 82.5
11°	60 06.9 -06.2 80.1	59 08.2 -05.8 80.3	58 09.5 -05.5 80.4	57 10.8 -05.1 80.5	56 12.1 -04.9 80.7
12°	60 00.7 -08.1 78.1	59 02.4 -07.6 78.3	58 04.0 -07.1 78.5	57 05.7 -06.8 78.7	56 07.2 -06.3 78.9
13°	59 52.6 -09.8 76.1	58 54.8 -09.3 76.4	57 56.9 -08.8 76.6	56 58.9 -08.3 76.9	56 00.9 -07.9 77.1
14°	59 42.8 -11.5 74.2	58 45.5 -11.0 74.5	57 48.1 -10.4 74.8	56 50.6 -09.9 75.1	55 53.0 -09.4 75.3
15°	59 31.3 -13.2 72.2	58 34.5 -12.6 72.6	57 37.7 -12.0 72.9	56 40.7 -11.5 73.3	55 43.6 -10.9 73.6
16°	59 18.1 -14.9 70.3	58 21.9 -14.2 70.7	57 25.7 -13.6 71.1	56 29.2 -12.9 71.5	55 32.7 -12.3 71.8
17°	59 03.2 -16.6 68.4	58 07.7 -15.8 68.9	57 12.1 -15.1 69.3	56 16.3 -14.5 69.7	55 20.4 -13.8 70.1
18°	58 46.6 -18.1 66.5	57 51.9 -17.3 67.1	56 57.0 -16.6 67.5	56 01.8 -15.9 68.0	55 06.6 -15.3 68.4
19°	58 28.5 -19.6 64.7	57 34.6 -18.9 65.3	56 40.4 -18.1 65.8	55 45.9 -17.3 66.3	54 51.3 -16.6 66.7
20°	58 08.9 -21.2 62.9	57 15.7 -20.3 63.5	56 22.3 -19.5 64.0	55 28.6 -18.7 64.6	54 34.7 -17.9 65.0
21°	57 47.7 -22.5 61.1	56 55.4 -21.7 61.8	56 02.8 -20.9 62.3	55 09.9 -20.0 62.9	54 16.8 -19.3 63.4
22°	57 25.2 -24.0 59.4	56 33.7 -23.1 60.1	55 41.9 -22.2 60.7	54 49.9 -21.4 61.2	53 57.5 -20.5 61.8
23°	57 01.2 -25.3 57.7	56 10.6 -24.4 58.4	55 19.7 -23.5 59.0	54 28.5 -22.6 59.6	53 37.0 -21.8 60.2
24°	56 35.9 -26.6 56.1	55 46.2 -25.6 56.8	54 56.2 -24.7 57.4	54 05.9 -23.9 58.0	53 15.2 -23.0 58.6
25°	56 09.3 -27.9 54.5	55 20.6 -26.9 55.2	54 31.5 -26.0 55.8	53 42.0 -25.0 56.5	52 52.2 -24.2 57.1
26°	55 41.4 -29.0 52.9	54 53.7 -28.1 53.6	54 05.5 -27.1 54.3	53 17.0 -26.2 55.0	52 28.0 -25.3 55.6
27°	55 12.4 -30.2 51.3	54 25.6 -29.2 52.1	53 38.4 -28.2 52.8	52 50.8 -27.3 53.5	52 02.7 -26.4 54.1
28°	54 42.2 -31.3 49.8	53 56.4 -30.2 50.6	53 10.2 -29.3 51.3	52 23.5 -28.4 52.0	51 36.3 -27.4 52.7
29°	54 10.9 -32.3 48.4	53 26.2 -31.4 49.1	52 40.9 -30.4 49.9	51 55.1 -29.4 50.6	51 08.9 -28.5 51.2

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°	54 23.7 +11.8 99.9	53 25.0 +11.6 99.5	52 26.2 +11.4 99.2	51 27.4 +11.1 98.9	50 28.5 +10.9 98.6
1°	54 35.5 +10.5 98.2	53 36.6 +10.2 97.9	52 37.6 +10.0 97.6	51 38.5 +09.8 97.3	50 39.4 +09.6 97.0
2°	54 46.0 +09.0 96.5	53 46.8 +08.8 96.2	52 47.6 +08.6 95.9	51 48.3 +08.5 95.7	50 49.0 +08.4 95.5
3°	54 55.0 +07.5 94.8	53 55.6 +07.4 94.5	52 56.2 +07.3 94.3	51 56.8 +07.2 94.1	50 57.4 +07.1 93.9
4°	55 02.5 +06.0 93.0	54 03.0 +06.0 92.8	53 03.5 +06.0 92.7	52 04.0 +05.9 92.5	51 04.5 +05.9 92.3
5°	55 08.5 +04.6 91.3	54 09.0 +04.5 91.1	53 09.5 +04.5 91.0	52 09.9 +04.5 90.9	51 10.4 +04.5 90.7
6°	55 13.1 +03.1 89.6	54 13.5 +03.1 89.4	53 14.0 +03.1 89.3	52 14.4 +03.2 89.2	51 14.9 +03.2 89.1
7°	55 16.2 +01.5 87.8	54 16.6 +01.7 87.7	53 17.1 +01.8 87.7	52 17.6 +01.9 87.6	51 18.1 +02.0 87.5
8°	55 17.7 +00.0 86.0	54 18.3 +00.2 86.0	53 18.9 +00.3 86.0	52 19.5 +00.5 86.0	51 20.1 +00.6 85.9
9°	55 17.7 -01.4 84.3	54 18.5 -01.3 84.3	53 19.2 -01.0 84.3	52 20.0 -00.9 84.3	51 20.7 -00.7 84.3
10°	55 16.3 -03.0 82.5	54 17.2 -02.7 82.6	53 18.2 -02.5 82.6	52 19.1 -02.2 82.7	51 20.0 -02.0 82.7
11°	55 13.3 -04.5 80.8	54 14.5 -04.2 80.9	53 15.7 -03.9 81.0	52 16.9 -03.6 81.1	51 18.0 -03.3 81.1
12°	55 08.8 -06.0 79.0	54 10.3 -05.6 79.2	53 11.8 -05.2 79.3	52 13.3 -04.9 79.4	51 14.7 -04.6 79.5
13°	55 02.8 -07.4 77.3	54 04.7 -07.0 77.5	53 06.6 -06.7 77.6	52 08.4 -06.3 77.8	51 10.1 -05.8 77.9
14°	54 55.4 -09.0 75.6	53 57.7 -08.5 75.8	52 59.9 -08.0 76.0	52 02.1 -07.6 76.2	51 04.3 -07.2 76.4
15°	54 46.4 -10.3 73.8	53 49.2 -09.8 74.1	52 51.9 -09.4 74.3	51 54.5 -08.9 74.6	50 57.1 -08.4 74.8
16°	54 36.1 -11.8 72.1	53 39.4 -11.3 72.4	52 42.5 -10.7 72.7	51 45.6 -10.2 73.0	50 48.7 -09.7 73.2
17°	54 24.3 -13.2 70.5	53 28.1 -12.6 70.8	52 31.8 -12.0 71.1	51 35.4 -11.4 71.4	50 39.0 -11.0 71.6
18°	54 11.1 -14.5 68.8	53 15.5 -13.9 69.1	52 19.8 -13.3 69.5	51 24.0 -12.7 69.8	50 28.0 -12.1 70.1
19°	53 56.6 -16.0 67.1	53 01.6 -15.2 67.5	52 06.5 -14.6 67.9	51 11.3 -14.0 68.2	50 15.9 -13.4 68.6
20°	53 40.6 -17.2 65.5	52 46.4 -16.6 65.9	51 51.9 -15.8 66.3	50 57.3 -15.2 66.7	50 02.5 -14.5 67.0
21°	53 23.4 -18.5 63.9	52 29.8 -17.7 64.3	51 36.1 -17.1 64.8	50 42.1 -16.3 65.2	49 48.0 -15.7 65.5
22°	53 04.9 -19.7 62.3	52 12.1 -19.0 62.8	51 19.0 -18.2 63.2	50 25.8 -17.6 63.6	49 32.3 -16.8 64.0
23°	52 45.2 -21.0 60.7	51 53.1 -20.2 61.2	51 00.8 -19.5 61.7	50 08.2 -18.7 62.2	49 15.5 -18.0 62.6
24°	52 24.2 -22.2 59.2	51 32.9 -21.3 59.7	50 41.3 -20.5 60.2	49 49.5 -19.7 60.7	48 57.5 -19.0 61.1
25°	52 02.0 -23.3 57.7	51 11.6 -22.5 58.2	50 20.8 -21.7 58.7	49 29.8 -20.9 59.2	48 38.5 -20.1 59.7
26°	51 38.7 -24.4 56.2	50 49.1 -23.6 56.7	49 59.1 -22.7 57.3	49 08.9 -21.9 57.8	48 18.4 -21.2 58.3
27°	51 14.3 -25.5 54.7	50 25.5 -24.6 55.3	49 36.4 -23.8 55.8	48 47.0 -23.0 56.4	47 57.2 -22.1 56.9
28°	50 48.8 -26.5 53.3	50 00.9 -25.7 53.9	49 12.6 -24.8 54.4	48 24.0 -23.9 55.0	47 35.1 -23.1 55.5
29°	50 22.3 -27.6 51.9	49 35.2 -26.6 52.5	48 47.8 -25.8 53.0	48 00.1 -25.0 53.6	47 12.0 -24.1 54.1

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°	49 29.6 +10.7 98.3	48 30.7 +10.4 98.0	47 31.7 +10.2 97.7	46 32.6 +10.1 97.4	45 33.6 +09.9 97.2
1°	49 40.3 +09.4 96.7	48 41.1 +09.3 96.5	47 41.9 +09.2 96.2	46 42.7 +09.0 96.0	45 43.5 +08.9 95.8
2°	49 49.7 +08.3 95.2	48 50.4 +08.2 95.0	47 51.1 +08.0 94.8	46 51.7 +08.0 94.6	45 52.4 +07.8 94.4
3°	49 58.0 +07.0 93.7	48 58.6 +06.9 93.5	47 59.1 +06.9 93.3	46 59.7 +06.8 93.1	46 00.2 +06.7 92.9
4°	50 05.0 +05.8 92.1	49 05.5 +05.8 92.0	48 06.0 +05.7 91.8	47 06.5 +05.7 91.7	46 06.9 +05.7 91.5
5°	50 10.8 +04.6 90.6	49 11.3 +04.5 90.4	48 11.7 +04.6 90.3	47 12.2 +04.5 90.2	46 12.6 +04.6 90.1
6°	50 15.4 +03.2 89.0	49 15.8 +03.4 88.9	48 16.3 +03.4 88.8	47 16.7 +03.5 88.7	46 17.2 +03.5 88.6
7°	50 18.6 +02.1 87.5	49 19.2 +02.1 87.4	48 19.7 +02.2 87.3	47 20.2 +02.3 87.3	46 20.7 +02.4 87.2
8°	50 20.7 +00.7 85.9	49 21.3 +00.9 85.9	48 21.9 +01.0 85.8	47 22.5 +01.2 85.8	46 23.1 +01.3 85.7
9°	50 21.4 -00.5 84.3	49 22.2 -00.3 84.3	48 22.9 -00.1 84.3	47 23.7 +00.0 84.3	46 24.4 +00.2 84.3
10°	50 20.9 -01.7 82.8	49 21.9 -01.6 82.8	48 22.8 -01.3 82.8	47 23.7 -01.1 82.8	46 24.6 -00.9 82.8
11°	50 19.2 -03.0 81.2	49 20.3 -02.7 81.3	48 21.5 -02.5 81.3	47 22.6 -02.3 81.3	46 23.7 -02.0 81.4
12°	50 16.2 -04.3 79.6	49 17.6 -04.0 79.7	48 19.0 -03.7 79.8	47 20.3 -03.3 79.9	46 21.7 -03.1 79.9
13°	50 11.9 -05.5 78.1	49 13.6 -05.2 78.2	48 15.3 -04.8 78.3	47 17.0 -04.5 78.4	46 18.6 -04.2 78.5
14°	50 06.4 -06.8 76.5	49 08.4 -06.3 76.7	48 10.5 -06.0 76.8	47 12.5 -05.7 76.9	46 14.4 -05.2 77.0
15°	49 59.6 -08.0 75.0	49 02.1 -07.6 75.1	48 04.5 -07.2 75.3	47 06.8 -06.7 75.5	46 09.2 -06.4 75.6
16°	49 51.6 -09.2 73.4	48 54.5 -08.7 73.6	47 57.3 -08.3 73.8	47 00.1 -07.8 74.0	46 02.8 -07.4 74.2
17°	49 42.4 -10.4 71.9	48 45.8 -10.0 72.1	47 49.0 -09.4 72.4	46 52.3 -09.0 72.6	45 55.4 -08.5 72.7
18°	49 32.0 -11.6 70.4	48 35.8 -11.0 70.6	47 39.6 -10.5 70.9	46 43.3 -10.0 71.1	45 46.9 -09.5 71.3
19°	49 20.4 -12.8 68.9	48 24.8 -12.2 69.2	47 29.1 -11.7 69.4	46 33.3 -11.1 69.7	45 37.4 -10.6 69.9
20°	49 07.6 -13.9 67.4	48 12.6 -13.3 67.7	47 17.4 -12.7 68.0	46 22.2 -12.2 68.2	45 26.8 -11.6 68.5
21°	48 53.7 -15.0 65.9	47 59.3 -14.4 66.2	47 04.7 -13.8 66.5	46 10.0 -13.2 66.8	45 15.2 -12.6 67.1
22°	48 38.7 -16.2 64.4	47 44.9 -15.5 64.8	46 50.9 -14.8 65.1	45 56.8 -14.2 65.4	45 02.6 -13.6 65.7
23°	48 22.5 -17.2 63.0	47 29.4 -16.6 63.3	46 36.1 -15.9 63.7	45 42.6 -15.2 64.0	44 49.0 -14.6 64.3
24°	48 05.3 -18.3 61.5	47 12.8 -17.6 61.9	46 20.2 -16.9 62.3	45 27.4 -16.3 62.6	44 34.4 -15.6 63.0
25°	47 47.0 -19.4 60.1	46 55.2 -18.6 60.5	46 03.3 -17.9 60.9	45 11.1 -17.2 61.3	44 18.8 -16.5 61.6
26°	47 27.6 -20.3 58.7	46 36.6 -19.6 59.1	45 45.4 -18.9 59.5	44 53.9 -18.1 59.9	44 02.3 -17.4 60.3
27°	47 07.3 -21.4 57.3	46 17.0 -20.6 57.8	45 26.5 -19.8 58.2	44 35.8 -19.1 58.6	43 44.9 -18.4 59.0
28°	46 45.9 -22.3 55.9	45 56.4 -21.5 56.4	45 06.7 -20.8 56.8	44 16.7 -20.0 57.3	43 26.5 -19.2 57.6
29°	46 23.6 -23.3 54.6	45 34.9 -22.5 55.1	44 45.9 -21.6 55.5	43 56.7 -20.9 55.9	43 07.3 -20.2 56.3

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°	44 34.5 +09.7 96.9	43 35.3 +09.6 96.7	42 36.2 +09.4 96.5	41 37.0 +09.3 96.3	40 37.8 +09.2 96.0
1°	44 44.2 +08.8 95.6	43 44.9 +08.7 95.3	42 45.6 +08.6 95.1	41 46.3 +08.4 94.9	40 47.0 +08.3 94.7
2°	44 53.0 +07.7 94.2	43 53.6 +07.6 94.0	42 54.2 +07.5 93.8	41 54.7 +07.5 93.6	40 55.3 +07.4 93.4
3°	45 00.7 +06.7 92.8	44 01.2 +06.7 92.6	43 01.7 +06.6 92.4	42 02.2 +06.6 92.3	41 02.7 +06.5 92.1
4°	45 07.4 +05.7 91.4	44 07.9 +05.6 91.2	43 08.3 +05.7 91.1	42 08.8 +05.6 90.9	41 09.2 +05.6 90.8
5°	45 13.1 +04.6 89.9	44 13.5 +04.6 89.8	43 14.0 +04.6 89.7	42 14.4 +04.7 89.6	41 14.8 +04.8 89.5
6°	45 17.7 +03.5 88.5	44 18.1 +03.6 88.4	43 18.6 +03.7 88.3	42 19.1 +03.7 88.2	41 19.6 +03.7 88.2
7°	45 21.2 +02.5 87.1	44 21.7 +02.6 87.0	43 22.3 +02.6 87.0	42 22.8 +02.8 86.9	41 23.3 +02.9 86.8
8°	45 23.7 +01.4 85.7	44 24.3 +01.6 85.6	43 24.9 +01.7 85.6	42 25.6 +01.8 85.5	41 26.2 +01.9 85.5
9°	45 25.1 +00.4 84.3	44 25.9 +00.5 84.2	43 26.6 +00.7 84.2	42 27.4 +00.9 84.2	41 28.1 +01.1 84.2
10°	45 25.5 -00.7 82.8	44 26.4 -00.5 82.8	43 27.3 -00.3 82.8	42 28.3 -00.1 82.8	41 29.2 +00.1 82.8
11°	45 24.8 -01.7 81.4	44 25.9 -01.5 81.4	43 27.0 -01.2 81.5	42 28.2 -01.1 81.5	41 29.3 -00.9 81.5
12°	45 23.1 -02.8 80.0	44 24.4 -02.5 80.0	43 25.8 -02.3 80.1	42 27.1 -02.0 80.1	41 28.4 -01.7 80.2
13°	45 20.3 -03.9 78.6	44 21.9 -03.6 78.6	43 23.5 -03.3 78.7	42 25.1 -03.0 78.8	41 26.7 -02.7 78.8
14°	45 16.4 -04.9 77.2	44 18.3 -04.6 77.2	43 20.2 -04.2 77.3	42 22.1 -03.9 77.4	41 24.0 -03.6 77.5
15°	45 11.5 -06.0 75.7	44 13.7 -05.5 75.9	43 16.0 -05.2 76.0	42 18.2 -04.9 76.1	41 20.4 -04.5 76.2
16°	45 05.5 -07.0 74.3	44 08.2 -06.6 74.5	43 10.8 -06.2 74.6	42 13.3 -05.8 74.7	41 15.9 -05.5 74.8
17°	44 58.5 -08.0 72.9	44 01.6 -07.6 73.1	43 04.6 -07.2 73.2	42 07.5 -06.7 73.4	41 10.4 -06.3 73.5
18°	44 50.5 -09.1 71.5	43 54.0 -08.6 71.7	42 57.4 -08.1 71.9	42 00.8 -07.7 72.0	41 04.1 -07.2 72.2
19°	44 41.4 -10.0 70.1	43 45.4 -09.6 70.3	42 49.3 -09.1 70.5	41 53.1 -08.6 70.7	40 56.9 -08.2 70.9
20°	44 31.4 -11.1 68.7	43 35.8 -10.5 69.0	42 40.2 -10.0 69.2	41 44.5 -09.5 69.4	40 48.7 -09.0 69.6
21°	44 20.3 -12.0 67.4	43 25.3 -11.5 67.6	42 30.2 -11.0 67.8	41 35.0 -10.4 68.1	40 39.7 -09.9 68.3
22°	44 08.3 -13.1 66.0	43 13.8 -12.4 66.3	42 19.2 -11.8 66.5	41 24.6 -11.3 66.7	40 29.8 -10.8 67.0
23°	43 55.2 -13.9 64.6	43 01.4 -13.4 64.9	42 07.4 -12.8 65.2	41 13.3 -12.2 65.4	40 19.0 -11.6 65.7
24°	43 41.3 -15.0 63.3	42 48.0 -14.3 63.6	41 54.6 -13.7 63.9	41 01.1 -13.1 64.1	40 07.4 -12.4 64.4
25°	43 26.3 -15.8 62.0	42 33.7 -15.2 62.3	41 40.9 -14.5 62.6	40 48.0 -13.9 62.8	39 55.0 -13.3 63.1
26°	43 10.5 -16.7 60.6	42 18.5 -16.1 61.0	41 26.4 -15.4 61.3	40 34.1 -14.8 61.6	39 41.7 -14.2 61.8
27°	42 53.8 -17.7 59.3	42 02.4 -16.9 59.7	41 11.0 -16.3 60.0	40 19.3 -15.6 60.3	39 27.5 -14.9 60.6
28°	42 36.1 -18.5 58.0	41 45.5 -17.8 58.4	40 54.7 -17.1 58.7	40 03.7 -16.4 59.0	39 12.6 -15.7 59.3
29°	42 17.6 -19.4 56.7	41 27.7 -18.7 57.1	40 37.6 -17.9 57.4	39 47.3 -17.2 57.8	38 56.9 -16.6 58.1

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 38.6 +09.0 95.8	38 39.3 +09.0 95.6	37 40.0 +08.9 95.4	36 40.7 +08.8 95.2	35 41.4 +08.7 95.1
1°	39 47.6 +08.2 94.6	38 48.3 +08.1 94.4	37 48.9 +08.0 94.2	36 49.5 +07.9 94.0	35 50.1 +07.8 93.8
2°	39 55.8 +07.4 93.3	38 56.4 +07.3 93.1	37 56.9 +07.3 92.9	36 57.4 +07.2 92.8	35 57.9 +07.2 92.6
3°	40 03.2 +06.5 92.0	39 03.7 +06.4 91.8	38 04.2 +06.4 91.7	37 04.6 +06.4 91.5	36 05.1 +06.4 91.4
4°	40 09.7 +05.6 90.7	39 10.1 +05.6 90.5	38 10.6 +05.6 90.4	37 11.0 +05.7 90.3	36 11.5 +05.6 90.2
5°	40 15.3 +04.7 89.4	39 15.7 +04.8 89.3	38 16.2 +04.8 89.1	37 16.7 +04.8 89.0	36 17.1 +04.9 88.9
6°	40 20.0 +03.9 88.1	39 20.5 +03.9 88.0	38 21.0 +04.0 87.9	37 21.5 +04.0 87.8	36 22.0 +04.1 87.7
7°	40 23.9 +02.9 86.7	39 24.4 +03.1 86.7	38 25.0 +03.1 86.6	37 25.5 +03.3 86.5	36 26.1 +03.3 86.4
8°	40 26.8 +02.1 85.4	39 27.5 +02.2 85.4	38 28.1 +02.3 85.3	37 28.8 +02.4 85.3	36 29.4 +02.6 85.2
9°	40 28.9 +01.2 84.1	39 29.7 +01.3 84.1	38 30.4 +01.5 84.0	37 31.2 +01.6 84.0	36 32.0 +01.8 84.0
10°	40 30.1 +00.3 82.8	39 31.0 +00.5 82.8	38 31.9 +00.7 82.8	37 32.8 +00.9 82.7	36 33.8 +01.0 82.7
11°	40 30.4 -00.7 81.5	39 31.5 -00.4 81.5	38 32.6 -00.2 81.5	37 33.7 +00.0 81.5	36 34.8 +00.2 81.5
12°	40 29.7 -01.5 80.2	39 31.1 -01.3 80.2	38 32.4 -01.0 80.2	37 33.7 -00.8 80.2	36 35.0 -00.5 80.2
13°	40 28.2 -02.4 78.9	39 29.8 -02.1 78.9	38 31.4 -01.9 78.9	37 32.9 -01.6 79.0	36 34.5 -01.4 79.0
14°	40 25.8 -03.2 77.5	39 27.7 -03.0 77.6	38 29.5 -02.7 77.7	37 31.3 -02.4 77.7	36 33.1 -02.1 77.7
15°	40 22.6 -04.2 76.2	39 24.7 -03.8 76.3	38 26.8 -03.5 76.4	37 28.9 -03.1 76.4	36 31.0 -02.8 76.5
16°	40 18.4 -05.1 74.9	39 20.9 -04.7 75.0	38 23.3 -04.3 75.1	37 25.8 -04.0 75.2	36 28.2 -03.7 75.3
17°	40 13.3 -05.9 73.6	39 16.2 -05.6 73.7	38 19.0 -05.2 73.8	37 21.8 -04.8 73.9	36 24.5 -04.4 74.0
18°	40 07.4 -06.8 72.3	39 10.6 -06.4 72.4	38 13.8 -06.0 72.6	37 17.0 -05.6 72.7	36 20.1 -05.2 72.8
19°	40 00.6 -07.7 71.0	39 04.2 -07.2 71.2	38 07.8 -06.8 71.3	37 11.4 -06.3 71.4	36 14.9 -05.9 71.5
20°	39 52.9 -08.5 69.7	38 57.0 -08.1 69.9	38 01.0 -07.5 70.0	37 05.1 -07.2 70.2	36 09.0 -06.7 70.3
21°	39 44.4 -09.4 68.4	38 48.9 -08.9 68.6	37 53.5 -08.4 68.8	36 57.9 -07.9 68.9	36 02.3 -07.4 69.1
22°	39 35.0 -10.3 67.2	38 40.0 -09.7 67.3	37 45.1 -09.2 67.5	36 50.0 -08.7 67.7	35 54.9 -08.2 67.8
23°	39 24.7 -11.0 65.9	38 30.3 -10.5 66.1	37 35.9 -10.0 66.3	36 41.3 -09.4 66.5	35 46.7 -09.0 66.6
24°	39 13.7 -11.9 64.6	38 19.8 -11.3 64.8	37 25.9 -10.8 65.0	36 31.9 -10.3 65.2	35 37.7 -09.6 65.4
25°	39 01.8 -12.7 63.3	38 08.5 -12.1 63.6	37 15.1 -11.5 63.8	36 21.6 -10.9 64.0	35 28.1 -10.4 64.2
26°	38 49.1 -13.5 62.1	37 56.4 -12.9 62.3	37 03.6 -12.3 62.6	36 10.7 -11.7 62.8	35 17.7 -11.1 63.0
27°	38 35.6 -14.3 60.8	37 43.5 -13.6 61.1	36 51.3 -13.0 61.3	35 59.0 -12.4 61.6	35 06.6 -11.8 61.8
28°	38 21.3 -15.1 59.6	37 29.9 -14.5 59.9	36 38.5 -13.8 60.1	35 46.6 -13.2 60.4	34 54.8 -12.5 60.6
29°	38 06.2 -15.8 58.4	37 15.4 -15.1 58.6	36 24.5 -14.5 58.9	35 33.4 -13.8 59.2	34 42.3 -13.3 59.4

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°	34 42.1 +08.5 94.9	33 42.7 +08.5 94.7	32 43.4 +08.3 94.5	31 44.0 +08.3 94.4	30 44.6 +08.2 94.2
1°	34 50.6 +07.9 93.7	33 51.2 +07.8 93.5	32 51.7 +07.7 93.3	31 52.3 +07.6 93.2	30 52.8 +07.6 93.0
2°	34 58.5 +07.1 92.5	33 59.0 +07.0 92.3	32 59.4 +07.1 92.2	31 59.9 +07.0 92.0	31 00.4 +07.0 91.9
3°	35 05.6 +06.3 91.3	34 06.0 +06.4 91.1	33 06.5 +06.3 91.0	32 06.9 +06.4 90.8	31 07.4 +06.3 90.7
4°	35 11.9 +05.7 90.0	34 12.4 +05.6 89.9	33 12.8 +05.7 89.8	32 13.3 +05.7 89.7	31 13.7 +05.7 89.6
5°	35 17.6 +04.9 88.8	34 18.0 +05.0 88.7	33 18.5 +05.0 88.6	32 19.0 +05.0 88.5	31 19.4 +05.1 88.4
6°	35 22.5 +04.2 87.6	34 23.0 +04.2 87.5	33 23.5 +04.3 87.4	32 24.0 +04.4 87.3	31 24.5 +04.5 87.2
7°	35 26.7 +03.4 86.4	34 27.2 +03.5 86.3	33 27.8 +03.6 86.2	32 28.4 +03.7 86.1	31 29.0 +03.8 86.1
8°	35 30.1 +02.7 85.1	34 30.7 +02.8 85.1	33 31.4 +02.9 85.0	32 32.1 +03.0 85.0	31 32.8 +03.1 84.9
9°	35 32.8 +01.9 83.9	34 33.5 +02.1 83.9	33 34.3 +02.3 83.8	32 35.1 +02.4 83.8	31 35.9 +02.6 83.7
10°	35 34.7 +01.2 82.7	34 35.6 +01.4 82.7	33 36.6 +01.5 82.6	32 37.5 +01.7 82.6	31 38.5 +01.8 82.5
11°	35 35.9 +00.4 81.5	34 37.0 +00.6 81.4	33 38.1 +00.8 81.4	32 39.2 +01.1 81.4	31 40.3 +01.3 81.4
12°	35 36.3 -00.3 80.2	34 37.6 -00.1 80.2	33 38.9 +00.2 80.2	32 40.3 +00.3 80.2	31 41.6 +00.6 80.2
13°	35 36.0 -01.1 79.0	34 37.5 -00.8 79.0	33 39.1 -00.6 79.0	32 40.6 -00.3 79.0	31 42.2 -00.1 79.0
14°	35 34.9 -01.8 77.8	34 36.7 -01.5 77.8	33 38.5 -01.2 77.8	32 40.3 -01.0 77.8	31 42.1 -00.7 77.8
15°	35 33.1 -02.5 76.5	34 35.2 -02.2 76.6	33 37.3 -02.0 76.6	32 39.3 -01.6 76.6	31 41.4 -01.4 76.7
16°	35 30.6 -03.3 75.3	34 33.0 -03.0 75.4	33 35.3 -02.6 75.4	32 37.7 -02.3 75.5	31 40.0 -02.0 75.5
17°	35 27.3 -04.1 74.1	34 30.0 -03.7 74.2	33 32.7 -03.3 74.2	32 35.4 -03.0 74.3	31 38.0 -02.6 74.3
18°	35 23.2 -04.8 72.9	34 26.3 -04.4 72.9	33 29.4 -04.1 73.0	32 32.4 -03.7 73.1	31 35.4 -03.3 73.1
19°	35 18.4 -05.5 71.6	34 21.9 -05.1 71.7	33 25.3 -04.7 71.8	32 28.7 -04.3 71.9	31 32.1 -03.9 72.0
20°	35 12.9 -06.2 70.4	34 16.8 -05.8 70.5	33 20.6 -05.4 70.6	32 24.4 -05.0 70.7	31 28.2 -04.6 70.8
21°	35 06.7 -07.0 69.2	34 11.0 -06.6 69.3	33 15.2 -06.0 69.4	32 19.4 -05.6 69.5	31 23.6 -05.2 69.6
22°	34 59.7 -07.7 68.0	34 04.4 -07.2 68.1	33 09.2 -06.8 68.2	32 13.8 -06.3 68.4	31 18.4 -05.8 68.5
23°	34 52.0 -08.4 66.8	33 57.2 -07.9 66.9	33 02.4 -07.4 67.1	32 07.5 -06.9 67.2	31 12.6 -06.4 67.3
24°	34 43.6 -09.2 65.6	33 49.3 -08.6 65.7	32 55.0 -08.1 65.9	32 00.6 -07.6 66.0	31 06.2 -07.1 66.1
25°	34 34.4 -09.8 64.4	33 40.7 -09.3 64.5	32 46.9 -08.8 64.7	31 53.0 -08.2 64.8	30 59.1 -07.7 65.0
26°	34 24.6 -10.5 63.2	33 31.4 -10.0 63.4	32 38.1 -09.4 63.5	31 44.8 -08.9 63.7	30 51.4 -08.3 63.8
27°	34 14.1 -11.3 62.0	33 21.4 -10.6 62.2	32 28.7 -10.0 62.4	31 35.9 -09.5 62.5	30 43.1 -09.0 62.7
28°	34 02.8 -11.9 60.8	33 10.8 -11.3 61.0	32 18.7 -10.7 61.2	31 26.4 -10.1 61.4	30 34.1 -09.5 61.5
29°	33 50.9 -12.5 59.6	32 59.5 -11.9 59.8	32 08.0 -11.4 60.0	31 16.3 -10.7 60.2	30 24.6 -10.1 60.4

Declination SAME name as Latitude

Latitude 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 45.2 +08.2 94.0	28 45.8 +08.1 93.9	27 46.4 +08.0 93.7	26 47.0 +07.9 93.6	25 47.5 +07.9 93.4
1°	29 53.4 +07.5 92.9	28 53.9 +07.5 92.7	27 54.4 +07.4 92.6	26 54.9 +07.4 92.4	25 55.4 +07.4 92.3
2°	30 00.9 +06.9 91.7	29 01.4 +06.9 91.6	28 01.8 +06.9 91.5	27 02.3 +06.9 91.3	26 02.8 +06.8 91.2
3°	30 07.8 +06.4 90.6	29 08.3 +06.3 90.5	28 08.7 +06.4 90.3	27 09.2 +06.3 90.2	26 09.6 +06.4 90.1
4°	30 14.2 +05.7 89.4	29 14.6 +05.8 89.3	28 15.1 +05.8 89.2	27 15.5 +05.8 89.1	26 16.0 +05.8 89.0
5°	30 19.9 +05.1 88.3	29 20.4 +05.2 88.2	28 20.9 +05.2 88.1	27 21.3 +05.3 88.0	26 21.8 +05.4 87.9
6°	30 25.0 +04.6 87.1	29 25.6 +04.5 87.0	28 26.1 +04.7 86.9	27 26.6 +04.8 86.9	26 27.2 +04.8 86.8
7°	30 29.6 +03.9 86.0	29 30.1 +04.1 85.9	28 30.8 +04.1 85.8	27 31.4 +04.2 85.7	26 32.0 +04.3 85.6
8°	30 33.5 +03.2 84.8	29 34.2 +03.4 84.7	28 34.9 +03.5 84.7	27 35.6 +03.6 84.6	26 36.3 +03.7 84.5
9°	30 36.7 +02.7 83.7	29 37.6 +02.8 83.6	28 38.4 +02.9 83.5	27 39.2 +03.1 83.5	26 40.0 +03.3 83.4
10°	30 39.4 +02.1 82.5	29 40.4 +02.2 82.4	28 41.3 +02.4 82.4	27 42.3 +02.6 82.3	26 43.3 +02.7 82.3
11°	30 41.5 +01.4 81.3	29 42.6 +01.6 81.3	28 43.7 +01.8 81.3	27 44.9 +02.0 81.2	26 46.0 +02.2 81.2
12°	30 42.9 +00.8 80.2	29 44.2 +01.0 80.1	28 45.5 +01.3 80.1	27 46.9 +01.4 80.1	26 48.2 +01.7 80.1
13°	30 43.7 +00.2 79.0	29 45.2 +00.5 79.0	28 46.8 +00.7 79.0	27 48.3 +00.9 79.0	26 49.9 +01.1 78.9
14°	30 43.9 -00.5 77.8	29 45.7 -00.2 77.8	28 47.5 +00.0 77.8	27 49.2 +00.4 77.8	26 51.0 +00.6 77.8
15°	30 43.4 -01.0 76.7	29 45.5 -00.8 76.7	28 47.5 -00.4 76.7	27 49.6 -00.2 76.7	26 51.6 +00.1 76.7
16°	30 42.4 -01.7 75.5	29 44.7 -01.3 75.5	28 47.1 -01.1 75.6	27 49.4 -00.8 75.6	26 51.7 -00.4 75.6
17°	30 40.7 -02.3 74.4	29 43.4 -02.0 74.4	28 46.0 -01.6 74.4	27 48.6 -01.3 74.4	26 51.3 -01.0 74.5
18°	30 38.4 -02.9 73.2	29 41.4 -02.6 73.2	28 44.4 -02.2 73.3	27 47.3 -01.8 73.3	26 50.3 -01.5 73.3
19°	30 35.5 -03.6 72.0	29 38.8 -03.1 72.1	28 42.2 -02.8 72.1	27 45.5 -02.4 72.2	26 48.8 -02.1 72.2
20°	30 31.9 -04.1 70.9	29 35.7 -03.8 70.9	28 39.4 -03.4 71.0	27 43.1 -03.0 71.0	26 46.7 -02.5 71.1
21°	30 27.8 -04.8 69.7	29 31.9 -04.3 69.8	28 36.0 -03.9 69.9	27 40.1 -03.5 69.9	26 44.2 -03.1 70.0
22°	30 23.0 -05.3 68.6	29 27.6 -05.0 68.6	28 32.1 -04.5 68.7	27 36.6 -04.1 68.8	26 41.1 -03.7 68.9
23°	30 17.7 -06.0 67.4	29 22.6 -05.5 67.5	28 27.6 -05.0 67.6	27 32.5 -04.6 67.7	26 37.4 -04.1 67.7
24°	30 11.7 -06.6 66.3	29 17.1 -06.1 66.4	28 22.6 -05.7 66.5	27 27.9 -05.1 66.5	26 33.3 -04.7 66.6
25°	30 05.1 -07.2 65.1	29 11.0 -06.6 65.2	28 16.9 -06.1 65.3	27 22.8 -05.7 65.4	26 28.6 -05.1 65.5
26°	29 57.9 -07.8 64.0	29 04.4 -07.3 64.1	28 10.8 -06.7 64.2	27 17.1 -06.2 64.3	26 23.5 -05.7 64.4
27°	29 50.1 -08.3 62.8	28 57.1 -07.8 62.9	28 04.1 -07.3 63.1	27 10.9 -06.7 63.2	26 17.8 -06.3 63.3
28°	29 41.8 -09.0 61.7	28 49.3 -08.4 61.8	27 56.8 -07.8 61.9	27 04.2 -07.3 62.1	26 11.5 -06.7 62.2
29°	29 32.8 -09.5 60.5	28 40.9 -08.9 60.7	27 49.0 -08.4 60.8	26 56.9 -07.8 61.0	26 04.8 -07.2 61.1

