

Sight Reduction Tables

Latitude 49° to 55°

Introduction.

The purpose and scope of these tables is to enable a navigator to establish his or her position at sea, or on land, using the Marc Saint Hilaire, or Intercept, method.

The author produced these tables with the objective of reducing the size of the printed tables to just what is required for his cruising latitude.

The tables cover 7 degrees of Latitude and Declination is limited to between 23°N and 23°S. Tables are provided for GHA and Declination interpolation and Sextant corrections. The Excel spreadsheet, from which this PDF file was generated, allows the navigator to enter the 'middle latitude' of his cruising ground. The tables are then produced using this middle latitude + and - 3°.

The tables have been designed primarily for establishing a Line of Position (LOP) from the altitude of the SUN. Two such LOPs, ideally either side of noon, giving a Sun-run-Sun calculated position.

LHA and Declination = SAME

For LHAs between 0° 360° to 90° 270°, the LHA is printed above and below the relevant table. The tabulated data is in normal text.

Where the LHA is > 90° and < 270°, the LHA is printed below the table while any tabulated Hc on the table is positive.

LHA and Declination = CONTRARY

For LHAs between 90° 270° and 0° 360° the LHA is printed above the table and the tabulated data is in **bold** text. The last contrary value of Hc in the relevant column is also underlined. Below that value the figures are for SAME.

When all the Hc° values are bold, indicating that there are no more SAME Hc° values, the LHA and text displayed at the bottom of the table changes accordingly.

NOTE

There are neither blank entries nor negative values for Hc° in these tables.

Accuracy and Precision

The tables were compiled using Microsoft Excel running under Microsoft Windows XP operating system.

Calculations were carried out to the full 15 decimal places, not precision as displayed.

These tables have been compared to the US National Imagery and Mapping Agency Sight Reduction Tables for Marine Navigation Pub229 with the following results.

No difference for Hc° has been identified by the author.

The difference in d' is occasionally 0.1'.

No difference in Z° has been identified by the author.

Disclaimer

While the author has taken great care with these tables, no warranty is implied or expressed as to their fitness for purpose.

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

4° 356° LHA

Latitude SAME as Declination

4° 356° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	40°52.7'	+59.9'	174.7°	39°53.0'	+59.9'	174.8°	38°53.2'	+59.9'	174.9°	37°53.5'	+59.9'	174.9°	36°53.7'	+59.9'	175.0°	35°53.9'	+59.9'	175.1°	34°54.1'	+59.9'	175.1°	0
1	41°52.6'	+59.9'	174.6°	40°52.9'	+59.9'	174.7°	39°53.1'	+59.9'	174.8°	38°53.4'	+59.9'	174.9°	37°53.6'	+59.9'	174.9°	36°53.8'	+59.9'	175.0°	35°54.1'	+59.9'	175.1°	1
2	42°52.5'	+59.9'	174.5°	41°52.8'	+59.9'	174.6°	40°53.0'	+59.9'	174.7°	39°53.3'	+59.9'	174.8°	38°53.5'	+59.9'	174.9°	37°53.8'	+59.9'	174.9°	36°54.0'	+59.9'	175.0°	2
3	43°52.4'	+59.9'	174.5°	42°52.7'	+59.9'	174.5°	41°52.9'	+59.9'	174.6°	40°53.2'	+59.9'	174.7°	39°53.4'	+59.9'	174.8°	38°53.7'	+59.9'	174.9°	37°53.9'	+59.9'	174.9°	3
4	44°52.3'	+59.9'	174.4°	43°52.5'	+59.9'	174.5°	42°52.8'	+59.9'	174.6°	41°53.1'	+59.9'	174.6°	40°53.3'	+59.9'	174.7°	39°53.6'	+59.9'	174.8°	38°53.8'	+59.9'	174.9°	4
5	45°52.1'	+59.9'	174.3°	44°52.4'	+59.9'	174.4°	43°52.7'	+59.9'	174.5°	42°53.0'	+59.9'	174.6°	41°53.3'	+59.9'	174.6°	40°53.5'	+59.9'	174.7°	39°53.8'	+59.9'	174.8°	5
6	46°52.0'	+59.9'	174.2°	45°52.3'	+59.9'	174.3°	44°52.6'	+59.9'	174.4°	43°52.9'	+59.9'	174.5°	42°53.2'	+59.9'	174.6°	41°53.4'	+59.9'	174.7°	40°53.7'	+59.9'	174.7°	6
7	47°51.9'	+59.9'	174.1°	46°52.2'	+59.9'	174.2°	45°52.5'	+59.9'	174.3°	44°52.8'	+59.9'	174.4°	43°53.1'	+59.9'	174.5°	42°53.3'	+59.9'	174.6°	41°53.6'	+59.9'	174.7°	7
8	48°51.7'	+59.9'	174.0°	47°52.0'	+59.9'	174.1°	46°52.4'	+59.9'	174.2°	45°52.7'	+59.9'	174.3°	44°52.9'	+59.9'	174.4°	43°53.2'	+59.9'	174.5°	42°53.5'	+59.9'	174.6°	8
9	49°51.6'	+59.9'	173.9°	48°51.9'	+59.9'	174.0°	47°52.2'	+59.9'	174.1°	46°52.5'	+59.9'	174.2°	45°52.8'	+59.9'	174.3°	44°53.1'	+59.9'	174.4°	43°53.4'	+59.9'	174.5°	9
10	50°51.4'	+59.9'	173.8°	49°51.8'	+59.9'	173.9°	48°52.1'	+59.9'	174.0°	47°52.4'	+59.9'	174.1°	46°52.7'	+59.9'	174.2°	45°53.0'	+59.9'	174.3°	44°53.3'	+59.9'	174.4°	10
11	51°51.3'	+59.9'	173.6°	50°51.6'	+59.9'	173.8°	49°52.0'	+59.9'	173.9°	48°52.3'	+59.9'	174.0°	47°52.6'	+59.9'	174.1°	46°52.9'	+59.9'	174.3°	45°53.2'	+59.9'	174.4°	11
12	52°51.1'	+59.9'	173.5°	51°51.5'	+59.9'	173.7°	50°51.8'	+59.9'	173.8°	49°52.2'	+59.9'	173.9°	48°52.5'	+59.9'	174.0°	47°52.8'	+59.9'	174.2°	46°53.1'	+59.9'	174.3°	12
13	53°50.9'	+59.9'	173.4°	52°51.3'	+59.9'	173.5°	51°51.7'	+59.9'	173.7°	50°52.0'	+59.9'	173.8°	49°52.4'	+59.9'	173.9°	48°52.7'	+59.9'	174.1°	47°53.0'	+59.9'	174.2°	13
14	54°50.7'	+59.9'	173.2°	53°51.1'	+59.9'	173.4°	52°51.5'	+59.9'	173.6°	51°51.9'	+59.9'	173.7°	50°52.2'	+59.9'	173.8°	49°52.6'	+59.9'	174.0°	48°52.9'	+59.9'	174.1°	14
15	55°50.5'	+59.9'	173.1°	54°51.0'	+59.9'	173.3°	53°51.4'	+59.9'	173.4°	52°51.7'	+59.9'	173.6°	51°52.1'	+59.9'	173.7°	50°52.5'	+59.9'	173.9°	49°52.8'	+59.9'	174.0°	15
16	56°50.3'	+59.9'	173.0°	55°50.8'	+59.9'	173.1°	54°51.2'	+59.9'	173.3°	53°51.6'	+59.9'	173.5°	52°52.0'	+59.9'	173.6°	51°52.3'	+59.9'	173.8°	50°52.7'	+59.9'	173.9°	16
17	57°50.1'	+59.9'	172.8°	56°50.6'	+59.9'	173.0°	55°51.0'	+59.9'	173.2°	54°51.4'	+59.9'	173.3°	53°51.8'	+59.9'	173.5°	52°52.2'	+59.9'	173.7°	51°52.5'	+59.9'	173.8°	17
18	58°49.9'	+59.9'	172.6°	57°50.4'	+59.9'	172.8°	56°50.8'	+59.9'	173.0°	55°51.2'	+59.9'	173.2°	54°51.7'	+59.9'	173.4°	53°52.0'	+59.9'	173.5°	52°52.4'	+59.9'	173.7°	18
19	59°49.6'	+59.9'	172.5°	58°50.1'	+59.9'	172.7°	57°50.6'	+59.9'	172.9°	56°51.1'	+59.9'	173.1°	55°51.5'	+59.9'	173.3°	54°51.9'	+59.9'	173.4°	53°52.3'	+59.9'	173.6°	19
20	60°49.4'	+59.9'	172.3°	59°49.9'	+59.9'	172.5°	58°50.4'	+59.9'	172.7°	57°50.9'	+59.9'	172.9°	56°51.3'	+59.9'	173.1°	55°51.7'	+59.9'	173.3°	54°52.1'	+59.9'	173.5°	20
21	61°49.1'	+59.9'	172.1°	60°49.7'	+59.9'	172.3°	59°50.2'	+59.9'	172.6°	58°50.7'	+59.9'	172.8°	57°51.1'	+59.9'	173.0°	56°51.6'	+59.9'	173.2°	55°52.0'	+59.9'	173.3°	21
22	62°48.8'	+59.9'	171.9°	61°49.4'	+59.9'	172.1°	60°49.9'	+59.9'	172.4°	59°50.5'	+59.9'	172.6°	58°50.9'	+59.9'	172.8°	57°51.4'	+59.9'	173.0°	56°51.8'	+59.9'	173.2°	22
23	63°48.5'	+59.9'	171.6°	62°49.1'	+59.9'	171.9°	61°49.7'	+59.9'	172.2°	60°50.2'	+59.9'	172.4°	59°50.7'	+59.9'	172.7°	58°51.2'	+59.9'	172.9°	57°51.7'	+59.9'	173.1°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

4° 356° LHA

Latitude SAME as Declination

4° 356° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

5° 355° LHA

Latitude SAME as Declination

5° 355° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	40°48.6'	+59.8'	173.4°	39°49.0'	+59.8'	173.5°	38°49.4'	+59.8'	173.6°	37°49.8'	+59.9'	173.7°	36°50.2'	+59.9'	173.7°	35°50.5'	+59.9'	173.8°	34°50.8'	+59.9'	173.9°	0
1	41°48.5'	+59.8'	173.3°	40°48.9'	+59.8'	173.4°	39°49.3'	+59.8'	173.5°	38°49.7'	+59.9'	173.6°	37°50.0'	+59.9'	173.7°	36°50.4'	+59.9'	173.7°	35°50.7'	+59.9'	173.8°	1
2	42°48.3'	+59.8'	173.2°	41°48.7'	+59.8'	173.3°	40°49.1'	+59.8'	173.4°	39°49.5'	+59.9'	173.5°	38°49.9'	+59.9'	173.6°	37°50.3'	+59.9'	173.7°	36°50.6'	+59.9'	173.8°	2
3	43°48.1'	+59.8'	173.1°	42°48.5'	+59.8'	173.2°	41°49.0'	+59.8'	173.3°	40°49.4'	+59.8'	173.4°	39°49.7'	+59.9'	173.5°	38°50.1'	+59.9'	173.6°	37°50.5'	+59.9'	173.7°	3
4	44°47.9'	+59.8'	173.0°	43°48.4'	+59.8'	173.1°	42°48.8'	+59.8'	173.2°	41°49.2'	+59.8'	173.3°	40°49.6'	+59.9'	173.4°	39°50.0'	+59.9'	173.5°	38°50.4'	+59.9'	173.6°	4
5	45°47.7'	+59.8'	172.8°	44°48.2'	+59.8'	173.0°	43°48.6'	+59.8'	173.1°	42°49.0'	+59.8'	173.2°	41°49.5'	+59.8'	173.3°	40°49.9'	+59.9'	173.4°	39°50.7'	+59.9'	173.5°	5
6	46°47.5'	+59.8'	172.7°	45°48.0'	+59.8'	172.9°	44°48.4'	+59.8'	173.0°	43°48.9'	+59.8'	173.1°	42°49.3'	+59.8'	173.2°	41°49.7'	+59.9'	173.3°	40°50.1'	+59.9'	173.4°	6
7	47°47.3'	+59.8'	172.6°	46°47.8'	+59.8'	172.7°	45°48.3'	+59.8'	172.9°	44°48.7'	+59.8'	173.0°	43°49.2'	+59.8'	173.1°	42°49.6'	+59.9'	173.2°	41°50.0'	+59.9'	173.3°	7
8	48°47.1'	+59.8'	172.5°	47°47.6'	+59.8'	172.6°	46°48.1'	+59.8'	172.8°	45°48.5'	+59.8'	172.9°	44°49.0'	+59.8'	173.0°	43°49.4'	+59.8'	173.1°	42°49.9'	+59.9'	173.2°	8
9	49°46.8'	+59.8'	172.3°	48°47.4'	+59.8'	172.5°	47°47.9'	+59.8'	172.6°	46°48.4'	+59.8'	172.8°	45°48.8'	+59.8'	172.9°	44°49.3'	+59.8'	173.0°	43°49.7'	+59.9'	173.1°	9
10	50°46.6'	+59.7'	172.2°	49°47.1'	+59.8'	172.4°	48°47.7'	+59.8'	172.5°	47°48.2'	+59.8'	172.7°	46°48.7'	+59.8'	172.8°	45°49.1'	+59.8'	172.9°	44°49.6'	+59.8'	173.0°	10
11	51°46.4'	+59.7'	172.1°	50°46.9'	+59.8'	172.2°	49°47.5'	+59.8'	172.4°	48°48.0'	+59.8'	172.5°	47°48.5'	+59.8'	172.7°	46°49.0'	+59.8'	172.8°	45°49.4'	+59.8'	172.9°	11
12	52°46.1'	+59.7'	171.9°	51°46.7'	+59.7'	172.1°	50°47.2'	+59.8'	172.3°	49°47.8'	+59.8'	172.4°	48°48.3'	+59.8'	172.6°	47°48.8'	+59.8'	172.7°	46°49.3'	+59.8'	172.8°	12
13	53°45.8'	+59.7'	171.7°	52°46.4'	+59.7'	171.9°	51°47.0'	+59.8'	172.1°	50°47.6'	+59.8'	172.3°	49°48.1'	+59.8'	172.4°	48°48.6'	+59.8'	172.6°	47°49.1'	+59.8'	172.7°	13
14	54°45.5'	+59.7'	171.6°	53°46.2'	+59.7'	171.8°	52°46.8'	+59.7'	172.0°	51°47.3'	+59.8'	172.1°	50°47.9'	+59.8'	172.3°	49°48.4'	+59.8'	172.5°	48°48.9'	+59.8'	172.6°	14
15	55°45.2'	+59.7'	171.4°	54°45.9'	+59.7'	171.6°	53°46.5'	+59.7'	171.8°	52°47.1'	+59.8'	172.0°	51°47.7'	+59.8'	172.2°	50°48.2'	+59.8'	172.3°	49°48.7'	+59.8'	172.5°	15
16	56°44.9'	+59.7'	171.2°	55°45.6'	+59.7'	171.4°	54°46.2'	+59.7'	171.6°	53°46.9'	+59.7'	171.8°	52°47.5'	+59.8'	172.0°	51°48.0'	+59.8'	172.2°	50°48.6'	+59.8'	172.4°	16
17	57°44.6'	+59.6'	171.0°	56°45.3'	+59.7'	171.3°	55°46.0'	+59.7'	171.5°	54°46.6'	+59.7'	171.7°	53°47.2'	+59.8'	171.9°	52°47.8'	+59.8'	172.1°	51°48.4'	+59.8'	172.3°	17
18	58°44.2'	+59.6'	170.8°	57°45.0'	+59.7'	171.1°	56°45.7'	+59.7'	171.3°	55°46.3'	+59.7'	171.5°	54°47.0'	+59.7'	171.7°	53°47.6'	+59.8'	171.9°	52°48.2'	+59.8'	172.1°	18
19	59°43.8'	+59.6'	170.6°	58°44.6'	+59.6'	170.9°	57°45.4'	+59.7'	171.1°	56°46.1'	+59.7'	171.4°	55°46.7'	+59.7'	171.6°	54°47.4'	+59.8'	171.8°	53°48.0'	+59.8'	172.0°	19
20	60°43.4'	+59.6'	170.4°	59°44.3'	+59.6'	170.6°	58°45.0'	+59.7'	170.9°	57°45.8'	+59.7'	171.2°	56°46.5'</									

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

6° 354° LHA

Latitude SAME as Declination

6° 354° LHA

Table with 12 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of celestial coordinates.

6° 354° LHA

Latitude SAME as Declination

6° 354° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

7° 353° LHA

Latitude SAME as Declination

7° 353° LHA

Table with 12 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of celestial coordinates.

7° 353° LHA

Latitude SAME as Declination

7° 353° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

8° 352° LHA

Latitude SAME as Declination

8° 352° LHA

Table with 12 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of celestial coordinates.

8° 352° LHA

Latitude SAME as Declination

8° 352° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

9° 351° LHA

Latitude SAME as Declination

9° 351° LHA

Table with 12 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of celestial coordinates.

9° 351° LHA

Latitude SAME as Declination

9° 351° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

10° 350° LHA

Latitude SAME as Declination

10° 350° LHA

Table with columns for Dec°, Hc°, d', Z° for declinations 49, 50, 51, 52, 53, 54, 55. The table is a grid where each cell contains three values representing Hc°, d', and Z° for a specific declination and row index.

10° 350° LHA

Latitude SAME as Declination

10° 350° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

11° 349° LHA

Latitude SAME as Declination

11° 349° LHA

Table with columns for Dec°, Hc°, d', Z° for declinations 49, 50, 51, 52, 53, 54, 55. The table is a grid where each cell contains three values representing Hc°, d', and Z° for a specific declination and row index.

11° 349° LHA

Latitude SAME as Declination

11° 349° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

12° 348° LHA

Latitude SAME as Declination

12° 348° LHA

Table with 11 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 23 rows of data for North Latitude.

12° 348° LHA

Latitude SAME as Declination

12° 348° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

13° 347° LHA

Latitude SAME as Declination

13° 347° LHA

Table with 11 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 23 rows of data for North Latitude.

13° 347° LHA

Latitude SAME as Declination

13° 347° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

14° 346° LHA

Latitude SAME as Declination

14° 346° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data for 14° 346° LHA.

14° 346° LHA

Latitude SAME as Declination

14° 346° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

15° 345° LHA

Latitude SAME as Declination

15° 345° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data for 15° 345° LHA.

15° 345° LHA

Latitude SAME as Declination

15° 345° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

16° 344° LHA

Latitude SAME as Declination

16° 344° LHA

Dec°	49			50			51			52			53			54			55			Dec°									
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°										
0	39°05.9'	+58.3'	159.2°	38°09.7'	+58.4'	159.5°	37°13.5'	+58.5'	159.7°	36°17.1'	+58.6'	160.0°	35°20.7'	+58.7'	160.2°	34°24.2'	+58.8'	160.5°	33°27.6'	+58.9'	160.7°	0									
1	40°04.2'	+58.3'	158.9°	39°08.2'	+58.4'	159.2°	38°12.0'	+58.5'	159.5°	37°15.8'	+58.6'	159.7°	36°19.4'	+58.7'	160.0°	35°23.0'	+58.8'	160.2°	34°26.5'	+58.9'	160.5°	1									
2	41°02.5'	+58.2'	158.6°	40°06.5'	+58.3'	158.9°	39°10.5'	+58.5'	159.2°	38°14.4'	+58.6'	159.5°	37°18.1'	+58.7'	159.7°	36°21.8'	+58.8'	160.0°	35°25.4'	+58.8'	160.2°	2									
3	42°00.7'	+58.2'	158.3°	41°04.9'	+58.3'	158.6°	40°09.0'	+58.4'	158.9°	39°12.9'	+58.5'	159.2°	38°16.8'	+58.6'	159.5°	37°20.6'	+58.7'	159.7°	36°24.2'	+58.8'	160.0°	3									
4	42°58.9'	+58.1'	157.9°	42°03.2'	+58.2'	158.3°	41°07.4'	+58.4'	158.6°	40°11.5'	+58.5'	158.9°	39°15.4'	+58.6'	159.2°	38°19.3'	+58.7'	159.5°	37°23.0'	+58.8'	159.8°	4									
5	43°57.0'	+58.0'	157.6°	43°01.4'	+58.2'	157.9°	42°05.7'	+58.3'	158.3°	41°09.9'	+58.4'	158.6°	40°14.0'	+58.5'	158.9°	39°18.0'	+58.7'	159.2°	38°21.8'	+58.8'	159.5°	5									
6	44°55.0'	+58.0'	157.2°	43°59.6'	+58.1'	157.6°	43°04.1'	+58.3'	158.0°	42°08.4'	+58.4'	158.3°	41°12.6'	+58.5'	158.6°	40°16.6'	+58.6'	158.9°	39°20.6'	+58.7'	159.2°	6									
7	45°53.0'	+57.9'	156.9°	44°57.7'	+58.1'	157.3°	44°02.3'	+58.2'	157.6°	43°06.8'	+58.3'	158.0°	42°11.1'	+58.5'	158.3°	41°15.2'	+58.6'	158.7°	40°19.3'	+58.7'	159.0°	7									
8	46°50.9'	+57.8'	156.5°	45°55.8'	+58.0'	156.9°	45°00.5'	+58.1'	157.3°	44°05.1'	+58.3'	157.7°	43°09.5'	+58.4'	158.0°	42°13.8'	+58.5'	158.4°	41°18.0'	+58.6'	158.7°	8									
9	47°48.7'	+57.7'	156.1°	46°53.8'	+57.9'	156.5°	45°58.6'	+58.1'	156.9°	45°03.4'	+58.2'	157.3°	44°07.9'	+58.3'	157.7°	43°12.3'	+58.5'	158.1°	42°16.6'	+58.6'	158.4°	9									
10	48°46.4'	+57.7'	155.7°	47°51.7'	+57.8'	156.1°	46°56.7'	+58.0'	156.6°	46°01.6'	+58.1'	157.0°	45°06.3'	+58.3'	157.4°	44°10.8'	+58.4'	157.8°	43°15.2'	+58.5'	158.1°	10									
11	49°44.1'	+57.6'	155.3°	48°49.5'	+57.7'	155.7°	47°54.7'	+57.9'	156.2°	46°59.7'	+58.1'	156.6°	46°04.6'	+58.2'	157.0°	45°09.2'	+58.4'	157.4°	44°13.7'	+58.5'	157.8°	11									
12	50°41.7'	+57.4'	154.8°	49°47.2'	+57.6'	155.3°	48°52.6'	+57.8'	155.8°	47°57.8'	+58.0'	156.3°	47°02.8'	+58.2'	156.7°	46°07.6'	+58.3'	157.1°	45°12.2'	+58.4'	157.5°	12									
13	51°39.1'	+57.3'	154.3°	50°44.9'	+57.5'	154.9°	49°50.5'	+57.7'	155.4°	48°55.8'	+57.9'	155.9°	48°00.9'	+58.1'	156.3°	47°05.9'	+58.2'	156.8°	46°10.7'	+58.4'	157.2°	13									
14	52°36.4'	+57.2'	153.9°	51°42.4'	+57.4'	154.4°	50°48.2'	+57.6'	155.0°	49°53.7'	+57.8'	155.5°	48°59.0'	+58.0'	156.0°	48°04.1'	+58.2'	156.4°	47°09.1'	+58.3'	156.8°	14									
15	53°33.7'	+57.1'	153.4°	52°39.9'	+57.3'	154.0°	51°45.8'	+57.5'	154.5°	50°51.6'	+57.7'	155.1°	49°57.0'	+57.9'	155.6°	49°02.3'	+58.1'	156.0°	48°07.4'	+58.3'	156.5°	15									
16	54°30.7'	+56.9'	152.8°	53°37.2'	+57.2'	153.5°	52°43.4'	+57.4'	154.1°	51°49.3'	+57.6'	154.6°	50°55.0'	+57.8'	155.1°	50°00.4'	+58.0'	155.7°	49°05.7'	+58.2'	156.1°	16									
17	55°27.7'	+56.8'	152.3°	54°34.4'	+57.1'	153.0°	53°40.8'	+57.3'	153.6°	52°46.9'	+57.5'	154.2°	51°52.8'	+57.7'	154.7°	50°58.4'	+57.9'	155.3°	50°03.8'	+58.1'	155.8°	17									
18	56°24.5'	+56.6'	151.7°	55°31.5'	+56.9'	152.4°	54°38.1'	+57.2'	153.1°	53°44.5'	+57.4'	153.7°	52°50.6'	+57.6'	154.3°	51°56.4'	+57.8'	154.8°	51°02.0'	+58.0'	155.4°	18									
19	57°21.1'	+56.4'	151.1°	56°28.4'	+56.7'	151.8°	55°35.3'	+57.0'	152.5°	54°41.9'	+57.3'	153.2°	53°48.2'	+57.5'	153.8°	52°54.2'	+57.7'	154.4°	52°00.0'	+57.9'	155.0°	19									
20	58°17.5'	+56.2'	150.5°	57°25.1'	+56.6'	151.2°	56°32.3'	+56.9'	152.0°	55°39.2'	+57.2'	152.7°	54°45.7'	+57.4'	153.3°	53°52.0'	+57.6'	153.9°	52°57.9'	+57.8'	154.5°	20									
21	59°13.8'	+56.0'	149.8°	58°21.7'	+56.4'	150.6°	57°29.2'	+56.7'	151.4°	56°36.3'	+57.0'	152.1°	55°43.1'	+57.3'	152.8°	54°49.6'	+57.5'	153.5°	53°55.8'	+57.7'	154.1°	21									
22	60°09.8'	+55.8'	149.1°	59°18.1'	+56.2'	150.0°	58°25.9'	+56.5'	150.8°	57°33.3'	+56.8'	151.6°	56°40.4'	+57.1'	152.3°	55°47.1'	+57.4'	153.0°	54°53.5'	+57.6'	153.6°	22									
23	61°05.5'	+55.5'	148.3°	60°14.2'	+55.9'	149.3°	59°22.4'	+56.3'	150.1°	58°30.2'	+56.7'	150.9°	57°37.5'	+57.0'	151.7°	56°44.5'	+57.3'	152.4°	55°51.1'	+57.5'	153.1°	23									
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°						
			49				50				51				52				53				54				55				Dec°

16° 344° LHA

Latitude SAME as Declination

16° 344° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

17° 343° LHA

Latitude SAME as Declination

17° 343° LHA

Dec°	49			50			51			52			53			54			55			Dec°	
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°		Hc°
0	38°51.5'	+58.1'	157.9°	37°55.8'	+58.2'	158.2°	37°00.0'	+58.4'	158.5°	36°04.1'	+58.5'	158.8°	35°08.2'	+58.6'	159.1°	34°12.1'	+58.7'	159.3°	33°15.9'	+58.8'	159.5°	0	
1	39°49.6'	+58.1'	157.6°	38°54.1'	+58.2'	157.9°	37°58.4'	+58.3'	158.2°	37°02.6'	+58.4'	158.5°	36°06.7'	+58.5'	158.8°	35°10.8'	+58.6'	159.0°	34°14.7'	+58.7'	159.3°	1	
2	40°47.7'	+58.0'	157.3°	39°52.3'	+58.1'	157.6°	38°56.7'	+58.3'	157.9°	38°01.1'	+58.4'	158.2°	37°05.3'	+58.5'	158.5°	36°09.4'	+58.6'	158.8°	35°13.4'	+58.7'	159.0°	2	
3	41°45.7'	+58.0'	157.0°	40°50.4'	+58.1'	157.3°	39°55.0'	+58.2'	157.6°	38°59.4'	+58.3'	157.9°	38°03.8'	+58.5'	158.2°	37°08.0'	+58.6'	158.5°	36°12.1'	+58.7'	158.8°	3	
4	42°43.6'	+57.9'	156.6°	41°48.5'	+58.0'	157.0°	40°53.2'	+58.2'	157.3°	39°57.8'	+58.3'	157.6°	39°02.2'	+58.4'	157.9°	38°06.6'	+58.5'	158.2°	37°10.8'	+58.6'	158.5°	4	
5	43°41.5'	+57.8'	156.2°	42°46.5'	+58.0'	156.6°	41°51.4'	+58.1'	157.0°	40°56.1'	+58.2'	157.3°	40°00.7'	+58.4'	157.6°	39°05.1'	+58.5'	158.0°	38°09.4'	+58.6'	158.3°	5	
6	44°39.3'	+57.7'	155.9°	43°44.5'	+57.9'	156.3°	42°49.5'	+58.1'	156.6°	41°54.3'	+58.2'	157.0°	40°59.0'	+58.3'	157.3°	40°03.6'	+58.4'	157.7°	39°08.0'	+58.6'	158.0°	6	
7	45°37.1'	+57.7'	155.5°	44°42.4'	+57.8'	155.9°	43°47.5'	+58.0'	156.3°	42°52.5'	+58.1'	156.7°	41°57.4'	+58.3'	157.0°	41°02.0'	+58.4'	157.4°	40°06.6'	+58.5'	157.7°	7	
8	46°34.7'	+57.6'	155.1°	45°40.2'	+57.7'	155.5°	44°45.5'	+57.9'	155.9°	43°50.7'	+58.1'	156.3°	42°55.6'	+58.2'	156.7°	42°00.4'	+58.3'	157.1°	41°05.1'	+58.5'	157.4°	8	
9	47°32.3'	+57.5'	154.7°	46°38.0'	+57.7'	155.1°	45°43.4'	+57.8'	155.6°	44°48.7'	+58.0'	156.0°	43°53.8'	+58.2'	156.4°	42°58.8'	+58.3'	156.8°	42°03.6'	+58.4'	157.1°	9	
10	48°29.8'	+57.4'	154.2°	47°35.6'	+57.6'	154.7°	46°41.3'	+57.8'	155.2°	45°46.7'	+57.9'	155.6°	44°52.0'	+58.1'	156.0°	43°57.1'	+58.2'	156.4°	43°02.0'	+58.4'	156.8°	10	
11	49°27.2'	+57.3'	153.8°	48°33.2'	+57.5'	154.3°	47°39.0'	+57.7'	154.8°	46°44.7'	+57.9'	155.2°	45°50.1'	+58.0'	155.7°	44°55.3'	+58.2'	156.1°	44°00.4'	+58.3'	156.5°	11	
12	50°24.4'	+57.2'	153.3°	49°30.7'	+57.4'	153.9°	48°36.7'	+57.6'	154.4°	47°42.5'	+57.8'	154.8°	46°48.1'	+57.9'	155.3°	45°53.5'	+58.1'	155.7°	44°58.7'	+58.3'	156.2°	12	
13	51°21.6'	+57.0'	152.9°	50°28.1'	+57.3'	153.4°	49°34.3'	+57.5'	153.9°	48°40.3'	+57.7'	154.4°	47°46.0'	+57.9'	154.9°	46°51.6'	+58.0'	155.4°	45°57.0'	+58.2'	155.8°	13	
14	52°18.6'	+56.9'	152.4°	51°25.3'	+57.1'	152.9°	50°31.8'	+57.4'	153.5°	49°38.0'	+57.6'	154.0°	48°43.9'	+57.8'	154.5°	47°49.6'	+58.0'	155.0°	46°55.2'	+58.1'	155.5°	14	
15	53°15.5'	+56.8'	151.8°	52°22.5'	+57.0'	152.4°	51°29.2'	+57.3'	153.0°	50°35.6'	+57.5'	153.6°	49°41.7'	+57.7'	154.1°	48°47.6'	+57.9'	154.6°	47°53.3'	+58.1'	155.1°	15	
16	54°12.3'	+56.6'	151.3°	53°19.5'	+56.9'	151.9°	52°26.4'	+57.1'	152.5°	51°33.0'	+57.4'	153.1°	50°39.4'	+57.6'	153.7°	49°45.5'	+57.8'	154.2°	48°51.3'	+58.0'	154.7°	16	
17	55°08.9'	+56.4'	150.7°	54°16.4'	+56.7'	151.4°	53°23.6'	+57.0'	152.0°	52°30.4'	+57.3'	152.7°	51°37.0'	+57.5'	153.2°	50°43.3'	+57.7'	153.8°	49°49.3'	+57.9'	154.3°	17	
18	56°05.3'	+56.2'	150.1°	55°13.1'	+56.6'	150.8°	54°20.6'	+56.9'	151.5°	53°27.7'	+57.1'	152.2°	52°34.5'	+57.4'	152.8°	51°41.0'	+57.6'	153.4°	50°47.2'	+57.8'	153.9°	18	
19	57°01.6'	+56.0'	149.5°	56°09.7'	+56.4'	150.2°	55°17.4'	+56.7'	151.0°	54°24.8'	+57.0'	151.6°	53°31.8'	+57.2'	152.3°	52°38.6'	+57.5'	152.9°	51°45.0'	+57.7'	153.5°	19	
20	57°57.6'	+55.8'	148.8°	57°06.1'	+56.2'	149.6°	56°14.1'	+56.5'	150.4°	55°21.8'													

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

18° 342° LHA

Latitude SAME as Declination

18° 342° LHA

Table with columns for Dec°, Hc°, d', Z° for years 49-55 and Dec° at the bottom.

18° 342° LHA

Latitude SAME as Declination

18° 342° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

19° 341° LHA

Latitude SAME as Declination

19° 341° LHA

Table with columns for Dec°, Hc°, d', Z° for years 49-55 and Dec° at the bottom.

19° 341° LHA

Latitude SAME as Declination

19° 341° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° ... Zn = 360-Z

20° 340° LHA

Latitude SAME as Declination

20° 340° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	38°03.6'	+57.5'	154.3°	37°09.5'	+57.6'	154.6°	36°15.2'	+57.8'	154.9°	35°20.8'	+57.9'	155.2°	34°26.3'	+58.1'	155.5°	33°31.7'	+58.2'	155.8°	32°36.9'	+58.3'	156.0°	0
1	39°01.1'	+57.4'	153.9°	38°07.2'	+57.6'	154.2°	37°13.0'	+57.7'	154.6°	36°18.8'	+57.9'	154.9°	35°24.4'	+58.0'	155.2°	34°29.9'	+58.2'	155.5°	33°35.2'	+58.3'	155.8°	1
2	39°58.5'	+57.3'	153.5°	39°04.7'	+57.5'	153.9°	38°10.8'	+57.7'	154.2°	37°16.7'	+57.8'	154.6°	36°22.4'	+58.0'	154.9°	35°28.0'	+58.1'	155.2°	34°33.5'	+58.3'	155.5°	2
3	40°55.8'	+57.3'	153.1°	40°02.2'	+57.4'	153.5°	39°08.5'	+57.6'	153.9°	38°14.5'	+57.8'	154.2°	37°20.4'	+57.9'	154.6°	36°26.1'	+58.1'	154.9°	35°31.8'	+58.2'	155.2°	3
4	41°53.1'	+57.2'	152.7°	40°59.7'	+57.4'	153.1°	40°06.1'	+57.5'	153.5°	39°12.3'	+57.7'	153.9°	38°18.3'	+57.9'	154.2°	37°24.2'	+58.0'	154.6°	36°30.0'	+58.2'	154.9°	4
5	42°50.3'	+57.1'	152.3°	41°57.0'	+57.3'	152.7°	41°03.6'	+57.5'	153.1°	40°10.0'	+57.6'	153.5°	39°16.2'	+57.8'	153.9°	38°22.2'	+58.0'	154.2°	37°28.1'	+58.1'	154.6°	5
6	43°47.3'	+57.0'	151.9°	42°54.3'	+57.2'	152.3°	42°01.1'	+57.4'	152.8°	41°07.6'	+57.6'	153.2°	40°14.0'	+57.7'	153.5°	39°20.2'	+57.9'	153.9°	38°26.2'	+58.1'	154.3°	6
7	44°44.3'	+56.9'	151.5°	43°51.5'	+57.1'	151.9°	42°58.5'	+57.3'	152.4°	42°05.2'	+57.5'	152.8°	41°11.8'	+57.7'	153.2°	40°18.1'	+57.8'	153.6°	39°24.3'	+58.0'	153.9°	7
8	45°41.2'	+56.8'	151.0°	44°48.6'	+57.0'	151.5°	43°55.8'	+57.2'	151.9°	43°02.7'	+57.4'	152.4°	42°09.4'	+57.6'	152.8°	41°16.0'	+57.8'	153.2°	40°22.3'	+57.9'	153.6°	8
9	46°38.0'	+56.6'	150.5°	45°45.6'	+56.9'	151.0°	44°53.0'	+57.1'	151.5°	44°00.1'	+57.3'	152.0°	43°07.0'	+57.5'	152.4°	42°13.7'	+57.7'	152.9°	41°20.3'	+57.9'	153.3°	9
10	47°34.6'	+56.5'	150.0°	46°42.5'	+56.8'	150.6°	45°50.1'	+57.0'	151.1°	44°57.4'	+57.2'	151.6°	44°04.6'	+57.4'	152.0°	43°11.5'	+57.6'	152.5°	42°18.1'	+57.8'	152.9°	10
11	48°31.1'	+56.4'	149.5°	47°39.3'	+56.7'	150.1°	46°47.1'	+56.9'	150.6°	45°54.7'	+57.1'	151.1°	45°02.0'	+57.4'	151.6°	44°09.1'	+57.6'	152.1°	43°16.0'	+57.7'	152.5°	11
12	49°27.5'	+56.2'	149.0°	48°35.9'	+56.5'	149.6°	47°44.0'	+56.8'	150.2°	46°51.8'	+57.0'	150.7°	45°59.4'	+57.3'	151.2°	45°06.6'	+57.5'	151.7°	44°13.7'	+57.7'	152.2°	12
13	50°23.7'	+56.1'	148.5°	49°32.4'	+56.4'	149.1°	48°40.8'	+56.7'	149.7°	47°48.8'	+56.9'	150.2°	46°56.6'	+57.2'	150.8°	46°04.1'	+57.4'	151.3°	45°11.4'	+57.6'	151.8°	13
14	51°19.8'	+55.9'	147.9°	50°28.8'	+56.2'	148.6°	49°37.4'	+56.5'	149.2°	48°45.8'	+56.8'	149.8°	47°53.8'	+57.0'	150.3°	47°01.5'	+57.3'	150.9°	46°09.0'	+57.5'	151.4°	14
15	52°15.7'	+55.7'	147.3°	51°25.0'	+56.1'	148.0°	50°34.0'	+56.4'	148.7°	49°42.5'	+56.7'	149.3°	48°50.8'	+56.9'	149.9°	47°58.8'	+57.2'	150.4°	47°06.5'	+57.4'	151.0°	15
16	53°11.5'	+55.5'	146.7°	52°21.1'	+55.9'	147.4°	51°30.3'	+56.2'	148.1°	50°39.2'	+56.5'	148.8°	49°47.7'	+56.8'	149.4°	48°55.9'	+57.1'	150.0°	48°03.9'	+57.3'	150.5°	16
17	54°07.0'	+55.3'	146.1°	53°17.0'	+55.7'	146.8°	52°26.6'	+56.0'	147.5°	51°35.7'	+56.4'	148.2°	50°44.5'	+56.7'	148.9°	49°53.0'	+56.9'	149.5°	49°01.2'	+57.2'	150.1°	17
18	55°02.3'	+55.1'	145.4°	54°12.7'	+55.5'	146.2°	53°22.6'	+55.9'	147.0°	52°32.1'	+56.2'	147.7°	51°41.2'	+56.5'	148.4°	50°50.0'	+56.8'	149.0°	49°58.4'	+57.1'	149.6°	18
19	55°57.4'	+54.8'	144.7°	55°08.2'	+55.3'	145.5°	54°18.5'	+55.7'	146.3°	53°28.3'	+56.0'	147.1°	52°37.7'	+56.4'	147.8°	51°46.8'	+56.7'	148.5°	50°55.4'	+57.0'	149.1°	19
20	56°52.2'	+54.6'	144.0°	56°03.5'	+55.0'	144.9°	55°14.1'	+55.5'	145.7°	54°24.3'	+55.8'	146.5°	53°34.1'	+56.2'	147.2°	52°43.4'	+56.5'	148.0°	51°52.4'	+56.8'	148.6°	20
21	57°46.8'	+54.3'	143.2°	56°58.5'	+54.8'	144.1°	56°09.6'	+55.2'	145.0°	55°20.2'	+55.6'	145.8°	54°30.3'	+56.0'	146.6°	53°40.0'	+56.4'	147.4°	52°49.2'	+56.7'	148.1°	21
22	58°41.1'	+54.0'	142.4°	57°53.2'	+54.5'	143.4°	57°04.8'	+55.0'	144.3°	56°15.8'	+55.4'	145.2°	55°26.3'	+55.8'	146.0°	54°36.3'	+56.2'	146.8°	53°45.9'	+56.5'	147.6°	22
23	59°35.1'	+53.6'	141.5°	58°47.7'	+54.2'	142.6°	57°59.8'	+54.7'	143.6°	57°11.2'	+55.2'	144.5°	56°22.1'	+55.6'	145.4°	55°32.5'	+56.0'	146.2°	54°42.4'	+56.3'	147.0°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

20° 340° LHA

Latitude SAME as Declination

20° 340° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° ... Zn = 360-Z

21° 339° LHA

Latitude SAME as Declination

21° 339° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	37°46.2'	+57.2'	153.0°	36°52.6'	+57.4'	153.4°	35°58.9'	+57.6'	153.7°	35°05.0'	+57.8'	154.0°	34°11.0'	+57.9'	154.3°	33°16.9'	+58.0'	154.6°	32°22.6'	+58.2'	154.9°	0
1	38°43.4'	+57.2'	152.7°	37°50.0'	+57.4'	153.0°	36°56.5'	+57.5'	153.4°	36°02.8'	+57.7'	153.7°	35°08.9'	+57.8'	154.0°	34°14.9'	+58.0'	154.3°	33°20.8'	+58.1'	154.6°	1
2	39°40.6'	+57.1'	152.3°	38°47.4'	+57.3'	152.6°	37°54.0'	+57.5'	153.0°	37°00.5'	+57.6'	153.4°	36°06.7'	+57.8'	153.7°	35°12.9'	+57.9'	154.0°	34°18.9'	+58.1'	154.3°	2
3	40°37.7'	+57.0'	151.9°	39°44.7'	+57.2'	152.3°	38°51.5'	+57.4'	152.6°	37°58.1'	+57.6'	153.0°	37°04.5'	+57.7'	153.3°	36°10.8'	+57.9'	153.7°	35°17.0'	+58.0'	154.0°	3
4	41°34.7'	+56.9'	151.5°	40°41.9'	+57.1'	151.9°	39°48.9'	+57.3'	152.3°	38°55.7'	+57.5'	152.6°	38°02.3'	+57.7'	153.0°	37°08.7'	+57.8'	153.4°	36°15.0'	+58.0'	153.7°	4
5	42°31.6'	+56.8'	151.0°	41°39.0'	+57.0'	151.5°	40°46.2'	+57.2'	151.9°	39°53.2'	+57.4'	152.3°	39°00.0'	+57.6'	152.7°	38°06.6'	+57.8'	153.0°	37°13.0'	+57.9'	153.4°	5
6	43°28.4'	+56.7'	150.6°	42°36.0'	+56.9'	151.0°	41°43.4'	+57.2'	151.5°	40°50.6'	+57.4'	151.9°	39°57.6'	+57.5'	152.3°	39°04.4'	+57.7'	152.7°	38°11.0'	+57.9'	153.0°	6
7	44°25.1'	+56.6'	150.1°	43°33.0'	+56.8'	150.6°	42°40.6'	+57.1'	151.1°	41°47.9'	+57.3'	151.5°	40°55.1'	+57.5'	151.9°	40°02.1'	+57.7'	152.3°	39°08.8'	+57.8'	152.7°	7
8	45°21.7'	+56.5'	149.7°	44°29.8'	+56.7'	150.2°	43°37.6'	+57.0'	150.6°	42°45.2'	+57.2'	151.1°	41°52.6'	+57.4'	151.5°	40°59.7'	+57.6'	152.0°	40°06.7'	+57.8'	152.4°	8
9	46°18.2'	+56.4'	149.2°	45°26.5'	+56.6'	149.7°	44°34.6'	+56.9'	150.2°	43°42.4'	+57.1'	150.7°	42°50.0'	+57.3'	151.1°	41°57.3'	+57.5'	151.6°	41°04.4'	+57.7'	152.0°	9
10	47°14.5'	+56.2'	148.7°	46°23.1'	+56.5'	149.2°	45°31.4'	+56.7'	149.8°	44°39.5'	+57.0'	150.3°	43°47.3'	+57.2'	150.7°	42°54.8'	+57.4'	151.2°	42°02.1'	+57.6'	151.6°	10
11	48°10.8'	+56.1'	148.2°	47°19.6'	+56.4'	148.7°	46°28.2'	+56.6'	149.3°	45°36.5'	+56.9'	149.8°	44°44.5'	+57.1'	150.3°	43°52.2'	+57.3'	150.8°	42°59.7'	+57.5'	151.3°	11
12	49°06.8'	+55.9'	147.6°	48°16.0'	+56.2'	148.2°	47°24.8'	+56.5'	148.8°	46°33.4'	+56.8'	149.4°	45°41.6'	+57.0'	149.9°	44°49.6'	+57.2'	150.4°	43°57.3'	+57.5'	150.9°	12
13	50°02.8'	+55.7'	147.1°	49°12.2'	+56.1'	147.7°	48°21.3'	+56.4'	148.3°	47°30.1'	+56.6'	148.9°	46°38.6'	+56.9'	149.4°	45°46.8'	+57.1'	150.0°	44°54.7'	+57.4'	150.5°	13
14	50°58.5'	+55.6'	146.5°	50°08.3'	+55.9'	147.1°	49°17.7'	+56.2'	147.8°	48°26.8'	+56.5'	148.4°	47°35.5'	+56.8'	149.0°	46°44.0'	+57.0'	149.5°	45°52.1'	+57.3'	150.0°	14
15	51°54.1'	+55.4'	145.9°	51°04.2'	+55.7'	146.6°	50°13.9'	+56.1'	147.2°	49°23.3'	+56.4'	147.9°	48°32.3'	+56.7'	148.5°	47°41.0'	+56.9'	149.1°	46°49.4'	+57.2'	149.6°	15
16	52°49.4'	+55.2'	145.2°	52°00.0'	+55.5'	146.0°	51°10.0'	+55.9'	146.7°	50°19.7'	+56.2'	147.3°	49°29.0'	+56.5'	148.0°	48°37.9'	+56.8'	148.6°	47°46.6'	+57.1'	149.2°	16
17	53°44.6'	+54.9'	144.6°	52°55.5'	+55.3'	145.4°	52°05.9'	+55.7'	146.1°	51°15.9'	+56.1'	146.8°	50°25.5'	+56.4'	147.5°	49°34.7'	+56.7'	148.1°	48°43.6'	+57.0'	148.7°	17
18	54°39.5'	+54.7'	143.9°	53°50.8'	+55.1'	144.7°	53°01.6'	+55.5'	145.5°	52°12.0'	+55.9'	146.2°	51°21.9'	+56.2'	146.9°	50°31.4'	+56.5'	147.6°	49°40.6'	+56.8'	148.2°	18
19	55°34.2'	+54.4'	143.2°	54°45.9'	+54.9'	144.0°	53°57.1'	+55.3'	144.8°	53°07.8'	+55.7'	145.6°	52°18.1'	+56.1'	146.4°	51°28.0'	+56.4'	147.0°	50°37.4'	+56.7'	147.7°	19
20	56°28.7'	+54.1'	142.4°	55°40.8'	+54.6'	143.3°	54°52.4'	+55.1'	144.2°	54°03.5'	+55.5'	145.0°	53°14.2'	+55.9'	145.8°	52°24.3'	+56.2'	146.5°	51°34.1'	+56.6'	147.2°	20
21																						

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

22° 338° LHA

Latitude SAME as Declination

22° 338° LHA

Table with 10 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of latitude/longitude data for 22° 338° LHA.

22° 338° LHA

Latitude SAME as Declination

22° 338° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

23° 337° LHA

Latitude SAME as Declination

23° 337° LHA

Table with 10 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of latitude/longitude data for 23° 337° LHA.

23° 337° LHA

Latitude SAME as Declination

23° 337° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

24° 336° LHA

Latitude SAME as Declination

24° 336° LHA

Table with 12 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data.

24° 336° LHA

Latitude SAME as Declination

24° 336° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

25° 335° LHA

Latitude SAME as Declination

25° 335° LHA

Table with 12 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data.

25° 335° LHA

Latitude SAME as Declination

25° 335° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

26° 334° LHA

Latitude SAME as Declination

26° 334° LHA

Dec°	49			50			51			52			53			54			55			Dec°	
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°		Hc°
0	36°08.0'	+56.0'	147.1°	35°17.5'	+56.3'	147.5°	34°26.8'	+56.5'	147.9°	33°35.8'	+56.7'	148.2°	32°44.7'	+56.9'	148.6°	31°53.4'	+57.1'	148.9°	31°02.0'	+57.3'	149.2°	0	
1	37°04.0'	+55.9'	146.7°	36°13.7'	+56.2'	147.1°	35°23.3'	+56.4'	147.5°	34°32.6'	+56.6'	147.9°	33°41.7'	+56.9'	148.2°	32°50.6'	+57.1'	148.6°	31°59.3'	+57.3'	148.9°	1	
2	38°00.0'	+55.8'	146.2°	37°09.9'	+56.1'	146.6°	36°19.7'	+56.3'	147.1°	35°29.2'	+56.6'	147.4°	34°38.5'	+56.8'	147.8°	33°47.6'	+57.0'	148.2°	32°56.6'	+57.2'	148.5°	2	
3	38°55.7'	+55.7'	145.8°	38°06.0'	+56.0'	146.2°	37°16.0'	+56.2'	146.6°	36°25.8'	+56.5'	147.0°	35°35.3'	+56.7'	147.4°	34°44.7'	+56.9'	147.8°	33°53.8'	+57.1'	148.2°	3	
4	39°51.4'	+55.6'	145.3°	39°02.0'	+55.9'	145.7°	38°12.2'	+56.1'	146.2°	37°22.3'	+56.4'	146.6°	36°32.0'	+56.6'	147.0°	35°41.6'	+56.9'	147.4°	34°50.9'	+57.1'	147.8°	4	
5	40°47.0'	+55.4'	144.8°	39°57.8'	+55.7'	145.3°	39°08.4'	+56.0'	145.7°	38°18.6'	+56.3'	146.2°	37°28.7'	+56.5'	146.6°	36°38.5'	+56.8'	147.0°	35°48.0'	+57.0'	147.4°	5	
6	41°42.4'	+55.3'	144.3°	40°53.6'	+55.6'	144.8°	40°04.4'	+55.9'	145.3°	39°14.9'	+56.2'	145.7°	38°25.2'	+56.4'	146.2°	37°35.2'	+56.7'	146.6°	36°45.0'	+56.9'	147.0°	6	
7	42°37.7'	+55.2'	143.7°	41°49.2'	+55.5'	144.3°	41°00.3'	+55.8'	144.8°	40°11.1'	+56.1'	145.3°	39°21.7'	+56.3'	145.8°	38°31.9'	+56.6'	146.2°	37°41.9'	+56.8'	146.6°	7	
8	43°32.9'	+55.0'	143.2°	42°44.6'	+55.3'	143.8°	41°56.1'	+55.7'	144.3°	41°07.2'	+56.0'	144.8°	40°18.0'	+56.2'	145.3°	39°28.5'	+56.5'	145.8°	38°38.8'	+56.8'	146.2°	8	
9	44°27.9'	+54.8'	142.7°	43°40.0'	+55.2'	143.2°	42°51.7'	+55.5'	143.8°	42°03.2'	+55.8'	144.3°	41°14.3'	+56.1'	144.8°	40°25.0'	+56.4'	145.3°	39°35.6'	+56.7'	145.8°	9	
10	45°22.7'	+54.6'	142.1°	44°35.2'	+55.0'	142.7°	43°47.3'	+55.4'	143.3°	42°59.0'	+55.7'	143.8°	42°10.4'	+56.0'	144.4°	41°21.5'	+56.3'	144.9°	40°32.2'	+56.6'	145.4°	10	
11	46°17.3'	+54.5'	141.5°	45°30.2'	+54.8'	142.1°	44°42.6'	+55.2'	142.7°	43°54.7'	+55.6'	143.3°	43°06.4'	+55.9'	143.9°	42°17.8'	+56.2'	144.4°	41°28.8'	+56.5'	144.9°	11	
12	47°11.8'	+54.3'	140.9°	46°25.0'	+54.7'	141.5°	45°37.8'	+55.0'	142.2°	44°50.2'	+55.4'	142.8°	44°02.3'	+55.7'	143.4°	43°13.9'	+56.1'	143.9°	42°25.3'	+56.4'	144.5°	12	
13	48°06.1'	+54.0'	140.2°	47°19.7'	+54.5'	140.9°	46°32.9'	+54.9'	141.6°	45°45.7'	+55.2'	142.2°	44°58.0'	+55.6'	142.9°	44°10.0'	+55.9'	143.5°	43°21.6'	+56.2'	144.0°	13	
14	49°00.1'	+53.8'	139.6°	48°14.2'	+54.3'	140.3°	47°27.8'	+54.7'	141.0°	46°40.9'	+55.1'	141.7°	45°53.6'	+55.4'	142.3°	45°05.9'	+55.8'	142.9°	44°17.9'	+56.1'	143.5°	14	
15	49°53.9'	+53.6'	138.9°	49°08.4'	+54.0'	139.7°	48°22.4'	+54.5'	140.4°	47°36.0'	+54.9'	141.1°	46°49.1'	+55.3'	141.8°	46°01.7'	+55.6'	142.4°	45°14.0'	+56.0'	143.0°	15	
16	50°47.5'	+53.3'	138.2°	50°02.5'	+53.8'	139.0°	49°16.9'	+54.3'	139.8°	48°30.9'	+54.7'	140.5°	47°44.3'	+55.1'	141.2°	46°57.4'	+55.5'	141.9°	46°09.9'	+55.8'	142.5°	16	
17	51°40.8'	+53.0'	137.5°	50°56.3'	+53.5'	138.3°	50°11.2'	+54.0'	139.1°	49°25.6'	+54.5'	139.9°	48°39.4'	+54.9'	140.6°	47°52.8'	+55.3'	141.3°	47°05.8'	+55.7'	142.0°	17	
18	52°33.8'	+52.7'	136.7°	51°49.8'	+53.3'	137.6°	51°05.2'	+53.8'	138.4°	50°20.0'	+54.3'	139.2°	49°34.3'	+54.7'	140.0°	48°48.1'	+55.1'	140.7°	48°01.5'	+55.5'	141.4°	18	
19	53°26.5'	+52.4'	135.9°	52°43.0'	+53.0'	136.8°	51°59.0'	+53.5'	137.7°	51°14.3'	+54.0'	138.5°	50°29.0'	+54.5'	139.4°	49°43.3'	+54.9'	140.1°	48°57.0'	+55.3'	140.9°	19	
20	54°18.8'	+52.0'	135.1°	53°36.0'	+52.6'	136.0°	52°52.5'	+53.2'	137.0°	52°08.3'	+53.8'	137.8°	51°23.5'	+54.3'	138.7°	50°38.2'	+54.7'	139.5°	49°52.3'	+55.1'	140.3°	20	
21	55°10.9'	+51.6'	134.2°	54°28.6'	+52.3'	135.2°	53°45.7'	+52.9'	136.2°	53°15.1'	+53.5'	137.1°	52°17.8'	+54.0'	138.0°	51°32.9'	+54.5'	138.8°	50°47.5'	+54.9'	139.7°	21	
22	56°02.5'	+51.2'	133.3°	55°20.9'	+51.9'	134.4°	54°38.6'	+52.6'	135.4°	53°55.5'	+53.2'	136.3°	53°11.8'	+53.7'	137.3°	52°27.4'	+54.2'	138.2°	51°42.4'	+54.7'	139.0°	22	
23	56°53.7'	+50.8'	132.4°	56°12.9'	+51.5'	133.5°	55°31.2'	+52.2'	134.5°	54°48.7'	+52.8'	135.6°	54°05.5'	+53.4'	136.5°	53°21.6'	+54.0'	137.5°	52°37.1'	+54.5'	138.3°	23	
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°	
	49			50			51			52			53			54			55				

