

**Latitude  $40^{\circ}$  -  $49^{\circ}$**

Declination SAME name as Latitude



# **Sight-Reduction Tables for Latitude 40° - 49°**

**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  $0^\circ$  to  $29^\circ$ , which applies to the Declination of the Sun, the Moon and the planets used for celestial navigation. The LHA range is such that the resulting Altitude is positive (object above the local horizon).

For practical Sight Reduction this manual is used as follows:

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

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

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



## Declination SAME name as Latitude

## Latitude 40°

| 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°  | 50 00.0 +60.0 180.0 | 49 59.4 +60.0 178.4 | 49 57.5 +60.0 176.9 | 49 54.4 +59.9 175.3 | 49 50.0 +59.8 173.8 |
| 1°  | 51 00.0 +60.0 180.0 | 50 59.4 +59.9 178.4 | 50 57.5 +59.9 176.8 | 50 54.3 +59.8 175.2 | 50 49.8 +59.8 173.7 |
| 2°  | 52 00.0 +60.0 180.0 | 51 59.3 +60.0 178.4 | 51 57.4 +59.9 176.8 | 51 54.1 +59.9 175.1 | 51 49.6 +59.8 173.5 |
| 3°  | 53 00.0 +60.0 180.0 | 52 59.3 +60.0 178.3 | 52 57.3 +60.0 176.7 | 52 54.0 +59.9 175.0 | 52 49.4 +59.7 173.4 |
| 4°  | 54 00.0 +60.0 180.0 | 53 59.3 +60.0 178.3 | 53 57.3 +59.9 176.6 | 53 53.9 +59.8 174.9 | 53 49.1 +59.8 173.2 |
| 5°  | 55 00.0 +60.0 180.0 | 54 59.3 +60.0 178.3 | 54 57.2 +59.9 176.5 | 54 53.7 +59.9 174.8 | 54 48.9 +59.7 173.1 |
| 6°  | 56 00.0 +60.0 180.0 | 55 59.3 +60.0 178.2 | 55 57.1 +60.0 176.4 | 55 53.6 +59.8 174.7 | 55 48.6 +59.7 172.9 |
| 7°  | 57 00.0 +60.0 180.0 | 56 59.3 +60.0 178.2 | 56 57.1 +59.9 176.4 | 56 53.4 +59.9 174.5 | 56 48.3 +59.7 172.7 |
| 8°  | 58 00.0 +60.0 180.0 | 57 59.3 +59.9 178.1 | 57 57.0 +59.9 176.3 | 57 53.3 +59.8 174.4 | 57 48.0 +59.7 172.6 |
| 9°  | 59 00.0 +60.0 180.0 | 58 59.2 +60.0 178.1 | 58 56.9 +59.9 176.2 | 58 53.1 +59.8 174.3 | 58 47.7 +59.7 172.4 |
| 10° | 60 00.0 +60.0 180.0 | 59 59.2 +60.0 178.0 | 59 56.8 +60.0 176.1 | 59 52.9 +59.8 174.1 | 59 47.4 +59.7 172.2 |
| 11° | 61 00.0 +60.0 180.0 | 60 59.2 +60.0 178.0 | 60 56.8 +59.9 176.0 | 60 52.7 +59.8 173.9 | 60 47.1 +59.6 171.9 |
| 12° | 62 00.0 +60.0 180.0 | 61 59.2 +59.9 177.9 | 61 56.7 +59.9 175.8 | 61 52.5 +59.8 173.8 | 61 46.7 +59.6 171.7 |
| 13° | 63 00.0 +60.0 180.0 | 62 59.1 +60.0 177.9 | 62 56.6 +59.9 175.7 | 62 52.3 +59.7 173.6 | 62 46.3 +59.6 171.5 |
| 14° | 64 00.0 +60.0 180.0 | 63 59.1 +60.0 177.8 | 63 56.5 +59.8 175.6 | 63 52.0 +59.8 173.4 | 63 45.9 +59.5 171.2 |
| 15° | 65 00.0 +60.0 180.0 | 64 59.1 +60.0 177.7 | 64 56.3 +59.9 175.4 | 64 51.8 +59.7 173.2 | 64 45.4 +59.5 170.9 |
| 16° | 66 00.0 +60.0 180.0 | 65 59.1 +59.9 177.6 | 65 56.2 +59.9 175.3 | 65 51.5 +59.7 172.9 | 65 44.9 +59.5 170.6 |
| 17° | 67 00.0 +60.0 180.0 | 66 59.0 +60.0 177.6 | 66 56.1 +59.8 175.1 | 66 51.2 +59.7 172.7 | 66 44.4 +59.4 170.3 |
| 18° | 68 00.0 +60.0 180.0 | 67 59.0 +59.9 177.5 | 67 55.9 +59.9 174.9 | 67 50.9 +59.6 172.4 | 67 43.8 +59.4 169.9 |
| 19° | 69 00.0 +60.0 180.0 | 68 58.9 +60.0 177.4 | 68 55.8 +59.8 174.7 | 68 50.5 +59.6 172.1 | 68 43.2 +59.3 169.5 |
| 20° | 70 00.0 +60.0 180.0 | 69 58.9 +60.0 177.3 | 69 55.6 +59.8 174.5 | 69 50.1 +59.6 171.8 | 69 42.5 +59.2 169.1 |
| 21° | 71 00.0 +60.0 180.0 | 70 58.9 +59.9 177.1 | 70 55.4 +59.8 174.3 | 70 49.7 +59.5 171.4 | 70 41.7 +59.2 168.6 |
| 22° | 72 00.0 +60.0 180.0 | 71 58.8 +59.9 177.0 | 71 55.2 +59.8 174.0 | 71 49.2 +59.5 171.1 | 71 40.9 +59.1 168.1 |
| 23° | 73 00.0 +60.0 180.0 | 72 58.7 +60.0 176.9 | 72 55.0 +59.7 173.7 | 72 48.7 +59.4 170.6 | 72 40.0 +59.0 167.6 |
| 24° | 74 00.0 +60.0 180.0 | 73 58.7 +59.9 176.7 | 73 54.7 +59.7 173.4 | 73 48.1 +59.3 170.1 | 73 39.0 +58.8 166.9 |
| 25° | 75 00.0 +60.0 180.0 | 74 58.6 +59.9 176.5 | 74 54.4 +59.7 173.0 | 74 47.4 +59.3 169.6 | 74 37.8 +58.7 166.2 |
| 26° | 76 00.0 +60.0 180.0 | 75 58.5 +59.9 176.3 | 75 54.1 +59.6 172.6 | 75 46.7 +59.1 169.0 | 75 36.5 +58.5 165.4 |
| 27° | 77 00.0 +60.0 180.0 | 76 58.4 +59.9 176.0 | 76 53.7 +59.5 172.1 | 76 45.8 +59.0 168.2 | 76 35.0 +58.2 164.5 |
| 28° | 78 00.0 +60.0 180.0 | 77 58.3 +59.9 175.8 | 77 53.2 +59.5 171.6 | 77 44.8 +58.9 167.4 | 77 33.2 +58.0 163.4 |
| 29° | 79 00.0 +60.0 180.0 | 78 58.2 +59.8 175.4 | 78 52.7 +59.4 170.9 | 78 43.7 +58.6 166.5 | 78 31.2 +57.6 162.1 |

| 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°  | 49 44.5 +59.6 172.2 | 49 37.6 +59.6 170.7 | 49 29.6 +59.4 169.2 | 49 20.4 +59.2 167.7 | 49 10.0 +59.0 166.2 |
| 1°  | 50 44.1 +59.7 172.1 | 50 37.2 +59.5 170.5 | 50 29.0 +59.3 169.0 | 50 19.6 +59.1 167.4 | 50 09.0 +58.9 165.9 |
| 2°  | 51 43.8 +59.6 171.9 | 51 36.7 +59.5 170.3 | 51 28.3 +59.3 168.7 | 51 18.7 +59.1 167.1 | 51 07.9 +58.8 165.6 |
| 3°  | 52 43.4 +59.7 171.7 | 52 36.2 +59.4 170.1 | 52 27.6 +59.3 168.5 | 52 17.8 +59.1 166.9 | 52 06.7 +58.9 165.3 |
| 4°  | 53 43.1 +59.6 171.6 | 53 35.6 +59.5 169.9 | 53 26.9 +59.2 168.2 | 53 16.9 +59.0 166.6 | 53 05.6 +58.7 164.9 |
| 5°  | 54 42.7 +59.5 171.4 | 54 35.1 +59.4 169.6 | 54 26.1 +59.2 168.0 | 54 15.9 +59.0 166.3 | 54 04.3 +58.7 164.6 |
| 6°  | 55 42.2 +59.6 171.2 | 55 34.5 +59.4 169.4 | 55 25.3 +59.2 167.7 | 55 14.9 +58.9 165.9 | 55 03.0 +58.7 164.2 |
| 7°  | 56 41.8 +59.6 170.9 | 56 33.9 +59.3 169.1 | 56 24.5 +59.1 167.4 | 56 13.8 +58.8 165.6 | 56 01.7 +58.5 163.9 |
| 8°  | 57 41.4 +59.5 170.7 | 57 33.2 +59.3 168.9 | 57 23.6 +59.1 167.1 | 57 12.6 +58.8 165.3 | 57 00.2 +58.5 163.5 |
| 9°  | 58 40.9 +59.5 170.5 | 58 32.5 +59.3 168.6 | 58 22.7 +59.0 166.7 | 58 11.4 +58.7 164.9 | 57 58.7 +58.4 163.1 |
| 10° | 59 40.4 +59.4 170.2 | 59 31.8 +59.2 168.3 | 59 21.7 +59.0 166.4 | 59 10.1 +58.7 164.5 | 58 57.1 +58.3 162.6 |
| 11° | 60 39.8 +59.4 169.9 | 60 31.0 +59.2 168.0 | 60 20.7 +58.8 166.0 | 60 08.8 +58.6 164.1 | 59 55.4 +58.2 162.2 |
| 12° | 61 39.2 +59.4 169.7 | 61 30.2 +59.1 167.6 | 61 19.5 +58.9 165.6 | 61 07.4 +58.4 163.6 | 60 53.6 +58.1 161.7 |
| 13° | 62 38.6 +59.4 169.4 | 62 29.3 +59.1 167.3 | 62 18.4 +58.7 165.2 | 62 05.8 +58.4 163.2 | 61 51.7 +58.0 161.1 |
| 14° | 63 38.0 +59.3 169.0 | 63 28.4 +59.0 166.9 | 63 17.1 +58.6 164.7 | 63 04.2 +58.3 162.7 | 62 49.7 +57.8 160.6 |
| 15° | 64 37.3 +59.2 168.7 | 64 27.4 +58.9 166.5 | 64 15.7 +58.6 164.3 | 64 02.5 +58.1 162.1 | 63 47.5 +57.7 160.0 |
| 16° | 65 36.5 +59.2 168.3 | 65 26.3 +58.8 166.0 | 65 14.3 +58.4 163.8 | 65 00.6 +58.0 161.5 | 64 45.2 +57.5 159.4 |
| 17° | 66 35.7 +59.1 167.9 | 66 25.1 +58.7 165.5 | 66 12.7 +58.3 163.2 | 65 58.6 +57.8 160.9 | 65 42.7 +57.3 158.7 |
| 18° | 67 34.8 +59.0 167.4 | 67 23.8 +58.7 165.0 | 67 11.0 +58.2 162.6 | 66 56.4 +57.6 160.2 | 66 40.0 +57.1 157.9 |
| 19° | 68 33.8 +59.0 167.0 | 68 22.5 +58.5 164.4 | 68 09.2 +58.0 162.0 | 67 54.0 +57.5 159.5 | 67 37.1 +56.8 157.1 |
| 20° | 69 32.8 +58.8 166.4 | 69 21.0 +58.3 163.8 | 69 07.2 +57.8 161.3 | 68 51.5 +57.2 158.7 | 68 33.9 +56.5 156.3 |
| 21° | 70 31.6 +58.7 165.9 | 70 19.3 +58.2 163.2 | 70 05.0 +57.6 160.5 | 69 48.7 +56.9 157.9 | 69 30.4 +56.2 155.3 |
| 22° | 71 30.3 +58.6 165.2 | 71 17.5 +58.0 162.4 | 71 02.6 +57.3 159.6 | 70 45.6 +56.6 156.9 | 70 26.6 +55.8 154.3 |
| 23° | 72 28.9 +58.4 164.5 | 72 15.5 +57.8 161.6 | 71 59.9 +57.1 158.7 | 71 42.2 +56.2 155.9 | 71 22.4 +55.4 153.2 |
| 24° | 73 27.3 +58.3 163.8 | 73 13.3 +57.5 160.7 | 72 57.0 +56.6 157.7 | 72 38.4 +55.8 154.8 | 72 17.8 +54.9 152.0 |
| 25° | 74 25.6 +57.9 162.9 | 74 10.8 +57.2 159.7 | 73 53.6 +56.3 156.5 | 73 34.2 +55.3 153.5 | 73 12.7 +54.3 150.6 |
| 26° | 75 23.5 +57.8 161.9 | 75 08.0 +56.8 158.5 | 74 49.9 +55.8 155.3 | 74 29.5 +54.8 152.1 | 74 07.0 +53.5 149.1 |
| 27° | 76 21.3 +57.3 160.8 | 76 04.8 +56.3 157.2 | 75 45.7 +55.2 153.8 | 75 24.3 +53.9 150.5 | 75 00.5 +52.8 147.4 |
| 28° | 77 18.6 +56.9 159.5 | 77 01.1 +55.8 155.7 | 76 40.9 +54.5 152.2 | 76 18.2 +53.1 148.7 | 75 53.3 +51.7 145.5 |
| 29° | 78 15.5 +56.4 158.0 | 77 56.9 +55.0 154.0 | 77 35.4 +53.5 150.3 | 77 11.3 +52.1 146.7 | 76 45.0 +50.5 143.3 |

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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°  | 48 58.4 +58.7 164.7 | 48 45.7 +58.5 163.2 | 48 31.8 +58.2 161.7 | 48 16.8 +57.9 160.2 | 48 00.7 +57.7 158.8 |
| 1°  | 49 57.1 +58.7 164.3 | 49 44.2 +58.4 162.8 | 49 30.0 +58.1 161.3 | 49 14.7 +57.9 159.8 | 48 58.4 +57.5 158.4 |
| 2°  | 50 55.8 +58.6 164.0 | 50 42.6 +58.3 162.5 | 50 28.1 +58.1 160.9 | 50 12.6 +57.7 159.4 | 49 55.9 +57.4 157.9 |
| 3°  | 51 54.4 +58.6 163.7 | 51 40.9 +58.3 162.1 | 51 26.2 +58.0 160.5 | 51 10.3 +57.6 159.0 | 50 53.3 +57.3 157.5 |
| 4°  | 52 53.0 +58.5 163.3 | 52 39.2 +58.2 161.7 | 52 24.2 +57.8 160.1 | 52 07.9 +57.6 158.6 | 51 50.6 +57.1 157.0 |
| 5°  | 53 51.5 +58.4 162.9 | 53 37.4 +58.1 161.3 | 53 22.0 +57.8 159.7 | 53 05.5 +57.4 158.1 | 52 47.7 +57.1 156.5 |
| 6°  | 54 49.9 +58.3 162.6 | 54 35.5 +58.0 160.9 | 54 19.8 +57.7 159.2 | 54 02.9 +57.3 157.6 | 53 44.8 +56.9 156.0 |
| 7°  | 55 48.2 +58.3 162.1 | 55 33.5 +57.9 160.4 | 55 17.5 +57.5 158.8 | 55 00.2 +57.1 157.1 | 54 41.7 +56.7 155.5 |
| 8°  | 56 46.5 +58.1 161.7 | 56 31.4 +57.8 160.0 | 56 15.0 +57.4 158.2 | 55 57.3 +57.1 156.6 | 55 38.4 +56.6 154.9 |
| 9°  | 57 44.6 +58.1 161.3 | 57 29.2 +57.7 159.5 | 57 12.4 +57.3 157.7 | 56 54.4 +56.8 156.0 | 56 35.0 +56.4 154.3 |
| 10° | 58 42.7 +57.9 160.8 | 58 26.9 +57.5 159.0 | 58 09.7 +57.1 157.2 | 57 51.2 +56.7 155.4 | 57 31.4 +56.3 153.7 |
| 11° | 59 40.6 +57.9 160.3 | 59 24.4 +57.4 158.4 | 59 06.8 +57.0 156.6 | 58 47.9 +56.5 154.8 | 58 27.7 +55.9 153.0 |
| 12° | 60 38.5 +57.6 159.7 | 60 21.8 +57.3 157.8 | 60 03.8 +56.7 156.0 | 59 44.4 +56.2 154.1 | 59 23.6 +55.8 152.3 |
| 13° | 61 36.1 +57.6 159.2 | 61 19.1 +57.0 157.2 | 61 00.5 +56.6 155.3 | 60 40.6 +56.1 153.4 | 60 19.4 +55.5 151.6 |
| 14° | 62 33.7 +57.3 158.6 | 62 16.1 +56.9 156.6 | 61 57.1 +56.3 154.6 | 61 36.7 +55.8 152.7 | 61 14.9 +55.2 150.8 |
| 15° | 63 31.0 +57.2 157.9 | 63 13.0 +56.6 155.9 | 62 53.4 +56.1 153.9 | 62 32.5 +55.5 151.9 | 62 10.1 +54.9 150.0 |
| 16° | 64 28.2 +57.0 157.2 | 64 09.6 +56.4 155.1 | 63 49.5 +55.8 153.1 | 63 28.0 +55.2 151.0 | 63 05.0 +54.6 149.1 |
| 17° | 65 25.2 +56.7 156.5 | 65 06.0 +56.1 154.3 | 64 45.3 +55.5 152.2 | 64 23.2 +54.8 150.2 | 63 59.6 +54.2 148.2 |
| 18° | 66 21.9 +56.4 155.7 | 66 02.1 +55.9 153.5 | 65 40.8 +55.2 151.3 | 65 18.0 +54.5 149.2 | 64 53.8 +53.7 147.2 |
| 19° | 67 18.3 +56.2 154.8 | 66 58.0 +55.4 152.5 | 66 36.0 +54.7 150.3 | 66 12.5 +54.0 148.2 | 65 47.5 +53.3 146.1 |
| 20° | 68 14.5 +55.8 153.9 | 67 53.4 +55.1 151.6 | 67 30.7 +54.4 149.3 | 67 06.5 +53.5 147.1 | 66 40.8 +52.8 145.0 |
| 21° | 69 10.3 +55.5 152.9 | 68 48.5 +54.7 150.5 | 68 25.1 +53.8 148.2 | 68 00.0 +53.0 145.9 | 67 33.6 +52.1 143.7 |
| 22° | 70 05.8 +55.0 151.8 | 69 43.2 +54.1 149.3 | 69 18.9 +53.3 146.9 | 68 53.0 +52.4 144.6 | 68 25.7 +51.5 142.4 |
| 23° | 71 00.8 +54.5 150.6 | 70 37.3 +53.6 148.0 | 70 12.2 +52.6 145.6 | 69 45.4 +51.7 143.2 | 69 17.2 +50.7 141.0 |
| 24° | 71 55.3 +53.9 149.3 | 71 30.9 +52.9 146.6 | 71 04.8 +51.8 144.1 | 70 37.1 +50.8 141.7 | 70 07.9 +49.8 139.4 |
| 25° | 72 49.2 +53.2 147.8 | 72 23.8 +52.1 145.1 | 71 56.6 +51.1 142.6 | 71 27.9 +50.0 140.1 | 70 57.7 +48.9 137.8 |
| 26° | 73 42.4 +52.4 146.2 | 73 15.9 +51.2 143.4 | 72 47.7 +50.0 140.8 | 72 17.9 +48.8 138.3 | 71 46.6 +47.7 135.9 |
| 27° | 74 34.8 +51.4 144.4 | 74 07.1 +50.2 141.6 | 73 37.7 +48.9 138.9 | 73 06.7 +47.7 136.4 | 72 34.3 +46.5 134.0 |
| 28° | 75 26.2 +50.3 142.4 | 74 57.3 +48.9 139.5 | 74 26.6 +47.6 136.8 | 73 54.4 +46.3 134.2 | 73 20.8 +45.0 131.8 |
| 29° | 76 16.5 +49.0 140.2 | 75 46.2 +47.5 137.2 | 75 14.2 +46.0 134.5 | 74 40.7 +44.6 131.9 | 74 05.8 +43.3 129.4 |

| 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°  | 47 43.6 +57.3 157.4 | 47 25.4 +56.9 156.0 | 47 06.1 +56.6 154.6 | 46 45.9 +56.2 153.2 | 46 24.7 +55.8 151.8 |
| 1°  | 48 40.9 +57.1 156.9 | 48 22.3 +56.9 155.5 | 48 02.7 +56.5 154.1 | 47 42.1 +56.1 152.7 | 47 20.5 +55.8 151.3 |
| 2°  | 49 38.0 +57.1 156.5 | 49 19.2 +56.7 155.0 | 48 59.2 +56.3 153.6 | 48 38.2 +56.0 152.1 | 48 16.3 +55.5 150.7 |
| 3°  | 50 35.1 +56.9 156.0 | 50 15.9 +56.5 154.5 | 49 55.5 +56.2 153.0 | 49 34.2 +55.8 151.6 | 49 11.8 +55.4 150.2 |
| 4°  | 51 32.0 +56.8 155.5 | 51 12.4 +56.4 154.0 | 50 51.7 +56.0 152.5 | 50 30.0 +55.6 151.0 | 50 07.2 +55.1 149.6 |
| 5°  | 52 28.8 +56.7 155.0 | 52 08.8 +56.3 153.4 | 51 47.7 +55.9 151.9 | 51 25.6 +55.4 150.4 | 51 02.3 +55.0 148.9 |
| 6°  | 53 25.5 +56.5 154.4 | 53 05.1 +56.1 152.8 | 52 43.6 +55.6 151.3 | 52 21.0 +55.2 149.8 | 51 57.3 +54.8 148.3 |
| 7°  | 54 22.0 +56.3 153.8 | 54 01.2 +55.9 152.2 | 53 39.2 +55.5 150.7 | 53 16.2 +55.0 149.1 | 52 52.1 +54.5 147.6 |
| 8°  | 55 18.3 +56.2 153.2 | 54 57.1 +55.7 151.6 | 54 34.7 +55.2 150.0 | 54 11.2 +54.7 148.5 | 53 46.6 +54.3 146.9 |
| 9°  | 56 14.5 +55.9 152.6 | 55 52.8 +55.4 151.0 | 55 29.9 +55.0 149.3 | 55 05.9 +54.5 147.8 | 54 40.9 +53.9 146.2 |
| 10° | 57 10.4 +55.8 152.0 | 56 48.2 +55.3 150.3 | 56 24.9 +54.7 148.6 | 56 00.4 +54.2 147.0 | 55 34.8 +53.7 145.4 |
| 11° | 58 06.2 +55.5 151.3 | 57 43.5 +54.9 149.6 | 57 19.6 +54.4 147.9 | 56 54.6 +53.9 146.2 | 56 28.5 +53.4 144.6 |
| 12° | 59 01.7 +55.2 150.5 | 58 38.4 +54.7 148.8 | 58 14.0 +54.2 147.1 | 57 48.5 +53.6 145.4 | 57 21.9 +53.0 143.8 |
| 13° | 59 56.9 +54.9 149.8 | 59 33.1 +54.4 148.0 | 59 08.2 +53.8 146.3 | 58 42.1 +53.2 144.6 | 58 14.9 +52.7 142.9 |
| 14° | 60 51.8 +54.7 148.9 | 60 27.5 +54.1 147.2 | 60 02.0 +53.4 145.4 | 59 35.3 +52.9 143.7 | 59 07.6 +52.2 142.0 |
| 15° | 61 46.5 +54.3 148.1 | 61 21.6 +53.6 146.3 | 60 55.4 +53.1 144.5 | 60 28.2 +52.4 142.7 | 59 59.8 +51.8 141.0 |
| 16° | 62 40.8 +53.9 147.2 | 62 15.2 +53.3 145.3 | 61 48.5 +52.6 143.5 | 61 20.6 +51.9 141.7 | 60 51.6 +51.2 140.0 |
| 17° | 63 34.7 +53.5 146.2 | 63 08.5 +52.8 144.3 | 62 41.1 +52.1 142.5 | 62 12.5 +51.4 140.7 | 61 42.8 +50.8 138.9 |
| 18° | 64 28.2 +53.0 145.2 | 64 01.3 +52.3 143.2 | 63 33.2 +51.6 141.4 | 63 03.9 +50.9 139.5 | 62 33.6 +50.1 137.8 |
| 19° | 65 21.2 +52.5 144.1 | 64 53.6 +51.8 142.1 | 64 24.8 +51.0 140.2 | 63 54.8 +50.2 138.4 | 63 23.7 +49.5 136.6 |
| 20° | 66 13.7 +52.0 142.9 | 65 45.4 +51.1 140.9 | 65 15.8 +50.3 139.0 | 64 45.0 +49.6 137.1 | 64 13.2 +48.8 135.3 |
| 21° | 67 05.7 +51.3 141.6 | 66 36.5 +50.5 139.6 | 66 06.1 +49.7 137.6 | 65 34.6 +48.8 135.8 | 65 02.0 +48.0 133.9 |
| 22° | 67 57.0 +50.6 140.3 | 67 27.0 +49.7 138.2 | 66 55.8 +48.8 136.2 | 66 23.4 +48.0 134.3 | 65 50.0 +47.1 132.5 |
| 23° | 68 47.6 +49.7 138.8 | 68 16.7 +48.8 136.7 | 67 44.6 +47.9 134.7 | 67 11.4 +47.0 132.8 | 66 37.1 +46.2 131.0 |
| 24° | 69 37.3 +48.9 137.2 | 69 05.5 +47.9 135.1 | 68 32.5 +46.9 133.1 | 67 58.4 +46.0 131.2 | 67 23.3 +45.1 129.3 |
| 25° | 70 26.2 +47.8 135.5 | 69 53.4 +46.8 133.4 | 69 19.4 +45.8 131.4 | 68 44.4 +44.9 129.4 | 68 08.4 +44.0 127.6 |
| 26° | 71 14.0 +46.6 133.7 | 70 40.2 +45.5 131.5 | 70 05.2 +44.6 129.5 | 69 29.3 +43.5 127.6 | 68 52.4 +42.6 125.7 |
| 27° | 72 00.6 +45.3 131.7 | 71 25.7 +44.2 129.5 | 70 49.8 +43.1 127.5 | 70 12.8 +42.2 125.6 | 69 35.0 +41.2 123.7 |
| 28° | 72 45.9 +43.8 129.5 | 72 09.9 +42.7 127.4 | 71 32.9 +41.6 125.3 | 70 55.0 +40.6 123.4 | 70 16.2 +39.6 121.6 |
| 29° | 73 29.7 +42.1 127.2 | 72 52.6 +40.9 125.0 | 72 14.5 +39.8 123.0 | 71 35.6 +38.7 121.1 | 70 55.8 +37.9 119.4 |



# Declination SAME name as Latitude

# Latitude 40°

| 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°  | 46 02.5 +55.5 150.5 | 45 39.4 +55.1 149.2 | 45 15.4 +54.7 147.8 | 44 50.5 +54.3 146.6 | 44 24.7 +53.9 145.3 |
| 1°  | 46 58.0 +55.3 149.9 | 46 34.5 +54.9 148.6 | 46 10.1 +54.5 147.3 | 45 44.8 +54.1 146.0 | 45 18.6 +53.7 144.7 |
| 2°  | 47 53.3 +55.1 149.4 | 47 29.4 +54.7 148.0 | 47 04.6 +54.3 146.7 | 46 38.9 +53.9 145.3 | 46 12.3 +53.5 144.0 |
| 3°  | 48 48.4 +55.0 148.8 | 48 24.1 +54.6 147.4 | 47 58.9 +54.1 146.0 | 47 32.8 +53.6 144.7 | 47 05.8 +53.2 143.4 |
| 4°  | 49 43.4 +54.7 148.1 | 49 18.7 +54.3 146.7 | 48 53.0 +53.9 145.4 | 48 26.4 +53.5 144.0 | 47 59.0 +53.0 142.7 |
| 5°  | 50 38.1 +54.6 147.5 | 50 13.0 +54.1 146.1 | 49 46.9 +53.6 144.7 | 49 19.9 +53.1 143.3 | 48 52.0 +52.7 142.0 |
| 6°  | 51 32.7 +54.3 146.8 | 51 07.1 +53.8 145.4 | 50 40.5 +53.4 144.0 | 50 13.0 +52.9 142.6 | 49 44.7 +52.4 141.2 |
| 7°  | 52 27.0 +54.0 146.2 | 52 00.9 +53.6 144.7 | 51 33.9 +53.0 143.3 | 51 05.9 +52.6 141.9 | 50 37.1 +52.1 140.5 |
| 8°  | 53 21.0 +53.8 145.4 | 52 54.5 +53.2 144.0 | 52 26.9 +52.8 142.5 | 51 58.5 +52.3 141.1 | 51 29.2 +51.8 139.7 |
| 9°  | 54 14.8 +53.5 144.7 | 53 47.7 +53.0 143.2 | 53 19.7 +52.5 141.7 | 52 50.8 +51.9 140.3 | 52 21.0 +51.4 138.9 |
| 10° | 55 08.3 +53.1 143.9 | 54 40.7 +52.6 142.4 | 54 12.2 +52.1 140.9 | 53 42.7 +51.6 139.4 | 53 12.4 +51.1 138.0 |
| 11° | 56 01.4 +52.9 143.1 | 55 33.3 +52.3 141.5 | 55 04.3 +51.7 140.0 | 54 34.3 +51.2 138.6 | 54 03.5 +50.6 137.1 |
| 12° | 56 54.3 +52.4 142.2 | 56 25.6 +51.9 140.7 | 55 56.0 +51.3 139.1 | 55 25.5 +50.7 137.7 | 54 54.1 +50.2 136.2 |
| 13° | 57 46.7 +52.1 141.3 | 57 17.5 +51.5 139.7 | 56 47.3 +50.9 138.2 | 56 16.2 +50.3 136.7 | 55 44.3 +49.7 135.3 |
| 14° | 58 38.8 +51.6 140.4 | 58 09.0 +51.0 138.8 | 57 38.2 +50.4 137.2 | 57 06.5 +49.9 135.7 | 56 34.0 +49.3 134.2 |
| 15° | 59 30.4 +51.1 139.4 | 59 00.0 +50.5 137.8 | 58 28.6 +49.9 136.2 | 57 56.4 +49.2 134.7 | 57 23.3 +48.6 133.2 |
| 16° | 60 21.5 +50.6 138.3 | 59 50.5 +49.9 136.7 | 59 18.5 +49.3 135.1 | 58 45.6 +48.7 133.6 | 58 11.9 +48.1 132.1 |
| 17° | 61 12.1 +50.1 137.2 | 60 40.4 +49.4 135.6 | 60 07.8 +48.8 134.0 | 59 34.3 +48.1 132.5 | 59 00.0 +47.5 131.0 |
| 18° | 62 02.2 +49.4 136.1 | 61 29.8 +48.8 134.4 | 60 56.6 +48.0 132.8 | 60 22.4 +47.4 131.3 | 59 47.5 +46.7 129.8 |
| 19° | 62 51.6 +48.8 134.9 | 62 18.6 +48.0 133.2 | 61 44.6 +47.4 131.6 | 61 09.8 +46.7 130.0 | 60 34.2 +46.0 128.5 |
| 20° | 63 40.4 +48.0 133.6 | 63 06.6 +47.3 131.9 | 62 32.0 +46.5 130.3 | 61 56.5 +45.9 128.7 | 61 20.2 +45.2 127.2 |
| 21° | 64 28.4 +47.3 132.2 | 63 53.9 +46.5 130.5 | 63 18.5 +45.8 128.9 | 62 42.4 +45.0 127.3 | 62 05.4 +44.4 125.8 |
| 22° | 65 15.7 +46.3 130.7 | 64 40.4 +45.5 129.0 | 64 04.3 +44.8 127.4 | 63 27.4 +44.0 125.8 | 62 49.8 +43.3 124.3 |
| 23° | 66 02.0 +45.3 129.2 | 65 25.9 +44.6 127.5 | 64 49.1 +43.7 125.9 | 64 11.4 +43.1 124.3 | 63 33.1 +42.4 122.8 |
| 24° | 66 47.3 +44.3 127.6 | 66 10.5 +43.4 125.9 | 65 32.8 +42.7 124.2 | 64 54.5 +41.9 122.7 | 64 15.5 +41.2 121.2 |
| 25° | 67 31.6 +43.1 125.8 | 66 53.9 +42.3 124.1 | 66 15.5 +41.5 122.5 | 65 36.4 +40.7 121.0 | 64 56.7 +40.0 119.5 |
| 26° | 68 14.7 +41.7 124.0 | 67 36.2 +40.9 122.3 | 66 57.0 +40.1 120.7 | 66 17.1 +39.4 119.2 | 65 36.7 +38.7 117.7 |
| 27° | 68 56.4 +40.3 122.0 | 68 17.1 +39.5 120.3 | 67 37.1 +38.7 118.8 | 66 56.5 +38.0 117.3 | 66 15.4 +37.3 115.8 |
| 28° | 69 36.7 +38.8 119.9 | 68 56.6 +37.9 118.3 | 68 15.8 +37.1 116.7 | 67 34.5 +36.4 115.3 | 66 52.7 +35.7 113.9 |
| 29° | 70 15.5 +36.9 117.7 | 69 34.5 +36.1 116.1 | 68 52.9 +35.4 114.6 | 68 10.9 +34.7 113.1 | 67 28.4 +34.1 111.8 |

| 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°  | 43 58.2 +53.4 144.0 | 43 30.8 +53.0 142.8 | 43 02.6 +52.7 141.6 | 42 33.7 +52.2 140.4 | 42 04.0 +51.8 139.2 |
| 1°  | 44 51.6 +53.3 143.4 | 44 23.8 +52.9 142.2 | 43 55.3 +52.4 140.9 | 43 25.9 +52.0 139.7 | 42 55.8 +51.6 138.5 |
| 2°  | 45 44.9 +53.0 142.8 | 45 16.7 +52.6 141.5 | 44 47.7 +52.2 140.3 | 44 17.9 +51.8 139.0 | 43 47.4 +51.3 137.8 |
| 3°  | 46 37.9 +52.8 142.1 | 46 09.3 +52.3 140.8 | 45 39.9 +51.9 139.6 | 45 09.7 +51.4 138.3 | 44 38.7 +51.1 137.1 |
| 4°  | 47 30.7 +52.5 141.4 | 47 01.6 +52.1 140.1 | 46 31.8 +51.6 138.8 | 46 01.1 +51.2 137.6 | 45 29.8 +50.7 136.4 |
| 5°  | 48 23.2 +52.3 140.7 | 47 53.7 +51.8 139.4 | 47 23.4 +51.3 138.1 | 46 52.3 +50.9 136.8 | 46 20.5 +50.4 135.6 |
| 6°  | 49 15.5 +51.9 139.9 | 48 45.5 +51.5 138.6 | 48 14.7 +51.0 137.3 | 47 43.2 +50.5 136.1 | 47 10.9 +50.1 134.8 |
| 7°  | 50 07.4 +51.7 139.1 | 49 37.0 +51.1 137.8 | 49 05.7 +50.7 136.5 | 48 33.7 +50.2 135.2 | 48 01.0 +49.7 134.0 |
| 8°  | 50 59.1 +51.2 138.3 | 50 28.1 +50.8 137.0 | 49 56.4 +50.3 135.7 | 49 23.9 +49.8 134.4 | 48 50.7 +49.4 133.2 |
| 9°  | 51 50.3 +51.0 137.5 | 51 18.9 +50.4 136.2 | 50 46.7 +49.9 134.8 | 50 13.7 +49.4 133.5 | 49 40.1 +48.9 132.3 |
| 10° | 52 41.3 +50.5 136.6 | 52 09.3 +50.0 135.3 | 51 36.6 +49.5 134.0 | 51 03.1 +49.0 132.7 | 50 29.0 +48.5 131.4 |
| 11° | 53 31.8 +50.1 135.7 | 52 59.3 +49.6 134.4 | 52 26.1 +49.0 133.0 | 51 52.1 +48.6 131.7 | 51 17.5 +48.0 130.4 |
| 12° | 54 21.9 +49.6 134.8 | 53 48.9 +49.1 133.4 | 53 15.1 +48.6 132.1 | 52 40.7 +48.0 130.8 | 52 05.5 +47.6 129.5 |
| 13° | 55 11.5 +49.2 133.8 | 54 38.0 +48.6 132.4 | 54 03.7 +48.1 131.1 | 53 28.7 +47.6 129.8 | 52 53.1 +47.0 128.5 |
| 14° | 56 00.7 +48.7 132.8 | 55 26.6 +48.1 131.4 | 54 51.8 +47.5 130.1 | 54 16.3 +47.0 128.7 | 53 40.1 +46.5 127.4 |
| 15° | 56 49.4 +48.0 131.8 | 56 14.7 +47.5 130.4 | 55 39.3 +47.0 129.0 | 55 03.3 +46.4 127.7 | 54 26.6 +45.8 126.4 |
| 16° | 57 37.4 +47.5 130.7 | 57 02.2 +46.9 129.2 | 56 26.3 +46.3 127.9 | 55 49.7 +45.7 126.5 | 55 12.4 +45.2 125.2 |
| 17° | 58 24.9 +46.9 129.5 | 57 49.1 +46.2 128.1 | 57 12.6 +45.6 126.7 | 56 35.4 +45.1 125.4 | 55 57.6 +44.6 124.1 |
| 18° | 59 11.8 +46.1 128.3 | 58 35.3 +45.6 126.9 | 57 58.2 +45.0 125.5 | 57 20.5 +44.4 124.2 | 56 42.2 +43.8 122.9 |
| 19° | 59 57.9 +45.4 127.0 | 59 20.9 +44.7 125.6 | 58 43.2 +44.1 124.2 | 58 04.9 +43.6 122.9 | 57 26.0 +43.0 121.6 |
| 20° | 60 43.3 +44.5 125.7 | 60 05.6 +43.9 124.3 | 59 27.3 +43.4 122.9 | 58 48.5 +42.7 121.6 | 58 09.0 +42.2 120.3 |
| 21° | 61 27.8 +43.7 124.3 | 60 49.5 +43.1 122.9 | 60 10.7 +42.4 121.5 | 59 31.2 +41.9 120.2 | 58 51.2 +41.3 118.9 |
| 22° | 62 11.5 +42.7 122.9 | 61 32.6 +42.0 121.5 | 60 53.1 +41.5 120.1 | 60 13.1 +40.9 118.8 | 59 32.5 +40.4 117.5 |
| 23° | 62 54.2 +41.7 121.3 | 62 14.6 +41.1 119.9 | 61 34.6 +40.4 118.6 | 60 54.0 +39.8 117.3 | 60 12.9 +39.3 116.1 |
| 24° | 63 35.9 +40.5 119.7 | 62 55.7 +39.9 118.4 | 62 15.0 +39.3 117.0 | 61 33.8 +38.8 115.8 | 60 52.2 +38.2 114.5 |
| 25° | 64 16.4 +39.4 118.1 | 63 35.6 +38.7 116.7 | 62 54.3 +38.1 115.4 | 62 12.6 +37.6 114.1 | 61 30.4 +37.1 112.9 |
| 26° | 64 55.8 +38.0 116.3 | 64 14.3 +37.5 115.0 | 63 32.4 +36.9 113.7 | 62 50.2 +36.3 112.4 | 62 07.5 +35.8 111.3 |
| 27° | 65 33.8 +36.6 114.5 | 64 51.8 +36.0 113.1 | 64 09.3 +35.5 111.9 | 63 26.5 +34.9 110.7 | 62 43.3 +34.5 109.5 |
| 28° | 66 10.4 +35.1 112.5 | 65 27.8 +34.5 111.2 | 64 44.8 +34.0 110.0 | 64 01.4 +33.5 108.8 | 63 17.8 +33.0 107.7 |
| 29° | 66 45.5 +33.5 110.5 | 66 02.3 +32.9 109.3 | 65 18.8 +32.4 108.1 | 64 34.9 +32.0 106.9 | 63 50.8 +31.6 105.8 |

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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°  | 41 33.6 +51.5 138.1 | 41 02.6 +51.0 136.9 | 40 30.9 +50.6 135.8 | 39 58.5 +50.2 134.7 | 39 25.6 +49.7 133.6 |
| 1°  | 42 25.1 +51.1 137.4 | 41 53.6 +50.7 136.2 | 41 21.5 +50.3 135.1 | 40 48.7 +49.9 134.0 | 40 15.3 +49.6 132.9 |
| 2°  | 43 16.2 +50.9 136.7 | 42 44.3 +50.5 135.5 | 42 11.8 +50.1 134.4 | 41 38.6 +49.7 133.2 | 41 04.9 +49.2 132.1 |
| 3°  | 44 07.1 +50.6 135.9 | 43 34.8 +50.2 134.8 | 43 01.9 +49.7 133.6 | 42 28.3 +49.3 132.5 | 41 54.1 +48.9 131.4 |
| 4°  | 44 57.7 +50.3 135.2 | 44 25.0 +49.8 134.0 | 43 51.6 +49.4 132.8 | 43 17.6 +49.0 131.7 | 42 43.0 +48.6 130.6 |
| 5°  | 45 48.0 +50.0 134.4 | 45 14.8 +49.6 133.2 | 44 41.0 +49.1 132.1 | 44 06.6 +48.6 130.9 | 43 31.6 +48.2 129.8 |
| 6°  | 46 38.0 +49.6 133.6 | 46 04.4 +49.1 132.4 | 45 30.1 +48.7 131.2 | 44 55.2 +48.3 130.1 | 44 19.8 +47.9 129.0 |
| 7°  | 47 27.6 +49.3 132.8 | 46 53.5 +48.8 131.6 | 46 18.8 +48.4 130.4 | 45 43.5 +48.0 129.3 | 45 07.7 +47.4 128.1 |
| 8°  | 48 16.9 +48.8 131.9 | 47 42.3 +48.4 130.7 | 47 07.2 +47.9 129.5 | 46 31.5 +47.5 128.4 | 45 55.1 +47.1 127.3 |
| 9°  | 49 05.7 +48.5 131.0 | 48 30.7 +48.0 129.8 | 47 55.1 +47.6 128.6 | 47 19.0 +47.0 127.5 | 46 42.2 +46.6 126.4 |
| 10° | 49 54.2 +48.0 130.1 | 49 18.7 +47.6 128.9 | 48 42.7 +47.0 127.7 | 48 06.0 +46.6 126.6 | 47 28.8 +46.2 125.4 |
| 11° | 50 42.2 +47.5 129.2 | 50 06.3 +47.0 128.0 | 49 29.7 +46.6 126.8 | 48 52.6 +46.2 125.6 | 48 15.0 +45.7 124.5 |
| 12° | 51 29.7 +47.1 128.2 | 50 53.3 +46.6 127.0 | 50 16.3 +46.1 125.8 | 49 38.8 +45.6 124.6 | 49 00.7 +45.2 123.5 |
| 13° | 52 16.8 +46.5 127.2 | 51 39.9 +46.0 126.0 | 51 02.4 +45.6 124.8 | 50 24.4 +45.1 123.6 | 49 45.9 +44.6 122.5 |
| 14° | 53 03.3 +45.9 126.2 | 52 25.9 +45.5 125.0 | 51 48.0 +44.9 123.8 | 51 09.5 +44.5 122.6 | 50 30.5 +44.1 121.4 |
| 15° | 53 49.2 +45.4 125.1 | 53 11.4 +44.8 123.9 | 52 32.9 +44.4 122.7 | 51 54.0 +43.9 121.5 | 51 14.6 +43.4 120.4 |
| 16° | 54 34.6 +44.7 124.0 | 53 56.2 +44.2 122.8 | 53 17.3 +43.7 121.6 | 52 37.9 +43.2 120.4 | 51 58.0 +42.8 119.3 |
| 17° | 55 19.3 +44.0 122.8 | 54 40.4 +43.5 121.6 | 54 01.0 +43.0 120.4 | 53 21.1 +42.6 119.2 | 52 40.8 +42.1 118.1 |
| 18° | 56 03.3 +43.3 121.6 | 55 23.9 +42.8 120.4 | 54 44.0 +42.3 119.2 | 54 03.7 +41.8 118.0 | 53 22.9 +41.4 116.9 |
| 19° | 56 46.6 +42.5 120.4 | 56 06.7 +42.0 119.1 | 55 26.3 +41.5 118.0 | 54 45.5 +41.1 116.8 | 54 04.3 +40.6 115.7 |
| 20° | 57 29.1 +41.7 119.1 | 56 48.7 +41.2 117.9 | 56 07.8 +40.7 116.7 | 55 26.6 +40.2 115.5 | 54 44.9 +39.8 114.4 |
| 21° | 58 10.8 +40.8 117.7 | 57 29.9 +40.2 116.5 | 56 48.5 +39.8 115.4 | 56 06.8 +39.4 114.2 | 55 24.7 +38.9 113.1 |
| 22° | 58 51.6 +39.8 116.3 | 58 10.1 +39.4 115.1 | 57 28.3 +38.9 114.0 | 56 46.2 +38.4 112.9 | 56 03.6 +38.0 111.8 |
| 23° | 59 31.4 +38.8 114.8 | 58 49.5 +38.3 113.7 | 58 07.2 +37.9 112.5 | 57 24.6 +37.4 111.4 | 56 41.6 +37.1 110.4 |
| 24° | 60 10.2 +37.7 113.3 | 59 27.8 +37.3 112.2 | 58 45.1 +36.8 111.1 | 58 02.0 +36.4 110.0 | 57 18.7 +36.0 108.9 |
| 25° | 60 47.9 +36.6 111.7 | 60 05.1 +36.1 110.6 | 59 21.9 +35.7 109.5 | 58 38.4 +35.3 108.5 | 57 54.7 +34.9 107.4 |
| 26° | 61 24.5 +35.3 110.1 | 60 41.2 +34.9 109.0 | 59 57.6 +34.5 107.9 | 59 13.7 +34.2 106.9 | 58 29.6 +33.8 105.9 |
| 27° | 61 59.8 +34.1 108.4 | 61 16.1 +33.6 107.3 | 60 32.1 +33.2 106.3 | 59 47.9 +32.9 105.3 | 59 03.4 +32.6 104.3 |
| 28° | 62 33.9 +32.6 106.6 | 61 49.7 +32.3 105.6 | 61 05.3 +31.9 104.6 | 60 20.8 +31.5 103.6 | 59 36.0 +31.3 102.7 |
| 29° | 63 06.5 +31.2 104.8 | 62 22.0 +30.8 103.8 | 61 37.2 +30.5 102.8 | 60 52.3 +30.2 101.9 | 60 07.3 +29.9 101.0 |

| 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°  | 38 52.0 +49.4 132.6 | 38 17.8 +49.0 131.5 | 37 43.1 +48.7 130.5 | 37 07.9 +48.2 129.4 | 36 32.2 +47.8 128.4 |
| 1°  | 39 41.4 +49.1 131.8 | 39 06.8 +48.8 130.8 | 38 31.8 +48.3 129.7 | 37 56.1 +48.0 128.7 | 37 20.0 +47.6 127.7 |
| 2°  | 40 30.5 +48.8 131.1 | 39 55.6 +48.4 130.0 | 39 20.1 +48.0 129.0 | 38 44.1 +47.6 127.9 | 38 07.6 +47.2 126.9 |
| 3°  | 41 19.3 +48.5 130.3 | 40 44.0 +48.1 129.2 | 40 08.1 +47.7 128.2 | 39 31.7 +47.3 127.1 | 38 54.8 +47.0 126.1 |
| 4°  | 42 07.8 +48.2 129.5 | 41 32.1 +47.7 128.4 | 40 55.8 +47.4 127.4 | 40 19.0 +47.0 126.3 | 39 41.8 +46.6 125.3 |
| 5°  | 42 56.0 +47.8 128.7 | 42 19.8 +47.4 127.6 | 41 43.2 +47.0 126.6 | 41 06.0 +46.6 125.5 | 40 28.4 +46.2 124.5 |
| 6°  | 43 43.8 +47.4 127.9 | 43 07.2 +47.1 126.8 | 42 30.2 +46.6 125.7 | 41 52.6 +46.3 124.7 | 41 14.6 +45.8 123.7 |
| 7°  | 44 31.2 +47.1 127.0 | 43 54.3 +46.6 125.9 | 43 16.8 +46.2 124.9 | 42 38.9 +45.8 123.8 | 42 00.4 +45.5 122.8 |
| 8°  | 45 18.3 +46.6 126.1 | 44 40.9 +46.2 125.1 | 44 03.0 +45.9 124.0 | 43 24.7 +45.4 122.9 | 42 45.9 +45.0 121.9 |
| 9°  | 46 04.9 +46.2 125.2 | 45 27.1 +45.8 124.1 | 44 48.9 +45.3 123.1 | 44 10.1 +45.0 122.0 | 43 30.9 +44.6 121.0 |
| 10° | 46 51.1 +45.8 124.3 | 46 12.9 +45.3 123.2 | 45 34.2 +45.0 122.2 | 44 55.1 +44.5 121.1 | 44 15.5 +44.2 120.1 |
| 11° | 47 36.9 +45.2 123.4 | 46 58.2 +44.9 122.3 | 46 19.2 +44.4 121.2 | 45 39.6 +44.1 120.2 | 44 59.7 +43.6 119.1 |
| 12° | 48 22.1 +44.8 122.4 | 47 43.1 +44.3 121.3 | 47 03.6 +43.9 120.2 | 46 23.7 +43.5 119.2 | 45 43.3 +43.2 118.1 |
| 13° | 49 06.9 +44.2 121.4 | 48 27.4 +43.8 120.3 | 47 47.5 +43.4 119.2 | 47 07.2 +43.0 118.2 | 46 26.5 +42.6 117.1 |
| 14° | 49 51.1 +43.6 120.3 | 49 11.2 +43.2 119.2 | 48 30.9 +42.8 118.2 | 47 50.2 +42.4 117.1 | 47 09.1 +42.0 116.1 |
| 15° | 50 34.7 +43.0 119.3 | 49 54.4 +42.6 118.2 | 49 13.7 +42.1 117.1 | 48 32.6 +41.8 116.1 | 47 51.1 +41.4 115.1 |
| 16° | 51 17.7 +42.4 118.1 | 50 37.0 +41.9 117.1 | 49 55.8 +41.6 116.0 | 49 14.4 +41.1 115.0 | 48 32.5 +40.8 114.0 |
| 17° | 52 00.1 +41.6 117.0 | 51 18.9 +41.3 115.9 | 50 37.4 +40.9 114.9 | 49 55.5 +40.5 113.9 | 49 13.3 +40.2 112.9 |
| 18° | 52 41.7 +41.0 115.8 | 52 00.2 +40.5 114.8 | 51 18.3 +40.1 113.7 | 50 36.0 +39.8 112.7 | 49 53.5 +39.4 111.7 |
| 19° | 53 22.7 +40.2 114.6 | 52 40.7 +39.8 113.6 | 51 58.4 +39.4 112.5 | 51 15.8 +39.1 111.5 | 50 32.9 +38.7 110.5 |
| 20° | 54 02.9 +39.4 113.4 | 53 20.5 +39.0 112.3 | 52 37.8 +38.7 111.3 | 51 54.9 +38.3 110.3 | 51 11.6 +38.0 109.3 |
| 21° | 54 42.3 +38.5 112.1 | 53 59.5 +38.2 111.0 | 53 16.5 +37.8 110.0 | 52 33.2 +37.4 109.0 | 51 49.6 +37.1 108.1 |
| 22° | 55 20.8 +37.6 110.7 | 54 37.7 +37.2 109.7 | 53 54.3 +36.9 108.7 | 53 10.6 +36.6 107.7 | 52 26.7 +36.3 106.8 |
| 23° | 55 58.4 +36.7 109.3 | 55 14.9 +36.3 108.3 | 54 31.2 +36.0 107.4 | 53 47.2 +35.7 106.4 | 53 03.0 +35.4 105.5 |
| 24° | 56 35.1 +35.6 107.9 | 55 51.2 +35.4 106.9 | 55 07.2 +35.0 106.0 | 54 22.9 +34.7 105.0 | 53 38.4 +34.4 104.1 |
| 25° | 57 10.7 +34.6 106.4 | 56 26.6 +34.2 105.5 | 55 42.2 +33.9 104.5 | 54 57.6 +33.7 103.6 | 54 12.8 +33.5 102.7 |
| 26° | 57 45.3 +33.5 104.9 | 57 00.8 +33.2 104.0 | 56 16.1 +32.9 103.1 | 55 31.3 +32.6 102.2 | 54 46.3 +32.4 101.3 |
| 27° | 58 18.8 +32.3 103.4 | 57 34.0 +32.0 102.4 | 56 49.0 +31.8 101.6 | 56 03.9 +31.6 100.7 | 55 18.7 +31.3 99.8  |
| 28° | 58 51.1 +31.0 101.7 | 58 06.0 +30.8 100.9 | 57 20.8 +30.6 100.0 | 56 35.5 +30.3 99.2  | 55 50.0 +30.2 98.3  |
| 29° | 59 22.1 +29.7 100.1 | 58 36.8 +29.5 99.2  | 57 51.4 +29.3 98.4  | 57 05.8 +29.2 97.6  | 56 20.2 +29.0 96.8  |

# Declination SAME name as Latitude

# Latitude 40°

| 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°  | 35 55.9 +47.5 127.5 | 35 19.2 +47.1 126.5 | 34 42.0 +46.8 125.5 | 34 04.4 +46.4 124.6 | 33 26.3 +46.1 123.6 |
| 1°  | 36 43.4 +47.2 126.7 | 36 06.3 +46.8 125.7 | 35 28.8 +46.4 124.8 | 34 50.8 +46.1 123.8 | 34 12.4 +45.8 122.9 |
| 2°  | 37 30.6 +46.9 125.9 | 36 53.1 +46.6 124.9 | 36 15.2 +46.2 124.0 | 35 36.9 +45.8 123.0 | 34 58.2 +45.5 122.1 |
| 3°  | 38 17.5 +46.5 125.1 | 37 39.7 +46.2 124.1 | 37 01.4 +45.8 123.2 | 36 22.7 +45.5 122.2 | 35 43.7 +45.1 121.3 |
| 4°  | 39 04.0 +46.3 124.3 | 38 25.9 +45.8 123.3 | 37 47.2 +45.5 122.4 | 37 08.2 +45.2 121.4 | 36 28.8 +44.8 120.5 |
| 5°  | 39 50.3 +45.8 123.5 | 39 11.7 +45.5 122.5 | 38 32.7 +45.2 121.5 | 37 53.4 +44.8 120.6 | 37 13.6 +44.5 119.6 |
| 6°  | 40 36.1 +45.5 122.7 | 39 57.2 +45.1 121.7 | 39 17.9 +44.7 120.7 | 38 38.2 +44.4 119.7 | 37 58.1 +44.0 118.8 |
| 7°  | 41 21.6 +45.1 121.8 | 40 42.3 +44.7 120.8 | 40 02.6 +44.4 119.8 | 39 22.6 +44.0 118.9 | 38 42.1 +43.7 117.9 |
| 8°  | 42 06.7 +44.6 120.9 | 41 27.0 +44.3 119.9 | 40 47.0 +44.0 118.9 | 40 06.6 +43.6 118.0 | 39 25.8 +43.3 117.1 |
| 9°  | 42 51.3 +44.3 120.0 | 42 11.3 +43.9 119.0 | 41 31.0 +43.5 118.0 | 40 50.2 +43.2 117.1 | 40 09.1 +42.9 116.1 |
| 10° | 43 35.6 +43.7 119.1 | 42 55.2 +43.4 118.1 | 42 14.5 +43.0 117.1 | 41 33.4 +42.7 116.2 | 40 52.0 +42.4 115.2 |
| 11° | 44 19.3 +43.3 118.1 | 43 38.6 +42.9 117.1 | 42 57.5 +42.6 116.2 | 42 16.1 +42.3 115.2 | 41 34.4 +41.9 114.3 |
| 12° | 45 02.6 +42.8 117.1 | 44 21.5 +42.5 116.2 | 43 40.1 +42.1 115.2 | 42 58.4 +41.7 114.3 | 42 16.3 +41.4 113.3 |
| 13° | 45 45.4 +42.2 116.1 | 45 04.0 +41.8 115.2 | 44 22.2 +41.5 114.2 | 43 40.1 +41.2 113.3 | 42 57.7 +41.0 112.3 |
| 14° | 46 27.6 +41.7 115.1 | 45 45.8 +41.4 114.1 | 45 03.7 +41.0 113.2 | 44 21.3 +40.7 112.3 | 43 38.7 +40.4 111.3 |
| 15° | 47 09.3 +41.1 114.1 | 46 27.2 +40.7 113.1 | 45 44.7 +40.5 112.2 | 45 02.0 +40.1 111.2 | 44 19.1 +39.8 110.3 |
| 16° | 47 50.4 +40.4 113.0 | 47 07.9 +40.1 112.0 | 46 25.2 +39.8 111.1 | 45 42.1 +39.6 110.2 | 44 58.9 +39.2 109.3 |
| 17° | 48 30.8 +39.8 111.9 | 47 48.0 +39.5 110.9 | 47 05.0 +39.1 110.0 | 46 21.7 +38.8 109.1 | 45 38.1 +38.6 108.2 |
| 18° | 49 10.6 +39.1 110.7 | 48 27.5 +38.8 109.8 | 47 44.1 +38.6 108.9 | 47 00.5 +38.3 108.0 | 46 16.7 +38.0 107.1 |
| 19° | 49 49.7 +38.4 109.6 | 49 06.3 +38.1 108.6 | 48 22.7 +37.8 107.7 | 47 38.8 +37.5 106.8 | 46 54.7 +37.2 106.0 |
| 20° | 50 28.1 +37.7 108.4 | 49 44.4 +37.3 107.5 | 49 00.5 +37.0 106.6 | 48 16.3 +36.8 105.7 | 47 31.9 +36.6 104.8 |
| 21° | 51 05.8 +36.8 107.1 | 50 21.7 +36.6 106.2 | 49 37.5 +36.3 105.3 | 48 53.1 +36.1 104.5 | 48 08.5 +35.8 103.6 |
| 22° | 51 42.6 +36.0 105.9 | 50 58.3 +35.7 105.0 | 50 13.8 +35.5 104.1 | 49 29.2 +35.2 103.3 | 48 44.3 +35.1 102.4 |
| 23° | 52 18.6 +35.1 104.6 | 51 34.0 +34.9 103.7 | 50 49.3 +34.6 102.8 | 50 04.4 +34.4 102.0 | 49 19.4 +34.2 101.2 |
| 24° | 52 53.7 +34.2 103.2 | 52 08.9 +34.0 102.4 | 51 23.9 +33.8 101.5 | 50 38.8 +33.6 100.7 | 49 53.6 +33.4 99.9  |
| 25° | 53 27.9 +33.2 101.9 | 52 42.9 +33.0 101.0 | 51 57.7 +32.8 100.2 | 51 12.4 +32.7 99.4  | 50 27.0 +32.5 98.6  |
| 26° | 54 01.1 +32.3 100.5 | 53 15.9 +32.0 99.6  | 52 30.5 +31.9 98.8  | 51 45.1 +31.7 98.1  | 50 59.5 +31.6 97.3  |
| 27° | 54 33.4 +31.1 99.0  | 53 47.9 +31.0 98.2  | 53 02.4 +30.8 97.4  | 52 16.8 +30.7 96.7  | 51 31.1 +30.6 95.9  |
| 28° | 55 04.5 +30.1 97.5  | 54 18.9 +29.9 96.8  | 53 33.2 +29.8 96.0  | 52 47.5 +29.7 95.3  | 52 01.7 +29.6 94.5  |
| 29° | 55 34.6 +28.9 96.0  | 54 48.8 +28.8 95.3  | 54 03.0 +28.7 94.5  | 53 17.2 +28.6 93.8  | 52 31.3 +28.6 93.1  |

| 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°  | 32 47.9 +45.7 122.7 | 32 09.0 +45.4 121.8 | 31 29.8 +45.1 120.9 | 30 50.2 +44.7 120.1 | 30 10.2 +44.5 119.2 |
| 1°  | 33 33.6 +45.4 122.0 | 32 54.4 +45.1 121.1 | 32 14.9 +44.8 120.2 | 31 34.9 +44.5 119.3 | 30 54.7 +44.2 118.4 |
| 2°  | 34 19.0 +45.2 121.2 | 33 39.5 +44.8 120.3 | 32 59.7 +44.5 119.4 | 32 19.4 +44.2 118.5 | 31 38.9 +43.9 117.6 |
| 3°  | 35 04.2 +44.8 120.4 | 34 24.3 +44.5 119.5 | 33 44.2 +44.1 118.6 | 33 03.6 +43.9 117.7 | 32 22.8 +43.5 116.8 |
| 4°  | 35 49.0 +44.5 119.6 | 35 08.8 +44.2 118.6 | 34 28.3 +43.9 117.8 | 33 47.5 +43.5 116.9 | 33 06.3 +43.3 116.0 |
| 5°  | 36 33.5 +44.1 118.7 | 35 53.0 +43.8 117.8 | 35 12.2 +43.5 116.9 | 34 31.0 +43.2 116.0 | 33 49.6 +42.9 115.2 |
| 6°  | 37 17.6 +43.8 117.9 | 36 36.8 +43.4 117.0 | 35 55.7 +43.1 116.1 | 35 14.2 +42.9 115.2 | 34 32.5 +42.6 114.3 |
| 7°  | 38 01.4 +43.3 117.0 | 37 20.2 +43.1 116.1 | 36 38.8 +42.8 115.2 | 35 57.1 +42.5 114.3 | 35 15.1 +42.2 113.5 |
| 8°  | 38 44.7 +43.0 116.1 | 38 03.3 +42.7 115.2 | 37 21.6 +42.3 114.3 | 36 39.6 +42.0 113.5 | 35 57.3 +41.8 112.6 |
| 9°  | 39 27.7 +42.5 115.2 | 38 46.0 +42.2 114.3 | 38 03.9 +42.0 113.4 | 37 21.6 +41.7 112.6 | 36 39.1 +41.3 111.7 |
| 10° | 40 10.2 +42.1 114.3 | 39 28.2 +41.8 113.4 | 38 45.9 +41.5 112.5 | 38 03.3 +41.2 111.7 | 37 20.4 +41.0 110.8 |
| 11° | 40 52.3 +41.7 113.4 | 40 10.0 +41.3 112.5 | 39 27.4 +41.0 111.6 | 38 44.5 +40.8 110.7 | 38 01.4 +40.5 109.9 |
| 12° | 41 34.0 +41.1 112.4 | 40 51.3 +40.9 111.5 | 40 08.4 +40.6 110.6 | 39 25.3 +40.3 109.8 | 38 41.9 +40.1 108.9 |
| 13° | 42 15.1 +40.6 111.4 | 41 32.2 +40.3 110.5 | 40 49.0 +40.1 109.7 | 40 05.6 +39.9 108.8 | 39 22.0 +39.6 108.0 |
| 14° | 42 55.7 +40.1 110.4 | 42 12.5 +39.9 109.6 | 41 29.1 +39.6 108.7 | 40 45.5 +39.3 107.8 | 40 01.6 +39.1 107.0 |
| 15° | 43 35.8 +39.6 109.4 | 42 52.4 +39.2 108.5 | 42 08.7 +39.0 107.7 | 41 24.8 +38.8 106.8 | 40 40.7 +38.6 106.0 |
| 16° | 44 15.4 +38.9 108.4 | 43 31.6 +38.7 107.5 | 42 47.7 +38.5 106.6 | 42 03.6 +38.2 105.8 | 41 19.3 +38.0 105.0 |
| 17° | 44 54.3 +38.4 107.3 | 44 10.3 +38.1 106.4 | 43 26.2 +37.8 105.6 | 42 41.8 +37.7 104.8 | 41 57.3 +37.4 104.0 |
| 18° | 45 32.7 +37.7 106.2 | 44 48.4 +37.5 105.4 | 44 04.0 +37.3 104.5 | 43 19.5 +37.0 103.7 | 42 34.7 +36.9 102.9 |
| 19° | 46 10.4 +37.0 105.1 | 45 25.9 +36.8 104.3 | 44 41.3 +36.6 103.4 | 43 56.5 +36.4 102.6 | 43 11.6 +36.2 101.8 |
| 20° | 46 47.4 +36.4 104.0 | 46 02.7 +36.2 103.1 | 45 17.9 +35.9 102.3 | 44 32.9 +35.8 101.5 | 43 47.8 +35.6 100.7 |
| 21° | 47 23.8 +35.6 102.8 | 46 38.9 +35.4 102.0 | 45 53.8 +35.3 101.2 | 45 08.7 +35.1 100.4 | 44 23.4 +35.0 99.6  |
| 22° | 47 59.4 +34.8 101.6 | 47 14.3 +34.7 100.8 | 46 29.1 +34.5 100.0 | 45 43.8 +34.3 99.2  | 44 58.4 +34.2 98.5  |
| 23° | 48 34.2 +34.1 100.4 | 47 49.0 +33.9 99.6  | 47 03.6 +33.7 98.8  | 46 18.1 +33.6 98.0  | 45 32.6 +33.5 97.3  |
| 24° | 49 08.3 +33.2 99.1  | 48 22.9 +33.0 98.3  | 47 37.3 +33.0 97.6  | 46 51.7 +32.9 96.8  | 46 06.1 +32.7 96.1  |
| 25° | 49 41.5 +32.4 97.8  | 48 55.9 +32.3 97.1  | 48 10.3 +32.1 96.3  | 47 24.6 +32.0 95.6  | 46 38.8 +32.0 94.9  |
| 26° | 50 13.9 +31.4 96.5  | 49 28.2 +31.3 95.8  | 48 42.4 +31.3 95.1  | 47 56.6 +31.2 94.3  | 47 10.8 +31.1 93.6  |
| 27° | 50 45.3 +30.6 95.2  | 49 59.5 +30.5 94.5  | 49 13.7 +30.4 93.8  | 48 27.8 +30.3 93.1  | 47 41.9 +30.3 92.4  |
| 28° | 51 15.9 +29.5 93.8  | 50 30.0 +29.5 93.1  | 49 44.1 +29.4 92.4  | 48 58.1 +29.5 91.8  | 48 12.2 +29.4 91.1  |
| 29° | 51 45.4 +28.5 92.4  | 50 59.5 +28.5 91.7  | 50 13.5 +28.5 91.1  | 49 27.6 +28.4 90.4  | 48 41.6 +28.5 89.8  |

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# Latitude 40°

# 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°  | 29 29.9 +44.2 118.3 | 28 49.3 +43.9 117.5 | 28 08.4 +43.6 116.7 | 27 27.2 +43.3 115.8 | 26 45.7 +43.0 115.0 |
| 1°  | 30 14.1 +43.9 117.6 | 29 33.2 +43.6 116.7 | 28 52.0 +43.3 115.9 | 28 10.5 +43.1 115.1 | 27 28.7 +42.8 114.3 |
| 2°  | 30 58.0 +43.6 116.8 | 30 16.8 +43.3 115.9 | 29 35.3 +43.1 115.1 | 28 53.6 +42.7 114.3 | 28 11.5 +42.5 113.5 |
| 3°  | 31 41.6 +43.3 116.0 | 31 00.1 +43.0 115.1 | 30 18.4 +42.7 114.3 | 29 36.3 +42.5 113.5 | 28 54.0 +42.3 112.7 |
| 4°  | 32 24.9 +43.0 115.1 | 31 43.1 +42.7 114.3 | 31 01.1 +42.4 113.5 | 30 18.8 +42.2 112.7 | 29 36.3 +41.9 111.8 |
| 5°  | 33 07.9 +42.6 114.3 | 32 25.8 +42.4 113.5 | 31 43.5 +42.1 112.6 | 31 01.0 +41.8 111.8 | 30 18.2 +41.6 111.0 |
| 6°  | 33 50.5 +42.3 113.5 | 33 08.2 +42.0 112.6 | 32 25.6 +41.8 111.8 | 31 42.8 +41.6 111.0 | 30 59.8 +41.3 110.2 |
| 7°  | 34 32.8 +41.9 112.6 | 33 50.2 +41.7 111.8 | 33 07.4 +41.4 110.9 | 32 24.4 +41.1 110.1 | 31 41.1 +40.9 109.3 |
| 8°  | 35 14.7 +41.5 111.7 | 34 31.9 +41.3 110.9 | 33 48.8 +41.1 110.1 | 33 05.5 +40.8 109.3 | 32 22.0 +40.6 108.5 |
| 9°  | 35 56.2 +41.2 110.9 | 35 13.2 +40.8 110.0 | 34 29.9 +40.6 109.2 | 33 46.3 +40.5 108.4 | 33 02.6 +40.2 107.6 |
| 10° | 36 37.4 +40.7 110.0 | 35 54.0 +40.5 109.1 | 35 10.5 +40.3 108.3 | 34 26.8 +40.0 107.5 | 33 42.8 +39.9 106.7 |
| 11° | 37 18.1 +40.3 109.0 | 36 34.5 +40.1 108.2 | 35 50.8 +39.8 107.4 | 35 06.8 +39.6 106.6 | 34 22.7 +39.4 105.8 |
| 12° | 37 58.4 +39.8 108.1 | 37 14.6 +39.6 107.3 | 36 30.6 +39.4 106.5 | 35 46.4 +39.2 105.7 | 35 02.1 +39.0 104.9 |
| 13° | 38 38.2 +39.4 107.1 | 37 54.2 +39.1 106.3 | 37 10.0 +38.9 105.5 | 36 25.6 +38.8 104.7 | 35 41.1 +38.5 104.0 |
| 14° | 39 17.6 +38.8 106.2 | 38 33.3 +38.7 105.4 | 37 48.9 +38.5 104.6 | 37 04.4 +38.2 103.8 | 36 19.6 +38.2 103.0 |
| 15° | 39 56.4 +38.4 105.2 | 39 12.0 +38.1 104.4 | 38 27.4 +38.0 103.6 | 37 42.6 +37.8 102.8 | 36 57.8 +37.6 102.0 |
| 16° | 40 34.8 +37.8 104.2 | 39 50.1 +37.7 103.4 | 39 05.4 +37.4 102.6 | 38 20.4 +37.3 101.8 | 37 35.4 +37.1 101.1 |
| 17° | 41 12.6 +37.3 103.2 | 40 27.8 +37.1 102.4 | 39 42.8 +36.9 101.6 | 38 57.7 +36.8 100.8 | 38 12.5 +36.6 100.1 |
| 18° | 41 49.9 +36.6 102.1 | 41 04.9 +36.5 101.3 | 40 19.7 +36.4 100.6 | 39 34.5 +36.2 99.8  | 38 49.1 +36.1 99.1  |
| 19° | 42 26.5 +36.1 101.0 | 41 41.4 +35.9 100.3 | 40 56.1 +35.8 99.5  | 40 10.7 +35.7 98.8  | 39 25.2 +35.6 98.0  |
| 20° | 43 02.6 +35.5 99.9  | 42 17.3 +35.3 99.2  | 41 31.9 +35.2 98.4  | 40 46.4 +35.0 97.7  | 40 00.8 +34.9 97.0  |
| 21° | 43 38.1 +34.7 98.8  | 42 52.6 +34.7 98.1  | 42 07.1 +34.5 97.4  | 41 21.4 +34.5 96.6  | 40 35.7 +34.4 95.9  |
| 22° | 44 12.8 +34.1 97.7  | 43 27.3 +34.0 97.0  | 42 41.6 +33.9 96.2  | 41 55.9 +33.8 95.5  | 41 10.1 +33.8 94.8  |
| 23° | 44 46.9 +33.4 96.6  | 44 01.3 +33.3 95.8  | 43 15.5 +33.2 95.1  | 42 29.7 +33.2 94.4  | 41 43.9 +33.1 93.7  |
| 24° | 45 20.3 +32.7 95.4  | 44 34.6 +32.5 94.7  | 43 48.7 +32.5 94.0  | 43 02.9 +32.4 93.3  | 42 17.0 +32.4 92.6  |
| 25° | 45 53.0 +31.9 94.2  | 45 07.1 +31.9 93.5  | 44 21.2 +31.8 92.8  | 43 35.3 +31.8 92.1  | 42 49.4 +31.7 91.5  |
| 26° | 46 24.9 +31.1 93.0  | 45 39.0 +31.0 92.3  | 44 53.0 +31.1 91.6  | 44 07.1 +31.0 90.9  | 43 21.1 +31.0 90.3  |
| 27° | 46 56.0 +30.2 91.7  | 46 10.0 +30.3 91.0  | 45 24.1 +30.2 90.4  | 44 38.1 +30.3 89.8  | 43 52.1 +30.3 89.1  |
| 28° | 47 26.2 +29.4 90.4  | 46 40.3 +29.4 89.8  | 45 54.3 +29.4 89.2  | 45 08.4 +29.4 88.5  | 44 22.4 +29.5 87.9  |
| 29° | 47 55.6 +28.6 89.1  | 47 09.7 +28.5 88.5  | 46 23.7 +28.6 87.9  | 45 37.8 +28.7 87.3  | 44 51.9 +28.7 86.7  |

| 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°  | 26 03.9 +42.8 114.2 | 25 21.8 +42.6 113.4 | 24 39.5 +42.4 112.7 | 23 57.0 +42.1 111.9 | 23 14.2 +41.9 111.1 |
| 1°  | 26 46.7 +42.5 113.4 | 26 04.4 +42.3 112.7 | 25 21.9 +42.0 111.9 | 24 39.1 +41.8 111.1 | 23 56.1 +41.6 110.3 |
| 2°  | 27 29.2 +42.3 112.7 | 26 46.7 +42.0 111.9 | 26 03.9 +41.8 111.1 | 25 20.9 +41.6 110.3 | 24 37.7 +41.4 109.5 |
| 3°  | 28 11.5 +42.0 111.9 | 27 28.7 +41.8 111.1 | 26 45.7 +41.6 110.3 | 26 02.5 +41.3 109.5 | 25 19.1 +41.1 108.7 |
| 4°  | 28 53.5 +41.7 111.0 | 28 10.5 +41.4 110.3 | 27 27.3 +41.2 109.5 | 26 43.8 +41.1 108.7 | 26 00.2 +40.8 107.9 |
| 5°  | 29 35.2 +41.4 110.2 | 28 51.9 +41.2 109.4 | 28 08.5 +40.9 108.7 | 27 24.9 +40.7 107.9 | 26 41.0 +40.6 107.1 |
| 6°  | 30 16.6 +41.0 109.4 | 29 33.1 +40.8 108.6 | 28 49.4 +40.7 107.8 | 28 05.6 +40.4 107.1 | 27 21.6 +40.2 106.3 |
| 7°  | 30 57.6 +40.7 108.5 | 30 13.9 +40.6 107.8 | 29 30.1 +40.3 107.0 | 28 46.0 +40.2 106.2 | 28 01.8 +40.0 105.5 |
| 8°  | 31 38.3 +40.4 107.7 | 30 54.5 +40.1 106.9 | 30 10.4 +40.0 106.1 | 29 26.2 +39.7 105.4 | 28 41.8 +39.6 104.6 |
| 9°  | 32 18.7 +40.0 106.8 | 31 34.6 +39.8 106.0 | 30 50.4 +39.6 105.3 | 30 05.9 +39.5 104.5 | 29 21.4 +39.3 103.7 |
| 10° | 32 58.7 +39.7 105.9 | 32 14.4 +39.5 105.1 | 31 30.0 +39.3 104.4 | 30 45.4 +39.1 103.6 | 30 00.7 +38.9 102.9 |
| 11° | 33 38.4 +39.2 105.0 | 32 53.9 +39.0 104.2 | 32 09.3 +38.8 103.5 | 31 24.5 +38.7 102.7 | 30 39.6 +38.6 102.0 |
| 12° | 34 17.6 +38.8 104.1 | 33 32.9 +38.7 103.3 | 32 48.1 +38.5 102.6 | 32 03.2 +38.4 101.8 | 31 18.2 +38.2 101.1 |
| 13° | 34 56.4 +38.4 103.2 | 34 11.6 +38.2 102.4 | 33 26.6 +38.1 101.7 | 32 41.6 +37.9 100.9 | 31 56.4 +37.8 100.2 |
| 14° | 35 34.8 +37.9 102.2 | 34 49.8 +37.8 101.5 | 34 04.7 +37.7 100.7 | 33 19.5 +37.5 100.0 | 32 34.2 +37.4 99.3  |
| 15° | 36 12.7 +37.5 101.3 | 35 27.6 +37.3 100.5 | 34 42.4 +37.2 99.8  | 33 57.0 +37.1 99.1  | 33 11.6 +37.0 98.3  |
| 16° | 36 50.2 +37.0 100.3 | 36 04.9 +36.9 99.6  | 35 19.6 +36.7 98.8  | 34 34.1 +36.7 98.1  | 33 48.6 +36.5 97.4  |
| 17° | 37 27.2 +36.5 99.3  | 36 41.8 +36.4 98.6  | 35 56.3 +36.3 97.9  | 35 10.8 +36.1 97.2  | 34 25.1 +36.1 96.4  |
| 18° | 38 03.7 +36.0 98.3  | 37 18.2 +35.9 97.6  | 36 32.6 +35.8 96.9  | 35 46.9 +35.7 96.2  | 35 01.2 +35.6 95.5  |
| 19° | 38 39.7 +35.4 97.3  | 37 54.1 +35.3 96.6  | 37 08.4 +35.2 95.9  | 36 22.6 +35.2 95.2  | 35 36.8 +35.2 94.5  |
| 20° | 39 15.1 +34.9 96.3  | 38 29.4 +34.8 95.6  | 37 43.6 +34.8 94.9  | 36 57.8 +34.7 94.2  | 36 12.0 +34.6 93.5  |
| 21° | 39 50.0 +34.3 95.2  | 39 04.2 +34.2 94.5  | 38 18.4 +34.1 93.8  | 37 32.5 +34.1 93.1  | 36 46.6 +34.1 92.5  |
| 22° | 40 24.3 +33.7 94.1  | 39 38.4 +33.7 93.4  | 38 52.5 +33.6 92.8  | 38 06.6 +33.6 92.1  | 37 20.7 +33.5 91.4  |
| 23° | 40 58.0 +33.0 93.0  | 40 12.1 +33.0 92.4  | 39 26.1 +33.0 91.7  | 38 40.2 +33.0 91.0  | 37 54.2 +33.0 90.4  |
| 24° | 41 31.0 +32.4 91.9  | 40 45.1 +32.4 91.3  | 39 59.1 +32.4 90.6  | 39 13.2 +32.3 90.0  | 38 27.2 +32.4 89.3  |
| 25° | 42 03.4 +31.8 90.8  | 41 17.5 +31.7 90.2  | 40 31.5 +31.8 89.5  | 39 45.5 +31.8 88.9  | 38 59.6 +31.8 88.3  |
| 26° | 42 35.2 +31.0 89.7  | 41 49.2 +31.1 89.0  | 41 03.3 +31.0 88.4  | 40 17.3 +31.1 87.8  | 39 31.4 +31.2 87.2  |
| 27° | 43 06.2 +30.3 88.5  | 42 20.3 +30.3 87.9  | 41 34.3 +30.4 87.3  | 40 48.4 +30.5 86.6  | 40 02.6 +30.5 86.0  |
| 28° | 43 36.5 +29.6 87.3  | 42 50.6 +29.6 86.7  | 42 04.7 +29.7 86.1  | 41 18.9 +29.8 85.5  | 40 33.1 +29.8 84.9  |
| 29° | 44 06.1 +28.7 86.1  | 43 20.2 +28.9 85.5  | 42 34.4 +29.0 84.9  | 41 48.7 +29.0 84.3  | 41 02.9 +29.2 83.8  |

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# Declination SAME name as Latitude

# Latitude 40°

| 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°  | 22 31.3 +41.6 110.4 | 21 48.1 +41.4 109.6 | 21 04.7 +41.2 108.9 | 20 21.1 +41.0 108.1 | 19 37.3 +40.9 107.4 |
| 1°  | 23 12.9 +41.4 109.6 | 22 29.5 +41.2 108.8 | 21 45.9 +41.0 108.1 | 21 02.1 +40.8 107.4 | 20 18.2 +40.6 106.6 |
| 2°  | 23 54.3 +41.2 108.8 | 23 10.7 +41.0 108.0 | 22 26.9 +40.8 107.3 | 21 42.9 +40.6 106.6 | 20 58.8 +40.4 105.8 |
| 3°  | 24 35.5 +40.9 108.0 | 23 51.7 +40.7 107.2 | 23 07.7 +40.5 106.5 | 22 23.5 +40.4 105.8 | 21 39.2 +40.2 105.0 |
| 4°  | 25 16.4 +40.6 107.2 | 24 32.4 +40.4 106.4 | 23 48.2 +40.3 105.7 | 23 03.9 +40.1 105.0 | 22 19.4 +39.9 104.2 |
| 5°  | 25 57.0 +40.4 106.4 | 25 12.8 +40.2 105.6 | 24 28.5 +40.0 104.9 | 23 44.0 +39.8 104.2 | 22 59.3 +39.7 103.4 |
| 6°  | 26 37.4 +40.0 105.5 | 25 53.0 +39.9 104.8 | 25 08.5 +39.7 104.1 | 24 23.8 +39.6 103.3 | 23 39.0 +39.5 102.6 |
| 7°  | 27 17.4 +39.8 104.7 | 26 32.9 +39.6 104.0 | 25 48.2 +39.5 103.2 | 25 03.4 +39.3 102.5 | 24 18.5 +39.2 101.8 |
| 8°  | 27 57.2 +39.5 103.9 | 27 12.5 +39.3 103.1 | 26 27.7 +39.1 102.4 | 25 42.7 +39.1 101.7 | 24 57.7 +38.9 101.0 |
| 9°  | 28 36.7 +39.1 103.0 | 27 51.8 +39.0 102.3 | 27 06.8 +38.9 101.6 | 26 21.8 +38.7 100.8 | 25 36.6 +38.6 100.1 |
| 10° | 29 15.8 +38.8 102.1 | 28 30.8 +38.6 101.4 | 27 45.7 +38.5 100.7 | 27 00.5 +38.4 100.0 | 26 15.2 +38.2 99.3  |
| 11° | 29 54.6 +38.4 101.3 | 29 09.4 +38.4 100.5 | 28 24.2 +38.2 99.8  | 27 38.9 +38.1 99.1  | 26 53.4 +38.0 98.4  |
| 12° | 30 33.0 +38.1 100.4 | 29 47.8 +37.9 99.7  | 29 02.4 +37.8 98.9  | 28 17.0 +37.7 98.2  | 27 31.4 +37.7 97.5  |
| 13° | 31 11.1 +37.7 99.5  | 30 25.7 +37.6 98.8  | 29 40.2 +37.5 98.1  | 28 54.7 +37.4 97.4  | 28 09.1 +37.3 96.7  |
| 14° | 31 48.8 +37.3 98.6  | 31 03.3 +37.2 97.9  | 30 17.7 +37.1 97.2  | 29 32.1 +37.0 96.5  | 28 46.4 +36.9 95.8  |
| 15° | 32 26.1 +36.9 97.6  | 31 40.5 +36.8 96.9  | 30 54.8 +36.7 96.2  | 30 09.1 +36.7 95.5  | 29 23.3 +36.6 94.9  |
| 16° | 33 03.0 +36.4 96.7  | 32 17.3 +36.4 96.0  | 31 31.5 +36.4 95.3  | 30 45.8 +36.2 94.6  | 29 59.9 +36.2 94.0  |
| 17° | 33 39.4 +36.0 95.7  | 32 53.7 +35.9 95.1  | 32 07.9 +35.8 94.4  | 31 22.0 +35.8 93.7  | 30 36.1 +35.8 93.0  |
| 18° | 34 15.4 +35.6 94.8  | 33 29.6 +35.5 94.1  | 32 43.7 +35.5 93.4  | 31 57.8 +35.5 92.8  | 31 11.9 +35.4 92.1  |
| 19° | 34 51.0 +35.1 93.8  | 34 05.1 +35.0 93.1  | 33 19.2 +35.0 92.5  | 32 33.3 +34.9 91.8  | 31 47.3 +35.0 91.1  |
| 20° | 35 26.1 +34.5 92.8  | 34 40.1 +34.6 92.1  | 33 54.2 +34.5 91.5  | 33 08.2 +34.6 90.8  | 32 22.3 +34.5 90.2  |
| 21° | 36 00.6 +34.1 91.8  | 35 14.7 +34.1 91.2  | 34 28.7 +34.1 90.5  | 33 42.8 +34.0 89.9  | 32 56.8 +34.1 89.2  |
| 22° | 36 34.7 +33.6 90.8  | 35 48.8 +33.5 90.1  | 35 02.8 +33.5 89.5  | 34 16.8 +33.6 88.9  | 33 30.9 +33.6 88.2  |
| 23° | 37 08.3 +32.9 89.8  | 36 22.3 +33.0 89.1  | 35 36.3 +33.1 88.5  | 34 50.4 +33.1 87.9  | 34 04.5 +33.1 87.2  |
| 24° | 37 41.2 +32.5 88.7  | 36 55.3 +32.5 88.1  | 36 09.4 +32.5 87.5  | 35 23.5 +32.5 86.8  | 34 37.6 +32.6 86.2  |
| 25° | 38 13.7 +31.8 87.6  | 37 27.8 +31.8 87.0  | 36 41.9 +31.9 86.4  | 35 56.0 +32.0 85.8  | 35 10.2 +32.1 85.2  |
| 26° | 38 45.5 +31.2 86.5  | 37 59.6 +31.3 85.9  | 37 13.8 +31.4 85.3  | 36 28.0 +31.5 84.8  | 35 42.3 +31.5 84.2  |
| 27° | 39 16.7 +30.6 85.4  | 38 30.9 +30.7 84.9  | 37 45.2 +30.7 84.3  | 36 59.5 +30.8 83.7  | 36 13.8 +31.0 83.1  |
| 28° | 39 47.3 +30.0 84.3  | 39 01.6 +30.1 83.8  | 38 15.9 +30.2 83.2  | 37 30.3 +30.3 82.6  | 36 44.8 +30.4 82.0  |
| 29° | 40 17.3 +29.2 83.2  | 39 31.7 +29.4 82.6  | 38 46.1 +29.5 82.1  | 38 00.6 +29.7 81.5  | 37 15.2 +29.8 81.0  |

| Dec | LHA 065° / 295°     | LHA 066° / 294°     | LHA 067° / 293°     | LHA 068° / 292°     | LHA 069° / 291°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 18 53.4 +40.6 106.7 | 18 09.3 +40.5 106.0 | 17 25.0 +40.3 105.3 | 16 40.6 +40.2 104.6 | 15 56.0 +40.0 103.9 |
| 1°  | 19 34.0 +40.5 105.9 | 18 49.8 +40.3 105.2 | 18 05.3 +40.2 104.5 | 17 20.8 +39.9 103.8 | 16 36.0 +39.9 103.1 |
| 2°  | 20 14.5 +40.2 105.1 | 19 30.1 +40.0 104.4 | 18 45.5 +39.9 103.7 | 18 00.7 +39.8 103.0 | 17 15.9 +39.7 102.3 |
| 3°  | 20 54.7 +40.1 104.3 | 20 10.1 +39.9 103.6 | 19 25.4 +39.7 102.9 | 18 40.5 +39.7 102.2 | 17 55.6 +39.4 101.5 |
| 4°  | 21 34.8 +39.8 103.5 | 20 50.0 +39.7 102.8 | 20 05.1 +39.6 102.1 | 19 20.2 +39.3 101.4 | 18 35.0 +39.3 100.7 |
| 5°  | 22 14.6 +39.5 102.7 | 21 29.7 +39.4 102.0 | 20 44.7 +39.3 101.3 | 19 59.5 +39.2 100.6 | 19 14.3 +39.1 99.9  |
| 6°  | 22 54.1 +39.3 101.9 | 22 09.1 +39.2 101.2 | 21 24.0 +39.0 100.5 | 20 38.7 +39.0 99.8  | 19 53.4 +38.8 99.1  |
| 7°  | 23 33.4 +39.1 101.1 | 22 48.3 +38.9 100.4 | 22 03.0 +38.8 99.7  | 21 17.7 +38.7 99.0  | 20 32.2 +38.7 98.3  |
| 8°  | 24 12.5 +38.8 100.3 | 23 27.2 +38.7 99.6  | 22 41.8 +38.6 98.9  | 21 56.4 +38.4 98.2  | 21 10.9 +38.3 97.5  |
| 9°  | 24 51.3 +38.4 99.4  | 24 05.9 +38.4 98.7  | 23 20.4 +38.3 98.0  | 22 34.8 +38.3 97.3  | 21 49.2 +38.2 96.7  |
| 10° | 25 29.7 +38.2 98.6  | 24 44.3 +38.1 97.9  | 23 58.7 +38.0 97.2  | 23 13.1 +37.9 96.5  | 22 27.4 +37.8 95.8  |
| 11° | 26 07.9 +37.9 97.7  | 25 22.4 +37.8 97.0  | 24 36.7 +37.7 96.3  | 23 51.0 +37.7 95.7  | 23 05.2 +37.6 95.0  |
| 12° | 26 45.8 +37.6 96.8  | 26 00.2 +37.5 96.2  | 25 14.4 +37.5 95.5  | 24 28.7 +37.3 94.8  | 23 42.8 +37.4 94.1  |
| 13° | 27 23.4 +37.2 96.0  | 26 37.7 +37.1 95.3  | 25 51.9 +37.1 94.6  | 25 06.0 +37.1 93.9  | 24 20.2 +37.0 93.3  |
| 14° | 28 00.6 +36.9 95.1  | 27 14.8 +36.9 94.4  | 26 29.0 +36.8 93.7  | 25 43.1 +36.7 93.1  | 24 57.2 +36.7 92.4  |
| 15° | 28 37.5 +36.5 94.2  | 27 51.7 +36.4 93.5  | 27 05.8 +36.4 92.9  | 26 19.8 +36.5 92.2  | 25 33.9 +36.4 91.5  |
| 16° | 29 14.0 +36.2 93.3  | 28 28.1 +36.2 92.6  | 27 42.2 +36.1 92.0  | 26 56.3 +36.1 91.3  | 26 10.3 +36.1 90.7  |
| 17° | 29 50.2 +35.8 92.4  | 29 04.3 +35.7 91.7  | 28 18.3 +35.8 91.1  | 27 32.4 +35.7 90.4  | 26 46.4 +35.7 89.8  |
| 18° | 30 26.0 +35.4 91.4  | 29 40.0 +35.4 90.8  | 28 54.1 +35.3 90.1  | 28 08.1 +35.4 89.5  | 27 22.1 +35.4 88.9  |
| 19° | 31 01.4 +34.9 90.5  | 30 15.4 +35.0 89.9  | 29 29.4 +35.0 89.2  | 28 43.5 +35.0 88.6  | 27 57.5 +35.1 88.0  |
| 20° | 31 36.3 +34.6 89.5  | 30 50.4 +34.5 88.9  | 30 04.4 +34.6 88.3  | 29 18.5 +34.6 87.7  | 28 32.6 +34.6 87.0  |
| 21° | 32 10.9 +34.1 88.6  | 31 24.9 +34.1 88.0  | 30 39.0 +34.2 87.3  | 29 53.1 +34.2 86.7  | 29 07.2 +34.3 86.1  |
| 22° | 32 45.0 +33.6 87.6  | 31 59.0 +33.7 87.0  | 31 13.2 +33.7 86.4  | 30 27.3 +33.8 85.8  | 29 41.5 +33.8 85.2  |
| 23° | 33 18.6 +33.1 86.6  | 32 32.7 +33.2 86.0  | 31 46.9 +33.3 85.4  | 31 01.1 +33.3 84.8  | 30 15.3 +33.5 84.2  |
| 24° | 33 51.7 +32.7 85.6  | 33 05.9 +32.8 85.0  | 32 20.2 +32.8 84.4  | 31 34.4 +33.0 83.8  | 30 48.8 +33.0 83.2  |
| 25° | 34 24.4 +32.2 84.6  | 33 38.7 +32.2 84.0  | 32 53.0 +32.3 83.4  | 32 07.4 +32.4 82.8  | 31 21.8 +32.5 82.3  |
| 26° | 34 56.6 +31.6 83.6  | 34 10.9 +31.8 83.0  | 33 25.3 +31.9 82.4  | 32 39.8 +32.0 81.8  | 31 54.3 +32.1 81.3  |
| 27° | 35 28.2 +31.1 82.5  | 34 42.7 +31.2 82.0  | 33 57.2 +31.3 81.4  | 33 11.8 +31.4 80.8  | 32 26.4 +31.6 80.3  |
| 28° | 35 59.3 +30.5 81.5  | 35 13.9 +30.6 80.9  | 34 28.5 +30.8 80.4  | 33 43.2 +31.0 79.8  | 32 58.0 +31.2 79.3  |
| 29° | 36 29.8 +30.0 80.4  | 35 44.5 +30.2 79.9  | 34 59.3 +30.3 79.3  | 34 14.2 +30.4 78.8  | 33 29.2 +30.6 78.2  |

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# Latitude 40°

# 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°  | 15 11.3 +39.9 103.2 | 14 26.5 +39.8 102.5 | 13 41.6 +39.6 101.8 | 12 56.5 +39.5 101.1 | 12 11.4 +39.4 100.4 |
| 1°  | 15 51.2 +39.7 102.4 | 15 06.3 +39.6 101.7 | 14 21.2 +39.5 101.0 | 13 36.0 +39.4 100.3 | 12 50.8 +39.2 99.7  |
| 2°  | 16 30.9 +39.6 101.6 | 15 45.9 +39.4 100.9 | 15 00.7 +39.3 100.2 | 14 15.4 +39.2 99.6  | 13 30.0 +39.1 98.9  |
| 3°  | 17 10.5 +39.3 100.8 | 16 25.3 +39.2 100.1 | 15 40.0 +39.1 99.5  | 14 54.6 +39.1 98.8  | 14 09.1 +39.0 98.1  |
| 4°  | 17 49.8 +39.2 100.0 | 17 04.5 +39.1 99.4  | 16 19.1 +39.0 98.7  | 15 33.7 +38.8 98.0  | 14 48.1 +38.8 97.3  |
| 5°  | 18 29.0 +39.0 99.2  | 17 43.6 +38.9 98.6  | 16 58.1 +38.8 97.9  | 16 12.5 +38.7 97.2  | 15 26.9 +38.6 96.5  |
| 6°  | 19 08.0 +38.7 98.4  | 18 22.5 +38.6 97.8  | 17 36.9 +38.6 97.1  | 16 51.2 +38.5 96.4  | 16 05.5 +38.5 95.7  |
| 7°  | 19 46.7 +38.5 97.6  | 19 01.1 +38.5 96.9  | 18 15.5 +38.3 96.3  | 17 29.7 +38.4 95.6  | 16 44.0 +38.2 94.9  |
| 8°  | 20 25.2 +38.3 96.8  | 19 39.6 +38.2 96.1  | 18 53.8 +38.2 95.5  | 18 08.1 +38.1 94.8  | 17 22.2 +38.1 94.1  |
| 9°  | 21 03.5 +38.1 96.0  | 20 17.8 +38.0 95.3  | 19 32.0 +38.0 94.6  | 18 46.2 +37.9 94.0  | 18 00.3 +37.9 93.3  |
| 10° | 21 41.6 +37.8 95.2  | 20 55.8 +37.8 94.5  | 20 10.0 +37.7 93.8  | 19 24.1 +37.7 93.2  | 18 38.2 +37.6 92.5  |
| 11° | 22 19.4 +37.6 94.3  | 21 33.6 +37.5 93.7  | 20 47.7 +37.5 93.0  | 20 01.8 +37.4 92.3  | 19 15.8 +37.5 91.7  |
| 12° | 22 57.0 +37.3 93.5  | 22 11.1 +37.2 92.8  | 21 25.2 +37.2 92.2  | 20 39.2 +37.2 91.5  | 19 53.3 +37.2 90.9  |
| 13° | 23 34.3 +37.0 92.6  | 22 48.3 +37.0 92.0  | 22 02.4 +36.9 91.3  | 21 16.4 +37.0 90.7  | 20 30.5 +36.9 90.0  |
| 14° | 24 11.3 +36.7 91.8  | 23 25.3 +36.7 91.1  | 22 39.3 +36.7 90.5  | 21 53.4 +36.7 89.8  | 21 07.4 +36.7 89.2  |
| 15° | 24 48.0 +36.4 90.9  | 24 02.0 +36.4 90.2  | 23 16.0 +36.4 89.6  | 22 30.1 +36.4 89.0  | 21 44.1 +36.5 88.3  |
| 16° | 25 24.4 +36.0 90.0  | 24 38.4 +36.1 89.4  | 23 52.4 +36.2 88.7  | 23 06.5 +36.1 88.1  | 22 20.6 +36.1 87.5  |
| 17° | 26 00.4 +35.8 89.1  | 25 14.5 +35.8 88.5  | 24 28.6 +35.8 87.9  | 23 42.6 +35.9 87.2  | 22 56.7 +35.9 86.6  |
| 18° | 26 36.2 +35.4 88.2  | 25 50.3 +35.4 87.6  | 25 04.4 +35.4 87.0  | 24 18.5 +35.5 86.4  | 23 32.6 +35.6 85.7  |
| 19° | 27 11.6 +35.1 87.3  | 26 25.7 +35.1 86.7  | 25 39.8 +35.2 86.1  | 24 54.0 +35.2 85.5  | 24 08.2 +35.3 84.9  |
| 20° | 27 46.7 +34.7 86.4  | 27 00.8 +34.8 85.8  | 26 15.0 +34.8 85.2  | 25 29.2 +34.9 84.6  | 24 43.5 +35.0 84.0  |
| 21° | 28 21.4 +34.3 85.5  | 27 35.6 +34.4 84.9  | 26 49.8 +34.5 84.3  | 26 04.1 +34.6 83.7  | 25 18.5 +34.6 83.1  |
| 22° | 28 55.7 +33.9 84.5  | 28 10.0 +34.0 83.9  | 27 24.3 +34.1 83.4  | 26 38.7 +34.2 82.8  | 25 53.1 +34.3 82.2  |
| 23° | 29 29.6 +33.6 83.6  | 28 44.0 +33.6 83.0  | 27 58.4 +33.7 82.4  | 27 12.9 +33.8 81.8  | 26 27.4 +34.0 81.2  |
| 24° | 30 03.2 +33.1 82.6  | 29 17.6 +33.2 82.1  | 28 32.1 +33.4 81.5  | 27 46.7 +33.5 80.9  | 27 01.4 +33.5 80.3  |
| 25° | 30 36.3 +32.6 81.7  | 29 50.8 +32.8 81.1  | 29 05.5 +32.9 80.5  | 28 20.2 +33.0 80.0  | 27 34.9 +33.2 79.4  |
| 26° | 31 08.9 +32.3 80.7  | 30 23.6 +32.4 80.1  | 29 38.4 +32.5 79.6  | 28 53.2 +32.7 79.0  | 28 08.1 +32.9 78.4  |
| 27° | 31 41.2 +31.7 79.7  | 30 56.0 +31.9 79.2  | 30 10.9 +32.1 78.6  | 29 25.9 +32.2 78.1  | 28 41.0 +32.4 77.5  |
| 28° | 32 12.9 +31.3 78.7  | 31 27.9 +31.5 78.2  | 30 43.0 +31.6 77.6  | 29 58.1 +31.8 77.1  | 29 13.4 +32.0 76.5  |
| 29° | 32 44.2 +30.8 77.7  | 31 59.4 +30.9 77.2  | 31 14.6 +31.2 76.6  | 30 29.9 +31.4 76.1  | 29 45.4 +31.5 75.6  |

| Dec | LHA 075° / 285°    | LHA 076° / 284°    | LHA 077° / 283°    | LHA 078° / 282°    | LHA 079° / 281°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | 11 26.1 +39.3 99.8 | 10 40.8 +39.2 99.1 | 9 55.4 +39.1 98.4  | 9 09.9 +39.0 97.8  | 8 24.3 +38.9 97.1  |
| 1°  | 12 05.4 +39.2 99.0 | 11 20.0 +39.1 98.3 | 10 34.5 +39.0 97.7 | 9 48.9 +38.9 97.0  | 9 03.2 +38.9 96.4  |
| 2°  | 12 44.6 +39.0 98.2 | 11 59.1 +38.9 97.6 | 11 13.5 +38.8 96.9 | 10 27.8 +38.8 96.2 | 9 42.1 +38.7 95.6  |
| 3°  | 13 23.6 +38.9 97.4 | 12 38.0 +38.8 96.8 | 11 52.3 +38.8 96.1 | 11 06.6 +38.7 95.5 | 10 20.8 +38.6 94.8 |
| 4°  | 14 02.5 +38.7 96.7 | 13 16.8 +38.7 96.0 | 12 31.1 +38.6 95.3 | 11 45.3 +38.5 94.7 | 10 59.4 +38.6 94.0 |
| 5°  | 14 41.2 +38.6 95.9 | 13 55.5 +38.5 95.2 | 13 09.7 +38.4 94.6 | 12 23.8 +38.4 93.9 | 11 38.0 +38.3 93.2 |
| 6°  | 15 19.8 +38.4 95.1 | 14 34.0 +38.3 94.4 | 13 48.1 +38.3 93.8 | 13 02.2 +38.3 93.1 | 12 16.3 +38.3 92.5 |
| 7°  | 15 58.2 +38.2 94.3 | 15 12.3 +38.2 93.6 | 14 26.4 +38.2 93.0 | 13 40.5 +38.1 92.3 | 12 54.6 +38.1 91.7 |
| 8°  | 16 36.4 +38.0 93.5 | 15 50.5 +38.0 92.8 | 15 04.6 +38.0 92.2 | 14 18.6 +38.0 91.5 | 13 32.7 +37.9 90.9 |
| 9°  | 17 14.4 +37.9 92.7 | 16 28.5 +37.8 92.0 | 15 42.6 +37.8 91.4 | 14 56.6 +37.8 90.7 | 14 10.6 +37.8 90.1 |
| 10° | 17 52.3 +37.6 91.9 | 17 06.3 +37.6 91.2 | 16 20.4 +37.6 90.6 | 15 34.4 +37.6 89.9 | 14 48.4 +37.7 89.3 |
| 11° | 18 29.9 +37.4 91.0 | 17 43.9 +37.4 90.4 | 16 58.0 +37.4 89.7 | 16 12.0 +37.4 89.1 | 15 26.1 +37.4 88.5 |
| 12° | 19 07.3 +37.2 90.2 | 18 21.3 +37.2 89.6 | 17 35.4 +37.2 88.9 | 16 49.4 +37.3 88.3 | 16 03.5 +37.3 87.7 |
| 13° | 19 44.5 +37.0 89.4 | 18 58.5 +37.0 88.7 | 18 12.6 +37.0 88.1 | 17 26.7 +37.0 87.5 | 16 40.8 +37.0 86.8 |
| 14° | 20 21.5 +36.7 88.5 | 19 35.5 +36.8 87.9 | 18 49.6 +36.8 87.3 | 18 03.7 +36.8 86.6 | 17 17.8 +36.9 86.0 |
| 15° | 20 58.2 +36.5 87.7 | 20 12.3 +36.5 87.1 | 19 26.4 +36.5 86.4 | 18 40.5 +36.6 85.8 | 17 54.7 +36.7 85.2 |
| 16° | 21 34.7 +36.2 86.8 | 20 48.8 +36.2 86.2 | 20 02.9 +36.3 85.6 | 19 17.1 +36.4 85.0 | 18 31.4 +36.4 84.4 |
| 17° | 22 10.9 +35.9 86.0 | 21 25.0 +36.0 85.4 | 20 39.2 +36.1 84.7 | 19 53.5 +36.1 84.1 | 19 07.8 +36.2 83.5 |
| 18° | 22 46.8 +35.7 85.1 | 22 01.0 +35.8 84.5 | 21 15.3 +35.8 83.9 | 20 29.6 +35.9 83.3 | 19 44.0 +36.0 82.7 |
| 19° | 23 22.5 +35.3 84.2 | 22 36.8 +35.4 83.6 | 21 51.1 +35.5 83.0 | 21 05.5 +35.6 82.4 | 20 20.0 +35.7 81.8 |
| 20° | 23 57.8 +35.1 83.4 | 23 12.2 +35.1 82.8 | 22 26.6 +35.3 82.2 | 21 41.1 +35.4 81.6 | 20 55.7 +35.5 81.0 |
| 21° | 24 32.9 +34.7 82.5 | 23 47.3 +34.9 81.9 | 23 01.9 +34.9 81.3 | 22 16.5 +35.0 80.7 | 21 31.2 +35.1 80.1 |
| 22° | 25 07.6 +34.4 81.6 | 24 22.2 +34.5 81.0 | 23 36.8 +34.7 80.4 | 22 51.5 +34.8 79.8 | 22 06.3 +35.0 79.2 |
| 23° | 25 42.0 +34.1 80.7 | 24 56.7 +34.2 80.1 | 24 11.5 +34.3 79.5 | 23 26.3 +34.5 78.9 | 22 41.3 +34.6 78.3 |
| 24° | 26 16.1 +33.7 79.7 | 25 30.9 +33.9 79.2 | 24 45.8 +34.0 78.6 | 24 00.8 +34.1 78.0 | 23 15.9 +34.3 77.5 |
| 25° | 26 49.8 +33.4 78.8 | 26 04.8 +33.5 78.3 | 25 19.8 +33.7 77.7 | 24 34.9 +33.9 77.1 | 23 50.2 +34.0 76.6 |
| 26° | 27 23.2 +32.9 77.9 | 26 38.3 +33.1 77.3 | 25 53.5 +33.3 76.8 | 25 08.8 +33.5 76.2 | 24 24.2 +33.7 75.7 |
| 27° | 27 56.1 +32.6 76.9 | 27 11.4 +32.8 76.4 | 26 26.8 +32.9 75.8 | 25 42.3 +33.1 75.3 | 24 57.9 +33.3 74.7 |
| 28° | 28 28.7 +32.2 76.0 | 27 44.2 +32.3 75.5 | 26 59.7 +32.6 74.9 | 26 15.4 +32.8 74.4 | 25 31.2 +33.0 73.8 |
| 29° | 29 00.9 +31.8 75.0 | 28 16.5 +32.0 74.5 | 27 32.3 +32.2 74.0 | 26 48.2 +32.4 73.4 | 26 04.2 +32.6 72.9 |

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# Declination SAME name as Latitude

# Latitude 40°

| 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°  | 7 38.7 +38.8 96.5  | 6 53.0 +38.8 95.8  | 6 07.2 +38.8 95.2  | 5 21.4 +38.7 94.5  | 4 35.6 +38.6 93.9  |
| 1°  | 8 17.5 +38.8 95.7  | 7 31.8 +38.7 95.0  | 6 46.0 +38.6 94.4  | 6 00.1 +38.7 93.7  | 5 14.2 +38.6 93.1  |
| 2°  | 8 56.3 +38.7 94.9  | 8 10.5 +38.6 94.3  | 7 24.6 +38.6 93.6  | 6 38.8 +38.5 93.0  | 5 52.8 +38.6 92.3  |
| 3°  | 9 35.0 +38.6 94.2  | 8 49.1 +38.6 93.5  | 8 03.2 +38.6 92.9  | 7 17.3 +38.5 92.2  | 6 31.4 +38.5 91.6  |
| 4°  | 10 13.6 +38.5 93.4 | 9 27.7 +38.4 92.7  | 8 41.8 +38.4 92.1  | 7 55.8 +38.4 91.4  | 7 09.9 +38.4 90.8  |
| 5°  | 10 52.1 +38.3 92.6 | 10 06.1 +38.4 91.9 | 9 20.2 +38.3 91.3  | 8 34.2 +38.3 90.7  | 7 48.3 +38.3 90.0  |
| 6°  | 11 30.4 +38.2 91.8 | 10 44.5 +38.2 91.2 | 9 58.5 +38.2 90.5  | 9 12.5 +38.2 89.9  | 8 26.6 +38.2 89.2  |
| 7°  | 12 08.6 +38.1 91.0 | 11 22.7 +38.1 90.4 | 10 36.7 +38.1 89.7 | 9 50.7 +38.2 89.1  | 9 04.8 +38.1 88.5  |
| 8°  | 12 46.7 +38.0 90.2 | 12 00.8 +37.9 89.6 | 11 14.8 +38.0 88.9 | 10 28.9 +37.9 88.3 | 9 42.9 +38.0 87.7  |
| 9°  | 13 24.7 +37.8 89.4 | 12 38.7 +37.8 88.8 | 11 52.8 +37.8 88.2 | 11 06.8 +37.9 87.5 | 10 20.9 +37.9 86.9 |
| 10° | 14 02.5 +37.6 88.6 | 13 16.5 +37.7 88.0 | 12 30.6 +37.7 87.4 | 11 44.7 +37.7 86.7 | 10 58.8 +37.8 86.1 |
| 11° | 14 40.1 +37.5 87.8 | 13 54.2 +37.5 87.2 | 13 08.3 +37.6 86.6 | 12 22.4 +37.6 85.9 | 11 36.6 +37.7 85.3 |
| 12° | 15 17.6 +37.3 87.0 | 14 31.7 +37.3 86.4 | 13 45.9 +37.3 85.8 | 13 00.0 +37.5 85.1 | 12 14.3 +37.5 84.5 |
| 13° | 15 54.9 +37.1 86.2 | 15 09.0 +37.2 85.6 | 14 23.2 +37.3 85.0 | 13 37.5 +37.3 84.3 | 12 51.8 +37.3 83.7 |
| 14° | 16 32.0 +36.9 85.4 | 15 46.2 +37.0 84.8 | 15 00.5 +37.0 84.1 | 14 14.8 +37.1 83.5 | 13 29.1 +37.2 82.9 |
| 15° | 17 08.9 +36.8 84.6 | 16 23.2 +36.8 83.9 | 15 37.5 +36.9 83.3 | 14 51.9 +37.0 82.7 | 14 06.3 +37.1 82.1 |
| 16° | 17 45.7 +36.5 83.7 | 17 00.0 +36.6 83.1 | 16 14.4 +36.7 82.5 | 15 28.9 +36.7 81.9 | 14 43.4 +36.9 81.3 |
| 17° | 18 22.2 +36.3 82.9 | 17 36.6 +36.4 82.3 | 16 51.1 +36.5 81.7 | 16 05.6 +36.6 81.1 | 15 20.3 +36.7 80.5 |
| 18° | 18 58.5 +36.0 82.1 | 18 13.0 +36.1 81.5 | 17 27.6 +36.2 80.9 | 16 42.2 +36.4 80.2 | 15 57.0 +36.5 79.6 |
| 19° | 19 34.5 +35.8 81.2 | 18 49.1 +36.0 80.6 | 18 03.8 +36.1 80.0 | 17 18.6 +36.2 79.4 | 16 33.5 +36.3 78.8 |
| 20° | 20 10.3 +35.6 80.4 | 19 25.1 +35.7 79.8 | 18 39.9 +35.8 79.2 | 17 54.8 +35.9 78.6 | 17 09.8 +36.1 78.0 |
| 21° | 20 45.9 +35.3 79.5 | 20 00.8 +35.4 78.9 | 19 15.7 +35.6 78.3 | 18 30.7 +35.8 77.7 | 17 45.9 +35.9 77.1 |
| 22° | 21 21.2 +35.1 78.6 | 20 36.2 +35.2 78.1 | 19 51.3 +35.4 77.5 | 19 06.5 +35.5 76.9 | 18 21.8 +35.6 76.3 |
| 23° | 21 56.3 +34.8 77.8 | 21 11.4 +34.9 77.2 | 20 26.7 +35.0 76.6 | 19 42.0 +35.3 76.0 | 18 57.4 +35.5 75.5 |
| 24° | 22 31.1 +34.4 76.9 | 21 46.3 +34.7 76.3 | 21 01.7 +34.9 75.7 | 20 17.3 +35.0 75.2 | 19 32.9 +35.2 74.6 |
| 25° | 23 05.5 +34.2 76.0 | 22 21.0 +34.4 75.4 | 21 36.6 +34.5 74.9 | 20 52.3 +34.7 74.3 | 20 08.1 +34.9 73.7 |
| 26° | 23 39.7 +33.9 75.1 | 22 55.4 +34.0 74.5 | 22 11.1 +34.3 74.0 | 21 27.0 +34.5 73.4 | 20 43.0 +34.7 72.9 |
| 27° | 24 13.6 +33.5 74.2 | 23 29.4 +33.8 73.6 | 22 45.4 +33.9 73.1 | 22 01.5 +34.1 72.6 | 21 17.7 +34.4 72.0 |
| 28° | 24 47.1 +33.2 73.3 | 24 03.2 +33.4 72.7 | 23 19.3 +33.7 72.2 | 22 35.6 +33.9 71.7 | 21 52.1 +34.1 71.1 |
| 29° | 25 20.3 +32.9 72.4 | 24 36.6 +33.1 71.8 | 23 53.0 +33.3 71.3 | 23 09.5 +33.6 70.8 | 22 26.2 +33.8 70.2 |

| 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°  | 3 49.7 +38.6 93.2  | 3 03.8 +38.6 92.6  | 2 17.9 +38.5 91.9  | 1 31.9 +38.6 91.3  | 0 46.0 +38.5 90.6  |
| 1°  | 4 28.3 +38.6 92.5  | 3 42.4 +38.6 91.8  | 2 56.4 +38.6 91.2  | 2 10.5 +38.5 90.5  | 1 24.5 +38.6 89.9  |
| 2°  | 5 06.9 +38.5 91.7  | 4 21.0 +38.5 91.0  | 3 35.0 +38.5 90.4  | 2 49.0 +38.6 89.8  | 2 03.1 +38.5 89.1  |
| 3°  | 5 45.4 +38.5 90.9  | 4 59.5 +38.4 90.3  | 4 13.5 +38.5 89.6  | 3 27.6 +38.4 89.0  | 2 41.6 +38.5 88.3  |
| 4°  | 6 23.9 +38.4 90.1  | 5 37.9 +38.4 89.5  | 4 52.0 +38.4 88.9  | 4 06.0 +38.5 88.2  | 3 20.1 +38.5 87.6  |
| 5°  | 7 02.3 +38.3 89.4  | 6 16.3 +38.4 88.7  | 5 30.4 +38.4 88.1  | 4 44.5 +38.4 87.4  | 3 58.6 +38.4 86.8  |
| 6°  | 7 40.6 +38.3 88.6  | 6 54.7 +38.2 88.0  | 6 08.8 +38.2 87.3  | 5 22.9 +38.3 86.7  | 4 37.0 +38.4 86.0  |
| 7°  | 8 18.9 +38.1 87.8  | 7 32.9 +38.2 87.2  | 6 47.0 +38.3 86.5  | 6 01.2 +38.2 85.9  | 5 15.4 +38.3 85.3  |
| 8°  | 8 57.0 +38.1 87.0  | 8 11.1 +38.1 86.4  | 7 25.3 +38.1 85.8  | 6 39.4 +38.2 85.1  | 5 53.7 +38.2 84.5  |
| 9°  | 9 35.1 +37.9 86.2  | 8 49.2 +38.0 85.6  | 8 03.4 +38.0 85.0  | 7 17.6 +38.1 84.3  | 6 31.9 +38.2 83.7  |
| 10° | 10 13.0 +37.8 85.5 | 9 27.2 +37.9 84.8  | 8 41.4 +38.0 84.2  | 7 55.7 +38.1 83.6  | 7 10.1 +38.1 82.9  |
| 11° | 10 50.8 +37.7 84.7 | 10 05.1 +37.8 84.0 | 9 19.4 +37.8 83.4  | 8 33.8 +37.9 82.8  | 7 48.2 +38.0 82.2  |
| 12° | 11 28.5 +37.6 83.9 | 10 42.9 +37.6 83.3 | 9 57.2 +37.8 82.6  | 9 11.7 +37.8 82.0  | 8 26.2 +37.9 81.4  |
| 13° | 12 06.1 +37.5 83.1 | 11 20.5 +37.5 82.5 | 10 35.0 +37.6 81.8 | 9 49.5 +37.7 81.2  | 9 04.1 +37.9 80.6  |
| 14° | 12 43.6 +37.2 82.3 | 11 58.0 +37.4 81.7 | 11 12.6 +37.5 81.0 | 10 27.2 +37.6 80.4 | 9 42.0 +37.7 79.8  |
| 15° | 13 20.8 +37.2 81.5 | 12 35.4 +37.3 80.9 | 11 50.1 +37.3 80.2 | 11 04.8 +37.5 79.6 | 10 19.7 +37.6 79.0 |
| 16° | 13 58.0 +37.0 80.7 | 13 12.7 +37.1 80.1 | 12 27.4 +37.3 79.4 | 11 42.3 +37.3 78.8 | 10 57.3 +37.4 78.2 |
| 17° | 14 35.0 +36.8 79.9 | 13 49.8 +36.9 79.3 | 13 04.7 +37.0 78.6 | 12 19.6 +37.3 78.0 | 11 34.7 +37.4 77.4 |
| 18° | 15 11.8 +36.6 79.0 | 14 26.7 +36.8 78.4 | 13 41.7 +36.9 77.8 | 12 56.9 +37.0 77.2 | 12 12.1 +37.2 76.6 |
| 19° | 15 48.4 +36.5 78.2 | 15 03.5 +36.6 77.6 | 14 18.6 +36.8 77.0 | 13 33.9 +36.9 76.4 | 12 49.3 +37.0 75.8 |
| 20° | 16 24.9 +36.2 77.4 | 15 40.1 +36.4 76.8 | 14 55.4 +36.5 76.2 | 14 10.8 +36.7 75.6 | 13 26.3 +36.9 75.0 |
| 21° | 17 01.1 +36.1 76.6 | 16 16.5 +36.2 76.0 | 15 31.9 +36.4 75.4 | 14 47.5 +36.6 74.8 | 14 03.2 +36.8 74.2 |
| 22° | 17 37.2 +35.8 75.7 | 16 52.7 +36.0 75.1 | 16 08.3 +36.2 74.6 | 15 24.1 +36.4 74.0 | 14 40.0 +36.5 73.4 |
| 23° | 18 13.0 +35.6 74.9 | 17 28.7 +35.8 74.3 | 16 44.5 +36.0 73.7 | 16 00.5 +36.1 73.1 | 15 16.5 +36.4 72.6 |
| 24° | 18 48.6 +35.4 74.0 | 18 04.5 +35.6 73.5 | 17 20.5 +35.8 72.9 | 16 36.6 +36.0 72.3 | 15 52.9 +36.2 71.7 |
| 25° | 19 24.0 +35.1 73.2 | 18 40.1 +35.3 72.6 | 17 56.3 +35.5 72.0 | 17 12.6 +35.8 71.5 | 16 29.1 +36.0 70.9 |
| 26° | 19 59.1 +34.9 72.3 | 19 15.4 +35.1 71.8 | 18 31.8 +35.4 71.2 | 17 48.4 +35.6 70.6 | 17 05.1 +35.8 70.1 |
| 27° | 20 34.0 +34.7 71.4 | 19 50.5 +34.9 70.9 | 19 07.2 +35.1 70.3 | 18 24.0 +35.3 69.8 | 17 40.9 +35.6 69.2 |
| 28° | 21 08.7 +34.3 70.6 | 20 25.4 +34.6 70.0 | 19 42.3 +34.8 69.5 | 18 59.3 +35.1 68.9 | 18 16.5 +35.3 68.4 |
| 29° | 21 43.0 +34.1 69.7 | 21 00.0 +34.3 69.2 | 20 17.1 +34.6 68.6 | 19 34.4 +34.8 68.1 | 18 51.8 +35.2 67.5 |

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# Latitude 40°

# 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 +38.6 90.0  | -0 46.0 +38.6      | -1 31.9 +38.6      | -2 17.9 +38.6      | -3 03.8 +38.6      |
| 1°  | 0 38.6 +38.5 89.2  | -0 07.4 +38.6      | -0 53.3 +38.6      | -1 39.3 +38.7      | -2 25.2 +38.7      |
| 2°  | 1 17.1 +38.6 88.5  | 0 31.2 +38.6 87.8  | -0 14.7 +38.6      | -1 00.6 +38.6      | -1 46.5 +38.7      |
| 3°  | 1 55.7 +38.5 87.7  | 1 09.8 +38.5 87.1  | 0 23.9 +38.6 86.4  | -0 22.0 +38.7      | -1 07.8 +38.7      |
| 4°  | 2 34.2 +38.5 86.9  | 1 48.3 +38.6 86.3  | 1 02.5 +38.5 85.7  | 0 16.7 +38.6 85.0  | -0 29.1 +38.7      |
| 5°  | 3 12.7 +38.5 86.2  | 2 26.9 +38.5 85.5  | 1 41.0 +38.6 84.9  | 0 55.3 +38.6 84.2  | 0 09.6 +38.7 83.6  |
| 6°  | 3 51.2 +38.4 85.4  | 3 05.4 +38.4 84.8  | 2 19.6 +38.6 84.1  | 1 33.9 +38.6 83.5  | 0 48.3 +38.7 82.8  |
| 7°  | 4 29.6 +38.3 84.6  | 3 43.8 +38.5 84.0  | 2 58.2 +38.5 83.4  | 2 12.5 +38.6 82.7  | 1 27.0 +38.7 82.1  |
| 8°  | 5 07.9 +38.4 83.9  | 4 22.3 +38.4 83.2  | 3 36.7 +38.4 82.6  | 2 51.1 +38.6 81.9  | 2 05.7 +38.6 81.3  |
| 9°  | 5 46.3 +38.2 83.1  | 5 00.7 +38.3 82.4  | 4 15.1 +38.5 81.8  | 3 29.7 +38.5 81.2  | 2 44.3 +38.6 80.5  |
| 10° | 6 24.5 +38.2 82.3  | 5 39.0 +38.3 81.7  | 4 53.6 +38.3 81.0  | 4 08.2 +38.5 80.4  | 3 22.9 +38.6 79.8  |
| 11° | 7 02.7 +38.1 81.5  | 6 17.3 +38.2 80.9  | 5 31.9 +38.3 80.3  | 4 46.7 +38.4 79.6  | 4 01.5 +38.6 79.0  |
| 12° | 7 40.8 +38.0 80.8  | 6 55.5 +38.1 80.1  | 6 10.2 +38.3 79.5  | 5 25.1 +38.4 78.9  | 4 40.1 +38.4 78.2  |
| 13° | 8 18.8 +38.0 80.0  | 7 33.6 +38.1 79.3  | 6 48.5 +38.2 78.7  | 6 03.5 +38.3 78.1  | 5 18.5 +38.5 77.5  |
| 14° | 8 56.8 +37.8 79.2  | 8 11.7 +37.9 78.6  | 7 26.7 +38.1 77.9  | 6 41.8 +38.2 77.3  | 5 57.0 +38.4 76.7  |
| 15° | 9 34.6 +37.7 78.4  | 8 49.6 +37.9 77.8  | 8 04.8 +38.0 77.2  | 7 20.0 +38.1 76.5  | 6 35.4 +38.3 75.9  |
| 16° | 10 12.3 +37.6 77.6 | 9 27.5 +37.7 77.0  | 8 42.8 +37.9 76.4  | 7 58.1 +38.1 75.8  | 7 13.7 +38.2 75.2  |
| 17° | 10 49.9 +37.5 76.8 | 10 05.2 +37.7 76.2 | 9 20.7 +37.8 75.6  | 8 36.2 +38.0 75.0  | 7 51.9 +38.1 74.4  |
| 18° | 11 27.4 +37.4 76.0 | 10 42.9 +37.5 75.4 | 9 58.5 +37.6 74.8  | 9 14.2 +37.8 74.2  | 8 30.0 +38.0 73.6  |
| 19° | 12 04.8 +37.2 75.2 | 11 20.4 +37.4 74.6 | 10 36.1 +37.6 74.0 | 9 52.0 +37.8 73.4  | 9 08.0 +38.0 72.8  |
| 20° | 12 42.0 +37.1 74.4 | 11 57.8 +37.2 73.8 | 11 13.7 +37.5 73.2 | 10 29.8 +37.6 72.6 | 9 46.0 +37.8 72.0  |
| 21° | 13 19.1 +36.9 73.6 | 12 35.0 +37.2 73.0 | 11 51.2 +37.3 72.4 | 11 07.4 +37.5 71.8 | 10 23.8 +37.7 71.2 |
| 22° | 13 56.0 +36.8 72.8 | 13 12.2 +36.9 72.2 | 12 28.5 +37.1 71.6 | 11 44.9 +37.4 71.0 | 11 01.5 +37.6 70.4 |
| 23° | 14 32.8 +36.6 72.0 | 13 49.1 +36.8 71.4 | 13 05.6 +37.1 70.8 | 12 22.3 +37.2 70.2 | 11 39.1 +37.5 69.6 |
| 24° | 15 09.4 +36.4 71.2 | 14 25.9 +36.7 70.6 | 13 42.7 +36.8 70.0 | 12 59.5 +37.1 69.4 | 12 16.6 +37.3 68.9 |
| 25° | 15 45.8 +36.2 70.3 | 15 02.6 +36.4 69.8 | 14 19.5 +36.7 69.2 | 13 36.6 +37.0 68.6 | 12 53.9 +37.2 68.0 |
| 26° | 16 22.0 +36.0 69.5 | 15 39.0 +36.3 68.9 | 14 56.2 +36.5 68.4 | 14 13.6 +36.7 67.8 | 13 31.1 +37.0 67.2 |
| 27° | 16 58.0 +35.8 68.7 | 16 15.3 +36.1 68.1 | 15 32.7 +36.3 67.6 | 14 50.3 +36.6 67.0 | 14 08.1 +36.9 66.4 |
| 28° | 17 33.8 +35.6 67.8 | 16 51.4 +35.8 67.3 | 16 09.0 +36.2 66.7 | 15 26.9 +36.4 66.2 | 14 45.0 +36.6 65.6 |
| 29° | 18 09.4 +35.4 67.0 | 17 27.2 +35.7 66.4 | 16 45.2 +35.9 65.9 | 16 03.3 +36.2 65.3 | 15 21.6 +36.5 64.8 |

| 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°  | -3 49.7 +38.7      | -4 35.6 +38.7      | -5 21.4 +38.8      | -6 07.2 +38.8      | -6 53.0 +38.9      |
| 1°  | -3 11.0 +38.7      | -3 56.9 +38.8      | -4 42.6 +38.8      | -5 28.4 +38.9      | -6 14.1 +39.0      |
| 2°  | -2 32.3 +38.7      | -3 18.1 +38.8      | -4 03.8 +38.8      | -4 49.5 +38.9      | -5 35.1 +39.0      |
| 3°  | -1 53.6 +38.8      | -2 39.3 +38.8      | -3 25.0 +38.9      | -4 10.6 +39.0      | -4 56.1 +39.0      |
| 4°  | -1 14.8 +38.7      | -2 00.5 +38.9      | -2 46.1 +38.9      | -3 31.6 +39.0      | -4 17.1 +39.1      |
| 5°  | -0 36.1 +38.8      | -1 21.6 +38.8      | -2 07.2 +39.0      | -2 52.6 +39.0      | -3 38.0 +39.2      |
| 6°  | 0 02.7 +38.8 82.2  | -0 42.8 +38.9      | -1 28.2 +39.0      | -2 13.6 +39.1      | -2 58.8 +39.2      |
| 7°  | 0 41.5 +38.8 81.4  | -0 03.9 +38.8      | -0 49.2 +38.9      | -1 34.5 +39.1      | -2 19.6 +39.2      |
| 8°  | 1 20.3 +38.7 80.7  | 0 34.9 +38.9 80.0  | -0 10.3 +39.0      | -0 55.4 +39.1      | -1 40.4 +39.2      |
| 9°  | 1 59.0 +38.7 79.9  | 1 13.8 +38.8 79.3  | 0 28.7 +39.0 78.6  | -0 16.3 +39.1      | -1 01.2 +39.2      |
| 10° | 2 37.7 +38.7 79.1  | 1 52.6 +38.9 78.5  | 1 07.7 +38.9 77.9  | 0 22.8 +39.1 77.2  | -0 22.0 +39.2      |
| 11° | 3 16.4 +38.7 78.4  | 2 31.5 +38.8 77.7  | 1 46.6 +38.9 77.1  | 1 01.9 +39.0 76.5  | 0 17.2 +39.3 75.8  |
| 12° | 3 55.1 +38.6 77.6  | 3 10.3 +38.7 77.0  | 2 25.5 +39.0 76.3  | 1 40.9 +39.1 75.7  | 0 56.5 +39.2 75.1  |
| 13° | 4 33.7 +38.6 76.8  | 3 49.0 +38.8 76.2  | 3 04.5 +38.8 75.6  | 2 20.0 +39.0 74.9  | 1 35.7 +39.2 74.3  |
| 14° | 5 12.3 +38.5 76.1  | 4 27.8 +38.6 75.4  | 3 43.3 +38.9 74.8  | 2 59.0 +39.0 74.2  | 2 14.9 +39.2 73.6  |
| 15° | 5 50.8 +38.5 75.3  | 5 06.4 +38.7 74.7  | 4 22.2 +38.8 74.1  | 3 38.0 +39.0 73.4  | 2 54.1 +39.1 72.8  |
| 16° | 6 29.3 +38.4 74.5  | 5 45.1 +38.5 73.9  | 5 01.0 +38.7 73.3  | 4 17.0 +38.9 72.7  | 3 33.2 +39.1 72.0  |
| 17° | 7 07.7 +38.3 73.8  | 6 23.6 +38.5 73.1  | 5 39.7 +38.7 72.5  | 4 55.9 +38.9 71.9  | 4 12.3 +39.1 71.3  |
| 18° | 7 46.0 +38.2 73.0  | 7 02.1 +38.4 72.4  | 6 18.4 +38.6 71.8  | 5 34.8 +38.8 71.1  | 4 51.4 +39.0 70.5  |
| 19° | 8 24.2 +38.1 72.2  | 7 40.5 +38.4 71.6  | 6 57.0 +38.5 71.0  | 6 13.6 +38.8 70.4  | 5 30.4 +39.0 69.8  |
| 20° | 9 02.3 +38.1 71.4  | 8 18.9 +38.2 70.8  | 7 35.5 +38.5 70.2  | 6 52.4 +38.6 69.6  | 6 09.4 +38.9 69.0  |
| 21° | 9 40.4 +37.9 70.6  | 8 57.1 +38.1 70.0  | 8 14.0 +38.3 69.4  | 7 31.0 +38.6 68.8  | 6 48.3 +38.8 68.2  |
| 22° | 10 18.3 +37.8 69.9 | 9 35.2 +38.1 69.3  | 8 52.3 +38.3 68.7  | 8 09.6 +38.5 68.1  | 7 27.1 +38.7 67.5  |
| 23° | 10 56.1 +37.7 69.1 | 10 13.3 +37.9 68.5 | 9 30.6 +38.2 67.9  | 8 48.1 +38.4 67.3  | 8 05.8 +38.7 66.7  |
| 24° | 11 33.8 +37.6 68.3 | 10 51.2 +37.8 67.7 | 10 08.8 +38.0 67.1 | 9 26.5 +38.3 66.5  | 8 44.5 +38.5 65.9  |
| 25° | 12 11.4 +37.4 67.5 | 11 29.0 +37.7 66.9 | 10 46.8 +37.9 66.3 | 10 04.8 +38.2 65.7 | 9 23.0 +38.5 65.1  |
| 26° | 12 48.8 +37.3 66.7 | 12 06.7 +37.5 66.1 | 11 24.7 +37.9 65.5 | 10 43.0 +38.1 64.9 | 10 01.5 +38.3 64.4 |
| 27° | 13 26.1 +37.1 65.9 | 12 44.2 +37.4 65.3 | 12 02.6 +37.6 64.7 | 11 21.1 +37.9 64.2 | 10 39.8 +38.3 63.6 |
| 28° | 14 03.2 +36.9 65.1 | 13 21.6 +37.2 64.5 | 12 40.2 +37.5 63.9 | 11 59.0 +37.8 63.4 | 11 18.1 +38.1 62.8 |
| 29° | 14 40.1 +36.8 64.2 | 13 58.8 +37.1 63.7 | 13 17.7 +37.4 63.1 | 12 36.8 +37.7 62.6 | 11 56.2 +37.9 62.0 |

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# Declination SAME name as Latitude

# Latitude 40°

| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°   | LHA 103° / 257°   | LHA 104° / 256°   |
|-----|--------------------|--------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  | -7 38.7 +39.0      | -8 24.3 +39.0      | -9 09.9 +39.1     | -9 55.4 +39.2     |                   |
| 1°  | -6 59.7 +39.0      | -7 45.3 +39.1      | -8 30.8 +39.2     | -9 16.2 +39.3     |                   |
| 2°  | -6 20.7 +39.1      | -7 06.2 +39.2      | -7 51.6 +39.3     | -8 36.9 +39.4     | -9 22.1 +39.5     |
| 3°  | -5 41.6 +39.2      | -6 27.0 +39.3      | -7 12.3 +39.4     | -7 57.5 +39.5     | -8 42.6 +39.6     |
| 4°  | -5 02.4 +39.2      | -5 47.7 +39.3      | -6 32.9 +39.4     | -7 18.0 +39.6     | -8 03.0 +39.7     |
| 5°  | -4 23.2 +39.2      | -5 08.4 +39.4      | -5 53.5 +39.5     | -6 38.4 +39.6     | -7 23.3 +39.8     |
| 6°  | -3 44.0 +39.3      | -4 29.0 +39.4      | -5 14.0 +39.6     | -5 58.8 +39.7     | -6 43.5 +39.8     |
| 7°  | -3 04.7 +39.3      | -3 49.6 +39.4      | -4 34.4 +39.6     | -5 19.1 +39.7     | -6 03.7 +39.9     |
| 8°  | -2 25.4 +39.4      | -3 10.2 +39.5      | -3 54.8 +39.6     | -4 39.4 +39.8     | -5 23.8 +39.9     |
| 9°  | -1 46.0 +39.4      | -2 30.7 +39.5      | -3 15.2 +39.7     | -3 59.6 +39.8     | -4 43.9 +40.0     |
| 10° | -1 06.6 +39.3      | -1 51.2 +39.6      | -2 35.5 +39.6     | -3 19.8 +39.9     | -4 03.9 +40.0     |
| 11° | -0 27.3 +39.4      | -1 11.6 +39.5      | -1 55.9 +39.8     | -2 39.9 +39.9     | -3 23.9 +40.1     |
| 12° | 0 12.1 +39.4 74.4  | -0 32.1 +39.6      | -1 16.1 +39.7     | -2 00.0 +39.9     | -2 43.8 +40.1     |
| 13° | 0 51.5 +39.4 73.7  | 0 07.5 +39.5 73.0  | -0 36.4 +39.7     | -1 20.1 +39.9     | -2 03.7 +40.1     |
| 14° | 1 30.9 +39.3 72.9  | 0 47.0 +39.6 72.3  | 0 03.3 +39.8 71.6 | -0 40.2 +39.9     | -1 23.6 +40.1     |
| 15° | 2 10.2 +39.4 72.2  | 1 26.6 +39.5 71.5  | 0 43.1 +39.7 70.9 | -0 00.3 +39.9     | -0 43.5 +40.2     |
| 16° | 2 49.6 +39.3 71.4  | 2 06.1 +39.5 70.8  | 1 22.8 +39.7 70.1 | 0 39.6 +40.0 69.5 | -0 03.3 +40.1     |
| 17° | 3 28.9 +39.2 70.7  | 2 45.6 +39.5 70.0  | 2 02.5 +39.7 69.4 | 1 19.6 +39.9 68.8 | 0 36.8 +40.1 68.1 |
| 18° | 4 08.1 +39.3 69.9  | 3 25.1 +39.4 69.3  | 2 42.2 +39.6 68.6 | 1 59.5 +39.9 68.0 | 1 16.9 +40.2 67.4 |
| 19° | 4 47.4 +39.1 69.1  | 4 04.5 +39.4 68.5  | 3 21.8 +39.7 67.9 | 2 39.4 +39.8 67.3 | 1 57.1 +40.1 66.6 |
| 20° | 5 26.5 +39.2 68.4  | 4 43.9 +39.4 67.8  | 4 01.5 +39.6 67.1 | 3 19.2 +39.8 66.5 | 2 37.2 +40.0 65.9 |
| 21° | 6 05.7 +39.0 67.6  | 5 23.3 +39.3 67.0  | 4 41.1 +39.5 66.4 | 3 59.0 +39.8 65.8 | 3 17.2 +40.1 65.1 |
| 22° | 6 44.7 +39.0 66.8  | 6 02.6 +39.2 66.2  | 5 20.6 +39.5 65.6 | 4 38.8 +39.8 65.0 | 3 57.3 +40.0 64.4 |
| 23° | 7 23.7 +38.9 66.1  | 6 41.8 +39.1 65.5  | 6 00.1 +39.4 64.9 | 5 18.6 +39.6 64.3 | 4 37.3 +39.9 63.6 |
| 24° | 8 02.6 +38.8 65.3  | 7 20.9 +39.1 64.7  | 6 39.5 +39.3 64.1 | 5 58.2 +39.7 63.5 | 5 17.2 +39.9 62.9 |
| 25° | 8 41.4 +38.7 64.5  | 8 00.0 +39.0 63.9  | 7 18.8 +39.3 63.4 | 6 37.9 +39.5 62.8 | 5 57.1 +39.9 62.1 |
| 26° | 9 20.1 +38.7 63.8  | 8 39.0 +38.9 63.2  | 7 58.1 +39.2 62.6 | 7 17.4 +39.5 62.0 | 6 37.0 +39.7 61.4 |
| 27° | 9 58.8 +38.5 63.0  | 9 17.9 +38.8 62.4  | 8 37.3 +39.1 61.8 | 7 56.9 +39.4 61.2 | 7 16.7 +39.7 60.6 |
| 28° | 10 37.3 +38.4 62.2 | 9 56.7 +38.7 61.6  | 9 16.4 +39.0 61.1 | 8 36.3 +39.3 60.5 | 7 56.4 +39.6 59.9 |
| 29° | 11 15.7 +38.3 61.4 | 10 35.4 +38.6 60.9 | 9 55.4 +38.9 60.3 | 9 15.6 +39.2 59.7 | 8 36.0 +39.5 59.1 |

| Dec | LHA 105° / 255°   | LHA 106° / 254°   | LHA 107° / 253°   | LHA 108° / 252°   | LHA 109° / 251°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  |                   |                   |                   |                   |                   |
| 3°  | -9 27.6 +39.7     |                   |                   |                   |                   |
| 4°  | -8 47.9 +39.9     | -9 32.6 +39.9     |                   |                   |                   |
| 5°  | -8 08.0 +39.9     | -8 52.7 +40.1     | -9 37.1 +40.2     |                   |                   |
| 6°  | -7 28.1 +39.9     | -8 12.6 +40.1     | -8 56.9 +40.3     | -9 41.1 +40.5     |                   |
| 7°  | -6 48.2 +40.1     | -7 32.5 +40.2     | -8 16.6 +40.3     | -9 00.6 +40.5     | -9 44.5 +40.7     |
| 8°  | -6 08.1 +40.1     | -6 52.3 +40.3     | -7 36.3 +40.5     | -8 20.1 +40.6     | -9 03.8 +40.9     |
| 9°  | -5 28.0 +40.1     | -6 12.0 +40.3     | -6 55.8 +40.5     | -7 39.5 +40.8     | -8 22.9 +40.9     |
| 10° | -4 47.9 +40.3     | -5 31.7 +40.4     | -6 15.3 +40.6     | -6 58.7 +40.7     | -7 42.0 +41.0     |
| 11° | -4 07.6 +40.2     | -4 51.3 +40.5     | -5 34.7 +40.6     | -6 18.0 +40.9     | -7 01.0 +41.0     |
| 12° | -3 27.4 +40.3     | -4 10.8 +40.5     | -4 54.1 +40.7     | -5 37.1 +40.9     | -6 20.0 +41.1     |
| 13° | -2 47.1 +40.3     | -3 30.3 +40.5     | -4 13.4 +40.8     | -4 56.2 +40.9     | -5 38.9 +41.2     |
| 14° | -2 06.8 +40.3     | -2 49.8 +40.5     | -3 32.6 +40.7     | -4 15.3 +41.0     | -4 57.7 +41.2     |
| 15° | -1 26.5 +40.4     | -2 09.3 +40.6     | -2 51.9 +40.8     | -3 34.3 +41.1     | -4 16.5 +41.3     |
| 16° | -0 46.1 +40.4     | -1 28.7 +40.6     | -2 11.1 +40.8     | -2 53.2 +41.0     | -3 35.2 +41.3     |
| 17° | -0 05.7 +40.3     | -0 48.1 +40.6     | -1 30.3 +40.9     | -2 12.2 +41.1     | -2 53.9 +41.3     |
| 18° | 0 34.6 +40.4 66.7 | -0 07.5 +40.6     | -0 49.4 +40.8     | -1 31.1 +41.1     | -2 12.6 +41.3     |
| 19° | 1 15.0 +40.3 66.0 | 0 33.1 +40.6 65.4 | -0 08.6 +40.9     | -0 50.0 +41.1     | -1 31.3 +41.4     |
| 20° | 1 55.3 +40.3 65.3 | 1 13.7 +40.6 64.6 | 0 32.3 +40.8 64.0 | -0 08.9 +41.1     | -0 49.9 +41.4     |
| 21° | 2 35.6 +40.3 64.5 | 1 54.3 +40.5 63.9 | 1 13.1 +40.8 63.3 | 0 32.2 +41.1 62.6 | -0 08.5 +41.3     |
| 22° | 3 15.9 +40.3 63.8 | 2 34.8 +40.5 63.1 | 1 53.9 +40.8 62.5 | 1 13.3 +41.0 61.9 | 0 32.8 +41.4 61.2 |
| 23° | 3 56.2 +40.2 63.0 | 3 15.3 +40.5 62.4 | 2 34.7 +40.8 61.8 | 1 54.3 +41.1 61.2 | 1 14.2 +41.4 60.5 |
| 24° | 4 36.4 +40.2 62.3 | 3 55.8 +40.5 61.7 | 3 15.5 +40.8 61.1 | 2 35.4 +41.0 60.4 | 1 55.6 +41.3 59.8 |
| 25° | 5 16.6 +40.1 61.5 | 4 36.3 +40.4 60.9 | 3 56.3 +40.7 60.3 | 3 16.4 +41.0 59.7 | 2 36.9 +41.3 59.1 |
| 26° | 5 56.7 +40.1 60.8 | 5 16.7 +40.4 60.2 | 4 37.0 +40.6 59.6 | 3 57.4 +41.0 59.0 | 3 18.2 +41.3 58.3 |
| 27° | 6 36.8 +40.0 60.0 | 5 57.1 +40.3 59.4 | 5 17.6 +40.6 58.8 | 4 38.4 +40.9 58.2 | 3 59.5 +41.2 57.6 |
| 28° | 7 16.8 +39.9 59.3 | 6 37.4 +40.2 58.7 | 5 58.2 +40.6 58.1 | 5 19.3 +40.9 57.5 | 4 40.7 +41.2 56.9 |
| 29° | 7 56.7 +39.8 58.5 | 7 17.6 +40.2 58.0 | 6 38.8 +40.5 57.4 | 6 00.2 +40.8 56.8 | 5 21.9 +41.1 56.2 |

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# Latitude 40°

# Declination SAME name as Latitude

| Dec | LHA 110° / 250°   | LHA 111° / 249°   | LHA 112° / 248°   | LHA 113° / 247°   | LHA 114° / 246°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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 47.2 +41.0     |                   |                   |                   |                   |
| 9°  | -9 06.2 +41.1     | -9 49.3 +41.3     |                   |                   |                   |
| 10° | -8 25.1 +41.2     | -9 08.0 +41.4     | -9 50.7 +41.6     |                   |                   |
| 11° | -7 43.9 +41.3     | -8 26.6 +41.5     | -9 09.1 +41.7     | -9 51.3 +41.9     |                   |
| 12° | -7 02.6 +41.3     | -7 45.1 +41.6     | -8 27.4 +41.8     | -9 09.4 +42.0     | -9 51.2 +42.3     |
| 13° | -6 21.3 +41.4     | -7 03.5 +41.6     | -7 45.6 +41.9     | -8 27.4 +42.2     | -9 08.9 +42.3     |
| 14° | -5 39.9 +41.4     | -6 21.9 +41.7     | -7 03.7 +41.9     | -7 45.2 +42.1     | -8 26.6 +42.5     |
| 15° | -4 58.5 +41.5     | -5 40.2 +41.7     | -6 21.8 +42.0     | -7 03.1 +42.3     | -7 44.1 +42.5     |
| 16° | -4 17.0 +41.6     | -4 58.5 +41.8     | -5 39.8 +42.1     | -6 20.8 +42.3     | -7 01.6 +42.6     |
| 17° | -3 35.4 +41.6     | -4 16.7 +41.8     | -4 57.7 +42.1     | -5 38.5 +42.4     | -6 19.0 +42.6     |
| 18° | -2 53.8 +41.6     | -3 34.9 +41.9     | -4 15.6 +42.1     | -4 56.1 +42.4     | -5 36.4 +42.7     |
| 19° | -2 12.2 +41.6     | -2 53.0 +41.9     | -3 33.5 +42.2     | -4 13.7 +42.4     | -4 53.7 +42.7     |
| 20° | -1 30.6 +41.6     | -2 11.1 +41.9     | -2 51.3 +42.2     | -3 31.3 +42.5     | -4 11.0 +42.8     |
| 21° | -0 49.0 +41.7     | -1 29.2 +42.0     | -2 09.1 +42.2     | -2 48.8 +42.5     | -3 28.2 +42.8     |
| 22° | -0 07.3 +41.6     | -0 47.2 +41.9     | -1 26.9 +42.2     | -2 06.3 +42.5     | -2 45.4 +42.8     |
| 23° | 0 34.3 +41.7 59.9 | -0 05.3 +41.9     | -0 44.7 +42.3     | -1 23.8 +42.6     | -2 02.6 +42.9     |
| 24° | 1 16.0 +41.6 59.2 | 0 36.6 +42.0 58.5 | -0 02.4 +42.2     | -0 41.2 +42.5     | -1 19.7 +42.8     |
| 25° | 1 57.6 +41.6 58.4 | 1 18.6 +41.9 57.8 | 0 39.8 +42.2 57.2 | 0 01.3 +42.5 56.5 | -0 36.9 +42.9     |
| 26° | 2 39.2 +41.6 57.7 | 2 00.5 +41.9 57.1 | 1 22.0 +42.2 56.5 | 0 43.8 +42.6 55.8 | 0 06.0 +42.8 55.2 |
| 27° | 3 20.8 +41.5 57.0 | 2 42.4 +41.8 56.4 | 2 04.2 +42.2 55.8 | 1 26.4 +42.5 55.1 | 0 48.8 +42.9 54.5 |
| 28° | 4 02.3 +41.6 56.3 | 3 24.2 +41.9 55.7 | 2 46.4 +42.2 55.0 | 2 08.9 +42.5 54.4 | 1 31.7 +42.8 53.8 |
| 29° | 4 43.9 +41.4 55.6 | 4 06.1 +41.8 54.9 | 3 28.6 +42.1 54.3 | 2 51.4 +42.5 53.7 | 2 14.5 +42.8 53.1 |

| Dec | LHA 115° / 245°   | LHA 116° / 244°   | LHA 117° / 243°   | LHA 118° / 242° | LHA 119° / 241° |
|-----|-------------------|-------------------|-------------------|-----------------|-----------------|
|     | 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° | -9 50.2 +42.6     |                   |                   |                 |                 |
| 14° | -9 07.6 +42.7     | -9 48.4 +42.9     |                   |                 |                 |
| 15° | -8 24.9 +42.8     | -9 05.5 +43.1     | -9 45.7 +43.3     |                 |                 |
| 16° | -7 42.1 +42.8     | -8 22.4 +43.1     | -9 02.4 +43.4     | -9 42.1 +43.7   |                 |
| 17° | -6 59.3 +42.9     | -7 39.3 +43.2     | -8 19.0 +43.5     | -8 58.4 +43.7   |                 |
| 18° | -6 16.4 +43.0     | -6 56.1 +43.3     | -7 35.5 +43.5     | -8 14.7 +43.8   |                 |
| 19° | -5 33.4 +43.0     | -6 12.8 +43.3     | -6 52.0 +43.6     | -7 30.9 +43.9   |                 |
| 20° | -4 50.4 +43.1     | -5 29.5 +43.3     | -6 08.4 +43.7     | -6 47.0 +44.0   |                 |
| 21° | -4 07.3 +43.1     | -4 46.2 +43.4     | -5 24.7 +43.7     | -6 03.0 +44.0   |                 |
| 22° | -3 24.2 +43.1     | -4 02.8 +43.4     | -4 41.0 +43.7     | -5 19.0 +44.1   |                 |
| 23° | -2 41.1 +43.1     | -3 19.4 +43.5     | -3 57.3 +43.8     | -4 34.9 +44.1   |                 |
| 24° | -1 58.0 +43.2     | -2 35.9 +43.5     | -3 13.5 +43.8     | -3 50.8 +44.1   |                 |
| 25° | -1 14.8 +43.2     | -1 52.4 +43.5     | -2 29.7 +43.8     | -3 06.7 +44.1   |                 |
| 26° | -0 31.6 +43.2     | -1 08.9 +43.5     | -1 45.9 +43.8     | -2 22.6 +44.2   |                 |
| 27° | 0 11.6 +43.1 53.9 | -0 25.4 +43.5     | -1 02.1 +43.9     | -1 38.4 +44.2   |                 |
| 28° | 0 54.7 +43.2 53.2 | 0 18.1 +43.5 52.5 | -0 18.2 +43.8     | -0 54.2 +44.2   |                 |
| 29° | 1 37.9 +43.2 52.5 | 1 01.6 +43.5 51.8 | 0 25.6 +43.9 51.2 | -0 10.0 +44.2   |                 |

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| 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°  | 49 00.0 +60.0 180.0 | 48 59.4 +60.0 178.5 | 48 57.6 +59.9 177.0 | 48 54.6 +59.9 175.4 | 48 50.4 +59.8 173.9 |
| 1°  | 50 00.0 +60.0 180.0 | 49 59.4 +60.0 178.4 | 49 57.5 +60.0 176.9 | 49 54.5 +59.9 175.3 | 49 50.2 +59.8 173.8 |
| 2°  | 51 00.0 +60.0 180.0 | 50 59.4 +60.0 178.4 | 50 57.5 +59.9 176.8 | 50 54.4 +59.8 175.2 | 50 50.0 +59.8 173.7 |
| 3°  | 52 00.0 +60.0 180.0 | 51 59.4 +59.9 178.4 | 51 57.4 +60.0 176.8 | 51 54.2 +59.9 175.1 | 51 49.8 +59.7 173.5 |
| 4°  | 53 00.0 +60.0 180.0 | 52 59.3 +60.0 178.3 | 52 57.4 +59.9 176.7 | 52 54.1 +59.9 175.0 | 52 49.5 +59.8 173.4 |
| 5°  | 54 00.0 +60.0 180.0 | 53 59.3 +60.0 178.3 | 53 57.3 +60.0 176.6 | 53 54.0 +59.8 174.9 | 53 49.3 +59.8 173.2 |
| 6°  | 55 00.0 +60.0 180.0 | 54 59.3 +60.0 178.3 | 54 57.3 +59.9 176.5 | 54 53.8 +59.9 174.8 | 54 49.1 +59.7 173.1 |
| 7°  | 56 00.0 +60.0 180.0 | 55 59.3 +60.0 178.2 | 55 57.2 +59.9 176.5 | 55 53.7 +59.8 174.7 | 55 48.8 +59.7 172.9 |
| 8°  | 57 00.0 +60.0 180.0 | 56 59.3 +60.0 178.2 | 56 57.1 +60.0 176.4 | 56 53.5 +59.9 174.6 | 56 48.5 +59.8 172.8 |
| 9°  | 58 00.0 +60.0 180.0 | 57 59.3 +59.9 178.1 | 57 57.1 +59.9 176.3 | 57 53.4 +59.8 174.4 | 57 48.3 +59.7 172.6 |
| 10° | 59 00.0 +60.0 180.0 | 58 59.2 +60.0 178.1 | 58 57.0 +59.9 176.2 | 58 53.2 +59.8 174.3 | 58 48.0 +59.6 172.4 |
| 11° | 60 00.0 +60.0 180.0 | 59 59.2 +60.0 178.0 | 59 56.9 +59.9 176.1 | 59 53.0 +59.8 174.1 | 59 47.6 +59.7 172.2 |
| 12° | 61 00.0 +60.0 180.0 | 60 59.2 +60.0 178.0 | 60 56.8 +59.9 176.0 | 60 52.8 +59.8 174.0 | 60 47.3 +59.6 172.0 |
| 13° | 62 00.0 +60.0 180.0 | 61 59.2 +60.0 177.9 | 61 56.7 +59.9 175.9 | 61 52.6 +59.8 173.8 | 61 46.9 +59.6 171.7 |
| 14° | 63 00.0 +60.0 180.0 | 62 59.2 +59.9 177.9 | 62 56.6 +59.9 175.7 | 62 52.4 +59.8 173.6 | 62 46.5 +59.6 171.5 |
| 15° | 64 00.0 +60.0 180.0 | 63 59.1 +60.0 177.8 | 63 56.5 +59.9 175.6 | 63 52.2 +59.7 173.4 | 63 46.1 +59.6 171.2 |
| 16° | 65 00.0 +60.0 180.0 | 64 59.1 +60.0 177.7 | 64 56.4 +59.9 175.5 | 64 51.9 +59.8 173.2 | 64 45.7 +59.5 171.0 |
| 17° | 66 00.0 +60.0 180.0 | 65 59.1 +59.9 177.6 | 65 56.3 +59.9 175.3 | 65 51.7 +59.7 173.0 | 65 45.2 +59.5 170.7 |
| 18° | 67 00.0 +60.0 180.0 | 66 59.0 +60.0 177.6 | 66 56.2 +59.8 175.1 | 66 51.4 +59.7 172.7 | 66 44.7 +59.4 170.3 |
| 19° | 68 00.0 +60.0 180.0 | 67 59.0 +60.0 177.5 | 67 56.0 +59.9 175.0 | 67 51.1 +59.6 172.5 | 67 44.1 +59.4 170.0 |
| 20° | 69 00.0 +60.0 180.0 | 68 59.0 +59.9 177.4 | 68 55.9 +59.8 174.8 | 68 50.7 +59.6 172.2 | 68 43.5 +59.4 169.6 |
| 21° | 70 00.0 +60.0 180.0 | 69 58.9 +60.0 177.3 | 69 55.7 +59.8 174.6 | 69 50.3 +59.6 171.9 | 69 42.9 +59.2 169.2 |
| 22° | 71 00.0 +60.0 180.0 | 70 58.9 +59.9 177.2 | 70 55.5 +59.8 174.3 | 70 49.9 +59.6 171.5 | 70 42.1 +59.2 168.7 |
| 23° | 72 00.0 +60.0 180.0 | 71 58.8 +60.0 177.0 | 71 55.3 +59.8 174.1 | 71 49.5 +59.4 171.1 | 71 41.3 +59.1 168.2 |
| 24° | 73 00.0 +60.0 180.0 | 72 58.8 +59.9 176.9 | 72 55.1 +59.7 173.8 | 72 48.9 +59.5 170.7 | 72 40.4 +59.0 167.6 |
| 25° | 74 00.0 +60.0 180.0 | 73 58.7 +59.9 176.7 | 73 54.8 +59.7 173.4 | 73 48.4 +59.3 170.2 | 73 39.4 +58.9 167.0 |
| 26° | 75 00.0 +60.0 180.0 | 74 58.6 +59.9 176.5 | 74 54.5 +59.7 173.1 | 74 47.7 +59.3 169.7 | 74 38.3 +58.7 166.3 |
| 27° | 76 00.0 +60.0 180.0 | 75 58.5 +60.0 176.3 | 75 54.2 +59.6 172.7 | 75 47.0 +59.2 169.1 | 75 37.0 +58.6 165.5 |
| 28° | 77 00.0 +60.0 180.0 | 76 58.5 +59.8 176.1 | 76 53.8 +59.6 172.2 | 76 46.2 +59.0 168.4 | 76 35.6 +58.3 164.6 |
| 29° | 78 00.0 +60.0 180.0 | 77 58.3 +59.9 175.8 | 77 53.4 +59.5 171.6 | 77 45.2 +58.9 167.5 | 77 33.9 +58.0 163.5 |

| 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°  | 48 45.0 +59.7 172.4 | 48 38.4 +59.6 170.9 | 48 30.7 +59.4 169.4 | 48 21.8 +59.2 167.9 | 48 11.7 +59.0 166.4 |
| 1°  | 49 44.7 +59.7 172.2 | 49 38.0 +59.5 170.7 | 49 30.1 +59.4 169.2 | 49 21.0 +59.2 167.7 | 49 10.7 +59.0 166.2 |
| 2°  | 50 44.4 +59.6 172.1 | 50 37.5 +59.5 170.5 | 50 29.5 +59.3 169.0 | 50 20.2 +59.2 167.4 | 50 09.7 +59.0 165.9 |
| 3°  | 51 44.0 +59.7 171.9 | 51 37.0 +59.5 170.3 | 51 28.8 +59.3 168.7 | 51 19.4 +59.1 167.2 | 51 08.7 +58.9 165.6 |
| 4°  | 52 43.7 +59.6 171.7 | 52 36.5 +59.5 170.1 | 52 28.1 +59.3 168.5 | 52 18.5 +59.1 166.9 | 52 07.6 +58.8 165.3 |
| 5°  | 53 43.3 +59.6 171.6 | 53 36.0 +59.5 169.9 | 53 27.4 +59.3 168.2 | 53 17.6 +59.0 166.6 | 53 06.4 +58.8 165.0 |
| 6°  | 54 42.9 +59.6 171.4 | 54 35.5 +59.4 169.7 | 54 26.7 +59.2 168.0 | 54 16.6 +59.0 166.3 | 54 05.2 +58.8 164.6 |
| 7°  | 55 42.5 +59.6 171.2 | 55 34.9 +59.4 169.4 | 55 25.9 +59.2 167.7 | 55 15.6 +59.0 166.0 | 55 04.0 +58.7 164.3 |
| 8°  | 56 42.1 +59.6 171.0 | 56 34.3 +59.4 169.2 | 56 25.1 +59.2 167.4 | 56 14.6 +58.8 165.6 | 56 02.7 +58.6 163.9 |
| 9°  | 57 41.7 +59.5 170.7 | 57 33.7 +59.3 168.9 | 57 24.3 +59.0 167.1 | 57 13.4 +58.9 165.3 | 57 01.3 +58.5 163.5 |
| 10° | 58 41.2 +59.5 170.5 | 58 33.0 +59.3 168.6 | 58 23.3 +59.1 166.8 | 58 12.3 +58.7 164.9 | 57 59.8 +58.4 163.1 |
| 11° | 59 40.7 +59.5 170.2 | 59 32.3 +59.2 168.3 | 59 22.4 +59.0 166.4 | 59 11.0 +58.7 164.5 | 58 58.2 +58.4 162.7 |
| 12° | 60 40.2 +59.4 170.0 | 60 31.5 +59.2 168.0 | 60 21.4 +58.9 166.1 | 60 09.7 +58.6 164.1 | 59 56.6 +58.3 162.2 |
| 13° | 61 39.6 +59.4 169.7 | 61 30.7 +59.2 167.7 | 61 20.3 +58.8 165.7 | 61 08.3 +58.5 163.7 | 60 54.9 +58.1 161.7 |
| 14° | 62 39.0 +59.4 169.4 | 62 29.9 +59.1 167.3 | 62 19.1 +58.8 165.3 | 62 06.8 +58.5 163.2 | 61 53.0 +58.0 161.2 |
| 15° | 63 38.4 +59.3 169.1 | 63 29.0 +59.0 166.9 | 63 17.9 +58.7 164.8 | 63 05.3 +58.3 162.7 | 62 51.0 +57.9 160.7 |
| 16° | 64 37.7 +59.3 168.7 | 64 28.0 +58.9 166.5 | 64 16.6 +58.6 164.3 | 64 03.6 +58.1 162.2 | 63 48.9 +57.7 160.1 |
| 17° | 65 37.0 +59.2 168.4 | 65 26.9 +58.9 166.1 | 65 15.2 +58.5 163.8 | 65 01.7 +58.1 161.6 | 64 46.6 +57.6 159.4 |
| 18° | 66 36.2 +59.1 168.0 | 66 25.8 +58.8 165.6 | 66 13.7 +58.3 163.3 | 65 59.8 +57.9 161.0 | 65 44.2 +57.4 158.8 |
| 19° | 67 35.3 +59.1 167.5 | 67 24.6 +58.6 165.1 | 67 12.0 +58.2 162.7 | 66 57.7 +57.7 160.4 | 66 41.6 +57.1 158.0 |
| 20° | 68 34.4 +58.9 167.0 | 68 23.2 +58.6 164.5 | 68 10.2 +58.1 162.1 | 67 55.4 +57.5 159.6 | 67 38.7 +56.9 157.3 |
| 21° | 69 33.3 +58.9 166.5 | 69 21.8 +58.4 163.9 | 69 08.3 +57.8 161.4 | 68 52.9 +57.2 158.9 | 68 35.6 +56.7 156.4 |
| 22° | 70 32.2 +58.8 166.0 | 70 20.2 +58.2 163.3 | 70 06.1 +57.7 160.6 | 69 50.1 +57.1 158.0 | 69 32.3 +56.3 155.5 |
| 23° | 71 31.0 +58.6 165.3 | 71 18.4 +58.1 162.5 | 71 03.8 +57.4 159.8 | 70 47.2 +56.7 157.1 | 70 28.6 +55.9 154.5 |
| 24° | 72 29.6 +58.5 164.7 | 72 16.5 +57.8 161.7 | 72 01.2 +57.1 158.9 | 71 43.9 +56.3 156.1 | 71 24.5 +55.5 153.4 |
| 25° | 73 28.1 +58.2 163.9 | 73 14.3 +57.6 160.8 | 72 58.3 +56.8 157.8 | 72 40.2 +55.9 154.9 | 72 20.0 +55.0 152.1 |
| 26° | 74 26.3 +58.1 163.0 | 74 11.9 +57.3 159.8 | 73 55.1 +56.4 156.7 | 73 36.1 +55.5 153.7 | 73 15.0 +54.5 150.8 |
| 27° | 75 24.4 +57.8 162.0 | 75 09.2 +56.8 158.7 | 74 51.5 +55.9 155.4 | 74 31.6 +54.8 152.3 | 74 09.5 +54.3 149.3 |
| 28° | 76 22.2 +57.4 160.9 | 76 06.0 +56.5 157.4 | 75 47.4 +55.3 154.0 | 75 26.4 +54.1 150.7 | 75 03.2 +52.9 147.6 |
| 29° | 77 19.6 +57.0 159.7 | 77 02.5 +55.8 155.9 | 76 42.7 +54.6 152.4 | 76 20.5 +53.3 149.0 | 75 56.1 +51.9 145.7 |

| 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°  | 48 00.5 +58.8 165.0 | 47 48.2 +58.6 163.5 | 47 34.8 +58.3 162.0 | 47 20.3 +58.0 160.6 | 47 04.7 +57.8 159.2 |
| 1°  | 48 59.3 +58.8 164.7 | 48 46.8 +58.5 163.2 | 48 33.1 +58.3 161.7 | 48 18.3 +58.0 160.2 | 48 02.5 +57.7 158.8 |
| 2°  | 49 58.1 +58.7 164.3 | 49 45.3 +58.5 162.8 | 49 31.4 +58.1 161.3 | 49 16.3 +57.9 159.8 | 49 00.2 +57.5 158.4 |
| 3°  | 50 56.8 +58.7 164.0 | 50 43.8 +58.3 162.5 | 50 29.5 +58.2 161.0 | 50 14.2 +57.8 159.4 | 49 57.7 +57.5 157.9 |
| 4°  | 51 55.5 +58.6 163.7 | 51 42.1 +58.4 162.1 | 51 27.7 +58.0 160.6 | 51 12.0 +57.7 159.0 | 50 55.2 +57.4 157.5 |
| 5°  | 52 54.1 +58.5 163.3 | 52 40.5 +58.2 161.7 | 52 25.7 +57.9 160.1 | 52 09.7 +57.6 158.6 | 51 52.6 +57.3 157.0 |
| 6°  | 53 52.6 +58.5 163.0 | 53 38.7 +58.2 161.3 | 53 23.6 +57.8 159.7 | 53 07.3 +57.5 158.1 | 52 49.9 +57.1 156.5 |
| 7°  | 54 51.1 +58.3 162.6 | 54 36.9 +58.0 160.9 | 54 21.4 +57.8 159.3 | 54 04.8 +57.4 157.6 | 53 47.0 +57.0 156.0 |
| 8°  | 55 49.4 +58.3 162.2 | 55 34.9 +58.0 160.5 | 55 19.2 +57.6 158.8 | 55 02.2 +57.2 157.1 | 54 44.0 +56.8 155.5 |
| 9°  | 56 47.7 +58.3 161.7 | 56 32.9 +57.9 160.0 | 56 16.8 +57.5 158.3 | 55 59.4 +57.1 156.6 | 55 40.8 +56.7 154.9 |
| 10° | 57 46.0 +58.1 161.3 | 57 30.8 +57.7 159.5 | 57 14.3 +57.3 157.8 | 56 56.5 +57.0 156.0 | 56 37.5 +56.5 154.3 |
| 11° | 58 44.1 +58.0 160.8 | 58 28.5 +57.6 159.0 | 58 11.6 +57.2 157.2 | 57 53.5 +56.7 155.5 | 57 34.0 +56.3 153.7 |
| 12° | 59 42.1 +57.8 160.3 | 59 26.1 +57.5 158.5 | 59 08.8 +57.1 156.6 | 58 50.2 +56.6 154.8 | 58 30.3 +56.1 153.1 |
| 13° | 60 39.9 +57.8 159.8 | 60 23.6 +57.3 157.9 | 60 05.9 +56.8 156.0 | 59 46.8 +56.4 154.2 | 59 26.4 +55.9 152.4 |
| 14° | 61 37.7 +57.6 159.2 | 61 20.9 +57.1 157.3 | 61 02.7 +56.7 155.4 | 60 43.2 +56.1 153.5 | 60 22.3 +55.7 151.7 |
| 15° | 62 35.3 +57.4 158.6 | 62 18.0 +57.0 156.6 | 61 59.4 +56.4 154.7 | 61 39.3 +55.9 152.8 | 61 18.0 +55.3 150.9 |
| 16° | 63 32.7 +57.3 158.0 | 63 15.0 +56.7 156.0 | 62 55.8 +56.2 153.9 | 62 35.2 +55.7 152.0 | 62 13.3 +55.1 150.1 |
| 17° | 64 30.0 +57.0 157.3 | 64 11.7 +56.5 155.2 | 63 52.0 +55.9 153.2 | 63 30.9 +55.3 151.2 | 63 08.4 +54.7 149.2 |
| 18° | 65 27.0 +56.8 156.6 | 65 08.2 +56.3 154.4 | 64 47.9 +55.7 152.3 | 64 26.2 +55.0 150.3 | 64 03.1 +54.3 148.3 |
| 19° | 66 23.8 +56.6 155.8 | 66 04.5 +55.9 153.6 | 65 43.6 +55.2 151.4 | 65 21.2 +54.6 149.3 | 64 57.4 +53.9 147.3 |
| 20° | 67 20.4 +56.3 154.9 | 67 00.4 +55.6 152.7 | 66 38.8 +54.9 150.5 | 66 15.8 +54.2 148.3 | 65 51.3 +53.5 146.2 |
| 21° | 68 16.7 +55.9 154.0 | 67 56.0 +55.2 151.7 | 67 33.7 +54.5 149.4 | 67 10.0 +53.7 147.2 | 66 44.8 +52.9 145.1 |
| 22° | 69 12.6 +55.6 153.0 | 68 51.2 +54.8 150.6 | 68 28.2 +54.0 148.3 | 68 03.7 +53.1 146.1 | 67 37.7 +52.3 143.9 |
| 23° | 70 08.2 +55.1 151.9 | 69 46.0 +54.3 149.5 | 69 22.2 +53.4 147.1 | 68 56.8 +52.6 144.8 | 68 30.0 +51.7 142.6 |
| 24° | 71 03.3 +54.6 150.8 | 70 40.3 +53.7 148.2 | 70 15.6 +52.8 145.8 | 69 49.4 +51.9 143.4 | 69 21.7 +50.9 141.2 |
| 25° | 71 57.9 +54.1 149.4 | 71 34.0 +53.1 146.8 | 71 08.4 +52.1 144.3 | 70 41.3 +51.0 141.9 | 70 12.6 +50.1 139.6 |
| 26° | 72 52.0 +53.4 148.0 | 72 27.1 +52.3 145.3 | 72 00.5 +51.3 142.8 | 71 32.3 +50.2 140.3 | 71 02.7 +49.1 138.0 |
| 27° | 73 45.4 +52.6 146.4 | 73 19.4 +51.5 143.7 | 72 51.8 +50.2 141.0 | 72 22.5 +49.2 138.5 | 71 51.8 +48.1 136.2 |
| 28° | 74 38.0 +51.6 144.7 | 74 10.9 +50.4 141.8 | 73 42.0 +49.2 139.1 | 73 11.7 +47.9 136.6 | 72 39.9 +46.7 134.2 |
| 29° | 75 29.6 +50.6 142.7 | 75 01.3 +49.1 139.8 | 74 31.2 +47.8 137.1 | 73 59.6 +46.6 134.5 | 73 26.6 +45.3 132.1 |

| 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°  | 46 48.1 +57.5 157.8 | 46 30.5 +57.1 156.4 | 46 11.9 +56.8 155.0 | 45 52.2 +56.5 153.7 | 45 31.7 +56.1 152.3 |
| 1°  | 47 45.6 +57.3 157.4 | 47 27.6 +57.1 155.9 | 47 08.7 +56.7 154.5 | 46 48.7 +56.4 153.2 | 46 27.8 +56.0 151.8 |
| 2°  | 48 42.9 +57.3 156.9 | 48 24.7 +56.9 155.5 | 48 05.4 +56.5 154.1 | 47 45.1 +56.2 152.7 | 47 23.8 +55.8 151.3 |
| 3°  | 49 40.2 +57.1 156.5 | 49 21.6 +56.8 155.0 | 49 01.9 +56.5 153.6 | 48 41.3 +56.0 152.1 | 48 19.6 +55.7 150.7 |
| 4°  | 50 37.3 +57.1 156.0 | 50 18.4 +56.6 154.5 | 49 58.4 +56.2 153.0 | 49 37.3 +55.9 151.6 | 49 15.3 +55.5 150.2 |
| 5°  | 51 34.4 +56.9 155.5 | 51 15.0 +56.6 154.0 | 50 54.6 +56.2 152.5 | 50 33.2 +55.7 151.0 | 50 10.8 +55.3 149.6 |
| 6°  | 52 31.3 +56.7 155.0 | 52 11.6 +56.3 153.4 | 51 50.8 +55.9 151.9 | 51 28.9 +55.6 150.4 | 51 06.1 +55.1 149.0 |
| 7°  | 53 28.0 +56.6 154.4 | 53 07.9 +56.2 152.9 | 52 46.7 +55.8 151.3 | 52 24.5 +55.3 149.8 | 52 01.2 +54.9 148.3 |
| 8°  | 54 24.6 +56.4 153.9 | 54 04.1 +56.0 152.3 | 53 42.5 +55.6 150.7 | 53 19.8 +55.1 149.2 | 52 56.1 +54.7 147.7 |
| 9°  | 55 21.0 +56.3 153.3 | 55 00.1 +55.8 151.7 | 54 38.1 +55.3 150.1 | 54 14.9 +54.9 148.5 | 53 50.8 +54.4 147.0 |
| 10° | 56 17.3 +56.1 152.7 | 55 55.9 +55.6 151.0 | 55 33.4 +55.2 149.4 | 55 09.8 +54.7 147.8 | 54 45.2 +54.1 146.2 |
| 11° | 57 13.4 +55.8 152.0 | 56 51.5 +55.4 150.3 | 56 28.6 +54.8 148.7 | 56 04.5 +54.4 147.1 | 55 39.3 +53.9 145.5 |
| 12° | 58 09.2 +55.6 151.3 | 57 46.9 +55.1 149.6 | 57 23.4 +54.6 147.9 | 56 58.9 +54.0 146.3 | 56 33.2 +53.6 144.7 |
| 13° | 59 04.8 +55.4 150.6 | 58 42.0 +54.9 148.9 | 58 18.0 +54.3 147.2 | 57 52.9 +53.8 145.5 | 57 26.8 +53.2 143.9 |
| 14° | 60 00.2 +55.1 149.8 | 59 36.9 +54.5 148.1 | 59 12.3 +54.0 146.3 | 58 46.7 +53.4 144.7 | 58 20.0 +52.8 143.0 |
| 15° | 60 55.3 +54.8 149.0 | 60 31.4 +54.2 147.2 | 60 06.3 +53.6 145.5 | 59 40.1 +53.0 143.8 | 59 12.8 +52.4 142.1 |
| 16° | 61 50.1 +54.4 148.2 | 61 25.6 +53.8 146.4 | 60 59.9 +53.2 144.6 | 60 33.1 +52.6 142.8 | 60 05.2 +52.0 141.1 |
| 17° | 62 44.5 +54.1 147.3 | 62 19.4 +53.5 145.4 | 61 53.1 +52.8 143.6 | 61 25.7 +52.2 141.8 | 60 57.2 +51.5 140.1 |
| 18° | 63 38.6 +53.7 146.3 | 63 12.9 +53.0 144.4 | 62 45.9 +52.4 142.6 | 62 17.9 +51.6 140.8 | 61 48.7 +51.0 139.0 |
| 19° | 64 32.3 +53.2 145.3 | 64 05.9 +52.5 143.4 | 63 38.3 +51.8 141.5 | 63 09.5 +51.1 139.7 | 62 39.7 +50.4 137.9 |
| 20° | 65 25.5 +52.7 144.2 | 64 58.4 +51.9 142.2 | 64 30.1 +51.2 140.3 | 64 00.6 +50.5 138.5 | 63 30.1 +49.7 136.7 |
| 21° | 66 18.2 +52.1 143.0 | 65 50.3 +51.4 141.0 | 65 21.3 +50.6 139.1 | 64 51.1 +49.8 137.2 | 64 19.8 +49.1 135.4 |
| 22° | 67 10.3 +51.5 141.8 | 66 41.7 +50.7 139.8 | 66 11.9 +49.8 137.8 | 65 40.9 +49.1 135.9 | 65 08.9 +48.2 134.1 |
| 23° | 68 01.8 +50.8 140.4 | 67 32.4 +49.9 138.4 | 67 01.7 +49.1 136.4 | 66 30.0 +48.2 134.5 | 65 57.1 +47.5 132.7 |
| 24° | 68 52.6 +50.1 139.0 | 68 22.3 +49.1 136.9 | 67 50.8 +48.2 134.9 | 67 18.2 +47.3 133.0 | 66 44.6 +46.5 131.1 |
| 25° | 69 42.7 +49.1 137.4 | 69 11.4 +48.2 135.3 | 68 39.0 +47.2 133.3 | 68 05.5 +46.3 131.4 | 67 31.1 +45.4 129.5 |
| 26° | 70 31.8 +48.0 135.7 | 69 59.6 +47.0 133.6 | 69 26.2 +46.1 131.6 | 68 51.8 +45.2 129.6 | 68 16.5 +44.3 127.8 |
| 27° | 71 19.8 +47.0 133.9 | 70 46.6 +45.9 131.8 | 70 12.3 +44.9 129.7 | 69 37.0 +43.9 127.8 | 69 00.8 +42.9 125.9 |
| 28° | 72 06.8 +45.6 131.9 | 71 32.5 +44.5 129.8 | 70 57.2 +43.5 127.7 | 70 20.9 +42.5 125.8 | 69 43.7 +41.6 123.9 |
| 29° | 72 52.4 +44.1 129.8 | 72 17.0 +43.0 127.6 | 71 40.7 +41.9 125.6 | 71 03.4 +40.9 123.6 | 70 25.3 +40.0 121.8 |

# Declination SAME name as Latitude

# Latitude 41°

| 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°  | 45 10.2 +55.7 151.0 | 44 47.7 +55.4 149.7 | 44 24.4 +55.1 148.4 | 44 00.3 +54.6 147.1 | 43 35.2 +54.3 145.8 |
| 1°  | 46 05.9 +55.6 150.5 | 45 43.1 +55.3 149.1 | 45 19.5 +54.8 147.8 | 44 54.9 +54.5 146.5 | 44 29.5 +54.1 145.2 |
| 2°  | 47 01.5 +55.5 149.9 | 46 38.4 +55.0 148.6 | 46 14.3 +54.7 147.2 | 45 49.4 +54.2 145.9 | 45 23.6 +53.8 144.6 |
| 3°  | 47 57.0 +55.3 149.3 | 47 33.4 +54.9 148.0 | 47 09.0 +54.4 146.6 | 46 43.6 +54.1 145.3 | 46 17.4 +53.7 144.0 |
| 4°  | 48 52.3 +55.1 148.8 | 48 28.3 +54.7 147.4 | 48 03.4 +54.3 146.0 | 47 37.7 +53.8 144.7 | 47 11.1 +53.4 143.3 |
| 5°  | 49 47.4 +54.9 148.1 | 49 23.0 +54.5 146.7 | 48 57.7 +54.0 145.4 | 48 31.5 +53.6 144.0 | 48 04.5 +53.2 142.7 |
| 6°  | 50 42.3 +54.6 147.5 | 50 17.5 +54.2 146.1 | 49 51.7 +53.8 144.7 | 49 25.1 +53.4 143.3 | 48 57.7 +52.9 142.0 |
| 7°  | 51 36.9 +54.5 146.9 | 51 11.7 +54.0 145.4 | 50 45.5 +53.6 144.0 | 50 18.5 +53.1 142.6 | 49 50.6 +52.6 141.2 |
| 8°  | 52 31.4 +54.2 146.2 | 52 05.7 +53.7 144.7 | 51 39.1 +53.3 143.3 | 51 11.6 +52.8 141.9 | 50 43.2 +52.3 140.5 |
| 9°  | 53 25.6 +53.9 145.5 | 52 59.4 +53.5 144.0 | 52 32.4 +52.9 142.5 | 52 04.4 +52.4 141.1 | 51 35.5 +52.0 139.7 |
| 10° | 54 19.5 +53.7 144.7 | 53 52.9 +53.2 143.2 | 53 25.3 +52.7 141.8 | 52 56.8 +52.2 140.3 | 52 27.5 +51.7 138.9 |
| 11° | 55 13.2 +53.3 143.9 | 54 46.1 +52.8 142.4 | 54 18.0 +52.3 140.9 | 53 49.0 +51.8 139.5 | 53 19.2 +51.2 138.1 |
| 12° | 56 06.5 +53.1 143.1 | 55 38.9 +52.5 141.6 | 55 10.3 +51.9 140.1 | 54 40.8 +51.4 138.6 | 54 10.4 +50.9 137.2 |
| 13° | 56 59.6 +52.6 142.3 | 56 31.4 +52.1 140.7 | 56 02.2 +51.6 139.2 | 55 32.2 +51.0 137.7 | 55 01.3 +50.5 136.3 |
| 14° | 57 52.2 +52.3 141.4 | 57 23.5 +51.6 139.8 | 56 53.8 +51.1 138.3 | 56 23.2 +50.6 136.8 | 55 51.8 +50.0 135.3 |
| 15° | 58 44.5 +51.8 140.5 | 58 15.1 +51.3 138.9 | 57 44.9 +50.6 137.3 | 57 13.8 +50.0 135.8 | 56 41.8 +49.5 134.3 |
| 16° | 59 36.3 +51.4 139.5 | 59 06.4 +50.7 137.9 | 58 35.5 +50.2 136.3 | 58 03.8 +49.6 134.8 | 57 31.3 +48.9 133.3 |
| 17° | 60 27.7 +50.8 138.4 | 59 57.1 +50.3 136.8 | 59 25.7 +49.6 135.2 | 58 53.4 +48.9 133.7 | 58 20.2 +48.4 132.2 |
| 18° | 61 18.5 +50.3 137.3 | 60 47.4 +49.6 135.7 | 60 15.3 +49.0 134.1 | 59 42.3 +48.4 132.6 | 59 08.6 +47.7 131.0 |
| 19° | 62 08.8 +49.7 136.2 | 61 37.0 +49.0 134.5 | 61 04.3 +48.3 132.9 | 60 30.7 +47.7 131.4 | 59 56.3 +47.1 129.8 |
| 20° | 62 58.5 +49.1 135.0 | 62 26.0 +48.4 133.3 | 61 52.6 +47.7 131.7 | 61 18.4 +47.0 130.1 | 60 43.4 +46.3 128.6 |
| 21° | 63 47.6 +48.3 133.7 | 63 14.4 +47.5 132.0 | 62 40.3 +46.9 130.4 | 62 05.4 +46.2 128.8 | 61 29.7 +45.6 127.3 |
| 22° | 64 35.9 +47.5 132.3 | 64 01.9 +46.8 130.6 | 63 27.2 +46.0 129.0 | 62 51.6 +45.3 127.4 | 62 15.3 +44.6 125.9 |
| 23° | 65 23.4 +46.6 130.9 | 64 48.7 +45.9 129.2 | 64 13.2 +45.1 127.5 | 63 36.9 +44.4 126.0 | 62 59.9 +43.7 124.4 |
| 24° | 66 10.0 +45.7 129.4 | 65 34.6 +44.8 127.6 | 64 58.3 +44.1 126.0 | 64 21.3 +43.4 124.4 | 63 43.6 +42.7 122.9 |
| 25° | 66 55.7 +44.6 127.7 | 66 19.4 +43.8 126.0 | 65 42.4 +43.1 124.4 | 65 04.7 +42.3 122.8 | 64 26.3 +41.6 121.3 |
| 26° | 67 40.3 +43.4 126.0 | 67 03.2 +42.6 124.3 | 66 25.5 +41.8 122.7 | 65 47.0 +41.1 121.1 | 65 07.9 +40.4 119.6 |
| 27° | 68 23.7 +42.1 124.1 | 67 45.8 +41.3 122.5 | 67 07.3 +40.5 120.8 | 66 28.1 +39.8 119.3 | 65 48.3 +39.1 117.8 |
| 28° | 69 05.8 +40.7 122.2 | 68 27.1 +39.9 120.5 | 67 47.8 +39.1 118.9 | 67 07.9 +38.3 117.4 | 66 27.4 +37.7 116.0 |
| 29° | 69 46.5 +39.1 120.1 | 69 07.0 +38.2 118.4 | 68 26.9 +37.5 116.9 | 67 46.2 +36.8 115.4 | 67 05.1 +36.1 114.0 |

| 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°  | 43 09.4 +53.9 144.6 | 42 42.8 +53.5 143.4 | 42 15.4 +53.1 142.2 | 41 47.2 +52.7 141.0 | 41 18.4 +52.3 139.8 |
| 1°  | 44 03.3 +53.6 144.0 | 43 36.3 +53.2 142.8 | 43 08.5 +52.8 141.5 | 42 39.9 +52.5 140.3 | 42 10.7 +52.0 139.1 |
| 2°  | 44 56.9 +53.5 143.4 | 44 29.5 +53.1 142.1 | 44 01.3 +52.7 140.9 | 43 32.4 +52.2 139.7 | 43 02.7 +51.8 138.5 |
| 3°  | 45 50.4 +53.2 142.7 | 45 22.6 +52.8 141.4 | 44 54.0 +52.4 140.2 | 44 24.6 +52.0 139.0 | 43 54.5 +51.6 137.8 |
| 4°  | 46 43.6 +53.0 142.0 | 46 15.4 +52.5 140.8 | 45 46.4 +52.1 139.5 | 45 16.6 +51.7 138.3 | 44 46.1 +51.3 137.1 |
| 5°  | 47 36.6 +52.7 141.4 | 47 07.9 +52.3 140.1 | 46 38.5 +51.8 138.8 | 46 08.3 +51.4 137.6 | 45 37.4 +51.0 136.3 |
| 6°  | 48 29.3 +52.5 140.6 | 48 00.2 +52.0 139.3 | 47 30.3 +51.6 138.1 | 46 59.7 +51.1 136.8 | 46 28.4 +50.6 135.6 |
| 7°  | 49 21.8 +52.2 139.9 | 48 52.2 +51.7 138.6 | 48 21.9 +51.2 137.3 | 47 50.8 +50.8 136.0 | 47 19.0 +50.4 134.8 |
| 8°  | 50 14.0 +51.8 139.1 | 49 43.9 +51.4 137.8 | 49 13.1 +51.0 136.5 | 48 41.6 +50.5 135.2 | 48 09.4 +50.0 134.0 |
| 9°  | 51 05.8 +51.5 138.3 | 50 35.3 +51.0 137.0 | 50 04.1 +50.5 135.7 | 49 32.1 +50.0 134.4 | 48 59.4 +49.6 133.1 |
| 10° | 51 57.3 +51.2 137.5 | 51 26.3 +50.7 136.2 | 50 54.6 +50.2 134.8 | 50 22.1 +49.7 133.5 | 49 49.0 +49.2 132.3 |
| 11° | 52 48.5 +50.8 136.7 | 52 17.0 +50.3 135.3 | 51 44.8 +49.8 134.0 | 51 11.8 +49.3 132.7 | 50 38.2 +48.8 131.4 |
| 12° | 53 39.3 +50.3 135.8 | 53 07.3 +49.8 134.4 | 52 34.6 +49.3 133.1 | 52 01.1 +48.8 131.7 | 51 27.0 +48.3 130.5 |
| 13° | 54 29.6 +49.9 134.8 | 53 57.1 +49.4 133.5 | 53 23.9 +48.9 132.1 | 52 49.9 +48.4 130.8 | 52 15.3 +47.9 129.5 |
| 14° | 55 19.5 +49.5 133.9 | 54 46.5 +48.9 132.5 | 54 12.8 +48.3 131.1 | 53 38.3 +47.8 129.8 | 53 03.2 +47.3 128.5 |
| 15° | 56 09.0 +48.9 132.9 | 55 35.4 +48.4 131.5 | 55 01.1 +47.9 130.1 | 54 26.1 +47.3 128.8 | 53 50.5 +46.8 127.5 |
| 16° | 56 57.9 +48.4 131.8 | 56 23.8 +47.8 130.4 | 55 49.0 +47.2 129.0 | 55 13.4 +46.8 127.7 | 54 37.3 +46.2 126.4 |
| 17° | 57 46.3 +47.8 130.7 | 57 11.6 +47.2 129.3 | 56 36.2 +46.7 127.9 | 56 00.2 +46.1 126.6 | 55 23.5 +45.6 125.3 |
| 18° | 58 34.1 +47.1 129.6 | 57 58.8 +46.5 128.2 | 57 22.9 +45.9 126.8 | 56 46.3 +45.4 125.4 | 56 09.1 +44.9 124.1 |
| 19° | 59 21.2 +46.4 128.4 | 58 45.3 +45.9 127.0 | 58 08.8 +45.3 125.6 | 57 31.7 +44.7 124.2 | 56 54.0 +44.1 122.9 |
| 20° | 60 07.6 +45.7 127.1 | 59 31.2 +45.1 125.7 | 58 54.1 +44.5 124.3 | 58 16.4 +43.9 123.0 | 57 38.1 +43.4 121.7 |
| 21° | 60 53.3 +44.9 125.8 | 60 16.3 +44.3 124.4 | 59 38.6 +43.7 123.0 | 59 00.3 +43.2 121.7 | 58 21.5 +42.6 120.4 |
| 22° | 61 38.2 +44.0 124.4 | 61 00.6 +43.4 123.0 | 60 22.3 +42.8 121.6 | 59 43.5 +42.2 120.3 | 59 04.1 +41.7 119.0 |
| 23° | 62 22.2 +43.1 123.0 | 61 44.0 +42.4 121.6 | 61 05.1 +41.8 120.2 | 60 25.7 +41.3 118.9 | 59 45.8 +40.7 117.6 |
| 24° | 63 05.3 +42.1 121.5 | 62 26.4 +41.4 120.1 | 61 46.9 +40.9 118.7 | 61 07.0 +40.2 117.4 | 60 26.5 +39.8 116.1 |
| 25° | 63 47.4 +40.9 119.9 | 63 07.8 +40.3 118.5 | 62 27.8 +39.7 117.1 | 61 47.2 +39.2 115.8 | 61 06.3 +38.6 114.6 |
| 26° | 64 28.3 +39.7 118.2 | 63 48.1 +39.1 116.8 | 63 07.5 +38.5 115.5 | 62 26.4 +38.0 114.2 | 61 44.9 +37.5 113.0 |
| 27° | 65 08.0 +38.5 116.4 | 64 27.2 +37.9 115.1 | 63 46.0 +37.3 113.8 | 63 04.4 +36.7 112.5 | 62 22.4 +36.2 111.3 |
| 28° | 65 46.5 +37.0 114.6 | 65 05.1 +36.4 113.3 | 64 23.3 +35.8 112.0 | 63 41.1 +35.4 110.8 | 62 58.6 +34.9 109.6 |
| 29° | 66 23.5 +35.5 112.6 | 65 41.5 +34.9 111.3 | 64 59.1 +34.5 110.1 | 64 16.5 +33.9 108.9 | 63 33.5 +33.5 107.8 |