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 48.1 +07.8 93.3	23 48.6 +07.8 93.1	22 49.1 +07.7 93.0	21 49.7 +07.6 92.8	20 50.2 +07.6 92.7
1°	24 55.9 +07.3 92.2	23 56.4 +07.3 92.0	22 56.8 +07.3 91.9	21 57.3 +07.3 91.8	20 57.8 +07.2 91.6
2°	25 03.2 +06.9 91.1	24 03.7 +06.8 90.9	23 04.1 +06.9 90.8	22 04.6 +06.8 90.7	21 05.0 +06.9 90.6
3°	25 10.1 +06.3 90.0	24 10.5 +06.4 89.8	23 11.0 +06.4 89.7	22 11.4 +06.4 89.6	21 11.9 +06.4 89.5
4°	25 16.4 +05.9 88.9	24 16.9 +05.9 88.8	23 17.4 +05.9 88.6	22 17.8 +06.0 88.5	21 18.3 +06.0 88.4
5°	25 22.3 +05.4 87.8	24 22.8 +05.5 87.7	23 23.3 +05.5 87.6	22 23.8 +05.6 87.5	21 24.3 +05.6 87.4
6°	25 27.7 +04.9 86.7	24 28.3 +04.9 86.6	23 28.8 +05.1 86.5	22 29.4 +05.1 86.4	21 29.9 +05.3 86.3
7°	25 32.6 +04.4 85.6	24 33.2 +04.5 85.5	23 33.9 +04.6 85.4	22 34.5 +04.7 85.3	21 35.2 +04.8 85.2
8°	25 37.0 +03.9 84.5	24 37.7 +04.0 84.4	23 38.5 +04.1 84.3	22 39.2 +04.3 84.2	21 40.0 +04.4 84.1
9°	25 40.9 +03.4 83.3	24 41.7 +03.6 83.3	23 42.6 +03.7 83.2	22 43.5 +03.8 83.1	21 44.4 +03.9 83.1
10°	25 44.3 +02.9 82.2	24 45.3 +03.0 82.2	23 46.3 +03.2 82.1	22 47.3 +03.4 82.1	21 48.3 +03.6 82.0
11°	25 47.2 +02.4 81.1	24 48.3 +02.6 81.1	23 49.5 +02.8 81.0	22 50.7 +02.9 81.0	21 51.9 +03.1 80.9
12°	25 49.6 +01.8 80.0	24 50.9 +02.1 80.0	23 52.3 +02.3 79.9	22 53.6 +02.5 79.9	21 55.0 +02.7 79.8
13°	25 51.4 +01.4 78.9	24 53.0 +01.6 78.9	23 54.6 +01.8 78.8	22 56.1 +02.1 78.8	21 57.7 +02.3 78.8
14°	25 52.8 +00.9 77.8	24 54.6 +01.1 77.8	23 56.4 +01.4 77.8	22 58.2 +01.6 77.7	22 00.0 +01.9 77.7
15°	25 53.7 +00.3 76.7	24 55.7 +00.7 76.7	23 57.8 +00.9 76.7	22 59.8 +01.2 76.6	22 01.9 +01.4 76.6
16°	25 54.0 -00.1 75.6	24 56.4 +00.1 75.6	23 58.7 +00.4 75.6	23 01.0 +00.7 75.5	22 03.3 +01.1 75.5
17°	25 53.9 -00.7 74.5	24 56.5 -00.3 74.5	23 59.1 +00.0 74.5	23 01.7 +00.3 74.5	22 04.4 +00.6 74.5
18°	25 53.2 -01.1 73.4	24 56.2 -00.9 73.4	23 59.1 -00.5 73.4	23 02.0 -00.1 73.4	22 05.0 +00.1 73.4
19°	25 52.1 -01.7 72.2	24 55.3 -01.3 72.3	23 58.6 -00.9 72.3	23 01.9 -00.6 72.3	22 05.1 -00.2 72.3
20°	25 50.4 -02.2 71.1	24 54.0 -01.8 71.2	23 57.7 -01.5 71.2	23 01.3 -01.1 71.2	22 04.9 -00.7 71.2
21°	25 48.2 -02.7 70.0	24 52.2 -02.3 70.1	23 56.2 -01.9 70.1	23 00.2 -01.5 70.1	22 04.2 -01.1 70.1
22°	25 45.5 -03.2 68.9	24 49.9 -02.7 69.0	23 54.3 -02.3 69.0	22 58.7 -01.9 69.0	22 03.1 -01.5 69.1
23°	25 42.3 -03.7 67.8	24 47.2 -03.3 67.9	23 52.0 -02.8 67.9	22 56.8 -02.4 67.9	22 01.6 -01.9 68.0
24°	25 38.6 -04.2 66.7	24 43.9 -03.7 66.8	23 49.2 -03.3 66.8	22 54.4 -02.8 66.9	21 59.7 -02.4 66.9
25°	25 34.4 -04.7 65.6	24 40.2 -04.2 65.7	23 45.9 -03.7 65.7	22 51.6 -03.3 65.8	21 57.3 -02.8 65.8
26°	25 29.7 -05.2 64.5	24 36.0 -04.7 64.6	23 42.2 -04.2 64.6	22 48.3 -03.7 64.7	21 54.5 -03.2 64.7
27°	25 24.5 -05.6 63.4	24 31.3 -05.2 63.5	23 38.0 -04.7 63.5	22 44.6 -04.1 63.6	21 51.3 -03.6 63.7
28°	25 18.9 -06.2 62.3	24 26.1 -05.6 62.4	23 33.3 -05.1 62.5	22 40.5 -04.6 62.5	21 47.7 -04.1 62.6
29°	25 12.7 -06.7 61.2	24 20.5 -06.1 61.3	23 28.2 -05.5 61.4	22 35.9 -05.0 61.4	21 43.6 -04.4 61.5

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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 50.7 +07.6 92.5	18 51.2 +07.5 92.4	17 51.7 +07.5 92.3	16 52.2 +07.5 92.1	15 52.7 +07.4 92.0
1°	19 58.3 +07.2 91.5	18 58.7 +07.2 91.4	17 59.2 +07.2 91.2	16 59.7 +07.1 91.1	16 00.1 +07.2 91.0
2°	20 05.5 +06.8 90.4	19 05.9 +06.9 90.3	18 06.4 +06.8 90.2	17 06.8 +06.9 90.1	16 07.3 +06.8 89.9
3°	20 12.3 +06.5 89.4	19 12.8 +06.4 89.3	18 13.2 +06.5 89.1	17 13.7 +06.5 89.0	16 14.1 +06.6 88.9
4°	20 18.8 +06.0 88.3	19 19.2 +06.2 88.2	18 19.7 +06.2 88.1	17 20.2 +06.2 88.0	16 20.7 +06.2 87.9
5°	20 24.8 +05.7 87.2	19 25.4 +05.7 87.1	18 25.9 +05.8 87.0	17 26.4 +05.9 86.9	16 26.9 +06.0 86.8
6°	20 30.5 +05.3 86.2	19 31.1 +05.4 86.1	18 31.7 +05.5 86.0	17 32.3 +05.5 85.9	16 32.9 +05.6 85.8
7°	20 35.8 +04.9 85.1	19 36.5 +05.0 85.0	18 37.2 +05.1 84.9	17 37.8 +05.3 84.8	16 38.5 +05.4 84.8
8°	20 40.7 +04.5 84.1	19 41.5 +04.6 84.0	18 42.3 +04.7 83.9	17 43.1 +04.9 83.8	16 43.9 +05.0 83.7
9°	20 45.2 +04.2 83.0	19 46.1 +04.3 82.9	18 47.0 +04.5 82.8	17 48.0 +04.5 82.8	16 48.9 +04.7 82.7
10°	20 49.4 +03.7 81.9	19 50.4 +03.9 81.9	18 51.5 +04.0 81.8	17 52.5 +04.2 81.7	16 53.6 +04.4 81.6
11°	20 53.1 +03.3 80.9	19 54.3 +03.5 80.8	18 55.5 +03.7 80.7	17 56.7 +03.9 80.7	16 58.0 +04.1 80.6
12°	20 56.4 +02.9 79.8	19 57.8 +03.1 79.7	18 59.2 +03.3 79.7	18 00.6 +03.6 79.6	17 02.1 +03.7 79.5
13°	20 59.3 +02.5 78.7	20 00.9 +02.8 78.7	19 02.5 +03.0 78.6	18 04.2 +03.2 78.6	17 05.8 +03.4 78.5
14°	21 01.8 +02.2 77.6	20 03.7 +02.3 77.6	19 05.5 +02.6 77.6	18 07.4 +02.8 77.5	17 09.2 +03.1 77.5
15°	21 04.0 +01.7 76.6	20 06.0 +02.0 76.5	19 08.1 +02.3 76.5	18 10.2 +02.6 76.5	17 12.3 +02.8 76.4
16°	21 05.7 +01.3 75.5	20 08.0 +01.6 75.5	19 10.4 +01.9 75.4	18 12.8 +02.1 75.4	17 15.1 +02.5 75.4
17°	21 07.0 +00.9 74.4	20 09.6 +01.3 74.4	19 12.3 +01.5 74.4	18 14.9 +01.9 74.4	17 17.6 +02.1 74.3
18°	21 07.9 +00.5 73.4	20 10.9 +00.8 73.3	19 13.8 +01.2 73.3	18 16.8 +01.4 73.3	17 19.7 +01.8 73.3
19°	21 08.4 +00.1 72.3	20 11.7 +00.4 72.3	19 15.0 +00.8 72.3	18 18.2 +01.2 72.2	17 21.5 +01.5 72.2
20°	21 08.5 -00.3 71.2	20 12.1 +00.1 71.2	19 15.8 +00.4 71.2	18 19.4 +00.8 71.2	17 23.0 +01.2 71.2
21°	21 08.2 -00.7 70.1	20 12.2 -00.3 70.2	19 16.2 +00.0 70.1	18 20.2 +00.4 70.1	17 24.2 +00.8 70.1
22°	21 07.5 -01.1 69.1	20 11.9 -00.7 69.1	19 16.2 -00.3 69.1	18 20.6 +00.1 69.1	17 25.0 +00.5 69.1
23°	21 06.4 -01.5 68.0	20 11.2 -01.1 68.0	19 15.9 -00.6 68.0	18 20.7 -00.2 68.0	17 25.5 +00.2 68.0
24°	21 04.9 -01.9 66.9	20 10.1 -01.5 67.0	19 15.3 -01.1 67.0	18 20.5 -00.6 67.0	17 25.7 -00.2 67.0
25°	21 03.0 -02.4 65.9	20 08.6 -01.9 65.9	19 14.2 -01.4 65.9	18 19.9 -01.0 65.9	17 25.5 -00.5 65.9
26°	21 00.6 -02.7 64.8	20 06.7 -02.2 64.8	19 12.8 -01.7 64.9	18 18.9 -01.3 64.9	17 25.0 -00.8 64.9
27°	20 57.9 -03.1 63.7	20 04.5 -02.6 63.8	19 11.1 -02.2 63.8	18 17.6 -01.6 63.8	17 24.2 -01.2 63.8
28°	20 54.8 -03.5 62.6	20 01.9 -03.0 62.7	19 08.9 -02.5 62.7	18 16.0 -02.0 62.8	17 23.0 -01.4 62.8
29°	20 51.3 -04.0 61.6	19 58.9 -03.4 61.6	19 06.4 -02.8 61.7	18 14.0 -02.3 61.7	17 21.6 -01.8 61.7

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 53.1 +07.5 91.9	13 53.6 +07.4 91.7	12 54.1 +07.4 91.6	11 54.6 +07.3 91.5	10 55.0 +07.4 91.4
1°	15 00.6 +07.1 90.8	14 01.0 +07.2 90.7	13 01.5 +07.1 90.6	12 01.9 +07.2 90.5	11 02.4 +07.1 90.3
2°	15 07.7 +06.9 89.8	14 08.2 +06.9 89.7	13 08.6 +06.9 89.6	12 09.1 +06.9 89.5	11 09.5 +07.0 89.3
3°	15 14.6 +06.6 88.8	14 15.1 +06.6 88.7	13 15.5 +06.7 88.6	12 16.0 +06.7 88.4	11 16.5 +06.7 88.3
4°	15 21.2 +06.3 87.8	14 21.7 +06.3 87.6	13 22.2 +06.4 87.5	12 22.7 +06.5 87.4	11 23.2 +06.5 87.3
5°	15 27.5 +06.0 86.7	14 28.0 +06.1 86.6	13 28.6 +06.2 86.5	12 29.2 +06.2 86.4	11 29.7 +06.3 86.3
6°	15 33.5 +05.7 85.7	14 34.1 +05.8 85.6	13 34.8 +05.9 85.5	12 35.4 +06.0 85.4	11 36.0 +06.1 85.3
7°	15 39.2 +05.5 84.7	14 39.9 +05.6 84.6	13 40.7 +05.6 84.5	12 41.4 +05.8 84.4	11 42.1 +05.9 84.3
8°	15 44.7 +05.1 83.6	14 45.5 +05.3 83.5	13 46.3 +05.4 83.4	12 47.2 +05.5 83.3	11 48.0 +05.7 83.2
9°	15 49.8 +04.9 82.6	14 50.8 +05.0 82.5	13 51.7 +05.2 82.4	12 52.7 +05.3 82.3	11 53.7 +05.5 82.2
10°	15 54.7 +04.5 81.6	14 55.8 +04.7 81.5	13 56.9 +04.9 81.4	12 58.0 +05.1 81.3	11 59.2 +05.2 81.2
11°	15 59.2 +04.3 80.5	15 00.5 +04.4 80.4	14 01.8 +04.6 80.4	13 03.1 +04.8 80.3	12 04.4 +05.0 80.2
12°	16 03.5 +04.0 79.5	15 04.9 +04.2 79.4	14 06.4 +04.4 79.3	13 07.9 +04.6 79.3	12 09.4 +04.8 79.2
13°	16 07.5 +03.6 78.4	15 09.1 +03.9 78.4	14 10.8 +04.1 78.3	13 12.5 +04.3 78.2	12 14.2 +04.6 78.2
14°	16 11.1 +03.4 77.4	15 13.0 +03.6 77.3	14 14.9 +03.8 77.3	13 16.8 +04.1 77.2	12 18.8 +04.3 77.1
15°	16 14.5 +03.0 76.4	15 16.6 +03.3 76.3	14 18.7 +03.6 76.2	13 20.9 +03.8 76.2	12 23.1 +04.1 76.1
16°	16 17.5 +02.8 75.3	15 19.9 +03.0 75.3	14 22.3 +03.3 75.2	13 24.7 +03.6 75.2	12 27.2 +03.9 75.1
17°	16 20.3 +02.4 74.3	15 22.9 +02.8 74.2	14 25.6 +03.1 74.2	13 28.3 +03.4 74.1	12 31.1 +03.6 74.1
18°	16 22.7 +02.1 73.2	15 25.7 +02.4 73.2	14 28.7 +02.7 73.2	13 31.7 +03.1 73.1	12 34.7 +03.4 73.0
19°	16 24.8 +01.8 72.2	15 28.1 +02.2 72.2	14 31.4 +02.5 72.1	13 34.8 +02.8 72.1	12 38.1 +03.2 72.0
20°	16 26.6 +01.6 71.2	15 30.3 +01.9 71.1	14 33.9 +02.3 71.1	13 37.6 +02.6 71.0	12 41.3 +02.9 71.0
21°	16 28.2 +01.2 70.1	15 32.2 +01.5 70.1	14 36.2 +01.9 70.1	13 40.2 +02.3 70.0	12 44.2 +02.7 70.0
22°	16 29.4 +00.9 69.1	15 33.7 +01.3 69.0	14 38.1 +01.7 69.0	13 42.5 +02.1 69.0	12 46.9 +02.5 69.0
23°	16 30.3 +00.5 68.0	15 35.0 +01.0 68.0	14 39.8 +01.4 68.0	13 44.6 +01.8 68.0	12 49.4 +02.2 67.9
24°	16 30.8 +00.3 67.0	15 36.0 +00.7 67.0	14 41.2 +01.2 67.0	13 46.4 +01.6 66.9	12 51.6 +02.0 66.9
25°	16 31.1 +00.0 65.9	15 36.7 +00.4 65.9	14 42.4 +00.8 65.9	13 48.0 +01.3 65.9	12 53.6 +01.8 65.9
26°	16 31.1 -00.4 64.9	15 37.1 +00.2 64.9	14 43.2 +00.6 64.9	13 49.3 +01.1 64.9	12 55.4 +01.5 64.9
27°	16 30.7 -00.6 63.9	15 37.3 -00.2 63.9	14 43.8 +00.3 63.9	13 50.4 +00.7 63.8	12 56.9 +01.3 63.8
28°	16 30.1 -01.0 62.8	15 37.1 -00.5 62.8	14 44.1 +00.1 62.8	13 51.1 +00.6 62.8	12 58.2 +01.0 62.8
29°	16 29.1 -01.3 61.8	15 36.6 -00.7 61.8	14 44.2 -00.3 61.8	13 51.7 +00.3 61.8	12 59.2 +00.8 61.8

Declination SAME name as Latitude

Latitude 7°

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 55.5 +07.3 91.2	8 55.9 +07.4 91.1	7 56.4 +07.3 91.0	6 56.9 +07.3 90.9	5 57.3 +07.3 90.7
1°	10 02.8 +07.2 90.2	9 03.3 +07.1 90.1	8 03.7 +07.2 90.0	7 04.2 +07.1 89.9	6 04.6 +07.2 89.7
2°	10 10.0 +06.9 89.2	9 10.4 +07.0 89.1	8 10.9 +07.0 89.0	7 11.3 +07.1 88.9	6 11.8 +07.1 88.7
3°	10 16.9 +06.8 88.2	9 17.4 +06.8 88.1	8 17.9 +06.9 88.0	7 18.4 +06.9 87.9	6 18.9 +06.9 87.7
4°	10 23.7 +06.6 87.2	9 24.2 +06.7 87.1	8 24.8 +06.7 87.0	7 25.3 +06.8 86.9	6 25.8 +06.9 86.7
5°	10 30.3 +06.4 86.2	9 30.9 +06.5 86.1	8 31.5 +06.5 86.0	7 32.1 +06.6 85.9	6 32.7 +06.7 85.7
6°	10 36.7 +06.2 85.2	9 37.4 +06.3 85.1	8 38.0 +06.4 85.0	7 38.7 +06.5 84.8	6 39.4 +06.6 84.7
7°	10 42.9 +06.0 84.2	9 43.7 +06.1 84.1	8 44.4 +06.3 84.0	7 45.2 +06.4 83.8	6 46.0 +06.5 83.7
8°	10 48.9 +05.8 83.1	9 49.8 +05.9 83.0	8 50.7 +06.0 82.9	7 51.6 +06.2 82.8	6 52.5 +06.3 82.7
9°	10 54.7 +05.6 82.1	9 55.7 +05.8 82.0	8 56.7 +06.0 81.9	7 57.8 +06.1 81.8	6 58.8 +06.3 81.7
10°	11 00.3 +05.4 81.1	10 01.5 +05.6 81.0	9 02.7 +05.7 80.9	8 03.9 +05.9 80.8	7 05.1 +06.1 80.7
11°	11 05.7 +05.2 80.1	10 07.1 +05.3 80.0	9 08.4 +05.6 79.9	8 09.8 +05.8 79.8	7 11.2 +06.0 79.7
12°	11 10.9 +05.0 79.1	10 12.4 +05.3 79.0	9 14.0 +05.4 78.9	8 15.6 +05.6 78.8	7 17.2 +05.8 78.7
13°	11 15.9 +04.8 78.1	10 17.7 +05.0 78.0	9 19.4 +05.3 77.9	8 21.2 +05.5 77.8	7 23.0 +05.7 77.7
14°	11 20.7 +04.6 77.1	10 22.7 +04.8 77.0	9 24.7 +05.0 76.9	8 26.7 +05.3 76.8	7 28.7 +05.6 76.7
15°	11 25.3 +04.4 76.0	10 27.5 +04.6 76.0	9 29.7 +04.9 75.9	8 32.0 +05.2 75.8	7 34.3 +05.4 75.7
16°	11 29.7 +04.1 75.0	10 32.1 +04.5 75.0	9 34.6 +04.8 74.9	8 37.2 +05.0 74.8	7 39.7 +05.3 74.7
17°	11 33.8 +04.0 74.0	10 36.6 +04.2 73.9	9 39.4 +04.5 73.9	8 42.2 +04.8 73.8	7 45.0 +05.1 73.7
18°	11 37.8 +03.7 73.0	10 40.8 +04.1 72.9	9 43.9 +04.4 72.9	8 47.0 +04.7 72.8	7 50.1 +05.0 72.7
19°	11 41.5 +03.5 72.0	10 44.9 +03.8 71.9	9 48.3 +04.2 71.8	8 51.7 +04.5 71.8	7 55.1 +04.9 71.7
20°	11 45.0 +03.3 70.9	10 48.7 +03.7 70.9	9 52.5 +04.0 70.8	8 56.2 +04.4 70.8	8 00.0 +04.7 70.7
21°	11 48.3 +03.1 69.9	10 52.4 +03.4 69.9	9 56.5 +03.8 69.8	9 00.6 +04.2 69.8	8 04.7 +04.6 69.7
22°	11 51.4 +02.8 68.9	10 55.8 +03.3 68.9	10 00.3 +03.6 68.8	9 04.8 +04.0 68.7	8 09.3 +04.4 68.7
23°	11 54.2 +02.7 67.9	10 59.1 +03.0 67.8	10 03.9 +03.5 67.8	9 08.8 +03.9 67.7	8 13.7 +04.3 67.7
24°	11 56.9 +02.4 66.9	11 02.1 +02.9 66.8	10 07.4 +03.2 66.8	9 12.7 +03.7 66.7	8 18.0 +04.1 66.7
25°	11 59.3 +02.2 65.8	11 05.0 +02.6 65.8	10 10.6 +03.1 65.8	9 16.4 +03.5 65.7	8 22.1 +04.0 65.6
26°	12 01.5 +02.0 64.8	11 07.6 +02.4 64.8	10 13.7 +02.9 64.7	9 19.9 +03.3 64.7	8 26.1 +03.8 64.6
27°	12 03.5 +01.7 63.8	11 10.0 +02.3 63.8	10 16.6 +02.7 63.7	9 23.2 +03.2 63.7	8 29.9 +03.6 63.6
28°	12 05.2 +01.5 62.8	11 12.3 +02.0 62.8	10 19.3 +02.5 62.7	9 26.4 +03.0 62.7	8 33.5 +03.5 62.6
29°	12 06.7 +01.3 61.8	11 14.3 +01.8 61.7	10 21.8 +02.4 61.7	9 29.4 +02.8 61.7	8 37.0 +03.3 61.6

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 57.8 +07.3 90.6	3 58.2 +07.3 90.5	2 58.7 +07.3 90.4	1 59.1 +07.3 90.2	0 59.6 +07.3 90.1
1°	5 05.1 +07.2 89.6	4 05.5 +07.2 89.5	3 06.0 +07.2 89.4	2 06.4 +07.3 89.3	1 06.9 +07.2 89.1
2°	5 12.3 +07.1 88.6	4 12.7 +07.2 88.5	3 13.2 +07.2 88.4	2 13.7 +07.2 88.3	1 14.1 +07.3 88.1
3°	5 19.4 +07.0 87.6	4 19.9 +07.0 87.5	3 20.4 +07.1 87.4	2 20.9 +07.2 87.3	1 21.4 +07.2 87.1
4°	5 26.4 +06.9 86.6	4 26.9 +07.0 86.5	3 27.5 +07.1 86.4	2 28.1 +07.1 86.3	1 28.6 +07.2 86.2
5°	5 33.3 +06.8 85.6	4 33.9 +06.9 85.5	3 34.6 +06.9 85.4	2 35.2 +07.1 85.3	1 35.8 +07.2 85.2
6°	5 40.1 +06.7 84.6	4 40.8 +06.8 84.5	3 41.5 +07.0 84.4	2 42.3 +07.0 84.3	1 43.0 +07.2 84.2
7°	5 46.8 +06.6 83.6	4 47.6 +06.8 83.5	3 48.5 +06.8 83.4	2 49.3 +07.0 83.3	1 50.2 +07.1 83.2
8°	5 53.4 +06.5 82.6	4 54.4 +06.6 82.5	3 55.3 +06.8 82.4	2 56.3 +06.9 82.3	1 57.3 +07.1 82.2
9°	5 59.9 +06.4 81.6	5 01.0 +06.6 81.5	4 02.1 +06.7 81.4	3 03.2 +06.9 81.3	2 04.4 +07.0 81.2
10°	6 06.3 +06.3 80.6	5 07.6 +06.4 80.5	4 08.8 +06.7 80.4	3 10.1 +06.8 80.3	2 11.4 +07.0 80.2
11°	6 12.6 +06.2 79.6	5 14.0 +06.4 79.5	4 15.5 +06.5 79.4	3 16.9 +06.8 79.3	2 18.4 +07.0 79.2
12°	6 18.8 +06.0 78.6	5 20.4 +06.3 78.5	4 22.0 +06.5 78.4	3 23.7 +06.7 78.3	2 25.4 +06.9 78.2
13°	6 24.8 +05.9 77.6	5 26.7 +06.1 77.5	4 28.5 +06.4 77.4	3 30.4 +06.6 77.3	2 32.3 +06.9 77.2
14°	6 30.7 +05.9 76.6	5 32.8 +06.1 76.5	4 34.9 +06.3 76.4	3 37.0 +06.6 76.3	2 39.2 +06.8 76.2
15°	6 36.6 +05.7 75.6	5 38.9 +06.0 75.5	4 41.2 +06.3 75.4	3 43.6 +06.5 75.3	2 46.0 +06.8 75.2
16°	6 42.3 +05.5 74.6	5 44.9 +05.8 74.5	4 47.5 +06.1 74.4	3 50.1 +06.5 74.3	2 52.8 +06.7 74.2
17°	6 47.8 +05.5 73.6	5 50.7 +05.8 73.5	4 53.6 +06.1 73.4	3 56.6 +06.3 73.3	2 59.5 +06.7 73.2
18°	6 53.3 +05.3 72.6	5 56.5 +05.6 72.5	4 59.7 +05.9 72.4	4 02.9 +06.3 72.3	3 06.2 +06.6 72.2
19°	6 58.6 +05.2 71.6	6 02.1 +05.6 71.5	5 05.6 +05.9 71.4	4 09.2 +06.2 71.3	3 12.8 +06.6 71.2
20°	7 03.8 +05.1 70.6	6 07.7 +05.4 70.5	5 11.5 +05.8 70.4	4 15.4 +06.2 70.3	3 19.4 +06.5 70.2
21°	7 08.9 +04.9 69.6	6 13.1 +05.3 69.5	5 17.3 +05.7 69.4	4 21.6 +06.0 69.3	3 25.9 +06.4 69.2
22°	7 13.8 +04.8 68.6	6 18.4 +05.2 68.5	5 23.0 +05.6 68.4	4 27.6 +06.0 68.3	3 32.3 +06.4 68.3
23°	7 18.6 +04.7 67.6	6 23.6 +05.1 67.5	5 28.6 +05.5 67.4	4 33.6 +05.9 67.3	3 38.7 +06.3 67.3
24°	7 23.3 +04.5 66.6	6 28.7 +04.9 66.5	5 34.1 +05.4 66.4	4 39.5 +05.8 66.4	3 45.0 +06.2 66.3
25°	7 27.8 +04.5 65.6	6 33.6 +04.9 65.5	5 39.5 +05.2 65.4	4 45.3 +05.7 65.4	3 51.2 +06.2 65.3
26°	7 32.3 +04.2 64.6	6 38.5 +04.7 64.5	5 44.7 +05.2 64.4	4 51.0 +05.7 64.4	3 57.4 +06.1 64.3
27°	7 36.5 +04.1 63.6	6 43.2 +04.6 63.5	5 49.9 +05.1 63.4	4 56.7 +05.5 63.4	4 03.5 +06.0 63.3
28°	7 40.6 +04.0 62.6	6 47.8 +04.5 62.5	5 55.0 +05.0 62.4	5 02.2 +05.5 62.4	4 09.5 +05.9 62.3
29°	7 44.6 +03.9 61.6	6 52.3 +04.3 61.5	6 00.0 +04.8 61.4	5 07.7 +05.3 61.4	4 15.4 +05.9 61.3

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 +07.3 90.0	-0 59.6 +07.4	-1 59.1 +07.3	-2 58.7 +07.4	-3 58.2 +07.4
1°	0 07.3 +07.3 89.0	-0 52.2 +07.3	-1 51.8 +07.4	-2 51.3 +07.4	-3 50.8 +07.4
2°	0 14.6 +07.3 88.0	-0 44.9 +07.4	-1 44.4 +07.4	-2 43.9 +07.4	-3 43.4 +07.5
3°	0 21.9 +07.3 87.0	-0 37.5 +07.3	-1 37.0 +07.4	-2 36.5 +07.5	-3 35.9 +07.6
4°	0 29.2 +07.3 86.0	-0 30.2 +07.4	-1 29.6 +07.5	-2 29.0 +07.6	-3 28.3 +07.6
5°	0 36.5 +07.3 85.0	-0 22.8 +07.4	-1 22.1 +07.5	-2 21.4 +07.6	-3 20.7 +07.7
6°	0 43.8 +07.3 84.0	-0 15.4 +07.4	-1 14.6 +07.5	-2 13.8 +07.6	-3 13.0 +07.7
7°	0 51.1 +07.2 83.1	-0 08.0 +07.3	-1 07.1 +07.5	-2 06.2 +07.6	-3 05.3 +07.8
8°	0 58.3 +07.2 82.1	-0 00.7 +07.4	-0 59.6 +07.5	-1 58.6 +07.7	-2 57.5 +07.9
9°	1 05.5 +07.3 81.1	0 06.7 +07.4 80.9	-0 52.1 +07.6	-1 50.9 +07.8	-2 49.6 +07.9
10°	1 12.8 +07.1 80.1	0 14.1 +07.4 80.0	-0 44.5 +07.5	-1 43.1 +07.7	-2 41.7 +07.9
11°	1 19.9 +07.2 79.1	0 21.5 +07.4 79.1	-0 37.0 +07.6	-1 35.4 +07.8	-2 33.8 +08.0
12°	1 27.1 +07.2 78.1	0 28.9 +07.3 78.0	-0 29.4 +07.6	-1 27.6 +07.8	-2 25.8 +08.1
13°	1 34.3 +07.1 77.1	0 36.2 +07.4 77.0	-0 21.8 +07.6	-1 19.8 +07.9	-2 17.7 +08.1
14°	1 41.4 +07.1 76.1	0 43.6 +07.3 76.0	-0 14.2 +07.6	-1 11.9 +07.8	-2 09.6 +08.1
15°	1 48.5 +07.0 75.1	0 50.9 +07.3 75.0	-0 06.6 +07.6	-1 04.1 +07.9	-2 01.5 +08.2
16°	1 55.5 +07.0 74.1	0 58.2 +07.3 74.0	0 01.0 +07.6 73.9	-0 56.2 +07.9	-1 53.3 +08.2
17°	2 02.5 +07.0 73.1	1 05.5 +07.3 73.0	0 08.6 +07.6 72.9	-0 48.3 +07.9	-1 45.1 +08.2
18°	2 09.5 +06.9 72.1	1 12.8 +07.3 72.0	0 16.2 +07.6 71.9	-0 40.4 +08.0	-1 36.9 +08.2
19°	2 16.4 +06.9 71.1	1 20.1 +07.2 71.0	0 23.8 +07.6 70.9	-0 32.4 +07.9	-1 28.7 +08.3
20°	2 23.3 +06.9 70.1	1 27.3 +07.3 70.0	0 31.4 +07.6 69.9	-0 24.5 +07.9	-1 20.4 +08.3
21°	2 30.2 +06.8 69.1	1 34.6 +07.1 69.0	0 39.0 +07.5 68.9	-0 16.6 +08.0	-1 12.1 +08.4
22°	2 37.0 +06.8 68.1	1 41.7 +07.2 68.0	0 46.5 +07.6 67.9	-0 08.6 +07.9	-1 03.7 +08.3
23°	2 43.8 +06.7 67.2	1 48.9 +07.1 67.0	0 54.1 +07.5 66.9	-0 00.7 +08.0	-0 55.4 +08.4
24°	2 50.5 +06.6 66.2	1 56.0 +07.1 66.1	1 01.6 +07.5 65.9	0 07.3 +07.9 65.8	-0 47.0 +08.3
25°	2 57.1 +06.6 65.2	2 03.1 +07.1 65.1	1 09.1 +07.5 65.0	0 15.2 +08.0 64.8	-0 38.7 +08.4
26°	3 03.7 +06.6 64.2	2 10.2 +07.0 64.1	1 16.6 +07.5 64.0	0 23.2 +07.9 63.8	-0 30.3 +08.4
27°	3 10.3 +06.5 63.2	2 17.2 +07.0 63.1	1 24.1 +07.5 63.0	0 31.1 +07.9 62.9	-0 21.9 +08.4
28°	3 16.8 +06.4 62.2	2 24.2 +06.9 62.1	1 31.6 +07.4 62.0	0 39.0 +07.9 61.9	-0 13.5 +08.4
29°	3 23.2 +06.4 61.2	2 31.1 +06.9 61.1	1 39.0 +07.4 61.0	0 46.9 +07.9 60.9	-0 05.1 +08.4

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°					
1°					
2°					
3°					
4°					
5°					
6°					
7°					
8°					
9°					
10°					
11°					
12°					
13°					
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16°					
17°					
18°					
19°					
20°					
21°					
22°					
23°					
24°					
25°					
26°					
27°					
28°					
29°					

