

# Sight Reduction Tables

Latitude 63° to 69°

## 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

6° 354° LHA

Latitude SAME as Declination

6° 354° LHA

Table with columns: Dec°, Hc°, d', Z° for declinations 63-69. It contains astronomical data for latitude 6°.

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 columns: Dec°, Hc°, d', Z° for declinations 63-69. It contains astronomical data for latitude 7°.

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°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows (0-23). Each column contains three sub-columns (Hc°, d', Z°) representing 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°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows (0-23). Each column contains three sub-columns (Hc°, d', Z°) representing 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

12° 348° LHA

Latitude SAME as Declination

12° 348° LHA

Table with 10 columns (Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of data. Each cell contains three values (Hc°, d', Z°).

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 10 columns (Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of data. Each cell contains three values (Hc°, d', Z°).

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

**22° 338° LHA** Latitude SAME as Declination **22° 338° LHA**

Table with 10 columns (Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows (0-23). Each row contains three columns of coordinates (Hc°, d', Z°).

**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°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows (0-23). Each row contains three columns of coordinates (Hc°, d', Z°).

**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

28° 332° LHA

Latitude SAME as Declination

28° 332° LHA

Table with 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of celestial coordinates (Hc, d, Z).

28° 332° LHA

Latitude SAME as Declination

28° 332° 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 SAME as Declination

29° 331° LHA

Table with 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of celestial coordinates (Hc, d, Z).

29° 331° LHA

Latitude SAME as 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

34° 326° LHA

Latitude SAME as Declination

34° 326° LHA

Table with 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of celestial coordinates.

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 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of celestial coordinates.

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°, Hc°, d', Z°, and 7 columns for LHA values (63-69), and Dec°. Rows 0-23.

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°, Hc°, d', Z°, and 7 columns for LHA values (63-69), and Dec°. Rows 0-23.

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 columns for Dec° (0-23), Hc°, d', Z° for LHA 63-69, and Dec° (0-23). It contains a grid of 24 rows and 10 columns of coordinate data.

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 columns for Dec° (0-23), Hc°, d', Z° for LHA 63-69, and Dec° (0-23). It contains a grid of 24 rows and 10 columns of coordinate data.

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

44° 316° LHA

Latitude SAME as Declination

44° 316° LHA

Table with columns for Dec (0-23) and grid columns 63-69. Each cell contains three values: Hc°, d', and Z°. The table is framed with a thick border and has a header row for each grid column.

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

Table with columns for Dec (0-23) and grid columns 63-69. Each cell contains three values: Hc°, d', and Z°. The table is framed with a thick border and has a header row for each grid column.

45° 315° LHA

Latitude SAME as 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

46° 314° LHA

Latitude SAME as Declination

46° 314° LHA

Table with 11 columns: Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°. Each column contains values in Hc°, d', Z° format. Rows 0-23.

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 11 columns: Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°. Each column contains values in Hc°, d', Z° format. Rows 0-23.

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 columns: Dec°, Hc°, d', Z° (for values 63-69), and Dec°. Contains 24 rows of astronomical data.

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 columns: Dec°, Hc°, d', Z° (for values 63-69), and Dec°. Contains 24 rows of astronomical data.

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

Table with columns for Dec°, Hc°, d', Z° and rows for declinations 0 to 23. Each declination row contains three columns of data for LHA values 63, 64, 65, 66, 67, 68, 69.

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

Table with columns for Dec°, Hc°, d', Z° and rows for declinations 0 to 23. Each declination row contains three columns of data for LHA values 63, 64, 65, 66, 67, 68, 69.

51° 309° LHA

Latitude SAME as Declination

51° 309° LHA

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













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

62° 298° LHA

Latitude SAME as Declination

62° 298° LHA

Table with 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of coordinate data.

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 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of coordinate data.

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°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of astronomical data.

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°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of astronomical data.

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

**76° 284° LHA**

**Latitude SAME as Declination**

**76° 284° LHA**

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	6°18.3'	+53.8'	102.5°	6°05.3'	+54.2'	102.6°	5°52.1'	+54.7'	102.7°	5°38.8'	+55.1'	102.8°	5°25.4'	+55.5'	102.9°	5°12.0'	+55.9'	103.0°	4°58.4'	+56.2'	103.1°	0
1	7°12.1'	+53.7'	102.1°	6°59.5'	+54.2'	102.2°	6°46.7'	+54.6'	102.3°	6°33.9'	+55.1'	102.4°	6°20.9'	+55.5'	102.5°	6°07.8'	+55.8'	102.6°	5°54.6'	+56.2'	102.8°	1
2	8°05.9'	+53.7'	101.6°	7°53.7'	+54.2'	101.8°	7°41.4'	+54.6'	101.9°	7°28.9'	+55.0'	102.0°	7°16.4'	+55.4'	102.2°	7°03.7'	+55.8'	102.3°	6°50.8'	+56.2'	102.4°	2
3	8°59.6'	+53.7'	101.2°	8°47.9'	+54.1'	101.3°	8°36.0'	+54.6'	101.5°	8°24.0'	+55.0'	101.6°	8°11.8'	+55.4'	101.8°	7°59.5'	+55.8'	101.9°	7°47.0'	+56.2'	102.0°	3
4	9°53.3'	+53.6'	100.7°	9°42.0'	+54.1'	100.9°	9°30.6'	+54.6'	101.1°	9°19.0'	+55.0'	101.2°	9°07.2'	+55.4'	101.4°	8°55.3'	+55.8'	101.5°	8°43.2'	+56.2'	101.7°	4
5	10°46.9'	+53.6'	100.3°	10°36.1'	+54.1'	100.5°	10°25.1'	+54.5'	100.6°	10°14.0'	+54.9'	100.8°	10°02.6'	+55.4'	101.0°	9°51.1'	+55.8'	101.2°	9°39.4'	+56.1'	101.3°	5
6	11°40.5'	+53.6'	99.8°	11°30.2'	+54.0'	100.0°	11°19.6'	+54.5'	100.2°	11°08.9'	+54.9'	100.4°	10°58.0'	+55.3'	100.6°	10°46.8'	+55.7'	100.8°	10°35.5'	+56.1'	101.0°	6
7	12°34.1'	+53.5'	99.4°	12°24.2'	+54.0'	99.6°	12°14.1'	+54.4'	99.8°	12°03.8'	+54.9'	100.0°	11°53.3'	+55.3'	100.2°	11°42.6'	+55.7'	100.4°	11°31.6'	+56.1'	100.6°	7
8	13°27.6'	+53.5'	98.9°	13°18.2'	+53.9'	99.1°	13°08.6'	+54.4'	99.4°	12°58.7'	+54.8'	99.6°	12°48.6'	+55.3'	99.8°	12°38.3'	+55.7'	100.0°	12°27.7'	+56.1'	100.3°	8
9	14°21.1'	+53.4'	98.4°	14°12.1'	+53.9'	98.7°	14°03.0'	+54.4'	98.9°	13°53.5'	+54.8'	99.2°	13°43.9'	+55.2'	99.4°	13°33.9'	+55.6'	99.6°	13°23.7'	+56.0'	99.9°	9
10	15°14.5'	+53.4'	98.0°	15°06.0'	+53.8'	98.2°	14°57.3'	+54.3'	98.5°	14°48.3'	+54.7'	98.7°	14°39.1'	+55.2'	99.0°	14°29.5'	+55.6'	99.3°	14°19.8'	+56.0'	99.5°	10
11	16°07.8'	+53.3'	97.5°	15°59.9'	+53.8'	97.8°	15°51.6'	+54.2'	98.0°	15°43.1'	+54.7'	98.3°	15°34.3'	+55.1'	98.6°	15°25.1'	+55.6'	98.9°	15°15.7'	+55.9'	99.1°	11
12	17°01.1'	+53.2'	97.0°	16°53.6'	+53.7'	97.3°	16°45.9'	+54.2'	97.6°	16°37.8'	+54.6'	97.9°	16°29.4'	+55.1'	98.2°	16°20.7'	+55.5'	98.5°	16°11.7'	+55.9'	98.8°	12
13	17°54.3'	+53.1'	96.5°	17°47.4'	+53.6'	96.8°	17°40.1'	+54.1'	97.1°	17°32.4'	+54.6'	97.5°	17°24.5'	+55.0'	97.8°	17°16.2'	+55.5'	98.1°	17°07.6'	+55.9'	98.4°	13
14	18°47.5'	+53.1'	96.0°	18°41.0'	+53.6'	96.4°	18°34.2'	+54.1'	96.7°	18°27.0'	+54.5'	97.0°	18°19.5'	+55.0'	97.4°	18°11.7'	+55.4'	97.7°	18°03.5'	+55.8'	98.0°	14
15	19°40.5'	+53.0'	95.5°	19°34.6'	+53.5'	95.9°	19°28.2'	+54.0'	96.2°	19°21.5'	+54.5'	96.6°	19°14.5'	+54.9'	96.9°	19°07.1'	+55.4'	97.3°	18°59.3'	+55.8'	97.6°	15
16	20°33.5'	+52.9'	95.0°	20°28.1'	+53.4'	95.4°	20°22.2'	+53.9'	95.8°	20°16.0'	+54.4'	96.1°	20°09.4'	+54.9'	96.5°	20°02.4'	+55.3'	96.9°	19°55.1'	+55.7'	97.2°	16
17	21°26.4'	+52.8'	94.5°	21°21.5'	+53.3'	94.9°	21°16.2'	+53.8'	95.3°	21°10.4'	+54.3'	95.7°	21°04.3'	+54.8'	96.1°	20°57.7'	+55.2'	96.5°	20°50.8'	+55.7'	96.8°	17
18	22°19.2'	+52.7'	94.0°	22°14.8'	+53.2'	94.4°	22°10.0'	+53.8'	94.8°	22°04.7'	+54.2'	95.2°	21°59.1'	+54.7'	95.6°	21°53.0'	+55.2'	96.0°	21°46.4'	+55.6'	96.4°	18
19	23°12.0'	+52.6'	93.5°	23°08.1'	+53.1'	93.9°	23°03.8'	+53.7'	94.3°	22°59.0'	+54.2'	94.8°	22°53.8'	+54.6'	95.2°	22°48.1'	+55.1'	95.6°	22°42.0'	+55.5'	96.0°	19
20	24°04.6'	+52.5'	93.0°	24°01.2'	+53.0'	93.4°	23°57.4'	+53.6'	93.9°	23°53.1'	+54.1'	94.3°	23°48.4'	+54.6'	94.7°	23°43.2'	+55.0'	95.2°	23°37.6'	+55.5'	95.6°	20
21	24°57.1'	+52.4'	92.4°	24°54.3'	+52.9'	92.9°	24°51.0'	+53.5'	93.4°	24°47.2'	+54.0'	93.8°	24°43.0'	+54.5'	94.3°	24°38.3'	+55.0'	94.7°	24°33.1'	+55.4'	95.2°	21
22	25°49.4'	+52.3'	91.9°	25°47.2'	+52.8'	92.4°	25°44.5'	+53.4'	92.9°	25°41.2'	+53.9'	93.3°	25°37.5'	+54.4'	93.8°	25°33.2'	+54.9'	94.3°	25°28.5'	+55.3'	94.8°	22
23	26°41.7'	+52.1'	91.3°	26°40.0'	+52.7'	91.9°	26°37.8'	+53.3'	92.4°	26°35.1'	+53.8'	92.9°	26°31.9'	+54.3'	93.4°	26°28.1'	+54.8'	93.8°	26°23.8'	+55.3'	94.3°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	<b>63</b>			<b>64</b>			<b>65</b>			<b>66</b>			<b>67</b>			<b>68</b>			<b>69</b>			

**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°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	5°51.7'	+53.7'	101.6°	5°39.6'	+54.2'	101.7°	5°27.3'	+54.6'	101.8°	5°15.0'	+55.0'	101.9°	5°02.6'	+55.4'	102.0°	4°50.0'	+55.8'	102.1°	4°37.4'	+56.2'	102.2°	0
1	6°45.4'	+53.7'	101.2°	6°33.7'	+54.2'	101.3°	6°21.9'	+54.6'	101.4°	6°10.0'	+55.0'	101.5°	5°58.0'	+55.4'	101.6°	5°45.9'	+55.8'	101.7°	5°33.6'	+56.2'	101.8°	1
2	7°39.1'	+53.7'	100.7°	7°27.9'	+54.1'	100.9°	7°16.5'	+54.6'	101.0°	7°05.0'	+55.0'	101.1°	6°53.4'	+55.4'	101.2°	6°41.7'	+55.8'	101.3°	6°29.8'	+56.2'	101.5°	2
3	8°32.8'	+53.6'	100.3°	8°22.0'	+54.1'	100.4°	8°11.1'	+54.5'	100.6°	8°00.0'	+55.0'	100.7°	7°48.8'	+55.4'	100.8°	7°37.5'	+55.8'	101.0°	7°26.0'	+56.1'	101.1°	3
4	9°26.5'	+53.6'	99.8°	9°16.1'	+54.1'	100.0°	9°05.7'	+54.5'	100.1°	8°55.0'	+54.9'	100.3°	8°44.2'	+55.4'	100.5°	8°33.2'	+55.8'	100.6°	8°22.1'	+56.1'	100.7°	4
5	10°20.1'	+53.6'	99.4°	10°10.2'	+54.0'	99.5°	10°00.2'	+54.5'	99.7°	9°49.9'	+54.9'	99.9°	9°39.6'	+55.3'	100.1°	9°29.0'	+55.7'	100.2°	9°18.2'	+56.1'	100.4°	5
6	11°13.6'	+53.5'	98.9°	11°04.2'	+54.0'	99.1°	10°54.7'	+54.5'	99.3°	10°44.9'	+54.9'	99.5°	10°34.9'	+55.3'	99.7°	10°24.7'	+55.7'	99.9°	10°14.4'	+56.1'	100.0°	6
7	12°07.2'	+53.5'	98.4°	11°58.2'	+54.0'	98.7°	11°49.1'	+54.4'	98.9°	11°39.8'	+54.8'	99.1°	11°30.2'	+55.3'	99.3°	11°20.4'	+55.7'	99.5°	11°10.4'	+56.1'	99.7°	7
8	13°00.7'	+53.4'	98.0°	12°52.2'	+53.9'	98.2°	12°43.5'	+54.4'	98.4°	12°34.6'	+54.8'	98.7°	12°25.5'	+55.2'	98.9°	12°16.1'	+55.6'	99.1°	12°06.5'	+56.0'	99.3°	8
9	13°54.1'	+53.4'	97.5°	13°46.1'	+53.9'	97.8°	13°37.9'	+54.3'	98.0°	13°29.4'	+54.8'	98.2°	13°20.7'	+55.2'	98.5°	13°11.7'	+55.6'	98.7°	13°02.5'	+56.0'	98.9°	9
10	14°47.5'	+53.3'	97.0°	14°40.0'	+53.8'	97.3°	14°32.2'	+54.3'	97.6°	14°24.2'	+54.7'	97.8°	14°15.9'	+55.2'	98.1°	14°07.3'	+55.6'	98.3°	13°58.5'	+56.0'	98.6°	10
11	15°40.8'	+53.3'	96.6°	15°33.8'	+53.8'	96.8°	15°26.5'	+54.2'	97.1°	15°18.9'	+54.7'	97.4°	15°11.0'	+55.1'	97.7°	15°02.9'	+55.5'	97.9°	14°54.5'	+55.9'	98.2°	11
12	16°34.0'	+53.2'	96.1°	16°27.5'	+53.7'	96.4°	16°20.7'	+54.2'	96.7°	16°13.6'	+54.6'	97.0°	16°06.2'	+55.1'	97.3°	15°58.4'	+55.5'	97.5°	15°50.4'	+55.9'	97.8°	12
13	17°27.2'	+53.1'	95.6°	17°21.2'	+53.6'	95.9°	17°14.9'	+54.1'	96.2°	17°08.2'	+54.6'	96.5°	17°01.2'	+55.0'	96.8°	16°53.9'	+55.4'	97.1°	16°46.3'	+55.8'	97.4°	13
14	18°20.4'	+53.0'	95.1°	18°14.8'	+53.6'	95.4°	18°09.0'	+54.0'	95.8°	18°02.8'	+54.5'	96.1°	17°56.2'	+55.0'	96.4°	17°49.4'	+55.4'	96.7°	17°42.1'	+55.8'	97.1°	14
15	19°13.4'	+53.0'	94.6°	19°08.4'	+53.5'	95.0°	19°03.0'	+54.0'	95.3°	18°57.3'	+54.4'	95.7°	18°51.2'	+54.9'	96.0°	18°44.7'	+55.3'	96.3°	18°37.9'	+55.8'	96.7°	15
16	20°06.4'	+52.9'	94.1°	20°01.9'	+53.4'	94.5°	19°57.0'	+53.9'	94.9°	19°51.7'	+54.4'	95.2°	19°46.1'	+54.8'	95.6°	19°40.1'	+55.3'	95.9°	19°33.7'	+55.7'	96.3°	16
17	20°59.3'	+52.8'	93.6°	20°55.3'	+53.3'	94.0°	20°50.9'	+53.8'	94.4°	20°46.1'	+54.3'	94.8°	20°40.9'	+54.8'	95.1°	20°35.4'	+55.2'	95.5°	20°29.4'	+55.6'	95.9°	17
18	21°52.1'	+52.7'	93.1°	21°48.6'	+53.2'	93.5°	21°44.7'	+53.7'	93.9°	21°40.4'	+54.2'	94.3°	21°35.7'	+54.7'	94.7°	21°30.6'	+55.2'	95.1°	21°25.1'	+55.6'	95.5°	18
19	22°44.8'	+52.6'	92.6°	22°41.8'	+53.1'	93.0°	22°38.5'	+53.7'	93.4°	22°34.6'	+54.2'	93.8°	22°30.4'	+54.6'	94.3°	22°25.7'	+55.1'	94.7°	22°20.6'	+55.5'	95.1°	19
20	23°37.4'	+52.5'	92.1°	23°35.0'	+53.0'	92.5°	23°32.1'	+53.6'	92.9°	23°28.8'	+54.1'	93.4°	23°25.0'	+54.6'	93.8°	23°20.8'	+55.0'	94.2°	23°16.2'	+55.5'	94.7°	20
21	24°29.8'	+52.4'	91.5°	24°28.0'	+52.9'	92.0°	24°25.7'	+53.5'	92.4°	24°22.9'	+54.0'	92.9°	24°19.6'	+54.5'	93.4°	24°15.8'	+54.9'	93.8°	24°11.6'	+55.4'	94.3°	

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, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of astronomical data for 78° 282° LHA.

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, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of astronomical data for 79° 281° LHA.

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**

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	4°31.3'	+53.6'	98.9°	4°21.9'	+54.1'	99.0°	4°12.5'	+54.5'	99.1°	4°03.0'	+54.9'	99.2°	3°53.4'	+55.4'	99.2°	3°43.8'	+55.7'	99.3°	3°34.1'	+56.1'	99.3°	0
1	5°24.9'	+53.6'	98.5°	5°16.0'	+54.1'	98.6°	5°07.0'	+54.5'	98.7°	4°58.0'	+54.9'	98.7°	4°48.8'	+55.3'	98.8°	4°39.5'	+55.7'	98.9°	4°30.2'	+56.1'	99.0°	1
2	6°18.5'	+53.6'	98.0°	6°10.1'	+54.0'	98.1°	6°01.5'	+54.5'	98.2°	5°52.9'	+54.9'	98.3°	5°44.1'	+55.3'	98.4°	5°35.3'	+55.7'	98.5°	5°26.3'	+56.1'	98.6°	2
3	7°12.1'	+53.5'	97.6°	7°04.1'	+54.0'	97.7°	6°56.0'	+54.5'	97.8°	6°47.8'	+54.9'	97.9°	6°39.4'	+55.3'	98.1°	6°31.0'	+55.7'	98.2°	6°22.4'	+56.1'	98.3°	3
4	8°05.6'	+53.5'	97.1°	7°58.1'	+54.0'	97.3°	7°50.5'	+54.4'	97.4°	7°42.7'	+54.9'	97.5°	7°34.7'	+55.3'	97.7°	7°26.7'	+55.7'	97.8°	7°18.5'	+56.1'	97.9°	4
5	8°59.2'	+53.5'	96.7°	8°52.1'	+54.0'	96.8°	8°44.9'	+54.4'	97.0°	8°37.5'	+54.8'	97.1°	8°30.0'	+55.3'	97.3°	8°22.4'	+55.7'	97.4°	8°14.5'	+56.0'	97.6°	5
6	9°52.6'	+53.4'	96.2°	9°46.1'	+53.9'	96.4°	9°39.3'	+54.4'	96.5°	9°32.4'	+54.8'	96.7°	9°25.3'	+55.2'	96.9°	9°18.0'	+55.6'	97.0°	9°10.6'	+56.0'	97.2°	6
7	10°46.1'	+53.4'	95.7°	10°40.0'	+53.9'	95.9°	10°33.7'	+54.3'	96.1°	10°27.2'	+54.8'	96.3°	10°20.5'	+55.2'	96.5°	10°13.7'	+55.6'	96.7°	10°06.6'	+56.0'	96.8°	7
8	11°39.5'	+53.4'	95.3°	11°33.9'	+53.8'	95.5°	11°28.0'	+54.3'	95.7°	11°22.0'	+54.7'	95.9°	11°15.7'	+55.2'	96.1°	11°09.3'	+55.6'	96.3°	11°02.6'	+56.0'	96.5°	8
9	12°32.8'	+53.3'	94.8°	12°27.7'	+53.8'	95.0°	12°22.3'	+54.3'	95.2°	12°16.7'	+54.7'	95.5°	12°10.9'	+55.1'	95.7°	12°04.9'	+55.5'	95.9°	11°58.6'	+55.9'	96.1°	9
10	13°26.2'	+53.3'	94.3°	13°21.5'	+53.7'	94.6°	13°16.6'	+54.2'	94.8°	13°11.4'	+54.7'	95.0°	13°06.0'	+55.1'	95.3°	13°00.4'	+55.5'	95.5°	12°54.5'	+55.9'	95.7°	10
11	14°19.4'	+53.2'	93.9°	14°15.2'	+53.7'	94.1°	14°10.8'	+54.2'	94.4°	14°06.1'	+54.6'	94.6°	14°01.1'	+55.1'	94.9°	13°55.9'	+55.5'	95.1°	13°50.4'	+55.9'	95.4°	11
12	15°12.6'	+53.1'	93.4°	15°08.9'	+53.6'	93.7°	15°05.0'	+54.1'	93.9°	15°00.7'	+54.6'	94.2°	14°56.2'	+55.0'	94.5°	14°51.4'	+55.4'	94.7°	14°46.3'	+55.8'	95.0°	12
13	16°05.8'	+53.1'	92.9°	16°02.6'	+53.6'	93.2°	15°59.1'	+54.1'	93.5°	15°55.3'	+54.5'	93.8°	15°51.2'	+55.0'	94.0°	15°46.8'	+55.4'	94.3°	15°42.2'	+55.8'	94.6°	13
14	16°58.8'	+53.0'	92.4°	16°56.1'	+53.5'	92.7°	16°53.1'	+54.0'	93.0°	16°49.8'	+54.5'	93.3°	16°46.2'	+54.9'	93.6°	16°42.2'	+55.3'	93.9°	16°38.0'	+55.8'	94.2°	14
15	17°51.8'	+52.9'	91.9°	17°49.7'	+53.4'	92.2°	17°47.1'	+53.9'	92.6°	17°44.3'	+54.4'	92.9°	17°41.1'	+54.9'	93.2°	17°37.6'	+55.3'	93.5°	17°33.7'	+55.7'	93.8°	15
16	18°44.8'	+52.9'	91.4°	18°43.1'	+53.4'	91.8°	18°41.1'	+53.9'	92.1°	18°38.7'	+54.3'	92.4°	18°36.0'	+54.8'	92.8°	18°32.9'	+55.2'	93.1°	18°29.4'	+55.7'	93.4°	16
17	19°37.6'	+52.8'	90.9°	19°36.5'	+53.3'	91.3°	19°34.9'	+53.8'	91.6°	19°33.0'	+54.3'	92.0°	19°30.8'	+54.7'	92.3°	19°28.1'	+55.2'	92.7°	19°25.1'	+55.6'	93.1°	17
18	20°30.4'	+52.7'	90.4°	20°29.8'	+53.2'	90.8°	20°28.7'	+53.7'	91.2°	20°27.3'	+54.2'	91.5°	20°25.5'	+54.7'	91.9°	20°23.3'	+55.1'	92.3°	20°20.7'	+55.6'	92.7°	18
19	21°23.1'	+52.6'	89.9°	21°23.0'	+53.1'	90.3°	21°22.4'	+53.6'	90.7°	21°21.5'	+54.1'	91.1°	21°20.2'	+54.6'	91.5°	21°18.4'	+55.1'	91.9°	21°16.3'	+55.5'	92.3°	19
20	22°15.6'	+52.5'	89.4°	22°16.1'	+53.0'	89.8°	22°16.1'	+53.5'	90.2°	22°15.6'	+54.0'	90.6°	22°14.8'	+54.5'	91.0°	22°13.5'	+55.0'	91.4°	22°11.8'	+55.4'	91.8°	20
21	23°08.1'	+52.4'	88.9°	23°09.1'	+52.9'	89.3°	23°09.6'	+53.5'	89.7°	23°09.7'	+54.0'	90.1°	23°09.3'	+54.5'	90.6°	23°08.5'	+54.9'	91.0°	23°07.2'	+55.4'	91.4°	21
22	24°00.5'	+52.3'	88.3°	24°02.0'	+52.8'	88.8°	24°03.1'	+53.4'	89.2°	24°03.6'	+53.9'	89.7°	24°03.8'	+54.4'	90.1°	24°03.8'	+54.8'	90.6°	24°02.6'	+55.3'	91.0°	22
23	24°52.8'	+52.1'	87.8°	24°54.8'	+52.7'	88.3°	24°56.4'	+53.3'	88.7°	24°57.5'	+53.8'	89.2°	24°58.1'	+54.3'	89.7°	24°58.3'	+54.8'	90.1°	24°57.9'	+55.2'	90.6°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	<b>63</b>			<b>64</b>			<b>65</b>			<b>66</b>			<b>67</b>			<b>68</b>			<b>69</b>			

**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**

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	4°04.4'	+53.6'	98.0°	3°55.9'	+54.0'	98.1°	3°47.4'	+54.5'	98.2°	3°38.9'	+54.9'	98.2°	3°30.3'	+55.3'	98.3°	3°21.6'	+55.7'	98.4°	3°12.8'	+56.1'	98.4°	0
1	4°57.9'	+53.6'	97.6°	4°50.0'	+54.0'	97.7°	4°41.9'	+54.5'	97.7°	4°33.8'	+54.9'	97.8°	4°25.6'	+55.3'	97.9°	4°17.3'	+55.7'	98.0°	4°08.9'	+56.1'	98.1°	1
2	5°51.5'	+53.5'	97.1°	5°44.0'	+54.0'	97.2°	5°36.4'	+54.5'	97.3°	5°28.7'	+54.9'	97.4°	5°20.9'	+55.3'	97.5°	5°13.0'	+55.7'	97.6°	5°05.0'	+56.1'	97.7°	2
3	6°45.1'	+53.5'	96.7°	6°38.0'	+54.0'	96.8°	6°30.9'	+54.4'	96.9°	6°23.6'	+54.9'	97.0°	6°16.2'	+55.3'	97.1°	6°08.7'	+55.7'	97.2°	6°01.1'	+56.1'	97.3°	3
4	7°38.6'	+53.5'	96.2°	7°32.0'	+54.0'	96.4°	7°25.3'	+54.4'	96.5°	7°18.5'	+54.8'	96.6°	7°11.5'	+55.3'	96.7°	7°04.4'	+55.7'	96.9°	6°57.2'	+56.0'	97.0°	4
5	8°32.1'	+53.5'	95.8°	8°26.0'	+53.9'	95.9°	8°19.7'	+54.4'	96.1°	8°13.3'	+54.8'	96.2°	8°06.8'	+55.2'	96.3°	8°00.1'	+55.6'	96.5°	7°53.2'	+56.0'	96.6°	5
6	9°25.5'	+53.4'	95.3°	9°19.9'	+53.9'	95.5°	9°14.1'	+54.4'	95.6°	9°08.1'	+54.8'	95.8°	9°02.0'	+55.2'	95.9°	8°55.7'	+55.6'	96.1°	8°49.2'	+56.0'	96.3°	6
7	10°19.0'	+53.4'	94.8°	10°13.8'	+53.9'	95.0°	10°08.5'	+54.3'	95.2°	10°02.9'	+54.8'	95.4°	9°57.2'	+55.2'	95.6°	9°51.3'	+55.6'	95.7°	9°45.2'	+56.0'	95.9°	7
8	11°12.3'	+53.3'	94.4°	11°07.7'	+53.8'	94.6°	11°02.8'	+54.3'	94.8°	10°57.7'	+54.7'	95.0°	10°52.4'	+55.2'	95.2°	10°46.9'	+55.6'	95.3°	10°41.2'	+56.0'	95.5°	8
9	12°05.7'	+53.3'	93.9°	12°01.5'	+53.8'	94.1°	11°57.1'	+54.2'	94.3°	11°52.4'	+54.7'	94.5°	11°47.6'	+55.1'	94.8°	11°42.5'	+55.5'	95.0°	11°37.2'	+55.9'	95.2°	9
10	12°59.0'	+53.2'	93.4°	12°55.3'	+53.7'	93.7°	12°51.3'	+54.2'	93.9°	12°47.1'	+54.7'	94.1°	12°42.7'	+55.1'	94.3°	12°38.0'	+55.5'	94.6°	12°33.1'	+55.9'	94.8°	10
11	13°52.2'	+53.2'	93.0°	13°49.0'	+53.7'	93.2°	13°45.5'	+54.2'	93.5°	13°41.8'	+54.6'	93.7°	13°37.8'	+55.0'	93.9°	13°33.5'	+55.5'	94.2°	13°29.0'	+55.9'	94.4°	11
12	14°45.4'	+53.1'	92.5°	14°42.7'	+53.6'	92.7°	14°39.7'	+54.1'	93.0°	14°36.4'	+54.6'	93.3°	14°32.8'	+55.0'	93.5°	14°29.0'	+55.4'	93.8°	14°24.9'	+55.8'	94.0°	12
13	15°38.5'	+53.1'	92.0°	15°36.3'	+53.6'	92.3°	15°33.8'	+54.0'	92.6°	15°30.9'	+54.5'	92.8°	15°27.8'	+55.0'	93.1°	15°24.4'	+55.4'	93.4°	15°20.7'	+55.8'	93.7°	13
14	16°31.6'	+53.0'	91.5°	16°29.9'	+53.5'	91.8°	16°27.8'	+54.0'	92.1°	16°25.4'	+54.5'	92.4°	16°22.8'	+54.9'	92.7°	16°19.8'	+55.3'	93.0°	16°16.5'	+55.8'	93.3°	14
15	17°24.6'	+52.9'	91.0°	17°23.4'	+53.4'	91.3°	17°21.8'	+53.9'	91.7°	17°19.9'	+54.4'	92.0°	17°17.7'	+54.9'	92.3°	17°15.1'	+55.3'	92.6°	17°12.3'	+55.7'	92.9°	15
16	18°17.5'	+52.8'	90.5°	18°16.8'	+53.4'	90.9°	18°15.7'	+53.9'	91.2°	18°14.3'	+54.3'	91.5°	18°12.5'	+54.8'	91.9°	18°10.4'	+55.2'	92.2°	18°08.0'	+55.7'	92.5°	16
17	19°10.4'	+52.8'	90.0°	19°10.2'	+53.3'	90.4°	19°09.6'	+53.8'	90.7°	19°08.6'	+54.3'	91.1°	19°07.3'	+54.7'	91.4°	19°05.7'	+55.2'	91.8°	19°03.6'	+55.6'	92.1°	17
18	20°03.1'	+52.7'	89.5°	20°03.4'	+53.2'	89.9°	20°03.4'	+53.7'	90.3°	20°02.9'	+54.2'	90.6°	20°02.1'	+54.7'	91.0°	20°00.8'	+55.1'	91.4°	19°59.2'	+55.6'	91.7°	18
19	20°55.8'	+52.6'	89.0°	20°56.7'	+53.1'	89.4°	20°57.1'	+53.6'	89.8°	20°57.1'	+54.1'	90.2°	20°56.7'	+54.6'	90.5°	20°56.0'	+55.1'	90.9°	20°54.8'	+55.5'	91.3°	19
20	21°48.4'	+52.5'	88.5°	21°49.8'	+53.0'	88.9°	21°50.7'	+53.5'	89.3°	21°51.2'	+54.0'	89.7°	21°51.3'	+54.5'	90.1°	21°51.0'	+55.0'	90.5°	21°50.3'	+55.4'	90.9°	20
21	22°40.9'	+52.4'	88.0°	22°42.8'	+52.9'	88.4°	22°44.3'	+53.5'	88.8°	22°45.3'	+54.0'	89.2°	22°45.9'	+54.5'	89.7°	22°46.0'	+54.9'	90.1°	22°45.7'	+55.4'	90.5°	21
22	23°33.3'	+52.3'	87.4°	23°35.7'	+52.8'	87.9°	23°37.7'	+53.4'	88.3°	23°39.2'	+53.9'	88.8°										

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

82° 278° LHA

Latitude SAME as Declination

82° 278° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	3°37.4'	+53.6'	97.1°	3°29.9'	+54.0'	97.2°	3°22.3'	+54.5'	97.3°	3°14.7'	+54.9'	97.3°	3°07.0'	+55.3'	97.4°	2°59.3'	+55.7'	97.4°	2°51.5'	+56.1'	97.5°	0
1	4°30.9'	+53.5'	96.7°	4°23.9'	+54.0'	96.8°	4°16.8'	+54.5'	96.8°	4°09.6'	+54.9'	96.9°	4°02.3'	+55.3'	97.0°	3°55.0'	+55.7'	97.1°	3°47.6'	+56.1'	97.1°	1
2	5°24.5'	+53.5'	96.2°	5°17.9'	+54.0'	96.3°	5°11.2'	+54.4'	96.4°	5°04.5'	+54.9'	96.5°	4°57.6'	+55.3'	96.6°	4°50.7'	+55.7'	96.7°	4°43.7'	+56.1'	96.8°	2
3	6°18.0'	+53.5'	95.8°	6°11.9'	+54.0'	95.9°	6°05.7'	+54.4'	96.0°	5°59.4'	+54.8'	96.1°	5°52.9'	+55.3'	96.2°	5°46.4'	+55.7'	96.3°	5°39.7'	+56.0'	96.4°	3
4	7°11.5'	+53.5'	95.3°	7°05.8'	+53.9'	95.4°	7°00.1'	+54.4'	95.6°	6°54.2'	+54.8'	95.7°	6°48.2'	+55.2'	95.8°	6°42.1'	+55.6'	95.9°	6°35.8'	+56.0'	96.0°	4
5	8°05.0'	+53.4'	94.9°	7°59.8'	+53.9'	95.0°	7°54.5'	+54.4'	95.1°	7°49.0'	+54.8'	95.3°	7°43.4'	+55.2'	95.4°	7°37.7'	+55.6'	95.6°	7°31.8'	+56.0'	95.7°	5
6	8°58.4'	+53.4'	94.4°	8°53.7'	+53.9'	94.6°	8°48.8'	+54.3'	94.7°	8°43.8'	+54.8'	94.9°	8°38.7'	+55.2'	95.0°	8°33.3'	+55.6'	95.2°	8°27.8'	+56.0'	95.3°	6
7	9°51.8'	+53.4'	93.9°	9°47.6'	+53.8'	94.1°	9°43.2'	+54.3'	94.3°	9°38.6'	+54.7'	94.5°	9°33.9'	+55.2'	94.6°	9°28.9'	+55.6'	94.8°	9°23.8'	+56.0'	95.0°	7
8	10°45.2'	+53.3'	93.5°	10°41.4'	+53.8'	93.7°	10°37.5'	+54.3'	93.9°	10°33.4'	+54.7'	94.0°	10°29.0'	+55.1'	94.2°	10°24.5'	+55.6'	94.4°	10°19.8'	+55.9'	94.6°	8
9	11°38.5'	+53.3'	93.0°	11°35.2'	+53.8'	93.2°	11°31.8'	+54.2'	93.4°	11°28.1'	+54.7'	93.6°	11°24.2'	+55.1'	93.8°	11°20.1'	+55.5'	94.0°	11°15.8'	+55.9'	94.2°	9
10	12°31.8'	+53.2'	92.5°	12°29.0'	+53.7'	92.8°	12°26.0'	+54.2'	93.0°	12°22.8'	+54.6'	93.2°	12°19.3'	+55.1'	93.4°	12°15.6'	+55.5'	93.6°	12°11.7'	+55.9'	93.9°	10
11	13°25.0'	+53.2'	92.1°	13°22.7'	+53.7'	92.3°	13°20.2'	+54.1'	92.5°	13°17.4'	+54.6'	92.8°	13°14.4'	+55.0'	93.0°	13°11.1'	+55.5'	93.2°	13°07.6'	+55.9'	93.5°	11
12	14°18.2'	+53.1'	91.6°	14°16.4'	+53.6'	91.8°	14°14.3'	+54.1'	92.1°	14°12.0'	+54.6'	92.4°	14°09.4'	+55.0'	92.6°	14°06.5'	+55.4'	92.9°	14°03.4'	+55.8'	93.1°	12
13	15°11.3'	+53.1'	91.1°	15°10.0'	+53.6'	91.4°	15°08.4'	+54.0'	91.7°	15°06.6'	+54.5'	91.9°	15°04.4'	+54.9'	92.2°	15°02.0'	+55.4'	92.5°	14°59.2'	+55.8'	92.7°	13
14	16°04.4'	+53.0'	90.6°	16°03.6'	+53.5'	90.9°	16°02.5'	+54.0'	91.2°	16°01.1'	+54.5'	91.5°	15°59.3'	+54.9'	91.8°	15°57.3'	+55.3'	92.1°	15°55.0'	+55.7'	92.3°	14
15	16°57.4'	+52.9'	90.1°	16°57.1'	+53.4'	90.4°	16°56.4'	+53.9'	90.7°	16°55.5'	+54.4'	91.1°	16°54.2'	+54.8'	91.4°	16°52.7'	+55.3'	91.7°	16°50.8'	+55.7'	92.0°	15
16	17°50.3'	+52.8'	89.6°	17°50.5'	+53.4'	90.0°	17°50.4'	+53.9'	90.3°	17°49.9'	+54.3'	90.6°	17°49.1'	+54.8'	90.9°	17°48.0'	+55.2'	91.3°	17°46.5'	+55.7'	91.6°	16
17	18°43.1'	+52.8'	89.1°	18°43.9'	+53.3'	89.5°	18°44.2'	+53.8'	89.8°	18°44.2'	+54.3'	90.2°	18°43.9'	+54.7'	90.5°	18°43.2'	+55.2'	90.8°	18°42.1'	+55.6'	91.2°	17
18	19°35.9'	+52.7'	88.6°	19°37.1'	+53.2'	89.0°	19°38.0'	+53.7'	89.4°	19°38.5'	+54.2'	89.7°	19°38.6'	+54.7'	90.1°	19°38.4'	+55.1'	90.4°	19°37.7'	+55.6'	90.8°	18
19	20°28.6'	+52.6'	88.1°	20°30.4'	+53.1'	88.5°	20°31.7'	+53.6'	88.9°	20°32.7'	+54.1'	89.3°	20°33.3'	+54.6'	89.6°	20°33.5'	+55.1'	90.0°	20°33.3'	+55.5'	90.4°	19
20	21°21.2'	+52.5'	87.6°	21°23.5'	+53.0'	88.0°	21°25.4'	+53.6'	88.4°	21°26.8'	+54.1'	88.8°	21°27.9'	+54.5'	89.2°	21°28.5'	+55.0'	89.6°	21°28.8'	+55.4'	90.0°	20
21	22°13.7'	+52.4'	87.1°	22°16.5'	+52.9'	87.5°	22°18.9'	+53.5'	87.9°	22°20.9'	+54.0'	88.3°	22°22.4'	+54.5'	88.7°	22°23.5'	+54.9'	89.1°	22°24.2'	+55.4'	89.6°	21
22	23°06.1'	+52.3'	86.6°	23°09.5'	+52.8'	87.0°	23°12.4'	+53.4'	87.4°	23°14.9'	+53.9'	87.8°	23°16.9'	+54.4'	88.3°	23°18.5'	+54.9'	88.7°	23°19.6'	+55.3'	89.1°	22
23	23°58.4'	+52.2'	86.0°	24°02.3'	+52.7'	86.5°	24°05.8'	+53.3'	86.9°	24°08.7'	+53.8'	87.4°	24°11.3'	+54.3'	87.8°	24°13.3'	+54.8'	88.3°	24°14.9'	+55.2'	88.7°	23

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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	3°10.3'	+53.5'	96.2°	3°03.7'	+54.0'	96.3°	2°57.1'	+54.4'	96.3°	2°50.5'	+54.9'	96.4°	2°43.8'	+55.3'	96.4°	2°37.0'	+55.7'	96.5°	2°30.2'	+56.1'	96.5°	0
1	4°03.8'	+53.5'	95.8°	3°57.7'	+54.0'	95.9°	3°51.6'	+54.4'	95.9°	3°45.4'	+54.9'	96.0°	3°39.0'	+55.3'	96.1°	3°32.7'	+55.7'	96.1°	3°26.3'	+56.1'	96.2°	1
2	4°57.4'	+53.5'	95.3°	4°51.7'	+54.0'	95.4°	4°46.0'	+54.4'	95.5°	4°40.2'	+54.9'	95.6°	4°34.3'	+55.3'	95.7°	4°28.4'	+55.7'	95.7°	4°22.3'	+56.0'	95.8°	2
3	5°50.9'	+53.5'	94.9°	5°45.7'	+53.9'	95.0°	5°40.4'	+54.4'	95.1°	5°35.1'	+54.8'	95.2°	5°29.6'	+55.3'	95.3°	5°24.0'	+55.7'	95.4°	5°18.4'	+56.0'	95.5°	3
4	6°44.3'	+53.5'	94.4°	6°39.6'	+53.9'	94.5°	6°34.8'	+54.4'	94.7°	6°29.9'	+54.8'	94.8°	6°24.8'	+55.2'	94.9°	6°19.7'	+55.6'	95.0°	6°14.4'	+56.0'	95.1°	4
5	7°37.8'	+53.4'	94.0°	7°33.6'	+53.9'	94.1°	7°29.2'	+54.4'	94.2°	7°24.7'	+54.8'	94.4°	7°20.1'	+55.2'	94.5°	7°15.3'	+55.6'	94.6°	7°10.4'	+56.0'	94.7°	5
6	8°31.2'	+53.4'	93.5°	8°27.5'	+53.9'	93.7°	8°23.6'	+54.3'	93.8°	8°19.5'	+54.8'	94.0°	8°15.3'	+55.2'	94.1°	8°10.9'	+55.6'	94.2°	8°06.4'	+56.0'	94.4°	6
7	9°24.6'	+53.4'	93.0°	9°21.3'	+53.8'	93.2°	9°17.9'	+54.3'	93.4°	9°14.3'	+54.7'	93.5°	9°10.5'	+55.2'	93.7°	9°06.5'	+55.6'	93.9°	9°02.4'	+56.0'	94.0°	7
8	10°18.0'	+53.3'	92.6°	10°15.2'	+53.8'	92.8°	10°12.2'	+54.3'	92.9°	10°09.0'	+54.7'	93.1°	10°05.6'	+55.1'	93.3°	10°02.1'	+55.5'	93.5°	9°58.4'	+55.9'	93.7°	8
9	11°11.3'	+53.3'	92.1°	11°09.0'	+53.8'	92.3°	11°06.4'	+54.2'	92.5°	11°03.7'	+54.7'	92.7°	11°00.8'	+55.1'	92.9°	10°57.6'	+55.5'	93.1°	10°54.3'	+55.9'	93.3°	9
10	12°04.6'	+53.2'	91.6°	12°02.7'	+53.7'	91.9°	12°00.7'	+54.2'	92.1°	11°58.4'	+54.6'	92.3°	11°55.9'	+55.1'	92.5°	11°53.2'	+55.5'	92.7°	11°50.2'	+55.9'	92.9°	10
11	12°57.8'	+53.2'	91.2°	12°56.4'	+53.7'	91.4°	12°54.8'	+54.1'	91.6°	12°53.0'	+54.6'	91.9°	12°50.9'	+55.0'	92.1°	12°48.6'	+55.4'	92.3°	12°46.1'	+55.9'	92.5°	11
12	13°51.0'	+53.1'	90.7°	13°50.1'	+53.6'	90.9°	13°49.0'	+54.1'	91.2°	13°47.6'	+54.5'	91.4°	13°46.0'	+55.0'	91.7°	13°44.1'	+55.4'	91.9°	13°41.9'	+55.8'	92.2°	12
13	14°44.1'	+53.1'	90.2°	14°43.7'	+53.6'	90.5°	14°43.1'	+54.0'	90.7°	14°42.2'	+54.5'	91.0°	14°41.0'	+54.9'	91.3°	14°39.5'	+55.4'	91.5°	14°37.8'	+55.8'	91.8°	13
14	15°37.1'	+53.0'	89.7°	15°37.3'	+53.5'	90.0°	15°37.1'	+54.0'	90.3°	15°36.7'	+54.4'	90.6°	15°35.9'	+54.9'	90.9°	15°34.9'	+55.3'	91.1°	15°33.5'	+55.7'	91.4°	14
15	16°30.1'	+52.9'	89.2°	16°30.8'	+53.4'	89.5°	16°31.1'	+53.9'	89.8°	16°31.1'	+54.4'	90.1°	16°30.8'	+54.8'	90.4°	16°30.2'	+55.3'	90.7°	16°29.3'	+55.7'	91.0°	15
16	17°23.1'	+52.9'	88.8°	17°24.2'	+53.4'	89.1°	17°25.0'	+53.9'	89.4°	17°25.5'	+54.3'	89.7°	17°25.7'	+54.8'	90.0°	17°25.5'	+55.2'	90.3°	17°25.0'	+55.7'	90.6°	16
17	18°15.9'	+52.8'	88.3°	18°17.6'	+53.3'	88.6°	18°18.9'	+53.8'	88.9°	18°19.8'	+54.3'	89.2°	18°20.4'	+54.7'	89.6°	18°20.7'	+55.2'	89.9°	18°20.6'	+55.6'	90.2°	17
18	19°08.7'	+52.7'	87.8°	19°10.9'	+53.2'	88.1°	19°12.7'	+53.7'	88.4°	19°14.1'	+54.2'	88.8°	19°15.2'	+54.7'	89.1°	19°15.9'	+55.1'	89.5°	19°16.2'	+55.6'	89.8°	18
19	20°01.4'	+52.6'	87.2°	20°04.1'	+53.1'	87.6°	20°06.4'	+53.6'	88.0°	20°08.3'	+54.1'	88.3°	20°09.8'	+54.6'	88.7°	20°11.0'	+55.1'	89.1°	20°11.8'	+55.5'	89.4°	19
20	20°54.0'	+52.5'	86.7°	20°57.2'	+53.0'	87.1°	21°00.0'	+53.6'	87.5°	21°02.4'	+54.1'	87.9°	21°04.5'	+54.5'	88.3°	21°06.1'	+55.0'	88.7°	21°07.3'	+55.4'	89.0°	20
21	21°46.5'	+52.4'	86.2°	21°50.2'	+53.0'	86.6°	21°53.6'	+53.5'	87.0°	21°56.5'	+54.0'	87.4°	21°59.0'	+54.5'	87.8°	22°01.1'	+54.9'	88.2°	22°02.7'	+55.4'	88.6°	21
22	22°38.9'	+52.3'	85.7°	22°43.2'	+52.9'	86.1°	22°47.1'	+53.4'	86.5°	22°50.5'	+53.9'	86.9°	22°53.5'	+54.4'	87.4°	22°56.0'	+54.9'	87.8°	22°58.1'	+55.3'	88.2°	22
23	23°31.2'	+52.2'	85.2°	23°36.1'	+52.8'	85.6°	23°40.4'	+53.3'	86.0°	23°44.4'	+53.8'	86.5°	23°47.8'	+54.3'	86.9°	23°50.8'	+54.8'	87.3°	23°			

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

84° 276° LHA

Latitude SAME as Declination

84° 276° LHA

Table with 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of data for 84° 276° LHA. Each cell contains three values: Hc°, d', Z°.

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

Table with 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of data for 85° 275° LHA. Each cell contains three values: Hc°, d', Z°.

85° 275° LHA

Latitude SAME as Declination

85° 275° LHA

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

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

86° 274° LHA

Latitude SAME as Declination

86° 274° LHA

Table with 10 columns (Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of latitude/longitude data for 86° LHA.

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

Table with 10 columns (Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of latitude/longitude data for 87° LHA.

87° 273° LHA

Latitude SAME as Declination

87° 273° LHA

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

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

88° 272° LHA

Latitude SAME as Declination

88° 272° LHA

Table with columns: Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°. Each column contains three sub-columns: Hc°, d', Z°. Rows 0-23 show values for each declination degree.

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: Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°. Each column contains three sub-columns: Hc°, d', Z°. Rows 0-23 show values for each declination degree.

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°	63			64			65			66			67			68			69			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'	+53.5'	90.0°	0°00.0'	+53.9'	90.0°	0°00.0'	+54.4'	90.0°	0°00.0'	+54.8'	90.0°	0°00.0'	+55.2'	90.0°	0°00.0'	+55.6'	90.0°	0°00.0'	+56.0'	90.0°	0
1	0°53.5'	+53.5'	89.5°	0°53.9'	+53.9'	89.6°	0°54.4'	+54.4'	89.6°	0°54.8'	+54.8'	89.6°	0°55.2'	+55.2'	89.6°	0°55.6'	+55.6'	89.6°	0°56.0'	+56.0'	89.6°	1
2	1°46.9'	+53.4'	89.1°	1°47.9'	+53.9'	89.1°	1°48.8'	+54.4'	89.2°	1°49.6'	+54.8'	89.2°	1°50.5'	+55.2'	89.2°	1°51.3'	+55.6'	89.3°	1°52.0'	+56.0'	89.3°	2
3	2°40.4'	+53.4'	88.6°	2°41.8'	+53.9'	88.7°	2°43.1'	+54.4'	88.7°	2°44.4'	+54.8'	88.8°	2°45.7'	+55.2'	88.8°	2°46.9'	+55.6'	88.9°	2°48.0'	+56.0'	88.9°	3
4	3°33.8'	+53.4'	88.2°	3°35.7'	+53.9'	88.2°	3°37.5'	+54.3'	88.3°	3°39.2'	+54.8'	88.4°	3°40.9'	+55.2'	88.4°	3°42.5'	+55.6'	88.5°	3°44.0'	+56.0'	88.6°	4
5	4°27.2'	+53.4'	87.7°	4°29.6'	+53.9'	87.8°	4°31.8'	+54.3'	87.9°	4°34.0'	+54.8'	88.0°	4°36.1'	+55.2'	88.0°	4°38.1'	+55.6'	88.1°	4°40.0'	+56.0'	88.2°	5
6	5°20.6'	+53.4'	87.3°	5°23.5'	+53.9'	87.4°	5°26.2'	+54.3'	87.5°	5°28.8'	+54.8'	87.6°	5°31.3'	+55.2'	87.6°	5°33.7'	+55.6'	87.7°	5°36.0'	+56.0'	87.8°	6
7	6°14.0'	+53.4'	86.8°	6°17.3'	+53.8'	86.9°	6°20.5'	+54.3'	87.0°	6°23.5'	+54.7'	87.1°	6°26.5'	+55.2'	87.3°	6°29.3'	+55.6'	87.4°	6°32.0'	+56.0'	87.5°	7
8	7°07.4'	+53.3'	86.3°	7°11.2'	+53.8'	86.5°	7°14.8'	+54.3'	86.6°	7°18.3'	+54.7'	86.7°	7°21.6'	+55.1'	86.9°	7°24.8'	+55.5'	87.0°	7°27.9'	+55.9'	87.1°	8
9	8°00.7'	+53.3'	85.9°	8°05.0'	+53.8'	86.0°	8°09.0'	+54.2'	86.2°	8°13.0'	+54.7'	86.3°	8°16.8'	+55.1'	86.5°	8°20.4'	+55.5'	86.6°	8°23.9'	+55.9'	86.8°	9
10	8°54.0'	+53.3'	85.4°	8°58.7'	+53.8'	85.6°	9°03.3'	+54.2'	85.7°	9°07.7'	+54.7'	85.9°	9°11.9'	+55.1'	86.1°	9°15.9'	+55.5'	86.2°	9°19.8'	+55.9'	86.4°	10
11	9°47.3'	+53.2'	85.0°	9°52.5'	+53.7'	85.1°	9°57.5'	+54.2'	85.3°	10°02.3'	+54.6'	85.5°	10°07.0'	+55.1'	85.7°	10°11.4'	+55.5'	85.8°	10°15.7'	+55.9'	86.0°	11
12	10°40.5'	+53.2'	84.5°	10°46.2'	+53.7'	84.7°	10°51.7'	+54.1'	84.9°	10°56.9'	+54.6'	85.1°	11°02.0'	+55.0'	85.3°	11°06.9'	+55.4'	85.4°	11°11.5'	+55.8'	85.6°	12
13	11°33.7'	+53.1'	84.0°	11°39.9'	+53.6'	84.2°	11°45.8'	+54.1'	84.4°	11°51.5'	+54.6'	84.6°	11°57.0'	+55.0'	84.8°	12°02.3'	+55.4'	85.1°	12°07.4'	+55.8'	85.3°	13
14	12°26.9'	+53.1'	83.5°	12°33.5'	+53.6'	83.8°	12°39.9'	+54.1'	84.0°	12°46.1'	+54.5'	84.2°	12°52.0'	+55.0'	84.4°	12°57.7'	+55.4'	84.7°	13°03.2'	+55.8'	84.9°	14
15	13°20.0'	+53.0'	83.1°	13°27.1'	+53.5'	83.3°	13°34.0'	+54.0'	83.5°	13°40.6'	+54.5'	83.8°	13°47.0'	+54.9'	84.0°	13°53.1'	+55.3'	84.3°	13°59.0'	+55.7'	84.5°	15
16	14°13.0'	+53.0'	82.6°	14°20.6'	+53.5'	82.8°	14°28.0'	+54.0'	83.1°	14°35.1'	+54.4'	83.3°	14°41.9'	+54.9'	83.6°	14°48.4'	+55.3'	83.9°	14°54.7'	+55.7'	84.1°	16
17	15°06.0'	+52.9'	82.1°	15°14.1'	+53.4'	82.4°	15°21.9'	+53.9'	82.6°	15°29.5'	+54.4'	82.9°	15°36.7'	+54.8'	83.2°	15°43.7'	+55.2'	83.5°	15°50.4'	+55.7'	83.7°	17
18	15°58.9'	+52.9'	81.6°	16°07.5'	+53.4'	81.9°	16°15.8'	+53.8'	82.2°	16°23.9'	+54.3'	82.5°	16°31.6'	+54.8'	82.8°	16°39.0'	+55.2'	83.1°	16°46.1'	+55.6'	83.4°	18
19	16°51.8'	+52.8'	81.1°	17°00.9'	+53.3'	81.4°	17°09.7'	+53.8'	81.7°	17°18.2'	+54.3'	82.0°	17°26.3'	+54.7'	82.3°	17°34.2'	+55.1'	82.7°	17°41.7'	+55.6'	83.0°	19
20	17°44.6'	+52.7'	80.6°	17°54.2'	+53.2'	80.9°	18°03.5'	+53.7'	81.3°	18°12.4'	+54.2'	81.6°	18°21.0'	+54.7'	81.9°	18°29.3'	+55.1'	82.2°	18°37.2'	+55.5'	82.6°	20
21	18°37.3'	+52.6'	80.1°	18°47.4'	+53.1'	80.4°	18°57.2'	+53.6'	80.8°	19°06.6'	+54.1'	81.1°	19°15.7'	+54.6'	81.5°	19°24.4'	+55.0'	81.8°	19°32.8'	+55.5'	82.2°	21
22	19°29.9'	+52.5'	79.6°	19°40.5'	+53.1'	80.0°	19°50.8'	+53.6'	80.3°	20°00.7'	+54.1'	80.7°	20°10.3'	+54.5'	81.0°	20°19.4'	+55.0'	81.4°	20°28.2'	+55.4'	81.8°	22
23	20°22.4'	+52.4'	79.1°	20°33.6'	+53.0'	79.5°	20°44.4'	+53.5'	79.8°	20°54.8'	+54.0'	80.2°	21°04.8'	+54.4'	80.6°	21°14.4'	+54.9'	81.0°	21°23.6'	+55.3'	81.4°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

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°	63			64			65			66			67			68			69			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°27.2'</u>	<u>-53.5'</u>	<u>90.9°</u>	<u>0°26.3'</u>	<u>-53.9'</u>	<u>90.9°</u>	<u>0°25.4'</u>	<u>-54.4'</u>	<u>90.9°</u>	<u>0°24.4'</u>	<u>-54.8'</u>	<u>90.9°</u>	<u>0°23.4'</u>	<u>-55.2'</u>	<u>90.9°</u>	<u>0°22.5'</u>	<u>-55.6'</u>	<u>90.9°</u>	<u>0°21.5'</u>	<u>-56.0'</u>	<u>90.9°</u>	0
1	0°26.2'	+53.5'	88.7°	0°27.6'	+53.9'	88.7°	0°29.0'	+54.4'	88.7°	0°30.4'	+54.8'	88.7°	0°31.8'	+55.2'	88.7°	0°33.2'	+55.6'	88.7°	0°34.5'	+56.0'	88.7°	1
2	1°19.7'	+53.5'	88.2°	1°21.6'	+53.9'	88.2°	1°23.4'	+54.4'	88.2°	1°25.2'	+54.8'	88.3°	1°27.0'	+55.2'	88.3°	1°28.8'	+55.6'	88.3°	1°30.5'	+56.0'	88.3°	2
3	2°13.1'	+53.4'	87.7°	2°15.5'	+53.9'	87.8°	2°17.8'	+54.4'	87.8°	2°20.0'	+54.8'	87.9°	2°22.2'	+55.2'	87.9°	2°24.4'	+55.6'	87.9°	2°26.5'	+56.0'	88.0°	3
4	3°06.6'	+53.4'	87.3°	3°09.4'	+53.9'	87.3°	3°12.1'	+54.4'	87.4°	3°14.8'	+54.8'	87.5°	3°17.5'	+55.2'	87.5°	3°20.0'	+55.6'	87.6°	3°22.5'	+56.0'	87.6°	4
5	4°00.0'	+53.4'	86.8°	4°03.3'	+53.9'	86.9°	4°06.5'	+54.3'	87.0°	4°09.6'	+54.8'	87.0°	4°12.7'	+55.2'	87.1°	4°15.6'	+55.6'	87.2°	4°18.5'	+56.0'	87.3°	5
6	4°53.4'	+53.4'	86.4°	4°57.2'	+53.9'	86.5°	5°00.8'	+54.3'	86.6°	5°04.4'	+54.8'	86.6°	5°07.9'	+55.2'	86.7°	5°11.2'	+55.6'	86.8°	5°14.5'	+56.0'	86.9°	6
7	5°46.8'	+53.4'	85.9°	5°51.1'	+53.9'	86.0°	5°55.2'	+54.3'	86.1°	5°59.2'	+54.7'	86.2°	6°03.1'	+55.2'	86.3°	6°06.8'	+55.6'	86.4°	6°10.5'	+56.0'	86.5°	7
8	6°40.2'	+53.4'	85.5°	6°44.9'	+53.8'	85.6°	6°49.5'	+54.3'	85.7°	6°53.9'	+54.7'	85.8°	6°58.2'	+55.1'	85.9°	7°02.4'	+55.5'	86.1°	7°06.5'	+55.9'	86.2°	8
9	7°33.6'	+53.3'	85.0°	7°38.7'	+53.8'	85.1°	7°43.8'	+54.3'	85.3°	7°48.6'	+54.7'	85.4°	7°53.4'	+55.1'	85.5°	7°58.0'	+55.5'	85.7°	8°02.4'	+55.9'	85.8°	9
10	8°26.9'	+53.3'	84.5°	8°32.5'	+53.8'	84.7°	8°38.0'	+54.2'	84.8°	8°43.3'	+54.7'	85.0°	8°48.5'	+55.1'	85.1°	8°53.5'	+55.5'	85.3°	8°58.3'	+55.9'	85.5°	10
11	9°20.2'	+53.3'	84.1°	9°26.3'	+53.7'	84.2°	9°32.2'	+54.2'	84.4°	9°38.0'	+54.6'	84.6°	9°43.6'	+55.1'	84.7°	9°49.0'	+55.5'	84.9°	9°54.2'	+55.9'	85.1°	11
12	10°13.5'	+53.2'	83.6°	10°20.0'	+53.7'	83.8°	10°26.4'	+54.2'	84.0°	10°32.6'	+54.6'	84.2°	10°38.7'	+55.0'	84.3°	10°44.5'	+55.5'	84.5°	10°50.1'	+55.9'	84.7°	12
13	11°06.7'	+53.2'	83.1°	11°13.7'	+53.7'	83.3°	11°20.6'	+54.1'	83.5°	11°27.3'	+54.6'	83.7°	11°33.7'	+55.0'	83.9°	11°39.9'	+55.4'	84.1°	11°46.0'	+55.8'	84.3°	13
14	11°59.8'	+53.1'	82.7°	12°07.4'	+53.6'	82.9°	12°14.7'	+54.1'	83.1°	12°21.8'	+54.5'	83.3°	12°28.7'	+55.0'	83.5°	12°35.4'	+55.4'	83.7°	12°41.8'	+55.8'	84.0°	14
15	12°53.0'	+53.1'	82.2°	13°01.0'	+53.6'	82.4°	13°08.8'	+54.0'	82.6°	13°16.4'	+54.5'	82.9°	13°23.7'	+54.9'	83.1°	13°30.8'	+55.4'	83.4°	13°37.6'	+55.8'	83.6°	15
16	13°46.0'	+53.0'	81.7°	13°54.6'	+53.5'	82.0°	14°02.8'	+54.0'	82.2°	14°10.9'	+54.4'	82.4°	14°18.6'	+54.9'	82.7°	14°26.1'	+55.3'	83.0°	14°33.3'	+55.7'	83.2°	16
17	14°39.1'	+53.0'	81.2°	14°48.1'	+53.5'	81.5°	14°56.8'	+53.9'	81.7°	15°05.3'	+54.4'	82.0°	15°13.5'	+54.8'	82.3°	15°21.4'	+55.3'	82.6°	15°29.0'	+55.7'	82.8°	17
18	15°32.0'	+52.9'	80.7°	15°41.5'	+53.4'	81.0°	15°50.7'	+53.9'	81.3°	15°59.7'	+54.3'	81.6°	16°08.3'	+54.8'	81.9°	16°16.7'	+55.2'	82.1°	16°24.7'	+55.6'	82.4°	18
19	16°24.9'	+52.8'	80.2°	16°34.9'	+53.3'	80.5°	16°44.6'	+53.8'	80.8°	16°54.0'	+54.3'	81.1°	17°03.1'	+54.7'	81.4°	17°11.9'	+55.2'	81.7°	17°20.4'	+55.6'	82.0°	19
20	17°17.7'	+52.7'	79.8°	17°28.2'	+53.3'	80.1°	17°38.4'	+53.7'	80.4°	17°48.3'	+54.2'	80.7°	17°57.9'	+54.7'	81.0°	18°07.1'	+55.1'	81.3°	18°15.9'	+55.5'	81.7°	20
21	18°10.5'	+52.7'	79.3°	18°21.5'	+53.2'	79.6°	18°32.2'	+53.7'	79.9°	18°42.5'	+54.2'	80.2°	18°52.5'	+54.6'	80.6°	19°02.2'	+55.1'	80.9°	19°11.5'	+55.5'	81.3°	21
22	19°03.1'	+52.6'	78.7°	19°14.7'	+53.1'	79.1°	19°25.9'	+53.6'	79.4°	19°36.7'	+54.1'	79.8°										