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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°  | 40 48.8 +51.9 138.7 | 40 18.6 +51.5 137.5 | 39 47.6 +51.2 136.4 | 39 16.1 +50.7 135.3 | 38 43.9 +50.4 134.2 |
| 1°  | 41 40.7 +51.7 138.0 | 41 10.1 +51.2 136.8 | 40 38.8 +50.8 135.7 | 40 06.8 +50.5 134.6 | 39 34.3 +50.1 133.5 |
| 2°  | 42 32.4 +51.4 137.3 | 42 01.3 +51.0 136.1 | 41 29.6 +50.6 135.0 | 40 57.3 +50.2 133.9 | 40 24.4 +49.8 132.8 |
| 3°  | 43 23.8 +51.1 136.6 | 42 52.3 +50.7 135.4 | 42 20.2 +50.3 134.3 | 41 47.5 +49.9 133.2 | 41 14.2 +49.5 132.0 |
| 4°  | 44 14.9 +50.9 135.9 | 43 43.0 +50.5 134.7 | 43 10.5 +50.1 133.5 | 42 37.4 +49.6 132.4 | 42 03.7 +49.2 131.3 |
| 5°  | 45 05.8 +50.5 135.1 | 44 33.5 +50.1 133.9 | 44 00.6 +49.7 132.8 | 43 27.0 +49.3 131.6 | 42 52.9 +48.9 130.5 |
| 6°  | 45 56.3 +50.2 134.4 | 45 23.6 +49.8 133.2 | 44 50.3 +49.3 132.0 | 44 16.3 +49.0 130.8 | 43 41.8 +48.5 129.7 |
| 7°  | 46 46.5 +49.9 133.6 | 46 13.4 +49.5 132.4 | 45 39.6 +49.1 131.2 | 45 05.3 +48.6 130.0 | 44 30.3 +48.2 128.9 |
| 8°  | 47 36.4 +49.6 132.7 | 47 02.9 +49.1 131.5 | 46 28.7 +48.6 130.4 | 45 53.9 +48.2 129.2 | 45 18.5 +47.8 128.1 |
| 9°  | 48 26.0 +49.1 131.9 | 47 52.0 +48.7 130.7 | 47 17.3 +48.3 129.5 | 46 42.1 +47.8 128.3 | 46 06.3 +47.4 127.2 |
| 10° | 49 15.1 +48.8 131.0 | 48 40.7 +48.3 129.8 | 48 05.6 +47.8 128.6 | 47 29.9 +47.4 127.4 | 46 53.7 +47.0 126.3 |
| 11° | 50 03.9 +48.3 130.1 | 49 29.0 +47.8 128.9 | 48 53.4 +47.4 127.7 | 48 17.3 +47.0 126.5 | 47 40.7 +46.5 125.4 |
| 12° | 50 52.2 +47.9 129.2 | 50 16.8 +47.4 128.0 | 49 40.8 +46.9 126.8 | 49 04.3 +46.4 125.6 | 48 27.2 +46.0 124.4 |
| 13° | 51 40.1 +47.3 128.2 | 51 04.2 +46.9 127.0 | 50 27.7 +46.5 125.8 | 49 50.7 +46.0 124.6 | 49 13.2 +45.6 123.5 |
| 14° | 52 27.4 +46.9 127.2 | 51 51.1 +46.3 126.0 | 51 14.2 +45.9 124.8 | 50 36.7 +45.5 123.6 | 49 58.8 +45.0 122.5 |
| 15° | 53 14.3 +46.3 126.2 | 52 37.4 +45.8 125.0 | 52 00.1 +45.3 123.8 | 51 22.2 +44.8 122.6 | 50 43.8 +44.4 121.4 |
| 16° | 54 00.6 +45.7 125.1 | 53 23.2 +45.2 123.9 | 52 45.4 +44.7 122.7 | 52 07.0 +44.3 121.5 | 51 28.2 +43.8 120.4 |
| 17° | 54 46.3 +45.0 124.0 | 54 08.4 +44.6 122.8 | 53 30.1 +44.1 121.6 | 52 51.3 +43.6 120.4 | 52 12.0 +43.2 119.2 |
| 18° | 55 31.3 +44.4 122.9 | 54 53.0 +43.9 121.6 | 54 14.2 +43.4 120.4 | 53 34.9 +43.0 119.2 | 52 55.2 +42.5 118.1 |
| 19° | 56 15.7 +43.6 121.7 | 55 36.9 +43.1 120.4 | 54 57.6 +42.7 119.2 | 54 17.9 +42.2 118.1 | 53 37.7 +41.8 116.9 |
| 20° | 56 59.3 +42.9 120.4 | 56 20.0 +42.4 119.2 | 55 40.3 +41.9 118.0 | 55 00.1 +41.4 116.8 | 54 19.5 +41.0 115.7 |
| 21° | 57 42.2 +42.1 119.1 | 57 02.4 +41.6 117.9 | 56 22.2 +41.1 116.7 | 55 41.5 +40.7 115.6 | 55 00.5 +40.2 114.4 |
| 22° | 58 24.3 +41.1 117.8 | 57 44.0 +40.7 116.6 | 57 03.3 +40.2 115.4 | 56 22.2 +39.7 114.2 | 55 40.7 +39.4 113.1 |
| 23° | 59 05.4 +40.3 116.4 | 58 24.7 +39.7 115.2 | 57 43.5 +39.3 114.0 | 57 01.9 +38.9 112.9 | 56 20.1 +38.4 111.8 |
| 24° | 59 45.7 +39.2 114.9 | 59 04.4 +38.7 113.7 | 58 22.8 +38.3 112.6 | 57 40.8 +37.9 111.5 | 56 58.5 +37.5 110.4 |
| 25° | 60 24.9 +38.1 113.4 | 59 43.1 +37.7 112.2 | 59 01.1 +37.2 111.1 | 58 18.7 +36.8 110.0 | 57 36.0 +36.4 108.9 |
| 26° | 61 03.0 +37.0 111.8 | 60 20.8 +36.6 110.7 | 59 38.3 +36.1 109.6 | 58 55.5 +35.7 108.5 | 58 12.4 +35.4 107.5 |
| 27° | 61 40.0 +35.8 110.2 | 60 57.4 +35.3 109.0 | 60 14.4 +35.0 108.0 | 59 31.2 +34.6 106.9 | 58 47.8 +34.2 105.9 |
| 28° | 62 15.8 +34.4 108.5 | 61 32.7 +34.0 107.4 | 60 49.4 +33.6 106.3 | 60 05.8 +33.3 105.3 | 59 22.0 +33.0 104.3 |
| 29° | 62 50.2 +33.1 106.7 | 62 06.7 +32.7 105.6 | 61 23.0 +32.4 104.6 | 60 39.1 +32.0 103.6 | 59 55.0 +31.7 102.7 |

| Dec | LHA 035° / 325°     | LHA 036° / 324°     | LHA 037° / 323°     | LHA 038° / 322°     | LHA 039° / 321°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 38 11.2 +49.9 133.1 | 37 37.9 +49.5 132.1 | 37 04.0 +49.2 131.0 | 36 29.6 +48.8 130.0 | 35 54.6 +48.5 129.0 |
| 1°  | 39 01.1 +49.7 132.4 | 38 27.4 +49.3 131.4 | 37 53.2 +48.9 130.3 | 37 18.4 +48.5 129.3 | 36 43.1 +48.2 128.3 |
| 2°  | 39 50.8 +49.4 131.7 | 39 16.7 +49.1 130.6 | 38 42.1 +48.7 129.6 | 38 06.9 +48.3 128.6 | 37 31.3 +47.9 127.5 |
| 3°  | 40 40.2 +49.2 131.0 | 40 05.8 +48.7 129.9 | 39 30.8 +48.3 128.8 | 38 55.2 +48.0 127.8 | 38 19.2 +47.6 126.8 |
| 4°  | 41 29.4 +48.8 130.2 | 40 54.5 +48.4 129.1 | 40 19.1 +48.0 128.1 | 39 43.2 +47.6 127.0 | 39 06.8 +47.3 126.0 |
| 5°  | 42 18.2 +48.5 129.4 | 41 42.9 +48.1 128.3 | 41 07.1 +47.7 127.3 | 40 30.8 +47.4 126.2 | 39 54.1 +46.9 125.2 |
| 6°  | 43 06.7 +48.1 128.6 | 42 31.0 +47.7 127.5 | 41 54.8 +47.4 126.5 | 41 18.2 +46.9 125.4 | 40 41.0 +46.6 124.4 |
| 7°  | 43 54.8 +47.8 127.8 | 43 18.7 +47.4 126.7 | 42 42.2 +47.0 125.6 | 42 05.1 +46.6 124.6 | 41 27.6 +46.2 123.5 |
| 8°  | 44 42.6 +47.4 126.9 | 44 06.1 +47.0 125.8 | 43 29.2 +46.6 124.8 | 42 51.7 +46.2 123.7 | 42 13.8 +45.9 122.7 |
| 9°  | 45 30.0 +46.9 126.1 | 44 53.1 +46.6 125.0 | 44 15.8 +46.1 123.9 | 43 37.9 +45.8 122.8 | 42 59.7 +45.4 121.8 |
| 10° | 46 16.9 +46.6 125.2 | 45 39.7 +46.1 124.1 | 45 01.9 +45.8 123.0 | 44 23.7 +45.4 121.9 | 43 45.1 +45.0 120.9 |
| 11° | 47 03.5 +46.1 124.3 | 46 25.8 +45.7 123.2 | 45 47.7 +45.3 122.1 | 45 09.1 +44.9 121.0 | 44 30.1 +44.5 120.0 |
| 12° | 47 49.6 +45.6 123.3 | 47 11.5 +45.2 122.2 | 46 33.0 +44.8 121.1 | 45 54.0 +44.4 120.1 | 45 14.6 +44.1 119.0 |
| 13° | 48 35.2 +45.1 122.3 | 47 56.7 +44.7 121.2 | 47 17.8 +44.3 120.2 | 46 38.4 +43.9 119.1 | 45 58.7 +43.5 118.1 |
| 14° | 49 20.3 +44.6 121.3 | 48 41.4 +44.2 120.2 | 48 02.1 +43.7 119.2 | 47 22.3 +43.4 118.1 | 46 42.2 +43.0 117.1 |
| 15° | 50 04.9 +44.0 120.3 | 49 25.6 +43.6 119.2 | 48 45.8 +43.2 118.1 | 48 05.7 +42.8 117.1 | 47 25.2 +42.5 116.1 |
| 16° | 50 48.9 +43.4 119.2 | 50 09.2 +42.9 118.1 | 49 29.0 +42.6 117.1 | 48 48.5 +42.2 116.0 | 48 07.7 +41.8 115.0 |
| 17° | 51 32.3 +42.7 118.1 | 50 52.1 +42.4 117.0 | 50 11.6 +42.0 116.0 | 49 30.7 +41.6 114.9 | 48 49.5 +41.2 113.9 |
| 18° | 52 15.0 +42.1 117.0 | 51 34.5 +41.7 115.9 | 50 53.6 +41.3 114.9 | 50 12.3 +41.0 113.8 | 49 30.7 +40.6 112.8 |
| 19° | 52 57.1 +41.4 115.8 | 52 16.2 +40.9 114.7 | 51 34.9 +40.6 113.7 | 50 53.3 +40.2 112.7 | 50 11.3 +39.9 111.7 |
| 20° | 53 38.5 +40.6 114.6 | 52 57.1 +40.3 113.5 | 52 15.5 +39.8 112.5 | 51 33.5 +39.5 111.5 | 50 51.2 +39.2 110.5 |
| 21° | 54 19.1 +39.8 113.4 | 53 37.4 +39.4 112.3 | 52 55.3 +39.1 111.3 | 52 13.0 +38.7 110.3 | 51 30.4 +38.4 109.3 |
| 22° | 54 58.9 +39.0 112.1 | 54 16.8 +38.6 111.0 | 53 34.4 +38.2 110.0 | 52 51.7 +37.9 109.0 | 52 08.8 +37.5 108.0 |
| 23° | 55 37.9 +38.0 110.7 | 54 55.4 +37.7 109.7 | 54 12.6 +37.3 108.7 | 53 29.6 +37.0 107.7 | 52 46.3 +36.8 106.8 |
| 24° | 56 15.9 +37.1 109.3 | 55 33.1 +36.7 108.3 | 54 49.9 +36.5 107.3 | 54 06.6 +36.1 106.4 | 53 23.1 +35.8 105.4 |
| 25° | 56 53.0 +36.1 107.9 | 56 09.8 +35.8 106.9 | 55 26.4 +35.4 106.0 | 54 42.7 +35.2 105.0 | 53 58.9 +34.9 104.1 |
| 26° | 57 29.1 +35.0 106.4 | 56 45.6 +34.7 105.5 | 56 01.8 +34.5 104.5 | 55 17.9 +34.2 103.6 | 54 33.8 +33.9 102.7 |
| 27° | 58 04.1 +33.9 104.9 | 57 20.3 +33.6 104.0 | 56 36.3 +33.3 103.0 | 55 52.1 +33.1 102.1 | 55 07.7 +33.2 101.3 |
| 28° | 58 38.0 +32.7 103.4 | 57 53.9 +32.4 102.4 | 57 09.6 +32.2 101.5 | 56 25.2 +31.9 100.6 | 55 40.6 +31.8 99.8  |
| 29° | 59 10.7 +31.5 101.7 | 58 26.3 +31.3 100.8 | 57 41.8 +31.0 100.0 | 56 57.1 +30.9 99.1  | 56 12.4 +30.6 98.3  |

| 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°  | 35 19.2 +48.1 128.0 | 34 43.3 +47.7 127.0 | 34 06.9 +47.4 126.1 | 33 30.1 +47.1 125.1 | 32 52.8 +46.8 124.2 |
| 1°  | 36 07.3 +47.8 127.3 | 35 31.0 +47.5 126.3 | 34 54.3 +47.2 125.3 | 34 17.2 +46.8 124.4 | 33 39.6 +46.4 123.4 |
| 2°  | 36 55.1 +47.6 126.5 | 36 18.5 +47.2 125.5 | 35 41.5 +46.8 124.6 | 35 04.0 +46.5 123.6 | 34 26.0 +46.2 122.7 |
| 3°  | 37 42.7 +47.2 125.8 | 37 05.7 +46.9 124.8 | 36 28.3 +46.5 123.8 | 35 50.5 +46.2 122.8 | 35 12.2 +45.9 121.9 |
| 4°  | 38 29.9 +46.9 125.0 | 37 52.6 +46.6 124.0 | 37 14.8 +46.3 123.0 | 36 36.7 +45.8 122.1 | 35 58.1 +45.5 121.1 |
| 5°  | 39 16.8 +46.6 124.2 | 38 39.2 +46.2 123.2 | 38 01.1 +45.8 122.2 | 37 22.5 +45.6 121.2 | 36 43.6 +45.2 120.3 |
| 6°  | 40 03.4 +46.3 123.4 | 39 25.4 +45.9 122.4 | 38 46.9 +45.6 121.4 | 38 08.1 +45.2 120.4 | 37 28.8 +44.9 119.5 |
| 7°  | 40 49.7 +45.8 122.5 | 40 11.3 +45.5 121.5 | 39 32.5 +45.1 120.5 | 38 53.3 +44.8 119.6 | 38 13.7 +44.5 118.6 |
| 8°  | 41 35.5 +45.5 121.7 | 40 56.8 +45.1 120.7 | 40 17.6 +44.8 119.7 | 39 38.1 +44.4 118.7 | 38 58.2 +44.1 117.8 |
| 9°  | 42 21.0 +45.0 120.8 | 41 41.9 +44.7 119.8 | 41 02.4 +44.3 118.8 | 40 22.5 +44.1 117.8 | 39 42.3 +43.7 116.9 |
| 10° | 43 06.0 +44.7 119.9 | 42 26.6 +44.3 118.9 | 41 46.7 +44.0 117.9 | 41 06.6 +43.6 116.9 | 40 26.0 +43.3 116.0 |
| 11° | 43 50.7 +44.1 119.0 | 43 10.9 +43.8 118.0 | 42 30.7 +43.5 117.0 | 41 50.2 +43.1 116.0 | 41 09.3 +42.8 115.1 |
| 12° | 44 34.8 +43.7 118.0 | 43 54.7 +43.3 117.0 | 43 14.2 +43.0 116.1 | 42 33.3 +42.7 115.1 | 41 52.1 +42.4 114.2 |
| 13° | 45 18.5 +43.2 117.1 | 44 38.0 +42.9 116.1 | 43 57.2 +42.5 115.1 | 43 16.0 +42.2 114.1 | 42 34.5 +41.9 113.2 |
| 14° | 46 01.7 +42.7 116.1 | 45 20.9 +42.3 115.1 | 44 39.7 +42.0 114.1 | 43 58.2 +41.7 113.2 | 43 16.4 +41.4 112.2 |
| 15° | 46 44.4 +42.0 115.0 | 46 03.2 +41.7 114.1 | 45 21.7 +41.4 113.1 | 44 39.9 +41.1 112.1 | 43 57.8 +40.8 111.2 |
| 16° | 47 26.4 +41.6 114.0 | 46 44.9 +41.2 113.0 | 46 03.1 +40.9 112.1 | 45 21.0 +40.6 111.1 | 44 38.6 +40.3 110.2 |
| 17° | 48 08.0 +40.9 112.9 | 47 26.1 +40.6 111.9 | 46 44.0 +40.2 111.0 | 46 01.6 +39.9 110.1 | 45 18.9 +39.7 109.1 |
| 18° | 48 48.9 +40.2 111.8 | 48 06.7 +39.9 110.9 | 47 24.2 +39.7 109.9 | 46 41.5 +39.4 109.0 | 45 58.6 +39.1 108.1 |
| 19° | 49 29.1 +39.6 110.7 | 48 46.6 +39.3 109.7 | 48 03.9 +38.9 108.8 | 47 20.9 +38.7 107.9 | 46 37.7 +38.4 107.0 |
| 20° | 50 08.7 +38.8 109.5 | 49 25.9 +38.5 108.6 | 48 42.8 +38.3 107.6 | 47 59.6 +38.0 106.7 | 47 16.1 +37.7 105.9 |
| 21° | 50 47.5 +38.1 108.3 | 50 04.4 +37.8 107.4 | 49 21.1 +37.5 106.5 | 48 37.6 +37.2 105.6 | 47 53.8 +37.1 104.7 |
| 22° | 51 25.6 +37.3 107.1 | 50 42.2 +37.0 106.2 | 49 58.6 +36.8 105.3 | 49 14.8 +36.5 104.4 | 48 30.9 +36.3 103.5 |
| 23° | 52 02.9 +36.4 105.8 | 51 19.2 +36.2 104.9 | 50 35.4 +35.9 104.0 | 49 51.3 +35.8 103.2 | 49 07.2 +35.5 102.3 |
| 24° | 52 39.3 +35.6 104.5 | 51 55.4 +35.3 103.6 | 51 11.3 +35.1 102.8 | 50 27.1 +34.9 101.9 | 49 42.7 +34.7 101.1 |
| 25° | 53 14.9 +34.7 103.2 | 52 30.7 +34.5 102.3 | 51 46.4 +34.2 101.5 | 51 02.0 +34.0 100.6 | 50 17.4 +33.9 99.8  |
| 26° | 53 49.6 +33.6 101.8 | 53 05.2 +33.4 101.0 | 52 20.6 +33.3 100.1 | 51 36.0 +33.1 99.3  | 50 51.3 +32.9 98.5  |
| 27° | 54 23.2 +32.7 100.4 | 53 38.6 +32.5 99.6  | 52 53.9 +32.4 98.8  | 52 09.1 +32.2 98.0  | 51 24.2 +32.1 97.2  |
| 28° | 54 55.9 +31.6 99.0  | 54 11.1 +31.5 98.1  | 53 26.3 +31.3 97.3  | 52 41.3 +31.2 96.6  | 51 56.3 +31.1 96.8  |
| 29° | 55 27.5 +30.5 97.5  | 54 42.6 +30.3 96.7  | 53 57.6 +30.2 95.9  | 53 12.5 +30.2 95.2  | 52 27.4 +30.0 94.4  |

| 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°  | 32 15.2 +46.4 123.3 | 31 37.1 +46.1 122.4 | 30 58.7 +45.8 121.5 | 30 19.9 +45.5 120.6 | 29 40.7 +45.2 119.7 |
| 1°  | 33 01.6 +46.1 122.5 | 32 23.2 +45.8 121.6 | 31 44.5 +45.5 120.7 | 31 05.4 +45.2 119.8 | 30 25.9 +44.9 118.9 |
| 2°  | 33 47.7 +45.9 121.7 | 33 09.0 +45.6 120.8 | 32 30.0 +45.2 119.9 | 31 50.6 +44.9 119.0 | 31 10.8 +44.6 118.2 |
| 3°  | 34 33.6 +45.5 121.0 | 33 54.6 +45.2 120.1 | 33 15.2 +44.9 119.1 | 32 35.5 +44.6 118.3 | 31 55.4 +44.4 117.4 |
| 4°  | 35 19.1 +45.3 120.2 | 34 39.8 +44.9 119.3 | 34 00.1 +44.6 118.4 | 33 20.1 +44.3 117.5 | 32 39.8 +44.0 116.6 |
| 5°  | 36 04.4 +44.8 119.4 | 35 24.7 +44.6 118.4 | 34 44.7 +44.3 117.5 | 34 04.4 +44.0 116.7 | 33 23.8 +43.7 115.8 |
| 6°  | 36 49.2 +44.6 118.5 | 36 09.3 +44.2 117.6 | 35 29.0 +43.9 116.7 | 34 48.4 +43.7 115.8 | 34 07.5 +43.4 114.9 |
| 7°  | 37 33.8 +44.2 117.7 | 36 53.5 +43.9 116.8 | 36 12.9 +43.6 115.9 | 35 32.1 +43.2 115.0 | 34 50.9 +43.0 114.1 |
| 8°  | 38 18.0 +43.8 116.8 | 37 37.4 +43.5 115.9 | 36 56.5 +43.2 115.0 | 36 15.3 +43.0 114.1 | 35 33.9 +42.6 113.3 |
| 9°  | 39 01.8 +43.4 116.0 | 38 20.9 +43.1 115.1 | 37 39.7 +42.8 114.1 | 36 58.3 +42.5 113.3 | 36 16.5 +42.3 112.4 |
| 10° | 39 45.2 +42.9 115.1 | 39 04.0 +42.7 114.2 | 38 22.5 +42.4 113.3 | 37 40.8 +42.1 112.4 | 36 58.8 +41.9 111.5 |
| 11° | 40 28.1 +42.6 114.2 | 39 46.7 +42.2 113.2 | 39 04.9 +42.0 112.4 | 38 22.9 +41.7 111.5 | 37 40.7 +41.4 110.6 |
| 12° | 41 10.7 +42.1 113.2 | 40 28.9 +41.8 112.3 | 39 46.9 +41.5 111.4 | 39 04.6 +41.3 110.5 | 38 22.1 +41.0 109.7 |
| 13° | 41 52.8 +41.6 112.3 | 41 10.7 +41.3 111.4 | 40 28.4 +41.1 110.5 | 39 45.9 +40.8 109.6 | 39 03.1 +40.6 108.7 |
| 14° | 42 34.4 +41.0 111.3 | 41 52.0 +40.9 110.4 | 41 09.5 +40.5 109.5 | 40 26.7 +40.3 108.7 | 39 43.7 +40.0 107.8 |
| 15° | 43 15.4 +40.6 110.3 | 42 32.9 +40.2 109.4 | 41 50.0 +40.1 108.5 | 41 07.0 +39.8 107.7 | 40 23.7 +39.6 106.8 |
| 16° | 43 56.0 +40.0 109.3 | 43 13.1 +39.8 108.4 | 42 30.1 +39.5 107.5 | 41 46.8 +39.3 106.7 | 41 03.3 +39.1 105.8 |
| 17° | 44 36.0 +39.4 108.2 | 43 52.9 +39.2 107.4 | 43 09.6 +38.9 106.5 | 42 26.1 +38.7 105.7 | 41 42.4 +38.5 104.8 |
| 18° | 45 15.4 +38.9 107.2 | 44 32.1 +38.6 106.3 | 43 48.5 +38.4 105.5 | 43 04.8 +38.1 104.6 | 42 20.9 +37.9 103.8 |
| 19° | 45 54.3 +38.1 106.1 | 45 10.7 +37.9 105.2 | 44 26.9 +37.7 104.4 | 43 42.9 +37.6 103.6 | 42 58.8 +37.4 102.7 |
| 20° | 46 32.4 +37.6 105.0 | 45 48.6 +37.3 104.1 | 45 04.6 +37.1 103.3 | 44 20.5 +36.9 102.5 | 43 36.2 +36.7 101.7 |
| 21° | 47 10.0 +36.8 103.8 | 46 25.9 +36.6 103.0 | 45 41.7 +36.4 102.2 | 44 57.4 +36.2 101.4 | 44 12.9 +36.1 100.6 |
| 22° | 47 46.8 +36.1 102.7 | 47 02.5 +35.9 101.8 | 46 18.1 +35.8 101.0 | 45 33.6 +35.6 100.2 | 44 49.0 +35.4 99.4  |
| 23° | 48 22.9 +35.3 101.5 | 47 38.4 +35.2 100.7 | 46 53.9 +35.0 99.9  | 46 09.2 +34.9 99.1  | 45 24.4 +34.8 98.3  |
| 24° | 48 58.2 +34.5 100.3 | 48 13.6 +34.4 99.4  | 47 28.9 +34.2 98.7  | 46 44.1 +34.1 97.9  | 45 59.2 +34.0 97.1  |
| 25° | 49 32.7 +33.7 99.0  | 48 48.0 +33.5 98.2  | 48 03.1 +33.4 97.4  | 47 18.2 +33.3 96.7  | 46 33.2 +33.2 95.9  |
| 26° | 50 06.4 +32.9 97.7  | 49 21.5 +32.8 96.9  | 48 36.5 +32.7 96.2  | 47 51.5 +32.5 95.4  | 47 06.4 +32.4 94.7  |
| 27° | 50 39.3 +31.9 96.4  | 49 54.3 +31.8 96.9  | 49 09.2 +31.7 94.9  | 48 24.0 +31.7 94.2  | 47 38.8 +31.7 93.5  |
| 28° | 51 11.2 +31.0 95.1  | 50 26.1 +30.9 94.3  | 49 40.9 +30.9 93.6  | 48 55.7 +30.8 92.9  | 48 10.5 +30.7 92.2  |
| 29° | 51 42.2 +30.0 93.7  | 50 57.0 +30.0 93.0  | 50 11.8 +29.9 92.3  | 49 26.5 +29.9 91.6  | 48 41.2 +29.9 90.9  |

| 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°  | 29 01.2 +44.9 118.8 | 28 21.4 +44.6 118.0 | 27 41.2 +44.4 117.1 | 27 00.8 +44.1 116.3 | 26 20.1 +43.8 115.5 |
| 1°  | 29 46.1 +44.6 118.1 | 29 06.0 +44.3 117.2 | 28 25.6 +44.0 116.4 | 27 44.9 +43.8 115.5 | 27 03.9 +43.5 114.7 |
| 2°  | 30 30.7 +44.4 117.3 | 29 50.3 +44.1 116.4 | 29 09.6 +43.8 115.6 | 28 28.7 +43.5 114.8 | 27 47.4 +43.3 113.9 |
| 3°  | 31 15.1 +44.0 116.5 | 30 34.4 +43.8 115.7 | 29 53.4 +43.5 114.8 | 29 12.2 +43.3 114.0 | 28 30.7 +43.0 113.2 |
| 4°  | 31 59.1 +43.8 115.7 | 31 18.2 +43.4 114.9 | 30 36.9 +43.3 114.0 | 29 55.5 +42.9 113.2 | 29 13.7 +42.7 112.4 |
| 5°  | 32 42.9 +43.4 114.9 | 32 01.6 +43.2 114.1 | 31 20.2 +42.9 113.2 | 30 38.4 +42.7 112.4 | 29 56.4 +42.4 111.6 |
| 6°  | 33 26.3 +43.1 114.1 | 32 44.8 +42.9 113.2 | 32 03.1 +42.6 112.4 | 31 21.1 +42.3 111.6 | 30 38.8 +42.2 110.7 |
| 7°  | 34 09.4 +42.7 113.2 | 33 27.7 +42.4 112.4 | 32 45.7 +42.2 111.6 | 32 03.4 +42.0 110.7 | 31 21.0 +41.7 109.9 |
| 8°  | 34 52.1 +42.4 112.4 | 34 10.1 +42.2 111.5 | 33 27.9 +41.9 110.7 | 32 45.4 +41.7 109.9 | 32 02.7 +41.5 109.1 |
| 9°  | 35 34.5 +42.0 111.5 | 34 52.3 +41.8 110.7 | 34 09.8 +41.5 109.8 | 33 27.1 +41.3 109.0 | 32 44.2 +41.1 108.2 |
| 10° | 36 16.5 +41.7 110.6 | 35 34.1 +41.3 109.8 | 34 51.3 +41.2 109.0 | 34 08.4 +40.9 108.1 | 33 25.3 +40.7 107.3 |
| 11° | 36 58.2 +41.2 109.7 | 36 15.4 +41.0 108.9 | 35 32.5 +40.7 108.1 | 34 49.3 +40.6 107.3 | 34 06.0 +40.3 106.5 |
| 12° | 37 39.4 +40.7 108.8 | 36 56.4 +40.5 108.0 | 36 13.2 +40.4 107.2 | 35 29.9 +40.1 106.4 | 34 46.3 +40.0 105.6 |
| 13° | 38 20.1 +40.4 107.9 | 37 36.9 +40.1 107.1 | 36 53.6 +39.9 106.2 | 36 10.0 +39.7 105.4 | 35 26.3 +39.5 104.6 |
| 14° | 39 00.5 +39.8 107.0 | 38 17.0 +39.7 106.1 | 37 33.5 +39.4 105.3 | 36 49.7 +39.3 104.5 | 36 05.8 +39.1 103.7 |
| 15° | 39 40.3 +39.4 106.0 | 38 56.7 +39.1 105.2 | 38 12.9 +39.0 104.4 | 37 29.0 +38.7 103.6 | 36 44.9 +38.6 102.8 |
| 16° | 40 19.7 +38.8 105.0 | 39 35.8 +38.7 104.2 | 38 51.9 +38.4 103.4 | 38 07.7 +38.4 102.6 | 37 23.5 +38.1 101.8 |
| 17° | 40 58.5 +38.3 104.0 | 40 14.5 +38.1 103.2 | 39 30.3 +38.0 102.4 | 38 46.1 +37.8 101.6 | 38 01.6 +37.7 100.8 |
| 18° | 41 36.8 +37.8 103.0 | 40 52.6 +37.6 102.2 | 40 08.3 +37.4 101.4 | 39 23.9 +37.2 100.6 | 38 39.3 +37.1 99.8  |
| 19° | 42 14.6 +37.2 101.9 | 41 30.2 +37.0 101.1 | 40 45.7 +36.9 100.4 | 40 01.1 +36.8 99.6  | 39 16.4 +36.7 98.8  |
| 20° | 42 51.8 +36.6 100.9 | 42 07.2 +36.5 100.1 | 41 22.6 +36.3 99.3  | 40 37.9 +36.2 98.6  | 39 53.1 +36.0 97.8  |
| 21° | 43 28.4 +35.9 99.8  | 42 43.7 +35.8 99.0  | 41 58.9 +35.7 98.2  | 41 14.1 +35.5 97.5  | 40 29.1 +35.5 96.8  |
| 22° | 44 04.3 +35.3 98.7  | 43 19.5 +35.2 97.9  | 42 34.6 +35.1 97.2  | 41 49.6 +35.0 96.4  | 41 04.6 +34.9 95.7  |
| 23° | 44 39.6 +34.6 97.5  | 43 54.7 +34.5 96.8  | 43 09.7 +34.4 96.1  | 42 24.6 +34.3 95.3  | 41 39.5 +34.3 94.6  |
| 24° | 45 14.2 +33.9 96.4  | 44 29.2 +33.8 95.6  | 43 44.1 +33.7 94.9  | 42 58.9 +33.7 94.2  | 42 13.8 +33.6 93.5  |
| 25° | 45 48.1 +33.1 95.2  | 45 03.0 +33.1 94.5  | 44 17.8 +33.0 93.8  | 43 32.6 +33.0 93.1  | 42 47.4 +32.9 92.4  |
| 26° | 46 21.2 +32.4 94.0  | 45 36.1 +32.3 93.3  | 44 50.8 +32.3 92.6  | 44 05.6 +32.2 91.9  | 43 20.3 +32.3 91.2  |
| 27° | 46 53.6 +31.6 92.8  | 46 08.4 +31.5 92.1  | 45 23.1 +31.6 91.4  | 44 37.8 +31.6 90.7  | 43 52.6 +31.5 90.1  |
| 28° | 47 25.2 +30.8 91.5  | 46 39.9 +30.8 90.9  | 45 54.7 +30.7 90.2  | 45 09.4 +30.7 89.5  | 44 24.1 +30.8 88.9  |
| 29° | 47 56.0 +29.8 90.3  | 47 10.7 +29.9 89.6  | 46 25.4 +29.9 89.0  | 45 40.1 +30.0 88.3  | 44 54.9 +30.0 87.7  |

| 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°  | 25 39.0 +43.6 114.7 | 24 57.8 +43.3 113.9 | 24 16.2 +43.1 113.1 | 23 34.4 +42.9 112.3 | 22 52.4 +42.6 111.5 |
| 1°  | 26 22.6 +43.3 113.9 | 25 41.1 +43.0 113.1 | 24 59.3 +42.8 112.3 | 24 17.3 +42.6 111.5 | 23 35.0 +42.4 110.7 |
| 2°  | 27 05.9 +43.0 113.1 | 26 24.1 +42.8 112.3 | 25 42.1 +42.6 111.5 | 24 59.9 +42.3 110.8 | 24 17.4 +42.2 110.0 |
| 3°  | 27 48.9 +42.8 112.3 | 27 06.9 +42.6 111.5 | 26 24.7 +42.3 110.8 | 25 42.2 +42.1 110.0 | 24 59.6 +41.9 109.2 |
| 4°  | 28 31.7 +42.5 111.6 | 27 49.5 +42.2 110.7 | 27 07.0 +42.1 110.0 | 26 24.3 +41.9 109.2 | 25 41.5 +41.6 108.4 |
| 5°  | 29 14.2 +42.2 110.7 | 28 31.7 +42.0 109.9 | 27 49.1 +41.7 109.2 | 27 06.2 +41.5 108.4 | 26 23.1 +41.4 107.6 |
| 6°  | 29 56.4 +41.9 109.9 | 29 13.7 +41.7 109.1 | 28 30.8 +41.5 108.3 | 27 47.7 +41.3 107.6 | 27 04.5 +41.1 106.8 |
| 7°  | 30 38.3 +41.5 109.1 | 29 55.4 +41.3 108.3 | 29 12.3 +41.2 107.5 | 28 29.0 +41.0 106.7 | 27 45.6 +40.8 106.0 |
| 8°  | 31 19.8 +41.3 108.3 | 30 36.7 +41.1 107.5 | 29 53.5 +40.8 106.7 | 29 10.0 +40.6 105.9 | 28 26.4 +40.4 105.1 |
| 9°  | 32 01.1 +40.9 107.4 | 31 17.8 +40.7 106.6 | 30 34.3 +40.5 105.8 | 29 50.6 +40.4 105.1 | 29 06.8 +40.2 104.3 |
| 10° | 32 42.0 +40.5 106.5 | 31 58.5 +40.3 105.7 | 31 14.8 +40.2 105.0 | 30 31.0 +40.0 104.2 | 29 47.0 +39.8 103.4 |
| 11° | 33 22.5 +40.1 105.7 | 32 38.8 +40.0 104.9 | 31 55.0 +39.7 104.1 | 31 11.0 +39.6 103.3 | 30 26.8 +39.5 102.6 |
| 12° | 34 02.6 +39.8 104.8 | 33 18.8 +39.5 104.0 | 32 34.7 +39.5 103.2 | 31 50.6 +39.3 102.5 | 31 06.3 +39.1 101.7 |
| 13° | 34 42.4 +39.3 103.9 | 33 58.3 +39.2 103.1 | 33 14.2 +39.0 102.3 | 32 29.9 +38.8 101.6 | 31 45.4 +38.8 100.8 |
| 14° | 35 21.7 +38.9 102.9 | 34 37.5 +38.8 102.2 | 33 53.2 +38.6 101.4 | 33 08.7 +38.5 100.7 | 32 24.2 +38.3 99.9  |
| 15° | 36 00.6 +38.5 102.0 | 35 16.3 +38.3 101.2 | 34 31.8 +38.2 100.5 | 33 47.2 +38.1 99.7  | 33 02.5 +38.0 99.0  |
| 16° | 36 39.1 +38.0 101.0 | 35 54.6 +37.9 100.3 | 35 10.0 +37.7 99.5  | 34 25.3 +37.6 98.8  | 33 40.5 +37.5 98.1  |
| 17° | 37 17.1 +37.5 100.1 | 36 32.5 +37.4 99.3  | 35 47.7 +37.3 98.6  | 35 02.9 +37.2 97.8  | 34 18.0 +37.1 97.1  |
| 18° | 37 54.6 +37.1 99.1  | 37 09.9 +36.9 98.3  | 36 25.0 +36.8 97.6  | 35 40.1 +36.7 96.9  | 34 55.1 +36.7 96.2  |
| 19° | 38 31.7 +36.5 98.1  | 37 46.8 +36.4 97.4  | 37 01.8 +36.4 96.6  | 36 16.8 +36.3 95.9  | 35 31.8 +36.1 95.2  |
| 20° | 39 08.2 +35.9 97.1  | 38 23.2 +35.9 96.3  | 37 38.2 +35.7 95.6  | 36 53.1 +35.7 94.9  | 36 07.9 +35.7 94.2  |
| 21° | 39 44.1 +35.4 96.0  | 38 59.1 +35.3 95.3  | 38 13.9 +35.3 94.6  | 37 28.8 +35.2 93.9  | 36 43.6 +35.2 93.2  |
| 22° | 40 19.5 +34.8 95.0  | 39 34.4 +34.7 94.3  | 38 49.2 +34.7 93.6  | 38 04.0 +34.7 92.9  | 37 18.8 +34.6 92.2  |
| 23° | 40 54.3 +34.2 93.9  | 40 09.1 +34.2 93.2  | 39 23.9 +34.1 92.5  | 38 38.7 +34.1 91.8  | 37 53.4 +34.1 91.2  |
| 24° | 41 28.5 +33.6 92.8  | 40 43.3 +33.5 92.1  | 39 58.0 +33.6 91.5  | 39 12.8 +33.5 90.8  | 38 27.5 +33.5 90.1  |
| 25° | 42 02.1 +32.9 91.7  | 41 16.8 +33.0 91.0  | 40 31.6 +32.9 90.4  | 39 46.3 +32.9 89.7  | 39 01.0 +32.9 89.1  |
| 26° | 42 35.0 +32.3 90.6  | 41 49.8 +32.2 89.9  | 41 04.5 +32.2 89.3  | 40 19.2 +32.3 88.6  | 39 33.9 +32.4 88.0  |
| 27° | 43 07.3 +31.5 89.4  | 42 22.0 +31.6 88.8  | 41 36.7 +31.6 88.1  | 40 51.5 +31.6 87.5  | 40 06.3 +31.7 86.9  |
| 28° | 43 38.8 +30.8 88.3  | 42 53.6 +30.8 87.6  | 42 08.3 +30.9 87.0  | 41 23.1 +31.0 86.4  | 40 38.0 +31.0 85.8  |
| 29° | 44 09.6 +30.1 87.1  | 43 24.4 +30.1 86.4  | 42 39.2 +30.2 85.8  | 41 54.1 +30.3 85.2  | 41 09.0 +30.4 84.6  |



# Declination SAME name as Latitude

# Latitude 41°

| 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°  | 22 10.2 +42.4 110.7 | 21 27.7 +42.2 110.0 | 20 45.1 +42.0 109.2 | 20 02.2 +41.8 108.5 | 19 19.2 +41.6 107.7 |
| 1°  | 22 52.6 +42.2 110.0 | 22 09.9 +42.0 109.2 | 21 27.1 +41.8 108.5 | 20 44.0 +41.6 107.7 | 20 00.8 +41.4 107.0 |
| 2°  | 23 34.8 +41.9 109.2 | 22 51.9 +41.8 108.4 | 22 08.9 +41.5 107.7 | 21 25.6 +41.4 106.9 | 20 42.2 +41.2 106.2 |
| 3°  | 24 16.7 +41.7 108.4 | 23 33.7 +41.5 107.7 | 22 50.4 +41.4 106.9 | 22 07.0 +41.2 106.2 | 21 23.4 +41.0 105.4 |
| 4°  | 24 58.4 +41.5 107.6 | 24 15.2 +41.2 106.9 | 23 31.8 +41.0 106.1 | 22 48.2 +40.9 105.4 | 22 04.4 +40.8 104.6 |
| 5°  | 25 39.9 +41.1 106.8 | 24 56.4 +41.0 106.1 | 24 12.8 +40.9 105.3 | 23 29.1 +40.7 104.6 | 22 45.2 +40.5 103.8 |
| 6°  | 26 21.0 +40.9 106.0 | 25 37.4 +40.8 105.3 | 24 53.7 +40.6 104.5 | 24 09.8 +40.4 103.8 | 23 25.7 +40.3 103.0 |
| 7°  | 27 01.9 +40.7 105.2 | 26 18.2 +40.4 104.5 | 25 34.3 +40.3 103.7 | 24 50.2 +40.1 103.0 | 24 06.0 +40.0 102.2 |
| 8°  | 27 42.6 +40.3 104.4 | 26 58.6 +40.2 103.6 | 26 14.6 +40.0 102.9 | 25 30.3 +39.9 102.1 | 24 46.0 +39.8 101.4 |
| 9°  | 28 22.9 +40.0 103.5 | 27 38.8 +39.9 102.8 | 26 54.6 +39.7 102.0 | 26 10.2 +39.6 101.3 | 25 25.8 +39.4 100.6 |
| 10° | 29 02.9 +39.7 102.7 | 28 18.7 +39.5 101.9 | 27 34.3 +39.4 101.2 | 26 49.8 +39.3 100.5 | 26 05.2 +39.2 99.8  |
| 11° | 29 42.6 +39.3 101.8 | 28 58.2 +39.2 101.1 | 28 13.7 +39.1 100.4 | 27 29.1 +39.0 99.6  | 26 44.4 +38.9 98.9  |
| 12° | 30 21.9 +39.0 101.0 | 29 37.4 +38.9 100.2 | 28 52.8 +38.7 99.5  | 28 08.1 +38.6 98.8  | 27 23.3 +38.5 98.1  |
| 13° | 31 00.9 +38.6 100.1 | 30 16.3 +38.5 99.3  | 29 31.5 +38.5 98.6  | 28 46.7 +38.3 97.9  | 28 01.8 +38.3 97.2  |
| 14° | 31 39.5 +38.3 99.2  | 30 54.8 +38.1 98.4  | 30 10.0 +38.0 97.7  | 29 25.0 +38.0 97.0  | 28 40.1 +37.9 96.3  |
| 15° | 32 17.8 +37.8 98.3  | 31 32.9 +37.8 97.5  | 30 48.0 +37.7 96.8  | 30 03.0 +37.6 96.1  | 29 18.0 +37.5 95.4  |
| 16° | 32 55.6 +37.5 97.3  | 32 10.7 +37.3 96.6  | 31 25.7 +37.2 95.9  | 30 40.6 +37.2 95.2  | 29 55.5 +37.1 94.5  |
| 17° | 33 33.1 +37.0 96.4  | 32 48.0 +37.0 95.7  | 32 02.9 +36.9 95.0  | 31 17.8 +36.8 94.3  | 30 32.6 +36.8 93.6  |
| 18° | 34 10.1 +36.5 95.5  | 33 25.0 +36.5 94.8  | 32 39.8 +36.5 94.1  | 31 54.6 +36.4 93.4  | 31 09.4 +36.4 92.7  |
| 19° | 34 46.6 +36.1 94.5  | 34 01.5 +36.0 93.8  | 33 16.3 +36.0 93.1  | 32 31.0 +36.0 92.4  | 31 45.8 +36.0 91.8  |
| 20° | 35 22.7 +35.7 93.5  | 34 37.5 +35.6 92.8  | 33 52.3 +35.6 92.2  | 33 07.0 +35.6 91.5  | 32 21.8 +35.5 90.8  |
| 21° | 35 58.4 +35.1 92.5  | 35 13.1 +35.1 91.9  | 34 27.9 +35.0 91.2  | 33 42.6 +35.1 90.5  | 32 57.3 +35.1 89.9  |
| 22° | 36 33.5 +34.6 91.5  | 35 48.2 +34.6 90.9  | 35 02.9 +34.7 90.2  | 34 17.7 +34.6 89.5  | 33 32.4 +34.6 88.9  |
| 23° | 37 08.1 +34.1 90.5  | 36 22.8 +34.1 89.8  | 35 37.6 +34.1 89.2  | 34 52.3 +34.1 88.6  | 34 07.0 +34.2 87.9  |
| 24° | 37 42.2 +33.5 89.5  | 36 56.9 +33.6 88.8  | 36 11.7 +33.5 88.2  | 35 26.4 +33.6 87.5  | 34 41.2 +33.6 86.9  |
| 25° | 38 15.7 +33.0 88.4  | 37 30.5 +33.0 87.8  | 36 45.2 +33.1 87.2  | 36 00.0 +33.1 86.5  | 35 14.8 +33.2 85.9  |
| 26° | 38 48.7 +32.4 87.4  | 38 03.5 +32.4 86.7  | 37 18.3 +32.5 86.1  | 36 33.1 +32.6 85.5  | 35 48.0 +32.6 84.9  |
| 27° | 39 21.1 +31.7 86.3  | 38 35.9 +31.8 85.7  | 37 50.8 +31.9 85.0  | 37 05.7 +32.0 84.4  | 36 20.6 +32.1 83.8  |
| 28° | 39 52.8 +31.1 85.2  | 39 07.7 +31.2 84.6  | 38 22.7 +31.3 84.0  | 37 37.7 +31.4 83.4  | 36 52.7 +31.5 82.8  |
| 29° | 40 23.9 +30.5 84.0  | 39 38.9 +30.6 83.5  | 38 54.0 +30.6 82.9  | 38 09.1 +30.8 82.3  | 37 24.2 +30.9 81.7  |

| 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°  | 18 36.0 +41.4 107.0 | 17 52.6 +41.3 106.3 | 17 09.1 +41.1 105.6 | 16 25.4 +40.9 104.8 | 15 41.5 +40.8 104.1 |
| 1°  | 19 17.4 +41.3 106.2 | 18 33.9 +41.1 105.5 | 17 50.2 +40.9 104.8 | 17 06.3 +40.8 104.1 | 16 22.3 +40.7 103.4 |
| 2°  | 19 58.7 +41.0 105.5 | 19 15.0 +40.8 104.7 | 18 31.1 +40.7 104.0 | 17 47.1 +40.6 103.3 | 17 03.0 +40.4 102.6 |
| 3°  | 20 39.7 +40.8 104.7 | 19 55.8 +40.7 104.0 | 19 11.8 +40.6 103.3 | 18 27.7 +40.4 102.5 | 17 43.4 +40.3 101.8 |
| 4°  | 21 20.5 +40.7 103.9 | 20 36.5 +40.5 103.2 | 19 52.4 +40.3 102.5 | 19 08.1 +40.2 101.8 | 18 23.7 +40.1 101.1 |
| 5°  | 22 01.2 +40.3 103.1 | 21 17.0 +40.2 102.4 | 20 32.7 +40.1 101.7 | 19 48.3 +40.0 101.0 | 19 03.8 +39.9 100.3 |
| 6°  | 22 41.5 +40.2 102.3 | 21 57.2 +40.1 101.6 | 21 12.8 +39.9 100.9 | 20 28.3 +39.8 100.2 | 19 43.7 +39.7 99.5  |
| 7°  | 23 21.7 +39.9 101.5 | 22 37.3 +39.7 100.8 | 21 52.7 +39.7 100.1 | 21 08.1 +39.6 99.4  | 20 23.4 +39.4 98.7  |
| 8°  | 24 01.6 +39.6 100.7 | 23 17.0 +39.5 100.0 | 22 32.4 +39.4 99.3  | 21 47.7 +39.3 98.6  | 21 02.8 +39.3 97.9  |
| 9°  | 24 41.2 +39.4 99.9  | 23 56.5 +39.3 99.2  | 23 11.8 +39.2 98.5  | 22 27.0 +39.0 97.8  | 21 42.1 +39.0 97.1  |
| 10° | 25 20.6 +39.0 99.0  | 24 35.8 +39.0 98.3  | 23 51.0 +38.8 97.6  | 23 06.0 +38.9 96.9  | 22 21.1 +38.7 96.2  |
| 11° | 25 59.6 +38.8 98.2  | 25 14.8 +38.7 97.5  | 24 29.8 +38.7 96.8  | 23 44.9 +38.5 96.1  | 22 59.8 +38.5 95.4  |
| 12° | 26 38.4 +38.5 97.3  | 25 53.5 +38.4 96.6  | 25 08.5 +38.3 95.9  | 24 23.4 +38.3 95.3  | 23 38.3 +38.2 94.6  |
| 13° | 27 16.9 +38.1 96.5  | 26 31.9 +38.0 95.8  | 25 46.8 +38.0 95.1  | 25 01.7 +37.9 94.4  | 24 16.5 +37.9 93.7  |
| 14° | 27 55.0 +37.8 95.6  | 27 09.9 +37.8 94.9  | 26 24.8 +37.7 94.2  | 25 39.6 +37.7 93.6  | 24 54.4 +37.6 92.9  |
| 15° | 28 32.8 +37.5 94.7  | 27 47.7 +37.4 94.0  | 27 02.5 +37.4 93.4  | 26 17.3 +37.3 92.7  | 25 32.0 +37.4 92.0  |
| 16° | 29 10.3 +37.1 93.8  | 28 25.1 +37.1 93.2  | 27 39.9 +37.0 92.5  | 26 54.6 +37.1 91.8  | 26 09.4 +37.0 91.1  |
| 17° | 29 47.4 +36.8 92.9  | 29 02.2 +36.7 92.3  | 28 16.9 +36.7 91.6  | 27 31.7 +36.7 90.9  | 26 46.4 +36.7 90.3  |
| 18° | 30 24.2 +36.3 92.0  | 29 38.9 +36.3 91.4  | 28 53.6 +36.4 90.7  | 28 08.4 +36.3 90.0  | 27 23.1 +36.3 89.4  |
| 19° | 31 00.5 +36.0 91.1  | 30 15.2 +36.0 90.4  | 29 30.0 +35.9 89.8  | 28 44.7 +35.9 89.1  | 27 59.4 +36.0 88.5  |
| 20° | 31 36.5 +35.5 90.2  | 30 51.2 +35.5 89.5  | 30 05.9 +35.6 88.9  | 29 20.6 +35.6 88.2  | 28 35.4 +35.6 87.6  |
| 21° | 32 12.0 +35.1 89.2  | 31 26.7 +35.2 88.6  | 30 41.5 +35.1 87.9  | 29 56.2 +35.2 87.3  | 29 11.0 +35.3 86.7  |
| 22° | 32 47.1 +34.7 88.3  | 32 01.9 +34.7 87.6  | 31 16.6 +34.8 87.0  | 30 31.4 +34.8 86.3  | 29 46.3 +34.8 85.7  |
| 23° | 33 21.8 +34.2 87.3  | 32 36.6 +34.2 86.6  | 31 51.4 +34.3 86.0  | 31 06.2 +34.4 85.4  | 30 21.1 +34.4 84.8  |
| 24° | 33 56.0 +33.7 86.3  | 33 10.8 +33.8 85.7  | 32 25.7 +33.8 85.1  | 31 40.6 +33.9 84.4  | 30 55.5 +34.0 83.8  |
| 25° | 34 29.7 +33.2 85.3  | 33 44.6 +33.3 84.7  | 32 59.5 +33.4 84.1  | 32 14.5 +33.5 83.5  | 31 29.5 +33.6 82.9  |
| 26° | 35 02.9 +32.7 84.3  | 34 17.9 +32.8 83.7  | 33 32.9 +32.9 83.1  | 32 48.0 +33.0 82.5  | 32 03.1 +33.1 81.9  |
| 27° | 35 35.6 +32.2 83.2  | 34 50.7 +32.3 82.7  | 34 05.8 +32.4 82.1  | 33 21.0 +32.5 81.5  | 32 36.2 +32.7 80.9  |
| 28° | 36 07.8 +31.6 82.2  | 35 23.0 +31.7 81.6  | 34 38.2 +31.9 81.1  | 33 53.5 +32.0 80.5  | 33 08.9 +32.2 79.9  |
| 29° | 36 39.4 +31.1 81.2  | 35 54.7 +31.2 80.6  | 35 10.1 +31.3 80.0  | 34 25.5 +31.5 79.5  | 33 41.1 +31.6 78.9  |

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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°  | 14 57.5 +40.7 103.4 | 14 13.4 +40.6 102.7 | 13 29.2 +40.4 102.0 | 12 44.9 +40.2 101.3 | 12 00.4 +40.2 100.7 |
| 1°  | 15 38.2 +40.5 102.7 | 14 54.0 +40.3 102.0 | 14 09.6 +40.3 101.3 | 13 25.1 +40.2 100.6 | 12 40.6 +40.0 99.9  |
| 2°  | 16 18.7 +40.4 101.9 | 15 34.3 +40.3 101.2 | 14 49.9 +40.1 100.5 | 14 05.3 +40.0 99.8  | 13 20.6 +39.9 99.1  |
| 3°  | 16 59.1 +40.1 101.1 | 16 14.6 +40.0 100.4 | 15 30.0 +39.9 99.7  | 14 45.3 +39.9 99.0  | 14 00.5 +39.8 98.4  |
| 4°  | 17 39.2 +40.0 100.3 | 16 54.6 +39.9 99.7  | 16 09.9 +39.8 99.0  | 15 25.2 +39.7 98.3  | 14 40.3 +39.6 97.6  |
| 5°  | 18 19.2 +39.8 99.6  | 17 34.5 +39.7 98.9  | 16 49.7 +39.6 98.2  | 16 04.9 +39.5 97.5  | 15 19.9 +39.5 96.8  |
| 6°  | 18 59.0 +39.6 98.8  | 18 14.2 +39.5 98.1  | 17 29.3 +39.4 97.4  | 16 44.4 +39.3 96.7  | 15 59.4 +39.3 96.0  |
| 7°  | 19 38.6 +39.3 98.0  | 18 53.7 +39.3 97.3  | 18 08.7 +39.3 96.6  | 17 23.7 +39.2 95.9  | 16 38.7 +39.1 95.2  |
| 8°  | 20 17.9 +39.2 97.2  | 19 33.0 +39.1 96.5  | 18 48.0 +39.0 95.8  | 18 02.9 +38.9 95.1  | 17 17.8 +38.9 94.4  |
| 9°  | 20 57.1 +38.9 96.4  | 20 12.1 +38.8 95.7  | 19 27.0 +38.8 95.0  | 18 41.8 +38.8 94.3  | 17 56.7 +38.7 93.6  |
| 10° | 21 36.0 +38.7 95.5  | 20 50.9 +38.6 94.9  | 20 05.8 +38.6 94.2  | 19 20.6 +38.5 93.5  | 18 35.4 +38.5 92.8  |
| 11° | 22 14.7 +38.4 94.7  | 21 29.5 +38.4 94.0  | 20 44.4 +38.3 93.4  | 19 59.1 +38.3 92.7  | 19 13.9 +38.3 92.0  |
| 12° | 22 53.1 +38.2 93.9  | 22 07.9 +38.2 93.2  | 21 22.7 +38.1 92.5  | 20 37.4 +38.1 91.9  | 19 52.2 +38.1 91.2  |
| 13° | 23 31.3 +37.9 93.1  | 22 46.1 +37.8 92.4  | 22 00.8 +37.8 91.7  | 21 15.5 +37.9 91.1  | 20 30.3 +37.8 90.4  |
| 14° | 24 09.2 +37.6 92.2  | 23 23.9 +37.6 91.5  | 22 38.6 +37.6 90.9  | 21 53.4 +37.5 90.2  | 21 08.1 +37.6 89.6  |
| 15° | 24 46.8 +37.3 91.4  | 24 01.5 +37.3 90.7  | 23 16.2 +37.3 90.0  | 22 30.9 +37.4 89.4  | 21 45.7 +37.3 88.7  |
| 16° | 25 24.1 +37.0 90.5  | 24 38.8 +37.0 89.8  | 23 53.5 +37.1 89.2  | 23 08.3 +37.0 88.5  | 22 23.0 +37.1 87.9  |
| 17° | 26 01.1 +36.7 89.6  | 25 15.8 +36.7 89.0  | 24 30.6 +36.7 88.3  | 23 45.3 +36.8 87.7  | 23 00.1 +36.8 87.0  |
| 18° | 26 37.8 +36.4 88.7  | 25 52.5 +36.4 88.1  | 25 07.3 +36.4 87.4  | 24 22.1 +36.4 86.8  | 23 36.9 +36.5 86.2  |
| 19° | 27 14.2 +36.0 87.8  | 26 28.9 +36.1 87.2  | 25 43.7 +36.1 86.6  | 24 58.5 +36.2 85.9  | 24 13.4 +36.2 85.3  |
| 20° | 27 50.2 +35.6 86.9  | 27 05.0 +35.7 86.3  | 26 19.8 +35.8 85.7  | 25 34.7 +35.8 85.0  | 24 49.6 +35.9 84.4  |
| 21° | 28 25.8 +35.3 86.0  | 27 40.7 +35.3 85.4  | 26 55.6 +35.4 84.8  | 26 10.5 +35.5 84.2  | 25 25.5 +35.5 83.5  |
| 22° | 29 01.1 +34.9 85.1  | 28 16.0 +35.0 84.5  | 27 31.0 +35.0 83.9  | 26 46.0 +35.1 83.3  | 26 01.0 +35.3 82.6  |
| 23° | 29 36.0 +34.5 84.2  | 28 51.0 +34.6 83.6  | 28 06.0 +34.7 82.9  | 27 21.1 +34.8 82.3  | 26 36.3 +34.9 81.7  |
| 24° | 30 10.5 +34.1 83.2  | 29 25.6 +34.2 82.6  | 28 40.7 +34.3 82.0  | 27 55.9 +34.4 81.4  | 27 11.2 +34.5 80.8  |
| 25° | 30 44.6 +33.7 82.3  | 29 59.8 +33.8 81.7  | 29 15.0 +33.9 81.1  | 28 30.3 +34.1 80.5  | 27 45.7 +34.2 79.9  |
| 26° | 31 18.3 +33.3 81.3  | 30 33.6 +33.4 80.7  | 29 48.9 +33.5 80.1  | 29 04.4 +33.6 79.6  | 28 19.9 +33.8 79.0  |
| 27° | 31 51.6 +32.7 80.3  | 31 07.0 +32.9 79.8  | 30 22.4 +33.1 79.2  | 29 38.0 +33.2 78.6  | 28 53.7 +33.4 78.0  |
| 28° | 32 24.3 +32.4 79.3  | 31 39.9 +32.5 78.8  | 30 55.5 +32.7 78.2  | 30 11.2 +32.8 77.6  | 29 27.1 +32.9 77.1  |
| 29° | 32 56.7 +31.8 78.3  | 32 12.4 +32.0 77.8  | 31 28.2 +32.1 77.2  | 30 44.0 +32.4 76.7  | 30 00.0 +32.6 76.1  |

| 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°  | 11 15.9 +40.0 100.0 | 10 31.2 +40.0 99.3 | 9 46.5 +39.9 98.6  | 9 01.7 +39.8 97.9  | 8 16.8 +39.7 97.3  |
| 1°  | 11 55.9 +40.0 99.2  | 11 11.2 +39.9 98.5 | 10 26.4 +39.8 97.9 | 9 41.5 +39.7 97.2  | 8 56.5 +39.7 96.5  |
| 2°  | 12 35.9 +39.8 98.4  | 11 51.1 +39.7 97.8 | 11 06.2 +39.6 97.1 | 10 21.2 +39.6 96.4 | 9 36.2 +39.5 95.7  |
| 3°  | 13 15.7 +39.7 97.7  | 12 30.8 +39.6 97.0 | 11 45.8 +39.6 96.3 | 11 00.8 +39.5 95.7 | 10 15.7 +39.4 95.0 |
| 4°  | 13 55.4 +39.5 96.9  | 13 10.4 +39.5 96.2 | 12 25.4 +39.4 95.6 | 11 40.3 +39.3 94.9 | 10 55.1 +39.4 94.2 |
| 5°  | 14 34.9 +39.4 96.1  | 13 49.9 +39.3 95.5 | 13 04.8 +39.3 94.8 | 12 19.6 +39.3 94.1 | 11 34.5 +39.1 93.4 |
| 6°  | 15 14.3 +39.2 95.4  | 14 29.2 +39.2 94.7 | 13 44.1 +39.1 94.0 | 12 58.9 +39.1 93.3 | 12 13.6 +39.1 92.7 |
| 7°  | 15 53.5 +39.1 94.6  | 15 08.4 +39.0 93.9 | 14 23.2 +39.0 93.2 | 13 38.0 +38.9 92.6 | 12 52.7 +38.9 91.9 |
| 8°  | 16 32.6 +38.9 93.8  | 15 47.4 +38.8 93.1 | 15 02.2 +38.8 92.4 | 14 16.9 +38.8 91.8 | 13 31.6 +38.8 91.1 |
| 9°  | 17 11.5 +38.6 93.0  | 16 26.2 +38.7 92.3 | 15 41.0 +38.6 91.6 | 14 55.7 +38.6 91.0 | 14 10.4 +38.7 90.3 |
| 10° | 17 50.1 +38.5 92.2  | 17 04.9 +38.5 91.5 | 16 19.6 +38.5 90.9 | 15 34.3 +38.5 90.2 | 14 49.1 +38.4 89.5 |
| 11° | 18 28.6 +38.3 91.4  | 17 43.4 +38.2 90.7 | 16 58.1 +38.2 90.1 | 16 12.8 +38.3 89.4 | 15 27.5 +38.3 88.7 |
| 12° | 19 06.9 +38.1 90.6  | 18 21.6 +38.1 89.9 | 17 36.3 +38.1 89.2 | 16 51.1 +38.1 88.6 | 16 05.8 +38.1 87.9 |
| 13° | 19 45.0 +37.8 89.7  | 18 59.7 +37.8 89.1 | 18 14.4 +37.9 88.4 | 17 29.2 +37.9 87.8 | 16 43.9 +37.9 87.1 |
| 14° | 20 22.8 +37.6 88.9  | 19 37.5 +37.7 88.3 | 18 52.3 +37.6 87.6 | 18 07.1 +37.6 87.0 | 17 21.8 +37.8 86.3 |
| 15° | 21 00.4 +37.4 88.1  | 20 15.2 +37.3 87.4 | 19 29.9 +37.5 86.8 | 18 44.7 +37.5 86.2 | 17 59.6 +37.5 85.5 |
| 16° | 21 37.8 +37.1 87.2  | 20 52.5 +37.2 86.6 | 20 07.4 +37.1 86.0 | 19 22.2 +37.2 85.3 | 18 37.1 +37.3 84.7 |
| 17° | 22 14.9 +36.8 86.4  | 21 29.7 +36.9 85.8 | 20 44.5 +37.0 85.1 | 19 59.4 +37.1 84.5 | 19 14.4 +37.1 83.9 |
| 18° | 22 51.7 +36.6 85.5  | 22 06.6 +36.6 84.9 | 21 21.5 +36.7 84.3 | 20 36.5 +36.7 83.7 | 19 51.5 +36.8 83.0 |
| 19° | 23 28.3 +36.2 84.7  | 22 43.2 +36.3 84.0 | 21 58.2 +36.4 83.4 | 21 13.2 +36.5 82.8 | 20 28.3 +36.6 82.2 |
| 20° | 24 04.5 +36.0 83.8  | 23 19.5 +36.1 83.2 | 22 34.6 +36.1 82.6 | 21 49.7 +36.3 82.0 | 21 04.9 +36.4 81.3 |
| 21° | 24 40.5 +35.7 82.9  | 23 55.6 +35.7 82.3 | 23 10.7 +35.9 81.7 | 22 26.0 +35.9 81.1 | 21 41.3 +36.1 80.5 |
| 22° | 25 16.2 +35.3 82.0  | 24 31.3 +35.5 81.4 | 23 46.6 +35.6 80.8 | 23 01.9 +35.7 80.2 | 22 17.4 +35.8 79.6 |
| 23° | 25 51.5 +35.0 81.1  | 25 06.8 +35.1 80.5 | 24 22.2 +35.2 79.9 | 23 37.6 +35.4 79.3 | 22 53.2 +35.5 78.8 |
| 24° | 26 26.5 +34.7 80.2  | 25 41.9 +34.8 79.6 | 24 57.4 +35.0 79.1 | 24 13.0 +35.1 78.5 | 23 28.7 +35.2 77.9 |
| 25° | 27 01.2 +34.3 79.3  | 26 16.7 +34.5 78.7 | 25 32.4 +34.6 78.2 | 24 48.1 +34.7 77.6 | 24 03.9 +34.9 77.0 |
| 26° | 27 35.5 +33.9 78.4  | 26 51.2 +34.1 77.8 | 26 07.0 +34.2 77.2 | 25 22.8 +34.5 76.7 | 24 38.8 +34.6 76.1 |
| 27° | 28 09.4 +33.6 77.5  | 27 25.3 +33.7 76.9 | 26 41.2 +33.9 76.3 | 25 57.3 +34.0 75.8 | 25 13.4 +34.3 75.2 |
| 28° | 28 43.0 +33.1 76.5  | 27 59.0 +33.3 76.0 | 27 15.1 +33.5 75.4 | 26 31.3 +33.8 74.8 | 25 47.7 +33.9 74.3 |
| 29° | 29 16.1 +32.8 75.6  | 28 32.3 +33.0 75.0 | 27 48.6 +33.2 74.5 | 27 05.1 +33.3 73.9 | 26 21.6 +33.6 73.4 |

| 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°  | 7 31.8 +39.7 96.6  | 6 46.8 +39.6 95.9  | 6 01.8 +39.5 95.3  | 5 16.6 +39.5 94.6  | 4 31.5 +39.4 93.9  |
| 1°  | 8 11.5 +39.6 95.8  | 7 26.4 +39.5 95.2  | 6 41.3 +39.5 94.5  | 5 56.1 +39.5 93.8  | 5 10.9 +39.5 93.2  |
| 2°  | 8 51.1 +39.5 95.1  | 8 05.9 +39.5 94.4  | 7 20.8 +39.4 93.8  | 6 35.6 +39.4 93.1  | 5 50.4 +39.3 92.4  |
| 3°  | 9 30.6 +39.4 94.3  | 8 45.4 +39.3 93.7  | 8 00.2 +39.3 93.0  | 7 15.0 +39.2 92.3  | 6 29.7 +39.3 91.7  |
| 4°  | 10 10.0 +39.2 93.6 | 9 24.7 +39.3 92.9  | 8 39.5 +39.2 92.2  | 7 54.2 +39.3 91.6  | 7 09.0 +39.2 90.9  |
| 5°  | 10 49.2 +39.2 92.8 | 10 04.0 +39.1 92.1 | 9 18.7 +39.2 91.5  | 8 33.5 +39.1 90.8  | 7 48.2 +39.1 90.1  |
| 6°  | 11 28.4 +39.0 92.0 | 10 43.1 +39.1 91.4 | 9 57.9 +39.0 90.7  | 9 12.6 +39.0 90.0  | 8 27.3 +39.0 89.4  |
| 7°  | 12 07.4 +39.0 91.2 | 11 22.2 +38.9 90.6 | 10 36.9 +38.9 89.9 | 9 51.6 +38.9 89.3  | 9 06.3 +39.0 88.6  |
| 8°  | 12 46.4 +38.7 90.5 | 12 01.1 +38.8 89.8 | 11 15.8 +38.8 89.1 | 10 30.5 +38.8 88.5 | 9 45.3 +38.8 87.8  |
| 9°  | 13 25.1 +38.7 89.7 | 12 39.9 +38.6 89.0 | 11 54.6 +38.7 88.4 | 11 09.3 +38.7 87.7 | 10 24.1 +38.7 87.1 |
| 10° | 14 03.8 +38.4 88.9 | 13 18.5 +38.5 88.2 | 12 33.3 +38.5 87.6 | 11 48.0 +38.6 86.9 | 11 02.8 +38.6 86.3 |
| 11° | 14 42.2 +38.4 88.1 | 13 57.0 +38.3 87.4 | 13 11.8 +38.4 86.8 | 12 26.6 +38.4 86.2 | 11 41.4 +38.5 85.5 |
| 12° | 15 20.6 +38.1 87.3 | 14 35.3 +38.2 86.7 | 13 50.2 +38.2 86.0 | 13 05.0 +38.3 85.4 | 12 19.9 +38.3 84.7 |
| 13° | 15 58.7 +38.0 86.5 | 15 13.5 +38.0 85.9 | 14 28.4 +38.0 85.2 | 13 43.3 +38.1 84.6 | 12 58.2 +38.2 83.9 |
| 14° | 16 36.7 +37.8 85.7 | 15 51.5 +37.9 85.1 | 15 06.4 +37.9 84.4 | 14 21.4 +38.0 83.8 | 13 36.4 +38.1 83.1 |
| 15° | 17 14.5 +37.5 84.9 | 16 29.4 +37.6 84.2 | 15 44.3 +37.8 83.6 | 14 59.4 +37.8 83.0 | 14 14.5 +37.8 82.3 |
| 16° | 17 52.0 +37.4 84.1 | 17 07.0 +37.5 83.4 | 16 22.1 +37.5 82.8 | 15 37.2 +37.6 82.2 | 14 52.3 +37.8 81.5 |
| 17° | 18 29.4 +37.2 83.2 | 17 44.5 +37.2 82.6 | 16 59.6 +37.3 82.0 | 16 14.8 +37.4 81.4 | 15 30.1 +37.5 80.7 |
| 18° | 19 06.6 +36.9 82.4 | 18 21.7 +37.0 81.8 | 17 36.9 +37.2 81.2 | 16 52.2 +37.3 80.5 | 16 07.6 +37.4 79.9 |
| 19° | 19 43.5 +36.7 81.6 | 18 58.7 +36.8 81.0 | 18 14.1 +36.9 80.3 | 17 29.5 +37.0 79.7 | 16 45.0 +37.1 79.1 |
| 20° | 20 20.2 +36.5 80.7 | 19 35.5 +36.6 80.1 | 18 51.0 +36.7 79.5 | 18 06.5 +36.8 78.9 | 17 22.1 +37.0 78.3 |
| 21° | 20 56.7 +36.2 79.9 | 20 12.1 +36.4 79.3 | 19 27.7 +36.4 78.7 | 18 43.3 +36.6 78.1 | 17 59.1 +36.7 77.5 |
| 22° | 21 32.9 +35.9 79.0 | 20 48.5 +36.0 78.4 | 20 04.1 +36.3 77.8 | 19 19.9 +36.4 77.2 | 18 35.8 +36.5 76.6 |
| 23° | 22 08.8 +35.7 78.2 | 21 24.5 +35.8 77.6 | 20 40.4 +35.9 77.0 | 19 56.3 +36.1 76.4 | 19 12.3 +36.3 75.8 |
| 24° | 22 44.5 +35.3 77.3 | 22 00.3 +35.6 76.7 | 21 16.3 +35.7 76.1 | 20 32.4 +35.9 75.5 | 19 48.6 +36.1 74.9 |
| 25° | 23 19.8 +35.1 76.4 | 22 35.9 +35.2 75.8 | 21 52.0 +35.5 75.3 | 21 08.3 +35.6 74.7 | 20 24.7 +35.8 74.1 |
| 26° | 23 54.9 +34.8 75.5 | 23 11.1 +35.0 75.0 | 22 27.5 +35.1 74.4 | 21 43.9 +35.4 73.8 | 21 00.5 +35.5 73.2 |
| 27° | 24 29.7 +34.5 74.6 | 23 46.1 +34.7 74.1 | 23 02.6 +34.9 73.5 | 22 19.3 +35.0 72.9 | 21 36.0 +35.3 72.4 |
| 28° | 25 04.2 +34.1 73.7 | 24 20.8 +34.3 73.2 | 23 37.5 +34.5 72.6 | 22 54.3 +34.8 72.1 | 22 11.3 +35.0 71.5 |
| 29° | 25 38.3 +33.8 72.8 | 24 55.1 +34.0 72.3 | 24 12.0 +34.3 71.7 | 23 29.1 +34.5 71.2 | 22 46.3 +34.7 70.6 |

| 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°  | 3 46.3 +39.4 93.3  | 3 01.1 +39.4 92.6  | 2 15.8 +39.4 92.0  | 1 30.6 +39.3 91.3  | 0 45.3 +39.3 90.7  |
| 1°  | 4 25.7 +39.4 92.5  | 3 40.5 +39.3 91.9  | 2 55.2 +39.4 91.2  | 2 09.9 +39.4 90.6  | 1 24.6 +39.4 89.9  |
| 2°  | 5 05.1 +39.3 91.8  | 4 19.8 +39.3 91.1  | 3 34.6 +39.3 90.5  | 2 49.3 +39.3 89.8  | 2 04.0 +39.3 89.1  |
| 3°  | 5 44.4 +39.3 91.0  | 4 59.1 +39.3 90.4  | 4 13.9 +39.2 89.7  | 3 28.6 +39.3 89.0  | 2 43.3 +39.3 88.4  |
| 4°  | 6 23.7 +39.2 90.3  | 5 38.4 +39.2 89.6  | 4 53.1 +39.3 88.9  | 4 07.9 +39.2 88.3  | 3 22.6 +39.3 87.6  |
| 5°  | 7 02.9 +39.1 89.5  | 6 17.6 +39.2 88.8  | 5 32.4 +39.1 88.2  | 4 47.1 +39.2 87.5  | 4 01.9 +39.2 86.9  |
| 6°  | 7 42.0 +39.1 88.7  | 6 56.8 +39.0 88.1  | 6 11.5 +39.1 87.4  | 5 26.3 +39.1 86.8  | 4 41.1 +39.2 86.1  |
| 7°  | 8 21.1 +38.9 88.0  | 7 35.8 +39.0 87.3  | 6 50.6 +39.0 86.7  | 6 05.4 +39.1 86.0  | 5 20.3 +39.1 85.4  |
| 8°  | 9 00.0 +38.9 87.2  | 8 14.8 +38.9 86.5  | 7 29.6 +39.0 85.9  | 6 44.5 +39.0 85.2  | 5 59.4 +39.0 84.6  |
| 9°  | 9 38.9 +38.7 86.4  | 8 53.7 +38.8 85.8  | 8 08.6 +38.8 85.1  | 7 23.5 +38.9 84.5  | 6 38.4 +39.0 83.8  |
| 10° | 10 17.6 +38.7 85.6 | 9 32.5 +38.7 85.0  | 8 47.4 +38.8 84.4  | 8 02.4 +38.8 83.7  | 7 17.4 +38.9 83.1  |
| 11° | 10 56.3 +38.5 84.9 | 10 11.2 +38.6 84.2 | 9 26.2 +38.7 83.6  | 8 41.2 +38.8 82.9  | 7 56.3 +38.8 82.3  |
| 12° | 11 34.8 +38.4 84.1 | 10 49.8 +38.5 83.4 | 10 04.9 +38.5 82.8 | 9 20.0 +38.6 82.2  | 8 35.1 +38.8 81.5  |
| 13° | 12 13.2 +38.3 83.3 | 11 28.3 +38.3 82.7 | 10 43.4 +38.4 82.0 | 9 58.6 +38.5 81.4  | 9 13.9 +38.6 80.8  |
| 14° | 12 51.5 +38.1 82.5 | 12 06.6 +38.2 81.9 | 11 21.8 +38.3 81.2 | 10 37.1 +38.4 80.6 | 9 52.5 +38.5 80.0  |
| 15° | 13 29.6 +38.0 81.7 | 12 44.8 +38.1 81.1 | 12 00.1 +38.2 80.5 | 11 15.5 +38.3 79.8 | 10 31.0 +38.4 79.2 |
| 16° | 14 07.6 +37.8 80.9 | 13 22.9 +37.9 80.3 | 12 38.3 +38.1 79.7 | 11 53.8 +38.2 79.0 | 11 09.4 +38.3 78.4 |
| 17° | 14 45.4 +37.7 80.1 | 14 00.8 +37.8 79.5 | 13 16.4 +37.9 78.9 | 12 32.0 +38.0 78.3 | 11 47.7 +38.1 77.6 |
| 18° | 15 23.1 +37.4 79.3 | 14 38.6 +37.6 78.7 | 13 54.3 +37.7 78.1 | 13 10.0 +37.9 77.5 | 12 25.8 +38.1 76.8 |
| 19° | 16 00.5 +37.3 78.5 | 15 16.2 +37.4 77.9 | 14 32.0 +37.6 77.3 | 13 47.9 +37.7 76.7 | 13 03.9 +37.8 76.0 |
| 20° | 16 37.8 +37.1 77.7 | 15 53.6 +37.3 77.1 | 15 09.6 +37.3 76.5 | 14 25.6 +37.5 75.9 | 13 41.7 +37.7 75.2 |
| 21° | 17 14.9 +36.9 76.9 | 16 30.9 +37.0 76.3 | 15 46.9 +37.3 75.7 | 15 03.1 +37.4 75.1 | 14 19.4 +37.6 74.4 |
| 22° | 17 51.8 +36.7 76.0 | 17 07.9 +36.9 75.4 | 16 24.2 +37.0 74.8 | 15 40.5 +37.2 74.2 | 14 57.0 +37.4 73.6 |
| 23° | 18 28.5 +36.5 75.2 | 17 44.8 +36.6 74.6 | 17 01.2 +36.8 74.0 | 16 17.7 +37.0 73.4 | 15 34.4 +37.2 72.8 |
| 24° | 19 05.0 +36.2 74.4 | 18 21.4 +36.4 73.8 | 17 38.0 +36.6 73.2 | 16 54.7 +36.8 72.6 | 16 11.6 +37.0 72.0 |
| 25° | 19 41.2 +36.0 73.5 | 18 57.8 +36.2 72.9 | 18 14.6 +36.4 72.4 | 17 31.5 +36.6 71.8 | 16 48.6 +36.8 71.2 |
| 26° | 20 17.2 +35.7 72.7 | 19 34.0 +36.0 72.1 | 18 51.0 +36.2 71.5 | 18 08.1 +36.4 70.9 | 17 25.4 +36.6 70.4 |
| 27° | 20 52.9 +35.5 71.8 | 20 10.0 +35.7 71.2 | 19 27.2 +35.9 70.7 | 18 44.5 +36.2 70.1 | 18 02.0 +36.4 69.5 |
| 28° | 21 28.4 +35.3 70.9 | 20 45.7 +35.5 70.4 | 20 03.1 +35.7 69.8 | 19 20.7 +35.9 69.3 | 18 38.4 +36.2 68.7 |
| 29° | 22 03.7 +34.9 70.1 | 21 21.2 +35.2 69.5 | 20 38.8 +35.5 69.0 | 19 56.6 +35.7 68.4 | 19 14.6 +36.0 67.9 |

| 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 +39.4 90.0  | -0 45.3 +39.4      | -1 30.6 +39.4      | -2 15.8 +39.4      | -3 01.1 +39.5      |
| 1°  | 0 39.4 +39.3 89.2  | -0 05.9 +39.4      | -0 51.2 +39.4      | -1 36.4 +39.4      | -2 21.6 +39.4      |
| 2°  | 1 18.7 +39.4 88.5  | 0 33.5 +39.3 87.8  | -0 11.8 +39.4      | -0 57.0 +39.4      | -1 42.2 +39.5      |
| 3°  | 1 58.1 +39.3 87.7  | 1 12.8 +39.4 87.1  | 0 27.6 +39.4 86.4  | -0 17.6 +39.5      | -1 02.7 +39.5      |
| 4°  | 2 37.4 +39.3 87.0  | 1 52.2 +39.3 86.3  | 1 07.0 +39.4 85.7  | 0 21.9 +39.4 85.0  | -0 23.2 +39.5      |
| 5°  | 3 16.7 +39.2 86.2  | 2 31.5 +39.3 85.6  | 1 46.4 +39.3 84.9  | 1 01.3 +39.4 84.3  | 0 16.3 +39.5 83.6  |
| 6°  | 3 55.9 +39.3 85.5  | 3 10.8 +39.3 84.8  | 2 25.7 +39.4 84.2  | 1 40.7 +39.4 83.5  | 0 55.8 +39.4 82.9  |
| 7°  | 4 35.2 +39.1 84.7  | 3 50.1 +39.2 84.1  | 3 05.1 +39.3 83.4  | 2 20.1 +39.4 82.8  | 1 35.2 +39.5 82.1  |
| 8°  | 5 14.3 +39.1 83.9  | 4 29.3 +39.2 83.3  | 3 44.4 +39.2 82.6  | 2 59.5 +39.4 82.0  | 2 14.7 +39.4 81.3  |
| 9°  | 5 53.4 +39.1 83.2  | 5 08.5 +39.1 82.5  | 4 23.6 +39.3 81.9  | 3 38.9 +39.3 81.2  | 2 54.1 +39.4 80.6  |
| 10° | 6 32.5 +39.0 82.4  | 5 47.6 +39.1 81.8  | 5 02.9 +39.1 81.1  | 4 18.2 +39.2 80.5  | 3 33.5 +39.4 79.8  |
| 11° | 7 11.5 +38.9 81.7  | 6 26.7 +39.0 81.0  | 5 42.0 +39.1 80.4  | 4 57.4 +39.2 79.7  | 4 12.9 +39.3 79.1  |
| 12° | 7 50.4 +38.8 80.9  | 7 05.7 +38.9 80.2  | 6 21.1 +39.1 79.6  | 5 36.6 +39.2 79.0  | 4 52.2 +39.3 78.3  |
| 13° | 8 29.2 +38.7 80.1  | 7 44.6 +38.9 79.5  | 7 00.2 +38.9 78.8  | 6 15.8 +39.1 78.2  | 5 31.5 +39.2 77.6  |
| 14° | 9 07.9 +38.7 79.3  | 8 23.5 +38.7 78.7  | 7 39.1 +38.9 78.1  | 6 54.9 +39.0 77.4  | 6 10.7 +39.2 76.8  |
| 15° | 9 46.6 +38.5 78.6  | 9 02.2 +38.7 77.9  | 8 18.0 +38.8 77.3  | 7 33.9 +38.9 76.7  | 6 49.9 +39.1 76.0  |
| 16° | 10 25.1 +38.4 77.8 | 9 40.9 +38.5 77.2  | 8 56.8 +38.7 76.5  | 8 12.8 +38.9 75.9  | 7 29.0 +39.0 75.3  |
| 17° | 11 03.5 +38.3 77.0 | 10 19.4 +38.5 76.4 | 9 35.5 +38.6 75.8  | 8 51.7 +38.7 75.1  | 8 08.0 +38.9 74.5  |
| 18° | 11 41.8 +38.2 76.2 | 10 57.9 +38.3 75.6 | 10 14.1 +38.5 75.0 | 9 30.4 +38.7 74.4  | 8 46.9 +38.8 73.7  |
| 19° | 12 20.0 +38.0 75.4 | 11 36.2 +38.2 74.8 | 10 52.6 +38.3 74.2 | 10 09.1 +38.5 73.6 | 9 25.7 +38.7 73.0  |
| 20° | 12 58.0 +37.9 74.6 | 12 14.4 +38.1 74.0 | 11 30.9 +38.3 73.4 | 10 47.6 +38.4 72.8 | 10 04.4 +38.6 72.2 |
| 21° | 13 35.9 +37.7 73.8 | 12 52.5 +37.9 73.2 | 12 09.2 +38.1 72.6 | 11 26.0 +38.3 72.0 | 10 43.0 +38.5 71.4 |
| 22° | 14 13.6 +37.6 73.0 | 13 30.4 +37.7 72.4 | 12 47.3 +37.9 71.8 | 12 04.3 +38.2 71.2 | 11 21.5 +38.4 70.6 |
| 23° | 14 51.2 +37.4 72.2 | 14 08.1 +37.6 71.6 | 13 25.2 +37.8 71.0 | 12 42.5 +38.0 70.4 | 11 59.9 +38.2 69.8 |
| 24° | 15 28.6 +37.2 71.4 | 14 45.7 +37.5 70.8 | 14 03.0 +37.7 70.2 | 13 20.5 +37.9 69.7 | 12 38.1 +38.1 69.1 |
| 25° | 16 05.8 +37.1 70.6 | 15 23.2 +37.2 70.0 | 14 40.7 +37.5 69.4 | 13 58.4 +37.7 68.9 | 13 16.2 +38.0 68.3 |
| 26° | 16 42.9 +36.8 69.8 | 16 00.4 +37.1 69.2 | 15 18.2 +37.3 68.6 | 14 36.1 +37.5 68.1 | 13 54.2 +37.8 67.5 |
| 27° | 17 19.7 +36.6 69.0 | 16 37.5 +36.9 68.4 | 15 55.5 +37.1 67.8 | 15 13.6 +37.4 67.2 | 14 32.0 +37.6 66.7 |
| 28° | 17 56.3 +36.5 68.1 | 17 14.4 +36.7 67.6 | 16 32.6 +36.9 67.0 | 15 51.0 +37.2 66.4 | 15 09.6 +37.5 65.9 |
| 29° | 18 32.8 +36.2 67.3 | 17 51.1 +36.4 66.7 | 17 09.5 +36.8 66.2 | 16 28.2 +37.0 65.6 | 15 47.1 +37.2 65.1 |

| 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°  | -3 46.3 +39.5      | -4 31.5 +39.5      | -5 16.6 +39.5      | -6 01.8 +39.7      | -6 46.8 +39.7      |
| 1°  | -3 06.8 +39.5      | -3 52.0 +39.6      | -4 37.1 +39.6      | -5 22.1 +39.6      | -6 07.1 +39.7      |
| 2°  | -2 27.3 +39.5      | -3 12.4 +39.6      | -3 57.5 +39.7      | -4 42.5 +39.7      | -5 27.4 +39.8      |
| 3°  | -1 47.8 +39.5      | -2 32.8 +39.6      | -3 17.8 +39.7      | -4 02.8 +39.8      | -4 47.6 +39.8      |
| 4°  | -1 08.3 +39.6      | -1 53.2 +39.6      | -2 38.1 +39.7      | -3 23.0 +39.8      | -4 07.8 +39.9      |
| 5°  | -0 28.7 +39.6      | -1 13.6 +39.6      | -1 58.4 +39.7      | -2 43.2 +39.8      | -3 27.9 +39.9      |
| 6°  | 0 10.9 +39.5 82.2  | -0 34.0 +39.7      | -1 18.7 +39.7      | -2 03.4 +39.9      | -2 48.0 +40.0      |
| 7°  | 0 50.4 +39.6 81.4  | 0 05.7 +39.6 80.8  | -0 39.0 +39.8      | -1 23.5 +39.8      | -2 08.0 +40.0      |
| 8°  | 1 30.0 +39.5 80.7  | 0 45.3 +39.7 80.0  | 0 00.8 +39.7 79.4  | -0 43.7 +39.9      | -1 28.0 +39.9      |
| 9°  | 2 09.5 +39.5 79.9  | 1 25.0 +39.6 79.3  | 0 40.5 +39.8 78.6  | -0 03.8 +39.8      | -0 48.1 +40.0      |
| 10° | 2 49.0 +39.5 79.2  | 2 04.6 +39.6 78.5  | 1 20.3 +39.7 77.9  | 0 36.0 +39.9 77.2  | -0 08.1 +40.0      |
| 11° | 3 28.5 +39.4 78.4  | 2 44.2 +39.6 77.8  | 2 00.0 +39.7 77.1  | 1 15.9 +39.8 76.5  | 0 31.9 +40.0 75.8  |
| 12° | 4 07.9 +39.5 77.7  | 3 23.8 +39.5 77.0  | 2 39.7 +39.7 76.4  | 1 55.7 +39.9 75.7  | 1 11.9 +40.0 75.1  |
| 13° | 4 47.4 +39.3 76.9  | 4 03.3 +39.5 76.3  | 3 19.4 +39.6 75.6  | 2 35.6 +39.8 75.0  | 1 51.9 +40.0 74.3  |
| 14° | 5 26.7 +39.3 76.2  | 4 42.8 +39.4 75.5  | 3 59.0 +39.6 74.9  | 3 15.4 +39.7 74.2  | 2 31.9 +39.9 73.6  |
| 15° | 6 06.0 +39.2 75.4  | 5 22.2 +39.4 74.8  | 4 38.6 +39.6 74.1  | 3 55.1 +39.8 73.5  | 3 11.8 +39.9 72.8  |
| 16° | 6 45.2 +39.2 74.6  | 6 01.6 +39.4 74.0  | 5 18.2 +39.5 73.4  | 4 34.9 +39.6 72.7  | 3 51.7 +39.9 72.1  |
| 17° | 7 24.4 +39.1 73.9  | 6 41.0 +39.2 73.3  | 5 57.7 +39.4 72.6  | 5 14.5 +39.7 72.0  | 4 31.6 +39.8 71.3  |
| 18° | 8 03.5 +39.0 73.1  | 7 20.2 +39.2 72.5  | 6 37.1 +39.4 71.9  | 5 54.2 +39.5 71.2  | 5 11.4 +39.7 70.6  |
| 19° | 8 42.5 +38.9 72.3  | 7 59.4 +39.1 71.7  | 7 16.5 +39.3 71.1  | 6 33.7 +39.5 70.5  | 5 51.1 +39.7 69.8  |
| 20° | 9 21.4 +38.8 71.6  | 8 38.5 +39.0 71.0  | 7 55.8 +39.2 70.3  | 7 13.2 +39.4 69.7  | 6 30.8 +39.7 69.1  |
| 21° | 10 00.2 +38.7 70.8 | 9 17.5 +38.9 70.2  | 8 35.0 +39.1 69.6  | 7 52.6 +39.4 69.0  | 7 10.5 +39.5 68.3  |
| 22° | 10 38.9 +38.6 70.0 | 9 56.4 +38.8 69.4  | 9 14.1 +39.0 68.8  | 8 32.0 +39.2 68.2  | 7 50.0 +39.5 67.6  |
| 23° | 11 17.5 +38.4 69.2 | 10 35.2 +38.7 68.6 | 9 53.1 +38.9 68.0  | 9 11.2 +39.2 67.4  | 8 29.5 +39.4 66.8  |
| 24° | 11 55.9 +38.4 68.5 | 11 13.9 +38.6 67.9 | 10 32.0 +38.8 67.3 | 9 50.4 +39.0 66.7  | 9 08.9 +39.3 66.1  |
| 25° | 12 34.3 +38.1 67.7 | 11 52.5 +38.4 67.1 | 11 10.8 +38.7 66.5 | 10 29.4 +38.9 65.9 | 9 48.2 +39.2 65.3  |
| 26° | 13 12.4 +38.1 66.9 | 12 30.9 +38.3 66.3 | 11 49.5 +38.6 65.7 | 11 08.3 +38.9 65.1 | 10 27.4 +39.0 64.5 |
| 27° | 13 50.5 +37.9 66.1 | 13 09.2 +38.1 65.5 | 12 28.1 +38.4 64.9 | 11 47.2 +38.6 64.3 | 11 06.4 +39.0 63.7 |
| 28° | 14 28.4 +37.7 65.3 | 13 47.3 +38.0 64.7 | 13 06.5 +38.3 64.1 | 12 25.8 +38.6 63.6 | 11 45.4 +38.8 63.0 |
| 29° | 15 06.1 +37.6 64.5 | 14 25.3 +37.9 63.9 | 13 44.8 +38.1 63.3 | 13 04.4 +38.4 62.8 | 12 24.2 +38.7 62.2 |

# Declination SAME name as Latitude

# Latitude 41°

| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°    | LHA 103° / 257°   | LHA 104° / 256°   |
|-----|--------------------|--------------------|--------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  | -7 31.8 +39.7      | -8 16.8 +39.8      | -9 01.7 +39.9      | -9 46.5 +40.0     |                   |
| 1°  | -6 52.1 +39.8      | -7 37.0 +39.9      | -8 21.8 +40.0      | -9 06.5 +40.1     | -9 51.1 +40.2     |
| 2°  | -6 12.3 +39.9      | -6 57.1 +40.0      | -7 41.8 +40.1      | -8 26.4 +40.2     | -9 10.9 +40.3     |
| 3°  | -5 32.4 +39.9      | -6 17.1 +40.0      | -7 01.7 +40.1      | -7 46.2 +40.2     | -8 30.6 +40.3     |
| 4°  | -4 52.5 +40.0      | -5 37.1 +40.1      | -6 21.6 +40.2      | -7 06.0 +40.3     | -7 50.3 +40.5     |
| 5°  | -4 12.5 +40.1      | -4 57.0 +40.2      | -5 41.4 +40.3      | -6 25.7 +40.4     | -7 09.8 +40.5     |
| 6°  | -3 32.4 +40.0      | -4 16.8 +40.2      | -5 01.1 +40.3      | -5 45.3 +40.5     | -6 29.3 +40.6     |
| 7°  | -2 52.4 +40.1      | -3 36.6 +40.2      | -4 20.8 +40.4      | -5 04.8 +40.5     | -5 48.7 +40.6     |
| 8°  | -2 12.3 +40.1      | -2 56.4 +40.2      | -3 40.4 +40.3      | -4 24.3 +40.5     | -5 08.1 +40.7     |
| 9°  | -1 32.2 +40.2      | -2 16.2 +40.3      | -3 00.1 +40.5      | -3 43.8 +40.6     | -4 27.4 +40.7     |
| 10° | -0 52.0 +40.1      | -1 35.9 +40.3      | -2 19.6 +40.4      | -3 03.2 +40.6     | -3 46.7 +40.8     |
| 11° | -0 11.9 +40.1      | -0 55.6 +40.3      | -1 39.2 +40.5      | -2 22.6 +40.6     | -3 05.9 +40.8     |
| 12° | 0 28.2 +40.2 74.4  | -0 15.3 +40.3      | -0 58.7 +40.4      | -1 42.0 +40.7     | -2 25.1 +40.9     |
| 13° | 1 08.4 +40.1 73.7  | 0 25.0 +40.3 73.0  | -0 18.3 +40.5      | -1 01.3 +40.6     | -1 44.2 +40.8     |
| 14° | 1 48.5 +40.1 72.9  | 1 05.3 +40.3 72.3  | 0 22.2 +40.5 71.6  | -0 20.7 +40.7     | -1 03.4 +40.9     |
| 15° | 2 28.6 +40.1 72.2  | 1 45.6 +40.2 71.6  | 1 02.7 +40.4 70.9  | 0 20.0 +40.6 70.3 | -0 22.5 +40.8     |
| 16° | 3 08.7 +40.0 71.5  | 2 25.8 +40.3 70.8  | 1 43.1 +40.5 70.2  | 1 00.6 +40.7 69.5 | 0 18.3 +40.9 68.9 |
| 17° | 3 48.7 +40.0 70.7  | 3 06.1 +40.2 70.1  | 2 23.6 +40.4 69.4  | 1 41.3 +40.6 68.8 | 0 59.2 +40.8 68.1 |
| 18° | 4 28.7 +40.0 70.0  | 3 46.3 +40.2 69.3  | 3 04.0 +40.4 68.7  | 2 21.9 +40.6 68.0 | 1 40.0 +40.8 67.4 |
| 19° | 5 08.7 +39.9 69.2  | 4 26.5 +40.1 68.6  | 3 44.4 +40.3 67.9  | 3 02.5 +40.6 67.3 | 2 20.8 +40.9 66.7 |
| 20° | 5 48.6 +39.9 68.5  | 5 06.6 +40.1 67.8  | 4 24.7 +40.4 67.2  | 3 43.1 +40.5 66.6 | 3 01.7 +40.7 65.9 |
| 21° | 6 28.5 +39.8 67.7  | 5 46.7 +40.0 67.1  | 5 05.1 +40.2 66.5  | 4 23.6 +40.5 65.8 | 3 42.4 +40.8 65.2 |
| 22° | 7 08.3 +39.7 67.0  | 6 26.7 +39.9 66.3  | 5 45.3 +40.2 65.7  | 5 04.1 +40.5 65.1 | 4 23.2 +40.7 64.5 |
| 23° | 7 48.0 +39.6 66.2  | 7 06.6 +39.9 65.6  | 6 25.5 +40.1 65.0  | 5 44.6 +40.4 64.3 | 5 03.9 +40.6 63.7 |
| 24° | 8 27.6 +39.5 65.4  | 7 46.5 +39.8 64.8  | 7 05.6 +40.1 64.2  | 6 25.0 +40.3 63.6 | 5 44.5 +40.6 63.0 |
| 25° | 9 07.1 +39.5 64.7  | 8 26.3 +39.7 64.1  | 7 45.7 +40.0 63.5  | 7 05.3 +40.2 62.9 | 6 25.1 +40.5 62.2 |
| 26° | 9 46.6 +39.3 63.9  | 9 06.0 +39.6 63.3  | 8 25.7 +39.9 62.7  | 7 45.5 +40.2 62.1 | 7 05.6 +40.5 61.5 |
| 27° | 10 25.9 +39.3 63.2 | 9 45.6 +39.6 62.6  | 9 05.6 +39.8 62.0  | 8 25.7 +40.1 61.4 | 7 46.1 +40.4 60.8 |
| 28° | 11 05.2 +39.1 62.4 | 10 25.2 +39.4 61.8 | 9 45.4 +39.7 61.2  | 9 05.8 +40.0 60.6 | 8 26.5 +40.3 60.0 |
| 29° | 11 44.3 +39.0 61.6 | 11 04.6 +39.3 61.0 | 10 25.1 +39.6 60.4 | 9 45.8 +39.9 59.9 | 9 06.8 +40.2 59.3 |

| Dec | LHA 105° / 255°   | LHA 106° / 254°   | LHA 107° / 253°   | LHA 108° / 252°   | LHA 109° / 251°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  | -9 55.4 +40.4     |                   |                   |                   |                   |
| 3°  | -9 15.0 +40.5     | -9 59.2 +40.7     |                   |                   |                   |
| 4°  | -8 34.5 +40.6     | -9 18.5 +40.7     |                   |                   |                   |
| 5°  | -7 53.9 +40.7     | -8 37.8 +40.8     | -9 21.6 +41.0     |                   |                   |
| 6°  | -7 13.2 +40.7     | -7 57.0 +40.9     | -8 40.6 +41.0     | -9 24.1 +41.2     |                   |
| 7°  | -6 32.5 +40.8     | -7 16.1 +40.9     | -7 59.6 +41.1     | -8 42.9 +41.3     | -9 26.1 +41.5     |
| 8°  | -5 51.7 +40.9     | -6 35.2 +41.1     | -7 18.5 +41.2     | -8 01.6 +41.3     | -8 44.6 +41.5     |
| 9°  | -5 10.8 +40.9     | -5 54.1 +41.0     | -6 37.3 +41.3     | -7 20.3 +41.5     | -8 03.1 +41.7     |
| 10° | -4 29.9 +40.9     | -5 13.1 +41.2     | -5 56.0 +41.3     | -6 38.8 +41.5     | -7 21.4 +41.7     |
| 11° | -3 49.0 +41.0     | -4 31.9 +41.1     | -5 14.7 +41.3     | -5 57.3 +41.5     | -6 39.7 +41.7     |
| 12° | -3 08.0 +41.0     | -3 50.8 +41.2     | -4 33.4 +41.5     | -5 15.8 +41.7     | -5 58.0 +41.9     |
| 13° | -2 27.0 +41.0     | -3 09.6 +41.3     | -3 51.9 +41.4     | -4 34.1 +41.6     | -5 16.1 +41.8     |
| 14° | -1 46.0 +41.1     | -2 28.3 +41.2     | -3 10.5 +41.5     | -3 52.5 +41.7     | -4 34.3 +41.9     |
| 15° | -1 04.9 +41.1     | -1 47.1 +41.3     | -2 29.0 +41.5     | -3 10.8 +41.7     | -3 52.4 +42.0     |
| 16° | -0 23.8 +41.0     | -1 05.8 +41.3     | -1 47.5 +41.5     | -2 29.1 +41.8     | -3 10.4 +42.0     |
| 17° | 0 17.2 +41.1 67.5 | -0 24.5 +41.3     | -1 06.0 +41.5     | -1 47.3 +41.7     | -2 28.4 +42.0     |
| 18° | 0 58.3 +41.1 66.7 | 0 16.8 +41.3 66.1 | -0 24.5 +41.5     | -1 05.6 +41.8     | -1 46.4 +42.0     |
| 19° | 1 39.4 +41.0 66.0 | 0 58.1 +41.3 65.4 | 0 17.0 +41.6 64.7 | -0 23.8 +41.8     | -1 04.4 +42.0     |
| 20° | 2 20.4 +41.0 65.3 | 1 39.4 +41.2 64.6 | 0 58.6 +41.5 64.0 | 0 18.0 +41.8 63.3 | -0 22.4 +42.1     |
| 21° | 3 01.4 +41.0 64.6 | 2 20.6 +41.3 63.9 | 1 40.1 +41.5 63.3 | 0 59.8 +41.7 62.6 | 0 19.7 +42.0 62.0 |
| 22° | 3 42.4 +41.0 63.8 | 3 01.9 +41.2 63.2 | 2 21.6 +41.5 62.6 | 1 41.5 +41.8 61.9 | 1 01.7 +42.0 61.3 |
| 23° | 4 23.4 +40.9 63.1 | 3 43.1 +41.2 62.5 | 3 03.1 +41.4 61.8 | 2 23.3 +41.7 61.2 | 1 43.7 +42.0 60.5 |
| 24° | 5 04.3 +40.8 62.4 | 4 24.3 +41.1 61.7 | 3 44.5 +41.4 61.1 | 3 05.0 +41.7 60.5 | 2 25.7 +42.0 59.8 |
| 25° | 5 45.1 +40.9 61.6 | 5 05.4 +41.1 61.0 | 4 25.9 +41.4 60.4 | 3 46.7 +41.7 59.7 | 3 07.7 +42.0 59.1 |
| 26° | 6 26.0 +40.7 60.9 | 5 46.5 +41.0 60.3 | 5 07.3 +41.3 59.7 | 4 28.4 +41.6 59.0 | 3 49.7 +41.9 58.4 |
| 27° | 7 06.7 +40.7 60.1 | 6 27.5 +41.0 59.5 | 5 48.6 +41.3 58.9 | 5 10.0 +41.5 58.3 | 4 31.6 +41.8 57.7 |
| 28° | 7 47.4 +40.6 59.4 | 7 08.5 +40.9 58.8 | 6 29.9 +41.2 58.2 | 5 51.5 +41.6 57.6 | 5 13.4 +41.9 57.0 |
| 29° | 8 28.0 +40.5 58.7 | 7 49.4 +40.8 58.1 | 7 11.1 +41.1 57.5 | 6 33.1 +41.4 56.9 | 5 55.3 +41.7 56.2 |

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# Latitude 41°

# Declination SAME name as Latitude

| Dec | LHA 110° / 250°   | LHA 111° / 249°   | LHA 112° / 248°   | LHA 113° / 247°   | LHA 114° / 246°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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 27.4 +41.7     |                   |                   |                   |                   |
| 9°  | -8 45.7 +41.9     | -9 28.1 +42.0     |                   |                   |                   |
| 10° | -8 03.8 +41.9     | -8 46.1 +42.1     | -9 28.1 +42.3     |                   |                   |
| 11° | -7 21.9 +41.9     | -8 04.0 +42.2     | -8 45.8 +42.4     | -9 27.4 +42.7     |                   |
| 12° | -6 40.0 +42.1     | -7 21.8 +42.3     | -8 03.4 +42.5     | -8 44.7 +42.7     | -9 25.9 +43.0     |
| 13° | -5 57.9 +42.1     | -6 39.5 +42.3     | -7 20.9 +42.6     | -8 02.0 +42.8     | -8 42.9 +43.0     |
| 14° | -5 15.8 +42.1     | -5 57.2 +42.4     | -6 38.3 +42.6     | -7 19.2 +42.8     | -7 59.9 +43.1     |
| 15° | -4 33.7 +42.2     | -5 14.8 +42.4     | -5 55.7 +42.7     | -6 36.4 +43.0     | -7 16.8 +43.2     |
| 16° | -3 51.5 +42.2     | -4 32.4 +42.5     | -5 13.0 +42.7     | -5 53.4 +42.9     | -6 33.6 +43.2     |
| 17° | -3 09.3 +42.3     | -3 49.9 +42.5     | -4 30.3 +42.7     | -5 10.5 +43.0     | -5 50.4 +43.3     |
| 18° | -2 27.0 +42.2     | -3 07.4 +42.5     | -3 47.6 +42.8     | -4 27.5 +43.1     | -5 07.1 +43.3     |
| 19° | -1 44.8 +42.3     | -2 24.9 +42.6     | -3 04.8 +42.8     | -3 44.4 +43.1     | -4 23.8 +43.4     |
| 20° | -1 02.5 +42.3     | -1 42.3 +42.5     | -2 22.0 +42.9     | -3 01.3 +43.1     | -3 40.4 +43.4     |
| 21° | -0 20.2 +42.3     | -0 59.8 +42.6     | -1 39.1 +42.8     | -2 18.2 +43.1     | -2 57.0 +43.4     |
| 22° | 0 22.1 +42.3 60.6 | -0 17.2 +42.6     | -0 56.3 +42.9     | -1 35.1 +43.2     | -2 13.6 +43.4     |
| 23° | 1 04.4 +42.3 59.9 | 0 25.4 +42.5 59.2 | -0 13.4 +42.8     | -0 51.9 +43.1     | -1 30.2 +43.5     |
| 24° | 1 46.7 +42.3 59.2 | 1 07.9 +42.6 58.5 | 0 29.4 +42.9 57.9 | -0 08.8 +43.2     | -0 46.7 +43.5     |
| 25° | 2 29.0 +42.2 58.5 | 1 50.5 +42.6 57.8 | 1 12.3 +42.9 57.2 | 0 34.4 +43.1 56.5 | -0 03.2 +43.4     |
| 26° | 3 11.2 +42.2 57.8 | 2 33.1 +42.5 57.1 | 1 55.2 +42.8 56.5 | 1 17.5 +43.2 55.8 | 0 40.2 +43.5 55.2 |
| 27° | 3 53.4 +42.2 57.1 | 3 15.6 +42.5 56.4 | 2 38.0 +42.8 55.8 | 2 00.7 +43.1 55.2 | 1 23.7 +43.4 54.5 |
| 28° | 4 35.6 +42.2 56.3 | 3 58.1 +42.4 55.7 | 3 20.8 +42.8 55.1 | 2 43.8 +43.1 54.5 | 2 07.1 +43.4 53.8 |
| 29° | 5 17.8 +42.1 55.6 | 4 40.5 +42.4 55.0 | 4 03.6 +42.7 54.4 | 3 26.9 +43.1 53.8 | 2 50.5 +43.4 53.1 |

| Dec | LHA 115° / 245°   | LHA 116° / 244°   | LHA 117° / 243°   | LHA 118° / 242°   | LHA 119° / 241° |
|-----|-------------------|-------------------|-------------------|-------------------|-----------------|
|     | 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° | -9 23.6 +43.3     |                   |                   |                   |                 |
| 14° | -8 40.3 +43.4     | -9 20.4 +43.6     |                   |                   |                 |
| 15° | -7 56.9 +43.4     | -8 36.8 +43.7     | -9 16.4 +43.9     | -9 55.8 +44.2     |                 |
| 16° | -7 13.5 +43.5     | -7 53.1 +43.7     | -8 32.5 +44.0     | -9 11.6 +44.3     | -9 50.3 +44.5   |
| 17° | -6 30.0 +43.5     | -7 09.4 +43.9     | -7 48.5 +44.1     | -8 27.3 +44.4     | -9 05.8 +44.7   |
| 18° | -5 46.5 +43.6     | -6 25.5 +43.8     | -7 04.4 +44.2     | -7 42.9 +44.5     | -8 21.1 +44.7   |
| 19° | -5 02.9 +43.7     | -5 41.7 +43.9     | -6 20.2 +44.2     | -6 58.4 +44.5     | -7 36.4 +44.8   |
| 20° | -4 19.2 +43.7     | -4 57.8 +44.0     | -5 36.0 +44.3     | -6 13.9 +44.5     | -6 51.6 +44.9   |
| 21° | -3 35.5 +43.7     | -4 13.8 +44.0     | -4 51.7 +44.3     | -5 29.4 +44.6     | -6 06.7 +44.9   |
| 22° | -2 51.8 +43.7     | -3 29.8 +44.0     | -4 07.4 +44.3     | -4 44.8 +44.6     | -5 21.8 +44.9   |
| 23° | -2 08.1 +43.7     | -2 45.8 +44.1     | -3 23.1 +44.3     | -4 00.2 +44.7     | -4 36.9 +45.0   |
| 24° | -1 24.4 +43.8     | -2 01.7 +44.1     | -2 38.8 +44.4     | -3 15.5 +44.7     | -3 51.9 +45.0   |
| 25° | -0 40.6 +43.8     | -1 17.6 +44.0     | -1 54.4 +44.4     | -2 30.8 +44.7     | -3 06.9 +45.0   |
| 26° | 0 03.2 +43.7 54.5 | -0 33.6 +44.1     | -1 10.0 +44.4     | -1 46.1 +44.7     | -2 21.9 +45.1   |
| 27° | 0 46.9 +43.8 53.9 | 0 10.5 +44.1 53.2 | -0 25.6 +44.4     | -1 01.4 +44.8     | -1 36.8 +45.0   |
| 28° | 1 30.7 +43.8 53.2 | 0 54.6 +44.1 52.5 | 0 18.8 +44.4 51.9 | -0 16.6 +44.7     | -0 51.8 +45.1   |
| 29° | 2 14.5 +43.7 52.5 | 1 38.7 +44.0 51.9 | 1 03.2 +44.4 51.2 | 0 28.1 +44.7 50.6 | -0 06.7 +45.1   |

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| 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°  | 48 00.0 +60.0 180.0 | 47 59.4 +60.0 178.5 | 47 57.7 +59.9 177.0 | 47 54.8 +59.9 175.5 | 47 50.7 +59.8 174.0 |
| 1°  | 49 00.0 +60.0 180.0 | 48 59.4 +60.0 178.5 | 48 57.6 +60.0 177.0 | 48 54.7 +59.9 175.4 | 48 50.5 +59.8 173.9 |
| 2°  | 50 00.0 +60.0 180.0 | 49 59.4 +60.0 178.4 | 49 57.6 +59.9 176.9 | 49 54.6 +59.8 175.3 | 49 50.3 +59.8 173.8 |
| 3°  | 51 00.0 +60.0 180.0 | 50 59.4 +60.0 178.4 | 50 57.5 +60.0 176.8 | 50 54.4 +59.9 175.2 | 50 50.1 +59.8 173.7 |
| 4°  | 52 00.0 +60.0 180.0 | 51 59.4 +60.0 178.4 | 51 57.5 +59.9 176.8 | 51 54.3 +59.9 175.1 | 51 49.9 +59.8 173.5 |
| 5°  | 53 00.0 +60.0 180.0 | 52 59.4 +59.9 178.3 | 52 57.4 +60.0 176.7 | 52 54.2 +59.9 175.0 | 52 49.7 +59.8 173.4 |
| 6°  | 54 00.0 +60.0 180.0 | 53 59.3 +60.0 178.3 | 53 57.4 +59.9 176.6 | 53 54.1 +59.8 174.9 | 53 49.5 +59.8 173.3 |
| 7°  | 55 00.0 +60.0 180.0 | 54 59.3 +60.0 178.3 | 54 57.3 +59.9 176.5 | 54 53.9 +59.9 174.8 | 54 49.3 +59.7 173.1 |
| 8°  | 56 00.0 +60.0 180.0 | 55 59.3 +60.0 178.2 | 55 57.2 +60.0 176.5 | 55 53.8 +59.9 174.7 | 55 49.0 +59.7 172.9 |
| 9°  | 57 00.0 +60.0 180.0 | 56 59.3 +60.0 178.2 | 56 57.2 +59.9 176.4 | 56 53.7 +59.8 174.6 | 56 48.7 +59.8 172.8 |
| 10° | 58 00.0 +60.0 180.0 | 57 59.3 +60.0 178.1 | 57 57.1 +59.9 176.3 | 57 53.5 +59.8 174.4 | 57 48.5 +59.7 172.6 |
| 11° | 59 00.0 +60.0 180.0 | 58 59.3 +59.9 178.1 | 58 57.0 +60.0 176.2 | 58 53.3 +59.9 174.3 | 58 48.2 +59.7 172.4 |
| 12° | 60 00.0 +60.0 180.0 | 59 59.2 +60.0 178.0 | 59 57.0 +59.9 176.1 | 59 53.2 +59.8 174.1 | 59 47.9 +59.6 172.2 |
| 13° | 61 00.0 +60.0 180.0 | 60 59.2 +60.0 178.0 | 60 56.9 +59.9 176.0 | 60 53.0 +59.8 174.0 | 60 47.5 +59.7 172.0 |
| 14° | 62 00.0 +60.0 180.0 | 61 59.2 +60.0 177.9 | 61 56.8 +59.9 175.9 | 61 52.8 +59.8 173.8 | 61 47.2 +59.6 171.8 |
| 15° | 63 00.0 +60.0 180.0 | 62 59.2 +59.9 177.9 | 62 56.7 +59.9 175.7 | 62 52.6 +59.7 173.6 | 62 46.8 +59.6 171.5 |
| 16° | 64 00.0 +60.0 180.0 | 63 59.1 +60.0 177.8 | 63 56.6 +59.9 175.6 | 63 52.3 +59.8 173.4 | 63 46.4 +59.6 171.3 |
| 17° | 65 00.0 +60.0 180.0 | 64 59.1 +60.0 177.7 | 64 56.5 +59.9 175.5 | 64 52.1 +59.7 173.2 | 64 46.0 +59.5 171.0 |
| 18° | 66 00.0 +60.0 180.0 | 65 59.1 +60.0 177.7 | 65 56.4 +59.8 175.3 | 65 51.8 +59.8 173.0 | 65 45.5 +59.5 170.7 |
| 19° | 67 00.0 +60.0 180.0 | 66 59.1 +59.9 177.6 | 66 56.2 +59.9 175.2 | 66 51.6 +59.6 172.8 | 66 45.0 +59.5 170.4 |
| 20° | 68 00.0 +60.0 180.0 | 67 59.0 +60.0 177.5 | 67 56.1 +59.9 175.0 | 67 51.2 +59.7 172.5 | 67 44.5 +59.4 170.0 |
| 21° | 69 00.0 +60.0 180.0 | 68 59.0 +59.9 177.4 | 68 56.0 +59.8 174.8 | 68 50.9 +59.6 172.2 | 68 43.9 +59.3 169.7 |
| 22° | 70 00.0 +60.0 180.0 | 69 58.9 +60.0 177.3 | 69 55.8 +59.8 174.6 | 69 50.5 +59.6 171.9 | 69 43.2 +59.3 169.2 |
| 23° | 71 00.0 +60.0 180.0 | 70 58.9 +60.0 177.2 | 70 55.6 +59.8 174.4 | 70 50.1 +59.6 171.6 | 70 42.5 +59.3 168.8 |
| 24° | 72 00.0 +60.0 180.0 | 71 58.9 +59.9 177.0 | 71 55.4 +59.8 174.1 | 71 49.7 +59.5 171.2 | 71 41.8 +59.1 168.3 |
| 25° | 73 00.0 +60.0 180.0 | 72 58.8 +59.9 176.9 | 72 55.2 +59.7 173.8 | 72 49.2 +59.4 170.8 | 72 40.9 +59.0 167.7 |
| 26° | 74 00.0 +60.0 180.0 | 73 58.7 +60.0 176.7 | 73 54.9 +59.8 173.5 | 73 48.6 +59.4 170.3 | 73 39.9 +58.9 167.1 |
| 27° | 75 00.0 +60.0 180.0 | 74 58.7 +59.9 176.6 | 74 54.7 +59.6 173.1 | 74 48.0 +59.3 169.8 | 74 38.8 +58.8 166.4 |
| 28° | 76 00.0 +60.0 180.0 | 75 58.6 +59.9 176.4 | 75 54.3 +59.7 172.7 | 75 47.3 +59.2 169.2 | 75 37.6 +58.6 165.6 |
| 29° | 77 00.0 +60.0 180.0 | 76 58.5 +59.9 176.1 | 76 54.0 +59.5 172.3 | 76 46.5 +59.1 168.5 | 76 36.2 +58.3 164.7 |

| 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°  | 47 45.5 +59.7 172.6 | 47 39.2 +59.5 171.1 | 47 31.7 +59.4 169.6 | 47 23.1 +59.2 168.1 | 47 13.3 +59.1 166.7 |
| 1°  | 48 45.2 +59.7 172.4 | 48 38.7 +59.6 170.9 | 48 31.1 +59.4 169.4 | 48 22.3 +59.3 167.9 | 48 12.4 +59.1 166.4 |
| 2°  | 49 44.9 +59.7 172.3 | 49 38.3 +59.6 170.7 | 49 30.5 +59.4 169.2 | 49 21.6 +59.2 167.7 | 49 11.5 +59.0 166.2 |
| 3°  | 50 44.6 +59.7 172.1 | 50 37.9 +59.5 170.5 | 50 29.9 +59.4 169.0 | 50 20.8 +59.2 167.4 | 50 10.5 +59.0 165.9 |
| 4°  | 51 44.3 +59.7 171.9 | 51 37.4 +59.5 170.3 | 51 29.3 +59.4 168.7 | 51 20.0 +59.2 167.2 | 51 09.5 +58.9 165.6 |
| 5°  | 52 44.0 +59.6 171.8 | 52 36.9 +59.5 170.1 | 52 28.7 +59.3 168.5 | 52 19.2 +59.1 166.9 | 52 08.4 +58.9 165.3 |
| 6°  | 53 43.6 +59.6 171.6 | 53 36.4 +59.5 169.9 | 53 28.0 +59.3 168.3 | 53 18.3 +59.1 166.6 | 53 07.3 +58.9 165.0 |
| 7°  | 54 43.2 +59.6 171.4 | 54 35.9 +59.4 169.7 | 54 27.3 +59.2 168.0 | 54 17.4 +59.0 166.3 | 54 06.2 +58.8 164.6 |
| 8°  | 55 42.8 +59.6 171.2 | 55 35.3 +59.5 169.4 | 55 26.5 +59.2 167.7 | 55 16.4 +59.0 166.0 | 55 05.0 +58.7 164.3 |
| 9°  | 56 42.4 +59.6 171.0 | 56 34.8 +59.3 169.2 | 56 25.7 +59.2 167.4 | 56 15.4 +58.9 165.7 | 56 03.7 +58.6 163.9 |
| 10° | 57 42.0 +59.6 170.8 | 57 34.1 +59.4 168.9 | 57 24.9 +59.1 167.1 | 57 14.3 +58.8 165.3 | 57 02.3 +58.6 163.6 |
| 11° | 58 41.6 +59.5 170.5 | 58 33.5 +59.3 168.7 | 58 24.0 +59.1 166.8 | 58 13.1 +58.8 165.0 | 58 00.9 +58.5 163.1 |
| 12° | 59 41.1 +59.5 170.3 | 59 32.8 +59.3 168.4 | 59 23.1 +59.0 166.5 | 59 11.9 +58.8 164.6 | 58 59.4 +58.4 162.7 |
| 13° | 60 40.6 +59.4 170.0 | 60 32.1 +59.2 168.1 | 60 22.1 +59.0 166.1 | 60 10.7 +58.6 164.2 | 59 57.8 +58.3 162.3 |
| 14° | 61 40.0 +59.4 169.7 | 61 31.3 +59.2 167.7 | 61 21.1 +58.8 165.7 | 61 09.3 +58.6 163.7 | 60 56.1 +58.2 161.8 |
| 15° | 62 39.4 +59.4 169.4 | 62 30.5 +59.1 167.4 | 62 19.9 +58.8 165.3 | 62 07.9 +58.4 163.3 | 61 54.3 +58.1 161.3 |
| 16° | 63 38.8 +59.4 169.1 | 63 29.6 +59.0 167.0 | 63 18.7 +58.8 164.9 | 63 06.3 +58.4 162.8 | 62 52.4 +57.9 160.7 |
| 17° | 64 38.2 +59.2 168.8 | 64 28.6 +59.0 166.6 | 64 17.5 +58.6 164.4 | 64 04.7 +58.2 162.3 | 63 50.3 +57.8 160.2 |
| 18° | 65 37.4 +59.3 168.4 | 65 27.6 +58.9 166.2 | 65 16.1 +58.5 163.9 | 65 02.9 +58.1 161.7 | 64 48.1 +57.7 159.5 |
| 19° | 66 36.7 +59.1 168.0 | 66 26.5 +58.8 165.7 | 66 14.6 +58.4 163.4 | 66 01.0 +58.0 161.1 | 65 45.8 +57.4 158.9 |
| 20° | 67 35.8 +59.1 167.6 | 67 25.3 +58.7 165.2 | 67 13.0 +58.3 162.8 | 66 59.0 +57.7 160.5 | 66 43.2 +57.3 158.2 |
| 21° | 68 34.9 +59.0 167.1 | 68 24.0 +58.6 164.6 | 68 11.3 +58.1 162.2 | 67 56.7 +57.6 159.8 | 67 40.5 +56.9 157.4 |
| 22° | 69 33.9 +58.9 166.6 | 69 22.6 +58.5 164.0 | 69 09.4 +57.9 161.5 | 68 54.3 +57.4 159.0 | 68 37.4 +56.8 156.6 |
| 23° | 70 32.8 +58.8 166.1 | 70 21.1 +58.3 163.4 | 70 07.3 +57.8 160.7 | 69 51.7 +57.1 158.2 | 69 34.2 +56.4 155.6 |
| 24° | 71 31.6 +58.7 165.4 | 71 19.4 +58.1 162.7 | 71 05.1 +57.4 159.9 | 70 48.8 +56.8 157.2 | 70 30.6 +56.0 154.6 |
| 25° | 72 30.3 +58.5 164.8 | 72 17.5 +57.9 161.9 | 72 02.5 +57.2 159.0 | 71 45.6 +56.4 156.2 | 71 26.6 +55.7 153.5 |
| 26° | 73 28.8 +58.3 164.0 | 73 15.4 +57.6 161.0 | 72 59.7 +56.9 158.0 | 72 42.0 +56.0 155.1 | 72 22.3 +55.1 152.3 |
| 27° | 74 27.1 +58.1 163.2 | 74 13.0 +57.4 160.0 | 73 56.6 +56.5 156.9 | 73 38.0 +55.6 153.9 | 73 17.4 +54.6 151.0 |
| 28° | 75 25.2 +57.9 162.2 | 75 10.4 +56.9 158.9 | 74 53.1 +56.0 155.6 | 74 33.6 +55.0 152.5 | 74 12.0 +53.9 149.5 |
| 29° | 76 23.1 +57.5 161.1 | 76 07.3 +56.6 157.6 | 75 49.1 +55.5 154.2 | 75 28.6 +54.3 151.0 | 75 05.9 +53.1 147.9 |

| 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°  | 47 02.5 +58.9 165.2 | 46 50.6 +58.7 163.8 | 46 37.7 +58.4 162.4 | 46 23.6 +58.2 161.0 | 46 08.6 +57.9 159.6 |
| 1°  | 48 01.4 +58.9 165.0 | 47 49.3 +58.6 163.5 | 47 36.1 +58.4 162.0 | 47 21.8 +58.1 160.6 | 47 06.5 +57.8 159.2 |
| 2°  | 49 00.3 +58.8 164.7 | 48 47.9 +58.6 163.2 | 48 34.5 +58.3 161.7 | 48 19.9 +58.1 160.2 | 48 04.3 +57.8 158.8 |
| 3°  | 49 59.1 +58.7 164.4 | 49 46.5 +58.5 162.8 | 49 32.8 +58.2 161.3 | 49 18.0 +57.9 159.8 | 49 02.1 +57.6 158.4 |
| 4°  | 50 57.8 +58.7 164.0 | 50 45.0 +58.4 162.5 | 50 31.0 +58.2 161.0 | 50 15.9 +57.9 159.4 | 49 59.7 +57.6 158.0 |
| 5°  | 51 56.5 +58.7 163.7 | 51 43.4 +58.4 162.1 | 51 29.2 +58.1 160.6 | 51 13.8 +57.7 159.0 | 50 57.3 +57.4 157.5 |
| 6°  | 52 55.2 +58.5 163.4 | 52 41.8 +58.3 161.8 | 52 27.3 +57.9 160.2 | 52 11.5 +57.7 158.6 | 51 54.7 +57.4 157.0 |
| 7°  | 53 53.7 +58.6 163.0 | 53 40.1 +58.2 161.4 | 53 25.2 +57.9 159.7 | 53 09.2 +57.6 158.1 | 52 52.1 +57.2 156.6 |
| 8°  | 54 52.3 +58.4 162.6 | 54 38.3 +58.1 160.9 | 54 23.1 +57.8 159.3 | 54 06.8 +57.4 157.7 | 53 49.3 +57.0 156.1 |
| 9°  | 55 50.7 +58.3 162.2 | 55 36.4 +58.1 160.5 | 55 20.9 +57.7 158.8 | 55 04.2 +57.4 157.2 | 54 46.3 +57.0 155.5 |
| 10° | 56 49.0 +58.3 161.8 | 56 34.5 +57.9 160.1 | 56 18.6 +57.6 158.3 | 56 01.6 +57.1 156.6 | 55 43.3 +56.8 155.0 |
| 11° | 57 47.3 +58.2 161.4 | 57 32.4 +57.8 159.6 | 57 16.2 +57.4 157.8 | 56 58.7 +57.1 156.1 | 56 40.1 +56.6 154.4 |
| 12° | 58 45.5 +58.0 160.9 | 58 30.2 +57.7 159.1 | 58 13.6 +57.3 157.3 | 57 55.8 +56.8 155.5 | 57 36.7 +56.4 153.8 |
| 13° | 59 43.5 +58.0 160.4 | 59 27.9 +57.5 158.5 | 59 10.9 +57.1 156.7 | 58 52.6 +56.7 154.9 | 58 33.1 +56.2 153.1 |
| 14° | 60 41.5 +57.8 159.9 | 60 25.4 +57.4 158.0 | 60 08.0 +57.0 156.1 | 59 49.3 +56.5 154.3 | 59 29.3 +56.0 152.5 |
| 15° | 61 39.3 +57.6 159.3 | 61 22.8 +57.2 157.4 | 61 05.0 +56.7 155.5 | 60 45.8 +56.3 153.6 | 60 25.3 +55.8 151.7 |
| 16° | 62 36.9 +57.5 158.7 | 62 20.0 +57.1 156.7 | 62 01.7 +56.6 154.8 | 61 42.1 +56.0 152.9 | 61 21.1 +55.5 151.0 |
| 17° | 63 34.4 +57.4 158.1 | 63 17.1 +56.8 156.1 | 62 58.3 +56.3 154.1 | 62 38.1 +55.7 152.1 | 62 16.6 +55.1 150.2 |
| 18° | 64 31.8 +57.1 157.4 | 64 13.9 +56.6 155.3 | 63 54.6 +56.0 153.3 | 63 33.8 +55.5 151.3 | 63 11.7 +54.9 149.3 |
| 19° | 65 28.9 +56.9 156.7 | 65 10.5 +56.3 154.6 | 64 50.6 +55.8 152.5 | 64 29.3 +55.1 150.4 | 64 06.6 +54.5 148.4 |
| 20° | 66 25.8 +56.7 155.9 | 66 06.8 +56.1 153.7 | 65 46.4 +55.4 151.6 | 65 24.4 +54.8 149.5 | 65 01.1 +54.1 147.4 |
| 21° | 67 22.5 +56.4 155.1 | 67 02.9 +55.7 152.8 | 66 41.8 +55.0 150.6 | 66 19.2 +54.3 148.5 | 65 55.2 +53.6 146.4 |
| 22° | 68 18.9 +56.0 154.2 | 67 58.6 +55.4 151.8 | 67 36.8 +54.6 149.6 | 67 13.5 +53.9 147.4 | 66 48.8 +53.1 145.3 |
| 23° | 69 14.9 +55.7 153.2 | 68 54.0 +54.9 150.8 | 68 31.4 +54.2 148.5 | 68 07.4 +53.3 146.2 | 67 41.9 +52.5 144.1 |
| 24° | 70 10.6 +55.3 152.1 | 69 48.9 +54.4 149.7 | 69 25.6 +53.6 147.3 | 69 00.7 +52.8 145.0 | 68 34.4 +51.9 142.8 |
| 25° | 71 05.9 +54.7 150.9 | 70 43.3 +53.9 148.4 | 70 19.2 +53.0 146.0 | 69 53.5 +52.1 143.6 | 69 26.3 +51.2 141.4 |
| 26° | 72 00.6 +54.3 149.6 | 71 37.2 +53.3 147.0 | 71 12.2 +52.3 144.6 | 70 45.6 +51.3 142.2 | 70 17.5 +50.3 139.9 |
| 27° | 72 54.9 +53.5 148.2 | 72 30.5 +52.5 145.6 | 72 04.5 +51.4 143.0 | 71 36.9 +50.4 140.5 | 71 07.8 +49.4 138.2 |
| 28° | 73 48.4 +52.8 146.6 | 73 23.0 +51.7 143.9 | 72 55.9 +50.5 141.3 | 72 27.3 +49.4 138.8 | 71 57.2 +48.3 136.4 |
| 29° | 74 41.2 +51.9 144.9 | 74 14.7 +50.6 142.1 | 73 46.4 +49.4 139.4 | 73 16.7 +48.2 136.9 | 72 45.5 +47.1 134.5 |

| 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°  | 45 52.5 +57.6 158.2 | 45 35.4 +57.4 156.8 | 45 17.4 +57.0 155.4 | 44 58.4 +56.7 154.1 | 44 38.4 +56.4 152.8 |
| 1°  | 46 50.1 +57.6 157.8 | 46 32.8 +57.2 156.4 | 46 14.4 +56.9 155.0 | 45 55.1 +56.5 153.6 | 45 34.8 +56.2 152.3 |
| 2°  | 47 47.7 +57.4 157.4 | 47 30.0 +57.1 155.9 | 47 11.3 +56.8 154.5 | 46 51.6 +56.5 153.2 | 46 31.0 +56.1 151.8 |
| 3°  | 48 45.1 +57.3 156.9 | 48 27.1 +57.0 155.5 | 48 08.1 +56.7 154.1 | 47 48.1 +56.3 152.7 | 47 27.1 +56.0 151.3 |
| 4°  | 49 42.4 +57.3 156.5 | 49 24.1 +56.9 155.0 | 49 04.8 +56.5 153.6 | 48 44.4 +56.2 152.1 | 48 23.1 +55.8 150.7 |
| 5°  | 50 39.7 +57.1 156.0 | 50 21.0 +56.8 154.5 | 50 01.3 +56.4 153.0 | 49 40.6 +56.0 151.6 | 49 18.9 +55.6 150.2 |
| 6°  | 51 36.8 +57.0 155.5 | 51 17.8 +56.6 154.0 | 50 57.7 +56.2 152.5 | 50 36.6 +55.8 151.0 | 50 14.5 +55.5 149.6 |
| 7°  | 52 33.8 +56.8 155.0 | 52 14.4 +56.4 153.5 | 51 53.9 +56.1 151.9 | 51 32.4 +55.7 150.5 | 51 10.0 +55.2 149.0 |
| 8°  | 53 30.6 +56.7 154.5 | 53 10.8 +56.3 152.9 | 52 50.0 +55.9 151.4 | 52 28.1 +55.5 149.8 | 52 05.2 +55.1 148.4 |
| 9°  | 54 27.3 +56.5 153.9 | 54 07.1 +56.2 152.3 | 53 45.9 +55.7 150.8 | 53 23.6 +55.3 149.2 | 53 00.3 +54.8 147.7 |
| 10° | 55 23.8 +56.4 153.3 | 55 03.3 +55.9 151.7 | 54 41.6 +55.5 150.1 | 54 18.9 +55.0 148.6 | 53 55.1 +54.6 147.0 |
| 11° | 56 20.2 +56.2 152.7 | 55 59.2 +55.7 151.1 | 55 37.1 +55.3 149.5 | 55 13.9 +54.8 147.9 | 54 49.7 +54.3 146.3 |
| 12° | 57 16.4 +56.0 152.1 | 56 54.9 +55.5 150.4 | 56 32.4 +55.0 148.8 | 56 08.7 +54.5 147.1 | 55 44.0 +54.0 145.6 |
| 13° | 58 12.4 +55.7 151.4 | 57 50.4 +55.3 149.7 | 57 27.4 +54.7 148.0 | 57 03.2 +54.3 146.4 | 56 38.0 +53.7 144.8 |
| 14° | 59 08.1 +55.5 150.7 | 58 45.7 +55.0 149.0 | 58 22.1 +54.5 147.3 | 57 57.5 +53.9 145.6 | 57 31.7 +53.4 144.0 |
| 15° | 60 03.6 +55.2 149.9 | 59 40.7 +54.7 148.2 | 59 16.6 +54.1 146.4 | 58 51.4 +53.6 144.8 | 58 25.1 +53.1 143.1 |
| 16° | 60 58.8 +54.9 149.1 | 60 35.4 +54.3 147.3 | 60 10.7 +53.8 145.6 | 59 45.0 +53.2 143.9 | 59 18.2 +52.6 142.2 |
| 17° | 61 53.7 +54.6 148.3 | 61 29.7 +54.0 146.5 | 61 04.5 +53.4 144.7 | 60 38.2 +52.8 142.9 | 60 10.8 +52.2 141.2 |
| 18° | 62 48.3 +54.3 147.4 | 62 23.7 +53.6 145.5 | 61 57.9 +53.0 143.7 | 61 31.0 +52.3 142.0 | 61 03.0 +51.7 140.2 |
| 19° | 63 42.6 +53.8 146.5 | 63 17.3 +53.2 144.6 | 62 50.9 +52.5 142.7 | 62 23.3 +51.9 140.9 | 61 54.7 +51.2 139.2 |
| 20° | 64 36.4 +53.4 145.4 | 64 10.5 +52.7 143.5 | 63 43.4 +52.0 141.6 | 63 15.2 +51.3 139.8 | 62 45.9 +50.6 138.0 |
| 21° | 65 29.8 +52.9 144.4 | 65 03.2 +52.2 142.4 | 64 35.4 +51.5 140.5 | 64 06.5 +50.7 138.6 | 63 36.5 +50.1 136.9 |
| 22° | 66 22.7 +52.4 143.2 | 65 55.4 +51.6 141.2 | 65 26.9 +50.8 139.3 | 64 57.2 +50.1 137.4 | 64 26.6 +49.3 135.6 |
| 23° | 67 15.1 +51.7 142.0 | 66 47.0 +50.9 139.9 | 66 17.7 +50.1 138.0 | 65 47.3 +49.3 136.1 | 65 15.9 +48.5 134.3 |
| 24° | 68 06.8 +51.0 140.6 | 67 37.9 +50.2 138.6 | 67 07.8 +49.4 136.6 | 66 36.6 +48.6 134.7 | 66 04.4 +47.8 132.8 |
| 25° | 68 57.8 +50.3 139.2 | 68 28.1 +49.3 137.1 | 67 57.2 +48.4 135.1 | 67 25.2 +47.6 133.2 | 66 52.2 +46.7 131.3 |
| 26° | 69 48.1 +49.4 137.6 | 69 17.4 +48.5 135.5 | 68 45.6 +47.6 133.5 | 68 12.8 +46.6 131.6 | 67 38.9 +45.8 129.7 |
| 27° | 70 37.5 +48.3 136.0 | 70 05.9 +47.3 133.8 | 69 33.2 +46.4 131.8 | 68 59.4 +45.5 129.8 | 68 24.7 +44.6 128.0 |
| 28° | 71 25.8 +47.3 134.1 | 70 53.2 +46.2 132.0 | 70 19.6 +45.2 129.9 | 69 44.9 +44.2 128.0 | 69 09.3 +43.3 126.1 |
| 29° | 72 13.1 +45.9 132.2 | 71 39.4 +44.9 130.0 | 71 04.8 +43.8 127.9 | 70 29.1 +42.9 126.0 | 69 52.6 +42.0 124.1 |



## Declination SAME name as Latitude

## Latitude 42°

| 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°  | 44 17.6 +56.0 151.5 | 43 55.8 +55.7 150.2 | 43 33.2 +55.3 148.9 | 43 09.7 +55.0 147.6 | 42 45.4 +54.6 146.4 |
| 1°  | 45 13.6 +55.9 151.0 | 44 51.5 +55.5 149.6 | 44 28.5 +55.2 148.3 | 44 04.7 +54.8 147.1 | 43 40.0 +54.5 145.8 |
| 2°  | 46 09.5 +55.7 150.4 | 45 47.0 +55.4 149.1 | 45 23.7 +55.0 147.8 | 44 59.5 +54.6 146.5 | 44 34.5 +54.2 145.2 |
| 3°  | 47 05.2 +55.6 149.9 | 46 42.4 +55.2 148.5 | 46 18.7 +54.8 147.2 | 45 54.1 +54.5 145.9 | 45 28.7 +54.0 144.6 |
| 4°  | 48 00.8 +55.4 149.3 | 47 37.6 +55.0 148.0 | 47 13.5 +54.6 146.6 | 46 48.6 +54.2 145.3 | 46 22.7 +53.9 144.0 |
| 5°  | 48 56.2 +55.3 148.8 | 48 32.6 +54.9 147.4 | 48 08.1 +54.5 146.0 | 47 42.8 +54.0 144.7 | 47 16.6 +53.6 143.3 |
| 6°  | 49 51.5 +55.0 148.2 | 49 27.5 +54.6 146.7 | 49 02.6 +54.2 145.4 | 48 36.8 +53.8 144.0 | 48 10.2 +53.3 142.7 |
| 7°  | 50 46.5 +54.8 147.5 | 50 22.1 +54.4 146.1 | 49 56.8 +54.0 144.7 | 49 30.6 +53.5 143.3 | 49 03.5 +53.1 142.0 |
| 8°  | 51 41.3 +54.6 146.9 | 51 16.5 +54.2 145.4 | 50 50.8 +53.7 144.0 | 50 24.1 +53.3 142.6 | 49 56.6 +52.9 141.3 |
| 9°  | 52 35.9 +54.4 146.2 | 52 10.7 +53.9 144.7 | 51 44.5 +53.4 143.3 | 51 17.4 +53.0 141.9 | 50 49.5 +52.5 140.5 |
| 10° | 53 30.3 +54.1 145.5 | 53 04.6 +53.6 144.0 | 52 37.9 +53.2 142.6 | 52 10.4 +52.7 141.1 | 51 42.0 +52.2 139.7 |
| 11° | 54 24.4 +53.9 144.8 | 53 58.2 +53.4 143.3 | 53 31.1 +52.9 141.8 | 53 03.1 +52.4 140.4 | 52 34.2 +51.9 138.9 |
| 12° | 55 18.3 +53.5 144.0 | 54 51.6 +53.0 142.5 | 54 24.0 +52.5 141.0 | 53 55.5 +52.0 139.5 | 53 26.1 +51.5 138.1 |
| 13° | 56 11.8 +53.2 143.2 | 55 44.6 +52.7 141.7 | 55 16.5 +52.2 140.2 | 54 47.5 +51.6 138.7 | 54 17.6 +51.1 137.2 |
| 14° | 57 05.0 +52.8 142.4 | 56 37.3 +52.3 140.8 | 56 08.7 +51.7 139.3 | 55 39.1 +51.3 137.8 | 55 08.7 +50.7 136.3 |
| 15° | 57 57.8 +52.5 141.5 | 57 29.6 +51.9 139.9 | 57 00.4 +51.4 138.4 | 56 30.4 +50.8 136.8 | 55 59.4 +50.3 135.4 |
| 16° | 58 50.3 +52.1 140.6 | 58 21.5 +51.5 139.0 | 57 51.8 +50.9 137.4 | 57 21.2 +50.3 135.9 | 56 49.7 +49.8 134.4 |
| 17° | 59 42.4 +51.6 139.6 | 59 13.0 +51.0 138.0 | 58 42.7 +50.4 136.4 | 58 11.5 +49.8 134.9 | 57 39.5 +49.2 133.4 |
| 18° | 60 34.0 +51.1 138.6 | 60 04.0 +50.4 136.9 | 59 33.1 +49.8 135.3 | 59 01.3 +49.2 133.8 | 58 28.7 +48.7 132.3 |
| 19° | 61 25.1 +50.5 137.5 | 60 54.4 +49.9 135.8 | 60 22.9 +49.3 134.2 | 59 50.5 +48.7 132.7 | 59 17.4 +48.0 131.1 |
| 20° | 62 15.6 +50.0 136.3 | 61 44.3 +49.3 134.7 | 61 12.2 +48.6 133.0 | 60 39.2 +48.0 131.5 | 60 05.4 +47.4 130.0 |
| 21° | 63 05.6 +49.3 135.1 | 62 33.6 +48.7 133.4 | 62 00.8 +48.0 131.8 | 61 27.2 +47.3 130.2 | 60 52.8 +46.6 128.7 |
| 22° | 63 54.9 +48.6 133.8 | 63 22.3 +47.8 132.2 | 62 48.8 +47.2 130.5 | 62 14.5 +46.5 128.9 | 61 39.4 +45.9 127.4 |
| 23° | 64 43.5 +47.8 132.5 | 64 10.1 +47.1 130.8 | 63 36.0 +46.3 129.1 | 63 01.0 +45.7 127.6 | 62 25.3 +45.0 126.0 |
| 24° | 65 31.3 +46.9 131.1 | 64 57.2 +46.2 129.3 | 64 22.3 +45.5 127.7 | 63 46.7 +44.7 126.1 | 63 10.3 +44.1 124.6 |
| 25° | 66 18.2 +46.0 129.5 | 65 43.4 +45.2 127.8 | 65 07.8 +44.4 126.2 | 64 31.4 +43.8 124.6 | 63 54.4 +43.0 123.1 |
| 26° | 67 04.2 +44.9 127.9 | 66 28.6 +44.1 126.2 | 65 52.2 +43.4 124.6 | 65 15.2 +42.6 123.0 | 64 37.4 +42.0 121.5 |
| 27° | 67 49.1 +43.8 126.2 | 67 12.7 +43.0 124.5 | 66 35.6 +42.2 122.8 | 65 57.8 +41.5 121.3 | 65 19.4 +40.8 119.8 |
| 28° | 68 32.9 +42.5 124.3 | 67 55.7 +41.7 122.6 | 67 17.8 +40.9 121.0 | 66 39.3 +40.1 119.5 | 66 00.2 +39.5 118.0 |
| 29° | 69 15.4 +41.0 122.4 | 68 37.4 +40.2 120.7 | 67 57.7 +39.5 119.1 | 67 19.4 +38.8 117.6 | 66 39.7 +38.0 116.1 |

| 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°  | 42 20.3 +54.3 145.1 | 41 54.5 +53.8 143.9 | 41 27.8 +53.5 142.7 | 41 00.5 +53.1 141.5 | 40 32.4 +52.7 140.4 |
| 1°  | 43 14.6 +54.0 144.5 | 42 48.3 +53.7 143.3 | 42 21.3 +53.3 142.1 | 41 53.6 +52.9 140.9 | 41 25.1 +52.5 139.7 |
| 2°  | 44 08.6 +53.9 143.9 | 43 42.0 +53.4 142.7 | 43 14.6 +53.1 141.5 | 42 46.5 +52.6 140.3 | 42 17.6 +52.3 139.1 |
| 3°  | 45 02.5 +53.6 143.3 | 44 35.4 +53.3 142.1 | 44 07.7 +52.8 140.8 | 43 39.1 +52.5 139.6 | 43 09.9 +52.0 138.4 |
| 4°  | 45 56.1 +53.4 142.7 | 45 28.7 +53.0 141.4 | 45 00.5 +52.6 140.2 | 44 31.6 +52.2 138.9 | 44 01.9 +51.8 137.7 |
| 5°  | 46 49.5 +53.2 142.0 | 46 21.7 +52.8 140.7 | 45 53.1 +52.4 139.5 | 45 23.8 +51.9 138.2 | 44 53.7 +51.5 137.0 |
| 6°  | 47 42.7 +53.0 141.3 | 47 14.5 +52.5 140.0 | 46 45.5 +52.0 138.8 | 46 15.7 +51.7 137.5 | 45 45.2 +51.3 136.3 |
| 7°  | 48 35.7 +52.6 140.6 | 48 07.0 +52.2 139.3 | 47 37.5 +51.8 138.0 | 47 07.4 +51.3 136.8 | 46 36.5 +50.9 135.5 |
| 8°  | 49 28.3 +52.4 139.9 | 48 59.2 +51.9 138.6 | 48 29.3 +51.5 137.3 | 47 58.7 +51.1 136.0 | 47 27.4 +50.6 134.8 |
| 9°  | 50 20.7 +52.1 139.1 | 49 51.1 +51.7 137.8 | 49 20.8 +51.2 136.5 | 48 49.8 +50.7 135.2 | 48 18.0 +50.3 134.0 |
| 10° | 51 12.8 +51.7 138.4 | 50 42.8 +51.2 137.0 | 50 12.0 +50.8 135.7 | 49 40.5 +50.3 134.4 | 49 08.3 +49.9 133.1 |
| 11° | 52 04.5 +51.4 137.5 | 51 34.0 +51.0 136.2 | 51 02.8 +50.4 134.9 | 50 30.8 +50.0 133.6 | 49 58.2 +49.5 132.3 |
| 12° | 52 55.9 +51.0 136.7 | 52 25.0 +50.5 135.3 | 51 53.2 +50.1 134.0 | 51 20.8 +49.6 132.7 | 50 47.7 +49.1 131.4 |
| 13° | 53 46.9 +50.7 135.8 | 53 15.5 +50.1 134.4 | 52 43.3 +49.6 133.1 | 52 10.4 +49.1 131.8 | 51 36.8 +48.6 130.5 |
| 14° | 54 37.6 +50.1 134.9 | 54 05.6 +49.6 133.5 | 53 32.9 +49.1 132.1 | 52 59.5 +48.6 130.8 | 52 25.4 +48.2 129.5 |
| 15° | 55 27.7 +49.7 133.9 | 54 55.2 +49.2 132.5 | 54 22.0 +48.7 131.2 | 53 48.1 +48.2 129.8 | 53 13.6 +47.6 128.5 |
| 16° | 56 17.4 +49.3 132.9 | 55 44.4 +48.7 131.5 | 55 10.7 +48.1 130.2 | 54 36.3 +47.6 128.8 | 54 01.2 +47.1 127.5 |
| 17° | 57 06.7 +48.6 131.9 | 56 33.1 +48.1 130.5 | 55 58.8 +47.6 129.1 | 55 23.9 +47.1 127.8 | 54 48.3 +46.6 126.4 |
| 18° | 57 55.3 +48.1 130.8 | 57 21.2 +47.5 129.4 | 56 46.4 +47.0 128.0 | 56 11.0 +46.4 126.7 | 55 34.9 +45.9 125.3 |
| 19° | 58 43.4 +47.5 129.7 | 58 08.7 +46.9 128.2 | 57 33.4 +46.3 126.9 | 56 57.4 +45.8 125.5 | 56 20.8 +45.2 124.2 |
| 20° | 59 30.9 +46.7 128.5 | 58 55.6 +46.2 127.0 | 58 19.7 +45.6 125.7 | 57 43.2 +45.0 124.3 | 57 06.0 +44.6 123.0 |
| 21° | 60 17.6 +46.1 127.2 | 59 41.8 +45.4 125.8 | 59 05.3 +44.9 124.4 | 58 28.2 +44.3 123.1 | 57 50.6 +43.8 121.7 |
| 22° | 61 03.7 +45.2 125.9 | 60 27.2 +44.7 124.5 | 59 50.2 +44.0 123.1 | 59 12.5 +43.5 121.8 | 58 34.4 +42.9 120.4 |
| 23° | 61 48.9 +44.4 124.5 | 61 11.9 +43.7 123.1 | 60 34.2 +43.2 121.7 | 59 56.0 +42.6 120.4 | 59 17.3 +42.1 119.1 |
| 24° | 62 33.3 +43.4 123.1 | 61 55.6 +42.8 121.7 | 61 17.4 +42.2 120.3 | 60 38.6 +41.7 119.0 | 59 59.4 +41.1 117.7 |
| 25° | 63 16.7 +42.4 121.6 | 62 38.4 +41.8 120.2 | 61 59.6 +41.2 118.8 | 61 20.3 +40.7 117.5 | 60 40.5 +40.1 116.2 |
| 26° | 63 59.1 +41.3 120.0 | 63 20.2 +40.7 118.6 | 62 40.0 +40.1 117.2 | 62 01.0 +39.5 115.9 | 61 20.6 +39.1 114.7 |
| 27° | 64 40.4 +40.2 118.3 | 64 00.9 +39.5 116.9 | 63 20.9 +39.0 115.6 | 62 40.5 +38.4 114.3 | 61 59.7 +37.9 113.1 |
| 28° | 65 20.6 +38.8 116.6 | 64 40.4 +38.3 115.2 | 63 59.9 +37.6 113.9 | 63 18.9 +37.1 112.6 | 62 37.6 +36.6 111.4 |
| 29° | 65 59.4 +37.4 114.7 | 65 18.7 +36.8 113.4 | 64 37.5 +36.3 112.1 | 63 56.0 +35.8 110.9 | 63 14.2 +35.3 109.7 |

| Dec | LHA 030° / 330°     | LHA 031° / 329°     | LHA 032° / 328°     | LHA 033° / 327°     | LHA 034° / 326°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 40 03.6 +52.3 139.2 | 39 34.1 +52.0 138.1 | 39 04.0 +51.6 137.0 | 38 33.2 +51.3 135.9 | 38 01.9 +50.8 134.8 |
| 1°  | 40 55.9 +52.1 138.6 | 40 26.1 +51.7 137.4 | 39 55.6 +51.4 136.3 | 39 24.5 +51.0 135.2 | 38 52.7 +50.7 134.1 |
| 2°  | 41 48.0 +51.9 137.9 | 41 17.8 +51.5 136.8 | 40 47.0 +51.1 135.6 | 40 15.5 +50.7 134.5 | 39 43.4 +50.3 133.4 |
| 3°  | 42 39.9 +51.7 137.2 | 42 09.3 +51.3 136.1 | 41 38.1 +50.8 134.9 | 41 06.2 +50.5 133.8 | 40 33.7 +50.1 132.7 |
| 4°  | 43 31.6 +51.4 136.5 | 43 00.6 +51.0 135.4 | 42 28.9 +50.6 134.2 | 41 56.7 +50.2 133.1 | 41 23.8 +49.8 132.0 |
| 5°  | 44 23.0 +51.1 135.8 | 43 51.6 +50.7 134.6 | 43 19.5 +50.3 133.5 | 42 46.9 +49.9 132.3 | 42 13.6 +49.5 131.2 |
| 6°  | 45 14.1 +50.8 135.1 | 44 42.3 +50.4 133.9 | 44 09.8 +50.0 132.7 | 43 36.8 +49.6 131.6 | 43 03.1 +49.2 130.4 |
| 7°  | 46 04.9 +50.5 134.3 | 45 32.7 +50.1 133.1 | 44 59.8 +49.7 131.9 | 44 26.4 +49.2 130.8 | 43 52.3 +48.9 129.7 |
| 8°  | 46 55.4 +50.2 133.5 | 46 22.8 +49.7 132.3 | 45 49.5 +49.3 131.1 | 45 15.6 +48.9 130.0 | 44 41.2 +48.5 128.8 |
| 9°  | 47 45.6 +49.8 132.7 | 47 12.5 +49.4 131.5 | 46 38.8 +49.0 130.3 | 46 04.5 +48.6 129.2 | 45 29.7 +48.1 128.0 |
| 10° | 48 35.4 +49.5 131.9 | 48 01.9 +49.0 130.7 | 47 27.8 +48.6 129.5 | 46 53.1 +48.1 128.3 | 46 17.8 +47.7 127.2 |
| 11° | 49 24.9 +49.0 131.0 | 48 50.9 +48.6 129.8 | 48 16.4 +48.1 128.6 | 47 41.2 +47.8 127.4 | 47 05.5 +47.4 126.3 |
| 12° | 50 13.9 +48.6 130.1 | 49 39.5 +48.2 128.9 | 49 04.5 +47.7 127.7 | 48 29.0 +47.2 126.5 | 47 52.9 +46.8 125.4 |
| 13° | 51 02.5 +48.2 129.2 | 50 27.7 +47.7 128.0 | 49 52.2 +47.3 126.8 | 49 16.2 +46.9 125.6 | 48 39.7 +46.4 124.4 |
| 14° | 51 50.7 +47.7 128.3 | 51 15.4 +47.2 127.0 | 50 39.5 +46.8 125.8 | 50 03.1 +46.3 124.6 | 49 26.1 +45.9 123.5 |
| 15° | 52 38.4 +47.2 127.3 | 52 02.6 +46.7 126.0 | 51 26.3 +46.2 124.8 | 50 49.4 +45.8 123.6 | 50 12.0 +45.4 122.5 |
| 16° | 53 25.6 +46.6 126.2 | 52 49.3 +46.2 125.0 | 52 12.5 +45.7 123.8 | 51 35.2 +45.2 122.6 | 50 57.4 +44.8 121.4 |
| 17° | 54 12.2 +46.0 125.2 | 53 35.5 +45.5 123.9 | 52 58.2 +45.1 122.7 | 52 20.4 +44.7 121.5 | 51 42.2 +44.2 120.4 |
| 18° | 54 58.2 +45.4 124.1 | 54 21.0 +44.9 122.8 | 53 43.3 +44.4 121.6 | 53 05.1 +44.0 120.4 | 52 26.4 +43.6 119.3 |
| 19° | 55 43.6 +44.8 122.9 | 55 05.9 +44.3 121.7 | 54 27.7 +43.8 120.5 | 53 49.1 +43.3 119.3 | 53 10.0 +42.9 118.1 |
| 20° | 56 28.4 +44.0 121.7 | 55 50.2 +43.5 120.5 | 55 11.5 +43.1 119.3 | 54 32.4 +42.6 118.1 | 53 52.9 +42.2 116.9 |
| 21° | 57 12.4 +43.3 120.5 | 56 33.7 +42.8 119.2 | 55 54.6 +42.3 118.0 | 55 15.0 +41.9 116.9 | 54 35.1 +41.4 115.7 |
| 22° | 57 55.7 +42.4 119.2 | 57 16.5 +42.0 118.0 | 56 36.9 +41.5 116.8 | 55 56.9 +41.0 115.6 | 55 16.5 +40.6 114.5 |
| 23° | 58 38.1 +41.6 117.8 | 57 58.5 +41.0 116.6 | 57 18.4 +40.6 115.4 | 56 37.9 +40.2 114.3 | 55 57.1 +39.8 113.2 |
| 24° | 59 19.7 +40.6 116.4 | 58 39.5 +40.2 115.2 | 57 59.0 +39.7 114.1 | 57 18.1 +39.3 112.9 | 56 36.9 +38.9 111.8 |
| 25° | 60 00.3 +39.6 115.0 | 59 19.7 +39.2 113.8 | 58 38.7 +38.7 112.6 | 57 57.4 +38.3 111.5 | 57 15.8 +37.9 110.4 |
| 26° | 60 39.9 +38.6 113.5 | 59 58.9 +38.1 112.3 | 59 17.4 +37.7 111.1 | 58 35.7 +37.3 110.0 | 57 53.7 +36.8 109.0 |
| 27° | 61 18.5 +37.4 111.9 | 60 37.0 +36.9 110.7 | 59 55.1 +36.5 109.6 | 59 13.0 +36.1 108.5 | 58 30.5 +35.9 107.5 |
| 28° | 61 55.9 +36.2 110.2 | 61 13.9 +35.8 109.1 | 60 31.6 +35.4 108.0 | 59 49.1 +35.0 107.0 | 59 06.4 +34.6 105.9 |
| 29° | 62 32.1 +34.9 108.5 | 61 49.7 +34.4 107.4 | 61 07.0 +34.1 106.4 | 60 24.1 +33.8 105.3 | 59 41.0 +33.4 104.3 |

| 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°  | 37 29.9 +50.5 133.7 | 36 57.4 +50.1 132.6 | 36 24.4 +49.7 131.6 | 35 50.7 +49.5 130.6 | 35 16.6 +49.1 129.6 |
| 1°  | 38 20.4 +50.3 133.0 | 37 47.5 +49.9 132.0 | 37 14.1 +49.5 130.9 | 36 40.2 +49.1 129.9 | 36 05.7 +48.8 128.9 |
| 2°  | 39 10.7 +50.0 132.3 | 38 37.4 +49.6 131.2 | 38 03.6 +49.3 130.2 | 37 29.3 +48.9 129.2 | 36 54.5 +48.5 128.1 |
| 3°  | 40 00.7 +49.7 131.6 | 39 27.0 +49.4 130.5 | 38 52.9 +48.9 129.5 | 38 18.2 +48.6 128.4 | 37 43.0 +48.3 127.4 |
| 4°  | 40 50.4 +49.4 130.9 | 40 16.4 +49.0 129.8 | 39 41.8 +48.7 128.7 | 39 06.8 +48.3 127.7 | 38 31.3 +47.9 126.6 |
| 5°  | 41 39.8 +49.1 130.1 | 41 05.4 +48.8 129.0 | 40 30.5 +48.4 128.0 | 39 55.1 +48.0 126.9 | 39 19.2 +47.6 125.9 |
| 6°  | 42 28.9 +48.8 129.3 | 41 54.2 +48.4 128.2 | 41 18.9 +48.0 127.2 | 40 43.1 +47.7 126.1 | 40 06.8 +47.3 125.1 |
| 7°  | 43 17.7 +48.5 128.5 | 42 42.6 +48.0 127.4 | 42 06.9 +47.7 126.4 | 41 30.8 +47.3 125.3 | 40 54.1 +47.0 124.3 |
| 8°  | 44 06.2 +48.1 127.7 | 43 30.6 +47.8 126.6 | 42 54.6 +47.3 125.5 | 42 18.1 +46.9 124.5 | 41 41.1 +46.6 123.4 |
| 9°  | 44 54.3 +47.7 126.9 | 44 18.4 +47.3 125.8 | 43 41.9 +47.0 124.7 | 43 05.0 +46.6 123.6 | 42 27.7 +46.2 122.6 |
| 10° | 45 42.0 +47.3 126.0 | 45 05.7 +46.9 124.9 | 44 28.9 +46.5 123.8 | 43 51.6 +46.2 122.8 | 43 13.9 +45.8 121.7 |
| 11° | 46 29.3 +46.9 125.1 | 45 52.6 +46.5 124.0 | 45 15.4 +46.1 122.9 | 44 37.8 +45.7 121.9 | 43 59.7 +45.4 120.8 |
| 12° | 47 16.2 +46.5 124.2 | 46 39.1 +46.1 123.1 | 46 01.5 +45.7 122.0 | 45 23.5 +45.3 121.0 | 44 45.1 +44.9 119.9 |
| 13° | 48 02.7 +46.0 123.3 | 47 25.2 +45.6 122.2 | 46 47.2 +45.2 121.1 | 46 08.8 +44.8 120.0 | 45 30.0 +44.5 119.0 |
| 14° | 48 48.7 +45.5 122.3 | 48 10.8 +45.0 121.2 | 47 32.4 +44.7 120.1 | 46 53.6 +44.3 119.1 | 46 14.5 +43.9 118.0 |
| 15° | 49 34.2 +44.9 121.3 | 48 55.8 +44.6 120.2 | 48 17.1 +44.1 119.1 | 47 37.9 +43.8 118.1 | 46 58.4 +43.4 117.0 |
| 16° | 50 19.1 +44.4 120.3 | 49 40.4 +44.0 119.2 | 49 01.2 +43.6 118.1 | 48 21.7 +43.2 117.0 | 47 41.8 +42.9 116.0 |
| 17° | 51 03.5 +43.8 119.2 | 50 24.4 +43.4 118.1 | 49 44.8 +43.0 117.0 | 49 04.9 +42.7 116.0 | 48 24.7 +42.3 115.0 |
| 18° | 51 47.3 +43.1 118.1 | 51 07.8 +42.7 117.0 | 50 27.8 +42.4 116.0 | 49 47.6 +42.0 114.9 | 49 07.0 +41.6 113.9 |
| 19° | 52 30.4 +42.5 117.0 | 51 50.5 +42.1 115.9 | 51 10.2 +41.7 114.8 | 50 29.6 +41.3 113.8 | 49 48.6 +41.0 112.8 |
| 20° | 53 12.9 +41.8 115.8 | 52 32.6 +41.4 114.7 | 51 51.9 +41.1 113.7 | 51 10.9 +40.7 112.6 | 50 29.6 +40.4 111.6 |
| 21° | 53 54.7 +41.0 114.6 | 53 14.0 +40.6 113.5 | 52 33.0 +40.2 112.5 | 51 51.6 +39.9 111.5 | 51 10.0 +39.6 110.5 |
| 22° | 54 35.7 +40.3 113.4 | 53 54.6 +39.9 112.3 | 53 13.2 +39.5 111.3 | 52 31.5 +39.2 110.2 | 51 49.6 +38.8 109.2 |
| 23° | 55 16.0 +39.3 112.1 | 54 34.5 +39.0 111.0 | 53 52.7 +38.7 110.0 | 53 10.7 +38.3 109.0 | 52 28.4 +38.0 108.0 |
| 24° | 55 55.3 +38.5 110.7 | 55 13.5 +38.1 109.7 | 54 31.4 +37.8 108.7 | 53 49.0 +37.5 107.7 | 53 06.4 +37.2 106.7 |
| 25° | 56 33.8 +37.6 109.4 | 55 51.6 +37.2 108.3 | 55 09.2 +36.9 107.3 | 54 26.5 +36.6 106.4 | 53 43.6 +36.3 105.4 |
| 26° | 57 11.4 +36.5 107.9 | 56 28.8 +36.2 106.9 | 55 46.1 +35.9 105.9 | 55 03.1 +35.6 105.0 | 54 19.9 +35.4 104.1 |
| 27° | 57 47.9 +35.5 106.5 | 57 05.0 +35.2 105.5 | 56 22.0 +34.8 104.5 | 55 38.7 +34.6 103.6 | 54 55.3 +34.3 102.7 |
| 28° | 58 23.4 +34.3 104.9 | 57 40.2 +34.0 104.0 | 56 56.8 +33.8 103.0 | 56 13.3 +33.6 102.1 | 55 29.6 +33.4 101.2 |
| 29° | 58 57.7 +33.2 103.4 | 58 14.2 +32.9 102.4 | 57 30.6 +32.7 101.5 | 56 46.9 +32.4 100.6 | 56 03.0 +32.2 99.7  |

| 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°  | 34 42.0 +48.7 128.6 | 34 06.9 +48.4 127.6 | 33 31.3 +48.1 126.6 | 32 55.3 +47.7 125.7 | 32 18.9 +47.4 124.7 |
| 1°  | 35 30.7 +48.5 127.9 | 34 55.3 +48.1 126.9 | 34 19.4 +47.8 125.9 | 33 43.0 +47.5 124.9 | 33 06.3 +47.1 124.0 |
| 2°  | 36 19.2 +48.2 127.1 | 35 43.4 +47.8 126.1 | 35 07.2 +47.5 125.2 | 34 30.5 +47.2 124.2 | 33 53.4 +46.8 123.2 |
| 3°  | 37 07.4 +47.8 126.4 | 36 31.2 +47.6 125.4 | 35 54.7 +47.2 124.4 | 35 17.7 +46.8 123.4 | 34 40.2 +46.6 122.5 |
| 4°  | 37 55.2 +47.6 125.6 | 37 18.8 +47.2 124.6 | 36 41.9 +46.9 123.6 | 36 04.5 +46.6 122.7 | 35 26.8 +46.3 121.7 |
| 5°  | 38 42.8 +47.3 124.8 | 38 06.0 +47.0 123.8 | 37 28.8 +46.6 122.9 | 36 51.1 +46.3 121.9 | 36 13.1 +45.9 120.9 |
| 6°  | 39 30.1 +47.0 124.1 | 38 53.0 +46.6 123.1 | 38 15.4 +46.3 122.1 | 37 37.4 +45.9 121.1 | 36 59.0 +45.6 120.1 |
| 7°  | 40 17.1 +46.6 123.2 | 39 39.6 +46.2 122.2 | 39 01.7 +45.9 121.2 | 38 23.3 +45.6 120.3 | 37 44.6 +45.3 119.3 |
| 8°  | 41 03.7 +46.2 122.4 | 40 25.8 +45.9 121.4 | 39 47.6 +45.5 120.4 | 39 08.9 +45.3 119.4 | 38 29.9 +44.9 118.5 |
| 9°  | 41 49.9 +45.9 121.6 | 41 11.7 +45.5 120.6 | 40 33.1 +45.2 119.6 | 39 54.2 +44.8 118.6 | 39 14.8 +44.6 117.6 |
| 10° | 42 35.8 +45.4 120.7 | 41 57.2 +45.1 119.7 | 41 18.3 +44.8 118.7 | 40 39.0 +44.5 117.7 | 39 59.4 +44.1 116.8 |
| 11° | 43 21.2 +45.0 119.8 | 42 42.3 +44.7 118.8 | 42 03.1 +44.3 117.8 | 41 23.5 +44.0 116.8 | 40 43.5 +43.7 115.9 |
| 12° | 44 06.2 +44.6 118.9 | 43 27.0 +44.2 117.9 | 42 47.4 +43.9 116.9 | 42 07.5 +43.6 115.9 | 41 27.2 +43.3 115.0 |
| 13° | 44 50.8 +44.1 117.9 | 44 11.2 +43.8 116.9 | 43 31.3 +43.4 116.0 | 42 51.1 +43.1 115.0 | 42 10.5 +42.8 114.0 |
| 14° | 45 34.9 +43.6 117.0 | 44 55.0 +43.3 116.0 | 44 14.7 +43.0 115.0 | 43 34.2 +42.6 114.0 | 42 53.3 +42.3 113.1 |
| 15° | 46 18.5 +43.1 116.0 | 45 38.3 +42.7 115.0 | 44 57.7 +42.4 114.0 | 44 16.8 +42.1 113.1 | 43 35.6 +41.9 112.1 |
| 16° | 47 01.6 +42.5 115.0 | 46 21.0 +42.2 114.0 | 45 40.1 +41.9 113.0 | 44 58.9 +41.6 112.1 | 44 17.5 +41.3 111.1 |
| 17° | 47 44.1 +41.9 113.9 | 47 03.2 +41.6 112.9 | 46 22.0 +41.3 112.0 | 45 40.5 +41.0 111.0 | 44 58.8 +40.7 110.1 |
| 18° | 48 26.0 +41.4 112.9 | 47 44.8 +41.0 111.9 | 47 03.3 +40.7 110.9 | 46 21.5 +40.4 110.0 | 45 39.5 +40.1 109.1 |
| 19° | 49 07.4 +40.7 111.8 | 48 25.8 +40.4 110.8 | 47 44.0 +40.1 109.8 | 47 01.9 +39.8 108.9 | 46 19.6 +39.6 108.0 |
| 20° | 49 48.1 +40.0 110.6 | 49 06.2 +39.7 109.7 | 48 24.1 +39.4 108.7 | 47 41.7 +39.2 107.8 | 46 59.2 +38.9 106.9 |
| 21° | 50 28.1 +39.3 109.5 | 49 45.9 +39.0 108.5 | 49 03.5 +38.7 107.6 | 48 20.9 +38.5 106.7 | 47 38.1 +38.2 105.8 |
| 22° | 51 07.4 +38.5 108.3 | 50 24.9 +38.3 107.3 | 49 42.2 +38.0 106.4 | 48 59.4 +37.7 105.5 | 48 16.3 +37.5 104.6 |
| 23° | 51 45.9 +37.7 107.1 | 51 03.2 +37.4 106.1 | 50 20.2 +37.2 105.2 | 49 37.1 +37.0 104.3 | 48 53.8 +36.8 103.4 |
| 24° | 52 23.6 +36.9 105.8 | 51 40.6 +36.7 104.9 | 50 57.4 +36.5 104.0 | 50 14.1 +36.2 103.1 | 49 30.6 +36.0 102.2 |
| 25° | 53 00.5 +36.1 104.5 | 52 17.3 +35.8 103.6 | 51 33.9 +35.5 102.7 | 50 50.3 +35.4 101.8 | 50 06.6 +35.2 101.0 |
| 26° | 53 36.6 +35.1 103.1 | 52 53.1 +34.9 102.3 | 52 09.4 +34.7 101.4 | 51 25.7 +34.5 100.5 | 50 41.8 +34.3 99.7  |
| 27° | 54 11.7 +34.1 101.8 | 53 28.0 +33.9 100.9 | 52 44.1 +33.8 100.1 | 52 00.2 +33.6 99.2  | 51 16.1 +33.5 98.4  |
| 28° | 54 45.8 +33.2 100.4 | 54 01.9 +33.0 99.5  | 53 17.9 +32.8 98.7  | 52 33.8 +32.6 97.9  | 51 49.6 +32.5 97.1  |
| 29° | 55 19.0 +32.0 98.9  | 54 34.9 +31.9 98.1  | 53 50.7 +31.8 97.3  | 53 06.4 +31.7 96.5  | 52 22.1 +31.5 95.7  |

| 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°  | 31 42.0 +47.1 123.8 | 31 04.8 +46.7 122.9 | 30 27.1 +46.5 122.0 | 29 49.1 +46.2 121.1 | 29 10.8 +45.8 120.2 |
| 1°  | 32 29.1 +46.8 123.1 | 31 51.5 +46.5 122.1 | 31 13.6 +46.2 121.2 | 30 35.3 +45.9 120.3 | 29 56.6 +45.6 119.4 |
| 2°  | 33 15.9 +46.5 122.3 | 32 38.0 +46.3 121.4 | 31 59.8 +45.9 120.5 | 31 21.2 +45.6 119.6 | 30 42.2 +45.4 118.7 |
| 3°  | 34 02.4 +46.3 121.6 | 33 24.3 +45.9 120.6 | 32 45.7 +45.7 119.7 | 32 06.8 +45.4 118.8 | 31 27.6 +45.0 117.9 |
| 4°  | 34 48.7 +45.9 120.8 | 34 10.2 +45.6 119.9 | 33 31.4 +45.3 118.9 | 32 52.2 +45.0 118.0 | 32 12.6 +44.8 117.1 |
| 5°  | 35 34.6 +45.7 120.0 | 34 55.8 +45.4 119.1 | 34 16.7 +45.0 118.2 | 33 37.2 +44.8 117.2 | 32 57.4 +44.5 116.4 |
| 6°  | 36 20.3 +45.3 119.2 | 35 41.2 +45.0 118.3 | 35 01.7 +44.8 117.3 | 34 22.0 +44.4 116.4 | 33 41.9 +44.2 115.6 |
| 7°  | 37 05.6 +45.0 118.4 | 36 26.2 +44.7 117.4 | 35 46.5 +44.3 116.5 | 35 06.4 +44.1 115.6 | 34 26.1 +43.8 114.7 |
| 8°  | 37 50.6 +44.6 117.5 | 37 10.9 +44.3 116.6 | 36 30.8 +44.0 115.7 | 35 50.5 +43.7 114.8 | 35 09.9 +43.5 113.9 |
| 9°  | 38 35.2 +44.2 116.7 | 37 55.2 +43.9 115.8 | 37 14.8 +43.7 114.8 | 36 34.2 +43.4 113.9 | 35 53.4 +43.1 113.1 |
| 10° | 39 19.4 +43.8 115.8 | 38 39.1 +43.5 114.9 | 37 58.5 +43.3 114.0 | 37 17.6 +43.0 113.1 | 36 36.5 +42.7 112.2 |
| 11° | 40 03.2 +43.4 114.9 | 39 22.6 +43.2 114.0 | 38 41.8 +42.8 113.1 | 38 00.6 +42.6 112.2 | 37 19.2 +42.3 111.3 |
| 12° | 40 46.6 +43.0 114.0 | 40 05.8 +42.7 113.1 | 39 24.6 +42.4 112.2 | 38 43.2 +42.2 111.3 | 38 01.5 +42.0 110.4 |
| 13° | 41 29.6 +42.5 113.1 | 40 48.5 +42.2 112.2 | 40 07.0 +42.0 111.3 | 39 25.4 +41.7 110.4 | 38 43.5 +41.4 109.5 |
| 14° | 42 12.1 +42.1 112.2 | 41 30.7 +41.8 111.2 | 40 49.0 +41.5 110.3 | 40 07.1 +41.3 109.5 | 39 24.9 +41.1 108.6 |
| 15° | 42 54.2 +41.5 111.2 | 42 12.5 +41.3 110.3 | 41 30.5 +41.1 109.4 | 40 48.4 +40.8 108.5 | 40 06.0 +40.5 107.6 |
| 16° | 43 35.7 +41.1 110.2 | 42 53.8 +40.7 109.3 | 42 11.6 +40.5 108.4 | 41 29.2 +40.2 107.5 | 40 46.5 +40.1 106.7 |
| 17° | 44 16.8 +40.4 109.2 | 43 34.5 +40.2 108.3 | 42 52.1 +40.0 107.4 | 42 09.4 +39.8 106.5 | 41 26.6 +39.5 105.7 |
| 18° | 44 57.2 +39.9 108.1 | 44 14.7 +39.7 107.2 | 43 32.1 +39.4 106.4 | 42 49.2 +39.2 105.5 | 42 06.1 +39.0 104.7 |
| 19° | 45 37.1 +39.3 107.1 | 44 54.4 +39.1 106.2 | 44 11.5 +38.8 105.3 | 43 28.4 +38.6 104.5 | 42 45.1 +38.5 103.6 |
| 20° | 46 16.4 +38.7 106.0 | 45 33.5 +38.4 105.1 | 44 50.3 +38.3 104.3 | 44 07.0 +38.1 103.4 | 43 23.6 +37.8 102.6 |
| 21° | 46 55.1 +38.0 104.9 | 46 11.9 +37.8 104.0 | 45 28.6 +37.5 103.2 | 44 45.1 +37.4 102.3 | 44 01.4 +37.3 101.5 |
| 22° | 47 33.1 +37.3 103.7 | 46 49.7 +37.1 102.9 | 46 06.1 +37.0 102.0 | 45 22.5 +36.7 101.2 | 44 38.7 +36.6 100.4 |
| 23° | 48 10.4 +36.5 102.6 | 47 26.8 +36.4 101.7 | 46 43.1 +36.2 100.9 | 45 59.2 +36.1 100.1 | 45 15.3 +35.9 99.3  |
| 24° | 48 46.9 +35.9 101.4 | 48 03.2 +35.6 100.5 | 47 19.3 +35.5 99.7  | 46 35.3 +35.3 98.9  | 45 51.2 +35.2 98.2  |
| 25° | 49 22.8 +35.0 100.2 | 48 38.8 +34.9 99.3  | 47 54.8 +34.7 98.5  | 47 10.6 +34.6 97.8  | 46 26.4 +34.5 97.0  |
| 26° | 49 57.8 +34.2 98.9  | 49 13.7 +34.0 98.1  | 48 29.5 +33.9 97.3  | 47 45.2 +33.9 96.5  | 47 00.9 +33.7 95.8  |
| 27° | 50 32.0 +33.3 97.6  | 49 47.7 +33.2 96.8  | 49 03.4 +33.1 96.1  | 48 19.1 +33.0 95.3  | 47 34.6 +33.0 94.6  |
| 28° | 51 05.3 +32.4 96.3  | 50 20.9 +32.3 95.5  | 49 36.5 +32.3 94.8  | 48 52.1 +32.1 94.0  | 48 07.6 +32.1 93.3  |
| 29° | 51 37.7 +31.5 94.9  | 50 53.2 +31.4 94.2  | 50 08.8 +31.3 93.5  | 49 24.2 +31.3 92.8  | 48 39.7 +31.2 92.1  |

| 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°  | 28 32.1 +45.5 119.3 | 27 53.0 +45.3 118.5 | 27 13.7 +45.0 117.6 | 26 34.0 +44.8 116.8 | 25 54.0 +44.5 115.9 |
| 1°  | 29 17.6 +45.4 118.6 | 28 38.3 +45.1 117.7 | 27 58.7 +44.8 116.9 | 27 18.8 +44.5 116.0 | 26 38.5 +44.3 115.2 |
| 2°  | 30 03.0 +45.0 117.8 | 29 23.4 +44.8 117.0 | 28 43.5 +44.5 116.1 | 28 03.3 +44.3 115.3 | 27 22.8 +44.1 114.4 |
| 3°  | 30 48.0 +44.8 117.1 | 30 08.2 +44.5 116.2 | 29 28.0 +44.3 115.3 | 28 47.6 +44.0 114.5 | 28 06.9 +43.7 113.7 |
| 4°  | 31 32.8 +44.5 116.3 | 30 52.7 +44.2 115.4 | 30 12.3 +44.0 114.6 | 29 31.6 +43.7 113.7 | 28 50.6 +43.5 112.9 |
| 5°  | 32 17.3 +44.2 115.5 | 31 36.9 +44.0 114.6 | 30 56.3 +43.6 113.8 | 30 15.3 +43.5 112.9 | 29 34.1 +43.2 112.1 |
| 6°  | 33 01.5 +43.9 114.7 | 32 20.9 +43.6 113.8 | 31 39.9 +43.4 113.0 | 30 58.8 +43.1 112.1 | 30 17.3 +42.9 111.3 |
| 7°  | 33 45.4 +43.6 113.9 | 33 04.5 +43.3 113.0 | 32 23.3 +43.1 112.1 | 31 41.9 +42.8 111.3 | 31 00.2 +42.7 110.5 |
| 8°  | 34 29.0 +43.2 113.0 | 33 47.8 +43.0 112.2 | 33 06.4 +42.7 111.3 | 32 24.7 +42.5 110.5 | 31 42.9 +42.2 109.6 |
| 9°  | 35 12.2 +42.9 112.2 | 34 30.8 +42.6 111.3 | 33 49.1 +42.4 110.5 | 33 07.2 +42.2 109.6 | 32 25.1 +42.0 108.8 |
| 10° | 35 55.1 +42.4 111.3 | 35 13.4 +42.2 110.5 | 34 31.5 +42.0 109.6 | 33 49.4 +41.8 108.8 | 33 07.1 +41.6 108.0 |
| 11° | 36 37.5 +42.1 110.5 | 35 55.6 +41.9 109.6 | 35 13.5 +41.7 108.8 | 34 31.2 +41.4 107.9 | 33 48.7 +41.2 107.1 |
| 12° | 37 19.6 +41.7 109.6 | 36 37.5 +41.5 108.7 | 35 55.2 +41.2 107.9 | 35 12.6 +41.1 107.0 | 34 29.9 +40.9 106.2 |
| 13° | 38 01.3 +41.3 108.6 | 37 19.0 +41.0 107.8 | 36 36.4 +40.8 107.0 | 35 53.7 +40.6 106.1 | 35 10.8 +40.4 105.3 |
| 14° | 38 42.6 +40.8 107.7 | 38 00.0 +40.6 106.9 | 37 17.2 +40.4 106.0 | 36 34.3 +40.2 105.2 | 35 51.2 +40.0 104.4 |
| 15° | 39 23.4 +40.3 106.8 | 38 40.6 +40.1 105.9 | 37 57.6 +40.0 105.1 | 37 14.5 +39.8 104.3 | 36 31.2 +39.6 103.5 |
| 16° | 40 03.7 +39.9 105.8 | 39 20.7 +39.7 105.0 | 38 37.6 +39.5 104.2 | 37 54.3 +39.3 103.4 | 37 10.8 +39.2 102.6 |
| 17° | 40 43.6 +39.3 104.8 | 40 00.4 +39.2 104.0 | 39 17.1 +38.9 103.2 | 38 33.6 +38.8 102.4 | 37 50.0 +38.6 101.6 |
| 18° | 41 22.9 +38.8 103.8 | 40 39.6 +38.6 103.0 | 39 56.0 +38.5 102.2 | 39 12.4 +38.3 101.4 | 38 28.6 +38.2 100.6 |
| 19° | 42 01.7 +38.3 102.8 | 41 18.2 +38.1 102.0 | 40 34.5 +38.0 101.2 | 39 50.7 +37.8 100.4 | 39 06.8 +37.7 99.6  |
| 20° | 42 40.0 +37.7 101.8 | 41 56.3 +37.5 101.0 | 41 12.5 +37.3 100.2 | 40 28.5 +37.3 99.4  | 39 44.5 +37.1 98.6  |
| 21° | 43 17.7 +37.1 100.7 | 42 33.8 +37.0 99.9  | 41 49.8 +36.8 99.1  | 41 05.8 +36.7 98.4  | 40 21.6 +36.6 97.6  |
| 22° | 43 54.8 +36.4 99.6  | 43 10.8 +36.3 98.8  | 42 26.6 +36.3 98.1  | 41 42.5 +36.1 97.3  | 40 58.2 +36.0 96.6  |
| 23° | 44 31.2 +35.8 98.5  | 43 47.1 +35.6 97.7  | 43 02.9 +35.5 97.0  | 42 18.6 +35.4 96.2  | 41 34.2 +35.4 95.5  |
| 24° | 45 07.0 +35.1 97.4  | 44 22.7 +35.1 96.6  | 43 38.4 +34.9 95.9  | 42 54.0 +34.9 95.1  | 42 09.6 +34.8 94.4  |
| 25° | 45 42.1 +34.4 96.2  | 44 57.8 +34.3 95.5  | 44 13.3 +34.3 94.7  | 43 28.9 +34.2 94.0  | 42 44.4 +34.1 93.3  |
| 26° | 46 16.5 +33.7 95.0  | 45 32.1 +33.6 94.3  | 44 47.6 +33.5 93.6  | 44 03.1 +33.5 92.9  | 43 18.5 +33.5 92.2  |
| 27° | 46 50.2 +32.8 93.8  | 46 05.7 +32.8 93.1  | 45 21.1 +32.8 92.4  | 44 36.6 +32.7 91.7  | 43 52.0 +32.7 91.0  |
| 28° | 47 23.0 +32.1 92.6  | 46 38.5 +32.0 91.9  | 45 53.9 +32.0 91.2  | 45 09.3 +32.1 90.5  | 44 24.7 +32.1 89.9  |
| 29° | 47 55.1 +31.3 91.4  | 47 10.5 +31.3 90.7  | 46 25.9 +31.3 90.0  | 45 41.4 +31.2 89.3  | 44 56.8 +31.3 88.7  |

| 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°  | 25 13.8 +44.3 115.1 | 24 33.3 +44.0 114.3 | 23 52.5 +43.8 113.5 | 23 11.5 +43.6 112.7 | 22 30.2 +43.4 111.9 |
| 1°  | 25 58.1 +44.0 114.4 | 25 17.3 +43.8 113.5 | 24 36.3 +43.6 112.7 | 23 55.1 +43.3 111.9 | 23 13.6 +43.1 111.2 |
| 2°  | 26 42.1 +43.8 113.6 | 26 01.1 +43.6 112.8 | 25 19.9 +43.3 112.0 | 24 38.4 +43.1 111.2 | 23 56.7 +42.9 110.4 |
| 3°  | 27 25.9 +43.5 112.8 | 26 44.7 +43.3 112.0 | 26 03.2 +43.1 111.2 | 25 21.5 +42.9 110.4 | 24 39.6 +42.7 109.6 |
| 4°  | 28 09.4 +43.3 112.1 | 27 28.0 +43.0 111.2 | 26 46.3 +42.8 110.4 | 26 04.4 +42.6 109.6 | 25 22.3 +42.4 108.9 |
| 5°  | 28 52.7 +43.0 111.3 | 28 11.0 +42.8 110.5 | 27 29.1 +42.6 109.6 | 26 47.0 +42.4 108.9 | 26 04.7 +42.2 108.1 |
| 6°  | 29 35.7 +42.7 110.5 | 28 53.8 +42.5 109.7 | 28 11.7 +42.3 108.9 | 27 29.4 +42.1 108.1 | 26 46.9 +41.9 107.3 |
| 7°  | 30 18.4 +42.4 109.7 | 29 36.3 +42.2 108.8 | 28 54.0 +42.0 108.0 | 28 11.5 +41.8 107.3 | 27 28.8 +41.6 106.5 |
| 8°  | 31 00.8 +42.0 108.8 | 30 18.5 +41.8 108.0 | 29 36.0 +41.6 107.2 | 28 53.3 +41.5 106.4 | 28 10.4 +41.4 105.7 |
| 9°  | 31 42.8 +41.8 108.0 | 31 00.3 +41.6 107.2 | 30 17.6 +41.4 106.4 | 29 34.8 +41.2 105.6 | 28 51.8 +41.0 104.8 |
| 10° | 32 24.6 +41.4 107.1 | 31 41.9 +41.2 106.3 | 30 59.0 +41.0 105.6 | 30 16.0 +40.8 104.8 | 29 32.8 +40.7 104.0 |
| 11° | 33 06.0 +41.0 106.3 | 32 23.1 +40.8 105.5 | 31 40.0 +40.7 104.7 | 30 56.8 +40.6 103.9 | 30 13.5 +40.4 103.1 |
| 12° | 33 47.0 +40.7 105.4 | 33 03.9 +40.5 104.6 | 32 20.7 +40.3 103.8 | 31 37.4 +40.1 103.1 | 30 53.9 +40.0 102.3 |
| 13° | 34 27.7 +40.2 104.5 | 33 44.4 +40.1 103.7 | 33 01.0 +40.0 103.0 | 32 17.5 +39.8 102.2 | 31 33.9 +39.6 101.4 |
| 14° | 35 07.9 +39.9 103.6 | 34 24.5 +39.7 102.8 | 33 41.0 +39.5 102.1 | 32 57.3 +39.4 101.3 | 32 13.5 +39.3 100.5 |
| 15° | 35 47.8 +39.4 102.7 | 35 04.2 +39.3 101.9 | 34 20.5 +39.2 101.2 | 33 36.7 +39.1 100.4 | 32 52.8 +38.9 99.6  |
| 16° | 36 27.2 +39.0 101.8 | 35 43.5 +38.9 101.0 | 34 59.7 +38.7 100.2 | 34 15.8 +38.6 99.5  | 33 31.7 +38.5 98.7  |
| 17° | 37 06.2 +38.6 100.8 | 36 22.4 +38.4 100.1 | 35 38.4 +38.3 99.3  | 34 54.4 +38.1 98.5  | 34 10.2 +38.1 97.8  |
| 18° | 37 44.8 +38.0 99.9  | 37 00.8 +37.9 99.1  | 36 16.7 +37.8 98.3  | 35 32.5 +37.8 97.6  | 34 48.3 +37.6 96.9  |
| 19° | 38 22.8 +37.6 98.9  | 37 38.7 +37.4 98.1  | 36 54.5 +37.4 97.4  | 36 10.3 +37.2 96.6  | 35 25.9 +37.2 95.9  |
| 20° | 39 00.4 +37.0 97.9  | 38 16.1 +37.0 97.1  | 37 31.9 +36.8 96.4  | 36 47.5 +36.8 95.7  | 36 03.1 +36.7 94.9  |
| 21° | 39 37.4 +36.5 96.9  | 38 53.1 +36.4 96.1  | 38 08.7 +36.3 95.4  | 37 24.3 +36.3 94.7  | 36 39.8 +36.3 94.0  |
| 22° | 40 13.9 +35.9 95.8  | 39 29.5 +35.8 95.1  | 38 45.0 +35.8 94.4  | 38 00.6 +35.7 93.7  | 37 16.1 +35.7 93.0  |
| 23° | 40 49.8 +35.3 94.8  | 40 05.3 +35.3 94.1  | 39 20.8 +35.3 93.3  | 38 36.3 +35.2 92.6  | 37 51.8 +35.1 91.9  |
| 24° | 41 25.1 +34.8 93.7  | 40 40.6 +34.7 93.0  | 39 56.1 +34.6 92.3  | 39 11.5 +34.7 91.6  | 38 26.9 +34.7 90.9  |
| 25° | 41 59.9 +34.1 92.6  | 41 15.3 +34.1 91.9  | 40 30.7 +34.1 91.2  | 39 46.2 +34.0 90.5  | 39 01.6 +34.0 89.9  |
| 26° | 42 34.0 +33.4 91.5  | 41 49.4 +33.4 90.8  | 41 04.8 +33.4 90.1  | 40 20.2 +33.4 89.5  | 39 35.6 +33.5 88.8  |
| 27° | 43 07.4 +32.8 90.4  | 42 22.8 +32.8 89.7  | 41 38.2 +32.8 89.0  | 40 53.6 +32.9 88.4  | 40 09.1 +32.8 87.7  |
| 28° | 43 40.2 +32.0 89.2  | 42 55.6 +32.1 88.6  | 42 11.0 +32.1 87.9  | 41 26.5 +32.1 87.3  | 40 41.9 +32.2 86.6  |
| 29° | 44 12.2 +31.3 88.0  | 43 27.7 +31.3 87.4  | 42 43.1 +31.4 86.8  | 41 58.6 +31.5 86.1  | 41 14.1 +31.6 85.5  |