Declination SAME name as Latitude

Latitude 8°

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°	82 00.0 +60.0 180.0	81 56.3 +59.5 172.9	81 45.3 +58.0 165.9	81 27.6 +55.7 159.4	81 03.7 +53.0 153.3
1°	83 00.0 +60.0 180.0	82 55.8 +59.3 171.9	82 43.3 +57.4 164.0	82 23.3 +54.6 156.7	81 56.7 +51.2 150.1
2°	84 00.0 +60.0 180.0	83 55.1 +59.0 170.5	83 40.7 +56.4 161.5	83 17.9 +52.7 153.4	82 47.9 +48.7 146.2
3°	85 00.0 +60.0 180.0	84 54.1 +58.6 168.7	84 37.1 +54.9 158.2	84 10.6 +50.0 149.0	83 36.6 +45.0 141.3
4°	86 00.0 +60.0 180.0	85 52.7 +57.7 166.0	85 32.0 +52.1 153.4	85 00.6 +45.7 143.1	84 21.6 +39.7 134.9
5°	87 00.0 +60.0 180.0	86 50.4 +55.6 161.6	86 24.1 +46.8 146.4	85 46.3 +38.5 135.0	85 01.3 +32.0 126.8
6°	88 00.0 +60.0 180.0	87 46.0 +49.5 153.5	87 10.9 +35.9 135.1	86 24.8 +26.9 123.7	85 33.3 +21.3 116.5
7°	89 00.0 +60.0 180.0	88 35.5 +25.1 135.2	87 46.8 +14.4 116.6	86 51.7 +10.1 108.4	85 54.6 +07.7 103.9
8°	90 00.0 -60.0 0.0	89 00.6 -25.0 89.9	88 01.2 -14.2 89.9	87 01.8 -09.7 89.8	86 02.3 -07.1 89.7
9°	89 00.0 -60.0 0.0	88 35.6 -49.4 44.6	87 47.0 -35.7 63.0	86 52.1 -26.6 71.2	85 55.2 -20.9 75.5
10°	88 00.0 -60.0 0.0	87 46.2 -55.7 26.2	87 11.3 -46.7 44.5	86 25.5 -38.3 55.8	85 34.3 -31.6 62.8
11°	87 00.0 -60.0 0.0	86 50.5 -57.7 18.1	86 24.6 -52.1 33.2	85 47.2 -45.5 44.4	85 02.7 -39.5 52.4
12°	86 00.0 -60.0 0.0	85 52.8 -58.5 13.7	85 32.5 -54.9 26.0	85 01.7 -50.0 36.2	84 23.2 -44.8 44.2
13°	85 00.0 -60.0 0.0	84 54.3 -59.1 11.0	84 37.6 -56.4 21.3	84 11.7 -52.7 30.3	83 38.4 -48.6 37.8
14°	84 00.0 -60.0 0.0	83 55.2 -59.3 9.2	83 41.2 -57.3 17.9	83 19.0 -54.5 25.9	82 49.8 -51.1 32.8
15°	83 00.0 -60.0 0.0	82 55.9 -59.5 7.9	82 43.9 -58.0 15.5	82 24.5 -55.7 22.5	81 58.7 -52.9 28.9
16°	82 00.0 -60.0 0.0	81 56.4 -59.6 6.9	81 45.9 -58.4 13.5	81 28.8 -56.6 19.8	81 05.8 -54.3 25.7
17°	81 00.0 -60.0 0.0	80 56.8 -59.6 6.1	80 47.5 -58.8 12.0	80 32.2 -57.2 17.7	80 11.5 -55.3 23.1
18°	80 00.0 -60.0 0.0	79 57.2 -59.8 5.5	79 48.7 -58.9 10.8	79 35.0 -57.7 16.0	79 16.2 -56.1 20.9
19°	79 00.0 -60.0 0.0	78 57.4 -59.7 4.9	78 49.8 -59.1 9.8	78 37.3 -58.1 14.5	78 20.1 -56.7 19.0
20°	78 00.0 -60.0 0.0	77 57.7 -59.8 4.5	77 50.7 -59.3 9.0	77 39.2 -58.3 13.3	77 23.4 -57.1 17.5
21°	77 00.0 -60.0 0.0	76 57.9 -59.9 4.1	76 51.4 -59.3 8.2	76 40.9 -58.6 12.2	76 26.3 -57.5 16.1
22°	76 00.0 -60.0 0.0	75 58.0 -59.8 3.8	75 52.1 -59.4 7.6	75 42.3 -58.7 11.3	75 28.8 -57.8 14.9
23°	75 00.0 -60.0 0.0	74 58.2 -59.9 3.6	74 52.7 -59.5 7.1	74 43.6 -58.9 10.5	74 31.0 -58.1 13.9
24°	74 00.0 -60.0 0.0	73 58.3 -59.9 3.3	73 53.2 -59.6 6.6	73 44.7 -59.1 9.8	73 32.9 -58.3 13.0
25°	73 00.0 -60.0 0.0	72 58.4 -59.9 3.1	72 53.6 -59.6 6.2	72 45.6 -59.1 9.2	72 34.6 -58.5 12.2
26°	72 00.0 -60.0 0.0	71 58.5 -59.9 2.9	71 54.0 -59.7 5.8	71 46.5 -59.2 8.7	71 36.1 -58.6 11.5
27°	71 00.0 -60.0 0.0	70 58.6 -59.9 2.7	70 54.3 -59.6 5.5	70 47.3 -59.3 8.1	70 37.5 -58.7 10.8
28°	70 00.0 -60.0 0.0	69 58.7 -60.0 2.6	69 54.7 -59.8 5.1	69 48.0 -59.3 7.7	69 38.8 -58.9 10.2
29°	69 00.0 -60.0 0.0	68 58.7 -59.9 2.4	68 54.9 -59.7 4.9	68 48.7 -59.4 7.3	68 39.9 -58.9 9.7

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°	80 34.5 +50.0 147.8	80 00.7 +47.0 142.9	79 23.1 +44.0 138.6	78 42.3 +41.2 134.7	77 58.8 +38.7 131.3
1°	81 24.5 +47.7 144.3	80 47.7 +44.3 139.2	80 07.1 +41.1 134.8	79 23.5 +38.1 130.9	78 37.5 +35.4 127.5
2°	82 12.2 +44.6 140.1	81 32.0 +40.7 134.8	80 48.2 +37.3 130.4	80 01.6 +34.4 126.6	79 12.9 +31.7 123.3
3°	82 56.8 +40.3 134.9	82 12.7 +36.3 129.6	81 25.5 +32.8 125.3	80 36.0 +29.8 121.7	79 44.6 +27.3 118.7
4°	83 37.1 +34.7 128.5	82 49.0 +30.6 123.5	81 58.3 +27.3 119.5	81 05.8 +24.5 116.2	80 11.9 +22.2 113.6
5°	84 11.8 +27.2 120.8	83 19.6 +23.5 116.3	82 25.6 +20.6 112.9	81 30.3 +18.4 110.2	80 34.1 +16.7 108.0
6°	84 39.0 +17.6 111.6	83 43.1 +15.0 108.2	82 46.2 +13.1 105.6	81 48.7 +11.7 103.6	80 50.8 +10.5 102.0
7°	84 56.6 +06.3 101.1	83 58.1 +05.4 99.1	82 59.3 +04.8 97.7	82 00.4 +04.3 96.7	81 01.3 +04.0 95.8
8°	85 02.9 -05.6 89.7	84 03.5 -04.6 89.6	83 04.1 -03.8 89.5	82 04.7 -03.2 89.4	81 05.3 -02.7 89.4
9°	84 57.3 -17.0 78.2	83 58.9 -14.1 80.0	83 00.3 -12.1 81.3	82 01.5 -10.5 82.2	81 02.6 -09.2 82.9
10°	84 40.3 -26.6 67.6	83 44.8 -22.8 70.9	82 48.2 -19.8 73.3	81 51.0 -17.4 75.2	80 53.4 -15.5 76.6
11°	84 13.7 -34.3 58.3	83 22.0 -30.1 62.6	82 28.4 -26.5 66.0	81 33.6 -23.6 68.6	80 37.9 -21.2 70.6
12°	83 39.4 -40.1 50.5	82 51.9 -35.8 55.4	82 01.9 -32.2 59.3	81 10.0 -29.1 62.4	80 16.7 -26.4 65.0
13°	82 59.3 -44.3 44.1	82 16.1 -40.4 49.2	81 29.7 -36.9 53.4	80 40.9 -33.7 56.9	79 50.3 -30.8 59.8
14°	82 15.0 -47.5 38.8	81 35.7 -44.0 43.9	80 52.8 -40.6 48.3	80 07.2 -37.5 51.9	79 19.5 -34.8 55.0
15°	81 27.5 -49.9 34.5	80 51.7 -46.8 39.5	80 12.2 -43.7 43.8	79 29.7 -40.8 47.5	78 44.7 -38.0 50.7
16°	80 37.6 -51.7 31.0	80 04.9 -49.0 35.7	79 28.5 -46.2 39.9	78 48.9 -43.5 43.6	78 06.7 -40.9 46.9
17°	79 45.9 -53.1 28.0	79 15.9 -50.6 32.5	78 42.3 -48.2 36.5	78 05.4 -45.7 40.2	77 25.8 -43.3 43.4
18°	78 52.8 -54.2 25.5	78 25.3 -52.1 29.7	77 54.1 -49.8 33.6	77 19.7 -47.6 37.1	76 42.5 -45.3 40.3
19°	77 58.6 -55.0 23.3	77 33.2 -53.1 27.3	77 04.3 -51.2 31.0	76 32.1 -49.0 34.4	75 57.2 -47.0 37.5
20°	77 03.6 -55.7 21.5	76 40.1 -54.1 25.2	76 13.1 -52.2 28.7	75 43.1 -50.4 32.0	75 10.2 -48.4 35.1
21°	76 07.9 -56.2 19.8	75 46.0 -54.7 23.4	75 20.9 -53.2 26.7	74 52.7 -51.5 29.9	74 21.8 -49.7 32.8
22°	75 11.7 -56.7 18.4	74 51.3 -55.4 21.8	74 27.7 -53.9 24.9	74 01.2 -52.3 28.0	73 32.1 -50.8 30.8
23°	74 15.0 -57.0 17.2	73 55.9 -55.9 20.3	73 33.8 -54.6 23.4	73 08.9 -53.2 26.2	72 41.3 -51.6 28.9
24°	73 18.0 -57.4 16.1	73 00.0 -56.3 19.1	72 39.2 -55.1 21.9	72 15.7 -53.8 24.7	71 49.7 -52.5 27.3
25°	72 20.6 -57.7 15.1	72 03.7 -56.7 17.9	71 44.1 -55.6 20.6	71 21.9 -54.4 23.2	70 57.2 -53.1 25.8
26°	71 22.9 -57.8 14.2	71 07.0 -57.0 16.9	70 48.5 -56.0 19.5	70 27.5 -54.9 22.0	70 04.1 -53.7 24.4
27°	70 25.1 -58.1 13.4	70 10.0 -57.3 15.9	69 52.5 -56.4 18.4	69 32.6 -55.4 20.8	69 10.4 -54.3 23.1
28°	69 27.0 -58.2 12.7	69 12.7 -57.5 15.1	68 56.1 -56.6 17.4	68 37.2 -55.7 19.7	68 16.1 -54.7 21.9
29°	68 28.8 -58.4 12.0	68 15.2 -57.7 14.3	67 59.5 -57.0 16.5	67 41.5 -56.1 18.7	67 21.4 -55.1 20.8

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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°	77 13.2 +36.2 128.3	76 25.7 +34.1 125.6	75 36.6 +32.2 123.2	74 46.3 +30.4 121.1	73 54.9 +28.8 119.2
1°	77 49.4 +33.1 124.6	76 59.8 +30.9 122.0	76 08.8 +29.0 119.8	75 16.7 +27.3 117.7	74 23.7 +25.7 116.0
2°	78 22.5 +29.3 120.5	77 30.7 +27.3 118.1	76 37.8 +25.5 116.0	75 44.0 +23.9 114.2	74 49.4 +22.6 112.6
3°	78 51.8 +25.2 116.1	77 58.0 +23.3 113.9	77 03.3 +21.7 112.1	76 07.9 +20.3 110.4	75 12.0 +19.0 109.0
4°	79 17.0 +20.4 111.3	78 21.3 +18.8 109.4	77 25.0 +17.4 107.8	76 28.2 +16.3 106.4	75 31.0 +15.3 105.2
5°	79 37.4 +15.1 106.2	78 40.1 +14.0 104.7	77 42.4 +13.0 103.4	76 44.5 +12.1 102.3	75 46.3 +11.4 101.3
6°	79 52.5 +09.6 100.8	78 54.1 +08.8 99.7	77 55.4 +08.3 98.8	76 56.6 +07.8 98.0	75 57.7 +07.4 97.3
7°	80 02.1 +03.8 95.1	79 02.9 +03.5 94.5	78 03.7 +03.3 94.0	77 04.4 +03.2 93.6	76 05.1 +03.1 93.2
8°	80 05.9 -02.3 89.3	79 06.4 -01.9 89.2	78 07.0 -01.6 89.2	77 07.6 -01.3 89.1	76 08.2 -01.1 89.0
9°	80 03.6 -08.2 83.5	79 04.5 -07.3 83.9	78 05.4 -06.5 84.3	77 06.3 -05.9 84.6	76 07.1 -05.3 84.8
10°	79 55.4 -13.9 77.8	78 57.2 -12.5 78.7	77 58.9 -11.4 79.5	77 00.4 -10.3 80.2	76 01.8 -09.5 80.7
11°	79 41.5 -19.1 72.3	78 44.7 -17.4 73.7	77 47.5 -15.9 74.8	76 50.1 -14.7 75.8	75 52.3 -13.4 76.6
12°	79 22.4 -24.0 67.1	78 27.3 -22.0 68.8	77 31.6 -20.2 70.3	76 35.4 -18.6 71.6	75 38.9 -17.3 72.7
13°	78 58.4 -28.4 62.2	78 05.3 -26.2 64.3	77 11.4 -24.2 66.0	76 16.8 -22.5 67.5	75 21.6 -20.9 68.9
14°	78 30.0 -32.2 57.7	77 39.1 -29.8 60.0	76 47.2 -27.8 62.0	75 54.3 -25.9 63.7	75 00.7 -24.2 65.2
15°	77 57.8 -35.5 53.5	77 09.3 -33.3 56.0	76 19.4 -31.1 58.1	75 28.4 -29.1 60.0	74 36.5 -27.3 61.7
16°	77 22.3 -38.5 49.8	76 36.0 -36.1 52.3	75 48.3 -34.0 54.6	74 59.3 -32.0 56.6	74 09.2 -30.2 58.4
17°	76 43.8 -40.9 46.3	75 59.9 -38.7 49.0	75 14.3 -36.6 51.3	74 27.3 -34.7 53.4	73 39.0 -32.8 55.3
18°	76 02.9 -43.1 43.2	75 21.2 -40.9 45.9	74 37.7 -38.9 48.2	73 52.6 -36.9 50.4	73 06.2 -35.1 52.3
19°	75 19.8 -44.9 40.4	74 40.3 -42.9 43.0	73 58.8 -40.9 45.4	73 15.7 -39.0 47.6	72 31.1 -37.2 49.6
20°	74 34.9 -46.5 37.9	73 57.4 -44.6 40.4	73 17.9 -42.7 42.8	72 36.7 -40.9 45.0	71 53.9 -39.1 47.0
21°	73 48.4 -47.9 35.5	73 12.8 -46.1 38.1	72 35.2 -44.3 40.4	71 55.8 -42.6 42.6	71 14.8 -40.9 44.6
22°	73 00.5 -49.1 33.4	72 26.7 -47.4 35.9	71 50.9 -45.7 38.2	71 13.2 -44.0 40.4	70 33.9 -42.4 42.4
23°	72 11.4 -50.1 31.5	71 39.3 -48.5 33.9	71 05.2 -47.0 36.2	70 29.2 -45.4 38.3	69 51.5 -43.7 40.3
24°	71 21.3 -51.0 29.7	70 50.8 -49.6 32.1	70 18.2 -48.0 34.3	69 43.8 -46.5 36.4	69 07.8 -45.0 38.3
25°	70 30.3 -51.8 28.1	70 01.2 -50.4 30.4	69 30.2 -49.0 32.6	68 57.3 -47.5 34.6	68 22.8 -46.1 36.5
26°	69 38.5 -52.5 26.7	69 10.8 -51.2 28.8	68 41.2 -49.9 30.9	68 09.8 -48.5 32.9	67 36.7 -47.2 34.8
27°	68 46.0 -53.1 25.3	68 19.6 -51.9 27.4	67 51.3 -50.6 29.4	67 21.3 -49.4 31.4	66 49.5 -48.0 33.2
28°	67 52.9 -53.6 24.0	67 27.7 -52.5 26.1	67 00.7 -51.3 28.0	66 31.9 -50.1 29.9	66 01.5 -48.9 31.7
29°	66 59.3 -54.1 22.9	66 35.2 -53.0 24.8	66 09.4 -51.9 26.7	65 41.8 -50.8 28.6	65 12.6 -49.6 30.3

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°	73 02.6 +27.3 117.4	72 09.5 +25.9 115.9	71 15.7 +24.7 114.5	70 21.4 +23.6 113.2	69 26.5 +22.6 112.0
1°	73 29.9 +24.4 114.4	72 35.4 +23.2 112.9	71 40.4 +22.1 111.6	70 45.0 +21.0 110.4	69 49.1 +20.1 109.3
2°	73 54.3 +21.2 111.1	72 58.6 +20.2 109.8	72 02.5 +19.2 108.6	71 06.0 +18.3 107.6	70 09.2 +17.5 106.6
3°	74 15.5 +18.0 107.7	73 18.8 +17.0 106.5	72 21.7 +16.1 105.5	71 24.3 +15.4 104.6	70 26.7 +14.7 103.8
4°	74 33.5 +14.5 104.1	73 35.8 +13.7 103.2	72 37.8 +13.1 102.3	71 39.7 +12.4 101.5	70 41.4 +11.9 100.8
5°	74 48.0 +10.8 100.5	73 49.5 +10.2 99.7	72 50.9 +09.7 99.0	71 52.1 +09.4 98.4	70 53.3 +09.0 97.9
6°	74 58.8 +06.9 96.7	73 59.7 +06.7 96.1	73 00.6 +06.4 95.7	72 01.5 +06.1 95.2	71 02.3 +06.0 94.8
7°	75 05.7 +03.1 92.8	74 06.4 +03.0 92.5	73 07.0 +03.0 92.3	72 07.6 +03.0 92.0	71 08.3 +02.9 91.8
8°	75 08.8 -00.9 89.0	74 09.4 -00.7 88.9	73 10.0 -00.5 88.8	72 10.6 -00.3 88.7	71 11.2 -00.1 88.7
9°	75 07.9 -04.8 85.1	74 08.7 -04.3 85.2	73 09.5 -03.9 85.4	72 10.3 -03.6 85.5	71 11.1 -03.3 85.6
10°	75 03.1 -08.6 81.2	74 04.4 -08.0 81.6	73 05.6 -07.4 81.9	72 06.7 -06.7 82.2	71 07.8 -06.2 82.5
11°	74 54.5 -12.5 77.4	73 56.4 -11.5 78.0	72 58.2 -10.7 78.5	72 00.0 -10.0 79.0	71 01.6 -09.2 79.4
12°	74 42.0 -16.0 73.6	73 44.9 -14.9 74.4	72 47.5 -13.9 75.2	71 50.0 -13.0 75.8	70 52.4 -12.2 76.4
13°	74 26.0 -19.5 70.0	73 30.0 -18.2 71.0	72 33.6 -17.0 71.9	71 37.0 -15.9 72.7	70 40.2 -15.0 73.4
14°	74 06.5 -22.7 66.5	73 11.8 -21.3 67.7	72 16.6 -20.0 68.7	71 21.1 -18.9 69.7	70 25.2 -17.7 70.5
15°	73 43.8 -25.7 63.2	72 50.5 -24.2 64.5	71 56.6 -22.8 65.7	71 02.2 -21.5 66.7	70 07.5 -20.4 67.7
16°	73 18.1 -28.5 60.0	72 26.3 -26.9 61.4	71 33.8 -25.4 62.7	70 40.7 -24.0 63.9	69 47.1 -22.8 64.9
17°	72 49.6 -31.0 57.0	71 59.4 -29.4 58.5	71 08.4 -27.9 59.9	70 16.7 -26.5 61.1	69 24.3 -25.1 62.3
18°	72 18.6 -33.3 54.1	71 30.0 -31.7 55.7	70 40.5 -30.2 57.2	69 50.2 -28.7 58.5	68 59.2 -27.3 59.7
19°	71 45.3 -35.5 51.4	70 58.3 -33.9 53.1	70 10.3 -32.3 54.6	69 21.5 -30.8 56.0	68 31.9 -29.5 57.3
20°	71 09.8 -37.5 48.9	70 24.4 -35.8 50.6	69 38.0 -34.2 52.1	68 50.7 -32.8 53.6	68 02.4 -31.3 54.9
21°	70 32.3 -39.1 46.5	69 48.6 -37.5 48.2	69 03.8 -36.1 49.8	68 17.9 -34.6 51.3	67 31.1 -33.1 52.6
22°	69 53.2 -40.8 44.3	69 11.1 -39.3 46.0	68 27.7 -37.7 47.6	67 43.3 -36.2 49.1	66 58.0 -34.9 50.5
23°	69 12.4 -42.2 42.2	68 31.8 -40.6 43.9	67 50.0 -39.2 45.5	67 07.1 -37.7 47.0	66 23.1 -36.3 48.4
24°	68 30.2 -43.5 40.2	67 51.2 -42.1 41.9	67 10.8 -40.6 43.5	66 29.4 -39.2 45.0	65 46.8 -37.8 46.5
25°	67 46.7 -44.7 38.3	67 09.1 -43.3 40.0	66 30.2 -41.8 41.7	65 50.2 -40.5 43.2	65 09.0 -39.2 44.6
26°	67 02.0 -45.8 36.6	66 25.8 -44.3 38.3	65 48.4 -43.0 39.9	65 09.7 -41.7 41.4	64 29.8 -40.3 42.8
27°	66 16.2 -46.7 35.0	65 41.5 -45.4 36.6	65 05.4 -44.1 38.2	64 28.0 -42.8 39.7	63 49.5 -41.5 41.1
28°	65 29.5 -47.6 33.4	64 56.1 -46.4 35.1	64 21.3 -45.1 36.6	63 45.2 -43.8 38.1	63 08.0 -42.6 39.5
29°	64 41.9 -48.4 32.0	64 09.7 -47.2 33.6	63 36.2 -46.0 35.1	63 01.4 -44.8 36.6	62 25.4 -43.5 38.0

Declination SAME name as Latitude

Latitude 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°	68 31.2 +21.7 110.9	67 35.5 +20.8 109.9	66 39.5 +20.0 109.0	65 43.2 +19.3 108.2	64 46.6 +18.6 107.4
1°	68 52.9 +19.2 108.4	67 56.3 +18.5 107.4	66 59.5 +17.8 106.6	66 02.5 +17.1 105.8	65 05.2 +16.5 105.1
2°	69 12.1 +16.8 105.7	68 14.8 +16.1 104.9	67 17.3 +15.5 104.2	66 19.6 +14.9 103.5	65 21.7 +14.4 102.8
3°	69 28.9 +14.1 103.0	68 30.9 +13.6 102.3	67 32.8 +13.0 101.6	66 34.5 +12.6 101.0	65 36.1 +12.2 100.5
4°	69 43.0 +11.4 100.2	68 44.5 +11.0 99.6	67 45.8 +10.6 99.1	66 47.1 +10.3 98.6	65 48.3 +10.0 98.1
5°	69 54.4 +08.7 97.4	68 55.5 +08.3 96.9	67 56.4 +08.1 96.5	66 57.4 +07.9 96.1	65 58.3 +07.6 95.7
6°	70 03.1 +05.8 94.5	69 03.8 +05.7 94.1	68 04.5 +05.6 93.8	67 05.3 +05.4 93.5	66 05.9 +05.4 93.2
7°	70 08.9 +02.9 91.5	69 09.5 +02.9 91.3	68 10.1 +02.9 91.1	67 10.7 +02.9 91.0	66 11.3 +02.9 90.8
8°	70 11.8 +00.0 88.6	69 12.4 +00.2 88.5	68 13.0 +00.3 88.5	67 13.6 +00.5 88.4	66 14.2 +00.6 88.3
9°	70 11.8 -02.9 85.6	69 12.6 -02.6 85.7	68 13.3 -02.3 85.8	67 14.1 -02.1 85.8	66 14.8 -01.8 85.8
10°	70 08.9 -05.7 82.7	69 10.0 -05.3 82.9	68 11.0 -04.9 83.1	67 12.0 -04.5 83.2	66 13.0 -04.2 83.3
11°	70 03.2 -08.7 79.8	69 04.7 -08.1 80.1	68 06.1 -07.5 80.4	67 07.5 -07.0 80.6	66 08.8 -06.5 80.9
12°	69 54.5 -11.4 76.9	68 56.6 -10.7 77.3	67 58.6 -10.0 77.7	67 00.5 -09.4 78.1	66 02.3 -08.8 78.4
13°	69 43.1 -14.0 74.0	68 45.9 -13.2 74.6	67 48.6 -12.5 75.1	66 51.1 -11.8 75.6	65 53.5 -11.1 76.0
14°	69 29.1 -16.8 71.2	68 32.7 -15.8 71.9	67 36.1 -14.9 72.5	66 39.3 -14.1 73.1	65 42.4 -13.3 73.6
15°	69 12.3 -19.2 68.5	68 16.9 -18.2 69.3	67 21.2 -17.2 70.0	66 25.2 -16.3 70.6	65 29.1 -15.5 71.2
16°	68 53.1 -21.6 65.9	67 58.7 -20.5 66.7	67 04.0 -19.5 67.5	66 08.9 -18.5 68.3	65 13.6 -17.6 68.9
17°	68 31.5 -23.9 63.3	67 38.2 -22.7 64.3	66 44.5 -21.6 65.1	65 50.4 -20.6 65.9	64 56.0 -19.6 66.6
18°	68 07.6 -26.0 60.8	67 15.5 -24.9 61.8	66 22.9 -23.7 62.8	65 29.8 -22.6 63.6	64 36.4 -21.6 64.4
19°	67 41.6 -28.1 58.4	66 50.6 -26.8 59.5	65 59.2 -25.7 60.5	65 07.2 -24.5 61.4	64 14.8 -23.4 62.3
20°	67 13.5 -30.0 56.1	66 23.8 -28.7 57.3	65 33.5 -27.4 58.3	64 42.7 -26.3 59.3	63 51.4 -25.2 60.2
21°	66 43.5 -31.8 53.9	65 55.1 -30.5 55.1	65 06.1 -29.3 56.2	64 16.4 -28.0 57.2	63 26.2 -26.9 58.1
22°	66 11.7 -33.5 51.8	65 24.6 -32.1 53.0	64 36.8 -30.9 54.1	63 48.4 -29.7 55.2	62 59.3 -28.5 56.1
23°	65 38.2 -35.0 49.7	64 52.5 -33.7 51.0	64 05.9 -32.4 52.1	63 18.7 -31.2 53.2	62 30.8 -30.0 54.2
24°	65 03.2 -36.4 47.8	64 18.8 -35.2 49.1	63 33.5 -33.9 50.2	62 47.5 -32.7 51.3	62 00.8 -31.6 52.4
25°	64 26.8 -37.9 45.9	63 43.6 -36.5 47.2	62 59.6 -35.3 48.4	62 14.8 -34.1 49.5	61 29.2 -32.8 50.6
26°	63 48.9 -39.0 44.2	63 07.1 -37.8 45.4	62 24.3 -36.5 46.6	61 40.7 -35.3 47.8	60 56.4 -34.2 48.8
27°	63 09.9 -40.3 42.5	62 29.3 -39.0 43.7	61 47.8 -37.8 44.9	61 05.4 -36.6 46.1	60 22.2 -35.4 47.1
28°	62 29.6 -41.3 40.8	61 50.3 -40.1 42.1	61 10.0 -38.9 43.3	60 28.8 -37.7 44.4	59 46.8 -36.5 45.5
29°	61 48.3 -42.3 39.3	61 10.2 -41.1 40.5	60 31.1 -39.9 41.7	59 51.1 -38.8 42.9	59 10.3 -37.7 44.0

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 49.8 +17.9 106.6	62 52.7 +17.4 105.9	61 55.5 +16.9 105.3	60 58.1 +16.4 104.7	60 00.6 +15.8 104.1
1°	64 07.7 +16.0 104.4	63 10.1 +15.5 103.8	62 12.4 +15.0 103.2	61 14.5 +14.5 102.7	60 16.4 +14.2 102.2
2°	64 23.7 +14.0 102.2	63 25.6 +13.5 101.7	62 27.4 +13.0 101.1	61 29.0 +12.7 100.7	60 30.6 +12.4 100.2
3°	64 37.7 +11.8 100.0	63 39.1 +11.5 99.5	62 40.4 +11.2 99.0	61 41.7 +10.9 98.6	60 43.0 +10.5 98.2
4°	64 49.5 +09.6 97.7	63 50.6 +09.4 97.3	62 51.6 +09.2 96.9	61 52.6 +08.9 96.5	60 53.5 +08.8 96.2
5°	64 59.1 +07.5 95.3	64 00.0 +07.3 95.0	63 00.8 +07.1 94.7	62 01.5 +07.1 94.4	61 02.3 +06.9 94.1
6°	65 06.6 +05.2 93.0	64 07.3 +05.1 92.7	63 07.9 +05.1 92.5	62 08.6 +05.0 92.3	61 09.2 +05.0 92.1
7°	65 11.8 +03.0 90.6	64 12.4 +03.0 90.5	63 13.0 +03.1 90.3	62 13.6 +03.1 90.2	61 14.2 +03.1 90.0
8°	65 14.8 +00.7 88.2	64 15.4 +00.9 88.2	63 16.1 +00.9 88.1	62 16.7 +01.1 88.0	61 17.3 +01.2 87.9
9°	65 15.5 -01.5 85.8	64 16.3 -01.3 85.9	63 17.0 -01.1 85.9	62 17.8 -00.9 85.9	61 18.5 -00.7 85.9
10°	65 14.0 -03.8 83.5	64 15.0 -03.5 83.6	63 15.9 -03.2 83.6	62 16.9 -02.9 83.7	61 17.8 -02.6 83.8
11°	65 10.2 -06.1 81.1	64 11.5 -05.7 81.3	63 12.7 -05.2 81.4	62 14.0 -04.9 81.6	61 15.2 -04.6 81.7
12°	65 04.1 -08.3 78.7	64 05.8 -07.8 79.0	63 07.5 -07.3 79.2	62 09.1 -06.9 79.4	61 10.6 -06.4 79.6
13°	64 55.8 -10.5 76.4	63 58.0 -09.8 76.7	63 00.2 -09.3 77.0	62 02.2 -08.7 77.3	61 04.2 -08.2 77.6
14°	64 45.3 -12.6 74.1	63 48.2 -12.0 74.5	62 50.9 -11.3 74.9	61 53.5 -10.7 75.2	60 56.0 -10.2 75.5
15°	64 32.7 -14.7 71.8	63 36.2 -13.9 72.3	62 39.6 -13.3 72.7	61 42.8 -12.6 73.1	60 45.8 -11.9 73.5
16°	64 18.0 -16.7 69.5	63 22.3 -15.9 70.1	62 26.3 -15.1 70.6	61 30.2 -14.4 71.1	60 33.9 -13.7 71.5
17°	64 01.3 -18.7 67.3	63 06.4 -17.8 67.9	62 11.2 -17.0 68.5	61 15.8 -16.2 69.0	60 20.2 -15.4 69.5
18°	63 42.6 -20.5 65.2	62 48.6 -19.7 65.8	61 54.2 -18.7 66.5	60 59.6 -17.9 67.0	60 04.8 -17.1 67.6
19°	63 22.1 -22.4 63.1	62 28.9 -21.4 63.8	61 35.5 -20.5 64.5	60 41.7 -19.6 65.1	59 47.7 -18.7 65.7
20°	62 59.7 -24.2 61.0	62 07.5 -23.1 61.8	61 15.0 -22.2 62.5	60 22.1 -21.2 63.2	59 29.0 -20.4 63.8
21°	62 35.5 -25.8 59.0	61 44.4 -24.8 59.8	60 52.8 -23.7 60.6	60 00.9 -22.8 61.3	59 08.6 -21.8 61.9
22°	62 09.7 -27.4 57.0	61 19.6 -26.3 57.9	60 29.1 -25.3 58.7	59 38.1 -24.3 59.4	58 46.8 -23.4 60.1
23°	61 42.3 -28.9 55.2	60 53.3 -27.8 56.0	60 03.8 -26.8 56.9	59 13.8 -25.8 57.6	58 23.4 -24.8 58.4
24°	61 13.4 -30.4 53.3	60 25.5 -29.3 54.2	59 37.0 -28.2 55.1	58 48.0 -27.1 55.9	57 58.6 -26.1 56.6
25°	60 43.0 -31.7 51.5	59 56.2 -30.6 52.5	59 08.8 -29.5 53.4	58 20.9 -28.5 54.2	57 32.5 -27.5 55.0
26°	60 11.3 -33.0 49.8	59 25.6 -31.9 50.8	58 39.3 -30.8 51.7	57 52.4 -29.8 52.5	57 05.0 -28.7 53.3
27°	59 38.3 -34.3 48.2	58 53.7 -33.1 49.1	58 08.5 -32.1 50.0	57 22.6 -30.9 50.9	56 36.3 -30.0 51.7
28°	59 04.0 -35.4 46.5	58 20.6 -34.3 47.5	57 36.4 -33.2 48.4	56 51.7 -32.2 49.3	56 06.3 -31.1 50.1
29°	58 28.6 -36.5 45.0	57 46.3 -35.4 46.0	57 03.2 -34.3 46.9	56 19.5 -33.2 47.8	55 35.2 -32.2 48.6

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Latitude 8°

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°	59 02.9 +15.4 103.6	58 05.0 +15.1 103.0	57 07.1 +14.6 102.6	56 09.1 +14.2 102.1	55 10.9 +13.9 101.7
1°	59 18.3 +13.8 101.7	58 20.1 +13.4 101.2	57 21.7 +13.1 100.8	56 23.3 +12.8 100.3	55 24.8 +12.5 99.9
2°	59 32.1 +12.0 99.8	58 33.5 +11.7 99.3	57 34.8 +11.5 98.9	56 36.1 +11.2 98.6	55 37.3 +11.0 98.2
3°	59 44.1 +10.3 97.8	58 45.2 +10.1 97.5	57 46.3 +9.9 97.1	56 47.3 +9.7 96.8	55 48.3 +9.5 96.5
4°	59 54.4 +08.6 95.9	58 55.3 +08.4 95.6	57 56.2 +08.2 95.3	56 57.0 +08.1 95.0	55 57.8 +08.0 94.7
5°	60 03.0 +06.8 93.9	59 03.7 +06.7 93.6	58 04.4 +06.6 93.4	57 05.1 +06.5 93.2	56 05.8 +06.4 92.9
6°	60 09.8 +05.0 91.9	59 10.4 +05.0 91.7	58 11.0 +04.9 91.5	57 11.6 +04.9 91.3	56 12.2 +04.9 91.2
7°	60 14.8 +03.1 89.9	59 15.4 +03.1 89.7	58 15.9 +03.3 89.6	57 16.5 +03.3 89.5	56 17.1 +03.3 89.4
8°	60 17.9 +01.3 87.9	59 18.5 +01.5 87.8	58 19.2 +01.5 87.7	57 19.8 +01.7 87.6	56 20.4 +01.8 87.6
9°	60 19.2 -00.5 85.8	59 20.0 -00.4 85.8	58 20.7 -00.1 85.8	57 21.5 +00.0 85.8	56 22.2 +00.2 85.8
10°	60 18.7 -02.3 83.8	59 19.6 -02.0 83.9	58 20.6 -01.9 83.9	57 21.5 -01.6 83.9	56 22.4 -01.4 84.0
11°	60 16.4 -04.2 81.8	59 17.6 -03.9 81.9	58 18.7 -03.5 82.0	57 19.9 -03.3 82.1	56 21.0 -02.9 82.1
12°	60 12.2 -06.0 79.8	59 13.7 -05.6 80.0	58 15.2 -05.3 80.1	57 16.6 -04.8 80.2	56 18.1 -04.6 80.3
13°	60 06.2 -07.8 77.8	59 08.1 -07.3 78.0	58 09.9 -06.8 78.2	57 11.8 -06.5 78.4	56 13.5 -06.0 78.6
14°	59 58.4 -09.6 75.8	59 00.8 -09.1 76.1	58 03.1 -08.6 76.3	57 05.3 -08.1 76.6	56 07.5 -07.6 76.8
15°	59 48.8 -11.3 73.8	58 51.7 -10.7 74.2	57 54.5 -10.2 74.5	56 57.2 -09.6 74.7	55 59.9 -09.2 75.0
16°	59 37.5 -13.0 71.9	58 41.0 -12.4 72.3	57 44.3 -11.7 72.6	56 47.6 -11.2 72.9	55 50.7 -10.6 73.2
17°	59 24.5 -14.7 70.0	58 28.6 -14.0 70.4	57 32.6 -13.4 70.8	56 36.4 -12.7 71.1	55 40.1 -12.1 71.5
18°	59 09.8 -16.3 68.1	58 14.6 -15.6 68.5	57 19.2 -14.9 69.0	56 23.7 -14.2 69.4	55 28.0 -13.6 69.7
19°	58 53.5 -18.0 66.2	57 59.0 -17.2 66.7	57 04.3 -16.4 67.2	56 09.5 -15.7 67.6	55 14.4 -15.0 68.0
20°	58 35.5 -19.5 64.4	57 41.8 -18.6 64.9	56 47.9 -17.9 65.4	55 53.8 -17.1 65.9	54 59.4 -16.3 66.3
21°	58 16.0 -20.9 62.6	57 23.2 -20.2 63.1	56 30.0 -19.3 63.7	55 36.7 -18.5 64.2	54 43.1 -17.8 64.7
22°	57 55.1 -22.5 60.8	57 03.0 -21.5 61.4	56 10.7 -20.7 62.0	55 18.2 -19.9 62.5	54 25.3 -19.0 63.0
23°	57 32.6 -23.8 59.1	56 41.5 -22.9 59.7	55 50.0 -22.0 60.3	54 58.3 -21.2 60.9	54 06.3 -20.4 61.4
24°	57 08.8 -25.2 57.4	56 18.6 -24.3 58.0	55 28.0 -23.3 58.6	54 37.1 -22.5 59.2	53 45.9 -21.6 59.8
25°	56 43.6 -26.5 55.7	55 54.3 -25.5 56.4	55 04.7 -24.6 57.0	54 14.6 -23.7 57.6	53 24.3 -22.8 58.2
26°	56 17.1 -27.7 54.1	55 28.8 -26.8 54.8	54 40.1 -25.9 55.4	53 50.9 -24.9 56.1	53 01.5 -24.0 56.7
27°	55 49.4 -28.9 52.5	55 02.0 -27.9 53.2	54 14.2 -26.9 53.9	53 26.0 -26.0 54.5	52 37.5 -25.2 55.2
28°	55 20.5 -30.1 50.9	54 34.1 -29.1 51.7	53 47.3 -28.2 52.4	53 00.0 -27.2 53.0	52 12.3 -26.2 53.7
29°	54 50.4 -31.2 49.4	54 05.0 -30.2 50.2	53 19.1 -29.2 50.9	52 32.8 -28.2 51.6	51 46.1 -27.3 52.2