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

88° 272° LHA

Latitude CONTRARY to Declination

88° 272° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	0°54.4'	-53.5'	91.8°	0°52.6'	-53.9'	91.8°	0°50.7'	-54.4'	91.8°	0°48.8'	-54.8'	91.8°	0°46.9'	-55.2'	91.8°	0°44.9'	-55.6'	91.9°	0°43.0'	-56.0'	91.9°	0
1	0°01.0'	-53.5'	92.2°	0°01.3'	+53.9'	87.8°	0°03.7'	+54.4'	87.8°	0°06.0'	+54.8'	87.8°	0°08.4'	+55.2'	87.8°	0°10.7'	+55.6'	87.8°	0°13.0'	+56.0'	87.8°	1
2	0°52.5'	+53.5'	87.3°	0°55.3'	+53.9'	87.3°	0°58.1'	+54.4'	87.3°	1°00.8'	+54.8'	87.4°	1°03.6'	+55.2'	87.4°	1°06.3'	+55.6'	87.4°	1°09.0'	+56.0'	87.4°	2
3	1°45.9'	+53.5'	86.9°	1°49.2'	+53.9'	86.9°	1°52.4'	+54.4'	86.9°	1°55.7'	+54.8'	87.0°	1°58.8'	+55.2'	87.0°	2°02.0'	+55.6'	87.0°	2°05.1'	+56.0'	87.1°	3
4	2°39.4'	+53.4'	86.4°	2°43.1'	+53.9'	86.4°	2°46.8'	+54.4'	86.5°	2°50.5'	+54.8'	86.5°	2°54.1'	+55.2'	86.6°	2°57.6'	+55.6'	86.6°	3°01.1'	+56.0'	86.7°	4
5	3°32.8'	+53.4'	85.9°	3°37.0'	+53.9'	86.0°	3°41.2'	+54.4'	86.1°	3°45.3'	+54.8'	86.1°	3°49.3'	+55.2'	86.2°	3°53.2'	+55.6'	86.3°	3°57.1'	+56.0'	86.3°	5
6	4°26.3'	+53.4'	85.5°	4°30.9'	+53.9'	85.6°	4°35.5'	+54.3'	85.6°	4°40.1'	+54.8'	85.7°	4°44.5'	+55.2'	85.8°	4°48.8'	+55.6'	85.9°	4°53.1'	+56.0'	86.0°	6
7	5°19.7'	+53.4'	85.0°	5°24.8'	+53.9'	85.1°	5°29.9'	+54.3'	85.2°	5°34.8'	+54.8'	85.3°	5°39.7'	+55.2'	85.4°	5°44.4'	+55.6'	85.5°	5°49.1'	+56.0'	85.6°	7
8	6°13.1'	+53.4'	84.6°	6°18.7'	+53.8'	84.7°	6°24.2'	+54.3'	84.8°	6°29.6'	+54.7'	84.9°	6°34.9'	+55.2'	85.0°	6°40.0'	+55.6'	85.1°	6°45.0'	+56.0'	85.3°	8
9	7°06.5'	+53.3'	84.1°	7°12.5'	+53.8'	84.2°	7°18.5'	+54.3'	84.4°	7°24.3'	+54.7'	84.5°	7°30.0'	+55.1'	84.6°	7°35.6'	+55.5'	84.8°	7°41.0'	+55.9'	84.9°	9
10	7°59.8'	+53.3'	83.7°	8°06.4'	+53.8'	83.8°	8°12.8'	+54.2'	83.9°	8°19.0'	+54.7'	84.1°	8°25.2'	+55.1'	84.2°	8°31.1'	+55.5'	84.4°	8°36.9'	+55.9'	84.5°	10
11	8°53.1'	+53.3'	83.2°	9°00.2'	+53.8'	83.3°	9°07.0'	+54.2'	83.5°	9°13.7'	+54.7'	83.7°	9°20.3'	+55.1'	83.8°	9°26.6'	+55.5'	84.0°	9°32.8'	+55.9'	84.2°	11
12	9°46.4'	+53.2'	82.7°	9°53.9'	+53.7'	82.9°	10°01.2'	+54.2'	83.1°	10°08.4'	+54.6'	83.2°	10°15.4'	+55.1'	83.4°	10°22.1'	+55.5'	83.6°	10°28.7'	+55.9'	83.8°	12
13	10°39.7'	+53.2'	82.3°	10°47.6'	+53.7'	82.4°	10°55.4'	+54.1'	82.6°	11°03.0'	+54.6'	82.8°	11°10.4'	+55.0'	83.0°	11°17.6'	+55.4'	83.2°	11°24.6'	+55.8'	83.4°	13
14	11°32.9'	+53.2'	81.8°	11°41.3'	+53.6'	82.0°	11°49.6'	+54.1'	82.2°	11°57.6'	+54.6'	82.4°	12°05.4'	+55.0'	82.6°	12°13.0'	+55.4'	82.8°	12°20.4'	+55.8'	83.0°	14
15	12°26.0'	+53.1'	81.3°	12°35.0'	+53.6'	81.5°	12°43.7'	+54.1'	81.8°	12°52.2'	+54.5'	82.0°	13°00.4'	+55.0'	82.2°	13°08.4'	+55.4'	82.4°	13°16.2'	+55.8'	82.7°	15
16	13°19.1'	+53.1'	80.8°	13°28.5'	+53.5'	81.1°	13°37.7'	+54.0'	81.3°	13°46.7'	+54.5'	81.5°	13°55.4'	+54.9'	81.8°	14°03.8'	+55.3'	82.0°	14°12.0'	+55.7'	82.3°	16
17	14°12.2'	+53.0'	80.4°	14°22.1'	+53.5'	80.6°	14°31.8'	+54.0'	80.9°	14°41.2'	+54.4'	81.1°	14°50.3'	+54.9'	81.4°	14°59.1'	+55.3'	81.6°	15°07.7'	+55.7'	81.9°	17
18	15°05.2'	+52.9'	79.9°	15°15.6'	+53.4'	80.1°	15°25.7'	+53.9'	80.4°	15°35.6'	+54.4'	80.7°	15°45.2'	+54.8'	81.0°	15°54.4'	+55.2'	81.2°	16°03.4'	+55.7'	81.5°	18
19	15°58.1'	+52.9'	79.4°	16°09.0'	+53.4'	79.7°	16°19.6'	+53.8'	79.9°	16°29.9'	+54.3'	80.2°	16°40.0'	+54.8'	80.5°	16°49.7'	+55.2'	80.8°	16°59.1'	+55.6'	81.1°	19
20	16°51.0'	+52.8'	78.9°	17°02.4'	+53.3'	79.2°	17°13.5'	+53.8'	79.5°	17°24.3'	+54.3'	79.8°	17°34.7'	+54.7'	80.1°	17°44.9'	+55.1'	80.4°	17°54.7'	+55.6'	80.7°	20
21	17°43.7'	+52.7'	78.4°	17°55.7'	+53.2'	78.7°	18°07.3'	+53.7'	79.0°	18°18.5'	+54.2'	79.3°	18°29.4'	+54.6'	79.7°	18°40.0'	+55.1'	80.0°	18°50.3'	+55.5'	80.3°	21
22	18°36.5'	+52.6'	77.9°	18°48.9'	+53.1'	78.2°	19°01.0'	+53.6'	78.6°	19°12.7'	+54.1'	78.9°	19°24.1'	+54.6'	79.2°	19°35.1'	+55.0'	79.6°	19°45.8'	+55.5'	79.9°	22
23	19°29.1'	+52.6'	77.4°	19°42.0'	+53.1'	77.7°	19°54.6'	+53.6'	78.1°	20°06.8'	+54.1'	78.4°	20°18.7'	+54.5'	78.8°	20°30.1'	+55.0'	79.2°	20°41.2'	+55.4'	79.5°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

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°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	1°21.6'	-53.5'	92.7°	1°18.9'	-53.9'	92.7°	1°16.0'	-54.4'	92.7°	1°13.2'	-54.8'	92.7°	1°10.3'	-55.2'	92.8°	1°07.4'	-55.6'	92.8°	1°04.5'	-56.0'	92.8°	0
1	0°28.2'	-53.5'	93.1°	0°24.9'	-53.9'	93.1°	0°21.6'	-54.4'	93.1°	0°18.4'	-54.8'	93.1°	0°15.1'	-55.2'	93.2°	0°11.8'	-55.6'	93.2°	0°08.5'	-56.0'	93.2°	1
2	0°25.3'	+53.5'	86.4°	0°29.0'	+53.9'	86.4°	0°32.7'	+54.4'	86.4°	0°36.5'	+54.8'	86.4°	0°40.2'	+55.2'	86.5°	0°43.9'	+55.6'	86.5°	0°47.6'	+56.0'	86.5°	2
3	1°18.7'	+53.5'	86.0°	1°23.0'	+53.9'	86.0°	1°27.1'	+54.4'	86.0°	1°31.3'	+54.8'	86.0°	1°35.4'	+55.2'	86.1°	1°39.5'	+55.6'	86.1°	1°43.6'	+56.0'	86.1°	3
4	2°12.2'	+53.5'	85.5°	2°16.9'	+53.9'	85.6°	2°21.5'	+54.4'	85.6°	2°26.1'	+54.8'	85.6°	2°30.7'	+55.2'	85.7°	2°35.2'	+55.6'	85.7°	2°39.6'	+56.0'	85.8°	4
5	3°05.7'	+53.5'	85.1°	3°10.8'	+53.9'	85.1°	3°15.9'	+54.4'	85.2°	3°20.9'	+54.8'	85.2°	3°25.9'	+55.2'	85.3°	3°30.8'	+55.6'	85.3°	3°35.6'	+56.0'	85.4°	5
6	3°59.1'	+53.4'	84.6°	4°04.7'	+53.9'	84.7°	4°10.3'	+54.4'	84.7°	4°15.7'	+54.8'	84.8°	4°21.1'	+55.2'	84.9°	4°26.4'	+55.6'	85.0°	4°31.6'	+56.0'	85.0°	6
7	4°52.6'	+53.4'	84.1°	4°58.6'	+53.9'	84.2°	5°04.6'	+54.3'	84.3°	5°10.5'	+54.8'	84.4°	5°16.3'	+55.2'	84.5°	5°22.0'	+55.6'	84.6°	5°27.6'	+56.0'	84.7°	7
8	5°46.0'	+53.4'	83.7°	5°52.5'	+53.9'	83.8°	5°59.0'	+54.3'	83.9°	6°05.3'	+54.8'	84.0°	6°11.5'	+55.2'	84.1°	6°17.6'	+55.6'	84.2°	6°23.6'	+56.0'	84.3°	8
9	6°39.4'	+53.4'	83.2°	6°46.4'	+53.8'	83.3°	6°53.3'	+54.3'	83.5°	7°00.1'	+54.7'	83.6°	7°06.7'	+55.2'	83.7°	7°13.2'	+55.6'	83.8°	7°19.6'	+55.9'	84.0°	9
10	7°32.8'	+53.3'	82.8°	7°40.2'	+53.8'	82.9°	7°47.6'	+54.3'	83.0°	7°54.8'	+54.7'	83.2°	8°01.8'	+55.1'	83.3°	8°08.8'	+55.5'	83.5°	8°15.5'	+55.9'	83.6°	10
11	8°26.1'	+53.3'	82.3°	8°34.1'	+53.8'	82.5°	8°41.9'	+54.2'	82.6°	8°49.5'	+54.7'	82.8°	8°57.0'	+55.1'	82.9°	9°04.3'	+55.5'	83.1°	9°11.5'	+55.9'	83.2°	11
12	9°19.4'	+53.3'	81.8°	9°27.8'	+53.7'	82.0°	9°36.1'	+54.2'	82.2°	9°44.2'	+54.7'	82.3°	9°52.1'	+55.1'	82.5°	9°59.8'	+55.5'	82.7°	10°07.4'	+55.9'	82.9°	12
13	10°12.7'	+53.2'	81.4°	10°21.6'	+53.7'	81.6°	10°30.3'	+54.2'	81.7°	10°38.8'	+54.6'	81.9°	10°47.2'	+55.0'	82.1°	10°55.3'	+55.5'	82.3°	11°03.2'	+55.9'	82.5°	13
14	11°05.9'	+53.2'	80.9°	11°15.3'	+53.7'	81.1°	11°24.5'	+54.1'	81.3°	11°33.5'	+54.6'	81.5°	11°42.2'	+55.0'	81.7°	11°50.8'	+55.4'	81.9°	11°59.1'	+55.8'	82.1°	14
15	11°59.1'	+53.1'	80.4°	12°09.0'	+53.6'	80.6°	12°18.6'	+54.1'	80.9°	12°28.0'	+54.5'	81.1°	12°37.2'	+55.0'	81.3°	12°46.2'	+55.4'	81.5°	12°54.9'	+55.8'	81.7°	15
16	12°52.3'	+53.1'	80.0°	13°02.6'	+53.6'	80.2°	13°12.7'	+54.0'	80.4°	13°22.6'	+54.5'	80.6°	13°32.2'	+54.9'	80.9°	13°41.6'	+55.4'	81.1°	13°50.7'	+55.8'	81.4°	16
17	13°45.3'	+53.0'	79.5°	13°56.2'	+53.5'	79.7°	14°06.8'	+54.0'	80.0°	14°17.1'	+54.5'	80.2°	14°27.1'	+54.9'	80.5°	14°36.9'	+55.3'	80.7°	14°46.5'	+55.7'	81.0°	17
18	14°38.4'	+53.0'	79.0°	14°49.7'	+53.5'	79.3°	15°00.7'	+53.9'	79.5°	15°11.5'	+54.4'	79.8°	15°22.0'	+54.8'	80.1°	15°32.3'	+55.3'	80.3°	15°42.2'	+55.7'	80.6°	18
19	15°31.4'	+52.9'	78.5°	15°43.2'	+53.4'	78.8°	15°54.7'	+53.9'	79.1°	16°05.9'	+54.3'	79.3°	16°16.9'	+54.8'	79.6°	16°27.5'	+55.2'	79.9°	16°37.9'	+55.6'	80.2°	19
20	16°24.3'	+52.8'	78.0°	16°36.6'	+53.3'	78.3°	16°48.6'	+53.8'	78.6°	17°00.3'	+54.3'	78.9°	17°11.7'	+54.7'	79.2°	17°22.7'	+55.2'	79.5°	17°33.5'	+55.6'	79.8°	20
21	17°17.1'	+52.8'	77.5°	17°29.9'	+53.3'	77.8°	17°42.4'	+53.8'	78.1°	17°54.6'	+54.2'	78.5°	18°06.4'	+54.7'	78.8°	18°17.9'	+55.1'	79.1°	18°29.1'	+55.5'	79.4°	21
22	18°09.9'	+52.7'	77.0°	18°23.2'	+53.2'	77.3°	18°36.2'	+53.7'	77.7°	18°48.8'	+54.2'	78.0°	19°01.1'	+54.6'	78.3°	19°13.0'	+55.1'	78.7°	19°24.6'	+55.5'	79.0°	22
2																						

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

86° 274° LHA

Latitude CONTRARY to Declination

86° 274° LHA

Table with 10 columns (Dec, 63-69, Dec) and 24 rows of latitude/longitude data for 86° 274° LHA.

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 10 columns (Dec, 63-69, Dec) and 24 rows of latitude/longitude data for 85° 275° LHA.

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

Table with 10 columns (Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of celestial coordinates (Hc°, d', Z°).

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

Table with 10 columns (Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of celestial coordinates (Hc°, d', Z°).

97° 263° LHA

Latitude SAME as DECLINATION

97° 263° 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 CONTRARY to Declination

82° 278° LHA

Table with columns for Dec°, 63, 64, 65, 66, 67, 68, 69, and Dec°. Each column contains three sub-columns for Hc°, d', and Z°. Rows are numbered 0 to 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 columns for Dec°, 63, 64, 65, 66, 67, 68, 69, and Dec°. Each column contains three sub-columns for Hc°, d', and Z°. Rows are numbered 0 to 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

Dec°	63			64			65			66			67			68			69			Dec°			
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°				
0	4°31.2'	-53.6'	98.9°	4°21.9'	-54.1'	99.0°	4°12.5'	-54.5'	99.1°	4°03.0'	-55.0'	99.2°	3°53.4'	-55.4'	99.2°	3°43.8'	-55.8'	99.3°	3°34.1'	-56.1'	99.3°	0			
1	3°37.6'	-53.6'	99.4°	3°27.9'	-54.1'	99.4°	3°18.0'	-54.5'	99.5°	3°08.1'	-55.0'	99.6°	2°58.1'	-55.4'	99.6°	2°48.0'	-55.8'	99.7°	2°37.9'	-56.1'	99.7°	1			
2	2°44.0'	-53.7'	99.8°	2°33.7'	-54.1'	99.9°	2°23.4'	-54.5'	99.9°	2°13.1'	-55.0'	100.0°	2°02.7'	-55.4'	100.0°	1°52.3'	-55.8'	100.0°	1°41.8'	-56.1'	100.1°	2			
3	1°50.4'	-53.7'	100.3°	1°39.6'	-54.1'	100.3°	1°28.9'	-54.6'	100.3°	1°18.1'	-55.0'	100.4°	1°07.3'	-55.4'	100.4°	0°56.5'	-55.8'	100.4°	0°45.7'	-56.1'	100.4°	3			
4	0°56.7'	-53.7'	100.7°	<u>0°45.5' -54.1' 100.7°</u>	<u>0°34.3' -54.6' 100.7°</u>	<u>0°23.1' -55.0' 100.8°</u>	<u>0°11.9' -55.4' 100.8°</u>	<u>0°00.7' -55.8' 100.8°</u>	0°10.5'	+56.1'	79.2°	0°08.6'	+54.1'	78.8°	0°20.2'	+54.6'	78.8°	0°31.8'	+55.0'	78.8°	0°43.4'	+55.4'	78.9°	4	
5	<u>0°03.0' -53.7' 101.2°</u>	0°08.6'	+54.1'	78.8°	0°20.2'	+54.6'	78.8°	0°31.8'	+55.0'	78.8°	0°43.4'	+55.4'	78.9°	0°55.0'	+55.8'	78.9°	1°06.6'	+56.1'	78.9°	1°19.1'	+56.6'	78.9°	5		
6	0°50.6'	+53.7'	78.4°	1°02.7'	+54.1'	78.4°	1°14.8'	+54.6'	78.4°	1°26.8'	+55.0'	78.4°	1°38.8'	+55.4'	78.5°	1°50.8'	+55.8'	78.5°	2°02.7'	+56.1'	78.5°	6			
7	1°44.3'	+53.7'	77.9°	1°56.8'	+54.1'	78.0°	2°09.3'	+54.5'	78.0°	2°21.8'	+55.0'	78.0°	2°34.2'	+55.4'	78.1°	2°46.6'	+55.8'	78.1°	2°58.9'	+56.1'	78.2°	7			
8	2°38.0'	+53.6'	77.5°	2°50.9'	+54.1'	77.5°	3°03.9'	+54.5'	77.6°	3°16.7'	+55.0'	77.6°	3°29.6'	+55.4'	77.7°	3°42.3'	+55.7'	77.8°	3°55.0'	+56.1'	77.8°	8			
9	3°31.6'	+53.6'	77.0°	3°45.0'	+54.1'	77.1°	3°58.4'	+54.5'	77.2°	4°11.7'	+54.9'	77.2°	4°24.9'	+55.3'	77.3°	4°38.1'	+55.7'	77.4°	4°51.1'	+56.1'	77.5°	9			
10	4°25.3'	+53.6'	76.6°	4°39.1'	+54.1'	76.7°	4°52.9'	+54.5'	76.7°	5°06.6'	+54.9'	76.8°	5°20.3'	+55.3'	76.9°	5°33.8'	+55.7'	77.0°	5°47.2'	+56.1'	77.1°	10			
11	5°18.9'	+53.6'	76.1°	5°33.2'	+54.1'	76.2°	5°47.4'	+54.5'	76.3°	6°01.6'	+54.9'	76.4°	6°15.6'	+55.3'	76.5°	6°29.5'	+55.7'	76.6°	6°43.3'	+56.1'	76.8°	11			
12	6°12.5'	+53.6'	75.7°	6°27.3'	+54.0'	75.8°	6°41.9'	+54.5'	75.9°	6°56.5'	+54.9'	76.0°	7°10.9'	+55.3'	76.1°	7°25.2'	+55.7'	76.3°	7°39.4'	+56.1'	76.4°	12			
13	7°06.1'	+53.6'	75.2°	7°21.3'	+54.0'	75.4°	7°36.4'	+54.4'	75.5°	7°51.4'	+54.9'	75.6°	8°06.2'	+55.3'	75.8°	8°20.9'	+55.7'	75.9°	8°35.4'	+56.0'	76.0°	13			
14	7°59.6'	+53.5'	74.8°	8°15.3'	+54.0'	74.9°	8°30.8'	+54.4'	75.1°	8°46.2'	+54.8'	75.2°	9°01.5'	+55.2'	75.4°	9°16.6'	+55.6'	75.5°	9°31.5'	+56.0'	75.7°	14			
15	8°53.1'	+53.5'	74.3°	9°09.3'	+53.9'	74.5°	9°25.2'	+54.4'	74.6°	9°41.1'	+54.8'	74.8°	9°56.7'	+55.2'	75.0°	10°12.2'	+55.6'	75.1°	10°27.5'	+56.0'	75.3°	15			
16	9°46.6'	+53.5'	73.9°	10°03.2'	+53.9'	74.0°	10°19.6'	+54.3'	74.2°	10°35.9'	+54.8'	74.4°	10°51.9'	+55.2'	74.6°	11°07.8'	+55.6'	74.8°	11°23.5'	+56.0'	74.9°	16			
17	10°40.1'	+53.4'	73.4°	10°57.1'	+53.9'	73.6°	11°14.0'	+54.3'	73.8°	11°30.6'	+54.7'	74.0°	11°47.1'	+55.2'	74.2°	12°03.4'	+55.6'	74.4°	12°19.4'	+55.9'	74.6°	17			
18	11°33.5'	+53.4'	72.9°	11°51.0'	+53.8'	73.1°	12°08.3'	+54.3'	73.3°	12°25.4'	+54.7'	73.5°	12°42.3'	+55.1'	73.8°	12°58.9'	+55.5'	74.0°	13°15.4'	+55.9'	74.2°	18			
19	12°26.8'	+53.3'	72.5°	12°44.8'	+53.8'	72.7°	13°02.6'	+54.2'	72.9°	13°20.1'	+54.7'	73.1°	13°37.4'	+55.1'	73.4°	13°54.5'	+55.5'	73.6°	14°11.3'	+55.9'	73.8°	19			
20	13°20.2'	+53.3'	72.0°	13°38.6'	+53.7'	72.2°	13°56.8'	+54.2'	72.5°	14°14.7'	+54.6'	72.7°	14°32.5'	+55.0'	72.9°	14°49.9'	+55.4'	73.2°	15°07.1'	+55.8'	73.5°	20			
21	14°13.4'	+53.2'	71.5°	14°32.3'	+53.7'	71.8°	14°51.0'	+54.1'	72.0°	15°09.4'	+54.6'	72.3°	15°27.5'	+55.0'	72.5°	15°45.4'	+55.4'	72.8°	16°03.0'	+55.8'	73.1°	21			
22	15°06.6'	+53.1'	71.0°	15°26.0'	+53.6'	71.3°	15°45.1'	+54.1'	71.6°	16°03.9'	+54.5'	71.8°	16°22.5'	+54.9'	72.1°	16°40.8'	+55.3'	72.4°	16°58.8'	+55.7'	72.7°	22			
23	15°59.8'	+53.1'	70.6°	16°19.6'	+53.6'	70.8°	16°39.2'	+54.0'	71.1°	16°58.4'	+54.5'	71.4°	17°17.4'	+54.9'	71.7°	17°36.1'	+55.3'	72.0°	17°54.5'	+55.7'	72.3°	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°
	63			64			65			66			67			68			69						

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

Dec°	63			64			65			66			67			68			69			Dec°		
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°			
0	4°58.1'	-53.7'	99.8°	4°47.9'	-54.1'	99.9°	4°37.5'	-54.6'	100.0°	4°27.1'	-55.0'	100.1°	4°16.5'	-55.4'	100.1°	4°05.9'	-55.8'	100.2°	3°55.3'	-56.2'	100.3°	0		
1	4°04.4'	-53.7'	100.3°	3°53.8'	-54.1'	100.3°	3°43.0'	-54.6'	100.4°	3°32.1'	-55.0'	100.5°	3°21.1'	-55.4'	100.5°	3°10.2'	-55.8'	100.6°	2°59.1'	-56.2'	100.6°	1		
2	3°10.8'	-53.7'	100.7°	2°59.6'	-54.1'	100.8°	2°48.4'	-54.6'	100.8°	2°37.1'	-55.0'	100.9°	2°25.8'	-55.4'	100.9°	2°14.4'	-55.8'	101.0°	2°02.9'	-56.2'	101.0°	2		
3	2°17.1'	-53.7'	101.2°	2°05.5'	-54.2'	101.2°	1°53.8'	-54.6'	101.2°	1°42.1'	-55.0'	101.3°	1°30.3'	-55.4'	101.3°	1°18.6'	-55.8'	101.3°	1°06.8'	-56.2'	101.3°	3		
4	1°23.4'	-53.7'	101.6°	<u>1°11.3' -54.2' 101.6°</u>	<u>0°59.2' -54.6' 101.7°</u>	<u>0°47.1' -55.0' 101.7°</u>	<u>0°34.9' -55.4' 101.7°</u>	<u>0°22.8' -55.8' 101.7°</u>	0°10.6'	-56.2'	101.7°	0°08.6'	+55.4'	77.9°	0°20.5'	+55.8'	77.9°	0°33.0'	+56.2'	78.0°	0°45.5'	+56.2'	78.0°	4
5	<u>0°29.7' -53.7' 102.1°</u>	<u>0°17.2' -54.2' 102.1°</u>	<u>0°04.6' -54.6' 102.1°</u>	0°50.0'	+54.6'	77.5°	0°50.0'	+54.6'	77.5°	1°02.9'	+55.0'	77.5°	1°15.9'	+55.4'	77.6°	1°28.8'	+55.8'	77.6°	1°41.7'	+56.2'	77.6°	5		
6	0°24.0'	+53.7'	77.5°	0°37.0'	+54.2'	77.5°	0°50.0'	+54.6'	77.5°	1°02.9'	+55.0'	77.5°	1°15.9'	+55.4'	77.6°	1°28.8'	+55.8'	77.6°	1°41.7'	+56.2'	77.6°	6		
7	1°17.7'	+53.7'	77.0°	1°31.2'	+54.2'	77.1°	1°44.6'	+54.6'	77.1°	1°57.9'	+55.0'	77.1°	2°11.3'	+55.4'	77.2°	2°24.6'	+55.8'	77.2°	2°37.9'	+56.2'	77.2°	7		
8	2°11.4'	+53.7'	76.6°	2°25.3'	+54.1'	76.6°	2°39.2'	+54.6'	76.7°	2°52.9'	+55.0'	76.7°	3°06.7'	+55.4'	76.8°	3°20.4'	+55.8'	76.8°	3°34.0'	+56.1'	76.9°	8		
9	3°05.1'	+53.7'	76.2°	3°19.5'	+54.1'	76.2°	3°33.7'	+54.6'	76.3°	3°47.9'	+55.0'	76.3°	4°02.1'	+55.4'	76.4°	4°16.2'	+55.8'	76.5°	4°30.2'	+56.1'	76.5°	9		
10	3°58.8'	+53.7'	75.7°	4°13.6'	+54.1'	75.8°	4°28.3'	+54.6'	75.9°	4°42.9'	+55.0'	75.9°	4°57.5'	+55.4'	76.0°	5°11.9'	+55.8'	76.1°	5°26.3'	+56.1'	76.2°	10		
11	4°52.5'	+53.7'	75.3°	5°07.7'	+54.1'	75.3°	5°22.8'	+54.5'	75.4°	5°37.9'	+55.0'	75.5°	5°52.8'	+55.4'	75.6°	6°07.7'	+55.7'	75.7°	6°22.4'	+56.1'	75.8°	11		
12	5°46.1'	+53.6'	74.8°	6°01.8'	+54.1'	74.9°	6°17.4'	+54.5'	75.0°	6°32.8'	+54.9'	75.1°	6°48.2'	+55.3'	75.2°	7°03.4'	+55.7'	75.4°	7°18.5'	+56.1'	75.5°	12		
13	6°39.8'	+53.6'	74.4°	6°55.9'	+54.1'	74.5°	7°11.9'	+54.5'	74.6°	7°27.8'	+54.9'	74.7°	7°43.5'	+55.3'	74.8°	7°59.1'	+55.7'	75.0°	8°14.6'	+56.1'	75.1°	13		
14	7°33.4'	+53.6'	73.9°	7°49.9'	+54.0'	74.0°	8°06.4'	+54.5'	74.2°	8°22.7'	+54.9'	74.3°	8°38.8'	+55.3'	74.5°	8°54.8'	+55.7'	74.6°	9°10.7'	+56.1'	74.8°	14		
15	8°27.0'	+53.5'	73.5°	8°44.0'	+54.0'	73.6°	9°00.8'	+54.4'	73.7°	9°17.6'	+54.9'	73.9°	9°34.1'	+55.3'	74.1°	9°50.5'	+55.7'	74.2°	10°06.7'	+56.0'	74.4°	15		
16	9°20.5'	+53.5'	73.0°	9°38.0'	+54.0'	73.2°	9°55.3'	+54.4'	73.3°	10°12.4'	+54.8'	73.5°	10°29.4'	+55.2'	73.7°	10°46.2'	+55.6'	73.8°	11°02.8'	+56.0'	74.0°	16		
17	10°14.0'	+53.5'	72.5°	10°31.9'	+53.9'	72.7°	10°49.7'	+54.4'	72.9°	11°07.2'	+54.8'	73.1°	11°24.6'	+55.2'	73.3°	11°41.8'	+55.6'	73.5°	11°58.8'	+56.0'	73.7°	17		
18	11°07.5'	+53.4'	72.1°	11°25.9'	+53.9'	72.3°	11°44.1'	+54.3'	72.5°	12°02.0'	+54.8'	72.7°	12°19.8'	+55.2'	72.9°	12°37.4'	+55.6'	73.1°	12°54.7'	+55.9'	73.3°	18		
19	12°00.9'	+53.4'	71.6°	12°19.8'	+53.8'	71.8°	12°38.4'	+54.3'	72.0°	12°56.8'	+54.7'	72.2°	13°15.0'	+55.1'	72.5°	13°32.9'	+55.5'	72.7°	13°50.7'	+55.9'	72.9°	19		
20	12°54.3'	+53.3'	71.1°	13°13.6'	+53.8'	71.4°	13°32.7'	+54.2'	71.6°	13°51.5'	+54.7'	71.8°	14°10.1'	+55.1'	72.1°	14°28.5'	+55.5'	72.3°	14°46.6'	+55.9'	72.5°	20		
21	13°47.7'	+53.3'	70.7°	14°07.4'	+53.7'	70.9°	14°26.9'	+54.2'	71.1°	14°46.2'	+54.6'	71.4°	15°05.2'	+										

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

**78° 282° LHA**

**Latitude CONTRARY to Declination**

**78° 282° LHA**

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	5°24.9'	-53.7'	100.7°	5°13.8'	-54.2'	100.8°	5°02.5'	-54.6'	100.9°	4°51.1'	-55.0'	101.0°	4°39.6'	-55.4'	101.1°	4°28.0'	-55.8'	101.1°	4°16.4'	-56.2'	101.2°	0
1	4°31.2'	-53.7'	101.2°	4°19.6'	-54.2'	101.2°	4°07.9'	-54.6'	101.3°	3°56.0'	-55.0'	101.4°	3°44.2'	-55.4'	101.5°	3°32.2'	-55.8'	101.5°	3°20.2'	-56.2'	101.6°	1
2	3°37.5'	-53.7'	101.6°	3°25.4'	-54.2'	101.7°	3°13.2'	-54.6'	101.7°	3°01.0'	-55.0'	101.8°	2°48.7'	-55.4'	101.8°	2°36.4'	-55.8'	101.9°	2°24.0'	-56.2'	101.9°	2
3	2°43.8'	-53.7'	102.1°	2°31.2'	-54.2'	102.1°	2°18.6'	-54.6'	102.1°	2°06.0'	-55.0'	102.2°	1°53.3'	-55.4'	102.2°	1°40.6'	-55.8'	102.3°	1°27.8'	-56.2'	102.3°	3
4	1°50.0'	-53.8'	102.5°	1°37.0'	-54.2'	102.5°	1°24.0'	-54.6'	102.6°	1°10.9'	-55.0'	102.6°	0°57.9'	-55.4'	102.6°	<u>0°44.8' -55.8' 102.6°</u>	<u>0°31.6' -56.2' 102.6°</u>					4
5	0°56.3'	-53.8'	103.0°	<u>0°42.8' -54.2' 103.0°</u>			<u>0°29.4' -54.6' 103.0°</u>			<u>0°15.9' -55.0' 103.0°</u>			<u>0°02.4' -55.4' 103.0°</u>			0°11.1'	+55.8'	77.0°	0°24.6'	+56.2'	77.0°	5
6	<u>0°02.5' -53.8' 103.4°</u>			0°11.4'	+54.2'	76.6°	0°25.3'	+54.6'	76.6°	0°39.2'	+55.0'	76.6°	0°53.0'	+55.4'	76.6°	1°06.9'	+55.8'	76.6°	1°20.7'	+56.2'	76.7°	6
7	0°51.2'	+53.8'	76.2°	1°05.6'	+54.2'	76.2°	1°19.9'	+54.6'	76.2°	1°34.2'	+55.0'	76.2°	1°48.5'	+55.4'	76.2°	2°02.7'	+55.8'	76.3°	2°16.9'	+56.2'	76.3°	7
8	1°45.0'	+53.7'	75.7°	1°59.8'	+54.2'	75.7°	2°14.5'	+54.6'	75.8°	2°29.2'	+55.0'	75.8°	2°43.9'	+55.4'	75.9°	2°58.5'	+55.8'	75.9°	3°13.1'	+56.2'	76.0°	8
9	2°38.7'	+53.7'	75.3°	2°54.0'	+54.2'	75.3°	3°09.1'	+54.6'	75.4°	3°24.3'	+55.0'	75.4°	3°39.3'	+55.4'	75.5°	3°54.4'	+55.8'	75.5°	4°09.3'	+56.2'	75.6°	9
10	3°32.5'	+53.7'	74.8°	3°48.1'	+54.2'	74.9°	4°03.8'	+54.6'	75.0°	4°19.3'	+55.0'	75.0°	4°34.8'	+55.4'	75.1°	4°50.2'	+55.8'	75.2°	5°05.5'	+56.2'	75.3°	10
11	4°26.2'	+53.7'	74.4°	4°42.3'	+54.2'	74.5°	4°58.4'	+54.6'	74.5°	5°14.3'	+55.0'	74.6°	5°30.2'	+55.4'	74.7°	5°45.9'	+55.8'	74.8°	6°01.6'	+56.1'	74.9°	11
12	5°19.9'	+53.7'	73.9°	5°36.5'	+54.1'	74.0°	5°52.9'	+54.6'	74.1°	6°09.3'	+55.0'	74.2°	6°25.6'	+55.4'	74.3°	6°41.7'	+55.8'	74.4°	6°57.8'	+56.1'	74.6°	12
13	6°13.6'	+53.7'	73.5°	6°30.6'	+54.1'	73.6°	6°47.5'	+54.5'	73.7°	7°04.3'	+55.0'	73.8°	7°20.9'	+55.4'	73.9°	7°37.5'	+55.7'	74.1°	7°53.9'	+56.1'	74.2°	13
14	7°07.3'	+53.6'	73.0°	7°24.7'	+54.1'	73.2°	7°42.0'	+54.5'	73.3°	7°59.2'	+54.9'	73.4°	8°16.3'	+55.3'	73.6°	8°33.2'	+55.7'	73.7°	8°50.0'	+56.1'	73.8°	14
15	8°00.9'	+53.6'	72.6°	8°18.8'	+54.1'	72.7°	8°36.6'	+54.5'	72.9°	8°54.2'	+54.9'	73.0°	9°11.6'	+55.3'	73.2°	9°28.9'	+55.7'	73.3°	9°46.1'	+56.1'	73.5°	15
16	8°54.5'	+53.6'	72.1°	9°12.9'	+54.0'	72.3°	9°31.0'	+54.5'	72.4°	9°49.1'	+54.9'	72.6°	10°06.9'	+55.3'	72.8°	10°24.6'	+55.7'	72.9°	10°42.1'	+56.0'	73.1°	16
17	9°48.1'	+53.5'	71.7°	10°06.9'	+54.0'	71.8°	10°25.5'	+54.4'	72.0°	10°44.0'	+54.8'	72.2°	11°02.2'	+55.2'	72.4°	11°20.3'	+55.6'	72.6°	11°38.2'	+56.0'	72.8°	17
18	10°41.6'	+53.5'	71.2°	11°00.9'	+54.0'	71.4°	11°19.9'	+54.4'	71.6°	11°38.8'	+54.8'	71.8°	11°57.5'	+55.2'	72.0°	12°15.9'	+55.6'	72.2°	12°34.2'	+56.0'	72.4°	18
19	11°35.2'	+53.5'	70.8°	11°54.8'	+53.9'	70.9°	12°14.3'	+54.3'	71.1°	12°33.6'	+54.8'	71.4°	12°52.7'	+55.2'	71.6°	13°11.5'	+55.6'	71.8°	13°30.2'	+55.9'	72.0°	19
20	12°28.6'	+53.4'	70.3°	12°48.7'	+53.9'	70.5°	13°08.7'	+54.3'	70.7°	13°28.4'	+54.7'	70.9°	13°47.9'	+55.1'	71.2°	14°07.1'	+55.5'	71.4°	14°26.1'	+55.9'	71.6°	20
21	13°22.0'	+53.4'	69.8°	13°42.6'	+53.8'	70.0°	14°03.0'	+54.3'	70.3°	14°23.1'	+54.7'	70.5°	14°43.0'	+55.1'	70.8°	15°02.6'	+55.5'	71.0°	15°22.0'	+55.9'	71.3°	21
22	14°15.4'	+53.3'	69.3°	14°36.4'	+53.8'	69.6°	14°57.2'	+54.2'	69.8°	15°17.8'	+54.6'	70.1°	15°38.1'	+55.0'	70.4°	15°58.1'	+55.4'	70.6°	16°17.9'	+55.8'	70.9°	22
23	15°08.7'	+53.2'	68.9°	15°30.2'	+53.7'	69.1°	15°51.4'	+54.1'	69.4°	16°12.4'	+54.6'	69.7°	16°33.1'	+55.0'	69.9°	16°53.6'	+55.4'	70.2°	17°13.7'	+55.8'	70.5°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

**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**

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	5°51.6'	-53.8'	101.6°	5°39.6'	-54.2'	101.7°	5°27.3'	-54.6'	101.8°	5°15.0'	-55.1'	101.9°	5°02.6'	-55.5'	102.0°	4°50.0'	-55.8'	102.1°	4°37.4'	-56.2'	102.2°	0
1	4°57.9'	-53.8'	102.1°	4°45.4'	-54.2'	102.2°	4°32.7'	-54.6'	102.2°	4°19.9'	-55.1'	102.3°	4°07.1'	-55.5'	102.4°	3°54.2'	-55.8'	102.4°	3°41.2'	-56.2'	102.5°	1
2	4°04.1'	-53.8'	102.5°	3°51.1'	-54.2'	102.6°	3°38.0'	-54.7'	102.6°	3°24.9'	-55.1'	102.7°	3°11.6'	-55.5'	102.8°	2°58.4'	-55.9'	102.8°	2°45.0'	-56.2'	102.9°	2
3	3°10.4'	-53.8'	103.0°	2°56.9'	-54.2'	103.0°	2°43.4'	-54.7'	103.1°	2°29.8'	-55.1'	103.1°	2°16.2'	-55.5'	103.1°	2°02.5'	-55.9'	103.2°	1°48.8'	-56.2'	103.2°	3
4	2°16.6'	-53.8'	103.4°	2°02.7'	-54.2'	103.4°	1°48.7'	-54.7'	103.5°	1°34.7'	-55.1'	103.5°	1°20.7'	-55.5'	103.5°	<u>1°06.6' -55.9' 103.5°</u>	<u>0°52.6' -56.2' 103.6°</u>					4
5	1°22.8'	-53.8'	103.8°	1°08.4'	-54.3'	103.9°	<u>0°54.0' -54.7' 103.9°</u>			<u>0°39.6' -55.1' 103.9°</u>			<u>0°25.2' -55.5' 103.9°</u>			<u>0°10.8' -55.9' 103.9°</u>			0°03.6'	+56.2'	76.1°	5
6	<u>0°29.0' -53.8' 104.3°</u>			<u>0°14.2' -54.3' 104.3°</u>			0°00.6'	+54.7'	75.7°	0°15.5'	+55.1'	75.7°	0°30.3'	+55.5'	75.7°	0°45.1'	+55.9'	75.7°	0°59.9'	+56.2'	75.7°	6
7	0°24.8'	+53.8'	75.3°	0°40.1'	+54.2'	75.3°	0°55.3'	+54.7'	75.3°	1°10.5'	+55.1'	75.3°	1°25.8'	+55.5'	75.3°	1°40.9'	+55.9'	75.4°	1°56.1'	+56.2'	75.4°	7
8	1°18.6'	+53.8'	74.8°	1°34.3'	+54.2'	74.9°	1°50.0'	+54.7'	74.9°	2°05.6'	+55.1'	74.9°	2°21.2'	+55.5'	75.0°	2°36.8'	+55.8'	75.0°	2°52.3'	+56.2'	75.0°	8
9	2°12.4'	+53.8'	74.4°	2°28.6'	+54.2'	74.4°	2°44.7'	+54.7'	74.5°	3°00.7'	+55.1'	74.5°	3°16.7'	+55.5'	74.6°	3°32.6'	+55.8'	74.6°	3°48.5'	+56.2'	74.7°	9
10	3°06.2'	+53.8'	73.9°	3°22.8'	+54.2'	74.0°	3°39.3'	+54.6'	74.1°	3°55.8'	+55.1'	74.1°	4°12.2'	+55.5'	74.2°	4°28.5'	+55.8'	74.3°	4°44.7'	+56.2'	74.3°	10
11	4°00.0'	+53.8'	73.5°	4°17.0'	+54.2'	73.6°	4°34.0'	+54.6'	73.6°	4°50.8'	+55.0'	73.7°	5°07.6'	+55.4'	73.8°	5°24.3'	+55.8'	73.9°	5°40.9'	+56.2'	74.0°	11
12	4°53.8'	+53.8'	73.1°	5°11.2'	+54.2'	73.1°	5°28.6'	+54.6'	73.2°	5°45.9'	+55.0'	73.3°	6°03.0'	+55.4'	73.4°	6°20.1'	+55.8'	73.5°	6°37.1'	+56.2'	73.6°	12
13	5°47.5'	+53.7'	72.6°	6°05.4'	+54.2'	72.7°	6°23.2'	+54.6'	72.8°	6°40.9'	+55.0'	72.9°	6°58.5'	+55.4'	73.0°	7°15.9'	+55.8'	73.2°	7°33.2'	+56.1'	73.3°	13
14	6°41.3'	+53.7'	72.2°	6°59.6'	+54.1'	72.3°	7°17.8'	+54.6'	72.4°	7°35.9'	+55.0'	72.5°	7°53.9'	+55.4'	72.6°	8°11.7'	+55.8'	72.8°	8°29.4'	+56.1'	72.9°	14
15	7°35.0'	+53.7'	71.7°	7°53.8'	+54.1'	71.8°	8°12.4'	+54.5'	72.0°	8°30.9'	+55.0'	72.1°	8°49.2'	+55.4'	72.3°	9°07.5'	+55.7'	72.4°	9°25.5'	+56.1'	72.6°	15
16	8°28.7'	+53.6'	71.3°	8°47.9'	+54.1'	71.4°	9°06.9'	+54.5'	71.6°	9°25.8'	+54.9'	71.7°	9°44.6'	+55.3'	71.9°	10°03.2'	+55.7'	72.0°	10°21.6'	+56.1'	72.2°	16
17	9°22.3'	+53.6'	70.8°	9°42.0'	+54.1'	71.0°	10°01.5'	+54.5'	71.1°	10°20.8'	+54.9'	71.3°	10°39.9'	+55.3'	71.5°	10°58.9'	+55.7'	71.7°	11°17.7'	+56.1'	71.8°	17
18	10°15.9'	+53.6'	70.3°	10°36.0'	+54.0'	70.5°	10°55.9'	+54.4'	70.7°	11°15.7'	+54.9'	70.9°	11°35.2'	+55.3'	71.1°	11°54.6'	+55.7'	71.3°	12°13.8'	+56.0'	71.5°	18
19	11°09.5'	+53.5'	69.9°	11°30.0'	+54.0'	70.1°	11°50.4'	+54.4'	70.3°	12°10.5'	+54.8'	70.5°	12°30.5'	+55.2'	70.7°	12°50.2'	+55.6'	70.9°	13°09.8'	+56.0'	71.1°	19
20	12°03.0'	+53.5'	69.4°	12°24.0'	+53.9'	69.6°	12°44.8'	+54.4'	69.8°	13°05.4'	+54.8'	70.1°	13°25.7'	+55.2'	70.3°	13°45.9'	+55.6'	70.5°	14°05.8'	+56.0'	70.7°	20
21	12°56.5'	+53.4'	69.0°	13°18.0'	+53.9'	69.2°	13°39.2'	+54.3'	69.4°	14°00.2'	+54.7'	69.6°	14°20.9'	+55.2'	69.9°	14°41.4'	+55.5'	70.1°	15°01.7'	+55.9'	70.4°	21
22	13°50.0'	+53.4'	68.5°	14°11.8'	+53.8'	68.7°	14°33.5'</															

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

76° 284° LHA

Latitude CONTRARY to Declination

76° 284° LHA

Table with columns for Dec°, Hc°, d', Z° for values 63-69 and rows 0-23. Includes a summary row at the bottom.

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

Table with columns for Dec°, Hc°, d', Z° for values 63-69 and rows 0-23. Includes a summary row at the bottom.

105° 255° LHA

Latitude SAME as DECLINATION

105° 255° 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 CONTRARY to Declination

74° 286° LHA

Table with 10 columns (Dec, 63-69, Dec) and 28 rows (0-23). Columns 63-69 contain three sub-columns (Hc, d, Z) for each degree. The table provides celestial navigation data for a latitude of 74° 286' LHA.

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 10 columns (Dec, 63-69, Dec) and 28 rows (0-23). Columns 63-69 contain three sub-columns (Hc, d, Z) for each degree. The table provides celestial navigation data for a latitude of 73° 287' LHA.

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 columns for Dec°, Hc°, d', Z° for values 63-69. It lists celestial coordinates for various declinations from 0 to 23 degrees.

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 columns for Dec°, Hc°, d', Z° for values 63-69. It lists celestial coordinates for various declinations from 0 to 23 degrees.

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 columns: Dec°, 63 (Hc°, d', Z°), 64 (Hc°, d', Z°), 65 (Hc°, d', Z°), 66 (Hc°, d', Z°), 67 (Hc°, d', Z°), 68 (Hc°, d', Z°), 69 (Hc°, d', Z°), Dec°. Rows 0-23. Includes values for Hc, d, and Z for each degree.

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 columns: Dec°, 63 (Hc°, d', Z°), 64 (Hc°, d', Z°), 65 (Hc°, d', Z°), 66 (Hc°, d', Z°), 67 (Hc°, d', Z°), 68 (Hc°, d', Z°), 69 (Hc°, d', Z°), Dec°. Rows 0-23. Includes values for Hc, d, and Z for each degree.

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

Table with 9 columns (Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of celestial data. Each column contains Hc°, d', and Z° values.

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

Table with 9 columns (Dec°, 63, 64, 65, 66, 67, 68, 69, Dec°) and 24 rows of celestial data. Each column contains Hc°, d', and Z° values.

113° 247° LHA

Latitude SAME as DECLINATION

113° 247° 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 CONTRARY to Declination

66° 294° LHA

Table with 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of celestial coordinates. Includes sub-headers for Hc, d, Z and various degree/minute/second values.

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

Table with 10 columns (Dec, 63, 64, 65, 66, 67, 68, 69, Dec) and 24 rows of celestial coordinates. Includes sub-headers for Hc, d, Z and various degree/minute/second values.

115° 245° LHA

Latitude SAME as DECLINATION

115° 245° LHA

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

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

**64° 296° LHA**

**Latitude CONTRARY to Declination**

**64° 296° LHA**

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	11°28.7'	-54.6'	113.5°	11°04.8'	-55.0'	113.7°	10°40.6'	-55.4'	113.8°	10°16.3'	-55.7'	114.0°	9°51.8'	-56.1'	114.2°	9°27.1'	-56.4'	114.3°	9°02.3'	-56.7'	114.5°	0
1	10°34.1'	-54.6'	113.9°	10°09.8'	-55.0'	114.1°	9°45.2'	-55.4'	114.2°	9°20.5'	-55.7'	114.4°	8°55.7'	-56.1'	114.5°	8°30.7'	-56.4'	114.7°	8°05.6'	-56.7'	114.8°	1
2	9°39.5'	-54.6'	114.3°	9°14.8'	-55.0'	114.5°	8°49.9'	-55.4'	114.6°	8°24.8'	-55.8'	114.8°	7°59.6'	-56.1'	114.9°	7°34.3'	-56.4'	115.0°	7°08.8'	-56.8'	115.1°	2
3	8°45.0'	-54.7'	114.8°	8°19.8'	-55.0'	114.9°	7°54.5'	-55.4'	115.0°	7°29.0'	-55.8'	115.1°	7°03.5'	-56.1'	115.3°	6°37.8'	-56.5'	115.4°	6°12.1'	-56.8'	115.5°	3
4	7°50.3'	-54.7'	115.2°	7°24.7'	-55.1'	115.3°	6°59.0'	-55.4'	115.4°	6°33.2'	-55.8'	115.5°	6°07.4'	-56.1'	115.6°	5°41.4'	-56.5'	115.7°	5°15.3'	-56.8'	115.8°	4
5	6°55.6'	-54.7'	115.6°	6°29.7'	-55.1'	115.7°	6°03.6'	-55.5'	115.8°	5°37.4'	-55.8'	115.9°	5°11.2'	-56.2'	116.0°	4°44.9'	-56.5'	116.0°	4°18.5'	-56.8'	116.1°	5
6	6°00.9'	-54.7'	116.0°	5°34.6'	-55.1'	116.1°	5°08.1'	-55.5'	116.2°	4°41.6'	-55.8'	116.2°	4°15.1'	-56.2'	116.3°	3°48.4'	-56.5'	116.4°	3°21.7'	-56.8'	116.4°	6
7	5°06.2'	-54.7'	116.4°	4°39.5'	-55.1'	116.5°	4°12.7'	-55.5'	116.6°	3°45.8'	-55.8'	116.6°	3°18.9'	-56.2'	116.7°	2°52.0'	-56.5'	116.7°	2°25.0'	-56.8'	116.8°	7
8	4°11.4'	-54.8'	116.8°	3°44.3'	-55.1'	116.9°	3°17.2'	-55.5'	116.9°	2°50.0'	-55.8'	117.0°	2°22.7'	-56.2'	117.0°	1°55.5'	-56.5'	117.1°	1°28.2'	-56.8'	117.1°	8
9	3°16.7'	-54.8'	117.2°	2°49.2'	-55.1'	117.3°	2°21.7'	-55.5'	117.3°	1°54.1'	-55.8'	117.3°	1°26.6'	-56.2'	117.4°	0°59.0'	-56.5'	117.4°	0°31.4'	-56.8'	117.4°	9
10	2°21.9'	-54.8'	117.6°	1°54.1'	-55.1'	117.7°	1°26.2'	-55.5'	117.7°	0°58.3'	-55.8'	117.7°	0°30.4'	-56.2'	117.7°	0°02.5'	-56.5'	117.7°	0°25.5'	+56.8'	62.3°	10
11	1°27.1'	-54.8'	118.0°	0°58.9'	-55.1'	118.1°	0°30.7'	-55.5'	118.1°	0°02.5'	-55.8'	118.1°	0°25.8'	+56.2'	61.9°	0°54.0'	+56.5'	61.9°	1°22.3'	+56.8'	61.9°	11
12	0°32.4'	-54.8'	118.5°	0°03.8'	-55.1'	118.5°	0°24.8'	+55.5'	61.5°	0°53.4'	+55.8'	61.6°	1°22.0'	+56.2'	61.6°	1°50.5'	+56.5'	61.6°	2°19.1'	+56.8'	61.6°	12
13	0°22.4'	+54.8'	61.1°	0°51.4'	+55.1'	61.1°	1°20.3'	+55.5'	61.2°	1°49.2'	+55.8'	61.2°	2°18.1'	+56.2'	61.2°	2°47.0'	+56.5'	61.3°	3°15.8'	+56.8'	61.3°	13
14	1°17.2'	+54.8'	60.7°	1°46.5'	+55.1'	60.8°	2°15.8'	+55.5'	60.8°	2°45.1'	+55.8'	60.8°	3°14.3'	+56.2'	60.9°	3°43.5'	+56.5'	60.9°	4°12.6'	+56.8'	61.0°	14
15	2°12.0'	+54.8'	60.3°	2°41.6'	+55.1'	60.4°	3°11.3'	+55.5'	60.4°	3°40.9'	+55.8'	60.5°	4°10.5'	+56.2'	60.5°	4°40.0'	+56.5'	60.6°	5°09.4'	+56.8'	60.7°	15
16	3°06.7'	+54.8'	59.9°	3°36.8'	+55.1'	60.0°	4°06.8'	+55.5'	60.0°	4°36.7'	+55.8'	60.1°	5°06.6'	+56.1'	60.2°	5°36.4'	+56.5'	60.2°	6°06.2'	+56.8'	60.3°	16
17	4°01.5'	+54.7'	59.5°	4°31.9'	+55.1'	59.6°	5°02.3'	+55.5'	59.6°	5°32.6'	+55.8'	59.7°	6°02.8'	+56.1'	59.8°	6°32.9'	+56.4'	59.9°	7°02.9'	+56.7'	60.0°	17
18	4°56.2'	+54.7'	59.1°	5°27.0'	+55.1'	59.2°	5°57.7'	+55.4'	59.3°	6°28.3'	+55.8'	59.3°	6°58.9'	+56.1'	59.5°	7°29.3'	+56.4'	59.6°	7°59.7'	+56.7'	59.7°	18
19	5°50.9'	+54.7'	58.7°	6°22.1'	+55.1'	58.8°	6°53.2'	+55.4'	58.9°	7°24.1'	+55.8'	59.0°	7°55.0'	+56.1'	59.1°	8°25.8'	+56.4'	59.2°	8°56.4'	+56.7'	59.3°	19
20	6°45.7'	+54.7'	58.3°	7°17.2'	+55.1'	58.4°	7°48.6'	+55.4'	58.5°	8°19.9'	+55.7'	58.6°	8°51.1'	+56.1'	58.7°	9°22.2'	+56.4'	58.9°	9°53.1'	+56.7'	59.0°	20
21	7°40.3'	+54.7'	57.9°	8°12.2'	+55.0'	58.0°	8°44.0'	+55.4'	58.1°	9°15.6'	+55.7'	58.2°	9°47.2'	+56.0'	58.4°	10°18.6'	+56.3'	58.5°	10°49.8'	+56.7'	58.7°	21
22	8°35.0'	+54.8'	57.4°	9°07.3'	+55.0'	57.6°	9°39.4'	+55.4'	57.7°	10°11.4'	+55.7'	57.9°	10°43.2'	+56.0'	58.0°	11°14.9'	+56.3'	58.2°	11°46.5'	+56.6'	58.3°	22
23	9°29.7'	+54.6'	57.0°	10°02.3'	+55.0'	57.2°	10°34.7'	+55.3'	57.3°	11°07.1'	+55.7'	57.5°	11°39.2'	+56.0'	57.6°	12°11.3'	+56.3'	57.8°	12°43.1'	+56.6'	58.0°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

**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°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	11°53.6'	-54.7'	114.4°	11°28.8'	-55.0'	114.6°	11°03.7'	-55.4'	114.8°	10°38.5'	-55.8'	115.0°	10°13.1'	-56.1'	115.1°	9°47.5'	-56.5'	115.3°	9°21.8'	-56.8'	115.4°	0
1	10°59.0'	-54.7'	114.8°	10°33.7'	-55.1'	115.0°	10°08.3'	-55.4'	115.2°	9°42.7'	-55.8'	115.3°	9°16.9'	-56.2'	115.5°	8°51.0'	-56.5'	115.6°	8°25.0'	-56.8'	115.8°	1
2	10°04.3'	-54.7'	115.3°	9°38.6'	-55.1'	115.4°	9°12.8'	-55.5'	115.6°	8°46.9'	-55.8'	115.7°	8°20.8'	-56.2'	115.8°	7°54.6'	-56.5'	116.0°	7°28.2'	-56.8'	116.1°	2
3	9°09.6'	-54.7'	115.7°	8°43.5'	-55.1'	115.8°	8°17.4'	-55.5'	115.9°	7°51.0'	-55.9'	116.1°	7°24.6'	-56.2'	116.2°	6°58.1'	-56.5'	116.3°	6°31.4'	-56.8'	116.4°	3
4	8°14.9'	-54.8'	116.1°	7°48.4'	-55.2'	116.2°	7°21.9'	-55.5'	116.3°	6°55.2'	-55.9'	116.4°	6°28.4'	-56.2'	116.6°	6°01.5'	-56.5'	116.6°	5°34.6'	-56.8'	116.7°	4
5	7°20.1'	-54.8'	116.5°	6°53.3'	-55.2'	116.6°	6°26.3'	-55.5'	116.7°	5°59.3'	-55.9'	116.8°	5°32.2'	-56.2'	116.9°	5°05.0'	-56.5'	117.0°	4°37.8'	-56.8'	117.1°	5
6	6°25.3'	-54.8'	116.9°	5°58.1'	-55.2'	117.0°	5°30.8'	-55.5'	117.1°	5°03.4'	-55.9'	117.2°	4°36.0'	-56.2'	117.3°	4°02.5'	-56.5'	117.3°	3°40.9'	-56.8'	117.4°	6
7	5°30.5'	-54.8'	117.3°	5°02.9'	-55.2'	117.4°	4°35.3'	-55.6'	117.5°	4°07.5'	-55.9'	117.5°	3°39.8'	-56.2'	117.6°	3°11.9'	-56.6'	117.7°	2°44.1'	-56.9'	117.7°	7
8	4°35.6'	-54.8'	117.7°	4°07.7'	-55.2'	117.8°	3°39.7'	-55.6'	117.9°	3°11.6'	-55.9'	117.9°	2°43.5'	-56.2'	118.0°	2°15.4'	-56.6'	118.0°	1°47.2'	-56.9'	118.0°	8
9	3°40.8'	-54.9'	118.1°	3°12.5'	-55.2'	118.2°	2°44.1'	-55.6'	118.2°	2°15.7'	-55.9'	118.3°	1°47.3'	-56.2'	118.3°	1°18.8'	-56.6'	118.3°	0°50.4'	-56.9'	118.3°	9
10	2°46.0'	-54.9'	118.5°	2°17.3'	-55.2'	118.6°	1°48.6'	-55.6'	118.6°	1°19.8'	-55.9'	118.6°	0°51.1'	-56.2'	118.6°	0°22.3'	-56.6'	118.7°	0°06.5'	+56.9'	61.3°	10
11	1°51.1'	-54.9'	118.9°	1°22.0'	-55.2'	119.0°	0°53.0'	-55.6'	119.0°	0°23.9'	-55.9'	119.0°	0°05.2'	+56.2'	61.0°	0°34.3'	+56.6'	61.0°	1°03.4'	+56.9'	61.0°	11
12	0°56.2'	-54.9'	119.3°	0°26.8'	-55.2'	119.4°	0°02.6'	+55.6'	60.6°	0°32.0'	+55.9'	60.6°	1°01.4'	+56.2'	60.7°	1°30.8'	+56.6'	60.7°	2°00.2'	+56.9'	60.7°	12
13	0°01.3'	-54.9'	119.8°	0°28.4'	+55.2'	60.3°	0°58.2'	+55.6'	60.3°	1°28.0'	+55.9'	60.3°	1°57.7'	+56.2'	60.3°	2°27.4'	+56.5'	60.3°	2°57.1'	+56.8'	60.4°	13
14	0°53.5'	+54.9'	59.8°	1°23.7'	+55.2'	59.9°	1°53.8'	+55.6'	59.9°	2°23.9'	+55.9'	59.9°	2°53.9'	+56.2'	60.0°	3°23.9'	+56.5'	60.0°	3°53.9'	+56.8'	60.1°	14
15	1°48.4'	+54.9'	59.4°	2°18.9'	+55.2'	59.5°	2°49.4'	+55.6'	59.5°	3°19.8'	+55.9'	59.6°	3°50.2'	+56.2'	59.6°	4°20.5'	+56.5'	59.7°	4°50.8'	+56.8'	59.7°	15
16	2°43.3'	+54.9'	59.0°	3°14.1'	+55.2'	59.1°	3°44.9'	+55.6'	59.1°	4°15.7'	+55.9'	59.2°	4°46.4'	+56.2'	59.3°	5°17.0'	+56.5'	59.3°	5°47.6'	+56.8'	59.4°	16
17	3°38.1'	+54.8'	58.6°	4°09.3'	+55.2'	58.7°	4°40.5'	+55.5'	58.8°	5°11.6'	+55.9'	58.8°	5°42.6'	+56.2'	58.9°	6°13.5'	+56.5'	59.0°	6°44.4'	+56.8'	59.1°	17
18	4°33.0'	+54.8'	58.2°	5°04.5'	+55.2'	58.3°	5°36.0'	+55.5'	58.4°	6°07.5'	+55.9'	58.5°	6°38.8'	+56.2'	58.6°	7°10.1'	+56.5'	58.7°	7°41.2'	+56.8'	58.8°	18
19	5°27.8'	+54.8'	57.8°	5°59.7'	+55.2'	57.9°	6°31.6'	+55.5'	58.0°	7°03.3'	+55.8'	58.1°	7°35.0'	+56.2'	58.2°	8°06.5'	+56.5'	58.3°	8°38.0'	+56.8'	58.4°	19
20	6°22.6'	+54.8'	57.4°	6°54.9'	+55.2'	57.5°	7°27.1'	+55.5'	57.6°	7°59.2'	+55.8'	57.7°	8°31.2'	+56.1'	57.8°	9°03.0'	+56.5'	58.0°	9°34.8'	+56.8'	58.1°	20
21	7°17.4'	+54.8'	57.0°	7°50.0'	+55.1'	57.1°	8°22.6'	+55.5'	57.2°	8°55.0'	+55.8'	57.4°	9°27.3'	+56.1'	57.5°	9°59.5'	+56.4'	57.6°	10°31.5'	+56.7'	57.8°	21
22	8°12.2'	+54.7'	56.6°	8°45.2'	+55.1'	56.7°	9°18.0'	+55.4'	56.8°	9°50.8'	+55.8'	57.0°	10°23.4'	+56.1'	57.1°	10°55.9'	+56.4'	57.3°	11°28.3'	+56.7'	57.5°	22
23	9°06.9'	+54.7'	56.2°	9°40.3'	+55.1'	56.3°	10°13.5'	+55.4'	56.5°</													

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

62° 298° LHA

Latitude CONTRARY to Declination

62° 298° LHA

Table with columns for Dec°, Hc°, d', Z° for values 63 through 69. Rows 0-23. Includes underlined values for rows 12-15.

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 columns for Dec°, Hc°, d', Z° for values 63 through 69. Rows 0-23. Includes underlined values for rows 12-15.