## Declination SAME name as Latitude

## Latitude 42°

| 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°  | 21 48.8 +43.1 111.1 | 21 07.1 +42.9 110.4 | 20 25.1 +42.8 109.6 | 19 43.0 +42.6 108.8 | 19 00.7 +42.4 108.1 |
| 1°  | 22 31.9 +42.9 110.4 | 21 50.0 +42.7 109.6 | 21 07.9 +42.5 108.8 | 20 25.6 +42.4 108.1 | 19 43.1 +42.2 107.3 |
| 2°  | 23 14.8 +42.7 109.6 | 22 32.7 +42.5 108.8 | 21 50.4 +42.4 108.1 | 21 08.0 +42.1 107.3 | 20 25.3 +42.0 106.6 |
| 3°  | 23 57.5 +42.5 108.8 | 23 15.2 +42.3 108.1 | 22 32.8 +42.1 107.3 | 21 50.1 +42.0 106.6 | 21 07.3 +41.8 105.8 |
| 4°  | 24 40.0 +42.3 108.1 | 23 57.5 +42.1 107.3 | 23 14.9 +41.9 106.5 | 22 32.1 +41.7 105.8 | 21 49.1 +41.5 105.0 |
| 5°  | 25 22.3 +41.9 107.3 | 24 39.6 +41.8 106.5 | 23 56.8 +41.6 105.8 | 23 13.8 +41.5 105.0 | 22 30.6 +41.4 104.3 |
| 6°  | 26 04.2 +41.8 106.5 | 25 21.4 +41.6 105.7 | 24 38.4 +41.4 105.0 | 23 55.3 +41.2 104.2 | 23 12.0 +41.1 103.5 |
| 7°  | 26 46.0 +41.4 105.7 | 26 03.0 +41.2 104.9 | 25 19.8 +41.1 104.2 | 24 36.5 +41.0 103.4 | 23 53.1 +40.8 102.7 |
| 8°  | 27 27.4 +41.2 104.9 | 26 44.2 +41.1 104.1 | 26 00.9 +40.9 103.4 | 25 17.5 +40.7 102.6 | 24 33.9 +40.6 101.9 |
| 9°  | 28 08.6 +40.8 104.1 | 27 25.3 +40.7 103.3 | 26 41.8 +40.6 102.5 | 25 58.2 +40.5 101.8 | 25 14.5 +40.3 101.1 |
| 10° | 28 49.4 +40.6 103.2 | 28 06.0 +40.4 102.5 | 27 22.4 +40.2 101.7 | 26 38.7 +40.1 101.0 | 25 54.8 +40.1 100.2 |
| 11° | 29 30.0 +40.2 102.4 | 28 46.4 +40.1 101.6 | 28 02.6 +40.0 100.9 | 27 18.8 +39.9 100.1 | 26 34.9 +39.7 99.4  |
| 12° | 30 10.2 +39.9 101.5 | 29 26.5 +39.7 100.8 | 28 42.6 +39.7 100.0 | 27 58.7 +39.5 99.3  | 27 14.6 +39.5 98.6  |
| 13° | 30 50.1 +39.6 100.7 | 30 06.2 +39.5 99.9  | 29 22.3 +39.3 99.2  | 28 38.2 +39.2 98.4  | 27 54.1 +39.1 97.7  |
| 14° | 31 29.7 +39.1 99.8  | 30 45.7 +39.0 99.0  | 30 01.6 +39.0 98.3  | 29 17.4 +38.9 97.6  | 28 33.2 +38.8 96.9  |
| 15° | 32 08.8 +38.8 98.9  | 31 24.7 +38.7 98.2  | 30 40.6 +38.6 97.4  | 29 56.3 +38.5 96.7  | 29 12.0 +38.4 96.0  |
| 16° | 32 47.6 +38.4 98.0  | 32 03.4 +38.3 97.3  | 31 19.2 +38.2 96.5  | 30 34.8 +38.2 95.8  | 29 50.4 +38.1 95.1  |
| 17° | 33 26.0 +38.0 97.1  | 32 41.7 +37.9 96.3  | 31 57.4 +37.8 95.6  | 31 13.0 +37.8 94.9  | 30 28.5 +37.8 94.2  |
| 18° | 34 04.0 +37.6 96.1  | 33 19.6 +37.5 95.4  | 32 35.2 +37.5 94.7  | 31 50.8 +37.4 94.0  | 31 06.3 +37.3 93.3  |
| 19° | 34 41.6 +37.1 95.2  | 33 57.1 +37.1 94.5  | 33 12.7 +37.0 93.8  | 32 28.2 +36.9 93.1  | 31 43.6 +37.0 92.4  |
| 20° | 35 18.7 +36.6 94.2  | 34 34.2 +36.6 93.5  | 33 49.7 +36.6 92.8  | 33 05.1 +36.6 92.1  | 32 20.6 +36.5 91.5  |
| 21° | 35 55.3 +36.2 93.3  | 35 10.8 +36.2 92.6  | 34 26.3 +36.1 91.9  | 33 41.7 +36.1 91.2  | 32 57.1 +36.1 90.5  |
| 22° | 36 31.5 +35.7 92.3  | 35 47.0 +35.6 91.6  | 35 02.4 +35.6 90.9  | 34 17.8 +35.6 90.2  | 33 33.2 +35.7 89.6  |
| 23° | 37 07.2 +35.2 91.3  | 36 22.6 +35.2 90.6  | 35 38.0 +35.2 89.9  | 34 53.4 +35.2 89.2  | 34 08.9 +35.1 88.6  |
| 24° | 37 42.4 +34.6 90.2  | 36 57.8 +34.6 89.6  | 36 13.2 +34.6 88.9  | 35 28.6 +34.7 88.3  | 34 44.0 +34.8 87.6  |
| 25° | 38 17.0 +34.0 89.2  | 37 32.4 +34.1 88.6  | 36 47.8 +34.2 87.9  | 36 03.3 +34.1 87.3  | 35 18.8 +34.2 86.6  |
| 26° | 38 51.0 +33.5 88.2  | 38 06.5 +33.5 87.5  | 37 22.0 +33.5 86.9  | 36 37.4 +33.7 86.2  | 35 53.0 +33.7 85.6  |
| 27° | 39 24.5 +32.9 87.1  | 38 40.0 +33.0 86.5  | 37 55.5 +33.1 85.8  | 37 11.1 +33.1 85.2  | 36 26.7 +33.1 84.6  |
| 28° | 39 57.4 +32.3 86.0  | 39 13.0 +32.3 85.4  | 38 28.6 +32.4 84.8  | 37 44.2 +32.5 84.1  | 36 59.8 +32.7 83.5  |
| 29° | 40 29.7 +31.7 84.9  | 39 45.3 +31.8 84.3  | 39 01.0 +31.8 83.7  | 38 16.7 +31.9 83.1  | 37 32.5 +32.0 82.5  |

| 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°  | 18 18.3 +42.2 107.3 | 17 35.6 +42.1 106.6 | 16 52.8 +41.9 105.9 | 16 09.8 +41.8 105.1 | 15 26.7 +41.6 104.4 |
| 1°  | 19 00.5 +42.0 106.6 | 18 17.7 +41.8 105.8 | 17 34.7 +41.7 105.1 | 16 51.6 +41.5 104.4 | 16 08.3 +41.4 103.7 |
| 2°  | 19 42.5 +41.8 105.8 | 18 59.5 +41.7 105.1 | 18 16.4 +41.5 104.4 | 17 33.1 +41.4 103.6 | 16 49.7 +41.3 102.9 |
| 3°  | 20 24.3 +41.6 105.1 | 19 41.2 +41.5 104.3 | 18 57.9 +41.3 103.6 | 18 14.5 +41.2 102.9 | 17 31.0 +41.0 102.1 |
| 4°  | 21 05.9 +41.4 104.3 | 20 22.7 +41.2 103.6 | 19 39.2 +41.2 102.8 | 18 55.7 +41.0 102.1 | 18 12.0 +40.9 101.4 |
| 5°  | 21 47.3 +41.2 103.5 | 21 03.9 +41.1 102.8 | 20 20.4 +40.9 102.0 | 19 36.7 +40.8 101.3 | 18 52.9 +40.7 100.6 |
| 6°  | 22 28.5 +41.0 102.7 | 21 45.0 +40.8 102.0 | 21 01.3 +40.7 101.3 | 20 17.5 +40.6 100.5 | 19 33.6 +40.5 99.8  |
| 7°  | 23 09.5 +40.7 101.9 | 22 25.8 +40.6 101.2 | 21 42.0 +40.5 100.5 | 20 58.1 +40.4 99.8  | 20 14.1 +40.3 99.0  |
| 8°  | 23 50.2 +40.5 101.1 | 23 06.4 +40.4 100.4 | 22 22.5 +40.3 99.7  | 21 38.5 +40.2 99.0  | 20 54.4 +40.1 98.2  |
| 9°  | 24 30.7 +40.2 100.3 | 23 46.8 +40.1 99.6  | 23 02.8 +40.0 98.9  | 22 18.7 +39.9 98.2  | 21 34.5 +39.8 97.5  |
| 10° | 25 10.9 +39.9 99.5  | 24 26.9 +39.8 98.8  | 23 42.8 +39.7 98.1  | 22 58.6 +39.6 97.4  | 22 14.3 +39.6 96.6  |
| 11° | 25 50.8 +39.7 98.7  | 25 06.7 +39.6 98.0  | 24 22.5 +39.5 97.2  | 23 38.2 +39.5 96.5  | 22 53.9 +39.4 95.8  |
| 12° | 26 30.5 +39.3 97.8  | 25 46.3 +39.2 97.1  | 25 02.0 +39.2 96.4  | 24 17.7 +39.1 95.7  | 23 33.3 +39.0 95.0  |
| 13° | 27 09.8 +39.1 97.0  | 26 25.5 +39.0 96.3  | 25 41.2 +38.9 95.6  | 24 56.8 +38.9 94.9  | 24 12.3 +38.9 94.2  |
| 14° | 27 48.9 +38.7 96.1  | 27 04.5 +38.7 95.4  | 26 20.1 +38.6 94.7  | 25 35.7 +38.5 94.0  | 24 51.2 +38.5 93.3  |
| 15° | 28 27.6 +38.4 95.3  | 27 43.2 +38.3 94.6  | 26 58.7 +38.3 93.9  | 26 14.2 +38.3 93.2  | 25 29.7 +38.2 92.5  |
| 16° | 29 06.0 +38.1 94.4  | 28 21.5 +38.0 93.7  | 27 37.0 +38.0 93.0  | 26 52.5 +37.9 92.3  | 26 07.9 +37.9 91.6  |
| 17° | 29 44.1 +37.6 93.5  | 28 59.5 +37.7 92.8  | 28 15.0 +37.6 92.1  | 27 30.4 +37.6 91.4  | 26 45.8 +37.6 90.8  |
| 18° | 30 21.7 +37.4 92.6  | 29 37.2 +37.3 91.9  | 28 52.6 +37.3 91.2  | 28 08.0 +37.3 90.6  | 27 23.4 +37.3 89.9  |
| 19° | 30 59.1 +36.9 91.7  | 30 14.5 +36.9 91.0  | 29 29.9 +36.9 90.3  | 28 45.3 +36.9 89.7  | 28 00.7 +37.0 89.0  |
| 20° | 31 36.0 +36.5 90.8  | 30 51.4 +36.5 90.1  | 30 06.8 +36.5 89.4  | 29 22.2 +36.6 88.8  | 28 37.7 +36.5 88.1  |
| 21° | 32 12.5 +36.1 89.8  | 31 27.9 +36.1 89.2  | 30 43.3 +36.2 88.5  | 29 58.8 +36.1 87.9  | 29 14.2 +36.2 87.2  |
| 22° | 32 48.6 +35.7 88.9  | 32 04.0 +35.7 88.2  | 31 19.5 +35.7 87.6  | 30 34.9 +35.8 86.9  | 29 50.4 +35.9 86.3  |
| 23° | 33 24.3 +35.2 87.9  | 32 39.7 +35.3 87.3  | 31 55.2 +35.3 86.6  | 31 10.7 +35.4 86.0  | 30 26.3 +35.4 85.4  |
| 24° | 33 59.5 +34.8 87.0  | 33 15.0 +34.8 86.3  | 32 30.5 +34.9 85.7  | 31 46.1 +34.9 85.1  | 31 01.7 +35.0 84.4  |
| 25° | 34 34.3 +34.2 86.0  | 33 49.8 +34.3 85.3  | 33 05.4 +34.4 84.7  | 32 21.0 +34.5 84.1  | 31 36.7 +34.6 83.5  |
| 26° | 35 08.5 +33.8 85.0  | 34 24.1 +33.9 84.4  | 33 39.8 +33.9 83.7  | 32 55.5 +34.0 83.1  | 32 11.3 +34.1 82.5  |
| 27° | 35 42.3 +33.3 84.0  | 34 58.0 +33.3 83.4  | 34 13.7 +33.5 82.7  | 33 29.5 +33.6 82.1  | 32 45.4 +33.7 81.5  |
| 28° | 36 15.6 +32.7 82.9  | 35 31.3 +32.9 82.3  | 34 47.2 +32.9 81.7  | 34 03.1 +33.1 81.1  | 33 19.1 +33.2 80.6  |
| 29° | 36 48.3 +32.1 81.9  | 36 04.2 +32.3 81.3  | 35 20.1 +32.5 80.7  | 34 36.2 +32.5 80.1  | 33 52.3 +32.7 79.6  |

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The data on this page is believed to be accurate but no warranty is given for its correctness. Use it only for training and exercising!

| 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°  | 14 43.5 +41.4 103.7 | 14 00.1 +41.3 103.0 | 13 16.6 +41.2 102.3 | 12 32.9 +41.1 101.6 | 11 49.2 +41.0 100.9 |
| 1°  | 15 24.9 +41.3 102.9 | 14 41.4 +41.1 102.2 | 13 57.8 +41.0 101.5 | 13 14.0 +40.9 100.8 | 12 30.2 +40.8 100.1 |
| 2°  | 16 06.2 +41.1 102.2 | 15 22.5 +41.1 101.5 | 14 38.8 +40.9 100.8 | 13 54.9 +40.8 100.1 | 13 11.0 +40.7 99.4  |
| 3°  | 16 47.3 +41.0 101.4 | 16 03.6 +40.8 100.7 | 15 19.7 +40.7 100.0 | 14 35.7 +40.7 99.3  | 13 51.7 +40.6 98.6  |
| 4°  | 17 28.3 +40.8 100.7 | 16 44.4 +40.7 100.0 | 16 00.4 +40.6 99.2  | 15 16.4 +40.5 98.5  | 14 32.3 +40.4 97.8  |
| 5°  | 18 09.1 +40.6 99.9  | 17 25.1 +40.5 99.2  | 16 41.0 +40.4 98.5  | 15 56.9 +40.3 97.8  | 15 12.7 +40.2 97.1  |
| 6°  | 18 49.7 +40.4 99.1  | 18 05.6 +40.3 98.4  | 17 21.4 +40.3 97.7  | 16 37.2 +40.2 97.0  | 15 52.9 +40.1 96.3  |
| 7°  | 19 30.1 +40.2 98.3  | 18 45.9 +40.1 97.6  | 18 01.7 +40.0 96.9  | 17 17.4 +40.0 96.2  | 16 33.0 +39.9 95.5  |
| 8°  | 20 10.3 +39.9 97.5  | 19 26.0 +39.9 96.8  | 18 41.7 +39.9 96.1  | 17 57.4 +39.7 95.4  | 17 12.9 +39.8 94.8  |
| 9°  | 20 50.2 +39.8 96.7  | 20 05.9 +39.7 96.0  | 19 21.6 +39.6 95.4  | 18 37.1 +39.6 94.7  | 17 52.7 +39.5 94.0  |
| 10° | 21 30.0 +39.5 95.9  | 20 45.6 +39.5 95.2  | 20 01.2 +39.4 94.6  | 19 16.7 +39.4 93.9  | 18 32.2 +39.4 93.2  |
| 11° | 22 09.5 +39.3 95.1  | 21 25.1 +39.2 94.4  | 20 40.6 +39.2 93.7  | 19 56.1 +39.2 93.1  | 19 11.6 +39.1 92.4  |
| 12° | 22 48.8 +39.1 94.3  | 22 04.3 +39.0 93.6  | 21 19.8 +39.0 92.9  | 20 35.3 +38.9 92.3  | 19 50.7 +38.9 91.6  |
| 13° | 23 27.9 +38.7 93.5  | 22 43.3 +38.8 92.8  | 21 58.8 +38.7 92.1  | 21 14.2 +38.7 91.4  | 20 29.6 +38.7 90.8  |
| 14° | 24 06.6 +38.5 92.7  | 23 22.1 +38.5 92.0  | 22 37.5 +38.5 91.3  | 21 52.9 +38.5 90.6  | 21 08.3 +38.5 89.9  |
| 15° | 24 45.1 +38.2 91.8  | 24 00.6 +38.2 91.1  | 23 16.0 +38.2 90.5  | 22 31.4 +38.2 89.8  | 21 46.8 +38.2 89.1  |
| 16° | 25 23.3 +38.0 91.0  | 24 38.8 +37.9 90.3  | 23 54.2 +37.9 89.6  | 23 09.6 +37.9 89.0  | 22 25.0 +38.0 88.3  |
| 17° | 26 01.3 +37.6 90.1  | 25 16.7 +37.6 89.4  | 24 32.1 +37.6 88.8  | 23 47.5 +37.7 88.1  | 23 03.0 +37.6 87.5  |
| 18° | 26 38.9 +37.2 89.2  | 25 54.3 +37.3 88.6  | 25 09.7 +37.3 87.9  | 24 25.2 +37.3 87.3  | 23 40.6 +37.4 86.6  |
| 19° | 27 16.1 +37.0 88.4  | 26 31.6 +37.0 87.7  | 25 47.0 +37.1 87.0  | 25 02.5 +37.1 86.4  | 24 18.0 +37.2 85.7  |
| 20° | 27 53.1 +36.6 87.5  | 27 08.6 +36.6 86.8  | 26 24.1 +36.7 86.2  | 25 39.6 +36.7 85.5  | 24 55.2 +36.8 84.9  |
| 21° | 28 29.7 +36.3 86.6  | 27 45.2 +36.3 85.9  | 27 00.8 +36.3 85.3  | 26 16.3 +36.5 84.6  | 25 32.0 +36.5 84.0  |
| 22° | 29 06.0 +35.8 85.7  | 28 21.5 +36.0 85.0  | 27 37.1 +36.0 84.4  | 26 52.8 +36.1 83.8  | 26 08.5 +36.1 83.1  |
| 23° | 29 41.8 +35.5 84.7  | 28 57.5 +35.5 84.1  | 28 13.1 +35.7 83.5  | 27 28.9 +35.7 82.9  | 26 44.6 +35.9 82.2  |
| 24° | 30 17.3 +35.1 83.8  | 29 33.0 +35.2 83.2  | 28 48.8 +35.2 82.6  | 28 04.6 +35.4 82.0  | 27 20.5 +35.5 81.3  |
| 25° | 30 52.4 +34.7 82.9  | 30 08.2 +34.8 82.2  | 29 24.0 +34.9 81.6  | 28 40.0 +35.0 81.0  | 27 56.0 +35.1 80.4  |
| 26° | 31 27.1 +34.2 81.9  | 30 43.0 +34.3 81.3  | 29 58.9 +34.5 80.7  | 29 15.0 +34.6 80.1  | 28 31.1 +34.7 79.5  |
| 27° | 32 01.3 +33.8 80.9  | 31 17.3 +34.0 80.3  | 30 33.4 +34.1 79.8  | 29 49.6 +34.2 79.2  | 29 05.8 +34.4 78.6  |
| 28° | 32 35.1 +33.4 80.0  | 31 51.3 +33.4 79.4  | 31 07.5 +33.6 78.8  | 30 23.8 +33.8 78.2  | 29 40.2 +33.9 77.6  |
| 29° | 33 08.5 +32.8 79.0  | 32 24.7 +33.1 78.4  | 31 41.1 +33.2 77.8  | 30 57.6 +33.3 77.3  | 30 14.1 +33.6 76.7  |

| 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°  | 11 05.4 +40.8 100.2 | 10 21.4 +40.8 99.5 | 9 37.4 +40.7 98.8  | 8 53.3 +40.6 98.1  | 8 09.1 +40.5 97.4  |
| 1°  | 11 46.2 +40.8 99.4  | 11 02.2 +40.6 98.7 | 10 18.1 +40.5 98.0 | 9 33.9 +40.5 97.3  | 8 49.6 +40.5 96.7  |
| 2°  | 12 27.0 +40.6 98.7  | 11 42.8 +40.6 98.0 | 10 58.6 +40.5 97.3 | 10 14.4 +40.4 96.6 | 9 30.1 +40.3 95.9  |
| 3°  | 13 07.6 +40.5 97.9  | 12 23.4 +40.4 97.2 | 11 39.1 +40.3 96.5 | 10 54.8 +40.3 95.8 | 10 10.4 +40.2 95.2 |
| 4°  | 13 48.1 +40.3 97.2  | 13 03.8 +40.2 96.5 | 12 19.4 +40.3 95.8 | 11 35.1 +40.1 95.1 | 10 50.6 +40.1 94.4 |
| 5°  | 14 28.4 +40.2 96.4  | 13 44.0 +40.2 95.7 | 12 59.7 +40.0 95.0 | 12 15.2 +40.1 94.3 | 11 30.7 +40.0 93.7 |
| 6°  | 15 08.6 +40.0 95.6  | 14 24.2 +40.0 94.9 | 13 39.7 +40.0 94.3 | 12 55.3 +39.9 93.6 | 12 10.7 +39.9 92.9 |
| 7°  | 15 48.6 +39.9 94.8  | 15 04.2 +39.8 94.2 | 14 19.7 +39.8 93.5 | 13 35.2 +39.7 92.8 | 12 50.6 +39.7 92.1 |
| 8°  | 16 28.5 +39.7 94.1  | 15 44.0 +39.7 93.4 | 14 59.5 +39.6 92.7 | 14 14.9 +39.6 92.0 | 13 30.3 +39.6 91.4 |
| 9°  | 17 08.2 +39.5 93.3  | 16 23.7 +39.4 92.6 | 15 39.1 +39.5 91.9 | 14 54.5 +39.5 91.3 | 14 09.9 +39.5 90.6 |
| 10° | 17 47.7 +39.3 92.5  | 17 03.1 +39.3 91.8 | 16 18.6 +39.3 91.1 | 15 34.0 +39.3 90.5 | 14 49.4 +39.3 89.8 |
| 11° | 18 27.0 +39.1 91.7  | 17 42.4 +39.2 91.0 | 16 57.9 +39.1 90.4 | 16 13.3 +39.1 89.7 | 15 28.7 +39.1 89.0 |
| 12° | 19 06.1 +39.0 90.9  | 18 21.6 +38.9 90.2 | 17 37.0 +38.9 89.6 | 16 52.4 +38.9 88.9 | 16 07.8 +39.0 88.2 |
| 13° | 19 45.1 +38.7 90.1  | 19 00.5 +38.7 89.4 | 18 15.9 +38.7 88.8 | 17 31.3 +38.8 88.1 | 16 46.8 +38.7 87.4 |
| 14° | 20 23.8 +38.4 89.3  | 19 39.2 +38.5 88.6 | 18 54.6 +38.5 88.0 | 18 10.1 +38.5 87.3 | 17 25.5 +38.6 86.6 |
| 15° | 21 02.2 +38.2 88.5  | 20 17.7 +38.2 87.8 | 19 33.1 +38.3 87.1 | 18 48.6 +38.3 86.5 | 18 04.1 +38.4 85.8 |
| 16° | 21 40.4 +38.0 87.6  | 20 55.9 +38.0 87.0 | 20 11.4 +38.1 86.3 | 19 26.9 +38.1 85.7 | 18 42.5 +38.1 85.0 |
| 17° | 22 18.4 +37.7 86.8  | 21 33.9 +37.8 86.1 | 20 49.5 +37.8 85.5 | 20 05.0 +37.9 84.9 | 19 20.6 +38.0 84.2 |
| 18° | 22 56.1 +37.5 86.0  | 22 11.7 +37.5 85.3 | 21 27.3 +37.5 84.7 | 20 42.9 +37.6 84.0 | 19 58.6 +37.7 83.4 |
| 19° | 23 33.6 +37.2 85.1  | 22 49.2 +37.2 84.5 | 22 04.8 +37.3 83.8 | 21 20.5 +37.4 83.2 | 20 36.3 +37.5 82.6 |
| 20° | 24 10.8 +36.9 84.2  | 23 26.4 +37.0 83.6 | 22 42.1 +37.1 83.0 | 21 57.9 +37.2 82.4 | 21 13.8 +37.2 81.7 |
| 21° | 24 47.7 +36.5 83.4  | 24 03.4 +36.7 82.8 | 23 19.2 +36.7 82.1 | 22 35.1 +36.8 81.5 | 21 51.0 +37.0 80.9 |
| 22° | 25 24.2 +36.3 82.5  | 24 40.1 +36.3 81.9 | 23 55.9 +36.5 81.3 | 23 11.9 +36.6 80.6 | 22 28.0 +36.7 80.0 |
| 23° | 26 00.5 +35.9 81.6  | 25 16.4 +36.1 81.0 | 24 32.4 +36.2 80.4 | 23 48.5 +36.3 79.8 | 23 04.7 +36.4 79.2 |
| 24° | 26 36.4 +35.6 80.7  | 25 52.5 +35.7 80.1 | 25 08.6 +35.8 79.5 | 24 24.8 +36.0 78.9 | 23 41.1 +36.1 78.3 |
| 25° | 27 12.0 +35.3 79.8  | 26 28.2 +35.4 79.2 | 25 44.4 +35.6 78.6 | 25 00.8 +35.6 78.0 | 24 17.2 +35.8 77.4 |
| 26° | 27 47.3 +34.9 78.9  | 27 03.6 +35.0 78.3 | 26 20.0 +35.1 77.7 | 25 36.4 +35.4 77.1 | 24 53.0 +35.5 76.5 |
| 27° | 28 22.2 +34.5 78.0  | 27 38.6 +34.7 77.4 | 26 55.1 +34.9 76.8 | 26 11.8 +35.0 76.2 | 25 28.5 +35.2 75.7 |
| 28° | 28 56.7 +34.1 77.1  | 28 13.3 +34.3 76.5 | 27 30.0 +34.4 75.9 | 26 46.8 +34.6 75.3 | 26 03.7 +34.8 74.8 |
| 29° | 29 30.8 +33.7 76.1  | 28 47.6 +33.9 75.5 | 28 04.4 +34.1 75.0 | 27 21.4 +34.3 74.4 | 26 38.5 +34.5 73.9 |

# Declination SAME name as Latitude

# Latitude 42°

| 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°  | 7 24.9 +40.4 96.7  | 6 40.6 +40.3 96.0  | 5 56.2 +40.3 95.4  | 5 11.8 +40.3 94.7  | 4 27.3 +40.3 94.0  |
| 1°  | 8 05.3 +40.4 96.0  | 7 20.9 +40.4 95.3  | 6 36.5 +40.3 94.6  | 5 52.1 +40.2 94.0  | 5 07.6 +40.2 93.3  |
| 2°  | 8 45.7 +40.3 95.2  | 8 01.3 +40.2 94.6  | 7 16.8 +40.2 93.9  | 6 32.3 +40.1 93.2  | 5 47.8 +40.1 92.5  |
| 3°  | 9 26.0 +40.1 94.5  | 8 41.5 +40.1 93.8  | 7 57.0 +40.1 93.1  | 7 12.4 +40.1 92.5  | 6 27.9 +40.1 91.8  |
| 4°  | 10 06.1 +40.1 93.7 | 9 21.6 +40.1 93.1  | 8 37.1 +40.0 92.4  | 7 52.5 +40.0 91.7  | 7 08.0 +40.0 91.0  |
| 5°  | 10 46.2 +40.0 93.0 | 10 01.7 +39.9 92.3 | 9 17.1 +39.9 91.6  | 8 32.5 +40.0 91.0  | 7 48.0 +39.9 90.3  |
| 6°  | 11 26.2 +39.8 92.2 | 10 41.6 +39.9 91.5 | 9 57.0 +39.9 90.9  | 9 12.5 +39.8 90.2  | 8 27.9 +39.8 89.5  |
| 7°  | 12 06.0 +39.8 91.5 | 11 21.5 +39.7 90.8 | 10 36.9 +39.7 90.1 | 9 52.3 +39.7 89.4  | 9 07.7 +39.7 88.8  |
| 8°  | 12 45.8 +39.6 90.7 | 12 01.2 +39.6 90.0 | 11 16.6 +39.6 89.3 | 10 32.0 +39.6 88.7 | 9 47.4 +39.7 88.0  |
| 9°  | 13 25.4 +39.4 89.9 | 12 40.8 +39.4 89.2 | 11 56.2 +39.5 88.6 | 11 11.6 +39.5 87.9 | 10 27.1 +39.5 87.3 |
| 10° | 14 04.8 +39.3 89.1 | 13 20.2 +39.3 88.5 | 12 35.7 +39.3 87.8 | 11 51.1 +39.4 87.1 | 11 06.6 +39.4 86.5 |
| 11° | 14 44.1 +39.2 88.4 | 13 59.5 +39.2 87.7 | 13 15.0 +39.2 87.0 | 12 30.5 +39.2 86.4 | 11 46.0 +39.3 85.7 |
| 12° | 15 23.3 +38.9 87.6 | 14 38.7 +39.0 86.9 | 13 54.2 +39.1 86.3 | 13 09.7 +39.1 85.6 | 12 25.3 +39.1 84.9 |
| 13° | 16 02.2 +38.8 86.8 | 15 17.7 +38.9 86.1 | 14 33.3 +38.8 85.5 | 13 48.8 +39.0 84.8 | 13 04.4 +39.1 84.2 |
| 14° | 16 41.0 +38.6 86.0 | 15 56.6 +38.6 85.3 | 15 12.1 +38.8 84.7 | 14 27.8 +38.8 84.0 | 13 43.5 +38.8 83.4 |
| 15° | 17 19.6 +38.5 85.2 | 16 35.2 +38.5 84.5 | 15 50.9 +38.5 83.9 | 15 06.6 +38.6 83.2 | 14 22.3 +38.7 82.6 |
| 16° | 17 58.1 +38.2 84.4 | 17 13.7 +38.3 83.7 | 16 29.4 +38.4 83.1 | 15 45.2 +38.5 82.5 | 15 01.0 +38.6 81.8 |
| 17° | 18 36.3 +38.0 83.6 | 17 52.0 +38.1 82.9 | 17 07.8 +38.2 82.3 | 16 23.7 +38.2 81.7 | 15 39.6 +38.3 81.0 |
| 18° | 19 14.3 +37.8 82.8 | 18 30.1 +37.9 82.1 | 17 46.0 +38.0 81.5 | 17 01.9 +38.1 80.8 | 16 17.9 +38.2 80.2 |
| 19° | 19 52.1 +37.6 81.9 | 19 08.0 +37.7 81.3 | 18 24.0 +37.7 80.7 | 17 40.0 +37.9 80.0 | 16 56.1 +38.0 79.4 |
| 20° | 20 29.7 +37.3 81.1 | 19 45.7 +37.4 80.5 | 19 01.7 +37.6 79.8 | 18 17.9 +37.7 79.2 | 17 34.1 +37.8 78.6 |
| 21° | 21 07.0 +37.1 80.3 | 20 23.1 +37.2 79.6 | 19 39.3 +37.3 79.0 | 18 55.6 +37.4 78.4 | 18 11.9 +37.6 77.8 |
| 22° | 21 44.1 +36.8 79.4 | 21 00.3 +36.9 78.8 | 20 16.6 +37.1 78.2 | 19 33.0 +37.2 77.6 | 18 49.5 +37.4 77.0 |
| 23° | 22 20.9 +36.6 78.6 | 21 37.2 +36.7 78.0 | 20 53.7 +36.8 77.3 | 20 10.2 +37.0 76.7 | 19 26.9 +37.1 76.1 |
| 24° | 22 57.5 +36.2 77.7 | 22 13.9 +36.5 77.1 | 21 30.5 +36.6 76.5 | 20 47.2 +36.8 75.9 | 20 04.0 +36.9 75.3 |
| 25° | 23 33.7 +36.0 76.8 | 22 50.4 +36.1 76.2 | 22 07.1 +36.3 75.6 | 21 24.0 +36.5 75.1 | 20 40.9 +36.7 74.5 |
| 26° | 24 09.7 +35.7 76.0 | 23 26.5 +35.9 75.4 | 22 43.4 +36.0 74.8 | 22 00.5 +36.2 74.2 | 21 17.6 +36.4 73.6 |
| 27° | 24 45.4 +35.3 75.1 | 24 02.4 +35.5 74.5 | 23 19.4 +35.8 73.9 | 22 36.7 +35.9 73.3 | 21 54.0 +36.2 72.8 |
| 28° | 25 20.7 +35.1 74.2 | 24 37.9 +35.2 73.6 | 23 55.2 +35.4 73.0 | 23 12.6 +35.7 72.5 | 22 30.2 +35.8 71.9 |
| 29° | 25 55.8 +34.7 73.3 | 25 13.1 +34.9 72.7 | 24 30.6 +35.2 72.2 | 23 48.3 +35.3 71.6 | 23 06.0 +35.6 71.0 |

| 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°  | 3 42.8 +40.2 93.4  | 2 58.3 +40.2 92.7  | 2 13.7 +40.2 92.0  | 1 29.2 +40.1 91.3  | 0 44.6 +40.1 90.7  |
| 1°  | 4 23.0 +40.2 92.6  | 3 38.5 +40.1 91.9  | 2 53.9 +40.1 91.3  | 2 09.3 +40.2 90.6  | 1 24.7 +40.2 89.9  |
| 2°  | 5 03.2 +40.1 91.9  | 4 18.6 +40.1 91.2  | 3 34.0 +40.1 90.5  | 2 49.5 +40.1 89.9  | 2 04.9 +40.1 89.2  |
| 3°  | 5 43.3 +40.1 91.1  | 4 58.7 +40.1 90.4  | 4 14.1 +40.1 89.8  | 3 29.6 +40.0 89.1  | 2 45.0 +40.1 88.4  |
| 4°  | 6 23.4 +40.0 90.4  | 5 38.8 +40.0 89.7  | 4 54.2 +40.0 89.0  | 4 09.6 +40.0 88.4  | 3 25.1 +40.0 87.7  |
| 5°  | 7 03.4 +39.9 89.6  | 6 18.8 +39.9 88.9  | 5 34.2 +40.0 88.3  | 4 49.6 +40.0 87.6  | 4 05.1 +40.0 86.9  |
| 6°  | 7 43.3 +39.8 88.9  | 6 58.7 +39.9 88.2  | 6 14.2 +39.8 87.5  | 5 29.6 +39.9 86.9  | 4 45.1 +40.0 86.2  |
| 7°  | 8 23.1 +39.8 88.1  | 7 38.6 +39.8 87.4  | 6 54.0 +39.9 86.8  | 6 09.5 +39.9 86.1  | 5 25.1 +39.9 85.4  |
| 8°  | 9 02.9 +39.6 87.3  | 8 18.4 +39.7 86.7  | 7 33.9 +39.7 86.0  | 6 49.4 +39.8 85.4  | 6 05.0 +39.8 84.7  |
| 9°  | 9 42.5 +39.6 86.6  | 8 58.1 +39.6 85.9  | 8 13.6 +39.7 85.3  | 7 29.2 +39.7 84.6  | 6 44.8 +39.8 83.9  |
| 10° | 10 22.1 +39.5 85.8 | 9 37.7 +39.5 85.2  | 8 53.3 +39.5 84.5  | 8 08.9 +39.6 83.9  | 7 24.6 +39.7 83.2  |
| 11° | 11 01.6 +39.3 85.1 | 10 17.2 +39.4 84.4 | 9 32.8 +39.5 83.7  | 8 48.5 +39.6 83.1  | 8 04.3 +39.6 82.4  |
| 12° | 11 40.9 +39.2 84.3 | 10 56.6 +39.2 83.6 | 10 12.3 +39.3 83.0 | 9 28.1 +39.4 82.3  | 8 43.9 +39.5 81.7  |
| 13° | 12 20.1 +39.1 83.5 | 11 35.8 +39.2 82.9 | 10 51.6 +39.3 82.2 | 10 07.5 +39.3 81.6 | 9 23.4 +39.4 80.9  |
| 14° | 12 59.2 +38.9 82.7 | 12 15.0 +39.0 82.1 | 11 30.9 +39.1 81.4 | 10 46.8 +39.2 80.8 | 10 02.8 +39.4 80.1 |
| 15° | 13 38.1 +38.8 82.0 | 12 54.0 +38.9 81.3 | 12 10.0 +39.0 80.7 | 11 26.0 +39.1 80.0 | 10 42.2 +39.2 79.4 |
| 16° | 14 16.9 +38.7 81.2 | 13 32.9 +38.8 80.5 | 12 49.0 +38.8 79.9 | 12 05.1 +39.0 79.2 | 11 21.4 +39.0 78.6 |
| 17° | 14 55.6 +38.4 80.4 | 14 11.7 +38.5 79.7 | 13 27.8 +38.7 79.1 | 12 44.1 +38.8 78.5 | 12 00.4 +39.0 77.8 |
| 18° | 15 34.0 +38.3 79.6 | 14 50.2 +38.5 79.0 | 14 06.5 +38.6 78.3 | 13 22.9 +38.7 77.7 | 12 39.4 +38.8 77.1 |
| 19° | 16 12.3 +38.2 78.8 | 15 28.7 +38.2 78.2 | 14 45.1 +38.4 77.5 | 14 01.6 +38.5 76.9 | 13 18.2 +38.7 76.3 |
| 20° | 16 50.5 +37.9 78.0 | 16 06.9 +38.1 77.4 | 15 23.5 +38.2 76.7 | 14 40.1 +38.4 76.1 | 13 56.9 +38.5 75.5 |
| 21° | 17 28.4 +37.7 77.2 | 16 45.0 +37.9 76.5 | 16 01.7 +38.0 75.9 | 15 18.5 +38.2 75.3 | 14 35.4 +38.4 74.7 |
| 22° | 18 06.1 +37.6 76.3 | 17 22.9 +37.6 75.7 | 16 39.7 +37.9 75.1 | 15 56.7 +38.0 74.5 | 15 13.8 +38.2 73.9 |
| 23° | 18 43.7 +37.3 75.5 | 18 00.5 +37.5 74.9 | 17 17.6 +37.6 74.3 | 16 34.7 +37.8 73.7 | 15 52.0 +38.0 73.1 |
| 24° | 19 21.0 +37.1 74.7 | 18 38.0 +37.3 74.1 | 17 55.2 +37.5 73.5 | 17 12.5 +37.7 72.9 | 16 30.0 +37.8 72.3 |
| 25° | 19 58.1 +36.8 73.9 | 19 15.3 +37.0 73.3 | 18 32.7 +37.2 72.7 | 17 50.2 +37.4 72.1 | 17 07.8 +37.6 71.5 |
| 26° | 20 34.9 +36.6 73.0 | 19 52.3 +36.8 72.4 | 19 09.9 +37.0 71.8 | 18 27.6 +37.2 71.3 | 17 45.4 +37.5 70.7 |
| 27° | 21 11.5 +36.3 72.2 | 20 29.1 +36.6 71.6 | 19 46.9 +36.8 71.0 | 19 04.8 +37.0 70.4 | 18 22.9 +37.2 69.8 |
| 28° | 21 47.8 +36.1 71.3 | 21 05.7 +36.3 70.7 | 20 23.7 +36.5 70.2 | 19 41.8 +36.7 69.6 | 19 00.1 +37.0 69.0 |
| 29° | 22 23.9 +35.8 70.5 | 21 42.0 +36.0 69.9 | 21 00.2 +36.3 69.3 | 20 18.5 +36.6 68.8 | 19 37.1 +36.7 68.2 |

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 The data on this page is believed to be accurate but no warranty is given for it's correctness. Use it only for training and exercising!

| 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 +40.1 90.0  | -0 44.6 +40.2      | -1 29.2 +40.2      | -2 13.7 +40.1      | -2 58.3 +40.2      |
| 1°  | 0 40.1 +40.2 89.3  | -0 04.4 +40.1      | -0 49.0 +40.2      | -1 33.6 +40.3      | -2 18.1 +40.3      |
| 2°  | 1 20.3 +40.1 88.5  | 0 35.7 +40.2 87.8  | -0 08.8 +40.2      | -0 53.3 +40.2      | -1 37.8 +40.2      |
| 3°  | 2 00.4 +40.1 87.8  | 1 15.9 +40.1 87.1  | 0 31.4 +40.1 86.4  | -0 13.1 +40.2      | -0 57.6 +40.3      |
| 4°  | 2 40.5 +40.1 87.0  | 1 56.0 +40.1 86.4  | 1 11.5 +40.2 85.7  | 0 27.1 +40.2 85.0  | -0 17.3 +40.3      |
| 5°  | 3 20.6 +40.0 86.3  | 2 36.1 +40.1 85.6  | 1 51.7 +40.1 84.9  | 1 07.3 +40.2 84.3  | 0 23.0 +40.2 83.6  |
| 6°  | 4 00.6 +40.0 85.5  | 3 16.2 +40.1 84.9  | 2 31.8 +40.1 84.2  | 1 47.5 +40.2 83.5  | 1 03.2 +40.3 82.9  |
| 7°  | 4 40.6 +40.0 84.8  | 3 56.3 +40.0 84.1  | 3 11.9 +40.1 83.5  | 2 27.7 +40.1 82.8  | 1 43.5 +40.2 82.1  |
| 8°  | 5 20.6 +39.9 84.0  | 4 36.3 +40.0 83.4  | 3 52.0 +40.1 82.7  | 3 07.8 +40.2 82.0  | 2 23.7 +40.2 81.4  |
| 9°  | 6 00.5 +39.8 83.3  | 5 16.3 +39.9 82.6  | 4 32.1 +40.0 82.0  | 3 48.0 +40.0 81.3  | 3 03.9 +40.2 80.6  |
| 10° | 6 40.3 +39.8 82.5  | 5 56.2 +39.8 81.9  | 5 12.1 +39.9 81.2  | 4 28.0 +40.1 80.6  | 3 44.1 +40.1 79.9  |
| 11° | 7 20.1 +39.7 81.8  | 6 36.0 +39.8 81.1  | 5 52.0 +39.9 80.5  | 5 08.1 +40.0 79.8  | 4 24.2 +40.1 79.2  |
| 12° | 7 59.8 +39.6 81.0  | 7 15.8 +39.7 80.4  | 6 31.9 +39.8 79.7  | 5 48.1 +39.9 79.1  | 5 04.3 +40.1 78.4  |
| 13° | 8 39.4 +39.6 80.3  | 7 55.5 +39.7 79.6  | 7 11.7 +39.8 79.0  | 6 28.0 +39.9 78.3  | 5 44.4 +40.0 77.7  |
| 14° | 9 19.0 +39.4 79.5  | 8 35.2 +39.5 78.9  | 7 51.5 +39.6 78.2  | 7 07.9 +39.8 77.6  | 6 24.4 +39.9 76.9  |
| 15° | 9 58.4 +39.3 78.7  | 9 14.7 +39.4 78.1  | 8 31.1 +39.6 77.4  | 7 47.7 +39.7 76.8  | 7 04.3 +39.9 76.2  |
| 16° | 10 37.7 +39.2 78.0 | 9 54.1 +39.4 77.3  | 9 10.7 +39.5 76.7  | 8 27.4 +39.6 76.0  | 7 44.2 +39.7 75.4  |
| 17° | 11 16.9 +39.1 77.2 | 10 33.5 +39.2 76.6 | 9 50.2 +39.3 75.9  | 9 07.0 +39.5 75.3  | 8 23.9 +39.7 74.6  |
| 18° | 11 56.0 +39.0 76.4 | 11 12.7 +39.1 75.8 | 10 29.5 +39.3 75.2 | 9 46.5 +39.4 74.5  | 9 03.6 +39.6 73.9  |
| 19° | 12 35.0 +38.8 75.6 | 11 51.8 +39.0 75.0 | 11 08.8 +39.2 74.4 | 10 25.9 +39.4 73.8 | 9 43.2 +39.5 73.1  |
| 20° | 13 13.8 +38.7 74.9 | 12 30.8 +38.9 74.2 | 11 48.0 +39.0 73.6 | 11 05.3 +39.1 73.0 | 10 22.7 +39.4 72.4 |
| 21° | 13 52.5 +38.5 74.1 | 13 09.7 +38.7 73.5 | 12 27.0 +38.9 72.8 | 11 44.4 +39.1 72.2 | 11 02.1 +39.2 71.6 |
| 22° | 14 31.0 +38.4 73.3 | 13 48.4 +38.5 72.7 | 13 05.9 +38.7 72.1 | 12 23.5 +39.0 71.4 | 11 41.3 +39.2 70.8 |
| 23° | 15 09.4 +38.2 72.5 | 14 26.9 +38.4 71.9 | 13 44.6 +38.6 71.3 | 13 02.5 +38.8 70.7 | 12 20.5 +39.0 70.0 |
| 24° | 15 47.6 +38.0 71.7 | 15 05.3 +38.2 71.1 | 14 23.2 +38.4 70.5 | 13 41.3 +38.6 69.9 | 12 59.5 +38.8 69.3 |
| 25° | 16 25.6 +37.8 70.9 | 15 43.5 +38.1 70.3 | 15 01.6 +38.3 69.7 | 14 19.9 +38.5 69.1 | 13 38.3 +38.8 68.5 |
| 26° | 17 03.4 +37.7 70.1 | 16 21.6 +37.9 69.5 | 15 39.9 +38.1 68.9 | 14 58.4 +38.3 68.3 | 14 17.1 +38.5 67.7 |
| 27° | 17 41.1 +37.4 69.3 | 16 59.5 +37.6 68.7 | 16 18.0 +37.9 68.1 | 15 36.7 +38.2 67.5 | 14 55.6 +38.4 66.9 |
| 28° | 18 18.5 +37.3 68.4 | 17 37.1 +37.5 67.9 | 16 55.9 +37.7 67.3 | 16 14.9 +38.0 66.7 | 15 34.0 +38.3 66.1 |
| 29° | 18 55.8 +37.0 67.6 | 18 14.6 +37.3 67.0 | 17 33.6 +37.6 66.5 | 16 52.9 +37.7 65.9 | 16 12.3 +38.0 65.3 |

| Dec | LHA 095° / 265°    | LHA 096° / 264°    | LHA 097° / 263°    | LHA 098° / 262°    | LHA 099° / 261°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -3 42.8 +40.2      | -4 27.3 +40.3      | -5 11.8 +40.4      | -5 56.2 +40.4      | -6 40.6 +40.5      |
| 1°  | -3 02.6 +40.3      | -3 47.0 +40.3      | -4 31.4 +40.4      | -5 15.8 +40.5      | -6 00.1 +40.5      |
| 2°  | -2 22.3 +40.3      | -3 06.7 +40.4      | -3 51.0 +40.4      | -4 35.3 +40.4      | -5 19.6 +40.6      |
| 3°  | -1 42.0 +40.3      | -2 26.3 +40.4      | -3 10.6 +40.4      | -3 54.9 +40.6      | -4 39.0 +40.6      |
| 4°  | -1 01.7 +40.4      | -1 45.9 +40.4      | -2 30.2 +40.5      | -3 14.3 +40.5      | -3 58.4 +40.6      |
| 5°  | -0 21.3 +40.3      | -1 05.5 +40.4      | -1 49.7 +40.5      | -2 33.8 +40.6      | -3 17.8 +40.7      |
| 6°  | 0 19.0 +40.3 82.2  | -0 25.1 +40.4      | -1 09.2 +40.5      | -1 53.2 +40.6      | -2 37.1 +40.7      |
| 7°  | 0 59.3 +40.4 81.5  | 0 15.3 +40.4 80.8  | -0 28.7 +40.5      | -1 12.6 +40.6      | -1 56.4 +40.8      |
| 8°  | 1 39.7 +40.3 80.7  | 0 55.7 +40.4 80.1  | 0 11.8 +40.5 79.4  | -0 32.0 +40.7      | -1 15.6 +40.7      |
| 9°  | 2 20.0 +40.2 80.0  | 1 36.1 +40.4 79.3  | 0 52.3 +40.5 78.6  | 0 08.7 +40.6 78.0  | -0 34.9 +40.8      |
| 10° | 3 00.2 +40.3 79.2  | 2 16.5 +40.4 78.6  | 1 32.8 +40.5 77.9  | 0 49.3 +40.6 77.2  | 0 05.9 +40.7 76.6  |
| 11° | 3 40.5 +40.2 78.5  | 2 56.9 +40.3 77.8  | 2 13.3 +40.5 77.2  | 1 29.9 +40.6 76.5  | 0 46.6 +40.8 75.8  |
| 12° | 4 20.7 +40.2 77.8  | 3 37.2 +40.3 77.1  | 2 53.8 +40.4 76.4  | 2 10.5 +40.6 75.8  | 1 27.4 +40.7 75.1  |
| 13° | 5 00.9 +40.1 77.0  | 4 17.5 +40.3 76.4  | 3 34.2 +40.4 75.7  | 2 51.1 +40.5 75.0  | 2 08.1 +40.7 74.4  |
| 14° | 5 41.0 +40.1 76.3  | 4 57.8 +40.2 75.6  | 4 14.6 +40.4 75.0  | 3 31.6 +40.6 74.3  | 2 48.8 +40.7 73.6  |
| 15° | 6 21.1 +40.0 75.5  | 5 38.0 +40.1 74.9  | 4 55.0 +40.3 74.2  | 4 12.2 +40.4 73.6  | 3 29.5 +40.6 72.9  |
| 16° | 7 01.1 +39.9 74.8  | 6 18.1 +40.1 74.1  | 5 35.3 +40.2 73.5  | 4 52.6 +40.4 72.8  | 4 10.1 +40.6 72.2  |
| 17° | 7 41.0 +39.8 74.0  | 6 58.2 +40.0 73.4  | 6 15.5 +40.2 72.7  | 5 33.0 +40.4 72.1  | 4 50.7 +40.6 71.4  |
| 18° | 8 20.8 +39.8 73.3  | 7 38.2 +40.0 72.6  | 6 55.7 +40.2 72.0  | 6 13.4 +40.3 71.3  | 5 31.3 +40.5 70.7  |
| 19° | 9 00.6 +39.7 72.5  | 8 18.2 +39.8 71.9  | 7 35.9 +40.0 71.2  | 6 53.7 +40.3 70.6  | 6 11.8 +40.4 69.9  |
| 20° | 9 40.3 +39.5 71.7  | 8 58.0 +39.8 71.1  | 8 15.9 +40.0 70.5  | 7 34.0 +40.1 69.8  | 6 52.2 +40.4 69.2  |
| 21° | 10 19.8 +39.5 71.0 | 9 37.8 +39.6 70.3  | 8 55.9 +39.8 69.7  | 8 14.1 +40.1 69.1  | 7 32.6 +40.2 68.5  |
| 22° | 10 59.3 +39.3 70.2 | 10 17.4 +39.6 69.6 | 9 35.7 +39.8 69.0  | 8 54.2 +40.0 68.3  | 8 12.8 +40.3 67.7  |
| 23° | 11 38.6 +39.3 69.4 | 10 57.0 +39.4 68.8 | 10 15.5 +39.6 68.2 | 9 34.2 +39.9 67.6  | 8 53.1 +40.1 67.0  |
| 24° | 12 17.9 +39.0 68.7 | 11 36.4 +39.3 68.0 | 10 55.1 +39.6 67.4 | 10 14.1 +39.7 66.8 | 9 33.2 +40.0 66.2  |
| 25° | 12 56.9 +39.0 67.9 | 12 15.7 +39.2 67.3 | 11 34.7 +39.4 66.7 | 10 53.8 +39.7 66.1 | 10 13.2 +39.9 65.4 |
| 26° | 13 35.9 +38.8 67.1 | 12 54.9 +39.1 66.5 | 12 14.1 +39.3 65.9 | 11 33.5 +39.6 65.3 | 10 53.1 +39.8 64.7 |
| 27° | 14 14.7 +38.6 66.3 | 13 34.0 +39.1 65.7 | 12 53.4 +39.2 65.1 | 12 13.1 +39.4 64.5 | 11 32.9 +39.7 63.9 |
| 28° | 14 53.3 +38.5 65.5 | 14 12.9 +38.7 64.9 | 13 32.6 +39.0 64.3 | 12 52.5 +39.3 63.8 | 12 12.6 +39.5 63.2 |
| 29° | 15 31.8 +38.3 64.7 | 14 51.6 +38.6 64.1 | 14 11.6 +38.8 63.6 | 13 31.8 +39.1 63.0 | 12 52.1 +39.5 62.4 |



# Declination SAME name as Latitude

# Latitude 42°

| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°    | LHA 103° / 257°    | LHA 104° / 256°   |
|-----|--------------------|--------------------|--------------------|--------------------|-------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °    |
| 0°  | -7 24.9 +40.6      | -8 09.1 +40.6      | -8 53.3 +40.7      | -9 37.4 +40.8      |                   |
| 1°  | -6 44.3 +40.5      | -7 28.5 +40.7      | -8 12.6 +40.7      | -8 56.6 +40.8      | -9 40.6 +41.0     |
| 2°  | -6 03.8 +40.7      | -6 47.8 +40.7      | -7 31.9 +40.9      | -8 15.8 +41.0      | -8 59.6 +41.0     |
| 3°  | -5 23.1 +40.7      | -6 07.1 +40.8      | -6 51.0 +40.9      | -7 34.8 +41.0      | -8 18.6 +41.2     |
| 4°  | -4 42.4 +40.7      | -5 26.3 +40.8      | -6 10.1 +40.9      | -6 53.8 +41.0      | -7 37.4 +41.2     |
| 5°  | -4 01.7 +40.8      | -4 45.5 +40.9      | -5 29.2 +41.1      | -6 12.8 +41.2      | -6 56.2 +41.2     |
| 6°  | -3 20.9 +40.9      | -4 04.6 +41.0      | -4 48.1 +41.0      | -5 31.6 +41.2      | -6 15.0 +41.4     |
| 7°  | -2 40.0 +40.8      | -3 23.6 +41.0      | -4 07.1 +41.1      | -4 50.4 +41.2      | -5 33.6 +41.4     |
| 8°  | -1 59.2 +40.9      | -2 42.6 +41.0      | -3 26.0 +41.2      | -4 09.2 +41.3      | -4 52.2 +41.4     |
| 9°  | -1 18.3 +40.9      | -2 01.6 +41.0      | -2 44.8 +41.1      | -3 27.9 +41.3      | -4 10.8 +41.5     |
| 10° | -0 37.4 +40.8      | -1 20.6 +41.0      | -2 03.7 +41.2      | -2 46.6 +41.4      | -3 29.3 +41.5     |
| 11° | 0 03.4 +40.9 75.2  | -0 39.6 +41.0      | -1 22.5 +41.2      | -2 05.2 +41.3      | -2 47.8 +41.5     |
| 12° | 0 44.3 +40.9 74.4  | 0 01.4 +41.1 73.8  | -0 41.3 +41.2      | -1 23.9 +41.4      | -2 06.3 +41.5     |
| 13° | 1 25.2 +40.9 73.7  | 0 42.5 +41.0 73.0  | -0 00.1 +41.2      | -0 42.5 +41.4      | -1 24.8 +41.6     |
| 14° | 2 06.1 +40.8 73.0  | 1 23.5 +41.0 72.3  | 0 41.1 +41.2 71.7  | -0 01.1 +41.4      | -0 43.2 +41.6     |
| 15° | 2 46.9 +40.8 72.2  | 2 04.5 +41.0 71.6  | 1 22.3 +41.2 70.9  | 0 40.3 +41.3 70.3  | -0 01.6 +41.5     |
| 16° | 3 27.7 +40.8 71.5  | 2 45.5 +41.0 70.9  | 2 03.5 +41.2 70.2  | 1 21.6 +41.4 69.5  | 0 39.9 +41.6 68.9 |
| 17° | 4 08.5 +40.8 70.8  | 3 26.5 +40.9 70.1  | 2 44.7 +41.1 69.5  | 2 03.0 +41.3 68.8  | 1 21.5 +41.6 68.1 |
| 18° | 4 49.3 +40.7 70.0  | 4 07.4 +40.9 69.4  | 3 25.8 +41.1 68.7  | 2 44.3 +41.3 68.1  | 2 03.1 +41.5 67.4 |
| 19° | 5 30.0 +40.6 69.3  | 4 48.3 +40.9 68.7  | 4 06.9 +41.1 68.0  | 3 25.6 +41.3 67.4  | 2 44.6 +41.5 66.7 |
| 20° | 6 10.6 +40.6 68.6  | 5 29.2 +40.8 67.9  | 4 48.0 +41.0 67.3  | 4 06.9 +41.3 66.6  | 3 26.1 +41.5 66.0 |
| 21° | 6 51.2 +40.5 67.8  | 6 10.0 +40.7 67.2  | 5 29.0 +40.9 66.5  | 4 48.2 +41.2 65.9  | 4 07.6 +41.4 65.3 |
| 22° | 7 31.7 +40.4 67.1  | 6 50.7 +40.7 66.4  | 6 09.9 +40.9 65.8  | 5 29.4 +41.1 65.2  | 4 49.0 +41.4 64.5 |
| 23° | 8 12.1 +40.4 66.3  | 7 31.4 +40.6 65.7  | 6 50.8 +40.9 65.1  | 6 10.5 +41.1 64.4  | 5 30.4 +41.3 63.8 |
| 24° | 8 52.5 +40.2 65.6  | 8 12.0 +40.5 65.0  | 7 31.7 +40.7 64.3  | 6 51.6 +41.0 63.7  | 6 11.7 +41.3 63.1 |
| 25° | 9 32.7 +40.2 64.8  | 8 52.5 +40.4 64.2  | 8 12.4 +40.7 63.6  | 7 32.6 +40.9 63.0  | 6 53.0 +41.2 62.3 |
| 26° | 10 12.9 +40.1 64.1 | 9 32.9 +40.3 63.5  | 8 53.1 +40.6 62.9  | 8 13.5 +40.9 62.2  | 7 34.2 +41.1 61.6 |
| 27° | 10 53.0 +39.9 63.3 | 10 13.2 +40.2 62.7 | 9 33.7 +40.5 62.1  | 8 54.4 +40.8 61.5  | 8 15.3 +41.1 60.9 |
| 28° | 11 32.9 +39.8 62.6 | 10 53.4 +40.2 62.0 | 10 14.2 +40.4 61.4 | 9 35.2 +40.7 60.8  | 8 56.4 +41.0 60.1 |
| 29° | 12 12.7 +39.7 61.8 | 11 33.6 +39.9 61.2 | 10 54.6 +40.3 60.6 | 10 15.9 +40.5 60.0 | 9 37.4 +40.8 59.4 |

| Dec | LHA 105° / 255°   | LHA 106° / 254°   | LHA 107° / 253°   | LHA 108° / 252°   | LHA 109° / 251°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  | -9 43.3 +41.1     |                   |                   |                   |                   |
| 3°  | -9 02.2 +41.3     | -9 45.7 +41.4     |                   |                   |                   |
| 4°  | -8 20.9 +41.3     | -9 04.3 +41.5     | -9 47.5 +41.6     |                   |                   |
| 5°  | -7 39.6 +41.4     | -8 22.8 +41.5     | -9 05.9 +41.7     | -9 48.8 +41.8     |                   |
| 6°  | -6 58.2 +41.5     | -7 41.3 +41.7     | -8 24.2 +41.8     | -9 07.0 +41.9     | -9 49.6 +42.1     |
| 7°  | -6 16.7 +41.5     | -6 59.6 +41.6     | -7 42.4 +41.8     | -8 25.1 +42.1     | -9 07.5 +42.2     |
| 8°  | -5 35.2 +41.6     | -6 18.0 +41.8     | -7 00.6 +41.9     | -7 43.0 +42.1     | -8 25.3 +42.2     |
| 9°  | -4 53.6 +41.6     | -5 36.2 +41.8     | -6 18.7 +42.0     | -7 00.9 +42.1     | -7 43.1 +42.4     |
| 10° | -4 12.0 +41.7     | -4 54.4 +41.8     | -5 36.7 +42.0     | -6 18.8 +42.2     | -7 00.7 +42.4     |
| 11° | -3 30.3 +41.7     | -4 12.6 +41.9     | -4 54.7 +42.1     | -5 36.6 +42.3     | -6 18.3 +42.5     |
| 12° | -2 48.6 +41.8     | -3 30.7 +42.0     | -4 12.6 +42.1     | -4 54.3 +42.3     | -5 35.8 +42.5     |
| 13° | -2 06.8 +41.7     | -2 48.7 +41.9     | -3 30.5 +42.2     | -4 12.0 +42.4     | -4 53.3 +42.5     |
| 14° | -1 25.1 +41.8     | -2 06.8 +42.0     | -2 48.3 +42.1     | -3 29.6 +42.3     | -4 10.8 +42.6     |
| 15° | -0 43.3 +41.7     | -1 24.8 +41.9     | -2 06.2 +42.2     | -2 47.3 +42.4     | -3 28.2 +42.7     |
| 16° | -0 01.6 +41.8     | -0 42.9 +42.0     | -1 24.0 +42.2     | -2 04.9 +42.5     | -2 45.5 +42.6     |
| 17° | 0 40.2 +41.8 67.5 | -0 00.9 +42.0     | -0 41.8 +42.3     | -1 22.4 +42.4     | -2 02.9 +42.7     |
| 18° | 1 22.0 +41.7 66.8 | 0 41.1 +42.0 66.1 | 0 00.5 +42.2 65.4 | -0 40.0 +42.5     | -1 20.2 +42.7     |
| 19° | 2 03.7 +41.8 66.0 | 1 23.1 +42.0 65.4 | 0 42.7 +42.2 64.7 | 0 02.5 +42.4 64.1 | -0 37.5 +42.7     |
| 20° | 2 45.5 +41.7 65.3 | 2 05.1 +41.9 64.7 | 1 24.9 +42.2 64.0 | 0 44.9 +42.4 63.4 | 0 05.2 +42.7 62.7 |
| 21° | 3 27.2 +41.7 64.6 | 2 47.0 +41.9 64.0 | 2 07.1 +42.1 63.3 | 1 27.3 +42.5 62.6 | 0 47.9 +42.6 62.0 |
| 22° | 4 08.9 +41.6 63.9 | 3 28.9 +41.9 63.2 | 2 49.2 +42.2 62.6 | 2 09.8 +42.4 61.9 | 1 30.5 +42.7 61.3 |
| 23° | 4 50.5 +41.6 63.2 | 4 10.8 +41.9 62.5 | 3 31.4 +42.1 61.9 | 2 52.2 +42.3 61.2 | 2 13.2 +42.7 60.6 |
| 24° | 5 32.1 +41.5 62.4 | 4 52.7 +41.8 61.8 | 4 13.5 +42.1 61.2 | 3 34.5 +42.4 60.5 | 2 55.9 +42.6 59.9 |
| 25° | 6 13.6 +41.5 61.7 | 5 34.5 +41.7 61.1 | 4 55.6 +42.0 60.4 | 4 16.9 +42.3 59.8 | 3 38.5 +42.6 59.2 |
| 26° | 6 55.1 +41.4 61.0 | 6 16.2 +41.7 60.4 | 5 37.6 +42.0 59.7 | 4 59.2 +42.3 59.1 | 4 21.1 +42.5 58.5 |
| 27° | 7 36.5 +41.3 60.3 | 6 57.9 +41.6 59.6 | 6 19.6 +41.9 59.0 | 5 41.5 +42.2 58.4 | 5 03.6 +42.5 57.8 |
| 28° | 8 17.8 +41.3 59.5 | 7 39.5 +41.6 58.9 | 7 01.5 +41.8 58.3 | 6 23.7 +42.1 57.7 | 5 46.1 +42.5 57.0 |
| 29° | 8 59.1 +41.2 58.8 | 8 21.1 +41.5 58.2 | 7 43.3 +41.8 57.6 | 7 05.8 +42.1 57.0 | 6 28.6 +42.4 56.3 |

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| Dec | LHA 110° / 250°   | LHA 111° / 249°   | LHA 112° / 248°   | LHA 113° / 247°   | LHA 114° / 246°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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 49.8 +42.4     |                   |                   |                   |                   |
| 9°  | -9 07.4 +42.4     | -9 49.4 +42.7     |                   |                   |                   |
|     | -8 25.0 +42.6     | -9 06.7 +42.7     | -9 48.3 +43.0     |                   |                   |
| 10° | -7 42.4 +42.6     | -8 24.0 +42.8     | -9 05.3 +43.0     | -9 46.4 +43.2     |                   |
| 11° | -6 59.8 +42.6     | -7 41.2 +42.9     | -8 22.3 +43.1     | -9 03.2 +43.3     | -9 43.9 +43.5     |
| 12° | -6 17.2 +42.7     | -6 58.3 +42.9     | -7 39.2 +43.1     | -8 19.9 +43.4     | -9 00.4 +43.7     |
| 13° | -5 34.5 +42.8     | -6 15.4 +43.0     | -6 56.1 +43.3     | -7 36.5 +43.4     | -8 16.7 +43.6     |
| 14° | -4 51.7 +42.8     | -5 32.4 +43.1     | -6 12.8 +43.2     | -6 53.1 +43.5     | -7 33.1 +43.8     |
| 15° | -4 08.9 +42.9     | -4 49.3 +43.1     | -5 29.6 +43.4     | -6 09.6 +43.6     | -6 49.3 +43.8     |
| 16° | -3 26.0 +42.9     | -4 06.2 +43.1     | -4 46.2 +43.3     | -5 26.0 +43.6     | -6 05.5 +43.9     |
| 17° | -2 43.1 +42.9     | -3 23.1 +43.1     | -4 02.9 +43.4     | -4 42.4 +43.7     | -5 21.6 +43.9     |
| 18° | -2 00.2 +42.9     | -2 40.0 +43.2     | -3 19.5 +43.5     | -3 58.7 +43.7     | -4 37.7 +43.9     |
| 19° | -1 17.3 +43.0     | -1 56.8 +43.2     | -2 36.0 +43.4     | -3 15.0 +43.7     | -3 53.8 +44.0     |
| 20° | -0 34.3 +42.9     | -1 13.6 +43.2     | -1 52.6 +43.5     | -2 31.3 +43.7     | -3 09.8 +44.0     |
| 21° | 0 08.6 +43.0 61.3 | -0 30.4 +43.2     | -1 09.1 +43.5     | -1 47.6 +43.8     | -2 25.8 +44.0     |
| 22° | 0 51.6 +42.9 60.6 | 0 12.8 +43.2 60.0 | -0 25.6 +43.5     | -1 03.8 +43.7     | -1 41.8 +44.1     |
| 23° | 1 34.5 +42.9 59.9 | 0 56.0 +43.2 59.3 | 0 17.9 +43.4 58.6 | -0 20.1 +43.8     | -0 57.7 +44.0     |
| 24° | 2 17.4 +42.9 59.2 | 1 39.2 +43.2 58.6 | 1 01.3 +43.5 57.9 | 0 23.7 +43.8 57.2 | -0 13.7 +44.1     |
| 25° | 3 00.3 +42.9 58.5 | 2 22.4 +43.2 57.9 | 1 44.8 +43.5 57.2 | 1 07.5 +43.7 56.6 | 0 30.4 +44.0 55.9 |
| 26° | 3 43.2 +42.8 57.8 | 3 05.6 +43.1 57.2 | 2 28.3 +43.4 56.5 | 1 51.2 +43.7 55.9 | 1 14.4 +44.1 55.2 |
| 27° | 4 26.0 +42.8 57.1 | 3 48.7 +43.1 56.5 | 3 11.7 +43.4 55.8 | 2 34.9 +43.8 55.2 | 1 58.5 +44.0 54.5 |
| 28° | 5 08.8 +42.8 56.4 | 4 31.8 +43.1 55.8 | 3 55.1 +43.4 55.1 | 3 18.7 +43.6 54.5 | 2 42.5 +44.0 53.9 |
| 29° | 5 51.6 +42.7 55.7 | 5 14.9 +43.0 55.1 | 4 38.5 +43.3 54.4 | 4 02.3 +43.7 53.8 | 3 26.5 +44.0 53.2 |

| Dec | LHA 115° / 245°   | LHA 116° / 244°   | LHA 117° / 243°   | LHA 118° / 242°   | LHA 119° / 241°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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° | -9 40.6 +43.9     |                   |                   |                   |                   |
| 13° | -8 56.7 +43.9     | -9 36.5 +44.2     |                   |                   |                   |
| 14° | -8 12.8 +44.0     | -8 52.3 +44.3     | -9 31.5 +44.5     |                   |                   |
| 15° | -7 28.8 +44.1     | -8 08.0 +44.3     | -8 47.0 +44.6     | -9 25.7 +44.8     |                   |
| 16° | -6 44.7 +44.1     | -7 23.7 +44.4     | -8 02.4 +44.6     | -8 40.9 +45.0     | -9 19.0 +45.2     |
| 17° | -6 00.6 +44.1     | -6 39.3 +44.4     | -7 17.8 +44.7     | -7 55.9 +44.9     | -8 33.8 +45.2     |
| 18° | -5 16.5 +44.3     | -5 54.9 +44.5     | -6 33.1 +44.8     | -7 11.0 +45.1     | -7 48.6 +45.4     |
| 19° | -4 32.2 +44.2     | -5 10.4 +44.5     | -5 48.3 +44.8     | -6 25.9 +45.0     | -7 03.2 +45.3     |
| 20° | -3 48.0 +44.3     | -4 25.9 +44.6     | -5 03.5 +44.8     | -5 40.9 +45.2     | -6 17.9 +45.4     |
| 21° | -3 03.7 +44.3     | -3 41.3 +44.6     | -4 18.7 +44.9     | -4 55.7 +45.1     | -5 32.5 +45.5     |
| 22° | -2 19.4 +44.3     | -2 56.7 +44.6     | -3 33.8 +44.9     | -4 10.6 +45.2     | -4 47.0 +45.5     |
| 23° | -1 35.1 +44.4     | -2 12.1 +44.6     | -2 48.9 +44.9     | -3 25.4 +45.3     | -4 01.5 +45.5     |
| 24° | -0 50.7 +44.3     | -1 27.5 +44.7     | -2 04.0 +45.0     | -2 40.1 +45.2     | -3 16.0 +45.6     |
| 25° | -0 06.4 +44.4     | -0 42.8 +44.6     | -1 19.0 +44.9     | -1 54.9 +45.3     | -2 30.4 +45.6     |
| 26° | 0 38.0 +44.3 54.6 | 0 01.8 +44.7 53.9 | -0 34.1 +45.0     | -1 09.6 +45.3     | -1 44.8 +45.5     |
| 27° | 1 22.3 +44.4 53.9 | 0 46.5 +44.6 53.2 | 0 10.9 +45.0 52.6 | -0 24.3 +45.2     | -0 59.3 +45.6     |
| 28° | 2 06.7 +44.3 53.2 | 1 31.1 +44.6 52.5 | 0 55.9 +44.9 51.9 | 0 20.9 +45.3 51.2 | -0 13.7 +45.6     |
| 29° | 2 51.0 +44.3 52.5 | 2 15.7 +44.6 51.9 | 1 40.8 +45.0 51.2 | 1 06.2 +45.3 50.6 | 0 31.9 +45.6 49.9 |

| Dec | LHA 120° / 240° | LHA 121° / 239° | LHA 122° / 238° | LHA 123° / 237° | LHA 124° / 236° |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
|     | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  |
| 0°  |                 |                 |                 |                 |                 |
| 1°  |                 |                 |                 |                 |                 |
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| 12° |                 |                 |                 |                 |                 |
| 13° |                 |                 |                 |                 |                 |
| 14° |                 |                 |                 |                 |                 |
| 15° |                 |                 |                 |                 |                 |
| 16° | -9 56.8 +45.4   |                 |                 |                 |                 |
| 17° | -9 11.4 +45.6   |                 |                 |                 |                 |
| 18° | -8 25.8 +45.6   |                 |                 |                 |                 |
| 19° | -7 40.2 +45.6   |                 |                 |                 |                 |
| 20° | -6 54.6 +45.7   |                 |                 |                 |                 |
| 21° | -6 08.9 +45.8   |                 |                 |                 |                 |
| 22° | -5 23.1 +45.8   |                 |                 |                 |                 |
| 23° | -4 37.3 +45.8   |                 |                 |                 |                 |
| 24° | -3 51.5 +45.9   |                 |                 |                 |                 |
| 25° | -3 05.6 +45.9   |                 |                 |                 |                 |
| 26° | -2 19.7 +45.9   |                 |                 |                 |                 |
| 27° | -1 33.8 +45.9   |                 |                 |                 |                 |
| 28° | -0 47.9 +45.9   |                 |                 |                 |                 |
| 29° | -0 02.0 +45.9   |                 |                 |                 |                 |

| Dec | LHA 125° / 235° | LHA 126° / 234° | LHA 127° / 233° | LHA 128° / 232° | LHA 129° / 231° |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
|     | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  |
| 0°  |                 |                 |                 |                 |                 |
| 1°  |                 |                 |                 |                 |                 |
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| 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°  | 47 00.0 +60.0 180.0 | 46 59.4 +60.0 178.5 | 46 57.8 +59.9 177.1 | 46 55.0 +59.9 175.6 | 46 51.0 +59.9 174.1 |
| 1°  | 48 00.0 +60.0 180.0 | 47 59.4 +60.0 178.5 | 47 57.7 +60.0 177.0 | 47 54.9 +59.9 175.5 | 47 50.9 +59.8 174.0 |
| 2°  | 49 00.0 +60.0 180.0 | 48 59.4 +60.0 178.5 | 48 57.7 +59.9 177.0 | 48 54.8 +59.9 175.4 | 48 50.7 +59.8 173.9 |
| 3°  | 50 00.0 +60.0 180.0 | 49 59.4 +60.0 178.4 | 49 57.6 +60.0 176.9 | 49 54.7 +59.8 175.3 | 49 50.5 +59.8 173.8 |
| 4°  | 51 00.0 +60.0 180.0 | 50 59.4 +60.0 178.4 | 50 57.6 +59.9 176.8 | 50 54.5 +59.9 175.3 | 50 50.3 +59.8 173.7 |
| 5°  | 52 00.0 +60.0 180.0 | 51 59.4 +60.0 178.4 | 51 57.5 +60.0 176.8 | 51 54.4 +59.9 175.2 | 51 50.1 +59.8 173.5 |
| 6°  | 53 00.0 +60.0 180.0 | 52 59.4 +60.0 178.3 | 52 57.5 +59.9 176.7 | 52 54.3 +59.9 175.0 | 52 49.9 +59.8 173.4 |
| 7°  | 54 00.0 +60.0 180.0 | 53 59.4 +59.9 178.3 | 53 57.4 +60.0 176.6 | 53 54.2 +59.9 174.9 | 53 49.7 +59.7 173.3 |
| 8°  | 55 00.0 +60.0 180.0 | 54 59.3 +60.0 178.3 | 54 57.4 +59.9 176.5 | 54 54.1 +59.8 174.8 | 54 49.4 +59.8 173.1 |
| 9°  | 56 00.0 +60.0 180.0 | 55 59.3 +60.0 178.2 | 55 57.3 +59.9 176.5 | 55 53.9 +59.9 174.7 | 55 49.2 +59.8 173.0 |
| 10° | 57 00.0 +60.0 180.0 | 56 59.3 +60.0 178.2 | 56 57.2 +60.0 176.4 | 56 53.8 +59.8 174.6 | 56 49.0 +59.7 172.8 |
| 11° | 58 00.0 +60.0 180.0 | 57 59.3 +60.0 178.1 | 57 57.2 +59.9 176.3 | 57 53.6 +59.9 174.5 | 57 48.7 +59.7 172.6 |
| 12° | 59 00.0 +60.0 180.0 | 58 59.3 +60.0 178.1 | 58 57.1 +59.9 176.2 | 58 53.5 +59.8 174.3 | 58 48.4 +59.7 172.4 |
| 13° | 60 00.0 +60.0 180.0 | 59 59.3 +59.9 178.1 | 59 57.0 +59.9 176.1 | 59 53.3 +59.8 174.2 | 59 48.1 +59.7 172.2 |
| 14° | 61 00.0 +60.0 180.0 | 60 59.2 +60.0 178.0 | 60 56.9 +60.0 176.0 | 60 53.1 +59.8 174.0 | 60 47.8 +59.6 172.0 |
| 15° | 62 00.0 +60.0 180.0 | 61 59.2 +60.0 177.9 | 61 56.9 +59.9 175.9 | 61 52.9 +59.8 173.8 | 61 47.4 +59.7 171.8 |
| 16° | 63 00.0 +60.0 180.0 | 62 59.2 +60.0 177.9 | 62 56.8 +59.9 175.8 | 62 52.7 +59.8 173.7 | 62 47.1 +59.6 171.6 |
| 17° | 64 00.0 +60.0 180.0 | 63 59.2 +59.9 177.8 | 63 56.7 +59.9 175.6 | 63 52.5 +59.8 173.5 | 63 46.7 +59.6 171.3 |
| 18° | 65 00.0 +60.0 180.0 | 64 59.1 +60.0 177.8 | 64 56.6 +59.8 175.5 | 64 52.3 +59.7 173.3 | 64 46.3 +59.5 171.0 |
| 19° | 66 00.0 +60.0 180.0 | 65 59.1 +60.0 177.7 | 65 56.4 +59.9 175.4 | 65 52.0 +59.7 173.0 | 65 45.8 +59.5 170.8 |
| 20° | 67 00.0 +60.0 180.0 | 66 59.1 +59.9 177.6 | 66 56.3 +59.9 175.2 | 66 51.7 +59.7 172.8 | 66 45.3 +59.5 170.4 |
| 21° | 68 00.0 +60.0 180.0 | 67 59.0 +60.0 177.5 | 67 56.2 +59.8 175.0 | 67 51.4 +59.7 172.6 | 67 44.8 +59.4 170.1 |
| 22° | 69 00.0 +60.0 180.0 | 68 59.0 +60.0 177.4 | 68 56.0 +59.9 174.8 | 68 51.1 +59.7 172.3 | 68 44.2 +59.4 169.7 |
| 23° | 70 00.0 +60.0 180.0 | 69 59.0 +59.9 177.3 | 69 55.9 +59.8 174.6 | 69 50.8 +59.6 172.0 | 69 43.6 +59.3 169.3 |
| 24° | 71 00.0 +60.0 180.0 | 70 58.9 +60.0 177.2 | 70 55.7 +59.8 174.4 | 70 50.4 +59.5 171.6 | 70 42.9 +59.3 168.9 |
| 25° | 72 00.0 +60.0 180.0 | 71 58.9 +59.9 177.1 | 71 55.5 +59.8 174.1 | 71 49.9 +59.6 171.2 | 71 42.2 +59.1 168.4 |
| 26° | 73 00.0 +60.0 180.0 | 72 58.8 +60.0 176.9 | 72 55.3 +59.8 173.9 | 72 49.5 +59.4 170.8 | 72 41.3 +59.1 167.8 |
| 27° | 74 00.0 +60.0 180.0 | 73 58.8 +59.9 176.8 | 73 55.1 +59.7 173.6 | 73 48.9 +59.4 170.4 | 73 40.4 +58.9 167.2 |
| 28° | 75 00.0 +60.0 180.0 | 74 58.7 +59.9 176.6 | 74 54.8 +59.7 173.2 | 74 48.3 +59.3 169.8 | 74 39.3 +58.8 166.5 |
| 29° | 76 00.0 +60.0 180.0 | 75 58.6 +59.9 176.4 | 75 54.5 +59.6 172.8 | 75 47.6 +59.2 169.3 | 75 38.1 +58.7 165.8 |

| Dec | LHA 005° / 355°     | LHA 006° / 354°     | LHA 007° / 353°     | LHA 008° / 352°     | LHA 009° / 351°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 46 46.0 +59.7 172.7 | 46 39.9 +59.6 171.2 | 46 32.6 +59.5 169.8 | 46 24.3 +59.4 168.4 | 46 14.9 +59.2 166.9 |
| 1°  | 47 45.7 +59.8 172.6 | 47 39.5 +59.6 171.1 | 47 32.1 +59.5 169.6 | 47 23.7 +59.3 168.1 | 47 14.1 +59.1 166.7 |
| 2°  | 48 45.5 +59.7 172.4 | 48 39.1 +59.6 170.9 | 48 31.6 +59.4 169.4 | 48 23.0 +59.2 167.9 | 48 13.2 +59.1 166.4 |
| 3°  | 49 45.2 +59.7 172.3 | 49 38.7 +59.6 170.7 | 49 31.0 +59.5 169.2 | 49 22.2 +59.3 167.7 | 49 12.3 +59.1 166.2 |
| 4°  | 50 44.9 +59.7 172.1 | 50 38.3 +59.5 170.5 | 50 30.5 +59.3 169.0 | 50 21.5 +59.2 167.4 | 50 11.4 +59.0 165.9 |
| 5°  | 51 44.6 +59.6 171.9 | 51 37.8 +59.5 170.3 | 51 29.8 +59.4 168.8 | 51 20.7 +59.2 167.2 | 51 10.4 +58.9 165.6 |
| 6°  | 52 44.2 +59.7 171.8 | 52 37.3 +59.5 170.1 | 52 29.2 +59.4 168.5 | 52 19.9 +59.1 166.9 | 52 09.3 +59.0 165.3 |
| 7°  | 53 43.9 +59.6 171.6 | 53 36.8 +59.5 169.9 | 53 28.6 +59.3 168.3 | 53 19.0 +59.1 166.6 | 53 08.3 +58.8 165.0 |
| 8°  | 54 43.5 +59.7 171.4 | 54 36.3 +59.5 169.7 | 54 27.9 +59.2 168.0 | 54 18.1 +59.1 166.3 | 54 07.1 +58.9 164.7 |
| 9°  | 55 43.2 +59.6 171.2 | 55 35.8 +59.4 169.5 | 55 27.1 +59.3 167.7 | 55 17.2 +59.0 166.0 | 55 06.0 +58.7 164.3 |
| 10° | 56 42.8 +59.5 171.0 | 56 35.2 +59.4 169.2 | 56 26.4 +59.2 167.5 | 56 16.2 +58.9 165.7 | 56 04.7 +58.7 164.0 |
| 11° | 57 42.3 +59.6 170.8 | 57 34.6 +59.4 169.0 | 57 25.6 +59.1 167.2 | 57 15.1 +58.9 165.4 | 57 03.4 +58.6 163.6 |
| 12° | 58 41.9 +59.5 170.6 | 58 34.0 +59.3 168.7 | 58 24.7 +59.1 166.8 | 58 14.0 +58.9 165.0 | 58 02.0 +58.6 163.2 |
| 13° | 59 41.4 +59.5 170.3 | 59 33.3 +59.3 168.4 | 59 23.8 +59.1 166.5 | 59 12.9 +58.7 164.6 | 59 00.6 +58.4 162.8 |
| 14° | 60 40.9 +59.5 170.1 | 60 32.6 +59.3 168.1 | 60 22.9 +58.9 166.2 | 60 11.6 +58.7 164.2 | 59 59.0 +58.4 162.3 |
| 15° | 61 40.4 +59.5 169.8 | 61 31.9 +59.2 167.8 | 61 21.8 +59.0 165.8 | 61 10.3 +58.6 163.8 | 60 57.4 +58.2 161.9 |
| 16° | 62 39.9 +59.4 169.5 | 62 31.1 +59.1 167.4 | 62 20.8 +58.8 165.4 | 62 08.9 +58.5 163.4 | 61 55.6 +58.2 161.4 |
| 17° | 63 39.3 +59.3 169.2 | 63 30.2 +59.1 167.1 | 63 19.6 +58.8 165.0 | 63 07.4 +58.4 162.9 | 62 53.8 +58.0 160.8 |
| 18° | 64 38.6 +59.3 168.8 | 64 29.3 +59.0 166.7 | 64 18.4 +58.6 164.5 | 64 05.8 +58.3 162.4 | 63 51.8 +57.9 160.3 |
| 19° | 65 37.9 +59.3 168.5 | 65 28.3 +58.9 166.2 | 65 17.0 +58.6 164.0 | 65 04.1 +58.2 161.8 | 64 49.7 +57.7 159.7 |
| 20° | 66 37.2 +59.2 168.1 | 66 27.2 +58.9 165.8 | 66 15.6 +58.5 163.5 | 66 02.3 +58.0 161.2 | 65 47.4 +57.5 159.0 |
| 21° | 67 36.4 +59.1 167.7 | 67 26.1 +58.7 165.3 | 67 14.1 +58.3 162.9 | 67 00.3 +57.8 160.6 | 66 44.9 +57.3 158.3 |
| 22° | 68 35.5 +59.0 167.2 | 68 24.8 +58.7 164.7 | 68 12.4 +58.1 162.3 | 67 58.1 +57.7 159.9 | 67 42.2 +57.1 157.5 |
| 23° | 69 34.5 +59.0 166.7 | 69 23.5 +58.5 164.1 | 69 10.5 +58.0 161.6 | 68 55.8 +57.4 159.1 | 68 39.3 +56.8 156.7 |
| 24° | 70 33.5 +58.8 166.2 | 70 22.0 +58.3 163.5 | 70 08.5 +57.8 160.9 | 69 53.2 +57.2 158.3 | 69 36.1 +56.5 155.8 |
| 25° | 71 32.3 +58.7 165.6 | 71 20.3 +58.2 162.8 | 71 06.3 +57.6 160.1 | 70 50.4 +56.9 157.4 | 70 32.6 +56.2 154.8 |
| 26° | 72 31.0 +58.5 164.9 | 72 18.5 +57.9 162.0 | 72 03.9 +57.3 159.2 | 71 47.3 +56.5 156.4 | 71 28.8 +55.7 153.7 |
| 27° | 73 29.5 +58.4 164.1 | 73 16.4 +57.8 161.1 | 73 01.2 +56.9 158.2 | 72 43.8 +56.2 155.3 | 72 24.5 +55.3 152.5 |
| 28° | 74 27.9 +58.2 163.3 | 74 14.2 +57.4 160.1 | 73 58.1 +56.6 157.1 | 73 40.0 +55.7 154.1 | 73 19.8 +54.8 151.2 |
| 29° | 75 26.1 +57.9 162.4 | 75 11.6 +57.0 159.0 | 74 54.7 +56.2 155.8 | 74 35.7 +55.1 152.7 | 74 14.6 +54.0 149.7 |

| 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°  | 46 04.5 +58.9 165.5 | 45 53.0 +58.7 164.1 | 45 40.4 +58.6 162.7 | 45 26.9 +58.3 161.3 | 45 12.3 +58.0 159.9 |
| 1°  | 47 03.4 +59.0 165.2 | 46 51.7 +58.7 163.8 | 46 39.0 +58.4 162.4 | 46 25.2 +58.2 161.0 | 46 10.3 +58.0 159.6 |
| 2°  | 48 02.4 +58.9 165.0 | 47 50.4 +58.7 163.5 | 47 37.4 +58.5 162.0 | 47 23.4 +58.2 160.6 | 47 08.3 +57.9 159.2 |
| 3°  | 49 01.3 +58.8 164.7 | 48 49.1 +58.6 163.2 | 48 35.9 +58.3 161.7 | 48 21.6 +58.0 160.2 | 48 06.2 +57.8 158.8 |
| 4°  | 50 00.1 +58.8 164.4 | 49 47.7 +58.6 162.9 | 49 34.2 +58.3 161.3 | 49 19.6 +58.1 159.9 | 49 04.0 +57.7 158.4 |
| 5°  | 50 58.9 +58.7 164.1 | 50 46.3 +58.5 162.5 | 50 32.5 +58.2 161.0 | 50 17.7 +57.9 159.5 | 50 01.7 +57.7 158.0 |
| 6°  | 51 57.6 +58.7 163.7 | 51 44.8 +58.4 162.2 | 51 30.7 +58.2 160.6 | 51 15.6 +57.8 159.1 | 50 59.4 +57.5 157.5 |
| 7°  | 52 56.3 +58.6 163.4 | 52 43.2 +58.3 161.8 | 52 28.9 +58.0 160.2 | 52 13.4 +57.8 158.6 | 51 56.9 +57.4 157.1 |
| 8°  | 53 54.9 +58.6 163.0 | 53 41.5 +58.3 161.4 | 53 26.9 +58.0 159.8 | 53 11.2 +57.6 158.2 | 52 54.3 +57.3 156.6 |
| 9°  | 54 53.5 +58.5 162.6 | 54 39.8 +58.2 161.0 | 54 24.9 +57.9 159.3 | 54 08.8 +57.6 157.7 | 53 51.6 +57.2 156.1 |
| 10° | 55 52.0 +58.4 162.3 | 55 38.0 +58.1 160.6 | 55 22.8 +57.7 158.9 | 55 06.4 +57.4 157.2 | 54 48.8 +57.0 155.6 |
| 11° | 56 50.4 +58.3 161.8 | 56 36.1 +58.0 160.1 | 56 20.5 +57.7 158.4 | 56 03.8 +57.2 156.7 | 55 45.8 +56.9 155.0 |
| 12° | 57 48.7 +58.2 161.4 | 57 34.1 +57.8 159.6 | 57 18.2 +57.5 157.9 | 57 01.0 +57.1 156.2 | 56 42.7 +56.7 154.5 |
| 13° | 58 46.9 +58.1 160.9 | 58 31.9 +57.8 159.1 | 58 15.7 +57.3 157.3 | 57 58.1 +57.0 155.6 | 57 39.4 +56.5 153.9 |
| 14° | 59 45.0 +58.0 160.5 | 59 29.7 +57.6 158.6 | 59 13.0 +57.2 156.8 | 58 55.1 +56.8 155.0 | 58 35.9 +56.4 153.2 |
| 15° | 60 43.0 +57.9 159.9 | 60 27.3 +57.5 158.1 | 60 10.2 +57.1 156.2 | 59 51.9 +56.6 154.4 | 59 32.3 +56.1 152.6 |
| 16° | 61 40.9 +57.7 159.4 | 61 24.8 +57.3 157.5 | 61 07.3 +56.8 155.6 | 60 48.5 +56.3 153.7 | 60 28.4 +55.9 151.8 |
| 17° | 62 38.6 +57.6 158.8 | 62 22.1 +57.1 156.8 | 62 04.1 +56.7 154.9 | 61 44.8 +56.2 153.0 | 61 24.3 +55.6 151.1 |
| 18° | 63 36.2 +57.4 158.2 | 63 19.2 +56.9 156.2 | 63 00.8 +56.4 154.2 | 62 41.0 +55.9 152.2 | 62 19.9 +55.3 150.3 |
| 19° | 64 33.6 +57.3 157.5 | 64 16.1 +56.7 155.4 | 63 57.2 +56.1 153.4 | 63 36.9 +55.5 151.4 | 63 15.2 +55.0 149.5 |
| 20° | 65 30.9 +57.0 156.8 | 65 12.8 +56.5 154.7 | 64 53.3 +55.9 152.6 | 64 32.4 +55.3 150.5 | 64 10.2 +54.6 148.5 |
| 21° | 66 27.9 +56.7 156.0 | 66 09.3 +56.1 153.9 | 65 49.2 +55.5 151.7 | 65 27.7 +54.9 149.6 | 65 04.8 +54.3 147.6 |
| 22° | 67 24.6 +56.5 155.2 | 67 05.4 +55.9 153.0 | 66 44.7 +55.2 150.8 | 66 22.6 +54.5 148.6 | 65 59.1 +53.8 146.6 |
| 23° | 68 21.1 +56.2 154.3 | 68 01.3 +55.5 152.0 | 67 39.9 +54.8 149.8 | 67 17.1 +54.1 147.6 | 66 52.9 +53.3 145.4 |
| 24° | 69 17.3 +55.8 153.4 | 68 56.8 +55.0 151.0 | 68 34.7 +54.3 148.7 | 68 11.2 +53.5 146.4 | 67 46.2 +52.7 144.3 |
| 25° | 70 13.1 +55.4 152.3 | 69 51.8 +54.6 149.8 | 69 29.0 +53.8 147.5 | 69 04.7 +52.9 145.2 | 68 38.9 +52.1 143.0 |
| 26° | 71 08.5 +54.9 151.1 | 70 46.4 +54.1 148.6 | 70 22.8 +53.2 146.2 | 69 57.6 +52.3 143.8 | 69 31.0 +51.4 141.6 |
| 27° | 72 03.4 +54.4 149.9 | 71 40.5 +53.4 147.3 | 71 16.0 +52.5 144.8 | 70 49.9 +51.6 142.4 | 70 22.4 +50.6 140.1 |
| 28° | 72 57.8 +53.7 148.4 | 72 33.9 +52.8 145.8 | 72 08.5 +51.7 143.2 | 71 41.5 +50.6 140.8 | 71 13.0 +49.7 138.4 |
| 29° | 73 51.5 +53.0 146.9 | 73 26.7 +51.8 144.1 | 73 00.2 +50.7 141.5 | 72 32.1 +49.7 139.0 | 72 02.7 +48.5 136.7 |

| 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°  | 44 56.7 +57.8 158.6 | 44 40.2 +57.5 157.2 | 44 22.7 +57.2 155.9 | 44 04.3 +56.9 154.5 | 43 45.0 +56.6 153.2 |
| 1°  | 45 54.5 +57.7 158.2 | 45 37.7 +57.4 156.8 | 45 19.9 +57.1 155.4 | 45 01.2 +56.8 154.1 | 44 41.6 +56.4 152.7 |
| 2°  | 46 52.2 +57.6 157.8 | 46 35.1 +57.3 156.4 | 46 17.0 +57.0 155.0 | 45 58.0 +56.7 153.6 | 45 38.0 +56.4 152.3 |
| 3°  | 47 49.8 +57.5 157.4 | 47 32.4 +57.2 155.9 | 47 14.0 +56.9 154.5 | 46 54.7 +56.5 153.1 | 46 34.4 +56.2 151.8 |
| 4°  | 48 47.3 +57.4 156.9 | 48 29.6 +57.1 155.5 | 48 10.9 +56.8 154.1 | 47 51.2 +56.5 152.7 | 47 30.6 +56.1 151.3 |
| 5°  | 49 44.7 +57.4 156.5 | 49 26.7 +57.0 155.0 | 49 07.7 +56.6 153.6 | 48 47.7 +56.3 152.1 | 48 26.7 +55.9 150.7 |
| 6°  | 50 42.1 +57.2 156.0 | 50 23.7 +56.9 154.5 | 50 04.3 +56.5 153.1 | 49 44.0 +56.1 151.6 | 49 22.6 +55.8 150.2 |
| 7°  | 51 39.3 +57.0 155.5 | 51 20.6 +56.7 154.0 | 51 00.8 +56.4 152.5 | 50 40.1 +56.0 151.1 | 50 18.4 +55.6 149.6 |
| 8°  | 52 36.3 +57.0 155.0 | 52 17.3 +56.6 153.5 | 51 57.2 +56.2 152.0 | 51 36.1 +55.8 150.5 | 51 14.0 +55.4 149.0 |
| 9°  | 53 33.3 +56.8 154.5 | 53 13.9 +56.4 152.9 | 52 53.4 +56.0 151.4 | 52 31.9 +55.6 149.9 | 52 09.4 +55.1 148.4 |
| 10° | 54 30.1 +56.6 154.0 | 54 10.3 +56.2 152.4 | 53 49.4 +55.8 150.8 | 53 27.5 +55.4 149.3 | 53 04.5 +55.0 147.7 |
| 11° | 55 26.7 +56.5 153.4 | 55 06.5 +56.1 151.8 | 54 45.2 +55.6 150.2 | 54 22.9 +55.2 148.6 | 53 59.5 +54.8 147.1 |
| 12° | 56 23.2 +56.3 152.8 | 56 02.6 +55.8 151.1 | 55 40.8 +55.4 149.5 | 55 18.1 +54.9 147.9 | 54 54.3 +54.4 146.4 |
| 13° | 57 19.5 +56.1 152.2 | 56 58.4 +55.7 150.5 | 56 36.2 +55.2 148.8 | 56 13.0 +54.7 147.2 | 55 48.7 +54.2 145.6 |
| 14° | 58 15.6 +55.8 151.5 | 57 54.1 +55.3 149.8 | 57 31.4 +54.9 148.1 | 57 07.7 +54.4 146.5 | 56 42.9 +53.9 144.9 |
| 15° | 59 11.4 +55.7 150.8 | 58 49.4 +55.2 149.0 | 58 26.3 +54.6 147.3 | 58 02.1 +54.1 145.7 | 57 36.8 +53.6 144.0 |
| 16° | 60 07.1 +55.3 150.0 | 59 44.6 +54.8 148.3 | 59 20.9 +54.3 146.5 | 58 56.2 +53.8 144.9 | 58 30.4 +53.2 143.2 |
| 17° | 61 02.4 +55.1 149.3 | 60 39.4 +54.5 147.5 | 60 15.2 +54.0 145.7 | 59 50.0 +53.4 144.0 | 59 23.6 +52.9 142.3 |
| 18° | 61 57.5 +54.8 148.4 | 61 33.9 +54.2 146.6 | 61 09.2 +53.6 144.8 | 60 43.4 +53.0 143.1 | 60 16.5 +52.4 141.4 |
| 19° | 62 52.3 +54.4 147.5 | 62 28.1 +53.8 145.7 | 62 02.8 +53.2 143.9 | 61 36.4 +52.5 142.1 | 61 08.9 +51.9 140.4 |
| 20° | 63 46.7 +54.0 146.6 | 63 21.9 +53.4 144.7 | 62 56.0 +52.7 142.9 | 62 28.9 +52.1 141.1 | 62 00.8 +51.5 139.3 |
| 21° | 64 40.7 +53.6 145.6 | 64 15.3 +52.9 143.7 | 63 48.7 +52.2 141.8 | 63 21.0 +51.6 140.0 | 62 52.3 +50.9 138.2 |
| 22° | 65 34.3 +53.1 144.5 | 65 08.2 +52.4 142.6 | 64 40.9 +51.7 140.7 | 64 12.6 +50.9 138.8 | 63 43.2 +50.2 137.0 |
| 23° | 66 27.4 +52.5 143.4 | 66 00.6 +51.8 141.4 | 65 32.6 +51.1 139.5 | 65 03.5 +50.4 137.6 | 64 33.4 +49.6 135.8 |
| 24° | 67 19.9 +52.0 142.2 | 66 52.4 +51.1 140.1 | 66 23.7 +50.3 138.2 | 65 53.9 +49.6 136.3 | 65 23.0 +48.9 134.4 |
| 25° | 68 11.9 +51.2 140.8 | 67 43.5 +50.5 138.8 | 67 14.0 +49.7 136.8 | 66 43.5 +48.8 134.9 | 66 11.9 +48.0 133.0 |
| 26° | 69 03.1 +50.5 139.4 | 68 34.0 +49.6 137.3 | 68 03.7 +48.7 135.3 | 67 32.3 +47.9 133.4 | 66 57.9 +47.1 131.5 |
| 27° | 69 53.6 +49.7 137.9 | 69 23.6 +48.7 135.7 | 68 52.4 +47.8 133.7 | 68 20.2 +46.9 131.8 | 67 47.0 +46.1 129.9 |
| 28° | 70 43.3 +48.6 136.2 | 70 12.3 +47.7 134.1 | 69 40.2 +46.8 132.0 | 69 07.1 +45.8 130.0 | 68 33.1 +44.9 128.2 |
| 29° | 71 31.9 +47.5 134.4 | 71 00.0 +46.5 132.2 | 70 27.0 +45.5 130.2 | 69 52.9 +44.6 128.2 | 69 18.0 +43.7 126.3 |

# Declination SAME name as Latitude

# Latitude 43°

| 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°  | 43 24.8 +56.2 151.9 | 43 03.7 +55.9 150.6 | 42 41.7 +55.6 149.4 | 42 18.9 +55.3 148.1 | 41 55.4 +54.9 146.9 |
| 1°  | 44 21.0 +56.2 151.4 | 43 59.6 +55.8 150.1 | 43 37.3 +55.5 148.8 | 43 14.2 +55.1 147.6 | 42 50.3 +54.7 146.3 |
| 2°  | 45 17.2 +56.0 150.9 | 44 55.4 +55.7 149.6 | 44 32.8 +55.3 148.3 | 44 09.3 +55.0 147.0 | 43 45.0 +54.6 145.8 |
| 3°  | 46 13.2 +55.9 150.4 | 45 51.1 +55.5 149.1 | 45 28.1 +55.1 147.8 | 45 04.3 +54.8 146.5 | 44 39.6 +54.4 145.2 |
| 4°  | 47 09.1 +55.7 149.9 | 46 46.6 +55.3 148.5 | 46 23.2 +55.0 147.2 | 45 59.1 +54.6 145.9 | 45 34.0 +54.2 144.6 |
| 5°  | 48 04.8 +55.5 149.3 | 47 41.9 +55.2 148.0 | 47 18.2 +54.8 146.6 | 46 53.7 +54.4 145.3 | 46 28.2 +54.1 144.0 |
| 6°  | 49 00.3 +55.4 148.8 | 48 37.1 +55.0 147.4 | 48 13.0 +54.6 146.0 | 47 48.1 +54.1 144.7 | 47 22.3 +53.7 143.3 |
| 7°  | 49 55.7 +55.2 148.2 | 49 32.1 +54.8 146.8 | 49 07.6 +54.4 145.4 | 48 42.2 +54.0 144.0 | 48 16.0 +53.6 142.7 |
| 8°  | 50 50.9 +55.0 147.6 | 50 26.9 +54.6 146.1 | 50 02.0 +54.1 144.7 | 49 36.2 +53.7 143.3 | 49 09.6 +53.3 142.0 |
| 9°  | 51 45.9 +54.7 146.9 | 51 21.5 +54.3 145.5 | 50 56.1 +53.9 144.0 | 50 29.9 +53.5 142.6 | 50 02.9 +53.0 141.3 |
| 10° | 52 40.6 +54.6 146.3 | 52 15.8 +54.1 144.8 | 51 50.0 +53.7 143.3 | 51 23.4 +53.2 141.9 | 50 55.9 +52.8 140.5 |
| 11° | 53 35.2 +54.3 145.6 | 53 09.9 +53.8 144.1 | 52 43.7 +53.4 142.6 | 52 16.6 +52.9 141.2 | 51 48.7 +52.4 139.8 |
| 12° | 54 29.5 +54.0 144.8 | 54 03.7 +53.6 143.3 | 53 37.1 +53.0 141.8 | 53 09.5 +52.6 140.4 | 52 41.1 +52.1 139.0 |
| 13° | 55 23.5 +53.7 144.1 | 54 57.3 +53.2 142.5 | 54 30.1 +52.8 141.1 | 54 02.1 +52.2 139.6 | 53 33.2 +51.8 138.2 |
| 14° | 56 17.2 +53.4 143.3 | 55 50.5 +52.9 141.7 | 55 22.9 +52.3 140.2 | 54 54.3 +51.9 138.7 | 54 25.0 +51.4 137.3 |
| 15° | 57 10.6 +53.0 142.4 | 56 43.4 +52.5 140.9 | 56 15.2 +52.0 139.4 | 55 46.2 +51.5 137.9 | 55 16.4 +50.9 136.4 |
| 16° | 58 03.6 +52.7 141.6 | 57 35.9 +52.1 140.0 | 57 07.2 +51.6 138.4 | 56 37.7 +51.0 136.9 | 56 07.3 +50.5 135.5 |
| 17° | 58 56.3 +52.3 140.7 | 58 28.0 +51.7 139.1 | 57 58.8 +51.2 137.5 | 57 28.7 +50.6 136.0 | 56 57.8 +50.1 134.5 |
| 18° | 59 48.6 +51.8 139.7 | 59 19.7 +51.3 138.1 | 58 50.0 +50.6 136.5 | 58 19.3 +50.1 135.0 | 57 47.9 +49.5 133.5 |
| 19° | 60 40.4 +51.3 138.7 | 60 11.0 +50.7 137.0 | 59 40.6 +50.1 135.4 | 59 09.4 +49.5 133.9 | 58 37.4 +48.9 132.4 |
| 20° | 61 31.7 +50.8 137.6 | 61 01.7 +50.2 136.0 | 60 30.7 +49.6 134.3 | 59 58.9 +49.0 132.8 | 59 26.3 +48.4 131.3 |
| 21° | 62 22.5 +50.3 136.5 | 61 51.9 +49.5 134.8 | 61 20.3 +48.9 133.2 | 60 47.9 +48.3 131.6 | 60 14.7 +47.7 130.1 |
| 22° | 63 12.8 +49.5 135.3 | 62 41.4 +48.9 133.6 | 62 09.2 +48.3 132.0 | 61 36.2 +47.6 130.4 | 61 02.4 +47.0 128.8 |
| 23° | 64 02.3 +48.9 134.0 | 63 30.3 +48.2 132.3 | 62 57.5 +47.5 130.7 | 62 23.8 +46.8 129.1 | 61 49.4 +46.2 127.5 |
| 24° | 64 51.2 +48.1 132.7 | 64 18.5 +47.4 131.0 | 63 45.0 +46.6 129.3 | 63 10.6 +46.0 127.7 | 62 35.6 +45.3 126.2 |
| 25° | 65 39.3 +47.3 131.2 | 65 05.9 +46.5 129.5 | 64 31.6 +45.8 127.9 | 63 56.6 +45.1 126.3 | 63 20.9 +44.4 124.7 |
| 26° | 66 26.6 +46.3 129.7 | 65 52.4 +45.6 128.0 | 65 17.4 +44.9 126.3 | 64 41.7 +44.1 124.8 | 64 05.3 +43.5 123.2 |
| 27° | 67 12.9 +45.3 128.1 | 66 38.0 +44.4 126.4 | 66 02.3 +43.7 124.7 | 65 25.8 +43.1 123.1 | 64 48.8 +42.3 121.6 |
| 28° | 67 58.2 +44.1 126.4 | 67 22.4 +43.4 124.7 | 66 46.0 +42.6 123.0 | 66 08.9 +41.8 121.4 | 65 31.1 +41.2 119.9 |
| 29° | 68 42.3 +42.8 124.5 | 68 05.8 +42.0 122.8 | 67 28.6 +41.2 121.2 | 66 50.7 +40.6 119.6 | 66 12.3 +39.9 118.2 |

| 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°  | 41 31.0 +54.5 145.6 | 41 05.8 +54.2 144.4 | 40 39.9 +53.9 143.2 | 40 13.3 +53.5 142.1 | 39 46.0 +53.1 140.9 |
| 1°  | 42 25.5 +54.4 145.1 | 42 00.0 +54.1 143.9 | 41 33.8 +53.7 142.7 | 41 06.8 +53.3 141.5 | 40 39.1 +53.0 140.3 |
| 2°  | 43 19.9 +54.3 144.5 | 42 54.1 +53.8 143.3 | 42 27.5 +53.4 142.0 | 42 00.1 +53.1 140.8 | 41 32.1 +52.7 139.7 |
| 3°  | 44 14.2 +54.0 143.9 | 43 47.9 +53.7 142.7 | 43 20.9 +53.3 141.4 | 42 53.2 +52.9 140.2 | 42 24.8 +52.5 139.0 |
| 4°  | 45 08.2 +53.8 143.3 | 44 41.6 +53.4 142.0 | 44 14.2 +53.1 140.8 | 43 46.1 +52.7 139.6 | 43 17.3 +52.3 138.4 |
| 5°  | 46 02.0 +53.6 142.7 | 45 35.0 +53.2 141.4 | 45 07.3 +52.8 140.1 | 44 38.8 +52.4 138.9 | 44 09.6 +52.0 137.7 |
| 6°  | 46 55.6 +53.4 142.0 | 46 28.2 +53.0 140.7 | 46 00.1 +52.6 139.5 | 45 31.2 +52.2 138.2 | 45 01.6 +51.8 137.0 |
| 7°  | 47 49.0 +53.2 141.3 | 47 21.2 +52.8 140.0 | 46 52.7 +52.3 138.8 | 46 23.4 +51.9 137.5 | 45 53.4 +51.5 136.3 |
| 8°  | 48 42.2 +52.8 140.6 | 48 14.0 +52.4 139.3 | 47 45.0 +52.0 138.0 | 47 15.3 +51.6 136.8 | 46 44.9 +51.2 135.5 |
| 9°  | 49 35.0 +52.6 139.9 | 49 06.4 +52.2 138.6 | 48 37.0 +51.7 137.3 | 48 06.9 +51.3 136.0 | 47 36.1 +50.8 134.8 |
| 10° | 50 27.6 +52.3 139.2 | 49 58.6 +51.8 137.8 | 49 28.7 +51.5 136.5 | 48 58.2 +51.0 135.2 | 48 26.9 +50.6 134.0 |
| 11° | 51 19.9 +52.0 138.4 | 50 50.4 +51.6 137.0 | 50 20.2 +51.0 135.7 | 49 49.2 +50.6 134.4 | 49 17.5 +50.2 133.1 |
| 12° | 52 11.9 +51.7 137.6 | 51 42.0 +51.1 136.2 | 51 11.2 +50.7 134.9 | 50 39.8 +50.2 133.6 | 50 07.7 +49.7 132.3 |
| 13° | 53 03.6 +51.2 136.7 | 52 33.1 +50.8 135.4 | 52 01.9 +50.3 134.0 | 51 30.0 +49.9 132.7 | 50 57.4 +49.4 131.4 |
| 14° | 53 54.8 +50.9 135.9 | 53 23.9 +50.4 134.5 | 52 52.2 +49.9 133.1 | 52 19.9 +49.4 131.8 | 51 46.8 +49.0 130.5 |
| 15° | 54 45.7 +50.5 135.0 | 54 14.3 +49.9 133.6 | 53 42.1 +49.5 132.2 | 53 09.3 +48.9 130.9 | 52 35.8 +48.5 129.6 |
| 16° | 55 36.2 +49.9 134.0 | 55 04.2 +49.5 132.6 | 54 31.6 +48.9 131.2 | 53 58.2 +48.5 129.9 | 53 24.3 +47.9 128.6 |
| 17° | 56 26.1 +49.5 133.0 | 55 53.7 +49.0 131.6 | 55 20.5 +48.5 130.2 | 54 46.7 +47.9 128.9 | 54 12.2 +47.5 127.6 |
| 18° | 57 15.6 +49.0 132.0 | 56 42.7 +48.4 130.6 | 56 09.0 +47.9 129.2 | 55 34.6 +47.4 127.8 | 54 59.7 +46.9 126.5 |
| 19° | 58 04.6 +48.4 130.9 | 57 31.1 +47.8 129.5 | 56 56.9 +47.3 128.1 | 56 22.0 +46.8 126.7 | 55 46.6 +46.2 125.4 |
| 20° | 58 53.0 +47.8 129.8 | 58 18.9 +47.2 128.3 | 57 44.2 +46.6 126.9 | 57 08.8 +46.1 125.6 | 56 32.8 +45.6 124.3 |
| 21° | 59 40.8 +47.1 128.6 | 59 06.1 +46.5 127.2 | 58 30.8 +46.0 125.8 | 57 54.9 +45.4 124.4 | 57 18.4 +44.9 123.1 |
| 22° | 60 27.9 +46.3 127.4 | 59 52.6 +45.8 125.9 | 59 16.8 +45.2 124.5 | 58 40.3 +44.7 123.2 | 58 03.3 +44.2 121.8 |
| 23° | 61 14.2 +45.6 126.1 | 60 38.4 +45.0 124.6 | 60 02.0 +44.4 123.2 | 59 25.0 +43.9 121.9 | 58 47.5 +43.3 120.5 |
| 24° | 61 59.8 +44.7 124.7 | 61 23.4 +44.1 123.2 | 60 46.4 +43.6 121.9 | 60 08.9 +43.0 120.5 | 59 30.8 +42.5 119.2 |
| 25° | 62 44.5 +43.8 123.2 | 62 07.5 +43.2 121.8 | 61 30.0 +42.6 120.4 | 60 51.9 +42.0 119.1 | 60 13.3 +41.5 117.8 |
| 26° | 63 28.3 +42.8 121.7 | 62 50.7 +42.2 120.3 | 62 12.6 +41.6 118.9 | 61 33.9 +41.1 117.6 | 60 54.8 +40.6 116.3 |
| 27° | 64 11.1 +41.7 120.1 | 63 32.9 +41.1 118.7 | 62 54.2 +40.5 117.4 | 62 15.0 +40.0 116.1 | 61 35.4 +39.4 114.8 |
| 28° | 64 52.8 +40.5 118.5 | 64 14.0 +39.9 117.1 | 63 34.7 +39.3 115.7 | 62 55.0 +38.8 114.4 | 62 14.8 +38.3 113.2 |
| 29° | 65 33.3 +39.3 116.7 | 64 53.9 +38.7 115.3 | 64 14.0 +38.1 114.0 | 63 33.8 +37.5 112.7 | 62 53.1 +37.1 111.5 |

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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°  | 39 18.0 +52.7 139.8 | 38 49.3 +52.4 138.6 | 38 19.9 +52.1 137.5 | 37 50.0 +51.7 136.4 | 37 19.4 +51.4 135.3 |
| 1°  | 40 10.7 +52.6 139.1 | 39 41.7 +52.2 138.0 | 39 12.0 +51.9 136.9 | 38 41.7 +51.5 135.8 | 38 10.8 +51.1 134.7 |
| 2°  | 41 03.3 +52.4 138.5 | 40 33.9 +52.0 137.3 | 40 03.9 +51.6 136.2 | 39 33.2 +51.2 135.1 | 39 01.9 +50.9 134.0 |
| 3°  | 41 55.7 +52.1 137.8 | 41 25.9 +51.8 136.7 | 40 55.5 +51.4 135.5 | 40 24.4 +51.1 134.4 | 39 52.8 +50.6 133.3 |
| 4°  | 42 47.8 +51.9 137.2 | 42 17.7 +51.5 136.0 | 41 46.9 +51.1 134.9 | 41 15.5 +50.7 133.7 | 40 43.4 +50.4 132.6 |
| 5°  | 43 39.7 +51.7 136.5 | 43 09.2 +51.2 135.3 | 42 38.0 +50.9 134.1 | 42 06.2 +50.5 133.0 | 41 33.8 +50.1 131.9 |
| 6°  | 44 31.4 +51.3 135.8 | 44 00.4 +51.0 134.6 | 43 28.9 +50.5 133.4 | 42 56.7 +50.2 132.3 | 42 23.9 +49.8 131.1 |
| 7°  | 45 22.7 +51.1 135.0 | 44 51.4 +50.7 133.9 | 44 19.4 +50.3 132.7 | 43 46.9 +49.9 131.5 | 43 13.7 +49.5 130.4 |
| 8°  | 46 13.8 +50.8 134.3 | 45 42.1 +50.3 133.1 | 45 09.7 +50.0 131.9 | 44 36.8 +49.5 130.7 | 44 03.2 +49.2 129.6 |
| 9°  | 47 04.6 +50.4 133.5 | 46 32.4 +50.1 132.3 | 45 59.7 +49.6 131.1 | 45 26.3 +49.2 129.9 | 44 52.4 +48.8 128.8 |
| 10° | 47 55.0 +50.1 132.7 | 47 22.5 +49.7 131.5 | 46 49.3 +49.3 130.3 | 46 15.5 +48.9 129.1 | 45 41.2 +48.5 128.0 |
| 11° | 48 45.1 +49.8 131.9 | 48 12.2 +49.3 130.7 | 47 38.6 +48.9 129.5 | 47 04.4 +48.5 128.3 | 46 29.7 +48.1 127.1 |
| 12° | 49 34.9 +49.3 131.0 | 49 01.5 +48.9 129.8 | 48 27.5 +48.4 128.6 | 47 52.9 +48.0 127.4 | 47 17.8 +47.6 126.2 |
| 13° | 50 24.2 +48.9 130.1 | 49 50.4 +48.5 128.9 | 49 15.9 +48.1 127.7 | 48 40.9 +47.7 126.5 | 48 05.4 +47.2 125.3 |
| 14° | 51 13.1 +48.5 129.2 | 50 38.9 +48.0 128.0 | 50 04.0 +47.6 126.8 | 49 28.6 +47.1 125.6 | 48 52.6 +46.8 124.4 |
| 15° | 52 01.6 +48.0 128.3 | 51 26.9 +47.6 127.0 | 50 51.6 +47.1 125.8 | 50 15.7 +46.7 124.6 | 49 39.4 +46.2 123.5 |
| 16° | 52 49.6 +47.6 127.3 | 52 14.5 +47.0 126.0 | 51 38.7 +46.6 124.8 | 51 02.4 +46.2 123.6 | 50 25.6 +45.8 122.5 |
| 17° | 53 37.2 +46.9 126.3 | 53 01.5 +46.5 125.0 | 52 25.3 +46.0 123.8 | 51 48.6 +45.6 122.6 | 51 11.4 +45.2 121.4 |
| 18° | 54 24.1 +46.4 125.2 | 53 48.0 +45.9 124.0 | 53 11.3 +45.5 122.7 | 52 34.2 +45.0 121.5 | 51 56.6 +44.5 120.4 |
| 19° | 55 10.5 +45.8 124.1 | 54 33.9 +45.3 122.9 | 53 56.8 +44.8 121.6 | 53 19.2 +44.4 120.4 | 52 41.1 +44.0 119.3 |
| 20° | 55 56.3 +45.1 123.0 | 55 19.2 +44.6 121.7 | 54 41.6 +44.2 120.5 | 54 03.6 +43.7 119.3 | 53 25.1 +43.3 118.2 |
| 21° | 56 41.4 +44.4 121.8 | 56 03.8 +44.0 120.5 | 55 25.8 +43.5 119.3 | 54 47.3 +43.0 118.1 | 54 08.4 +42.6 117.0 |
| 22° | 57 25.8 +43.6 120.6 | 56 47.8 +43.1 119.3 | 56 09.3 +42.7 118.3 | 55 30.3 +42.3 116.9 | 54 51.0 +41.9 115.8 |
| 23° | 58 09.4 +42.9 119.3 | 57 30.9 +42.4 118.0 | 56 52.0 +41.9 116.8 | 56 12.6 +41.5 115.6 | 55 32.9 +41.0 114.5 |
| 24° | 58 52.3 +41.9 117.9 | 58 13.3 +41.5 116.7 | 57 33.9 +41.0 115.5 | 56 54.1 +40.6 114.3 | 56 13.9 +40.2 113.2 |
| 25° | 59 34.2 +41.1 116.5 | 58 54.8 +40.5 115.3 | 58 14.9 +40.1 114.1 | 57 34.7 +39.7 113.0 | 56 54.1 +39.3 111.9 |
| 26° | 60 15.3 +40.0 115.1 | 59 35.3 +39.6 113.9 | 58 55.0 +39.2 112.7 | 58 14.4 +38.7 111.6 | 57 33.4 +38.4 110.5 |
| 27° | 60 55.3 +39.0 113.6 | 60 14.9 +38.5 112.4 | 59 34.2 +38.1 111.2 | 58 53.1 +37.7 110.1 | 58 11.8 +37.3 109.0 |
| 28° | 61 34.3 +37.8 112.0 | 60 53.4 +37.4 110.8 | 60 12.3 +36.9 109.7 | 59 30.8 +36.6 108.6 | 58 49.1 +36.2 107.5 |
| 29° | 62 12.1 +36.6 110.3 | 61 30.8 +36.2 109.2 | 60 49.2 +35.8 108.1 | 60 07.4 +35.4 107.0 | 59 25.3 +35.1 106.0 |

| 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°  | 36 48.3 +51.0 134.2 | 36 16.6 +50.6 133.2 | 35 44.3 +50.3 132.1 | 35 11.5 +50.0 131.1 | 34 38.2 +49.6 130.1 |
| 1°  | 37 39.3 +50.8 133.6 | 37 07.2 +50.4 132.5 | 36 34.6 +50.1 131.5 | 36 01.5 +49.7 130.4 | 35 27.8 +49.4 129.4 |
| 2°  | 38 30.1 +50.5 132.9 | 37 57.6 +50.2 131.8 | 37 24.7 +49.8 130.8 | 36 51.2 +49.5 129.7 | 36 17.2 +49.1 128.7 |
| 3°  | 39 20.6 +50.3 132.2 | 38 47.8 +49.9 131.1 | 38 14.5 +49.6 130.1 | 37 40.7 +49.2 129.0 | 37 06.3 +48.9 128.0 |
| 4°  | 40 10.9 +50.0 131.5 | 39 37.7 +49.7 130.4 | 39 04.1 +49.2 129.4 | 38 29.9 +48.9 128.3 | 37 55.2 +48.6 127.3 |
| 5°  | 41 00.9 +49.7 130.8 | 40 27.4 +49.3 129.7 | 39 53.3 +49.0 128.6 | 39 18.8 +48.6 127.6 | 38 43.8 +48.3 126.5 |
| 6°  | 41 50.6 +49.4 130.0 | 41 16.7 +49.1 128.9 | 40 42.3 +48.7 127.9 | 40 07.4 +48.4 126.8 | 39 32.1 +48.0 125.8 |
| 7°  | 42 40.0 +49.2 129.3 | 42 05.8 +48.7 128.2 | 41 31.0 +48.4 127.1 | 40 55.8 +48.0 126.0 | 40 20.1 +47.6 125.0 |
| 8°  | 43 29.2 +48.7 128.5 | 42 54.5 +48.4 127.4 | 42 19.4 +48.1 126.3 | 41 43.8 +47.7 125.2 | 41 07.7 +47.3 124.2 |
| 9°  | 44 17.9 +48.5 127.7 | 43 42.9 +48.1 126.6 | 43 07.5 +47.6 125.5 | 42 31.5 +47.3 124.4 | 41 55.0 +47.0 123.4 |
| 10° | 45 06.4 +48.0 126.8 | 44 31.0 +47.7 125.7 | 43 55.1 +47.3 124.6 | 43 18.8 +46.9 123.6 | 42 42.0 +46.6 122.5 |
| 11° | 45 54.4 +47.7 126.0 | 45 18.7 +47.3 124.9 | 44 42.4 +46.9 123.8 | 44 05.7 +46.6 122.7 | 43 28.6 +46.2 121.6 |
| 12° | 46 42.1 +47.3 125.1 | 46 06.0 +46.8 124.0 | 45 29.3 +46.5 122.9 | 44 52.3 +46.1 121.8 | 44 14.8 +45.7 120.8 |
| 13° | 47 29.4 +46.8 124.2 | 46 52.8 +46.5 123.1 | 46 15.8 +46.1 122.0 | 45 38.4 +45.7 120.9 | 45 00.5 +45.4 119.9 |
| 14° | 48 16.2 +46.3 123.3 | 47 39.3 +45.9 122.1 | 47 01.9 +45.5 121.0 | 46 24.1 +45.2 120.0 | 45 45.9 +44.8 118.9 |
| 15° | 49 02.5 +45.9 122.3 | 48 25.2 +45.5 121.2 | 47 47.4 +45.1 120.1 | 47 09.3 +44.7 119.0 | 46 30.7 +44.4 118.0 |
| 16° | 49 48.4 +45.3 121.3 | 49 10.7 +44.9 120.2 | 48 32.5 +44.6 119.1 | 47 54.0 +44.2 118.0 | 47 15.1 +43.8 117.0 |
| 17° | 50 33.7 +44.8 120.3 | 49 55.6 +44.4 119.2 | 49 17.1 +44.0 118.1 | 48 38.2 +43.6 117.0 | 47 58.9 +43.3 116.0 |
| 18° | 51 18.5 +44.2 119.2 | 50 40.0 +43.8 118.1 | 50 01.1 +43.4 117.0 | 49 21.8 +43.1 116.0 | 48 42.2 +42.7 114.9 |
| 19° | 52 02.7 +43.5 118.1 | 51 23.8 +43.1 117.0 | 50 44.5 +42.8 115.9 | 50 04.9 +42.4 114.9 | 49 24.9 +42.1 113.8 |
| 20° | 52 46.2 +42.9 117.0 | 52 06.9 +42.6 115.9 | 51 27.3 +42.1 114.8 | 50 47.3 +41.8 113.8 | 50 07.0 +41.4 112.7 |
| 21° | 53 29.1 +42.2 115.9 | 52 49.5 +41.8 114.8 | 52 09.4 +41.5 113.7 | 51 29.1 +41.1 112.6 | 50 48.4 +40.8 111.6 |
| 22° | 54 11.3 +41.5 114.6 | 53 31.3 +41.0 113.6 | 52 50.9 +40.7 112.5 | 52 10.2 +40.4 111.5 | 51 29.2 +40.0 110.4 |
| 23° | 54 52.8 +40.6 113.4 | 54 12.3 +40.3 112.3 | 53 31.6 +39.9 111.3 | 52 50.6 +39.6 110.2 | 52 09.2 +39.3 109.2 |
| 24° | 55 33.4 +39.8 112.1 | 54 52.6 +39.5 111.0 | 54 11.5 +39.1 110.0 | 53 30.2 +38.7 109.0 | 52 48.5 +38.5 108.0 |
| 25° | 56 13.2 +39.0 110.8 | 55 32.1 +38.5 109.7 | 54 50.6 +38.3 108.7 | 54 08.9 +38.0 107.7 | 53 27.0 +37.7 106.7 |
| 26° | 56 52.2 +37.9 109.4 | 56 10.6 +37.7 108.4 | 55 28.9 +37.3 107.3 | 54 46.9 +37.0 106.4 | 54 04.7 +36.7 105.4 |
| 27° | 57 30.1 +37.0 108.0 | 56 48.3 +36.6 106.9 | 56 06.2 +36.4 106.0 | 55 23.9 +36.1 105.0 | 54 41.4 +35.8 104.0 |
| 28° | 58 07.1 +35.9 106.5 | 57 24.9 +35.6 105.5 | 56 42.6 +35.3 104.5 | 56 00.0 +35.0 103.6 | 55 17.2 +34.9 102.6 |
| 29° | 58 43.0 +34.8 105.0 | 58 00.5 +34.6 104.0 | 57 17.9 +34.2 103.0 | 56 35.0 +34.1 102.1 | 55 52.1 +33.8 101.2 |



| 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°  | 34 04.4 +49.3 129.1 | 33 30.1 +48.9 128.1 | 32 55.3 +48.7 127.1 | 32 20.1 +48.4 126.2 | 31 44.5 +48.0 125.2 |
| 1°  | 34 53.7 +49.0 128.4 | 34 19.0 +48.8 127.4 | 33 44.0 +48.4 126.4 | 33 08.5 +48.0 125.5 | 32 32.5 +47.8 124.5 |
| 2°  | 35 42.7 +48.8 127.7 | 35 07.8 +48.4 126.7 | 34 32.4 +48.1 125.7 | 33 56.5 +47.8 124.8 | 33 20.3 +47.5 123.8 |
| 3°  | 36 31.5 +48.5 127.0 | 35 56.2 +48.2 126.0 | 35 20.5 +47.9 125.0 | 34 44.3 +47.6 124.0 | 34 07.8 +47.2 123.1 |
| 4°  | 37 20.0 +48.3 126.2 | 36 44.4 +47.9 125.2 | 36 08.4 +47.5 124.3 | 35 31.9 +47.3 123.3 | 34 55.0 +47.0 122.3 |
| 5°  | 38 08.3 +47.9 125.5 | 37 32.3 +47.7 124.5 | 36 55.9 +47.3 123.5 | 36 19.2 +46.9 122.5 | 35 42.0 +46.6 121.6 |
| 6°  | 38 56.2 +47.7 124.7 | 38 20.0 +47.3 123.7 | 37 43.2 +47.0 122.7 | 37 06.1 +46.7 121.7 | 36 28.6 +46.4 120.8 |
| 7°  | 39 43.9 +47.3 123.9 | 39 07.3 +46.9 122.9 | 38 30.2 +46.7 121.9 | 37 52.8 +46.3 121.0 | 37 15.0 +46.0 120.0 |
| 8°  | 40 31.2 +47.0 123.1 | 39 54.2 +46.7 122.1 | 39 16.9 +46.3 121.1 | 38 39.1 +46.0 120.1 | 38 01.0 +45.7 119.2 |
| 9°  | 41 18.2 +46.6 122.3 | 40 40.9 +46.3 121.3 | 40 03.2 +45.9 120.3 | 39 25.1 +45.7 119.3 | 38 46.7 +45.3 118.3 |
| 10° | 42 04.8 +46.2 121.5 | 41 27.2 +45.9 120.5 | 40 49.1 +45.6 119.5 | 40 10.8 +45.2 118.5 | 39 32.0 +45.0 117.5 |
| 11° | 42 51.0 +45.9 120.6 | 42 13.1 +45.5 119.6 | 41 34.7 +45.2 118.6 | 40 56.0 +44.9 117.6 | 40 17.0 +44.5 116.6 |
| 12° | 43 36.9 +45.4 119.7 | 42 58.6 +45.0 118.7 | 42 19.9 +44.8 117.7 | 41 40.9 +44.4 116.7 | 41 01.5 +44.2 115.8 |
| 13° | 44 22.3 +45.0 118.8 | 43 43.6 +44.7 117.8 | 43 04.7 +44.3 116.8 | 42 25.3 +44.0 115.8 | 41 45.7 +43.7 114.9 |
| 14° | 45 07.3 +44.5 117.9 | 44 28.3 +44.2 116.9 | 43 49.0 +43.8 115.9 | 43 09.3 +43.6 114.9 | 42 29.4 +43.2 113.9 |
| 15° | 45 51.8 +44.0 116.9 | 45 12.5 +43.7 115.9 | 44 32.8 +43.4 114.9 | 43 52.9 +43.0 113.9 | 43 12.6 +42.8 113.0 |
| 16° | 46 35.8 +43.5 115.9 | 45 56.2 +43.1 114.9 | 45 16.2 +42.9 113.9 | 44 35.9 +42.6 113.0 | 43 55.4 +42.3 112.0 |
| 17° | 47 19.3 +42.9 114.9 | 46 39.3 +42.7 113.9 | 45 59.1 +42.3 112.9 | 45 18.5 +42.0 112.0 | 44 37.7 +41.7 111.0 |
| 18° | 48 02.2 +42.4 113.9 | 47 22.0 +42.0 112.9 | 46 41.4 +41.7 111.9 | 46 00.5 +41.5 111.0 | 45 19.4 +41.2 110.0 |
| 19° | 48 44.6 +41.8 112.8 | 48 04.0 +41.5 111.8 | 47 23.1 +41.2 110.9 | 46 42.0 +40.9 109.9 | 46 00.6 +40.6 109.0 |
| 20° | 49 26.4 +41.1 111.7 | 48 45.5 +40.8 110.7 | 48 04.3 +40.5 109.8 | 47 22.9 +40.3 108.8 | 46 41.2 +40.0 107.9 |
| 21° | 50 07.5 +40.5 110.6 | 49 26.3 +40.2 109.6 | 48 44.8 +39.9 108.7 | 48 03.2 +39.6 107.7 | 47 21.2 +39.4 106.8 |
| 22° | 50 48.0 +39.7 109.4 | 50 06.5 +39.4 108.5 | 49 24.7 +39.2 107.5 | 48 42.8 +38.9 106.6 | 48 00.6 +38.7 105.7 |
| 23° | 51 27.7 +39.0 108.3 | 50 45.9 +38.7 107.3 | 50 03.9 +38.5 106.4 | 49 21.7 +38.2 105.4 | 48 39.3 +38.0 104.5 |
| 24° | 52 06.7 +38.2 107.0 | 51 24.6 +38.0 106.1 | 50 42.4 +37.7 105.2 | 49 59.9 +37.5 104.2 | 49 17.3 +37.3 103.4 |
| 25° | 52 44.9 +37.4 105.8 | 52 02.6 +37.1 104.8 | 51 20.1 +36.9 103.9 | 50 37.4 +36.7 103.0 | 49 54.6 +36.4 102.1 |
| 26° | 53 22.3 +36.5 104.5 | 52 39.7 +36.3 103.5 | 51 57.0 +36.0 102.6 | 51 14.1 +35.8 101.8 | 50 31.0 +35.7 100.9 |
| 27° | 53 58.8 +35.6 103.1 | 53 16.0 +35.3 102.2 | 52 33.0 +35.2 101.3 | 51 49.9 +35.0 100.5 | 51 06.7 +34.8 99.6  |
| 28° | 54 34.4 +34.6 101.7 | 53 51.3 +34.4 100.9 | 53 08.2 +34.2 100.0 | 52 24.9 +34.1 99.2  | 51 41.5 +33.9 98.3  |
| 29° | 55 09.0 +33.6 100.3 | 54 25.7 +33.5 99.5  | 53 42.4 +33.3 98.6  | 52 59.0 +33.1 97.8  | 52 15.4 +33.0 97.0  |

| 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°  | 31 08.5 +47.6 124.3 | 30 32.0 +47.4 123.4 | 29 55.2 +47.1 122.5 | 29 18.0 +46.8 121.6 | 28 40.4 +46.5 120.7 |
| 1°  | 31 56.1 +47.5 123.6 | 31 19.4 +47.1 122.7 | 30 42.3 +46.8 121.7 | 30 04.8 +46.5 120.8 | 29 26.9 +46.3 119.9 |
| 2°  | 32 43.6 +47.2 122.9 | 32 06.5 +46.9 121.9 | 31 29.1 +46.6 121.0 | 30 51.3 +46.3 120.1 | 30 13.2 +46.0 119.2 |
| 3°  | 33 30.8 +46.9 122.1 | 32 53.4 +46.7 121.2 | 32 15.7 +46.4 120.3 | 31 37.6 +46.1 119.4 | 30 59.2 +45.8 118.5 |
| 4°  | 34 17.7 +46.7 121.4 | 33 40.1 +46.3 120.4 | 33 02.1 +46.0 119.5 | 32 23.7 +45.8 118.6 | 31 45.0 +45.5 117.7 |
| 5°  | 35 04.4 +46.3 120.6 | 34 26.4 +46.1 119.7 | 33 48.1 +45.8 118.7 | 33 09.5 +45.5 117.8 | 32 30.5 +45.2 116.9 |
| 6°  | 35 50.7 +46.1 119.8 | 35 12.5 +45.7 118.9 | 34 33.9 +45.5 118.0 | 33 55.0 +45.2 117.1 | 33 15.7 +44.9 116.2 |
| 7°  | 36 36.8 +45.7 119.0 | 35 58.2 +45.5 118.1 | 35 19.4 +45.1 117.2 | 34 40.2 +44.8 116.3 | 34 00.6 +44.7 115.4 |
| 8°  | 37 22.5 +45.4 118.2 | 36 43.7 +45.1 117.3 | 36 04.5 +44.8 116.4 | 35 25.0 +44.6 115.4 | 34 45.3 +44.2 114.5 |
| 9°  | 38 07.9 +45.0 117.4 | 37 28.8 +44.7 116.5 | 36 49.3 +44.5 115.5 | 36 09.6 +44.2 114.6 | 35 29.5 +44.0 113.7 |
| 10° | 38 52.9 +44.7 116.5 | 38 13.5 +44.4 115.6 | 37 33.8 +44.1 114.7 | 36 53.8 +43.8 113.8 | 36 13.5 +43.5 112.9 |
| 11° | 39 37.6 +44.2 115.7 | 38 57.9 +44.0 114.7 | 38 17.9 +43.7 113.8 | 37 37.6 +43.4 112.9 | 36 57.0 +43.2 112.0 |
| 12° | 40 21.8 +43.9 114.8 | 39 41.9 +43.5 113.9 | 39 01.6 +43.3 112.9 | 38 21.0 +43.1 112.0 | 37 40.2 +42.8 111.2 |
| 13° | 41 05.7 +43.4 113.9 | 40 25.4 +43.2 113.0 | 39 44.9 +42.9 112.1 | 39 04.1 +42.6 111.1 | 38 23.0 +42.4 110.3 |
| 14° | 41 49.1 +43.0 113.0 | 41 08.6 +42.7 112.1 | 40 27.8 +42.4 111.1 | 39 46.7 +42.2 110.2 | 39 05.4 +42.0 109.4 |
| 15° | 42 32.1 +42.5 112.0 | 41 51.3 +42.2 111.1 | 41 10.2 +42.0 110.2 | 40 28.9 +41.8 109.3 | 39 47.4 +41.5 108.4 |
| 16° | 43 14.6 +42.0 111.1 | 42 33.5 +41.8 110.2 | 41 52.2 +41.5 109.3 | 41 10.7 +41.2 108.4 | 40 28.9 +41.1 107.5 |
| 17° | 43 56.6 +41.5 110.1 | 43 15.3 +41.2 109.2 | 42 33.7 +41.0 108.3 | 41 51.9 +40.8 107.4 | 41 10.0 +40.5 106.5 |
| 18° | 44 38.1 +40.9 109.1 | 43 56.5 +40.7 108.2 | 43 14.7 +40.5 107.3 | 42 32.7 +40.2 106.4 | 41 50.5 +40.0 105.5 |
| 19° | 45 19.0 +40.4 108.0 | 44 37.2 +40.1 107.1 | 43 55.2 +39.9 106.3 | 43 12.9 +39.7 105.4 | 42 30.5 +39.5 104.5 |
| 20° | 45 59.4 +39.7 107.0 | 45 17.3 +39.6 106.1 | 44 35.1 +39.3 105.2 | 43 52.6 +39.2 104.4 | 43 10.0 +39.0 103.5 |
| 21° | 46 39.1 +39.2 105.9 | 45 56.9 +38.9 105.0 | 45 14.4 +38.7 104.1 | 44 31.8 +38.5 103.3 | 43 49.0 +38.3 102.5 |
| 22° | 47 18.3 +38.5 104.8 | 46 35.8 +38.2 103.9 | 45 53.1 +38.1 103.1 | 45 10.3 +37.9 102.2 | 44 27.3 +37.8 101.4 |
| 23° | 47 56.8 +37.7 103.7 | 47 14.0 +37.6 102.8 | 46 31.2 +37.4 101.9 | 45 48.2 +37.2 101.1 | 45 05.1 +37.0 100.3 |
| 24° | 48 34.5 +37.1 102.5 | 47 51.6 +36.9 101.6 | 47 08.6 +36.7 100.8 | 46 25.4 +36.6 100.0 | 45 42.1 +36.5 99.2  |
| 25° | 49 11.6 +36.3 101.3 | 48 28.5 +36.1 100.5 | 47 45.3 +36.0 99.6  | 47 02.0 +35.8 98.8  | 46 18.6 +35.7 98.0  |
| 26° | 49 47.9 +35.5 100.1 | 49 04.6 +35.4 99.2  | 48 21.3 +35.2 98.4  | 47 37.8 +35.1 97.6  | 46 54.3 +35.0 96.9  |
| 27° | 50 23.4 +34.7 98.8  | 49 40.0 +34.5 98.0  | 48 56.5 +34.4 97.2  | 48 12.9 +34.3 96.4  | 47 29.3 +34.2 95.7  |
| 28° | 50 58.1 +33.8 97.5  | 50 14.5 +33.7 96.7  | 49 30.9 +33.6 96.0  | 48 47.2 +33.5 95.2  | 48 03.5 +33.4 94.4  |
| 29° | 51 31.9 +32.8 96.2  | 50 48.2 +32.8 95.4  | 50 04.5 +32.7 94.7  | 49 20.7 +32.7 93.9  | 48 36.9 +32.6 93.2  |

| Dec | LHA 050° / 310°     | LHA 051° / 309°     | LHA 052° / 308°     | LHA 053° / 307°     | LHA 054° / 306°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 28 02.5 +46.2 119.8 | 27 24.2 +46.0 118.9 | 26 45.6 +45.8 118.1 | 26 06.8 +45.4 117.2 | 25 27.6 +45.2 116.4 |
| 1°  | 28 48.7 +46.0 119.1 | 28 10.2 +45.7 118.2 | 27 31.4 +45.4 117.3 | 26 52.2 +45.3 116.5 | 26 12.8 +45.0 115.6 |
| 2°  | 29 34.7 +45.8 118.3 | 28 55.9 +45.5 117.4 | 28 16.8 +45.3 116.6 | 27 37.5 +45.0 115.7 | 26 57.8 +44.7 114.9 |
| 3°  | 30 20.5 +45.5 117.6 | 29 41.4 +45.3 116.7 | 29 02.1 +45.0 115.8 | 28 22.5 +44.7 115.0 | 27 42.5 +44.6 114.1 |
| 4°  | 31 06.0 +45.2 116.8 | 30 26.7 +45.0 115.9 | 29 47.1 +44.7 115.1 | 29 07.2 +44.5 114.2 | 28 27.1 +44.2 113.4 |
| 5°  | 31 51.2 +45.0 116.0 | 31 11.7 +44.7 115.2 | 30 31.8 +44.5 114.3 | 29 51.7 +44.2 113.5 | 29 11.3 +44.0 112.6 |
| 6°  | 32 36.2 +44.7 115.3 | 31 56.4 +44.4 114.4 | 31 16.3 +44.1 113.5 | 30 35.9 +43.9 112.7 | 29 55.3 +43.7 111.8 |
| 7°  | 33 20.9 +44.3 114.5 | 32 40.8 +44.1 113.6 | 32 00.4 +43.9 112.7 | 31 19.8 +43.7 111.9 | 30 39.0 +43.4 111.0 |
| 8°  | 34 05.2 +44.0 113.7 | 33 24.9 +43.8 112.8 | 32 44.3 +43.5 111.9 | 32 03.5 +43.3 111.1 | 31 22.4 +43.1 110.2 |
| 9°  | 34 49.2 +43.7 112.8 | 34 08.7 +43.4 112.0 | 33 27.8 +43.2 111.1 | 32 46.8 +43.0 110.2 | 32 05.5 +42.8 109.4 |
| 10° | 35 32.9 +43.3 112.0 | 34 52.1 +43.1 111.1 | 34 11.0 +42.9 110.3 | 33 29.8 +42.6 109.4 | 32 48.3 +42.4 108.6 |
| 11° | 36 16.2 +43.0 111.1 | 35 35.2 +42.7 110.3 | 34 53.9 +42.5 109.4 | 34 12.4 +42.3 108.6 | 33 30.7 +42.1 107.7 |
| 12° | 36 59.2 +42.6 110.3 | 36 17.9 +42.4 109.4 | 35 36.4 +42.2 108.5 | 34 54.7 +41.9 107.7 | 34 12.8 +41.8 106.9 |
| 13° | 37 41.8 +42.1 109.4 | 37 00.3 +41.9 108.5 | 36 18.6 +41.7 107.7 | 35 36.6 +41.6 106.8 | 34 54.6 +41.3 106.0 |
| 14° | 38 23.9 +41.8 108.5 | 37 42.2 +41.5 107.6 | 37 00.3 +41.3 106.8 | 36 18.2 +41.1 105.9 | 35 35.9 +41.0 105.1 |
| 15° | 39 05.7 +41.3 107.6 | 38 23.7 +41.1 106.7 | 37 41.6 +40.9 105.9 | 36 59.3 +40.7 105.0 | 36 16.9 +40.5 104.2 |
| 16° | 39 47.0 +40.8 106.6 | 39 04.8 +40.7 105.8 | 38 22.5 +40.5 104.9 | 37 40.0 +40.3 104.1 | 36 57.4 +40.1 103.3 |
| 17° | 40 27.8 +40.3 105.7 | 39 45.5 +40.1 104.8 | 39 03.0 +39.9 104.0 | 38 20.3 +39.8 103.2 | 37 37.5 +39.7 102.4 |
| 18° | 41 08.1 +39.9 104.7 | 40 25.6 +39.7 103.8 | 39 42.9 +39.5 103.0 | 39 00.1 +39.4 102.2 | 38 17.2 +39.2 101.4 |
| 19° | 41 48.0 +39.3 103.7 | 41 05.3 +39.1 102.9 | 40 22.4 +39.0 102.0 | 39 39.5 +38.8 101.2 | 38 56.4 +38.7 100.4 |
| 20° | 42 27.3 +38.8 102.7 | 41 44.4 +38.6 101.8 | 41 01.4 +38.5 101.0 | 40 18.3 +38.3 100.2 | 39 35.1 +38.1 99.5  |
| 21° | 43 06.1 +38.1 101.6 | 42 23.0 +38.1 100.8 | 41 39.9 +37.9 100.0 | 40 56.6 +37.8 99.2  | 40 13.2 +37.7 98.4  |
| 22° | 43 44.2 +37.6 100.6 | 43 01.1 +37.4 99.8  | 42 17.8 +37.3 99.0  | 41 34.4 +37.2 98.2  | 40 50.9 +37.1 97.4  |
| 23° | 44 21.8 +37.0 99.5  | 43 38.5 +36.8 98.7  | 42 55.1 +36.7 97.9  | 42 11.6 +36.6 97.1  | 41 28.0 +36.5 96.4  |
| 24° | 44 58.8 +36.3 98.4  | 44 15.3 +36.2 97.6  | 43 31.8 +36.1 96.8  | 42 48.2 +36.0 96.1  | 42 04.5 +35.9 95.3  |
| 25° | 45 35.1 +35.6 97.2  | 44 51.5 +35.5 96.5  | 44 07.9 +35.4 95.7  | 43 24.2 +35.3 95.0  | 42 40.4 +35.3 94.2  |
| 26° | 46 10.7 +34.9 96.1  | 45 27.0 +34.8 95.3  | 44 43.3 +34.8 94.6  | 43 59.5 +34.7 93.8  | 43 15.7 +34.7 93.1  |
| 27° | 46 45.6 +34.1 94.9  | 46 01.8 +34.1 94.2  | 45 18.1 +34.0 93.4  | 44 34.2 +34.0 92.7  | 43 50.4 +34.0 92.0  |
| 28° | 47 19.7 +33.4 93.7  | 46 35.9 +33.4 93.0  | 45 52.1 +33.3 92.3  | 45 08.2 +33.3 91.5  | 44 24.4 +33.2 90.8  |
| 29° | 47 53.1 +32.6 92.5  | 47 09.3 +32.5 91.8  | 46 25.4 +32.5 91.1  | 45 41.5 +32.5 90.4  | 44 57.6 +32.6 89.7  |

| 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°  | 24 48.1 +45.0 115.5 | 24 08.4 +44.7 114.7 | 23 28.4 +44.5 113.9 | 22 48.2 +44.2 113.1 | 22 07.7 +44.0 112.3 |
| 1°  | 25 33.1 +44.8 114.8 | 24 53.1 +44.6 114.0 | 24 12.9 +44.3 113.2 | 23 32.4 +44.1 112.3 | 22 51.7 +43.9 111.5 |
| 2°  | 26 17.9 +44.5 114.1 | 25 37.7 +44.2 113.2 | 24 57.2 +44.1 112.4 | 24 16.5 +43.9 111.6 | 23 35.6 +43.7 110.8 |
| 3°  | 27 02.4 +44.2 113.3 | 26 21.9 +44.1 112.5 | 25 41.3 +43.8 111.7 | 25 00.4 +43.6 110.9 | 24 19.3 +43.4 110.1 |
| 4°  | 27 46.6 +44.1 112.5 | 27 06.0 +43.8 111.7 | 26 25.1 +43.6 110.9 | 25 44.0 +43.4 110.1 | 25 02.7 +43.2 109.3 |
| 5°  | 28 30.7 +43.7 111.8 | 27 49.8 +43.6 110.9 | 27 08.7 +43.4 110.1 | 26 27.4 +43.2 109.3 | 25 45.9 +43.0 108.5 |
| 6°  | 29 14.4 +43.5 111.0 | 28 33.4 +43.2 110.2 | 27 52.1 +43.0 109.4 | 27 10.6 +42.8 108.5 | 26 28.9 +42.7 107.8 |
| 7°  | 29 57.9 +43.2 110.2 | 29 16.6 +43.0 109.4 | 28 35.1 +42.8 108.6 | 27 53.4 +42.6 107.8 | 27 11.6 +42.4 107.0 |
| 8°  | 30 41.1 +42.9 109.4 | 29 59.6 +42.7 108.6 | 29 17.9 +42.5 107.8 | 28 36.0 +42.4 107.0 | 27 54.0 +42.1 106.2 |
| 9°  | 31 24.0 +42.6 108.6 | 30 42.3 +42.4 107.8 | 30 00.4 +42.2 107.0 | 29 18.4 +42.0 106.1 | 28 36.1 +41.9 105.4 |
| 10° | 32 06.6 +42.2 107.8 | 31 24.7 +42.1 106.9 | 30 42.6 +41.9 106.1 | 30 00.4 +41.7 105.3 | 29 18.0 +41.5 104.5 |
| 11° | 32 48.8 +41.9 106.9 | 32 06.8 +41.7 106.1 | 31 24.5 +41.6 105.3 | 30 42.1 +41.4 104.5 | 29 59.5 +41.3 103.7 |
| 12° | 33 30.7 +41.6 106.1 | 32 48.5 +41.4 105.2 | 32 06.1 +41.2 104.4 | 31 23.5 +41.1 103.7 | 30 40.8 +40.9 102.9 |
| 13° | 34 12.3 +41.2 105.2 | 33 29.9 +41.0 104.4 | 32 47.3 +40.8 103.6 | 32 04.6 +40.7 102.8 | 31 21.7 +40.6 102.0 |
| 14° | 34 53.5 +40.7 104.3 | 34 10.9 +40.6 103.5 | 33 28.1 +40.5 102.7 | 32 45.3 +40.3 101.9 | 32 02.3 +40.2 101.1 |
| 15° | 35 34.2 +40.4 103.4 | 34 51.5 +40.2 102.6 | 34 08.6 +40.1 101.8 | 33 25.6 +39.9 101.0 | 32 42.5 +39.8 100.3 |
| 16° | 36 14.6 +40.0 102.5 | 35 31.7 +39.8 101.7 | 34 48.7 +39.7 100.9 | 34 05.5 +39.6 100.1 | 33 22.3 +39.4 99.4  |
| 17° | 36 54.6 +39.5 101.6 | 36 11.5 +39.4 100.8 | 35 28.4 +39.2 100.0 | 34 45.1 +39.1 99.2  | 34 01.7 +39.1 98.5  |
| 18° | 37 34.1 +39.0 100.6 | 36 50.9 +38.9 99.8  | 36 07.6 +38.8 99.1  | 35 24.2 +38.8 98.3  | 34 40.8 +38.6 97.6  |
| 19° | 38 13.1 +38.6 99.7  | 37 29.8 +38.5 98.9  | 36 46.4 +38.4 98.1  | 36 03.0 +38.2 97.4  | 35 19.4 +38.2 96.6  |
| 20° | 38 51.7 +38.1 98.7  | 38 08.3 +38.0 97.9  | 37 24.8 +37.9 97.2  | 36 41.2 +37.8 96.4  | 35 57.6 +37.7 95.7  |
| 21° | 39 29.8 +37.5 97.7  | 38 46.3 +37.4 96.9  | 38 02.7 +37.4 96.2  | 37 19.0 +37.3 95.4  | 36 35.3 +37.3 94.7  |
| 22° | 40 07.3 +37.1 96.7  | 39 23.7 +37.0 95.9  | 38 40.1 +36.8 95.2  | 37 56.3 +36.8 94.4  | 37 12.6 +36.7 93.7  |
| 23° | 40 44.4 +36.4 95.6  | 40 00.7 +36.3 94.9  | 39 16.9 +36.3 94.2  | 38 33.1 +36.3 93.4  | 37 49.3 +36.3 92.7  |
| 24° | 41 20.8 +35.9 94.6  | 40 37.0 +35.9 93.8  | 39 53.2 +35.8 93.1  | 39 09.4 +35.7 92.4  | 38 25.6 +35.7 91.7  |
| 25° | 41 56.7 +35.2 93.5  | 41 12.9 +35.2 92.8  | 40 29.0 +35.2 92.1  | 39 45.1 +35.2 91.4  | 39 01.3 +35.1 90.7  |
| 26° | 42 31.9 +34.6 92.4  | 41 48.1 +34.6 91.7  | 41 04.2 +34.6 91.0  | 40 20.3 +34.6 90.3  | 39 36.4 +34.6 89.6  |
| 27° | 43 06.5 +34.0 91.3  | 42 22.7 +33.9 90.6  | 41 38.8 +33.9 89.9  | 40 54.9 +34.0 89.2  | 40 11.0 +34.0 88.6  |
| 28° | 43 40.5 +33.3 90.2  | 42 56.6 +33.3 89.5  | 42 12.7 +33.3 88.8  | 41 28.9 +33.3 88.1  | 40 45.0 +33.4 87.5  |
| 29° | 44 13.8 +32.5 89.0  | 43 29.9 +32.6 88.3  | 42 46.0 +32.7 87.7  | 42 02.2 +32.7 87.0  | 41 18.4 +32.7 86.4  |

| 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°  | 21 27.0 +43.8 111.5 | 20 46.0 +43.7 110.7 | 20 04.9 +43.4 109.9 | 19 23.5 +43.3 109.2 | 18 42.0 +43.1 108.4 |
| 1°  | 22 10.8 +43.7 110.8 | 21 29.7 +43.5 110.0 | 20 48.3 +43.3 109.2 | 20 06.8 +43.1 108.4 | 19 25.1 +42.9 107.7 |
| 2°  | 22 54.5 +43.4 110.0 | 22 13.2 +43.2 109.2 | 21 31.6 +43.1 108.5 | 20 49.9 +42.9 107.7 | 20 08.0 +42.8 106.9 |
| 3°  | 23 37.9 +43.3 109.3 | 22 56.4 +43.1 108.5 | 22 14.7 +42.9 107.7 | 21 32.8 +42.7 106.9 | 20 50.8 +42.5 106.2 |
| 4°  | 24 21.2 +43.0 108.5 | 23 39.5 +42.8 107.7 | 22 57.6 +42.7 106.9 | 22 15.5 +42.5 106.2 | 21 33.3 +42.4 105.4 |
| 5°  | 25 04.2 +42.8 107.7 | 24 22.3 +42.6 107.0 | 23 40.3 +42.4 106.2 | 22 58.0 +42.3 105.4 | 22 15.7 +42.1 104.7 |
| 6°  | 25 47.0 +42.5 107.0 | 25 04.9 +42.4 106.2 | 24 22.7 +42.2 105.4 | 23 40.3 +42.1 104.6 | 22 57.8 +41.9 103.9 |
| 7°  | 26 29.5 +42.3 106.2 | 25 47.3 +42.1 105.4 | 25 04.9 +41.9 104.6 | 24 22.4 +41.8 103.9 | 23 39.7 +41.6 103.1 |
| 8°  | 27 11.8 +41.9 105.4 | 26 29.4 +41.8 104.6 | 25 46.8 +41.7 103.8 | 25 04.2 +41.5 103.1 | 24 21.3 +41.5 102.3 |
| 9°  | 27 53.7 +41.7 104.6 | 27 11.2 +41.5 103.8 | 26 28.5 +41.4 103.0 | 25 45.7 +41.3 102.3 | 25 02.8 +41.1 101.5 |
| 10° | 28 35.4 +41.4 103.8 | 27 52.7 +41.3 103.0 | 27 09.9 +41.2 102.2 | 26 27.0 +41.0 101.5 | 25 43.9 +40.9 100.7 |
| 11° | 29 16.8 +41.1 102.9 | 28 34.0 +41.0 102.2 | 27 51.1 +40.8 101.4 | 27 08.0 +40.7 100.6 | 26 24.8 +40.6 99.9  |
| 12° | 29 57.9 +40.8 102.1 | 29 15.0 +40.6 101.3 | 28 31.9 +40.5 100.6 | 27 48.7 +40.4 99.8  | 27 05.4 +40.3 99.1  |
| 13° | 30 38.7 +40.5 101.2 | 29 55.6 +40.3 100.5 | 29 12.4 +40.2 99.7  | 28 29.1 +40.1 99.0  | 27 45.7 +40.0 98.2  |
| 14° | 31 19.2 +40.0 100.4 | 30 35.9 +40.0 99.6  | 29 52.6 +39.9 98.9  | 29 09.2 +39.8 98.1  | 28 25.7 +39.7 97.4  |
| 15° | 31 59.2 +39.8 99.5  | 31 15.9 +39.6 98.8  | 30 32.5 +39.5 98.0  | 29 49.0 +39.4 97.3  | 29 05.4 +39.4 96.5  |
| 16° | 32 39.0 +39.3 98.6  | 31 55.5 +39.3 97.9  | 31 12.0 +39.2 97.1  | 30 28.4 +39.1 96.4  | 29 44.8 +39.0 95.7  |
| 17° | 33 18.3 +38.9 97.7  | 32 34.8 +38.8 97.0  | 31 51.2 +38.8 96.2  | 31 07.5 +38.8 95.5  | 30 23.8 +38.7 94.8  |
| 18° | 33 57.2 +38.6 96.8  | 33 13.6 +38.5 96.1  | 32 30.0 +38.4 95.3  | 31 46.3 +38.3 94.6  | 31 02.5 +38.3 93.9  |
| 19° | 34 35.8 +38.1 95.9  | 33 52.1 +38.0 95.1  | 33 08.4 +38.0 94.4  | 32 24.6 +38.0 93.7  | 31 40.8 +37.9 93.0  |
| 20° | 35 13.9 +37.7 94.9  | 34 30.1 +37.7 94.2  | 33 46.4 +37.5 93.5  | 33 02.6 +37.5 92.8  | 32 18.7 +37.5 92.1  |
| 21° | 35 51.6 +37.2 94.0  | 35 07.8 +37.1 93.3  | 34 23.9 +37.2 92.6  | 33 40.1 +37.1 91.9  | 32 56.2 +37.1 91.2  |
| 22° | 36 28.8 +36.7 93.0  | 35 44.9 +36.7 92.3  | 35 01.1 +36.6 91.6  | 34 17.2 +36.7 90.9  | 33 33.3 +36.7 90.2  |
| 23° | 37 05.5 +36.2 92.0  | 36 21.6 +36.2 91.3  | 35 37.7 +36.2 90.6  | 34 53.9 +36.2 89.9  | 34 10.0 +36.2 89.3  |
| 24° | 37 41.7 +35.7 91.0  | 36 57.8 +35.7 90.3  | 36 13.9 +35.7 89.6  | 35 30.1 +35.7 89.0  | 34 46.2 +35.7 88.3  |
| 25° | 38 17.4 +35.2 90.0  | 37 33.5 +35.2 89.3  | 36 49.6 +35.2 88.6  | 36 05.8 +35.2 88.0  | 35 21.9 +35.3 87.3  |
| 26° | 38 52.6 +34.6 89.0  | 38 08.7 +34.6 88.3  | 37 24.8 +34.7 87.6  | 36 41.0 +34.7 87.0  | 35 57.2 +34.8 86.3  |
| 27° | 39 27.2 +34.0 87.9  | 38 43.3 +34.1 87.3  | 37 59.5 +34.1 86.6  | 37 15.7 +34.2 86.0  | 36 32.0 +34.2 85.3  |
| 28° | 40 01.2 +33.4 86.8  | 39 17.4 +33.5 86.3  | 38 33.6 +33.6 85.6  | 37 49.9 +33.6 84.9  | 37 06.2 +33.7 84.3  |
| 29° | 40 34.6 +32.8 85.7  | 39 50.9 +32.8 85.1  | 39 07.2 +32.9 84.5  | 38 23.5 +33.1 83.9  | 37 39.9 +33.2 83.2  |

| 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°  | 18 00.2 +43.0 107.6 | 17 18.3 +42.8 106.9 | 16 36.3 +42.6 106.1 | 15 54.0 +42.5 105.4 | 15 11.7 +42.3 104.7 |
| 1°  | 18 43.2 +42.8 106.9 | 18 01.1 +42.6 106.2 | 17 18.9 +42.4 105.4 | 16 36.5 +42.3 104.7 | 15 54.0 +42.2 103.9 |
| 2°  | 19 26.0 +42.5 106.2 | 18 43.7 +42.5 105.4 | 18 01.3 +42.3 104.7 | 17 18.8 +42.2 103.9 | 16 36.2 +42.0 103.2 |
| 3°  | 20 08.5 +42.4 105.4 | 19 26.2 +42.2 104.7 | 18 43.6 +42.1 103.9 | 18 01.0 +42.0 103.2 | 17 18.2 +41.8 102.4 |
| 4°  | 20 50.9 +42.2 104.7 | 20 08.4 +42.1 103.9 | 19 25.7 +42.0 103.2 | 18 43.0 +41.8 102.4 | 18 00.0 +41.7 101.7 |
| 5°  | 21 33.1 +42.0 103.9 | 20 50.5 +41.8 103.1 | 20 07.7 +41.7 102.4 | 19 24.8 +41.6 101.7 | 18 41.7 +41.5 100.9 |
| 6°  | 22 15.1 +41.8 103.1 | 21 32.3 +41.6 102.4 | 20 49.4 +41.5 101.6 | 20 06.4 +41.4 100.9 | 19 23.2 +41.3 100.2 |
| 7°  | 22 56.9 +41.5 102.3 | 22 13.9 +41.5 101.6 | 21 30.9 +41.3 100.9 | 20 47.8 +41.2 100.1 | 20 04.5 +41.1 99.4  |
| 8°  | 23 38.4 +41.3 101.6 | 22 55.4 +41.1 100.8 | 22 12.2 +41.1 100.1 | 21 29.0 +40.9 99.4  | 20 45.6 +40.9 98.6  |
| 9°  | 24 19.7 +41.0 100.8 | 23 36.5 +41.0 100.0 | 22 53.3 +40.8 99.3  | 22 09.9 +40.8 98.6  | 21 26.5 +40.7 97.8  |
| 10° | 25 00.7 +40.8 100.0 | 24 17.5 +40.7 99.2  | 23 34.1 +40.6 98.5  | 22 50.7 +40.5 97.8  | 22 07.2 +40.4 97.0  |
| 11° | 25 41.5 +40.5 99.2  | 24 58.2 +40.4 98.4  | 24 14.7 +40.4 97.7  | 23 31.2 +40.3 97.0  | 22 47.6 +40.2 96.3  |
| 12° | 26 22.0 +40.3 98.3  | 25 38.6 +40.1 97.6  | 24 55.1 +40.0 96.9  | 24 11.5 +40.0 96.2  | 23 27.8 +39.9 95.4  |
| 13° | 27 02.3 +39.9 97.5  | 26 18.7 +39.9 96.8  | 25 35.1 +39.8 96.1  | 24 51.5 +39.7 95.3  | 24 07.7 +39.7 94.6  |
| 14° | 27 42.2 +39.6 96.7  | 26 58.6 +39.5 95.9  | 26 14.9 +39.5 95.2  | 25 31.2 +39.4 94.5  | 24 47.4 +39.4 93.8  |
| 15° | 28 21.8 +39.3 95.8  | 27 38.1 +39.3 95.1  | 26 54.4 +39.2 94.4  | 26 10.6 +39.2 93.7  | 25 26.8 +39.1 93.0  |
| 16° | 29 01.1 +39.0 95.0  | 28 17.4 +38.9 94.2  | 27 33.6 +38.9 93.5  | 26 49.8 +38.8 92.8  | 26 05.9 +38.9 92.1  |
| 17° | 29 40.1 +38.6 94.1  | 28 56.3 +38.6 93.4  | 28 12.5 +38.5 92.7  | 27 28.6 +38.6 92.0  | 26 44.8 +38.5 91.3  |
| 18° | 30 18.7 +38.3 93.2  | 29 34.9 +38.2 92.5  | 28 51.0 +38.2 91.8  | 28 07.2 +38.2 91.1  | 27 23.3 +38.2 90.4  |
| 19° | 30 57.0 +37.8 92.3  | 30 13.1 +37.9 91.6  | 29 29.2 +37.9 90.9  | 28 45.4 +37.8 90.2  | 28 01.5 +37.8 89.5  |
| 20° | 31 34.8 +37.5 91.4  | 30 51.0 +37.5 90.7  | 30 07.1 +37.5 90.0  | 29 23.2 +37.5 89.3  | 28 39.3 +37.6 88.7  |
| 21° | 32 12.3 +37.1 90.5  | 31 28.5 +37.1 89.8  | 30 44.6 +37.1 89.1  | 30 00.7 +37.1 88.4  | 29 16.9 +37.1 87.8  |
| 22° | 32 49.4 +36.7 89.5  | 32 05.6 +36.6 88.9  | 31 21.7 +36.7 88.2  | 30 37.8 +36.8 87.5  | 29 54.0 +36.8 86.9  |
| 23° | 33 26.1 +36.2 88.6  | 32 42.2 +36.3 87.9  | 31 58.4 +36.3 87.3  | 31 14.6 +36.3 86.6  | 30 30.8 +36.4 86.0  |
| 24° | 34 02.3 +35.8 87.6  | 33 18.5 +35.8 87.0  | 32 34.7 +35.9 86.3  | 31 50.9 +35.9 85.7  | 31 07.2 +36.0 85.0  |
| 25° | 34 38.1 +35.3 86.7  | 33 54.3 +35.4 86.0  | 33 10.6 +35.4 85.4  | 32 26.8 +35.5 84.7  | 31 43.2 +35.5 84.1  |
| 26° | 35 13.4 +34.8 85.7  | 34 29.7 +34.9 85.0  | 33 46.0 +35.0 84.4  | 33 02.3 +35.1 83.8  | 32 18.7 +35.2 83.1  |
| 27° | 35 48.2 +34.4 84.7  | 35 04.6 +34.4 84.0  | 34 21.0 +34.5 83.4  | 33 37.4 +34.6 82.8  | 32 53.9 +34.7 82.2  |
| 28° | 36 22.6 +33.8 83.7  | 35 39.0 +33.9 83.0  | 34 55.5 +34.0 82.4  | 34 12.0 +34.1 81.8  | 33 28.6 +34.2 81.2  |
| 29° | 36 56.4 +33.2 82.6  | 36 12.9 +33.3 82.0  | 35 29.5 +33.4 81.4  | 34 46.1 +33.6 80.8  | 34 02.8 +33.8 80.2  |

| 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°  | 14 29.1 +42.2 103.9 | 13 46.5 +42.1 103.2 | 13 03.7 +41.9 102.5 | 12 20.8 +41.8 101.8 | 11 37.8 +41.7 101.1 |
| 1°  | 15 11.3 +42.1 103.2 | 14 28.6 +41.9 102.5 | 13 45.6 +41.9 101.8 | 13 02.6 +41.7 101.0 | 12 19.5 +41.6 100.3 |
| 2°  | 15 53.4 +41.9 102.5 | 15 10.5 +41.8 101.7 | 14 27.5 +41.6 101.0 | 13 44.3 +41.6 100.3 | 13 01.1 +41.5 99.6  |
| 3°  | 16 35.3 +41.7 101.7 | 15 52.3 +41.6 101.0 | 15 09.1 +41.6 100.3 | 14 25.9 +41.4 99.6  | 13 42.6 +41.3 98.8  |
| 4°  | 17 17.0 +41.6 101.0 | 16 33.9 +41.5 100.2 | 15 50.7 +41.3 99.5  | 15 07.3 +41.3 98.8  | 14 23.9 +41.2 98.1  |
| 5°  | 17 58.6 +41.4 100.2 | 17 15.4 +41.2 99.5  | 16 32.0 +41.2 98.8  | 15 48.6 +41.1 98.1  | 15 05.1 +41.1 97.4  |
| 6°  | 18 40.0 +41.2 99.4  | 17 56.6 +41.2 98.7  | 17 13.2 +41.1 98.0  | 16 29.7 +41.0 97.3  | 15 46.2 +40.9 96.6  |
| 7°  | 19 21.2 +41.0 98.7  | 18 37.8 +40.9 98.0  | 17 54.3 +40.8 97.2  | 17 10.7 +40.8 96.5  | 16 27.1 +40.7 95.8  |
| 8°  | 20 02.2 +40.8 97.9  | 19 18.7 +40.7 97.2  | 18 35.1 +40.7 96.5  | 17 51.5 +40.6 95.8  | 17 07.8 +40.6 95.1  |
| 9°  | 20 43.0 +40.6 97.1  | 19 59.4 +40.5 96.4  | 19 15.8 +40.5 95.7  | 18 32.1 +40.4 95.0  | 17 48.4 +40.3 94.3  |
| 10° | 21 23.6 +40.4 96.3  | 20 39.9 +40.4 95.6  | 19 56.3 +40.2 94.9  | 19 12.5 +40.2 94.2  | 18 28.7 +40.2 93.5  |
| 11° | 22 04.0 +40.1 95.5  | 21 20.3 +40.0 94.8  | 20 36.5 +40.0 94.1  | 19 52.7 +40.0 93.4  | 19 08.9 +40.0 92.7  |
| 12° | 22 44.1 +39.9 94.7  | 22 00.3 +39.9 94.0  | 21 16.5 +39.9 93.3  | 20 32.7 +39.8 92.6  | 19 48.9 +39.7 91.9  |
| 13° | 23 24.0 +39.6 93.9  | 22 40.2 +39.6 93.2  | 21 56.4 +39.5 92.5  | 21 12.5 +39.6 91.8  | 20 28.6 +39.6 91.1  |
| 14° | 24 03.6 +39.4 93.1  | 23 19.8 +39.3 92.4  | 22 35.9 +39.4 91.7  | 21 52.1 +39.3 91.0  | 21 08.2 +39.3 90.3  |
| 15° | 24 43.0 +39.1 92.3  | 23 59.1 +39.1 91.6  | 23 15.3 +39.0 90.9  | 22 31.4 +39.1 90.2  | 21 47.5 +39.1 89.5  |
| 16° | 25 22.1 +38.8 91.4  | 24 38.2 +38.8 90.7  | 23 54.3 +38.8 90.1  | 23 10.5 +38.8 89.4  | 22 26.6 +38.8 88.7  |
| 17° | 26 00.9 +38.5 90.6  | 25 17.0 +38.5 89.9  | 24 33.1 +38.6 89.2  | 23 49.3 +38.5 88.6  | 23 05.4 +38.6 87.9  |
| 18° | 26 39.4 +38.2 89.7  | 25 55.5 +38.2 89.1  | 25 11.7 +38.2 88.4  | 24 27.8 +38.3 87.7  | 23 44.0 +38.3 87.0  |
| 19° | 27 17.6 +37.9 88.9  | 26 33.7 +37.9 88.2  | 25 49.9 +37.9 87.5  | 25 06.1 +37.9 86.9  | 24 22.3 +38.0 86.2  |
| 20° | 27 55.5 +37.5 88.0  | 27 11.6 +37.6 87.3  | 26 27.8 +37.6 86.7  | 25 44.0 +37.7 86.0  | 25 00.3 +37.7 85.3  |
| 21° | 28 33.0 +37.2 87.1  | 27 49.2 +37.2 86.4  | 27 05.4 +37.3 85.8  | 26 21.7 +37.3 85.1  | 25 38.0 +37.4 84.5  |
| 22° | 29 10.2 +36.8 86.2  | 28 26.4 +36.9 85.6  | 27 42.7 +37.0 84.9  | 26 59.0 +37.0 84.3  | 26 15.4 +37.1 83.6  |
| 23° | 29 47.0 +36.5 85.3  | 29 03.3 +36.5 84.7  | 28 19.7 +36.6 84.0  | 27 36.0 +36.7 83.4  | 26 52.5 +36.7 82.7  |
| 24° | 30 23.5 +36.1 84.4  | 29 39.8 +36.2 83.7  | 28 56.3 +36.2 83.1  | 28 12.7 +36.3 82.5  | 27 29.2 +36.5 81.9  |
| 25° | 30 59.6 +35.6 83.5  | 30 16.0 +35.7 82.8  | 29 32.5 +35.8 82.2  | 28 49.0 +36.0 81.6  | 28 05.7 +36.0 81.0  |
| 26° | 31 35.2 +35.3 82.5  | 30 51.7 +35.4 81.9  | 30 08.3 +35.5 81.3  | 29 25.0 +35.6 80.7  | 28 41.7 +35.7 80.0  |
| 27° | 32 10.5 +34.8 81.6  | 31 27.1 +34.9 80.9  | 30 43.8 +35.0 80.3  | 30 00.6 +35.1 79.7  | 29 17.4 +35.3 79.1  |
| 28° | 32 45.3 +34.3 80.6  | 32 02.0 +34.5 80.0  | 31 18.8 +34.7 79.4  | 30 35.7 +34.8 78.8  | 29 52.7 +35.0 78.2  |
| 29° | 33 19.6 +33.9 79.6  | 32 36.5 +34.0 79.0  | 31 53.5 +34.1 78.4  | 31 10.5 +34.4 77.8  | 30 27.7 +34.5 77.3  |

| 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°  | 10 54.7 +41.6 100.4 | 10 11.5 +41.5 99.7 | 9 28.2 +41.4 98.9  | 8 44.8 +41.3 98.2  | 8 01.3 +41.3 97.6  |
| 1°  | 11 36.3 +41.5 99.6  | 10 53.0 +41.4 98.9 | 10 09.6 +41.3 98.2 | 9 26.1 +41.3 97.5  | 8 42.6 +41.2 96.8  |
| 2°  | 12 17.8 +41.4 98.9  | 11 34.4 +41.3 98.2 | 10 50.9 +41.3 97.5 | 10 07.4 +41.2 96.8 | 9 23.8 +41.1 96.1  |
| 3°  | 12 59.2 +41.3 98.1  | 12 15.7 +41.2 97.4 | 11 32.2 +41.1 96.7 | 10 48.6 +41.0 96.0 | 10 04.9 +41.0 95.3 |
| 4°  | 13 40.5 +41.1 97.4  | 12 56.9 +41.1 96.7 | 12 13.3 +41.0 96.0 | 11 29.6 +41.0 95.3 | 10 45.9 +40.9 94.6 |
| 5°  | 14 21.6 +41.0 96.6  | 13 38.0 +40.9 95.9 | 12 54.3 +40.9 95.2 | 12 10.6 +40.8 94.5 | 11 26.8 +40.8 93.9 |
| 6°  | 15 02.6 +40.8 95.9  | 14 18.9 +40.8 95.2 | 13 35.2 +40.7 94.5 | 12 51.4 +40.7 93.8 | 12 07.6 +40.7 93.1 |
| 7°  | 15 43.4 +40.7 95.1  | 14 59.7 +40.6 94.4 | 14 15.9 +40.6 93.7 | 13 32.1 +40.6 93.0 | 12 48.3 +40.5 92.4 |
| 8°  | 16 24.1 +40.5 94.4  | 15 40.3 +40.5 93.7 | 14 56.5 +40.4 93.0 | 14 12.7 +40.4 92.3 | 13 28.8 +40.4 91.6 |
| 9°  | 17 04.6 +40.3 93.6  | 16 20.8 +40.3 92.9 | 15 36.9 +40.3 92.2 | 14 53.1 +40.2 91.5 | 14 09.2 +40.3 90.8 |
| 10° | 17 44.9 +40.2 92.8  | 17 01.1 +40.1 92.1 | 16 17.2 +40.1 91.4 | 15 33.3 +40.1 90.8 | 14 49.5 +40.1 90.1 |
| 11° | 18 25.1 +39.9 92.0  | 17 41.2 +39.9 91.3 | 16 57.3 +40.0 90.7 | 16 13.4 +40.0 90.0 | 15 29.6 +39.9 89.3 |
| 12° | 19 05.0 +39.8 91.2  | 18 21.1 +39.8 90.6 | 17 37.3 +39.7 89.9 | 16 53.4 +39.7 89.2 | 16 09.5 +39.8 88.5 |
| 13° | 19 44.8 +39.5 90.5  | 19 00.9 +39.5 89.8 | 18 17.0 +39.6 89.1 | 17 33.1 +39.6 88.4 | 16 49.3 +39.6 87.7 |
| 14° | 20 24.3 +39.3 89.7  | 19 40.4 +39.4 89.0 | 18 56.6 +39.3 88.3 | 18 12.7 +39.4 87.6 | 17 28.9 +39.4 87.0 |
| 15° | 21 03.6 +39.1 88.8  | 20 19.8 +39.1 88.2 | 19 35.9 +39.1 87.5 | 18 52.1 +39.2 86.8 | 18 08.3 +39.2 86.2 |
| 16° | 21 42.7 +38.9 88.0  | 20 58.9 +38.8 87.4 | 20 15.0 +39.0 86.7 | 19 31.3 +38.9 86.0 | 18 47.5 +39.0 85.4 |
| 17° | 22 21.6 +38.6 87.2  | 21 37.7 +38.7 86.5 | 20 54.0 +38.6 85.9 | 20 10.2 +38.7 85.2 | 19 26.5 +38.8 84.6 |
| 18° | 23 00.2 +38.3 86.4  | 22 16.4 +38.4 85.7 | 21 32.6 +38.5 85.1 | 20 48.9 +38.5 84.4 | 20 05.3 +38.6 83.8 |
| 19° | 23 38.5 +38.1 85.5  | 22 54.8 +38.1 84.9 | 22 11.1 +38.2 84.2 | 21 27.4 +38.3 83.6 | 20 43.9 +38.3 82.9 |
| 20° | 24 16.6 +37.7 84.7  | 23 32.9 +37.8 84.0 | 22 49.3 +37.9 83.4 | 22 05.7 +38.0 82.8 | 21 22.2 +38.1 82.1 |
| 21° | 24 54.3 +37.5 83.8  | 24 10.7 +37.6 83.2 | 23 27.2 +37.6 82.6 | 22 43.7 +37.7 81.9 | 22 00.3 +37.8 81.3 |
| 22° | 25 31.8 +37.2 83.0  | 24 48.3 +37.3 82.3 | 24 04.8 +37.4 81.7 | 23 21.4 +37.5 81.1 | 22 38.1 +37.6 80.4 |
| 23° | 26 09.0 +36.8 82.1  | 25 25.6 +36.9 81.5 | 24 42.2 +37.1 80.8 | 23 58.9 +37.2 80.2 | 23 15.7 +37.3 79.6 |
| 24° | 26 45.8 +36.6 81.2  | 26 02.5 +36.7 80.6 | 25 19.3 +36.7 80.0 | 24 36.1 +36.9 79.4 | 23 53.0 +37.0 78.7 |
| 25° | 27 22.4 +36.2 80.3  | 26 39.2 +36.3 79.7 | 25 56.0 +36.5 79.1 | 25 13.0 +36.5 78.5 | 24 30.0 +36.7 77.9 |
| 26° | 27 58.6 +35.8 79.4  | 27 15.5 +35.9 78.8 | 26 32.5 +36.1 78.2 | 25 49.5 +36.3 77.6 | 25 06.7 +36.4 77.0 |
| 27° | 28 34.4 +35.4 78.5  | 27 51.4 +35.6 77.9 | 27 08.6 +35.7 77.3 | 26 25.8 +35.9 76.7 | 25 43.1 +36.1 76.1 |
| 28° | 29 09.8 +35.1 77.6  | 28 27.0 +35.3 77.0 | 27 44.3 +35.4 76.4 | 27 01.7 +35.6 75.8 | 26 19.2 +35.8 75.2 |
| 29° | 29 44.9 +34.7 76.7  | 29 02.3 +34.8 76.1 | 28 19.7 +35.1 75.5 | 27 37.3 +35.2 74.9 | 26 55.0 +35.4 74.3 |

# Declination SAME name as Latitude

# Latitude 43°

| 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°  | 7 17.8 +41.2 96.9  | 6 34.2 +41.1 96.2  | 5 50.5 +41.1 95.5  | 5 06.8 +41.1 94.8  | 4 23.1 +41.0 94.1  |
| 1°  | 7 59.0 +41.1 96.1  | 7 15.3 +41.1 95.4  | 6 31.6 +41.1 94.7  | 5 47.9 +41.0 94.1  | 5 04.1 +40.9 93.4  |
| 2°  | 8 40.1 +41.1 95.4  | 7 56.4 +41.0 94.7  | 7 12.7 +40.9 94.0  | 6 28.9 +40.9 93.3  | 5 45.0 +41.0 92.6  |
| 3°  | 9 21.2 +40.9 94.6  | 8 37.4 +40.9 94.0  | 7 53.6 +40.9 93.3  | 7 09.8 +40.9 92.6  | 6 26.0 +40.8 91.9  |
| 4°  | 10 02.1 +40.9 93.9 | 9 18.3 +40.9 93.2  | 8 34.5 +40.8 92.5  | 7 50.7 +40.8 91.8  | 7 06.8 +40.8 91.2  |
| 5°  | 10 43.0 +40.8 93.2 | 9 59.2 +40.7 92.5  | 9 15.3 +40.7 91.8  | 8 31.5 +40.7 91.1  | 7 47.6 +40.7 90.4  |
| 6°  | 11 23.8 +40.6 92.4 | 10 39.9 +40.6 91.7 | 9 56.0 +40.7 91.0  | 9 12.2 +40.6 90.4  | 8 28.3 +40.6 89.7  |
| 7°  | 12 04.4 +40.5 91.7 | 11 20.5 +40.6 91.0 | 10 36.7 +40.5 90.3 | 9 52.8 +40.5 89.6  | 9 08.9 +40.5 88.9  |
| 8°  | 12 44.9 +40.4 90.9 | 12 01.1 +40.3 90.2 | 11 17.2 +40.4 89.5 | 10 33.3 +40.4 88.9 | 9 49.4 +40.5 88.2  |
| 9°  | 13 25.3 +40.3 90.2 | 12 41.4 +40.3 89.5 | 11 57.6 +40.2 88.8 | 11 13.7 +40.3 88.1 | 10 29.9 +40.3 87.4 |
| 10° | 14 05.6 +40.1 89.4 | 13 21.7 +40.1 88.7 | 12 37.8 +40.2 88.0 | 11 54.0 +40.2 87.4 | 11 10.2 +40.2 86.7 |
| 11° | 14 45.7 +39.9 88.6 | 14 01.8 +40.0 87.9 | 13 18.0 +40.0 87.3 | 12 34.2 +40.0 86.6 | 11 50.4 +40.1 85.9 |
| 12° | 15 25.6 +39.8 87.8 | 14 41.8 +39.8 87.2 | 13 58.0 +39.9 86.5 | 13 14.2 +39.9 85.8 | 12 30.5 +39.9 85.2 |
| 13° | 16 05.4 +39.7 87.1 | 15 21.6 +39.7 86.4 | 14 37.9 +39.7 85.7 | 13 54.1 +39.8 85.1 | 13 10.4 +39.8 84.4 |
| 14° | 16 45.1 +39.4 86.3 | 16 01.3 +39.5 85.6 | 15 17.6 +39.5 85.0 | 14 33.9 +39.6 84.3 | 13 50.2 +39.7 83.6 |
| 15° | 17 24.5 +39.3 85.5 | 16 40.8 +39.3 84.8 | 15 57.1 +39.4 84.2 | 15 13.5 +39.4 83.5 | 14 29.9 +39.5 82.9 |
| 16° | 18 03.8 +39.0 84.7 | 17 20.1 +39.1 84.0 | 16 36.5 +39.2 83.4 | 15 52.9 +39.3 82.7 | 15 09.4 +39.4 82.1 |
| 17° | 18 42.8 +38.9 83.9 | 17 59.2 +39.0 83.2 | 17 15.7 +39.0 82.6 | 16 32.2 +39.1 81.9 | 15 48.8 +39.2 81.3 |
| 18° | 19 21.7 +38.7 83.1 | 18 38.2 +38.7 82.4 | 17 54.7 +38.8 81.8 | 17 11.3 +38.9 81.2 | 16 28.0 +39.0 80.5 |
| 19° | 20 00.4 +38.4 82.3 | 19 16.9 +38.5 81.6 | 18 33.5 +38.6 81.0 | 17 50.2 +38.7 80.4 | 17 07.0 +38.8 79.7 |
| 20° | 20 38.8 +38.2 81.5 | 19 55.4 +38.3 80.8 | 19 12.1 +38.4 80.2 | 18 28.9 +38.5 79.5 | 17 45.8 +38.7 78.9 |
| 21° | 21 17.0 +37.9 80.6 | 20 33.7 +38.1 80.0 | 19 50.5 +38.2 79.4 | 19 07.4 +38.3 78.7 | 18 24.5 +38.4 78.1 |
| 22° | 21 54.9 +37.7 79.8 | 21 11.8 +37.8 79.2 | 20 28.7 +37.9 78.6 | 19 45.7 +38.1 77.9 | 19 02.9 +38.2 77.3 |
| 23° | 22 32.6 +37.4 79.0 | 21 49.6 +37.5 78.3 | 21 06.6 +37.7 77.7 | 20 23.8 +37.9 77.1 | 19 41.1 +38.0 76.5 |
| 24° | 23 10.0 +37.2 78.1 | 22 27.1 +37.3 77.5 | 21 44.3 +37.5 76.9 | 21 01.7 +37.6 76.3 | 20 19.1 +37.7 75.7 |
| 25° | 23 47.2 +36.8 77.3 | 23 04.4 +37.0 76.7 | 22 21.8 +37.2 76.0 | 21 39.3 +37.3 75.4 | 20 56.8 +37.6 74.8 |
| 26° | 24 24.0 +36.6 76.4 | 23 41.4 +36.8 75.8 | 22 59.0 +36.9 75.2 | 22 16.6 +37.1 74.6 | 21 34.4 +37.2 74.0 |
| 27° | 25 00.6 +36.3 75.5 | 24 18.2 +36.4 74.9 | 23 35.9 +36.6 74.3 | 22 53.7 +36.8 73.7 | 22 11.6 +37.0 73.1 |
| 28° | 25 36.9 +35.9 74.6 | 24 54.6 +36.1 74.1 | 24 12.5 +36.3 73.5 | 23 30.5 +36.5 72.9 | 22 48.6 +36.7 72.3 |
| 29° | 26 12.8 +35.6 73.8 | 25 30.7 +35.8 73.2 | 24 48.8 +36.0 72.6 | 24 07.0 +36.2 72.0 | 23 25.3 +36.5 71.4 |

| 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°  | 3 39.3 +41.0 93.4  | 2 55.5 +40.9 92.7  | 2 11.6 +41.0 92.0  | 1 27.8 +40.9 91.4  | 0 43.9 +40.9 90.7  |
| 1°  | 4 20.3 +40.9 92.7  | 3 36.4 +40.9 92.0  | 2 52.6 +40.9 91.3  | 2 08.7 +40.9 90.6  | 1 24.8 +40.9 90.0  |
| 2°  | 5 01.2 +40.9 91.9  | 4 17.3 +40.9 91.3  | 3 33.5 +40.8 90.6  | 2 49.6 +40.9 89.9  | 2 05.7 +40.9 89.2  |
| 3°  | 5 42.1 +40.8 91.2  | 4 58.2 +40.9 90.5  | 4 14.3 +40.9 89.8  | 3 30.5 +40.8 89.2  | 2 46.6 +40.8 88.5  |
| 4°  | 6 22.9 +40.8 90.5  | 5 39.1 +40.7 89.8  | 4 55.2 +40.8 89.1  | 4 11.3 +40.8 88.4  | 3 27.4 +40.9 87.8  |
| 5°  | 7 03.7 +40.7 89.7  | 6 19.8 +40.7 89.1  | 5 36.0 +40.7 88.4  | 4 52.1 +40.8 87.7  | 4 08.3 +40.7 87.0  |
| 6°  | 7 44.4 +40.6 89.0  | 7 00.5 +40.7 88.3  | 6 16.7 +40.7 87.6  | 5 32.9 +40.7 87.0  | 4 49.0 +40.8 86.3  |
| 7°  | 8 25.0 +40.6 88.3  | 7 41.2 +40.6 87.6  | 6 57.4 +40.6 86.9  | 6 13.6 +40.6 86.2  | 5 29.8 +40.7 85.5  |
| 8°  | 9 05.6 +40.4 87.5  | 8 21.8 +40.4 86.8  | 7 38.0 +40.5 86.2  | 6 54.2 +40.6 85.5  | 6 10.5 +40.6 84.8  |
| 9°  | 9 46.0 +40.4 86.8  | 9 02.2 +40.4 86.1  | 8 18.5 +40.4 85.4  | 7 34.8 +40.4 84.7  | 6 51.1 +40.5 84.1  |
| 10° | 10 26.4 +40.2 86.0 | 9 42.6 +40.3 85.3  | 8 58.9 +40.4 84.7  | 8 15.2 +40.5 84.0  | 7 31.6 +40.5 83.3  |
| 11° | 11 06.6 +40.2 85.3 | 10 22.9 +40.2 84.6 | 9 39.3 +40.2 83.9  | 8 55.7 +40.3 83.2  | 8 12.1 +40.4 82.6  |
| 12° | 11 46.8 +40.0 84.5 | 11 03.1 +40.1 83.8 | 10 19.5 +40.2 83.2 | 9 36.0 +40.2 82.5  | 8 52.5 +40.3 81.8  |
| 13° | 12 26.8 +39.9 83.7 | 11 43.2 +39.9 83.1 | 10 59.7 +40.0 82.4 | 10 16.2 +40.1 81.7 | 9 32.8 +40.2 81.1  |
| 14° | 13 06.7 +39.7 83.0 | 12 23.1 +39.9 82.3 | 11 39.7 +39.9 81.6 | 10 56.3 +40.0 81.0 | 10 13.0 +40.1 80.3 |
| 15° | 13 46.4 +39.6 82.2 | 13 03.0 +39.7 81.5 | 12 19.6 +39.8 80.9 | 11 36.3 +39.9 80.2 | 10 53.1 +40.0 79.6 |
| 16° | 14 26.0 +39.5 81.4 | 13 42.7 +39.5 80.8 | 12 59.4 +39.6 80.1 | 12 16.2 +39.8 79.5 | 11 33.1 +39.9 78.8 |
| 17° | 15 05.5 +39.3 80.6 | 14 22.2 +39.4 80.0 | 13 39.0 +39.5 79.3 | 12 56.0 +39.6 78.7 | 12 13.0 +39.7 78.0 |
| 18° | 15 44.8 +39.1 79.9 | 15 01.6 +39.2 79.2 | 14 18.5 +39.4 78.6 | 13 35.6 +39.5 77.9 | 12 52.7 +39.6 77.3 |
| 19° | 16 23.9 +38.9 79.1 | 15 40.8 +39.1 78.4 | 14 57.9 +39.2 77.8 | 14 15.1 +39.3 77.1 | 13 32.3 +39.5 76.5 |
| 20° | 17 02.8 +38.8 78.3 | 16 19.9 +38.9 77.6 | 15 37.1 +39.0 77.0 | 14 54.4 +39.2 76.4 | 14 11.8 +39.3 75.7 |
| 21° | 17 41.6 +38.5 77.5 | 16 58.8 +38.7 76.8 | 16 16.1 +38.9 76.2 | 15 33.6 +39.0 75.6 | 14 51.1 +39.2 75.0 |
| 22° | 18 20.1 +38.4 76.7 | 17 37.5 +38.5 76.0 | 16 55.0 +38.6 75.4 | 16 12.6 +38.8 74.8 | 15 30.3 +39.0 74.2 |
| 23° | 18 58.5 +38.1 75.9 | 18 16.0 +38.3 75.2 | 17 33.6 +38.5 74.6 | 16 51.4 +38.6 74.0 | 16 09.3 +38.8 73.4 |
| 24° | 19 36.6 +38.0 75.0 | 18 54.3 +38.1 74.4 | 18 12.1 +38.3 73.8 | 17 30.0 +38.5 73.2 | 16 48.1 +38.6 72.6 |
| 25° | 20 14.6 +37.6 74.2 | 19 32.4 +37.9 73.6 | 18 50.4 +38.0 73.0 | 18 08.5 +38.2 72.4 | 17 26.7 +38.4 71.8 |
| 26° | 20 52.2 +37.5 73.4 | 20 10.3 +37.6 72.8 | 19 28.4 +37.8 72.2 | 18 46.7 +38.0 71.6 | 18 05.1 +38.3 71.0 |
| 27° | 21 29.7 +37.2 72.5 | 20 47.9 +37.4 72.0 | 20 06.2 +37.6 71.4 | 19 24.7 +37.8 70.8 | 18 43.4 +38.0 70.2 |
| 28° | 22 06.9 +36.9 71.7 | 21 25.3 +37.1 71.1 | 20 43.8 +37.4 70.5 | 20 02.5 +37.6 69.9 | 19 21.4 +37.8 69.3 |
| 29° | 22 43.8 +36.7 70.8 | 22 02.4 +36.9 70.3 | 21 21.2 +37.1 69.7 | 20 40.1 +37.4 69.1 | 19 59.2 +37.6 68.5 |