26° 334° LHA

Latitude SAME as Declination

26° 334° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

27° 333° LHA

Latitude SAME as Declination

27° 333° LHA

Dec°	49			50			51			52			53			54			55			Dec°	
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°		Hc°
0	35°46.3'	+55.8'	146.0°	34°56.4'	+56.0'	146.4°	34°06.4'	+56.3'	146.7°	33°16.1'	+56.5'	147.1°	32°25.6'	+56.7'	147.5°	31°34.9'	+56.9'	147.8°	30°44.1'	+57.2'	148.1°	0	
1	36°42.0'	+55.7'	145.5°	35°52.5'	+55.9'	145.9°	35°02.6'	+56.2'	146.3°	34°12.6'	+56.4'	146.7°	33°22.3'	+56.7'	147.1°	32°31.9'	+56.9'	147.4°	31°41.2'	+57.1'	147.8°	1	
2	37°37.7'	+55.5'	145.0°	36°48.4'	+55.8'	145.5°	35°58.8'	+56.1'	145.9°	35°09.0'	+56.3'	146.3°	34°19.0'	+56.6'	146.7°	33°28.8'	+56.8'	147.0°	32°38.3'	+57.0'	147.4°	2	
3	38°33.2'	+55.4'	144.6°	37°44.2'	+55.7'	145.0°	36°54.9'	+56.0'	145.5°	36°05.4'	+56.3'	145.9°	35°15.6'	+56.5'	146.3°	34°25.6'	+56.7'	146.7°	33°35.3'	+57.0'	147.0°	3	
4	39°28.6'	+55.3'	144.1°	38°39.9'	+55.6'	144.5°	37°50.9'	+55.9'	145.0°	37°01.6'	+56.2'	145.4°	36°12.1'	+56.4'	145.9°	35°22.3'	+56.7'	146.3°	34°32.3'	+56.9'	146.6°	4	
5	40°23.9'	+55.2'	143.6°	39°35.5'	+55.5'	144.1°	38°46.8'	+55.8'	144.5°	37°57.8'	+56.1'	145.0°	37°08.5'	+56.3'	145.4°	36°19.0'	+56.6'	145.9°	35°29.2'	+56.8'	146.3°	5	
6	41°19.1'	+55.0'	143.0°	40°31.0'	+55.3'	143.6°	39°42.5'	+55.6'	144.1°	38°53.8'	+55.9'	144.5°	38°04.8'	+56.2'	145.0°	37°15.5'	+56.5'	145.4°	36°26.0'	+56.7'	145.9°	6	
7	42°14.1'	+54.9'	142.5°	41°26.3'	+55.2'	143.1°	40°38.2'	+55.5'	143.6°	39°49.8'	+55.8'	144.1°	39°01.0'	+56.1'	144.6°	38°12.0'	+56.4'	145.0°	37°22.7'	+56.6'	145.5°	7	
8	43°08.9'	+54.7'	142.0°	42°21.5'	+55.0'	142.5°	41°33.7'	+55.4'	143.1°	40°45.6'	+55.7'	143.6°	39°57.1'	+56.0'	144.1°	39°08.4'	+56.3'	144.6°	38°19.4'	+56.6'	145.0°	8	
9	44°03.6'	+54.5'	141.4°	43°16.6'	+54.9'	142.0°	42°29.1'	+55.2'	142.6°	41°41.3'	+55.6'	143.1°	40°53.1'	+55.9'	143.6°	40°04.7'	+56.2'	144.1°	39°26.9'	+56.5'	144.6°	9	
10	44°58.1'	+54.3'	140.8°	44°11.4'	+54.7'	141.4°	43°24.3'	+55.1'	142.0°	42°36.9'	+55.4'	142.6°	41°49.0'	+55.8'	143.1°	41°00.9'	+56.1'	143.7°	40°12.4'	+56.4'	144.2°	10	
11	45°52.5'	+54.1'	140.2°	45°06.2'	+54.5'	140.8°	44°19.4'	+54.9'	141.5°	43°32.3'	+55.3'	142.1°	42°44.8'	+55.6'	142.6°	41°56.9'	+55.9'	143.2°	41°08.7'	+56.2'	143.7°	11	
12	46°46.6'	+53.9'	139.6°	46°00.7'	+54.3'	140.3°	45°14.4'	+54.8'	140.9°	44°27.6'	+55.1'	141.5°	43°40.4'	+55.5'	142.1°	42°52.9'	+55.8'	142.7°	42°05.0'	+56.1'	143.2°	12	
13	47°40.5'	+53.7'	138.9°	46°55.1'	+54.1'	139.6°	46°09.1'	+54.6'	140.3°	45°22.7'	+55.0'	141.0°	44°35.9'	+55.3'	141.6°	43°48.7'	+55.7'	142.2°	43°01.1'	+56.0'	142.8°	13	
14	48°34.2'	+53.5'	138.3°	47°49.2'	+53.9'	139.0°	47°03.7'	+54.4'	139.7°	46°17.7'	+54.8'	140.4°	45°31.2'	+55.2'	141.0°	44°44.4'	+55.5'	141.7°	43°57.1'	+55.9'	142.3°	14	
15	49°27.7'	+53.2'	137.6°	48°43.1'	+53.7'	138.3°	47°58.0'	+54.2'	139.1°	47°12.5'	+54.6'	139.8°	46°26.4'	+55.0'	140.5°	45°39.9'	+55.4'	141.1°	44°53.0'	+55.7'	141.8°	15	
16	50°20.9'	+52.9'	136.9°	49°36.8'	+53.4'	137.7°	48°52.2'	+53.9'	138.4°	48°07.0'	+54.4'	139.2°	47°21.4'	+54.8'	139.9°	46°35.3'	+55.2'	140.6°	45°48.7'	+55.6'	141.2°	16	
17	51°13.8'	+52.6'	136.1°	50°30.3'	+53.2'	137.0°	49°46.1'	+53.7'	137.8°	49°01.4'	+54.2'	138.5°	48°16.2'	+54.6'	139.3°	47°30.5'	+55.0'	140.0°	46°44.3'	+55.4'	140.7°	17	
18	52°06.4'	+52.3'	135.3°	51°23.4'	+52.9'	136.2°	50°39.8'	+53.4'	137.1°	49°55.6'	+53.9'	137.9°	49°10.8'	+54.4'	138.7°	48°25.5'	+54.8'	139.4°	47°39.7'	+55.2'	140.1°	18	
19	52°58.7'	+52.0'	134.5°	52°16.3'	+52.6'	135.5°	51°33.2'	+53.1'	136.3°	50°49.5'	+53.7'	137.2°	50°05.2'	+54.2'	138.0°	49°20.3'	+54.6'	138.8°	48°34.9'	+55.1'	139.5°	19	
20	53°50.7'	+51.6'	133.7°	53°08.9'	+52.2'	134.7°	52°26.4'	+52.8'	135.6°	51°43.2'	+53.4'	136.5°	50°59.4'	+53.9'	137.3°	50°15.0'	+54.4'	138.2°	49°30.0'	+54.9'	1		

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

30° 330° LHA			Latitude SAME as Declination										30° 330° LHA									
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	34°37.3'	+55.0'	142.6°	33°49.6'	+55.3'	143.0°	33°01.5'	+55.6'	143.4°	32°13.2'	+55.8'	143.8°	31°24.7'	+56.1'	144.1°	30°36.0'	+56.4'	144.5°	29°47.0'	+56.6'	144.8°	0
1	35°32.3'	+54.8'	142.1°	34°44.8'	+55.2'	142.5°	33°57.1'	+55.5'	142.9°	33°09.1'	+55.8'	143.3°	32°20.8'	+56.0'	143.7°	31°32.3'	+56.3'	144.1°	30°43.6'	+56.5'	144.4°	1
2	36°27.2'	+54.7'	141.6°	35°40.0'	+55.0'	142.0°	34°52.5'	+55.4'	142.5°	34°04.8'	+55.7'	142.9°	33°16.8'	+55.9'	143.3°	32°28.6'	+56.2'	143.7°	31°40.2'	+56.5'	144.0°	2
3	37°21.9'	+54.6'	141.1°	36°35.0'	+54.9'	141.6°	35°47.9'	+55.2'	142.0°	35°00.5'	+55.5'	142.4°	34°12.8'	+55.8'	142.9°	33°24.8'	+56.1'	143.3°	32°36.6'	+56.4'	143.6°	3
4	38°16.5'	+54.4'	140.6°	37°30.0'	+54.8'	141.0°	36°43.1'	+55.1'	141.5°	35°56.0'	+55.4'	142.0°	35°08.6'	+55.7'	142.4°	34°20.9'	+56.0'	142.8°	33°33.0'	+56.3'	143.2°	4
5	39°10.9'	+54.3'	140.0°	38°24.7'	+54.6'	140.5°	37°38.3'	+55.0'	141.0°	36°51.5'	+55.3'	141.5°	36°04.4'	+55.6'	142.0°	35°17.0'	+55.9'	142.4°	34°29.3'	+56.2'	142.8°	5
6	40°05.2'	+54.1'	139.5°	39°19.4'	+54.5'	140.0°	38°33.3'	+54.9'	140.5°	37°46.8'	+55.2'	141.0°	37°00.0'	+55.5'	141.5°	36°12.9'	+55.8'	142.0°	35°25.5'	+56.1'	142.4°	6
7	40°59.3'	+54.0'	138.9°	40°13.9'	+54.3'	139.5°	39°28.1'	+54.7'	140.0°	38°42.0'	+55.1'	140.5°	37°55.5'	+55.4'	141.0°	37°08.7'	+55.7'	141.5°	36°21.6'	+56.0'	142.0°	7
8	41°53.2'	+53.8'	138.3°	41°08.2'	+54.2'	138.9°	40°22.8'	+54.6'	139.5°	39°37.1'	+54.9'	140.0°	38°50.9'	+55.3'	140.5°	38°04.4'	+55.6'	141.0°	37°17.6'	+55.9'	141.5°	8
9	42°47.0'	+53.6'	137.7°	42°02.4'	+54.0'	138.3°	41°17.4'	+54.4'	138.9°	40°32.0'	+54.8'	139.5°	39°46.2'	+55.1'	140.0°	39°00.0'	+55.5'	140.5°	38°13.5'	+55.8'	141.1°	9
10	43°40.6'	+53.4'	137.1°	42°56.4'	+53.8'	137.7°	42°11.8'	+54.2'	138.3°	41°26.8'	+54.6'	138.9°	40°41.3'	+55.0'	139.5°	39°55.5'	+55.4'	140.1°	39°09.3'	+55.7'	140.6°	10
11	44°34.0'	+53.2'	136.5°	43°50.2'	+53.6'	137.1°	43°06.0'	+54.0'	137.8°	42°21.4'	+54.5'	138.4°	41°36.3'	+54.9'	139.0°	40°50.9'	+55.2'	139.5°	40°05.0'	+55.6'	140.1°	11
12	45°27.1'	+52.9'	135.8°	44°43.8'	+53.4'	136.5°	44°00.1'	+53.9'	137.2°	43°15.9'	+54.3'	137.8°	42°31.2'	+54.7'	138.4°	41°46.1'	+55.1'	139.0°	41°00.6'	+55.4'	139.6°	12
13	46°20.0'	+52.7'	135.1°	45°37.2'	+53.2'	135.8°	44°53.9'	+53.7'	136.5°	44°10.1'	+54.1'	137.2°	43°25.9'	+54.5'	137.9°	42°41.2'	+54.9'	138.5°	41°56.0'	+55.3'	139.1°	13
14	47°12.7'	+52.4'	134.4°	46°30.4'	+52.9'	135.2°	45°47.6'	+53.4'	135.9°	45°04.2'	+53.9'	136.6°	44°20.4'	+54.3'	137.3°	43°36.1'	+54.8'	137.9°	42°51.3'	+55.1'	138.6°	14
15	48°05.1'	+52.1'	133.7°	47°23.4'	+52.7'	134.5°	46°41.0'	+53.2'	135.3°	45°58.1'	+53.7'	136.0°	45°14.7'	+54.1'	136.7°	44°30.8'	+54.6'	137.4°	43°46.5'	+55.0'	138.0°	15
16	48°57.2'	+51.8'	133.0°	48°16.0'	+52.4'	133.8°	47°34.2'	+52.9'	134.6°	46°51.8'	+53.5'	135.3°	46°08.9'	+53.9'	136.1°	45°25.4'	+54.4'	136.8°	44°41.4'	+54.8'	137.5°	16
17	49°49.1'	+51.5'	132.2°	49°08.4'	+52.1'	133.0°	48°27.2'	+52.7'	133.9°	47°45.3'	+53.2'	134.7°	47°02.8'	+53.7'	135.4°	46°19.8'	+54.2'	136.2°	45°36.3'	+54.6'	136.9°	17
18	50°40.6'	+51.2'	131.4°	50°00.5'	+51.8'	132.3°	49°19.8'	+52.4'	133.1°	48°38.5'	+53.0'	134.0°	47°56.5'	+53.5'	134.8°	47°14.0'	+54.0'	135.5°	46°30.9'	+54.4'	136.3°	18
19	51°31.7'	+50.8'	130.5°	50°52.3'	+51.5'	131.5°	50°12.2'	+52.1'	132.4°	49°31.5'	+52.7'	133.3°	48°50.0'	+53.2'	134.1°	48°08.0'	+53.8'	134.9°	47°25.3'	+54.2'	135.7°	19
20	52°22.5'	+50.4'	129.7°	51°43.8'	+51.1'	130.7°	51°04.3'	+51.8'	131.6°	50°24.1'	+52.4'	132.5°	49°43.3'	+53.0'	133.4°	49°01.7'	+53.5'	134.2°	48°19.6'	+54.0'	135.0°	20
21	53°12.9'	+50.0'	128.8°	52°34.9'	+50.7'	129.8°	51°56.1'	+51.4'	130.9°	51°16.5'	+52.1'	131.7°	50°36.1'	+52.7'	132.7°	49°55.2'	+53.3'	133.5°	49°13.6'	+53.8'	134.4°	21
22	54°02.9'	+49.5'	127.8°	53°25.6'	+50.3'	128.9°	52°47.5'	+51.0'	129.8°	52°08.6'	+51.7'	130.9°	51°28.9'	+52.4'	131.9°	50°48.5'	+53.0'	132.8°	50°07.4'	+53.5'	133.7°	22
23	54°52.4'	+49.0'	126.9°	54°15.9'	+49.9'	128.0°	53°38.6'	+50.6'	129.1°	53°00.3'	+51.4'	130.1°	52°21.3'	+52.0'	131.1°	51°41.5'	+52.7'	132.1°	51°00.9'	+53.3'	133.0°	23

30° 330° LHA			Latitude SAME as Declination										30° 330° LHA		
South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z															

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

31° 329° LHA			Latitude SAME as Declination										31° 329° LHA									
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	34°13.1'	+54.7'	141.5°	33°26.0'	+55.0'	141.9°	32°38.7'	+55.3'	142.3°	31°51.1'	+55.6'	142.7°	31°03.3'	+55.9'	143.0°	30°15.2'	+56.2'	143.4°	29°26.9'	+56.4'	143.7°	0
1	35°07.8'	+54.6'	141.0°	34°21.1'	+54.9'	141.4°	33°34.0'	+55.2'	141.8°	32°46.7'	+55.5'	142.2°	31°59.2'	+55.8'	142.6°	31°11.4'	+56.1'	143.0°	30°23.4'	+56.3'	143.3°	1
2	36°02.4'	+54.4'	140.5°	35°16.0'	+54.8'	140.9°	34°29.2'	+55.1'	141.4°	33°42.2'	+55.4'	141.8°	32°55.0'	+55.7'	142.2°	32°07.5'	+56.0'	142.6°	31°19.7'	+56.3'	142.9°	2
3	36°56.8'	+54.3'	139.9°	36°10.8'	+54.7'	140.4°	35°24.4'	+55.0'	140.9°	34°37.7'	+55.3'	141.3°	33°50.7'	+55.6'	141.7°	33°03.5'	+55.9'	142.1°	32°16.0'	+56.2'	142.5°	3
4	37°51.1'	+54.2'	139.4°	37°05.4'	+54.5'	139.9°	36°19.4'	+54.9'	140.4°	35°33.0'	+55.2'	140.8°	34°46.3'	+55.5'	141.3°	33°59.4'	+55.8'	141.7°	33°12.1'	+56.1'	142.1°	4
5	38°45.3'	+54.0'	138.9°	38°00.0'	+54.4'	139.4°	37°14.2'	+54.7'	139.9°	36°28.2'	+55.1'	140.4°	35°41.8'	+55.4'	140.8°	34°55.2'	+55.7'	141.3°	34°08.2'	+56.0'	141.7°	5
6	39°39.3'	+53.8'	138.3°	38°54.3'	+54.2'	138.8°	38°09.0'	+54.6'	139.4°	37°23.3'	+54.9'	139.9°	36°37.2'	+55.3'	140.3°	35°50.9'	+55.6'	140.8°	35°04.2'	+55.9'	141.3°	6
7	40°33.1'	+53.7'	137.7°	39°48.5'	+54.1'	138.3°	39°03.5'	+54.4'	138.8°	38°18.2'	+54.8'	139.4°	37°32.5'	+55.2'	139.9°	36°46.5'	+55.5'	140.3°	36°00.1'	+55.8'	140.8°	7
8	41°26.8'	+53.5'	137.1°	40°42.6'	+53.9'	137.7°	39°58.0'	+54.3'	138.3°	39°13.0'	+54.7'	138.8°	38°27.7'	+55.0'	139.4°	37°42.0'	+55.4'	139.9°	36°55.9'	+55.7'	140.4°	8
9	42°20.2'	+53.3'	136.5°	41°36.5'	+53.7'	137.1°	40°52.3'	+54.1'	137.7°	40°07.7'	+54.5'	138.3°	39°22.7'	+54.9'	138.8°	38°37.3'	+55.2'	139.4°	37°51.6'	+55.6'	139.9°	9
10	43°13.5'	+53.1'	135.9°	42°30.2'	+53.5'	136.5°	41°46.4'	+53.9'	137.1°	41°02.2'	+54.4'	137.7°	40°17.6'	+54.7'	138.3°	39°32.6'	+55.1'	138.9°	38°47.2'	+55.5'	139.4°	10
11	44°06.5'	+52.8'	135.2°	43°23.7'	+53.3'	135.9°	42°40.4'	+53.8'	136.6°	41°56.6'	+54.2'	137.2°	41°12.3'	+54.6'	137.8°	40°27.7'	+55.0'	138.4°	39°42.7'	+55.3'	138.9°	11
12	44°59.4'	+52.6'	134.6°	44°17.0'	+53.1'	135.3°	43°34.1'	+53.6'	135.9°	42°50.8'	+54.0'	136.6°	42°06.9'	+54.4'	137.2°	41°22.7'	+54.8'	137.8°	40°38.0'	+55.2'	138.4°	12
13	45°52.0'	+52.3'	133.9°	45°10.1'	+52.9'	134.6°	44°27.7'	+53.3'	135.3°	43°44.8'	+53.8'	136.0°	43°01.4'	+54.3'	136.7°	42°17.5'	+54.7'	137.3°	41°33.2'	+55.1'	137.9°	13
14	46°44.3'	+52.1'	133.2°	46°02.9'	+52.6'	133.9°	45°21.0'	+53.1'	134.7°	44°38.6'	+53.6'	135.4°	43°56.6'	+54.1'	136.1°	43°12.2'	+54.5'	136.7°	42°28.3'	+54.9'	137.4°	14
15	47°36.3'	+51.8'	132.5°	46°55.5'	+52.3'	133.2°	46°14.1'	+52.9'	134.0°	45°32.2'	+53.4'	134.7°	44°49.7'	+53.9'	135.5°	44°06.7'	+54.3'	136.1°	43°23.2'	+54.7'	136.8°	15
16	48°28.1'	+51.5'	131.7°	47°47.9'	+52.1'	132.5°	47°07.0'	+52.6'	133.3°	46°25.6'	+53.2'	134.1°	45°43.5'	+53.7'	134.8°	45°01.0'	+54.1'	135.5°	44°17.9'	+54.6'	136.2°	16
17	49°19.6'	+51.1'	130.9°	48°40.0'	+51.8'	131.8°	47°59.7'	+52.4'	132.6°	47°18.7'	+52.9'	133.4°	46°37.2'	+53.4'	134.2°	45°55.1'	+53.9'	134.9°	45°12.5'	+54.4'	135.6°	17
18	50°10.7'	+50.8'	130.1°	49°31.7'	+51.4'	131.0°	48°52.0'	+52.1'	131.9°	48°11.6'	+52.6'	132.7°	47°30.6'	+53.2'	133.5°	46°49.0'	+53.7'	134.3°	46°06.8'	+54.2'	135.0°	18
19	51°01.5'	+50.4'	129.3°	50°23.2'	+51.1'	130.2°	49°44.1'	+51.8'	131.1°	49°04.3'	+52.4'	132.0°	48°23.8'	+52.9'	132.8°	47°42.7'	+53.5'	133.6°	47°01.0'	+54.0'	134.4°	19
20	51°51.9'	+50.0'	128.4°	51°14.3'	+50.7'	129.4°	50°35.8'	+51.4'	130.3°	49°56.6'	+52.1'	131.2°	49°16.7'	+52.7'	132.1°	48°36.2'	+53.2'	133.0°	47°55.0'	+53.7'	133.8°	20
21	52°42.0'	+49.6'	127.5°	52°05.0'	+50.3'	128.5°	51°27.2'	+51.1'	129.5°	50°48.7'	+51.7'	130.5°	50°09.4'	+52.4'	131.4°	49°29.4'	+52.9'	132.3°	48°48.7'	+53.5'	133.1°	21
22	53°31.5'	+49.1'	126.6°	52°55.4'	+49.9'	127.6°	52°18.3'	+50.7'	128.6°	51°40.4'	+51.4'	129.6°	51°01.8'	+52.0'	130.6°	50°22.3'	+52.7'	1				

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

32° 328° LHA

Latitude SAME as Declination

32° 328° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	33°48.3'	+54.4'	140.4°	33°02.0'	+54.8'	140.8°	32°15.3'	+55.1'	141.2°	31°28.4'	+55.4'	141.6°	30°41.3'	+55.7'	142.0°	29°53.9'	+56.0'	142.3°	29°06.3'	+56.2'	142.7°	0
1	34°42.7'	+54.3'	139.9°	33°56.7'	+54.6'	140.3°	33°10.4'	+55.0'	140.7°	32°23.8'	+55.3'	141.1°	31°37.0'	+55.6'	141.5°	30°49.9'	+55.9'	141.9°	30°02.6'	+56.1'	142.3°	1
2	35°37.0'	+54.2'	139.3°	34°51.4'	+54.5'	139.8°	34°05.4'	+54.9'	140.2°	33°19.1'	+55.2'	140.7°	32°32.6'	+55.5'	141.1°	31°45.8'	+55.8'	141.5°	30°58.7'	+56.1'	141.9°	2
3	36°31.2'	+54.0'	138.8°	35°45.9'	+54.4'	139.3°	35°00.2'	+54.7'	139.8°	34°14.3'	+55.1'	140.2°	33°28.1'	+55.4'	140.6°	32°41.5'	+55.7'	141.0°	31°54.8'	+56.0'	141.4°	3
4	37°25.2'	+53.9'	138.3°	36°40.3'	+54.2'	138.8°	35°55.0'	+54.6'	139.3°	35°09.4'	+55.0'	139.7°	34°23.4'	+55.3'	140.2°	33°37.2'	+55.6'	140.6°	32°50.7'	+55.9'	141.0°	4
5	38°19.1'	+53.7'	137.7°	37°34.5'	+54.1'	138.2°	36°49.6'	+54.5'	138.7°	36°04.3'	+54.8'	139.2°	35°18.7'	+55.2'	139.7°	34°32.8'	+55.5'	140.1°	33°46.6'	+55.8'	140.6°	5
6	39°12.8'	+53.5'	137.1°	38°28.6'	+53.9'	137.7°	37°44.1'	+54.3'	138.2°	36°59.2'	+54.7'	138.7°	36°13.9'	+55.1'	139.2°	35°28.3'	+55.4'	139.7°	34°44.1'	+55.7'	140.1°	6
7	40°06.3'	+53.4'	136.6°	39°22.6'	+53.8'	137.1°	38°38.4'	+54.2'	137.7°	37°53.9'	+54.6'	138.2°	37°09.0'	+54.9'	138.7°	36°23.7'	+55.3'	139.2°	35°38.1'	+55.6'	139.7°	7
8	40°59.7'	+53.2'	136.0°	40°16.3'	+53.6'	136.5°	39°32.6'	+54.0'	137.1°	38°48.4'	+54.4'	137.7°	38°03.9'	+54.8'	138.2°	37°19.0'	+55.1'	138.7°	36°33.7'	+55.5'	139.2°	8
9	41°52.8'	+53.0'	135.3°	41°09.9'	+53.4'	136.0°	40°26.6'	+53.8'	136.5°	39°42.8'	+54.3'	137.1°	38°58.7'	+54.6'	137.7°	38°14.1'	+55.0'	138.2°	37°29.2'	+55.4'	138.7°	9
10	42°45.8'	+52.7'	134.7°	42°03.4'	+53.2'	135.3°	41°20.4'	+53.7'	136.0°	40°37.1'	+54.1'	136.6°	39°53.3'	+54.5'	137.1°	39°09.1'	+54.9'	137.7°	38°24.6'	+55.2'	138.2°	10
11	43°38.5'	+52.5'	134.0°	42°56.6'	+53.0'	134.7°	42°14.1'	+53.5'	135.4°	41°31.2'	+53.9'	136.0°	40°47.8'	+54.3'	136.6°	40°04.0'	+54.7'	137.2°	39°19.8'	+55.1'	137.7°	11
12	44°31.0'	+52.3'	133.4°	43°49.6'	+52.8'	134.1°	43°07.6'	+53.3'	134.7°	42°25.1'	+53.7'	135.4°	41°42.1'	+54.2'	136.0°	40°58.7'	+54.6'	136.6°	40°14.9'	+55.0'	137.2°	12
13	45°23.3'	+52.0'	132.7°	44°42.3'	+52.5'	133.4°	44°00.8'	+53.0'	134.1°	43°18.8'	+53.5'	134.8°	42°36.3'	+54.0'	135.5°	41°53.3'	+54.4'	136.1°	41°09.9'	+54.8'	136.7°	13
14	46°15.3'	+51.7'	132.0°	45°34.9'	+52.3'	132.7°	44°53.9'	+52.8'	133.5°	44°12.4'	+53.3'	134.2°	43°30.3'	+53.8'	134.9°	42°47.7'	+54.2'	135.5°	42°04.7'	+54.7'	136.2°	14
15	47°07.0'	+51.4'	131.2°	46°27.2'	+52.0'	132.0°	45°46.7'	+52.6'	132.8°	45°05.7'	+53.1'	133.5°	44°24.1'	+53.6'	134.2°	43°42.0'	+54.1'	134.9°	42°59.3'	+54.5'	135.6°	15
16	47°58.4'	+51.1'	130.5°	47°19.2'	+51.7'	131.3°	46°39.3'	+52.3'	132.1°	45°58.8'	+52.9'	132.9°	45°17.7'	+53.4'	133.6°	44°36.0'	+53.9'	134.3°	43°53.8'	+54.3'	135.0°	16
17	48°49.6'	+50.8'	129.7°	48°10.9'	+51.4'	130.5°	47°31.6'	+52.0'	131.4°	46°51.6'	+52.6'	132.2°	46°11.0'	+53.1'	132.9°	45°29.9'	+53.6'	133.7°	44°48.1'	+54.1'	134.4°	17
18	49°40.3'	+50.4'	128.9°	49°02.3'	+51.1'	129.8°	48°23.6'	+51.7'	130.6°	47°44.2'	+52.3'	131.5°	47°04.2'	+52.9'	132.3°	46°23.5'	+53.4'	133.1°	45°42.3'	+53.9'	133.8°	18
19	50°30.8'	+50.0'	128.0°	49°53.4'	+50.8'	128.9°	49°15.4'	+51.4'	129.9°	48°36.5'	+52.0'	130.7°	47°57.1'	+52.6'	131.6°	47°16.9'	+53.2'	132.4°	46°36.2'	+53.7'	133.2°	19
20	51°20.8'	+49.6'	127.1°	50°44.2'	+50.4'	128.1°	50°06.8'	+51.1'	129.1°	49°28.6'	+51.7'	130.0°	48°49.7'	+52.3'	130.9°	48°10.1'	+52.9'	131.7°	47°29.9'	+53.5'	132.5°	20
21	52°10.5'	+49.2'	126.2°	51°34.6'	+50.0'	127.2°	50°57.8'	+50.7'	128.2°	50°20.3'	+51.4'	129.2°	49°42.0'	+52.0'	130.1°	49°03.0'	+52.7'	131.0°	48°23.3'	+53.2'	131.8°	21
22	52°59.7'	+48.7'	125.3°	52°24.5'	+49.6'	126.3°	51°48.6'	+50.3'	127.4°	51°11.7'	+51.0'	128.4°	50°34.1'	+51.7'	129.3°	49°55.7'	+52.4'	130.2°	49°16.6'	+53.0'	131.1°	22
23	53°48.4'	+48.2'	124.3°	53°14.1'	+49.1'	125.4°	52°38.9'	+49.9'	126.5°	52°02.8'	+50.7'	127.5°	51°25.8'	+51.4'	128.5°	50°48.0'	+52.0'	129.5°	50°09.5'	+52.7'	130.4°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

32° 328° LHA

Latitude SAME as Declination

32° 328° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

33° 327° LHA

Latitude SAME as Declination

33° 327° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	33°22.9'	+54.2'	139.3°	32°37.3'	+54.5'	139.7°	31°51.4'	+54.8'	140.1°	31°05.2'	+55.2'	140.5°	30°18.8'	+55.5'	140.9°	29°32.1'	+55.7'	141.2°	28°45.2'	+56.0'	141.6°	0
1	34°17.1'	+54.0'	138.8°	33°31.8'	+54.4'	139.2°	32°46.2'	+54.7'	139.6°	32°00.4'	+55.1'	140.0°	31°14.2'	+55.4'	140.4°	30°27.9'	+55.7'	140.8°	29°41.2'	+55.9'	141.2°	1
2	35°11.1'	+53.9'	138.2°	34°26.2'	+54.3'	138.7°	33°41.0'	+54.6'	139.1°	32°55.4'	+54.9'	139.6°	32°09.6'	+55.3'	140.0°	31°23.5'	+55.6'	140.4°	30°37.2'	+55.9'	140.8°	2
3	36°05.0'	+53.7'	137.7°	35°20.5'	+54.1'	138.2°	34°35.6'	+54.5'	138.6°	33°50.4'	+54.8'	139.1°	33°04.9'	+55.2'	139.5°	32°19.1'	+55.5'	139.9°	31°33.0'	+55.8'	140.3°	3
4	36°58.7'	+53.6'	137.1°	36°14.6'	+54.0'	137.7°	35°30.1'	+54.4'	138.1°	34°45.2'	+54.7'	138.6°	34°00.1'	+55.1'	139.1°	33°14.6'	+55.4'	139.5°	32°28.8'	+55.7'	139.9°	4
5	37°52.3'	+53.4'	136.6°	37°08.6'	+53.8'	137.1°	36°24.4'	+54.2'	137.6°	35°39.9'	+54.6'	138.1°	34°55.1'	+54.9'	138.6°	34°10.0'	+55.3'	139.0°	33°24.5'	+55.6'	139.5°	5
6	38°45.7'	+53.2'	136.0°	38°02.4'	+53.7'	136.5°	37°18.6'	+54.1'	137.1°	36°34.5'	+54.5'	137.6°	35°50.0'	+54.8'	138.1°	35°05.2'	+55.2'	138.6°	34°20.1'	+55.5'	139.0°	6
7	39°39.0'	+53.1'	135.4°	38°56.0'	+53.5'	136.0°	38°12.7'	+53.9'	136.5°	37°29.0'	+54.3'	137.1°	36°44.9'	+54.7'	137.6°	36°00.4'	+55.0'	138.1°	35°15.6'	+55.4'	138.5°	7
8	40°32.0'	+52.9'	134.8°	39°49.5'	+53.3'	135.4°	39°06.6'	+53.7'	136.0°	38°23.3'	+54.2'	136.5°	37°39.5'	+54.5'	137.1°	36°55.4'	+54.9'	137.6°	36°11.0'	+55.3'	138.1°	8
9	41°24.9'	+52.6'	134.2°	40°42.8'	+53.1'	134.8°	40°00.4'	+53.6'	135.4°	39°17.4'	+54.0'	136.0°	38°34.1'	+54.4'	136.5°	37°50.4'	+54.8'	137.1°	37°06.2'	+55.1'	137.6°	9
10	42°17.5'	+52.4'	133.5°	41°36.0'	+52.9'	134.2°	40°53.9'	+53.4'	134.8°	40°11.4'	+53.8'	135.4°	39°28.5'	+54.2'	136.0°	38°45.1'	+54.6'	136.5°	38°01.4'	+55.0'	137.1°	10
11	43°10.0'	+52.2'	132.9°	42°28.9'	+52.7'	133.5°	41°47.3'	+53.2'	134.2°	41°05.2'	+53.6'	134.8°	40°22.7'	+54.1'	135.4°	39°39.8'	+54.5'	136.0°	38°56.4'	+54.9'	136.6°	11
12	44°02.1'	+51.9'	132.2°	43°21.6'	+52.5'	132.9°	42°40.5'	+53.0'	133.6°	41°58.9'	+53.5'	134.2°	41°16.8'	+53.9'	134.9°	40°34.3'	+54.3'	135.5°	39°51.3'	+54.7'	136.1°	12
13	44°54.1'	+51.7'	131.5°	44°14.1'	+52.2'	132.2°	43°33.5'	+52.8'	132.9°	42°52.3'	+53.2'	133.6°	42°10.7'	+53.7'	134.3°	41°28.6'	+54.2'	134.9°	40°46.0'	+54.6'	135.5°	13
14	45°45.8'	+51.4'	130.8°	45°06.3'	+52.0'	131.5°	44°26.2'	+52.5'	132.3°	43°45.6'	+53.0'	133.0°	43°04.4'	+53.5'	133.7°	42°22.8'	+54.0'	134.3°	41°40.6'	+54.4'	135.0°	14
15	46°37.1'	+51.1'	130.0°	45°58.2'	+51.7'	130.8°	45°18.7'	+52.3'	131.6°	44°38.6'	+52.8'	132.3°	43°57.9'	+53.3'	133.0°	43°16.7'	+53.8'	133.7°	42°35.0'	+54.2'	134.4°	15
16	47°28.2'	+50.8'	129.2°	46°49.9'	+51.4'	130.1°	46°11.0'	+52.0'	130.9°	45°31.4'	+52.6'	131.6°	44°51.3'	+53.1'	132.4°	44°10.5'	+53.6'	133.1°	43°29.2'	+54.1'	133.8°	16
17	48°19.0'	+50.4'	128.4°	47°41.3'	+51.1'	129.3°	47°03.0'	+51.7'	130.1°	46°24.0'	+52.3'	131.0°	45°44.3'	+52.9'	131.7°	45°04.1'	+53.4'	132.5°	44°23.3'	+53.9'	133.2°	17
18	49°09.4'	+50.1'	127.6°	48°32.4'	+50.8'	128.5°	47°54.7'	+51.4'	129.4°	47°16.3'	+52.0'	130.2°	46°37.2'	+52.6'	131.0°	45°57.5'	+53.1'	131.8°	45°17.2'	+53.7'	132.6°	18
19	49°59.5'	+49.7'	126.8°	49°23.2'	+50.4'	127.7°	48°46.1'	+51.1'	128.6°	48°28.3'	+51.7'	129.5°	47°29.8'	+52.3'	130.3°	46°50.6'	+52.9'	131.2°	46°10.8'	+53.4'	131.9°	19
20	50°49.2'	+49.3'	125.9°	50°13.6'	+50.0'	126.9°	49°37.2'	+50.7'	127.8°	49°00.0'	+51.4'	128.7°	48°22.1'	+52.0'	129.6°	47°43.5'	+52.6'	130.5°	47°04.3'	+53.2		

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

34° 326° LHA

Latitude SAME as Declination

34° 326° LHA

Table with 12 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of celestial coordinates (Hc°, d', Z°).

34° 326° LHA

Latitude SAME as Declination

34° 326° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

35° 325° LHA

Latitude SAME as Declination

35° 325° LHA

Table with 12 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of celestial coordinates (Hc°, d', Z°).

35° 325° LHA

Latitude SAME as Declination

35° 325° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

36° 324° LHA

Latitude SAME as Declination

36° 324° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of coordinate data for 36° latitude.

36° 324° LHA

Latitude SAME as Declination

36° 324° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

37° 323° LHA

Latitude SAME as Declination

37° 323° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of coordinate data for 37° latitude.

37° 323° LHA

Latitude SAME as Declination

37° 323° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

38° 322° LHA

Latitude SAME as Declination

38° 322° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of latitude/longitude data for 38° 322° LHA.

38° 322° LHA

Latitude SAME as Declination

38° 322° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

39° 321° LHA

Latitude SAME as Declination

39° 321° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of latitude/longitude data for 39° 321° LHA.

39° 321° LHA

Latitude SAME as Declination

39° 321° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

40° 320° LHA

Latitude SAME as Declination

40° 320° LHA

Table with 10 columns (Dec, Hc, d, Z for 49-55) and 10 rows (0-23). Contains declination correction data for 40° LHA.

40° 320° LHA

Latitude SAME as Declination

40° 320° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

41° 319° LHA

Latitude SAME as Declination

41° 319° LHA

Table with 10 columns (Dec, Hc, d, Z for 49-55) and 10 rows (0-23). Contains declination correction data for 41° LHA.

41° 319° LHA

Latitude SAME as Declination

41° 319° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

42° 318° LHA		Latitude SAME as Declination								42° 318° LHA															
Dec°	49			50			51			52			53			54			55			Dec°			
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°				
0	29°10.8'	+51.8'	130.0°	28°32.1'	+52.2'	130.4°	27°53.0'	+52.7'	130.8°	27°13.7'	+53.1'	131.2°	26°34.0'	+53.5'	131.6°	25°54.0'	+53.9'	131.9°	25°13.8'	+54.3'	132.3°	0			
1	30°02.6'	+51.6'	129.4°	29°24.3'	+52.1'	129.8°	28°45.7'	+52.6'	130.3°	28°06.8'	+53.0'	130.7°	27°27.5'	+53.4'	131.1°	26°47.9'	+53.8'	131.5°	26°08.1'	+54.2'	131.8°	1			
2	30°54.2'	+51.5'	128.8°	30°16.4'	+52.0'	129.3°	29°38.3'	+52.4'	129.7°	28°59.8'	+52.9'	130.1°	28°20.9'	+53.3'	130.5°	27°41.8'	+53.7'	131.0°	27°02.3'	+54.1'	131.3°	2			
3	31°45.7'	+51.3'	128.2°	31°08.4'	+51.8'	128.7°	30°30.7'	+52.3'	129.1°	29°52.6'	+52.7'	129.6°	29°14.2'	+53.2'	130.0°	28°35.5'	+53.6'	130.4°	27°56.4'	+54.0'	130.9°	3			
4	32°37.0'	+51.1'	127.6°	32°00.2'	+51.6'	128.1°	31°22.9'	+52.1'	128.6°	30°45.3'	+52.6'	129.0°	30°07.4'	+53.0'	129.5°	29°29.0'	+53.5'	129.9°	28°50.4'	+53.9'	130.4°	4			
5	33°28.1'	+50.9'	127.0°	32°51.8'	+51.4'	127.5°	32°15.1'	+52.0'	128.0°	31°37.9'	+52.4'	128.5°	31°00.4'	+52.9'	128.9°	30°22.5'	+53.3'	129.4°	29°44.2'	+53.8'	129.9°	5			
6	34°19.0'	+50.7'	126.3°	33°43.2'	+51.3'	126.9°	33°07.0'	+51.8'	127.4°	32°30.4'	+52.3'	127.9°	31°53.3'	+52.7'	128.4°	31°15.8'	+53.2'	128.9°	30°38.0'	+53.6'	129.3°	6			
7	35°09.7'	+50.5'	125.7°	34°34.5'	+51.1'	126.2°	33°58.8'	+51.6'	126.8°	33°22.6'	+52.1'	127.3°	32°46.0'	+52.6'	127.8°	32°09.0'	+53.1'	128.3°	31°31.6'	+53.5'	128.8°	7			
8	36°00.2'	+50.3'	125.0°	35°25.5'	+50.9'	125.6°	34°50.4'	+51.4'	126.2°	34°14.7'	+51.9'	126.7°	33°38.6'	+52.4'	127.3°	33°02.1'	+52.9'	127.8°	32°25.1'	+53.4'	128.3°	8			
9	36°50.5'	+50.0'	124.3°	36°16.4'	+50.6'	124.9°	35°41.8'	+51.2'	125.5°	35°06.7'	+51.7'	126.1°	34°31.1'	+52.3'	126.7°	33°55.0'	+52.8'	127.2°	33°18.5'	+53.2'	127.7°	9			
10	37°40.6'	+49.8'	123.6°	37°07.0'	+50.4'	124.3°	36°33.0'	+51.0'	124.9°	35°58.4'	+51.5'	125.5°	35°23.3'	+52.1'	126.1°	34°47.8'	+52.6'	126.6°	34°11.7'	+53.1'	127.2°	10			
11	38°30.4'	+49.5'	122.9°	37°57.4'	+50.2'	123.6°	37°24.0'	+50.8'	124.2°	36°50.0'	+51.3'	124.9°	36°15.4'	+51.9'	125.5°	35°40.4'	+52.4'	126.0°	35°04.8'	+52.9'	126.6°	11			
12	39°19.9'	+49.3'	122.2°	38°47.6'	+49.9'	122.9°	38°14.7'	+50.5'	123.6°	37°41.3'	+51.1'	124.2°	37°07.3'	+51.7'	124.8°	36°32.8'	+52.2'	125.4°	35°57.7'	+52.7'	126.0°	12			
13	40°09.1'	+49.0'	121.5°	39°37.5'	+49.6'	122.2°	39°05.3'	+50.3'	122.9°	38°32.4'	+50.9'	123.5°	37°59.0'	+51.5'	124.2°	37°25.0'	+52.0'	124.8°	36°50.5'	+52.6'	125.4°	13			
14	40°58.1'	+48.7'	120.7°	40°27.2'	+49.4'	121.4°	39°55.5'	+50.0'	122.2°	39°23.3'	+50.6'	122.9°	38°50.4'	+51.2'	123.5°	38°17.0'	+51.8'	124.2°	37°43.0'	+52.4'	124.8°	14			
15	41°46.8'	+48.3'	119.9°	41°16.5'	+49.0'	120.7°	40°45.5'	+49.7'	121.4°	40°13.9'	+50.4'	122.2°	39°41.7'	+51.0'	122.9°	39°08.8'	+51.6'	123.5°	38°35.4'	+52.2'	124.2°	15			
16	42°35.1'	+48.0'	119.1°	42°05.6'	+48.7'	119.9°	41°35.3'	+49.4'	120.7°	41°04.3'	+50.1'	121.4°	40°32.7'	+50.8'	122.2°	40°00.4'	+51.4'	122.9°	39°27.5'	+52.0'	123.6°	16			
17	43°23.1'	+47.6'	118.3°	42°54.3'	+48.4'	119.1°	42°24.7'	+49.1'	119.9°	41°54.4'	+49.8'	120.7°	41°23.5'	+50.5'	121.5°	40°51.8'	+51.1'	122.2°	40°19.5'	+51.7'	122.9°	17			
18	44°10.7'	+47.3'	117.5°	43°42.7'	+48.0'	118.3°	43°13.8'	+48.8'	119.1°	42°44.3'	+49.5'	120.0°	42°13.9'	+50.2'	120.7°	41°42.9'	+50.9'	121.5°	41°11.2'	+51.5'	122.3°	18			
19	44°58.0'	+46.8'	116.6°	44°30.7'	+47.7'	117.5°	44°02.6'	+48.4'	118.3°	43°33.8'	+49.2'	119.2°	43°04.1'	+49.9'	120.0°	42°33.8'	+50.6'	120.8°	42°02.7'	+51.2'	121.6°	19			
20	45°44.8'	+46.4'	115.7°	45°18.4'	+47.3'	116.6°	44°51.1'	+48.1'	117.5°	44°23.0'	+48.9'	118.4°	43°54.1'	+49.6'	119.2°	43°24.4'	+50.3'	120.1°	42°54.0'	+51.0'	120.9°	20			
21	46°31.3'	+46.0'	114.8°	46°05.7'	+46.9'	115.7°	45°39.2'	+47.7'	116.7°	45°11.8'	+48.5'	117.6°	44°43.7'	+49.3'	118.4°	44°14.7'	+50.0'	119.3°	43°44.9'	+50.7'	120.1°	21			
22	47°17.2'	+45.5'	113.8°	46°52.5'	+46.4'	114.8°	46°26.9'	+47.3'	115.8°	46°00.3'	+48.1'	116.7°	45°32.9'	+48.9'	117.6°	45°04.7'	+49.7'	118.5°	44°35.6'	+50.4'	119.4°	22			
23	48°02.7'	+45.0'	112.9°	47°38.9'	+45.9'	113.9°	47°14.1'	+46.8'	114.9°	46°48.4'	+47.7'	115.9°	46°21.8'	+48.5'	116.8°	45°54.3'	+49.3'	117.7°	45°26.0'	+50.1'	118.6°	23			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55						

42° 318° LHA Latitude SAME as Declination 42° 318° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

43° 317° LHA		Latitude SAME as Declination								43° 317° LHA												
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	28°40.4'	+51.5'	129.0°	28°02.5'	+52.0'	129.4°	27°24.2'	+52.5'	129.8°	26°45.6'	+52.9'	130.2°	26°06.8'	+53.3'	130.6°	25°27.6'	+53.7'	130.9°	24°48.1'	+54.1'	131.3°	0
1	29°31.9'	+51.4'	128.4°	28°54.5'	+51.9'	128.8°	28°16.7'	+52.3'	129.3°	27°38.5'	+52.8'	129.7°	27°00.1'	+53.2'	130.1°	26°21.3'	+53.6'	130.4°	25°42.2'	+54.0'	130.8°	1
2	30°23.3'	+51.2'	127.8°	29°46.3'	+51.7'	128.3°	29°09.0'	+52.2'	128.7°	28°31.3'	+52.6'	129.1°	27°53.3'	+53.1'	129.5°	27°14.9'	+53.5'	129.9°	26°36.2'	+53.9'	130.3°	2
3	31°14.5'	+51.0'	127.2°	30°38.0'	+51.5'	127.7°	30°01.2'	+52.0'	128.1°	29°23.9'	+52.5'	128.6°	28°46.4'	+53.0'	129.0°	28°08.4'	+53.4'	129.4°	27°30.1'	+53.8'	129.8°	3
4	32°05.6'	+50.9'	126.6°	31°29.6'	+51.4'	127.1°	30°53.2'	+51.9'	127.6°	30°16.5'	+52.4'	128.0°	29°39.3'	+52.8'	128.5°	29°01.8'	+53.3'	128.9°	28°23.9'	+53.7'	129.3°	4
5	32°56.4'	+50.7'	125.9°	32°21.0'	+51.2'	126.5°	31°45.1'	+51.7'	127.0°	31°08.8'	+52.2'	127.5°	30°32.1'	+52.7'	127.9°	29°55.1'	+53.1'	128.4°	29°17.6'	+53.6'	128.8°	5
6	33°47.1'	+50.5'	125.3°	33°12.2'	+51.0'	125.8°	32°36.8'	+51.5'	126.4°	32°01.0'	+52.0'	126.9°	31°24.8'	+52.5'	127.4°	30°48.2'	+53.0'	127.8°	30°11.2'	+53.4'	128.3°	6
7	34°37.5'	+50.2'	124.7°	34°03.2'	+50.8'	125.2°	33°28.3'	+51.4'	125.8°	32°53.1'	+51.9'	126.3°	32°17.3'	+52.4'	126.8°	31°41.2'	+52.9'	127.3°	31°04.6'	+53.3'	127.8°	7
8	35°27.8'	+50.0'	124.0°	34°54.0'	+50.6'	124.6°	34°19.7'	+51.2'	125.1°	33°44.9'	+51.7'	125.7°	33°09.7'	+52.2'	126.2°	32°34.0'	+52.7'	126.7°	31°57.9'	+53.2'	127.2°	8
9	36°17.8'	+49.8'	123.3°	35°44.6'	+50.4'	123.9°	35°10.9'	+51.0'	124.5°	34°36.6'	+51.5'	125.1°	34°01.9'	+52.0'	125.6°	33°26.7'	+52.5'	126.2°	32°51.1'	+53.0'	126.7°	9
10	37°07.6'	+49.5'	122.6°	36°35.0'	+50.2'	123.2°	36°01.8'	+50.7'	123.8°	35°28.1'	+51.3'	124.4°	34°54.0'	+51.9'	125.0°	34°19.3'	+52.4'	125.6°	33°44.1'	+52.9'	126.1°	10
11	37°57.1'	+49.3'	121.9°	37°25.1'	+49.9'	122.5°	36°52.6'	+50.5'	123.2°	36°19.5'	+51.1'	123.8°	35°45.8'	+51.7'	124.4°	35°11.6'	+52.2'	125.0°	34°37.0'	+52.7'	125.6°	11
12	38°46.4'	+49.0'	121.2°	38°15.0'	+49.7'	121.8°	37°43.1'	+50.3'	122.5°	37°10.6'	+50.9'	123.2°	36°37.5'	+51.5'	123.8°	36°03.8'	+52.0'	124.4°	35°29.7'	+52.5'	125.0°	12
13	39°35.4'	+48.7'	120.4°	39°04.7'	+49.4'	121.1°	38°33.4'	+50.0'	121.8°	38°01.4'	+50.6'	122.5°	37°28.9'	+51.2'	123.1°	36°55.8'	+51.8'	123.8°	36°22.2'	+52.4'	124.4°	13
14	40°24.1'	+48.4'	119.7°	39°54.1'	+49.1'	120.4°	39°23.4'	+49.8'	121.1°	38°52.1'	+50.4'	121.8°	38°20.2'	+51.0'	122.5°	37°47.7'	+51.6'	123.1°	37°14.6'	+52.2'	123.8°	14
15	41°12.5'	+48.1'	118.9°	40°43.2'	+48.8'	119.6°	40°13.1'	+49.5'	120.4°	39°42.5'	+50.1'	121.1°	39°11.2'	+50.8'	121.8°	38°39.3'	+51.4'	122.5°	38°06.7'	+52.0'	123.1°	15
16	42°00.6'	+47.7'	118.1°	41°31.9'	+48.5'	118.9°	41°02.6'	+49.2'	119.6°	40°32.6'	+49.9'	120.4°	40°02.0'	+50.5'	121.1°	39°30.6'	+51.1'	121.8°	38°58.7'	+51.7'	122.5°	16
17	42°48.3'	+47.4'	117.3°	42°20.4'	+48.1'	118.1°	41°51.8'	+48.9'	118.9°	41°22.5'	+49.6'	119.6°	40°52.5'	+50.3'	120.4°	40°21.8'	+50.9'	121.1°	39°50.4'	+51.5'	121.9°	17
18	43°35.6'	+47.0'	116.4°	43°08.6'	+47.8'	117.3°	42°40.7'	+48.5'	118.1°	42°12.1'	+49.3'	118.9°	41°42.7'	+50.0'	119.7°	41°12.7'	+50.6'	120.4°	40°42.0'	+51.3'	121.2°	18
19	44°22.6'	+46.6'	115.6°	43°56.3'	+47.4'	116.4°	43°29.2'	+48.2'	117.3°	43°01.4'	+49.0'	118.1°	42°32.7'	+49.7'	118.9°	42°03.3'	+50.4'	119.7°	41°33.2'	+51.0'	120.5°	19
20	45°09.2'	+46.2'	114.7°	44°43.8'	+47.0'	115.6°	44°17.4'	+47.8'	116.5°	43°50.3'	+48.6'	117.3°	43°22.4'	+49.4'	118.2°	42°53.7'	+50.1'	119.0°	42°24.2'	+50.8'	119.8°	20
21	45°55.4'	+45.7'	113.8°	45°30.8'	+46.6'	114.7°	45°05.3'	+47.4'	115.6°	44°38.9'	+48.3'	116.5°	44°11.7'	+49.0'	117.4°	43°43.8						

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

44° 316° LHA

Latitude SAME as Declination

44° 316° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	28°09.6'	+51.3'	128.0°	27°32.5'	+51.8'	128.4°	26°55.0'	+52.2'	128.8°	26°17.2'	+52.7'	129.2°	25°39.1'	+53.1'	129.6°	25°00.8'	+53.5'	130.0°	24°22.1'	+53.9'	130.3°	0
1	29°00.9'	+51.1'	127.4°	28°24.2'	+51.6'	127.9°	27°47.2'	+52.1'	128.3°	27°09.9'	+52.5'	128.7°	26°32.2'	+53.0'	129.1°	25°54.3'	+53.4'	129.5°	25°16.0'	+53.8'	129.8°	1
2	29°52.0'	+51.0'	126.8°	29°15.8'	+51.5'	127.3°	28°39.3'	+52.0'	127.7°	28°02.5'	+52.4'	128.1°	27°25.2'	+52.9'	128.5°	26°47.7'	+53.3'	128.9°	26°09.8'	+53.7'	129.3°	2
3	30°43.0'	+50.8'	126.2°	30°07.3'	+51.3'	126.7°	29°31.3'	+51.8'	127.1°	28°54.9'	+52.3'	127.6°	28°18.1'	+52.7'	128.0°	27°41.0'	+53.2'	128.4°	27°03.5'	+53.6'	128.8°	3
4	31°33.7'	+50.6'	125.6°	30°58.6'	+51.1'	126.1°	30°23.1'	+51.6'	126.6°	29°47.2'	+52.1'	127.0°	29°10.8'	+52.6'	127.5°	28°34.2'	+53.1'	127.9°	27°57.1'	+53.5'	128.3°	4
5	32°24.3'	+50.4'	124.9°	31°49.8'	+51.0'	125.5°	31°14.7'	+51.5'	126.0°	30°39.3'	+52.0'	126.4°	30°03.4'	+52.5'	126.9°	29°27.2'	+52.9'	127.4°	28°50.6'	+53.4'	127.8°	5
6	33°14.8'	+50.2'	124.3°	32°40.7'	+50.8'	124.8°	32°06.2'	+51.3'	125.4°	31°31.3'	+51.8'	125.9°	31°05.9'	+52.3'	126.4°	30°20.1'	+52.8'	126.8°	29°44.0'	+53.2'	127.3°	6
7	34°05.0'	+50.0'	123.6°	33°31.5'	+50.6'	124.2°	32°57.5'	+51.1'	124.7°	32°23.1'	+51.6'	125.3°	31°48.2'	+52.2'	125.8°	31°12.9'	+52.6'	126.3°	30°37.2'	+53.1'	126.8°	7
8	34°54.9'	+49.8'	123.0°	34°22.0'	+50.4'	123.6°	33°48.6'	+50.9'	124.1°	33°14.7'	+51.5'	124.7°	32°40.4'	+52.0'	125.2°	32°05.6'	+52.5'	125.7°	31°30.3'	+53.0'	126.2°	8
9	35°44.7'	+49.5'	122.3°	35°12.4'	+50.1'	122.9°	34°39.6'	+50.7'	123.5°	34°06.2'	+51.3'	124.0°	33°32.4'	+51.8'	124.6°	32°58.1'	+52.3'	125.1°	32°23.3'	+52.8'	125.7°	9
10	36°34.2'	+49.3'	121.6°	36°02.5'	+49.9'	122.2°	35°30.3'	+50.5'	122.8°	34°57.5'	+51.1'	123.4°	34°24.2'	+51.6'	124.0°	33°50.4'	+52.2'	124.5°	33°16.1'	+52.7'	125.1°	10
11	37°23.5'	+49.0'	120.9°	36°52.4'	+49.7'	121.5°	36°20.8'	+50.3'	122.2°	35°48.6'	+50.9'	122.8°	35°15.8'	+51.4'	123.4°	34°42.6'	+52.0'	124.0°	34°08.8'	+52.5'	124.5°	11
12	38°12.5'	+48.7'	120.1°	37°42.1'	+49.4'	120.8°	37°11.1'	+50.0'	121.5°	36°39.4'	+50.6'	122.1°	36°07.3'	+51.2'	122.7°	35°34.6'	+51.8'	123.3°	35°01.3'	+52.3'	123.9°	12
13	39°01.3'	+48.4'	119.4°	38°31.5'	+49.1'	120.1°	38°01.1'	+49.8'	120.8°	37°30.1'	+50.4'	121.4°	36°58.5'	+51.0'	122.1°	36°26.4'	+51.6'	122.7°	35°53.7'	+52.1'	123.3°	13
14	39°49.7'	+48.1'	118.6°	39°20.6'	+48.8'	119.4°	38°50.9'	+49.5'	120.1°	38°20.5'	+50.2'	120.8°	37°49.5'	+50.8'	121.4°	37°17.9'	+51.4'	122.1°	36°45.8'	+52.0'	122.7°	14
15	40°37.8'	+47.8'	117.9°	40°09.5'	+48.5'	118.6°	39°40.4'	+49.2'	119.3°	39°10.7'	+49.9'	120.1°	38°40.3'	+50.6'	120.7°	38°09.3'	+51.2'	121.4°	37°37.8'	+51.7'	122.1°	15
16	41°25.7'	+47.5'	117.1°	40°58.0'	+48.2'	117.8°	40°29.6'	+48.9'	118.6°	40°00.6'	+49.6'	119.3°	39°30.9'	+50.3'	120.1°	39°00.5'	+50.9'	120.8°	38°29.5'	+51.5'	121.4°	16
17	42°13.1'	+47.1'	116.2°	41°46.2'	+47.9'	117.0°	41°18.6'	+48.6'	117.8°	40°50.2'	+49.3'	118.6°	40°21.2'	+50.0'	119.3°	39°51.4'	+50.7'	120.1°	39°21.0'	+51.3'	120.8°	17
18	43°00.2'	+46.7'	115.4°	42°34.1'	+47.5'	116.2°	42°07.2'	+48.3'	117.0°	41°39.6'	+49.0'	117.8°	41°11.2'	+49.7'	118.6°	40°42.1'	+50.4'	119.4°	40°12.3'	+51.1'	120.1°	18
19	43°47.0'	+46.3'	114.5°	43°21.7'	+47.2'	115.4°	42°55.5'	+48.0'	116.2°	42°28.6'	+48.7'	117.1°	42°00.9'	+49.4'	117.9°	41°32.5'	+50.1'	118.7°	41°03.4'	+50.8'	119.4°	19
20	44°33.3'	+45.9'	113.6°	44°08.8'	+46.8'	114.5°	43°43.5'	+47.6'	115.4°	43°17.3'	+48.4'	116.3°	42°50.4'	+49.1'	117.1°	42°22.7'	+49.9'	117.9°	41°54.2'	+50.5'	118.7°	20
21	45°19.2'	+45.5'	112.7°	44°55.6'	+46.4'	113.7°	44°31.1'	+47.2'	114.6°	44°05.7'	+48.0'	115.4°	43°39.5'	+48.8'	116.3°	43°12.5'	+49.5'	117.2°	42°44.8'	+50.3'	118.0°	21
22	46°04.7'	+45.0'	111.8°	45°41.9'	+45.9'	112.8°	45°18.3'	+46.8'	113.7°	44°53.7'	+47.6'	114.6°	44°28.3'	+48.4'	115.5°	44°02.1'	+49.2'	116.4°	43°35.0'	+50.0'	117.2°	22
23	46°49.7'	+44.5'	110.8°	46°27.8'	+45.4'	111.8°	46°05.1'	+46.4'	112.8°	45°41.4'	+47.2'	113.7°	45°16.8'	+48.1'	114.7°	44°51.3'	+48.9'	115.6°	44°25.0'	+49.6'	116.5°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

44° 316° LHA

Latitude SAME as Declination

44° 316° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

45° 315° LHA

Latitude SAME as Declination

45° 315° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	27°38.4'	+51.0'	127.0°	27°02.0'	+51.5'	127.5°	26°25.4'	+52.0'	127.9°	25°48.4'	+52.5'	128.2°	25°11.1'	+52.9'	128.6°	24°33.5'	+53.3'	129.0°	23°55.6'	+53.7'	129.3°	0
1	28°29.4'	+50.9'	126.4°	27°53.6'	+51.4'	126.9°	27°17.4'	+51.9'	127.3°	26°40.9'	+52.3'	127.7°	26°04.0'	+52.8'	128.1°	25°26.8'	+53.2'	128.5°	24°49.4'	+53.6'	128.8°	1
2	29°20.3'	+50.7'	125.8°	28°45.0'	+51.2'	126.3°	28°09.3'	+51.7'	126.7°	27°33.2'	+52.2'	127.1°	26°56.8'	+52.7'	127.6°	26°20.1'	+53.1'	128.0°	25°43.0'	+53.5'	128.3°	2
3	30°11.0'	+50.5'	125.2°	29°36.2'	+51.1'	125.7°	29°01.0'	+51.6'	126.1°	28°25.4'	+52.1'	126.6°	27°49.5'	+52.5'	127.0°	27°13.2'	+53.0'	127.4°	26°36.5'	+53.4'	127.8°	3
4	31°01.5'	+50.4'	124.6°	30°27.2'	+50.9'	125.1°	29°52.6'	+51.4'	125.6°	29°17.5'	+51.9'	126.0°	28°42.0'	+52.4'	126.5°	28°06.1'	+52.9'	126.9°	27°29.9'	+53.3'	127.3°	4
5	31°51.9'	+50.2'	124.0°	31°18.1'	+50.7'	124.5°	30°44.0'	+51.2'	125.0°	30°09.1'	+51.8'	125.4°	29°34.4'	+52.3'	125.9°	28°59.0'	+52.8'	126.4°	28°23.2'	+53.2'	126.8°	5
6	32°42.0'	+50.0'	123.3°	32°08.9'	+50.5'	123.8°	31°35.2'	+51.1'	124.4°	31°01.1'	+51.6'	124.9°	30°26.6'	+52.1'	125.3°	29°51.7'	+52.6'	125.8°	29°16.4'	+53.1'	126.3°	6
7	33°32.0'	+49.7'	122.7°	32°59.4'	+50.3'	123.2°	32°26.3'	+50.9'	123.7°	31°52.7'	+51.4'	124.3°	31°18.7'	+51.9'	124.8°	30°44.3'	+52.4'	125.3°	30°09.5'	+52.9'	125.7°	7
8	34°21.7'	+49.5'	122.0°	33°49.7'	+50.1'	122.5°	33°17.2'	+50.7'	123.1°	32°44.2'	+51.2'	123.6°	32°10.7'	+51.8'	124.2°	31°36.8'	+52.3'	124.7°	31°02.4'	+52.8'	125.2°	8
9	35°11.3'	+49.3'	121.3°	34°39.8'	+49.9'	121.9°	34°07.9'	+50.5'	122.5°	33°35.4'	+51.1'	123.0°	33°02.5'	+51.6'	123.6°	32°29.1'	+52.1'	124.1°	31°55.2'	+52.6'	124.6°	9
10	36°00.5'	+49.0'	120.6°	35°29.7'	+49.7'	121.2°	34°58.4'	+50.3'	121.8°	34°26.5'	+50.9'	122.4°	33°54.1'	+51.4'	123.0°	33°21.2'	+52.0'	123.5°	32°47.8'	+52.5'	124.1°	10
11	36°49.6'	+48.8'	119.9°	36°19.4'	+49.4'	120.5°	35°48.6'	+50.0'	121.1°	35°17.3'	+50.6'	121.7°	34°45.5'	+51.2'	122.3°	34°13.1'	+51.8'	122.9°	33°40.3'	+52.3'	123.5°	11
12	37°38.3'	+48.5'	119.1°	37°08.8'	+49.2'	119.8°	36°38.7'	+49.8'	120.5°	36°08.0'	+50.4'	121.1°	35°36.7'	+51.0'	121.7°	35°04.9'	+51.6'	122.3°	34°32.6'	+52.1'	122.9°	12
13	38°26.8'	+48.2'	118.4°	37°58.0'	+48.9'	119.1°	37°28.5'	+49.6'	119.8°	36°58.4'	+50.2'	120.4°	36°27.7'	+50.8'	121.1°	35°56.5'	+51.4'	121.7°	35°24.7'	+51.9'	122.3°	13
14	39°15.0'	+47.9'	117.6°	38°46.8'	+48.6'	118.3°	38°18.0'	+49.3'	119.0°	37°48.6'	+49.9'	119.7°	37°18.5'	+50.6'	120.4°	36°47.9'	+51.2'	121.0°	36°16.7'	+51.8'	121.7°	14
15	40°02.9'	+47.6'	116.8°	39°35.4'	+48.3'	117.6°	39°07.3'	+49.0'	118.3°	38°38.5'	+49.7'	119.0°	38°09.1'	+50.3'	119.7°	37°39.1'	+51.0'	120.4°	37°08.4'	+51.5'	121.0°	15
16	40°50.4'	+47.2'	116.0°	40°23.7'	+48.0'	116.8°	39°56.3'	+48.7'	117.6°	39°28.2'	+49.4'	118.3°	38°59.5'	+50.1'	119.0°	38°30.0'	+50.7'	119.7°	38°00.0'	+51.3'	120.4°	16
17	41°37.7'	+46.9'	115.2°	41°11.7'	+47.6'	116.0°	40°45.0'	+48.4'	116.8°	40°17.6'	+49.1'	117.6°	39°49.5'	+49.8'	118.3°	39°20.7'	+50.5'	119.0°	38°51.3'	+51.1'	119.7°	17
18	42°24.5'	+46.5'	114.4°	41°59.4'	+47.3'	115.2°	41°33.4'	+48.1'	116.0°	41°06.8'	+48.8'	116.8°	40°39.3'	+49.5'	117.6°	40°11.2'	+50.2'	118.3°	39°42.4'	+50.9'	119.1°	18
19	43°11.0'	+46.1'	113.5°	42°46.7'	+46.9'	114.4°	42°21.5'	+47.7'	115.2°	41°55.6'	+48.5'	116.0°	41°28.9'	+49.2'	116.8°	41°01.4'	+49.9'	117.6°	40°33.3'	+50.6'	118.4°	19
20	43°57.1'	+45.7'	112.6°	43°33.6'	+46.5'	113.5°	43°09.2'	+47.4'	114.4°	42°44.1'	+48.2'	115.2°	42°18.1'	+48.9'	116.1°	4						

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

46° 314° LHA

Latitude SAME as Declination

46° 314° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data including Hc, d, and Z values.