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°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	13°07.2'	-54.9'	117.2°	12°39.7'	-55.3'	117.4°	12°11.9'	-55.7'	117.6°	11°44.0'	-56.0'	117.8°	11°16.0'	-56.3'	118.0°	10°47.7'	-56.6'	118.2°	10°19.3'	-56.9'	118.3°	0
1	12°12.3'	-54.9'	117.6°	11°44.4'	-55.3'	117.8°	11°16.3'	-55.7'	118.0°	10°48.0'	-56.0'	118.2°	10°19.6'	-56.4'	118.3°	9°51.1'	-56.7'	118.5°	9°22.4'	-57.0'	118.6°	1
2	11°17.3'	-55.0'	118.0°	10°49.1'	-55.4'	118.2°	10°20.6'	-55.7'	118.4°	9°52.0'	-56.0'	118.5°	9°23.3'	-56.4'	118.7°	8°54.4'	-56.7'	118.8°	8°25.4'	-57.0'	119.0°	2
3	10°22.4'	-55.0'	118.5°	9°53.7'	-55.4'	118.6°	9°24.9'	-55.7'	118.8°	8°56.0'	-56.1'	118.9°	8°26.9'	-56.4'	119.0°	7°57.7'	-56.7'	119.2°	7°28.4'	-57.0'	119.3°	3
4	9°27.4'	-55.0'	118.9°	8°58.3'	-55.4'	119.0°	8°29.2'	-55.8'	119.1°	7°59.9'	-56.1'	119.3°	7°30.5'	-56.4'	119.4°	7°01.0'	-56.7'	119.5°	6°31.5'	-57.0'	119.6°	4
5	8°32.3'	-55.1'	119.3°	8°02.9'	-55.4'	119.4°	7°33.4'	-55.8'	119.5°	7°03.8'	-56.1'	119.6°	6°34.1'	-56.4'	119.7°	6°04.3'	-56.7'	119.8°	5°34.5'	-57.0'	119.9°	5
6	7°37.2'	-55.1'	119.7°	7°07.5'	-55.4'	119.8°	6°37.7'	-55.8'	119.9°	6°07.7'	-56.1'	120.0°	5°37.7'	-56.4'	120.1°	5°07.6'	-56.7'	120.1°	4°37.4'	-57.0'	120.2°	6
7	6°42.2'	-55.1'	120.1°	6°12.1'	-55.5'	120.2°	5°41.9'	-55.8'	120.2°	5°11.6'	-56.1'	120.3°	4°41.3'	-56.4'	120.4°	4°10.9'	-56.7'	120.5°	3°40.4'	-57.0'	120.5°	7
8	5°47.1'	-55.1'	120.5°	5°16.6'	-55.5'	120.5°	4°46.1'	-55.8'	120.6°	4°15.5'	-56.1'	120.7°	3°44.8'	-56.4'	120.7°	3°14.1'	-56.7'	120.8°	2°43.4'	-57.0'	120.8°	8
9	4°51.9'	-55.1'	120.9°	4°21.1'	-55.5'	120.9°	3°50.3'	-55.8'	121.0°	3°19.3'	-56.1'	121.0°	2°48.4'	-56.5'	121.1°	2°17.4'	-56.8'	121.1°	1°46.4'	-57.0'	121.2°	9
10	3°56.8'	-55.1'	121.3°	3°25.6'	-55.5'	121.3°	2°54.4'	-55.8'	121.4°	2°23.2'	-56.1'	121.4°	1°51.9'	-56.5'	121.4°	1°20.6'	-56.8'	121.4°	<u>0°49.3'-57.0' 121.5°</u>			10
11	3°01.6'	-55.2'	121.6°	2°30.1'	-55.5'	121.7°	1°58.6'	-55.8'	121.7°	1°27.1'	-56.2'	121.7°	<u>0°55.5'-56.5' 121.8°</u>			<u>0°23.9'-56.8' 121.8°</u>			0°07.7'	+57.0'	58.2°	11
12	2°06.5'	-55.2'	122.0°	1°34.6'	-55.5'	122.1°	1°02.8'	-55.8'	122.1°	<u>0°30.9'-56.2' 122.1°</u>			0°01.0'	+56.5'	57.9°	0°32.9'	+56.8'	57.9°	1°04.8'	+57.0'	57.9°	12
13	1°11.3'	-55.2'	122.4°	<u>0°39.1'-55.5' 122.4°</u>			<u>0°06.9'-55.8' 122.5°</u>			0°25.3'	+56.2'	57.5°	0°57.4'	+56.5'	57.6°	1°29.6'	+56.8'	57.6°	2°01.8'	+57.0'	57.6°	13
14	<u>0°16.2'-55.2' 122.8°</u>			0°16.4'	+55.5'	57.2°	0°48.9'	+55.8'	57.2°	1°21.4'	+56.2'	57.2°	1°53.9'	+56.5'	57.2°	2°26.4'	+56.7'	57.3°	2°58.8'	+57.0'	57.3°	14
15	0°39.0'	+55.2'	56.8°	1°11.9'	+55.5'	56.8°	1°44.7'	+55.8'	56.8°	2°17.6'	+56.1'	56.8°	2°50.4'	+56.4'	56.9°	3°23.1'	+56.7'	56.9°	3°55.8'	+57.0'	57.0°	15
16	1°34.2'	+55.2'	56.4°	2°07.4'	+55.5'	56.4°	2°40.6'	+55.8'	56.4°	3°13.7'	+56.1'	56.5°	3°46.8'	+56.4'	56.5°	4°19.9'	+56.7'	56.6°	4°52.9'	+57.0'	56.7°	16
17	2°29.3'	+55.2'	56.0°	3°02.9'	+55.5'	56.0°	3°36.4'	+55.8'	56.1°	4°09.8'	+56.1'	56.1°	4°43.2'	+56.4'	56.2°	5°16.6'	+56.7'	56.3°	5°49.9'	+57.0'	56.4°	17
18	3°24.5'	+55.1'	55.6°	3°58.4'	+55.5'	55.7°	4°32.2'	+55.8'	55.7°	5°06.0'	+56.1'	55.8°	5°39.7'	+56.4'	55.9°	6°13.3'	+56.7'	55.9°	6°46.9'	+57.0'	56.0°	18
19	4°19.6'	+55.1'	55.2°	4°53.9'	+55.5'	55.3°	5°28.0'	+55.8'	55.3°	6°02.1'	+56.1'	55.4°	6°36.1'	+56.4'	55.5°	7°10.0'	+56.7'	55.6°	7°43.9'	+57.0'	55.7°	19
20	5°14.8'	+55.1'	54.8°	5°49.3'	+55.5'	54.9°	6°23.8'	+55.8'	55.0°	6°58.2'	+56.1'	55.1°	7°32.5'	+56.4'	55.2°	8°06.7'	+56.7'	55.3°	8°40.8'	+57.0'	55.4°	20
21	6°09.9'	+55.1'	54.4°	6°44.8'	+55.4'	54.5°	7°19.6'	+55.8'	54.6°	7°54.3'	+56.1'	54.7°	8°28.9'	+56.4'	54.8°	9°03.4'	+56.7'	55.0°	9°37.8'	+56.9'	55.1°	21
22	7°05.0'	+55.1'	54.0°	7°40.2'	+55.4'	54.1°	8°15.3'	+55.7'	54.2°	8°50.3'	+56.0'	54.4°	9°25.3'	+56.3'	54.5°	10°00.1'	+56.6'	54.6°	10°34.7'	+56.9'	54.8°	22
23	8°00.1'	+55.1'	53.6°	8°35.6'	+55.4'	53.7°	9°11.1'	+55.7'	53.9°	9°46.4'	+56.0'	54.0°	10°21.6'	+56.3'	54.1°	10°56.7'	+56.6'	54.3°	11°31.7'	+56.9'	54.4°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	<b>63</b>			<b>64</b>			<b>65</b>			<b>66</b>			<b>67</b>			<b>68</b>			<b>69</b>			

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°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	13°31.3'	-55.0'	118.2°	13°02.9'	-55.4'	118.4°	12°34.3'	-55.7'	118.6°	12°05.5'	-56.1'	118.8°	11°36.6'	-56.4'	118.9°	11°07.5'	-56.7'	119.1°	10°38.2'	-57.0'	119.3°	0
1	12°36.3'	-55.0'	118.6°	12°07.5'	-55.4'	118.8°	11°38.6'	-55.8'	119.0°	11°09.5'	-56.1'	119.1°	10°40.2'	-56.4'	119.3°	10°10.7'	-56.7'	119.5°	9°41.2'	-57.0'	119.6°	1
2	11°41.2'	-55.1'	119.0°	11°12.1'	-55.4'	119.2°	10°42.8'	-55.8'	119.3°	10°13.4'	-56.1'	119.5°	9°43.8'	-56.4'	119.6°	9°14.0'	-56.7'	119.8°	8°44.2'	-57.0'	119.9°	2
3	10°46.2'	-55.1'	119.4°	10°16.7'	-55.5'	119.5°	9°47.0'	-55.8'	119.7°	9°17.2'	-56.1'	119.8°	8°47.3'	-56.5'	120.0°	8°17.3'	-56.8'	120.1°	7°47.1'	-57.1'	120.2°	3
4	9°51.1'	-55.1'	119.8°	9°21.2'	-55.5'	119.9°	8°51.2'	-55.8'	120.1°	8°21.1'	-56.2'	120.2°	7°50.9'	-56.5'	120.3°	7°20.5'	-56.8'	120.4°	6°50.1'	-57.1'	120.5°	4
5	8°56.0'	-55.2'	120.2°	8°25.7'	-55.5'	120.3°	7°55.4'	-55.9'	120.4°	7°24.9'	-56.2'	120.6°	6°54.4'	-56.5'	120.7°	6°23.9'	-56.8'	120.8°	5°53.0'	-57.1'	120.9°	5
6	8°00.8'	-55.2'	120.6°	7°40.2'	-55.5'	120.7°	6°59.5'	-55.9'	120.8°	6°28.8'	-56.2'	120.9°	5°57.9'	-56.5'	121.0°	5°27.0'	-56.8'	121.1°	4°55.9'	-57.1'	121.2°	6
7	7°05.6'	-55.2'	121.0°	6°34.7'	-55.6'	121.1°	6°03.7'	-55.9'	121.2°	5°32.6'	-56.2'	121.3°	5°01.4'	-56.5'	121.3°	4°30.2'	-56.8'	121.4°	3°58.8'	-57.1'	121.5°	7
8	6°10.4'	-55.2'	121.4°	5°39.1'	-55.6'	121.5°	5°07.8'	-55.9'	121.5°	4°36.4'	-56.2'	121.6°	4°04.9'	-56.5'	121.7°	3°33.3'	-56.8'	121.7°	3°01.8'	-57.1'	121.8°	8
9	5°15.2'	-55.2'	121.8°	4°43.6'	-55.6'	121.8°	4°11.9'	-55.9'	121.9°	3°40.2'	-56.2'	122.0°	3°08.4'	-56.5'	122.0°	2°36.5'	-56.8'	122.1°	2°04.7'	-57.1'	122.1°	9
10	4°20.0'	-55.2'	122.2°	3°48.0'	-55.6'	122.2°	3°16.0'	-55.9'	122.3°	2°43.9'	-56.2'	122.3°	2°11.8'	-56.5'	122.4°	1°39.7'	-56.8'	122.4°	1°07.6'	-57.1'	122.4°	10
11	3°24.7'	-55.3'	122.6°	2°52.4'	-55.6'	122.6°	2°20.1'	-55.9'	122.6°	1°47.7'	-56.2'	122.7°	1°15.3'	-56.5'	122.7°	<u>0°42.9'-56.8' 122.7°</u>			<u>0°10.5'-57.1' 122.7°</u>			11
12	2°29.5'	-55.3'	122.9°	1°56.8'	-55.6'	123.0°	1°24.2'	-55.9'	123.0°	<u>0°51.5'-56.2' 123.0°</u>			<u>0°18.8'-56.5' 123.0°</u>			0°13.9'	+56.8'	57.0°	0°46.6'	+57.1'	57.0°	12
13	1°34.2'	-55.3'	123.3°	1°01.2'	-55.6'	123.3°	<u>0°28.2'-55.9' 123.4°</u>			0°04.8'	+56.2'	56.6°	0°37.8'	+56.5'	56.6°	1°10.8'	+56.8'	56.7°	1°43.7'	+57.1'	56.7°	13
14	<u>0°38.9'-55.3' 123.7°</u>			<u>0°05.6'-55.6' 123.7°</u>			0°27.7'	+55.9'	56.3°	1°01.0'	+56.2'	56.3°	1°34.3'	+56.5'	56.3°	2°07.6'	+56.8'	56.3°	2°40.8'	+57.1'	56.4°	14
15	0°16.3'	+55.3'	55.9°	0°50.0'	+55.6'	55.9°	1°23.6'	+55.9'	55.9°	1°57.2'	+56.2'	55.9°	2°30.8'	+56.5'	56.0°	3°04.4'	+56.8'	56.0°	3°37.9'	+57.1'	56.1°	15
16	1°11.6'	+55.3'	55.5°	1°45.6'	+55.6'	55.5°	2°19.5'	+55.9'	55.6°	2°53.5'	+56.2'	55.6°	3°27.4'	+56.5'	55.6°	4°01.2'	+56.8'	55.7°	4°35.0'	+57.1'	55.8°	16
17	2°06.9'	+55.3'	55.1°	2°41.2'	+55.6'	55.1°	3°15.5'	+55.9'	55.2°	3°49.7'	+56.2'	55.2°	4°23.9'	+56.5'	55.3°	4°58.0'	+56.8'	55.4°	5°32.1'	+57.1'	55.4°	17
18	3°02.1'	+55.3'	54.7°	3°36.8'	+55.6'	54.8°	4°11.4'	+55.9'	54.8°	4°45.9'	+56.2'	54.9°	5°20.4'	+56.5'	55.0°	5°54.8'	+56.8'	55.0°	6°29.1'	+57.1'	55.1°	18
19	3°57.4'	+55.2'	54.3°	4°32.4'	+55.6'	54.4°	5°07.3'	+55.9'	54.5°	5°42.1'	+56.2'	54.5°	6°16.9'	+56.5'	54.6°	6°51.6'	+56.8'	54.7°	7°26.2'	+57.0'	54.8°	19
20	4°52.6'	+55.2'	53.9°	5°27.9'	+55.6'	54.0°	6°03.1'	+55.9'	54.1°	6°38.3'	+56.2'	54.2°	7°13.4'	+56.5'	54.3°	7°48.3'	+56.8'	54.4°	8°23.2'	+57.0'	54.5°	20
21	5°47.9'	+55.2'	53.5°	6°23.5'	+55.5'	53.6°	6°59.0'	+55.9'	53.7°	7°34.5'	+56.2'	53.8°	8°09.8'	+56.5'	53.9°	8°45.1'	+56.7'	54.1°	9°20.3'	+57.0'	54.2°	21
22	6°43.1'	+55.2'	53.2°	7°19.0'	+55.5'	53.3°	7°54.9'	+55.8														

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

58° 302° LHA

Latitude CONTRARY to Declination

58° 302° LHA

Table with columns for Dec°, Hc°, d', Z° and rows for declination values from 0 to 23. Includes sub-headers 63, 64, 65, 66, 67, 68, 69.

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

Table with columns for Dec°, Hc°, d', Z° and rows for declination values from 0 to 23. Includes sub-headers 63, 64, 65, 66, 67, 68, 69.

123° 237° LHA

Latitude SAME as DECLINATION

123° 237° LHA

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



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

56° 304° LHA

Latitude CONTRARY to Declination

56° 304° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	14°42.3'	-55.3'	121.0°	14°11.4'	-55.6'	121.2°	13°40.2'	-56.0'	121.4°	13°08.8'	-56.3'	121.6°	12°37.2'	-56.6'	121.8°	12°05.5'	-56.9'	122.0°	11°33.6'	-57.2'	122.2°	0
1	13°47.1'	-55.3'	121.4°	13°15.7'	-55.7'	121.6°	12°44.2'	-56.0'	121.8°	12°12.5'	-56.3'	122.0°	11°40.6'	-56.6'	122.2°	11°08.6'	-56.9'	122.3°	10°36.4'	-57.2'	122.5°	1
2	12°51.7'	-55.4'	121.8°	12°20.1'	-55.7'	122.0°	11°48.2'	-56.0'	122.2°	11°16.2'	-56.4'	122.3°	10°44.0'	-56.7'	122.5°	10°11.7'	-56.9'	122.7°	9°39.2'	-57.2'	122.8°	2
3	11°56.4'	-55.4'	122.2°	11°24.4'	-55.7'	122.4°	10°52.2'	-56.1'	122.5°	10°19.8'	-56.4'	122.7°	9°47.3'	-56.7'	122.8°	9°14.7'	-57.0'	123.0°	8°42.0'	-57.2'	123.1°	3
4	11°01.0'	-55.4'	122.6°	10°28.6'	-55.8'	122.7°	9°56.1'	-56.1'	122.9°	9°23.4'	-56.4'	123.0°	8°50.7'	-56.7'	123.2°	8°17.8'	-57.0'	123.3°	7°44.8'	-57.2'	123.4°	4
5	10°05.6'	-55.5'	123.0°	9°32.9'	-55.8'	123.1°	9°00.0'	-56.1'	123.3°	8°27.0'	-56.4'	123.4°	7°54.0'	-56.7'	123.5°	7°20.8'	-57.0'	123.6°	6°47.5'	-57.3'	123.7°	5
6	9°10.1'	-55.5'	123.4°	8°37.1'	-55.8'	123.5°	8°03.9'	-56.1'	123.6°	7°30.6'	-56.4'	123.7°	6°57.3'	-56.7'	123.8°	6°23.8'	-57.0'	123.9°	5°50.3'	-57.3'	124.0°	6
7	8°14.6'	-55.5'	123.8°	7°41.3'	-55.8'	123.9°	7°07.8'	-56.1'	124.0°	6°34.2'	-56.4'	124.1°	6°00.5'	-56.7'	124.2°	5°26.8'	-57.0'	124.2°	4°53.0'	-57.3'	124.3°	7
8	7°19.1'	-55.5'	124.1°	6°45.4'	-55.8'	124.2°	6°11.6'	-56.2'	124.3°	5°37.8'	-56.5'	124.4°	5°03.8'	-56.7'	124.5°	4°29.8'	-57.0'	124.6°	3°55.7'	-57.3'	124.6°	8
9	6°23.6'	-55.5'	124.5°	5°49.6'	-55.9'	124.6°	5°15.5'	-56.2'	124.7°	4°41.3'	-56.5'	124.8°	4°07.1'	-56.8'	124.8°	3°32.8'	-57.0'	124.9°	2°58.4'	-57.3'	124.9°	9
10	5°28.1'	-55.6'	124.9°	4°53.7'	-55.9'	125.0°	4°19.3'	-56.2'	125.0°	3°44.8'	-56.5'	125.1°	3°10.3'	-56.8'	125.1°	2°35.8'	-57.0'	125.2°	2°01.2'	-57.3'	125.2°	10
11	4°32.5'	-55.6'	125.3°	3°57.8'	-55.9'	125.3°	3°23.1'	-56.2'	125.4°	2°48.4'	-56.5'	125.4°	2°13.6'	-56.8'	125.5°	1°38.7'	-57.0'	125.5°	1°03.9'	-57.3'	125.5°	11
12	3°37.0'	-55.6'	125.7°	3°02.0'	-55.9'	125.7°	2°26.9'	-56.2'	125.7°	1°51.9'	-56.5'	125.8°	1°16.8'	-56.8'	125.8°	<u>0°41.7' -57.0' 125.8°</u>	<u>0°06.6' -57.3' 125.8°</u>					12
13	2°41.4'	-55.6'	126.0°	2°06.1'	-55.9'	126.1°	1°30.7'	-56.2'	126.1°	<u>0°55.4' -56.5' 126.1°</u>		<u>0°20.0' -56.8' 126.1°</u>			0°15.3' +57.0' 53.9°			0°50.7' +57.3' 53.9°			13	
14	1°45.8'	-55.6'	126.4°	1°10.2'	-55.9'	126.4°	<u>0°34.5' -56.2' 126.4°</u>			0°01.1' +56.5' 53.6°		0°36.7' +56.8' 53.6°			1°12.4' +57.0' 53.6°			1°48.0' +57.3' 53.6°			14	
15	<u>0°50.2' -55.6' 126.8°</u>	<u>0°14.3' -55.9' 126.8°</u>		0°21.6' +56.2' 53.2°			0°57.6' +56.5' 53.2°			1°33.5' +56.8' 53.2°		2°09.4' +57.0' 53.3°			2°45.3' +57.3' 53.3°			2°45.3' +57.3' 53.3°			15	
16	0°05.4' +55.6' 52.8°	0°41.6' +55.9' 52.8°		1°17.8' +56.2' 52.9°			1°54.1' +56.5' 52.9°			2°30.3' +56.8' 52.9°		3°06.4' +57.0' 52.9°			3°42.6' +57.3' 53.0°			3°42.6' +57.3' 53.0°			16	
17	1°01.0' +55.6' 52.5°	1°37.5' +55.9' 52.5°		2°14.0' +56.2' 52.5°			2°50.5' +56.5' 52.5°			3°27.0' +56.7' 52.6°		4°03.5' +57.0' 52.6°			4°39.8' +57.3' 52.7°			4°39.8' +57.3' 52.7°			17	
18	1°56.5' +55.6' 52.1°	2°33.4' +55.9' 52.1°		3°10.2' +56.2' 52.2°			3°47.0' +56.5' 52.2°			4°23.8' +56.7' 52.3°		5°00.5' +57.0' 52.3°			5°37.1' +57.3' 52.4°			5°37.1' +57.3' 52.4°			18	
19	2°52.1' +55.6' 51.7°	3°29.3' +55.9' 51.8°		4°06.4' +56.2' 51.8°			4°43.5' +56.5' 51.9°			5°20.5' +56.7' 51.9°		5°57.5' +57.0' 52.0°			6°34.4' +57.2' 52.1°			6°34.4' +57.2' 52.1°			19	
20	3°47.7' +55.6' 51.3°	4°25.2' +55.9' 51.4°		5°02.6' +56.2' 51.5°			5°39.9' +56.4' 51.5°			6°17.2' +56.7' 51.6°		6°54.5' +57.0' 51.7°			7°31.6' +57.2' 51.8°			7°31.6' +57.2' 51.8°			20	
21	4°43.3' +55.6' 51.0°	5°21.0' +55.9' 51.0°		5°58.7' +56.1' 51.1°			6°36.4' +56.4' 51.2°			7°14.0' +56.7' 51.3°		7°51.4' +57.0' 51.4°			8°28.9' +57.2' 51.5°			8°28.9' +57.2' 51.5°			21	
22	5°38.8' +55.6' 50.6°	6°16.9' +55.8' 50.7°		6°54.9' +56.1' 50.7°			7°32.8' +56.4' 50.8°			8°10.7' +56.7' 50.9°		8°48.4' +57.0' 51.1°			9°26.1' +57.2' 51.2°			9°26.1' +57.2' 51.2°			22	
23	6°34.3' +55.5' 50.2°	7°12.7' +55.8' 50.3°		7°51.0' +56.1' 50.4°			8°29.2' +56.4' 50.5°			9°07.3' +56.7' 50.6°		9°45.4' +56.9' 50.7°			10°23.3' +57.2' 50.9°			10°23.3' +57.2' 50.9°			23	
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	15°05.6'	-55.4'	122.0°	14°33.8'	-55.7'	122.2°	14°01.7'	-56.1'	122.4°	13°29.5'	-56.4'	122.6°	12°57.0'	-56.7'	122.8°	12°24.5'	-57.0'	123.0°	11°51.7'	-57.2'	123.2°	0
1	14°10.2'	-55.4'	122.4°	13°38.0'	-55.8'	122.6°	13°05.6'	-56.1'	122.8°	12°33.1'	-56.4'	123.0°	12°00.4'	-56.7'	123.1°	11°27.5'	-57.0'	123.3°	10°54.5'	-57.3'	123.5°	1
2	13°14.8'	-55.5'	122.8°	12°42.3'	-55.8'	122.9°	12°09.5'	-56.1'	123.1°	11°36.7'	-56.4'	123.3°	11°03.7'	-56.7'	123.5°	10°30.5'	-57.0'	123.6°	9°57.2'	-57.3'	123.8°	2
3	12°19.3'	-55.5'	123.1°	11°46.5'	-55.8'	123.3°	11°13.4'	-56.2'	123.5°	10°40.2'	-56.5'	123.7°	10°06.9'	-56.7'	123.8°	9°33.5'	-57.0'	123.9°	8°59.9'	-57.3'	124.1°	3
4	11°23.8'	-55.5'	123.5°	10°50.6'	-55.9'	123.7°	10°17.3'	-56.2'	123.8°	9°43.8'	-56.5'	124.0°	9°10.2'	-56.8'	124.1°	8°36.5'	-57.0'	124.3°	8°02.6'	-57.3'	124.4°	4
5	10°28.3'	-55.6'	123.9°	9°54.8'	-55.9'	124.1°	9°21.1'	-56.2'	124.2°	8°47.3'	-56.5'	124.3°	8°13.4'	-56.8'	124.5°	7°39.4'	-57.1'	124.6°	7°05.3'	-57.3'	124.7°	5
6	9°32.7'	-55.6'	124.3°	8°58.9'	-55.8'	124.4°	8°24.9'	-56.2'	124.6°	7°50.8'	-56.5'	124.7°	7°16.6'	-56.8'	124.8°	6°42.3'	-57.1'	124.9°	6°08.0'	-57.3'	125.0°	6
7	8°37.2'	-55.6'	124.7°	8°03.0'	-55.9'	124.8°	7°28.7'	-56.2'	124.9°	6°54.3'	-56.5'	125.0°	6°19.8'	-56.8'	125.1°	5°45.3'	-57.1'	125.2°	5°10.7'	-57.3'	125.3°	7
8	7°41.6'	-55.6'	125.1°	7°07.0'	-55.9'	125.2°	6°32.4'	-56.2'	125.3°	5°57.8'	-56.5'	125.4°	5°23.0'	-56.8'	125.4°	4°48.2'	-57.1'	125.5°	4°13.3'	-57.3'	125.6°	8
9	6°45.9'	-55.6'	125.4°	6°11.1'	-56.0'	125.5°	5°36.2'	-56.3'	125.6°	5°01.2'	-56.5'	125.7°	4°26.2'	-56.8'	125.8°	3°51.1'	-57.1'	125.8°	3°16.0'	-57.3'	125.9°	9
10	5°50.3'	-55.7'	125.8°	5°15.2'	-56.0'	125.9°	4°39.9'	-56.3'	126.0°	4°04.7'	-56.6'	126.0°	3°29.4'	-56.8'	126.1°	2°54.0'	-57.1'	126.1°	2°18.6'	-57.4'	126.2°	10
11	4°54.6'	-55.7'	126.2°	4°19.2'	-56.0'	126.3°	3°43.7'	-56.3'	126.3°	3°08.1'	-56.6'	126.4°	2°32.5'	-56.8'	126.4°	1°56.9'	-57.1'	126.4°	1°21.3'	-57.4'	126.5°	11
12	3°59.0'	-55.7'	126.6°	3°23.2'	-56.0'	126.6°	2°47.4'	-56.3'	126.7°	2°11.6'	-56.6'	126.7°	1°35.7'	-56.8'	126.7°	<u>0°59.8' -57.1' 126.7°</u>	<u>0°23.9' -57.4' 126.7°</u>					12
13	3°03.3'	-55.7'	126.9°	2°27.2'	-56.0'	127.0°	1°51.1'	-56.3'	127.0°	1°15.0'	-56.6'	127.0°	<u>0°38.9' -56.8' 127.0°</u>			<u>0°02.7' -57.1' 127.0°</u>			0°33.4' +57.4' 53.0°			13
14	2°07.6'	-55.7'	127.3°	1°31.2'	-56.0'	127.3°	<u>0°54.8' -56.3' 127.4°</u>			<u>0°18.4' -56.6' 127.4°</u>		0°18.0' +56.8' 52.6°			0°54.4' +57.1' 52.6°			1°30.8' +57.4' 52.7°			14	
15	1°11.9'	-55.7'	127.7°	<u>0°35.2' -56.0' 127.7°</u>			0°01.5' +56.3' 52.3°			0°38.2' +56.6' 52.3°		1°14.8' +56.8' 52.3°			1°51.5' +57.1' 52.3°			2°28.1' +57.3' 52.4°			15	
16	<u>0°16.2' -55.7' 128.1°</u>	0°20.8' +56.0' 51.9°		0°57.8' +56.3' 52.0°			1°34.7' +56.6' 52.0°			2°11.7' +56.8' 52.0°		2°48.6' +57.1' 52.0°			3°25.5' +57.3' 52.1°			3°25.5' +57.3' 52.1°			16	
17	0°39.5' +55.7' 51.6°	1°16.8' +56.0' 51.6°		1°54.0' +56.3' 51.6°			2°31.3' +56.6' 51.6°			3°08.5' +56.8' 51.7°		3°45.7' +57.1' 51.7°			4°22.8' +57.3' 51.8°			4°22.8' +57.3' 51.8°			17	
18	1°35.2' +55.7' 51.2°	2°12.8' +56.0' 51.2°		2°50.3' +56.3' 51.3°			3°27.9' +56.6' 51.3°			4°05.3' +56.8' 51.4°		4°42.8' +57.1' 51.4°			5°20.2' +57.3' 51.5°			5°20.2' +57.3' 51.5°			18	
19	2°30.9' +55.7' 50.8°	3°08.8' +56.0' 50.9°		3°46.6' +56.3' 50.9°			4°24.4' +56.6' 51.0°			5°02.2' +56.8' 51.0°		5°39.9' +57.1' 51.1°			6°17.5' +57.3' 51.2°			6°17.5' +57.3' 51.2°			19	
20	3°26.6' +55.7' 50.5°	4°04.7' +56.0' 50.5°		4°42.9' +56.3' 50.6°																		

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

54° 306° LHA

Latitude CONTRARY to Declination

54° 306° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	15°28.6'	-55.5'	123.9°	14°55.9'	-55.8'	123.1°	14°23.0'	-56.2'	123.4°	13°49.9'	-56.5'	123.6°	13°16.6'	-56.8'	123.8°	12°43.2'	-57.0'	124.0°	12°09.6'	-57.3'	124.1°	0
1	14°33.1'	-55.5'	123.3°	14°00.1'	-55.9'	123.5°	13°26.8'	-56.2'	123.7°	12°53.4'	-56.5'	123.9°	12°19.9'	-56.8'	124.1°	11°46.2'	-57.1'	124.3°	11°12.3'	-57.3'	124.5°	1
2	13°37.5'	-55.6'	123.7°	13°04.2'	-55.9'	123.9°	12°30.7'	-56.2'	124.1°	11°57.0'	-56.5'	124.3°	11°23.1'	-56.8'	124.4°	10°49.1'	-57.1'	124.6°	10°15.0'	-57.3'	124.8°	2
3	12°42.0'	-55.6'	124.1°	12°08.3'	-55.9'	124.3°	11°34.4'	-56.2'	124.4°	11°00.4'	-56.5'	124.6°	10°26.3'	-56.8'	124.8°	9°52.0'	-57.1'	124.9°	9°17.6'	-57.4'	125.0°	3
4	11°46.4'	-55.6'	124.5°	11°12.4'	-56.0'	124.6°	10°38.2'	-56.3'	124.8°	10°03.9'	-56.6'	124.9°	9°29.5'	-56.8'	125.1°	8°54.9'	-57.1'	125.2°	8°20.3'	-57.4'	125.3°	4
5	10°50.8'	-55.7'	124.9°	10°16.4'	-56.0'	125.0°	9°41.9'	-56.3'	125.2°	9°07.3'	-56.6'	125.3°	8°32.6'	-56.9'	125.4°	7°57.8'	-57.1'	125.5°	7°22.9'	-57.4'	125.6°	5
6	9°55.1'	-55.7'	125.2°	9°20.4'	-56.0'	125.4°	8°45.7'	-56.3'	125.5°	8°10.8'	-56.6'	125.6°	7°35.8'	-56.9'	125.7°	7°00.7'	-57.1'	125.8°	6°25.5'	-57.4'	125.9°	6
7	8°59.4'	-55.7'	125.6°	8°24.4'	-56.0'	125.7°	7°49.4'	-56.3'	125.9°	7°14.2'	-56.6'	126.0°	6°38.9'	-56.9'	126.1°	6°03.5'	-57.2'	126.1°	5°28.1'	-57.4'	126.2°	7
8	8°03.7'	-55.7'	126.0°	7°28.4'	-56.0'	126.1°	6°53.0'	-56.3'	126.2°	6°17.6'	-56.6'	126.3°	5°42.0'	-56.9'	126.4°	5°06.4'	-57.2'	126.5°	4°30.7'	-57.4'	126.5°	8
9	7°08.0'	-55.7'	126.4°	6°32.4'	-56.1'	126.5°	5°56.7'	-56.3'	126.5°	5°20.9'	-56.6'	126.6°	4°45.1'	-56.9'	126.7°	4°09.2'	-57.2'	126.8°	3°33.3'	-57.4'	126.8°	9
10	6°12.3'	-55.8'	126.7°	5°36.3'	-56.1'	126.8°	5°00.3'	-56.4'	126.9°	4°24.3'	-56.6'	127.0°	3°48.2'	-56.9'	127.0°	3°12.1'	-57.2'	127.1°	2°35.9'	-57.4'	127.1°	10
11	5°16.5'	-55.8'	127.1°	4°40.3'	-56.1'	127.2°	4°04.0'	-56.4'	127.2°	3°27.7'	-56.6'	127.3°	2°51.3'	-56.9'	127.3°	2°14.9'	-57.2'	127.4°	1°38.5'	-57.4'	127.4°	11
12	4°20.7'	-55.8'	127.5°	3°44.2'	-56.1'	127.5°	3°07.6'	-56.4'	127.6°	2°31.0'	-56.7'	127.6°	1°54.4'	-56.9'	127.6°	1°17.7'	-57.2'	127.7°	<u>0°41.0' -57.4' 127.7°</u>			12
13	3°24.9'	-55.8'	127.8°	2°48.1'	-56.1'	127.9°	2°11.2'	-56.4'	127.9°	1°34.4'	-56.7'	127.9°	0°57.5'	-56.9'	128.0°	<u>0°20.5' -57.2' 128.0°</u>			0°16.4'	+57.4'	52.0°	13
14	2°29.1'	-55.8'	128.2°	1°52.0'	-56.1'	128.2°	1°14.9'	-56.4'	128.3°	<u>0°37.7' -56.7' 128.3°</u>			<u>0°00.5' -56.9' 128.3°</u>			0°36.6'	+57.2'	51.7°	1°13.8'	+57.4'	51.7°	14
15	1°33.3'	-55.8'	128.6°	<u>0°55.9' -56.1' 128.6°</u>			<u>0°18.5' -56.4' 128.6°</u>			0°19.0'	+56.7'	51.4°	0°56.4'	+56.9'	51.4°	1°33.8'	+57.2'	51.4°	2°11.2'	+57.4'	51.4°	15
16	<u>0°37.5' -55.8' 128.9°</u>			0°00.2'	+56.1'	51.0°	0°37.9'	+56.4'	51.1°	1°15.6'	+56.7'	51.1°	1°53.3'	+56.9'	51.1°	2°31.0'	+57.2'	51.1°	3°08.6'	+57.4'	51.2°	16
17	0°18.3'	+55.8'	50.7°	0°56.3'	+56.1'	50.7°	1°34.3'	+56.4'	50.7°	2°12.3'	+56.7'	50.7°	2°50.2'	+56.9'	50.8°	3°28.2'	+57.2'	50.8°	4°06.1'	+57.4'	50.9°	17
18	1°14.1'	+55.8'	50.3°	1°52.4'	+56.1'	50.3°	2°30.7'	+56.4'	50.4°	3°08.9'	+56.6'	50.4°	3°47.1'	+56.9'	50.5°	4°25.3'	+57.2'	50.5°	5°03.5'	+57.4'	50.6°	18
19	2°09.9'	+55.8'	50.0°	2°48.5'	+56.1'	50.0°	3°27.0'	+56.4'	50.0°	4°05.6'	+56.6'	50.1°	4°44.1'	+56.9'	50.1°	5°22.5'	+57.1'	50.2°	6°00.9'	+57.4'	50.3°	19
20	3°05.7'	+55.8'	49.6°	3°44.6'	+56.1'	49.6°	4°23.4'	+56.4'	49.7°	5°02.2'	+56.6'	49.7°	5°40.9'	+56.9'	49.8°	6°19.6'	+57.1'	49.9°	6°58.2'	+57.4'	50.0°	20
21	4°01.5'	+55.8'	49.2°	4°40.6'	+56.1'	49.3°	5°19.8'	+56.3'	49.3°	5°58.8'	+56.6'	49.4°	6°37.8'	+56.9'	49.5°	7°16.8'	+57.1'	49.6°	7°55.6'	+57.4'	49.7°	21
22	4°57.3'	+55.8'	48.8°	5°36.7'	+56.1'	48.9°	6°16.1'	+56.3'	49.0°	6°55.4'	+56.6'	49.1°	7°34.7'	+56.9'	49.2°	8°13.9'	+57.1'	49.3°	8°53.0'	+57.4'	49.4°	22
23	5°53.0'	+55.8'	48.5°	6°32.8'	+56.0'	48.6°	7°12.4'	+56.3'	48.6°	7°52.0'	+56.6'	48.7°	8°31.6'	+56.8'	48.9°	9°11.0'	+57.1'	49.0°	9°50.3'	+57.3'	49.1°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

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°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	15°51.3'	-55.6'	123.9°	15°17.8'	-55.9'	124.1°	14°44.1'	-56.2'	124.3°	14°10.1'	-56.5'	124.5°	13°36.0'	-56.8'	124.7°	13°01.7'	-57.1'	124.9°	12°27.3'	-57.4'	125.1°	0
1	14°55.7'	-55.6'	124.3°	14°21.9'	-56.0'	124.5°	13°47.8'	-56.3'	124.7°	13°13.6'	-56.6'	124.9°	12°39.2'	-56.9'	125.1°	12°04.6'	-57.1'	125.3°	11°29.9'	-57.4'	125.4°	1
2	14°00.1'	-55.7'	124.7°	13°25.9'	-56.0'	124.9°	12°51.5'	-56.3'	125.0°	12°17.0'	-56.6'	125.2°	11°42.3'	-56.9'	125.4°	11°07.5'	-57.2'	125.6°	10°32.5'	-57.4'	125.7°	2
3	13°04.5'	-55.7'	125.0°	12°29.9'	-56.0'	125.2°	11°55.2'	-56.3'	125.4°	11°20.4'	-56.6'	125.6°	10°45.4'	-56.9'	125.7°	10°10.3'	-57.2'	125.9°	9°35.1'	-57.4'	126.0°	3
4	12°08.7'	-55.7'	125.4°	11°33.9'	-56.1'	125.6°	10°58.9'	-56.4'	125.8°	10°23.8'	-56.6'	125.9°	9°48.5'	-56.9'	126.0°	9°13.2'	-57.2'	126.2°	8°37.7'	-57.4'	126.3°	4
5	11°13.0'	-55.8'	125.8°	10°37.8'	-56.1'	126.0°	10°02.6'	-56.4'	126.1°	9°27.1'	-56.7'	126.2°	8°51.6'	-56.9'	126.5°	8°16.0'	-57.2'	126.5°	7°40.3'	-57.4'	126.6°	5
6	10°17.2'	-55.8'	126.2°	9°41.8'	-56.1'	126.3°	9°06.2'	-56.4'	126.4°	8°30.5'	-56.7'	126.6°	7°54.7'	-57.0'	126.7°	7°18.8'	-57.2'	126.8°	6°42.8'	-57.5'	126.9°	6
7	9°21.5'	-55.8'	126.5°	8°45.7'	-56.1'	126.7°	8°09.8'	-56.4'	126.8°	7°33.8'	-56.7'	126.9°	6°57.7'	-57.0'	127.0°	6°21.6'	-57.2'	127.1°	5°45.3'	-57.5'	127.2°	7
8	8°25.6'	-55.8'	126.9°	7°49.6'	-56.1'	127.0°	7°13.4'	-56.4'	127.1°	6°37.1'	-56.7'	127.2°	6°00.8'	-57.0'	127.3°	5°24.4'	-57.2'	127.4°	4°47.9'	-57.5'	127.5°	8
9	7°29.8'	-55.9'	127.3°	6°53.4'	-56.2'	127.4°	6°16.9'	-56.4'	127.5°	5°40.4'	-56.7'	127.6°	5°03.8'	-57.0'	127.6°	4°27.1'	-57.2'	127.7°	3°50.4'	-57.5'	127.8°	9
10	6°34.0'	-55.9'	127.7°	5°57.3'	-56.2'	127.7°	5°20.5'	-56.5'	127.8°	4°43.7'	-56.7'	127.9°	4°06.8'	-57.0'	128.0°	3°29.9'	-57.2'	128.0°	2°52.9'	-57.5'	128.0°	10
11	5°38.1'	-55.9'	128.0°	5°01.1'	-56.2'	128.1°	4°24.0'	-56.5'	128.2°	3°47.0'	-56.7'	128.2°	3°09.8'	-57.0'	128.3°	2°32.6'	-57.2'	128.3°	1°55.4'	-57.5'	128.3°	11
12	4°42.2'	-55.9'	128.4°	4°04.9'	-56.2'	128.4°	3°27.6'	-56.5'	128.5°	2°50.2'	-56.7'	128.5°	2°12.8'	-57.0'	128.6°	1°35.4'	-57.3'	128.6°	0°57.9'	-57.5'	128.6°	12
13	3°46.3'	-55.9'	128.8°	3°08.7'	-56.2'	128.8°	2°31.1'	-56.5'	128.8°	1°53.5'	-56.7'	128.9°	1°15.8'	-57.0'	128.9°	<u>0°38.1' -57.3' 128.9°</u>			<u>0°00.5' -57.5' 128.9°</u>			13
14	2°50.4'	-55.9'	129.1°	2°12.5'	-56.2'	129.2°	1°34.6'	-56.5'	129.2°	<u>0°56.7' -56.7' 129.2°</u>			<u>0°18.8' -57.0' 129.2°</u>			0°19.1'	+57.3'	50.8°	0°57.0'	+57.5'	50.8°	14
15	1°54.5'	-55.9'	129.5°	1°16.3'	-56.2'	129.5°	<u>0°38.2' -56.5' 129.5°</u>			0°00.0'	+56.7'	50.5°	0°38.2'	+57.0'	50.5°	1°16.4'	+57.2'	50.5°	1°54.5'	+57.5'	50.5°	15
16	0°58.6'	-55.9'	129.8°	<u>0°20.1' -56.2' 129.9°</u>			0°18.3'	+56.5'	50.1°	0°56.8'	+56.7'	50.2°	1°35.2'	+57.0'	50.2°	2°13.6'	+57.2'	50.2°	2°52.0'	+57.5'	50.2°	16
17	<u>0°02.7' -55.9' 130.2°</u>			0°36.1'	+56.2'	49.8°	1°14.8'	+56.5'	49.8°	1°53.5'	+56.7'	49.8°	2°32.2'	+57.0'	49.9°	3°10.9'	+57.2'	49.9°	3°49.5'	+57.5'	49.9°	17
18	0°53.3'	+55.9'	49.4°	1°32.3'	+56.2'	49.4°	2°11.3'	+56.5'	49.5°	2°50.2'	+56.7'	49.5°	3°29.2'	+57.0'	49.5°	4°08.1'	+57.2'	49.6°	4°47.0'	+57.5'	49.7°	18
19	1°49.2'	+55.9'	49.1°	2°28.5'	+56.2'	49.1°	3°07.7'	+56.5'	49.1°	3°47.0'	+56.7'	49.2°	4°26.2'	+57.0'	49.2°	5°05.3'	+57.2'	49.3°	5°44.4'	+57.5'	49.4°	19
20	2°45.1'	+55.9'	48.7°	3°24.7'	+56.2'	48.7°	4°04.2'	+56.5'	48.8°	4°43.7'	+56.7'	48.9°	5°23.2'	+57.0'	48.9°	6°02.6'	+57.2'	49.0°	6°41.9'	+57.4'	49.1°	20
21	3°41.0'	+55.9'	48.3°	4°20.8'	+56.2'	48.4°	5°00.7'	+56.4'	48.5°	5°40.4'	+56.7'	48.5°	6°20.1'	+57.0'	48.6°	6°59.8'	+57.2'	48.7°	7°39.3'	+57.4'	48.8°	21
22																						

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

52° 308° LHA

Latitude CONTRARY to Declination

52° 308° LHA

Dec°	63			64			65			66			67			68			69			Dec°			
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°				
0	16°13.8'	-55.7'	124.8°	15°39.5'	-56.0'	125.1°	15°04.9'	-56.3'	125.3°	14°30.1'	-56.6'	125.5°	13°55.2'	-56.9'	125.7°	13°20.1'	-57.2'	125.9°	12°44.8'	-57.4'	126.1°	0			
1	15°18.1'	-55.7'	125.2°	14°43.4'	-56.1'	125.4°	14°08.5'	-56.4'	125.7°	13°33.5'	-56.7'	125.9°	12°58.3'	-56.9'	126.0°	12°22.9'	-57.2'	126.2°	11°47.3'	-57.5'	126.4°	1			
2	14°22.3'	-55.8'	125.6°	13°47.4'	-56.1'	125.8°	13°12.2'	-56.4'	126.0°	12°36.8'	-56.7'	126.2°	12°01.3'	-57.0'	126.4°	11°25.7'	-57.2'	126.5°	10°49.9'	-57.5'	126.7°	2			
3	13°26.6'	-55.8'	126.0°	12°51.3'	-56.1'	126.2°	12°15.8'	-56.4'	126.4°	11°40.1'	-56.7'	126.5°	11°04.4'	-57.0'	126.7°	10°28.4'	-57.2'	126.8°	9°52.4'	-57.5'	127.0°	3			
4	12°30.8'	-55.8'	126.4°	11°55.2'	-56.1'	126.5°	11°19.4'	-56.4'	126.7°	10°43.4'	-56.7'	126.9°	10°07.4'	-57.0'	127.0°	9°31.2'	-57.3'	127.1°	8°54.9'	-57.5'	127.3°	4			
5	11°35.0'	-55.9'	126.7°	10°59.0'	-56.2'	126.9°	10°22.9'	-56.5'	127.1°	9°46.7'	-56.7'	127.2°	9°10.4'	-57.0'	127.3°	8°33.9'	-57.3'	127.5°	7°57.4'	-57.5'	127.6°	5			
6	10°39.1'	-55.9'	127.1°	10°02.8'	-56.2'	127.3°	9°26.5'	-56.5'	127.4°	8°50.0'	-56.8'	127.5°	8°13.4'	-57.0'	127.6°	7°36.7'	-57.3'	127.8°	6°59.9'	-57.5'	127.9°	6			
7	9°43.2'	-55.9'	127.5°	9°06.6'	-56.2'	127.6°	8°30.0'	-56.5'	127.7°	7°53.2'	-56.8'	127.9°	7°16.3'	-57.0'	128.0°	6°39.4'	-57.3'	128.1°	6°02.4'	-57.5'	128.1°	7			
8	8°47.3'	-55.9'	127.9°	8°10.4'	-56.2'	128.0°	7°33.5'	-56.5'	128.1°	6°56.4'	-56.8'	128.2°	6°19.3'	-57.1'	128.3°	5°42.1'	-57.3'	128.4°	5°04.8'	-57.5'	128.4°	8			
9	7°51.3'	-56.0'	128.2°	7°14.2'	-56.3'	128.3°	6°36.9'	-56.5'	128.4°	5°59.6'	-56.8'	128.5°	5°22.2'	-57.1'	128.6°	4°44.8'	-57.3'	128.6°	4°07.3'	-57.5'	128.7°	9			
10	6°55.4'	-56.0'	128.6°	6°17.9'	-56.3'	128.7°	5°40.4'	-56.5'	128.8°	5°02.8'	-56.8'	128.8°	4°25.2'	-57.1'	128.9°	3°47.5'	-57.3'	128.9°	3°09.7'	-57.6'	129.0°	10			
11	5°59.4'	-56.0'	128.9°	5°21.7'	-56.3'	129.0°	4°43.9'	-56.6'	129.1°	4°06.0'	-56.8'	129.1°	3°28.1'	-57.1'	129.2°	2°50.2'	-57.3'	129.2°	2°12.2'	-57.6'	129.3°	11			
12	5°03.4'	-56.0'	129.3°	4°25.4'	-56.3'	129.4°	3°47.3'	-56.6'	129.4°	3°09.2'	-56.8'	129.5°	2°31.0'	-57.1'	129.5°	1°52.8'	-57.3'	129.5°	1°14.6'	-57.6'	129.6°	12			
13	4°07.4'	-56.0'	129.7°	3°29.1'	-56.3'	129.7°	2°50.7'	-56.6'	129.8°	2°12.4'	-56.8'	129.8°	1°33.9'	-57.1'	129.8°	<u>0°55.5' -57.3' 129.8°</u>	<u>0°17.1' -57.6' 129.8°</u>					13			
14	3°11.4'	-56.0'	130.0°	2°32.8'	-56.3'	130.1°	1°54.2'	-56.6'	130.1°	1°15.5'	-56.8'	130.1°	<u>0°36.9' -57.1' 130.1°</u>			0°01.8' +57.3' 49.9°			0°40.5' +57.6' 49.9°			14			
15	2°15.4'	-56.0'	130.4°	1°36.5'	-56.3'	130.4°	0°57.6'	-56.6'	130.4°	<u>0°18.7' -56.8' 130.4°</u>			0°20.2' +57.1' 49.6°			0°59.1' +57.3' 49.6°			1°38.0' +57.6' 49.6°			15			
16	1°19.4'	-56.0'	130.7°	<u>0°40.2' -56.3' 130.8°</u>			<u>0°01.0' -56.6' 130.8°</u>			0°38.1' +56.8' 49.2°			1°17.3' +57.1' 49.3°			1°56.5' +57.3' 49.3°			2°35.6' +57.6' 49.3°			16			
17	<u>0°23.3' -56.0' 131.1°</u>			0°16.1' +56.3' 48.9°			0°55.5' +56.6' 48.9°			1°35.0' +56.8' 48.9°			2°14.4' +57.1' 49.0°			2°53.8' +57.3' 49.0°			3°33.1' +57.5' 49.0°			17			
18	0°32.7' +56.0' 48.5°			1°12.4' +56.3' 48.6°			1°52.1' +56.6' 48.6°			2°31.8' +56.8' 48.6°			3°11.5' +57.1' 48.6°			3°51.1' +57.3' 48.7°			4°30.7' +57.5' 48.7°			18			
19	1°28.7' +56.0' 48.2°			2°08.7' +56.3' 48.2°			2°48.7' +56.6' 48.2°			3°28.6' +56.8' 48.3°			4°08.5' +57.1' 48.3°			4°48.4' +57.3' 48.4°			5°28.2' +57.5' 48.5°			19			
20	2°24.8' +56.0' 47.8°			3°05.0' +56.3' 47.9°			3°45.3' +56.6' 47.9°			4°25.5' +56.8' 48.0°			5°05.6' +57.1' 48.0°			5°45.7' +57.3' 48.1°			6°25.8' +57.5' 48.2°			20			
21	3°20.8' +56.0' 47.5°			4°01.3' +56.3' 47.5°			4°41.8' +56.6' 47.6°			5°22.3' +56.8' 47.6°			6°02.7' +57.0' 47.7°			6°43.0' +57.3' 47.8°			7°23.3' +57.5' 47.9°			21			
22	4°16.8' +56.0' 47.1°			4°57.6' +56.3' 47.2°			5°38.4' +56.6' 47.2°			6°19.1' +56.8' 47.3°			6°59.7' +57.0' 47.4°			7°40.3' +57.3' 47.5°			8°20.8' +57.5' 47.6°			22			
23	5°12.8' +56.0' 46.8°			5°53.9' +56.3' 46.8°			6°34.9' +56.6' 46.9°			7°15.9' +56.8' 47.0°			7°56.7' +57.0' 47.1°			8°37.6' +57.3' 47.2°			9°18.3' +57.5' 47.3°			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°
	63			64			65			66			67			68			69						

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°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	16°36.0'	-55.8'	125.8°	16°00.9'	-56.1'	126.0°	15°25.4'	-56.4'	126.3°	14°49.9'	-56.7'	126.5°	14°14.1'	-57.0'	126.7°	13°38.1'	-57.3'	126.9°	13°02.0'	-57.5'	127.1°	0
1	15°40.2'	-55.8'	126.2°	15°04.7'	-56.2'	126.4°	14°29.0'	-56.5'	126.6°	13°53.1'	-56.7'	126.8°	13°17.1'	-57.0'	127.0°	12°40.9'	-57.3'	127.2°	12°04.5'	-57.5'	127.4°	1
2	14°44.4'	-55.9'	126.6°	14°08.6'	-56.2'	126.8°	13°32.6'	-56.5'	127.0°	12°56.4'	-56.8'	127.2°	12°20.1'	-57.0'	127.3°	11°43.6'	-57.3'	127.5°	11°07.0'	-57.5'	127.7°	2
3	13°48.5'	-55.9'	126.9°	13°12.4'	-56.2'	127.1°	12°36.1'	-56.5'	127.3°	11°59.6'	-56.8'	127.5°	11°23.0'	-57.1'	127.7°	10°46.3'	-57.3'	127.8°	10°09.5'	-57.6'	128.0°	3
4	12°52.6'	-55.9'	127.3°	12°16.2'	-56.2'	127.5°	11°39.6'	-56.5'	127.7°	11°02.8'	-56.8'	127.8°	10°26.0'	-57.1'	128.0°	9°49.0'	-57.3'	128.1°	9°11.9'	-57.6'	128.2°	4
5	11°56.7'	-56.0'	127.7°	11°19.9'	-56.3'	127.9°	10°43.0'	-56.6'	128.0°	10°06.0'	-56.8'	128.2°	9°28.9'	-57.1'	128.3°	8°51.7'	-57.3'	128.3°	8°14.3'	-57.6'	128.5°	5
6	11°00.7'	-56.0'	128.1°	10°23.6'	-56.3'	128.2°	9°46.5'	-56.6'	128.3°	9°09.2'	-56.8'	128.5°	8°31.8'	-57.1'	128.6°	7°54.3'	-57.4'	128.7°	7°16.8'	-57.6'	128.8°	6
7	10°04.7'	-56.0'	128.4°	9°27.3'	-56.3'	128.6°	8°49.9'	-56.6'	128.7°	8°12.3'	-56.9'	128.8°	7°34.7'	-57.1'	128.9°	6°57.0'	-57.4'	129.0°	6°19.2'	-57.6'	129.1°	7
8	9°08.7'	-56.0'	128.8°	8°31.0'	-56.3'	128.9°	7°53.3'	-56.6'	129.0°	7°15.5'	-56.9'	129.1°	6°37.6'	-57.1'	129.2°	5°59.6'	-57.4'	129.3°	5°21.6'	-57.6'	129.4°	8
9	8°12.6'	-56.1'	129.1°	7°34.7'	-56.4'	129.3°	6°56.7'	-56.6'	129.4°	6°18.6'	-56.9'	129.4°	5°40.4'	-57.1'	129.5°	5°02.2'	-57.4'	129.6°	4°24.0'	-57.6'	129.7°	9
10	7°16.5'	-56.1'	129.5°	6°38.3'	-56.4'	129.6°	6°00.1'	-56.6'	129.7°	5°21.7'	-56.9'	129.8°	4°43.3'	-57.2'	129.8°	4°04.8'	-57.4'	129.9°	3°26.3'	-57.6'	129.9°	10
11	6°20.5'	-56.1'	129.9°	5°42.0'	-56.4'	129.9°	5°03.4'	-56.6'	130.0°	4°24.8'	-56.9'	130.1°	3°46.1'	-57.2'	130.1°	3°07.5'	-57.4'	130.2°	2°28.7'	-57.6'	130.2°	11
12	5°24.4'	-56.1'	130.2°	4°45.6'	-56.4'	130.3°	4°06.8'	-56.7'	130.3°	3°27.9'	-56.9'	130.4°	2°49.0'	-57.2'	130.4°	2°10.1'	-57.4'	130.5°	1°31.1'	-57.6'	130.5°	12
13	4°28.2'	-56.1'	130.6°	3°49.2'	-56.4'	130.6°	3°10.1'	-56.7'	130.7°	2°31.0'	-56.9'	130.7°	1°51.8'	-57.2'	130.7°	1°12.7'	-57.4'	130.8°	<u>0°33.5' -57.6' 130.8°</u>			13
14	3°32.1'	-56.1'	130.9°	2°52.8'	-56.4'	131.0°	2°13.4'	-56.7'	131.0°	1°34.1'	-56.9'	131.0°	<u>0°54.7' -57.2' 131.0°</u>			<u>0°15.3' -57.4' 131.1°</u>			0°24.1' +57.6' 48.9°			14
15	2°36.0'	-56.1'	131.3°	1°56.4'	-56.4'	131.3°	1°16.8'	-56.7'	131.3°	<u>0°37.1' -56.9' 131.3°</u>			0°02.5' +57.2' 48.6°			0°42.1' +57.4' 48.7°			1°21.8' +57.6' 48.7°			15
16	1°39.9'	-56.1'	131.6°	<u>0°60.0' -56.4' 131.7°</u>			<u>0°20.1' -56.7' 131.7°</u>			0°19.8' +56.9' 48.3°			0°59.7' +57.2' 48.3°			1°39.5' +57.4' 48.4°			2°19.4' +57.6' 48.4°			16
17	<u>0°43.7' -56.1' 132.0°</u>			<u>0°03.6' -56.4' 132.0°</u>			0°36.6' +56.7' 48.0°			1°16.7' +56.9' 48.0°			1°56.8' +57.2' 48.0°			2°36.9' +57.4' 48.1°			3°17.0' +57.6' 48.1°			17
18	0°12.4' +56.1' 47.7°			0°52.8' +56.4' 47.7°			1°33.2' +56.7' 47.7°			2°13.6' +56.9' 47.7°			2°54.0' +57.2' 47.7°			3°34.3' +57.4' 47.8°			4°14.6' +57.6' 47.8°			18
19	1°08.6' +56.1' 47.3°			1°49.2' +56.4' 47.3°			2°29.9' +56.7' 47.3°			3°10.5' +56.9' 47.4°			3°51.2' +57.2' 47.4°			4°31.7' +57.4' 47.5°			5°12.2' +57.6' 47.5°			19
20	2°04.7' +56.1' 47.0°			2°45.7' +56.4' 47.0°			3°26.6' +56.7' 47.0°			4°07.5' +56.9' 47.1°			4°48.3' +57.1' 47.1°			5°29.1' +57.4' 47.2°			6°09.8' +57.6' 47.3°			20
21	3																					

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

50° 310° LHA

Latitude CONTRARY to Declination

50° 310° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	16°58.0'	-55.9'	126.8°	16°22.0'	-56.2'	127.0°	15°45.8'	-56.5'	127.3°	15°09.4'	-56.8'	127.5°	14°32.8'	-57.1'	127.7°	13°56.0'	-57.3'	127.9°	13°19.1'	-57.6'	128.1°	0
1	16°02.1'	-56.0'	127.2°	15°25.8'	-56.3'	127.4°	14°49.2'	-56.6'	127.6°	14°12.5'	-56.8'	127.8°	13°35.7'	-57.1'	128.0°	12°58.7'	-57.3'	128.2°	12°21.5'	-57.6'	128.4°	1
2	15°06.1'	-56.0'	127.5°	14°29.5'	-56.3'	127.7°	13°52.7'	-56.6'	127.9°	13°15.7'	-56.9'	128.1°	12°38.6'	-57.1'	128.3°	12°01.3'	-57.4'	128.5°	11°23.9'	-57.6'	128.6°	2
3	14°10.2'	-56.0'	127.9°	13°33.2'	-56.3'	128.1°	12°56.1'	-56.6'	128.3°	12°18.9'	-56.9'	128.5°	11°41.5'	-57.1'	128.6°	11°04.0'	-57.4'	128.8°	10°26.3'	-57.6'	128.9°	3
4	13°14.1'	-56.1'	128.3°	12°36.9'	-56.3'	128.5°	11°59.5'	-56.6'	128.6°	11°22.0'	-56.9'	128.8°	10°44.3'	-57.2'	128.9°	10°06.6'	-57.4'	129.1°	9°28.7'	-57.6'	129.2°	4
5	12°18.1'	-56.1'	128.6°	11°40.5'	-56.4'	128.8°	11°02.9'	-56.7'	129.0°	10°25.1'	-56.9'	129.1°	9°47.2'	-57.2'	129.2°	9°09.2'	-57.4'	129.4°	8°31.0'	-57.6'	129.5°	5
6	11°22.0'	-56.1'	129.0°	10°44.2'	-56.4'	129.2°	10°06.2'	-56.7'	129.3°	9°28.2'	-56.9'	129.4°	8°50.0'	-57.2'	129.6°	8°11.7'	-57.4'	129.7°	7°33.4'	-57.7'	129.8°	6
7	10°25.9'	-56.1'	129.4°	9°47.8'	-56.4'	129.5°	9°09.6'	-56.7'	129.6°	8°31.2'	-57.0'	129.8°	7°52.8'	-57.2'	129.9°	7°14.3'	-57.4'	130.0°	6°35.7'	-57.7'	130.1°	7
8	9°29.7'	-56.2'	129.7°	8°51.4'	-56.4'	129.8°	8°12.9'	-56.7'	130.0°	7°34.3'	-57.0'	130.1°	6°55.6'	-57.2'	130.2°	6°16.9'	-57.4'	130.3°	5°38.1'	-57.7'	130.3°	8
9	8°33.6'	-56.2'	130.1°	7°54.9'	-56.5'	130.2°	7°16.2'	-56.7'	130.3°	6°37.3'	-57.0'	130.4°	5°58.4'	-57.2'	130.5°	5°19.4'	-57.5'	130.5°	4°40.4'	-57.7'	130.6°	9
10	7°37.4'	-56.2'	130.4°	6°58.5'	-56.5'	130.5°	6°19.4'	-56.7'	130.6°	5°40.3'	-57.0'	130.7°	5°01.2'	-57.2'	130.8°	4°22.0'	-57.5'	130.8°	3°42.7'	-57.7'	130.9°	10
11	6°41.2'	-56.2'	130.8°	6°02.0'	-56.5'	130.9°	5°22.7'	-56.7'	130.9°	4°43.3'	-57.0'	131.0°	4°03.9'	-57.2'	131.1°	3°24.5'	-57.5'	131.1°	2°45.0'	-57.7'	131.2°	11
12	5°45.0'	-56.2'	131.1°	5°05.5'	-56.5'	131.2°	4°26.0'	-56.8'	131.3°	3°46.4'	-57.0'	131.3°	3°06.7'	-57.2'	131.4°	2°27.0'	-57.5'	131.4°	1°47.3'	-57.7'	131.4°	12
13	4°48.8'	-56.2'	131.5°	4°09.0'	-56.5'	131.6°	3°29.2'	-56.8'	131.6°	2°49.3'	-57.0'	131.6°	2°09.5'	-57.2'	131.7°	1°29.6'	-57.5'	131.7°	<u>0°49.6'</u>	-57.7'	<u>131.7°</u>	13
14	3°52.6'	-56.2'	131.8°	3°12.5'	-56.5'	131.9°	2°32.4'	-56.8'	131.9°	1°52.3'	-57.0'	132.0°	1°12.2'	-57.2'	132.0°	<u>0°32.1'</u>	-57.5'	<u>132.0°</u>	0°08.0'	+57.7'	48.0°	14
15	2°56.3'	-56.2'	132.2°	2°16.0'	-56.5'	132.2°	1°35.7'	-56.8'	132.2°	<u>0°55.3'</u>	-57.0'	<u>132.3°</u>	<u>0°15.0'</u>	-57.2'	<u>132.3°</u>	0°25.4'	+57.5'	47.7°	1°05.7'	+57.7'	47.7°	15
16	2°00.1'	-56.3'	132.5°	1°19.5'	-56.5'	132.6°	<u>0°38.9'</u>	-56.8'	<u>132.6°</u>	0°01.7'	+57.0'	47.4°	0°42.3'	+57.2'	47.4°	1°22.9'	+57.5'	47.4°	2°03.4'	+57.7'	47.5°	16
17	1°03.8'	-56.3'	132.9°	<u>0°23.0'</u>	-56.5'	<u>132.9°</u>	0°17.9'	+56.8'	47.1°	0°58.7'	+57.0'	47.1°	1°39.5'	+57.2'	47.1°	2°20.3'	+57.5'	47.2°	3°01.1'	+57.7'	47.2°	17
18	<u>0°07.6'</u>	-56.3'	<u>133.2°</u>	0°33.5'	+56.5'	46.8°	1°14.6'	+56.8'	46.8°	1°55.7'	+57.0'	46.8°	2°36.8'	+57.2'	46.8°	3°17.8'	+57.5'	46.9°	3°58.8'	+57.7'	46.9°	18
19	0°48.7'	+56.3'	46.4°	1°30.0'	+56.5'	46.4°	2°11.4'	+56.8'	46.5°	2°52.7'	+57.0'	46.5°	3°34.0'	+57.2'	46.5°	4°15.3'	+57.5'	46.6°	4°56.5'	+57.7'	46.6°	19
20	1°44.9'	+56.2'	46.1°	2°26.6'	+56.5'	46.1°	3°08.2'	+56.8'	46.1°	3°49.7'	+57.0'	46.2°	4°31.2'	+57.2'	46.2°	5°12.7'	+57.5'	46.3°	5°54.2'	+57.7'	46.4°	20
21	2°41.2'	+56.2'	45.7°	3°23.1'	+56.5'	45.8°	4°04.9'	+56.7'	45.8°	4°46.7'	+57.0'	45.9°	5°28.5'	+57.2'	45.9°	6°10.2'	+57.4'	46.0°	6°51.8'	+57.7'	46.1°	21
22	3°37.4'	+56.2'	45.4°	4°19.6'	+56.5'	45.4°	5°01.7'	+56.7'	45.5°	5°43.7'	+57.0'	45.5°	6°25.7'	+57.2'	45.6°	7°07.6'	+57.4'	45.7°	7°49.5'	+57.6'	45.8°	22
23	4°33.7'	+56.2'	45.0°	5°16.1'	+56.5'	45.1°	5°58.4'	+56.7'	45.2°	6°40.7'	+57.0'	45.2°	7°22.9'	+57.2'	45.3°	8°05.1'	+57.4'	45.4°	8°47.1'	+57.6'	45.5°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

130° 230° LHA

Latitude SAME as DECLINATION

130° 230° 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°	63			64			65			66			67			68			69			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'	-56.0'	127.8°	16°42.9'	-56.3'	128.0°	16°05.8'	-56.6'	128.2°	15°28.6'	-56.9'	128.5°	14°51.2'	-57.2'	128.7°	14°13.6'	-57.4'	128.9°	13°35.9'	-57.6'	129.1°	0
1	16°23.6'	-56.1'	128.1°	15°46.5'	-56.4'	128.4°	15°09.2'	-56.6'	128.6°	14°31.7'	-56.9'	128.8°	13°54.0'	-57.2'	129.0°	13°16.2'	-57.4'	129.2°	12°38.2'	-57.7'	129.3°	1
2	15°27.6'	-56.1'	128.5°	14°50.2'	-56.4'	128.7°	14°12.6'	-56.7'	128.9°	13°34.8'	-56.9'	129.1°	12°56.9'	-57.2'	129.3°	12°18.8'	-57.4'	129.5°	11°40.6'	-57.7'	129.6°	2
3	14°31.5'	-56.1'	128.9°	13°53.8'	-56.4'	129.1°	13°15.9'	-56.7'	129.3°	12°37.8'	-57.0'	129.4°	11°59.7'	-57.2'	129.6°	11°21.4'	-57.5'	129.8°	10°42.9'	-57.7'	129.9°	3
4	13°35.4'	-56.2'	129.2°	12°57.4'	-56.5'	129.4°	12°19.2'	-56.7'	129.6°	11°40.9'	-57.0'	129.8°	11°02.4'	-57.2'	129.9°	10°23.9'	-57.5'	130.1°	9°45.2'	-57.7'	130.2°	4
5	12°39.2'	-56.2'	129.6°	12°00.9'	-56.5'	129.8°	11°22.5'	-56.7'	129.9°	10°43.9'	-57.0'	130.1°	10°05.2'	-57.3'	130.2°	9°26.4'	-57.5'	130.3°	8°47.5'	-57.7'	130.5°	5
6	11°43.0'	-56.2'	130.0°	11°04.4'	-56.5'	130.1°	10°25.7'	-56.8'	130.3°	9°46.9'	-57.0'	130.4°	9°08.0'	-57.3'	130.5°	8°28.9'	-57.5'	130.6°	7°49.8'	-57.7'	130.7°	6
7	10°46.8'	-56.2'	130.3°	10°07.9'	-56.5'	130.5°	9°28.9'	-56.8'	130.6°	8°49.9'	-57.0'	130.7°	8°10.7'	-57.3'	130.8°	7°31.4'	-57.5'	130.9°	6°52.1'	-57.7'	131.0°	7
8	9°50.6'	-56.3'	130.7°	9°11.4'	-56.5'	130.8°	8°32.2'	-56.8'	130.9°	7°52.8'	-57.1'	131.0°	7°13.4'	-57.3'	131.1°	6°33.9'	-57.5'	131.2°	5°54.3'	-57.7'	131.3°	8
9	8°54.3'	-56.3'	131.0°	8°14.9'	-56.6'	131.1°	7°35.4'	-56.8'	131.2°	6°55.8'	-57.1'	131.3°	6°16.1'	-57.3'	131.4°	5°36.4'	-57.5'	131.5°	4°56.6'	-57.7'	131.6°	9
10	7°58.0'	-56.3'	131.4°	7°18.3'	-56.6'	131.5°	6°38.5'	-56.8'	131.6°	5°58.7'	-57.1'	131.6°	5°18.8'	-57.3'	131.7°	4°38.9'	-57.5'	131.8°	3°58.9'	-57.8'	131.8°	10
11	7°01.7'	-56.3'	131.7°	6°21.7'	-56.6'	131.8°	5°41.7'	-56.8'	131.9°	5°01.6'	-57.1'	132.0°	4°21.5'	-57.3'	132.0°	3°41.3'	-57.5'	132.1°	3°01.1'	-57.8'	132.1°	11
12	6°05.4'	-56.3'	132.1°	5°25.2'	-56.6'	132.1°	4°44.9'	-56.8'	132.2°	4°04.5'	-57.1'	132.3°	3°24.2'	-57.3'	132.3°	2°43.8'	-57.5'	132.3°	2°03.3'	-57.8'	132.4°	12
13	5°09.1'	-56.3'	132.4°	4°28.6'	-56.6'	132.5°	3°48.0'	-56.9'	132.5°	3°07.5'	-57.1'	132.6°	2°26.9'	-57.3'	132.6°	1°46.2'	-57.6'	132.6°	1°05.6'	-57.8'	132.7°	13
14	4°12.7'	-56.4'	132.8°	3°32.0'	-56.6'	132.8°	2°51.2'	-56.9'	132.8°	2°10.4'	-57.1'	132.9°	1°29.5'	-57.3'	132.9°	<u>0°48.7'</u>	-57.6'	<u>132.9°</u>	<u>0°07.8'</u>	-57.8'	<u>132.9°</u>	14
15	3°16.4'	-56.4'	133.1°	2°35.3'	-56.6'	133.1°	1°54.3'	-56.9'	133.2°	1°13.3'	-57.1'	133.2°	<u>0°32.2'</u>	-57.3'	<u>133.2°</u>	0°08.9'	+57.6'	46.8°	0°49.9'	+57.8'	46.8°	15
16	2°20.0'	-56.4'	133.4°	1°38.7'	-56.6'	133.5°	0°57.4'	-56.9'	133.5°	<u>0°16.2'</u>	-57.1'	<u>133.5°</u>	0°25.1'	+57.3'	46.5°	1°06.4'	+57.6'	46.5°	1°47.7'	+57.8'	46.5°	16
17	1°23.6'	-56.4'	133.8°	<u>0°42.1'</u>	-56.6'	<u>133.8°</u>	0°00.6'	-56.9'	133.8°	0°40.9'	+57.1'	46.2°	1°22.5'	+57.3'	46.2°	2°04.0'	+57.5'	46.2°	2°45.5'	+57.8'	46.3°	17
18	<u>0°27.3'</u>	-56.4'	<u>134.1°</u>	0°14.5'	+56.6'	45.9°	0°56.3'	+56.9'	45.9°	1°38.1'	+57.1'	45.9°	2°19.8'	+57.3'	45.9°	3°01.5'	+57.5'	46.0°	3°43.2'	+57.8'	46.0°	18
19	0°29.1'	+56.4'	45.5°	1°11.1'	+56.6'	45.5°	1°53.2'	+56.9'	45.6°	2°35.2'	+57.1'	45.6°	3°17.1'	+57.3'	45.6°	3°59.1'	+57.5'	45.7°	4°41.0'	+57.7'	45.7°	19
20	1°25.5'	+56.4'	45.2°	2°07.8'	+56.6'	45.2°	2°50.0'	+56.9'	45.2°	3°32.2'	+57.1'	45.3°	4°14.4'	+57.3'	45.3°	4°56.6'	+57.5'	45.4°	5°38.7'	+57.7'	45.5°	20
21	2°21.8'	+56.4'	44.8°	3°04.4'	+56.6'	44.9°	3°46.9'	+56.8'	44.9°	4°29.3'	+57.1'	45.0°	5°11.8'	+57.3'	45.0°	5°54.1'	+57.5'	45				

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

48° 312° LHA

Latitude CONTRARY to Declination

48° 312° LHA

Table with columns for Dec°, Hc°, d', Z° for latitudes 63 to 69. Includes values for declinations 0 to 23 and a final Dec° row.