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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 +40.9 90.0  | -0 43.9 +40.9      | -1 27.8 +41.0      | -2 11.6 +40.9      | -2 55.5 +41.0      |
| 1°  | 0 40.9 +40.9 89.3  | -0 03.0 +41.0      | -0 46.8 +40.9      | -1 30.7 +41.0      | -2 14.5 +41.0      |
| 2°  | 1 21.8 +40.9 88.5  | 0 38.0 +40.9 87.9  | -0 05.9 +41.0      | -0 49.7 +41.0      | -1 33.5 +41.1      |
| 3°  | 2 02.7 +40.9 87.8  | 1 18.9 +40.9 87.1  | 0 35.1 +40.9 86.4  | -0 08.7 +41.0      | -0 52.4 +41.0      |
| 4°  | 2 43.6 +40.9 87.1  | 1 59.8 +40.9 86.4  | 1 16.0 +41.0 85.7  | 0 32.3 +41.0 85.0  | -0 11.4 +41.0      |
| 5°  | 3 24.5 +40.8 86.3  | 2 40.7 +40.8 85.7  | 1 57.0 +40.9 85.0  | 1 13.3 +40.9 84.3  | 0 29.6 +41.1 83.6  |
| 6°  | 4 05.3 +40.8 85.6  | 3 21.5 +40.9 84.9  | 2 37.9 +40.8 84.2  | 1 54.2 +41.0 83.6  | 1 10.7 +41.0 82.9  |
| 7°  | 4 46.1 +40.7 84.9  | 4 02.4 +40.8 84.2  | 3 18.7 +40.9 83.5  | 2 35.2 +40.9 82.8  | 1 51.7 +41.0 82.2  |
| 8°  | 5 26.8 +40.7 84.1  | 4 43.2 +40.7 83.5  | 3 59.6 +40.8 82.8  | 3 16.1 +40.9 82.1  | 2 32.7 +40.9 81.4  |
| 9°  | 6 07.5 +40.6 83.4  | 5 23.9 +40.7 82.7  | 4 40.4 +40.8 82.0  | 3 57.0 +40.8 81.4  | 3 13.6 +41.0 80.7  |
| 10° | 6 48.1 +40.5 82.7  | 6 04.6 +40.6 82.0  | 5 21.2 +40.7 81.3  | 4 37.8 +40.8 80.6  | 3 54.6 +40.9 80.0  |
| 11° | 7 28.6 +40.5 81.9  | 6 45.2 +40.6 81.2  | 6 01.9 +40.6 80.6  | 5 18.6 +40.8 79.9  | 4 35.5 +40.9 79.2  |
| 12° | 8 09.1 +40.4 81.2  | 7 25.8 +40.5 80.5  | 6 42.5 +40.6 79.8  | 5 59.4 +40.7 79.2  | 5 16.4 +40.8 78.5  |
| 13° | 8 49.5 +40.3 80.4  | 8 06.3 +40.4 79.8  | 7 23.1 +40.6 79.1  | 6 40.1 +40.6 78.4  | 5 57.2 +40.7 77.8  |
| 14° | 9 29.8 +40.2 79.7  | 8 46.7 +40.3 79.0  | 8 03.7 +40.4 78.3  | 7 20.7 +40.6 77.7  | 6 37.9 +40.7 77.0  |
| 15° | 10 10.0 +40.1 78.9 | 9 27.0 +40.2 78.3  | 8 44.1 +40.3 77.6  | 8 01.3 +40.5 76.9  | 7 18.6 +40.6 76.3  |
| 16° | 10 50.1 +40.0 78.2 | 10 07.2 +40.1 77.5 | 9 24.4 +40.3 76.8  | 8 41.8 +40.3 76.2  | 7 59.2 +40.5 75.5  |
| 17° | 11 30.1 +39.9 77.4 | 10 47.3 +40.0 76.7 | 10 04.7 +40.1 76.1 | 9 22.1 +40.3 75.4  | 8 39.7 +40.5 74.8  |
| 18° | 12 10.0 +39.7 76.6 | 11 27.3 +39.9 76.0 | 10 44.8 +40.1 75.3 | 10 02.4 +40.2 74.7 | 9 20.2 +40.3 74.0  |
| 19° | 12 49.7 +39.6 75.9 | 12 07.2 +39.8 75.2 | 11 24.9 +39.9 74.6 | 10 42.6 +40.1 73.9 | 10 00.5 +40.3 73.3 |
| 20° | 13 29.3 +39.5 75.1 | 12 47.0 +39.6 74.5 | 12 04.8 +39.8 73.8 | 11 22.7 +40.0 73.2 | 10 40.8 +40.1 72.5 |
| 21° | 14 08.8 +39.3 74.3 | 13 26.6 +39.5 73.7 | 12 44.6 +39.6 73.1 | 12 02.7 +39.8 72.4 | 11 20.9 +40.0 71.8 |
| 22° | 14 48.1 +39.2 73.5 | 14 06.1 +39.4 72.9 | 13 24.2 +39.6 72.3 | 12 42.5 +39.7 71.7 | 12 00.9 +39.9 71.0 |
| 23° | 15 27.3 +39.0 72.8 | 14 45.5 +39.1 72.1 | 14 03.8 +39.3 71.5 | 13 22.2 +39.6 70.9 | 12 40.8 +39.8 70.3 |
| 24° | 16 06.3 +38.8 72.0 | 15 24.6 +39.0 71.3 | 14 43.1 +39.2 70.7 | 14 01.8 +39.4 70.1 | 13 20.6 +39.6 69.5 |
| 25° | 16 45.1 +38.6 71.2 | 16 03.6 +38.9 70.6 | 15 22.3 +39.1 69.9 | 14 41.2 +39.3 69.3 | 14 00.2 +39.5 68.7 |
| 26° | 17 23.7 +38.5 70.4 | 16 42.5 +38.6 69.8 | 16 01.4 +38.9 69.2 | 15 20.5 +39.1 68.5 | 14 39.7 +39.3 67.9 |
| 27° | 18 02.2 +38.2 69.6 | 17 21.1 +38.5 69.0 | 16 40.3 +38.7 68.4 | 15 59.6 +38.9 67.8 | 15 19.0 +39.2 67.2 |
| 28° | 18 40.4 +38.1 68.8 | 17 59.6 +38.3 68.2 | 17 19.0 +38.5 67.6 | 16 38.5 +38.7 67.0 | 15 58.2 +39.0 66.4 |
| 29° | 19 18.5 +37.8 67.9 | 18 37.9 +38.0 67.3 | 17 57.5 +38.3 66.8 | 17 17.2 +38.6 66.2 | 16 37.2 +38.8 65.6 |

| 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°  | -3 39.3 +41.0      | -4 23.1 +41.1      | -5 06.8 +41.1      | -5 50.5 +41.1      | -6 34.2 +41.2      |
| 1°  | -2 58.3 +41.1      | -3 42.0 +41.1      | -4 25.7 +41.1      | -5 09.4 +41.3      | -5 53.0 +41.3      |
| 2°  | -2 17.2 +41.1      | -3 00.9 +41.1      | -3 44.6 +41.2      | -4 28.1 +41.2      | -5 11.7 +41.4      |
| 3°  | -1 36.1 +41.1      | -2 19.8 +41.2      | -3 03.4 +41.2      | -3 46.9 +41.3      | -4 30.3 +41.3      |
| 4°  | -0 55.0 +41.0      | -1 38.6 +41.1      | -2 22.2 +41.3      | -3 05.6 +41.3      | -3 49.0 +41.4      |
| 5°  | -0 14.0 +41.1      | -0 57.5 +41.2      | -1 40.9 +41.2      | -2 24.3 +41.4      | -3 07.6 +41.5      |
| 6°  | 0 27.1 +41.1 82.2  | -0 16.3 +41.2      | -0 59.7 +41.3      | -1 42.9 +41.3      | -2 26.1 +41.4      |
| 7°  | 1 08.2 +41.1 81.5  | 0 24.9 +41.2 80.8  | -0 18.4 +41.3      | -1 01.6 +41.4      | -1 44.7 +41.5      |
| 8°  | 1 49.3 +41.1 80.8  | 1 06.1 +41.1 80.1  | 0 22.9 +41.2 79.4  | -0 20.2 +41.4      | -1 03.2 +41.5      |
| 9°  | 2 30.4 +41.0 80.0  | 1 47.2 +41.2 79.3  | 1 04.1 +41.3 78.7  | 0 21.2 +41.3 78.0  | -0 21.7 +41.5      |
| 10° | 3 11.4 +41.0 79.3  | 2 28.4 +41.1 78.6  | 1 45.4 +41.2 77.9  | 1 02.5 +41.4 77.3  | 0 19.8 +41.5 76.6  |
| 11° | 3 52.4 +41.0 78.6  | 3 09.5 +41.1 77.9  | 2 26.6 +41.2 77.2  | 1 43.9 +41.3 76.5  | 1 01.3 +41.5 75.9  |
| 12° | 4 33.4 +40.9 77.8  | 3 50.6 +41.0 77.2  | 3 07.8 +41.2 76.5  | 2 25.2 +41.4 75.8  | 1 42.8 +41.4 75.1  |
| 13° | 5 14.3 +40.9 77.1  | 4 31.6 +41.0 76.4  | 3 49.0 +41.2 75.8  | 3 06.6 +41.2 75.1  | 2 24.2 +41.5 74.4  |
| 14° | 5 55.2 +40.8 76.4  | 5 12.6 +41.0 75.7  | 4 30.2 +41.1 75.0  | 3 47.8 +41.3 74.4  | 3 05.7 +41.4 73.7  |
| 15° | 6 36.0 +40.8 75.6  | 5 53.6 +40.9 75.0  | 5 11.3 +41.0 74.3  | 4 29.1 +41.2 73.6  | 3 47.1 +41.3 73.0  |
| 16° | 7 16.8 +40.7 74.9  | 6 34.5 +40.8 74.2  | 5 52.3 +41.0 73.6  | 5 10.3 +41.2 72.9  | 4 28.4 +41.4 72.2  |
| 17° | 7 57.5 +40.6 74.1  | 7 15.3 +40.8 73.5  | 6 33.3 +40.9 72.8  | 5 51.5 +41.1 72.2  | 5 09.8 +41.3 71.5  |
| 18° | 8 38.1 +40.5 73.4  | 7 56.1 +40.7 72.7  | 7 14.2 +40.9 72.1  | 6 32.6 +41.0 71.4  | 5 51.1 +41.2 70.8  |
| 19° | 9 18.6 +40.4 72.6  | 8 36.8 +40.6 72.0  | 7 55.1 +40.8 71.4  | 7 13.6 +41.0 70.7  | 6 32.3 +41.1 70.1  |
| 20° | 9 59.0 +40.3 71.9  | 9 17.4 +40.5 71.3  | 8 35.9 +40.7 70.6  | 7 54.6 +40.9 70.0  | 7 13.4 +41.1 69.3  |
| 21° | 10 39.3 +40.2 71.1 | 9 57.9 +40.4 70.5  | 9 16.6 +40.6 69.9  | 8 35.5 +40.8 69.2  | 7 54.5 +41.0 68.6  |
| 22° | 11 19.5 +40.1 70.4 | 10 38.3 +40.3 69.8 | 9 57.2 +40.5 69.1  | 9 16.3 +40.7 68.5  | 8 35.5 +41.0 67.8  |
| 23° | 11 59.6 +40.0 69.6 | 11 18.6 +40.1 69.0 | 10 37.7 +40.4 68.4 | 9 57.0 +40.6 67.7  | 9 16.5 +40.8 67.1  |
| 24° | 12 39.6 +39.8 68.9 | 11 58.7 +40.1 68.2 | 11 18.1 +40.3 67.6 | 10 37.6 +40.5 67.0 | 9 57.3 +40.7 66.4  |
| 25° | 13 19.4 +39.7 68.1 | 12 38.8 +39.9 67.5 | 11 58.4 +40.1 66.9 | 11 18.1 +40.4 66.2 | 10 38.0 +40.7 65.6 |
| 26° | 13 59.1 +39.6 67.3 | 13 18.7 +39.8 66.7 | 12 38.5 +40.1 66.1 | 11 58.5 +40.3 65.5 | 11 18.7 +40.5 64.9 |
| 27° | 14 38.7 +39.4 66.6 | 13 58.5 +39.7 65.9 | 13 18.6 +39.8 65.3 | 12 38.8 +40.1 64.7 | 11 59.2 +40.4 64.1 |
| 28° | 15 18.1 +39.2 65.8 | 14 38.2 +39.5 65.2 | 13 58.4 +39.8 64.6 | 13 18.9 +40.0 64.0 | 12 39.6 +40.3 63.4 |
| 29° | 15 57.3 +39.1 65.0 | 15 17.7 +39.3 64.4 | 14 38.2 +39.6 63.8 | 13 58.9 +39.9 63.2 | 13 19.9 +40.1 62.6 |

| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°    | LHA 103° / 257°    | LHA 104° / 256°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -7 17.8 +41.3      | -8 01.3 +41.4      | -8 44.8 +41.5      | -9 28.2 +41.6      |                    |
| 1°  | -6 36.5 +41.4      | -7 19.9 +41.4      | -8 03.3 +41.5      | -8 46.6 +41.6      | -9 29.8 +41.7      |
| 2°  | -5 55.1 +41.4      | -6 38.5 +41.5      | -7 21.8 +41.6      | -8 05.0 +41.7      | -8 48.1 +41.8      |
| 3°  | -5 13.7 +41.4      | -5 57.0 +41.5      | -6 40.2 +41.6      | -7 23.3 +41.7      | -8 06.3 +41.8      |
| 4°  | -4 32.3 +41.5      | -5 15.5 +41.6      | -5 58.6 +41.7      | -6 41.6 +41.9      | -7 24.5 +42.0      |
| 5°  | -3 50.8 +41.6      | -4 33.9 +41.7      | -5 16.9 +41.8      | -5 59.7 +41.8      | -6 42.5 +42.0      |
| 6°  | -3 09.2 +41.5      | -3 52.2 +41.7      | -4 35.1 +41.8      | -5 17.9 +42.0      | -6 00.5 +42.1      |
| 7°  | -2 27.7 +41.6      | -3 10.5 +41.7      | -3 53.3 +41.9      | -4 35.9 +41.9      | -5 18.4 +42.1      |
| 8°  | -1 46.1 +41.7      | -2 28.8 +41.7      | -3 11.4 +41.8      | -3 54.0 +42.1      | -4 36.3 +42.1      |
| 9°  | -1 04.4 +41.6      | -1 47.1 +41.8      | -2 29.6 +41.9      | -3 11.9 +42.0      | -3 54.2 +42.2      |
| 10° | -0 22.8 +41.6      | -1 05.3 +41.7      | -1 47.7 +41.9      | -2 29.9 +42.1      | -3 12.0 +42.2      |
| 11° | 0 18.8 +41.6 75.2  | -0 23.6 +41.8      | -1 05.8 +41.9      | -1 47.8 +42.0      | -2 29.8 +42.3      |
| 12° | 1 00.4 +41.6 74.5  | 0 18.2 +41.8 73.8  | -0 23.9 +42.0      | -1 05.8 +42.1      | -1 47.5 +42.2      |
| 13° | 1 42.0 +41.6 73.7  | 1 00.0 +41.7 73.1  | 0 18.1 +41.9 72.4  | -0 23.7 +42.1      | -1 05.3 +42.3      |
| 14° | 2 23.6 +41.6 73.0  | 1 41.7 +41.8 72.3  | 1 00.0 +41.9 71.7  | 0 18.4 +42.1 71.0  | -0 23.0 +42.3      |
| 15° | 3 05.2 +41.5 72.3  | 2 23.5 +41.7 71.6  | 1 41.9 +41.9 70.9  | 1 00.5 +42.1 70.3  | 0 19.3 +42.3 69.6  |
| 16° | 3 46.7 +41.5 71.6  | 3 05.2 +41.7 70.9  | 2 23.8 +41.9 70.2  | 1 42.6 +42.1 69.6  | 1 01.6 +42.2 68.9  |
| 17° | 4 28.2 +41.5 70.8  | 3 46.9 +41.6 70.2  | 3 05.7 +41.8 69.5  | 2 24.7 +42.0 68.8  | 1 43.8 +42.3 68.2  |
| 18° | 5 09.7 +41.4 70.1  | 4 28.5 +41.6 69.5  | 3 47.5 +41.8 68.8  | 3 06.7 +42.0 68.1  | 2 26.1 +42.2 67.5  |
| 19° | 5 51.1 +41.4 69.4  | 5 10.1 +41.6 68.7  | 4 29.3 +41.8 68.1  | 3 48.7 +42.0 67.4  | 3 08.3 +42.2 66.8  |
| 20° | 6 32.5 +41.3 68.7  | 5 51.7 +41.5 68.0  | 5 11.1 +41.7 67.4  | 4 30.7 +41.9 66.7  | 3 50.5 +42.1 66.0  |
| 21° | 7 13.8 +41.2 67.9  | 6 33.2 +41.4 67.3  | 5 52.8 +41.7 66.6  | 5 12.6 +41.9 66.0  | 4 32.6 +42.2 65.3  |
| 22° | 7 55.0 +41.1 67.2  | 7 14.6 +41.4 66.6  | 6 34.5 +41.6 65.9  | 5 54.5 +41.8 65.3  | 5 14.8 +42.0 64.6  |
| 23° | 8 36.1 +41.1 66.5  | 7 56.0 +41.3 65.8  | 7 16.1 +41.5 65.2  | 6 36.3 +41.8 64.5  | 5 56.8 +42.0 63.9  |
| 24° | 9 17.2 +41.0 65.7  | 8 37.3 +41.2 65.1  | 7 57.6 +41.5 64.5  | 7 18.1 +41.7 63.8  | 6 38.8 +42.0 63.2  |
| 25° | 9 58.2 +40.8 65.0  | 9 18.5 +41.1 64.4  | 8 39.1 +41.3 63.7  | 7 59.8 +41.6 63.1  | 7 20.8 +41.9 62.5  |
| 26° | 10 39.0 +40.8 64.2 | 9 59.6 +41.1 63.6  | 9 20.4 +41.3 63.0  | 8 41.4 +41.6 62.4  | 8 02.7 +41.8 61.7  |
| 27° | 11 19.8 +40.7 63.5 | 10 40.7 +40.9 62.9 | 10 01.7 +41.2 62.3 | 9 23.0 +41.4 61.6  | 8 44.5 +41.7 61.0  |
| 28° | 12 00.5 +40.5 62.7 | 11 21.6 +40.8 62.1 | 10 42.9 +41.1 61.5 | 10 04.4 +41.4 60.9 | 9 26.2 +41.6 60.3  |
| 29° | 12 41.0 +40.4 62.0 | 12 02.4 +40.7 61.4 | 11 24.0 +40.9 60.8 | 10 45.8 +41.2 60.2 | 10 07.8 +41.6 59.6 |

| Dec | LHA 105° / 255°   | LHA 106° / 254°   | LHA 107° / 253°   | LHA 108° / 252°   | LHA 109° / 251°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  | -9 31.1 +41.9     |                   |                   |                   |                   |
| 3°  | -8 49.2 +42.0     | -9 32.0 +42.1     |                   |                   |                   |
| 4°  | -8 07.2 +42.0     | -8 49.9 +42.2     | -9 32.4 +42.4     |                   |                   |
| 5°  | -7 25.2 +42.2     | -8 07.7 +42.3     | -8 50.0 +42.4     | -9 32.3 +42.6     |                   |
| 6°  | -6 43.0 +42.2     | -7 25.4 +42.4     | -8 07.6 +42.5     | -8 49.7 +42.7     | -9 31.6 +42.8     |
| 7°  | -6 00.8 +42.2     | -6 43.0 +42.4     | -7 25.1 +42.5     | -8 07.0 +42.7     | -8 48.8 +42.9     |
| 8°  | -5 18.6 +42.4     | -6 00.6 +42.4     | -6 42.6 +42.7     | -7 24.3 +42.8     | -8 05.9 +43.0     |
| 9°  | -4 36.2 +42.3     | -5 18.2 +42.5     | -5 59.9 +42.7     | -6 41.5 +42.8     | -7 22.9 +43.0     |
| 10° | -3 53.9 +42.4     | -4 35.7 +42.6     | -5 17.2 +42.7     | -5 58.7 +43.0     | -6 39.9 +43.1     |
| 11° | -3 11.5 +42.4     | -3 53.1 +42.6     | -4 34.5 +42.8     | -5 15.7 +42.9     | -5 56.8 +43.2     |
| 12° | -2 29.1 +42.4     | -3 10.5 +42.6     | -3 51.7 +42.8     | -4 32.8 +43.0     | -5 13.6 +43.2     |
| 13° | -1 46.7 +42.5     | -2 27.9 +42.7     | -3 08.9 +42.8     | -3 49.8 +43.0     | -4 30.4 +43.2     |
| 14° | -1 04.2 +42.5     | -1 45.2 +42.6     | -2 26.1 +42.9     | -3 06.8 +43.1     | -3 47.2 +43.3     |
| 15° | -0 21.7 +42.4     | -1 02.6 +42.7     | -1 43.2 +42.8     | -2 23.7 +43.1     | -3 03.9 +43.3     |
| 16° | 0 20.7 +42.5 68.2 | -0 19.9 +42.6     | -1 00.4 +42.9     | -1 40.6 +43.1     | -2 20.6 +43.3     |
| 17° | 1 03.2 +42.4 67.5 | 0 22.7 +42.7 66.8 | -0 17.5 +42.9     | -0 57.5 +43.1     | -1 37.3 +43.3     |
| 18° | 1 45.6 +42.5 66.8 | 1 05.4 +42.7 66.1 | 0 25.4 +42.9 65.4 | -0 14.4 +43.1     | -0 54.0 +43.4     |
| 19° | 2 28.1 +42.4 66.1 | 1 48.1 +42.6 65.4 | 1 08.3 +42.8 64.7 | 0 28.7 +43.1 64.1 | -0 10.6 +43.3     |
| 20° | 3 10.5 +42.4 65.4 | 2 30.7 +42.6 64.7 | 1 51.1 +42.9 64.0 | 1 11.8 +43.1 63.4 | 0 32.7 +43.3 62.7 |
| 21° | 3 52.9 +42.3 64.7 | 3 13.3 +42.6 64.0 | 2 34.0 +42.8 63.3 | 1 54.9 +43.1 62.7 | 1 16.0 +43.4 62.0 |
| 22° | 4 35.2 +42.3 64.0 | 3 55.9 +42.6 63.3 | 3 16.8 +42.8 62.6 | 2 38.0 +43.0 62.0 | 1 59.4 +43.3 61.3 |
| 23° | 5 17.5 +42.3 63.2 | 4 38.5 +42.5 62.6 | 3 59.6 +42.8 61.9 | 3 21.0 +43.1 61.3 | 2 42.7 +43.3 60.6 |
| 24° | 5 59.8 +42.2 62.5 | 5 21.0 +42.4 61.9 | 4 42.4 +42.7 61.2 | 4 04.1 +42.9 60.6 | 3 26.0 +43.2 59.9 |
| 25° | 6 42.0 +42.1 61.8 | 6 03.4 +42.4 61.2 | 5 25.1 +42.7 60.5 | 4 47.0 +43.0 59.9 | 4 09.2 +43.2 59.2 |
| 26° | 7 24.1 +42.1 61.1 | 6 45.8 +42.4 60.5 | 6 07.8 +42.6 59.8 | 5 30.0 +42.9 59.2 | 4 52.4 +43.2 58.5 |
| 27° | 8 06.2 +42.0 60.4 | 7 28.2 +42.3 59.7 | 6 50.4 +42.6 59.1 | 6 12.9 +42.8 58.5 | 5 35.6 +43.1 57.8 |
| 28° | 8 48.2 +41.9 59.7 | 8 10.5 +42.2 59.0 | 7 33.0 +42.4 58.4 | 6 55.7 +42.8 57.8 | 6 18.7 +43.1 57.1 |
| 29° | 9 30.1 +41.9 58.9 | 8 52.7 +42.1 58.3 | 8 15.4 +42.5 57.7 | 7 38.5 +42.7 57.1 | 7 01.8 +43.0 56.4 |

| Dec | LHA 110° / 250° | LHA 111° / 249° | LHA 112° / 248° | LHA 113° / 247° | LHA 114° / 246° |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
|     | 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 30.4 +43.1   |                 |                 |                 |                 |
| 9°  | -8 47.3 +43.1   | -9 28.5 +43.3   |                 |                 |                 |
| 10° | -8 04.2 +43.3   | -8 45.2 +43.4   | -9 26.0 +43.6   |                 |                 |
| 11° |                 |                 |                 |                 |                 |
| 12° |                 |                 |                 |                 |                 |
| 13° |                 |                 |                 |                 |                 |
| 14° |                 |                 |                 |                 |                 |
| 15° |                 |                 |                 |                 |                 |
| 16° |                 |                 |                 |                 |                 |
| 17° |                 |                 |                 |                 |                 |
| 18° |                 |                 |                 |                 |                 |
| 19° |                 |                 |                 |                 |                 |
| 20° |                 |                 |                 |                 |                 |
| 21° |                 |                 |                 |                 |                 |
| 22° |                 |                 |                 |                 |                 |
| 23° |                 |                 |                 |                 |                 |
| 24° |                 |                 |                 |                 |                 |
| 25° |                 |                 |                 |                 |                 |
| 26° |                 |                 |                 |                 |                 |
| 27° |                 |                 |                 |                 |                 |
| 28° |                 |                 |                 |                 |                 |
| 29° |                 |                 |                 |                 |                 |

| Dec | LHA 115° / 245° | LHA 116° / 244° | LHA 117° / 243° | LHA 118° / 242° | LHA 119° / 241° |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
|     | 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 120° / 240°   | LHA 121° / 239°   | LHA 122° / 238° | LHA 123° / 237° | LHA 124° / 236° |
|-----|-------------------|-------------------|-----------------|-----------------|-----------------|
|     | 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° | -9 24.7 +46.0     |                   |                 |                 |                 |
| 17° | -8 38.7 +46.1     | -9 15.3 +46.4     | -9 51.5 +46.6   |                 |                 |
| 18° | -7 52.6 +46.2     | -8 28.9 +46.4     | -9 04.9 +46.7   |                 |                 |
| 19° | -7 06.4 +46.2     | -7 42.5 +46.5     | -8 18.2 +46.8   |                 |                 |
| 20° | -6 20.2 +46.3     | -6 56.0 +46.6     | -7 31.4 +46.8   |                 |                 |
| 21° | -5 33.9 +46.3     | -6 09.4 +46.6     | -6 44.6 +46.9   |                 |                 |
| 22° | -4 47.6 +46.3     | -5 22.8 +46.6     | -5 57.7 +46.9   |                 |                 |
| 23° | -4 01.3 +46.4     | -4 36.2 +46.7     | -5 10.8 +47.0   |                 |                 |
| 24° | -3 14.9 +46.4     | -3 49.5 +46.7     | -4 23.8 +47.0   |                 |                 |
| 25° | -2 28.5 +46.4     | -3 02.8 +46.7     | -3 36.8 +47.0   |                 |                 |
| 26° | -1 42.1 +46.4     | -2 16.1 +46.7     | -2 49.8 +47.1   |                 |                 |
| 27° | -0 55.7 +46.4     | -1 29.4 +46.8     | -2 02.7 +47.0   |                 |                 |
| 28° | -0 09.3 +46.5     | -0 42.6 +46.7     | -1 15.7 +47.1   |                 |                 |
| 29° | 0 37.2 +46.4 49.2 | 0 04.1 +46.7 48.6 | -0 28.6 +47.0   |                 |                 |

| Dec | LHA 125° / 235° | LHA 126° / 234° | LHA 127° / 233° | LHA 128° / 232° | LHA 129° / 231° |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
|     | 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°  | 46 00.0 +60.0 180.0 | 45 59.5 +59.9 178.6 | 45 57.8 +60.0 177.1 | 45 55.1 +59.9 175.7 | 45 51.3 +59.9 174.3 |
| 1°  | 47 00.0 +60.0 180.0 | 46 59.4 +60.0 178.5 | 46 57.8 +60.0 177.1 | 46 55.0 +59.9 175.6 | 46 51.2 +59.8 174.1 |
| 2°  | 48 00.0 +60.0 180.0 | 47 59.4 +60.0 178.5 | 47 57.8 +59.9 177.0 | 47 54.9 +59.9 175.5 | 47 51.0 +59.8 174.0 |
| 3°  | 49 00.0 +60.0 180.0 | 48 59.4 +60.0 178.5 | 48 57.7 +60.0 177.0 | 48 54.8 +59.9 175.4 | 48 50.8 +59.9 173.9 |
| 4°  | 50 00.0 +60.0 180.0 | 49 59.4 +60.0 178.4 | 49 57.7 +59.9 176.9 | 49 54.7 +59.9 175.3 | 49 50.7 +59.8 173.8 |
| 5°  | 51 00.0 +60.0 180.0 | 50 59.4 +60.0 178.4 | 50 57.6 +60.0 176.8 | 50 54.6 +59.9 175.3 | 50 50.5 +59.8 173.7 |
| 6°  | 52 00.0 +60.0 180.0 | 51 59.4 +60.0 178.4 | 51 57.6 +59.9 176.8 | 51 54.5 +59.9 175.2 | 51 50.3 +59.8 173.6 |
| 7°  | 53 00.0 +60.0 180.0 | 52 59.4 +60.0 178.4 | 52 57.5 +60.0 176.7 | 52 54.4 +59.9 175.1 | 52 50.1 +59.8 173.4 |
| 8°  | 54 00.0 +60.0 180.0 | 53 59.4 +60.0 178.3 | 53 57.5 +59.9 176.6 | 53 54.3 +59.9 175.0 | 53 49.9 +59.7 173.3 |
| 9°  | 55 00.0 +60.0 180.0 | 54 59.4 +59.9 178.3 | 54 57.4 +59.9 176.6 | 54 54.2 +59.8 174.8 | 54 49.6 +59.8 173.1 |
| 10° | 56 00.0 +60.0 180.0 | 55 59.3 +60.0 178.2 | 55 57.3 +60.0 176.5 | 55 54.0 +59.9 174.7 | 55 49.4 +59.8 173.0 |
| 11° | 57 00.0 +60.0 180.0 | 56 59.3 +60.0 178.2 | 56 57.3 +59.9 176.4 | 56 53.9 +59.9 174.6 | 56 49.2 +59.7 172.8 |
| 12° | 58 00.0 +60.0 180.0 | 57 59.3 +60.0 178.2 | 57 57.2 +60.0 176.3 | 57 53.8 +59.8 174.5 | 57 48.9 +59.7 172.6 |
| 13° | 59 00.0 +60.0 180.0 | 58 59.3 +60.0 178.1 | 58 57.2 +59.9 176.2 | 58 53.6 +59.8 174.3 | 58 48.6 +59.7 172.5 |
| 14° | 60 00.0 +60.0 180.0 | 59 59.3 +59.9 178.1 | 59 57.1 +59.9 176.1 | 59 53.4 +59.9 174.2 | 59 48.3 +59.7 172.3 |
| 15° | 61 00.0 +60.0 180.0 | 60 59.2 +60.0 178.0 | 60 57.0 +59.9 176.0 | 60 53.3 +59.8 174.0 | 60 48.0 +59.7 172.1 |
| 16° | 62 00.0 +60.0 180.0 | 61 59.2 +60.0 178.0 | 61 56.9 +59.9 175.9 | 61 53.1 +59.8 173.9 | 61 47.7 +59.7 171.8 |
| 17° | 63 00.0 +60.0 180.0 | 62 59.2 +60.0 177.9 | 62 56.8 +59.9 175.8 | 62 52.9 +59.8 173.7 | 62 47.4 +59.6 171.6 |
| 18° | 64 00.0 +60.0 180.0 | 63 59.2 +60.0 177.8 | 63 56.7 +59.9 175.7 | 63 52.7 +59.7 173.5 | 63 47.0 +59.6 171.4 |
| 19° | 65 00.0 +60.0 180.0 | 64 59.2 +59.9 177.8 | 64 56.6 +59.9 175.5 | 64 52.4 +59.8 173.3 | 64 46.6 +59.5 171.1 |
| 20° | 66 00.0 +60.0 180.0 | 65 59.1 +60.0 177.7 | 65 56.5 +59.9 175.4 | 65 52.2 +59.7 173.1 | 65 46.1 +59.6 170.8 |
| 21° | 67 00.0 +60.0 180.0 | 66 59.1 +60.0 177.6 | 66 56.4 +59.9 175.2 | 66 51.9 +59.7 172.9 | 66 45.7 +59.5 170.5 |
| 22° | 68 00.0 +60.0 180.0 | 67 59.1 +59.9 177.5 | 67 56.3 +59.8 175.1 | 67 51.6 +59.7 172.6 | 67 45.2 +59.4 170.2 |
| 23° | 69 00.0 +60.0 180.0 | 68 59.0 +60.0 177.4 | 68 56.1 +59.9 174.9 | 68 51.3 +59.7 172.3 | 68 44.6 +59.4 169.8 |
| 24° | 70 00.0 +60.0 180.0 | 69 59.0 +60.0 177.3 | 69 56.0 +59.8 174.7 | 69 51.0 +59.6 172.0 | 69 44.0 +59.3 169.4 |
| 25° | 71 00.0 +60.0 180.0 | 70 59.0 +59.9 177.2 | 70 55.8 +59.8 174.4 | 70 50.6 +59.6 171.7 | 70 43.3 +59.3 169.0 |
| 26° | 72 00.0 +60.0 180.0 | 71 58.9 +60.0 177.1 | 71 55.6 +59.8 174.2 | 71 50.2 +59.5 171.3 | 71 42.6 +59.2 168.5 |
| 27° | 73 00.0 +60.0 180.0 | 72 58.9 +59.9 177.0 | 72 55.4 +59.8 173.9 | 72 49.7 +59.5 170.9 | 72 41.8 +59.1 167.9 |
| 28° | 74 00.0 +60.0 180.0 | 73 58.8 +59.9 176.8 | 73 55.2 +59.7 173.6 | 73 49.2 +59.4 170.5 | 73 40.9 +59.0 167.3 |
| 29° | 75 00.0 +60.0 180.0 | 74 58.7 +60.0 176.6 | 74 54.9 +59.7 173.3 | 74 48.6 +59.4 169.9 | 74 39.9 +58.8 166.7 |

| 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°  | 45 46.5 +59.7 172.8 | 45 40.6 +59.6 171.4 | 45 33.6 +59.5 170.0 | 45 25.5 +59.4 168.6 | 45 16.5 +59.2 167.2 |
| 1°  | 46 46.2 +59.8 172.7 | 46 40.2 +59.6 171.2 | 46 33.1 +59.5 169.8 | 46 24.9 +59.4 168.4 | 46 15.7 +59.2 166.9 |
| 2°  | 47 46.0 +59.7 172.6 | 47 39.8 +59.7 171.1 | 47 32.6 +59.5 169.6 | 47 24.3 +59.3 168.1 | 47 14.9 +59.1 166.7 |
| 3°  | 48 45.7 +59.7 172.4 | 48 39.5 +59.6 170.9 | 48 32.1 +59.4 169.4 | 48 23.6 +59.3 167.9 | 48 14.0 +59.1 166.4 |
| 4°  | 49 45.4 +59.7 172.3 | 49 39.1 +59.5 170.7 | 49 31.5 +59.5 169.2 | 49 22.9 +59.3 167.7 | 49 13.1 +59.1 166.2 |
| 5°  | 50 45.1 +59.7 172.1 | 50 38.6 +59.6 170.5 | 50 31.0 +59.4 169.0 | 50 22.2 +59.2 167.4 | 50 12.2 +59.1 165.9 |
| 6°  | 51 44.8 +59.7 172.0 | 51 38.2 +59.6 170.4 | 51 30.4 +59.4 168.8 | 51 21.4 +59.2 167.2 | 51 11.3 +59.0 165.6 |
| 7°  | 52 44.5 +59.7 171.8 | 52 37.8 +59.5 170.2 | 52 29.8 +59.3 168.5 | 52 20.6 +59.2 166.9 | 52 10.3 +58.9 165.3 |
| 8°  | 53 44.2 +59.6 171.6 | 53 37.3 +59.5 169.9 | 53 29.1 +59.4 168.3 | 53 19.8 +59.1 166.7 | 53 09.2 +58.9 165.0 |
| 9°  | 54 43.8 +59.7 171.4 | 54 36.8 +59.5 169.7 | 54 28.5 +59.3 168.0 | 54 18.9 +59.1 166.4 | 54 08.1 +58.9 164.7 |
| 10° | 55 43.5 +59.6 171.2 | 55 36.3 +59.4 169.5 | 55 27.8 +59.2 167.8 | 55 18.0 +59.0 166.1 | 55 07.0 +58.8 164.4 |
| 11° | 56 43.1 +59.6 171.0 | 56 35.7 +59.4 169.3 | 56 27.0 +59.2 167.5 | 56 17.0 +59.0 165.8 | 56 05.8 +58.7 164.0 |
| 12° | 57 42.7 +59.6 170.8 | 57 35.1 +59.4 169.0 | 57 26.2 +59.2 167.2 | 57 16.0 +59.0 165.4 | 57 04.5 +58.7 163.6 |
| 13° | 58 42.3 +59.5 170.6 | 58 34.5 +59.4 168.7 | 58 25.4 +59.1 166.9 | 58 15.0 +58.8 165.1 | 58 03.2 +58.6 163.3 |
| 14° | 59 41.8 +59.5 170.4 | 59 33.9 +59.3 168.5 | 59 24.5 +59.1 166.6 | 59 13.8 +58.8 164.7 | 59 01.8 +58.5 162.8 |
| 15° | 60 41.3 +59.5 170.1 | 60 33.2 +59.3 168.1 | 60 23.6 +59.0 166.2 | 60 12.6 +58.8 164.3 | 60 00.3 +58.4 162.4 |
| 16° | 61 40.8 +59.5 169.8 | 61 32.5 +59.2 167.8 | 61 22.6 +59.0 165.8 | 61 11.4 +58.6 163.9 | 60 58.7 +58.3 161.9 |
| 17° | 62 40.3 +59.4 169.5 | 62 31.7 +59.2 167.5 | 62 21.6 +58.9 165.5 | 62 10.0 +58.6 163.4 | 61 57.0 +58.2 161.5 |
| 18° | 63 39.7 +59.4 169.2 | 63 30.9 +59.1 167.1 | 63 20.5 +58.8 165.0 | 63 08.6 +58.4 163.0 | 62 55.2 +58.1 160.9 |
| 19° | 64 39.1 +59.3 168.9 | 64 30.0 +59.0 166.7 | 64 19.3 +58.7 164.6 | 64 07.0 +58.4 162.5 | 63 53.3 +57.9 160.4 |
| 20° | 65 38.4 +59.3 168.5 | 65 29.0 +59.0 166.3 | 65 18.0 +58.6 164.1 | 65 05.4 +58.2 161.9 | 64 51.2 +57.8 159.8 |
| 21° | 66 37.7 +59.2 168.2 | 66 28.0 +58.9 165.9 | 66 16.6 +58.5 163.6 | 66 03.6 +58.1 161.3 | 65 49.0 +57.6 159.1 |
| 22° | 67 36.9 +59.1 167.7 | 67 26.9 +58.8 165.4 | 67 15.1 +58.4 163.0 | 67 01.7 +57.9 160.7 | 66 46.6 +57.4 158.4 |
| 23° | 68 36.0 +59.1 167.3 | 68 25.7 +58.6 164.8 | 68 13.5 +58.2 162.4 | 67 59.6 +57.7 160.0 | 67 44.0 +57.2 157.7 |
| 24° | 69 35.1 +59.0 166.8 | 69 24.3 +58.6 164.2 | 69 11.7 +58.1 161.7 | 68 57.3 +57.5 159.3 | 68 41.2 +56.9 156.8 |
| 25° | 70 34.1 +58.9 166.3 | 70 22.9 +58.4 163.6 | 70 09.8 +57.8 161.0 | 69 54.8 +57.3 158.5 | 69 38.1 +56.6 156.0 |
| 26° | 71 33.0 +58.7 165.7 | 71 21.3 +58.2 162.9 | 71 07.6 +57.6 160.2 | 70 52.1 +56.9 157.6 | 70 34.7 +56.3 155.0 |
| 27° | 72 31.7 +58.6 165.0 | 72 19.5 +58.0 162.1 | 72 05.2 +57.4 159.3 | 71 49.0 +56.7 156.6 | 71 31.0 +55.9 153.9 |
| 28° | 73 30.3 +58.4 164.3 | 73 17.5 +57.8 161.3 | 73 02.6 +57.1 158.3 | 72 45.7 +56.3 155.5 | 72 26.9 +55.4 152.7 |
| 29° | 74 28.7 +58.3 163.4 | 74 15.3 +57.5 160.3 | 73 59.7 +56.7 157.3 | 73 42.0 +55.8 154.3 | 73 22.3 +54.9 151.4 |

| 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°  | 45 06.3 +59.1 165.8 | 44 55.2 +58.9 164.4 | 44 43.1 +58.6 163.0 | 44 30.0 +58.4 161.6 | 44 15.9 +58.1 160.3 |
| 1°  | 46 05.4 +59.0 165.5 | 45 54.1 +58.8 164.1 | 45 41.7 +58.6 162.7 | 45 28.4 +58.3 161.3 | 45 14.0 +58.1 159.9 |
| 2°  | 47 04.4 +58.9 165.2 | 46 52.9 +58.7 163.8 | 46 40.3 +58.5 162.4 | 46 26.7 +58.3 161.0 | 46 12.1 +58.1 159.6 |
| 3°  | 48 03.3 +59.0 165.0 | 47 51.6 +58.7 163.5 | 47 38.8 +58.5 162.0 | 47 25.0 +58.2 160.6 | 47 10.2 +57.9 159.2 |
| 4°  | 49 02.3 +58.8 164.7 | 48 50.3 +58.7 163.2 | 48 37.3 +58.4 161.7 | 48 23.2 +58.2 160.3 | 48 08.1 +57.9 158.8 |
| 5°  | 50 01.1 +58.9 164.4 | 49 49.0 +58.6 162.9 | 49 35.7 +58.4 161.4 | 49 21.4 +58.1 159.9 | 49 06.0 +57.8 158.4 |
| 6°  | 51 00.0 +58.8 164.1 | 50 47.6 +58.5 162.5 | 50 34.1 +58.2 161.0 | 50 19.5 +58.0 159.5 | 50 03.8 +57.7 158.0 |
| 7°  | 51 58.8 +58.7 163.8 | 51 46.1 +58.5 162.2 | 51 32.3 +58.2 160.6 | 51 17.5 +57.9 159.1 | 51 01.5 +57.6 157.6 |
| 8°  | 52 57.5 +58.6 163.4 | 52 44.6 +58.4 161.8 | 52 30.5 +58.2 160.2 | 52 15.4 +57.8 158.7 | 51 59.1 +57.5 157.1 |
| 9°  | 53 56.1 +58.7 163.1 | 53 43.0 +58.3 161.4 | 53 28.7 +58.0 159.8 | 53 13.2 +57.7 158.2 | 52 56.6 +57.4 156.6 |
| 10° | 54 54.8 +58.5 162.7 | 54 41.3 +58.3 161.0 | 54 26.7 +57.9 159.4 | 54 10.9 +57.6 157.8 | 53 54.0 +57.3 156.1 |
| 11° | 55 53.3 +58.4 162.3 | 55 39.6 +58.1 160.6 | 55 24.6 +57.9 158.9 | 55 08.5 +57.5 157.3 | 54 51.3 +57.1 155.6 |
| 12° | 56 51.7 +58.4 161.9 | 56 37.7 +58.1 160.2 | 56 22.5 +57.7 158.5 | 56 06.0 +57.4 156.8 | 55 48.4 +57.0 155.1 |
| 13° | 57 50.1 +58.3 161.5 | 57 35.8 +57.9 159.7 | 57 20.2 +57.6 158.0 | 57 03.4 +57.2 156.2 | 56 45.4 +56.8 154.5 |
| 14° | 58 48.4 +58.2 161.0 | 58 33.7 +57.8 159.2 | 58 17.8 +57.4 157.4 | 58 00.6 +57.0 155.7 | 57 42.2 +56.6 153.9 |
| 15° | 59 46.6 +58.0 160.5 | 59 31.5 +57.7 158.7 | 59 15.2 +57.3 156.9 | 58 57.6 +56.9 155.1 | 58 38.8 +56.5 153.3 |
| 16° | 60 44.6 +58.0 160.0 | 60 29.2 +57.6 158.1 | 60 12.5 +57.1 156.3 | 59 54.5 +56.7 154.5 | 59 35.3 +56.2 152.7 |
| 17° | 61 42.6 +57.8 159.5 | 61 26.8 +57.4 157.6 | 61 09.6 +57.0 155.7 | 60 51.2 +56.5 153.8 | 60 31.5 +56.0 152.0 |
| 18° | 62 40.4 +57.6 158.9 | 62 24.2 +57.2 156.9 | 62 06.6 +56.7 155.0 | 61 47.7 +56.2 153.1 | 61 27.5 +55.8 151.2 |
| 19° | 63 38.0 +57.5 158.3 | 63 21.4 +57.0 156.3 | 63 03.3 +56.5 154.3 | 62 43.9 +56.0 152.3 | 62 23.3 +55.4 150.4 |
| 20° | 64 35.5 +57.3 157.6 | 64 18.4 +56.8 155.6 | 63 59.8 +56.3 153.5 | 63 39.9 +55.8 151.5 | 63 18.7 +55.2 149.6 |
| 21° | 65 32.8 +57.1 156.9 | 65 15.2 +56.5 154.8 | 64 56.1 +56.0 152.7 | 64 35.7 +55.4 150.7 | 64 13.9 +54.8 148.7 |
| 22° | 66 29.9 +56.9 156.2 | 66 11.7 +56.3 154.0 | 65 52.1 +55.7 151.9 | 65 31.1 +55.0 149.8 | 65 08.7 +54.4 147.7 |
| 23° | 67 26.8 +56.6 155.4 | 67 08.0 +56.0 153.1 | 66 47.8 +55.3 150.9 | 66 26.1 +54.7 148.8 | 66 03.1 +54.0 146.7 |
| 24° | 68 23.4 +56.3 154.5 | 68 04.0 +55.6 152.2 | 67 43.1 +54.9 149.9 | 67 20.8 +54.2 147.8 | 66 57.1 +53.5 145.6 |
| 25° | 69 19.7 +55.9 153.5 | 68 59.6 +55.2 151.2 | 68 38.0 +54.5 148.9 | 68 15.0 +53.7 146.6 | 67 50.6 +52.9 144.5 |
| 26° | 70 15.6 +55.5 152.5 | 69 54.8 +54.8 150.0 | 69 32.5 +54.0 147.7 | 69 08.7 +53.2 145.4 | 68 43.5 +52.3 143.2 |
| 27° | 71 11.1 +55.1 151.3 | 70 49.6 +54.2 148.8 | 70 26.5 +53.3 146.4 | 70 01.9 +52.5 144.1 | 69 35.8 +51.7 141.8 |
| 28° | 72 06.2 +54.5 150.1 | 71 43.8 +53.7 147.5 | 71 19.8 +52.7 145.0 | 70 54.4 +51.7 142.6 | 70 27.5 +50.8 140.3 |
| 29° | 73 00.7 +53.9 148.7 | 72 37.5 +52.9 146.0 | 72 12.5 +51.9 143.5 | 71 46.1 +50.9 141.0 | 71 18.3 +49.9 138.7 |

| 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°  | 44 00.8 +57.9 158.9 | 43 44.8 +57.7 157.6 | 43 27.9 +57.4 156.2 | 43 10.0 +57.1 154.9 | 42 51.3 +56.8 153.6 |
| 1°  | 44 58.7 +57.9 158.5 | 44 42.5 +57.5 157.2 | 44 25.3 +57.3 155.8 | 44 07.1 +57.0 154.5 | 43 48.1 +56.7 153.2 |
| 2°  | 45 56.6 +57.8 158.2 | 45 40.0 +57.5 156.8 | 45 22.6 +57.2 155.4 | 45 04.1 +56.9 154.1 | 44 44.8 +56.6 152.7 |
| 3°  | 46 54.4 +57.6 157.8 | 46 37.5 +57.4 156.4 | 46 19.8 +57.1 155.0 | 46 01.0 +56.8 153.6 | 45 41.4 +56.5 152.3 |
| 4°  | 47 52.0 +57.6 157.4 | 47 34.9 +57.3 155.9 | 47 16.9 +56.9 154.5 | 46 57.8 +56.7 153.1 | 46 37.9 +56.3 151.8 |
| 5°  | 48 49.6 +57.5 156.9 | 48 32.2 +57.2 155.5 | 48 13.8 +56.9 154.1 | 47 54.5 +56.5 152.7 | 47 34.2 +56.2 151.3 |
| 6°  | 49 47.1 +57.4 156.5 | 49 29.4 +57.1 155.0 | 49 10.7 +56.8 153.6 | 48 51.0 +56.4 152.2 | 48 30.4 +56.1 150.7 |
| 7°  | 50 44.5 +57.3 156.0 | 50 26.5 +57.0 154.6 | 50 07.5 +56.6 153.1 | 49 47.4 +56.3 151.6 | 49 26.5 +55.9 150.2 |
| 8°  | 51 41.8 +57.2 155.6 | 51 23.5 +56.8 154.1 | 51 04.1 +56.4 152.6 | 50 43.7 +56.1 151.1 | 50 22.4 +55.7 149.6 |
| 9°  | 52 39.0 +57.0 155.1 | 52 20.3 +56.7 153.5 | 52 00.5 +56.3 152.0 | 51 39.8 +55.9 150.5 | 51 18.1 +55.5 149.0 |
| 10° | 53 36.0 +56.9 154.6 | 53 17.0 +56.5 153.0 | 52 56.8 +56.2 151.5 | 52 35.7 +55.8 149.9 | 52 13.6 +55.4 148.4 |
| 11° | 54 32.9 +56.8 154.0 | 54 13.5 +56.3 152.4 | 53 53.0 +55.9 150.9 | 53 31.5 +55.5 149.3 | 53 09.0 +55.1 147.8 |
| 12° | 55 29.7 +56.6 153.5 | 55 09.8 +56.2 151.8 | 54 48.9 +55.8 150.2 | 54 27.0 +55.3 148.7 | 54 04.1 +54.9 147.1 |
| 13° | 56 26.3 +56.4 152.9 | 56 06.0 +56.0 151.2 | 55 44.7 +55.5 149.6 | 55 22.3 +55.1 148.0 | 55 00.0 +54.6 146.4 |
| 14° | 57 22.7 +56.2 152.2 | 57 02.0 +55.8 150.6 | 56 40.2 +55.4 148.9 | 56 17.4 +54.9 147.3 | 55 53.6 +54.4 145.7 |
| 15° | 58 18.9 +56.0 151.6 | 57 57.8 +55.5 149.9 | 57 35.6 +55.0 148.2 | 57 12.3 +54.6 146.6 | 56 48.0 +54.1 144.9 |
| 16° | 59 14.9 +55.7 150.9 | 58 53.3 +55.3 149.2 | 58 30.6 +54.8 147.4 | 58 06.9 +54.2 145.8 | 57 42.1 +53.8 144.1 |
| 17° | 60 10.6 +55.5 150.2 | 59 48.6 +55.0 148.4 | 59 25.4 +54.5 146.7 | 59 01.1 +54.0 145.0 | 58 35.9 +53.4 143.3 |
| 18° | 61 06.1 +55.3 149.4 | 60 43.6 +54.7 147.6 | 60 19.9 +54.1 145.8 | 59 55.1 +53.6 144.1 | 59 29.3 +53.0 142.4 |
| 19° | 62 01.4 +54.9 148.6 | 61 38.3 +54.3 146.7 | 61 14.0 +53.8 144.9 | 60 48.7 +53.2 143.2 | 60 22.3 +52.6 141.5 |
| 20° | 62 56.3 +54.5 147.7 | 62 32.6 +54.0 145.8 | 62 07.8 +53.4 144.0 | 61 41.9 +52.8 142.2 | 61 14.9 +52.2 140.5 |
| 21° | 63 50.8 +54.2 146.8 | 63 26.6 +53.5 144.9 | 63 01.2 +52.9 143.0 | 62 34.7 +52.3 141.2 | 62 07.1 +51.7 139.5 |
| 22° | 64 45.0 +53.8 145.8 | 64 20.1 +53.1 143.8 | 63 54.1 +52.4 142.0 | 63 27.0 +51.8 140.1 | 62 58.8 +51.1 138.4 |
| 23° | 65 38.8 +53.3 144.7 | 65 13.2 +52.6 142.7 | 64 46.5 +52.0 140.8 | 64 18.8 +51.2 139.0 | 63 49.9 +50.6 137.2 |
| 24° | 66 32.1 +52.7 143.6 | 66 05.8 +52.1 141.6 | 65 38.5 +51.3 139.6 | 65 10.0 +50.5 137.8 | 64 40.5 +49.8 135.9 |
| 25° | 67 24.8 +52.2 142.4 | 66 57.9 +51.4 140.3 | 66 29.8 +50.6 138.4 | 66 00.5 +49.9 136.5 | 65 30.3 +49.2 134.6 |
| 26° | 68 17.0 +51.5 141.0 | 67 49.3 +50.7 139.0 | 67 20.4 +49.9 137.0 | 66 50.4 +49.1 135.1 | 66 19.5 +48.3 133.2 |
| 27° | 69 08.5 +50.8 139.6 | 68 40.0 +49.9 137.5 | 68 10.3 +49.0 135.5 | 67 39.5 +48.2 133.6 | 67 07.8 +47.4 131.7 |
| 28° | 69 59.3 +49.9 138.1 | 69 29.9 +48.9 136.0 | 68 59.3 +48.1 133.9 | 68 27.7 +47.3 132.0 | 67 55.2 +46.4 130.1 |
| 29° | 70 49.2 +48.9 136.4 | 70 18.8 +48.0 134.3 | 69 47.4 +47.1 132.2 | 69 15.0 +46.1 130.3 | 68 41.6 +45.3 128.4 |

| 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°  | 42 31.7 +56.5 152.3 | 42 11.3 +56.2 151.1 | 41 50.0 +55.8 149.8 | 41 27.9 +55.5 148.6 | 41 05.0 +55.2 147.3 |
| 1°  | 43 28.2 +56.4 151.9 | 43 07.5 +56.0 150.6 | 42 45.8 +55.8 149.3 | 42 23.4 +55.4 148.1 | 42 00.2 +55.1 146.8 |
| 2°  | 44 24.6 +56.3 151.4 | 44 03.5 +56.0 150.1 | 43 41.6 +55.6 148.8 | 43 18.8 +55.3 147.5 | 42 55.3 +54.9 146.3 |
| 3°  | 45 20.9 +56.1 150.9 | 44 59.5 +55.8 149.6 | 44 37.2 +55.5 148.3 | 44 14.1 +55.1 147.0 | 43 50.2 +54.8 145.7 |
| 4°  | 46 17.0 +56.0 150.4 | 45 55.3 +55.6 149.1 | 45 32.7 +55.3 147.8 | 45 09.2 +55.0 146.4 | 44 45.0 +54.5 145.2 |
| 5°  | 47 13.0 +55.9 149.9 | 46 50.9 +55.5 148.5 | 46 28.0 +55.1 147.2 | 46 04.2 +54.7 145.9 | 45 39.5 +54.4 144.6 |
| 6°  | 48 08.9 +55.7 149.3 | 47 46.4 +55.3 148.0 | 47 23.1 +54.9 146.6 | 46 58.9 +54.6 145.3 | 46 33.9 +54.2 144.0 |
| 7°  | 49 04.6 +55.5 148.8 | 48 41.7 +55.2 147.4 | 48 18.0 +54.8 146.0 | 47 53.5 +54.4 144.7 | 47 28.1 +54.0 143.3 |
| 8°  | 50 00.1 +55.3 148.2 | 49 36.9 +54.9 146.8 | 49 12.8 +54.6 145.4 | 48 47.9 +54.1 144.0 | 48 22.1 +53.8 142.7 |
| 9°  | 50 55.4 +55.1 147.6 | 50 31.8 +54.8 146.2 | 50 07.4 +54.3 144.8 | 49 42.0 +53.9 143.4 | 49 15.9 +53.5 142.0 |
| 10° | 51 50.5 +55.0 147.0 | 51 26.6 +54.5 145.5 | 51 01.7 +54.1 144.1 | 50 35.9 +53.7 142.7 | 50 09.4 +53.2 141.3 |
| 11° | 52 45.5 +54.7 146.3 | 52 21.1 +54.2 144.8 | 51 55.8 +53.8 143.4 | 51 29.6 +53.4 142.0 | 51 02.6 +53.0 140.6 |
| 12° | 53 40.2 +54.4 145.6 | 53 15.3 +54.1 144.1 | 52 49.6 +53.6 142.7 | 52 23.0 +53.1 141.2 | 51 55.6 +52.6 139.8 |
| 13° | 54 34.6 +54.2 144.9 | 54 09.4 +53.7 143.4 | 53 43.2 +53.2 141.9 | 53 16.1 +52.8 140.5 | 52 48.2 +52.4 139.0 |
| 14° | 55 28.8 +53.9 144.2 | 55 03.1 +53.4 142.6 | 54 36.4 +53.0 141.1 | 54 08.9 +52.5 139.7 | 53 40.6 +52.0 138.2 |
| 15° | 56 22.7 +53.6 143.4 | 55 56.5 +53.1 141.8 | 55 29.4 +52.6 140.3 | 55 01.4 +52.1 138.8 | 54 32.6 +51.6 137.4 |
| 16° | 57 16.3 +53.3 142.5 | 56 49.6 +52.7 141.0 | 56 22.0 +52.2 139.4 | 55 53.5 +51.7 137.9 | 55 24.2 +51.2 136.5 |
| 17° | 58 09.6 +52.9 141.7 | 57 42.3 +52.4 140.1 | 57 14.2 +51.8 138.5 | 56 45.2 +51.3 137.0 | 56 15.4 +50.8 135.6 |
| 18° | 59 02.5 +52.4 140.8 | 58 34.7 +51.9 139.2 | 58 06.0 +51.4 137.6 | 57 36.5 +50.9 136.1 | 57 06.2 +50.3 134.6 |
| 19° | 59 54.9 +52.1 139.8 | 59 26.6 +51.5 138.2 | 58 57.4 +50.9 136.6 | 58 27.4 +50.3 135.1 | 57 56.5 +49.8 133.6 |
| 20° | 60 47.0 +51.6 138.8 | 60 18.1 +51.0 137.2 | 59 48.3 +50.4 135.6 | 59 17.7 +49.8 134.0 | 58 46.3 +49.2 132.5 |
| 21° | 61 38.6 +51.0 137.8 | 61 09.1 +50.4 136.1 | 60 38.7 +49.9 134.5 | 60 07.5 +49.3 132.9 | 59 35.5 +48.7 131.4 |
| 22° | 62 29.6 +50.5 136.6 | 61 59.5 +49.9 135.0 | 61 28.6 +49.2 133.3 | 60 56.8 +48.6 131.8 | 60 24.2 +48.0 130.2 |
| 23° | 63 20.1 +49.9 135.4 | 62 49.4 +49.2 133.8 | 62 17.8 +48.5 132.1 | 61 45.4 +47.9 130.5 | 61 12.2 +47.3 129.0 |
| 24° | 64 10.0 +49.1 134.2 | 63 38.6 +48.5 132.5 | 63 06.3 +47.8 130.8 | 62 33.3 +47.2 129.2 | 61 59.5 +46.5 127.7 |
| 25° | 64 59.1 +48.4 132.9 | 64 27.1 +47.7 131.1 | 63 54.1 +47.1 129.5 | 63 20.5 +46.3 127.9 | 62 46.0 +45.7 126.3 |
| 26° | 65 47.5 +47.6 131.4 | 65 14.8 +46.8 129.7 | 64 41.2 +46.1 128.1 | 64 06.8 +45.5 126.4 | 63 31.7 +44.8 124.9 |
| 27° | 66 35.1 +46.6 129.9 | 66 01.6 +45.9 128.2 | 65 27.3 +45.2 126.5 | 64 52.3 +44.4 124.9 | 64 16.5 +43.9 123.4 |
| 28° | 67 21.7 +45.7 128.3 | 66 47.5 +44.8 126.6 | 66 12.5 +44.1 124.9 | 65 36.7 +43.4 123.3 | 65 00.4 +42.7 121.8 |
| 29° | 68 07.4 +44.4 126.6 | 67 32.3 +43.7 124.9 | 66 56.6 +42.9 123.2 | 66 20.1 +42.3 121.6 | 65 43.1 +41.5 120.1 |

| 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°  | 40 41.3 +54.9 146.1 | 40 16.9 +54.5 144.9 | 39 51.7 +54.2 143.7 | 39 25.8 +53.9 142.6 | 38 59.2 +53.6 141.4 |
| 1°  | 41 36.2 +54.7 145.6 | 41 11.4 +54.4 144.4 | 40 45.9 +54.1 143.2 | 40 19.7 +53.7 142.0 | 39 52.8 +53.3 140.8 |
| 2°  | 42 30.9 +54.6 145.0 | 42 05.8 +54.2 143.8 | 41 40.0 +53.8 142.6 | 41 13.4 +53.5 141.4 | 40 46.1 +53.2 140.2 |
| 3°  | 43 25.5 +54.4 144.5 | 43 00.0 +54.1 143.2 | 42 33.8 +53.7 142.0 | 42 06.9 +53.3 140.8 | 41 39.3 +53.0 139.6 |
| 4°  | 44 19.9 +54.2 143.9 | 43 54.1 +53.8 142.6 | 43 27.5 +53.5 141.4 | 43 00.2 +53.2 140.2 | 42 32.3 +52.7 139.0 |
| 5°  | 45 14.1 +54.0 143.3 | 44 47.9 +53.7 142.0 | 44 21.0 +53.3 140.8 | 43 53.4 +52.8 139.5 | 43 25.0 +52.5 138.3 |
| 6°  | 46 08.1 +53.9 142.7 | 45 41.6 +53.4 141.4 | 45 14.3 +53.0 140.1 | 44 46.2 +52.7 138.9 | 44 17.5 +52.3 137.7 |
| 7°  | 47 02.0 +53.5 142.0 | 46 35.0 +53.2 140.7 | 46 07.3 +52.8 139.5 | 45 38.9 +52.4 138.2 | 45 09.8 +52.0 137.0 |
| 8°  | 47 55.5 +53.4 141.4 | 47 28.2 +52.9 140.0 | 47 00.1 +52.6 138.8 | 46 31.3 +52.1 137.5 | 46 01.8 +51.7 136.3 |
| 9°  | 48 48.9 +53.1 140.7 | 48 21.1 +52.7 139.3 | 47 52.7 +52.2 138.0 | 47 23.4 +51.9 136.8 | 46 53.5 +51.5 135.5 |
| 10° | 49 42.0 +52.8 139.9 | 49 13.8 +52.4 138.6 | 48 44.9 +52.0 137.3 | 48 15.3 +51.6 136.0 | 47 45.0 +51.1 134.8 |
| 11° | 50 34.8 +52.5 139.2 | 50 06.2 +52.1 137.9 | 49 36.9 +51.7 136.5 | 49 06.9 +51.2 135.2 | 48 36.1 +50.8 134.0 |
| 12° | 51 27.3 +52.2 138.4 | 50 58.3 +51.8 137.1 | 50 28.6 +51.3 135.8 | 49 58.1 +50.9 134.4 | 49 26.9 +50.5 133.2 |
| 13° | 52 19.5 +51.9 137.6 | 51 50.1 +51.4 136.3 | 51 19.9 +51.0 134.9 | 50 49.0 +50.5 133.6 | 50 17.4 +50.1 132.3 |
| 14° | 53 11.4 +51.5 136.8 | 52 41.5 +51.1 135.4 | 52 10.9 +50.5 134.1 | 51 39.5 +50.1 132.8 | 51 07.5 +49.7 131.5 |
| 15° | 54 02.9 +51.2 135.9 | 53 32.6 +50.6 134.6 | 53 01.4 +50.2 133.2 | 52 29.6 +49.7 131.9 | 51 57.2 +49.2 130.6 |
| 16° | 54 54.1 +50.7 135.0 | 54 23.2 +50.2 133.6 | 53 51.6 +49.8 132.3 | 53 19.3 +49.3 130.9 | 52 46.4 +48.8 129.6 |
| 17° | 55 44.8 +50.3 134.1 | 55 13.4 +49.8 132.7 | 54 41.4 +49.2 131.3 | 54 08.6 +48.8 130.0 | 53 35.2 +48.3 128.6 |
| 18° | 56 35.1 +49.7 133.1 | 56 03.2 +49.3 131.7 | 55 30.6 +48.8 130.3 | 54 57.4 +48.2 129.0 | 54 23.5 +47.8 127.6 |
| 19° | 57 24.8 +49.3 132.1 | 56 52.5 +48.7 130.7 | 56 19.4 +48.2 129.3 | 55 45.6 +47.7 127.9 | 55 11.3 +47.2 126.6 |
| 20° | 58 14.1 +48.7 131.0 | 57 41.2 +48.1 129.6 | 57 07.6 +47.6 128.2 | 56 33.3 +47.2 126.8 | 55 58.5 +46.6 125.5 |
| 21° | 59 02.8 +48.1 129.9 | 58 29.3 +47.6 128.5 | 57 55.2 +47.0 127.1 | 57 20.5 +46.4 125.7 | 56 45.1 +46.0 124.4 |
| 22° | 59 50.9 +47.4 128.7 | 59 16.9 +46.8 127.3 | 58 42.2 +46.3 125.9 | 58 06.9 +45.8 124.5 | 57 31.1 +45.3 123.2 |
| 23° | 60 38.3 +46.7 127.5 | 60 03.7 +46.2 126.0 | 59 28.5 +45.6 124.6 | 58 52.7 +45.1 123.3 | 58 16.4 +44.5 121.9 |
| 24° | 61 25.0 +45.9 126.2 | 60 49.9 +45.3 124.7 | 60 14.1 +44.8 123.3 | 59 37.8 +44.2 122.0 | 59 00.9 +43.7 120.7 |
| 25° | 62 10.9 +45.1 124.8 | 61 35.2 +44.5 123.4 | 60 58.9 +43.9 122.0 | 60 22.0 +43.4 120.6 | 59 44.6 +42.9 119.3 |
| 26° | 62 56.0 +44.2 123.4 | 62 19.7 +43.6 122.0 | 61 42.8 +43.0 120.6 | 61 05.4 +42.4 119.2 | 60 27.5 +41.9 117.9 |
| 27° | 63 40.2 +43.2 121.9 | 63 03.3 +42.5 120.5 | 62 25.8 +42.0 119.1 | 61 47.8 +41.5 117.7 | 61 09.4 +41.0 116.4 |
| 28° | 64 23.4 +42.1 120.3 | 63 45.8 +41.5 118.9 | 63 07.8 +40.9 117.5 | 62 29.3 +40.4 116.2 | 61 50.4 +39.8 114.9 |
| 29° | 65 05.5 +40.9 118.6 | 64 27.3 +40.4 117.2 | 63 48.7 +39.8 115.9 | 63 09.7 +39.2 114.6 | 62 30.2 +38.8 113.3 |

| 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°  | 38 32.0 +53.2 140.3 | 38 04.1 +52.8 139.1 | 37 35.5 +52.5 138.0 | 37 06.3 +52.2 136.9 | 36 36.6 +51.8 135.8 |
| 1°  | 39 25.2 +53.0 139.7 | 38 56.9 +52.7 138.5 | 38 28.0 +52.3 137.4 | 37 58.5 +52.0 136.3 | 37 28.4 +51.6 135.2 |
| 2°  | 40 18.2 +52.8 139.1 | 39 49.6 +52.4 137.9 | 39 20.3 +52.1 136.8 | 38 50.5 +51.7 135.7 | 38 20.0 +51.4 134.6 |
| 3°  | 41 11.0 +52.6 138.4 | 40 42.0 +52.3 137.3 | 40 12.4 +51.9 136.1 | 39 42.2 +51.5 135.0 | 39 11.4 +51.2 133.9 |
| 4°  | 42 03.6 +52.4 137.8 | 41 34.3 +52.0 136.6 | 41 04.3 +51.7 135.5 | 40 33.7 +51.3 134.3 | 40 02.6 +50.9 133.2 |
| 5°  | 42 56.0 +52.1 137.1 | 42 26.3 +51.7 136.0 | 41 56.0 +51.4 134.8 | 41 25.0 +51.1 133.7 | 40 53.5 +50.7 132.5 |
| 6°  | 43 48.1 +51.9 136.5 | 43 18.0 +51.6 135.3 | 42 47.4 +51.1 134.1 | 42 16.1 +50.7 132.9 | 41 44.2 +50.4 131.8 |
| 7°  | 44 40.0 +51.6 135.8 | 44 09.6 +51.2 134.6 | 43 38.5 +50.9 133.4 | 43 06.8 +50.5 132.2 | 42 34.6 +50.1 131.1 |
| 8°  | 45 31.6 +51.4 135.0 | 45 00.8 +51.0 133.8 | 44 29.4 +50.5 132.6 | 43 57.3 +50.2 131.5 | 43 24.7 +49.8 130.3 |
| 9°  | 46 23.0 +51.0 134.3 | 45 51.8 +50.6 133.1 | 45 19.9 +50.3 131.9 | 44 47.5 +49.9 130.7 | 44 14.5 +49.5 129.6 |
| 10° | 47 14.0 +50.7 133.5 | 46 42.4 +50.3 132.3 | 46 10.2 +49.9 131.1 | 45 37.4 +49.5 129.9 | 45 04.0 +49.1 128.8 |
| 11° | 48 04.7 +50.4 132.7 | 47 32.7 +50.0 131.5 | 47 00.1 +49.6 130.3 | 46 26.9 +49.2 129.1 | 45 53.1 +48.8 127.9 |
| 12° | 48 55.1 +50.1 131.9 | 48 22.7 +49.6 130.7 | 47 49.7 +49.2 129.5 | 47 16.1 +48.8 128.3 | 46 41.9 +48.4 127.1 |
| 13° | 49 45.2 +49.6 131.1 | 49 12.3 +49.2 129.8 | 48 38.9 +48.8 128.6 | 48 04.9 +48.4 127.4 | 47 30.3 +48.0 126.2 |
| 14° | 50 34.8 +49.3 130.2 | 50 01.5 +48.8 128.9 | 49 27.7 +48.4 127.7 | 48 53.3 +47.9 126.5 | 48 18.3 +47.6 125.3 |
| 15° | 51 24.1 +48.8 129.3 | 50 50.3 +48.4 128.0 | 50 16.1 +47.9 126.8 | 49 41.2 +47.5 125.6 | 49 05.9 +47.1 124.4 |
| 16° | 52 12.9 +48.3 128.3 | 51 38.7 +47.9 127.1 | 51 04.0 +47.5 125.8 | 50 28.7 +47.1 124.6 | 49 53.0 +46.6 123.5 |
| 17° | 53 01.2 +47.8 127.4 | 52 26.6 +47.4 126.1 | 51 51.5 +46.9 124.9 | 51 15.8 +46.5 123.7 | 50 39.6 +46.1 122.5 |
| 18° | 53 49.0 +47.3 126.3 | 53 14.0 +46.8 125.1 | 52 38.4 +46.4 123.8 | 52 02.3 +46.0 122.6 | 51 25.7 +45.6 121.5 |
| 19° | 54 36.3 +46.8 125.3 | 54 00.8 +46.3 124.0 | 53 24.8 +45.8 122.8 | 52 48.3 +45.4 121.6 | 52 11.3 +45.0 120.4 |
| 20° | 55 23.1 +46.1 124.2 | 54 47.1 +45.7 122.9 | 54 10.6 +45.3 121.7 | 53 33.7 +44.8 120.5 | 52 56.3 +44.3 119.3 |
| 21° | 56 09.2 +45.5 123.1 | 55 32.8 +45.0 121.8 | 54 55.9 +44.5 120.6 | 54 18.5 +44.1 119.4 | 53 40.6 +43.7 118.2 |
| 22° | 56 54.7 +44.8 121.9 | 56 17.8 +44.3 120.6 | 55 40.4 +43.9 119.4 | 55 02.6 +43.4 118.2 | 54 24.3 +43.1 117.0 |
| 23° | 57 39.5 +44.0 120.6 | 57 02.1 +43.6 119.4 | 56 24.3 +43.1 118.2 | 55 46.0 +42.7 117.0 | 55 07.4 +42.2 115.8 |
| 24° | 58 23.5 +43.2 119.4 | 57 45.7 +42.7 118.1 | 57 07.4 +42.3 116.9 | 56 28.7 +41.9 115.7 | 55 49.6 +41.5 114.6 |
| 25° | 59 06.7 +42.4 118.0 | 58 28.4 +41.9 116.8 | 57 49.7 +41.4 115.6 | 57 10.6 +41.0 114.4 | 56 31.1 +40.6 113.3 |
| 26° | 59 49.1 +41.5 116.6 | 59 10.3 +41.0 115.4 | 58 31.1 +40.6 114.2 | 57 51.6 +40.1 113.0 | 57 11.7 +39.8 111.9 |
| 27° | 60 30.6 +40.4 115.2 | 59 51.3 +40.0 114.0 | 59 11.7 +39.6 112.8 | 58 31.7 +39.2 111.6 | 57 51.5 +38.7 110.5 |
| 28° | 61 11.0 +39.4 113.7 | 60 31.3 +39.0 112.5 | 59 51.3 +38.5 111.3 | 59 10.9 +38.1 110.2 | 58 30.2 +37.8 109.1 |
| 29° | 61 50.4 +38.3 112.1 | 61 10.3 +37.8 110.9 | 60 29.8 +37.4 109.8 | 59 49.0 +37.1 108.7 | 59 08.0 +36.7 107.6 |

| 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°  | 36 06.2 +51.5 134.8 | 35 35.3 +51.2 133.7 | 35 03.8 +50.9 132.7 | 34 31.8 +50.5 131.6 | 33 59.3 +50.2 130.6 |
| 1°  | 36 57.7 +51.3 134.1 | 36 26.5 +50.9 133.1 | 35 54.7 +50.6 132.0 | 35 22.3 +50.3 131.0 | 34 49.5 +49.9 130.0 |
| 2°  | 37 49.0 +51.0 133.5 | 37 17.4 +50.7 132.4 | 36 45.3 +50.3 131.4 | 36 12.6 +50.0 130.3 | 35 39.4 +49.7 129.3 |
| 3°  | 38 40.0 +50.9 132.8 | 38 08.1 +50.5 131.7 | 37 35.6 +50.2 130.7 | 37 02.6 +49.8 129.6 | 36 29.1 +49.5 128.6 |
| 4°  | 39 30.9 +50.5 132.1 | 38 58.6 +50.2 131.0 | 38 25.8 +49.8 130.0 | 37 52.4 +49.6 128.9 | 37 18.6 +49.2 127.9 |
| 5°  | 40 21.4 +50.3 131.4 | 39 48.8 +50.0 130.3 | 39 15.6 +49.6 129.3 | 38 42.0 +49.2 128.2 | 38 07.8 +48.9 127.2 |
| 6°  | 41 11.7 +50.1 130.7 | 40 38.8 +49.6 129.6 | 40 05.2 +49.4 128.5 | 39 31.2 +49.0 127.5 | 38 56.7 +48.7 126.4 |
| 7°  | 42 01.8 +49.7 130.0 | 41 28.4 +49.4 128.9 | 40 54.6 +49.0 127.8 | 40 20.2 +48.7 126.7 | 39 45.4 +48.3 125.7 |
| 8°  | 42 51.5 +49.5 129.2 | 42 17.8 +49.1 128.1 | 41 43.6 +48.7 127.0 | 41 08.9 +48.4 125.9 | 40 33.7 +48.0 124.9 |
| 9°  | 43 41.0 +49.1 128.4 | 43 06.9 +48.7 127.3 | 42 32.3 +48.4 126.2 | 41 57.3 +48.0 125.1 | 41 21.7 +47.7 124.1 |
| 10° | 44 30.1 +48.7 127.6 | 43 55.6 +48.4 126.5 | 43 20.7 +48.0 125.4 | 42 45.3 +47.7 124.3 | 42 09.4 +47.4 123.3 |
| 11° | 45 18.8 +48.4 126.8 | 44 44.0 +48.1 125.7 | 44 08.7 +47.7 124.6 | 43 33.0 +47.3 123.5 | 42 56.8 +46.9 122.4 |
| 12° | 46 07.2 +48.0 126.0 | 45 32.1 +47.6 124.8 | 44 56.4 +47.3 123.7 | 44 20.3 +46.9 122.7 | 43 43.7 +46.6 121.6 |
| 13° | 46 55.2 +47.7 125.1 | 46 19.7 +47.2 124.0 | 45 43.7 +46.8 122.9 | 45 07.2 +46.5 121.8 | 44 30.3 +46.1 120.7 |
| 14° | 47 42.9 +47.1 124.2 | 47 06.9 +46.8 123.1 | 46 30.5 +46.4 122.0 | 45 53.7 +46.0 120.9 | 45 16.4 +45.8 119.8 |
| 15° | 48 30.0 +46.7 123.3 | 47 53.7 +46.3 122.1 | 47 16.9 +46.0 121.0 | 46 39.7 +45.6 119.9 | 46 02.2 +45.2 118.9 |
| 16° | 49 16.7 +46.3 122.3 | 48 40.0 +45.9 121.2 | 48 02.9 +45.5 120.1 | 47 25.3 +45.2 119.0 | 46 47.4 +44.8 117.9 |
| 17° | 50 03.0 +45.7 121.3 | 49 25.9 +45.3 120.2 | 48 48.4 +44.9 119.1 | 48 10.5 +44.6 118.0 | 47 32.2 +44.2 116.9 |
| 18° | 50 48.7 +45.1 120.3 | 50 11.2 +44.8 119.2 | 49 33.3 +44.4 118.1 | 48 55.1 +44.0 117.0 | 48 16.4 +43.7 115.9 |
| 19° | 51 33.8 +44.6 119.3 | 50 56.0 +44.2 118.1 | 50 17.7 +43.9 117.0 | 49 39.1 +43.5 116.0 | 49 00.1 +43.2 114.9 |
| 20° | 52 18.4 +44.0 118.2 | 51 40.2 +43.6 117.1 | 51 01.6 +43.2 116.0 | 50 22.6 +42.8 114.9 | 49 43.3 +42.5 113.8 |
| 21° | 53 02.4 +43.3 117.1 | 52 23.8 +42.9 115.9 | 51 44.8 +42.5 114.8 | 51 05.4 +42.3 113.8 | 50 25.8 +41.9 112.7 |
| 22° | 53 45.7 +42.6 115.9 | 53 06.7 +42.2 114.8 | 52 27.3 +41.9 113.7 | 51 47.7 +41.5 112.6 | 51 07.7 +41.2 111.6 |
| 23° | 54 28.3 +41.9 114.7 | 53 48.9 +41.5 113.6 | 53 09.2 +41.2 112.5 | 52 29.2 +40.8 111.5 | 51 48.9 +40.5 110.4 |
| 24° | 55 10.2 +41.1 113.4 | 54 30.4 +40.8 112.4 | 53 50.4 +40.3 111.3 | 53 10.0 +40.1 110.2 | 52 29.4 +39.7 109.2 |
| 25° | 55 51.3 +40.2 112.2 | 55 11.2 +39.8 111.1 | 54 30.7 +39.6 110.0 | 53 50.1 +39.2 109.0 | 53 09.1 +39.0 108.0 |
| 26° | 56 31.5 +39.4 110.8 | 55 51.0 +39.1 109.8 | 55 10.3 +38.7 108.7 | 54 29.3 +38.4 107.7 | 53 48.1 +38.1 106.7 |
| 27° | 57 10.9 +38.4 109.4 | 56 30.1 +38.1 108.4 | 55 49.0 +37.8 107.4 | 55 07.7 +37.5 106.4 | 54 26.2 +37.2 105.4 |
| 28° | 57 49.3 +37.4 108.0 | 57 08.2 +37.1 107.0 | 56 26.8 +36.8 106.0 | 55 45.2 +36.5 105.0 | 55 03.4 +36.3 104.0 |
| 29° | 58 26.7 +36.4 106.5 | 57 45.3 +36.0 105.5 | 57 03.6 +35.8 104.5 | 56 21.7 +35.5 103.6 | 55 39.7 +35.3 102.6 |

# Declination SAME name as Latitude

# Latitude 44°

| 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°  | 33 26.3 +49.9 129.6 | 32 52.8 +49.6 128.6 | 32 18.9 +49.2 127.7 | 31 44.5 +48.9 126.7 | 31 09.7 +48.6 125.7 |
| 1°  | 34 16.2 +49.6 128.9 | 33 42.4 +49.3 128.0 | 33 08.1 +49.0 127.0 | 32 33.4 +48.7 126.0 | 31 58.3 +48.3 125.0 |
| 2°  | 35 05.8 +49.4 128.3 | 34 31.7 +49.0 127.3 | 33 57.1 +48.7 126.3 | 33 22.1 +48.4 125.3 | 32 46.6 +48.2 124.3 |
| 3°  | 35 55.2 +49.1 127.6 | 35 20.7 +48.8 126.6 | 34 45.8 +48.5 125.6 | 34 10.5 +48.2 124.6 | 33 34.8 +47.9 123.6 |
| 4°  | 36 44.3 +48.9 126.9 | 36 09.5 +48.6 125.8 | 35 34.3 +48.3 124.9 | 34 58.7 +47.9 123.9 | 34 22.7 +47.6 122.9 |
| 5°  | 37 33.2 +48.6 126.1 | 36 58.1 +48.3 125.1 | 36 22.6 +47.9 124.1 | 35 46.6 +47.7 123.1 | 35 10.3 +47.3 122.2 |
| 6°  | 38 21.8 +48.3 125.4 | 37 46.4 +47.9 124.4 | 37 10.5 +47.7 123.4 | 36 34.3 +47.3 122.4 | 35 57.6 +47.1 121.4 |
| 7°  | 39 10.1 +48.0 124.6 | 38 34.3 +47.7 123.6 | 37 58.2 +47.4 122.6 | 37 21.6 +47.1 121.6 | 36 44.7 +46.7 120.6 |
| 8°  | 39 58.1 +47.7 123.8 | 39 22.0 +47.4 122.8 | 38 45.6 +47.0 121.8 | 38 08.7 +46.7 120.8 | 37 31.4 +46.5 119.8 |
| 9°  | 40 45.8 +47.3 123.0 | 40 09.4 +47.0 122.0 | 39 32.6 +46.7 121.0 | 38 55.4 +46.4 120.0 | 38 17.9 +46.1 119.0 |
| 10° | 41 33.1 +47.0 122.2 | 40 56.4 +46.7 121.2 | 40 19.3 +46.4 120.2 | 39 41.8 +46.1 119.2 | 39 04.0 +45.7 118.2 |
| 11° | 42 20.1 +46.6 121.4 | 41 43.1 +46.3 120.4 | 41 05.7 +45.9 119.4 | 40 27.9 +45.6 118.4 | 39 49.7 +45.4 117.4 |
| 12° | 43 06.7 +46.3 120.5 | 42 29.4 +45.9 119.5 | 41 51.6 +45.6 118.5 | 41 13.5 +45.3 117.5 | 40 35.1 +45.0 116.5 |
| 13° | 43 53.0 +45.8 119.7 | 43 15.3 +45.5 118.6 | 42 37.2 +45.2 117.6 | 41 58.8 +44.9 116.6 | 41 20.1 +44.5 115.7 |
| 14° | 44 38.8 +45.4 118.8 | 44 00.8 +45.0 117.7 | 43 22.4 +44.7 116.7 | 42 43.7 +44.4 115.7 | 42 04.6 +44.2 114.8 |
| 15° | 45 24.2 +44.9 117.8 | 44 45.8 +44.6 116.8 | 44 07.1 +44.3 115.8 | 43 28.1 +44.0 114.8 | 42 48.8 +43.7 113.8 |
| 16° | 46 09.1 +44.4 116.9 | 45 30.4 +44.1 115.9 | 44 51.4 +43.8 114.9 | 44 12.1 +43.5 113.9 | 43 32.5 +43.2 112.9 |
| 17° | 46 53.5 +43.9 115.9 | 46 14.5 +43.6 114.9 | 45 35.2 +43.3 113.9 | 44 55.6 +43.0 112.9 | 44 15.7 +42.7 111.9 |
| 18° | 47 37.4 +43.4 114.9 | 46 58.1 +43.1 113.9 | 46 18.5 +42.8 112.9 | 45 38.6 +42.5 111.9 | 44 58.4 +42.2 111.0 |
| 19° | 48 20.8 +42.8 113.9 | 47 41.2 +42.5 112.9 | 47 01.3 +42.2 111.9 | 46 21.1 +41.9 110.9 | 45 40.6 +41.7 109.9 |
| 20° | 49 03.6 +42.2 112.8 | 48 23.7 +41.9 111.8 | 47 43.5 +41.6 110.8 | 47 03.0 +41.4 109.9 | 46 22.3 +41.1 108.9 |
| 21° | 49 45.8 +41.6 111.7 | 49 05.6 +41.3 110.7 | 48 25.1 +41.0 109.7 | 47 44.4 +40.7 108.8 | 47 03.4 +40.5 107.8 |
| 22° | 50 27.4 +40.9 110.6 | 49 46.9 +40.6 109.6 | 49 06.1 +40.3 108.6 | 48 25.1 +40.1 107.7 | 47 43.9 +39.8 106.7 |
| 23° | 51 08.3 +40.2 109.4 | 50 27.5 +39.9 108.5 | 49 46.4 +39.7 107.5 | 49 05.2 +39.4 106.6 | 48 23.7 +39.2 105.6 |
| 24° | 51 48.5 +39.5 108.2 | 51 07.4 +39.2 107.3 | 50 26.1 +38.9 106.3 | 49 44.6 +38.7 105.4 | 49 02.9 +38.4 104.5 |
| 25° | 52 28.0 +38.6 107.0 | 51 46.6 +38.4 106.1 | 51 05.0 +38.2 105.1 | 50 23.3 +37.9 104.2 | 49 41.3 +37.8 103.3 |
| 26° | 53 06.6 +37.9 105.8 | 52 25.0 +37.6 104.8 | 51 43.2 +37.3 103.9 | 51 01.2 +37.2 103.0 | 50 19.1 +36.9 102.1 |
| 27° | 53 44.5 +36.9 104.4 | 53 02.6 +36.7 103.5 | 52 20.5 +36.6 102.6 | 51 38.4 +36.3 101.7 | 50 56.0 +36.2 100.9 |
| 28° | 54 21.4 +36.1 103.1 | 53 39.3 +35.9 102.2 | 52 57.1 +35.6 101.3 | 52 14.7 +35.4 100.4 | 51 32.2 +35.3 99.6  |
| 29° | 54 57.5 +35.1 101.7 | 54 15.2 +34.8 100.8 | 53 32.7 +34.7 100.0 | 52 50.1 +34.6 99.1  | 52 07.5 +34.4 98.3  |

| 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°  | 30 34.4 +48.3 124.8 | 29 58.8 +48.0 123.9 | 29 22.8 +47.7 122.9 | 28 46.3 +47.5 122.0 | 28 09.6 +47.1 121.1 |
| 1°  | 31 22.7 +48.1 124.1 | 30 46.8 +47.8 123.2 | 30 10.5 +47.5 122.2 | 29 33.8 +47.2 121.3 | 28 56.7 +47.0 120.4 |
| 2°  | 32 10.8 +47.8 123.4 | 31 34.6 +47.5 122.5 | 30 58.0 +47.2 121.5 | 30 21.0 +47.0 120.6 | 29 43.7 +46.7 119.7 |
| 3°  | 32 58.6 +47.6 122.7 | 32 22.1 +47.3 121.7 | 31 45.2 +47.0 120.8 | 31 08.0 +46.7 119.9 | 30 30.4 +46.5 119.0 |
| 4°  | 33 46.2 +47.4 121.9 | 33 09.4 +47.1 121.0 | 32 32.2 +46.8 120.1 | 31 54.7 +46.5 119.2 | 31 16.9 +46.2 118.2 |
| 5°  | 34 33.6 +47.0 121.2 | 33 56.5 +46.7 120.3 | 33 19.0 +46.5 119.3 | 32 41.2 +46.2 118.4 | 32 03.1 +45.9 117.5 |
| 6°  | 35 20.6 +46.8 120.4 | 34 43.2 +46.5 119.5 | 34 05.5 +46.2 118.6 | 33 27.4 +45.9 117.6 | 32 49.0 +45.7 116.7 |
| 7°  | 36 07.4 +46.4 119.7 | 35 29.7 +46.2 118.7 | 34 51.7 +45.9 117.8 | 34 13.3 +45.6 116.9 | 33 34.7 +45.3 116.0 |
| 8°  | 36 53.8 +46.2 118.9 | 36 15.9 +45.8 117.9 | 35 37.6 +45.5 117.0 | 34 58.9 +45.4 116.1 | 34 20.0 +45.1 115.2 |
| 9°  | 37 40.0 +45.8 118.1 | 37 01.7 +45.5 117.1 | 36 23.1 +45.3 116.2 | 35 44.3 +44.9 115.3 | 35 05.1 +44.7 114.4 |
| 10° | 38 25.8 +45.4 117.3 | 37 47.2 +45.2 116.3 | 37 08.4 +44.9 115.4 | 36 29.2 +44.7 114.5 | 35 49.8 +44.4 113.5 |
| 11° | 39 11.2 +45.1 116.4 | 38 32.4 +44.8 115.5 | 37 53.3 +44.5 114.5 | 37 13.9 +44.3 113.6 | 36 34.2 +44.0 112.7 |
| 12° | 39 56.3 +44.7 115.6 | 39 17.2 +44.4 114.6 | 38 37.8 +44.2 113.7 | 37 58.2 +43.9 112.8 | 37 18.2 +43.7 111.9 |
| 13° | 40 41.0 +44.3 114.7 | 40 01.6 +44.1 113.7 | 39 22.0 +43.8 112.8 | 38 42.1 +43.5 111.9 | 38 01.9 +43.3 111.0 |
| 14° | 41 25.3 +43.9 113.8 | 40 45.7 +43.6 112.9 | 40 05.8 +43.3 111.9 | 39 25.6 +43.1 111.0 | 38 45.2 +42.8 110.1 |
| 15° | 42 09.2 +43.4 112.9 | 41 29.3 +43.1 111.9 | 40 49.1 +42.9 111.0 | 40 08.7 +42.7 110.1 | 39 28.0 +42.5 109.2 |
| 16° | 42 52.6 +42.9 111.9 | 42 12.4 +42.7 111.0 | 41 32.0 +42.5 110.1 | 40 51.4 +42.2 109.2 | 40 10.5 +42.0 108.3 |
| 17° | 43 35.5 +42.5 111.0 | 42 55.1 +42.2 110.1 | 42 14.5 +41.9 109.1 | 41 33.6 +41.7 108.2 | 40 52.5 +41.5 107.4 |
| 18° | 44 18.0 +42.0 110.0 | 43 37.3 +41.7 109.1 | 42 56.4 +41.5 108.2 | 42 15.3 +41.3 107.3 | 41 34.0 +41.0 106.4 |
| 19° | 45 00.0 +41.4 109.0 | 44 19.0 +41.2 108.1 | 43 37.9 +40.9 107.2 | 42 56.6 +40.7 106.3 | 42 15.0 +40.6 105.4 |
| 20° | 45 41.4 +40.8 108.0 | 45 00.2 +40.6 107.1 | 44 18.8 +40.4 106.2 | 43 37.3 +40.2 105.3 | 42 55.6 +40.0 104.4 |
| 21° | 46 22.2 +40.2 106.9 | 45 40.8 +40.0 106.0 | 44 59.2 +39.8 105.1 | 44 17.5 +39.6 104.2 | 43 35.6 +39.4 103.4 |
| 22° | 47 02.4 +39.6 105.8 | 46 20.8 +39.4 104.9 | 45 39.0 +39.2 104.1 | 44 57.1 +39.0 103.2 | 44 15.0 +38.8 102.3 |
| 23° | 47 42.0 +39.0 104.7 | 47 00.2 +38.8 103.8 | 46 18.2 +38.6 103.0 | 45 36.1 +38.4 102.1 | 44 53.8 +38.3 101.3 |
| 24° | 48 21.0 +38.3 103.6 | 47 39.0 +38.0 102.7 | 46 56.8 +37.9 101.9 | 46 14.5 +37.7 101.0 | 45 32.1 +37.6 100.2 |
| 25° | 48 59.3 +37.5 102.4 | 48 17.0 +37.4 101.6 | 47 34.7 +37.2 100.7 | 46 52.2 +37.1 99.9  | 46 09.7 +36.9 99.1  |
| 26° | 49 36.8 +36.8 101.2 | 48 54.4 +36.6 100.4 | 48 11.9 +36.5 99.5  | 47 29.3 +36.3 98.7  | 46 46.6 +36.2 97.9  |
| 27° | 50 13.6 +36.0 100.0 | 49 31.0 +35.9 99.2  | 48 48.4 +35.7 98.3  | 48 05.6 +35.6 97.5  | 47 22.8 +35.5 96.7  |
| 28° | 50 49.6 +35.1 98.7  | 50 06.9 +35.0 97.9  | 49 24.1 +34.9 97.1  | 48 41.2 +34.8 96.3  | 47 58.3 +34.7 95.5  |
| 29° | 51 24.7 +34.3 97.4  | 50 41.9 +34.2 96.6  | 49 59.0 +34.1 95.9  | 49 16.0 +34.0 95.1  | 48 33.0 +33.9 94.3  |

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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°  | 27 32.5 +46.9 120.2 | 26 55.0 +46.6 119.4 | 26 17.2 +46.4 118.5 | 25 39.1 +46.2 117.6 | 25 00.8 +45.8 116.8 |
| 1°  | 28 19.4 +46.6 119.5 | 27 41.6 +46.5 118.7 | 27 03.6 +46.2 117.8 | 26 25.3 +45.9 116.9 | 25 46.6 +45.7 116.1 |
| 2°  | 29 06.0 +46.5 118.8 | 28 28.1 +46.1 117.9 | 27 49.8 +45.9 117.1 | 27 11.2 +45.7 116.2 | 26 32.3 +45.5 115.3 |
| 3°  | 29 52.5 +46.2 118.1 | 29 14.2 +46.0 117.2 | 28 35.7 +45.7 116.3 | 27 56.9 +45.4 115.5 | 27 17.8 +45.2 114.6 |
| 4°  | 30 38.7 +45.9 117.3 | 30 00.2 +45.7 116.5 | 29 21.4 +45.5 115.6 | 28 42.3 +45.3 114.7 | 28 03.0 +45.0 113.9 |
| 5°  | 31 24.6 +45.7 116.6 | 30 45.9 +45.4 115.7 | 30 06.9 +45.2 114.8 | 29 27.6 +44.9 114.0 | 28 48.0 +44.7 113.1 |
| 6°  | 32 10.3 +45.4 115.8 | 31 31.3 +45.2 114.9 | 30 52.1 +44.9 114.1 | 30 12.5 +44.7 113.2 | 29 32.7 +44.5 112.4 |
| 7°  | 32 55.7 +45.1 115.1 | 32 16.5 +44.8 114.2 | 31 37.0 +44.6 113.3 | 30 57.2 +44.4 112.4 | 30 17.2 +44.2 111.6 |
| 8°  | 33 40.8 +44.8 114.3 | 33 01.3 +44.6 113.4 | 32 21.6 +44.3 112.5 | 31 41.6 +44.1 111.6 | 31 01.4 +43.9 110.8 |
| 9°  | 34 25.6 +44.5 113.5 | 33 45.9 +44.3 112.6 | 33 05.9 +44.1 111.7 | 32 25.7 +43.8 110.8 | 31 45.3 +43.6 110.0 |
| 10° | 35 10.1 +44.2 112.7 | 34 30.2 +43.9 111.8 | 33 50.0 +43.6 110.9 | 33 09.5 +43.5 110.0 | 32 28.9 +43.2 109.2 |
| 11° | 35 54.3 +43.8 111.8 | 35 14.1 +43.5 110.9 | 34 33.6 +43.4 110.1 | 33 53.0 +43.1 109.2 | 33 12.1 +43.0 108.4 |
| 12° | 36 38.1 +43.4 111.0 | 35 57.6 +43.2 110.1 | 35 17.0 +43.0 109.2 | 34 36.1 +42.8 108.4 | 33 55.1 +42.6 107.5 |
| 13° | 37 21.5 +43.0 110.1 | 36 40.8 +42.9 109.2 | 36 00.0 +42.6 108.4 | 35 18.9 +42.5 107.5 | 34 37.7 +42.2 106.7 |
| 14° | 38 04.5 +42.7 109.2 | 37 23.7 +42.4 108.4 | 36 42.6 +42.2 107.5 | 36 01.4 +42.0 106.6 | 35 19.9 +41.9 105.8 |
| 15° | 38 47.2 +42.2 108.3 | 38 06.1 +42.0 107.5 | 37 24.8 +41.9 106.6 | 36 43.4 +41.6 105.8 | 36 01.8 +41.4 104.9 |
| 16° | 39 29.4 +41.8 107.4 | 38 48.1 +41.6 106.5 | 38 06.7 +41.4 105.7 | 37 25.0 +41.2 104.9 | 36 43.2 +41.1 104.0 |
| 17° | 40 11.2 +41.3 106.5 | 39 29.7 +41.1 105.6 | 38 48.1 +40.9 104.8 | 38 06.2 +40.8 103.9 | 37 24.3 +40.6 103.1 |
| 18° | 40 52.5 +40.9 105.5 | 40 10.8 +40.7 104.7 | 39 29.0 +40.5 103.8 | 38 47.0 +40.3 103.0 | 38 04.9 +40.2 102.2 |
| 19° | 41 33.4 +40.3 104.6 | 40 51.5 +40.2 103.7 | 40 09.5 +40.0 102.9 | 39 27.3 +39.9 102.0 | 38 45.1 +39.7 101.2 |
| 20° | 42 13.7 +39.8 103.6 | 41 31.7 +39.6 102.7 | 40 49.5 +39.5 101.9 | 40 07.2 +39.3 101.1 | 39 24.8 +39.2 100.3 |
| 21° | 42 53.5 +39.3 102.5 | 42 11.3 +39.1 101.7 | 41 29.0 +38.9 100.9 | 40 46.5 +38.9 100.1 | 40 04.0 +38.7 99.3  |
| 22° | 43 32.8 +38.6 101.5 | 42 50.4 +38.5 100.7 | 42 07.9 +38.4 99.9  | 41 25.4 +38.3 99.1  | 40 42.7 +38.2 98.3  |
| 23° | 44 11.4 +38.1 100.4 | 43 28.9 +38.0 99.6  | 42 46.3 +37.9 98.8  | 42 03.7 +37.7 98.0  | 41 20.9 +37.6 97.3  |
| 24° | 44 49.5 +37.5 99.4  | 44 06.9 +37.3 98.6  | 43 24.2 +37.2 97.8  | 42 41.4 +37.1 97.0  | 41 58.5 +37.0 96.2  |
| 25° | 45 27.0 +36.8 98.3  | 44 44.2 +36.7 97.5  | 44 01.4 +36.6 96.7  | 43 18.5 +36.5 95.9  | 42 35.5 +36.5 95.1  |
| 26° | 46 03.8 +36.1 97.1  | 45 20.9 +36.0 96.3  | 44 38.0 +35.9 95.6  | 43 55.0 +35.9 94.8  | 43 12.0 +35.8 94.1  |
| 27° | 46 39.9 +35.4 96.0  | 45 56.9 +35.4 95.2  | 45 13.9 +35.3 94.4  | 44 30.9 +35.2 93.7  | 43 47.8 +35.2 93.0  |
| 28° | 47 15.3 +34.7 94.8  | 46 32.3 +34.6 94.0  | 45 49.2 +34.5 93.3  | 45 06.1 +34.5 92.6  | 44 23.0 +34.4 91.8  |
| 29° | 47 50.0 +33.8 93.6  | 47 06.9 +33.8 92.8  | 46 23.7 +33.8 92.1  | 45 40.6 +33.8 91.4  | 44 57.4 +33.8 90.7  |

| 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°  | 24 22.1 +45.6 115.9 | 23 43.1 +45.5 115.1 | 23 03.9 +45.2 114.3 | 22 24.5 +44.9 113.5 | 21 44.7 +44.8 112.7 |
| 1°  | 25 07.7 +45.5 115.2 | 24 28.6 +45.2 114.4 | 23 49.1 +45.0 113.6 | 23 09.4 +44.8 112.7 | 22 29.5 +44.6 111.9 |
| 2°  | 25 53.2 +45.2 114.5 | 25 13.8 +45.0 113.7 | 24 34.1 +44.8 112.8 | 23 54.2 +44.6 112.0 | 23 14.1 +44.4 111.2 |
| 3°  | 26 38.4 +45.0 113.8 | 25 58.8 +44.8 112.9 | 25 18.9 +44.6 112.1 | 24 38.8 +44.4 111.3 | 23 58.5 +44.2 110.5 |
| 4°  | 27 23.4 +44.8 113.0 | 26 43.6 +44.5 112.2 | 26 03.5 +44.3 111.4 | 25 23.2 +44.1 110.5 | 24 42.7 +43.9 109.7 |
| 5°  | 28 08.2 +44.5 112.3 | 27 28.1 +44.3 111.4 | 26 47.8 +44.1 110.6 | 26 07.3 +43.9 109.8 | 25 26.6 +43.7 109.0 |
| 6°  | 28 52.7 +44.2 111.5 | 28 12.4 +44.1 110.7 | 27 31.9 +43.9 109.8 | 26 51.2 +43.7 109.0 | 26 10.3 +43.5 108.2 |
| 7°  | 29 36.9 +44.0 110.7 | 28 56.5 +43.7 109.9 | 28 15.8 +43.6 109.1 | 27 34.9 +43.4 108.3 | 26 53.8 +43.2 107.5 |
| 8°  | 30 20.9 +43.7 110.0 | 29 40.2 +43.5 109.1 | 28 59.4 +43.3 108.3 | 28 18.3 +43.1 107.5 | 27 37.0 +43.0 106.7 |
| 9°  | 31 04.6 +43.4 109.2 | 30 23.7 +43.2 108.3 | 29 42.7 +43.0 107.5 | 29 01.4 +42.8 106.7 | 28 20.0 +42.7 105.9 |
| 10° | 31 48.0 +43.1 108.3 | 31 06.9 +42.9 107.5 | 30 25.7 +42.7 106.7 | 29 44.2 +42.6 105.9 | 29 02.7 +42.3 105.1 |
| 11° | 32 31.1 +42.7 107.5 | 31 49.8 +42.6 106.7 | 31 08.4 +42.4 105.9 | 30 26.8 +42.2 105.1 | 29 45.0 +42.1 104.3 |
| 12° | 33 13.8 +42.4 106.7 | 32 32.4 +42.2 105.9 | 31 50.8 +42.1 105.0 | 31 09.0 +42.0 104.2 | 30 27.1 +41.8 103.4 |
| 13° | 33 56.2 +42.1 105.8 | 33 14.6 +41.9 105.0 | 32 32.9 +41.7 104.2 | 31 51.0 +41.5 103.4 | 31 08.9 +41.4 102.6 |
| 14° | 34 38.3 +41.7 105.0 | 33 56.5 +41.5 104.2 | 33 14.6 +41.4 103.3 | 32 32.5 +41.3 102.5 | 31 50.3 +41.1 101.8 |
| 15° | 35 20.0 +41.3 104.1 | 34 38.0 +41.2 103.3 | 33 56.0 +41.0 102.5 | 33 13.8 +40.8 101.7 | 32 31.4 +40.8 100.9 |
| 16° | 36 01.3 +40.9 103.2 | 35 19.2 +40.7 102.4 | 34 37.0 +40.6 101.6 | 33 54.6 +40.5 100.8 | 33 12.2 +40.4 100.0 |
| 17° | 36 42.2 +40.4 102.3 | 35 59.9 +40.4 101.5 | 35 17.6 +40.2 100.7 | 34 35.1 +40.1 99.9  | 33 52.6 +39.9 99.1  |
| 18° | 37 22.6 +40.1 101.4 | 36 40.3 +39.9 100.6 | 35 57.8 +39.8 99.8  | 35 15.2 +39.7 99.0  | 34 32.5 +39.6 98.2  |
| 19° | 38 02.7 +39.6 100.4 | 37 20.2 +39.4 99.6  | 36 37.6 +39.3 98.9  | 35 54.9 +39.2 98.1  | 35 12.1 +39.2 97.3  |
| 20° | 38 42.3 +39.1 99.5  | 37 59.6 +39.0 98.7  | 37 16.9 +38.9 97.9  | 36 34.1 +38.8 97.1  | 35 51.3 +38.7 96.4  |
| 21° | 39 21.4 +38.5 98.5  | 38 38.6 +38.5 97.7  | 37 55.8 +38.4 96.9  | 37 12.9 +38.4 96.2  | 36 30.0 +38.3 95.4  |
| 22° | 39 59.9 +38.1 97.5  | 39 17.1 +38.0 96.7  | 38 34.2 +37.9 96.0  | 37 51.3 +37.8 95.2  | 37 08.3 +37.8 94.5  |
| 23° | 40 38.0 +37.6 96.5  | 39 55.1 +37.5 95.7  | 39 12.1 +37.4 95.0  | 38 29.1 +37.4 94.2  | 37 46.1 +37.3 93.5  |
| 24° | 41 15.6 +36.9 95.5  | 40 32.6 +36.9 94.7  | 39 49.5 +36.9 94.0  | 39 06.5 +36.8 93.2  | 38 23.4 +36.7 92.5  |
| 25° | 41 52.5 +36.4 94.4  | 41 09.5 +36.3 93.7  | 40 26.4 +36.3 92.9  | 39 43.3 +36.2 92.2  | 39 00.1 +36.3 91.5  |
| 26° | 42 28.9 +35.8 93.3  | 41 45.8 +35.7 92.6  | 41 02.7 +35.7 91.9  | 40 19.5 +35.7 91.2  | 39 36.4 +35.7 90.5  |
| 27° | 43 04.7 +35.1 92.2  | 42 21.5 +35.2 91.5  | 41 38.4 +35.1 90.8  | 40 55.2 +35.1 90.1  | 40 12.1 +35.1 89.4  |
| 28° | 43 39.8 +34.5 91.1  | 42 56.7 +34.4 90.4  | 42 13.5 +34.5 89.7  | 41 30.3 +34.5 89.0  | 40 47.2 +34.5 88.3  |
| 29° | 44 14.3 +33.8 90.0  | 43 31.1 +33.8 89.3  | 42 48.0 +33.8 88.6  | 42 04.8 +33.9 87.9  | 41 21.7 +33.9 87.3  |



# Declination SAME name as Latitude

# Latitude 44°

| 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°  | 21 04.8 +44.6 111.9 | 20 24.6 +44.4 111.1 | 19 44.2 +44.2 110.3 | 19 03.7 +44.0 109.5 | 18 22.9 +43.8 108.7 |
| 1°  | 21 49.4 +44.4 111.1 | 21 09.0 +44.2 110.3 | 20 28.4 +44.1 109.6 | 19 47.7 +43.8 108.8 | 19 06.7 +43.7 108.0 |
| 2°  | 22 33.8 +44.2 110.4 | 21 53.2 +44.0 109.6 | 21 12.5 +43.8 108.8 | 20 31.5 +43.7 108.0 | 19 50.4 +43.5 107.3 |
| 3°  | 23 18.0 +43.9 109.7 | 22 37.2 +43.8 108.9 | 21 56.3 +43.6 108.1 | 21 15.2 +43.4 107.3 | 20 33.9 +43.3 106.5 |
| 4°  | 24 01.9 +43.8 108.9 | 23 21.0 +43.6 108.1 | 22 39.9 +43.4 107.3 | 21 58.6 +43.3 106.6 | 21 17.2 +43.1 105.8 |
| 5°  | 24 45.7 +43.5 108.2 | 24 04.6 +43.4 107.4 | 23 23.3 +43.2 106.6 | 22 41.9 +43.0 105.8 | 22 00.3 +42.9 105.0 |
| 6°  | 25 29.2 +43.3 107.4 | 24 48.0 +43.1 106.6 | 24 06.5 +43.0 105.8 | 23 24.9 +42.9 105.1 | 22 43.2 +42.7 104.3 |
| 7°  | 26 12.5 +43.1 106.7 | 25 31.1 +42.9 105.9 | 24 49.5 +42.7 105.1 | 24 07.8 +42.6 104.3 | 23 25.9 +42.4 103.5 |
| 8°  | 26 55.6 +42.8 105.9 | 26 14.0 +42.6 105.1 | 25 32.2 +42.5 104.3 | 24 50.4 +42.3 103.5 | 24 08.3 +42.2 102.8 |
| 9°  | 27 38.4 +42.5 105.1 | 26 56.6 +42.4 104.3 | 26 14.7 +42.3 103.5 | 25 32.7 +42.1 102.7 | 24 50.5 +42.0 102.0 |
| 10° | 28 20.9 +42.2 104.3 | 27 39.0 +42.1 103.5 | 26 57.0 +41.9 102.7 | 26 14.8 +41.8 101.9 | 25 32.5 +41.7 101.2 |
| 11° | 29 03.1 +42.0 103.5 | 28 21.1 +41.8 102.7 | 27 38.9 +41.7 101.9 | 26 56.6 +41.6 101.1 | 26 14.2 +41.5 100.4 |
| 12° | 29 45.1 +41.6 102.7 | 29 02.9 +41.5 101.9 | 28 20.6 +41.4 101.1 | 27 38.2 +41.3 100.3 | 26 55.7 +41.2 99.6  |
| 13° | 30 26.7 +41.3 101.8 | 29 44.4 +41.2 101.0 | 29 02.0 +41.1 100.3 | 28 19.5 +41.0 99.5  | 27 36.9 +40.8 98.8  |
| 14° | 31 08.0 +41.0 101.0 | 30 25.6 +40.9 100.2 | 29 43.1 +40.7 99.4  | 29 00.5 +40.6 98.7  | 28 17.7 +40.6 97.9  |
| 15° | 31 49.0 +40.6 100.1 | 31 06.5 +40.5 99.4  | 30 23.8 +40.5 98.6  | 29 41.1 +40.4 97.8  | 28 58.3 +40.3 97.1  |
| 16° | 32 29.6 +40.3 99.3  | 31 47.0 +40.2 98.5  | 31 04.3 +40.0 97.7  | 30 21.5 +40.0 97.0  | 29 38.6 +39.9 96.2  |
| 17° | 33 09.9 +39.9 98.4  | 32 27.2 +39.8 97.6  | 31 44.3 +39.8 96.9  | 31 01.5 +39.6 96.1  | 30 18.5 +39.6 95.4  |
| 18° | 33 49.8 +39.5 97.5  | 33 07.0 +39.4 96.7  | 32 24.1 +39.3 96.0  | 31 41.1 +39.3 95.2  | 30 58.1 +39.2 94.5  |
| 19° | 34 29.3 +39.1 96.6  | 33 46.4 +39.0 95.8  | 33 03.4 +39.0 95.1  | 32 20.4 +38.9 94.3  | 31 37.3 +38.9 93.6  |
| 20° | 35 08.4 +38.6 95.6  | 34 25.4 +38.6 94.9  | 33 42.4 +38.5 94.2  | 32 59.3 +38.5 93.4  | 32 16.2 +38.5 92.7  |
| 21° | 35 47.0 +38.2 94.7  | 35 04.0 +38.1 94.0  | 34 20.9 +38.1 93.2  | 33 37.8 +38.1 92.5  | 32 54.7 +38.0 91.8  |
| 22° | 36 25.2 +37.8 93.7  | 35 42.1 +37.7 93.0  | 34 59.0 +37.7 92.3  | 34 15.9 +37.6 91.6  | 33 32.7 +37.7 90.9  |
| 23° | 37 03.0 +37.2 92.8  | 36 19.8 +37.3 92.1  | 35 36.7 +37.2 91.3  | 34 53.5 +37.3 90.6  | 34 10.4 +37.2 89.9  |
| 24° | 37 40.2 +36.8 91.8  | 36 57.1 +36.7 91.1  | 36 13.9 +36.8 90.4  | 35 30.8 +36.7 89.7  | 34 47.6 +36.8 89.0  |
| 25° | 38 17.0 +36.2 90.8  | 37 33.8 +36.3 90.1  | 36 50.7 +36.2 89.4  | 36 07.5 +36.3 88.7  | 35 24.4 +36.3 88.0  |
| 26° | 38 53.2 +35.7 89.8  | 38 10.1 +35.7 89.1  | 37 26.9 +35.8 88.4  | 36 43.8 +35.8 87.7  | 36 00.7 +35.8 87.0  |
| 27° | 39 28.9 +35.2 88.7  | 38 45.8 +35.1 88.1  | 38 02.7 +35.2 87.4  | 37 19.6 +35.2 86.7  | 36 36.5 +35.3 86.1  |
| 28° | 40 04.1 +34.5 87.7  | 39 20.9 +34.6 87.0  | 38 37.9 +34.6 86.3  | 37 54.8 +34.7 85.7  | 37 11.8 +34.8 85.0  |
| 29° | 40 38.6 +34.0 86.6  | 39 55.5 +34.1 85.9  | 39 12.5 +34.1 85.3  | 38 29.5 +34.2 84.7  | 37 46.6 +34.2 84.0  |

| Dec | LHA 065° / 295°     | LHA 066° / 294°     | LHA 067° / 293°     | LHA 068° / 292°     | LHA 069° / 291°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 17 41.9 +43.7 107.9 | 17 00.8 +43.5 107.2 | 16 19.4 +43.4 106.4 | 15 38.0 +43.2 105.7 | 14 56.3 +43.1 104.9 |
| 1°  | 18 25.6 +43.5 107.2 | 17 44.3 +43.3 106.5 | 17 02.8 +43.2 105.7 | 16 21.2 +43.0 105.0 | 15 39.4 +42.9 104.2 |
| 2°  | 19 09.1 +43.3 106.5 | 18 27.6 +43.2 105.7 | 17 46.0 +43.0 105.0 | 17 04.2 +42.9 104.2 | 16 22.3 +42.8 103.5 |
| 3°  | 19 52.4 +43.2 105.8 | 19 10.8 +43.0 105.0 | 18 29.0 +42.9 104.2 | 17 47.1 +42.8 103.5 | 17 05.1 +42.6 102.7 |
| 4°  | 20 35.6 +42.9 105.0 | 19 53.8 +42.8 104.3 | 19 11.9 +42.7 103.5 | 18 29.9 +42.5 102.8 | 17 47.7 +42.5 102.0 |
| 5°  | 21 18.5 +42.8 104.3 | 20 36.6 +42.7 103.5 | 19 54.6 +42.5 102.8 | 19 12.4 +42.4 102.0 | 18 30.2 +42.2 101.3 |
| 6°  | 22 01.3 +42.5 103.5 | 21 19.3 +42.4 102.8 | 20 37.1 +42.3 102.0 | 19 54.8 +42.2 101.3 | 19 12.4 +42.1 100.5 |
| 7°  | 22 43.8 +42.4 102.8 | 22 01.7 +42.2 102.0 | 21 19.4 +42.1 101.3 | 20 37.0 +42.0 100.5 | 19 54.5 +41.9 99.8  |
| 8°  | 23 26.2 +42.1 102.0 | 22 43.9 +42.0 101.2 | 22 01.5 +41.9 100.5 | 21 19.0 +41.8 99.7  | 20 36.4 +41.7 99.0  |
| 9°  | 24 08.3 +41.8 101.2 | 23 25.9 +41.7 100.5 | 22 43.4 +41.6 99.7  | 22 00.8 +41.6 99.0  | 21 18.1 +41.5 98.2  |
| 10° | 24 50.1 +41.6 100.4 | 24 07.6 +41.5 99.7  | 23 25.0 +41.5 98.9  | 22 42.4 +41.3 98.2  | 21 59.6 +41.3 97.5  |
| 11° | 25 31.7 +41.4 99.6  | 24 49.1 +41.3 98.9  | 24 06.5 +41.1 98.1  | 23 23.7 +41.1 97.4  | 22 40.9 +41.0 96.7  |
| 12° | 26 13.1 +41.1 98.8  | 25 30.4 +41.0 98.1  | 24 47.6 +40.9 97.3  | 24 04.8 +40.8 96.6  | 23 21.9 +40.8 95.9  |
| 13° | 26 54.2 +40.8 98.0  | 26 11.4 +40.7 97.3  | 25 28.5 +40.7 96.5  | 24 45.6 +40.6 95.8  | 24 02.7 +40.5 95.1  |
| 14° | 27 35.0 +40.5 97.2  | 26 52.1 +40.4 96.4  | 26 09.2 +40.4 95.7  | 25 26.2 +40.3 95.0  | 24 43.2 +40.3 94.3  |
| 15° | 28 15.5 +40.2 96.3  | 27 32.5 +40.2 95.6  | 26 49.6 +40.0 94.9  | 26 06.5 +40.1 94.2  | 25 23.5 +40.0 93.4  |
| 16° | 28 55.7 +39.8 95.5  | 28 12.7 +39.8 94.8  | 27 29.6 +39.8 94.0  | 26 46.6 +39.7 93.3  | 26 03.5 +39.7 92.6  |
| 17° | 29 35.5 +39.6 94.6  | 28 52.5 +39.5 93.9  | 28 09.4 +39.5 93.2  | 27 26.3 +39.4 92.5  | 26 43.2 +39.4 91.8  |
| 18° | 30 15.1 +39.1 93.8  | 29 32.0 +39.1 93.1  | 28 48.9 +39.1 92.3  | 28 05.7 +39.1 91.6  | 27 22.6 +39.1 90.9  |
| 19° | 30 54.2 +38.9 92.9  | 30 11.1 +38.8 92.2  | 29 28.0 +38.8 91.5  | 28 44.8 +38.8 90.8  | 28 01.7 +38.8 90.1  |
| 20° | 31 33.1 +38.4 92.0  | 30 49.9 +38.5 91.3  | 30 06.8 +38.4 90.6  | 29 23.6 +38.4 89.9  | 28 40.5 +38.4 89.2  |
| 21° | 32 11.5 +38.1 91.1  | 31 28.4 +38.0 90.4  | 30 45.2 +38.1 89.7  | 30 02.0 +38.1 89.0  | 29 18.9 +38.1 88.3  |
| 22° | 32 49.6 +37.6 90.2  | 32 06.4 +37.7 89.5  | 31 23.3 +37.6 88.8  | 30 40.1 +37.7 88.1  | 29 57.0 +37.7 87.4  |
| 23° | 33 27.2 +37.3 89.3  | 32 44.1 +37.2 88.6  | 32 00.9 +37.3 87.9  | 31 17.8 +37.3 87.2  | 30 34.7 +37.4 86.5  |
| 24° | 34 04.5 +36.7 88.3  | 33 21.3 +36.8 87.6  | 32 38.2 +36.9 87.0  | 31 55.1 +36.9 86.3  | 31 12.1 +36.9 85.6  |
| 25° | 34 41.2 +36.4 87.4  | 33 58.1 +36.4 86.7  | 33 15.1 +36.4 86.0  | 32 32.0 +36.5 85.4  | 31 49.0 +36.6 84.7  |
| 26° | 35 17.6 +35.8 86.4  | 34 34.5 +35.9 85.7  | 33 51.5 +36.0 85.1  | 33 08.5 +36.1 84.4  | 32 25.6 +36.1 83.8  |
| 27° | 35 53.4 +35.4 85.4  | 35 10.4 +35.5 84.7  | 34 27.5 +35.5 84.1  | 33 44.6 +35.6 83.5  | 33 01.7 +35.7 83.0  |
| 28° | 36 28.8 +34.9 84.4  | 35 45.9 +34.9 83.8  | 35 03.0 +35.0 83.1  | 34 20.2 +35.1 82.5  | 33 37.4 +35.3 81.9  |
| 29° | 37 03.7 +34.3 83.4  | 36 20.8 +34.5 82.8  | 35 38.0 +34.6 82.1  | 34 55.3 +34.7 81.5  | 34 12.7 +34.7 80.9  |

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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°  | 14 14.6 +42.9 104.2 | 13 32.6 +42.9 103.5 | 12 50.6 +42.7 102.7 | 12 08.4 +42.6 102.0 | 11 26.2 +42.4 101.3 |
| 1°  | 14 57.5 +42.8 103.5 | 14 15.5 +42.6 102.7 | 13 33.3 +42.6 102.0 | 12 51.0 +42.5 101.3 | 12 08.6 +42.4 100.5 |
| 2°  | 15 40.3 +42.6 102.7 | 14 58.1 +42.6 102.0 | 14 15.9 +42.4 101.3 | 13 33.5 +42.3 100.5 | 12 51.0 +42.2 99.8  |
| 3°  | 16 22.9 +42.5 102.0 | 15 40.7 +42.4 101.3 | 14 58.3 +42.3 100.5 | 14 15.8 +42.2 99.8  | 13 33.2 +42.1 99.1  |
| 4°  | 17 05.4 +42.4 101.3 | 16 23.1 +42.2 100.5 | 15 40.6 +42.1 99.8  | 14 58.0 +42.1 99.1  | 14 15.3 +42.0 98.4  |
| 5°  | 17 47.8 +42.2 100.5 | 17 05.3 +42.1 99.8  | 16 22.7 +42.0 99.1  | 15 40.1 +41.9 98.3  | 14 57.3 +41.9 97.6  |
| 6°  | 18 30.0 +41.9 99.8  | 17 47.4 +41.9 99.0  | 17 04.7 +41.8 98.3  | 16 22.0 +41.7 97.6  | 15 39.2 +41.6 96.9  |
| 7°  | 19 11.9 +41.9 99.0  | 18 29.3 +41.7 98.3  | 17 46.5 +41.7 97.6  | 17 03.7 +41.6 96.8  | 16 20.8 +41.5 96.1  |
| 8°  | 19 53.8 +41.6 98.3  | 19 11.0 +41.5 97.5  | 18 28.2 +41.4 96.8  | 17 45.3 +41.4 96.1  | 17 02.3 +41.4 95.4  |
| 9°  | 20 35.4 +41.4 97.5  | 19 52.5 +41.4 96.8  | 19 09.6 +41.3 96.0  | 18 26.7 +41.2 95.3  | 17 43.7 +41.2 94.6  |
| 10° | 21 16.8 +41.2 96.7  | 20 33.9 +41.1 96.0  | 19 50.9 +41.1 95.3  | 19 07.9 +41.0 94.6  | 18 24.9 +41.0 93.8  |
| 11° | 21 58.0 +40.9 95.9  | 21 15.0 +40.9 95.2  | 20 32.0 +40.9 94.5  | 19 48.9 +40.9 93.8  | 19 05.9 +40.8 93.1  |
| 12° | 22 38.9 +40.8 95.1  | 21 55.9 +40.7 94.4  | 21 12.9 +40.6 93.7  | 20 29.8 +40.6 93.0  | 19 46.7 +40.6 92.3  |
| 13° | 23 19.7 +40.4 94.4  | 22 36.6 +40.4 93.6  | 21 53.5 +40.4 92.9  | 21 10.4 +40.4 92.2  | 20 27.3 +40.3 91.5  |
| 14° | 24 00.1 +40.3 93.5  | 23 17.0 +40.2 92.8  | 22 33.9 +40.2 92.1  | 21 50.8 +40.2 91.4  | 21 07.6 +40.2 90.7  |
| 15° | 24 40.4 +39.9 92.7  | 23 57.2 +40.0 92.0  | 23 14.1 +39.9 91.3  | 22 31.0 +39.9 90.6  | 21 47.8 +39.9 89.9  |
| 16° | 25 20.3 +39.7 91.9  | 24 37.2 +39.7 91.2  | 23 54.0 +39.7 90.5  | 23 10.9 +39.6 89.8  | 22 27.7 +39.7 89.1  |
| 17° | 26 00.0 +39.4 91.1  | 25 16.9 +39.4 90.4  | 24 33.7 +39.4 89.7  | 23 50.5 +39.5 89.0  | 23 07.4 +39.4 88.3  |
| 18° | 26 39.4 +39.1 90.2  | 25 56.3 +39.1 89.5  | 25 13.1 +39.1 88.9  | 24 30.0 +39.1 88.2  | 23 46.8 +39.2 87.5  |
| 19° | 27 18.5 +38.8 89.4  | 26 35.4 +38.8 88.7  | 25 52.2 +38.8 88.0  | 25 09.1 +38.9 87.3  | 24 26.0 +38.9 86.7  |
| 20° | 27 57.3 +38.5 88.5  | 27 14.2 +38.4 87.8  | 26 31.0 +38.6 87.2  | 25 48.0 +38.5 86.5  | 25 04.9 +38.6 85.8  |
| 21° | 28 35.8 +38.1 87.7  | 27 52.6 +38.2 87.0  | 27 09.6 +38.2 86.3  | 26 26.5 +38.3 85.6  | 25 43.5 +38.3 85.0  |
| 22° | 29 13.9 +37.8 86.8  | 28 30.8 +37.8 86.1  | 27 47.8 +37.8 85.4  | 27 04.8 +37.9 84.8  | 26 21.8 +38.0 84.1  |
| 23° | 29 51.7 +37.4 85.9  | 29 08.6 +37.5 85.2  | 28 25.6 +37.6 84.6  | 27 42.7 +37.6 83.9  | 26 59.8 +37.7 83.2  |
| 24° | 30 29.1 +37.0 85.0  | 29 46.1 +37.1 84.3  | 29 03.2 +37.1 83.7  | 28 20.3 +37.2 83.0  | 27 37.5 +37.3 82.4  |
| 25° | 31 06.1 +36.6 84.1  | 30 23.2 +36.7 83.4  | 29 40.3 +36.8 82.8  | 28 57.5 +36.9 82.1  | 28 14.8 +37.0 81.5  |
| 26° | 31 42.7 +36.2 83.1  | 30 59.9 +36.3 82.5  | 30 17.1 +36.4 81.9  | 29 34.4 +36.6 81.2  | 28 51.8 +36.7 80.6  |
| 27° | 32 18.9 +35.8 82.2  | 31 36.2 +35.9 81.6  | 30 53.5 +36.1 80.9  | 30 11.0 +36.1 80.3  | 29 28.5 +36.2 79.7  |
| 28° | 32 54.7 +35.4 81.2  | 32 12.1 +35.5 80.6  | 31 29.6 +35.6 80.0  | 30 47.1 +35.7 79.4  | 30 04.7 +35.9 78.8  |
| 29° | 33 30.1 +34.9 80.3  | 32 47.6 +35.0 79.7  | 32 05.2 +35.2 79.0  | 31 22.8 +35.4 78.4  | 30 40.6 +35.5 77.8  |

| 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°  | 10 43.8 +42.4 100.5 | 10 01.3 +42.3 99.8 | 9 18.7 +42.2 99.1  | 8 36.1 +42.1 98.4  | 7 53.3 +42.1 97.7  |
| 1°  | 11 26.2 +42.2 99.8  | 10 43.6 +42.2 99.1 | 10 00.9 +42.1 98.4 | 9 18.2 +42.0 97.7  | 8 35.4 +41.9 97.0  |
| 2°  | 12 08.4 +42.2 99.1  | 11 25.8 +42.0 98.4 | 10 43.0 +42.0 97.7 | 10 00.2 +42.0 97.0 | 9 17.3 +41.9 96.2  |
| 3°  | 12 50.6 +42.0 98.4  | 12 07.8 +42.0 97.7 | 11 25.0 +41.9 96.9 | 10 42.2 +41.8 96.2 | 9 59.2 +41.8 95.5  |
| 4°  | 13 32.6 +41.9 97.6  | 12 49.8 +41.8 96.9 | 12 06.9 +41.8 96.2 | 11 24.0 +41.7 95.5 | 10 41.0 +41.7 94.8 |
| 5°  | 14 14.5 +41.8 96.9  | 13 31.6 +41.7 96.2 | 12 48.7 +41.6 95.5 | 12 05.7 +41.6 94.8 | 11 22.7 +41.5 94.1 |
| 6°  | 14 56.3 +41.6 96.2  | 14 13.3 +41.6 95.4 | 13 30.3 +41.6 94.7 | 12 47.3 +41.5 94.0 | 12 04.2 +41.5 93.3 |
| 7°  | 15 37.9 +41.5 95.4  | 14 54.9 +41.4 94.7 | 14 11.9 +41.3 94.0 | 13 28.8 +41.3 93.3 | 12 45.7 +41.3 92.6 |
| 8°  | 16 19.4 +41.3 94.7  | 15 36.3 +41.3 93.9 | 14 53.2 +41.3 93.2 | 14 10.1 +41.2 92.5 | 13 27.0 +41.2 91.8 |
| 9°  | 17 00.7 +41.1 93.9  | 16 17.6 +41.1 93.2 | 15 34.5 +41.1 92.5 | 14 51.3 +41.1 91.8 | 14 08.2 +41.1 91.1 |
| 10° | 17 41.8 +41.0 93.1  | 16 58.7 +40.9 92.4 | 16 15.6 +40.9 91.7 | 15 32.4 +40.9 91.0 | 14 49.3 +40.9 90.3 |
| 11° | 18 22.8 +40.7 92.4  | 17 39.6 +40.8 91.7 | 16 56.5 +40.7 91.0 | 16 13.3 +40.8 90.3 | 15 30.2 +40.7 89.6 |
| 12° | 19 03.5 +40.6 91.6  | 18 20.4 +40.5 90.9 | 17 37.2 +40.6 90.2 | 16 54.1 +40.5 89.5 | 16 10.9 +40.6 88.8 |
| 13° | 19 44.1 +40.4 90.8  | 19 00.9 +40.4 90.1 | 18 17.8 +40.4 89.4 | 17 34.6 +40.4 88.7 | 16 51.5 +40.4 88.0 |
| 14° | 20 24.5 +40.1 90.0  | 19 41.3 +40.2 89.3 | 18 58.2 +40.1 88.6 | 18 15.0 +40.2 88.0 | 17 31.9 +40.2 87.3 |
| 15° | 21 04.6 +40.0 89.2  | 20 21.5 +39.9 88.5 | 19 38.3 +40.0 87.9 | 18 55.2 +40.0 87.2 | 18 12.1 +40.1 86.5 |
| 16° | 21 44.6 +39.7 88.4  | 21 01.4 +39.8 87.7 | 20 18.3 +39.8 87.1 | 19 35.2 +39.8 86.4 | 18 52.2 +39.8 85.7 |
| 17° | 22 24.3 +39.4 87.6  | 21 41.2 +39.4 86.9 | 20 58.1 +39.5 86.3 | 20 15.0 +39.6 85.6 | 19 32.0 +39.6 84.9 |
| 18° | 23 03.7 +39.2 86.8  | 22 20.6 +39.3 86.1 | 21 37.6 +39.3 85.5 | 20 54.6 +39.3 84.8 | 20 11.6 +39.5 84.1 |
| 19° | 23 42.9 +39.0 86.0  | 22 59.9 +39.0 85.3 | 22 16.9 +39.0 84.6 | 21 33.9 +39.2 84.0 | 20 51.1 +39.1 83.3 |
| 20° | 24 21.9 +38.6 85.1  | 23 38.9 +38.7 84.5 | 22 55.9 +38.8 83.8 | 22 13.1 +38.8 83.2 | 21 30.2 +39.0 82.5 |
| 21° | 25 00.5 +38.4 84.3  | 24 17.6 +38.4 83.6 | 23 34.7 +38.6 83.0 | 22 51.9 +38.6 82.3 | 22 09.2 +38.7 81.7 |
| 22° | 25 38.9 +38.1 83.5  | 24 56.0 +38.2 82.8 | 24 13.3 +38.2 82.1 | 23 30.5 +38.4 81.5 | 22 47.9 +38.4 80.9 |
| 23° | 26 17.0 +37.7 82.6  | 25 34.2 +37.9 81.9 | 24 51.5 +38.0 81.3 | 24 08.9 +38.0 80.7 | 23 26.3 +38.2 80.0 |
| 24° | 26 54.7 +37.5 81.7  | 26 12.1 +37.5 81.1 | 25 29.5 +37.6 80.4 | 24 46.9 +37.8 79.8 | 24 04.5 +37.9 79.2 |
| 25° | 27 32.2 +37.1 80.8  | 26 49.6 +37.2 80.2 | 26 07.1 +37.4 79.6 | 25 24.7 +37.5 79.0 | 24 42.4 +37.6 78.3 |
| 26° | 28 09.3 +36.7 80.0  | 27 26.8 +36.9 79.3 | 26 44.5 +37.0 78.7 | 26 02.2 +37.1 78.1 | 25 20.0 +37.3 77.5 |
| 27° | 28 46.0 +36.4 79.1  | 28 03.7 +36.5 78.4 | 27 21.5 +36.7 77.8 | 26 39.3 +36.9 77.2 | 25 57.3 +37.0 76.6 |
| 28° | 29 22.4 +36.1 78.1  | 28 40.2 +36.2 77.5 | 27 58.2 +36.3 76.9 | 27 16.2 +36.5 76.3 | 26 34.3 +36.6 75.7 |
| 29° | 29 58.5 +35.6 77.2  | 29 16.4 +35.8 76.6 | 28 34.5 +36.0 76.0 | 27 52.7 +36.1 75.4 | 27 10.9 +36.4 74.8 |

# Declination SAME name as Latitude

# Latitude 44°

| 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°  | 7 10.5 +42.0 97.0  | 6 27.7 +41.9 96.3  | 5 44.7 +41.9 95.6  | 5 01.8 +41.8 94.9  | 4 18.7 +41.8 94.2  |
| 1°  | 7 52.5 +41.9 96.3  | 7 09.6 +41.8 95.6  | 6 26.6 +41.8 94.9  | 5 43.6 +41.7 94.2  | 5 00.5 +41.7 93.5  |
| 2°  | 8 34.4 +41.8 95.5  | 7 51.4 +41.8 94.8  | 7 08.4 +41.7 94.1  | 6 25.3 +41.7 93.4  | 5 42.2 +41.7 92.7  |
| 3°  | 9 16.2 +41.8 94.8  | 8 33.2 +41.7 94.1  | 7 50.1 +41.7 93.4  | 7 07.0 +41.7 92.7  | 6 23.9 +41.6 92.0  |
| 4°  | 9 58.0 +41.6 94.1  | 9 14.9 +41.6 93.4  | 8 31.8 +41.6 92.7  | 7 48.7 +41.5 92.0  | 7 05.5 +41.6 91.3  |
| 5°  | 10 39.6 +41.5 93.4 | 9 56.5 +41.5 92.7  | 9 13.4 +41.5 92.0  | 8 30.2 +41.5 91.3  | 7 47.1 +41.4 90.6  |
| 6°  | 11 21.1 +41.5 92.6 | 10 38.0 +41.4 91.9 | 9 54.9 +41.4 91.2  | 9 11.7 +41.4 90.5  | 8 28.5 +41.4 89.8  |
| 7°  | 12 02.6 +41.3 91.9 | 11 19.4 +41.3 91.2 | 10 36.3 +41.2 90.5 | 9 53.1 +41.3 89.8  | 9 09.9 +41.3 89.1  |
| 8°  | 12 43.9 +41.1 91.1 | 12 00.7 +41.2 90.4 | 11 17.5 +41.2 89.7 | 10 34.4 +41.2 89.1 | 9 51.2 +41.2 88.4  |
| 9°  | 13 25.0 +41.1 90.4 | 12 41.9 +41.0 89.7 | 11 58.7 +41.1 89.0 | 11 15.6 +41.1 88.3 | 10 32.4 +41.1 87.6 |
| 10° | 14 06.1 +40.9 89.6 | 13 22.9 +41.0 88.9 | 12 39.8 +40.9 88.3 | 11 56.7 +40.9 87.6 | 11 13.5 +41.0 86.9 |
| 11° | 14 47.0 +40.8 88.9 | 14 03.9 +40.7 88.2 | 13 20.7 +40.8 87.5 | 12 37.6 +40.9 86.8 | 11 54.5 +40.9 86.1 |
| 12° | 15 27.8 +40.6 88.1 | 14 44.6 +40.7 87.4 | 14 01.5 +40.7 86.8 | 13 18.5 +40.7 86.1 | 12 35.4 +40.8 85.4 |
| 13° | 16 08.4 +40.4 87.4 | 15 25.3 +40.4 86.7 | 14 42.2 +40.5 86.0 | 13 59.2 +40.5 85.3 | 13 16.2 +40.6 84.6 |
| 14° | 16 48.8 +40.3 86.6 | 16 05.7 +40.3 85.9 | 15 22.7 +40.4 85.2 | 14 39.7 +40.4 84.6 | 13 56.8 +40.4 83.9 |
| 15° | 17 29.1 +40.0 85.8 | 16 46.0 +40.2 85.1 | 16 03.1 +40.1 84.5 | 15 20.1 +40.3 83.8 | 14 37.2 +40.4 83.1 |
| 16° | 18 09.1 +39.9 85.0 | 17 26.2 +39.9 84.4 | 16 43.2 +40.1 83.7 | 16 00.4 +40.1 83.0 | 15 17.6 +40.1 82.3 |
| 17° | 18 49.0 +39.7 84.2 | 18 06.1 +39.8 83.6 | 17 23.3 +39.8 82.9 | 16 40.5 +39.9 82.2 | 15 57.7 +40.0 81.6 |
| 18° | 19 28.7 +39.5 83.4 | 18 45.9 +39.5 82.8 | 18 03.1 +39.6 82.1 | 17 20.4 +39.7 81.5 | 16 37.7 +39.9 80.8 |
| 19° | 20 08.2 +39.3 82.6 | 19 25.4 +39.4 82.0 | 18 42.7 +39.5 81.3 | 18 00.1 +39.6 80.7 | 17 17.6 +39.6 80.0 |
| 20° | 20 47.5 +39.0 81.8 | 20 04.8 +39.1 81.2 | 19 22.2 +39.2 80.5 | 18 39.7 +39.3 79.9 | 17 57.2 +39.5 79.2 |
| 21° | 21 26.5 +38.8 81.0 | 20 43.9 +38.9 80.4 | 20 01.4 +39.0 79.7 | 19 19.0 +39.1 79.1 | 18 36.7 +39.2 78.4 |
| 22° | 22 05.3 +38.6 80.2 | 21 22.8 +38.7 79.6 | 20 40.4 +38.8 78.9 | 19 58.1 +38.9 78.3 | 19 15.9 +39.0 77.6 |
| 23° | 22 43.9 +38.3 79.4 | 22 01.5 +38.4 78.7 | 21 19.2 +38.6 78.1 | 20 37.0 +38.7 77.5 | 19 54.9 +38.9 76.8 |
| 24° | 23 22.2 +38.0 78.5 | 22 39.9 +38.2 77.9 | 21 57.8 +38.2 77.3 | 21 15.7 +38.4 76.6 | 20 33.8 +38.6 76.0 |
| 25° | 24 00.2 +37.7 77.7 | 23 18.1 +37.8 77.1 | 22 36.0 +38.1 76.4 | 21 54.1 +38.2 75.8 | 21 12.4 +38.3 75.2 |
| 26° | 24 37.9 +37.5 76.8 | 23 55.9 +37.7 76.2 | 23 14.1 +37.7 75.6 | 22 32.3 +38.0 75.0 | 21 50.7 +38.1 74.4 |
| 27° | 25 15.4 +37.1 76.0 | 24 33.6 +37.3 75.4 | 23 51.8 +37.5 74.8 | 23 10.3 +37.6 74.1 | 22 28.8 +37.9 73.5 |
| 28° | 25 52.5 +36.8 75.1 | 25 10.9 +37.0 74.5 | 24 29.3 +37.2 73.9 | 23 47.9 +37.4 73.3 | 23 06.7 +37.5 72.7 |
| 29° | 26 29.3 +36.6 74.2 | 25 47.9 +36.7 73.6 | 25 06.5 +36.9 73.0 | 24 25.3 +37.1 72.4 | 23 44.2 +37.3 71.8 |

| 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°  | 3 35.7 +41.7 93.5  | 2 52.6 +41.7 92.8  | 2 09.5 +41.7 92.1  | 1 26.3 +41.7 91.4  | 0 43.2 +41.6 90.7  |
| 1°  | 4 17.4 +41.7 92.8  | 3 34.3 +41.7 92.1  | 2 51.2 +41.6 91.4  | 2 08.0 +41.7 90.7  | 1 24.8 +41.7 90.0  |
| 2°  | 4 59.1 +41.7 92.0  | 4 16.0 +41.6 91.3  | 3 32.8 +41.7 90.6  | 2 49.7 +41.6 89.9  | 2 06.5 +41.6 89.3  |
| 3°  | 5 40.8 +41.6 91.3  | 4 57.6 +41.6 90.6  | 4 14.5 +41.6 89.9  | 3 31.3 +41.6 89.2  | 2 48.1 +41.7 88.5  |
| 4°  | 6 22.4 +41.5 90.6  | 5 39.2 +41.6 89.9  | 4 56.1 +41.5 89.2  | 4 12.9 +41.6 88.5  | 3 29.8 +41.6 87.8  |
| 5°  | 7 03.9 +41.5 89.9  | 6 20.8 +41.4 89.2  | 5 37.6 +41.5 88.5  | 4 54.5 +41.5 87.8  | 4 11.4 +41.5 87.1  |
| 6°  | 7 45.4 +41.4 89.1  | 7 02.2 +41.5 88.4  | 6 19.1 +41.4 87.7  | 5 36.0 +41.4 87.1  | 4 52.9 +41.5 86.4  |
| 7°  | 8 26.8 +41.3 88.4  | 7 43.7 +41.3 87.7  | 7 00.5 +41.4 87.0  | 6 17.4 +41.5 86.3  | 5 34.4 +41.4 85.6  |
| 8°  | 9 08.1 +41.2 87.7  | 8 25.0 +41.2 87.0  | 7 41.9 +41.3 86.3  | 6 58.9 +41.3 85.6  | 6 15.8 +41.4 84.9  |
| 9°  | 9 49.3 +41.2 86.9  | 9 06.2 +41.2 86.2  | 8 23.2 +41.2 85.6  | 7 40.2 +41.3 84.9  | 6 57.2 +41.3 84.2  |
| 10° | 10 30.5 +41.0 86.2 | 9 47.4 +41.1 85.5  | 9 04.4 +41.1 84.8  | 8 21.5 +41.1 84.1  | 7 38.5 +41.3 83.5  |
| 11° | 11 11.5 +40.9 85.4 | 10 28.5 +41.0 84.8 | 9 45.5 +41.1 84.1  | 9 02.6 +41.1 83.4  | 8 19.8 +41.2 82.7  |
| 12° | 11 52.4 +40.8 84.7 | 11 09.5 +40.8 84.0 | 10 26.6 +40.9 83.3 | 9 43.7 +41.0 82.7  | 9 01.0 +41.0 82.0  |
| 13° | 12 33.2 +40.7 84.0 | 11 50.3 +40.8 83.3 | 11 07.5 +40.8 82.6 | 10 24.7 +40.9 81.9 | 9 42.0 +41.0 81.2  |
| 14° | 13 13.9 +40.5 83.2 | 12 31.1 +40.6 82.5 | 11 48.3 +40.7 81.9 | 11 05.6 +40.8 81.2 | 10 23.0 +40.9 80.5 |
| 15° | 13 54.4 +40.4 82.4 | 13 11.7 +40.5 81.8 | 12 29.0 +40.6 81.1 | 11 46.4 +40.7 80.4 | 11 03.9 +40.7 79.8 |
| 16° | 14 34.8 +40.3 81.7 | 13 52.2 +40.3 81.0 | 13 09.6 +40.4 80.3 | 12 27.1 +40.5 79.7 | 11 44.6 +40.7 79.0 |
| 17° | 15 15.1 +40.1 80.9 | 14 32.5 +40.2 80.2 | 13 50.0 +40.3 79.6 | 13 07.6 +40.4 78.9 | 12 25.3 +40.5 78.3 |
| 18° | 15 55.2 +39.9 80.1 | 15 12.7 +40.0 79.5 | 14 30.3 +40.2 78.8 | 13 48.0 +40.3 78.2 | 13 05.8 +40.4 77.5 |
| 19° | 16 35.1 +39.8 79.4 | 15 52.7 +39.9 78.7 | 15 10.5 +39.9 78.1 | 14 28.3 +40.1 77.4 | 13 46.2 +40.3 76.7 |
| 20° | 17 14.9 +39.5 78.6 | 16 32.6 +39.7 77.9 | 15 50.4 +39.9 77.3 | 15 08.4 +40.0 76.6 | 14 26.5 +40.1 76.0 |
| 21° | 17 54.4 +39.4 77.8 | 17 12.3 +39.5 77.1 | 16 30.3 +39.6 76.5 | 15 48.4 +39.8 75.9 | 15 06.6 +39.9 75.2 |
| 22° | 18 33.8 +39.2 77.0 | 17 51.8 +39.3 76.4 | 17 09.9 +39.5 75.7 | 16 28.2 +39.6 75.1 | 15 46.5 +39.8 74.4 |
| 23° | 19 13.0 +38.9 76.2 | 18 31.1 +39.1 75.6 | 17 49.4 +39.3 74.9 | 17 07.8 +39.4 74.3 | 16 26.3 +39.6 73.7 |
| 24° | 19 51.9 +38.8 75.4 | 19 10.2 +38.9 74.8 | 18 28.7 +39.0 74.1 | 17 47.2 +39.3 73.5 | 17 05.9 +39.4 72.9 |
| 25° | 20 30.7 +38.5 74.6 | 19 49.1 +38.7 74.0 | 19 07.7 +38.9 73.3 | 18 26.5 +39.0 72.7 | 17 45.3 +39.3 72.1 |
| 26° | 21 09.2 +38.3 73.8 | 20 27.8 +38.5 73.1 | 19 46.6 +38.6 72.5 | 19 05.5 +38.8 71.9 | 18 24.6 +39.0 71.3 |
| 27° | 21 47.5 +38.0 72.9 | 21 06.3 +38.2 72.3 | 20 25.2 +38.5 71.7 | 19 44.3 +38.7 71.1 | 19 03.6 +38.8 70.5 |
| 28° | 22 25.5 +37.8 72.1 | 21 44.5 +38.0 71.5 | 21 03.7 +38.1 70.9 | 20 23.0 +38.3 70.3 | 19 42.4 +38.6 69.7 |
| 29° | 23 03.3 +37.5 71.2 | 22 22.5 +37.7 70.7 | 21 41.8 +38.0 70.1 | 21 01.3 +38.2 69.5 | 20 21.0 +38.4 68.9 |

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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 +41.7 90.0  | -0 43.2 +41.7      | -1 26.3 +41.7      | -2 09.5 +41.8      | -2 52.6 +41.8      |
| 1°  | 0 41.7 +41.7 89.3  | -0 01.5 +41.7      | -0 44.6 +41.7      | -1 27.7 +41.7      | -2 10.8 +41.7      |
| 2°  | 1 23.4 +41.6 88.6  | 0 40.2 +41.7 87.9  | -0 02.9 +41.7      | -0 46.0 +41.7      | -1 29.1 +41.8      |
| 3°  | 2 05.0 +41.6 87.8  | 1 21.9 +41.7 87.1  | 0 38.8 +41.7 86.5  | -0 04.3 +41.8      | -0 47.3 +41.8      |
| 4°  | 2 46.6 +41.7 87.1  | 2 03.6 +41.6 86.4  | 1 20.5 +41.7 85.7  | 0 37.5 +41.7 85.0  | -0 05.5 +41.8      |
| 5°  | 3 28.3 +41.5 86.4  | 2 45.2 +41.6 85.7  | 2 02.2 +41.7 85.0  | 1 19.2 +41.7 84.3  | 0 36.3 +41.8 83.6  |
| 6°  | 4 09.8 +41.6 85.7  | 3 26.8 +41.6 85.0  | 2 43.9 +41.6 84.3  | 2 00.9 +41.7 83.6  | 1 18.1 +41.7 82.9  |
| 7°  | 4 51.4 +41.5 85.0  | 4 08.4 +41.6 84.3  | 3 25.5 +41.6 83.6  | 2 42.6 +41.7 82.9  | 1 59.8 +41.8 82.2  |
| 8°  | 5 32.9 +41.4 84.2  | 4 50.0 +41.5 83.5  | 4 07.1 +41.6 82.9  | 3 24.3 +41.7 82.2  | 2 41.6 +41.7 81.5  |
| 9°  | 6 14.3 +41.4 83.5  | 5 31.5 +41.4 82.8  | 4 48.7 +41.5 82.1  | 4 06.0 +41.6 81.4  | 3 23.3 +41.7 80.8  |
| 10° | 6 55.7 +41.3 82.8  | 6 12.9 +41.4 82.1  | 5 30.2 +41.5 81.4  | 4 47.6 +41.5 80.7  | 4 05.0 +41.7 80.0  |
| 11° | 7 37.0 +41.2 82.0  | 6 54.3 +41.3 81.4  | 6 11.7 +41.4 80.7  | 5 29.1 +41.5 80.0  | 4 46.7 +41.6 79.3  |
| 12° | 8 18.2 +41.2 81.3  | 7 35.6 +41.3 80.6  | 6 53.1 +41.3 79.9  | 6 10.6 +41.5 79.3  | 5 28.3 +41.5 78.6  |
| 13° | 8 59.4 +41.1 80.6  | 8 16.9 +41.1 79.9  | 7 34.4 +41.3 79.2  | 6 52.1 +41.4 78.5  | 6 09.8 +41.5 77.9  |
| 14° | 9 40.5 +41.0 79.8  | 8 58.0 +41.1 79.2  | 8 15.7 +41.2 78.5  | 7 33.5 +41.3 77.8  | 6 51.3 +41.5 77.1  |
| 15° | 10 21.5 +40.8 79.1 | 9 39.1 +41.0 78.4  | 8 56.9 +41.1 77.7  | 8 14.8 +41.2 77.1  | 7 32.8 +41.3 76.4  |
| 16° | 11 02.3 +40.8 78.3 | 10 20.1 +40.9 77.7 | 9 38.0 +41.0 77.0  | 8 56.0 +41.1 76.3  | 8 14.1 +41.3 75.7  |
| 17° | 11 43.1 +40.6 77.6 | 11 01.0 +40.8 76.9 | 10 19.0 +40.9 76.3 | 9 37.1 +41.1 75.6  | 8 55.4 +41.2 74.9  |
| 18° | 12 23.7 +40.6 76.8 | 11 41.8 +40.6 76.2 | 10 59.9 +40.8 75.5 | 10 18.2 +40.9 74.9 | 9 36.6 +41.1 74.2  |
| 19° | 13 04.3 +40.4 76.1 | 12 22.4 +40.6 75.4 | 11 40.7 +40.7 74.8 | 10 59.1 +40.9 74.1 | 10 17.7 +41.0 73.5 |
| 20° | 13 44.7 +40.2 75.3 | 13 03.0 +40.4 74.7 | 12 21.4 +40.6 74.0 | 11 40.0 +40.7 73.4 | 10 58.7 +40.9 72.7 |
| 21° | 14 24.9 +40.1 74.6 | 13 43.4 +40.2 73.9 | 13 02.0 +40.4 73.3 | 12 20.7 +40.6 72.6 | 11 39.6 +40.8 72.0 |
| 22° | 15 05.0 +39.9 73.8 | 14 23.6 +40.1 73.2 | 13 42.4 +40.3 72.5 | 13 01.3 +40.5 71.9 | 12 20.4 +40.6 71.2 |
| 23° | 15 44.9 +39.8 73.0 | 15 03.7 +40.0 72.4 | 14 22.7 +40.1 71.7 | 13 41.8 +40.3 71.1 | 13 01.0 +40.5 70.5 |
| 24° | 16 24.7 +39.6 72.2 | 15 43.7 +39.8 71.6 | 15 02.8 +40.0 71.0 | 14 22.1 +40.2 70.3 | 13 41.5 +40.4 69.7 |
| 25° | 17 04.3 +39.5 71.5 | 16 23.5 +39.6 70.8 | 15 42.8 +39.8 70.2 | 15 02.3 +40.0 69.6 | 14 21.9 +40.2 69.0 |
| 26° | 17 43.8 +39.2 70.7 | 17 03.1 +39.4 70.0 | 16 22.6 +39.7 69.4 | 15 42.3 +39.8 68.8 | 15 02.1 +40.1 68.2 |
| 27° | 18 23.0 +39.0 69.9 | 17 42.5 +39.3 69.3 | 17 02.3 +39.4 68.6 | 16 22.1 +39.7 68.0 | 15 42.2 +39.9 67.4 |
| 28° | 19 02.0 +38.8 69.1 | 18 21.8 +39.0 68.5 | 17 41.7 +39.3 67.9 | 17 01.8 +39.5 67.2 | 16 22.1 +39.8 66.6 |
| 29° | 19 40.8 +38.6 68.3 | 19 00.8 +38.9 67.7 | 18 21.0 +39.1 67.1 | 17 41.3 +39.4 66.5 | 17 01.9 +39.5 65.9 |

| Dec | LHA 095° / 265°    | LHA 096° / 264°    | LHA 097° / 263°    | LHA 098° / 262°    | LHA 099° / 261°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -3 35.7 +41.8      | -4 18.7 +41.8      | -5 01.8 +41.9      | -5 44.7 +41.9      | -6 27.7 +42.0      |
| 1°  | -2 53.9 +41.8      | -3 36.9 +41.8      | -4 19.9 +41.9      | -5 02.8 +41.9      | -5 45.7 +42.0      |
| 2°  | -2 12.1 +41.8      | -2 55.1 +41.9      | -3 38.0 +41.9      | -4 20.9 +42.0      | -5 03.7 +42.1      |
| 3°  | -1 30.3 +41.9      | -2 13.2 +41.9      | -2 56.1 +42.0      | -3 38.9 +42.1      | -4 21.6 +42.1      |
| 4°  | -0 48.4 +41.8      | -1 31.3 +41.9      | -2 14.1 +42.0      | -2 56.8 +42.0      | -3 39.5 +42.2      |
| 5°  | -0 06.6 +41.9      | -0 49.4 +41.9      | -1 32.1 +42.0      | -2 14.8 +42.1      | -2 57.3 +42.2      |
| 6°  | 0 35.3 +41.8 82.2  | -0 07.5 +42.0      | -0 50.1 +42.0      | -1 32.7 +42.1      | -2 15.1 +42.2      |
| 7°  | 1 17.1 +41.8 81.5  | 0 34.5 +41.9 80.8  | -0 08.1 +42.0      | -0 50.6 +42.1      | -1 32.9 +42.2      |
| 8°  | 1 58.9 +41.9 80.8  | 1 16.4 +41.9 80.1  | 0 33.9 +42.0 79.4  | -0 08.5 +42.2      | -0 50.7 +42.2      |
| 9°  | 2 40.8 +41.7 80.1  | 1 58.3 +41.9 79.4  | 1 15.9 +42.0 78.7  | 0 33.7 +42.1 78.0  | -0 08.5 +42.2      |
| 10° | 3 22.5 +41.8 79.3  | 2 40.2 +41.8 78.7  | 1 57.9 +42.0 78.0  | 1 15.8 +42.0 77.3  | 0 33.7 +42.2 76.6  |
| 11° | 4 04.3 +41.7 78.6  | 3 22.0 +41.9 77.9  | 2 39.9 +41.9 77.3  | 1 57.8 +42.1 76.6  | 1 15.9 +42.2 75.9  |
| 12° | 4 46.0 +41.7 77.9  | 4 03.9 +41.8 77.2  | 3 21.8 +42.0 76.5  | 2 39.9 +42.1 75.9  | 1 58.1 +42.2 75.2  |
| 13° | 5 27.7 +41.6 77.2  | 4 45.7 +41.7 76.5  | 4 03.8 +41.8 75.8  | 3 22.0 +42.0 75.1  | 2 40.3 +42.2 74.5  |
| 14° | 6 09.3 +41.6 76.5  | 5 27.4 +41.7 75.8  | 4 45.6 +41.9 75.1  | 4 04.0 +42.0 74.4  | 3 22.5 +42.1 73.7  |
| 15° | 6 50.9 +41.5 75.7  | 6 09.1 +41.6 75.1  | 5 27.5 +41.8 74.4  | 4 46.0 +41.9 73.7  | 4 04.6 +42.1 73.0  |
| 16° | 7 32.4 +41.4 75.0  | 6 50.7 +41.6 74.3  | 6 09.3 +41.7 73.7  | 5 27.9 +41.9 73.0  | 4 46.7 +42.1 72.3  |
| 17° | 8 13.8 +41.3 74.3  | 7 32.3 +41.5 73.6  | 6 51.0 +41.6 72.9  | 6 09.8 +41.8 72.3  | 5 28.8 +42.0 71.6  |
| 18° | 8 55.1 +41.3 73.5  | 8 13.8 +41.4 72.9  | 7 32.6 +41.6 72.2  | 6 51.6 +41.8 71.5  | 6 10.8 +41.9 70.9  |
| 19° | 9 36.4 +41.2 72.8  | 8 55.2 +41.4 72.1  | 8 14.2 +41.5 71.5  | 7 33.4 +41.7 70.8  | 6 52.7 +41.9 70.2  |
| 20° | 10 17.6 +41.0 72.1 | 9 36.6 +41.2 71.4  | 8 55.7 +41.5 70.8  | 8 15.1 +41.6 70.1  | 7 34.6 +41.8 69.4  |
| 21° | 10 58.6 +41.0 71.3 | 10 17.8 +41.1 70.7 | 9 37.2 +41.3 70.0  | 8 56.7 +41.5 69.4  | 8 16.4 +41.7 68.7  |
| 22° | 11 39.6 +40.8 70.6 | 10 58.9 +41.1 69.9 | 10 18.5 +41.2 69.3 | 9 38.2 +41.4 68.6  | 8 58.1 +41.6 68.0  |
| 23° | 12 20.4 +40.7 69.8 | 11 40.0 +40.9 69.2 | 10 59.7 +41.1 68.5 | 10 19.6 +41.4 67.9 | 9 39.7 +41.6 67.3  |
| 24° | 13 01.1 +40.6 69.1 | 12 20.9 +40.8 68.4 | 11 40.8 +41.0 67.8 | 11 01.0 +41.2 67.2 | 10 21.3 +41.4 66.5 |
| 25° | 13 41.7 +40.5 68.3 | 13 01.7 +40.6 67.7 | 12 21.8 +40.9 67.1 | 11 42.2 +41.1 66.4 | 11 02.7 +41.4 65.8 |
| 26° | 14 22.2 +40.2 67.6 | 13 42.3 +40.6 66.9 | 13 02.7 +40.8 66.3 | 12 23.3 +41.0 65.7 | 11 44.1 +41.2 65.1 |
| 27° | 15 02.4 +40.2 66.8 | 14 22.9 +40.4 66.2 | 13 43.5 +40.6 65.6 | 13 04.3 +40.8 64.9 | 12 25.3 +41.1 64.3 |
| 28° | 15 42.6 +40.0 66.0 | 15 03.3 +40.2 65.4 | 14 24.1 +40.5 64.8 | 13 45.1 +40.8 64.2 | 13 06.4 +41.0 63.6 |
| 29° | 16 22.6 +39.8 65.2 | 15 43.5 +40.0 64.6 | 15 04.6 +40.3 64.0 | 14 25.9 +40.5 63.4 | 13 47.4 +40.8 62.8 |

| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°    | LHA 103° / 257°    | LHA 104° / 256°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -7 10.5 +42.0      | -7 53.3 +42.1      | -8 36.1 +42.2      | -9 18.7 +42.2      |                    |
| 1°  | -6 28.5 +42.1      | -7 11.2 +42.1      | -7 53.9 +42.3      | -8 36.5 +42.4      | -9 18.9 +42.4      |
| 2°  | -5 46.4 +42.2      | -6 29.1 +42.3      | -7 11.6 +42.3      | -7 54.1 +42.4      | -8 36.5 +42.6      |
| 3°  | -5 04.2 +42.2      | -5 46.8 +42.3      | -6 29.3 +42.4      | -7 11.7 +42.5      | -7 53.9 +42.6      |
| 4°  | -4 22.0 +42.2      | -5 04.5 +42.3      | -5 46.9 +42.4      | -6 29.2 +42.6      | -7 11.3 +42.6      |
| 5°  | -3 39.8 +42.3      | -4 22.2 +42.4      | -5 04.5 +42.5      | -5 46.6 +42.6      | -6 28.7 +42.8      |
| 6°  | -2 57.5 +42.3      | -3 39.8 +42.4      | -4 22.0 +42.6      | -5 04.0 +42.6      | -5 45.9 +42.7      |
| 7°  | -2 15.2 +42.3      | -2 57.4 +42.5      | -3 39.4 +42.5      | -4 21.4 +42.7      | -5 03.2 +42.9      |
| 8°  | -1 32.9 +42.3      | -2 14.9 +42.4      | -2 56.9 +42.6      | -3 38.7 +42.8      | -4 20.3 +42.8      |
| 9°  | -0 50.6 +42.4      | -1 32.5 +42.5      | -2 14.3 +42.6      | -2 55.9 +42.7      | -3 37.5 +42.9      |
| 10° | -0 08.2 +42.3      | -0 50.0 +42.5      | -1 31.7 +42.7      | -2 13.2 +42.8      | -2 54.6 +43.0      |
| 11° | 0 34.1 +42.4 75.2  | -0 07.5 +42.5      | -0 49.0 +42.6      | -1 30.4 +42.8      | -2 11.6 +42.9      |
| 12° | 1 16.5 +42.3 74.5  | 0 35.0 +42.4 73.8  | -0 06.4 +42.6      | -0 47.6 +42.8      | -1 28.7 +43.0      |
| 13° | 1 58.8 +42.3 73.8  | 1 17.4 +42.5 73.1  | 0 36.2 +42.7 72.4  | -0 04.8 +42.8      | -0 45.7 +42.9      |
| 14° | 2 41.1 +42.3 73.1  | 1 59.9 +42.5 72.4  | 1 18.9 +42.6 71.7  | 0 38.0 +42.8 71.0  | -0 02.8 +43.0      |
| 15° | 3 23.4 +42.3 72.3  | 2 42.4 +42.4 71.7  | 2 01.5 +42.6 71.0  | 1 20.8 +42.7 70.3  | 0 40.2 +43.0 69.6  |
| 16° | 4 05.7 +42.2 71.6  | 3 24.8 +42.4 71.0  | 2 44.1 +42.5 70.3  | 2 03.5 +42.8 69.6  | 1 23.2 +42.9 68.9  |
| 17° | 4 47.9 +42.2 70.9  | 4 07.2 +42.3 70.2  | 3 26.6 +42.6 69.6  | 2 46.3 +42.7 68.9  | 2 06.1 +42.9 68.2  |
| 18° | 5 30.1 +42.1 70.2  | 4 49.5 +42.3 69.5  | 4 09.2 +42.5 68.9  | 3 29.0 +42.7 68.2  | 2 49.0 +43.0 67.5  |
| 19° | 6 12.2 +42.0 69.5  | 5 31.8 +42.3 68.8  | 4 51.7 +42.5 68.2  | 4 11.7 +42.7 67.5  | 3 32.0 +42.8 66.8  |
| 20° | 6 54.2 +42.0 68.8  | 6 14.1 +42.2 68.1  | 5 34.2 +42.4 67.4  | 4 54.4 +42.6 66.8  | 4 14.8 +42.9 66.1  |
| 21° | 7 36.2 +42.0 68.1  | 6 56.3 +42.1 67.4  | 6 16.6 +42.3 66.7  | 5 37.0 +42.6 66.1  | 4 57.7 +42.8 65.4  |
| 22° | 8 18.2 +41.8 67.3  | 7 38.4 +42.1 66.7  | 6 58.9 +42.3 66.0  | 6 19.6 +42.5 65.4  | 5 40.5 +42.7 64.7  |
| 23° | 9 00.0 +41.8 66.6  | 8 20.5 +42.0 66.0  | 7 41.2 +42.2 65.3  | 7 02.1 +42.4 64.7  | 6 23.2 +42.7 64.0  |
| 24° | 9 41.8 +41.7 65.9  | 9 02.5 +41.9 65.2  | 8 23.4 +42.1 64.6  | 7 44.5 +42.4 63.9  | 7 05.9 +42.6 63.3  |
| 25° | 10 23.5 +41.5 65.2 | 9 44.4 +41.8 64.5  | 9 05.5 +42.1 63.9  | 8 26.9 +42.3 63.2  | 7 48.5 +42.5 62.6  |
| 26° | 11 05.0 +41.5 64.4 | 10 26.2 +41.7 63.8 | 9 47.6 +42.0 63.1  | 9 09.2 +42.2 62.5  | 8 31.0 +42.5 61.9  |
| 27° | 11 46.5 +41.4 63.7 | 11 07.9 +41.6 63.1 | 10 29.6 +41.8 62.4 | 9 51.4 +42.1 61.8  | 9 13.5 +42.4 61.1  |
| 28° | 12 27.9 +41.2 62.9 | 11 49.5 +41.5 62.3 | 11 11.4 +41.8 61.7 | 10 33.5 +42.1 61.1 | 9 55.9 +42.3 60.4  |
| 29° | 13 09.1 +41.1 62.2 | 12 31.0 +41.4 61.6 | 11 53.2 +41.6 61.0 | 11 15.6 +41.9 60.3 | 10 38.2 +42.2 59.7 |

| Dec | LHA 105° / 255°    | LHA 106° / 254°   | LHA 107° / 253°   | LHA 108° / 252°   | LHA 109° / 251°   |
|-----|--------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                    |                   |                   |                   |                   |
| 1°  |                    |                   |                   |                   |                   |
| 2°  | -9 18.8 +42.7      |                   |                   |                   |                   |
| 3°  | -8 36.1 +42.7      | -9 18.2 +42.9     |                   |                   |                   |
| 4°  | -7 53.4 +42.8      | -8 35.3 +42.9     | -9 17.1 +43.1     | -9 58.7 +43.2     |                   |
| 5°  | -7 10.6 +42.9      | -7 52.4 +43.0     | -8 34.0 +43.1     | -9 15.5 +43.2     | -9 56.9 +43.4     |
| 6°  | -6 27.7 +42.9      | -7 09.4 +43.1     | -7 50.9 +43.2     | -8 32.3 +43.4     | -9 13.5 +43.6     |
| 7°  | -5 44.8 +43.0      | -6 26.3 +43.1     | -7 07.7 +43.3     | -7 48.9 +43.4     | -8 29.9 +43.6     |
| 8°  | -5 01.8 +43.0      | -5 43.2 +43.2     | -6 24.4 +43.3     | -7 05.5 +43.5     | -7 46.3 +43.6     |
| 9°  | -4 18.8 +43.0      | -5 00.0 +43.2     | -5 41.1 +43.4     | -6 22.0 +43.6     | -7 02.7 +43.7     |
| 10° | -3 35.8 +43.1      | -4 16.8 +43.2     | -4 57.7 +43.4     | -5 38.4 +43.6     | -6 19.0 +43.8     |
| 11° | -2 52.7 +43.1      | -3 33.6 +43.3     | -4 14.3 +43.5     | -4 54.8 +43.6     | -5 35.2 +43.9     |
| 12° | -2 09.6 +43.2      | -2 50.3 +43.3     | -3 30.8 +43.5     | -4 11.2 +43.7     | -4 51.3 +43.8     |
| 13° | -1 26.4 +43.1      | -2 07.0 +43.3     | -2 47.3 +43.5     | -3 27.5 +43.7     | -4 07.5 +43.9     |
| 14° | -0 43.3 +43.1      | -1 23.7 +43.4     | -2 03.8 +43.5     | -2 43.8 +43.7     | -3 23.6 +44.0     |
| 15° | -0 00.2 +43.2      | -0 40.3 +43.3     | -1 20.3 +43.5     | -2 00.1 +43.8     | -2 39.6 +43.9     |
| 16° | 0 43.0 +43.1 68.2  | 0 03.0 +43.4 67.5 | -0 36.8 +43.6     | -1 16.3 +43.7     | -1 55.7 +44.0     |
| 17° | 1 26.1 +43.2 67.5  | 0 46.4 +43.3 66.8 | 0 06.8 +43.5 66.1 | -0 32.6 +43.8     | -1 11.7 +44.0     |
| 18° | 2 09.3 +43.1 66.8  | 1 29.7 +43.3 66.1 | 0 50.3 +43.6 65.4 | 0 11.2 +43.7 64.8 | -0 27.7 +43.9     |
| 19° | 2 52.4 +43.1 66.1  | 2 13.0 +43.3 65.4 | 1 33.9 +43.5 64.8 | 0 54.9 +43.8 64.1 | 0 16.2 +44.0 63.4 |
| 20° | 3 35.5 +43.0 65.4  | 2 56.3 +43.3 64.8 | 2 17.4 +43.5 64.1 | 1 38.7 +43.7 63.4 | 1 00.2 +44.0 62.7 |
| 21° | 4 18.5 +43.0 64.7  | 3 39.6 +43.2 64.1 | 3 00.9 +43.5 63.4 | 2 22.4 +43.7 62.7 | 1 44.2 +44.0 62.0 |
| 22° | 5 01.5 +43.0 64.0  | 4 22.8 +43.3 63.4 | 3 44.4 +43.4 62.7 | 3 06.1 +43.7 62.0 | 2 28.2 +43.9 61.3 |
| 23° | 5 44.5 +42.9 63.3  | 5 06.1 +43.1 62.7 | 4 27.8 +43.4 62.0 | 3 49.8 +43.7 61.3 | 3 12.1 +43.9 60.7 |
| 24° | 6 27.4 +42.9 62.6  | 5 49.2 +43.1 62.0 | 5 11.2 +43.4 61.3 | 4 33.5 +43.6 60.6 | 3 56.0 +43.9 60.0 |
| 25° | 7 10.3 +42.8 61.9  | 6 32.3 +43.1 61.3 | 5 54.6 +43.3 60.6 | 5 17.1 +43.6 60.0 | 4 39.9 +43.8 59.3 |
| 26° | 7 53.1 +42.7 61.2  | 7 15.4 +43.0 60.6 | 6 37.9 +43.3 59.9 | 6 00.7 +43.5 59.3 | 5 23.7 +43.8 58.6 |
| 27° | 8 35.8 +42.7 60.5  | 7 58.4 +42.9 59.9 | 7 21.2 +43.1 59.2 | 6 44.2 +43.5 58.6 | 6 07.5 +43.7 57.9 |
| 28° | 9 18.5 +42.5 59.8  | 8 41.3 +42.8 59.2 | 8 04.3 +43.2 58.5 | 7 27.7 +43.4 57.9 | 6 51.2 +43.7 57.2 |
| 29° | 10 01.0 +42.5 59.1 | 9 24.1 +42.8 58.5 | 8 47.5 +43.0 57.8 | 8 11.1 +43.3 57.2 | 7 34.9 +43.6 56.5 |

| Dec | LHA 110° / 250°   | LHA 111° / 249°   | LHA 112° / 248°   | LHA 113° / 247°   | LHA 114° / 246°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  |                   |                   |                   |                   |                   |
| 3°  |                   |                   |                   |                   |                   |
| 4°  |                   |                   |                   |                   |                   |
| 5°  |                   |                   |                   |                   |                   |
| 6°  | -9 54.5 +43.7     |                   |                   |                   |                   |
| 7°  | -9 10.8 +43.8     | -9 51.5 +44.0     |                   |                   |                   |
| 8°  | -8 27.0 +43.8     | -9 07.5 +44.0     | -9 47.9 +44.2     |                   |                   |
| 9°  | -7 43.2 +43.9     | -8 23.5 +44.1     | -9 03.7 +44.3     | -9 43.6 +44.5     |                   |
| 10° | -6 59.3 +44.0     | -7 39.4 +44.1     | -8 19.4 +44.4     | -8 59.1 +44.6     | -9 38.6 +44.8     |
| 11° | -6 15.3 +44.0     | -6 55.3 +44.2     | -7 35.0 +44.4     | -8 14.5 +44.6     | -8 53.8 +44.8     |
| 12° | -5 31.3 +44.1     | -6 11.1 +44.3     | -6 50.6 +44.5     | -7 29.9 +44.7     | -8 09.0 +44.9     |
| 13° | -4 47.2 +44.1     | -5 26.8 +44.3     | -6 06.1 +44.5     | -6 45.2 +44.7     | -7 24.1 +45.0     |
| 14° | -4 03.1 +44.1     | -4 42.5 +44.4     | -5 21.6 +44.6     | -6 00.5 +44.8     | -6 39.1 +45.0     |
| 15° | -3 19.0 +44.2     | -3 58.1 +44.4     | -4 37.0 +44.6     | -5 15.7 +44.8     | -5 54.1 +45.1     |
| 16° | -2 34.8 +44.2     | -3 13.7 +44.4     | -3 52.4 +44.6     | -4 30.9 +44.9     | -5 09.0 +45.1     |
| 17° | -1 50.6 +44.2     | -2 29.3 +44.4     | -3 07.8 +44.7     | -3 46.0 +44.9     | -4 23.9 +45.1     |
| 18° | -1 06.4 +44.2     | -1 44.9 +44.4     | -2 23.1 +44.7     | -3 01.1 +44.9     | -3 38.8 +45.2     |
| 19° | -0 22.2 +44.2     | -1 00.5 +44.5     | -1 38.4 +44.7     | -2 16.2 +45.0     | -2 53.6 +45.2     |
| 20° | 0 22.0 +44.2 62.0 | -0 16.0 +44.5     | -0 53.7 +44.7     | -1 31.2 +44.9     | -2 08.4 +45.2     |
| 21° | 1 06.2 +44.2 61.3 | 0 28.5 +44.4 60.6 | -0 09.0 +44.7     | -0 46.3 +45.0     | -1 23.2 +45.2     |
| 22° | 1 50.4 +44.2 60.7 | 1 12.9 +44.5 60.0 | 0 35.7 +44.7 59.3 | -0 01.3 +45.0     | -0 38.0 +45.2     |
| 23° | 2 34.6 +44.2 60.0 | 1 57.4 +44.4 59.3 | 1 20.4 +44.7 58.6 | 0 43.7 +44.9 57.9 | 0 07.2 +45.2 57.2 |
| 24° | 3 18.8 +44.1 59.3 | 2 41.8 +44.4 58.6 | 2 05.1 +44.6 58.0 | 1 28.6 +45.0 57.3 | 0 52.4 +45.3 56.6 |
| 25° | 4 02.9 +44.1 58.6 | 3 26.2 +44.4 58.0 | 2 49.7 +44.7 57.3 | 2 13.6 +44.9 56.6 | 1 37.7 +45.2 55.9 |
| 26° | 4 47.0 +44.1 57.9 | 4 10.6 +44.3 57.3 | 3 34.4 +44.6 56.6 | 2 58.5 +44.9 55.9 | 2 22.9 +45.2 55.3 |
| 27° | 5 31.1 +44.0 57.3 | 4 54.9 +44.3 56.6 | 4 19.0 +44.6 55.9 | 3 43.4 +44.9 55.3 | 3 08.1 +45.1 54.6 |
| 28° | 6 15.1 +44.0 56.6 | 5 39.2 +44.3 55.9 | 5 03.6 +44.5 55.3 | 4 28.3 +44.8 54.6 | 3 53.2 +45.1 53.9 |
| 29° | 6 59.1 +43.9 55.9 | 6 23.5 +44.2 55.2 | 5 48.1 +44.5 54.6 | 5 13.1 +44.8 53.9 | 4 38.3 +45.1 53.3 |

| Dec | LHA 115° / 245°   | LHA 116° / 244°   | LHA 117° / 243°   | LHA 118° / 242°   | LHA 119° / 241°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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° | -9 32.9 +45.1     |                   |                   |                   |                   |
| 12° | -8 47.8 +45.1     | -9 26.4 +45.3     |                   |                   |                   |
| 13° | -8 02.7 +45.2     | -8 41.1 +45.5     | -9 19.2 +45.7     | -9 57.0 +45.9     |                   |
| 14° | -7 17.5 +45.2     | -7 55.6 +45.4     | -8 33.5 +45.7     | -9 11.1 +46.0     | -9 48.4 +46.2     |
| 15° | -6 32.3 +45.3     | -7 10.2 +45.6     | -7 47.8 +45.8     | -8 25.1 +46.0     | -9 02.2 +46.3     |
| 16° | -5 47.0 +45.4     | -6 24.6 +45.6     | -7 02.0 +45.8     | -7 39.1 +46.1     | -8 15.9 +46.3     |
| 17° | -5 01.6 +45.4     | -5 39.0 +45.6     | -6 16.2 +45.9     | -6 53.0 +46.1     | -7 29.6 +46.4     |
| 18° | -4 16.2 +45.4     | -4 53.4 +45.7     | -5 30.3 +45.9     | -6 06.9 +46.2     | -6 43.2 +46.5     |
| 19° | -3 30.8 +45.4     | -4 07.7 +45.7     | -4 44.4 +46.0     | -5 20.7 +46.2     | -5 56.7 +46.5     |
| 20° | -2 45.4 +45.5     | -3 22.0 +45.7     | -3 58.4 +46.0     | -4 34.5 +46.3     | -5 10.2 +46.5     |
| 21° | -1 59.9 +45.5     | -2 36.3 +45.7     | -3 12.4 +46.0     | -3 48.2 +46.3     | -4 23.7 +46.5     |
| 22° | -1 14.4 +45.5     | -1 50.6 +45.8     | -2 26.4 +46.0     | -3 01.9 +46.3     | -3 37.2 +46.6     |
| 23° | -0 28.9 +45.5     | -1 04.8 +45.8     | -1 40.4 +46.1     | -2 15.6 +46.3     | -2 50.6 +46.6     |
| 24° | 0 16.6 +45.5 55.9 | -0 19.0 +45.8     | -0 54.3 +46.0     | -1 29.3 +46.3     | -2 04.0 +46.7     |
| 25° | 1 02.1 +45.4 55.2 | 0 26.8 +45.7 54.5 | -0 08.3 +46.1     | -0 43.0 +46.4     | -1 17.3 +46.6     |
| 26° | 1 47.5 +45.5 54.6 | 1 12.5 +45.8 53.9 | 0 37.8 +46.1 53.2 | 0 03.4 +46.3 52.5 | -0 30.7 +46.6     |
| 27° | 2 33.0 +45.5 53.9 | 1 58.3 +45.7 53.3 | 1 23.9 +46.0 52.6 | 0 49.7 +46.4 51.9 | 0 15.9 +46.7 51.2 |
| 28° | 3 18.5 +45.4 53.3 | 2 44.0 +45.8 52.6 | 2 09.9 +46.0 51.9 | 1 36.1 +46.3 51.3 | 1 02.6 +46.6 50.6 |
| 29° | 4 03.9 +45.4 52.6 | 3 29.8 +45.6 52.0 | 2 55.9 +46.0 51.3 | 2 22.4 +46.3 50.6 | 1 49.2 +46.6 49.9 |

| Dec | LHA 120° / 240°   | LHA 121° / 239°   | LHA 122° / 238°   | LHA 123° / 237° | LHA 124° / 236° |
|-----|-------------------|-------------------|-------------------|-----------------|-----------------|
|     | 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° | -9 39.0 +46.6     |                   |                   |                 |                 |
| 16° | -8 52.4 +46.6     | -9 28.7 +46.9     |                   |                 |                 |
| 17° | -8 05.8 +46.6     | -8 41.8 +46.9     | -9 17.4 +47.2     | -9 52.7 +47.4   |                 |
| 18° | -7 19.2 +46.7     | -7 54.9 +47.0     | -8 30.2 +47.2     | -9 05.3 +47.6   |                 |
| 19° | -6 32.5 +46.8     | -7 07.9 +47.1     | -7 43.0 +47.3     | -8 17.7 +47.6   |                 |
| 20° | -5 45.7 +46.8     | -6 20.8 +47.0     | -6 55.7 +47.4     | -7 30.1 +47.6   |                 |
| 21° | -4 58.9 +46.8     | -5 33.8 +47.2     | -6 08.3 +47.4     | -6 42.5 +47.7   |                 |
| 22° | -4 12.1 +46.9     | -4 46.6 +47.1     | -5 20.9 +47.4     | -5 54.8 +47.7   |                 |
| 23° | -3 25.2 +46.9     | -3 59.5 +47.2     | -4 33.5 +47.5     | -5 07.1 +47.8   |                 |
| 24° | -2 38.3 +46.9     | -3 12.3 +47.2     | -3 46.0 +47.5     | -4 19.3 +47.8   |                 |
| 25° | -1 51.4 +46.9     | -2 25.1 +47.2     | -2 58.5 +47.5     | -3 31.5 +47.8   |                 |
| 26° | -1 04.5 +47.0     | -1 37.9 +47.2     | -2 11.0 +47.5     | -2 43.7 +47.8   |                 |
| 27° | -0 17.5 +46.9     | -0 50.7 +47.3     | -1 23.5 +47.6     | -1 55.9 +47.8   |                 |
| 28° | 0 29.4 +46.9 49.9 | -0 03.4 +47.2     | -0 35.9 +47.5     | -1 08.1 +47.9   |                 |
| 29° | 1 16.3 +47.0 49.3 | 0 43.8 +47.2 48.6 | 0 11.6 +47.6 47.9 | -0 20.2 +47.8   |                 |

| Dec | LHA 125° / 235° | LHA 126° / 234° | LHA 127° / 233° | LHA 128° / 232° | LHA 129° / 231° |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
|     | 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 45°

| 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°  | 45 00.0 +60.0 180.0 | 44 59.5 +60.0 178.6 | 44 57.9 +60.0 177.2 | 44 55.3 +59.9 175.8 | 44 51.6 +59.9 174.4 |
| 1°  | 46 00.0 +60.0 180.0 | 45 59.5 +60.0 178.6 | 45 57.9 +59.9 177.1 | 45 55.2 +59.9 175.7 | 45 51.5 +59.8 174.3 |
| 2°  | 47 00.0 +60.0 180.0 | 46 59.5 +59.9 178.5 | 46 57.8 +60.0 177.1 | 46 55.1 +59.9 175.6 | 46 51.3 +59.9 174.1 |
| 3°  | 48 00.0 +60.0 180.0 | 47 59.4 +60.0 178.5 | 47 57.8 +59.9 177.0 | 47 55.0 +59.9 175.5 | 47 51.2 +59.8 174.0 |
| 4°  | 49 00.0 +60.0 180.0 | 48 59.4 +60.0 178.5 | 48 57.7 +60.0 177.0 | 48 54.9 +59.9 175.4 | 48 51.0 +59.8 173.9 |
| 5°  | 50 00.0 +60.0 180.0 | 49 59.4 +60.0 178.5 | 49 57.7 +60.0 176.9 | 49 54.8 +59.9 175.4 | 49 50.8 +59.9 173.8 |
| 6°  | 51 00.0 +60.0 180.0 | 50 59.4 +60.0 178.4 | 50 57.7 +59.9 176.8 | 50 54.7 +59.9 175.3 | 50 50.7 +59.8 173.7 |
| 7°  | 52 00.0 +60.0 180.0 | 51 59.4 +60.0 178.4 | 51 57.6 +60.0 176.8 | 51 54.6 +59.9 175.2 | 51 50.5 +59.8 173.6 |
| 8°  | 53 00.0 +60.0 180.0 | 52 59.4 +60.0 178.4 | 52 57.6 +59.9 176.7 | 52 54.5 +59.9 175.1 | 52 50.3 +59.8 173.4 |
| 9°  | 54 00.0 +60.0 180.0 | 53 59.4 +60.0 178.3 | 53 57.5 +60.0 176.6 | 53 54.4 +59.9 175.0 | 53 50.1 +59.8 173.3 |
| 10° | 55 00.0 +60.0 180.0 | 54 59.4 +60.0 178.3 | 54 57.5 +59.9 176.6 | 54 54.3 +59.9 174.9 | 54 49.9 +59.7 173.2 |
| 11° | 56 00.0 +60.0 180.0 | 55 59.4 +59.9 178.2 | 55 57.4 +59.9 176.5 | 55 54.2 +59.8 174.7 | 55 49.6 +59.8 173.0 |
| 12° | 57 00.0 +60.0 180.0 | 56 59.3 +60.0 178.2 | 56 57.3 +60.0 176.4 | 56 54.0 +59.9 174.6 | 56 49.4 +59.7 172.8 |
| 13° | 58 00.0 +60.0 180.0 | 57 59.3 +60.0 178.2 | 57 57.3 +59.9 176.3 | 57 53.9 +59.8 174.5 | 57 49.1 +59.8 172.7 |
| 14° | 59 00.0 +60.0 180.0 | 58 59.3 +60.0 178.1 | 58 57.2 +59.9 176.2 | 58 53.7 +59.9 174.4 | 58 48.9 +59.7 172.5 |
| 15° | 60 00.0 +60.0 180.0 | 59 59.3 +60.0 178.1 | 59 57.1 +60.0 176.1 | 59 53.6 +59.8 174.2 | 59 48.6 +59.7 172.3 |
| 16° | 61 00.0 +60.0 180.0 | 60 59.3 +59.9 178.0 | 60 57.1 +59.9 176.0 | 60 53.4 +59.8 174.1 | 60 48.3 +59.7 172.1 |
| 17° | 62 00.0 +60.0 180.0 | 61 59.2 +60.0 178.0 | 61 57.0 +59.9 175.9 | 61 53.2 +59.8 173.9 | 61 48.0 +59.6 171.9 |
| 18° | 63 00.0 +60.0 180.0 | 62 59.2 +60.0 177.9 | 62 56.9 +59.9 175.8 | 62 53.0 +59.8 173.7 | 62 47.6 +59.7 171.7 |
| 19° | 64 00.0 +60.0 180.0 | 63 59.2 +60.0 177.8 | 63 56.8 +59.9 175.7 | 63 52.8 +59.8 173.5 | 63 47.3 +59.6 171.4 |
| 20° | 65 00.0 +60.0 180.0 | 64 59.2 +60.0 177.8 | 64 56.7 +59.9 175.6 | 64 52.6 +59.8 173.3 | 64 46.9 +59.6 171.2 |
| 21° | 66 00.0 +60.0 180.0 | 65 59.2 +59.9 177.7 | 65 56.6 +59.9 175.4 | 65 52.4 +59.7 173.1 | 65 46.5 +59.5 170.9 |
| 22° | 67 00.0 +60.0 180.0 | 66 59.1 +60.0 177.6 | 66 56.5 +59.9 175.3 | 66 52.1 +59.7 172.9 | 66 46.0 +59.5 170.6 |
| 23° | 68 00.0 +60.0 180.0 | 67 59.1 +60.0 177.5 | 67 56.4 +59.8 175.1 | 67 51.8 +59.7 172.7 | 67 45.5 +59.5 170.2 |
| 24° | 69 00.0 +60.0 180.0 | 68 59.1 +59.9 177.5 | 68 56.2 +59.9 174.9 | 68 51.5 +59.7 172.4 | 68 45.0 +59.4 169.9 |
| 25° | 70 00.0 +60.0 180.0 | 69 59.0 +60.0 177.4 | 69 56.1 +59.8 174.7 | 69 51.2 +59.6 172.1 | 69 44.4 +59.4 169.5 |
| 26° | 71 00.0 +60.0 180.0 | 70 59.0 +59.9 177.2 | 70 55.9 +59.8 174.5 | 70 50.8 +59.6 171.8 | 70 43.8 +59.3 169.0 |
| 27° | 72 00.0 +60.0 180.0 | 71 58.9 +60.0 177.1 | 71 55.7 +59.8 174.2 | 71 50.4 +59.6 171.4 | 71 43.1 +59.2 168.6 |
| 28° | 73 00.0 +60.0 180.0 | 72 58.9 +59.9 177.0 | 72 55.5 +59.8 174.0 | 72 50.0 +59.5 171.0 | 72 42.3 +59.1 168.0 |
| 29° | 74 00.0 +60.0 180.0 | 73 58.8 +60.0 176.8 | 73 55.3 +59.8 173.7 | 73 49.5 +59.4 170.5 | 73 41.4 +59.0 167.5 |

| 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°  | 44 46.9 +59.8 172.9 | 44 41.2 +59.7 171.5 | 44 34.5 +59.5 170.1 | 44 26.7 +59.4 168.8 | 44 17.9 +59.3 167.4 |
| 1°  | 45 46.7 +59.8 172.8 | 45 40.9 +59.6 171.4 | 45 34.0 +59.6 170.0 | 45 26.1 +59.4 168.6 | 45 17.2 +59.2 167.2 |
| 2°  | 46 46.5 +59.7 172.7 | 46 40.5 +59.7 171.2 | 46 33.6 +59.5 169.8 | 46 25.5 +59.4 168.4 | 46 16.4 +59.3 166.9 |
| 3°  | 47 46.2 +59.8 172.6 | 47 40.2 +59.6 171.1 | 47 33.1 +59.5 169.6 | 47 24.9 +59.3 168.1 | 47 15.7 +59.1 166.7 |
| 4°  | 48 46.0 +59.7 172.4 | 48 39.8 +59.6 170.9 | 48 32.6 +59.5 169.4 | 48 24.2 +59.4 167.9 | 48 14.8 +59.2 166.4 |
| 5°  | 49 45.7 +59.7 172.3 | 49 39.4 +59.6 170.7 | 49 32.1 +59.4 169.2 | 49 23.6 +59.3 167.7 | 49 14.0 +59.1 166.2 |
| 6°  | 50 45.4 +59.7 172.1 | 50 39.0 +59.6 170.6 | 50 31.5 +59.4 169.0 | 50 22.9 +59.2 167.5 | 50 13.1 +59.1 165.9 |
| 7°  | 51 45.1 +59.7 172.0 | 51 38.6 +59.6 170.4 | 51 30.9 +59.5 168.8 | 51 22.1 +59.3 167.2 | 51 12.2 +59.0 165.7 |
| 8°  | 52 44.8 +59.7 171.8 | 52 38.2 +59.5 170.2 | 52 30.4 +59.3 168.6 | 52 21.4 +59.2 167.0 | 52 11.2 +59.0 165.4 |
| 9°  | 53 44.5 +59.7 171.6 | 53 37.7 +59.5 170.0 | 53 29.7 +59.4 168.3 | 53 20.6 +59.1 166.7 | 53 10.2 +59.0 165.1 |
| 10° | 54 44.2 +59.6 171.5 | 54 37.2 +59.5 169.8 | 54 29.1 +59.3 168.1 | 54 19.7 +59.1 166.4 | 54 09.2 +58.8 164.7 |
| 11° | 55 43.8 +59.6 171.3 | 55 36.7 +59.5 169.5 | 55 28.4 +59.3 167.8 | 55 18.8 +59.1 166.1 | 55 08.0 +58.9 164.4 |
| 12° | 56 43.4 +59.7 171.1 | 56 36.2 +59.5 169.3 | 56 27.7 +59.2 167.5 | 56 17.9 +59.0 165.8 | 56 06.9 +58.8 164.1 |
| 13° | 57 43.1 +59.5 170.9 | 57 35.7 +59.4 169.0 | 57 26.9 +59.2 167.3 | 57 16.9 +59.0 165.5 | 57 05.7 +58.7 163.7 |
| 14° | 58 42.6 +59.6 170.6 | 58 35.1 +59.3 168.8 | 58 26.1 +59.2 166.9 | 58 15.9 +58.9 165.1 | 58 04.4 +58.6 163.3 |
| 15° | 59 42.2 +59.5 170.4 | 59 34.4 +59.4 168.5 | 59 25.3 +59.1 166.6 | 59 14.8 +58.9 164.8 | 59 03.0 +58.6 162.9 |
| 16° | 60 41.7 +59.6 170.1 | 60 33.8 +59.3 168.2 | 60 24.4 +59.1 166.3 | 60 13.7 +58.7 164.4 | 60 01.6 +58.4 162.5 |
| 17° | 61 41.3 +59.4 169.9 | 61 33.1 +59.2 167.9 | 61 23.5 +58.9 165.9 | 61 12.4 +58.7 164.0 | 61 00.0 +58.4 162.0 |
| 18° | 62 40.7 +59.5 169.6 | 62 32.3 +59.2 167.6 | 62 22.4 +59.0 165.5 | 62 11.1 +58.6 163.5 | 61 58.4 +58.2 161.5 |
| 19° | 63 40.2 +59.4 169.3 | 63 31.5 +59.2 167.2 | 63 21.4 +58.8 165.1 | 63 09.7 +58.5 163.1 | 62 56.6 +58.2 161.0 |
| 20° | 64 39.6 +59.3 169.0 | 64 30.7 +59.0 166.8 | 64 20.2 +58.8 164.7 | 64 08.2 +58.4 162.6 | 63 54.8 +58.0 160.5 |
| 21° | 65 38.9 +59.3 168.6 | 65 29.7 +59.0 166.4 | 65 19.0 +58.6 164.2 | 65 06.6 +58.3 162.0 | 64 52.8 +57.8 159.9 |
| 22° | 66 38.2 +59.3 168.2 | 66 28.7 +59.0 165.9 | 66 17.6 +58.6 163.7 | 66 04.9 +58.1 161.4 | 65 50.6 +57.7 159.2 |
| 23° | 67 37.5 +59.1 167.8 | 67 27.7 +58.8 165.5 | 67 16.2 +58.4 163.1 | 67 03.0 +58.0 160.8 | 66 48.3 +57.5 158.6 |
| 24° | 68 36.6 +59.1 167.4 | 68 26.5 +58.7 164.9 | 68 14.6 +58.3 162.5 | 68 01.0 +57.8 160.1 | 67 45.8 +57.3 157.8 |
| 25° | 69 35.7 +59.0 166.9 | 69 25.2 +58.6 164.4 | 69 12.9 +58.1 161.9 | 68 58.8 +57.6 159.4 | 68 43.1 +57.0 157.0 |
| 26° | 70 34.7 +58.9 166.4 | 70 23.8 +58.4 163.7 | 70 11.0 +57.9 161.1 | 69 56.4 +57.3 158.6 | 69 40.1 +56.7 156.1 |
| 27° | 71 33.6 +58.8 165.8 | 71 22.2 +58.3 163.0 | 71 08.9 +57.7 160.4 | 70 53.7 +57.1 157.7 | 70 36.8 +56.4 155.2 |
| 28° | 72 32.4 +58.7 165.1 | 72 20.5 +58.1 162.3 | 72 06.6 +57.5 159.5 | 71 50.8 +56.8 156.8 | 71 33.2 +56.0 154.1 |
| 29° | 73 31.1 +58.5 164.4 | 73 18.6 +57.9 161.4 | 73 04.1 +57.1 158.5 | 72 47.6 +56.4 155.7 | 72 29.2 +55.6 153.0 |

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The data on this page is believed to be accurate but no warranty is given for it's correctness. Use it only for training and exercising!