46° 314° LHA

Latitude SAME as Declination

46° 314° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

47° 313° LHA

Latitude SAME as Declination

47° 313° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data including Hc, d, and Z values.

47° 313° LHA

Latitude SAME as Declination

47° 313° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

48° 312° LHA

Latitude SAME as Declination

48° 312° LHA

Table with 24 rows (Dec 0-23) and columns for LHA (49-55) and Dec. Each cell contains three coordinate values (Hc, d, Z).

48° 312° LHA

Latitude SAME as Declination

48° 312° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

49° 311° LHA

Latitude SAME as Declination

49° 311° LHA

Table with 24 rows (Dec 0-23) and columns for LHA (49-55) and Dec. Each cell contains three coordinate values (Hc, d, Z).

49° 311° LHA

Latitude SAME as Declination

49° 311° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

50° 310° LHA

Latitude SAME as Declination

50° 310° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	24°56.5'	+49.9'	122.3°	24°24.3'	+50.4'	122.7°	23°51.7'	+50.9'	123.1°	23°18.7'	+51.4'	123.5°	22°45.5'	+51.9'	123.8°	22°11.9'	+52.4'	124.2°	21°38.1'	+52.8'	124.5°	0
1	25°46.4'	+49.7'	121.7°	25°14.7'	+50.3'	122.1°	24°42.6'	+50.8'	122.5°	24°10.1'	+51.3'	122.9°	23°37.4'	+51.8'	123.3°	23°04.3'	+52.3'	123.6°	22°30.9'	+52.7'	124.0°	1
2	26°36.1'	+49.5'	121.1°	26°04.9'	+50.1'	121.5°	25°33.4'	+50.6'	121.9°	25°01.4'	+51.2'	122.3°	24°29.2'	+51.7'	122.7°	23°56.6'	+52.2'	123.1°	23°23.6'	+52.6'	123.5°	2
3	27°25.7'	+49.4'	120.5°	26°55.0'	+49.9'	120.9°	26°24.0'	+50.5'	121.3°	25°52.6'	+51.0'	121.8°	25°20.8'	+51.5'	122.2°	24°48.7'	+52.0'	122.6°	24°16.3'	+52.5'	122.9°	3
4	28°15.0'	+49.2'	119.8°	27°45.0'	+49.8'	120.3°	27°14.5'	+50.3'	120.7°	26°43.6'	+50.9'	121.2°	26°12.4'	+51.4'	121.6°	25°40.8'	+51.9'	122.0°	25°08.8'	+52.4'	122.4°	4
5	29°04.2'	+49.0'	119.2°	28°34.7'	+49.6'	119.7°	28°04.8'	+50.2'	120.1°	27°34.5'	+50.7'	120.6°	27°03.8'	+51.3'	121.0°	26°32.7'	+51.8'	121.5°	26°01.2'	+52.3'	121.9°	5
6	29°53.2'	+48.8'	118.5°	29°24.3'	+49.4'	119.0°	28°55.0'	+50.0'	119.5°	28°25.2'	+50.6'	120.0°	27°55.1'	+51.1'	120.4°	27°24.5'	+51.6'	120.9°	26°53.5'	+52.1'	121.3°	6
7	30°42.0'	+48.6'	117.8°	30°13.7'	+49.2'	118.4°	29°45.0'	+49.8'	118.9°	29°15.8'	+50.4'	119.4°	28°46.2'	+51.0'	119.8°	28°16.1'	+51.5'	120.3°	27°45.6'	+52.0'	120.8°	7
8	31°30.6'	+48.4'	117.2°	31°02.9'	+49.0'	117.7°	30°34.8'	+49.6'	118.2°	30°06.2'	+50.2'	118.7°	29°37.1'	+50.8'	119.2°	29°07.6'	+51.3'	119.7°	28°37.6'	+51.9'	120.2°	8
9	32°18.9'	+48.1'	116.5°	31°51.9'	+48.8'	117.0°	31°24.4'	+49.4'	117.6°	30°56.4'	+50.0'	118.1°	30°27.9'	+50.6'	118.6°	29°58.9'	+51.2'	119.1°	29°29.5'	+51.7'	119.6°	9
10	33°07.0'	+47.9'	115.7°	32°40.7'	+48.5'	116.3°	32°13.8'	+49.2'	116.9°	31°46.4'	+49.8'	117.5°	31°18.5'	+50.4'	118.0°	30°50.1'	+51.0'	118.5°	30°21.2'	+51.6'	119.0°	10
11	33°54.9'	+47.6'	115.0°	33°29.2'	+48.3'	115.6°	33°03.0'	+49.0'	116.2°	32°36.2'	+49.6'	116.8°	32°08.9'	+50.2'	117.4°	31°41.1'	+50.8'	117.9°	31°12.8'	+51.4'	118.4°	11
12	34°42.5'	+47.3'	114.3°	34°17.5'	+48.0'	114.9°	33°52.0'	+48.7'	115.5°	33°25.8'	+49.4'	116.1°	32°59.1'	+50.0'	116.7°	32°31.9'	+50.6'	117.3°	32°04.1'	+51.2'	117.8°	12
13	35°29.9'	+47.1'	113.5°	35°05.6'	+47.8'	114.2°	34°40.7'	+48.5'	114.8°	34°15.2'	+49.2'	115.4°	33°49.2'	+49.8'	116.0°	33°22.5'	+50.4'	116.6°	32°55.4'	+51.0'	117.2°	13
14	36°16.9'	+46.8'	112.8°	35°53.4'	+47.5'	113.4°	35°29.2'	+48.2'	114.1°	35°04.4'	+48.9'	114.7°	34°39.0'	+49.6'	115.4°	34°13.0'	+50.2'	116.0°	33°46.4'	+50.8'	116.6°	14
15	37°03.7'	+46.6'	112.0°	36°40.9'	+47.2'	112.7°	36°17.4'	+47.9'	113.4°	35°53.3'	+48.7'	114.0°	35°28.6'	+49.3'	114.7°	35°03.2'	+50.0'	115.3°	34°37.2'	+50.6'	116.0°	15
16	37°50.1'	+46.1'	111.2°	37°28.1'	+46.9'	111.9°	37°05.4'	+47.7'	112.6°	36°42.0'	+48.4'	113.3°	36°17.9'	+49.1'	114.0°	35°53.2'	+49.8'	114.6°	35°27.9'	+50.4'	115.3°	16
17	38°36.2'	+45.8'	110.4°	38°15.0'	+46.6'	111.1°	37°53.0'	+47.4'	111.8°	37°30.3'	+48.1'	112.6°	37°07.0'	+48.8'	113.3°	36°42.9'	+49.5'	114.0°	36°18.3'	+50.2'	114.6°	17
18	39°22.0'	+45.4'	109.5°	39°01.6'	+46.2'	110.3°	38°40.4'	+47.0'	111.1°	38°18.4'	+47.8'	111.8°	37°55.8'	+48.5'	112.5°	37°32.5'	+49.3'	113.2°	37°08.4'	+49.9'	113.9°	18
19	40°07.4'	+45.0'	108.7°	39°47.8'	+45.9'	109.5°	39°27.4'	+46.7'	110.3°	39°06.2'	+47.5'	111.0°	38°44.3'	+48.2'	111.8°	38°21.7'	+49.0'	112.5°	37°58.4'	+49.7'	113.2°	19
20	40°52.5'	+44.6'	107.8°	40°33.7'	+45.5'	108.6°	40°14.1'	+46.3'	109.4°	39°53.7'	+47.2'	110.2°	39°32.6'	+47.9'	111.0°	39°10.7'	+48.7'	111.8°	38°48.1'	+49.4'	112.5°	20
21	41°37.1'	+44.2'	106.9°	41°19.2'	+45.1'	107.8°	41°00.4'	+46.0'	108.6°	40°40.9'	+46.8'	109.4°	40°20.5'	+47.6'	110.2°	39°59.4'	+48.4'	111.0°	39°37.5'	+49.1'	111.8°	21
22	42°21.3'	+43.8'	106.0°	42°04.3'	+44.7'	106.9°	41°46.4'	+45.6'	107.8°	41°27.7'	+46.4'	108.6°	41°08.1'	+47.3'	109.4°	40°47.8'	+48.1'	110.2°	40°26.6'	+48.8'	111.0°	22
23	43°05.0'	+43.3'	105.1°	42°49.0'	+44.3'	106.0°	42°32.0'	+45.2'	106.9°	42°14.1'	+46.1'	107.7°	41°55.4'	+46.9'	108.6°	41°35.9'	+47.7'	109.5°	41°15.5'	+48.5'	110.3°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°

50° 310° LHA

Latitude SAME as Declination

50° 310° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

51° 309° LHA

Latitude SAME as Declination

51° 309° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	24°23.1'	+49.6'	121.4°	23°51.7'	+50.2'	121.8°	23°19.9'	+50.7'	122.2°	22°47.7'	+51.2'	122.5°	22°15.3'	+51.7'	122.9°	21°42.6'	+52.2'	123.2°	21°09.6'	+52.7'	123.6°	0
1	25°12.8'	+49.5'	120.8°	24°41.8'	+50.0'	121.2°	24°10.6'	+50.6'	121.6°	23°39.0'	+51.1'	122.0°	23°07.0'	+51.6'	122.3°	22°34.8'	+52.1'	122.7°	22°02.2'	+52.6'	123.0°	1
2	26°02.2'	+49.3'	120.2°	25°31.9'	+49.9'	120.6°	25°01.2'	+50.4'	121.0°	24°30.1'	+51.0'	121.4°	23°58.6'	+51.5'	121.8°	23°26.9'	+52.0'	122.2°	22°54.8'	+52.5'	122.5°	2
3	26°51.6'	+49.1'	119.5°	26°21.8'	+49.7'	120.0°	25°51.6'	+50.3'	120.4°	25°21.0'	+50.8'	120.8°	24°50.1'	+51.4'	121.2°	24°18.8'	+51.9'	121.6°	23°47.2'	+52.3'	122.0°	3
4	27°40.7'	+49.0'	118.9°	27°11.5'	+49.6'	119.4°	26°41.9'	+50.1'	119.8°	26°11.9'	+50.7'	120.2°	25°41.5'	+51.2'	120.6°	25°10.7'	+51.7'	121.1°	24°39.6'	+52.2'	121.5°	4
5	28°29.7'	+48.8'	118.2°	28°01.1'	+49.4'	118.7°	27°32.0'	+50.0'	119.2°	27°02.6'	+50.5'	119.6°	26°32.7'	+51.1'	120.1°	26°02.4'	+51.6'	120.5°	25°31.8'	+52.1'	120.9°	5
6	29°18.5'	+48.6'	117.6°	28°50.4'	+49.2'	118.1°	28°22.0'	+49.8'	118.6°	27°53.1'	+50.4'	119.0°	27°23.8'	+50.9'	119.5°	26°54.0'	+51.5'	119.9°	25°23.9'	+52.0'	120.4°	6
7	30°07.0'	+48.4'	116.9°	29°39.6'	+49.0'	117.4°	29°11.8'	+49.6'	117.9°	28°43.5'	+50.2'	118.4°	28°14.7'	+50.8'	118.9°	27°45.5'	+51.3'	119.3°	27°15.9'	+51.8'	119.8°	7
8	30°55.4'	+48.1'	116.2°	30°28.6'	+48.8'	116.8°	30°01.4'	+49.4'	117.3°	29°33.7'	+50.0'	117.8°	29°05.5'	+50.6'	118.3°	28°36.8'	+51.2'	118.8°	28°07.7'	+51.7'	119.2°	8
9	31°43.5'	+47.9'	115.5°	31°17.4'	+48.6'	116.1°	30°50.8'	+49.2'	116.6°	30°23.7'	+49.8'	117.1°	29°56.1'	+50.4'	117.7°	29°28.0'	+51.0'	118.2°	28°59.4'	+51.5'	118.7°	9
10	32°31.4'	+47.7'	114.8°	32°06.0'	+48.3'	115.4°	31°40.0'	+49.0'	115.9°	31°13.5'	+49.6'	116.5°	30°46.5'	+50.2'	117.0°	30°19.0'	+50.8'	117.6°	29°51.0'	+51.4'	118.1°	10
11	33°19.1'	+47.4'	114.1°	32°54.3'	+48.1'	114.7°	32°29.0'	+48.8'	115.3°	32°03.1'	+49.4'	115.8°	31°36.7'	+50.0'	116.4°	31°09.8'	+50.6'	116.9°	30°42.4'	+51.2'	117.5°	11
12	34°06.5'	+47.1'	113.4°	33°42.4'	+47.8'	114.0°	33°17.8'	+48.5'	114.6°	32°52.5'	+49.2'	115.2°	32°26.8'	+49.8'	115.7°	32°00.4'	+50.5'	116.3°	31°33.6'	+51.0'	116.9°	12
13	34°53.6'	+46.9'	112.6°	34°30.3'	+47.6'	113.2°	34°06.3'	+48.3'	113.9°	33°41.7'	+49.0'	114.5°	33°16.6'	+49.6'	115.1°	32°50.9'	+50.3'	115.7°	32°24.6'	+50.9'	116.2°	13
14	35°40.5'	+46.6'	111.8°	35°17.9'	+47.3'	112.5°	34°54.6'	+48.0'	113.1°	34°30.7'	+48.7'	113.8°	34°06.2'	+49.4'	114.4°	33°41.1'	+50.0'	115.0°	33°15.5'	+50.7'	115.6°	14
15	36°27.1'	+46.2'	111.1°	36°05.2'	+47.0'	111.7°	35°42.6'	+47.8'	112.4°	35°19.4'	+48.5'	113.1°	34°55.6'	+49.2'	113.7°	34°31.2'	+49.8'	114.3°	34°06.2'	+50.5'	115.0°	15
16	37°13.3'	+45.9'	110.3°	36°52.2'	+46.7'	111.0°	36°30.4'	+47.5'	111.7°	36°07.9'	+48.2'	112.3°	35°44.8'	+48.9'	113.0°	35°21.0'	+49.6'	113.7°	34°56.6'	+50.2'	114.3°	16
17	37°59.2'	+45.6'	109.4°	37°38.9'	+46.4'	110.2°	37°17.9'	+47.2'	110.9°	36°56.1'	+47.9'	111.6°	36°33.7'	+48.6'	112.3°	36°10.6'	+49.3'	113.0°	35°46.9'	+50.0'	113.6°	17
18	38°44.8'	+45.2'	108.6°	38°25.3'	+46.1'	109.4°	38°05.0'	+46.9'	110.1°	37°44.0'	+47.6'	110.8°	37°22.3'	+48.4'	111.6°	37°00.0'	+49.1'	112.3°	36°36.9'	+49.8'	113.3°	18
19	39°30.0'	+44.8'	107.8°	39°11.3'	+45.7'	108.5°	38°51.9'	+46.5'	109.3°	38°31.7'	+47.3'	110.1°	38°10.7'	+48.1'	110.8°	37°49.0'	+48.8'	111.5°	37°26.6'	+49.5'	112.0°	19
20	40°14.9'	+44.4'	106.9°	39°57.0'	+45.3'	107.7°	39°38.4'	+46.2'	108.5°	39°19.0'	+47.0'	109.3°	38°58.8'	+47.8'	110.0°	38°37.8'	+48.5'	110.8°	38°16.2'	+49.3'	111.5°	20
21	40°59.3'	+44.0'	106.0°	40°42.4'	+44.9'	106.8°	40°24.6'	+45.8'	107.7°	40°05.9'	+46.6'	108.5°	39°46.5'	+47.4'	109.3°	39°26.4'	+48.2'	110.0°	39°05.4'	+49.0'	110.8°	21
22	41°43.4'	+43.6'	105.1°																			

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

52° 308° LHA

Latitude SAME as Declination

52° 308° LHA

Table with 11 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data for 52° 308° LHA.

52° 308° LHA

Latitude SAME as Declination

52° 308° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

53° 307° LHA

Latitude SAME as Declination

53° 307° LHA

Table with 11 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data for 53° 307° LHA.

53° 307° LHA

Latitude SAME as Declination

53° 307° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

54° 306° LHA

Latitude SAME as Declination

54° 306° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	22°40.9'	+49.0'	118.7°	22°11.9'	+49.6'	119.1°	21°42.6'	+50.1'	119.5°	21°12.9'	+50.7'	119.8°	20°43.0'	+51.2'	120.1°	20°12.7'	+51.7'	120.4°	19°42.2'	+52.2'	120.8°	0
1	23°29.9'	+48.9'	118.1°	23°01.5'	+49.4'	118.5°	22°32.7'	+50.0'	118.9°	22°03.6'	+50.5'	119.2°	21°34.1'	+51.1'	119.6°	21°04.4'	+51.6'	119.9°	20°34.3'	+52.1'	120.2°	1
2	24°18.8'	+48.7'	117.5°	23°50.9'	+49.3'	117.9°	23°22.7'	+49.9'	118.3°	22°54.1'	+50.4'	118.6°	22°25.2'	+50.9'	119.0°	21°56.0'	+51.5'	119.4°	21°26.4'	+52.0'	119.7°	2
3	25°07.5'	+48.5'	116.8°	24°40.2'	+49.1'	117.2°	24°12.6'	+49.7'	117.6°	23°44.5'	+50.3'	118.0°	23°16.1'	+50.8'	118.4°	22°47.4'	+51.3'	118.8°	22°18.3'	+51.9'	119.2°	3
4	25°56.0'	+48.3'	116.2°	25°29.3'	+49.0'	116.6°	25°02.3'	+49.6'	117.0°	24°34.8'	+50.1'	117.4°	24°07.0'	+50.7'	117.8°	23°38.8'	+51.2'	118.2°	23°10.2'	+51.7'	118.6°	4
5	26°44.4'	+48.2'	115.5°	26°18.3'	+48.8'	116.0°	25°51.8'	+49.4'	116.4°	25°24.9'	+50.0'	116.8°	24°57.6'	+50.5'	117.3°	24°30.0'	+51.1'	117.7°	24°01.9'	+51.6'	118.1°	5
6	27°32.5'	+48.0'	114.8°	27°07.1'	+48.6'	115.3°	26°41.2'	+49.2'	115.8°	26°14.9'	+49.8'	116.2°	25°48.2'	+50.4'	116.7°	25°21.1'	+51.0'	117.1°	24°53.6'	+51.5'	117.5°	6
7	28°20.5'	+47.8'	114.2°	27°55.7'	+48.4'	114.7°	27°30.4'	+49.0'	115.1°	27°04.7'	+49.6'	115.6°	26°38.6'	+50.2'	116.1°	26°12.0'	+50.8'	116.5°	25°45.0'	+51.4'	116.9°	7
8	29°08.2'	+47.5'	113.5°	28°44.1'	+48.2'	114.0°	28°19.5'	+48.9'	114.5°	27°54.4'	+49.5'	115.0°	27°28.8'	+50.1'	115.4°	27°02.8'	+50.7'	115.9°	26°36.4'	+51.2'	116.4°	8
9	29°55.8'	+47.3'	112.8°	29°32.3'	+48.0'	113.3°	29°08.3'	+48.7'	113.8°	28°43.8'	+49.3'	114.3°	28°18.9'	+49.9'	114.8°	27°53.5'	+50.5'	115.3°	27°27.6'	+51.1'	115.8°	9
10	30°43.1'	+47.1'	112.1°	30°20.3'	+47.8'	112.6°	29°57.0'	+48.4'	113.1°	29°33.1'	+49.1'	113.7°	29°08.8'	+49.7'	114.2°	28°44.0'	+50.3'	114.7°	28°18.7'	+50.9'	115.2°	10
11	31°30.2'	+46.8'	111.3°	31°08.1'	+47.5'	111.9°	30°45.4'	+48.2'	112.5°	30°22.2'	+48.9'	113.0°	29°58.5'	+49.5'	113.5°	29°34.3'	+50.1'	114.1°	29°09.6'	+50.7'	114.6°	11
12	32°17.0'	+46.6'	110.6°	31°55.6'	+47.3'	111.2°	31°33.6'	+48.0'	111.8°	31°11.1'	+48.7'	112.3°	30°48.0'	+49.3'	112.9°	30°24.4'	+50.0'	113.4°	30°00.3'	+50.6'	114.0°	12
13	33°03.6'	+46.3'	109.9°	32°42.9'	+47.0'	110.5°	32°21.6'	+47.8'	111.1°	31°59.8'	+48.4'	111.6°	31°37.4'	+49.1'	112.2°	31°14.4'	+49.8'	112.8°	30°50.9'	+50.4'	113.3°	13
14	33°49.9'	+46.0'	109.1°	33°29.9'	+46.8'	109.7°	33°09.4'	+47.5'	110.3°	32°48.2'	+48.2'	110.9°	32°26.5'	+48.9'	111.5°	32°04.2'	+49.6'	112.1°	31°41.3'	+50.2'	112.7°	14
15	34°35.9'	+45.7'	108.3°	34°16.7'	+46.5'	109.0°	33°56.9'	+47.2'	109.6°	33°36.4'	+48.0'	110.2°	33°15.4'	+48.7'	110.9°	32°53.7'	+49.3'	111.5°	32°31.5'	+50.0'	112.1°	15
16	35°21.6'	+45.4'	107.5°	35°03.2'	+46.2'	108.2°	34°44.1'	+47.0'	108.9°	34°24.4'	+47.7'	109.5°	34°04.0'	+48.4'	110.1°	33°43.1'	+49.1'	110.8°	33°21.5'	+49.8'	111.4°	16
17	36°07.0'	+45.1'	106.7°	35°49.4'	+45.9'	107.4°	35°31.1'	+46.7'	108.1°	35°12.1'	+47.4'	108.8°	34°52.5'	+48.2'	109.4°	34°32.2'	+48.9'	110.1°	34°11.3'	+49.6'	110.7°	17
18	36°52.0'	+44.7'	105.9°	36°35.3'	+45.6'	106.6°	36°17.7'	+46.4'	107.3°	35°59.5'	+47.1'	108.0°	35°40.6'	+47.9'	108.7°	35°21.1'	+48.6'	109.4°	35°00.8'	+49.3'	110.0°	18
19	37°36.8'	+44.4'	105.1°	37°20.8'	+45.2'	105.8°	37°04.1'	+46.0'	106.5°	36°46.7'	+46.8'	107.2°	36°28.5'	+47.6'	108.0°	36°09.7'	+48.4'	108.7°	35°50.1'	+49.1'	109.3°	19
20	38°21.1'	+44.0'	104.2°	38°06.0'	+44.9'	105.0°	37°50.1'	+45.7'	105.7°	37°33.5'	+46.5'	106.5°	37°16.1'	+47.3'	107.2°	36°58.0'	+48.1'	107.9°	36°39.2'	+48.8'	108.6°	20
21	39°05.1'	+43.6'	103.3°	38°50.9'	+44.5'	104.1°	38°35.8'	+45.3'	104.9°	38°20.0'	+46.2'	105.7°	38°03.4'	+47.0'	106.4°	37°46.1'	+47.8'	107.2°	37°28.0'	+48.5'	107.9°	21
22	39°48.7'	+43.2'	102.4°	39°35.3'	+44.1'	103.3°	39°21.2'	+45.0'	104.1°	39°06.2'	+45.8'	104.8°	38°50.4'	+46.7'	105.6°	38°33.9'	+47.5'	106.4°	38°16.6'	+48.2'	107.2°	22
23	40°31.8'	+42.7'	101.5°	40°19.4'	+43.7'	102.4°	40°06.1'	+44.6'	103.2°	39°52.0'	+45.5'	104.0°	39°37.1'	+46.3'	104.8°	39°21.4'	+47.1'	105.6°	39°04.8'	+47.9'	106.4°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

54° 306° LHA

Latitude SAME as Declination

54° 306° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

55° 305° LHA

Latitude SAME as Declination

55° 305° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	22°06.3'	+48.8'	117.9°	21°38.1'	+49.4'	118.2°	21°09.6'	+49.9'	118.6°	20°40.7'	+50.5'	118.9°	20°11.6'	+51.0'	119.2°	19°42.2'	+51.5'	119.5°	19°12.4'	+52.0'	119.8°	0
1	22°55.1'	+48.7'	117.2°	22°27.5'	+49.2'	117.6°	21°59.5'	+49.8'	118.0°	21°31.2'	+50.4'	118.3°	21°02.6'	+50.9'	118.7°	20°33.7'	+51.4'	119.0°	20°04.4'	+51.9'	119.3°	1
2	23°43.7'	+48.5'	116.6°	23°16.7'	+49.1'	117.0°	22°49.3'	+49.7'	117.4°	22°21.6'	+50.2'	117.7°	21°53.5'	+50.8'	118.1°	21°25.1'	+51.3'	118.4°	20°56.4'	+51.8'	118.8°	2
3	24°32.2'	+48.3'	115.9°	24°05.8'	+48.9'	116.3°	23°39.0'	+49.5'	116.7°	23°11.8'	+50.1'	117.1°	22°44.3'	+50.6'	117.5°	22°16.4'	+51.2'	117.9°	21°48.2'	+51.7'	118.2°	3
4	25°20.6'	+48.2'	115.3°	24°54.7'	+48.8'	115.7°	24°28.5'	+49.4'	116.1°	24°01.9'	+50.0'	116.5°	23°34.9'	+50.5'	116.9°	23°07.6'	+51.1'	117.3°	22°39.9'	+51.6'	117.7°	4
5	26°08.7'	+48.0'	114.6°	25°43.5'	+48.6'	115.1°	25°17.9'	+49.2'	115.5°	24°51.8'	+49.8'	115.9°	24°25.4'	+50.4'	116.3°	23°58.6'	+50.9'	116.7°	23°31.4'	+51.5'	117.1°	5
6	26°56.7'	+47.8'	114.0°	26°32.1'	+48.4'	114.4°	26°07.1'	+49.0'	114.9°	25°41.6'	+49.6'	115.3°	25°15.8'	+50.2'	115.7°	24°49.5'	+50.8'	116.2°	24°22.9'	+51.3'	116.6°	6
7	27°44.4'	+47.6'	113.3°	27°20.5'	+48.2'	113.8°	26°56.1'	+48.9'	114.2°	26°31.3'	+49.5'	114.7°	26°06.0'	+50.1'	115.1°	25°40.3'	+50.6'	115.6°	25°14.2'	+51.2'	116.0°	7
8	28°32.0'	+47.4'	112.6°	28°08.7'	+48.0'	113.1°	27°45.0'	+48.7'	113.6°	27°20.8'	+49.3'	114.0°	26°56.1'	+49.9'	114.5°	26°31.0'	+50.5'	115.0°	26°05.4'	+51.1'	115.4°	8
9	29°19.4'	+47.1'	111.9°	28°56.8'	+47.8'	112.4°	28°33.7'	+48.5'	112.9°	28°10.1'	+49.1'	113.4°	27°46.0'	+49.7'	113.9°	27°21.5'	+50.3'	114.4°	26°56.5'	+50.9'	114.8°	9
10	30°06.5'	+46.9'	111.2°	29°44.6'	+47.6'	111.7°	29°22.1'	+48.3'	112.2°	28°59.2'	+48.9'	112.7°	28°35.7'	+49.6'	113.3°	28°11.8'	+50.2'	113.7°	27°47.4'	+50.8'	114.2°	10
11	30°53.4'	+46.7'	110.4°	30°32.2'	+47.4'	111.0°	30°10.4'	+48.1'	111.5°	29°48.1'	+48.7'	112.1°	29°25.3'	+49.4'	112.6°	29°02.0'	+50.0'	113.1°	28°38.2'	+50.6'	113.6°	11
12	31°40.1'	+46.4'	109.7°	31°19.5'	+47.1'	110.3°	30°58.5'	+47.8'	110.9°	30°36.8'	+48.5'	111.4°	30°14.7'	+49.2'	112.0°	29°52.0'	+49.8'	112.5°	29°28.8'	+50.4'	113.0°	12
13	32°26.4'	+46.1'	109.0°	32°06.7'	+46.9'	109.6°	31°46.3'	+47.6'	110.1°	31°25.3'	+48.3'	110.7°	31°03.8'	+49.0'	111.3°	30°41.8'	+49.6'	111.8°	30°19.2'	+50.2'	112.4°	13
14	33°12.6'	+45.8'	108.2°	32°53.5'	+46.6'	108.8°	32°33.9'	+47.3'	109.4°	32°13.6'	+48.1'	110.0°	31°52.8'	+48.7'	110.6°	31°31.4'	+49.4'	111.2°	31°09.4'	+50.1'	111.8°	14
15	33°58.4'	+45.5'	107.4°	33°40.1'	+46.3'	108.1°	33°21.2'	+47.1'	108.7°	33°01.7'	+47.8'	109.3°	32°41.5'	+48.5'	109.9°	32°20.8'	+49.2'	110.5°	31°59.5'	+49.8'	111.1°	15
16	34°44.0'	+45.2'	106.6°	34°26.5'	+46.0'	107.3°	34°08.3'	+46.8'	107.9°	33°49.5'	+47.5'	108.6°	33°30.0'	+48.3'	109.2°	33°10.0'	+49.0'	109.8°	32°49.3'	+49.6'	110.4°	16
17	35°29.2'	+44.9'	105.8°	35°12.5'	+45.7'	106.5°	34°55.1'	+46.5'	107.2°	34°37.0'	+47.3'	107.8°	34°18.3'	+48.0'	108.5°	33°59.0'	+48.7'	109.1°	33°39.0'	+49.4'	109.8°	17
18	36°14.1'	+44.6'	105.0°	35°58.2'	+45.4'	105.7°	35°41.6'	+46.2'	106.4°	35°24.3'	+47.0'	107.1°	35°06.3'	+47.7'	107.8°	34°47.7'	+48.5'	108.4°	34°28.4'	+49.2'	109.1°	18
19	36°58.7'	+44.2'	104.2°	36°43.6'	+45.1'	104.9°	36°27.8'	+45.9'	105.6°	36°11.3'	+46.7'	106.3°	35°54.1'	+47.5'	107.0°	35°36.2'	+48.2'	107.7°	35°17.6'	+48.9'	108.4°	19
20	37°42.9'	+43.8'	103.3°	37°28.7'	+44.7'	104.1°	37°13.7'	+45.6'	104.8°	36°58.0'	+46.4'	105.5°	36°41.5'	+47.2'	106.3°	36°24.4'	+47.9'	107.0°	36°06.5'	+48.7'	107.7°	20
21	38°26.7'	+43.4'	102.5°	38°13.4'	+44.3'	103.2°	37°59.3'	+45.2'	104.0°	37°44.4'												

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn = 360-Z

56° 304° LHA			Latitude SAME as Declination						56° 304° LHA													
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	21°31.3'	+48.6'	117.0°	21°04.0'	+49.2'	117.3°	20°36.3'	+49.8'	117.7°	20°08.2'	+50.3'	118.0°	19°39.9'	+50.8'	118.3°	19°11.3'	+51.3'	118.6°	18°42.5'	+51.8'	118.9°	0
1	22°19.9'	+48.5'	116.3°	21°53.1'	+49.0'	116.7°	21°26.0'	+49.6'	117.1°	20°58.5'	+50.2'	117.4°	20°30.8'	+50.7'	117.7°	20°02.7'	+51.2'	118.1°	19°34.3'	+51.8'	118.4°	1
2	23°08.4'	+48.3'	115.7°	22°42.2'	+48.9'	116.1°	22°15.6'	+49.5'	116.5°	21°48.7'	+50.1'	116.8°	21°21.5'	+50.6'	117.2°	20°53.9'	+51.1'	117.5°	20°26.1'	+51.6'	117.9°	2
3	23°56.7'	+48.1'	115.1°	23°31.1'	+48.7'	115.5°	23°05.1'	+49.3'	115.8°	22°38.8'	+49.9'	116.2°	22°12.1'	+50.5'	116.6°	21°45.1'	+51.0'	117.0°	21°17.7'	+51.5'	117.3°	3
4	24°44.8'	+48.0'	114.4°	24°19.8'	+48.6'	114.8°	23°54.5'	+49.2'	115.2°	23°28.7'	+49.8'	115.6°	23°02.6'	+50.3'	116.0°	22°36.1'	+50.9'	116.4°	22°09.2'	+51.4'	116.8°	4
5	25°32.8'	+47.8'	113.7°	25°08.4'	+48.4'	114.2°	24°43.7'	+49.0'	114.6°	24°18.5'	+49.6'	115.0°	23°52.9'	+50.2'	115.4°	23°27.0'	+50.8'	115.8°	23°00.7'	+51.3'	116.2°	5
6	26°20.6'	+47.6'	113.1°	25°56.8'	+48.2'	113.5°	25°32.7'	+48.9'	114.0°	25°08.1'	+49.5'	114.4°	24°43.1'	+50.1'	114.8°	24°17.8'	+50.6'	115.2°	23°52.0'	+51.2'	115.6°	6
7	27°08.2'	+47.4'	112.4°	26°45.1'	+48.0'	112.9°	26°19.2'	+48.7'	113.3°	25°57.6'	+49.3'	113.8°	25°33.2'	+49.9'	114.2°	25°08.4'	+50.5'	114.6°	24°43.2'	+51.1'	115.1°	7
8	27°55.6'	+47.2'	111.7°	27°33.1'	+47.9'	112.2°	27°10.2'	+48.5'	112.7°	26°46.9'	+49.1'	113.1°	26°23.1'	+49.8'	113.6°	25°58.9'	+50.3'	114.0°	25°34.2'	+50.9'	114.5°	8
9	28°42.7'	+47.0'	111.0°	28°21.0'	+47.6'	111.5°	27°58.8'	+48.3'	112.0°	27°36.0'	+49.0'	112.5°	27°12.9'	+49.6'	113.0°	26°49.2'	+50.2'	113.4°	26°25.1'	+50.8'	113.9°	9
10	29°29.7'	+46.7'	110.3°	29°08.6'	+47.4'	110.8°	28°47.1'	+48.1'	111.3°	28°25.0'	+48.8'	111.8°	28°02.4'	+49.4'	112.3°	27°39.4'	+50.0'	112.8°	27°15.9'	+50.6'	113.3°	10
11	30°16.4'	+46.5'	109.6°	29°56.1'	+47.2'	110.1°	29°35.2'	+47.9'	110.6°	29°13.8'	+48.6'	111.2°	28°51.8'	+49.2'	111.7°	28°29.4'	+49.8'	112.2°	28°06.5'	+50.5'	112.7°	11
12	31°02.9'	+46.2'	108.8°	30°43.3'	+47.0'	109.4°	30°23.1'	+47.7'	109.9°	30°02.3'	+48.4'	110.5°	29°41.1'	+49.0'	111.0°	29°19.3'	+49.7'	111.6°	28°57.0'	+50.3'	112.1°	12
13	31°49.1'	+46.0'	108.1°	31°30.2'	+46.7'	108.7°	31°10.7'	+47.4'	109.2°	30°50.7'	+48.1'	109.8°	30°30.1'	+48.8'	110.4°	30°08.9'	+49.5'	110.9°	29°47.3'	+50.1'	111.4°	13
14	32°35.1'	+45.7'	107.3°	32°16.9'	+46.4'	107.9°	31°58.2'	+47.2'	108.5°	31°38.8'	+47.9'	109.1°	31°18.9'	+48.6'	109.7°	30°58.4'	+49.3'	110.2°	30°37.4'	+49.9'	110.8°	14
15	33°20.8'	+45.4'	106.5°	33°03.4'	+46.2'	107.2°	32°45.4'	+46.9'	107.8°	32°26.7'	+47.7'	108.4°	32°07.5'	+48.4'	109.0°	31°47.7'	+49.1'	109.6°	31°27.3'	+49.7'	110.2°	15
16	34°06.2'	+45.1'	105.8°	33°49.5'	+45.9'	106.4°	33°32.3'	+46.7'	107.0°	33°14.4'	+47.4'	107.7°	32°55.9'	+48.1'	108.3°	32°36.7'	+48.8'	108.9°	32°17.0'	+49.5'	109.5°	16
17	34°51.2'	+44.8'	105.0°	34°35.4'	+45.6'	105.6°	34°18.9'	+46.4'	106.3°	34°01.8'	+47.1'	106.9°	33°44.0'	+47.9'	107.6°	33°25.5'	+48.6'	108.2°	33°06.5'	+49.3'	108.8°	17
18	35°36.0'	+44.4'	104.1°	35°21.0'	+45.3'	104.8°	35°05.3'	+46.1'	105.5°	34°48.9'	+46.9'	106.2°	34°31.9'	+47.6'	106.8°	34°14.1'	+48.3'	107.5°	33°55.8'	+49.1'	108.1°	18
19	36°20.4'	+44.1'	103.3°	36°06.3'	+44.9'	104.0°	35°51.4'	+45.8'	104.7°	35°35.8'	+46.6'	105.4°	35°19.5'	+47.3'	106.1°	35°02.5'	+48.1'	106.8°	34°44.8'	+48.8'	107.4°	19
20	37°04.5'	+43.7'	102.5°	36°51.2'	+44.6'	103.2°	36°37.1'	+45.4'	103.9°	36°22.3'	+46.2'	104.6°	36°06.8'	+47.0'	105.3°	35°50.6'	+47.8'	106.0°	35°33.6'	+48.6'	106.7°	20
21	37°48.2'	+43.3'	101.6°	37°35.8'	+44.2'	102.4°	37°22.6'	+45.1'	103.1°	37°08.6'	+45.9'	103.8°	36°53.8'	+46.7'	104.6°	36°38.4'	+47.5'	105.3°	36°22.2'	+48.3'	106.0°	21
22	38°31.6'	+42.9'	100.7°	38°20.0'	+43.8'	101.5°	38°07.6'	+44.7'	102.3°	37°54.5'	+45.6'	103.0°	37°40.6'	+46.4'	103.8°	37°25.9'	+47.2'	104.5°	37°10.5'	+48.0'	105.3°	22
23	39°14.5'	+42.5'	99.8°	39°03.8'	+43.4'	100.6°	38°52.4'	+44.3'	101.4°	38°40.1'	+45.2'	102.2°	38°27.0'	+46.1'	103.0°	38°13.1'	+46.9'	103.8°	37°58.5'	+47.7'	104.5°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

56° 304° LHA Latitude SAME as Declination 56° 304° LHA
 South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn = 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn = 360-Z

57° 303° LHA			Latitude SAME as Declination						57° 303° LHA													
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	20°56.1'	+48.4'	116.1°	20°29.6'	+49.0'	116.4°	20°02.7'	+49.6'	116.8°	19°35.5'	+50.1'	117.1°	19°08.0'	+50.7'	117.4°	18°40.3'	+51.2'	117.7°	18°12.2'	+51.7'	118.0°	0
1	21°44.5'	+48.3'	115.5°	21°18.6'	+48.9'	115.8°	20°52.3'	+49.4'	116.2°	20°25.6'	+50.0'	116.5°	19°58.7'	+50.6'	116.8°	19°31.4'	+51.1'	117.2°	19°03.9'	+51.6'	117.5°	1
2	22°32.8'	+48.1'	114.8°	22°07.4'	+48.7'	115.2°	21°41.7'	+49.3'	115.6°	21°15.6'	+49.9'	115.9°	20°49.2'	+50.4'	116.3°	20°22.5'	+51.0'	116.6°	19°55.5'	+51.5'	116.9°	2
3	23°20.9'	+47.9'	114.2°	22°56.1'	+48.6'	114.6°	22°31.0'	+49.2'	115.0°	22°05.5'	+49.8'	115.3°	21°39.7'	+50.3'	115.7°	21°13.5'	+50.9'	116.0°	20°47.0'	+51.4'	116.4°	3
4	24°08.9'	+47.8'	113.5°	23°44.7'	+48.4'	113.9°	23°20.2'	+49.0'	114.3°	22°55.3'	+49.6'	114.7°	22°30.0'	+50.2'	115.1°	22°04.4'	+50.7'	115.5°	21°38.4'	+51.3'	115.8°	4
5	24°56.6'	+47.6'	112.9°	24°33.1'	+48.2'	113.3°	24°09.2'	+48.9'	113.7°	23°44.9'	+49.5'	114.1°	23°20.2'	+50.1'	114.5°	22°55.1'	+50.6'	114.9°	22°29.7'	+51.2'	115.3°	5
6	25°44.2'	+47.4'	112.2°	25°21.4'	+48.1'	112.6°	24°58.1'	+48.7'	113.1°	24°34.4'	+49.3'	113.5°	24°10.2'	+49.9'	113.9°	23°45.7'	+50.5'	114.3°	23°20.8'	+51.0'	114.7°	6
7	26°31.7'	+47.2'	111.5°	26°09.4'	+47.9'	112.0°	25°46.8'	+48.5'	112.4°	25°23.7'	+49.2'	112.9°	25°00.2'	+49.8'	113.3°	24°36.2'	+50.3'	113.7°	24°11.9'	+50.9'	114.1°	7
8	27°18.9'	+47.0'	110.8°	26°57.3'	+47.7'	111.3°	26°35.3'	+48.3'	111.8°	26°12.8'	+49.0'	112.2°	25°49.9'	+49.6'	112.7°	25°26.6'	+50.2'	113.1°	25°02.8'	+50.8'	113.5°	8
9	28°05.9'	+46.8'	110.1°	27°45.0'	+47.5'	110.6°	27°23.6'	+48.2'	111.1°	27°01.8'	+48.8'	111.6°	26°39.5'	+49.4'	112.0°	26°16.8'	+50.0'	112.5°	25°53.6'	+50.6'	113.0°	9
10	28°52.7'	+46.6'	109.4°	28°32.5'	+47.3'	109.9°	28°11.8'	+47.9'	110.4°	27°50.6'	+48.6'	110.9°	27°28.9'	+49.3'	111.4°	27°06.8'	+49.9'	111.9°	26°44.2'	+50.5'	112.4°	10
11	29°39.2'	+46.3'	108.7°	29°19.7'	+47.0'	109.2°	28°59.7'	+47.7'	109.7°	28°39.2'	+48.4'	110.3°	28°18.2'	+49.1'	110.8°	27°56.7'	+49.7'	111.3°	27°34.7'	+50.3'	111.8°	11
12	30°25.5'	+46.1'	107.9°	30°06.8'	+46.8'	108.5°	29°47.5'	+47.5'	109.0°	29°27.6'	+48.2'	109.6°	29°07.3'	+48.9'	110.1°	28°46.4'	+49.5'	110.6°	28°25.0'	+50.1'	111.1°	12
13	31°11.6'	+45.8'	107.2°	30°53.6'	+46.6'	107.8°	30°35.0'	+47.3'	108.3°	30°15.8'	+48.0'	108.9°	29°56.1'	+48.7'	109.4°	29°35.9'	+49.3'	110.0°	29°15.1'	+50.0'	110.5°	13
14	31°57.4'	+45.5'	106.4°	31°40.1'	+46.3'	107.0°	31°22.3'	+47.0'	107.6°	31°03.8'	+47.8'	108.2°	30°44.8'	+48.5'	108.8°	30°25.2'	+49.1'	109.3°	30°05.1'	+49.8'	109.9°	14
15	32°43.0'	+45.2'	105.7°	32°26.4'	+46.0'	106.3°	32°09.3'	+46.8'	106.9°	31°51.6'	+47.5'	107.5°	31°33.3'	+48.2'	108.1°	31°14.4'	+48.9'	108.7°	30°54.9'	+49.6'	109.2°	15
16	33°28.2'	+44.9'	104.9°	33°12.5'	+45.7'	105.5°	32°56.1'	+46.5'	106.1°	32°39.1'	+47.3'	106.8°	32°21.5'	+48.0'	107.4°	32°03.3'	+48.7'	108.0°	31°44.5'	+49.4'	108.6°	16
17	34°13.1'	+44.6'	104.1°	33°58.2'	+45.4'	104.7°	33°42.6'	+46.2'	105.4°	33°26.4'	+47.0'	106.0°	33°09.5'	+47.7'	106.7°	32°52.0'	+48.5'	107.3°	32°33.8'	+49.2'	107.9°	17
18	34°57.8'	+44.3'	103.3°	34°43.6'	+45.1'	104.0°	34°28.8'	+45.9'	104.6°	34°13.4'	+46.7'	105.3°	33°57.2'	+47.5'	105.9°	33°40.4'	+48.2'	106.6°	33°23.0'	+48.9'	107.2°	18
19	35°42.1'	+44.0'	102.4°	35°28.8'	+44.8'	103.1°	35°14.8'	+45.6'	103.8°	35°00.1'	+46.4'	104.5°	34°44.7'	+47.2'	105.2°	34°28.6'	+48.0'	105.9°	34°11.9'	+48.7'	106.5°	19
20	36°26.0'	+43.6'	101.6°	36°13.6'	+44.5'	102.3°	36°00.4'	+45.3'	103.0°	35°46.5'	+46.1'	103.7°	35°31.9'	+46.9'	104.4°	35°16.6'	+47.7'	105.1°	35°00.6'	+48.4'	105.8°	20
21	37°09.6'	+43.3'	100.7°	36°58.0'	+44.1'	101.5°	36°45.7'	+45.0'	102.2°	36°32.6'	+45.8'	102.9°	36°18.8'	+46.6'	103.7°	36°04.3'	+4					

North Lat. LHA > 180° ... Zn = Z LHA < 180° ... Zn = 360-Z

58° 302° LHA

Latitude SAME as Declination

58° 302° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	20°20.6'	+48.2'	115.2°	19°54.9'	+48.8'	115.6°	19°28.8'	+49.4'	115.9°	19°02.5'	+50.0'	116.2°	18°35.8'	+50.5'	116.5°	18°08.9'	+51.0'	116.8°	17°41.7'	+51.5'	117.1°	0
1	21°08.9'	+48.1'	114.6°	20°43.7'	+48.7'	115.0°	20°18.2'	+49.3'	115.3°	19°52.4'	+49.8'	115.6°	19°26.3'	+50.4'	116.0°	19°00.0'	+50.9'	116.3°	18°33.2'	+51.5'	116.6°	1
2	21°57.0'	+47.9'	114.0°	21°32.4'	+48.5'	114.3°	21°07.5'	+49.1'	114.7°	20°42.3'	+49.7'	115.0°	20°16.7'	+50.3'	115.4°	19°50.9'	+50.8'	115.7°	19°24.7'	+51.4'	116.0°	2
3	22°44.9'	+47.8'	113.3°	22°21.0'	+48.4'	113.7°	21°56.7'	+49.0'	114.1°	21°32.0'	+49.6'	114.4°	21°07.0'	+50.2'	114.8°	20°41.7'	+50.7'	115.1°	20°16.1'	+51.3'	115.5°	3
4	23°32.7'	+47.6'	112.7°	23°09.3'	+48.2'	113.1°	22°45.7'	+48.9'	113.4°	22°21.6'	+49.5'	113.8°	21°57.2'	+50.0'	114.2°	21°32.4'	+50.6'	114.6°	21°07.3'	+51.1'	114.9°	4
5	24°20.3'	+47.4'	112.0°	23°57.6'	+48.1'	112.4°	23°34.5'	+48.7'	112.8°	23°11.1'	+49.3'	113.2°	22°47.2'	+49.9'	113.6°	22°23.0'	+50.5'	114.0°	21°58.4'	+51.0'	114.4°	5
6	25°07.7'	+47.2'	111.3°	24°45.7'	+47.9'	111.8°	24°23.2'	+48.5'	112.2°	24°00.4'	+49.2'	112.6°	23°37.1'	+49.8'	113.0°	23°13.5'	+50.3'	113.4°	22°49.5'	+50.9'	113.8°	6
7	25°54.9'	+47.0'	110.6°	25°33.6'	+47.7'	111.1°	25°11.8'	+48.4'	111.5°	24°49.5'	+49.0'	112.0°	24°26.9'	+49.6'	112.4°	24°03.8'	+50.2'	112.8°	23°40.4'	+50.8'	113.2°	7
8	26°42.0'	+46.8'	109.9°	26°21.3'	+47.5'	110.4°	26°00.1'	+48.2'	110.9°	25°38.5'	+48.8'	111.3°	25°16.5'	+49.5'	111.8°	24°54.0'	+50.1'	112.2°	24°31.1'	+50.6'	112.6°	8
9	27°28.8'	+46.6'	109.2°	27°08.8'	+47.3'	109.7°	26°48.3'	+48.0'	110.2°	26°27.3'	+48.7'	110.7°	26°05.9'	+49.3'	111.1°	25°44.1'	+49.9'	111.6°	25°21.8'	+50.5'	112.0°	9
10	28°15.4'	+46.4'	108.5°	27°56.1'	+47.1'	109.0°	27°36.3'	+47.8'	109.5°	27°16.0'	+48.5'	110.0°	26°55.2'	+49.1'	110.5°	26°34.0'	+49.7'	111.0°	26°12.3'	+50.3'	111.4°	10
11	29°01.8'	+46.2'	107.8°	28°43.2'	+46.9'	108.3°	28°24.1'	+47.6'	108.8°	28°04.5'	+48.3'	109.4°	27°44.3'	+48.9'	109.9°	27°23.7'	+49.6'	110.3°	27°02.6'	+50.2'	110.8°	11
12	29°48.0'	+45.9'	107.1°	29°30.1'	+46.7'	107.6°	29°11.7'	+47.4'	108.2°	28°52.7'	+48.1'	108.7°	28°33.3'	+48.7'	109.2°	28°13.3'	+49.4'	109.7°	27°52.8'	+50.0'	110.2°	12
13	30°33.9'	+45.7'	106.3°	30°16.8'	+46.4'	106.9°	29°59.1'	+47.1'	107.4°	29°40.8'	+47.8'	108.0°	29°22.0'	+48.5'	108.5°	29°02.7'	+49.2'	109.1°	28°42.8'	+49.8'	109.6°	13
14	31°19.6'	+45.4'	105.6°	31°03.2'	+46.2'	106.2°	30°46.2'	+46.9'	106.7°	30°28.6'	+47.6'	107.3°	30°10.5'	+48.3'	107.9°	29°51.8'	+49.0'	108.4°	29°32.6'	+49.7'	108.9°	14
15	32°05.0'	+45.1'	104.8°	31°49.3'	+45.9'	105.4°	31°33.1'	+46.6'	106.0°	31°16.3'	+47.4'	106.6°	30°58.8'	+48.1'	107.2°	30°40.8'	+48.8'	107.7°	30°22.3'	+49.5'	108.3°	15
16	32°50.1'	+44.8'	104.0°	32°35.2'	+45.6'	104.6°	32°19.7'	+46.4'	105.3°	32°03.6'	+47.1'	105.9°	31°46.9'	+47.9'	106.5°	31°29.6'	+48.6'	107.1°	31°11.7'	+49.3'	107.6°	16
17	33°34.9'	+44.5'	103.2°	33°20.8'	+45.3'	103.9°	33°06.1'	+46.1'	104.5°	32°50.8'	+46.9'	105.1°	32°34.8'	+47.6'	105.8°	32°18.2'	+48.3'	106.4°	32°01.0'	+49.0'	107.0°	17
18	34°19.4'	+44.2'	102.4°	34°06.1'	+45.0'	103.1°	33°52.2'	+45.8'	103.7°	33°37.7'	+46.6'	104.4°	33°22.4'	+47.4'	105.0°	33°06.5'	+48.1'	105.7°	32°50.0'	+48.8'	106.3°	18
19	35°03.6'	+43.8'	101.6°	34°51.2'	+44.7'	102.3°	34°38.0'	+45.5'	103.0°	34°24.3'	+46.3'	103.6°	34°09.8'	+47.1'	104.3°	33°54.6'	+47.8'	104.9°	33°38.8'	+48.6'	105.6°	19
20	35°47.4'	+43.5'	100.8°	35°35.8'	+44.3'	101.5°	35°23.6'	+45.2'	102.2°	35°10.6'	+46.0'	102.9°	34°56.9'	+46.8'	103.5°	34°42.5'	+47.6'	104.2°	34°27.4'	+48.3'	104.9°	20
21	36°30.9'	+43.1'	99.9°	36°20.2'	+44.0'	100.6°	36°08.8'	+44.9'	101.4°	35°56.6'	+45.7'	102.1°	35°43.7'	+46.5'	102.8°	35°30.1'	+47.3'	103.5°	35°15.7'	+48.1'	104.2°	21
22	37°14.0'	+42.7'	99.0°	37°04.2'	+43.6'	99.8°	36°53.6'	+44.5'	100.5°	36°42.3'	+45.4'	101.3°	36°30.2'	+46.2'	102.0°	36°17.4'	+47.0'	102.7°	36°03.8'	+47.8'	103.4°	22
23	37°56.7'	+42.3'	98.2°	37°47.8'	+43.2'	98.9°	37°38.1'	+44.1'	99.7°	37°27.6'	+45.0'	100.4°	37°16.4'	+45.9'	101.2°	37°04.4'	+46.7'	101.9°	36°51.6'	+47.5'	102.7°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