132° 228° LHA

Latitude SAME as DECLINATION

132° 228° 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 for Dec°, Hc°, d', Z° for latitudes 63 to 69. Includes values for declinations 0 to 23 and a final Dec° row.

133° 227° LHA

Latitude SAME as DECLINATION

133° 227° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	18°22.9'	-56.4'	130.7°	17°43.8'	-56.6'	131.0°	17°04.3'	-56.9'	131.2°	16°24.7'	-57.2'	131.4°	15°44.9'	-57.4'	131.6°	15°05.0'	-57.6'	131.8°	14°24.9'	-57.8'	132.0°	0
1	17°26.6'	-56.4'	131.1°	16°47.1'	-56.7'	131.3°	16°07.4'	-56.9'	131.5°	15°27.6'	-57.2'	131.7°	14°47.5'	-57.4'	131.9°	14°07.4'	-57.6'	132.1°	13°27.1'	-57.9'	132.3°	1
2	16°30.2'	-56.4'	131.4°	15°50.4'	-56.7'	131.6°	15°10.5'	-57.0'	131.9°	14°30.4'	-57.2'	132.0°	13°50.1'	-57.4'	132.2°	13°09.7'	-57.7'	132.4°	12°29.2'	-57.9'	132.6°	2
3	15°33.8'	-56.5'	131.8°	14°53.7'	-56.7'	132.0°	14°13.5'	-57.0'	132.2°	13°33.2'	-57.2'	132.4°	12°52.7'	-57.5'	132.5°	12°12.1'	-57.7'	132.7°	11°31.3'	-57.9'	132.9°	3
4	14°37.3'	-56.5'	132.1°	13°57.0'	-56.8'	132.3°	13°16.6'	-57.0'	132.5°	12°35.9'	-57.3'	132.7°	11°55.2'	-57.5'	132.8°	11°14.4'	-57.7'	133.0°	10°33.4'	-57.9'	133.1°	4
5	13°40.8'	-56.5'	132.5°	13°00.3'	-56.8'	132.7°	12°19.5'	-57.0'	132.8°	11°38.7'	-57.3'	133.0°	10°57.7'	-57.5'	133.1°	10°16.7'	-57.7'	133.3°	9°35.5'	-57.9'	133.4°	5
6	12°44.3'	-56.5'	132.8°	12°03.5'	-56.8'	133.0°	11°22.5'	-57.1'	133.1°	10°41.4'	-57.3'	133.3°	10°00.2'	-57.5'	133.4°	9°19.0'	-57.7'	133.5°	8°37.6'	-57.9'	133.6°	6
7	11°47.8'	-56.6'	133.2°	11°06.7'	-56.8'	133.3°	10°25.5'	-57.1'	133.5°	9°44.1'	-57.3'	133.6°	9°02.7'	-57.5'	133.7°	8°21.2'	-57.7'	133.8°	7°39.7'	-57.9'	133.9°	7
8	10°51.2'	-56.6'	133.5°	10°09.8'	-56.8'	133.6°	9°28.4'	-57.1'	133.8°	8°46.8'	-57.3'	133.9°	8°05.2'	-57.5'	134.0°	7°23.5'	-57.7'	134.1°	6°41.7'	-57.9'	134.2°	8
9	9°54.6'	-56.6'	133.8°	9°13.0'	-56.9'	134.0°	8°31.3'	-57.1'	134.1°	7°49.5'	-57.3'	134.2°	7°07.7'	-57.5'	134.3°	6°25.8'	-57.8'	134.4°	5°43.8'	-58.0'	134.4°	9
10	8°58.0'	-56.6'	134.2°	8°16.1'	-56.9'	134.3°	7°34.2'	-57.1'	134.4°	6°52.2'	-57.3'	134.5°	6°10.1'	-57.6'	134.6°	5°28.0'	-57.8'	134.6°	4°45.8'	-58.0'	134.7°	10
11	8°01.4'	-56.7'	134.5°	7°19.3'	-56.9'	134.6°	6°37.1'	-57.1'	134.7°	5°54.9'	-57.4'	134.8°	5°12.6'	-57.6'	134.8°	4°30.2'	-57.8'	134.9°	3°47.9'	-58.0'	135.0°	11
12	7°04.7'	-56.7'	134.8°	6°22.4'	-56.9'	134.9°	5°40.0'	-57.1'	135.0°	4°57.5'	-57.4'	135.1°	4°15.0'	-57.6'	135.1°	3°32.5'	-57.8'	135.2°	2°49.9'	-58.0'	135.2°	12
13	6°08.0'	-56.7'	135.2°	5°25.5'	-56.9'	135.2°	4°42.8'	-57.1'	135.3°	4°00.1'	-57.4'	135.4°	3°17.4'	-57.6'	135.4°	2°34.7'	-57.8'	135.4°	1°51.9'	-58.0'	135.5°	13
14	5°11.4'	-56.7'	135.5°	4°28.5'	-56.9'	135.6°	3°45.7'	-57.2'	135.6°	3°02.8'	-57.4'	135.7°	2°19.9'	-57.6'	135.7°	1°36.9'	-57.8'	135.7°	<u>0°54.0'</u>	-58.0'	<u>135.7°</u>	14
15	4°14.7'	-56.7'	135.8°	3°31.6'	-56.9'	135.9°	2°48.5'	-57.2'	135.9°	2°05.4'	-57.4'	135.9°	1°22.3'	-57.6'	136.0°	<u>0°39.1'</u>	-57.8'	<u>136.0°</u>	0°04.0'	+58.0'	44.0°	15
16	3°18.0'	-56.7'	136.2°	2°34.7'	-56.9'	136.2°	1°51.4'	-57.2'	136.2°	1°08.0'	-57.4'	136.2°	<u>0°24.7'</u>	-57.6'	<u>136.3°</u>	0°18.6'	+57.8'	43.7°	1°02.0'	+58.0'	43.8°	16
17	2°21.3'	-56.7'	136.5°	1°37.7'	-56.9'	136.5°	<u>0°54.2'</u>	-57.2'	<u>136.5°</u>	<u>0°10.7'</u>	-57.4'	<u>136.5°</u>	0°32.9'	+57.6'	43.5°	1°16.4'	+57.8'	43.5°	1°60.0'	+58.0'	43.5°	17
18	1°24.6'	-56.7'	136.8°	<u>0°40.8'</u>	-56.9'	<u>136.8°</u>	0°02.9'	+57.2'	43.2°	0°46.7'	+57.4'	43.2°	1°30.5'	+57.6'	43.2°	2°14.2'	+57.8'	43.2°	2°57.9'	+58.0'	43.2°	18
19	<u>0°27.9'</u>	-56.7'	<u>137.1°</u>	0°16.1'	+56.9'	42.9°	1°00.1'	+57.2'	42.9°	1°44.1'	+57.4'	42.9°	2°28.0'	+57.6'	42.9°	3°12.0'	+57.8'	42.9°	3°55.9'	+58.0'	43.0°	19
20	0°28.9'	+56.7'	42.5°	1°13.1'	+56.9'	42.5°	1°57.3'	+57.2'	42.6°	2°41.5'	+57.4'	42.6°	3°25.6'	+57.6'	42.6°	4°09.7'	+57.8'	42.7°	4°53.8'	+58.0'	42.7°	20
21	1°25.6'	+56.7'	42.2°	2°10.0'	+56.9'	42.2°	2°54.4'	+57.1'	42.3°	3°38.8'	+57.4'	42.3°	4°23.2'	+57.6'	42.3°	5°07.5'	+57.8'	42.4°	5°51.8'	+57.9'	42.5°	21
22	2°22.3'	+2213.6'	41.9°	3°06.9'	+2141.8'	41.9°	3°51.6'	+2069.3'	41.9°	4°36.2'	+1996.2'	42.0°	5°20.7'	+1922.6'	42.1°	6°05.3'	+1848.3'	42.1°	6°49.7'	+1773.5'	42.2°	22
23	3°19.0'	-1322.4'	41.5°	4°03.9'	-1327.3'	41.6°	4°48.7'	-1332.0'	41.6°	5°33.5'	-1336.4'	41.7°	6°18.3'	-1340.6'	41.8°	7°03.0'	-1344.6'	41.9°	7°47.7'	-1348.4'	41.9°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	18°43.4'	-56.5'	131.7°	18°03.5'	-56.7'	131.9°	17°23.3'	-57.0'	132.2°	16°42.9'	-57.2'	132.4°	16°02.3'	-57.5'	132.6°	15°21.6'	-57.7'	132.8°	14°40.7'	-57.9'	133.0°	0
1	17°47.0'	-56.5'	132.1°	17°06.7'	-56.8'	132.3°	16°26.3'	-57.0'	132.5°	15°45.6'	-57.3'	132.7°	15°04.9'	-57.5'	132.9°	14°23.9'	-57.7'	133.1°	13°42.8'	-57.9'	133.3°	1
2	16°50.5'	-56.5'	132.4°	16°10.0'	-56.8'	132.6°	15°29.2'	-57.1'	132.8°	14°48.4'	-57.3'	133.0°	14°07.3'	-57.5'	133.2°	13°26.2'	-57.7'	133.4°	12°44.9'	-57.9'	133.6°	2
3	15°54.0'	-56.6'	132.8°	15°13.1'	-56.8'	133.0°	14°32.2'	-57.1'	133.2°	13°51.1'	-57.3'	133.3°	13°09.8'	-57.5'	133.5°	12°28.4'	-57.8'	133.7°	11°47.0'	-58.0'	133.8°	3
4	14°57.4'	-56.6'	133.1°	14°16.3'	-56.9'	133.3°	13°35.1'	-57.1'	133.5°	12°53.8'	-57.3'	133.6°	12°12.3'	-57.6'	133.8°	11°30.7'	-57.8'	134.0°	10°49.0'	-58.0'	134.1°	4
5	14°00.8'	-56.6'	133.4°	13°19.5'	-56.9'	133.6°	12°38.0'	-57.1'	133.8°	11°56.4'	-57.4'	133.9°	11°14.7'	-57.6'	134.1°	10°32.9'	-57.8'	134.2°	9°51.0'	-58.0'	134.4°	5
6	13°04.1'	-56.7'	133.8°	12°22.6'	-56.9'	133.9°	11°40.9'	-57.1'	134.1°	10°59.1'	-57.4'	134.2°	10°17.1'	-57.6'	134.4°	9°35.1'	-57.8'	134.5°	8°53.0'	-58.0'	134.6°	6
7	12°07.5'	-56.7'	134.1°	11°25.7'	-56.9'	134.3°	10°43.7'	-57.2'	134.4°	10°01.7'	-57.4'	134.5°	9°19.5'	-57.6'	134.7°	8°37.3'	-57.8'	134.8°	7°55.0'	-58.0'	134.9°	7
8	11°10.8'	-56.7'	134.5°	10°28.7'	-57.0'	134.6°	9°46.6'	-57.2'	134.7°	9°04.3'	-57.4'	134.8°	8°21.9'	-57.6'	134.9°	7°39.5'	-57.8'	135.0°	6°57.0'	-58.0'	135.1°	8
9	10°14.1'	-56.7'	134.8°	9°31.8'	-57.0'	134.9°	8°49.4'	-57.2'	135.0°	8°06.9'	-57.4'	135.1°	7°24.3'	-57.6'	135.2°	6°41.7'	-57.8'	135.3°	5°59.0'	-58.0'	135.4°	9
10	9°17.4'	-56.7'	135.1°	8°34.8'	-57.0'	135.2°	7°52.2'	-57.2'	135.3°	7°09.5'	-57.4'	135.4°	6°26.7'	-57.6'	135.5°	5°43.9'	-57.8'	135.6°	5°01.0'	-58.0'	135.6°	10
11	8°20.6'	-56.8'	135.4°	7°37.8'	-57.0'	135.5°	6°55.0'	-57.2'	135.6°	6°12.0'	-57.4'	135.7°	5°29.1'	-57.6'	135.8°	4°46.0'	-57.8'	135.9°	4°03.0'	-58.0'	135.9°	11
12	7°23.9'	-56.8'	135.8°	6°40.8'	-57.0'	135.9°	5°57.7'	-57.2'	135.9°	5°14.6'	-57.4'	136.0°	4°31.4'	-57.6'	136.1°	3°48.2'	-57.8'	136.1°	3°04.9'	-58.0'	136.2°	12
13	6°27.1'	-56.8'	136.1°	5°43.8'	-57.0'	136.2°	5°00.5'	-57.2'	136.2°	4°17.1'	-57.5'	136.3°	3°33.8'	-57.7'	136.3°	2°50.3'	-57.9'	136.4°	2°06.9'	-58.0'	136.4°	13
14	5°30.3'	-56.8'	136.4°	4°46.8'	-57.0'	136.5°	4°03.3'	-57.2'	136.5°	3°19.7'	-57.5'	136.6°	2°36.1'	-57.7'	136.6°	1°52.5'	-57.9'	136.6°	1°08.8'	-58.0'	136.7°	14
15	4°33.5'	-56.8'	136.8°	3°49.8'	-57.0'	136.8°	3°06.0'	-57.3'	136.8°	2°22.2'	-57.5'	136.9°	1°38.4'	-57.7'	136.9°	<u>0°54.6'</u>	-57.9'	<u>136.9°</u>	<u>0°10.8'</u>	-58.0'	<u>136.9°</u>	15
16	3°36.7'	-56.8'	137.1°	2°52.7'	-57.0'	137.1°	2°08.8'	-57.3'	137.1°	1°24.8'	-57.5'	137.2°	<u>0°40.8'</u>	-57.7'	<u>137.2°</u>	0°03.2'	+57.9'	42.8°	0°47.2'	+58.0'	42.8°	16
17	2°39.9'	-56.8'	137.4°	1°55.7'	-57.0'	137.4°	1°11.5'	-57.3'	137.4°	<u>0°27.3'</u>	-57.5'	<u>137.5°</u>	0°16.9'	+57.7'	42.5°	1°01.1'	+57.9'	42.6°	1°45.3'	+58.0'	42.6°	17
18	1°43.1'	-56.8'	137.7°	0°58.7'	-57.0'	137.7°	<u>0°14.3'</u>	-57.3'	<u>137.7°</u>	0°30.2'	+57.5'	42.3°	1°14.6'	+57.7'	42.3°	1°58.9'	+57.9'	42.3°	2°43.3'	+58.0'	42.3°	18
19	<u>0°46.2'</u>	-56.8'	<u>138.0°</u>	<u>0°01.6'</u>	-57.0'	<u>138.0°</u>	0°43.0'	+57.3'	42.0°	1°27.6'	+57.5'	42.0°	2°12.2'	+57.7'	42.0°	2°56.8'	+57.8'	42.0°	3°41.4'	+58.0'	42.1°	19
20	0°10.6'	+56.8'	41.6°	0°55.4'	+57.0'	41.6°	1°40.3'	+57.3'	41.7°	2°25.1'	+57.5'	41.7°	3°09.9'	+57.7'	41.7°	3°54.6'	+57.8'	41.8°	4°39.4'	+58.0'	41.8°	20
21	1°07.4'	+56.8'	41.3°	1°52.5'	+57.0'	41.3°	2°37.5'	+57.2'	41.4°	3°22.5'	+5											

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

44° 316° LHA

Latitude CONTRARY to Declination

44° 316° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	19°03.6'	-56.6'	132.7°	18°22.9'	-56.8'	132.9°	17°41.9'	-57.1'	133.2°	17°00.8'	-57.3'	133.4°	16°19.4'	-57.6'	133.6°	15°38.0'	-57.8'	133.8°	14°56.3'	-58.0'	134.0°	0
1	18°07.0'	-56.6'	133.0°	17°26.0'	-56.9'	133.3°	16°44.8'	-57.1'	133.5°	16°03.4'	-57.4'	133.7°	15°21.9'	-57.6'	133.9°	14°40.2'	-57.8'	134.1°	13°58.3'	-58.0'	134.3°	1
2	17°10.4'	-56.7'	133.4°	16°29.1'	-56.9'	133.6°	15°47.7'	-57.2'	133.8°	15°06.1'	-57.4'	134.0°	14°24.3'	-57.6'	134.2°	13°42.4'	-57.8'	134.4°	13°00.3'	-58.0'	134.6°	2
3	16°13.8'	-56.7'	133.7°	15°32.2'	-56.9'	133.9°	14°50.5'	-57.2'	134.1°	14°08.7'	-57.4'	134.3°	13°26.7'	-57.6'	134.5°	12°44.6'	-57.8'	134.7°	12°02.3'	-58.0'	134.8°	3
4	15°17.1'	-56.7'	134.1°	14°35.3'	-57.0'	134.3°	13°53.4'	-57.2'	134.5°	13°11.3'	-57.4'	134.6°	12°29.1'	-57.6'	134.8°	11°46.7'	-57.8'	134.9°	11°04.3'	-58.0'	135.1°	4
5	14°20.4'	-56.7'	134.4°	13°38.3'	-57.0'	134.6°	12°56.1'	-57.2'	134.8°	12°13.8'	-57.4'	134.9°	11°31.4'	-57.7'	135.1°	10°48.9'	-57.9'	135.2°	10°06.3'	-58.1'	135.3°	5
6	13°23.7'	-56.8'	134.8°	12°41.3'	-57.0'	134.9°	11°58.9'	-57.2'	135.1°	11°16.4'	-57.5'	135.2°	10°33.8'	-57.7'	135.4°	9°51.0'	-57.9'	135.5°	9°08.2'	-58.1'	135.6°	6
7	12°26.9'	-56.8'	135.1°	11°44.3'	-57.0'	135.2°	11°01.7'	-57.3'	135.4°	10°18.9'	-57.5'	135.5°	9°36.1'	-57.7'	135.6°	8°53.1'	-57.9'	135.7°	8°10.1'	-58.1'	135.8°	7
8	11°30.1'	-56.8'	135.4°	10°47.3'	-57.1'	135.6°	10°04.4'	-57.3'	135.7°	9°21.4'	-57.5'	135.8°	8°38.4'	-57.7'	135.9°	7°55.3'	-57.9'	136.0°	7°12.1'	-58.1'	136.1°	8
9	10°33.3'	-56.8'	135.7°	9°50.2'	-57.1'	135.9°	9°07.1'	-57.3'	136.0°	8°24.0'	-57.5'	136.1°	7°40.7'	-57.7'	136.2°	6°57.4'	-57.9'	136.3°	6°14.0'	-58.1'	136.4°	9
10	9°36.4'	-56.9'	136.1°	8°53.2'	-57.1'	136.2°	8°09.8'	-57.3'	136.3°	7°26.4'	-57.5'	136.4°	6°43.0'	-57.7'	136.5°	5°59.5'	-57.9'	136.5°	5°15.9'	-58.1'	136.6°	10
11	8°39.6'	-56.9'	136.4°	7°56.1'	-57.1'	136.5°	7°12.5'	-57.3'	136.6°	6°28.9'	-57.5'	136.7°	5°45.3'	-57.7'	136.7°	5°01.5'	-57.9'	136.8°	4°17.8'	-58.1'	136.9°	11
12	7°42.7'	-56.9'	136.7°	6°59.0'	-57.1'	136.8°	6°15.2'	-57.3'	136.9°	5°31.4'	-57.5'	136.9°	4°47.5'	-57.7'	137.0°	4°03.6'	-57.9'	137.1°	3°19.7'	-58.1'	137.1°	12
13	6°45.8'	-56.9'	137.0°	6°01.9'	-57.1'	137.1°	5°17.9'	-57.3'	137.2°	4°33.9'	-57.5'	137.2°	3°49.8'	-57.7'	137.3°	3°05.7'	-57.9'	137.3°	2°21.6'	-58.1'	137.4°	13
14	5°48.9'	-56.9'	137.4°	5°04.8'	-57.1'	137.4°	4°20.6'	-57.3'	137.5°	3°36.3'	-57.5'	137.5°	2°52.1'	-57.7'	137.6°	2°07.8'	-57.9'	137.6°	1°23.5'	-58.1'	137.6°	14
15	4°52.0'	-56.9'	137.7°	4°07.6'	-57.1'	137.7°	3°23.2'	-57.3'	137.8°	2°38.8'	-57.6'	137.8°	1°54.3'	-57.7'	137.8°	1°09.8'	-57.9'	137.8°	0°25.4'	-58.1'	137.9°	15
16	3°55.1'	-56.9'	138.0°	3°10.5'	-57.1'	138.0°	2°25.9'	-57.4'	138.1°	1°41.2'	-57.6'	138.1°	0°56.6'	-57.7'	138.1°	0°11.9'	-57.9'	138.1°	0°32.8'	+58.1'	41.9°	16
17	2°58.2'	-56.9'	138.3°	2°13.3'	-57.1'	138.3°	1°28.5'	-57.4'	138.4°	0°43.7'	-57.6'	138.4°	0°01.2'	+57.7'	41.6°	0°46.0'	+57.9'	41.6°	1°30.9'	+58.1'	41.6°	17
18	2°01.2'	-56.9'	138.6°	1°16.2'	-57.1'	138.6°	0°31.2'	-57.4'	138.6°	0°13.9'	+57.6'	41.4°	0°58.9'	+57.7'	41.4°	1°44.0'	+57.9'	41.4°	2°29.0'	+58.1'	41.4°	18
19	1°04.3'	-56.9'	138.9°	0°19.0'	-57.2'	138.9°	0°26.2'	+57.4'	41.1°	1°11.4'	+57.6'	41.1°	1°56.7'	+57.7'	41.1°	2°41.9'	+57.9'	41.1°	3°27.1'	+58.1'	41.1°	19
20	0°07.3'	-56.9'	139.2°	0°38.1'	+57.1'	40.8°	1°23.6'	+57.4'	40.8°	2°09.0'	+57.5'	40.8°	2°54.4'	+57.7'	40.8°	3°39.8'	+57.9'	40.9°	4°25.2'	+58.1'	40.9°	20
21	0°49.6'	+56.9'	40.4°	1°35.3'	+57.1'	40.4°	2°20.9'	+57.3'	40.5°	3°06.5'	+57.5'	40.5°	3°52.2'	+57.7'	40.5°	4°37.7'	+57.9'	40.6°	5°23.3'	+58.1'	40.6°	21
22	1°46.5'	+56.9'	40.1°	2°32.4'	+57.1'	40.1°	3°18.3'	+57.3'	40.2°	4°04.1'	+57.5'	40.2°	4°49.9'	+57.7'	40.3°	5°35.6'	+57.9'	40.3°	6°21.4'	+58.1'	40.4°	22
23	2°43.5'	+56.9'	39.8°	3°29.5'	+57.1'	39.8°	4°15.6'	+57.3'	39.9°	5°01.6'	+57.5'	39.9°	5°47.6'	+57.7'	40.0°	6°33.6'	+57.9'	40.1°	7°19.5'	+58.1'	40.1°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

136° 224° LHA

Latitude SAME as DECLINATION

136° 224° 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°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	19°23.5'	-56.7'	133.7°	18°42.0'	-57.0'	133.9°	18°00.2'	-57.2'	134.2°	17°18.3'	-57.4'	134.4°	16°36.3'	-57.6'	134.6°	15°54.0'	-57.9'	134.8°	15°11.7'	-58.1'	135.0°	0
1	18°26.8'	-56.7'	134.0°	17°45.0'	-57.0'	134.3°	17°03.0'	-57.2'	134.5°	16°20.9'	-57.5'	134.7°	15°38.6'	-57.7'	134.9°	14°56.2'	-57.9'	135.1°	14°13.6'	-58.1'	135.3°	1
2	17°30.0'	-56.8'	134.4°	16°48.0'	-57.0'	134.6°	16°05.8'	-57.2'	134.8°	15°23.5'	-57.5'	135.0°	14°41.0'	-57.7'	135.2°	13°58.3'	-57.9'	135.4°	13°15.5'	-58.1'	135.6°	2
3	16°33.3'	-56.8'	134.7°	15°51.0'	-57.0'	134.9°	15°08.6'	-57.3'	135.1°	14°26.0'	-57.5'	135.3°	13°43.3'	-57.7'	135.5°	13°00.4'	-57.9'	135.7°	12°17.5'	-58.1'	135.8°	3
4	15°36.5'	-56.8'	135.1°	14°54.0'	-57.1'	135.3°	14°11.3'	-57.3'	135.4°	13°28.5'	-57.5'	135.6°	12°45.6'	-57.7'	135.8°	12°02.5'	-57.9'	135.9°	11°19.4'	-58.1'	136.1°	4
5	14°39.7'	-56.9'	135.4°	13°56.9'	-57.1'	135.6°	13°14.0'	-57.3'	135.7°	12°31.4'	-57.5'	135.9°	11°47.8'	-57.7'	136.0°	11°04.6'	-57.9'	136.2°	10°21.2'	-58.1'	136.3°	5
6	13°42.8'	-56.9'	135.7°	12°59.8'	-57.1'	135.9°	12°16.7'	-57.3'	136.0°	11°33.4'	-57.6'	136.2°	10°50.1'	-57.8'	136.3°	10°06.6'	-58.0'	136.5°	9°23.1'	-58.1'	136.6°	6
7	12°45.9'	-56.9'	136.0°	12°02.7'	-57.1'	136.2°	11°19.3'	-57.4'	136.3°	10°35.9'	-57.6'	136.5°	9°52.3'	-57.8'	136.6°	9°08.7'	-58.0'	136.7°	8°25.0'	-58.1'	136.8°	7
8	11°49.0'	-56.9'	136.4°	11°05.6'	-57.2'	136.5°	10°22.0'	-57.4'	136.6°	9°38.3'	-57.6'	136.8°	8°54.6'	-57.8'	136.9°	8°10.7'	-58.0'	137.0°	7°26.8'	-58.2'	137.1°	8
9	10°52.1'	-56.9'	136.7°	10°08.4'	-57.2'	136.8°	9°24.6'	-57.4'	136.9°	8°40.7'	-57.6'	137.0°	7°56.8'	-57.8'	137.1°	7°12.8'	-58.0'	137.2°	6°28.7'	-58.2'	137.3°	9
10	9°55.2'	-57.0'	137.0°	9°11.2'	-57.2'	137.1°	8°27.2'	-57.4'	137.2°	7°43.1'	-57.6'	137.3°	6°59.0'	-57.8'	137.4°	6°14.8'	-58.0'	137.5°	5°30.5'	-58.2'	137.6°	10
11	8°58.2'	-57.0'	137.3°	8°14.0'	-57.2'	137.4°	7°29.8'	-57.4'	137.5°	6°45.5'	-57.6'	137.6°	6°01.2'	-57.8'	137.7°	5°16.8'	-58.0'	137.8°	4°32.4'	-58.2'	137.8°	11
12	8°01.2'	-57.0'	137.6°	7°16.8'	-57.2'	137.7°	6°32.4'	-57.4'	137.8°	5°47.9'	-57.6'	137.9°	5°03.4'	-57.8'	138.0°	4°18.8'	-58.0'	138.0°	3°34.2'	-58.2'	138.1°	12
13	7°04.2'	-57.0'	138.0°	6°19.6'	-57.2'	138.0°	5°35.0'	-57.4'	138.1°	4°50.3'	-57.6'	138.2°	4°05.6'	-57.8'	138.2°	3°20.8'	-58.0'	138.3°	2°36.0'	-58.2'	138.3°	13
14	6°07.2'	-57.0'	138.3°	5°22.4'	-57.2'	138.3°	4°37.5'	-57.4'	138.4°	3°52.7'	-57.6'	138.5°	3°07.7'	-57.8'	138.5°	2°22.8'	-58.0'	138.5°	1°37.8'	-58.2'	138.5°	14
15	5°10.2'	-57.0'	138.6°	4°25.2'	-57.2'	138.6°	3°40.1'	-57.4'	138.7°	2°55.0'	-57.6'	138.7°	2°09.9'	-57.8'	138.8°	1°24.8'	-58.0'	138.8°	0°39.7'	-58.2'	138.8°	15
16	4°13.1'	-57.0'	138.9°	3°27.9'	-57.2'	138.9°	2°42.7'	-57.4'	139.0°	1°57.4'	-57.6'	139.0°	1°12.1'	-57.8'	139.0°	0°26.8'	-58.0'	139.0°	0°18.5'	+58.2'	41.0°	16
17	3°16.1'	-57.0'	139.2°	2°30.7'	-57.3'	139.2°	1°45.2'	-57.5'	139.3°	0°59.7'	-57.6'	139.3°	0°14.3'	-57.8'	139.3°	0°31.2'	+58.0'	40.7°	1°16.7'	+58.2'	40.7°	17
18	2°19.1'	-57.0'	139.5°	1°33.4'	-57.3'	139.5°	0°47.8'	-57.5'	139.6°	0°02.1'	-57.6'	139.6°	0°43.6'	+57.8'	40.4°	1°29.2'	+58.0'	40.5°	2°14.9'	+58.2'	40.5°	18
19	1°22.0'	-57.1'	139.8°	0°36.2'	-57.3'	139.8°	0°09.7'	+57.5'	40.2°	0°55.6'	+57.6'	40.2°	1°41.4'	+57.8'	40.2°	2°27.2'	+58.0'	40.2°	3°13.1'	+58.2'	40.2°	19
20	0°25.0'	-57.1'	140.1°	0°21.1'	+57.3'	39.9°	1°07.2'	+57.5'	39.9°	1°53.2'	+57.6'	39.9°	2°39.2'	+57.8'	39.9°	3°25.2'	+58.0'	39.9°	4°11.2'	+58.2'	40.0°	20
21	0°32.1'	+57.1'	39.5°	1°18.3'	+57.3'	39.6°	2°04.6'	+57.4'	39.6°	2°50.8'	+57.6'	39.6°	3°37.1'	+57.8'	39.6°	4°23.2'	+58.0'	39.7°	5°09.4'	+58.2'	39.7°	21
22</																						

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

42° 318° LHA

Latitude CONTRARY to Declination

42° 318° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	19°43.0'	-56.8'	134.7°	19°00.7'	-57.1'	134.9°	18°18.3'	-57.3'	135.2°	17°35.6'	-57.5'	135.4°	16°52.8'	-57.7'	135.6°	16°09.8'	-57.9'	135.8°	15°26.7'	-58.1'	136.0°	0
1	18°46.2'	-56.8'	135.0°	18°03.7'	-57.1'	135.3°	17°21.0'	-57.3'	135.5°	16°38.1'	-57.5'	135.7°	15°55.1'	-57.8'	135.9°	15°11.9'	-57.9'	136.1°	14°28.6'	-58.1'	136.3°	1
2	17°49.3'	-56.9'	135.4°	17°06.6'	-57.1'	135.6°	16°23.7'	-57.3'	135.8°	15°40.6'	-57.6'	136.0°	14°57.3'	-57.8'	136.2°	14°14.0'	-58.0'	136.4°	13°30.5'	-58.2'	136.5°	2
3	16°52.5'	-56.9'	135.7°	16°09.5'	-57.1'	135.9°	15°26.3'	-57.4'	136.1°	14°43.0'	-57.6'	136.3°	13°59.6'	-57.8'	136.5°	13°16.0'	-58.0'	136.6°	12°32.3'	-58.2'	136.8°	3
4	15°55.6'	-56.9'	136.0°	15°12.3'	-57.2'	136.2°	14°28.9'	-57.4'	136.4°	13°45.4'	-57.6'	136.6°	13°01.8'	-57.8'	136.8°	12°18.0'	-58.0'	136.9°	11°34.1'	-58.2'	137.1°	4
5	14°58.7'	-57.0'	136.4°	14°15.2'	-57.2'	136.5°	13°31.5'	-57.4'	136.7°	12°47.8'	-57.6'	136.9°	12°04.0'	-57.8'	137.0°	11°20.0'	-58.0'	137.2°	10°36.0'	-58.2'	137.3°	5
6	14°01.7'	-57.0'	136.7°	13°18.0'	-57.2'	136.9°	12°34.1'	-57.4'	137.0°	11°50.2'	-57.6'	137.2°	11°06.1'	-57.8'	137.3°	10°22.0'	-58.0'	137.4°	9°37.8'	-58.2'	137.5°	6
7	13°04.7'	-57.0'	137.0°	12°20.7'	-57.2'	137.2°	11°36.7'	-57.5'	137.3°	10°52.5'	-57.7'	137.4°	10°08.3'	-57.9'	137.6°	9°24.0'	-58.0'	137.7°	8°39.6'	-58.2'	137.8°	7
8	12°07.7'	-57.0'	137.3°	11°23.5'	-57.3'	137.5°	10°39.2'	-57.5'	137.6°	9°54.9'	-57.7'	137.7°	9°10.4'	-57.9'	137.8°	8°25.9'	-58.0'	137.9°	7°41.3'	-58.2'	138.0°	8
9	11°10.6'	-57.1'	137.6°	10°26.2'	-57.3'	137.8°	9°41.8'	-57.5'	137.9°	8°57.2'	-57.7'	138.0°	8°12.6'	-57.9'	138.1°	7°27.9'	-58.1'	138.2°	6°43.1'	-58.2'	138.3°	9
10	10°13.6'	-57.1'	138.0°	9°29.0'	-57.3'	138.1°	8°44.3'	-57.5'	138.2°	7°59.5'	-57.7'	138.3°	7°14.7'	-57.9'	138.4°	6°29.8'	-58.1'	138.5°	5°44.9'	-58.2'	138.5°	10
11	9°16.5'	-57.1'	138.3°	8°31.7'	-57.3'	138.4°	7°46.8'	-57.5'	138.5°	7°01.8'	-57.7'	138.6°	6°16.8'	-57.9'	138.6°	5°31.8'	-58.1'	138.7°	4°46.7'	-58.2'	138.8°	11
12	8°19.4'	-57.1'	138.6°	7°34.4'	-57.3'	138.7°	6°49.3'	-57.5'	138.8°	6°04.1'	-57.7'	138.8°	5°18.9'	-57.9'	138.9°	4°33.7'	-58.1'	139.0°	3°48.4'	-58.2'	139.0°	12
13	7°22.3'	-57.1'	138.9°	6°37.0'	-57.3'	139.0°	5°51.8'	-57.5'	139.0°	5°06.4'	-57.7'	139.1°	4°21.0'	-57.9'	139.2°	3°35.6'	-58.1'	139.2°	2°50.2'	-58.2'	139.2°	13
14	6°25.2'	-57.1'	139.2°	5°39.7'	-57.3'	139.3°	4°54.2'	-57.5'	139.3°	4°08.7'	-57.7'	139.4°	3°23.1'	-57.9'	139.4°	2°37.5'	-58.1'	139.5°	1°51.9'	-58.2'	139.5°	14
15	5°28.0'	-57.1'	139.5°	4°42.4'	-57.3'	139.6°	3°56.7'	-57.5'	139.6°	3°11.0'	-57.7'	139.7°	2°25.2'	-57.9'	139.7°	1°39.5'	-58.1'	139.7°	0°53.7'	-58.2'	139.7°	15
16	4°30.9'	-57.1'	139.8°	3°45.0'	-57.4'	139.9°	2°59.1'	-57.5'	139.9°	2°13.2'	-57.7'	139.9°	1°27.3'	-57.9'	140.0°	0°41.4'	-58.1'	140.0°	0°04.6'	+58.2'	40.0°	16
17	3°33.7'	-57.2'	140.1°	2°47.7'	-57.4'	140.2°	2°01.6'	-57.5'	140.2°	1°15.5'	-57.7'	140.2°	0°29.4'	-57.9'	140.2°	0°16.7'	+58.1'	39.8°	1°02.8'	+58.2'	39.8°	17
18	2°36.6'	-57.2'	140.4°	1°50.3'	-57.4'	140.5°	1°04.1'	-57.6'	140.5°	0°17.8'	-57.7'	140.5°	0°02.8'	+57.9'	39.5°	1°14.8'	+58.1'	39.5°	2°01.1'	+58.2'	39.6°	18
19	1°39.4'	-57.2'	140.7°	0°53.0'	-57.4'	140.7°	0°06.5'	-57.6'	140.8°	0°40.0'	+57.7'	39.3°	1°26.4'	+57.9'	39.3°	2°12.9'	+58.1'	39.3°	2°59.3'	+58.2'	39.3°	19
20	0°42.3'	-57.2'	141.0°	0°04.4'	+57.4'	39.0°	0°51.1'	+57.5'	39.0°	1°37.7'	+57.7'	39.0°	2°24.3'	+57.9'	39.0°	3°11.0'	+58.1'	39.0°	3°57.5'	+58.2'	39.1°	20
21	0°14.9'	+57.2'	38.7°	1°01.8'	+57.4'	38.7°	1°48.6'	+57.5'	38.7°	2°35.4'	+57.7'	38.7°	3°22.2'	+57.9'	38.7°	4°09.0'	+58.1'	38.8°	4°55.8'	+58.2'	38.8°	21
22	1°12.1'	+57.2'	38.4°	1°59.1'	+57.4'	38.4°	2°46.1'	+57.5'	38.4°	3°33.2'	+57.7'	38.4°	4°20.1'	+57.9'	38.5°	5°07.1'	+58.1'	38.5°	5°54.0'	+58.2'	38.6°	22
23	2°09.2'	+57.2'	38.1°	2°56.5'	+57.4'	38.1°	3°43.7'	+57.5'	38.1°	4°30.9'	+57.7'	38.2°	5°18.0'	+57.9'	38.2°	6°05.2'	+58.1'	38.3°	6°52.2'	+58.2'	38.3°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

138° 222° LHA

Latitude SAME as DECLINATION

138° 222° 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°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	20°02.2'	-56.9'	135.7°	19°19.2'	-57.2'	136.0°	18°36.0'	-57.4'	136.2°	17°52.6'	-57.6'	136.4°	17°09.1'	-57.8'	136.6°	16°25.4'	-58.0'	136.8°	15°41.5'	-58.2'	137.0°	0
1	19°05.3'	-57.0'	136.0°	18°22.0'	-57.2'	136.3°	17°38.6'	-57.4'	136.5°	16°55.0'	-57.6'	136.7°	16°11.2'	-57.8'	136.9°	15°27.3'	-58.0'	137.1°	14°43.3'	-58.2'	137.3°	1
2	18°08.3'	-57.0'	136.4°	17°24.8'	-57.2'	136.6°	16°41.2'	-57.4'	136.8°	15°57.4'	-57.7'	137.0°	15°13.4'	-57.9'	137.2°	14°29.3'	-58.0'	137.4°	13°45.1'	-58.2'	137.5°	2
3	17°11.4'	-57.0'	136.7°	16°27.6'	-57.3'	136.9°	15°43.7'	-57.5'	137.1°	14°59.7'	-57.7'	137.3°	14°15.6'	-57.9'	137.5°	13°31.3'	-58.1'	137.6°	12°46.9'	-58.2'	137.8°	3
4	16°14.3'	-57.1'	137.0°	15°30.4'	-57.3'	137.2°	14°46.3'	-57.5'	137.4°	14°02.0'	-57.7'	137.6°	13°17.7'	-57.9'	137.7°	12°33.2'	-58.1'	137.9°	11°48.7'	-58.2'	138.0°	4
5	15°17.3'	-57.1'	137.3°	14°33.1'	-57.3'	137.5°	13°48.8'	-57.5'	137.7°	13°04.3'	-57.7'	137.9°	12°19.8'	-57.9'	138.0°	11°35.1'	-58.1'	138.2°	10°50.4'	-58.3'	138.3°	5
6	14°20.2'	-57.1'	137.7°	13°35.8'	-57.3'	137.8°	12°51.3'	-57.5'	138.0°	12°06.6'	-57.7'	138.1°	11°21.9'	-57.9'	138.3°	10°37.1'	-58.1'	138.4°	9°52.1'	-58.3'	138.5°	6
7	13°23.1'	-57.1'	138.0°	12°38.5'	-57.3'	138.1°	11°53.7'	-57.5'	138.3°	11°08.9'	-57.7'	138.4°	10°24.0'	-57.9'	138.5°	9°39.0'	-58.1'	138.7°	8°53.9'	-58.3'	138.8°	7
8	12°26.0'	-57.2'	138.3°	11°41.1'	-57.4'	138.4°	10°56.2'	-57.6'	138.6°	10°11.1'	-57.8'	138.7°	9°26.0'	-57.9'	138.8°	8°40.8'	-58.1'	138.9°	7°55.6'	-58.3'	139.0°	8
9	11°28.8'	-57.2'	138.6°	10°43.8'	-57.4'	138.7°	9°58.6'	-57.6'	138.9°	9°13.4'	-57.8'	139.0°	8°28.1'	-58.0'	139.1°	7°42.7'	-58.1'	139.2°	6°57.3'	-58.3'	139.2°	9
10	10°31.6'	-57.2'	138.9°	9°46.4'	-57.4'	139.0°	9°01.0'	-57.6'	139.1°	8°15.6'	-57.8'	139.2°	7°30.1'	-58.0'	139.3°	6°44.6'	-58.1'	139.4°	5°59.0'	-58.3'	139.5°	10
11	9°34.4'	-57.2'	139.2°	8°49.0'	-57.4'	139.3°	8°03.4'	-57.6'	139.4°	7°17.8'	-57.8'	139.5°	6°32.2'	-58.0'	139.6°	5°46.5'	-58.1'	139.7°	5°00.7'	-58.3'	139.7°	11
12	8°37.2'	-57.2'	139.5°	7°51.6'	-57.4'	139.6°	7°05.8'	-57.6'	139.7°	6°20.0'	-57.8'	139.8°	5°34.2'	-58.0'	139.9°	4°48.3'	-58.1'	139.9°	4°02.4'	-58.3'	140.0°	12
13	7°40.0'	-57.2'	139.8°	6°54.1'	-57.4'	139.9°	6°08.2'	-57.6'	140.0°	5°22.2'	-57.8'	140.1°	4°36.2'	-58.0'	140.1°	3°50.2'	-58.2'	140.2°	3°04.1'	-58.3'	140.2°	13
14	6°42.8'	-57.2'	140.1°	5°56.7'	-57.4'	140.2°	5°10.6'	-57.6'	140.3°	4°24.4'	-57.8'	140.3°	3°38.2'	-58.0'	140.4°	2°52.0'	-58.2'	140.4°	2°05.8'	-58.3'	140.4°	14
15	5°45.5'	-57.3'	140.4°	4°59.3'	-57.4'	140.5°	4°13.0'	-57.6'	140.5°	3°26.6'	-57.8'	140.6°	2°40.2'	-58.0'	140.6°	1°53.9'	-58.2'	140.7°	1°07.5'	-58.3'	140.7°	15
16	4°48.3'	-57.3'	140.7°	4°01.8'	-57.5'	140.8°	3°15.3'	-57.6'	140.8°	2°28.8'	-57.8'	140.9°	1°42.3'	-58.0'	140.9°	0°55.7'	-58.2'	140.9°	0°09.1'	-58.3'	140.9°	16
17	3°51.0'	-57.3'	141.0°	3°04.4'	-57.5'	141.1°	2°17.7'	-57.6'	141.1°	1°31.0'	-57.8'	141.1°	0°44.3'	-58.0'	141.1°	0°02.5'	+58.2'	38.9°	0°49.2'	+58.3'	38.9°	17
18	2°53.8'	-57.3'	141.3°	2°06.9'	-57.5'	141.4°	1°20.0'	-57.6'	141.4°	0°33.2'	-57.8'	141.4°	0°13.7'	+58.0'	38.6°	1°00.6'	+58.2'	38.6°	1°47.5'	+58.3'	38.6°	18
19	1°56.5'	-57.3'	141.6°	1°09.4'	-57.5'	141.7°	0°22.4'	-57.6'	141.7°	0°24.7'	+57.8'	38.3°	1°11.7'	+58.0'	38.3°	1°56.9'	+58.2'	38.4°	2°45.8'	+58.3'	38.4°	19
20	0°59.2'	-57.3'	141.9°	0°12.0'	-57.5'	141.9°	0°35.3'	+57.6'	38.1°	1°22.5'	+57.8'	38.1°	2°09.7'	+58.0'	38.1°	2°56.9'	+58.2'	38.1°	3°44.1'	+58.3'	38.2°	20
21	0°01.9'	-57.3'	142.2°	0°45.5'	+57.5'	37.8°	1°32.9'	+57.6'	37.8°	2°20.3'	+57.8'	37.8°	3°07.7'	+58.0'	37.8°	3°55.1'	+58.1'	37.9°	4°42.4'	+58.3'	37.9°	2



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

40° 320° LHA

Latitude CONTRARY to Declination

40° 320° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	20°21.0'	-57.0'	136.7°	19°37.3'	-57.3'	137.0°	18°53.4'	-57.5'	137.2°	18°09.3'	-57.7'	137.4°	17°25.0'	-57.9'	137.6°	16°40.6'	-58.1'	137.9°	15°56.0'	-58.3'	138.1°	0
1	19°24.0'	-57.1'	137.0°	18°40.0'	-57.3'	137.3°	17°55.9'	-57.5'	137.5°	17°11.6'	-57.7'	137.7°	16°27.1'	-57.9'	137.9°	15°42.5'	-58.1'	138.1°	14°57.8'	-58.3'	138.3°	1
2	18°26.9'	-57.1'	137.4°	17°42.7'	-57.3'	137.6°	16°58.4'	-57.5'	137.8°	16°13.8'	-57.7'	138.0°	15°29.2'	-57.9'	138.2°	14°44.4'	-58.1'	138.4°	13°59.5'	-58.3'	138.5°	2
3	17°29.9'	-57.1'	137.7°	16°45.4'	-57.4'	137.9°	16°00.8'	-57.6'	138.1°	15°16.1'	-57.8'	138.3°	14°31.2'	-58.0'	138.5°	13°46.3'	-58.1'	138.6°	13°01.2'	-58.3'	138.8°	3
4	16°32.7'	-57.2'	138.0°	15°48.1'	-57.4'	138.2°	15°03.3'	-57.6'	138.4°	14°18.3'	-57.8'	138.6°	13°33.3'	-58.0'	138.7°	12°48.1'	-58.1'	138.9°	12°02.9'	-58.3'	139.0°	4
5	15°35.6'	-57.2'	138.3°	14°50.7'	-57.4'	138.5°	14°05.7'	-57.6'	138.7°	13°20.6'	-57.8'	138.8°	12°35.3'	-58.0'	139.0°	11°50.0'	-58.2'	139.1°	11°04.6'	-58.3'	139.3°	5
6	14°38.4'	-57.2'	138.6°	13°53.3'	-57.4'	138.8°	13°08.1'	-57.6'	139.0°	12°22.7'	-57.8'	139.1°	11°37.3'	-58.0'	139.3°	10°51.8'	-58.2'	139.4°	10°06.2'	-58.3'	139.5°	6
7	13°41.2'	-57.2'	139.0°	12°55.8'	-57.4'	139.1°	12°10.4'	-57.6'	139.3°	11°24.9'	-57.8'	139.4°	10°39.3'	-58.0'	139.5°	9°53.7'	-58.2'	139.6°	9°07.9'	-58.3'	139.7°	7
8	12°43.9'	-57.3'	139.3°	11°58.4'	-57.5'	139.4°	11°12.8'	-57.7'	139.5°	10°27.1'	-57.8'	139.7°	9°41.3'	-58.0'	139.8°	8°55.5'	-58.2'	139.9°	8°09.6'	-58.4'	140.0°	8
9	11°46.6'	-57.3'	139.6°	11°00.9'	-57.5'	139.7°	10°15.1'	-57.7'	139.8°	9°29.2'	-57.9'	139.9°	8°43.3'	-58.0'	140.0°	7°57.3'	-58.2'	140.1°	7°11.2'	-58.4'	140.2°	9
10	10°49.4'	-57.3'	139.9°	10°03.4'	-57.5'	140.0°	9°17.5'	-57.7'	140.1°	8°31.4'	-57.9'	140.2°	7°45.3'	-58.0'	140.3°	6°59.1'	-58.2'	140.4°	6°12.8'	-58.4'	140.4°	10
11	9°52.1'	-57.3'	140.2°	9°06.0'	-57.5'	140.3°	8°19.8'	-57.7'	140.4°	7°33.5'	-57.9'	140.5°	6°47.2'	-58.1'	140.5°	6°00.9'	-58.2'	140.6°	5°14.5'	-58.4'	140.7°	11
12	8°54.8'	-57.3'	140.5°	8°08.4'	-57.5'	140.6°	7°22.1'	-57.7'	140.7°	6°35.6'	-57.9'	140.7°	5°49.2'	-58.1'	140.8°	5°02.6'	-58.2'	140.9°	4°16.1'	-58.4'	140.9°	12
13	7°57.4'	-57.3'	140.8°	7°10.9'	-57.5'	140.9°	6°24.4'	-57.7'	140.9°	5°37.8'	-57.9'	141.0°	4°51.1'	-58.1'	141.1°	4°04.4'	-58.2'	141.1°	3°17.7'	-58.4'	141.1°	13
14	7°00.1'	-57.4'	141.1°	6°13.4'	-57.5'	141.1°	5°26.6'	-57.7'	141.2°	4°39.9'	-57.9'	141.3°	3°53.0'	-58.1'	141.3°	3°06.2'	-58.2'	141.3°	2°19.3'	-58.4'	141.4°	14
15	6°02.7'	-57.4'	141.4°	5°15.8'	-57.6'	141.4°	4°28.9'	-57.7'	141.5°	3°42.0'	-57.9'	141.5°	2°55.0'	-58.1'	141.6°	2°08.0'	-58.2'	141.6°	1°20.9'	-58.4'	141.6°	15
16	5°05.4'	-57.4'	141.7°	4°18.3'	-57.6'	141.7°	3°31.2'	-57.7'	141.8°	2°44.0'	-57.9'	141.8°	1°56.9'	-58.1'	141.8°	1°09.7'	-58.2'	141.8°	0°22.6'	-58.4'	141.8°	16
17	4°08.0'	-57.4'	142.0°	3°20.7'	-57.6'	142.0°	2°33.4'	-57.7'	142.0°	1°46.1'	-57.9'	142.0°	0°58.8'	-58.1'	142.1°	<u>0°11.5' -58.2' 142.1°</u>			0°35.8'	+58.4'	37.9°	17
18	3°10.6'	-57.4'	142.2°	2°23.2'	-57.6'	142.3°	1°35.7'	-57.7'	142.3°	<u>0°48.2' -57.9' 142.3°</u>			<u>0°00.7' -58.1' 142.3°</u>			0°46.7'	+58.2'	37.7°	1°34.2'	+58.4'	37.7°	18
19	2°13.2'	-57.4'	142.5°	1°25.6'	-57.6'	142.6°	<u>0°38.0' -57.7' 142.6°</u>			0°09.7'	+57.9'	37.4°	0°57.3'	+58.1'	37.4°	1°45.0'	+58.2'	37.4°	2°32.6'	+58.4'	37.5°	19
20	1°15.8'	-57.4'	142.8°	<u>0°28.0' -57.6' 142.8°</u>			0°19.8'	+57.7'	37.2°	1°07.6'	+57.9'	37.2°	1°55.4'	+58.1'	37.2°	2°43.2'	+58.2'	37.2°	3°31.0'	+58.4'	37.2°	20
21	<u>0°18.5' -57.4' 143.1°</u>			0°29.5'	+57.6'	36.9°	1°17.5'	+57.7'	36.9°	2°05.5'	+57.9'	36.9°	2°53.5'	+58.1'	36.9°	3°41.4'	+58.2'	37.0°	4°29.4'	+58.4'	37.0°	21
22	0°38.9'	+57.4'	36.6°	1°27.1'	+57.6'	36.6°	2°15.3'	+57.7'	36.6°	3°03.4'	+57.9'	36.6°	3°51.6'	+58.1'	36.7°	4°39.7'	+58.2'	36.7°	5°27.7'	+58.4'	36.8°	22
23	1°36.3'	+57.4'	36.3°	2°24.7'	+57.6'	36.3°	3°13.0'	+57.7'	36.3°	4°01.3'	+57.9'	36.4°	4°49.6'	+58.1'	36.4°	5°37.9'	+58.2'	36.5°	6°26.1'	+58.4'	36.5°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

140° 220° LHA

Latitude SAME as DECLINATION

140° 220° 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 CONTRARY to Declination

39° 321° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	20°39.5'	-57.2'	137.7°	19°55.1'	-57.4'	138.0°	19°10.4'	-57.6'	138.2°	18°25.6'	-57.8'	138.4°	17°40.6'	-58.0'	138.7°	16°55.5'	-58.2'	138.9°	16°10.3'	-58.3'	139.1°	0
1	19°42.4'	-57.2'	138.1°	18°57.7'	-57.4'	138.3°	18°12.8'	-57.6'	138.5°	17°27.8'	-57.8'	138.7°	16°42.7'	-58.0'	138.9°	15°57.4'	-58.2'	139.1°	15°11.9'	-58.3'	139.3°	1
2	18°45.2'	-57.2'	138.4°	18°00.3'	-57.4'	138.6°	17°15.2'	-57.6'	138.8°	16°30.0'	-57.8'	139.0°	15°44.7'	-58.0'	139.2°	14°59.2'	-58.2'	139.4°	14°13.6'	-58.4'	139.5°	2
3	17°48.0'	-57.2'	138.7°	17°02.9'	-57.5'	138.9°	16°17.6'	-57.7'	139.1°	15°32.2'	-57.9'	139.3°	14°46.6'	-58.0'	139.5°	14°01.0'	-58.2'	139.6°	13°15.2'	-58.4'	139.8°	3
4	16°50.8'	-57.3'	139.0°	16°05.4'	-57.5'	139.2°	15°19.9'	-57.7'	139.4°	14°34.3'	-57.9'	139.6°	13°48.6'	-58.1'	139.7°	13°02.8'	-58.2'	139.9°	12°16.8'	-58.4'	140.0°	4
5	15°53.5'	-57.3'	139.3°	15°07.9'	-57.5'	139.5°	14°22.2'	-57.7'	139.7°	13°36.5'	-57.9'	139.8°	12°50.6'	-58.1'	140.0°	12°04.6'	-58.2'	140.1°	11°18.5'	-58.4'	140.3°	5
6	14°56.2'	-57.3'	139.6°	14°10.4'	-57.5'	139.8°	13°24.5'	-57.7'	140.0°	12°38.6'	-57.9'	140.1°	11°52.5'	-58.1'	140.2°	11°06.3'	-58.2'	140.4°	10°20.1'	-58.4'	140.5°	6
7	13°58.9'	-57.4'	139.9°	13°12.9'	-57.6'	140.1°	12°26.8'	-57.7'	140.2°	11°40.7'	-57.9'	140.4°	10°54.4'	-58.1'	140.5°	10°08.1'	-58.3'	140.6°	9°21.7'	-58.4'	140.7°	7
8	13°01.5'	-57.4'	140.2°	12°15.3'	-57.6'	140.4°	11°29.1'	-57.8'	140.5°	10°42.7'	-57.9'	140.6°	9°56.3'	-58.1'	140.8°	9°09.8'	-58.3'	140.9°	8°23.2'	-58.4'	141.0°	8
9	12°04.1'	-57.4'	140.5°	11°17.8'	-57.6'	140.7°	10°31.3'	-57.8'	140.8°	9°44.8'	-57.9'	140.9°	8°58.2'	-58.1'	141.0°	8°11.5'	-58.3'	141.1°	7°24.8'	-58.4'	141.2°	9
10	11°06.7'	-57.4'	140.8°	10°20.2'	-57.6'	141.0°	9°33.6'	-57.8'	141.1°	8°46.9'	-58.0'	141.2°	8°00.1'	-58.1'	141.3°	7°13.3'	-58.3'	141.3°	6°26.4'	-58.4'	141.4°	10
11	10°09.3'	-57.4'	141.1°	9°22.6'	-57.6'	141.2°	8°35.8'	-57.8'	141.3°	7°48.9'	-58.0'	141.4°	7°02.0'	-58.1'	141.5°	6°15.0'	-58.3'	141.6°	5°27.9'	-58.4'	141.6°	11
12	9°11.9'	-57.4'	141.4°	8°25.0'	-57.6'	141.5°	7°38.0'	-57.8'	141.6°	6°50.9'	-58.0'	141.7°	6°03.8'	-58.1'	141.8°	5°16.7'	-58.3'	141.8°	4°29.5'	-58.4'	141.9°	12
13	8°14.5'	-57.5'	141.7°	7°27.4'	-57.6'	141.8°	6°40.2'	-57.8'	141.9°	5°53.0'	-58.0'	141.9°	5°05.7'	-58.1'	142.0°	4°18.4'	-58.3'	142.1°	3°31.1'	-58.4'	142.1°	13
14	7°17.0'	-57.5'	142.0°	6°29.7'	-57.6'	142.1°	5°42.4'	-57.8'	142.1°	4°55.0'	-58.0'	142.2°	4°07.5'	-58.2'	142.3°	3°20.1'	-58.3'	142.3°	2°32.6'	-58.5'	142.3°	14
15	6°19.6'	-57.5'	142.3°	5°32.1'	-57.7'	142.4°	4°44.5'	-57.8'	142.4°	3°57.0'	-58.0'	142.5°	3°09.4'	-58.2'	142.5°	2°21.8'	-58.3'	142.5°	1°34.2'	-58.5'	142.5°	15
16	5°22.1'	-57.5'	142.6°	4°34.4'	-57.7'	142.6°	3°46.7'	-57.8'	142.7°	2°59.0'	-58.0'	142.7°	2°11.2'	-58.2'	142.7°	1°23.5'	-58.3'	142.8°	<u>0°35.7' -58.5' 142.8°</u>			16
17	4°24.6'	-57.5'	142.9°	3°36.8'	-57.7'	142.9°	2°48.9'	-57.8'	142.9°	2°01.0'	-58.0'	143.0°	1°13.1'	-58.2'	143.0°	<u>0°25.2' -58.3' 143.0°</u>			0°22.7'	+58.5'	37.0°	17
18	3°27.1'	-57.5'	143.2°	2°39.1'	-57.7'	143.2°	1°51.0'	-57.8'	143.2°	1°03.0'	-58.0'	143.2°	<u>0°14.9' -58.2' 143.2°</u>			0°33.1'	+58.3'	36.8°	1°21.2'	+58.5'	36.8°	18
19	2°29.6'	-57.5'	143.4°	1°41.4'	-57.7'	143.5°	<u>0°53.2' -57.8' 143.5°</u>			<u>0°05.0' -58.0' 143.5°</u>			0°43.2'	+58.2'	36.5°	1°31.4'	+58.3'	36.5°	2°19.7'	+58.5'	36.6°	19
20	1°32.1'	-57.5'	143.7°	<u>0°43.8' -57.7' 143.7°</u>			0°04.6'	+57.8'	36.3°	0°53.0'	+58.0'	36.3°	1°41.4'	+58.2'	36.3°	2°29.8'	+58.3'	36.3°	3°18.1'	+58.4'	36.3°	20
21	<u>0°34.6' -57.5' 144.0°</u>			0°13.9'	+57.7'	36.0°	1°02.5'	+57.8'	36.0°	1°51.0'	+58.0'	36.0°</										

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

38° 322° LHA

Latitude CONTRARY to Declination

38° 322° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	20°57.7'	-57.3'	138.8°	20°12.5'	-57.5'	139.0°	19°27.2'	-57.7'	139.2°	18°41.6'	-57.9'	139.5°	17°56.0'	-58.1'	139.7°	17°10.2'	-58.2'	139.9°	16°24.2'	-58.4'	140.1°	0
1	20°00.4'	-57.3'	139.1°	19°15.0'	-57.5'	139.3°	18°29.5'	-57.7'	139.5°	17°43.8'	-57.9'	139.7°	16°57.9'	-58.1'	139.9°	16°11.9'	-58.3'	140.1°	15°25.8'	-58.4'	140.3°	1
2	19°03.1'	-57.3'	139.4°	18°17.5'	-57.5'	139.6°	17°31.8'	-57.7'	139.8°	16°45.9'	-57.9'	140.0°	15°59.8'	-58.1'	140.2°	15°13.7'	-58.3'	140.4°	14°27.4'	-58.4'	140.5°	2
3	18°05.8'	-57.4'	139.7°	17°20.0'	-57.6'	139.9°	16°34.0'	-57.8'	140.1°	15°47.9'	-57.9'	140.3°	15°01.7'	-58.1'	140.5°	14°15.4'	-58.3'	140.6°	13°29.0'	-58.4'	140.8°	3
4	17°08.5'	-57.4'	140.0°	16°22.4'	-57.6'	140.2°	15°36.3'	-57.8'	140.4°	14°50.0'	-58.0'	140.6°	14°03.6'	-58.1'	140.7°	13°17.1'	-58.3'	140.9°	12°30.5'	-58.5'	141.0°	4
5	16°11.1'	-57.4'	140.3°	15°24.8'	-57.6'	140.5°	14°38.5'	-57.8'	140.7°	13°52.0'	-58.0'	140.8°	13°05.5'	-58.1'	141.0°	12°18.8'	-58.3'	141.1°	11°32.1'	-58.5'	141.2°	5
6	15°13.7'	-57.4'	140.6°	14°27.2'	-57.6'	140.8°	13°40.7'	-57.8'	140.9°	12°54.1'	-58.0'	141.1°	12°07.3'	-58.2'	141.2°	11°20.5'	-58.3'	141.4°	10°33.6'	-58.5'	141.5°	6
7	14°16.2'	-57.5'	140.9°	13°29.6'	-57.7'	141.1°	12°42.9'	-57.8'	141.2°	11°56.1'	-58.0'	141.3°	11°09.2'	-58.2'	141.5°	10°22.2'	-58.3'	141.6°	9°35.1'	-58.5'	141.7°	7
8	13°18.8'	-57.5'	141.2°	12°31.9'	-57.7'	141.4°	11°45.0'	-57.8'	141.5°	10°58.1'	-58.0'	141.6°	10°11.0'	-58.2'	141.7°	9°23.8'	-58.3'	141.8°	8°36.6'	-58.5'	141.9°	8
9	12°21.3'	-57.5'	141.5°	11°34.3'	-57.7'	141.6°	10°47.2'	-57.9'	141.8°	10°00.0'	-58.0'	141.9°	9°12.8'	-58.2'	142.0°	8°25.5'	-58.4'	142.1°	7°38.2'	-58.5'	142.2°	9
10	11°23.8'	-57.5'	141.8°	10°36.6'	-57.7'	141.9°	9°49.3'	-57.9'	142.0°	9°02.0'	-58.0'	142.1°	8°14.6'	-58.2'	142.2°	7°27.2'	-58.4'	142.3°	6°39.7'	-58.5'	142.4°	10
11	10°26.3'	-57.5'	142.1°	9°38.9'	-57.7'	142.2°	8°51.4'	-57.9'	142.3°	8°04.0'	-58.1'	142.4°	7°16.4'	-58.2'	142.5°	6°28.8'	-58.4'	142.5°	5°41.2'	-58.5'	142.6°	11
12	9°28.7'	-57.5'	142.4°	8°41.2'	-57.7'	142.5°	7°53.6'	-57.9'	142.6°	7°05.9'	-58.1'	142.6°	6°18.2'	-58.2'	142.7°	5°30.4'	-58.4'	142.8°	4°42.6'	-58.5'	142.8°	12
13	8°31.2'	-57.6'	142.7°	7°43.4'	-57.7'	142.7°	6°55.7'	-57.9'	142.8°	6°07.8'	-58.1'	142.9°	5°20.0'	-58.2'	143.0°	4°32.1'	-58.4'	143.0°	3°44.1'	-58.5'	143.0°	13
14	7°33.6'	-57.6'	142.9°	6°45.7'	-57.7'	143.0°	5°57.8'	-57.9'	143.1°	5°09.8'	-58.1'	143.1°	4°21.7'	-58.2'	143.2°	3°33.7'	-58.4'	143.2°	2°45.6'	-58.5'	143.3°	14
15	6°36.0'	-57.6'	143.2°	5°48.0'	-57.8'	143.3°	4°59.8'	-57.9'	143.3°	4°11.7'	-58.1'	143.4°	3°23.5'	-58.2'	143.4°	2°35.3'	-58.4'	143.5°	1°47.1'	-58.5'	143.5°	15
16	5°38.5'	-57.6'	143.5°	4°50.2'	-57.8'	143.6°	4°01.9'	-57.9'	143.6°	3°13.6'	-58.1'	143.6°	2°25.3'	-58.2'	143.7°	1°36.9'	-58.4'	143.7°	0°48.6'	-58.5'	143.7°	16
17	4°40.9'	-57.6'	143.8°	3°52.4'	-57.8'	143.8°	3°04.0'	-57.9'	143.9°	2°15.5'	-58.1'	143.9°	1°27.0'	-58.2'	143.9°	<u>0°38.5' -58.4' 143.9°</u>			0°09.9'	+58.5'	36.1°	17
18	3°43.3'	-57.6'	144.1°	2°54.7'	-57.8'	144.1°	2°06.1'	-57.9'	144.1°	1°17.4'	-58.1'	144.1°	<u>0°28.8' -58.2' 144.2°</u>			0°19.8'	+58.4'	35.8°	1°08.5'	+58.5'	35.8°	18
19	2°45.7'	-57.6'	144.4°	1°56.9'	-57.8'	144.4°	1°08.1'	-57.9'	144.4°	<u>0°19.4' -58.1' 144.4°</u>			0°29.4'	+58.2'	35.6°	1°18.2'	+58.4'	35.6°	2°07.0'	+58.5'	35.6°	19
20	1°48.1'	-57.6'	144.6°	0°59.1'	-57.8'	144.6°	<u>0°10.2' -57.9' 144.7°</u>			0°38.7'	+58.1'	35.3°	1°27.7'	+58.2'	35.4°	2°16.6'	+58.4'	35.4°	3°05.5'	+58.5'	35.4°	20
21	<u>0°50.5' -57.6' 144.9°</u>			<u>0°14.4' -57.8' 144.9°</u>			0°47.7'	+57.9'	35.1°	1°36.8'	+58.1'	35.1°	2°25.9'	+58.2'	35.1°	3°15.0'	+58.4'	35.1°	4°04.0'	+58.5'	35.2°	21
22	0°07.1'	+57.6'	34.8°	0°56.4'	+57.8'	34.8°	1°45.7'	+57.9'	34.8°	2°34.9'	+58.1'	34.8°	3°24.1'	+58.2'	34.9°	4°13.4'	+58.4'	34.9°	5°02.5'	+58.5'	35.0°	22
23	1°04.8'	+57.6'	34.5°	1°54.2'	+57.8'	34.5°	2°43.6'	+57.9'	34.6°	3°33.0'	+58.1'	34.6°	4°22.4'	+58.2'	34.6°	5°11.7'	+58.4'	34.7°	6°01.0'	+58.5'	34.7°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