| 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°  | 44 08.2 +59.1 166.0 | 43 57.4 +58.9 164.6 | 43 45.7 +58.7 163.3 | 43 33.0 +58.5 161.9 | 43 19.3 +58.3 160.6 |
| 1°  | 45 07.3 +59.0 165.8 | 44 56.3 +58.9 164.4 | 44 44.4 +58.7 163.0 | 44 31.5 +58.5 161.6 | 44 17.6 +58.3 160.2 |
| 2°  | 46 06.3 +59.1 165.5 | 45 55.2 +58.8 164.1 | 45 43.1 +58.6 162.7 | 45 30.0 +58.4 161.3 | 45 15.9 +58.1 159.9 |
| 3°  | 47 05.4 +59.0 165.2 | 46 54.0 +58.8 163.8 | 46 41.7 +58.6 162.4 | 46 28.4 +58.3 161.0 | 46 14.0 +58.1 159.6 |
| 4°  | 48 04.4 +58.9 165.0 | 47 52.8 +58.8 163.5 | 47 40.3 +58.5 162.1 | 47 26.7 +58.3 160.6 | 47 12.1 +58.1 159.2 |
| 5°  | 49 03.3 +58.9 164.7 | 48 51.6 +58.7 163.2 | 48 38.8 +58.5 161.7 | 48 25.0 +58.2 160.3 | 48 10.2 +57.9 158.8 |
| 6°  | 50 02.2 +58.9 164.4 | 49 50.3 +58.6 162.9 | 49 37.3 +58.4 161.4 | 49 23.2 +58.2 159.9 | 49 08.1 +57.9 158.4 |
| 7°  | 51 01.1 +58.8 164.1 | 50 48.9 +58.6 162.6 | 50 35.7 +58.3 161.0 | 50 21.4 +58.0 159.5 | 50 06.0 +57.8 158.0 |
| 8°  | 51 59.9 +58.8 163.8 | 51 47.5 +58.5 162.2 | 51 34.0 +58.3 160.7 | 51 19.4 +58.0 159.1 | 51 03.8 +57.7 157.6 |
| 9°  | 52 58.7 +58.7 163.5 | 52 46.0 +58.5 161.9 | 52 32.3 +58.2 160.3 | 52 17.4 +57.9 158.7 | 52 01.5 +57.5 157.2 |
| 10° | 53 57.4 +58.6 163.1 | 53 44.5 +58.4 161.5 | 53 30.5 +58.0 159.9 | 53 15.3 +57.8 158.3 | 52 59.0 +57.5 156.7 |
| 11° | 54 56.0 +58.6 162.7 | 54 42.9 +58.3 161.1 | 54 28.5 +58.0 159.4 | 54 13.1 +57.7 157.8 | 53 56.5 +57.4 156.2 |
| 12° | 55 54.6 +58.5 162.4 | 55 41.2 +58.2 160.7 | 55 26.5 +57.9 159.0 | 55 10.8 +57.5 157.3 | 54 53.9 +57.2 155.7 |
| 13° | 56 53.1 +58.5 162.0 | 56 39.4 +58.1 160.2 | 56 24.4 +57.8 158.5 | 56 08.3 +57.5 156.8 | 55 51.1 +57.0 155.2 |
| 14° | 57 51.6 +58.3 161.5 | 57 37.5 +58.0 159.8 | 57 22.2 +57.7 158.0 | 57 05.8 +57.3 156.3 | 56 48.1 +57.0 154.6 |
| 15° | 58 49.9 +58.2 161.1 | 58 35.5 +57.9 159.3 | 58 19.9 +57.5 157.5 | 58 03.1 +57.1 155.8 | 57 45.1 +56.7 154.0 |
| 16° | 59 48.1 +58.2 160.6 | 59 33.4 +57.8 158.8 | 59 17.4 +57.4 157.0 | 59 00.2 +57.0 155.2 | 58 41.8 +56.6 153.4 |
| 17° | 60 46.3 +58.0 160.1 | 60 31.2 +57.6 158.2 | 60 14.8 +57.2 156.4 | 59 57.2 +56.8 154.6 | 59 38.4 +56.3 152.8 |
| 18° | 61 44.3 +57.8 159.6 | 61 28.8 +57.5 157.7 | 61 12.0 +57.1 155.8 | 60 54.0 +56.6 153.9 | 60 34.7 +56.1 152.1 |
| 19° | 62 42.1 +57.8 159.0 | 62 26.3 +57.3 157.1 | 62 09.1 +56.8 155.1 | 61 50.6 +56.4 153.2 | 61 30.8 +55.9 151.3 |
| 20° | 63 39.9 +57.6 158.4 | 63 23.6 +57.1 156.4 | 63 05.9 +56.7 154.4 | 62 47.0 +56.1 152.5 | 62 26.7 +55.6 150.6 |
| 21° | 64 37.5 +57.3 157.8 | 64 20.7 +56.9 155.7 | 64 02.6 +56.3 153.7 | 63 43.1 +55.8 151.7 | 63 22.3 +55.3 149.7 |
| 22° | 65 34.8 +57.2 157.1 | 65 17.6 +56.7 155.0 | 64 58.9 +56.2 152.9 | 64 38.9 +55.6 150.8 | 64 17.6 +55.0 148.9 |
| 23° | 66 32.0 +57.0 156.3 | 66 14.3 +56.4 154.2 | 65 55.1 +55.8 152.0 | 65 34.5 +55.2 149.9 | 65 12.6 +54.6 147.9 |
| 24° | 67 29.0 +56.7 155.5 | 67 10.7 +56.1 153.3 | 66 50.9 +55.4 151.1 | 66 29.7 +54.8 149.0 | 66 07.2 +54.1 146.9 |
| 25° | 68 25.7 +56.4 154.7 | 68 06.8 +55.7 152.4 | 67 46.3 +55.1 150.1 | 67 24.5 +54.4 147.9 | 67 01.3 +53.7 145.8 |
| 26° | 69 22.1 +56.0 153.7 | 69 02.5 +55.4 151.3 | 68 41.4 +54.7 149.1 | 68 18.9 +53.9 146.8 | 67 55.0 +53.2 144.7 |
| 27° | 70 18.1 +55.7 152.7 | 69 57.9 +54.9 150.2 | 69 36.1 +54.1 147.9 | 69 12.8 +53.4 145.6 | 68 48.2 +52.5 143.4 |
| 28° | 71 13.8 +55.2 151.5 | 70 52.8 +54.4 149.0 | 70 30.2 +53.6 146.6 | 70 06.2 +52.7 144.3 | 69 40.7 +51.9 142.0 |
| 29° | 72 09.0 +54.7 150.3 | 71 47.2 +53.8 147.7 | 71 23.8 +52.9 145.2 | 70 58.9 +52.0 142.9 | 70 32.6 +51.0 140.6 |

| 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°  | 43 04.8 +58.0 159.2 | 42 49.3 +57.8 157.9 | 42 32.9 +57.5 156.6 | 42 15.6 +57.3 155.3 | 41 57.5 +57.0 154.0 |
| 1°  | 44 02.8 +58.0 158.9 | 43 47.1 +57.7 157.6 | 43 30.4 +57.5 156.2 | 43 12.9 +57.2 154.9 | 42 54.5 +56.9 153.6 |
| 2°  | 45 00.8 +57.9 158.5 | 44 44.8 +57.7 157.2 | 44 27.9 +57.4 155.8 | 44 10.1 +57.1 154.5 | 43 51.4 +56.8 153.2 |
| 3°  | 45 58.7 +57.9 158.2 | 45 42.5 +57.6 156.8 | 45 25.3 +57.3 155.4 | 45 07.2 +57.0 154.1 | 44 48.2 +56.7 152.7 |
| 4°  | 46 56.6 +57.7 157.8 | 46 40.1 +57.4 156.4 | 46 22.6 +57.2 155.0 | 46 04.2 +56.9 153.6 | 45 44.9 +56.6 152.3 |
| 5°  | 47 54.3 +57.7 157.4 | 47 37.5 +57.4 156.0 | 47 19.8 +57.1 154.5 | 47 01.1 +56.8 153.2 | 46 41.5 +56.4 151.8 |
| 6°  | 48 52.0 +57.6 157.0 | 48 34.9 +57.3 155.5 | 48 16.9 +56.9 154.1 | 47 57.9 +56.6 152.7 | 47 37.9 +56.3 151.3 |
| 7°  | 49 49.6 +57.5 156.5 | 49 32.2 +57.2 155.1 | 49 13.8 +56.9 153.6 | 48 54.5 +56.5 152.2 | 48 34.2 +56.2 150.8 |
| 8°  | 50 47.1 +57.4 156.1 | 50 29.4 +57.0 154.6 | 50 10.7 +56.7 153.1 | 49 51.0 +56.4 151.7 | 49 30.4 +56.0 150.2 |
| 9°  | 51 44.5 +57.2 155.6 | 51 26.4 +57.0 154.1 | 51 07.4 +56.6 152.6 | 50 47.4 +56.2 151.1 | 50 26.4 +55.9 149.7 |
| 10° | 52 41.7 +57.2 155.1 | 52 23.4 +56.7 153.6 | 52 04.0 +56.4 152.1 | 51 43.6 +56.1 150.6 | 51 22.3 +55.7 149.1 |
| 11° | 53 38.9 +57.0 154.6 | 53 20.1 +56.7 153.1 | 53 00.4 +56.3 151.5 | 52 39.7 +55.9 150.0 | 52 18.0 +55.5 148.5 |
| 12° | 54 35.9 +56.8 154.1 | 54 16.8 +56.5 152.5 | 53 56.7 +56.1 150.9 | 53 35.6 +55.7 149.4 | 53 13.5 +55.3 147.9 |
| 13° | 55 32.7 +56.7 153.5 | 55 13.3 +56.3 151.9 | 54 52.8 +55.9 150.3 | 54 31.3 +55.4 148.8 | 54 08.8 +55.0 147.2 |
| 14° | 56 29.4 +56.5 152.9 | 56 09.6 +56.1 151.3 | 55 48.7 +55.6 149.7 | 55 26.7 +55.3 148.1 | 55 03.8 +54.8 146.5 |
| 15° | 57 25.9 +56.3 152.3 | 57 05.7 +55.9 150.7 | 56 44.3 +55.5 149.0 | 56 22.0 +55.0 147.4 | 55 58.6 +54.6 145.8 |
| 16° | 58 22.2 +56.2 151.7 | 58 01.6 +55.6 150.0 | 57 39.8 +55.2 148.3 | 57 17.0 +54.7 146.7 | 56 53.2 +54.2 145.0 |
| 17° | 59 18.4 +55.9 151.0 | 58 57.2 +55.5 149.3 | 58 35.0 +54.9 147.6 | 58 11.7 +54.5 145.9 | 57 47.4 +54.0 144.3 |
| 18° | 60 14.3 +55.6 150.3 | 59 52.7 +55.1 148.5 | 59 29.9 +54.7 146.8 | 59 06.2 +54.1 145.1 | 58 41.4 +53.6 143.4 |
| 19° | 61 09.9 +55.4 149.5 | 60 47.8 +54.9 147.7 | 60 24.6 +54.3 146.0 | 60 00.3 +53.8 144.2 | 59 35.0 +53.3 142.6 |
| 20° | 62 05.3 +55.0 148.7 | 61 42.7 +54.5 146.9 | 61 18.9 +54.0 145.1 | 60 54.1 +53.4 143.3 | 60 28.3 +52.8 141.6 |
| 21° | 63 00.3 +54.8 147.8 | 62 37.2 +54.1 146.0 | 62 12.9 +53.6 144.2 | 61 47.5 +53.0 142.4 | 61 21.1 +52.4 140.7 |
| 22° | 63 55.1 +54.3 146.9 | 63 31.3 +53.8 145.0 | 63 06.5 +53.1 143.2 | 62 40.5 +52.5 141.4 | 62 13.5 +51.9 139.6 |
| 23° | 64 49.4 +54.0 145.9 | 64 25.1 +53.3 144.0 | 63 59.6 +52.7 142.1 | 63 33.0 +52.0 140.3 | 63 05.4 +51.4 138.5 |
| 24° | 65 43.4 +53.5 144.9 | 65 18.4 +52.8 142.9 | 64 52.3 +52.1 141.0 | 64 25.0 +51.5 139.2 | 63 56.8 +50.8 137.4 |
| 25° | 66 36.9 +53.0 143.8 | 66 11.2 +52.3 141.8 | 65 44.4 +51.5 139.8 | 65 16.5 +50.8 138.0 | 64 47.6 +50.1 136.1 |
| 26° | 67 29.9 +52.3 142.6 | 67 03.5 +51.6 140.5 | 66 35.9 +50.9 138.6 | 66 07.3 +50.2 136.7 | 65 37.7 +49.5 134.8 |
| 27° | 68 22.2 +51.8 141.3 | 67 55.1 +51.0 139.2 | 67 26.8 +50.2 137.2 | 66 57.5 +49.4 135.3 | 66 27.2 +48.6 133.4 |
| 28° | 69 14.0 +51.0 139.9 | 68 46.1 +50.1 137.8 | 68 17.0 +49.3 135.8 | 67 46.9 +48.5 133.8 | 67 15.8 +47.7 131.9 |
| 29° | 70 05.0 +50.2 138.4 | 69 36.2 +49.3 136.2 | 69 06.3 +48.4 134.2 | 68 35.4 +47.6 132.2 | 68 03.5 +46.8 130.4 |

# Declination SAME name as Latitude

# Latitude 45°

| 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°  | 41 38.5 +56.7 152.8 | 41 18.6 +56.5 151.5 | 40 58.0 +56.1 150.3 | 40 36.5 +55.9 149.0 | 40 14.3 +55.5 147.8 |
| 1°  | 42 35.2 +56.6 152.3 | 42 15.1 +56.3 151.0 | 41 54.1 +56.0 149.8 | 41 32.4 +55.7 148.5 | 41 09.8 +55.4 147.3 |
| 2°  | 43 31.8 +56.5 151.9 | 43 11.4 +56.2 150.6 | 42 50.1 +55.9 149.3 | 42 28.1 +55.5 148.0 | 42 05.2 +55.3 146.8 |
| 3°  | 44 28.3 +56.4 151.4 | 44 07.6 +56.1 150.1 | 43 46.0 +55.8 148.8 | 43 23.6 +55.5 147.5 | 43 00.5 +55.0 146.3 |
| 4°  | 45 24.7 +56.3 150.9 | 45 03.7 +55.9 149.6 | 44 41.8 +55.6 148.3 | 44 19.1 +55.2 147.0 | 43 55.5 +55.0 145.7 |
| 5°  | 46 21.0 +56.1 150.4 | 45 59.6 +55.8 149.1 | 45 37.4 +55.4 147.8 | 45 14.3 +55.1 146.4 | 44 50.5 +54.7 145.1 |
| 6°  | 47 17.1 +56.0 149.9 | 46 55.4 +55.6 148.5 | 46 32.8 +55.3 147.2 | 46 09.4 +55.0 145.9 | 45 45.2 +54.6 144.6 |
| 7°  | 48 13.1 +55.8 149.4 | 47 51.0 +55.5 148.0 | 47 28.1 +55.1 146.6 | 47 04.4 +54.7 145.3 | 46 39.8 +54.4 144.0 |
| 8°  | 49 08.9 +55.7 148.8 | 48 46.5 +55.3 147.4 | 48 23.2 +54.9 146.0 | 47 59.1 +54.6 144.7 | 47 34.2 +54.1 143.3 |
| 9°  | 50 04.6 +55.5 148.2 | 49 41.8 +55.1 146.8 | 49 18.1 +54.8 145.4 | 48 53.7 +54.3 144.1 | 48 28.3 +54.0 142.7 |
| 10° | 51 00.1 +55.3 147.6 | 50 36.9 +54.9 146.2 | 50 12.9 +54.5 144.8 | 49 48.0 +54.1 143.4 | 49 22.3 +53.7 142.0 |
| 11° | 51 55.4 +55.0 147.0 | 51 31.8 +54.7 145.6 | 51 07.4 +54.3 144.1 | 50 42.1 +53.9 142.7 | 50 16.0 +53.5 141.3 |
| 12° | 52 50.4 +54.9 146.4 | 52 26.5 +54.4 144.9 | 52 01.7 +54.0 143.4 | 51 36.0 +53.6 142.0 | 51 09.5 +53.1 140.6 |
| 13° | 53 45.3 +54.6 145.7 | 53 20.9 +54.2 144.2 | 52 55.7 +53.7 142.7 | 52 29.6 +53.3 141.3 | 52 02.6 +52.9 139.9 |
| 14° | 54 39.9 +54.4 145.0 | 54 15.1 +54.0 143.5 | 53 49.4 +53.5 142.0 | 53 22.9 +53.0 140.5 | 52 55.5 +52.6 139.1 |
| 15° | 55 34.3 +54.1 144.2 | 55 09.1 +53.6 142.7 | 54 42.9 +53.2 141.2 | 54 15.9 +52.7 139.7 | 53 48.1 +52.2 138.3 |
| 16° | 56 28.4 +53.8 143.5 | 56 02.7 +53.3 141.9 | 55 36.1 +52.8 140.4 | 55 08.6 +52.4 138.9 | 54 40.3 +51.9 137.5 |
| 17° | 57 22.2 +53.4 142.7 | 56 56.0 +52.9 141.1 | 56 28.9 +52.5 139.6 | 56 01.0 +51.9 138.0 | 55 32.2 +51.5 136.6 |
| 18° | 58 15.6 +53.1 141.8 | 57 48.9 +52.6 140.2 | 57 21.4 +52.0 138.7 | 56 52.9 +51.6 137.1 | 56 23.7 +51.0 135.7 |
| 19° | 59 08.7 +52.7 140.9 | 58 41.5 +52.2 139.3 | 58 13.4 +51.7 137.7 | 57 44.5 +51.1 136.2 | 57 14.7 +50.6 134.7 |
| 20° | 60 01.4 +52.3 140.0 | 59 33.7 +51.7 138.3 | 59 05.1 +51.1 136.8 | 58 35.6 +50.6 135.2 | 58 05.3 +50.1 133.7 |
| 21° | 60 53.7 +51.8 139.0 | 60 25.4 +51.3 137.3 | 59 56.2 +50.7 135.7 | 59 26.2 +50.1 134.2 | 58 55.4 +49.5 132.6 |
| 22° | 61 45.5 +51.4 137.9 | 61 16.7 +50.7 136.3 | 60 46.9 +50.1 134.6 | 60 16.3 +49.5 133.1 | 59 44.9 +49.0 131.5 |
| 23° | 62 36.9 +50.7 136.8 | 62 07.4 +50.1 135.1 | 61 37.0 +49.5 133.5 | 61 05.8 +48.9 131.9 | 60 33.9 +48.3 130.4 |
| 24° | 63 27.6 +50.1 135.6 | 62 57.5 +49.5 133.9 | 62 26.5 +48.9 132.3 | 61 54.7 +48.3 130.7 | 61 22.2 +47.6 129.2 |
| 25° | 64 17.7 +49.5 134.4 | 63 47.0 +48.8 132.7 | 63 15.4 +48.1 131.0 | 62 43.0 +47.5 129.4 | 62 09.8 +46.9 127.9 |
| 26° | 65 07.2 +48.7 133.1 | 64 35.8 +48.0 131.3 | 64 03.5 +47.3 129.7 | 63 30.5 +46.7 128.1 | 62 56.7 +46.1 126.5 |
| 27° | 65 55.9 +47.9 131.6 | 65 23.8 +47.2 129.9 | 64 50.8 +46.5 128.3 | 64 17.2 +45.8 126.6 | 63 42.8 +45.1 125.1 |
| 28° | 66 43.8 +47.0 130.1 | 66 11.0 +46.2 128.4 | 65 37.3 +45.5 126.7 | 65 03.0 +44.8 125.1 | 64 27.9 +44.2 123.6 |
| 29° | 67 30.8 +45.9 128.5 | 66 57.2 +45.2 126.8 | 66 22.8 +44.5 125.1 | 65 47.8 +43.8 123.5 | 65 12.1 +43.2 122.0 |

| 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°  | 39 51.3 +55.2 146.6 | 39 27.6 +54.9 145.4 | 39 03.2 +54.5 144.2 | 38 38.0 +54.3 143.1 | 38 12.2 +53.9 141.9 |
| 1°  | 40 46.5 +55.1 146.1 | 40 22.5 +54.7 144.9 | 39 57.7 +54.4 143.7 | 39 32.3 +54.0 142.5 | 39 06.1 +53.7 141.3 |
| 2°  | 41 41.6 +54.9 145.6 | 41 17.2 +54.6 144.3 | 40 52.1 +54.3 143.1 | 40 26.3 +53.9 141.9 | 39 59.8 +53.6 140.8 |
| 3°  | 42 36.5 +54.8 145.0 | 42 11.8 +54.4 143.8 | 41 46.4 +54.0 142.6 | 41 20.2 +53.8 141.4 | 40 53.4 +53.4 140.2 |
| 4°  | 43 31.3 +54.5 144.5 | 43 06.2 +54.3 143.2 | 42 40.4 +53.9 142.0 | 42 14.0 +53.5 140.8 | 41 46.8 +53.2 139.6 |
| 5°  | 44 25.8 +54.4 143.9 | 44 00.5 +54.0 142.6 | 43 34.3 +53.7 141.4 | 43 07.5 +53.3 140.1 | 42 40.0 +52.9 138.9 |
| 6°  | 45 20.2 +54.3 143.3 | 44 54.5 +53.8 142.0 | 44 28.0 +53.5 140.8 | 44 00.8 +53.1 139.5 | 43 32.9 +52.8 138.3 |
| 7°  | 46 14.5 +54.0 142.7 | 45 48.3 +53.7 141.4 | 45 21.5 +53.3 140.1 | 44 53.9 +52.9 138.9 | 44 25.7 +52.5 137.6 |
| 8°  | 47 08.5 +53.7 142.0 | 46 42.0 +53.4 140.7 | 46 14.8 +53.0 139.5 | 45 46.8 +52.7 138.2 | 45 18.2 +52.3 137.0 |
| 9°  | 48 02.2 +53.6 141.4 | 47 35.4 +53.1 140.1 | 47 07.8 +52.8 138.8 | 46 39.5 +52.4 137.5 | 46 10.5 +52.0 136.3 |
| 10° | 48 55.8 +53.3 140.7 | 48 28.5 +53.0 139.4 | 48 00.6 +52.5 138.1 | 47 31.9 +52.1 136.8 | 47 02.5 +51.7 135.5 |
| 11° | 49 49.1 +53.1 140.0 | 49 21.5 +52.6 138.6 | 48 53.1 +52.2 137.3 | 48 24.0 +51.8 136.0 | 47 54.2 +51.4 134.8 |
| 12° | 50 42.2 +52.7 139.3 | 50 14.1 +52.3 137.9 | 49 45.3 +51.9 136.6 | 49 15.8 +51.5 135.3 | 48 45.6 +51.1 134.0 |
| 13° | 51 34.9 +52.5 138.5 | 51 06.4 +52.0 137.1 | 50 37.2 +51.6 135.8 | 50 07.3 +51.1 134.5 | 49 36.7 +50.7 133.2 |
| 14° | 52 27.4 +52.1 137.7 | 51 58.4 +51.7 136.3 | 51 28.8 +51.2 135.0 | 50 58.4 +50.8 133.7 | 50 27.4 +50.4 132.4 |
| 15° | 53 19.5 +51.7 136.9 | 52 50.1 +51.3 135.5 | 52 20.0 +50.9 134.1 | 51 49.2 +50.4 132.8 | 51 17.8 +50.0 131.5 |
| 16° | 54 11.2 +51.4 136.0 | 53 41.4 +50.9 134.6 | 53 10.9 +50.4 133.3 | 52 39.6 +50.0 131.9 | 52 07.8 +49.5 130.6 |
| 17° | 55 02.6 +51.0 135.1 | 54 32.3 +50.5 133.7 | 54 01.3 +50.1 132.4 | 53 29.6 +49.6 131.0 | 52 57.3 +49.1 129.7 |
| 18° | 55 53.6 +50.6 134.2 | 55 22.8 +50.1 132.8 | 54 51.4 +49.5 131.4 | 54 19.2 +49.1 130.0 | 53 46.4 +48.6 128.7 |
| 19° | 56 44.2 +50.0 133.2 | 56 12.9 +49.6 131.8 | 55 40.9 +49.1 130.4 | 55 08.3 +48.6 129.1 | 54 35.0 +48.2 127.7 |
| 20° | 57 34.2 +49.6 132.2 | 57 02.5 +49.0 130.8 | 56 30.0 +48.5 129.4 | 55 56.9 +48.0 128.0 | 55 23.2 +47.5 126.7 |
| 21° | 58 23.8 +49.0 131.2 | 57 51.5 +48.5 129.7 | 57 18.5 +48.0 128.3 | 56 44.9 +47.5 126.9 | 56 10.7 +47.0 125.6 |
| 22° | 59 12.8 +48.4 130.0 | 58 40.0 +47.8 128.6 | 58 06.5 +47.3 127.2 | 57 32.4 +46.8 125.8 | 56 57.7 +46.3 124.5 |
| 23° | 60 01.2 +47.8 128.9 | 59 27.8 +47.2 127.4 | 58 53.8 +46.7 126.0 | 58 19.2 +46.1 124.6 | 57 44.0 +45.7 123.3 |
| 24° | 60 49.0 +47.0 127.6 | 60 15.0 +46.5 126.2 | 59 40.5 +45.9 124.8 | 59 05.3 +45.5 123.4 | 58 29.7 +44.9 122.1 |
| 25° | 61 36.0 +46.3 126.4 | 61 01.5 +45.7 124.9 | 60 26.4 +45.2 123.5 | 59 50.8 +44.6 122.1 | 59 14.6 +44.1 120.8 |
| 26° | 62 22.3 +45.4 125.0 | 61 47.2 +44.9 123.5 | 61 11.6 +44.3 122.1 | 60 35.4 +43.8 120.8 | 59 58.7 +43.3 119.4 |
| 27° | 63 07.7 +44.6 123.6 | 62 32.1 +44.0 122.1 | 61 55.9 +43.4 120.7 | 61 19.2 +42.8 119.4 | 60 42.0 +42.3 118.0 |
| 28° | 63 52.3 +43.6 122.1 | 63 16.1 +42.9 120.6 | 62 39.3 +42.4 119.2 | 62 02.0 +41.9 117.9 | 61 24.3 +41.4 116.6 |
| 29° | 64 35.9 +42.5 120.5 | 63 59.0 +41.9 119.1 | 63 21.7 +41.3 117.7 | 62 43.9 +40.8 116.3 | 62 05.7 +40.3 115.0 |

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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°  | 37 45.7 +53.6 140.8 | 37 18.5 +53.3 139.6 | 36 50.7 +53.0 138.5 | 36 22.3 +52.6 137.4 | 35 53.3 +52.3 136.4 |
| 1°  | 38 39.3 +53.4 140.2 | 38 11.8 +53.1 139.1 | 37 43.7 +52.7 137.9 | 37 14.9 +52.5 136.8 | 36 45.6 +52.1 135.7 |
| 2°  | 39 32.7 +53.2 139.6 | 39 04.9 +52.8 138.5 | 38 36.4 +52.6 137.3 | 38 07.4 +52.2 136.2 | 37 37.7 +51.9 135.1 |
| 3°  | 40 25.9 +53.0 139.0 | 39 57.7 +52.7 137.9 | 39 29.0 +52.3 136.7 | 38 59.6 +52.0 135.6 | 38 29.6 +51.7 134.5 |
| 4°  | 41 18.9 +52.9 138.4 | 40 50.4 +52.5 137.2 | 40 21.3 +52.2 136.1 | 39 51.6 +51.8 134.9 | 39 21.3 +51.4 133.8 |
| 5°  | 42 11.8 +52.6 137.8 | 41 42.9 +52.3 136.6 | 41 13.5 +51.9 135.4 | 40 43.4 +51.5 134.3 | 40 12.7 +51.2 133.2 |
| 6°  | 43 04.4 +52.4 137.1 | 42 35.2 +52.0 135.9 | 42 05.4 +51.6 134.8 | 41 34.9 +51.3 133.6 | 41 03.9 +51.0 132.5 |
| 7°  | 43 56.8 +52.1 136.4 | 43 27.2 +51.8 135.2 | 42 57.0 +51.4 134.1 | 42 26.2 +51.1 132.9 | 41 54.9 +50.7 131.8 |
| 8°  | 44 48.9 +51.9 135.7 | 44 19.0 +51.5 134.5 | 43 48.4 +51.2 133.4 | 43 17.3 +50.8 132.2 | 42 45.6 +50.4 131.0 |
| 9°  | 45 40.8 +51.6 135.0 | 45 10.5 +51.2 133.8 | 44 39.6 +50.8 132.6 | 44 08.1 +50.4 131.5 | 43 36.0 +50.1 130.3 |
| 10° | 46 32.4 +51.3 134.3 | 46 01.7 +51.0 133.1 | 45 30.4 +50.6 131.9 | 44 58.5 +50.2 130.7 | 44 26.1 +49.8 129.5 |
| 11° | 47 23.7 +51.0 133.5 | 46 52.7 +50.6 132.3 | 46 21.0 +50.2 131.1 | 45 48.7 +49.9 129.9 | 45 15.9 +49.5 128.7 |
| 12° | 48 14.7 +50.7 132.7 | 47 43.3 +50.2 131.5 | 47 11.2 +49.9 130.3 | 46 38.6 +49.5 129.1 | 46 05.4 +49.1 127.9 |
| 13° | 49 05.4 +50.3 131.9 | 48 33.5 +50.0 130.7 | 48 01.1 +49.5 129.5 | 47 28.1 +49.1 128.3 | 46 54.5 +48.7 127.1 |
| 14° | 49 55.7 +50.0 131.1 | 49 23.5 +49.5 129.8 | 48 50.6 +49.1 128.6 | 48 17.2 +48.7 127.4 | 47 43.2 +48.4 126.2 |
| 15° | 50 45.7 +49.5 130.2 | 50 13.0 +49.1 129.0 | 49 39.7 +48.7 127.7 | 49 05.9 +48.3 126.5 | 48 31.6 +47.9 125.4 |
| 16° | 51 35.2 +49.2 129.3 | 51 02.1 +48.7 128.1 | 50 28.4 +48.3 126.8 | 49 54.2 +47.9 125.6 | 49 19.5 +47.4 124.4 |
| 17° | 52 24.4 +48.6 128.4 | 51 50.8 +48.2 127.1 | 51 16.7 +47.8 125.9 | 50 42.1 +47.4 124.7 | 50 06.9 +47.0 123.5 |
| 18° | 53 13.0 +48.2 127.4 | 52 39.0 +47.8 126.2 | 52 04.5 +47.3 124.9 | 51 29.5 +46.9 123.7 | 50 53.9 +46.5 122.5 |
| 19° | 54 01.2 +47.6 126.4 | 53 26.8 +47.2 125.1 | 52 51.8 +46.8 123.9 | 52 16.4 +46.3 122.7 | 51 40.4 +46.0 121.5 |
| 20° | 54 48.8 +47.1 125.4 | 54 14.0 +46.6 124.1 | 53 38.6 +46.2 122.9 | 53 02.7 +45.8 121.6 | 52 26.4 +45.3 120.5 |
| 21° | 55 35.9 +46.5 124.3 | 55 00.6 +46.1 123.0 | 54 24.8 +45.6 121.8 | 53 48.5 +45.2 120.6 | 53 11.7 +44.8 119.4 |
| 22° | 56 22.4 +45.9 123.2 | 55 46.7 +45.3 121.9 | 55 10.4 +44.9 120.6 | 54 33.7 +44.5 119.4 | 53 56.5 +44.1 118.3 |
| 23° | 57 08.3 +45.1 122.0 | 56 32.0 +44.7 120.7 | 55 55.3 +44.3 119.5 | 55 18.2 +43.8 118.3 | 54 40.6 +43.4 117.1 |
| 24° | 57 53.4 +44.5 120.8 | 57 16.7 +44.0 119.5 | 56 39.6 +43.5 118.3 | 56 02.0 +43.1 117.1 | 55 24.0 +42.7 115.9 |
| 25° | 58 37.9 +43.6 119.5 | 58 00.7 +43.2 118.2 | 57 23.1 +42.7 117.0 | 56 45.1 +42.3 115.8 | 56 06.7 +41.9 114.6 |
| 26° | 59 21.5 +42.8 118.1 | 58 43.9 +42.3 116.9 | 58 05.8 +41.9 115.7 | 57 27.4 +41.5 114.5 | 56 48.6 +41.1 113.3 |
| 27° | 60 04.3 +41.8 116.8 | 59 26.2 +41.4 115.5 | 58 47.7 +41.0 114.3 | 58 08.9 +40.5 113.1 | 57 29.7 +40.2 112.0 |
| 28° | 60 46.1 +40.9 115.3 | 60 07.6 +40.4 114.1 | 59 28.7 +40.0 112.9 | 58 49.4 +39.6 111.7 | 58 09.9 +39.2 110.6 |
| 29° | 61 27.0 +39.9 113.8 | 60 48.0 +39.4 112.6 | 60 08.7 +39.0 111.4 | 59 29.0 +38.6 110.3 | 58 49.1 +38.2 109.2 |

| 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°  | 35 23.8 +51.9 135.3 | 34 53.6 +51.7 134.2 | 34 23.0 +51.3 133.2 | 33 51.8 +51.0 132.1 | 33 20.1 +50.6 131.1 |
| 1°  | 36 15.7 +51.8 134.7 | 35 45.3 +51.4 133.6 | 35 14.3 +51.1 132.5 | 34 42.8 +50.8 131.5 | 34 10.7 +50.5 130.5 |
| 2°  | 37 07.5 +51.5 134.0 | 36 36.7 +51.2 133.0 | 36 05.4 +50.9 131.9 | 35 33.6 +50.5 130.9 | 35 01.2 +50.3 129.8 |
| 3°  | 37 59.0 +51.4 133.4 | 37 27.9 +51.0 132.3 | 36 56.3 +50.7 131.2 | 36 24.1 +50.4 130.2 | 35 51.5 +50.0 129.2 |
| 4°  | 38 50.4 +51.1 132.7 | 38 18.9 +50.8 131.6 | 37 47.0 +50.4 130.6 | 37 14.5 +50.1 129.5 | 36 41.5 +49.8 128.5 |
| 5°  | 39 41.5 +50.8 132.1 | 39 09.7 +50.5 131.0 | 38 37.4 +50.2 129.9 | 38 04.6 +49.9 128.8 | 37 31.3 +49.5 127.8 |
| 6°  | 40 32.3 +50.7 131.4 | 40 00.2 +50.3 130.3 | 39 27.6 +49.9 129.2 | 38 54.5 +49.6 128.1 | 38 20.8 +49.3 127.1 |
| 7°  | 41 23.0 +50.3 130.6 | 40 50.5 +50.0 129.5 | 40 17.5 +49.7 128.5 | 39 44.1 +49.3 127.4 | 39 10.1 +49.0 126.3 |
| 8°  | 42 13.3 +50.1 129.9 | 41 40.5 +49.7 128.8 | 41 07.2 +49.3 127.7 | 40 33.4 +49.0 126.6 | 39 59.1 +48.7 125.6 |
| 9°  | 43 03.4 +49.7 129.2 | 42 30.2 +49.4 128.1 | 41 56.5 +49.1 127.0 | 41 22.4 +48.7 125.9 | 40 47.8 +48.4 124.8 |
| 10° | 43 53.1 +49.4 128.4 | 43 19.6 +49.1 127.3 | 42 45.6 +48.7 126.2 | 42 11.1 +48.4 125.1 | 41 36.2 +48.0 124.0 |
| 11° | 44 42.5 +49.1 127.6 | 44 08.7 +48.7 126.5 | 43 34.3 +48.4 125.4 | 42 59.5 +48.0 124.3 | 42 24.2 +47.7 123.2 |
| 12° | 45 31.6 +48.8 126.8 | 44 57.4 +48.4 125.7 | 44 22.7 +48.0 124.6 | 43 47.5 +47.7 123.5 | 43 11.9 +47.4 122.4 |
| 13° | 46 20.4 +48.3 126.0 | 45 45.8 +48.0 124.8 | 45 10.7 +47.7 123.7 | 44 35.2 +47.3 122.6 | 43 59.3 +46.9 121.5 |
| 14° | 47 08.7 +48.0 125.1 | 46 33.8 +47.6 124.0 | 45 58.4 +47.2 122.8 | 45 22.5 +46.9 121.7 | 44 46.2 +46.6 120.7 |
| 15° | 47 56.7 +47.5 124.2 | 47 21.4 +47.1 123.1 | 46 45.6 +46.8 121.9 | 46 09.4 +46.4 120.9 | 45 32.8 +46.1 119.8 |
| 16° | 48 44.2 +47.1 123.3 | 48 08.5 +46.8 122.1 | 47 32.4 +46.3 121.0 | 46 55.8 +46.0 119.9 | 46 18.9 +45.6 118.9 |
| 17° | 49 31.3 +46.6 122.3 | 48 55.3 +46.2 121.2 | 48 18.7 +45.9 120.1 | 47 41.8 +45.5 119.0 | 47 04.5 +45.2 117.9 |
| 18° | 50 17.9 +46.1 121.4 | 49 41.5 +45.7 120.2 | 49 04.6 +45.4 119.1 | 48 27.3 +45.1 118.0 | 47 49.7 +44.7 116.9 |
| 19° | 51 04.0 +45.6 120.3 | 50 27.2 +45.2 119.2 | 49 50.0 +44.8 118.1 | 49 12.4 +44.4 117.0 | 48 34.4 +44.1 115.9 |
| 20° | 51 49.6 +45.0 119.3 | 51 12.4 +44.6 118.2 | 50 34.8 +44.2 117.1 | 49 56.8 +43.9 116.0 | 49 18.5 +43.6 114.9 |
| 21° | 52 34.6 +44.3 118.2 | 51 57.0 +44.0 117.1 | 51 19.0 +43.7 116.0 | 50 40.7 +43.3 114.9 | 50 02.1 +42.9 113.8 |
| 22° | 53 18.9 +43.8 117.1 | 52 41.0 +43.3 116.0 | 52 02.7 +43.0 114.9 | 51 24.0 +42.7 113.8 | 50 45.0 +42.4 112.7 |
| 23° | 54 02.7 +43.0 115.9 | 53 24.3 +42.7 114.8 | 52 45.7 +42.3 113.7 | 52 06.7 +41.9 112.7 | 51 27.4 +41.6 111.6 |
| 24° | 54 45.7 +42.3 114.7 | 54 07.0 +41.9 113.6 | 53 28.0 +41.6 112.6 | 52 48.6 +41.3 111.5 | 52 09.0 +41.0 110.5 |
| 25° | 55 28.0 +41.5 113.5 | 54 48.9 +41.2 112.4 | 54 09.6 +40.8 111.3 | 53 29.9 +40.5 110.3 | 52 50.0 +40.2 109.3 |
| 26° | 56 09.5 +40.7 112.2 | 55 30.1 +40.3 111.1 | 54 50.4 +40.0 110.1 | 54 10.4 +39.7 109.0 | 53 30.2 +39.4 108.0 |
| 27° | 56 50.2 +39.8 110.9 | 56 10.4 +39.5 109.8 | 55 30.4 +39.1 108.8 | 54 50.1 +38.8 107.7 | 54 09.6 +38.5 106.7 |
| 28° | 57 30.0 +38.9 109.5 | 56 49.9 +38.5 108.4 | 56 09.5 +38.3 107.4 | 55 28.9 +38.0 106.4 | 54 48.1 +37.7 105.4 |
| 29° | 58 08.9 +37.9 108.1 | 57 28.4 +37.6 107.0 | 56 47.8 +37.2 106.0 | 56 06.9 +37.0 105.0 | 55 25.8 +36.8 104.1 |

# Declination SAME name as Latitude

# Latitude 45°

| 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°  | 32 47.9 +50.3 130.1 | 32 15.2 +50.1 129.1 | 31 42.0 +49.8 128.1 | 31 08.5 +49.4 127.2 | 30 34.4 +49.2 126.2 |
| 1°  | 33 38.2 +50.2 129.5 | 33 05.3 +49.8 128.5 | 32 31.8 +49.6 127.5 | 31 57.9 +49.3 126.5 | 31 23.6 +49.0 125.5 |
| 2°  | 34 28.4 +49.9 128.8 | 33 55.1 +49.6 127.8 | 33 21.4 +49.3 126.8 | 32 47.2 +49.0 125.8 | 32 12.6 +48.7 124.9 |
| 3°  | 35 18.3 +49.8 128.1 | 34 44.7 +49.5 127.1 | 34 10.7 +49.1 126.1 | 33 36.2 +48.8 125.1 | 33 01.3 +48.5 124.2 |
| 4°  | 36 08.1 +49.4 127.4 | 35 34.2 +49.1 126.4 | 34 59.8 +48.9 125.4 | 34 25.0 +48.6 124.4 | 33 49.8 +48.3 123.5 |
| 5°  | 36 57.5 +49.3 126.7 | 36 23.3 +48.9 125.7 | 35 48.7 +48.6 124.7 | 35 13.6 +48.3 123.7 | 34 38.1 +48.0 122.7 |
| 6°  | 37 46.8 +48.9 126.0 | 37 12.2 +48.7 125.0 | 36 37.3 +48.3 124.0 | 36 01.9 +48.0 123.0 | 35 26.1 +47.7 122.0 |
| 7°  | 38 35.7 +48.7 125.3 | 38 00.9 +48.3 124.3 | 37 25.6 +48.0 123.2 | 36 49.9 +47.7 122.3 | 36 13.8 +47.5 121.3 |
| 8°  | 39 24.4 +48.3 124.5 | 38 49.2 +48.1 123.5 | 38 13.6 +47.8 122.5 | 37 37.6 +47.5 121.5 | 37 01.3 +47.1 120.5 |
| 9°  | 40 12.7 +48.1 123.8 | 39 37.3 +47.7 122.7 | 39 01.4 +47.4 121.7 | 38 25.1 +47.1 120.7 | 37 48.4 +46.9 119.7 |
| 10° | 41 00.8 +47.7 123.0 | 40 25.0 +47.4 121.9 | 39 48.8 +47.1 120.9 | 39 12.2 +46.8 119.9 | 38 35.3 +46.5 118.9 |
| 11° | 41 48.5 +47.4 122.2 | 41 12.4 +47.1 121.1 | 40 35.9 +46.7 120.1 | 39 59.0 +46.5 119.1 | 39 21.8 +46.1 118.1 |
| 12° | 42 35.9 +47.0 121.3 | 41 59.5 +46.7 120.3 | 41 22.6 +46.4 119.3 | 40 45.5 +46.0 118.3 | 40 07.9 +45.8 117.3 |
| 13° | 43 22.9 +46.6 120.5 | 42 46.2 +46.3 119.4 | 42 09.0 +46.0 118.4 | 41 31.5 +45.7 117.4 | 40 53.7 +45.4 116.4 |
| 14° | 44 09.5 +46.2 119.6 | 43 32.5 +45.9 118.6 | 42 55.0 +45.6 117.6 | 42 17.2 +45.3 116.6 | 41 39.1 +45.0 115.6 |
| 15° | 44 55.7 +45.8 118.7 | 44 18.4 +45.4 117.7 | 43 40.6 +45.2 116.7 | 43 02.5 +44.9 115.7 | 42 24.1 +44.6 114.7 |
| 16° | 45 41.5 +45.4 117.8 | 45 03.8 +45.0 116.8 | 44 25.8 +44.7 115.7 | 43 47.4 +44.4 114.7 | 43 08.7 +44.2 113.8 |
| 17° | 46 26.9 +44.8 116.9 | 45 48.8 +44.6 115.8 | 45 10.5 +44.2 114.8 | 44 31.8 +44.0 113.8 | 43 52.9 +43.6 112.8 |
| 18° | 47 11.7 +44.3 115.9 | 46 33.4 +44.0 114.9 | 45 54.7 +43.8 113.8 | 45 15.8 +43.4 112.9 | 44 36.5 +43.2 111.9 |
| 19° | 47 56.0 +43.9 114.9 | 47 17.4 +43.5 113.9 | 46 38.5 +43.2 112.9 | 45 59.2 +42.9 111.9 | 45 19.7 +42.7 110.9 |
| 20° | 48 39.9 +43.2 113.9 | 48 00.9 +42.9 112.8 | 47 21.7 +42.6 111.8 | 46 42.1 +42.4 110.9 | 46 02.4 +42.1 109.9 |
| 21° | 49 23.1 +42.7 112.8 | 48 43.8 +42.4 111.8 | 48 04.3 +42.1 110.8 | 47 24.5 +41.8 109.8 | 46 44.5 +41.5 108.9 |
| 22° | 50 05.8 +42.0 111.7 | 49 26.2 +41.7 110.7 | 48 46.4 +41.4 109.7 | 48 06.3 +41.2 108.7 | 47 26.0 +41.0 107.8 |
| 23° | 50 47.8 +41.3 110.6 | 50 07.9 +41.1 109.6 | 49 27.8 +40.8 108.6 | 48 47.5 +40.6 107.6 | 48 07.0 +40.3 106.7 |
| 24° | 51 29.1 +40.7 109.4 | 50 49.0 +40.4 108.4 | 50 08.6 +40.2 107.5 | 49 28.1 +39.9 106.5 | 48 47.3 +39.7 105.6 |
| 25° | 52 09.8 +39.9 108.2 | 51 29.4 +39.6 107.3 | 50 48.8 +39.4 106.3 | 50 08.0 +39.1 105.4 | 49 27.0 +38.9 104.4 |
| 26° | 52 49.7 +39.1 107.0 | 52 09.0 +38.9 106.1 | 51 28.2 +38.6 105.1 | 50 47.1 +38.4 104.2 | 50 05.9 +38.2 103.3 |
| 27° | 53 28.8 +38.3 105.8 | 52 47.9 +38.1 104.8 | 52 06.8 +37.8 103.9 | 51 25.5 +37.7 103.0 | 50 44.1 +37.5 102.1 |
| 28° | 54 07.1 +37.5 104.5 | 53 26.0 +37.2 103.5 | 52 44.6 +37.1 102.6 | 52 03.2 +36.8 101.7 | 51 21.6 +36.6 100.8 |
| 29° | 54 44.6 +36.5 103.1 | 54 03.2 +36.3 102.2 | 53 21.7 +36.1 101.3 | 52 40.0 +35.9 100.4 | 51 58.2 +35.8 99.5  |

| Dec | LHA 045° / 315°     | LHA 046° / 314°     | LHA 047° / 313°     | LHA 048° / 312°     | LHA 049° / 311°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 30 00.0 +48.9 125.3 | 29 25.2 +48.6 124.3 | 28 49.9 +48.4 123.4 | 28 14.3 +48.1 122.5 | 27 38.4 +47.7 121.6 |
| 1°  | 30 48.9 +48.7 124.6 | 30 13.8 +48.4 123.7 | 29 38.3 +48.1 122.7 | 29 02.4 +47.8 121.8 | 28 26.1 +47.6 120.9 |
| 2°  | 31 37.6 +48.4 123.9 | 31 02.2 +48.1 123.0 | 30 26.4 +47.9 122.0 | 29 50.2 +47.7 121.1 | 29 13.7 +47.4 120.2 |
| 3°  | 32 26.0 +48.2 123.2 | 31 50.3 +48.0 122.3 | 31 14.3 +47.6 121.3 | 30 37.9 +47.3 120.4 | 30 01.1 +47.1 119.5 |
| 4°  | 33 14.2 +48.0 122.5 | 32 38.3 +47.7 121.6 | 32 01.9 +47.5 120.6 | 31 25.2 +47.2 119.7 | 30 48.2 +46.9 118.8 |
| 5°  | 34 02.2 +47.7 121.8 | 33 26.0 +47.4 120.8 | 32 49.4 +47.1 119.9 | 32 12.4 +46.9 119.0 | 31 35.1 +46.7 118.0 |
| 6°  | 34 49.9 +47.5 121.0 | 34 13.4 +47.2 120.1 | 33 36.5 +46.9 119.2 | 32 59.3 +46.6 118.2 | 32 21.8 +46.3 117.3 |
| 7°  | 35 37.4 +47.1 120.3 | 35 00.6 +46.8 119.3 | 34 23.4 +46.6 118.4 | 33 45.9 +46.4 117.5 | 33 08.1 +46.1 116.5 |
| 8°  | 36 24.5 +46.9 119.5 | 35 47.4 +46.6 118.6 | 35 10.0 +46.3 117.6 | 34 32.3 +46.0 116.7 | 33 54.2 +45.8 115.8 |
| 9°  | 37 11.4 +46.6 118.8 | 36 34.0 +46.3 117.8 | 35 56.3 +46.1 116.9 | 35 18.3 +45.8 115.9 | 34 40.0 +45.5 115.0 |
| 10° | 37 58.0 +46.2 118.0 | 37 20.3 +46.0 117.0 | 36 42.4 +45.6 116.1 | 36 04.1 +45.4 115.1 | 35 25.5 +45.2 114.2 |
| 11° | 38 44.2 +45.9 117.1 | 38 06.3 +45.6 116.2 | 37 28.0 +45.4 115.2 | 36 49.5 +45.1 114.3 | 36 10.7 +44.9 113.4 |
| 12° | 39 30.1 +45.5 116.3 | 38 51.9 +45.2 115.4 | 38 13.4 +45.0 114.4 | 37 34.6 +44.7 113.5 | 36 55.6 +44.5 112.6 |
| 13° | 40 15.6 +45.1 115.5 | 39 37.1 +44.9 114.5 | 38 58.4 +44.6 113.6 | 38 19.3 +44.4 112.6 | 37 40.1 +44.1 111.7 |
| 14° | 41 00.7 +44.7 114.6 | 40 22.0 +44.4 113.6 | 39 43.0 +44.2 112.7 | 39 03.7 +44.0 111.8 | 38 24.2 +43.7 110.9 |
| 15° | 41 45.4 +44.3 113.7 | 41 06.4 +44.1 112.8 | 40 27.2 +43.8 111.8 | 39 47.7 +43.5 110.9 | 39 07.9 +43.4 110.0 |
| 16° | 42 29.7 +43.9 112.8 | 41 50.5 +43.6 111.8 | 41 11.0 +43.4 110.9 | 40 31.2 +43.2 110.0 | 39 51.3 +42.9 109.1 |
| 17° | 43 13.6 +43.4 111.9 | 42 34.1 +43.2 110.9 | 41 54.4 +42.9 110.0 | 41 14.4 +42.7 109.1 | 40 34.2 +42.5 108.2 |
| 18° | 43 57.0 +43.0 110.9 | 43 17.3 +42.7 110.0 | 42 37.3 +42.4 109.0 | 41 57.1 +42.2 108.1 | 41 16.7 +42.0 107.2 |
| 19° | 44 40.0 +42.4 109.9 | 44 00.0 +42.1 109.0 | 43 19.7 +42.0 108.1 | 42 39.3 +41.7 107.2 | 41 58.7 +41.5 106.3 |
| 20° | 45 22.4 +41.8 108.9 | 44 42.1 +41.7 108.0 | 44 01.7 +41.4 107.1 | 43 21.0 +41.2 106.2 | 42 40.2 +41.0 105.3 |
| 21° | 46 04.2 +41.3 107.9 | 45 23.8 +41.0 107.0 | 44 43.1 +40.9 106.1 | 44 02.2 +40.7 105.2 | 43 21.2 +40.5 104.3 |
| 22° | 46 45.5 +40.8 106.9 | 46 04.8 +40.5 105.9 | 45 24.0 +40.3 105.0 | 44 42.9 +40.1 104.2 | 44 01.7 +39.9 103.3 |
| 23° | 47 26.3 +40.0 105.8 | 46 45.3 +39.9 104.9 | 46 04.3 +39.6 104.0 | 45 23.0 +39.5 103.1 | 44 41.6 +39.4 102.2 |
| 24° | 48 06.3 +39.5 104.7 | 47 25.2 +39.3 103.8 | 46 43.9 +39.1 102.9 | 46 02.5 +38.9 102.0 | 45 21.0 +38.7 101.2 |
| 25° | 48 45.8 +38.7 103.5 | 48 04.5 +38.5 102.7 | 47 23.0 +38.4 101.8 | 46 41.4 +38.2 100.9 | 45 59.7 +38.1 100.1 |
| 26° | 49 24.5 +38.1 102.4 | 48 43.0 +37.9 101.5 | 48 01.4 +37.7 100.6 | 47 19.6 +37.6 99.8  | 46 37.8 +37.4 99.0  |
| 27° | 50 02.6 +37.2 101.2 | 49 20.9 +37.1 100.3 | 48 39.1 +36.9 99.5  | 47 57.2 +36.8 99.6  | 47 15.2 +36.7 97.8  |
| 28° | 50 39.8 +36.5 99.9  | 49 58.0 +36.3 99.1  | 49 16.0 +36.3 98.3  | 48 34.0 +36.1 97.4  | 47 51.9 +36.0 96.6  |
| 29° | 51 16.3 +35.6 98.7  | 50 34.3 +35.5 97.9  | 49 52.3 +35.4 97.0  | 49 10.1 +35.3 96.2  | 48 27.9 +35.2 95.4  |

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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°  | 27 02.0 +47.6 120.7 | 26 25.4 +47.3 119.8 | 25 48.4 +47.0 118.9 | 25 11.1 +46.8 118.1 | 24 33.5 +46.6 117.2 |
| 1°  | 27 49.6 +47.3 120.0 | 27 12.7 +47.0 119.1 | 26 35.4 +46.9 118.2 | 25 57.9 +46.6 117.4 | 25 20.1 +46.3 116.5 |
| 2°  | 28 36.9 +47.1 119.3 | 27 59.7 +46.9 118.4 | 27 22.3 +46.6 117.5 | 26 44.5 +46.4 116.7 | 26 06.4 +46.2 115.8 |
| 3°  | 29 24.0 +46.9 118.6 | 28 46.6 +46.6 117.7 | 28 08.9 +46.4 116.8 | 27 30.9 +46.1 115.9 | 26 52.6 +45.9 115.1 |
| 4°  | 30 10.9 +46.6 117.9 | 29 33.2 +46.4 117.0 | 28 55.3 +46.1 116.1 | 28 17.0 +45.9 115.2 | 27 38.5 +45.7 114.4 |
| 5°  | 30 57.5 +46.4 117.1 | 30 19.6 +46.2 116.2 | 29 41.4 +45.9 115.4 | 29 02.9 +45.7 114.5 | 28 24.2 +45.5 113.6 |
| 6°  | 31 43.9 +46.1 116.4 | 31 05.8 +45.8 115.5 | 30 27.3 +45.7 114.6 | 29 48.6 +45.4 113.7 | 29 09.7 +45.2 112.9 |
| 7°  | 32 30.0 +45.9 115.6 | 31 51.6 +45.6 114.7 | 31 13.0 +45.3 113.9 | 30 34.0 +45.2 113.0 | 29 54.9 +44.9 112.1 |
| 8°  | 33 15.9 +45.5 114.9 | 32 37.2 +45.4 114.0 | 31 58.3 +45.1 113.1 | 31 19.2 +44.9 112.2 | 30 39.8 +44.7 111.4 |
| 9°  | 34 01.4 +45.3 114.1 | 33 22.6 +45.0 113.2 | 32 43.4 +44.9 112.3 | 32 04.1 +44.6 111.4 | 31 24.5 +44.3 110.6 |
| 10° | 34 46.7 +44.9 113.3 | 34 07.6 +44.7 112.4 | 33 28.3 +44.4 111.5 | 32 48.7 +44.2 110.6 | 32 08.8 +44.1 109.8 |
| 11° | 35 31.6 +44.7 112.5 | 34 52.3 +44.4 111.6 | 34 12.7 +44.2 110.7 | 33 32.9 +44.0 109.8 | 32 52.9 +43.8 109.0 |
| 12° | 36 16.3 +44.2 111.7 | 35 36.7 +44.0 110.8 | 34 56.9 +43.8 109.9 | 34 16.9 +43.6 109.0 | 33 36.7 +43.4 108.2 |
| 13° | 37 00.5 +43.9 110.8 | 36 20.7 +43.7 109.9 | 35 40.7 +43.5 109.0 | 35 00.5 +43.3 108.2 | 34 20.1 +43.1 107.3 |
| 14° | 37 44.4 +43.5 110.0 | 37 04.4 +43.3 109.1 | 36 24.2 +43.1 108.2 | 35 43.8 +42.9 107.3 | 35 03.2 +42.8 106.5 |
| 15° | 38 27.9 +43.2 109.1 | 37 47.7 +43.0 108.2 | 37 07.3 +42.8 107.3 | 36 26.7 +42.6 106.5 | 35 46.0 +42.3 105.6 |
| 16° | 39 11.1 +42.7 108.2 | 38 30.7 +42.5 107.3 | 37 50.1 +42.3 106.4 | 37 09.3 +42.1 105.6 | 36 28.3 +42.0 104.7 |
| 17° | 39 53.8 +42.2 107.3 | 39 13.2 +42.0 106.4 | 38 32.4 +41.9 105.5 | 37 51.4 +41.7 104.7 | 37 10.3 +41.6 103.8 |
| 18° | 40 36.0 +41.8 106.4 | 39 55.2 +41.7 105.5 | 39 14.3 +41.4 104.6 | 38 33.1 +41.3 103.8 | 37 51.9 +41.1 102.9 |
| 19° | 41 17.8 +41.4 105.4 | 40 36.9 +41.1 104.5 | 39 55.7 +41.0 103.7 | 39 14.4 +40.9 102.8 | 38 33.0 +40.7 102.0 |
| 20° | 41 59.2 +40.8 104.4 | 41 18.0 +40.7 103.6 | 40 36.7 +40.5 102.7 | 39 55.3 +40.3 101.9 | 39 13.7 +40.2 101.1 |
| 21° | 42 40.0 +40.3 103.4 | 41 58.7 +40.1 102.6 | 41 17.2 +40.0 101.7 | 40 35.6 +39.9 100.9 | 39 53.9 +39.7 100.1 |
| 22° | 43 20.3 +39.8 102.4 | 42 38.8 +39.6 101.6 | 41 57.2 +39.5 100.8 | 41 15.5 +39.3 99.9  | 40 33.6 +39.2 99.1  |
| 23° | 44 00.1 +39.2 101.4 | 43 18.4 +39.1 100.6 | 42 36.7 +38.9 99.7  | 41 54.8 +38.8 98.9  | 41 12.8 +38.7 98.1  |
| 24° | 44 39.3 +38.6 100.3 | 43 57.5 +38.4 99.5  | 43 15.6 +38.3 98.7  | 42 33.6 +38.2 97.9  | 41 51.5 +38.2 97.1  |
| 25° | 45 17.9 +37.9 99.3  | 44 35.9 +37.9 98.4  | 43 53.9 +37.8 97.6  | 43 11.8 +37.7 96.8  | 42 29.7 +37.5 96.1  |
| 26° | 45 55.8 +37.3 98.1  | 45 13.8 +37.2 97.3  | 44 31.7 +37.1 96.5  | 43 49.5 +37.0 95.8  | 43 07.2 +37.0 95.0  |
| 27° | 46 33.1 +36.6 97.0  | 45 51.0 +36.5 96.2  | 45 08.8 +36.4 95.4  | 44 26.5 +36.4 94.7  | 43 44.2 +36.3 93.9  |
| 28° | 47 09.7 +35.9 95.9  | 46 27.5 +35.8 95.1  | 45 45.2 +35.8 94.3  | 45 02.9 +35.7 93.6  | 44 20.5 +35.7 92.8  |
| 29° | 47 45.6 +35.2 94.7  | 47 03.3 +35.1 93.9  | 46 21.0 +35.0 93.2  | 45 38.6 +35.0 92.4  | 44 56.2 +35.0 91.7  |

| 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°  | 23 55.6 +46.4 116.3 | 23 17.5 +46.1 115.5 | 22 39.1 +45.8 114.7 | 22 00.4 +45.7 113.8 | 21 21.5 +45.4 113.0 |
| 1°  | 24 42.0 +46.1 115.6 | 24 03.6 +45.9 114.8 | 23 24.9 +45.7 114.0 | 22 46.1 +45.4 113.1 | 22 06.9 +45.3 112.3 |
| 2°  | 25 28.1 +45.9 114.9 | 24 49.5 +45.7 114.1 | 24 10.6 +45.5 113.3 | 23 31.5 +45.3 112.4 | 22 52.2 +45.1 111.6 |
| 3°  | 26 14.0 +45.7 114.2 | 25 35.2 +45.5 113.4 | 24 56.1 +45.3 112.5 | 24 16.8 +45.1 111.7 | 23 37.3 +44.9 110.9 |
| 4°  | 26 59.7 +45.5 113.5 | 26 20.7 +45.3 112.7 | 25 41.4 +45.1 111.8 | 25 01.9 +44.9 111.0 | 24 22.2 +44.7 110.2 |
| 5°  | 27 45.2 +45.2 112.8 | 27 06.0 +45.0 111.9 | 26 26.5 +44.8 111.1 | 25 46.8 +44.6 110.2 | 25 06.9 +44.4 109.4 |
| 6°  | 28 30.4 +45.0 112.0 | 27 51.0 +44.8 111.2 | 27 11.3 +44.6 110.3 | 26 31.4 +44.4 109.5 | 25 51.3 +44.3 108.7 |
| 7°  | 29 15.4 +44.8 111.3 | 28 35.8 +44.5 110.4 | 27 55.9 +44.4 109.6 | 27 15.8 +44.2 108.8 | 26 35.6 +44.0 107.9 |
| 8°  | 30 00.2 +44.4 110.5 | 29 20.3 +44.3 109.7 | 28 40.3 +44.0 108.8 | 28 00.0 +43.9 108.0 | 27 19.6 +43.7 107.2 |
| 9°  | 30 44.6 +44.2 109.7 | 30 04.6 +44.0 108.9 | 29 24.3 +43.9 108.0 | 28 43.9 +43.7 107.2 | 28 03.3 +43.5 106.4 |
| 10° | 31 28.8 +43.9 108.9 | 30 48.6 +43.7 108.1 | 30 08.2 +43.5 107.3 | 29 27.6 +43.3 106.4 | 28 46.8 +43.2 105.6 |
| 11° | 32 12.7 +43.6 108.1 | 31 32.3 +43.4 107.3 | 30 51.7 +43.2 106.5 | 30 10.9 +43.1 105.6 | 29 30.0 +42.9 104.8 |
| 12° | 32 56.3 +43.2 107.3 | 32 15.7 +43.1 106.5 | 31 34.9 +42.9 105.6 | 30 54.0 +42.7 104.8 | 30 12.9 +42.6 104.0 |
| 13° | 33 39.5 +43.0 106.5 | 32 58.8 +42.7 105.6 | 32 17.8 +42.6 104.8 | 31 36.7 +42.5 104.0 | 30 55.5 +42.3 103.2 |
| 14° | 34 22.5 +42.5 105.6 | 33 41.5 +42.4 104.8 | 33 00.4 +42.3 104.0 | 32 19.2 +42.1 103.2 | 31 37.8 +42.0 102.4 |
| 15° | 35 05.0 +42.2 104.8 | 34 23.9 +42.1 104.0 | 33 42.7 +41.9 103.1 | 33 01.3 +41.8 102.3 | 32 19.8 +41.6 101.5 |
| 16° | 35 47.2 +41.8 103.9 | 35 06.0 +41.6 103.1 | 34 24.6 +41.5 102.3 | 33 43.1 +41.3 101.5 | 33 01.4 +41.3 100.7 |
| 17° | 36 29.0 +41.4 103.0 | 35 47.6 +41.3 102.2 | 35 06.1 +41.1 101.4 | 34 24.4 +41.1 100.6 | 33 42.7 +40.9 99.8  |
| 18° | 37 10.4 +41.0 102.1 | 36 28.9 +40.9 101.3 | 35 47.2 +40.8 100.5 | 35 05.5 +40.6 99.7  | 34 23.6 +40.5 98.9  |
| 19° | 37 51.4 +40.6 101.2 | 37 09.8 +40.4 100.4 | 36 28.0 +40.3 99.6  | 35 46.1 +40.2 98.8  | 35 04.1 +40.1 98.0  |
| 20° | 38 32.0 +40.1 100.3 | 37 50.2 +40.0 99.5  | 37 08.3 +39.9 98.7  | 36 26.3 +39.8 97.9  | 35 44.2 +39.7 97.1  |
| 21° | 39 12.1 +39.6 99.3  | 38 30.2 +39.5 98.5  | 37 48.2 +39.4 97.7  | 37 06.1 +39.3 96.9  | 36 23.9 +39.3 96.2  |
| 22° | 39 51.7 +39.1 98.3  | 39 09.7 +39.0 97.5  | 38 27.6 +38.9 96.8  | 37 45.4 +38.9 96.0  | 37 03.2 +38.8 95.2  |
| 23° | 40 30.8 +38.6 97.3  | 39 48.7 +38.5 96.6  | 39 06.5 +38.5 95.8  | 38 24.3 +38.4 95.0  | 37 42.0 +38.3 94.3  |
| 24° | 41 09.4 +38.1 96.3  | 40 27.2 +38.0 95.6  | 39 45.0 +37.9 94.8  | 39 02.7 +37.8 94.0  | 38 20.3 +37.8 93.3  |
| 25° | 41 47.5 +37.5 95.3  | 41 05.2 +37.4 94.5  | 40 22.9 +37.4 93.8  | 39 40.5 +37.4 93.0  | 38 58.1 +37.4 92.3  |
| 26° | 42 25.0 +36.9 94.2  | 41 42.6 +36.9 93.5  | 41 00.3 +36.8 92.7  | 40 17.9 +36.8 92.0  | 39 35.5 +36.7 91.3  |
| 27° | 43 01.9 +36.2 93.2  | 42 19.5 +36.2 92.4  | 41 37.1 +36.2 91.7  | 40 54.7 +36.2 91.0  | 40 12.2 +36.3 90.3  |
| 28° | 43 38.1 +35.7 92.1  | 42 55.7 +35.7 91.3  | 42 13.3 +35.6 90.6  | 41 30.9 +35.6 89.9  | 40 48.5 +35.6 89.2  |
| 29° | 44 13.8 +35.0 91.0  | 43 31.4 +35.0 90.2  | 42 48.9 +35.0 89.5  | 42 06.5 +35.0 88.8  | 41 24.1 +35.1 88.1  |

# Declination SAME name as Latitude

# Latitude 45°

| 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°  | 20 42.3 +45.3 112.2 | 20 02.9 +45.1 111.4 | 19 23.3 +44.9 110.6 | 18 43.5 +44.7 109.8 | 18 03.5 +44.5 109.0 |
| 1°  | 21 27.6 +45.0 111.5 | 20 48.0 +44.9 110.7 | 20 08.2 +44.7 109.9 | 19 28.2 +44.5 109.1 | 18 48.0 +44.4 108.3 |
| 2°  | 22 12.6 +45.0 110.8 | 21 32.9 +44.7 110.0 | 20 52.9 +44.6 109.2 | 20 12.7 +44.4 108.4 | 19 32.4 +44.2 107.6 |
| 3°  | 22 57.6 +44.7 110.1 | 22 17.6 +44.5 109.3 | 21 37.5 +44.3 108.5 | 20 57.1 +44.2 107.7 | 20 16.6 +44.1 106.9 |
| 4°  | 23 42.3 +44.5 109.3 | 23 02.1 +44.4 108.5 | 22 21.8 +44.2 107.7 | 21 41.3 +44.0 107.0 | 21 00.7 +43.8 106.2 |
| 5°  | 24 26.8 +44.3 108.6 | 23 46.5 +44.1 107.8 | 23 06.0 +43.9 107.0 | 22 25.3 +43.8 106.2 | 21 44.5 +43.7 105.4 |
| 6°  | 25 11.1 +44.0 107.9 | 24 30.6 +43.9 107.1 | 23 49.9 +43.8 106.3 | 23 09.1 +43.6 105.5 | 22 28.2 +43.4 104.7 |
| 7°  | 25 55.1 +43.8 107.1 | 25 14.5 +43.6 106.3 | 24 33.7 +43.5 105.5 | 23 52.7 +43.4 104.7 | 23 11.6 +43.3 103.9 |
| 8°  | 26 38.9 +43.6 106.4 | 25 58.1 +43.5 105.6 | 25 17.2 +43.3 104.8 | 24 36.1 +43.1 104.0 | 23 54.9 +43.0 103.2 |
| 9°  | 27 22.5 +43.3 105.6 | 26 41.6 +43.1 104.8 | 26 00.5 +43.0 104.0 | 25 19.2 +42.9 103.2 | 24 37.9 +42.7 102.4 |
| 10° | 28 05.8 +43.1 104.8 | 27 24.7 +43.0 104.0 | 26 43.5 +42.8 103.2 | 26 02.1 +42.7 102.4 | 25 20.6 +42.6 101.6 |
| 11° | 28 48.9 +42.8 104.0 | 28 07.7 +42.6 103.2 | 27 26.3 +42.5 102.4 | 26 44.8 +42.4 101.6 | 26 03.2 +42.3 100.9 |
| 12° | 29 31.7 +42.4 103.2 | 28 50.3 +42.3 102.4 | 28 08.8 +42.2 101.6 | 27 27.2 +42.1 100.8 | 26 45.5 +42.0 100.1 |
| 13° | 30 14.1 +42.2 102.4 | 29 32.6 +42.1 101.6 | 28 51.0 +42.0 100.8 | 28 09.3 +41.8 100.0 | 27 27.5 +41.7 99.3  |
| 14° | 30 56.3 +41.9 101.6 | 30 14.7 +41.7 100.8 | 29 33.0 +41.6 100.0 | 28 51.1 +41.5 99.2  | 28 09.2 +41.4 98.5  |
| 15° | 31 38.2 +41.5 100.7 | 30 56.4 +41.4 99.9  | 30 14.6 +41.3 99.2  | 29 32.6 +41.3 98.4  | 28 50.6 +41.2 97.6  |
| 16° | 32 19.7 +41.1 99.9  | 31 37.8 +41.1 99.1  | 30 55.9 +41.0 98.3  | 30 13.9 +40.9 97.6  | 29 31.8 +40.8 96.8  |
| 17° | 33 00.8 +40.8 99.0  | 32 18.9 +40.7 98.2  | 31 36.9 +40.6 97.5  | 30 54.8 +40.5 96.7  | 30 12.6 +40.5 96.0  |
| 18° | 33 41.6 +40.5 98.1  | 32 59.6 +40.3 97.4  | 32 17.5 +40.3 96.6  | 31 35.3 +40.2 95.8  | 30 53.1 +40.1 95.1  |
| 19° | 34 22.1 +40.0 97.2  | 33 39.9 +40.0 96.5  | 32 57.8 +39.8 95.7  | 32 15.5 +39.9 95.0  | 31 33.2 +39.8 94.2  |
| 20° | 35 02.1 +39.6 96.3  | 34 19.9 +39.6 95.6  | 33 37.6 +39.6 94.8  | 32 55.4 +39.4 94.1  | 32 13.0 +39.4 93.3  |
| 21° | 35 41.7 +39.2 95.4  | 34 59.5 +39.1 94.7  | 34 17.2 +39.0 93.9  | 33 34.8 +39.1 93.2  | 32 52.4 +39.1 92.5  |
| 22° | 36 20.9 +38.8 94.5  | 35 38.6 +38.7 93.7  | 34 56.2 +38.7 93.0  | 34 13.9 +38.6 92.3  | 33 31.5 +38.6 91.5  |
| 23° | 36 59.7 +38.2 93.5  | 36 17.3 +38.3 92.8  | 35 34.9 +38.2 92.1  | 34 52.5 +38.2 91.3  | 34 10.1 +38.2 90.6  |
| 24° | 37 37.9 +37.8 92.6  | 36 55.6 +37.7 91.8  | 36 13.1 +37.8 91.1  | 35 30.7 +37.8 90.4  | 34 48.3 +37.8 89.7  |
| 25° | 38 15.7 +37.3 91.6  | 37 33.3 +37.3 90.9  | 36 50.9 +37.3 90.1  | 36 08.5 +37.3 89.4  | 35 26.1 +37.3 88.7  |
| 26° | 38 53.0 +36.8 90.6  | 38 10.6 +36.8 89.9  | 37 28.2 +36.8 89.2  | 36 45.8 +36.8 88.5  | 36 03.4 +36.8 87.8  |
| 27° | 39 29.8 +36.3 89.6  | 38 47.4 +36.2 88.9  | 38 05.0 +36.3 88.2  | 37 22.6 +36.3 87.5  | 36 40.2 +36.4 86.8  |
| 28° | 40 06.1 +35.6 88.5  | 39 23.6 +35.7 87.8  | 38 41.3 +35.7 87.1  | 37 58.9 +35.8 86.5  | 37 16.6 +35.8 85.8  |
| 29° | 40 41.7 +35.1 87.5  | 39 59.3 +35.2 86.8  | 39 17.0 +35.2 86.1  | 38 34.7 +35.2 85.4  | 37 52.4 +35.3 84.8  |

| 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°  | 17 23.3 +44.3 108.2 | 16 42.9 +44.2 107.5 | 16 02.3 +44.1 106.7 | 15 21.6 +43.9 105.9 | 14 40.7 +43.8 105.2 |
| 1°  | 18 07.6 +44.3 107.5 | 17 27.1 +44.1 106.8 | 16 46.4 +43.9 106.0 | 16 05.5 +43.8 105.2 | 15 24.5 +43.7 104.5 |
| 2°  | 18 51.9 +44.0 106.8 | 18 11.2 +43.9 106.1 | 17 30.3 +43.8 105.3 | 16 49.3 +43.7 104.5 | 16 08.2 +43.5 103.8 |
| 3°  | 19 35.9 +43.9 106.1 | 18 55.1 +43.7 105.3 | 18 14.1 +43.6 104.6 | 17 33.0 +43.5 103.8 | 16 51.7 +43.4 103.0 |
| 4°  | 20 19.8 +43.7 105.4 | 19 38.8 +43.6 104.6 | 18 57.7 +43.5 103.8 | 18 16.5 +43.3 103.1 | 17 35.1 +43.2 102.3 |
| 5°  | 21 03.5 +43.6 104.7 | 20 22.4 +43.4 103.9 | 19 41.2 +43.2 103.1 | 18 59.8 +43.1 102.4 | 18 18.3 +43.0 101.6 |
| 6°  | 21 47.1 +43.3 103.9 | 21 05.8 +43.2 103.1 | 20 24.4 +43.1 102.4 | 19 42.9 +43.0 101.6 | 19 01.3 +42.9 100.9 |
| 7°  | 22 30.4 +43.1 103.2 | 21 49.0 +43.0 102.4 | 21 07.5 +42.9 101.6 | 20 25.9 +42.8 100.9 | 19 44.2 +42.6 100.1 |
| 8°  | 23 13.5 +42.9 102.4 | 22 32.0 +42.8 101.6 | 21 50.4 +42.6 100.9 | 21 08.7 +42.5 100.1 | 20 26.8 +42.5 99.4  |
| 9°  | 23 56.4 +42.6 101.6 | 23 14.8 +42.5 100.9 | 22 33.0 +42.5 100.1 | 21 51.2 +42.4 99.4  | 21 09.3 +42.3 98.6  |
| 10° | 24 39.0 +42.5 100.9 | 23 57.3 +42.3 100.1 | 23 15.5 +42.2 99.4  | 22 33.6 +42.1 98.6  | 21 51.6 +42.1 97.9  |
| 11° | 25 21.5 +42.1 100.1 | 24 39.6 +42.1 99.3  | 23 57.7 +42.0 98.6  | 23 15.7 +42.0 97.8  | 22 33.7 +41.8 97.1  |
| 12° | 26 03.6 +42.0 99.3  | 25 21.7 +41.9 98.5  | 24 39.7 +41.8 97.8  | 23 57.7 +41.6 97.0  | 23 15.5 +41.6 96.3  |
| 13° | 26 45.6 +41.6 98.5  | 26 03.6 +41.5 97.8  | 25 21.5 +41.5 97.0  | 24 39.3 +41.5 96.3  | 23 57.1 +41.4 95.5  |
| 14° | 27 27.2 +41.4 97.7  | 26 45.1 +41.3 96.9  | 26 03.0 +41.2 96.2  | 25 20.8 +41.1 95.5  | 24 38.5 +41.1 94.7  |
| 15° | 28 08.6 +41.0 96.9  | 27 26.4 +41.0 96.1  | 26 44.2 +40.9 95.4  | 26 01.9 +40.9 94.7  | 25 19.6 +40.9 93.9  |
| 16° | 28 49.6 +40.8 96.1  | 28 07.4 +40.7 95.3  | 27 25.1 +40.7 94.6  | 26 42.8 +40.6 93.8  | 26 00.5 +40.5 93.1  |
| 17° | 29 30.4 +40.4 95.2  | 28 48.1 +40.4 94.5  | 28 05.8 +40.3 93.7  | 27 23.4 +40.3 93.0  | 26 41.0 +40.3 92.3  |
| 18° | 30 10.8 +40.1 94.4  | 29 28.5 +40.0 93.6  | 28 46.1 +40.0 92.9  | 28 03.7 +40.0 92.2  | 27 21.3 +40.0 91.5  |
| 19° | 30 50.9 +39.7 93.5  | 30 08.5 +39.8 92.8  | 29 26.1 +39.7 92.0  | 28 43.7 +39.7 91.3  | 28 01.3 +39.7 90.6  |
| 20° | 31 30.6 +39.4 92.6  | 30 48.3 +39.3 91.9  | 30 05.8 +39.4 91.2  | 29 23.4 +39.4 90.5  | 28 41.0 +39.3 89.8  |
| 21° | 32 10.0 +39.0 91.7  | 31 27.6 +39.0 91.0  | 30 45.2 +39.0 90.3  | 30 02.8 +39.0 89.6  | 29 20.3 +39.1 88.9  |
| 22° | 32 49.0 +38.7 90.8  | 32 06.6 +38.6 90.1  | 31 24.2 +38.6 89.4  | 30 41.8 +38.6 88.7  | 29 59.4 +38.6 88.0  |
| 23° | 33 27.7 +38.2 89.9  | 32 45.2 +38.3 89.2  | 32 02.8 +38.3 88.5  | 31 20.4 +38.3 87.8  | 30 38.0 +38.3 87.1  |
| 24° | 34 05.9 +37.7 89.0  | 33 23.5 +37.8 88.3  | 32 41.1 +37.8 87.6  | 31 58.7 +37.8 86.9  | 31 16.3 +37.9 86.2  |
| 25° | 34 43.6 +37.4 88.0  | 34 01.3 +37.3 87.4  | 33 18.9 +37.4 86.7  | 32 36.5 +37.5 86.0  | 31 54.2 +37.6 85.3  |
| 26° | 35 21.0 +36.9 87.1  | 34 38.6 +37.0 86.4  | 33 56.3 +37.0 85.7  | 33 14.0 +37.1 85.1  | 32 31.8 +37.1 84.4  |
| 27° | 35 57.9 +36.4 86.1  | 35 15.6 +36.4 85.5  | 34 33.3 +36.5 84.8  | 33 51.1 +36.6 84.1  | 33 08.9 +36.7 83.5  |
| 28° | 36 34.3 +35.9 85.1  | 35 52.0 +36.0 84.5  | 35 09.8 +36.1 83.8  | 34 27.7 +36.1 83.2  | 33 45.6 +36.2 82.5  |
| 29° | 37 10.2 +35.4 84.1  | 36 28.0 +35.5 83.5  | 35 45.9 +35.6 82.8  | 35 03.8 +35.7 82.2  | 34 21.8 +35.8 81.6  |

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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°  | 13 59.7 +43.7 104.4 | 13 18.6 +43.5 103.7 | 12 37.3 +43.4 102.9 | 11 55.9 +43.3 102.2 | 11 14.4 +43.2 101.5 |
| 1°  | 14 43.4 +43.5 103.7 | 14 02.1 +43.4 103.0 | 13 20.7 +43.3 102.2 | 12 39.2 +43.2 101.5 | 11 57.6 +43.1 100.8 |
| 2°  | 15 26.9 +43.4 103.0 | 14 45.5 +43.3 102.3 | 14 04.0 +43.2 101.5 | 13 22.4 +43.1 100.8 | 12 40.7 +42.9 100.0 |
| 3°  | 16 10.3 +43.3 102.3 | 15 28.8 +43.1 101.5 | 14 47.2 +43.0 100.8 | 14 05.5 +42.9 100.1 | 13 23.6 +42.9 99.3  |
| 4°  | 16 53.6 +43.1 101.6 | 16 11.9 +43.0 100.8 | 15 30.2 +42.9 100.1 | 14 48.4 +42.8 99.3  | 14 06.5 +42.7 98.6  |
| 5°  | 17 36.7 +42.9 100.8 | 16 54.9 +42.9 100.1 | 16 13.1 +42.8 99.4  | 15 31.2 +42.7 98.6  | 14 49.2 +42.6 97.9  |
| 6°  | 18 19.6 +42.8 100.1 | 17 37.8 +42.7 99.4  | 16 55.9 +42.6 98.6  | 16 13.9 +42.5 97.9  | 15 31.8 +42.5 97.2  |
| 7°  | 19 02.4 +42.5 99.4  | 18 20.5 +42.5 98.6  | 17 38.5 +42.4 97.9  | 16 56.4 +42.4 97.1  | 16 14.3 +42.3 96.4  |
| 8°  | 19 44.9 +42.4 98.6  | 19 03.0 +42.3 97.9  | 18 20.9 +42.2 97.1  | 17 38.8 +42.2 96.4  | 16 56.6 +42.1 95.7  |
| 9°  | 20 27.3 +42.2 97.9  | 19 45.3 +42.1 97.1  | 19 03.1 +42.1 96.4  | 18 21.0 +42.0 95.7  | 17 38.7 +42.0 94.9  |
| 10° | 21 09.5 +42.0 97.1  | 20 27.4 +41.9 96.4  | 19 45.2 +41.9 95.6  | 19 03.0 +41.8 94.9  | 18 20.7 +41.8 94.2  |
| 11° | 21 51.5 +41.8 96.3  | 21 09.3 +41.8 95.6  | 20 27.1 +41.7 94.9  | 19 44.8 +41.6 94.1  | 19 02.5 +41.6 93.4  |
| 12° | 22 33.3 +41.6 95.6  | 21 51.1 +41.5 94.8  | 21 08.8 +41.4 94.1  | 20 26.4 +41.5 93.4  | 19 44.1 +41.4 92.7  |
| 13° | 23 14.9 +41.3 94.8  | 22 32.6 +41.3 94.1  | 21 50.2 +41.3 93.3  | 21 07.9 +41.2 92.6  | 20 25.5 +41.2 91.9  |
| 14° | 23 56.2 +41.1 94.0  | 23 13.9 +41.0 93.3  | 22 31.5 +41.0 92.5  | 21 49.1 +41.0 91.8  | 21 06.7 +41.0 91.1  |
| 15° | 24 37.3 +40.8 93.2  | 23 54.9 +40.8 92.5  | 23 12.5 +40.8 91.7  | 22 30.1 +40.7 91.0  | 21 47.7 +40.7 90.3  |
| 16° | 25 18.1 +40.5 92.4  | 24 35.7 +40.5 91.7  | 23 53.3 +40.5 90.9  | 23 10.8 +40.6 90.2  | 22 28.4 +40.6 89.5  |
| 17° | 25 58.6 +40.3 91.6  | 25 16.2 +40.3 90.8  | 24 33.8 +40.3 90.1  | 23 51.4 +40.2 89.4  | 23 09.0 +40.2 88.7  |
| 18° | 26 38.9 +40.0 90.7  | 25 56.5 +40.0 90.0  | 25 14.1 +39.9 89.3  | 24 31.6 +40.0 88.6  | 23 49.2 +40.1 87.9  |
| 19° | 27 18.9 +39.7 89.9  | 26 36.5 +39.7 89.2  | 25 54.0 +39.8 88.5  | 25 11.6 +39.8 87.8  | 24 29.3 +39.7 87.1  |
| 20° | 27 58.6 +39.3 89.1  | 27 16.2 +39.3 88.4  | 26 33.8 +39.4 87.7  | 25 51.4 +39.4 87.0  | 25 09.0 +39.5 86.3  |
| 21° | 28 37.9 +39.1 88.2  | 27 55.5 +39.1 87.5  | 27 13.2 +39.1 86.8  | 26 30.8 +39.2 86.1  | 25 48.5 +39.2 85.4  |
| 22° | 29 17.0 +38.7 87.3  | 28 34.6 +38.7 86.6  | 27 52.3 +38.7 86.0  | 27 10.0 +38.8 85.3  | 26 27.7 +38.9 84.6  |
| 23° | 29 55.7 +38.3 86.4  | 29 13.3 +38.4 85.8  | 28 31.0 +38.5 85.1  | 27 48.8 +38.5 84.4  | 27 06.6 +38.6 83.8  |
| 24° | 30 34.0 +38.0 85.6  | 29 51.7 +38.1 84.9  | 29 09.5 +38.1 84.2  | 28 27.3 +38.2 83.6  | 27 45.2 +38.2 82.9  |
| 25° | 31 12.0 +37.6 84.7  | 30 29.8 +37.6 84.0  | 29 47.6 +37.7 83.3  | 29 05.5 +37.8 82.7  | 28 23.4 +38.0 82.0  |
| 26° | 31 49.6 +37.2 83.7  | 31 07.4 +37.3 83.1  | 30 25.3 +37.4 82.4  | 29 43.3 +37.5 81.8  | 29 01.4 +37.5 81.1  |
| 27° | 32 26.8 +36.7 82.8  | 31 44.7 +36.9 82.2  | 31 02.7 +37.0 81.5  | 30 20.8 +37.1 80.9  | 29 38.9 +37.2 80.2  |
| 28° | 33 03.5 +36.4 81.9  | 32 21.6 +36.4 81.2  | 31 39.7 +36.6 80.6  | 30 57.9 +36.7 80.0  | 30 16.1 +36.9 79.3  |
| 29° | 33 39.9 +35.9 80.9  | 32 58.0 +36.1 80.3  | 32 16.3 +36.1 79.7  | 31 34.6 +36.3 79.0  | 30 53.0 +36.4 78.4  |

| 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°  | 10 32.7 +43.1 100.7 | 9 51.0 +43.0 100.0 | 9 09.2 +42.9 99.3  | 8 27.2 +42.9 98.5  | 7 45.2 +42.8 97.8  |
| 1°  | 11 15.8 +43.0 100.0 | 10 34.0 +42.9 99.3 | 9 52.1 +42.8 98.6  | 9 10.1 +42.8 97.8  | 8 28.0 +42.7 97.1  |
| 2°  | 11 58.8 +42.9 99.3  | 11 16.9 +42.8 98.6 | 10 34.9 +42.8 97.9 | 9 52.9 +42.6 97.1  | 9 10.7 +42.7 96.4  |
| 3°  | 12 41.7 +42.8 98.6  | 11 59.7 +42.7 97.9 | 11 17.7 +42.6 97.1 | 10 35.5 +42.6 96.4 | 9 53.4 +42.5 95.7  |
| 4°  | 13 24.5 +42.7 97.9  | 12 42.4 +42.6 97.1 | 12 00.3 +42.6 96.4 | 11 18.1 +42.5 95.7 | 10 35.9 +42.4 95.0 |
| 5°  | 14 07.2 +42.5 97.1  | 13 25.0 +42.5 96.4 | 12 42.9 +42.4 95.7 | 12 00.6 +42.4 95.0 | 11 18.3 +42.3 94.3 |
| 6°  | 14 49.7 +42.4 96.4  | 14 07.5 +42.3 95.7 | 13 25.3 +42.3 95.0 | 12 43.0 +42.2 94.3 | 12 00.6 +42.3 93.5 |
| 7°  | 15 32.1 +42.2 95.7  | 14 49.8 +42.2 95.0 | 14 07.6 +42.1 94.2 | 13 25.2 +42.1 93.5 | 12 42.9 +42.1 92.8 |
| 8°  | 16 14.3 +42.1 94.9  | 15 32.0 +42.1 94.2 | 14 49.7 +42.0 93.5 | 14 07.3 +42.0 92.8 | 13 25.0 +41.9 92.1 |
| 9°  | 16 56.4 +41.9 94.2  | 16 14.1 +41.9 93.5 | 15 31.7 +41.9 92.8 | 14 49.3 +41.9 92.1 | 14 06.9 +41.9 91.3 |
| 10° | 17 38.3 +41.8 93.5  | 16 56.0 +41.7 92.7 | 16 13.6 +41.7 92.0 | 15 31.2 +41.7 91.3 | 14 48.8 +41.7 90.6 |
| 11° | 18 20.1 +41.6 92.7  | 17 37.7 +41.6 92.0 | 16 55.3 +41.5 91.3 | 16 12.9 +41.5 90.6 | 15 30.5 +41.5 89.9 |
| 12° | 19 01.7 +41.4 91.9  | 18 19.3 +41.3 91.2 | 17 36.8 +41.4 90.5 | 16 54.4 +41.4 89.8 | 16 12.0 +41.4 89.1 |
| 13° | 19 43.1 +41.2 91.2  | 19 00.6 +41.2 90.5 | 18 18.2 +41.2 89.8 | 17 35.8 +41.2 89.0 | 16 53.4 +41.2 88.3 |
| 14° | 20 24.3 +40.9 90.4  | 19 41.8 +41.0 89.7 | 18 59.4 +41.0 89.0 | 18 17.0 +41.0 88.3 | 17 34.6 +41.0 87.6 |
| 15° | 21 05.2 +40.8 89.6  | 20 22.8 +40.8 88.9 | 19 40.4 +40.8 88.2 | 18 58.0 +40.8 87.5 | 18 15.6 +40.9 86.8 |
| 16° | 21 46.0 +40.5 88.8  | 21 03.6 +40.6 88.1 | 20 21.2 +40.6 87.4 | 19 38.8 +40.6 86.7 | 18 56.5 +40.6 86.0 |
| 17° | 22 26.5 +40.3 88.0  | 21 44.2 +40.3 87.3 | 21 01.8 +40.3 86.6 | 20 19.4 +40.5 86.0 | 19 37.1 +40.5 85.3 |
| 18° | 23 06.8 +40.1 87.2  | 22 24.5 +40.1 86.5 | 21 42.1 +40.2 85.9 | 20 59.9 +40.1 85.2 | 20 17.6 +40.2 84.5 |
| 19° | 23 46.9 +39.8 86.4  | 23 04.6 +39.8 85.7 | 22 22.3 +39.9 85.0 | 21 40.0 +40.0 84.4 | 20 57.8 +40.1 83.7 |
| 20° | 24 26.7 +39.5 85.6  | 23 44.4 +39.6 84.9 | 23 02.2 +39.6 84.2 | 22 20.0 +39.7 83.6 | 21 37.9 +39.8 82.9 |
| 21° | 25 06.2 +39.3 84.8  | 24 24.0 +39.3 84.1 | 23 41.8 +39.4 83.4 | 22 59.7 +39.5 82.8 | 22 17.7 +39.5 82.1 |
| 22° | 25 45.5 +39.0 83.9  | 25 03.3 +39.1 83.3 | 24 21.2 +39.1 82.6 | 23 39.2 +39.2 81.9 | 22 57.2 +39.3 81.3 |
| 23° | 26 24.5 +38.6 83.1  | 25 42.4 +38.7 82.4 | 25 00.3 +38.9 81.8 | 24 18.4 +38.9 81.1 | 23 36.5 +39.0 80.4 |
| 24° | 27 03.1 +38.4 82.2  | 26 21.1 +38.4 81.6 | 25 39.2 +38.5 80.9 | 24 57.3 +38.7 80.3 | 24 15.5 +38.8 79.6 |
| 25° | 27 41.5 +38.0 81.4  | 26 59.5 +38.2 80.7 | 26 17.7 +38.3 80.1 | 25 36.0 +38.3 79.4 | 24 54.3 +38.5 78.8 |
| 26° | 28 19.5 +37.7 80.5  | 27 37.7 +37.8 79.8 | 26 56.0 +37.9 79.2 | 26 14.3 +38.1 78.6 | 25 32.8 +38.2 77.9 |
| 27° | 28 57.2 +37.3 79.6  | 28 15.5 +37.4 79.0 | 27 33.9 +37.6 78.3 | 26 52.4 +37.7 77.7 | 26 11.0 +37.8 77.1 |
| 28° | 29 34.5 +36.9 78.7  | 28 52.9 +37.1 78.1 | 28 11.5 +37.2 77.4 | 27 30.1 +37.4 76.8 | 26 48.8 +37.6 76.2 |
| 29° | 30 11.4 +36.6 77.8  | 29 30.0 +36.8 77.2 | 28 48.7 +36.9 76.6 | 28 07.5 +37.0 75.9 | 27 26.4 +37.2 75.3 |



# Declination SAME name as Latitude

# Latitude 45°

| 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°  | 7 03.2 +42.7 97.1  | 6 21.0 +42.7 96.4  | 5 38.9 +42.6 95.7  | 4 56.6 +42.6 95.0  | 4 14.3 +42.5 94.3  |
| 1°  | 7 45.9 +42.6 96.4  | 7 03.7 +42.6 95.7  | 6 21.5 +42.5 95.0  | 5 39.2 +42.5 94.3  | 4 56.8 +42.5 93.5  |
| 2°  | 8 28.5 +42.6 95.7  | 7 46.3 +42.5 95.0  | 7 04.0 +42.5 94.3  | 6 21.7 +42.4 93.5  | 5 39.3 +42.5 92.8  |
| 3°  | 9 11.1 +42.5 95.0  | 8 28.8 +42.5 94.3  | 7 46.5 +42.4 93.5  | 7 04.1 +42.4 92.8  | 6 21.8 +42.3 92.1  |
| 4°  | 9 53.6 +42.4 94.3  | 9 11.3 +42.3 93.5  | 8 28.9 +42.3 92.8  | 7 46.5 +42.3 92.1  | 7 04.1 +42.3 91.4  |
| 5°  | 10 36.0 +42.3 93.5 | 9 53.6 +42.3 92.8  | 9 11.2 +42.3 92.1  | 8 28.8 +42.3 91.4  | 7 46.4 +42.2 90.7  |
| 6°  | 11 18.3 +42.2 92.8 | 10 35.9 +42.2 92.1 | 9 53.5 +42.2 91.4  | 9 11.1 +42.1 90.7  | 8 28.6 +42.2 90.0  |
| 7°  | 12 00.5 +42.1 92.1 | 11 18.1 +42.0 91.4 | 10 35.7 +42.0 90.7 | 9 53.2 +42.1 90.0  | 9 10.8 +42.1 89.3  |
| 8°  | 12 42.6 +41.9 91.4 | 12 00.1 +42.0 90.7 | 11 17.7 +42.0 89.9 | 10 35.3 +41.9 89.2 | 9 52.9 +41.9 88.5  |
| 9°  | 13 24.5 +41.8 90.6 | 12 42.1 +41.8 89.9 | 11 59.7 +41.8 89.2 | 11 17.2 +41.9 88.5 | 10 34.8 +41.9 87.8 |
| 10° | 14 06.3 +41.7 89.9 | 13 23.9 +41.7 89.2 | 12 41.5 +41.7 88.5 | 11 59.1 +41.7 87.8 | 11 16.7 +41.8 87.1 |
| 11° | 14 48.0 +41.6 89.1 | 14 05.6 +41.6 88.4 | 13 23.2 +41.6 87.7 | 12 40.8 +41.6 87.0 | 11 58.5 +41.6 86.3 |
| 12° | 15 29.6 +41.4 88.4 | 14 47.2 +41.4 87.7 | 14 04.8 +41.4 87.0 | 13 22.4 +41.5 86.3 | 12 40.1 +41.5 85.6 |
| 13° | 16 11.0 +41.2 87.6 | 15 28.6 +41.3 86.9 | 14 46.2 +41.4 86.3 | 14 03.9 +41.4 85.6 | 13 21.6 +41.4 84.9 |
| 14° | 16 52.2 +41.1 86.9 | 16 09.9 +41.1 86.2 | 15 27.6 +41.1 85.5 | 14 45.3 +41.2 84.8 | 14 03.0 +41.3 84.1 |
| 15° | 17 33.3 +40.9 86.1 | 16 51.0 +40.9 85.4 | 16 08.7 +41.0 84.7 | 15 26.5 +41.0 84.1 | 14 44.3 +41.1 83.4 |
| 16° | 18 14.2 +40.7 85.4 | 17 31.9 +40.8 84.7 | 16 49.7 +40.8 84.0 | 16 07.5 +40.9 83.3 | 15 25.4 +41.0 82.6 |
| 17° | 18 54.9 +40.5 84.6 | 18 12.7 +40.5 83.9 | 17 30.5 +40.7 83.2 | 16 48.4 +40.7 82.5 | 16 06.4 +40.8 81.9 |
| 18° | 19 35.4 +40.3 83.8 | 18 53.2 +40.4 83.1 | 18 11.2 +40.4 82.4 | 17 29.1 +40.6 81.8 | 16 47.2 +40.6 81.1 |
| 19° | 20 15.7 +40.1 83.0 | 19 33.6 +40.2 82.3 | 18 51.6 +40.3 81.7 | 18 09.7 +40.3 81.0 | 17 27.8 +40.5 80.3 |
| 20° | 20 55.8 +39.9 82.2 | 20 13.8 +40.0 81.5 | 19 31.9 +40.0 80.9 | 18 50.0 +40.2 80.2 | 18 08.3 +40.2 79.5 |
| 21° | 21 35.7 +39.6 81.4 | 20 53.8 +39.7 80.8 | 20 11.9 +39.9 80.1 | 19 30.2 +39.9 79.4 | 18 48.5 +40.1 78.8 |
| 22° | 22 15.3 +39.4 80.6 | 21 33.5 +39.5 79.9 | 20 51.8 +39.6 79.3 | 20 10.1 +39.8 78.6 | 19 28.6 +39.8 78.0 |
| 23° | 22 54.7 +39.2 79.8 | 22 13.0 +39.3 79.1 | 21 31.4 +39.4 78.5 | 20 49.9 +39.5 77.8 | 20 08.4 +39.7 77.2 |
| 24° | 23 33.9 +38.8 79.0 | 22 52.3 +39.0 78.3 | 22 10.8 +39.1 77.7 | 21 29.4 +39.2 77.0 | 20 48.1 +39.4 76.4 |
| 25° | 24 12.7 +38.6 78.1 | 23 31.3 +38.7 77.5 | 22 49.9 +38.9 76.9 | 22 08.6 +39.1 76.2 | 21 27.5 +39.2 75.6 |
| 26° | 24 51.3 +38.4 77.3 | 24 10.0 +38.5 76.7 | 23 28.8 +38.6 76.0 | 22 47.7 +38.8 75.4 | 22 06.7 +38.9 74.8 |
| 27° | 25 29.7 +38.0 76.4 | 24 48.5 +38.2 75.8 | 24 07.4 +38.3 75.2 | 23 26.5 +38.5 74.6 | 22 45.6 +38.7 73.9 |
| 28° | 26 07.7 +37.7 75.6 | 25 26.7 +37.8 75.0 | 24 45.7 +38.1 74.3 | 24 05.0 +38.2 73.7 | 23 24.3 +38.4 73.1 |
| 29° | 26 45.4 +37.4 74.7 | 26 04.5 +37.6 74.1 | 25 23.8 +37.8 73.5 | 24 43.2 +37.9 72.9 | 24 02.7 +38.2 72.3 |

| Dec | LHA 085° / 275°    | LHA 086° / 274°    | LHA 087° / 273°    | LHA 088° / 272°    | LHA 089° / 271°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | 3 32.0 +42.5 93.5  | 2 49.6 +42.5 92.8  | 2 07.3 +42.4 92.1  | 1 24.8 +42.5 91.4  | 0 42.4 +42.5 90.7  |
| 1°  | 4 14.5 +42.4 92.8  | 3 32.1 +42.4 92.1  | 2 49.7 +42.4 91.4  | 2 07.3 +42.4 90.7  | 1 24.9 +42.4 90.0  |
| 2°  | 4 56.9 +42.4 92.1  | 4 14.5 +42.4 91.4  | 3 32.1 +42.4 90.7  | 2 49.7 +42.4 90.0  | 2 07.3 +42.4 89.3  |
| 3°  | 5 39.3 +42.4 91.4  | 4 56.9 +42.4 90.7  | 4 14.5 +42.3 90.0  | 3 32.1 +42.3 89.3  | 2 49.7 +42.3 88.6  |
| 4°  | 6 21.7 +42.3 90.7  | 5 39.3 +42.3 90.0  | 4 56.8 +42.3 89.3  | 4 14.4 +42.3 88.6  | 3 32.0 +42.4 87.9  |
| 5°  | 7 04.0 +42.2 90.0  | 6 21.6 +42.2 89.3  | 5 39.1 +42.3 88.6  | 4 56.7 +42.3 87.9  | 4 14.4 +42.3 87.2  |
| 6°  | 7 46.2 +42.2 89.3  | 7 03.8 +42.2 88.6  | 6 21.4 +42.2 87.9  | 5 39.0 +42.2 87.2  | 4 56.7 +42.2 86.5  |
| 7°  | 8 28.4 +42.1 88.6  | 7 46.0 +42.1 87.8  | 7 03.6 +42.1 87.1  | 6 21.2 +42.2 86.4  | 5 38.9 +42.2 85.7  |
| 8°  | 9 10.5 +42.0 87.8  | 8 28.1 +42.0 87.1  | 7 45.7 +42.1 86.4  | 7 03.4 +42.1 85.7  | 6 21.1 +42.1 85.0  |
| 9°  | 9 52.5 +41.9 87.1  | 9 10.1 +41.9 86.4  | 8 27.8 +41.9 85.7  | 7 45.5 +42.0 85.0  | 7 03.2 +42.1 84.3  |
| 10° | 10 34.4 +41.8 86.4 | 9 52.0 +41.9 85.7  | 9 09.7 +41.9 85.0  | 8 27.5 +41.9 84.3  | 7 45.3 +42.0 83.6  |
| 11° | 11 16.2 +41.6 85.6 | 10 33.9 +41.7 85.0 | 9 51.6 +41.8 84.3  | 9 09.4 +41.9 83.6  | 8 27.3 +41.9 82.9  |
| 12° | 11 57.8 +41.6 84.9 | 11 15.6 +41.6 84.2 | 10 33.4 +41.7 83.5 | 9 51.3 +41.8 82.8  | 9 09.2 +41.9 82.1  |
| 13° | 12 39.4 +41.5 84.2 | 11 57.2 +41.6 83.5 | 11 15.1 +41.6 82.8 | 10 33.1 +41.6 82.1 | 9 51.1 +41.7 81.4  |
| 14° | 13 20.9 +41.3 83.4 | 12 38.8 +41.3 82.7 | 11 56.7 +41.5 82.1 | 11 14.7 +41.6 81.4 | 10 32.8 +41.6 80.7 |
| 15° | 14 02.2 +41.2 82.7 | 13 20.1 +41.3 82.0 | 12 38.2 +41.3 81.3 | 11 56.3 +41.4 80.6 | 11 14.4 +41.6 80.0 |
| 16° | 14 43.4 +41.0 81.9 | 14 01.4 +41.1 81.3 | 13 19.5 +41.2 80.6 | 12 37.7 +41.3 79.9 | 11 56.0 +41.4 79.2 |
| 17° | 15 24.4 +40.9 81.2 | 14 42.5 +41.0 80.5 | 14 00.7 +41.1 79.8 | 13 19.0 +41.2 79.2 | 12 37.4 +41.3 78.5 |
| 18° | 16 05.3 +40.7 80.4 | 15 23.5 +40.8 79.7 | 14 41.8 +40.9 79.1 | 14 00.2 +41.0 78.4 | 13 18.7 +41.2 77.7 |
| 19° | 16 46.0 +40.6 79.7 | 16 04.3 +40.7 79.0 | 15 22.7 +40.8 78.3 | 14 41.2 +40.9 77.7 | 13 59.9 +41.0 77.0 |
| 20° | 17 26.6 +40.4 78.9 | 16 45.0 +40.5 78.2 | 16 03.5 +40.6 77.6 | 15 22.1 +40.8 76.9 | 14 40.9 +40.9 76.2 |
| 21° | 18 07.0 +40.1 78.1 | 17 25.5 +40.3 77.4 | 16 44.1 +40.5 76.8 | 16 02.9 +40.6 76.1 | 15 21.8 +40.7 75.5 |
| 22° | 18 47.1 +40.0 77.3 | 18 05.8 +40.1 76.7 | 17 24.6 +40.2 76.0 | 16 43.5 +40.4 75.4 | 16 02.5 +40.5 74.7 |
| 23° | 19 27.1 +39.8 76.5 | 18 45.9 +39.9 75.9 | 18 04.8 +40.1 75.2 | 17 23.9 +40.2 74.6 | 16 43.0 +40.4 73.9 |
| 24° | 20 06.9 +39.6 75.7 | 19 25.8 +39.8 75.1 | 18 44.9 +39.9 74.5 | 18 04.1 +40.0 73.8 | 17 23.4 +40.2 73.2 |
| 25° | 20 46.5 +39.3 74.9 | 20 05.6 +39.5 74.3 | 19 24.8 +39.7 73.7 | 18 44.1 +39.9 73.0 | 18 03.6 +40.0 72.4 |
| 26° | 21 25.8 +39.1 74.1 | 20 45.1 +39.2 73.5 | 20 04.5 +39.4 72.9 | 19 24.0 +39.6 72.2 | 18 43.6 +39.9 71.6 |
| 27° | 22 04.9 +38.9 73.3 | 21 24.3 +39.1 72.7 | 20 43.9 +39.2 72.1 | 20 03.6 +39.4 71.4 | 19 23.5 +39.6 70.8 |
| 28° | 22 43.8 +38.6 72.5 | 22 03.4 +38.8 71.9 | 21 23.1 +39.0 71.3 | 20 43.0 +39.2 70.6 | 20 03.1 +39.4 70.0 |
| 29° | 23 22.4 +38.3 71.7 | 22 42.2 +38.5 71.0 | 22 02.1 +38.8 70.4 | 21 22.2 +39.0 69.8 | 20 42.5 +39.2 69.2 |

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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 +42.4 90.0  | -0 42.4 +42.4      | -1 24.8 +42.4      | -2 07.3 +42.5      | -2 49.6 +42.5      |
| 1°  | 0 42.4 +42.4 89.3  | 0 00.0 +42.4 88.6  | -0 42.4 +42.5      | -1 24.8 +42.5      | -2 07.1 +42.5      |
| 2°  | 1 24.8 +42.5 88.6  | 0 42.4 +42.5 87.9  | 0 00.1 +42.4 87.2  | -0 42.3 +42.5      | -1 24.6 +42.5      |
| 3°  | 2 07.3 +42.3 87.9  | 1 24.9 +42.4 87.2  | 0 42.5 +42.4 86.5  | 0 00.2 +42.5 85.8  | -0 42.1 +42.5      |
| 4°  | 2 49.6 +42.4 87.2  | 2 07.3 +42.4 86.5  | 1 24.9 +42.5 85.8  | 0 42.7 +42.4 85.1  | 0 00.4 +42.5 84.3  |
| 5°  | 3 32.0 +42.3 86.5  | 2 49.7 +42.3 85.8  | 2 07.4 +42.4 85.1  | 1 25.1 +42.5 84.3  | 0 42.9 +42.6 83.6  |
| 6°  | 4 14.3 +42.3 85.7  | 3 32.0 +42.4 85.0  | 2 49.8 +42.4 84.3  | 2 07.6 +42.4 83.6  | 1 25.5 +42.5 82.9  |
| 7°  | 4 56.6 +42.3 85.0  | 4 14.4 +42.3 84.3  | 3 32.2 +42.3 83.6  | 2 50.0 +42.5 82.9  | 2 08.0 +42.5 82.2  |
| 8°  | 5 38.9 +42.1 84.3  | 4 56.7 +42.2 83.6  | 4 14.5 +42.3 82.9  | 3 32.5 +42.3 82.2  | 2 50.5 +42.4 81.5  |
| 9°  | 6 21.0 +42.2 83.6  | 5 38.9 +42.2 82.9  | 4 56.8 +42.3 82.2  | 4 14.8 +42.4 81.5  | 3 32.9 +42.5 80.8  |
| 10° | 7 03.2 +42.0 82.9  | 6 21.1 +42.2 82.2  | 5 39.1 +42.2 81.5  | 4 57.2 +42.3 80.8  | 4 15.4 +42.3 80.1  |
| 11° | 7 45.2 +42.0 82.2  | 7 03.3 +42.0 81.5  | 6 21.3 +42.2 80.8  | 5 39.5 +42.2 80.1  | 4 57.7 +42.4 79.4  |
| 12° | 8 27.2 +42.0 81.5  | 7 45.3 +42.0 80.8  | 7 03.5 +42.1 80.1  | 6 21.7 +42.2 79.4  | 5 40.1 +42.3 78.7  |
| 13° | 9 09.2 +41.8 80.7  | 8 27.3 +41.9 80.0  | 7 45.6 +42.0 79.4  | 7 03.9 +42.2 78.7  | 6 22.4 +42.2 78.0  |
| 14° | 9 51.0 +41.7 80.0  | 9 09.2 +41.9 79.3  | 8 27.6 +41.9 78.6  | 7 46.1 +42.0 77.9  | 7 04.6 +42.2 77.3  |
| 15° | 10 32.7 +41.7 79.3 | 9 51.1 +41.7 78.6  | 9 09.5 +41.9 77.9  | 8 28.1 +42.0 77.2  | 7 46.8 +42.1 76.5  |
| 16° | 11 14.4 +41.5 78.5 | 10 32.8 +41.7 77.9 | 9 51.4 +41.8 77.2  | 9 10.1 +41.9 76.5  | 8 28.9 +42.0 75.8  |
| 17° | 11 55.9 +41.4 77.8 | 11 14.5 +41.5 77.1 | 10 33.2 +41.6 76.4 | 9 52.0 +41.8 75.8  | 9 10.9 +41.9 75.1  |
| 18° | 12 37.3 +41.3 77.1 | 11 56.0 +41.4 76.4 | 11 14.8 +41.6 75.7 | 10 33.8 +41.7 75.0 | 9 52.8 +41.9 74.4  |
| 19° | 13 18.6 +41.1 76.3 | 12 37.4 +41.3 75.6 | 11 56.4 +41.4 75.0 | 11 15.5 +41.5 74.3 | 10 34.7 +41.7 73.6 |
| 20° | 13 59.7 +41.0 75.6 | 13 18.7 +41.2 74.9 | 12 37.8 +41.3 74.2 | 11 57.0 +41.5 73.6 | 11 16.4 +41.6 72.9 |
| 21° | 14 40.7 +40.9 74.8 | 13 59.9 +41.0 74.2 | 13 19.1 +41.2 73.5 | 12 38.5 +41.4 72.8 | 11 58.0 +41.6 72.2 |
| 22° | 15 21.6 +40.7 74.1 | 14 40.9 +40.9 73.4 | 14 00.3 +41.0 72.7 | 13 19.9 +41.2 72.1 | 12 39.6 +41.3 71.4 |
| 23° | 16 02.3 +40.6 73.3 | 15 21.8 +40.7 72.6 | 14 41.3 +40.9 72.0 | 14 01.1 +41.0 71.3 | 13 20.9 +41.3 70.7 |
| 24° | 16 42.9 +40.4 72.5 | 16 02.5 +40.5 71.9 | 15 22.2 +40.8 71.2 | 14 42.1 +41.0 70.6 | 14 02.2 +41.1 69.9 |
| 25° | 17 23.3 +40.2 71.8 | 16 43.0 +40.4 71.1 | 16 03.0 +40.6 70.5 | 15 23.1 +40.7 69.8 | 14 43.3 +41.0 69.2 |
| 26° | 18 03.5 +40.0 71.0 | 17 23.4 +40.2 70.3 | 16 43.6 +40.4 69.7 | 16 03.8 +40.7 69.1 | 15 24.3 +40.8 68.4 |
| 27° | 18 43.5 +39.8 70.2 | 18 03.6 +40.1 69.6 | 17 24.0 +40.2 68.9 | 16 44.5 +40.4 68.3 | 16 05.1 +40.7 67.7 |
| 28° | 19 23.3 +39.6 69.4 | 18 43.7 +39.8 68.8 | 18 04.2 +40.0 68.2 | 17 24.9 +40.3 67.5 | 16 45.8 +40.5 66.9 |
| 29° | 20 02.9 +39.4 68.6 | 19 23.5 +39.6 68.0 | 18 44.2 +39.9 67.4 | 18 05.2 +40.0 66.8 | 17 26.3 +40.3 66.1 |

| 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°  | -3 32.0 +42.5      | -4 14.3 +42.5      | -4 56.6 +42.6      | -5 38.9 +42.7      | -6 21.0 +42.7      |
| 1°  | -2 49.5 +42.6      | -3 31.8 +42.6      | -4 14.0 +42.6      | -4 56.2 +42.7      | -5 38.3 +42.7      |
| 2°  | -2 06.9 +42.5      | -2 49.2 +42.6      | -3 31.4 +42.7      | -4 13.5 +42.7      | -4 55.6 +42.8      |
| 3°  | -1 24.4 +42.6      | -2 06.6 +42.7      | -2 48.7 +42.7      | -3 30.8 +42.8      | -4 12.8 +42.9      |
| 4°  | -0 41.8 +42.6      | -1 23.9 +42.6      | -2 06.0 +42.7      | -2 48.0 +42.8      | -3 29.9 +42.9      |
| 5°  | 0 00.8 +42.6 82.9  | -0 41.3 +42.7      | -1 23.3 +42.8      | -2 05.2 +42.8      | -2 47.0 +42.9      |
| 6°  | 0 43.4 +42.6 82.2  | 0 01.4 +42.6 81.5  | -0 40.5 +42.7      | -1 22.4 +42.9      | -2 04.1 +42.9      |
| 7°  | 1 26.0 +42.5 81.5  | 0 44.0 +42.7 80.8  | 0 02.2 +42.7 80.1  | -0 39.5 +42.8      | -1 21.2 +42.9      |
| 8°  | 2 08.5 +42.6 80.8  | 1 26.7 +42.6 80.1  | 0 44.9 +42.8 79.4  | 0 03.3 +42.8 78.7  | -0 38.3 +43.0      |
| 9°  | 2 51.1 +42.5 80.1  | 2 09.3 +42.7 79.4  | 1 27.7 +42.7 78.7  | 0 46.1 +42.9 78.0  | 0 04.7 +42.9 77.3  |
| 10° | 3 33.6 +42.5 79.4  | 2 52.0 +42.5 78.7  | 2 10.4 +42.7 78.0  | 1 29.0 +42.8 77.3  | 0 47.6 +43.0 76.6  |
| 11° | 4 16.1 +42.4 78.7  | 3 34.5 +42.6 78.0  | 2 53.1 +42.7 77.3  | 2 11.8 +42.8 76.6  | 1 30.6 +42.9 75.9  |
| 12° | 4 58.5 +42.4 78.0  | 4 17.1 +42.5 77.3  | 3 35.8 +42.6 76.6  | 2 54.6 +42.7 75.9  | 2 13.5 +42.9 75.2  |
| 13° | 5 40.9 +42.4 77.3  | 4 59.6 +42.5 76.6  | 4 18.4 +42.6 75.9  | 3 37.3 +42.8 75.2  | 2 56.4 +42.9 74.5  |
| 14° | 6 23.3 +42.3 76.6  | 5 42.1 +42.4 75.9  | 5 01.0 +42.6 75.2  | 4 20.1 +42.7 74.5  | 3 39.3 +42.8 73.8  |
| 15° | 7 05.6 +42.2 75.9  | 6 24.5 +42.4 75.2  | 5 43.6 +42.5 74.5  | 5 02.8 +42.6 73.8  | 4 22.1 +42.8 73.1  |
| 16° | 7 47.8 +42.2 75.1  | 7 06.9 +42.3 74.5  | 6 26.1 +42.4 73.8  | 5 45.4 +42.6 73.1  | 5 04.9 +42.8 72.4  |
| 17° | 8 30.0 +42.1 74.4  | 7 49.2 +42.2 73.7  | 7 08.5 +42.4 73.1  | 6 28.0 +42.5 72.4  | 5 47.7 +42.7 71.7  |
| 18° | 9 12.1 +41.9 73.7  | 8 31.4 +42.1 73.0  | 7 50.9 +42.3 72.3  | 7 10.5 +42.5 71.7  | 6 30.4 +42.6 71.0  |
| 19° | 9 54.0 +41.9 73.0  | 9 13.5 +42.1 72.3  | 8 33.2 +42.2 71.6  | 7 53.0 +42.4 71.0  | 7 13.0 +42.6 70.3  |
| 20° | 10 35.9 +41.8 72.2 | 9 55.6 +42.0 71.6  | 9 15.4 +42.2 70.9  | 8 35.4 +42.3 70.2  | 7 55.6 +42.5 69.6  |
| 21° | 11 17.7 +41.7 71.5 | 10 37.6 +41.8 70.9 | 9 57.6 +42.0 70.2  | 9 17.7 +42.3 69.5  | 8 38.1 +42.4 68.9  |
| 22° | 11 59.4 +41.6 70.8 | 11 19.4 +41.8 70.1 | 10 39.6 +42.0 69.5 | 10 00.0 +42.1 68.8 | 9 20.5 +42.4 68.1  |
| 23° | 12 41.0 +41.4 70.0 | 12 01.2 +41.6 69.4 | 11 21.6 +41.8 68.7 | 10 42.1 +42.1 68.1 | 10 02.9 +42.2 67.4 |
| 24° | 13 22.4 +41.4 69.3 | 12 42.8 +41.6 68.7 | 12 03.4 +41.7 68.0 | 11 24.2 +41.9 67.3 | 10 45.1 +42.2 66.7 |
| 25° | 14 03.8 +41.1 68.6 | 13 24.4 +41.3 67.9 | 12 45.1 +41.6 67.3 | 12 06.1 +41.8 66.6 | 11 27.3 +42.0 66.0 |
| 26° | 14 44.9 +41.1 67.8 | 14 05.7 +41.3 67.2 | 13 26.7 +41.5 66.5 | 12 47.9 +41.7 65.9 | 12 09.3 +41.9 65.2 |
| 27° | 15 26.0 +40.8 67.0 | 14 47.0 +41.1 66.4 | 14 08.2 +41.3 65.8 | 13 29.6 +41.6 65.1 | 12 51.2 +41.8 64.5 |
| 28° | 16 06.8 +40.8 66.3 | 15 28.1 +40.9 65.7 | 14 49.5 +41.2 65.0 | 14 11.2 +41.4 64.4 | 13 33.0 +41.7 63.8 |
| 29° | 16 47.6 +40.5 65.5 | 16 09.0 +40.8 64.9 | 15 30.7 +41.1 64.3 | 14 52.6 +41.3 63.7 | 14 14.7 +41.5 63.0 |

# Declination SAME name as Latitude

# Latitude 45°

| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°    | LHA 103° / 257°    | LHA 104° / 256°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -7 03.2 +42.8      | -7 45.2 +42.8      | -8 27.2 +42.9      | -9 09.2 +43.1      | -9 51.0 +43.1      |
| 1°  | -6 20.4 +42.8      | -7 02.4 +42.9      | -7 44.3 +43.0      | -8 26.1 +43.0      | -9 07.9 +43.2      |
| 2°  | -5 37.6 +42.9      | -6 19.5 +43.0      | -7 01.3 +43.0      | -7 43.1 +43.2      | -8 24.7 +43.3      |
| 3°  | -4 54.7 +43.0      | -5 36.5 +43.0      | -6 18.3 +43.2      | -6 59.9 +43.2      | -7 41.4 +43.3      |
| 4°  | -4 11.7 +42.9      | -4 53.5 +43.1      | -5 35.1 +43.1      | -6 16.7 +43.3      | -6 58.1 +43.4      |
| 5°  | -3 28.8 +43.0      | -4 10.4 +43.1      | -4 52.0 +43.2      | -5 33.4 +43.3      | -6 14.7 +43.4      |
| 6°  | -2 45.8 +43.1      | -3 27.3 +43.1      | -4 08.8 +43.3      | -4 50.1 +43.4      | -5 31.3 +43.5      |
| 7°  | -2 02.7 +43.0      | -2 44.2 +43.2      | -3 25.5 +43.3      | -4 06.7 +43.4      | -4 47.8 +43.6      |
| 8°  | -1 19.7 +43.1      | -2 01.0 +43.1      | -2 42.2 +43.3      | -3 23.3 +43.4      | -4 04.2 +43.5      |
| 9°  | -0 36.6 +43.0      | -1 17.9 +43.2      | -1 58.9 +43.3      | -2 39.9 +43.5      | -3 20.7 +43.6      |
| 10° | 0 06.4 +43.1 75.9  | -0 34.7 +43.2      | -1 15.6 +43.3      | -1 56.4 +43.4      | -2 37.1 +43.6      |
| 11° | 0 49.5 +43.0 75.2  | 0 08.5 +43.2 74.5  | -0 32.3 +43.3      | -1 13.0 +43.5      | -1 53.5 +43.7      |
| 12° | 1 32.5 +43.1 74.5  | 0 51.7 +43.2 73.8  | 0 11.0 +43.4 73.1  | -0 29.5 +43.5      | -1 09.8 +43.6      |
| 13° | 2 15.6 +43.0 73.8  | 1 34.9 +43.2 73.1  | 0 54.4 +43.3 72.4  | 0 14.0 +43.5 71.7  | -0 26.2 +43.7      |
| 14° | 2 58.6 +43.0 73.1  | 2 18.1 +43.1 72.4  | 1 37.7 +43.3 71.7  | 0 57.5 +43.5 71.0  | 0 17.5 +43.6 70.3  |
| 15° | 3 41.6 +42.9 72.4  | 3 01.2 +43.1 71.7  | 2 21.0 +43.3 71.0  | 1 41.0 +43.4 70.3  | 1 01.1 +43.7 69.6  |
| 16° | 4 24.5 +43.0 71.7  | 3 44.3 +43.1 71.0  | 3 04.3 +43.3 70.3  | 2 24.4 +43.5 69.6  | 1 44.8 +43.6 68.9  |
| 17° | 5 07.5 +42.8 71.0  | 4 27.4 +43.1 70.3  | 3 47.6 +43.2 69.6  | 3 07.9 +43.4 68.9  | 2 28.4 +43.6 68.2  |
| 18° | 5 50.3 +42.8 70.3  | 5 10.5 +43.0 69.6  | 4 30.8 +43.2 68.9  | 3 51.3 +43.4 68.2  | 3 12.0 +43.6 67.6  |
| 19° | 6 33.1 +42.8 69.6  | 5 53.5 +42.9 68.9  | 5 14.0 +43.1 68.2  | 4 34.7 +43.3 67.6  | 3 55.6 +43.5 66.9  |
| 20° | 7 15.9 +42.7 68.9  | 6 36.4 +42.9 68.2  | 5 57.1 +43.1 67.5  | 5 18.0 +43.3 66.9  | 4 39.1 +43.5 66.2  |
| 21° | 7 58.6 +42.6 68.2  | 7 19.3 +42.8 67.5  | 6 40.2 +43.0 66.8  | 6 01.3 +43.2 66.2  | 5 22.6 +43.4 65.5  |
| 22° | 8 41.2 +42.6 67.5  | 8 02.1 +42.8 66.8  | 7 23.2 +43.0 66.1  | 6 44.5 +43.2 65.5  | 6 06.0 +43.5 64.8  |
| 23° | 9 23.8 +42.4 66.8  | 8 44.9 +42.7 66.1  | 8 06.2 +42.9 65.4  | 7 27.7 +43.1 64.8  | 6 49.5 +43.3 64.1  |
| 24° | 10 06.2 +42.4 66.0 | 9 27.6 +42.5 65.4  | 8 49.1 +42.8 64.7  | 8 10.8 +43.1 64.1  | 7 32.8 +43.3 63.4  |
| 25° | 10 48.6 +42.3 65.3 | 10 10.1 +42.5 64.7 | 9 31.9 +42.7 64.0  | 8 53.9 +42.9 63.4  | 8 16.1 +43.2 62.7  |
| 26° | 11 30.9 +42.1 64.6 | 10 52.6 +42.4 64.0 | 10 14.6 +42.7 63.3 | 9 36.8 +42.9 62.7  | 8 59.3 +43.1 62.0  |
| 27° | 12 13.0 +42.1 63.9 | 11 35.0 +42.3 63.2 | 10 57.3 +42.5 62.6 | 10 19.7 +42.8 61.9 | 9 42.4 +43.0 61.3  |
| 28° | 12 55.1 +41.9 63.1 | 12 17.3 +42.2 62.5 | 11 39.8 +42.4 61.9 | 11 02.5 +42.7 61.2 | 10 25.4 +43.0 60.6 |
| 29° | 13 37.0 +41.8 62.4 | 12 59.5 +42.0 61.8 | 12 22.2 +42.3 61.1 | 11 45.2 +42.5 60.5 | 11 08.4 +42.8 59.9 |

| Dec | LHA 105° / 255°    | LHA 106° / 254°   | LHA 107° / 253°   | LHA 108° / 252°   | LHA 109° / 251°   |
|-----|--------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                    |                   |                   |                   |                   |
| 1°  | -9 49.5 +43.3      |                   |                   |                   |                   |
| 2°  | -9 06.2 +43.3      | -9 47.6 +43.4     |                   |                   |                   |
| 3°  | -8 22.9 +43.5      | -9 04.2 +43.6     | -9 45.3 +43.6     |                   |                   |
| 4°  | -7 39.4 +43.5      | -8 20.6 +43.6     | -9 01.7 +43.8     | -9 42.6 +43.9     |                   |
| 5°  | -6 55.9 +43.6      | -7 37.0 +43.7     | -8 17.9 +43.9     | -8 58.7 +44.0     | -9 39.3 +44.2     |
| 6°  | -6 12.3 +43.6      | -6 53.3 +43.8     | -7 34.0 +43.9     | -8 14.7 +44.1     | -8 55.1 +44.2     |
| 7°  | -5 28.7 +43.7      | -6 09.5 +43.8     | -6 50.1 +43.9     | -7 30.6 +44.1     | -8 10.9 +44.2     |
| 8°  | -4 45.0 +43.7      | -5 25.7 +43.9     | -6 06.2 +44.0     | -6 46.5 +44.2     | -7 26.7 +44.4     |
| 9°  | -4 01.3 +43.7      | -4 41.8 +43.9     | -5 22.2 +44.1     | -6 02.3 +44.2     | -6 42.3 +44.4     |
| 10° | -3 17.6 +43.8      | -3 57.9 +43.9     | -4 38.1 +44.1     | -5 18.1 +44.3     | -5 57.9 +44.4     |
| 11° | -2 33.8 +43.8      | -3 14.0 +44.0     | -3 54.0 +44.1     | -4 33.8 +44.3     | -5 13.5 +44.5     |
| 12° | -1 50.0 +43.8      | -2 30.0 +43.9     | -3 09.9 +44.2     | -3 49.5 +44.3     | -4 29.0 +44.5     |
| 13° | -1 06.2 +43.8      | -1 46.1 +44.0     | -2 25.7 +44.2     | -3 05.2 +44.4     | -3 44.5 +44.6     |
| 14° | -0 22.4 +43.8      | -1 02.1 +44.0     | -1 41.5 +44.2     | -2 20.8 +44.4     | -2 59.9 +44.6     |
| 15° | 0 21.4 +43.9 68.9  | -0 18.1 +44.1     | -0 57.3 +44.2     | -1 36.4 +44.4     | -2 15.3 +44.6     |
| 16° | 1 05.3 +43.8 68.2  | 0 26.0 +44.0 67.5 | -0 13.1 +44.2     | -0 52.0 +44.4     | -1 30.7 +44.6     |
| 17° | 1 49.1 +43.8 67.5  | 1 10.0 +44.0 66.8 | 0 31.1 +44.2 66.1 | -0 07.6 +44.4     | -0 46.1 +44.6     |
| 18° | 2 32.9 +43.7 66.9  | 1 54.0 +43.9 66.2 | 1 15.3 +44.1 65.5 | 0 36.8 +44.4 64.8 | -0 01.5 +44.6     |
| 19° | 3 16.6 +43.8 66.2  | 2 37.9 +44.0 65.5 | 1 59.4 +44.2 64.8 | 1 21.2 +44.4 64.1 | 0 43.1 +44.6 63.4 |
| 20° | 4 00.4 +43.7 65.5  | 3 21.9 +43.9 64.8 | 2 43.6 +44.2 64.1 | 2 05.6 +44.3 63.4 | 1 27.7 +44.6 62.7 |
| 21° | 4 44.1 +43.7 64.8  | 4 05.8 +43.9 64.1 | 3 27.8 +44.1 63.4 | 2 49.9 +44.4 62.7 | 2 12.3 +44.6 62.1 |
| 22° | 5 27.8 +43.6 64.1  | 4 49.7 +43.9 63.4 | 4 11.9 +44.1 62.8 | 3 34.3 +44.3 62.1 | 2 56.9 +44.6 61.4 |
| 23° | 6 11.4 +43.6 63.4  | 5 33.6 +43.8 62.8 | 4 56.0 +44.0 62.1 | 4 18.6 +44.3 61.4 | 3 41.5 +44.5 60.7 |
| 24° | 6 55.0 +43.5 62.7  | 6 17.4 +43.7 62.1 | 5 40.0 +44.0 61.4 | 5 02.9 +44.2 60.7 | 4 26.0 +44.5 60.0 |
| 25° | 7 38.5 +43.4 62.0  | 7 01.1 +43.7 61.4 | 6 24.0 +43.9 60.7 | 5 47.1 +44.2 60.0 | 5 10.5 +44.4 59.4 |
| 26° | 8 21.9 +43.4 61.3  | 7 44.8 +43.6 60.7 | 7 07.9 +43.9 60.0 | 6 31.3 +44.1 59.4 | 5 54.9 +44.4 58.7 |
| 27° | 9 05.3 +43.3 60.6  | 8 28.4 +43.6 60.0 | 7 51.8 +43.8 59.3 | 7 15.4 +44.1 58.7 | 6 39.3 +44.4 58.0 |
| 28° | 9 48.6 +43.2 59.9  | 9 12.0 +43.4 59.3 | 8 35.6 +43.8 58.6 | 7 59.5 +44.0 58.0 | 7 23.7 +44.3 57.3 |
| 29° | 10 31.8 +43.1 59.2 | 9 55.4 +43.4 58.6 | 9 19.4 +43.6 58.0 | 8 43.5 +44.0 57.3 | 8 08.0 +44.2 56.7 |

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# Latitude 45°

# Declination SAME name as Latitude

| Dec | LHA 110° / 250°   | LHA 111° / 249°   | LHA 112° / 248°   | LHA 113° / 247°   | LHA 114° / 246°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  |                   |                   |                   |                   |                   |
| 3°  |                   |                   |                   |                   |                   |
| 4°  |                   |                   |                   |                   |                   |
| 5°  |                   |                   |                   |                   |                   |
| 6°  | -9 35.4 +44.3     |                   |                   |                   |                   |
| 7°  | -8 51.1 +44.5     | -9 31.0 +44.6     |                   |                   |                   |
| 8°  | -8 06.6 +44.5     | -8 46.4 +44.7     | -9 26.0 +44.9     |                   |                   |
| 9°  | -7 22.1 +44.6     | -8 01.7 +44.7     | -8 41.1 +44.9     | -9 20.3 +45.1     | -9 59.3 +45.3     |
| 10° | -6 37.5 +44.6     | -7 17.0 +44.8     | -7 56.2 +45.0     | -8 35.2 +45.2     | -9 14.0 +45.4     |
| 11° | -5 52.9 +44.7     | -6 32.2 +44.9     | -7 11.2 +45.1     | -7 50.0 +45.3     | -8 28.6 +45.5     |
| 12° | -5 08.2 +44.7     | -5 47.3 +44.9     | -6 26.1 +45.1     | -7 04.7 +45.3     | -7 43.1 +45.5     |
| 13° | -4 23.5 +44.7     | -5 02.4 +45.0     | -5 41.0 +45.1     | -6 19.4 +45.4     | -6 57.6 +45.6     |
| 14° | -3 38.8 +44.8     | -4 17.4 +45.0     | -4 55.9 +45.2     | -5 34.0 +45.4     | -6 12.0 +45.6     |
| 15° | -2 54.0 +44.8     | -3 32.4 +45.0     | -4 10.7 +45.3     | -4 48.6 +45.4     | -5 26.4 +45.7     |
| 16° | -2 09.2 +44.8     | -2 47.4 +45.0     | -3 25.4 +45.2     | -4 03.2 +45.5     | -4 40.7 +45.7     |
| 17° | -1 24.4 +44.9     | -2 02.4 +45.1     | -2 40.2 +45.3     | -3 17.7 +45.5     | -3 55.0 +45.8     |
| 18° | -0 39.5 +44.8     | -1 17.3 +45.0     | -1 54.9 +45.3     | -2 32.2 +45.5     | -3 09.2 +45.7     |
| 19° | 0 05.3 +44.8 62.7 | -0 32.3 +45.1     | -1 09.6 +45.3     | -1 46.7 +45.6     | -2 23.5 +45.8     |
| 20° | 0 50.1 +44.9 62.0 | 0 12.8 +45.1 61.3 | -0 24.3 +45.3     | -1 01.1 +45.5     | -1 37.7 +45.8     |
| 21° | 1 35.0 +44.8 61.4 | 0 57.9 +45.0 60.7 | 0 21.0 +45.3 60.0 | -0 15.6 +45.6     | -0 51.9 +45.8     |
| 22° | 2 19.8 +44.8 60.7 | 1 42.9 +45.1 60.0 | 1 06.3 +45.3 59.3 | 0 30.0 +45.5 58.6 | -0 06.1 +45.8     |
| 23° | 3 04.6 +44.8 60.0 | 2 28.0 +45.0 59.3 | 1 51.6 +45.3 58.6 | 1 15.5 +45.5 57.9 | 0 39.7 +45.8 57.2 |
| 24° | 3 49.4 +44.7 59.4 | 3 13.0 +45.0 58.7 | 2 36.9 +45.2 58.0 | 2 01.0 +45.6 57.3 | 1 25.5 +45.8 56.6 |
| 25° | 4 34.1 +44.7 58.7 | 3 58.0 +45.0 58.0 | 3 22.1 +45.3 57.3 | 2 46.6 +45.5 56.6 | 2 11.3 +45.7 56.0 |
| 26° | 5 18.8 +44.7 58.0 | 4 43.0 +44.9 57.3 | 4 07.4 +45.2 56.7 | 3 32.1 +45.4 56.0 | 2 57.0 +45.8 55.3 |
| 27° | 6 03.5 +44.6 57.3 | 5 27.9 +44.9 56.7 | 4 52.6 +45.1 56.0 | 4 17.5 +45.5 55.3 | 3 42.8 +45.7 54.7 |
| 28° | 6 48.1 +44.5 56.7 | 6 12.8 +44.8 56.0 | 5 37.7 +45.2 55.3 | 5 03.0 +45.4 54.7 | 4 28.5 +45.7 54.0 |
| 29° | 7 32.6 +44.5 56.0 | 6 57.6 +44.8 55.3 | 6 22.9 +45.0 54.7 | 5 48.4 +45.3 54.0 | 5 14.2 +45.6 53.4 |

| Dec | LHA 115° / 245°   | LHA 116° / 244°   | LHA 117° / 243°   | LHA 118° / 242°   | LHA 119° / 241°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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° | -9 52.5 +45.6     |                   |                   |                   |                   |
| 11° | -9 06.9 +45.7     | -9 45.0 +45.9     |                   |                   |                   |
| 12° | -8 21.2 +45.7     | -8 59.1 +45.9     | -9 36.8 +46.2     |                   |                   |
| 13° | -7 35.5 +45.8     | -8 13.2 +46.1     | -8 50.6 +46.3     | -9 27.7 +46.5     |                   |
| 14° | -6 49.7 +45.9     | -7 27.1 +46.0     | -8 04.3 +46.3     | -8 41.2 +46.5     | -9 17.9 +46.8     |
| 15° | -6 03.8 +45.9     | -6 41.1 +46.2     | -7 18.0 +46.4     | -7 54.7 +46.6     | -8 31.1 +46.9     |
| 16° | -5 17.9 +45.9     | -5 54.9 +46.1     | -6 31.6 +46.4     | -7 08.1 +46.7     | -7 44.2 +46.9     |
| 17° | -4 32.0 +46.0     | -5 08.8 +46.3     | -5 45.2 +46.4     | -6 21.4 +46.7     | -6 57.3 +46.9     |
| 18° | -3 46.0 +46.0     | -4 22.5 +46.2     | -4 58.8 +46.5     | -5 34.7 +46.7     | -6 10.4 +47.0     |
| 19° | -3 00.0 +46.0     | -3 36.3 +46.3     | -4 12.3 +46.5     | -4 48.0 +46.8     | -5 23.4 +47.1     |
| 20° | -2 14.0 +46.0     | -2 50.0 +46.3     | -3 25.8 +46.6     | -4 01.2 +46.8     | -4 36.3 +47.0     |
| 21° | -1 28.0 +46.1     | -2 03.7 +46.3     | -2 39.2 +46.6     | -3 14.4 +46.9     | -3 49.3 +47.1     |
| 22° | -0 41.9 +46.1     | -1 17.4 +46.3     | -1 52.6 +46.6     | -2 27.5 +46.8     | -3 02.2 +47.2     |
| 23° | 0 04.2 +46.0 56.5 | -0 31.1 +46.3     | -1 06.0 +46.5     | -1 40.7 +46.9     | -2 15.0 +47.1     |
| 24° | 0 50.2 +46.1 55.9 | 0 15.2 +46.4 55.2 | -0 19.5 +46.6     | -0 53.8 +46.8     | -1 27.9 +47.1     |
| 25° | 1 36.3 +46.0 55.3 | 1 01.6 +46.3 54.6 | 0 27.1 +46.6 53.9 | -0 07.0 +46.9     | -0 40.8 +47.2     |
| 26° | 2 22.3 +46.0 54.6 | 1 47.9 +46.3 53.9 | 1 13.7 +46.6 53.2 | 0 39.9 +46.9 52.5 | 0 06.4 +47.1 51.8 |
| 27° | 3 08.3 +46.0 54.0 | 2 34.2 +46.2 53.3 | 2 00.3 +46.6 52.6 | 1 26.8 +46.8 51.9 | 0 53.5 +47.2 51.2 |
| 28° | 3 54.3 +46.0 53.3 | 3 20.4 +46.3 52.6 | 2 46.9 +46.5 52.0 | 2 13.6 +46.9 51.3 | 1 40.7 +47.1 50.6 |
| 29° | 4 40.3 +45.9 52.7 | 4 06.7 +46.2 52.0 | 3 33.4 +46.5 51.3 | 3 00.5 +46.8 50.7 | 2 27.8 +47.1 50.0 |

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| Dec | LHA 120° / 240°   | LHA 121° / 239°   | LHA 122° / 238°   | LHA 123° / 237°   | LHA 124° / 236° |
|-----|-------------------|-------------------|-------------------|-------------------|-----------------|
|     | 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° | -9 54.2 +47.0     |                   |                   |                   |                 |
| 15° | -9 07.2 +47.1     | -9 43.0 +47.4     |                   |                   |                 |
| 16° | -8 20.1 +47.2     | -8 55.6 +47.4     | -9 30.8 +47.6     |                   |                 |
| 17° | -7 32.9 +47.2     | -8 08.2 +47.5     | -8 43.2 +47.8     | -9 17.8 +48.0     | -9 52.1 +48.2   |
| 18° | -6 45.7 +47.3     | -7 20.7 +47.5     | -7 55.4 +47.7     | -8 29.8 +48.0     | -9 03.9 +48.3   |
| 19° | -5 58.4 +47.2     | -6 33.2 +47.5     | -7 07.7 +47.9     | -7 41.8 +48.1     | -8 15.6 +48.4   |
| 20° | -5 11.2 +47.4     | -5 45.7 +47.6     | -6 19.8 +47.8     | -6 53.7 +48.1     | -7 27.2 +48.4   |
| 21° | -4 23.8 +47.3     | -4 58.1 +47.7     | -5 32.0 +47.9     | -6 05.6 +48.2     | -6 38.8 +48.5   |
| 22° | -3 36.5 +47.4     | -4 10.4 +47.6     | -4 44.1 +48.0     | -5 17.4 +48.2     | -5 50.3 +48.5   |
| 23° | -2 49.1 +47.4     | -3 22.8 +47.7     | -3 56.1 +47.9     | -4 29.2 +48.3     | -5 01.8 +48.5   |
| 24° | -2 01.7 +47.5     | -2 35.1 +47.7     | -3 08.2 +48.0     | -3 40.9 +48.3     | -4 13.3 +48.5   |
| 25° | -1 14.2 +47.4     | -1 47.4 +47.7     | -2 20.2 +48.0     | -2 52.6 +48.2     | -3 24.8 +48.6   |
| 26° | -0 26.8 +47.4     | -0 59.7 +47.8     | -1 32.2 +48.0     | -2 04.4 +48.3     | -2 36.2 +48.6   |
| 27° | 0 20.6 +47.5 50.5 | -0 11.9 +47.7     | -0 44.2 +48.0     | -1 16.1 +48.3     | -1 47.6 +48.6   |
| 28° | 1 08.1 +47.4 49.9 | 0 35.8 +47.7 49.2 | 0 03.8 +48.1 48.5 | -0 27.8 +48.4     | -0 59.0 +48.6   |
| 29° | 1 55.5 +47.4 49.3 | 1 23.5 +47.7 48.6 | 0 51.9 +48.0 47.9 | 0 20.6 +48.3 47.2 | -0 10.4 +48.6   |

| Dec | LHA 125° / 235° | LHA 126° / 234° | LHA 127° / 233° | LHA 128° / 232° | LHA 129° / 231° |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
|     | 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°  | 44 00.0 +60.0 180.0 | 43 59.5 +60.0 178.6 | 43 58.0 +59.9 177.2 | 43 55.5 +59.9 175.8 | 43 51.9 +59.9 174.4 |
| 1°  | 45 00.0 +60.0 180.0 | 44 59.5 +60.0 178.6 | 44 57.9 +60.0 177.2 | 44 55.4 +59.9 175.8 | 44 51.8 +59.8 174.4 |
| 2°  | 46 00.0 +60.0 180.0 | 45 59.5 +60.0 178.6 | 45 57.9 +60.0 177.1 | 45 55.3 +59.9 175.7 | 45 51.6 +59.9 174.3 |
| 3°  | 47 00.0 +60.0 180.0 | 46 59.5 +60.0 178.5 | 46 57.9 +59.9 177.1 | 46 55.2 +59.9 175.6 | 46 51.5 +59.8 174.2 |
| 4°  | 48 00.0 +60.0 180.0 | 47 59.5 +59.9 178.5 | 47 57.8 +60.0 177.0 | 47 55.1 +59.9 175.5 | 47 51.3 +59.9 174.0 |
| 5°  | 49 00.0 +60.0 180.0 | 48 59.4 +60.0 178.5 | 48 57.8 +60.0 177.0 | 48 55.0 +59.9 175.4 | 48 51.2 +59.8 173.9 |
| 6°  | 50 00.0 +60.0 180.0 | 49 59.4 +60.0 178.5 | 49 57.8 +59.9 176.9 | 49 54.9 +59.9 175.4 | 49 51.0 +59.8 173.8 |
| 7°  | 51 00.0 +60.0 180.0 | 50 59.4 +60.0 178.4 | 50 57.7 +60.0 176.8 | 50 54.8 +59.9 175.3 | 50 50.8 +59.9 173.7 |
| 8°  | 52 00.0 +60.0 180.0 | 51 59.4 +60.0 178.4 | 51 57.7 +59.9 176.8 | 51 54.7 +59.9 175.2 | 51 50.7 +59.8 173.6 |
| 9°  | 53 00.0 +60.0 180.0 | 52 59.4 +60.0 178.4 | 52 57.6 +60.0 176.7 | 52 54.6 +59.9 175.1 | 52 50.5 +59.8 173.5 |
| 10° | 54 00.0 +60.0 180.0 | 53 59.4 +60.0 178.3 | 53 57.6 +59.9 176.7 | 53 54.5 +59.9 175.0 | 53 50.3 +59.8 173.3 |
| 11° | 55 00.0 +60.0 180.0 | 54 59.4 +60.0 178.3 | 54 57.5 +60.0 176.6 | 54 54.4 +59.9 174.9 | 54 50.1 +59.7 173.2 |
| 12° | 56 00.0 +60.0 180.0 | 55 59.4 +59.9 178.3 | 55 57.5 +59.9 176.5 | 55 54.3 +59.9 174.8 | 55 49.8 +59.8 173.0 |
| 13° | 57 00.0 +60.0 180.0 | 56 59.3 +60.0 178.2 | 56 57.4 +59.9 176.4 | 56 54.2 +59.8 174.6 | 56 49.6 +59.8 172.9 |
| 14° | 58 00.0 +60.0 180.0 | 57 59.3 +60.0 178.2 | 57 57.3 +60.0 176.3 | 57 54.0 +59.9 174.5 | 57 49.4 +59.7 172.7 |
| 15° | 59 00.0 +60.0 180.0 | 58 59.3 +60.0 178.1 | 58 57.3 +59.9 176.3 | 58 53.9 +59.8 174.4 | 58 49.1 +59.7 172.5 |
| 16° | 60 00.0 +60.0 180.0 | 59 59.3 +60.0 178.1 | 59 57.2 +59.9 176.2 | 59 53.7 +59.9 174.2 | 59 48.8 +59.8 172.3 |
| 17° | 61 00.0 +60.0 180.0 | 60 59.3 +60.0 178.0 | 60 57.1 +60.0 176.1 | 60 53.6 +59.8 174.1 | 60 48.6 +59.7 172.1 |
| 18° | 62 00.0 +60.0 180.0 | 61 59.3 +59.9 178.0 | 61 57.1 +59.9 176.0 | 61 53.4 +59.8 173.9 | 61 48.3 +59.6 171.9 |
| 19° | 63 00.0 +60.0 180.0 | 62 59.2 +60.0 177.9 | 62 57.0 +59.9 175.8 | 62 53.2 +59.8 173.8 | 62 47.9 +59.7 171.7 |
| 20° | 64 00.0 +60.0 180.0 | 63 59.2 +60.0 177.9 | 63 56.9 +59.9 175.7 | 63 53.0 +59.8 173.6 | 63 47.6 +59.6 171.5 |
| 21° | 65 00.0 +60.0 180.0 | 64 59.2 +60.0 177.8 | 64 56.8 +59.9 175.6 | 64 52.8 +59.8 173.4 | 64 47.2 +59.6 171.2 |
| 22° | 66 00.0 +60.0 180.0 | 65 59.2 +59.9 177.7 | 65 56.7 +59.9 175.4 | 65 52.6 +59.7 173.2 | 65 46.8 +59.6 170.9 |
| 23° | 67 00.0 +60.0 180.0 | 66 59.1 +60.0 177.6 | 66 56.6 +59.9 175.3 | 66 52.3 +59.7 173.0 | 66 46.4 +59.5 170.6 |
| 24° | 68 00.0 +60.0 180.0 | 67 59.1 +60.0 177.6 | 67 56.5 +59.8 175.1 | 67 52.0 +59.7 172.7 | 67 45.9 +59.5 170.3 |
| 25° | 69 00.0 +60.0 180.0 | 68 59.1 +59.9 177.5 | 68 56.3 +59.9 175.0 | 68 51.7 +59.7 172.4 | 68 45.4 +59.4 170.0 |
| 26° | 70 00.0 +60.0 180.0 | 69 59.0 +60.0 177.4 | 69 56.2 +59.8 174.8 | 69 51.4 +59.7 172.1 | 69 44.8 +59.4 169.6 |
| 27° | 71 00.0 +60.0 180.0 | 70 59.0 +60.0 177.3 | 70 56.0 +59.9 174.5 | 70 51.1 +59.6 171.8 | 70 44.2 +59.3 169.1 |
| 28° | 72 00.0 +60.0 180.0 | 71 59.0 +59.9 177.1 | 71 55.9 +59.8 174.3 | 71 50.7 +59.6 171.5 | 71 43.5 +59.2 168.7 |
| 29° | 73 00.0 +60.0 180.0 | 72 58.9 +60.0 177.0 | 72 55.7 +59.7 174.0 | 72 50.3 +59.5 171.1 | 72 42.7 +59.2 168.2 |

| 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°  | 43 47.4 +59.8 173.1 | 43 41.9 +59.7 171.7 | 43 35.3 +59.6 170.3 | 43 27.8 +59.5 168.9 | 43 19.4 +59.3 167.6 |
| 1°  | 44 47.2 +59.8 172.9 | 44 41.6 +59.6 171.5 | 44 34.9 +59.6 170.1 | 44 27.3 +59.4 168.8 | 44 18.7 +59.3 167.4 |
| 2°  | 45 47.0 +59.7 172.8 | 45 41.2 +59.7 171.4 | 45 34.5 +59.5 170.0 | 45 26.7 +59.4 168.6 | 45 18.0 +59.2 167.2 |
| 3°  | 46 46.7 +59.8 172.7 | 46 40.9 +59.7 171.2 | 46 34.0 +59.6 169.8 | 46 26.1 +59.4 168.4 | 46 17.2 +59.3 166.9 |
| 4°  | 47 46.5 +59.7 172.6 | 47 40.6 +59.6 171.1 | 47 33.6 +59.5 169.6 | 47 25.5 +59.4 168.2 | 47 16.5 +59.2 166.7 |
| 5°  | 48 46.2 +59.8 172.4 | 48 40.2 +59.6 170.9 | 48 33.1 +59.5 169.4 | 48 24.9 +59.4 167.9 | 48 15.7 +59.2 166.5 |
| 6°  | 49 46.0 +59.7 172.3 | 49 39.8 +59.6 170.8 | 49 32.6 +59.5 169.2 | 49 24.3 +59.3 167.7 | 49 14.9 +59.1 166.2 |
| 7°  | 50 45.7 +59.7 172.1 | 50 39.4 +59.6 170.6 | 50 32.1 +59.4 169.0 | 50 23.6 +59.3 167.5 | 50 14.0 +59.1 166.0 |
| 8°  | 51 45.4 +59.7 172.0 | 51 39.0 +59.6 170.4 | 51 31.5 +59.4 168.8 | 51 22.9 +59.2 167.2 | 51 13.1 +59.1 165.7 |
| 9°  | 52 45.1 +59.7 171.8 | 52 38.6 +59.6 170.2 | 52 30.9 +59.5 168.6 | 52 22.1 +59.3 167.0 | 52 12.2 +59.0 165.4 |
| 10° | 53 44.8 +59.7 171.7 | 53 38.2 +59.5 170.0 | 53 30.4 +59.3 168.4 | 53 21.4 +59.1 166.7 | 53 11.2 +59.0 165.1 |
| 11° | 54 44.5 +59.7 171.5 | 54 37.7 +59.5 169.8 | 54 29.7 +59.4 168.1 | 54 20.5 +59.2 166.4 | 54 10.2 +58.9 164.8 |
| 12° | 55 44.2 +59.6 171.3 | 55 37.2 +59.5 169.6 | 55 29.1 +59.3 167.9 | 55 19.7 +59.1 166.2 | 55 09.1 +58.9 164.5 |
| 13° | 56 43.8 +59.6 171.1 | 56 36.7 +59.5 169.3 | 56 28.4 +59.3 167.6 | 56 18.8 +59.1 165.8 | 56 08.0 +58.8 164.1 |
| 14° | 57 43.4 +59.6 170.9 | 57 36.2 +59.4 169.1 | 57 27.7 +59.2 167.3 | 57 17.9 +59.0 165.5 | 57 06.8 +58.8 163.8 |
| 15° | 58 43.0 +59.6 170.7 | 58 35.6 +59.4 168.8 | 58 26.9 +59.2 167.0 | 58 16.9 +58.9 165.2 | 58 05.6 +58.7 163.4 |
| 16° | 59 42.6 +59.6 170.4 | 59 35.0 +59.4 168.6 | 59 26.1 +59.1 166.7 | 59 15.8 +58.9 164.8 | 59 04.3 +58.6 163.0 |
| 17° | 60 42.2 +59.5 170.2 | 60 34.4 +59.3 168.3 | 60 25.2 +59.1 166.3 | 60 14.7 +58.8 164.4 | 60 02.9 +58.5 162.6 |
| 18° | 61 41.7 +59.5 169.9 | 61 33.7 +59.3 168.0 | 61 24.3 +59.0 166.0 | 61 13.5 +58.7 164.0 | 61 01.4 +58.4 162.1 |
| 19° | 62 41.2 +59.4 169.7 | 62 33.0 +59.2 167.6 | 62 23.3 +59.0 165.6 | 62 12.2 +58.7 163.6 | 61 59.8 +58.3 161.6 |
| 20° | 63 40.6 +59.4 169.4 | 63 32.2 +59.2 167.3 | 63 22.3 +58.8 165.2 | 63 10.9 +58.6 163.1 | 62 58.1 +58.2 161.1 |
| 21° | 64 40.0 +59.4 169.0 | 64 31.4 +59.1 166.9 | 64 21.1 +58.8 164.8 | 64 09.5 +58.4 162.7 | 63 56.3 +58.1 160.6 |
| 22° | 65 39.4 +59.3 168.7 | 65 30.5 +59.0 166.5 | 65 19.9 +58.8 164.3 | 65 07.9 +58.3 162.1 | 64 54.4 +57.9 160.0 |
| 23° | 66 38.7 +59.3 168.3 | 66 29.5 +59.0 166.0 | 66 18.7 +58.5 163.8 | 66 06.2 +58.2 161.6 | 65 52.3 +57.8 159.4 |
| 24° | 67 38.0 +59.2 167.9 | 67 28.5 +58.8 165.6 | 67 17.2 +58.5 163.2 | 67 04.4 +58.1 161.0 | 66 50.1 +57.5 158.7 |
| 25° | 68 37.2 +59.1 167.5 | 68 27.3 +58.8 165.1 | 68 15.7 +58.4 162.6 | 68 02.5 +57.8 160.3 | 67 47.6 +57.4 158.0 |
| 26° | 69 36.3 +59.1 167.0 | 69 26.1 +58.6 164.5 | 69 14.1 +58.1 162.0 | 69 00.3 +57.7 159.6 | 68 45.0 +57.1 157.2 |
| 27° | 70 35.4 +58.9 166.5 | 70 24.7 +58.5 163.9 | 70 12.2 +58.0 161.3 | 69 58.0 +57.5 158.8 | 69 42.1 +56.8 156.3 |
| 28° | 71 34.3 +58.9 165.9 | 71 23.2 +58.4 163.2 | 71 10.2 +57.8 160.5 | 70 55.5 +57.1 157.9 | 70 38.9 +56.5 155.4 |
| 29° | 72 33.2 +58.7 165.3 | 72 21.6 +58.1 162.4 | 72 08.0 +57.6 159.7 | 71 52.6 +56.9 157.0 | 71 35.4 +56.2 154.3 |

| 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°  | 43 09.9 +59.2 166.2 | 42 59.5 +59.0 164.9 | 42 48.2 +58.8 163.5 | 42 35.9 +58.6 162.2 | 42 22.7 +58.4 160.9 |
| 1°  | 44 09.1 +59.1 166.0 | 43 58.5 +59.0 164.6 | 43 47.0 +58.7 163.3 | 43 34.5 +58.6 161.9 | 43 21.1 +58.4 160.6 |
| 2°  | 45 08.2 +59.1 165.8 | 44 57.5 +58.9 164.4 | 44 45.7 +58.8 163.0 | 44 33.1 +58.5 161.6 | 44 19.5 +58.2 160.2 |
| 3°  | 46 07.3 +59.1 165.5 | 45 56.4 +58.9 164.1 | 45 44.5 +58.6 162.7 | 45 31.6 +58.4 161.3 | 45 17.7 +58.3 159.9 |
| 4°  | 47 06.4 +59.0 165.3 | 46 55.3 +58.8 163.8 | 46 43.1 +58.7 162.4 | 46 30.0 +58.5 161.0 | 46 16.0 +58.1 159.6 |
| 5°  | 48 05.4 +59.0 165.0 | 47 54.1 +58.8 163.5 | 47 41.8 +58.6 162.1 | 47 28.5 +58.3 160.6 | 47 14.1 +58.1 159.2 |
| 6°  | 49 04.4 +59.0 164.7 | 48 52.9 +58.7 163.2 | 48 40.4 +58.5 161.8 | 48 26.8 +58.3 160.3 | 48 12.2 +58.1 158.8 |
| 7°  | 50 03.4 +58.9 164.4 | 49 51.6 +58.7 162.9 | 49 38.9 +58.4 161.4 | 49 25.1 +58.2 159.9 | 49 10.3 +57.9 158.5 |
| 8°  | 51 02.3 +58.8 164.1 | 50 50.3 +58.7 162.6 | 50 37.3 +58.4 161.1 | 50 23.3 +58.1 159.6 | 50 08.2 +57.9 158.1 |
| 9°  | 52 01.1 +58.8 163.8 | 51 49.0 +58.5 162.3 | 51 35.7 +58.3 160.7 | 51 21.4 +58.1 159.2 | 51 06.1 +57.7 157.6 |
| 10° | 52 59.9 +58.8 163.5 | 52 47.5 +58.5 161.9 | 52 34.0 +58.3 160.3 | 52 19.5 +57.9 158.7 | 52 03.8 +57.7 157.2 |
| 11° | 53 58.7 +58.7 163.2 | 53 46.0 +58.5 161.5 | 53 32.3 +58.1 159.9 | 53 17.4 +57.9 158.3 | 53 01.5 +57.5 156.7 |
| 12° | 54 57.4 +58.6 162.8 | 54 44.5 +58.3 161.1 | 54 30.4 +58.1 159.5 | 54 15.3 +57.7 157.9 | 53 59.0 +57.5 156.3 |
| 13° | 55 56.0 +58.6 162.4 | 55 42.8 +58.3 160.7 | 55 28.5 +58.0 159.1 | 55 13.0 +57.7 157.4 | 54 56.5 +57.3 155.8 |
| 14° | 56 54.6 +58.4 162.0 | 56 41.1 +58.2 160.3 | 56 26.5 +57.8 158.6 | 56 10.7 +57.5 156.9 | 55 53.8 +57.2 155.3 |
| 15° | 57 53.0 +58.4 161.6 | 57 39.3 +58.1 159.8 | 57 24.3 +57.8 158.1 | 57 08.2 +57.4 156.4 | 56 51.0 +57.0 154.7 |
| 16° | 58 51.4 +58.3 161.2 | 58 37.4 +57.9 159.4 | 58 22.1 +57.6 157.6 | 58 05.6 +57.2 155.9 | 57 48.0 +56.8 154.1 |
| 17° | 59 49.7 +58.2 160.7 | 59 35.3 +57.9 158.9 | 59 19.7 +57.5 157.1 | 59 02.8 +57.1 155.3 | 58 44.8 +56.7 153.5 |
| 18° | 60 47.9 +58.1 160.2 | 60 33.2 +57.7 158.3 | 60 17.2 +57.3 156.5 | 59 59.9 +56.9 154.7 | 59 41.5 +56.5 152.9 |
| 19° | 61 46.0 +57.9 159.7 | 61 30.9 +57.5 157.8 | 61 14.5 +57.1 155.9 | 60 56.8 +56.7 154.0 | 60 38.0 +56.2 152.2 |
| 20° | 62 43.9 +57.9 159.1 | 62 28.4 +57.4 157.2 | 62 11.6 +57.0 155.2 | 61 53.5 +56.5 153.3 | 61 34.2 +56.0 151.5 |
| 21° | 63 41.8 +57.6 158.5 | 63 25.8 +57.2 156.5 | 63 08.6 +56.7 154.6 | 62 50.0 +56.3 152.6 | 62 30.2 +55.8 150.7 |
| 22° | 64 39.4 +57.5 157.9 | 64 23.0 +57.0 155.8 | 64 05.3 +56.5 153.8 | 63 46.3 +56.0 151.8 | 63 26.0 +55.4 149.9 |
| 23° | 65 36.9 +57.3 157.2 | 65 20.0 +56.8 155.1 | 65 01.8 +56.3 153.0 | 64 42.3 +55.7 151.0 | 64 21.4 +55.2 149.0 |
| 24° | 66 34.2 +57.0 156.5 | 66 16.8 +56.5 154.3 | 65 58.1 +55.9 152.2 | 65 38.0 +55.3 150.1 | 65 16.6 +54.7 148.1 |
| 25° | 67 31.2 +56.8 155.7 | 67 13.3 +56.3 153.5 | 66 54.0 +55.6 151.3 | 66 33.3 +55.0 149.2 | 66 11.3 +54.4 147.1 |
| 26° | 68 28.0 +56.5 154.8 | 68 09.6 +55.8 152.5 | 67 49.6 +55.3 150.3 | 67 28.3 +54.6 148.1 | 67 05.7 +53.8 146.0 |
| 27° | 69 24.5 +56.2 153.9 | 69 05.4 +55.6 151.6 | 68 44.9 +54.8 149.3 | 68 22.9 +54.1 147.0 | 67 59.5 +53.4 144.9 |
| 28° | 70 20.7 +55.8 152.9 | 70 01.0 +55.0 150.5 | 69 39.7 +54.3 148.1 | 69 17.0 +53.5 145.8 | 68 52.9 +52.8 143.6 |
| 29° | 71 16.5 +55.4 151.8 | 70 56.0 +54.6 149.3 | 70 34.0 +53.7 146.9 | 70 10.5 +52.9 144.5 | 69 45.7 +52.1 142.3 |

| 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°  | 42 08.6 +58.2 159.6 | 41 53.6 +58.0 158.3 | 41 37.7 +57.7 157.0 | 41 21.0 +57.5 155.7 | 41 03.4 +57.2 154.4 |
| 1°  | 43 06.8 +58.1 159.2 | 42 51.6 +57.8 157.9 | 42 35.4 +57.7 156.6 | 42 18.5 +57.3 155.3 | 42 00.6 +57.1 154.0 |
| 2°  | 44 04.9 +58.1 158.9 | 43 49.4 +57.9 157.6 | 43 33.1 +57.5 156.2 | 43 15.8 +57.3 154.9 | 42 57.7 +57.1 153.6 |
| 3°  | 45 03.0 +58.0 158.5 | 44 47.3 +57.7 157.2 | 44 30.6 +57.5 155.8 | 44 13.1 +57.2 154.5 | 43 54.8 +56.9 153.2 |
| 4°  | 46 01.0 +57.9 158.2 | 45 45.0 +57.6 156.8 | 45 28.1 +57.4 155.4 | 45 10.3 +57.1 154.1 | 44 51.7 +56.8 152.7 |
| 5°  | 46 58.9 +57.8 157.8 | 46 42.6 +57.6 156.4 | 46 25.5 +57.3 155.0 | 46 07.4 +57.0 153.6 | 45 48.5 +56.7 152.3 |
| 6°  | 47 56.7 +57.8 157.4 | 47 40.2 +57.5 156.0 | 47 22.8 +57.2 154.6 | 47 04.4 +56.9 153.2 | 46 45.2 +56.5 151.8 |
| 7°  | 48 54.5 +57.6 157.0 | 48 37.7 +57.4 155.5 | 48 20.0 +57.0 154.1 | 48 01.3 +56.8 152.7 | 47 41.7 +56.5 151.3 |
| 8°  | 49 52.1 +57.6 156.6 | 49 35.1 +57.2 155.1 | 49 17.0 +57.0 153.7 | 48 58.1 +56.6 152.2 | 48 38.2 +56.3 150.8 |
| 9°  | 50 49.7 +57.5 156.1 | 50 32.3 +57.2 154.6 | 50 14.0 +56.8 153.2 | 49 54.7 +56.5 151.7 | 49 34.5 +56.2 150.3 |
| 10° | 51 47.2 +57.3 155.7 | 51 29.5 +57.0 154.2 | 51 10.8 +56.7 152.7 | 50 51.2 +56.4 151.2 | 50 30.7 +56.0 149.7 |
| 11° | 52 44.5 +57.2 155.2 | 52 26.5 +56.9 153.6 | 52 07.5 +56.6 152.1 | 51 47.6 +56.1 150.6 | 51 26.7 +55.8 149.2 |
| 12° | 53 41.7 +57.1 154.7 | 53 23.4 +56.8 153.1 | 53 04.1 +56.4 151.6 | 52 43.7 +56.1 150.1 | 52 22.5 +55.6 148.6 |
| 13° | 54 38.8 +57.0 154.2 | 54 20.2 +56.6 152.6 | 54 00.5 +56.2 151.0 | 53 39.8 +55.8 149.5 | 53 18.1 +55.4 147.9 |
| 14° | 55 35.8 +56.8 153.6 | 55 16.8 +56.4 152.0 | 54 56.7 +56.0 150.4 | 54 35.6 +55.6 148.8 | 54 13.5 +55.3 147.3 |
| 15° | 56 32.6 +56.6 153.0 | 56 13.2 +56.2 151.4 | 55 52.7 +55.8 149.8 | 55 31.2 +55.4 148.2 | 55 08.8 +54.9 146.6 |
| 16° | 57 29.2 +56.5 152.4 | 57 09.4 +56.0 150.8 | 56 48.5 +55.6 149.1 | 56 26.6 +55.2 147.5 | 56 03.7 +54.8 145.9 |
| 17° | 58 25.7 +56.2 151.8 | 58 05.4 +55.9 150.1 | 57 44.1 +55.4 148.4 | 57 21.8 +54.9 146.8 | 56 58.5 +54.4 145.2 |
| 18° | 59 21.9 +56.1 151.1 | 59 01.3 +55.5 149.4 | 58 39.5 +55.1 147.7 | 58 16.7 +54.6 146.0 | 57 52.9 +54.2 144.4 |
| 19° | 60 18.0 +55.7 150.4 | 59 56.8 +55.3 148.6 | 59 34.6 +54.8 146.9 | 59 11.3 +54.3 145.2 | 58 47.1 +53.8 143.6 |
| 20° | 61 13.7 +55.6 149.6 | 60 52.1 +55.0 147.9 | 60 29.4 +54.5 146.1 | 60 05.6 +54.0 144.4 | 59 40.9 +53.4 142.7 |
| 21° | 62 09.3 +55.2 148.8 | 61 47.1 +54.7 147.0 | 61 23.9 +54.2 145.2 | 60 59.6 +53.6 143.5 | 60 34.3 +53.1 141.8 |
| 22° | 63 04.5 +54.9 148.0 | 62 41.8 +54.4 146.1 | 62 18.1 +53.7 144.3 | 61 53.2 +53.2 142.6 | 61 27.4 +52.6 140.8 |
| 23° | 63 59.4 +54.5 147.1 | 63 36.2 +53.9 145.2 | 63 11.8 +53.4 143.4 | 62 46.4 +52.8 141.6 | 62 20.0 +52.2 139.8 |
| 24° | 64 53.9 +54.2 146.1 | 64 30.1 +53.5 144.2 | 64 05.2 +52.9 142.3 | 63 39.2 +52.3 140.5 | 63 12.2 +51.6 138.7 |
| 25° | 65 48.1 +53.7 145.1 | 65 23.6 +53.1 143.1 | 64 58.1 +52.3 141.2 | 64 31.5 +51.7 139.4 | 64 03.8 +51.1 137.6 |
| 26° | 66 41.8 +53.1 144.0 | 66 16.7 +52.5 142.0 | 65 50.4 +51.8 140.1 | 65 23.2 +51.1 138.2 | 64 54.9 +50.4 136.4 |
| 27° | 67 34.9 +52.7 142.8 | 67 09.2 +51.8 140.8 | 66 42.2 +51.2 138.8 | 66 14.3 +50.4 136.9 | 65 45.3 +49.7 135.1 |
| 28° | 68 27.6 +51.9 141.5 | 68 01.0 +51.2 139.4 | 67 33.4 +50.4 137.5 | 67 04.7 +49.7 135.5 | 66 35.0 +48.9 133.7 |
| 29° | 69 19.5 +51.3 140.1 | 68 52.2 +50.5 138.0 | 68 23.8 +49.6 136.0 | 67 54.4 +48.8 134.1 | 67 23.9 +48.1 132.2 |



| 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°  | 40 45.0 +57.0 153.2 | 40 25.8 +56.7 151.9 | 40 05.8 +56.4 150.7 | 39 45.0 +56.1 149.5 | 39 23.4 +55.8 148.2 |
| 1°  | 41 42.0 +56.8 152.7 | 41 22.5 +56.5 151.5 | 41 02.2 +56.2 150.2 | 40 41.1 +55.9 149.0 | 40 19.2 +55.7 147.8 |
| 2°  | 42 38.8 +56.7 152.3 | 42 19.0 +56.4 151.0 | 41 58.4 +56.2 149.8 | 41 37.0 +55.9 148.5 | 41 14.9 +55.5 147.3 |
| 3°  | 43 35.5 +56.6 151.9 | 43 15.4 +56.4 150.6 | 42 54.6 +56.0 149.3 | 42 32.9 +55.7 148.0 | 42 10.4 +55.4 146.8 |
| 4°  | 44 32.1 +56.6 151.4 | 44 11.8 +56.2 150.1 | 43 50.6 +55.9 148.8 | 43 28.6 +55.6 147.5 | 43 05.8 +55.3 146.2 |
| 5°  | 45 28.7 +56.3 150.9 | 45 08.0 +56.1 149.6 | 44 46.5 +55.7 148.3 | 44 24.2 +55.4 147.0 | 44 01.1 +55.1 145.7 |
| 6°  | 46 25.0 +56.3 150.4 | 46 04.1 +55.9 149.1 | 45 42.2 +55.6 147.8 | 45 19.6 +55.3 146.4 | 44 56.2 +54.9 145.2 |
| 7°  | 47 21.3 +56.1 149.9 | 47 00.0 +55.8 148.6 | 46 37.8 +55.5 147.2 | 46 14.9 +55.1 145.9 | 45 51.1 +54.7 144.6 |
| 8°  | 48 17.4 +56.0 149.4 | 47 55.8 +55.6 148.0 | 47 33.3 +55.2 146.7 | 47 10.0 +54.9 145.3 | 46 45.8 +54.6 144.0 |
| 9°  | 49 13.4 +55.8 148.9 | 48 51.4 +55.4 147.5 | 48 28.5 +55.1 146.1 | 48 04.9 +54.7 144.7 | 47 40.4 +54.4 143.4 |
| 10° | 50 09.2 +55.6 148.3 | 49 46.8 +55.3 146.9 | 49 23.6 +54.9 145.5 | 48 59.6 +54.5 144.1 | 48 34.8 +54.1 142.7 |
| 11° | 51 04.8 +55.5 147.7 | 50 42.1 +55.1 146.3 | 50 18.5 +54.7 144.8 | 49 54.1 +54.3 143.5 | 49 28.9 +53.9 142.1 |
| 12° | 52 00.3 +55.2 147.1 | 51 37.2 +54.8 145.6 | 51 13.2 +54.5 144.2 | 50 48.4 +54.1 142.8 | 50 22.8 +53.7 141.4 |
| 13° | 52 55.5 +55.1 146.4 | 52 32.0 +54.7 145.0 | 52 07.7 +54.2 143.5 | 51 42.5 +53.8 142.1 | 51 16.5 +53.4 140.7 |
| 14° | 53 50.6 +54.8 145.8 | 53 26.7 +54.3 144.3 | 53 01.9 +54.0 142.8 | 52 36.3 +53.5 141.4 | 52 09.9 +53.1 140.0 |
| 15° | 54 45.4 +54.5 145.1 | 54 21.0 +54.2 143.6 | 53 55.9 +53.6 142.1 | 53 29.8 +53.3 140.6 | 53 03.0 +52.8 139.2 |
| 16° | 55 39.9 +54.3 144.3 | 55 15.2 +53.8 142.8 | 54 49.5 +53.4 141.3 | 54 23.1 +52.9 139.8 | 53 55.8 +52.5 138.4 |
| 17° | 56 34.2 +54.0 143.6 | 56 09.0 +53.5 142.0 | 55 42.9 +53.1 140.5 | 55 16.0 +52.6 139.0 | 54 48.3 +52.1 137.6 |
| 18° | 57 28.2 +53.6 142.8 | 57 02.5 +53.2 141.2 | 56 36.0 +52.6 139.7 | 56 08.6 +52.2 138.2 | 55 40.4 +51.7 136.7 |
| 19° | 58 21.8 +53.3 141.9 | 57 55.7 +52.8 140.3 | 57 28.6 +52.4 138.8 | 57 00.8 +51.8 137.3 | 56 32.1 +51.3 135.8 |
| 20° | 59 15.1 +53.0 141.1 | 58 48.5 +52.4 139.4 | 58 21.0 +51.8 137.9 | 57 52.6 +51.4 136.3 | 57 23.4 +50.9 134.8 |
| 21° | 60 08.1 +52.5 140.1 | 59 40.9 +52.0 138.5 | 59 12.8 +51.5 136.9 | 58 44.0 +50.9 135.3 | 58 14.3 +50.3 133.8 |
| 22° | 61 00.6 +52.1 139.1 | 60 32.9 +51.5 137.5 | 60 04.3 +50.9 135.9 | 59 34.9 +50.3 134.3 | 59 04.6 +49.9 132.8 |
| 23° | 61 52.7 +51.5 138.1 | 61 24.4 +50.9 136.4 | 60 55.2 +50.4 134.8 | 60 25.2 +49.9 133.2 | 59 54.5 +49.3 131.7 |
| 24° | 62 44.2 +51.0 137.0 | 62 15.3 +50.4 135.3 | 61 45.6 +49.8 133.7 | 61 15.1 +49.2 132.1 | 60 43.8 +48.6 130.5 |
| 25° | 63 35.2 +50.4 135.8 | 63 05.7 +49.8 134.1 | 62 35.4 +49.2 132.5 | 62 04.3 +48.5 130.9 | 61 32.4 +48.0 129.3 |
| 26° | 64 25.6 +49.8 134.6 | 63 55.5 +49.1 132.9 | 63 24.6 +48.4 131.2 | 62 52.8 +47.9 129.6 | 62 20.4 +47.2 128.0 |
| 27° | 65 15.4 +49.0 133.3 | 64 44.6 +48.4 131.6 | 64 13.0 +47.7 129.9 | 63 40.7 +47.0 128.3 | 63 07.6 +46.4 126.7 |
| 28° | 66 04.4 +48.2 131.9 | 65 33.0 +47.5 130.1 | 65 00.7 +46.8 128.5 | 64 27.7 +46.2 126.8 | 63 54.0 +45.6 125.3 |
| 29° | 66 52.6 +47.3 130.4 | 66 20.5 +46.6 128.6 | 65 47.5 +45.9 127.0 | 65 13.9 +45.2 125.3 | 64 39.6 +44.5 123.8 |

| 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°  | 39 01.1 +55.5 147.0 | 38 38.1 +55.2 145.9 | 38 14.3 +54.9 144.7 | 37 49.9 +54.6 143.5 | 37 24.8 +54.3 142.4 |
| 1°  | 39 56.6 +55.4 146.6 | 39 33.3 +55.0 145.4 | 39 09.2 +54.8 144.2 | 38 44.5 +54.4 143.0 | 38 19.1 +54.1 141.8 |
| 2°  | 40 52.0 +55.2 146.0 | 40 28.3 +54.9 144.8 | 40 04.0 +54.6 143.6 | 39 38.9 +54.3 142.5 | 39 13.2 +53.9 141.3 |
| 3°  | 41 47.2 +55.1 145.5 | 41 23.2 +54.8 144.3 | 40 58.6 +54.4 143.1 | 40 33.2 +54.1 141.9 | 40 07.1 +53.8 140.7 |
| 4°  | 42 42.3 +54.9 145.0 | 42 18.0 +54.6 143.8 | 41 53.0 +54.3 142.5 | 41 27.3 +53.9 141.3 | 41 00.9 +53.6 140.1 |
| 5°  | 43 37.2 +54.8 144.4 | 43 12.6 +54.4 143.2 | 42 47.3 +54.1 142.0 | 42 21.2 +53.8 140.7 | 41 54.5 +53.4 139.5 |
| 6°  | 44 32.0 +54.6 143.9 | 44 07.0 +54.3 142.6 | 43 41.4 +53.8 141.4 | 43 15.0 +53.5 140.1 | 42 47.9 +53.2 138.9 |
| 7°  | 45 26.6 +54.4 143.3 | 45 01.3 +54.0 142.0 | 44 35.2 +53.7 140.7 | 44 08.5 +53.4 139.5 | 43 41.1 +53.0 138.3 |
| 8°  | 46 21.0 +54.2 142.7 | 45 55.3 +53.8 141.4 | 45 28.9 +53.5 140.1 | 45 01.9 +53.1 138.9 | 44 34.1 +52.8 137.6 |
| 9°  | 47 15.2 +53.9 142.1 | 46 49.1 +53.7 140.7 | 46 22.4 +53.3 139.5 | 45 55.0 +52.9 138.2 | 45 26.9 +52.5 137.0 |
| 10° | 48 09.1 +53.8 141.4 | 47 42.8 +53.4 140.1 | 47 15.7 +53.0 138.8 | 46 47.9 +52.6 137.5 | 46 19.4 +52.2 136.3 |
| 11° | 49 02.9 +53.5 140.7 | 48 36.2 +53.1 139.4 | 48 08.7 +52.7 138.1 | 47 40.5 +52.3 136.8 | 47 11.6 +52.0 135.5 |
| 12° | 49 56.4 +53.3 140.0 | 49 29.3 +52.8 138.7 | 49 01.4 +52.5 137.4 | 48 32.8 +52.1 136.1 | 48 03.6 +51.7 134.8 |
| 13° | 50 49.7 +53.0 139.3 | 50 22.1 +52.6 138.0 | 49 53.9 +52.1 136.6 | 49 24.9 +51.8 135.3 | 48 55.3 +51.3 134.0 |
| 14° | 51 42.7 +52.7 138.6 | 51 14.7 +52.3 137.2 | 50 46.0 +51.9 135.9 | 50 16.7 +51.4 134.5 | 49 46.6 +51.1 133.2 |
| 15° | 52 35.4 +52.3 137.8 | 52 07.0 +51.9 136.4 | 51 37.9 +51.5 135.1 | 51 08.1 +51.1 133.7 | 50 37.7 +50.6 132.4 |
| 16° | 53 27.7 +52.0 137.0 | 52 58.9 +51.6 135.6 | 52 29.4 +51.1 134.2 | 51 59.2 +50.7 132.9 | 51 28.3 +50.3 131.6 |
| 17° | 54 19.7 +51.7 136.1 | 53 50.5 +51.2 134.7 | 53 20.5 +50.8 133.3 | 52 49.9 +50.3 132.0 | 52 18.6 +49.9 130.7 |
| 18° | 55 11.4 +51.2 135.2 | 54 41.7 +50.8 133.8 | 54 11.3 +50.3 132.4 | 53 40.2 +49.9 131.1 | 53 08.5 +49.4 129.8 |
| 19° | 56 02.6 +50.9 134.3 | 55 32.5 +50.3 132.9 | 55 01.6 +49.9 131.5 | 54 30.1 +49.4 130.1 | 53 57.9 +48.9 128.8 |
| 20° | 56 53.5 +50.3 133.4 | 56 22.8 +49.9 131.9 | 55 51.5 +49.3 130.5 | 55 19.5 +48.9 129.2 | 54 46.8 +48.5 127.8 |
| 21° | 57 43.8 +49.9 132.4 | 57 12.7 +49.3 130.9 | 56 40.8 +48.9 129.5 | 56 08.4 +48.3 128.1 | 55 35.3 +47.9 126.8 |
| 22° | 58 33.7 +49.3 131.3 | 58 02.0 +48.8 129.8 | 57 29.7 +48.3 128.4 | 56 56.7 +47.8 127.1 | 56 23.2 +47.3 125.7 |
| 23° | 59 23.0 +48.7 130.2 | 58 50.8 +48.2 128.7 | 58 18.0 +47.7 127.3 | 57 44.5 +47.2 125.9 | 57 10.5 +46.7 124.6 |
| 24° | 60 11.7 +48.1 129.0 | 59 39.0 +47.6 127.6 | 59 05.7 +47.0 126.1 | 58 31.7 +46.5 124.8 | 57 57.2 +46.0 123.4 |
| 25° | 60 59.8 +47.4 127.8 | 60 26.6 +46.8 126.4 | 59 52.7 +46.3 124.9 | 59 18.2 +45.8 123.5 | 58 43.2 +45.3 122.2 |
| 26° | 61 47.2 +46.7 126.5 | 61 13.4 +46.1 125.1 | 60 39.0 +45.5 123.6 | 60 04.0 +45.0 122.3 | 59 28.5 +44.5 120.9 |
| 27° | 62 33.9 +45.8 125.2 | 61 59.5 +45.2 123.7 | 61 24.5 +44.7 122.3 | 60 49.0 +44.2 120.9 | 60 13.0 +43.7 119.6 |
| 28° | 63 19.7 +44.9 123.8 | 62 44.7 +44.4 122.3 | 62 09.2 +43.8 120.9 | 61 33.2 +43.3 119.5 | 60 56.7 +42.8 118.2 |
| 29° | 64 04.6 +44.0 122.3 | 63 29.1 +43.4 120.8 | 62 53.0 +42.8 119.4 | 62 16.5 +42.3 118.0 | 61 39.5 +41.8 116.7 |

| Dec        | LHA 030° / 330°     | LHA 031° / 329°     | LHA 032° / 328°     | LHA 033° / 327°     | LHA 034° / 326°     |
|------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|            | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| <b>0°</b>  | 36 59.0 +54.0 141.2 | 36 32.6 +53.7 140.1 | 36 05.6 +53.3 139.0 | 35 38.0 +53.0 137.9 | 35 09.8 +52.7 136.8 |
| <b>1°</b>  | 37 53.0 +53.8 140.7 | 37 26.3 +53.5 139.6 | 36 58.9 +53.2 138.4 | 36 31.0 +52.8 137.3 | 36 02.5 +52.5 136.3 |
| <b>2°</b>  | 38 46.8 +53.6 140.1 | 38 19.8 +53.3 139.0 | 37 52.1 +53.0 137.9 | 37 23.8 +52.7 136.8 | 36 55.0 +52.3 135.7 |
| <b>3°</b>  | 39 40.4 +53.5 139.6 | 39 13.1 +53.1 138.4 | 38 45.1 +52.8 137.3 | 38 16.5 +52.5 136.1 | 37 47.3 +52.2 135.0 |
| <b>4°</b>  | 40 33.9 +53.2 139.0 | 40 06.2 +52.9 137.8 | 39 37.9 +52.6 136.7 | 39 09.0 +52.3 135.5 | 38 39.5 +51.9 134.4 |
| <b>5°</b>  | 41 27.1 +53.1 138.4 | 40 59.1 +52.8 137.2 | 40 30.5 +52.4 136.0 | 40 01.3 +52.0 134.9 | 39 31.4 +51.8 133.8 |
| <b>6°</b>  | 42 20.2 +52.9 137.7 | 41 51.9 +52.5 136.5 | 41 22.9 +52.2 135.4 | 40 53.3 +51.8 134.2 | 40 23.2 +51.5 133.1 |
| <b>7°</b>  | 43 13.1 +52.6 137.1 | 42 44.4 +52.2 135.9 | 42 15.1 +51.9 134.7 | 41 45.1 +51.6 133.6 | 41 14.7 +51.2 132.4 |
| <b>8°</b>  | 44 05.7 +52.4 136.4 | 43 36.6 +52.1 135.2 | 43 07.0 +51.7 134.0 | 42 36.7 +51.4 132.9 | 42 05.9 +51.0 131.7 |
| <b>9°</b>  | 44 58.1 +52.1 135.7 | 44 28.7 +51.8 134.5 | 43 58.7 +51.4 133.3 | 43 28.1 +51.0 132.2 | 42 56.9 +50.7 131.0 |
| <b>10°</b> | 45 50.2 +51.9 135.0 | 45 20.5 +51.5 133.8 | 44 50.1 +51.1 132.6 | 44 19.1 +50.8 131.4 | 43 47.6 +50.4 130.3 |
| <b>11°</b> | 46 42.1 +51.6 134.3 | 46 12.0 +51.2 133.1 | 45 41.2 +50.9 131.9 | 45 09.9 +50.5 130.7 | 44 38.0 +50.1 129.5 |
| <b>12°</b> | 47 33.7 +51.3 133.6 | 47 03.2 +50.9 132.3 | 46 32.1 +50.5 131.1 | 46 00.4 +50.1 129.9 | 45 28.1 +49.8 128.7 |
| <b>13°</b> | 48 25.0 +51.0 132.8 | 47 54.1 +50.6 131.5 | 47 22.6 +50.2 130.3 | 46 50.5 +49.9 129.1 | 46 17.9 +49.5 127.9 |
| <b>14°</b> | 49 16.0 +50.6 132.0 | 48 44.7 +50.2 130.7 | 48 12.8 +49.8 129.5 | 47 40.4 +49.4 128.3 | 47 07.4 +49.1 127.1 |
| <b>15°</b> | 50 06.6 +50.2 131.1 | 49 34.9 +49.8 129.9 | 49 02.6 +49.5 128.7 | 48 29.8 +49.1 127.4 | 47 56.5 +48.6 126.3 |
| <b>16°</b> | 50 56.8 +49.9 130.3 | 50 24.7 +49.5 129.0 | 49 52.1 +49.0 127.8 | 49 18.9 +48.6 126.6 | 48 45.1 +48.3 125.4 |
| <b>17°</b> | 51 46.7 +49.4 129.4 | 51 14.2 +49.0 128.1 | 50 41.1 +48.6 126.9 | 50 07.5 +48.2 125.7 | 49 33.4 +47.8 124.5 |
| <b>18°</b> | 52 36.1 +49.0 128.5 | 52 03.2 +48.6 127.2 | 51 29.7 +48.2 126.0 | 50 55.7 +47.8 124.7 | 50 21.2 +47.4 123.5 |
| <b>19°</b> | 53 25.1 +48.5 127.5 | 52 51.8 +48.0 126.2 | 52 17.9 +47.6 125.0 | 51 43.5 +47.2 123.8 | 51 08.6 +46.9 122.6 |
| <b>20°</b> | 54 13.6 +48.0 126.5 | 53 39.8 +47.6 125.2 | 53 05.5 +47.2 124.0 | 52 30.7 +46.8 122.8 | 51 55.5 +46.3 121.6 |
| <b>21°</b> | 55 01.6 +47.5 125.5 | 54 27.4 +47.0 124.2 | 53 52.7 +46.6 122.9 | 53 17.5 +46.1 121.7 | 52 41.8 +45.7 120.5 |
| <b>22°</b> | 55 49.1 +46.8 124.4 | 55 14.4 +46.4 123.1 | 54 39.3 +45.9 121.9 | 54 03.6 +45.6 120.6 | 53 27.5 +45.2 119.4 |
| <b>23°</b> | 56 35.9 +46.3 123.3 | 56 00.8 +45.8 122.0 | 55 25.2 +45.4 120.7 | 54 49.2 +44.9 119.5 | 54 12.7 +44.5 118.3 |
| <b>24°</b> | 57 22.2 +45.5 122.1 | 56 46.6 +45.1 120.8 | 56 10.6 +44.6 119.6 | 55 34.1 +44.3 118.4 | 54 57.2 +43.9 117.2 |
| <b>25°</b> | 58 07.7 +44.8 120.9 | 57 31.7 +44.4 119.6 | 56 55.2 +44.0 118.4 | 56 18.4 +43.5 117.2 | 55 41.1 +43.1 116.0 |
| <b>26°</b> | 58 52.5 +44.1 119.6 | 58 16.1 +43.5 118.3 | 57 39.2 +43.1 117.1 | 57 01.9 +42.7 115.9 | 56 24.2 +42.3 114.7 |
| <b>27°</b> | 59 36.6 +43.1 118.3 | 58 59.6 +42.8 117.0 | 58 22.3 +42.3 115.8 | 57 44.6 +41.9 114.6 | 57 06.5 +41.5 113.4 |
| <b>28°</b> | 60 19.7 +42.3 116.9 | 59 42.4 +41.8 115.6 | 59 04.6 +41.4 114.4 | 58 26.5 +41.0 113.2 | 57 48.0 +40.6 112.1 |
| <b>29°</b> | 61 02.0 +41.4 115.4 | 60 24.2 +40.9 114.2 | 59 46.0 +40.5 113.0 | 59 07.5 +40.0 111.8 | 58 28.6 +39.7 110.7 |

| Dec        | LHA 035° / 325°     | LHA 036° / 324°     | LHA 037° / 323°     | LHA 038° / 322°     | LHA 039° / 321°     |
|------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|            | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| <b>0°</b>  | 34 41.0 +52.4 135.8 | 34 11.6 +52.1 134.7 | 33 41.7 +51.8 133.7 | 33 11.3 +51.5 132.6 | 32 40.4 +51.2 131.6 |
| <b>1°</b>  | 35 33.4 +52.2 135.2 | 35 03.7 +51.9 134.1 | 34 33.5 +51.6 133.1 | 34 02.8 +51.3 132.0 | 33 31.6 +51.0 131.0 |
| <b>2°</b>  | 36 25.6 +52.0 134.6 | 35 55.6 +51.7 133.5 | 35 25.1 +51.4 132.4 | 34 54.1 +51.1 131.4 | 34 22.6 +50.8 130.4 |
| <b>3°</b>  | 37 17.6 +51.8 133.9 | 36 47.3 +51.5 132.9 | 36 16.5 +51.2 131.8 | 35 45.2 +50.9 130.7 | 35 13.4 +50.6 129.7 |
| <b>4°</b>  | 38 09.4 +51.7 133.3 | 37 38.8 +51.3 132.2 | 37 07.7 +51.0 131.1 | 36 36.1 +50.6 130.1 | 36 04.0 +50.3 129.0 |
| <b>5°</b>  | 39 01.1 +51.4 132.7 | 38 30.1 +51.1 131.6 | 37 58.7 +50.7 130.5 | 37 26.7 +50.5 129.4 | 36 54.3 +50.1 128.4 |
| <b>6°</b>  | 39 52.5 +51.1 132.0 | 39 21.2 +50.8 130.9 | 38 49.4 +50.6 129.8 | 38 17.2 +50.2 128.7 | 37 44.4 +49.9 127.7 |
| <b>7°</b>  | 40 43.6 +50.9 131.3 | 40 12.0 +50.6 130.2 | 39 40.0 +50.2 129.1 | 39 07.4 +49.9 128.0 | 38 34.3 +49.6 127.0 |
| <b>8°</b>  | 41 34.5 +50.7 130.6 | 41 02.6 +50.3 129.5 | 40 30.2 +50.0 128.4 | 39 57.3 +49.6 127.3 | 39 23.9 +49.3 126.2 |
| <b>9°</b>  | 42 25.2 +50.3 129.9 | 41 52.9 +50.1 128.8 | 41 20.2 +49.7 127.7 | 40 46.9 +49.4 126.6 | 40 13.2 +49.1 125.5 |
| <b>10°</b> | 43 15.5 +50.1 129.1 | 42 43.0 +49.7 128.0 | 42 09.9 +49.4 126.9 | 41 36.3 +49.1 125.8 | 41 02.3 +48.7 124.7 |
| <b>11°</b> | 44 05.6 +49.8 128.4 | 43 32.7 +49.4 127.2 | 42 59.3 +49.0 126.1 | 42 25.4 +48.7 125.0 | 41 51.0 +48.4 124.0 |
| <b>12°</b> | 44 55.4 +49.4 127.6 | 44 22.1 +49.1 126.5 | 43 48.3 +48.8 125.3 | 43 14.1 +48.4 124.3 | 42 39.4 +48.1 123.2 |
| <b>13°</b> | 45 44.8 +49.1 126.8 | 45 11.2 +48.7 125.6 | 44 37.1 +48.4 124.5 | 44 02.5 +48.1 123.4 | 43 27.5 +47.7 122.4 |
| <b>14°</b> | 46 33.9 +48.7 126.0 | 45 59.9 +48.4 124.8 | 45 25.5 +48.0 123.7 | 44 50.6 +47.6 122.6 | 44 15.2 +47.4 121.5 |
| <b>15°</b> | 47 22.6 +48.3 125.1 | 46 48.3 +47.9 124.0 | 46 13.5 +47.6 122.8 | 45 38.2 +47.3 121.7 | 45 02.6 +46.9 120.6 |
| <b>16°</b> | 48 10.9 +47.9 124.2 | 47 36.2 +47.5 123.1 | 47 01.1 +47.1 121.9 | 46 25.5 +46.8 120.8 | 45 49.5 +46.5 119.8 |
| <b>17°</b> | 48 58.8 +47.5 123.3 | 48 23.7 +47.1 122.2 | 47 48.2 +46.8 121.0 | 47 12.3 +46.4 119.9 | 46 36.0 +46.1 118.8 |
| <b>18°</b> | 49 46.3 +46.9 122.4 | 49 10.8 +46.6 121.2 | 48 35.0 +46.2 120.1 | 47 58.7 +45.9 119.0 | 47 22.1 +45.6 117.9 |
| <b>19°</b> | 50 33.2 +46.5 121.4 | 49 57.4 +46.2 120.2 | 49 21.2 +45.8 119.1 | 48 44.6 +45.4 118.0 | 48 07.7 +45.0 116.9 |
| <b>20°</b> | 51 19.7 +46.0 120.4 | 50 43.6 +45.5 119.2 | 50 07.0 +45.2 118.1 | 49 30.0 +44.9 117.0 | 48 52.7 +44.6 115.9 |
| <b>21°</b> | 52 05.7 +45.3 119.4 | 51 29.1 +45.0 118.2 | 50 52.2 +44.7 117.1 | 50 14.9 +44.3 116.0 | 49 37.3 +44.0 114.9 |
| <b>22°</b> | 52 51.0 +44.8 118.3 | 52 14.1 +44.5 117.1 | 51 36.9 +44.0 116.0 | 50 59.2 +43.8 114.9 | 50 21.3 +43.4 113.9 |
| <b>23°</b> | 53 35.8 +44.2 117.2 | 52 58.6 +43.7 116.0 | 52 20.9 +43.5 114.9 | 51 43.0 +43.1 113.8 | 51 04.7 +42.8 112.8 |
| <b>24°</b> | 54 20.0 +43.4 116.0 | 53 42.3 +43.1 114.9 | 53 04.4 +42.7 113.8 | 52 26.1 +42.4 112.7 | 51 47.5 +42.1 111.6 |
| <b>25°</b> | 55 03.4 +42.8 114.8 | 54 25.4 +42.4 113.7 | 53 47.1 +42.0 112.6 | 53 08.5 +41.7 111.5 | 52 29.6 +41.4 110.5 |
| <b>26°</b> | 55 46.2 +41.9 113.6 | 55 07.8 +41.6 112.5 | 54 29.1 +41.3 111.4 | 53 50.2 +40.9 110.3 | 53 11.0 +40.6 109.3 |
| <b>27°</b> | 56 28.1 +41.2 112.3 | 55 49.4 +40.8 111.2 | 55 10.0 +40.5 110.1 | 54 31.1 +40.2 109.1 | 53 51.6 +39.9 108.0 |
| <b>28°</b> | 57 09.3 +40.2 111.0 | 56 30.2 +39.9 109.9 | 55 50.9 +39.6 108.8 | 55 11.3 +39.3 107.8 | 54 31.5 +39.0 106.8 |
| <b>29°</b> | 57 49.5 +39.3 109.6 | 57 10.1 +39.0 108.5 | 56 30.5 +38.7 107.5 | 55 50.6 +38.4 106.5 | 55 10.5 +38.2 105.5 |