58° 302° LHA

Latitude SAME as Declination

58° 302° LHA

South Lat. LHA > 180° ... Zn = 180-Z LHA < 180° ... Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° ... Zn = 360-Z

59° 301° LHA

Latitude SAME as Declination

59° 301° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	19°44.9'	+48.0'	114.4°	19°20.0'	+48.6'	114.7°	18°54.8'	+49.2'	115.0°	18°29.2'	+49.8'	115.3°	18°03.4'	+50.3'	115.6°	17°37.3'	+50.9'	115.9°	17°10.9'	+51.4'	116.2°	0
1	20°33.0'	+47.9'	113.8°	20°08.6'	+48.5'	114.1°	19°44.0'	+49.1'	114.4°	19°19.0'	+49.7'	114.7°	18°53.7'	+50.2'	115.1°	18°28.2'	+50.8'	115.4°	18°02.3'	+51.3'	115.7°	1
2	21°20.9'	+47.8'	113.1°	20°57.1'	+48.4'	113.5°	20°33.1'	+49.0'	113.8°	20°08.7'	+49.6'	114.2°	19°44.0'	+50.1'	114.5°	19°19.0'	+50.7'	114.8°	18°53.7'	+51.2'	115.1°	2
3	22°08.6'	+47.6'	112.5°	21°45.5'	+48.2'	112.8°	21°22.1'	+48.8'	113.2°	20°58.3'	+49.4'	113.5°	20°34.1'	+50.0'	113.9°	20°09.7'	+50.6'	114.2°	19°44.9'	+51.1'	114.6°	3
4	22°56.2'	+47.4'	111.8°	22°33.7'	+48.1'	112.2°	22°10.9'	+48.7'	112.6°	21°47.7'	+49.3'	112.9°	21°24.1'	+49.9'	113.3°	21°00.2'	+50.5'	113.7°	20°36.0'	+51.0'	114.0°	4
5	23°43.6'	+47.3'	111.1°	23°21.8'	+47.9'	111.5°	22°59.6'	+48.5'	111.9°	22°37.0'	+49.2'	112.3°	22°14.0'	+49.8'	112.7°	21°50.7'	+50.3'	113.1°	21°27.0'	+50.9'	113.4°	5
6	24°30.9'	+47.1'	110.5°	24°09.7'	+47.7'	110.9°	23°48.1'	+48.4'	111.3°	23°26.1'	+49.0'	111.7°	23°03.8'	+49.6'	112.1°	22°41.0'	+50.2'	112.5°	22°17.9'	+50.8'	112.9°	6
7	25°18.0'	+46.9'	109.8°	24°57.5'	+47.6'	110.2°	24°36.5'	+48.2'	110.6°	24°15.2'	+48.8'	111.1°	23°53.4'	+49.5'	111.5°	23°31.2'	+50.1'	111.9°	23°08.6'	+50.6'	112.3°	7
8	26°04.9'	+46.7'	109.1°	25°45.0'	+47.4'	109.5°	25°24.7'	+48.0'	110.0°	25°04.0'	+48.7'	110.4°	24°42.8'	+49.3'	110.9°	24°21.3'	+49.9'	111.3°	23°59.3'	+50.5'	111.7°	8
9	26°51.5'	+46.5'	108.4°	26°32.4'	+47.2'	108.9°	26°12.8'	+47.8'	109.3°	25°52.7'	+48.5'	109.8°	25°32.2'	+49.1'	110.2°	25°11.2'	+49.8'	110.7°	24°49.8'	+50.4'	111.1°	9
10	27°38.0'	+46.3'	107.7°	27°19.6'	+47.0'	108.2°	27°00.6'	+47.7'	108.6°	26°41.2'	+48.3'	109.1°	26°21.3'	+49.0'	109.6°	26°00.9'	+49.6'	110.1°	25°40.1'	+50.2'	110.5°	10
11	28°24.3'	+46.0'	106.9°	28°06.5'	+46.7'	107.5°	27°48.3'	+47.4'	108.0°	27°29.5'	+48.1'	108.5°	27°10.3'	+48.8'	109.0°	26°50.5'	+49.4'	109.4°	26°30.3'	+50.1'	109.9°	11
12	29°10.3'	+45.8'	106.2°	28°53.3'	+46.5'	106.7°	28°35.7'	+47.2'	107.3°	28°17.6'	+47.9'	107.8°	27°59.1'	+48.6'	108.3°	27°40.0'	+49.3'	108.8°	27°20.4'	+49.9'	109.3°	12
13	29°56.1'	+45.5'	105.5°	29°39.8'	+46.3'	106.0°	29°22.9'	+47.0'	106.6°	29°05.6'	+47.7'	107.1°	28°47.7'	+48.4'	107.6°	28°29.2'	+49.1'	108.1°	28°10.3'	+49.7'	108.7°	13
14	30°41.6'	+45.3'	104.7°	30°26.1'	+46.0'	105.3°	30°10.0'	+46.8'	105.8°	29°53.3'	+47.5'	106.4°	29°36.1'	+48.2'	107.0°	29°18.3'	+48.9'	107.5°	29°00.0'	+49.5'	108.0°	14
15	31°26.8'	+45.0'	103.9°	31°12.1'	+45.8'	104.5°	30°56.7'	+46.5'	105.1°	30°40.8'	+47.3'	105.7°	30°24.3'	+48.0'	106.3°	30°07.2'	+48.7'	106.8°	29°49.5'	+49.3'	107.4°	15
16	32°11.8'	+44.7'	103.2°	31°57.8'	+45.5'	103.8°	31°43.2'	+46.3'	104.4°	31°28.0'	+47.0'	105.0°	31°12.2'	+47.7'	105.6°	30°55.8'	+48.4'	106.1°	30°38.9'	+49.1'	106.7°	16
17	32°56.5'	+44.4'	102.4°	32°43.3'	+45.2'	103.0°	32°29.5'	+46.0'	103.6°	32°15.0'	+46.8'	104.2°	32°00.0'	+47.5'	104.9°	31°44.3'	+48.2'	105.5°	31°28.0'	+48.9'	106.0°	17
18	33°40.9'	+44.1'	101.6°	33°28.5'	+44.9'	102.2°	33°15.5'	+45.7'	102.9°	33°01.8'	+46.5'	103.5°	32°47.5'	+47.2'	104.1°	32°32.5'	+48.0'	104.8°	32°16.9'	+48.7'	105.4°	18
19	34°25.0'	+43.7'	100.8°	34°13.4'	+44.6'	101.4°	34°01.2'	+45.4'	102.1°	33°48.3'	+46.2'	102.7°	33°34.7'	+47.0'	103.4°	33°20.5'	+47.7'	104.0°	33°05.6'	+48.5'	104.7°	19
20	35°08.7'	+43.4'	99.9°	34°58.0'	+44.2'	100.6°	34°46.6'	+45.1'	101.3°	34°34.5'	+45.9'	102.0°	34°21.7'	+46.7'	102.6°	34°08.2'	+47.5'					

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

62° 298° LHA

Latitude SAME as Declination

62° 298° LHA

Table with columns for Dec°, Hc°, d', Z° for declinations 49 through 55, and a final Dec° column. Rows 0-23 show coordinate values.

62° 298° LHA

Latitude SAME as Declination

62° 298° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

63° 297° LHA

Latitude SAME as Declination

63° 297° LHA

Table with columns for Dec°, Hc°, d', Z° for declinations 49 through 55, and a final Dec° column. Rows 0-23 show coordinate values.

63° 297° LHA

Latitude SAME as Declination

63° 297° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

66° 294° LHA

Latitude SAME as Declination

66° 294° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of latitude/longitude data for 66° 294° LHA.

66° 294° LHA

Latitude SAME as Declination

66° 294° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

67° 293° LHA

Latitude SAME as Declination

67° 293° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of latitude/longitude data for 67° 293° LHA.

67° 293° LHA

Latitude SAME as Declination

67° 293° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

72° 288° LHA

Latitude SAME as Declination

72° 288° LHA

Table with columns for Dec°, 49, 50, 51, 52, 53, 54, 55, and Dec°. Each column contains three sub-columns for Hc°, d', and Z°. Rows range from 0 to 23.

72° 288° LHA

Latitude SAME as Declination

72° 288° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

73° 287° LHA

Latitude SAME as Declination

73° 287° LHA

Table with columns for Dec°, 49, 50, 51, 52, 53, 54, 55, and Dec°. Each column contains three sub-columns for Hc°, d', and Z°. Rows range from 0 to 23.

73° 287° LHA

Latitude SAME as Declination

73° 287° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

74° 286° LHA

Latitude SAME as Declination

74° 286° LHA

Table with columns for Dec°, Hc°, d', Z° for values 49 through 55, and a final Dec° column. Rows 0-23.

74° 286° LHA

Latitude SAME as Declination

74° 286° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

75° 285° LHA

Latitude SAME as Declination

75° 285° LHA

Table with columns for Dec°, Hc°, d', Z° for values 49 through 55, and a final Dec° column. Rows 0-23.

75° 285° LHA

Latitude SAME as Declination

75° 285° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

76° 284° LHA				Latitude SAME as Declination												76° 284° LHA									
Dec°	49			50			51			52			53			54			55			Dec°			
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°				
0	9°07.9'	+45.8'	100.7°	8°56.8'	+46.5'	100.8°	8°45.4'	+47.1'	101.0°	8°33.9'	+47.8'	101.1°	8°22.3'	+48.4'	101.3°	8°10.5'	+49.0'	101.4°	7°58.6'	+49.6'	101.5°	0			
1	9°53.8'	+45.8'	100.0°	9°43.3'	+46.4'	100.2°	9°32.6'	+47.1'	100.3°	9°21.7'	+47.7'	100.5°	9°10.7'	+48.3'	100.7°	8°59.5'	+49.0'	100.8°	8°48.2'	+49.6'	101.0°	1			
2	10°39.5'	+45.7'	99.3°	10°29.7'	+46.3'	99.5°	10°19.7'	+47.0'	99.7°	10°09.4'	+47.7'	99.9°	9°59.0'	+48.3'	100.1°	9°48.5'	+48.9'	100.2°	9°37.7'	+49.5'	100.4°	2			
3	11°25.2'	+45.6'	98.7°	11°16.0'	+46.3'	98.9°	11°06.7'	+46.9'	99.1°	10°57.1'	+47.6'	99.3°	10°47.3'	+48.2'	99.5°	10°37.4'	+48.8'	99.6°	10°27.2'	+49.4'	99.8°	3			
4	12°10.8'	+45.5'	98.0°	12°02.3'	+46.2'	98.2°	11°53.6'	+46.8'	98.4°	11°44.7'	+47.5'	98.6°	11°35.5'	+48.1'	98.9°	11°26.2'	+48.8'	99.1°	11°16.7'	+49.4'	99.3°	4			
5	12°56.3'	+45.4'	97.4°	12°48.5'	+46.1'	97.6°	12°40.4'	+46.7'	97.8°	12°32.2'	+47.4'	98.0°	12°23.7'	+48.1'	98.2°	12°15.0'	+48.7'	98.5°	12°06.0'	+49.3'	98.7°	5			
6	13°41.6'	+45.3'	96.7°	13°34.5'	+46.0'	96.9°	13°27.2'	+46.6'	97.2°	13°19.6'	+47.3'	97.4°	13°11.7'	+48.0'	97.6°	13°03.6'	+48.6'	97.9°	12°55.3'	+49.2'	98.1°	6			
7	14°26.9'	+45.2'	96.0°	14°20.5'	+45.9'	96.3°	14°13.8'	+46.5'	96.5°	14°06.9'	+47.2'	96.8°	13°59.7'	+47.9'	97.0°	13°52.2'	+48.5'	97.3°	13°44.5'	+49.1'	97.5°	7			
8	15°12.1'	+45.0'	95.3°	15°06.4'	+45.7'	95.6°	15°00.4'	+46.4'	95.9°	14°54.1'	+47.1'	96.1°	14°47.6'	+47.8'	96.4°	14°40.8'	+48.4'	96.6°	14°33.7'	+49.0'	96.9°	8			
9	15°57.1'	+44.9'	94.6°	15°52.1'	+45.6'	94.9°	15°46.8'	+46.3'	95.2°	15°41.2'	+47.0'	95.5°	15°35.3'	+47.7'	95.8°	15°29.2'	+48.3'	96.0°	15°22.7'	+48.9'	96.3°	9			
10	16°42.0'	+44.8'	93.9°	16°37.7'	+45.5'	94.2°	16°33.1'	+46.2'	94.5°	16°28.2'	+46.9'	94.8°	16°23.0'	+47.5'	95.1°	16°17.5'	+48.2'	95.4°	16°11.7'	+48.8'	95.7°	10			
11	17°26.8'	+44.6'	93.2°	17°23.2'	+45.3'	93.6°	17°19.3'	+46.1'	93.9°	17°15.1'	+46.7'	94.2°	17°10.5'	+47.4'	94.5°	17°05.7'	+48.1'	94.8°	17°00.5'	+48.7'	95.1°	11			
12	18°11.4'	+44.5'	92.5°	18°08.5'	+45.2'	92.9°	18°05.4'	+45.9'	93.2°	18°01.8'	+46.6'	93.5°	17°58.0'	+47.3'	93.8°	17°53.8'	+48.0'	94.2°	17°49.2'	+48.6'	94.5°	12			
13	18°55.8'	+44.3'	91.8°	18°53.7'	+45.0'	92.2°	18°51.3'	+45.8'	92.5°	18°48.4'	+46.5'	92.9°	18°45.3'	+47.2'	93.2°	18°41.7'	+47.8'	93.5°	18°37.9'	+48.5'	93.9°	13			
14	19°40.1'	+44.1'	91.1°	19°38.8'	+44.9'	91.5°	19°37.0'	+45.6'	91.8°	19°34.9'	+46.3'	92.2°	19°32.4'	+47.0'	92.5°	19°29.6'	+47.7'	92.9°	19°26.4'	+48.4'	93.3°	14			
15	20°24.2'	+43.9'	90.4°	20°23.6'	+44.7'	90.8°	20°22.6'	+45.4'	91.1°	20°21.2'	+46.2'	91.5°	20°19.5'	+46.9'	91.9°	20°17.3'	+47.6'	92.3°	20°14.7'	+48.2'	92.6°	15			
16	21°08.2'	+43.8'	89.7°	21°08.3'	+44.5'	90.1°	21°08.1'	+45.3'	90.4°	21°07.4'	+46.0'	90.8°	21°06.3'	+46.7'	91.2°	21°04.9'	+47.4'	91.6°	21°03.0'	+48.1'	92.0°	16			
17	21°52.0'	+43.6'	88.9°	21°52.9'	+44.3'	89.3°	21°53.3'	+45.1'	89.7°	21°53.4'	+45.8'	90.1°	21°53.0'	+46.5'	90.5°	21°52.3'	+47.3'	90.9°	21°51.1'	+47.9'	91.3°	17			
18	22°35.5'	+43.4'	88.2°	22°37.2'	+44.1'	88.6°	22°38.4'	+44.9'	89.0°	22°39.2'	+45.6'	89.4°	22°39.6'	+46.4'	89.9°	22°39.5'	+47.1'	90.3°	22°39.0'	+47.8'	90.7°	18			
19	23°18.9'	+43.1'	87.4°	23°21.3'	+43.9'	87.9°	23°23.3'	+44.7'	88.3°	23°24.9'	+45.4'	88.7°	23°26.0'	+46.2'	89.2°	23°26.6'	+46.9'	89.6°	23°26.8'	+47.6'	90.0°	19			
20	24°02.0'	+42.9'	86.7°	24°05.2'	+43.7'	87.1°	24°08.0'	+44.5'	87.6°	24°10.3'	+45.2'	88.0°	24°12.1'	+46.0'	88.5°	24°13.5'	+46.7'	88.9°	24°14.4'	+47.4'	89.4°	20			
21	24°44.9'	+42.7'	85.9°	24°48.9'	+43.5'	86.4°	24°52.5'	+44.3'	86.8°	24°55.6'	+45.0'	87.3°	24°58.1'	+45.8'	87.8°	25°00.2'	+46.5'	88.2°	25°01.8'	+47.3'	88.7°	21			
22	25°27.6'	+42.4'	85.1°	25°32.4'	+43.2'	85.6°	25°36.8'	+44.0'	86.1°	25°40.6'	+44.8'	86.6°	25°43.9'	+45.6'	87.1°	25°46.8'	+46.3'	87.5°	25°49.1'	+47.1'	88.0°	22			
23	26°10.0'	+42.2'	84.4°	26°15.7'	+43.0'	84.8°	26°20.8'	+43.8'	85.3°	26°25.4'	+44.6'	85.8°	26°29.5'	+45.4'	86.3°	26°33.1'	+46.1'	86.8°	26°36.1'	+46.9'	87.3°	23			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55						

76° 284° LHA

Latitude SAME as Declination

76° 284° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

77° 283° LHA				Latitude SAME as Declination												77° 283° LHA						
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	8°29.2'	+45.8'	99.9°	8°18.8'	+46.4'	100.0°	8°08.3'	+47.1'	100.2°	7°57.6'	+47.7'	100.3°	7°46.8'	+48.3'	100.4°	7°35.9'	+48.9'	100.6°	7°24.8'	+49.5'	100.7°	0
1	9°15.0'	+45.7'	99.2°	9°05.3'	+46.4'	99.4°	8°55.4'	+47.0'	99.5°	8°45.4'	+47.7'	99.7°	8°35.2'	+48.3'	99.8°	8°24.8'	+48.9'	100.0°	8°14.3'	+49.5'	100.1°	1
2	10°00.6'	+45.6'	98.6°	9°51.6'	+46.3'	98.7°	9°42.4'	+46.9'	98.9°	9°33.0'	+47.6'	99.1°	9°23.5'	+48.2'	99.2°	9°13.7'	+48.8'	99.4°	9°03.8'	+49.4'	99.6°	2
3	10°46.2'	+45.5'	97.9°	10°37.9'	+46.2'	98.1°	10°29.3'	+46.9'	98.3°	10°20.6'	+47.5'	98.5°	10°11.7'	+48.2'	98.6°	10°02.6'	+48.8'	98.8°	9°53.3'	+49.4'	99.0°	3
4	11°31.8'	+45.4'	97.2°	11°24.1'	+46.1'	97.4°	11°16.2'	+46.8'	97.6°	11°08.1'	+47.4'	97.8°	10°59.8'	+48.1'	98.0°	10°51.3'	+48.7'	98.2°	10°42.7'	+49.3'	98.4°	4
5	12°17.2'	+45.3'	96.6°	12°10.2'	+46.0'	96.8°	12°03.0'	+46.7'	97.0°	11°55.6'	+47.4'	97.2°	11°47.9'	+48.0'	97.4°	11°40.0'	+48.6'	97.6°	11°32.0'	+49.2'	97.8°	5
6	13°02.5'	+45.2'	95.9°	12°56.2'	+45.9'	96.1°	12°49.7'	+46.6'	96.4°	12°42.9'	+47.3'	96.6°	12°35.9'	+47.9'	96.8°	12°28.7'	+48.6'	97.0°	12°21.2'	+49.2'	97.3°	6
7	13°47.7'	+45.1'	95.2°	13°42.1'	+45.8'	95.5°	13°36.3'	+46.5'	95.7°	13°30.2'	+47.2'	96.0°	13°23.8'	+47.8'	96.2°	13°17.2'	+48.5'	96.4°	13°10.4'	+49.1'	96.7°	7
8	14°32.8'	+45.0'	94.6°	14°27.9'	+45.7'	94.8°	14°22.8'	+46.4'	95.1°	14°17.3'	+47.1'	95.3°	14°11.7'	+47.7'	95.6°	14°05.7'	+48.4'	95.8°	13°59.5'	+49.0'	96.1°	8
9	15°17.8'	+44.9'	93.9°	15°13.6'	+45.6'	94.1°	15°09.2'	+46.3'	94.4°	15°04.4'	+47.0'	94.7°	14°59.4'	+47.6'	94.9°	14°54.1'	+48.3'	95.2°	14°48.5'	+48.9'	95.5°	9
10	16°02.7'	+44.7'	93.2°	15°59.2'	+45.5'	93.5°	15°55.5'	+46.2'	93.7°	15°51.4'	+46.8'	94.0°	15°47.0'	+47.5'	94.3°	15°42.4'	+48.2'	94.6°	15°37.4'	+48.8'	94.9°	10
11	16°47.4'	+44.6'	92.5°	16°44.7'	+45.3'	92.8°	16°41.6'	+46.0'	93.1°	16°38.2'	+46.7'	93.4°	16°34.5'	+47.4'	93.7°	16°30.5'	+48.1'	94.0°	16°26.2'	+48.7'	94.3°	11
12	17°32.0'	+44.4'	91.8°	17°30.0'	+45.2'	92.1°	17°27.6'	+45.9'	92.4°	17°24.9'	+46.6'	92.7°	17°21.9'	+47.3'	93.0°	17°18.6'	+47.9'	93.4°	17°14.9'	+48.6'	93.7°	12
13	18°16.5'	+44.3'	91.1°	18°15.2'	+45.0'	91.4°	18°13.5'	+45.7'	91.7°	18°11.5'	+46.5'	92.1°	18°09.2'	+47.1'	92.4°	18°06.5'	+47.8'	92.7°	18°03.5'	+48.5'	93.0°	13
14	19°00.8'	+44.1'	90.4°	19°00.2'	+44.9'	90.7°	18°59.3'	+45.6'	91.1°	18°58.0'	+46.3'	91.4°	18°56.4'	+47.0'	91.7°	18°54.4'	+47.7'	92.1°	18°52.0'	+48.4'	92.4°	14
15	19°44.9'	+43.9'	89.6°	19°45.1'	+44.7'	90.0°	19°44.9'	+45.4'	90.4°	19°44.3'	+46.2'	90.7°	19°43.4'	+46.9'	91.1°	19°42.0'	+47.6'	91.4°	19°40.3'	+48.2'	91.8°	15
16	20°28.8'	+43.8'	88.9°	20°29.8'	+44.5'	89.3°	20°30.3'	+45.3'	89.7°	20°30.5'	+46.0'	90.0°	20°30.2'	+46.7'	90.4°	20°29.6'	+47.4'	90.8°	20°28.6'	+48.1'	91.2°	16
17	21°12.6'	+43.6'	88.2°	21°14.3'	+44.3'	88.6°	21°15.6'	+45.1'	89.0°	21°16.5'	+45.8'	89.4°	21°16.9'	+46.5'	89.7°	21°17.0'	+47.3'	90.1°	21°16.7'	+47.9'	90.5°	17
18	21°56.2'	+43.4'	87.5°	21°58.6'	+44.1'	87.9°	22°00.7'	+44.9'	88.3°	22°02.3'	+45.7'	88.7°	22°03.5'	+46.4'	89.1°	22°04.2'	+47.1'	89.5°	22°04.6'	+47.8'	89.9°	18
19	22°39.6'	+43.2'	86.7°	22°42.8'	+43.9'	87.1°	22°45.6'	+44.7'	87.5°	22°47.9'	+45.5'	88.0°	22°49.9'	+46.2'	88.4°							

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

78° 282° LHA

Latitude SAME as Declination

78° 282° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows (0-23) showing latitude/longitude data for North Latitude.

78° 282° LHA

Latitude SAME as Declination

78° 282° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

79° 281° LHA

Latitude SAME as Declination

79° 281° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows (0-23) showing latitude/longitude data for North Latitude.

79° 281° LHA

Latitude SAME as Declination

79° 281° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

80° 280° LHA

Latitude SAME as Declination

80° 280° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 23 rows of astronomical data.

80° 280° LHA

Latitude SAME as Declination

80° 280° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

81° 279° LHA

Latitude SAME as Declination

81° 279° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 23 rows of astronomical data.

81° 279° LHA

Latitude SAME as Declination

81° 279° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

82° 278° LHA

Latitude SAME as Declination

82° 278° LHA

Table with columns for Declination (Dec°), Azimuth (49-55), and Zenith Distance (Hc°, d', Z°). Rows represent declination values from 0 to 23 degrees.

82° 278° LHA

Latitude SAME as Declination

82° 278° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

83° 277° LHA

Latitude SAME as Declination

83° 277° LHA

Table with columns for Declination (Dec°), Azimuth (49-55), and Zenith Distance (Hc°, d', Z°). Rows represent declination values from 0 to 23 degrees.

83° 277° LHA

Latitude SAME as Declination

83° 277° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

84° 276° LHA			Latitude SAME as Declination									84° 276° LHA										
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	3°55.9'+45.4'	94.5°		3°51.2'+46.1'	94.6°		3°46.3'+46.7'	94.7°		3°41.4'+47.4'	94.7°		3°36.4'+48.0'	94.8°		3°31.3'+48.6'	94.9°		3°26.2'+49.2'	94.9°		0
1	4°41.3'+45.3'	93.9°		4°37.2'+46.0'	94.0°		4°33.0'+46.7'	94.0°		4°28.8'+47.3'	94.1°		4°24.4'+48.0'	94.2°		4°20.0'+48.6'	94.3°		4°15.5'+49.2'	94.3°		1
2	5°26.6'+45.3'	93.2°		5°23.2'+46.0'	93.3°		5°19.7'+46.6'	93.4°		5°16.1'+47.3'	93.5°		5°12.4'+47.9'	93.6°		5°08.6'+48.6'	93.7°		5°04.7'+49.2'	93.8°		2
3	6°11.9'+45.2'	92.6°		6°09.2'+45.9'	92.7°		6°06.3'+46.6'	92.8°		6°03.4'+47.3'	92.9°		6°00.3'+47.9'	93.0°		5°57.1'+48.5'	93.1°		5°53.8'+49.1'	93.2°		3
4	6°57.2'+45.2'	91.9°		6°55.1'+45.9'	92.0°		6°52.9'+46.5'	92.1°		6°50.6'+47.2'	92.3°		6°48.2'+47.9'	92.4°		6°45.6'+48.5'	92.5°		6°43.0'+49.1'	92.6°		4
5	7°42.4'+45.1'	91.2°		7°41.0'+45.8'	91.4°		7°39.5'+46.5'	91.5°		7°37.8'+47.2'	91.6°		7°36.1'+47.8'	91.8°		7°34.1'+48.4'	91.9°		7°32.1'+49.0'	92.0°		5
6	8°27.5'+45.1'	90.6°		8°26.8'+45.8'	90.7°		8°26.0'+46.4'	90.9°		8°25.0'+47.1'	91.0°		8°23.9'+47.7'	91.2°		8°22.6'+48.4'	91.3°		8°21.1'+49.0'	91.5°		6
7	9°12.6'+45.0'	89.9°		9°12.6'+45.7'	90.1°		9°12.4'+46.4'	90.2°		9°12.1'+47.0'	90.4°		9°11.6'+47.7'	90.6°		9°10.9'+48.3'	90.7°		9°10.1'+48.9'	90.9°		7
8	9°57.5'+44.9'	89.2°		9°58.3'+45.6'	89.4°		9°58.8'+46.3'	89.6°		9°59.1'+47.0'	89.8°		9°59.3'+47.6'	89.9°		9°59.3'+48.3'	90.1°		9°59.0'+48.9'	90.3°		8
9	10°42.4'+44.8'	88.6°		10°43.9'+45.5'	88.7°		10°45.1'+46.2'	88.9°		10°46.1'+46.9'	89.1°		10°46.9'+47.5'	89.3°		10°47.5'+48.2'	89.5°		10°47.9'+48.8'	89.7°		9
10	11°27.3'+44.7'	87.9°		11°29.4'+45.4'	88.1°		11°31.3'+46.1'	88.3°		11°33.0'+46.8'	88.5°		11°34.4'+47.5'	88.7°		11°35.7'+48.1'	88.9°		11°36.7'+48.7'	89.1°		10
11	12°12.0'+44.6'	87.2°		12°14.8'+45.3'	87.4°		12°17.4'+46.0'	87.6°		12°19.8'+46.7'	87.9°		12°21.9'+47.4'	88.1°		12°23.8'+48.0'	88.3°		12°25.5'+48.7'	88.5°		11
12	12°56.6'+44.5'	86.5°		13°00.1'+45.2'	86.7°		13°03.4'+45.9'	87.0°		13°06.5'+46.6'	87.2°		13°09.3'+47.3'	87.4°		13°11.8'+47.9'	87.7°		13°14.1'+48.6'	87.9°		12
13	13°41.1'+44.4'	85.8°		13°45.4'+45.1'	86.1°		13°49.4'+45.8'	86.3°		13°53.1'+46.5'	86.6°		13°56.6'+47.2'	86.8°		13°59.8'+47.8'	87.1°		14°02.7'+48.5'	87.3°		13
14	14°25.5'+44.3'	85.1°		14°30.5'+45.0'	85.4°		14°35.2'+45.7'	85.6°		14°39.6'+46.4'	85.9°		14°43.7'+47.1'	86.2°		14°47.6'+47.7'	86.4°		14°51.2'+48.4'	86.7°		14
15	15°09.8'+44.1'	84.4°		15°15.5'+44.9'	84.7°		15°20.9'+45.6'	85.0°		15°26.0'+46.3'	85.3°		15°30.8'+47.0'	85.5°		15°35.3'+47.6'	85.8°		15°39.6'+48.3'	86.1°		15
16	15°54.0'+44.0'	83.7°		16°00.4'+44.7'	84.0°		16°06.5'+45.5'	84.3°		16°12.3'+46.2'	84.6°		16°17.8'+46.8'	84.9°		16°23.0'+47.5'	85.2°		16°27.9'+48.2'	85.5°		16
17	16°38.0'+43.9'	83.0°		16°45.1'+44.6'	83.3°		16°51.9'+45.3'	83.6°		16°58.4'+46.0'	83.9°		17°04.6'+46.7'	84.2°		17°10.5'+47.4'	84.5°		17°16.0'+48.1'	84.8°		17
18	17°21.8'+43.7'	82.3°		17°29.7'+44.5'	82.6°		17°37.2'+45.2'	82.9°		17°44.5'+45.9'	83.3°		17°51.3'+46.6'	83.6°		17°57.9'+47.3'	83.9°		18°04.1'+47.9'	84.2°		18
19	18°05.5'+43.6'	81.6°		18°14.1'+44.3'	81.9°		18°22.4'+45.0'	82.2°		18°30.3'+45.7'	82.6°		18°37.9'+46.4'	82.9°		18°45.2'+47.1'	83.2°		18°52.0'+47.8'	83.6°		19
20	18°49.1'+43.4'	80.9°		18°58.4'+44.1'	81.2°		19°07.4'+44.9'	81.5°		19°16.1'+45.6'	81.9°		19°24.4'+46.3'	82.2°		19°32.3'+47.0'	82.6°		19°39.8'+47.7'	82.9°		20
21	19°32.5'+43.2'	80.1°		19°42.6'+44.0'	80.5°		19°52.3'+44.7'	80.8°		20°01.7'+45.4'	81.2°		20°10.7'+46.1'	81.6°		20°19.3'+46.8'	81.9°		20°27.5'+47.5'	82.3°		21
22	20°15.7'+43.0'	79.4°		20°26.5'+43.8'	79.8°		20°37.0'+44.5'	80.1°		20°47.1'+45.3'	80.5°		20°56.8'+46.0'	80.9°		21°06.1'+46.7'	81.3°		21°15.0'+47.4'	81.6°		22
23	20°58.7'+42.8'	78.7°		21°10.3'+43.6'	79.0°		21°21.5'+44.3'	79.4°		21°32.4'+45.1'	79.8°		21°42.8'+45.8'	80.2°		21°52.8'+46.5'	80.6°		22°02.4'+47.2'	81.0°		23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

84° 276° LHA

Latitude SAME as Declination

84° 276° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

85° 275° LHA			Latitude SAME as Declination									85° 275° LHA										
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	3°16.7'+45.3'	93.8°		3°12.7'+46.0'	93.8°		3°08.7'+46.7'	93.9°		3°04.6'+47.3'	93.9°		3°00.4'+48.0'	94.0°		2°56.2'+48.6'	94.0°		2°51.9'+49.2'	94.1°		0
1	4°02.0'+45.3'	93.1°		3°58.7'+46.0'	93.2°		3°55.3'+46.7'	93.3°		3°51.9'+47.3'	93.3°		3°48.4'+47.9'	93.4°		3°44.8'+48.6'	93.5°		3°41.1'+49.2'	93.5°		1
2	4°47.3'+45.3'	92.5°		4°44.7'+46.0'	92.5°		4°42.0'+46.6'	92.6°		4°39.2'+47.3'	92.7°		4°36.3'+47.9'	92.8°		4°33.4'+48.5'	92.9°		4°30.3'+49.2'	93.0°		2
3	5°32.6'+45.2'	91.8°		5°30.7'+45.9'	91.9°		5°28.6'+46.6'	92.0°		5°26.5'+47.2'	92.1°		5°24.2'+47.9'	92.2°		5°21.9'+48.5'	92.3°		5°19.5'+49.1'	92.4°		3
4	6°17.8'+45.2'	91.1°		6°16.6'+45.9'	91.3°		6°15.2'+46.5'	91.4°		6°13.7'+47.2'	91.5°		6°12.1'+47.8'	91.6°		6°10.4'+48.5'	91.7°		6°08.6'+49.1'	91.8°		4
5	7°03.0'+45.1'	90.5°		7°02.4'+45.8'	90.6°		7°01.7'+46.5'	90.7°		7°00.9'+47.1'	90.9°		7°00.0'+47.8'	91.0°		6°58.9'+48.4'	91.1°		6°57.7'+49.0'	91.2°		5
6	7°48.1'+45.1'	89.8°		7°48.3'+45.8'	90.0°		7°48.2'+46.4'	90.1°		7°48.1'+47.1'	90.2°		7°47.8'+47.7'	90.4°		7°47.3'+48.4'	90.5°		7°46.7'+49.0'	90.6°		6
7	8°33.2'+45.0'	89.2°		8°34.0'+45.7'	89.3°		8°34.7'+46.4'	89.5°		8°35.2'+47.0'	89.6°		8°35.5'+47.7'	89.8°		8°35.7'+48.3'	89.9°		8°35.7'+48.9'	90.1°		7
8	9°18.2'+44.9'	88.5°		9°19.7'+45.6'	88.6°		9°21.0'+46.3'	88.8°		9°22.2'+47.0'	89.0°		9°23.2'+47.6'	89.1°		9°24.0'+48.3'	89.3°		9°24.6'+48.9'	89.5°		8
9	10°03.1'+44.8'	87.8°		10°05.3'+45.5'	88.0°		10°07.3'+46.2'	88.2°		10°09.2'+46.9'	88.3°		10°10.8'+47.5'	88.5°		10°12.2'+48.2'	88.7°		10°13.5'+48.8'	88.9°		9
10	10°47.9'+44.7'	87.1°		10°50.8'+45.4'	87.3°		10°53.5'+46.1'	87.5°		10°56.0'+46.8'	87.7°		10°58.3'+47.5'	87.9°		11°00.4'+48.1'	88.1°		11°02.3'+48.7'	88.3°		10
11	11°32.7'+44.7'	86.5°		11°36.3'+45.4'	86.7°		11°39.7'+46.1'	86.9°		11°42.9'+46.7'	87.1°		11°45.8'+47.4'	87.3°		11°48.6'+48.0'	87.5°		11°51.1'+48.7'	87.7°		11
12	12°17.3'+44.5'	85.8°		12°21.7'+45.3'	86.0°		12°25.7'+46.0'	86.2°		12°29.6'+46.6'	86.4°		12°33.2'+47.3'	86.6°		12°36.6'+48.0'	86.9°		12°39.8'+48.6'	87.1°		12
13	13°01.9'+44.4'	85.1°		13°06.9'+45.2'	85.3°		13°11.7'+45.9'	85.5°		13°16.2'+46.5'	85.8°		13°20.5'+47.2'	86.0°		13°24.6'+47.9'	86.3°		13°28.3'+48.5'	86.5°		13
14	13°46.3'+44.3'	84.4°		13°52.1'+45.0'	84.6°		13°57.5'+45.7'	84.9°		14°02.8'+46.4'	85.1°		14°07.7'+47.1'	85.4°		14°12.4'+47.8'	85.6°		14°16.9'+48.4'	85.9°		14
15	14°30.7'+44.2'	83.7°		14°37.1'+44.9'	84.0°		14°43.3'+45.6'	84.2°		14°49.2'+46.3'	84.5°		14°54.8'+47.0'	84.7°		15°00.2'+47.7'	85.0°		15°05.3'+48.3'	85.3°		15
16	15°14.9'+44.1'	83.0°		15°22.0'+44.8'	83.3°		15°28.9'+45.5'	83.5°		15°35.5'+46.2'	83.8°		15°41.8'+46.9'	84.1°		15°47.9'+47.6'	84.4°		15°53.6'+48.2'	84.7°		16
17	15°58.9'+43.9'	82.3°		16°06.8'+44.7'	82.6°		16°14.4'+45.4'	82.9°		16°21.7'+46.1'	83.2°		16°28.7'+46.8'	83.4°		16°35.4'+47.4'	83.7°		16°41.8'+48.1'	84.0°		17
18	16°42.9'+43.8'	81.6°		16°51.5'+44.5'	81.9°		16°59.8'+45.2'	82.2°		17°07.8'+45.9'	82.5°		17°15.5'+46.6'	82.8°		17°22.8'+47.3'	83.1°		17°29.9'+48.0'	83.4°		18
19	17°26.6'+43.6'	80.9°		17°36.0'+44.4'	81.2°		17°45.0'+45.1'	81.5°		17°53.7'+45.8'	81.8°		18°02.1'+46.5'	82.1°		18°10.2'+47.2'	82.5°		18°17.9'+47.9'	82.8°		19
20	18°10.3'+43.5'	80.1°		18°20.4'+44.2'	80.5°		18°30.1'+44.9'	80.8°		18°39.6'+45.7'	81.1°		18°48.6'+46.4'	81.5°		18°57.4'+47.0'	81.8°		19°05.7'+47.7'	82.1°		20
21	18°53.7'+43.3'	79.4°		19°04.6'+44.0'	79.8°		19°15.1'+44.8'	80.1°		19°25.2'+45.5'	80.4°		19°35.0'+46.2'	80.8°		19°44.4'+46.9'	81.1°		19°53.4'+47.6'	81.5°		21
22																						

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

86° 274° LHA

Latitude SAME as Declination

86° 274° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	2°37.4'	+45.3'	93.0°	2°34.2'	+46.0'	93.1°	2°31.0'	+46.7'	93.1°	2°27.7'	+47.3'	93.2°	2°24.4'	+48.0'	93.2°	2°21.0'	+48.6'	93.2°	2°17.6'	+49.2'	93.3°	0
1	3°22.7'	+45.3'	92.4°	3°20.2'	+46.0'	92.4°	3°17.6'	+46.6'	92.5°	3°15.0'	+47.3'	92.5°	3°12.3'	+47.9'	92.6°	3°09.6'	+48.6'	92.7°	3°06.8'	+49.2'	92.7°	1
2	4°08.0'	+45.3'	91.7°	4°06.2'	+45.9'	91.8°	4°04.3'	+46.6'	91.9°	4°02.3'	+47.3'	91.9°	4°00.2'	+47.9'	92.0°	3°58.1'	+48.5'	92.1°	3°55.9'	+49.1'	92.1°	2
3	4°53.3'	+45.2'	91.0°	4°52.1'	+45.9'	91.1°	4°50.9'	+46.6'	91.2°	4°49.6'	+47.2'	91.3°	4°48.1'	+47.9'	91.4°	4°46.6'	+48.5'	91.5°	4°45.1'	+49.1'	91.6°	3
4	5°38.5'	+45.2'	90.4°	5°38.0'	+45.9'	90.5°	5°37.5'	+46.5'	90.6°	5°36.8'	+47.2'	90.7°	5°36.0'	+47.8'	90.8°	5°35.1'	+48.5'	90.9°	5°34.2'	+49.1'	91.0°	4
5	6°23.6'	+45.1'	89.7°	6°23.9'	+45.8'	89.8°	6°24.0'	+46.5'	90.0°	6°24.0'	+47.1'	90.1°	6°23.9'	+47.8'	90.2°	6°23.6'	+48.4'	90.3°	6°23.3'	+49.0'	90.4°	5
6	7°08.8'	+45.1'	89.1°	7°09.7'	+45.8'	89.2°	7°10.5'	+46.4'	89.3°	7°11.1'	+47.1'	89.4°	7°11.6'	+47.7'	89.6°	7°12.0'	+48.4'	89.7°	7°12.3'	+49.0'	89.8°	6
7	7°53.8'	+45.0'	88.4°	7°55.4'	+45.7'	88.5°	7°56.9'	+46.4'	88.7°	7°58.2'	+47.0'	88.8°	7°59.4'	+47.7'	89.0°	8°00.4'	+48.3'	89.1°	8°01.3'	+48.9'	89.2°	7
8	8°38.8'	+44.9'	87.7°	8°41.1'	+45.6'	87.9°	8°43.3'	+46.3'	88.0°	8°45.3'	+47.0'	88.2°	8°47.1'	+47.6'	88.3°	8°48.7'	+48.3'	88.5°	8°50.2'	+48.9'	88.7°	8
9	9°23.8'	+44.9'	87.1°	9°26.8'	+45.6'	87.2°	9°29.6'	+46.2'	87.4°	9°32.2'	+46.9'	87.6°	9°34.7'	+47.6'	87.7°	9°37.0'	+48.2'	87.9°	9°39.1'	+48.8'	88.1°	9
10	10°08.6'	+44.8'	86.4°	10°12.3'	+45.5'	86.6°	10°15.8'	+46.2'	86.7°	10°19.1'	+46.8'	86.9°	10°22.3'	+47.5'	87.1°	10°25.2'	+48.1'	87.3°	10°27.9'	+48.8'	87.5°	10
11	10°53.4'	+44.7'	85.7°	10°57.8'	+45.4'	85.9°	11°02.0'	+46.1'	86.1°	11°06.0'	+46.8'	86.3°	11°09.8'	+47.4'	86.5°	11°13.3'	+48.1'	86.7°	11°16.7'	+48.7'	86.9°	11
12	11°38.1'	+44.6'	85.0°	11°43.2'	+45.3'	85.2°	11°48.1'	+46.0'	85.4°	11°52.7'	+46.7'	85.6°	11°57.2'	+47.3'	85.9°	12°01.4'	+48.0'	86.1°	12°05.4'	+48.6'	86.3°	12
13	12°22.7'	+44.5'	84.3°	12°28.5'	+45.2'	84.6°	12°34.1'	+45.9'	84.8°	12°39.4'	+46.6'	85.0°	12°44.5'	+47.2'	85.2°	12°49.4'	+47.9'	85.5°	12°54.0'	+48.5'	85.7°	13
14	13°07.2'	+44.4'	83.7°	13°13.7'	+45.1'	83.9°	13°20.0'	+45.8'	84.1°	13°26.0'	+46.5'	84.4°	13°31.8'	+47.1'	84.6°	13°37.3'	+47.8'	84.8°	13°42.5'	+48.4'	85.1°	14
15	13°51.6'	+44.3'	83.0°	13°58.8'	+45.0'	83.2°	14°05.7'	+45.7'	83.5°	14°12.5'	+46.4'	83.7°	14°18.9'	+47.0'	84.0°	14°25.1'	+47.7'	84.2°	14°31.0'	+48.3'	84.5°	15
16	14°35.8'	+44.1'	82.3°	14°43.8'	+44.9'	82.5°	14°51.4'	+45.6'	82.8°	14°58.8'	+46.3'	83.1°	15°05.9'	+46.9'	83.3°	15°12.8'	+47.6'	83.6°	15°19.3'	+48.2'	83.9°	16
17	15°20.0'	+44.0'	81.6°	15°28.6'	+44.7'	81.8°	15°37.0'	+45.4'	82.1°	15°45.1'	+46.1'	82.4°	15°52.9'	+46.8'	82.7°	16°00.4'	+47.5'	83.0°	16°07.6'	+48.1'	83.2°	17
18	16°04.0'	+43.9'	80.9°	16°13.3'	+44.6'	81.1°	16°22.4'	+45.3'	81.4°	16°31.2'	+46.0'	81.7°	16°39.7'	+46.7'	82.0°	16°47.9'	+47.4'	82.3°	16°55.7'	+48.0'	82.6°	18
19	16°47.8'	+43.7'	80.1°	16°57.9'	+44.4'	80.4°	17°07.7'	+45.2'	80.7°	17°17.2'	+45.9'	81.1°	17°26.4'	+46.6'	81.4°	17°35.2'	+47.2'	81.7°	17°43.8'	+47.9'	82.0°	19
20	17°31.5'	+43.6'	79.4°	17°42.4'	+44.3'	79.7°	17°52.9'	+45.0'	80.1°	18°03.1'	+45.7'	80.4°	18°13.0'	+46.4'	80.7°	18°22.5'	+47.1'	81.0°	18°31.7'	+47.8'	81.4°	20
21	18°15.1'	+43.4'	78.7°	18°26.7'	+44.1'	79.0°	18°37.9'	+44.9'	79.4°	18°48.8'	+45.6'	79.7°	18°59.4'	+46.3'	80.0°	19°09.6'	+47.0'	80.4°	19°19.4'	+47.6'	80.7°	21
22	18°58.5'	+43.2'	78.0°	19°10.8'	+44.0'	78.3°	19°22.8'	+44.7'	78.7°	19°34.4'	+45.4'	79.0°	19°45.7'	+46.1'	79.4°	19°56.6'	+46.8'	79.7°	20°07.1'	+47.5'	80.1°	22
23	19°41.7'	+43.0'	77.2°	19°54.8'	+43.8'	77.6°	20°07.5'	+44.5'	78.0°	20°19.8'	+45.3'	78.3°	20°31.8'	+46.0'	78.7°	20°43.4'	+46.7'	79.0°	20°54.6'	+47.4'	79.4°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

86° 274° LHA

Latitude SAME as Declination

86° 274° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

87° 273° LHA

Latitude SAME as Declination

87° 273° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	1°58.1'	+45.3'	92.3°	1°55.7'	+46.0'	92.3°	1°53.2'	+46.6'	92.3°	1°50.8'	+47.3'	92.4°	1°48.3'	+47.9'	92.4°	1°45.8'	+48.6'	92.4°	1°43.2'	+49.2'	92.5°	0
1	2°43.4'	+45.3'	91.6°	2°41.7'	+46.0'	91.7°	2°39.9'	+46.6'	91.7°	2°38.1'	+47.3'	91.7°	2°36.2'	+47.9'	91.8°	2°34.3'	+48.5'	91.8°	2°32.4'	+49.2'	91.9°	1
2	3°28.6'	+45.3'	91.0°	3°27.6'	+45.9'	91.0°	3°26.5'	+46.6'	91.1°	3°25.4'	+47.3'	91.1°	3°24.1'	+47.9'	91.2°	3°22.9'	+48.5'	91.3°	3°21.5'	+49.1'	91.3°	2
3	4°13.9'	+45.2'	90.3°	4°13.5'	+45.9'	90.4°	4°13.1'	+46.6'	90.4°	4°12.6'	+47.2'	90.5°	4°12.0'	+47.9'	90.6°	4°11.4'	+48.5'	90.7°	4°10.7'	+49.1'	90.7°	3
4	4°59.1'	+45.2'	89.6°	4°59.4'	+45.9'	89.7°	4°59.7'	+46.5'	89.8°	4°59.8'	+47.2'	89.9°	4°59.0'	+47.8'	90.0°	4°58.9'	+48.5'	90.1°	4°58.8'	+49.1'	90.2°	4
5	5°44.3'	+45.1'	89.0°	5°45.3'	+45.8'	89.1°	5°46.2'	+46.5'	89.2°	5°47.0'	+47.2'	89.3°	5°47.7'	+47.8'	89.4°	5°48.3'	+48.4'	89.5°	5°48.8'	+49.0'	89.6°	5
6	6°29.4'	+45.1'	88.3°	6°31.1'	+45.8'	88.4°	6°32.7'	+46.4'	88.5°	6°34.2'	+47.1'	88.7°	6°35.5'	+47.8'	88.8°	6°36.8'	+48.4'	88.9°	6°37.9'	+49.0'	89.0°	6
7	7°14.5'	+45.0'	87.6°	7°16.9'	+45.7'	87.8°	7°19.2'	+46.4'	87.9°	7°21.3'	+47.1'	88.0°	7°23.3'	+47.7'	88.2°	7°25.2'	+48.3'	88.3°	7°26.9'	+49.0'	88.4°	7
8	7°59.5'	+45.0'	87.0°	8°02.6'	+45.7'	87.1°	8°05.6'	+46.3'	87.3°	8°08.3'	+47.0'	87.4°	8°11.0'	+47.6'	87.5°	8°13.5'	+48.3'	87.7°	8°15.8'	+48.9'	87.8°	8
9	8°44.5'	+44.9'	86.3°	8°48.3'	+45.6'	86.5°	8°51.9'	+46.3'	86.6°	8°55.3'	+46.9'	86.8°	8°58.6'	+47.6'	86.9°	9°01.8'	+48.2'	87.1°	9°04.7'	+48.8'	87.2°	9
10	9°29.4'	+44.8'	85.6°	9°33.8'	+45.5'	85.8°	9°38.2'	+46.2'	86.0°	9°42.3'	+46.9'	86.1°	9°46.2'	+47.5'	86.3°	9°50.0'	+48.2'	86.5°	9°53.6'	+48.8'	86.7°	10
11	10°14.2'	+44.7'	85.0°	10°19.4'	+45.4'	85.1°	10°24.3'	+46.1'	85.3°	10°29.1'	+46.8'	85.5°	10°33.7'	+47.4'	85.7°	10°38.1'	+48.1'	85.9°	10°42.4'	+48.7'	86.1°	11
12	10°58.9'	+44.6'	84.3°	11°04.8'	+45.3'	84.5°	11°10.5'	+46.0'	84.7°	11°15.9'	+46.7'	84.9°	11°21.2'	+47.4'	85.1°	11°26.2'	+48.0'	85.3°	11°31.1'	+48.6'	85.5°	12
13	11°43.5'	+44.5'	83.6°	11°50.1'	+45.2'	83.8°	11°56.5'	+45.9'	84.0°	12°02.6'	+46.6'	84.2°	12°08.5'	+47.3'	84.4°	12°14.2'	+47.9'	84.7°	12°19.7'	+48.6'	84.9°	13
14	12°28.1'	+44.4'	82.9°	12°35.4'	+45.1'	83.1°	12°42.4'	+45.8'	83.4°	12°49.2'	+46.5'	83.6°	12°55.8'	+47.2'	83.8°	13°02.2'	+47.8'	84.0°	13°08.3'	+48.5'	84.3°	14
15	13°12.5'	+44.3'	82.2°	13°20.5'	+45.0'	82.5°	13°28.3'	+45.7'	82.7°	13°35.8'	+46.4'	82.9°	13°43.0'	+47.1'	83.2°	13°50.0'	+47.7'	83.4°	13°56.8'	+48.4'	83.7°	15
16	13°56.8'	+44.2'	81.5°	14°05.6'	+44.9'	81.8°	14°14.0'	+45.6'	82.0°	14°22.2'	+46.3'	82.3°	14°30.1'	+47.0'	82.5°	14°37.8'	+47.6'	82.8°	14°45.2'	+48.3'	83.1°	16
17	14°41.1'	+44.1'	80.8°	14°50.5'	+44.8'	81.1°	14°59.6'	+45.5'	81.4°	15°08.5'	+46.2'	81.6°	15°17.1'	+46.9'	81.9°	15°25.4'	+47.5'	82.2°	15°33.4'	+48.2'	82.4°	17
18	15°25.1'	+43.9'	80.1°	15°35.3'	+44.7'	80.4°	15°45.1'	+45.4'	80.7°	15°54.7'	+46.1'	81.0°	16°04.0'	+46.8'	81.2°	16°13.0'	+47.4'	81.5°	16°21.6'	+48.1'	81.8°	18
19	16°09.1'	+43.8'	79.4°	16°19.9'	+44.5'	79.7°	16°30.5'	+45.2'	80.0°	16°40.8'	+45.9'	80.3°	16°50.7'	+46.6'	80.6°	17°00.4'	+47.3'	80.9°	17°09.7'	+48.0'	81.2°	19
20	16°52.9'	+43.7'	78.7°	17°04.5'	+44.4'	79.0°	17°15.7'	+45.1'	79.3°	17°26.7'	+45.8'	79.6°	17°37.4'	+46.5'	79.9°	17°47.7'	+47.2'	80.3°	17°57.7'	+47.8'	80.6°	20
21	17°36.5'	+43.5'	78.0°	17°48.9'	+44.2'	78.3°	18°00.9'	+45.0'	78.6°	18°12.5'	+45.7'	78.9°	18°23.9'	+46.4'	79.3°	18°34.9'	+47.0'	79.6°	18°45.5'	+47.7'	79.9°	21
22	18°20.0'	+43.3'	77.3°	18°33.1'	+44.1'	77.6°	18°45.8'	+44.8'	77.9°	18°58.2'	+45.5'	78.3°	19°10.2'	+46.2'	78.6°	19°21.9'	+46.9'	78.9°	19°33.2'			

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

88° 272° LHA

Latitude SAME as Declination

88° 272° LHA

Table with columns for Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each cell contains a 3-part coordinate (Hc°, d', Z°).

88° 272° LHA

Latitude SAME as Declination

88° 272° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

89° 271° LHA

Latitude SAME as Declination

89° 271° LHA

Table with columns for Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each cell contains a 3-part coordinate (Hc°, d', Z°).