142° 218° LHA

Latitude SAME as DECLINATION

142° 218° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	21°15.4'	-57.4'	139.8°	20°29.6'	-57.6'	140.0°	19°43.5'	-57.8'	140.3°	18°57.3'	-58.0'	140.5°	18°11.0'	-58.1'	140.7°	17°24.5'	-58.3'	140.9°	16°37.9'	-58.5'	141.1°	0
1	20°18.1'	-57.4'	140.1°	19°32.0'	-57.6'	140.3°	18°45.8'	-57.8'	140.5°	17°59.4'	-58.0'	140.8°	17°12.8'	-58.2'	141.0°	16°26.2'	-58.3'	141.1°	15°39.4'	-58.5'	141.3°	1
2	19°20.7'	-57.4'	140.4°	18°34.4'	-57.6'	140.6°	17°48.0'	-57.8'	140.8°	17°01.4'	-58.0'	141.0°	16°14.7'	-58.2'	141.2°	15°27.8'	-58.3'	141.4°	14°40.9'	-58.5'	141.6°	2
3	18°23.3'	-57.5'	140.7°	17°36.8'	-57.7'	140.9°	16°50.1'	-57.9'	141.1°	16°03.4'	-58.0'	141.3°	15°16.5'	-58.2'	141.5°	14°29.5'	-58.4'	141.6°	13°42.4'	-58.5'	141.8°	3
4	17°25.8'	-57.5'	141.0°	16°39.1'	-57.7'	141.2°	15°52.3'	-57.9'	141.4°	15°05.3'	-58.0'	141.6°	14°18.3'	-58.2'	141.7°	13°31.1'	-58.4'	141.9°	12°43.9'	-58.5'	142.0°	4
5	16°28.3'	-57.5'	141.3°	15°41.4'	-57.7'	141.5°	14°54.4'	-57.9'	141.7°	14°07.3'	-58.1'	141.8°	13°20.1'	-58.2'	142.0°	12°32.8'	-58.4'	142.1°	11°45.4'	-58.5'	142.2°	5
6	15°30.8'	-57.5'	141.6°	14°43.7'	-57.7'	141.8°	13°56.5'	-57.9'	141.9°	13°09.2'	-58.1'	142.1°	12°21.8'	-58.2'	142.2°	11°34.4'	-58.4'	142.3°	10°46.8'	-58.5'	142.5°	6
7	14°33.2'	-57.6'	141.9°	13°45.9'	-57.8'	142.0°	12°58.6'	-57.9'	142.2°	12°11.1'	-58.1'	142.3°	11°23.6'	-58.3'	142.5°	10°36.0'	-58.4'	142.6°	9°48.3'	-58.5'	142.7°	7
8	13°35.6'	-57.6'	142.2°	12°48.2'	-57.8'	142.3°	12°00.7'	-57.9'	142.5°	11°13.0'	-58.1'	142.6°	10°25.3'	-58.3'	142.7°	9°37.6'	-58.4'	142.8°	8°49.8'	-58.6'	142.9°	8
9	12°38.0'	-57.6'	142.5°	11°50.4'	-57.8'	142.6°	11°02.7'	-58.0'	142.7°	10°14.9'	-58.1'	142.8°	9°27.1'	-58.3'	142.9°	8°39.2'	-58.4'	143.0°	7°51.2'	-58.6'	143.1°	9
10	11°40.4'	-57.6'	142.8°	10°52.6'	-57.8'	142.9°	10°04.8'	-58.0'	143.0°	9°16.8'	-58.1'	143.1°	8°28.8'	-58.3'	143.2°	7°40.7'	-58.4'	143.3°	6°52.6'	-58.6'	143.3°	10
11	10°42.8'	-57.6'	143.0°	9°54.8'	-57.8'	143.2°	9°06.8'	-58.0'	143.3°	8°18.7'	-58.1'	143.3°	7°30.5'	-58.3'	143.4°	6°42.3'	-58.4'	143.5°	5°54.1'	-58.6'	143.6°	11
12	9°45.2'	-57.7'	143.3°	8°57.0'	-57.8'	143.4°	8°08.8'	-58.0'	143.5°	7°20.5'	-58.1'	143.6°	6°32.2'	-58.3'	143.7°	5°43.9'	-58.4'	143.7°	4°55.5'	-58.6'	143.8°	12
13	8°47.5'	-57.7'	143.6°	7°59.2'	-57.8'	143.7°	7°10.8'	-58.0'	143.8°	6°22.4'	-58.2'	143.8°	5°33.9'	-58.3'	143.9°	4°45.4'	-58.4'	144.0°	3°56.9'	-58.6'	144.0°	13
14	7°49.9'	-57.7'	143.9°	7°01.4'	-57.8'	144.0°	6°12.8'	-58.0'	144.0°	5°24.2'	-58.2'	144.1°	4°35.6'	-58.3'	144.1°	3°47.0'	-58.5'	144.2°	2°58.3'	-58.6'	144.2°	14
15	6°52.2'	-57.7'	144.2°	6°03.5'	-57.9'	144.2°	5°14.8'	-58.0'	144.3°	4°26.1'	-58.2'	144.3°	3°37.3'	-58.3'	144.4°	2°48.5'	-58.5'	144.4°	1°59.7'	-58.6'	144.4°	15
16	5°54.5'	-57.7'	144.4°	5°05.7'	-57.9'	144.5°	4°16.8'	-58.0'	144.5°	3°27.9'	-58.2'	144.6°	2°39.0'	-58.3'	144.6°	1°50.1'	-58.5'	144.6°	1°01.2'	-58.6'	144.6°	16
17	4°56.8'	-57.7'	144.7°	4°07.8'	-57.9'	144.8°	3°18.8'	-58.0'	144.8°	2°29.7'	-58.2'	144.8°	1°40.7'	-58.3'	144.8°	<u>0°51.6' -58.5' 144.9°</u>			<u>0°02.6' -58.6' 144.9°</u>			17
18	3°59.1'	-57.7'	145.0°	3°09.9'	-57.9'	145.0°	2°20.8'	-58.0'	145.1°	1°31.6'	-58.2'	145.1°	<u>0°42.4' -58.3' 145.1°</u>			0°06.8'	+58.5'	34.9°	0°56.0'	+58.6'	34.9°	18
19	3°01.4'	-57.7'	145.3°	2°12.1'	-57.9'	145.3°	1°22.7'	-58.0'	145.3°	<u>0°33.4' -58.2' 145.3°</u>			0°15.9'	+58.3'	34.7°	1°05.3'	+58.5'	34.7°	1°54.6'	+58.6'	34.7°	19
20	2°03.7'	-57.7'	145.5°	1°14.2'	-57.9'	145.6°	<u>0°24.7' -58.0' 145.6°</u>			0°24.8'	+58.2'	34.4°	1°14.3'	+58.3'	34.4°	2°03.7'	+58.5'	34.5°	2°53.2'	+58.6'	34.5°	20
21	1°05.9'	-57.7'	145.8°	<u>0°16.3' -57.9' 145.8°</u>			0°33.3'	+58.0'	34.2°	1°22.9'	+58.2'											

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

36° 324° LHA

Latitude CONTRARY to Declination

36° 324° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	21°32.9'	-57.5'	140.8°	20°46.3'	-57.7'	141.0°	19°59.6'	-57.9'	141.3°	19°12.7'	-58.1'	141.5°	18°25.7'	-58.2'	141.7°	17°38.5'	-58.4'	141.9°	16°51.2'	-58.5'	142.1°	0
1	20°35.4'	-57.5'	141.1°	19°48.6'	-57.7'	141.3°	19°01.7'	-57.9'	141.6°	18°14.6'	-58.1'	141.8°	17°27.4'	-58.2'	142.0°	16°40.1'	-58.4'	142.2°	15°52.7'	-58.6'	142.3°	1
2	19°37.8'	-57.6'	141.4°	18°50.9'	-57.7'	141.6°	18°03.8'	-57.9'	141.8°	17°16.6'	-58.1'	142.0°	16°29.2'	-58.3'	142.2°	15°41.7'	-58.4'	142.4°	14°54.1'	-58.6'	142.6°	2
3	18°40.3'	-57.6'	141.7°	17°53.2'	-57.8'	141.9°	17°05.9'	-57.9'	142.1°	16°18.5'	-58.1'	142.3°	15°30.9'	-58.3'	142.5°	14°43.3'	-58.4'	142.6°	13°55.6'	-58.6'	142.8°	3
4	17°42.7'	-57.6'	142.0°	16°55.4'	-57.8'	142.2°	16°07.9'	-58.0'	142.4°	15°20.3'	-58.1'	142.6°	14°32.7'	-58.3'	142.7°	13°44.9'	-58.4'	142.9°	12°57.0'	-58.6'	143.0°	4
5	16°45.1'	-57.6'	142.3°	15°57.6'	-57.8'	142.5°	15°10.0'	-58.0'	142.7°	14°22.2'	-58.2'	142.8°	13°34.4'	-58.3'	143.0°	12°46.4'	-58.5'	143.1°	11°58.4'	-58.6'	143.2°	5
6	15°47.5'	-57.7'	142.6°	14°59.8'	-57.8'	142.8°	14°12.0'	-58.0'	142.9°	13°24.1'	-58.2'	143.1°	12°36.1'	-58.3'	143.2°	11°48.0'	-58.5'	143.3°	10°59.8'	-58.6'	143.5°	6
7	14°49.8'	-57.7'	142.9°	14°01.9'	-57.9'	143.0°	13°14.0'	-58.0'	143.2°	12°25.9'	-58.2'	143.3°	11°37.7'	-58.3'	143.4°	10°49.5'	-58.5'	143.6°	10°01.2'	-58.6'	143.7°	7
8	13°52.2'	-57.7'	143.2°	13°04.1'	-57.9'	143.3°	12°15.9'	-58.0'	143.4°	11°27.7'	-58.2'	143.6°	10°39.4'	-58.3'	143.7°	9°51.0'	-58.5'	143.8°	9°02.6'	-58.6'	143.9°	8
9	12°54.5'	-57.7'	143.4°	12°06.2'	-57.9'	143.6°	11°17.9'	-58.0'	143.7°	10°29.5'	-58.2'	143.8°	9°41.1'	-58.4'	143.9°	8°52.5'	-58.5'	144.0°	8°04.0'	-58.6'	144.1°	9
10	11°56.7'	-57.7'	143.7°	11°08.3'	-57.9'	143.8°	10°19.9'	-58.1'	144.0°	9°31.3'	-58.2'	144.1°	8°42.7'	-58.4'	144.2°	7°54.0'	-58.5'	144.2°	7°05.3'	-58.6'	144.3°	10
11	10°59.0'	-57.7'	144.0°	10°10.4'	-57.9'	144.1°	9°21.8'	-58.1'	144.2°	8°33.1'	-58.2'	144.3°	7°44.3'	-58.4'	144.4°	6°55.5'	-58.5'	144.5°	6°06.7'	-58.6'	144.5°	11
12	10°01.3'	-57.8'	144.3°	9°12.5'	-57.9'	144.4°	8°23.7'	-58.1'	144.5°	7°34.9'	-58.2'	144.5°	6°46.0'	-58.4'	144.6°	5°57.0'	-58.5'	144.7°	5°08.0'	-58.6'	144.7°	12
13	9°03.5'	-57.8'	144.6°	8°14.6'	-57.9'	144.6°	7°25.6'	-58.1'	144.7°	6°36.6'	-58.2'	144.8°	5°47.6'	-58.4'	144.9°	4°58.5'	-58.5'	144.9°	4°09.4'	-58.6'	145.0°	13
14	8°05.7'	-57.8'	144.8°	7°16.7'	-57.9'	144.9°	6°27.5'	-58.1'	145.0°	5°38.4'	-58.2'	145.0°	4°49.2'	-58.4'	145.1°	3°60.0'	-58.5'	145.1°	3°10.8'	-58.7'	145.2°	14
15	7°07.9'	-57.8'	145.1°	6°18.7'	-58.0'	145.2°	5°29.4'	-58.1'	145.2°	4°40.1'	-58.3'	145.3°	3°50.8'	-58.4'	145.3°	3°01.5'	-58.5'	145.4°	2°12.1'	-58.7'	145.4°	15
16	6°10.1'	-57.8'	145.4°	5°20.8'	-58.0'	145.4°	4°31.3'	-58.1'	145.5°	3°41.9'	-58.3'	145.5°	2°52.4'	-58.4'	145.5°	2°02.9'	-58.5'	145.6°	1°13.5'	-58.7'	145.6°	16
17	5°12.3'	-57.8'	145.6°	4°22.8'	-58.0'	145.7°	3°33.2'	-58.1'	145.7°	2°43.6'	-58.3'	145.8°	1°54.0'	-58.4'	145.8°	1°04.4'	-58.5'	145.8°	0°14.8'	-58.7'	145.8°	17
18	4°14.5'	-57.8'	145.9°	3°24.8'	-58.0'	145.9°	2°35.1'	-58.1'	146.0°	1°45.4'	-58.3'	146.0°	0°55.6'	-58.4'	146.0°	0°05.9'	-58.5'	146.0°	0°43.9'	+58.7'	34.0°	18
19	3°16.7'	-57.8'	146.2°	2°26.9'	-58.0'	146.2°	1°37.0'	-58.1'	146.2°	0°47.1'	-58.3'	146.2°	0°02.8'	+58.4'	33.8°	0°52.6'	+58.5'	33.8°	1°42.5'	+58.7'	33.8°	19
20	2°18.9'	-57.8'	146.4°	1°28.9'	-58.0'	146.5°	0°38.9'	-58.1'	146.5°	0°11.1'	+58.3'	33.5°	1°01.1'	+58.4'	33.5°	1°51.2'	+58.5'	33.5°	2°41.2'	+58.6'	33.6°	20
21	1°21.1'	-57.8'	146.7°	0°30.9'	-58.0'	146.7°	0°19.2'	+58.1'	33.3°	1°09.4'	+58.3'	33.3°	1°59.5'	+58.4'	33.3°	2°49.7'	+58.5'	33.3°	3°39.8'	+58.6'	33.4°	21
22	0°23.3'	-57.8'	147.0°	0°27.1'	+58.0'	33.0°	1°17.4'	+58.1'	33.0°	2°07.7'	+58.3'	33.0°	2°57.9'	+58.4'	33.1°	3°48.2'	+58.5'	33.1°	4°38.5'	+58.6'	33.1°	22
23	0°34.6'	+57.8'	32.8°	1°25.0'	+58.0'	32.8°	2°15.5'	+58.1'	32.8°	3°05.9'	+58.3'	32.8°	3°56.3'	+58.4'	32.8°	4°46.7'	+58.5'	32.9°	5°37.1'	+58.6'	32.9°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

144° 216° LHA

Latitude SAME as DECLINATION

144° 216° 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 CONTRARY to Declination

35° 325° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	21°49.9'	-57.6'	141.8°	21°02.7'	-57.8'	142.1°	20°15.3'	-58.0'	142.3°	19°27.7'	-58.1'	142.5°	18°40.0'	-58.3'	142.7°	17°52.2'	-58.5'	142.9°	17°04.3'	-58.6'	143.1°	0
1	20°52.3'	-57.6'	142.1°	20°04.9'	-57.8'	142.4°	19°17.3'	-58.0'	142.6°	18°29.6'	-58.2'	142.8°	17°41.7'	-58.3'	143.0°	16°53.7'	-58.5'	143.2°	16°05.7'	-58.6'	143.4°	1
2	19°54.6'	-57.7'	142.4°	19°07.0'	-57.8'	142.6°	18°19.3'	-58.0'	142.9°	17°31.4'	-58.2'	143.0°	16°43.4'	-58.3'	143.2°	15°55.3'	-58.5'	143.4°	15°07.0'	-58.6'	143.6°	2
3	18°57.0'	-57.7'	142.7°	18°09.2'	-57.9'	142.9°	17°21.3'	-58.0'	143.1°	16°33.2'	-58.2'	143.3°	15°45.0'	-58.4'	143.5°	14°56.8'	-58.5'	143.6°	14°08.4'	-58.6'	143.8°	3
4	17°59.3'	-57.7'	143.0°	17°11.3'	-57.9'	143.2°	16°23.2'	-58.1'	143.4°	15°35.0'	-58.2'	143.6°	14°46.7'	-58.4'	143.7°	13°58.3'	-58.5'	143.9°	13°09.8'	-58.7'	144.0°	4
5	17°01.6'	-57.7'	143.3°	16°13.4'	-57.9'	143.5°	15°25.2'	-58.1'	143.6°	14°36.8'	-58.2'	143.8°	13°48.3'	-58.4'	144.0°	12°59.8'	-58.5'	144.1°	12°11.1'	-58.7'	144.2°	5
6	16°03.9'	-57.8'	143.6°	15°15.5'	-57.9'	143.8°	14°27.1'	-58.1'	143.9°	13°38.5'	-58.3'	144.1°	12°49.9'	-58.4'	144.2°	12°01.2'	-58.5'	144.3°	11°12.5'	-58.7'	144.4°	6
7	15°06.1'	-57.8'	143.9°	14°17.6'	-58.0'	144.0°	13°29.0'	-58.1'	144.2°	12°40.3'	-58.3'	144.3°	11°51.5'	-58.4'	144.4°	11°02.7'	-58.5'	144.5°	10°13.8'	-58.7'	144.7°	7
8	14°08.3'	-57.8'	144.1°	13°19.6'	-58.0'	144.3°	12°30.9'	-58.1'	144.4°	11°42.0'	-58.3'	144.5°	10°53.1'	-58.4'	144.7°	10°04.1'	-58.6'	144.8°	9°15.1'	-58.7'	144.9°	8
9	13°10.5'	-57.8'	144.4°	12°21.7'	-58.0'	144.6°	11°32.7'	-58.1'	144.7°	10°43.8'	-58.3'	144.8°	9°54.7'	-58.4'	144.9°	9°05.6'	-58.6'	145.0°	8°16.4'	-58.7'	145.1°	9
10	12°12.7'	-57.8'	144.7°	11°23.7'	-58.0'	144.8°	10°34.6'	-58.2'	144.9°	9°45.5'	-58.3'	145.0°	8°56.3'	-58.4'	145.1°	8°07.0'	-58.6'	145.2°	7°17.7'	-58.7'	145.3°	10
11	11°14.8'	-57.9'	145.0°	10°25.7'	-58.0'	145.1°	9°36.4'	-58.2'	145.2°	8°47.2'	-58.3'	145.3°	7°57.8'	-58.4'	145.4°	7°08.4'	-58.6'	145.4°	6°19.0'	-58.7'	145.5°	11
12	10°17.0'	-57.9'	145.2°	9°27.7'	-58.0'	145.3°	8°38.3'	-58.2'	145.4°	7°48.9'	-58.3'	145.5°	6°59.4'	-58.5'	145.6°	6°09.9'	-58.6'	145.6°	5°20.3'	-58.7'	145.7°	12
13	9°19.1'	-57.9'	145.5°	8°29.6'	-58.0'	145.6°	7°40.1'	-58.2'	145.7°	6°50.5'	-58.3'	145.7°	6°00.9'	-58.5'	145.8°	5°11.3'	-58.6'	145.9°	4°21.6'	-58.7'	145.9°	13
14	8°21.2'	-57.9'	145.8°	7°31.6'	-58.0'	145.8°	6°41.9'	-58.2'	145.9°	5°52.2'	-58.3'	146.0°	5°02.5'	-58.5'	146.0°	4°12.7'	-58.6'	146.1°	3°22.9'	-58.7'	146.1°	14
15	7°23.3'	-57.9'	146.0°	6°33.6'	-58.1'	146.1°	5°43.7'	-58.2'	146.2°	4°53.9'	-58.3'	146.2°	4°04.0'	-58.5'	146.3°	3°14.1'	-58.6'	146.3°	2°24.2'	-58.7'	146.3°	15
16	6°25.4'	-57.9'	146.3°	5°35.5'	-58.1'	146.4°	4°45.5'	-58.2'	146.4°	3°55.5'	-58.3'	146.5°	3°05.5'	-58.5'	146.5°	2°15.5'	-58.6'	146.5°	1°25.5'	-58.7'	146.5°	16
17	5°27.5'	-57.9'	146.6°	4°37.5'	-58.1'	146.6°	3°47.3'	-58.2'	146.7°	2°57.2'	-58.3'	146.7°	2°07.1'	-58.5'	146.7°	1°16.9'	-58.6'	146.7°	0°26.7'	-58.7'	146.7°	17
18	4°29.6'	-57.9'	146.8°	3°39.4'	-58.1'	146.9°	2°49.1'	-58.2'	146.9°	1°58.9'	-58.3'	146.9°	1°08.6'	-58.5'	146.9°	0°18.3'	-58.6'	146.9°	0°32.0'	+58.7'	33.1°	18
19	3°31.7'	-57.9'	147.1°	2°41.3'	-58.1'	147.1°	1°50.9'	-58.2'	147.1°	1°00.5'	-58.3'	147.2°	0°10.1'	-58.5'	147.2°	0°40.3'	+58.6'	32.8°	1°30.7'	+58.7'	32.9°	19
20	2°33.8'	-57.9'	147.3°	1°43.3'	-58.1'	147.4°	0°52.7'	-58.2'	147.4°	0°02.2'	-58.3'	147.4°	0°48.4'	+58.5'	32.6°	1°38.9'	+58.6'	32.6°	2°29.4'	+58.7'	32.6°	20
21	1°35.9'	-57.9'	147.6°	0°45.2'	-58.1'	147.6°	0°05.5'	+58.2'	32.4°	0°56.2'	+58.3'	32.4°	1°46.8'	+58.5'	32.4°	2°37.5'	+58.6'					

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

34° 326° LHA

Latitude CONTRARY to Declination

34° 326° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	22°06.5'	-57.7'	142.9°	21°18.6'	-57.9'	143.1°	20°30.6'	-58.1'	143.3°	19°42.4'	-58.2'	143.6°	18°54.0'	-58.4'	143.8°	18°05.6'	-58.5'	144.0°	17°17.0'	-58.7'	144.2°	0
1	21°08.8'	-57.7'	143.2°	20°20.7'	-57.9'	143.4°	19°32.5'	-58.1'	143.6°	18°44.1'	-58.3'	143.8°	17°55.7'	-58.4'	144.0°	17°07.1'	-58.5'	144.2°	16°18.3'	-58.7'	144.4°	1
2	20°11.0'	-57.8'	143.5°	19°22.8'	-58.0'	143.7°	18°34.4'	-58.1'	143.9°	17°45.9'	-58.3'	144.1°	16°57.3'	-58.4'	144.3°	16°08.5'	-58.6'	144.4°	15°19.7'	-58.7'	144.6°	2
3	19°13.3'	-57.8'	143.7°	18°24.9'	-58.0'	143.9°	17°36.3'	-58.1'	144.1°	16°47.6'	-58.3'	144.3°	15°58.8'	-58.4'	144.5°	15°09.9'	-58.6'	144.6°	14°21.0'	-58.7'	144.8°	3
4	18°15.5'	-57.8'	144.0°	17°26.9'	-58.0'	144.2°	16°38.2'	-58.2'	144.4°	15°49.3'	-58.3'	144.6°	15°00.4'	-58.5'	144.7°	14°11.4'	-58.6'	144.9°	13°22.3'	-58.7'	145.0°	4
5	17°17.7'	-57.9'	144.3°	16°28.9'	-58.0'	144.5°	15°40.0'	-58.2'	144.7°	14°51.0'	-58.3'	144.8°	14°01.9'	-58.5'	145.0°	13°12.8'	-58.6'	145.1°	12°23.5'	-58.7'	145.2°	5
6	16°19.8'	-57.9'	144.6°	15°30.9'	-58.0'	144.7°	14°41.8'	-58.2'	144.9°	13°52.7'	-58.3'	145.1°	13°03.5'	-58.5'	145.2°	12°14.2'	-58.6'	145.3°	11°24.8'	-58.7'	145.4°	6
7	15°22.0'	-57.9'	144.9°	14°32.8'	-58.1'	145.0°	13°43.6'	-58.2'	145.2°	12°54.4'	-58.4'	145.3°	12°05.0'	-58.5'	145.4°	11°15.6'	-58.6'	145.5°	10°26.1'	-58.7'	145.6°	7
8	14°24.1'	-57.9'	145.1°	13°34.8'	-58.1'	145.3°	12°45.4'	-58.2'	145.4°	11°56.0'	-58.4'	145.5°	11°06.5'	-58.5'	145.6°	10°16.9'	-58.6'	145.8°	9°27.3'	-58.8'	145.8°	8
9	13°26.2'	-57.9'	145.4°	12°36.7'	-58.1'	145.5°	11°47.2'	-58.2'	145.7°	10°57.7'	-58.4'	145.8°	10°08.0'	-58.5'	145.9°	9°18.3'	-58.6'	146.0°	8°28.6'	-58.8'	146.1°	9
10	12°28.2'	-57.9'	145.7°	11°38.6'	-58.1'	145.8°	10°49.0'	-58.2'	145.9°	9°59.3'	-58.4'	146.0°	9°09.5'	-58.5'	146.1°	8°19.7'	-58.6'	146.2°	7°29.8'	-58.8'	146.3°	10
11	11°30.3'	-58.0'	145.9°	10°40.5'	-58.1'	146.0°	9°50.7'	-58.3'	146.1°	9°00.9'	-58.4'	146.2°	8°11.0'	-58.5'	146.3°	7°21.0'	-58.6'	146.4°	6°31.0'	-58.8'	146.5°	11
12	10°32.3'	-58.0'	146.2°	9°42.4'	-58.1'	146.3°	8°52.5'	-58.3'	146.4°	8°02.5'	-58.4'	146.5°	7°12.5'	-58.5'	146.5°	6°22.4'	-58.7'	146.6°	5°32.3'	-58.8'	146.7°	12
13	9°34.4'	-58.0'	146.5°	8°44.3'	-58.1'	146.5°	7°54.2'	-58.3'	146.6°	7°04.1'	-58.4'	146.7°	6°13.9'	-58.5'	146.8°	5°23.7'	-58.7'	146.8°	4°33.5'	-58.8'	146.9°	13
14	8°36.4'	-58.0'	146.7°	7°46.2'	-58.1'	146.8°	6°56.0'	-58.3'	146.9°	6°05.7'	-58.4'	146.9°	5°15.4'	-58.5'	147.0°	4°25.1'	-58.7'	147.0°	3°34.7'	-58.8'	147.1°	14
15	7°38.4'	-58.0'	147.0°	6°48.0'	-58.1'	147.0°	5°57.7'	-58.3'	147.1°	5°07.3'	-58.4'	147.2°	4°16.9'	-58.5'	147.2°	3°26.4'	-58.7'	147.2°	2°36.0'	-58.8'	147.3°	15
16	6°40.4'	-58.0'	147.2°	5°49.9'	-58.2'	147.3°	4°59.4'	-58.3'	147.3°	4°08.9'	-58.4'	147.4°	3°18.3'	-58.5'	147.4°	2°27.8'	-58.7'	147.5°	1°37.2'	-58.8'	147.5°	16
17	5°42.4'	-58.0'	147.5°	4°51.7'	-58.2'	147.5°	4°01.1'	-58.3'	147.6°	3°10.4'	-58.4'	147.6°	2°19.8'	-58.5'	147.6°	1°29.1'	-58.7'	147.7°	<u>0°38.4' -58.8' 147.7°</u>			17
18	4°44.3'	-58.0'	147.7°	3°53.6'	-58.2'	147.8°	3°02.8'	-58.3'	147.8°	2°12.0'	-58.4'	147.8°	1°21.2'	-58.5'	147.9°	<u>0°30.4' -58.7' 147.9°</u>			0°20.4'	+58.8'	32.1°	18
19	3°46.3'	-58.0'	148.0°	2°55.4'	-58.2'	148.0°	2°04.5'	-58.3'	148.1°	1°13.6'	-58.4'	148.1°	<u>0°22.7' -58.6' 148.1°</u>			0°28.3'	+58.7'	31.9°	1°19.2'	+58.8'	31.9°	19
20	2°48.3'	-58.0'	148.3°	1°57.3'	-58.2'	148.3°	1°06.2'	-58.3'	148.3°	<u>0°15.2' -58.4' 148.3°</u>			0°35.9'	+58.5'	31.7°	1°26.9'	+58.7'	31.7°	2°18.0'	+58.8'	31.7°	20
21	1°50.3'	-58.0'	148.5°	0°59.9'	-58.2'	148.5°	<u>0°07.9' -58.3' 148.5°</u>			0°43.3'	+58.4'	31.5°	1°34.4'	+58.5'	31.5°	2°25.6'	+58.7'	31.5°	3°16.7'	+58.8'	31.5°	21
22	<u>0°52.2' -58.0' 148.8°</u>			<u>0°00.9' -58.2' 148.8°</u>			0°50.4'	+58.3'	31.2°	1°41.7'	+58.4'	31.2°	2°33.0'	+58.5'	31.3°	3°24.3'	+58.7'	31.3°	4°15.5'	+58.8'	31.3°	22
23	0°05.8'	+58.0'	31.0°	0°57.2'	+58.2'	31.0°	1°48.7'	+58.3'	31.0°	2°40.1'	+58.4'	31.0°	3°31.5'	+58.5'	31.0°	4°22.9'	+58.7'	31.1°	5°14.3'	+58.8'	31.1°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

146° 214° LHA

Latitude SAME as DECLINATION

146° 214° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	22°22.8'	-57.8'	143.9°	21°34.2'	-58.0'	144.2°	20°45.5'	-58.2'	144.4°	19°56.7'	-58.3'	144.6°	19°07.7'	-58.5'	144.8°	18°18.6'	-58.6'	145.0°	17°29.4'	-58.7'	145.2°	0
1	21°24.9'	-57.9'	144.2°	20°36.2'	-58.0'	144.4°	19°47.4'	-58.2'	144.6°	18°58.4'	-58.3'	144.8°	18°09.3'	-58.5'	145.0°	17°20.0'	-58.6'	145.2°	16°30.7'	-58.7'	145.4°	1
2	20°27.1'	-57.9'	144.5°	19°38.2'	-58.1'	144.7°	18°49.2'	-58.2'	144.9°	18°00.0'	-58.4'	145.1°	17°10.8'	-58.5'	145.3°	16°21.4'	-58.6'	145.4°	15°32.0'	-58.8'	145.6°	2
3	19°29.2'	-57.9'	144.8°	18°40.2'	-58.1'	145.0°	17°51.0'	-58.2'	145.2°	17°01.7'	-58.4'	145.3°	16°12.3'	-58.5'	145.5°	15°22.8'	-58.6'	145.7°	14°33.2'	-58.8'	145.8°	3
4	18°31.3'	-57.9'	145.0°	17°42.1'	-58.1'	145.2°	16°52.7'	-58.2'	145.4°	16°03.3'	-58.4'	145.6°	15°13.8'	-58.5'	145.7°	14°24.1'	-58.7'	145.9°	13°34.4'	-58.8'	146.0°	4
5	17°33.4'	-58.0'	145.3°	16°44.0'	-58.1'	145.5°	15°54.5'	-58.3'	145.7°	15°04.9'	-58.4'	145.8°	14°15.2'	-58.5'	146.0°	13°25.5'	-58.7'	146.1°	12°35.6'	-58.8'	146.2°	5
6	16°35.4'	-58.0'	145.6°	15°45.9'	-58.1'	145.7°	14°56.2'	-58.3'	145.9°	14°06.5'	-58.4'	146.0°	13°16.7'	-58.6'	146.2°	12°26.8'	-58.7'	146.3°	11°36.9'	-58.8'	146.4°	6
7	15°37.4'	-58.0'	145.9°	14°47.7'	-58.2'	146.0°	13°58.0'	-58.3'	146.1°	13°08.1'	-58.4'	146.3°	12°18.1'	-58.6'	146.4°	11°28.1'	-58.7'	146.5°	10°38.1'	-58.8'	146.6°	7
8	14°39.4'	-58.0'	146.1°	13°49.6'	-58.2'	146.3°	12°59.7'	-58.3'	146.4°	12°09.7'	-58.4'	146.5°	11°19.6'	-58.6'	146.6°	10°29.4'	-58.7'	146.7°	9°39.2'	-58.8'	146.8°	8
9	13°41.4'	-58.0'	146.4°	12°51.4'	-58.2'	146.5°	12°01.4'	-58.3'	146.6°	11°11.2'	-58.5'	146.7°	10°21.0'	-58.6'	146.9°	9°30.7'	-58.7'	146.9°	8°40.4'	-58.8'	147.0°	9
10	12°43.4'	-58.0'	146.6°	11°53.2'	-58.2'	146.8°	11°03.0'	-58.3'	146.9°	10°12.8'	-58.5'	147.0°	9°22.4'	-58.6'	147.1°	8°32.0'	-58.7'	147.2°	7°41.6'	-58.8'	147.2°	10
11	11°45.3'	-58.1'	146.9°	10°55.1'	-58.2'	147.0°	10°04.7'	-58.3'	147.1°	9°14.3'	-58.5'	147.2°	8°23.8'	-58.6'	147.3°	7°33.3'	-58.7'	147.4°	6°42.8'	-58.8'	147.4°	11
12	10°47.3'	-58.1'	147.2°	9°56.8'	-58.2'	147.3°	9°06.4'	-58.4'	147.3°	8°15.8'	-58.5'	147.4°	7°25.2'	-58.6'	147.5°	6°34.6'	-58.7'	147.6°	5°43.9'	-58.8'	147.6°	12
13	9°49.2'	-58.1'	147.4°	8°58.6'	-58.2'	147.5°	8°08.0'	-58.4'	147.6°	7°17.3'	-58.5'	147.7°	6°26.6'	-58.6'	147.7°	5°35.9'	-58.7'	147.8°	4°45.1'	-58.8'	147.8°	13
14	8°51.1'	-58.1'	147.7°	8°00.4'	-58.2'	147.7°	7°09.6'	-58.4'	147.8°	6°18.8'	-58.5'	147.9°	5°28.0'	-58.6'	147.9°	4°37.2'	-58.7'	148.0°	3°46.3'	-58.8'	148.0°	14
15	7°53.0'	-58.1'	147.9°	7°02.2'	-58.2'	148.0°	6°11.3'	-58.4'	148.1°	5°20.4'	-58.5'	148.1°	4°29.4'	-58.6'	148.1°	3°38.4'	-58.7'	148.2°	2°47.4'	-58.8'	148.2°	15
16	6°54.9'	-58.1'	148.2°	6°03.9'	-58.2'	148.2°	5°12.9'	-58.4'	148.3°	4°21.9'	-58.5'	148.3°	3°30.8'	-58.6'	148.4°	2°39.7'	-58.7'	148.4°	1°48.6'	-58.8'	148.4°	16
17	5°56.8'	-58.1'	148.4°	5°05.7'	-58.3'	148.5°	4°14.5'	-58.4'	148.5°	3°23.4'	-58.5'	148.6°	2°32.2'	-58.6'	148.6°	1°41.0'	-58.7'	148.6°	<u>0°49.7' -58.8' 148.6°</u>			17
18	4°58.7'	-58.1'	148.7°	4°07.4'	-58.3'	148.7°	3°16.1'	-58.4'	148.7°	2°24.8'	-58.5'	148.8°	1°33.5'	-58.6'	148.8°	<u>0°42.2' -58.7' 148.8°</u>			0°09.1'	+58.8'	31.2°	18
19	4°00.6'	-58.1'	148.9°	3°09.2'	-58.3'	149.0°	2°17.8'	-58.4'	149.0°	1°26.3'	-58.5'	149.0°	<u>0°34.9' -58.6' 149.0°</u>			0°16.5'	+58.7'	31.0°	1°08.0'	+58.8'	31.0°	19
20	3°02.4'	-58.1'	149.2°	2°10.9'	-58.3'	149.2°	1°19.4'	-58.4'	149.2°	<u>0°27.8' -58.5' 149.2°</u>			0°23.7'	+58.6'	30.8°	1°15.3'	+58.7'	30.8°	2°06.8'	+58.8'	30.8°	20
21	2°04.3'	-58.1'	149.4°	1°12.6'	-58.3'	149.4°	<u>0°21.0' -58.4' 149.4°</u>															

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

32° 328° LHA

Latitude CONTRARY to Declination

32° 328° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	22°38.6'	-57.9'	145.0°	21°49.5'	-58.1'	145.2°	21°00.1'	-58.3'	145.4°	20°10.7'	-58.4'	145.6°	19°21.1'	-58.5'	145.8°	18°31.4'	-58.7'	146.0°	17°41.6'	-58.8'	146.2°	0
1	21°40.7'	-58.0'	145.2°	20°51.3'	-58.1'	145.5°	20°01.9'	-58.3'	145.7°	19°12.3'	-58.4'	145.9°	18°22.5'	-58.6'	146.1°	17°32.7'	-58.7'	146.2°	16°42.8'	-58.8'	146.4°	1
2	20°42.7'	-58.0'	145.5°	19°53.2'	-58.2'	145.7°	19°03.6'	-58.3'	145.9°	18°13.8'	-58.4'	146.1°	17°24.0'	-58.6'	146.3°	16°34.0'	-58.7'	146.5°	15°44.0'	-58.8'	146.6°	2
3	19°44.7'	-58.0'	145.8°	18°55.1'	-58.2'	146.0°	18°05.3'	-58.3'	146.2°	17°15.4'	-58.5'	146.3°	16°25.4'	-58.6'	146.5°	15°35.3'	-58.7'	146.7°	14°45.1'	-58.8'	146.8°	3
4	18°46.7'	-58.0'	146.1°	17°56.9'	-58.2'	146.2°	17°07.0'	-58.3'	146.4°	16°16.9'	-58.5'	146.6°	15°26.8'	-58.6'	146.7°	14°36.6'	-58.7'	146.9°	13°46.3'	-58.8'	147.0°	4
5	17°48.7'	-58.1'	146.3°	16°58.7'	-58.2'	146.5°	16°08.6'	-58.4'	146.7°	15°18.4'	-58.5'	146.8°	14°28.2'	-58.6'	147.0°	13°37.9'	-58.7'	147.1°	12°47.4'	-58.9'	147.2°	5
6	16°50.6'	-58.1'	146.6°	16°00.5'	-58.2'	146.8°	15°10.3'	-58.4'	146.9°	14°20.0'	-58.5'	147.0°	13°29.6'	-58.6'	147.2°	12°39.1'	-58.7'	147.3°	11°48.6'	-58.9'	147.4°	6
7	15°52.5'	-58.1'	146.9°	15°02.3'	-58.2'	147.0°	14°11.9'	-58.4'	147.1°	13°21.5'	-58.5'	147.3°	12°30.9'	-58.6'	147.4°	11°40.4'	-58.8'	147.5°	10°49.7'	-58.9'	147.6°	7
8	14°54.4'	-58.1'	147.1°	14°04.0'	-58.3'	147.2°	13°13.5'	-58.4'	147.4°	12°22.9'	-58.5'	147.5°	11°32.3'	-58.6'	147.6°	10°41.6'	-58.8'	147.7°	9°50.8'	-58.9'	147.8°	8
9	13°56.3'	-58.1'	147.4°	13°05.7'	-58.3'	147.5°	12°15.1'	-58.4'	147.6°	11°24.4'	-58.5'	147.7°	10°33.7'	-58.7'	147.8°	9°42.8'	-58.8'	147.9°	8°52.0'	-58.9'	148.0°	9
10	12°58.2'	-58.1'	147.6°	12°07.5'	-58.3'	147.7°	11°16.7'	-58.4'	147.8°	10°25.9'	-58.5'	148.0°	9°35.0'	-58.7'	148.0°	8°44.1'	-58.8'	148.1°	7°53.1'	-58.9'	148.2°	10
11	12°00.0'	-58.2'	147.9°	11°09.2'	-58.3'	148.0°	10°18.3'	-58.4'	148.1°	9°27.3'	-58.6'	148.2°	8°36.3'	-58.7'	148.3°	7°45.3'	-58.8'	148.3°	6°54.2'	-58.9'	148.4°	11
12	11°01.9'	-58.2'	148.1°	10°10.9'	-58.3'	148.2°	9°19.9'	-58.4'	148.3°	8°28.8'	-58.6'	148.4°	7°37.7'	-58.7'	148.5°	6°46.5'	-58.8'	148.5°	5°55.3'	-58.9'	148.6°	12
13	10°03.7'	-58.2'	148.4°	9°12.6'	-58.3'	148.5°	8°21.4'	-58.4'	148.5°	7°30.2'	-58.6'	148.6°	6°39.0'	-58.7'	148.7°	5°47.7'	-58.8'	148.7°	4°56.4'	-58.9'	148.8°	13
14	9°05.5'	-58.2'	148.6°	8°14.3'	-58.3'	148.7°	7°23.0'	-58.5'	148.8°	6°31.6'	-58.6'	148.8°	5°40.3'	-58.7'	148.9°	4°48.9'	-58.8'	148.9°	3°57.5'	-58.9'	149.0°	14
15	8°07.3'	-58.2'	148.9°	7°15.9'	-58.3'	148.9°	6°24.5'	-58.5'	149.0°	5°33.1'	-58.6'	149.1°	4°41.6'	-58.7'	149.1°	3°50.1'	-58.8'	149.1°	2°58.6'	-58.9'	149.2°	15
16	7°09.1'	-58.2'	149.1°	6°17.6'	-58.3'	149.2°	5°26.1'	-58.5'	149.2°	4°34.5'	-58.6'	149.3°	3°42.9'	-58.7'	149.3°	2°51.3'	-58.8'	149.3°	1°59.7'	-58.9'	149.4°	16
17	6°10.9'	-58.2'	149.4°	5°19.3'	-58.3'	149.4°	4°27.6'	-58.5'	149.4°	3°35.9'	-58.6'	149.5°	2°44.2'	-58.7'	149.5°	1°52.5'	-58.8'	149.5°	1°00.8'	-58.9'	149.5°	17
18	5°12.7'	-58.2'	149.6°	4°20.9'	-58.4'	149.6°	3°29.1'	-58.5'	149.7°	2°37.3'	-58.6'	149.7°	1°45.5'	-58.7'	149.7°	<u>0°53.7' -58.8' 149.7°</u>			<u>0°01.9' -58.9' 149.7°</u>			18
19	4°14.4'	-58.2'	149.8°	3°22.6'	-58.4'	149.9°	2°30.7'	-58.5'	149.9°	1°38.7'	-58.6'	149.9°	<u>0°46.8' -58.7' 149.9°</u>			0°05.1' +58.8' 30.1°			0°57.0' +58.9' 30.1°			19
20	3°16.2'	-58.2'	150.1°	2°24.2'	-58.4'	150.1°	1°32.2'	-58.5'	150.1°	<u>0°40.2' -58.6' 150.1°</u>			0°11.9' +58.7' 29.9°			1°03.9' +58.8' 29.9°			1°55.9' +58.9' 29.9°			20
21	2°18.0'	-58.2'	150.3°	1°25.8'	-58.4'	150.3°	<u>0°33.7' -58.5' 150.3°</u>			0°18.4' +58.6' 29.7°			1°10.6' +58.7' 29.7°			2°02.7' +58.8' 29.7°			2°54.8' +58.9' 29.7°			21
22	1°19.7'	-58.2'	150.6°	<u>0°27.5' -58.4' 150.6°</u>			0°24.8' +58.5' 29.4°			1°17.0' +58.6' 29.4°			2°09.3' +58.7' 29.5°			3°01.5' +58.8' 29.5°			3°53.7' +58.9' 29.5°			22
23	<u>0°21.5' -58.2' 150.8°</u>			0°30.9' +58.4' 29.2°			1°23.2' +58.5' 29.2°			2°15.6' +58.6' 29.2°			3°08.0' +58.7' 29.2°			4°00.3' +58.8' 29.3°			4°52.6' +58.9' 29.3°			23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

148° 212° LHA

Latitude SAME as DECLINATION

148° 212° 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 CONTRARY to Declination

31° 329° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	22°54.0'	-58.0'	146.0°	22°04.3'	-58.2'	146.2°	21°14.3'	-58.4'	146.5°	20°24.3'	-58.5'	146.7°	19°34.1'	-58.6'	146.9°	18°43.8'	-58.7'	147.1°	17°53.4'	-58.9'	147.2°	0
1	21°56.0'	-58.1'	146.3°	21°06.1'	-58.2'	146.5°	20°16.0'	-58.4'	146.7°	19°25.8'	-58.5'	146.9°	18°35.4'	-58.6'	147.1°	17°45.0'	-58.8'	147.3°	16°54.5'	-58.9'	147.4°	1
2	20°57.9'	-58.1'	146.5°	20°07.8'	-58.3'	146.8°	19°17.6'	-58.4'	147.0°	18°27.3'	-58.5'	147.1°	17°36.8'	-58.7'	147.3°	16°46.3'	-58.8'	147.5°	15°55.6'	-58.9'	147.6°	2
3	19°59.9'	-58.1'	146.8°	19°09.6'	-58.3'	147.0°	18°19.2'	-58.4'	147.2°	17°28.7'	-58.5'	147.4°	16°38.1'	-58.7'	147.5°	15°47.5'	-58.8'	147.7°	14°56.7'	-58.9'	147.8°	3
4	19°01.7'	-58.1'	147.1°	18°11.3'	-58.3'	147.3°	17°20.8'	-58.4'	147.4°	16°30.2'	-58.6'	147.6°	15°39.5'	-58.7'	147.8°	14°48.7'	-58.8'	147.9°	13°57.8'	-58.9'	148.0°	4
5	18°03.6'	-58.2'	147.3°	17°13.0'	-58.3'	147.5°	16°22.4'	-58.4'	147.7°	15°31.6'	-58.6'	147.8°	14°40.8'	-58.7'	148.0°	13°49.9'	-58.8'	148.1°	12°58.9'	-58.9'	148.2°	5
6	17°05.4'	-58.2'	147.6°	16°14.7'	-58.3'	147.8°	15°22.9'	-58.5'	147.9°	14°33.1'	-58.6'	148.0°	13°42.1'	-58.7'	148.2°	12°51.1'	-58.8'	148.3°	12°00.0'	-58.9'	148.4°	6
7	16°07.2'	-58.2'	147.9°	15°16.4'	-58.3'	148.0°	14°25.5'	-58.5'	148.1°	13°34.5'	-58.6'	148.3°	12°43.4'	-58.7'	148.4°	11°52.3'	-58.8'	148.5°	11°01.1'	-58.9'	148.6°	7
8	15°09.0'	-58.2'	148.1°	14°18.0'	-58.4'	148.2°	13°27.0'	-58.5'	148.4°	12°35.9'	-58.6'	148.5°	11°44.7'	-58.7'	148.6°	10°53.4'	-58.8'	148.7°	10°02.1'	-58.9'	148.8°	8
9	14°10.8'	-58.2'	148.4°	13°19.7'	-58.4'	148.5°	12°28.5'	-58.5'	148.6°	11°37.3'	-58.6'	148.7°	10°46.0'	-58.7'	148.8°	9°54.6'	-58.8'	148.9°	9°03.2'	-58.9'	149.0°	9
10	13°12.6'	-58.3'	148.6°	12°21.3'	-58.4'	148.7°	11°30.0'	-58.5'	148.8°	10°38.7'	-58.6'	148.9°	9°47.2'	-58.7'	149.0°	8°55.8'	-58.8'	149.1°	8°04.3'	-59.0'	149.2°	10
11	12°14.3'	-58.3'	148.8°	11°22.9'	-58.4'	149.0°	10°31.5'	-58.5'	149.1°	9°40.0'	-58.6'	149.1°	8°48.5'	-58.7'	149.2°	7°56.9'	-58.9'	149.3°	7°05.3'	-59.0'	149.4°	11
12	11°16.1'	-58.3'	149.1°	10°24.5'	-58.4'	149.2°	9°33.0'	-58.5'	149.3°	8°41.4'	-58.6'	149.4°	7°49.7'	-58.8'	149.4°	6°58.1'	-58.9'	149.5°	6°06.4'	-59.0'	149.6°	12
13	10°17.8'	-58.3'	149.3°	9°26.1'	-58.4'	149.4°	8°34.5'	-58.5'	149.5°	7°42.8'	-58.6'	149.6°	6°51.0'	-58.8'	149.6°	5°59.2'	-58.9'	149.7°	5°07.4'	-59.0'	149.7°	13
14	9°19.5'	-58.3'	149.6°	8°27.7'	-58.4'	149.7°	7°35.9'	-58.5'	149.7°	6°44.1'	-58.7'	149.8°	5°52.2'	-58.8'	149.8°	5°00.3'	-58.9'	149.9°	4°08.4'	-59.0'	149.9°	14
15	8°21.2'	-58.3'	149.8°	7°29.3'	-58.4'	149.9°	6°37.4'	-58.5'	149.9°	5°45.5'	-58.7'	150.0°	4°53.5'	-58.8'	150.0°	4°01.5'	-58.9'	150.1°	3°09.5'	-59.0'	150.1°	15
16	7°22.9'	-58.3'	150.1°	6°30.9'	-58.4'	150.1°	5°38.9'	-58.5'	150.2°	4°46.8'	-58.7'	150.2°	3°54.7'	-58.8'	150.2°	3°02.6'	-58.9'	150.3°	2°10.5'	-59.0'	150.3°	16
17	6°24.6'	-58.3'	150.3°	5°32.5'	-58.4'	150.3°	4°40.3'	-58.6'	150.4°	3°48.1'	-58.7'	150.4°	2°55.9'	-58.8'	150.5°	2°03.7'	-58.9'	150.5°	1°11.5'	-59.0'	150.5°	17
18	5°26.3'	-58.3'	150.5°	4°34.0'	-58.4'	150.6°	3°41.8'	-58.6'	150.6°	2°49.5'	-58.7'	150.6°	1°57.2'	-58.8'	150.7°	1°04.9'	-58.9'	150.7°	<u>0°12.6' -59.0' 150.7°</u>			18
19	4°27.9'	-58.3'	150.8°	3°35.6'	-58.4'	150.8°	2°43.2'	-58.6'	150.8°	1°50.8'	-58.7'	150.8°	<u>0°58.4' -58.8' 150.9°</u>			<u>0°06.0' -58.9' 150.9°</u>			0°46.4' +59.0' 29.1°			19
20	3°29.6'	-58.3'	151.0°	2°37.1'	-58.4'	151.0°	1°44.6'	-58.6'	151.0°	<u>0°52.1' -58.7' 151.1°</u>			0°00.4' +58.8' 28.9°			0°52.9' +58.9' 28.9°			1°45.4' +59.0' 29.0°			20
21	2°31.3'	-58.3'	151.2°	1°38																		

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

30° 330° LHA

Latitude CONTRARY to Declination

30° 330° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	23°09.1'	-58.2'	147.1°	22°18.7'	-58.3'	147.3°	21°28.1'	-58.4'	147.5°	20°37.5'	-58.6'	147.7°	19°46.7'	-58.7'	147.9°	18°55.8'	-58.8'	148.1°	18°04.8'	-58.9'	148.3°	0
1	22°10.9'	-58.2'	147.3°	21°20.4'	-58.3'	147.5°	20°29.7'	-58.5'	147.7°	19°38.9'	-58.6'	147.9°	18°48.0'	-58.7'	148.1°	17°57.0'	-58.8'	148.3°	17°05.9'	-58.9'	148.5°	1
2	21°12.7'	-58.2'	147.6°	20°22.1'	-58.3'	147.8°	19°31.2'	-58.5'	148.0°	18°40.3'	-58.6'	148.2°	17°49.3'	-58.7'	148.3°	16°58.2'	-58.8'	148.5°	16°07.0'	-59.0'	148.7°	2
3	20°14.6'	-58.2'	147.8°	19°23.7'	-58.4'	148.0°	18°32.8'	-58.5'	148.2°	17°41.7'	-58.6'	148.4°	16°50.6'	-58.7'	148.6°	15°59.3'	-58.9'	148.7°	15°08.0'	-59.0'	148.9°	3
4	19°16.3'	-58.2'	148.1°	18°25.3'	-58.4'	148.3°	17°34.3'	-58.5'	148.5°	16°43.1'	-58.6'	148.6°	15°51.8'	-58.8'	148.8°	15°00.5'	-58.9'	148.9°	14°09.1'	-59.0'	149.0°	4
5	18°18.1'	-58.3'	148.4°	17°27.0'	-58.4'	148.5°	16°35.7'	-58.5'	148.7°	15°44.4'	-58.7'	148.8°	14°53.1'	-58.8'	149.0°	14°01.6'	-58.9'	149.1°	13°10.1'	-59.0'	149.2°	5
6	17°19.8'	-58.3'	148.6°	16°28.6'	-58.4'	148.8°	15°37.2'	-58.5'	148.9°	14°45.8'	-58.7'	149.1°	13°54.3'	-58.8'	149.2°	13°02.7'	-58.9'	149.3°	12°11.1'	-59.0'	149.4°	6
7	16°21.5'	-58.3'	148.9°	15°30.1'	-58.4'	149.0°	14°38.7'	-58.6'	149.1°	13°47.1'	-58.7'	149.3°	12°55.5'	-58.8'	149.4°	12°03.8'	-58.9'	149.5°	11°12.1'	-59.0'	149.6°	7
8	15°23.2'	-58.3'	149.1°	14°31.7'	-58.4'	149.2°	13°40.1'	-58.6'	149.4°	12°48.4'	-58.7'	149.5°	11°56.7'	-58.8'	149.6°	11°05.0'	-58.9'	149.7°	10°13.1'	-59.0'	149.8°	8
9	14°24.9'	-58.3'	149.3°	13°33.2'	-58.5'	149.5°	12°41.5'	-58.6'	149.6°	11°49.8'	-58.7'	149.7°	10°57.9'	-58.8'	149.8°	10°06.1'	-58.9'	149.9°	9°14.1'	-59.0'	150.0°	9
10	13°26.6'	-58.3'	149.6°	12°34.8'	-58.5'	149.7°	11°43.0'	-58.6'	149.8°	10°51.1'	-58.7'	149.9°	9°59.1'	-58.8'	150.0°	9°07.1'	-58.9'	150.1°	8°15.1'	-59.0'	150.2°	10
11	12°28.2'	-58.4'	149.8°	11°36.3'	-58.5'	149.9°	10°44.4'	-58.6'	150.0°	9°52.4'	-58.7'	150.1°	9°00.3'	-58.8'	150.2°	8°08.2'	-58.9'	150.3°	7°16.1'	-59.0'	150.3°	11
12	11°29.8'	-58.4'	150.1°	10°37.8'	-58.5'	150.2°	9°45.8'	-58.6'	150.2°	8°53.7'	-58.7'	150.3°	8°01.5'	-58.8'	150.4°	7°09.3'	-58.9'	150.5°	6°17.1'	-59.0'	150.5°	12
13	10°31.5'	-58.4'	150.3°	9°39.3'	-58.5'	150.4°	8°47.2'	-58.6'	150.5°	7°54.9'	-58.7'	150.5°	7°02.7'	-58.8'	150.6°	6°10.4'	-58.9'	150.7°	5°18.1'	-59.0'	150.7°	13
14	9°33.1'	-58.4'	150.5°	8°40.8'	-58.5'	150.6°	7°48.5'	-58.6'	150.7°	6°56.2'	-58.7'	150.7°	6°03.8'	-58.8'	150.8°	5°11.5'	-58.9'	150.8°	4°19.1'	-59.0'	150.9°	14
15	8°34.7'	-58.4'	150.8°	7°42.3'	-58.5'	150.8°	6°49.9'	-58.6'	150.9°	5°57.5'	-58.7'	150.9°	5°05.0'	-58.8'	151.0°	4°12.5'	-58.9'	151.0°	3°20.0'	-59.0'	151.1°	15
16	7°36.3'	-58.4'	151.0°	6°43.8'	-58.5'	151.1°	5°51.3'	-58.6'	151.1°	4°58.7'	-58.7'	151.2°	4°06.2'	-58.8'	151.2°	3°13.6'	-58.9'	151.2°	2°21.0'	-59.0'	151.2°	16
17	6°37.9'	-58.4'	151.2°	5°45.3'	-58.5'	151.3°	4°52.7'	-58.6'	151.3°	4°00.0'	-58.7'	151.4°	3°07.3'	-58.8'	151.4°	2°14.7'	-58.9'	151.4°	1°22.0'	-59.0'	151.4°	17
18	5°39.5'	-58.4'	151.5°	4°46.8'	-58.5'	151.5°	3°54.0'	-58.6'	151.5°	3°01.3'	-58.7'	151.6°	2°08.5'	-58.8'	151.6°	1°15.7'	-58.9'	151.6°	<u>0°22.9'</u>	-59.0'	<u>151.6°</u>	18
19	4°41.1'	-58.4'	151.7°	3°48.2'	-58.5'	151.7°	2°55.4'	-58.6'	151.7°	2°02.5'	-58.7'	151.8°	1°09.7'	-58.8'	151.8°	<u>0°16.8'</u>	-58.9'	<u>151.8°</u>	0°36.1'	+59.0'	28.2°	19
20	3°42.6'	-58.4'	151.9°	2°49.7'	-58.5'	151.9°	1°56.7'	-58.6'	152.0°	1°03.8'	-58.7'	152.0°	<u>0°10.8'</u>	-58.8'	<u>152.0°</u>	0°42.2'	+58.9'	28.0°	1°35.1'	+59.0'	28.0°	20
21	2°44.2'	-58.4'	152.1°	1°51.1'	-58.5'	152.2°	<u>0°58.1'</u>	-58.6'	<u>152.2°</u>	<u>0°05.0'</u>	-58.7'	<u>152.2°</u>	0°48.0'	+58.8'	27.8°	1°41.1'	+58.9'	27.8°	2°34.1'	+59.0'	27.9°	21
22	1°45.8'	-58.4'	152.4°	<u>0°52.6'</u>	-58.5'	<u>152.4°</u>	0°00.6'	+58.6'	27.6°	0°53.7'	+58.7'	27.6°	1°46.9'	+58.8'	27.6°	2°40.0'	+58.9'	27.7°	3°33.2'	+59.0'	27.7°	22
23	<u>0°47.3'</u>	-58.4'	<u>152.6°</u>	0°05.9'	+58.5'	27.4°	0°59.2'	+58.6'	27.4°	1°52.5'	+58.7'	27.4°	2°45.7'	+58.8'	27.4°	3°39.0'	+58.9'	27.5°	4°32.2'	+59.0'	27.5°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

150° 210° LHA

Latitude SAME as DECLINATION

150° 210° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	23°23.7'	-58.3'	148.1°	22°32.7'	-58.4'	148.3°	21°41.6'	-58.5'	148.5°	20°50.3'	-58.7'	148.8°	19°59.0'	-58.8'	148.9°	19°07.5'	-58.9'	149.1°	18°16.0'	-59.0'	149.3°	0
1	22°25.4'	-58.3'	148.4°	21°34.3'	-58.4'	148.6°	20°43.0'	-58.6'	148.8°	19°51.7'	-58.7'	149.0°	19°00.2'	-58.8'	149.2°	18°08.6'	-58.9'	149.3°	17°17.0'	-59.0'	149.5°	1
2	21°27.1'	-58.3'	148.6°	20°35.9'	-58.4'	148.8°	19°44.5'	-58.6'	149.0°	18°53.0'	-58.7'	149.2°	18°01.4'	-58.8'	149.4°	17°09.7'	-58.9'	149.5°	16°18.0'	-59.0'	149.7°	2
3	20°28.8'	-58.3'	148.9°	19°37.4'	-58.5'	149.1°	18°45.9'	-58.6'	149.2°	17°54.3'	-58.7'	149.4°	17°02.6'	-58.8'	149.6°	16°10.8'	-58.9'	149.7°	15°19.0'	-59.0'	149.9°	3
4	19°30.5'	-58.4'	149.1°	18°39.0'	-58.5'	149.3°	17°47.3'	-58.6'	149.5°	16°55.6'	-58.7'	149.6°	16°03.8'	-58.8'	149.8°	15°11.9'	-58.9'	149.9°	14°20.0'	-59.0'	150.1°	4
5	18°32.2'	-58.4'	149.4°	17°40.5'	-58.5'	149.5°	16°48.7'	-58.6'	149.7°	15°56.9'	-58.7'	149.8°	15°05.0'	-58.8'	150.0°	14°13.0'	-58.9'	150.1°	13°20.9'	-59.0'	150.2°	5
6	17°33.8'	-58.4'	149.6°	16°42.0'	-58.5'	149.8°	15°50.1'	-58.6'	149.9°	14°58.2'	-58.7'	150.1°	14°06.1'	-58.8'	150.2°	13°14.0'	-59.0'	150.3°	12°21.9'	-59.0'	150.4°	6
7	16°35.4'	-58.4'	149.9°	15°43.5'	-58.5'	150.0°	14°51.5'	-58.6'	150.1°	13°59.4'	-58.8'	150.3°	13°07.3'	-58.9'	150.4°	12°15.1'	-59.0'	150.5°	11°22.8'	-59.1'	150.6°	7
8	15°37.0'	-58.4'	150.1°	14°45.0'	-58.5'	150.2°	13°52.8'	-58.7'	150.4°	13°00.7'	-58.8'	150.5°	12°08.4'	-58.9'	150.6°	11°16.1'	-59.0'	150.7°	10°23.8'	-59.1'	150.8°	8
9	14°38.6'	-58.4'	150.3°	13°46.4'	-58.6'	150.5°	12°54.2'	-58.7'	150.6°	12°01.9'	-58.8'	150.7°	11°09.5'	-58.9'	150.8°	10°17.2'	-59.0'	150.9°	9°24.7'	-59.1'	151.0°	9
10	13°40.1'	-58.4'	150.6°	12°47.9'	-58.6'	150.7°	11°55.5'	-58.7'	150.8°	11°03.1'	-58.8'	150.9°	10°10.7'	-58.9'	151.0°	9°18.2'	-59.0'	151.1°	8°25.7'	-59.1'	151.1°	10
11	12°41.7'	-58.5'	150.8°	11°49.3'	-58.6'	150.9°	10°56.8'	-58.7'	151.0°	10°04.3'	-58.8'	151.1°	9°11.8'	-58.9'	151.2°	8°19.2'	-59.0'	151.3°	7°26.6'	-59.1'	151.3°	11
12	11°43.2'	-58.5'	151.0°	10°50.7'	-58.6'	151.1°	9°58.2'	-58.7'	151.2°	9°05.6'	-58.8'	151.3°	8°12.9'	-58.9'	151.4°	7°20.2'	-59.0'	151.4°	6°27.5'	-59.1'	151.5°	12
13	10°44.8'	-58.5'	151.3°	9°52.1'	-58.6'	151.3°	8°59.5'	-58.7'	151.4°	8°06.8'	-58.8'	151.5°	7°14.0'	-58.9'	151.6°	6°21.2'	-59.0'	151.6°	5°28.4'	-59.1'	151.7°	13
14	9°46.3'	-58.5'	151.5°	8°53.6'	-58.6'	151.6°	8°00.8'	-58.7'	151.6°	7°08.0'	-58.8'	151.7°	6°15.1'	-58.9'	151.8°	5°22.2'	-59.0'	151.8°	4°29.4'	-59.1'	151.8°	14
15	8°47.8'	-58.5'	151.7°	7°55.0'	-58.6'	151.8°	7°02.1'	-58.7'	151.8°	6°09.2'	-58.8'	151.9°	5°16.2'	-58.9'	151.9°	4°23.2'	-59.0'	152.0°	3°30.3'	-59.1'	152.0°	15
16	7°49.3'	-58.5'	151.9°	6°56.3'	-58.6'	152.0°	6°03.4'	-58.7'	152.1°	5°10.3'	-58.8'	152.1°	4°17.3'	-58.9'	152.1°	3°24.3'	-59.0'	152.2°	2°31.2'	-59.1'	152.2°	16
17	6°50.8'	-58.5'	152.2°	5°57.7'	-58.6'	152.2°	5°04.6'	-58.7'	152.3°	4°11.5'	-58.8'	152.3°	3°18.4'	-58.9'	152.3°	2°25.3'	-59.0'	152.4°	1°32.1'	-59.1'	152.4°	17
18	5°52.3'	-58.5'	152.4°	4°59.1'	-58.6'	152.4°	4°05.9'	-58.7'	152.5°	3°12.7'	-58.8'	152.5°	2°19.5'	-58.9'	152.5°	1°26.3'	-59.0'	152.5°	<u>0°33.0'</u>	-59.1'	<u>152.5°</u>	18
19	4°53.8'	-58.5'	152.6°	4°00.5'	-58.6'	152.6°	3°07.2'	-58.7'	152.7°	2°13.9'	-58.8'	152.7°	1°20.6'	-58.9'	152.7°	<u>0°27.2'</u>	-59.0'	<u>152.7°</u>	0°26.1'	+59.1'	27.3°	19
20	3°55.3'	-58.5'	152.8°	3°01.9'	-58.6'	152.9°	2°08.5'	-58.7'	152.9°	1°15.1'	-58.8'	152.9°	<u>0°21.7'</u>	-58.9'	<u>152.9°</u>	0°31.8'	+59.0'	27.1°	1°25.2'	+59.1'	27.1°	20
21	2°56.7'	-58.5'	153.1°	2°03.2'	-58.6'	153.1°																