# Declination SAME name as Latitude

# Latitude 46°

| 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°  | 32 09.0 +50.9 130.6 | 31 37.1 +50.6 129.6 | 31 04.8 +50.3 128.6 | 30 32.0 +50.0 127.6 | 29 58.8 +49.7 126.7 |
| 1°  | 32 59.9 +50.7 130.0 | 32 27.7 +50.4 129.0 | 31 55.1 +50.1 128.0 | 31 22.0 +49.8 127.0 | 30 48.5 +49.6 126.0 |
| 2°  | 33 50.6 +50.5 129.3 | 33 18.1 +50.2 128.3 | 32 45.2 +49.9 127.3 | 32 11.8 +49.6 126.3 | 31 38.1 +49.3 125.4 |
| 3°  | 34 41.1 +50.2 128.7 | 34 08.3 +50.0 127.7 | 33 35.1 +49.7 126.7 | 33 01.4 +49.4 125.7 | 32 27.4 +49.1 124.7 |
| 4°  | 35 31.3 +50.1 128.0 | 34 58.3 +49.7 127.0 | 34 24.8 +49.4 126.0 | 33 50.8 +49.2 125.0 | 33 16.5 +48.9 124.0 |
| 5°  | 36 21.4 +49.8 127.3 | 35 48.0 +49.5 126.3 | 35 14.2 +49.2 125.3 | 34 40.0 +48.9 124.3 | 34 05.4 +48.6 123.3 |
| 6°  | 37 11.2 +49.6 126.6 | 36 37.5 +49.3 125.6 | 36 03.4 +49.0 124.6 | 35 28.9 +48.7 123.6 | 34 54.0 +48.4 122.6 |
| 7°  | 38 00.8 +49.3 125.9 | 37 26.8 +49.0 124.9 | 36 52.4 +48.7 123.9 | 36 17.6 +48.4 122.9 | 35 42.4 +48.1 121.9 |
| 8°  | 38 50.1 +49.0 125.2 | 38 15.8 +48.7 124.2 | 37 41.1 +48.4 123.1 | 37 06.0 +48.1 122.1 | 36 30.5 +47.9 121.1 |
| 9°  | 39 39.1 +48.7 124.5 | 39 04.5 +48.4 123.4 | 38 29.5 +48.1 122.4 | 37 54.1 +47.9 121.4 | 37 18.4 +47.5 120.4 |
| 10° | 40 27.8 +48.4 123.7 | 39 52.9 +48.2 122.7 | 39 17.6 +47.9 121.6 | 38 42.0 +47.5 120.6 | 38 05.9 +47.3 119.6 |
| 11° | 41 16.2 +48.1 122.9 | 40 41.1 +47.7 121.9 | 40 05.5 +47.5 120.8 | 39 29.5 +47.2 119.8 | 38 53.2 +46.9 118.8 |
| 12° | 42 04.3 +47.8 122.1 | 41 28.8 +47.5 121.1 | 40 53.0 +47.1 120.0 | 40 16.7 +46.8 119.0 | 39 40.1 +46.5 118.0 |
| 13° | 42 52.1 +47.4 121.3 | 42 16.3 +47.1 120.2 | 41 40.1 +46.8 119.2 | 41 03.5 +46.5 118.2 | 40 26.6 +46.3 117.2 |
| 14° | 43 39.5 +47.0 120.4 | 43 03.4 +46.7 119.4 | 42 26.9 +46.4 118.4 | 41 50.0 +46.2 117.4 | 41 12.9 +45.8 116.4 |
| 15° | 44 26.5 +46.6 119.6 | 43 50.1 +46.3 118.5 | 43 13.3 +46.0 117.5 | 42 36.2 +45.7 116.5 | 41 58.7 +45.4 115.5 |
| 16° | 45 13.1 +46.2 118.7 | 44 36.4 +45.9 117.6 | 43 59.3 +45.6 116.6 | 43 21.9 +45.3 115.6 | 42 44.1 +45.1 114.6 |
| 17° | 45 59.3 +45.8 117.8 | 45 22.3 +45.4 116.7 | 44 44.9 +45.1 115.7 | 44 07.2 +44.8 114.7 | 43 29.2 +44.5 113.7 |
| 18° | 46 45.1 +45.2 116.8 | 46 07.7 +45.0 115.8 | 45 30.0 +44.7 114.8 | 44 52.0 +44.4 113.8 | 44 13.7 +44.2 112.8 |
| 19° | 47 30.3 +44.8 115.9 | 46 52.7 +44.4 114.8 | 46 14.7 +44.2 113.8 | 45 36.4 +43.9 112.8 | 44 57.9 +43.6 111.8 |
| 20° | 48 15.1 +44.2 114.9 | 47 37.1 +44.0 113.9 | 46 58.9 +43.6 112.8 | 46 20.3 +43.4 111.8 | 45 41.5 +43.1 110.9 |
| 21° | 48 59.3 +43.7 113.9 | 48 21.1 +43.4 112.8 | 47 42.5 +43.1 111.8 | 47 03.7 +42.8 110.8 | 46 24.6 +42.6 109.9 |
| 22° | 49 43.0 +43.1 112.8 | 49 04.5 +42.8 111.8 | 48 25.6 +42.5 110.8 | 47 46.5 +42.3 109.8 | 47 07.2 +42.0 108.8 |
| 23° | 50 26.1 +42.5 111.7 | 49 47.3 +42.1 110.7 | 49 08.1 +42.0 109.7 | 48 28.8 +41.7 108.7 | 47 49.2 +41.4 107.8 |
| 24° | 51 08.6 +41.8 110.6 | 50 29.4 +41.6 109.6 | 49 50.1 +41.2 108.6 | 49 10.5 +41.0 107.6 | 48 30.6 +40.8 106.7 |
| 25° | 51 50.4 +41.1 109.5 | 51 11.0 +40.8 108.5 | 50 31.3 +40.6 107.5 | 49 51.5 +40.3 106.5 | 49 11.4 +40.1 105.6 |
| 26° | 52 31.5 +40.4 108.3 | 51 51.8 +40.1 107.3 | 51 11.9 +39.9 106.3 | 50 31.8 +39.7 105.4 | 49 51.5 +39.5 104.4 |
| 27° | 53 11.9 +39.6 107.0 | 52 31.9 +39.4 106.1 | 51 51.8 +39.1 105.1 | 51 11.5 +38.9 104.2 | 50 31.0 +38.7 103.2 |
| 28° | 53 51.5 +38.8 105.8 | 53 11.3 +38.5 104.8 | 52 30.9 +38.3 103.9 | 51 50.4 +38.1 102.9 | 51 09.7 +37.9 102.0 |
| 29° | 54 30.3 +37.9 104.5 | 53 49.8 +37.7 103.5 | 53 09.2 +37.5 102.6 | 52 28.5 +37.3 101.7 | 51 47.6 +37.1 100.8 |

| 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°  | 29 25.2 +49.4 125.7 | 28 51.1 +49.2 124.8 | 28 16.7 +48.9 123.9 | 27 41.9 +48.7 122.9 | 27 06.7 +48.4 122.0 |
| 1°  | 30 14.6 +49.3 125.1 | 29 40.3 +49.0 124.1 | 29 05.6 +48.7 123.2 | 28 30.6 +48.4 122.3 | 27 55.1 +48.2 121.4 |
| 2°  | 31 03.9 +49.0 124.4 | 30 29.3 +48.8 123.5 | 29 54.3 +48.5 122.5 | 29 19.0 +48.3 121.6 | 28 43.3 +48.0 120.7 |
| 3°  | 31 52.9 +48.9 123.7 | 31 18.1 +48.5 122.8 | 30 42.8 +48.3 121.8 | 30 07.3 +48.0 120.9 | 29 31.3 +47.8 120.0 |
| 4°  | 32 41.8 +48.6 123.0 | 32 06.6 +48.4 122.1 | 31 31.1 +48.1 121.1 | 30 55.3 +47.8 120.2 | 30 19.1 +47.6 119.3 |
| 5°  | 33 30.4 +48.3 122.3 | 32 55.0 +48.0 121.4 | 32 19.2 +47.8 120.4 | 31 43.1 +47.6 119.5 | 31 06.7 +47.3 118.6 |
| 6°  | 34 18.7 +48.1 121.6 | 33 43.0 +47.9 120.7 | 33 07.0 +47.6 119.7 | 32 30.7 +47.3 118.8 | 31 54.0 +47.0 117.9 |
| 7°  | 35 06.8 +47.9 120.9 | 34 30.9 +47.6 119.9 | 33 54.6 +47.3 119.0 | 33 18.0 +47.0 118.1 | 32 41.0 +46.8 117.1 |
| 8°  | 35 54.7 +47.5 120.2 | 35 18.5 +47.3 119.2 | 34 41.9 +47.0 118.2 | 34 05.0 +46.8 117.3 | 33 27.8 +46.6 116.4 |
| 9°  | 36 42.2 +47.3 119.4 | 36 05.8 +47.0 118.4 | 35 28.9 +46.8 117.5 | 34 51.8 +46.5 116.5 | 34 14.4 +46.2 115.6 |
| 10° | 37 29.5 +47.0 118.6 | 36 52.8 +46.7 117.7 | 36 15.7 +46.4 116.7 | 35 38.3 +46.2 115.8 | 35 00.6 +46.0 114.8 |
| 11° | 38 16.5 +46.6 117.9 | 37 39.5 +46.3 116.9 | 37 02.1 +46.1 115.9 | 36 24.5 +45.9 115.0 | 35 46.6 +45.6 114.1 |
| 12° | 39 03.1 +46.3 117.0 | 38 25.8 +46.1 116.1 | 37 48.2 +45.8 115.1 | 37 10.4 +45.5 114.2 | 36 32.2 +45.3 113.3 |
| 13° | 39 49.4 +46.0 116.2 | 39 11.9 +45.6 115.3 | 38 34.0 +45.5 114.3 | 37 55.9 +45.2 113.4 | 37 17.5 +45.0 112.4 |
| 14° | 40 35.4 +45.5 115.4 | 39 57.5 +45.4 114.4 | 39 19.5 +45.0 113.5 | 38 41.1 +44.8 112.5 | 38 02.5 +44.5 111.6 |
| 15° | 41 20.9 +45.2 114.5 | 40 42.9 +44.9 113.6 | 40 04.5 +44.7 112.6 | 39 25.9 +44.4 111.7 | 38 47.0 +44.3 110.7 |
| 16° | 42 06.1 +44.7 113.6 | 41 27.8 +44.5 112.7 | 40 49.2 +44.2 111.7 | 40 10.3 +44.1 110.8 | 39 31.3 +43.8 109.9 |
| 17° | 42 50.8 +44.4 112.7 | 42 12.3 +44.0 111.8 | 41 33.4 +43.9 110.8 | 40 54.4 +43.6 109.9 | 40 15.1 +43.4 109.0 |
| 18° | 43 35.2 +43.8 111.8 | 42 56.3 +43.7 110.9 | 42 17.3 +43.4 109.9 | 41 38.0 +43.1 109.0 | 40 58.5 +42.9 108.1 |
| 19° | 44 19.0 +43.4 110.9 | 43 40.0 +43.1 109.9 | 43 00.7 +42.9 109.0 | 42 21.1 +42.7 108.0 | 41 41.4 +42.5 107.1 |
| 20° | 45 02.4 +42.9 109.9 | 44 23.1 +42.6 108.9 | 43 43.6 +42.4 108.0 | 43 03.8 +42.2 107.1 | 42 23.9 +42.0 106.2 |
| 21° | 45 45.3 +42.3 108.9 | 45 05.7 +42.2 108.0 | 44 26.0 +41.9 107.0 | 43 46.0 +41.7 106.1 | 43 05.9 +41.5 105.2 |
| 22° | 46 27.6 +41.8 107.9 | 45 47.9 +41.5 106.9 | 45 07.9 +41.3 106.0 | 44 27.7 +41.2 105.1 | 43 47.4 +41.0 104.2 |
| 23° | 47 09.4 +41.2 106.8 | 46 29.4 +41.0 105.9 | 45 49.2 +40.8 105.0 | 45 08.9 +40.6 104.1 | 44 28.4 +40.4 103.2 |
| 24° | 47 50.6 +40.6 105.7 | 47 10.4 +40.4 104.8 | 46 30.0 +40.2 103.9 | 45 49.5 +40.0 103.0 | 45 08.8 +39.9 102.2 |
| 25° | 48 31.2 +39.9 104.6 | 47 50.8 +39.7 103.7 | 47 10.2 +39.6 102.8 | 46 29.5 +39.4 102.0 | 45 48.7 +39.2 101.1 |
| 26° | 49 11.1 +39.2 103.5 | 48 30.5 +39.0 102.6 | 47 49.8 +38.8 101.7 | 47 08.9 +38.7 100.9 | 46 27.9 +38.6 100.0 |
| 27° | 49 50.3 +38.5 102.3 | 49 09.5 +38.4 101.5 | 48 28.6 +38.2 100.6 | 47 47.6 +38.1 99.7  | 47 06.5 +37.9 98.9  |
| 28° | 50 28.8 +37.8 101.1 | 49 47.9 +37.6 100.3 | 49 06.8 +37.5 99.4  | 48 25.7 +37.3 98.6  | 47 44.4 +37.2 97.7  |
| 29° | 51 06.6 +37.0 99.9  | 50 25.5 +36.8 99.1  | 49 44.3 +36.7 98.2  | 49 03.0 +36.6 97.4  | 48 21.6 +36.5 96.6  |

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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°  | 26 31.2 +48.2 121.1 | 25 55.4 +47.9 120.2 | 25 19.2 +47.7 119.3 | 24 42.7 +47.4 118.5 | 24 05.9 +47.2 117.6 |
| 1°  | 27 19.4 +47.9 120.4 | 26 43.3 +47.7 119.5 | 26 06.9 +47.4 118.7 | 25 30.1 +47.3 117.8 | 24 53.1 +47.0 116.9 |
| 2°  | 28 07.3 +47.8 119.8 | 27 31.0 +47.5 118.9 | 26 54.3 +47.3 118.0 | 26 17.4 +47.0 117.1 | 25 40.1 +46.8 116.2 |
| 3°  | 28 55.1 +47.5 119.1 | 28 18.5 +47.3 118.2 | 27 41.6 +47.0 117.3 | 27 04.4 +46.8 116.4 | 26 26.9 +46.6 115.5 |
| 4°  | 29 42.6 +47.3 118.4 | 29 05.8 +47.0 117.5 | 28 28.6 +46.9 116.6 | 27 51.2 +46.6 115.7 | 27 13.5 +46.4 114.8 |
| 5°  | 30 29.9 +47.1 117.7 | 29 52.8 +46.9 116.8 | 29 15.5 +46.6 115.9 | 28 37.8 +46.4 115.0 | 27 59.9 +46.2 114.1 |
| 6°  | 31 17.0 +46.8 116.9 | 30 39.7 +46.6 116.0 | 30 02.1 +46.3 115.1 | 29 24.2 +46.2 114.3 | 28 46.1 +45.9 113.4 |
| 7°  | 32 03.8 +46.6 116.2 | 31 26.3 +46.3 115.3 | 30 48.4 +46.1 114.4 | 30 10.4 +45.8 113.5 | 29 32.0 +45.7 112.6 |
| 8°  | 32 50.4 +46.3 115.5 | 32 12.6 +46.1 114.6 | 31 34.5 +45.9 113.7 | 30 56.2 +45.7 112.8 | 30 17.7 +45.4 111.9 |
| 9°  | 33 36.7 +46.0 114.7 | 32 58.7 +45.7 113.8 | 32 20.4 +45.5 112.9 | 31 41.9 +45.3 112.0 | 31 03.1 +45.2 111.1 |
| 10° | 34 22.7 +45.7 113.9 | 33 44.4 +45.5 113.0 | 33 05.9 +45.3 112.1 | 32 27.2 +45.1 111.2 | 31 48.3 +44.8 110.4 |
| 11° | 35 08.4 +45.4 113.1 | 34 29.9 +45.2 112.2 | 33 51.2 +45.0 111.3 | 33 12.3 +44.7 110.5 | 32 33.1 +44.6 109.6 |
| 12° | 35 53.8 +45.0 112.3 | 35 15.1 +44.9 111.4 | 34 36.2 +44.6 110.5 | 33 57.0 +44.5 109.7 | 33 17.7 +44.2 108.8 |
| 13° | 36 38.8 +44.8 111.5 | 36 00.0 +44.5 110.6 | 35 20.8 +44.3 109.7 | 34 41.5 +44.1 108.8 | 34 01.9 +44.0 108.0 |
| 14° | 37 23.6 +44.3 110.7 | 36 44.5 +44.1 109.8 | 36 05.1 +44.0 108.9 | 35 25.6 +43.8 108.0 | 34 45.9 +43.6 107.1 |
| 15° | 38 07.9 +44.0 109.8 | 37 28.6 +43.8 108.9 | 36 49.1 +43.6 108.0 | 36 09.4 +43.4 107.2 | 35 29.5 +43.2 106.3 |
| 16° | 38 51.9 +43.6 109.0 | 38 12.4 +43.4 108.1 | 37 32.7 +43.2 107.2 | 36 52.8 +43.0 106.3 | 36 12.7 +42.9 105.5 |
| 17° | 39 35.5 +43.2 108.1 | 38 55.8 +43.0 107.2 | 38 15.9 +42.8 106.3 | 37 35.8 +42.7 105.4 | 36 55.6 +42.4 104.6 |
| 18° | 40 18.7 +42.8 107.2 | 39 38.8 +42.6 106.3 | 38 58.7 +42.4 105.4 | 38 18.5 +42.2 104.5 | 37 38.0 +42.1 103.7 |
| 19° | 41 01.5 +42.3 106.2 | 40 21.4 +42.1 105.4 | 39 41.1 +42.0 104.5 | 39 00.7 +41.8 103.6 | 38 20.1 +41.6 102.8 |
| 20° | 41 43.8 +41.8 105.3 | 41 03.5 +41.7 104.4 | 40 23.1 +41.4 103.6 | 39 42.5 +41.3 102.7 | 39 01.7 +41.2 101.9 |
| 21° | 42 25.6 +41.3 104.3 | 41 45.2 +41.1 103.5 | 41 04.5 +41.1 102.6 | 40 23.8 +40.9 101.8 | 39 42.9 +40.8 100.9 |
| 22° | 43 06.9 +40.8 103.3 | 42 26.3 +40.7 102.5 | 41 45.6 +40.5 101.6 | 41 04.7 +40.3 100.8 | 40 23.7 +40.2 100.0 |
| 23° | 43 47.7 +40.3 102.3 | 43 07.0 +40.1 101.5 | 42 26.1 +39.9 100.6 | 41 45.0 +39.9 99.8  | 41 03.9 +39.8 99.0  |
| 24° | 44 28.0 +39.7 101.3 | 43 47.1 +39.5 100.5 | 43 06.0 +39.5 99.6  | 42 24.9 +39.3 98.8  | 41 43.7 +39.2 98.0  |
| 25° | 45 07.7 +39.1 100.2 | 44 26.6 +39.0 99.4  | 43 45.5 +38.8 98.6  | 43 04.2 +38.8 97.8  | 42 22.9 +38.6 97.0  |
| 26° | 45 46.8 +38.5 99.2  | 45 05.6 +38.3 98.3  | 44 24.3 +38.3 97.5  | 43 43.0 +38.1 96.7  | 43 01.5 +38.1 95.9  |
| 27° | 46 25.3 +37.8 98.1  | 45 43.9 +37.8 97.2  | 45 02.6 +37.6 96.4  | 44 21.1 +37.6 95.6  | 43 39.6 +37.5 94.9  |
| 28° | 47 03.1 +37.1 96.9  | 46 21.7 +37.0 96.1  | 45 40.2 +36.9 95.3  | 44 58.7 +36.9 94.5  | 44 17.1 +36.8 93.8  |
| 29° | 47 40.2 +36.4 95.8  | 46 58.7 +36.3 95.0  | 46 17.1 +36.3 94.2  | 45 35.6 +36.2 93.4  | 44 53.9 +36.2 92.7  |

| 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°  | 23 28.8 +47.0 116.7 | 22 51.5 +46.7 115.9 | 22 13.8 +46.6 115.0 | 21 36.0 +46.3 114.2 | 20 57.8 +46.2 113.4 |
| 1°  | 24 15.8 +46.8 116.1 | 23 38.2 +46.6 115.2 | 23 00.4 +46.3 114.4 | 22 22.3 +46.2 113.5 | 21 44.0 +45.9 112.7 |
| 2°  | 25 02.6 +46.6 115.4 | 24 24.8 +46.4 114.5 | 23 46.7 +46.2 113.7 | 23 08.5 +45.9 112.8 | 22 29.9 +45.8 112.0 |
| 3°  | 25 49.2 +46.4 114.7 | 25 11.2 +46.2 113.8 | 24 32.9 +46.0 113.0 | 23 54.4 +45.8 112.1 | 23 15.7 +45.6 111.3 |
| 4°  | 26 35.6 +46.1 114.0 | 25 57.4 +45.9 113.1 | 25 18.9 +45.8 112.3 | 24 40.2 +45.6 111.4 | 24 01.3 +45.4 110.6 |
| 5°  | 27 21.7 +46.0 113.2 | 26 43.3 +45.8 112.4 | 26 04.7 +45.5 111.5 | 25 25.8 +45.4 110.7 | 24 46.7 +45.2 109.9 |
| 6°  | 28 07.7 +45.7 112.5 | 27 29.1 +45.5 111.7 | 26 50.2 +45.4 110.8 | 26 11.2 +45.1 110.0 | 25 31.9 +45.0 109.1 |
| 7°  | 28 53.4 +45.5 111.8 | 28 14.6 +45.3 110.9 | 27 35.6 +45.1 110.1 | 26 56.3 +44.9 109.2 | 26 16.9 +44.7 108.4 |
| 8°  | 29 38.9 +45.2 111.0 | 28 59.9 +45.0 110.2 | 28 20.7 +44.8 109.3 | 27 41.2 +44.7 108.5 | 27 01.6 +44.5 107.7 |
| 9°  | 30 24.1 +45.0 110.3 | 29 44.9 +44.8 109.4 | 29 05.5 +44.6 108.6 | 28 25.9 +44.4 107.7 | 27 46.1 +44.3 106.9 |
| 10° | 31 09.1 +44.6 109.5 | 30 29.7 +44.5 108.6 | 29 50.1 +44.3 107.8 | 29 10.3 +44.2 107.0 | 28 30.4 +44.0 106.1 |
| 11° | 31 53.7 +44.4 108.7 | 31 14.2 +44.2 107.9 | 30 34.4 +44.0 107.0 | 29 54.5 +43.8 106.2 | 29 14.4 +43.7 105.4 |
| 12° | 32 38.1 +44.1 107.9 | 31 58.4 +43.9 107.1 | 31 18.4 +43.8 106.2 | 30 38.3 +43.6 105.4 | 29 58.1 +43.4 104.6 |
| 13° | 33 22.2 +43.8 107.1 | 32 42.3 +43.6 106.3 | 32 02.2 +43.4 105.4 | 31 21.9 +43.3 104.6 | 30 41.5 +43.2 103.8 |
| 14° | 34 06.0 +43.4 106.3 | 33 25.9 +43.2 105.4 | 32 45.6 +43.1 104.6 | 32 05.2 +43.0 103.8 | 31 24.7 +42.8 103.0 |
| 15° | 34 49.4 +43.0 105.5 | 34 09.1 +42.9 104.6 | 33 28.7 +42.8 103.8 | 32 48.2 +42.6 103.0 | 32 07.5 +42.5 102.1 |
| 16° | 35 32.4 +42.7 104.6 | 34 52.0 +42.6 103.8 | 34 11.5 +42.4 102.9 | 33 30.8 +42.3 102.1 | 32 50.0 +42.1 101.3 |
| 17° | 36 15.1 +42.4 103.7 | 35 34.6 +42.2 102.9 | 34 53.9 +42.0 102.1 | 34 13.1 +41.9 101.3 | 33 32.1 +41.9 100.5 |
| 18° | 36 57.5 +41.9 102.9 | 36 16.8 +41.8 102.0 | 35 35.9 +41.7 101.2 | 34 55.0 +41.5 100.4 | 34 14.0 +41.4 99.6  |
| 19° | 37 39.4 +41.5 102.0 | 36 58.6 +41.3 101.1 | 36 17.6 +41.3 100.3 | 35 36.5 +41.2 99.5  | 34 55.4 +41.0 98.7  |
| 20° | 38 20.9 +41.1 101.0 | 37 39.9 +41.0 100.2 | 36 58.9 +40.8 99.4  | 36 17.7 +40.7 98.6  | 35 36.4 +40.7 97.8  |
| 21° | 39 02.0 +40.6 100.1 | 38 20.9 +40.5 99.3  | 37 39.7 +40.4 98.5  | 36 58.4 +40.3 97.7  | 36 17.1 +40.2 96.9  |
| 22° | 39 42.6 +40.1 99.1  | 39 01.4 +40.0 98.3  | 38 20.1 +39.9 97.5  | 37 38.7 +39.9 96.8  | 36 57.3 +39.8 96.0  |
| 23° | 40 22.7 +39.6 98.2  | 39 41.4 +39.6 97.4  | 39 00.0 +39.5 96.6  | 38 18.6 +39.4 95.8  | 37 37.1 +39.4 95.0  |
| 24° | 41 02.3 +39.2 97.2  | 40 21.0 +39.0 96.4  | 39 39.5 +39.0 95.6  | 38 58.0 +38.9 94.8  | 38 16.5 +38.8 94.1  |
| 25° | 41 41.5 +38.5 96.2  | 41 00.0 +38.5 95.4  | 40 18.5 +38.4 94.6  | 39 36.9 +38.4 93.9  | 38 55.3 +38.4 93.1  |
| 26° | 42 20.0 +38.1 95.1  | 41 38.5 +38.0 94.4  | 40 56.9 +37.9 93.6  | 40 15.3 +37.9 92.9  | 39 33.7 +37.8 92.1  |
| 27° | 42 58.1 +37.4 94.1  | 42 16.5 +37.3 93.3  | 41 34.8 +37.4 92.6  | 40 53.2 +37.3 91.8  | 40 11.5 +37.3 91.1  |
| 28° | 43 35.5 +36.8 93.0  | 42 53.8 +36.8 92.3  | 42 12.2 +36.8 91.5  | 41 30.5 +36.8 90.8  | 40 48.8 +36.8 90.1  |
| 29° | 44 12.3 +36.2 91.9  | 43 30.6 +36.2 91.2  | 42 49.0 +36.1 90.5  | 42 07.3 +36.1 89.7  | 41 25.6 +36.2 89.0  |

| 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°  | 20 19.4 +46.0 112.6 | 19 40.8 +45.8 111.7 | 19 02.0 +45.6 110.9 | 18 23.0 +45.4 110.1 | 17 43.8 +45.2 109.3 |
| 1°  | 21 05.4 +45.8 111.9 | 20 26.6 +45.6 111.1 | 19 47.6 +45.4 110.2 | 19 08.4 +45.2 109.4 | 18 29.0 +45.1 108.6 |
| 2°  | 21 51.2 +45.6 111.2 | 21 12.2 +45.4 110.4 | 20 33.0 +45.3 109.5 | 19 53.6 +45.1 108.7 | 19 14.1 +44.9 107.9 |
| 3°  | 22 36.8 +45.4 110.5 | 21 57.6 +45.3 109.7 | 21 18.3 +45.0 108.8 | 20 38.7 +44.9 108.0 | 19 59.0 +44.8 107.2 |
| 4°  | 23 22.2 +45.2 109.8 | 22 42.9 +45.0 108.9 | 22 03.3 +44.9 108.1 | 21 23.6 +44.8 107.3 | 20 43.8 +44.5 106.5 |
| 5°  | 24 07.4 +45.0 109.0 | 23 27.9 +44.9 108.2 | 22 48.2 +44.7 107.4 | 22 08.4 +44.5 106.6 | 21 28.3 +44.4 105.8 |
| 6°  | 24 52.4 +44.8 108.3 | 24 12.8 +44.6 107.5 | 23 32.9 +44.5 106.7 | 22 52.9 +44.4 105.9 | 22 12.7 +44.2 105.1 |
| 7°  | 25 37.2 +44.6 107.6 | 24 57.4 +44.4 106.8 | 24 17.4 +44.3 106.0 | 23 37.3 +44.1 105.2 | 22 56.9 +44.0 104.4 |
| 8°  | 26 21.8 +44.3 106.8 | 25 41.8 +44.2 106.0 | 25 01.7 +44.0 105.2 | 24 21.4 +43.9 104.4 | 23 40.9 +43.8 103.6 |
| 9°  | 27 06.1 +44.1 106.1 | 26 26.0 +44.0 105.3 | 25 45.7 +43.8 104.5 | 25 05.3 +43.7 103.7 | 24 24.7 +43.6 102.9 |
| 10° | 27 50.2 +43.9 105.3 | 27 10.0 +43.7 104.5 | 26 29.5 +43.6 103.7 | 25 49.0 +43.4 102.9 | 25 08.3 +43.3 102.1 |
| 11° | 28 34.1 +43.6 104.5 | 27 53.7 +43.4 103.7 | 27 13.1 +43.3 102.9 | 26 32.4 +43.2 102.1 | 25 51.6 +43.1 101.3 |
| 12° | 29 17.7 +43.3 103.8 | 28 37.1 +43.2 102.9 | 27 56.4 +43.1 102.1 | 27 15.6 +43.0 101.4 | 26 34.7 +42.8 100.6 |
| 13° | 30 01.0 +43.0 103.0 | 29 20.3 +42.9 102.2 | 28 39.5 +42.7 101.4 | 27 58.6 +42.6 100.6 | 27 17.5 +42.6 99.8  |
| 14° | 30 44.0 +42.7 102.2 | 30 03.2 +42.5 101.3 | 29 22.2 +42.5 100.6 | 28 41.2 +42.4 99.8  | 28 00.1 +42.3 99.0  |
| 15° | 31 26.7 +42.4 101.3 | 30 45.7 +42.3 100.5 | 30 04.7 +42.2 99.7  | 29 23.6 +42.1 99.0  | 28 42.4 +42.0 98.2  |
| 16° | 32 09.1 +42.0 100.5 | 31 28.0 +42.0 99.7  | 30 46.9 +41.8 98.9  | 30 05.7 +41.7 98.1  | 29 24.4 +41.7 97.4  |
| 17° | 32 51.1 +41.7 99.7  | 32 10.0 +41.6 98.9  | 31 28.7 +41.6 98.1  | 30 47.4 +41.5 97.3  | 30 06.1 +41.3 96.5  |
| 18° | 33 32.8 +41.3 98.8  | 32 51.6 +41.2 98.0  | 32 10.3 +41.1 97.2  | 31 28.9 +41.1 96.5  | 30 47.4 +41.1 95.7  |
| 19° | 34 14.1 +41.0 97.9  | 33 32.8 +40.9 97.1  | 32 51.4 +40.9 96.4  | 32 10.0 +40.7 95.6  | 31 28.5 +40.7 94.8  |
| 20° | 34 55.1 +40.6 97.0  | 34 13.7 +40.5 96.3  | 33 32.3 +40.4 95.5  | 32 50.7 +40.4 94.7  | 32 09.2 +40.3 94.0  |
| 21° | 35 35.7 +40.1 96.1  | 34 54.2 +40.1 95.4  | 34 12.7 +40.0 94.6  | 33 31.1 +40.0 93.8  | 32 49.5 +40.0 93.1  |
| 22° | 36 15.8 +39.8 95.2  | 35 34.3 +39.7 94.5  | 34 52.7 +39.7 93.7  | 34 11.1 +39.6 92.9  | 33 29.5 +39.6 92.2  |
| 23° | 36 55.6 +39.3 94.3  | 36 14.0 +39.2 93.5  | 35 32.4 +39.2 92.8  | 34 50.7 +39.2 92.0  | 34 09.1 +39.1 91.3  |
| 24° | 37 34.9 +38.8 93.3  | 36 53.2 +38.8 92.6  | 36 11.6 +38.8 91.8  | 35 29.9 +38.8 91.1  | 34 48.2 +38.8 90.4  |
| 25° | 38 13.7 +38.3 92.4  | 37 32.0 +38.3 91.6  | 36 50.4 +38.3 90.9  | 36 08.7 +38.3 90.2  | 35 27.0 +38.3 89.5  |
| 26° | 38 52.0 +37.9 91.4  | 38 10.3 +37.9 90.7  | 37 28.7 +37.8 89.9  | 36 47.0 +37.8 89.2  | 36 05.3 +37.9 88.5  |
| 27° | 39 29.9 +37.3 90.4  | 38 48.2 +37.3 89.7  | 38 06.5 +37.3 88.9  | 37 24.8 +37.4 88.2  | 36 43.2 +37.4 87.5  |
| 28° | 40 07.2 +36.7 89.4  | 39 25.5 +36.8 88.6  | 38 43.8 +36.8 87.9  | 38 02.2 +36.8 87.3  | 37 20.6 +36.9 86.6  |
| 29° | 40 43.9 +36.2 88.3  | 40 02.3 +36.2 87.6  | 39 20.8 +36.3 86.9  | 38 39.0 +36.4 86.2  | 37 57.5 +36.3 85.6  |

| 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°  | 17 04.3 +45.1 108.5 | 16 24.7 +44.9 107.8 | 15 44.9 +44.8 107.0 | 15 05.0 +44.6 106.2 | 14 24.9 +44.5 105.4 |
| 1°  | 17 49.4 +44.9 107.9 | 17 09.6 +44.8 107.1 | 16 29.7 +44.7 106.3 | 15 49.6 +44.5 105.5 | 15 09.4 +44.4 104.7 |
| 2°  | 18 34.3 +44.8 107.2 | 17 54.4 +44.7 106.4 | 17 14.4 +44.5 105.6 | 16 34.1 +44.4 104.8 | 15 53.8 +44.2 104.0 |
| 3°  | 19 19.1 +44.6 106.5 | 18 39.1 +44.4 105.7 | 17 58.9 +44.3 104.9 | 17 18.5 +44.2 104.1 | 16 38.0 +44.1 103.3 |
| 4°  | 20 03.7 +44.5 105.7 | 19 23.5 +44.3 105.0 | 18 43.2 +44.2 104.2 | 18 02.7 +44.1 103.4 | 17 22.1 +44.0 102.6 |
| 5°  | 20 48.2 +44.2 105.0 | 20 07.8 +44.2 104.2 | 19 27.4 +44.0 103.5 | 18 46.8 +43.9 102.7 | 18 06.1 +43.7 101.9 |
| 6°  | 21 32.4 +44.1 104.3 | 20 52.0 +43.9 103.5 | 20 11.4 +43.8 102.7 | 19 30.7 +43.7 102.0 | 18 49.8 +43.7 101.2 |
| 7°  | 22 16.5 +43.9 103.6 | 21 35.9 +43.8 102.8 | 20 55.2 +43.7 102.0 | 20 14.4 +43.5 101.2 | 19 33.5 +43.4 100.5 |
| 8°  | 23 00.4 +43.6 102.8 | 22 19.7 +43.5 102.0 | 21 38.9 +43.4 101.3 | 20 57.9 +43.4 100.5 | 20 16.9 +43.2 99.7  |
| 9°  | 23 44.0 +43.5 102.1 | 23 03.2 +43.4 101.3 | 22 22.3 +43.2 100.5 | 21 41.3 +43.1 99.8  | 21 00.1 +43.1 99.0  |
| 10° | 24 27.5 +43.2 101.3 | 23 46.6 +43.1 100.5 | 23 05.5 +43.1 99.8  | 22 24.4 +43.0 99.0  | 21 43.2 +42.9 98.2  |
| 11° | 25 10.7 +43.0 100.6 | 24 29.7 +42.9 99.8  | 23 48.6 +42.8 99.0  | 23 07.4 +42.7 98.3  | 22 26.1 +42.6 97.5  |
| 12° | 25 53.7 +42.7 99.8  | 25 12.6 +42.6 99.0  | 24 31.4 +42.5 98.2  | 23 50.1 +42.5 97.5  | 23 08.7 +42.4 96.7  |
| 13° | 26 36.4 +42.5 99.0  | 25 55.2 +42.4 98.2  | 25 13.9 +42.3 97.5  | 24 32.6 +42.2 96.7  | 23 51.1 +42.2 96.0  |
| 14° | 27 18.9 +42.2 98.2  | 26 37.6 +42.1 97.4  | 25 56.2 +42.1 96.7  | 25 14.8 +42.0 95.9  | 24 33.3 +42.0 95.2  |
| 15° | 28 01.1 +41.9 97.4  | 27 19.7 +41.9 96.6  | 26 38.3 +41.8 95.9  | 25 56.8 +41.7 95.1  | 25 15.3 +41.7 94.4  |
| 16° | 28 43.0 +41.6 96.6  | 28 01.6 +41.5 95.8  | 27 20.1 +41.5 95.1  | 26 38.5 +41.5 94.3  | 25 57.0 +41.4 93.6  |
| 17° | 29 24.6 +41.3 95.8  | 28 43.1 +41.3 95.0  | 28 01.6 +41.2 94.3  | 27 20.0 +41.2 93.5  | 26 38.4 +41.1 92.8  |
| 18° | 30 05.9 +41.0 94.9  | 29 24.4 +40.9 94.2  | 28 42.8 +40.9 93.4  | 28 01.2 +40.9 92.7  | 27 19.5 +40.9 92.0  |
| 19° | 30 46.9 +40.7 94.1  | 30 05.3 +40.7 93.3  | 29 23.7 +40.6 92.6  | 28 42.1 +40.5 91.9  | 28 00.4 +40.6 91.1  |
| 20° | 31 27.6 +40.3 93.2  | 30 46.0 +40.2 92.5  | 30 04.3 +40.3 91.8  | 29 22.6 +40.3 91.0  | 28 41.0 +40.2 90.3  |
| 21° | 32 07.9 +39.9 92.4  | 31 26.2 +40.0 91.6  | 30 44.6 +39.9 90.9  | 30 02.9 +39.9 90.2  | 29 21.2 +39.9 89.5  |
| 22° | 32 47.8 +39.6 91.5  | 32 06.2 +39.5 90.7  | 31 24.5 +39.5 90.0  | 30 42.8 +39.6 89.3  | 30 01.1 +39.6 88.6  |
| 23° | 33 27.4 +39.2 90.6  | 32 45.7 +39.2 89.9  | 32 04.0 +39.2 89.1  | 31 22.4 +39.2 88.4  | 30 40.7 +39.2 87.7  |
| 24° | 34 06.6 +38.7 89.7  | 33 24.9 +38.8 89.0  | 32 43.2 +38.8 88.2  | 32 01.6 +38.8 87.5  | 31 19.9 +38.9 86.8  |
| 25° | 34 45.3 +38.4 88.7  | 34 03.7 +38.3 88.0  | 33 22.0 +38.4 87.3  | 32 40.4 +38.4 86.6  | 31 58.8 +38.5 85.9  |
| 26° | 35 23.7 +37.9 87.8  | 34 42.0 +38.0 87.1  | 34 00.4 +38.0 86.4  | 33 18.8 +38.1 85.7  | 32 37.3 +38.1 85.0  |
| 27° | 36 01.6 +37.4 86.8  | 35 20.0 +37.4 86.2  | 34 38.4 +37.5 85.5  | 33 56.9 +37.6 84.8  | 33 15.4 +37.6 84.1  |
| 28° | 36 39.0 +36.9 85.9  | 35 57.4 +37.0 85.2  | 35 15.9 +37.1 84.5  | 34 34.5 +37.1 83.9  | 33 53.0 +37.3 83.2  |
| 29° | 37 15.9 +36.5 84.9  | 36 34.4 +36.6 84.2  | 35 53.0 +36.6 83.6  | 35 11.6 +36.7 82.9  | 34 30.3 +36.8 82.2  |

# Latitude 46°

# 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°  | 13 44.7 +44.3 104.7 | 13 04.3 +44.2 103.9 | 12 23.7 +44.2 103.2 | 11 43.1 +44.0 102.4 | 11 02.3 +44.0 101.7 |
| 1°  | 14 29.0 +44.3 104.0 | 13 48.5 +44.1 103.2 | 13 07.9 +44.0 102.5 | 12 27.1 +43.9 101.7 | 11 46.3 +43.8 101.0 |
| 2°  | 15 13.3 +44.1 103.3 | 14 32.6 +44.1 102.5 | 13 51.9 +43.9 101.8 | 13 11.0 +43.8 101.0 | 12 30.1 +43.7 100.3 |
| 3°  | 15 57.4 +44.0 102.6 | 15 16.7 +43.8 101.8 | 14 35.8 +43.8 101.1 | 13 54.8 +43.7 100.3 | 13 13.8 +43.6 99.6  |
| 4°  | 16 41.4 +43.8 101.9 | 16 00.5 +43.8 101.1 | 15 19.6 +43.6 100.4 | 14 38.5 +43.6 99.6  | 13 57.4 +43.5 98.9  |
| 5°  | 17 25.2 +43.7 101.2 | 16 44.3 +43.6 100.4 | 16 03.2 +43.5 99.6  | 15 22.1 +43.4 98.9  | 14 40.9 +43.3 98.1  |
| 6°  | 18 08.9 +43.5 100.4 | 17 27.9 +43.4 99.7  | 16 46.7 +43.4 98.9  | 16 05.5 +43.3 98.2  | 15 24.2 +43.2 97.4  |
| 7°  | 18 52.4 +43.4 99.7  | 18 11.3 +43.3 98.9  | 17 30.1 +43.2 98.2  | 16 48.8 +43.1 97.4  | 16 07.4 +43.1 96.7  |
| 8°  | 19 35.8 +43.1 99.0  | 18 54.6 +43.1 98.2  | 18 13.3 +43.0 97.5  | 17 31.9 +43.0 96.7  | 16 50.5 +42.9 96.0  |
| 9°  | 20 18.9 +43.0 98.2  | 19 37.7 +42.9 97.5  | 18 56.3 +42.8 96.7  | 18 14.9 +42.8 96.0  | 17 33.4 +42.7 95.2  |
| 10° | 21 01.9 +42.8 97.5  | 20 20.6 +42.7 96.7  | 19 39.1 +42.7 96.0  | 18 57.7 +42.6 95.2  | 18 16.1 +42.6 94.5  |
| 11° | 21 44.7 +42.6 96.7  | 21 03.3 +42.5 96.0  | 20 21.8 +42.5 95.2  | 19 40.3 +42.4 94.5  | 18 58.7 +42.4 93.8  |
| 12° | 22 27.3 +42.4 96.0  | 21 45.8 +42.3 95.2  | 21 04.3 +42.2 94.5  | 20 22.7 +42.2 93.7  | 19 41.1 +42.2 93.0  |
| 13° | 23 09.7 +42.1 95.2  | 22 28.1 +42.1 94.5  | 21 46.5 +42.1 93.7  | 21 04.9 +42.1 93.0  | 20 23.3 +42.0 92.3  |
| 14° | 23 51.8 +41.9 94.4  | 23 10.2 +41.9 93.7  | 22 28.6 +41.8 93.0  | 21 47.0 +41.8 92.2  | 21 05.3 +41.8 91.5  |
| 15° | 24 33.7 +41.6 93.6  | 23 52.1 +41.6 92.9  | 23 10.4 +41.6 92.2  | 22 28.8 +41.6 91.4  | 21 47.1 +41.6 90.7  |
| 16° | 25 15.3 +41.4 92.9  | 24 33.7 +41.4 92.1  | 23 52.0 +41.4 91.4  | 23 10.4 +41.3 90.7  | 22 28.7 +41.4 89.9  |
| 17° | 25 56.7 +41.2 92.1  | 25 15.1 +41.1 91.3  | 24 33.4 +41.1 90.6  | 23 51.7 +41.1 89.9  | 23 10.1 +41.1 89.2  |
| 18° | 26 37.9 +40.8 91.2  | 25 56.2 +40.8 90.5  | 25 14.5 +40.9 89.8  | 24 32.8 +40.9 89.1  | 23 51.2 +40.9 88.4  |
| 19° | 27 18.7 +40.6 90.4  | 26 37.0 +40.6 89.7  | 25 55.4 +40.5 89.0  | 25 13.7 +40.6 88.3  | 24 32.1 +40.6 87.6  |
| 20° | 27 59.3 +40.2 89.6  | 27 17.6 +40.3 88.9  | 26 35.9 +40.3 88.2  | 25 54.3 +40.3 87.5  | 25 12.7 +40.3 86.8  |
| 21° | 28 39.5 +40.0 88.7  | 27 57.9 +39.9 88.0  | 27 16.2 +40.0 87.3  | 26 34.6 +40.0 86.6  | 25 53.0 +40.1 85.9  |
| 22° | 29 19.5 +39.6 87.9  | 28 37.8 +39.7 87.2  | 27 56.2 +39.7 86.5  | 27 14.6 +39.8 85.8  | 26 33.1 +39.8 85.1  |
| 23° | 29 59.1 +39.2 87.0  | 29 17.5 +39.3 86.3  | 28 35.9 +39.3 85.6  | 27 54.4 +39.4 84.9  | 27 12.9 +39.4 84.3  |
| 24° | 30 38.3 +39.0 86.1  | 29 56.8 +38.9 85.5  | 29 15.2 +39.1 84.8  | 28 33.8 +39.1 84.1  | 27 52.3 +39.2 83.4  |
| 25° | 31 17.3 +38.5 85.3  | 30 35.7 +38.6 84.6  | 29 54.3 +38.6 83.9  | 29 12.9 +38.7 83.2  | 28 31.5 +38.8 82.6  |
| 26° | 31 55.8 +38.1 84.4  | 31 14.3 +38.3 83.7  | 30 32.9 +38.3 83.0  | 29 51.6 +38.4 82.3  | 29 10.3 +38.5 81.7  |
| 27° | 32 33.9 +37.8 83.4  | 31 52.6 +37.8 82.8  | 31 11.2 +38.0 82.1  | 30 30.0 +38.0 81.5  | 29 48.8 +38.1 80.8  |
| 28° | 33 11.7 +37.3 82.5  | 32 30.4 +37.4 81.9  | 31 49.2 +37.5 81.2  | 31 08.0 +37.7 80.6  | 30 26.9 +37.8 79.9  |
| 29° | 33 49.0 +36.9 81.6  | 33 07.8 +37.0 80.9  | 32 26.7 +37.1 80.3  | 31 45.7 +37.2 79.6  | 31 04.7 +37.4 79.0  |

| 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°  | 10 21.5 +43.8 100.9 | 9 40.5 +43.7 100.2 | 8 59.4 +43.7 99.4  | 8 18.2 +43.6 98.7  | 7 37.0 +43.5 98.0  |
| 1°  | 11 05.3 +43.7 100.2 | 10 24.2 +43.7 99.5 | 9 43.1 +43.5 98.7  | 9 01.8 +43.5 98.0  | 8 20.5 +43.5 97.3  |
| 2°  | 11 49.0 +43.6 99.5  | 11 07.9 +43.5 98.8 | 10 26.6 +43.5 98.0 | 9 45.3 +43.4 97.3  | 9 04.0 +43.3 96.6  |
| 3°  | 12 32.6 +43.6 98.8  | 11 51.4 +43.5 98.1 | 11 10.1 +43.4 97.3 | 10 28.7 +43.4 96.6 | 9 47.3 +43.3 95.9  |
| 4°  | 13 16.2 +43.4 98.1  | 12 34.9 +43.3 97.4 | 11 53.5 +43.3 96.6 | 11 12.1 +43.2 95.9 | 10 30.6 +43.2 95.2 |
| 5°  | 13 59.6 +43.3 97.4  | 13 18.2 +43.2 96.7 | 12 36.8 +43.1 95.9 | 11 55.3 +43.1 95.2 | 11 13.8 +43.0 94.5 |
| 6°  | 14 42.9 +43.1 96.7  | 14 01.4 +43.1 95.9 | 13 19.9 +43.1 95.2 | 12 38.4 +43.0 94.5 | 11 56.8 +43.0 93.7 |
| 7°  | 15 26.0 +43.0 96.0  | 14 44.5 +43.0 95.2 | 14 03.0 +42.9 94.5 | 13 21.4 +42.9 93.8 | 12 39.8 +42.9 93.0 |
| 8°  | 16 09.0 +42.9 95.2  | 15 27.5 +42.8 94.5 | 14 45.9 +42.8 93.8 | 14 04.3 +42.8 93.0 | 13 22.7 +42.7 92.3 |
| 9°  | 16 51.9 +42.7 94.5  | 16 10.3 +42.7 93.8 | 15 28.7 +42.6 93.0 | 14 47.1 +42.6 92.3 | 14 05.4 +42.6 91.6 |
| 10° | 17 34.6 +42.5 93.8  | 16 53.0 +42.5 93.0 | 16 11.3 +42.5 92.3 | 15 29.7 +42.4 91.6 | 14 48.0 +42.5 90.9 |
| 11° | 18 17.1 +42.4 93.0  | 17 35.5 +42.3 92.3 | 16 53.8 +42.3 91.6 | 16 12.1 +42.4 90.9 | 15 30.5 +42.3 90.1 |
| 12° | 18 59.5 +42.1 92.3  | 18 17.8 +42.2 91.6 | 17 36.1 +42.2 90.8 | 16 54.5 +42.1 90.1 | 16 12.8 +42.1 89.4 |
| 13° | 19 41.6 +42.0 91.5  | 19 00.0 +42.0 90.8 | 18 18.3 +42.0 90.1 | 17 36.6 +42.0 89.4 | 16 54.9 +42.1 88.7 |
| 14° | 20 23.6 +41.8 90.8  | 19 42.0 +41.8 90.0 | 19 00.3 +41.8 89.3 | 18 18.6 +41.8 88.6 | 17 37.0 +41.8 87.9 |
| 15° | 21 05.4 +41.6 90.0  | 20 23.8 +41.5 89.3 | 19 42.1 +41.6 88.6 | 19 00.4 +41.7 87.9 | 18 18.8 +41.6 87.1 |
| 16° | 21 47.0 +41.4 89.2  | 21 05.3 +41.4 88.5 | 20 23.7 +41.4 87.8 | 19 42.1 +41.4 87.1 | 19 00.4 +41.5 86.4 |
| 17° | 22 28.4 +41.1 88.4  | 21 46.7 +41.2 87.7 | 21 05.1 +41.2 87.0 | 20 23.5 +41.2 86.3 | 19 41.9 +41.3 85.6 |
| 18° | 23 09.5 +40.9 87.7  | 22 27.9 +40.9 87.0 | 21 46.3 +41.0 86.2 | 21 04.7 +41.0 85.5 | 20 23.2 +41.0 84.9 |
| 19° | 23 50.4 +40.7 86.9  | 23 08.8 +40.7 86.2 | 22 27.3 +40.7 85.5 | 21 45.7 +40.8 84.8 | 21 04.2 +40.9 84.1 |
| 20° | 24 31.1 +40.4 86.1  | 23 49.5 +40.4 85.4 | 23 08.0 +40.5 84.7 | 22 26.5 +40.6 84.0 | 21 45.1 +40.6 83.3 |
| 21° | 25 11.5 +40.1 85.2  | 24 29.9 +40.2 84.5 | 23 48.5 +40.2 83.9 | 23 07.1 +40.3 83.2 | 22 25.7 +40.4 82.5 |
| 22° | 25 51.6 +39.8 84.4  | 25 10.1 +39.9 83.7 | 24 28.7 +40.0 83.0 | 23 47.4 +40.0 82.4 | 23 06.1 +40.1 81.7 |
| 23° | 26 31.4 +39.6 83.6  | 25 50.0 +39.6 82.9 | 25 08.7 +39.7 82.2 | 24 27.4 +39.8 81.6 | 23 46.2 +39.9 80.9 |
| 24° | 27 11.0 +39.2 82.7  | 26 29.6 +39.4 82.1 | 25 48.4 +39.4 81.4 | 25 07.2 +39.5 80.7 | 24 26.1 +39.7 80.1 |
| 25° | 27 50.2 +38.9 81.9  | 27 09.0 +39.0 81.2 | 26 27.8 +39.1 80.6 | 25 46.7 +39.3 79.9 | 25 05.8 +39.3 79.2 |
| 26° | 28 29.1 +38.6 81.0  | 27 48.0 +38.7 80.4 | 27 06.9 +38.8 79.7 | 26 26.0 +38.9 79.0 | 25 45.1 +39.0 78.4 |
| 27° | 29 07.7 +38.2 80.1  | 28 26.7 +38.3 79.5 | 27 45.7 +38.5 78.8 | 27 04.9 +38.6 78.2 | 26 24.1 +38.8 77.6 |
| 28° | 29 45.9 +37.9 79.3  | 29 05.0 +38.1 78.6 | 28 24.2 +38.2 78.0 | 27 43.5 +38.3 77.3 | 27 02.9 +38.4 76.7 |
| 29° | 30 23.8 +37.5 78.4  | 29 43.1 +37.6 77.7 | 29 02.4 +37.8 77.1 | 28 21.8 +38.0 76.5 | 27 41.3 +38.1 75.8 |

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# Declination SAME name as Latitude

# Latitude 46°

| 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°  | 6 55.7 +43.4 97.2  | 6 14.3 +43.4 96.5  | 5 32.9 +43.3 95.8  | 4 51.4 +43.3 95.0  | 4 09.8 +43.3 94.3  |
| 1°  | 7 39.1 +43.4 96.5  | 6 57.7 +43.3 95.8  | 6 16.2 +43.3 95.1  | 5 34.7 +43.2 94.4  | 4 53.1 +43.2 93.6  |
| 2°  | 8 22.5 +43.3 95.8  | 7 41.0 +43.3 95.1  | 6 59.5 +43.2 94.4  | 6 17.9 +43.2 93.7  | 5 36.3 +43.2 92.9  |
| 3°  | 9 05.8 +43.3 95.1  | 8 24.3 +43.2 94.4  | 7 42.7 +43.2 93.7  | 7 01.1 +43.1 93.0  | 6 19.5 +43.1 92.2  |
| 4°  | 9 49.1 +43.1 94.4  | 9 07.5 +43.1 93.7  | 8 25.9 +43.0 93.0  | 7 44.2 +43.1 92.3  | 7 02.6 +43.0 91.5  |
| 5°  | 10 32.2 +43.0 93.7 | 9 50.6 +43.0 93.0  | 9 08.9 +43.0 92.3  | 8 27.3 +43.0 91.6  | 7 45.6 +43.0 90.8  |
| 6°  | 11 15.2 +43.0 93.0 | 10 33.6 +42.9 92.3 | 9 51.9 +43.0 91.6  | 9 10.3 +42.9 90.8  | 8 28.6 +42.9 90.1  |
| 7°  | 11 58.2 +42.8 92.3 | 11 16.5 +42.8 91.6 | 10 34.9 +42.8 90.9 | 9 53.2 +42.8 90.1  | 9 11.5 +42.8 89.4  |
| 8°  | 12 41.0 +42.7 91.6 | 11 59.3 +42.7 90.9 | 11 17.7 +42.7 90.1 | 10 36.0 +42.7 89.4 | 9 54.3 +42.7 88.7  |
| 9°  | 13 23.7 +42.6 90.9 | 12 42.0 +42.6 90.1 | 12 00.4 +42.6 89.4 | 11 18.7 +42.6 88.7 | 10 37.0 +42.7 88.0 |
| 10° | 14 06.3 +42.5 90.1 | 13 24.6 +42.5 89.4 | 12 43.0 +42.4 88.7 | 12 01.3 +42.5 88.0 | 11 19.7 +42.5 87.3 |
| 11° | 14 48.8 +42.3 89.4 | 14 07.1 +42.3 88.7 | 13 25.4 +42.4 88.0 | 12 43.8 +42.4 87.3 | 12 02.2 +42.4 86.6 |
| 12° | 15 31.1 +42.2 88.7 | 14 49.4 +42.2 88.0 | 14 07.8 +42.2 87.3 | 13 26.2 +42.2 86.5 | 12 44.6 +42.3 85.8 |
| 13° | 16 13.3 +42.0 87.9 | 15 31.6 +42.1 87.2 | 14 50.0 +42.1 86.5 | 14 08.4 +42.2 85.8 | 13 26.9 +42.2 85.1 |
| 14° | 16 55.3 +41.9 87.2 | 16 13.7 +41.9 86.5 | 15 32.1 +41.9 85.8 | 14 50.6 +41.9 85.1 | 14 09.1 +42.0 84.4 |
| 15° | 17 37.2 +41.7 86.4 | 16 55.6 +41.7 85.7 | 16 14.0 +41.8 85.0 | 15 32.5 +41.9 84.3 | 14 51.1 +41.9 83.6 |
| 16° | 18 18.9 +41.5 85.7 | 17 37.3 +41.6 85.0 | 16 55.8 +41.6 84.3 | 16 14.4 +41.7 83.6 | 15 33.0 +41.7 82.9 |
| 17° | 19 00.4 +41.3 84.9 | 18 18.9 +41.4 84.2 | 17 37.4 +41.5 83.5 | 16 56.1 +41.5 82.8 | 16 14.7 +41.6 82.1 |
| 18° | 19 41.7 +41.1 84.2 | 19 00.3 +41.1 83.5 | 18 18.9 +41.2 82.8 | 17 37.6 +41.3 82.1 | 16 56.3 +41.4 81.4 |
| 19° | 20 22.8 +40.9 83.4 | 19 41.4 +41.0 82.7 | 19 00.1 +41.1 82.0 | 18 18.9 +41.1 81.3 | 17 37.7 +41.3 80.6 |
| 20° | 21 03.7 +40.7 82.6 | 20 22.4 +40.8 81.9 | 19 41.2 +40.9 81.2 | 19 00.0 +41.0 80.6 | 18 19.0 +41.0 79.9 |
| 21° | 21 44.4 +40.5 81.8 | 21 03.2 +40.6 81.1 | 20 22.1 +40.6 80.5 | 19 41.0 +40.8 79.8 | 19 00.0 +40.9 79.1 |
| 22° | 22 24.9 +40.2 81.0 | 21 43.8 +40.3 80.3 | 21 02.7 +40.5 79.7 | 20 21.8 +40.5 79.0 | 19 40.9 +40.7 78.3 |
| 23° | 23 05.1 +40.0 80.2 | 22 24.1 +40.1 79.5 | 21 43.2 +40.2 78.9 | 21 02.3 +40.3 78.2 | 20 21.6 +40.4 77.5 |
| 24° | 23 45.1 +39.8 79.4 | 23 04.2 +39.8 78.7 | 22 23.4 +39.9 78.1 | 21 42.6 +40.1 77.4 | 21 02.0 +40.3 76.8 |
| 25° | 24 24.9 +39.4 78.6 | 23 44.0 +39.6 77.9 | 23 03.3 +39.8 77.3 | 22 22.7 +39.9 76.6 | 21 42.3 +40.0 76.0 |
| 26° | 25 04.3 +39.2 77.7 | 24 23.6 +39.4 77.1 | 23 43.1 +39.4 76.4 | 23 02.6 +39.6 75.8 | 22 22.3 +39.7 75.2 |
| 27° | 25 43.5 +38.9 76.9 | 25 03.0 +39.0 76.3 | 24 22.5 +39.2 75.6 | 23 42.2 +39.4 75.0 | 23 02.0 +39.5 74.3 |
| 28° | 26 22.4 +38.6 76.1 | 25 42.0 +38.7 75.4 | 25 01.7 +38.9 74.8 | 24 21.6 +39.0 74.2 | 23 41.5 +39.3 73.5 |
| 29° | 27 01.0 +38.3 75.2 | 26 20.7 +38.5 74.6 | 25 40.6 +38.6 73.9 | 25 00.6 +38.8 73.3 | 24 20.8 +39.0 72.7 |

| Dec | LHA 085° / 275°    | LHA 086° / 274°    | LHA 087° / 273°    | LHA 088° / 272°    | LHA 089° / 271°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | 3 28.3 +43.2 93.6  | 2 46.6 +43.2 92.9  | 2 05.0 +43.2 92.2  | 1 23.4 +43.1 91.4  | 0 41.7 +43.1 90.7  |
| 1°  | 4 11.5 +43.2 92.9  | 3 29.8 +43.2 92.2  | 2 48.2 +43.1 91.5  | 2 06.5 +43.2 90.7  | 1 24.8 +43.2 90.0  |
| 2°  | 4 54.7 +43.1 92.2  | 4 13.0 +43.1 91.5  | 3 31.3 +43.2 90.8  | 2 49.7 +43.1 90.0  | 2 08.0 +43.1 89.3  |
| 3°  | 5 37.8 +43.1 91.5  | 4 56.1 +43.1 90.8  | 4 14.5 +43.0 90.1  | 3 32.8 +43.1 89.4  | 2 51.1 +43.1 88.6  |
| 4°  | 6 20.9 +43.0 90.8  | 5 39.2 +43.1 90.1  | 4 57.5 +43.1 89.4  | 4 15.9 +43.0 88.7  | 3 34.2 +43.1 87.9  |
| 5°  | 7 03.9 +43.0 90.1  | 6 22.3 +42.9 89.4  | 5 40.6 +43.0 88.7  | 4 58.9 +43.0 88.0  | 4 17.3 +43.0 87.2  |
| 6°  | 7 46.9 +42.9 89.4  | 7 05.2 +43.0 88.7  | 6 23.6 +42.9 88.0  | 5 41.9 +43.0 87.3  | 5 00.3 +43.0 86.5  |
| 7°  | 8 29.8 +42.8 88.7  | 7 48.2 +42.8 88.0  | 7 06.5 +42.9 87.3  | 6 24.9 +42.9 86.6  | 5 43.3 +42.9 85.8  |
| 8°  | 9 12.6 +42.8 88.0  | 8 31.0 +42.8 87.3  | 7 49.4 +42.8 86.6  | 7 07.8 +42.8 85.8  | 6 26.2 +42.9 85.1  |
| 9°  | 9 55.4 +42.6 87.3  | 9 13.8 +42.7 86.6  | 8 32.2 +42.7 85.9  | 7 50.6 +42.8 85.1  | 7 09.1 +42.8 84.4  |
| 10° | 10 38.0 +42.6 86.6 | 9 56.5 +42.5 85.9  | 9 14.9 +42.6 85.1  | 8 33.4 +42.7 84.4  | 7 51.9 +42.8 83.7  |
| 11° | 11 20.6 +42.5 85.8 | 10 39.0 +42.5 85.1 | 9 57.5 +42.6 84.4  | 9 16.1 +42.6 83.7  | 8 34.7 +42.7 83.0  |
| 12° | 12 03.1 +42.3 85.1 | 11 21.5 +42.4 84.4 | 10 40.1 +42.4 83.7 | 9 58.7 +42.5 83.0  | 9 17.4 +42.5 82.3  |
| 13° | 12 45.4 +42.2 84.4 | 12 03.9 +42.3 83.7 | 11 22.5 +42.4 83.0 | 10 41.2 +42.4 82.3 | 9 59.9 +42.5 81.6  |
| 14° | 13 27.6 +42.1 83.7 | 12 46.2 +42.2 83.0 | 12 04.9 +42.2 82.3 | 11 23.6 +42.3 81.6 | 10 42.4 +42.4 80.9 |
| 15° | 14 09.7 +42.0 82.9 | 13 28.4 +42.0 82.2 | 12 47.1 +42.1 81.5 | 12 05.9 +42.2 80.8 | 11 24.8 +42.3 80.2 |
| 16° | 14 51.7 +41.8 82.2 | 14 10.4 +41.9 81.5 | 13 29.2 +42.0 80.8 | 12 48.1 +42.1 80.1 | 12 07.1 +42.2 79.4 |
| 17° | 15 33.5 +41.6 81.5 | 14 52.3 +41.8 80.8 | 14 11.2 +41.8 80.1 | 13 30.2 +41.9 79.4 | 12 49.3 +42.0 78.7 |
| 18° | 16 15.1 +41.5 80.7 | 15 34.1 +41.6 80.0 | 14 53.0 +41.7 79.3 | 14 12.1 +41.8 78.7 | 13 31.3 +41.9 78.0 |
| 19° | 16 56.6 +41.4 80.0 | 16 15.7 +41.4 79.3 | 15 34.7 +41.6 78.6 | 14 53.9 +41.7 77.9 | 14 13.2 +41.8 77.2 |
| 20° | 17 38.0 +41.2 79.2 | 16 57.1 +41.3 78.5 | 16 16.3 +41.4 77.8 | 15 35.6 +41.5 77.2 | 14 55.0 +41.7 76.5 |
| 21° | 18 19.2 +40.9 78.4 | 17 38.4 +41.1 77.8 | 16 57.7 +41.2 77.1 | 16 17.1 +41.4 76.4 | 15 36.7 +41.5 75.7 |
| 22° | 19 00.1 +40.8 77.7 | 18 19.5 +40.9 77.0 | 17 38.9 +41.1 76.3 | 16 58.5 +41.2 75.7 | 16 18.2 +41.3 75.0 |
| 23° | 19 40.9 +40.6 76.9 | 19 00.4 +40.7 76.2 | 18 20.0 +40.8 75.6 | 17 39.7 +41.0 74.9 | 16 59.5 +41.1 74.2 |
| 24° | 20 21.5 +40.4 76.1 | 19 41.1 +40.5 75.4 | 19 00.8 +40.7 74.8 | 18 20.7 +40.8 74.1 | 17 40.6 +41.0 73.5 |
| 25° | 21 01.9 +40.1 75.3 | 20 21.6 +40.3 74.7 | 19 41.5 +40.5 74.0 | 19 01.5 +40.6 73.4 | 18 21.6 +40.8 72.7 |
| 26° | 21 42.0 +39.9 74.5 | 21 01.9 +40.1 73.9 | 20 22.0 +40.2 73.2 | 19 42.1 +40.4 72.6 | 19 02.4 +40.6 71.9 |
| 27° | 22 21.9 +39.7 73.7 | 21 42.0 +39.9 73.1 | 20 02.2 +40.0 72.4 | 20 22.5 +40.3 71.8 | 19 43.0 +40.4 71.1 |
| 28° | 23 01.6 +39.5 72.9 | 22 21.9 +39.6 72.3 | 21 42.2 +39.8 71.6 | 21 02.8 +39.9 71.0 | 20 23.4 +40.2 70.4 |
| 29° | 23 41.1 +39.1 72.1 | 23 01.5 +39.3 71.4 | 22 22.0 +39.6 70.8 | 21 42.7 +39.8 70.2 | 21 03.6 +40.0 69.6 |

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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 +43.2 90.0  | -0 41.7 +43.2      | -1 23.4 +43.2      | -2 05.0 +43.2      | -2 46.6 +43.2      |
| 1°  | 0 43.2 +43.1 89.3  | 0 01.5 +43.2 88.6  | -0 40.2 +43.2      | -1 21.8 +43.2      | -2 03.4 +43.2      |
| 2°  | 1 26.3 +43.2 88.6  | 0 44.7 +43.1 87.9  | 0 03.0 +43.2 87.2  | -0 38.6 +43.2      | -1 20.2 +43.3      |
| 3°  | 2 09.5 +43.1 87.9  | 1 27.8 +43.2 87.2  | 0 46.2 +43.2 86.5  | 0 04.6 +43.2 85.8  | -0 36.9 +43.2      |
| 4°  | 2 52.6 +43.1 87.2  | 2 11.0 +43.1 86.5  | 1 29.4 +43.1 85.8  | 0 47.8 +43.2 85.1  | 0 06.3 +43.3 84.3  |
| 5°  | 3 35.7 +43.0 86.5  | 2 54.1 +43.1 85.8  | 2 12.5 +43.2 85.1  | 1 31.0 +43.2 84.4  | 0 49.6 +43.2 83.7  |
| 6°  | 4 18.7 +43.1 85.8  | 3 37.2 +43.1 85.1  | 2 55.7 +43.1 84.4  | 2 14.2 +43.2 83.7  | 1 32.8 +43.3 83.0  |
| 7°  | 5 01.8 +42.9 85.1  | 4 20.3 +43.0 84.4  | 3 38.8 +43.1 83.7  | 2 57.4 +43.1 83.0  | 2 16.1 +43.2 82.3  |
| 8°  | 5 44.7 +43.0 84.4  | 5 03.3 +43.0 83.7  | 4 21.9 +43.0 83.0  | 3 40.5 +43.2 82.3  | 2 59.3 +43.2 81.6  |
| 9°  | 6 27.7 +42.8 83.7  | 5 46.3 +42.9 83.0  | 5 04.9 +43.0 82.3  | 4 23.7 +43.0 81.6  | 3 42.5 +43.1 80.9  |
| 10° | 7 10.5 +42.8 83.0  | 6 29.2 +42.9 82.3  | 5 47.9 +43.0 81.6  | 5 06.7 +43.1 80.9  | 4 25.6 +43.1 80.2  |
| 11° | 7 53.3 +42.8 82.3  | 7 12.1 +42.8 81.6  | 6 30.9 +42.9 80.9  | 5 49.8 +43.0 80.2  | 5 08.7 +43.1 79.5  |
| 12° | 8 36.1 +42.6 81.6  | 7 54.9 +42.7 80.9  | 7 13.8 +42.8 80.2  | 6 32.8 +42.9 79.5  | 5 51.8 +43.0 78.8  |
| 13° | 9 18.7 +42.6 80.9  | 8 37.6 +42.7 80.2  | 7 56.6 +42.8 79.5  | 7 15.7 +42.8 78.8  | 6 34.8 +43.0 78.1  |
| 14° | 10 01.3 +42.5 80.2 | 9 20.3 +42.6 79.5  | 8 39.4 +42.6 78.8  | 7 58.5 +42.8 78.1  | 7 17.8 +42.9 77.4  |
| 15° | 10 43.8 +42.4 79.5 | 10 02.9 +42.4 78.8 | 9 22.0 +42.6 78.1  | 8 41.3 +42.7 77.4  | 8 00.7 +42.8 76.7  |
| 16° | 11 26.2 +42.2 78.7 | 10 45.3 +42.4 78.0 | 10 04.6 +42.5 77.4 | 9 24.0 +42.6 76.7  | 8 43.5 +42.8 76.0  |
| 17° | 12 08.4 +42.2 78.0 | 11 27.7 +42.3 77.3 | 10 47.1 +42.4 76.6 | 10 06.6 +42.6 75.9 | 9 26.3 +42.6 75.3  |
| 18° | 12 50.6 +42.0 77.3 | 12 10.0 +42.2 76.6 | 11 29.5 +42.3 75.9 | 10 49.2 +42.4 75.2 | 10 08.9 +42.6 74.5 |
| 19° | 13 32.6 +42.0 76.5 | 12 52.2 +42.0 75.9 | 12 11.8 +42.2 75.2 | 11 31.6 +42.3 74.5 | 10 51.5 +42.5 73.8 |
| 20° | 14 14.6 +41.7 75.8 | 13 34.2 +41.9 75.1 | 12 54.0 +42.0 74.5 | 12 13.9 +42.2 73.8 | 11 34.0 +42.3 73.1 |
| 21° | 14 56.3 +41.7 75.1 | 14 16.1 +41.8 74.4 | 13 36.0 +42.0 73.7 | 12 56.1 +42.1 73.1 | 12 16.3 +42.3 72.4 |
| 22° | 15 38.0 +41.4 74.3 | 14 57.9 +41.6 73.7 | 14 18.0 +41.8 73.0 | 13 38.2 +41.9 72.3 | 12 58.6 +42.1 71.7 |
| 23° | 16 19.4 +41.4 73.6 | 15 39.5 +41.5 72.9 | 14 59.8 +41.6 72.2 | 14 20.1 +41.9 71.6 | 13 40.7 +42.0 70.9 |
| 24° | 17 00.8 +41.1 72.8 | 16 21.0 +41.3 72.2 | 15 41.4 +41.5 71.5 | 15 02.0 +41.6 70.8 | 14 22.7 +41.8 70.2 |
| 25° | 17 41.9 +41.0 72.1 | 17 02.3 +41.2 71.4 | 16 22.9 +41.3 70.7 | 15 43.6 +41.5 70.1 | 15 04.5 +41.7 69.4 |
| 26° | 18 22.9 +40.8 71.3 | 17 43.5 +40.9 70.6 | 17 04.2 +41.2 70.0 | 16 25.1 +41.4 69.3 | 15 46.2 +41.6 68.7 |
| 27° | 19 03.7 +40.5 70.5 | 18 24.4 +40.8 69.9 | 17 45.4 +41.0 69.2 | 17 06.5 +41.2 68.6 | 16 27.8 +41.4 67.9 |
| 28° | 19 44.2 +40.4 69.7 | 19 05.2 +40.6 69.1 | 18 26.4 +40.8 68.5 | 17 47.7 +41.0 67.8 | 17 09.2 +41.2 67.2 |
| 29° | 20 24.6 +40.2 68.9 | 19 45.8 +40.4 68.3 | 19 07.2 +40.6 67.7 | 18 28.7 +40.8 67.1 | 17 50.4 +41.1 66.4 |

| 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°  | -3 28.3 +43.3      | -4 09.8 +43.3      | -4 51.4 +43.4      | -5 32.9 +43.4      | -6 14.3 +43.4      |
| 1°  | -2 45.0 +43.3      | -3 26.5 +43.3      | -4 08.0 +43.3      | -4 49.5 +43.4      | -5 30.9 +43.5      |
| 2°  | -2 01.7 +43.3      | -2 43.2 +43.3      | -3 24.7 +43.4      | -4 06.1 +43.5      | -4 47.4 +43.6      |
| 3°  | -1 18.4 +43.3      | -1 59.9 +43.4      | -2 41.3 +43.5      | -3 22.6 +43.5      | -4 03.8 +43.5      |
| 4°  | -0 35.1 +43.3      | -1 16.5 +43.4      | -1 57.8 +43.4      | -2 39.1 +43.5      | -3 20.3 +43.6      |
| 5°  | 0 08.2 +43.3 82.9  | -0 33.1 +43.3      | -1 14.4 +43.5      | -1 55.6 +43.6      | -2 36.7 +43.6      |
| 6°  | 0 51.5 +43.3 82.2  | 0 10.2 +43.4 81.5  | -0 30.9 +43.4      | -1 12.0 +43.5      | -1 53.1 +43.7      |
| 7°  | 1 34.8 +43.3 81.6  | 0 53.6 +43.4 80.8  | 0 12.5 +43.5 80.1  | -0 28.5 +43.5      | -1 09.4 +43.6      |
| 8°  | 2 18.1 +43.3 80.9  | 1 37.0 +43.3 80.1  | 0 56.0 +43.4 79.4  | 0 15.0 +43.6 78.7  | -0 25.8 +43.7      |
| 9°  | 3 01.4 +43.2 80.2  | 2 20.3 +43.4 79.5  | 1 39.4 +43.4 78.7  | 0 58.6 +43.5 78.0  | 0 17.9 +43.6 77.3  |
| 10° | 3 44.6 +43.2 79.5  | 3 03.7 +43.3 78.8  | 2 22.8 +43.5 78.0  | 1 42.1 +43.5 77.3  | 1 01.5 +43.7 76.6  |
| 11° | 4 27.8 +43.2 78.8  | 3 47.0 +43.3 78.1  | 3 06.3 +43.3 77.4  | 2 25.6 +43.6 76.6  | 1 45.2 +43.6 75.9  |
| 12° | 5 11.0 +43.1 78.1  | 4 30.3 +43.2 77.4  | 3 49.6 +43.4 76.7  | 3 09.2 +43.4 76.0  | 2 28.8 +43.6 75.2  |
| 13° | 5 54.1 +43.1 77.4  | 5 13.5 +43.2 76.7  | 4 33.0 +43.3 76.0  | 3 52.6 +43.5 75.3  | 3 12.4 +43.6 74.6  |
| 14° | 6 37.2 +43.0 76.7  | 5 56.7 +43.1 76.0  | 5 16.3 +43.3 75.3  | 4 36.1 +43.4 74.6  | 3 56.0 +43.5 73.9  |
| 15° | 7 20.2 +42.9 76.0  | 6 39.8 +43.1 75.3  | 5 59.6 +43.2 74.6  | 5 19.5 +43.3 73.9  | 4 39.5 +43.5 73.2  |
| 16° | 8 03.1 +42.9 75.3  | 7 22.9 +43.0 74.6  | 6 42.8 +43.1 73.9  | 6 02.8 +43.3 73.2  | 5 23.0 +43.5 72.5  |
| 17° | 8 46.0 +42.8 74.6  | 8 05.9 +43.0 73.9  | 7 25.9 +43.1 73.2  | 6 46.1 +43.3 72.5  | 6 06.5 +43.4 71.8  |
| 18° | 9 28.8 +42.7 73.9  | 8 48.9 +42.8 73.2  | 8 09.0 +43.0 72.5  | 7 29.4 +43.1 71.8  | 6 49.9 +43.3 71.1  |
| 19° | 10 11.5 +42.6 73.1 | 9 31.7 +42.8 72.5  | 8 52.0 +43.0 71.8  | 8 12.5 +43.1 71.1  | 7 33.2 +43.3 70.4  |
| 20° | 10 54.1 +42.6 72.4 | 10 14.5 +42.7 71.7 | 9 35.0 +42.8 71.1  | 8 55.6 +43.1 70.4  | 8 16.5 +43.2 69.7  |
| 21° | 11 36.7 +42.4 71.7 | 10 57.2 +42.5 71.0 | 10 17.8 +42.8 70.4 | 9 38.7 +42.9 69.7  | 8 59.7 +43.1 69.0  |
| 22° | 12 19.1 +42.3 71.0 | 11 39.7 +42.5 70.3 | 11 00.6 +42.6 69.6 | 10 21.6 +42.8 69.0 | 9 42.8 +43.0 68.3  |
| 23° | 13 01.4 +42.1 70.3 | 12 22.2 +42.4 69.6 | 11 43.2 +42.6 68.9 | 11 04.4 +42.8 68.3 | 10 25.8 +43.0 67.6 |
| 24° | 13 43.5 +42.1 69.5 | 13 04.6 +42.2 68.9 | 12 25.8 +42.4 68.2 | 11 47.2 +42.6 67.5 | 11 08.8 +42.8 66.9 |
| 25° | 14 25.6 +41.9 68.8 | 13 46.8 +42.1 68.1 | 13 08.2 +42.3 67.5 | 12 29.8 +42.5 66.8 | 11 51.6 +42.7 66.2 |
| 26° | 15 07.5 +41.7 68.0 | 14 28.9 +42.0 67.4 | 13 50.5 +42.2 66.7 | 13 12.3 +42.4 66.1 | 12 34.3 +42.6 65.4 |
| 27° | 15 49.2 +41.7 67.3 | 15 10.9 +41.8 66.7 | 14 32.7 +42.1 66.0 | 13 54.7 +42.3 65.4 | 13 16.9 +42.5 64.7 |
| 28° | 16 30.9 +41.4 66.6 | 15 52.7 +41.7 65.9 | 15 14.8 +41.8 65.3 | 14 37.0 +42.1 64.6 | 13 59.4 +42.4 64.0 |
| 29° | 17 12.3 +41.3 65.8 | 16 34.4 +41.5 65.2 | 15 56.6 +41.8 64.5 | 15 19.1 +42.0 63.9 | 14 41.8 +42.2 63.3 |



| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°    | LHA 103° / 257°    | LHA 104° / 256°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -6 55.7 +43.5      | -7 37.0 +43.6      | -8 18.2 +43.6      | -8 59.4 +43.7      | -9 40.5 +43.8      |
| 1°  | -6 12.2 +43.6      | -6 53.4 +43.6      | -7 34.6 +43.7      | -8 15.7 +43.8      | -8 56.7 +43.9      |
| 2°  | -5 28.6 +43.6      | -6 09.8 +43.7      | -6 50.9 +43.8      | -7 31.9 +43.9      | -8 12.8 +44.0      |
| 3°  | -4 45.0 +43.6      | -5 26.1 +43.7      | -6 07.1 +43.8      | -6 48.0 +43.9      | -7 28.8 +44.1      |
| 4°  | -4 01.4 +43.7      | -4 42.4 +43.8      | -5 23.3 +43.9      | -6 04.1 +44.0      | -6 44.7 +44.0      |
| 5°  | -3 17.7 +43.7      | -3 58.6 +43.8      | -4 39.4 +43.9      | -5 20.1 +44.0      | -6 00.7 +44.2      |
| 6°  | -2 34.0 +43.8      | -3 14.8 +43.9      | -3 55.5 +44.0      | -4 36.1 +44.1      | -5 16.5 +44.2      |
| 7°  | -1 50.2 +43.7      | -2 30.9 +43.8      | -3 11.5 +43.9      | -3 52.0 +44.1      | -4 32.3 +44.2      |
| 8°  | -1 06.5 +43.8      | -1 47.1 +43.9      | -2 27.6 +44.0      | -3 07.9 +44.1      | -3 48.1 +44.2      |
| 9°  | -0 22.7 +43.7      | -1 03.2 +43.9      | -1 43.6 +44.1      | -2 23.8 +44.2      | -3 03.9 +44.3      |
| 10° | 0 21.0 +43.8 75.9  | -0 19.3 +43.9      | -0 59.5 +44.0      | -1 39.6 +44.1      | -2 19.6 +44.3      |
| 11° | 1 04.8 +43.7 75.2  | 0 24.6 +43.8 74.5  | -0 15.5 +44.0      | -0 55.5 +44.2      | -1 35.3 +44.3      |
| 12° | 1 48.5 +43.8 74.5  | 1 08.4 +43.9 73.8  | 0 28.5 +44.0 73.1  | -0 11.3 +44.2      | -0 51.0 +44.4      |
| 13° | 2 32.3 +43.7 73.8  | 1 52.3 +43.9 73.1  | 1 12.5 +44.0 72.4  | 0 32.9 +44.1 71.7  | -0 06.6 +44.3      |
| 14° | 3 16.0 +43.7 73.2  | 2 36.2 +43.8 72.4  | 1 56.5 +44.0 71.7  | 1 17.0 +44.2 71.0  | 0 37.7 +44.3 70.3  |
| 15° | 3 59.7 +43.6 72.5  | 3 20.0 +43.8 71.8  | 2 40.5 +44.0 71.1  | 2 01.2 +44.1 70.3  | 1 22.0 +44.3 69.6  |
| 16° | 4 43.3 +43.6 71.8  | 4 03.8 +43.8 71.1  | 3 24.5 +43.9 70.4  | 2 45.3 +44.1 69.7  | 2 06.3 +44.3 69.0  |
| 17° | 5 26.9 +43.6 71.1  | 4 47.6 +43.7 70.4  | 4 08.4 +43.9 69.7  | 3 29.4 +44.1 69.0  | 2 50.6 +44.3 68.3  |
| 18° | 6 10.5 +43.5 70.4  | 5 31.3 +43.7 69.7  | 4 52.3 +43.9 69.0  | 4 13.5 +44.0 68.3  | 3 34.9 +44.2 67.6  |
| 19° | 6 54.0 +43.5 69.7  | 6 15.0 +43.6 69.0  | 5 36.2 +43.8 68.3  | 4 57.5 +44.0 67.6  | 4 19.1 +44.2 66.9  |
| 20° | 7 37.5 +43.3 69.0  | 6 58.6 +43.6 68.3  | 6 20.0 +43.8 67.6  | 5 41.5 +44.0 66.9  | 5 03.3 +44.2 66.3  |
| 21° | 8 20.8 +43.4 68.3  | 7 42.2 +43.5 67.6  | 7 03.8 +43.7 66.9  | 6 25.5 +43.9 66.3  | 5 47.5 +44.1 65.6  |
| 22° | 9 04.2 +43.2 67.6  | 8 25.7 +43.4 66.9  | 7 47.5 +43.6 66.3  | 7 09.4 +43.8 65.6  | 6 31.6 +44.0 64.9  |
| 23° | 9 47.4 +43.1 66.9  | 9 09.1 +43.4 66.2  | 8 31.1 +43.5 65.6  | 7 53.2 +43.8 64.9  | 7 15.6 +44.0 64.2  |
| 24° | 10 30.5 +43.1 66.2 | 9 52.5 +43.2 65.5  | 9 14.6 +43.5 64.9  | 8 37.0 +43.7 64.2  | 7 59.6 +43.9 63.5  |
| 25° | 11 13.6 +42.9 65.5 | 10 35.7 +43.2 64.8 | 9 58.1 +43.4 64.2  | 9 20.7 +43.6 63.5  | 8 43.5 +43.9 62.8  |
| 26° | 11 56.5 +42.9 64.8 | 11 18.9 +43.1 64.1 | 10 41.5 +43.3 63.5 | 10 04.3 +43.6 62.8 | 9 27.4 +43.7 62.1  |
| 27° | 12 39.4 +42.7 64.1 | 12 02.0 +42.9 63.4 | 11 24.8 +43.2 62.8 | 10 47.9 +43.4 62.1 | 10 11.1 +43.7 61.4 |
| 28° | 13 22.1 +42.6 63.3 | 12 44.9 +42.9 62.7 | 12 08.0 +43.1 62.1 | 11 31.3 +43.3 61.4 | 10 54.8 +43.6 60.8 |
| 29° | 14 04.7 +42.4 62.6 | 13 27.8 +42.7 62.0 | 12 51.1 +43.0 61.3 | 12 14.6 +43.2 60.7 | 11 38.4 +43.5 60.0 |

| Dec | LHA 105° / 255°    | LHA 106° / 254°    | LHA 107° / 253°   | LHA 108° / 252°   | LHA 109° / 251°   |
|-----|--------------------|--------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                    |                    |                   |                   |                   |
| 1°  | -9 37.5 +44.0      |                    |                   |                   |                   |
| 2°  | -8 53.5 +44.0      | -9 34.2 +44.2      |                   |                   |                   |
| 3°  | -8 09.5 +44.2      | -8 50.0 +44.3      | -9 30.4 +44.4     |                   |                   |
| 4°  | -7 25.3 +44.2      | -8 05.7 +44.3      | -8 46.0 +44.4     | -9 26.2 +44.6     |                   |
| 5°  | -6 41.1 +44.3      | -7 21.4 +44.4      | -8 01.6 +44.5     | -8 41.6 +44.7     | -9 21.5 +44.8     |
| 6°  | -5 56.8 +44.3      | -6 37.0 +44.4      | -7 17.1 +44.6     | -7 56.9 +44.7     | -8 36.7 +44.9     |
| 7°  | -5 12.5 +44.3      | -5 52.6 +44.5      | -6 32.5 +44.7     | -7 12.2 +44.8     | -7 51.8 +45.0     |
| 8°  | -4 28.2 +44.4      | -5 08.1 +44.6      | -5 47.8 +44.7     | -6 27.4 +44.8     | -7 06.8 +45.0     |
| 9°  | -3 43.8 +44.4      | -4 23.5 +44.5      | -5 03.1 +44.7     | -5 42.6 +44.9     | -6 21.8 +45.0     |
| 10° | -2 59.4 +44.5      | -3 39.0 +44.6      | -4 18.4 +44.7     | -4 57.7 +44.9     | -5 36.8 +45.1     |
| 11° | -2 14.9 +44.5      | -2 54.4 +44.7      | -3 33.7 +44.8     | -4 12.8 +45.0     | -4 51.7 +45.1     |
| 12° | -1 30.4 +44.4      | -2 09.7 +44.6      | -2 48.9 +44.9     | -3 27.8 +45.0     | -4 06.6 +45.2     |
| 13° | -0 46.0 +44.5      | -1 25.1 +44.7      | -2 04.0 +44.8     | -2 42.8 +45.0     | -3 21.4 +45.2     |
| 14° | -0 01.5 +44.5      | -0 40.4 +44.6      | -1 19.2 +44.8     | -1 57.8 +45.0     | -2 36.2 +45.2     |
| 15° | 0 43.0 +44.5 68.9  | 0 04.2 +44.7 68.2  | -0 34.4 +44.9     | -1 12.8 +45.1     | -1 51.0 +45.3     |
| 16° | 1 27.5 +44.5 68.2  | 0 48.9 +44.6 67.5  | 0 10.5 +44.8 66.8 | -0 27.7 +45.0     | -1 05.7 +45.2     |
| 17° | 2 12.0 +44.4 67.6  | 1 33.5 +44.7 66.9  | 0 55.3 +44.9 66.2 | 0 17.3 +45.0 65.4 | -0 20.5 +45.2     |
| 18° | 2 56.4 +44.5 66.9  | 2 18.2 +44.6 66.2  | 1 40.2 +44.8 65.5 | 1 02.3 +45.1 64.8 | 0 24.7 +45.3 64.1 |
| 19° | 3 40.9 +44.3 66.2  | 3 02.8 +44.6 65.5  | 2 25.0 +44.8 64.8 | 1 47.4 +45.0 64.1 | 1 10.0 +45.2 63.4 |
| 20° | 4 25.2 +44.4 65.6  | 3 47.4 +44.6 64.9  | 3 09.8 +44.8 64.2 | 2 32.4 +45.0 63.5 | 1 55.2 +45.2 62.7 |
| 21° | 5 09.6 +44.3 64.9  | 4 32.0 +44.5 64.2  | 3 54.6 +44.7 63.5 | 3 17.4 +45.0 62.8 | 2 40.4 +45.2 62.1 |
| 22° | 5 53.9 +44.3 64.2  | 5 16.5 +44.5 63.5  | 4 39.3 +44.7 62.8 | 4 02.4 +44.9 62.1 | 3 25.6 +45.2 61.4 |
| 23° | 6 38.2 +44.2 63.5  | 6 01.0 +44.4 62.8  | 5 24.0 +44.7 62.2 | 4 47.3 +44.9 61.5 | 4 10.8 +45.1 60.8 |
| 24° | 7 22.4 +44.2 62.8  | 6 45.4 +44.4 62.2  | 6 08.7 +44.6 61.5 | 5 32.2 +44.8 60.8 | 4 55.9 +45.1 60.1 |
| 25° | 8 06.6 +44.0 62.2  | 7 29.8 +44.3 61.5  | 6 53.3 +44.6 60.8 | 6 17.0 +44.8 60.1 | 5 41.0 +45.1 59.4 |
| 26° | 8 50.6 +44.0 61.5  | 8 14.1 +44.3 60.8  | 7 37.9 +44.5 60.1 | 7 01.8 +44.8 59.5 | 6 26.1 +45.0 58.8 |
| 27° | 9 34.6 +44.0 60.8  | 8 58.4 +44.2 60.1  | 8 22.4 +44.4 59.5 | 7 46.6 +44.7 58.8 | 7 11.1 +44.9 58.1 |
| 28° | 10 18.6 +43.8 60.1 | 9 42.6 +44.0 59.4  | 9 06.8 +44.3 58.8 | 8 31.3 +44.6 58.1 | 7 56.0 +44.9 57.4 |
| 29° | 11 02.4 +43.7 59.4 | 10 26.6 +44.0 58.7 | 9 51.1 +44.3 58.1 | 9 15.9 +44.5 57.4 | 8 40.9 +44.8 56.8 |

# Latitude 46°

# Declination SAME name as Latitude

| Dec | LHA 110° / 250°   | LHA 111° / 249°   | LHA 112° / 248°   | LHA 113° / 247°   | LHA 114° / 246°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  |                   |                   |                   |                   |                   |
| 3°  |                   |                   |                   |                   |                   |
| 4°  |                   |                   |                   |                   |                   |
| 5°  |                   |                   |                   |                   |                   |
| 6°  | -9 16.2 +45.0     | -9 55.6 +45.2     |                   |                   |                   |
| 7°  | -8 31.2 +45.1     | -9 10.4 +45.3     | -9 49.4 +45.4     |                   |                   |
| 8°  | -7 46.1 +45.2     | -8 25.1 +45.3     | -9 04.0 +45.5     | -9 42.6 +45.7     |                   |
| 9°  | -7 00.9 +45.2     | -7 39.8 +45.4     | -8 18.5 +45.6     | -8 56.9 +45.7     | -9 35.2 +46.0     |
| 10° | -6 15.7 +45.3     | -6 54.4 +45.5     | -7 32.9 +45.7     | -8 11.2 +45.9     | -8 49.2 +46.0     |
| 11° | -5 30.4 +45.3     | -6 08.9 +45.5     | -6 47.2 +45.6     | -7 25.3 +45.8     | -8 03.2 +46.1     |
| 12° | -4 45.1 +45.4     | -5 23.4 +45.5     | -6 01.6 +45.8     | -6 39.5 +46.0     | -7 17.1 +46.1     |
| 13° | -3 59.7 +45.3     | -4 37.9 +45.6     | -5 15.8 +45.8     | -5 53.5 +46.0     | -6 31.0 +46.2     |
| 14° | -3 14.4 +45.5     | -3 52.3 +45.6     | -4 30.0 +45.8     | -5 07.5 +46.0     | -5 44.8 +46.2     |
| 15° | -2 28.9 +45.4     | -3 06.7 +45.6     | -3 44.2 +45.8     | -4 21.5 +46.0     | -4 58.6 +46.3     |
| 16° | -1 43.5 +45.4     | -2 21.1 +45.7     | -2 58.4 +45.9     | -3 35.5 +46.1     | -4 12.3 +46.3     |
| 17° | -0 58.1 +45.5     | -1 35.4 +45.7     | -2 12.5 +45.9     | -2 49.4 +46.1     | -3 26.0 +46.3     |
| 18° | -0 12.6 +45.4     | -0 49.7 +45.6     | -1 26.6 +45.9     | -2 03.3 +46.1     | -2 39.7 +46.4     |
| 19° | 0 32.8 +45.5 62.7 | -0 04.1 +45.7     | -0 40.7 +45.9     | -1 17.2 +46.2     | -1 53.3 +46.3     |
| 20° | 1 18.3 +45.4 62.0 | 0 41.6 +45.7 61.3 | 0 05.2 +45.8 60.6 | -0 31.0 +46.1     | -1 07.0 +46.4     |
| 21° | 2 03.7 +45.4 61.4 | 1 27.3 +45.6 60.7 | 0 51.0 +45.9 60.0 | 0 15.1 +46.1 59.2 | -0 20.6 +46.4     |
| 22° | 2 49.1 +45.4 60.7 | 2 12.9 +45.7 60.0 | 1 36.9 +45.9 59.3 | 1 01.2 +46.1 58.6 | 0 25.8 +46.4 57.9 |
| 23° | 3 34.5 +45.4 60.1 | 2 58.6 +45.6 59.4 | 2 22.8 +45.9 58.7 | 1 47.3 +46.2 58.0 | 1 12.2 +46.3 57.3 |
| 24° | 4 19.9 +45.4 59.4 | 3 44.2 +45.6 58.7 | 3 08.7 +45.8 58.0 | 2 33.5 +46.0 57.3 | 1 58.5 +46.4 56.6 |
| 25° | 5 05.3 +45.3 58.8 | 4 29.8 +45.5 58.1 | 3 54.5 +45.8 57.4 | 3 19.5 +46.1 56.7 | 2 44.9 +46.3 56.0 |
| 26° | 5 50.6 +45.2 58.1 | 5 15.3 +45.5 57.4 | 4 40.3 +45.8 56.7 | 4 05.6 +46.0 56.0 | 3 31.2 +46.3 55.4 |
| 27° | 6 35.8 +45.2 57.4 | 6 00.8 +45.5 56.8 | 5 26.1 +45.7 56.1 | 4 51.6 +46.0 55.4 | 4 17.5 +46.2 54.7 |
| 28° | 7 21.0 +45.2 56.8 | 6 46.3 +45.4 56.1 | 6 11.8 +45.7 55.4 | 5 37.6 +46.0 54.8 | 5 03.7 +46.3 54.1 |
| 29° | 8 06.2 +45.0 56.1 | 7 31.7 +45.3 55.4 | 6 57.5 +45.6 54.8 | 6 23.6 +45.9 54.1 | 5 50.0 +46.1 53.4 |

| Dec | LHA 115° / 245°   | LHA 116° / 244°   | LHA 117° / 243°   | LHA 118° / 242°   | LHA 119° / 241°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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° | -9 27.1 +46.3     |                   |                   |                   |                   |
| 11° | -8 40.8 +46.3     | -9 18.2 +46.5     | -9 55.4 +46.8     |                   |                   |
| 12° | -7 54.5 +46.3     | -8 31.7 +46.5     | -9 08.6 +46.7     | -9 45.3 +47.0     |                   |
| 13° | -7 08.2 +46.4     | -7 45.2 +46.7     | -8 21.9 +46.9     | -8 58.3 +47.1     | -9 34.5 +47.3     |
| 14° | -6 21.8 +46.5     | -6 58.5 +46.6     | -7 35.0 +46.9     | -8 11.2 +47.1     | -8 47.2 +47.4     |
| 15° | -5 35.3 +46.4     | -6 11.9 +46.7     | -6 48.1 +46.9     | -7 24.1 +47.1     | -7 59.8 +47.4     |
| 16° | -4 48.9 +46.6     | -5 25.2 +46.8     | -6 01.2 +47.0     | -6 37.0 +47.3     | -7 12.4 +47.4     |
| 17° | -4 02.3 +46.5     | -4 38.4 +46.8     | -5 14.2 +47.0     | -5 49.7 +47.2     | -6 25.0 +47.5     |
| 18° | -3 15.8 +46.6     | -3 51.6 +46.8     | -4 27.2 +47.1     | -5 02.5 +47.3     | -5 37.5 +47.6     |
| 19° | -2 29.2 +46.6     | -3 04.8 +46.8     | -3 40.1 +47.0     | -4 15.2 +47.3     | -4 49.9 +47.6     |
| 20° | -1 42.6 +46.6     | -2 18.0 +46.9     | -2 53.1 +47.1     | -3 27.9 +47.4     | -4 02.3 +47.6     |
| 21° | -0 56.0 +46.6     | -1 31.1 +46.8     | -2 06.0 +47.1     | -2 40.5 +47.4     | -3 14.7 +47.6     |
| 22° | -0 09.4 +46.6     | -0 44.3 +46.9     | -1 18.9 +47.2     | -1 53.1 +47.3     | -2 27.1 +47.6     |
| 23° | 0 37.2 +46.6 56.5 | 0 02.6 +46.9 55.8 | -0 31.7 +47.1     | -1 05.8 +47.4     | -1 39.5 +47.7     |
| 24° | 1 23.8 +46.6 55.9 | 0 49.5 +46.8 55.2 | 0 15.4 +47.1 54.5 | -0 18.4 +47.4     | -0 51.8 +47.6     |
| 25° | 2 10.4 +46.6 55.3 | 1 36.3 +46.9 54.6 | 1 02.5 +47.1 53.9 | 0 29.0 +47.4 53.2 | -0 04.2 +47.7     |
| 26° | 2 57.0 +46.6 54.7 | 2 23.2 +46.8 54.0 | 1 49.6 +47.1 53.2 | 1 16.4 +47.4 52.5 | 0 43.5 +47.6 51.8 |
| 27° | 3 43.6 +46.5 54.0 | 3 10.0 +46.8 53.3 | 2 36.7 +47.1 52.6 | 2 03.8 +47.3 51.9 | 1 31.1 +47.7 51.2 |
| 28° | 4 30.1 +46.5 53.4 | 3 56.8 +46.8 52.7 | 3 23.8 +47.1 52.0 | 2 51.1 +47.4 51.3 | 2 18.8 +47.6 50.6 |
| 29° | 5 16.6 +46.5 52.8 | 4 43.6 +46.8 52.1 | 4 10.9 +47.0 51.4 | 3 38.5 +47.3 50.7 | 3 06.4 +47.6 50.0 |

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| Dec | LHA 120° / 240°   | LHA 121° / 239°   | LHA 122° / 238°   | LHA 123° / 237°   | LHA 124° / 236°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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° | -9 22.8 +47.6     | -9 58.2 +47.9     |                   |                   |                   |
| 15° | -8 35.2 +47.6     | -9 10.3 +47.8     | -9 45.1 +48.1     |                   |                   |
| 16° | -7 47.6 +47.7     | -8 22.5 +48.0     | -8 57.0 +48.2     | -9 31.2 +48.4     |                   |
| 17° | -6 59.9 +47.8     | -7 34.5 +48.0     | -8 08.8 +48.2     | -8 42.8 +48.5     | -9 16.5 +48.8     |
| 18° | -6 12.1 +47.7     | -6 46.5 +48.0     | -7 20.6 +48.3     | -7 54.3 +48.5     | -8 27.7 +48.8     |
| 19° | -5 24.4 +47.9     | -5 58.5 +48.1     | -6 32.3 +48.3     | -7 05.8 +48.6     | -7 38.9 +48.9     |
| 20° | -4 36.5 +47.8     | -5 10.4 +48.1     | -5 44.0 +48.4     | -6 17.2 +48.7     | -6 50.0 +48.9     |
| 21° | -3 48.7 +47.9     | -4 22.3 +48.1     | -4 55.6 +48.4     | -5 28.5 +48.6     | -6 01.1 +48.9     |
| 22° | -3 00.8 +47.9     | -3 34.2 +48.2     | -4 07.2 +48.5     | -4 39.9 +48.7     | -5 12.2 +49.0     |
| 23° | -2 12.9 +47.9     | -2 46.0 +48.2     | -3 18.7 +48.4     | -3 51.2 +48.8     | -4 23.2 +48.9     |
| 24° | -1 25.0 +47.9     | -1 57.8 +48.2     | -2 30.3 +48.5     | -3 02.4 +48.7     | -3 34.3 +49.1     |
| 25° | -0 37.1 +48.0     | -1 09.6 +48.2     | -1 41.8 +48.4     | -2 13.7 +48.7     | -2 45.2 +49.0     |
| 26° | 0 10.9 +47.9 51.1 | -0 21.4 +48.2     | -0 53.4 +48.5     | -1 25.0 +48.8     | -1 56.2 +49.0     |
| 27° | 0 58.8 +47.9 50.5 | 0 26.8 +48.2 49.8 | -0 04.9 +48.5     | -0 36.2 +48.8     | -1 07.2 +49.1     |
| 28° | 1 46.7 +47.9 49.9 | 1 15.0 +48.2 49.2 | 0 43.6 +48.5 48.5 | 0 12.6 +48.7 47.8 | -0 18.1 +49.0     |
| 29° | 2 34.6 +47.9 49.3 | 2 03.2 +48.2 48.6 | 1 32.1 +48.5 47.9 | 1 01.3 +48.8 47.2 | 0 30.9 +49.1 46.5 |

| Dec | LHA 125° / 235°   | LHA 126° / 234° | LHA 127° / 233° | LHA 128° / 232° | LHA 129° / 231° |
|-----|-------------------|-----------------|-----------------|-----------------|-----------------|
|     | 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° | -9 49.8 +49.0     |                 |                 |                 |                 |
| 18° | -9 00.8 +49.1     | -9 33.5 +49.4   |                 |                 |                 |
| 19° | -8 11.7 +49.1     | -8 44.1 +49.4   |                 |                 |                 |
| 20° | -7 22.6 +49.2     | -7 54.7 +49.4   |                 |                 |                 |
| 21° | -6 33.4 +49.2     | -7 05.3 +49.5   |                 |                 |                 |
| 22° | -5 44.2 +49.2     | -6 15.8 +49.5   |                 |                 |                 |
| 23° | -4 55.0 +49.3     | -5 26.3 +49.5   |                 |                 |                 |
| 24° | -4 05.7 +49.3     | -4 36.8 +49.6   |                 |                 |                 |
| 25° | -3 16.4 +49.3     | -3 47.2 +49.6   |                 |                 |                 |
| 26° | -2 27.1 +49.3     | -2 57.6 +49.6   |                 |                 |                 |
| 27° | -1 37.8 +49.4     | -2 08.0 +49.6   |                 |                 |                 |
| 28° | -0 48.4 +49.3     | -1 18.4 +49.6   |                 |                 |                 |
| 29° | 0 00.9 +49.3 45.8 | -0 28.8 +49.6   |                 |                 |                 |



| 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°  | 43 00.0 +60.0 180.0 | 42 59.5 +60.0 178.6 | 42 58.0 +60.0 177.3 | 42 55.6 +59.9 175.9 | 42 52.2 +59.9 174.5 |
| 1°  | 44 00.0 +60.0 180.0 | 43 59.5 +60.0 178.6 | 43 58.0 +60.0 177.2 | 43 55.5 +60.0 175.8 | 43 52.1 +59.8 174.4 |
| 2°  | 45 00.0 +60.0 180.0 | 44 59.5 +60.0 178.6 | 44 58.0 +59.9 177.2 | 44 55.5 +59.9 175.8 | 44 51.9 +59.9 174.4 |
| 3°  | 46 00.0 +60.0 180.0 | 45 59.5 +60.0 178.6 | 45 57.9 +60.0 177.1 | 45 55.4 +59.9 175.7 | 45 51.8 +59.9 174.3 |
| 4°  | 47 00.0 +60.0 180.0 | 46 59.5 +60.0 178.5 | 46 57.9 +60.0 177.1 | 46 55.3 +59.9 175.6 | 46 51.7 +59.8 174.2 |
| 5°  | 48 00.0 +60.0 180.0 | 47 59.5 +60.0 178.5 | 47 57.9 +59.9 177.0 | 47 55.2 +59.9 175.5 | 47 51.5 +59.9 174.1 |
| 6°  | 49 00.0 +60.0 180.0 | 48 59.5 +59.9 178.5 | 48 57.8 +60.0 177.0 | 48 55.1 +59.9 175.5 | 48 51.4 +59.8 173.9 |
| 7°  | 50 00.0 +60.0 180.0 | 49 59.4 +60.0 178.5 | 49 57.8 +60.0 176.9 | 49 55.0 +59.9 175.4 | 49 51.2 +59.8 173.8 |
| 8°  | 51 00.0 +60.0 180.0 | 50 59.4 +60.0 178.4 | 50 57.8 +59.9 176.9 | 50 54.9 +60.0 175.3 | 50 51.0 +59.9 173.7 |
| 9°  | 52 00.0 +60.0 180.0 | 51 59.4 +60.0 178.4 | 51 57.7 +60.0 176.8 | 51 54.9 +59.8 175.2 | 51 50.9 +59.8 173.6 |
| 10° | 53 00.0 +60.0 180.0 | 52 59.4 +60.0 178.4 | 52 57.7 +59.9 176.7 | 52 54.7 +59.9 175.1 | 52 50.7 +59.8 173.5 |
| 11° | 54 00.0 +60.0 180.0 | 53 59.4 +60.0 178.3 | 53 57.6 +60.0 176.7 | 53 54.6 +59.9 175.0 | 53 50.5 +59.8 173.3 |
| 12° | 55 00.0 +60.0 180.0 | 54 59.4 +60.0 178.3 | 54 57.6 +59.9 176.6 | 54 54.5 +59.9 174.9 | 54 50.3 +59.8 173.2 |
| 13° | 56 00.0 +60.0 180.0 | 55 59.4 +60.0 178.3 | 55 57.5 +60.0 176.5 | 55 54.4 +59.9 174.8 | 55 50.1 +59.7 173.0 |
| 14° | 57 00.0 +60.0 180.0 | 56 59.4 +59.9 178.2 | 56 57.5 +59.9 176.4 | 56 54.3 +59.9 174.7 | 56 49.8 +59.8 172.9 |
| 15° | 58 00.0 +60.0 180.0 | 57 59.3 +60.0 178.2 | 57 57.4 +59.9 176.4 | 57 54.2 +59.8 174.5 | 57 49.6 +59.8 172.7 |
| 16° | 59 00.0 +60.0 180.0 | 58 59.3 +60.0 178.1 | 58 57.3 +60.0 176.3 | 58 54.0 +59.9 174.4 | 58 49.4 +59.7 172.6 |
| 17° | 60 00.0 +60.0 180.0 | 59 59.3 +60.0 178.1 | 59 57.3 +59.9 176.2 | 59 53.9 +59.8 174.3 | 59 49.1 +59.7 172.4 |
| 18° | 61 00.0 +60.0 180.0 | 60 59.3 +60.0 178.0 | 60 57.2 +59.9 176.1 | 60 53.7 +59.8 174.1 | 60 48.8 +59.7 172.2 |
| 19° | 62 00.0 +60.0 180.0 | 61 59.3 +60.0 178.0 | 61 57.1 +59.9 176.0 | 61 53.5 +59.9 174.0 | 61 48.5 +59.7 172.0 |
| 20° | 63 00.0 +60.0 180.0 | 62 59.3 +59.9 177.9 | 62 57.0 +60.0 175.9 | 62 53.4 +59.8 173.8 | 62 48.2 +59.7 171.8 |
| 21° | 64 00.0 +60.0 180.0 | 63 59.2 +60.0 177.9 | 63 57.0 +59.9 175.7 | 63 53.2 +59.8 173.6 | 63 47.9 +59.6 171.5 |
| 22° | 65 00.0 +60.0 180.0 | 64 59.2 +60.0 177.8 | 64 56.9 +59.9 175.6 | 64 53.0 +59.7 173.4 | 64 47.5 +59.6 171.3 |
| 23° | 66 00.0 +60.0 180.0 | 65 59.2 +60.0 177.7 | 65 56.8 +59.9 175.5 | 65 52.7 +59.8 173.2 | 65 47.1 +59.6 171.0 |
| 24° | 67 00.0 +60.0 180.0 | 66 59.2 +59.9 177.7 | 66 56.7 +59.8 175.3 | 66 52.5 +59.7 173.0 | 66 46.7 +59.6 170.7 |
| 25° | 68 00.0 +60.0 180.0 | 67 59.1 +60.0 177.6 | 67 56.5 +59.9 175.2 | 67 52.2 +59.8 172.8 | 67 46.3 +59.5 170.4 |
| 26° | 69 00.0 +60.0 180.0 | 68 59.1 +60.0 177.5 | 68 56.4 +59.9 175.0 | 68 52.0 +59.7 172.5 | 68 45.8 +59.4 170.0 |
| 27° | 70 00.0 +60.0 180.0 | 69 59.1 +59.9 177.4 | 69 56.3 +59.8 174.8 | 69 51.7 +59.6 172.2 | 69 45.2 +59.4 169.7 |
| 28° | 71 00.0 +60.0 180.0 | 70 59.0 +60.0 177.3 | 70 56.1 +59.9 174.6 | 70 51.3 +59.6 171.9 | 70 44.6 +59.4 169.2 |
| 29° | 72 00.0 +60.0 180.0 | 71 59.0 +59.9 177.2 | 71 56.0 +59.8 174.4 | 71 50.9 +59.6 171.6 | 71 44.0 +59.2 168.8 |

| Dec | LHA 005° / 355°     | LHA 006° / 354°     | LHA 007° / 353°     | LHA 008° / 352°     | LHA 009° / 351°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 42 47.8 +59.8 173.2 | 42 42.5 +59.7 171.8 | 42 36.2 +59.6 170.5 | 42 28.9 +59.5 169.1 | 42 20.7 +59.4 167.8 |
| 1°  | 43 47.6 +59.8 173.1 | 43 42.2 +59.7 171.7 | 43 35.8 +59.6 170.3 | 43 28.4 +59.5 168.9 | 43 20.1 +59.3 167.6 |
| 2°  | 44 47.4 +59.8 173.0 | 44 41.9 +59.7 171.5 | 44 35.4 +59.6 170.2 | 44 27.9 +59.5 168.8 | 44 19.4 +59.4 167.4 |
| 3°  | 45 47.2 +59.8 172.8 | 45 41.6 +59.7 171.4 | 45 35.0 +59.5 170.0 | 45 27.4 +59.4 168.6 | 45 18.8 +59.3 167.2 |
| 4°  | 46 47.0 +59.7 172.7 | 46 41.3 +59.6 171.3 | 46 34.5 +59.6 169.8 | 46 26.8 +59.4 168.4 | 46 18.1 +59.2 166.9 |
| 5°  | 47 46.7 +59.8 172.6 | 47 40.9 +59.7 171.1 | 47 34.1 +59.5 169.6 | 47 26.2 +59.4 168.2 | 47 17.3 +59.3 166.7 |
| 6°  | 48 46.5 +59.8 172.4 | 48 40.6 +59.6 170.9 | 48 33.6 +59.5 169.4 | 48 25.6 +59.4 168.0 | 48 16.6 +59.2 166.5 |
| 7°  | 49 46.3 +59.7 172.3 | 49 40.2 +59.7 170.8 | 49 33.1 +59.5 169.3 | 49 25.0 +59.3 167.7 | 49 15.8 +59.1 166.2 |
| 8°  | 50 46.0 +59.7 172.2 | 50 39.9 +59.6 170.6 | 50 32.6 +59.5 169.1 | 50 24.3 +59.3 167.5 | 50 14.9 +59.2 166.0 |
| 9°  | 51 45.7 +59.7 172.0 | 51 39.5 +59.6 170.4 | 51 32.1 +59.5 168.8 | 51 23.6 +59.3 167.3 | 51 14.1 +59.1 165.7 |
| 10° | 52 45.4 +59.7 171.8 | 52 39.1 +59.5 170.2 | 52 31.6 +59.4 168.6 | 52 22.9 +59.3 167.0 | 52 13.2 +59.0 165.4 |
| 11° | 53 45.1 +59.7 171.7 | 53 38.6 +59.6 170.0 | 53 31.0 +59.4 168.4 | 53 22.2 +59.2 166.8 | 53 12.2 +59.1 165.1 |
| 12° | 54 44.8 +59.7 171.5 | 54 38.2 +59.5 169.8 | 54 30.4 +59.3 168.2 | 54 21.4 +59.2 166.5 | 54 11.3 +58.9 164.8 |
| 13° | 55 44.5 +59.7 171.3 | 55 37.7 +59.5 169.6 | 55 29.7 +59.4 167.9 | 55 20.6 +59.1 166.2 | 55 10.2 +59.0 164.5 |
| 14° | 56 44.2 +59.6 171.1 | 56 37.2 +59.5 169.4 | 56 29.1 +59.3 167.6 | 56 19.7 +59.1 165.9 | 56 09.2 +58.8 164.2 |
| 15° | 57 43.8 +59.6 170.9 | 57 36.7 +59.5 169.1 | 57 28.4 +59.2 167.4 | 57 18.8 +59.0 165.6 | 57 08.0 +58.8 163.8 |
| 16° | 58 43.4 +59.6 170.7 | 58 36.2 +59.4 168.9 | 58 27.6 +59.3 167.1 | 58 17.8 +59.0 165.3 | 58 06.8 +58.7 163.5 |
| 17° | 59 43.0 +59.6 170.5 | 59 35.6 +59.4 168.6 | 59 26.9 +59.1 166.7 | 59 16.8 +59.0 164.9 | 59 05.5 +58.7 163.1 |
| 18° | 60 42.6 +59.5 170.2 | 60 35.0 +59.3 168.3 | 60 26.0 +59.1 166.4 | 60 15.8 +58.8 164.5 | 60 04.2 +58.6 162.7 |
| 19° | 61 42.1 +59.5 170.0 | 61 34.3 +59.3 168.0 | 61 25.1 +59.1 166.1 | 61 14.6 +58.8 164.1 | 61 02.8 +58.4 162.2 |
| 20° | 62 41.6 +59.5 169.7 | 62 33.6 +59.3 167.7 | 62 24.2 +59.0 165.7 | 62 13.4 +58.7 163.7 | 62 01.2 +58.4 161.7 |
| 21° | 63 41.1 +59.4 169.4 | 63 32.9 +59.2 167.3 | 63 23.2 +58.9 165.3 | 63 12.1 +58.6 163.3 | 62 59.6 +58.3 161.2 |
| 22° | 64 40.5 +59.4 169.1 | 64 32.1 +59.1 167.0 | 64 22.1 +58.8 164.9 | 64 10.7 +58.5 162.8 | 63 57.9 +58.1 160.7 |
| 23° | 65 39.9 +59.4 168.8 | 65 31.2 +59.1 166.6 | 65 20.9 +58.8 164.4 | 65 09.2 +58.4 162.2 | 64 56.0 +58.0 160.1 |
| 24° | 66 39.3 +59.3 168.4 | 66 30.3 +59.0 166.1 | 66 19.7 +58.6 163.9 | 66 07.6 +58.3 161.7 | 65 54.0 +57.8 159.5 |
| 25° | 67 38.6 +59.2 168.0 | 67 29.3 +58.9 165.7 | 67 18.3 +58.6 163.4 | 67 05.9 +58.1 161.1 | 66 51.8 +57.7 158.8 |
| 26° | 68 37.8 +59.2 167.6 | 68 28.2 +58.8 165.2 | 68 16.9 +58.4 162.8 | 68 04.0 +57.9 160.4 | 67 49.5 +57.4 158.1 |
| 27° | 69 37.0 +59.0 167.1 | 69 27.0 +58.7 164.6 | 69 15.3 +58.2 162.1 | 69 01.9 +57.8 159.7 | 68 46.9 +57.2 157.3 |
| 28° | 70 36.0 +59.0 166.6 | 70 25.7 +58.5 164.0 | 70 13.5 +58.1 161.5 | 69 59.7 +57.5 158.9 | 69 44.1 +57.0 156.5 |
| 29° | 71 35.0 +58.9 166.0 | 71 24.2 +58.4 163.3 | 71 11.6 +57.8 160.7 | 70 57.2 +57.3 158.1 | 70 41.1 +56.6 155.6 |

| 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°  | 42 11.6 +59.2 166.4 | 42 01.6 +59.0 165.1 | 41 50.6 +58.9 163.8 | 41 38.7 +58.7 162.5 | 41 26.0 +58.5 161.2 |
| 1°  | 43 10.8 +59.2 166.2 | 43 00.6 +59.0 164.9 | 42 49.5 +58.8 163.5 | 42 37.4 +58.7 162.2 | 42 24.5 +58.4 160.9 |
| 2°  | 44 10.0 +59.2 166.0 | 43 59.6 +59.0 164.6 | 43 48.3 +58.8 163.3 | 43 36.1 +58.6 161.9 | 43 22.9 +58.4 160.6 |
| 3°  | 45 09.2 +59.1 165.8 | 44 58.6 +59.0 164.4 | 44 47.1 +58.8 163.0 | 44 34.7 +58.6 161.6 | 44 21.3 +58.4 160.3 |
| 4°  | 46 08.3 +59.1 165.5 | 45 57.6 +58.9 164.1 | 45 45.9 +58.7 162.7 | 45 33.3 +58.5 161.3 | 45 19.7 +58.3 159.9 |
| 5°  | 47 07.4 +59.1 165.3 | 46 56.5 +58.9 163.8 | 46 44.6 +58.7 162.4 | 46 31.8 +58.4 161.0 | 46 18.0 +58.2 159.6 |
| 6°  | 48 06.5 +59.0 165.0 | 47 55.4 +58.8 163.6 | 47 43.3 +58.6 162.1 | 47 30.2 +58.4 160.7 | 47 16.2 +58.2 159.2 |
| 7°  | 49 05.5 +59.0 164.7 | 48 54.2 +58.8 163.3 | 48 41.9 +58.6 161.8 | 48 28.6 +58.4 160.3 | 48 14.4 +58.1 158.9 |
| 8°  | 50 04.5 +59.0 164.5 | 49 53.0 +58.8 162.9 | 49 40.5 +58.5 161.4 | 49 27.0 +58.3 160.0 | 49 12.5 +58.0 158.5 |
| 9°  | 51 03.5 +58.9 164.2 | 50 51.8 +58.6 162.6 | 50 39.0 +58.5 161.1 | 50 25.3 +58.2 159.6 | 50 10.5 +57.9 158.1 |
| 10° | 52 02.4 +58.8 163.9 | 51 50.4 +58.7 162.3 | 51 37.5 +58.3 160.7 | 51 23.5 +58.1 159.2 | 51 08.4 +57.9 157.7 |
| 11° | 53 01.2 +58.8 163.5 | 52 49.1 +58.5 161.9 | 52 35.8 +58.4 160.4 | 52 21.6 +58.0 158.8 | 52 06.3 +57.7 157.3 |
| 12° | 54 00.0 +58.7 163.2 | 53 47.6 +58.5 161.6 | 53 34.2 +58.2 160.0 | 53 19.6 +57.9 158.4 | 53 04.0 +57.6 156.8 |
| 13° | 54 58.7 +58.7 162.9 | 54 46.1 +58.4 161.2 | 54 32.4 +58.1 159.6 | 54 17.5 +57.9 157.9 | 54 01.6 +57.6 156.3 |
| 14° | 55 57.4 +58.6 162.5 | 55 44.5 +58.4 160.8 | 55 30.5 +58.0 159.1 | 55 15.4 +57.7 157.5 | 54 59.2 +57.4 155.9 |
| 15° | 56 56.0 +58.6 162.1 | 56 42.9 +58.2 160.4 | 56 28.5 +58.0 158.7 | 56 13.1 +57.6 157.0 | 55 56.6 +57.2 155.3 |
| 16° | 57 54.6 +58.4 161.7 | 57 41.1 +58.1 159.9 | 57 26.5 +57.8 158.2 | 57 10.7 +57.5 156.5 | 56 53.8 +57.2 154.8 |
| 17° | 58 53.0 +58.4 161.3 | 58 39.2 +58.1 159.5 | 58 24.3 +57.7 157.7 | 58 08.2 +57.3 156.0 | 57 51.0 +56.9 154.2 |
| 18° | 59 51.4 +58.2 160.8 | 59 37.3 +57.9 159.0 | 59 22.0 +57.6 157.2 | 59 05.5 +57.2 155.4 | 58 47.9 +56.8 153.6 |
| 19° | 60 49.6 +58.2 160.3 | 60 35.2 +57.8 158.4 | 60 19.6 +57.4 156.6 | 60 02.7 +57.0 154.8 | 59 44.7 +56.6 153.0 |
| 20° | 61 47.8 +58.0 159.8 | 61 33.0 +57.6 157.9 | 61 17.0 +57.2 156.0 | 60 59.7 +56.8 154.2 | 60 41.3 +56.4 152.3 |
| 21° | 62 45.8 +57.9 159.3 | 62 30.6 +57.5 157.3 | 62 14.2 +57.1 155.4 | 61 56.5 +56.7 153.5 | 61 37.7 +56.1 151.6 |
| 22° | 63 43.7 +57.7 158.7 | 63 28.1 +57.3 156.7 | 63 11.3 +56.8 154.7 | 62 53.2 +56.3 152.8 | 62 33.8 +55.9 150.9 |
| 23° | 64 41.4 +57.6 158.0 | 64 25.4 +57.1 156.0 | 64 08.1 +56.6 154.0 | 63 49.5 +56.2 152.0 | 63 29.7 +55.6 150.1 |
| 24° | 65 39.0 +57.3 157.4 | 65 22.5 +56.9 155.3 | 65 04.7 +56.4 153.2 | 64 45.7 +55.8 151.2 | 64 25.3 +55.3 149.2 |
| 25° | 66 36.3 +57.2 156.6 | 66 19.4 +56.6 154.5 | 66 01.1 +56.1 152.4 | 65 41.5 +55.5 150.3 | 65 20.6 +54.9 148.3 |
| 26° | 67 33.5 +56.9 155.9 | 67 16.0 +56.4 153.7 | 66 57.2 +55.8 151.5 | 66 37.0 +55.1 149.4 | 66 15.5 +54.5 147.3 |
| 27° | 68 30.4 +56.6 155.0 | 68 12.4 +56.0 152.7 | 67 53.0 +55.3 150.5 | 67 32.1 +54.8 148.4 | 67 10.0 +54.1 146.3 |
| 28° | 69 27.0 +56.4 154.1 | 69 08.4 +55.7 151.8 | 68 48.3 +55.0 149.5 | 68 26.9 +54.3 147.3 | 68 04.1 +53.6 145.1 |
| 29° | 70 23.4 +55.9 153.1 | 70 04.1 +55.2 150.7 | 69 43.3 +54.5 148.4 | 69 21.2 +53.7 146.1 | 68 57.7 +53.0 143.9 |

| 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°  | 41 12.3 +58.3 159.9 | 40 57.8 +58.1 158.6 | 40 42.5 +57.8 157.3 | 40 26.3 +57.6 156.0 | 40 09.2 +57.4 154.8 |
| 1°  | 42 10.6 +58.3 159.6 | 41 55.9 +58.0 158.3 | 41 40.3 +57.8 157.0 | 41 23.9 +57.5 155.7 | 41 06.6 +57.3 154.4 |
| 2°  | 43 08.9 +58.2 159.2 | 42 53.9 +58.0 157.9 | 42 38.1 +57.7 156.6 | 42 21.4 +57.5 155.3 | 42 03.9 +57.2 154.0 |
| 3°  | 44 07.1 +58.1 158.9 | 43 51.9 +57.9 157.6 | 43 35.8 +57.7 156.2 | 43 18.9 +57.4 154.9 | 43 01.1 +57.1 153.6 |
| 4°  | 45 05.2 +58.0 158.6 | 44 49.8 +57.8 157.2 | 44 33.5 +57.5 155.8 | 44 16.3 +57.3 154.5 | 43 58.2 +57.1 153.2 |
| 5°  | 46 03.2 +58.0 158.2 | 45 47.6 +57.7 156.8 | 45 31.0 +57.5 155.4 | 45 13.6 +57.2 154.1 | 44 55.3 +56.9 152.7 |
| 6°  | 47 01.2 +57.9 157.8 | 46 45.3 +57.7 156.4 | 46 28.5 +57.4 155.0 | 46 10.8 +57.1 153.7 | 45 52.2 +56.8 152.3 |
| 7°  | 47 59.1 +57.9 157.4 | 47 43.0 +57.5 156.0 | 47 25.9 +57.3 154.6 | 47 07.9 +57.0 153.2 | 46 49.0 +56.7 151.8 |
| 8°  | 48 57.0 +57.7 157.0 | 48 40.5 +57.5 155.6 | 48 23.2 +57.1 154.2 | 48 04.9 +56.8 152.7 | 47 45.7 +56.5 151.3 |
| 9°  | 49 54.7 +57.7 156.6 | 49 38.0 +57.4 155.1 | 49 20.3 +57.1 153.7 | 49 01.7 +56.8 152.3 | 48 42.2 +56.5 150.8 |
| 10° | 50 52.4 +57.5 156.2 | 50 35.4 +57.2 154.7 | 50 17.4 +56.9 153.2 | 49 58.5 +56.6 151.8 | 49 38.7 +56.3 150.3 |
| 11° | 51 49.9 +57.5 155.7 | 51 32.6 +57.2 154.2 | 51 14.3 +56.8 152.7 | 50 55.1 +56.5 151.2 | 50 35.0 +56.1 149.8 |
| 12° | 52 47.4 +57.3 155.3 | 52 29.8 +57.0 153.7 | 52 11.1 +56.7 152.2 | 51 51.6 +56.3 150.7 | 51 31.1 +56.0 149.2 |
| 13° | 53 44.7 +57.2 154.8 | 53 26.8 +56.8 153.2 | 53 07.8 +56.5 151.7 | 52 47.9 +56.2 150.1 | 52 27.1 +55.8 148.6 |
| 14° | 54 41.9 +57.1 154.2 | 54 23.6 +56.7 152.7 | 54 04.3 +56.4 151.1 | 53 44.1 +55.9 149.5 | 53 22.9 +55.5 148.0 |
| 15° | 55 39.0 +56.9 153.7 | 55 20.3 +56.6 152.1 | 55 00.7 +56.1 150.5 | 54 40.0 +55.8 148.9 | 54 18.4 +55.4 147.4 |
| 16° | 56 35.9 +56.7 153.1 | 56 16.9 +56.3 151.5 | 55 56.8 +56.0 149.9 | 55 35.8 +55.6 148.3 | 55 13.8 +55.2 146.7 |
| 17° | 57 32.6 +56.6 152.5 | 57 13.2 +56.2 150.9 | 56 52.8 +55.7 149.2 | 56 31.4 +55.3 147.6 | 56 09.0 +54.9 146.0 |
| 18° | 58 29.2 +56.4 151.9 | 58 09.4 +55.9 150.2 | 57 48.5 +55.6 148.5 | 57 26.7 +55.1 146.9 | 57 03.9 +54.6 145.3 |
| 19° | 59 25.6 +56.1 151.2 | 59 05.3 +55.8 149.5 | 58 44.1 +55.2 147.8 | 58 21.8 +54.8 146.1 | 57 58.5 +54.3 144.5 |
| 20° | 60 21.7 +56.0 150.5 | 60 01.1 +55.4 148.8 | 59 39.3 +55.0 147.1 | 59 16.6 +54.5 145.4 | 58 52.8 +54.0 143.7 |
| 21° | 61 17.7 +55.6 149.8 | 60 56.5 +55.2 148.0 | 60 34.3 +54.7 146.3 | 60 11.1 +54.1 144.5 | 59 46.8 +53.7 142.9 |
| 22° | 62 13.3 +55.4 149.0 | 61 51.7 +54.9 147.2 | 61 29.0 +54.3 145.4 | 61 05.2 +53.9 143.7 | 60 40.5 +53.3 142.0 |
| 23° | 63 08.7 +55.1 148.2 | 62 46.6 +54.5 146.3 | 62 23.3 +54.0 144.5 | 61 59.1 +53.4 142.7 | 61 33.8 +52.9 141.0 |
| 24° | 64 03.8 +54.7 147.3 | 63 41.1 +54.1 145.4 | 63 17.3 +53.6 143.5 | 62 52.5 +53.0 141.7 | 62 26.7 +52.4 140.0 |
| 25° | 64 58.5 +54.3 146.3 | 64 35.2 +53.8 144.4 | 64 10.9 +53.1 142.5 | 63 45.5 +52.5 140.7 | 63 19.1 +51.8 138.9 |
| 26° | 65 52.8 +53.9 145.3 | 65 29.0 +53.2 143.3 | 65 04.0 +52.6 141.4 | 64 38.0 +51.9 139.6 | 64 10.9 +51.4 137.8 |
| 27° | 66 46.7 +53.4 144.2 | 66 22.2 +52.7 142.2 | 65 56.6 +52.0 140.3 | 65 29.9 +51.4 138.4 | 65 02.3 +50.7 136.6 |
| 28° | 67 40.1 +52.8 143.0 | 67 14.9 +52.1 141.0 | 66 48.6 +51.4 139.0 | 66 21.3 +50.7 137.1 | 65 53.0 +50.0 135.3 |
| 29° | 68 32.9 +52.3 141.8 | 68 07.0 +51.5 139.7 | 67 40.0 +50.7 137.7 | 67 12.0 +50.0 135.8 | 66 43.0 +49.2 133.9 |

## Declination SAME name as Latitude

## Latitude 47°

| 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°  | 39 51.4 +57.1 153.5 | 39 32.8 +56.8 152.3 | 39 13.4 +56.6 151.1 | 38 53.2 +56.3 149.9 | 38 32.3 +56.0 148.7 |
| 1°  | 40 48.5 +57.1 153.1 | 40 29.6 +56.8 151.9 | 40 10.0 +56.5 150.7 | 39 49.5 +56.2 149.4 | 39 28.3 +56.0 148.2 |
| 2°  | 41 45.6 +56.9 152.7 | 41 26.4 +56.7 151.5 | 41 06.5 +56.4 150.2 | 40 45.7 +56.2 149.0 | 40 24.3 +55.8 147.7 |
| 3°  | 42 42.5 +56.8 152.3 | 42 23.1 +56.5 151.0 | 42 02.9 +56.2 149.8 | 41 41.9 +55.9 148.5 | 41 20.1 +55.7 147.3 |
| 4°  | 43 39.3 +56.8 151.9 | 43 19.6 +56.5 150.6 | 42 59.1 +56.2 149.3 | 42 37.8 +55.9 148.0 | 42 15.8 +55.5 146.8 |
| 5°  | 44 36.1 +56.6 151.4 | 44 16.1 +56.3 150.1 | 43 55.3 +56.0 148.8 | 43 33.7 +55.7 147.5 | 43 11.3 +55.5 146.2 |
| 6°  | 45 32.7 +56.5 150.9 | 45 12.4 +56.2 149.6 | 44 51.3 +55.9 148.3 | 44 29.4 +55.6 147.0 | 44 06.8 +55.2 145.7 |
| 7°  | 46 29.2 +56.4 150.5 | 46 08.6 +56.1 149.1 | 45 47.2 +55.8 147.8 | 45 25.0 +55.4 146.5 | 45 02.0 +55.1 145.2 |
| 8°  | 47 25.6 +56.3 150.0 | 47 04.7 +55.9 148.6 | 46 43.0 +55.6 147.2 | 46 20.4 +55.3 145.9 | 45 57.1 +55.0 144.6 |
| 9°  | 48 21.9 +56.1 149.4 | 48 00.6 +55.8 148.1 | 47 38.6 +55.4 146.7 | 47 15.7 +55.1 145.3 | 46 52.1 +54.7 144.0 |
| 10° | 49 18.0 +55.9 148.9 | 48 56.4 +55.6 147.5 | 48 34.0 +55.3 146.1 | 48 10.8 +54.9 144.8 | 47 46.8 +54.5 143.4 |
| 11° | 50 13.9 +55.8 148.3 | 49 52.0 +55.5 146.9 | 49 29.3 +55.0 145.5 | 49 05.7 +54.7 144.1 | 48 41.3 +54.4 142.8 |
| 12° | 51 09.7 +55.6 147.8 | 50 47.5 +55.2 146.3 | 50 24.3 +54.9 144.9 | 50 00.4 +54.5 143.5 | 49 35.7 +54.1 142.1 |
| 13° | 52 05.3 +55.4 147.2 | 51 42.7 +55.0 145.7 | 51 19.2 +54.7 144.3 | 50 54.9 +54.3 142.9 | 50 29.8 +53.9 141.5 |
| 14° | 53 00.7 +55.2 146.5 | 52 37.7 +54.8 145.0 | 52 13.9 +54.4 143.6 | 51 49.2 +54.0 142.2 | 51 23.7 +53.6 140.8 |
| 15° | 53 55.9 +55.0 145.9 | 53 32.5 +54.6 144.4 | 53 08.3 +54.1 142.9 | 52 43.2 +53.7 141.5 | 52 17.3 +53.3 140.0 |
| 16° | 54 50.9 +54.7 145.2 | 54 27.1 +54.3 143.7 | 54 02.4 +53.9 142.2 | 53 36.9 +53.5 140.7 | 53 10.6 +53.0 139.3 |
| 17° | 55 45.6 +54.5 144.5 | 55 21.4 +54.0 142.9 | 54 56.3 +53.6 141.4 | 54 30.4 +53.1 139.9 | 54 03.6 +52.8 138.5 |
| 18° | 56 40.1 +54.2 143.7 | 56 15.4 +53.8 142.2 | 55 49.9 +53.3 140.6 | 55 23.5 +52.8 139.1 | 54 56.4 +52.3 137.7 |
| 19° | 57 34.3 +53.8 142.9 | 57 09.2 +53.3 141.3 | 56 43.2 +52.9 139.8 | 56 16.3 +52.5 138.3 | 55 48.7 +52.0 136.8 |
| 20° | 58 28.1 +53.6 142.1 | 58 02.5 +53.1 140.5 | 57 36.1 +52.5 138.9 | 57 08.8 +52.1 137.4 | 56 40.7 +51.6 135.9 |
| 21° | 59 21.7 +53.1 141.2 | 58 55.6 +52.6 139.6 | 58 28.6 +52.2 138.0 | 58 00.9 +51.6 136.5 | 57 32.3 +51.1 135.0 |
| 22° | 60 14.8 +52.8 140.3 | 59 48.2 +52.2 138.7 | 59 20.8 +51.7 137.1 | 58 52.5 +51.2 135.5 | 58 23.4 +50.7 134.0 |
| 23° | 61 07.6 +52.3 139.3 | 60 40.4 +51.8 137.7 | 60 12.5 +51.2 136.1 | 59 43.7 +50.6 134.5 | 59 14.1 +50.1 133.0 |
| 24° | 61 59.9 +51.8 138.3 | 61 32.2 +51.3 136.6 | 61 03.7 +50.7 135.0 | 60 34.3 +50.2 133.4 | 60 04.2 +49.6 131.9 |
| 25° | 62 51.7 +51.3 137.2 | 62 23.5 +50.6 135.5 | 61 54.4 +50.1 133.9 | 61 24.5 +49.5 132.3 | 60 53.8 +49.0 130.7 |
| 26° | 63 43.0 +50.7 136.0 | 63 14.1 +50.1 134.3 | 62 44.5 +49.4 132.7 | 62 14.0 +48.9 131.1 | 61 42.8 +48.3 129.5 |
| 27° | 64 33.7 +50.0 134.8 | 64 04.2 +49.4 133.1 | 63 33.9 +48.8 131.4 | 63 02.9 +48.1 129.8 | 62 31.1 +47.6 128.2 |
| 28° | 65 23.7 +49.4 133.5 | 64 53.6 +48.7 131.8 | 64 22.7 +48.0 130.1 | 63 51.0 +47.4 128.5 | 63 18.7 +46.7 126.9 |
| 29° | 66 13.1 +48.5 132.1 | 65 42.3 +47.8 130.4 | 65 10.7 +47.2 128.7 | 64 38.4 +46.6 127.1 | 64 05.4 +46.0 125.5 |

| 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°  | 38 10.7 +55.7 147.5 | 37 48.3 +55.5 146.3 | 37 25.3 +55.1 145.1 | 37 01.5 +54.9 144.0 | 36 37.1 +54.6 142.8 |
| 1°  | 39 06.4 +55.7 147.0 | 38 43.8 +55.3 145.8 | 38 20.4 +55.1 144.6 | 37 56.4 +54.8 143.5 | 37 31.7 +54.5 142.3 |
| 2°  | 40 02.1 +55.5 146.5 | 39 39.1 +55.3 145.3 | 39 15.5 +54.9 144.1 | 38 51.2 +54.6 143.0 | 38 26.2 +54.3 141.8 |
| 3°  | 40 57.6 +55.4 146.0 | 40 34.4 +55.0 144.8 | 40 10.4 +54.8 143.6 | 39 45.8 +54.5 142.4 | 39 20.5 +54.2 141.2 |
| 4°  | 41 53.0 +55.2 145.5 | 41 29.4 +55.0 144.3 | 41 05.2 +54.6 143.1 | 40 40.3 +54.3 141.9 | 40 14.7 +54.0 140.7 |
| 5°  | 42 48.2 +55.1 145.0 | 42 24.4 +54.8 143.7 | 41 59.8 +54.5 142.5 | 41 34.6 +54.1 141.3 | 41 08.7 +53.8 140.1 |
| 6°  | 43 43.3 +55.0 144.4 | 43 19.2 +54.6 143.2 | 42 54.3 +54.3 141.9 | 42 28.7 +54.0 140.7 | 42 02.5 +53.6 139.5 |
| 7°  | 44 38.3 +54.7 143.9 | 44 13.8 +54.4 142.6 | 43 48.6 +54.1 141.4 | 43 22.7 +53.8 140.1 | 42 56.1 +53.5 138.9 |
| 8°  | 45 33.0 +54.6 143.3 | 45 08.2 +54.3 142.0 | 44 42.7 +53.9 140.8 | 44 16.5 +53.5 139.5 | 43 49.6 +53.2 138.3 |
| 9°  | 46 27.6 +54.4 142.7 | 46 02.5 +54.0 141.4 | 45 36.6 +53.7 140.1 | 45 10.0 +53.4 138.9 | 44 42.8 +53.0 137.6 |
| 10° | 47 22.0 +54.2 142.1 | 46 56.5 +53.8 140.8 | 46 30.3 +53.5 139.5 | 46 03.4 +53.1 138.2 | 45 35.8 +52.7 137.0 |
| 11° | 48 16.2 +54.0 141.4 | 47 50.3 +53.6 140.1 | 47 23.8 +53.2 138.8 | 46 56.5 +52.8 137.5 | 46 28.5 +52.5 136.3 |
| 12° | 49 10.2 +53.7 140.8 | 48 43.9 +53.4 139.5 | 48 17.0 +53.0 138.1 | 47 49.3 +52.6 136.8 | 47 21.0 +52.3 135.6 |
| 13° | 50 03.9 +53.5 140.1 | 49 37.3 +53.1 138.8 | 49 10.0 +52.7 137.4 | 48 41.9 +52.4 136.1 | 48 13.3 +51.9 134.8 |
| 14° | 50 57.4 +53.2 139.4 | 50 30.4 +52.8 138.0 | 50 02.7 +52.4 136.7 | 49 34.3 +52.0 135.4 | 49 05.2 +51.6 134.1 |
| 15° | 51 50.6 +52.9 138.6 | 51 23.2 +52.5 137.3 | 50 55.1 +52.1 135.9 | 50 26.3 +51.7 134.6 | 49 56.8 +51.3 133.3 |
| 16° | 52 43.5 +52.6 137.9 | 52 15.7 +52.2 136.5 | 51 47.2 +51.8 135.1 | 51 18.0 +51.4 133.8 | 50 48.1 +51.0 132.5 |
| 17° | 53 36.1 +52.3 137.1 | 53 07.9 +51.9 135.7 | 52 39.0 +51.4 134.3 | 52 09.4 +51.0 133.0 | 51 39.1 +50.6 131.6 |
| 18° | 54 28.4 +51.9 136.2 | 53 59.8 +51.4 134.8 | 53 30.4 +51.0 133.4 | 53 00.4 +50.6 132.1 | 52 29.7 +50.1 130.8 |
| 19° | 55 20.3 +51.6 135.4 | 54 51.2 +51.1 133.9 | 54 21.4 +50.6 132.6 | 53 51.0 +50.1 131.2 | 53 19.8 +49.8 129.9 |
| 20° | 56 11.9 +51.1 134.5 | 55 42.3 +50.6 133.0 | 55 12.0 +50.2 131.6 | 54 41.1 +49.8 130.3 | 54 09.6 +49.3 128.9 |
| 21° | 57 03.0 +50.6 133.5 | 56 32.9 +50.2 132.1 | 56 02.2 +49.7 130.7 | 55 30.9 +49.2 129.3 | 54 58.9 +48.8 127.9 |
| 22° | 57 53.6 +50.2 132.5 | 57 23.1 +49.7 131.1 | 56 51.9 +49.2 129.6 | 56 20.1 +48.7 128.3 | 55 47.7 +48.2 126.9 |
| 23° | 58 43.8 +49.6 131.5 | 58 12.8 +49.1 130.0 | 57 41.1 +48.6 128.6 | 57 08.8 +48.1 127.2 | 56 35.9 +47.7 125.8 |
| 24° | 59 33.4 +49.1 130.4 | 59 01.9 +48.5 128.9 | 58 29.7 +48.0 127.5 | 57 56.9 +47.6 126.1 | 57 23.6 +47.1 124.7 |
| 25° | 60 22.5 +48.4 129.2 | 59 50.4 +47.9 127.7 | 59 17.7 +47.4 126.3 | 58 44.5 +46.9 124.9 | 58 10.7 +46.4 123.6 |
| 26° | 61 10.9 +47.7 128.0 | 60 38.3 +47.2 126.5 | 60 05.1 +46.7 125.1 | 59 31.4 +46.1 123.7 | 58 57.1 +45.6 122.3 |
| 27° | 61 58.6 +47.0 126.7 | 61 25.5 +46.5 125.3 | 60 51.8 +45.9 123.8 | 60 17.5 +45.4 122.4 | 59 42.7 +44.9 121.1 |
| 28° | 62 45.6 +46.2 125.4 | 62 12.0 +45.6 123.9 | 61 37.7 +45.1 122.5 | 61 02.9 +44.6 121.1 | 60 27.6 +44.1 119.7 |
| 29° | 63 31.8 +45.3 124.0 | 62 57.6 +44.7 122.5 | 62 22.8 +44.2 121.1 | 61 47.5 +43.7 119.7 | 61 11.7 +43.2 118.4 |

| 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°  | 36 12.1 +54.3 141.7 | 35 46.4 +54.0 140.6 | 35 20.1 +53.8 139.5 | 34 53.3 +53.4 138.4 | 34 25.8 +53.1 137.3 |
| 1°  | 37 06.4 +54.2 141.2 | 36 40.4 +53.9 140.1 | 36 13.9 +53.5 138.9 | 35 46.7 +53.3 137.8 | 35 18.9 +53.0 136.7 |
| 2°  | 38 00.6 +54.0 140.6 | 37 34.3 +53.7 139.5 | 37 07.4 +53.4 138.4 | 36 40.0 +53.0 137.3 | 36 11.9 +52.8 136.2 |
| 3°  | 38 54.6 +53.8 140.1 | 38 28.0 +53.5 138.9 | 38 00.8 +53.3 137.8 | 37 33.0 +53.0 136.7 | 37 04.7 +52.6 135.6 |
| 4°  | 39 48.4 +53.7 139.5 | 39 21.5 +53.4 138.4 | 38 54.1 +53.0 137.2 | 38 26.0 +52.7 136.1 | 37 57.3 +52.4 135.0 |
| 5°  | 40 42.1 +53.5 138.9 | 40 14.9 +53.2 137.8 | 39 47.1 +52.9 136.6 | 39 18.7 +52.5 135.5 | 38 49.7 +52.2 134.4 |
| 6°  | 41 35.6 +53.3 138.3 | 41 08.1 +53.0 137.1 | 40 40.0 +52.6 136.0 | 40 11.2 +52.4 134.8 | 39 41.9 +52.0 133.7 |
| 7°  | 42 28.9 +53.1 137.7 | 42 01.1 +52.7 136.5 | 41 32.6 +52.4 135.4 | 41 03.6 +52.1 134.2 | 40 33.9 +51.8 133.1 |
| 8°  | 43 22.0 +52.9 137.1 | 42 53.8 +52.6 135.9 | 42 25.0 +52.2 134.7 | 41 55.7 +51.8 133.5 | 41 25.7 +51.5 132.4 |
| 9°  | 44 14.9 +52.6 136.4 | 43 46.4 +52.3 135.2 | 43 17.2 +52.0 134.0 | 42 47.5 +51.6 132.9 | 42 17.2 +51.3 131.7 |
| 10° | 45 07.5 +52.4 135.7 | 44 38.7 +52.0 134.5 | 44 09.2 +51.7 133.3 | 43 39.1 +51.4 132.2 | 43 08.5 +51.0 131.0 |
| 11° | 45 59.9 +52.2 135.0 | 45 30.7 +51.8 133.8 | 45 00.9 +51.4 132.6 | 44 30.5 +51.1 131.4 | 43 59.5 +50.8 130.3 |
| 12° | 46 52.1 +51.8 134.3 | 46 22.5 +51.5 133.1 | 45 52.3 +51.2 131.9 | 45 21.6 +50.8 130.7 | 44 50.3 +50.4 129.5 |
| 13° | 47 43.9 +51.6 133.6 | 47 14.0 +51.2 132.3 | 46 43.5 +50.8 131.1 | 46 12.4 +50.4 129.9 | 45 40.7 +50.1 128.8 |
| 14° | 48 35.5 +51.2 132.8 | 48 05.2 +50.9 131.6 | 47 34.3 +50.5 130.3 | 47 02.8 +50.1 129.1 | 46 30.8 +49.8 128.0 |
| 15° | 49 26.7 +51.0 132.0 | 48 56.1 +50.5 130.8 | 48 24.8 +50.1 129.5 | 47 52.9 +49.8 128.3 | 47 20.6 +49.4 127.1 |
| 16° | 50 17.7 +50.5 131.2 | 49 46.6 +50.1 129.9 | 49 14.9 +49.8 128.7 | 48 42.7 +49.4 127.5 | 48 10.0 +49.0 126.3 |
| 17° | 51 08.2 +50.2 130.4 | 50 36.7 +49.8 129.1 | 50 04.7 +49.4 127.8 | 49 32.1 +49.0 126.6 | 48 59.0 +48.6 125.4 |
| 18° | 51 58.4 +49.7 129.5 | 51 26.5 +49.4 128.2 | 50 54.1 +48.9 127.0 | 50 21.1 +48.6 125.7 | 49 47.6 +48.2 124.5 |
| 19° | 52 48.1 +49.4 128.6 | 52 15.9 +48.9 127.3 | 51 43.0 +48.5 126.0 | 51 09.7 +48.1 124.8 | 50 35.8 +47.8 123.6 |
| 20° | 53 37.5 +48.8 127.6 | 53 04.8 +48.4 126.3 | 52 31.5 +48.1 125.1 | 51 57.8 +47.6 123.8 | 51 23.6 +47.2 122.6 |
| 21° | 54 26.3 +48.4 126.6 | 53 53.2 +47.9 125.3 | 53 19.6 +47.5 124.1 | 52 45.4 +47.1 122.8 | 52 10.8 +46.7 121.6 |
| 22° | 55 14.7 +47.8 125.6 | 54 41.1 +47.4 124.3 | 54 07.1 +46.9 123.0 | 53 32.5 +46.6 121.8 | 52 57.5 +46.2 120.6 |
| 23° | 56 02.5 +47.2 124.5 | 55 28.5 +46.8 123.2 | 54 54.0 +46.4 122.0 | 54 19.1 +45.9 120.7 | 53 43.7 +45.6 119.5 |
| 24° | 56 49.7 +46.6 123.4 | 56 15.3 +46.1 122.1 | 55 40.4 +45.7 120.9 | 55 05.0 +45.4 119.6 | 54 29.3 +44.9 118.4 |
| 25° | 57 36.3 +45.9 122.2 | 57 01.4 +45.5 121.0 | 56 26.1 +45.1 119.7 | 55 50.4 +44.6 118.5 | 55 14.2 +44.2 117.3 |
| 26° | 58 22.2 +45.2 121.0 | 57 46.9 +44.8 119.7 | 57 11.2 +44.3 118.5 | 56 35.0 +43.9 117.3 | 55 58.4 +43.6 116.1 |
| 27° | 59 07.4 +44.5 119.8 | 58 31.7 +44.0 118.5 | 57 55.5 +43.6 117.2 | 57 18.9 +43.2 116.0 | 56 42.0 +42.8 114.8 |
| 28° | 59 51.9 +43.6 118.4 | 59 15.7 +43.2 117.2 | 58 39.1 +42.7 115.9 | 58 02.1 +42.3 114.7 | 57 24.8 +41.9 113.5 |
| 29° | 60 35.5 +42.7 117.1 | 59 58.9 +42.2 115.8 | 59 21.8 +41.9 114.6 | 58 44.4 +41.5 113.4 | 58 06.7 +41.1 112.2 |

| 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°  | 33 57.8 +52.8 136.2 | 33 29.2 +52.6 135.2 | 33 00.1 +52.3 134.1 | 32 30.5 +51.9 133.1 | 32 00.4 +51.6 132.1 |
| 1°  | 34 50.6 +52.7 135.7 | 34 21.8 +52.3 134.6 | 33 52.4 +52.0 133.6 | 33 22.4 +51.8 132.5 | 32 52.0 +51.5 131.5 |
| 2°  | 35 43.3 +52.5 135.1 | 35 14.1 +52.2 134.0 | 34 44.4 +51.9 133.0 | 34 14.2 +51.6 131.9 | 33 43.5 +51.3 130.9 |
| 3°  | 36 35.8 +52.3 134.5 | 36 06.3 +52.0 133.4 | 35 36.3 +51.7 132.3 | 35 05.8 +51.4 131.3 | 34 34.8 +51.1 130.2 |
| 4°  | 37 28.1 +52.1 133.9 | 36 58.3 +51.8 132.8 | 36 28.0 +51.5 131.7 | 35 57.2 +51.2 130.7 | 35 25.9 +50.9 129.6 |
| 5°  | 38 20.2 +51.9 133.2 | 37 50.1 +51.6 132.1 | 37 19.5 +51.3 131.1 | 36 48.4 +51.0 130.0 | 36 16.8 +50.7 128.9 |
| 6°  | 39 12.1 +51.7 132.6 | 38 41.7 +51.4 131.5 | 38 10.8 +51.0 130.4 | 37 39.4 +50.7 129.3 | 37 07.5 +50.4 128.3 |
| 7°  | 40 03.8 +51.4 131.9 | 39 33.1 +51.1 130.8 | 39 01.8 +50.9 129.7 | 38 30.1 +50.5 128.7 | 37 57.9 +50.3 127.6 |
| 8°  | 40 55.2 +51.2 131.3 | 40 24.2 +50.9 130.1 | 39 52.7 +50.5 129.1 | 39 20.6 +50.3 128.0 | 38 48.2 +49.9 126.9 |
| 9°  | 41 46.4 +51.0 130.6 | 41 15.1 +50.6 129.4 | 40 43.2 +50.3 128.3 | 40 10.9 +50.0 127.3 | 39 38.1 +49.7 126.2 |
| 10° | 42 37.4 +50.7 129.9 | 42 05.7 +50.4 128.7 | 41 33.5 +50.1 127.6 | 41 00.9 +49.7 126.5 | 40 27.8 +49.4 125.5 |
| 11° | 43 28.1 +50.4 129.1 | 42 56.1 +50.0 128.0 | 42 23.6 +49.7 126.9 | 41 50.6 +49.4 125.8 | 41 17.2 +49.1 124.7 |
| 12° | 44 18.5 +50.0 128.4 | 43 46.1 +49.8 127.2 | 43 13.3 +49.4 126.1 | 42 40.0 +49.1 125.0 | 42 06.3 +48.8 123.9 |
| 13° | 45 08.5 +49.8 127.6 | 44 35.9 +49.4 126.5 | 44 02.7 +49.1 125.3 | 43 29.1 +48.8 124.2 | 42 55.1 +48.4 123.1 |
| 14° | 45 58.3 +49.4 126.8 | 45 25.3 +49.1 125.7 | 44 51.8 +48.7 124.5 | 44 17.9 +48.4 123.4 | 43 43.5 +48.1 122.3 |
| 15° | 46 47.7 +49.1 126.0 | 46 14.4 +48.7 124.8 | 45 40.5 +48.4 123.7 | 45 06.3 +48.0 122.6 | 44 31.6 +47.7 121.5 |
| 16° | 47 36.8 +48.6 125.1 | 47 03.1 +48.3 124.0 | 46 28.9 +48.0 122.8 | 45 54.3 +47.7 121.7 | 45 19.3 +47.3 120.6 |
| 17° | 48 25.4 +48.3 124.3 | 47 51.4 +47.9 123.1 | 47 16.9 +47.6 122.0 | 46 42.0 +47.2 120.9 | 46 06.6 +46.9 119.8 |
| 18° | 49 13.7 +47.8 123.4 | 48 39.3 +47.5 122.2 | 48 04.5 +47.1 121.1 | 47 29.2 +46.8 119.9 | 46 53.5 +46.5 118.9 |
| 19° | 50 01.5 +47.4 122.4 | 49 26.8 +47.0 121.3 | 48 51.6 +46.6 120.1 | 48 16.0 +46.3 119.0 | 47 40.0 +46.0 117.9 |
| 20° | 50 48.9 +46.8 121.5 | 50 13.8 +46.5 120.3 | 49 38.2 +46.2 119.2 | 49 02.3 +45.8 118.1 | 48 26.0 +45.5 117.0 |
| 21° | 51 35.7 +46.4 120.5 | 51 00.3 +46.0 119.3 | 50 24.4 +45.6 118.2 | 49 48.1 +45.3 117.1 | 49 11.5 +45.0 116.0 |
| 22° | 52 22.1 +45.8 119.4 | 51 46.3 +45.4 118.3 | 51 10.0 +45.1 117.1 | 50 33.4 +44.8 116.0 | 49 56.5 +44.4 115.0 |
| 23° | 53 07.9 +45.2 118.4 | 52 31.7 +44.8 117.2 | 51 55.1 +44.5 116.1 | 51 18.2 +44.1 115.0 | 50 40.9 +43.9 113.9 |
| 24° | 53 53.1 +44.5 117.3 | 53 16.5 +44.2 116.1 | 52 39.6 +43.8 115.0 | 52 02.3 +43.6 113.9 | 51 24.8 +43.2 112.8 |
| 25° | 54 37.6 +43.9 116.1 | 54 00.7 +43.5 115.0 | 53 23.4 +43.2 113.9 | 52 45.9 +42.8 112.8 | 52 08.0 +42.5 111.7 |
| 26° | 55 21.5 +43.2 114.9 | 54 44.2 +42.8 113.8 | 54 06.6 +42.5 112.7 | 53 28.7 +42.2 111.6 | 52 50.5 +41.9 110.5 |
| 27° | 56 04.7 +42.4 113.7 | 55 27.0 +42.1 112.6 | 54 49.1 +41.7 111.5 | 54 10.9 +41.4 110.4 | 53 32.4 +41.1 109.3 |
| 28° | 56 47.1 +41.6 112.4 | 56 09.1 +41.2 111.3 | 55 30.8 +41.0 110.2 | 54 52.3 +40.6 109.1 | 54 13.5 +40.4 108.1 |
| 29° | 57 28.7 +40.7 111.1 | 56 50.3 +40.4 110.0 | 56 11.8 +40.0 108.9 | 55 32.9 +39.8 107.9 | 54 53.9 +39.5 106.8 |



| 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°  | 31 29.8 +51.3 131.1 | 30 58.7 +51.1 130.1 | 30 27.1 +50.9 129.1 | 29 55.2 +50.5 128.1 | 29 22.8 +50.2 127.1 |
| 1°  | 32 21.1 +51.2 130.5 | 31 49.8 +50.9 129.5 | 31 18.0 +50.6 128.5 | 30 45.7 +50.4 127.5 | 30 13.0 +50.1 126.5 |
| 2°  | 33 12.3 +51.1 129.8 | 32 40.7 +50.7 128.8 | 32 08.6 +50.4 127.8 | 31 36.1 +50.1 126.8 | 31 03.1 +49.9 125.9 |
| 3°  | 34 03.4 +50.8 129.2 | 33 31.4 +50.5 128.2 | 32 59.0 +50.3 127.2 | 32 26.2 +50.0 126.2 | 31 53.0 +49.7 125.2 |
| 4°  | 34 54.2 +50.6 128.6 | 34 21.9 +50.4 127.5 | 33 49.3 +50.0 126.5 | 33 16.2 +49.7 125.5 | 32 42.7 +49.5 124.6 |
| 5°  | 35 44.8 +50.3 127.9 | 35 12.3 +50.1 126.9 | 34 39.3 +49.8 125.9 | 34 05.9 +49.6 124.9 | 33 32.2 +49.2 123.9 |
| 6°  | 36 35.1 +50.2 127.2 | 36 02.4 +49.8 126.2 | 35 29.1 +49.6 125.2 | 34 55.5 +49.3 124.2 | 34 21.4 +49.0 123.2 |
| 7°  | 37 25.3 +49.9 126.6 | 36 52.2 +49.6 125.5 | 36 18.7 +49.3 124.5 | 35 44.8 +49.0 123.5 | 35 10.4 +48.8 122.5 |
| 8°  | 38 15.2 +49.7 125.8 | 37 41.8 +49.4 124.8 | 37 08.0 +49.1 123.8 | 36 33.8 +48.8 122.8 | 35 59.2 +48.5 121.8 |
| 9°  | 39 04.9 +49.3 125.1 | 38 31.2 +49.1 124.1 | 37 57.1 +48.8 123.1 | 37 22.6 +48.5 122.0 | 36 47.7 +48.3 121.0 |
| 10° | 39 54.2 +49.1 124.4 | 39 20.3 +48.8 123.3 | 38 45.9 +48.5 122.3 | 38 11.1 +48.2 121.3 | 37 36.0 +47.9 120.3 |
| 11° | 40 43.3 +48.8 123.6 | 40 09.1 +48.4 122.6 | 39 34.4 +48.2 121.6 | 38 59.3 +47.9 120.5 | 38 23.9 +47.6 119.5 |
| 12° | 41 32.1 +48.5 122.9 | 40 57.5 +48.2 121.8 | 40 22.6 +47.9 120.8 | 39 47.2 +47.6 119.8 | 39 11.5 +47.4 118.8 |
| 13° | 42 20.6 +48.1 122.1 | 41 45.7 +47.9 121.0 | 41 10.5 +47.5 120.0 | 40 34.8 +47.3 119.0 | 39 58.9 +46.9 118.0 |
| 14° | 43 08.7 +47.8 121.3 | 42 33.6 +47.4 120.2 | 41 58.0 +47.2 119.2 | 41 22.1 +46.9 118.1 | 40 45.8 +46.7 117.1 |
| 15° | 43 56.5 +47.4 120.4 | 43 21.0 +47.1 119.4 | 42 45.2 +46.8 118.3 | 42 09.0 +46.5 117.3 | 41 32.5 +46.2 116.3 |
| 16° | 44 43.9 +47.0 119.6 | 44 08.1 +46.8 118.5 | 43 32.0 +46.4 117.5 | 42 55.5 +46.2 116.5 | 42 18.7 +45.9 115.4 |
| 17° | 45 30.9 +46.6 118.7 | 44 54.9 +46.2 117.6 | 44 18.4 +46.0 116.6 | 43 41.7 +45.7 115.6 | 43 04.6 +45.5 114.6 |
| 18° | 46 17.5 +46.2 117.8 | 45 41.1 +45.9 116.7 | 45 04.4 +45.6 115.7 | 44 27.4 +45.3 114.7 | 43 50.1 +45.0 113.7 |
| 19° | 47 03.7 +45.7 116.9 | 46 27.0 +45.4 115.8 | 45 50.0 +45.1 114.8 | 45 12.7 +44.8 113.7 | 44 35.1 +44.6 112.7 |
| 20° | 47 49.4 +45.2 115.9 | 47 12.4 +44.9 114.8 | 46 35.1 +44.6 113.8 | 45 57.5 +44.4 112.8 | 45 19.7 +44.1 111.8 |
| 21° | 48 34.6 +44.6 114.9 | 47 57.3 +44.4 113.9 | 47 19.7 +44.1 112.8 | 46 41.9 +43.8 111.8 | 46 03.8 +43.5 110.8 |
| 22° | 49 19.2 +44.2 113.9 | 48 41.7 +43.8 112.8 | 48 03.8 +43.6 111.8 | 47 25.7 +43.3 110.8 | 46 47.3 +43.1 109.8 |
| 23° | 50 03.4 +43.5 112.8 | 49 25.5 +43.3 111.8 | 48 47.4 +43.0 110.8 | 48 09.0 +42.7 109.8 | 47 30.4 +42.5 108.8 |
| 24° | 50 46.9 +42.9 111.8 | 50 08.8 +42.6 110.7 | 49 30.4 +42.3 109.7 | 48 51.7 +42.2 108.7 | 48 12.9 +41.9 107.8 |
| 25° | 51 29.8 +42.3 110.6 | 50 51.4 +42.0 109.6 | 50 12.7 +41.8 108.6 | 49 33.9 +41.4 107.6 | 48 54.8 +41.2 106.7 |
| 26° | 52 12.1 +41.6 109.5 | 51 33.4 +41.3 108.5 | 50 54.5 +41.0 107.5 | 50 15.3 +40.9 106.5 | 49 36.0 +40.6 105.6 |
| 27° | 52 53.7 +40.8 108.3 | 52 14.7 +40.6 107.3 | 51 35.5 +40.4 106.3 | 50 56.2 +40.1 105.4 | 50 16.6 +39.9 104.4 |
| 28° | 53 34.5 +40.1 107.1 | 52 55.3 +39.8 106.1 | 52 15.9 +39.6 105.1 | 51 36.3 +39.4 104.2 | 50 56.5 +39.2 103.2 |
| 29° | 54 14.6 +39.2 105.8 | 53 35.1 +39.0 104.8 | 52 55.5 +38.8 103.9 | 52 15.7 +38.6 103.0 | 51 35.7 +38.5 102.0 |

| 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°  | 28 49.9 +50.0 126.2 | 28 16.7 +49.7 125.2 | 27 43.1 +49.5 124.3 | 27 09.1 +49.2 123.4 | 26 34.7 +49.0 122.4 |
| 1°  | 29 39.9 +49.9 125.5 | 29 06.4 +49.6 124.6 | 28 32.6 +49.3 123.7 | 27 58.3 +49.1 122.7 | 27 23.7 +48.8 121.8 |
| 2°  | 30 29.8 +49.6 124.9 | 29 56.0 +49.4 123.9 | 29 21.9 +49.1 123.0 | 28 47.4 +48.8 122.1 | 28 12.5 +48.6 121.1 |
| 3°  | 31 19.4 +49.4 124.2 | 30 45.4 +49.1 123.3 | 30 11.0 +48.9 122.3 | 29 36.2 +48.7 121.4 | 29 01.1 +48.4 120.5 |
| 4°  | 32 08.8 +49.2 123.6 | 31 34.5 +49.0 122.6 | 30 59.9 +48.7 121.7 | 30 24.9 +48.4 120.7 | 29 49.5 +48.2 119.8 |
| 5°  | 32 58.0 +49.0 122.9 | 32 23.5 +48.7 121.9 | 31 48.6 +48.4 121.0 | 31 13.3 +48.2 120.0 | 30 37.7 +48.0 119.1 |
| 6°  | 33 47.0 +48.7 122.2 | 33 12.2 +48.5 121.2 | 32 37.0 +48.3 120.3 | 32 01.5 +48.0 119.3 | 31 25.7 +47.7 118.4 |
| 7°  | 34 35.7 +48.5 121.5 | 34 00.7 +48.2 120.5 | 33 25.3 +47.9 119.6 | 32 49.5 +47.7 118.6 | 32 13.4 +47.5 117.7 |
| 8°  | 35 24.2 +48.3 120.8 | 34 48.9 +48.0 119.8 | 34 13.2 +47.8 118.9 | 33 37.2 +47.5 117.9 | 33 00.9 +47.2 117.0 |
| 9°  | 36 12.5 +47.9 120.1 | 35 36.9 +47.7 119.1 | 35 01.0 +47.4 118.1 | 34 24.7 +47.2 117.2 | 33 48.1 +47.0 116.2 |
| 10° | 37 00.4 +47.7 119.3 | 36 24.6 +47.4 118.3 | 35 48.4 +47.2 117.4 | 35 11.9 +46.9 116.4 | 34 35.1 +46.7 115.5 |
| 11° | 37 48.1 +47.4 118.5 | 37 12.0 +47.1 117.6 | 36 35.6 +46.8 116.6 | 35 58.8 +46.7 115.6 | 35 21.8 +46.4 114.7 |
| 12° | 38 35.5 +47.0 117.8 | 37 59.1 +46.8 116.8 | 37 22.4 +46.6 115.8 | 36 45.5 +46.3 114.9 | 36 08.2 +46.1 113.9 |
| 13° | 39 22.5 +46.8 117.0 | 38 45.9 +46.5 116.0 | 38 09.0 +46.2 115.0 | 37 31.8 +45.9 114.1 | 36 54.3 +45.7 113.1 |
| 14° | 40 09.3 +46.3 116.1 | 39 32.4 +46.1 115.2 | 38 55.2 +45.9 114.2 | 38 17.7 +45.7 113.3 | 37 40.0 +45.4 112.3 |
| 15° | 40 55.6 +46.0 115.3 | 40 18.5 +45.8 114.3 | 39 41.1 +45.5 113.4 | 39 03.4 +45.3 112.4 | 38 25.4 +45.1 111.5 |
| 16° | 41 41.6 +45.7 114.5 | 41 04.3 +45.3 113.5 | 40 26.6 +45.1 112.5 | 39 48.7 +44.9 111.6 | 39 10.5 +44.7 110.6 |
| 17° | 42 27.3 +45.2 113.6 | 41 49.6 +45.0 112.6 | 41 11.7 +44.7 111.6 | 40 33.6 +44.4 110.7 | 39 55.2 +44.2 109.8 |
| 18° | 43 12.5 +44.7 112.7 | 42 34.6 +44.5 111.7 | 41 56.4 +44.3 110.8 | 41 18.0 +44.1 109.8 | 40 39.4 +43.9 108.9 |
| 19° | 43 57.2 +44.3 111.8 | 43 19.1 +44.1 110.8 | 42 40.7 +43.9 109.8 | 42 02.1 +43.7 108.9 | 41 23.3 +43.4 108.0 |
| 20° | 44 41.5 +43.9 110.8 | 44 03.2 +43.6 109.9 | 43 24.6 +43.4 108.9 | 42 45.8 +43.1 108.0 | 42 06.7 +43.0 107.1 |
| 21° | 45 25.4 +43.3 109.9 | 44 46.8 +43.1 108.9 | 44 08.0 +42.9 108.0 | 43 28.9 +42.7 107.0 | 42 49.7 +42.5 106.1 |
| 22° | 46 08.7 +42.8 108.9 | 45 29.9 +42.6 107.9 | 44 50.9 +42.3 107.0 | 44 11.6 +42.2 106.1 | 43 32.2 +42.0 105.1 |
| 23° | 46 51.5 +42.3 107.8 | 46 12.5 +42.0 106.9 | 45 33.2 +41.9 106.0 | 44 53.8 +41.7 105.1 | 44 14.2 +41.5 104.2 |
| 24° | 47 33.8 +41.7 106.8 | 46 54.5 +41.5 105.9 | 46 15.1 +41.2 104.9 | 45 35.5 +41.0 104.0 | 44 55.7 +40.9 103.1 |
| 25° | 48 15.5 +41.0 105.7 | 47 36.0 +40.8 104.8 | 46 56.3 +40.7 103.9 | 46 16.5 +40.5 103.0 | 45 36.6 +40.3 102.1 |
| 26° | 48 56.5 +40.4 104.6 | 48 16.8 +40.3 103.7 | 47 37.0 +40.0 102.8 | 46 57.0 +39.9 101.9 | 46 16.9 +39.8 101.0 |
| 27° | 49 36.9 +39.7 103.5 | 48 57.1 +39.5 102.6 | 48 17.0 +39.4 101.7 | 47 36.9 +39.2 100.8 | 46 56.7 +39.1 99.9  |
| 28° | 50 16.6 +39.0 102.3 | 49 36.6 +38.8 101.4 | 48 56.4 +38.7 100.5 | 48 16.1 +38.6 99.7  | 47 35.8 +38.4 98.8  |
| 29° | 50 55.6 +38.3 101.1 | 50 15.4 +38.1 100.2 | 49 35.1 +38.0 99.4  | 48 54.7 +37.8 98.5  | 48 14.2 +37.7 97.7  |

## Latitude 47°

## 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°  | 26 00.0 +48.8 121.5 | 25 25.0 +48.5 120.6 | 24 49.6 +48.3 119.7 | 24 13.9 +48.1 118.9 | 23 37.9 +47.9 118.0 |
| 1°  | 26 48.8 +48.5 120.9 | 26 13.5 +48.3 120.0 | 25 37.9 +48.1 119.1 | 25 02.0 +47.8 118.2 | 24 25.8 +47.6 117.3 |
| 2°  | 27 37.3 +48.4 120.2 | 27 01.8 +48.1 119.3 | 26 26.0 +47.9 118.4 | 25 49.8 +47.7 117.5 | 25 13.4 +47.5 116.7 |
| 3°  | 28 25.7 +48.1 119.6 | 27 49.9 +48.0 118.6 | 27 13.9 +47.7 117.7 | 26 37.5 +47.5 116.9 | 26 00.9 +47.2 116.0 |
| 4°  | 29 13.8 +48.0 118.9 | 28 37.9 +47.7 118.0 | 28 01.6 +47.5 117.1 | 27 25.0 +47.3 116.2 | 26 48.1 +47.1 115.3 |
| 5°  | 30 01.8 +47.7 118.2 | 29 25.6 +47.5 117.3 | 28 49.1 +47.2 116.4 | 28 12.3 +47.0 115.5 | 27 35.2 +46.8 114.6 |
| 6°  | 30 49.5 +47.5 117.5 | 30 13.1 +47.3 116.6 | 29 36.3 +47.1 115.7 | 28 59.3 +46.9 114.8 | 28 22.0 +46.7 113.9 |
| 7°  | 31 37.0 +47.3 116.8 | 31 00.4 +47.0 115.8 | 30 23.4 +46.8 114.9 | 29 46.2 +46.5 114.0 | 29 08.7 +46.3 113.2 |
| 8°  | 32 24.3 +47.0 116.0 | 31 47.4 +46.8 115.1 | 31 10.2 +46.6 114.2 | 30 32.7 +46.4 113.3 | 29 55.0 +46.2 112.4 |
| 9°  | 33 11.3 +46.7 115.3 | 32 34.2 +46.5 114.4 | 31 56.8 +46.3 113.5 | 31 19.1 +46.1 112.6 | 30 41.2 +45.9 111.7 |
| 10° | 33 58.0 +46.5 114.5 | 33 20.7 +46.2 113.6 | 32 43.1 +46.0 112.7 | 32 05.2 +45.8 111.8 | 31 27.1 +45.6 110.9 |
| 11° | 34 44.5 +46.2 113.8 | 34 06.9 +46.0 112.9 | 33 29.1 +45.7 112.0 | 32 51.0 +45.6 111.1 | 32 12.7 +45.4 110.2 |
| 12° | 35 30.7 +45.8 113.0 | 34 52.9 +45.6 112.1 | 34 14.8 +45.5 111.2 | 33 36.6 +45.2 110.3 | 32 58.1 +45.0 109.4 |
| 13° | 36 16.5 +45.5 112.2 | 35 38.5 +45.3 111.3 | 35 00.3 +45.1 110.4 | 34 21.8 +44.9 109.5 | 33 43.1 +44.8 108.6 |
| 14° | 37 02.0 +45.2 111.4 | 36 23.8 +45.0 110.5 | 35 45.4 +44.8 109.6 | 35 06.7 +44.6 108.7 | 34 27.9 +44.4 107.8 |
| 15° | 37 47.2 +44.9 110.6 | 37 08.8 +44.6 109.7 | 36 30.2 +44.4 108.8 | 35 51.3 +44.3 107.9 | 35 12.3 +44.1 107.0 |
| 16° | 38 32.1 +44.4 109.7 | 37 53.4 +44.3 108.8 | 37 14.6 +44.1 107.9 | 36 35.6 +43.9 107.0 | 35 56.4 +43.7 106.2 |
| 17° | 39 16.5 +44.1 108.9 | 38 37.7 +43.9 107.9 | 37 58.7 +43.7 107.1 | 37 19.5 +43.5 106.2 | 36 40.1 +43.4 105.3 |
| 18° | 40 00.6 +43.7 108.0 | 39 21.6 +43.5 107.1 | 38 42.4 +43.3 106.2 | 38 03.0 +43.1 105.3 | 37 23.5 +42.9 104.4 |
| 19° | 40 44.3 +43.2 107.1 | 40 05.1 +43.0 106.2 | 39 25.7 +42.9 105.3 | 38 46.1 +42.8 104.4 | 38 06.4 +42.6 103.6 |
| 20° | 41 27.5 +42.8 106.2 | 40 48.1 +42.6 105.3 | 40 08.6 +42.4 104.4 | 39 28.9 +42.3 103.5 | 38 49.0 +42.2 102.7 |
| 21° | 42 10.3 +42.3 105.2 | 41 30.7 +42.2 104.3 | 40 51.0 +42.0 103.5 | 40 11.2 +41.8 102.6 | 39 31.2 +41.7 101.7 |
| 22° | 42 52.6 +41.9 104.3 | 42 12.9 +41.7 103.4 | 41 33.0 +41.5 102.5 | 40 53.0 +41.4 101.6 | 40 12.9 +41.2 100.8 |
| 23° | 43 34.5 +41.3 103.3 | 42 54.6 +41.1 102.4 | 42 14.5 +41.0 101.5 | 41 34.4 +40.9 100.7 | 40 54.1 +40.8 99.8  |
| 24° | 44 15.8 +40.7 102.3 | 43 35.7 +40.6 101.4 | 42 55.5 +40.5 100.5 | 42 15.3 +40.3 99.7  | 41 34.9 +40.2 98.9  |
| 25° | 44 56.5 +40.2 101.2 | 44 16.3 +40.1 100.4 | 43 36.0 +40.0 99.5  | 42 55.6 +39.8 98.7  | 42 15.1 +39.8 97.9  |
| 26° | 45 36.7 +39.6 100.2 | 44 56.4 +39.5 99.3  | 44 16.0 +39.3 98.5  | 43 35.4 +39.3 97.7  | 42 54.9 +39.1 96.9  |
| 27° | 46 16.3 +39.0 99.1  | 45 35.9 +38.8 98.3  | 44 55.3 +38.8 97.4  | 44 14.7 +38.7 96.6  | 43 34.0 +38.6 95.8  |
| 28° | 46 55.3 +38.3 98.0  | 46 14.7 +38.2 97.2  | 45 34.1 +38.1 96.3  | 44 53.4 +38.0 95.5  | 44 12.6 +38.0 94.8  |
| 29° | 47 33.6 +37.6 96.9  | 46 52.9 +37.6 96.0  | 46 12.2 +37.5 95.2  | 45 31.4 +37.4 94.4  | 44 50.6 +37.4 93.7  |

| 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°  | 23 01.7 +47.6 117.1 | 22 25.1 +47.4 116.3 | 21 48.3 +47.2 115.4 | 21 11.2 +47.0 114.6 | 20 33.8 +46.8 113.7 |
| 1°  | 23 49.3 +47.4 116.5 | 23 12.5 +47.2 115.6 | 22 35.5 +47.0 114.7 | 21 58.2 +46.8 113.9 | 21 20.6 +46.7 113.1 |
| 2°  | 24 36.7 +47.2 115.8 | 23 59.7 +47.1 114.9 | 23 22.5 +46.8 114.1 | 22 45.0 +46.6 113.2 | 22 07.3 +46.4 112.4 |
| 3°  | 25 23.9 +47.1 115.1 | 24 46.8 +46.8 114.2 | 24 09.3 +46.7 113.4 | 23 31.6 +46.5 112.5 | 22 53.7 +46.3 111.7 |
| 4°  | 26 11.0 +46.8 114.4 | 25 33.6 +46.7 113.5 | 24 56.0 +46.4 112.7 | 24 18.1 +46.3 111.8 | 23 40.0 +46.1 111.0 |
| 5°  | 26 57.8 +46.7 113.7 | 26 20.3 +46.4 112.8 | 25 42.4 +46.3 112.0 | 25 04.4 +46.0 111.1 | 24 26.1 +45.9 110.3 |
| 6°  | 27 44.5 +46.4 113.0 | 27 06.7 +46.2 112.1 | 26 28.7 +46.0 111.3 | 25 50.4 +45.9 110.4 | 25 12.0 +45.7 109.6 |
| 7°  | 28 30.9 +46.2 112.3 | 27 52.9 +46.0 111.4 | 27 14.7 +45.9 110.6 | 26 36.3 +45.7 109.7 | 25 57.7 +45.5 108.9 |
| 8°  | 29 17.1 +46.0 111.6 | 28 38.9 +45.8 110.7 | 28 00.6 +45.5 109.8 | 27 22.0 +45.4 109.0 | 26 43.2 +45.2 108.1 |
| 9°  | 30 03.1 +45.7 110.8 | 29 24.7 +45.5 110.0 | 28 46.1 +45.4 109.1 | 28 07.4 +45.1 108.2 | 27 28.4 +45.0 107.4 |
| 10° | 30 48.8 +45.4 110.1 | 30 10.2 +45.3 109.2 | 29 31.5 +45.1 108.3 | 28 52.5 +45.0 107.5 | 28 13.4 +44.8 106.7 |
| 11° | 31 34.2 +45.2 109.3 | 30 55.5 +45.0 108.4 | 30 16.6 +44.8 107.6 | 29 37.5 +44.6 106.7 | 28 58.2 +44.5 105.9 |
| 12° | 32 19.4 +44.8 108.5 | 31 40.5 +44.7 107.7 | 31 01.4 +44.5 106.8 | 30 22.1 +44.4 106.0 | 29 42.7 +44.2 105.1 |
| 13° | 33 04.2 +44.6 107.7 | 32 25.2 +44.4 106.9 | 31 45.9 +44.3 106.0 | 31 06.5 +44.1 105.2 | 30 26.9 +44.0 104.3 |
| 14° | 33 48.8 +44.3 106.9 | 33 09.6 +44.1 106.1 | 32 30.2 +44.0 105.2 | 31 50.6 +43.8 104.4 | 31 10.9 +43.7 103.6 |
| 15° | 34 33.1 +43.9 106.1 | 33 53.7 +43.7 105.3 | 33 14.1 +43.6 104.4 | 32 34.4 +43.5 103.6 | 31 54.6 +43.3 102.7 |
| 16° | 35 17.0 +43.5 105.3 | 34 37.4 +43.4 104.4 | 33 57.7 +43.3 103.6 | 33 17.9 +43.1 102.8 | 32 37.9 +43.0 101.9 |
| 17° | 36 00.5 +43.3 104.4 | 35 20.8 +43.1 103.6 | 34 41.0 +42.9 102.8 | 34 01.0 +42.8 101.9 | 33 20.9 +42.7 101.1 |
| 18° | 36 43.8 +42.8 103.6 | 36 03.9 +42.7 102.7 | 35 23.9 +42.6 101.9 | 34 43.8 +42.5 101.1 | 34 03.6 +42.3 100.3 |
| 19° | 37 26.6 +42.4 102.7 | 36 46.6 +42.3 101.9 | 36 06.5 +42.2 101.0 | 35 26.3 +42.0 100.2 | 34 45.9 +42.0 99.4  |
| 20° | 38 09.0 +42.0 101.8 | 37 28.9 +41.9 101.0 | 36 48.7 +41.8 100.1 | 36 08.3 +41.7 99.3  | 35 27.9 +41.6 98.5  |
| 21° | 38 51.0 +41.6 100.9 | 38 10.8 +41.5 100.1 | 37 30.5 +41.3 99.2  | 36 50.0 +41.3 98.4  | 36 09.5 +41.2 97.6  |
| 22° | 39 32.6 +41.1 100.0 | 38 52.3 +41.0 99.1  | 38 11.8 +40.9 98.3  | 37 31.3 +40.8 97.5  | 36 50.7 +40.7 96.7  |
| 23° | 40 13.7 +40.7 99.0  | 39 33.3 +40.5 98.2  | 38 52.7 +40.5 97.4  | 38 12.1 +40.4 96.6  | 37 31.4 +40.4 95.8  |
| 24° | 40 54.4 +40.2 98.0  | 40 13.8 +40.1 97.2  | 39 33.2 +40.0 96.4  | 38 52.5 +39.9 95.7  | 38 11.8 +39.8 94.9  |
| 25° | 41 34.6 +39.6 97.1  | 40 53.9 +39.6 96.3  | 40 13.2 +39.5 95.5  | 39 32.4 +39.5 94.7  | 38 51.6 +39.4 93.9  |
| 26° | 42 14.2 +39.1 96.1  | 41 33.5 +39.0 95.3  | 40 52.7 +39.0 94.5  | 40 11.9 +38.9 93.7  | 39 31.0 +38.9 92.9  |
| 27° | 42 53.3 +38.5 95.0  | 42 12.5 +38.5 94.2  | 41 31.7 +38.4 93.5  | 40 50.8 +38.4 92.7  | 40 09.9 +38.4 92.1  |
| 28° | 43 31.8 +38.0 94.0  | 42 51.0 +37.9 93.2  | 42 10.1 +37.9 92.4  | 41 29.2 +37.9 91.7  | 40 48.3 +37.9 90.9  |
| 29° | 44 09.8 +37.3 92.9  | 43 28.9 +37.3 92.1  | 42 48.0 +37.3 91.4  | 42 07.1 +37.3 90.6  | 41 26.2 +37.2 89.9  |

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The data on this page is believed to be accurate but no warranty is given for its correctness. Use it only for training and exercising!