89° 271° LHA

Latitude SAME as Declination

89° 271° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

90° 270° LHA

Latitude CONTRARY or SAME as Declination

90° 270° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	0°00.0'	+45.3'	90.0°	0°00.0'	+46.0'	90.0°	0°00.0'	+46.6'	90.0°	0°00.0'	+47.3'	90.0°	0°00.0'	+47.9'	90.0°	0°00.0'	+48.5'	90.0°	0°00.0'	+49.1'	90.0°	0
1	0°45.3'	+45.3'	89.3°	0°46.0'	+46.0'	89.4°	0°46.6'	+46.6'	89.4°	0°47.3'	+47.3'	89.4°	0°47.9'	+47.9'	89.4°	0°48.5'	+48.5'	89.4°	0°49.1'	+49.1'	89.4°	1
2	1°30.6'	+45.3'	88.7°	1°31.9'	+45.9'	88.7°	1°33.3'	+46.6'	88.7°	1°34.6'	+47.3'	88.8°	1°35.8'	+47.9'	88.8°	1°37.1'	+48.5'	88.8°	1°38.3'	+49.1'	88.9°	2
3	2°15.8'	+45.2'	88.0°	2°17.9'	+45.9'	88.1°	2°19.9'	+46.6'	88.1°	2°21.8'	+47.2'	88.2°	2°23.7'	+47.9'	88.2°	2°25.6'	+48.5'	88.2°	2°27.4'	+49.1'	88.3°	3
4	3°01.1'	+45.2'	87.4°	3°03.8'	+45.9'	87.4°	3°06.5'	+46.6'	87.5°	3°09.1'	+47.2'	87.5°	3°11.6'	+47.9'	87.6°	3°14.1'	+48.5'	87.6°	3°16.5'	+49.1'	87.7°	4
5	3°46.3'	+45.2'	86.7°	3°49.7'	+45.9'	86.8°	3°53.0'	+46.5'	86.8°	3°56.3'	+47.2'	86.9°	3°59.5'	+47.8'	87.0°	4°02.6'	+48.5'	87.1°	4°05.6'	+49.1'	87.1°	5
6	4°31.5'	+45.2'	86.1°	4°35.6'	+45.8'	86.1°	4°39.6'	+46.5'	86.2°	4°43.5'	+47.2'	86.3°	4°47.3'	+47.8'	86.4°	4°51.1'	+48.4'	86.5°	4°54.7'	+49.0'	86.6°	6
7	5°16.6'	+45.1'	85.4°	5°21.4'	+45.8'	85.5°	5°26.1'	+46.5'	85.6°	5°30.7'	+47.1'	85.7°	5°35.1'	+47.8'	85.8°	5°39.5'	+48.4'	85.9°	5°43.8'	+49.0'	86.0°	7
8	6°01.8'	+45.1'	84.7°	6°07.2'	+45.8'	84.8°	6°12.5'	+46.4'	84.9°	6°17.8'	+47.1'	85.1°	6°22.9'	+47.7'	85.2°	6°27.9'	+48.4'	85.3°	6°32.8'	+49.0'	85.4°	8
9	6°46.8'	+45.0'	84.1°	6°53.0'	+45.7'	84.2°	6°59.0'	+46.4'	84.3°	7°04.9'	+47.0'	84.4°	7°10.6'	+47.7'	84.6°	7°16.2'	+48.3'	84.7°	7°21.7'	+48.9'	84.8°	9
10	7°31.8'	+45.0'	83.4°	7°38.7'	+45.6'	83.5°	7°45.3'	+46.3'	83.7°	7°51.9'	+47.0'	83.8°	7°58.3'	+47.6'	83.9°	8°04.6'	+48.3'	84.1°	8°10.7'	+48.9'	84.2°	10
11	8°16.8'	+44.9'	82.7°	8°24.3'	+45.6'	82.9°	8°31.7'	+46.3'	83.0°	8°38.9'	+46.9'	83.2°	8°45.9'	+47.6'	83.3°	8°52.8'	+48.2'	83.5°	8°59.5'	+48.8'	83.6°	11
12	9°01.7'	+44.8'	82.1°	9°09.9'	+45.5'	82.2°	9°17.9'	+46.2'	82.4°	9°25.8'	+46.8'	82.5°	9°33.5'	+47.5'	82.7°	9°41.0'	+48.1'	82.9°	9°48.4'	+48.8'	83.0°	12
13	9°46.5'	+44.7'	81.4°	9°55.4'	+45.4'	81.6°	10°04.1'	+46.1'	81.7°	10°12.6'	+46.8'	81.9°	10°21.0'	+47.4'	82.1°	10°29.1'	+48.1'	82.3°	10°37.1'	+48.7'	82.5°	13
14	10°31.2'	+44.6'	80.7°	10°40.8'	+45.3'	80.9°	10°50.2'	+46.0'	81.1°	10°59.4'	+46.7'	81.3°	11°08.4'	+47.3'	81.5°	11°17.2'	+48.0'	81.7°	11°25.8'	+48.6'	81.9°	14
15	11°15.9'	+44.6'	80.0°	11°26.1'	+45.2'	80.2°	11°36.2'	+45.9'	80.4°	11°46.1'	+46.6'	80.6°	11°55.7'	+47.3'	80.8°	12°05.2'	+47.9'	81.0°	12°14.4'	+48.5'	81.3°	15
16	12°00.4'	+44.5'	79.3°	12°11.4'	+45.2'	79.6°	12°22.2'	+45.8'	79.8°	12°32.7'	+46.5'	80.0°	12°43.0'	+47.2'	80.2°	12°53.1'	+47.8'	80.4°	13°03.0'	+48.5'	80.7°	16
17	12°44.9'	+44.3'	78.7°	12°56.5'	+45.0'	78.9°	13°08.0'	+45.7'	79.1°	13°19.2'	+46.4'	79.3°	13°30.2'	+47.1'	79.6°	13°40.9'	+47.7'	79.8°	13°51.4'	+48.4'	80.1°	17
18	13°29.2'	+44.2'	78.0°	13°41.6'	+44.9'	78.2°	13°53.7'	+45.6'	78.4°	14°05.6'	+46.3'	78.7°	14°17.3'	+47.0'	78.9°	14°28.7'	+47.6'	79.2°	14°39.8'	+48.3'	79.4°	18
19	14°13.4'	+44.1'	77.3°	14°26.5'	+44.8'	77.5°	14°39.4'	+45.5'	77.8°	14°51.9'	+46.2'	78.0°	15°04.2'	+46.9'	78.3°	15°16.3'	+47.5'	78.6°	15°28.0'	+48.2'	78.8°	19
20	14°57.5'	+44.0'	76.6°	15°11.3'	+44.7'	76.8°	15°24.9'	+45.4'	77.1°	15°38.1'	+46.1'	77.4°	15°51.1'	+46.7'	77.6°	16°03.8'	+47.4'	77.9°	16°16.2'	+48.1'	78.2°	20
21	15°41.5'	+43.8'	75.9°	15°56.0'	+44.6'	76.1°	16°10.3'	+45.3'	76.4°	16°24.2'	+45.9'	76.7°	16°37.9'	+46.6'	77.0°	16°51.2'	+47.3'	77.3°	17°04.3'	+47.9'	77.6°	21
22	16°25.4'	+43.7'	75.2°	16°40.6'	+44.4'	75.4°	16°55.5'	+45.1'	75.7°	17°10.2'	+45.8'	76.0°	17°24.5'	+46.5'	76.3°	17°38.5'	+47.2'	76.6°	17°52.2'	+47.8'	77.0°	22
23	17°09.1'	+43.5'	74.4°	17°25.0'	+44.3'	74.7°	17°40.6'	+45.0'	75.0°	17°56.0'	+45.7'	75.4°	18°11.0'	+46.4'	75.7°	18°25.7'	+47.0'	76.0°	18°40.0'	+47.7'	76.3°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°

90° 270° LHA

Latitude CONTRARY or SAME as Declination

90° 270° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

89° 271° LHA

Latitude CONTRARY to Declination

89° 271° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	<u>0°39.4'</u>	<u>-45.3'</u>	<u>90.8°</u>	<u>0°38.6'</u>	<u>-46.0'</u>	<u>90.8°</u>	<u>0°37.8'</u>	<u>-46.6'</u>	<u>90.8°</u>	<u>0°36.9'</u>	<u>-47.3'</u>	<u>90.8°</u>	<u>0°36.1'</u>	<u>-47.9'</u>	<u>90.8°</u>	<u>0°35.3'</u>	<u>-48.5'</u>	<u>90.8°</u>	<u>0°34.4'</u>	<u>-49.2'</u>	<u>90.8°</u>	0
1	0°05.9'	+45.3'	88.6°	0°07.4'	+46.0'	88.6°	0°08.9'	+46.6'	88.6°	0°10.3'	+47.3'	88.6°	0°11.8'	+47.9'	88.6°	0°13.3'	+48.5'	88.6°	0°14.7'	+49.2'	88.6°	1
2	0°51.2'	+45.3'	87.9°	0°53.4'	+46.0'	87.9°	0°55.5'	+46.6'	88.0°	0°57.6'	+47.3'	88.0°	0°59.7'	+47.9'	88.0°	1°01.8'	+48.5'	88.0°	1°03.9'	+49.1'	88.0°	2
3	1°36.5'	+45.3'	87.3°	1°39.3'	+45.9'	87.3°	1°42.1'	+46.6'	87.3°	1°44.9'	+47.3'	87.4°	1°47.6'	+47.9'	87.4°	1°50.4'	+48.5'	87.4°	1°53.0'	+49.1'	87.5°	3
4	2°21.8'	+45.2'	86.6°	2°25.3'	+45.9'	86.7°	2°28.7'	+46.6'	86.7°	2°32.2'	+47.2'	86.7°	2°35.6'	+47.9'	86.8°	2°38.9'	+48.5'	86.8°	2°42.2'	+49.1'	86.9°	4
5	3°07.0'	+45.2'	86.0°	3°11.2'	+45.9'	86.0°	3°15.3'	+46.6'	86.1°	3°19.4'	+47.2'	86.1°	3°23.4'	+47.9'	86.2°	3°27.4'	+48.5'	86.2°	3°31.3'	+49.1'	86.3°	5
6	3°52.2'	+45.2'	85.3°	3°57.1'	+45.9'	85.4°	4°01.9'	+46.5'	85.4°	4°06.6'	+47.2'	85.5°	4°11.3'	+47.8'	85.6°	4°15.9'	+48.5'	85.7°	4°20.4'	+49.1'	85.7°	6
7	4°37.4'	+45.2'	84.6°	4°43.0'	+45.8'	84.7°	4°48.5'	+46.5'	84.8°	4°53.8'	+47.2'	84.9°	4°59.1'	+47.8'	85.0°	5°04.3'	+48.4'	85.1°	5°09.5'	+49.0'	85.2°	7
8	5°22.6'	+45.1'	84.0°	5°28.8'	+45.8'	84.1°	5°35.0'	+46.5'	84.2°	5°41.0'	+47.1'	84.3°	5°46.9'	+47.8'	84.4°	5°52.8'	+48.4'	84.5°	5°58.5'	+49.0'	84.6°	8
9	6°07.7'	+45.1'	83.3°	6°14.6'	+45.7'	83.4°	6°21.4'	+46.4'	83.5°	6°28.1'	+47.1'	83.7°	6°34.7'	+47.7'	83.8°	6°41.2'	+48.3'	83.9°	6°47.5'	+49.0'	84.0°	9
10	6°52.8'	+45.0'	82.7°	7°00.4'	+45.7'	82.8°	7°07.8'	+46.4'	82.9°	7°15.2'	+47.0'	83.0°	7°22.4'	+47.7'	83.2°	7°29.5'	+48.3'	83.3°	7°36.4'	+48.9'	83.4°	10
11	7°37.8'	+44.9'	82.0°	7°46.1'	+45.6'	82.1°	7°54.2'	+46.3'	82.3°	8°02.2'	+47.0'	82.4°	8°10.1'	+47.6'	82.5°	8°17.8'	+48.2'	82.7°	8°25.4'	+48.9'	82.8°	11
12	8°22.7'	+44.9'	81.3°	8°31.7'	+45.6'	81.5°	8°40.5'	+46.2'	81.6°	8°49.2'	+46.9'	81.8°	8°57.7'	+47.6'	81.9°	9°06.0'	+48.2'	82.1°	9°14.2'	+48.8'	82.2°	12
13	9°07.6'	+44.8'	80.6°	9°17.3'	+45.5'	80.8°	9°26.8'	+46.2'	81.0°	9°36.1'	+46.8'	81.1°	9°45.2'	+47.5'	81.3°	9°54.2'	+48.1'	81.5°	10°03.0'	+48.7'	81.7°	13
14	9°52.4'	+44.7'	80.0°	10°02.8'	+45.4'	80.1°	10°12.9'	+46.1'	80.3°	10°22.9'	+46.8'	80.5°	10°32.7'	+47.4'	80.7°	10°42.3'	+48.0'	80.9°	10°51.8'	+48.7'	81.1°	14
15	10°37.1'	+44.6'	79.3°	10°48.2'	+45.3'	79.5°	10°59.0'	+46.0'	79.7°	11°09.7'	+46.7'	79.9°	11°20.1'	+47.3'	80.1°	11°30.4'	+48.0'	80.3°	11°40.4'	+48.6'	80.5°	15
16	11°21.8'	+44.5'	78.6°	11°33.5'	+45.2'	78.8°	11°45.0'	+45.9'	79.0°	11°56.4'	+46.6'	79.2°	12°07.5'	+47.2'	79.4°	12°18.4'	+47.9'	79.6°	12°29.0'	+48.5'	79.9°	16
17	12°06.3'	+44.4'	77.9°	12°18.7'	+45.1'	78.1°	12°31.0'	+45.8'	78.4°	12°43.0'	+46.5'	78.6°	12°54.7'	+47.2'	78.8°	13°06.3'	+47.8'	79.0°	13°17.6'	+48.4'	79.3°	17
18	12°50.8'	+44.3'	77.2°	13°03.9'	+45.0'	77.5°	13°16.8'	+45.7'	77.7°	13°29.5'	+46.4'	77.9°	13°41.9'	+47.1'	78.2°	13°54.1'	+47.7'	78.4°	14°06.0'	+48.3'	78.7°	18
19	13°35.1'	+44.2'	76.6°	13°48.9'	+44.9'	76.8°	14°02.5'	+45.6'	77.0°	14°15.8'	+46.3'	77.3°	14°28.9'	+47.0'	77.5°	14°41.8'	+47.6'	77.8°	14°54.3'	+48.2'	78.0°	19
20	14°19.3'	+44.1'	75.9°	14°33.8'	+44.8'	76.1°	14°48.1'	+45.5'	76.4°	15°02.1'	+46.2'	76.6°	15°15.9'	+46.8'	76.9°	15°29.4'	+47.5'	77.2°	15°42.6'	+48.1'	77.4°	20
21	15°03.4'	+44.0'	75.2°	15°18.6'	+44.7'	75.4°	15°33.6'	+45.4'	75.7°	15°48.3'	+46.1'	76.0°	16°02.7'	+46.7'	76.2°	16°16.9'	+47.4'	76.5°	16°30.7'	+48.0'	76.8°	21
22	15°47.4'	+43.8'	74.4°	16°03.3'	+44.5'	74.7°	16°19.0'	+45.2'	75.0°	16°34.4'	+45.9'	75.3°	16°49.5'	+46.6'	75.6°	17°04.2'	+47.3'	75.9°	17°18.7'	+47.9'	76.2°	22
23	16°31.2'	+43.7'	73.7°	16°47.9'	+44.4'	74.0°	17°04.2'	+45.1'	74.3°	17°20.3'	+45.8'	74.6°	17°36.0'	+46.5'	74.9°	17°51.5'	+47.1'	75.2°	18°06.6'	+47.8'	75.5°	

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

88° 272° LHA

Latitude CONTRARY to Declination

88° 272° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	1°18.7'	45.3'	91.5°	1°17.1'	46.0'	91.5°	1°15.5'	46.6'	91.6°	1°13.9'	47.3'	91.6°	1°12.2'	47.9'	91.6°	1°10.5'	48.6'	91.6°	1°08.8'	49.2'	91.6°	0
1	<u>0°33.4'</u>	<u>45.3'</u>	<u>92.2°</u>	<u>0°31.1'</u>	<u>46.0'</u>	<u>92.2°</u>	<u>0°28.9'</u>	<u>46.6'</u>	<u>92.2°</u>	<u>0°26.6'</u>	<u>47.3'</u>	<u>92.2°</u>	<u>0°24.3'</u>	<u>47.9'</u>	<u>92.2°</u>	<u>0°22.0'</u>	<u>48.6'</u>	<u>92.2°</u>	<u>0°19.7'</u>	<u>49.2'</u>	<u>92.2°</u>	1
2	0°11.9'	+45.3'	87.2°	0°14.8'	+46.0'	87.2°	0°17.8'	+46.6'	87.2°	0°20.7'	+47.3'	87.2°	0°23.7'	+47.9'	87.2°	0°26.6'	+48.6'	87.2°	0°29.5'	+49.2'	87.2°	2
3	0°57.2'	+45.3'	86.5°	1°00.8'	+46.0'	86.5°	1°04.4'	+46.6'	86.6°	1°08.0'	+47.3'	86.6°	1°11.6'	+47.9'	86.6°	1°15.1'	+48.5'	86.6°	1°18.7'	+49.2'	86.6°	3
4	1°42.5'	+45.3'	85.9°	1°46.8'	+46.0'	85.9°	1°51.1'	+46.6'	85.9°	1°55.3'	+47.3'	86.0°	1°59.5'	+47.9'	86.0°	2°03.7'	+48.5'	86.0°	2°07.8'	+49.1'	86.1°	4
5	2°27.8'	+45.3'	85.2°	2°32.7'	+45.9'	85.3°	2°37.7'	+46.6'	85.3°	2°42.6'	+47.3'	85.3°	2°47.4'	+47.9'	85.4°	2°52.2'	+48.5'	85.4°	2°57.0'	+49.1'	85.5°	5
6	3°13.0'	+45.2'	84.6°	3°18.7'	+45.9'	84.6°	3°24.3'	+46.6'	84.7°	3°29.8'	+47.2'	84.7°	3°35.3'	+47.9'	84.8°	3°40.7'	+48.5'	84.9°	3°46.1'	+49.1'	84.9°	6
7	3°58.3'	+45.2'	83.9°	4°04.6'	+45.9'	84.0°	4°10.9'	+46.5'	84.0°	4°17.1'	+47.2'	84.1°	4°23.2'	+47.8'	84.2°	4°29.2'	+48.5'	84.3°	4°35.2'	+49.1'	84.3°	7
8	4°43.5'	+45.2'	83.2°	4°50.5'	+45.8'	83.3°	4°57.4'	+46.5'	83.4°	5°04.3'	+47.2'	83.5°	5°11.0'	+47.8'	83.6°	5°17.7'	+48.4'	83.7°	5°24.3'	+49.0'	83.8°	8
9	5°28.6'	+45.1'	82.6°	5°36.3'	+45.8'	82.7°	5°43.9'	+46.5'	82.8°	5°51.4'	+47.1'	82.9°	5°58.8'	+47.8'	83.0°	6°06.1'	+48.4'	83.1°	6°13.3'	+49.0'	83.2°	9
10	6°13.8'	+45.1'	81.9°	6°22.1'	+45.8'	82.0°	6°30.4'	+46.4'	82.1°	6°38.6'	+47.1'	82.2°	6°46.6'	+47.7'	82.4°	6°54.5'	+48.3'	82.5°	7°02.3'	+49.0'	82.6°	10
11	6°58.8'	+45.0'	81.2°	7°07.9'	+45.7'	81.4°	7°16.8'	+46.4'	81.5°	7°25.6'	+47.0'	81.6°	7°34.3'	+47.7'	81.8°	7°42.8'	+48.3'	81.9°	7°51.2'	+48.9'	82.0°	11
12	7°43.8'	+45.0'	80.6°	7°53.6'	+45.6'	80.7°	8°03.2'	+46.3'	80.9°	8°12.7'	+47.0'	81.0°	8°22.0'	+47.6'	81.1°	8°31.1'	+48.2'	81.3°	8°40.2'	+48.9'	81.4°	12
13	8°28.8'	+44.9'	79.9°	8°39.2'	+45.6'	80.1°	8°49.5'	+46.2'	80.2°	8°59.6'	+46.9'	80.4°	9°09.6'	+47.5'	80.5°	9°19.4'	+48.2'	80.7°	9°29.0'	+48.8'	80.8°	13
14	9°13.7'	+44.8'	79.2°	9°24.8'	+45.5'	79.4°	9°35.8'	+46.2'	79.6°	9°46.5'	+46.8'	79.7°	9°57.1'	+47.5'	79.9°	10°07.6'	+48.1'	80.1°	10°17.8'	+48.7'	80.3°	14
15	9°58.5'	+44.7'	78.6°	10°10.3'	+45.4'	78.7°	10°21.9'	+46.1'	78.9°	10°33.4'	+46.8'	79.1°	10°44.6'	+47.4'	79.3°	10°55.7'	+48.0'	79.5°	11°06.5'	+48.7'	79.7°	15
16	10°43.2'	+44.6'	77.9°	10°55.7'	+45.3'	78.1°	11°08.0'	+46.0'	78.3°	11°20.1'	+46.7'	78.5°	11°32.0'	+47.3'	78.7°	11°43.7'	+48.0'	78.9°	11°55.2'	+48.6'	79.1°	16
17	11°27.9'	+44.5'	77.2°	11°41.1'	+45.2'	77.4°	11°54.0'	+45.9'	77.6°	12°06.8'	+46.6'	77.8°	12°19.3'	+47.2'	78.0°	12°31.7'	+47.9'	78.2°	12°43.8'	+48.5'	78.5°	17
18	12°12.4'	+44.4'	76.5°	12°26.3'	+45.1'	76.7°	12°39.9'	+45.8'	77.0°	12°53.4'	+46.5'	77.2°	13°06.6'	+47.1'	77.4°	13°19.6'	+47.8'	77.6°	13°32.3'	+48.4'	77.9°	18
19	12°56.9'	+44.3'	75.8°	13°11.4'	+45.0'	76.1°	13°25.8'	+45.7'	76.3°	13°39.9'	+46.4'	76.5°	13°53.7'	+47.0'	76.8°	14°07.3'	+47.7'	77.0°	14°20.7'	+48.3'	77.3°	19
20	13°41.2'	+44.2'	75.1°	13°56.5'	+44.9'	75.4°	14°11.5'	+45.6'	75.6°	14°26.3'	+46.3'	75.9°	14°40.8'	+46.9'	76.1°	14°55.0'	+47.6'	76.4°	15°09.0'	+48.2'	76.6°	20
21	14°25.4'	+44.1'	74.4°	14°41.4'	+44.8'	74.7°	14°57.1'	+45.5'	75.0°	15°12.5'	+46.2'	75.2°	15°27.7'	+46.8'	75.5°	15°42.6'	+47.5'	75.7°	15°57.3'	+48.1'	76.0°	21
22	15°09.5'	+44.0'	73.7°	15°26.2'	+44.7'	74.0°	15°42.6'	+45.4'	74.3°	15°58.7'	+46.0'	74.5°	16°14.5'	+46.7'	74.8°	16°30.1'	+47.4'	75.1°	16°45.4'	+48.0'	75.4°	22
23	15°53.5'	+43.8'	73.0°	16°10.8'	+44.5'	73.3°	16°27.9'	+45.2'	73.6°	16°44.7'	+45.9'	73.9°	17°01.2'	+46.6'	74.2°	17°17.5'	+47.2'	74.5°	17°33.4'	+47.9'	74.8°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

92° 268° LHA

Latitude SAME as DECLINATION

92° 268° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

87° 273° LHA

Latitude CONTRARY to Declination

87° 273° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	1°58.0'	45.3'	92.3°	1°55.7'	46.0'	92.3°	1°53.2'	46.7'	92.3°	1°50.8'	47.3'	92.4°	1°48.3'	47.9'	92.4°	1°45.8'	48.6'	92.4°	1°43.2'	49.2'	92.5°	0
1	1°12.7'	45.3'	92.9°	1°09.7'	46.0'	92.9°	1°06.6'	46.7'	93.0°	1°03.5'	47.3'	93.0°	1°00.3'	48.0'	93.0°	0°57.2'	48.6'	93.0°	0°54.0'	49.2'	93.0°	1
2	<u>0°27.4'</u>	<u>45.3'</u>	<u>93.6°</u>	<u>0°23.7'</u>	<u>46.0'</u>	<u>93.6°</u>	<u>0°19.9'</u>	<u>46.7'</u>	<u>93.6°</u>	<u>0°16.2'</u>	<u>47.3'</u>	<u>93.6°</u>	<u>0°12.4'</u>	<u>48.0'</u>	<u>93.6°</u>	<u>0°08.6'</u>	<u>48.6'</u>	<u>93.6°</u>	<u>0°04.9'</u>	<u>49.2'</u>	<u>93.6°</u>	2
3	0°17.9'	+45.3'	85.8°	0°22.3'	+46.0'	85.8°	0°26.8'	+46.7'	85.8°	0°31.2'	+47.3'	85.8°	0°35.6'	+48.0'	85.8°	0°39.9'	+48.6'	85.8°	0°44.3'	+49.2'	85.8°	3
4	1°03.2'	+45.3'	85.1°	1°08.3'	+46.0'	85.1°	1°13.4'	+46.7'	85.2°	1°18.5'	+47.3'	85.2°	1°23.5'	+47.9'	85.2°	1°28.5'	+48.6'	85.2°	1°33.5'	+49.2'	85.3°	4
5	1°48.6'	+45.3'	84.5°	1°54.3'	+46.0'	84.5°	2°00.1'	+46.6'	84.5°	2°05.8'	+47.3'	84.6°	2°11.5'	+47.9'	84.6°	2°17.1'	+48.5'	84.6°	2°22.7'	+49.2'	84.7°	5
6	2°33.9'	+45.3'	83.8°	2°40.3'	+46.0'	83.8°	2°46.7'	+46.6'	83.9°	2°53.1'	+47.3'	83.9°	2°59.4'	+7.9'	84.0°	3°05.6'	+48.5'	84.0°	3°11.8'	+49.1'	84.1°	6
7	3°19.1'	+45.3'	83.1°	3°26.3'	+45.9'	83.2°	3°33.3'	+46.6'	83.3°	3°40.3'	+47.2'	83.3°	3°47.3'	+47.9'	83.4°	3°54.2'	+48.5'	83.5°	4°01.0'	+49.1'	83.5°	7
8	4°04.4'	+45.2'	82.5°	4°12.2'	+45.9'	82.6°	4°19.9'	+46.6'	82.6°	4°27.6'	+47.2'	82.7°	4°35.2'	+47.9'	82.8°	4°42.7'	+48.5'	82.9°	4°50.1'	+49.1'	83.0°	8
9	4°49.6'	+45.2'	81.8°	4°58.1'	+45.9'	81.9°	5°06.5'	+46.5'	82.0°	5°14.8'	+47.2'	82.1°	5°23.0'	+47.8'	82.2°	5°31.1'	+48.4'	82.3°	5°39.1'	+49.0'	82.4°	9
10	5°34.8'	+45.1'	81.2°	5°44.0'	+45.8'	81.3°	5°53.0'	+46.5'	81.4°	6°02.0'	+47.1'	81.5°	6°10.8'	+47.8'	81.6°	6°19.6'	+48.4'	81.7°	6°28.2'	+49.0'	81.8°	10
11	6°20.0'	+45.1'	80.5°	6°29.8'	+45.8'	80.6°	6°39.5'	+46.4'	80.7°	6°49.1'	+47.1'	80.8°	6°58.6'	+47.7'	81.0°	7°08.0'	+48.4'	81.1°	7°17.2'	+49.0'	81.2°	11
12	7°05.1'	+45.0'	79.8°	7°15.6'	+45.7'	80.0°	7°26.0'	+46.4'	80.1°	7°36.2'	+47.0'	80.2°	7°46.3'	+47.7'	80.4°	7°56.3'	+48.3'	80.5°	8°06.2'	+48.9'	80.6°	12
13	7°50.1'	+45.0'	79.2°	8°01.3'	+45.7'	79.3°	8°12.3'	+46.3'	79.5°	8°23.3'	+47.0'	79.6°	8°34.0'	+47.6'	79.7°	8°44.6'	+48.2'	79.9°	8°55.1'	+48.9'	80.0°	13
14	8°35.1'	+44.9'	78.5°	8°46.9'	+45.6'	78.7°	8°58.7'	+46.3'	78.8°	9°10.2'	+46.9'	79.0°	9°21.6'	+47.6'	79.1°	9°32.9'	+48.2'	79.3°	9°43.9'	+48.8'	79.5°	14
15	9°20.0'	+44.8'	77.8°	9°32.5'	+45.5'	78.0°	9°44.9'	+46.2'	78.2°	9°57.1'	+46.8'	78.3°	10°09.2'	+47.5'	78.5°	10°21.0'	+48.1'	78.7°	10°32.7'	+48.7'	78.9°	15
16	10°04.8'	+44.7'	77.2°	10°18.0'	+45.4'	77.3°	10°31.1'	+46.1'	77.5°	10°44.0'	+46.8'	77.7°	10°56.7'	+47.4'	77.9°	11°09.2'	+48.0'	78.1°	11°21.5'	+48.7'	78.3°	16
17	10°49.5'	+44.7'	76.5°	11°03.5'	+45.3'	76.7°	11°17.2'	+46.0'	76.9°	11°30.7'	+46.7'	77.1°	11°44.1'	+47.3'	77.3°	11°57.2'	+48.0'	77.5°	12°10.1'	+48.6'	77.7°	17
18	11°34.2'	+44.6'	75.8°	11°48.8'	+45.2'	76.0°	12°03.2'	+45.9'	76.2°	12°17.4'	+46.6'	76.4°	12°31.4'	+47.2'	76.6°	12°45.2'	+47.9'	76.8°	12°58.7'	+48.5'	77.1°	18
19	12°18.8'	+44.5'	75.1°	12°34.1'	+45.1'	75.3°	12°49.1'	+45.8'	75.5°	13°04.0'	+46.5'	75.8°	13°18.6'	+47.1'	76.0°	13°33.0'	+47.8'	76.2°	13°47.2'	+48.4'	76.5°	19
20	13°03.2'	+44.3'	74.4°	13°19.2'	+45.0'	74.7°	13°35.0'	+45.7'	74.9°	13°50.5'	+46.4'	75.1°	14°05.8'	+47.0'	75.4°	14°20.8'	+47.7'	75.6°	14°35.6'	+48.3'	75.9°	20
21	13°47.6'	+44.2'	73.7°	14°04.2'	+44.9'	74.0°	14°20.7'	+45.6'	74.2°	14°36.9'	+46.3'	74.5°	14°52.8'	+46.9'	74.7°	15°08.5'	+47.6'	75.0°	15°23.9'	+48.2'	75.2°	21
22	14°31.8'																					

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

86° 274° LHA

Latitude CONTRARY to Declination

86° 274° LHA

Table with 26 rows (Dec 0-23) and 10 columns (49-55). Each cell contains three angles (Hc, d, Z) for a specific declination. The table is bordered and includes a footer row with column indices 49-55.

94° 266° LHA

Latitude SAME as DECLINATION

94° 266° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

85° 275° LHA

Latitude CONTRARY to Declination

85° 275° LHA

Table with 26 rows (Dec 0-23) and 10 columns (49-55). Each cell contains three angles (Hc, d, Z) for a specific declination. The table is bordered and includes a footer row with column indices 49-55.

95° 265° LHA

Latitude SAME as DECLINATION

95° 265° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

84° 276° LHA

Latitude CONTRARY to Declination

84° 276° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	3°55.9'	-45.4'	94.5°	3°51.2'	-46.1'	94.6°	3°46.3'	-46.7'	94.7°	3°41.4'	-47.4'	94.7°	3°36.4'	-48.0'	94.8°	3°31.3'	-48.6'	94.9°	3°26.2'	-49.2'	94.9°	0
1	3°10.5'	-45.4'	95.2°	3°05.1'	-46.1'	95.2°	2°59.6'	-46.8'	95.3°	2°54.0'	-47.4'	95.3°	2°48.4'	-48.0'	95.4°	2°42.7'	-48.7'	95.4°	2°37.0'	-49.3'	95.5°	1
2	2°25.1'	-45.4'	95.8°	2°19.0'	-46.1'	95.9°	2°12.8'	-46.8'	95.9°	2°06.6'	-47.4'	96.0°	2°00.3'	-48.1'	96.0°	1°54.0'	-48.7'	96.0°	1°47.7'	-49.3'	96.1°	2
3	1°39.7'	-45.5'	96.5°	1°32.9'	-46.1'	96.5°	1°26.0'	-46.8'	96.6°	1°19.2'	-47.4'	96.6°	1°12.3'	-48.1'	96.6°	1°05.4'	-48.7'	96.6°	0°58.5'	-49.3'	96.6°	3
4	0°54.2'	-45.5'	97.2°	0°46.7'	-46.1'	97.2°	0°39.2'	-46.8'	97.2°	0°31.7'	-47.4'	97.2°	0°24.2'	-48.1'	97.2°	0°16.7'	-48.7'	97.2°	0°09.2'	-49.3'	97.2°	4
5	0°08.7'	-45.5'	97.8°	0°00.6'	-46.1'	97.8°	0°07.6'	+46.8'	82.2°	0°15.7'	+47.4'	82.2°	0°23.9'	+48.1'	82.2°	0°32.0'	+48.7'	82.2°	0°40.1'	+49.3'	82.2°	5
6	0°36.7'	+45.5'	81.5°	0°45.6'	+46.1'	81.6°	0°54.4'	+46.8'	81.6°	1°03.1'	+47.4'	81.6°	1°11.9'	+48.1'	81.6°	1°20.7'	+48.7'	81.6°	1°29.4'	+49.3'	81.7°	6
7	1°22.2'	+45.5'	80.9°	1°31.7'	+46.1'	80.9°	1°41.1'	+46.8'	80.9°	1°50.6'	+47.4'	81.0°	1°59.6'	+48.0'	81.0°	2°08.3'	+48.7'	81.0°	2°17.0'	+49.3'	81.1°	7
8	2°07.7'	+45.4'	80.2°	2°17.8'	+46.1'	80.3°	2°27.9'	+46.8'	80.3°	2°38.0'	+47.4'	80.4°	2°48.0'	+48.0'	80.4°	2°58.0'	+48.6'	80.5°	3°07.9'	+49.2'	80.5°	8
9	2°53.1'	+45.4'	79.6°	3°03.9'	+46.1'	79.6°	3°14.7'	+46.7'	79.7°	3°25.4'	+47.4'	79.7°	3°36.0'	+48.0'	79.8°	3°46.6'	+48.6'	79.9°	3°57.1'	+49.2'	79.9°	9
10	3°38.5'	+45.4'	78.9°	3°50.0'	+46.1'	79.0°	4°01.4'	+46.7'	79.1°	4°12.8'	+47.3'	79.1°	4°24.0'	+48.0'	79.2°	4°35.2'	+48.6'	79.3°	4°46.4'	+49.2'	79.4°	10
11	4°23.9'	+45.4'	78.3°	4°36.0'	+46.0'	78.4°	4°48.1'	+46.7'	78.4°	5°00.1'	+47.3'	78.5°	5°12.0'	+47.9'	78.6°	5°23.8'	+48.5'	78.7°	5°35.5'	+49.1'	78.8°	11
12	5°09.2'	+45.3'	77.6°	5°22.1'	+46.0'	77.7°	5°34.8'	+46.6'	77.8°	5°47.4'	+47.3'	77.9°	5°59.9'	+47.9'	78.0°	6°12.4'	+48.5'	78.1°	6°24.7'	+49.1'	78.2°	12
13	5°54.6'	+45.3'	77.0°	6°08.0'	+45.9'	77.1°	6°21.4'	+46.6'	77.2°	6°34.7'	+47.2'	77.3°	6°47.8'	+47.9'	77.4°	7°00.9'	+48.5'	77.5°	7°13.8'	+49.1'	77.6°	13
14	6°39.8'	+45.2'	76.3°	6°54.0'	+45.9'	76.4°	7°08.0'	+46.5'	76.5°	7°21.9'	+47.2'	76.7°	7°35.7'	+47.8'	76.8°	7°49.3'	+48.4'	76.9°	8°02.9'	+49.0'	77.1°	14
15	7°25.0'	+45.2'	75.6°	7°39.9'	+45.8'	75.8°	7°54.5'	+46.5'	75.9°	8°09.1'	+47.1'	76.0°	8°23.5'	+47.7'	76.2°	8°37.8'	+48.4'	76.3°	8°51.9'	+49.0'	76.5°	15
16	8°10.2'	+45.1'	75.0°	8°25.7'	+45.8'	75.1°	8°41.0'	+46.4'	75.3°	8°56.2'	+47.1'	75.4°	9°11.2'	+47.7'	75.6°	9°26.1'	+48.3'	75.7°	9°40.8'	+48.9'	75.9°	16
17	8°55.3'	+45.0'	74.3°	9°11.4'	+45.7'	74.5°	9°27.4'	+46.3'	74.6°	9°43.3'	+47.0'	74.8°	9°58.9'	+47.6'	74.9°	10°14.4'	+48.2'	75.1°	10°29.7'	+48.8'	75.3°	17
18	9°40.3'	+44.9'	73.6°	9°57.1'	+45.6'	73.8°	10°13.8'	+46.3'	74.0°	10°30.2'	+46.9'	74.1°	10°46.5'	+47.5'	74.3°	11°02.7'	+48.2'	74.5°	11°18.6'	+48.8'	74.7°	18
19	10°25.2'	+44.9'	73.0°	10°42.7'	+45.5'	73.1°	11°00.0'	+46.2'	73.3°	11°17.1'	+46.8'	73.5°	11°34.1'	+47.5'	73.7°	11°50.8'	+48.1'	73.9°	12°07.3'	+48.7'	74.1°	19
20	11°10.1'	+44.8'	72.3°	11°28.2'	+45.4'	72.5°	11°46.2'	+46.1'	72.7°	12°04.0'	+46.7'	72.9°	12°21.5'	+47.4'	73.1°	12°38.9'	+48.0'	73.3°	12°56.0'	+48.6'	73.5°	20
21	11°54.8'	+44.7'	71.6°	12°13.7'	+45.3'	71.8°	12°32.3'	+46.0'	72.0°	12°50.7'	+46.6'	72.2°	13°08.9'	+47.3'	72.5°	13°26.9'	+47.9'	72.7°	13°44.6'	+48.5'	72.9°	21
22	12°39.5'	+44.6'	70.9°	12°59.0'	+45.2'	71.1°	13°18.3'	+45.9'	71.4°	13°37.4'	+46.5'	71.6°	13°56.2'	+47.2'	71.8°	14°14.8'	+47.8'	72.1°	14°33.2'	+48.4'	72.3°	22
23	13°24.1'	+44.4'	70.2°	13°44.2'	+45.1'	70.5°	14°04.2'	+45.8'	70.7°	14°23.9'	+46.4'	70.9°	14°43.4'	+47.1'	71.2°	15°02.6'	+47.7'	71.4°	15°21.6'	+48.3'	71.7°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

96° 264° LHA

Latitude SAME as DECLINATION

96° 264° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

83° 277° LHA

Latitude CONTRARY to Declination

83° 277° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	4°35.1'	-45.4'	95.3°	4°29.6'	-46.1'	95.4°	4°23.9'	-46.8'	95.5°	4°18.2'	-47.4'	95.5°	4°12.4'	-48.1'	95.6°	4°06.5'	-48.7'	95.7°	4°00.5'	-49.3'	95.7°	0
1	3°49.7'	-45.5'	95.9°	3°43.5'	-46.1'	96.0°	3°37.1'	-46.8'	96.1°	3°30.7'	-47.5'	96.1°	3°24.3'	-48.1'	96.2°	3°17.8'	-48.7'	96.3°	3°11.2'	-49.3'	96.3°	1
2	3°04.2'	-45.5'	96.6°	2°57.3'	-46.2'	96.7°	2°50.3'	-46.8'	96.7°	2°43.3'	-47.5'	96.8°	2°36.2'	-48.1'	96.8°	2°29.1'	-48.7'	96.8°	2°21.9'	-49.3'	96.9°	2
3	2°18.7'	-45.5'	97.3°	2°11.1'	-46.2'	97.3°	2°03.5'	-46.8'	97.3°	1°55.8'	-47.5'	97.4°	1°48.1'	-48.1'	97.4°	1°40.4'	-48.7'	97.4°	1°32.6'	-49.3'	97.5°	3
4	1°33.2'	-45.5'	97.9°	1°25.0'	-46.2'	97.9°	1°16.7'	-46.9'	98.0°	1°08.3'	-47.5'	98.0°	1°00.0'	-48.1'	98.0°	0°51.7'	-48.7'	98.0°	0°43.3'	-49.3'	98.0°	4
5	0°47.7'	-45.5'	98.6°	0°38.8'	-46.2'	98.6°	0°29.8'	-46.9'	98.6°	0°20.9'	-47.5'	98.6°	0°11.9'	-48.1'	98.6°	0°02.9'	-48.7'	98.6°	0°06.0'	+49.3'	81.4°	5
6	0°02.2'	-45.5'	99.2°	0°07.4'	+46.2'	80.8°	0°17.0'	+46.9'	80.8°	0°26.6'	+47.5'	80.8°	0°36.2'	+48.1'	80.8°	0°45.8'	+48.7'	80.8°	0°55.4'	+49.3'	80.8°	6
7	0°43.4'	+45.5'	80.1°	0°53.6'	+46.2'	80.2°	1°03.9'	+46.8'	80.2°	1°14.1'	+47.5'	80.2°	1°24.3'	+48.1'	80.2°	1°34.5'	+48.7'	80.2°	1°44.7'	+49.3'	80.3°	7
8	1°28.9'	+45.5'	79.5°	1°39.8'	+46.2'	79.5°	1°50.7'	+46.8'	79.5°	2°01.6'	+47.5'	79.6°	2°12.5'	+48.1'	79.6°	2°23.2'	+48.7'	79.7°	2°34.0'	+49.3'	79.7°	8
9	2°14.4'	+45.5'	78.8°	2°26.0'	+46.2'	78.9°	2°37.6'	+46.8'	78.9°	2°49.1'	+47.4'	79.0°	3°00.5'	+48.1'	79.0°	3°12.0'	+48.7'	79.1°	3°23.3'	+49.3'	79.1°	9
10	3°00.0'	+45.5'	78.2°	3°12.2'	+46.1'	78.2°	3°24.4'	+46.8'	78.3°	3°36.5'	+47.4'	78.4°	3°48.6'	+48.0'	78.4°	4°00.6'	+48.7'	78.5°	4°12.6'	+49.3'	78.6°	10
11	3°45.4'	+45.4'	77.5°	3°58.3'	+46.1'	77.6°	4°11.2'	+46.8'	77.7°	4°24.0'	+47.4'	77.7°	4°36.7'	+48.0'	77.8°	4°49.3'	+48.6'	77.9°	5°01.8'	+49.2'	78.0°	11
12	4°30.9'	+45.4'	76.9°	4°44.4'	+46.1'	77.0°	4°57.9'	+46.7'	77.0°	5°11.4'	+47.4'	77.1°	5°24.7'	+48.0'	77.2°	5°37.9'	+48.6'	77.3°	5°51.0'	+49.2'	77.4°	12
13	5°16.3'	+45.4'	76.2°	5°30.5'	+46.0'	76.3°	5°44.7'	+46.7'	76.4°	5°58.7'	+47.3'	76.5°	6°12.7'	+47.9'	76.6°	6°26.5'	+48.5'	76.7°	6°40.2'	+49.1'	76.8°	13
14	6°01.6'	+45.3'	75.6°	6°16.5'	+46.0'	75.7°	6°31.3'	+46.6'	75.8°	6°46.0'	+47.3'	75.9°	7°00.6'	+47.9'	76.0°	7°15.1'	+48.5'	76.1°	7°29.4'	+49.1'	76.3°	14
15	6°47.0'	+45.3'	74.9°	7°02.5'	+45.9'	75.0°	7°18.0'	+46.6'	75.1°	7°33.3'	+47.2'	75.3°	7°48.5'	+47.8'	75.4°	8°03.6'	+48.5'	75.5°	8°18.5'	+49.0'	75.7°	15
16	7°32.2'	+45.2'	74.2°	7°48.5'	+45.9'	74.4°	8°04.6'	+46.5'	74.5°	8°20.5'	+47.2'	74.6°	8°36.3'	+47.8'	74.8°	8°52.0'	+48.4'	74.9°	9°07.5'	+49.0'	75.1°	16
17	8°17.4'	+45.1'	73.6°	8°34.3'	+45.8'	73.7°	8°51.1'	+46.5'	73.9°	9°07.7'	+47.1'	74.0°	9°24.1'	+47.7'	74.2°	9°40.4'	+48.3'	74.3°	9°56.5'	+48.9'	74.5°	17
18	9°02.6'	+45.1'	72.9°	9°20.1'	+45.7'	73.1°	9°37.5'	+46.4'	73.2°	9°54.8'	+47.0'	73.4°	10°11.8'	+47.7'	73.6°	10°28.7'	+48.3'	73.7°	10°45.4'	+48.9'	73.9°	18
19	9°47.7'	+44.9'	72.2°	10°05.9'	+45.7'	72.4°	10°23.9'	+46.3'	72.6°	10°41.8'	+46.9'	72.8°	10°59.5'	+47.6'	72.9°	11°17.0'	+48.2'	73.1°	11°34.3'	+48.8'	73.3°	19
20	10°32.7'	+44.9'	71.6°	10°51.5'	+45.6'	71.7°	11°10.2'	+46.2'	71.9°	11°28.7'	+46.9'	72.1°	11°47.1'	+47.5'	72.3°	12°05.2'	+48.1'	72.5°	12°23.1'	+48.7'	72.7°	20
21	11°17.6'	+44.8'	70.9°	11°37.1'	+45.5'	71.1°	11°56.5'	+46.1'	71.3°	12°15.6'	+46.8'	71.5°	12°34.6'	+47.4'	71.7°	12°53.3'	+48.0'	71.9°	13°11.8'	+48.6'	72.1°	21
22	12°02.4'	+44.7'	70.2°	12°22.6'	+45.4'	70.4°	12°42.6'	+46.0'	70.6°	13°02.4'	+46.7'	70.8°	13°22.0'	+47.3'	71.1°	13°41.3'	+47.9'	71.3°	14°00.4'	+48.5'	71.5°	22
23	12°47.1'	+44.6'																				

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

82° 278° LHA

Latitude CONTRARY to Declination

82° 278° LHA

Table with 11 columns: Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each column contains three sub-columns (Hc°, d', Z°) for values 0-23.

98° 262° LHA

Latitude SAME as DECLINATION

98° 262° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

81° 279° LHA

Latitude CONTRARY to Declination

81° 279° LHA

Table with 11 columns: Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each column contains three sub-columns (Hc°, d', Z°) for values 0-23.

99° 261° LHA

Latitude SAME as DECLINATION

99° 261° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

80° 280° LHA

Latitude CONTRARY to Declination

80° 280° LHA

Table with 10 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of astronomical data.

100° 260° LHA

Latitude SAME as DECLINATION

100° 260° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

79° 281° LHA

Latitude CONTRARY to Declination

79° 281° LHA

Table with 10 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of astronomical data.

101° 259° LHA

Latitude SAME as DECLINATION

101° 259° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

78° 282° LHA

Latitude CONTRARY to Declination

78° 282° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows. Each cell contains three values (Hc, d, Z) for a given declination. The table is structured with a header row for declination and a footer row for LHA values.

102° 258° LHA

Latitude SAME as DECLINATION

102° 258° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

77° 283° LHA

Latitude CONTRARY to Declination

77° 283° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows. Each cell contains three values (Hc, d, Z) for a given declination. The table is structured with a header row for declination and a footer row for LHA values.

103° 257° LHA

Latitude SAME as DECLINATION

103° 257° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

76° 284° LHA

Latitude CONTRARY to Declination

76° 284° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	9°07.9'	-45.9'	100.7°	8°56.8'	-46.6'	100.8°	8°45.4'	-47.2'	101.0°	8°33.9'	-47.8'	101.1°	8°22.3'	-48.5'	101.3°	8°10.5'	-49.1'	101.4°	7°58.6'	-49.7'	101.5°	0
1	8°22.0'	-46.0'	101.3°	8°10.2'	-46.6'	101.5°	7°58.2'	-47.3'	101.6°	7°46.1'	-47.9'	101.7°	7°33.8'	-48.5'	101.9°	7°21.4'	-49.1'	102.0°	7°08.9'	-49.7'	102.1°	1
2	7°36.0'	-46.0'	102.0°	7°23.6'	-46.7'	102.1°	7°11.0'	-47.3'	102.2°	6°58.2'	-47.9'	102.3°	6°45.3'	-48.6'	102.5°	6°32.3'	-49.1'	102.6°	6°19.2'	-49.7'	102.7°	2
3	6°50.1'	-46.1'	102.6°	6°36.9'	-46.7'	102.7°	6°23.6'	-47.4'	102.8°	6°10.3'	-48.0'	102.9°	5°56.8'	-48.6'	103.0°	5°43.2'	-49.2'	103.1°	5°29.5'	-49.8'	103.2°	3
4	6°04.0'	-46.1'	103.2°	5°50.2'	-46.8'	103.4°	5°36.3'	-47.4'	103.4°	5°22.3'	-48.0'	103.5°	5°08.2'	-48.6'	103.6°	4°54.0'	-49.2'	103.7°	4°39.7'	-49.8'	103.8°	4
5	5°17.9'	-46.2'	103.9°	5°03.4'	-46.8'	104.0°	4°48.9'	-47.4'	104.1°	4°34.3'	-48.0'	104.1°	4°19.6'	-48.6'	104.2°	4°04.8'	-49.2'	104.3°	3°49.9'	-49.8'	104.4°	5
6	4°31.7'	-46.2'	104.5°	4°16.6'	-46.8'	104.6°	4°01.5'	-47.5'	104.7°	3°46.2'	-48.1'	104.7°	3°30.9'	-48.7'	104.8°	3°15.6'	-49.3'	104.9°	3°00.1'	-49.8'	104.9°	6
7	3°45.5'	-46.2'	105.2°	3°29.8'	-46.9'	105.2°	3°14.0'	-47.5'	105.3°	2°58.1'	-48.1'	105.3°	2°42.2'	-48.7'	105.4°	2°26.3'	-49.3'	105.4°	2°10.3'	-49.8'	105.5°	7
8	2°59.3'	-46.2'	105.8°	2°42.9'	-46.9'	105.9°	2°26.5'	-47.5'	105.9°	2°10.1'	-48.1'	105.9°	1°53.6'	-48.7'	106.0°	1°37.0'	-49.3'	106.0°	1°20.5'	-49.8'	106.0°	8
9	2°13.1'	-46.3'	106.4°	1°56.1'	-46.9'	106.5°	1°39.0'	-47.5'	106.5°	1°22.0'	-48.1'	106.5°	1°04.9'	-48.7'	106.6°	<u>0°47.7' -49.3' 106.6°</u>	<u>0°30.6' -49.8' 106.6°</u>	<u>0°19.2' +49.8' 72.9°</u>	<u>0°01.9' +49.8' 72.9°</u>	<u>0°01.9' +49.8' 72.9°</u>	<u>0°01.9' +49.8' 72.9°</u>	9
10	1°26.8'	-46.3'	107.1°	1°09.2'	-46.9'	107.1°	0°51.5'	-47.5'	107.1°	<u>0°33.8' -48.1' 107.1°</u>	<u>0°16.2' -48.7' 107.1°</u>	<u>0°01.5' +49.3' 72.9°</u>	<u>0°01.5' +49.3' 72.9°</u>	<u>0°01.5' +49.3' 72.9°</u>	<u>0°01.5' +49.3' 72.9°</u>	<u>0°01.5' +49.3' 72.9°</u>	<u>0°01.5' +49.3' 72.9°</u>	<u>0°01.5' +49.3' 72.9°</u>	<u>0°01.5' +49.3' 72.9°</u>	<u>0°01.5' +49.3' 72.9°</u>	<u>0°01.5' +49.3' 72.9°</u>	10
11	<u>0°40.5' -46.3' 107.7°</u>	<u>0°22.3' -46.9' 107.7°</u>	<u>0°04.0' -47.5' 107.7°</u>	<u>0°14.3' +48.1' 72.3°</u>	<u>0°32.6' +48.7' 72.3°</u>	<u>0°50.8' +49.3' 72.3°</u>	<u>0°05.7' +46.3' 71.6°</u>	<u>0°24.6' +46.9' 71.6°</u>	<u>0°43.5' +47.5' 71.7°</u>	<u>1°02.4' +48.1' 71.7°</u>	<u>1°21.3' +48.7' 71.7°</u>	<u>1°40.1' +49.3' 71.7°</u>	<u>1°58.9' +49.8' 71.7°</u>	<u>1°58.9' +49.8' 71.7°</u>	<u>1°58.9' +49.8' 71.7°</u>	<u>1°58.9' +49.8' 71.7°</u>	<u>1°58.9' +49.8' 71.7°</u>	<u>1°58.9' +49.8' 71.7°</u>	<u>1°58.9' +49.8' 71.7°</u>	<u>1°58.9' +49.8' 71.7°</u>	<u>1°58.9' +49.8' 71.7°</u>	11
12	0°05.7'	+46.3'	71.6°	0°24.6'	+46.9'	71.6°	0°43.5'	+47.5'	71.7°	1°02.4'	+48.1'	71.7°	1°21.3'	+48.7'	71.7°	1°40.1'	+49.3'	71.7°	1°58.9'	+49.8'	71.7°	12
13	0°52.0'	+46.3'	71.0°	1°11.5'	+46.9'	71.0°	1°31.0'	+47.5'	71.0°	1°50.5'	+48.1'	71.1°	2°10.0'	+48.7'	71.1°	2°29.4'	+49.3'	71.1°	2°48.7'	+49.8'	71.2°	13
14	1°38.3'	+46.3'	70.4°	1°58.4'	+46.9'	70.4°	2°18.5'	+47.5'	70.4°	2°38.6'	+48.1'	70.5°	2°58.6'	+48.7'	70.5°	3°18.6'	+49.2'	70.6°	3°38.6'	+49.8'	70.6°	14
15	2°24.5'	+46.2'	69.7°	2°45.3'	+46.9'	69.8°	3°06.0'	+47.5'	69.8°	3°26.7'	+48.1'	69.9°	3°47.3'	+48.6'	69.9°	4°07.9'	+49.2'	70.0°	4°28.3'	+49.8'	70.1°	15
16	3°10.8'	+46.2'	69.1°	3°32.1'	+46.8'	69.1°	3°53.5'	+47.4'	69.2°	4°14.7'	+48.0'	69.3°	4°35.9'	+48.6'	69.3°	4°57.1'	+49.2'	69.4°	5°18.1'	+49.7'	69.5°	16
17	3°57.0'	+46.2'	68.5°	4°19.0'	+46.8'	68.5°	4°40.9'	+47.4'	68.6°	5°02.8'	+48.0'	68.7°	5°24.6'	+48.6'	68.8°	5°46.2'	+49.1'	68.8°	6°07.9'	+49.7'	68.9°	17
18	4°43.1'	+46.1'	67.8°	5°05.8'	+46.8'	67.9°	5°28.3'	+47.4'	68.0°	5°50.8'	+48.0'	68.1°	6°13.1'	+48.5'	68.2°	6°35.4'	+49.1'	68.3°	6°57.6'	+49.7'	68.4°	18
19	5°29.3'	+46.1'	67.2°	5°52.5'	+46.7'	67.3°	6°15.7'	+47.3'	67.4°	6°38.7'	+47.9'	67.5°	7°01.7'	+48.5'	67.6°	7°24.5'	+49.1'	67.7°	7°47.2'	+49.6'	67.8°	19
20	6°15.4'	+46.1'	66.5°	6°39.3'	+46.7'	66.6°	7°03.0'	+47.3'	66.7°	7°26.6'	+47.9'	66.9°	7°50.2'	+48.4'	67.0°	8°13.6'	+49.0'	67.1°	8°36.8'	+49.6'	67.2°	20
21	7°01.5'	+46.0'	65.9°	7°25.9'	+46.6'	66.0°	7°50.3'	+47.2'	66.1°	8°14.5'	+47.8'	66.2°	8°38.6'	+48.3'	66.4°	9°02.3'	+48.3'	66.5°	9°26.4'	+49.5'	66.7°	21
22	7°47.5'	+45.9'	65.2°	8°12.5'	+46.6'	65.4°	8°37.5'	+47.2'	65.5°	9°02.3'	+47.7'	65.6°	9°27.0'	+48.3'	65.8°	9°51.5'	+48.9'	65.9°	10°15.9'	+49.4'	66.1°	22
23	8°33.4'	+45.9'	64.6°	8°59.1'	+46.5'	64.7°	9°24.6'	+47.1'	64.9°	9°50.1'	+47.7'	65.0°	10°15.3'	+48.3'	65.2°	10°40.4'	+48.8'	65.4°	11°05.4'	+49.4'	65.5°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

104° 256° LHA

Latitude SAME as DECLINATION

104° 256° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

75° 285° LHA

Latitude CONTRARY to Declination

75° 285° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	9°46.5'	-46.0'	101.4°	9°34.6'	-46.6'	101.6°	9°22.4'	-47.3'	101.8°	9°10.1'	-47.9'	101.9°	8°57.7'	-48.5'	102.1°	8°45.0'	-49.1'	102.2°	8°32.2'	-49.7'	102.4°	0
1	9°00.5'	-46.1'	102.1°	8°47.9'	-46.7'	102.2°	8°35.2'	-47.4'	102.4°	8°22.2'	-48.0'	102.5°	8°09.1'	-48.6'	102.7°	7°55.9'	-49.2'	102.8°	7°42.5'	-49.8'	102.9°	1
2	8°14.5'	-46.1'	102.7°	8°01.2'	-46.8'	102.9°	7°47.8'	-47.4'	103.0°	7°34.2'	-48.0'	103.1°	7°20.5'	-48.6'	103.3°	7°06.7'	-49.2'	103.4°	6°52.7'	-49.8'	103.5°	2
3	7°28.4'	-46.2'	103.4°	7°14.5'	-46.8'	103.5°	7°00.4'	-47.5'	103.6°	6°46.2'	-48.1'	103.7°	6°31.9'	-48.7'	103.9°	6°17.5'	-49.3'	104.0°	6°02.9'	-49.8'	104.1°	3
4	6°42.2'	-46.2'	104.0°	6°27.6'	-46.9'	104.1°	6°12.9'	-47.5'	104.2°	5°58.1'	-48.1'	104.3°	5°43.2'	-48.7'	104.4°	5°28.2'	-49.3'	104.5°	5°13.1'	-49.9'	104.6°	4
5	5°56.0'	-46.3'	104.7°	5°40.8'	-46.9'	104.8°	5°25.4'	-47.5'	104.9°	5°10.0'	-48.1'	104.9°	4°54.5'	-48.7'	105.0°	4°38.9'	-49.3'	105.1°	4°23.2'	-49.9'	105.2°	5
6	5°09.8'	-46.3'	105.3°	4°53.9'	-46.9'	105.4°	4°37.9'	-47.6'	105.5°	4°21.9'	-48.2'	105.5°	4°05.8'	-48.8'	105.6°	3°49.6'	-49.3'	105.7°	3°33.3'	-49.9'	105.7°	6
7	4°23.4'	-46.3'	105.9°	4°06.9'	-47.0'	106.0°	3°50.3'	-47.6'	106.1°	3°33.7'	-48.2'	106.1°	3°17.0'	-48.8'	106.2°	3°00.2'	-49.4'	106.3°	2°43.4'	-49.9'	106.3°	7
8	3°37.1'	-46.4'	106.6°	3°20.0'	-47.0'	106.6°	3°02.8'	-47.6'	106.7°	2°45.5'	-48.2'	106.7°	2°28.2'	-48.8'	106.8°	2°10.9'	-49.4'	106.8°	1°53.5'	-49.9'	106.9°	8
9	2°50.7'	-46.4'	107.2°	2°33.0'	-47.0'	107.3°	2°15.1'	-47.6'	107.3°	1°57.3'	-48.2'	107.3°	1°39.4'	-48.8'	107.4°	1°21.5'	-49.4'	107.4°	1°03.5'	-49.9'	107.4°	9
10	2°04.4'	-46.4'	107.8°	1°46.0'	-47.0'	107.9°	1°27.5'	-47.6'	107.9°	1°09.1'	-48.2'	107.9°	0°50.6'	-48.8'	107.9°	<u>0°32.1' -49.4' 108.0°</u>	<u>0°13.6' -49.9' 108.0°</u>	<u>0°01.3' +49.9' 71.5°</u>	<u>0°01.3' +49.9' 71.5°</u>	<u>0°01.3' +49.9' 71.5°</u>	<u>0°01.3' +49.9' 71.5°</u>	10
11	1°18.0'	-46.4'	108.5°	0°58.9'	-47.0'	108.5°	<u>0°39.9' -47.6' 108.5°</u>	<u>0°20.8' -48.2' 108.5°</u>	<u>0°01.8' -48.8' 108.5°</u>	<u>0°17.3' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	<u>0°06.7' +49.4' 71.5°</u>	11
12	<u>0°31.5' -46.4' 109.1°</u>	<u>0°11.9' -47.0' 109.1°</u>	<u>0°07.8' +47.6' 70.9°</u>	<u>0°35.1' +47.0' 70.3°</u>	<u>0°55.4' +47.6' 70.3°</u>	<u>1°15.6' +48.2' 70.3°</u>	<u>1°27.4' +48.2' 70.9°</u>	<u>1°47.1' +48.8' 70.9°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	<u>1°06.7' +49.4' 71.5°</u>	12
13	0°14.9'	+46.4'	70.3°	0°35.1'	+47.0'	70.3°	0°55.4'	+47.6'	70.3°	1°15.6'	+48.2'	70.3°	1°35.9'	+48.8'	70.3°	1°56.1'	+49.4'	70.3°	2°16.2'	+49.9'	70.4°	13
14	1°01.3'	+46.4'	69.6°	1°22.2'	+47.0'	69.6°	1°43.0'	+47.6'	69.7°	2°03.9'	+48.2'	69.7°	2°24.7'	+48.8'	69.7°	2°45.4'	+49.4'	69.8°	3°06.2'	+49.9'	69.8°	14
15	1°47.7'	+46.4'	69.0°	2°09.2'	+47.0'	69.0°	2°30.7'	+47.6'	69.1°	2°52.1'	+48.2'	69.1°	3°13.5'	+48.8'	69.1°	3°34.8'	+49.3'	69.2°	3°56.1'	+49.9'	69.3°	15
16	2°34.1'	+46.4'	68.3°	2°56.2'	+47.0'	68.4°	3°18.3'	+47.6'	6													

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

74° 286° LHA

Latitude CONTRARY to Declination

74° 286° LHA

Table with columns: Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Rows 0-23. Each cell contains three values: Hc°, d', Z°. Some values are underlined.