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

28° 332° LHA

Latitude CONTRARY to Declination

28° 332° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	23°37.8'	-58.4'	149.2°	22°46.3'	-58.5'	149.4°	21°54.6'	-58.6'	149.6°	21°02.8'	-58.7'	149.8°	20°10.9'	-58.9'	150.0°	19°18.9'	-59.0'	150.2°	18°26.8'	-59.1'	150.3°	0
1	22°39.5'	-58.4'	149.4°	21°47.8'	-58.5'	149.6°	20°56.0'	-58.6'	149.8°	20°04.1'	-58.8'	150.0°	19°12.0'	-58.9'	150.2°	18°19.9'	-59.0'	150.4°	17°27.7'	-59.1'	150.5°	1
2	21°41.1'	-58.4'	149.7°	20°49.3'	-58.5'	149.9°	19°57.3'	-58.7'	150.1°	19°05.3'	-58.8'	150.2°	18°13.2'	-58.9'	150.4°	17°21.0'	-59.0'	150.6°	16°28.7'	-59.1'	150.7°	2
3	20°42.7'	-58.4'	149.9°	19°50.7'	-58.6'	150.1°	18°58.7'	-58.7'	150.3°	18°06.5'	-58.8'	150.4°	17°14.3'	-58.9'	150.6°	16°22.0'	-59.0'	150.7°	15°29.6'	-59.1'	150.9°	3
4	19°44.3'	-58.5'	150.2°	18°52.2'	-58.6'	150.3°	18°00.0'	-58.7'	150.5°	17°07.7'	-58.8'	150.7°	16°15.4'	-58.9'	150.8°	15°23.0'	-59.0'	150.9°	14°30.5'	-59.1'	151.1°	4
5	18°45.8'	-58.5'	150.4°	17°53.6'	-58.6'	150.6°	17°01.3'	-58.7'	150.7°	16°09.0'	-58.8'	150.9°	15°16.5'	-58.9'	151.0°	14°24.0'	-59.0'	151.1°	13°31.4'	-59.1'	151.2°	5
6	17°47.4'	-58.5'	150.6°	16°55.0'	-58.6'	150.8°	16°02.6'	-58.7'	150.9°	15°10.1'	-58.8'	151.1°	14°17.6'	-58.9'	151.2°	13°25.0'	-59.0'	151.3°	12°32.3'	-59.1'	151.4°	6
7	16°48.9'	-58.5'	150.9°	15°56.4'	-58.6'	151.0°	15°03.9'	-58.7'	151.1°	14°11.3'	-58.8'	151.3°	13°18.7'	-58.9'	151.4°	12°26.0'	-59.0'	151.5°	11°33.2'	-59.1'	151.6°	7
8	15°50.4'	-58.5'	151.1°	14°57.8'	-58.6'	151.2°	14°05.2'	-58.7'	151.4°	13°12.5'	-58.8'	151.5°	12°19.8'	-58.9'	151.6°	11°27.0'	-59.0'	151.7°	10°34.1'	-59.1'	151.8°	8
9	14°51.9'	-58.5'	151.3°	13°59.2'	-58.6'	151.5°	13°06.4'	-58.7'	151.6°	12°13.7'	-58.8'	151.7°	11°20.8'	-58.9'	151.8°	10°27.9'	-59.0'	151.9°	9°35.0'	-59.1'	151.9°	9
10	13°53.3'	-58.5'	151.6°	13°00.5'	-58.7'	151.7°	12°07.7'	-58.8'	151.8°	11°14.8'	-58.9'	151.9°	10°21.9'	-59.0'	152.0°	9°28.9'	-59.0'	152.0°	8°35.9'	-59.1'	152.1°	10
11	12°54.8'	-58.6'	151.8°	12°01.9'	-58.7'	151.9°	11°08.9'	-58.8'	152.0°	10°16.0'	-58.9'	152.1°	9°22.9'	-59.0'	152.2°	8°29.8'	-59.0'	152.2°	7°36.7'	-59.1'	152.3°	11
12	11°56.2'	-58.6'	152.0°	11°03.2'	-58.7'	152.1°	10°10.2'	-58.8'	152.2°	9°17.1'	-58.9'	152.3°	8°24.0'	-59.0'	152.3°	7°30.8'	-59.1'	152.4°	6°37.6'	-59.1'	152.5°	12
13	10°57.7'	-58.6'	152.2°	10°04.6'	-58.7'	152.3°	9°11.4'	-58.8'	152.4°	8°18.2'	-58.9'	152.5°	7°25.0'	-59.0'	152.5°	6°31.8'	-59.1'	152.6°	5°38.5'	-59.1'	152.6°	13
14	9°59.1'	-58.6'	152.4°	9°05.9'	-58.7'	152.5°	8°12.6'	-58.8'	152.6°	7°19.3'	-58.9'	152.7°	6°26.0'	-59.0'	152.7°	5°32.7'	-59.1'	152.8°	4°39.3'	-59.1'	152.8°	14
15	9°00.5'	-58.6'	152.7°	8°07.2'	-58.7'	152.7°	7°13.8'	-58.8'	152.8°	6°20.5'	-58.9'	152.9°	5°27.1'	-59.0'	152.9°	4°33.6'	-59.1'	152.9°	3°40.2'	-59.1'	153.0°	15
16	8°01.9'	-58.6'	152.9°	7°08.5'	-58.7'	152.9°	6°15.1'	-58.8'	153.0°	5°21.6'	-58.9'	153.0°	4°28.1'	-59.0'	153.1°	3°34.6'	-59.1'	153.1°	2°41.1'	-59.1'	153.1°	16
17	7°03.3'	-58.6'	153.1°	6°09.8'	-58.7'	153.2°	5°16.3'	-58.8'	153.2°	4°22.7'	-58.9'	153.2°	3°29.1'	-59.0'	153.3°	2°35.5'	-59.1'	153.3°	1°41.9'	-59.1'	153.3°	17
18	6°04.7'	-58.6'	153.3°	5°11.1'	-58.7'	153.4°	4°17.5'	-58.8'	153.4°	3°23.8'	-58.9'	153.4°	2°30.1'	-59.0'	153.5°	1°36.5'	-59.1'	153.5°	<u>0°42.8'</u>	-59.1'	<u>153.5°</u>	18
19	5°06.1'	-58.6'	153.5°	4°12.4'	-58.7'	153.6°	3°18.7'	-58.8'	153.6°	2°24.9'	-58.9'	153.6°	1°31.2'	-59.0'	153.6°	<u>0°37.4'</u>	-59.1'	<u>153.6°</u>	0°16.4'	+59.1'	26.4°	19
20	4°07.5'	-58.6'	153.7°	3°13.7'	-58.7'	153.8°	2°19.9'	-58.8'	153.8°	1°26.0'	-58.9'	153.8°	<u>0°32.2'</u>	-59.0'	<u>153.8°</u>	0°21.7'	+59.1'	26.2°	1°15.5'	+59.1'	26.2°	20
21	3°08.9'	-58.6'	154.0°	2°15.0'	-58.7'	154.0°	1°21.0'	-58.8'	154.0°	<u>0°27.1'</u>	-58.9'	<u>154.0°</u>	0°26.8'	+59.0'	26.0°	1°20.7'	+59.1'	26.0°	2°14.7'	+59.1'	26.0°	21
22	2°10.3'	-58.6'	154.2°	1°16.3'	-58.7'	154.2°	<u>0°22.2'</u>	-58.8'	<u>154.2°</u>	0°31.8'	+58.9'	25.8°	1°25.8'	+59.0'	25.8°	2°19.8'	+59.1'	25.8°	3°13.8'	+59.1'	25.8°	22
23	<u>1°11.6'</u>	-58.6'	<u>154.4°</u>	<u>0°17.5'</u>	-58.7'	<u>154.4°</u>	<u>0°36.6'</u>	+58.8'	25.6°	1°30.7'	+58.9'	25.6°	2°24.8'	+59.0'	25.6°	3°18.9'	+59.1'	25.7°	4°12.9'	+59.1'	25.7°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

152° 208° LHA

Latitude SAME as DECLINATION

152° 208° 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 CONTRARY to Declination

27° 333° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	23°51.6'	-58.5'	150.2°	22°59.5'	-58.6'	150.5°	22°07.2'	-58.7'	150.7°	21°14.9'	-58.8'	150.8°	20°22.4'	-58.9'	151.0°	19°29.9'	-59.0'	151.2°	18°37.3'	-59.1'	151.4°	0
1	22°53.1'	-58.5'	150.5°	22°00.9'	-58.6'	150.7°	21°08.5'	-58.7'	150.9°	20°16.1'	-58.8'	151.1°	19°23.5'	-58.9'	151.2°	18°30.9'	-59.0'	151.4°	17°38.2'	-59.1'	151.6°	1
2	21°54.6'	-58.5'	150.7°	21°02.3'	-58.6'	150.9°	20°09.8'	-58.7'	151.1°	19°17.2'	-58.8'	151.3°	18°24.6'	-58.9'	151.4°	17°31.8'	-59.0'	151.6°	16°39.0'	-59.1'	151.7°	2
3	20°56.2'	-58.5'	151.0°	20°03.6'	-58.6'	151.1°	19°11.1'	-58.8'	151.3°	18°18.4'	-58.9'	151.5°	17°25.6'	-59.0'	151.6°	16°32.8'	-59.1'	151.8°	15°39.9'	-59.1'	151.9°	3
4	19°57.6'	-58.5'	151.2°	19°05.0'	-58.7'	151.4°	18°12.3'	-58.8'	151.5°	17°19.5'	-58.9'	151.7°	16°26.7'	-59.0'	151.8°	15°33.7'	-59.1'	152.0°	14°40.8'	-59.1'	152.1°	4
5	18°59.1'	-58.6'	151.4°	18°06.3'	-58.7'	151.6°	17°13.5'	-58.8'	151.7°	16°20.6'	-58.9'	151.9°	15°27.7'	-59.0'	152.0°	14°34.7'	-59.1'	152.1°	13°41.6'	-59.2'	152.3°	5
6	18°00.5'	-58.6'	151.7°	17°07.7'	-58.7'	151.8°	16°14.7'	-58.8'	151.9°	15°21.8'	-58.9'	152.1°	14°28.7'	-59.0'	152.2°	13°35.6'	-59.1'	152.3°	12°42.4'	-59.2'	152.4°	6
7	17°01.9'	-58.6'	151.9°	16°09.0'	-58.7'	152.0°	15°15.9'	-58.8'	152.2°	14°22.9'	-58.9'	152.3°	13°29.7'	-59.0'	152.4°	12°36.5'	-59.1'	152.5°	11°43.3'	-59.2'	152.6°	7
8	16°03.3'	-58.6'	152.1°	15°10.3'	-58.7'	152.2°	14°17.1'	-58.8'	152.4°	13°24.0'	-58.9'	152.5°	12°30.7'	-59.0'	152.6°	11°37.4'	-59.1'	152.7°	10°44.1'	-59.2'	152.8°	8
9	15°04.7'	-58.6'	152.3°	14°11.5'	-58.7'	152.5°	13°18.3'	-58.8'	152.6°	12°25.0'	-58.9'	152.7°	11°31.7'	-59.0'	152.8°	10°38.4'	-59.1'	152.9°	9°44.9'	-59.2'	152.9°	9
10	14°06.1'	-58.6'	152.5°	13°12.8'	-58.7'	152.7°	12°19.5'	-58.8'	152.8°	11°26.1'	-58.9'	152.9°	10°32.7'	-59.0'	152.9°	9°39.3'	-59.1'	153.0°	8°45.8'	-59.2'	153.1°	10
11	13°07.5'	-58.6'	152.8°	12°14.1'	-58.7'	152.9°	11°20.7'	-58.8'	153.0°	10°27.2'	-58.9'	153.1°	9°33.7'	-59.0'	153.1°	8°40.2'	-59.1'	153.2°	7°46.6'	-59.2'	153.3°	11
12	12°08.8'	-58.7'	153.0°	11°15.3'	-58.8'	153.1°	10°21.8'	-58.9'	153.2°	9°28.3'	-58.9'	153.2°	8°34.7'	-59.0'	153.3°	7°41.0'	-59.1'	153.4°	6°47.4'	-59.2'	153.4°	12
13	11°10.2'	-58.7'	153.2°	10°16.6'	-58.8'	153.3°	9°23.0'	-58.9'	153.4°	8°29.3'	-58.9'	153.4°	7°35.6'	-59.0'	153.5°	6°41.9'	-59.1'	153.6°	5°48.2'	-59.2'	153.6°	13
14	10°11.5'	-58.7'	153.4°	9°17.8'	-58.8'	153.5°	8°24.1'	-58.9'	153.6°	7°30.4'	-59.0'	153.6°	6°36.6'	-59.0'	153.7°	5°42.8'	-59.1'	153.7°	4°49.0'	-59.2'	153.8°	14
15	9°12.8'	-58.7'	153.6°	8°19.0'	-58.8'	153.7°	7°25.2'	-58.9'	153.8°	6°31.4'	-59.0'	153.8°	5°37.6'	-59.0'	153.9°	4°43.7'	-59.1'	153.9°	3°49.8'	-59.2'	153.9°	15
16	8°14.1'	-58.7'	153.8°	7°20.3'	-58.8'	153.9°	6°26.4'	-58.9'	153.9°	5°32.5'	-59.0'	154.0°	4°38.5'	-59.0'	154.0°	3°44.6'	-59.1'	154.1°	2°50.6'	-59.2'	154.1°	16
17	7°15.4'	-58.7'	154.0°	6°21.5'	-58.8'	154.1°	5°27.5'	-58.9'	154.1°	4°33.5'	-59.0'	154.2°	3°39.5'	-59.0'	154.2°	2°45.5'	-59.1'	154.2°	1°51.4'	-59.2'	154.3°	17
18	6°16.8'	-58.7'	154.3°	5°22.7'	-58.8'	154.3°	4°28.6'	-58.9'	154.3°	3°34.5'	-59.0'	154.4°	2°40.4'	-59.0'	154.4°	1°46.3'	-59.1'	154.4°	<u>0°52.2'</u>	-59.2'	<u>154.4°</u>	18
19	5°18.1'	-58.7'	154.5°	4°23.9'	-58.8'	154.5°	3°29.7'	-58.9'	154.5°	2°35.6'	-59.0'	154.6°	1°41.4'	-59.0'	154.6°	<u>0°47.2'</u>	-59.1'	<u>154.6°</u>	0°07.0'	+59.2'	25.4°	19
20	4°19.4'	-58.7'	154.7°	3°25.1'	-58.8'	154.7°	2°30.9'	-58.9'	154.7°	1°36.6'	-59.0'	154.7°	<u>0°42.3'</u>	-59.0'	<u>154.7°</u>	0°11.9'	+59.1'	25.3°	1°06.2'	+59.2'	25.3°	20
21	3°20.6'	-58.7'	154.9°	2°26.3'	-58.8'</																	

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

26° 334° LHA

Latitude CONTRARY to Declination

26° 334° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	24°04.9'	-58.6'	151.3°	23°12.2'	-58.7'	151.5°	22°19.5'	-58.8'	151.7°	21°26.6'	-58.9'	151.9°	20°33.6'	-59.0'	152.1°	19°40.5'	-59.1'	152.3°	18°47.4'	-59.2'	152.4°	0
1	23°06.3'	-58.6'	151.5°	22°13.6'	-58.7'	151.7°	21°20.7'	-58.8'	151.9°	20°27.7'	-58.9'	152.1°	19°34.6'	-59.0'	152.3°	18°41.4'	-59.1'	152.4°	17°48.2'	-59.2'	152.6°	1
2	22°07.7'	-58.6'	151.8°	21°14.9'	-58.7'	152.0°	20°21.8'	-58.8'	152.1°	19°28.8'	-58.9'	152.3°	18°35.6'	-59.0'	152.5°	17°42.4'	-59.1'	152.6°	16°49.0'	-59.2'	152.8°	2
3	21°09.2'	-58.6'	152.0°	20°16.1'	-58.7'	152.2°	19°23.0'	-58.8'	152.3°	18°29.8'	-58.9'	152.5°	17°36.6'	-59.0'	152.7°	16°43.2'	-59.1'	152.8°	15°49.8'	-59.2'	152.9°	3
4	20°10.5'	-58.6'	152.2°	19°17.4'	-58.8'	152.4°	18°24.2'	-58.9'	152.6°	17°30.9'	-58.9'	152.7°	16°37.5'	-59.0'	152.8°	15°44.1'	-59.1'	153.0°	14°50.7'	-59.2'	153.1°	4
5	19°11.9'	-58.7'	152.5°	18°18.6'	-58.8'	152.6°	17°25.3'	-58.9'	152.8°	16°32.0'	-59.0'	152.9°	15°38.5'	-59.0'	153.0°	14°45.0'	-59.1'	153.2°	13°51.4'	-59.2'	153.3°	5
6	18°13.2'	-58.7'	152.7°	17°19.9'	-58.8'	152.8°	16°26.5'	-58.9'	153.0°	15°33.0'	-59.0'	153.1°	14°39.5'	-59.1'	153.2°	13°45.9'	-59.1'	153.3°	12°52.2'	-59.2'	153.4°	6
7	17°14.5'	-58.7'	152.9°	16°21.1'	-58.8'	153.0°	15°27.6'	-58.9'	153.2°	14°34.0'	-59.0'	153.3°	13°40.4'	-59.1'	153.4°	12°46.7'	-59.1'	153.5°	11°53.0'	-59.2'	153.6°	7
8	16°15.9'	-58.7'	153.1°	15°22.3'	-58.8'	153.2°	14°28.7'	-58.9'	153.4°	13°35.1'	-59.0'	153.5°	12°41.3'	-59.1'	153.6°	11°47.6'	-59.2'	153.7°	10°53.8'	-59.2'	153.8°	8
9	15°17.2'	-58.7'	153.3°	14°23.5'	-58.8'	153.4°	13°29.8'	-58.9'	153.6°	12°36.1'	-59.0'	153.7°	11°42.3'	-59.1'	153.8°	10°48.4'	-59.2'	153.8°	9°54.6'	-59.2'	153.9°	9
10	14°18.4'	-58.7'	153.5°	13°24.7'	-58.8'	153.7°	12°30.9'	-58.9'	153.8°	11°37.1'	-59.0'	153.8°	10°43.2'	-59.1'	153.9°	9°49.3'	-59.2'	154.0°	8°55.3'	-59.2'	154.1°	10
11	13°19.7'	-58.7'	153.8°	12°25.9'	-58.8'	153.9°	11°32.0'	-58.9'	153.9°	10°38.1'	-59.0'	154.0°	9°44.1'	-59.1'	154.1°	8°50.1'	-59.2'	154.2°	7°56.1'	-59.2'	154.2°	11
12	12°21.0'	-58.7'	154.0°	11°27.0'	-58.8'	154.1°	10°33.1'	-58.9'	154.1°	9°39.1'	-59.0'	154.2°	8°45.0'	-59.1'	154.3°	7°50.9'	-59.2'	154.4°	6°56.8'	-59.2'	154.4°	12
13	11°22.2'	-58.8'	154.2°	10°28.2'	-58.8'	154.3°	9°34.1'	-58.9'	154.3°	8°40.0'	-59.0'	154.4°	7°45.9'	-59.1'	154.5°	6°51.8'	-59.2'	154.5°	5°57.6'	-59.2'	154.6°	13
14	10°23.5'	-58.8'	154.4°	9°29.4'	-58.9'	154.5°	8°35.2'	-58.9'	154.5°	7°41.0'	-59.0'	154.6°	6°46.8'	-59.1'	154.6°	5°52.6'	-59.2'	154.7°	4°58.4'	-59.3'	154.7°	14
15	9°24.7'	-58.8'	154.6°	8°30.5'	-58.9'	154.7°	7°36.3'	-58.9'	154.7°	6°42.0'	-59.0'	154.8°	5°47.7'	-59.1'	154.8°	4°53.4'	-59.2'	154.9°	3°59.1'	-59.3'	154.9°	15
16	8°25.9'	-58.8'	154.8°	7°31.6'	-58.9'	154.8°	6°37.3'	-58.9'	154.9°	5°43.0'	-59.0'	154.9°	4°48.6'	-59.1'	155.0°	3°54.2'	-59.2'	155.0°	2°59.8'	-59.3'	155.0°	16
17	7°27.2'	-58.8'	155.0°	6°32.8'	-58.9'	155.0°	5°38.4'	-59.0'	155.1°	4°44.0'	-59.0'	155.1°	3°49.5'	-59.1'	155.2°	2°55.1'	-59.2'	155.2°	2°00.6'	-59.3'	155.2°	17
18	6°28.4'	-58.8'	155.2°	5°33.9'	-58.9'	155.2°	4°39.4'	-59.0'	155.3°	3°44.9'	-59.0'	155.3°	2°50.4'	-59.1'	155.3°	1°55.9'	-59.2'	155.3°	1°01.3'	-59.3'	155.4°	18
19	5°29.6'	-58.8'	155.4°	4°35.0'	-58.9'	155.4°	3°40.5'	-59.0'	155.5°	2°45.9'	-59.0'	155.5°	1°51.3'	-59.1'	155.5°	<u>0°56.7'</u>	<u>-59.2'</u>	<u>155.5°</u>	<u>0°02.1'</u>	<u>-59.3'</u>	<u>155.5°</u>	19
20	4°30.8'	-58.8'	155.6°	3°36.2'	-58.9'	155.6°	2°41.5'	-59.0'	155.6°	1°46.8'	-59.0'	155.7°	<u>0°52.2'</u>	<u>-59.1'</u>	<u>155.7°</u>	0°02.5'	+59.2'	24.3°	0°57.2'	+59.3'	24.3°	20
21	3°32.0'	-58.8'	155.8°	2°37.3'	-58.9'	155.8°	1°42.5'	-59.0'	155.8°	<u>0°47.8'</u>	<u>-59.0'</u>	<u>155.8°</u>	0°06.9'	+59.1'	24.2°	1°01.7'	+59.2'	24.2°	1°56.4'	+59.3'	24.2°	21
22	2°33.2'	-58.8'	156.0°	1°38.4'	-58.9'	156.0°	<u>0°43.6'</u>	<u>-59.0'</u>	<u>156.0°</u>	0°11.2'	+59.0'	24.0°	1°06.1'	+59.1'	24.0°	2°00.9'	+59.2'	24.0°	2°55.7'	+59.3'	24.0°	22
23	1°34.4'	-58.8'	156.2°	<u>0°39.5'</u>	<u>-58.9'</u>	<u>156.2°</u>	0°15.4'	+59.0'	23.8°	1°10.3'	+59.0'	23.8°	2°05.2'	+59.1'	23.8°	3°00.1'	+59.2'	23.8°	3°54.9'	+59.3'	23.9°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

154° 206° LHA

Latitude SAME as DECLINATION

154° 206° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	24°17.7'	-58.7'	152.4°	23°24.6'	-58.8'	152.6°	22°31.3'	-58.9'	152.8°	21°37.9'	-59.0'	153.0°	20°44.4'	-59.1'	153.1°	19°50.8'	-59.1'	153.3°	18°57.2'	-59.2'	153.5°	0
1	23°19.1'	-58.7'	152.6°	22°25.8'	-58.8'	152.8°	21°32.4'	-58.9'	153.0°	20°38.9'	-59.0'	153.2°	19°45.3'	-59.1'	153.3°	18°51.7'	-59.2'	153.5°	17°57.9'	-59.2'	153.6°	1
2	22°20.4'	-58.7'	152.8°	21°27.0'	-58.8'	153.0°	20°33.5'	-58.9'	153.2°	19°39.9'	-59.0'	153.4°	18°46.2'	-59.1'	153.5°	17°52.5'	-59.2'	153.7°	16°58.7'	-59.2'	153.8°	2
3	21°21.7'	-58.7'	153.1°	20°28.2'	-58.8'	153.2°	19°34.6'	-58.9'	153.4°	18°40.9'	-59.0'	153.5°	17°47.2'	-59.1'	153.7°	16°53.3'	-59.2'	153.8°	15°59.5'	-59.3'	154.0°	3
4	20°23.0'	-58.7'	153.3°	19°29.4'	-58.8'	153.4°	18°35.7'	-58.9'	153.6°	17°41.9'	-59.0'	153.7°	16°48.1'	-59.1'	153.9°	15°54.2'	-59.2'	154.0°	15°00.9'	-59.3'	154.1°	4
5	19°24.3'	-58.8'	153.5°	18°30.5'	-58.9'	153.6°	17°36.7'	-58.9'	153.8°	16°42.9'	-59.0'	153.9°	15°49.0'	-59.1'	154.1°	14°55.0'	-59.2'	154.2°	14°00.9'	-59.3'	154.3°	5
6	18°25.5'	-58.8'	153.7°	17°31.7'	-58.9'	153.8°	16°37.8'	-59.0'	154.0°	15°43.8'	-59.0'	154.1°	14°49.8'	-59.1'	154.2°	13°55.8'	-59.2'	154.3°	13°01.7'	-59.3'	154.4°	6
7	17°26.7'	-58.8'	153.9°	16°32.8'	-58.9'	154.0°	15°38.8'	-59.0'	154.2°	14°44.8'	-59.0'	154.3°	13°50.7'	-59.1'	154.4°	12°56.6'	-59.2'	154.5°	12°02.4'	-59.3'	154.6°	7
8	16°28.0'	-58.8'	154.1°	15°33.9'	-58.9'	154.3°	14°39.9'	-59.0'	154.4°	13°45.8'	-59.1'	154.5°	12°51.6'	-59.1'	154.6°	11°57.4'	-59.2'	154.7°	11°03.1'	-59.3'	154.8°	8
9	15°29.2'	-58.8'	154.3°	14°35.1'	-58.9'	154.4°	13°40.9'	-59.0'	154.6°	12°46.7'	-59.1'	154.7°	11°52.5'	-59.1'	154.8°	10°58.2'	-59.2'	154.8°	10°03.8'	-59.3'	154.9°	9
10	14°30.4'	-58.8'	154.5°	13°36.2'	-58.9'	154.6°	12°41.9'	-59.0'	154.7°	11°47.6'	-59.1'	154.8°	10°53.3'	-59.1'	154.9°	9°58.9'	-59.2'	155.0°	9°04.6'	-59.3'	155.1°	10
11	13°31.5'	-58.8'	154.7°	12°37.3'	-58.9'	154.8°	11°42.9'	-59.0'	154.9°	10°48.6'	-59.1'	155.0°	9°54.2'	-59.2'	155.1°	8°59.7'	-59.2'	155.2°	8°05.3'	-59.3'	155.2°	11
12	12°32.7'	-58.8'	154.9°	11°38.3'	-58.9'	155.0°	10°43.9'	-59.0'	155.1°	9°49.5'	-59.1'	155.2°	8°55.0'	-59.2'	155.3°	8°00.5'	-59.2'	155.3°	7°06.0'	-59.3'	155.4°	12
13	11°33.9'	-58.8'	155.1°	10°39.4'	-58.9'	155.2°	9°44.9'	-59.0'	155.3°	8°50.4'	-59.1'	155.4°	7°55.9'	-59.2'	155.4°	7°01.3'	-59.2'	155.5°	6°06.7'	-59.3'	155.5°	13
14	10°35.0'	-58.8'	155.3°	9°40.5'	-58.9'	155.4°	8°45.9'	-59.0'	155.5°	7°51.3'	-59.1'	155.5°	6°56.7'	-59.2'	155.6°	6°02.0'	-59.2'	155.6°	5°07.4'	-59.3'	155.7°	14
15	9°36.2'	-58.9'	155.5°	8°41.6'	-58.9'	155.6°	7°46.9'	-59.0'	155.7°	6°52.2'	-59.1'	155.7°	5°57.5'	-59.2'	155.8°	5°02.8'	-59.2'	155.8°	4°08.1'	-59.3'	155.8°	15
16	8°37.3'	-58.9'	155.7°	7°42.6'	-58.9'	155.8°	6°47.9'	-59.0'	155.9°	5°53.1'	-59.1'	155.9°	4°58.4'	-59.2'	155.9°	4°03.6'	-59.2'	156.0°	3°08.8'	-59.3'	156.0°	16
17	7°38.5'	-58.9'	155.9°	6°43.7'	-58.9'	156.0°	5°48.9'	-59.0'	156.0°	4°54.0'	-59.1'	156.1°	3°59.2'	-59.2'	156.1°	3°04.3'	-59.2'	156.1°	2°09.5'	-59.3'	156.1°	17
18	6°39.6'	-58.9'	156.1°	5°44.7'	-59.0'	156.2°	4°49.8'	-59.0'	156.2°	3°54.9'	-59.1'	156.2°	3°00.0'	-59.2'	156.3°	2°05.1'	-59.2'	156.3°	1°10.1'	-59.3'	156.3°	18
19	5°40.7'	-58.9'	156.3°	4°45.8'	-59.0'	156.4°	3°50.8'	-59.0'	156.4°	2°55.8'	-59.1'	156.4°	2°00.8'	-59.2'	156.4°	1°05.8'	-59.2'	156.4°	<u>0°10.8'</u>	<u>-59.3'</u>	<u>156.4°</u>	19
20	4°41.9'	-58.9'	156.5°	3°46.8'	-59.0'	156.5°	2°51.8'	-59.0'	156.6°	1°56.7'	-59.1'	156.6°	1°01.7'	-59.2'	156.6°	<u>0°06.6'</u>	<u>-59.2'</u>	<u>156.6°</u>	0°48.5'	+59.3'	23.4°	20
21	3°43.0'	-58.9'	156.7°																			



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

24° 336° LHA

Latitude CONTRARY to Declination

24° 336° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	24°30.1'	-58.8'	153.4°	23°36.5'	-58.9'	153.6°	22°42.7'	-59.0'	153.8°	21°48.8'	-59.0'	154.0°	20°54.8'	-59.1'	154.2°	20°00.7'	-59.2'	154.3°	19°06.6'	-59.3'	154.5°	0
1	23°31.4'	-58.8'	153.7°	22°37.6'	-58.9'	153.9°	21°43.7'	-59.0'	154.0°	20°49.7'	-59.1'	154.2°	19°55.7'	-59.1'	154.4°	19°01.5'	-59.2'	154.5°	18°07.3'	-59.3'	154.7°	1
2	22°32.6'	-58.8'	153.9°	21°38.7'	-58.9'	154.1°	20°44.7'	-59.0'	154.2°	19°50.7'	-59.1'	154.4°	18°56.5'	-59.2'	154.5°	18°02.3'	-59.2'	154.7°	17°08.0'	-59.3'	154.8°	2
3	21°33.8'	-58.8'	154.1°	20°39.8'	-58.9'	154.3°	19°45.7'	-59.0'	154.4°	18°51.6'	-59.1'	154.6°	17°57.4'	-59.2'	154.7°	17°03.1'	-59.2'	154.9°	16°08.7'	-59.3'	155.0°	3
4	20°35.0'	-58.8'	154.3°	19°40.9'	-58.9'	154.5°	18°46.7'	-59.0'	154.6°	17°52.5'	-59.1'	154.8°	16°58.2'	-59.2'	154.9°	16°03.8'	-59.2'	155.0°	15°09.4'	-59.3'	155.1°	4
5	19°36.2'	-58.8'	154.5°	18°42.0'	-58.9'	154.7°	17°47.7'	-59.0'	154.8°	16°53.4'	-59.1'	154.9°	15°59.0'	-59.2'	155.1°	15°04.6'	-59.3'	155.2°	14°10.1'	-59.3'	155.3°	5
6	18°37.4'	-58.9'	154.7°	17°43.1'	-58.9'	154.9°	16°48.7'	-59.0'	155.0°	15°54.3'	-59.1'	155.1°	14°59.8'	-59.2'	155.2°	14°05.3'	-59.3'	155.4°	12°10.8'	-59.3'	155.5°	6
7	17°38.5'	-58.9'	154.9°	16°44.1'	-59.0'	155.1°	15°49.7'	-59.0'	155.2°	14°55.2'	-59.1'	155.3°	14°00.7'	-59.2'	155.4°	13°06.1'	-59.3'	155.5°	10°11.5'	-59.3'	155.6°	7
8	16°39.6'	-58.9'	155.1°	15°45.2'	-59.0'	155.3°	14°50.6'	-59.0'	155.4°	13°56.1'	-59.1'	155.5°	13°01.5'	-59.2'	155.6°	12°06.8'	-59.3'	155.7°	11°12.1'	-59.3'	155.8°	8
9	15°40.8'	-58.9'	155.3°	14°46.2'	-59.0'	155.5°	13°51.6'	-59.1'	155.6°	12°57.0'	-59.1'	155.7°	12°02.3'	-59.2'	155.7°	11°07.5'	-59.3'	155.8°	10°12.8'	-59.3'	155.9°	9
10	14°41.9'	-58.9'	155.5°	13°47.2'	-59.0'	155.6°	12°52.5'	-59.1'	155.7°	11°57.8'	-59.1'	155.8°	11°03.1'	-59.2'	155.9°	10°08.3'	-59.3'	156.0°	9°13.4'	-59.3'	156.1°	10
11	13°43.0'	-58.9'	155.7°	12°48.2'	-59.0'	155.8°	11°53.5'	-59.1'	155.9°	10°58.7'	-59.1'	156.0°	10°03.9'	-59.2'	156.1°	9°09.0'	-59.3'	156.1°	8°14.1'	-59.3'	156.2°	11
12	12°44.0'	-58.9'	155.9°	11°49.2'	-59.0'	156.0°	10°54.4'	-59.1'	156.1°	9°59.5'	-59.1'	156.2°	9°04.6'	-59.2'	156.2°	8°09.7'	-59.3'	156.3°	7°14.8'	-59.4'	156.4°	12
13	11°45.1'	-58.9'	156.1°	10°50.2'	-59.0'	156.2°	9°55.3'	-59.1'	156.3°	9°00.4'	-59.2'	156.3°	8°05.4'	-59.2'	156.4°	7°10.4'	-59.3'	156.5°	6°15.4'	-59.4'	156.5°	13
14	10°46.2'	-58.9'	156.3°	9°51.2'	-59.0'	156.4°	8°56.3'	-59.1'	156.5°	8°01.2'	-59.2'	156.5°	7°06.2'	-59.2'	156.6°	6°11.1'	-59.3'	156.6°	5°16.1'	-59.4'	156.7°	14
15	9°47.3'	-58.9'	156.5°	8°52.2'	-59.0'	156.6°	7°57.2'	-59.1'	156.6°	7°02.1'	-59.2'	156.7°	6°07.0'	-59.2'	156.7°	5°11.8'	-59.3'	156.8°	4°16.7'	-59.4'	156.8°	15
16	8°48.3'	-58.9'	156.7°	7°53.2'	-59.0'	156.8°	6°58.1'	-59.1'	156.8°	6°02.9'	-59.2'	156.8°	5°07.7'	-59.2'	156.9°	4°12.5'	-59.3'	156.9°	3°17.3'	-59.4'	156.9°	16
17	7°49.4'	-59.0'	156.9°	6°54.2'	-59.0'	156.9°	5°59.0'	-59.1'	157.0°	5°03.7'	-59.2'	157.0°	4°08.5'	-59.2'	157.0°	3°13.2'	-59.3'	157.1°	2°18.0'	-59.4'	157.1°	17
18	6°50.4'	-59.0'	157.1°	5°55.2'	-59.0'	157.1°	4°59.9'	-59.1'	157.2°	4°04.6'	-59.2'	157.2°	3°09.3'	-59.2'	157.2°	2°14.0'	-59.3'	157.2°	1°18.6'	-59.4'	157.2°	18
19	5°51.5'	-59.0'	157.3°	4°56.1'	-59.0'	157.3°	4°00.8'	-59.1'	157.3°	3°05.4'	-59.2'	157.3°	2°10.0'	-59.2'	157.4°	1°14.7'	-59.3'	157.4°	0°19.3'	-59.4'	157.4°	19
20	4°52.5'	-59.0'	157.4°	3°57.1'	-59.0'	157.5°	3°01.7'	-59.1'	157.5°	2°06.2'	-59.2'	157.5°	1°10.8'	-59.2'	157.5°	<u>0°15.4' -59.3' 157.5°</u>			0°40.1'	+59.4'	22.5°	20
21	3°53.6'	-59.0'	157.6°	2°58.1'	-59.0'	157.7°	2°02.6'	-59.1'	157.7°	1°07.1'	-59.2'	157.7°	<u>0°11.6' -59.2' 157.7°</u>			0°43.9'	+59.3'	22.3°	1°39.4'	+59.4'	22.3°	21
22	2°54.6'	-59.0'	157.8°	1°59.0'	-59.0'	157.8°	1°03.5'	-59.1'	157.8°	<u>0°07.9' -59.2' 157.8°</u>			0°47.7'	+59.2'	22.2°	1°43.2'	+59.3'	22.2°	2°38.8'	+59.4'	22.2°	22
23	<u>1°55.6' -59.0' 158.0°</u>			<u>0°60.0' -59.0' 158.0°</u>			<u>0°04.4' -59.1' 158.0°</u>			0°51.3'	+59.2'	22.0°	1°46.9'	+59.2'	22.0°	2°42.5'	+59.3'	22.0°	3°38.2'	+59.4'	22.0°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

156° 204° LHA

Latitude SAME as DECLINATION

156° 204° 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 CONTRARY to Declination

23° 337° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	24°42.1'	-58.9'	154.5°	23°47.9'	-58.9'	154.7°	22°53.6'	-59.0'	154.9°	21°59.2'	-59.1'	155.1°	21°04.8'	-59.2'	155.2°	20°10.3'	-59.3'	155.4°	19°15.7'	-59.3'	155.5°	0
1	23°43.2'	-58.9'	154.7°	22°49.0'	-59.0'	154.9°	21°54.6'	-59.0'	155.1°	21°00.1'	-59.1'	155.3°	20°05.6'	-59.2'	155.4°	19°11.0'	-59.3'	155.6°	18°16.3'	-59.3'	155.7°	1
2	22°44.4'	-58.9'	155.0°	21°50.0'	-59.0'	155.1°	20°55.5'	-59.1'	155.3°	20°01.0'	-59.1'	155.4°	19°06.4'	-59.2'	155.6°	18°11.7'	-59.3'	155.7°	17°17.0'	-59.4'	155.9°	2
3	21°45.5'	-58.9'	155.2°	20°51.0'	-59.0'	155.3°	19°56.5'	-59.1'	155.5°	19°01.9'	-59.2'	155.6°	18°07.2'	-59.2'	155.8°	17°12.4'	-59.3'	155.9°	16°17.6'	-59.4'	156.0°	3
4	20°46.6'	-58.9'	155.4°	19°52.0'	-59.0'	155.5°	18°57.4'	-59.1'	155.7°	18°02.7'	-59.2'	155.8°	17°08.0'	-59.2'	155.9°	16°13.1'	-59.3'	156.1°	15°18.3'	-59.4'	156.2°	4
5	19°47.7'	-58.9'	155.6°	18°53.0'	-59.0'	155.7°	17°58.3'	-59.1'	155.8°	17°03.5'	-59.2'	156.0°	16°08.7'	-59.2'	156.1°	15°13.8'	-59.3'	156.2°	14°18.9'	-59.4'	156.3°	5
6	18°48.8'	-58.9'	155.8°	17°54.0'	-59.0'	155.9°	16°59.2'	-59.1'	156.0°	16°04.4'	-59.2'	156.1°	15°09.5'	-59.2'	156.3°	14°14.5'	-59.3'	156.4°	13°19.5'	-59.4'	156.5°	6
7	17°49.8'	-59.0'	156.0°	16°55.0'	-59.0'	156.1°	16°00.1'	-59.1'	156.2°	15°05.2'	-59.2'	156.3°	14°10.2'	-59.3'	156.4°	13°15.2'	-59.3'	156.5°	12°20.2'	-59.4'	156.6°	7
8	16°50.9'	-59.0'	156.2°	15°56.0'	-59.0'	156.3°	15°01.0'	-59.1'	156.4°	14°06.0'	-59.2'	156.5°	13°11.0'	-59.3'	156.6°	12°15.9'	-59.3'	156.7°	11°20.8'	-59.4'	156.8°	8
9	15°51.9'	-59.0'	156.3°	14°56.9'	-59.1'	156.5°	14°01.9'	-59.1'	156.6°	13°06.8'	-59.2'	156.7°	12°11.7'	-59.3'	156.7°	11°16.6'	-59.3'	156.8°	10°21.4'	-59.4'	156.9°	9
10	14°52.9'	-59.0'	156.5°	13°57.9'	-59.1'	156.6°	13°02.8'	-59.1'	156.7°	12°07.6'	-59.2'	156.8°	11°12.4'	-59.3'	156.9°	10°17.2'	-59.3'	157.0°	9°22.0'	-59.4'	157.0°	10
11	13°53.9'	-59.0'	156.7°	12°58.8'	-59.1'	156.8°	12°03.6'	-59.1'	156.9°	11°08.4'	-59.2'	157.0°	10°13.2'	-59.3'	157.1°	9°17.9'	-59.3'	157.1°	8°22.6'	-59.4'	157.2°	11
12	12°54.9'	-59.0'	156.9°	11°59.7'	-59.1'	157.0°	11°04.5'	-59.1'	157.1°	10°09.2'	-59.2'	157.2°	9°13.9'	-59.3'	157.2°	8°18.6'	-59.3'	157.3°	7°23.2'	-59.4'	157.3°	12
13	11°55.9'	-59.0'	157.1°	11°00.7'	-59.1'	157.2°	10°05.3'	-59.2'	157.3°	9°10.0'	-59.2'	157.3°	8°14.6'	-59.3'	157.4°	7°19.2'	-59.3'	157.4°	6°23.8'	-59.4'	157.5°	13
14	10°56.9'	-59.0'	157.3°	10°01.6'	-59.1'	157.4°	9°06.2'	-59.2'	157.4°	8°10.8'	-59.2'	157.5°	7°15.3'	-59.3'	157.5°	6°19.9'	-59.3'	157.6°	5°24.4'	-59.4'	157.6°	14
15	9°57.9'	-59.0'	157.5°	9°02.5'	-59.1'	157.5°	8°07.0'	-59.2'	157.6°	7°11.5'	-59.2'	157.6°	6°16.0'	-59.3'	157.7°	5°20.5'	-59.3'	157.7°	4°25.0'	-59.4'	157.8°	15
16	8°58.9'	-59.0'	157.7°	8°03.4'	-59.1'	157.7°	7°07.9'	-59.2'	157.8°	6°12.3'	-59.2'	157.8°	5°16.8'	-59.3'	157.8°	4°21.2'	-59.4'	157.9°	3°25.6'	-59.4'	157.9°	16
17	7°59.9'	-59.0'	157.8°	7°04.3'	-59.1'	157.9°	6°08.7'	-59.2'	157.9°	5°13.1'	-59.2'	158.0°	4°17.5'	-59.3'	158.0°	3°21.8'	-59.4'	158.0°	2°26.2'	-59.4'	158.0°	17
18	7°00.8'	-59.0'	158.0°	6°05.2'	-59.1'	158.1°	5°09.5'	-59.2'	158.1°	4°13.9'	-59.2'	158.1°	3°18.2'	-59.3'	158.1°	2°22.5'	-59.4'	158.2°	1°26.8'	-59.4'	158.2°	18
19	6°01.8'	-59.0'	158.2°	5°06.1'	-59.1'	158.2°	4°10.4'	-59.2'	158.3°	3°14.6'	-59.2'	158.3°	2°18.9'	-59.3'	158.3°	1°23.1'	-59.4'	158.3°	<u>0°27.4' -59.4' 158.3°</u>			19
20	5°02.8'	-59.0'	158.4°	4°07.0'	-59.1'	158.4°	3°11.2'	-59.2'	158.4°	2°15.4'	-59.2'	158.4°	1°19.6'	-59.3'	158.5°	<u>0°23.8' -59.4' 158.5°</u>			0°32.0'	+59.4'	21.5°	20
21	4°03.7'	-59.0'	158.5°	3°07.9'	-59.1'	158.6°	2°12															

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

22° 338° LHA

Latitude CONTRARY to Declination

22° 338° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	24°53.6'	-58.9'	155.6°	23°58.9'	-59.0'	155.8°	23°04.2'	-59.1'	156.0°	22°09.3'	-59.2'	156.1°	21°14.4'	-59.3'	156.3°	20°19.4'	-59.3'	156.5°	19°24.4'	-59.4'	156.6°	0
1	23°54.6'	-59.0'	155.8°	22°59.9'	-59.0'	156.0°	22°05.0'	-59.1'	156.2°	21°10.1'	-59.2'	156.3°	20°15.2'	-59.3'	156.5°	19°20.1'	-59.3'	156.6°	18°25.0'	-59.4'	156.7°	1
2	22°55.7'	-59.0'	156.0°	22°00.8'	-59.1'	156.2°	21°05.9'	-59.1'	156.3°	20°10.9'	-59.2'	156.5°	19°15.9'	-59.3'	156.6°	18°20.8'	-59.3'	156.8°	17°25.6'	-59.4'	156.9°	2
3	21°56.7'	-59.0'	156.2°	21°01.8'	-59.1'	156.4°	20°06.8'	-59.1'	156.5°	19°11.7'	-59.2'	156.7°	18°16.6'	-59.3'	156.8°	17°21.4'	-59.4'	156.9°	16°26.2'	-59.4'	157.0°	3
4	20°57.7'	-59.0'	156.4°	20°02.7'	-59.1'	156.6°	19°07.6'	-59.2'	156.7°	18°12.5'	-59.2'	156.8°	17°17.3'	-59.3'	157.0°	16°22.1'	-59.4'	157.1°	15°26.8'	-59.4'	157.2°	4
5	19°58.7'	-59.0'	156.6°	19°03.6'	-59.1'	156.7°	18°08.5'	-59.2'	156.9°	17°13.3'	-59.2'	157.0°	16°18.0'	-59.3'	157.1°	15°22.7'	-59.4'	157.2°	14°27.4'	-59.4'	157.3°	5
6	18°59.7'	-59.0'	156.8°	18°04.5'	-59.1'	156.9°	17°09.3'	-59.2'	157.1°	16°14.0'	-59.2'	157.2°	15°18.7'	-59.3'	157.3°	14°23.4'	-59.4'	157.4°	13°28.0'	-59.4'	157.5°	6
7	18°00.7'	-59.0'	157.0°	17°05.4'	-59.1'	157.1°	16°10.1'	-59.2'	157.2°	15°14.8'	-59.3'	157.3°	14°19.4'	-59.3'	157.4°	13°24.0'	-59.4'	157.5°	12°28.5'	-59.4'	157.6°	7
8	17°01.7'	-59.0'	157.2°	16°06.3'	-59.1'	157.3°	15°11.0'	-59.2'	157.4°	14°15.6'	-59.3'	157.5°	13°20.1'	-59.3'	157.6°	12°24.6'	-59.4'	157.7°	11°29.1'	-59.4'	157.8°	8
9	16°02.6'	-59.1'	157.4°	15°07.2'	-59.1'	157.5°	14°11.8'	-59.2'	157.6°	13°16.3'	-59.3'	157.7°	12°20.8'	-59.3'	157.7°	11°25.2'	-59.4'	157.8°	10°29.7'	-59.4'	157.9°	9
10	15°03.5'	-59.1'	157.5°	14°08.1'	-59.1'	157.6°	13°12.6'	-59.2'	157.7°	12°17.0'	-59.3'	157.8°	11°21.5'	-59.3'	157.9°	10°25.9'	-59.4'	158.0°	9°30.2'	-59.4'	158.0°	10
11	14°04.5'	-59.1'	157.7°	13°08.9'	-59.1'	157.8°	12°13.4'	-59.2'	157.9°	11°17.8'	-59.3'	158.0°	10°22.1'	-59.3'	158.0°	9°26.5'	-59.4'	158.1°	8°30.8'	-59.4'	158.2°	11
12	13°05.4'	-59.1'	157.9°	12°09.8'	-59.2'	158.0°	11°14.2'	-59.2'	158.1°	10°18.5'	-59.3'	158.1°	9°22.8'	-59.3'	158.2°	8°27.1'	-59.4'	158.3°	7°31.3'	-59.4'	158.3°	12
13	12°06.3'	-59.1'	158.1°	11°10.6'	-59.2'	158.2°	10°14.9'	-59.2'	158.2°	9°19.2'	-59.3'	158.3°	8°23.5'	-59.3'	158.3°	7°27.7'	-59.4'	158.4°	6°31.9'	-59.5'	158.4°	13
14	11°07.2'	-59.1'	158.3°	10°11.5'	-59.2'	158.3°	9°15.7'	-59.2'	158.4°	8°19.9'	-59.3'	158.4°	7°24.1'	-59.3'	158.5°	6°28.3'	-59.4'	158.5°	5°32.4'	-59.5'	158.6°	14
15	10°08.1'	-59.1'	158.4°	9°12.3'	-59.2'	158.5°	8°16.5'	-59.2'	158.6°	7°20.6'	-59.3'	158.6°	6°24.8'	-59.3'	158.6°	5°28.9'	-59.4'	158.7°	4°33.0'	-59.5'	158.7°	15
16	9°09.0'	-59.1'	158.6°	8°13.2'	-59.2'	158.7°	7°17.3'	-59.2'	158.7°	6°21.4'	-59.3'	158.8°	5°25.4'	-59.3'	158.8°	4°29.5'	-59.4'	158.8°	3°33.5'	-59.5'	158.9°	16
17	8°09.9'	-59.1'	158.8°	7°14.0'	-59.2'	158.8°	6°18.0'	-59.2'	158.9°	5°22.1'	-59.3'	158.9°	4°26.1'	-59.4'	158.9°	3°30.1'	-59.4'	159.0°	2°34.1'	-59.5'	159.0°	17
18	7°10.8'	-59.1'	159.0°	6°14.8'	-59.2'	159.0°	5°18.8'	-59.2'	159.0°	4°22.8'	-59.3'	159.1°	3°26.7'	-59.4'	159.1°	2°30.7'	-59.4'	159.1°	1°34.6'	-59.5'	159.1°	18
19	6°11.7'	-59.1'	159.1°	5°15.6'	-59.2'	159.2°	4°19.6'	-59.2'	159.2°	3°23.5'	-59.3'	159.2°	2°27.4'	-59.4'	159.2°	1°31.3'	-59.4'	159.2°	0°35.2'	-59.5'	159.3°	19
20	5°12.6'	-59.1'	159.3°	4°16.5'	-59.2'	159.3°	3°20.3'	-59.2'	159.4°	2°24.2'	-59.3'	159.4°	1°28.0'	-59.4'	159.4°	<u>0°31.9'</u>	-59.4'	159.4°	0°24.3'	+59.5'	20.6°	20
21	4°13.5'	-59.1'	159.5°	3°17.3'	-59.2'	159.5°	2°21.1'	-59.2'	159.5°	1°24.9'	-59.3'	159.5°	<u>0°28.7'</u>	-59.4'	159.5°	0°27.5'	+59.4'	20.5°	1°23.8'	+59.5'	20.5°	21
22	3°14.4'	-59.1'	159.6°	2°18.1'	-59.2'	159.7°	1°21.8'	-59.2'	159.7°	<u>0°25.6'</u>	-59.3'	159.7°	0°30.7'	+59.4'	20.3°	1°27.0'	+59.4'	20.3°	2°23.2'	+59.5'	20.3°	22
23	<u>2°15.2'</u>	-59.1'	159.8°	<u>1°18.9'</u>	-59.2'	159.8°	<u>0°22.6'</u>	-59.2'	159.8°	<u>0°33.7'</u>	+59.3'	20.2°	1°30.0'	+59.4'	20.2°	2°26.4'	+59.4'	20.2°	3°22.7'	+59.5'	20.2°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

158° 202° LHA

Latitude SAME as DECLINATION

158° 202° 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 CONTRARY to Declination

21° 339° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	25°04.6'	-59.0'	156.7°	24°09.5'	-59.1'	156.9°	23°14.3'	-59.2'	157.0°	22°19.0'	-59.3'	157.2°	21°23.6'	-59.3'	157.4°	20°28.2'	-59.4'	157.5°	19°32.8'	-59.4'	157.6°	0
1	24°05.5'	-59.0'	156.9°	23°10.4'	-59.1'	157.1°	22°15.1'	-59.2'	157.2°	21°19.7'	-59.3'	157.4°	20°24.3'	-59.3'	157.5°	19°28.8'	-59.4'	157.7°	18°33.3'	-59.5'	157.8°	1
2	23°06.5'	-59.1'	157.1°	22°11.2'	-59.1'	157.2°	21°15.9'	-59.2'	157.4°	20°20.5'	-59.3'	157.5°	19°25.0'	-59.3'	157.7°	18°29.5'	-59.4'	157.8°	17°33.9'	-59.5'	157.9°	2
3	22°07.5'	-59.1'	157.3°	21°12.1'	-59.1'	157.4°	20°16.7'	-59.2'	157.6°	19°21.2'	-59.3'	157.7°	18°25.6'	-59.3'	157.8°	17°30.1'	-59.4'	158.0°	16°34.4'	-59.5'	158.1°	3
4	21°08.4'	-59.1'	157.5°	20°13.0'	-59.2'	157.6°	19°17.5'	-59.2'	157.7°	18°21.9'	-59.3'	157.9°	17°26.3'	-59.4'	158.0°	16°30.6'	-59.4'	158.1°	15°35.0'	-59.5'	158.2°	4
5	20°09.3'	-59.1'	157.6°	19°13.8'	-59.2'	157.8°	18°18.2'	-59.2'	157.9°	17°22.6'	-59.3'	158.0°	16°26.9'	-59.4'	158.1°	15°31.2'	-59.4'	158.3°	14°35.5'	-59.5'	158.4°	5
6	19°10.2'	-59.1'	157.8°	18°14.6'	-59.2'	158.0°	17°19.0'	-59.2'	158.1°	16°23.3'	-59.3'	158.2°	15°27.6'	-59.4'	158.3°	14°31.8'	-59.4'	158.4°	13°36.0'	-59.5'	158.5°	6
7	18°11.1'	-59.1'	158.0°	17°15.5'	-59.2'	158.1°	16°19.8'	-59.3'	158.2°	15°24.0'	-59.3'	158.3°	14°28.2'	-59.4'	158.4°	13°32.4'	-59.4'	158.5°	12°36.5'	-59.5'	158.6°	7
8	17°12.0'	-59.1'	158.2°	16°16.3'	-59.2'	158.3°	15°20.5'	-59.3'	158.4°	14°24.7'	-59.3'	158.5°	13°28.8'	-59.4'	158.6°	12°33.0'	-59.4'	158.7°	11°37.1'	-59.5'	158.8°	8
9	16°12.9'	-59.1'	158.4°	15°17.1'	-59.2'	158.5°	14°21.2'	-59.3'	158.6°	13°25.4'	-59.3'	158.7°	12°29.5'	-59.4'	158.7°	11°33.5'	-59.4'	158.8°	10°37.6'	-59.5'	158.9°	9
10	15°13.7'	-59.1'	158.5°	14°17.9'	-59.2'	158.6°	13°22.0'	-59.3'	158.7°	12°26.0'	-59.3'	158.8°	11°30.1'	-59.4'	158.9°	10°34.1'	-59.4'	159.0°	9°38.1'	-59.5'	159.0°	10
11	14°14.6'	-59.2'	158.7°	13°18.7'	-59.2'	158.8°	12°22.7'	-59.3'	158.9°	11°26.7'	-59.3'	159.0°	10°30.7'	-59.4'	159.0°	9°34.7'	-59.4'	159.1°	8°38.6'	-59.5'	159.2°	11
12	13°15.4'	-59.2'	158.9°	12°19.4'	-59.2'	159.0°	11°23.4'	-59.3'	159.0°	10°27.4'	-59.3'	159.1°	9°31.3'	-59.4'	159.2°	8°35.2'	-59.4'	159.2°	7°39.1'	-59.5'	159.3°	12
13	12°16.3'	-59.2'	159.1°	11°20.2'	-59.2'	159.1°	10°24.1'	-59.3'	159.2°	9°28.0'	-59.3'	159.3°	8°31.9'	-59.4'	159.3°	7°35.8'	-59.4'	159.4°	6°39.6'	-59.5'	159.4°	13
14	11°17.1'	-59.2'	159.2°	10°21.0'	-59.2'	159.3°	9°24.9'	-59.3'	159.4°	8°28.7'	-59.3'	159.4°	7°32.5'	-59.4'	159.5°	6°36.3'	-59.5'	159.5°	5°40.1'	-59.5'	159.5°	14
15	10°17.9'	-59.2'	159.4°	9°21.8'	-59.2'	159.5°	8°25.6'	-59.3'	159.5°	7°29.4'	-59.3'	159.6°	6°33.1'	-59.4'	159.6°	5°36.9'	-59.5'	159.6°	4°40.6'	-59.5'	159.7°	15
16	9°18.8'	-59.2'	159.6°	8°22.5'	-59.2'	159.6°	7°26.3'	-59.3'	159.7°	6°30.0'	-59.4'	159.7°	5°33.7'	-59.4'	159.8°	4°37.4'	-59.5'	159.8°	3°41.1'	-59.5'	159.8°	16
17	8°19.6'	-59.2'	159.7°	7°23.3'	-59.2'	159.8°	6°27.0'	-59.3'	159.8°	5°30.7'	-59.4'	159.9°	4°34.3'	-59.4'	159.9°	3°38.0'	-59.5'	159.9°	2°41.6'	-59.5'	159.9°	17
18	7°20.4'	-59.2'	159.9°	6°24.0'	-59.2'	159.9°	5°27.7'	-59.3'	160.0°	4°31.3'	-59.4'	160.0°	3°34.9'	-59.4'	160.0°	2°38.5'	-59.5'	160.1°	1°42.1'	-59.5'	160.1°	18
19	6°21.2'	-59.2'	160.1°	5°24.8'	-59.2'	160.1°	4°28.4'	-59.3'	160.1°	3°31.9'	-59.4'	160.2°	2°35.5'	-59.4'	160.2°	1°39.1'	-59.5'	160.2°	<u>0°42.6'</u>	-59.5'	160.2°	19
20	5°22.0'	-59.2'	160.2°	4°25.5'	-59.3'	160.3°	3°29.1'	-59.3'	160.3°	2°32.6'	-59.4'	160.3°	1°36.1'	-59.4'	160.3°	<u>0°39.6'</u>	-59.5'	160.3°	0°16.9'	+59.5'	19.7°	20
21	4°22.8'	-59.2'	160.4°	3°26.3'	-59.3'	160.4°	2°29.8'	-														

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

20° 340° LHA

Latitude CONTRARY to Declination

20° 340° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	25°15.1'	-59.1'	157.8°	24°19.6'	-59.2'	158.0°	23°23.9'	-59.3'	158.1°	22°28.2'	-59.3'	158.3°	21°32.5'	-59.4'	158.4°	20°36.6'	-59.4'	158.6°	19°40.8'	-59.5'	158.7°	0
1	24°16.0'	-59.1'	158.0°	23°20.4'	-59.2'	158.1°	22°24.7'	-59.3'	158.3°	21°28.9'	-59.3'	158.4°	20°33.1'	-59.4'	158.6°	19°37.2'	-59.4'	158.7°	18°41.3'	-59.5'	158.8°	1
2	23°16.9'	-59.1'	158.2°	22°21.2'	-59.2'	158.3°	21°25.4'	-59.3'	158.5°	20°29.6'	-59.3'	158.6°	19°33.7'	-59.4'	158.7°	18°37.8'	-59.5'	158.9°	17°41.8'	-59.5'	159.0°	2
3	22°17.8'	-59.2'	158.3°	21°22.0'	-59.2'	158.5°	20°26.1'	-59.3'	158.6°	19°30.2'	-59.3'	158.8°	18°34.3'	-59.4'	158.9°	17°38.3'	-59.5'	159.0°	16°42.3'	-59.5'	159.1°	3
4	21°18.6'	-59.2'	158.5°	20°22.8'	-59.2'	158.7°	19°26.9'	-59.3'	158.8°	18°30.9'	-59.4'	158.9°	17°34.9'	-59.4'	159.0°	16°38.8'	-59.5'	159.1°	15°42.8'	-59.5'	159.2°	4
5	20°19.5'	-59.2'	158.7°	19°23.5'	-59.2'	158.8°	18°27.6'	-59.3'	158.9°	17°31.5'	-59.4'	159.1°	16°35.5'	-59.4'	159.2°	15°39.4'	-59.5'	159.3°	14°43.2'	-59.5'	159.4°	5
6	19°20.3'	-59.2'	158.9°	18°24.3'	-59.3'	159.0°	17°28.3'	-59.3'	159.1°	16°32.2'	-59.4'	159.2°	15°36.1'	-59.4'	159.3°	14°39.9'	-59.5'	159.4°	13°43.7'	-59.5'	159.5°	6
7	18°21.1'	-59.2'	159.0°	17°25.0'	-59.3'	159.2°	16°28.9'	-59.3'	159.3°	15°32.8'	-59.4'	159.4°	14°36.6'	-59.4'	159.5°	13°40.4'	-59.5'	159.6°	12°44.2'	-59.5'	159.6°	7
8	17°21.9'	-59.2'	159.2°	16°25.8'	-59.3'	159.3°	15°29.6'	-59.3'	159.4°	14°33.4'	-59.4'	159.5°	13°37.2'	-59.4'	159.6°	12°41.0'	-59.5'	159.7°	11°44.7'	-59.5'	159.8°	8
9	16°22.7'	-59.2'	159.4°	15°26.5'	-59.3'	159.5°	14°30.3'	-59.3'	159.6°	13°34.1'	-59.4'	159.7°	12°37.8'	-59.4'	159.7°	11°41.5'	-59.5'	159.8°	10°45.1'	-59.5'	159.9°	9
10	15°23.5'	-59.2'	159.6°	14°27.2'	-59.3'	159.6°	13°31.0'	-59.3'	159.7°	12°34.7'	-59.4'	159.8°	11°38.3'	-59.4'	159.9°	10°42.0'	-59.5'	160.0°	9°45.6'	-59.5'	160.0°	10
11	14°24.3'	-59.2'	159.7°	13°28.0'	-59.3'	159.8°	12°31.6'	-59.3'	159.9°	11°35.3'	-59.4'	160.0°	10°38.9'	-59.4'	160.0°	9°42.5'	-59.5'	160.1°	8°46.1'	-59.5'	160.1°	11
12	13°25.0'	-59.2'	159.9°	12°28.7'	-59.3'	160.0°	11°32.3'	-59.3'	160.0°	10°35.9'	-59.4'	160.1°	9°39.5'	-59.4'	160.2°	8°43.0'	-59.5'	160.2°	7°46.5'	-59.5'	160.3°	12
13	12°25.8'	-59.2'	160.0°	11°29.4'	-59.3'	160.1°	10°32.9'	-59.3'	160.2°	9°36.5'	-59.4'	160.2°	8°40.0'	-59.5'	160.3°	7°43.5'	-59.5'	160.3°	6°47.0'	-59.5'	160.4°	13
14	11°26.6'	-59.2'	160.2°	10°30.1'	-59.3'	160.3°	9°33.6'	-59.4'	160.3°	8°37.1'	-59.4'	160.4°	7°40.6'	-59.5'	160.4°	6°44.0'	-59.5'	160.5°	5°47.5'	-59.5'	160.5°	14
15	10°27.3'	-59.2'	160.4°	9°30.8'	-59.3'	160.4°	8°34.2'	-59.4'	160.5°	7°37.7'	-59.4'	160.5°	6°41.1'	-59.5'	160.6°	5°44.5'	-59.5'	160.6°	4°47.9'	-59.5'	160.6°	15
16	9°28.1'	-59.3'	160.5°	8°31.5'	-59.3'	160.6°	7°34.9'	-59.4'	160.6°	6°38.3'	-59.4'	160.7°	5°41.6'	-59.5'	160.7°	4°45.0'	-59.5'	160.7°	3°48.4'	-59.5'	160.8°	16
17	8°28.8'	-59.3'	160.7°	7°32.2'	-59.3'	160.7°	6°35.5'	-59.4'	160.8°	5°38.9'	-59.4'	160.8°	4°42.2'	-59.5'	160.8°	3°45.5'	-59.5'	160.9°	2°48.8'	-59.5'	160.9°	17
18	7°29.5'	-59.3'	160.8°	6°32.9'	-59.3'	160.9°	5°36.2'	-59.4'	160.9°	4°39.5'	-59.4'	161.0°	3°42.7'	-59.5'	161.0°	2°46.0'	-59.5'	161.0°	1°49.3'	-59.5'	161.0°	18
19	6°30.3'	-59.3'	161.0°	5°33.5'	-59.3'	161.0°	4°36.8'	-59.4'	161.1°	3°40.0'	-59.4'	161.1°	2°43.3'	-59.5'	161.1°	1°46.5'	-59.5'	161.1°	0°49.7'	-59.5'	161.1°	19
20	5°31.0'	-59.3'	161.2°	4°34.2'	-59.3'	161.2°	3°37.4'	-59.4'	161.2°	2°40.6'	-59.4'	161.2°	1°43.8'	-59.5'	161.2°	0°47.0'	-59.5'	161.3°	0°09.8'	+59.5'	18.7°	20
21	4°31.8'	-59.3'	161.3°	3°34.9'	-59.3'	161.3°	2°38.1'	-59.4'	161.4°	1°41.2'	-59.4'	161.4°	0°44.4'	-59.5'	161.4°	0°12.5'	+59.5'	18.6°	1°09.4'	+59.5'	18.6°	21
22	3°32.5'	-59.3'	161.5°	2°35.6'	-59.3'	161.5°	1°38.7'	-59.4'	161.5°	0°41.8'	-59.4'	161.5°	0°15.1'	+59.5'	18.5°	1°12.0'	+59.5'	18.5°	2°08.9'	+59.5'	18.5°	22
23	2°33.2'	-59.3'	161.6°	1°36.3'	-59.3'	161.6°	0°39.3'	-59.4'	161.6°	0°17.6'	+59.4'	18.4°	1°14.6'	+59.5'	18.4°	2°11.5'	+59.5'	18.4°	3°08.5'	+59.5'	18.4°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