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°	54 12.7 +13.6 101.2	53 14.4 +13.3 100.8	52 16.0 +13.0 100.5	51 17.5 +12.7 100.1	50 19.0 +12.5 99.8
1°	54 26.3 +12.2 99.6	53 27.7 +11.9 99.2	52 29.0 +11.7 98.9	51 30.2 +11.5 98.5	50 31.5 +11.2 98.2
2°	54 38.5 +10.7 97.9	53 39.6 +10.5 97.6	52 40.7 +10.3 97.3	51 41.7 +10.2 97.0	50 42.7 +10.0 96.7
3°	54 49.2 +09.4 96.2	53 50.1 +09.2 95.9	52 51.0 +09.1 95.6	51 51.9 +08.9 95.4	50 52.7 +08.8 95.1
4°	54 58.6 +07.8 94.5	53 59.3 +07.8 94.2	53 00.1 +07.6 94.0	52 00.8 +07.5 93.8	51 01.5 +07.5 93.5
5°	55 06.4 +06.4 92.7	54 07.1 +06.3 92.5	53 07.7 +06.3 92.3	52 08.3 +06.3 92.1	51 09.0 +06.2 92.0
6°	55 12.8 +04.9 91.0	54 13.4 +04.9 90.8	53 14.0 +04.9 90.7	52 14.6 +04.9 90.5	51 15.2 +04.9 90.4
7°	55 17.7 +03.4 89.2	54 18.3 +03.4 89.1	53 18.9 +03.5 89.0	52 19.5 +03.5 88.9	51 20.1 +03.6 88.8
8°	55 21.1 +01.9 87.5	54 21.7 +02.0 87.4	53 22.4 +02.1 87.3	52 23.0 +02.2 87.3	51 23.7 +02.3 87.2
9°	55 23.0 +00.3 85.7	54 23.7 +00.5 85.7	53 24.5 +00.6 85.7	52 25.2 +00.9 85.6	51 26.0 +01.0 85.6
10°	55 23.3 -01.1 84.0	54 24.2 -00.9 84.0	53 25.1 -00.7 84.0	52 26.1 -00.6 84.0	51 27.0 -00.4 84.0
11°	55 22.2 -02.7 82.2	54 23.3 -02.4 82.3	53 24.4 -02.1 82.3	52 25.5 -01.9 82.3	51 26.6 -01.6 82.4
12°	55 19.5 -04.2 80.5	54 20.9 -03.9 80.5	53 22.3 -03.6 80.6	52 23.6 -03.2 80.7	51 25.0 -03.0 80.8
13°	55 15.3 -05.7 78.7	54 17.0 -05.3 78.8	53 18.7 -04.9 79.0	52 20.4 -04.6 79.1	51 22.0 -04.2 79.2
14°	55 09.6 -07.2 77.0	54 11.7 -06.7 77.1	53 13.8 -06.4 77.3	52 15.8 -05.9 77.4	51 17.8 -05.6 77.6
15°	55 02.4 -08.6 75.2	54 05.0 -08.2 75.4	53 07.4 -07.7 75.6	52 09.9 -07.3 75.8	51 12.2 -06.8 76.0
16°	54 53.8 -10.1 73.5	53 56.8 -09.6 73.7	52 59.7 -09.0 74.0	52 02.6 -08.6 74.2	51 05.4 -08.1 74.4
17°	54 43.7 -11.5 71.8	53 47.2 -10.9 72.1	52 50.7 -10.5 72.3	51 54.0 -09.9 72.6	50 57.3 -09.4 72.8
18°	54 32.2 -12.9 70.1	53 36.3 -12.4 70.4	52 40.2 -11.7 70.7	51 44.1 -11.2 71.0	50 47.9 -10.6 71.3
19°	54 19.3 -14.4 68.4	53 23.9 -13.6 68.8	52 28.5 -13.1 69.1	51 32.9 -12.4 69.4	50 37.3 -11.9 69.7
20°	54 04.9 -15.6 66.8	53 10.3 -15.0 67.1	52 15.4 -14.3 67.5	51 20.5 -13.7 67.8	50 25.4 -13.1 68.2
21°	53 49.3 -17.0 65.1	52 55.3 -16.3 65.5	52 01.1 -15.6 65.9	51 06.8 -14.9 66.3	50 12.3 -14.2 66.6
22°	53 32.3 -18.3 63.5	52 39.0 -17.6 63.9	51 45.5 -16.8 64.4	50 51.9 -16.1 64.7	49 58.1 -15.5 65.1
23°	53 14.0 -19.6 61.9	52 21.4 -18.7 62.4	51 28.7 -18.0 62.8	50 35.8 -17.3 63.2	49 42.6 -16.6 63.6
24°	52 54.4 -20.8 60.3	52 02.7 -20.0 60.8	51 10.7 -19.2 61.3	50 18.5 -18.5 61.7	49 26.0 -17.7 62.1
25°	52 33.6 -21.9 58.8	51 42.7 -21.2 59.3	50 51.5 -20.4 59.8	50 00.0 -19.6 60.2	49 08.3 -18.8 60.7
26°	52 11.7 -23.2 57.2	51 21.5 -22.3 57.8	50 31.1 -21.4 58.3	49 40.4 -20.6 58.8	48 49.5 -19.9 59.2
27°	51 48.5 -24.2 55.7	50 59.2 -23.4 56.3	50 09.7 -22.6 56.8	49 19.8 -21.7 57.3	48 29.6 -20.9 57.8
28°	51 24.3 -25.4 54.3	50 35.8 -24.4 54.8	49 47.1 -23.6 55.4	48 58.1 -22.8 55.9	48 08.7 -21.9 56.4
29°	50 58.9 -26.4 52.8	50 11.4 -25.5 53.4	49 23.5 -24.6 54.0	48 35.3 -23.8 54.5	47 46.8 -23.0 55.0

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Declination SAME name as Latitude

Latitude 8°

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°	49 20.4 +12.2 99.4	48 21.8 +12.0 99.1	47 23.1 +11.7 98.8	46 24.3 +11.6 98.5	45 25.5 +11.4 98.2
1°	49 32.6 +11.1 97.9	48 33.8 +10.8 97.6	47 34.8 +10.7 97.3	46 35.9 +10.5 97.1	45 36.9 +10.4 96.8
2°	49 43.7 +09.8 96.4	48 44.6 +09.7 96.1	47 45.5 +09.6 95.9	46 46.4 +09.4 95.6	45 47.3 +09.3 95.4
3°	49 53.5 +08.7 94.9	48 54.3 +08.5 94.6	47 55.1 +08.4 94.4	46 55.8 +08.4 94.2	45 56.6 +08.2 94.0
4°	50 02.2 +07.4 93.3	49 02.8 +07.4 93.1	48 03.5 +07.3 92.9	47 04.2 +07.2 92.7	46 04.8 +07.2 92.5
5°	50 09.6 +06.1 91.8	49 10.2 +06.1 91.6	48 10.8 +06.1 91.4	47 11.4 +06.1 91.3	46 12.0 +06.1 91.1
6°	50 15.7 +05.0 90.2	49 16.3 +05.0 90.1	48 16.9 +05.0 89.9	47 17.5 +05.0 89.8	46 18.1 +05.0 89.7
7°	50 20.7 +03.6 88.7	49 21.3 +03.7 88.6	48 21.9 +03.8 88.4	47 22.5 +03.8 88.3	46 23.1 +03.9 88.2
8°	50 24.3 +02.4 87.1	49 25.0 +02.5 87.0	48 25.7 +02.6 86.9	47 26.3 +02.8 86.9	46 27.0 +02.8 86.8
9°	50 26.7 +01.2 85.5	49 27.5 +01.3 85.5	48 28.3 +01.4 85.4	47 29.1 +01.5 85.4	46 29.8 +01.7 85.3
10°	50 27.9 -00.2 84.0	49 28.8 +00.1 83.9	48 29.7 +00.3 83.9	47 30.6 +00.5 83.9	46 31.5 +00.7 83.9
11°	50 27.7 -01.4 82.4	49 28.9 -01.2 82.4	48 30.0 -01.0 82.4	47 31.1 -00.8 82.4	46 32.2 -00.5 82.4
12°	50 26.3 -02.6 80.8	49 27.7 -02.4 80.9	48 29.0 -02.1 80.9	47 30.3 -01.8 80.9	46 31.7 -01.6 81.0
13°	50 23.7 -03.9 79.3	49 25.3 -03.6 79.3	48 26.9 -03.3 79.4	47 28.5 -03.0 79.5	46 30.1 -02.7 79.5
14°	50 19.8 -05.2 77.7	49 21.7 -04.8 77.8	48 23.6 -04.5 77.9	47 25.5 -04.1 78.0	46 27.4 -03.8 78.1
15°	50 14.6 -06.5 76.1	49 16.9 -06.1 76.3	48 19.1 -05.6 76.4	47 21.4 -05.3 76.5	46 23.6 -04.9 76.6
16°	50 08.1 -07.6 74.6	49 10.8 -07.2 74.7	48 13.5 -06.8 74.9	47 16.1 -06.4 75.0	46 18.7 -06.0 75.2
17°	50 00.5 -08.9 73.0	49 03.6 -08.4 73.2	48 06.7 -08.0 73.4	47 09.7 -07.5 73.6	46 12.7 -07.0 73.7
18°	49 51.6 -10.1 71.5	48 55.2 -09.6 71.7	47 58.7 -09.0 71.9	47 02.2 -08.6 72.1	46 05.7 -08.2 72.3
19°	49 41.5 -11.3 70.0	48 45.6 -10.7 70.2	47 49.7 -10.3 70.5	46 53.6 -09.7 70.7	45 57.5 -09.2 70.9
20°	49 30.2 -12.5 68.5	48 34.9 -11.9 68.7	47 39.4 -11.3 69.0	46 43.9 -10.7 69.2	45 48.3 -10.2 69.5
21°	49 17.7 -13.6 66.9	48 23.0 -13.0 67.3	47 28.1 -12.4 67.5	46 33.2 -11.9 67.8	45 38.1 -11.3 68.0
22°	49 04.1 -14.8 65.5	48 10.0 -14.2 65.8	47 15.7 -13.5 66.1	46 21.3 -12.9 66.4	45 26.8 -12.3 66.6
23°	48 49.3 -15.9 64.0	47 55.8 -15.2 64.3	47 02.2 -14.6 64.7	46 08.4 -13.9 65.0	45 14.5 -13.3 65.3
24°	48 33.4 -17.0 62.5	47 40.6 -16.3 62.9	46 47.6 -15.6 63.2	45 54.5 -14.9 63.6	45 01.2 -14.3 63.9
25°	48 16.4 -18.0 61.1	47 24.3 -17.3 61.5	46 32.0 -16.6 61.8	45 39.6 -16.0 62.2	44 46.9 -15.2 62.5
26°	47 58.4 -19.2 59.6	47 07.0 -18.4 60.1	46 15.4 -17.6 60.4	45 23.6 -16.9 60.8	44 31.7 -16.3 61.1
27°	47 39.2 -20.1 58.2	46 48.6 -19.4 58.7	45 57.8 -18.7 59.1	45 06.7 -17.9 59.4	44 15.4 -17.1 59.8
28°	47 19.1 -21.1 56.8	46 29.2 -20.3 57.3	45 39.1 -19.6 57.7	44 48.8 -18.8 58.1	43 58.3 -18.1 58.5
29°	46 58.0 -22.2 55.5	46 08.9 -21.3 55.9	45 19.5 -20.5 56.3	44 30.0 -19.8 56.8	43 40.2 -19.0 57.1

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 26.7 +11.2 97.9	43 27.8 +11.1 97.7	42 28.9 +10.9 97.4	41 30.0 +10.7 97.1	40 31.0 +10.6 96.9
1°	44 37.9 +10.2 96.5	43 38.9 +10.0 96.3	42 39.8 +09.9 96.1	41 40.7 +09.8 95.8	40 41.6 +09.6 95.6
2°	44 48.1 +09.2 95.2	43 48.9 +09.1 94.9	42 49.7 +09.0 94.7	41 50.5 +08.9 94.5	40 51.2 +08.8 94.3
3°	44 57.3 +08.2 93.8	43 58.0 +08.1 93.6	42 58.7 +08.0 93.4	41 59.4 +07.9 93.2	41 00.0 +07.9 93.0
4°	45 05.5 +07.1 92.4	44 06.1 +07.1 92.2	43 06.7 +07.1 92.0	42 07.3 +07.1 91.8	41 07.9 +07.0 91.7
5°	45 12.6 +06.1 91.0	44 13.2 +06.1 90.8	43 13.8 +06.0 90.6	42 14.4 +06.0 90.5	41 14.9 +06.1 90.4
6°	45 18.7 +05.0 89.5	44 19.3 +05.0 89.4	43 19.8 +05.1 89.3	42 20.4 +05.2 89.2	41 21.0 +05.2 89.0
7°	45 23.7 +04.0 88.1	44 24.3 +04.1 88.0	43 24.9 +04.2 87.9	42 25.6 +04.2 87.8	41 26.2 +04.3 87.7
8°	45 27.7 +02.9 86.7	44 28.4 +03.0 86.6	43 29.1 +03.1 86.5	42 29.8 +03.2 86.5	41 30.5 +03.3 86.4
9°	45 30.6 +01.9 85.3	44 31.4 +02.0 85.2	43 32.2 +02.1 85.2	42 33.0 +02.3 85.1	41 33.8 +02.4 85.0
10°	45 32.5 +00.8 83.8	44 33.4 +01.0 83.8	43 34.3 +01.2 83.8	42 35.3 +01.3 83.7	41 36.2 +01.5 83.7
11°	45 33.3 -00.3 82.4	44 34.4 -00.1 82.4	43 35.5 +00.1 82.4	42 36.6 +00.3 82.4	41 37.7 +00.5 82.4
12°	45 33.0 -01.4 81.0	44 34.3 -01.1 81.0	43 35.6 -00.8 81.0	42 36.9 -00.6 81.0	41 38.2 -00.3 81.0
13°	45 31.6 -02.4 79.6	44 33.2 -02.1 79.6	43 34.8 -01.9 79.6	42 36.3 -01.6 79.7	41 37.9 -01.4 79.7
14°	45 29.2 -03.4 78.1	44 31.1 -03.2 78.2	43 32.9 -02.8 78.3	42 34.7 -02.5 78.3	41 36.5 -02.2 78.4
15°	45 25.8 -04.6 76.7	44 27.9 -04.2 76.8	43 30.1 -03.9 76.9	42 32.2 -03.5 77.0	41 34.3 -03.2 77.0
16°	45 21.2 -05.5 75.3	44 23.7 -05.1 75.4	43 26.2 -04.8 75.5	42 28.7 -04.5 75.6	41 31.1 -04.1 75.7
17°	45 15.7 -06.7 73.9	44 18.6 -06.3 74.0	43 21.4 -05.8 74.1	42 24.2 -05.4 74.2	41 27.0 -05.0 74.3
18°	45 09.0 -07.6 72.5	44 12.3 -07.2 72.6	43 15.6 -06.8 72.8	42 18.8 -06.3 72.9	41 22.0 -05.9 73.0
19°	45 01.4 -08.7 71.1	44 05.1 -08.2 71.2	43 08.8 -07.7 71.4	42 12.5 -07.3 71.6	41 16.1 -06.8 71.7
20°	44 52.7 -09.7 69.7	43 56.9 -09.2 69.9	43 01.1 -08.7 70.0	42 05.2 -08.2 70.2	41 09.3 -07.8 70.4
21°	44 43.0 -10.8 68.3	43 47.7 -10.2 68.5	42 52.4 -09.7 68.7	41 57.0 -09.1 68.9	41 01.5 -08.6 69.1
22°	44 32.2 -11.7 66.9	43 37.5 -11.1 67.1	42 42.7 -10.5 67.4	41 47.9 -10.1 67.6	40 52.9 -09.5 67.7
23°	44 20.5 -12.7 65.5	43 26.4 -12.1 65.8	42 32.2 -11.6 66.0	41 37.8 -10.9 66.2	40 43.4 -10.4 66.4
24°	44 07.8 -13.6 64.2	43 14.3 -13.0 64.4	42 20.6 -12.4 64.7	41 26.9 -11.9 64.9	40 33.0 -11.2 65.1
25°	43 54.2 -14.6 62.8	43 01.3 -14.0 63.1	42 08.2 -13.3 63.4	41 15.0 -12.7 63.6	40 21.8 -12.2 63.9
26°	43 39.6 -15.6 61.5	42 47.3 -14.9 61.8	41 54.9 -14.3 62.0	41 02.3 -13.6 62.3	40 09.6 -12.9 62.6
27°	43 24.0 -16.5 60.1	42 32.4 -15.8 60.4	41 40.6 -15.1 60.7	40 48.7 -14.4 61.0	39 56.7 -13.8 61.3
28°	43 07.5 -17.3 58.8	42 16.6 -16.6 59.1	41 25.5 -15.9 59.5	40 34.3 -15.3 59.7	39 42.9 -14.6 60.0
29°	42 50.2 -18.3 57.5	42 00.0 -17.6 57.8	41 09.6 -16.8 58.2	40 19.0 -16.1 58.5	39 28.3 -15.4 58.8

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 32.0 +10.4 96.7	38 33.0 +10.3 96.4	37 33.9 +10.2 96.2	36 34.9 +10.0 96.0	35 35.8 +09.9 95.8
1°	39 42.4 +09.6 95.4	38 43.3 +09.4 95.2	37 44.1 +09.3 95.0	36 44.9 +09.2 94.8	35 45.7 +09.1 94.6
2°	39 52.0 +08.7 94.1	38 52.7 +08.7 93.9	37 53.4 +08.6 93.7	36 54.1 +08.5 93.5	35 54.8 +08.5 93.3
3°	40 00.7 +07.8 92.8	39 01.4 +07.7 92.6	38 02.0 +07.7 92.5	37 02.6 +07.7 92.3	36 03.3 +07.6 92.1
4°	40 08.5 +07.0 91.5	39 09.1 +07.0 91.4	38 09.7 +07.0 91.2	37 10.3 +07.0 91.0	36 10.9 +07.0 90.9
5°	40 15.5 +06.1 90.2	39 16.1 +06.1 90.1	38 16.7 +06.1 89.9	37 17.3 +06.1 89.8	36 17.9 +06.1 89.7
6°	40 21.6 +05.2 88.9	39 22.2 +05.3 88.8	38 22.8 +05.3 88.7	37 23.4 +05.4 88.5	36 24.0 +05.4 88.4
7°	40 26.8 +04.4 87.6	39 27.5 +04.4 87.5	38 28.1 +04.5 87.4	37 28.8 +04.5 87.3	36 29.4 +04.7 87.2
8°	40 31.2 +03.4 86.3	39 31.9 +03.5 86.2	38 32.6 +03.6 86.1	37 33.3 +03.8 86.0	36 34.1 +03.8 85.9
9°	40 34.6 +02.6 85.0	39 35.4 +02.7 84.9	38 36.2 +02.9 84.8	37 37.1 +02.9 84.8	36 37.9 +03.1 84.7
10°	40 37.2 +01.6 83.7	39 38.1 +01.8 83.6	38 39.1 +01.9 83.6	37 40.0 +02.2 83.5	36 41.0 +02.3 83.5
11°	40 38.8 +00.8 82.3	39 39.9 +01.0 82.3	38 41.0 +01.2 82.3	37 42.2 +01.3 82.2	36 43.3 +01.5 82.2
12°	40 39.6 -00.2 81.0	39 40.9 +00.0 81.0	38 42.2 +00.3 81.0	37 43.5 +00.5 81.0	36 44.8 +00.8 81.0
13°	40 39.4 -01.0 79.7	39 40.9 -00.8 79.7	38 42.5 -00.6 79.7	37 44.0 -00.3 79.7	36 45.6 -00.1 79.7
14°	40 38.4 -02.0 78.4	39 40.1 -01.6 78.4	38 41.9 -01.3 78.4	37 43.7 -01.1 78.5	36 45.5 -00.8 78.5
15°	40 36.4 -02.8 77.1	39 38.5 -02.5 77.1	38 40.6 -02.3 77.2	37 42.6 -01.9 77.2	36 44.7 -01.6 77.2
16°	40 33.6 -03.8 75.8	39 36.0 -03.4 75.8	38 38.3 -03.0 75.9	37 40.7 -02.7 75.9	36 43.1 -02.4 76.0
17°	40 29.8 -04.6 74.4	39 32.6 -04.3 74.5	38 35.3 -03.9 74.6	37 38.0 -03.5 74.7	36 40.7 -03.2 74.7
18°	40 25.2 -05.5 73.1	39 28.3 -05.1 73.2	38 31.4 -04.7 73.3	37 34.5 -04.3 73.4	36 37.5 -03.9 73.5
19°	40 19.7 -06.4 71.8	39 23.2 -05.9 71.9	38 26.7 -05.5 72.0	37 30.2 -05.2 72.1	36 33.6 -04.7 72.2
20°	40 13.3 -07.3 70.5	39 17.3 -06.9 70.7	38 21.2 -06.4 70.8	37 25.0 -05.9 70.9	36 28.9 -05.5 71.0
21°	40 06.0 -08.1 69.2	39 10.4 -07.6 69.4	38 14.8 -07.2 69.5	37 19.1 -06.7 69.6	36 23.4 -06.2 69.8
22°	39 57.9 -09.0 67.9	39 02.8 -08.5 68.1	38 07.6 -07.9 68.2	37 12.4 -07.5 68.4	36 17.2 -07.0 68.5
23°	39 48.9 -09.8 66.6	38 54.3 -09.3 66.8	37 59.7 -08.8 67.0	37 04.9 -08.2 67.1	36 10.2 -07.8 67.3
24°	39 39.1 -10.7 65.4	38 45.0 -10.1 65.6	37 50.9 -09.6 65.7	36 56.7 -09.1 65.9	36 02.4 -08.5 66.1
25°	39 28.4 -11.6 64.1	38 34.9 -11.0 64.3	37 41.3 -10.4 64.5	36 47.6 -09.8 64.7	35 53.9 -09.3 64.8
26°	39 16.8 -12.3 62.8	38 23.9 -11.7 63.0	37 30.9 -11.1 63.2	36 37.8 -10.5 63.4	35 44.6 -09.9 63.6
27°	39 04.5 -13.2 61.5	38 12.2 -12.5 61.8	37 19.8 -11.9 62.0	36 27.3 -11.3 62.2	35 34.7 -10.7 62.4
28°	38 51.3 -13.9 60.3	37 59.7 -13.3 60.5	37 07.9 -12.7 60.8	36 16.0 -12.1 61.0	35 24.0 -11.5 61.2
29°	38 37.4 -14.8 59.0	37 46.4 -14.1 59.3	36 55.2 -13.4 59.6	36 03.9 -12.7 59.8	35 12.5 -12.1 60.0

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 36.6 +09.8 95.6	33 37.5 +09.7 95.4	32 38.3 +09.6 95.2	31 39.1 +09.5 95.0	30 39.9 +09.4 94.8
1°	34 46.4 +09.1 94.4	33 47.2 +09.0 94.2	32 47.9 +08.9 94.0	31 48.6 +08.9 93.8	30 49.3 +08.8 93.6
2°	34 55.5 +08.4 93.2	33 56.2 +08.3 93.0	32 56.8 +08.3 92.8	31 57.5 +08.2 92.6	30 58.1 +08.2 92.5
3°	35 03.9 +07.6 92.0	34 04.5 +07.6 91.8	33 05.1 +07.6 91.6	32 05.7 +07.6 91.5	31 06.3 +07.6 91.3
4°	35 11.5 +06.9 90.7	34 12.1 +06.9 90.6	33 12.7 +06.9 90.4	32 13.3 +06.9 90.3	31 13.9 +06.9 90.2
5°	35 18.4 +06.2 89.5	34 19.0 +06.2 89.4	33 19.6 +06.3 89.3	32 20.2 +06.3 89.1	31 20.8 +06.3 89.0
6°	35 24.6 +05.5 88.3	34 25.2 +05.5 88.2	33 25.9 +05.5 88.1	32 26.5 +05.6 88.0	31 27.1 +05.7 87.8
7°	35 30.1 +04.7 87.1	34 30.7 +04.8 87.0	33 31.4 +04.9 86.9	32 32.1 +04.9 86.8	31 32.8 +05.0 86.7
8°	35 34.8 +03.9 85.9	34 35.5 +04.1 85.8	33 36.3 +04.2 85.7	32 37.0 +04.3 85.6	31 37.8 +04.4 85.5
9°	35 38.7 +03.3 84.6	34 39.6 +03.3 84.6	33 40.5 +03.4 84.5	32 41.3 +03.6 84.4	31 42.2 +03.7 84.3
10°	35 42.0 +02.4 83.4	34 42.9 +02.7 83.3	33 43.9 +02.8 83.3	32 44.9 +03.0 83.2	31 45.9 +03.1 83.2
11°	35 44.4 +01.7 82.2	34 45.6 +01.9 82.1	33 46.7 +02.1 82.1	32 47.9 +02.2 82.0	31 49.0 +02.5 82.0
12°	35 46.1 +01.0 80.9	34 47.5 +01.1 80.9	33 48.8 +01.4 80.9	32 50.1 +01.6 80.8	31 51.5 +01.8 80.8
13°	35 47.1 +00.2 79.7	34 48.6 +00.5 79.7	33 50.2 +00.7 79.7	32 51.7 +00.9 79.7	31 53.3 +01.1 79.6
14°	35 47.3 -00.6 78.5	34 49.1 -00.3 78.5	33 50.9 -00.1 78.5	32 52.6 +00.3 78.5	31 54.4 +00.5 78.4
15°	35 46.7 -01.3 77.2	34 48.8 -01.0 77.3	33 50.8 -00.7 77.3	32 52.9 -00.5 77.3	31 54.9 -00.1 77.3
16°	35 45.4 -02.0 76.0	34 47.8 -01.8 76.0	33 50.1 -01.4 76.1	32 52.4 -01.1 76.1	31 54.8 -00.8 76.1
17°	35 43.4 -02.8 74.8	34 46.0 -02.4 74.8	33 48.7 -02.1 74.9	32 51.3 -01.8 74.9	31 54.0 -01.5 74.9
18°	35 40.6 -03.6 73.5	34 43.6 -03.2 73.6	33 46.6 -02.9 73.7	32 49.5 -02.4 73.7	31 52.5 -02.1 73.7
19°	35 37.0 -04.3 72.3	34 40.4 -03.9 72.4	33 43.7 -03.5 72.5	32 47.1 -03.2 72.5	31 50.4 -02.8 72.6
20°	35 32.7 -05.1 71.1	34 36.5 -04.7 71.2	33 40.2 -04.2 71.3	32 43.9 -03.8 71.3	31 47.6 -03.4 71.4
21°	35 27.6 -05.8 69.9	34 31.8 -05.3 70.0	33 36.0 -04.9 70.1	32 40.1 -04.4 70.1	31 44.2 -04.0 70.2
22°	35 21.8 -06.5 68.6	34 26.5 -06.1 68.8	33 31.1 -05.6 68.9	32 35.7 -05.2 69.0	31 40.2 -04.7 69.0
23°	35 15.3 -07.2 67.4	34 20.4 -06.7 67.6	33 25.5 -06.3 67.7	32 30.5 -05.8 67.8	31 35.5 -05.3 67.9
24°	35 08.1 -08.0 66.2	34 13.7 -07.5 66.3	33 19.2 -07.0 66.5	32 24.7 -06.5 66.6	31 30.2 -06.0 66.7
25°	35 00.1 -08.7 65.0	34 06.2 -08.2 65.2	33 12.2 -07.6 65.3	32 18.2 -07.1 65.4	31 24.2 -06.6 65.5
26°	34 51.4 -09.4 63.8	33 58.0 -08.8 64.0	33 04.6 -08.3 64.1	32 11.1 -07.7 64.2	31 17.6 -07.2 64.4
27°	34 42.0 -10.2 62.6	33 49.2 -09.6 62.8	32 56.3 -09.0 62.9	32 03.4 -08.4 63.1	31 10.4 -07.9 63.2
28°	34 31.8 -10.8 61.4	33 39.6 -10.2 61.6	32 47.3 -09.6 61.7	31 55.0 -09.1 61.9	31 02.5 -08.5 62.0
29°	34 21.0 -11.5 60.2	33 29.4 -10.9 60.4	32 37.7 -10.3 60.6	31 45.9 -09.7 60.7	30 54.0 -09.0 60.9

Declination SAME name as Latitude

Latitude 8°

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 40.7 +09.3 94.6	28 41.5 +09.2 94.4	27 42.2 +09.2 94.2	26 43.0 +09.1 94.1	25 43.7 +09.0 93.9
1°	29 50.0 +08.8 93.5	28 50.7 +08.7 93.3	27 51.4 +08.6 93.1	26 52.1 +08.5 92.9	25 52.7 +08.5 92.8
2°	29 58.8 +08.1 92.3	28 59.4 +08.1 92.2	28 00.0 +08.1 92.0	27 00.6 +08.1 91.8	26 01.2 +08.1 91.7
3°	30 06.9 +07.6 91.2	29 07.5 +07.5 91.0	28 08.1 +07.5 90.9	27 08.7 +07.5 90.7	26 09.3 +07.5 90.6
4°	30 14.5 +06.9 90.0	29 15.0 +07.0 89.9	28 15.6 +07.0 89.7	27 16.2 +07.0 89.6	26 16.8 +07.0 89.5
5°	30 21.4 +06.3 88.9	29 22.0 +06.4 88.7	28 22.6 +06.4 88.6	27 23.2 +06.4 88.5	26 23.8 +06.5 88.4
6°	30 27.7 +05.8 87.7	29 28.4 +05.8 87.6	28 29.0 +05.9 87.5	27 29.6 +06.0 87.4	26 30.3 +06.0 87.3
7°	30 33.5 +05.1 86.6	29 34.2 +05.1 86.5	28 34.9 +05.2 86.4	27 35.6 +05.3 86.2	26 36.3 +05.4 86.1
8°	30 38.6 +04.5 85.4	29 39.3 +04.7 85.3	28 40.1 +04.7 85.2	27 40.9 +04.9 85.1	26 41.7 +05.0 85.0
9°	30 43.1 +03.8 84.2	29 44.0 +04.0 84.2	28 44.8 +04.2 84.1	27 45.8 +04.2 84.0	26 46.7 +04.4 83.9
10°	30 46.9 +03.3 83.1	29 48.0 +03.4 83.0	28 49.0 +03.6 82.9	27 50.0 +03.8 82.9	26 51.1 +03.9 82.8
11°	30 50.2 +02.6 81.9	29 51.4 +02.8 81.9	28 52.6 +03.0 81.8	27 53.8 +03.1 81.7	26 55.0 +03.3 81.7
12°	30 52.8 +02.0 80.8	29 54.2 +02.2 80.7	28 55.6 +02.4 80.7	27 56.9 +02.7 80.6	26 58.3 +02.8 80.6
13°	30 54.8 +01.4 79.6	29 56.4 +01.6 79.6	28 58.0 +01.8 79.5	27 59.6 +02.0 79.5	27 01.1 +02.3 79.4
14°	30 56.2 +00.8 78.4	29 58.0 +01.0 78.4	28 59.8 +01.3 78.4	28 01.6 +01.5 78.3	27 03.4 +01.8 78.3
15°	30 57.0 +00.1 77.3	29 59.0 +00.4 77.3	29 01.1 +00.6 77.2	28 03.1 +01.0 77.2	27 05.2 +01.2 77.2
16°	30 57.1 -00.5 76.1	29 59.4 -00.2 76.1	29 01.7 +00.1 76.1	28 04.1 +00.4 76.1	27 06.4 +00.7 76.1
17°	30 56.6 -01.1 74.9	29 59.2 -00.8 74.9	29 01.8 -00.4 74.9	28 04.5 -00.2 75.0	27 07.1 +00.1 74.9
18°	30 55.5 -01.8 73.8	29 58.4 -01.4 73.8	29 01.4 -01.1 73.8	28 04.3 -00.7 73.8	27 07.2 -00.4 73.8
19°	30 53.7 -02.4 72.6	29 57.0 -02.0 72.6	29 00.3 -01.7 72.7	28 03.6 -01.3 72.7	27 06.8 -00.9 72.7
20°	30 51.3 -03.0 71.4	29 55.0 -02.6 71.5	28 58.6 -02.2 71.5	28 02.3 -01.9 71.6	27 05.9 -01.4 71.6
21°	30 48.3 -03.6 70.3	29 52.4 -03.2 70.3	28 56.4 -02.8 70.4	28 00.4 -02.3 70.4	27 04.5 -02.0 70.5
22°	30 44.7 -04.3 69.1	29 49.2 -03.8 69.2	28 53.6 -03.4 69.2	27 58.1 -03.0 69.3	27 02.5 -02.6 69.3
23°	30 40.4 -04.8 68.0	29 45.4 -04.5 68.0	28 50.2 -03.9 68.1	27 55.1 -03.5 68.2	26 59.9 -03.0 68.2
24°	30 35.6 -05.5 66.8	29 40.9 -05.0 66.9	28 46.3 -04.5 67.0	27 51.6 -04.1 67.0	26 56.9 -03.6 67.1
25°	30 30.1 -06.1 65.6	29 35.9 -05.5 65.7	28 41.8 -05.1 65.8	27 47.5 -04.6 65.9	26 53.3 -04.1 66.0
26°	30 24.0 -06.7 64.5	29 30.4 -06.2 64.6	28 36.7 -05.7 64.7	27 42.9 -05.1 64.8	26 49.2 -04.7 64.9
27°	30 17.3 -07.3 63.3	29 24.2 -06.8 63.4	28 31.0 -06.2 63.6	27 37.8 -05.7 63.6	26 44.5 -05.2 63.7
28°	30 10.0 -07.9 62.2	29 17.4 -07.3 62.3	28 24.8 -06.8 62.4	27 32.1 -06.3 62.5	26 39.3 -05.6 62.6
29°	30 02.1 -08.5 61.0	29 10.1 -07.9 61.2	28 18.0 -07.4 61.3	27 25.8 -06.7 61.4	26 33.7 -06.3 61.5