106° 254° LHA

Latitude SAME as DECLINATION

106° 254° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

73° 287° LHA

Latitude CONTRARY to Declination

73° 287° LHA

Table with columns: Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Rows 0-23. Each cell contains three values: Hc°, d', Z°. Some values are underlined.

107° 253° LHA

Latitude SAME as DECLINATION

107° 253° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

72° 288° LHA

Latitude CONTRARY to Declination

72° 288° LHA

Table with 10 columns (Dec, Hc, d, Z for 49-55) and 11 rows (0-23). Includes underlined values for rows 12-15.

108° 252° LHA

Latitude SAME as DECLINATION

108° 252° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

71° 289° LHA

Latitude CONTRARY to Declination

71° 289° LHA

Table with 10 columns (Dec, Hc, d, Z for 49-55) and 24 rows (0-23).

109° 251° LHA

Latitude SAME as DECLINATION

109° 251° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

70° 290° LHA

Latitude CONTRARY to Declination

70° 290° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of celestial data including Hc, d, and Z values.

110° 250° LHA

Latitude SAME as DECLINATION

110° 250° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

69° 291° LHA

Latitude CONTRARY to Declination

69° 291° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of celestial data including Hc, d, and Z values.

111° 249° LHA

Latitude SAME as DECLINATION

111° 249° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

68° 292° LHA

Latitude CONTRARY to Declination

68° 292° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	14°13.6'	-46.8'	107.0°	13°56.0'	-47.4'	107.2°	13°38.1'	-48.0'	107.4°	13°20.1'	-48.6'	107.7°	13°01.7'	-49.2'	107.9°	12°43.2'	-49.8'	108.1°	12°24.5'	-50.4'	108.3°	0
1	13°26.8'	-46.9'	107.6°	13°08.6'	-47.5'	107.8°	12°50.1'	-48.1'	108.0°	12°31.4'	-48.7'	108.3°	12°12.5'	-49.3'	108.5°	11°53.4'	-49.9'	108.7°	11°34.1'	-50.4'	108.9°	1
2	12°39.9'	-47.0'	108.2°	12°21.1'	-47.6'	108.5°	12°02.0'	-48.2'	108.7°	11°42.7'	-48.8'	108.9°	11°23.2'	-49.4'	109.1°	11°03.5'	-49.9'	109.2°	10°43.7'	-50.5'	109.4°	2
3	11°53.0'	-47.0'	108.9°	11°33.5'	-47.7'	109.1°	11°13.8'	-48.3'	109.3°	10°53.9'	-48.9'	109.5°	10°33.9'	-49.4'	109.6°	10°13.6'	-50.0'	109.8°	9°53.2'	-50.5'	110.0°	3
4	11°06.0'	-47.1'	109.5°	10°45.9'	-47.7'	109.7°	10°25.5'	-48.3'	109.9°	10°05.1'	-48.9'	110.0°	9°44.4'	-49.5'	110.2°	9°23.6'	-50.0'	110.4°	9°02.7'	-50.6'	110.5°	4
5	10°18.9'	-47.2'	110.1°	9°58.1'	-47.8'	110.3°	9°37.2'	-48.4'	110.5°	9°16.2'	-49.0'	110.6°	8°54.9'	-49.5'	110.8°	8°33.6'	-50.1'	110.9°	8°12.1'	-50.6'	111.1°	5
6	9°31.7'	-47.3'	110.8°	9°10.3'	-47.9'	110.9°	8°48.8'	-48.5'	111.1°	8°27.2'	-49.0'	111.2°	8°05.4'	-49.6'	111.4°	7°43.5'	-50.1'	111.5°	7°21.5'	-50.7'	111.6°	6
7	8°44.4'	-47.3'	111.4°	8°22.5'	-47.9'	111.5°	8°00.4'	-48.5'	111.7°	7°38.2'	-49.1'	111.8°	7°15.8'	-49.6'	111.9°	6°53.4'	-50.2'	112.0°	6°30.8'	-50.7'	112.1°	7
8	7°57.1'	-47.4'	112.0°	7°34.5'	-48.0'	112.1°	7°11.9'	-48.5'	112.3°	6°49.1'	-49.1'	112.4°	6°26.2'	-49.7'	112.5°	6°03.2'	-50.2'	112.6°	5°40.1'	-50.7'	112.7°	8
9	7°09.7'	-47.4'	112.6°	6°46.6'	-48.0'	112.7°	6°23.3'	-48.6'	112.9°	5°60.0'	-49.1'	113.0°	5°36.5'	-49.7'	113.0°	5°13.0'	-50.2'	113.1°	4°49.4'	-50.8'	113.2°	9
10	6°22.3'	-47.5'	113.3°	5°58.6'	-48.1'	113.4°	5°34.7'	-48.6'	113.4°	5°10.8'	-49.2'	113.5°	4°46.8'	-49.7'	113.6°	4°22.8'	-50.3'	113.7°	3°58.6'	-50.8'	113.8°	10
11	5°34.8'	-47.5'	113.9°	5°10.5'	-48.1'	114.0°	4°46.1'	-48.7'	114.0°	4°21.6'	-49.2'	114.1°	3°57.1'	-49.7'	114.2°	3°32.5'	-50.3'	114.2°	3°07.9'	-50.8'	114.3°	11
12	4°47.3'	-47.5'	114.5°	4°22.4'	-48.1'	114.6°	3°57.5'	-48.7'	114.6°	3°32.4'	-49.2'	114.7°	3°07.4'	-49.8'	114.7°	2°42.2'	-50.3'	114.8°	2°17.1'	-50.8'	114.8°	12
13	3°59.8'	-47.6'	115.1°	3°34.3'	-48.1'	115.2°	3°08.8'	-48.7'	115.2°	2°43.2'	-49.2'	115.3°	2°17.6'	-49.8'	115.3°	1°51.9'	-50.3'	115.3°	1°26.3'	-50.8'	115.4°	13
14	3°12.2'	-47.6'	115.7°	2°46.2'	-48.2'	115.8°	2°20.1'	-48.7'	115.8°	1°54.0'	-49.3'	115.8°	1°27.8'	-49.8'	115.9°	1°01.6'	-50.3'	115.9°	<u>0°35.5'</u>	-50.8'	115.9°	14
15	2°24.6'	-47.6'	116.3°	1°58.0'	-48.2'	116.3°	1°31.4'	-48.7'	116.4°	1°04.7'	-49.3'	116.4°	<u>0°38.0'</u>	-49.8'	116.4°	<u>0°11.3'</u>	-50.3'	116.4°	0°15.4'	+50.8'	63.6°	15
16	1°37.0'	-47.6'	116.9°	1°09.8'	-48.2'	116.9°	<u>0°42.6'</u>	-48.7'	117.0°	<u>0°15.4'</u>	-49.3'	117.0°	0°11.8'	+49.8'	63.0°	0°39.0'	+50.3'	63.0°	1°06.2'	+50.8'	63.1°	16
17	0°49.4'	-47.6'	117.5°	<u>0°21.7'</u>	-48.2'	117.5°	0°06.1'	+48.7'	62.5°	0°33.8'	+49.3'	62.5°	1°01.6'	+49.8'	62.5°	1°29.3'	+50.3'	62.5°	1°57.0'	+50.8'	62.5°	17
18	<u>0°01.8'</u>	-47.6'	118.1°	0°26.5'	+48.2'	61.9°	0°54.8'	+48.7'	61.9°	1°23.1'	+49.3'	61.9°	1°51.3'	+49.8'	61.9°	2°19.6'	+50.3'	61.9°	2°47.8'	+50.8'	62.0°	18
19	0°45.8'	+47.6'	61.3°	1°14.7'	+48.2'	61.3°	1°43.5'	+48.7'	61.3°	2°12.3'	+49.2'	61.3°	2°41.1'	+49.8'	61.4°	3°09.9'	+50.3'	61.4°	3°38.5'	+50.8'	61.5°	19
20	1°33.5'	+47.6'	60.6°	2°02.9'	+48.2'	60.7°	2°32.2'	+48.7'	60.7°	3°01.6'	+49.2'	60.7°	3°30.9'	+49.7'	60.8°	4°00.1'	+50.2'	60.9°	4°29.3'	+50.7'	60.9°	20
21	2°21.1'	+47.6'	60.0°	2°51.0'	+48.1'	60.1°	3°20.9'	+48.7'	60.1°	3°50.8'	+49.2'	60.2°	4°20.6'	+49.7'	60.2°	4°50.4'	+50.2'	60.3°	5°20.0'	+50.7'	60.4°	21
22	3°08.7'	+47.6'	59.4°	3°39.2'	+48.1'	59.5°	4°09.6'	+48.6'	59.5°	4°40.0'	+49.2'	59.6°	5°10.3'	+49.7'	59.7°	5°40.6'	+50.2'	59.8°	6°10.8'	+50.7'	59.8°	22
23	3°56.2'	+47.5'	58.8°	4°27.3'	+48.1'	58.9°	4°58.2'	+48.6'	58.9°	5°29.2'	+49.1'	59.0°	6°00.0'	+49.6'	59.1°	6°30.8'	+50.1'	59.2°	7°01.4'	+50.6'	59.3°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

112° 248° LHA

Latitude SAME as DECLINATION

112° 248° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

67° 293° LHA

Latitude CONTRARY to Declination

67° 293° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	14°51.1'	-46.9'	107.8°	14°32.8'	-47.5'	108.0°	14°14.1'	-48.2'	108.3°	13°55.2'	-48.8'	108.5°	13°36.0'	-49.3'	108.7°	13°16.6'	-49.9'	109.0°	12°57.0'	-50.5'	109.2°	0
1	14°04.2'	-47.0'	108.4°	13°45.2'	-47.6'	108.6°	13°25.9'	-48.2'	108.9°	13°06.4'	-48.8'	109.1°	12°46.7'	-49.4'	109.3°	12°26.7'	-50.0'	109.5°	12°06.6'	-50.5'	109.7°	1
2	13°17.2'	-47.1'	109.0°	12°57.6'	-47.7'	109.3°	12°37.7'	-48.3'	109.5°	12°17.6'	-48.9'	109.7°	11°57.3'	-49.5'	109.9°	11°36.8'	-50.0'	110.1°	11°16.0'	-50.6'	110.3°	2
3	12°30.2'	-47.2'	109.7°	12°09.9'	-47.8'	109.9°	11°49.4'	-48.4'	110.1°	11°28.7'	-49.0'	110.3°	11°07.8'	-49.6'	110.5°	10°46.7'	-50.1'	110.7°	10°25.5'	-50.6'	110.8°	3
4	11°43.0'	-47.3'	110.3°	11°22.1'	-47.9'	110.5°	11°01.0'	-48.5'	110.7°	10°39.7'	-49.1'	110.9°	10°18.2'	-49.6'	111.0°	9°56.6'	-50.2'	111.2°	9°34.8'	-50.7'	111.4°	4
5	10°55.7'	-47.3'	110.9°	10°34.2'	-47.9'	111.1°	10°12.5'	-48.5'	111.3°	9°50.6'	-49.1'	111.5°	9°28.6'	-49.7'	111.6°	9°06.4'	-50.2'	111.8°	8°44.1'	-50.7'	111.9°	5
6	10°08.4'	-47.4'	111.6°	9°46.2'	-48.0'	111.7°	9°24.0'	-48.6'	111.9°	9°01.5'	-49.2'	112.0°	8°38.9'	-49.7'	112.2°	8°16.2'	-50.3'	112.3°	7°53.4'	-50.8'	112.5°	6
7	9°21.0'	-47.5'	112.2°	8°58.2'	-48.1'	112.3°	8°35.4'	-48.7'	112.5°	8°12.4'	-49.2'	112.6°	7°49.2'	-49.8'	112.7°	7°26.0'	-50.3'	112.9°	7°02.6'	-50.8'	113.0°	7
8	8°33.5'	-47.5'	112.8°	8°10.2'	-48.1'	112.9°	7°46.7'	-48.7'	113.1°	7°23.1'	-49.3'	113.2°	6°59.5'	-49.8'	113.3°	6°35.7'	-50.3'	113.4°	6°11.8'	-50.9'	113.5°	8
9	7°45.9'	-47.6'	113.4°	7°22.0'	-48.2'	113.5°	6°58.0'	-48.7'	113.7°	6°33.9'	-49.3'	113.8°	6°09.6'	-49.8'	113.9°	5°45.3'	-50.4'	114.0°	5°20.9'	-50.9'	114.1°	9
10	6°58.4'	-47.6'	114.0°	6°33.9'	-48.2'	114.1°	6°09.3'	-48.8'	114.2°	5°44.6'	-49.3'	114.3°	5°19.8'	-49.9'	114.4°	4°55.0'	-50.4'	114.5°	4°30.0'	-50.9'	114.6°	10
11	6°10.7'	-47.7'	114.7°	5°45.6'	-48.3'	114.7°	5°20.5'	-48.8'	114.8°	4°55.2'	-49.4'	114.9°	4°29.9'	-49.9'	115.0°	4°04.6'	-50.4'	115.1°	3°39.1'	-50.9'	115.1°	11
12	5°23.0'	-47.7'	115.3°	4°57.4'	-48.3'	115.3°	4°31.7'	-48.8'	115.4°	4°05.9'	-49.4'	115.5°	3°40.0'	-49.9'	115.5°	3°14.1'	-50.4'	115.6°	2°48.2'	-50.9'	115.6°	12
13	4°35.3'	-47.7'	115.9°	4°09.1'	-48.3'	115.9°	3°42.8'	-48.9'	116.0°	3°16.5'	-49.4'	116.1°	2°50.1'	-49.9'	116.1°	2°23.7'	-50.4'	116.1°	1°57.3'	-50.9'	116.2°	13
14	3°47.6'	-47.8'	116.5°	3°20.8'	-48.3'	116.5°	2°54.0'	-48.9'	116.6°	2°27.1'	-49.4'	116.6°	2°00.2'	-49.9'	116.7°	1°33.3'	-50.5'	116.7°	1°06.3'	-51.0'	116.7°	14
15	2°59.8'	-47.8'	117.1°	2°32.5'	-48.4'	117.1°	2°05.1'	-48.9'	117.2°	1°37.7'	-49.4'	117.2°	1°10.2'	-49.9'	117.2°	<u>0°42.8'</u>	-50.5'	117.2°	<u>0°15.4'</u>	-51.0'	117.2°	15
16	2°12.0'	-47.8'	117.7°	1°44.1'	-48.4'	117.7°	1°16.2'	-48.9'	117.7°	<u>0°48.2'</u>	-49.4'	117.8°	<u>0°20.3'</u>	-50.0'	117.8°	0°07.7'	+50.5'	62.2°	0°35.6'	+51.0'	62.2°	16
17	1°24.2'	-47.8'	118.3°	0°55.7'	-48.4'	118.3°	<u>0°27.3'</u>	-48.9'	118.3°	0°01.2'	+49.4'	61.7°	0°29.7'	+49.9'	61.7°	0°58.1'	+50.5'	61.7°	1°26.6'	+50.9'	61.7°	17
18	<u>0°36.4'</u>	-47.8'	118.9°	<u>0°07.4'</u>	-48.4'	118.9°	0°21.6'	+48.9'	61.1°	0°50.6'	+49.4'	61.1°	1°19.6'	+49.9'	61.1°	1°48.6'	+50.4'	61.2°	2°17.5'	+50.9'	61.2°	18
19	0°11.5'	+47.8'	60.5°	0°41.0'	+48.4'	60.5°	1°10.5'	+48.9'	60.5°	1°40.0'	+49.4'	60.5°	2°09.5'	+49.9'	60.6°	2°39.9'	+50.4'	60.6°	3°08.4'	+50.9'	60.7°	19
20	0°59.3'	+47.8'	59.9°	1°29.4'	+48.4'	59.9°	1°59.4'	+48.9'	59.9°	2°29.5'	+49.4'	60.0°	2°59.5'	+49.9'	60.0°	3°29.4'	+50.4'	60.1°	3°59.4'	+50.9'	60.1°	20
21	1°47.1'	+47.8'	59.3°	2°17.7'	+48.3'	59.3°	2°48.3'	+48.9'	59.4°	3°18.9'	+49.4'	59.4°	3°49.4'	+49.9'	59.5°	4°1						

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

66° 294° LHA

Latitude CONTRARY to Declination

66° 294° LHA

Dec°	49			50			51			52			53			54			55			Dec°			
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°		Hc°	d'	Z°
0	15°28.5'	-47.0'	108.6°	15°09.4'	-47.7'	108.8°	14°49.9'	-48.3'	109.1°	14°30.1'	-48.9'	109.3°	14°10.1'	-49.5'	109.6°	13°49.9'	-50.0'	109.8°	13°29.5'	-50.6'	110.0°	0			
1	14°41.5'	-47.1'	109.2°	14°21.7'	-47.8'	109.5°	14°01.6'	-48.4'	109.7°	13°41.2'	-49.0'	109.9°	13°20.7'	-49.5'	110.2°	12°59.9'	-50.1'	110.4°	12°38.9'	-50.6'	110.6°	1			
2	13°54.4'	-47.2'	109.9°	13°33.9'	-47.9'	110.1°	13°13.2'	-48.5'	110.3°	12°52.3'	-49.0'	110.5°	12°31.1'	-49.6'	110.7°	12°09.8'	-50.2'	110.9°	11°48.2'	-50.7'	111.1°	2			
3	13°07.2'	-47.3'	110.5°	12°46.0'	-47.9'	110.7°	12°24.7'	-48.5'	110.9°	12°03.2'	-49.1'	111.1°	11°41.5'	-49.7'	111.3°	11°19.6'	-50.2'	111.5°	10°57.5'	-50.8'	111.7°	3			
4	12°19.8'	-47.4'	111.1°	11°58.1'	-48.0'	111.3°	11°36.2'	-48.6'	111.5°	11°14.1'	-49.2'	111.7°	10°51.8'	-49.7'	111.9°	10°29.4'	-50.3'	112.1°	10°06.8'	-50.8'	112.2°	4			
5	11°32.4'	-47.5'	111.7°	11°10.1'	-48.1'	111.9°	10°47.6'	-48.7'	112.1°	10°24.9'	-49.3'	112.3°	10°02.1'	-49.8'	112.5°	9°39.1'	-50.3'	112.6°	9°15.9'	-50.9'	112.8°	5			
6	10°44.9'	-47.6'	112.4°	10°22.0'	-48.2'	112.5°	9°58.9'	-48.7'	112.7°	9°35.7'	-49.3'	112.9°	9°12.3'	-49.9'	113.0°	8°48.7'	-50.4'	113.2°	8°25.1'	-50.9'	113.3°	6			
7	9°57.3'	-47.6'	113.0°	9°33.8'	-48.2'	113.1°	9°10.1'	-48.8'	113.3°	8°46.3'	-49.4'	113.4°	8°22.4'	-49.9'	113.6°	7°58.3'	-50.4'	113.7°	7°34.2'	-51.0'	113.8°	7			
8	9°09.7'	-47.7'	113.6°	8°45.6'	-48.3'	113.7°	8°21.3'	-48.9'	113.9°	7°57.0'	-49.4'	114.0°	7°32.5'	-49.9'	114.1°	7°07.9'	-50.5'	114.3°	6°43.2'	-51.0'	114.4°	8			
9	8°22.0'	-47.8'	114.2°	7°57.3'	-48.3'	114.3°	7°32.5'	-48.9'	114.5°	7°07.6'	-49.5'	114.6°	6°42.6'	-50.0'	114.7°	6°17.4'	-50.5'	114.8°	5°52.2'	-51.0'	114.9°	9			
10	7°34.2'	-47.8'	114.8°	7°08.9'	-48.4'	114.9°	6°43.6'	-48.9'	115.1°	6°18.1'	-49.5'	115.2°	5°52.6'	-50.0'	115.3°	5°26.9'	-50.5'	115.3°	5°01.2'	-51.0'	115.4°	10			
11	6°46.4'	-47.9'	115.4°	6°20.6'	-48.4'	115.5°	5°54.6'	-49.0'	115.6°	5°28.6'	-49.5'	115.7°	5°02.6'	-50.0'	115.8°	4°36.4'	-50.6'	115.9°	4°10.2'	-51.1'	116.0°	11			
12	5°58.5'	-47.9'	116.0°	5°32.1'	-48.5'	116.1°	5°05.7'	-49.0'	116.2°	4°39.1'	-49.5'	116.3°	4°12.5'	-50.1'	116.4°	3°45.8'	-50.6'	116.4°	3°19.1'	-51.1'	116.5°	12			
13	5°10.6'	-47.9'	116.6°	4°43.7'	-48.5'	116.7°	4°16.7'	-49.0'	116.8°	3°49.6'	-49.6'	116.9°	3°22.4'	-50.1'	116.9°	2°55.3'	-50.6'	117.0°	2°28.0'	-51.1'	117.0°	13			
14	4°22.7'	-48.0'	117.3°	3°55.2'	-48.5'	117.3°	3°27.6'	-49.1'	117.4°	3°00.0'	-49.6'	117.4°	2°32.3'	-50.1'	117.5°	2°04.7'	-50.6'	117.5°	1°36.9'	-51.1'	117.5°	14			
15	3°34.7'	-48.0'	117.9°	3°06.7'	-48.5'	117.9°	2°38.6'	-49.1'	118.0°	2°10.4'	-49.6'	118.0°	1°42.2'	-50.1'	118.0°	1°14.0'	-50.6'	118.0°	0°45.8'	-51.1'	118.1°	15			
16	2°46.7'	-48.0'	118.5°	2°18.1'	-48.6'	118.5°	1°49.5'	-49.1'	118.5°	1°20.8'	-49.6'	118.6°	0°52.1'	-50.1'	118.6°	0°23.4'	-50.6'	118.6°	0°05.3'	+51.1'	61.4°	16			
17	1°58.7'	-48.0'	119.1°	1°29.6'	-48.6'	119.1°	1°00.4'	-49.1'	119.1°	0°31.2'	-49.6'	119.1°	0°02.0'	-50.1'	119.1°	0°27.2'	+50.6'	60.9°	0°56.4'	+51.1'	60.9°	17			
18	1°10.7'	-48.0'	119.7°	0°41.0'	-48.6'	119.7°	0°11.3'	-49.1'	119.7°	0°18.4'	+49.6'	60.3°	0°48.1'	+50.1'	60.3°	1°17.8'	+50.6'	60.3°	1°47.5'	+51.1'	60.4°	18			
19	0°22.7'	-48.0'	120.3°	0°07.6'	+48.6'	59.7°	0°37.8'	+49.1'	59.7°	1°08.0'	+49.6'	59.8°	1°38.2'	+50.1'	59.8°	2°08.4'	+50.6'	59.8°	2°38.6'	+51.1'	59.8°	19			
20	0°25.4'	+48.0'	59.1°	0°56.1'	+48.6'	59.2°	1°26.9'	+49.1'	59.2°	1°57.6'	+49.6'	59.2°	2°28.3'	+50.1'	59.2°	2°59.0'	+50.6'	59.3°	3°29.6'	+51.1'	59.3°	20			
21	1°13.4'	+48.0'	58.5°	1°44.7'	+48.5'	58.6°	2°16.0'	+49.1'	58.6°	2°47.2'	+49.6'	58.6°	3°18.4'	+50.1'	58.7°	3°49.6'	+50.6'	58.7°	4°20.7'	+51.0'	58.8°	21			
22	2°01.4'	+48.0'	57.9°	2°33.2'	+48.5'	58.0°	3°05.0'	+49.0'	58.0°	3°36.8'	+49.6'	58.1°	4°08.5'	+50.0'	58.1°	4°40.1'	+50.5'	58.2°	5°11.7'	+51.0'	58.3°	22			
23	2°49.4'	+48.0'	57.3°	3°21.8'	+48.5'	57.4°	3°54.1'	+49.0'	57.4°	4°26.3'	+49.5'	57.5°	4°58.5'	+50.0'	57.6°	5°30.7'	+50.5'	57.7°	6°02.7'	+51.0'	57.7°	23			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55						

114° 246° LHA

Latitude SAME as DECLINATION

114° 246° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

65° 295° LHA

Latitude CONTRARY to Declination

65° 295° LHA

Dec°	49			50			51			52			53			54			55			Dec°	
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°		Hc°
0	16°05.8'	-47.2'	109.4°	15°45.8'	-47.8'	109.7°	15°25.4'	-48.4'	109.9°	15°04.9'	-49.0'	110.2°	14°44.1'	-49.6'	110.4°	14°23.0'	-50.2'	110.7°	14°01.7'	-50.7'	110.9°	0	
1	15°18.6'	-47.3'	110.0°	14°58.0'	-47.9'	110.3°	14°37.0'	-48.5'	110.5°	14°15.9'	-49.1'	110.8°	13°54.5'	-49.7'	111.0°	13°32.9'	-50.2'	111.2°	13°11.0'	-50.8'	111.5°	1	
2	14°31.3'	-47.4'	110.7°	14°10.0'	-48.0'	110.9°	13°48.5'	-48.6'	111.1°	13°26.8'	-49.2'	111.4°	13°04.8'	-49.7'	111.6°	12°42.6'	-50.3'	111.8°	12°20.2'	-50.8'	112.0°	2	
3	13°43.9'	-47.5'	111.3°	13°22.0'	-48.1'	111.5°	12°59.9'	-48.7'	111.7°	12°37.6'	-49.3'	112.0°	12°15.1'	-49.8'	112.2°	11°52.3'	-50.4'	112.4°	11°29.4'	-50.9'	112.5°	3	
4	12°56.4'	-47.6'	111.9°	12°33.9'	-48.2'	112.1°	12°11.2'	-48.8'	112.3°	11°48.3'	-49.3'	112.5°	11°25.2'	-49.9'	112.7°	11°02.0'	-50.4'	112.9°	10°38.5'	-50.9'	113.1°	4	
5	12°08.9'	-47.7'	112.6°	11°45.7'	-48.3'	112.7°	11°22.5'	-48.8'	112.9°	10°59.0'	-49.4'	113.1°	10°35.3'	-49.9'	113.3°	10°11.5'	-50.5'	113.5°	9°47.6'	-51.0'	113.6°	5	
6	11°21.2'	-47.7'	113.2°	10°57.5'	-48.3'	113.4°	10°33.6'	-48.9'	113.5°	10°09.6'	-49.5'	113.7°	9°45.4'	-50.0'	113.9°	9°21.1'	-50.5'	114.0°	8°56.6'	-51.0'	114.2°	6	
7	10°33.4'	-47.8'	113.8°	10°09.2'	-48.4'	114.0°	9°44.7'	-49.0'	114.1°	9°20.1'	-49.5'	114.3°	8°55.4'	-50.1'	114.4°	8°30.5'	-50.6'	114.6°	8°05.5'	-51.1'	114.7°	7	
8	9°45.6'	-47.9'	114.4°	9°20.8'	-48.5'	114.6°	8°55.8'	-49.0'	114.7°	8°30.6'	-49.6'	114.8°	8°05.4'	-50.1'	115.0°	7°40.0'	-50.6'	115.1°	7°14.5'	-51.1'	115.2°	8	
9	8°57.7'	-47.9'	115.0°	8°32.3'	-48.5'	115.2°	8°06.7'	-49.1'	115.3°	7°41.1'	-49.6'	115.4°	7°15.3'	-50.1'	115.5°	6°49.3'	-50.7'	115.6°	6°23.3'	-51.2'	115.7°	9	
10	8°09.8'	-48.0'	115.6°	7°43.8'	-48.6'	115.7°	7°17.7'	-49.1'	115.9°	6°51.4'	-49.6'	116.0°	6°25.1'	-50.2'	116.1°	5°58.7'	-50.7'	116.2°	5°32.2'	-51.2'	116.3°	10	
11	7°21.8'	-48.0'	116.2°	6°55.2'	-48.6'	116.3°	6°28.6'	-49.1'	116.4°	6°01.8'	-49.7'	116.5°	5°34.9'	-50.2'	116.6°	5°08.0'	-50.7'	116.7°	4°41.0'	-51.2'	116.8°	11	
12	6°33.8'	-48.1'	116.8°	6°06.6'	-48.6'	116.9°	5°39.4'	-49.2'	117.0°	5°12.1'	-49.7'	117.1°	4°44.7'	-50.2'	117.2°	4°17.3'	-50.7'	117.3°	3°49.8'	-51.2'	117.3°	12	
13	5°45.7'	-48.1'	117.4°	5°18.0'	-48.7'	117.5°	4°50.2'	-49.2'	117.6°	4°22.4'	-49.7'	117.7°	3°54.5'	-50.2'	117.7°	3°26.6'	-50.7'	117.8°	2°58.6'	-51.2'	117.8°	13	
14	4°57.6'	-48.2'	118.0°	4°29.3'	-48.7'	118.1°	4°01.0'	-49.2'	118.2°	3°32.7'	-49.8'	118.2°	3°04.3'	-50.3'	118.3°	2°35.8'	-50.8'	118.3°	2°07.3'	-51.2'	118.4°	14	
15	4°09.4'	-48.2'	118.6°	3°40.6'	-48.7'	118.7°	3°11.8'	-49.3'	118.7°	2°42.9'	-49.8'	118.8°	2°14.0'	-50.3'	118.8°	1°45.1'	-50.8'	118.9°	1°16.1'	-51.3'	118.9°	15	
16	3°21.2'	-48.2'	119.2°	2°51.9'	-48.7'	119.3°	2°22.5'	-49.3'	119.3°	1°53.1'	-49.8'	119.3°	1°23.7'	-50.3'	119.4°	0°54.3'	-50.8'	119.4°	0°24.8'	-51.3'	119.4°	16	
17	2°33.0'	-48.2'	119.8°	2°03.1'	-48.8'	119.9°	1°33.3'	-49.3'	119.9°	1°03.4'	-49.8'	119.9°	0°33.4'	-50.3'	119.9°	0°03.5'	-50.8'	119.9°	0°26.4'	+51.3'	60.1°	17	
18	1°44.8'	-48.2'	120.4°	1°14.4'	-48.8'	120.4°	0°44.0'	-49.3'	120.5°	0°13.6'	-49.8'	120.5°	0°16.9'	+50.3'	59.5°	0°47.3'	+50.8'	59.5°	1°17.7'	+51.2'	59.6°	18	
19	0°56.5'	-48.2'	121.0°	0°25.6'	-48.8'	121.0°	0°05.3'	+49.3'	59.0°	0°36.2'	+49.8'	59.0°	1°07.1'	+50.3'	59.0°	1°38.0'	+50.8'	59.0°	2°08.9'	+51.2'	59.0°	19	
20	0°08.3'	-48.2'	121.6°	0°23.1'	+48.8'	58.4°	0°54.6'	+49.3'	58.4°	1°26.0'	+49.8'	58.4°	1°57.4'	+50.3'	58.4°	2°28.8'	+50.8'	58.5°	3°00.2'	+51.2'	58.5°	20	
21	0°39.9'	+48.2'	57.8°	1°11.9'	+48.8'	57.8°	1°43.9'	+49.3'	57.8°	2°15.8'	+49.8'	57.9°	2°47.7'	+50.3'	57.9°	3°19.6'	+50.7'						

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

64° 296° LHA		Latitude CONTRARY to Declination							64° 296° LHA													
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	16°42.8'	-47.3'	110.2°	16°22.0'	-48.0'	110.5°	16°00.9'	-48.6'	110.8°	15°39.5'	-49.2'	111.0°	15°17.8'	-49.7'	111.3°	14°55.9'	-50.3'	111.5°	14°33.8'	-50.8'	111.8°	0
1	15°55.5'	-47.5'	110.8°	15°34.0'	-48.1'	111.1°	15°12.3'	-48.7'	111.4°	14°50.3'	-49.2'	111.6°	14°28.1'	-49.8'	111.9°	14°05.6'	-50.4'	112.1°	13°42.9'	-50.9'	112.3°	1
2	15°08.0'	-47.6'	111.5°	14°46.0'	-48.2'	111.7°	14°23.6'	-48.8'	112.0°	14°01.1'	-49.3'	112.2°	13°38.3'	-49.9'	112.4°	13°15.3'	-50.4'	112.7°	12°52.1'	-51.0'	112.9°	2
3	14°20.5'	-47.7'	112.1°	13°57.8'	-48.3'	112.3°	13°34.9'	-48.8'	112.6°	13°11.7'	-49.4'	112.8°	12°48.4'	-50.0'	113.0°	12°24.8'	-50.5'	113.2°	12°01.1'	-51.0'	113.4°	3
4	13°32.8'	-47.7'	112.7°	13°09.5'	-48.3'	113.0°	12°46.0'	-48.9'	113.2°	12°22.3'	-49.5'	113.4°	11°58.4'	-50.0'	113.6°	11°34.3'	-50.6'	113.8°	11°10.1'	-51.1'	113.9°	4
5	12°45.1'	-47.8'	113.4°	12°21.2'	-48.4'	113.6°	11°57.1'	-49.0'	113.8°	11°32.9'	-49.5'	114.0°	11°08.4'	-50.1'	114.1°	10°43.8'	-50.6'	114.3°	10°19.0'	-51.1'	114.5°	5
6	11°57.3'	-47.9'	114.0°	11°32.8'	-48.5'	114.2°	11°08.1'	-49.1'	114.4°	10°43.3'	-49.6'	114.5°	10°18.3'	-50.1'	114.7°	9°53.2'	-50.7'	114.9°	9°27.9'	-51.2'	115.0°	6
7	11°09.3'	-48.0'	114.6°	10°44.3'	-48.6'	114.8°	10°19.1'	-49.1'	114.9°	9°53.7'	-49.7'	115.1°	9°28.2'	-50.2'	115.3°	9°02.5'	-50.7'	115.4°	8°36.7'	-51.2'	115.5°	7
8	10°21.4'	-48.1'	115.2°	9°55.7'	-48.6'	115.4°	9°30.0'	-49.2'	115.5°	9°04.0'	-49.7'	115.7°	8°38.0'	-50.2'	115.8°	8°11.8'	-50.8'	115.9°	7°45.5'	-51.3'	116.1°	8
9	9°33.3'	-48.1'	115.8°	9°07.1'	-48.7'	116.0°	8°40.8'	-49.2'	116.1°	8°14.3'	-49.8'	116.2°	7°47.7'	-50.3'	116.4°	7°21.0'	-50.8'	116.5°	6°54.2'	-51.3'	116.6°	9
10	8°45.2'	-48.2'	116.4°	8°18.4'	-48.7'	116.6°	7°51.5'	-49.3'	116.7°	7°24.5'	-49.8'	116.8°	6°57.4'	-50.3'	116.9°	6°30.2'	-50.8'	117.0°	6°02.9'	-51.3'	117.1°	10
11	7°57.0'	-48.2'	117.0°	7°29.7'	-48.8'	117.1°	7°02.3'	-49.3'	117.3°	6°34.7'	-49.8'	117.4°	6°07.1'	-50.4'	117.5°	5°39.4'	-50.9'	117.6°	5°11.6'	-51.3'	117.6°	11
12	7°08.8'	-48.3'	117.6°	6°40.9'	-48.8'	117.7°	6°12.9'	-49.4'	117.8°	5°44.9'	-49.9'	117.9°	5°16.7'	-50.4'	118.0°	4°48.5'	-50.9'	118.1°	4°20.3'	-51.4'	118.2°	12
13	6°20.5'	-48.3'	118.2°	5°52.1'	-48.9'	118.3°	5°23.6'	-49.4'	118.4°	4°55.0'	-49.9'	118.5°	4°26.4'	-50.4'	118.6°	3°57.7'	-50.9'	118.6°	3°28.9'	-51.4'	118.7°	13
14	5°32.2'	-48.4'	118.8°	5°03.2'	-48.9'	118.9°	4°34.2'	-49.4'	119.0°	4°05.1'	-49.9'	119.0°	3°35.9'	-50.4'	119.1°	3°06.7'	-50.9'	119.1°	2°37.5'	-51.4'	119.2°	14
15	4°43.8'	-48.4'	119.4°	4°14.3'	-48.9'	119.5°	3°44.8'	-49.4'	119.5°	3°15.2'	-49.9'	119.6°	2°45.5'	-50.4'	119.6°	2°15.8'	-50.9'	119.7°	1°46.1'	-51.4'	119.7°	15
16	3°55.4'	-48.4'	120.0°	3°25.4'	-48.9'	120.1°	2°55.3'	-49.5'	120.1°	2°25.2'	-50.0'	120.1°	1°55.1'	-50.5'	120.2°	1°24.9'	-50.9'	120.2°	0°54.7'	-51.4'	120.2°	16
17	3°07.0'	-48.4'	120.6°	2°36.5'	-49.0'	120.6°	2°05.9'	-49.5'	120.7°	1°35.2'	-50.0'	120.7°	1°04.6'	-50.5'	120.7°	<u>0°34.0'</u>	<u>-50.9'</u>	<u>120.7°</u>	<u>0°03.3'</u>	<u>-51.4'</u>	<u>120.7°</u>	17
18	2°18.6'	-48.4'	121.2°	1°47.5'	-49.0'	121.2°	1°16.4'	-49.5'	121.2°	<u>0°45.3'</u>	<u>-50.0'</u>	<u>121.3°</u>	<u>0°14.1'</u>	<u>-50.5'</u>	<u>121.3°</u>	0°17.0'	+50.9'	58.7°	0°48.1'	+51.4'	58.7°	18
19	1°30.1'	-48.5'	121.8°	0°58.5'	-49.0'	121.8°	<u>0°26.9'</u>	<u>-49.5'</u>	<u>121.8°</u>	0°04.7'	+50.0'	58.2°	0°36.3'	+50.5'	58.2°	1°07.9'	+50.9'	58.2°	1°39.5'	+51.4'	58.2°	19
20	<u>0°41.7'</u>	<u>-48.5'</u>	<u>122.4°</u>	<u>0°09.6'</u>	<u>-49.0'</u>	<u>122.4°</u>	0°22.6'	+49.5'	57.6°	0°54.7'	+50.0'	57.6°	1°26.8'	+50.5'	57.7°	1°58.9'	+50.9'	57.7°	2°30.9'	+51.4'	57.7°	20
21	0°06.8'	+48.5'	57.0°	0°39.4'	+49.0'	57.1°	1°12.0'	+49.5'	57.1°	1°44.6'	+50.0'	57.1°	2°17.2'	+50.4'	57.1°	2°49.8'	+50.9'	57.2°	3°22.3'	+51.4'	57.2°	21
22	0°55.2'	+48.5'	56.5°	1°28.4'	+49.0'	56.5°	2°01.5'	+49.5'	56.5°	2°34.6'	+49.9'	56.5°	3°07.7'	+50.3'	56.6°	3°40.7'	+50.9'	56.6°	4°13.7'	+51.4'	56.7°	22
23	1°43.7'	+48.5'	55.9°	2°17.3'	+48.9'	55.9°	2°51.0'	+49.4'	55.9°	3°24.6'	+49.9'	56.0°	3°58.1'	+50.4'	56.0°	4°31.6'	+50.9'	56.1°	5°05.0'	+51.3'	56.2°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

116° 244° LHA Latitude SAME as DECLINATION 116° 244° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

63° 297° LHA		Latitude CONTRARY to Declination							63° 297° LHA													
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	17°19.6'	-47.5'	111.0°	16°58.0'	-48.1'	111.3°	16°36.1'	-48.7'	111.6°	16°13.8'	-49.3'	111.9°	15°51.4'	-49.9'	112.1°	15°28.6'	-50.4'	112.4°	15°05.6'	-50.9'	112.7°	0
1	16°32.1'	-47.6'	111.7°	16°09.9'	-48.2'	111.9°	15°47.4'	-48.8'	112.2°	15°24.5'	-49.4'	112.5°	15°01.5'	-49.9'	112.7°	14°38.2'	-50.5'	113.0°	14°14.7'	-51.0'	113.3°	1
2	15°44.5'	-47.7'	112.3°	15°21.7'	-48.3'	112.6°	14°58.5'	-48.9'	112.8°	14°35.2'	-49.5'	113.1°	14°11.5'	-50.0'	113.3°	13°47.7'	-50.6'	113.5°	13°23.7'	-51.1'	113.7°	2
3	14°56.9'	-47.8'	112.9°	14°33.4'	-48.4'	113.2°	14°09.6'	-49.0'	113.4°	13°45.7'	-49.6'	113.6°	13°21.5'	-50.1'	113.9°	12°57.1'	-50.6'	114.1°	12°32.6'	-51.2'	114.3°	3
4	14°09.0'	-47.9'	113.6°	13°45.0'	-48.5'	113.8°	13°20.6'	-49.1'	114.0°	12°56.1'	-49.6'	114.2°	12°31.4'	-50.2'	114.4°	12°06.5'	-50.7'	114.6°	11°41.4'	-51.2'	114.8°	4
5	13°21.1'	-48.0'	114.2°	12°56.4'	-48.6'	114.4°	12°31.6'	-49.2'	114.6°	12°06.5'	-49.7'	114.8°	11°41.2'	-50.2'	115.0°	11°15.8'	-50.8'	115.2°	10°50.2'	-51.3'	115.3°	5
6	12°33.1'	-48.1'	114.8°	12°07.9'	-48.7'	115.0°	11°42.4'	-49.2'	115.2°	11°16.8'	-49.8'	115.4°	10°51.0'	-50.3'	115.5°	10°25.1'	-50.8'	115.7°	9°58.9'	-51.3'	115.9°	6
7	11°45.0'	-48.2'	115.4°	11°19.2'	-48.7'	115.6°	10°53.2'	-49.3'	115.8°	10°27.0'	-49.8'	115.9°	10°00.7'	-50.4'	116.1°	9°34.2'	-50.9'	116.3°	9°07.6'	-51.4'	116.4°	7
8	10°56.9'	-48.2'	116.0°	10°30.5'	-48.8'	116.2°	10°03.9'	-49.3'	116.3°	9°37.2'	-49.9'	116.5°	9°10.4'	-50.4'	116.6°	8°43.4'	-50.9'	116.8°	8°16.3'	-51.4'	116.9°	8
9	10°08.6'	-48.3'	116.6°	9°41.7'	-48.9'	116.8°	9°14.6'	-49.4'	116.9°	8°47.3'	-49.9'	117.1°	8°20.0'	-50.4'	117.2°	7°52.5'	-50.9'	117.3°	7°24.9'	-51.4'	117.4°	9
10	9°20.3'	-48.4'	117.2°	8°52.8'	-48.9'	117.4°	8°25.2'	-49.5'	117.5°	7°57.4'	-50.0'	117.6°	7°29.5'	-50.5'	117.7°	7°01.5'	-51.0'	117.9°	6°33.4'	-51.5'	118.0°	10
11	8°31.9'	-48.4'	117.8°	8°03.9'	-49.0'	117.9°	7°35.7'	-49.5'	118.1°	7°07.4'	-50.0'	118.2°	6°39.0'	-50.5'	118.3°	6°10.5'	-51.0'	118.4°	5°42.0'	-51.5'	118.5°	11
12	7°43.5'	-48.5'	118.4°	7°14.9'	-49.0'	118.5°	6°46.2'	-49.5'	118.6°	6°17.4'	-50.1'	118.7°	5°48.5'	-50.6'	118.8°	5°19.5'	-51.0'	118.9°	4°50.5'	-51.5'	119.0°	12
13	6°55.0'	-48.5'	119.0°	6°25.9'	-49.1'	119.1°	5°56.7'	-49.6'	119.2°	5°27.3'	-50.1'	119.3°	4°58.0'	-50.6'	119.4°	4°28.5'	-51.1'	119.4°	3°59.0'	-51.5'	119.5°	13
14	6°06.5'	-48.6'	119.6°	5°36.8'	-49.1'	119.7°	5°07.1'	-49.6'	119.8°	4°37.3'	-50.1'	119.8°	4°07.4'	-50.6'	119.9°	3°37.4'	-51.1'	120.0°	3°07.4'	-51.6'	120.0°	14
15	5°18.0'	-48.6'	120.2°	4°47.8'	-49.1'	120.3°	4°17.5'	-49.6'	120.3°	3°47.2'	-50.1'	120.4°	3°16.8'	-50.6'	120.5°	2°46.3'	-51.1'	120.5°	2°15.9'	-51.6'	120.5°	15
16	4°29.4'	-48.6'	120.8°	3°58.6'	-49.1'	120.8°	3°27.9'	-49.6'	120.9°	2°57.0'	-50.1'	120.9°	2°26.2'	-50.6'	121.0°	1°55.2'	-51.1'	121.0°	1°24.3'	-51.6'	121.0°	16
17	3°40.8'	-48.6'	121.4°	3°09.5'	-49.2'	121.4°	2°38.2'	-49.7'	121.5°	2°06.9'	-50.2'	121.5°	1°35.5'	-50.6'	121.5°	1°04.1'	-51.1'	121.5°	<u>0°32.7'</u>	<u>-51.6'</u>	<u>121.6°</u>	17
18	2°52.1'	-48.7'	122.0°	2°20.4'	-49.2'	122.0°	1°48.6'	-49.7'	122.0°	1°16.7'	-50.2'	122.0°	<u>0°44.9'</u>	<u>-50.6'</u>	<u>122.1°</u>	<u>0°13.0'</u>	<u>-51.1'</u>	<u>122.1°</u>	0°18.8'	+51.6'	57.9°	18
19	2°03.5'	-48.7'	122.5°	1°31.2'	-49.2'	122.6°	0°58.9'	-49.7'	122.6°	<u>0°26.6'</u>	<u>-50.2'</u>	<u>122.6°</u>	0°05.8'	+50.6'	57.4°	0°38.1'	+51.1'	57.4°	1°10.4'	+51.6'	57.4°	19
20	1°14.8'	-48.7'	123.1°	<u>0°42.0'</u>	<u>-49.2'</u>	<u>123.1°</u>	<u>0°09.2'</u>	<u>-49.7'</u>	<u>123.1°</u>	0°23.6'	+50.2'	56.9°	0°56.4'	+50.6'	56.9°	1°29.2'	+51.1'	56.9°	2°02.0'	+51.6'	56.9°	20
21	<u>0°26.1'</u>	<u>-48.7'</u>	<u>123.7°</u>	0°07.2'	+49.2'	56.3°	0°40.5'	+49.7'	56.3°	1°13.8'	+50.2'	56.3°	1°47.0'	+50.6'	56.3°	2°20.3'	+51.1'	56.4°	2°53.5'	+51.5'	56.4°	21
22	0°22.6'	+48.7'	55.7°	0°56.4'	+49.2'	55.7°	1°30.2'	+49.7'	55.7°	2°03.9'	+50.1'	55.8°	2°37.7'	+50.6'	55.8°	3°11.4'	+51.1'					

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

62° 298° LHA

Latitude CONTRARY to Declination

62° 298° LHA

Table with 12 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows (0-23). Each cell contains three values (Hc, d, Z) in degrees and minutes.

118° 242° LHA

Latitude SAME as DECLINATION

118° 242° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

61° 299° LHA

Latitude CONTRARY to Declination

61° 299° LHA

Table with 12 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows (0-23). Each cell contains three values (Hc, d, Z) in degrees and minutes.