160° 200° LHA

Latitude SAME as DECLINATION

160° 200° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	25°25.2'	-59.2'	158.9°	24°29.2'	-59.3'	159.0°	23°33.2'	-59.3'	159.2°	22°37.0'	-59.4'	159.3°	21°40.9'	-59.4'	159.5°	20°44.7'	-59.5'	159.6°	19°48.4'	-59.5'	159.8°	0
1	24°26.0'	-59.2'	159.1°	23°30.0'	-59.3'	159.2°	22°33.8'	-59.3'	159.4°	21°37.7'	-59.4'	159.5°	20°41.4'	-59.4'	159.6°	19°45.2'	-59.5'	159.8°	18°48.8'	-59.5'	159.9°	1
2	23°26.8'	-59.2'	159.2°	22°30.7'	-59.3'	159.4°	21°34.5'	-59.3'	159.5°	20°38.3'	-59.4'	159.7°	19°42.0'	-59.5'	159.8°	18°45.7'	-59.5'	159.9°	17°49.3'	-59.6'	160.0°	2
3	22°27.6'	-59.2'	159.4°	21°31.4'	-59.3'	159.5°	20°35.2'	-59.4'	159.7°	19°38.9'	-59.4'	159.8°	18°42.5'	-59.5'	159.9°	17°46.2'	-59.5'	160.0°	16°49.8'	-59.6'	160.1°	3
4	21°28.4'	-59.2'	159.6°	20°32.1'	-59.3'	159.7°	19°35.8'	-59.4'	159.8°	18°39.5'	-59.4'	160.0°	17°43.1'	-59.5'	160.1°	16°46.7'	-59.5'	160.2°	15°50.2'	-59.6'	160.3°	4
5	20°29.1'	-59.3'	159.7°	19°32.8'	-59.3'	159.9°	18°36.4'	-59.4'	160.0°	17°40.1'	-59.4'	160.1°	16°43.6'	-59.5'	160.2°	15°47.1'	-59.5'	160.3°	14°50.6'	-59.6'	160.4°	5
6	19°29.9'	-59.3'	159.9°	18°33.5'	-59.3'	160.0°	17°37.1'	-59.4'	160.1°	16°40.6'	-59.4'	160.2°	15°44.1'	-59.5'	160.3°	14°47.6'	-59.5'	160.4°	13°51.1'	-59.6'	160.5°	6
7	18°30.6'	-59.3'	160.1°	17°34.2'	-59.3'	160.2°	16°37.7'	-59.4'	160.3°	15°41.2'	-59.4'	160.4°	14°44.7'	-59.5'	160.5°	13°48.1'	-59.5'	160.6°	12°51.5'	-59.6'	160.6°	7
8	17°31.3'	-59.3'	160.2°	16°34.8'	-59.3'	160.3°	15°38.3'	-59.4'	160.4°	14°41.8'	-59.4'	160.5°	13°45.2'	-59.5'	160.6°	12°48.6'	-59.5'	160.7°	11°51.9'	-59.6'	160.8°	8
9	16°32.1'	-59.3'	160.4°	15°35.5'	-59.3'	160.5°	14°38.9'	-59.4'	160.6°	13°42.3'	-59.4'	160.7°	12°45.7'	-59.5'	160.7°	11°49.0'	-59.5'	160.8°	10°52.4'	-59.6'	160.9°	9
10	15°32.8'	-59.3'	160.6°	14°36.2'	-59.3'	160.7°	13°39.5'	-59.4'	160.7°	12°42.9'	-59.4'	160.8°	11°46.2'	-59.5'	160.9°	10°49.5'	-59.5'	160.9°	9°52.8'	-59.6'	161.0°	10
11	14°33.5'	-59.3'	160.7°	13°36.8'	-59.4'	160.8°	12°40.1'	-59.4'	160.9°	11°43.4'	-59.5'	160.9°	10°46.7'	-59.5'	161.0°	9°50.0'	-59.5'	161.1°	8°53.2'	-59.6'	161.1°	11
12	13°34.2'	-59.3'	160.9°	12°37.5'	-59.4'	161.0°	11°40.7'	-59.4'	161.0°	10°44.0'	-59.5'	161.1°	9°47.2'	-59.5'	161.1°	8°50.4'	-59.5'	161.2°	7°53.6'	-59.6'	161.2°	12
13	12°34.9'	-59.3'	161.0°	11°38.1'	-59.4'	161.1°	10°41.3'	-59.4'	161.2°	9°44.5'	-59.5'	161.2°	8°47.7'	-59.5'	161.3°	7°50.9'	-59.5'	161.3°	6°54.0'	-59.6'	161.4°	13
14	11°35.6'	-59.3'	161.2°	10°38.8'	-59.4'	161.3°	9°41.9'	-59.4'	161.3°	8°45.1'	-59.5'	161.4°	7°48.2'	-59.5'	161.4°	6°51.3'	-59.5'	161.4°	5°54.5'	-59.6'	161.5°	14
15	10°36.2'	-59.3'	161.3°	9°39.4'	-59.4'	161.4°	8°42.5'	-59.4'	161.4°	7°45.6'	-59.5'	161.5°	6°48.7'	-59.5'	161.5°	5°51.8'	-59.5'	161.6°	4°54.9'	-59.6'	161.6°	15
16	9°36.9'	-59.3'	161.5°	8°40.0'	-59.4'	161.5°	7°43.1'	-59.4'	161.6°	6°46.2'	-59.5'	161.6°	5°49.2'	-59.5'	161.7°	4°52.3'	-59.5'	161.7°	3°55.3'	-59.6'	161.7°	16
17	8°37.6'	-59.3'	161.6°	7°40.6'	-59.4'	161.7°	6°43.7'	-59.4'	161.7°	5°46.7'	-59.5'	161.8°	4°49.7'	-59.5'	161.8°	3°52.7'	-59.6'	161.8°	2°55.7'	-59.6'	161.8°	17
18	7°38.3'	-59.3'	161.8°	6°41.3'	-59.4'	161.8°	5°44.3'	-59.4'	161.9°	4°47.2'	-59.5'	161.9°	3°50.2'	-59.5'	161.9°	2°53.2'	-59.6'	161.9°	1°56.1'	-59.6'	162.0°	18
19	6°38.9'	-59.3'	161.9°	5°41.9'	-59.4'	162.0°	4°44.8'	-59.4'	162.0°	3°47.8'	-59.5'	162.0°	2°50.7'	-59.5'	162.0°	1°53.6'	-59.6'	162.1°	0°56.5'	-59.6'	162.1°	19
20	5°39.6'	-59.3'	162.1°	4°42.5'	-59.4'	162.1°	3°45.4'	-59.4'	162.1°	2°48.3'	-59.5'	162.2°	1°51.2'	-59.5'	162.2°	0°54.0'	-59.6'	162.2°	0°03.1'	+59.6'	17.8°	20
21	4°40.3'	-59.3'	162.2°	3°43.1'	-59.4'	162.3°																

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

18° 342° LHA

Latitude CONTRARY to Declination

18° 342° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	25°34.7'	-59.3'	160.0°	24°38.4'	-59.3'	160.1°	23°41.9'	-59.4'	160.3°	22°45.4'	-59.4'	160.4°	21°48.9'	-59.5'	160.6°	20°52.3'	-59.5'	160.7°	19°55.6'	-59.6'	160.8°	0
1	24°35.5'	-59.3'	160.1°	23°39.1'	-59.3'	160.3°	22°42.6'	-59.4'	160.4°	21°46.0'	-59.5'	160.6°	20°49.4'	-59.5'	160.7°	19°52.7'	-59.5'	160.8°	18°56.1'	-59.6'	160.9°	1
2	23°36.2'	-59.3'	160.3°	22°39.7'	-59.4'	160.4°	21°43.2'	-59.4'	160.6°	20°46.5'	-59.5'	160.7°	19°49.9'	-59.5'	160.8°	18°53.2'	-59.6'	160.9°	17°56.5'	-59.6'	161.1°	2
3	22°36.9'	-59.3'	160.5°	21°40.4'	-59.4'	160.6°	20°43.7'	-59.4'	160.7°	19°47.1'	-59.5'	160.9°	18°50.4'	-59.5'	161.0°	17°53.6'	-59.6'	161.1°	16°56.9'	-59.6'	161.2°	3
4	21°37.6'	-59.3'	160.6°	20°41.0'	-59.4'	160.8°	19°44.3'	-59.4'	160.9°	18°47.6'	-59.5'	161.0°	17°50.9'	-59.5'	161.1°	16°54.1'	-59.6'	161.2°	15°57.3'	-59.6'	161.3°	4
5	20°38.3'	-59.3'	160.8°	19°41.6'	-59.4'	160.9°	18°44.9'	-59.4'	161.0°	17°48.1'	-59.5'	161.1°	16°51.4'	-59.5'	161.2°	15°54.5'	-59.6'	161.3°	14°57.7'	-59.6'	161.4°	5
6	19°39.0'	-59.3'	161.0°	18°42.3'	-59.4'	161.1°	17°45.5'	-59.4'	161.2°	16°48.7'	-59.5'	161.3°	15°51.8'	-59.5'	161.4°	14°55.0'	-59.6'	161.5°	13°58.1'	-59.6'	161.5°	6
7	18°39.7'	-59.3'	161.1°	17°42.9'	-59.4'	161.2°	16°46.0'	-59.4'	161.3°	15°49.2'	-59.5'	161.4°	14°52.3'	-59.5'	161.5°	13°55.4'	-59.6'	161.6°	12°58.5'	-59.6'	161.7°	7
8	17°40.3'	-59.3'	161.3°	16°43.5'	-59.4'	161.4°	15°46.6'	-59.4'	161.5°	14°49.7'	-59.5'	161.5°	13°52.8'	-59.5'	161.6°	12°55.8'	-59.6'	161.7°	11°58.8'	-59.6'	161.8°	8
9	16°41.0'	-59.4'	161.4°	15°44.1'	-59.4'	161.5°	14°47.2'	-59.5'	161.6°	13°50.2'	-59.5'	161.7°	12°53.2'	-59.5'	161.8°	11°56.2'	-59.6'	161.8°	10°59.2'	-59.6'	161.9°	9
10	15°41.6'	-59.4'	161.6°	14°44.7'	-59.4'	161.7°	13°47.7'	-59.5'	161.7°	12°50.7'	-59.5'	161.8°	11°53.7'	-59.5'	161.9°	10°56.7'	-59.6'	161.9°	9°59.6'	-59.6'	162.0°	10
11	14°42.2'	-59.4'	161.7°	13°45.3'	-59.4'	161.8°	12°48.2'	-59.5'	161.9°	11°51.2'	-59.5'	161.9°	10°54.2'	-59.5'	162.0°	9°57.1'	-59.6'	162.1°	8°60.0'	-59.6'	162.1°	11
12	13°42.9'	-59.4'	161.9°	12°45.8'	-59.4'	161.9°	11°48.8'	-59.5'	162.0°	10°51.7'	-59.5'	162.1°	9°54.6'	-59.5'	162.1°	8°57.5'	-59.6'	162.2°	7°00.4'	-59.6'	162.2°	12
13	12°43.5'	-59.4'	162.0°	11°46.4'	-59.4'	162.1°	10°49.3'	-59.5'	162.1°	9°52.2'	-59.5'	162.2°	8°55.1'	-59.6'	162.3°	7°57.9'	-59.6'	162.3°	6°00.7'	-59.6'	162.3°	13
14	11°44.1'	-59.4'	162.2°	10°47.0'	-59.4'	162.2°	9°49.8'	-59.5'	162.3°	8°52.7'	-59.5'	162.3°	7°55.5'	-59.6'	162.4°	6°58.3'	-59.6'	162.4°	5°01.1'	-59.6'	162.5°	14
15	10°44.7'	-59.4'	162.3°	9°47.6'	-59.4'	162.4°	8°50.4'	-59.5'	162.4°	7°53.2'	-59.5'	162.5°	6°56.0'	-59.6'	162.5°	5°58.7'	-59.6'	162.5°	4°01.5'	-59.6'	162.6°	15
16	9°45.4'	-59.4'	162.5°	8°48.1'	-59.4'	162.5°	7°50.9'	-59.5'	162.6°	6°53.7'	-59.5'	162.6°	5°56.4'	-59.6'	162.6°	4°59.1'	-59.6'	162.7°	3°01.9'	-59.6'	162.7°	16
17	8°46.0'	-59.4'	162.6°	7°48.7'	-59.4'	162.6°	6°51.4'	-59.5'	162.7°	5°54.1'	-59.5'	162.7°	4°56.8'	-59.6'	162.7°	3°59.5'	-59.6'	162.8°	2°02.2'	-59.6'	162.8°	17
18	7°46.6'	-59.4'	162.7°	6°49.3'	-59.4'	162.8°	5°51.9'	-59.5'	162.8°	4°54.6'	-59.5'	162.8°	3°57.3'	-59.6'	162.9°	2°59.9'	-59.6'	162.9°	1°02.6'	-59.6'	162.9°	18
19	6°47.2'	-59.4'	162.9°	5°49.8'	-59.4'	162.9°	4°52.5'	-59.5'	162.9°	3°55.1'	-59.5'	163.0°	2°57.7'	-59.6'	163.0°	2°00.3'	-59.6'	163.0°	0°03.0'	-59.6'	163.0°	19
20	5°47.8'	-59.4'	163.0°	4°50.4'	-59.4'	163.1°	3°53.0'	-59.5'	163.1°	2°55.6'	-59.5'	163.1°	1°58.2'	-59.6'	163.1°	1°00.8'	-59.6'	163.1°	0°03.3'	-59.6'	163.1°	20
21	4°48.4'	-59.4'	163.2°	3°50.9'	-59.4'	163.2°	2°53.5'	-59.5'	163.2°	1°56.0'	-59.5'	163.2°	0°58.6'	-59.6'	163.2°	0°01.2'	-59.6'	163.2°	0°56.3'	+59.6'	16.8°	21
22	3°49.0'	-59.4'	163.3°	2°51.5'	-59.4'	163.3°	1°54.0'	-59.5'	163.3°	0°56.5'	-59.5'	163.3°	0°01.0'	+59.6'	16.6°	0°58.4'	+59.6'	16.7°	1°55.9'	+59.6'	16.7°	22
23	2°49.6'	-59.4'	163.5°	1°52.0'	-59.4'	163.5°	0°54.5'	-59.5'	163.5°	0°03.0'	+59.5'	16.5°	1°00.5'	+59.6'	16.5°	1°58.0'	+59.6'	16.5°	2°55.6'	+59.6'	16.5°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

162° 198° LHA

Latitude SAME as DECLINATION

162° 198° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	25°43.8'	-59.4'	161.1°	24°47.1'	-59.4'	161.2°	23°50.3'	-59.5'	161.4°	22°53.4'	-59.5'	161.5°	21°56.5'	-59.5'	161.6°	20°59.5'	-59.6'	161.8°	20°02.5'	-59.6'	161.9°	0
1	24°44.5'	-59.4'	161.2°	23°47.7'	-59.4'	161.4°	22°50.8'	-59.5'	161.5°	21°53.9'	-59.5'	161.6°	20°56.9'	-59.6'	161.8°	19°59.9'	-59.6'	161.9°	19°02.9'	-59.6'	162.0°	1
2	23°45.1'	-59.4'	161.4°	22°48.3'	-59.4'	161.5°	21°51.4'	-59.5'	161.6°	20°54.4'	-59.5'	161.8°	19°57.4'	-59.6'	161.9°	19°00.3'	-59.6'	162.0°	18°03.3'	-59.6'	162.1°	2
3	22°45.8'	-59.4'	161.5°	21°48.9'	-59.4'	161.7°	20°51.9'	-59.5'	161.8°	19°54.9'	-59.5'	161.9°	18°57.8'	-59.6'	162.0°	18°00.7'	-59.6'	162.1°	17°03.6'	-59.6'	162.2°	3
4	21°46.4'	-59.4'	161.7°	20°49.4'	-59.4'	161.8°	19°52.4'	-59.5'	161.9°	18°55.4'	-59.5'	162.0°	17°58.3'	-59.6'	162.1°	17°01.1'	-59.6'	162.2°	16°04.0'	-59.6'	162.3°	4
5	20°47.0'	-59.4'	161.8°	19°50.0'	-59.4'	162.0°	18°52.9'	-59.5'	162.1°	17°55.8'	-59.5'	162.2°	16°58.7'	-59.6'	162.3°	16°01.5'	-59.6'	162.4°	15°04.3'	-59.6'	162.4°	5
6	19°47.6'	-59.4'	162.0°	18°50.6'	-59.5'	162.1°	17°53.4'	-59.5'	162.2°	16°56.3'	-59.5'	162.3°	15°59.1'	-59.6'	162.4°	15°01.9'	-59.6'	162.5°	14°04.7'	-59.7'	162.6°	6
7	18°48.2'	-59.4'	162.1°	17°51.1'	-59.5'	162.2°	16°53.9'	-59.5'	162.3°	15°56.8'	-59.5'	162.4°	14°59.5'	-59.6'	162.5°	14°02.3'	-59.6'	162.6°	13°05.0'	-59.7'	162.7°	7
8	17°48.8'	-59.4'	162.3°	16°51.7'	-59.5'	162.4°	15°54.4'	-59.5'	162.5°	14°57.2'	-59.5'	162.6°	13°60.0'	-59.6'	162.6°	13°02.7'	-59.6'	162.7°	12°05.4'	-59.7'	162.8°	8
9	16°49.4'	-59.4'	162.4°	15°52.2'	-59.5'	162.5°	14°54.9'	-59.5'	162.6°	13°57.7'	-59.5'	162.7°	13°00.4'	-59.6'	162.8°	12°03.1'	-59.6'	162.8°	11°05.7'	-59.7'	162.9°	9
10	15°50.0'	-59.4'	162.6°	14°52.7'	-59.5'	162.7°	13°55.4'	-59.5'	162.7°	12°58.1'	-59.6'	162.8°	12°00.8'	-59.6'	162.9°	11°03.4'	-59.6'	162.9°	10°06.1'	-59.7'	163.0°	10
11	14°50.6'	-59.4'	162.7°	13°53.2'	-59.5'	162.8°	12°55.9'	-59.5'	162.9°	11°58.6'	-59.6'	162.9°	11°01.2'	-59.6'	163.0°	10°03.8'	-59.6'	163.1°	9°06.4'	-59.7'	163.1°	11
12	13°51.1'	-59.4'	162.9°	12°53.8'	-59.5'	162.9°	11°56.4'	-59.5'	163.0°	10°59.0'	-59.6'	163.1°	10°01.6'	-59.6'	163.1°	9°04.2'	-59.6'	163.2°	8°06.8'	-59.7'	163.2°	12
13	12°51.7'	-59.4'	163.0°	11°54.3'	-59.5'	163.1°	10°56.9'	-59.5'	163.1°	9°59.5'	-59.6'	163.2°	9°02.0'	-59.6'	163.2°	8°04.6'	-59.6'	163.3°	7°07.1'	-59.7'	163.3°	13
14	11°52.2'	-59.4'	163.1°	10°54.8'	-59.5'	163.2°	9°57.4'	-59.5'	163.3°	8°59.9'	-59.6'	163.3°	8°02.4'	-59.6'	163.4°	7°04.9'	-59.6'	163.4°	6°07.4'	-59.7'	163.4°	14
15	10°52.8'	-59.5'	163.3°	9°55.3'	-59.5'	163.3°	8°57.8'	-59.5'	163.4°	8°00.3'	-59.6'	163.4°	7°02.8'	-59.6'	163.5°	6°05.3'	-59.6'	163.5°	5°07.8'	-59.7'	163.5°	15
16	9°53.3'	-59.5'	163.4°	8°55.8'	-59.5'	163.5°	7°58.3'	-59.5'	163.5°	7°00.8'	-59.6'	163.6°	6°03.2'	-59.6'	163.6°	5°05.7'	-59.6'	163.6°	4°08.1'	-59.7'	163.6°	16
17	8°53.9'	-59.5'	163.6°	7°56.3'	-59.5'	163.6°	6°58.8'	-59.5'	163.6°	6°01.2'	-59.6'	163.7°	5°03.6'	-59.6'	163.7°	4°06.0'	-59.6'	163.7°	3°08.4'	-59.7'	163.7°	17
18	7°54.4'	-59.5'	163.7°	6°56.8'	-59.5'	163.7°	5°59.2'	-59.5'	163.8°	5°01.6'	-59.6'	163.8°	4°04.0'	-59.6'	163.8°	3°06.4'	-59.6'	163.8°	2°08.8'	-59.7'	163.8°	18
19	6°55.0'	-59.5'	163.8°	5°57.3'	-59.5'	163.9°	4°59.7'	-59.5'	163.9°	4°02.1'	-59.6'	163.9°	3°04.4'	-59.6'	163.9°	2°06.7'	-59.6'	163.9°	1°09.1'	-59.7'	163.9°	19
20	5°55.5'	-59.5'	164.0°	4°57.8'	-59.5'	164.0°	4°00.2'	-59.5'	164.0°	3°02.5'	-59.6'	164.0°	2°04.8'	-59.6'	164.0°	1°07.1'	-59.6'	164.1°	0°09.4'	-59.7'	164.1°	20
21	4°56.0'	-59.5'	164.1°	3°58.3'	-59.5'	164.1°	3°00.6'	-59.5'	164.1°	2°02.9'												

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

16° 344° LHA

Latitude CONTRARY to Declination

16° 344° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	25°52.4'	-59.4'	162.2°	24°55.3'	-59.5'	162.3°	23°58.2'	-59.5'	162.4°	23°00.9'	-59.6'	162.6°	22°03.7'	-59.6'	162.7°	21°06.4'	-59.6'	162.8°	20°09.0'	-59.7'	162.9°	0
1	24°53.0'	-59.4'	162.3°	23°55.9'	-59.5'	162.5°	22°58.6'	-59.5'	162.6°	22°01.4'	-59.6'	162.7°	21°04.1'	-59.6'	162.8°	20°06.7'	-59.6'	162.9°	19°09.4'	-59.7'	163.0°	1
2	23°53.6'	-59.4'	162.5°	22°56.4'	-59.5'	162.6°	21°59.1'	-59.5'	162.7°	21°01.8'	-59.6'	162.8°	20°04.5'	-59.6'	162.9°	19°07.1'	-59.6'	163.0°	18°09.7'	-59.7'	163.1°	2
3	22°54.2'	-59.4'	162.6°	21°56.9'	-59.5'	162.7°	20°59.6'	-59.5'	162.9°	20°02.2'	-59.6'	163.0°	19°04.9'	-59.6'	163.1°	18°07.4'	-59.6'	163.2°	17°10.0'	-59.7'	163.3°	3
4	21°54.7'	-59.5'	162.8°	20°57.4'	-59.5'	162.9°	20°00.1'	-59.5'	163.0°	19°02.7'	-59.6'	163.1°	18°05.2'	-59.6'	163.2°	17°07.8'	-59.7'	163.3°	16°10.3'	-59.7'	163.4°	4
5	20°55.3'	-59.5'	162.9°	19°57.9'	-59.5'	163.0°	19°00.5'	-59.5'	163.1°	18°03.1'	-59.6'	163.2°	17°05.6'	-59.6'	163.3°	16°08.1'	-59.7'	163.4°	15°10.6'	-59.7'	163.5°	5
6	19°55.8'	-59.5'	163.0°	18°58.4'	-59.5'	163.1°	18°01.0'	-59.6'	163.2°	17°03.5'	-59.6'	163.3°	16°06.0'	-59.6'	163.4°	15°08.5'	-59.7'	163.5°	14°11.0'	-59.7'	163.6°	6
7	18°56.4'	-59.5'	163.2°	17°58.9'	-59.5'	163.3°	17°01.4'	-59.6'	163.4°	16°03.9'	-59.6'	163.5°	15°06.4'	-59.6'	163.5°	14°08.8'	-59.7'	163.6°	13°11.3'	-59.7'	163.7°	7
8	17°56.9'	-59.5'	163.3°	16°59.4'	-59.5'	163.4°	16°01.9'	-59.6'	163.5°	15°04.3'	-59.6'	163.6°	14°06.8'	-59.6'	163.7°	13°09.2'	-59.7'	163.7°	12°11.6'	-59.7'	163.8°	8
9	16°57.4'	-59.5'	163.5°	15°59.9'	-59.5'	163.5°	15°02.3'	-59.6'	163.6°	14°04.7'	-59.6'	163.7°	13°07.1'	-59.6'	163.8°	12°09.5'	-59.7'	163.8°	11°11.9'	-59.7'	163.9°	9
10	15°57.9'	-59.5'	163.6°	15°00.3'	-59.5'	163.7°	14°02.7'	-59.6'	163.8°	13°05.1'	-59.6'	163.8°	12°07.5'	-59.6'	163.9°	11°09.8'	-59.7'	163.9°	10°12.2'	-59.7'	164.0°	10
11	14°58.4'	-59.5'	163.7°	14°00.8'	-59.5'	163.8°	13°03.2'	-59.6'	163.9°	12°05.5'	-59.6'	163.9°	11°07.9'	-59.6'	164.0°	10°10.2'	-59.7'	164.0°	9°12.5'	-59.7'	164.1°	11
12	13°58.9'	-59.5'	163.9°	13°01.3'	-59.5'	163.9°	12°03.6'	-59.6'	164.0°	11°05.9'	-59.6'	164.1°	10°08.2'	-59.6'	164.1°	9°10.5'	-59.7'	164.2°	8°12.8'	-59.7'	164.2°	12
13	12°59.4'	-59.5'	164.0°	12°01.7'	-59.5'	164.1°	11°04.0'	-59.6'	164.1°	10°06.3'	-59.6'	164.2°	9°08.6'	-59.6'	164.2°	8°10.8'	-59.7'	164.3°	7°13.1'	-59.7'	164.3°	13
14	11°59.9'	-59.5'	164.1°	11°02.2'	-59.5'	164.2°	10°04.5'	-59.6'	164.2°	9°06.7'	-59.6'	164.3°	8°08.9'	-59.6'	164.3°	7°11.2'	-59.7'	164.4°	6°13.4'	-59.7'	164.4°	14
15	11°00.4'	-59.5'	164.3°	10°02.6'	-59.5'	164.3°	9°04.9'	-59.6'	164.4°	8°07.1'	-59.6'	164.4°	7°09.3'	-59.6'	164.4°	6°11.5'	-59.7'	164.5°	5°13.7'	-59.7'	164.5°	15
16	10°00.9'	-59.5'	164.4°	9°03.1'	-59.6'	164.4°	8°05.3'	-59.6'	164.5°	7°07.5'	-59.6'	164.5°	6°09.6'	-59.6'	164.5°	5°11.8'	-59.7'	164.6°	4°14.0'	-59.7'	164.6°	16
17	9°01.4'	-59.5'	164.5°	8°03.5'	-59.6'	164.6°	7°05.7'	-59.6'	164.6°	6°07.9'	-59.6'	164.6°	5°10.0'	-59.6'	164.7°	4°12.1'	-59.7'	164.7°	3°14.3'	-59.7'	164.7°	17
18	8°01.9'	-59.5'	164.6°	7°04.0'	-59.6'	164.7°	6°06.1'	-59.6'	164.7°	5°08.2'	-59.6'	164.7°	4°10.4'	-59.6'	164.8°	3°12.5'	-59.7'	164.8°	2°14.6'	-59.7'	164.8°	18
19	7°02.3'	-59.5'	164.8°	6°04.4'	-59.6'	164.8°	5°06.5'	-59.6'	164.8°	4°08.6'	-59.6'	164.9°	3°10.7'	-59.7'	164.9°	2°12.8'	-59.7'	164.9°	1°14.9'	-59.7'	164.9°	19
20	6°02.8'	-59.5'	164.9°	5°04.9'	-59.6'	164.9°	4°06.9'	-59.6'	164.9°	3°09.0'	-59.6'	165.0°	2°11.1'	-59.7'	165.0°	1°13.1'	-59.7'	165.0°	<u>0°15.2'</u>	-59.7'	165.0°	20
21	5°03.3'	-59.5'	165.0°	4°05.3'	-59.6'	165.0°	3°07.4'	-59.6'	165.1°	2°09.4'	-59.6'	165.1°	1°11.4'	-59.7'	165.1°	<u>0°13.4'</u>	-59.7'	165.1°	0°44.6'	+59.7'	14.9°	21
22	4°03.8'	-59.5'	165.2°	3°05.8'	-59.6'	165.2°	2°07.8'	-59.6'	165.2°	1°09.8'	-59.6'	165.2°	<u>0°11.8'</u>	-59.7'	165.2°	0°46.3'	+59.7'	14.8°	1°44.3'	+59.7'	14.8°	22
23	<u>3°04.2'</u>	-59.5'	165.3°	<u>2°06.2'</u>	-59.6'	165.3°	<u>1°08.2'</u>	-59.6'	165.3°	<u>0°10.1'</u>	-59.6'	165.3°	<u>0°47.9'</u>	+59.7'	14.7°	1°45.9'	+59.7'	14.7°	2°44.0'	+59.7'	14.7°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

164° 196° LHA

Latitude SAME as DECLINATION

164° 196° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°00.5'	-59.5'	163.3°	25°03.1'	-59.5'	163.4°	24°05.6'	-59.6'	163.5°	23°08.0'	-59.6'	163.7°	22°10.4'	-59.6'	163.8°	21°12.8'	-59.7'	163.9°	20°15.1'	-59.7'	164.0°	0
1	25°01.0'	-59.5'	163.4°	24°03.6'	-59.5'	163.5°	23°06.0'	-59.6'	163.7°	22°08.4'	-59.6'	163.8°	21°10.8'	-59.6'	163.9°	20°13.1'	-59.7'	164.0°	19°15.4'	-59.7'	164.1°	1
2	24°01.5'	-59.5'	163.5°	23°04.0'	-59.5'	163.7°	22°06.4'	-59.6'	163.8°	21°08.8'	-59.6'	163.9°	20°11.1'	-59.7'	164.0°	19°13.4'	-59.7'	164.1°	18°15.7'	-59.7'	164.2°	2
3	23°02.1'	-59.5'	163.7°	22°04.5'	-59.6'	163.8°	21°06.8'	-59.6'	163.9°	20°09.2'	-59.6'	164.0°	19°11.5'	-59.7'	164.1°	18°13.8'	-59.7'	164.2°	17°16.0'	-59.7'	164.3°	3
4	22°02.6'	-59.5'	163.8°	21°04.9'	-59.6'	163.9°	20°07.3'	-59.6'	164.0°	19°09.6'	-59.6'	164.1°	18°11.8'	-59.7'	164.2°	17°14.1'	-59.7'	164.3°	16°16.3'	-59.7'	164.4°	4
5	21°03.1'	-59.5'	164.0°	20°05.4'	-59.6'	164.1°	19°07.7'	-59.6'	164.2°	18°09.9'	-59.6'	164.3°	17°12.2'	-59.7'	164.3°	16°14.4'	-59.7'	164.4°	15°16.6'	-59.7'	164.5°	5
6	20°03.5'	-59.5'	164.1°	19°05.8'	-59.6'	164.2°	18°08.1'	-59.6'	164.3°	17°10.3'	-59.6'	164.4°	16°12.5'	-59.7'	164.5°	15°14.7'	-59.7'	164.5°	14°16.9'	-59.7'	164.6°	6
7	19°04.0'	-59.5'	164.2°	18°06.2'	-59.6'	164.3°	17°08.5'	-59.6'	164.4°	16°10.7'	-59.6'	164.5°	15°12.8'	-59.7'	164.6°	14°15.0'	-59.7'	164.6°	13°17.1'	-59.7'	164.7°	7
8	18°04.5'	-59.5'	164.4°	17°06.7'	-59.6'	164.4°	16°08.9'	-59.6'	164.5°	15°11.0'	-59.6'	164.6°	14°13.2'	-59.7'	164.7°	13°15.3'	-59.7'	164.7°	12°17.4'	-59.7'	164.8°	8
9	17°04.9'	-59.5'	164.5°	16°07.1'	-59.6'	164.6°	15°09.2'	-59.6'	164.6°	14°11.4'	-59.6'	164.7°	13°13.5'	-59.7'	164.8°	12°15.6'	-59.7'	164.8°	11°17.7'	-59.7'	164.9°	9
10	16°05.4'	-59.6'	164.6°	15°07.5'	-59.6'	164.7°	14°09.6'	-59.6'	164.8°	13°11.7'	-59.6'	164.8°	12°13.8'	-59.7'	164.9°	11°15.9'	-59.7'	164.9°	10°17.9'	-59.7'	165.0°	10
11	15°05.8'	-59.6'	164.7°	14°07.9'	-59.6'	164.8°	13°10.0'	-59.6'	164.9°	12°12.1'	-59.7'	164.9°	11°14.1'	-59.7'	165.0°	10°16.2'	-59.7'	165.0°	9°18.2'	-59.7'	165.1°	11
12	14°06.3'	-59.6'	164.9°	13°08.3'	-59.6'	164.9°	12°10.4'	-59.6'	165.0°	11°12.4'	-59.7'	165.0°	10°14.4'	-59.7'	165.1°	9°16.5'	-59.7'	165.1°	8°18.5'	-59.7'	165.2°	12
13	13°06.7'	-59.6'	165.0°	12°08.7'	-59.6'	165.1°	11°10.8'	-59.6'	165.1°	10°12.8'	-59.7'	165.2°	9°14.8'	-59.7'	165.2°	8°16.8'	-59.7'	165.2°	7°18.7'	-59.7'	165.3°	13
14	12°07.1'	-59.6'	165.1°	11°09.1'	-59.6'	165.2°	10°11.1'	-59.6'	165.2°	9°13.1'	-59.7'	165.3°	8°15.1'	-59.7'	165.3°	7°17.0'	-59.7'	165.3°	6°19.0'	-59.7'	165.4°	14
15	11°07.6'	-59.6'	165.2°	10°09.5'	-59.6'	165.3°	9°11.5'	-59.6'	165.3°	8°13.5'	-59.7'	165.4°	7°15.4'	-59.7'	165.4°	6°17.3'	-59.7'	165.4°	5°19.3'	-59.7'	165.5°	15
16	10°08.0'	-59.6'	165.4°	9°09.9'	-59.6'	165.4°	8°11.9'	-59.6'	165.4°	7°13.8'	-59.7'	165.5°	6°15.7'	-59.7'	165.5°	5°17.6'	-59.7'	165.5°	4°19.5'	-59.7'	165.6°	16
17	9°08.4'	-59.6'	165.5°	8°10.3'	-59.6'	165.5°	7°12.2'	-59.6'	165.6°	6°14.1'	-59.7'	165.6°	5°16.0'	-59.7'	165.6°	4°17.9'	-59.7'	165.6°	3°19.8'	-59.7'	165.6°	17
18	8°08.9'	-59.6'	165.6°	7°10.7'	-59.6'	165.6°	6°12.6'	-59.6'	165.7°	5°14.5'	-59.7'	165.7°	4°16.3'	-59.7'	165.7°	3°18.2'	-59.7'	165.7°	2°20.0'	-59.7'	165.7°	18
19	7°09.3'	-59.6'	165.7°	6°11.1'	-59.6'	165.8°	5°13.0'	-59.6'	165.8°	4°14.8'	-59.7'	165.8°	3°16.6'	-59.7'	165.8°	2°18.5'	-59.7'	165.8°	1°20.3'	-59.7'	165.8°	19
20	6°09.7'	-59.6'	165.8°	5°11.5'	-59.6'	165.9°	4°13.3'	-59.6'	165.9°	3°15.1'	-59.7'	165.9°	2°16.9'	-59.7'	165.9°	1°18.7'	-59.7'	165.9°	<u>0°20.6'</u>	-59.7'	165.9°	20
21	5°10.1'	-59.6'	166.0°	4°11.9'	-59.6'	166																

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

14° 346° LHA

Latitude CONTRARY to Declination

14° 346° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°08.1'	-59.6'	164.4°	25°10.4'	-59.6'	164.5°	24°12.5'	-59.6'	164.6°	23°14.7'	-59.7'	164.7°	22°16.8'	-59.7'	164.8°	21°18.8'	-59.7'	164.9°	20°20.9'	-59.7'	165.0°	0
1	25°08.6'	-59.6'	164.5°	24°10.8'	-59.6'	164.6°	23°12.9'	-59.6'	164.7°	22°15.0'	-59.7'	164.9°	21°17.1'	-59.7'	165.0°	20°19.1'	-59.7'	165.1°	19°21.1'	-59.7'	165.1°	1
2	24°09.0'	-59.6'	164.6°	23°11.2'	-59.6'	164.8°	22°13.3'	-59.6'	164.9°	21°15.3'	-59.7'	165.0°	20°17.4'	-59.7'	165.1°	19°19.4'	-59.7'	165.2°	18°21.4'	-59.8'	165.2°	2
3	23°09.5'	-59.6'	164.8°	22°11.6'	-59.6'	164.9°	21°13.6'	-59.6'	165.0°	20°15.7'	-59.7'	165.1°	19°17.7'	-59.7'	165.2°	18°19.7'	-59.7'	165.3°	17°21.6'	-59.8'	165.3°	3
4	22°09.9'	-59.6'	164.9°	21°12.0'	-59.6'	165.0°	20°14.0'	-59.6'	165.1°	19°16.0'	-59.7'	165.2°	18°18.0'	-59.7'	165.3°	17°20.0'	-59.7'	165.4°	16°21.9'	-59.8'	165.4°	4
5	21°10.3'	-59.6'	165.0°	20°12.4'	-59.6'	165.1°	19°14.4'	-59.6'	165.2°	18°16.3'	-59.7'	165.3°	17°18.3'	-59.7'	165.4°	16°20.2'	-59.7'	165.5°	15°22.1'	-59.8'	165.5°	5
6	20°10.7'	-59.6'	165.1°	19°12.7'	-59.6'	165.2°	18°14.7'	-59.7'	165.3°	17°16.7'	-59.7'	165.4°	16°18.6'	-59.7'	165.5°	15°20.5'	-59.7'	165.6°	14°22.4'	-59.8'	165.6°	6
7	19°11.2'	-59.6'	165.3°	18°13.1'	-59.6'	165.4°	17°15.1'	-59.7'	165.4°	16°17.0'	-59.7'	165.5°	15°18.9'	-59.7'	165.6°	14°20.8'	-59.7'	165.6°	13°22.6'	-59.8'	165.7°	7
8	18°11.6'	-59.6'	165.4°	17°13.5'	-59.6'	165.5°	16°15.4'	-59.7'	165.5°	15°17.3'	-59.7'	165.6°	14°19.2'	-59.7'	165.7°	13°21.0'	-59.7'	165.7°	12°22.9'	-59.8'	165.8°	8
9	17°12.0'	-59.6'	165.5°	16°13.9'	-59.6'	165.6°	15°15.7'	-59.7'	165.7°	14°17.6'	-59.7'	165.7°	13°19.4'	-59.7'	165.8°	12°21.3'	-59.7'	165.8°	11°23.1'	-59.8'	165.9°	9
10	16°12.4'	-59.6'	165.6°	15°14.2'	-59.6'	165.7°	14°16.1'	-59.7'	165.8°	13°17.9'	-59.7'	165.8°	12°19.7'	-59.7'	165.9°	11°21.5'	-59.7'	165.9°	10°23.3'	-59.8'	166.0°	10
11	15°12.7'	-59.6'	165.8°	14°14.6'	-59.6'	165.8°	13°16.4'	-59.7'	165.9°	12°18.2'	-59.7'	165.9°	11°20.0'	-59.7'	166.0°	10°21.8'	-59.7'	166.0°	9°23.6'	-59.8'	166.1°	11
12	14°13.1'	-59.6'	165.9°	13°14.9'	-59.6'	165.9°	12°16.7'	-59.7'	166.0°	11°18.5'	-59.7'	166.0°	10°20.3'	-59.7'	166.1°	9°22.0'	-59.7'	166.1°	8°23.8'	-59.8'	166.2°	12
13	13°13.5'	-59.6'	166.0°	12°15.3'	-59.6'	166.0°	11°17.1'	-59.7'	166.1°	10°18.8'	-59.7'	166.1°	9°20.6'	-59.7'	166.2°	8°22.3'	-59.7'	166.2°	7°24.0'	-59.8'	166.2°	13
14	12°13.9'	-59.6'	166.1°	11°15.7'	-59.6'	166.2°	10°17.4'	-59.7'	166.2°	9°19.1'	-59.7'	166.2°	8°20.8'	-59.7'	166.3°	7°22.5'	-59.7'	166.3°	6°24.2'	-59.8'	166.3°	14
15	11°14.3'	-59.6'	166.2°	10°16.0'	-59.7'	166.3°	9°17.7'	-59.7'	166.3°	8°19.4'	-59.7'	166.3°	7°21.1'	-59.7'	166.4°	6°22.8'	-59.8'	166.4°	5°24.5'	-59.8'	166.4°	15
16	10°14.7'	-59.6'	166.3°	9°16.4'	-59.7'	166.4°	8°18.0'	-59.7'	166.4°	7°19.7'	-59.7'	166.4°	6°21.4'	-59.7'	166.5°	5°23.0'	-59.8'	166.5°	4°24.7'	-59.8'	166.5°	16
17	9°15.0'	-59.6'	166.4°	8°16.7'	-59.7'	166.5°	7°18.4'	-59.7'	166.5°	6°20.0'	-59.7'	166.5°	5°21.7'	-59.7'	166.6°	4°23.3'	-59.8'	166.6°	3°24.9'	-59.8'	166.6°	17
18	8°15.4'	-59.6'	166.6°	7°17.0'	-59.7'	166.6°	6°18.7'	-59.7'	166.6°	5°20.3'	-59.7'	166.6°	4°21.9'	-59.7'	166.7°	3°23.5'	-59.8'	166.7°	2°25.2'	-59.8'	166.7°	18
19	7°15.8'	-59.6'	166.7°	6°17.4'	-59.7'	166.7°	5°19.0'	-59.7'	166.7°	4°20.6'	-59.7'	166.7°	3°22.2'	-59.7'	166.8°	2°23.8'	-59.8'	166.8°	1°25.4'	-59.8'	166.8°	19
20	6°16.1'	-59.6'	166.8°	5°17.7'	-59.7'	166.8°	4°19.3'	-59.7'	166.8°	3°20.9'	-59.7'	166.8°	2°22.5'	-59.7'	166.8°	1°24.0'	-59.8'	166.9°	<u>0°25.6'</u>	-59.8'	166.9°	20
21	5°16.5'	-59.6'	166.9°	4°18.1'	-59.7'	166.9°	3°19.6'	-59.7'	166.9°	2°21.2'	-59.7'	166.9°	1°22.7'	-59.7'	166.9°	<u>0°24.3'</u>	-59.8'	166.9°	0°34.2'	+59.8'	13.1°	21
22	4°16.9'	-59.6'	167.0°	3°18.4'	-59.7'	167.0°	2°19.9'	-59.7'	167.0°	1°21.5'	-59.7'	167.0°	<u>0°23.0'</u>	-59.7'	167.0°	0°35.5'	+59.8'	13.0°	1°33.9'	+59.8'	13.0°	22
23	3°17.2'	-59.6'	167.1°	2°18.7'	-59.7'	167.1°	1°20.3'	-59.7'	167.1°	<u>0°21.8'</u>	-59.7'	167.1°	0°36.7'	+59.7'	12.9°	1°35.2'	+59.8'	12.9°	2°33.7'	+59.8'	12.9°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

166° 194° LHA

Latitude SAME as DECLINATION

166° 194° 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 CONTRARY to Declination

13° 347° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°15.2'	-59.6'	165.5°	25°17.2'	-59.6'	165.6°	24°19.0'	-59.7'	165.7°	23°20.9'	-59.7'	165.8°	22°22.7'	-59.7'	165.9°	21°24.5'	-59.8'	166.0°	20°26.2'	-59.8'	166.1°	0
1	25°15.6'	-59.6'	165.6°	24°17.5'	-59.7'	165.7°	23°19.4'	-59.7'	165.8°	22°21.2'	-59.7'	165.9°	21°23.0'	-59.7'	166.0°	20°24.7'	-59.8'	166.1°	19°26.5'	-59.8'	166.2°	1
2	24°16.0'	-59.6'	165.7°	23°17.9'	-59.7'	165.8°	22°19.7'	-59.7'	165.9°	21°21.5'	-59.7'	166.0°	20°23.2'	-59.7'	166.1°	19°25.0'	-59.8'	166.2°	18°26.7'	-59.8'	166.3°	2
3	23°16.4'	-59.6'	165.8°	22°18.2'	-59.7'	165.9°	21°20.0'	-59.7'	166.0°	20°21.7'	-59.7'	166.1°	19°23.5'	-59.7'	166.2°	18°25.2'	-59.8'	166.3°	17°26.9'	-59.8'	166.4°	3
4	22°16.8'	-59.6'	166.0°	21°18.5'	-59.7'	166.1°	20°20.3'	-59.7'	166.2°	19°22.0'	-59.7'	166.2°	18°23.7'	-59.7'	166.3°	17°25.4'	-59.8'	166.4°	16°27.1'	-59.8'	166.5°	4
5	21°17.1'	-59.6'	166.1°	20°18.9'	-59.7'	166.2°	19°20.6'	-59.7'	166.3°	18°22.3'	-59.7'	166.3°	17°24.0'	-59.7'	166.4°	16°25.7'	-59.8'	166.5°	15°27.3'	-59.8'	166.6°	5
6	20°17.5'	-59.6'	166.2°	19°19.2'	-59.7'	166.3°	18°20.9'	-59.7'	166.4°	17°22.6'	-59.7'	166.4°	16°24.3'	-59.7'	166.5°	15°25.9'	-59.8'	166.6°	14°27.5'	-59.8'	166.6°	6
7	19°17.8'	-59.6'	166.3°	18°19.5'	-59.7'	166.4°	17°21.2'	-59.7'	166.5°	16°22.9'	-59.7'	166.5°	15°24.5'	-59.8'	166.6°	14°26.1'	-59.8'	166.7°	13°27.7'	-59.8'	166.7°	7
8	18°18.2'	-59.7'	166.4°	17°19.9'	-59.7'	166.5°	16°21.5'	-59.7'	166.6°	15°23.1'	-59.7'	166.6°	14°24.8'	-59.8'	166.7°	13°26.4'	-59.8'	166.8°	12°27.9'	-59.8'	166.8°	8
9	17°18.5'	-59.7'	166.5°	16°20.2'	-59.7'	166.6°	15°21.8'	-59.7'	166.7°	14°23.4'	-59.7'	166.7°	13°25.0'	-59.8'	166.8°	12°26.6'	-59.8'	166.8°	11°28.1'	-59.8'	166.9°	9
10	16°18.9'	-59.7'	166.7°	15°20.5'	-59.7'	166.7°	14°22.1'	-59.7'	166.8°	13°23.7'	-59.7'	166.8°	12°25.2'	-59.8'	166.9°	11°26.8'	-59.8'	166.9°	10°28.4'	-59.8'	167.0°	10
11	15°19.2'	-59.7'	166.8°	14°20.8'	-59.7'	166.8°	13°22.4'	-59.7'	166.9°	12°23.9'	-59.7'	166.9°	11°25.5'	-59.8'	167.0°	10°27.0'	-59.8'	167.0°	9°28.6'	-59.8'	167.1°	11
12	14°19.6'	-59.7'	166.9°	13°21.1'	-59.7'	166.9°	12°22.7'	-59.7'	167.0°	11°24.2'	-59.7'	167.0°	10°25.7'	-59.8'	167.1°	9°27.2'	-59.8'	167.1°	8°28.8'	-59.8'	167.1°	12
13	13°19.9'	-59.7'	167.0°	12°21.4'	-59.7'	167.0°	11°22.9'	-59.7'	167.1°	10°24.5'	-59.7'	167.1°	9°26.0'	-59.8'	167.2°	8°27.5'	-59.8'	167.2°	7°29.0'	-59.8'	167.2°	13
14	12°20.2'	-59.7'	167.1°	11°21.7'	-59.7'	167.1°	10°23.2'	-59.7'	167.2°	9°24.7'	-59.7'	167.2°	8°26.2'	-59.8'	167.3°	7°27.7'	-59.8'	167.3°	6°29.1'	-59.8'	167.3°	14
15	11°20.5'	-59.7'	167.2°	10°22.0'	-59.7'	167.2°	9°23.5'	-59.7'	167.3°	8°25.0'	-59.7'	167.3°	7°26.4'	-59.8'	167.3°	6°27.9'	-59.8'	167.4°	5°29.3'	-59.8'	167.4°	15
16	10°20.9'	-59.7'	167.3°	9°22.3'	-59.7'	167.3°	8°23.8'	-59.7'	167.4°	7°25.2'	-59.7'	167.4°	6°26.7'	-59.8'	167.4°	5°28.1'	-59.8'	167.5°	4°29.5'	-59.8'	167.5°	16
17	9°21.2'	-59.7'	167.4°	8°22.6'	-59.7'	167.4°	7°24.1'	-59.7'	167.5°	6°25.5'	-59.7'	167.5°	5°26.9'	-59.8'	167.5°	4°28.3'	-59.8'	167.5°	3°29.7'	-59.8'	167.6°	17
18	8°21.5'	-59.7'	167.5°	7°22.9'	-59.7'	167.5°	6°24.3'	-59.7'	167.6°	5°25.2'	-59.7'	167.6°	4°27.1'	-59.8'	167.6°	3°28.5'	-59.8'	167.6°	2°29.9'	-59.8'	167.6°	18
19	7°21.8'	-59.7'	167.6°	6°23.2'	-59.7'	167.6°	5°24.6'	-59.7'	167.7°	4°26.0'	-59.7'	167.7°	3°27.4'	-59.8'	167.7°	2°28.8'	-59.8'	167.7°	1°30.1'	-59.8'	167.7°	19
20	6°22.2'	-59.7'	167.7°	5°23.5'	-59.7'	167.7°	4°24.9'	-59.7'	167.8°	3°26.3'	-59.7'	167.8°	2°27.6'	-59.8'	167.8°	1°29.0'	-59.8'	167.8°	<u>0°30.3'</u>	-59.8'	167.8°	20
21	5°22.5'	-59.7'	167.8°	4°23.8'	-59.7'	167.8°	3°25.2'															

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

12° 348° LHA

Latitude CONTRARY to Declination

12° 348° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°21.8'	-59.7'	166.6°	25°23.5'	-59.7'	166.7°	24°25.1'	-59.7'	166.8°	23°26.6'	-59.7'	166.9°	22°28.2'	-59.8'	167.0°	21°29.7'	-59.8'	167.1°	20°31.2'	-59.8'	167.2°	0
1	25°22.1'	-59.7'	166.7°	24°23.8'	-59.7'	166.8°	23°25.3'	-59.7'	166.9°	22°26.9'	-59.8'	167.0°	21°28.4'	-59.8'	167.1°	20°29.9'	-59.8'	167.2°	19°31.4'	-59.8'	167.3°	1
2	24°22.4'	-59.7'	166.8°	23°24.1'	-59.7'	166.9°	22°25.6'	-59.7'	167.0°	21°27.1'	-59.8'	167.1°	20°28.6'	-59.8'	167.2°	19°30.1'	-59.8'	167.3°	18°31.6'	-59.8'	167.3°	2
3	23°22.8'	-59.7'	166.9°	22°24.4'	-59.7'	167.0°	21°25.9'	-59.7'	167.1°	20°27.4'	-59.8'	167.2°	19°28.9'	-59.8'	167.3°	18°30.3'	-59.8'	167.4°	17°31.8'	-59.8'	167.4°	3
4	22°23.1'	-59.7'	167.0°	21°24.6'	-59.7'	167.1°	20°26.1'	-59.7'	167.2°	19°27.6'	-59.8'	167.3°	18°29.1'	-59.8'	167.4°	17°30.5'	-59.8'	167.4°	16°32.0'	-59.8'	167.5°	4
5	21°23.4'	-59.7'	167.1°	20°24.9'	-59.7'	167.2°	19°26.4'	-59.7'	167.3°	18°27.9'	-59.8'	167.4°	17°29.3'	-59.8'	167.5°	16°30.7'	-59.8'	167.5°	15°32.1'	-59.8'	167.6°	5
6	20°23.7'	-59.7'	167.3°	19°25.2'	-59.7'	167.3°	18°26.7'	-59.7'	167.4°	17°28.1'	-59.8'	167.5°	16°29.5'	-59.8'	167.5°	15°30.9'	-59.8'	167.6°	14°32.3'	-59.8'	167.7°	6
7	19°24.0'	-59.7'	167.4°	18°25.5'	-59.7'	167.4°	17°26.9'	-59.7'	167.5°	16°28.3'	-59.8'	167.6°	15°29.7'	-59.8'	167.6°	14°31.1'	-59.8'	167.7°	13°32.5'	-59.8'	167.7°	7
8	18°24.3'	-59.7'	167.5°	17°25.8'	-59.7'	167.5°	16°27.2'	-59.7'	167.6°	15°28.6'	-59.8'	167.7°	14°29.9'	-59.8'	167.7°	13°31.3'	-59.8'	167.8°	12°32.7'	-59.8'	167.8°	8
9	17°24.6'	-59.7'	167.6°	16°26.0'	-59.7'	167.6°	15°27.4'	-59.8'	167.7°	14°28.8'	-59.8'	167.8°	13°30.2'	-59.8'	167.8°	12°31.5'	-59.8'	167.9°	11°32.8'	-59.8'	167.9°	9
10	16°24.9'	-59.7'	167.7°	15°26.3'	-59.7'	167.7°	14°27.7'	-59.8'	167.8°	13°29.0'	-59.8'	167.8°	12°30.4'	-59.8'	167.9°	11°31.7'	-59.8'	167.9°	10°33.0'	-59.8'	168.0°	10
11	15°25.2'	-59.7'	167.8°	14°26.6'	-59.7'	167.8°	13°27.9'	-59.8'	167.9°	12°29.2'	-59.8'	167.9°	11°30.6'	-59.8'	168.0°	10°31.9'	-59.8'	168.0°	9°33.2'	-59.8'	168.1°	11
12	14°25.5'	-59.7'	167.9°	13°26.8'	-59.7'	167.9°	12°28.2'	-59.8'	168.0°	11°29.5'	-59.8'	168.0°	10°30.8'	-59.8'	168.1°	9°32.1'	-59.8'	168.1°	8°33.4'	-59.8'	168.1°	12
13	13°25.8'	-59.7'	168.0°	12°27.1'	-59.7'	168.0°	11°28.4'	-59.8'	168.1°	10°29.7'	-59.8'	168.1°	9°31.0'	-59.8'	168.1°	8°32.3'	-59.8'	168.2°	7°33.5'	-59.8'	168.2°	13
14	12°26.1'	-59.7'	168.1°	11°27.4'	-59.7'	168.1°	10°28.6'	-59.8'	168.2°	9°29.9'	-59.8'	168.2°	8°31.2'	-59.8'	168.2°	7°32.4'	-59.8'	168.3°	6°33.7'	-59.8'	168.3°	14
15	11°26.4'	-59.7'	168.2°	10°27.6'	-59.7'	168.2°	9°28.9'	-59.8'	168.3°	8°30.1'	-59.8'	168.3°	7°31.4'	-59.8'	168.3°	6°32.6'	-59.8'	168.3°	5°33.9'	-59.8'	168.4°	15
16	10°26.6'	-59.7'	168.3°	9°27.9'	-59.7'	168.3°	8°29.1'	-59.8'	168.3°	7°30.4'	-59.8'	168.4°	6°31.6'	-59.8'	168.4°	5°32.8'	-59.8'	168.4°	4°34.0'	-59.8'	168.4°	16
17	9°26.9'	-59.7'	168.4°	8°28.1'	-59.7'	168.4°	7°29.4'	-59.8'	168.4°	6°30.6'	-59.8'	168.5°	5°31.8'	-59.8'	168.5°	4°33.0'	-59.8'	168.5°	3°34.2'	-59.8'	168.5°	17
18	8°27.2'	-59.7'	168.5°	7°28.4'	-59.7'	168.5°	6°29.6'	-59.8'	168.5°	5°30.8'	-59.8'	168.5°	4°32.0'	-59.8'	168.6°	3°33.2'	-59.8'	168.6°	2°34.4'	-59.8'	168.6°	18
19	7°27.5'	-59.7'	168.6°	6°28.6'	-59.7'	168.6°	5°29.8'	-59.8'	168.6°	4°31.0'	-59.8'	168.6°	3°32.2'	-59.8'	168.6°	2°33.4'	-59.8'	168.7°	1°34.5'	-59.8'	168.7°	19
20	6°27.7'	-59.7'	168.7°	5°28.9'	-59.7'	168.7°	4°30.1'	-59.8'	168.7°	3°31.2'	-59.8'	168.7°	2°32.4'	-59.8'	168.7°	1°33.5'	-59.8'	168.7°	<u>0°34.7'</u>	-59.8'	168.7°	20
21	5°28.0'	-59.7'	168.8°	4°29.1'	-59.7'	168.8°	3°30.3'	-59.8'	168.8°	2°31.4'	-59.8'	168.8°	1°32.6'	-59.8'	168.8°	<u>0°33.7'</u>	-59.8'	168.8°	0°25.1'	+59.8'	11.1°	21
22	4°28.3'	-59.7'	168.9°	3°29.4'	-59.7'	168.9°	2°30.5'	-59.8'	168.9°	1°31.7'	-59.8'	168.9°	<u>0°32.8'</u>	-59.8'	168.9°	0°26.1'	+59.8'	11.1°	1°25.0'	+59.8'	11.1°	22
23	3°28.5'	-59.7'	169.0°	2°29.7'	-59.7'	169.0°	1°30.8'	-59.8'	169.0°	0°31.9'	-59.8'	169.0°	0°27.0'	+59.8'	11.0°	1°25.9'	+59.8'	11.0°	2°24.8'	+59.8'	11.0°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

168° 192° LHA

Latitude SAME as DECLINATION

168° 192° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°27.8'	-59.7'	167.7°	25°29.3'	-59.7'	167.8°	24°30.6'	-59.8'	167.9°	23°31.9'	-59.8'	168.0°	22°33.2'	-59.8'	168.1°	21°34.5'	-59.8'	168.2°	20°35.8'	-59.8'	168.2°	0
1	25°28.1'	-59.7'	167.8°	24°29.5'	-59.7'	167.9°	23°30.8'	-59.8'	168.0°	22°32.1'	-59.8'	168.1°	21°33.4'	-59.8'	168.2°	20°34.7'	-59.8'	168.2°	19°35.9'	-59.8'	168.3°	1
2	24°28.4'	-59.7'	167.9°	23°29.8'	-59.8'	168.0°	22°31.1'	-59.8'	168.1°	21°32.4'	-59.8'	168.2°	20°33.6'	-59.8'	168.2°	19°34.9'	-59.8'	168.3°	18°36.1'	-59.8'	168.4°	2
3	23°28.7'	-59.7'	168.0°	22°30.0'	-59.8'	168.1°	21°31.3'	-59.8'	168.2°	20°32.6'	-59.8'	168.3°	19°33.8'	-59.8'	168.3°	18°35.0'	-59.8'	168.4°	17°36.3'	-59.8'	168.5°	3
4	22°29.0'	-59.7'	168.1°	21°30.3'	-59.8'	168.2°	20°31.5'	-59.8'	168.3°	19°32.8'	-59.8'	168.3°	18°34.0'	-59.8'	168.4°	17°35.2'	-59.8'	168.5°	16°36.4'	-59.8'	168.5°	4
5	21°29.2'	-59.7'	168.2°	20°30.5'	-59.8'	168.3°	19°31.7'	-59.8'	168.4°	18°33.0'	-59.8'	168.4°	17°34.2'	-59.8'	168.5°	16°35.4'	-59.8'	168.6°	15°36.6'	-59.8'	168.6°	5
6	20°29.5'	-59.7'	168.3°	19°30.7'	-59.8'	168.4°	18°32.0'	-59.8'	168.5°	17°33.2'	-59.8'	168.5°	16°34.4'	-59.8'	168.6°	15°35.5'	-59.8'	168.6°	14°36.7'	-59.9'	168.7°	6
7	19°29.8'	-59.7'	168.4°	18°31.0'	-59.8'	168.5°	17°32.2'	-59.8'	168.5°	16°33.4'	-59.8'	168.6°	15°34.5'	-59.8'	168.7°	14°35.7'	-59.8'	168.7°	13°36.9'	-59.9'	168.8°	7
8	18°30.0'	-59.8'	168.5°	17°31.2'	-59.8'	168.6°	16°32.4'	-59.8'	168.6°	15°33.6'	-59.8'	168.7°	14°34.7'	-59.8'	168.7°	13°35.9'	-59.8'	168.8°	12°37.0'	-59.9'	168.8°	8
9	17°30.3'	-59.8'	168.6°	16°31.4'	-59.8'	168.7°	15°32.6'	-59.8'	168.7°	14°33.8'	-59.8'	168.8°	13°34.9'	-59.8'	168.8°	12°36.0'	-59.8'	168.9°	11°37.2'	-59.9'	168.9°	9
10	16°30.5'	-59.8'	168.7°	15°31.7'	-59.8'	168.8°	14°32.8'	-59.8'	168.8°	13°34.0'	-59.8'	168.9°	12°35.1'	-59.8'	168.9°	11°36.2'	-59.8'	168.9°	10°37.3'	-59.9'	169.0°	10
11	15°30.8'	-59.8'	168.8°	14°31.9'	-59.8'	168.8°	13°33.0'	-59.8'	168.9°	12°34.1'	-59.8'	168.9°	11°35.3'	-59.8'	169.0°	10°36.4'	-59.8'	169.0°	9°37.5'	-59.9'	169.0°	11
12	14°31.0'	-59.8'	168.9°	13°32.1'	-59.8'	168.9°	12°33.2'	-59.8'	169.0°	11°34.3'	-59.8'	169.0°	10°35.4'	-59.8'	169.1°	9°36.5'	-59.8'	169.1°	8°37.6'	-59.9'	169.1°	12
13	13°31.2'	-59.8'	169.0°	12°32.3'	-59.8'	169.0°	11°33.4'	-59.8'	169.1°	10°34.5'	-59.8'	169.1°	9°35.6'	-59.8'	169.1°	8°36.7'	-59.8'	169.2°	7°37.7'	-59.9'	169.2°	13
14	12°31.5'	-59.8'	169.1°	11°32.6'	-59.8'	169.1°	10°33.6'	-59.8'	169.1°	9°34.7'	-59.8'	169.2°	8°35.8'	-59.8'	169.2°	7°36.8'	-59.8'	169.2°	6°37.9'	-59.9'	169.3°	14
15	11°31.7'	-59.8'	169.2°	10°32.8'	-59.8'	169.2°	9°33.8'	-59.8'	169.2°	8°34.9'	-59.8'	169.3°	7°35.9'	-59.8'	169.3°	6°37.0'	-59.8'	169.3°	5°38.0'	-59.9'	169.3°	15
16	10°31.9'	-59.8'	169.2°	9°33.0'	-59.8'	169.3°	8°34.0'	-59.8'	169.3°	7°35.1'	-59.8'	169.3°	6°36.1'	-59.8'	169.4°	5°37.1'	-59.8'	169.4°	4°38.2'	-59.9'	169.4°	16
17	9°32.2'	-59.8'	169.3°	8°33.2'	-59.8'	169.4°	7°34.2'	-59.8'	169.4°	6°35.3'	-59.8'	169.4°	5°36.3'	-59.8'	169.4°	4°37.3'	-59.8'	169.5°	3°38.3'	-59.9'	169.5°	17
18	8°32.4'	-59.8'	169.4°	7°33.4'	-59.8'	169.5°	6°34.4'	-59.8'	169.5°	5°35.4'	-59.8'	169.5°	4°36.4'	-59.8'	169.5°	3°37.4'	-59.8'	169.5°	2°38.4'	-59.9'	169.5°	18
19	7°32.6'	-59.8'	169.5°	6°33.6'	-59.8'	169.5°	5°34.6'	-59.8'	169.6°	4°35.6'	-59.8'	169.6°	3°36.6'	-59.8'	169.6°	2°37.6'	-59.8'	169.6°	1°38.6'	-59.9'	169.6°	19
20	6°32.9'	-59.8'	169.6°	5°33.8'	-59.8'	169.6°	4°34.8'	-59.8'	169.6°	3°35.8'	-59.8'	169.7°	2°36.8'	-59.8'	169.7°	1°37.8'	-59.8'	169.7°	<u>0°38.7'</u>	-59.9'	169.7°	20
21	5°33.1'	-59.8'	169.7°	4°34.1'	-59.8'	169.7°	3°35.0'	-59.8'														