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°	24 44.4 +09.0 93.7	23 45.1 +08.9 93.5	22 45.8 +08.9 93.4	21 46.5 +08.8 93.2	20 47.2 +08.7 93.1
1°	24 53.4 +08.5 92.6	23 54.0 +08.5 92.5	22 54.7 +08.4 92.3	21 55.3 +08.4 92.2	20 55.9 +08.3 92.0
2°	25 01.9 +08.0 91.5	24 02.5 +07.9 91.4	23 03.1 +07.9 91.2	22 03.7 +07.9 91.1	21 04.2 +08.0 90.9
3°	25 09.9 +07.5 90.4	24 10.4 +07.6 90.3	23 11.0 +07.6 90.2	22 11.6 +07.5 90.0	21 12.2 +07.5 89.9
4°	25 17.4 +07.0 89.3	24 18.0 +07.0 89.2	23 18.6 +07.0 89.1	22 19.1 +07.2 88.9	21 19.7 +07.2 88.8
5°	25 24.4 +06.5 88.2	24 25.0 +06.6 88.1	23 25.6 +06.7 88.0	22 26.3 +06.7 87.9	21 26.9 +06.7 87.7
6°	25 30.9 +06.1 87.1	24 31.6 +06.1 87.0	23 32.3 +06.2 86.9	22 33.0 +06.2 86.8	21 33.6 +06.4 86.7
7°	25 37.0 +05.5 86.0	24 37.7 +05.7 85.9	23 38.5 +05.7 85.8	22 39.2 +05.8 85.7	21 40.0 +05.9 85.6
8°	25 42.5 +05.1 84.9	24 43.4 +05.1 84.8	23 44.2 +05.3 84.7	22 45.0 +05.4 84.6	21 45.9 +05.5 84.5
9°	25 47.6 +04.5 83.8	24 48.5 +04.7 83.7	23 49.5 +04.8 83.6	22 50.4 +05.0 83.6	21 51.4 +05.1 83.5
10°	25 52.1 +04.1 82.7	24 53.2 +04.2 82.6	23 54.3 +04.3 82.6	22 55.4 +04.5 82.5	21 56.5 +04.6 82.4
11°	25 56.2 +03.5 81.6	24 57.4 +03.7 81.5	23 58.6 +03.9 81.5	22 59.9 +04.1 81.4	22 01.1 +04.3 81.3
12°	25 59.7 +03.0 80.5	25 01.1 +03.2 80.4	24 02.5 +03.5 80.4	23 04.0 +03.6 80.3	22 05.4 +03.8 80.2
13°	26 02.7 +02.5 79.4	25 04.3 +02.8 79.3	24 06.0 +02.9 79.3	23 07.6 +03.2 79.2	22 09.2 +03.4 79.2
14°	26 05.2 +02.1 78.3	25 07.1 +02.2 78.2	24 08.9 +02.5 78.2	23 10.8 +02.7 78.1	22 12.6 +03.0 78.1
15°	26 07.3 +01.4 77.2	25 09.3 +01.8 77.1	24 11.4 +02.0 77.1	23 13.5 +02.3 77.0	22 15.6 +02.5 77.0
16°	26 08.7 +01.0 76.0	25 11.1 +01.2 76.0	24 13.4 +01.6 76.0	23 15.8 +01.8 76.0	22 18.1 +02.2 75.9
17°	26 09.7 +00.5 74.9	25 12.3 +00.8 74.9	24 15.0 +01.1 74.9	23 17.6 +01.4 74.9	22 20.3 +01.6 74.8
18°	26 10.2 -00.1 73.8	25 13.1 +00.3 73.8	24 16.1 +00.6 73.8	23 19.0 +00.9 73.8	22 21.9 +01.3 73.8
19°	26 10.1 -00.5 72.7	25 13.4 -00.2 72.7	24 16.7 +00.1 72.7	23 19.9 +00.5 72.7	22 23.2 +00.8 72.7
20°	26 09.6 -01.1 71.6	25 13.2 -00.7 71.6	24 16.8 -00.3 71.6	23 20.4 +00.0 71.6	22 24.0 +00.4 71.6
21°	26 08.5 -01.6 70.5	25 12.5 -01.2 70.5	24 16.5 -00.9 70.5	23 20.4 -00.4 70.5	22 24.4 +00.0 70.5
22°	26 06.9 -02.1 69.4	25 11.3 -01.7 69.4	24 15.6 -01.2 69.4	23 20.0 -00.9 69.4	22 24.4 -00.5 69.4
23°	26 04.8 -02.7 68.3	25 09.6 -02.2 68.3	24 14.4 -01.8 68.3	23 19.1 -01.3 68.3	22 23.9 -00.9 68.4
24°	26 02.1 -03.1 67.1	25 07.4 -02.7 67.2	24 12.6 -02.2 67.2	23 17.8 -01.8 67.3	22 23.0 -01.3 67.3
25°	25 59.0 -03.6 66.0	25 04.7 -03.2 66.1	24 10.4 -02.7 66.1	23 16.0 -02.2 66.2	22 21.7 -01.8 66.2
26°	25 55.4 -04.2 64.9	25 01.5 -03.6 65.0	24 07.7 -03.2 65.0	23 13.8 -02.7 65.1	22 19.9 -02.2 65.1
27°	25 51.2 -04.6 63.8	24 57.9 -04.1 63.9	24 04.5 -03.6 63.9	23 11.1 -03.1 64.0	22 17.7 -02.6 64.0
28°	25 46.6 -05.2 62.7	24 53.8 -04.7 62.8	24 00.9 -04.1 62.8	23 08.0 -03.6 62.9	22 15.1 -03.0 63.0
29°	25 41.4 -05.6 61.6	24 49.1 -05.1 61.7	23 56.8 -04.5 61.8	23 04.4 -04.0 61.8	22 12.1 -03.5 61.9

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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 47.8 +08.7 92.9	18 48.5 +08.6 92.7	17 49.1 +08.6 92.6	16 49.8 +08.5 92.4	15 50.4 +08.5 92.3
1°	19 56.5 +08.3 91.8	18 57.1 +08.3 91.7	17 57.7 +08.3 91.5	16 58.3 +08.3 91.4	15 58.9 +08.3 91.3
2°	20 04.8 +08.0 90.8	19 05.4 +08.0 90.7	18 06.0 +08.0 90.5	17 06.6 +07.9 90.4	16 07.2 +07.9 90.2
3°	20 12.8 +07.5 89.7	19 13.4 +07.5 89.6	18 14.0 +07.5 89.5	17 14.5 +07.7 89.3	16 15.1 +07.7 89.2
4°	20 20.3 +07.2 88.7	19 20.9 +07.3 88.5	18 21.5 +07.3 88.4	17 22.2 +07.3 88.3	16 22.8 +07.3 88.2
5°	20 27.5 +06.8 87.6	19 28.2 +06.8 87.5	18 28.8 +06.9 87.4	17 29.5 +06.9 87.2	16 30.1 +07.0 87.1
6°	20 34.3 +06.4 86.6	19 35.0 +06.5 86.4	18 35.7 +06.6 86.3	17 36.4 +06.7 86.2	16 37.1 +06.8 86.1
7°	20 40.7 +06.0 85.5	19 41.5 +06.1 85.4	18 42.3 +06.2 85.3	17 43.1 +06.3 85.2	16 43.9 +06.4 85.1
8°	20 46.7 +05.7 84.4	19 47.6 +05.8 84.3	18 48.5 +05.8 84.2	17 49.4 +06.0 84.1	16 50.3 +06.1 84.0
9°	20 52.4 +05.2 83.4	19 53.4 +05.3 83.3	18 54.3 +05.6 83.2	17 55.4 +05.6 83.1	16 56.4 +05.8 83.0
10°	20 57.6 +04.8 82.3	19 58.7 +05.0 82.2	18 59.9 +05.1 82.1	18 01.0 +05.3 82.0	17 02.2 +05.4 81.9
11°	21 02.4 +04.4 81.2	20 03.7 +04.6 81.2	19 05.0 +04.8 81.1	18 06.3 +05.0 81.0	17 07.6 +05.2 80.9
12°	21 06.8 +04.1 80.2	20 08.3 +04.2 80.1	19 09.8 +04.4 80.0	18 11.3 +04.6 79.9	17 12.8 +04.8 79.8
13°	21 10.9 +03.6 79.1	20 12.5 +03.9 79.0	19 14.2 +04.1 79.0	18 15.9 +04.3 78.9	17 17.6 +04.5 78.8
14°	21 14.5 +03.2 78.0	20 16.4 +03.4 78.0	19 18.3 +03.7 77.9	18 20.2 +03.9 77.8	17 22.1 +04.2 77.8
15°	21 17.7 +02.8 77.0	20 19.8 +03.1 76.9	19 22.0 +03.3 76.8	18 24.1 +03.6 76.8	17 26.3 +03.8 76.7
16°	21 20.5 +02.4 75.9	20 22.9 +02.7 75.8	19 25.3 +03.0 75.8	18 27.7 +03.2 75.7	17 30.1 +03.6 75.7
17°	21 22.9 +02.0 74.8	20 25.6 +02.3 74.8	19 28.3 +02.5 74.7	18 30.9 +02.9 74.7	17 33.7 +03.1 74.6
18°	21 24.9 +01.6 73.7	20 27.9 +01.9 73.7	19 30.8 +02.3 73.7	18 33.8 +02.6 73.6	17 36.8 +02.9 73.6
19°	21 26.5 +01.2 72.7	20 29.8 +01.5 72.6	19 33.1 +01.8 72.6	18 36.4 +02.2 72.6	17 39.7 +02.5 72.5
20°	21 27.7 +00.7 71.6	20 31.3 +01.1 71.6	19 34.9 +01.5 71.5	18 38.6 +01.8 71.5	17 42.2 +02.2 71.5
21°	21 28.4 +00.4 70.5	20 32.4 +00.7 70.5	19 36.4 +01.1 70.5	18 40.4 +01.5 70.5	17 44.4 +01.9 70.4
22°	21 28.8 -00.1 69.4	20 33.1 +00.4 69.4	19 37.5 +00.7 69.4	18 41.9 +01.1 69.4	17 46.3 +01.5 69.4
23°	21 28.7 -00.5 68.4	20 33.5 -00.1 68.4	19 38.2 +00.4 68.4	18 43.0 +00.8 68.3	17 47.8 +01.2 68.3
24°	21 28.2 -00.9 67.3	20 33.4 -00.5 67.3	19 38.6 +00.0 67.3	18 43.8 +00.4 67.3	17 49.0 +00.8 67.3
25°	21 27.3 -01.3 66.2	20 32.9 -00.8 66.2	19 38.6 -00.4 66.2	18 44.2 +00.1 66.2	17 49.8 +00.5 66.2
26°	21 26.0 -01.7 65.1	20 32.1 -01.2 65.2	19 38.2 -00.8 65.2	18 44.3 -00.3 65.2	17 50.3 +00.2 65.2
27°	21 24.3 -02.1 64.1	20 30.9 -01.7 64.1	19 37.4 -01.1 64.1	18 44.0 -00.7 64.1	17 50.5 -00.2 64.1
28°	21 22.2 -02.5 63.0	20 29.2 -02.0 63.0	19 36.3 -01.5 63.1	18 43.3 -01.0 63.1	17 50.3 -00.5 63.1
29°	21 19.7 -03.0 61.9	20 27.2 -02.4 62.0	19 34.8 -01.9 62.0	18 42.3 -01.3 62.0	17 49.8 -00.8 62.0

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 51.0 +08.5 92.1	13 51.7 +08.4 92.0	12 52.3 +08.4 91.8	11 52.9 +08.4 91.7	10 53.5 +08.4 91.5
1°	14 59.5 +08.3 91.1	14 00.1 +08.3 91.0	13 00.7 +08.2 90.8	12 01.3 +08.2 90.7	11 01.9 +08.2 90.5
2°	15 07.8 +07.9 90.1	14 08.4 +07.9 89.9	13 08.9 +08.0 89.8	12 09.5 +08.0 89.7	11 10.1 +08.0 89.5
3°	15 15.7 +07.7 89.1	14 16.3 +07.7 88.9	13 16.9 +07.7 88.8	12 17.5 +07.8 88.7	11 18.1 +07.8 88.5
4°	15 23.4 +07.4 88.0	14 24.0 +07.4 87.9	13 24.6 +07.5 87.8	12 25.3 +07.5 87.6	11 25.9 +07.6 87.5
5°	15 30.8 +07.1 87.0	14 31.4 +07.2 86.9	13 32.1 +07.2 86.7	12 32.8 +07.3 86.6	11 33.5 +07.4 86.5
6°	15 37.9 +06.8 86.0	14 38.6 +06.9 85.8	13 39.3 +07.0 85.7	12 40.1 +07.1 85.6	11 40.9 +07.1 85.5
7°	15 44.7 +06.5 84.9	14 45.5 +06.6 84.8	13 46.3 +06.8 84.7	12 47.2 +06.8 84.6	11 48.0 +07.0 84.5
8°	15 51.2 +06.2 83.9	14 52.1 +06.4 83.8	13 53.1 +06.4 83.7	12 54.0 +06.6 83.6	11 55.0 +06.7 83.5
9°	15 57.4 +05.9 82.9	14 58.5 +06.0 82.8	13 59.5 +06.3 82.7	13 00.6 +06.4 82.5	12 01.7 +06.5 82.4
10°	16 03.3 +05.7 81.8	15 04.5 +05.8 81.7	14 05.8 +05.9 81.6	13 07.0 +06.1 81.5	12 08.2 +06.3 81.4
11°	16 09.0 +05.3 80.8	15 10.3 +05.5 80.7	14 11.7 +05.7 80.6	13 13.1 +05.9 80.5	12 14.5 +06.1 80.4
12°	16 14.3 +05.0 79.8	15 15.8 +05.3 79.7	14 17.4 +05.4 79.6	13 19.0 +05.6 79.5	12 20.6 +05.8 79.4
13°	16 19.3 +04.8 78.7	15 21.1 +04.9 78.6	14 22.8 +05.2 78.6	13 24.6 +05.4 78.5	12 26.4 +05.6 78.4
14°	16 24.1 +04.4 77.7	15 26.0 +04.7 77.6	14 28.0 +04.9 77.5	13 30.0 +05.1 77.4	12 32.0 +05.4 77.3
15°	16 28.5 +04.1 76.6	15 30.7 +04.3 76.6	14 32.9 +04.6 76.5	13 35.1 +04.9 76.4	12 37.4 +05.1 76.3
16°	16 32.6 +03.8 75.6	15 35.0 +04.1 75.5	14 37.5 +04.4 75.5	13 40.0 +04.6 75.4	12 42.5 +04.9 75.3
17°	16 36.4 +03.5 74.6	15 39.1 +03.8 74.5	14 41.9 +04.0 74.4	13 44.6 +04.4 74.4	12 47.4 +04.7 74.3
18°	16 39.9 +03.1 73.5	15 42.9 +03.5 73.5	14 45.9 +03.8 73.4	13 49.0 +04.1 73.3	12 52.1 +04.4 73.3
19°	16 43.0 +02.9 72.5	15 46.4 +03.2 72.4	14 49.7 +03.6 72.4	13 53.1 +03.9 72.3	12 56.5 +04.2 72.2
20°	16 45.9 +02.5 71.4	15 49.6 +02.9 71.4	14 53.3 +03.2 71.3	13 57.0 +03.6 71.3	13 00.7 +04.0 71.2
21°	16 48.4 +02.3 70.4	15 52.5 +02.6 70.4	14 56.5 +03.0 70.3	14 00.6 +03.3 70.2	13 04.7 +03.7 70.2
22°	16 50.7 +01.9 69.3	15 55.1 +02.3 69.3	14 59.5 +02.7 69.3	14 03.9 +03.1 69.2	13 08.4 +03.5 69.2
23°	16 52.6 +01.6 68.3	15 57.4 +02.0 68.3	15 02.2 +02.4 68.2	14 07.0 +02.8 68.2	13 11.9 +03.2 68.1
24°	16 54.2 +01.2 67.3	15 59.4 +01.7 67.2	15 04.6 +02.1 67.2	14 09.8 +02.6 67.2	13 15.1 +03.0 67.1
25°	16 55.4 +01.0 66.2	16 01.1 +01.4 66.2	15 06.7 +01.9 66.2	14 12.4 +02.3 66.1	13 18.1 +02.7 66.1
26°	16 56.4 +00.6 65.2	16 02.5 +01.1 65.2	15 08.6 +01.5 65.1	14 14.7 +02.0 65.1	13 20.8 +02.5 65.1
27°	16 57.0 +00.4 64.1	16 03.6 +00.8 64.1	15 10.1 +01.3 64.1	14 16.7 +01.8 64.1	13 23.3 +02.2 64.0
28°	16 57.4 +00.0 63.1	16 04.4 +00.5 63.1	15 11.4 +01.0 63.1	14 18.5 +01.4 63.0	13 25.5 +02.0 63.0
29°	16 57.4 -00.4 62.0	16 04.9 +00.2 62.0	15 12.4 +00.7 62.0	14 19.9 +01.3 62.0	13 27.5 +01.7 62.0

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 54.1 +08.4 91.4	8 54.7 +08.4 91.3	7 55.3 +08.4 91.1	6 55.9 +08.3 91.0	5 56.5 +08.3 90.8
1°	10 02.5 +08.2 90.4	9 03.1 +08.2 90.3	8 03.7 +08.2 90.1	7 04.2 +08.3 90.0	6 04.8 +08.3 89.8
2°	10 10.7 +08.0 89.4	9 11.3 +08.0 89.3	8 11.9 +08.0 89.1	7 12.5 +08.1 89.0	6 13.1 +08.1 88.8
3°	10 18.7 +07.8 88.4	9 19.3 +07.9 88.3	8 19.9 +08.0 88.1	7 20.6 +07.9 88.0	6 21.2 +08.0 87.8
4°	10 26.5 +07.7 87.4	9 27.2 +07.7 87.2	8 27.9 +07.7 87.1	7 28.5 +07.8 87.0	6 29.2 +07.9 86.9
5°	10 34.2 +07.4 86.4	9 34.9 +07.5 86.2	8 35.6 +07.6 86.1	7 36.3 +07.7 86.0	6 37.1 +07.7 85.9
6°	10 41.6 +07.3 85.4	9 42.4 +07.4 85.2	8 43.2 +07.5 85.1	7 44.0 +07.6 85.0	6 44.8 +07.7 84.9
7°	10 48.9 +07.1 84.4	9 49.8 +07.1 84.2	8 50.7 +07.3 84.1	7 51.6 +07.4 84.0	6 52.5 +07.5 83.9
8°	10 56.0 +06.8 83.3	9 56.9 +07.0 83.2	8 58.0 +07.1 83.1	7 59.0 +07.2 83.0	7 00.0 +07.4 82.9
9°	11 02.8 +06.7 82.3	10 03.9 +06.8 82.2	9 05.1 +06.9 82.1	8 06.2 +07.1 82.0	7 07.4 +07.3 81.9
10°	11 09.5 +06.4 81.3	10 10.7 +06.7 81.2	9 12.0 +06.8 81.1	8 13.3 +07.0 81.0	7 14.7 +07.1 80.9
11°	11 15.9 +06.3 80.3	10 17.4 +06.4 80.2	9 18.8 +06.7 80.1	8 20.3 +06.8 80.0	7 21.8 +07.0 79.9
12°	11 22.2 +06.0 79.3	10 23.8 +06.2 79.2	9 25.5 +06.4 79.1	8 27.1 +06.7 79.0	7 28.8 +06.9 78.9
13°	11 28.2 +05.8 78.3	10 30.0 +06.1 78.2	9 31.9 +06.3 78.1	8 33.8 +06.5 78.0	7 35.7 +06.7 77.9
14°	11 34.0 +05.7 77.3	10 36.1 +05.9 77.2	9 38.2 +06.1 77.1	8 40.3 +06.3 77.0	7 42.4 +06.6 76.8
15°	11 39.7 +05.4 76.2	10 42.0 +05.6 76.1	9 44.3 +05.9 76.1	8 46.6 +06.2 76.0	7 49.0 +06.5 75.8
16°	11 45.1 +05.1 75.2	10 47.6 +05.5 75.1	9 50.2 +05.7 75.0	8 52.8 +06.0 74.9	7 55.5 +06.3 74.8
17°	11 50.2 +05.0 74.2	10 53.1 +05.2 74.1	9 55.9 +05.6 74.0	8 58.8 +05.9 73.9	8 01.8 +06.1 73.8
18°	11 55.2 +04.8 73.2	10 58.3 +05.1 73.1	10 01.5 +05.4 73.0	9 04.7 +05.7 72.9	8 07.9 +06.0 72.8
19°	12 00.0 +04.5 72.2	11 03.4 +04.9 72.1	10 06.9 +05.2 72.0	9 10.4 +05.5 71.9	8 13.9 +05.9 71.8
20°	12 04.5 +04.3 71.1	11 08.3 +04.6 71.1	10 12.1 +05.0 71.0	9 15.9 +05.4 70.9	8 19.8 +05.7 70.8
21°	12 08.8 +04.1 70.1	11 12.9 +04.5 70.1	10 17.1 +04.8 70.0	9 21.3 +05.2 69.9	8 25.5 +05.5 69.8
22°	12 12.9 +03.8 69.1	11 17.4 +04.2 69.0	10 21.9 +04.6 69.0	9 26.5 +05.0 68.9	8 31.0 +05.4 68.8
23°	12 16.7 +03.7 68.1	11 21.6 +04.0 68.0	10 26.5 +04.5 68.0	9 31.5 +04.8 67.9	8 36.4 +05.3 67.8
24°	12 20.4 +03.3 67.1	11 25.6 +03.9 67.0	10 31.0 +04.2 66.9	9 36.3 +04.7 66.9	8 41.7 +05.1 66.8
25°	12 23.7 +03.2 66.0	11 29.5 +03.6 66.0	10 35.2 +04.0 65.9	9 41.0 +04.5 65.9	8 46.8 +04.9 65.8
26°	12 26.9 +03.0 65.0	11 33.1 +03.4 65.0	10 39.2 +03.9 64.9	9 45.5 +04.3 64.8	8 51.7 +04.7 64.8
27°	12 29.9 +02.7 64.0	11 36.5 +03.1 63.9	10 43.1 +03.7 63.9	9 49.8 +04.1 63.8	8 56.4 +04.6 63.8
28°	12 32.6 +02.4 63.0	11 39.6 +03.0 62.9	10 46.8 +03.4 62.9	9 53.9 +03.9 62.8	9 01.0 +04.5 62.8
29°	12 35.0 +02.3 61.9	11 42.6 +02.8 61.9	10 50.2 +03.3 61.9	9 57.8 +03.8 61.8	9 05.5 +04.2 61.8

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 57.1 +08.3 90.7	3 57.7 +08.3 90.6	2 58.2 +08.4 90.4	1 58.8 +08.4 90.3	0 59.4 +08.4 90.1
1°	5 05.4 +08.3 89.7	4 06.0 +08.3 89.6	3 06.6 +08.3 89.4	2 07.2 +08.3 89.3	1 07.8 +08.3 89.1
2°	5 13.7 +08.1 88.7	4 14.3 +08.1 88.6	3 14.9 +08.2 88.4	2 15.5 +08.2 88.3	1 16.1 +08.3 88.2
3°	5 21.8 +08.1 87.7	4 22.4 +08.1 87.6	3 23.1 +08.1 87.4	2 23.7 +08.2 87.3	1 24.4 +08.3 87.2
4°	5 29.9 +07.9 86.7	4 30.5 +08.1 86.6	3 31.2 +08.1 86.4	2 31.9 +08.2 86.3	1 32.7 +08.2 86.2
5°	5 37.8 +07.9 85.7	4 38.6 +07.9 85.6	3 39.3 +08.1 85.5	2 40.1 +08.1 85.3	1 40.9 +08.2 85.2
6°	5 45.7 +07.7 84.7	4 46.5 +07.9 84.6	3 47.4 +07.9 84.5	2 48.2 +08.1 84.3	1 49.1 +08.2 84.2
7°	5 53.4 +07.7 83.7	4 54.4 +07.7 83.6	3 55.3 +07.9 83.5	2 56.3 +08.0 83.3	1 57.3 +08.1 83.2
8°	6 01.1 +07.5 82.7	5 02.1 +07.7 82.6	4 03.2 +07.8 82.5	3 04.3 +08.0 82.3	2 05.4 +08.2 82.2
9°	6 08.6 +07.4 81.7	5 09.8 +07.6 81.6	4 11.0 +07.8 81.5	3 12.3 +07.9 81.4	2 13.6 +08.0 81.2
10°	6 16.0 +07.3 80.7	5 17.4 +07.5 80.6	4 18.8 +07.7 80.5	3 20.2 +07.8 80.4	2 21.6 +08.1 80.2
11°	6 23.3 +07.2 79.7	5 24.9 +07.4 79.6	4 26.5 +07.5 79.5	3 28.0 +07.8 79.4	2 29.7 +07.9 79.2
12°	6 30.5 +07.1 78.7	5 32.3 +07.3 78.6	4 34.0 +07.5 78.5	3 35.8 +07.7 78.4	2 37.6 +08.0 78.2
13°	6 37.6 +07.0 77.7	5 39.6 +07.2 77.6	4 41.5 +07.5 77.5	3 43.5 +07.7 77.4	2 45.6 +07.9 77.3
14°	6 44.6 +06.8 76.7	5 46.8 +07.0 76.6	4 49.0 +07.3 76.5	3 51.2 +07.6 76.4	2 53.5 +07.8 76.3
15°	6 51.4 +06.7 75.7	5 53.8 +07.0 75.6	4 56.3 +07.2 75.5	3 58.8 +07.5 75.4	3 01.3 +07.8 75.3
16°	6 58.1 +06.6 74.7	6 00.8 +06.9 74.6	5 03.5 +07.2 74.5	4 06.3 +07.4 74.4	3 09.1 +07.7 74.3
17°	7 04.7 +06.5 73.7	6 07.7 +06.7 73.6	5 10.7 +07.0 73.5	4 13.7 +07.4 73.4	3 16.8 +07.7 73.3
18°	7 11.2 +06.3 72.7	6 14.4 +06.7 72.6	5 17.7 +07.0 72.5	4 21.1 +07.3 72.4	3 24.5 +07.6 72.3
19°	7 17.5 +06.2 71.7	6 21.1 +06.5 71.6	5 24.7 +06.9 71.5	4 28.4 +07.2 71.4	3 32.1 +07.5 71.3
20°	7 23.7 +06.0 70.7	6 27.6 +06.4 70.6	5 31.6 +06.7 70.5	4 35.6 +07.1 70.4	3 39.6 +07.5 70.3
21°	7 29.7 +06.0 69.7	6 34.0 +06.3 69.6	5 38.3 +06.7 69.5	4 42.7 +07.0 69.4	3 47.1 +07.4 69.3
22°	7 35.7 +05.7 68.7	6 40.3 +06.2 68.6	5 45.0 +06.6 68.5	4 49.7 +07.0 68.4	3 54.5 +07.3 68.3
23°	7 41.4 +05.7 67.7	6 46.5 +06.0 67.6	5 51.6 +06.4 67.5	4 56.7 +06.8 67.4	4 01.8 +07.3 67.3
24°	7 47.1 +05.5 66.7	6 52.5 +06.0 66.6	5 58.0 +06.4 66.5	5 03.5 +06.8 66.4	4 09.1 +07.2 66.3
25°	7 52.6 +05.3 65.7	6 58.5 +05.7 65.6	6 04.4 +06.2 65.5	5 10.3 +06.7 65.4	4 16.3 +07.1 65.3
26°	7 57.9 +05.3 64.7	7 04.2 +05.7 64.6	6 10.6 +06.1 64.5	5 17.0 +06.5 64.4	4 23.4 +07.0 64.3
27°	8 03.2 +05.0 63.7	7 09.9 +05.6 63.6	6 16.7 +06.0 63.5	5 23.5 +06.5 63.4	4 30.4 +07.0 63.3
28°	8 08.2 +04.9 62.7	7 15.5 +05.4 62.6	6 22.7 +05.9 62.5	5 30.0 +06.4 62.4	4 37.4 +06.8 62.3
29°	8 13.1 +04.8 61.7	7 20.9 +05.2 61.6	6 28.6 +05.8 61.5	5 36.4 +06.3 61.4	4 44.2 +06.8 61.3

Latitude 8°

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 +08.3 90.0	-0 59.4 +08.3	-1 58.8 +08.3	-2 58.2 +08.3	-3 57.7 +08.4
1°	0 08.3 +08.4 89.0	-0 51.1 +08.4	-1 50.5 +08.4	-2 49.9 +08.5	-3 49.3 +08.5
2°	0 16.7 +08.3 88.0	-0 42.7 +08.4	-1 42.1 +08.5	-2 41.4 +08.5	-3 40.8 +08.6
3°	0 25.0 +08.4 87.0	-0 34.3 +08.4	-1 33.6 +08.4	-2 32.9 +08.5	-3 32.2 +08.6
4°	0 33.4 +08.3 86.0	-0 25.9 +08.4	-1 25.2 +08.5	-2 24.4 +08.6	-3 23.6 +08.6
5°	0 41.7 +08.3 85.0	-0 17.5 +08.4	-1 16.7 +08.5	-2 15.8 +08.6	-3 15.0 +08.7
6°	0 50.0 +08.3 84.1	-0 09.1 +08.4	-1 08.2 +08.6	-2 07.2 +08.6	-3 06.3 +08.8
7°	0 58.3 +08.3 83.1	-0 00.7 +08.5	-0 59.6 +08.5	-1 58.6 +08.7	-2 57.5 +08.9
8°	1 06.6 +08.3 82.1	0 07.8 +08.4 81.9	-0 51.1 +08.6	-1 49.9 +08.8	-2 48.6 +08.8
9°	1 14.9 +08.2 81.1	0 16.2 +08.4 80.9	-0 42.5 +08.6	-1 41.1 +08.7	-2 39.8 +09.0
10°	1 23.1 +08.2 80.1	0 24.6 +08.4 80.0	-0 33.9 +08.6	-1 32.4 +08.8	-2 30.8 +08.9
11°	1 31.3 +08.2 79.1	0 33.0 +08.4 79.0	-0 25.3 +08.6	-1 23.6 +08.8	-2 21.9 +09.1
12°	1 39.5 +08.1 78.1	0 41.4 +08.3 78.0	-0 16.7 +08.6	-1 14.8 +08.8	-2 12.8 +09.0
13°	1 47.6 +08.2 77.1	0 49.7 +08.4 77.0	-0 08.1 +08.6	-1 06.0 +08.9	-2 03.8 +09.1
14°	1 55.8 +08.1 76.1	0 58.1 +08.3 76.0	0 00.5 +08.6 75.9	-0 57.1 +08.8	-1 54.7 +09.1
15°	2 03.9 +08.0 75.1	1 06.4 +08.4 75.0	0 09.1 +08.6 74.9	-0 48.3 +08.9	-1 45.6 +09.2
16°	2 11.9 +08.0 74.1	1 14.8 +08.3 74.0	0 17.7 +08.6 73.9	-0 39.4 +08.9	-1 36.4 +09.2
17°	2 19.9 +08.0 73.2	1 23.1 +08.3 73.0	0 26.3 +08.6 72.9	-0 30.5 +08.9	-1 27.2 +09.2
18°	2 27.9 +07.9 72.2	1 31.4 +08.2 72.0	0 34.9 +08.5 71.9	-0 21.6 +08.9	-1 18.0 +09.2
19°	2 35.8 +07.9 71.2	1 39.6 +08.2 71.0	0 43.4 +08.6 70.9	-0 12.7 +08.9	-1 08.8 +09.3
20°	2 43.7 +07.8 70.2	1 47.8 +08.2 70.1	0 52.0 +08.5 69.9	-0 03.8 +08.9	-0 59.5 +09.3
21°	2 51.5 +07.8 69.2	1 56.0 +08.2 69.1	1 00.5 +08.6 68.9	0 05.1 +08.9 68.8	-0 50.2 +09.2
22°	2 59.3 +07.7 68.2	2 04.2 +08.1 68.1	1 09.1 +08.5 67.9	0 14.0 +08.9 67.8	-0 41.0 +09.3
23°	3 07.0 +07.7 67.2	2 12.3 +08.1 67.1	1 17.6 +08.5 67.0	0 22.9 +08.9 66.8	-0 31.7 +09.4
24°	3 14.7 +07.6 66.2	2 20.4 +08.0 66.1	1 26.1 +08.4 66.0	0 31.8 +08.9 65.8	-0 22.3 +09.3
25°	3 22.3 +07.6 65.2	2 28.4 +08.0 65.1	1 34.5 +08.5 65.0	0 40.7 +08.9 64.8	-0 13.0 +09.3
26°	3 29.9 +07.5 64.2	2 36.4 +07.9 64.1	1 43.0 +08.4 64.0	0 49.6 +08.9 63.9	-0 03.7 +09.3
27°	3 37.4 +07.4 63.2	2 44.3 +07.9 63.1	1 51.4 +08.3 63.0	0 58.5 +08.8 62.9	0 05.6 +09.3 62.7
28°	3 44.8 +07.3 62.2	2 52.2 +07.9 62.1	1 59.7 +08.4 62.0	1 07.3 +08.8 61.9	0 14.9 +09.4 61.7
29°	3 52.1 +07.3 61.2	3 00.1 +07.8 61.1	2 08.1 +08.3 61.0	1 16.1 +08.8 60.9	0 24.3 +09.3 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 57.1 +08.5				
1°	-4 48.6 +08.5				
2°	-4 40.1 +08.6				
3°	-4 31.5 +08.6				
4°	-4 22.9 +08.8				
5°	-4 14.1 +08.8				
6°	-4 05.3 +08.9				
7°	-3 56.4 +09.0				
8°	-3 47.4 +09.0				
9°	-3 38.4 +09.2				
10°	-3 29.2 +09.1				
11°	-3 20.1 +09.3				
12°	-3 10.8 +09.2				
13°	-3 01.6 +09.4				
14°	-2 52.2 +09.4				
15°	-2 42.8 +09.4				
16°	-2 33.4 +09.5				
17°	-2 23.9 +09.5				
18°	-2 14.4 +09.6				
19°	-2 04.8 +09.6				
20°	-1 55.2 +09.6				
21°	-1 45.6 +09.7				
22°	-1 35.9 +09.7				
23°	-1 26.2 +09.7				
24°	-1 16.5 +09.8				
25°	-1 06.7 +09.8				
26°	-0 56.9 +09.7				
27°	-0 47.2 +09.8				
28°	-0 37.4 +09.9				
29°	-0 27.5 +09.8				

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Declination SAME name as Latitude