119° 241° LHA

Latitude SAME as DECLINATION

119° 241° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

60° 300° LHA

Latitude CONTRARY to Declination

60° 300° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	19°08.9'	-48.0'	113.5°	18°44.8'	-48.6'	113.9°	18°20.4'	-49.2'	114.2°	17°55.7'	-49.7'	114.5°	17°30.7'	-50.3'	114.8°	17°05.5'	-50.8'	115.0°	16°39.9'	-51.3'	115.3°	0
1	18°20.9'	-48.1'	114.2°	17°56.2'	-48.7'	114.5°	17°31.2'	-49.3'	114.8°	17°06.0'	-49.8'	115.0°	16°40.4'	-50.4'	115.3°	16°14.6'	-50.9'	115.6°	15°48.6'	-51.4'	115.9°	1
2	17°32.8'	-48.2'	114.8°	17°07.5'	-48.8'	115.1°	16°41.9'	-49.4'	115.4°	16°16.1'	-49.9'	115.6°	15°50.0'	-50.5'	115.9°	15°23.7'	-51.0'	116.1°	14°57.2'	-51.5'	116.4°	2
3	16°44.6'	-48.4'	115.4°	16°18.7'	-48.9'	115.7°	15°52.6'	-49.5'	116.0°	15°26.2'	-50.0'	116.2°	14°59.6'	-50.6'	116.5°	14°32.7'	-51.1'	116.7°	14°05.7'	-51.6'	116.9°	3
4	15°56.2'	-48.5'	116.0°	15°29.8'	-49.0'	116.3°	15°03.1'	-49.6'	116.5°	14°36.2'	-50.1'	116.8°	14°09.0'	-50.6'	117.0°	13°41.7'	-51.1'	117.2°	13°14.1'	-51.6'	117.4°	4
5	15°07.8'	-48.6'	116.7°	14°40.7'	-49.1'	116.9°	14°13.5'	-49.7'	117.1°	13°46.0'	-50.2'	117.3°	13°18.4'	-50.7'	117.6°	12°50.5'	-51.2'	117.8°	12°22.5'	-51.7'	118.0°	5
6	14°19.2'	-48.6'	117.3°	13°51.6'	-49.2'	117.5°	13°23.8'	-49.7'	117.7°	12°55.9'	-50.3'	117.9°	12°27.7'	-50.8'	118.1°	11°59.3'	-51.3'	118.3°	11°30.8'	-51.7'	118.5°	6
7	13°30.6'	-48.7'	117.9°	13°02.4'	-49.3'	118.1°	12°34.1'	-49.8'	118.3°	12°05.6'	-50.3'	118.5°	11°36.9'	-50.8'	118.7°	11°08.1'	-51.3'	118.8°	10°39.0'	-51.8'	119.0°	7
8	12°41.8'	-48.8'	118.5°	12°13.2'	-49.4'	118.7°	11°44.3'	-49.9'	118.8°	11°15.3'	-50.4'	119.0°	10°46.1'	-50.9'	119.2°	10°16.7'	-51.4'	119.4°	9°47.2'	-51.8'	119.5°	8
9	11°53.0'	-48.9'	119.1°	11°23.8'	-49.4'	119.2°	10°54.4'	-49.9'	119.4°	10°24.9'	-50.4'	119.6°	9°55.2'	-50.9'	119.7°	9°25.4'	-51.4'	119.9°	8°55.4'	-51.9'	120.0°	9
10	11°04.1'	-49.0'	119.7°	10°34.4'	-49.5'	119.8°	10°04.5'	-50.0'	120.0°	9°34.4'	-50.5'	120.1°	9°04.2'	-51.0'	120.3°	8°33.9'	-51.5'	120.4°	8°03.5'	-51.9'	120.5°	10
11	10°15.2'	-49.0'	120.2°	9°44.9'	-49.5'	120.4°	9°14.5'	-50.0'	120.5°	8°43.9'	-50.5'	120.7°	8°13.3'	-51.0'	120.8°	7°42.5'	-51.5'	120.9°	7°11.6'	-52.0'	121.0°	11
12	9°26.2'	-49.1'	120.8°	8°55.4'	-49.6'	121.0°	8°24.4'	-50.1'	121.1°	7°53.4'	-50.6'	121.2°	7°22.2'	-51.1'	121.3°	6°51.0'	-51.5'	121.4°	6°19.6'	-52.0'	121.5°	12
13	8°37.1'	-49.1'	121.4°	8°05.8'	-49.6'	121.5°	7°34.3'	-50.1'	121.7°	7°02.8'	-50.6'	121.8°	6°31.2'	-51.1'	121.9°	5°59.5'	-51.6'	122.0°	5°27.7'	-52.0'	122.0°	13
14	7°48.0'	-49.2'	122.0°	7°16.1'	-49.7'	122.1°	6°44.2'	-50.2'	122.2°	6°12.2'	-50.7'	122.3°	5°40.1'	-51.1'	122.4°	5°07.9'	-51.6'	122.5°	4°35.7'	-52.0'	122.5°	14
15	6°58.8'	-49.2'	122.6°	6°26.4'	-49.7'	122.7°	5°54.0'	-50.2'	122.8°	5°21.5'	-50.7'	122.8°	4°48.9'	-51.2'	122.9°	4°16.3'	-51.6'	123.0°	3°43.6'	-52.0'	123.0°	15
16	6°09.6'	-49.3'	123.1°	5°36.7'	-49.8'	123.2°	5°03.8'	-50.2'	123.3°	4°30.8'	-50.7'	123.4°	3°57.8'	-51.2'	123.4°	3°24.7'	-51.6'	123.5°	2°51.6'	-52.1'	123.5°	16
17	5°20.3'	-49.3'	123.7°	4°47.0'	-49.8'	123.8°	4°13.6'	-50.3'	123.9°	3°40.1'	-50.7'	123.9°	3°06.6'	-51.2'	124.0°	2°33.1'	-51.6'	124.0°	1°59.5'	-52.1'	124.0°	17
18	4°31.0'	-49.3'	124.3°	3°57.2'	-49.8'	124.4°	3°23.3'	-50.3'	124.4°	2°49.4'	-50.7'	124.4°	2°15.4'	-51.2'	124.5°	1°41.5'	-51.6'	124.5°	1°07.5'	-52.1'	124.5°	18
19	3°41.7'	-49.3'	124.9°	3°07.4'	-49.8'	124.9°	2°33.0'	-50.3'	124.9°	1°58.7'	-50.8'	125.0°	1°24.2'	-51.2'	125.0°	0°49.8'	-51.6'	125.0°	0°15.4'	-52.1'	125.0°	19
20	2°52.4'	-49.4'	125.4°	2°17.6'	-49.8'	125.5°	1°42.7'	-50.3'	125.5°	1°07.9'	-50.8'	125.5°	0°33.0'	-51.2'	125.5°	0°01.8'	+51.6'	54.5°	0°36.7'	+52.1'	54.5°	20
21	2°03.0'	-49.4'	126.0°	1°27.7'	-49.8'	126.0°	0°52.4'	-50.3'	126.0°	0°17.1'	-50.8'	126.0°	0°18.2'	+51.2'	54.0°	0°53.5'	+51.6'	54.0°	1°28.8'	+52.1'	54.0°	21
22	1°13.7'	-49.4'	126.6°	0°37.9'	-49.8'	126.6°	0°02.1'	-50.3'	126.6°	0°33.6'	+50.8'	53.4°	1°09.4'	+51.2'	53.4°	1°45.1'	+51.6'	53.5°	2°20.8'	+51.9'	53.5°	22
23	0°24.3'	-49.4'	127.1°	0°11.9'	+49.8'	52.9°	0°48.2'	+50.3'	52.9°	1°24.4'	+50.7'	52.9°	2°00.6'	+51.2'	52.9°	2°36.7'	+51.6'	52.9°	3°12.9'	+52.0'	53.0°	23

120° 240° LHA

Latitude SAME as DECLINATION

120° 240° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

59° 301° LHA

Latitude CONTRARY to Declination

59° 301° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	19°44.9'	-48.2'	114.4°	19°20.0'	-48.8'	114.7°	18°54.8'	-49.3'	115.0°	18°29.2'	-49.9'	115.3°	18°03.4'	-50.4'	115.6°	17°37.3'	-51.0'	115.9°	17°10.9'	-51.5'	116.2°	0
1	18°56.7'	-48.3'	115.0°	18°31.2'	-48.9'	115.3°	18°05.4'	-49.5'	115.6°	17°39.3'	-50.0'	115.9°	17°13.0'	-50.5'	116.2°	16°46.3'	-51.1'	116.5°	16°19.5'	-51.6'	116.7°	1
2	18°08.4'	-48.4'	115.7°	17°42.3'	-49.0'	115.9°	17°15.9'	-49.6'	116.2°	16°49.3'	-50.1'	116.5°	16°22.4'	-50.6'	116.8°	15°55.3'	-51.1'	117.0°	15°27.9'	-51.6'	117.3°	2
3	17°20.0'	-48.5'	116.3°	16°53.3'	-49.1'	116.5°	16°26.4'	-49.7'	116.8°	15°59.2'	-50.2'	117.1°	15°31.8'	-50.7'	117.3°	15°04.1'	-51.2'	117.6°	14°36.2'	-51.7'	117.8°	3
4	16°31.5'	-48.6'	116.9°	16°04.2'	-49.2'	117.1°	15°36.7'	-49.8'	117.4°	15°09.0'	-50.3'	117.6°	14°41.1'	-50.8'	117.9°	14°12.9'	-51.3'	118.1°	13°44.5'	-51.8'	118.3°	4
5	15°42.8'	-48.7'	117.5°	15°15.0'	-49.3'	117.7°	14°47.0'	-49.8'	118.0°	14°18.7'	-50.4'	118.2°	13°50.3'	-50.9'	118.4°	13°21.6'	-51.4'	118.6°	12°52.8'	-51.8'	118.8°	5
6	14°54.1'	-48.8'	118.1°	14°25.7'	-49.4'	118.3°	13°57.1'	-49.9'	118.6°	13°28.4'	-50.4'	118.8°	12°59.4'	-50.9'	119.0°	12°30.2'	-51.4'	119.2°	12°00.9'	-51.9'	119.4°	6
7	14°05.2'	-48.9'	118.7°	13°36.3'	-49.5'	118.9°	13°07.2'	-50.0'	119.1°	12°37.9'	-50.5'	119.3°	12°08.5'	-51.0'	119.5°	11°38.8'	-51.5'	119.7°	11°09.0'	-51.9'	119.9°	7
8	13°16.3'	-49.0'	119.3°	12°46.9'	-49.5'	119.5°	12°17.2'	-50.1'	119.7°	11°47.4'	-50.6'	119.9°	11°17.5'	-51.1'	120.1°	10°47.3'	-51.5'	120.2°	10°17.1'	-52.0'	120.4°	8
9	12°27.3'	-49.1'	119.9°	11°57.3'	-49.6'	120.1°	11°27.2'	-50.1'	120.3°	10°56.9'	-50.6'	120.4°	10°26.4'	-51.1'	120.6°	9°55.8'	-51.6'	120.7°	9°25.1'	-52.0'	120.9°	9
10	11°38.2'	-49.2'	120.5°	11°07.7'	-49.7'	120.6°	10°37.0'	-50.2'	120.8°	10°06.2'	-50.7'	121.0°	9°35.3'	-51.2'	121.1°	9°04.2'	-51.6'	121.3°	8°33.0'	-52.1'	121.4°	10
11	10°49.1'	-49.2'	121.1°	10°18.0'	-49.7'	121.2°	9°46.9'	-50.2'	121.4°	9°15.6'	-50.7'	121.5°	8°44.1'	-51.2'	121.6°	8°12.6'	-51.7'	121.8°	7°41.0'	-52.1'	121.9°	11
12	9°59.8'	-49.3'	121.6°	9°28.3'	-49.8'	121.8°	8°56.6'	-50.3'	121.9°	8°24.8'	-50.8'	122.1°	7°52.9'	-51.2'	122.2°	7°20.9'	-51.7'	122.3°	6°48.8'	-52.1'	122.4°	12
13	9°10.5'	-49.3'	122.2°	8°38.5'	-49.8'	122.4°	8°06.3'	-50.3'	122.5°	7°34.1'	-50.8'	122.6°	7°01.7'	-51.3'	122.7°	6°29.2'	-51.7'	122.8°	5°56.7'	-52.2'	122.9°	13
14	8°21.2'	-49.4'	122.8°	7°48.7'	-49.9'	122.9°	7°16.0'	-50.4'	123.0°	6°43.3'	-50.8'	123.1°	6°10.4'	-51.3'	123.2°	5°37.5'	-51.8'	123.3°	5°04.5'	-52.2'	123.4°	14
15	7°31.8'	-49.4'	123.4°	6°58.8'	-49.9'	123.5°	6°25.6'	-50.4'	123.6°	5°52.4'	-50.9'	123.7°	5°19.1'	-51.3'	123.7°	4°45.8'	-51.8'	123.8°	4°12.3'	-52.2'	123.9°	15
16	6°42.4'	-49.5'	123.9°	6°08.8'	-50.0'	124.0°	5°35.2'	-50.4'	124.1°	5°01.5'	-50.9'	124.2°	4°27.8'	-51.4'	124.3°	3°54.0'	-51.8'	124.3°	3°20.1'	-52.2'	124.4°	16
17	5°52.9'	-49.5'	124.5°	5°18.9'	-50.0'	124.6°	4°44.8'	-50.5'	124.7°	4°10.6'	-50.9'	124.7°	3°36.4'	-51.4'	124.8°	3°02.2'	-51.8'	124.8°	2°27.9'	-52.2'	124.9°	17
18	5°03.4'	-49.5'	125.1°	4°28.9'	-50.0'	125.1°	3°54.3'	-50.5'	125.2°	3°19.7'	-50.9'	125.3°	2°45.1'	-51.4'	125.3°	2°10.4'	-51.8'	125.3°	1°35.7'	-52.2'	125.4°	18
19	4°13.9'	-49.6'	125.6°	3°38.9'	-50.0'	125.7°	3°03.8'	-50.5'	125.7°	2°28.8'	-51.0'	125.8°	1°53.7'	-51.4'	125.8°	1°18.6'	-51.8'	125.8°	0°43.4'	-52.2'	125.9°	19
20	3°24.3'	-49.6'	126.2°	2°48.8'	-50.1'	126.2°	2°13.3'	-50.5'	126.3°	1°37.8'	-51.0'	126.3°	1°02.3'	-51.4'	126.3°	0°25.1'	+51.8'	53.2°	0°08.8'	+52.2'	53.7°	20
21	2°34.7'	-49.6'	126.8°	1°58.8'	-50.1'	126.8°	1°22.8'	-50.5'	126.8°	0°46.9'	-51.0'	126.8°	0°19.9'	-51.4'	126.8°	0°02.5'	+51.8'	53.2°	1°01.1'	+52.2'	53.2°	21
22	1°45.1'	-49.6'	127.3°	1°08.7'	-50.1'	127.4°	0°32.3'	-50.5'	127.4°	0°04.1'	+51.0'	52.6°	0°40.5'	+51.4'	52.6°	1°16.9'	+51.8'	52.7°	1°53.3'	+52.2'</		

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

58° 302° LHA

Latitude CONTRARY to Declination

58° 302° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	20°20.6'	-48.4'	115.2°	19°54.9'	-48.9'	115.6°	19°28.8'	-49.5'	115.9°	19°02.5'	-50.1'	116.2°	18°35.8'	-50.6'	116.5°	18°08.9'	-51.1'	116.8°	17°41.7'	-51.6'	117.1°	0
1	19°32.2'	-48.5'	115.9°	19°06.0'	-49.1'	116.2°	18°39.3'	-49.6'	116.5°	18°12.4'	-50.2'	116.8°	17°45.2'	-50.7'	117.1°	17°17.8'	-51.2'	117.4°	16°50.1'	-51.7'	117.6°	1
2	18°43.7'	-48.6'	116.5°	18°16.9'	-49.2'	116.8°	17°49.7'	-49.7'	117.1°	17°22.2'	-50.3'	117.4°	16°54.5'	-50.8'	117.6°	16°26.6'	-51.3'	117.9°	15°58.4'	-51.8'	118.2°	2
3	17°55.2'	-48.7'	117.1°	17°27.7'	-49.3'	117.4°	16°60.0'	-49.8'	117.7°	16°32.0'	-50.4'	117.9°	16°03.7'	-50.9'	118.2°	15°35.3'	-51.4'	118.5°	15°06.6'	-51.9'	118.7°	3
4	17°06.5'	-48.8'	117.7°	16°38.4'	-49.4'	118.0°	16°10.1'	-49.9'	118.3°	15°41.6'	-50.5'	118.5°	15°12.8'	-51.0'	118.8°	14°43.9'	-51.5'	119.0°	14°14.7'	-51.9'	119.2°	4
5	16°17.6'	-48.9'	118.3°	15°49.0'	-49.5'	118.6°	15°20.2'	-50.0'	118.8°	14°51.1'	-50.5'	119.1°	14°21.9'	-51.0'	119.3°	13°52.4'	-51.5'	119.5°	13°22.8'	-52.0'	119.7°	5
6	15°28.7'	-49.0'	118.9°	14°59.5'	-49.6'	119.2°	14°30.2'	-50.1'	119.4°	14°00.6'	-50.6'	119.6°	13°30.9'	-51.1'	119.8°	13°00.9'	-51.6'	120.0°	12°30.8'	-52.0'	120.2°	6
7	14°39.6'	-49.1'	119.5°	14°09.9'	-49.7'	119.8°	13°40.1'	-50.2'	120.0°	13°10.0'	-50.7'	120.2°	12°39.7'	-51.2'	120.4°	12°09.3'	-51.6'	120.6°	11°38.7'	-52.1'	120.7°	7
8	13°50.5'	-49.2'	120.1°	13°20.3'	-49.7'	120.3°	12°49.9'	-50.2'	120.5°	12°19.3'	-50.7'	120.7°	11°48.6'	-51.2'	120.9°	11°17.7'	-51.7'	121.1°	10°46.6'	-52.2'	121.3°	8
9	13°01.3'	-49.3'	120.7°	12°30.6'	-49.8'	120.9°	11°59.6'	-50.3'	121.1°	11°28.6'	-50.8'	121.3°	10°57.4'	-51.3'	121.4°	10°26.0'	-51.7'	121.6°	9°54.5'	-52.2'	121.8°	9
10	12°12.0'	-49.4'	121.3°	11°40.7'	-49.9'	121.5°	11°09.3'	-50.4'	121.7°	10°37.8'	-50.9'	121.8°	10°06.1'	-51.3'	122.0°	9°34.2'	-51.8'	122.1°	9°02.3'	-52.2'	122.3°	10
11	11°22.6'	-49.4'	121.9°	10°50.9'	-49.9'	122.0°	10°19.0'	-50.4'	122.2°	9°46.9'	-50.9'	122.4°	9°14.7'	-51.4'	122.5°	8°42.4'	-51.8'	122.6°	8°10.0'	-52.3'	122.8°	11
12	10°33.2'	-49.5'	122.5°	10°00.9'	-50.0'	122.6°	9°28.5'	-50.5'	122.8°	8°56.0'	-51.0'	122.9°	8°23.4'	-51.4'	123.0°	7°50.6'	-51.9'	123.1°	7°17.8'	-52.3'	123.2°	12
13	9°43.7'	-49.6'	123.0°	9°10.9'	-50.0'	123.2°	8°38.0'	-50.5'	123.3°	8°05.0'	-51.0'	123.4°	7°31.9'	-51.5'	123.5°	6°58.7'	-51.9'	123.6°	6°25.5'	-52.3'	123.7°	13
14	8°54.1'	-49.6'	123.6°	8°20.9'	-50.1'	123.7°	7°47.5'	-50.6'	123.8°	7°14.0'	-51.0'	124.0°	6°40.5'	-51.5'	124.1°	6°06.8'	-51.9'	124.2°	5°33.1'	-52.4'	124.2°	14
15	8°04.5'	-49.7'	124.2°	7°30.8'	-50.1'	124.3°	6°56.9'	-50.6'	124.4°	6°23.0'	-51.1'	124.5°	5°49.0'	-51.5'	124.6°	5°14.9'	-52.0'	124.7°	4°40.8'	-52.4'	124.7°	15
16	7°14.9'	-49.7'	124.7°	6°40.6'	-50.2'	124.8°	6°06.3'	-50.6'	124.9°	5°31.9'	-51.1'	125.0°	4°57.5'	-51.5'	125.1°	4°23.0'	-52.0'	125.2°	3°48.4'	-52.4'	125.2°	16
17	6°25.2'	-49.7'	125.3°	5°50.5'	-50.2'	125.4°	5°15.7'	-50.7'	125.5°	4°40.8'	-51.1'	125.5°	4°05.9'	-51.6'	125.6°	3°31.0'	-52.0'	125.7°	2°56.0'	-52.4'	125.7°	17
18	5°35.5'	-49.8'	125.9°	5°00.3'	-50.2'	125.9°	4°25.0'	-50.7'	126.0°	3°49.7'	-51.1'	126.1°	3°14.4'	-51.6'	126.1°	2°39.0'	-52.0'	126.2°	2°03.6'	-52.4'	126.2°	18
19	4°45.7'	-49.8'	126.4°	4°10.0'	-50.3'	126.5°	3°34.3'	-50.7'	126.5°	2°58.6'	-51.2'	126.6°	2°22.8'	-51.6'	126.6°	1°47.0'	-52.0'	126.7°	1°11.2'	-52.4'	126.7°	19
20	3°55.9'	-49.8'	127.0°	3°19.8'	-50.3'	127.0°	2°43.6'	-50.7'	127.1°	2°07.4'	-51.2'	127.1°	1°31.2'	-51.6'	127.1°	0°55.0'	-52.0'	127.2°	<u>0°18.7'</u>	-52.4'	<u>127.2°</u>	20
21	3°06.1'	-49.8'	127.5°	2°29.5'	-50.3'	127.6°	1°52.9'	-50.7'	127.6°	1°16.3'	-51.2'	127.6°	<u>0°39.6'</u>	-51.6'	<u>127.6°</u>	<u>0°03.0'</u>	-52.0'	<u>127.7°</u>	0°33.7'	+52.4'	52.4°	21
22	2°16.3'	-49.8'	128.1°	1°39.2'	-50.3'	128.1°	1°02.2'	-50.7'	128.1°	<u>0°25.1'</u>	-51.2'	<u>128.2°</u>	0°12.0'	+51.6'	51.8°	0°49.0'	+52.0'	51.8°	1°26.1'	+52.4'	51.9°	22
23	<u>1°26.4'</u>	-49.9'	<u>128.7°</u>	<u>0°48.9'</u>	-50.3'	<u>128.7°</u>	<u>0°11.4'</u>	-50.7'	<u>128.7°</u>	0°26.1'	+51.2'	51.3°	1°03.6'	+51.6'	51.3°	1°41.1'	+52.0'	51.3°	2°18.5'	+52.4'	51.4°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

122° 238° LHA

Latitude SAME as DECLINATION

122° 238° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

57° 303° LHA

Latitude CONTRARY to Declination

57° 303° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	20°56.1'	-48.6'	116.1°	20°29.6'	-49.1'	116.4°	20°02.7'	-49.7'	116.8°	19°35.5'	-50.2'	117.1°	19°08.0'	-50.8'	117.4°	18°40.3'	-51.3'	117.7°	18°12.2'	-51.8'	118.0°	0
1	20°07.5'	-48.7'	116.7°	19°40.4'	-49.3'	117.1°	19°13.0'	-49.8'	117.4°	18°45.3'	-50.3'	117.7°	18°17.2'	-50.9'	118.0°	17°49.0'	-51.4'	118.3°	17°20.4'	-51.9'	118.5°	1
2	19°18.8'	-48.8'	117.4°	18°51.2'	-49.4'	117.7°	18°23.2'	-49.9'	118.0°	17°54.9'	-50.4'	118.3°	17°26.4'	-51.0'	118.5°	16°57.6'	-51.5'	118.8°	16°28.6'	-51.9'	119.1°	2
3	18°30.1'	-48.9'	118.0°	18°01.8'	-49.5'	118.3°	17°33.3'	-50.0'	118.5°	17°04.5'	-50.5'	118.8°	16°35.4'	-51.0'	119.1°	16°06.1'	-51.5'	119.3°	15°36.6'	-52.0'	119.6°	3
4	17°41.2'	-49.0'	118.6°	17°12.3'	-49.6'	118.9°	16°43.2'	-50.1'	119.1°	16°13.9'	-50.6'	119.4°	15°44.4'	-51.1'	119.6°	15°14.6'	-51.6'	119.9°	14°44.6'	-52.1'	120.1°	4
5	16°52.1'	-49.1'	119.2°	16°22.7'	-49.7'	119.4°	15°53.1'	-50.2'	119.7°	15°23.3'	-50.7'	119.9°	14°53.2'	-51.2'	120.2°	14°23.0'	-51.7'	120.4°	13°52.5'	-52.1'	120.6°	5
6	16°03.0'	-49.2'	119.8°	15°33.1'	-49.8'	120.0°	15°02.9'	-50.3'	120.3°	14°32.6'	-50.8'	120.5°	14°02.0'	-51.3'	120.7°	13°31.3'	-51.7'	120.9°	13°00.4'	-52.2'	121.1°	6
7	15°13.7'	-49.3'	120.4°	14°43.3'	-49.9'	120.6°	14°12.6'	-50.4'	120.8°	13°41.8'	-50.9'	121.0°	13°10.8'	-51.3'	121.2°	12°39.5'	-51.8'	121.4°	12°08.2'	-52.3'	121.6°	7
8	14°24.4'	-49.4'	121.0°	13°53.4'	-49.9'	121.2°	13°22.3'	-50.4'	121.4°	12°50.9'	-50.9'	121.6°	12°19.4'	-51.4'	121.8°	11°47.7'	-51.9'	122.0°	11°15.9'	-52.3'	122.1°	8
9	13°35.0'	-49.5'	121.6°	13°03.5'	-50.0'	121.8°	12°31.8'	-50.5'	121.9°	12°00.0'	-51.0'	122.1°	11°28.0'	-51.5'	122.3°	10°55.9'	-51.9'	122.5°	10°23.6'	-52.4'	122.6°	9
10	12°45.5'	-49.6'	122.1°	12°13.5'	-50.1'	122.3°	11°41.3'	-50.6'	122.5°	11°09.0'	-51.0'	122.7°	10°36.6'	-51.5'	122.8°	10°04.0'	-52.0'	123.0°	9°31.2'	-52.4'	123.1°	10
11	11°55.9'	-49.6'	122.7°	11°23.4'	-50.1'	122.9°	10°50.8'	-50.6'	123.0°	10°18.0'	-51.1'	123.2°	9°45.0'	-51.6'	123.3°	9°12.0'	-52.0'	123.5°	8°38.8'	-52.4'	123.6°	11
12	11°06.3'	-49.7'	123.3°	10°33.3'	-50.2'	123.4°	10°00.1'	-50.7'	123.6°	9°26.9'	-51.1'	123.7°	8°53.5'	-51.6'	123.9°	8°20.0'	-52.0'	124.0°	7°46.4'	-52.5'	124.1°	12
13	10°16.5'	-49.8'	123.9°	9°43.1'	-50.3'	124.0°	9°09.4'	-50.7'	124.1°	8°35.7'	-51.2'	124.3°	8°01.9'	-51.6'	124.4°	7°28.0'	-52.1'	124.5°	6°53.9'	-52.5'	124.6°	13
14	9°26.8'	-49.8'	124.4°	8°52.8'	-50.3'	124.6°	8°18.7'	-50.8'	124.7°	7°44.5'	-51.2'	124.8°	7°10.3'	-51.7'	124.9°	6°35.9'	-52.1'	125.0°	6°01.4'	-52.5'	125.1°	14
15	8°36.9'	-49.9'	125.0°	8°02.5'	-50.3'	125.1°	7°27.9'	-50.8'	125.2°	6°53.3'	-51.3'	125.3°	6°18.6'	-51.7'	125.4°	5°43.8'	-52.1'	125.5°	5°08.9'	-52.5'	125.6°	15
16	7°47.1'	-49.9'	125.5°	7°12.1'	-50.4'	125.6°	6°37.1'	-50.8'	125.7°	6°02.0'	-51.3'	125.8°	5°26.9'	-51.7'	125.9°	4°51.6'	-52.2'	126.0°	4°16.4'	-52.6'	126.1°	16
17	6°57.2'	-50.0'	126.1°	6°21.8'	-50.4'	126.2°	5°46.3'	-50.9'	126.3°	5°10.7'	-51.3'	126.4°	4°35.1'	-51.7'	126.4°	3°59.5'	-52.2'	126.5°	3°23.8'	-52.6'	126.5°	17
18	6°07.2'	-50.0'	126.7°	5°31.3'	-50.5'	126.7°	4°55.4'	-50.9'	126.8°	4°19.4'	-51.3'	126.9°	3°43.4'	-51.8'	126.9°	3°07.3'	-52.2'	127.0°	2°31.2'	-52.6'	127.0°	18
19	5°17.2'	-50.0'	127.2°	4°40.9'	-50.5'	127.3°	4°04.5'	-50.9'	127.3°	3°28.1'	-51.4'	127.4°	2°51.6'	-51.8'	127.4°	2°15.1'	-52.2'	127.5°	1°38.6'	-52.6'	127.5°	19
20	4°27.2'	-50.0'	127.8°	3°50.4'	-50.5'	127.8°	3°13.6'	-50.9'	127.9°	2°36.7'	-51.4'	127.9°	1°59.8'	-51.8'	127.9°	1°22.9'	-52.2'	128.0°	<u>0°46.0'</u>	-52.6'	<u>128.0°</u>	20
21	3°37.1'	-50.1'	128.3°	2°59.9'	-50.5'	128.4°	2°22.6'	-51.0														

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

56° 304° LHA

Latitude CONTRARY to Declination

56° 304° LHA

Table with 12 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of astronomical data.

124° 236° LHA

Latitude SAME as DECLINATION

124° 236° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

55° 305° LHA

Latitude CONTRARY to Declination

55° 305° LHA

Table with 12 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of astronomical data.

125° 235° LHA

Latitude SAME as DECLINATION

125° 235° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

54° 306° LHA

Latitude CONTRARY to Declination

54° 306° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	22°40.9'	49.1'	118.7°	22°11.9'	49.7'	119.1°	21°42.6'	50.3'	119.5°	21°12.9'	50.8'	119.8°	20°43.0'	51.3'	120.1°	20°12.7'	51.8'	120.4°	19°42.2'	52.3'	120.8°	0
1	21°51.7'	49.3'	119.4°	21°22.2'	49.8'	119.7°	20°52.3'	50.4'	120.0°	20°22.2'	50.9'	120.4°	19°51.7'	51.4'	120.7°	19°20.9'	51.9'	121.0°	18°49.9'	52.3'	121.3°	1
2	21°02.5'	49.4'	120.0°	20°32.4'	50.0'	120.3°	20°02.0'	50.5'	120.6°	19°31.3'	51.0'	120.9°	19°00.3'	51.5'	121.2°	18°29.1'	52.0'	121.5°	17°57.6'	52.4'	121.8°	2
3	20°13.1'	49.5'	120.6°	19°42.4'	50.1'	120.9°	19°11.5'	50.6'	121.2°	18°40.3'	51.1'	121.5°	18°08.8'	51.6'	121.8°	17°37.1'	52.0'	122.0°	17°05.2'	52.5'	122.3°	3
4	19°23.5'	49.7'	121.2°	18°52.4'	50.2'	121.5°	18°20.9'	50.7'	121.8°	17°49.2'	51.2'	122.0°	17°17.2'	51.7'	122.3°	16°45.1'	52.1'	122.6°	16°12.7'	52.6'	122.8°	4
5	18°33.9'	49.8'	121.8°	18°02.2'	50.3'	122.0°	17°30.2'	50.8'	122.3°	16°58.0'	51.3'	122.6°	16°25.6'	51.7'	122.8°	15°53.0'	52.2'	123.1°	15°20.1'	52.6'	123.3°	5
6	17°44.1'	49.9'	122.4°	17°11.9'	50.4'	122.6°	16°39.4'	50.9'	122.9°	16°06.8'	51.3'	123.1°	15°33.9'	51.8'	123.4°	15°00.8'	52.3'	123.6°	14°27.5'	52.7'	123.8°	6
7	16°54.2'	50.0'	122.9°	16°21.5'	50.5'	123.2°	15°48.6'	51.0'	123.4°	15°15.4'	51.4'	123.7°	14°42.1'	51.9'	123.9°	14°08.5'	52.3'	124.1°	13°34.8'	52.7'	124.3°	7
8	16°04.3'	50.1'	123.5°	15°31.0'	50.6'	123.8°	14°57.6'	51.0'	124.0°	14°24.0'	51.5'	124.2°	13°50.2'	51.9'	124.4°	13°16.2'	52.4'	124.6°	12°42.0'	52.8'	124.8°	8
9	15°14.2'	50.1'	124.1°	14°40.5'	50.6'	124.3°	14°06.6'	51.1'	124.5°	13°32.5'	51.6'	124.7°	12°58.2'	52.0'	124.9°	12°23.8'	52.4'	125.1°	11°49.2'	52.9'	125.3°	9
10	14°24.1'	50.2'	124.7°	13°49.9'	50.7'	124.9°	13°15.5'	51.2'	125.1°	12°40.9'	51.6'	125.2°	12°06.2'	52.1'	125.4°	11°31.4'	52.5'	125.6°	10°56.4'	52.9'	125.8°	10
11	13°33.8'	50.3'	125.2°	12°59.2'	50.8'	125.4°	12°24.3'	51.2'	125.6°	11°49.3'	51.7'	125.8°	11°14.2'	52.1'	125.9°	10°38.9'	52.5'	126.1°	10°03.5'	52.9'	126.2°	11
12	12°43.5'	50.4'	125.8°	12°08.4'	50.8'	126.0°	11°33.1'	51.3'	126.1°	10°57.6'	51.7'	126.3°	10°22.1'	52.2'	126.4°	9°46.4'	52.6'	126.6°	9°10.5'	53.0'	126.7°	12
13	11°53.2'	50.4'	126.3°	11°17.5'	50.9'	126.5°	10°41.8'	51.3'	126.7°	10°05.9'	51.8'	126.8°	9°29.9'	52.2'	126.9°	8°53.8'	52.6'	127.1°	8°17.6'	53.0'	127.2°	13
14	11°02.7'	50.5'	126.9°	10°26.6'	51.0'	127.0°	9°50.4'	51.4'	127.2°	9°14.1'	51.8'	127.3°	8°37.7'	52.2'	127.4°	8°01.2'	52.6'	127.6°	7°24.6'	53.0'	127.7°	14
15	10°12.2'	50.6'	127.4°	9°35.7'	51.0'	127.6°	8°59.0'	51.4'	127.7°	8°22.3'	51.9'	127.8°	7°45.5'	52.3'	127.9°	7°08.5'	52.7'	128.0°	6°31.5'	53.1'	128.1°	15
16	9°21.7'	50.6'	128.0°	8°44.7'	51.0'	128.1°	8°07.6'	51.5'	128.2°	7°30.4'	51.9'	128.3°	6°53.2'	52.3'	128.4°	6°15.8'	52.7'	128.5°	5°38.4'	53.1'	128.6°	16
17	8°31.1'	50.6'	128.5°	7°53.6'	51.1'	128.6°	7°16.1'	51.5'	128.7°	6°38.5'	51.9'	128.8°	6°00.9'	52.3'	128.9°	5°23.1'	52.7'	129.0°	4°45.4'	53.1'	129.1°	17
18	7°40.4'	50.7'	129.1°	7°02.6'	51.1'	129.2°	6°24.6'	51.5'	129.3°	5°46.6'	52.0'	129.3°	5°08.5'	52.4'	129.4°	4°30.4'	52.7'	129.5°	3°52.2'	53.1'	129.5°	18
19	6°49.7'	50.7'	129.6°	6°11.4'	51.2'	129.7°	5°33.1'	51.6'	129.8°	4°54.7'	52.0'	129.8°	4°16.2'	52.4'	129.9°	3°37.7'	52.8'	130.0°	2°59.1'	53.1'	130.0°	19
20	5°59.0'	50.8'	130.1°	5°20.3'	51.2'	130.2°	4°41.5'	51.6'	130.3°	4°02.7'	52.0'	130.3°	3°23.8'	52.4'	130.4°	2°44.9'	52.8'	130.4°	2°06.0'	53.1'	130.5°	20
21	5°08.2'	50.8'	130.7°	4°29.1'	51.2'	130.7°	3°49.9'	51.6'	130.8°	3°10.7'	52.0'	130.8°	2°31.4'	52.4'	130.9°	1°52.2'	52.8'	130.9°	1°12.8'	53.1'	130.9°	21
22	4°17.5'	50.8'	131.2°	3°37.9'	51.2'	131.3°	2°58.3'	51.6'	131.3°	2°18.7'	52.0'	131.3°	1°39.0'	52.4'	131.4°	0°59.4'	52.8'	131.4°	0°19.7'	53.1'	131.4°	22
23	3°26.7'	50.8'	131.8°	2°46.7'	51.2'	131.8°	2°06.7'	51.6'	131.8°	1°26.7'	52.0'	131.8°	0°46.6'	52.4'	131.9°	0°06.6'	52.8'	131.9°	0°33.4'	53.1'	48.1°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

126° 234° LHA

Latitude SAME as DECLINATION

126° 234° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

53° 307° LHA

Latitude CONTRARY to Declination

53° 307° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	23°15.3'	49.4'	119.6°	22°45.5'	49.9'	120.0°	22°15.3'	50.4'	120.4°	21°44.8'	51.0'	120.7°	21°14.1'	51.5'	121.0°	20°43.0'	51.9'	121.4°	20°11.6'	52.4'	121.7°	0
1	22°25.9'	49.5'	120.2°	21°55.6'	50.0'	120.6°	21°24.9'	50.6'	120.9°	20°53.9'	51.1'	121.3°	20°22.6'	51.6'	121.6°	19°51.0'	52.0'	121.9°	19°19.2'	52.5'	122.2°	1
2	21°36.4'	49.6'	120.9°	21°05.5'	50.2'	121.2°	20°34.3'	50.7'	121.5°	20°02.8'	51.2'	121.8°	19°31.0'	51.7'	122.1°	18°59.0'	52.1'	122.4°	18°26.7'	52.6'	122.7°	2
3	20°46.8'	49.8'	121.5°	20°15.4'	50.3'	121.8°	19°43.6'	50.8'	122.1°	19°11.6'	51.3'	122.4°	18°39.4'	51.8'	122.7°	18°06.9'	52.2'	123.0°	17°34.1'	52.7'	123.2°	3
4	19°57.1'	49.9'	122.1°	19°25.1'	50.4'	122.4°	18°52.9'	50.9'	122.6°	18°20.4'	51.4'	122.9°	17°47.6'	51.8'	123.2°	17°14.6'	52.3'	123.5°	16°41.4'	52.7'	123.7°	4
5	19°07.2'	50.0'	122.6°	18°34.7'	50.5'	122.9°	18°02.0'	51.0'	123.2°	17°29.0'	51.5'	123.5°	16°55.8'	51.9'	123.7°	16°22.4'	52.4'	124.0°	15°48.7'	52.8'	124.2°	5
6	18°17.2'	50.1'	123.2°	17°44.2'	50.6'	123.5°	17°11.0'	51.1'	123.8°	16°37.5'	51.5'	124.0°	16°03.9'	52.0'	124.3°	15°30.0'	52.4'	124.5°	14°55.9'	52.9'	124.7°	6
7	17°27.1'	50.2'	123.8°	16°53.6'	50.7'	124.1°	16°19.9'	51.2'	124.3°	15°46.0'	51.6'	124.5°	15°11.9'	52.1'	124.8°	14°37.6'	52.5'	125.0°	14°03.1'	52.9'	125.2°	7
8	16°36.9'	50.3'	124.4°	16°02.9'	50.8'	124.6°	15°28.8'	51.2'	124.9°	14°54.4'	51.7'	125.1°	14°19.8'	52.1'	125.3°	13°45.1'	52.6'	125.5°	13°10.1'	53.0'	125.7°	8
9	15°46.7'	50.4'	124.9°	15°12.2'	50.8'	125.2°	14°37.5'	51.3'	125.4°	14°02.7'	51.8'	125.6°	13°27.7'	52.2'	125.8°	12°52.5'	52.6'	126.0°	12°17.2'	53.0'	126.2°	9
10	14°56.3'	50.5'	125.5°	14°21.3'	50.9'	125.7°	13°46.2'	51.4'	125.9°	13°10.9'	51.8'	126.1°	12°35.5'	52.2'	126.3°	11°59.9'	52.7'	126.5°	11°24.1'	53.1'	126.6°	10
11	14°05.8'	50.5'	126.1°	13°30.4'	51.0'	126.3°	12°54.8'	51.4'	126.5°	12°19.1'	51.9'	126.6°	11°43.2'	52.3'	126.8°	11°07.2'	52.7'	127.0°	10°31.1'	53.1'	127.1°	11
12	13°15.3'	50.6'	126.6°	12°39.4'	51.1'	126.8°	12°03.4'	51.5'	127.0°	11°27.2'	51.9'	127.2°	10°50.9'	52.3'	127.3°	10°14.5'	52.8'	127.5°	9°38.0'	53.1'	127.6°	12
13	12°24.7'	50.7'	127.2°	11°48.4'	51.1'	127.3°	11°11.9'	51.6'	127.5°	10°35.3'	52.0'	127.7°	9°58.6'	52.4'	127.8°	9°21.8'	52.8'	127.9°	8°44.8'	53.2'	128.1°	13
14	11°34.0'	50.7'	127.7°	10°57.3'	51.2'	127.9°	10°20.4'	51.6'	128.0°	9°43.3'	52.0'	128.2°	9°06.2'	52.4'	128.3°	8°29.0'	52.8'	128.4°	7°51.6'	53.2'	128.5°	14
15	10°43.3'	50.8'	128.3°	10°06.1'	51.2'	128.4°	9°28.8'	51.6'	128.5°	8°51.3'	52.1'	128.7°	8°13.8'	52.5'	128.8°	7°36.1'	52.9'	128.9°	6°58.4'	53.2'	129.0°	15
16	9°52.5'	50.8'	128.8°	9°14.9'	51.3'	128.9°	8°37.1'	51.7'	129.1°	7°59.2'	52.1'	129.2°	7°21.3'	52.5'	129.3°	6°43.3'	52.9'	129.4°	6°05.2'	53.3'	129.5°	16
17	9°01.7'	50.9'	129.3°	8°23.6'	51.3'	129.5°	7°45.4'	51.7'	129.6°	7°07.1'	52.1'	129.7°	6°28.8'	52.5'	129.8°	5°50.4'	52.9'	129.9°	5°11.9'	53.3'	129.9°	17
18	8°10.8'	50.9'	129.9°	7°32.3'	51.3'	130.0°	6°53.7'	51.8'	130.1°	6°15.0'	52.2'	130.2°	5°36.3'	52.6'	130.3°	4°57.5'	52.9'	130.3°	4°18.6'	53.3'	130.4°	18
19	7°19.9'	51.0'	130.4°	6°40.9'	51.4'	130.5°	6°01.9'	51.8'	130.6°	5°22.9'	52.2'	130.7°	4°43.7'	52.6'	130.7°	4°04.5'	52.9'	130.8°	3°25.3'	53.3'	130.8°	19
20	6°28.9'	51.0'	130.9°	5°49.6'	51.4'	131.0°	5°10.1'	51.8'	131.1°	4°30.7'	52.2'	131.2°	3°51.2'	52.6'	131.2°	3°11.6'	53.0'	131.3°	2°32.0'	53.3'	131.3°	20
21	5°37.9'	51.0'	131.5°	4°58.2'	51.4'	131.5°	4°18.3'	51.8'	131.6°	3°38.5'	52.2'	131.7°	2°58.6'	52.6'	131.7°	2°18.6'	53.0'	131.7°	1°38.7'	53.3'	131.8°	21
22	4°46.9'	51.0'	132.0°	4°06.7'	51.																	

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

52° 308° LHA

Latitude CONTRARY to Declination

52° 308° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	23°49.3'	-49.6'	120.5°	23°18.7'	-50.1'	120.9°	22°47.7'	-50.6'	121.3°	22°16.5'	-51.2'	121.6°	21°44.8'	-51.6'	122.0°	21°12.9'	-52.1'	122.3°	20°40.7'	-52.6'	122.6°	0
1	22°59.7'	-49.7'	121.1°	22°28.6'	-50.2'	121.5°	21°57.1'	-50.8'	121.8°	21°25.3'	-51.3'	122.2°	20°53.2'	-51.7'	122.5°	20°20.8'	-52.2'	122.8°	19°48.1'	-52.7'	123.1°	1
2	22°10.0'	-49.8'	121.7°	21°38.4'	-50.4'	122.1°	21°06.3'	-50.9'	122.4°	20°34.0'	-51.4'	122.7°	20°01.5'	-51.8'	123.0°	19°28.6'	-52.3'	123.3°	18°55.5'	-52.7'	123.6°	2
3	21°20.2'	-50.0'	122.3°	20°48.0'	-50.5'	122.7°	20°15.5'	-51.0'	123.0°	19°42.7'	-51.5'	123.3°	19°09.6'	-51.9'	123.6°	18°36.3'	-52.4'	123.9°	18°02.7'	-52.8'	124.1°	3
4	20°30.3'	-50.1'	122.9°	19°57.5'	-50.6'	123.2°	19°24.5'	-51.1'	123.5°	18°51.2'	-51.6'	123.8°	18°17.7'	-52.0'	124.1°	17°43.9'	-52.5'	124.4°	17°09.9'	-52.9'	124.6°	4
5	19°40.2'	-50.2'	123.5°	19°06.9'	-50.7'	123.8°	18°33.4'	-51.2'	124.1°	17°59.6'	-51.7'	124.4°	17°25.6'	-52.1'	124.6°	16°51.4'	-52.5'	124.9°	16°17.0'	-53.0'	125.1°	5
6	18°50.0'	-50.3'	124.1°	18°16.2'	-50.8'	124.4°	17°42.2'	-51.3'	124.6°	17°08.0'	-51.7'	124.9°	16°33.5'	-52.2'	125.2°	15°58.9'	-52.6'	125.4°	15°24.0'	-53.0'	125.6°	6
7	17°59.7'	-50.4'	124.7°	17°25.4'	-50.9'	124.9°	16°50.9'	-51.4'	125.2°	16°16.3'	-51.8'	125.4°	15°41.4'	-52.3'	125.7°	14°49.1'	-52.7'	125.9°	14°31.0'	-53.1'	126.1°	7
8	17°09.3'	-50.5'	125.2°	16°34.5'	-51.0'	125.5°	15°59.6'	-51.4'	125.7°	15°24.4'	-51.9'	126.0°	14°49.1'	-52.3'	126.2°	14°13.6'	-52.7'	126.4°	13°37.9'	-53.1'	126.6°	8
9	16°18.7'	-50.6'	125.8°	15°43.5'	-51.1'	126.0°	15°08.1'	-51.5'	126.3°	14°32.6'	-52.0'	126.5°	13°56.8'	-52.4'	126.7°	13°20.9'	-52.8'	126.9°	12°44.8'	-53.2'	127.1°	9
10	15°28.2'	-50.7'	126.4°	14°52.5'	-51.1'	126.6°	14°16.6'	-51.6'	126.8°	13°40.6'	-52.0'	127.0°	13°04.4'	-52.4'	127.2°	12°28.1'	-52.8'	127.4°	11°51.6'	-53.2'	127.5°	10
11	14°37.5'	-50.8'	126.9°	14°01.3'	-51.2'	127.1°	13°25.0'	-51.6'	127.3°	12°48.6'	-52.1'	127.5°	12°12.0'	-52.5'	127.7°	11°35.2'	-52.9'	127.8°	10°58.4'	-53.3'	128.0°	11
12	13°46.7'	-50.8'	127.5°	13°10.1'	-51.3'	127.7°	12°33.4'	-51.7'	127.8°	11°56.5'	-52.1'	128.0°	11°19.5'	-52.5'	128.2°	10°42.3'	-52.9'	128.3°	10°05.1'	-53.3'	128.5°	12
13	12°55.9'	-50.9'	128.0°	12°18.9'	-51.3'	128.2°	11°41.7'	-51.8'	128.4°	11°04.4'	-52.2'	128.5°	10°27.0'	-52.6'	128.7°	9°49.4'	-53.0'	128.8°	9°11.7'	-53.4'	128.9°	13
14	12°05.0'	-51.0'	128.6°	11°27.5'	-51.4'	128.7°	10°49.9'	-51.8'	128.9°	10°12.2'	-52.2'	129.0°	9°34.4'	-52.6'	129.2°	8°56.4'	-53.0'	129.3°	8°18.4'	-53.4'	129.4°	14
15	11°14.0'	-51.0'	129.1°	10°36.1'	-51.4'	129.3°	9°58.1'	-51.9'	129.4°	9°20.0'	-52.3'	129.5°	8°41.7'	-52.7'	129.6°	8°03.4'	-53.0'	129.8°	7°25.0'	-53.4'	129.9°	15
16	10°23.0'	-51.1'	129.6°	9°44.7'	-51.5'	129.8°	9°06.2'	-51.9'	129.9°	8°27.7'	-52.3'	130.0°	7°49.1'	-52.7'	130.1°	7°10.4'	-53.1'	130.2°	6°31.6'	-53.4'	130.3°	16
17	9°31.9'	-51.1'	130.2°	8°53.2'	-51.5'	130.3°	8°14.3'	-51.9'	130.4°	7°35.4'	-52.3'	130.5°	6°56.4'	-52.7'	130.6°	6°17.3'	-53.1'	130.7°	5°38.1'	-53.5'	130.8°	17
18	8°40.8'	-51.2'	130.7°	8°01.7'	-51.6'	130.8°	7°22.4'	-52.0'	130.9°	6°43.1'	-52.4'	131.0°	6°03.7'	-52.7'	131.1°	5°24.2'	-53.1'	131.2°	4°44.7'	-53.5'	131.2°	18
19	7°49.7'	-51.2'	131.2°	7°10.1'	-51.6'	131.3°	6°30.4'	-52.0'	131.4°	5°50.7'	-52.4'	131.5°	5°10.9'	-52.8'	131.6°	4°31.1'	-53.1'	131.6°	3°51.2'	-53.5'	131.7°	19
20	6°58.5'	-51.2'	131.8°	6°18.5'	-51.6'	131.8°	5°38.4'	-52.0'	131.9°	4°58.3'	-52.4'	132.0°	4°18.1'	-52.8'	132.0°	3°37.9'	-53.2'	132.1°	2°57.7'	-53.5'	132.1°	20
21	6°07.2'	-51.3'	132.3°	5°26.8'	-51.7'	132.4°	4°46.4'	-52.1'	132.4°	4°05.9'	-52.4'	132.5°	3°25.4'	-52.8'	132.5°	2°44.8'	-53.2'	132.6°	2°04.2'	-53.5'	132.6°	21
22	5°16.0'	-51.3'	132.8°	4°35.2'	-51.7'	132.9°	3°54.3'	-52.1'	132.9°	3°13.5'	-52.4'	133.0°	2°32.6'	-52.8'	133.0°	1°51.6'	-53.2'	133.0°	1°10.7'	-53.5'	133.0°	22
23	4°24.7'	-51.3'	133.3°	3°43.5'	-51.7'	133.4°	3°02.3'	-52.1'	133.4°	2°21.0'	-52.5'	133.4°	1°39.7'	-52.8'	133.5°	0°58.4'	-53.2'	133.5°	0°17.1'	-53.5'	133.5°	23
Dec°	49			50			51			52			53			54			55			Dec°

128° 232° LHA

Latitude SAME as DECLINATION

128° 232° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

51° 309° LHA

Latitude CONTRARY to Declination

51° 309° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	24°23.1'	-49.8'	121.4°	23°51.7'	-50.3'	121.8°	23°19.9'	-50.8'	122.2°	22°47.7'	-51.3'	122.5°	22°15.3'	-51.8'	122.9°	21°42.6'	-52.3'	123.2°	21°09.6'	-52.7'	123.6°	0
1	23°33.3'	-49.9'	122.0°	23°01.3'	-50.5'	122.4°	22°29.0'	-51.0'	122.8°	21°56.4'	-51.5'	123.1°	21°23.5'	-51.9'	123.4°	20°50.3'	-52.4'	123.8°	20°16.8'	-52.8'	124.1°	1
2	22°43.3'	-50.1'	122.6°	22°10.9'	-50.6'	123.0°	21°38.1'	-51.1'	123.3°	21°04.9'	-51.6'	123.7°	20°31.6'	-52.0'	124.0°	19°57.9'	-52.5'	124.3°	19°24.0'	-52.9'	124.6°	2
3	21°53.3'	-50.2'	123.2°	21°20.3'	-50.7'	123.6°	20°47.0'	-51.2'	123.9°	20°13.4'	-51.7'	124.2°	19°39.5'	-52.1'	124.5°	19°05.4'	-52.6'	124.8°	18°31.1'	-53.0'	125.1°	3
4	21°03.1'	-50.3'	123.8°	20°29.6'	-50.8'	124.1°	19°55.8'	-51.3'	124.4°	19°21.7'	-51.8'	124.7°	18°47.4'	-52.2'	125.0°	18°12.9'	-52.6'	125.3°	17°38.1'	-53.1'	125.6°	4
5	20°12.8'	-50.4'	124.4°	19°38.8'	-50.9'	124.7°	19°04.5'	-51.4'	125.0°	18°30.0'	-51.8'	125.3°	17°55.2'	-52.3'	125.5°	17°20.2'	-52.7'	125.8°	16°45.0'	-53.1'	126.1°	5
6	19°22.4'	-50.5'	125.0°	18°47.9'	-51.0'	125.3°	18°13.1'	-51.5'	125.5°	17°38.1'	-51.9'	125.8°	17°02.9'	-52.4'	126.1°	16°27.5'	-52.8'	126.3°	15°51.9'	-53.2'	126.5°	6
7	18°31.9'	-50.6'	125.6°	17°56.9'	-51.1'	125.8°	17°21.6'	-51.6'	126.1°	16°46.2'	-52.0'	126.3°	16°10.5'	-52.4'	126.6°	15°34.7'	-52.9'	126.8°	14°58.7'	-53.3'	127.0°	7
8	17°41.2'	-50.7'	126.1°	17°05.7'	-51.2'	126.4°	16°30.1'	-51.6'	126.6°	15°54.2'	-52.1'	126.8°	15°18.1'	-52.5'	127.1°	14°41.8'	-52.9'	127.3°	14°05.4'	-53.3'	127.5°	8
9	16°50.5'	-50.8'	126.7°	16°14.5'	-51.3'	126.9°	15°38.4'	-51.7'	127.1°	15°02.1'	-52.2'	127.4°	14°25.6'	-52.6'	127.6°	13°48.9'	-53.0'	127.8°	13°12.1'	-53.4'	128.0°	9
10	15°59.7'	-50.9'	127.2°	15°23.3'	-51.4'	127.5°	14°46.7'	-51.8'	127.7°	14°09.9'	-52.2'	127.9°	13°33.0'	-52.6'	128.1°	12°55.9'	-53.0'	128.3°	12°18.7'	-53.4'	128.4°	10
11	15°08.8'	-51.0'	127.8°	14°31.9'	-51.4'	128.0°	13°54.9'	-51.9'	128.2°	13°17.7'	-52.3'	128.4°	12°40.4'	-52.7'	128.6°	12°02.9'	-53.1'	128.7°	11°25.3'	-53.5'	128.9°	11
12	14°17.8'	-51.1'	128.3°	13°40.5'	-51.5'	128.5°	13°03.0'	-51.9'	128.7°	12°25.4'	-52.3'	128.9°	11°47.7'	-52.7'	129.1°	11°09.8'	-53.1'	129.2°	10°31.8'	-53.5'	129.4°	12
13	13°26.7'	-51.1'	128.9°	12°49.0'	-51.6'	129.1°	12°11.1'	-52.0'	129.2°	11°33.1'	-52.4'	129.4°	10°55.0'	-52.8'	129.5°	10°16.7'	-53.2'	129.7°	9°38.4'	-53.5'	129.8°	13
14	12°35.6'	-51.2'	129.4°	11°57.4'	-51.6'	129.6°	11°19.1'	-52.0'	129.7°	10°40.7'	-52.4'	129.9°	10°02.2'	-52.8'	130.0°	9°23.6'	-53.2'	130.2°	8°44.8'	-53.6'	130.3°	14
15	11°44.4'	-51.3'	129.9°	11°05.8'	-51.7'	130.1°	10°27.1'	-52.1'	130.2°	9°48.3'	-52.5'	130.4°	9°09.4'	-52.9'	130.5°	8°30.4'	-53.2'	130.6°	7°51.2'	-53.6'	130.7°	15
16	10°53.1'	-51.3'	130.5°	10°14.1'	-51.7'	130.6°	9°35.0'	-52.1'	130.7°	8°55.8'	-52.5'	130.9°	8°16.5'	-52.9'	131.0°	7°37.1'	-53.3'	131.1°	6°57.7'	-53.6'	131.2°	16
17	10°01.8'	-51.4'	131.0°	9°22.4'	-51.8'	131.1°	8°42.9'	-52.2'	131.2°	8°03.3'	-52.5'	131.4°	7°23.6'	-52.9'	131.5°	6°43.9'	-53.3'	131.6°	6°04.0'	-53.6'	131.6°	17
18	9°10.5'	-51.4'	131.5°	8°30.7'	-51.8'	131.6°	7°50.8'	-52.2'	131.7°	7°10.8'	-52.6'	131.8°	6°30.7'	-52.9'	131.9°	5°50.6'	-53.3'	132.0°	5°10.4'	-53.7'	132.1°	18
19	8°19.1'	-51.4'	132.0°	7°38.9'	-51.8'	132.1°	6°58.6'	-52.2'	132.2°	6°18.2'	-52.6'	132.3°	5°37.8'	-53.0'	132.4°	4°57.3'	-53.3'	132.5°	4°16.7'	-53.7'	132.5°	19
20	7°27.6'	-51.5'	132.6°	6°47.0'	-51.9'	132.7°	6°06.3'	-52.3'	132.7°	5°25.6'	-52.6'	132.8°	4°44.8'	-53.0'	132.9°	4°03.9'	-53.3'	132.9°	3°23.0'	-53.7'	133.0°	20
21	6°36.2'	-51.5'	133.1°	5°55.2'	-51.9'	133.2°	5°14.1'	-52.3'	133.2°	4°33.0'	-52.6'	133.3°	3°51.8'	-53.0'	133.3°	3°10.6'	-53.4'	133.4°	2°29.3'	-53.7'		