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

10° 350° LHA

Latitude CONTRARY to Declination

10° 350° LHA

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°33.4'	-59.8'	168.8°	25°34.6'	-59.8'	168.9°	24°35.7'	-59.8'	169.0°	23°36.8'	-59.8'	169.1°	22°37.9'	-59.8'	169.2°	21°38.9'	-59.9'	169.2°	20°40.0'	-59.9'	169.3°	0
1	25°33.6'	-59.8'	168.9°	24°34.8'	-59.8'	169.0°	23°35.9'	-59.8'	169.1°	22°37.0'	-59.8'	169.2°	21°38.0'	-59.8'	169.2°	20°39.1'	-59.9'	169.3°	19°40.1'	-59.9'	169.4°	1
2	24°33.9'	-59.8'	169.0°	23°35.0'	-59.8'	169.1°	22°36.1'	-59.8'	169.2°	21°37.1'	-59.8'	169.2°	20°38.2'	-59.8'	169.3°	19°39.2'	-59.9'	169.4°	18°40.2'	-59.9'	169.4°	2
3	23°34.1'	-59.8'	169.1°	22°35.2'	-59.8'	169.2°	21°36.3'	-59.8'	169.3°	20°37.3'	-59.8'	169.3°	19°38.3'	-59.8'	169.4°	18°39.4'	-59.9'	169.5°	17°40.4'	-59.9'	169.5°	3
4	22°34.3'	-59.8'	169.2°	21°35.4'	-59.8'	169.3°	20°36.4'	-59.8'	169.3°	19°37.5'	-59.8'	169.4°	18°38.5'	-59.8'	169.5°	17°39.5'	-59.9'	169.5°	16°40.5'	-59.9'	169.6°	4
5	21°34.6'	-59.8'	169.3°	20°35.6'	-59.8'	169.4°	19°36.6'	-59.8'	169.4°	18°37.6'	-59.8'	169.5°	17°38.6'	-59.8'	169.5°	16°39.6'	-59.9'	169.6°	15°40.6'	-59.9'	169.6°	5
6	20°34.8'	-59.8'	169.4°	19°35.8'	-59.8'	169.4°	18°36.8'	-59.8'	169.5°	17°37.8'	-59.8'	169.6°	16°38.8'	-59.9'	169.6°	15°39.8'	-59.9'	169.7°	14°40.7'	-59.9'	169.7°	6
7	19°35.0'	-59.8'	169.5°	18°36.0'	-59.8'	169.5°	17°37.0'	-59.8'	169.6°	16°38.0'	-59.8'	169.6°	15°39.9'	-59.9'	169.7°	14°39.9'	-59.9'	169.7°	13°40.9'	-59.9'	169.8°	7
8	18°35.2'	-59.8'	169.5°	17°36.2'	-59.8'	169.6°	16°37.2'	-59.8'	169.7°	15°38.1'	-59.8'	169.7°	14°39.1'	-59.9'	169.8°	13°40.0'	-59.9'	169.8°	12°41.0'	-59.9'	169.8°	8
9	17°35.4'	-59.8'	169.6°	16°36.4'	-59.8'	169.7°	15°37.3'	-59.8'	169.7°	14°38.3'	-59.8'	169.8°	13°39.2'	-59.9'	169.8°	12°40.2'	-59.9'	169.9°	11°41.1'	-59.9'	169.9°	9
10	16°35.6'	-59.8'	169.7°	15°36.6'	-59.8'	169.8°	14°37.5'	-59.8'	169.8°	13°38.5'	-59.8'	169.9°	12°39.4'	-59.9'	169.9°	11°40.3'	-59.9'	169.9°	10°41.2'	-59.9'	170.0°	10
11	15°35.8'	-59.8'	169.8°	14°36.8'	-59.8'	169.9°	13°37.7'	-59.8'	169.9°	12°38.6'	-59.8'	169.9°	11°39.5'	-59.9'	170.0°	10°40.4'	-59.9'	170.0°	9°41.4'	-59.9'	170.0°	11
12	14°36.0'	-59.8'	169.9°	13°36.9'	-59.8'	169.9°	12°37.9'	-59.8'	170.0°	11°38.8'	-59.8'	170.0°	10°39.7'	-59.9'	170.0°	9°40.6'	-59.9'	170.1°	8°41.5'	-59.9'	170.1°	12
13	13°36.2'	-59.8'	170.0°	12°37.1'	-59.8'	170.0°	11°38.0'	-59.8'	170.1°	10°38.9'	-59.8'	170.1°	9°39.8'	-59.9'	170.1°	8°40.7'	-59.9'	170.1°	7°41.6'	-59.9'	170.2°	13
14	12°36.4'	-59.8'	170.1°	11°37.3'	-59.8'	170.1°	10°38.2'	-59.8'	170.1°	9°39.1'	-59.8'	170.2°	8°40.0'	-59.9'	170.2°	7°40.8'	-59.9'	170.2°	6°41.7'	-59.9'	170.2°	14
15	11°36.6'	-59.8'	170.1°	10°37.5'	-59.8'	170.2°	9°38.4'	-59.8'	170.2°	8°39.2'	-59.8'	170.2°	7°40.1'	-59.9'	170.3°	6°41.0'	-59.9'	170.3°	5°41.8'	-59.9'	170.3°	15
16	10°36.8'	-59.8'	170.2°	9°37.7'	-59.8'	170.3°	8°38.5'	-59.8'	170.3°	7°39.4'	-59.8'	170.3°	6°40.2'	-59.9'	170.3°	5°41.1'	-59.9'	170.3°	4°41.9'	-59.9'	170.4°	16
17	9°37.0'	-59.8'	170.3°	8°37.8'	-59.8'	170.3°	7°38.7'	-59.8'	170.4°	6°39.5'	-59.8'	170.4°	5°40.4'	-59.9'	170.4°	4°41.2'	-59.9'	170.4°	3°42.1'	-59.9'	170.4°	17
18	8°37.2'	-59.8'	170.4°	7°38.0'	-59.8'	170.4°	6°38.9'	-59.8'	170.4°	5°39.7'	-59.8'	170.4°	4°40.5'	-59.9'	170.5°	3°41.4'	-59.9'	170.5°	2°42.2'	-59.9'	170.5°	18
19	7°37.4'	-59.8'	170.5°	6°38.2'	-59.8'	170.5°	5°39.0'	-59.8'	170.5°	4°39.8'	-59.8'	170.5°	3°40.7'	-59.9'	170.5°	2°41.5'	-59.9'	170.5°	1°42.3'	-59.9'	170.5°	19
20	6°37.6'	-59.8'	170.5°	5°38.4'	-59.8'	170.6°	4°39.2'	-59.8'	170.6°	3°40.0'	-59.8'	170.6°	2°40.8'	-59.9'	170.6°	1°41.6'	-59.9'	170.6°	<u>0°42.4'</u>	-59.9'	170.6°	20
21	5°37.7'	-59.8'	170.6°	4°38.5'	-59.8'	170.6°	3°39.3'	-59.8'	170.7°	2°40.1'	-59.8'	170.7°	1°40.9'	-59.9'	170.7°	<u>0°41.7'</u>	-59.9'	170.7°	0°17.5'	+59.9'	9.3°	21
22	4°37.9'	-59.8'	170.7°	3°38.7'	-59.8'	170.7°	2°39.5'	-59.8'	170.7°	1°40.3'	-59.9'	170.7°	<u>0°41.1'</u>	-59.9'	170.7°	0°18.1'	+59.9'	9.3°	1°17.4'	+59.9'	9.3°	22
23	<u>3°38.1'</u>	-59.8'	170.8°	<u>2°38.9'</u>	-59.8'	170.8°	<u>1°39.7'</u>	-59.8'	170.8°	<u>0°40.4'</u>	-59.9'	170.8°	0°18.8'	+59.9'	9.2°	1°18.0'	+59.9'	9.2°	2°17.2'	+59.9'	9.2°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

170° 190° LHA

Latitude SAME as DECLINATION

170° 190° 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

Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°38.4'	-59.8'	169.9°	25°39.4'	-59.8'	170.0°	24°40.3'	-59.8'	170.1°	23°41.2'	-59.9'	170.2°	22°42.1'	-59.9'	170.2°	21°42.9'	-59.9'	170.3°	20°43.8'	-59.9'	170.4°	0
1	25°38.6'	-59.8'	170.0°	24°39.6'	-59.8'	170.1°	23°40.4'	-59.8'	170.2°	22°41.3'	-59.9'	170.2°	21°42.2'	-59.9'	170.3°	20°43.0'	-59.9'	170.4°	19°43.9'	-59.9'	170.4°	1
2	24°38.8'	-59.8'	170.1°	23°39.7'	-59.8'	170.2°	22°40.6'	-59.8'	170.2°	21°41.5'	-59.9'	170.3°	20°42.3'	-59.9'	170.4°	19°43.2'	-59.9'	170.4°	18°44.0'	-59.9'	170.5°	2
3	23°39.0'	-59.8'	170.2°	22°39.9'	-59.8'	170.3°	21°40.8'	-59.8'	170.3°	20°41.6'	-59.9'	170.4°	19°42.4'	-59.9'	170.4°	18°43.3'	-59.9'	170.5°	17°44.1'	-59.9'	170.6°	3
4	22°39.2'	-59.8'	170.3°	21°40.1'	-59.8'	170.3°	20°40.9'	-59.9'	170.4°	19°41.7'	-59.9'	170.5°	18°42.6'	-59.9'	170.5°	17°43.4'	-59.9'	170.6°	16°44.2'	-59.9'	170.6°	4
5	21°39.4'	-59.8'	170.3°	20°40.2'	-59.8'	170.4°	19°41.1'	-59.9'	170.5°	18°41.9'	-59.9'	170.5°	17°42.7'	-59.9'	170.6°	16°43.5'	-59.9'	170.6°	15°44.3'	-59.9'	170.7°	5
6	20°39.6'	-59.8'	170.4°	19°40.4'	-59.8'	170.5°	18°41.2'	-59.9'	170.5°	17°42.0'	-59.9'	170.6°	16°42.8'	-59.9'	170.7°	15°43.6'	-59.9'	170.7°	14°44.4'	-59.9'	170.7°	6
7	19°39.7'	-59.8'	170.5°	18°40.5'	-59.8'	170.6°	17°41.3'	-59.9'	170.6°	16°42.1'	-59.9'	170.7°	15°42.9'	-59.9'	170.7°	14°43.7'	-59.9'	170.8°	13°44.5'	-59.9'	170.8°	7
8	18°39.9'	-59.8'	170.6°	17°40.7'	-59.8'	170.6°	16°41.5'	-59.9'	170.7°	15°42.3'	-59.9'	170.7°	14°43.1'	-59.9'	170.8°	13°43.8'	-59.9'	170.8°	12°44.6'	-59.9'	170.9°	8
9	17°40.1'	-59.8'	170.7°	16°40.9'	-59.8'	170.7°	15°41.6'	-59.9'	170.8°	14°42.4'	-59.9'	170.8°	13°43.2'	-59.9'	170.8°	12°43.9'	-59.9'	170.9°	11°44.7'	-59.9'	170.9°	9
10	16°40.2'	-59.8'	170.7°	15°41.0'	-59.8'	170.8°	14°41.8'	-59.9'	170.8°	13°42.5'	-59.9'	170.9°	12°43.3'	-59.9'	170.9°	11°44.0'	-59.9'	170.9°	10°44.8'	-59.9'	171.0°	10
11	15°40.4'	-59.8'	170.8°	14°41.2'	-59.8'	170.9°	13°41.9'	-59.9'	170.9°	12°42.7'	-59.9'	170.9°	11°43.4'	-59.9'	171.0°	10°44.2'	-59.9'	171.0°	9°44.9'	-59.9'	171.0°	11
12	14°40.6'	-59.8'	170.9°	13°41.3'	-59.9'	170.9°	12°42.1'	-59.9'	171.0°	11°42.8'	-59.9'	171.0°	10°43.5'	-59.9'	171.0°	9°44.3'	-59.9'	171.1°	8°45.0'	-59.9'	171.1°	12
13	13°40.7'	-59.8'	171.0°	12°41.5'	-59.9'	171.0°	11°42.2'	-59.9'	171.0°	10°42.9'	-59.9'	171.1°	9°43.6'	-59.9'	171.1°	8°44.4'	-59.9'	171.1°	7°45.1'	-59.9'	171.2°	13
14	12°40.9'	-59.8'	171.0°	11°41.6'	-59.9'	171.1°	10°42.3'	-59.9'	171.1°	9°43.0'	-59.9'	171.1°	8°43.8'	-59.9'	171.2°	7°44.5'	-59.9'	171.2°	6°45.2'	-59.9'	171.2°	14
15	11°41.0'	-59.8'	171.1°	10°41.8'	-59.9'	171.2°	9°42.5'	-59.9'	171.2°	8°43.2'	-59.9'	171.2°	7°43.9'	-59.9'	171.2°	6°44.6'	-59.9'	171.2°	5°45.3'	-59.9'	171.3°	15
16	10°41.2'	-59.8'	171.2°	9°41.9'	-59.9'	171.2°	8°42.6'	-59.9'	171.2°	7°43.3'	-59.9'	171.3°	6°44.0'	-59.9'	171.3°	5°44.7'	-59.9'	171.3°	4°45.4'	-59.9'	171.3°	16
17	9°41.4'	-59.8'	171.3°	8°42.0'	-59.9'	171.3°	7°42.7'	-59.9'	171.3°	6°43.4'	-59.9'	171.3°	5°44.1'	-59.9'	171.4°	4°44.8'	-59.9'	171.4°	3°45.5'	-59.9'	171.4°	17
18	8°41.5'	-59.8'	171.3°	7°42.2'	-59.9'	171.4°	6°42.9'	-59.9'	171.4°	5°43.5'	-59.9'	171.4°	4°44.2'	-59.9'	171.4°	3°44.9'	-59.9'	171.4°	2°45.6'	-59.9'	171.4°	18
19	7°41.7'	-59.8'	171.4°	6°42.3'	-59.9'	171.4°	5°43.0'	-59.9'	171.5°	4°43.7'	-59.9'	171.5°	3°44.3'	-59.9'	171.5°	2°45.0'	-59.9'	171.5°	1°45.7'	-59.9'	171.5°	19
20	6°41.8'	-59.8'	171.5°	5°42.5'	-59.9'	171.5°	4°43.1'	-59.9'	171.5°	3°43.8'	-59.9'	171.5°	2°44.4'	-59.9'	171.5°	1°45.1'	-59.9'	171.5°	<u>0°45.7'</u>	-59.9'	171.5°	20
21	5°42.0'	-59.8'	171.6°	4°42.6'	-59.9'	171.6°	3°43															



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

8° 352° LHA			Latitude CONTRARY to Declination								8° 352° LHA											
Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°42.9'	-59.9'	171.0°	25°43.7'	-59.9'	171.1°	24°44.4'	-59.9'	171.2°	23°45.1'	-59.9'	171.3°	22°45.8'	-59.9'	171.3°	21°46.5'	-59.9'	171.4°	20°47.2'	-59.9'	171.4°	0
1	25°43.1'	-59.9'	171.1°	24°43.8'	-59.9'	171.2°	23°44.5'	-59.9'	171.3°	22°45.2'	-59.9'	171.3°	21°45.9'	-59.9'	171.4°	20°46.6'	-59.9'	171.4°	19°47.3'	-59.9'	171.5°	1
2	24°43.2'	-59.9'	171.2°	23°44.0'	-59.9'	171.3°	22°44.7'	-59.9'	171.3°	21°45.3'	-59.9'	171.4°	20°46.0'	-59.9'	171.4°	19°46.7'	-59.9'	171.5°	18°47.3'	-59.9'	171.6°	2
3	23°43.4'	-59.9'	171.3°	22°44.1'	-59.9'	171.3°	21°44.8'	-59.9'	171.4°	20°45.5'	-59.9'	171.5°	19°46.1'	-59.9'	171.5°	18°46.8'	-59.9'	171.6°	17°47.4'	-59.9'	171.6°	3
4	22°43.6'	-59.9'	171.3°	21°44.2'	-59.9'	171.4°	20°44.9'	-59.9'	171.5°	19°45.6'	-59.9'	171.5°	18°46.2'	-59.9'	171.6°	17°46.9'	-59.9'	171.6°	16°47.5'	-59.9'	171.7°	4
5	21°43.7'	-59.9'	171.4°	20°44.4'	-59.9'	171.5°	19°45.0'	-59.9'	171.5°	18°45.7'	-59.9'	171.6°	17°46.3'	-59.9'	171.6°	16°47.0'	-59.9'	171.7°	15°47.6'	-59.9'	171.7°	5
6	20°43.8'	-59.9'	171.5°	19°44.5'	-59.9'	171.5°	18°45.1'	-59.9'	171.6°	17°45.8'	-59.9'	171.6°	16°46.4'	-59.9'	171.7°	15°47.0'	-59.9'	171.7°	14°47.7'	-59.9'	171.8°	6
7	19°44.0'	-59.9'	171.6°	18°44.6'	-59.9'	171.6°	17°45.3'	-59.9'	171.7°	16°45.9'	-59.9'	171.7°	15°46.5'	-59.9'	171.7°	14°47.1'	-59.9'	171.8°	13°47.7'	-59.9'	171.8°	7
8	18°44.1'	-59.9'	171.6°	17°44.7'	-59.9'	171.7°	16°45.4'	-59.9'	171.7°	15°46.0'	-59.9'	171.8°	14°46.6'	-59.9'	171.8°	13°47.2'	-59.9'	171.8°	12°47.8'	-59.9'	171.9°	8
9	17°44.2'	-59.9'	171.7°	16°44.9'	-59.9'	171.7°	15°45.5'	-59.9'	171.8°	14°46.1'	-59.9'	171.8°	13°46.7'	-59.9'	171.9°	12°47.3'	-59.9'	171.9°	11°47.9'	-59.9'	171.9°	9
10	16°44.4'	-59.9'	171.8°	15°45.0'	-59.9'	171.8°	14°45.6'	-59.9'	171.9°	13°46.2'	-59.9'	171.9°	12°46.8'	-59.9'	171.9°	11°47.4'	-59.9'	172.0°	10°48.0'	-59.9'	172.0°	10
11	15°44.5'	-59.9'	171.8°	14°45.1'	-59.9'	171.9°	13°45.7'	-59.9'	171.9°	12°46.3'	-59.9'	171.9°	11°46.9'	-59.9'	172.0°	10°47.5'	-59.9'	172.0°	9°48.1'	-59.9'	172.0°	11
12	14°44.6'	-59.9'	171.9°	13°45.2'	-59.9'	171.9°	12°45.8'	-59.9'	172.0°	11°46.4'	-59.9'	172.0°	10°47.0'	-59.9'	172.0°	9°47.6'	-59.9'	172.1°	8°48.1'	-59.9'	172.1°	12
13	13°44.8'	-59.9'	172.0°	12°45.3'	-59.9'	172.0°	11°45.9'	-59.9'	172.0°	10°46.5'	-59.9'	172.1°	9°47.1'	-59.9'	172.1°	8°47.6'	-59.9'	172.1°	7°48.2'	-59.9'	172.1°	13
14	12°44.9'	-59.9'	172.0°	11°45.5'	-59.9'	172.1°	10°46.0'	-59.9'	172.1°	9°46.6'	-59.9'	172.1°	8°47.2'	-59.9'	172.1°	7°47.7'	-59.9'	172.2°	6°48.3'	-59.9'	172.2°	14
15	11°45.0'	-59.9'	172.1°	10°45.6'	-59.9'	172.1°	9°46.1'	-59.9'	172.2°	8°46.7'	-59.9'	172.2°	7°47.3'	-59.9'	172.2°	6°47.8'	-59.9'	172.2°	5°48.4'	-59.9'	172.2°	15
16	10°45.1'	-59.9'	172.2°	9°45.7'	-59.9'	172.2°	8°46.2'	-59.9'	172.2°	7°46.8'	-59.9'	172.2°	6°47.3'	-59.9'	172.3°	5°47.9'	-59.9'	172.3°	4°48.4'	-59.9'	172.3°	16
17	9°45.3'	-59.9'	172.2°	8°45.8'	-59.9'	172.3°	7°46.3'	-59.9'	172.3°	6°46.9'	-59.9'	172.3°	5°47.4'	-59.9'	172.3°	4°48.0'	-59.9'	172.3°	3°48.5'	-59.9'	172.3°	17
18	8°45.4'	-59.9'	172.3°	7°45.9'	-59.9'	172.3°	6°46.5'	-59.9'	172.3°	5°47.0'	-59.9'	172.4°	4°47.5'	-59.9'	172.4°	3°48.1'	-59.9'	172.4°	2°48.6'	-59.9'	172.4°	18
19	7°45.5'	-59.9'	172.4°	6°46.0'	-59.9'	172.4°	5°46.6'	-59.9'	172.4°	4°47.1'	-59.9'	172.4°	3°47.6'	-59.9'	172.4°	2°48.1'	-59.9'	172.4°	1°48.7'	-59.9'	172.4°	19
20	6°45.6'	-59.9'	172.4°	5°46.1'	-59.9'	172.4°	4°46.7'	-59.9'	172.5°	3°47.2'	-59.9'	172.5°	2°47.7'	-59.9'	172.5°	1°48.2'	-59.9'	172.5°	<u>0°48.7'</u>	-59.9'	172.5°	20
21	5°45.7'	-59.9'	172.5°	4°46.3'	-59.9'	172.5°	3°46.8'	-59.9'	172.5°	2°47.3'	-59.9'	172.5°	1°47.8'	-59.9'	172.5°	<u>0°48.3'</u>	-59.9'	172.5°	0°11.2'	+59.9'	7.5°	21
22	4°45.9'	-59.9'	172.6°	3°46.4'	-59.9'	172.6°	2°46.9'	-59.9'	172.6°	1°47.4'	-59.9'	172.6°	<u>0°47.9'</u>	-59.9'	172.6°	0°11.6'	+59.9'	7.4°	1°11.1'	+59.9'	7.4°	22
23	<u>3°46.0'</u>	-59.9'	172.6°	<u>2°46.5'</u>	-59.9'	172.6°	<u>1°47.0'</u>	-59.9'	172.6°	<u>0°47.5'</u>	-59.9'	172.6°	0°12.0'	+59.9'	7.4°	0°11.5'	+59.9'	7.4°	2°11.0'	+59.9'	7.4°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

172° 188° LHA

Latitude SAME as DECLINATION

172° 188° 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											
Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°46.9'	-59.9'	172.2°	25°47.5'	-59.9'	172.2°	24°48.1'	-59.9'	172.3°	23°48.6'	-59.9'	172.3°	22°49.1'	-59.9'	172.4°	21°49.7'	-59.9'	172.5°	20°50.2'	-59.9'	172.5°	0
1	25°47.0'	-59.9'	172.2°	24°47.6'	-59.9'	172.3°	23°48.2'	-59.9'	172.3°	22°48.7'	-59.9'	172.4°	21°49.2'	-59.9'	172.5°	20°49.7'	-59.9'	172.5°	19°50.2'	-59.9'	172.6°	1
2	24°47.1'	-59.9'	172.3°	23°47.7'	-59.9'	172.4°	22°48.3'	-59.9'	172.4°	21°48.8'	-59.9'	172.5°	20°49.3'	-59.9'	172.5°	19°49.8'	-59.9'	172.6°	18°50.3'	-59.9'	172.6°	2
3	23°47.3'	-59.9'	172.4°	22°47.8'	-59.9'	172.4°	21°48.3'	-59.9'	172.5°	20°48.9'	-59.9'	172.5°	19°49.4'	-59.9'	172.6°	18°49.9'	-59.9'	172.6°	17°50.4'	-59.9'	172.7°	3
4	22°47.4'	-59.9'	172.4°	21°47.9'	-59.9'	172.5°	20°48.4'	-59.9'	172.6°	19°48.9'	-59.9'	172.6°	18°49.4'	-59.9'	172.6°	17°49.9'	-59.9'	172.7°	16°50.4'	-59.9'	172.7°	4
5	21°47.5'	-59.9'	172.5°	20°48.0'	-59.9'	172.5°	19°48.5'	-59.9'	172.6°	18°49.0'	-59.9'	172.6°	17°49.5'	-59.9'	172.7°	16°50.0'	-59.9'	172.7°	15°50.5'	-59.9'	172.8°	5
6	20°47.6'	-59.9'	172.6°	19°48.1'	-59.9'	172.6°	18°48.6'	-59.9'	172.6°	17°49.1'	-59.9'	172.7°	16°49.6'	-59.9'	172.7°	15°50.1'	-59.9'	172.8°	14°50.5'	-59.9'	172.8°	6
7	19°47.7'	-59.9'	172.6°	18°48.2'	-59.9'	172.7°	17°48.7'	-59.9'	172.7°	16°49.2'	-59.9'	172.7°	15°49.7'	-59.9'	172.8°	14°50.1'	-59.9'	172.8°	13°50.6'	-59.9'	172.8°	7
8	18°47.8'	-59.9'	172.7°	17°48.3'	-59.9'	172.7°	16°48.8'	-59.9'	172.8°	15°49.3'	-59.9'	172.8°	14°49.7'	-59.9'	172.8°	13°50.2'	-59.9'	172.9°	12°50.7'	-59.9'	172.9°	8
9	17°47.9'	-59.9'	172.7°	16°48.4'	-59.9'	172.8°	15°48.9'	-59.9'	172.8°	14°49.3'	-59.9'	172.8°	13°49.8'	-59.9'	172.9°	12°50.3'	-59.9'	172.9°	11°50.7'	-59.9'	172.9°	9
10	16°48.0'	-59.9'	172.8°	15°48.5'	-59.9'	172.8°	14°49.0'	-59.9'	172.9°	13°49.4'	-59.9'	172.9°	12°49.9'	-59.9'	172.9°	11°50.3'	-59.9'	173.0°	10°50.8'	-59.9'	173.0°	10
11	15°48.1'	-59.9'	172.9°	14°48.6'	-59.9'	172.9°	13°49.0'	-59.9'	172.9°	12°49.5'	-59.9'	173.0°	11°50.0'	-59.9'	173.0°	10°50.4'	-59.9'	173.0°	9°50.8'	-59.9'	173.0°	11
12	14°48.2'	-59.9'	172.9°	13°48.7'	-59.9'	172.9°	12°49.1'	-59.9'	173.0°	11°49.6'	-59.9'	173.0°	10°50.0'	-59.9'	173.0°	9°50.5'	-59.9'	173.1°	8°50.9'	-59.9'	173.1°	12
13	13°48.3'	-59.9'	173.0°	12°48.8'	-59.9'	173.0°	11°49.2'	-59.9'	173.0°	10°49.7'	-59.9'	173.1°	9°50.1'	-59.9'	173.1°	8°50.5'	-59.9'	173.1°	7°51.0'	-59.9'	173.1°	13
14	12°48.4'	-59.9'	173.0°	11°48.9'	-59.9'	173.1°	10°49.3'	-59.9'	173.1°	9°49.7'	-59.9'	173.1°	8°50.2'	-59.9'	173.1°	7°50.6'	-59.9'	173.1°	6°51.0'	-59.9'	173.2°	14
15	11°48.5'	-59.9'	173.1°	10°49.0'	-59.9'	173.1°	9°49.4'	-59.9'	173.1°	8°49.8'	-59.9'	173.2°	7°50.2'	-59.9'	173.2°	6°50.7'	-59.9'	173.2°	5°51.1'	-59.9'	173.2°	15
16	10°48.6'	-59.9'	173.2°	9°49.0'	-59.9'	173.2°	8°49.5'	-59.9'	173.2°	7°49.9'	-59.9'	173.2°	6°50.3'	-59.9'	173.2°	5°50.7'	-59.9'	173.2°	4°51.1'	-59.9'	173.2°	16
17	9°48.7'	-59.9'	173.2°	8°49.1'	-59.9'	173.2°	7°49.5'	-59.9'	173.2°	6°50.0'	-59.9'	173.3°	5°50.4'	-59.9'	173.3°	4°50.8'	-59.9'	173.3°	3°51.2'	-59.9'	173.3°	17
18	8°48.8'	-59.9'	173.3°	7°49.2'	-59.9'	173.3°	6°49.6'	-59.9'	173.3°	5°50.0'	-59.9'	173.3°	4°50.4'	-59.9'	173.3°	3°50.8'	-59.9'	173.3°	2°51.3'	-59.9'	173.3°	18
19	7°48.9'	-59.9'	173.3°	6°49.3'	-59.9'	173.3°	5°49.7'	-59.9'	173.3°	4°50.1'	-59.9'	173.4°	3°50.5'	-59.9'	173.4°	2°50.9'	-59.9'	173.4°	1°51.3'	-59.9'	173.4°	19
20	6°49.0'	-59.9'	173.4°	5°49.4'	-59.9'	173.4°	4°49.8'	-59.9'	173.4°	3°50.2'	-59.9'	173.4°	2°50.6'	-59.9'	173.4°	1°51.0'	-59.9'	173.4°	<u>0°51.4'</u>	-59.9'	173.4°	20
21	5°49.1'	-59.9'	173.4°	4°49.5'	-59.9'	173.4°	3°49.9'	-59.9'	173.5°	2°50.3'	-59.9'	173.5°	1°50.6'	-59.9'	173.5°	<u>0°51.0'</u>	-59.9'	173.5°	0°08.6'	+59.9'	6.5°	

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

6° 354° LHA			Latitude CONTRARY to Declination							6° 354° LHA												
Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°50.4'	-59.9'	173.3°	25°50.8'	-59.9'	173.3°	24°51.2'	-59.9'	173.4°	23°51.6'	-59.9'	173.4°	22°52.0'	-59.9'	173.5°	21°52.4'	-59.9'	173.5°	20°52.8'	-60.0'	173.6°	0
1	25°50.4'	-59.9'	173.3°	24°50.9'	-59.9'	173.4°	23°51.3'	-59.9'	173.4°	22°51.7'	-59.9'	173.5°	21°52.1'	-59.9'	173.5°	20°52.4'	-59.9'	173.6°	19°52.8'	-60.0'	173.6°	1
2	24°50.5'	-59.9'	173.4°	23°51.0'	-59.9'	173.4°	22°51.4'	-59.9'	173.5°	21°51.7'	-59.9'	173.5°	20°52.1'	-59.9'	173.6°	19°52.5'	-59.9'	173.6°	18°52.9'	-60.0'	173.7°	2
3	23°50.7'	-59.9'	173.4°	22°51.0'	-59.9'	173.5°	21°51.4'	-59.9'	173.5°	20°51.8'	-59.9'	173.6°	19°52.2'	-59.9'	173.6°	18°52.6'	-59.9'	173.7°	17°52.9'	-60.0'	173.7°	3
4	22°50.7'	-59.9'	173.5°	21°51.1'	-59.9'	173.5°	20°51.5'	-59.9'	173.6°	19°51.9'	-59.9'	173.6°	18°52.2'	-59.9'	173.7°	17°52.6'	-59.9'	173.7°	16°53.0'	-60.0'	173.7°	4
5	21°50.8'	-59.9'	173.6°	20°51.2'	-59.9'	173.6°	19°51.6'	-59.9'	173.6°	18°52.0'	-59.9'	173.7°	17°52.3'	-59.9'	173.7°	16°52.7'	-60.0'	173.8°	15°53.0'	-60.0'	173.8°	5
6	20°50.9'	-59.9'	173.6°	19°51.3'	-59.9'	173.7°	18°51.6'	-59.9'	173.7°	17°52.0'	-59.9'	173.7°	16°52.4'	-59.9'	173.8°	15°52.7'	-60.0'	173.8°	14°53.1'	-60.0'	173.8°	6
7	19°51.0'	-59.9'	173.7°	18°51.3'	-59.9'	173.7°	17°51.7'	-59.9'	173.7°	16°52.1'	-59.9'	173.8°	15°52.4'	-59.9'	173.8°	14°52.8'	-60.0'	173.8°	13°53.1'	-60.0'	173.9°	7
8	18°51.0'	-59.9'	173.7°	17°51.4'	-59.9'	173.8°	16°51.8'	-59.9'	173.8°	15°52.1'	-59.9'	173.8°	14°52.5'	-59.9'	173.9°	13°52.8'	-60.0'	173.9°	12°53.1'	-60.0'	173.9°	8
9	17°51.1'	-59.9'	173.8°	16°51.5'	-59.9'	173.8°	15°51.8'	-59.9'	173.8°	14°52.2'	-59.9'	173.9°	13°52.5'	-59.9'	173.9°	12°52.9'	-60.0'	173.9°	11°53.2'	-60.0'	174.0°	9
10	16°51.2'	-59.9'	173.8°	15°51.5'	-59.9'	173.9°	14°51.9'	-59.9'	173.9°	13°52.2'	-59.9'	173.9°	12°52.6'	-59.9'	174.0°	11°52.9'	-60.0'	174.0°	10°53.2'	-60.0'	174.0°	10
11	15°51.3'	-59.9'	173.9°	14°51.6'	-59.9'	173.9°	13°52.0'	-59.9'	173.9°	12°52.3'	-59.9'	174.0°	11°52.6'	-59.9'	174.0°	10°52.9'	-60.0'	174.0°	9°53.3'	-60.0'	174.0°	11
12	14°51.3'	-59.9'	173.9°	13°51.7'	-59.9'	174.0°	12°52.0'	-59.9'	174.0°	11°52.3'	-59.9'	174.0°	10°52.7'	-59.9'	174.0°	9°53.0'	-60.0'	174.0°	8°53.3'	-60.0'	174.1°	12
13	13°51.4'	-59.9'	174.0°	12°51.7'	-59.9'	174.0°	11°52.1'	-59.9'	174.0°	10°52.4'	-59.9'	174.0°	9°52.7'	-59.9'	174.1°	8°53.0'	-60.0'	174.1°	7°53.4'	-60.0'	174.1°	13
14	12°51.5'	-59.9'	174.0°	11°51.8'	-59.9'	174.1°	10°52.1'	-59.9'	174.1°	9°52.5'	-59.9'	174.1°	8°52.8'	-59.9'	174.1°	7°53.1'	-60.0'	174.1°	6°53.4'	-60.0'	174.1°	14
15	11°51.6'	-59.9'	174.1°	10°51.9'	-59.9'	174.1°	9°52.2'	-59.9'	174.1°	8°52.5'	-59.9'	174.1°	7°52.8'	-59.9'	174.1°	6°53.1'	-60.0'	174.2°	5°53.4'	-60.0'	174.2°	15
16	10°51.6'	-59.9'	174.1°	9°51.9'	-59.9'	174.1°	8°52.3'	-59.9'	174.2°	7°52.6'	-59.9'	174.2°	6°52.9'	-59.9'	174.2°	5°53.2'	-60.0'	174.2°	4°53.5'	-60.0'	174.2°	16
17	9°51.7'	-59.9'	174.2°	8°52.0'	-59.9'	174.2°	7°52.3'	-59.9'	174.2°	6°52.6'	-59.9'	174.2°	5°52.9'	-59.9'	174.2°	4°53.2'	-60.0'	174.2°	3°53.5'	-60.0'	174.2°	17
18	8°51.8'	-59.9'	174.2°	7°52.1'	-59.9'	174.2°	6°52.4'	-59.9'	174.3°	5°52.7'	-59.9'	174.3°	4°53.0'	-59.9'	174.3°	3°53.3'	-60.0'	174.3°	2°53.6'	-60.0'	174.3°	18
19	7°51.8'	-59.9'	174.3°	6°52.1'	-59.9'	174.3°	5°52.4'	-59.9'	174.3°	4°52.7'	-59.9'	174.3°	3°53.0'	-59.9'	174.3°	2°53.3'	-60.0'	174.3°	1°53.6'	-60.0'	174.3°	19
20	6°51.9'	-59.9'	174.3°	5°52.2'	-59.9'	174.3°	4°52.5'	-59.9'	174.3°	3°52.8'	-59.9'	174.4°	2°53.1'	-59.9'	174.4°	1°53.4'	-60.0'	174.4°	<u>0°53.7' -60.0' 174.4°</u>			20
21	5°52.0'	-59.9'	174.4°	4°52.3'	-59.9'	174.4°	3°52.6'	-59.9'	174.4°	2°52.9'	-59.9'	174.4°	1°53.1'	-59.9'	174.4°	<u>0°53.4' -60.0' 174.4°</u>	0°06.3' +60.0'	5.6°	1°06.3' +60.0'	5.6°		21
22	4°52.0'	-59.9'	174.4°	3°52.3'	-59.9'	174.4°	2°52.6'	-59.9'	174.4°	1°52.9'	-59.9'	174.4°	<u>0°53.2' -59.9' 174.4°</u>	0°06.8' +59.9'	5.5°	1°06.5' +60.0'	5.5°	2°06.2' +60.0'	5.5°		22	
23	<u>3°52.1' -59.9' 174.5°</u>	<u>2°52.4' -59.9' 174.5°</u>	<u>1°52.7' -59.9' 174.5°</u>	<u>0°52.9' -59.9' 174.5°</u>																		23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

174° 186° LHA

Latitude SAME as DECLINATION

174° 186° 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 CONTRARY to Declination							5° 355° LHA												
Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°53.3'	-59.9'	174.4°	25°53.6'	-59.9'	174.4°	24°53.9'	-60.0'	174.5°	23°54.2'	-60.0'	174.5°	22°54.4'	-60.0'	174.6°	21°54.7'	-60.0'	174.6°	20°55.0'	-60.0'	174.6°	0
1	25°53.3'	-59.9'	174.4°	24°53.7'	-59.9'	174.5°	23°54.0'	-60.0'	174.5°	22°54.2'	-60.0'	174.6°	21°54.5'	-60.0'	174.6°	20°54.8'	-60.0'	174.6°	19°55.0'	-60.0'	174.7°	1
2	24°53.4'	-59.9'	174.5°	23°53.7'	-59.9'	174.5°	22°54.0'	-60.0'	174.6°	21°54.3'	-60.0'	174.6°	20°54.5'	-60.0'	174.6°	19°54.8'	-60.0'	174.7°	18°55.0'	-60.0'	174.7°	2
3	23°53.5'	-59.9'	174.5°	22°53.8'	-59.9'	174.6°	21°54.0'	-60.0'	174.6°	20°54.3'	-60.0'	174.7°	19°54.6'	-60.0'	174.7°	18°54.8'	-60.0'	174.7°	17°55.1'	-60.0'	174.8°	3
4	22°53.6'	-59.9'	174.6°	21°53.8'	-59.9'	174.6°	20°54.1'	-60.0'	174.7°	19°54.4'	-60.0'	174.7°	18°54.6'	-60.0'	174.7°	17°54.9'	-60.0'	174.8°	16°55.1'	-60.0'	174.8°	4
5	21°53.6'	-59.9'	174.6°	20°53.9'	-60.0'	174.7°	19°54.1'	-60.0'	174.7°	18°54.4'	-60.0'	174.7°	17°54.6'	-60.0'	174.8°	16°54.9'	-60.0'	174.8°	15°55.1'	-60.0'	174.8°	5
6	20°53.7'	-59.9'	174.7°	19°53.9'	-60.0'	174.7°	18°54.2'	-60.0'	174.7°	17°54.4'	-60.0'	174.8°	16°54.7'	-60.0'	174.8°	15°54.9'	-60.0'	174.8°	14°55.2'	-60.0'	174.9°	6
7	19°53.7'	-59.9'	174.7°	18°54.0'	-60.0'	174.8°	17°54.2'	-60.0'	174.8°	16°54.5'	-60.0'	174.8°	15°54.7'	-60.0'	174.8°	14°55.0'	-60.0'	174.9°	13°55.2'	-60.0'	174.9°	7
8	18°53.8'	-59.9'	174.8°	17°54.0'	-60.0'	174.8°	16°54.3'	-60.0'	174.8°	15°54.5'	-60.0'	174.9°	14°54.8'	-60.0'	174.9°	13°55.0'	-60.0'	174.9°	12°55.2'	-60.0'	174.9°	8
9	17°53.8'	-59.9'	174.8°	16°54.1'	-60.0'	174.8°	15°54.3'	-60.0'	174.9°	14°54.6'	-60.0'	174.9°	13°54.8'	-60.0'	174.9°	12°55.0'	-60.0'	174.9°	11°55.3'	-60.0'	175.0°	9
10	16°53.9'	-59.9'	174.9°	15°54.1'	-60.0'	174.9°	14°54.4'	-60.0'	174.9°	13°54.6'	-60.0'	174.9°	12°54.8'	-60.0'	174.9°	11°55.1'	-60.0'	175.0°	10°55.3'	-60.0'	175.0°	10
11	15°53.9'	-59.9'	174.9°	14°54.2'	-60.0'	174.9°	13°54.4'	-60.0'	174.9°	12°54.6'	-60.0'	175.0°	11°54.9'	-60.0'	175.0°	10°55.1'	-60.0'	175.0°	9°55.3'	-60.0'	175.0°	11
12	14°54.0'	-59.9'	174.9°	13°54.2'	-60.0'	175.0°	12°54.5'	-60.0'	175.0°	11°54.7'	-60.0'	175.0°	10°54.9'	-60.0'	175.0°	9°55.1'	-60.0'	175.0°	8°55.4'	-60.0'	175.0°	12
13	13°54.0'	-60.0'	175.0°	12°54.3'	-60.0'	175.0°	11°54.5'	-60.0'	175.0°	10°54.7'	-60.0'	175.0°	9°54.9'	-60.0'	175.1°	8°55.2'	-60.0'	175.1°	7°55.4'	-60.0'	175.1°	13
14	12°54.1'	-60.0'	175.0°	11°54.3'	-60.0'	175.0°	10°54.5'	-60.0'	175.1°	9°54.8'	-60.0'	175.1°	8°55.0'	-60.0'	175.1°	7°55.2'	-60.0'	175.1°	6°55.4'	-60.0'	175.1°	14
15	11°54.1'	-60.0'	175.1°	10°54.4'	-60.0'	175.1°	9°54.6'	-60.0'	175.1°	8°54.8'	-60.0'	175.1°	7°55.0'	-60.0'	175.1°	6°55.2'	-60.0'	175.1°	5°55.4'	-60.0'	175.1°	15
16	10°54.2'	-60.0'	175.1°	9°54.4'	-60.0'	175.1°	8°54.6'	-60.0'	175.1°	7°54.8'	-60.0'	175.1°	6°55.1'	-60.0'	175.2°	5°55.3'	-60.0'	175.2°	4°55.5'	-60.0'	175.2°	16
17	9°54.2'	-60.0'	175.1°	8°54.4'	-60.0'	175.2°	7°54.7'	-60.0'	175.2°	6°54.9'	-60.0'	175.2°	5°55.1'	-60.0'	175.2°	4°55.3'	-60.0'	175.2°	3°55.5'	-60.0'	175.2°	17
18	8°54.3'	-60.0'	175.2°	7°54.5'	-60.0'	175.2°	6°54.7'	-60.0'	175.2°	5°54.9'	-60.0'	175.2°	4°55.1'	-60.0'	175.2°	3°55.3'	-60.0'	175.2°	2°55.5'	-60.0'	175.2°	18
19	7°54.3'	-60.0'	175.2°	6°54.5'	-60.0'	175.2°	5°54.7'	-60.0'	175.2°	4°55.0'	-60.0'	175.3°	3°55.2'	-60.0'	175.3°	2°55.4'	-60.0'	175.3°	1°55.6'	-60.0'	175.3°	19
20	6°54.4'	-60.0'	175.3°	5°54.6'	-60.0'	175.3°	4°54.8'	-60.0'	175.3°	3°55.0'	-60.0'	175.3°	2°55.2'	-60.0'	175.3°	1°55.4'	-60.0'	175.3°	<u>0°55.6' -60.0' 175.3°</u>			20
21	5°54.4'	-60.0'	175.3°	4°54.6'	-60.0'	175.3°	3°54.8'	-60.0'	175.3°	2°55.0'	-60.0'	175.3°	1°55.2'	-60.0'	175.3°	<u>0°55.4' -60.0' 175.3°</u>	0°04.4' +60.0'	4.7°	1°04			

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

4° 356° LHA			Latitude CONTRARY to Declination							4° 356° LHA												
Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°55.7'	-60.0'	175.5°	25°55.9'	-60.0'	175.6°	24°56.1'	-60.0'	175.6°	23°56.3'	-60.0'	175.6°	22°56.4'	-60.0'	175.7°	21°56.6'	-60.0'	175.7°	20°56.8'	-60.0'	175.7°	0
1	25°55.7'	-60.0'	175.6°	24°56.0'	-60.0'	175.6°	23°56.1'	-60.0'	175.6°	22°56.3'	-60.0'	175.7°	21°56.5'	-60.0'	175.7°	20°56.6'	-60.0'	175.7°	19°56.8'	-60.0'	175.7°	1
2	24°55.8'	-60.0'	175.6°	23°56.0'	-60.0'	175.6°	22°56.2'	-60.0'	175.7°	21°56.3'	-60.0'	175.7°	20°56.5'	-60.0'	175.7°	19°56.7'	-60.0'	175.7°	18°56.8'	-60.0'	175.8°	2
3	23°55.8'	-60.0'	175.6°	22°56.0'	-60.0'	175.7°	21°56.2'	-60.0'	175.7°	20°56.4'	-60.0'	175.7°	19°56.5'	-60.0'	175.8°	18°56.7'	-60.0'	175.8°	17°56.8'	-60.0'	175.8°	3
4	22°55.9'	-60.0'	175.7°	21°56.1'	-60.0'	175.7°	20°56.2'	-60.0'	175.7°	19°56.4'	-60.0'	175.8°	18°56.5'	-60.0'	175.8°	17°56.7'	-60.0'	175.8°	16°56.9'	-60.0'	175.8°	4
5	21°55.9'	-60.0'	175.7°	20°56.1'	-60.0'	175.7°	19°56.2'	-60.0'	175.8°	18°56.4'	-60.0'	175.8°	17°56.6'	-60.0'	175.8°	16°56.7'	-60.0'	175.8°	15°56.9'	-60.0'	175.9°	5
6	20°56.0'	-60.0'	175.7°	19°56.1'	-60.0'	175.8°	18°56.3'	-60.0'	175.8°	17°56.4'	-60.0'	175.8°	16°56.6'	-60.0'	175.8°	15°56.8'	-60.0'	175.9°	14°56.9'	-60.0'	175.9°	6
7	19°56.0'	-60.0'	175.8°	18°56.1'	-60.0'	175.8°	17°56.3'	-60.0'	175.8°	16°56.5'	-60.0'	175.8°	15°56.6'	-60.0'	175.9°	14°56.8'	-60.0'	175.9°	13°56.9'	-60.0'	175.9°	7
8	18°56.0'	-60.0'	175.8°	17°56.2'	-60.0'	175.8°	16°56.3'	-60.0'	175.9°	15°56.5'	-60.0'	175.9°	14°56.6'	-60.0'	175.9°	13°56.8'	-60.0'	175.9°	12°57.0'	-60.0'	175.9°	8
9	17°56.1'	-60.0'	175.8°	16°56.2'	-60.0'	175.9°	15°56.4'	-60.0'	175.9°	14°56.5'	-60.0'	175.9°	13°56.7'	-60.0'	175.9°	12°56.8'	-60.0'	175.9°	11°57.0'	-60.0'	176.0°	9
10	16°56.1'	-60.0'	175.9°	15°56.2'	-60.0'	175.9°	14°56.4'	-60.0'	175.9°	13°56.5'	-60.0'	175.9°	12°56.7'	-60.0'	176.0°	11°56.8'	-60.0'	176.0°	10°57.0'	-60.0'	176.0°	10
11	15°56.1'	-60.0'	175.9°	14°56.3'	-60.0'	175.9°	13°56.4'	-60.0'	176.0°	12°56.6'	-60.0'	176.0°	11°56.7'	-60.0'	176.0°	10°56.9'	-60.0'	176.0°	9°57.0'	-60.0'	176.0°	11
12	14°56.2'	-60.0'	176.0°	13°56.3'	-60.0'	176.0°	12°56.4'	-60.0'	176.0°	11°56.6'	-60.0'	176.0°	10°56.7'	-60.0'	176.0°	9°56.9'	-60.0'	176.0°	8°57.0'	-60.0'	176.0°	12
13	13°56.2'	-60.0'	176.0°	12°56.3'	-60.0'	176.0°	11°56.5'	-60.0'	176.0°	10°56.6'	-60.0'	176.0°	9°56.8'	-60.0'	176.0°	8°56.9'	-60.0'	176.1°	7°57.0'	-60.0'	176.1°	13
14	12°56.2'	-60.0'	176.0°	11°56.4'	-60.0'	176.0°	10°56.5'	-60.0'	176.0°	9°56.6'	-60.0'	176.1°	8°56.8'	-60.0'	176.1°	7°56.9'	-60.0'	176.1°	6°57.1'	-60.0'	176.1°	14
15	11°56.2'	-60.0'	176.1°	10°56.4'	-60.0'	176.1°	9°56.5'	-60.0'	176.1°	8°56.7'	-60.0'	176.1°	7°56.8'	-60.0'	176.1°	6°56.9'	-60.0'	176.1°	5°57.1'	-60.0'	176.1°	15
16	10°56.3'	-60.0'	176.1°	9°56.4'	-60.0'	176.1°	8°56.6'	-60.0'	176.1°	7°56.7'	-60.0'	176.1°	6°56.8'	-60.0'	176.1°	5°57.0'	-60.0'	176.1°	4°57.1'	-60.0'	176.1°	16
17	9°56.3'	-60.0'	176.1°	8°56.4'	-60.0'	176.1°	7°56.6'	-60.0'	176.1°	6°56.7'	-60.0'	176.1°	5°56.9'	-60.0'	176.2°	4°57.0'	-60.0'	176.2°	3°57.1'	-60.0'	176.2°	17
18	8°56.3'	-60.0'	176.1°	7°56.5'	-60.0'	176.2°	6°56.6'	-60.0'	176.2°	5°56.7'	-60.0'	176.2°	4°56.9'	-60.0'	176.2°	3°57.0'	-60.0'	176.2°	2°57.1'	-60.0'	176.2°	18
19	7°56.4'	-60.0'	176.2°	6°56.5'	-60.0'	176.2°	5°56.6'	-60.0'	176.2°	4°56.8'	-60.0'	176.2°	3°56.9'	-60.0'	176.2°	2°57.0'	-60.0'	176.2°	1°57.2'	-60.0'	176.2°	19
20	6°56.4'	-60.0'	176.2°	5°56.5'	-60.0'	176.2°	4°56.7'	-60.0'	176.2°	3°56.8'	-60.0'	176.2°	2°56.9'	-60.0'	176.2°	1°57.1'	-60.0'	176.2°	<u>0°57.2'</u>	-60.0'	176.2°	20
21	5°56.4'	-60.0'	176.2°	4°56.6'	-60.0'	176.3°	3°56.7'	-60.0'	176.3°	2°56.8'	-60.0'	176.3°	1°56.9'	-60.0'	176.3°	<u>0°57.1'</u>	-60.0'	176.3°	0°02.8'	+60.0'	3.7°	21
22	4°56.5'	-60.0'	176.3°	3°56.6'	-60.0'	176.3°	2°56.7'	-60.0'	176.3°	1°56.8'	-60.0'	176.3°	<u>0°57.0'</u>	-60.0'	176.3°	0°02.9'	+60.0'	3.7°	1°02.8'	+60.0'	3.7°	22
23	<u>3°56.5'</u>	-60.0'	176.3°	<u>2°56.6'</u>	-60.0'	176.3°	<u>1°56.7'</u>	-60.0'	176.3°	<u>0°56.9'</u>	-60.0'	176.3°	0°03.0'	+60.0'	3.7°	1°02.9'	+60.0'	3.7°	2°02.8'	+60.0'	3.7°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

176° 184° LHA

Latitude SAME as DECLINATION

176° 184° LHA

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

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

3° 357° LHA			Latitude CONTRARY to Declination							3° 357° LHA												
Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	26°57.5'	-60.0'	176.6°	25°57.7'	-60.0'	176.7°	24°57.8'	-60.0'	176.7°	23°57.9'	-60.0'	176.7°	22°58.0'	-60.0'	176.7°	21°58.1'	-60.0'	176.8°	20°58.2'	-60.0'	176.8°	0
1	25°57.6'	-60.0'	176.7°	24°57.7'	-60.0'	176.7°	23°57.8'	-60.0'	176.7°	22°57.9'	-60.0'	176.7°	21°58.0'	-60.0'	176.8°	20°58.1'	-60.0'	176.8°	19°58.2'	-60.0'	176.8°	1
2	24°57.6'	-60.0'	176.7°	23°57.7'	-60.0'	176.7°	22°57.8'	-60.0'	176.7°	21°57.9'	-60.0'	176.8°	20°58.0'	-60.0'	176.8°	19°58.1'	-60.0'	176.8°	18°58.2'	-60.0'	176.8°	2
3	23°57.7'	-60.0'	176.7°	22°57.8'	-60.0'	176.7°	21°57.9'	-60.0'	176.8°	20°58.0'	-60.0'	176.8°	19°58.0'	-60.0'	176.8°	18°58.1'	-60.0'	176.8°	17°58.2'	-60.0'	176.9°	3
4	22°57.7'	-60.0'	176.7°	21°57.8'	-60.0'	176.8°	20°57.9'	-60.0'	176.8°	19°58.0'	-60.0'	176.8°	18°58.1'	-60.0'	176.8°	17°58.1'	-60.0'	176.9°	16°58.2'	-60.0'	176.9°	4
5	21°57.7'	-60.0'	176.8°	20°57.8'	-60.0'	176.8°	19°57.9'	-60.0'	176.8°	18°58.0'	-60.0'	176.8°	17°58.1'	-60.0'	176.9°	16°58.2'	-60.0'	176.9°	15°58.3'	-60.0'	176.9°	5
6	20°57.7'	-60.0'	176.8°	19°57.8'	-60.0'	176.8°	18°57.9'	-60.0'	176.8°	17°58.0'	-60.0'	176.9°	16°58.1'	-60.0'	176.9°	15°58.2'	-60.0'	176.9°	14°58.3'	-60.0'	176.9°	6
7	19°57.7'	-60.0'	176.8°	18°57.8'	-60.0'	176.9°	17°57.9'	-60.0'	176.9°	16°58.0'	-60.0'	176.9°	15°58.1'	-60.0'	176.9°	14°58.2'	-60.0'	176.9°	13°58.3'	-60.0'	176.9°	7
8	18°57.8'	-60.0'	176.9°	17°57.8'	-60.0'	176.9°	16°57.9'	-60.0'	176.9°	15°58.0'	-60.0'	176.9°	14°58.1'	-60.0'	176.9°	13°58.2'	-60.0'	176.9°	12°58.3'	-60.0'	177.0°	8
9	17°57.8'	-60.0'	176.9°	16°57.9'	-60.0'	176.9°	15°58.0'	-60.0'	176.9°	14°58.0'	-60.0'	176.9°	13°58.1'	-60.0'	176.9°	12°58.2'	-60.0'	177.0°	11°58.3'	-60.0'	177.0°	9
10	16°57.8'	-60.0'	176.9°	15°57.9'	-60.0'	176.9°	14°58.0'	-60.0'	176.9°	13°58.1'	-60.0'	177.0°	12°58.1'	-60.0'	177.0°	11°58.2'	-60.0'	177.0°	10°58.3'	-60.0'	177.0°	10
11	15°57.8'	-60.0'	176.9°	14°57.9'	-60.0'	177.0°	13°58.0'	-60.0'	177.0°	12°58.1'	-60.0'	177.0°	11°58.2'	-60.0'	177.0°	10°58.2'	-60.0'	177.0°	9°58.3'	-60.0'	177.0°	11
12	14°57.8'	-60.0'	177.0°	13°57.9'	-60.0'	177.0°	12°58.0'	-60.0'	177.0°	11°58.1'	-60.0'	177.0°	10°58.2'	-60.0'	177.0°	9°58.2'	-60.0'	177.0°	8°58.3'	-60.0'	177.0°	12
13	13°57.9'	-60.0'	177.0°	12°57.9'	-60.0'	177.0°	11°58.0'	-60.0'	177.0°	10°58.1'	-60.0'	177.0°	9°58.2'	-60.0'	177.0°	8°58.3'	-60.0'	177.0°	7°58.3'	-60.0'	177.0°	13
14	12°57.9'	-60.0'	177.0°	11°58.0'	-60.0'	177.0°	10°58.0'	-60.0'	177.0°	9°58.1'	-60.0'	177.0°	8°58.2'	-60.0'	177.1°	7°58.3'	-60.0'	177.1°	6°58.3'	-60.0'	177.1°	14
15	11°57.9'	-60.0'	177.0°	10°58.0'	-60.0'	177.0°	9°58.0'	-60.0'	177.1°	8°58.1'	-60.0'	177.1°	7°58.2'	-60.0'	177.1°	6°58.3'	-60.0'	177.1°	5°58.4'	-60.0'	177.1°	15
16	10°57.9'	-60.0'	177.1°	9°58.0'	-60.0'	177.1°	8°58.1'	-60.0'	177.1°	7°58.1'	-60.0'	177.1°	6°58.2'	-60.0'	177.1°	5°58.3'	-60.0'	177.1°	4°58.4'	-60.0'	177.1°	16
17	9°57.9'	-60.0'	177.1°	8°58.0'	-60.0'	177.1°	7°58.1'	-60.0'	177.1°	6°58.2'	-60.0'	177.1°	5°58.2'	-60.0'	177.1°	4°58.3'	-60.0'	177.1°	3°58.4'	-60.0'	177.1°	17
18	8°57.9'	-60.0'	177.1°	7°58.0'	-60.0'	177.1°	6°58.1'	-60.0'	177.1°	5°58.2'	-60.0'	177.1°	4°58.2'	-60.0'	177.1°	3°58.3'	-60.0'	177.1°	2°58.4'	-60.0'	177.1°	18
19	7°58.0'	-60.0'	177.1°	6°58.0'	-60.0'	177.1°	5°58.1'	-60.0'	177.1°	4°58.2'	-60.0'	177.2°	3°58.3'	-60.0'	177.2°	2°58.3'	-60.0'	177.2°	1°58.4'	-60.0'	177.2°	19
20	6°58.0'	-60.0'	177.2°	5°58.0'	-60.0'	177.2°	4°58.1'	-60.0'	177.2°	3°58.2'	-60.0'	177.2°	2°58.3'	-60.0'	177.2°	1°58.3'	-60.0'	177.2°	<u>0°58.4'</u>	-60.0'	177.2°	20
21	5°58.0'	-60.0'	177.2°	4°58.1'	-60.0'	177.2°	3°58.1'	-60.0'	177.2°	2°58.2'	-60.0'	177.2°	1°58.3'	-60.0'	177.2°	<u>0°58.4'</u>	-60.0'	177.2°	0°01.6'	+60.0'	2.8°	2



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

0° 360° LHA		Latitude CONTRARY to Declination						0° 360° LHA														
Dec°	63			64			65			66			67			68			69			Dec°
	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	
0	27°00.0'	-60.0'	180.0°	26°00.0'	-60.0'	180.0°	25°00.0'	-60.0'	180.0°	24°00.0'	-60.0'	180.0°	23°00.0'	-60.0'	180.0°	22°00.0'	-60.0'	180.0°	21°00.0'	-60.0'	180.0°	0
1	26°00.0'	-60.0'	180.0°	25°00.0'	-60.0'	180.0°	24°00.0'	-60.0'	180.0°	23°00.0'	-60.0'	180.0°	22°00.0'	-60.0'	180.0°	21°00.0'	-60.0'	180.0°	20°00.0'	-60.0'	180.0°	1
2	25°00.0'	-60.0'	180.0°	24°00.0'	-60.0'	180.0°	23°00.0'	-60.0'	180.0°	22°00.0'	-60.0'	180.0°	21°00.0'	-60.0'	180.0°	20°00.0'	-60.0'	180.0°	19°00.0'	-60.0'	180.0°	2
3	24°00.0'	-60.0'	180.0°	23°00.0'	-60.0'	180.0°	22°00.0'	-60.0'	180.0°	21°00.0'	-60.0'	180.0°	20°00.0'	-60.0'	180.0°	19°00.0'	-60.0'	180.0°	18°00.0'	-60.0'	180.0°	3
4	23°00.0'	-60.0'	180.0°	22°00.0'	-60.0'	180.0°	21°00.0'	-60.0'	180.0°	20°00.0'	-60.0'	180.0°	19°00.0'	-60.0'	180.0°	18°00.0'	-60.0'	180.0°	17°00.0'	-60.0'	180.0°	4
5	22°00.0'	-60.0'	180.0°	21°00.0'	-60.0'	180.0°	20°00.0'	-60.0'	180.0°	19°00.0'	-60.0'	180.0°	18°00.0'	-60.0'	180.0°	17°00.0'	-60.0'	180.0°	16°00.0'	-60.0'	180.0°	5
6	21°00.0'	-60.0'	180.0°	20°00.0'	-60.0'	180.0°	19°00.0'	-60.0'	180.0°	18°00.0'	-60.0'	180.0°	17°00.0'	-60.0'	180.0°	16°00.0'	-60.0'	180.0°	15°00.0'	-60.0'	180.0°	6
7	20°00.0'	-60.0'	180.0°	19°00.0'	-60.0'	180.0°	18°00.0'	-60.0'	180.0°	17°00.0'	-60.0'	180.0°	16°00.0'	-60.0'	180.0°	15°00.0'	-60.0'	180.0°	14°00.0'	-60.0'	180.0°	7
8	19°00.0'	-60.0'	180.0°	18°00.0'	-60.0'	180.0°	17°00.0'	-60.0'	180.0°	16°00.0'	-60.0'	180.0°	15°00.0'	-60.0'	180.0°	14°00.0'	-60.0'	180.0°	13°00.0'	-60.0'	180.0°	8
9	18°00.0'	-60.0'	180.0°	17°00.0'	-60.0'	180.0°	16°00.0'	-60.0'	180.0°	15°00.0'	-60.0'	180.0°	14°00.0'	-60.0'	180.0°	13°00.0'	-60.0'	180.0°	12°00.0'	-60.0'	180.0°	9
10	17°00.0'	-60.0'	180.0°	16°00.0'	-60.0'	180.0°	15°00.0'	-60.0'	180.0°	14°00.0'	-60.0'	180.0°	13°00.0'	-60.0'	180.0°	12°00.0'	-60.0'	180.0°	11°00.0'	-60.0'	180.0°	10
11	16°00.0'	-60.0'	180.0°	15°00.0'	-60.0'	180.0°	14°00.0'	-60.0'	180.0°	13°00.0'	-60.0'	180.0°	12°00.0'	-60.0'	180.0°	11°00.0'	-60.0'	180.0°	10°00.0'	-60.0'	180.0°	11
12	15°00.0'	-60.0'	180.0°	14°00.0'	-60.0'	180.0°	13°00.0'	-60.0'	180.0°	12°00.0'	-60.0'	180.0°	11°00.0'	-60.0'	180.0°	10°00.0'	-60.0'	180.0°	9°00.0'	-60.0'	180.0°	12
13	14°00.0'	-60.0'	180.0°	13°00.0'	-60.0'	180.0°	12°00.0'	-60.0'	180.0°	11°00.0'	-60.0'	180.0°	10°00.0'	-60.0'	180.0°	8°60.0'	-60.0'	180.0°	8°00.0'	-60.0'	180.0°	13
14	13°00.0'	-60.0'	180.0°	12°00.0'	-60.0'	180.0°	11°00.0'	-60.0'	180.0°	10°00.0'	-60.0'	180.0°	9°00.0'	-60.0'	180.0°	7°60.0'	-60.0'	180.0°	7°00.0'	-60.0'	180.0°	14
15	12°00.0'	-60.0'	180.0°	11°00.0'	-60.0'	180.0°	10°00.0'	-60.0'	180.0°	9°00.0'	-60.0'	180.0°	8°00.0'	-60.0'	180.0°	7°00.0'	-60.0'	180.0°	6°00.0'	-60.0'	180.0°	15
16	11°00.0'	-60.0'	180.0°	10°00.0'	-60.0'	180.0°	9°00.0'	-60.0'	180.0°	8°00.0'	-60.0'	180.0°	7°00.0'	-60.0'	180.0°	6°00.0'	-60.0'	180.0°	5°00.0'	-60.0'	180.0°	16
17	10°00.0'	-60.0'	180.0°	9°00.0'	-60.0'	180.0°	8°00.0'	-60.0'	180.0°	7°00.0'	-60.0'	180.0°	5°60.0'	-60.0'	180.0°	4°60.0'	-60.0'	180.0°	4°00.0'	-60.0'	180.0°	17
18	9°00.0'	-60.0'	180.0°	8°00.0'	-60.0'	180.0°	7°00.0'	-60.0'	180.0°	6°00.0'	-60.0'	180.0°	5°00.0'	-60.0'	180.0°	4°00.0'	-60.0'	180.0°	3°00.0'	-60.0'	180.0°	18
19	8°00.0'	-60.0'	180.0°	7°00.0'	-60.0'	180.0°	6°00.0'	-60.0'	180.0°	5°00.0'	-60.0'	180.0°	3°60.0'	-60.0'	180.0°	3°00.0'	-60.0'	180.0°	2°00.0'	-60.0'	180.0°	19
20	7°00.0'	-60.0'	180.0°	6°00.0'	-60.0'	180.0°	5°00.0'	-60.0'	180.0°	4°00.0'	-60.0'	180.0°	3°00.0'	-60.0'	180.0°	2°00.0'	-60.0'	180.0°	1°00.0'	-60.0'	180.0°	20
21	6°00.0'	-60.0'	180.0°	5°00.0'	-60.0'	180.0°	4°00.0'	-60.0'	180.0°	3°00.0'	-60.0'	180.0°	2°00.0'	-60.0'	180.0°	0°60.0'	-60.0'	180.0°	0°00.0'	-60.0'	180.0°	21
22	5°00.0'	-60.0'	180.0°	4°00.0'	-60.0'	180.0°	3°00.0'	-60.0'	180.0°	2°00.0'	-60.0'	180.0°	0°60.0'	-60.0'	180.0°	0°00.0'	+60.0'	0.0°	0°60.0'	+60.0'	0.0°	22
23	4°00.0'	-60.0'	180.0°	3°00.0'	-60.0'	180.0°	2°00.0'	-60.0'	180.0°	1°00.0'	-60.0'	180.0°	0°00.0'	+60.0'	0.0°	1°00.0'	+60.0'	0.0°	1°60.0'	+60.0'	0.0°	23
Dec°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Hc°	d'	Z°	Dec°
	63			64			65			66			67			68			69			

180° 180° LHA

Latitude SAME as DECLINATION

180° 180° 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 = Actual measure altitude  
 Ha = Hs +/- Index Error (IE) - Dip  
 Altitude Corrections  
 Ho = True Observed Altitude  
 Ho = Ha + Parallax - 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**