## Declination SAME name as Latitude

## Latitude 47°

| 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°  | 19 56.3 +46.6 112.9 | 19 18.5 +46.4 112.1 | 18 40.4 +46.3 111.2 | 18 02.2 +46.1 110.4 | 17 23.7 +46.0 109.6 |
| 1°  | 20 42.9 +46.4 112.2 | 20 04.9 +46.2 111.4 | 19 26.7 +46.1 110.6 | 18 48.3 +45.9 109.8 | 18 09.7 +45.7 109.0 |
| 2°  | 21 29.3 +46.3 111.5 | 20 51.1 +46.1 110.7 | 20 12.8 +45.9 109.9 | 19 34.2 +45.8 109.1 | 18 55.4 +45.6 108.3 |
| 3°  | 22 15.6 +46.1 110.9 | 21 37.2 +46.0 110.0 | 20 58.7 +45.8 109.2 | 20 20.0 +45.6 108.4 | 19 41.0 +45.5 107.6 |
| 4°  | 23 01.7 +45.9 110.2 | 22 23.2 +45.7 109.3 | 21 44.5 +45.6 108.5 | 21 05.6 +45.4 107.7 | 20 26.5 +45.3 106.9 |
| 5°  | 23 47.6 +45.7 109.5 | 23 08.9 +45.6 108.6 | 22 30.1 +45.4 107.8 | 21 51.0 +45.3 107.0 | 21 11.8 +45.1 106.2 |
| 6°  | 24 33.3 +45.6 108.8 | 23 54.5 +45.4 107.9 | 23 15.5 +45.2 107.1 | 22 36.3 +45.1 106.3 | 21 56.9 +45.0 105.5 |
| 7°  | 25 18.9 +45.3 108.0 | 24 39.9 +45.1 107.2 | 24 00.7 +45.0 106.4 | 23 21.4 +44.8 105.6 | 22 41.9 +44.7 104.8 |
| 8°  | 26 04.2 +45.1 107.3 | 25 25.0 +45.0 106.5 | 24 45.7 +44.8 105.7 | 24 06.2 +44.7 104.8 | 23 26.6 +44.5 104.0 |
| 9°  | 26 49.3 +44.8 106.6 | 26 10.0 +44.7 105.7 | 25 30.5 +44.6 104.9 | 24 50.9 +44.4 104.1 | 24 11.1 +44.4 103.3 |
| 10° | 27 34.1 +44.7 105.8 | 26 54.7 +44.5 105.0 | 26 15.1 +44.3 104.2 | 25 35.3 +44.3 103.4 | 24 55.5 +44.1 102.6 |
| 11° | 28 18.8 +44.3 105.1 | 27 39.2 +44.2 104.2 | 26 59.4 +44.1 103.4 | 26 19.6 +44.0 102.6 | 25 39.6 +43.9 101.8 |
| 12° | 29 03.1 +44.1 104.3 | 28 23.4 +44.0 103.5 | 27 43.5 +43.9 102.7 | 27 03.6 +43.7 101.9 | 26 23.5 +43.6 101.1 |
| 13° | 29 47.2 +43.8 103.5 | 29 07.4 +43.7 102.7 | 28 27.4 +43.6 101.9 | 27 47.3 +43.5 101.1 | 27 07.1 +43.4 100.3 |
| 14° | 30 31.0 +43.6 102.7 | 29 51.1 +43.4 101.9 | 29 11.0 +43.3 101.1 | 28 30.8 +43.2 100.3 | 27 50.5 +43.1 99.5  |
| 15° | 31 14.6 +43.2 101.9 | 30 34.5 +43.1 101.1 | 29 54.3 +43.0 100.3 | 29 14.0 +42.9 99.5  | 28 33.6 +42.8 98.7  |
| 16° | 31 57.8 +42.9 101.1 | 31 17.6 +42.8 100.3 | 30 37.3 +42.7 99.5  | 29 56.9 +42.6 98.7  | 29 16.4 +42.5 97.9  |
| 17° | 32 40.7 +42.6 100.3 | 32 00.4 +42.5 99.5  | 32 00.4 +42.4 98.7  | 30 39.5 +42.3 97.9  | 29 58.9 +42.3 97.1  |
| 18° | 33 23.3 +42.2 99.4  | 32 42.9 +42.1 98.6  | 32 02.4 +42.1 97.9  | 31 21.8 +42.0 97.1  | 30 41.2 +41.9 96.3  |
| 19° | 34 05.5 +41.9 98.6  | 33 25.0 +41.8 97.8  | 32 44.5 +41.7 97.0  | 32 03.8 +41.7 96.2  | 31 23.1 +41.6 95.5  |
| 20° | 34 47.4 +41.5 97.7  | 34 06.8 +41.4 96.9  | 33 26.2 +41.3 96.1  | 32 45.5 +41.3 95.4  | 32 04.7 +41.2 94.6  |
| 21° | 35 28.9 +41.1 96.8  | 34 48.2 +41.1 96.1  | 34 07.5 +41.0 95.3  | 33 26.8 +40.9 94.5  | 32 45.9 +40.9 93.7  |
| 22° | 36 10.0 +40.7 95.9  | 35 29.3 +40.6 95.2  | 34 48.5 +40.6 94.4  | 34 07.7 +40.5 93.6  | 33 26.8 +40.6 92.9  |
| 23° | 36 50.7 +40.3 95.0  | 36 09.9 +40.2 94.3  | 35 29.1 +40.2 93.5  | 34 48.2 +40.2 92.7  | 34 07.4 +40.1 92.0  |
| 24° | 37 31.0 +39.8 94.1  | 36 50.1 +39.8 93.3  | 36 09.3 +39.7 92.6  | 35 28.4 +39.7 91.8  | 34 47.5 +39.7 91.1  |
| 25° | 38 10.8 +39.4 93.1  | 37 29.9 +39.4 92.4  | 36 49.0 +39.3 91.6  | 36 08.1 +39.3 90.9  | 35 27.2 +39.3 90.2  |
| 26° | 38 50.2 +38.8 92.2  | 38 09.3 +38.8 91.4  | 37 28.3 +38.9 90.7  | 36 47.4 +38.9 90.0  | 36 06.5 +38.9 89.2  |
| 27° | 39 29.0 +38.4 91.2  | 38 48.1 +38.4 90.5  | 38 07.2 +38.4 89.7  | 37 26.3 +38.4 89.0  | 36 45.4 +38.4 88.3  |
| 28° | 40 07.4 +37.8 90.2  | 39 26.5 +37.8 89.5  | 38 45.6 +37.8 88.7  | 38 04.7 +37.9 88.0  | 37 23.8 +37.9 87.3  |
| 29° | 40 45.2 +37.3 89.2  | 40 04.3 +37.3 88.5  | 39 23.4 +37.4 87.8  | 38 42.6 +37.3 87.0  | 38 01.7 +37.4 86.3  |

| 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°  | 16 45.1 +45.8 108.8 | 16 06.3 +45.6 108.0 | 15 27.3 +45.5 107.2 | 14 48.1 +45.4 106.5 | 14 08.8 +45.2 105.7 |
| 1°  | 17 30.9 +45.6 108.2 | 16 51.9 +45.5 107.4 | 16 12.8 +45.3 106.6 | 15 33.5 +45.2 105.8 | 14 54.0 +45.1 105.0 |
| 2°  | 18 16.5 +45.5 107.5 | 17 37.4 +45.3 106.7 | 16 58.1 +45.2 105.9 | 16 18.7 +45.0 105.1 | 15 39.1 +44.9 104.3 |
| 3°  | 19 02.0 +45.3 106.8 | 18 22.7 +45.2 106.0 | 17 43.3 +45.0 105.2 | 17 03.7 +45.0 104.4 | 16 24.0 +44.8 103.6 |
| 4°  | 19 47.3 +45.1 106.1 | 19 07.9 +45.0 105.3 | 18 28.3 +44.9 104.5 | 17 48.7 +44.7 103.7 | 17 08.8 +44.7 102.9 |
| 5°  | 20 32.4 +45.0 105.4 | 19 52.9 +44.9 104.6 | 19 13.2 +44.8 103.8 | 18 33.4 +44.7 103.0 | 17 53.5 +44.5 102.2 |
| 6°  | 21 17.4 +44.8 104.7 | 20 37.8 +44.6 103.9 | 19 58.0 +44.5 103.1 | 19 18.1 +44.4 102.3 | 18 38.0 +44.4 101.5 |
| 7°  | 22 02.2 +44.6 104.0 | 21 22.4 +44.5 103.2 | 20 42.5 +44.4 102.4 | 20 02.5 +44.3 101.6 | 19 22.4 +44.2 100.8 |
| 8°  | 22 46.8 +44.5 103.2 | 22 06.9 +44.4 102.4 | 21 26.9 +44.2 101.7 | 20 46.8 +44.1 100.9 | 20 06.6 +44.0 100.1 |
| 9°  | 23 31.3 +44.2 102.5 | 22 51.3 +44.1 101.7 | 22 11.1 +44.0 100.9 | 21 30.9 +43.9 100.1 | 20 50.6 +43.8 99.4  |
| 10° | 24 15.5 +44.0 101.8 | 23 35.4 +43.9 101.0 | 22 55.1 +43.8 100.2 | 22 14.8 +43.7 99.4  | 21 34.4 +43.6 98.6  |
| 11° | 24 59.5 +43.7 101.0 | 24 19.3 +43.6 100.2 | 23 38.9 +43.6 99.4  | 22 58.5 +43.5 98.7  | 22 18.0 +43.5 97.9  |
| 12° | 25 43.2 +43.6 100.3 | 25 02.9 +43.5 99.5  | 24 22.5 +43.4 98.7  | 23 42.0 +43.3 97.9  | 23 01.5 +43.2 97.2  |
| 13° | 26 26.8 +43.3 99.5  | 25 46.4 +43.2 98.7  | 25 05.9 +43.1 97.9  | 24 25.3 +43.1 97.2  | 23 44.7 +43.0 96.4  |
| 14° | 27 10.1 +43.0 98.7  | 26 29.6 +42.9 97.9  | 25 49.0 +42.9 97.2  | 25 08.4 +42.8 96.4  | 24 27.7 +42.7 95.6  |
| 15° | 27 53.1 +42.7 97.9  | 27 12.5 +42.7 97.2  | 26 31.9 +42.6 96.4  | 25 51.2 +42.5 95.6  | 25 10.4 +42.5 94.9  |
| 16° | 28 35.8 +42.5 97.1  | 27 55.2 +42.4 96.4  | 27 14.5 +42.3 95.6  | 26 33.7 +42.3 94.8  | 25 52.9 +42.3 94.1  |
| 17° | 29 18.3 +42.2 96.3  | 28 37.6 +42.1 95.6  | 27 56.8 +42.1 94.8  | 27 16.0 +42.1 94.0  | 26 35.2 +42.0 93.3  |
| 18° | 30 00.5 +41.8 95.5  | 29 19.7 +41.8 94.7  | 28 38.9 +41.8 94.0  | 27 58.1 +41.7 93.2  | 27 17.2 +41.7 92.5  |
| 19° | 30 42.3 +41.6 94.7  | 30 01.5 +41.5 93.9  | 29 20.7 +41.5 93.2  | 28 39.8 +41.5 92.4  | 27 58.9 +41.5 91.7  |
| 20° | 31 23.9 +41.2 93.8  | 30 43.0 +41.2 93.1  | 30 02.2 +41.1 92.3  | 29 21.3 +41.1 91.6  | 28 40.4 +41.1 90.9  |
| 21° | 32 05.1 +40.9 93.0  | 31 24.2 +40.9 92.2  | 30 43.3 +40.8 91.5  | 30 02.4 +40.8 90.8  | 29 21.5 +40.8 90.0  |
| 22° | 32 46.0 +40.4 92.1  | 32 05.1 +40.4 91.4  | 31 24.1 +40.5 90.6  | 30 43.2 +40.5 89.9  | 30 02.3 +40.5 89.2  |
| 23° | 33 26.4 +40.2 91.2  | 32 45.5 +40.1 90.5  | 32 04.6 +40.1 89.8  | 31 23.7 +40.1 89.0  | 30 42.8 +40.1 88.3  |
| 24° | 34 06.6 +39.7 90.3  | 33 25.6 +39.8 89.6  | 32 44.7 +39.8 88.9  | 32 03.8 +39.8 88.2  | 31 22.9 +39.8 87.5  |
| 25° | 34 46.3 +39.3 89.4  | 34 05.4 +39.3 88.7  | 33 24.5 +39.3 88.0  | 32 43.6 +39.4 87.3  | 32 02.7 +39.4 86.6  |
| 26° | 35 25.6 +38.9 88.5  | 34 44.7 +38.9 87.8  | 34 03.8 +39.0 87.1  | 33 23.0 +38.9 86.4  | 32 42.1 +39.1 85.7  |
| 27° | 36 04.5 +38.4 87.6  | 35 23.6 +38.5 86.9  | 34 42.8 +38.5 86.2  | 34 01.9 +38.6 85.5  | 33 21.2 +38.6 84.8  |
| 28° | 36 42.9 +38.0 86.6  | 36 02.1 +38.0 85.9  | 35 21.3 +38.1 85.2  | 34 40.5 +38.2 84.5  | 33 59.8 +38.2 83.9  |
| 29° | 37 20.9 +37.5 85.6  | 36 40.1 +37.5 85.0  | 35 59.4 +37.6 84.3  | 35 18.7 +37.7 83.6  | 34 38.0 +37.8 82.9  |

| 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°  | 13 29.3 +45.1 104.9 | 12 49.7 +45.0 104.1 | 12 10.0 +44.8 103.4 | 11 30.1 +44.7 102.6 | 10 50.1 +44.6 101.8 |
| 1°  | 14 14.4 +45.0 104.2 | 13 34.7 +44.8 103.5 | 12 54.8 +44.7 102.7 | 12 14.8 +44.7 101.9 | 11 34.7 +44.6 101.2 |
| 2°  | 14 59.4 +44.8 103.5 | 14 19.5 +44.7 102.8 | 13 39.5 +44.7 102.0 | 12 59.5 +44.5 101.2 | 12 19.3 +44.4 100.5 |
| 3°  | 15 44.2 +44.7 102.9 | 15 04.2 +44.6 102.1 | 14 24.2 +44.5 101.3 | 13 44.0 +44.4 100.5 | 13 03.7 +44.3 99.8  |
| 4°  | 16 28.9 +44.6 102.2 | 15 48.8 +44.5 101.4 | 15 08.7 +44.3 100.6 | 14 28.4 +44.3 99.9  | 13 48.0 +44.2 99.1  |
| 5°  | 17 13.5 +44.4 101.5 | 16 33.3 +44.3 100.7 | 15 53.0 +44.3 99.9  | 15 12.7 +44.1 99.2  | 14 32.2 +44.1 98.4  |
| 6°  | 17 57.9 +44.2 100.8 | 17 17.6 +44.2 100.0 | 16 37.3 +44.1 99.2  | 15 56.8 +44.1 98.5  | 15 16.3 +44.0 97.7  |
| 7°  | 18 42.1 +44.1 100.0 | 18 01.8 +44.0 99.3  | 17 21.4 +43.9 98.5  | 16 40.9 +43.8 97.7  | 16 00.3 +43.8 97.0  |
| 8°  | 19 26.2 +44.0 99.3  | 18 45.8 +43.9 98.6  | 18 05.3 +43.8 97.8  | 17 24.7 +43.7 97.0  | 16 44.1 +43.6 96.3  |
| 9°  | 20 10.2 +43.7 98.6  | 19 29.7 +43.6 97.8  | 18 49.1 +43.6 97.1  | 18 08.4 +43.6 96.3  | 17 27.7 +43.5 95.6  |
| 10° | 20 53.9 +43.6 97.9  | 20 13.3 +43.5 97.1  | 19 32.7 +43.4 96.3  | 18 52.0 +43.4 95.6  | 18 11.2 +43.4 94.8  |
| 11° | 21 37.5 +43.3 97.1  | 20 56.8 +43.3 96.4  | 20 16.1 +43.3 95.6  | 19 35.4 +43.2 94.9  | 18 54.6 +43.2 94.1  |
| 12° | 22 20.8 +43.2 96.4  | 21 40.1 +43.1 95.6  | 20 59.4 +43.0 94.9  | 20 18.6 +43.0 94.1  | 19 37.8 +42.9 93.4  |
| 13° | 23 04.0 +42.9 95.6  | 22 23.2 +42.9 94.9  | 21 42.4 +42.9 94.1  | 21 01.6 +42.8 93.4  | 20 20.7 +42.8 92.6  |
| 14° | 23 46.9 +42.7 94.9  | 23 06.1 +42.7 94.1  | 22 25.3 +42.6 93.4  | 21 44.4 +42.7 92.6  | 21 03.5 +42.6 91.9  |
| 15° | 24 29.6 +42.5 94.1  | 23 48.8 +42.4 93.4  | 23 07.9 +42.5 92.6  | 22 27.1 +42.4 91.9  | 21 46.1 +42.4 91.1  |
| 16° | 25 12.1 +42.2 93.3  | 24 31.2 +42.3 92.6  | 23 50.4 +42.1 91.8  | 23 09.5 +42.1 91.1  | 22 28.5 +42.2 90.4  |
| 17° | 25 54.3 +42.0 92.5  | 25 13.5 +41.9 91.8  | 24 32.5 +42.0 91.1  | 23 51.6 +42.0 90.3  | 23 10.7 +42.0 89.6  |
| 18° | 26 36.3 +41.7 91.7  | 25 55.4 +41.7 91.0  | 25 14.5 +41.7 90.3  | 24 33.6 +41.7 89.5  | 23 52.7 +41.7 88.8  |
| 19° | 27 18.0 +41.4 90.9  | 26 37.1 +41.4 90.2  | 25 56.2 +41.4 89.5  | 25 15.3 +41.4 88.7  | 24 34.4 +41.4 88.0  |
| 20° | 27 59.4 +41.2 90.1  | 27 18.5 +41.2 89.4  | 26 37.6 +41.2 88.7  | 25 56.7 +41.2 87.9  | 25 15.8 +41.2 87.2  |
| 21° | 28 40.6 +40.8 89.3  | 27 59.7 +40.8 88.6  | 27 18.8 +40.8 87.8  | 26 37.9 +40.9 87.1  | 25 57.0 +40.9 86.4  |
| 22° | 29 21.4 +40.5 88.5  | 28 40.5 +40.5 87.7  | 27 59.6 +40.6 87.0  | 27 18.8 +40.6 86.3  | 26 37.9 +40.7 85.6  |
| 23° | 30 01.9 +40.2 87.6  | 29 21.0 +40.2 86.9  | 28 40.2 +40.2 86.2  | 27 59.4 +40.3 85.5  | 27 18.6 +40.3 84.8  |
| 24° | 30 42.1 +39.8 86.7  | 30 01.2 +39.9 86.0  | 29 20.4 +39.9 85.3  | 28 39.7 +39.9 84.6  | 27 58.9 +40.1 83.9  |
| 25° | 31 21.9 +39.5 85.9  | 30 41.1 +39.5 85.2  | 30 00.3 +39.6 84.5  | 29 19.6 +39.7 83.8  | 28 39.0 +39.7 83.1  |
| 26° | 32 01.4 +39.1 85.0  | 31 20.6 +39.2 84.3  | 30 39.9 +39.3 83.6  | 29 59.3 +39.3 82.9  | 29 18.7 +39.4 82.2  |
| 27° | 32 40.5 +38.7 84.1  | 31 59.8 +38.8 83.4  | 31 19.2 +38.8 82.7  | 30 38.6 +38.9 82.0  | 29 58.1 +39.1 81.4  |
| 28° | 33 19.2 +38.3 83.2  | 32 38.6 +38.3 82.5  | 31 58.0 +38.5 81.8  | 31 17.5 +38.6 81.2  | 30 37.2 +38.6 80.5  |
| 29° | 33 57.5 +37.8 82.2  | 33 16.9 +38.0 81.6  | 32 36.5 +38.1 80.9  | 31 56.1 +38.2 80.3  | 31 15.8 +38.4 79.6  |

| Dec | LHA 075° / 285°     | LHA 076° / 284°    | LHA 077° / 283°    | LHA 078° / 282°    | LHA 079° / 281°    |
|-----|---------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | 10 10.0 +44.5 101.1 | 9 29.8 +44.5 100.3 | 8 49.5 +44.4 99.6  | 8 09.1 +44.3 98.8  | 7 28.6 +44.3 98.1  |
| 1°  | 10 54.5 +44.5 100.4 | 10 14.3 +44.3 99.7 | 9 33.9 +44.3 98.9  | 8 53.4 +44.2 98.2  | 8 12.9 +44.1 97.4  |
| 2°  | 11 39.0 +44.3 99.7  | 10 58.6 +44.3 99.0 | 10 18.2 +44.2 98.2 | 9 37.6 +44.2 97.5  | 8 57.0 +44.1 96.7  |
| 3°  | 12 23.3 +44.3 99.0  | 11 42.9 +44.2 98.3 | 11 02.4 +44.1 97.5 | 10 21.8 +44.0 96.8 | 9 41.1 +44.0 96.0  |
| 4°  | 13 07.6 +44.1 98.3  | 12 27.1 +44.0 97.6 | 11 46.5 +44.0 96.8 | 11 05.8 +44.0 96.1 | 10 25.1 +43.9 95.3 |
| 5°  | 13 51.7 +44.0 97.6  | 13 11.1 +44.0 96.9 | 12 30.5 +43.9 96.1 | 11 49.8 +43.8 95.4 | 11 09.0 +43.8 94.7 |
| 6°  | 14 35.7 +43.9 96.9  | 13 55.1 +43.8 96.2 | 13 14.4 +43.8 95.4 | 12 33.6 +43.8 94.7 | 11 52.8 +43.7 94.0 |
| 7°  | 15 19.6 +43.8 96.2  | 14 38.9 +43.7 95.5 | 13 58.2 +43.6 94.7 | 13 17.4 +43.6 94.0 | 12 36.5 +43.6 93.3 |
| 8°  | 16 03.4 +43.6 95.5  | 15 22.6 +43.6 94.8 | 14 41.8 +43.6 94.0 | 14 01.0 +43.5 93.3 | 13 20.1 +43.5 92.5 |
| 9°  | 16 47.0 +43.5 94.8  | 16 06.2 +43.4 94.1 | 15 25.4 +43.4 93.3 | 14 44.5 +43.4 92.6 | 14 03.6 +43.4 91.8 |
| 10° | 17 30.5 +43.3 94.1  | 16 49.6 +43.3 93.3 | 16 08.8 +43.2 92.6 | 15 27.9 +43.2 91.9 | 14 47.0 +43.2 91.1 |
| 11° | 18 13.8 +43.1 93.4  | 17 32.9 +43.1 92.6 | 16 52.0 +43.1 91.9 | 16 11.1 +43.1 91.1 | 15 30.2 +43.1 90.4 |
| 12° | 18 56.9 +43.0 92.6  | 18 16.0 +43.0 91.9 | 17 35.1 +42.9 91.1 | 16 54.2 +42.9 90.4 | 16 13.3 +42.9 89.7 |
| 13° | 19 39.9 +42.7 91.9  | 18 59.0 +42.7 91.2 | 18 18.0 +42.8 90.4 | 17 37.1 +42.8 89.7 | 16 56.2 +42.8 89.0 |
| 14° | 20 22.6 +42.6 91.1  | 19 41.7 +42.6 90.4 | 19 00.8 +42.6 89.7 | 18 19.9 +42.6 88.9 | 17 39.0 +42.6 88.2 |
| 15° | 21 05.2 +42.4 90.4  | 20 24.3 +42.4 89.7 | 19 43.4 +42.4 88.9 | 19 02.5 +42.4 88.2 | 18 21.6 +42.4 87.5 |
| 16° | 21 47.6 +42.2 89.6  | 21 06.7 +42.2 88.9 | 20 25.8 +42.2 88.2 | 19 44.9 +42.2 87.5 | 19 04.0 +42.3 86.7 |
| 17° | 22 29.8 +42.0 88.9  | 21 48.9 +42.0 88.1 | 21 08.0 +42.0 87.4 | 20 27.1 +42.1 86.7 | 19 46.3 +42.1 86.0 |
| 18° | 23 11.8 +41.7 88.1  | 22 30.9 +41.7 87.4 | 21 50.0 +41.8 86.6 | 21 09.2 +41.8 85.9 | 20 28.4 +41.8 85.2 |
| 19° | 23 53.5 +41.5 87.3  | 23 12.6 +41.5 86.6 | 22 31.8 +41.5 85.9 | 21 51.0 +41.6 85.2 | 21 10.2 +41.7 84.5 |
| 20° | 24 35.0 +41.2 86.5  | 23 54.1 +41.3 85.8 | 23 13.3 +41.4 85.1 | 22 32.6 +41.4 84.4 | 21 51.9 +41.4 83.7 |
| 21° | 25 16.2 +41.0 85.7  | 24 35.4 +41.0 85.0 | 23 54.7 +41.1 84.3 | 23 14.0 +41.1 83.6 | 22 33.3 +41.3 82.9 |
| 22° | 25 57.2 +40.7 84.9  | 25 16.4 +40.8 84.2 | 24 35.8 +40.8 83.5 | 23 55.1 +40.9 82.8 | 23 14.6 +40.9 82.1 |
| 23° | 26 37.9 +40.4 84.1  | 25 57.2 +40.5 83.4 | 25 16.6 +40.5 82.7 | 24 36.0 +40.7 82.0 | 23 55.5 +40.8 81.3 |
| 24° | 27 18.3 +40.1 83.2  | 26 37.7 +40.2 82.6 | 25 57.1 +40.3 81.9 | 25 16.7 +40.3 81.2 | 24 36.3 +40.4 80.5 |
| 25° | 27 58.4 +39.8 82.4  | 27 17.9 +39.9 81.7 | 26 37.4 +40.0 81.0 | 25 57.0 +40.1 80.4 | 25 16.7 +40.2 79.7 |
| 26° | 28 38.2 +39.5 81.6  | 27 57.8 +39.5 80.9 | 27 17.4 +39.7 80.2 | 26 37.1 +39.8 79.5 | 25 56.9 +39.9 78.9 |
| 27° | 29 17.7 +39.1 80.7  | 28 37.3 +39.3 80.9 | 27 57.1 +39.4 79.4 | 27 16.9 +39.5 78.7 | 26 36.8 +39.7 78.0 |
| 28° | 29 56.8 +38.8 79.8  | 29 16.6 +38.9 79.2 | 28 36.5 +39.0 78.5 | 27 56.4 +39.2 77.9 | 27 16.5 +39.3 77.2 |
| 29° | 30 35.6 +38.5 78.9  | 29 55.5 +38.6 78.3 | 29 15.5 +38.7 77.6 | 28 35.6 +38.8 77.0 | 27 55.8 +39.0 76.3 |

| 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°  | 6 48.1 +44.1 97.3  | 6 07.5 +44.1 96.6  | 5 26.8 +44.0 95.9  | 4 46.1 +44.0 95.1  | 4 05.3 +44.0 94.4  |
| 1°  | 7 32.2 +44.1 96.7  | 6 51.6 +44.0 95.9  | 6 10.8 +44.0 95.2  | 5 30.1 +43.9 94.4  | 4 49.3 +43.9 93.7  |
| 2°  | 8 16.3 +44.1 96.0  | 7 35.6 +44.0 95.2  | 6 54.8 +44.0 94.5  | 6 14.0 +43.9 93.8  | 5 33.2 +43.9 93.0  |
| 3°  | 9 00.4 +43.9 95.3  | 8 19.6 +43.9 94.6  | 7 38.8 +43.9 93.8  | 6 57.9 +43.9 93.1  | 6 17.1 +43.8 92.3  |
| 4°  | 9 44.3 +43.9 94.6  | 9 03.5 +43.9 93.9  | 8 22.7 +43.8 93.1  | 7 41.8 +43.8 92.4  | 7 00.9 +43.8 91.7  |
| 5°  | 10 28.2 +43.8 93.9 | 9 47.4 +43.7 93.2  | 9 06.5 +43.7 92.4  | 8 25.6 +43.7 91.7  | 7 44.7 +43.7 91.0  |
| 6°  | 11 12.0 +43.7 93.2 | 10 31.1 +43.7 92.5 | 9 50.2 +43.7 91.7  | 9 09.3 +43.6 91.0  | 8 28.4 +43.6 90.3  |
| 7°  | 11 55.7 +43.5 92.5 | 11 14.8 +43.5 91.8 | 10 33.9 +43.5 91.0 | 9 52.9 +43.6 90.3  | 9 12.0 +43.6 89.6  |
| 8°  | 12 39.2 +43.5 91.8 | 11 58.3 +43.5 91.1 | 11 17.4 +43.5 90.3 | 10 36.5 +43.4 89.6 | 9 55.6 +43.4 88.9  |
| 9°  | 13 22.7 +43.3 91.1 | 12 41.8 +43.3 90.4 | 12 00.9 +43.3 89.6 | 11 19.9 +43.4 88.9 | 10 39.0 +43.4 88.2 |
| 10° | 14 06.0 +43.3 90.4 | 13 25.1 +43.2 89.7 | 12 44.2 +43.2 88.9 | 12 03.3 +43.2 88.2 | 11 22.4 +43.3 87.5 |
| 11° | 14 49.3 +43.0 89.7 | 14 08.3 +43.1 88.9 | 13 27.4 +43.2 88.2 | 12 46.5 +43.2 87.5 | 12 05.7 +43.1 86.8 |
| 12° | 15 32.3 +43.0 89.0 | 14 51.4 +43.0 88.2 | 14 10.6 +42.9 87.5 | 13 29.7 +43.0 86.8 | 12 48.8 +43.1 86.1 |
| 13° | 16 15.3 +42.8 88.2 | 15 34.4 +42.8 87.5 | 14 53.5 +42.9 86.8 | 14 12.7 +42.9 86.1 | 13 31.9 +42.9 85.3 |
| 14° | 16 58.1 +42.6 87.5 | 16 17.2 +42.7 86.8 | 15 36.4 +42.7 86.1 | 14 55.6 +42.7 85.3 | 14 14.8 +42.8 84.6 |
| 15° | 17 40.7 +42.5 86.8 | 16 59.9 +42.5 86.0 | 16 19.1 +42.5 85.3 | 15 38.3 +42.6 84.6 | 14 57.6 +42.7 83.9 |
| 16° | 18 23.2 +42.3 86.0 | 17 42.4 +42.3 85.3 | 17 01.6 +42.4 84.6 | 16 20.9 +42.5 83.9 | 15 40.3 +42.5 83.2 |
| 17° | 19 05.5 +42.1 85.3 | 18 24.7 +42.2 84.6 | 17 44.0 +42.3 83.8 | 17 03.4 +42.3 83.1 | 16 22.8 +42.3 82.4 |
| 18° | 19 47.6 +41.9 84.5 | 19 06.9 +42.0 83.8 | 18 26.3 +42.0 83.1 | 17 45.7 +42.1 82.4 | 17 05.1 +42.2 81.7 |
| 19° | 20 29.5 +41.8 83.8 | 19 48.9 +41.8 83.0 | 19 08.3 +41.9 82.3 | 18 27.8 +41.9 81.6 | 17 47.3 +42.1 81.0 |
| 20° | 21 11.3 +41.5 83.0 | 20 30.7 +41.6 82.3 | 19 50.2 +41.6 81.6 | 19 09.7 +41.8 80.9 | 18 29.4 +41.8 80.2 |
| 21° | 21 52.8 +41.3 82.2 | 21 12.3 +41.3 81.5 | 20 31.8 +41.5 80.8 | 19 51.5 +41.5 80.1 | 19 11.2 +41.7 79.4 |
| 22° | 22 34.1 +41.0 81.4 | 21 53.6 +41.2 80.7 | 21 13.3 +41.2 80.0 | 20 33.0 +41.4 79.4 | 19 52.9 +41.4 78.7 |
| 23° | 23 15.1 +40.8 80.6 | 22 34.8 +40.9 79.9 | 21 54.5 +41.1 79.3 | 21 14.4 +41.1 78.6 | 20 34.3 +41.3 77.9 |
| 24° | 23 55.9 +40.6 79.8 | 23 15.7 +40.7 79.2 | 22 35.6 +40.8 78.5 | 21 55.5 +40.9 77.8 | 21 15.6 +41.0 77.1 |
| 25° | 24 36.5 +40.3 79.0 | 23 56.4 +40.4 78.4 | 23 16.4 +40.5 77.7 | 22 36.4 +40.7 77.0 | 21 56.6 +40.8 76.3 |
| 26° | 25 16.8 +40.1 78.2 | 24 36.8 +40.2 77.5 | 23 56.9 +40.3 76.9 | 23 17.1 +40.4 76.2 | 22 37.4 +40.6 75.6 |
| 27° | 25 56.9 +39.7 77.4 | 25 17.0 +39.9 76.7 | 24 37.2 +40.0 76.1 | 23 57.5 +40.2 75.4 | 23 18.0 +40.3 74.8 |
| 28° | 26 36.6 +39.5 76.5 | 25 56.9 +39.6 75.7 | 25 17.2 +39.8 75.2 | 24 37.7 +39.9 74.6 | 23 58.3 +40.1 73.9 |
| 29° | 27 16.1 +39.1 75.7 | 26 36.5 +39.3 75.1 | 25 57.0 +39.5 74.4 | 25 17.6 +39.7 73.8 | 24 38.4 +39.8 73.1 |

| 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°  | 3 24.5 +43.9 93.7  | 2 43.6 +43.9 92.9  | 2 02.7 +43.9 92.2  | 1 21.8 +43.9 91.5  | 0 40.9 +43.9 90.7  |
| 1°  | 4 08.4 +43.9 93.0  | 3 27.5 +43.9 92.2  | 2 46.6 +43.9 91.5  | 2 05.7 +43.9 90.8  | 1 24.8 +43.9 90.0  |
| 2°  | 4 52.3 +43.9 92.3  | 4 11.4 +43.9 91.6  | 3 30.5 +43.9 90.8  | 2 49.6 +43.8 90.1  | 2 08.7 +43.8 89.4  |
| 3°  | 5 36.2 +43.8 91.6  | 4 55.3 +43.8 90.9  | 4 14.4 +43.8 90.1  | 3 33.4 +43.8 89.4  | 2 52.5 +43.8 88.7  |
| 4°  | 6 20.0 +43.8 90.9  | 5 39.1 +43.7 90.2  | 4 58.2 +43.7 89.5  | 4 17.2 +43.8 88.7  | 3 36.3 +43.8 88.0  |
| 5°  | 7 03.8 +43.7 90.2  | 6 22.8 +43.8 89.5  | 5 41.9 +43.7 88.8  | 5 01.0 +43.8 88.0  | 4 20.1 +43.8 87.3  |
| 6°  | 7 47.5 +43.6 89.5  | 7 06.6 +43.6 88.8  | 6 25.6 +43.7 88.1  | 5 44.8 +43.6 87.4  | 5 03.9 +43.7 86.6  |
| 7°  | 8 31.1 +43.6 88.8  | 7 50.2 +43.6 88.1  | 7 09.3 +43.6 87.4  | 6 28.4 +43.7 86.7  | 5 47.6 +43.7 85.9  |
| 8°  | 9 14.7 +43.4 88.2  | 8 33.8 +43.5 87.4  | 7 52.9 +43.5 86.7  | 7 12.1 +43.5 86.0  | 6 31.3 +43.6 85.2  |
| 9°  | 9 58.1 +43.4 87.5  | 9 17.3 +43.4 86.7  | 8 36.4 +43.5 86.0  | 7 55.6 +43.5 85.3  | 7 14.9 +43.5 84.6  |
| 10° | 10 41.5 +43.3 86.8 | 10 00.7 +43.3 86.0 | 9 19.9 +43.4 85.3  | 8 39.1 +43.5 84.6  | 7 58.4 +43.5 83.9  |
| 11° | 11 24.8 +43.2 86.0 | 10 44.0 +43.3 85.3 | 10 03.3 +43.3 84.6 | 9 22.6 +43.3 83.9  | 8 41.9 +43.4 83.2  |
| 12° | 12 08.0 +43.1 85.3 | 11 27.3 +43.1 84.6 | 10 46.6 +43.2 83.9 | 10 05.9 +43.3 83.2 | 9 25.3 +43.3 82.5  |
| 13° | 12 51.1 +43.0 84.6 | 12 10.4 +43.0 83.9 | 11 29.8 +43.0 83.2 | 10 49.2 +43.1 82.5 | 10 08.6 +43.2 81.8 |
| 14° | 13 34.1 +42.8 83.9 | 12 53.4 +42.9 83.2 | 12 12.8 +43.0 82.5 | 11 32.3 +43.1 81.8 | 10 51.8 +43.2 81.1 |
| 15° | 14 16.9 +42.8 83.2 | 13 36.3 +42.8 82.5 | 12 55.8 +42.9 81.8 | 12 15.4 +42.9 81.1 | 11 35.0 +43.0 80.4 |
| 16° | 14 59.7 +42.5 82.5 | 14 19.1 +42.7 81.8 | 13 38.7 +42.7 81.0 | 12 58.3 +42.8 80.3 | 12 18.0 +42.9 79.6 |
| 17° | 15 42.2 +42.5 81.7 | 15 01.8 +42.5 81.0 | 14 21.4 +42.6 80.3 | 13 41.1 +42.7 79.6 | 13 00.9 +42.8 78.9 |
| 18° | 16 24.7 +42.3 81.0 | 15 44.3 +42.4 80.3 | 15 04.0 +42.5 79.6 | 14 23.8 +42.6 78.9 | 13 43.7 +42.7 78.2 |
| 19° | 17 07.0 +42.1 80.3 | 16 26.7 +42.2 79.6 | 15 46.5 +42.3 78.9 | 15 06.4 +42.4 78.2 | 14 26.4 +42.5 77.5 |
| 20° | 17 49.1 +41.9 79.5 | 17 08.9 +42.0 78.8 | 16 28.8 +42.1 78.1 | 15 48.8 +42.3 77.4 | 15 08.9 +42.4 76.7 |
| 21° | 18 31.0 +41.8 78.8 | 17 50.9 +41.9 78.1 | 17 10.9 +42.0 77.4 | 16 31.1 +42.1 76.7 | 15 51.3 +42.3 76.0 |
| 22° | 19 12.8 +41.6 78.0 | 18 32.8 +41.7 77.3 | 17 52.9 +41.9 76.6 | 17 13.2 +41.9 76.0 | 16 33.6 +42.0 75.3 |
| 23° | 19 54.4 +41.3 77.2 | 19 14.5 +41.5 76.6 | 18 34.8 +41.6 75.9 | 17 55.1 +41.8 75.2 | 17 15.6 +42.0 74.5 |
| 24° | 20 35.7 +41.2 76.5 | 19 56.0 +41.3 75.8 | 19 16.4 +41.4 75.1 | 18 36.9 +41.6 74.4 | 17 57.6 +41.7 73.8 |
| 25° | 21 16.9 +41.0 75.7 | 20 37.3 +41.1 75.0 | 19 57.8 +41.3 74.4 | 19 18.5 +41.4 73.7 | 18 39.3 +41.6 73.0 |
| 26° | 21 57.9 +40.7 74.9 | 21 18.4 +40.9 74.2 | 20 39.1 +41.0 73.6 | 19 59.9 +41.2 72.9 | 19 20.9 +41.3 72.3 |
| 27° | 22 38.6 +40.5 74.1 | 21 59.3 +40.6 73.4 | 21 20.1 +40.9 72.8 | 20 41.1 +41.0 72.1 | 20 02.2 +41.2 71.5 |
| 28° | 23 19.1 +40.2 73.3 | 22 39.9 +40.5 72.7 | 22 01.0 +40.5 72.0 | 21 22.1 +40.8 71.4 | 20 43.4 +41.0 70.7 |
| 29° | 23 59.3 +40.0 72.5 | 23 20.4 +40.1 71.8 | 22 41.5 +40.4 71.2 | 22 02.9 +40.5 70.6 | 21 24.4 +40.7 69.9 |

# Latitude 47°

# 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 +43.9 90.0  | -0 40.9 +43.9      | -1 21.8 +43.9      | -2 02.7 +43.9      | -2 43.6 +43.9      |
| 1°  | 0 43.9 +43.9 89.3  | 0 03.0 +43.9 88.6  | -0 37.9 +43.9      | -1 18.8 +43.9      | -1 59.7 +44.0      |
| 2°  | 1 27.8 +43.8 88.6  | 0 46.9 +43.8 87.9  | 0 06.0 +43.9 87.2  | -0 34.9 +43.9      | -1 15.7 +44.0      |
| 3°  | 2 11.6 +43.9 88.0  | 1 30.7 +43.9 87.2  | 0 49.9 +43.9 86.5  | 0 09.0 +44.0 85.8  | -0 31.7 +43.9      |
| 4°  | 2 55.5 +43.8 87.3  | 2 14.6 +43.8 86.5  | 1 33.8 +43.9 85.8  | 0 53.0 +43.9 85.1  | 0 12.2 +44.0 84.3  |
| 5°  | 3 39.3 +43.8 86.6  | 2 58.4 +43.9 85.9  | 2 17.7 +43.8 85.1  | 1 36.9 +43.9 84.4  | 0 56.2 +44.0 83.7  |
| 6°  | 4 23.1 +43.7 85.9  | 3 42.3 +43.8 85.2  | 3 01.5 +43.9 84.4  | 2 20.8 +43.9 83.7  | 1 40.2 +43.9 83.0  |
| 7°  | 5 06.8 +43.7 85.2  | 4 26.1 +43.7 84.5  | 3 45.4 +43.8 83.8  | 3 04.7 +43.9 83.0  | 2 24.1 +43.9 82.3  |
| 8°  | 5 50.5 +43.7 84.5  | 5 09.8 +43.7 83.8  | 4 29.2 +43.7 83.1  | 3 48.6 +43.8 82.4  | 3 08.0 +44.0 81.6  |
| 9°  | 6 34.2 +43.6 83.8  | 5 53.5 +43.7 83.1  | 5 12.9 +43.7 82.4  | 4 32.4 +43.8 81.7  | 3 52.0 +43.8 80.9  |
| 10° | 7 17.8 +43.5 83.1  | 6 37.2 +43.6 82.4  | 5 56.6 +43.7 81.7  | 5 16.2 +43.7 81.0  | 4 35.8 +43.9 80.3  |
| 11° | 8 01.3 +43.5 82.4  | 7 20.8 +43.5 81.7  | 6 40.3 +43.6 81.0  | 5 59.9 +43.7 80.3  | 5 19.7 +43.7 79.6  |
| 12° | 8 44.8 +43.4 81.8  | 8 04.3 +43.5 81.0  | 7 23.9 +43.6 80.3  | 6 43.6 +43.7 79.6  | 6 03.4 +43.8 78.9  |
| 13° | 9 28.2 +43.3 81.1  | 8 47.8 +43.4 80.3  | 8 07.5 +43.5 79.6  | 7 27.3 +43.5 78.9  | 6 47.2 +43.6 78.2  |
| 14° | 10 11.5 +43.2 80.3 | 9 31.2 +43.3 79.6  | 8 51.0 +43.4 78.9  | 8 10.8 +43.6 78.2  | 7 30.8 +43.7 77.5  |
| 15° | 10 54.7 +43.1 79.6 | 10 14.5 +43.2 78.9 | 9 34.4 +43.3 78.2  | 8 54.4 +43.4 77.5  | 8 14.5 +43.5 76.8  |
| 16° | 11 37.8 +43.0 78.9 | 10 57.7 +43.1 78.2 | 10 17.7 +43.2 77.5 | 9 37.8 +43.3 76.8  | 8 58.0 +43.5 76.1  |
| 17° | 12 20.8 +42.9 78.2 | 11 40.8 +43.0 77.5 | 11 00.9 +43.1 76.8 | 10 21.1 +43.3 76.1 | 9 41.5 +43.3 75.4  |
| 18° | 13 03.7 +42.8 77.5 | 12 23.8 +42.9 76.8 | 11 44.0 +43.0 76.1 | 11 04.4 +43.1 75.4 | 10 24.8 +43.3 74.7 |
| 19° | 13 46.5 +42.6 76.8 | 13 06.7 +42.8 76.1 | 12 27.0 +43.0 75.4 | 11 47.5 +43.1 74.7 | 11 08.1 +43.2 74.0 |
| 20° | 14 29.1 +42.6 76.1 | 13 49.5 +42.6 75.4 | 13 10.0 +42.7 74.7 | 12 30.6 +42.9 74.0 | 11 51.3 +43.1 73.3 |
| 21° | 15 11.7 +42.3 75.3 | 14 32.1 +42.6 74.6 | 13 52.7 +42.7 74.0 | 13 13.5 +42.8 73.3 | 12 34.4 +42.9 72.6 |
| 22° | 15 54.0 +42.3 74.6 | 15 14.7 +42.3 73.9 | 14 35.4 +42.5 73.2 | 13 56.3 +42.7 72.6 | 13 17.3 +42.9 71.9 |
| 23° | 16 36.3 +42.0 73.9 | 15 57.0 +42.3 73.2 | 15 17.9 +42.4 72.5 | 14 39.0 +42.5 71.8 | 14 00.2 +42.7 71.2 |
| 24° | 17 18.3 +41.9 73.1 | 16 39.3 +42.0 72.4 | 16 00.3 +42.2 71.8 | 15 21.5 +42.4 71.1 | 14 42.9 +42.6 70.4 |
| 25° | 18 00.2 +41.8 72.4 | 17 21.3 +41.9 71.7 | 16 42.5 +42.1 71.0 | 16 03.9 +42.3 70.4 | 15 25.5 +42.4 69.7 |
| 26° | 18 42.0 +41.5 71.6 | 18 03.2 +41.7 70.9 | 17 24.6 +41.9 70.3 | 16 46.2 +42.1 69.6 | 16 07.9 +42.3 69.0 |
| 27° | 19 23.5 +41.4 70.8 | 18 44.9 +41.6 70.2 | 18 06.5 +41.7 69.5 | 17 28.3 +41.9 68.9 | 16 50.2 +42.1 68.2 |
| 28° | 20 04.9 +41.1 70.1 | 19 26.5 +41.3 69.4 | 18 48.2 +41.6 68.8 | 18 10.2 +41.7 68.1 | 17 32.3 +42.0 67.5 |
| 29° | 20 46.0 +41.0 69.3 | 20 07.8 +41.2 68.7 | 19 29.8 +41.3 68.0 | 18 51.9 +41.6 67.4 | 18 14.3 +41.7 66.7 |

| 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°  | -3 24.5 +44.0      | -4 05.3 +44.0      | -4 46.1 +44.1      | -5 26.8 +44.1      | -6 07.5 +44.2      |
| 1°  | -2 40.5 +44.0      | -3 21.3 +44.1      | -4 02.0 +44.1      | -4 42.7 +44.2      | -5 23.3 +44.2      |
| 2°  | -1 56.5 +44.0      | -2 37.2 +44.0      | -3 17.9 +44.1      | -3 58.5 +44.1      | -4 39.1 +44.2      |
| 3°  | -1 12.5 +44.0      | -1 53.2 +44.1      | -2 33.8 +44.1      | -3 14.4 +44.2      | -3 54.9 +44.3      |
| 4°  | -0 28.5 +44.1      | -1 09.1 +44.1      | -1 49.7 +44.2      | -2 30.2 +44.3      | -3 10.6 +44.3      |
| 5°  | 0 15.6 +44.0 82.9  | -0 25.0 +44.1      | -1 05.5 +44.1      | -1 45.9 +44.2      | -2 26.3 +44.3      |
| 6°  | 0 59.6 +44.0 82.3  | 0 19.1 +44.1 81.5  | -0 21.4 +44.2      | -1 01.7 +44.2      | -1 42.0 +44.4      |
| 7°  | 1 43.6 +44.0 81.6  | 1 03.2 +44.0 80.9  | 0 22.8 +44.2 80.1  | -0 17.5 +44.3      | -0 57.6 +44.3      |
| 8°  | 2 27.6 +44.0 80.9  | 1 47.2 +44.1 80.2  | 1 07.0 +44.1 79.4  | 0 26.8 +44.2 78.7  | -0 13.3 +44.4      |
| 9°  | 3 11.6 +43.9 80.2  | 2 31.3 +44.0 79.5  | 1 51.1 +44.2 78.8  | 1 11.0 +44.3 78.0  | 0 31.1 +44.3 77.3  |
| 10° | 3 55.5 +44.0 79.5  | 3 15.3 +44.1 78.8  | 2 35.3 +44.1 78.1  | 1 55.3 +44.2 77.4  | 1 15.4 +44.3 76.6  |
| 11° | 4 39.5 +43.8 78.9  | 3 59.4 +43.9 78.1  | 3 19.4 +44.1 77.4  | 2 39.5 +44.2 76.7  | 1 59.7 +44.3 76.0  |
| 12° | 5 23.3 +43.9 78.2  | 4 43.3 +44.0 77.4  | 4 03.5 +44.0 76.7  | 3 23.7 +44.2 76.0  | 2 44.0 +44.3 75.3  |
| 13° | 6 07.2 +43.8 77.5  | 5 27.3 +43.9 76.8  | 4 47.5 +44.0 76.0  | 4 07.9 +44.1 75.3  | 3 28.3 +44.3 74.6  |
| 14° | 6 51.0 +43.7 76.8  | 6 11.2 +43.8 76.1  | 5 31.5 +44.0 75.4  | 4 52.0 +44.1 74.7  | 4 12.6 +44.2 73.9  |
| 15° | 7 34.7 +43.6 76.1  | 6 55.0 +43.8 75.4  | 6 15.5 +43.9 74.7  | 5 36.1 +44.0 74.0  | 4 56.8 +44.2 73.3  |
| 16° | 8 18.3 +43.6 75.4  | 7 38.8 +43.7 74.7  | 6 59.4 +43.8 74.0  | 6 20.1 +44.0 73.3  | 5 41.0 +44.1 72.6  |
| 17° | 9 01.9 +43.5 74.7  | 8 22.5 +43.7 74.0  | 7 43.2 +43.8 73.3  | 7 04.1 +44.0 72.6  | 6 25.1 +44.1 71.9  |
| 18° | 9 45.4 +43.4 74.0  | 9 06.2 +43.5 73.3  | 8 27.0 +43.7 72.6  | 7 48.1 +43.8 71.9  | 7 09.2 +44.1 71.2  |
| 19° | 10 28.8 +43.4 73.3 | 9 49.7 +43.5 72.6  | 9 10.7 +43.7 71.9  | 8 31.9 +43.8 71.2  | 7 53.3 +43.9 70.5  |
| 20° | 11 12.2 +43.2 72.6 | 10 33.2 +43.4 71.9 | 9 54.4 +43.5 71.2  | 9 15.7 +43.7 70.5  | 8 37.2 +43.9 69.8  |
| 21° | 11 55.4 +43.1 71.9 | 11 16.6 +43.3 71.2 | 10 37.9 +43.5 70.5 | 9 59.4 +43.6 69.8  | 9 21.1 +43.8 69.1  |
| 22° | 12 38.5 +43.0 71.2 | 11 59.9 +43.1 70.5 | 11 21.4 +43.3 69.8 | 10 43.0 +43.6 69.1 | 10 04.9 +43.7 68.5 |
| 23° | 13 21.5 +42.9 70.5 | 12 43.0 +43.1 69.8 | 12 04.7 +43.3 69.1 | 11 26.6 +43.4 68.4 | 10 48.6 +43.6 67.8 |
| 24° | 14 04.4 +42.8 69.8 | 13 26.1 +42.9 69.1 | 12 48.0 +43.1 68.4 | 12 10.0 +43.3 67.7 | 11 32.2 +43.6 67.1 |
| 25° | 14 47.2 +42.6 69.0 | 14 09.0 +42.9 68.4 | 13 31.1 +43.0 67.7 | 12 53.3 +43.2 67.0 | 12 15.8 +43.4 66.4 |
| 26° | 15 29.8 +42.5 68.3 | 14 51.9 +42.6 67.6 | 14 14.1 +42.9 67.0 | 13 36.5 +43.1 66.3 | 12 59.2 +43.3 65.6 |
| 27° | 16 12.3 +42.3 67.6 | 15 34.5 +42.6 66.9 | 14 57.0 +42.7 66.3 | 14 19.6 +43.0 65.6 | 13 42.5 +43.1 64.9 |
| 28° | 16 54.6 +42.2 66.8 | 16 17.1 +42.3 66.2 | 15 39.7 +42.6 65.5 | 15 02.6 +42.8 64.9 | 14 25.6 +43.1 64.2 |
| 29° | 17 36.8 +42.0 66.1 | 16 59.4 +42.3 65.4 | 16 22.3 +42.5 64.8 | 15 45.4 +42.7 64.1 | 15 08.7 +42.9 63.5 |

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| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°    | LHA 103° / 257°    | LHA 104° / 256°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -6 48.1 +44.2      | -7 28.6 +44.3      | -8 09.1 +44.4      | -8 49.5 +44.4      | -9 29.8 +44.5      |
| 1°  | -6 03.9 +44.3      | -6 44.3 +44.3      | -7 24.7 +44.4      | -8 05.1 +44.6      | -8 45.3 +44.6      |
| 2°  | -5 19.6 +44.3      | -6 00.0 +44.4      | -6 40.3 +44.5      | -7 20.5 +44.5      | -8 00.7 +44.7      |
| 3°  | -4 35.3 +44.4      | -5 15.6 +44.4      | -5 55.8 +44.5      | -6 36.0 +44.6      | -7 16.0 +44.7      |
| 4°  | -3 50.9 +44.4      | -4 31.2 +44.5      | -5 11.3 +44.6      | -5 51.4 +44.7      | -6 31.3 +44.8      |
| 5°  | -3 06.5 +44.4      | -3 46.7 +44.5      | -4 26.7 +44.6      | -5 06.7 +44.7      | -5 46.5 +44.8      |
| 6°  | -2 22.1 +44.4      | -3 02.2 +44.5      | -3 42.1 +44.6      | -4 22.0 +44.8      | -5 01.7 +44.9      |
| 7°  | -1 37.7 +44.4      | -2 17.7 +44.6      | -2 57.5 +44.7      | -3 37.2 +44.8      | -4 16.8 +44.9      |
| 8°  | -0 53.3 +44.5      | -1 33.1 +44.6      | -2 12.8 +44.6      | -2 52.4 +44.8      | -3 31.9 +44.9      |
| 9°  | -0 08.8 +44.4      | -0 48.5 +44.5      | -1 28.2 +44.7      | -2 07.6 +44.8      | -2 47.0 +45.0      |
| 10° | 0 35.6 +44.5 75.9  | -0 04.0 +44.6      | -0 43.5 +44.7      | -1 22.8 +44.8      | -2 02.0 +45.0      |
| 11° | 1 20.1 +44.4 75.2  | 0 40.6 +44.6 74.5  | 0 01.2 +44.7 73.8  | -0 38.0 +44.9      | -1 17.0 +44.9      |
| 12° | 2 04.5 +44.5 74.6  | 1 25.2 +44.5 73.8  | 0 45.9 +44.7 73.1  | 0 06.9 +44.8 72.4  | -0 32.1 +45.0      |
| 13° | 2 49.0 +44.3 73.9  | 2 09.7 +44.5 73.2  | 1 30.6 +44.7 72.4  | 0 51.7 +44.8 71.7  | 0 12.9 +45.0 71.0  |
| 14° | 3 33.3 +44.4 73.2  | 2 54.2 +44.6 72.5  | 2 15.3 +44.7 71.8  | 1 36.5 +44.8 71.0  | 0 57.9 +45.0 70.3  |
| 15° | 4 17.7 +44.3 72.5  | 3 38.8 +44.4 71.8  | 3 00.0 +44.6 71.1  | 2 21.3 +44.8 70.4  | 1 42.9 +44.9 69.7  |
| 16° | 5 02.0 +44.3 71.9  | 4 23.2 +44.5 71.2  | 3 44.6 +44.6 70.4  | 3 06.1 +44.8 69.7  | 2 27.8 +45.0 69.0  |
| 17° | 5 46.3 +44.3 71.2  | 5 07.7 +44.4 70.5  | 4 29.2 +44.6 69.8  | 3 50.9 +44.7 69.1  | 3 12.8 +44.9 68.3  |
| 18° | 6 30.6 +44.2 70.5  | 5 52.1 +44.3 69.8  | 5 13.8 +44.5 69.1  | 4 35.6 +44.7 68.4  | 3 57.7 +44.9 67.7  |
| 19° | 7 14.8 +44.1 69.8  | 6 36.4 +44.3 69.1  | 5 58.3 +44.5 68.4  | 5 20.3 +44.7 67.7  | 4 42.6 +44.8 67.0  |
| 20° | 7 58.9 +44.0 69.1  | 7 20.7 +44.3 68.4  | 6 42.8 +44.4 67.7  | 6 05.0 +44.6 67.0  | 5 27.4 +44.8 66.3  |
| 21° | 8 42.9 +44.0 68.5  | 8 05.0 +44.1 67.8  | 7 27.2 +44.4 67.1  | 6 49.6 +44.6 66.4  | 6 12.2 +44.8 65.7  |
| 22° | 9 26.9 +43.9 67.8  | 8 49.1 +44.1 67.1  | 8 11.6 +44.2 66.4  | 7 34.2 +44.4 65.7  | 6 57.0 +44.7 65.0  |
| 23° | 10 10.8 +43.8 67.1 | 9 33.2 +44.0 66.4  | 8 55.8 +44.3 65.7  | 8 18.6 +44.5 65.0  | 7 41.7 +44.6 64.3  |
| 24° | 10 54.6 +43.8 66.4 | 10 17.2 +44.0 65.7 | 9 40.1 +44.1 65.0  | 9 03.1 +44.3 64.3  | 8 26.3 +44.6 63.7  |
| 25° | 11 38.4 +43.6 65.7 | 11 01.2 +43.8 65.0 | 10 24.2 +44.0 64.3 | 9 47.4 +44.3 63.7  | 9 10.9 +44.4 63.0  |
| 26° | 12 22.0 +43.5 65.0 | 11 45.0 +43.7 64.3 | 11 08.2 +44.0 63.6 | 10 31.7 +44.1 63.0 | 9 55.3 +44.4 62.3  |
| 27° | 13 05.5 +43.4 64.3 | 12 28.7 +43.7 63.6 | 11 52.2 +43.8 62.9 | 11 15.8 +44.1 62.3 | 10 39.7 +44.4 61.6 |
| 28° | 13 48.9 +43.3 63.6 | 13 12.4 +43.5 62.9 | 12 36.0 +43.8 62.2 | 11 59.9 +44.0 61.6 | 11 24.1 +44.2 60.9 |
| 29° | 14 32.2 +43.1 62.9 | 13 55.9 +43.3 62.2 | 13 19.8 +43.6 61.5 | 12 43.9 +43.9 60.9 | 12 08.3 +44.1 60.2 |

| Dec | LHA 105° / 255°    | LHA 106° / 254°    | LHA 107° / 253°    | LHA 108° / 252°   | LHA 109° / 251°   |
|-----|--------------------|--------------------|--------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                    |                    |                    |                   |                   |
| 1°  | -9 25.4 +44.7      |                    |                    |                   |                   |
| 2°  | -8 40.7 +44.8      | -9 20.6 +44.9      |                    |                   |                   |
| 3°  | -7 55.9 +44.8      | -8 35.7 +44.9      | -9 15.4 +45.1      | -9 54.9 +45.2     |                   |
| 4°  | -7 11.1 +44.9      | -7 50.8 +45.1      | -8 30.3 +45.1      | -9 09.7 +45.3     | -9 48.9 +45.4     |
| 5°  | -6 26.2 +45.0      | -7 05.7 +45.0      | -7 45.2 +45.2      | -8 24.4 +45.3     | -9 03.5 +45.4     |
| 6°  | -5 41.2 +45.0      | -6 20.7 +45.1      | -7 00.0 +45.3      | -7 39.1 +45.4     | -8 18.1 +45.6     |
| 7°  | -4 56.2 +45.0      | -5 35.6 +45.2      | -6 14.7 +45.3      | -6 53.7 +45.5     | -7 32.5 +45.6     |
| 8°  | -4 11.2 +45.0      | -4 50.4 +45.2      | -5 29.4 +45.3      | -6 08.2 +45.5     | -6 46.9 +45.6     |
| 9°  | -3 26.2 +45.1      | -4 05.2 +45.3      | -4 44.1 +45.4      | -5 22.7 +45.5     | -6 01.3 +45.7     |
| 10° | -2 41.1 +45.1      | -3 19.9 +45.2      | -3 58.7 +45.4      | -4 37.2 +45.6     | -5 15.6 +45.8     |
| 11° | -1 56.0 +45.2      | -2 34.7 +45.3      | -3 13.3 +45.5      | -3 51.6 +45.6     | -4 29.8 +45.7     |
| 12° | -1 10.8 +45.1      | -1 49.4 +45.3      | -2 27.8 +45.5      | -3 06.0 +45.6     | -3 44.1 +45.9     |
| 13° | -0 25.7 +45.2      | -1 04.1 +45.3      | -1 42.3 +45.4      | -2 20.4 +45.6     | -2 58.2 +45.8     |
| 14° | 0 19.5 +45.1 69.6  | -0 18.8 +45.3      | -0 56.9 +45.5      | -1 34.8 +45.7     | -2 12.4 +45.8     |
| 15° | 1 04.6 +45.1 68.9  | 0 26.5 +45.3 68.2  | -0 11.4 +45.5      | -0 49.1 +45.7     | -1 26.6 +45.9     |
| 16° | 1 49.7 +45.1 68.3  | 1 11.8 +45.3 67.6  | 0 34.1 +45.5 66.8  | -0 03.4 +45.6     | -0 40.7 +45.8     |
| 17° | 2 34.8 +45.1 67.6  | 1 57.1 +45.3 66.9  | 1 19.6 +45.4 66.2  | 0 42.2 +45.7 65.4 | 0 05.1 +45.9 64.7 |
| 18° | 3 19.9 +45.1 67.0  | 2 42.4 +45.2 66.2  | 2 05.0 +45.5 65.5  | 1 27.9 +45.6 64.8 | 0 51.0 +45.8 64.1 |
| 19° | 4 05.0 +45.0 66.3  | 3 27.6 +45.3 65.6  | 2 50.5 +45.4 64.9  | 2 13.5 +45.7 64.1 | 1 36.8 +45.9 63.4 |
| 20° | 4 50.0 +45.0 65.6  | 4 12.9 +45.2 64.9  | 3 35.9 +45.4 64.2  | 2 59.2 +45.6 63.5 | 2 22.7 +45.8 62.8 |
| 21° | 5 35.0 +45.0 65.0  | 4 58.1 +45.1 64.3  | 4 21.3 +45.4 63.6  | 3 44.8 +45.6 62.8 | 3 08.5 +45.8 62.1 |
| 22° | 6 20.0 +44.9 64.3  | 5 43.2 +45.1 63.6  | 5 06.7 +45.3 62.9  | 4 30.4 +45.5 62.2 | 3 54.3 +45.8 61.5 |
| 23° | 7 04.9 +44.8 63.6  | 6 28.3 +45.1 62.9  | 5 52.0 +45.3 62.2  | 5 15.9 +45.5 61.5 | 4 40.1 +45.7 60.8 |
| 24° | 7 49.7 +44.8 63.0  | 7 13.4 +45.0 62.3  | 6 37.3 +45.2 61.6  | 6 01.4 +45.5 60.9 | 5 25.8 +45.7 60.2 |
| 25° | 8 34.5 +44.7 62.3  | 7 58.4 +44.9 61.6  | 7 22.5 +45.2 60.9  | 6 46.9 +45.4 60.2 | 6 11.5 +45.6 59.5 |
| 26° | 9 19.2 +44.7 61.6  | 8 43.3 +44.9 60.9  | 8 07.7 +45.1 60.3  | 7 32.3 +45.3 59.6 | 6 57.1 +45.6 58.9 |
| 27° | 10 03.9 +44.5 60.9 | 9 28.2 +44.8 60.3  | 8 52.8 +45.0 59.6  | 8 17.6 +45.3 58.9 | 7 42.7 +45.5 58.2 |
| 28° | 10 48.4 +44.5 60.3 | 10 13.0 +44.7 59.6 | 9 37.8 +45.0 58.9  | 9 02.9 +45.2 58.2 | 8 28.2 +45.5 57.6 |
| 29° | 11 32.9 +44.3 59.6 | 10 57.7 +44.6 58.9 | 10 22.8 +44.9 58.2 | 9 48.1 +45.1 57.6 | 9 13.7 +45.4 56.9 |

| Dec | LHA 110° / 250°   | LHA 111° / 249°   | LHA 112° / 248°   | LHA 113° / 247°   | LHA 114° / 246°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  |                   |                   |                   |                   |                   |
| 3°  |                   |                   |                   |                   |                   |
| 4°  |                   |                   |                   |                   |                   |
| 5°  | -9 42.5 +45.6     |                   |                   |                   |                   |
| 6°  | -8 56.9 +45.7     | -9 35.5 +45.9     |                   |                   |                   |
| 7°  | -8 11.2 +45.8     | -8 49.6 +45.9     | -9 27.9 +46.1     |                   |                   |
| 8°  | -7 25.4 +45.8     | -8 03.7 +46.0     | -8 41.8 +46.1     | -9 19.7 +46.3     | -9 57.4 +46.5     |
| 9°  | -6 39.6 +45.9     | -7 17.7 +46.0     | -7 55.7 +46.2     | -8 33.4 +46.4     | -9 10.9 +46.6     |
| 10° | -5 53.7 +45.9     | -6 31.7 +46.1     | -7 09.5 +46.3     | -7 47.0 +46.4     | -8 24.3 +46.6     |
| 11° | -5 07.8 +45.9     | -5 45.6 +46.1     | -6 23.2 +46.3     | -7 00.6 +46.5     | -7 37.7 +46.7     |
| 12° | -4 21.9 +46.0     | -4 59.5 +46.2     | -5 36.9 +46.4     | -6 14.1 +46.6     | -6 51.0 +46.7     |
| 13° | -3 35.9 +46.0     | -4 13.3 +46.2     | -4 50.5 +46.3     | -5 27.5 +46.6     | -6 04.3 +46.8     |
| 14° | -2 49.9 +46.0     | -3 27.1 +46.2     | -4 04.2 +46.5     | -4 40.9 +46.6     | -5 17.5 +46.8     |
| 15° | -2 03.9 +46.1     | -2 40.9 +46.2     | -3 17.7 +46.4     | -3 54.3 +46.6     | -4 30.7 +46.9     |
| 16° | -1 17.8 +46.0     | -1 54.7 +46.3     | -2 31.3 +46.5     | -3 07.7 +46.7     | -3 43.8 +46.9     |
| 17° | -0 31.8 +46.1     | -1 08.4 +46.2     | -1 44.8 +46.4     | -2 21.0 +46.7     | -2 56.9 +46.9     |
| 18° | 0 14.3 +46.1 63.3 | -0 22.2 +46.3     | -0 58.4 +46.5     | -1 34.3 +46.7     | -2 10.0 +46.9     |
| 19° | 1 00.4 +46.0 62.7 | 0 24.1 +46.3 62.0 | -0 11.9 +46.5     | -0 47.6 +46.7     | -1 23.1 +46.9     |
| 20° | 1 46.4 +46.0 62.1 | 1 10.4 +46.2 61.3 | 0 34.6 +46.5 60.6 | -0 00.9 +46.7     | -0 36.2 +46.9     |
| 21° | 2 32.4 +46.1 61.4 | 1 56.6 +46.3 60.7 | 1 21.1 +46.4 60.0 | 0 45.8 +46.7 59.3 | 0 10.7 +47.0 58.5 |
| 22° | 3 18.5 +46.0 60.8 | 2 42.9 +46.2 60.1 | 2 07.5 +46.5 59.3 | 1 32.5 +46.7 58.6 | 0 57.7 +46.9 57.9 |
| 23° | 4 04.5 +45.9 60.1 | 3 29.1 +46.2 59.4 | 2 54.0 +46.4 58.7 | 2 19.2 +46.6 58.0 | 1 44.6 +46.9 57.3 |
| 24° | 4 50.4 +45.9 59.5 | 4 15.3 +46.2 58.8 | 3 40.4 +46.4 58.1 | 3 05.8 +46.7 57.4 | 2 31.5 +46.9 56.7 |
| 25° | 5 36.3 +45.9 58.8 | 5 01.5 +46.1 58.1 | 4 26.8 +46.4 57.4 | 3 52.5 +46.6 56.7 | 3 18.4 +46.9 56.0 |
| 26° | 6 22.2 +45.9 58.2 | 5 47.6 +46.1 57.5 | 5 13.2 +46.3 56.8 | 4 39.1 +46.6 56.1 | 4 05.3 +46.8 55.4 |
| 27° | 7 08.1 +45.7 57.5 | 6 33.7 +46.0 56.9 | 5 59.5 +46.3 56.2 | 5 25.7 +46.5 55.5 | 4 52.1 +46.8 54.8 |
| 28° | 7 53.8 +45.7 56.9 | 7 19.7 +46.0 56.2 | 6 45.8 +46.3 55.5 | 6 12.2 +46.5 54.8 | 5 38.9 +46.8 54.1 |
| 29° | 8 39.5 +45.7 56.2 | 8 05.7 +45.9 55.6 | 7 32.1 +46.1 54.9 | 6 58.7 +46.5 54.2 | 6 25.7 +46.7 53.5 |

| Dec | LHA 115° / 245°   | LHA 116° / 244°   | LHA 117° / 243°   | LHA 118° / 242°   | LHA 119° / 241°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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°  | -9 48.2 +46.8     |                   |                   |                   |                   |
| 10° | -9 01.4 +46.8     | -9 38.3 +47.0     |                   |                   |                   |
| 11° | -8 14.6 +46.9     | -8 51.3 +47.1     | -9 27.7 +47.3     |                   |                   |
| 12° | -7 27.7 +46.9     | -8 04.2 +47.2     | -8 40.4 +47.4     | -9 16.3 +47.5     | -9 52.0 +47.8     |
| 13° | -6 40.8 +47.0     | -7 17.0 +47.2     | -7 53.0 +47.4     | -8 28.8 +47.7     | -9 04.2 +47.8     |
| 14° | -5 53.8 +47.0     | -6 29.8 +47.2     | -7 05.6 +47.4     | -7 41.1 +47.6     | -8 16.4 +47.9     |
| 15° | -5 06.8 +47.1     | -5 42.6 +47.3     | -6 18.2 +47.5     | -6 53.5 +47.8     | -7 28.5 +48.0     |
| 16° | -4 19.7 +47.1     | -4 55.3 +47.3     | -5 30.7 +47.6     | -6 05.7 +47.7     | -6 40.5 +48.0     |
| 17° | -3 32.6 +47.1     | -4 08.0 +47.3     | -4 43.1 +47.5     | -5 18.0 +47.8     | -5 52.5 +48.0     |
| 18° | -2 45.5 +47.2     | -3 20.7 +47.4     | -3 55.6 +47.6     | -4 30.2 +47.9     | -5 04.5 +48.1     |
| 19° | -1 58.3 +47.1     | -2 33.3 +47.4     | -3 08.0 +47.7     | -3 42.3 +47.8     | -4 16.4 +48.1     |
| 20° | -1 11.2 +47.2     | -1 45.9 +47.4     | -2 20.3 +47.6     | -2 54.5 +47.9     | -3 28.3 +48.1     |
| 21° | -0 24.0 +47.1     | -0 58.5 +47.4     | -1 32.7 +47.6     | -2 06.6 +47.9     | -2 40.2 +48.1     |
| 22° | 0 23.1 +47.2 57.2 | -0 11.1 +47.4     | -0 45.1 +47.7     | -1 18.7 +47.9     | -1 52.1 +48.2     |
| 23° | 1 10.3 +47.2 56.6 | 0 36.3 +47.4 55.8 | 0 02.6 +47.6 55.1 | -0 30.8 +47.9     | -1 03.9 +48.1     |
| 24° | 1 57.5 +47.1 55.9 | 1 23.7 +47.4 55.2 | 0 50.2 +47.7 54.5 | 0 17.1 +47.9 53.8 | -0 15.8 +48.2     |
| 25° | 2 44.6 +47.1 55.3 | 2 11.1 +47.4 54.6 | 1 37.9 +47.6 53.9 | 1 05.0 +47.9 53.2 | 0 32.4 +48.1 52.4 |
| 26° | 3 31.7 +47.1 54.7 | 2 58.5 +47.3 54.0 | 2 25.5 +47.6 53.3 | 1 52.9 +47.9 52.6 | 1 20.5 +48.2 51.8 |
| 27° | 4 18.8 +47.1 54.1 | 3 45.8 +47.4 53.4 | 3 13.1 +47.6 52.7 | 2 40.8 +47.8 52.0 | 2 08.7 +48.1 51.2 |
| 28° | 5 05.9 +47.0 53.5 | 4 33.2 +47.3 52.8 | 4 00.7 +47.6 52.1 | 3 28.6 +47.9 51.4 | 2 56.8 +48.1 50.6 |
| 29° | 5 52.9 +47.0 52.8 | 5 20.5 +47.2 52.1 | 4 48.3 +47.5 51.4 | 4 16.5 +47.8 50.8 | 3 44.9 +48.1 50.0 |



| Dec | LHA 120° / 240°   | LHA 121° / 239°   | LHA 122° / 238°   | LHA 123° / 237°   | LHA 124° / 236°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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° | -9 39.4 +48.1     |                   |                   |                   |                   |
| 14° | -8 51.3 +48.1     | -9 26.0 +48.4     |                   |                   |                   |
| 15° | -8 03.2 +48.2     | -8 37.6 +48.4     | -9 11.7 +48.6     | -9 45.5 +48.9     |                   |
| 16° | -7 15.0 +48.2     | -7 49.2 +48.5     | -8 23.1 +48.7     | -8 56.6 +48.9     | -9 29.9 +49.2     |
| 17° | -6 26.8 +48.3     | -7 00.7 +48.5     | -7 34.4 +48.8     | -8 07.7 +49.0     | -8 40.7 +49.3     |
| 18° | -5 38.5 +48.3     | -6 12.2 +48.5     | -6 45.6 +48.8     | -7 18.7 +49.1     | -7 51.4 +49.3     |
| 19° | -4 50.2 +48.3     | -5 23.7 +48.6     | -5 56.8 +48.8     | -6 29.6 +49.0     | -7 02.1 +49.3     |
| 20° | -4 01.9 +48.4     | -4 35.1 +48.6     | -5 08.0 +48.9     | -5 40.6 +49.1     | -6 12.8 +49.4     |
| 21° | -3 13.5 +48.4     | -3 46.5 +48.7     | -4 19.1 +48.9     | -4 51.5 +49.2     | -5 23.4 +49.4     |
| 22° | -2 25.1 +48.4     | -2 57.8 +48.6     | -3 30.2 +48.9     | -4 02.3 +49.2     | -4 34.0 +49.4     |
| 23° | -1 36.7 +48.4     | -2 09.2 +48.7     | -2 41.3 +48.9     | -3 13.1 +49.1     | -3 44.6 +49.4     |
| 24° | -0 48.3 +48.4     | -1 20.5 +48.7     | -1 52.4 +48.9     | -2 24.0 +49.2     | -2 55.2 +49.5     |
| 25° | 0 00.1 +48.4 51.7 | -0 31.8 +48.6     | -1 03.5 +49.0     | -1 34.8 +49.3     | -2 05.7 +49.5     |
| 26° | 0 48.5 +48.4 51.1 | 0 16.8 +48.7 50.4 | -0 14.5 +48.9     | -0 45.5 +49.2     | -1 16.2 +49.5     |
| 27° | 1 36.9 +48.4 50.5 | 1 05.5 +48.7 49.8 | 0 34.4 +49.0 49.1 | 0 03.7 +49.2 48.4 | -0 26.7 +49.5     |
| 28° | 2 25.3 +48.4 49.9 | 1 54.2 +48.6 49.2 | 1 23.4 +48.9 48.5 | 0 52.9 +49.2 47.8 | 0 22.8 +49.4 47.1 |
| 29° | 3 13.7 +48.4 49.3 | 2 42.8 +48.7 48.6 | 2 12.3 +48.9 47.9 | 1 42.1 +49.2 47.2 | 1 12.2 +49.5 46.5 |

| Dec | LHA 125° / 235°   | LHA 126° / 234°   | LHA 127° / 233° | LHA 128° / 232° | LHA 129° / 231° |
|-----|-------------------|-------------------|-----------------|-----------------|-----------------|
|     | 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° | -9 13.3 +49.5     | -9 45.6 +49.7     |                 |                 |                 |
| 18° | -8 23.8 +49.5     | -8 55.9 +49.8     | -9 27.6 +50.1   |                 |                 |
| 19° | -7 34.3 +49.6     | -8 06.1 +49.9     | -8 37.5 +50.1   |                 |                 |
| 20° | -6 44.7 +49.6     | -7 16.2 +49.8     | -7 47.4 +50.1   |                 |                 |
| 21° | -5 55.1 +49.7     | -6 26.4 +50.0     | -6 57.3 +50.2   |                 |                 |
| 22° | -5 05.4 +49.7     | -5 36.4 +49.9     | -6 07.1 +50.2   |                 |                 |
| 23° | -4 15.7 +49.7     | -4 46.5 +50.0     | -5 16.9 +50.3   |                 |                 |
| 24° | -3 26.0 +49.7     | -3 56.5 +50.0     | -4 26.6 +50.2   |                 |                 |
| 25° | -2 36.3 +49.8     | -3 06.5 +50.0     | -3 36.4 +50.3   |                 |                 |
| 26° | -1 46.5 +49.7     | -2 16.5 +50.0     | -2 46.1 +50.3   |                 |                 |
| 27° | -0 56.8 +49.8     | -1 26.5 +50.1     | -1 55.8 +50.3   |                 |                 |
| 28° | -0 07.0 +49.8     | -0 36.4 +50.0     | -1 05.5 +50.3   |                 |                 |
| 29° | 0 42.8 +49.7 45.8 | 0 13.6 +50.1 45.0 | -0 15.2 +50.4   |                 |                 |



| 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°  | 42 00.0 +60.0 180.0 | 41 59.5 +60.0 178.7 | 41 58.1 +60.0 177.3 | 41 55.8 +59.9 176.0 | 41 52.5 +59.8 174.6 |
| 1°  | 43 00.0 +60.0 180.0 | 42 59.5 +60.0 178.6 | 42 58.1 +60.0 177.3 | 42 55.7 +59.9 175.9 | 42 52.3 +59.9 174.5 |
| 2°  | 44 00.0 +60.0 180.0 | 43 59.5 +60.0 178.6 | 43 58.1 +59.9 177.2 | 43 55.6 +60.0 175.8 | 43 52.2 +59.9 174.5 |
| 3°  | 45 00.0 +60.0 180.0 | 44 59.5 +60.0 178.6 | 44 58.0 +60.0 177.2 | 44 55.6 +59.9 175.8 | 44 52.1 +59.9 174.4 |
| 4°  | 46 00.0 +60.0 180.0 | 45 59.5 +60.0 178.6 | 45 58.0 +60.0 177.1 | 45 55.5 +59.9 175.7 | 45 52.0 +59.8 174.3 |
| 5°  | 47 00.0 +60.0 180.0 | 46 59.5 +60.0 178.5 | 46 58.0 +59.9 177.1 | 46 55.4 +59.9 175.6 | 46 51.8 +59.9 174.2 |
| 6°  | 48 00.0 +60.0 180.0 | 47 59.5 +60.0 178.5 | 47 57.9 +60.0 177.0 | 47 55.3 +59.9 175.5 | 47 51.7 +59.8 174.1 |
| 7°  | 49 00.0 +60.0 180.0 | 48 59.5 +60.0 178.5 | 48 57.9 +59.9 177.0 | 48 55.2 +59.9 175.5 | 48 51.5 +59.9 174.0 |
| 8°  | 50 00.0 +60.0 180.0 | 49 59.5 +60.0 178.5 | 49 57.8 +60.0 176.9 | 49 55.1 +60.0 175.4 | 49 51.4 +59.8 173.8 |
| 9°  | 51 00.0 +60.0 180.0 | 50 59.5 +59.9 178.4 | 50 57.8 +60.0 176.9 | 50 55.1 +59.9 175.3 | 50 51.2 +59.9 173.7 |
| 10° | 52 00.0 +60.0 180.0 | 51 59.4 +60.0 178.4 | 51 57.8 +59.9 176.8 | 51 55.0 +59.9 175.2 | 51 51.1 +59.8 173.6 |
| 11° | 53 00.0 +60.0 180.0 | 52 59.4 +60.0 178.4 | 52 57.7 +60.0 176.7 | 52 54.9 +59.9 175.1 | 52 50.9 +59.8 173.5 |
| 12° | 54 00.0 +60.0 180.0 | 53 59.4 +60.0 178.3 | 53 57.7 +59.9 176.7 | 53 54.8 +59.9 175.0 | 53 50.7 +59.8 173.4 |
| 13° | 55 00.0 +60.0 180.0 | 54 59.4 +60.0 178.3 | 54 57.6 +60.0 176.6 | 54 54.7 +59.8 174.9 | 54 50.5 +59.8 173.2 |
| 14° | 56 00.0 +60.0 180.0 | 55 59.4 +60.0 178.3 | 55 57.6 +59.9 176.5 | 55 54.5 +59.9 174.8 | 55 50.3 +59.8 173.1 |
| 15° | 57 00.0 +60.0 180.0 | 56 59.4 +60.0 178.2 | 56 57.5 +60.0 176.5 | 56 54.4 +59.9 174.7 | 56 50.1 +59.8 172.9 |
| 16° | 58 00.0 +60.0 180.0 | 57 59.4 +59.9 178.2 | 57 57.5 +59.9 176.4 | 57 54.3 +59.9 174.6 | 57 49.9 +59.7 172.8 |
| 17° | 59 00.0 +60.0 180.0 | 58 59.3 +60.0 178.1 | 58 57.4 +59.9 176.3 | 58 54.2 +59.8 174.4 | 58 49.6 +59.8 172.6 |
| 18° | 60 00.0 +60.0 180.0 | 59 59.3 +60.0 178.1 | 59 57.3 +60.0 176.2 | 59 54.0 +59.9 174.3 | 59 49.4 +59.7 172.4 |
| 19° | 61 00.0 +60.0 180.0 | 60 59.3 +60.0 178.1 | 60 57.3 +59.9 176.1 | 60 53.9 +59.8 174.2 | 60 49.1 +59.7 172.2 |
| 20° | 62 00.0 +60.0 180.0 | 61 59.3 +60.0 178.0 | 61 57.2 +59.9 176.0 | 61 53.7 +59.8 174.0 | 61 48.8 +59.7 172.0 |
| 21° | 63 00.0 +60.0 180.0 | 62 59.3 +60.0 177.9 | 62 57.1 +59.9 175.9 | 62 53.5 +59.8 173.8 | 62 48.5 +59.7 171.8 |
| 22° | 64 00.0 +60.0 180.0 | 63 59.3 +59.9 177.9 | 63 57.0 +60.0 175.8 | 63 53.3 +59.8 173.7 | 63 48.2 +59.6 171.6 |
| 23° | 65 00.0 +60.0 180.0 | 64 59.2 +60.0 177.8 | 64 57.0 +59.9 175.6 | 64 53.1 +59.8 173.5 | 64 47.8 +59.7 171.3 |
| 24° | 66 00.0 +60.0 180.0 | 65 59.2 +60.0 177.8 | 65 56.9 +59.9 175.5 | 65 52.9 +59.8 173.3 | 65 47.5 +59.6 171.1 |
| 25° | 67 00.0 +60.0 180.0 | 66 59.2 +60.0 177.7 | 66 56.8 +59.8 175.4 | 66 52.7 +59.8 173.1 | 66 47.1 +59.5 170.8 |
| 26° | 68 00.0 +60.0 180.0 | 67 59.2 +59.9 177.6 | 67 56.6 +59.9 175.2 | 67 52.5 +59.7 172.8 | 67 46.6 +59.5 170.5 |
| 27° | 69 00.0 +60.0 180.0 | 68 59.1 +60.0 177.5 | 68 56.5 +59.9 175.0 | 68 52.2 +59.7 172.6 | 68 46.1 +59.5 170.1 |
| 28° | 70 00.0 +60.0 180.0 | 69 59.1 +60.0 177.4 | 69 56.4 +59.8 174.8 | 69 51.9 +59.7 172.3 | 69 45.6 +59.4 169.7 |
| 29° | 71 00.0 +60.0 180.0 | 70 59.1 +59.9 177.3 | 70 56.2 +59.9 174.6 | 70 51.6 +59.6 172.0 | 70 45.0 +59.4 169.3 |

| Dec | LHA 005° / 355°     | LHA 006° / 354°     | LHA 007° / 353°     | LHA 008° / 352°     | LHA 009° / 351°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 41 48.2 +59.9 173.3 | 41 43.1 +59.7 171.9 | 41 37.0 +59.6 170.6 | 41 30.0 +59.5 169.3 | 41 22.1 +59.4 168.0 |
| 1°  | 42 48.1 +59.8 173.2 | 42 42.8 +59.7 171.8 | 42 36.6 +59.7 170.5 | 42 29.5 +59.5 169.1 | 42 21.5 +59.4 167.8 |
| 2°  | 43 47.9 +59.8 173.1 | 43 42.5 +59.7 171.7 | 43 36.3 +59.6 170.3 | 43 29.0 +59.5 168.9 | 43 20.9 +59.3 167.6 |
| 3°  | 44 47.7 +59.8 173.0 | 44 42.2 +59.8 171.6 | 44 35.9 +59.6 170.2 | 44 28.5 +59.5 168.8 | 44 20.2 +59.4 167.4 |
| 4°  | 45 47.5 +59.7 172.8 | 45 42.0 +59.6 171.4 | 45 35.5 +59.6 170.0 | 45 28.0 +59.5 168.6 | 45 19.6 +59.3 167.2 |
| 5°  | 46 47.2 +59.8 172.7 | 46 41.6 +59.7 171.3 | 46 35.1 +59.5 169.8 | 46 27.5 +59.4 168.4 | 46 18.9 +59.3 167.0 |
| 6°  | 47 47.0 +59.8 172.6 | 47 41.3 +59.7 171.1 | 47 34.6 +59.6 169.6 | 47 26.9 +59.4 168.2 | 47 18.2 +59.3 166.7 |
| 7°  | 48 46.8 +59.7 172.5 | 48 41.0 +59.7 171.0 | 48 34.2 +59.5 169.5 | 48 26.3 +59.4 168.0 | 48 17.5 +59.2 166.5 |
| 8°  | 49 46.5 +59.8 172.3 | 49 40.7 +59.6 170.8 | 49 33.7 +59.5 169.3 | 49 25.7 +59.4 167.8 | 49 16.7 +59.2 166.3 |
| 9°  | 50 46.3 +59.7 172.2 | 50 40.3 +59.6 170.6 | 50 33.2 +59.5 169.1 | 50 25.1 +59.3 167.5 | 50 15.9 +59.2 166.0 |
| 10° | 51 46.0 +59.8 172.0 | 51 39.9 +59.6 170.4 | 51 32.7 +59.5 168.9 | 51 24.4 +59.3 167.3 | 51 15.1 +59.1 165.8 |
| 11° | 52 45.8 +59.7 171.9 | 52 39.5 +59.6 170.3 | 52 32.2 +59.4 168.7 | 52 23.7 +59.3 167.1 | 52 14.2 +59.1 165.5 |
| 12° | 53 45.5 +59.7 171.7 | 53 39.1 +59.6 170.1 | 53 31.6 +59.4 168.4 | 53 23.0 +59.3 166.8 | 53 13.3 +59.1 165.2 |
| 13° | 54 45.2 +59.7 171.5 | 54 38.7 +59.5 169.9 | 54 31.0 +59.4 168.2 | 54 22.3 +59.2 166.5 | 54 12.4 +59.0 164.9 |
| 14° | 55 44.9 +59.6 171.4 | 55 38.2 +59.6 169.6 | 55 30.4 +59.4 167.9 | 55 21.5 +59.1 166.3 | 55 11.4 +58.9 164.6 |
| 15° | 56 44.5 +59.7 171.2 | 56 37.8 +59.5 169.4 | 56 29.8 +59.3 167.7 | 56 20.6 +59.2 166.0 | 56 10.3 +58.9 164.3 |
| 16° | 57 44.2 +59.6 171.0 | 57 37.3 +59.4 169.2 | 57 29.1 +59.3 167.4 | 57 19.8 +59.0 165.7 | 57 09.2 +58.9 163.9 |
| 17° | 58 43.8 +59.6 170.8 | 58 36.7 +59.5 168.9 | 58 28.4 +59.2 167.1 | 58 18.8 +59.1 165.3 | 58 08.1 +58.7 163.5 |
| 18° | 59 43.4 +59.6 170.5 | 59 36.2 +59.4 168.7 | 59 27.6 +59.2 166.8 | 59 17.9 +58.9 165.0 | 59 06.8 +58.7 163.2 |
| 19° | 60 43.0 +59.6 170.3 | 60 35.6 +59.3 168.4 | 60 26.8 +59.2 166.5 | 60 16.8 +58.9 164.6 | 60 05.5 +58.7 162.7 |
| 20° | 61 42.6 +59.5 170.0 | 61 34.9 +59.4 168.1 | 61 26.0 +59.1 166.1 | 61 15.7 +58.9 164.2 | 61 04.2 +58.5 162.3 |
| 21° | 62 42.1 +59.5 169.8 | 62 34.3 +59.3 167.8 | 62 25.1 +59.0 165.8 | 62 14.6 +58.7 163.8 | 62 02.7 +58.4 161.8 |
| 22° | 63 41.6 +59.4 169.5 | 63 33.6 +59.2 167.4 | 63 24.1 +59.0 165.4 | 63 13.3 +58.7 163.4 | 63 01.1 +58.4 161.4 |
| 23° | 64 41.0 +59.5 169.2 | 64 32.8 +59.2 167.1 | 64 23.1 +58.9 165.0 | 64 12.0 +58.5 162.9 | 63 59.5 +58.2 160.8 |
| 24° | 65 40.5 +59.3 168.9 | 65 32.0 +59.1 166.7 | 65 22.0 +58.8 164.5 | 65 10.5 +58.5 162.4 | 64 57.7 +58.0 160.3 |
| 25° | 66 39.8 +59.4 168.5 | 66 31.1 +59.0 166.2 | 66 20.8 +58.7 164.0 | 66 09.0 +58.3 161.8 | 65 55.7 +57.9 159.7 |
| 26° | 67 39.2 +59.2 168.1 | 67 30.1 +58.9 165.8 | 67 19.5 +58.5 163.5 | 67 07.3 +58.2 161.2 | 66 53.6 +57.8 159.0 |
| 27° | 68 38.4 +59.2 167.7 | 68 29.0 +58.9 165.3 | 68 18.0 +58.5 162.9 | 68 05.5 +58.0 160.6 | 67 51.4 +57.5 158.3 |
| 28° | 69 37.6 +59.1 167.2 | 69 27.9 +58.7 164.7 | 69 16.5 +58.3 162.3 | 69 03.5 +57.8 159.9 | 68 48.9 +57.3 157.5 |
| 29° | 70 36.7 +59.0 166.7 | 70 26.6 +58.6 164.1 | 70 14.8 +58.1 161.6 | 70 01.3 +57.6 159.1 | 69 46.2 +57.1 156.7 |

# Latitude 48°

# 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°  | 41 13.3 +59.2 166.7 | 41 03.5 +59.2 165.3 | 40 52.9 +59.0 164.0 | 40 41.5 +58.8 162.7 | 40 29.1 +58.6 161.5 |
| 1°  | 42 12.5 +59.3 166.4 | 42 02.7 +59.1 165.1 | 41 51.9 +58.9 163.8 | 41 40.3 +58.7 162.5 | 41 27.7 +58.6 161.2 |
| 2°  | 43 11.8 +59.2 166.2 | 43 01.8 +59.0 164.9 | 42 50.8 +58.9 163.5 | 42 39.0 +58.7 162.2 | 42 26.3 +58.5 160.9 |
| 3°  | 44 11.0 +59.2 166.0 | 44 00.8 +59.1 164.6 | 43 49.7 +58.9 163.3 | 43 37.7 +58.7 161.9 | 43 24.8 +58.5 160.6 |
| 4°  | 45 10.2 +59.2 165.8 | 44 59.9 +58.9 164.4 | 44 48.6 +58.8 163.0 | 44 36.4 +58.6 161.6 | 44 23.3 +58.4 160.3 |
| 5°  | 46 09.4 +59.1 165.5 | 45 58.8 +59.0 164.1 | 45 47.4 +58.8 162.7 | 45 35.0 +58.6 161.3 | 45 21.7 +58.3 159.9 |
| 6°  | 47 08.5 +59.1 165.3 | 46 57.8 +58.9 163.9 | 46 46.2 +58.7 162.4 | 46 33.6 +58.5 161.0 | 46 20.0 +58.3 159.6 |
| 7°  | 48 07.6 +59.1 165.0 | 47 56.7 +58.9 163.6 | 47 44.9 +58.7 162.1 | 47 32.1 +58.4 160.7 | 47 18.3 +58.3 159.3 |
| 8°  | 49 06.7 +59.0 164.8 | 48 55.6 +58.8 163.3 | 48 43.6 +58.6 161.8 | 48 30.5 +58.4 160.4 | 48 16.6 +58.1 158.9 |
| 9°  | 50 05.7 +59.0 164.5 | 49 54.4 +58.8 163.0 | 49 42.2 +58.6 161.5 | 49 28.9 +58.4 160.0 | 49 14.7 +58.1 158.5 |
| 10° | 51 04.7 +58.9 164.2 | 50 53.2 +58.8 162.7 | 50 40.8 +58.5 161.1 | 50 27.3 +58.2 159.6 | 50 12.8 +58.0 158.1 |
| 11° | 52 03.6 +58.9 163.9 | 51 52.0 +58.6 162.3 | 51 39.3 +58.4 160.8 | 51 25.5 +58.2 159.3 | 51 10.8 +58.0 157.7 |
| 12° | 53 02.5 +58.8 163.6 | 52 50.6 +58.6 162.0 | 52 37.7 +58.4 160.4 | 52 23.7 +58.1 158.9 | 52 08.8 +57.8 157.3 |
| 13° | 54 01.3 +58.8 163.3 | 53 49.2 +58.6 161.6 | 53 36.1 +58.3 160.0 | 53 21.8 +58.0 158.5 | 53 06.6 +57.7 156.9 |
| 14° | 55 00.1 +58.8 162.9 | 54 47.8 +58.5 161.3 | 54 34.4 +58.2 159.6 | 54 19.8 +58.0 158.0 | 54 04.3 +57.6 156.4 |
| 15° | 55 58.9 +58.6 162.6 | 55 46.3 +58.4 160.9 | 55 32.6 +58.1 159.2 | 55 17.8 +57.8 157.6 | 55 01.9 +57.5 155.9 |
| 16° | 56 57.5 +58.6 162.2 | 56 44.7 +58.3 160.5 | 56 30.7 +58.0 158.8 | 56 15.6 +57.7 157.1 | 55 59.4 +57.4 155.4 |
| 17° | 57 56.1 +58.5 161.8 | 57 43.0 +58.2 160.0 | 57 28.7 +57.9 158.3 | 57 13.3 +57.5 156.6 | 56 56.8 +57.2 154.9 |
| 18° | 58 54.6 +58.4 161.3 | 58 41.2 +58.1 159.6 | 58 26.6 +57.8 157.8 | 58 10.8 +57.5 156.1 | 57 54.0 +57.1 154.3 |
| 19° | 59 53.0 +58.3 160.9 | 59 39.3 +58.0 159.1 | 59 24.4 +57.6 157.3 | 59 08.3 +57.3 155.5 | 58 51.1 +56.9 153.8 |
| 20° | 60 51.3 +58.2 160.4 | 60 37.3 +57.8 158.6 | 60 22.0 +57.5 156.7 | 60 05.6 +57.1 154.9 | 59 48.0 +56.7 153.1 |
| 21° | 61 49.5 +58.1 159.9 | 61 35.1 +57.8 158.0 | 61 19.5 +57.3 156.1 | 61 02.7 +56.9 154.3 | 60 44.7 +56.5 152.5 |
| 22° | 62 47.6 +58.0 159.4 | 62 32.9 +57.5 157.4 | 62 16.8 +57.2 155.5 | 61 59.6 +56.7 153.6 | 61 41.2 +56.3 151.8 |
| 23° | 63 45.6 +57.8 158.8 | 63 30.4 +57.4 156.8 | 63 14.0 +57.0 154.9 | 62 56.3 +56.5 152.9 | 62 37.5 +56.0 151.0 |
| 24° | 64 43.4 +57.7 158.2 | 64 27.8 +57.2 156.1 | 64 11.0 +56.7 154.1 | 63 52.8 +56.3 152.2 | 63 33.5 +55.7 150.2 |
| 25° | 65 41.1 +57.4 157.5 | 65 25.0 +57.0 155.4 | 65 07.7 +56.5 153.4 | 64 49.1 +56.0 151.4 | 64 29.2 +55.5 149.4 |
| 26° | 66 38.5 +57.3 156.8 | 66 22.0 +56.8 154.7 | 66 04.2 +56.2 152.6 | 65 45.1 +55.6 150.5 | 65 24.7 +55.1 148.5 |
| 27° | 67 35.8 +57.0 156.0 | 67 18.8 +56.5 153.8 | 67 00.4 +55.9 151.7 | 66 40.7 +55.3 149.6 | 66 19.8 +54.7 147.5 |
| 28° | 68 32.8 +56.8 155.2 | 68 15.3 +56.1 153.0 | 67 56.3 +55.6 150.7 | 67 36.0 +55.0 148.6 | 67 14.5 +54.3 146.5 |
| 29° | 69 29.6 +56.4 154.3 | 69 11.4 +55.8 152.0 | 68 51.9 +55.1 149.7 | 68 31.0 +54.4 147.5 | 68 08.8 +53.7 145.4 |

| 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°  | 40 15.9 +58.4 160.2 | 40 01.9 +58.2 158.9 | 39 47.0 +58.0 157.6 | 39 31.3 +57.8 156.4 | 39 14.9 +57.5 155.1 |
| 1°  | 41 14.3 +58.4 159.9 | 41 00.1 +58.2 158.6 | 40 45.0 +58.0 157.3 | 40 29.1 +57.7 156.0 | 40 12.4 +57.5 154.8 |
| 2°  | 42 12.7 +58.3 159.6 | 41 58.3 +58.0 158.3 | 41 43.0 +57.8 157.0 | 41 26.8 +57.7 155.7 | 41 09.9 +57.4 154.4 |
| 3°  | 43 11.0 +58.3 159.2 | 42 56.3 +58.1 157.9 | 42 40.8 +57.8 156.6 | 42 24.5 +57.5 155.3 | 42 07.3 +57.3 154.0 |
| 4°  | 44 09.3 +58.2 158.9 | 43 54.4 +57.9 157.6 | 43 38.6 +57.8 156.2 | 43 22.0 +57.5 154.9 | 43 04.6 +57.2 153.6 |
| 5°  | 45 07.5 +58.1 158.6 | 44 52.3 +57.9 157.2 | 44 36.4 +57.6 155.9 | 44 19.5 +57.4 154.5 | 44 01.8 +57.1 153.2 |
| 6°  | 46 05.6 +58.1 158.2 | 45 50.2 +57.9 156.8 | 45 34.0 +57.6 155.5 | 45 16.9 +57.3 154.1 | 44 58.9 +57.1 152.8 |
| 7°  | 47 03.7 +58.0 157.8 | 46 48.1 +57.7 156.4 | 46 31.6 +57.5 155.1 | 46 14.2 +57.2 153.7 | 45 56.0 +56.9 152.3 |
| 8°  | 48 01.7 +57.9 157.5 | 47 45.8 +57.7 156.0 | 47 29.1 +57.3 154.6 | 47 11.4 +57.1 153.2 | 46 52.9 +56.8 151.9 |
| 9°  | 48 59.6 +57.8 157.1 | 48 43.5 +57.5 155.6 | 48 26.4 +57.3 154.2 | 48 08.5 +57.0 152.8 | 47 49.7 +56.7 151.4 |
| 10° | 49 57.4 +57.7 156.7 | 49 41.0 +57.5 155.2 | 49 23.7 +57.2 153.7 | 49 05.5 +56.9 152.3 | 48 46.4 +56.6 150.9 |
| 11° | 50 55.1 +57.7 156.2 | 50 38.5 +57.3 154.7 | 50 20.9 +57.0 153.3 | 50 02.4 +56.7 151.8 | 49 43.0 +56.4 150.4 |
| 12° | 51 52.8 +57.5 155.8 | 51 35.8 +57.3 154.3 | 51 17.9 +57.0 152.8 | 50 59.1 +56.6 151.3 | 50 39.4 +56.3 149.8 |
| 13° | 52 50.3 +57.4 155.3 | 52 33.1 +57.1 153.8 | 52 14.9 +56.7 152.3 | 51 55.7 +56.5 150.8 | 51 35.7 +56.1 149.3 |
| 14° | 53 47.7 +57.3 154.8 | 53 30.2 +56.9 153.3 | 53 11.6 +56.7 151.7 | 52 52.2 +56.2 150.2 | 52 31.8 +55.9 148.7 |
| 15° | 54 45.0 +57.2 154.3 | 54 27.1 +56.9 152.7 | 54 08.3 +56.4 151.2 | 53 48.4 +56.2 149.6 | 53 27.7 +55.7 148.1 |
| 16° | 55 42.2 +57.0 153.8 | 55 24.0 +56.6 152.2 | 55 04.7 +56.3 150.6 | 54 44.6 +55.9 149.0 | 54 23.4 +55.6 147.5 |
| 17° | 56 39.2 +56.9 153.2 | 56 20.6 +56.5 151.6 | 56 01.0 +56.1 150.0 | 55 40.5 +55.7 148.4 | 55 19.0 +55.3 146.8 |
| 18° | 57 36.1 +56.7 152.7 | 57 17.1 +56.3 151.0 | 56 57.1 +55.9 149.3 | 56 36.2 +55.5 147.7 | 56 14.3 +55.1 146.1 |
| 19° | 58 32.8 +56.5 152.0 | 58 13.4 +56.1 150.3 | 57 53.0 +55.7 148.7 | 57 31.7 +55.2 147.0 | 57 09.4 +54.8 145.4 |
| 20° | 59 29.3 +56.3 151.4 | 59 09.5 +55.9 149.7 | 58 48.7 +55.4 148.0 | 58 26.9 +55.0 146.3 | 58 04.2 +54.5 144.7 |
| 21° | 60 25.6 +56.0 150.7 | 60 05.4 +55.6 148.9 | 59 44.1 +55.2 147.2 | 59 21.9 +54.7 145.5 | 58 58.7 +54.2 143.9 |
| 22° | 61 21.6 +55.9 150.0 | 61 01.0 +55.3 148.2 | 60 39.3 +54.9 146.4 | 60 16.6 +54.4 144.7 | 59 52.9 +53.9 143.0 |
| 23° | 62 17.5 +55.5 149.2 | 61 56.3 +55.1 147.4 | 61 34.2 +54.5 145.6 | 61 11.0 +54.0 143.8 | 60 46.8 +53.5 142.1 |
| 24° | 63 13.0 +55.2 148.4 | 62 51.4 +54.7 146.5 | 62 28.7 +54.2 144.7 | 62 05.0 +53.6 142.9 | 61 40.3 +53.1 141.2 |
| 25° | 64 08.2 +54.9 147.5 | 63 46.1 +54.3 145.6 | 63 22.9 +53.7 143.7 | 62 58.6 +53.2 141.9 | 62 33.4 +52.6 140.2 |
| 26° | 65 03.1 +54.5 146.5 | 64 40.4 +53.9 144.6 | 64 16.6 +53.4 142.7 | 63 51.8 +52.8 140.9 | 63 26.0 +52.2 139.1 |
| 27° | 65 57.6 +54.1 145.5 | 65 34.3 +53.5 143.6 | 65 10.0 +52.8 141.7 | 64 44.6 +52.2 139.8 | 64 18.2 +51.6 138.0 |
| 28° | 66 51.7 +53.6 144.4 | 66 27.8 +53.0 142.5 | 66 02.8 +52.3 140.5 | 65 36.8 +51.6 138.6 | 65 09.8 +50.9 136.8 |
| 29° | 67 45.3 +53.1 143.3 | 67 20.8 +52.3 141.3 | 66 55.1 +51.7 139.3 | 66 28.4 +51.0 137.4 | 66 00.7 +50.4 135.5 |

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| 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°  | 38 57.6 +57.3 153.9 | 38 39.6 +57.0 152.7 | 38 20.8 +56.8 151.5 | 38 01.2 +56.6 150.3 | 37 40.9 +56.3 149.1 |
| 1°  | 39 54.9 +57.2 153.5 | 39 36.6 +57.0 152.3 | 39 17.6 +56.7 151.1 | 38 57.8 +56.4 149.8 | 38 37.2 +56.2 148.6 |
| 2°  | 40 52.1 +57.2 153.1 | 40 33.6 +56.9 151.9 | 40 14.3 +56.6 150.6 | 39 54.2 +56.4 149.4 | 39 33.4 +56.1 148.2 |
| 3°  | 41 49.3 +57.0 152.7 | 41 30.5 +56.8 151.5 | 41 10.9 +56.5 150.2 | 40 50.6 +56.2 148.9 | 40 29.5 +56.0 147.7 |
| 4°  | 42 46.3 +57.0 152.3 | 42 27.3 +56.7 151.0 | 42 07.4 +56.4 149.7 | 41 46.8 +56.2 148.5 | 41 25.5 +55.8 147.2 |
| 5°  | 43 43.3 +56.9 151.9 | 43 24.0 +56.5 150.6 | 43 03.8 +56.3 149.3 | 42 43.0 +56.0 148.0 | 42 21.3 +55.7 146.7 |
| 6°  | 44 40.2 +56.7 151.4 | 44 20.5 +56.5 150.1 | 44 00.1 +56.2 148.8 | 43 39.0 +55.8 147.5 | 43 17.0 +55.6 146.2 |
| 7°  | 45 36.9 +56.6 151.0 | 45 17.0 +56.4 149.6 | 44 56.3 +56.1 148.3 | 44 34.8 +55.8 147.0 | 44 12.6 +55.4 145.7 |
| 8°  | 46 33.5 +56.6 150.5 | 46 13.4 +56.2 149.1 | 45 52.4 +55.9 147.8 | 45 30.6 +55.6 146.5 | 45 08.0 +55.3 145.2 |
| 9°  | 47 30.1 +56.3 150.0 | 47 09.6 +56.0 148.6 | 46 48.3 +55.7 147.3 | 46 26.2 +55.4 145.9 | 46 03.3 +55.1 144.6 |
| 10° | 48 26.4 +56.3 149.5 | 48 05.6 +56.0 148.1 | 47 44.0 +55.6 146.7 | 47 21.6 +55.3 145.4 | 46 58.4 +54.9 144.1 |
| 11° | 49 22.7 +56.1 149.0 | 49 01.6 +55.7 147.6 | 48 39.6 +55.4 146.2 | 48 16.9 +55.1 144.8 | 47 53.3 +54.8 143.5 |
| 12° | 50 18.8 +55.9 148.4 | 49 57.3 +55.6 147.0 | 49 35.0 +55.3 145.6 | 49 12.0 +54.8 144.2 | 48 48.1 +54.5 142.8 |
| 13° | 51 14.7 +55.8 147.8 | 50 52.9 +55.4 146.4 | 50 30.3 +55.0 145.0 | 50 06.8 +54.7 143.6 | 49 42.6 +54.3 142.2 |
| 14° | 52 10.5 +55.5 147.2 | 51 48.3 +55.2 145.8 | 51 25.3 +54.9 144.3 | 51 01.5 +54.5 142.9 | 50 36.9 +54.1 141.5 |
| 15° | 53 06.0 +55.4 146.6 | 52 43.5 +55.0 145.1 | 52 20.2 +54.6 143.7 | 51 56.0 +54.2 142.3 | 51 31.0 +53.8 140.9 |
| 16° | 54 01.4 +55.2 146.0 | 53 38.5 +54.8 144.5 | 53 14.8 +54.3 143.0 | 52 50.2 +54.0 141.6 | 52 24.8 +53.6 140.1 |
| 17° | 54 56.6 +54.9 145.3 | 54 33.3 +54.5 143.8 | 54 09.1 +54.1 142.3 | 53 44.2 +53.6 140.8 | 53 18.4 +53.3 139.4 |
| 18° | 55 51.5 +54.6 144.6 | 55 27.8 +54.2 143.0 | 55 03.2 +53.8 141.5 | 54 37.8 +53.4 140.1 | 54 11.7 +52.9 138.6 |
| 19° | 56 46.1 +54.4 143.8 | 56 22.0 +53.9 142.3 | 55 57.0 +53.5 140.8 | 55 31.2 +53.1 139.3 | 55 04.6 +52.6 137.8 |
| 20° | 57 40.5 +54.1 143.1 | 57 15.9 +53.6 141.5 | 56 50.5 +53.2 139.9 | 56 24.3 +52.7 138.4 | 55 57.2 +52.3 136.9 |
| 21° | 58 34.6 +53.7 142.2 | 58 09.5 +53.3 140.6 | 57 43.7 +52.7 139.1 | 57 17.0 +52.3 137.6 | 56 49.5 +51.8 136.1 |
| 22° | 59 28.3 +53.4 141.4 | 59 02.8 +52.9 139.8 | 58 36.4 +52.4 138.2 | 58 09.3 +51.9 136.6 | 57 41.3 +51.4 135.1 |
| 23° | 60 21.7 +53.0 140.5 | 59 55.7 +52.5 138.8 | 59 28.8 +52.0 137.2 | 59 01.2 +51.4 135.7 | 58 32.7 +51.0 134.2 |
| 24° | 61 14.7 +52.5 139.5 | 60 48.2 +52.0 137.8 | 60 20.8 +51.5 136.2 | 59 52.6 +51.0 134.7 | 59 23.7 +50.4 133.1 |
| 25° | 62 07.2 +52.1 138.5 | 61 40.2 +51.5 136.8 | 61 12.3 +51.0 135.2 | 60 43.6 +50.4 133.6 | 60 14.1 +49.9 132.1 |
| 26° | 62 59.3 +51.6 137.4 | 62 31.7 +51.0 135.7 | 62 03.3 +50.4 134.1 | 61 34.0 +49.9 132.5 | 61 04.0 +49.3 130.9 |
| 27° | 63 50.9 +50.9 136.3 | 63 22.7 +50.3 134.6 | 62 53.7 +49.7 132.9 | 62 23.9 +49.2 131.3 | 61 53.3 +48.7 129.7 |
| 28° | 64 41.8 +50.4 135.0 | 64 13.0 +49.8 133.3 | 63 43.4 +49.1 131.7 | 63 13.1 +48.5 130.0 | 62 42.0 +47.9 128.5 |
| 29° | 65 32.2 +49.6 133.8 | 65 02.8 +49.0 132.0 | 64 32.5 +48.4 130.3 | 64 01.6 +47.7 128.7 | 63 29.9 +47.2 127.1 |

| 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°  | 37 19.9 +56.1 147.9 | 36 58.3 +55.7 146.7 | 36 35.9 +55.5 145.6 | 36 12.9 +55.2 144.4 | 35 49.2 +54.9 143.3 |
| 1°  | 38 16.0 +55.9 147.4 | 37 54.0 +55.7 146.3 | 37 31.4 +55.3 145.1 | 37 08.1 +55.0 143.9 | 36 44.1 +54.8 142.8 |
| 2°  | 39 11.9 +55.8 147.0 | 38 49.7 +55.5 145.8 | 38 26.7 +55.3 144.6 | 38 03.1 +55.0 143.4 | 37 38.9 +54.7 142.3 |
| 3°  | 40 07.7 +55.7 146.5 | 39 45.2 +55.4 145.3 | 39 22.0 +55.1 144.1 | 38 58.1 +54.8 142.9 | 38 33.6 +54.5 141.7 |
| 4°  | 41 03.4 +55.5 146.0 | 40 40.6 +55.2 144.8 | 40 17.1 +54.9 143.6 | 39 52.9 +54.7 142.4 | 39 28.1 +54.4 141.2 |
| 5°  | 41 58.9 +55.5 145.5 | 41 35.8 +55.2 144.3 | 41 12.0 +54.9 143.1 | 40 47.6 +54.5 141.8 | 40 22.5 +54.2 140.7 |
| 6°  | 42 54.4 +55.2 145.0 | 42 31.0 +54.9 143.7 | 42 06.9 +54.6 142.5 | 41 42.1 +54.3 141.3 | 41 16.7 +54.0 140.1 |
| 7°  | 43 49.6 +55.1 144.4 | 43 25.9 +54.8 143.2 | 43 01.5 +54.5 141.9 | 42 36.4 +54.2 140.7 | 42 10.7 +53.8 139.5 |
| 8°  | 44 44.7 +55.0 143.9 | 44 20.7 +54.7 142.6 | 43 56.0 +54.3 141.4 | 43 30.6 +54.0 140.1 | 43 04.5 +53.7 138.9 |
| 9°  | 45 39.7 +54.8 143.3 | 45 15.4 +54.4 142.0 | 44 50.3 +54.1 140.8 | 44 24.6 +53.8 139.5 | 43 58.2 +53.5 138.3 |
| 10° | 46 34.5 +54.6 142.7 | 46 09.8 +54.3 141.4 | 45 44.4 +54.0 140.2 | 45 18.4 +53.6 138.9 | 44 51.7 +53.2 137.7 |
| 11° | 47 29.1 +54.4 142.1 | 47 04.1 +54.0 140.8 | 46 38.4 +53.6 139.5 | 46 12.0 +53.3 138.3 | 45 44.9 +53.0 137.0 |
| 12° | 48 23.5 +54.1 141.5 | 47 58.1 +53.8 140.2 | 47 32.0 +53.5 138.9 | 47 05.3 +53.1 137.6 | 46 37.9 +52.8 136.3 |
| 13° | 49 17.6 +54.0 140.8 | 48 51.9 +53.6 139.5 | 48 25.5 +53.2 138.2 | 47 58.4 +52.9 136.9 | 47 30.7 +52.4 135.6 |
| 14° | 50 11.6 +53.7 140.2 | 49 45.5 +53.3 138.8 | 49 18.7 +53.0 137.5 | 48 51.3 +52.5 136.2 | 48 23.1 +52.3 134.9 |
| 15° | 51 05.3 +53.4 139.5 | 50 38.8 +53.1 138.1 | 50 11.7 +52.7 136.8 | 49 43.8 +52.3 135.4 | 49 15.4 +51.9 134.2 |
| 16° | 51 58.7 +53.2 138.7 | 51 31.9 +52.8 137.4 | 51 04.4 +52.3 136.0 | 50 36.1 +52.0 134.7 | 50 07.3 +51.6 133.4 |
| 17° | 52 51.9 +52.8 138.0 | 52 24.7 +52.4 136.6 | 51 56.7 +52.1 135.2 | 51 28.1 +51.7 133.9 | 50 58.9 +51.2 132.6 |
| 18° | 53 44.7 +52.6 137.2 | 53 17.1 +52.1 135.8 | 52 48.8 +51.7 134.4 | 52 19.8 +51.2 133.1 | 51 50.1 +50.9 131.7 |
| 19° | 54 37.3 +52.2 136.4 | 54 09.2 +51.8 134.9 | 53 40.5 +51.3 133.6 | 53 11.0 +50.9 132.2 | 52 41.0 +50.5 130.9 |
| 20° | 55 29.5 +51.7 135.5 | 55 01.0 +51.3 134.1 | 54 31.8 +50.9 132.7 | 54 01.9 +50.5 131.3 | 53 31.5 +50.0 130.0 |
| 21° | 56 21.2 +51.4 134.6 | 55 52.3 +50.9 133.2 | 55 22.7 +50.5 131.8 | 54 52.4 +50.1 130.4 | 54 21.5 +49.6 129.0 |
| 22° | 57 12.6 +51.0 133.7 | 56 43.2 +50.5 132.2 | 56 13.2 +50.0 130.8 | 55 42.5 +49.5 129.4 | 55 11.1 +49.2 128.1 |
| 23° | 58 03.6 +50.4 132.7 | 57 33.7 +50.0 131.2 | 57 03.2 +49.5 129.8 | 56 32.0 +49.1 128.4 | 56 00.3 +48.6 127.0 |
| 24° | 58 54.0 +50.0 131.6 | 58 23.7 +49.4 130.2 | 57 52.7 +49.0 128.7 | 57 21.1 +48.5 127.3 | 56 48.9 +48.0 126.0 |
| 25° | 59 44.0 +49.4 130.5 | 59 13.1 +48.9 129.1 | 58 41.7 +48.3 127.6 | 58 09.6 +47.9 126.2 | 57 36.9 +47.4 124.9 |
| 26° | 60 33.4 +48.7 129.4 | 60 02.0 +48.3 127.9 | 59 30.0 +47.8 126.5 | 58 57.5 +47.2 125.1 | 58 24.3 +46.8 123.7 |
| 27° | 61 22.1 +48.1 128.2 | 60 50.3 +47.5 126.7 | 60 17.8 +47.0 125.3 | 59 44.7 +46.6 123.9 | 59 11.1 +46.1 122.5 |
| 28° | 62 10.2 +47.4 126.9 | 61 37.8 +46.8 125.5 | 61 04.8 +46.3 124.0 | 60 31.3 +45.8 122.6 | 59 57.2 +45.3 121.2 |
| 29° | 62 57.6 +46.6 125.6 | 62 24.6 +46.1 124.1 | 61 51.1 +45.5 122.7 | 61 17.1 +44.9 121.3 | 60 42.5 +44.5 119.9 |

| 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°  | 35 24.9 +54.6 142.2 | 34 59.9 +54.4 141.0 | 34 34.4 +54.1 139.9 | 34 08.2 +53.8 138.9 | 33 41.5 +53.6 137.8 |
| 1°  | 36 19.5 +54.5 141.6 | 35 54.3 +54.2 140.5 | 35 28.5 +53.9 139.4 | 35 02.0 +53.7 138.3 | 34 35.1 +53.3 137.2 |
| 2°  | 37 14.0 +54.4 141.1 | 36 48.5 +54.1 140.0 | 36 22.4 +53.8 138.9 | 35 55.7 +53.5 137.8 | 35 28.4 +53.2 136.7 |
| 3°  | 38 08.4 +54.2 140.6 | 37 42.6 +53.9 139.4 | 37 16.2 +53.6 138.3 | 36 49.2 +53.3 137.2 | 36 21.6 +53.1 136.1 |
| 4°  | 39 02.6 +54.1 140.0 | 38 36.5 +53.8 138.9 | 38 09.8 +53.5 137.8 | 37 42.5 +53.2 136.6 | 37 14.7 +52.9 135.5 |
| 5°  | 39 56.7 +53.9 139.5 | 39 30.3 +53.6 138.3 | 39 03.3 +53.3 137.2 | 38 35.7 +53.0 136.0 | 38 07.6 +52.6 134.9 |
| 6°  | 40 50.6 +53.7 138.9 | 40 23.9 +53.4 137.7 | 39 56.6 +53.1 136.6 | 39 28.7 +52.8 135.4 | 39 00.2 +52.5 134.3 |
| 7°  | 41 44.3 +53.5 138.3 | 41 17.3 +53.2 137.1 | 40 49.7 +52.9 136.0 | 40 21.5 +52.6 134.8 | 39 52.7 +52.3 133.7 |
| 8°  | 42 37.8 +53.4 137.7 | 42 10.5 +53.0 136.5 | 41 42.6 +52.7 135.3 | 41 14.1 +52.4 134.2 | 40 45.0 +52.1 133.0 |
| 9°  | 43 31.2 +53.1 137.1 | 43 03.5 +52.8 135.9 | 42 35.3 +52.5 134.7 | 42 06.5 +52.1 133.5 | 41 37.1 +51.8 132.4 |
| 10° | 44 24.3 +52.9 136.4 | 43 56.3 +52.6 135.2 | 43 27.8 +52.2 134.0 | 42 58.6 +51.9 132.9 | 42 28.9 +51.6 131.7 |
| 11° | 45 17.2 +52.7 135.8 | 44 48.9 +52.3 134.5 | 44 20.0 +52.0 133.3 | 43 50.5 +51.6 132.2 | 43 20.5 +51.3 131.0 |
| 12° | 46 09.9 +52.4 135.1 | 45 41.2 +52.1 133.9 | 45 12.0 +51.7 132.6 | 44 42.1 +51.4 131.5 | 44 11.8 +51.0 130.3 |
| 13° | 47 02.3 +52.1 134.4 | 46 33.3 +51.7 133.1 | 46 03.7 +51.4 131.9 | 45 33.5 +51.1 130.7 | 45 02.8 +50.8 129.5 |
| 14° | 47 54.4 +51.8 133.6 | 47 25.0 +51.5 132.4 | 46 55.1 +51.1 131.2 | 46 24.6 +50.8 130.0 | 45 53.6 +50.4 128.8 |
| 15° | 48 46.2 +51.6 132.9 | 48 16.5 +51.2 131.6 | 47 46.2 +50.8 130.4 | 47 15.4 +50.4 129.2 | 46 44.0 +50.1 128.0 |
| 16° | 49 37.8 +51.2 132.1 | 49 07.7 +50.8 130.8 | 48 37.0 +50.5 129.6 | 48 05.8 +50.1 128.4 | 47 34.1 +49.8 127.2 |
| 17° | 50 29.0 +50.8 131.3 | 49 58.5 +50.5 130.0 | 49 27.5 +50.1 128.8 | 48 55.9 +49.8 127.6 | 48 23.9 +49.3 126.4 |
| 18° | 51 19.8 +50.5 130.4 | 50 49.0 +50.1 129.2 | 50 17.6 +49.7 127.9 | 49 45.7 +49.3 126.7 | 49 13.2 +49.0 125.5 |
| 19° | 52 10.3 +50.1 129.6 | 51 39.1 +49.7 128.3 | 51 07.3 +49.3 127.0 | 50 35.0 +48.9 125.8 | 50 02.2 +48.6 124.6 |
| 20° | 53 00.4 +49.7 128.7 | 52 28.8 +49.2 127.4 | 51 56.6 +48.9 126.1 | 51 23.9 +48.5 124.9 | 50 50.8 +48.1 123.7 |
| 21° | 53 50.1 +49.2 127.7 | 53 18.0 +48.8 126.4 | 52 45.5 +48.3 125.2 | 52 12.4 +48.0 123.9 | 51 38.9 +47.6 122.7 |
| 22° | 54 39.3 +48.6 126.7 | 54 06.8 +48.3 125.4 | 53 33.8 +47.9 124.2 | 53 00.4 +47.5 122.9 | 52 26.5 +47.1 121.7 |
| 23° | 55 27.9 +48.2 125.7 | 54 55.1 +47.7 124.4 | 54 21.7 +47.4 123.2 | 53 47.9 +46.9 121.9 | 53 13.6 +46.5 120.7 |
| 24° | 56 16.1 +47.6 124.7 | 55 42.8 +47.2 123.4 | 55 09.1 +46.7 122.1 | 54 34.8 +46.4 120.9 | 54 00.1 +46.0 119.6 |
| 25° | 57 03.7 +47.0 123.5 | 56 30.0 +46.5 122.3 | 55 55.8 +46.1 121.0 | 55 21.2 +45.7 119.7 | 54 46.1 +45.4 118.5 |
| 26° | 57 50.7 +46.3 122.4 | 57 16.5 +45.9 121.1 | 56 41.9 +45.5 119.8 | 56 06.9 +45.1 118.6 | 55 31.5 +44.6 117.4 |
| 27° | 58 37.0 +45.6 121.2 | 58 02.4 +45.2 119.9 | 57 27.4 +44.8 118.6 | 56 52.0 +44.3 117.4 | 56 16.1 +44.0 116.2 |
| 28° | 59 22.6 +44.9 119.9 | 58 47.6 +44.4 118.6 | 58 12.2 +44.0 117.4 | 57 36.3 +43.6 116.2 | 57 00.1 +43.2 115.0 |
| 29° | 60 07.5 +44.0 118.6 | 59 32.0 +43.6 117.3 | 58 56.2 +43.1 116.1 | 58 19.9 +42.8 114.9 | 57 43.3 +42.4 113.7 |

| Dec | LHA 035° / 325°     | LHA 036° / 324°     | LHA 037° / 323°     | LHA 038° / 322°     | LHA 039° / 321°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 33 14.3 +53.2 136.7 | 32 46.5 +52.9 135.6 | 32 18.2 +52.6 134.6 | 31 49.3 +52.4 133.6 | 31 20.0 +52.1 132.5 |
| 1°  | 34 07.5 +53.1 136.1 | 33 39.4 +52.8 135.1 | 33 10.8 +52.6 134.0 | 32 41.7 +52.3 133.0 | 32 12.1 +52.0 132.0 |
| 2°  | 35 00.6 +52.9 135.6 | 34 32.2 +52.7 134.5 | 34 03.4 +52.3 133.5 | 33 34.0 +52.0 132.4 | 33 04.1 +51.8 131.4 |
| 3°  | 35 53.5 +52.8 135.0 | 35 24.9 +52.4 133.9 | 34 55.7 +52.2 132.9 | 34 26.0 +51.9 131.8 | 33 55.9 +51.6 130.8 |
| 4°  | 36 46.3 +52.6 134.4 | 36 17.3 +52.3 133.3 | 35 47.9 +52.0 132.3 | 35 17.9 +51.7 131.2 | 34 47.5 +51.4 130.1 |
| 5°  | 37 38.9 +52.3 133.8 | 37 09.6 +52.1 132.7 | 36 39.9 +51.8 131.6 | 36 09.6 +51.5 130.6 | 35 38.9 +51.2 129.5 |
| 6°  | 38 31.2 +52.2 133.2 | 38 01.7 +51.9 132.1 | 37 31.7 +51.5 131.0 | 37 01.1 +51.3 129.9 | 36 30.1 +51.0 128.9 |
| 7°  | 39 23.4 +52.0 132.6 | 38 53.6 +51.7 131.4 | 38 23.2 +51.4 130.4 | 37 52.4 +51.1 129.3 | 37 21.1 +50.8 128.2 |
| 8°  | 40 15.4 +51.7 131.9 | 39 45.3 +51.4 130.8 | 39 14.6 +51.1 129.7 | 38 43.5 +50.8 128.6 | 38 11.9 +50.5 127.5 |
| 9°  | 41 07.1 +51.5 131.2 | 40 36.7 +51.2 130.1 | 40 05.7 +50.9 129.0 | 39 34.3 +50.6 127.9 | 39 02.4 +50.3 126.8 |
| 10° | 41 58.6 +51.3 130.6 | 41 27.9 +50.9 129.4 | 40 56.6 +50.7 128.3 | 40 24.9 +50.3 127.2 | 39 52.7 +50.0 126.1 |
| 11° | 42 49.9 +51.0 129.8 | 42 18.8 +50.7 128.7 | 41 47.3 +50.3 127.6 | 41 15.2 +50.1 126.5 | 40 42.7 +49.8 125.4 |
| 12° | 43 40.9 +50.7 129.1 | 43 09.5 +50.4 128.0 | 42 37.6 +50.1 126.9 | 42 05.3 +49.7 125.8 | 41 32.5 +49.4 124.7 |
| 13° | 44 31.6 +50.4 128.4 | 43 59.9 +50.1 127.2 | 43 27.7 +49.7 126.1 | 42 55.0 +49.5 125.0 | 42 21.9 +49.2 123.9 |
| 14° | 45 22.0 +50.1 127.6 | 44 50.0 +49.7 126.5 | 44 17.4 +49.5 125.3 | 43 44.5 +49.1 124.2 | 43 11.1 +48.8 123.1 |
| 15° | 46 12.1 +49.8 126.8 | 45 39.7 +49.5 125.7 | 45 06.9 +49.1 124.5 | 44 33.6 +48.8 123.4 | 43 59.9 +48.4 122.3 |
| 16° | 47 01.9 +49.4 126.0 | 46 29.2 +49.0 124.9 | 45 56.0 +48.7 123.7 | 45 22.4 +48.4 122.6 | 44 48.3 +48.2 121.5 |
| 17° | 47 51.3 +49.0 125.2 | 47 18.2 +48.7 124.0 | 46 44.7 +48.4 122.9 | 46 10.8 +48.0 121.8 | 45 36.5 +47.7 120.7 |
| 18° | 48 40.3 +48.6 124.3 | 48 06.9 +48.3 123.1 | 47 33.1 +47.9 122.0 | 46 58.8 +47.6 120.9 | 46 24.2 +47.3 119.8 |
| 19° | 49 28.9 +48.2 123.4 | 48 55.2 +47.8 122.2 | 48 21.0 +47.5 121.1 | 47 46.4 +47.2 120.0 | 47 11.5 +46.8 118.9 |
| 20° | 50 17.1 +47.8 122.5 | 49 43.0 +47.4 121.3 | 49 08.5 +47.1 120.2 | 48 33.6 +46.7 119.1 | 47 58.3 +46.5 118.0 |
| 21° | 51 04.9 +47.2 121.5 | 50 30.4 +46.9 120.4 | 49 55.6 +46.5 119.2 | 49 20.3 +46.3 118.1 | 48 44.8 +45.9 117.0 |
| 22° | 51 52.1 +46.7 120.5 | 51 17.3 +46.4 119.4 | 50 42.1 +46.1 118.2 | 50 06.6 +45.7 117.1 | 49 30.7 +45.4 116.0 |
| 23° | 52 38.8 +46.2 119.5 | 52 03.7 +45.8 118.4 | 51 28.2 +45.5 117.2 | 50 52.3 +45.2 116.1 | 50 16.1 +44.8 115.0 |
| 24° | 53 25.0 +45.6 118.5 | 52 49.5 +45.3 117.3 | 52 13.7 +44.9 116.2 | 51 37.5 +44.6 115.0 | 51 00.9 +44.3 114.0 |
| 25° | 54 10.6 +45.0 117.4 | 53 34.8 +44.6 116.2 | 52 58.6 +44.3 115.1 | 52 22.1 +43.9 114.0 | 51 45.2 +43.7 112.9 |
| 26° | 54 55.6 +44.3 116.2 | 54 19.4 +44.0 115.1 | 53 42.9 +43.6 113.9 | 53 06.0 +43.4 112.8 | 52 28.9 +43.0 111.8 |
| 27° | 55 39.9 +43.6 115.0 | 55 03.4 +43.2 113.9 | 54 26.5 +42.9 112.8 | 53 49.4 +42.6 111.7 | 53 11.9 +42.3 110.6 |
| 28° | 56 23.5 +42.9 113.8 | 55 46.6 +42.5 112.7 | 55 09.4 +42.2 111.6 | 54 32.0 +41.8 110.5 | 53 54.2 +41.6 109.4 |
| 29° | 57 06.4 +42.0 112.5 | 56 29.1 +41.7 111.4 | 55 51.6 +41.4 110.3 | 55 13.8 +41.1 109.2 | 54 35.8 +40.8 108.2 |

# Declination SAME name as Latitude

# Latitude 48°

| 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°  | 30 50.2 +51.8 131.5 | 30 19.9 +51.6 130.5 | 29 49.1 +51.3 129.5 | 29 18.0 +51.0 128.6 | 28 46.3 +50.8 127.6 |
| 1°  | 31 42.0 +51.7 130.9 | 31 11.5 +51.4 129.9 | 30 40.4 +51.2 128.9 | 30 09.0 +50.9 127.9 | 29 37.1 +50.7 127.0 |
| 2°  | 32 33.7 +51.5 130.3 | 32 02.9 +51.2 129.3 | 31 31.6 +51.0 128.3 | 30 59.9 +50.7 127.3 | 30 27.8 +50.4 126.3 |
| 3°  | 33 25.2 +51.3 129.7 | 32 54.1 +51.1 128.7 | 32 22.6 +50.7 127.7 | 31 50.6 +50.5 126.7 | 31 18.2 +50.2 125.7 |
| 4°  | 34 16.5 +51.2 129.1 | 33 45.2 +50.8 128.1 | 33 13.3 +50.6 127.1 | 32 41.1 +50.3 126.1 | 32 08.4 +50.1 125.1 |
| 5°  | 35 07.7 +50.9 128.5 | 34 36.0 +50.7 127.4 | 34 03.9 +50.4 126.4 | 33 31.4 +50.1 125.4 | 32 58.5 +49.8 124.4 |
| 6°  | 35 58.6 +50.7 127.8 | 35 26.7 +50.4 126.8 | 34 54.3 +50.2 125.8 | 34 21.5 +49.9 124.8 | 33 48.3 +49.7 123.8 |
| 7°  | 36 49.3 +50.5 127.2 | 36 17.1 +50.2 126.1 | 35 44.5 +49.9 125.1 | 35 11.4 +49.7 124.1 | 34 38.0 +49.3 123.1 |
| 8°  | 37 39.8 +50.3 126.5 | 37 07.3 +50.0 125.4 | 36 34.4 +49.7 124.4 | 36 01.1 +49.4 123.4 | 35 27.3 +49.2 122.4 |
| 9°  | 38 30.1 +50.0 125.8 | 37 57.3 +49.7 124.7 | 37 24.1 +49.4 123.7 | 36 50.5 +49.1 122.7 | 36 16.5 +48.9 121.7 |
| 10° | 39 20.1 +49.7 125.1 | 38 47.0 +49.4 124.0 | 38 13.5 +49.2 123.0 | 37 39.6 +48.9 122.0 | 37 05.4 +48.6 121.0 |
| 11° | 40 09.8 +49.4 124.3 | 39 36.4 +49.2 123.3 | 39 02.7 +48.9 122.3 | 38 28.5 +48.6 121.2 | 37 54.0 +48.4 120.2 |
| 12° | 40 59.2 +49.2 123.6 | 40 25.6 +48.9 122.5 | 39 51.6 +48.5 121.5 | 39 17.1 +48.3 120.5 | 38 42.4 +48.0 119.5 |
| 13° | 41 48.4 +48.8 122.8 | 41 14.5 +48.5 121.8 | 40 40.1 +48.3 120.7 | 40 05.4 +48.0 119.7 | 39 30.4 +47.7 118.7 |
| 14° | 42 37.2 +48.6 122.1 | 42 03.0 +48.2 121.0 | 41 28.4 +47.9 119.9 | 40 53.4 +47.7 118.9 | 40 18.1 +47.4 117.9 |
| 15° | 43 25.8 +48.1 121.2 | 42 51.2 +47.9 120.2 | 42 16.3 +47.6 119.1 | 41 41.1 +47.3 118.1 | 41 05.5 +47.1 117.1 |
| 16° | 44 13.9 +47.8 120.4 | 43 39.1 +47.5 119.4 | 43 03.9 +47.3 118.3 | 42 28.4 +47.0 117.3 | 41 52.6 +46.7 116.3 |
| 17° | 45 01.7 +47.4 119.6 | 44 26.6 +47.1 118.5 | 43 51.2 +46.8 117.5 | 43 15.4 +46.5 116.4 | 42 39.3 +46.3 115.4 |
| 18° | 45 49.1 +47.0 118.7 | 45 13.7 +46.7 117.6 | 44 38.0 +46.4 116.6 | 44 01.9 +46.2 115.6 | 43 25.6 +45.9 114.5 |
| 19° | 46 36.1 +46.6 117.8 | 46 00.4 +46.3 116.7 | 45 24.4 +46.0 115.7 | 44 48.1 +45.7 114.7 | 44 11.5 +45.4 113.6 |
| 20° | 47 22.7 +46.1 116.9 | 46 46.7 +45.8 115.8 | 46 10.4 +45.6 114.8 | 45 33.8 +45.3 113.7 | 44 56.9 +45.0 112.7 |
| 21° | 48 08.8 +45.6 115.9 | 47 32.5 +45.4 114.9 | 46 56.0 +45.0 113.8 | 46 19.1 +44.8 112.8 | 45 41.9 +44.6 111.8 |
| 22° | 48 54.4 +45.1 114.9 | 48 17.9 +44.8 113.9 | 47 41.0 +44.6 112.8 | 47 03.9 +44.3 111.8 | 46 26.5 +44.0 110.8 |
| 23° | 49 39.5 +44.6 113.9 | 49 02.7 +44.3 112.9 | 48 25.6 +44.0 111.8 | 47 48.2 +43.7 110.8 | 47 10.5 +43.5 109.8 |
| 24° | 50 24.1 +44.0 112.9 | 49 47.0 +43.7 111.8 | 49 09.6 +43.4 110.8 | 48 31.9 +43.2 109.8 | 47 54.0 +43.0 108.8 |
| 25° | 51 08.1 +43.4 111.8 | 50 30.7 +43.1 110.8 | 49 53.0 +42.9 109.8 | 49 15.1 +42.6 108.7 | 48 37.0 +42.4 107.8 |
| 26° | 51 51.5 +42.7 110.7 | 51 13.8 +42.4 109.7 | 50 35.9 +42.2 108.7 | 49 57.7 +42.0 107.7 | 49 19.4 +41.7 106.7 |
| 27° | 52 34.2 +42.0 109.6 | 51 56.2 +41.8 108.5 | 51 18.1 +41.5 107.5 | 50 39.7 +41.3 106.5 | 50 01.1 +41.1 105.6 |
| 28° | 53 16.2 +41.4 108.4 | 52 38.0 +41.1 107.4 | 51 59.6 +40.8 106.4 | 51 21.0 +40.6 105.4 | 50 42.2 +40.4 104.4 |
| 29° | 53 57.6 +40.5 107.2 | 53 19.1 +40.3 106.1 | 52 40.4 +40.1 105.2 | 52 01.6 +39.9 104.2 | 51 22.6 +39.7 103.3 |

| 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°  | 28 14.3 +50.6 126.6 | 27 41.9 +50.3 125.7 | 27 09.1 +50.0 124.7 | 26 35.9 +49.8 123.8 | 26 02.4 +49.5 122.9 |
| 1°  | 29 04.9 +50.3 126.0 | 28 32.2 +50.1 125.0 | 27 59.1 +49.9 124.1 | 27 25.7 +49.6 123.2 | 26 51.9 +49.4 122.2 |
| 2°  | 29 55.2 +50.2 125.4 | 29 22.3 +49.9 124.4 | 28 49.0 +49.7 123.5 | 28 15.3 +49.4 122.5 | 27 41.3 +49.2 121.6 |
| 3°  | 30 45.4 +50.0 124.7 | 30 12.2 +49.7 123.8 | 29 38.7 +49.4 122.8 | 29 04.7 +49.3 121.9 | 28 30.5 +49.0 120.9 |
| 4°  | 31 35.4 +49.8 124.1 | 31 01.9 +49.6 123.1 | 30 28.1 +49.3 122.2 | 29 54.0 +49.0 121.2 | 29 19.5 +48.8 120.3 |
| 5°  | 32 25.2 +49.6 123.4 | 31 51.5 +49.3 122.5 | 31 17.4 +49.1 121.5 | 30 43.0 +48.9 120.6 | 30 08.3 +48.6 119.6 |
| 6°  | 33 14.8 +49.3 122.8 | 32 40.8 +49.1 121.8 | 32 06.5 +48.9 120.8 | 31 31.9 +48.6 119.9 | 30 56.9 +48.4 118.9 |
| 7°  | 34 04.1 +49.2 122.1 | 33 29.9 +48.9 121.1 | 32 55.4 +48.6 120.1 | 32 20.5 +48.4 119.2 | 31 45.3 +48.1 118.2 |
| 8°  | 34 53.3 +48.8 121.4 | 34 18.8 +48.6 120.4 | 33 44.0 +48.4 119.4 | 33 08.9 +48.1 118.5 | 32 33.4 +48.0 117.5 |
| 9°  | 35 42.1 +48.7 120.7 | 35 07.4 +48.4 119.7 | 34 32.4 +48.1 118.7 | 33 57.0 +47.9 117.8 | 33 21.4 +47.6 116.8 |
| 10° | 36 30.8 +48.3 120.0 | 35 55.8 +48.1 119.0 | 35 20.5 +47.9 118.0 | 34 44.9 +47.7 117.0 | 34 09.0 +47.4 116.1 |
| 11° | 37 19.1 +48.1 119.2 | 36 43.9 +47.9 118.2 | 36 08.4 +47.6 117.3 | 35 32.6 +47.3 116.3 | 34 56.4 +47.1 115.3 |
| 12° | 38 07.2 +47.8 118.5 | 37 31.8 +47.5 117.5 | 36 56.0 +47.3 116.5 | 36 19.9 +47.1 115.5 | 35 43.5 +46.9 114.6 |
| 13° | 38 55.0 +47.5 117.7 | 38 19.3 +47.2 116.7 | 37 43.3 +47.0 115.7 | 37 07.0 +46.7 114.8 | 36 30.4 +46.5 113.8 |
| 14° | 39 42.5 +47.1 116.9 | 39 06.5 +46.9 115.9 | 38 30.3 +46.6 114.9 | 37 53.7 +46.4 114.0 | 37 16.9 +46.2 113.0 |
| 15° | 40 29.6 +46.8 116.1 | 39 53.4 +46.6 115.1 | 39 16.9 +46.3 114.1 | 38 40.1 +46.1 113.2 | 38 03.1 +45.9 112.2 |
| 16° | 41 16.4 +46.5 115.3 | 40 40.0 +46.2 114.3 | 40 03.2 +46.0 113.3 | 39 26.2 +45.7 112.3 | 38 49.0 +45.5 111.4 |
| 17° | 42 02.9 +46.0 114.4 | 41 26.2 +45.8 113.4 | 40 49.2 +45.6 112.5 | 40 11.9 +45.4 111.5 | 39 34.5 +45.1 110.6 |
| 18° | 42 48.9 +45.6 113.5 | 42 12.0 +45.4 112.6 | 41 34.8 +45.1 111.6 | 40 57.3 +45.0 110.6 | 40 19.6 +44.8 109.7 |
| 19° | 43 34.5 +45.3 112.7 | 42 57.4 +44.9 111.7 | 42 19.9 +44.8 110.7 | 41 42.3 +44.5 109.8 | 41 04.4 +44.3 108.8 |
| 20° | 44 19.8 +44.7 111.7 | 43 42.3 +44.6 110.8 | 43 04.7 +44.3 109.8 | 42 26.8 +44.1 108.9 | 41 48.7 +43.9 107.9 |
| 21° | 45 04.5 +44.3 110.8 | 44 26.9 +44.1 109.8 | 43 49.0 +43.9 108.9 | 43 10.9 +43.7 107.9 | 42 32.6 +43.5 107.0 |
| 22° | 45 48.8 +43.8 109.8 | 45 11.0 +43.5 108.9 | 44 32.9 +43.3 107.9 | 43 54.6 +43.1 107.0 | 43 16.1 +43.0 106.1 |
| 23° | 46 32.6 +43.3 108.9 | 45 54.5 +43.1 107.9 | 45 16.2 +42.9 106.9 | 44 37.7 +42.7 106.0 | 43 59.1 +42.4 105.1 |
| 24° | 47 15.9 +42.8 107.8 | 46 37.6 +42.5 106.9 | 45 59.1 +42.3 105.9 | 45 20.4 +42.1 105.0 | 44 41.5 +42.0 104.1 |
| 25° | 47 58.7 +42.1 106.8 | 47 20.1 +42.0 105.8 | 46 41.4 +41.8 104.9 | 46 02.5 +41.6 104.0 | 45 23.5 +41.4 103.1 |
| 26° | 48 40.8 +41.5 105.7 | 48 02.1 +41.3 104.8 | 47 23.2 +41.1 103.9 | 46 44.1 +41.0 103.0 | 46 04.9 +40.9 102.1 |
| 27° | 49 22.3 +40.9 104.6 | 48 43.4 +40.7 103.7 | 48 04.3 +40.6 102.8 | 47 25.1 +40.4 101.9 | 46 45.8 +40.2 101.0 |
| 28° | 50 03.2 +40.2 103.5 | 49 24.1 +40.1 102.6 | 48 44.9 +39.8 101.7 | 48 05.5 +39.7 100.8 | 47 26.0 +39.6 99.9  |
| 29° | 50 43.4 +39.5 102.3 | 50 04.2 +39.3 101.4 | 49 24.7 +39.2 100.5 | 48 45.2 +39.1 99.6  | 48 05.6 +38.9 98.8  |

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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°  | 25 28.5 +49.3 121.9 | 24 54.2 +49.1 121.0 | 24 19.7 +48.8 120.1 | 23 44.8 +48.6 119.2 | 23 09.6 +48.4 118.4 |
| 1°  | 26 17.8 +49.1 121.3 | 25 43.3 +48.9 120.4 | 25 08.5 +48.7 119.5 | 24 33.4 +48.5 118.6 | 23 58.0 +48.3 117.7 |
| 2°  | 27 06.9 +49.0 120.7 | 26 32.2 +48.8 119.8 | 25 57.2 +48.5 118.9 | 25 21.9 +48.3 118.0 | 24 46.3 +48.1 117.1 |
| 3°  | 27 55.9 +48.8 120.0 | 27 21.0 +48.5 119.1 | 26 45.7 +48.4 118.2 | 26 10.2 +48.1 117.3 | 25 34.4 +47.9 116.4 |
| 4°  | 28 44.7 +48.5 119.4 | 28 09.5 +48.4 118.4 | 27 34.1 +48.1 117.5 | 26 58.3 +47.9 116.6 | 26 22.3 +47.7 115.7 |
| 5°  | 29 33.2 +48.4 118.7 | 28 57.9 +48.1 117.8 | 28 22.2 +47.9 116.9 | 27 46.2 +47.7 116.0 | 27 10.0 +47.5 115.1 |
| 6°  | 30 21.6 +48.2 118.0 | 29 46.0 +47.9 117.1 | 29 10.1 +47.7 116.2 | 28 33.9 +47.6 115.3 | 27 57.5 +47.3 114.4 |
| 7°  | 31 09.8 +47.9 117.3 | 30 33.9 +47.7 116.4 | 29 57.8 +47.5 115.5 | 29 21.5 +47.2 114.6 | 28 44.8 +47.1 113.7 |
| 8°  | 31 57.7 +47.7 116.6 | 31 21.6 +47.5 115.7 | 30 45.3 +47.3 114.8 | 30 08.7 +47.1 113.9 | 29 31.9 +46.9 113.0 |
| 9°  | 32 45.4 +47.4 115.9 | 32 09.1 +47.2 115.0 | 31 32.6 +47.0 114.0 | 30 55.8 +46.8 113.1 | 30 18.8 +46.6 112.2 |
| 10° | 33 32.8 +47.2 115.2 | 32 56.3 +47.0 114.2 | 32 19.6 +46.8 113.3 | 31 42.6 +46.6 112.4 | 31 05.4 +46.3 111.5 |
| 11° | 34 20.0 +46.9 114.4 | 33 43.3 +46.7 113.5 | 33 06.4 +46.4 112.6 | 32 29.2 +46.2 111.7 | 31 51.7 +46.1 110.8 |
| 12° | 35 06.9 +46.6 113.6 | 34 30.0 +46.4 112.7 | 33 52.8 +46.2 111.8 | 33 15.4 +46.1 110.9 | 32 37.8 +45.9 110.0 |
| 13° | 35 53.5 +46.3 112.9 | 35 16.4 +46.1 111.9 | 34 39.0 +45.9 111.0 | 34 01.5 +45.7 110.1 | 33 23.7 +45.5 109.2 |
| 14° | 36 39.8 +46.0 112.1 | 36 02.5 +45.8 111.2 | 35 24.9 +45.6 110.2 | 34 47.2 +45.4 109.3 | 34 09.2 +45.2 108.5 |
| 15° | 37 25.8 +45.7 111.3 | 36 48.3 +45.4 110.4 | 36 10.5 +45.3 109.4 | 35 32.6 +45.1 108.5 | 34 54.4 +44.9 107.7 |
| 16° | 38 11.5 +45.3 110.5 | 37 33.7 +45.1 109.5 | 36 55.8 +44.9 108.6 | 36 17.7 +44.7 107.7 | 35 39.3 +44.6 106.8 |
| 17° | 38 56.8 +44.9 109.6 | 38 18.8 +44.8 108.7 | 37 40.7 +44.6 107.8 | 37 02.4 +44.4 106.9 | 36 23.9 +44.2 106.0 |
| 18° | 39 41.7 +44.6 108.8 | 39 03.6 +44.4 107.8 | 38 25.3 +44.2 106.9 | 37 46.8 +44.0 106.1 | 37 08.1 +43.9 105.2 |
| 19° | 40 26.3 +44.1 107.9 | 39 48.0 +43.9 107.0 | 39 09.5 +43.8 106.1 | 38 30.8 +43.6 105.2 | 37 52.0 +43.5 104.3 |
| 20° | 41 10.4 +43.7 107.0 | 40 31.9 +43.6 106.1 | 39 53.3 +43.3 105.2 | 39 14.4 +43.3 104.3 | 38 35.5 +43.0 103.4 |
| 21° | 41 54.1 +43.3 106.1 | 41 15.5 +43.1 105.2 | 40 36.6 +43.0 104.3 | 39 57.7 +42.8 103.4 | 39 18.5 +42.7 102.5 |
| 22° | 42 37.4 +42.8 105.1 | 41 58.6 +42.6 104.2 | 41 19.6 +42.5 103.4 | 40 40.5 +42.3 102.5 | 40 01.2 +42.2 101.6 |
| 23° | 43 20.2 +42.3 104.2 | 42 41.2 +42.2 103.3 | 42 02.1 +42.0 102.4 | 41 22.8 +41.9 101.5 | 40 43.4 +41.8 100.7 |
| 24° | 44 02.5 +41.8 103.2 | 43 23.4 +41.6 102.3 | 42 44.1 +41.5 101.5 | 42 04.7 +41.4 100.6 | 41 25.2 +41.2 99.7  |
| 25° | 44 44.3 +41.3 102.2 | 44 05.0 +41.2 101.3 | 43 25.6 +41.0 100.5 | 42 46.1 +40.9 99.6  | 42 06.4 +40.8 98.8  |
| 26° | 45 25.6 +40.7 101.2 | 44 46.2 +40.5 100.3 | 44 06.6 +40.4 99.5  | 43 27.0 +40.3 98.6  | 42 47.2 +40.3 97.8  |
| 27° | 46 06.3 +40.1 100.1 | 45 26.7 +40.0 99.3  | 44 47.0 +39.9 98.4  | 44 07.3 +39.8 97.6  | 43 27.5 +39.7 96.8  |
| 28° | 46 46.4 +39.5 99.0  | 46 06.7 +39.4 98.2  | 45 26.9 +39.3 97.4  | 44 47.1 +39.2 96.5  | 44 07.2 +39.1 95.7  |
| 29° | 47 25.9 +38.8 97.9  | 46 46.1 +38.7 97.1  | 46 06.2 +38.6 96.3  | 45 26.3 +38.5 95.5  | 44 46.3 +38.5 94.7  |

| 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°  | 22 34.1 +48.3 117.5 | 21 58.4 +48.0 116.6 | 21 22.4 +47.8 115.8 | 20 46.1 +47.6 114.9 | 20 09.5 +47.5 114.1 |
| 1°  | 23 22.4 +48.0 116.8 | 22 46.4 +47.8 116.0 | 22 10.2 +47.6 115.1 | 21 33.7 +47.5 114.3 | 20 57.0 +47.2 113.4 |
| 2°  | 24 10.4 +47.9 116.2 | 23 34.2 +47.7 115.3 | 22 57.8 +47.5 114.5 | 22 21.2 +47.2 113.6 | 21 44.2 +47.2 112.7 |
| 3°  | 24 58.3 +47.7 115.5 | 24 21.9 +47.5 114.7 | 23 45.3 +47.3 113.8 | 23 08.4 +47.2 112.9 | 22 31.4 +46.9 112.1 |
| 4°  | 25 46.0 +47.5 114.9 | 25 09.4 +47.3 114.0 | 24 32.6 +47.1 113.1 | 23 55.6 +46.9 112.3 | 23 18.3 +46.8 111.4 |
| 5°  | 26 33.5 +47.3 114.2 | 25 56.7 +47.2 113.3 | 25 19.7 +47.0 112.4 | 24 42.5 +46.8 111.6 | 24 05.1 +46.6 110.7 |
| 6°  | 27 20.8 +47.1 113.5 | 26 43.9 +46.9 112.6 | 26 06.7 +46.7 111.7 | 25 29.3 +46.5 110.9 | 24 51.7 +46.4 110.0 |
| 7°  | 28 07.9 +46.9 112.8 | 27 30.8 +46.7 111.9 | 26 53.4 +46.5 111.0 | 26 15.8 +46.4 110.2 | 25 38.1 +46.1 109.3 |
| 8°  | 28 54.8 +46.7 112.1 | 28 17.5 +46.5 111.2 | 27 39.9 +46.4 110.3 | 27 02.2 +46.1 109.5 | 26 24.2 +46.0 108.6 |
| 9°  | 29 41.5 +46.4 111.4 | 29 04.0 +46.2 110.5 | 28 26.3 +46.0 109.6 | 27 48.3 +45.9 108.7 | 27 10.2 +45.8 107.9 |
| 10° | 30 27.9 +46.2 110.6 | 29 50.2 +46.0 109.7 | 29 12.3 +45.9 108.9 | 28 34.2 +45.7 108.0 | 27 56.0 +45.5 107.2 |
| 11° | 31 14.1 +45.9 109.9 | 30 36.2 +45.8 109.0 | 29 58.2 +45.5 108.1 | 29 19.9 +45.4 107.3 | 28 41.5 +45.3 106.4 |
| 12° | 32 00.0 +45.6 109.1 | 31 22.0 +45.4 108.2 | 30 43.7 +45.4 107.4 | 30 05.3 +45.2 106.5 | 29 26.8 +45.0 105.7 |
| 13° | 32 45.6 +45.4 108.4 | 32 07.4 +45.2 107.5 | 31 29.1 +45.0 106.6 | 30 50.5 +44.9 105.8 | 30 11.8 +44.7 104.9 |
| 14° | 33 31.0 +45.1 107.6 | 32 52.6 +44.9 106.7 | 32 14.1 +44.7 105.8 | 31 35.4 +44.6 105.0 | 30 56.5 +44.5 104.1 |
| 15° | 34 16.1 +44.7 106.8 | 33 37.5 +44.6 105.9 | 32 58.8 +44.5 105.0 | 32 20.0 +44.3 104.2 | 31 41.0 +44.2 103.4 |
| 16° | 35 00.8 +44.4 106.0 | 34 22.1 +44.3 105.1 | 33 43.3 +44.1 104.2 | 33 04.3 +44.0 103.4 | 32 25.2 +43.8 102.6 |
| 17° | 35 45.2 +44.1 105.1 | 35 06.4 +43.9 104.3 | 34 27.4 +43.8 103.4 | 33 48.3 +43.7 102.6 | 33 09.0 +43.6 101.7 |
| 18° | 36 29.3 +43.7 104.3 | 35 50.3 +43.6 103.4 | 35 11.2 +43.4 102.6 | 34 32.0 +43.3 101.7 | 33 52.6 +43.2 100.9 |
| 19° | 37 13.0 +43.3 103.4 | 36 33.9 +43.2 102.6 | 35 54.6 +43.1 101.7 | 35 15.3 +42.9 100.9 | 34 35.8 +42.9 100.1 |
| 20° | 37 56.3 +43.0 102.6 | 37 17.1 +42.8 101.7 | 36 37.7 +42.7 100.9 | 35 58.2 +42.6 100.0 | 35 18.7 +42.5 99.2  |
| 21° | 38 39.3 +42.5 101.7 | 37 59.9 +42.4 100.8 | 37 20.4 +42.3 100.0 | 36 40.8 +42.2 99.2  | 36 01.2 +42.1 98.4  |
| 22° | 39 21.8 +42.1 100.8 | 38 42.3 +42.0 99.9  | 38 02.7 +41.9 99.1  | 37 23.0 +41.8 98.3  | 36 43.3 +41.7 97.5  |
| 23° | 40 03.9 +41.6 99.8  | 39 24.3 +41.5 99.0  | 38 44.6 +41.5 98.2  | 38 04.8 +41.4 97.4  | 37 25.0 +41.3 96.6  |
| 24° | 40 45.5 +41.2 98.9  | 40 05.8 +41.1 98.1  | 39 26.1 +40.9 97.3  | 38 46.2 +40.9 96.5  | 38 06.3 +40.8 95.7  |
| 25° | 41 26.7 +40.7 97.9  | 40 46.9 +40.6 97.1  | 40 07.0 +40.6 96.3  | 39 27.1 +40.5 95.5  | 38 47.1 +40.4 94.7  |
| 26° | 42 07.4 +40.2 97.0  | 41 27.5 +40.1 96.1  | 40 47.6 +40.0 95.3  | 40 07.6 +39.9 94.5  | 39 27.5 +40.0 93.8  |
| 27° | 42 47.6 +39.6 95.9  | 42 07.6 +39.6 95.1  | 41 27.6 +39.5 94.4  | 40 47.5 +39.5 93.6  | 40 07.5 +39.4 92.8  |
| 28° | 43 27.2 +39.0 94.9  | 42 47.2 +39.0 94.1  | 42 07.1 +39.0 93.3  | 41 27.0 +38.9 92.6  | 40 46.9 +38.9 91.8  |
| 29° | 44 06.2 +38.5 93.9  | 43 26.2 +38.4 93.1  | 42 46.1 +38.3 92.3  | 42 05.9 +38.4 91.5  | 41 25.8 +38.4 90.8  |



## Declination SAME name as Latitude

## Latitude 48°

| 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°  | 19 32.8 +47.2 113.2 | 18 55.8 +47.0 112.4 | 18 18.5 +46.9 111.6 | 17 41.1 +46.7 110.7 | 17 03.4 +46.6 109.9 |
| 1°  | 20 20.0 +47.1 112.6 | 19 42.8 +46.9 111.7 | 19 05.4 +46.8 110.9 | 18 27.8 +46.6 110.1 | 17 50.0 +46.5 109.3 |
| 2°  | 21 07.1 +46.9 111.9 | 20 29.7 +46.8 111.1 | 19 52.2 +46.6 110.2 | 19 14.4 +46.5 109.4 | 18 36.5 +46.3 108.6 |
| 3°  | 21 54.0 +46.8 111.2 | 21 16.5 +46.6 110.4 | 20 38.8 +46.4 109.6 | 20 00.9 +46.3 108.7 | 19 22.8 +46.1 107.9 |
| 4°  | 22 40.8 +46.6 110.6 | 22 03.1 +46.5 109.7 | 21 25.2 +46.3 108.9 | 20 47.2 +46.1 108.1 | 20 08.9 +46.0 107.2 |
| 5°  | 23 27.4 +46.4 109.9 | 22 49.6 +46.2 109.0 | 22 11.5 +46.1 108.2 | 21 33.3 +46.0 107.4 | 20 54.9 +45.8 106.6 |
| 6°  | 24 13.8 +46.3 109.2 | 23 35.8 +46.1 108.3 | 22 57.6 +46.0 107.5 | 22 19.3 +45.7 106.7 | 21 40.7 +45.7 105.9 |
| 7°  | 25 00.1 +46.0 108.5 | 24 21.9 +45.9 107.6 | 23 43.6 +45.7 106.8 | 23 05.0 +45.6 106.0 | 22 26.4 +45.4 105.2 |
| 8°  | 25 46.1 +45.8 107.8 | 25 07.8 +45.7 106.9 | 24 29.3 +45.5 106.1 | 23 50.6 +45.4 105.3 | 23 11.8 +45.3 104.5 |
| 9°  | 26 31.9 +45.6 107.0 | 25 53.5 +45.4 106.2 | 25 14.8 +45.4 105.4 | 24 36.0 +45.2 104.6 | 23 57.1 +45.1 103.7 |
| 10° | 27 17.5 +45.4 106.3 | 26 38.9 +45.3 105.5 | 26 00.2 +45.1 104.7 | 25 21.2 +45.0 103.8 | 24 42.2 +44.9 103.0 |
| 11° | 28 02.9 +45.1 105.6 | 27 24.2 +45.0 104.7 | 26 45.3 +44.8 103.9 | 26 06.2 +44.8 103.1 | 25 27.1 +44.6 102.3 |
| 12° | 28 48.0 +44.9 104.8 | 28 09.2 +44.7 104.0 | 27 30.1 +44.7 103.2 | 26 51.0 +44.5 102.4 | 26 11.7 +44.4 101.5 |
| 13° | 29 32.9 +44.6 104.1 | 28 53.9 +44.5 103.2 | 28 14.8 +44.3 102.4 | 27 35.5 +44.3 101.6 | 26 56.1 +44.2 100.8 |
| 14° | 30 17.5 +44.4 103.3 | 29 38.4 +44.2 102.5 | 28 59.1 +44.1 101.7 | 28 19.8 +44.0 100.8 | 27 40.3 +43.9 100.0 |
| 15° | 31 01.9 +44.0 102.5 | 30 22.6 +44.0 101.7 | 29 43.2 +43.9 100.9 | 29 03.8 +43.7 100.1 | 28 24.2 +43.6 99.3  |
| 16° | 31 45.9 +43.8 101.7 | 31 06.6 +43.6 100.9 | 30 27.1 +43.5 100.1 | 29 47.5 +43.5 99.3  | 29 07.8 +43.4 98.5  |
| 17° | 32 29.7 +43.4 100.9 | 31 50.2 +43.3 100.1 | 31 10.6 +43.3 99.3  | 30 31.0 +43.1 98.5  | 29 51.2 +43.1 97.7  |
| 18° | 33 13.1 +43.1 100.1 | 32 33.5 +43.1 99.3  | 31 53.9 +42.9 98.5  | 31 14.1 +42.9 97.7  | 30 34.3 +42.8 96.9  |
| 19° | 33 56.2 +42.8 99.3  | 33 16.6 +42.6 98.4  | 32 36.8 +42.6 97.6  | 31 57.0 +42.5 96.8  | 31 17.1 +42.4 96.1  |
| 20° | 34 39.0 +42.4 98.4  | 33 59.2 +42.4 97.6  | 33 19.4 +42.3 96.8  | 32 39.5 +42.2 96.0  | 31 59.5 +42.2 95.2  |
| 21° | 35 21.4 +42.0 97.5  | 34 41.6 +41.9 96.7  | 34 01.7 +41.9 96.0  | 33 21.7 +41.8 95.2  | 32 41.7 +41.8 94.4  |
| 22° | 36 03.4 +41.7 96.7  | 35 23.5 +41.6 95.9  | 34 43.6 +41.5 95.1  | 34 03.5 +41.5 94.3  | 33 23.5 +41.4 93.5  |
| 23° | 36 45.1 +41.2 95.8  | 36 05.1 +41.2 95.0  | 35 25.1 +41.1 94.2  | 34 45.0 +41.1 93.4  | 34 04.9 +41.1 92.7  |
| 24° | 37 26.3 +40.8 94.9  | 36 46.3 +40.7 94.1  | 36 06.2 +40.7 93.3  | 35 26.1 +40.7 92.5  | 34 46.0 +40.7 91.8  |
| 25° | 38 07.1 +40.3 93.9  | 37 27.0 +40.3 93.2  | 36 46.9 +40.3 92.4  | 36 06.8 +40.3 91.6  | 35 26.7 +40.2 90.9  |
| 26° | 38 47.4 +39.9 93.0  | 38 07.3 +39.9 92.2  | 37 27.2 +39.9 91.5  | 36 47.1 +39.8 90.7  | 36 06.9 +39.9 90.0  |
| 27° | 39 27.3 +39.4 92.0  | 38 47.2 +39.4 91.3  | 38 07.1 +39.4 90.5  | 37 26.9 +39.4 89.8  | 36 46.8 +39.4 89.0  |
| 28° | 40 06.7 +38.9 91.0  | 39 26.6 +38.9 90.3  | 38 46.5 +38.9 89.6  | 38 06.3 +38.9 88.8  | 37 26.2 +38.9 88.1  |
| 29° | 40 45.6 +38.4 90.0  | 40 05.5 +38.4 89.3  | 39 25.4 +38.4 88.6  | 38 45.2 +38.5 87.8  | 38 05.1 +38.5 87.1  |

| 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°  | 16 25.6 +46.4 109.1 | 15 47.6 +46.2 108.3 | 15 09.4 +46.1 107.5 | 14 31.0 +46.0 106.7 | 13 52.5 +45.8 105.9 |
| 1°  | 17 12.0 +46.3 108.5 | 16 33.8 +46.2 107.6 | 15 55.5 +46.0 106.8 | 15 17.0 +45.9 106.0 | 14 38.3 +45.8 105.3 |
| 2°  | 17 58.3 +46.2 107.8 | 17 20.0 +46.0 107.0 | 16 41.5 +45.9 106.2 | 16 02.9 +45.7 105.4 | 15 24.1 +45.6 104.6 |
| 3°  | 18 44.5 +46.0 107.1 | 18 06.0 +45.9 106.3 | 17 27.4 +45.7 105.5 | 16 48.6 +45.7 104.7 | 16 09.7 +45.5 103.9 |
| 4°  | 19 30.5 +45.8 106.4 | 18 51.9 +45.7 105.6 | 18 13.1 +45.7 104.8 | 17 34.3 +45.5 104.0 | 16 55.2 +45.4 103.2 |
| 5°  | 20 16.3 +45.7 105.7 | 19 37.6 +45.6 104.9 | 18 58.8 +45.4 104.1 | 18 19.8 +45.3 103.3 | 17 40.6 +45.3 102.5 |
| 6°  | 21 02.0 +45.5 105.1 | 20 23.2 +45.4 104.2 | 19 44.2 +45.3 103.4 | 19 05.1 +45.2 102.6 | 18 25.9 +45.0 101.9 |
| 7°  | 21 47.5 +45.4 104.4 | 21 08.6 +45.2 103.5 | 20 29.5 +45.1 102.7 | 19 50.3 +45.0 101.9 | 19 10.9 +45.0 101.2 |
| 8°  | 22 32.9 +45.1 103.6 | 21 53.8 +45.1 102.8 | 21 14.6 +44.9 102.0 | 20 35.3 +44.8 101.2 | 19 55.9 +44.7 100.5 |
| 9°  | 23 18.0 +45.0 102.9 | 22 38.9 +44.8 102.1 | 21 59.5 +44.8 101.3 | 21 20.1 +44.7 100.5 | 20 40.6 +44.6 99.7  |
| 10° | 24 03.0 +44.8 102.2 | 23 23.7 +44.7 101.4 | 22 44.3 +44.6 100.6 | 22 04.8 +44.5 99.8  | 21 25.2 +44.4 99.0  |
| 11° | 24 47.8 +44.5 101.5 | 24 08.4 +44.4 100.7 | 23 28.9 +44.3 99.9  | 22 49.3 +44.2 99.1  | 22 09.6 +44.2 98.3  |
| 12° | 25 32.3 +44.3 100.7 | 24 52.8 +44.2 99.9  | 24 13.2 +44.2 99.1  | 23 33.5 +44.1 98.4  | 22 53.8 +44.0 97.6  |
| 13° | 26 16.6 +44.1 100.0 | 25 37.0 +44.0 99.2  | 24 57.4 +43.9 98.4  | 24 17.6 +43.8 97.6  | 23 37.8 +43.7 96.8  |
| 14° | 27 00.7 +43.8 99.2  | 26 21.0 +43.8 98.4  | 25 41.3 +43.6 97.6  | 25 01.4 +43.7 96.9  | 24 21.5 +43.6 96.1  |
| 15° | 27 44.5 +43.6 98.5  | 27 04.8 +43.5 97.7  | 26 24.9 +43.5 96.9  | 25 45.1 +43.3 96.1  | 25 05.1 +43.3 95.3  |
| 16° | 28 28.1 +43.3 97.7  | 27 48.3 +43.2 96.9  | 27 08.4 +43.2 96.1  | 26 28.4 +43.2 95.3  | 25 48.4 +43.1 94.6  |
| 17° | 29 11.4 +43.0 96.9  | 28 31.5 +43.0 96.1  | 27 51.6 +42.9 95.3  | 27 11.6 +42.8 94.6  | 26 31.5 +42.8 93.8  |
| 18° | 29 54.4 +42.7 96.1  | 29 14.5 +42.6 95.3  | 28 34.5 +42.6 94.5  | 27 54.4 +42.6 93.8  | 27 14.3 +42.6 93.0  |
| 19° | 30 37.1 +42.4 95.3  | 29 57.1 +42.4 94.5  | 29 17.1 +42.3 93.7  | 28 37.0 +42.3 93.0  | 27 56.9 +42.3 92.2  |
| 20° | 31 19.5 +42.1 94.4  | 30 39.5 +42.1 93.7  | 29 59.4 +42.0 92.9  | 29 19.3 +42.0 92.2  | 28 39.2 +42.0 91.4  |
| 21° | 32 01.6 +41.8 93.6  | 31 21.6 +41.7 92.8  | 30 41.4 +41.8 92.1  | 30 01.3 +41.7 91.3  | 29 21.2 +41.7 90.6  |
| 22° | 32 43.4 +41.4 92.8  | 32 03.3 +41.4 92.0  | 31 23.2 +41.3 91.2  | 30 43.0 +41.4 90.5  | 30 02.9 +41.3 89.8  |
| 23° | 33 24.8 +41.0 91.9  | 32 44.7 +41.0 91.1  | 32 04.5 +41.1 90.4  | 31 24.4 +41.0 89.7  | 30 44.2 +41.1 88.9  |
| 24° | 34 05.8 +40.7 91.0  | 33 25.7 +40.7 90.3  | 32 45.6 +40.6 89.5  | 32 05.4 +40.7 88.8  | 31 25.3 +40.7 88.1  |
| 25° | 34 46.5 +40.3 90.1  | 34 06.4 +40.2 89.4  | 33 26.2 +40.3 88.7  | 32 46.1 +40.3 87.9  | 32 06.0 +40.3 87.2  |
| 26° | 35 26.8 +39.8 89.2  | 34 46.6 +39.9 88.5  | 34 06.5 +39.9 87.8  | 33 26.4 +39.9 87.0  | 32 46.3 +40.0 86.3  |
| 27° | 36 06.6 +39.5 88.3  | 35 26.5 +39.5 87.6  | 34 46.4 +39.5 86.9  | 34 06.3 +39.6 86.1  | 33 26.3 +39.6 85.4  |
| 28° | 36 46.1 +38.9 87.4  | 36 06.0 +39.0 86.6  | 35 25.9 +39.1 85.9  | 34 45.9 +39.1 85.2  | 34 05.9 +39.2 84.5  |
| 29° | 37 25.0 +38.5 86.4  | 36 45.0 +38.5 85.7  | 36 05.0 +38.6 85.0  | 35 25.0 +38.7 84.3  | 34 45.1 +38.7 83.6  |

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# Latitude 48°

# 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°  | 13 13.8 +45.7 105.1 | 12 35.0 +45.6 104.4 | 11 56.0 +45.5 103.6 | 11 16.9 +45.4 102.8 | 10 37.7 +45.3 102.0 |
| 1°  | 13 59.5 +45.7 104.5 | 13 20.6 +45.5 103.7 | 12 41.5 +45.4 102.9 | 12 02.3 +45.4 102.1 | 11 23.0 +45.3 101.4 |
| 2°  | 14 45.2 +45.5 103.8 | 14 06.1 +45.4 103.0 | 13 26.9 +45.4 102.2 | 12 47.7 +45.2 101.5 | 12 08.3 +45.1 100.7 |
| 3°  | 15 30.7 +45.4 103.1 | 14 51.5 +45.3 102.3 | 14 12.3 +45.2 101.6 | 13 32.9 +45.1 100.8 | 12 53.4 +45.0 100.0 |
| 4°  | 16 16.1 +45.3 102.4 | 15 36.8 +45.2 101.7 | 14 57.5 +45.1 100.9 | 14 18.0 +45.0 100.1 | 13 38.4 +44.9 99.3  |
| 5°  | 17 01.4 +45.1 101.8 | 16 22.0 +45.1 101.0 | 15 42.6 +44.9 100.2 | 15 03.0 +44.9 99.4  | 14 23.3 +44.8 98.7  |
| 6°  | 17 46.5 +45.0 101.1 | 17 07.1 +44.9 100.3 | 16 27.5 +44.8 99.5  | 15 47.9 +44.7 98.7  | 15 08.1 +44.7 98.0  |
| 7°  | 18 31.5 +44.8 100.4 | 17 52.0 +44.7 99.6  | 17 12.3 +44.7 98.8  | 16 32.6 +44.6 98.0  | 15 52.8 +44.6 97.3  |
| 8°  | 19 16.3 +44.7 99.7  | 18 36.7 +44.6 98.9  | 17 57.0 +44.5 98.1  | 17 17.2 +44.5 97.3  | 16 37.4 +44.4 96.6  |
| 9°  | 20 01.0 +44.5 99.0  | 19 21.3 +44.4 98.2  | 18 41.5 +44.4 97.4  | 18 01.7 +44.3 96.6  | 17 21.8 +44.2 95.9  |
| 10° | 20 45.5 +44.3 98.2  | 20 05.7 +44.3 97.5  | 19 25.9 +44.2 96.7  | 18 46.0 +44.1 95.9  | 18 06.0 +44.1 95.2  |
| 11° | 21 29.8 +44.1 97.5  | 20 50.0 +44.0 96.7  | 20 10.1 +44.0 96.0  | 19 30.1 +44.0 95.2  | 18 50.1 +43.9 94.4  |
| 12° | 22 13.9 +44.0 96.8  | 21 34.0 +43.9 96.0  | 20 54.1 +43.8 95.3  | 20 14.1 +43.8 94.5  | 19 34.0 +43.8 93.7  |
| 13° | 22 57.9 +43.7 96.1  | 22 17.9 +43.7 95.3  | 21 37.9 +43.7 94.5  | 20 57.9 +43.6 93.8  | 20 17.8 +43.6 93.0  |
| 14° | 23 41.6 +43.5 95.3  | 23 01.6 +43.5 94.5  | 22 21.6 +43.4 93.8  | 21 41.5 +43.4 93.0  | 21 01.4 +43.4 92.3  |
| 15° | 24 25.1 +43.3 94.6  | 23 45.1 +43.2 93.8  | 23 05.0 +43.2 93.0  | 22 24.9 +43.2 92.3  | 21 44.8 +43.1 91.5  |
| 16° | 25 08.4 +43.0 93.8  | 24 28.3 +43.0 93.0  | 23 48.2 +43.0 92.3  | 23 08.1 +43.0 91.5  | 22 27.9 +43.0 90.8  |
| 17° | 25 51.4 +42.8 93.0  | 25 11.3 +42.8 92.3  | 24 31.2 +42.8 91.5  | 23 51.1 +42.7 90.8  | 23 10.9 +42.8 90.0  |
| 18° | 26 34.2 +42.6 92.2  | 25 54.1 +42.5 91.5  | 25 14.0 +42.5 90.7  | 24 33.8 +42.5 90.0  | 23 53.7 +42.5 89.3  |
| 19° | 27 16.8 +42.2 91.4  | 26 36.6 +42.3 90.7  | 25 56.5 +42.2 90.0  | 25 16.3 +42.3 89.2  | 24 36.2 +42.3 88.5  |
| 20° | 27 59.0 +42.0 90.6  | 27 18.9 +42.0 89.9  | 26 38.7 +42.0 89.2  | 25 58.6 +42.0 88.4  | 25 18.5 +42.0 87.7  |
| 21° | 28 41.0 +41.7 89.8  | 28 00.9 +41.7 89.1  | 27 20.7 +41.8 88.4  | 26 40.6 +41.8 87.6  | 26 00.5 +41.8 86.9  |
| 22° | 29 22.7 +41.4 89.0  | 28 42.6 +41.4 88.3  | 28 02.5 +41.4 87.5  | 27 22.4 +41.4 86.8  | 26 42.3 +41.5 86.1  |
| 23° | 30 04.1 +41.1 88.2  | 29 24.0 +41.1 87.5  | 28 43.9 +41.1 86.7  | 28 03.8 +41.2 86.0  | 27 23.8 +41.2 85.3  |
| 24° | 30 45.2 +40.7 87.3  | 30 05.1 +40.7 86.6  | 29 25.0 +40.8 85.9  | 28 45.0 +40.8 85.2  | 28 05.0 +40.9 84.5  |
| 25° | 31 25.9 +40.4 86.5  | 30 45.8 +40.5 85.8  | 30 05.8 +40.5 85.0  | 29 25.8 +40.6 84.3  | 28 45.9 +40.6 83.6  |
| 26° | 32 06.3 +40.0 85.6  | 31 26.3 +40.0 84.9  | 30 46.3 +40.1 84.2  | 30 06.4 +40.2 83.5  | 29 26.5 +40.3 82.8  |
| 27° | 32 46.3 +39.6 84.7  | 32 06.3 +39.8 84.0  | 31 26.4 +39.8 83.3  | 30 46.6 +39.9 82.6  | 30 06.8 +40.0 81.9  |
| 28° | 33 25.9 +39.3 83.8  | 32 46.1 +39.3 83.1  | 32 06.2 +39.4 82.4  | 31 26.5 +39.5 81.8  | 30 46.8 +39.6 81.1  |
| 29° | 34 05.2 +38.8 82.9  | 33 25.4 +38.9 82.2  | 32 45.6 +39.1 81.6  | 32 06.0 +39.1 80.9  | 31 26.4 +39.2 80.2  |

| 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°  | 9 58.4 +45.2 101.3  | 9 19.0 +45.1 100.5 | 8 39.4 +45.1 99.7  | 7 59.8 +45.0 99.0  | 7 20.1 +44.9 98.2  |
| 1°  | 10 43.6 +45.2 100.6 | 10 04.1 +45.1 99.8 | 9 24.5 +45.0 99.1  | 8 44.8 +44.9 98.3  | 8 05.0 +44.9 97.6  |
| 2°  | 11 28.8 +45.0 99.9  | 10 49.2 +44.9 99.2 | 10 09.5 +44.9 98.4 | 9 29.7 +44.9 97.6  | 8 49.9 +44.8 96.9  |
| 3°  | 12 13.8 +45.0 99.2  | 11 34.1 +44.9 98.5 | 10 54.4 +44.8 97.7 | 10 14.6 +44.7 97.0 | 9 34.7 +44.7 96.2  |
| 4°  | 12 58.8 +44.8 98.6  | 12 19.0 +44.8 97.8 | 11 39.2 +44.7 97.0 | 10 59.3 +44.7 96.3 | 10 19.4 +44.6 95.5 |
| 5°  | 13 43.6 +44.7 97.9  | 13 03.8 +44.7 97.1 | 12 23.9 +44.7 96.4 | 11 44.0 +44.6 95.6 | 11 04.0 +44.6 94.8 |
| 6°  | 14 28.3 +44.7 97.2  | 13 48.5 +44.5 96.4 | 13 08.6 +44.5 95.7 | 12 28.6 +44.5 94.9 | 11 48.6 +44.4 94.2 |
| 7°  | 15 13.0 +44.4 96.5  | 14 33.0 +44.5 95.7 | 13 53.1 +44.4 95.0 | 13 13.1 +44.3 94.2 | 12 33.0 +44.3 93.5 |
| 8°  | 15 57.4 +44.4 95.8  | 15 17.5 +44.3 95.0 | 14 37.5 +44.2 94.3 | 13 57.4 +44.3 93.5 | 13 17.3 +44.2 92.8 |
| 9°  | 16 41.8 +44.2 95.1  | 16 01.8 +44.2 94.3 | 15 21.7 +44.2 93.6 | 14 41.7 +44.1 92.8 | 14 01.5 +44.1 92.1 |
| 10° | 17 26.0 +44.1 94.4  | 16 46.0 +44.0 93.6 | 16 05.9 +44.0 92.9 | 15 25.8 +44.0 92.1 | 14 45.6 +44.0 91.4 |
| 11° | 18 10.1 +43.9 93.7  | 17 30.0 +43.9 92.9 | 16 49.9 +43.8 92.2 | 16 09.8 +43.8 91.4 | 15 29.6 +43.8 90.7 |
| 12° | 18 54.0 +43.7 93.0  | 18 13.9 +43.7 92.2 | 17 33.7 +43.7 91.5 | 16 53.6 +43.7 90.7 | 16 13.4 +43.7 90.0 |
| 13° | 19 37.7 +43.6 92.2  | 18 57.6 +43.5 91.5 | 18 17.4 +43.6 90.7 | 17 37.3 +43.5 90.0 | 16 57.1 +43.6 89.3 |
| 14° | 20 21.3 +43.3 91.5  | 19 41.1 +43.4 90.8 | 19 01.0 +43.3 90.0 | 18 20.8 +43.4 89.3 | 17 40.7 +43.4 88.5 |
| 15° | 21 04.6 +43.2 90.8  | 20 24.5 +43.2 90.0 | 19 44.3 +43.2 89.3 | 19 04.2 +43.2 88.5 | 18 24.1 +43.2 87.8 |
| 16° | 21 47.8 +43.0 90.0  | 21 07.7 +42.9 89.3 | 20 27.5 +43.0 88.5 | 19 47.4 +43.0 87.8 | 19 07.3 +43.0 87.1 |
| 17° | 22 30.8 +42.7 89.3  | 21 50.6 +42.8 88.5 | 21 10.5 +42.8 87.8 | 20 30.4 +42.8 87.1 | 19 50.3 +42.9 86.3 |
| 18° | 23 13.5 +42.6 88.5  | 22 33.4 +42.6 87.8 | 21 53.3 +42.6 87.0 | 21 13.2 +42.6 86.3 | 20 33.2 +42.6 85.6 |
| 19° | 23 56.1 +42.3 87.7  | 23 16.0 +42.3 87.0 | 22 35.9 +42.4 86.3 | 21 55.8 +42.5 85.6 | 21 15.8 +42.5 84.8 |
| 20° | 24 38.4 +42.0 87.0  | 23 58.3 +42.1 86.2 | 23 18.3 +42.1 85.5 | 22 38.3 +42.1 84.8 | 21 58.3 +42.2 84.1 |
| 21° | 25 20.4 +41.9 86.2  | 24 40.4 +41.9 85.5 | 24 00.4 +41.9 84.7 | 23 20.4 +42.0 84.0 | 22 40.5 +42.1 83.3 |
| 22° | 26 02.3 +41.5 85.4  | 25 22.3 +41.6 84.7 | 24 42.3 +41.7 84.0 | 24 02.4 +41.7 83.2 | 23 22.6 +41.8 82.5 |
| 23° | 26 43.8 +41.3 84.6  | 26 03.9 +41.3 83.9 | 25 24.0 +41.4 83.2 | 24 44.1 +41.5 82.5 | 24 04.4 +41.5 81.8 |
| 24° | 27 25.1 +40.9 83.8  | 26 45.2 +41.0 83.1 | 26 05.4 +41.1 82.4 | 25 25.6 +41.2 81.7 | 24 45.9 +41.3 81.0 |
| 25° | 28 06.0 +40.7 82.9  | 27 26.2 +40.8 82.2 | 26 46.5 +40.8 81.5 | 26 06.8 +41.0 80.9 | 25 27.2 +41.1 80.2 |
| 26° | 28 46.7 +40.4 82.1  | 28 07.0 +40.5 81.4 | 27 27.3 +40.6 80.7 | 26 47.8 +40.6 80.0 | 26 08.3 +40.7 79.4 |
| 27° | 29 27.1 +40.0 81.3  | 28 47.5 +40.1 80.6 | 28 07.9 +40.2 79.9 | 27 28.4 +40.4 79.2 | 26 49.0 +40.5 78.5 |
| 28° | 30 07.1 +39.7 80.4  | 29 27.6 +39.8 79.7 | 28 48.1 +40.0 79.0 | 28 08.8 +40.0 78.4 | 27 29.5 +40.2 77.7 |
| 29° | 30 46.8 +39.4 79.5  | 30 07.4 +39.5 78.9 | 29 28.1 +39.6 78.2 | 28 48.8 +39.7 77.5 | 28 09.7 +39.8 76.9 |

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# Declination SAME name as Latitude

# Latitude 48°

| 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°  | 6 40.3 +44.9 97.5  | 6 00.5 +44.8 96.7  | 5 20.6 +44.8 96.0  | 4 40.6 +44.8 95.2  | 4 00.6 +44.7 94.5  |
| 1°  | 7 25.2 +44.8 96.8  | 6 45.3 +44.8 96.0  | 6 05.4 +44.7 95.3  | 5 25.4 +44.6 94.5  | 4 45.3 +44.7 93.8  |
| 2°  | 8 10.0 +44.8 96.1  | 7 30.1 +44.7 95.4  | 6 50.1 +44.6 94.6  | 6 10.0 +44.7 93.9  | 5 30.0 +44.6 93.1  |
| 3°  | 8 54.8 +44.6 95.5  | 8 14.8 +44.6 94.7  | 7 34.7 +44.6 93.9  | 6 54.7 +44.5 93.2  | 6 14.6 +44.5 92.5  |
| 4°  | 9 39.4 +44.6 94.8  | 8 59.4 +44.5 94.0  | 8 19.3 +44.5 93.3  | 7 39.2 +44.5 92.5  | 6 59.1 +44.5 91.8  |
| 5°  | 10 24.0 +44.5 94.1 | 9 43.9 +44.5 93.3  | 9 03.8 +44.5 92.6  | 8 23.7 +44.5 91.8  | 7 43.6 +44.4 91.1  |
| 6°  | 11 08.5 +44.4 93.4 | 10 28.4 +44.4 92.7 | 9 48.3 +44.4 91.9  | 9 08.2 +44.3 91.2  | 8 28.0 +44.4 90.4  |
| 7°  | 11 52.9 +44.3 92.7 | 11 12.8 +44.3 92.0 | 10 32.7 +44.2 91.2 | 9 52.5 +44.3 90.5  | 9 12.4 +44.2 89.7  |
| 8°  | 12 37.2 +44.2 92.0 | 11 57.1 +44.2 91.3 | 11 16.9 +44.2 90.5 | 10 36.8 +44.2 89.8 | 9 56.6 +44.2 89.1  |
| 9°  | 13 21.4 +44.1 91.3 | 12 41.3 +44.1 90.6 | 12 01.1 +44.1 89.9 | 11 21.0 +44.1 89.1 | 10 40.8 +44.1 88.4 |
| 10° | 14 05.5 +44.0 90.6 | 13 25.4 +43.9 89.9 | 12 45.2 +44.0 89.2 | 12 05.1 +44.0 88.4 | 11 24.9 +44.0 87.7 |
| 11° | 14 49.5 +43.8 89.9 | 14 09.3 +43.9 89.2 | 13 29.2 +43.8 88.5 | 12 49.1 +43.8 87.7 | 12 08.9 +43.9 87.0 |
| 12° | 15 33.3 +43.7 89.2 | 14 53.2 +43.7 88.5 | 14 13.0 +43.8 87.8 | 13 32.9 +43.8 87.0 | 12 52.8 +43.8 86.3 |
| 13° | 16 17.0 +43.6 88.5 | 15 36.9 +43.5 87.8 | 14 56.8 +43.6 87.0 | 14 16.7 +43.6 86.3 | 13 36.6 +43.7 85.6 |
| 14° | 17 00.6 +43.4 87.8 | 16 20.4 +43.5 87.1 | 15 40.4 +43.4 86.3 | 15 00.3 +43.5 85.6 | 14 20.3 +43.5 84.9 |
| 15° | 17 44.0 +43.2 87.1 | 17 03.9 +43.2 86.3 | 16 23.8 +43.3 85.6 | 15 43.8 +43.4 84.9 | 15 03.8 +43.5 84.2 |
| 16° | 18 27.2 +43.1 86.3 | 17 47.1 +43.2 85.6 | 17 07.1 +43.2 84.9 | 16 27.2 +43.2 84.2 | 15 47.3 +43.2 83.5 |
| 17° | 19 10.3 +42.9 85.6 | 18 30.3 +42.9 84.9 | 17 50.3 +43.0 84.2 | 17 10.4 +43.0 83.4 | 16 30.5 +43.1 82.7 |
| 18° | 19 53.2 +42.7 84.9 | 19 13.2 +42.8 84.2 | 18 33.3 +42.8 83.4 | 17 53.4 +42.9 82.7 | 17 13.6 +43.0 82.0 |
| 19° | 20 35.9 +42.5 84.1 | 19 56.0 +42.5 83.4 | 19 16.1 +42.7 82.7 | 18 36.3 +42.7 82.0 | 17 56.6 +42.8 81.3 |
| 20° | 21 18.4 +42.3 83.4 | 20 38.5 +42.4 82.7 | 19 58.8 +42.4 81.9 | 19 19.0 +42.6 81.2 | 18 39.4 +42.6 80.5 |
| 21° | 22 00.7 +42.1 82.6 | 21 20.9 +42.2 81.9 | 20 41.2 +42.3 81.2 | 20 01.6 +42.3 80.5 | 19 22.0 +42.5 79.8 |
| 22° | 22 42.8 +41.9 81.8 | 22 03.1 +41.9 81.1 | 21 23.5 +42.0 80.4 | 20 43.9 +42.2 79.7 | 20 04.5 +42.2 79.0 |
| 23° | 23 24.7 +41.6 81.1 | 22 45.0 +41.8 80.4 | 22 05.5 +41.8 79.7 | 21 26.1 +41.9 79.0 | 20 46.7 +42.0 78.3 |
| 24° | 24 06.3 +41.4 80.3 | 23 26.8 +41.5 79.6 | 22 47.3 +41.6 78.9 | 22 08.0 +41.7 78.2 | 21 28.7 +41.9 77.5 |
| 25° | 24 47.7 +41.1 79.5 | 24 08.3 +41.2 78.8 | 23 28.9 +41.4 78.1 | 22 49.7 +41.5 77.4 | 22 10.6 +41.6 76.7 |
| 26° | 25 28.8 +40.9 78.7 | 24 49.5 +41.0 78.0 | 24 10.3 +41.1 77.3 | 23 31.2 +41.2 76.6 | 22 52.2 +41.4 76.0 |
| 27° | 26 09.7 +40.6 77.9 | 25 30.5 +40.7 77.2 | 24 51.4 +40.9 76.5 | 24 12.4 +41.0 75.8 | 23 33.6 +41.1 75.2 |
| 28° | 26 50.3 +40.3 77.0 | 26 11.2 +40.5 76.4 | 25 32.3 +40.6 75.7 | 24 53.4 +40.8 75.0 | 24 14.7 +40.9 74.4 |
| 29° | 27 30.6 +40.0 76.2 | 26 51.7 +40.1 75.5 | 26 12.9 +40.3 74.9 | 25 34.2 +40.4 74.2 | 24 55.6 +40.6 73.6 |

| 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°  | 3 20.6 +44.6 93.7  | 2 40.5 +44.6 93.0  | 2 00.4 +44.6 92.2  | 1 20.3 +44.6 91.5  | 0 40.1 +44.6 90.7  |
| 1°  | 4 05.2 +44.7 93.1  | 3 25.1 +44.6 92.3  | 2 45.0 +44.6 91.6  | 2 04.9 +44.6 90.8  | 1 24.7 +44.6 90.1  |
| 2°  | 4 49.9 +44.5 92.4  | 4 09.7 +44.6 91.6  | 3 29.6 +44.6 90.9  | 2 49.5 +44.5 90.1  | 2 09.3 +44.6 89.4  |
| 3°  | 5 34.4 +44.6 91.7  | 4 54.3 +44.5 91.0  | 4 14.2 +44.5 90.2  | 3 34.0 +44.5 89.5  | 2 53.9 +44.5 88.7  |
| 4°  | 6 19.0 +44.5 91.0  | 5 38.8 +44.5 90.3  | 4 58.7 +44.5 89.5  | 4 18.5 +44.5 88.8  | 3 38.4 +44.5 88.1  |
| 5°  | 7 03.5 +44.4 90.4  | 6 23.3 +44.4 89.6  | 5 43.2 +44.4 88.9  | 5 03.0 +44.5 88.1  | 4 22.9 +44.5 87.4  |
| 6°  | 7 47.9 +44.3 89.7  | 7 07.7 +44.4 88.9  | 6 27.6 +44.4 88.2  | 5 47.5 +44.4 87.5  | 5 07.4 +44.4 86.7  |
| 7°  | 8 32.2 +44.3 89.0  | 7 52.1 +44.3 88.3  | 7 12.0 +44.3 87.5  | 6 31.9 +44.3 86.8  | 5 51.8 +44.4 86.0  |
| 8°  | 9 16.5 +44.2 88.3  | 8 36.4 +44.2 87.6  | 7 56.3 +44.2 86.8  | 7 16.2 +44.3 86.1  | 6 36.2 +44.3 85.4  |
| 9°  | 10 00.7 +44.1 87.6 | 9 20.6 +44.2 86.9  | 8 40.5 +44.2 86.2  | 8 00.5 +44.2 85.4  | 7 20.5 +44.3 84.7  |
| 10° | 10 44.8 +44.1 86.9 | 10 04.8 +44.0 86.2 | 9 24.7 +44.1 85.5  | 8 44.7 +44.2 84.7  | 8 04.8 +44.2 84.0  |
| 11° | 11 28.9 +43.9 86.2 | 10 48.8 +44.0 85.5 | 10 08.8 +44.0 84.8 | 9 28.9 +44.0 84.1  | 8 49.0 +44.1 83.3  |
| 12° | 12 12.8 +43.8 85.6 | 11 32.8 +43.9 84.8 | 10 52.8 +44.0 84.1 | 10 12.9 +44.0 83.4 | 9 33.1 +44.0 82.6  |
| 13° | 12 56.6 +43.7 84.9 | 12 16.7 +43.7 84.1 | 11 36.8 +43.8 83.4 | 10 56.9 +43.9 82.7 | 10 17.1 +44.0 81.9 |
| 14° | 13 40.3 +43.6 84.2 | 13 00.4 +43.7 83.4 | 12 20.6 +43.7 82.7 | 11 40.8 +43.8 82.0 | 11 01.1 +43.8 81.3 |
| 15° | 14 23.9 +43.5 83.4 | 13 44.1 +43.5 82.7 | 13 04.3 +43.6 82.0 | 12 24.6 +43.6 81.3 | 11 44.9 +43.8 80.6 |
| 16° | 15 07.4 +43.3 82.7 | 14 27.6 +43.4 82.0 | 13 47.9 +43.5 81.3 | 13 08.2 +43.6 80.6 | 12 28.7 +43.6 79.9 |
| 17° | 15 50.7 +43.2 82.0 | 15 11.0 +43.3 81.3 | 14 31.4 +43.3 80.6 | 13 51.8 +43.4 79.9 | 13 12.3 +43.6 79.2 |
| 18° | 16 33.9 +43.1 81.3 | 15 54.3 +43.1 80.6 | 15 14.7 +43.2 79.9 | 14 35.2 +43.3 79.2 | 13 55.9 +43.4 78.4 |
| 19° | 17 17.0 +42.8 80.6 | 16 37.4 +43.0 79.9 | 15 57.9 +43.1 79.1 | 15 18.5 +43.2 78.4 | 14 39.3 +43.2 77.7 |
| 20° | 17 59.8 +42.7 79.8 | 17 20.4 +42.8 79.1 | 16 41.0 +42.9 78.4 | 16 01.7 +43.0 77.7 | 15 22.5 +43.2 77.0 |
| 21° | 18 42.5 +42.6 79.1 | 18 03.2 +42.6 78.4 | 17 23.9 +42.8 77.7 | 16 44.7 +42.9 77.0 | 16 05.7 +43.0 76.3 |
| 22° | 19 25.1 +42.3 78.3 | 18 45.8 +42.5 77.6 | 18 06.7 +42.5 77.0 | 17 27.6 +42.7 76.3 | 16 48.7 +42.8 75.6 |
| 23° | 20 07.4 +42.2 77.6 | 19 28.3 +42.3 76.9 | 18 49.2 +42.4 76.2 | 18 10.3 +42.5 75.5 | 17 31.5 +42.7 74.8 |
| 24° | 20 49.6 +42.0 76.8 | 20 10.6 +42.0 76.1 | 19 31.6 +42.3 75.5 | 18 52.8 +42.4 74.8 | 18 14.2 +42.5 74.1 |
| 25° | 21 31.6 +41.7 76.1 | 20 52.6 +41.9 75.4 | 20 13.9 +42.0 74.7 | 19 35.2 +42.2 74.0 | 18 56.7 +42.3 73.3 |
| 26° | 22 13.3 +41.5 75.3 | 21 34.5 +41.7 74.6 | 20 55.9 +41.8 73.9 | 20 17.4 +41.9 73.3 | 19 39.0 +42.1 72.6 |
| 27° | 22 54.8 +41.3 74.5 | 22 16.2 +41.4 73.8 | 21 37.7 +41.6 73.2 | 20 59.3 +41.8 72.5 | 20 21.1 +42.0 71.8 |
| 28° | 23 36.1 +41.1 73.7 | 22 57.6 +41.2 73.1 | 22 19.3 +41.4 72.4 | 21 41.1 +41.6 71.7 | 21 03.1 +41.7 71.1 |
| 29° | 24 17.2 +40.8 72.9 | 23 38.8 +41.0 72.3 | 23 00.7 +41.1 71.6 | 22 22.7 +41.3 71.0 | 21 44.8 +41.5 70.3 |

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| Dec | LHA 090° / 270°    | LHA 091° / 269°    | LHA 092° / 268°    | LHA 093° / 267°    | LHA 094° / 266°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | 0 00.0 +44.6 90.0  | -0 40.1 +44.5      | -1 20.3 +44.6      | -2 00.4 +44.6      | -2 40.5 +44.6      |
| 1°  | 0 44.6 +44.6 89.3  | 0 04.4 +44.6 88.6  | -0 35.7 +44.6      | -1 15.8 +44.6      | -1 55.9 +44.7      |
| 2°  | 1 29.2 +44.5 88.7  | 0 49.0 +44.6 87.9  | 0 08.9 +44.6 87.2  | -0 31.2 +44.7      | -1 11.2 +44.7      |
| 3°  | 2 13.7 +44.6 88.0  | 1 33.6 +44.6 87.2  | 0 53.5 +44.6 86.5  | 0 13.5 +44.6 85.8  | -0 26.5 +44.6      |
| 4°  | 2 58.3 +44.5 87.3  | 2 18.2 +44.6 86.6  | 1 38.1 +44.6 85.8  | 0 58.1 +44.6 85.1  | 0 18.1 +44.7 84.4  |
| 5°  | 3 42.8 +44.5 86.6  | 3 02.8 +44.5 85.9  | 2 22.7 +44.6 85.2  | 1 42.7 +44.7 84.4  | 1 02.8 +44.7 83.7  |
| 6°  | 4 27.3 +44.5 86.0  | 3 47.3 +44.5 85.2  | 3 07.3 +44.5 84.5  | 2 27.4 +44.6 83.8  | 1 47.5 +44.6 83.0  |
| 7°  | 5 11.8 +44.4 85.3  | 4 31.8 +44.4 84.6  | 3 51.8 +44.6 83.8  | 3 12.0 +44.5 83.1  | 2 32.1 +44.7 82.3  |
| 8°  | 5 56.2 +44.4 84.6  | 5 16.2 +44.5 83.9  | 4 36.4 +44.4 83.2  | 3 56.5 +44.6 82.4  | 3 16.8 +44.6 81.7  |
| 9°  | 6 40.6 +44.3 84.0  | 6 00.7 +44.3 83.2  | 5 20.8 +44.5 82.5  | 4 41.1 +44.5 81.7  | 4 01.4 +44.5 81.0  |
| 10° | 7 24.9 +44.2 83.3  | 6 45.0 +44.3 82.5  | 6 05.3 +44.3 81.8  | 5 25.6 +44.4 81.1  | 4 45.9 +44.6 80.3  |
| 11° | 8 09.1 +44.2 82.6  | 7 29.3 +44.3 81.9  | 6 49.6 +44.4 81.1  | 6 10.0 +44.4 80.4  | 5 30.5 +44.4 79.7  |
| 12° | 8 53.3 +44.1 81.9  | 8 13.6 +44.2 81.2  | 7 34.0 +44.2 80.4  | 6 54.4 +44.3 79.7  | 6 14.9 +44.5 79.0  |
| 13° | 9 37.4 +44.0 81.2  | 8 57.8 +44.1 80.5  | 8 18.2 +44.2 79.8  | 7 38.7 +44.3 79.0  | 6 59.4 +44.4 78.3  |
| 14° | 10 21.4 +44.0 80.5 | 9 41.9 +44.0 79.8  | 9 02.4 +44.1 79.1  | 8 23.0 +44.2 78.4  | 7 43.8 +44.3 77.6  |
| 15° | 11 05.4 +43.8 79.8 | 10 25.9 +43.9 79.1 | 9 46.5 +44.0 78.4  | 9 07.2 +44.2 77.7  | 8 28.1 +44.2 77.0  |
| 16° | 11 49.2 +43.7 79.1 | 11 09.8 +43.9 78.4 | 10 30.5 +44.0 77.7 | 9 51.4 +44.0 77.0  | 9 12.3 +44.2 76.3  |
| 17° | 12 32.9 +43.7 78.4 | 11 53.7 +43.7 77.7 | 11 14.5 +43.8 77.0 | 10 35.4 +44.0 76.3 | 9 56.5 +44.1 75.6  |
| 18° | 13 16.6 +43.5 77.7 | 12 37.4 +43.6 77.0 | 11 58.3 +43.8 76.3 | 11 19.4 +43.8 75.6 | 10 40.6 +43.9 74.9 |
| 19° | 14 00.1 +43.4 77.0 | 13 21.0 +43.5 76.3 | 12 42.1 +43.6 75.6 | 12 03.2 +43.8 74.9 | 11 24.5 +43.9 74.2 |
| 20° | 14 43.5 +43.2 76.3 | 14 04.5 +43.4 75.6 | 13 25.7 +43.5 74.9 | 12 47.0 +43.6 74.2 | 12 08.4 +43.8 73.5 |
| 21° | 15 26.7 +43.1 75.6 | 14 47.9 +43.2 74.9 | 14 09.2 +43.4 74.2 | 13 30.6 +43.6 73.5 | 12 52.2 +43.7 72.8 |
| 22° | 16 09.8 +43.0 74.9 | 15 31.1 +43.2 74.2 | 14 52.6 +43.2 73.5 | 14 14.2 +43.4 72.8 | 13 35.9 +43.5 72.1 |
| 23° | 16 52.8 +42.8 74.1 | 16 14.3 +42.9 73.5 | 15 35.8 +43.1 72.8 | 14 57.6 +43.2 72.1 | 14 19.4 +43.5 71.4 |
| 24° | 17 35.6 +42.7 73.4 | 16 57.2 +42.8 72.7 | 16 18.9 +43.0 72.0 | 15 40.8 +43.2 71.4 | 15 02.9 +43.3 70.7 |
| 25° | 18 18.3 +42.4 72.7 | 17 40.0 +42.7 72.0 | 17 01.9 +42.8 71.3 | 16 24.0 +42.9 70.6 | 15 46.2 +43.1 70.0 |
| 26° | 19 00.7 +42.3 71.9 | 18 22.7 +42.4 71.3 | 17 44.7 +42.7 70.6 | 17 06.9 +42.8 69.9 | 16 29.3 +43.0 69.2 |
| 27° | 19 43.0 +42.1 71.2 | 19 05.1 +42.3 70.5 | 18 27.4 +42.4 69.8 | 17 49.7 +42.7 69.2 | 17 12.3 +42.8 68.5 |
| 28° | 20 25.1 +42.0 70.4 | 19 47.4 +42.1 69.8 | 19 09.8 +42.3 69.1 | 18 32.4 +42.5 68.4 | 17 55.1 +42.7 67.8 |
| 29° | 21 07.1 +41.7 69.6 | 20 29.5 +41.9 69.0 | 19 52.1 +42.1 68.3 | 19 14.9 +42.3 67.7 | 18 37.8 +42.5 67.0 |

| Dec | LHA 095° / 265°    | LHA 096° / 264°    | LHA 097° / 263°    | LHA 098° / 262°    | LHA 099° / 261°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -3 20.6 +44.7      | -4 00.6 +44.7      | -4 40.6 +44.7      | -5 20.6 +44.8      | -6 00.5 +44.9      |
| 1°  | -2 35.9 +44.7      | -3 15.9 +44.7      | -3 55.9 +44.8      | -4 35.8 +44.8      | -5 15.6 +44.9      |
| 2°  | -1 51.2 +44.7      | -2 31.2 +44.8      | -3 11.1 +44.8      | -3 51.0 +44.9      | -4 30.7 +44.9      |
| 3°  | -1 06.5 +44.7      | -1 46.4 +44.7      | -2 26.3 +44.8      | -3 06.1 +44.9      | -3 45.8 +45.0      |
| 4°  | -0 21.8 +44.7      | -1 01.7 +44.8      | -1 41.5 +44.9      | -2 21.2 +44.9      | -3 00.8 +44.9      |
| 5°  | 0 22.9 +44.8 82.9  | -0 16.9 +44.8      | -0 56.6 +44.8      | -1 36.3 +45.0      | -2 15.9 +45.1      |
| 6°  | 1 07.7 +44.7 82.3  | 0 27.9 +44.8 81.5  | -0 11.8 +44.9      | -0 51.3 +44.9      | -1 30.8 +45.0      |
| 7°  | 1 52.4 +44.7 81.6  | 1 12.7 +44.8 80.9  | 0 33.1 +44.9 80.1  | -0 06.4 +44.9      | -0 45.8 +45.0      |
| 8°  | 2 37.1 +44.6 80.9  | 1 57.5 +44.7 80.2  | 1 18.0 +44.8 79.5  | 0 38.5 +45.0 78.7  | -0 00.8 +45.0      |
| 9°  | 3 21.7 +44.7 80.3  | 2 42.2 +44.8 79.5  | 2 02.8 +44.8 78.8  | 1 23.5 +44.9 78.1  | 0 44.2 +45.1 77.3  |
| 10° | 4 06.4 +44.6 79.6  | 3 27.0 +44.7 78.9  | 2 47.6 +44.8 78.1  | 2 08.4 +44.9 77.4  | 1 29.3 +45.0 76.7  |
| 11° | 4 51.0 +44.6 78.9  | 4 11.7 +44.6 78.2  | 3 32.4 +44.8 77.5  | 2 53.3 +44.9 76.7  | 2 14.3 +45.0 76.0  |
| 12° | 5 35.6 +44.5 78.3  | 4 56.3 +44.7 77.5  | 4 17.2 +44.7 76.8  | 3 38.2 +44.8 76.1  | 2 59.3 +44.9 75.3  |
| 13° | 6 20.1 +44.5 77.6  | 5 41.0 +44.6 76.9  | 5 01.9 +44.7 76.1  | 4 23.0 +44.8 75.4  | 3 44.2 +45.0 74.7  |
| 14° | 7 04.6 +44.4 76.9  | 6 25.6 +44.5 76.2  | 5 46.6 +44.7 75.5  | 5 07.8 +44.8 74.7  | 4 29.2 +44.9 74.0  |
| 15° | 7 49.0 +44.4 76.2  | 7 10.1 +44.5 75.5  | 6 31.3 +44.6 74.8  | 5 52.6 +44.7 74.1  | 5 14.1 +44.8 73.3  |
| 16° | 8 33.4 +44.3 75.6  | 7 54.6 +44.4 74.8  | 7 15.9 +44.5 74.1  | 6 37.3 +44.7 73.4  | 5 58.9 +44.8 72.7  |
| 17° | 9 17.7 +44.2 74.9  | 8 39.0 +44.3 74.2  | 8 00.4 +44.5 73.4  | 7 22.0 +44.6 72.7  | 6 43.7 +44.8 72.0  |
| 18° | 10 01.9 +44.1 74.2 | 9 23.3 +44.3 73.5  | 8 44.9 +44.4 72.8  | 8 06.6 +44.6 72.0  | 7 28.5 +44.7 71.3  |
| 19° | 10 46.0 +44.0 73.5 | 10 07.6 +44.1 72.8 | 9 29.3 +44.3 72.1  | 8 51.2 +44.4 71.4  | 8 13.2 +44.6 70.7  |
| 20° | 11 30.0 +43.9 72.8 | 10 51.7 +44.1 72.1 | 10 13.6 +44.2 71.4 | 9 35.6 +44.4 70.7  | 8 57.8 +44.6 70.0  |
| 21° | 12 13.9 +43.9 72.1 | 11 35.8 +44.0 71.4 | 10 57.8 +44.2 70.7 | 10 20.0 +44.3 70.0 | 9 42.4 +44.4 69.3  |
| 22° | 12 57.8 +43.7 71.4 | 12 19.8 +43.9 70.7 | 11 42.0 +44.0 70.0 | 11 04.3 +44.2 69.3 | 10 26.8 +44.4 68.6 |
| 23° | 13 41.5 +43.6 70.7 | 13 03.7 +43.7 70.0 | 12 26.0 +43.9 69.3 | 11 48.5 +44.1 68.6 | 11 11.2 +44.3 67.9 |
| 24° | 14 25.1 +43.4 70.0 | 13 47.4 +43.7 69.3 | 13 09.9 +43.9 68.6 | 12 32.6 +44.0 67.9 | 11 55.5 +44.2 67.3 |
| 25° | 15 08.5 +43.3 69.3 | 14 31.1 +43.5 68.6 | 13 53.8 +43.7 67.9 | 13 16.6 +43.9 67.2 | 12 39.7 +44.1 66.6 |
| 26° | 15 51.8 +43.2 68.6 | 15 14.6 +43.3 67.9 | 14 37.5 +43.5 67.2 | 14 00.5 +43.8 66.5 | 13 23.8 +44.0 65.9 |
| 27° | 16 35.0 +43.1 67.8 | 15 57.9 +43.3 67.2 | 15 21.0 +43.3 66.5 | 14 44.3 +43.6 65.8 | 14 07.8 +43.8 65.2 |
| 28° | 17 18.1 +42.8 67.1 | 16 41.2 +43.0 66.4 | 16 04.5 +43.2 65.8 | 15 27.9 +43.5 65.1 | 14 51.6 +43.7 64.5 |
| 29° | 18 00.9 +42.7 66.4 | 17 24.2 +43.0 65.7 | 16 47.7 +43.2 65.1 | 16 11.4 +43.4 64.4 | 15 35.3 +43.6 63.7 |