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

50° 310° LHA			Latitude CONTRARY to Declination												50° 310° LHA							
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	24°56.5'	-50.0'	122.3°	24°24.3'	-50.5'	122.7°	23°51.7'	-51.0'	123.1°	23°18.7'	-51.5'	123.5°	22°45.5'	-52.0'	123.8°	22°11.9'	-52.5'	124.2°	21°38.1'	-52.9'	124.5°	0
1	24°06.5'	-50.2'	123.0°	23°33.7'	-50.7'	123.3°	23°00.6'	-51.2'	123.7°	22°27.2'	-51.7'	124.0°	21°53.5'	-52.1'	124.4°	21°19.5'	-52.6'	124.7°	20°45.2'	-53.0'	125.0°	1
2	23°16.3'	-50.3'	123.6°	22°43.1'	-50.8'	123.9°	22°09.4'	-51.3'	124.2°	21°35.5'	-51.8'	124.6°	21°01.3'	-52.2'	124.9°	20°26.9'	-52.7'	125.2°	19°52.2'	-53.1'	125.5°	2
3	22°26.1'	-50.4'	124.1°	21°52.3'	-50.9'	124.5°	21°18.2'	-51.4'	124.8°	20°43.8'	-51.9'	125.1°	20°09.1'	-52.3'	125.4°	19°34.2'	-52.7'	125.7°	18°59.1'	-53.2'	126.0°	3
4	21°35.7'	-50.5'	124.7°	21°01.3'	-51.0'	125.0°	20°26.8'	-51.5'	125.4°	19°51.9'	-52.0'	125.7°	19°16.8'	-52.4'	125.9°	18°41.5'	-52.8'	126.2°	18°05.9'	-53.2'	126.5°	4
5	20°45.1'	-50.7'	125.3°	20°10.3'	-51.1'	125.6°	19°35.3'	-51.6'	125.9°	18°59.9'	-52.0'	126.2°	18°24.4'	-52.5'	126.5°	17°48.6'	-52.9'	126.7°	17°12.7'	-53.3'	127.0°	5
6	19°54.5'	-50.8'	125.9°	19°19.2'	-51.2'	126.2°	18°43.7'	-51.7'	126.4°	18°07.9'	-52.1'	126.7°	17°31.9'	-52.6'	127.0°	16°55.7'	-53.0'	127.2°	16°19.3'	-53.4'	127.5°	6
7	19°03.7'	-50.9'	126.4°	18°27.9'	-51.3'	126.7°	17°52.0'	-51.8'	127.0°	17°15.8'	-52.2'	127.2°	16°39.4'	-52.6'	127.5°	16°02.8'	-53.0'	127.7°	15°26.0'	-53.4'	127.9°	7
8	18°12.8'	-51.0'	127.0°	17°36.6'	-51.4'	127.3°	17°00.2'	-51.9'	127.5°	16°23.6'	-52.3'	127.7°	15°46.7'	-52.7'	128.0°	15°09.7'	-53.1'	128.2°	14°32.5'	-53.5'	128.4°	8
9	17°21.9'	-51.1'	127.6°	16°45.2'	-51.5'	127.8°	16°08.3'	-51.9'	128.0°	15°31.3'	-52.4'	128.3°	14°54.0'	-52.8'	128.5°	14°16.6'	-53.2'	128.7°	13°39.1'	-53.5'	128.9°	9
10	16°30.8'	-51.1'	128.1°	15°53.7'	-51.6'	128.3°	15°16.4'	-52.0'	128.6°	14°38.9'	-52.4'	128.8°	14°01.3'	-52.8'	129.0°	13°23.5'	-53.2'	129.2°	12°45.5'	-53.6'	129.3°	10
11	15°39.7'	-51.2'	128.7°	15°02.1'	-51.7'	128.9°	14°24.4'	-52.1'	129.1°	13°46.5'	-52.5'	129.3°	13°08.4'	-52.9'	129.4°	12°30.3'	-53.3'	129.6°	11°51.9'	-53.6'	129.8°	11
12	14°48.5'	-51.3'	129.2°	14°10.5'	-51.7'	129.4°	13°32.3'	-52.1'	129.6°	12°54.0'	-52.5'	129.8°	12°15.6'	-52.9'	129.9°	11°37.0'	-53.3'	130.1°	10°58.3'	-53.7'	130.2°	12
13	13°57.2'	-51.4'	129.7°	13°18.8'	-51.8'	129.9°	12°40.2'	-52.2'	130.1°	12°01.5'	-52.6'	130.3°	11°22.6'	-53.0'	130.4°	10°43.7'	-53.3'	130.6°	10°04.6'	-53.7'	130.7°	13
14	13°05.8'	-51.4'	130.3°	12°27.0'	-51.8'	130.4°	11°48.0'	-52.2'	130.6°	11°08.9'	-52.6'	130.7°	10°29.7'	-53.0'	130.9°	9°50.3'	-53.4'	131.0°	9°10.9'	-53.7'	131.2°	14
15	12°14.4'	-51.5'	130.8°	11°35.1'	-51.9'	130.9°	10°55.8'	-52.3'	131.1°	10°16.3'	-52.7'	131.2°	9°36.7'	-53.1'	131.4°	8°57.0'	-53.4'	131.5°	8°17.2'	-53.8'	131.6°	15
16	11°22.9'	-51.5'	131.3°	10°43.2'	-51.9'	131.5°	10°03.5'	-52.3'	131.6°	9°23.6'	-52.7'	131.7°	8°43.6'	-53.1'	131.8°	8°03.5'	-53.5'	132.0°	7°23.4'	-53.8'	132.1°	16
17	10°31.4'	-51.6'	131.8°	9°51.3'	-52.0'	132.0°	9°11.1'	-52.4'	132.1°	8°30.9'	-52.8'	132.2°	7°50.5'	-53.1'	132.3°	7°10.1'	-53.5'	132.4°	6°29.6'	-53.8'	132.5°	17
18	9°39.8'	-51.6'	132.4°	8°59.3'	-52.0'	132.5°	8°18.7'	-52.4'	132.6°	7°38.1'	-52.8'	132.7°	6°57.4'	-53.1'	132.8°	6°16.6'	-53.5'	132.9°	5°35.8'	-53.8'	132.9°	18
19	8°48.1'	-51.7'	132.9°	8°07.3'	-52.1'	133.0°	7°26.3'	-52.4'	133.1°	6°45.3'	-52.8'	133.2°	6°04.2'	-53.2'	133.2°	5°23.1'	-53.5'	133.3°	4°41.9'	-53.9'	133.4°	19
20	7°56.4'	-51.7'	133.4°	7°15.2'	-52.1'	133.5°	6°33.9'	-52.5'	133.6°	5°52.5'	-52.8'	133.6°	5°11.1'	-53.2'	133.7°	4°29.6'	-53.5'	133.8°	3°48.0'	-53.9'	133.8°	20
21	7°04.7'	-51.8'	133.9°	6°23.1'	-52.1'	134.0°	5°41.4'	-52.5'	134.1°	4°59.7'	-52.9'	134.1°	4°17.9'	-53.2'	134.2°	3°36.0'	-53.6'	134.2°	2°54.2'	-53.9'	134.3°	21
22	6°13.0'	-51.8'	134.4°	5°31.0'	-52.2'	134.5°	4°48.9'	-52.5'	134.5°	4°06.8'	-52.9'	134.6°	3°24.7'	-53.2'	134.6°	2°42.5'	-53.6'	134.7°	2°00.3'	-53.9'	134.7°	22
23	5°21.2'	-51.8'	134.9°	4°38.8'	-52.2'	135.0°	3°56.4'	-52.5'	135.0°	3°13.9'	-52.9'	135.1°	2°31.4'	-53.2'	135.1°	1°48.9'	-53.6'	135.1°	1°06.4'	-53.9'	135.1°	23
Dec°	49			50			51			52			53			54			55			Dec°

50° 310° LHA Latitude CONTRARY to DECLINATION 50° 310° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

49° 311° LHA			Latitude CONTRARY to Declination												49° 311° LHA							
Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	25°29.6'	-50.2'	123.3°	24°56.5'	-50.8'	123.7°	24°23.1'	-51.3'	124.0°	23°49.4'	-51.7'	124.4°	23°15.3'	-52.2'	124.8°	22°40.9'	-52.7'	125.1°	22°06.3'	-53.1'	125.5°	0
1	24°39.3'	-50.4'	123.9°	24°05.8'	-50.9'	124.2°	23°31.9'	-51.4'	124.6°	22°57.6'	-51.9'	125.0°	22°23.1'	-52.3'	125.3°	21°48.3'	-52.8'	125.6°	21°13.2'	-53.2'	126.0°	1
2	23°49.0'	-50.5'	124.5°	23°14.9'	-51.0'	124.8°	22°40.5'	-51.5'	125.2°	22°05.8'	-52.0'	125.5°	21°30.8'	-52.4'	125.8°	20°55.5'	-52.8'	126.1°	20°20.0'	-53.3'	126.5°	2
3	22°58.5'	-50.6'	125.1°	22°23.9'	-51.1'	125.4°	21°49.0'	-51.6'	125.7°	21°13.8'	-52.1'	126.0°	20°38.4'	-52.5'	126.4°	20°02.7'	-52.9'	126.7°	19°26.7'	-53.3'	126.9°	3
4	22°07.8'	-50.8'	125.6°	21°32.7'	-51.2'	126.0°	20°57.4'	-51.7'	126.3°	20°21.7'	-52.2'	126.6°	19°45.9'	-52.6'	126.9°	19°09.7'	-53.0'	127.2°	18°33.4'	-53.4'	127.4°	4
5	21°17.1'	-50.9'	126.2°	20°41.5'	-51.4'	126.5°	20°05.7'	-51.8'	126.8°	19°29.6'	-52.2'	127.1°	18°53.3'	-52.7'	127.4°	18°16.7'	-53.1'	127.6°	17°40.5'	-53.5'	127.9°	5
6	20°26.2'	-51.0'	126.8°	19°50.1'	-51.5'	127.1°	19°13.9'	-51.9'	127.4°	18°37.3'	-52.3'	127.6°	18°00.6'	-52.8'	127.9°	17°23.7'	-53.2'	128.1°	16°46.5'	-53.5'	128.4°	6
7	19°35.2'	-51.1'	127.3°	18°58.7'	-51.5'	127.6°	18°22.0'	-52.0'	127.9°	17°45.0'	-52.4'	128.1°	17°07.8'	-52.8'	128.4°	16°30.5'	-53.2'	128.6°	15°53.0'	-53.6'	128.8°	7
8	18°44.1'	-51.2'	127.9°	18°07.1'	-51.6'	128.2°	17°30.0'	-52.1'	128.4°	16°52.6'	-52.5'	128.6°	16°15.0'	-52.9'	128.9°	15°37.3'	-53.3'	129.1°	14°59.3'	-53.7'	129.3°	8
9	17°52.9'	-51.3'	128.4°	17°15.5'	-51.7'	128.7°	16°37.9'	-52.1'	128.9°	16°00.1'	-52.6'	129.2°	15°22.1'	-53.0'	129.4°	14°44.0'	-53.3'	129.6°	14°05.7'	-53.7'	129.8°	9
10	17°01.6'	-51.4'	129.0°	16°23.8'	-51.8'	129.2°	15°45.7'	-52.2'	129.4°	15°07.5'	-52.6'	129.7°	14°29.2'	-53.0'	129.9°	13°50.6'	-53.4'	130.1°	13°12.0'	-53.8'	130.2°	10
11	16°10.2'	-51.5'	129.5°	15°32.0'	-51.9'	129.7°	14°53.5'	-52.3'	130.0°	14°14.9'	-52.7'	130.2°	13°36.2'	-53.1'	130.3°	12°57.2'	-53.4'	130.5°	12°18.2'	-53.8'	130.7°	11
12	15°18.8'	-51.5'	130.1°	14°40.1'	-51.9'	130.3°	14°01.2'	-52.3'	130.5°	13°22.2'	-52.7'	130.6°	12°43.1'	-53.1'	130.8°	12°03.8'	-53.5'	131.0°	11°24.4'	-53.9'	131.1°	12
13	14°27.3'	-51.6'	130.6°	13°48.1'	-52.0'	130.8°	13°08.9'	-52.4'	131.0°	12°29.5'	-52.8'	131.1°	11°50.0'	-53.2'	131.3°	11°10.3'	-53.5'	131.4°	10°30.5'	-53.9'	131.6°	13
14	13°35.7'	-51.7'	131.1°	12°56.1'	-52.1'	131.3°	12°16.5'	-52.5'	131.5°	11°36.7'	-52.8'	131.6°	10°56.8'	-53.2'	131.8°	10°16.8'	-53.6'	131.9°	9°36.6'	-53.9'	132.0°	14
15	12°44.0'	-51.7'	131.6°	12°04.1'	-52.1'	131.8°	11°24.0'	-52.5'	132.0°	10°43.8'	-52.9'	132.1°	10°03.6'	-53.3'	132.2°	9°23.2'	-53.6'	132.4°	8°42.7'	-54.0'	132.5°	15
16	11°52.3'	-51.8'	132.2°	11°11.9'	-52.2'	132.3°	10°31.5'	-52.6'	132.4°	9°51.0'	-52.9'	132.6°	9°10.3'	-53.3'	132.7°	8°29.6'	-53.6'	132.8°	7°48.8'	-54.0'	132.9°	16
17	11°00.5'	-51.8'	132.7°	10°19.8'	-52.2'	132.8°	9°39.0'	-52.6'	132.9°	8°58.0'	-53.0'	133.1°	8°17.0'	-53.3'	133.2°	7°35.9'	-53.7'	133.3°	6°54.8'	-54.0'	133.4°	17
18	10°08.7'	-51.9'	133.2°	9°27.6'	-52.3'	133.3°	8°46.4'	-52.6'	133.4°	8°05.1'	-53.0'	133.5°	7°23.7'	-53.4'	133.6°	6°42.3'	-53.7'	133.7°	6°00.8'	-54.0'	133.8°	18
19	9°16.8'	-51.9'	133.7°	8°35.3'	-52.3'	133.8°	7°53.7'	-52.7'	133.9°	7°12.1'	-53.0'	134.0°	6°30.4'	-53.4'	134.1°	5°48.6'	-53.7'	134.2°	5°06.7'	-54.0'	134.2°	19
20	8°24.9'	-52.0'	134.2°	7°43.0'	-52.3'	134.3°	7°01.1'	-52.7'	134.4°	6°19.0'	-53.1'	134.5°	5°37.0'	-53.4'	134.6°	4°54.9'	-53.7'	134.6°	4°12.7'	-54.1'	134.7°	20
21	7°32.9'	-52.0'	134.7°	6°50.7'	-52.4'	134.8°	6°08.4'	-52.7'	134.9°	5°26.0'	-53.1'	134.9°	4°43.6'	-53.4'	135.0°	4°01.1'	-53.7'	135.1°	3°18.6'	-54.1'	135.1°	21
22	6°40.9'	-52.0'	135.2°	5°58.3'	-52.4'	135.3°	5°15.6'	-52.7'	135.4°	4°32.9'	-53.1'	135.4°	3°50.2'	-53.4'	135.5°	3°07.4'	-53.8'	135.5°	2°24.6'	-54.1'	135.5°	

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

48° 312° LHA

Latitude CONTRARY to Declination

48° 312° LHA

Table with columns Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each column contains three sub-columns: Hc°, d', Z°. Rows 0-23 show declination values. Bottom row shows column headers 49-55.

48° 312° LHA

Latitude CONTRARY to DECLINATION

48° 312° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

47° 313° LHA

Latitude CONTRARY to Declination

47° 313° LHA

Table with columns Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each column contains three sub-columns: Hc°, d', Z°. Rows 0-23 show declination values. Bottom row shows column headers 49-55.

47° 313° LHA

Latitude CONTRARY to DECLINATION

47° 313° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

46° 314° LHA

Latitude CONTRARY to Declination

46° 314° LHA

Table with 24 rows and 12 columns (Dec, Hc, d, Z for LHA 49-55). Rows show Hc, d, Z values for each degree of declination from 0 to 23. Includes a bottom summary row for LHA values.

134° 226° LHA

Latitude SAME as DECLINATION

134° 226° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

45° 315° LHA

Latitude CONTRARY to Declination

45° 315° LHA

Table with 24 rows and 12 columns (Dec, Hc, d, Z for LHA 49-55). Rows show Hc, d, Z values for each degree of declination from 0 to 23. Includes a bottom summary row for LHA values.

45° 315° LHA

Latitude CONTRARY to DECLINATION

45° 315° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

44° 316° LHA

Latitude CONTRARY to Declination

44° 316° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	28°09.5'	-51.4'	128.0°	27°32.5'	-51.9'	128.4°	26°55.0'	-52.4'	128.8°	26°17.2'	-52.8'	129.2°	25°39.1'	-53.2'	129.6°	25°00.8'	-53.6'	130.0°	24°22.1'	-54.0'	130.3°	0
1	27°18.1'	-51.6'	128.6°	26°40.6'	-52.0'	129.0°	26°02.6'	-52.5'	129.4°	25°24.4'	-52.9'	129.7°	24°45.9'	-53.3'	130.1°	24°07.1'	-53.7'	130.4°	23°28.1'	-54.1'	130.8°	1
2	26°26.5'	-51.7'	129.2°	25°48.5'	-52.2'	129.5°	25°10.2'	-52.6'	129.9°	24°31.5'	-53.0'	130.3°	23°52.6'	-53.4'	130.6°	23°13.4'	-53.8'	130.9°	22°34.0'	-54.2'	131.3°	2
3	25°34.9'	-51.8'	129.7°	24°56.4'	-52.3'	130.1°	24°17.6'	-52.7'	130.4°	23°38.5'	-53.1'	130.8°	22°59.2'	-53.5'	131.1°	22°19.6'	-53.9'	131.4°	21°39.8'	-54.2'	131.7°	3
4	24°43.0'	-52.0'	130.3°	24°04.1'	-52.4'	130.6°	23°24.9'	-52.8'	131.0°	22°45.4'	-53.2'	131.3°	22°05.7'	-53.6'	131.6°	21°25.8'	-54.0'	131.9°	20°45.6'	-54.3'	132.2°	4
5	23°51.0'	-52.1'	130.8°	23°11.7'	-52.5'	131.2°	22°32.1'	-52.9'	131.5°	21°52.2'	-53.3'	131.8°	21°12.1'	-53.7'	132.1°	20°31.8'	-54.0'	132.4°	19°51.3'	-54.4'	132.6°	5
6	22°59.0'	-52.2'	131.4°	22°19.2'	-52.6'	131.7°	21°39.2'	-53.0'	132.0°	20°58.9'	-53.4'	132.3°	20°18.4'	-53.7'	132.6°	19°37.8'	-54.1'	132.8°	18°56.9'	-54.4'	133.1°	6
7	22°06.8'	-52.3'	131.9°	21°26.6'	-52.7'	132.2°	20°46.2'	-53.1'	132.5°	20°05.5'	-53.5'	132.8°	19°24.7'	-53.8'	133.0°	18°43.7'	-54.2'	133.3°	18°02.4'	-54.5'	133.5°	7
8	21°14.5'	-52.4'	132.4°	20°33.9'	-52.8'	132.7°	19°53.1'	-53.2'	133.0°	19°12.1'	-53.5'	133.2°	18°30.9'	-53.9'	133.5°	17°49.5'	-54.2'	133.7°	17°07.9'	-54.6'	134.0°	8
9	20°22.1'	-52.5'	133.0°	19°41.1'	-52.9'	133.2°	18°59.9'	-53.2'	133.5°	18°18.6'	-53.6'	133.7°	17°37.0'	-54.0'	134.0°	16°55.3'	-54.3'	134.2°	16°13.4'	-54.6'	134.4°	9
10	19°29.6'	-52.6'	133.5°	18°48.3'	-52.9'	133.7°	18°06.7'	-53.3'	134.0°	17°25.0'	-53.7'	134.2°	16°43.0'	-54.0'	134.4°	16°01.0'	-54.3'	134.6°	15°18.8'	-54.7'	134.8°	10
11	18°37.1'	-52.6'	134.0°	17°55.3'	-53.0'	134.2°	17°13.4'	-53.4'	134.4°	16°31.3'	-53.7'	134.7°	15°49.0'	-54.1'	134.9°	15°06.6'	-54.4'	135.1°	14°24.1'	-54.7'	135.2°	11
12	17°44.4'	-52.7'	134.5°	17°02.3'	-53.1'	134.7°	16°20.0'	-53.4'	134.9°	15°37.6'	-53.8'	135.1°	14°55.0'	-54.1'	135.3°	14°12.2'	-54.4'	135.5°	13°29.4'	-54.8'	135.7°	12
13	16°51.7'	-52.8'	135.0°	16°09.2'	-53.2'	135.2°	15°26.6'	-53.5'	135.4°	14°43.8'	-53.8'	135.6°	14°00.8'	-54.2'	135.8°	13°17.8'	-54.5'	135.9°	12°34.6'	-54.8'	136.1°	13
14	15°58.9'	-52.9'	135.5°	15°16.0'	-53.2'	135.7°	14°33.1'	-53.6'	135.9°	13°49.9'	-53.9'	136.0°	13°06.7'	-54.2'	136.2°	12°23.3'	-54.5'	136.4°	11°39.8'	-54.8'	136.5°	14
15	15°06.0'	-52.9'	136.0°	14°22.8'	-53.3'	136.2°	13°39.5'	-53.6'	136.3°	12°56.0'	-53.9'	136.5°	12°12.5'	-54.3'	136.6°	11°28.8'	-54.6'	136.8°	10°45.0'	-54.9'	136.9°	15
16	14°13.1'	-53.0'	136.5°	13°29.6'	-53.3'	136.6°	12°45.9'	-53.7'	136.8°	12°02.1'	-54.0'	136.9°	11°18.2'	-54.3'	137.1°	10°34.2'	-54.6'	137.2°	9°50.1'	-54.9'	137.3°	16
17	13°20.1'	-53.0'	136.9°	12°36.2'	-53.4'	137.1°	11°52.2'	-53.7'	137.2°	11°08.1'	-54.0'	137.4°	10°23.9'	-54.3'	137.5°	9°39.6'	-54.6'	137.6°	8°55.3'	-54.9'	137.7°	17
18	12°27.1'	-53.1'	137.4°	11°42.9'	-53.4'	137.6°	10°58.5'	-53.7'	137.7°	10°14.1'	-54.1'	137.8°	9°29.6'	-54.4'	137.9°	8°45.0'	-54.7'	138.1°	8°00.3'	-54.9'	138.2°	18
19	11°34.0'	-53.1'	137.9°	10°49.4'	-53.5'	138.0°	10°04.8'	-53.8'	138.2°	9°20.0'	-54.1'	138.3°	8°35.2'	-54.4'	138.4°	7°50.3'	-54.7'	138.5°	7°05.4'	-55.0'	138.6°	19
20	10°40.9'	-53.2'	138.4°	9°56.0'	-53.5'	138.5°	9°11.0'	-53.8'	138.6°	8°26.0'	-54.1'	138.7°	7°40.8'	-54.4'	138.8°	6°55.7'	-54.7'	138.9°	6°10.4'	-55.0'	139.0°	20
21	9°47.7'	-53.2'	138.8°	9°02.5'	-53.5'	139.0°	8°17.2'	-53.8'	139.1°	7°31.8'	-54.1'	139.1°	6°46.4'	-54.4'	139.2°	6°01.0'	-54.7'	139.3°	5°15.5'	-55.0'	139.4°	21
22	8°54.5'	-53.3'	139.3°	8°08.9'	-53.6'	139.4°	7°23.3'	-53.9'	139.5°	6°37.7'	-54.2'	139.6°	5°52.0'	-54.5'	139.6°	5°06.2'	-54.7'	139.7°	4°20.5'	-55.0'	139.8°	22
23	8°01.2'	-53.3'	139.8°	7°15.4'	-53.6'	139.9°	6°29.5'	-53.9'	139.9°	5°43.5'	-54.2'	140.0°	4°57.5'	-54.5'	140.1°	4°11.5'	-54.7'	140.1°	3°25.5'	-55.0'	140.2°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55			

44° 316° LHA

Latitude CONTRARY to DECLINATION

44° 316° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

43° 317° LHA

Latitude CONTRARY to Declination

43° 317° LHA

Dec°	49			50			51			52			53			54			55			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	28°40.3'	-51.7'	129.0°	28°02.5'	-52.1'	129.4°	27°24.2'	-52.6'	129.8°	26°45.6'	-53.0'	130.2°	26°06.8'	-53.4'	130.6°	25°27.6'	-53.8'	130.9°	24°48.1'	-54.2'	131.3°	0
1	27°48.6'	-51.8'	129.6°	27°10.3'	-52.3'	130.0°	26°31.6'	-52.7'	130.3°	25°52.6'	-53.1'	130.7°	25°13.3'	-53.5'	131.1°	24°33.8'	-53.9'	131.4°	23°53.9'	-54.3'	131.8°	1
2	26°56.8'	-52.0'	130.1°	26°18.0'	-52.4'	130.5°	25°38.9'	-52.8'	130.9°	24°59.5'	-53.2'	131.2°	24°19.8'	-53.6'	131.6°	23°39.9'	-54.0'	131.9°	22°59.7'	-54.4'	132.2°	2
3	26°04.9'	-52.1'	130.7°	25°25.7'	-52.5'	131.1°	24°46.1'	-52.9'	131.4°	24°06.3'	-53.3'	131.7°	23°26.2'	-53.7'	132.1°	22°45.9'	-54.1'	132.4°	22°05.3'	-54.4'	132.7°	3
4	25°12.8'	-52.2'	131.2°	24°33.1'	-52.6'	131.6°	23°53.2'	-53.0'	131.9°	23°13.0'	-53.4'	132.2°	22°32.5'	-53.8'	132.6°	21°51.8'	-54.2'	132.9°	21°10.9'	-54.5'	133.1°	4
5	24°20.6'	-52.3'	131.8°	23°40.5'	-52.7'	132.1°	22°00.2'	-53.1'	132.4°	22°19.9'	-53.5'	132.7°	21°38.7'	-53.9'	133.0°	20°57.7'	-54.2'	133.3°	20°16.4'	-54.6'	133.6°	5
6	23°28.3'	-52.4'	132.3°	22°47.8'	-52.8'	132.6°	22°07.0'	-53.2'	132.9°	21°26.0'	-53.6'	133.2°	20°44.8'	-53.9'	133.5°	20°03.4'	-54.3'	133.8°	19°21.8'	-54.6'	134.0°	6
7	22°35.9'	-52.5'	132.8°	21°54.9'	-52.9'	133.1°	21°13.8'	-53.3'	133.4°	20°32.5'	-53.7'	133.7°	19°50.9'	-54.0'	134.0°	19°09.1'	-54.4'	134.2°	18°27.2'	-54.7'	134.5°	7
8	21°43.3'	-52.6'	133.4°	21°02.0'	-53.0'	133.6°	20°20.5'	-53.4'	133.9°	19°38.8'	-53.7'	134.2°	18°56.9'	-54.1'	134.4°	18°14.8'	-54.4'	134.7°	17°32.5'	-54.7'	134.9°	8
9	20°50.7'	-52.7'	133.9°	20°09.0'	-53.1'	134.1°	19°27.1'	-53.5'	134.4°	18°45.0'	-53.8'	134.7°	18°02.8'	-54.2'	134.9°	17°20.4'	-54.5'	135.1°	16°37.8'	-54.8'	135.3°	9
10	19°58.0'	-52.8'	134.4°	19°15.9'	-53.2'	134.6°	18°33.7'	-53.5'	134.9°	17°51.2'	-53.9'	135.1°	17°08.6'	-54.2'	135.3°	16°25.9'	-54.5'	135.6°	15°43.0'	-54.8'	135.8°	10
11	19°05.2'	-52.9'	134.9°	18°22.7'	-53.3'	135.1°	17°40.1'	-53.6'	135.4°	16°57.3'	-53.9'	135.6°	16°14.4'	-54.3'	135.8°	15°31.3'	-54.6'	136.0°	14°48.1'	-54.9'	136.2°	11
12	18°12.3'	-53.0'	135.4°	17°29.5'	-53.3'	135.6°	16°46.5'	-53.7'	135.8°	16°03.4'	-54.0'	136.0°	15°20.1'	-54.3'	136.2°	14°36.8'	-54.6'	136.4°	13°53.2'	-54.9'	136.6°	12
13	17°19.3'	-53.0'	135.9°	16°36.2'	-53.4'	136.1°	15°52.9'	-53.7'	136.3°	15°09.4'	-54.1'	136.5°	14°25.8'	-54.4'	136.7°	13°42.1'	-54.7'	136.8°	12°58.3'	-55.0'	137.0°	13
14	16°26.3'	-53.1'	136.4°	15°42.8'	-53.4'	136.6°	14°59.1'	-53.8'	136.8°	14°15.4'	-54.1'	136.9°	13°31.5'	-54.4'	137.1°	12°47.4'	-54.7'	137.3°	12°03.3'	-55.0'	137.4°	14
15	15°33.2'	-53.2'	136.9°	14°49.3'	-53.5'	137.0°	14°05.4'	-53.8'	137.2°	13°21.3'	-54.1'	137.4°	12°37.0'	-54.5'	137.5°	11°52.7'	-54.8'	137.7°	11°08.3'	-55.0'	137.8°	15
16	14°40.0'	-53.2'	137.3°	13°55.8'	-53.6'	137.5°	13°11.5'	-53.9'	137.7°	12°27.1'	-54.2'	137.8°	11°42.6'	-54.5'	138.0°	10°58.0'	-54.8'	138.1°	10°13.3'	-55.1'	138.2°	16
17	13°46.8'	-53.3'	137.8°	13°02.3'	-53.6'	138.0°	12°17.6'	-53.9'	138.1°	11°32.9'	-54.2'	138.3°	10°48.1'	-54.5'	138.4°	10°03.2'	-54.8'	138.5°	9°18.2'	-55.1'	138.6°	17
18	12°53.5'	-53.3'	138.3°	12°08.7'	-53.7'	138.4°	11°23.7'	-54.0'	138.6°	10°38.7'	-54.3'	138.7°	9°53.6'	-54.6'	138.8°	9°08.4'	-54.8'	138.9°	8°23.1'	-55.1'	139.0°	18
19	12°00.2'	-53.4'	138.8°	11°15.0'	-53.7'	138.9°	10°29.8'	-54.0'	139.0°	9°44.4'	-54.3'	139.1°	8°59.0'	-54.6'	139.2°	8°13.5'	-54.9'	139.3°	7°28.0'	-55.1'	139.4°	19
20	11°06.8'	-53.4'	139.2°	10°21.3'	-53.7'	139.3°	9°35.8'	-54.0'	139.5°	8°50.1'	-54.3'	139.6°	8°04.4'	-54.6'	139.7°	7°18.7'	-54.9'	139.8°	6°32.8'	-55.2'	139.8°	20
21	10°13.4'	-53.5'	139.7°	9°27.6'	-53.8'	139.8°	8°41.7'	-54.1'	139.9°	7°55.8'	-54.4'	140.0°	7°09.8'	-54.6'	140.1°	6°23.8'	-54.9'	140.2°	5°37.7'	-55.2'	140	

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

42° 318° LHA			Latitude CONTRARY to Declination								42° 318° LHA														
Dec°	49			50			51			52			53			54			55			Dec°			
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°		Hc°	d'	Z°
0	29°10.7'	-51.9'	130.0°	28°32.1'	-52.4'	130.4°	27°53.0'	-52.8'	130.8°	27°13.7'	-53.2'	131.2°	26°34.0'	-53.6'	131.6°	25°54.0'	-54.0'	131.9°	25°13.8'	-54.4'	132.3°	0			
1	28°18.8'	-52.1'	130.5°	27°39.7'	-52.5'	130.9°	27°00.2'	-52.9'	131.3°	26°20.4'	-53.3'	131.7°	25°40.4'	-53.7'	132.1°	25°00.0'	-54.1'	132.4°	24°19.4'	-54.5'	132.8°	1			
2	27°26.7'	-52.2'	131.1°	26°47.2'	-52.6'	131.5°	26°07.3'	-53.0'	131.9°	25°27.1'	-53.4'	132.2°	24°46.6'	-53.8'	132.6°	24°05.9'	-54.2'	132.9°	23°25.0'	-54.5'	133.2°	2			
3	26°34.5'	-52.3'	131.7°	25°54.5'	-52.8'	132.0°	25°14.2'	-53.2'	132.4°	24°33.6'	-53.5'	132.7°	23°52.8'	-53.9'	133.0°	23°11.7'	-54.3'	133.4°	22°30.4'	-54.6'	133.7°	3			
4	25°42.2'	-52.5'	132.2°	25°01.8'	-52.9'	132.6°	24°21.1'	-53.3'	132.9°	23°40.1'	-53.6'	133.2°	22°58.9'	-54.0'	133.5°	22°17.5'	-54.3'	133.8°	21°35.8'	-54.7'	134.1°	4			
5	24°49.8'	-52.6'	132.7°	24°08.9'	-53.0'	133.1°	23°27.8'	-53.4'	133.4°	22°46.5'	-53.7'	133.7°	22°04.9'	-54.1'	134.0°	21°23.1'	-54.4'	134.3°	20°41.1'	-54.8'	134.6°	5			
6	23°57.2'	-52.7'	133.3°	23°15.9'	-53.1'	133.6°	22°34.5'	-53.4'	133.9°	21°52.7'	-53.8'	134.2°	21°10.8'	-54.2'	134.5°	20°28.7'	-54.5'	134.7°	19°46.4'	-54.8'	135.0°	6			
7	23°04.5'	-52.8'	133.8°	22°22.9'	-53.2'	134.1°	21°41.0'	-53.5'	134.4°	20°58.9'	-53.9'	134.7°	20°16.7'	-54.2'	134.9°	19°34.2'	-54.6'	135.2°	18°51.6'	-54.9'	135.4°	7			
8	22°11.7'	-52.9'	134.3°	21°29.7'	-53.2'	134.6°	20°47.5'	-53.6'	134.9°	20°05.1'	-54.0'	135.1°	19°22.4'	-54.3'	135.4°	18°39.6'	-54.6'	135.6°	17°56.7'	-54.9'	135.9°	8			
9	21°18.9'	-53.0'	134.8°	20°36.5'	-53.3'	135.1°	19°53.9'	-53.7'	135.3°	19°11.1'	-54.0'	135.6°	18°28.2'	-54.4'	135.8°	17°45.0'	-54.7'	136.1°	17°01.8'	-55.0'	136.3°	9			
10	20°25.9'	-53.1'	135.3°	19°43.1'	-53.4'	135.6°	19°00.2'	-53.8'	135.8°	18°17.1'	-54.1'	136.1°	17°33.8'	-54.4'	136.3°	16°50.4'	-54.7'	136.5°	16°06.8'	-55.0'	136.7°	10			
11	19°32.8'	-53.1'	135.8°	18°49.7'	-53.5'	136.1°	18°06.4'	-53.8'	136.3°	17°23.0'	-54.2'	136.5°	16°39.4'	-54.5'	136.7°	15°55.6'	-54.8'	136.9°	15°11.7'	-55.1'	137.1°	11			
12	18°39.7'	-53.2'	136.3°	17°56.2'	-53.6'	136.5°	17°12.6'	-53.9'	136.7°	16°28.8'	-54.2'	137.0°	15°44.9'	-54.5'	137.2°	15°00.9'	-54.8'	137.3°	14°16.7'	-55.1'	137.5°	12			
13	17°46.5'	-53.3'	136.8°	17°02.7'	-53.6'	137.0°	16°18.7'	-53.9'	137.2°	15°34.6'	-54.3'	137.4°	14°50.4'	-54.6'	137.6°	14°06.0'	-54.9'	137.8°	13°21.6'	-55.2'	137.9°	13			
14	16°53.2'	-53.3'	137.3°	16°09.1'	-53.7'	137.5°	15°24.8'	-54.0'	137.7°	14°40.4'	-54.3'	137.8°	13°55.8'	-54.6'	138.0°	13°11.2'	-54.9'	138.2°	12°26.4'	-55.2'	138.3°	14			
15	15°59.9'	-53.4'	137.7°	15°15.4'	-53.7'	137.9°	14°30.8'	-54.1'	138.1°	13°46.1'	-54.4'	138.3°	13°01.2'	-54.7'	138.4°	12°16.3'	-54.9'	138.6°	11°31.2'	-55.2'	138.7°	15			
16	15°06.5'	-53.5'	138.2°	14°21.7'	-53.8'	138.4°	13°36.7'	-54.1'	138.6°	12°51.7'	-54.4'	138.7°	12°06.6'	-54.7'	138.9°	11°21.3'	-55.0'	139.0°	10°36.0'	-55.3'	139.1°	16			
17	14°13.0'	-53.5'	138.7°	13°27.9'	-53.8'	138.9°	12°42.6'	-54.1'	139.0°	11°57.3'	-54.4'	139.2°	11°11.9'	-54.7'	139.3°	10°26.3'	-55.0'	139.4°	9°40.7'	-55.3'	139.5°	17			
18	13°19.5'	-53.6'	139.2°	12°34.0'	-53.9'	139.3°	11°48.5'	-54.2'	139.4°	11°02.9'	-54.5'	139.6°	10°17.1'	-54.8'	139.7°	9°31.3'	-55.0'	139.8°	8°45.5'	-55.3'	139.9°	18			
19	12°25.9'	-53.6'	139.6°	11°40.1'	-53.9'	139.8°	10°54.3'	-54.2'	139.9°	10°08.4'	-54.5'	140.0°	9°22.4'	-54.8'	140.1°	8°36.3'	-55.1'	140.2°	7°50.2'	-55.3'	140.3°	19			
20	11°32.3'	-53.7'	140.1°	10°46.2'	-54.0'	140.2°	10°00.1'	-54.3'	140.3°	9°13.9'	-54.5'	140.4°	8°27.6'	-54.8'	140.5°	7°41.2'	-55.1'	140.6°	6°54.8'	-55.3'	140.7°	20			
21	10°38.6'	-53.7'	140.5°	9°52.3'	-54.0'	140.6°	9°05.8'	-54.3'	140.8°	8°19.3'	-54.6'	140.9°	7°32.8'	-54.8'	140.9°	6°46.2'	-55.1'	141.0°	5°59.5'	-55.4'	141.1°	21			
22	9°44.9'	-53.7'	141.0°	8°58.3'	-54.0'	141.1°	8°11.5'	-54.3'	141.2°	7°24.8'	-54.6'	141.3°	6°37.9'	-54.9'	141.3°	5°51.1'	-55.1'	141.4°	5°04.1'	-55.4'	141.5°	22			
23	8°51.2'	-53.8'	141.4°	8°04.2'	-54.1'	141.5°	7°17.2'	-54.3'	141.6°	6°30.2'	-54.6'	141.7°	5°43.1'	-54.9'	141.8°	4°55.9'	-55.1'	141.8°	4°08.8'	-55.4'	141.9°	23			
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	49			50			51			52			53			54			55						

42° 318° LHA

Latitude CONTRARY to DECLINATION

42° 318° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

41° 319° LHA			Latitude CONTRARY to Declination								41° 319° LHA												
Dec°	49			50			51			52			53			54			55			Dec°	
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°		Hc°
0	29°40.7'	-52.2'	131.0°	29°01.2'	-52.6'	131.4°	28°21.4'	-53.0'	131.8°	27°41.2'	-53.5'	132.2°	27°00.8'	-53.8'	132.6°	26°20.1'	-54.2'	132.9°	25°39.0'	-54.6'	133.3°	0	
1	28°48.5'	-52.3'	131.5°	28°08.6'	-52.8'	131.9°	27°28.3'	-53.2'	132.3°	26°47.8'	-53.6'	132.7°	26°07.0'	-53.9'	133.1°	25°25.8'	-54.3'	133.4°	24°44.5'	-54.6'	133.8°	1	
2	27°56.1'	-52.5'	132.1°	27°15.8'	-52.9'	132.5°	26°35.2'	-53.3'	132.8°	25°54.2'	-53.7'	133.2°	25°13.0'	-54.0'	133.6°	24°31.5'	-54.4'	133.9°	23°49.8'	-54.7'	134.2°	2	
3	27°03.7'	-52.6'	132.6°	26°22.9'	-53.0'	133.0°	25°41.9'	-53.4'	133.4°	25°00.6'	-53.8'	133.7°	24°19.0'	-54.1'	134.0°	23°37.2'	-54.5'	134.4°	22°55.1'	-54.8'	134.7°	3	
4	26°11.1'	-52.7'	133.2°	25°30.0'	-53.1'	133.5°	24°48.5'	-53.5'	133.9°	24°06.8'	-53.9'	134.2°	23°24.9'	-54.2'	134.5°	22°42.7'	-54.5'	134.8°	22°00.3'	-54.9'	135.1°	4	
5	25°18.4'	-52.8'	133.7°	24°36.9'	-53.2'	134.0°	23°55.0'	-53.6'	134.4°	23°13.0'	-53.9'	134.7°	22°30.7'	-54.3'	135.0°	21°48.2'	-54.6'	135.3°	21°05.4'	-54.9'	135.5°	5	
6	24°25.6'	-52.9'	134.2°	23°43.6'	-53.3'	134.5°	23°01.4'	-53.7'	134.9°	22°19.0'	-54.0'	135.1°	21°36.4'	-54.4'	135.4°	20°53.5'	-54.7'	135.7°	20°10.5'	-55.0'	136.0°	6	
7	23°32.7'	-53.0'	134.7°	22°50.3'	-53.4'	135.0°	22°07.8'	-53.8'	135.3°	21°25.0'	-54.1'	135.6°	20°42.0'	-54.4'	135.9°	19°58.9'	-54.7'	136.1°	19°15.5'	-55.1'	136.4°	7	
8	22°39.7'	-53.1'	135.2°	21°57.0'	-53.5'	135.5°	21°14.0'	-53.8'	135.8°	20°30.9'	-54.2'	136.1°	19°47.6'	-54.5'	136.3°	19°04.1'	-54.8'	136.6°	18°20.4'	-55.1'	136.8°	8	
9	21°46.5'	-53.2'	135.8°	21°03.5'	-53.6'	136.0°	20°20.2'	-53.9'	136.3°	19°36.7'	-54.2'	136.5°	18°53.1'	-54.6'	136.8°	18°09.3'	-54.9'	137.0°	17°25.3'	-55.2'	137.2°	9	
10	20°53.3'	-53.3'	136.2°	20°09.9'	-53.6'	136.5°	19°26.3'	-54.0'	136.8°	18°42.5'	-54.3'	137.0°	17°58.5'	-54.6'	137.2°	17°14.4'	-54.9'	137.4°	16°30.2'	-55.2'	137.6°	10	
11	20°00.0'	-53.4'	136.7°	19°16.3'	-53.7'	137.0°	18°32.3'	-54.0'	137.2°	17°48.2'	-54.4'	137.4°	17°03.9'	-54.7'	137.6°	16°19.5'	-55.0'	137.9°	15°35.0'	-55.3'	138.0°	11	
12	19°06.7'	-53.5'	137.2°	18°22.5'	-53.8'	137.5°	17°38.3'	-54.1'	137.7°	16°53.8'	-54.4'	137.9°	16°09.3'	-54.7'	138.1°	15°24.5'	-55.0'	138.3°	14°39.7'	-55.3'	138.4°	12	
13	18°13.2'	-53.5'	137.7°	17°28.8'	-53.8'	137.9°	16°44.2'	-54.2'	138.1°	15°59.4'	-54.5'	138.3°	15°14.5'	-54.8'	138.5°	14°29.5'	-55.1'	138.7°	13°44.4'	-55.3'	138.8°	13	
14	17°19.7'	-53.6'	138.2°	16°34.9'	-53.9'	138.4°	15°50.0'	-54.2'	138.6°	15°04.9'	-54.5'	138.8°	14°19.8'	-54.8'	138.9°	13°34.5'	-55.1'	139.1°	12°49.1'	-55.4'	139.2°	14	
15	16°26.1'	-53.6'	138.6°	15°41.0'	-54.0'	138.8°	14°55.8'	-54.3'	139.0°	14°10.4'	-54.6'	139.2°	13°25.0'	-54.9'	139.3°	12°39.4'	-55.1'	139.5°	11°53.7'	-55.4'	139.6°	15	
16	15°32.5'	-53.7'	139.1°	14°47.0'	-54.0'	139.3°	14°01.5'	-54.3'	139.5°	13°15.8'	-54.6'	139.6°	12°30.1'	-54.9'	139.8°	11°44.2'	-55.2'	139.9°	10°58.3'	-55.4'	140.0°	16	
17	14°38.7'	-53.8'	139.6°	13°53.0'	-54.1'	139.7°	13°07.2'	-54.4'	139.9°	12°21.2'	-54.6'	140.0°	11°35.2'	-54.9'	140.2°	10°49.1'	-55.2'	140.3°	10°02.9'	-55.5'	140.4°	17	
18	13°45.0'	-53.8'	140.0°	12°59.0'	-54.1'	140.2°	12°12.8'	-54.4'	140.3°	11°26.6'	-54.7'	140.5°	10°40.3'	-55.0'	140.6°	9°53.9'	-55.2'	140.7°	9°07.4'	-55.5'	140.8°	18	
19	12°51.2'	-53.9'	140.5°	12°04.8'	-54.2'	140.6°	11°18.4'	-54.4'	140.8°	10°31.9'	-54.7'	140.9°	9°45.3'	-55.0'	141.0°	8°58.7'	-55.3'	141.1°	8°11.9'	-55.5'	141.2°	19	
20	11°57.3'	-53.9'	140.9°	11°10.7'	-54.2'	141.1°	10°24.0'	-54.5'	141.2°	9°37.2'	-54.7'	141.3°	8°50.3'	-55.0'	141.4°	8°03.4'	-55.3'	141.5°	7°16.4'	-55.5'	141.6°	20	
21	11°03.4'	-53.9'	141.4°	10°16.5'	-54.2'	141.5°	9°29.5'	-54.5'	141.6°	8°42.4'	-54.8'	1											

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

38° 322° LHA

Latitude CONTRARY to Declination

38° 322° LHA

Table with columns for Dec (0-23), Latitude (49-55), and Longitude (Hc, d, Z). Each cell contains three values representing celestial coordinates.

38° 322° LHA

Latitude CONTRARY to DECLINATION

38° 322° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

37° 323° LHA

Latitude CONTRARY to Declination

37° 323° LHA

Table with columns for Dec (0-23), Latitude (49-55), and Longitude (Hc, d, Z). Each cell contains three values representing celestial coordinates.

37° 323° LHA

Latitude CONTRARY to DECLINATION

37° 323° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

34° 326° LHA

Latitude CONTRARY to Declination

34° 326° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of coordinate data for Latitude CONTRARY to Declination at 34° 326° LHA.

34° 326° LHA

Latitude CONTRARY to DECLINATION

34° 326° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

33° 327° LHA

Latitude CONTRARY to Declination

33° 327° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of coordinate data for Latitude CONTRARY to Declination at 33° 327° LHA.

33° 327° LHA

Latitude CONTRARY to DECLINATION

33° 327° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn = 360-Z

Table with columns for Latitude CONTRARY to Declination, rows for Dec° 0 to 23, and sub-columns for Hc°, d', Z° for values 49 through 55.

Latitude CONTRARY to DECLINATION South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn = 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn = 360-Z

Table with columns for Latitude CONTRARY to Declination, rows for Dec° 0 to 23, and sub-columns for Hc°, d', Z° for values 49 through 55.

Latitude CONTRARY to DECLINATION South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

30° 330° LHA

Latitude CONTRARY to Declination

30° 330° LHA

Table with columns for Dec°, Hc°, d', Z° and rows for 0 to 23. It provides celestial navigation data for a 30° 330° LHA scenario.

30° 330° LHA

Latitude CONTRARY to DECLINATION

30° 330° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

29° 331° LHA

Latitude CONTRARY to Declination

29° 331° LHA

Table with columns for Dec°, Hc°, d', Z° and rows for 0 to 23. It provides celestial navigation data for a 29° 331° LHA scenario.

29° 331° LHA

Latitude CONTRARY to DECLINATION

29° 331° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn = 360-Z

26° 334° LHA

Latitude CONTRARY to Declination

26° 334° LHA

Table with columns: Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each column contains three sub-columns: Hc°, d', Z°. Rows 0-23 show latitude/longitude pairs for each degree.

26° 334° LHA

Latitude CONTRARY to DECLINATION

26° 334° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn = 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn = 360-Z

25° 335° LHA

Latitude CONTRARY to Declination

25° 335° LHA

Table with columns: Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each column contains three sub-columns: Hc°, d', Z°. Rows 0-23 show latitude/longitude pairs for each degree.

25° 335° LHA

Latitude CONTRARY to DECLINATION

25° 335° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

20° 340° LHA

Latitude CONTRARY to Declination

20° 340° LHA

Table with columns: Dec°, 49 (Hc°, d', Z°), 50 (Hc°, d', Z°), 51 (Hc°, d', Z°), 52 (Hc°, d', Z°), 53 (Hc°, d', Z°), 54 (Hc°, d', Z°), 55 (Hc°, d', Z°), Dec°. Rows 0-23.

20° 340° LHA

Latitude CONTRARY to DECLINATION

20° 340° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn = 360-Z

19° 341° LHA

Latitude CONTRARY to Declination

19° 341° LHA

Table with columns: Dec°, 49 (Hc°, d', Z°), 50 (Hc°, d', Z°), 51 (Hc°, d', Z°), 52 (Hc°, d', Z°), 53 (Hc°, d', Z°), 54 (Hc°, d', Z°), 55 (Hc°, d', Z°), Dec°. Rows 0-23.

19° 341° LHA

Latitude CONTRARY to DECLINATION

19° 341° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn = 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

18° 342° LHA

Latitude CONTRARY to Declination

18° 342° LHA

Table with 9 columns: Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each column contains a grid of Hc°, d', and Z° values for degrees 0 to 23. The 49 and 55 columns have sub-headers Hc°, d', Z°.

18° 342° LHA

Latitude CONTRARY to DECLINATION

18° 342° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

17° 343° LHA

Latitude CONTRARY to Declination

17° 343° LHA

Table with 9 columns: Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°. Each column contains a grid of Hc°, d', and Z° values for degrees 0 to 23. The 49 and 55 columns have sub-headers Hc°, d', Z°.

17° 343° LHA

Latitude CONTRARY to DECLINATION

17° 343° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

16° 344° LHA

Latitude CONTRARY to Declination

16° 344° LHA

Table with 9 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of celestial coordinates.

16° 344° LHA

Latitude CONTRARY to DECLINATION

16° 344° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° ... Zn = Z LHA < 180° .. Zn= 360-Z

15° 345° LHA

Latitude CONTRARY to Declination

15° 345° LHA

Table with 9 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of celestial coordinates.

15° 345° LHA

Latitude CONTRARY to DECLINATION

15° 345° LHA

South Lat. LHA > 180° .. Zn = 180-Z LHA < 180° .. Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

12° 348° LHA Latitude CONTRARY to Declination 12° 348° LHA

Table with 11 columns for declination (Dec°) from 0 to 23, and 8 columns for latitude (49-55) with sub-columns for Hc°, d', and Z°. Includes a footer row for Dec° with labels 49-55.

12° 348° LHA Latitude CONTRARY to DECLINATION 12° 348° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

11° 349° LHA Latitude CONTRARY to Declination 11° 349° LHA

Table with 11 columns for declination (Dec°) from 0 to 23, and 8 columns for latitude (49-55) with sub-columns for Hc°, d', and Z°. Includes a footer row for Dec° with labels 49-55.

11° 349° LHA Latitude CONTRARY to DECLINATION 11° 349° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

10° 350° LHA

Latitude CONTRARY to Declination

10° 350° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data.

10° 350° LHA

Latitude CONTRARY to DECLINATION

10° 350° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

9° 351° LHA

Latitude CONTRARY to Declination

9° 351° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data.

9° 351° LHA

Latitude CONTRARY to DECLINATION

9° 351° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

8° 352° LHA

Latitude CONTRARY to Declination

8° 352° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data for 8° 352° LHA.

8° 352° LHA

Latitude CONTRARY to DECLINATION

8° 352° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

7° 353° LHA

Latitude CONTRARY to Declination

7° 353° LHA

Table with 10 columns (Dec, 49, 50, 51, 52, 53, 54, 55, Dec) and 24 rows of astronomical data for 7° 353° LHA.

7° 353° LHA

Latitude CONTRARY to DECLINATION

7° 353° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

2° 358° LHA

Latitude CONTRARY to Declination

2° 358° LHA

Table with 10 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of data for 2° 358° LHA. Each cell contains three values: Hc°, d', Z°.

2° 358° LHA

Latitude CONTRARY to DECLINATION

2° 358° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

North Lat. LHA > 180° . . . Zn = Z LHA < 180° . . Zn= 360-Z

1° 359° LHA

Latitude CONTRARY to Declination

1° 359° LHA

Table with 10 columns (Dec°, 49, 50, 51, 52, 53, 54, 55, Dec°) and 24 rows of data for 1° 359° LHA. Each cell contains three values: Hc°, d', Z°.

1° 359° LHA

Latitude CONTRARY to DECLINATION

1° 359° LHA

South Lat. LHA > 180° . . Zn = 180-Z LHA < 180° . . Zn= 180+Z

SEMI DIAMETER (SD)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1	16.29'	16.26'	16.17'	16.03'	15.90'	15.80'	15.75'	15.78'	15.87'	16.00'	16.14'	16.24'
3	16.29'	16.25'	16.16'	16.02'	15.89'	15.79'	15.75'	15.79'	15.89'	16.02'	16.15'	16.25'
6	16.29'	16.24'	16.14'	16.00'	15.88'	15.78'	15.75'	15.79'	15.90'	16.03'	16.17'	16.26'
9	16.29'	16.23'	16.13'	15.99'	15.86'	15.78'	15.75'	15.80'	15.91'	16.04'	16.18'	16.26'
12	16.28'	16.22'	16.12'	15.98'	15.85'	15.77'	15.76'	15.81'	15.92'	16.06'	16.19'	16.27'
15	16.28'	16.21'	16.10'	15.96'	15.84'	15.77'	15.76'	15.82'	15.94'	16.07'	16.20'	16.27'
18	16.28'	16.20'	16.09'	15.95'	15.83'	15.76'	15.76'	15.83'	15.95'	16.08'	16.21'	16.28'
21	16.27'	16.19'	16.08'	15.94'	15.82'	15.76'	15.76'	15.84'	15.96'	16.10'	16.22'	16.28'
24	16.27'	16.18'	16.06'	15.92'	15.81'	15.76'	15.77'	15.85'	15.98'	16.11'	16.23'	16.29'
27	16.26'	16.17'	16.05'	15.91'	15.81'	15.76'	15.77'	15.86'	15.99'	16.12'	16.24'	16.29'
30	16.26'	16.17'	16.04'	15.90'	15.80'	15.75'	15.78'	15.87'	16.00'	16.14'	16.24'	16.29'

Lower Limb, ADD. Upper Limb, SUBTRACT

DIP Correction		
Meters	Dip '	Feet
0.4	1.11'	1.30
0.6	1.36'	1.95
0.8	1.57'	2.60
1.0	1.76'	3.25
1.2	1.93'	3.90
1.4	2.08'	4.55
1.6	2.23'	5.20
1.8	2.36'	5.85
2.0	2.49'	6.50
2.2	2.61'	7.15
2.4	2.73'	7.80
2.6	2.84'	8.45
2.8	2.95'	9.10
3.0	3.05'	9.75
3.2	3.15'	10.40
3.4	3.25'	11.05
3.6	3.34'	11.70
3.8	3.43'	12.35
4.0	3.52'	13.00

Always SUBTRACT

PARALLAX	
Alt (Ha)	Parallax
0	0.14'
5	0.14'
10	0.14'
15	0.14'
20	0.14'
25	0.13'
30	0.12'
35	0.12'
40	0.11'
45	0.10'
50	0.09'
55	0.08'
60	0.07'
65	0.06'
70	0.05'
75	0.04'
80	0.03'
85	0.01'
90	0.00'

Always ADD

Hs = Sextant Altitude
 Sextant Corrections
 $Ha = \text{Actual measure altitude}$
 $Ha = Hs +/- \text{Index Error (IE) - Dip}$
 Altitude Corrections
 $Ho = \text{True Observed Altitude}$
 $Ho = Ha + \text{Parallax} - \text{Refraction +/- SD}$
 ADD Index Error if OFF the arc
 SUBTRACT Index Error if ON the arc.

If using an artificial horizon Dip = 0.
 Add or Subtract IE as normal, then halve the angle Ha.
 Then apply the Altitude corrections as normal.

Alt (Ha)	mB & DegC			REFRACTION			mB & DegC		
	1000			1015			1030		
	10	20	30	10	20	30	10	20	30
1	24.14'	23.31'	22.54'	24.50'	23.66'	22.88'	24.86'	24.01'	23.22'
2	18.07'	17.46'	16.88'	18.34'	17.72'	17.13'	18.61'	17.98'	17.39'
3	14.23'	13.75'	13.29'	14.44'	13.95'	13.49'	14.66'	14.16'	13.69'
4	11.64'	11.25'	10.87'	11.82'	11.41'	11.04'	11.99'	11.58'	11.20'
5	9.80'	9.47'	9.16'	9.95'	9.61'	9.30'	10.10'	9.75'	9.43'
6	8.44'	8.15'	7.88'	8.57'	8.28'	8.00'	8.69'	8.40'	8.12'
7	7.39'	7.14'	6.91'	7.51'	7.25'	7.01'	7.62'	7.36'	7.11'
8	6.57'	6.34'	6.13'	6.67'	6.44'	6.23'	6.76'	6.53'	6.32'
9	5.90'	5.70'	5.51'	5.99'	5.78'	5.59'	6.08'	5.87'	5.68'
10	5.35'	5.17'	5.00'	5.43'	5.24'	5.07'	5.51'	5.32'	5.15'
12	4.50'	4.34'	4.20'	4.56'	4.41'	4.26'	4.63'	4.47'	4.32'
14	3.86'	3.73'	3.61'	3.92'	3.79'	3.66'	3.98'	3.84'	3.72'
16	3.38'	3.26'	3.16'	3.43'	3.31'	3.20'	3.48'	3.36'	3.25'
18	3.00'	2.89'	2.80'	3.04'	2.94'	2.84'	3.09'	2.98'	2.88'
20	2.68'	2.59'	2.50'	2.72'	2.63'	2.54'	2.76'	2.67'	2.58'
22	2.42'	2.34'	2.26'	2.46'	2.37'	2.30'	2.49'	2.41'	2.33'
24	2.20'	2.13'	2.06'	2.23'	2.16'	2.09'	2.27'	2.19'	2.12'
26	2.01'	1.94'	1.88'	2.04'	1.97'	1.91'	2.07'	2.00'	1.94'
28	1.85'	1.79'	1.73'	1.88'	1.81'	1.75'	1.90'	1.84'	1.78'
30	1.70'	1.65'	1.59'	1.73'	1.67'	1.62'	1.75'	1.69'	1.64'
35	1.41'	1.36'	1.31'	1.43'	1.38'	1.33'	1.45'	1.40'	1.35'
40	1.18'	1.14'	1.10'	1.19'	1.15'	1.11'	1.21'	1.17'	1.13'
45	0.99'	0.95'	0.92'	1.00'	0.97'	0.94'	1.02'	0.98'	0.95'
50	0.83'	0.80'	0.77'	0.84'	0.81'	0.79'	0.85'	0.82'	0.80'
55	0.69'	0.67'	0.65'	0.70'	0.68'	0.66'	0.71'	0.69'	0.67'
60	0.57'	0.55'	0.53'	0.58'	0.56'	0.54'	0.59'	0.57'	0.55'
65	0.46'	0.44'	0.43'	0.47'	0.45'	0.44'	0.47'	0.46'	0.44'
70	0.36'	0.35'	0.34'	0.36'	0.35'	0.34'	0.37'	0.36'	0.35'
75	0.26'	0.26'	0.25'	0.27'	0.26'	0.25'	0.27'	0.26'	0.25'
80	0.17'	0.17'	0.16'	0.18'	0.17'	0.16'	0.18'	0.17'	0.17'
85	0.09'	0.08'	0.08'	0.09'	0.08'	0.08'	0.09'	0.08'	0.08'
90	0.00'	0.00'	0.00'	0.00'	0.00'	0.00'	0.00'	0.00'	0.00'

Always SUBTRACT