Latitude 9°

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°	81 00.0 +60.0 180.0	80 56.7 +59.6 173.6	80 46.9 +58.5 167.4	80 31.0 +56.7 161.5	80 09.5 +54.3 155.9
1°	82 00.0 +60.0 180.0	81 56.3 +59.5 172.9	81 45.4 +58.0 165.9	81 27.7 +55.7 159.4	81 03.8 +53.1 153.3
2°	83 00.0 +60.0 180.0	82 55.8 +59.3 171.9	82 43.4 +57.4 164.0	82 23.4 +54.6 156.7	81 56.9 +51.2 150.2
3°	84 00.0 +60.0 180.0	83 55.1 +59.0 170.5	83 40.8 +56.4 161.5	83 18.0 +52.8 153.4	82 48.1 +48.7 146.2
4°	85 00.0 +60.0 180.0	84 54.1 +58.6 168.7	84 37.2 +54.9 158.2	84 10.8 +50.0 149.0	83 36.8 +45.1 141.3
5°	86 00.0 +60.0 180.0	85 52.7 +57.7 166.0	85 32.1 +52.1 153.5	85 00.8 +45.7 143.1	84 21.9 +39.8 135.0
6°	87 00.0 +60.0 180.0	86 50.4 +55.7 161.6	86 24.2 +46.9 146.4	85 46.5 +38.6 135.0	85 01.7 +32.1 126.8
7°	88 00.0 +60.0 180.0	87 46.1 +49.5 153.6	87 11.1 +35.9 135.1	86 25.1 +27.0 123.7	85 33.8 +21.4 116.5
8°	89 00.0 +60.0 180.0	88 35.6 +25.1 135.2	87 47.0 +14.5 116.7	86 52.1 +10.1 108.4	85 55.2 +07.8 103.9
9°	90 00.0 -60.0 0.0	89 00.7 -25.0 89.9	88 01.5 -14.2 89.8	87 02.2 -09.6 89.8	86 03.0 -07.2 89.7
10°	89 00.0 -60.0 0.0	88 35.7 -49.5 44.5	87 47.3 -35.7 63.0	86 52.6 -26.7 71.1	85 55.8 -20.9 75.5
11°	88 00.0 -60.0 0.0	87 46.2 -55.6 26.1	87 11.6 -46.8 44.4	86 25.9 -38.3 55.7	85 34.9 -31.7 62.7
12°	87 00.0 -60.0 0.0	86 50.6 -57.7 18.1	86 24.8 -52.1 33.1	85 47.6 -45.6 44.3	85 03.2 -39.5 52.3
13°	86 00.0 -60.0 0.0	85 52.9 -58.6 13.7	85 32.7 -54.9 26.0	85 02.0 -50.0 36.1	84 23.7 -44.8 44.1
14°	85 00.0 -60.0 0.0	84 54.3 -59.0 11.0	84 37.8 -56.4 21.2	84 12.0 -52.7 30.2	83 38.9 -48.6 37.7
15°	84 00.0 -60.0 0.0	83 55.3 -59.4 9.2	83 41.4 -57.4 17.9	83 19.3 -54.5 25.8	82 50.3 -51.2 32.7
16°	83 00.0 -60.0 0.0	82 55.9 -59.4 7.8	82 44.0 -58.0 15.4	82 24.8 -55.8 22.4	81 59.1 -52.9 28.7
17°	82 00.0 -60.0 0.0	81 56.5 -59.6 6.8	81 46.0 -58.4 13.5	81 29.0 -56.6 19.8	81 06.2 -54.4 25.6
18°	81 00.0 -60.0 0.0	80 56.9 -59.7 6.1	80 47.6 -58.8 12.0	80 32.4 -57.2 17.6	80 11.8 -55.3 22.9
19°	80 00.0 -60.0 0.0	79 57.2 -59.7 5.4	79 48.8 -58.9 10.8	79 35.2 -57.7 15.9	79 16.5 -56.1 20.8
20°	79 00.0 -60.0 0.0	78 57.5 -59.8 4.9	78 49.9 -59.1 9.7	78 37.5 -58.1 14.4	78 20.4 -56.6 18.9
21°	78 00.0 -60.0 0.0	77 57.7 -59.8 4.5	77 50.8 -59.3 8.9	77 39.4 -58.4 13.2	77 23.8 -57.2 17.4
22°	77 00.0 -60.0 0.0	76 57.9 -59.9 4.1	76 51.5 -59.3 8.2	76 41.0 -58.5 12.2	76 26.6 -57.5 16.0
23°	76 00.0 -60.0 0.0	75 58.0 -59.8 3.8	75 52.2 -59.5 7.6	75 42.5 -58.8 11.3	75 29.1 -57.8 14.8
24°	75 00.0 -60.0 0.0	74 58.2 -59.9 3.5	74 52.7 -59.5 7.0	74 43.7 -58.9 10.5	74 31.3 -58.1 13.8
25°	74 00.0 -60.0 0.0	73 58.3 -59.9 3.3	73 53.2 -59.5 6.5	73 44.8 -59.0 9.8	73 33.2 -58.3 12.9
26°	73 00.0 -60.0 0.0	72 58.4 -59.9 3.1	72 53.7 -59.6 6.1	72 45.8 -59.1 9.1	72 34.9 -58.5 12.1
27°	72 00.0 -60.0 0.0	71 58.5 -59.9 2.9	71 54.1 -59.7 5.7	71 46.7 -59.3 8.6	71 36.4 -58.6 11.4
28°	71 00.0 -60.0 0.0	70 58.6 -59.9 2.7	70 54.4 -59.7 5.4	70 47.4 -59.2 8.1	70 37.8 -58.8 10.7
29°	70 00.0 -60.0 0.0	69 58.7 -59.9 2.6	69 54.7 -59.7 5.1	69 48.2 -59.4 7.6	69 39.0 -58.8 10.1

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°	79 42.9 +51.8 150.8	79 11.8 +49.2 146.1	78 37.0 +46.5 141.9	77 58.8 +44.0 138.1	77 17.9 +41.5 134.6
1°	80 34.7 +50.1 147.8	80 01.0 +47.1 142.9	79 23.5 +44.1 138.6	78 42.8 +41.3 134.7	77 59.4 +38.7 131.3
2°	81 24.8 +47.7 144.3	80 48.1 +44.3 139.2	80 07.6 +41.1 134.7	79 24.1 +38.2 130.9	78 38.1 +35.6 127.5
3°	82 12.5 +44.7 140.1	81 32.4 +40.9 134.8	80 48.7 +37.5 130.3	80 02.3 +34.4 126.5	79 13.7 +31.8 123.3
4°	82 57.2 +40.4 134.9	82 13.3 +36.3 129.6	81 26.2 +32.9 125.3	80 36.7 +29.9 121.7	79 45.5 +27.4 118.6
5°	83 37.6 +34.8 128.5	82 49.6 +30.7 123.5	81 59.1 +27.3 119.5	81 06.6 +24.7 116.2	80 12.9 +22.3 113.5
6°	84 12.4 +27.2 120.8	83 20.3 +23.6 116.3	82 26.4 +20.7 112.9	81 31.3 +18.5 110.2	80 35.2 +16.8 108.0
7°	84 39.6 +17.7 111.6	83 43.9 +15.0 108.2	82 47.1 +13.2 105.6	81 49.8 +11.7 103.6	80 52.0 +10.6 102.0
8°	84 57.3 +06.4 101.1	83 58.9 +05.5 99.1	83 00.3 +04.9 97.7	82 01.5 +04.4 96.6	81 02.6 +04.1 95.7
9°	85 03.7 -05.6 89.6	84 04.4 -04.5 89.5	83 05.2 -03.8 89.5	82 05.9 -03.1 89.4	81 06.7 -02.6 89.3
10°	84 58.1 -17.0 78.1	83 59.9 -14.2 79.9	83 01.4 -12.0 81.2	82 02.8 -10.5 82.1	81 04.1 -09.2 82.8
11°	84 41.1 -26.6 67.5	83 45.7 -22.8 70.8	82 49.4 -19.8 73.2	81 52.3 -17.4 75.1	80 54.9 -15.5 76.5
12°	84 14.5 -34.3 58.2	83 22.9 -30.0 62.5	82 29.6 -26.6 65.8	81 34.9 -23.6 68.4	80 39.4 -21.2 70.5
13°	83 40.2 -40.2 50.4	82 52.9 -35.9 55.3	82 03.0 -32.2 59.2	81 11.3 -29.0 62.3	80 18.2 -26.3 64.8
14°	83 00.0 -44.3 43.9	82 17.0 -40.5 49.1	81 30.8 -36.9 53.3	80 42.3 -33.7 56.7	79 51.9 -30.9 59.6
15°	82 15.7 -47.6 38.7	81 36.5 -44.0 43.8	80 53.9 -40.7 48.1	80 08.6 -37.6 51.7	79 21.0 -34.7 54.9
16°	81 28.1 -50.0 34.4	80 52.5 -46.8 39.3	80 13.2 -43.7 43.6	79 31.0 -40.9 47.3	78 46.3 -38.1 50.6
17°	80 38.1 -51.7 30.8	80 05.7 -49.0 35.5	79 29.5 -46.2 39.7	78 50.1 -43.5 43.4	78 08.2 -40.9 46.7
18°	79 46.4 -53.1 27.8	79 16.7 -50.7 32.3	78 43.3 -48.3 36.3	78 06.6 -45.7 40.0	77 27.3 -43.3 43.2
19°	78 53.3 -54.2 25.3	78 26.0 -52.1 29.5	77 55.0 -49.8 33.4	77 20.9 -47.6 36.9	76 44.0 -45.4 40.1
20°	77 59.1 -55.0 23.2	77 33.9 -53.1 27.1	77 05.2 -51.2 30.8	76 33.3 -49.1 34.2	75 58.6 -47.0 37.3
21°	77 04.1 -55.7 21.3	76 40.8 -54.1 25.1	76 14.0 -52.2 28.6	75 44.2 -50.4 31.8	75 11.6 -48.5 34.9
22°	76 08.4 -56.2 19.7	75 46.7 -54.8 23.2	75 21.8 -53.2 26.6	74 53.8 -51.5 29.7	74 23.1 -49.7 32.6
23°	75 12.2 -56.7 18.3	74 51.9 -55.4 21.6	74 28.6 -54.0 24.8	74 02.3 -52.4 27.8	73 33.4 -50.7 30.6
24°	74 15.5 -57.1 17.1	73 56.5 -55.9 20.2	73 34.6 -54.6 23.2	73 09.9 -53.2 26.0	72 42.7 -51.7 28.7
25°	73 18.4 -57.4 16.0	73 00.6 -56.3 18.9	72 40.0 -55.1 21.8	72 16.7 -53.8 24.5	71 51.0 -52.5 27.1
26°	72 21.0 -57.7 15.0	72 04.3 -56.7 17.8	71 44.9 -55.6 20.5	71 22.9 -54.4 23.1	70 58.5 -53.2 25.6
27°	71 23.3 -57.8 14.1	71 07.6 -57.0 16.7	70 49.3 -56.1 19.3	70 28.5 -55.0 21.8	70 05.3 -53.7 24.2
28°	70 25.5 -58.1 13.3	70 10.6 -57.3 15.8	69 53.2 -56.3 18.2	69 33.5 -55.3 20.6	69 11.6 -54.3 22.9
29°	69 27.4 -58.3 12.5	69 13.3 -57.5 14.9	68 56.9 -56.7 17.3	68 38.2 -55.8 19.5	68 17.3 -54.7 21.7

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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°	76 34.6 +39.2 131.6	75 49.4 +37.0 128.8	75 02.4 +35.1 126.4	74 14.0 +33.2 124.1	73 24.3 +31.6 122.1
1°	77 13.8 +36.4 128.2	76 26.4 +34.2 125.5	75 37.5 +32.2 123.1	74 47.2 +30.5 121.0	73 55.9 +28.9 119.1
2°	77 50.2 +33.2 124.5	77 00.6 +31.1 122.0	76 09.7 +29.2 119.7	75 17.7 +27.5 117.7	74 24.8 +25.9 115.9
3°	78 23.4 +29.4 120.5	77 31.7 +27.4 118.1	76 38.9 +25.6 116.0	75 45.2 +24.0 114.1	74 50.7 +22.7 112.5
4°	78 52.8 +25.3 116.1	77 59.1 +23.4 113.9	77 04.5 +21.8 112.0	76 09.2 +20.4 110.3	75 13.4 +19.2 108.9
5°	79 18.1 +20.5 111.3	78 22.5 +18.9 109.4	77 26.3 +17.6 107.8	76 29.6 +16.5 106.4	75 32.6 +15.5 105.1
6°	79 38.6 +15.3 106.1	78 41.4 +14.2 104.6	77 43.9 +13.1 103.3	76 46.1 +12.3 102.2	75 48.1 +11.5 101.2
7°	79 53.9 +09.7 100.7	78 55.6 +08.9 99.6	77 57.0 +08.4 98.7	76 58.4 +07.9 97.9	75 59.6 +07.5 97.2
8°	80 03.6 +03.8 95.0	79 04.5 +03.7 94.4	78 05.4 +03.5 93.9	77 06.3 +03.3 93.5	76 07.1 +03.3 93.1
9°	80 07.4 -02.2 89.2	79 08.2 -01.9 89.1	78 08.9 -01.5 89.1	77 09.6 -01.2 89.0	76 10.4 -01.0 88.9
10°	80 05.2 -08.1 83.4	79 06.3 -07.2 83.8	78 07.4 -06.5 84.2	77 08.4 -05.8 84.5	76 09.4 -05.2 84.7
11°	79 57.1 -13.8 77.7	78 59.1 -12.4 78.6	78 00.9 -11.2 79.4	77 02.6 -10.2 80.0	76 04.2 -09.4 80.6
12°	79 43.3 -19.1 72.2	78 46.7 -17.4 73.5	77 49.7 -15.9 74.7	76 52.4 -14.6 75.7	75 54.8 -13.3 76.5
13°	79 24.2 -24.1 66.9	78 29.3 -22.0 68.7	77 33.8 -20.2 70.2	76 37.8 -18.6 71.4	75 41.5 -17.2 72.5
14°	79 00.1 -28.3 62.0	78 07.3 -26.1 64.1	77 13.6 -24.2 65.8	76 19.2 -22.4 67.4	75 24.3 -20.9 68.7
15°	78 31.8 -32.2 57.5	77 41.2 -29.9 59.8	76 49.4 -27.8 61.8	75 56.8 -25.9 63.5	75 03.4 -24.2 65.0
16°	77 59.6 -35.6 53.4	77 11.3 -33.2 55.8	76 21.6 -31.0 57.9	75 30.9 -29.1 59.8	74 39.2 -27.3 61.5
17°	77 24.0 -38.4 49.6	76 38.1 -36.2 52.1	75 50.6 -34.0 54.4	75 01.8 -32.0 56.4	74 11.9 -30.1 58.2
18°	76 45.6 -41.0 46.1	76 01.9 -38.7 48.7	75 16.6 -36.6 51.1	74 29.8 -34.6 53.2	73 41.8 -32.8 55.0
19°	76 04.6 -43.1 43.0	75 23.2 -41.0 45.7	74 40.0 -39.0 48.0	73 55.2 -37.0 50.2	73 09.0 -35.1 52.1
20°	75 21.5 -44.9 40.2	74 42.2 -42.9 42.8	74 01.0 -40.9 45.2	73 18.2 -39.0 47.4	72 33.9 -37.2 49.4
21°	74 36.6 -46.6 37.7	73 59.3 -44.6 40.2	73 20.1 -42.7 42.6	72 39.2 -41.0 44.8	71 56.7 -39.2 46.8
22°	73 50.0 -47.9 35.3	73 14.7 -46.1 37.9	72 37.4 -44.4 40.2	71 58.2 -42.5 42.4	71 17.5 -40.8 44.4
23°	73 02.1 -49.1 33.2	72 28.6 -47.4 35.7	71 53.0 -45.7 38.0	71 15.7 -44.1 40.1	70 36.7 -42.4 42.1
24°	72 13.0 -50.1 31.3	71 41.2 -48.6 33.7	71 07.3 -47.0 35.9	70 31.6 -45.3 38.1	69 54.3 -43.8 40.0
25°	71 22.9 -51.1 29.5	70 52.6 -49.6 31.9	70 20.3 -48.0 34.1	69 46.3 -46.6 36.1	69 10.5 -45.0 38.1
26°	70 31.8 -51.8 27.9	70 03.0 -50.4 30.2	69 32.3 -49.0 32.3	68 59.7 -47.6 34.3	68 25.5 -46.2 36.2
27°	69 40.0 -52.5 26.4	69 12.6 -51.2 28.6	68 43.3 -49.9 30.7	68 12.1 -48.5 32.7	67 39.3 -47.1 34.5
28°	68 47.5 -53.1 25.1	68 21.4 -51.9 27.2	67 53.4 -50.7 29.2	67 23.6 -49.4 31.1	66 52.2 -48.1 32.9
29°	67 54.4 -53.7 23.8	67 29.5 -52.5 25.8	67 02.7 -51.3 27.8	66 34.2 -50.1 29.7	66 04.1 -48.9 31.4

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°	72 33.6 +30.1 120.3	71 42.0 +28.7 118.6	70 49.6 +27.4 117.1	69 56.5 +26.2 115.7	69 02.9 +25.1 114.4
1°	73 03.7 +27.4 117.3	72 10.7 +26.1 115.8	71 17.0 +24.9 114.4	70 22.7 +23.8 113.1	69 28.0 +22.7 111.9
2°	73 31.1 +24.6 114.3	72 36.8 +23.3 112.8	71 41.9 +22.2 111.5	70 46.5 +21.2 110.3	69 50.7 +20.3 109.2
3°	73 55.7 +21.4 111.0	73 00.1 +20.3 109.7	72 04.1 +19.4 108.5	71 07.7 +18.5 107.4	70 11.0 +17.7 106.5
4°	74 17.1 +18.2 107.6	73 20.4 +17.2 106.4	72 23.5 +16.3 105.4	71 26.2 +15.6 104.5	70 28.7 +14.9 103.6
5°	74 35.3 +14.6 104.0	73 37.6 +13.9 103.1	72 39.8 +13.2 102.2	71 41.8 +12.6 101.4	70 43.6 +12.1 100.7
6°	74 49.9 +10.9 100.4	73 51.5 +10.4 99.6	72 53.0 +09.9 98.9	71 54.4 +09.5 98.3	70 55.7 +09.2 97.7
7°	75 00.8 +07.1 96.6	74 01.9 +06.8 96.0	73 02.9 +06.6 95.5	72 03.9 +06.4 95.1	71 04.9 +06.2 94.7
8°	75 07.9 +03.2 92.7	74 08.7 +03.2 92.4	73 09.5 +03.1 92.1	72 10.3 +03.1 91.8	71 11.1 +03.1 91.6
9°	75 11.1 -00.7 88.8	74 11.9 -00.5 88.7	73 12.6 -00.3 88.7	72 13.4 -00.1 88.6	71 14.2 +00.0 88.5
10°	75 10.4 -04.7 84.9	74 11.4 -04.3 85.1	73 12.3 -03.8 85.2	72 13.3 -03.4 85.3	71 14.2 -03.1 85.4
11°	75 05.7 -08.6 81.0	74 07.1 -07.8 81.4	73 08.5 -07.2 81.8	72 09.9 -06.7 82.0	71 11.1 -06.1 82.3
12°	74 57.1 -12.3 77.2	73 59.3 -11.4 77.8	73 01.3 -10.6 78.3	72 03.2 -09.8 78.8	71 05.0 -09.1 79.2
13°	74 44.8 -16.0 73.4	73 47.9 -14.9 74.3	72 50.7 -13.8 75.0	71 53.4 -12.9 75.6	70 55.9 -12.0 76.2
14°	74 28.8 -19.4 69.8	73 33.0 -18.1 70.8	72 36.9 -16.9 71.7	71 40.5 -15.9 72.5	70 43.9 -14.9 73.2
15°	74 09.4 -22.6 66.3	73 14.9 -21.2 67.5	72 20.0 -20.0 68.5	71 24.6 -18.7 69.4	70 29.0 -17.6 70.3
16°	73 46.8 -25.7 63.0	72 53.7 -24.1 64.3	72 00.0 -22.7 65.4	71 05.9 -21.4 66.5	70 11.4 -20.3 67.4
17°	73 21.1 -28.4 59.8	72 29.6 -26.9 61.2	71 37.3 -25.4 62.5	70 44.5 -24.0 63.6	69 51.1 -22.7 64.7
18°	72 52.7 -31.0 56.7	72 02.7 -29.4 58.3	71 11.9 -27.8 59.6	70 20.5 -26.4 60.9	69 28.4 -25.1 62.0
19°	72 21.7 -33.4 53.9	71 33.3 -31.7 55.5	70 44.1 -30.2 56.9	69 54.1 -28.7 58.2	69 03.3 -27.2 59.4
20°	71 48.3 -35.5 51.2	71 01.6 -33.8 52.8	70 13.9 -32.2 54.3	69 25.4 -30.8 55.7	68 36.1 -29.4 57.0
21°	71 12.8 -37.4 48.6	70 27.8 -35.8 50.3	69 41.7 -34.2 51.9	68 54.6 -32.7 53.3	68 06.7 -31.3 54.6
22°	70 35.4 -39.2 46.2	69 52.0 -37.6 47.9	69 07.5 -36.1 49.5	68 21.9 -34.6 51.0	67 35.4 -33.1 52.4
23°	69 56.2 -40.8 44.0	69 14.4 -39.2 45.7	68 31.4 -37.7 47.3	67 47.3 -36.2 48.8	67 02.3 -34.8 50.2
24°	69 15.4 -42.2 41.9	68 35.2 -40.7 43.6	67 53.7 -39.2 45.2	67 11.1 -37.7 46.7	66 27.5 -36.4 48.1
25°	68 33.2 -43.5 39.9	67 54.5 -42.0 41.6	67 14.5 -40.6 43.2	66 33.4 -39.2 44.7	65 51.1 -37.8 46.2
26°	67 49.7 -44.7 38.1	67 12.5 -43.3 39.8	66 33.9 -41.8 41.4	65 54.2 -40.5 42.9	65 13.3 -39.1 44.3
27°	67 05.0 -45.8 36.3	66 29.2 -44.4 38.0	65 52.1 -43.1 39.6	65 13.7 -41.7 41.1	64 34.2 -40.4 42.5
28°	66 19.2 -46.7 34.7	65 44.8 -45.4 36.3	65 09.0 -44.1 37.9	64 32.0 -42.8 39.4	63 53.8 -41.5 40.8
29°	65 32.5 -47.7 33.1	64 59.4 -46.4 34.8	64 24.9 -45.1 36.3	63 49.2 -43.8 37.8	63 12.3 -42.5 39.2

Declination SAME name as Latitude

Latitude 9°

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°	68 08.6 +24.2 113.3	67 14.0 +23.2 112.2	66 18.9 +22.3 111.2	65 23.5 +21.5 110.2	64 27.7 +20.8 109.4
1°	68 32.8 +21.8 110.8	67 37.2 +21.0 109.8	66 41.2 +20.3 108.8	65 45.0 +19.5 108.0	64 48.5 +18.8 107.2
2°	68 54.6 +19.5 108.2	67 58.2 +18.7 107.3	67 01.5 +18.0 106.4	66 04.5 +17.4 105.7	65 07.3 +16.8 104.9
3°	69 14.1 +16.9 105.6	68 16.9 +16.2 104.7	67 19.5 +15.6 104.0	66 21.9 +15.1 103.3	65 24.1 +14.6 102.6
4°	69 31.0 +14.3 102.8	68 33.1 +13.8 102.1	67 35.1 +13.3 101.5	66 37.0 +12.8 100.9	65 38.7 +12.5 100.3
5°	69 45.3 +11.7 100.0	68 46.9 +11.2 99.4	67 48.4 +10.9 98.9	66 49.8 +10.5 98.4	65 51.2 +10.2 97.9
6°	69 57.0 +08.8 97.2	68 58.1 +08.6 96.7	67 59.3 +08.3 96.3	67 00.3 +08.1 95.9	66 01.4 +07.9 95.5
7°	70 05.8 +06.0 94.3	69 06.7 +05.9 94.0	68 07.6 +05.7 93.6	67 08.4 +05.7 93.3	66 09.3 +05.5 93.0
8°	70 11.8 +03.1 91.4	69 12.6 +03.1 91.2	68 13.3 +03.2 91.0	67 14.1 +03.1 90.8	66 14.8 +03.2 90.6
9°	70 14.9 +00.2 88.4	69 15.7 +00.3 88.3	68 16.5 +00.5 88.3	67 17.2 +00.7 88.2	66 18.0 +00.8 88.1
10°	70 15.1 -02.7 85.5	69 16.0 -02.4 85.5	68 17.0 -02.2 85.6	67 17.9 -01.9 85.6	66 18.8 -01.6 85.6
11°	70 12.4 -05.6 82.5	69 13.6 -05.1 82.7	68 14.8 -04.7 82.9	67 16.0 -04.3 83.0	66 17.2 -04.0 83.1
12°	70 06.8 -08.5 79.6	69 08.5 -07.9 79.9	68 10.1 -07.3 80.2	67 11.7 -06.8 80.4	66 13.2 -06.3 80.6
13°	69 58.3 -11.2 76.7	69 00.6 -10.5 77.1	68 02.8 -09.9 77.5	67 04.9 -09.2 77.9	66 06.9 -08.6 78.2
14°	69 47.1 -14.0 73.8	68 50.1 -13.2 74.4	67 52.9 -12.3 74.9	66 55.7 -11.7 75.3	65 58.3 -11.0 75.7
15°	69 33.1 -16.6 71.0	68 36.9 -15.6 71.7	67 40.6 -14.8 72.3	66 44.0 -13.9 72.8	65 47.3 -13.1 73.3
16°	69 16.5 -19.1 68.3	68 21.3 -18.1 69.1	67 25.8 -17.1 69.8	66 30.1 -16.2 70.4	65 34.2 -15.4 71.0
17°	68 57.4 -21.6 65.6	68 03.2 -20.4 66.5	67 08.7 -19.4 67.3	66 13.9 -18.4 68.0	65 18.8 -17.4 68.6
18°	68 35.8 -23.8 63.0	67 42.8 -22.6 64.0	66 49.3 -21.5 64.9	65 55.5 -20.5 65.6	65 01.4 -19.5 66.4
19°	68 12.0 -26.0 60.6	67 20.2 -24.8 61.6	66 27.8 -23.6 62.5	65 35.0 -22.4 63.4	64 41.9 -21.4 64.1
20°	67 46.0 -28.0 58.1	66 55.4 -26.8 59.2	66 04.2 -25.5 60.2	65 12.6 -24.4 61.1	64 20.5 -23.4 62.0
21°	67 18.0 -29.9 55.8	66 28.6 -28.6 57.0	65 38.7 -27.4 58.0	64 48.2 -26.3 59.0	63 57.1 -25.1 59.9
22°	66 48.1 -31.8 53.6	66 00.0 -30.4 54.8	65 11.3 -29.2 55.9	64 21.9 -28.0 56.9	63 32.0 -26.8 57.8
23°	66 16.3 -33.4 51.5	65 29.6 -32.1 52.7	64 42.1 -30.8 53.8	63 53.9 -29.6 54.8	63 05.2 -28.4 55.8
24°	65 42.9 -35.0 49.4	64 57.5 -33.7 50.7	64 11.3 -32.4 51.8	63 24.3 -31.1 52.9	62 36.8 -30.0 53.9
25°	65 07.9 -36.4 47.5	64 23.8 -35.1 48.7	63 38.9 -33.9 49.9	62 53.2 -32.7 51.0	62 06.8 -31.5 52.0
26°	64 31.5 -37.8 45.6	63 48.7 -36.6 46.9	63 05.0 -35.3 48.1	62 20.5 -34.0 49.2	61 35.3 -32.8 50.2
27°	63 53.7 -39.1 43.8	63 12.1 -37.7 45.1	62 29.7 -36.5 46.3	61 46.5 -35.3 47.4	61 02.5 -34.1 48.5
28°	63 14.6 -40.2 42.1	62 34.4 -39.0 43.4	61 53.2 -37.7 44.6	61 11.2 -36.6 45.7	60 28.4 -35.4 46.8
29°	62 34.4 -41.4 40.5	61 55.4 -40.1 41.8	61 15.5 -38.9 42.9	60 34.6 -37.6 44.1	59 53.0 -36.5 45.2

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 31.7 +20.1 108.5	62 35.4 +19.4 107.8	61 38.8 +18.9 107.1	60 42.1 +18.3 106.4	59 45.1 +17.8 105.8
1°	63 51.8 +18.2 106.4	62 54.8 +17.7 105.7	61 57.7 +17.1 105.1	61 00.4 +16.6 104.4	60 02.9 +16.2 103.9
2°	64 10.0 +16.2 104.2	63 12.5 +15.7 103.6	62 14.8 +15.3 103.0	61 17.0 +14.8 102.4	60 19.1 +14.4 101.9
3°	64 26.2 +14.2 102.0	63 28.2 +13.7 101.5	62 30.1 +13.3 100.9	61 31.8 +13.0 100.4	60 33.5 +12.7 100.0
4°	64 40.4 +12.1 99.8	63 41.9 +11.8 99.3	62 43.4 +11.4 98.8	61 44.8 +11.1 98.4	60 46.2 +10.8 98.0
5°	64 52.5 +09.9 97.5	63 53.7 +09.6 97.0	62 54.8 +09.5 96.7	61 55.9 +09.3 96.3	60 57.0 +09.0 95.9
6°	65 02.4 +07.7 95.1	64 03.3 +07.6 94.8	63 04.3 +07.4 94.5	62 05.2 +07.2 94.2	61 06.0 +07.2 93.9
7°	65 10.1 +05.4 92.8	64 10.9 +05.4 92.5	63 11.7 +05.3 92.3	62 12.4 +05.4 92.1	61 13.2 +05.3 91.8
8°	65 15.5 +03.3 90.4	64 16.3 +03.2 90.2	63 17.0 +03.3 90.1	62 17.8 +03.3 89.9	61 18.5 +03.4 89.8
9°	65 18.8 +00.9 88.0	64 19.5 +01.1 87.9	63 20.3 +01.2 87.8	62 21.1 +01.3 87.8	61 21.9 +01.4 87.7
10°	65 19.7 -01.3 85.6	64 20.6 -01.1 85.6	63 21.5 -00.9 85.6	62 22.4 -00.6 85.6	61 23.3 -00.4 85.6
11°	65 18.4 -03.6 83.2	64 19.5 -03.3 83.3	63 20.6 -02.9 83.4	62 21.8 -02.7 83.5	61 22.9 -02.4 83.5
12°	65 14.8 -05.9 80.8	64 16.2 -05.4 81.0	63 17.7 -05.0 81.2	62 19.1 -04.6 81.3	61 20.5 -04.3 81.4
13°	65 08.9 -08.1 78.5	64 10.8 -07.6 78.7	63 12.7 -07.1 79.0	62 14.5 -06.6 79.2	61 16.2 -06.1 79.3
14°	65 00.8 -10.3 76.1	64 03.2 -09.7 76.4	63 05.6 -09.1 76.8	62 07.9 -08.6 77.0	61 10.1 -08.1 77.3
15°	64 50.5 -12.4 73.8	63 53.5 -11.7 74.2	62 56.5 -11.1 74.6	61 59.3 -10.5 74.9	61 02.0 -09.9 75.2
16°	64 38.1 -14.6 71.5	63 41.8 -13.8 72.0	62 45.4 -13.1 72.4	61 48.8 -12.4 72.8	60 52.1 -11.7 73.2
17°	64 23.5 -16.5 69.2	63 28.0 -15.7 69.8	62 32.3 -15.0 70.3	61 36.4 -14.2 70.8	60 40.4 -13.5 71.2
18°	64 07.0 -18.6 67.0	63 12.3 -17.7 67.6	62 17.3 -16.8 68.2	61 22.2 -16.0 68.7	60 26.9 -15.2 69.2
19°	63 48.4 -20.4 64.9	62 54.6 -19.5 65.5	62 00.5 -18.6 66.2	61 06.2 -17.7 66.7	60 11.7 -17.0 67.3
20°	63 28.0 -22.3 62.7	62 35.1 -21.3 63.5	61 41.9 -20.3 64.1	60 48.5 -19.5 64.8	59 54.7 -18.5 65.3
21°	63 05.7 -24.1 60.7	62 13.8 -23.0 61.4	61 21.6 -22.0 62.2	60 29.0 -21.1 62.8	59 36.2 -20.2 63.4
22°	62 41.6 -25.7 58.7	61 50.8 -24.7 59.5	60 59.6 -23.7 60.2	60 07.9 -22.6 60.9	59 16.0 -21.8 61.6
23°	62 15.9 -27.3 56.7	61 26.1 -26.2 57.6	60 35.9 -25.2 58.3	59 45.3 -24.2 59.1	58 54.2 -23.2 59.8
24°	61 48.6 -28.8 54.8	60 59.9 -27.7 55.7	60 10.7 -26.7 56.5	59 21.1 -25.7 57.3	58 31.0 -24.6 58.0
25°	61 19.8 -30.3 53.0	60 32.2 -29.2 53.9	59 44.0 -28.0 54.7	58 55.4 -27.0 55.5	58 06.4 -26.1 56.3
26°	60 49.5 -31.7 51.2	60 03.0 -30.5 52.1	59 16.0 -29.5 53.0	58 28.4 -28.4 53.8	57 40.3 -27.3 54.6
27°	60 17.8 -33.0 49.5	59 32.5 -31.9 50.4	58 46.5 -30.7 51.3	58 00.0 -29.7 52.1	57 13.0 -28.7 52.9
28°	59 44.8 -34.2 47.8	59 00.6 -33.1 48.7	58 15.8 -32.0 49.6	57 30.3 -30.9 50.5	56 44.3 -29.8 51.3
29°	59 10.6 -35.3 46.2	58 27.5 -34.2 47.1	57 43.8 -33.2 48.0	56 59.4 -32.1 48.9	56 14.5 -31.1 49.7

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Latitude 9°

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°	58 48.0 +17.3 105.2	57 50.7 +16.9 104.6	56 53.3 +16.4 104.1	55 55.7 +16.1 103.5	54 58.1 +15.6 103.1
1°	59 05.3 +15.7 103.3	58 07.6 +15.3 102.8	57 09.7 +15.0 102.3	56 11.8 +14.6 101.8	55 13.7 +14.3 101.4
2°	59 21.0 +14.1 101.4	58 22.9 +13.7 100.9	57 24.7 +13.3 100.5	56 26.4 +13.0 100.1	55 28.0 +12.8 99.7
3°	59 35.1 +12.3 99.5	58 36.6 +12.1 99.1	57 38.0 +11.8 98.7	56 39.4 +11.6 98.3	55 40.8 +11.3 97.9
4°	59 47.4 +10.7 97.6	58 48.7 +10.4 97.2	57 49.8 +10.2 96.8	56 51.0 +10.0 96.5	55 52.1 +09.8 96.2
5°	59 58.1 +08.8 95.6	58 59.1 +08.7 95.3	58 00.0 +08.6 95.0	57 01.0 +08.4 94.7	56 01.9 +08.3 94.4
6°	60 06.9 +07.1 93.6	59 07.8 +06.9 93.4	58 08.6 +06.9 93.1	57 09.4 +06.8 92.9	56 10.2 +06.8 92.6
7°	60 14.0 +05.2 91.6	59 14.7 +05.3 91.4	58 15.5 +05.2 91.2	57 16.2 +05.3 91.0	56 17.0 +05.2 90.9
8°	60 19.2 +03.5 89.6	59 20.0 +03.5 89.5	58 20.7 +03.6 89.3	57 21.5 +03.6 89.2	56 22.2 +03.7 89.1
9°	60 22.7 +01.6 87.6	59 23.5 +01.7 87.5	58 24.3 +01.8 87.4	57 25.1 +01.9 87.3	56 25.9 +02.0 87.3
10°	60 24.3 -00.3 85.6	59 25.2 -00.1 85.6	58 26.1 +00.1 85.5	57 27.0 +00.3 85.5	56 27.9 +00.5 85.5
11°	60 24.0 -02.1 83.6	59 25.1 -01.8 83.6	58 26.2 -01.5 83.6	57 27.3 -01.3 83.6	56 28.4 -01.0 83.6
12°	60 21.9 -03.9 81.5	59 23.3 -03.6 81.6	58 24.7 -03.3 81.7	57 26.0 -02.9 81.8	56 27.4 -02.7 81.8
13°	60 18.0 -05.8 79.5	59 19.7 -05.3 79.7	58 21.4 -05.0 79.8	57 23.1 -04.6 79.9	56 24.7 -04.2 80.0
14°	60 12.2 -07.5 77.5	59 14.4 -07.1 77.7	58 16.4 -06.6 77.9	57 18.5 -06.2 78.1	56 20.5 -05.8 78.2
15°	60 04.7 -09.4 75.5	59 07.3 -08.8 75.8	58 09.8 -08.3 76.0	57 12.3 -07.8 76.2	56 14.7 -07.4 76.4
16°	59 55.3 -11.1 73.5	58 58.5 -10.5 73.9	58 01.5 -09.9 74.1	57 04.5 -09.4 74.4	56 07.3 -08.8 74.6
17°	59 44.2 -12.8 71.6	58 48.0 -12.2 71.9	57 51.6 -11.6 72.3	56 55.1 -11.0 72.6	55 58.5 -10.4 72.9
18°	59 31.4 -14.5 69.7	58 35.8 -13.8 70.1	57 40.0 -13.1 70.4	56 44.1 -12.5 70.8	55 48.1 -11.9 71.1
19°	59 16.9 -16.1 67.7	58 22.0 -15.4 68.2	57 26.9 -14.7 68.6	56 31.6 -14.0 69.0	55 36.2 -13.3 69.4
20°	59 00.8 -17.8 65.9	58 06.6 -17.0 66.4	57 12.2 -16.2 66.8	56 17.6 -15.4 67.3	55 22.9 -14.8 67.7
21°	58 43.0 -19.3 64.0	57 49.6 -18.5 64.6	56 56.0 -17.7 65.1	56 02.2 -17.0 65.5	55 08.1 -16.1 66.0
22°	58 23.7 -20.8 62.2	57 31.1 -19.9 62.8	56 38.3 -19.1 63.3	55 45.2 -18.3 63.8	54 52.0 -17.6 64.3
23°	58 02.9 -22.3 60.4	57 11.2 -21.4 61.0	56 19.2 -20.5 61.6	55 26.9 -19.7 62.1	54 34.4 -18.9 62.6
24°	57 40.6 -23.7 58.7	56 49.8 -22.8 59.3	55 58.7 -21.9 59.9	55 07.2 -21.0 60.5	54 15.5 -20.1 61.0
25°	57 16.9 -25.1 57.0	56 27.0 -24.1 57.6	55 36.8 -23.2 58.3	54 46.2 -22.3 58.8	53 55.4 -21.5 59.4
26°	56 51.8 -26.4 55.3	56 02.9 -25.4 56.0	55 13.6 -24.5 56.6	54 23.9 -23.5 57.2	53 33.9 -22.6 57.8
27°	56 25.4 -27.6 53.7	55 37.5 -26.7 54.4	54 49.1 -25.7 55.0	54 00.4 -24.8 55.7	53 11.3 -23.9 56.3
28°	55 57.8 -28.8 52.1	55 10.8 -27.8 52.8	54 23.4 -26.8 53.5	53 35.6 -25.9 54.1	52 47.4 -25.0 54.7
29°	55 29.0 -30.0 50.5	54 43.0 -29.0 51.2	53 56.6 -28.0 51.9	53 09.7 -27.1 52.6	52 22.4 -26.1 53.2