# Declination SAME name as Latitude

# Latitude 48°

| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°    | LHA 103° / 257°    | LHA 104° / 256°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -6 40.3 +44.9      | -7 20.1 +45.0      | -7 59.8 +45.0      | -8 39.4 +45.1      | -9 19.0 +45.3      |
| 1°  | -5 55.4 +44.9      | -6 35.1 +45.0      | -7 14.8 +45.2      | -7 54.3 +45.2      | -8 33.7 +45.3      |
| 2°  | -5 10.5 +45.0      | -5 50.1 +45.1      | -6 29.6 +45.1      | -7 09.1 +45.3      | -7 48.4 +45.3      |
| 3°  | -4 25.5 +45.1      | -5 05.0 +45.1      | -5 44.5 +45.2      | -6 23.8 +45.3      | -7 03.1 +45.4      |
| 4°  | -3 40.4 +45.1      | -4 19.9 +45.2      | -4 59.3 +45.3      | -5 38.5 +45.3      | -6 17.7 +45.5      |
| 5°  | -2 55.3 +45.1      | -3 34.7 +45.2      | -4 14.0 +45.3      | -4 53.2 +45.4      | -5 32.2 +45.5      |
| 6°  | -2 10.2 +45.1      | -2 49.5 +45.2      | -3 28.7 +45.3      | -4 07.8 +45.4      | -4 46.7 +45.5      |
| 7°  | -1 25.1 +45.1      | -2 04.3 +45.2      | -2 43.4 +45.3      | -3 22.4 +45.5      | -4 01.2 +45.6      |
| 8°  | -0 40.0 +45.1      | -1 19.1 +45.2      | -1 58.1 +45.4      | -2 36.9 +45.4      | -3 15.6 +45.6      |
| 9°  | 0 05.1 +45.2 76.6  | -0 33.9 +45.3      | -1 12.7 +45.3      | -1 51.5 +45.5      | -2 30.0 +45.6      |
| 10° | 0 50.3 +45.1 75.9  | 0 11.4 +45.2 75.2  | -0 27.4 +45.4      | -1 06.0 +45.5      | -1 44.4 +45.6      |
| 11° | 1 35.4 +45.1 75.3  | 0 56.6 +45.2 74.5  | 0 18.0 +45.4 73.8  | -0 20.5 +45.5      | -0 58.8 +45.6      |
| 12° | 2 20.5 +45.1 74.6  | 1 41.8 +45.3 73.9  | 1 03.4 +45.3 73.1  | 0 25.0 +45.5 72.4  | -0 13.2 +45.7      |
| 13° | 3 05.6 +45.0 73.9  | 2 27.1 +45.2 73.2  | 1 48.7 +45.3 72.5  | 1 10.5 +45.5 71.7  | 0 32.5 +45.6 71.0  |
| 14° | 3 50.6 +45.1 73.3  | 3 12.3 +45.1 72.5  | 2 34.0 +45.4 71.8  | 1 56.0 +45.5 71.1  | 1 18.1 +45.6 70.3  |
| 15° | 4 35.7 +45.0 72.6  | 3 57.4 +45.2 71.9  | 3 19.4 +45.3 71.2  | 2 41.5 +45.4 70.4  | 2 03.7 +45.6 69.7  |
| 16° | 5 20.7 +44.9 72.0  | 4 42.6 +45.1 71.2  | 4 04.7 +45.2 70.5  | 3 26.9 +45.4 69.8  | 2 49.3 +45.6 69.0  |
| 17° | 6 05.6 +44.9 71.3  | 5 27.7 +45.1 70.6  | 4 49.9 +45.2 69.8  | 4 12.3 +45.4 69.1  | 3 34.9 +45.6 68.4  |
| 18° | 6 50.5 +44.9 70.6  | 6 12.8 +45.0 69.9  | 5 35.1 +45.2 69.2  | 4 57.7 +45.3 68.5  | 4 20.5 +45.5 67.7  |
| 19° | 7 35.4 +44.8 69.9  | 6 57.8 +44.9 69.2  | 6 20.3 +45.1 68.5  | 5 43.0 +45.4 67.8  | 5 06.0 +45.5 67.1  |
| 20° | 8 20.2 +44.7 69.3  | 7 42.7 +44.9 68.6  | 7 05.4 +45.1 67.9  | 6 28.4 +45.2 67.1  | 5 51.5 +45.4 66.4  |
| 21° | 9 04.9 +44.7 68.6  | 8 27.6 +44.8 67.9  | 7 50.5 +45.0 67.2  | 7 13.6 +45.2 66.5  | 6 36.9 +45.4 65.8  |
| 22° | 9 49.6 +44.5 67.9  | 9 12.4 +44.8 67.2  | 8 35.5 +45.0 66.5  | 7 58.8 +45.1 65.8  | 7 22.3 +45.3 65.1  |
| 23° | 10 34.1 +44.5 67.2 | 9 57.2 +44.7 66.5  | 9 20.5 +44.8 65.9  | 8 43.9 +45.1 65.2  | 8 07.6 +45.3 64.5  |
| 24° | 11 18.6 +44.4 66.6 | 10 41.9 +44.5 65.9 | 10 05.3 +44.8 65.2 | 9 29.0 +45.0 64.5  | 8 52.9 +45.1 63.8  |
| 25° | 12 03.0 +44.3 65.9 | 11 26.4 +44.5 65.2 | 10 50.1 +44.7 64.5 | 10 14.0 +44.9 63.8 | 9 38.0 +45.2 63.1  |
| 26° | 12 47.3 +44.1 65.2 | 12 10.9 +44.4 64.5 | 11 34.8 +44.6 63.8 | 10 58.9 +44.8 63.1 | 10 23.2 +45.0 62.5 |
| 27° | 13 31.4 +44.1 64.5 | 12 55.3 +44.3 63.8 | 12 19.4 +44.5 63.1 | 11 43.7 +44.7 62.5 | 11 08.2 +44.9 61.8 |
| 28° | 14 15.5 +43.9 63.8 | 13 39.6 +44.1 63.1 | 13 03.9 +44.4 62.4 | 12 28.4 +44.6 61.8 | 11 53.1 +44.9 61.1 |
| 29° | 14 59.4 +43.8 63.1 | 14 23.7 +44.1 62.4 | 13 48.3 +44.2 61.8 | 13 13.0 +44.5 61.1 | 12 38.0 +44.7 60.4 |

| Dec | LHA 105° / 255°    | LHA 106° / 254°    | LHA 107° / 253°    | LHA 108° / 252°    | LHA 109° / 251°   |
|-----|--------------------|--------------------|--------------------|--------------------|-------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °    |
| 0°  | -9 58.4 +45.3      |                    |                    |                    |                   |
| 1°  | -9 13.1 +45.4      | -9 52.3 +45.5      |                    |                    |                   |
| 2°  | -8 27.7 +45.5      | -9 06.8 +45.6      | -9 45.8 +45.7      |                    |                   |
| 3°  | -7 42.2 +45.5      | -8 21.2 +45.6      | -9 00.1 +45.7      | -9 38.9 +45.9      |                   |
| 4°  | -6 56.7 +45.5      | -7 35.6 +45.7      | -8 14.4 +45.8      | -8 53.0 +45.9      | -9 31.5 +46.1     |
| 5°  | -6 11.2 +45.7      | -6 49.9 +45.7      | -7 28.6 +45.9      | -8 07.1 +46.0      | -8 45.4 +46.1     |
| 6°  | -5 25.5 +45.6      | -6 04.2 +45.8      | -6 42.7 +45.9      | -7 21.1 +46.0      | -7 59.3 +46.2     |
| 7°  | -4 39.9 +45.7      | -5 18.4 +45.8      | -5 56.8 +45.9      | -6 35.1 +46.1      | -7 13.1 +46.2     |
| 8°  | -3 54.2 +45.7      | -4 32.6 +45.8      | -5 10.9 +46.0      | -5 49.0 +46.2      | -6 26.9 +46.3     |
| 9°  | -3 08.5 +45.8      | -3 46.8 +45.9      | -4 24.9 +46.1      | -5 02.8 +46.2      | -5 40.6 +46.3     |
| 10° | -2 22.7 +45.7      | -3 00.9 +45.9      | -3 38.8 +46.0      | -4 16.6 +46.2      | -4 54.3 +46.4     |
| 11° | -1 37.0 +45.8      | -2 15.0 +46.0      | -2 52.8 +46.1      | -3 30.4 +46.2      | -4 07.9 +46.4     |
| 12° | -0 51.2 +45.8      | -1 29.0 +45.9      | -2 06.7 +46.1      | -2 44.2 +46.3      | -3 21.5 +46.4     |
| 13° | -0 05.4 +45.8      | -0 43.1 +45.9      | -1 20.6 +46.1      | -1 57.9 +46.2      | -2 35.1 +46.5     |
| 14° | 0 40.4 +45.7 69.6  | 0 02.8 +46.0 68.9  | -0 34.5 +46.1      | -1 11.7 +46.3      | -1 48.6 +46.4     |
| 15° | 1 26.1 +45.8 69.0  | 0 48.8 +45.9 68.2  | 0 11.6 +46.1 67.5  | -0 25.4 +46.3      | -1 02.2 +46.5     |
| 16° | 2 11.9 +45.8 68.3  | 1 34.7 +45.9 67.6  | 0 57.7 +46.1 66.8  | 0 20.9 +46.3 66.1  | -0 15.7 +46.5     |
| 17° | 2 57.7 +45.7 67.7  | 2 20.6 +45.9 66.9  | 1 43.8 +46.1 66.2  | 1 07.2 +46.2 65.5  | 0 30.8 +46.4 64.7 |
| 18° | 3 43.4 +45.7 67.0  | 3 06.5 +45.9 66.3  | 2 29.9 +46.0 65.6  | 1 53.4 +46.3 64.8  | 1 17.2 +46.5 64.1 |
| 19° | 4 29.1 +45.7 66.4  | 3 52.4 +45.9 65.6  | 3 15.9 +46.1 64.9  | 2 39.7 +46.2 64.2  | 2 03.7 +46.4 63.5 |
| 20° | 5 14.8 +45.6 65.7  | 4 38.3 +45.8 65.0  | 4 02.0 +46.0 64.3  | 3 25.9 +46.2 63.5  | 2 50.1 +46.4 62.8 |
| 21° | 6 00.4 +45.6 65.1  | 5 24.1 +45.8 64.3  | 4 48.0 +46.0 63.6  | 4 12.1 +46.2 62.9  | 3 36.5 +46.4 62.2 |
| 22° | 6 46.0 +45.5 64.4  | 6 09.9 +45.7 63.7  | 5 34.0 +45.9 63.0  | 4 58.3 +46.2 62.3  | 4 22.9 +46.4 61.6 |
| 23° | 7 31.5 +45.4 63.7  | 6 55.6 +45.7 63.0  | 6 19.9 +45.9 62.3  | 5 44.5 +46.1 61.6  | 5 09.3 +46.3 60.9 |
| 24° | 8 16.9 +45.4 63.1  | 7 41.3 +45.6 62.4  | 7 05.8 +45.8 61.7  | 6 30.6 +46.0 61.0  | 5 55.6 +46.3 60.3 |
| 25° | 9 02.3 +45.4 62.4  | 8 26.9 +45.5 61.7  | 7 51.6 +45.8 61.0  | 7 16.6 +46.0 60.3  | 6 41.9 +46.2 59.6 |
| 26° | 9 47.7 +45.2 61.8  | 9 12.4 +45.5 61.1  | 8 37.4 +45.7 60.4  | 8 02.6 +46.0 59.7  | 7 28.1 +46.2 59.0 |
| 27° | 10 32.9 +45.2 61.1 | 9 57.9 +45.4 60.4  | 9 23.1 +45.6 59.7  | 8 48.6 +45.8 59.0  | 8 14.3 +46.1 58.3 |
| 28° | 11 18.1 +45.1 60.4 | 10 43.3 +45.3 59.7 | 10 08.7 +45.6 59.1 | 9 34.4 +45.8 58.4  | 9 00.4 +46.0 57.7 |
| 29° | 12 03.2 +44.9 59.8 | 11 28.6 +45.2 59.1 | 10 54.3 +45.5 58.4 | 10 20.2 +45.7 57.7 | 9 46.4 +46.0 57.1 |

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# Latitude 48°

# Declination SAME name as Latitude

| Dec | LHA 110° / 250°   | LHA 111° / 249°   | LHA 112° / 248°   | LHA 113° / 247°   | LHA 114° / 246°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  |                   |                   |                   |                   |                   |
| 3°  |                   |                   |                   |                   |                   |
| 4°  |                   |                   |                   |                   |                   |
| 5°  | -9 23.6 +46.3     |                   |                   |                   |                   |
| 6°  | -8 37.3 +46.3     | -9 15.2 +46.5     | -9 52.9 +46.7     |                   |                   |
| 7°  | -7 51.0 +46.4     | -8 28.7 +46.5     | -9 06.2 +46.7     | -9 43.6 +46.9     |                   |
| 8°  | -7 04.6 +46.4     | -7 42.2 +46.6     | -8 19.5 +46.7     | -8 56.7 +47.0     | -9 33.6 +47.1     |
| 9°  | -6 18.2 +46.5     | -6 55.6 +46.7     | -7 32.8 +46.9     | -8 09.7 +47.0     | -8 46.5 +47.2     |
| 10° | -5 31.7 +46.5     | -6 08.9 +46.7     | -6 45.9 +46.8     | -7 22.7 +47.0     | -7 59.3 +47.2     |
| 11° | -4 45.2 +46.6     | -5 22.2 +46.7     | -5 59.1 +47.0     | -6 35.7 +47.1     | -7 12.1 +47.3     |
| 12° | -3 58.6 +46.6     | -4 35.5 +46.8     | -5 12.1 +46.9     | -5 48.6 +47.1     | -6 24.8 +47.3     |
| 13° | -3 12.0 +46.6     | -3 48.7 +46.8     | -4 25.2 +47.0     | -5 01.5 +47.2     | -5 37.5 +47.4     |
| 14° | -2 25.4 +46.7     | -3 01.9 +46.8     | -3 38.2 +47.0     | -4 14.3 +47.2     | -4 50.1 +47.4     |
| 15° | -1 38.7 +46.6     | -2 15.1 +46.9     | -2 51.2 +47.0     | -3 27.1 +47.2     | -4 02.7 +47.4     |
| 16° | -0 52.1 +46.7     | -1 28.2 +46.8     | -2 04.2 +47.1     | -2 39.9 +47.3     | -3 15.3 +47.5     |
| 17° | -0 05.4 +46.6     | -0 41.4 +46.9     | -1 17.1 +47.0     | -1 52.6 +47.2     | -2 27.8 +47.4     |
| 18° | 0 41.2 +46.7 63.4 | 0 05.5 +46.8 62.6 | -0 30.1 +47.1     | -1 05.4 +47.3     | -1 40.4 +47.5     |
| 19° | 1 27.9 +46.6 62.7 | 0 52.3 +46.8 62.0 | 0 17.0 +47.0 61.2 | -0 18.1 +47.3     | -0 52.9 +47.5     |
| 20° | 2 14.5 +46.6 62.1 | 1 39.1 +46.9 61.4 | 1 04.0 +47.1 60.6 | 0 29.2 +47.2 59.9 | -0 05.4 +47.5     |
| 21° | 3 01.1 +46.6 61.5 | 2 26.0 +46.8 60.7 | 1 51.1 +47.0 60.0 | 1 16.4 +47.3 59.3 | 0 42.1 +47.4 58.5 |
| 22° | 3 47.7 +46.6 60.8 | 3 12.8 +46.8 60.1 | 2 38.1 +47.0 59.4 | 2 03.7 +47.2 58.7 | 1 29.5 +47.5 57.9 |
| 23° | 4 34.3 +46.5 60.2 | 3 59.6 +46.8 59.5 | 3 25.1 +47.0 58.8 | 2 50.9 +47.3 58.0 | 2 17.0 +47.5 57.3 |
| 24° | 5 20.8 +46.5 59.6 | 4 46.4 +46.7 58.9 | 4 12.1 +47.0 58.1 | 3 38.2 +47.2 57.4 | 3 04.5 +47.4 56.7 |
| 25° | 6 07.3 +46.5 58.9 | 5 33.1 +46.7 58.2 | 4 59.1 +46.9 57.5 | 4 25.4 +47.1 56.8 | 3 51.9 +47.4 56.1 |
| 26° | 6 53.8 +46.4 58.3 | 6 19.8 +46.6 57.6 | 5 46.0 +46.9 56.9 | 5 12.5 +47.1 56.2 | 4 39.3 +47.4 55.5 |
| 27° | 7 40.2 +46.4 57.7 | 7 06.4 +46.6 57.0 | 6 32.9 +46.8 56.3 | 5 59.6 +47.1 55.6 | 5 26.7 +47.3 54.9 |
| 28° | 8 26.6 +46.2 57.0 | 7 53.0 +46.5 56.3 | 7 19.7 +46.8 55.6 | 6 46.7 +47.1 54.9 | 6 14.0 +47.3 54.2 |
| 29° | 9 12.8 +46.3 56.4 | 8 39.5 +46.5 55.7 | 8 06.5 +46.7 55.0 | 7 33.8 +47.0 54.3 | 7 01.3 +47.3 53.6 |

| Dec | LHA 115° / 245°   | LHA 116° / 244°   | LHA 117° / 243°   | LHA 118° / 242°   | LHA 119° / 241°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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°  | -9 23.0 +47.3     | -9 59.4 +47.6     |                   |                   |                   |
| 10° | -8 35.7 +47.4     | -9 11.8 +47.6     | -9 47.7 +47.8     |                   |                   |
| 11° | -7 48.3 +47.5     | -8 24.2 +47.7     | -8 59.9 +47.9     | -9 35.3 +48.1     |                   |
| 12° | -7 00.8 +47.5     | -7 36.5 +47.7     | -8 12.0 +47.9     | -8 47.2 +48.1     | -9 22.2 +48.4     |
| 13° | -6 13.3 +47.6     | -6 48.8 +47.8     | -7 24.1 +48.0     | -7 59.1 +48.2     | -8 33.8 +48.3     |
| 14° | -5 25.7 +47.6     | -5 01.0 +47.8     | -6 36.1 +48.0     | -7 10.9 +48.2     | -7 45.5 +48.5     |
| 15° | -4 38.1 +47.6     | -5 13.2 +47.8     | -5 48.1 +48.0     | -6 22.7 +48.3     | -6 57.0 +48.5     |
| 16° | -3 50.5 +47.7     | -4 25.4 +47.9     | -5 00.1 +48.1     | -5 34.4 +48.3     | -6 08.5 +48.5     |
| 17° | -3 02.8 +47.7     | -3 37.5 +47.9     | -4 12.0 +48.1     | -4 46.1 +48.3     | -5 20.0 +48.6     |
| 18° | -2 15.1 +47.6     | -2 49.6 +47.9     | -3 23.9 +48.2     | -3 57.8 +48.4     | -4 31.4 +48.5     |
| 19° | -1 27.5 +47.8     | -2 01.7 +47.9     | -2 35.7 +48.1     | -3 09.4 +48.3     | -3 42.9 +48.6     |
| 20° | -0 39.7 +47.7     | -1 13.8 +47.9     | -1 47.6 +48.2     | -2 21.1 +48.4     | -2 54.3 +48.7     |
| 21° | 0 08.0 +47.7 57.8 | -0 25.9 +48.0     | -0 59.4 +48.2     | -1 32.7 +48.4     | -2 05.6 +48.6     |
| 22° | 0 55.7 +47.7 57.2 | 0 22.1 +47.9 56.4 | -0 11.2 +48.1     | -0 44.3 +48.4     | -1 17.0 +48.7     |
| 23° | 1 43.4 +47.7 56.6 | 1 10.0 +47.9 55.8 | 0 36.9 +48.2 55.1 | 0 04.1 +48.4 54.4 | -0 28.3 +48.6     |
| 24° | 2 31.1 +47.6 56.0 | 1 57.9 +47.9 55.2 | 1 25.1 +48.1 54.5 | 0 52.5 +48.5 53.8 | 0 20.3 +48.7 53.0 |
| 25° | 3 18.7 +47.7 55.4 | 2 45.8 +47.9 54.6 | 2 13.2 +48.2 53.9 | 1 41.0 +48.3 53.2 | 1 09.0 +48.6 52.5 |
| 26° | 4 06.4 +47.6 54.8 | 3 33.7 +47.9 54.0 | 3 01.4 +48.1 53.3 | 2 29.3 +48.4 52.6 | 1 57.6 +48.6 51.9 |
| 27° | 4 54.0 +47.6 54.1 | 4 21.6 +47.8 53.4 | 3 49.5 +48.1 52.7 | 3 17.7 +48.4 52.0 | 2 46.2 +48.6 51.3 |
| 28° | 5 41.6 +47.5 53.5 | 5 09.4 +47.9 52.8 | 4 37.6 +48.1 52.1 | 4 06.1 +48.3 51.4 | 3 34.8 +48.6 50.7 |
| 29° | 6 29.1 +47.5 52.9 | 5 57.3 +47.7 52.2 | 5 25.7 +48.0 51.5 | 4 54.4 +48.3 50.8 | 4 23.4 +48.6 50.1 |

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 The data on this page is believed to be accurate but no warranty is given for it's correctness. Use it only for training and exercising!

| Dec | LHA 120° / 240°   | LHA 121° / 239°   | LHA 122° / 238°   | LHA 123° / 237°   | LHA 124° / 236°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | 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° | -9 56.9 +48.6     |                   |                   |                   |                   |
| 13° | -9 08.3 +48.6     | -9 42.5 +48.9     |                   |                   |                   |
| 14° | -8 19.7 +48.7     | -8 53.6 +48.8     | -9 27.3 +49.1     |                   |                   |
| 15° | -7 31.0 +48.7     | -8 04.8 +49.0     | -8 38.2 +49.2     | -9 11.3 +49.4     | -9 44.1 +49.6     |
| 16° | -6 42.3 +48.7     | -7 15.8 +48.9     | -7 49.0 +49.2     | -8 21.9 +49.4     | -8 54.5 +49.7     |
| 17° | -5 53.6 +48.8     | -6 26.9 +49.1     | -6 59.8 +49.2     | -7 32.5 +49.5     | -8 04.8 +49.7     |
| 18° | -5 04.8 +48.8     | -5 37.8 +49.0     | -6 10.6 +49.3     | -6 43.0 +49.5     | -7 15.1 +49.8     |
| 19° | -4 16.0 +48.9     | -4 48.8 +49.1     | -5 21.3 +49.3     | -5 53.5 +49.6     | -6 25.3 +49.8     |
| 20° | -3 27.1 +48.8     | -3 59.7 +49.1     | -4 32.0 +49.4     | -5 03.9 +49.6     | -5 35.5 +49.8     |
| 21° | -2 38.3 +48.9     | -3 10.6 +49.1     | -3 42.6 +49.3     | -4 14.3 +49.6     | -4 45.7 +49.9     |
| 22° | -1 49.4 +48.9     | -2 21.5 +49.1     | -2 53.3 +49.4     | -3 24.7 +49.6     | -3 55.8 +49.9     |
| 23° | -1 00.5 +48.9     | -1 32.4 +49.2     | -2 03.9 +49.4     | -2 35.1 +49.7     | -3 05.9 +49.9     |
| 24° | -0 11.6 +48.9     | -0 43.2 +49.1     | -1 14.5 +49.4     | -1 45.4 +49.6     | -2 16.0 +49.9     |
| 25° | 0 37.3 +48.9 51.7 | 0 05.9 +49.2 51.0 | -0 25.1 +49.4     | -0 55.8 +49.7     | -1 26.1 +49.9     |
| 26° | 1 26.2 +48.9 51.1 | 0 55.1 +49.1 50.4 | 0 24.3 +49.4 49.7 | -0 06.1 +49.6     | -0 36.2 +49.9     |
| 27° | 2 15.1 +48.8 50.6 | 1 44.2 +49.2 49.8 | 1 13.7 +49.4 49.1 | 0 43.5 +49.7 48.4 | 0 13.7 +49.9 47.6 |
| 28° | 3 03.9 +48.9 50.0 | 2 33.4 +49.1 49.3 | 2 03.1 +49.4 48.5 | 1 33.2 +49.7 47.8 | 1 03.6 +50.0 47.1 |
| 29° | 3 52.8 +48.8 49.4 | 3 22.5 +49.1 48.7 | 2 52.5 +49.4 48.0 | 2 22.9 +49.6 47.2 | 1 53.6 +49.9 46.5 |

| Dec | LHA 125° / 235°   | LHA 126° / 234°   | LHA 127° / 233°   | LHA 128° / 232° | LHA 129° / 231° |
|-----|-------------------|-------------------|-------------------|-----------------|-----------------|
|     | 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° | -9 26.7 +49.9     | -9 58.5 +50.1     |                   |                 |                 |
| 17° | -8 36.8 +50.0     | -9 08.4 +50.2     | -9 39.7 +50.5     |                 |                 |
| 18° | -7 46.8 +50.0     | -8 18.2 +50.3     | -8 49.2 +50.5     | -9 19.9 +50.7   |                 |
| 19° | -6 56.8 +50.0     | -7 27.9 +50.2     | -7 58.7 +50.5     | -8 29.2 +50.8   |                 |
| 20° | -6 06.8 +50.1     | -6 37.7 +50.4     | -7 08.2 +50.6     | -7 38.4 +50.8   |                 |
| 21° | -5 16.7 +50.1     | -5 47.3 +50.3     | -6 17.6 +50.6     | -6 47.6 +50.9   |                 |
| 22° | -4 26.6 +50.2     | -4 57.0 +50.4     | -5 27.0 +50.6     | -5 56.7 +50.9   |                 |
| 23° | -3 36.4 +50.1     | -4 06.6 +50.4     | -4 36.4 +50.7     | -5 05.8 +50.9   |                 |
| 24° | -2 46.3 +50.2     | -3 16.2 +50.4     | -3 45.7 +50.7     | -4 14.9 +50.9   |                 |
| 25° | -1 56.1 +50.2     | -2 25.8 +50.5     | -2 55.0 +50.6     | -3 24.0 +51.0   |                 |
| 26° | -1 05.9 +50.1     | -1 35.3 +50.4     | -2 04.4 +50.8     | -2 33.0 +51.0   |                 |
| 27° | -0 15.8 +50.2     | -0 44.9 +50.5     | -1 13.6 +50.7     | -1 42.0 +50.9   |                 |
| 28° | 0 34.4 +50.2 46.3 | 0 05.6 +50.4 45.6 | -0 22.9 +50.7     | -0 51.1 +51.0   |                 |
| 29° | 1 24.6 +50.2 45.8 | 0 56.0 +50.5 45.0 | 0 27.8 +50.7 44.3 | -0 00.1 +51.0   |                 |





| 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°  | 41 00.0 +60.0 180.0 | 40 59.5 +60.0 178.7 | 40 58.2 +60.0 177.4 | 40 55.9 +59.9 176.0 | 40 52.7 +59.9 174.7 |
| 1°  | 42 00.0 +60.0 180.0 | 41 59.5 +60.0 178.7 | 41 58.2 +59.9 177.3 | 41 55.8 +60.0 176.0 | 41 52.6 +59.9 174.6 |
| 2°  | 43 00.0 +60.0 180.0 | 42 59.5 +60.0 178.6 | 42 58.1 +60.0 177.3 | 42 55.8 +59.9 175.9 | 42 52.5 +59.9 174.5 |
| 3°  | 44 00.0 +60.0 180.0 | 43 59.5 +60.0 178.6 | 43 58.1 +60.0 177.2 | 43 55.7 +59.9 175.8 | 43 52.4 +59.9 174.5 |
| 4°  | 45 00.0 +60.0 180.0 | 44 59.5 +60.0 178.6 | 44 58.1 +59.9 177.2 | 44 55.6 +60.0 175.8 | 44 52.3 +59.8 174.4 |
| 5°  | 46 00.0 +60.0 180.0 | 45 59.5 +60.0 178.6 | 45 58.0 +60.0 177.1 | 45 55.6 +59.9 175.7 | 45 52.1 +59.9 174.3 |
| 6°  | 47 00.0 +60.0 180.0 | 46 59.5 +60.0 178.5 | 46 58.0 +60.0 177.1 | 46 55.5 +59.9 175.6 | 46 52.0 +59.9 174.2 |
| 7°  | 48 00.0 +60.0 180.0 | 47 59.5 +60.0 178.5 | 47 58.0 +59.9 177.0 | 47 55.4 +59.9 175.6 | 47 51.9 +59.8 174.1 |
| 8°  | 49 00.0 +60.0 180.0 | 48 59.5 +60.0 178.5 | 48 57.9 +60.0 177.0 | 48 55.3 +60.0 175.5 | 48 51.7 +59.9 174.0 |
| 9°  | 50 00.0 +60.0 180.0 | 49 59.5 +60.0 178.5 | 49 57.9 +60.0 176.9 | 49 55.3 +59.9 175.4 | 49 51.6 +59.8 173.9 |
| 10° | 51 00.0 +60.0 180.0 | 50 59.5 +60.0 178.4 | 50 57.9 +59.9 176.9 | 50 55.2 +59.9 175.3 | 50 51.4 +59.9 173.8 |
| 11° | 52 00.0 +60.0 180.0 | 51 59.5 +59.9 178.4 | 51 57.8 +60.0 176.8 | 51 55.1 +59.9 175.2 | 51 51.3 +59.8 173.6 |
| 12° | 53 00.0 +60.0 180.0 | 52 59.4 +60.0 178.4 | 52 57.8 +59.9 176.8 | 52 55.0 +59.9 175.1 | 52 51.1 +59.8 173.5 |
| 13° | 54 00.0 +60.0 180.0 | 53 59.4 +60.0 178.3 | 53 57.7 +60.0 176.7 | 53 54.9 +59.9 175.0 | 53 50.9 +59.8 173.4 |
| 14° | 55 00.0 +60.0 180.0 | 54 59.4 +60.0 178.3 | 54 57.7 +59.9 176.6 | 54 54.8 +59.9 174.9 | 54 50.7 +59.8 173.2 |
| 15° | 56 00.0 +60.0 180.0 | 55 59.4 +60.0 178.3 | 55 57.6 +60.0 176.5 | 55 54.7 +59.9 174.8 | 55 50.5 +59.8 173.1 |
| 16° | 57 00.0 +60.0 180.0 | 56 59.4 +60.0 178.2 | 56 57.6 +59.9 176.5 | 56 54.6 +59.8 174.7 | 56 50.3 +59.8 173.0 |
| 17° | 58 00.0 +60.0 180.0 | 57 59.4 +60.0 178.2 | 57 57.5 +60.0 176.4 | 57 54.4 +59.9 174.6 | 57 50.1 +59.8 172.8 |
| 18° | 59 00.0 +60.0 180.0 | 58 59.4 +60.0 178.2 | 58 57.5 +59.9 176.3 | 58 54.3 +59.9 174.5 | 58 49.9 +59.7 172.6 |
| 19° | 60 00.0 +60.0 180.0 | 59 59.4 +59.9 178.1 | 59 57.4 +59.9 176.2 | 59 54.2 +59.8 174.3 | 59 49.6 +59.8 172.5 |
| 20° | 61 00.0 +60.0 180.0 | 60 59.3 +60.0 178.1 | 60 57.3 +60.0 176.1 | 60 54.0 +59.9 174.2 | 60 49.4 +59.7 172.3 |
| 21° | 62 00.0 +60.0 180.0 | 61 59.3 +60.0 178.0 | 61 57.3 +59.9 176.0 | 61 53.9 +59.8 174.0 | 61 49.1 +59.7 172.1 |
| 22° | 63 00.0 +60.0 180.0 | 62 59.3 +60.0 178.0 | 62 57.2 +59.9 175.9 | 62 53.7 +59.8 173.9 | 62 48.8 +59.7 171.9 |
| 23° | 64 00.0 +60.0 180.0 | 63 59.3 +60.0 177.9 | 63 57.1 +59.9 175.8 | 63 53.5 +59.8 173.7 | 63 48.5 +59.7 171.6 |
| 24° | 65 00.0 +60.0 180.0 | 64 59.3 +59.9 177.8 | 64 57.0 +59.9 175.7 | 64 53.3 +59.8 173.5 | 64 48.2 +59.6 171.4 |
| 25° | 66 00.0 +60.0 180.0 | 65 59.2 +60.0 177.8 | 65 56.9 +59.9 175.5 | 65 53.1 +59.8 173.3 | 65 47.8 +59.6 171.1 |
| 26° | 67 00.0 +60.0 180.0 | 66 59.2 +60.0 177.7 | 66 56.8 +59.9 175.4 | 66 52.9 +59.8 173.1 | 66 47.4 +59.6 170.8 |
| 27° | 68 00.0 +60.0 180.0 | 67 59.2 +60.0 177.6 | 67 56.7 +59.9 175.2 | 67 52.7 +59.7 172.9 | 67 47.0 +59.5 170.5 |
| 28° | 69 00.0 +60.0 180.0 | 68 59.2 +59.9 177.5 | 68 56.6 +59.9 175.1 | 68 52.4 +59.7 172.6 | 68 46.5 +59.5 170.2 |
| 29° | 70 00.0 +60.0 180.0 | 69 59.1 +60.0 177.4 | 69 56.5 +59.9 174.9 | 69 52.1 +59.7 172.4 | 69 46.0 +59.5 169.8 |

| Dec | LHA 005° / 355°     | LHA 006° / 354°     | LHA 007° / 353°     | LHA 008° / 352°     | LHA 009° / 351°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 40 48.6 +59.9 173.4 | 40 43.7 +59.7 172.1 | 40 37.8 +59.6 170.8 | 40 31.0 +59.6 169.5 | 40 23.4 +59.4 168.1 |
| 1°  | 41 48.5 +59.8 173.3 | 41 43.4 +59.8 172.0 | 41 37.4 +59.7 170.6 | 41 30.6 +59.5 169.3 | 41 22.8 +59.4 168.0 |
| 2°  | 42 48.3 +59.8 173.2 | 42 43.2 +59.7 171.8 | 42 37.1 +59.6 170.5 | 42 30.1 +59.6 169.1 | 42 22.2 +59.5 167.8 |
| 3°  | 43 48.1 +59.8 173.1 | 43 42.9 +59.7 171.7 | 43 36.7 +59.7 170.3 | 43 29.7 +59.5 169.0 | 43 21.7 +59.3 167.6 |
| 4°  | 44 47.9 +59.8 173.0 | 44 42.6 +59.7 171.6 | 44 36.4 +59.6 170.2 | 44 29.2 +59.5 168.8 | 44 21.0 +59.4 167.4 |
| 5°  | 45 47.7 +59.8 172.8 | 45 42.3 +59.7 171.4 | 45 36.0 +59.6 170.0 | 45 28.7 +59.5 168.6 | 45 20.4 +59.4 167.2 |
| 6°  | 46 47.5 +59.8 172.7 | 46 42.0 +59.7 171.3 | 46 35.6 +59.6 169.8 | 46 28.2 +59.4 168.4 | 46 19.8 +59.3 167.0 |
| 7°  | 47 47.3 +59.8 172.6 | 47 41.7 +59.7 171.1 | 47 35.2 +59.5 169.7 | 47 27.6 +59.5 168.2 | 47 19.1 +59.3 166.8 |
| 8°  | 48 47.1 +59.7 172.5 | 48 41.4 +59.7 171.0 | 48 34.7 +59.6 169.5 | 48 27.1 +59.4 168.0 | 48 18.4 +59.2 166.5 |
| 9°  | 49 46.8 +59.8 172.3 | 49 41.1 +59.6 170.8 | 49 34.3 +59.5 169.3 | 49 26.5 +59.4 167.8 | 49 17.6 +59.3 166.3 |
| 10° | 50 46.6 +59.8 172.2 | 50 40.7 +59.7 170.7 | 50 33.8 +59.5 169.1 | 50 25.9 +59.3 167.6 | 50 16.9 +59.2 166.0 |
| 11° | 51 46.4 +59.7 172.1 | 51 40.4 +59.6 170.5 | 51 33.3 +59.5 168.9 | 51 25.2 +59.4 167.3 | 51 16.1 +59.2 165.8 |
| 12° | 52 46.1 +59.7 171.9 | 52 40.0 +59.6 170.3 | 52 32.8 +59.5 168.7 | 52 24.6 +59.3 167.1 | 52 15.3 +59.1 165.5 |
| 13° | 53 45.8 +59.7 171.7 | 53 39.6 +59.6 170.1 | 53 32.3 +59.4 168.5 | 53 23.9 +59.3 166.9 | 53 14.4 +59.1 165.2 |
| 14° | 54 45.5 +59.7 171.6 | 54 39.2 +59.6 169.9 | 54 31.7 +59.4 168.2 | 54 23.2 +59.2 166.6 | 54 13.5 +59.0 165.0 |
| 15° | 55 45.2 +59.7 171.4 | 55 38.8 +59.5 169.7 | 55 31.1 +59.4 168.0 | 55 22.4 +59.2 166.3 | 55 12.5 +59.0 164.6 |
| 16° | 56 44.9 +59.7 171.2 | 56 38.3 +59.5 169.5 | 56 30.5 +59.4 167.7 | 56 21.6 +59.1 166.0 | 56 11.5 +59.0 164.3 |
| 17° | 57 44.6 +59.6 171.0 | 57 37.8 +59.5 169.2 | 57 29.9 +59.3 167.5 | 57 20.7 +59.2 165.7 | 57 10.5 +58.8 164.0 |
| 18° | 58 44.2 +59.6 170.8 | 58 37.3 +59.5 169.0 | 58 29.2 +59.3 167.2 | 58 19.9 +59.0 165.4 | 58 09.3 +58.9 163.6 |
| 19° | 59 43.8 +59.6 170.6 | 59 36.8 +59.4 168.7 | 59 28.5 +59.2 166.9 | 59 18.9 +59.0 165.1 | 59 08.2 +58.7 163.2 |
| 20° | 60 43.4 +59.6 170.4 | 60 36.2 +59.4 168.5 | 60 27.7 +59.2 166.6 | 60 17.9 +59.0 164.7 | 60 06.9 +58.7 162.8 |
| 21° | 61 43.0 +59.6 170.1 | 61 35.6 +59.3 168.2 | 61 26.9 +59.1 166.2 | 61 16.9 +58.8 164.3 | 61 05.6 +58.6 162.4 |
| 22° | 62 42.6 +59.5 169.8 | 62 34.9 +59.4 167.8 | 62 26.0 +59.1 165.9 | 62 15.7 +58.8 163.9 | 62 04.2 +58.5 162.0 |
| 23° | 63 42.1 +59.5 169.6 | 63 34.3 +59.2 167.5 | 63 25.1 +59.0 165.5 | 63 14.5 +58.7 163.5 | 63 02.7 +58.4 161.5 |
| 24° | 64 41.6 +59.4 169.3 | 64 33.5 +59.2 167.2 | 64 24.1 +58.9 165.1 | 64 13.2 +58.6 163.0 | 64 01.1 +58.2 161.0 |
| 25° | 65 41.0 +59.4 168.9 | 65 32.7 +59.2 166.8 | 65 23.0 +58.8 164.6 | 65 11.8 +58.6 162.5 | 64 59.3 +58.2 160.4 |
| 26° | 66 40.4 +59.3 168.6 | 66 31.9 +59.0 166.4 | 66 21.8 +58.8 164.1 | 66 10.4 +58.3 162.0 | 65 57.5 +58.0 159.8 |
| 27° | 67 39.7 +59.3 168.2 | 67 30.9 +59.0 165.9 | 67 20.6 +58.6 163.6 | 67 08.7 +58.3 161.4 | 66 55.5 +57.8 159.2 |
| 28° | 68 39.0 +59.2 167.8 | 68 29.9 +58.9 165.4 | 68 19.2 +58.5 163.1 | 68 07.0 +58.1 160.8 | 67 53.3 +57.6 158.5 |
| 29° | 69 38.2 +59.2 167.3 | 69 28.8 +58.8 164.9 | 69 17.7 +58.4 162.5 | 69 05.1 +57.9 160.1 | 68 50.9 +57.4 157.7 |

| 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°  | 40 14.9 +59.3 166.8 | 40 05.5 +59.1 165.6 | 39 55.2 +59.1 164.3 | 39 44.1 +58.9 163.0 | 39 32.2 +58.7 161.7 |
| 1°  | 41 14.2 +59.3 166.7 | 41 04.6 +59.2 165.3 | 40 54.3 +59.0 164.0 | 40 43.0 +58.8 162.7 | 40 30.9 +58.7 161.4 |
| 2°  | 42 13.5 +59.2 166.4 | 42 03.8 +59.1 165.1 | 41 53.3 +58.9 163.8 | 41 41.8 +58.8 162.5 | 41 29.6 +58.6 161.2 |
| 3°  | 43 12.7 +59.3 166.2 | 43 02.9 +59.1 164.9 | 42 52.2 +59.0 163.5 | 42 40.6 +58.8 162.2 | 42 28.2 +58.5 160.9 |
| 4°  | 44 12.0 +59.2 166.0 | 44 02.0 +59.1 164.6 | 43 51.2 +58.9 163.3 | 43 39.4 +58.7 161.9 | 43 26.7 +58.6 160.6 |
| 5°  | 45 11.2 +59.2 165.8 | 45 01.1 +59.0 164.4 | 44 50.1 +58.8 163.0 | 44 38.1 +58.7 161.6 | 44 25.3 +58.4 160.3 |
| 6°  | 46 10.4 +59.2 165.6 | 46 00.1 +59.0 164.1 | 45 48.9 +58.8 162.7 | 45 36.8 +58.6 161.3 | 45 23.7 +58.5 160.0 |
| 7°  | 47 09.6 +59.1 165.3 | 46 59.1 +59.0 163.9 | 46 47.7 +58.8 162.5 | 46 35.4 +58.6 161.0 | 46 22.2 +58.3 159.6 |
| 8°  | 48 08.7 +59.1 165.1 | 47 58.1 +58.9 163.6 | 47 46.5 +58.7 162.2 | 47 34.0 +58.5 160.7 | 47 20.5 +58.3 159.3 |
| 9°  | 49 07.8 +59.1 164.8 | 48 57.0 +58.9 163.3 | 48 45.2 +58.7 161.9 | 48 32.5 +58.5 160.4 | 48 18.8 +58.3 158.9 |
| 10° | 50 06.9 +59.0 164.5 | 49 55.9 +58.8 163.0 | 49 43.9 +58.6 161.5 | 49 31.0 +58.4 160.0 | 49 17.1 +58.1 158.6 |
| 11° | 51 05.9 +59.0 164.3 | 50 54.7 +58.8 162.7 | 50 42.5 +58.6 161.2 | 50 29.4 +58.3 159.7 | 50 15.2 +58.1 158.2 |
| 12° | 52 04.9 +58.9 164.0 | 51 53.5 +58.7 162.4 | 51 41.1 +58.5 160.9 | 51 27.7 +58.2 159.3 | 51 13.3 +58.0 157.8 |
| 13° | 53 03.8 +58.9 163.6 | 52 52.2 +58.7 162.1 | 52 39.6 +58.4 160.5 | 52 25.9 +58.2 158.9 | 52 11.3 +57.9 157.4 |
| 14° | 54 02.7 +58.8 163.3 | 53 50.9 +58.6 161.7 | 53 38.0 +58.4 160.1 | 53 24.1 +58.1 158.5 | 53 09.2 +57.8 157.0 |
| 15° | 55 01.5 +58.8 163.0 | 54 49.5 +58.5 161.3 | 54 36.4 +58.2 159.7 | 54 22.2 +58.0 158.1 | 54 07.0 +57.7 156.5 |
| 16° | 56 00.3 +58.7 162.6 | 55 48.0 +58.5 161.0 | 55 34.6 +58.2 159.3 | 55 20.2 +57.9 157.7 | 55 04.7 +57.6 156.0 |
| 17° | 56 59.0 +58.7 162.3 | 56 46.5 +58.3 160.5 | 56 32.8 +58.1 158.9 | 56 18.1 +57.8 157.2 | 56 02.3 +57.5 155.5 |
| 18° | 57 57.7 +58.5 161.9 | 57 44.8 +58.3 160.1 | 57 30.9 +58.0 158.4 | 57 15.9 +57.6 156.7 | 56 59.8 +57.3 155.0 |
| 19° | 58 56.2 +58.5 161.4 | 58 43.1 +58.2 159.7 | 58 28.9 +57.8 157.9 | 58 13.5 +57.6 156.2 | 57 57.1 +57.2 154.5 |
| 20° | 59 54.7 +58.4 161.0 | 59 41.3 +58.1 159.2 | 59 26.7 +57.8 157.4 | 59 11.1 +57.3 155.6 | 58 54.3 +57.0 153.9 |
| 21° | 60 53.1 +58.3 160.5 | 60 39.4 +57.9 158.7 | 60 24.5 +57.6 156.9 | 60 08.4 +57.3 155.1 | 59 51.3 +56.8 153.3 |
| 22° | 61 51.4 +58.1 160.0 | 61 37.3 +57.8 158.1 | 61 22.1 +57.4 156.3 | 61 05.7 +57.0 154.4 | 60 48.1 +56.6 152.6 |
| 23° | 62 49.5 +58.1 159.5 | 62 35.1 +57.7 157.6 | 62 19.5 +57.3 155.7 | 62 02.7 +56.8 153.8 | 61 44.7 +56.5 151.9 |
| 24° | 63 47.6 +57.9 158.9 | 63 32.8 +57.5 157.0 | 63 16.8 +57.0 155.0 | 62 59.5 +56.7 153.1 | 62 41.2 +56.1 151.2 |
| 25° | 64 45.5 +57.7 158.3 | 64 30.3 +57.3 156.3 | 64 13.8 +56.9 154.3 | 63 56.2 +56.4 152.4 | 63 37.3 +55.9 150.4 |
| 26° | 65 43.2 +57.6 157.7 | 65 27.6 +57.1 155.6 | 65 10.7 +56.6 153.6 | 64 52.6 +56.1 151.6 | 64 33.2 +55.6 149.6 |
| 27° | 66 40.8 +57.3 157.0 | 66 24.7 +56.9 154.9 | 66 07.3 +56.4 152.8 | 65 48.7 +55.8 150.7 | 65 28.8 +55.3 148.7 |
| 28° | 67 38.1 +57.1 156.2 | 67 21.6 +56.6 154.0 | 67 03.7 +56.0 151.9 | 66 44.5 +55.5 149.8 | 66 24.1 +54.9 147.8 |
| 29° | 68 35.2 +56.9 155.4 | 68 18.2 +56.3 153.2 | 67 59.7 +55.7 151.0 | 67 40.0 +55.1 148.8 | 67 19.0 +54.4 146.7 |

| 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°  | 39 19.4 +58.6 160.5 | 39 05.9 +58.3 159.2 | 38 51.5 +58.1 157.9 | 38 36.3 +57.9 156.7 | 38 20.4 +57.7 155.5 |
| 1°  | 40 18.0 +58.4 160.2 | 40 04.2 +58.3 158.9 | 39 49.6 +58.1 157.6 | 39 34.2 +57.9 156.4 | 39 18.1 +57.6 155.1 |
| 2°  | 41 16.4 +58.4 159.9 | 41 02.5 +58.2 158.6 | 40 47.7 +58.0 157.3 | 40 32.1 +57.8 156.0 | 40 15.7 +57.6 154.8 |
| 3°  | 42 14.8 +58.4 159.6 | 42 00.7 +58.2 158.3 | 41 45.7 +57.9 157.0 | 41 29.9 +57.7 155.7 | 41 13.3 +57.4 154.4 |
| 4°  | 43 13.2 +58.3 159.2 | 42 58.9 +58.1 157.9 | 42 43.6 +57.9 156.6 | 42 27.6 +57.7 155.3 | 42 10.7 +57.5 154.0 |
| 5°  | 44 11.5 +58.3 158.9 | 43 57.0 +58.0 157.6 | 43 41.5 +57.8 156.2 | 43 25.3 +57.5 154.9 | 43 08.2 +57.3 153.6 |
| 6°  | 45 09.8 +58.2 158.6 | 44 55.0 +58.0 157.2 | 44 39.3 +57.8 155.9 | 44 22.8 +57.5 154.5 | 44 05.5 +57.2 153.2 |
| 7°  | 46 08.0 +58.1 158.2 | 45 53.0 +57.9 156.9 | 45 37.1 +57.6 155.5 | 45 20.3 +57.4 154.1 | 45 02.7 +57.2 152.8 |
| 8°  | 47 06.1 +58.1 157.9 | 46 50.9 +57.8 156.5 | 46 34.7 +57.6 155.1 | 46 17.7 +57.3 153.7 | 46 59.9 +57.0 152.3 |
| 9°  | 48 04.2 +58.0 157.5 | 47 48.7 +57.7 156.1 | 47 32.3 +57.5 154.7 | 47 15.0 +57.2 153.3 | 46 56.9 +56.9 151.9 |
| 10° | 49 02.2 +57.9 157.1 | 48 46.4 +57.7 155.7 | 48 29.8 +57.4 154.2 | 48 12.2 +57.1 152.8 | 47 53.8 +56.9 151.4 |
| 11° | 50 00.1 +57.8 156.7 | 49 44.1 +57.6 155.3 | 49 27.2 +57.2 153.8 | 49 09.3 +57.0 152.4 | 48 50.7 +56.6 150.9 |
| 12° | 50 57.9 +57.8 156.3 | 50 41.7 +57.4 154.8 | 50 24.4 +57.2 153.3 | 50 06.3 +56.9 151.9 | 49 47.3 +56.6 150.4 |
| 13° | 51 55.7 +57.6 155.9 | 51 39.1 +57.3 154.3 | 51 21.6 +57.0 152.9 | 51 03.2 +56.7 151.4 | 50 43.9 +56.4 149.9 |
| 14° | 52 53.3 +57.5 155.4 | 52 36.4 +57.3 153.9 | 52 18.6 +56.9 152.4 | 51 59.9 +56.6 150.9 | 51 40.3 +56.3 149.4 |
| 15° | 53 50.8 +57.4 154.9 | 53 33.7 +57.0 153.4 | 53 15.5 +56.8 151.8 | 52 56.5 +56.4 150.3 | 52 36.6 +56.0 148.8 |
| 16° | 54 48.2 +57.3 154.4 | 54 30.7 +57.0 152.8 | 54 12.3 +56.6 151.3 | 53 52.9 +56.3 149.7 | 53 32.6 +55.9 148.2 |
| 17° | 55 45.5 +57.1 153.9 | 55 27.7 +56.8 152.3 | 55 08.9 +56.4 150.7 | 54 49.2 +56.0 149.1 | 54 28.5 +55.7 147.6 |
| 18° | 56 42.6 +57.0 153.4 | 56 24.5 +56.6 151.7 | 56 05.3 +56.3 150.1 | 55 45.2 +55.9 148.5 | 55 24.2 +55.5 147.0 |
| 19° | 57 39.6 +56.8 152.8 | 57 21.1 +56.4 151.1 | 57 01.6 +56.0 149.5 | 56 41.1 +55.7 147.9 | 56 19.7 +55.3 146.3 |
| 20° | 58 36.4 +56.6 152.2 | 58 17.5 +56.3 150.5 | 57 57.6 +55.9 148.8 | 57 36.8 +55.4 147.2 | 57 15.0 +55.0 145.6 |
| 21° | 59 33.0 +56.5 151.5 | 59 13.8 +56.0 149.8 | 58 53.5 +55.5 148.1 | 58 32.2 +55.1 146.4 | 58 10.0 +54.7 144.8 |
| 22° | 60 29.5 +56.2 150.8 | 60 09.8 +55.7 149.1 | 59 49.0 +55.4 147.4 | 59 27.3 +54.9 145.7 | 59 04.7 +54.4 144.0 |
| 23° | 61 25.7 +55.9 150.1 | 61 05.5 +55.5 148.3 | 60 44.4 +55.0 146.6 | 60 22.2 +54.6 144.9 | 59 59.1 +54.1 143.2 |
| 24° | 62 21.6 +55.7 149.4 | 62 01.0 +55.3 147.5 | 61 39.4 +54.7 145.8 | 61 16.8 +54.2 144.0 | 60 53.2 +53.7 142.3 |
| 25° | 63 17.3 +55.4 148.5 | 62 56.3 +54.8 146.7 | 62 34.1 +54.4 144.9 | 62 11.0 +53.8 143.1 | 61 46.9 +53.3 141.4 |
| 26° | 64 12.7 +55.1 147.7 | 63 51.1 +54.6 145.8 | 63 28.5 +54.0 144.0 | 63 04.8 +53.5 142.2 | 62 40.2 +52.9 140.4 |
| 27° | 65 07.8 +54.7 146.7 | 64 45.7 +54.1 144.8 | 64 22.5 +53.5 143.0 | 63 58.3 +52.9 141.1 | 63 33.1 +52.4 139.4 |
| 28° | 66 02.5 +54.3 145.8 | 65 39.8 +53.7 143.8 | 65 16.0 +53.1 141.9 | 64 51.2 +52.5 140.1 | 64 25.5 +51.9 138.2 |
| 29° | 66 56.8 +53.8 144.7 | 66 33.5 +53.2 142.7 | 66 09.1 +52.6 140.8 | 65 43.7 +51.9 138.9 | 65 17.4 +51.2 137.1 |

## Declination SAME name as Latitude

## Latitude 49°

| 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°  | 38 03.6 +57.5 154.3 | 37 46.2 +57.2 153.0 | 37 27.9 +57.1 151.8 | 37 09.0 +56.8 150.6 | 36 49.4 +56.5 149.5 |
| 1°  | 39 01.1 +57.4 153.9 | 38 43.4 +57.2 152.7 | 38 25.0 +56.9 151.4 | 38 05.8 +56.7 150.2 | 37 45.9 +56.4 149.0 |
| 2°  | 39 58.5 +57.3 153.5 | 39 40.6 +57.1 152.3 | 39 21.9 +56.8 151.0 | 39 02.5 +56.6 149.8 | 38 42.3 +56.3 148.6 |
| 3°  | 40 55.8 +57.3 153.1 | 40 37.7 +57.0 151.9 | 40 18.7 +56.8 150.6 | 39 59.1 +56.4 149.4 | 39 38.6 +56.3 148.2 |
| 4°  | 41 53.1 +57.2 152.7 | 41 34.7 +56.9 151.5 | 41 15.5 +56.6 150.2 | 40 55.5 +56.4 148.9 | 40 34.9 +56.1 147.7 |
| 5°  | 42 50.3 +57.0 152.3 | 42 31.6 +56.8 151.0 | 42 12.1 +56.6 149.8 | 41 51.9 +56.3 148.5 | 41 31.0 +56.0 147.2 |
| 6°  | 43 47.3 +57.0 151.9 | 43 28.4 +56.7 150.6 | 43 08.7 +56.4 149.3 | 42 48.2 +56.2 148.0 | 42 27.0 +55.9 146.8 |
| 7°  | 44 44.3 +56.9 151.5 | 44 25.1 +56.6 150.1 | 44 05.1 +56.3 148.8 | 43 44.4 +56.0 147.5 | 43 22.9 +55.7 146.3 |
| 8°  | 45 41.2 +56.8 151.0 | 45 21.7 +56.5 149.7 | 45 01.4 +56.2 148.3 | 44 40.4 +55.9 147.0 | 44 18.6 +55.6 145.7 |
| 9°  | 46 38.0 +56.6 150.5 | 46 18.2 +56.3 149.2 | 45 57.6 +56.1 147.8 | 45 36.3 +55.8 146.5 | 45 14.2 +55.5 145.2 |
| 10° | 47 34.6 +56.5 150.0 | 47 14.5 +56.3 148.7 | 46 53.7 +55.9 147.3 | 46 32.1 +55.6 146.0 | 46 09.7 +55.2 144.7 |
| 11° | 48 31.1 +56.4 149.5 | 48 10.8 +56.0 148.2 | 47 49.6 +55.8 146.8 | 47 27.7 +55.4 145.4 | 47 04.9 +55.2 144.1 |
| 12° | 49 27.5 +56.2 149.0 | 49 06.8 +56.0 147.6 | 48 45.4 +55.5 146.2 | 48 23.1 +55.2 144.9 | 48 00.1 +54.9 143.5 |
| 13° | 50 23.7 +56.1 148.5 | 50 02.8 +55.7 147.1 | 49 40.9 +55.5 145.7 | 49 18.3 +55.1 144.3 | 48 55.0 +54.7 142.9 |
| 14° | 51 19.8 +55.9 147.9 | 50 58.5 +55.6 146.5 | 50 36.4 +55.2 145.1 | 50 13.4 +54.9 143.7 | 49 49.7 +54.5 142.3 |
| 15° | 52 15.7 +55.8 147.3 | 51 54.1 +55.3 145.9 | 51 31.6 +55.0 144.4 | 51 08.3 +54.6 143.0 | 50 44.2 +54.3 141.6 |
| 16° | 53 11.5 +55.5 146.7 | 52 49.4 +55.2 145.2 | 52 26.6 +54.8 143.8 | 52 02.9 +54.5 142.4 | 51 38.5 +54.1 140.9 |
| 17° | 54 07.0 +55.3 146.1 | 53 44.6 +54.9 144.6 | 53 21.4 +54.5 143.1 | 52 57.4 +54.1 141.7 | 52 32.6 +53.7 140.2 |
| 18° | 55 02.3 +55.1 145.4 | 54 39.5 +54.7 143.9 | 54 15.9 +54.3 142.4 | 53 51.5 +53.9 140.9 | 53 26.3 +53.5 139.5 |
| 19° | 55 57.4 +54.8 144.7 | 55 34.2 +54.5 143.2 | 55 10.2 +54.1 141.7 | 54 45.4 +53.6 140.2 | 54 19.8 +53.2 138.7 |
| 20° | 56 52.2 +54.6 144.0 | 56 28.7 +54.1 142.4 | 56 04.3 +53.7 140.9 | 55 39.0 +53.3 139.4 | 55 13.0 +52.9 137.9 |
| 21° | 57 46.8 +54.3 143.2 | 57 22.8 +53.8 141.6 | 56 58.0 +53.4 140.1 | 56 32.3 +53.0 138.6 | 56 05.9 +52.5 137.1 |
| 22° | 58 41.1 +54.0 142.4 | 58 16.6 +53.5 140.8 | 57 51.4 +53.0 139.2 | 57 25.3 +52.5 137.7 | 56 58.4 +52.1 136.2 |
| 23° | 59 35.1 +53.6 141.5 | 59 10.1 +53.2 139.9 | 58 44.4 +52.6 138.4 | 58 17.8 +52.2 136.8 | 57 50.5 +51.7 135.3 |
| 24° | 60 28.7 +53.2 140.6 | 60 03.3 +52.7 139.0 | 59 37.0 +52.3 137.4 | 59 10.0 +51.7 135.9 | 58 42.2 +51.3 134.3 |
| 25° | 61 21.9 +52.8 139.7 | 60 56.0 +52.3 138.0 | 60 29.3 +51.7 136.4 | 60 01.7 +51.3 134.9 | 59 33.5 +50.7 133.3 |
| 26° | 62 14.7 +52.3 138.7 | 61 48.3 +51.8 137.0 | 61 21.0 +51.3 135.4 | 60 53.0 +50.7 133.8 | 60 24.2 +50.2 132.3 |
| 27° | 63 07.0 +51.8 137.6 | 62 40.1 +51.2 135.9 | 62 12.3 +50.7 134.3 | 61 43.7 +50.2 132.7 | 61 14.4 +49.7 131.1 |
| 28° | 63 58.8 +51.3 136.5 | 63 31.3 +50.7 134.8 | 63 03.0 +50.1 133.1 | 62 33.9 +49.5 131.5 | 62 04.1 +48.9 129.9 |
| 29° | 64 50.1 +50.7 135.3 | 64 22.0 +50.0 133.6 | 63 53.1 +49.4 131.9 | 63 23.4 +48.9 130.3 | 62 53.0 +48.3 128.7 |

| 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°  | 36 29.0 +56.3 148.3 | 36 08.0 +56.0 147.1 | 35 46.3 +55.7 146.0 | 35 23.9 +55.5 144.8 | 35 00.9 +55.3 143.7 |
| 1°  | 37 25.3 +56.2 147.9 | 37 04.0 +55.9 146.7 | 36 42.0 +55.7 145.5 | 36 19.4 +55.4 144.4 | 35 56.2 +55.1 143.2 |
| 2°  | 38 21.5 +56.0 147.4 | 37 59.9 +55.8 146.2 | 37 37.7 +55.5 145.0 | 37 14.8 +55.3 143.9 | 36 51.3 +55.0 142.7 |
| 3°  | 39 17.5 +56.0 147.0 | 38 55.7 +55.7 145.8 | 38 33.2 +55.4 144.6 | 38 10.1 +55.1 143.4 | 37 46.3 +54.9 142.2 |
| 4°  | 40 13.5 +55.8 146.5 | 39 51.4 +55.6 145.3 | 39 28.6 +55.3 144.1 | 39 05.2 +55.0 142.9 | 38 41.2 +54.7 141.7 |
| 5°  | 41 09.3 +55.8 146.0 | 40 47.0 +55.4 144.8 | 40 23.9 +55.2 143.6 | 40 00.2 +54.9 142.4 | 39 35.9 +54.5 141.2 |
| 6°  | 42 05.1 +55.5 145.5 | 41 42.4 +55.3 144.3 | 41 19.1 +55.0 143.0 | 40 55.1 +54.7 141.8 | 40 30.4 +54.5 140.6 |
| 7°  | 43 00.6 +55.5 145.0 | 42 37.7 +55.2 143.7 | 42 14.1 +54.8 142.5 | 41 49.8 +54.6 141.3 | 41 24.9 +54.2 140.1 |
| 8°  | 43 56.1 +55.3 144.5 | 43 32.9 +55.0 143.2 | 43 08.9 +54.7 142.0 | 42 44.4 +54.3 140.7 | 42 19.1 +54.1 139.5 |
| 9°  | 44 51.4 +55.1 143.9 | 44 27.9 +54.8 142.7 | 44 03.6 +54.5 141.4 | 43 38.7 +54.2 140.1 | 43 13.2 +53.9 138.9 |
| 10° | 45 46.5 +55.0 143.4 | 45 22.7 +54.6 142.1 | 44 58.1 +54.4 140.8 | 44 32.9 +54.1 139.6 | 44 07.1 +53.7 138.3 |
| 11° | 46 41.5 +54.8 142.8 | 46 17.3 +54.5 141.5 | 45 52.5 +54.1 140.2 | 45 27.0 +53.8 138.9 | 45 00.8 +53.4 137.7 |
| 12° | 47 36.3 +54.6 142.2 | 47 11.8 +54.3 140.9 | 46 46.6 +53.9 139.6 | 46 20.8 +53.5 138.3 | 45 54.2 +53.3 137.0 |
| 13° | 48 30.9 +54.4 141.6 | 48 06.1 +54.0 140.2 | 47 40.5 +53.7 138.9 | 47 14.3 +53.4 137.6 | 46 47.5 +53.0 136.4 |
| 14° | 49 25.3 +54.1 140.9 | 49 00.1 +53.8 139.6 | 48 34.2 +53.5 138.3 | 48 07.7 +53.1 137.0 | 47 40.5 +52.8 135.7 |
| 15° | 50 19.4 +54.0 140.3 | 49 53.9 +53.6 138.9 | 49 27.7 +53.2 137.6 | 49 00.8 +52.8 136.3 | 48 33.3 +52.4 135.0 |
| 16° | 51 13.4 +53.6 139.6 | 50 47.5 +53.3 138.2 | 50 20.9 +52.9 136.9 | 49 53.6 +52.6 135.5 | 49 25.7 +52.2 134.2 |
| 17° | 52 07.0 +53.4 138.8 | 51 40.8 +53.0 137.5 | 51 13.8 +52.6 136.1 | 50 46.2 +52.2 134.8 | 50 17.9 +51.9 133.5 |
| 18° | 53 00.4 +53.1 138.1 | 52 33.8 +52.7 136.7 | 52 06.4 +52.3 135.3 | 51 38.4 +52.0 134.0 | 51 09.8 +51.5 132.7 |
| 19° | 53 53.5 +52.8 137.3 | 53 26.5 +52.3 135.9 | 52 58.7 +52.0 134.5 | 52 30.4 +51.5 133.2 | 52 01.3 +51.2 131.8 |
| 20° | 54 46.3 +52.4 136.5 | 54 18.8 +52.1 135.1 | 53 50.7 +51.6 133.7 | 53 21.9 +51.2 132.3 | 52 52.5 +50.8 131.0 |
| 21° | 55 38.7 +52.1 135.6 | 55 10.9 +51.6 134.2 | 54 42.3 +51.2 132.8 | 54 13.1 +50.8 131.4 | 53 43.3 +50.4 130.1 |
| 22° | 56 30.8 +51.7 134.7 | 56 02.5 +51.2 133.3 | 55 33.5 +50.8 131.9 | 55 03.9 +50.4 130.5 | 54 33.7 +49.9 129.2 |
| 23° | 57 22.5 +51.2 133.8 | 56 53.7 +50.8 132.4 | 56 24.3 +50.3 131.0 | 55 54.3 +49.9 129.6 | 55 23.6 +49.5 128.2 |
| 24° | 58 13.7 +50.8 132.8 | 57 44.5 +50.3 131.4 | 57 14.6 +49.9 130.0 | 56 44.2 +49.4 128.6 | 56 13.1 +49.0 127.2 |
| 25° | 59 04.5 +50.2 131.8 | 58 34.8 +49.8 130.3 | 58 04.5 +49.3 128.9 | 57 33.6 +48.8 127.5 | 57 02.1 +48.4 126.1 |
| 26° | 59 54.7 +49.7 130.7 | 59 24.6 +49.2 129.3 | 58 53.8 +48.7 127.8 | 58 22.4 +48.3 126.4 | 57 50.5 +47.8 125.1 |
| 27° | 60 44.4 +49.1 129.6 | 60 13.8 +48.6 128.1 | 59 42.5 +48.1 126.7 | 59 10.7 +47.6 125.3 | 58 38.3 +47.1 123.9 |
| 28° | 61 33.5 +48.5 128.4 | 61 02.4 +47.9 126.9 | 60 30.6 +47.4 125.5 | 59 58.3 +46.9 124.1 | 59 25.4 +46.5 122.7 |
| 29° | 62 22.0 +47.7 127.2 | 61 50.3 +47.2 125.7 | 61 18.0 +46.7 124.2 | 60 45.2 +46.2 122.8 | 60 11.9 +45.7 121.4 |

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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°  | 34 37.3 +55.0 142.6 | 34 13.1 +54.7 141.5 | 33 48.3 +54.4 140.4 | 33 22.9 +54.2 139.3 | 32 57.0 +53.9 138.2 |
| 1°  | 35 32.3 +54.9 142.1 | 35 07.8 +54.6 141.0 | 34 42.7 +54.3 139.9 | 34 17.1 +54.0 138.8 | 33 50.9 +53.7 137.7 |
| 2°  | 36 27.2 +54.7 141.6 | 36 02.4 +54.4 140.5 | 35 37.0 +54.2 139.3 | 35 11.1 +53.9 138.2 | 34 44.6 +53.6 137.1 |
| 3°  | 37 21.9 +54.6 141.1 | 36 56.8 +54.3 139.9 | 36 31.2 +54.0 138.8 | 36 05.0 +53.7 137.7 | 35 38.2 +53.5 136.6 |
| 4°  | 38 16.5 +54.4 140.6 | 37 51.1 +54.2 139.4 | 37 25.2 +53.9 138.3 | 36 58.7 +53.6 137.1 | 36 31.7 +53.3 136.0 |
| 5°  | 39 10.9 +54.3 140.0 | 38 45.3 +54.0 138.9 | 38 19.1 +53.7 137.7 | 37 52.3 +53.4 136.6 | 37 25.0 +53.1 135.5 |
| 6°  | 40 05.2 +54.1 139.5 | 39 39.3 +53.8 138.3 | 39 12.8 +53.5 137.1 | 38 45.7 +53.3 136.0 | 38 18.1 +53.0 134.9 |
| 7°  | 40 59.3 +53.9 138.9 | 40 33.1 +53.7 137.7 | 40 06.3 +53.4 136.6 | 39 39.0 +53.0 135.4 | 39 11.1 +52.7 134.3 |
| 8°  | 41 53.2 +53.8 138.3 | 41 26.8 +53.4 137.1 | 40 59.7 +53.1 136.0 | 40 32.0 +52.9 134.8 | 40 03.8 +52.6 133.7 |
| 9°  | 42 47.0 +53.6 137.7 | 42 20.2 +53.3 136.5 | 41 52.8 +53.0 135.3 | 41 24.9 +52.6 134.2 | 40 56.4 +52.3 133.0 |
| 10° | 43 40.6 +53.4 137.1 | 43 13.5 +53.0 135.9 | 42 45.8 +52.7 134.7 | 42 17.5 +52.5 133.5 | 41 48.7 +52.1 132.4 |
| 11° | 44 34.0 +53.1 136.5 | 44 06.5 +52.9 135.2 | 43 38.5 +52.5 134.0 | 43 10.0 +52.1 132.9 | 42 40.8 +51.9 131.7 |
| 12° | 45 27.1 +52.9 135.8 | 44 59.4 +52.6 134.6 | 44 31.0 +52.3 133.4 | 44 02.1 +52.0 132.2 | 43 32.7 +51.6 131.0 |
| 13° | 46 20.0 +52.7 135.1 | 45 52.0 +52.3 133.9 | 45 23.3 +52.0 132.7 | 44 54.1 +51.7 131.5 | 44 24.3 +51.4 130.3 |
| 14° | 47 12.7 +52.4 134.4 | 46 44.3 +52.0 133.2 | 46 15.3 +51.7 132.0 | 45 45.8 +51.3 130.8 | 45 15.7 +51.0 129.6 |
| 15° | 48 05.1 +52.1 133.7 | 47 36.3 +51.8 132.5 | 47 07.0 +51.4 131.2 | 46 37.1 +51.1 130.0 | 46 06.7 +50.8 128.8 |
| 16° | 48 57.2 +51.9 133.0 | 48 28.1 +51.5 131.7 | 47 58.4 +51.2 130.5 | 47 28.2 +50.8 129.2 | 46 57.5 +50.4 128.0 |
| 17° | 49 49.1 +51.5 132.2 | 49 19.6 +51.1 130.9 | 48 49.6 +50.7 129.7 | 48 19.0 +50.4 128.4 | 47 47.9 +50.1 127.2 |
| 18° | 50 40.6 +51.1 131.4 | 50 10.7 +50.8 130.1 | 49 40.3 +50.5 128.9 | 49 09.4 +50.1 127.6 | 48 38.0 +49.7 126.4 |
| 19° | 51 31.7 +50.8 130.5 | 51 01.5 +50.4 129.3 | 50 30.8 +50.0 128.0 | 49 59.5 +49.7 126.8 | 49 27.7 +49.3 125.6 |
| 20° | 52 22.5 +50.4 129.7 | 51 51.9 +50.1 128.4 | 51 20.8 +49.7 127.1 | 50 49.2 +49.2 125.9 | 50 17.0 +49.0 124.7 |
| 21° | 53 12.9 +50.0 128.8 | 52 42.0 +49.5 127.5 | 52 10.5 +49.2 126.2 | 51 38.4 +48.9 125.0 | 51 06.0 +48.4 123.8 |
| 22° | 54 02.9 +49.5 127.8 | 53 31.5 +49.2 126.6 | 52 59.7 +48.7 125.3 | 52 27.3 +48.3 124.0 | 51 54.4 +48.0 122.8 |
| 23° | 54 52.4 +49.1 126.9 | 54 20.7 +48.6 125.6 | 53 48.4 +48.2 124.3 | 53 15.6 +47.9 123.1 | 52 42.4 +47.5 121.8 |
| 24° | 55 41.5 +48.5 125.9 | 55 09.3 +48.1 124.6 | 54 36.6 +47.8 123.3 | 54 03.5 +47.3 122.0 | 53 29.9 +47.0 120.8 |
| 25° | 56 30.0 +48.0 124.8 | 55 57.4 +47.6 123.5 | 55 24.4 +47.1 122.2 | 54 50.8 +46.8 121.0 | 54 16.9 +46.4 119.8 |
| 26° | 57 18.0 +47.3 123.7 | 56 45.0 +46.9 122.4 | 56 11.5 +46.5 121.1 | 55 37.6 +46.1 119.9 | 55 03.3 +45.7 118.7 |
| 27° | 58 05.3 +46.7 122.6 | 57 31.9 +46.3 121.3 | 56 58.0 +45.9 120.0 | 56 23.7 +45.5 118.7 | 55 49.0 +45.1 117.5 |
| 28° | 58 52.0 +46.1 121.4 | 58 18.2 +45.6 120.1 | 57 43.9 +45.2 118.8 | 57 09.2 +44.8 117.5 | 56 34.1 +44.4 116.3 |
| 29° | 59 38.1 +45.2 120.1 | 59 03.8 +44.8 118.8 | 58 29.1 +44.4 117.5 | 57 54.0 +44.0 116.3 | 57 18.5 +43.7 115.1 |

| Dec | LHA 035° / 325°     | LHA 036° / 324°     | LHA 037° / 323°     | LHA 038° / 322°     | LHA 039° / 321°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 32 30.5 +53.6 137.1 | 32 03.4 +53.4 136.1 | 31 35.9 +53.1 135.0 | 31 07.8 +52.8 134.0 | 30 39.2 +52.6 133.0 |
| 1°  | 33 24.1 +53.5 136.6 | 32 56.8 +53.2 135.5 | 32 29.0 +52.9 134.5 | 32 00.6 +52.7 133.5 | 31 31.8 +52.4 132.4 |
| 2°  | 34 17.6 +53.3 136.1 | 33 50.0 +53.1 135.0 | 33 21.9 +52.8 133.9 | 32 53.3 +52.5 132.9 | 32 24.2 +52.3 131.8 |
| 3°  | 35 10.9 +53.2 135.5 | 34 43.1 +52.9 134.4 | 34 14.7 +52.6 133.4 | 33 45.8 +52.4 132.3 | 33 16.5 +52.1 131.3 |
| 4°  | 36 04.1 +53.0 134.9 | 35 36.0 +52.7 133.9 | 35 07.3 +52.5 132.8 | 34 38.2 +52.2 131.7 | 34 08.6 +51.9 130.7 |
| 5°  | 36 57.1 +52.9 134.4 | 36 28.7 +52.6 133.3 | 35 59.8 +52.3 132.2 | 35 30.4 +52.0 131.1 | 35 00.5 +51.7 130.1 |
| 6°  | 37 50.0 +52.6 133.8 | 37 21.3 +52.3 132.7 | 36 52.1 +52.1 131.6 | 36 22.4 +51.8 130.5 | 35 52.2 +51.5 129.4 |
| 7°  | 38 42.6 +52.5 133.1 | 38 13.6 +52.2 132.0 | 37 44.2 +51.8 130.9 | 37 14.2 +51.6 129.9 | 36 43.7 +51.4 128.8 |
| 8°  | 39 35.1 +52.2 132.5 | 39 05.8 +52.0 131.4 | 38 36.0 +51.7 130.3 | 38 05.8 +51.4 129.2 | 37 35.1 +51.1 128.1 |
| 9°  | 40 27.3 +52.1 131.9 | 39 57.8 +51.7 130.8 | 39 27.7 +51.5 129.7 | 38 57.2 +51.1 128.6 | 38 26.2 +50.8 127.5 |
| 10° | 41 19.4 +51.8 131.2 | 40 49.5 +51.5 130.1 | 40 19.2 +51.2 129.0 | 39 48.3 +50.9 127.9 | 39 17.0 +50.7 126.8 |
| 11° | 42 11.2 +51.5 130.5 | 41 41.0 +51.3 129.4 | 41 10.4 +50.9 128.3 | 40 39.2 +50.7 127.2 | 40 07.7 +50.3 126.1 |
| 12° | 43 02.7 +51.3 129.9 | 42 32.3 +51.0 128.7 | 42 01.3 +50.7 127.6 | 41 29.9 +50.4 126.5 | 40 58.0 +50.1 125.4 |
| 13° | 43 54.0 +51.1 129.1 | 43 23.3 +50.7 128.0 | 42 52.0 +50.4 126.9 | 42 20.3 +50.1 125.8 | 41 48.1 +49.8 124.7 |
| 14° | 44 45.1 +50.7 128.4 | 44 14.0 +50.4 127.3 | 43 42.4 +50.1 126.1 | 43 10.4 +49.8 125.0 | 42 37.9 +49.5 123.9 |
| 15° | 45 35.8 +50.4 127.6 | 45 04.4 +50.1 126.5 | 44 32.5 +49.8 125.4 | 44 00.2 +49.5 124.2 | 43 27.4 +49.2 123.1 |
| 16° | 46 26.2 +50.1 126.9 | 45 54.5 +49.8 125.7 | 45 22.3 +49.5 124.6 | 44 49.7 +49.1 123.4 | 44 16.6 +48.9 122.3 |
| 17° | 47 16.3 +49.8 126.1 | 46 44.3 +49.4 124.9 | 46 11.8 +49.1 123.8 | 45 38.8 +48.8 122.6 | 45 05.5 +48.5 121.5 |
| 18° | 48 06.1 +49.4 125.2 | 47 33.7 +49.0 124.1 | 47 00.9 +48.7 122.9 | 46 27.6 +48.4 121.8 | 45 54.0 +48.1 120.7 |
| 19° | 48 55.5 +48.9 124.4 | 48 22.7 +48.7 123.2 | 47 49.6 +48.3 122.1 | 47 16.0 +48.0 120.9 | 46 42.1 +47.7 119.8 |
| 20° | 49 44.4 +48.6 123.5 | 49 11.4 +48.2 122.3 | 48 37.9 +47.9 121.2 | 48 04.0 +47.6 120.0 | 47 29.8 +47.2 118.9 |
| 21° | 50 33.0 +48.1 122.6 | 49 59.6 +47.8 121.4 | 49 25.8 +47.5 120.2 | 48 51.6 +47.1 119.1 | 48 17.0 +46.9 118.0 |
| 22° | 51 21.1 +47.7 121.6 | 50 47.4 +47.3 120.4 | 50 13.3 +46.9 119.3 | 49 38.7 +46.7 118.2 | 49 03.9 +46.3 117.1 |
| 23° | 52 08.8 +47.1 120.6 | 51 34.7 +46.8 119.5 | 51 00.2 +46.5 118.3 | 50 25.4 +46.1 117.2 | 49 50.2 +45.8 116.1 |
| 24° | 52 55.9 +46.6 119.6 | 52 21.5 +46.2 118.4 | 51 46.7 +45.9 117.3 | 51 11.5 +45.6 116.2 | 50 36.0 +45.3 115.1 |
| 25° | 53 42.5 +46.0 118.6 | 53 07.7 +45.7 117.4 | 52 32.6 +45.4 116.3 | 51 57.1 +45.1 115.1 | 51 21.3 +44.8 114.0 |
| 26° | 54 28.5 +45.4 117.5 | 53 53.4 +45.1 116.3 | 53 18.0 +44.7 115.2 | 52 42.2 +44.4 114.0 | 52 06.1 +44.1 113.0 |
| 27° | 55 13.9 +44.8 116.3 | 54 38.5 +44.4 115.2 | 54 02.7 +44.1 114.0 | 53 26.6 +43.7 112.9 | 52 50.2 +43.5 111.8 |
| 28° | 55 58.7 +44.0 115.2 | 55 22.9 +43.7 114.0 | 54 46.8 +43.3 112.9 | 54 10.3 +43.1 111.8 | 53 33.7 +42.7 110.7 |
| 29° | 56 42.7 +43.3 113.9 | 56 06.6 +42.9 112.8 | 55 30.1 +42.7 111.7 | 54 53.4 +42.4 110.6 | 54 16.4 +42.1 109.5 |

# Declination SAME name as Latitude

# Latitude 49°

| 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°  | 30 10.2 +52.3 132.0 | 29 40.7 +52.1 131.0 | 29 10.8 +51.8 130.0 | 28 40.4 +51.5 129.0 | 28 09.6 +51.3 128.0 |
| 1°  | 31 02.5 +52.2 131.4 | 30 32.8 +51.9 130.4 | 30 02.6 +51.6 129.4 | 29 31.9 +51.4 128.4 | 29 00.9 +51.1 127.4 |
| 2°  | 31 54.7 +52.0 130.8 | 31 24.7 +51.7 129.8 | 30 54.2 +51.5 128.8 | 30 23.3 +51.2 127.8 | 29 52.0 +51.0 126.8 |
| 3°  | 32 46.7 +51.8 130.2 | 32 16.4 +51.5 129.2 | 31 45.7 +51.3 128.2 | 31 14.5 +51.1 127.2 | 30 43.0 +50.7 126.2 |
| 4°  | 33 38.5 +51.6 129.6 | 33 07.9 +51.4 128.6 | 32 37.0 +51.1 127.6 | 32 05.6 +50.8 126.6 | 31 33.7 +50.6 125.6 |
| 5°  | 34 30.1 +51.5 129.0 | 33 59.3 +51.2 128.0 | 33 28.1 +50.9 127.0 | 32 56.4 +50.7 125.9 | 32 24.3 +50.5 124.9 |
| 6°  | 35 21.6 +51.2 128.4 | 34 50.5 +51.0 127.3 | 34 19.0 +50.7 126.3 | 33 47.1 +50.4 125.3 | 33 14.8 +50.2 124.3 |
| 7°  | 36 12.8 +51.1 127.7 | 35 41.5 +50.8 126.7 | 35 09.7 +50.5 125.7 | 34 37.5 +50.3 124.7 | 34 05.0 +49.9 123.6 |
| 8°  | 37 03.9 +50.8 127.1 | 36 32.3 +50.5 126.0 | 36 00.2 +50.3 125.0 | 35 27.8 +50.0 124.0 | 34 54.9 +49.8 123.0 |
| 9°  | 37 54.7 +50.6 126.4 | 37 22.8 +50.3 125.4 | 36 50.5 +50.1 124.3 | 36 17.8 +49.8 123.3 | 35 44.7 +49.5 122.3 |
| 10° | 38 45.3 +50.3 125.7 | 38 13.1 +50.1 124.7 | 37 40.6 +49.8 123.6 | 37 07.6 +49.5 122.6 | 36 34.2 +49.3 121.6 |
| 11° | 39 35.6 +50.1 125.0 | 39 03.2 +49.8 124.0 | 38 30.4 +49.5 122.9 | 37 57.1 +49.3 121.9 | 37 23.5 +49.0 120.9 |
| 12° | 40 25.7 +49.8 124.3 | 39 53.0 +49.5 123.3 | 39 19.9 +49.2 122.2 | 38 46.4 +49.0 121.2 | 38 12.5 +48.8 120.1 |
| 13° | 41 15.5 +49.6 123.6 | 40 42.5 +49.3 122.5 | 40 09.1 +49.0 121.5 | 39 35.4 +48.7 120.4 | 39 01.3 +48.4 119.4 |
| 14° | 42 05.1 +49.2 122.8 | 41 31.8 +48.9 121.8 | 40 58.1 +48.7 120.7 | 40 24.1 +48.4 119.7 | 39 49.7 +48.1 118.6 |
| 15° | 42 54.3 +48.9 122.0 | 42 20.7 +48.6 121.0 | 41 46.8 +48.3 119.9 | 41 12.5 +48.1 118.9 | 40 37.8 +47.9 117.9 |
| 16° | 43 43.2 +48.5 121.2 | 43 09.3 +48.3 120.2 | 42 35.1 +48.0 119.1 | 42 00.6 +47.7 118.1 | 41 25.7 +47.4 117.1 |
| 17° | 44 31.7 +48.2 120.4 | 43 57.6 +47.9 119.4 | 43 23.1 +47.6 118.3 | 42 48.3 +47.3 117.3 | 42 13.1 +47.1 116.2 |
| 18° | 45 19.9 +47.8 119.6 | 44 45.5 +47.5 118.5 | 44 10.7 +47.3 117.5 | 43 35.6 +47.0 116.4 | 43 00.2 +46.8 115.4 |
| 19° | 46 07.7 +47.4 118.7 | 45 33.0 +47.2 117.6 | 44 58.0 +46.8 116.6 | 44 22.6 +46.6 115.6 | 43 47.0 +46.3 114.5 |
| 20° | 46 55.1 +47.0 117.8 | 46 20.2 +46.6 116.8 | 45 44.8 +46.5 115.7 | 45 09.2 +46.2 114.7 | 44 33.3 +45.9 113.6 |
| 21° | 47 42.1 +46.5 116.9 | 47 06.8 +46.3 115.8 | 46 31.3 +45.9 114.8 | 45 55.4 +45.7 113.8 | 45 19.2 +45.5 112.7 |
| 22° | 48 28.6 +46.1 116.0 | 47 53.1 +45.8 114.9 | 47 17.2 +45.5 113.8 | 46 41.1 +45.2 112.8 | 46 04.7 +45.0 111.8 |
| 23° | 49 14.7 +45.5 115.0 | 48 38.9 +45.2 113.9 | 48 02.7 +45.0 112.9 | 47 26.3 +44.8 111.9 | 46 49.7 +44.5 110.8 |
| 24° | 50 00.2 +45.0 114.0 | 49 24.1 +44.8 112.9 | 48 47.7 +44.5 111.9 | 48 11.1 +44.2 110.9 | 47 34.2 +44.0 109.9 |
| 25° | 50 45.2 +44.5 113.0 | 50 08.9 +44.1 111.9 | 49 32.2 +43.9 110.9 | 48 55.3 +43.7 109.8 | 48 18.2 +43.4 108.8 |
| 26° | 51 29.7 +43.8 111.9 | 50 53.0 +43.6 110.8 | 50 16.1 +43.3 109.8 | 49 39.0 +43.0 108.8 | 49 01.6 +42.8 107.8 |
| 27° | 52 13.5 +43.2 110.8 | 51 36.6 +42.9 109.7 | 50 59.4 +42.7 108.7 | 50 22.0 +42.5 107.7 | 49 44.4 +42.2 106.7 |
| 28° | 52 56.7 +42.5 109.6 | 52 19.5 +42.3 108.6 | 51 42.1 +42.0 107.6 | 51 04.5 +41.8 106.6 | 50 26.6 +41.6 105.6 |
| 29° | 53 39.2 +41.8 108.5 | 53 01.8 +41.5 107.4 | 52 24.1 +41.3 106.4 | 51 46.3 +41.0 105.4 | 51 08.2 +40.9 104.5 |

| Dec | LHA 045° / 315°     | LHA 046° / 314°     | LHA 047° / 313°     | LHA 048° / 312°     | LHA 049° / 311°     |
|-----|---------------------|---------------------|---------------------|---------------------|---------------------|
|     | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      | H ° ' dH ' Z °      |
| 0°  | 27 38.4 +51.0 127.0 | 27 06.7 +50.8 126.1 | 26 34.7 +50.6 125.1 | 26 02.4 +50.3 124.2 | 25 29.6 +50.1 123.3 |
| 1°  | 28 29.4 +50.9 126.4 | 27 57.5 +50.7 125.5 | 27 25.3 +50.4 124.5 | 26 52.7 +50.1 123.6 | 26 19.7 +50.0 122.7 |
| 2°  | 29 20.3 +50.7 125.8 | 28 48.2 +50.4 124.9 | 28 15.7 +50.2 123.9 | 27 42.8 +50.0 123.0 | 27 09.7 +49.7 122.0 |
| 3°  | 30 11.0 +50.5 125.2 | 29 38.6 +50.3 124.3 | 29 05.9 +50.1 123.3 | 28 32.8 +49.9 122.3 | 27 59.4 +49.6 121.4 |
| 4°  | 31 01.5 +50.4 124.6 | 30 28.9 +50.1 123.6 | 29 56.0 +49.9 122.7 | 29 22.7 +49.6 121.7 | 28 49.0 +49.4 120.8 |
| 5°  | 31 51.9 +50.1 124.0 | 31 19.0 +50.0 123.0 | 30 45.9 +49.6 122.0 | 30 12.3 +49.4 121.1 | 29 38.4 +49.2 120.1 |
| 6°  | 32 42.0 +50.0 123.3 | 32 09.0 +49.7 122.3 | 31 35.5 +49.5 121.4 | 31 01.7 +49.3 120.4 | 30 27.6 +49.0 119.5 |
| 7°  | 33 32.0 +49.7 122.7 | 32 58.7 +49.5 121.7 | 32 25.0 +49.3 120.7 | 31 51.0 +49.0 119.7 | 31 16.6 +48.8 118.8 |
| 8°  | 34 21.7 +49.6 122.0 | 33 48.2 +49.2 121.0 | 33 14.3 +49.0 120.0 | 32 40.0 +48.8 119.1 | 32 05.4 +48.6 118.1 |
| 9°  | 35 11.3 +49.2 121.3 | 34 37.4 +49.1 120.3 | 34 03.3 +48.8 119.3 | 33 28.8 +48.6 118.4 | 32 54.0 +48.3 117.4 |
| 10° | 36 00.5 +49.1 120.6 | 35 26.5 +48.8 119.6 | 34 52.1 +48.5 118.6 | 34 17.4 +48.3 117.6 | 33 42.3 +48.1 116.7 |
| 11° | 36 49.6 +48.7 119.9 | 36 15.3 +48.5 118.9 | 35 40.6 +48.3 117.9 | 35 05.7 +48.0 116.9 | 34 30.4 +47.9 116.0 |
| 12° | 37 38.3 +48.5 119.1 | 37 03.8 +48.2 118.1 | 36 28.9 +48.0 117.2 | 35 53.7 +47.8 116.2 | 35 18.3 +47.5 115.2 |
| 13° | 38 26.8 +48.2 118.4 | 37 52.0 +48.0 117.4 | 37 16.9 +47.7 116.4 | 36 41.5 +47.5 115.4 | 36 05.8 +47.3 114.5 |
| 14° | 39 15.0 +47.9 117.6 | 38 40.0 +47.6 116.6 | 38 04.6 +47.4 115.6 | 37 29.0 +47.2 114.7 | 36 53.1 +47.0 113.7 |
| 15° | 40 02.9 +47.5 116.8 | 39 27.6 +47.3 115.8 | 38 52.0 +47.1 114.9 | 38 16.2 +46.8 113.9 | 37 40.1 +46.6 112.9 |
| 16° | 40 50.4 +47.3 116.0 | 40 14.9 +47.0 115.0 | 39 39.1 +46.8 114.1 | 39 03.0 +46.6 113.1 | 38 26.7 +46.3 112.1 |
| 17° | 41 37.7 +46.8 115.2 | 41 01.9 +46.6 114.2 | 40 25.9 +46.4 113.2 | 39 49.6 +46.2 112.3 | 39 13.0 +46.0 111.3 |
| 18° | 42 24.5 +46.5 114.4 | 41 48.5 +46.3 113.4 | 41 12.3 +46.0 112.4 | 40 35.8 +45.8 111.4 | 39 59.0 +45.6 110.5 |
| 19° | 43 11.0 +46.1 113.5 | 42 34.8 +45.8 112.5 | 41 58.3 +45.6 111.5 | 41 21.6 +45.4 110.6 | 40 44.6 +45.2 109.6 |
| 20° | 43 57.1 +45.7 112.6 | 43 20.6 +45.5 111.6 | 42 43.9 +45.3 110.7 | 42 07.0 +45.0 109.7 | 41 29.8 +44.8 108.8 |
| 21° | 44 42.8 +45.2 111.7 | 44 06.1 +45.0 110.7 | 43 29.2 +44.7 109.8 | 42 52.0 +44.6 108.8 | 42 14.6 +44.4 107.9 |
| 22° | 45 28.0 +44.8 110.8 | 44 51.1 +44.5 109.8 | 44 13.9 +44.4 108.8 | 43 36.6 +44.1 107.9 | 42 59.0 +44.0 107.0 |
| 23° | 46 12.8 +44.2 109.8 | 45 35.6 +44.1 108.9 | 44 58.3 +43.8 107.9 | 44 20.7 +43.7 107.0 | 43 43.0 +43.4 106.0 |
| 24° | 46 57.0 +43.8 108.9 | 46 19.7 +43.5 107.9 | 45 42.1 +43.4 106.9 | 45 04.4 +43.1 106.0 | 44 26.4 +43.0 105.1 |
| 25° | 47 40.8 +43.2 107.9 | 47 03.2 +43.0 106.9 | 46 25.5 +42.8 105.9 | 45 47.5 +42.6 105.0 | 45 09.4 +42.5 104.1 |
| 26° | 48 24.0 +42.6 106.8 | 47 46.2 +42.5 105.9 | 47 08.3 +42.2 104.9 | 46 30.1 +42.1 104.0 | 45 51.9 +41.9 103.1 |
| 27° | 49 06.6 +42.0 105.7 | 48 28.7 +41.8 104.8 | 47 50.5 +41.7 103.9 | 47 12.2 +41.5 102.9 | 46 33.8 +41.3 102.0 |
| 28° | 49 48.6 +41.4 104.6 | 49 10.5 +41.2 103.7 | 48 32.2 +41.0 102.8 | 47 53.7 +40.9 101.9 | 47 15.1 +40.8 101.0 |
| 29° | 50 30.0 +40.7 103.5 | 49 51.7 +40.5 102.6 | 49 13.2 +40.4 101.7 | 48 34.6 +40.2 100.8 | 47 55.9 +40.1 99.9  |

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**Latitude 49°**

**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°  | 24 56.5 +49.9 122.3 | 24 23.1 +49.7 121.4 | 23 49.4 +49.4 120.5 | 23 15.3 +49.2 119.6 | 22 40.9 +49.0 118.7 |
| 1°  | 25 46.4 +49.7 121.7 | 25 12.8 +49.4 120.8 | 24 38.8 +49.3 119.9 | 24 04.5 +49.1 119.0 | 23 29.9 +48.9 118.1 |
| 2°  | 26 36.1 +49.6 121.1 | 26 02.2 +49.4 120.2 | 25 28.1 +49.1 119.3 | 24 53.6 +48.9 118.4 | 24 18.8 +48.7 117.5 |
| 3°  | 27 25.7 +49.3 120.5 | 26 51.6 +49.1 119.5 | 26 17.2 +48.9 118.6 | 25 42.5 +48.7 117.7 | 25 07.5 +48.5 116.8 |
| 4°  | 28 15.0 +49.2 119.8 | 27 40.7 +49.0 118.9 | 27 06.1 +48.8 118.0 | 26 31.2 +48.5 117.1 | 25 56.0 +48.4 116.2 |
| 5°  | 29 04.2 +49.0 119.2 | 28 29.7 +48.8 118.2 | 27 54.9 +48.5 117.3 | 27 19.7 +48.4 116.4 | 26 44.4 +48.1 115.5 |
| 6°  | 29 53.2 +48.8 118.5 | 29 18.5 +48.5 117.6 | 28 43.4 +48.4 116.7 | 28 08.1 +48.2 115.8 | 27 32.5 +48.0 114.8 |
| 7°  | 30 42.0 +48.6 117.8 | 30 07.0 +48.4 116.9 | 29 31.8 +48.1 116.0 | 28 56.3 +47.9 115.1 | 28 20.5 +47.7 114.2 |
| 8°  | 31 30.6 +48.3 117.2 | 30 55.4 +48.1 116.2 | 30 19.9 +48.0 115.3 | 29 44.2 +47.8 114.4 | 29 08.2 +47.6 113.5 |
| 9°  | 32 18.9 +48.1 116.5 | 31 43.5 +47.9 115.5 | 31 07.9 +47.7 114.6 | 30 32.0 +47.5 113.7 | 29 55.8 +47.3 112.8 |
| 10° | 33 07.0 +47.9 115.7 | 32 31.4 +47.7 114.8 | 31 55.6 +47.4 113.9 | 31 19.5 +47.2 113.0 | 30 43.1 +47.1 112.1 |
| 11° | 33 54.9 +47.6 115.0 | 33 19.1 +47.4 114.1 | 32 43.0 +47.2 113.2 | 32 06.7 +47.0 112.2 | 31 30.2 +46.8 111.3 |
| 12° | 34 42.5 +47.4 114.3 | 34 06.5 +47.1 113.4 | 33 30.2 +47.0 112.4 | 32 53.7 +46.8 111.5 | 32 17.0 +46.6 110.6 |
| 13° | 35 29.9 +47.0 113.5 | 34 53.6 +46.9 112.6 | 34 17.2 +46.6 111.7 | 33 40.5 +46.5 110.8 | 33 03.6 +46.3 109.9 |
| 14° | 36 16.9 +46.8 112.8 | 35 40.5 +46.6 111.8 | 35 03.8 +46.4 110.9 | 34 27.0 +46.2 110.0 | 33 49.9 +46.0 109.1 |
| 15° | 37 03.7 +46.4 112.0 | 36 27.1 +46.2 111.1 | 35 50.2 +46.1 110.1 | 35 13.2 +45.8 109.2 | 34 35.9 +45.7 108.3 |
| 16° | 37 50.1 +46.1 111.2 | 37 13.3 +45.9 110.3 | 36 36.3 +45.7 109.3 | 35 59.0 +45.6 108.4 | 35 21.6 +45.4 107.5 |
| 17° | 38 36.2 +45.8 110.4 | 37 59.2 +45.6 109.4 | 37 22.0 +45.4 108.5 | 36 44.6 +45.2 107.6 | 36 07.0 +45.0 106.7 |
| 18° | 39 22.0 +45.4 109.5 | 38 44.8 +45.2 108.6 | 38 07.4 +45.1 107.7 | 37 29.8 +44.9 106.8 | 36 52.0 +44.8 105.9 |
| 19° | 40 07.4 +45.1 108.7 | 39 30.0 +44.9 107.8 | 38 52.5 +44.6 106.9 | 38 14.7 +44.5 106.0 | 37 36.8 +44.3 105.1 |
| 20° | 40 52.5 +44.6 107.8 | 40 14.9 +44.4 106.9 | 39 37.1 +44.3 106.0 | 38 59.2 +44.1 105.1 | 38 21.1 +44.0 104.2 |
| 21° | 41 37.1 +44.2 106.9 | 40 59.3 +44.1 106.0 | 40 21.4 +43.9 105.1 | 39 43.3 +43.8 104.2 | 39 05.1 +43.6 103.3 |
| 22° | 42 21.3 +43.7 106.0 | 41 43.4 +43.6 105.1 | 41 05.3 +43.4 104.2 | 40 27.1 +43.2 103.3 | 39 48.7 +43.1 102.4 |
| 23° | 43 05.0 +43.3 105.1 | 42 27.0 +43.1 104.2 | 41 48.7 +43.0 103.3 | 41 10.3 +42.9 102.4 | 40 31.8 +42.8 101.5 |
| 24° | 43 48.3 +42.9 104.1 | 43 10.1 +42.7 103.2 | 42 31.7 +42.5 102.4 | 41 53.2 +42.4 101.5 | 41 14.6 +42.2 100.6 |
| 25° | 44 31.2 +42.3 103.2 | 43 52.8 +42.1 102.3 | 43 14.2 +42.1 101.4 | 42 35.6 +41.9 100.5 | 41 56.8 +41.8 99.7  |
| 26° | 45 13.5 +41.7 102.2 | 44 34.9 +41.6 101.3 | 43 56.3 +41.5 100.4 | 43 17.5 +41.4 99.5  | 42 38.6 +41.3 98.7  |
| 27° | 45 55.2 +41.2 101.1 | 45 16.5 +41.1 100.3 | 44 37.8 +40.9 99.4  | 43 58.9 +40.8 98.5  | 43 19.9 +40.8 97.7  |
| 28° | 46 36.4 +40.6 100.1 | 45 57.6 +40.5 99.2  | 45 18.7 +40.4 98.4  | 44 39.7 +40.3 97.5  | 44 00.7 +40.2 96.7  |
| 29° | 47 17.0 +40.0 99.0  | 46 38.1 +39.9 98.1  | 45 59.1 +39.8 97.3  | 45 20.0 +39.7 96.5  | 44 40.9 +39.6 95.6  |

| 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°  | 22 06.3 +48.8 117.9 | 21 31.3 +48.6 117.0 | 20 56.1 +48.4 116.1 | 20 20.6 +48.3 115.2 | 19 44.9 +48.1 114.4 |
| 1°  | 22 55.1 +48.6 117.2 | 22 19.9 +48.5 116.3 | 21 44.5 +48.3 115.5 | 21 08.9 +48.1 114.6 | 20 33.0 +47.9 113.8 |
| 2°  | 23 43.7 +48.5 116.6 | 23 08.4 +48.3 115.7 | 22 32.8 +48.1 114.8 | 21 57.0 +47.9 114.0 | 21 20.9 +47.7 113.1 |
| 3°  | 24 32.2 +48.4 115.9 | 23 56.7 +48.1 115.1 | 23 20.9 +48.0 114.2 | 22 44.9 +47.8 113.3 | 22 08.6 +47.6 112.5 |
| 4°  | 25 20.6 +48.1 115.3 | 24 44.8 +48.0 114.4 | 24 08.9 +47.7 113.5 | 23 32.7 +47.6 112.7 | 22 56.2 +47.4 111.8 |
| 5°  | 26 08.7 +48.0 114.6 | 25 32.8 +47.8 113.7 | 24 56.6 +47.6 112.9 | 24 20.3 +47.4 112.0 | 23 43.6 +47.3 111.1 |
| 6°  | 26 56.7 +47.7 114.0 | 26 20.6 +47.6 113.1 | 25 44.2 +47.5 112.2 | 25 07.7 +47.2 111.3 | 24 30.9 +47.1 110.5 |
| 7°  | 27 44.4 +47.6 113.3 | 27 08.2 +47.4 112.4 | 26 31.7 +47.2 111.5 | 25 54.9 +47.1 110.6 | 25 18.0 +46.9 109.8 |
| 8°  | 28 32.0 +47.4 112.6 | 27 55.6 +47.1 111.7 | 27 18.9 +47.0 110.8 | 26 42.0 +46.8 109.9 | 26 04.9 +46.6 109.1 |
| 9°  | 29 19.4 +47.1 111.9 | 28 42.7 +47.0 111.0 | 28 05.9 +46.8 110.1 | 27 28.8 +46.6 109.2 | 26 51.5 +46.5 108.4 |
| 10° | 30 06.5 +46.9 111.2 | 29 29.7 +46.7 110.3 | 28 52.7 +46.5 109.4 | 28 15.4 +46.4 108.5 | 27 38.0 +46.3 107.7 |
| 11° | 30 53.4 +46.7 110.4 | 30 16.4 +46.5 109.6 | 29 39.2 +46.3 108.7 | 29 01.8 +46.2 107.8 | 28 24.3 +46.0 106.9 |
| 12° | 31 40.1 +46.3 109.7 | 31 02.9 +46.2 108.8 | 30 25.5 +46.1 107.9 | 29 48.0 +45.9 107.1 | 29 10.3 +45.8 106.2 |
| 13° | 32 26.4 +46.2 109.0 | 31 49.1 +46.0 108.1 | 31 11.6 +45.8 107.2 | 30 33.9 +45.7 106.3 | 29 56.1 +45.5 105.5 |
| 14° | 33 12.6 +45.8 108.2 | 32 35.1 +45.7 107.3 | 31 57.4 +45.6 106.4 | 31 19.6 +45.4 105.6 | 30 41.6 +45.2 104.7 |
| 15° | 33 58.4 +45.6 107.4 | 33 20.8 +45.4 106.5 | 32 43.0 +45.2 105.7 | 32 05.0 +45.1 104.8 | 31 26.8 +45.0 103.9 |
| 16° | 34 44.0 +45.2 106.6 | 34 06.2 +45.0 105.8 | 33 28.2 +44.9 104.9 | 32 50.1 +44.8 104.0 | 32 11.8 +44.7 103.2 |
| 17° | 35 29.2 +44.9 105.8 | 34 51.2 +44.8 105.0 | 34 13.1 +44.7 104.1 | 33 34.9 +44.5 103.2 | 32 56.5 +44.4 102.4 |
| 18° | 36 14.1 +44.6 105.0 | 35 36.0 +44.4 104.1 | 34 57.8 +44.3 103.3 | 34 19.4 +44.2 102.4 | 33 40.9 +44.1 101.6 |
| 19° | 36 58.7 +44.2 104.2 | 36 20.4 +44.1 103.3 | 35 42.1 +43.9 102.4 | 35 03.6 +43.8 101.6 | 34 25.0 +43.7 100.8 |
| 20° | 37 42.9 +43.8 103.3 | 37 04.5 +43.7 102.5 | 36 26.0 +43.6 101.6 | 35 47.4 +43.5 100.8 | 35 08.7 +43.4 99.9  |
| 21° | 38 26.7 +43.5 102.5 | 37 48.2 +43.4 101.6 | 37 09.6 +43.2 100.7 | 36 30.9 +43.1 99.9  | 35 52.1 +43.0 99.1  |
| 22° | 39 10.2 +43.0 101.6 | 38 31.6 +42.9 100.7 | 37 52.8 +42.8 99.9  | 37 14.0 +42.7 99.0  | 36 35.1 +42.6 98.2  |
| 23° | 39 53.2 +42.6 100.7 | 39 14.5 +42.5 99.8  | 38 35.6 +42.4 99.0  | 37 56.7 +42.3 98.2  | 37 17.7 +42.3 97.3  |
| 24° | 40 35.8 +42.2 99.8  | 39 57.0 +42.0 98.9  | 39 18.0 +42.0 98.1  | 38 39.0 +41.9 97.2  | 38 00.0 +41.8 96.4  |
| 25° | 41 18.0 +41.7 98.8  | 40 39.0 +41.6 98.0  | 40 00.0 +41.5 97.1  | 39 20.9 +41.5 96.3  | 38 41.8 +41.4 95.5  |
| 26° | 41 59.7 +41.2 97.8  | 41 20.6 +41.1 97.0  | 40 41.5 +41.1 96.2  | 40 02.4 +41.0 95.4  | 39 23.2 +40.9 94.6  |
| 27° | 42 40.9 +40.6 96.9  | 42 01.7 +40.7 96.0  | 41 22.6 +40.5 95.2  | 40 43.4 +40.4 94.4  | 40 04.1 +40.4 93.6  |
| 28° | 43 21.5 +40.2 95.9  | 42 42.4 +40.0 95.0  | 42 03.1 +40.1 94.2  | 41 23.8 +40.0 93.4  | 40 44.5 +40.0 92.7  |
| 29° | 44 01.7 +39.6 94.8  | 43 22.4 +39.6 94.0  | 42 43.2 +39.4 93.2  | 42 03.8 +39.5 92.4  | 41 24.5 +39.4 91.7  |

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## Declination SAME name as Latitude

## Latitude 49°

| 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°  | 19 09.0 +47.8 113.5 | 18 32.8 +47.6 112.7 | 17 56.3 +47.6 111.9 | 17 19.7 +47.4 111.0 | 16 42.9 +47.2 110.2 |
| 1°  | 19 56.8 +47.8 112.9 | 19 20.4 +47.6 112.1 | 18 43.9 +47.4 111.2 | 18 07.1 +47.2 110.4 | 17 30.1 +47.1 109.6 |
| 2°  | 20 44.6 +47.5 112.3 | 20 08.0 +47.4 111.4 | 19 31.3 +47.2 110.6 | 18 54.3 +47.1 109.7 | 18 17.2 +46.9 108.9 |
| 3°  | 21 32.1 +47.5 111.6 | 20 55.4 +47.3 110.8 | 20 18.5 +47.1 109.9 | 19 41.4 +47.0 109.1 | 19 04.1 +46.8 108.3 |
| 4°  | 22 19.6 +47.2 110.9 | 21 42.7 +47.1 110.1 | 21 05.6 +47.0 109.3 | 20 28.4 +46.8 108.4 | 19 50.9 +46.7 107.6 |
| 5°  | 23 06.8 +47.1 110.3 | 22 29.8 +46.9 109.4 | 21 52.6 +46.8 108.6 | 21 15.2 +46.6 107.8 | 20 37.6 +46.5 106.9 |
| 6°  | 23 53.9 +46.9 109.6 | 23 16.7 +46.8 108.8 | 22 39.4 +46.6 107.9 | 22 01.8 +46.5 107.1 | 21 24.1 +46.4 106.2 |
| 7°  | 24 40.8 +46.8 108.9 | 24 03.5 +46.6 108.1 | 23 26.0 +46.4 107.2 | 22 48.3 +46.3 106.4 | 22 10.5 +46.1 105.6 |
| 8°  | 25 27.6 +46.5 108.2 | 24 50.1 +46.4 107.4 | 24 12.4 +46.3 106.5 | 23 34.6 +46.1 105.7 | 22 56.6 +46.0 104.9 |
| 9°  | 26 14.1 +46.3 107.5 | 25 36.5 +46.2 106.7 | 24 58.7 +46.0 105.8 | 24 20.7 +46.0 105.0 | 23 42.6 +45.8 104.2 |
| 10° | 27 00.4 +46.1 106.8 | 26 22.7 +45.9 106.0 | 25 44.7 +45.9 105.1 | 25 06.7 +45.7 104.3 | 24 28.4 +45.6 103.5 |
| 11° | 27 46.5 +45.9 106.1 | 27 08.6 +45.8 105.2 | 26 30.6 +45.6 104.4 | 25 52.4 +45.5 103.6 | 25 14.0 +45.4 102.7 |
| 12° | 28 32.4 +45.6 105.4 | 27 54.4 +45.5 104.5 | 27 16.2 +45.4 103.7 | 26 37.9 +45.3 102.8 | 25 59.4 +45.2 102.0 |
| 13° | 29 18.0 +45.4 104.6 | 28 39.9 +45.3 103.8 | 28 01.6 +45.1 102.9 | 27 23.2 +45.0 102.1 | 26 44.6 +45.0 101.3 |
| 14° | 30 03.4 +45.2 103.9 | 29 25.2 +45.0 103.0 | 28 46.7 +44.9 102.2 | 28 08.2 +44.8 101.4 | 27 29.6 +44.7 100.5 |
| 15° | 30 48.6 +44.8 103.1 | 30 10.2 +44.7 102.3 | 29 31.6 +44.7 101.4 | 28 53.0 +44.5 100.6 | 28 14.3 +44.4 99.8  |
| 16° | 31 33.4 +44.6 102.3 | 30 54.9 +44.5 101.5 | 30 16.3 +44.3 100.7 | 29 37.5 +44.3 99.8  | 28 58.7 +44.2 99.0  |
| 17° | 32 18.0 +44.3 101.5 | 31 39.4 +44.1 100.7 | 31 00.6 +44.1 99.9  | 30 21.8 +44.0 99.1  | 29 42.9 +43.9 98.2  |
| 18° | 33 02.3 +43.9 100.7 | 32 23.5 +43.9 99.9  | 31 44.7 +43.8 99.1  | 31 05.8 +43.7 98.3  | 30 26.8 +43.6 97.5  |
| 19° | 33 46.2 +43.7 99.9  | 33 07.4 +43.5 99.1  | 32 28.5 +43.5 98.3  | 31 49.5 +43.4 97.5  | 31 10.4 +43.4 96.7  |
| 20° | 34 29.9 +43.3 99.1  | 33 50.9 +43.3 98.3  | 33 12.0 +43.1 97.5  | 32 32.9 +43.1 96.6  | 31 53.8 +43.0 95.8  |
| 21° | 35 13.2 +42.9 98.2  | 34 34.2 +42.8 97.4  | 33 55.1 +42.8 96.6  | 33 16.0 +42.7 95.8  | 32 36.8 +42.6 95.0  |
| 22° | 35 56.1 +42.5 97.4  | 35 17.0 +42.5 96.6  | 34 37.9 +42.4 95.8  | 33 58.7 +42.4 95.0  | 33 19.4 +42.4 94.2  |
| 23° | 36 38.6 +42.2 96.5  | 35 59.5 +42.1 95.7  | 35 20.3 +42.1 94.9  | 34 41.1 +42.0 94.1  | 34 01.8 +42.0 93.3  |
| 24° | 37 20.8 +41.8 95.6  | 36 41.6 +41.7 94.8  | 36 02.4 +41.6 94.0  | 35 23.1 +41.6 93.2  | 34 43.8 +41.6 92.5  |
| 25° | 38 02.6 +41.3 94.7  | 37 23.3 +41.3 93.9  | 36 44.0 +41.3 93.1  | 36 04.7 +41.2 92.4  | 35 25.4 +41.2 91.6  |
| 26° | 38 43.9 +40.9 93.8  | 38 04.6 +40.9 93.0  | 37 25.3 +40.8 92.2  | 36 45.9 +40.9 91.5  | 36 06.6 +40.8 90.7  |
| 27° | 39 24.8 +40.4 92.8  | 38 45.5 +40.4 92.1  | 38 06.1 +40.4 91.3  | 37 26.8 +40.3 90.5  | 36 47.4 +40.4 89.8  |
| 28° | 40 05.2 +39.9 91.9  | 39 25.9 +39.9 91.1  | 38 46.5 +39.9 90.4  | 38 07.1 +40.0 89.6  | 37 27.8 +39.9 88.9  |
| 29° | 40 45.1 +39.5 90.9  | 40 05.8 +39.4 90.1  | 39 26.4 +39.5 89.4  | 38 47.1 +39.4 88.6  | 38 07.7 +39.5 87.9  |

| 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°  | 16 05.8 +47.1 109.4 | 15 28.6 +46.9 108.6 | 14 51.2 +46.8 107.8 | 14 13.6 +46.7 107.0 | 13 35.9 +46.5 106.2 |
| 1°  | 16 52.9 +46.9 108.7 | 16 15.5 +46.8 107.9 | 15 38.0 +46.7 107.1 | 15 00.3 +46.5 106.3 | 14 22.4 +46.5 105.5 |
| 2°  | 17 39.8 +46.9 108.1 | 17 02.3 +46.7 107.3 | 16 24.7 +46.5 106.5 | 15 46.8 +46.5 105.7 | 15 08.9 +46.3 104.9 |
| 3°  | 18 26.7 +46.6 107.4 | 17 49.0 +46.6 106.6 | 17 11.2 +46.4 105.8 | 16 33.3 +46.3 105.0 | 15 55.2 +46.2 104.2 |
| 4°  | 19 13.3 +46.6 106.8 | 18 35.6 +46.4 105.9 | 17 57.6 +46.3 105.1 | 17 19.6 +46.1 104.3 | 16 41.4 +46.0 103.5 |
| 5°  | 19 59.9 +46.4 106.1 | 19 22.0 +46.2 105.3 | 18 43.9 +46.2 104.5 | 18 05.7 +46.1 103.7 | 17 27.4 +46.0 102.9 |
| 6°  | 20 46.3 +46.2 105.4 | 20 08.2 +46.1 104.6 | 19 30.1 +46.0 103.8 | 18 51.8 +45.9 103.0 | 18 13.4 +45.7 102.2 |
| 7°  | 21 32.5 +46.0 104.7 | 20 54.3 +46.0 103.9 | 20 16.1 +45.8 103.1 | 19 37.7 +45.7 102.3 | 18 59.1 +45.7 101.5 |
| 8°  | 22 18.5 +45.9 104.0 | 21 40.3 +45.7 103.2 | 21 01.9 +45.7 102.4 | 20 23.4 +45.6 101.6 | 19 44.8 +45.5 100.8 |
| 9°  | 23 04.4 +45.7 103.3 | 22 26.0 +45.6 102.5 | 21 47.6 +45.4 101.7 | 21 09.0 +45.4 100.9 | 20 30.3 +45.3 100.1 |
| 10° | 23 50.1 +45.5 102.6 | 23 11.6 +45.4 101.8 | 22 33.0 +45.3 101.0 | 21 54.4 +45.2 100.2 | 21 15.6 +45.1 99.4  |
| 11° | 24 35.6 +45.3 101.9 | 23 57.0 +45.2 101.1 | 23 18.3 +45.2 100.3 | 22 39.6 +45.0 99.5  | 22 00.7 +45.0 98.7  |
| 12° | 25 20.9 +45.1 101.2 | 24 42.2 +45.0 100.4 | 24 03.5 +44.9 99.6  | 23 24.6 +44.8 98.8  | 22 45.7 +44.7 98.0  |
| 13° | 26 06.0 +44.8 100.5 | 25 27.2 +44.8 99.7  | 24 48.4 +44.6 98.9  | 24 09.4 +44.6 98.1  | 23 30.4 +44.6 97.3  |
| 14° | 26 50.8 +44.6 99.7  | 26 12.0 +44.5 98.9  | 25 33.0 +44.5 98.1  | 24 54.0 +44.4 97.3  | 24 15.0 +44.3 96.5  |
| 15° | 27 35.4 +44.4 99.0  | 26 56.5 +44.3 98.2  | 26 17.5 +44.2 97.4  | 25 38.4 +44.2 96.6  | 24 59.3 +44.1 95.8  |
| 16° | 28 19.8 +44.1 98.2  | 27 40.8 +44.0 97.4  | 27 01.7 +44.0 96.6  | 26 22.6 +43.9 95.8  | 25 43.4 +43.9 95.0  |
| 17° | 29 03.9 +43.8 97.4  | 28 24.8 +43.8 96.6  | 27 45.7 +43.7 95.8  | 27 06.5 +43.7 95.1  | 26 27.3 +43.6 94.3  |
| 18° | 29 47.7 +43.6 96.7  | 29 08.6 +43.5 95.9  | 28 29.4 +43.5 95.1  | 27 50.2 +43.4 94.3  | 27 10.9 +43.4 93.5  |
| 19° | 30 31.3 +43.3 95.9  | 29 52.1 +43.2 95.1  | 29 12.9 +43.2 94.3  | 28 33.6 +43.2 93.5  | 27 54.3 +43.1 92.7  |
| 20° | 31 14.6 +42.9 95.1  | 30 35.3 +43.0 94.3  | 29 56.1 +42.9 93.5  | 29 16.8 +42.8 92.7  | 28 37.4 +42.9 91.9  |
| 21° | 31 57.5 +42.7 94.2  | 31 18.3 +42.6 93.5  | 30 39.0 +42.5 92.7  | 29 59.6 +42.6 91.9  | 29 20.3 +42.5 91.1  |
| 22° | 32 40.2 +42.3 93.4  | 32 00.9 +42.2 92.6  | 31 21.5 +42.3 91.9  | 30 42.2 +42.2 91.1  | 30 02.8 +42.3 90.3  |
| 23° | 33 22.5 +41.9 92.6  | 32 43.1 +42.0 91.8  | 32 03.8 +41.9 91.0  | 31 24.4 +41.9 90.3  | 30 45.1 +41.9 89.5  |
| 24° | 34 04.4 +41.6 91.7  | 33 25.1 +41.6 90.9  | 32 45.7 +41.6 90.2  | 32 06.3 +41.6 89.4  | 31 27.0 +41.6 88.7  |
| 25° | 34 46.0 +41.2 90.8  | 34 06.7 +41.2 90.1  | 33 27.3 +41.2 89.3  | 32 47.9 +41.3 88.6  | 32 08.6 +41.2 87.8  |
| 26° | 35 27.2 +40.8 89.9  | 34 47.9 +40.8 89.2  | 34 08.5 +40.8 88.4  | 33 29.2 +40.8 87.7  | 32 49.8 +40.9 87.0  |
| 27° | 36 08.0 +40.4 89.0  | 35 28.7 +40.4 88.3  | 34 49.3 +40.5 87.5  | 34 10.0 +40.5 86.8  | 33 30.7 +40.6 86.1  |
| 28° | 36 48.4 +40.0 88.1  | 36 09.1 +40.0 87.4  | 35 29.8 +40.0 86.6  | 34 50.5 +40.1 85.9  | 34 11.3 +40.1 85.2  |
| 29° | 37 28.4 +39.5 87.2  | 36 49.1 +39.5 86.4  | 36 09.8 +39.6 85.7  | 35 30.6 +39.6 85.0  | 34 51.4 +39.7 84.3  |

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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°  | 12 58.0 +46.4 105.4 | 12 20.0 +46.3 104.6 | 11 41.8 +46.2 103.8 | 11 03.5 +46.1 103.0 | 10 25.1 +46.0 102.2 |
| 1°  | 13 44.4 +46.3 104.7 | 13 06.3 +46.2 103.9 | 12 28.0 +46.1 103.1 | 11 49.6 +46.0 102.3 | 11 11.1 +45.9 101.6 |
| 2°  | 14 30.7 +46.2 104.1 | 13 52.5 +46.1 103.3 | 13 14.1 +46.0 102.5 | 12 35.6 +45.9 101.7 | 11 57.0 +45.8 100.9 |
| 3°  | 15 16.9 +46.1 103.4 | 14 38.6 +46.0 102.6 | 14 00.1 +45.9 101.8 | 13 21.5 +45.8 101.0 | 12 42.8 +45.8 100.2 |
| 4°  | 16 03.0 +46.0 102.7 | 15 24.6 +45.8 101.9 | 14 46.0 +45.8 101.1 | 14 07.3 +45.7 100.4 | 13 28.6 +45.6 99.6  |
| 5°  | 16 49.0 +45.8 102.1 | 16 10.4 +45.8 101.3 | 15 31.8 +45.6 100.5 | 14 53.0 +45.6 99.7  | 14 14.2 +45.5 98.9  |
| 6°  | 17 34.8 +45.7 101.4 | 16 56.2 +45.6 100.6 | 16 17.4 +45.6 99.8  | 15 38.6 +45.5 99.0  | 14 59.7 +45.4 98.2  |
| 7°  | 18 20.5 +45.6 100.7 | 17 41.8 +45.5 99.9  | 17 03.0 +45.4 99.1  | 16 24.1 +45.3 98.3  | 15 45.1 +45.2 97.6  |
| 8°  | 19 06.1 +45.4 100.0 | 18 27.3 +45.3 99.2  | 17 48.4 +45.2 98.4  | 17 09.4 +45.2 97.7  | 16 30.3 +45.2 96.9  |
| 9°  | 19 51.5 +45.2 99.3  | 19 12.6 +45.1 98.5  | 18 33.6 +45.1 97.7  | 17 54.6 +45.0 97.0  | 17 15.5 +44.9 96.2  |
| 10° | 20 36.7 +45.1 98.6  | 19 57.7 +45.0 97.8  | 19 18.7 +44.9 97.0  | 18 39.6 +44.9 96.3  | 18 00.4 +44.9 95.5  |
| 11° | 21 21.8 +44.8 97.9  | 20 42.7 +44.8 97.1  | 20 03.6 +44.8 96.3  | 19 24.5 +44.7 95.6  | 18 45.3 +44.7 94.8  |
| 12° | 22 06.6 +44.7 97.2  | 21 27.5 +44.7 96.4  | 20 48.4 +44.6 95.6  | 20 09.2 +44.5 94.9  | 19 30.0 +44.5 94.1  |
| 13° | 22 51.3 +44.5 96.5  | 22 12.2 +44.4 95.7  | 21 33.0 +44.4 94.9  | 20 53.7 +44.4 94.1  | 20 14.5 +44.3 93.4  |
| 14° | 23 35.8 +44.3 95.7  | 22 56.6 +44.3 95.0  | 22 17.4 +44.2 94.2  | 21 38.1 +44.2 93.4  | 20 58.8 +44.2 92.6  |
| 15° | 24 20.1 +44.1 95.0  | 23 40.9 +44.0 94.2  | 23 01.6 +44.0 93.5  | 22 22.3 +44.0 92.7  | 21 43.0 +43.9 91.9  |
| 16° | 25 04.2 +43.8 94.3  | 24 24.9 +43.8 93.5  | 23 45.6 +43.8 92.7  | 23 06.3 +43.7 91.9  | 22 26.9 +43.8 91.2  |
| 17° | 25 48.0 +43.6 93.5  | 25 08.7 +43.6 92.7  | 24 29.4 +43.5 92.0  | 23 50.0 +43.6 91.2  | 23 10.7 +43.5 90.4  |
| 18° | 26 31.6 +43.4 92.7  | 25 52.3 +43.3 92.0  | 25 12.9 +43.4 91.2  | 24 33.6 +43.3 90.4  | 23 54.2 +43.4 89.7  |
| 19° | 27 15.0 +43.1 92.0  | 26 35.6 +43.1 91.2  | 25 56.3 +43.1 90.4  | 25 16.9 +43.1 89.7  | 24 37.6 +43.0 88.9  |
| 20° | 27 58.1 +42.8 91.2  | 27 18.7 +42.8 90.4  | 26 39.4 +42.8 89.7  | 26 00.0 +42.8 88.9  | 25 20.6 +42.9 88.2  |
| 21° | 28 40.9 +42.6 90.4  | 28 01.5 +42.6 89.6  | 27 22.2 +42.5 88.9  | 26 42.8 +42.6 88.1  | 26 03.5 +42.6 87.4  |
| 22° | 29 23.5 +42.2 89.6  | 28 44.1 +42.3 88.8  | 28 04.7 +42.3 88.1  | 27 25.4 +42.3 87.3  | 26 46.1 +42.3 86.6  |
| 23° | 30 05.7 +41.9 88.8  | 29 26.4 +41.9 88.0  | 28 47.0 +42.0 87.3  | 28 07.7 +42.0 86.5  | 27 28.4 +42.1 85.8  |
| 24° | 30 47.6 +41.7 87.9  | 30 08.3 +41.7 87.2  | 29 29.0 +41.7 86.5  | 28 49.7 +41.8 85.7  | 28 10.5 +41.8 85.0  |
| 25° | 31 29.3 +41.2 87.1  | 30 50.0 +41.3 86.4  | 30 10.7 +41.4 85.6  | 29 31.5 +41.4 84.9  | 28 52.3 +41.5 84.2  |
| 26° | 32 10.5 +41.0 86.2  | 31 31.3 +41.0 85.5  | 30 52.1 +41.0 84.8  | 30 12.9 +41.1 84.1  | 29 33.8 +41.1 83.4  |
| 27° | 32 51.5 +40.6 85.4  | 32 12.3 +40.6 84.6  | 31 33.1 +40.7 83.9  | 30 54.0 +40.7 83.2  | 30 14.9 +40.9 82.5  |
| 28° | 33 32.1 +40.1 84.5  | 32 52.9 +40.3 83.8  | 32 13.8 +40.3 83.1  | 31 34.7 +40.5 82.4  | 30 55.8 +40.5 81.7  |
| 29° | 34 12.2 +39.8 83.6  | 33 33.2 +39.8 82.9  | 32 54.1 +40.0 82.2  | 32 15.2 +40.0 81.5  | 31 36.3 +40.1 80.8  |

| 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°  | 9 46.6 +45.9 101.4  | 9 07.9 +45.9 100.7 | 8 29.2 +45.8 99.9  | 7 50.4 +45.7 99.1  | 7 11.5 +45.6 98.3  |
| 1°  | 10 32.5 +45.8 100.8 | 9 53.8 +45.7 100.0 | 9 15.0 +45.6 99.2  | 8 36.1 +45.6 98.5  | 7 57.1 +45.5 97.7  |
| 2°  | 11 18.3 +45.8 100.1 | 10 39.5 +45.7 99.3 | 10 00.6 +45.6 98.6 | 9 21.7 +45.5 97.8  | 8 42.6 +45.5 97.0  |
| 3°  | 12 04.1 +45.6 99.5  | 11 25.2 +45.6 98.7 | 10 46.2 +45.6 97.9 | 10 07.2 +45.5 97.1 | 9 28.1 +45.4 96.4  |
| 4°  | 12 49.7 +45.6 98.8  | 12 10.8 +45.5 98.0 | 11 31.8 +45.4 97.2 | 10 52.7 +45.3 96.5 | 10 13.5 +45.4 95.7 |
| 5°  | 13 35.3 +45.4 98.1  | 12 56.3 +45.3 97.4 | 12 17.2 +45.3 96.6 | 11 38.0 +45.3 95.8 | 10 58.9 +45.2 95.0 |
| 6°  | 14 20.7 +45.3 97.5  | 13 41.6 +45.3 96.7 | 13 02.5 +45.2 95.9 | 12 23.3 +45.2 95.1 | 11 44.1 +45.1 94.4 |
| 7°  | 15 06.0 +45.2 96.8  | 14 26.9 +45.2 96.0 | 13 47.7 +45.1 95.2 | 13 08.5 +45.1 94.5 | 12 29.2 +45.1 93.7 |
| 8°  | 15 51.2 +45.1 96.1  | 15 12.1 +45.0 95.3 | 14 32.8 +45.0 94.6 | 13 53.6 +44.9 93.8 | 13 14.3 +44.9 93.0 |
| 9°  | 16 36.3 +44.9 95.4  | 15 57.1 +44.9 94.6 | 15 17.8 +44.9 93.9 | 14 38.5 +44.9 93.1 | 13 59.2 +44.8 92.3 |
| 10° | 17 21.2 +44.8 94.7  | 16 42.0 +44.8 93.9 | 16 02.7 +44.7 93.2 | 15 23.4 +44.7 92.4 | 14 44.0 +44.7 91.7 |
| 11° | 18 06.0 +44.7 94.0  | 17 26.8 +44.6 93.2 | 16 47.4 +44.6 92.5 | 16 08.1 +44.6 91.7 | 15 28.7 +44.6 91.0 |
| 12° | 18 50.7 +44.5 93.3  | 18 11.4 +44.4 92.5 | 17 32.0 +44.5 91.8 | 16 52.7 +44.4 91.0 | 16 13.3 +44.5 90.3 |
| 13° | 19 35.2 +44.3 92.6  | 18 55.8 +44.3 91.8 | 18 16.5 +44.3 91.1 | 17 37.1 +44.3 90.3 | 16 57.8 +44.2 89.6 |
| 14° | 20 19.5 +44.1 91.9  | 19 40.1 +44.1 91.1 | 19 00.8 +44.1 90.4 | 18 21.4 +44.1 89.6 | 17 42.0 +44.2 88.9 |
| 15° | 21 03.6 +44.0 91.2  | 20 24.2 +44.0 90.4 | 19 44.9 +43.9 89.6 | 19 05.5 +44.0 88.9 | 18 26.2 +44.0 88.1 |
| 16° | 21 47.6 +43.7 90.4  | 21 08.2 +43.8 89.7 | 20 28.8 +43.8 88.9 | 19 49.5 +43.8 88.2 | 19 10.2 +43.8 87.4 |
| 17° | 22 31.3 +43.6 89.7  | 21 52.0 +43.5 88.9 | 21 12.6 +43.6 88.2 | 20 33.3 +43.6 87.4 | 19 54.0 +43.6 86.7 |
| 18° | 23 14.9 +43.3 88.9  | 22 35.5 +43.4 88.2 | 21 56.2 +43.4 87.5 | 21 16.9 +43.4 86.7 | 20 37.6 +43.4 86.0 |
| 19° | 23 58.2 +43.1 88.2  | 23 18.9 +43.1 87.4 | 22 39.6 +43.1 86.7 | 22 00.3 +43.2 86.0 | 21 21.0 +43.3 85.2 |
| 20° | 24 41.3 +42.9 87.4  | 24 02.0 +42.9 86.7 | 23 22.7 +43.0 85.9 | 22 43.5 +43.0 85.2 | 22 04.3 +43.0 84.5 |
| 21° | 25 24.2 +42.6 86.7  | 24 44.9 +42.7 85.9 | 24 05.7 +42.7 85.2 | 23 26.5 +42.7 84.5 | 22 47.3 +42.8 83.7 |
| 22° | 26 06.8 +42.4 85.9  | 25 27.6 +42.4 85.1 | 24 48.4 +42.5 84.4 | 24 09.2 +42.6 83.7 | 23 30.1 +42.6 83.0 |
| 23° | 26 49.2 +42.1 85.1  | 26 10.0 +42.2 84.4 | 25 30.9 +42.2 83.6 | 24 51.8 +42.3 82.9 | 24 12.7 +42.4 82.2 |
| 24° | 27 31.3 +41.9 84.3  | 26 52.2 +41.9 83.6 | 26 13.1 +42.0 82.8 | 25 34.1 +42.0 82.1 | 24 55.1 +42.1 81.4 |
| 25° | 28 13.2 +41.5 83.5  | 27 34.1 +41.6 82.8 | 26 55.1 +41.6 82.0 | 26 16.1 +41.8 81.3 | 25 37.2 +41.9 80.6 |
| 26° | 28 54.7 +41.2 82.6  | 28 15.7 +41.3 81.9 | 27 36.7 +41.5 81.2 | 26 57.9 +41.5 80.5 | 26 19.1 +41.6 79.8 |
| 27° | 29 35.9 +41.0 81.8  | 28 57.0 +41.0 81.1 | 28 18.2 +41.1 80.4 | 27 39.4 +41.2 79.7 | 27 00.7 +41.3 79.0 |
| 28° | 30 16.9 +40.5 81.0  | 29 38.0 +40.7 80.3 | 28 59.3 +40.8 79.6 | 28 20.6 +40.9 78.9 | 27 42.0 +41.0 78.2 |
| 29° | 30 57.4 +40.3 80.1  | 30 18.7 +40.4 79.4 | 29 40.1 +40.4 78.7 | 29 01.5 +40.6 78.1 | 28 23.0 +40.8 77.4 |



| 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°  | 6 32.5 +45.5 97.6  | 5 53.4 +45.5 96.8  | 5 14.3 +45.5 96.1  | 4 35.2 +45.4 95.3  | 3 55.9 +45.4 94.5  |
| 1°  | 7 18.0 +45.5 96.9  | 6 38.9 +45.5 96.2  | 5 59.8 +45.4 95.4  | 5 20.6 +45.3 94.6  | 4 41.3 +45.3 93.9  |
| 2°  | 8 03.5 +45.5 96.3  | 7 24.4 +45.4 95.5  | 6 45.2 +45.3 94.7  | 6 05.9 +45.3 94.0  | 5 26.6 +45.3 93.2  |
| 3°  | 8 49.0 +45.3 95.6  | 8 09.8 +45.3 94.8  | 7 30.5 +45.3 94.1  | 6 51.2 +45.3 93.3  | 6 11.9 +45.3 92.6  |
| 4°  | 9 34.3 +45.3 94.9  | 8 55.1 +45.3 94.2  | 8 15.8 +45.2 93.4  | 7 36.5 +45.2 92.7  | 6 57.2 +45.2 91.9  |
| 5°  | 10 19.6 +45.2 94.3 | 9 40.4 +45.1 93.5  | 9 01.0 +45.2 92.8  | 8 21.7 +45.2 92.0  | 7 42.4 +45.1 91.2  |
| 6°  | 11 04.8 +45.1 93.6 | 10 25.5 +45.1 92.8 | 9 46.2 +45.1 92.1  | 9 06.9 +45.0 91.3  | 8 27.5 +45.1 90.6  |
| 7°  | 11 49.9 +45.1 92.9 | 11 10.6 +45.0 92.2 | 10 31.3 +45.0 91.4 | 9 51.9 +45.0 90.7  | 9 12.6 +44.9 89.9  |
| 8°  | 12 35.0 +44.9 92.3 | 11 55.6 +44.9 91.5 | 11 16.3 +44.9 90.7 | 10 36.9 +44.9 90.0 | 9 57.5 +44.9 89.2  |
| 9°  | 13 19.9 +44.8 91.6 | 12 40.5 +44.8 90.8 | 12 01.2 +44.8 90.1 | 11 21.8 +44.8 89.3 | 10 42.4 +44.9 88.6 |
| 10° | 14 04.7 +44.7 90.9 | 13 25.3 +44.7 90.1 | 12 46.0 +44.7 89.4 | 12 06.6 +44.7 88.6 | 11 27.3 +44.7 87.9 |
| 11° | 14 49.4 +44.6 90.2 | 14 10.0 +44.6 89.5 | 13 30.7 +44.5 88.7 | 12 51.3 +44.6 87.9 | 12 12.0 +44.6 87.2 |
| 12° | 15 34.0 +44.4 89.5 | 14 54.6 +44.4 88.8 | 14 15.2 +44.5 88.0 | 13 35.9 +44.5 87.3 | 12 56.6 +44.5 86.5 |
| 13° | 16 18.4 +44.3 88.8 | 15 39.0 +44.4 88.1 | 14 59.7 +44.3 87.3 | 14 20.4 +44.4 86.6 | 13 41.1 +44.4 85.8 |
| 14° | 17 02.7 +44.1 88.1 | 16 23.4 +44.1 87.4 | 15 44.0 +44.3 86.6 | 15 04.8 +44.2 85.9 | 14 25.5 +44.3 85.1 |
| 15° | 17 46.8 +44.0 87.4 | 17 07.5 +44.1 86.7 | 16 28.3 +44.0 85.9 | 15 49.0 +44.1 85.2 | 15 09.8 +44.2 84.4 |
| 16° | 18 30.8 +43.9 86.7 | 17 51.6 +43.8 85.9 | 17 12.3 +43.9 85.2 | 16 33.1 +44.0 84.5 | 15 54.0 +44.0 83.7 |
| 17° | 19 14.7 +43.6 86.0 | 18 35.4 +43.7 85.2 | 17 56.2 +43.8 84.5 | 17 17.1 +43.8 83.8 | 16 38.0 +43.8 83.0 |
| 18° | 19 58.3 +43.5 85.2 | 19 19.1 +43.6 84.5 | 18 40.0 +43.6 83.8 | 18 00.9 +43.6 83.0 | 17 21.8 +43.7 82.3 |
| 19° | 20 41.8 +43.3 84.5 | 20 02.7 +43.3 83.8 | 19 23.6 +43.4 83.0 | 18 44.5 +43.5 82.3 | 18 05.5 +43.6 81.6 |
| 20° | 21 25.1 +43.1 83.8 | 20 46.0 +43.2 83.0 | 20 07.0 +43.2 82.3 | 19 28.0 +43.3 81.6 | 18 49.1 +43.4 80.9 |
| 21° | 22 08.2 +42.9 83.0 | 21 29.2 +42.9 82.3 | 20 50.2 +43.0 81.6 | 20 11.3 +43.1 80.9 | 19 32.5 +43.2 80.1 |
| 22° | 22 51.1 +42.7 82.3 | 22 12.1 +42.8 81.5 | 21 33.2 +42.9 80.8 | 20 54.4 +42.9 80.1 | 20 15.7 +43.0 79.4 |
| 23° | 23 33.8 +42.4 81.5 | 22 54.9 +42.5 80.8 | 22 16.1 +42.6 80.1 | 21 37.3 +42.8 79.4 | 20 58.7 +42.8 78.7 |
| 24° | 24 16.2 +42.2 80.7 | 23 37.4 +42.3 80.0 | 22 58.7 +42.4 79.3 | 22 20.1 +42.5 78.6 | 21 41.5 +42.6 77.9 |
| 25° | 24 58.4 +42.0 79.9 | 24 19.7 +42.1 79.2 | 23 41.1 +42.2 78.5 | 23 02.6 +42.2 77.8 | 22 24.1 +42.4 77.1 |
| 26° | 25 40.4 +41.7 79.1 | 25 01.8 +41.8 78.4 | 24 23.3 +41.9 77.8 | 23 44.8 +42.1 77.1 | 23 06.5 +42.2 76.4 |
| 27° | 26 22.1 +41.4 78.3 | 25 43.6 +41.5 77.7 | 25 05.2 +41.7 77.0 | 24 26.9 +41.8 76.3 | 23 48.7 +41.9 75.6 |
| 28° | 27 03.5 +41.2 77.5 | 26 25.1 +41.3 76.8 | 25 46.9 +41.4 76.2 | 25 08.7 +41.5 75.5 | 24 30.6 +41.7 74.8 |
| 29° | 27 44.7 +40.8 76.7 | 27 06.4 +41.0 76.0 | 26 28.3 +41.1 75.4 | 25 50.2 +41.3 74.7 | 25 12.3 +41.5 74.0 |

| 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°  | 3 16.7 +45.3 93.8  | 2 37.4 +45.3 93.0  | 1 58.1 +45.3 92.3  | 1 18.7 +45.3 91.5  | 0 39.4 +45.2 90.8  |
| 1°  | 4 02.0 +45.3 93.1  | 3 22.7 +45.3 92.4  | 2 43.4 +45.2 91.6  | 2 04.0 +45.3 90.9  | 1 24.6 +45.3 90.1  |
| 2°  | 4 47.3 +45.3 92.5  | 4 08.0 +45.3 91.7  | 3 28.6 +45.3 91.0  | 2 49.3 +45.2 90.2  | 2 09.9 +45.3 89.4  |
| 3°  | 5 32.6 +45.2 91.8  | 4 53.3 +45.2 91.0  | 4 13.9 +45.2 90.3  | 3 34.5 +45.2 89.5  | 2 55.2 +45.2 88.8  |
| 4°  | 6 17.8 +45.2 91.1  | 5 38.5 +45.1 90.4  | 4 59.1 +45.2 89.6  | 4 19.7 +45.2 88.9  | 3 40.4 +45.2 88.1  |
| 5°  | 7 03.0 +45.1 90.5  | 6 23.6 +45.2 89.7  | 5 44.3 +45.1 89.0  | 5 04.9 +45.2 88.2  | 4 25.6 +45.2 87.5  |
| 6°  | 7 48.1 +45.1 89.8  | 7 08.8 +45.0 89.1  | 6 29.4 +45.1 88.3  | 5 50.1 +45.1 87.6  | 5 10.8 +45.1 86.8  |
| 7°  | 8 33.2 +45.0 89.2  | 7 53.8 +45.0 88.4  | 7 14.5 +45.0 87.6  | 6 35.2 +45.0 86.9  | 5 55.9 +45.1 86.1  |
| 8°  | 9 18.2 +44.9 88.5  | 8 38.8 +45.0 87.7  | 7 59.5 +45.0 87.0  | 7 20.2 +45.0 86.2  | 6 41.0 +45.0 85.5  |
| 9°  | 10 03.1 +44.8 87.8 | 9 23.8 +44.8 87.1  | 8 44.5 +44.9 86.3  | 8 05.2 +44.9 85.6  | 7 26.0 +45.0 84.8  |
| 10° | 10 47.9 +44.8 87.1 | 10 08.6 +44.8 86.4 | 9 29.4 +44.8 85.6  | 8 50.1 +44.9 84.9  | 8 11.0 +44.9 84.1  |
| 11° | 11 32.7 +44.6 86.5 | 10 53.4 +44.7 85.7 | 10 14.2 +44.7 85.0 | 9 35.0 +44.8 84.2  | 8 55.9 +44.8 83.5  |
| 12° | 12 17.3 +44.6 85.8 | 11 38.1 +44.6 85.0 | 10 58.9 +44.6 84.3 | 10 19.8 +44.7 83.5 | 9 40.7 +44.7 82.8  |
| 13° | 13 01.9 +44.4 85.1 | 12 22.7 +44.5 84.3 | 11 43.5 +44.6 83.6 | 11 04.5 +44.6 82.9 | 10 25.4 +44.7 82.1 |
| 14° | 13 46.3 +44.4 84.4 | 13 07.2 +44.4 83.7 | 12 28.1 +44.4 82.9 | 11 49.1 +44.5 82.2 | 11 10.1 +44.6 81.4 |
| 15° | 14 30.7 +44.2 83.7 | 13 51.6 +44.2 83.0 | 13 12.5 +44.3 82.2 | 12 33.6 +44.3 81.5 | 11 54.7 +44.4 80.8 |
| 16° | 15 14.9 +44.0 83.0 | 14 35.8 +44.2 82.3 | 13 56.8 +44.3 81.5 | 13 17.9 +44.3 80.8 | 12 39.1 +44.4 80.1 |
| 17° | 15 58.9 +44.0 82.3 | 15 20.0 +44.0 81.6 | 14 41.1 +44.0 80.8 | 14 02.2 +44.2 80.1 | 13 23.5 +44.2 79.4 |
| 18° | 16 42.9 +43.7 81.6 | 16 04.0 +43.8 80.9 | 15 25.1 +44.0 80.1 | 14 46.4 +44.0 79.4 | 14 07.7 +44.2 78.7 |
| 19° | 17 26.6 +43.7 80.9 | 16 47.8 +43.7 80.1 | 16 09.1 +43.8 79.4 | 15 30.4 +43.9 78.7 | 14 51.9 +44.0 78.0 |
| 20° | 18 10.3 +43.4 80.1 | 17 31.5 +43.6 79.4 | 16 52.9 +43.6 78.7 | 16 14.3 +43.8 78.0 | 15 35.9 +43.8 77.3 |
| 21° | 18 53.7 +43.3 79.4 | 18 15.1 +43.4 78.7 | 17 36.5 +43.5 78.0 | 16 58.1 +43.6 77.3 | 16 19.7 +43.8 76.6 |
| 22° | 19 37.0 +43.2 78.7 | 18 58.5 +43.2 78.0 | 18 20.0 +43.4 77.3 | 17 41.7 +43.4 76.6 | 17 03.5 +43.5 75.9 |
| 23° | 20 20.2 +42.9 77.9 | 19 41.7 +43.0 77.2 | 19 03.4 +43.1 76.5 | 18 25.1 +43.3 75.8 | 17 47.0 +43.4 75.1 |
| 24° | 21 03.1 +42.7 77.2 | 20 24.7 +42.9 76.5 | 19 46.5 +43.0 75.8 | 19 08.4 +43.1 75.1 | 18 30.4 +43.3 74.4 |
| 25° | 21 45.8 +42.5 76.4 | 21 07.6 +42.7 75.8 | 20 29.5 +42.8 75.1 | 19 51.5 +43.0 74.4 | 19 13.7 +43.1 73.7 |
| 26° | 22 28.3 +42.3 75.7 | 21 50.3 +42.4 75.0 | 21 12.3 +42.6 74.3 | 20 34.5 +42.7 73.6 | 19 56.8 +42.8 72.9 |
| 27° | 23 10.6 +42.1 74.9 | 22 32.7 +42.2 74.2 | 21 54.9 +42.4 73.6 | 21 17.2 +42.5 72.9 | 20 39.6 +42.7 72.2 |
| 28° | 23 52.7 +41.9 74.1 | 23 14.9 +42.0 73.5 | 22 37.3 +42.1 72.8 | 21 59.7 +42.3 72.1 | 21 22.3 +42.5 71.4 |
| 29° | 24 34.6 +41.6 73.4 | 23 56.9 +41.8 72.7 | 23 19.4 +41.9 72.0 | 22 42.0 +42.1 71.3 | 22 04.8 +42.3 70.7 |

# Latitude 49°

# 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 +45.3 90.0  | -0 39.4 +45.3      | -1 18.7 +45.3      | -1 58.1 +45.4      | -2 37.4 +45.4      |
| 1°  | 0 45.3 +45.3 89.3  | 0 05.9 +45.3 88.6  | -0 33.4 +45.3      | -1 12.7 +45.3      | -1 52.0 +45.3      |
| 2°  | 1 30.6 +45.2 88.7  | 0 51.2 +45.3 87.9  | 0 11.9 +45.3 87.2  | -0 27.4 +45.3      | -1 06.7 +45.4      |
| 3°  | 2 15.8 +45.3 88.0  | 1 36.5 +45.3 87.3  | 0 57.2 +45.3 86.5  | 0 17.9 +45.3 85.8  | -0 21.3 +45.3      |
| 4°  | 3 01.1 +45.2 87.4  | 2 21.8 +45.2 86.6  | 1 42.5 +45.3 85.9  | 1 03.2 +45.4 85.1  | 0 24.0 +45.4 84.4  |
| 5°  | 3 46.3 +45.2 86.7  | 3 07.0 +45.2 86.0  | 2 27.8 +45.2 85.2  | 1 48.6 +45.3 84.5  | 1 09.4 +45.4 83.7  |
| 6°  | 4 31.5 +45.1 86.1  | 3 52.2 +45.2 85.3  | 3 13.0 +45.3 84.6  | 2 33.9 +45.2 83.8  | 1 54.8 +45.3 83.1  |
| 7°  | 5 16.6 +45.2 85.4  | 4 37.4 +45.2 84.6  | 3 58.3 +45.2 83.9  | 3 19.1 +45.3 83.1  | 2 40.1 +45.3 82.4  |
| 8°  | 6 01.8 +45.0 84.7  | 5 22.6 +45.1 84.0  | 4 43.5 +45.1 83.2  | 4 04.4 +45.2 82.5  | 3 25.4 +45.3 81.7  |
| 9°  | 6 46.8 +45.0 84.1  | 6 07.7 +45.1 83.3  | 5 28.6 +45.2 82.6  | 4 49.6 +45.2 81.8  | 4 10.7 +45.3 81.1  |
| 10° | 7 31.8 +45.0 83.4  | 6 52.8 +45.0 82.7  | 6 13.8 +45.0 81.9  | 5 34.8 +45.2 81.2  | 4 56.0 +45.2 80.4  |
| 11° | 8 16.8 +44.9 82.7  | 7 37.8 +44.9 82.0  | 6 58.8 +45.0 81.2  | 6 20.0 +45.1 80.5  | 5 41.2 +45.2 79.8  |
| 12° | 9 01.7 +44.8 82.1  | 8 22.7 +44.9 81.3  | 7 43.8 +45.0 80.6  | 7 05.1 +45.0 79.8  | 6 26.4 +45.1 79.1  |
| 13° | 9 46.5 +44.7 81.4  | 9 07.6 +44.8 80.6  | 8 28.8 +44.9 79.9  | 7 50.1 +45.0 79.2  | 7 11.5 +45.0 78.4  |
| 14° | 10 31.2 +44.7 80.7 | 9 52.4 +44.7 80.0  | 9 13.7 +44.8 79.2  | 8 35.1 +44.9 78.5  | 7 56.5 +45.0 77.8  |
| 15° | 11 15.9 +44.5 80.0 | 10 37.1 +44.7 79.3 | 9 58.5 +44.7 78.6  | 9 20.0 +44.8 77.8  | 8 41.5 +45.0 77.1  |
| 16° | 12 00.4 +44.5 79.3 | 11 21.8 +44.5 78.6 | 10 43.2 +44.7 77.9 | 10 04.8 +44.7 77.2 | 9 26.5 +44.8 76.4  |
| 17° | 12 44.9 +44.3 78.7 | 12 06.3 +44.5 77.9 | 11 27.9 +44.5 77.2 | 10 49.5 +44.7 76.5 | 10 11.3 +44.8 75.8 |
| 18° | 13 29.2 +44.2 78.0 | 12 50.8 +44.3 77.2 | 12 12.4 +44.5 76.5 | 11 34.2 +44.6 75.8 | 10 56.1 +44.7 75.1 |
| 19° | 14 13.4 +44.1 77.3 | 13 35.1 +44.2 76.6 | 12 56.9 +44.3 75.8 | 12 18.8 +44.4 75.1 | 11 40.8 +44.6 74.4 |
| 20° | 14 57.5 +44.0 76.6 | 14 19.3 +44.1 75.9 | 13 41.2 +44.2 75.1 | 13 03.2 +44.4 74.4 | 12 25.4 +44.4 73.7 |
| 21° | 15 41.5 +43.9 75.9 | 15 03.4 +44.0 75.2 | 14 25.4 +44.1 74.4 | 13 47.6 +44.2 73.7 | 13 09.8 +44.4 73.0 |
| 22° | 16 25.4 +43.7 75.2 | 15 47.4 +43.8 74.4 | 15 09.5 +44.0 73.7 | 14 31.8 +44.1 73.0 | 13 54.2 +44.3 72.3 |
| 23° | 17 09.1 +43.5 74.4 | 16 31.2 +43.7 73.7 | 15 53.5 +43.8 73.0 | 15 15.9 +44.0 72.3 | 14 38.5 +44.1 71.6 |
| 24° | 17 52.6 +43.4 73.7 | 17 14.9 +43.5 73.0 | 16 37.3 +43.7 72.3 | 15 59.9 +43.8 71.6 | 15 22.6 +44.0 70.9 |
| 25° | 18 36.0 +43.2 73.0 | 17 58.4 +43.4 72.3 | 17 21.0 +43.5 71.6 | 16 43.7 +43.7 70.9 | 16 06.6 +43.8 70.2 |
| 26° | 19 19.2 +43.0 72.3 | 18 41.8 +43.2 71.6 | 18 04.5 +43.4 70.9 | 17 27.4 +43.5 70.2 | 16 50.4 +43.7 69.5 |
| 27° | 20 02.2 +42.9 71.5 | 19 25.0 +43.0 70.8 | 18 47.9 +43.2 70.2 | 18 10.9 +43.4 69.5 | 17 34.1 +43.6 68.8 |
| 28° | 20 45.1 +42.6 70.8 | 20 08.0 +42.8 70.1 | 19 31.1 +43.0 69.4 | 18 54.3 +43.2 68.8 | 18 17.7 +43.4 68.1 |
| 29° | 21 27.7 +42.5 70.0 | 20 50.8 +42.7 69.3 | 20 14.1 +42.8 68.7 | 19 37.5 +43.0 68.0 | 19 01.1 +43.2 67.3 |

| Dec | LHA 095° / 265°    | LHA 096° / 264°    | LHA 097° / 263°    | LHA 098° / 262°    | LHA 099° / 261°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -3 16.7 +45.4      | -3 55.9 +45.4      | -4 35.2 +45.5      | -5 14.3 +45.5      | -5 53.4 +45.5      |
| 1°  | -2 31.3 +45.4      | -3 10.5 +45.4      | -3 49.7 +45.5      | -4 28.8 +45.5      | -5 07.9 +45.6      |
| 2°  | -1 45.9 +45.4      | -2 25.1 +45.4      | -3 04.2 +45.5      | -3 43.3 +45.6      | -4 22.3 +45.6      |
| 3°  | -1 00.5 +45.4      | -1 39.7 +45.5      | -2 18.7 +45.5      | -2 57.7 +45.5      | -3 36.7 +45.7      |
| 4°  | -0 15.1 +45.4      | -0 54.2 +45.5      | -1 33.2 +45.5      | -2 12.2 +45.6      | -2 51.0 +45.6      |
| 5°  | 0 30.3 +45.4 83.0  | -0 08.7 +45.4      | -0 47.7 +45.5      | -1 26.6 +45.6      | -2 05.4 +45.7      |
| 6°  | 1 15.7 +45.4 82.3  | 0 36.7 +45.5 81.5  | -0 02.2 +45.6      | -0 41.0 +45.6      | -1 19.7 +45.7      |
| 7°  | 2 01.1 +45.4 81.6  | 1 22.2 +45.5 80.9  | 0 43.4 +45.5 80.1  | 0 04.6 +45.7 79.4  | -0 34.0 +45.7      |
| 8°  | 2 46.5 +45.4 81.0  | 2 07.7 +45.4 80.2  | 1 28.9 +45.5 79.5  | 0 50.3 +45.6 78.7  | 0 11.7 +45.7 78.0  |
| 9°  | 3 31.9 +45.3 80.3  | 2 53.1 +45.4 79.6  | 2 14.4 +45.5 78.8  | 1 35.9 +45.6 78.1  | 0 57.4 +45.7 77.3  |
| 10° | 4 17.2 +45.3 79.7  | 3 38.5 +45.4 78.9  | 2 59.9 +45.5 78.2  | 2 21.5 +45.5 77.4  | 1 43.1 +45.7 76.7  |
| 11° | 5 02.5 +45.2 79.0  | 4 23.9 +45.3 78.3  | 3 45.4 +45.5 77.5  | 3 07.0 +45.6 76.8  | 2 28.8 +45.6 76.0  |
| 12° | 5 47.7 +45.3 78.4  | 5 09.2 +45.4 77.6  | 4 30.9 +45.4 76.9  | 3 52.6 +45.5 76.1  | 3 14.4 +45.7 75.4  |
| 13° | 6 33.0 +45.1 77.7  | 5 54.6 +45.2 77.0  | 5 16.3 +45.3 76.2  | 4 38.1 +45.5 75.5  | 4 00.1 +45.6 74.7  |
| 14° | 7 18.1 +45.1 77.0  | 6 39.8 +45.2 76.3  | 6 01.6 +45.4 75.6  | 5 23.6 +45.4 74.8  | 4 45.7 +45.5 74.1  |
| 15° | 8 03.2 +45.1 76.4  | 7 25.0 +45.2 75.6  | 6 47.0 +45.2 74.9  | 6 09.0 +45.4 74.2  | 5 31.2 +45.5 73.4  |
| 16° | 8 48.3 +44.9 75.7  | 8 10.2 +45.1 75.0  | 7 32.2 +45.2 74.2  | 6 54.4 +45.4 73.5  | 6 16.7 +45.5 72.8  |
| 17° | 9 33.2 +44.9 75.0  | 8 55.3 +45.0 74.3  | 8 17.4 +45.2 73.6  | 7 39.8 +45.2 72.8  | 7 02.2 +45.4 72.1  |
| 18° | 10 18.1 +44.8 74.4 | 9 40.3 +44.9 73.6  | 9 02.6 +45.1 72.9  | 8 25.0 +45.2 72.2  | 7 47.6 +45.4 71.5  |
| 19° | 11 02.9 +44.7 73.7 | 10 25.2 +44.9 73.0 | 9 47.7 +45.0 72.2  | 9 10.2 +45.2 71.5  | 8 33.0 +45.3 70.8  |
| 20° | 11 47.6 +44.7 73.0 | 11 10.1 +44.7 72.3 | 10 32.7 +44.9 71.6 | 9 55.4 +45.0 70.9  | 9 18.3 +45.2 70.1  |
| 21° | 12 32.3 +44.5 72.3 | 11 54.8 +44.7 71.6 | 11 17.6 +44.8 70.9 | 10 40.4 +45.0 70.2 | 10 03.5 +45.1 69.5 |
| 22° | 13 16.8 +44.4 71.6 | 12 39.5 +44.6 70.9 | 12 02.4 +44.7 70.2 | 11 25.4 +44.9 69.5 | 10 48.6 +45.1 68.8 |
| 23° | 14 01.2 +44.3 70.9 | 13 24.1 +44.4 70.2 | 12 47.1 +44.6 69.5 | 12 10.3 +44.8 68.8 | 11 33.7 +44.9 68.1 |
| 24° | 14 45.5 +44.1 70.2 | 14 08.5 +44.3 69.5 | 13 31.7 +44.5 68.8 | 12 55.1 +44.7 68.1 | 12 18.6 +44.9 67.4 |
| 25° | 15 29.6 +44.0 69.5 | 14 52.8 +44.2 68.8 | 14 16.2 +44.4 68.2 | 13 39.8 +44.5 67.5 | 13 03.5 +44.7 66.8 |
| 26° | 16 13.6 +43.9 68.8 | 15 37.0 +44.1 68.1 | 15 00.6 +44.2 67.5 | 14 24.3 +44.5 66.8 | 13 48.2 +44.7 66.1 |
| 27° | 16 57.5 +43.8 68.1 | 16 21.1 +43.9 67.4 | 15 44.8 +44.1 66.8 | 15 08.8 +44.3 66.1 | 14 32.9 +44.5 65.4 |
| 28° | 17 41.3 +43.5 67.4 | 17 05.0 +43.8 66.7 | 16 28.9 +44.0 66.1 | 15 53.1 +44.1 65.4 | 15 17.4 +44.4 64.7 |
| 29° | 18 24.8 +43.4 66.7 | 17 48.8 +43.6 66.0 | 17 12.9 +43.8 65.3 | 16 37.2 +44.1 64.7 | 16 01.8 +44.2 64.0 |

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The data on this page is believed to be accurate but no warranty is given for it's correctness. Use it only for training and exercising!

| Dec | LHA 100° / 260°    | LHA 101° / 259°    | LHA 102° / 258°    | LHA 103° / 257°    | LHA 104° / 256°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -6 32.5 +45.6      | -7 11.5 +45.7      | -7 50.4 +45.8      | -8 29.2 +45.8      | -9 07.9 +45.9      |
| 1°  | -5 46.9 +45.7      | -6 25.8 +45.7      | -7 04.6 +45.7      | -7 43.4 +45.9      | -8 22.0 +45.9      |
| 2°  | -5 01.2 +45.6      | -5 40.1 +45.8      | -6 18.9 +45.9      | -6 57.5 +45.9      | -7 36.1 +46.0      |
| 3°  | -4 15.6 +45.8      | -4 54.3 +45.8      | -5 33.0 +45.9      | -6 11.6 +46.0      | -6 50.1 +46.1      |
| 4°  | -3 29.8 +45.7      | -4 08.5 +45.8      | -4 47.1 +45.9      | -5 25.6 +46.0      | -6 04.0 +46.1      |
| 5°  | -2 44.1 +45.8      | -3 22.7 +45.9      | -4 01.2 +45.9      | -4 39.6 +46.1      | -5 17.9 +46.2      |
| 6°  | -1 58.3 +45.8      | -2 36.8 +45.8      | -3 15.3 +46.0      | -3 53.5 +46.0      | -4 31.7 +46.2      |
| 7°  | -1 12.5 +45.8      | -1 51.0 +45.9      | -2 29.3 +46.0      | -3 07.5 +46.1      | -3 45.5 +46.2      |
| 8°  | -0 26.7 +45.8      | -1 05.1 +45.9      | -1 43.3 +46.0      | -2 21.4 +46.2      | -2 59.3 +46.2      |
| 9°  | 0 19.1 +45.7 76.6  | -0 19.2 +45.9      | -0 57.3 +46.0      | -1 35.2 +46.1      | -2 13.1 +46.3      |
| 10° | 1 04.8 +45.8 75.9  | 0 26.7 +45.9 75.2  | -0 11.3 +46.1      | -0 49.1 +46.1      | -1 26.8 +46.3      |
| 11° | 1 50.6 +45.8 75.3  | 1 12.6 +45.9 74.5  | 0 34.8 +46.0 73.8  | -0 03.0 +46.2      | -0 40.5 +46.2      |
| 12° | 2 36.4 +45.7 74.6  | 1 58.5 +45.9 73.9  | 1 20.8 +46.0 73.1  | 0 43.2 +46.1 72.4  | 0 05.7 +46.3 71.6  |
| 13° | 3 22.1 +45.8 74.0  | 2 44.4 +45.8 73.2  | 2 06.8 +46.0 72.5  | 1 29.3 +46.1 71.8  | 0 52.0 +46.3 71.0  |
| 14° | 4 07.9 +45.7 73.3  | 3 30.2 +45.9 72.6  | 2 52.8 +45.9 71.9  | 2 15.4 +46.1 71.1  | 1 38.3 +46.2 70.4  |
| 15° | 4 53.6 +45.6 72.7  | 4 16.1 +45.8 72.0  | 3 38.7 +46.0 71.2  | 3 01.5 +46.1 70.5  | 2 24.5 +46.3 69.7  |
| 16° | 5 39.2 +45.6 72.0  | 5 01.9 +45.7 71.3  | 4 24.7 +45.9 70.6  | 3 47.6 +46.1 69.8  | 3 10.8 +46.2 69.1  |
| 17° | 6 24.8 +45.6 71.4  | 5 47.6 +45.7 70.7  | 5 10.6 +45.8 69.9  | 4 33.7 +46.0 69.2  | 3 57.0 +46.1 68.5  |
| 18° | 7 10.4 +45.5 70.7  | 6 33.3 +45.7 70.0  | 5 56.4 +45.8 69.3  | 5 19.7 +46.0 68.5  | 4 43.1 +46.2 67.8  |
| 19° | 7 55.9 +45.4 70.1  | 7 19.0 +45.6 69.4  | 6 42.2 +45.8 68.6  | 6 05.7 +45.9 67.9  | 5 29.3 +46.1 67.2  |
| 20° | 8 41.3 +45.4 69.4  | 8 04.6 +45.5 68.7  | 7 28.0 +45.7 68.0  | 6 51.6 +45.9 67.3  | 6 15.4 +46.1 66.5  |
| 21° | 9 26.7 +45.3 68.8  | 8 50.1 +45.5 68.0  | 8 13.7 +45.7 67.3  | 7 37.5 +45.8 66.6  | 7 01.5 +46.0 65.9  |
| 22° | 10 12.0 +45.2 68.1 | 9 35.6 +45.4 67.4  | 8 59.4 +45.5 66.7  | 8 23.3 +45.8 65.9  | 7 47.5 +45.9 65.2  |
| 23° | 10 57.2 +45.2 67.4 | 10 21.0 +45.3 66.7 | 9 44.9 +45.5 66.0  | 9 09.1 +45.7 65.3  | 8 33.4 +45.9 64.6  |
| 24° | 11 42.4 +45.0 66.7 | 11 06.3 +45.2 66.0 | 10 30.4 +45.4 65.3 | 9 54.8 +45.6 64.6  | 9 19.3 +45.8 63.9  |
| 25° | 12 27.4 +44.9 66.1 | 11 51.5 +45.2 65.4 | 11 15.8 +45.4 64.7 | 10 40.4 +45.5 64.0 | 10 05.1 +45.7 63.3 |
| 26° | 13 12.3 +44.9 65.4 | 12 36.7 +45.0 64.7 | 12 01.2 +45.2 64.0 | 11 25.9 +45.4 63.3 | 10 50.8 +45.7 62.6 |
| 27° | 13 57.2 +44.7 64.7 | 13 21.7 +44.9 64.0 | 12 46.4 +45.1 63.3 | 12 11.3 +45.4 62.6 | 11 36.5 +45.5 62.0 |
| 28° | 14 41.9 +44.6 64.0 | 14 06.6 +44.8 63.3 | 13 31.5 +45.1 62.7 | 12 56.7 +45.2 62.0 | 12 22.0 +45.5 61.3 |
| 29° | 15 26.5 +44.4 63.3 | 14 51.4 +44.7 62.7 | 14 16.6 +44.9 62.0 | 13 41.9 +45.1 61.3 | 13 07.5 +45.4 60.6 |

| Dec | LHA 105° / 255°    | LHA 106° / 254°    | LHA 107° / 253°    | LHA 108° / 252°    | LHA 109° / 251°    |
|-----|--------------------|--------------------|--------------------|--------------------|--------------------|
|     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     | H ° ' dH ' Z °     |
| 0°  | -9 46.6 +46.0      |                    |                    |                    |                    |
| 1°  | -9 00.6 +46.1      | -9 39.0 +46.1      |                    |                    |                    |
| 2°  | -8 14.5 +46.1      | -8 52.9 +46.3      | -9 31.1 +46.3      |                    |                    |
| 3°  | -7 28.4 +46.2      | -8 06.6 +46.2      | -8 44.8 +46.4      | -9 22.7 +46.5      |                    |
| 4°  | -6 42.2 +46.2      | -7 20.4 +46.4      | -7 58.4 +46.5      | -8 36.2 +46.6      | -9 13.9 +46.7      |
| 5°  | -5 56.0 +46.2      | -6 34.0 +46.3      | -7 11.9 +46.5      | -7 49.6 +46.6      | -8 27.2 +46.8      |
| 6°  | -5 09.8 +46.4      | -5 47.7 +46.5      | -6 25.4 +46.6      | -7 03.0 +46.7      | -7 40.4 +46.8      |
| 7°  | -4 23.4 +46.3      | -5 01.2 +46.4      | -5 38.8 +46.5      | -6 16.3 +46.7      | -6 53.6 +46.9      |
| 8°  | -3 37.1 +46.4      | -4 14.8 +46.5      | -4 52.3 +46.7      | -5 29.6 +46.8      | -6 06.7 +46.9      |
| 9°  | -2 50.7 +46.3      | -3 28.3 +46.6      | -4 05.6 +46.6      | -4 42.8 +46.8      | -5 19.8 +46.9      |
| 10° | -2 04.4 +46.4      | -2 41.7 +46.5      | -3 19.0 +46.7      | -3 56.0 +46.8      | -4 32.9 +47.0      |
| 11° | -1 18.0 +46.5      | -1 55.2 +46.5      | -2 32.3 +46.7      | -3 09.2 +46.9      | -3 45.9 +47.0      |
| 12° | -0 31.5 +46.4      | -1 08.7 +46.6      | -1 45.6 +46.7      | -2 22.3 +46.8      | -2 58.9 +47.0      |
| 13° | 0 14.9 +46.4 70.3  | -0 22.1 +46.6      | -0 58.9 +46.7      | -1 35.5 +46.9      | -2 11.9 +47.1      |
| 14° | 1 01.3 +46.4 69.6  | 0 24.5 +46.5 68.9  | -0 12.2 +46.8      | -0 48.6 +46.9      | -1 24.8 +47.1      |
| 15° | 1 47.7 +46.4 69.0  | 1 11.0 +46.6 68.2  | 0 34.6 +46.7 67.5  | -0 01.7 +46.9      | -0 37.7 +47.0      |
| 16° | 2 34.1 +46.3 68.3  | 1 57.6 +46.5 67.6  | 1 21.3 +46.7 66.9  | 0 45.2 +46.9 66.1  | 0 09.3 +47.1 65.4  |
| 17° | 3 20.4 +46.4 67.7  | 2 44.1 +46.5 67.0  | 2 08.0 +46.7 66.2  | 1 32.1 +46.8 65.5  | 0 56.4 +47.0 64.7  |
| 18° | 4 06.8 +46.3 67.1  | 3 30.6 +46.5 66.3  | 2 54.7 +46.7 65.6  | 2 18.9 +46.9 64.9  | 1 43.4 +47.1 64.1  |
| 19° | 4 53.1 +46.3 66.4  | 4 17.1 +46.5 65.7  | 3 41.4 +46.6 65.0  | 3 05.8 +46.8 64.2  | 2 30.5 +47.0 63.5  |
| 20° | 5 39.4 +46.2 65.8  | 5 03.6 +46.4 65.1  | 4 28.0 +46.6 64.3  | 3 52.6 +46.8 63.6  | 3 17.5 +47.0 62.9  |
| 21° | 6 25.6 +46.2 65.2  | 5 50.0 +46.4 64.4  | 5 14.6 +46.6 63.7  | 4 39.4 +46.8 63.0  | 4 04.5 +47.0 62.2  |
| 22° | 7 11.8 +46.2 64.5  | 6 36.4 +46.3 63.8  | 6 01.2 +46.5 63.1  | 5 26.2 +46.7 62.3  | 4 51.5 +46.9 61.6  |
| 23° | 7 58.0 +46.0 63.9  | 7 22.7 +46.3 63.2  | 6 47.7 +46.5 62.4  | 6 12.9 +46.7 61.7  | 5 38.4 +46.9 61.0  |
| 24° | 8 44.0 +46.1 63.2  | 8 09.0 +46.2 62.5  | 7 34.2 +46.4 61.8  | 6 59.6 +46.7 61.1  | 6 25.3 +46.8 60.4  |
| 25° | 9 30.1 +45.9 62.6  | 8 55.2 +46.2 61.9  | 8 20.6 +46.4 61.2  | 7 46.3 +46.5 60.5  | 7 12.1 +46.8 59.7  |
| 26° | 10 16.0 +45.9 61.9 | 9 41.4 +46.1 61.2  | 9 07.0 +46.3 60.5  | 8 32.8 +46.6 59.8  | 7 58.9 +46.8 59.1  |
| 27° | 11 01.9 +45.7 61.3 | 10 27.5 +45.9 60.6 | 9 53.3 +46.2 59.9  | 9 19.4 +46.4 59.2  | 8 45.7 +46.7 58.5  |
| 28° | 11 47.6 +45.7 60.6 | 11 13.4 +46.0 59.9 | 10 39.5 +46.1 59.2 | 10 05.8 +46.4 58.5 | 9 32.4 +46.6 57.8  |
| 29° | 12 33.3 +45.6 59.9 | 11 59.4 +45.8 59.3 | 11 25.6 +46.1 58.6 | 10 52.2 +46.3 57.9 | 10 19.0 +46.5 57.2 |

# Latitude 49°

# Declination SAME name as Latitude

| Dec | LHA 110° / 250°   | LHA 111° / 249°   | LHA 112° / 248°   | LHA 113° / 247°   | LHA 114° / 246°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
| 0°  |                   |                   |                   |                   |                   |
| 1°  |                   |                   |                   |                   |                   |
| 2°  |                   |                   |                   |                   |                   |
| 3°  |                   |                   |                   |                   |                   |
| 4°  | -9 51.4 +46.8     |                   |                   |                   |                   |
| 5°  | -9 04.6 +46.9     | -9 41.8 +47.0     |                   |                   |                   |
| 6°  | -8 17.7 +47.0     | -8 54.8 +47.1     | -9 31.7 +47.3     |                   |                   |
| 7°  | -7 30.7 +47.0     | -8 07.7 +47.2     | -8 44.4 +47.3     | -9 21.0 +47.5     | -9 57.3 +47.6     |
| 8°  | -6 43.7 +47.0     | -7 20.5 +47.2     | -7 57.1 +47.4     | -8 33.5 +47.6     | -9 09.7 +47.7     |
| 9°  | -5 56.7 +47.2     | -6 33.3 +47.3     | -7 09.7 +47.4     | -7 45.9 +47.5     | -8 22.0 +47.8     |
| 10° | -5 09.5 +47.1     | -5 46.0 +47.3     | -6 22.3 +47.5     | -6 58.4 +47.7     | -7 34.2 +47.8     |
| 11° | -4 22.4 +47.2     | -4 58.7 +47.3     | -5 34.8 +47.5     | -6 10.7 +47.7     | -6 46.4 +47.9     |
| 12° | -3 35.2 +47.2     | -4 11.4 +47.4     | -4 47.3 +47.5     | -5 23.0 +47.7     | -5 58.5 +47.9     |
| 13° | -2 48.0 +47.2     | -3 24.0 +47.4     | -3 59.8 +47.6     | -4 35.3 +47.7     | -5 10.6 +47.9     |
| 14° | -2 00.8 +47.2     | -2 36.6 +47.4     | -3 12.2 +47.6     | -3 47.6 +47.8     | -4 22.7 +48.0     |
| 15° | -1 13.6 +47.2     | -1 49.2 +47.4     | -2 24.6 +47.6     | -2 59.8 +47.8     | -3 34.7 +48.0     |
| 16° | -0 26.4 +47.3     | -1 01.8 +47.4     | -1 37.0 +47.6     | -2 12.0 +47.8     | -2 46.7 +48.0     |
| 17° | 0 20.9 +47.2 64.0 | -0 14.4 +47.5     | -0 49.4 +47.6     | -1 24.2 +47.8     | -1 58.7 +48.0     |
| 18° | 1 08.1 +47.3 63.4 | 0 33.1 +47.4 62.6 | -0 01.8 +47.6     | -0 36.4 +47.9     | -1 10.7 +48.0     |
| 19° | 1 55.4 +47.2 62.7 | 1 20.5 +47.4 62.0 | 0 45.8 +47.7 61.3 | 0 11.5 +47.8 60.5 | -0 22.7 +48.1     |
| 20° | 2 42.6 +47.2 62.1 | 2 07.9 +47.4 61.4 | 1 33.5 +47.6 60.6 | 0 59.3 +47.8 59.9 | 0 25.4 +48.0 59.1 |
| 21° | 3 29.8 +47.1 61.5 | 2 55.3 +47.4 60.8 | 2 21.1 +47.6 60.0 | 1 47.1 +47.8 59.3 | 1 13.4 +48.0 58.5 |
| 22° | 4 16.9 +47.2 60.9 | 3 42.7 +47.3 60.2 | 3 08.7 +47.5 59.4 | 2 34.9 +47.8 58.7 | 2 01.4 +48.0 57.9 |
| 23° | 5 04.1 +47.1 60.3 | 4 30.0 +47.4 59.5 | 3 56.2 +47.6 58.8 | 3 22.7 +47.7 58.1 | 2 49.4 +48.0 57.3 |
| 24° | 5 51.2 +47.1 59.6 | 5 17.4 +47.2 58.9 | 4 43.8 +47.5 58.2 | 4 10.4 +47.8 57.5 | 3 37.4 +48.0 56.7 |
| 25° | 6 38.3 +47.0 59.0 | 6 04.6 +47.3 58.3 | 5 31.3 +47.5 57.6 | 4 58.2 +47.7 56.9 | 4 25.4 +47.9 56.1 |
| 26° | 7 25.3 +47.0 58.4 | 6 51.9 +47.2 57.7 | 6 18.8 +47.4 57.0 | 5 45.9 +47.6 56.3 | 5 13.3 +47.9 55.5 |
| 27° | 8 12.3 +46.9 57.8 | 7 39.1 +47.1 57.1 | 7 06.2 +47.4 56.4 | 6 33.5 +47.7 55.6 | 6 01.2 +47.8 54.9 |
| 28° | 8 59.2 +46.8 57.1 | 8 26.2 +47.1 56.4 | 7 53.6 +47.3 55.7 | 7 21.2 +47.5 55.0 | 6 49.0 +47.9 54.3 |
| 29° | 9 46.0 +46.8 56.5 | 9 13.3 +47.0 55.8 | 8 40.9 +47.3 55.1 | 8 08.7 +47.5 54.4 | 7 36.9 +47.7 53.7 |

| Dec | LHA 115° / 245°   | LHA 116° / 244°   | LHA 117° / 243°   | LHA 118° / 242°   | LHA 119° / 241°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
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| 5°  |                   |                   |                   |                   |                   |
| 6°  |                   |                   |                   |                   |                   |
| 7°  |                   |                   |                   |                   |                   |
| 8°  | -9 45.6 +47.9     |                   |                   |                   |                   |
| 9°  | -8 57.7 +47.9     | -9 33.3 +48.1     |                   |                   |                   |
| 10° | -8 09.8 +48.0     | -8 45.2 +48.2     | -9 20.3 +48.4     | -9 55.2 +48.6     |                   |
| 11° | -7 21.8 +48.0     | -7 57.0 +48.2     | -8 31.9 +48.4     | -9 06.6 +48.6     | -9 41.0 +48.8     |
| 12° | -6 33.8 +48.1     | -7 08.8 +48.3     | -7 43.5 +48.5     | -8 18.0 +48.7     | -8 52.2 +48.8     |
| 13° | -5 45.7 +48.1     | -6 20.5 +48.3     | -6 55.0 +48.5     | -7 29.3 +48.7     | -8 03.4 +49.0     |
| 14° | -4 57.6 +48.2     | -5 32.2 +48.4     | -6 06.5 +48.5     | -6 40.6 +48.7     | -7 14.4 +48.9     |
| 15° | -4 09.4 +48.2     | -4 43.8 +48.4     | -5 18.0 +48.6     | -5 51.9 +48.8     | -6 25.5 +49.0     |
| 16° | -3 21.2 +48.2     | -3 55.4 +48.4     | -4 29.4 +48.6     | -5 03.1 +48.9     | -5 36.5 +49.1     |
| 17° | -2 33.0 +48.2     | -3 07.0 +48.4     | -3 40.8 +48.7     | -4 14.2 +48.8     | -4 47.4 +49.0     |
| 18° | -1 44.8 +48.3     | -2 18.6 +48.5     | -2 52.1 +48.6     | -3 25.4 +48.9     | -3 58.4 +49.1     |
| 19° | -0 56.5 +48.2     | -1 30.1 +48.4     | -2 03.5 +48.7     | -2 36.5 +48.9     | -3 09.3 +49.2     |
| 20° | -0 08.3 +48.2     | -0 41.7 +48.5     | -1 14.8 +48.7     | -1 47.6 +48.9     | -2 20.1 +49.1     |
| 21° | 0 39.9 +48.3 57.8 | 0 06.8 +48.4 57.0 | -0 26.1 +48.7     | -0 58.7 +48.9     | -1 31.0 +49.1     |
| 22° | 1 28.2 +48.2 57.2 | 0 55.2 +48.5 56.5 | 0 22.6 +48.6 55.7 | -0 09.8 +48.9     | -0 41.9 +49.2     |
| 23° | 2 16.4 +48.2 56.6 | 1 43.7 +48.4 55.9 | 1 11.2 +48.7 55.1 | 0 39.1 +48.9 54.4 | 0 07.3 +49.1 53.6 |
| 24° | 3 04.6 +48.2 56.0 | 2 32.1 +48.4 55.3 | 1 59.9 +48.7 54.5 | 1 28.0 +48.9 53.8 | 0 56.4 +49.1 53.0 |
| 25° | 3 52.8 +48.2 55.4 | 3 20.5 +48.4 54.7 | 2 48.6 +48.6 53.9 | 2 16.9 +48.9 53.2 | 1 45.5 +49.1 52.5 |
| 26° | 4 41.0 +48.1 54.8 | 4 08.9 +48.4 54.1 | 3 37.2 +48.6 53.4 | 3 05.8 +48.8 52.6 | 2 34.6 +49.2 51.9 |
| 27° | 5 29.1 +48.1 54.2 | 4 57.3 +48.4 53.5 | 4 25.8 +48.6 52.8 | 3 54.6 +48.9 52.1 | 3 23.8 +49.0 51.3 |
| 28° | 6 17.2 +48.1 53.6 | 5 45.7 +48.3 52.9 | 5 14.4 +48.6 52.2 | 4 43.5 +48.8 51.5 | 4 12.8 +49.1 50.7 |
| 29° | 7 05.3 +48.0 53.0 | 6 34.0 +48.2 52.3 | 6 03.0 +48.5 51.6 | 5 32.3 +48.8 50.9 | 5 01.9 +49.0 50.2 |

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# Declination SAME name as Latitude

# Latitude 49°

| Dec | LHA 120° / 240°   | LHA 121° / 239°   | LHA 122° / 238°   | LHA 123° / 237°   | LHA 124° / 236°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
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| 9°  |                   |                   |                   |                   |                   |
| 10° |                   |                   |                   |                   |                   |
| 11° |                   |                   |                   |                   |                   |
| 12° | -9 26.2 +49.1     | -9 59.8 +49.3     |                   |                   |                   |
| 13° | -8 37.1 +49.1     | -9 10.5 +49.3     | -9 43.7 +49.6     |                   |                   |
| 14° | -7 48.0 +49.2     | -8 21.2 +49.4     | -8 54.1 +49.6     | -9 26.8 +49.9     | -9 59.1 +50.1     |
| 15° | -6 58.8 +49.2     | -7 31.8 +49.4     | -8 04.5 +49.6     | -8 36.9 +49.8     | -9 09.0 +50.1     |
| 16° | -6 09.6 +49.3     | -6 42.4 +49.5     | -7 14.9 +49.7     | -7 47.1 +49.9     | -8 18.9 +50.1     |
| 17° | -5 20.3 +49.3     | -5 52.9 +49.5     | -6 25.2 +49.7     | -6 57.2 +50.0     | -7 28.8 +50.2     |
| 18° | -4 31.0 +49.3     | -5 03.4 +49.5     | -5 35.5 +49.8     | -6 07.2 +50.0     | -6 38.6 +50.2     |
| 19° | -3 41.7 +49.3     | -4 13.9 +49.6     | -4 45.7 +49.8     | -5 17.2 +50.0     | -5 48.4 +50.3     |
| 20° | -2 52.4 +49.4     | -3 24.3 +49.6     | -3 55.9 +49.8     | -4 27.2 +50.1     | -4 58.1 +50.3     |
| 21° | -2 03.0 +49.3     | -2 34.7 +49.6     | -3 06.1 +49.8     | -3 37.1 +50.0     | -4 07.8 +50.3     |
| 22° | -1 13.7 +49.4     | -1 45.1 +49.6     | -2 16.3 +49.9     | -2 47.1 +50.1     | -3 17.5 +50.3     |
| 23° | -0 24.3 +49.4     | -0 55.5 +49.6     | -1 26.4 +49.8     | -1 57.0 +50.1     | -2 27.2 +50.3     |
| 24° | 0 25.1 +49.4 52.3 | -0 05.9 +49.6     | -0 36.6 +49.9     | -1 06.9 +50.1     | -1 36.9 +50.4     |
| 25° | 1 14.5 +49.3 51.7 | 0 43.7 +49.6 51.0 | 0 13.3 +49.9 50.2 | -0 16.8 +50.1     | -0 46.5 +50.3     |
| 26° | 2 03.8 +49.4 51.2 | 1 33.3 +49.6 50.4 | 1 03.2 +49.8 49.7 | 0 33.3 +50.1 48.9 | 0 03.8 +50.4 48.2 |
| 27° | 2 53.2 +49.3 50.6 | 2 22.9 +49.6 49.9 | 1 53.0 +49.8 49.1 | 1 23.4 +50.1 48.4 | 0 54.2 +50.3 47.6 |
| 28° | 3 42.5 +49.3 50.0 | 3 12.5 +49.6 49.3 | 2 42.8 +49.9 48.6 | 2 13.5 +50.1 47.8 | 1 44.5 +50.3 47.1 |
| 29° | 4 31.8 +49.3 49.4 | 4 02.1 +49.5 48.7 | 3 32.7 +49.8 48.0 | 3 03.6 +50.0 47.3 | 2 34.8 +50.4 46.5 |

| Dec | LHA 125° / 235°   | LHA 126° / 234°   | LHA 127° / 233°   | LHA 128° / 232°   | LHA 129° / 231°   |
|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
|     | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    | H ° ' dH ' Z °    |
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| 13° |                   |                   |                   |                   |                   |
| 14° |                   |                   |                   |                   |                   |
| 15° | -9 40.8 +50.3     |                   |                   |                   |                   |
| 16° | -8 50.5 +50.4     | -9 21.7 +50.6     | -9 52.5 +50.8     |                   |                   |
| 17° | -8 00.1 +50.4     | -8 31.1 +50.7     | -9 01.7 +50.9     | -9 31.9 +51.1     |                   |
| 18° | -7 09.7 +50.5     | -7 40.4 +50.7     | -8 10.8 +50.9     | -8 40.8 +51.1     | -9 10.5 +51.4     |
| 19° | -6 19.2 +50.5     | -6 49.7 +50.7     | -7 19.9 +51.0     | -7 49.7 +51.2     | -8 19.1 +51.5     |
| 20° | -5 28.7 +50.5     | -5 59.0 +50.8     | -6 28.9 +51.0     | -6 58.5 +51.3     | -7 27.6 +51.4     |
| 21° | -4 38.2 +50.5     | -5 08.2 +50.7     | -5 37.9 +51.0     | -6 07.2 +51.2     | -6 36.2 +51.5     |
| 22° | -3 47.7 +50.6     | -4 17.5 +50.8     | -4 46.9 +51.1     | -5 16.0 +51.3     | -5 44.7 +51.6     |
| 23° | -2 57.1 +50.6     | -3 26.7 +50.9     | -3 55.8 +51.0     | -4 24.7 +51.3     | -4 53.1 +51.5     |
| 24° | -2 06.5 +50.6     | -2 35.8 +50.8     | -3 04.8 +51.1     | -3 33.4 +51.4     | -4 01.6 +51.6     |
| 25° | -1 15.9 +50.6     | -1 45.0 +50.8     | -2 13.7 +51.1     | -2 42.0 +51.3     | -3 10.0 +51.6     |
| 26° | -0 25.3 +50.6     | -0 54.2 +50.9     | -1 22.6 +51.1     | -1 50.7 +51.4     | -2 18.4 +51.6     |
| 27° | 0 25.3 +50.5 46.9 | -0 03.3 +50.8     | -0 31.5 +51.1     | -0 59.3 +51.3     | -1 26.8 +51.6     |
| 28° | 1 15.8 +50.6 46.3 | 0 47.5 +50.9 45.6 | 0 19.6 +51.1 44.8 | -0 08.0 +51.4     | -0 35.2 +51.6     |
| 29° | 2 06.4 +50.6 45.8 | 1 38.4 +50.8 45.1 | 1 10.7 +51.1 44.3 | 0 43.4 +51.4 43.6 | 0 16.4 +51.7 42.8 |

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# Latitude 49°

# Declination SAME name as Latitude

| Dec | LHA 130° / 230° | LHA 131° / 229° | LHA 132° / 228° | LHA 133° / 227° | LHA 134° / 226° |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
|     | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  |
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| 15° |                 |                 |                 |                 |                 |
| 16° |                 |                 |                 |                 |                 |
| 17° |                 |                 |                 |                 |                 |
| 18° | -9 39.8 +51.7   |                 |                 |                 |                 |
| 19° | -8 48.1 +51.7   |                 |                 |                 |                 |
| 20° | -7 56.4 +51.7   |                 |                 |                 |                 |
| 21° | -7 04.7 +51.7   |                 |                 |                 |                 |
| 22° | -6 13.0 +51.8   |                 |                 |                 |                 |
| 23° | -5 21.2 +51.8   |                 |                 |                 |                 |
| 24° | -4 29.4 +51.8   |                 |                 |                 |                 |
| 25° | -3 37.6 +51.9   |                 |                 |                 |                 |
| 26° | -2 45.7 +51.8   |                 |                 |                 |                 |
| 27° | -1 53.9 +51.9   |                 |                 |                 |                 |
| 28° | -1 02.0 +51.9   |                 |                 |                 |                 |
| 29° | -0 10.1 +51.9   |                 |                 |                 |                 |

| Dec | LHA 135° / 225° | LHA 136° / 224° | LHA 137° / 223° | LHA 138° / 222° | LHA 139° / 221° |
|-----|-----------------|-----------------|-----------------|-----------------|-----------------|
|     | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  | H ° ' dH ' Z °  |
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