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°	54 00.3 +15.3 102.6	53 02.4 +15.0 102.2	52 04.4 +14.7 101.7	51 06.4 +14.3 101.3	50 08.2 +14.1 100.9
1°	54 15.6 +13.9 100.9	53 17.4 +13.6 100.5	52 19.1 +13.3 100.1	51 20.7 +13.1 99.8	50 22.3 +12.8 99.4
2°	54 29.5 +12.5 99.3	53 31.0 +12.3 98.9	52 32.4 +12.1 98.5	51 33.8 +11.8 98.2	50 35.1 +11.6 97.9
3°	54 42.0 +11.2 97.6	53 43.3 +10.9 97.3	52 44.5 +10.7 96.9	51 45.6 +10.6 96.6	50 46.7 +10.4 96.3
4°	54 53.2 +09.6 95.9	53 54.2 +09.5 95.6	52 55.2 +09.4 95.3	51 56.2 +09.2 95.0	50 57.1 +09.2 94.8
5°	55 02.8 +08.2 94.2	54 03.7 +08.1 93.9	53 04.6 +08.0 93.7	52 05.4 +08.0 93.4	51 06.3 +07.8 93.2
6°	55 11.0 +06.7 92.4	54 11.8 +06.7 92.2	53 12.6 +06.6 92.0	52 13.4 +06.6 91.8	51 14.1 +06.6 91.6
7°	55 17.7 +05.3 90.7	54 18.5 +05.2 90.5	53 19.2 +05.3 90.3	52 20.0 +05.2 90.2	51 20.7 +05.3 90.0
8°	55 23.0 +03.7 88.9	54 23.7 +03.8 88.8	53 24.5 +03.8 88.7	52 25.2 +03.9 88.6	51 26.0 +04.0 88.4
9°	55 26.7 +02.2 87.2	54 27.5 +02.3 87.1	53 28.3 +02.4 87.0	52 29.1 +02.6 86.9	51 30.0 +02.6 86.8
10°	55 28.9 +00.6 85.4	54 29.8 +00.8 85.4	53 30.7 +01.0 85.3	52 31.7 +01.2 85.3	51 32.6 +01.4 85.2
11°	55 29.5 -00.8 83.6	54 30.6 -00.6 83.6	53 31.7 -00.4 83.6	52 32.9 -00.2 83.6	51 34.0 +00.0 83.6
12°	55 28.7 -02.4 81.9	54 30.0 -02.1 81.9	53 31.3 -01.8 82.0	52 32.7 -01.6 82.0	51 34.0 -01.3 82.0
13°	55 26.3 -03.9 80.1	54 27.9 -03.5 80.2	53 29.5 -03.2 80.3	52 31.1 -02.9 80.3	51 32.7 -02.6 80.4
14°	55 22.4 -05.3 78.4	54 24.4 -05.0 78.5	53 26.3 -04.6 78.6	52 28.2 -04.3 78.7	51 30.1 -03.9 78.8
15°	55 17.1 -06.9 76.6	54 19.4 -06.5 76.8	53 21.7 -06.1 76.9	52 23.9 -05.6 77.1	51 26.2 -05.3 77.2
16°	55 10.2 -08.4 74.9	54 12.9 -07.9 75.1	53 15.6 -07.4 75.3	52 18.3 -07.0 75.4	51 20.9 -06.5 75.6
17°	55 01.8 -09.8 73.1	54 05.0 -09.3 73.4	53 08.2 -08.8 73.6	52 11.3 -08.2 73.8	51 14.4 -07.8 74.0
18°	54 52.0 -11.3 71.4	53 55.7 -10.7 71.7	52 59.4 -10.1 72.0	52 03.1 -09.7 72.2	51 06.6 -09.1 72.4
19°	54 40.7 -12.7 69.7	53 45.0 -12.0 70.0	52 49.3 -11.5 70.3	51 53.4 -10.9 70.6	50 57.5 -10.3 70.9
20°	54 28.0 -14.1 68.0	53 33.0 -13.5 68.4	52 37.8 -12.8 68.7	51 42.5 -12.1 69.0	50 47.2 -11.6 69.3
21°	54 13.9 -15.4 66.4	53 19.5 -14.7 66.7	52 25.0 -14.1 67.1	51 30.4 -13.5 67.4	50 35.6 -12.8 67.7
22°	53 58.5 -16.8 64.7	53 04.8 -16.1 65.1	52 10.9 -15.3 65.5	51 16.9 -14.6 65.9	50 22.8 -14.0 66.2
23°	53 41.7 -18.1 63.1	52 48.7 -17.3 63.5	51 55.6 -16.6 63.9	51 02.3 -15.9 64.3	50 08.8 -15.2 64.7
24°	53 23.6 -19.4 61.5	52 31.4 -18.6 62.0	51 39.0 -17.8 62.4	50 46.4 -17.1 62.8	49 53.6 -16.3 63.2
25°	53 04.2 -20.6 59.9	52 12.8 -19.8 60.4	51 21.2 -19.0 60.9	50 29.3 -18.2 61.3	49 37.3 -17.5 61.7
26°	52 43.6 -21.8 58.3	51 53.0 -20.9 58.9	51 02.2 -20.2 59.3	50 11.1 -19.4 59.8	49 19.8 -18.6 60.2
27°	52 21.8 -22.9 56.8	51 32.1 -22.1 57.3	50 42.0 -21.2 57.8	49 51.7 -20.4 58.3	49 01.2 -19.7 58.8
28°	51 58.9 -24.2 55.3	51 10.0 -23.3 55.9	50 20.8 -22.4 56.4	49 31.3 -21.6 56.9	48 41.5 -20.7 57.3
29°	51 34.7 -25.2 53.8	50 46.7 -24.3 54.4	49 58.4 -23.4 54.9	49 09.7 -22.5 55.4	48 20.8 -21.8 55.9

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Declination SAME name as Latitude

Latitude 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°	49 10.0 +13.8 100.6	48 11.7 +13.5 100.2	47 13.3 +13.3 99.9	46 14.9 +13.1 99.5	45 16.5 +12.8 99.2
1°	49 23.8 +12.6 99.1	48 25.2 +12.4 98.7	47 26.6 +12.2 98.4	46 28.0 +12.0 98.1	45 29.3 +11.8 97.8
2°	49 36.4 +11.4 97.6	48 37.6 +11.3 97.3	47 38.8 +11.1 97.0	46 40.0 +10.9 96.7	45 41.1 +10.8 96.4
3°	49 47.8 +10.3 96.0	48 48.9 +10.1 95.8	47 49.9 +10.0 95.5	46 50.9 +09.8 95.2	45 51.9 +09.7 95.0
4°	49 58.1 +09.0 94.5	48 59.0 +08.9 94.3	47 59.9 +08.8 94.0	47 00.7 +08.8 93.8	46 01.6 +08.7 93.6
5°	50 07.1 +07.8 93.0	49 07.9 +07.7 92.8	48 08.7 +07.7 92.6	47 09.5 +07.6 92.4	46 10.3 +07.6 92.2
6°	50 14.9 +06.5 91.4	49 15.6 +06.6 91.2	48 16.4 +06.5 91.1	47 17.1 +06.6 90.9	46 17.9 +06.5 90.7
7°	50 21.4 +05.3 89.9	49 22.2 +05.3 89.7	48 22.9 +05.4 89.6	47 23.7 +05.4 89.4	46 24.4 +05.4 89.3
8°	50 26.7 +04.1 88.3	49 27.5 +04.1 88.2	48 28.3 +04.2 88.1	47 29.1 +04.2 88.0	46 29.8 +04.4 87.8
9°	50 30.8 +02.8 86.7	49 31.6 +02.9 86.7	48 32.5 +03.0 86.6	47 33.3 +03.1 86.5	46 34.2 +03.2 86.4
10°	50 33.6 +01.5 85.2	49 34.5 +01.7 85.1	48 35.5 +01.8 85.1	47 36.4 +02.0 85.0	46 37.4 +02.1 84.9
11°	50 35.1 +00.8 83.6	49 36.2 +00.4 83.6	48 37.3 +00.6 83.5	47 38.4 +00.8 83.5	46 39.5 +01.0 83.5
12°	50 35.3 -01.0 82.0	49 36.6 -00.8 82.0	48 37.9 -00.5 82.0	47 39.2 -00.3 82.0	46 40.5 +00.0 82.0
13°	50 34.3 -02.4 80.4	49 35.8 -02.0 80.5	48 37.4 -01.8 80.5	47 38.9 -01.5 80.5	46 40.5 -01.2 80.6
14°	50 31.9 -03.5 78.9	49 33.8 -03.3 78.9	48 35.6 -02.9 79.0	47 37.4 -02.6 79.1	46 39.3 -02.4 79.1
15°	50 28.4 -04.9 77.3	49 30.5 -04.4 77.4	48 32.7 -04.1 77.5	47 34.8 -03.7 77.6	46 36.9 -03.4 77.6
16°	50 23.5 -06.1 75.7	49 26.1 -05.7 75.9	48 28.6 -05.3 76.0	47 31.1 -04.9 76.1	46 33.5 -04.5 76.2
17°	50 17.4 -07.3 74.2	49 20.4 -06.9 74.3	48 23.3 -06.5 74.5	47 26.2 -06.1 74.6	46 29.0 -05.6 74.7
18°	50 10.1 -08.6 72.6	49 13.5 -08.1 72.8	48 16.8 -07.6 73.0	47 20.1 -07.1 73.2	46 23.4 -06.7 73.3
19°	50 01.5 -09.8 71.1	49 05.4 -09.3 71.3	48 09.2 -08.7 71.5	47 13.0 -08.3 71.7	46 16.7 -07.8 71.9
20°	49 51.7 -11.0 69.6	48 56.1 -10.4 69.8	48 00.5 -09.9 70.0	47 04.7 -09.3 70.2	46 08.9 -08.8 70.4
21°	49 40.7 -12.2 68.0	48 45.7 -11.6 68.3	47 50.6 -11.1 68.6	46 55.4 -10.5 68.8	46 00.1 -09.9 69.0
22°	49 28.5 -13.4 66.5	48 34.1 -12.8 66.8	47 39.5 -12.1 67.1	46 44.9 -11.5 67.3	45 50.2 -11.0 67.6
23°	49 15.1 -14.5 65.0	48 21.3 -13.8 65.3	47 27.4 -13.2 65.6	46 33.4 -12.6 65.9	45 39.2 -12.0 66.2
24°	49 00.6 -15.6 63.5	48 07.5 -15.0 63.9	47 14.2 -14.3 64.2	46 20.8 -13.6 64.5	45 27.2 -13.0 64.8
25°	48 45.0 -16.8 62.1	47 52.5 -16.0 62.4	46 59.9 -15.3 62.8	46 07.2 -14.7 63.1	45 14.2 -14.0 63.4
26°	48 28.2 -17.8 60.6	47 36.5 -17.1 61.0	46 44.6 -16.4 61.4	45 52.5 -15.7 61.7	45 00.2 -15.0 62.0
27°	48 10.4 -18.9 59.2	47 19.4 -18.1 59.6	46 28.2 -17.4 60.0	45 36.8 -16.7 60.3	44 45.2 -15.9 60.6
28°	47 51.5 -19.9 57.8	47 01.3 -19.2 58.2	46 10.8 -18.4 58.6	45 20.1 -17.6 58.9	44 29.3 -16.9 59.3
29°	47 31.6 -20.9 56.4	46 42.1 -20.1 56.8	45 52.4 -19.3 57.2	45 02.5 -18.6 57.6	44 12.4 -17.9 57.9

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 17.9 +12.7 98.9	43 19.4 +12.4 98.6	42 20.7 +12.3 98.3	41 22.1 +12.0 98.0	40 23.4 +11.9 97.7
1°	44 30.6 +11.6 97.5	43 31.8 +11.5 97.2	42 33.0 +11.3 97.0	41 34.1 +11.2 96.7	40 35.3 +11.0 96.5
2°	44 42.2 +10.6 96.1	43 43.3 +10.5 95.9	42 44.3 +10.4 95.6	41 45.3 +10.3 95.4	40 46.3 +10.2 95.2
3°	44 52.8 +09.7 94.8	43 53.8 +09.5 94.5	42 54.7 +09.4 94.3	41 55.6 +09.3 94.1	40 56.5 +09.2 93.9
4°	45 02.5 +08.6 93.4	44 03.3 +08.5 93.2	43 04.1 +08.5 92.9	42 04.9 +08.5 92.7	41 05.7 +08.4 92.5
5°	45 11.1 +07.5 92.0	44 11.8 +07.6 91.8	43 12.6 +07.5 91.6	42 13.4 +07.4 91.4	41 14.1 +07.5 91.2
6°	45 18.6 +06.5 90.6	44 19.4 +06.5 90.4	43 20.1 +06.5 90.2	42 20.8 +06.6 90.1	41 21.6 +06.5 89.9
7°	45 25.1 +05.5 89.1	44 25.9 +05.5 89.0	43 26.6 +05.6 88.9	42 27.4 +05.6 88.7	41 28.1 +05.7 88.6
8°	45 30.6 +04.4 87.7	44 31.4 +04.5 87.6	43 32.2 +04.6 87.5	42 33.0 +04.6 87.4	41 33.8 +04.7 87.3
9°	45 35.0 +03.4 86.3	44 35.9 +03.5 86.2	43 36.8 +03.5 86.1	42 37.6 +03.7 86.0	41 38.5 +03.8 85.9
10°	45 38.4 +02.3 84.9	44 39.4 +02.4 84.8	43 40.3 +02.6 84.7	42 41.3 +02.8 84.7	41 42.3 +02.9 84.6
11°	45 40.7 +01.2 83.4	44 41.8 +01.4 83.4	43 42.9 +01.6 83.3	42 44.1 +01.7 83.3	41 45.2 +01.9 83.2
12°	45 41.9 +00.1 82.0	44 43.2 +00.3 82.0	43 44.5 +00.6 82.0	42 45.8 +00.8 81.9	41 47.1 +01.0 81.9
13°	45 42.0 -00.9 80.6	44 43.5 -00.6 80.6	43 45.1 -00.5 80.6	42 46.6 -00.2 80.6	41 48.1 +00.1 80.6
14°	45 41.1 -02.1 79.1	44 42.9 -01.8 79.2	43 44.6 -01.4 79.2	42 46.4 -01.1 79.2	41 48.2 -00.9 79.2
15°	45 39.0 -03.0 77.7	44 41.1 -02.7 77.8	43 43.2 -02.4 77.8	42 45.3 -02.1 77.9	41 47.3 -01.8 77.9
16°	45 36.0 -04.2 76.3	44 38.4 -03.8 76.4	43 40.8 -03.4 76.4	42 43.2 -03.1 76.5	41 45.5 -02.7 76.5
17°	45 31.8 -05.2 74.9	44 34.6 -04.8 75.0	43 37.4 -04.5 75.1	42 40.1 -04.0 75.1	41 42.8 -03.7 75.2
18°	45 26.6 -06.2 73.4	44 29.8 -05.8 73.6	43 32.9 -05.4 73.7	42 36.1 -05.0 73.8	41 39.1 -04.6 73.9
19°	45 20.4 -07.3 72.0	44 24.0 -06.9 72.2	43 27.5 -06.4 72.3	42 31.1 -06.0 72.4	41 34.5 -05.5 72.5
20°	45 13.1 -08.4 70.6	44 17.1 -07.8 70.8	43 21.1 -07.3 70.9	42 25.1 -06.9 71.1	41 29.0 -06.4 71.2
21°	45 04.7 -09.4 69.2	44 09.3 -08.9 69.4	43 13.8 -08.4 69.6	42 18.2 -07.8 69.7	41 22.6 -07.4 69.9
22°	44 55.3 -10.3 67.8	44 00.4 -09.8 68.0	43 05.4 -09.3 68.2	42 10.4 -08.8 68.4	41 15.2 -08.2 68.6
23°	44 45.0 -11.4 66.4	43 50.6 -10.8 66.6	42 56.1 -10.2 66.9	42 01.6 -09.7 67.1	41 07.0 -09.1 67.2
24°	44 33.6 -12.4 65.0	43 39.8 -11.8 65.3	42 45.9 -11.2 65.5	41 51.9 -10.6 65.7	40 57.9 -10.1 65.9
25°	44 21.2 -13.4 63.7	43 28.0 -12.7 63.9	42 34.7 -12.1 64.2	41 41.3 -11.5 64.4	40 47.8 -10.9 64.6
26°	44 07.8 -14.3 62.3	43 15.3 -13.7 62.6	42 22.6 -13.0 62.9	41 29.8 -12.4 63.1	40 36.9 -11.7 63.3
27°	43 53.5 -15.3 61.0	43 01.6 -14.6 61.3	42 09.6 -13.9 61.5	41 17.4 -13.2 61.8	40 25.2 -12.7 62.0
28°	43 38.2 -16.1 59.6	42 47.0 -15.4 59.9	41 55.7 -14.8 60.2	41 04.2 -14.2 60.5	40 12.5 -13.4 60.8
29°	43 22.1 -17.2 58.3	42 31.6 -16.4 58.6	41 40.9 -15.7 58.9	40 50.0 -14.9 59.2	39 59.1 -14.3 59.5

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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 24.6 +11.8 97.5	38 25.9 +11.5 97.2	37 27.1 +11.4 97.0	36 28.2 +11.3 96.7	35 29.3 +11.2 96.5
1°	39 36.4 +10.9 96.2	38 37.4 +10.8 96.0	37 38.5 +10.6 95.7	36 39.5 +10.6 95.5	35 40.5 +10.5 95.3
2°	39 47.3 +10.0 94.9	38 48.2 +10.0 94.7	37 49.1 +09.9 94.5	36 50.1 +09.7 94.3	35 51.0 +09.7 94.1
3°	39 57.3 +09.2 93.6	38 58.2 +09.1 93.4	37 59.0 +09.1 93.2	36 59.8 +09.1 93.0	36 00.7 +08.9 92.8
4°	40 06.5 +08.4 92.4	39 07.3 +08.3 92.2	38 08.1 +08.2 92.0	37 08.9 +08.2 91.8	36 09.6 +08.2 91.6
5°	40 14.9 +07.4 91.1	39 15.6 +07.5 90.9	38 16.3 +07.5 90.7	37 17.1 +07.4 90.6	36 17.8 +07.5 90.4
6°	40 22.3 +06.6 89.8	39 23.1 +06.6 89.6	38 23.8 +06.6 89.5	37 24.5 +06.7 89.3	36 25.3 +06.7 89.2
7°	40 28.9 +05.7 88.5	39 29.7 +05.7 88.3	38 30.4 +05.8 88.2	37 31.2 +05.9 88.1	36 32.0 +05.9 87.9
8°	40 34.6 +04.8 87.1	39 35.4 +04.9 87.0	38 36.2 +05.0 86.9	37 37.1 +05.0 86.8	36 37.9 +05.2 86.7
9°	40 39.4 +03.9 85.8	39 40.3 +04.1 85.7	38 41.2 +04.2 85.6	37 42.1 +04.3 85.5	36 43.1 +04.3 85.4
10°	40 43.3 +03.1 84.5	39 44.4 +03.1 84.4	38 45.4 +03.3 84.4	37 46.4 +03.5 84.3	36 47.4 +03.6 84.2
11°	40 46.4 +02.1 83.2	39 47.5 +02.3 83.1	38 48.7 +02.5 83.1	37 49.9 +02.6 83.0	36 51.0 +02.9 83.0
12°	40 48.5 +01.2 81.9	39 49.8 +01.4 81.8	38 51.2 +01.6 81.8	37 52.5 +01.8 81.8	36 53.9 +02.0 81.7
13°	40 49.7 +00.3 80.6	39 51.2 +00.6 80.5	38 52.8 +00.8 80.5	37 54.3 +01.0 80.5	36 55.9 +01.2 80.5
14°	40 50.0 -00.6 79.2	39 51.8 -00.3 79.2	38 53.6 -00.1 79.2	37 55.3 +00.2 79.2	36 57.1 +00.5 79.2
15°	40 49.4 -01.5 77.9	39 51.5 -01.2 77.9	38 53.5 -00.9 77.9	37 55.5 -00.6 77.9	36 57.6 -00.3 77.9
16°	40 47.9 -02.4 76.6	39 50.3 -02.1 76.6	38 52.6 -01.8 76.7	37 54.9 -01.4 76.7	36 57.3 -01.2 76.7
17°	40 45.5 -03.3 75.3	39 48.2 -03.0 75.3	38 50.8 -02.5 75.4	37 53.5 -02.2 75.4	36 56.1 -01.9 75.4
18°	40 42.2 -04.2 74.0	39 45.2 -03.8 74.0	38 48.3 -03.5 74.1	37 51.3 -03.1 74.1	36 54.2 -02.7 74.2
19°	40 38.0 -05.1 72.6	39 41.4 -04.7 72.7	38 44.8 -04.2 72.8	37 48.2 -03.9 72.9	36 51.5 -03.4 72.9
20°	40 32.9 -06.0 71.3	39 36.7 -05.5 71.4	38 40.6 -05.2 71.5	37 44.3 -04.6 71.6	36 48.1 -04.3 71.7
21°	40 26.9 -06.8 70.0	39 31.2 -06.4 70.1	38 35.4 -05.9 70.3	37 39.7 -05.5 70.4	36 43.8 -05.0 70.5
22°	40 20.1 -07.8 68.7	39 24.8 -07.2 68.9	38 29.5 -06.7 69.0	37 34.2 -06.3 69.1	36 38.8 -05.8 69.2
23°	40 12.3 -08.6 67.4	39 17.6 -08.1 67.6	38 22.8 -07.6 67.7	37 27.9 -07.1 67.9	36 33.0 -06.6 68.0
24°	40 03.7 -09.5 66.1	39 09.5 -08.9 66.3	38 15.2 -08.4 66.5	37 20.8 -07.8 66.6	36 26.4 -07.3 66.7
25°	39 54.2 -10.3 64.8	39 00.6 -09.8 65.0	38 06.8 -09.2 65.2	37 13.0 -08.7 65.4	36 19.1 -08.1 65.5
26°	39 43.9 -11.1 63.5	38 50.8 -10.6 63.7	37 57.6 -10.0 63.9	37 04.3 -09.4 64.1	36 11.0 -08.8 64.3
27°	39 32.8 -12.0 62.3	38 40.2 -11.3 62.5	37 47.6 -10.7 62.7	36 54.9 -10.1 62.9	36 02.2 -09.6 63.1
28°	39 20.8 -12.9 61.0	38 28.9 -12.2 61.2	37 36.9 -11.6 61.4	36 44.8 -11.0 61.6	35 52.6 -10.4 61.8
29°	39 07.9 -13.6 59.7	38 16.7 -13.0 60.0	37 25.3 -12.3 60.2	36 33.8 -11.6 60.4	35 42.2 -11.0 60.6

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 30.5 +11.0 96.3	33 31.5 +11.0 96.0	32 32.6 +10.8 95.8	31 33.6 +10.7 95.6	30 34.6 +10.6 95.4
1°	34 41.5 +10.3 95.1	33 42.5 +10.2 94.8	32 43.4 +10.2 94.6	31 44.3 +10.1 94.4	30 45.2 +10.0 94.2
2°	34 51.8 +09.7 93.9	33 52.7 +09.6 93.7	32 53.6 +09.5 93.5	31 54.4 +09.4 93.3	30 55.2 +09.4 93.1
3°	35 01.5 +08.9 92.7	34 02.3 +08.8 92.5	33 03.1 +08.8 92.3	32 03.8 +08.8 92.1	31 04.6 +08.8 91.9
4°	35 10.4 +08.2 91.4	34 11.1 +08.2 91.3	33 11.9 +08.1 91.1	32 12.6 +08.2 90.9	31 13.4 +08.1 90.8
5°	35 18.6 +07.4 90.2	34 19.3 +07.5 90.1	33 20.0 +07.5 89.9	32 20.8 +07.5 89.8	31 21.5 +07.5 89.6
6°	35 26.0 +06.8 89.0	34 26.8 +06.7 88.9	33 27.5 +06.8 88.7	32 28.3 +06.8 88.6	31 29.0 +06.9 88.4
7°	35 32.8 +05.9 87.8	34 33.5 +06.1 87.7	33 34.3 +06.2 87.5	32 35.1 +06.2 87.4	31 35.9 +06.3 87.3
8°	35 38.7 +05.3 86.6	34 39.6 +05.3 86.5	33 40.5 +05.4 86.3	32 41.3 +05.5 86.2	31 42.2 +05.6 86.1
9°	35 44.0 +04.5 85.3	34 44.9 +04.6 85.2	33 45.9 +04.7 85.1	32 46.8 +04.9 85.0	31 47.8 +05.0 84.9
10°	35 48.5 +03.7 84.1	34 49.5 +03.9 84.0	33 50.6 +04.0 83.9	32 51.7 +04.2 83.9	31 52.8 +04.3 83.8
11°	35 52.2 +03.0 82.9	34 53.4 +03.2 82.8	33 54.6 +03.4 82.7	32 55.9 +03.5 82.7	31 57.1 +03.7 82.6
12°	35 55.2 +02.3 81.7	34 56.6 +02.4 81.6	33 58.0 +02.6 81.5	32 59.4 +02.8 81.5	32 00.8 +03.0 81.4
13°	35 57.5 +01.4 80.4	34 59.0 +01.7 80.4	34 00.6 +01.9 80.3	33 02.2 +02.1 80.3	32 03.8 +02.3 80.2
14°	35 58.9 +00.7 79.2	35 00.7 +01.0 79.2	34 02.5 +01.2 79.1	33 04.3 +01.5 79.1	32 06.1 +01.7 79.1
15°	35 59.6 +00.0 77.9	35 01.7 +00.2 77.9	34 03.7 +00.5 77.9	33 05.8 +00.8 77.9	32 07.8 +01.1 77.9
16°	35 59.6 -00.8 76.7	35 01.9 -00.5 76.7	34 04.2 -00.2 76.7	33 06.6 +00.1 76.7	32 08.9 +00.4 76.7
17°	35 58.8 -01.6 75.5	35 01.4 -01.2 75.5	34 04.0 -00.9 75.5	33 06.7 -00.6 75.5	32 09.3 -00.3 75.5
18°	35 57.2 -02.3 74.2	35 00.2 -02.0 74.3	34 03.1 -01.6 74.3	33 06.1 -01.3 74.3	32 09.0 -00.9 74.3
19°	35 54.9 -03.1 73.0	34 58.2 -02.7 73.1	34 01.5 -02.3 73.1	33 04.8 -01.9 73.1	32 08.1 -01.6 73.2
20°	35 51.8 -03.8 71.8	34 55.5 -03.4 71.8	33 59.2 -03.0 71.9	33 02.9 -02.7 71.9	32 06.5 -02.2 72.0
21°	35 48.0 -04.6 70.5	34 52.1 -04.2 70.6	33 56.2 -03.8 70.7	33 00.2 -03.3 70.7	32 04.3 -02.9 70.8
22°	35 43.4 -05.4 69.3	34 47.9 -04.9 69.4	33 52.4 -04.4 69.5	32 56.9 -04.0 69.6	32 01.4 -03.6 69.6
23°	35 38.0 -06.1 68.1	34 43.0 -05.6 68.2	33 48.0 -05.1 68.3	32 52.9 -04.6 68.4	31 57.8 -04.2 68.4
24°	35 31.9 -06.8 66.9	34 37.4 -06.3 67.0	33 42.9 -05.9 67.1	32 48.3 -05.4 67.2	31 53.6 -04.8 67.3
25°	35 25.1 -07.5 65.6	34 31.1 -07.0 65.8	33 37.0 -06.5 65.9	32 42.9 -06.0 66.0	31 48.8 -05.5 66.1
26°	35 17.6 -08.3 64.4	34 24.1 -07.7 64.6	33 30.5 -07.2 64.7	32 36.9 -06.6 64.8	31 43.3 -06.1 64.9
27°	35 09.3 -09.0 63.2	34 16.4 -08.5 63.4	33 23.3 -07.8 63.5	32 30.3 -07.3 63.6	31 37.2 -06.8 63.8
28°	35 00.3 -09.7 62.0	34 07.9 -09.1 62.2	33 15.5 -08.6 62.3	32 23.0 -08.0 62.5	31 30.4 -07.4 62.6
29°	34 50.6 -10.5 60.8	33 58.8 -09.8 61.0	33 06.9 -09.2 61.1	32 15.0 -08.6 61.3	31 23.0 -08.0 61.4

Declination SAME name as Latitude

Latitude 9°

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 35.6 +10.5 95.2	28 36.6 +10.4 95.0	27 37.5 +10.4 94.8	26 38.5 +10.2 94.6	25 39.4 +10.2 94.4
1°	29 46.1 +09.9 94.0	28 47.0 +09.9 93.8	27 47.9 +09.8 93.6	26 48.7 +09.7 93.5	25 49.6 +09.6 93.3
2°	29 56.0 +09.4 92.9	28 56.9 +09.2 92.7	27 57.7 +09.2 92.5	26 58.4 +09.3 92.3	25 59.2 +09.2 92.2
3°	30 05.4 +08.7 91.7	29 06.1 +08.8 91.6	28 06.9 +08.7 91.4	27 07.7 +08.6 91.2	26 08.4 +08.7 91.1
4°	30 14.1 +08.2 90.6	29 14.9 +08.1 90.4	28 15.6 +08.2 90.3	27 16.3 +08.2 90.1	26 17.1 +08.1 90.0
5°	30 22.3 +07.5 89.5	29 23.0 +07.6 89.3	28 23.8 +07.5 89.2	27 24.5 +07.6 89.0	26 25.2 +07.7 88.9
6°	30 29.8 +06.9 88.3	29 30.6 +07.0 88.2	28 31.3 +07.1 88.0	27 32.1 +07.1 87.9	26 32.9 +07.1 87.8
7°	30 36.7 +06.4 87.2	29 37.6 +06.4 87.0	28 38.4 +06.4 86.9	27 39.2 +06.6 86.8	26 40.0 +06.7 86.6
8°	30 43.1 +05.7 86.0	29 44.0 +05.8 85.9	28 44.8 +06.0 85.8	27 45.8 +06.0 85.6	26 46.7 +06.1 85.5
9°	30 48.8 +05.1 84.8	29 49.8 +05.2 84.7	28 50.8 +05.3 84.6	27 51.8 +05.4 84.5	26 52.8 +05.5 84.4
10°	30 53.9 +04.4 83.7	29 55.0 +04.6 83.6	28 56.1 +04.7 83.5	27 57.2 +04.9 83.4	26 58.3 +05.1 83.3
11°	30 58.3 +03.9 82.5	29 59.6 +04.0 82.4	29 00.8 +04.2 82.4	28 02.1 +04.3 82.3	27 03.4 +04.5 82.2
12°	31 02.2 +03.2 81.4	30 03.6 +03.4 81.3	29 05.0 +03.6 81.2	28 06.4 +03.8 81.1	27 07.9 +04.0 81.1
13°	31 05.4 +02.6 80.2	30 07.0 +02.8 80.1	29 08.6 +03.0 80.1	28 10.2 +03.3 80.0	27 11.9 +03.4 79.9
14°	31 08.0 +01.9 79.0	30 09.8 +02.2 79.0	29 11.6 +02.4 78.9	28 13.5 +02.6 78.9	27 15.3 +02.9 78.8
15°	31 09.9 +01.3 77.9	30 12.0 +01.6 77.8	29 14.0 +01.9 77.8	28 16.1 +02.1 77.7	27 18.2 +02.4 77.7
16°	31 11.2 +00.7 76.7	30 13.6 +00.9 76.7	29 15.9 +01.3 76.6	28 18.2 +01.6 76.6	27 20.6 +01.8 76.6
17°	31 11.9 +00.1 75.5	30 14.5 +00.4 75.5	29 17.2 +00.6 75.5	28 19.8 +01.0 75.5	27 22.4 +01.3 75.4
18°	31 12.0 -00.6 74.3	30 14.9 -00.3 74.3	29 17.8 +00.1 74.3	28 20.8 +00.4 74.3	27 23.7 +00.7 74.3
19°	31 11.4 -01.3 73.2	30 14.6 -00.8 73.2	29 17.9 -00.5 73.2	28 21.2 -00.2 73.2	27 24.4 +00.2 73.2
20°	31 10.1 -01.8 72.0	30 13.8 -01.5 72.0	29 17.4 -01.1 72.0	28 21.0 -00.7 72.1	27 24.6 -00.3 72.1
21°	31 08.3 -02.5 70.8	30 12.3 -02.1 70.9	29 16.3 -01.7 70.9	28 20.3 -01.3 70.9	27 24.3 -00.9 70.9
22°	31 05.8 -03.1 69.7	30 10.2 -02.7 69.7	29 14.6 -02.2 69.8	28 19.0 -01.8 69.8	27 23.4 -01.4 69.8
23°	31 02.7 -03.7 68.5	30 07.5 -03.2 68.6	29 12.4 -02.9 68.6	28 17.2 -02.4 68.7	27 22.0 -02.0 68.7
24°	30 59.0 -04.4 67.3	30 04.3 -03.9 67.4	29 09.5 -03.4 67.5	28 14.8 -03.0 67.5	27 20.0 -02.5 67.6
25°	30 54.6 -05.0 66.2	30 00.4 -04.5 66.3	29 06.1 -04.0 66.3	28 11.8 -03.5 66.4	27 17.5 -03.1 66.4
26°	30 49.6 -05.6 65.0	29 55.9 -05.1 65.1	29 02.1 -04.6 65.2	28 08.3 -04.1 65.3	27 14.4 -03.5 65.3
27°	30 44.0 -06.2 63.9	29 50.8 -05.7 64.0	28 57.5 -05.2 64.0	28 04.2 -04.6 64.1	27 10.9 -04.2 64.2
28°	30 37.8 -06.9 62.7	29 45.1 -06.3 62.8	28 52.3 -05.7 62.9	27 59.6 -05.2 63.0	27 06.7 -04.6 63.1
29°	30 30.9 -07.4 61.5	29 38.8 -06.9 61.7	28 46.6 -06.3 61.8	27 54.4 -05.8 61.9	27 02.1 -05.2 61.9

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 40.3 +10.1 94.2	23 41.2 +10.0 94.0	22 42.1 +09.9 93.8	21 42.9 +09.9 93.6	20 43.8 +09.8 93.4
1°	24 50.4 +09.6 93.1	23 51.2 +09.6 92.9	22 52.0 +09.5 92.7	21 52.8 +09.5 92.6	20 53.6 +09.5 92.4
2°	25 00.0 +09.2 92.0	24 00.8 +09.1 91.8	23 01.5 +09.1 91.7	22 02.3 +09.1 91.5	21 03.1 +09.0 91.3
3°	25 09.2 +08.6 90.9	24 09.9 +08.7 90.7	23 10.6 +08.7 90.6	22 11.4 +08.6 90.4	21 12.1 +08.7 90.3
4°	25 17.8 +08.2 89.8	24 18.6 +08.2 89.7	23 19.3 +08.2 89.5	22 20.0 +08.3 89.4	21 20.8 +08.2 89.2
5°	25 26.0 +07.7 88.7	24 26.8 +07.7 88.6	23 27.5 +07.8 88.4	22 28.3 +07.8 88.3	21 29.0 +07.9 88.1
6°	25 33.7 +07.2 87.6	24 34.5 +07.2 87.5	23 35.3 +07.3 87.3	22 36.1 +07.4 87.2	21 36.9 +07.5 87.1
7°	25 40.9 +06.7 86.5	24 41.7 +06.8 86.4	23 42.6 +06.9 86.3	22 43.5 +06.9 86.1	21 44.4 +07.0 86.0
8°	25 47.6 +06.2 85.4	24 48.5 +06.3 85.3	23 49.5 +06.4 85.2	22 50.4 +06.5 85.1	21 51.4 +06.6 84.9
9°	25 53.8 +05.7 84.3	24 54.8 +05.9 84.2	23 55.9 +05.9 84.1	22 56.9 +06.1 84.0	21 58.0 +06.2 83.9
10°	25 59.5 +05.2 83.2	25 00.7 +05.3 83.1	24 01.8 +05.5 83.0	23 03.0 +05.6 82.9	22 04.2 +05.8 82.8
11°	26 04.7 +04.7 82.1	25 06.0 +04.8 82.0	24 07.3 +05.0 81.9	23 08.6 +05.2 81.8	22 10.0 +05.4 81.7
12°	26 09.4 +04.1 81.0	25 10.8 +04.4 80.9	24 12.3 +04.6 80.8	23 13.8 +04.8 80.7	22 15.4 +04.9 80.6
13°	26 13.5 +03.7 79.9	25 15.2 +03.9 79.8	24 16.9 +04.1 79.7	23 18.6 +04.3 79.6	22 20.3 +04.5 79.6
14°	26 17.2 +03.1 78.8	25 19.1 +03.4 78.7	24 21.0 +03.6 78.6	23 22.9 +03.8 78.6	22 24.8 +04.1 78.5
15°	26 20.3 +02.7 77.6	25 22.5 +02.8 77.6	24 24.6 +03.1 77.5	23 26.7 +03.4 77.5	22 28.9 +03.6 77.4
16°	26 23.0 +02.1 76.5	25 25.3 +02.4 76.5	24 27.7 +02.7 76.4	23 30.1 +03.0 76.4	22 32.5 +03.2 76.3
17°	26 25.1 +01.6 75.4	25 27.7 +01.9 75.4	24 30.4 +02.2 75.3	23 33.1 +02.4 75.3	22 35.7 +02.8 75.2
18°	26 26.7 +01.0 74.3	25 29.6 +01.4 74.3	24 32.6 +01.7 74.2	23 35.5 +02.1 74.2	22 38.5 +02.4 74.2
19°	26 27.7 +00.6 73.2	25 31.0 +00.9 73.2	24 34.3 +01.2 73.1	23 37.6 +01.5 73.1	22 40.9 +01.9 73.1
20°	26 28.3 +00.0 72.1	25 31.9 +00.4 72.1	24 35.5 +00.8 72.0	23 39.1 +01.1 72.0	22 42.8 +01.4 72.0
21°	26 28.3 -00.5 70.9	25 32.3 -00.1 70.9	24 36.3 +00.2 70.9	23 40.2 +00.7 70.9	22 44.2 +01.1 70.9
22°	26 27.8 -01.0 69.8	25 32.2 -00.7 69.8	24 36.5 -00.2 69.8	23 40.9 +00.2 69.8	22 45.3 +00.6 69.8
23°	26 26.8 -01.6 68.7	25 31.5 -01.1 68.7	24 36.3 -00.7 68.7	23 41.1 -00.3 68.7	22 45.9 +00.1 68.7
24°	26 25.2 -02.0 67.6	25 30.4 -01.6 67.6	24 35.6 -01.1 67.6	23 40.8 -00.7 67.7	22 46.0 -00.3 67.7
25°	26 23.2 -02.6 66.5	25 28.8 -02.1 66.5	24 34.5 -01.7 66.5	23 40.1 -01.2 66.6	22 45.7 -00.7 66.6
26°	26 20.6 -03.1 65.4	25 26.7 -02.6 65.4	24 32.8 -02.1 65.4	23 38.9 -01.6 65.5	22 45.0 -01.2 65.5
27°	26 17.5 -03.6 64.3	25 24.1 -03.1 64.3	24 30.7 -02.6 64.3	23 37.3 -02.1 64.4	22 43.8 -01.6 64.4
28°	26 13.9 -04.1 63.1	25 21.0 -03.6 63.2	24 28.1 -03.1 63.2	23 35.2 -02.6 63.3	22 42.2 -02.0 63.3
29°	26 09.8 -04.7 62.0	25 17.4 -04.1 62.1	24 25.0 -03.5 62.1	23 32.6 -03.0 62.2	22 40.2 -02.5 62.2

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Latitude 9°

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 44.6 +09.8 93.3	18 45.4 +09.8 93.1	17 46.3 +09.6 92.9	16 47.1 +09.6 92.7	15 47.9 +09.6 92.6
1°	19 54.4 +09.4 92.2	18 55.2 +09.4 92.0	17 55.9 +09.4 91.9	16 56.7 +09.4 91.7	15 57.5 +09.3 91.5
2°	20 03.8 +09.1 91.2	19 04.6 +09.0 91.0	18 05.3 +09.0 90.8	17 06.1 +09.0 90.7	16 06.8 +09.0 90.5
3°	20 12.9 +08.6 90.1	19 13.6 +08.7 89.9	18 14.3 +08.7 89.8	17 15.1 +08.7 89.6	16 15.8 +08.7 89.5
4°	20 21.5 +08.3 89.1	19 22.3 +08.3 88.9	18 23.0 +08.4 88.8	17 23.8 +08.4 88.6	16 24.5 +08.5 88.5
5°	20 29.8 +07.9 88.0	19 30.6 +07.9 87.9	18 31.4 +08.0 87.7	17 32.2 +08.0 87.6	16 33.0 +08.1 87.4
6°	20 37.7 +07.5 86.9	19 38.5 +07.6 86.8	18 39.4 +07.6 86.7	17 40.2 +07.8 86.5	16 41.1 +07.8 86.4
7°	20 45.2 +07.2 85.9	19 46.1 +07.3 85.7	18 47.0 +07.3 85.6	17 48.0 +07.4 85.5	16 48.9 +07.5 85.4
8°	20 52.4 +06.7 84.8	19 53.4 +06.8 84.7	18 54.3 +07.0 84.6	17 55.4 +07.0 84.4	16 56.4 +07.2 84.3
9°	20 59.1 +06.3 83.7	20 00.2 +06.5 83.6	19 01.3 +06.6 83.5	18 02.4 +06.8 83.4	17 03.6 +06.8 83.3
10°	21 05.4 +06.0 82.7	20 06.7 +06.0 82.6	19 07.9 +06.2 82.5	18 09.2 +06.3 82.4	17 10.4 +06.6 82.2
11°	21 11.4 +05.5 81.6	20 12.7 +05.7 81.5	19 14.1 +05.9 81.4	18 15.5 +06.1 81.3	17 17.0 +06.2 81.2
12°	21 16.9 +05.1 80.5	20 18.4 +05.4 80.5	19 20.0 +05.5 80.4	18 21.6 +05.7 80.3	17 23.2 +05.9 80.2
13°	21 22.0 +04.7 79.5	20 23.8 +04.9 79.4	19 25.5 +05.2 79.3	18 27.3 +05.4 79.2	17 29.1 +05.6 79.1
14°	21 26.7 +04.4 78.4	20 28.7 +04.5 78.3	19 30.7 +04.7 78.2	18 32.7 +05.0 78.2	17 34.7 +05.2 78.1
15°	21 31.1 +03.9 77.3	20 33.2 +04.2 77.3	19 35.4 +04.5 77.2	18 37.7 +04.6 77.1	17 39.9 +04.9 77.0
16°	21 35.0 +03.4 76.3	20 37.4 +03.8 76.2	19 39.9 +04.0 76.1	18 42.3 +04.3 76.1	17 44.8 +04.6 76.0
17°	21 38.4 +03.1 75.2	20 41.2 +03.3 75.1	19 43.9 +03.7 75.1	18 46.6 +04.0 75.0	17 49.4 +04.3 74.9
18°	21 41.5 +02.7 74.1	20 44.5 +03.0 74.1	19 47.6 +03.2 74.0	18 50.6 +03.6 73.9	17 53.7 +03.9 73.9
19°	21 44.2 +02.2 73.0	20 47.5 +02.6 73.0	19 50.8 +02.9 72.9	18 54.2 +03.2 72.9	17 57.6 +03.5 72.8
20°	21 46.4 +01.8 72.0	20 50.1 +02.2 71.9	19 53.7 +02.6 71.9	18 57.4 +02.9 71.8	18 01.1 +03.3 71.8
21°	21 48.2 +01.4 70.9	20 52.3 +01.7 70.9	19 56.3 +02.1 70.8	19 00.3 +02.5 70.8	18 04.4 +02.8 70.7
22°	21 49.6 +01.0 69.8	20 54.0 +01.4 69.8	19 58.4 +01.8 69.8	19 02.8 +02.2 69.7	18 07.2 +02.6 69.7
23°	21 50.6 +00.6 68.7	20 55.4 +01.0 68.7	20 00.2 +01.4 68.7	19 05.0 +01.8 68.7	18 09.8 +02.2 68.6
24°	21 51.2 +00.1 67.7	20 56.4 +00.6 67.6	20 01.6 +01.0 67.6	19 06.8 +01.4 67.6	18 12.0 +01.9 67.6
25°	21 51.3 -00.2 66.6	20 57.0 +00.1 66.6	20 02.6 +00.6 66.6	19 08.2 +01.1 66.5	18 13.9 +01.5 66.5
26°	21 51.1 -00.7 65.5	20 57.1 -00.2 65.5	20 03.2 +00.3 65.5	19 09.3 +00.7 65.5	18 15.4 +01.1 65.5
27°	21 50.4 -01.1 64.4	20 56.9 -00.6 64.4	20 03.5 -00.2 64.4	19 10.0 +00.3 64.4	18 16.5 +00.9 64.4
28°	21 49.3 -01.6 63.3	20 56.3 -01.0 63.4	20 03.3 -00.5 63.4	19 10.3 +00.0 63.4	18 17.4 +00.4 63.4
29°	21 47.7 -01.9 62.3	20 55.3 -01.5 62.3	20 02.8 -00.9 62.3	19 10.3 -00.4 62.3	18 17.8 +00.2 62.3

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 48.7 +09.5 92.4	13 49.5 +09.5 92.2	12 50.2 +09.5 92.1	11 51.0 +09.5 91.9	10 51.8 +09.4 91.7
1°	14 58.2 +09.3 91.4	13 59.0 +09.3 91.2	12 59.7 +09.3 91.1	12 00.5 +09.3 90.9	11 01.2 +09.3 90.7
2°	15 07.5 +09.1 90.4	14 08.3 +09.0 90.2	13 09.0 +09.1 90.0	12 09.8 +09.0 89.9	11 10.5 +09.1 89.7
3°	15 16.6 +08.7 89.3	14 17.3 +08.8 89.2	13 18.1 +08.7 89.0	12 18.8 +08.8 88.9	11 19.6 +08.8 88.7
4°	15 25.3 +08.5 88.3	14 26.1 +08.5 88.2	13 26.8 +08.6 88.0	12 27.6 +08.6 87.9	11 28.4 +08.6 87.7
5°	15 33.8 +08.1 87.3	14 34.6 +08.2 87.1	13 35.4 +08.3 87.0	12 36.2 +08.4 86.8	11 37.0 +08.5 86.7
6°	15 41.9 +07.9 86.2	14 42.8 +08.0 86.1	13 43.7 +08.0 86.0	12 44.6 +08.1 85.8	11 45.5 +08.2 85.7
7°	15 49.8 +07.6 85.2	14 50.8 +07.7 85.1	13 51.7 +07.8 85.0	12 52.7 +07.9 84.8	11 53.7 +08.0 84.7
8°	15 57.4 +07.3 84.2	14 58.5 +07.4 84.1	13 59.5 +07.6 83.9	13 00.6 +07.7 83.8	12 01.7 +07.8 83.7
9°	16 04.7 +07.0 83.2	15 05.9 +07.1 83.0	14 07.1 +07.3 82.9	13 08.3 +07.4 82.8	12 09.5 +07.6 82.7
10°	16 11.7 +06.7 82.1	15 13.0 +06.9 82.0	14 14.4 +07.0 81.9	13 15.7 +07.2 81.8	12 17.1 +07.3 81.6
11°	16 18.4 +06.4 81.1	15 19.9 +06.6 81.0	14 21.4 +06.7 80.9	13 22.9 +06.9 80.7	12 24.4 +07.1 80.6
12°	16 24.8 +06.1 80.0	15 26.5 +06.3 79.9	14 28.1 +06.5 79.8	13 29.8 +06.7 79.7	12 31.5 +06.9 79.6
13°	16 30.9 +05.8 79.0	15 32.8 +06.0 78.9	14 34.6 +06.2 78.8	13 36.5 +06.4 78.7	12 38.4 +06.6 78.6
14°	16 36.7 +05.5 78.0	15 38.8 +05.7 77.9	14 40.8 +06.0 77.8	13 42.9 +06.2 77.7	12 45.0 +06.4 77.6
15°	16 42.2 +05.1 76.9	15 44.5 +05.4 76.8	14 46.8 +05.6 76.7	13 49.1 +05.9 76.7	12 51.4 +06.2 76.5
16°	16 47.3 +04.9 75.9	15 49.9 +05.1 75.8	14 52.4 +05.4 75.7	13 55.0 +05.7 75.6	12 57.6 +06.0 75.5
17°	16 52.2 +04.5 74.9	15 55.0 +04.8 74.8	14 57.8 +05.2 74.7	14 00.7 +05.4 74.6	13 03.6 +05.7 74.5
18°	16 56.7 +04.2 73.8	15 59.8 +04.6 73.7	15 03.0 +04.8 73.7	14 06.1 +05.1 73.6	13 09.3 +05.4 73.5
19°	17 00.9 +03.9 72.8	16 04.4 +04.2 72.7	15 07.8 +04.5 72.6	14 11.2 +04.9 72.5	13 14.7 +05.2 72.5
20°	17 04.8 +03.6 71.7	16 08.6 +03.9 71.7	15 12.3 +04.3 71.6	14 16.1 +04.6 71.5	13 19.9 +05.0 71.4
21°	17 08.4 +03.3 70.7	16 12.5 +03.6 70.6	15 16.6 +04.0 70.6	14 20.7 +04.4 70.5	13 24.9 +04.7 70.4
22°	17 11.7 +02.9 69.6	16 16.1 +03.4 69.6	15 20.6 +03.7 69.5	14 25.1 +04.1 69.5	13 29.6 +04.5 69.4
23°	17 14.6 +02.6 68.6	16 19.5 +03.0 68.5	15 24.3 +03.4 68.5	14 29.2 +03.8 68.4	13 34.1 +04.2 68.4
24°	17 17.2 +02.3 67.5	16 22.5 +02.7 67.5	15 27.7 +03.2 67.5	14 33.0 +03.5 67.4	13 38.3 +04.0 67.3
25°	17 19.5 +02.0 66.5	16 25.2 +02.4 66.5	15 30.9 +02.8 66.4	14 36.5 +03.3 66.4	13 42.3 +03.7 66.3
26°	17 21.5 +01.6 65.4	16 27.6 +02.1 65.4	15 33.7 +02.5 65.4	14 39.8 +03.0 65.3	13 46.0 +03.4 65.3
27°	17 23.1 +01.3 64.4	16 29.7 +01.7 64.4	15 36.2 +02.3 64.3	14 42.8 +02.7 64.3	13 49.4 +03.2 64.3
28°	17 24.4 +01.0 63.4	16 31.4 +01.5 63.3	15 38.5 +01.9 63.3	14 45.5 +02.5 63.3	13 52.6 +03.0 63.2
29°	17 25.4 +00.6 62.3	16 32.9 +01.2 62.3	15 40.4 +01.7 62.3	14 48.0 +02.2 62.2	13 55.6 +02.7 62.2

Declination SAME name as Latitude

Latitude 9°

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 52.5 +09.5 91.6	8 53.3 +09.4 91.4	7 54.1 +09.4 91.3	6 54.8 +09.4 91.1	5 55.6 +09.3 90.9
1°	10 02.0 +09.2 90.6	9 02.7 +09.3 90.4	8 03.5 +09.2 90.3	7 04.2 +09.3 90.1	6 04.9 +09.3 89.9
2°	10 11.2 +09.1 89.6	9 12.0 +09.1 89.4	8 12.7 +09.1 89.3	7 13.5 +09.1 89.1	6 14.2 +09.2 89.0
3°	10 20.3 +08.9 88.6	9 21.1 +08.9 88.4	8 21.8 +09.0 88.3	7 22.6 +09.0 88.1	6 23.4 +09.0 88.0
4°	10 29.2 +08.7 87.6	9 30.0 +08.7 87.4	8 30.8 +08.8 87.3	7 31.6 +08.9 87.1	6 32.4 +08.9 87.0
5°	10 37.9 +08.5 86.6	9 38.7 +08.6 86.4	8 39.6 +08.7 86.3	7 40.5 +08.7 86.1	6 41.3 +08.9 86.0
6°	10 46.4 +08.3 85.5	9 47.3 +08.4 85.4	8 48.3 +08.4 85.3	7 49.2 +08.6 85.1	6 50.2 +08.6 85.0
7°	10 54.7 +08.1 84.5	9 55.7 +08.2 84.4	8 56.7 +08.4 84.3	7 57.8 +08.4 84.1	6 58.8 +08.6 84.0
8°	11 02.8 +07.9 83.5	10 03.9 +08.1 83.4	9 05.1 +08.1 83.3	8 06.2 +08.3 83.1	7 07.4 +08.4 83.0
9°	11 10.7 +07.7 82.5	10 12.0 +07.8 82.4	9 13.2 +08.0 82.3	8 14.5 +08.2 82.1	7 15.8 +08.3 82.0
10°	11 18.4 +07.5 81.5	10 19.8 +07.7 81.4	9 21.2 +07.9 81.3	8 22.7 +08.0 81.1	7 24.1 +08.2 81.0
11°	11 25.9 +07.3 80.5	10 27.5 +07.5 80.4	9 29.1 +07.6 80.2	8 30.7 +07.8 80.1	7 32.3 +08.0 80.0
12°	11 33.2 +07.1 79.5	10 35.0 +07.3 79.4	9 36.7 +07.5 79.2	8 38.5 +07.7 79.1	7 40.3 +07.9 79.0
13°	11 40.3 +06.9 78.5	10 42.3 +07.0 78.4	9 44.2 +07.3 78.2	8 46.2 +07.5 78.1	7 48.2 +07.8 78.0
14°	11 47.2 +06.6 77.5	10 49.3 +06.9 77.3	9 51.5 +07.2 77.2	8 53.7 +07.4 77.1	7 56.0 +07.6 77.0
15°	11 53.8 +06.5 76.4	10 56.2 +06.7 76.3	9 58.7 +06.9 76.2	9 01.1 +07.2 76.1	8 03.6 +07.5 76.0
16°	12 00.3 +06.2 75.4	11 02.9 +06.5 75.3	10 05.6 +06.8 75.2	9 08.3 +07.1 75.1	8 11.1 +07.3 75.0
17°	12 06.5 +06.0 74.4	11 09.4 +06.3 74.3	10 12.4 +06.5 74.2	9 15.4 +06.8 74.1	8 18.4 +07.2 74.0
18°	12 12.5 +05.7 73.4	11 15.7 +06.1 73.3	10 18.9 +06.4 73.2	9 22.2 +06.7 73.1	8 25.6 +07.0 73.0
19°	12 18.2 +05.6 72.4	11 21.8 +05.8 72.3	10 25.3 +06.2 72.2	9 28.9 +06.6 72.1	8 32.6 +06.8 72.0
20°	12 23.8 +05.3 71.4	11 27.6 +05.7 71.3	10 31.5 +06.0 71.2	9 35.5 +06.3 71.1	8 39.4 +06.7 71.0
21°	12 29.1 +05.1 70.3	11 33.3 +05.4 70.2	10 37.5 +05.8 70.2	9 41.8 +06.2 70.1	8 46.1 +06.6 70.0
22°	12 34.2 +04.8 69.3	11 38.7 +05.3 69.2	10 43.3 +05.7 69.1	9 48.0 +06.0 69.1	8 52.7 +06.3 69.0
23°	12 39.0 +04.6 68.3	11 44.0 +05.0 68.2	10 49.0 +05.4 68.1	9 54.0 +05.8 68.0	8 59.0 +06.3 67.9
24°	12 43.6 +04.4 67.3	11 49.0 +04.8 67.2	10 54.4 +05.2 67.1	9 59.8 +05.6 67.0	9 05.3 +06.0 66.9
25°	12 48.0 +04.2 66.2	11 53.8 +04.6 66.2	10 59.6 +05.0 66.1	10 05.4 +05.5 66.0	9 11.3 +05.9 65.9
26°	12 52.2 +03.9 65.2	11 58.4 +04.3 65.2	11 04.6 +04.8 65.1	10 10.9 +05.2 65.0	9 17.2 +05.7 64.9
27°	12 56.1 +03.6 64.2	12 02.7 +04.2 64.1	11 09.4 +04.6 64.1	10 16.1 +05.1 64.0	9 22.9 +05.5 63.9
28°	12 59.7 +03.5 63.2	12 06.9 +03.9 63.1	11 14.0 +04.4 63.1	10 21.2 +04.9 63.0	9 28.4 +05.4 62.9
29°	13 03.2 +03.1 62.2	12 10.8 +03.7 62.1	11 18.4 +04.2 62.0	10 26.1 +04.7 62.0	9 33.8 +05.2 61.9

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 56.3 +09.4 90.8	3 57.0 +09.4 90.6	2 57.8 +09.4 90.5	1 58.5 +09.4 90.3	0 59.3 +09.3 90.2
1°	5 05.7 +09.3 89.8	4 06.4 +09.3 89.6	3 07.2 +09.3 89.5	2 07.9 +09.3 89.3	1 08.6 +09.4 89.2
2°	5 15.0 +09.2 88.8	4 15.7 +09.2 88.6	3 16.5 +09.2 88.5	2 17.2 +09.3 88.3	1 18.0 +09.3 88.2
3°	5 24.2 +09.0 87.8	4 24.9 +09.2 87.7	3 25.7 +09.2 87.5	2 26.5 +09.3 87.3	1 27.3 +09.3 87.2
4°	5 33.2 +09.0 86.8	4 34.1 +09.0 86.7	3 34.9 +09.2 86.5	2 35.8 +09.2 86.4	1 36.6 +09.3 86.2
5°	5 42.2 +08.9 85.8	4 43.1 +09.0 85.7	3 44.1 +09.0 85.5	2 45.0 +09.1 85.4	1 45.9 +09.3 85.2
6°	5 51.1 +08.8 84.8	4 52.1 +08.9 84.7	3 53.1 +09.0 84.5	2 54.1 +09.1 84.4	1 55.2 +09.2 84.2
7°	5 59.9 +08.7 83.8	5 01.0 +08.8 83.7	4 02.1 +08.9 83.5	3 03.2 +09.1 83.4	2 04.4 +09.2 83.2
8°	6 08.6 +08.6 82.8	5 09.8 +08.7 82.7	4 11.0 +08.9 82.5	3 12.3 +09.0 82.4	2 13.6 +09.1 82.2
9°	6 17.2 +08.4 81.8	5 18.5 +08.6 81.7	4 19.9 +08.8 81.6	3 21.3 +08.9 81.4	2 22.7 +09.1 81.3
10°	6 25.6 +08.4 80.8	5 27.1 +08.5 80.7	4 28.7 +08.7 80.6	3 30.2 +08.9 80.4	2 31.8 +09.0 80.3
11°	6 34.0 +08.2 79.8	5 35.6 +08.5 79.7	4 37.4 +08.6 79.6	3 39.1 +08.8 79.4	2 40.8 +09.0 79.3
12°	6 42.2 +08.1 78.9	5 44.1 +08.3 78.7	4 46.0 +08.5 78.6	3 47.9 +08.7 78.4	2 49.8 +09.0 78.3
13°	6 50.3 +08.0 77.9	5 52.4 +08.2 77.7	4 54.5 +08.4 77.6	3 56.6 +08.7 77.4	2 58.8 +08.9 77.3
14°	6 58.3 +07.8 76.9	6 00.6 +08.1 76.7	5 02.9 +08.4 76.6	4 05.3 +08.6 76.5	3 07.7 +08.8 76.3
15°	7 06.1 +07.8 75.9	6 08.7 +08.0 75.7	5 11.3 +08.2 75.6	4 13.9 +08.5 75.5	3 16.5 +08.8 75.3
16°	7 13.9 +07.5 74.9	6 16.7 +07.8 74.7	5 19.5 +08.2 74.6	4 22.4 +08.4 74.5	3 25.3 +08.7 74.3
17°	7 21.4 +07.5 73.9	6 24.5 +07.8 73.7	5 27.7 +08.0 73.6	4 30.8 +08.4 73.5	3 34.0 +08.7 73.3
18°	7 28.9 +07.3 72.9	6 32.3 +07.6 72.7	5 35.7 +08.0 72.6	4 39.2 +08.3 72.5	3 42.7 +08.6 72.3
19°	7 36.2 +07.2 71.9	6 39.9 +07.6 71.7	5 43.7 +07.8 71.6	4 47.5 +08.1 71.5	3 51.3 +08.5 71.4
20°	7 43.4 +07.1 70.9	6 47.5 +07.4 70.7	5 51.5 +07.8 70.6	4 55.6 +08.1 70.5	3 59.8 +08.5 70.4
21°	7 50.5 +06.9 69.9	6 54.9 +07.2 69.7	5 59.3 +07.6 69.6	5 03.7 +08.1 69.5	4 08.3 +08.3 69.4
22°	7 57.4 +06.7 68.8	7 02.1 +07.2 68.7	6 06.9 +07.5 68.6	5 11.8 +07.9 68.5	4 16.6 +08.3 68.4
23°	8 04.1 +06.6 67.8	7 09.3 +07.0 67.7	6 14.4 +07.5 67.6	5 19.7 +07.8 67.5	4 24.9 +08.3 67.4
24°	8 10.7 +06.5 66.8	7 16.3 +06.9 66.7	6 21.9 +07.3 66.6	5 27.5 +07.7 66.5	4 33.2 +08.1 66.4
25°	8 17.2 +06.3 65.8	7 23.2 +06.7 65.7	6 29.2 +07.1 65.6	5 35.2 +07.6 65.5	4 41.3 +08.1 65.4
26°	8 23.5 +06.2 64.8	7 29.9 +06.6 64.7	6 36.3 +07.1 64.6	5 42.8 +07.5 64.5	4 49.4 +07.9 64.4
27°	8 29.7 +06.0 63.8	7 36.5 +06.5 63.7	6 43.4 +06.9 63.6	5 50.3 +07.4 63.5	4 57.3 +07.9 63.4
28°	8 35.7 +05.8 62.8	7 43.0 +06.3 62.7	6 50.3 +06.9 62.6	5 57.7 +07.3 62.5	5 05.2 +07.8 62.4
29°	8 41.5 +05.7 61.8	7 49.3 +06.2 61.7	6 57.2 +06.7 61.6	6 05.0 +07.2 61.5	5 13.0 +07.7 61.4

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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 +09.4 90.0	-0 59.3 +09.4	-1 58.5 +09.4	-2 57.8 +09.4	-3 57.0 +09.4
1°	0 09.4 +09.4 89.0	-0 49.9 +09.4	-1 49.1 +09.4	-2 48.4 +09.5	-3 47.6 +09.5
2°	0 18.8 +09.3 88.0	-0 40.5 +09.5	-1 39.7 +09.5	-2 38.9 +09.5	-3 38.1 +09.6
3°	0 28.1 +09.4 87.0	-0 31.0 +09.4	-1 30.2 +09.5	-2 29.4 +09.6	-3 28.5 +09.6
4°	0 37.5 +09.4 86.0	-0 21.6 +09.4	-1 20.7 +09.5	-2 19.8 +09.6	-3 18.9 +09.7
5°	0 46.9 +09.3 85.1	-0 12.2 +09.5	-1 11.2 +09.6	-2 10.2 +09.7	-3 09.2 +09.8
6°	0 56.2 +09.3 84.1	-0 02.7 +09.4	-1 01.6 +09.5	-2 00.5 +09.6	-2 59.4 +09.8
7°	1 05.5 +09.4 83.1	0 06.7 +09.5 82.9	-0 52.1 +09.6	-1 50.9 +09.8	-2 49.6 +09.8
8°	1 14.9 +09.2 82.1	0 16.2 +09.4 81.9	-0 42.5 +09.6	-1 41.1 +09.7	-2 39.8 +09.9
9°	1 24.1 +09.3 81.1	0 25.6 +09.4 81.0	-0 32.9 +09.6	-1 31.4 +09.8	-2 29.9 +10.0
10°	1 33.4 +09.2 80.1	0 35.0 +09.4 80.0	-0 23.3 +09.6	-1 21.6 +09.8	-2 19.9 +10.0
11°	1 42.6 +09.2 79.1	0 44.4 +09.5 79.0	-0 13.7 +09.6	-1 11.8 +09.8	-2 09.9 +10.0
12°	1 51.8 +09.2 78.1	0 53.9 +09.3 78.0	-0 04.1 +09.6	-1 02.0 +09.8	-1 59.9 +10.1
13°	2 01.0 +09.1 77.2	1 03.2 +09.4 77.0	0 05.5 +09.6 76.8	-0 52.2 +09.9	-1 49.8 +10.1
14°	2 10.1 +09.1 76.2	1 12.6 +09.4 76.0	0 15.1 +09.6 75.9	-0 42.3 +09.8	-1 39.7 +10.1
15°	2 19.2 +09.1 75.2	1 22.0 +09.3 75.0	0 24.7 +09.6 74.9	-0 32.5 +09.9	-1 29.6 +10.1
16°	2 28.3 +09.0 74.2	1 31.3 +09.3 74.0	0 34.3 +09.6 73.9	-0 22.6 +09.9	-1 19.5 +10.2
17°	2 37.3 +08.9 73.2	1 40.6 +09.2 73.1	0 43.9 +09.6 72.9	-0 12.7 +09.9	-1 09.3 +10.2
18°	2 46.2 +09.0 72.2	1 49.8 +09.3 72.1	0 53.5 +09.5 71.9	-0 02.8 +09.9	-0 59.1 +10.2
19°	2 55.2 +08.8 71.2	1 59.1 +09.2 71.1	1 03.0 +09.6 70.9	0 07.1 +09.8 70.8	-0 48.9 +10.3
20°	3 04.0 +08.8 70.2	2 08.3 +09.1 70.1	1 12.6 +09.5 69.9	0 16.9 +09.9 69.8	-0 38.6 +10.2
21°	3 12.8 +08.8 69.2	2 17.4 +09.2 69.1	1 22.1 +09.5 69.0	0 26.8 +09.9 68.8	-0 28.4 +10.3
22°	3 21.6 +08.7 68.2	2 26.6 +09.0 68.1	1 31.6 +09.5 68.0	0 36.7 +09.9 67.8	-0 18.1 +10.2
23°	3 30.3 +08.6 67.3	2 35.6 +09.1 67.1	1 41.1 +09.4 67.0	0 46.6 +09.8 66.8	-0 07.9 +10.3
24°	3 38.9 +08.5 66.3	2 44.7 +08.9 66.1	1 50.5 +09.4 66.0	0 56.4 +09.8 65.8	0 02.4 +10.2 65.7
25°	3 47.4 +08.5 65.3	2 53.6 +09.0 65.1	1 59.9 +09.4 65.0	1 06.2 +09.8 64.9	0 12.6 +10.3 64.7
26°	3 55.9 +08.5 64.3	3 02.6 +08.8 64.1	2 09.3 +09.3 64.0	1 16.0 +09.8 63.9	0 22.9 +10.2 63.7
27°	4 04.4 +08.3 63.3	3 11.4 +08.9 63.2	2 18.6 +09.3 63.0	1 25.8 +09.8 62.9	0 33.1 +10.2 62.7
28°	4 12.7 +08.3 62.3	3 20.3 +08.7 62.2	2 27.9 +09.2 62.0	1 35.6 +09.7 61.9	0 43.3 +10.3 61.7
29°	4 21.0 +08.2 61.3	3 29.0 +08.7 61.2	2 37.1 +09.2 61.0	1 45.3 +09.7 60.9	0 53.6 +10.2 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 56.3 +09.5	-5 55.6 +09.5			
1°	-4 46.8 +09.5	-5 46.1 +09.6			
2°	-4 37.3 +09.7	-5 36.5 +09.7			
3°	-4 27.6 +09.7	-5 26.8 +09.8			
4°	-4 17.9 +09.8	-5 17.0 +09.9			
5°	-4 08.1 +09.8	-5 07.1 +10.0			
6°	-3 58.3 +09.9	-4 57.1 +10.0			
7°	-3 48.4 +10.0	-4 47.1 +10.2			
8°	-3 38.4 +10.1	-4 36.9 +10.2			
9°	-3 28.3 +10.1	-4 26.7 +10.3			
10°	-3 18.2 +10.2	-4 16.4 +10.4			
11°	-3 08.0 +10.3	-4 06.0 +10.5			
12°	-2 57.7 +10.3	-3 55.5 +10.5			
13°	-2 47.4 +10.3	-3 45.0 +10.6			
14°	-2 37.1 +10.4	-3 34.4 +10.6			
15°	-2 26.7 +10.4	-3 23.8 +10.8			
16°	-2 16.3 +10.5	-3 13.0 +10.7			
17°	-2 05.8 +10.5	-3 02.3 +10.9			
18°	-1 55.3 +10.6	-2 51.4 +10.8			
19°	-1 44.7 +10.5	-2 40.6 +11.0			
20°	-1 34.2 +10.6	-2 29.6 +10.9			
21°	-1 23.6 +10.7	-2 18.7 +11.1			
22°	-1 12.9 +10.6	-2 07.6 +11.0			
23°	-1 02.3 +10.7	-1 56.6 +11.1			
24°	-0 51.6 +10.7	-1 45.5 +11.1			
25°	-0 40.9 +10.7	-1 34.4 +11.1			
26°	-0 30.2 +10.7	-1 23.3 +11.2			
27°	-0 19.5 +10.7	-1 12.1 +11.2			
28°	-0 08.8 +10.7	-1 00.9 +11.2			
29°	0 01.9 +10.7 60.6	-0 49.7 +11.2			